# PROJECT MANUAL

of the Material and Labor Required for Construction of:

Bartos Architecture Project Number
**21-012**

# Los Gatos High School
## Wellness Center

for

## Los Gatos – Saratoga
## Joint Union High School District
17421 Farley Road West
Los Gatos, California 95030

## Bids - December 13, 2022
## @ 2:30 pm

DSA Submittal Date:
26 April 2022

DSA Application Number:
01- 120127

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-120127 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 10/12/2022

# PROJECT MANUAL

of the Material and Labor
Required for Construction of

## Los Gatos High School
Wellness Center
20 High School Court, Los Gatos, California

## Los Gatos-Saratoga Joint Union High School District
17421 Farley Road West
Los Gatos, California 95030

**Architect**

Bartos Architecture, Inc
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San Mateo, CA. 94401

Mark Bartos, Architect

**Structural Engineer**

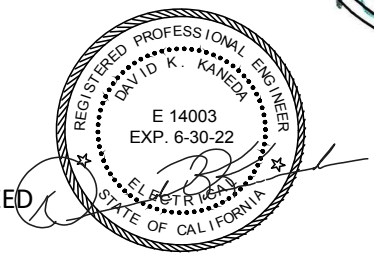
Rinne & Peterson
1121 San Antonio Road
Palo Alto, CA. 94303

Rodney Hartunian, SE

**Electrical Engineer**

IDeAs Consulting
21350 Vai Avenue
Cupertino, CA. 95014

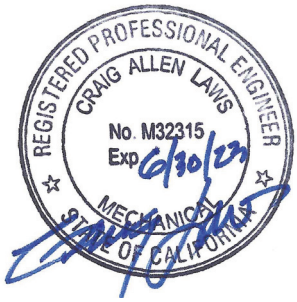
David Kaneda, PE, FAIA, LEED




**Mechanical Engineer**

Laws & Associates
1801 Murchison Dr. Suite 160
Burlingame, CA 94010

Craig Laws, P.E.



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# NOTICE TO BIDDERS / INVITATION TO BID

1. Notice is hereby given that the governing board ("Board") of the **Los Gatos Saratoga Joint Union High School District** ("District") will receive sealed bids for the following project:

   **Los Gatos High School Wellness Center** ("Project" or "Contract")

2. Sealed Bids will be received until 2:30 p.m., December 13, 2022, at the District Office, located at 17421 Farley Road West, Los Gatos, California 95030, at or after which time the bids will be opened and publicly read aloud. Any claim by a bidder of error in its bid must be made in compliance with section 5100 et seq. of the Public Contract Code. Any bid that is submitted after this time shall be non-responsive and returned to the bidder.

3. The Project consists of:

   **Five New Offices at the Los Gatos High School Wellness Center**

4. All bids shall be on the form provided by the District. Each bid must conform and be responsive to all pertinent Contract Documents, including, but not limited to, the Instructions to Bidders.

5. To bid on this Project, the Bidder is required to possess one or more of the following State of California Contractor Licenses: **B - General Building**

   The Bidder's license(s) must be active and in good standing at the time of the bid opening and must remain so throughout the term of the Contract.

6. As security for its Bid, each bidder shall provide with its Bid form
   - a bid bond issued by an admitted surety insurer on the form provided by the District,
   - cash, or
   - a cashier's check or a certified check, drawn to the order of the **Los Gatos Saratoga Joint Union High School District**,

   in the amount of ten percent (10%) of the total bid price. This bid security shall be a guarantee that the Bidder shall, within seven (7) calendar days after the date of the Notice of Award, enter into a contract with the District for the performance of the services as stipulated in the bid.

7. The successful Bidder shall be required to furnish a 100% Performance Bond and a 100% Payment Bond if it is awarded the contract for the Project.

8. The successful Bidder may substitute securities for any monies withheld by the District to ensure performance under the Contract, in accordance with the provisions of section 22300 of the Public Contract Code.

9. The successful Bidder and its subcontractors shall pay all workers on the Project not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial

Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code. Prevailing wage rates are on file with the District and are available to any interested party on request or at **www.dir.ca.gov/oprl/statistics_and_databases.html**. Bidders and Bidders' subcontractors shall comply with the registration and qualification requirements pursuant to sections 1725.5 and 1771.1 of the California Labor Code.

10. A voluntary pre-bid conference and site visit will be held on **December 1, 2022, at 2 p.m**. at 20 High School Court, Los Gatos, California 95030. All participants are required to sign in at the Administration Building. The Site Visit is expected to take approximately one (1) hour.

11. Contract Documents are available on December 26, 2021, for review at the District Facilities Office. In addition, Contract Documents are available for review at the following builders' exchanges:

    Contract Documents are also available on November 22, 2022, and are available electronically by contacting Greystone West Company, brenda@greystonewest.com or 707-933-0624.

12. The District's Board reserves the right to reject any and all bids and/or waive any irregularity in any bid received. If the District awards the Contract, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

13. District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on the base bid amount only.

Los Gatos Saratoga Union High School
By: Delores Perley, Assistant Superintendent, Business/CBO
Publication Dates: (1) November 22, 2022 (2) November 29, 2022

**End of Section**

Section 00 21 13

# INSTRUCTIONS TO BIDDERS

Bidders shall follow the instructions in this document, and shall submit all documents, forms, and information required for consideration of a Bid.

**Los Gatos Saratoga Joint Union High School District** ("District") will evaluate information submitted by the apparent low Bidder and, if incomplete or unsatisfactory to District, Bidder's bid may be rejected at the sole discretion of District.

1. **Project.** Bids are requested for a general construction contract, or work described in general, for the following project:

   **Los Gatos High School Wellness Center** ("Project" or "Contract")

2. **Sealed Bids.** District will receive sealed Bids from Bidders as indicated in the Invitation to Bid and each Bidder shall ensure that its Bid:

   a. Is sealed and marked with name and address of the Bidder, the Project name and number, the bid number and bid package (if applicable), and the date for opening bids;

   b. Contains all documents as required herein; and

   c. Is submitted by date and time shown in the Invitation to Bid.

3. **Bid Opening.** Bids will be opened at or after the time indicated for receipt of bids.

4. **Complete Bids.** Bidders must supply all information required by each Bid Document. Bids must be full and complete. District reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid. Each Bidder must complete and submit all of the following documents as its Bid:

   - Bid Form
   - Bid Bond or other security
   - Designated Subcontractors List
   - Noncollusion Declaration
   - Iran Contracting Act Certification

   a. **Bid Form.** Bidders must submit Bids on the Bid Form and all other required District forms. Bids not submitted on the District's required forms shall be deemed non-responsive and shall not be considered. Additional sheets required to fully respond to requested information are permissible. Bidders shall not modify the Bid Form or qualify their Bids. Bidders shall not submit scanned, re-typed, word-processed, or otherwise recreated versions of the Bid Form or other District-provided documents.

   b. **Bid Bond or Other Security.** Bidders must submit their Bid Form with cash, a cashier's check or a certified check payable to District, or a bid bond by an admitted surety insurer of not less than ten percent (10%) of their base Bid amount, including all additive alternates. Required form of corporate surety, Bid Bond, is provided by District and must be used and fully completed by Bidders choosing to provide a Bid Bond as security. The Surety on Bidders' Bid Bond must be an insurer admitted in

the State of California and authorized to issue surety bonds in the State of California. Bids submitted without necessary bid security will be deemed non-responsive and will not be considered.

c. **Designated Subcontractors List.** Bidders must submit with the Bid the Designated Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of total Bid. Failure to fully complete and submit this list when required by law shall result in Bid being deemed non-responsive and the Bid will not be considered.

d. **Noncollusion Declaration.** Bidders shall submit the Noncollusion Declaration with their Bids. Bids submitted without the Noncollusion Declaration shall be deemed non-responsive and will not be considered.

e. **Iran Contracting Act Certification.** Bidders shall submit the Iran Contracting Act Certification with their Bids. Bids submitted without the Iran Contracting Act Certification shall be deemed non-responsive and will not be considered.

5. **Erasures.** Bids shall be clearly written without erasure or deletions. District reserves the right to reject any Bid containing erasures or deletions.

6. **Words / Numerals.** Discrepancies between written words and figures, or words and numerals, will be resolved in favor of written words.

7. **Prevailing Wages.** Pursuant to sections 1770 et seq. of the California Labor Code, Bidder and all Subcontractors under the Bidder shall pay all workers on all work performed pursuant to the Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the State of California Department of Industrial Relations (DIR) for the type of work performed and the locality in which the work is to be performed within the boundaries of the District. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by the DIR are on file with the District and are available to any interested party on request or at **www.dir.ca.gov/oprl/statistics_and_databases.html**.

8. **Contractor Registration.** Bidder shall ensure that it and its Subcontractors comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including furnishing its CPRs to the Labor Commissioner, and are registered pursuant to Labor Code section 1725.5. Bidder and its subcontractors shall comply with Labor Code section 1725.5 to be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of the Contract.

9. **DVBE.** Section 17076.11 of the Education Code requires school districts using funds allocated pursuant to the State of California School Facility Program for the construction and/or modernization of school building(s) to have a participation goal for disabled veteran business enterprises (“DVBE”) of at least three percent (3%) per year of the overall dollar amount expended on projects that receive state funding. For any project that is at least partially state-funded, the low Bidder must submit certification of compliance with the procedures for implementation of DVBE contracting goals with its signed Agreement. DVBE Certification Participation Forms are attached. Bidders should not submit these forms with their Bids.

10. **Bidder Diligence.** Submission of Bid signifies careful examination of the Contract Documents and a complete understanding of the nature, extent, and location of Work to be performed. Bidders must complete the tasks listed below as a condition to bidding, and submission of Bid shall constitute the Bidder's express representation to District that Bidder has fully completed the following:

    a. Bidder has visited the Project Site, if required, and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions and federal, state and local laws, and regulations that in any manner may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;

    b. Bidder has conducted or obtained and has understood all examinations, investigations, explorations, tests, reports, and studies that pertain to the subsurface conditions, as-built conditions, underground facilities, and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance, or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Price, within the Contract Time, and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by Bidder for those purposes;

    c. Bidder has correlated its knowledge and the results of all observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents;

    d. Bidder has given the District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and the actual conditions, and the written resolution thereof by the District is acceptable to Bidder;

    e. Bidder has made a complete disclosure in writing to the District of all facts bearing upon any possible interest, direct or indirect, that Bidder believes any representative of the District or other officer or employee of the District presently has or will have in this Contract or in the performance thereof or in any portion of the profits thereof;

    f. Bidder must, prior to bidding, perform the work, investigations, research, and analysis required by the Instructions to Bidders and that Bidder represented in its Bid Form and the Agreement that it performed prior to bidding. Bidder is charged with all information and knowledge that a reasonable bidder would ascertain from having performed this required work, investigation, research, and analysis. Bid prices must include entire cost of all work “incidental” to completion of the Work.

    g. **Conditions Shown on the Contract Documents**: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents, e.g., on Drawings or in Specifications, has been obtained with reasonable care, and has been recorded in good faith. However, District only warrants, and Bidder may only rely, on the accuracy of limited types of information.

        (1) As to above-ground conditions or as-built conditions shown or indicated in the Contract Documents, there is no warranty, express or implied, or any representation express or implied, that this information is correctly shown or

indicated. This information is verifiable by independent investigation and Bidder is required to make that verification as a condition to bidding. In submitting its Bid, Bidder shall rely on the results of its own independent investigation. In submitting its Bid, Bidder shall not rely on District-supplied information regarding above-ground conditions or as-built conditions.

(2) As to any subsurface condition shown or indicated in the Contract Documents, Bidder may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated. District is not responsible for the completeness of this information for bidding or construction; nor is District responsible in any way for any conclusions or opinions of Bidder drawn from that information; nor is District responsible for subsurface conditions that are not specifically shown (for example, District is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown).

h. **Conditions Shown in Reports and Drawings Supplied for Informational Purposes**: Reference is made to the document entitled Existing Information and Documentation Regarding Project Site, for identification of:

(1) Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Project Site that have been utilized by Architect in preparing the Contract Documents; and

(2) Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Project Site that has been utilized by Architect in preparing the Contract Documents.

(3) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Existing Information and Documentation Regarding Project Site, and underground facilities data, Bidder may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, Bidder must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by District.

11. **As-Builts.** Bidders may examine any available "as-built" drawings of previous work by giving District reasonable advance notice. District will not be responsible for accuracy of "as-built" drawings. The document entitled Existing Information and Documentation Regarding Project Site applies to all supplied "as-built" drawings.

12. **Questions.** All questions about the meaning or intent of the Contract Documents are to be directed in writing to the District. Interpretations or clarifications considered necessary by the District in response to those questions will be issued in writing by Addenda faxed, mailed, or delivered to all parties recorded by the District as having received the Contract Documents. Questions received less than **SEVEN (7)** calendar days prior to the date for opening Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

13. **Addenda.** Addenda may also be issued to modify parts of the Contract Documents as deemed advisable by the District. Bidder must acknowledge each Addendum in its Bid Form by number or its Bid may be considered non-responsive. Each Addenda shall be part of the Contract Documents. A complete listing of Addenda may be obtained from

the District.

14. **Substitution for Specified Items**. Bids shall be based on products and systems specified in Contract Documents or listed by name in Addenda. All requests must comply with the requirements specified in the General Conditions, the Specifications and the following:

    a. **Request for Substitution Prior to Bid**.

        (1) District must receive any request for substitution a minimum of **FOURTEEN (14)** calendar days prior to the date of bid opening.

        (2) **Information with Request.** Requests for substitutions shall contain sufficient information to assess acceptability of the product or system and impact to Project, including, without limitation, the requirements specified in the General Conditions and the Specifications. Insufficient information shall be grounds for rejection of substitution.

        (3) The District's denial of a substitution request prior to the date of bid opening shall be conclusive, requiring Bidders to list only approved items. The District is not responsible and/or liable in any way for a Bidder's damages and/or claims related, in any way, to that Bidder's basing its bid on any requested substitution that the District has not approved. Bidder's Bid shall be deemed non-responsive if it identifies a product or manufacturer of a non-approved substitution.

        (4) Approved substitutions shall be listed in Addenda.

        (5) District reserves the right not to act upon submittals of substitutions until after the date of bid opening. If the District does not act on a substitution request prior to the date of bid opening, Bidders must bid based on products and systems specified in Contract Documents or listed by name in Addenda.

    b. **Request for Substitution after Bid Award**. Substitutions may be requested after Contract has been awarded only if indicated in and in accordance with requirements specified in the Agreement.

15. **Alternates.** The Contract may include alternates. Alternates are defined as alternate products, materials, equipment, systems, methods, or major elements of the construction, that may, at the District's option and under terms established in the Contract and pursuant to section 20103.8 of the Public Contract Code, be selected for the Work. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on the criteria as indicated in the Invitation to Bid.

16. **Notice of Award.** The Bidder awarded the Contract shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7TH)** calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles District to, among other remedies, make a claim against Bidder's Bid Bond or deposit Bidder's cash, cashier's check, or certified check. The proceeds thereof may be retained by District as liquidated damages, in District's sole discretion.

    a. Agreement: To be executed by successful Bidder. Submit four (4) copies, each bearing an original signature.

    b. Escrow of Bid Documentation: This must include all required documentation. See the

document Escrow of Bid Documentation for more information.

c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

d. Payment Bond (100%) (Contractor's Labor and Material Bond): On the form provided in the Contract Documents and fully executed as indicated on the form.

e. Insurance Certificates and Endorsements as required.

f. Certifications to be Completed by Contractor

g. Disabled Veterans' Business Enterprise Participation Certification.

h. Criminal Background Investigation/Fingerprinting Certification.

17. **Notice to Proceed**. District may issue a Notice to Proceed within **THREE (3)** months from the date of the Notice of Award. Upon receipt of the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation or additional time when the Notice to Proceed is issued within the 3-month period.

    a. The District may postpone issuing the Notice to Proceed beyond the 3-month period, upon reasonable notice to Contractor.

    b. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed beyond the 3-month period. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to Contractor, the Contractor may terminate the Contract. Contractor's termination due to a postponement beyond the 3-month period shall be by written notice to District within **SEVEN (7)** calendar days after receipt by Contractor of District's notice of postponement.

    c. It is further understood by Contractor that in the event Contractor terminates the Contract as a result of postponement by the District, District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement and which the District had in writing authorized Contractor to perform prior to issuing a Notice to Proceed.

    d. Should Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.

18. **Bid Protests.** Any bid protest by any Bidder regarding any other bid on this Project must be submitted in writing to the District, before 5:00 p.m. of the **THIRD (3rd)** Business Day following the date of bid opening.

    a. The protest must contain a complete statement of any and all bases for the protest.

    b. The protest must refer to the specific portions of all documents that form the bases for the protest, including the specific portion(s) of the bid(s) that the Bidder is protesting.

c. The protest must include the name, address and telephone number of the person representing the protesting party.

d. The party filing the protest must concurrently transmit a copy of the protest and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest, which must include all other bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

e. The procedure and time limits set forth in this paragraph are mandatory and are each bidder's sole and exclusive remedy in the event of bid protest. Failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

19. **Rejection of Bids.** District reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids, to re-bid, and to reject the bid of any bidder if District believes that it would not be in the best interest of the District to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by District. District also reserves the right to waive inconsequential deviations not involving price, time, or changes in the Work. For purposes of this paragraph, an "unbalanced bid" is one having nominal prices for work item(s) that represent substantive work and/or overly-enhanced prices for nominal work item(s).

20. **Bidder Responsibility.** Prior to the award of Contract, District reserves the right to consider the responsibility of the Bidder. District may conduct investigations as District deems necessary to assist in the evaluation of any bid and to establish the responsibility, including, without limitation, qualifications and financial ability of Bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to District's satisfaction within the Contract Time.

**End of Section**

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Section 00 31 19

# EXISTING INFORMATION AND DOCUMENTATION REGARDING PROJECT SITE

## 1.01 Summary

This document describes existing conditions at or near the Project and use of information available regarding existing conditions. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein. Contractor is required to request from the District a copy of any reports that it believes are necessary to perform Contractor's Work in a safe, efficient and workman-like manner.

## 1.02 Reports and Information on Existing Conditions

A. Documents providing a general description of the Site and conditions of the Work may have been collected by District, its consultants, contractors, and tenants. These documents may include previous contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding underground facilities.

B. Information regarding existing conditions may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports, documents, and other information are **not** part of the Contract Documents.

C. Information regarding existing conditions may also be included in the Project Manual, but shall **not** be considered part of the Contract Documents.

D. The reports and other data or information regarding existing conditions and underground facilities at or contiguous to the Project are the following:

1. **Geotechnical Data**. Geotechnical data at or near the Project that is in the District's possession available for Contractor's review.

2. **Geotechnical Reports**. Geotechnical reports that may have been prepared for and around the Site by soil investigation engineers hired by the District and its consultants, contractors, and tenants. Geotechnical reports may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports are **not** part of the Contract Documents. The reports and drawings of physical conditions that may relate to the Project are the following:

## 1.03 Use of Information

A. Information regarding existing conditions was obtained only for use of District and its consultants, contractors, and tenants for planning and design and is **not** part of the Contract Documents.

B. District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any information regarding existing conditions. Bidder represents and agrees that in submitting a bid it is not relying on any information regarding existing conditions supplied by District.

C. Under no circumstances shall District be deemed to warrant or represent existing above-ground conditions, as-built conditions, or other actual conditions, verifiable by independent investigation. These conditions are verifiable by Contractor by the performance of its own independent investigation that Contractor must perform as a condition to bidding, and Contractor should not and shall not rely on this information or any other information supplied by District regarding existing conditions.

D. Any information shown or indicated in the reports and other data supplied herein with respect to existing underground facilities at or contiguous to the Project may be based upon information and data furnished to District by the District's employees and/or consultants or builders of such underground facilities or others. District does not assume responsibility for the completeness of this information, and Bidder is solely responsible for any interpretation or conclusion drawn from this information.

E. District shall be responsible only for the general accuracy of information regarding underground facilities, and only for those underground facilities that are owned by District, and only where Bidder has conducted the independent investigation required of it pursuant to the Instructions to Bidders, and discrepancies are not apparent.

## 1.04 Limited Reliance on Certain Information

A. Reference is made herein for identification of:

1. Reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by District in preparation of the Contract Documents.

2. Drawings of physical conditions in or relating to existing subsurface structures (except underground facilities) that are at or contiguous to the Site and have been utilized by District in preparation of the Contract Documents.

B. Bidder may rely upon the general accuracy of the “technical data” contained in the reports and drawings identified above, but only insofar as it relates to subsurface conditions, provided Bidder has conducted the independent investigation required pursuant to Instructions to Bidders, and discrepancies are not apparent. The term “technical data” in the referenced reports and drawings shall be limited as follows:

1. The term “technical data” shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment or structures that were encountered during subsurface exploration. The term “technical data” does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures.

2. The term “technical data” shall not include the location of underground facilities.

3. Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder may rely upon the general accuracy of the “technical data” contained in such reports or drawings.

4. Bidder is solely responsible for any interpretation or conclusion drawn from any “technical data” or any other data, interpretations, opinions, or information provided in the identified reports and drawings.

### 1.05 Investigations/Site Examinations

A. Before submitting a Bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.

B. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Invitation to Bid and only under the provisions of the Contract Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District’s prior approval.

## End of Section

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Section 00 41 13

# BID FORM

To: Governing Board of **Los Gatos Saratoga Joint Union High School District** ("District")

From: _____
(Proper Name of Bidder)

1. **Total Bid.** The undersigned declares that the Contract Documents including, without limitation, the Invitation to Bid, the Instructions to Bidders, and the Special Conditions have been read, and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications for the following project:

   **Los Gatos High School Wellness Center** ("Project" or "Contract")

   and will accept in full payment for that Work the following total lump sum amount, all taxes included:

| |
|---|
| _____ **Dollars** **$** _____<br>***TOTAL BASE BID***<br><br>**NOTE: IF THERE ARE ALLOWANCES IDENTIFIED IN THIS BID FORM, DO <u>NOT</u> INCLUDE ANY ALLOWANCE(S) AMOUNTS IN THESE BID AMOUNTS.** |

2. **<u>Additive/Deductive Alternates:</u>** **N/A**

   Descriptions of alternates are primarily scope definitions and do not necessarily detail the full range of materials and processes needed to complete the construction.

3. **<u>Unit Price(s).</u>** The Bidder's Base Bid includes the following unit price(s), which the Bidder must provide and the District may, at its discretion, utilize in valuing additive and/or deductive change orders: **N/A**

4. **<u>Allowance(s).</u>** The Bidder's Base Bid shall **<u>NOT</u>** include the following potential Allowance(s). The District will add some or all of the following Allowance(s) amount(s) to the successful bidder's Contract, at the District's discretion. Contractor shall be permitted to invoice for Work under an Allowance in the identical structure as a Change Order. **N/A**

5. **<u>Contract Review.</u>** The undersigned has reviewed the Work outlined in the Contract Documents and fully understands the scope of Work required in this bid, understands the construction and project management function(s) is described in the Contract Documents, and that each Bidder who is awarded a contract shall be in fact a prime contractor, not a subcontractor, to the District, and agrees that its bid, if accepted by the District, will be the basis for the Bidder to enter into a contract with the District in

accordance with the intent of the Contract Documents.

6. **Requests for Clarification.** The undersigned has notified the District in writing of any discrepancies or omissions or of any doubt, questions, or ambiguities about the meaning of any of the Contract Documents, and has contacted the Construction Manager before bid date to verify the issuance of any clarifying Addenda.

7. **Contract Time.** The undersigned agrees to commence work under this Contract on the date established in the Contract Documents and to complete all work within the time specified in the Contract Documents.

8. **Contractual Provisions.** The undersigned hereby acknowledges and agrees to be bound by following provisions and all provisions in the Contract Documents:

    - The liquidated damages clause of the General Conditions and Agreement.
    - The "Changes in the Work" provisions in the General Conditions that limit the permitted charges and mark-ups on change orders and on the amount of home office overhead that the successful bidder can receive from the District.
    - The "Claims" provisions in the General Conditions that delineate the required process to submit and process disputes and claims.
    - The "COVID-19" provisions in the Contract Documents related to the Contractor's staffing requirements and its compliance with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with COVID-19, and/or any similar virus or derivative strain.

9. **Bid Open for 90 Days.** It is understood that the District reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of ninety (90) days.

10. **Attachments.** The following documents are attached hereto:

    - The Bid Bond on the District's form or other security
    - The Designated Subcontractors List
    - The Noncollusion Declaration
    - Iran Contracting Act Certification

11. **Addenda Acknowledgement.** Receipt and acceptance of the following addenda is hereby acknowledged:

| | |
|---|---|
| No.____, Dated _____ _____ | No.____, Dated _____ _____ |
| No.____, Dated _____ _____ | No.____, Dated _____ _____ |
| No.____, Dated _____ _____ | No.____, Dated _____ _____ |
| ☐ Or check here if **no** addenda were issued. | |

**12. Bidder's License.**

- Bidder acknowledges that the license required for performance of the Work is as stated in the Invitation to Bid.

- Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

**13. Labor Harmony.** The undersigned hereby certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

**14. DIR Registration.** Bidder shall ensure that it and its Subcontractors comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including furnishing its CPRs to the Labor Commissioner, and are registered pursuant to Labor Code section 1725.5.

**15. SWPPP QSP.** Bidder specifically acknowledges and understands that if it is awarded the Contract, it shall perform the Work of the Project related to being the District's Qualified SWPPP (Storm Water Pollution Prevention Plan) Practitioner ("QSP") and that the Bidder is certified to be the District's QSP, as required by the current California State Water Board's Construction General Permit.

**16. General Acknowledgement.** The Bidder represents that it is competent, knowledgeable, and has special skills with respect to the nature, extent, and inherent conditions of the Work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the Work that may create, during the Work, unusual or peculiar unsafe conditions hazardous to persons and property. Bidder expressly acknowledges that it is aware of such peculiar risks and that it has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the Work with respect to such hazards.

**17. False Claims Act.** Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.

Furthermore, Bidder hereby certifies to the District that all representations, certifications, and statements made by Bidder, as set forth in this bid form, are true and correct and are made under penalty of perjury.

Dated this _____ day of _____ 20 _____

Signature _____

Signed by (Print Name) _____

Title of Person Signing _____

Name of Bidder _____

Type of Organization _____

Address of Bidder _____

Taxpayer's Identification No. of Bidder _____

Telephone Number _____

Fax Number _____

E-mail _____ Web page _____

Bidder’s DIR Registration No.: No.:_____

Contractor's License No(s): No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class: _____ Expiration Date: _____

If Bidder is a corporation, provide the following:

Name of Corporation: _____

President: _____

Secretary: _____

Treasurer: _____

Manager: _____

**End of Section**

Section 00 43 13

# BID BOND (SECURITY)

**(Note: If Bidder is providing a bid bond as its bid security,
Bidder must use this form, NOT a surety company form.)**

KNOW ALL PERSONS BY THESE PRESENTS:

That the undersigned, _____ as Principal ("Principal"),

and _____ as Surety ("Surety"),

a corporation organized and existing under and by virtue of the laws of the State of _____

and authorized to do business as a surety in the State of California, are held and firmly bound unto the

**Los Gatos Saratoga Joint Union High School District** ("District")

of _____ County, State of California as Obligee, in the sum of

_____ ($ _____)

lawful money of the United States of America, for the payment of which sum well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted a bid to the District for all Work specifically described in the accompanying bid;

NOW, THEREFORE, if the Principal is awarded the Contract and, within the time and manner required under the Contract Documents, after the prescribed forms are presented to Principal for signature, enters into a written contract, in the prescribed form in accordance with the bid, and files two bonds, one guaranteeing faithful performance and the other guaranteeing payment for labor and materials as required by law, and meets all other conditions to the contract between the Principal and the Obligee becoming effective, or if the Principal shall fully reimburse and save harmless the Obligee from any damage sustained by the Obligee through failure of the Principal to enter into the written contract and to file the required performance and labor and material bonds, and to meet all other conditions to the Contract between the Principal and the Obligee becoming effective, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect. The full payment of the sum stated above shall be due immediately if Principal fails to execute the Contract within seven (7) days of the date of the District's Notice of Award to Principal.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or the call for bids, or to the work, or to the specifications.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorneys' fee to be fixed by the Court.

If the District awards the bid, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from

the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

IN WITNESS WHEREOF, this instrument has been duty executed by the Principal and Surety above named, on the

_____ day of _____, 20___.

_____
Principal

_____
By

_____
Surety

_____
By

_____
Name of California Agent of Surety

_____
Address of California Agent of Surety

_____
Telephone Number of California Agent of Surety

**Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notarial Acknowledgment for all Surety's signatures. The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.**

## End of Section

# DESIGNATED SUBCONTRACTORS LIST

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

**Los Gatos High School Wellness Center**("Project" or "Contract")

1. **Listed.** Bidder must list hereinafter the name and location of each subcontractor who will be employed, and the scope of Work that each will perform if the Contract is awarded to the Bidder. Bidder acknowledges and agrees that under Public Contract Code section 4100, et seq., it must clearly identify the name and location of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work in an amount in excess of one-half of one percent (1/2 of 1%) of Bidder's total Bid.

2. **CSLB Number.** Bidder must provide the Contactor State License Board number ("**CSLB No**.") for all listed subcontractors.

3. **DIR Number.** Bidder must provide the Department of Industrial Relations registration number ("**DIR No**.") for all listed subcontractors.

4. **Same Scope.** If more than one subcontractor is named for the same scope of Work, state with specificity the particular scope or portion that each subcontractor will perform.

5. **No Vendors or Suppliers.** Bidder need not list entities that are only vendors or suppliers of materials.

6. **Not Listed.** As to any Work that Bidder fails to list that is in excess of one-half of one percent (1/2 of 1%) of Bidder's total Bid, Bidder agrees that it is qualified to perform that scope of Work and will perform that scope of Work, or be subjected to penalty under applicable law.

7. **Alternate Work.** If alternate bids are called for and Bidder intends to use Subcontractors different from or in addition to those Subcontractors listed for work under the base Bid, Bidder must list Subcontractors that will perform Work in an amount in excess of one half of one percent (1/2 of 1%) of Bidder's total Bid, including alternates.

8. **Prequalification.** If the Project has electrical, mechanical, or plumbing components that will be performed by subcontractors performing under the following license classification(s), then each of those subcontractors must also have been prequalified by the District: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46. **N/A**

9. **DVBEs.** Bidder must indicate which, if any, of its subcontractors are disabled veteran business enterprises (DVBE) and the estimated percentage of the Work those subcontractor(s) will perform.

10. **Bidders may correct inadvertent error(s) in listing subcontractors' CSLB Nos. or DIR Nos. within twenty-four (24) hours after bid opening.**

11. **Additional Sheets.** If further space is required for the list of proposed subcontractors, additional sheets showing the required information, as indicated below, shall be attached hereto and made a part of this document and submitted with this form.

I certify and declare under penalty of perjury under the laws of the State of California that all the information listed on the following page(s) is complete, true, and correct.

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

---

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____ % CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____ % CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____ % CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____ % CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____ % CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____ % CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____ % CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

**Subcontractor Name**: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

**End of Section**

Section 00 43 40

# NONCOLLUSION DECLARATION

**Public Contract Code § 7106**

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ [**PRINT YOUR TITLE**]

of _____ [**PRINT FIRM NAME**],

the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on the following date:

Date: _____

Proper Name of Bidder: _____

City, State: _____, _____

Signature: _____

Print Name: _____

Title: _____

**END OF DOCUMENT**

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Section 00 43 50

# IRAN CONTRACTING ACT CERTIFICATION

**(Public Contract Code § 2204)**

**Los Gatos High School Wellness Center** ("Project" or "Contract")

Pursuant to Public Contract Code (PCC) section 2204, an Iran Contracting Act certification is required for solicitations of goods or services of one million dollars ($1,000,000) or more.

Bidder shall complete **ONLY ONE** of the following three paragraphs.

☐ 1. Bidder's Total Base Bid is less than one million dollars ($1,000,000).

**OR**

☐ 2. Bidder's Total Base Bid is one million dollars ($1,000,000) or more, but Bidder is **not** on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code § 2203(b), and Bidder is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

**OR**

☐ 3. Bidder's Total Base Bid is one million dollars ($1,000,000) or more, but the District has given prior written permission to Bidder to submit a proposal pursuant to PCC 2203(c) or (d). **A copy of the written permission from the District is included with Bid**.

I certify that I am duly authorized to legally bind the Bidder to this certification, that the contents of this certification are true, and that this certification is made under the laws of the State of California.

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

**End of Section**

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Section 00 45 00

# NOTICE OF AWARD

Dated: _____, 20___

To: _____
("Contractor")

_____
(Address)

From: Governing Board ("Board") of **Los Gatos Saratoga Joint Union High School District** ("District")

Re: **Los Gatos High School Wellness Center** ("Project" or "Contract")

Contractor was awarded the Contract on _____, 20___, by action of the superintendent or superintendent's designee pursuant to a delegation of authority by the District's Board.

The Contract Price is _____ Dollars ($_____), and includes alternates _____.

Three (3) copies of each of the Contract Documents (except Drawings) accompany the Notice of Award. Three (3) sets of the Drawings will be delivered separately or otherwise made available. Additional copies are available at cost of reproduction.

Contractor must comply with the following conditions precedent within **SEVEN (7)** calendar days of the date of this Notice of Award.

Contractor shall execute and submit the following Contract Documents by 5:00 p.m. of the **SEVENTH ($7^{TH}$)** calendar day following the date of the Notice of Award. Failure to properly and timely submit the following Contract Documents entitles District to foreclose on Contractor's bid bond and award the contract to the next responsive, responsible bidder.

a. Agreement: Submit four (4) copies, each bearing an original signature. **If Contractor is a corporation, Contractor must attach a certified copy of the corporation's by-laws, or the resolution of the Board of Directors of the corporation, authorizing the signatory to execute the Agreement and the bonds required by the Contract Documents.**

b. Escrow of Bid Documentation: Include all required documentation. Refer to the Escrow of Bid Documentation document for details.

c. Performance Bond (100%): Fully executed form provided in the Contract Documents.

d. Payment Bond (100%) (Contractor's Labor and Material Bond): Fully executed form provided in the Contract Documents.

e. Insurance Certificates and Endorsements as required.

f. Certifications to be Completed by Contractor

g. Disabled Veterans' Business Enterprise Participation Certification.

h. Criminal Background Investigation/Fingerprinting Certification.

Failure to comply with these conditions within the time specified will entitle District to consider Contractor's bid abandoned, to annul the Notice of Award, and to declare Contractor's Bid Security forfeited, as well as any other rights the District may have against Contractor.

District will return to Contractor one fully signed counterpart of the Agreement.

Los Gatos Saratoga Joint Union High School District

SIGNATURE: _____

NAME: _____

TITLE: _____

**End of Section**

Section 00 45 10

# AGREEMENT

This agreement is made and entered into on _____, 202_____, by and between the **Los Gatos Saratoga Joint Union High School District** ("District") and _____ _____ ("Contractor") ("Agreement"). The District and the Contractor agree as follows:

1. **The Work:** Contractor shall furnish all tools, equipment, apparatus, facilities, labor, and material necessary to perform and complete in a good and workmanlike manner, the work of the following project:

   **Los Gatos High School Wellness Center**("Project" or "Contract" or "Work")

   The Work shall be performed and completed as required in the Contract Documents as defined in the General Conditions including, without limitation, the Drawings and Specifications, under the direction and supervision of, and subject to, the approval of the District or its authorized representative.

2. **The Contract Documents**:

   a. The complete Contract consists of all Contract Documents as defined in the General Conditions and incorporated herein by this reference. All obligations of the District and Contractor are fully set forth and described in the Contract Documents. The Contract Documents are intended to cooperate so that Work called for in one and not mentioned in the other or vice versa is to be performed the same as if mentioned in all Contract Documents.

   b. **Interpretation of Contract Documents/Order of Precedence**: Questions concerning the intent, precedence, or meaning of the Contract Documents, including the Drawings or Specifications, shall be submitted to the District for interpretation. Inconsistencies in the Contract Documents shall be resolved by giving precedence in the following order:

      (i) District-approved modifications, beginning with the most recent (if any);
      (ii) Agreement;
      (iii) Special Conditions (if any);
      (iv) Supplemental Conditions (if any);
      (v) General Conditions;
      (vi) Remaining Division 0 documents (Documents beginning with "00");
      (vii) Division 1 Documents (Documents beginning with "01");
      (viii) Division 2 through Division 49 documents (Technical Specifications);
      (ix) Figured dimensions;
      (x) Large-scale drawings;
      (xi) Small-scale drawings.

      In case of conflict, the greater quantity and/or higher standard of workmanship shall apply unless the District expressly in writing (e.g., via a Change Order) accepts a lesser quantity or lower quality of workmanship and the Contract Price is adjusted accordingly. The decision of the District in the matter shall be final.

3. **Integration / Modification.** The Contract Documents and any documents specifically incorporated by reference are completely integrated as the complete and exclusive statement of the terms of the Agreement. This Agreement supersedes all previous contracts, agreements, and / or communications, both oral and

written, and constitutes the entire understanding of the District and Contractor. No extrinsic evidence whatsoever shall be admissible or used to explain or supplement the terms of the Contract, Contract Documents, or any items incorporated by reference. No changes, amendments or alterations shall be effective unless in writing, signed by both Parties, and unless provided otherwise by the Contract Documents.

4. **Time for Completion**: It is hereby understood and agreed that the Contractor shall complete the Work within **Forty (40)** consecutive calendar days ("Contract Time") from the date specified in the District's Notice to Proceed. The District shall not approve an early completion schedule by Contractor. A schedule showing the Work completed in less than the Contract Time indicated in the Contract, shall be considered to have Project Float.

5. **Completion-Extension of Time**: If Contractor fails to complete the Work within the Contract Time, due allowance being made for the contingencies provided for herein, Contractor shall become liable to District for all loss and damage that District may suffer on account thereof. Contractor shall coordinate its Work with the work of all other contractors. The District shall not be liable for delays resulting from Contractor's failure to coordinate its Work with other contractors in a manner that allows for timely completion of Contractor's Work. Contractor shall be liable for delays to other contractors caused by Contractor's failure to coordinate its Work with the work of other contractors.

6. **Liquidated Damages**: Time is of the essence for all Work to be performed. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that District will sustain in the event of and by reason of Contractor's delay; therefore, pursuant to Government Code section 53069.85 and Public Contract Code section 7203, Contractor shall forfeit and pay to District the following sum(s) as liquidated damages ("Liquidated Damages"):

    - **Project Completion:** Two Hundred Fifty dollars ($250.00) per day as Liquidated Damages for each and every day's delay beyond the Contract Time to complete all the Work.

    a. Each portion of the Liquidated Damages shall be calculated cumulatively. For example, if Contractor is late in completing two milestones and the entire Project, Contractor will forfeit and pay three separate Liquidated Damages amounts. It is hereby understood and agreed that neither the total cumulative Liquidate Damages amount nor any portion of the Liquidated Damage amount are penalties.

    b. District may deduct Liquidated Damages from money due or that may become due Contractor under this Agreement. Contractor's forfeiture of Liquidated Damages to District, and District's right to retain Liquidated Damages, are as indicated in Government Code section 53069.85 and as indicated herein and in the General Conditions. Liquidated Damages are automatically and without notice of any kind forfeited and payable by Contractor upon the accrual of each day of delay. Neither District's failure or delay in deducting Liquidated Damages from payments otherwise due the Contractor, nor District's failure or delay in notifying Contractor of the forfeiture and payment of Liquidated Damages, shall be deemed a waiver of District's right to Liquidated Damages and/or the District's right to withhold Liquidated Damages from any amounts that would otherwise be payable to the Contractor.

    c. Contractor and Surety shall be liable for and pay to District the entire amount of Liquidated Damages including any portion that exceeds the amount of the Contract Price then held, retained or controlled by District.

    d. Liquidated Damages shall be in addition, and not in lieu of, District's right to charge Contractor for the District's cost of completing or correcting items of the Work.

7. **Contract Price**: In consideration of the foregoing covenants, promises, and agreements, Contractor offers, in the amounts stated below, to perform the Work according to the Contract Documents. District covenants, promises, and agrees that it will pay and cause to be paid to Contractor in full, and as the Contract Price the

following amount(s):

**Dollars ($ )**

**("Contract Price")**

a. **THE ABOVE ALLOWANCES ARE WITHIN THE CONTRACT PRICE ONLY TO THE EXTENT CONTRACTOR HAS PERFORMED WORK ENCOMPASSED BY THE ALLOWANCE DESCRIPTION, CONTRACTOR HAS APPROPRIATELY INVOICED FOR THAT WORK, AND DISTRICT HAS APPROVED CONTRACTOR'S INVOICE. CONTRACTOR SHALL INVOICE ONLY FOR COMPONENTS OF THE WORK ENCOMPASSED BY THE ALLOWANCE DESCRIPTION, IN THE IDENTICAL STRUCTURE AS A CHANGE ORDER. THE UNUSED PORTION OF EACH ALLOWANCE SHALL BE RETAINED BY THE DISTRICT.**

b. The Contract Price shall be paid in lawful money of the United States pursuant to the payment provisions in the General Conditions.

c. The District may, at its sole discretion, increase or decrease the Contract Price by unit prices or alternates contained in Contractor's original bid. If the Bid for the Work included proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect to add any such Alternate Bid Item(s) if the item did not form a basis for award of the Agreement or delete any such Alternate Bid Item(s) if that item formed a basis for award of the Agreement. If the District elects to add or delete an Alternate Bid Item(s) pursuant to the foregoing, the cost or credit for that Alternate Bid Item(s) shall be as set forth in the Contractor's Bid, at the District's discretion. If any Alternate Bid Item is added or deleted from the Work pursuant to the foregoing, the Contract Time shall be adjusted by the number of days allocated for the added or deleted Alternate Bid Item in the Contract Documents; if days are not allocated for any Alternate Bid Item added or deleted pursuant to the foregoing, the Contract Time shall be equitably adjusted.

8. **Insurance and Bonds**: Contractor shall provide all required certificates of insurance, and payment and performance bonds.

9. **Performance of Work**: If Contractor fails to perform the Work properly or fails to perform any provisions of this Contract, the District, may, pursuant to the General Conditions and without prejudice to any other remedy it may have, cure the deficiencies and deduct the cost thereof from the payment then or thereafter due Contractor.

10. **COVID-19.** Contractor is responsible for complying with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with COVID-19, and/or any similar virus or derivative strain. Contractor shall ensure it has supervisor employees onsite that are trained and knowledgeable of all of these requirements to ensure full compliance on Project Site(s).

11. **Authority of Architect, Project Inspector, and DSA**: Contractor hereby acknowledges that the Architect(s), the Project Inspector(s), and the Division of the State Architect have authority to approve and/or stop Work if Contractor's Work does not comply with the requirements of the Contract Documents, Title 24 of the California Code of Regulations, and all applicable laws. Contractor shall be liable for any delay caused by its non-compliant Work.

12. **Assignment of Contract**: Neither the Contract, nor any part thereof, nor any moneys due or to become due thereunder, may be assigned by Contractor without the written approval of District, nor without the written consent of the Surety on Contractor's Performance Bond (the "Surety"), unless the Surety has waived in writing its right to notice of assignment.

13. **Classification of Contractor's License**: Contractor hereby acknowledges that it currently holds valid Type C-27

Contractor's license(s) issued by the State of California, Contractor's State Licensing Board, in accordance with division 3, chapter 9, of the Business and Professions Code and in the classification called for in the Contract Documents.

14. **Payment of Prevailing Wages**: Contractor and all Subcontractors under Contractor shall pay all workers on Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code.

15. **Contractor & Subcontractor Registration**: Contractor shall comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including complying with any applicable enforcement by the Department of Industrial Relations.

16. **Authority of Contractor's Representative**: Contractor hereby certifies that its legal representative as defined in the General Conditions and the person(s) it employees on the Project at or above the level of project superintendent, each have the authority to legally bind the Contractor.

17. **Severability**: If any term, covenant, condition, or provision of the Contract Documents is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the provisions in the Contract Documents shall remain in full force and effect and shall in no way be affected, impaired, or invalidated thereby.

IN WITNESS WHEREOF, accepted and agreed on the date indicated above:

| | |
|---|---|
| Dated: _____, 20_____ | Dated: _____, 20_____ |
| **Los Gatos Saratoga Joint Union High School District** | _____ **Contractor** |
| Signature: _____ | Signature: _____ |
| Print Name: _____ | Print Name: _____ |
| Print Title: _____ | Print Title: _____ |

**NOTE: If the Contractor is a corporation, Contractor must attach a certified copy of the corporation's by-laws, or of the resolution of the Board of Directors of the corporation, authorizing the above person to execute this Agreement and the bonds required by the Contract Documents**.

## End of Section

# CERTIFICATIONS TO BE COMPLETED BY CONTRACTOR

**THE UNDERSIGNED MUST CHECK EACH BOX AND EXECUTE THIS FORM AND HEREBY CERTIFIES TO THE GOVERNING BOARD OF THE DISTRICT THAT:**

- He/she is a representative of the Contractor,
- He/she is familiar with the facts herein certified and acknowledged,
- He/she is authorized and qualified to execute this Agreement and these certifications on behalf of Contractor and that by executing this Agreement he/she is certifying the following items.

☐ **Labor Code Sections 1860-1861 (Workers' Compensation).** In accordance with Labor Code section 3700, every contractor will be required to secure the payment of compensation to his or her employees. I acknowledge and certify under penalty of perjury that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

☐ **Government Code Sections 8355-8357 (Drug-Free Workplace).** I acknowledge and certify under penalty of perjury that I will provide a drug-free workplace by doing all of the following:

(1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's or organization's workplace and specifying the actions that will be taken against employees for violations of the prohibition.
(2) Establishing a drug-free awareness program to inform employees about all of the following:
(A) The dangers of drug abuse in the workplace.
(B) The person's or organization's policy of maintaining a drug-free workplace.
(C) Any available drug counseling, rehabilitation, and employee assistance programs.
(D) The penalties that may be imposed upon employees for drug abuse violations.
(3) Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by subdivision (a) and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I also acknowledge that this Contract may be subject to suspension of payments under the contract or grant or termination of the contract or grant, or both, and the contractor or grantee thereunder may be subject to debarment, in accordance with the requirements of the above-referenced statute, if the contracting or granting agency determines that any of the following has occurred:

(1) The contractor or grantee has made a false certification under Section 8355.
(2) The contractor or grantee violates the certification by failing to carry out the requirements of subdivisions (a) to (c), inclusive, of Section 8355.

I also acknowledge that the Department of General Services shall establish and maintain a list of individuals and organizations whose contracts or grants have been canceled due to failure to comply with the above-referenced statute. This list shall be updated monthly and published each month. No state agency shall award a contract or grant to a person or organization on the published list until that person or organization has complied with the above-referenced statute.

☐ **Tobacco-Free Environment**. Pursuant to, without limitation, 20 U.S.C. section 6083, Labor Code section 6400 et seq., Health & Safety Code section 104350 et seq. and District Board Policies, all District sites, including the Project site, are tobacco-free environments. Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school owned vehicles and vehicles owned by others while on District property.

I acknowledge and certify under penalty of perjury that I am aware of the District's policy regarding tobacco-free environments at District sites, including the Project site and acknowledge and certify that I will adhere to the requirements of that policy and not permit any of my firm's employees, agents, subcontractors, or my firm's subcontractors' employees or agents to use tobacco and/or smoke on the Project site. The District also prohibits electronic cigarettes, "vaping" or similar product uses on District sites.

☐ **No Hazardous Materials.** I acknowledge and certify under penalty of perjury that no Asbestos, or Asbestos-Containing Materials, polychlorinated biphenyl (PCB), or any material listed by the federal or state Environmental Protection Agency or federal or state health agencies as a hazardous material, or any other material defined as being hazardous under federal or state laws, rules, or regulations ("New Hazardous Material"), shall be furnished, installed, or incorporated in any way into the Project or in any tools, devices, clothing, or equipment used to affect any portion of Contractor's work on the Project for District. I have instructed our employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

(i) Asbestos and/or asbestos-containing material shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. Any or all material containing greater than one-tenth of one percent (.1%) asbestos shall be defined as asbestos-containing material. Any disputes involving the question of whether or not material is New Hazardous Material shall be settled by electron microscopy or other appropriate and recognized testing procedure, at the District's determination. The costs of any such tests shall be paid by Contractor if the material is found to be New Hazardous Material.

(ii) All Work or materials found to be New Hazardous Material or Work or material installed with equipment containing "New Hazardous Material," will be immediately rejected and this Work will be removed at Contractor's expense at no additional cost to the District.

**The Contractor must immediately notify the District within two (2) Business Days, if the Contractor finds and before it disturbs, any material that the Contractor believes may be hazardous waste, as defined in section 25117 of the Health and Safety Code, and requires removal to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law**

I acknowledge and certify under penalty of perjury that this certification provides notice to the Contractor that:

(1) The Contractor's work may disturb lead-containing building materials.
(2) The Contractor must notify the District if any work may result in the disturbance of lead-containing building materials.

☐ **Lead as a Health Hazard**. Lead poisoning is recognized as a serious environmental health hazard facing

children today. Even at low levels of exposure, much lower than previously believed, lead can impair the development of a child's central nervous system, causing learning disabilities, and leading to serious behavioral problems. Lead enters the environment as tiny lead particles and lead dust disburses when paint chips, chalks, peels, wears away over time, or is otherwise disturbed. Ingestion of lead dust is the most common pathway of childhood poisoning; lead dust gets on a child's hands and toys and then into a child's mouth through common hand-to-mouth activity. Exposures may result from construction or remodeling activities that disturb lead paint, from ordinary wear and tear of windows and doors, or from friction on other surfaces.

Ordinary construction and renovation or repainting activities carried out without lead-safe work practices can disturb lead-based paint and create significant hazards. Improper removal practices, such as dry scraping, sanding, or water blasting painted surfaces, are likely to generate high volumes of lead dust.

Because the Contractor and its employees will be providing services for the District, and because the Contractor's work may disturb lead-containing building materials, **Contractor is hereby notified** of the potential presence of lead-containing materials located within certain buildings utilized by the District. All school buildings built prior to 1993 are presumed to contain some lead-based paint until sampling proves otherwise.

(i) **Overview of California Law**

Education Code section 32240 et seq. is known as the Lead Safe Schools Protection Act. Under this act, the Department of Health Services ("DHS") is to conduct a sample survey of schools in the State of California for the purpose of developing risk factors to predict lead contamination in public schools. (Ed. Code, § 32241.)

Any school that undertakes any action to abate existing risk factors for lead is required to utilize trained and state-certified contractors, inspectors, and workers. (Ed. Code, § 32243, subd. (b).) Moreover, lead-based paint, lead plumbing, and solders, or other potential sources of lead contamination, shall not be utilized in the construction of any new school facility or the modernization or renovation of any existing school facility. (Ed. Code, § 32244.)

Both the Federal Occupational Safety and Health Administration ("Fed/OSHA") and the California Division of Occupational Safety and Health ("Cal/OSHA") have implemented safety orders applicable to all construction work where a contractor's employee may be occupationally exposed to lead.

The OSHA Regulations apply to all construction work where a contractor's employee may be occupationally exposed to lead. The OSHA Regulations contain specific and detailed requirements imposed on contractors subject to that regulation. The OSHA Regulations define construction work as work for construction, alteration, and/or repair, including painting and decorating. It includes, but is not limited to, the following:

a. Demolition or salvage of structures where lead or materials containing lead are present;

b. Removal or encapsulation of materials containing lead;

c. New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;

d. Installation of products containing lead;

e. Lead contamination/emergency cleanup;

f. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and

g. Maintenance operations associated with the construction activities described in the subsection.

Because it is assumed by the District that all painted surfaces (interior as well as exterior) within the District contain some level of lead, it is imperative that the Contractor, its workers and subcontractors fully and adequately comply with all applicable laws, rules and regulations governing lead-based materials (including title 8, California Code of Regulations, section 1532. 1).

**The Contractor must notify the District if any Work may result in the disturbance of lead-containing building materials. Any and all Work that may result in the disturbance of lead-containing building materials must be coordinated through the District. A signed copy of this Certification must be on file prior to beginning Work on the Project, along with all current insurance certificates.**

(ii) **Renovation, Repair and Painting Rule, Section 402(c)(3) of the Toxic Substances Control Act**

In 2008, the U.S. Environmental Protection Agency, issued a rule pursuant to the authority of Section 402(c)(3) of the Toxic Substances Control Act, requiring lead safe work practices to reduce exposure to lead hazards created by renovation, repair and painting activities that disturb lead-based paint (Renovation, Repair and Painting Rule). Renovations in homes, childcare facilities, and schools built prior to 1978 must be conducted by certified renovations firms, using renovators with accredited training, and following the work practice requirements to reduce human exposures to lead.

Contractor, its workers and subcontractors must fully and adequately comply with all applicable laws, rules and regulations governing lead-based materials, including those rules and regulations appearing within title 40 of the Code of Federal Regulations as part 745 (40 CFR 745).

The requirements apply to all contractors who disturb lead-based paint in a six-square-foot area or greater indoors or a 20-square-foot area outdoors. If a DPH-certified inspector or risk assessor determines that a home constructed before 1978 is lead-free, the federal certification is not required for anyone working on that particular building.

(iii) **Contractor's Liability**

If the Contractor fails to comply with any applicable laws, rules, or regulations, and that failure results in a site or worker contamination, the Contractor will be held solely responsible for all costs involved in any required corrective actions, and shall defend, indemnify, and hold harmless the District, pursuant to the indemnification provisions of the Contract, for all damages and other claims arising therefrom.

If lead disturbance is anticipated in the Work, only persons with appropriate accreditation, registrations, licenses, and training shall conduct this Work.

It shall be the responsibility of the Contractor to properly dispose of any and all waste products, including, but not limited to, paint chips, any collected residue, or any other visual material that may occur from the prepping of any painted surface. It will be the responsibility of the Contractor to provide the proper disposal of any hazardous waste by a certified hazardous waste hauler. This company shall be registered with the Department of Transportation (DOT) and shall be able to issue a current manifest number upon transporting any hazardous material from any school site within the District.

The Contractor shall provide the District with any sample results prior to beginning Work, during the Work, and after the completion of the Work. The District may request to examine, prior to the commencement of the Work, the lead training records of each employee of the Contractor.

I acknowledge and certify under penalty of perjury, that:

1. I have received notification of potential lead-based materials on the District's property;
2. I am knowledgeable regarding and will comply with all applicable laws, rules, and regulations governing work with, and disposal of, lead.

☐ **Imported Materials.** All soils, aggregate, or related materials ("Fill") that Contractor, a Subcontractor, agent or supplier, in any way, provides or delivers and/or supplies to the Project Site shall be free of any and all hazardous material as defined in section 25260 of the Health and Safety Code, shall satisfy the requirements of any environmental review of the Project performed pursuant to the statutes and guidelines of the California Environmental Quality Act, sections 21000 et seq. of the Public Resources Code ("CEQA"), and shall comply with the requirements of sections 17210 et seq. of the Education Code, including requirements for a Phase I environmental assessment acceptable to the State of California Department of Education and Department of Toxic Substances Control. I acknowledge that, to the furthest extent permitted by California law, the indemnification provisions in the Contract Documents apply to, without limitation, any claim(s) connected with providing, delivering, and/or supplying Fill.

☐ **Roofing Contract Financial Interest Certification (Public Contract Code § 3006)**

I, _____ [**Your Name**], _____ [**Firm Name**] certify that I have not offered, given, or agreed to give, received, accepted, or agreed to accept, any gift, contribution, or any financial incentive whatsoever to or from any person in connection with a roof project contract or subcontract on the Project. As used in this certification, "person" means any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

I, _____ [**Your Name**], _____ [**Firm Name**] certify that I do not have, and throughout the duration of the Contract, I will not have, any financial relationship in connection with the performance of the Contract with any architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor that is not disclosed below.

I, _____ [**Your Name**], _____ [**Firm Name**] have the following financial relationships with an architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor, or other person in connection with the following roof project contract:

Name of firm ("Firm"): _____
Mailing address: _____
Address of branch office used for this Project: _____
If subsidiary, name and address of parent company: _____

**For Projects without substantive roofing components, check the following box and execute this certification:**

☐ The Work on the Contract (1) does not include the replacement or repair of a roof or (2) is a repair of twenty five percent (25%) or less of the roof, (3) or is a repair project that has a total cost of twenty one thousand dollars ($21,000) or less.

I acknowledge and certify under penalty of perjury that I am duly authorized to legally bind the Contractor to all provisions and items included in these certifications, that the contents of these certifications are true, and that these certifications are made under the laws of the State of California.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

**End of Section**

Section 00 45 55

# DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION CERTIFICATION

Section 17076.11 of the Education Code requires school districts using funds allocated pursuant to the State of California School Facility Program ("Program") for the construction and/or modernization of school buildings to have a participation goal for disabled veteran business enterprises ("DVBE(s)") of at least three percent (3%), per year, of the overall dollar amount expended each year by the school district on projects that receive state funding.

Section 2001 of the Public Contract Code requires school districts to require each Bidder to provide in its bid certain information about its Subcontractors. In addition to completing this certification as indicated herein, each Bidder must provide the information related to DVBEs as required in the Designated Subcontractors List.

1. **Disabled Veteran Business Enterprise.** A DVBE is a business enterprise certified by the California Office of Small Business as a DVBE.

2. **DVBE Participation Policy.** The District is committed to achieving this DVBE participation goal. The District encourages Contractor to ensure maximum opportunities for the participation of DVBEs in the Work of the Contract.

3. **DVBE Participation Goal.** The three percent (3%) participation goal is not a quota, set-aside or rigid proportion.

4. **Certification of Participation.** At the time of execution of the Contract, the Contractor will provide a statement to the District of anticipated participation of DVBEs in the contract.

5. **Submission of Report.** During performance of the Contract, Contractor shall monitor the Work of the Contract, award of subcontracts and contracts for materials, equipment and supplies for the purpose of determining DVBE participation in the Work of the Contract.

    A. Contractor shall report on a monthly basis all DVBEs utilized in the performance of the Work, the type or classification of the Work performed by each DVBE, and the dollar value of the Work performed by each DVBE.

    B. Upon completion of the Work of the Contract, Contractor shall submit a report to the District in the form attached hereto identifying all DVBEs utilized in the performance of the Work, the type or classification of the Work performed by each DVBE, and the dollar value of the Work performed by each DVBE.

    C. The submission to the District of this report is a condition precedent to the District's obligation to make payment of the Final Payment under the Contract Documents. The submission of this report shall be in addition to, and not in lieu of, any other conditions precedent set forth in the Contract Documents for the District's obligation to make payment of the Final Payment.

    D. The District reserves the right to request additional information or documentation from the Contractor evidencing efforts to comply with the three percent (3%) DVBE participation goal.

## DVBE PARTICIPATION REPORT

**Contractor** Name: _____ Date: _____

Project Name: _____ Project Number: [PROJECT NO.]

| **DVBE Firm Name** | **Trade / Portion of Work** | **Subcontract/ Contract Value** |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| **Add more sheets as needed to include all information for each DVBE** | | |

Does the cumulative dollar value of these DVBE contracts meet or exceed the participation goal of three percent (3%) of the final Contract Price, as adjusted by all change orders?

YES _____ NO _____

If your response is "NO," please attach to this report a detailed description of the reasons your firm did not achieve the participation goal of three percent (3%) of the final Contract Price.

I certify and declare under penalty of perjury under the laws of the State of California that all the foregoing information is complete, true, and correct.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

**End of Section**

Section 00 45 85

# CRIMINAL BACKGROUND INVESTIGATION / FINGERPRINTING CERTIFICATION

The undersigned does hereby certify to the governing board of the District that he/she is a representative of the Contractor, is familiar with the facts herein certified, is authorized and qualified to execute this certificate on behalf of Contractor; and that the information in this Criminal Background Investigation / Fingerprinting Certification is true and correct.

1. **Education Code.** Contractor has taken at least one of the following actions with respect to the Project (check all that apply):

☐ The Contractor has complied with the fingerprinting requirements of Education Code section 45125.1 with respect to all Contractor's employees and all of its subcontractors' employees who may have contact with District pupils in the course of providing services pursuant to the Contract, and the California Department of Justice ("DOJ") has determined (per the DOJ process for Applicant Agencies described more fully on its website, located at: ) that none of those employees have been convicted of a felony, as that term is defined in Education Code section 45122.1. A complete and accurate list of Contractor's employees and of all of its subcontractors' employees who may come in contact with District pupils during the course and scope of the Contract is attached hereto; and/or

☐ Pursuant to Education Code section 45125.2, Contractor has installed or will install, prior to commencement of work, a physical barrier at the Project site, that will limit contact between Contractor's employees and District pupils at all times; and/or

☐ Pursuant to Education Code section 45125.2, Contractor certifies that all employees will be under the continual supervision of, and monitored by, an employee of the Contractor who the California Department of Justice has ascertained has not been convicted of a violent or serious felony. The name and title of the employee who will be supervising Contractor's employees and its subcontractors' employees is:
**Name:** _____ **Title:** _____

☐ The Work on the Contract is at an unoccupied school site and no employee and/or subcontractor or supplier of any tier of Contract shall come in contact with the District pupils.

2. **Megan's Law (Sex Offenders).** I have verified and will continue to verify that the employees of Contractor that will be on the Project site and the employees of the Subcontractor(s) that will be on the Project site are **not** listed on California's "Megan's Law" Website (http://www.meganslaw.ca.gov/).
Contractor's responsibility for background clearance extends to all of its employees, subcontractors, and employees of subcontractors coming into contact with District pupils regardless of whether they are designated as employees or acting as independent contractors of the Contractor.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

**End of Section**

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Section 00 54 50

# ESCROW OF BID DOCUMENTATION

## 1.01 Requirement to Escrow Bid Documentation

A. Contractor shall submit, within **Five (5) Business Days** after the date of the Notice of Award, one copy of all documentary information received or generated by Contractor in preparation of bid prices for this Contract. This material is referred to as "Escrow Bid Documentation." The Escrow Bid Documentation will be held in escrow by the District for the duration of the Contract.

B. Contractor agrees, as a condition of award of the Contract, that the Escrow Bid Documentation constitutes **ALL** written information used in the preparation of its bid, and that no other written bid preparation information shall be considered in resolving disputes or claims. Contractor also agrees that nothing in the Escrow Bid Documentation shall change or modify the terms or conditions of the Contract Documents.

C. The Escrow Bid Documentation will not be opened by District except as indicated herein. The Escrow Bid Documentation will be used only to assist in the negotiation of price adjustments and change orders or the settlement of disputes or claims.

D. Contractor's submission of the Escrow Bid Documentation, as with the bonds and insurance documents required, is considered an essential part of the Contract award. Should the Contractor fail to make the submission within the allowed time specified above, District may deem the Contractor to have failed to enter into the Contract, and the Contractor shall forfeit the amount of its bid security, accompanying the Contractor's bid, and District may award the Contract to the next lowest responsive responsible bidder.

## 1.02 NO PAYMENTS WILL BE MADE, NOR WILL DISTRICT ACCEPT PROPOSED CHANGE ORDERS UNTIL THE ESCROW BID DOCUMENTATION IS SUBMITTED AND APPROVED.

A. The Escrow Bid Documentation shall be submitted in person by an authorized representative of the Contractor to the District.

**1. Ownership of Escrow Bid Documentation**

B. The Escrow Bid Documentation is, and shall always remain, the property of Contractor, subject to review by District, as provided herein.

C. As trade secrets, the Escrow Bid Documentation is proprietary and confidential to the extent allowed by law. Escrow Bid Documentation constitute trade secrets, not known outside Contractor's business, known only to a limited extent and only by a limited number of employees of Contractor, safeguarded while in Contractor's possession, extremely valuable to Contractor, and could be extremely valuable to Contractor's competitors by virtue of it reflecting Contractor's contemplated techniques of construction. Subject to the provisions

herein, District agrees to safeguard the Escrow Bid Documentation, and all information contained therein, against disclosure to the fullest extent permitted by law.

## 1.03 Format and Contents of Escrow Bid Documentation

A. Contractor may submit Escrow Bid Documentation in its usual cost-estimating format; a standard format is not required.

B. Escrow Bid Documentation must clearly itemize the estimated costs of performing the work of each bid item contained in the bid schedule, separating bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review.

C. **Subcontractors.** The Escrow Bid Documentation shall include all subcontractor bids or quotes, supplier bids or quotes, quantity takeoffs, crews, equipment, calculations of rates of production and progress, copies of quotes from subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by the Contractor to arrive at the prices contained in the bid proposal.

D. Estimated costs should be broken down into Contractor's usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials, and subcontract costs as appropriate. Plant and equipment and indirect costs should be detailed in the Contractor's usual format. The Contractor's allocation of indirect costs, contingencies, markup, and other items to each bid item shall be identified.

E. **All costs shall be identified**. For bid items amounting to less than $10,000, estimated unit costs are acceptable without a detailed cost estimate, provided that labor, equipment, materials, and subcontracts, as applicable, are included and provided that indirect costs, contingencies, and markup, as applicable, are allocated.

F. Bid Documentation provided by District should not be included in the Escrow Bid Documentation unless needed to comply with the following requirements.

## 1.04 Submittal of Escrow Bid Documentation

A. The Escrow Bid Documentation shall be submitted by the Contractor in a sealed container/envelope within **Five (5) Business Days** after the date of the Notice of Award. The container/envelope shall be clearly marked on the outside with the Contractor's name, date of submittal, project name and the words "***Escrow Bid Documentation – To be opened only after written notice to Contractor and District.***".

B. By submitting Escrow Bid Documentation, Contractor represents that the material in the Escrow Bid Documentation constitutes of all the documentary information used in preparation of the bid and that the Contractor has personally examined the contents of the Escrow Bid Documentation container and has found that the documents in the container are complete.

C. **Subcontractors.** If Contractor's proposal is based upon subcontracting any part of the work, each subcontractor whose total subcontract price exceeds five percent (5%) of the total contract price proposed by Contractor, shall provide separate escrow documents to be included with those of Contractor. Those documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor. Each subcontractor's documents can be sealed within Contractor's Escrow Bid Documentation and will only be opened if the change order or dispute at issue relates to that subcontractor(s)' scope of work.

D. If Contractor wishes to subcontract any portion of the Work after award of the Contract, District retains the right to require Contractor to submit escrow documents for the Subcontractor before the subcontract is approved.

### 1.05 Storage, Examination and Final Disposition of Escrow Bid Documentation

A. The Escrow Bid Documentation will be placed in escrow, for the term of the Contract, at the District offices.

B. The Escrow Bid Documentation may be examined by the District, by the Contractor, and/or by both parties, upon **Five (5) Business Days** written notice from the party noticing the examination to the other party.

C. An examination is permissible at any time that one party reasonably believes that an examination of the Escrow Bid Documentation is necessary to assist in the negotiation of price adjustments and change orders or the settlement of disputes or claims. In the case of legal proceedings, Escrow Bid Documentation may be subject to the terms of an appropriate protective order, if requested via motion by Contractor and ordered by a court of competent jurisdiction.

D. If Contractor or District fails to designate a representative or fails to appear for the noticed examination, then the Contractor or District representative may examine the Escrow Bid Documents alone if a representative of the Contractor or District does not appear at the time set.

E. **Subcontractor.** If a subcontractor has submitted sealed information that is included in the Escrow Bid Documentation and that subcontractor is reasonably involved in the negotiation of price adjustments and change orders or the settlement of disputes or claims, then the party requesting examination (the Contractor or the District) is required to also notify that Subcontractor with the same **Five (5) Business Days** written notice that the requesting party sends to the other party.

F. The Escrow Bid Documentation will be returned to Contractor when the District accepts Project Completion, when all of Contractor's claims (if any) have been resolved to District's and Contractor's satisfaction, and when the Contractor certifies that it has no further claims against the District.

## End of Section

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# ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

**(Public Contact Code § 22300)**

This Escrow Agreement ("Escrow Agreement") is made and entered into on _____ _____, 202_____, by and between the following:

**Los Gatos Saratoga Joint Union High School District** ("District"), whose address is _____ _____, California, and

_____ ("Contractor"), whose address is _____ _____, and

_____ ("Escrow Agent"), a state or federally chartered bank in California, whose address is _____ _____.

For the consideration hereinafter set forth, District, Contractor, and Escrow Agent agree as follows:

**1.** Pursuant to section 22300 of Public Contract Code of the State of California, which is hereby incorporated by reference, Contractor has the following two (2) options:

☐ Deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by District pursuant to the Construction Contract No. _____ entered into between District and Contractor for the _____ _____ Project, in the amount of _____($_____) dated, _____, 20_____, (the "Contract");

**OR**

☐ On written request of Contractor, District shall make payments of the retention earnings for the Contract directly to Escrow Agent.

When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify District within ten (10) calendar days of the deposit. The market value of the securities at all times from substitution until the termination of the Escrow Agreement shall be at least equal to the cash amount then required to be withheld as retention pursuant to the Contract.

Securities shall be held in name of **Los Gatos Saratoga Joint Union High School District**, and shall designate Contractor as beneficial owner.

**2.** District shall make payments to Contractor for those funds which otherwise would be withheld from payments pursuant to Contract provisions, provided that Escrow Agent holds securities in the form and amount specified above.

**3.** When District makes payment of retention earned directly to Escrow Agent, Escrow Agent shall hold them for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the

payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the Parties shall be equally applicable and binding when District pays Escrow Agent directly.

**4.** Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of District. The District will charge Contractor $_____ for each of District's deposits to the escrow account. These expenses and payment terms shall be determined by District, Contractor, and Escrow Agent.

**5.** Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to District.

**6.** Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from District to Escrow Agent that District consents to withdrawal of amount sought to be withdrawn by Contractor.

**7.** District shall have the right to draw upon the securities and/or withdraw amounts from the Escrow Account in event of default by Contractor. Upon seven (7) days written notice to Escrow Agent from District of the default, if applicable, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by District.

**8.** Upon receipt of written notification from District certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.

**9.** Escrow Agent shall rely on written notifications from District and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Escrow Agreement and District and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth above.

**10.** Names of persons who are authorized to give written notice or to receive written notice on behalf of District and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

| **On behalf of District**: | **On behalf of Contractor**: |
|---|---|
| _____ | _____ |
| Title | Title |
| _____ | _____ |
| Name | Name |
| _____ | _____ |
| Signature | Signature |
| _____ | _____ |

Address

Address

**On behalf of Escrow Agent**:

_____
Title

_____
Name

_____
Signature

_____
Address

At the time the Escrow Account is opened, District and Contractor shall deliver to Escrow Agent a fully executed copy of this Escrow Agreement.

IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

**Los Gatos Saratoga Joint Union High School District**

Signature: _____

Print Name: _____

Print Title: _____

_____ **Contractor**

Signature: _____

Print Name: _____

Print Title: _____

_____ **Escrow Agent**

Signature: _____

Print Name: _____

Print Title: _____

**End of Section**

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Section 00 54 70

# STORM WATER POLLUTION PREVENTION PLAN

"NOT APPLICABLE"

**End of Section**

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Section 00 61 14

# PERFORMANCE BOND

**(100% of Contract Price)**
**(Note: Contractors must use this form, NOT a surety company form.)**

**KNOW ALL PERSONS BY THESE PRESENTS:**

**WHEREAS**, the governing board ("Board") of the **Los Gatos Saratoga Joint Union High School District**, ("District") and _____, ("Principal)" have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

**Los Gatos High School Wellness Center** ("Project" or "Contract")

which Contract dated _____, 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof, and

**WHEREAS**, said Principal is required under the terms of the Contract to furnish a bond for the faithful performance of the Contract;

**NOW, THEREFORE**, the Principal and _____ ("Surety") are held and firmly bound unto the Board of the District in the penal sum of:

_____ DOLLARS

($_____), lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents, to:

- Perform all the work required to complete the Project; and
- Pay to the District all damages the District incurs as a result of the Principal's failure to perform all the Work required to complete the Project.

In the event the Principal is declared by the District to be in breach or default in the performance of the Contract, then, after written notice from the District to the Surety, as provided for herein, the Surety shall either remedy the default or breach of the Principal or shall take charge of the Work of the Contract and complete the Contract with a Contractor other than the Principal at its own expense; provided, however, that the procedure by which the Surety undertakes to discharge its obligations under this Bond shall be subject to the advance written approval of the District.

The condition of the obligation is such that, if the above bounden Principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the Contract and any alteration thereof made as therein provided, on his or its part to be kept and performed at the time and in the intent and meaning, including all contractual guarantees and warrantees of materials and workmanship, and shall indemnify and save harmless the District, its trustees, officers and agents, as therein stipulated, then this obligation shall become null and void, otherwise it shall be and remain in full force and virtue.

As a condition precedent to the satisfactory completion of the Contract, the above obligation shall hold good for a

period equal to the warranty and/or guarantee period of the Contract, during which time Surety's obligation shall continue if Contractor shall fail to make full, complete, and satisfactory repair, replace, and totally protect the District from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the District's rights or the Contractor's or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or to the Work to be performed thereunder shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the Contract Documents or to the Work.

**Any claims under this bond may be addressed to the Surety at the following address. This cannot be the Contractor's broker for this bond, but must be an employee of the Surety or the Surety's legal counsel:**

_____

_____

**Attention:** _____

**Telephone No.:** **(_____) _____-_____**

**Fax No.:** **(_____) _____-_____**

**E-mail Address:** _____

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____, 20___.

| **Principal** | **Surety** |
|---|---|
| _____ | _____ |
| (Name of Principal) | (Name of Surety) |
| _____ | _____ |
| (Signature of Person with Authority) | (Signature of Person with Authority) |
| _____ | _____ |
| (Print Name) | (Print Name) |
| | _____ |
| | (Name of California Agent of Surety) |
| | _____ |
| | (Address of California Agent of Surety) |
| | _____ |
| | (Telephone Number of California Agent of Surety) |

**Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.**

## End of Section

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Section 00 61 15

# PAYMENT BOND

**Contractor's Labor & Material Bond (100% of Contract Price)**
**(Note: Contractors must use this form, NOT a surety company form.)**

**KNOW ALL PERSONS BY THESE PRESENTS:**

**WHEREAS**, the governing board ("Board") of the **Los Gatos Saratoga Joint Union High School District**, (or "District") and _____, ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to

**Los Gatos High School Wellness Center** ("Project" or "Contract")

which Contract dated _____, 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof, and

**WHEREAS**, pursuant to law and the Contract, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by which the Contract is awarded in an amount equal to 100 percent (100%) of the Contract price, to secure the claims to which reference is made in the Civil Code of California, including section 9100, and the Labor Code of California, including section 1741.

**NOW, THEREFORE**, the Principal and _____, ("Surety") are held and firmly bound unto all laborers, material men, and other persons referred to in said statutes in the penal sum of:

_____ DOLLARS

($_____), lawful money of the United States, being a sum not less than the total amount payable by the terms of Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

The condition of this obligation is that if the Principal or any of his or its subcontractors, of the heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, provender, or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, that the Surety will pay the same in an amount not exceeding the amount herein above set forth, and also in case suit is brought upon this bond, will pay a reasonable attorney's fee to be awarded and fixed by the Court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under sections 9000 through 9566 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void; otherwise it shall be and remain in full force and affect.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or to the Work to be performed thereunder shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the Contract Documents or to the Work.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____, 20___.

| **Principal** | **Surety** |
|---|---|
| _____ | _____ |
| (Name of Principal) | (Name of Surety) |
| _____ | _____ |
| (Signature of Person with Authority) | (Signature of Person with Authority) |
| _____ | _____ |
| (Print Name) | (Print Name) |
| | _____ |
| | (Name of California Agent of Surety) |
| | _____ |
| | (Address of California Agent of Surety) |
| | _____ |
| | (Telephone Number of California Agent of Surety) |

**Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.**

## End of Section

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Section 00 63 00

# DISTRICT CONTRACT FORMS

"NOT APPLICABLE"

**End of Section**

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Section 00 65 00

# DISTRICT CLOSEOUT FORMS

"NOT APPLICABLE"

**End of Section**

Section 00 65 10

# NOTICE TO PROCEED

Dated: _____, 20___

To: _____
("Contractor")

_____
(Address)

From: Governing Board ("Board") of **Los Gatos Saratoga Joint Union High School District** ("District")

Re: **Los Gatos High School Wellness Center**("Project" or "Contract")

Contractor is hereby notified that the Contract Time under the Contract will commence to run on _____ _____, 20___. By that date, Contractor shall start performing its obligations under the Contract Documents. In accordance with the Agreement executed by Contractor, the Contract Time and Project Completion is _____, 20___.

Contractor must submit the following documents by 5:00 p.m. of the **TENTH (10TH)** calendar day following the date of this Notice to Proceed:

1. Contractor's preliminary schedule of construction.

2. Contractor's preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals.

3. Contractor's preliminary schedule of values for all of the Work.

4. Contractor's preliminary Contractor's Safety Plan specifically adapted for the Project.

5. A complete subcontractors list, including the name, address, telephone number, facsimile number, California State Contractor's License number, classification, and monetary value of all Subcontracts.

Thank you. We look forward to a successful Project.

**Los Gatos Saratoga Joint Union High School District**

SIGNATURE: _____

NAME: _____

TITLE: _____

## End of Section

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Section 00 65 36

# WARRANTY AND GUARANTEE FORM

**1.** _____("Contractor")

hereby agrees that the _____ ("Work" of Contractor)

which Contractor has installed for the **Los Gatos Saratoga Joint Union High School District** ("District") for the following project:

**Los Gatos High School Wellness Center** ("Project" or "Contract")

was performed in accordance with the requirements of the Contract Documents and that the Work as installed fulfills the requirements of the Contract Documents.

**2.** Contractor agrees to repair or replace all of the Work that may prove to be defective in workmanship or material and any other adjacent Work that may be displaced in connection with such replacement within a period of _____ **YEAR(S)** from the date of Completion as defined in the Contract, ordinary wear and tear and unusual abuse or neglect excepted. The date of completion is _____, 20___.

**3.** In the event Contractor fails to comply with the above-mentioned conditions within a reasonable period of time, as determined by District, but not later than **SEVEN (7)** calendar days after being notified in writing by District, Contractor authorizes District to proceed to repair or replace the defective Work at the expense of Contractor. Contractor shall pay the costs and charges therefor upon demand.

**4.** **Representatives to be contacted for service subject to the terms of Contract:**

NAME: _____

ADDRESS: _____

PHONE NO.: _____

EMAIL: _____

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

**End of Section**

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Section 00 70 00

# General Conditions

## 1. CONTRACT TERMS AND DEFINITIONS

### 1.1. Definitions

**Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof:**

**1.1.1. Adverse Weather**: Weather that satisfies all of the following conditions: (1) unusually severe precipitation, sleet, snow, hail, heat, or cold conditions in excess of the norm for the location and time of year it occurred, (2) unanticipated, and (3) occurring at the Project Site.

**1.1.2. Allowance(s):** Amount(s) stated in the Agreement for specific scopes of work for which Contractor may bill its time, materials, and other items in the identical structure as a Change Order.

**1.1.3. Approval, Approved, and/or Accepted:** Refer to written authorization, unless stated otherwise.

**1.1.4. Architect**: The individual, partnership, corporation, joint venture, or any combination thereof, named as Architect that has the rights and authority assigned to the Architect in the Contract Documents. The term Architect means the District's Architect on this Project or the Architect's authorized representative.

**1.1.5. As-Built Drawings:** A reproducible full-size sets of drawings to be prepared on a monthly basis, and upon Project Completion, pursuant to the Contract Documents, that reflect changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed since the preceding monthly submittal.

**1.1.6. Bidder:** A contractor who intends to provide a bid to the District to perform the Work of the Contract.

**1.1.7. Change Order**: A written order to the Contractor authorizing an addition to, deletion from, or revision in the Work, and/or authorizing an adjustment in the Contract Price or Contract Time. If a Change Order is required to be approved by DSA, the District may call it a Construction Change Document.

**1.1.8. Completion**: When the entire Work shall have been completed, including all punch list items, as further detailed in the "Completion of the Project" Section herein. Final DSA approval of the Project is not required for Completion.

**1.1.9. Construction Manager**: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Construction Manager is used on the Project, then all references in the Contract Documents to Construction Manager shall be read to refer to District.

**1.1.10. Construction Schedule:** The progress schedule of construction of the Project as provided by Contractor and approved by District.

**1.1.11. Contract, Contract Documents**: The Contract consists exclusively of the documents evidencing the agreement of the District and Contractor, identified as the Contract Documents. The Contract Documents consist of the following documents:

**1.1.11.1.** Notice to Bidders / Invitation to Bid

**1.1.11.2.** Instructions to Bidders

**1.1.11.3.** Bid Form

**1.1.11.4.** Bid Bond

**1.1.11.5.** Designated Subcontractors List

**1.1.11.6.** Noncollusion Declaration

**1.1.11.7.** Iran Contracting Act Certification

**1.1.11.8.** Certifications to be Completed by Contractor

**1.1.11.9.** Disabled Veteran's Business Enterprise Participation Certification

**1.1.11.10.** Criminal Background Investigation/Fingerprinting Certification

**1.1.11.11.** Notice of Award

**1.1.11.12.** Agreement

**1.1.11.13.** Escrow of Bid Documentation (if applicable)

**1.1.11.14.** Escrow Agreement for Security Deposits in Lieu of Retention

**1.1.11.15.** Storm Water Pollution Prevention Plan (if applicable)

**1.1.11.16.** Notice to Proceed

**1.1.11.17.** Performance Bond

**1.1.11.18.** Payment Bond (Contractor's Labor and Material Bond)

**1.1.11.19.** District Contract Forms (if applicable)

**1.1.11.20.** District Closeout Forms (if applicable)

**1.1.11.21.** Warranty and Guarantee Form

**1.1.11.22.** General Conditions

**1.1.11.23.** Special Conditions

**1.1.11.24.** Project Plans, Specifications, Technical Specifications, and Drawings

**1.1.11.25.** Addenda to any of the above documents

**1.1.11.26.** Schedules if approved in writing by the District

**1.1.11.27.** Change Orders or written modifications to the above documents if approved in writing

by the District

**1.1.12. Contract Price**: The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

**1.1.13. Contract Time**: The time period stated in the Agreement for the Completion of the Work.

**1.1.14. Contractor**: The licensed person, entity, or entities identified in the Agreement as contracting to perform the Work.

**1.1.15. Daily Job Report(s)**: Daily Project reports prepared by the Contractor's employee(s) who are present on Site, which shall include the information required herein.

**1.1.16. Day(s)**: Unless otherwise designated, day(s) means calendar day(s). "**Business Day(s)**" shall mean days except Saturday, Sunday, a day that is federally-recognized holiday, or a day that is a California-recognized holiday.

**1.1.17. Defective or Nonconforming Work.** Defective or nonconforming Work is any Work which is unsatisfactory, faulty or deficient by: (a) not conforming to the requirements of the Contract Documents; (b) not conforming to the standards of workmanship of the applicable trade; (c) not being in compliance with the requirements of any inspection, reference, standard, test, or approval required by the Contract Documents; or (d) damage to Work occurring prior to Completion.

**1.1.18. District:** The public agency or the school district for which the Work is performed.

**1.1.19. Drawings**: (or "Plans") The graphic and pictorial portions of the Contract Documents showing the design, location, scope and dimensions of the Work, generally including plans, elevations, sections, details, schedules, sequence of operation, and diagrams.

**1.1.20. DSA:** Division of the State Architect.

**1.1.21. Force Account Directive**: A process that may be used when the District and the Contractor cannot agree on a price for a specific scope of work or before Contractor prepares a price for the scope of work, Contractor performs on a time and materials basis.

**1.1.22. Premises**: The real property owned by the District on which the Project Site is located.

**1.1.23. Product(s):** New material, machinery, components, equipment, fixtures and systems forming the Work, including existing materials or components required and approved by the District for reuse.

**1.1.24. Product Data:** Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by Contractor to illustrate a material, product, or system for a scope of the Work.

**1.1.25. Project**: The planned undertaking as provided for in the Contract Documents.

**1.1.26. Project Inspector**: (or "Inspector") Individual(s) retained by the District in accordance with title 24 of the California Code of Regulations to monitor and inspect the Project.

**1.1.27. Program Manager:** The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Program Manager is designated for the Project then all references to Project Manager shall refer to District.

**1.1.28. Proposed Change Order**: A written request prepared by the Contractor requesting that the District and the Architect issue a Change Order based upon a proposed change to the Work.

**1.1.29. Provide**: Shall include "provide complete in place," that is, "furnish and install," and "provide complete and functioning as intended in place" unless specifically stated otherwise.

**1.1.30. Request for Information**: (or "RFI") A written request prepared by the Contractor requesting that the Architect provide additional information necessary to clarify or amplify an item in the Contract Documents that the Contractor believes is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address issues that have arisen under field conditions.

**1.1.31. Request for Substitution**: A request by Contractor to substitute an equal or superior material, product, thing, or service for a specific material, product, thing, or service that has been designated in the Contract Documents by a specific brand or trade name.

**1.1.32. Safety Orders**: Written and/or verbal orders for construction issued by the California Division of Industrial Safety ("CalOSHA") or by the United States Occupational Safety and Health Administration ("OSHA").

**1.1.33. Safety Plan**: Contractor's safety plan specifically adapted for the Project. Contractor's Safety Plan shall comply with all provisions regarding Project safety, including all applicable provisions in these General Conditions.

**1.1.34. Samples**: Physical examples that illustrate materials, products, equipment, finishes, colors, or workmanship and that, when approved in accordance with the Contract Documents, establish standards by which portions of the Work will be judged.

**1.1.35. Shop Drawings**: All drawings, prints, diagrams, illustrations, brochures, schedules, and other data that are prepared by the Contractor, a subcontractor, manufacturer, supplier, or distributor, that illustrate how specific portions of the Work shall be fabricated or installed.

**1.1.36. Site**: The Project site as shown on the Drawings.

**1.1.37. Specifications**: That portion of the Contract Documents, Division 1 through Division 17, and all technical sections, and addenda to all of these, if any, consisting of written descriptions and requirements of a technical nature of materials, equipment, construction methods and systems, standards, and workmanship.

**1.1.38. Subcontractor**: A contractor and/or supplier who is under contract with the Contractor or with any other subcontractor, regardless of tier, to perform a portion of the Work.

**1.1.39. Submittal Schedule:** The schedule of submittals as provided by Contractor and approved by District.

**1.1.40. Surety**: The person, firm, or corporation that executes as surety the Contractor's Performance Bond and Payment Bond, and must be a California admitted surety insurer as defined in the Code of Civil Procedure section 995.120.

**1.1.41. SWPPP**: The District's Storm Water Pollution Prevention Plan.

**1.1.42. Terms.** The term "provide" means "provide complete in place" or to "furnish and install" such item. Unless otherwise provided in the Contract Documents, the terms "approved;" "directed;" "satisfactory;" "accepted;" "acceptable;" "proper;" "required;" "necessary" and "equal" shall mean as

approved, directed, satisfactory, accepted, acceptable, proper, required, necessary and equal, in the opinion of the District. The term "typical" as used in the Drawings shall require the installation or furnishing of such item(s) of the Work designated as "typical" in all other areas similarly marked as "typical"; Work in such other areas shall conform to that shown as "typical" or as reasonably inferable therefrom.

**1.1.43. Unilateral Change Order**: A written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work. **A Unilateral Change Order is NOT a Construction Change Document (which is defined above as a Change Order that DSA must approve).**

**1.1.44. Work:** All labor, materials, equipment, components, appliances, supervision, coordination, and services required by, or reasonably inferred from, the Contract Documents, that are necessary for the construction and Completion of the Project.

### 1.2. Laws Concerning the Contract

Contract is subject to all provisions of the Constitution and laws of California and the United States, governing, controlling, or affecting District, or the property, funds, operations, or powers of District, and such provisions are by this reference made a part hereof. Any provision required by law to be included in this Contract shall be deemed to be inserted.

### 1.3. No Oral Agreements

No oral agreement or conversation with any officer, agent, or employee of District, either before or after execution of Contract, shall affect or modify any of the terms or obligations contained in the Contract Documents.

### 1.4. No Assignment

Contractor shall not assign the Contract or any part thereof including, without limitation, any services or money to become due without the prior written consent of the District. Assignment without District's prior written consent shall be null and void. Any assignment of money due or to be come due under the Contract shall be subject to a prior lien for services rendered or material supplied for Work performed in favor of all persons, firms, or corporations rendering services or supplying material to the extent that claims are filed pursuant to the Civil Code, Code of Civil Procedure, Government Code, Labor Code, and/or Public Contract Code, and shall also be subject to deductions for Liquidated Damages or withholding of payments as determined by District in accordance with the Contract. Contractor shall not assign or transfer in any manner to a Subcontractor or supplier the right to prosecute or maintain an action against the District.

### 1.5. Confidentiality

Contractor shall maintain the confidentiality of all information, documents, programs, procedures and all other items that Contractor encounters while performing the Work. This requirement shall be ongoing and shall survive the expiration or termination of the Contract and specifically includes, without limitation, all student, parent, and employee disciplinary information and health information.

### 1.6. Notice and Service Thereof

**1.6.1.** Any notice required by the Contract shall be in writing, dated and signed by the party giving notice or by a duly authorized representative of that party. Notice shall be served and considered effective if given in one of the following manners:

**1.6.1.1.** By personal delivery; considered delivered on the day of delivery.

**1.6.1.2.** By overnight delivery service; considered delivered one (1) day after date deposited, as indicated by the delivery service.

**1.6.1.3.** By depositing same in United States mail, enclosed in a sealed envelope; considered delivered three (3) days after date deposited, as indicated by the postmarked date.

**1.6.1.4.** By registered or certified mail with postage prepaid, return receipt requested; considered delivered on the day the notice is signed for.

**1.7. No Waiver**

The failure of District in any one or more instances to insist upon strict performance of any term of the Contract or to exercise any District option shall not be construed as a waiver or relinquishment of the right to assert or rely upon any such term or option on a future occasion. No action or failure to act by the District, Architect, or Construction Manager shall constitute a waiver of any right or duty afforded the District under the Contract, nor shall any action or failure to act constitute an approval of or acquiescence in any breach hereunder, except as may be specifically agreed in writing.

**1.8. Substitutions for Specified Items**

**1.8.1.** Requests for substitutions prior to award of the Contract shall be submitted within the time period indicated in the Instructions to Bidders.

**1.8.2.** Requests for substitutions after award of the Contract shall be submitted within **THIRTY-FIVE** (**35**) days of the date of the Notice of Award. This time period may be extended by the District only, in its sole discretion.

**1.8.3.** Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified.

**1.8.3.1.** If the material, process, or article offered by Contractor is not, in the opinion of the District, substantially equal or better in every respect to that specified, then Contractor shall furnish the material, process, or article specified in the Specifications without any additional compensation or change order.

**1.8.3.2.** This provision shall not be applicable with respect to any material, product, thing or service for which District made findings and gave notice in accordance with Public Contract Code section 3400(b); therefore, Contractor shall not be entitled to request a substitution with respect to those materials, products or services.

**1.8.4.** A request for a substitution shall be in writing and shall include:

**1.8.4.1.** All variations of the proposed substitute from the material specified including, but not limited to, principles of operation, materials, or construction finish, thickness or gauge of materials, dimensions, weight, and tolerances;

**1.8.4.2.** Available maintenance, repair or replacement services;

**1.8.4.3.** Increases or decreases in operating, maintenance, repair, replacement, and spare parts

costs;

**1.8.4.4.** Whether or not acceptance of the substitute will require other changes in the Work (or in work performed by the District or others under Contract with the District); and

**1.8.4.5.** The time impact on any part of the Work resulting directly or indirectly from acceptance of the proposed substitute.

**1.8.5.** No substitutions shall be made until approved, in writing, by the District. The burden of proof as to equality of any material, process, or article shall rest with Contractor. The Contractor warrants that if substitutes are approved:

**1.8.5.1.** The proposed substitute is equal or superior in all respects to that specified, and that such proposed substitute is suitable and fit for the intended purpose and will perform adequately the function and achieve the results called for by the general design and the Contract Documents;

**1.8.5.2.** The Contractor provides the same warranties and guarantees for the substitute that would be provided for that specified;

**1.8.5.3.** The Contractor shall be fully responsible for the installation of the substitute and any changes in the Work required, either directly or indirectly, because of the acceptance of such substitute, with no increase in Contract Price or Contract Time. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time;

**1.8.5.4.** The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute; and

**1.8.5.5.** The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit.

**1.8.6.** In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.

**1.8.7.** In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

**1.8.8.** If the District approves a substitution after the award of the Contract, the District shall memorialize that approval in a Change Order or other applicable Contract modification process.

**1.9. Materials and Work**

**1.9.1.** Except as otherwise stated in the Contract, Contractor shall provide and pay for all materials, labor, tools, equipment, transportation, supervision, temporary constructions of every nature, and all other services, management, and facilities of every nature whatsoever necessary to execute and complete the Contract within the Contract Time.

**1.9.2. COVID-19.** Contractor shall comply with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in

connection with COVID-19, and/or any similar virus or derivative strain including, without limitation, providing personal protective equipment ("PPE") to its employees and to ensure that its subcontractors provide PPE equipment to its employees to prevent the spread of COVID-19 or any other similar virus or derivative strain at the Project Site(s). Contractor shall ensure it has supervisor employees onsite that are trained and knowledgeable of all of these requirements to ensure full compliance on Project Site(s).

**1.9.3.** Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted or specified, and workmanship shall be of good quality.

**1.9.4.** Materials shall be furnished in sufficient quantities and at such times as to insure uninterrupted progress of Work and shall be stored properly and protected as required.

**1.9.5.** For all materials and equipment specified or indicated in the Drawings, the Contractor shall provide all labor, materials, equipment, and services necessary for complete assemblies and complete working systems, functioning as intended. Incidental items not indicated on Drawings, nor mentioned in the Specifications, that can legitimately and reasonably be inferred to belong to the Work described, or be necessary in good practice to provide a complete assembly or system, shall be furnished as though itemized here in every detail. In all instances, material and equipment shall be installed in strict accordance with each manufacturer's most recent published recommendations and specifications.

**1.9.6.** Contractor shall, after award of Contract by District and after relevant submittals have been approved, place orders for materials and/or equipment as specified so that delivery of same may be made without delays to the Work. Contractor shall, upon demand from District, present documentary evidence showing that orders have been placed.

**1.9.7.** District reserves the right but has no obligation, for any neglect in complying with the above instructions, to place orders for such materials and/or equipment as it may deem advisable in order that the Work may be completed at the date specified in the Agreement, and all expenses incidental to the procuring of said materials and/or equipment shall be paid for by Contractor or withheld from payment(s) to Contractor.

**1.9.8.** Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon Completion of all Work to deliver the Site to District, together with all improvements and appurtenances constructed or placed thereon by it, and free from any claims, liens, or charges. Contractor further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any Work shall have any right to lien any portion of the Premises or any improvement or appurtenance thereon, except that Contractor may install metering devices or other equipment of utility companies or of political subdivision, title to which is commonly retained by utility company or political subdivision. In the event of installation of any such metering device or equipment, Contractor shall advise District as to owner thereof.

**1.9.9.** Nothing contained in this Article, however, shall defeat or impair the rights of persons furnishing materials or labor under any bond given by Contractor for their protection or any rights under law permitting such protection or any rights under law permitting such persons to look to funds due Contractor in hands of District (e.g., stop payment notices). This provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for work when no formal contract is entered into for such material.

**1.9.10.** Title to new materials and/or equipment for the Work and attendant liability for its protection and safety shall remain with Contractor until incorporated in the Work of this Contract and accepted by District. No part of any materials and/or equipment shall be removed from its place of storage except for immediate installation in the Work. Contractor shall keep an accurate inventory of all materials and/or equipment in a manner satisfactory to District or its authorized representative and shall, at the District's

request, forward it to the District.

**1.9.11.** Contractor certifies that it shall comply with the recycled product requirements of Public Contract Code section 22150, et seq., including, without limitation, section 22154 which states, "All businesses shall certify in writing to the contracting officer, or his or her representative, the minimum, if not exact, percentage of postconsumer material in the products, materials, goods, or supplies being offered or sold to any local public entity."

## 2. DISTRICT

**2.1.** The governing board of the District or its designees will act for the District in all matters pertaining to the Contract.

**2.2.** The District may, at any time,

**2.2.1.** Direct the Contractor to communicate with or provide notice to the Construction Manager or the Architect on matters for which the Contract Documents indicate the Contractor will communicate with or provide notice to the District; and/or

**2.2.2.** Direct the Construction Manager or the Architect to communicate with or direct the Contractor on matters for which the Contract Documents indicate the District will communicate with or direct the Contractor.

**2.3.** **District's Rights if Contractor Fails to Perform**. If the District at any time believes that the Contractor is behind schedule, is failing to construct the Project pursuant to the Contract Documents or is otherwise failing to perform any provisions of this Contract, the District, after **FORTY-EIGHT (48)** hours written notice to the Contractor, may take any action necessary or beneficial to the District to complete the Project, takeover the Work of the Contract, terminate or suspend the Contract as indicated herein, or any combination or portion of those actions. The Contractor and the Surety shall be liable to the District for any cost incurred by the District in those actions and the District has the right to deduct the cost thereof from any payment then or thereafter due the Contractor.

## 3. ARCHITECT

**3.1.** Architect shall have the authority to act on behalf of District to the extent expressly provided in the Contract Documents and to the extent determined by District to, among other things, observe the progress and quality of the Work on behalf of the District.

**3.2.** Architect shall have authority to reject materials, workmanship, and/or the Work whenever rejection may be necessary, in Architect's reasonable opinion, to insure the proper execution of the Contract and if Work is defective or does not conform to the requirements of the Contract Documents. Whenever the Architect considers it necessary or advisable, for implementation of the intent of the Contract Documents, the Architect will have authority to require additional inspections or testing of the Work, whether or not such Work is fabricated, installed or completed. Neither this authority of the Architect nor a decision made in good faith by the Architect to exercise or not to exercise that authority shall give rise to a duty or responsibility to the Contractor, Subcontractors, material suppliers, their agents or employees, or other persons performing portions of the Work.

**3.3.** Architect shall, with the District and on behalf of the District, determine the amount, quality, acceptability, and fitness of all parts of the Work, and interpret the Specifications, Drawings, and shall, with the District, interpret all other Contract Documents.

**3.4.** Architect shall have all authority and responsibility established by law, including title 24 of the

California Code of Regulations.

**3.5.** Contractor shall provide District and the Construction Manager with a copy of all written communication between Contractor and Architect at the same time as that communication is made to Architect, including, without limitation, all RFIs, correspondence, submittals, claims, and proposed change orders.

## 4. CONSTRUCTION MANAGER

**4.1.** If a Construction Manager is used on this Project, the Construction Manager will provide administration of the Contract on the District's behalf. After execution of the Contract and Notice to Proceed, all correspondence and/or instructions from Contractor and/or District shall be forwarded through the Construction Manager. The Construction Manager will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures or for safety precautions in connection with the Work, which shall all remain the Contractor's responsibility.

**4.2.** Construction Manager, however, will have authority to reject materials and/or workmanship not conforming to the Contract Documents, as determined by the District, the Architect, and/or the Project Inspector. Construction Manager shall also have the authority to require special inspection or testing of any portion of the Work, whether it has been fabricated, installed, or fully completed. Any decision made by Construction Manager, in good faith, shall not give rise to any duty or responsibility of the Construction Manager to the Contractor, any Subcontractor, their agents, employees, or other persons performing any of the Work. Construction Manager shall have free access to all parts of Work at any time.

**4.3.** If the District does not use a Construction Manager on this Project, all references to Construction Manager or CM shall be read as District.

## 5. INSPECTOR, INSPECTIONS AND TESTS

### 5.1. Project Inspector

**5.1.1.** One or more Project Inspector(s), including special Project Inspector(s), as required, will be assigned to the Work by District, in accordance with requirements of title 24, part 1, of the California Code of Regulations, to enforce the building code and monitor compliance with Plans and Specifications for the Project previously approved by the DSA. Duties of Project Inspector(s) are specifically defined in section 4-342 of said part 1 of title 24.

**5.1.2.** No Work shall be carried on except with the knowledge and under the inspection of the Project Inspector(s). The Project Inspector(s) shall have free access to all parts of Work at any time. Contractor shall furnish Project Inspector(s) reasonable opportunities for obtaining such information as may be necessary to keep Project Inspector(s) fully informed respecting progress and manner of work and character of materials. Inspection of Work shall not relieve Contractor from the obligation to fulfill the Contract. Project Inspector(s) and the DSA are authorized to stop work whenever the Contractor and/or its Subcontractor(s) are not complying with the Contract Documents. Any work stoppage by the Project Inspector(s) and/or DSA shall be without liability to the District. Contractor shall instruct its Subcontractors and employees accordingly.

**5.1.3.** If Contractor and/or any Subcontractor requests that the Project Inspector(s) perform any inspection off-site, this shall only be done if it is allowable pursuant to applicable regulations and DSA, if the Project Inspector(s) agree to do so, and at the expense of the Contractor.

**5.1.4. Limitations on Project Inspector Authority**. The Project Inspector does not have authority to

interpret the Contract Documents or to modify the Work depicted in the Contract Documents. No Work inconsistent with the Contract Documents shall be performed solely on the basis of the direction of the Project Inspector, and the Contractor shall be liable to the District for the consequences of all Work performed on such basis.

**5.2. Tests and Inspections**

**5.2.1.** Tests and Inspections shall comply with title 24, part 1, California Code of Regulations, group 1, article 5, section 4-335, and with the provisions of the Specifications.

**5.2.2.** If the Contract Documents, laws, ordinances or any public authority with jurisdiction over the Work requires the Work, or any portion thereof, to be specially tested, inspected or approved, the Contractor shall give the Architect, the Construction Manager and the Project Inspector written notice of the readiness of such Work for observation, testing or inspection at least seventy-two (72) hours prior to the time for the conducting of such test, inspection or observation. If inspection, testing or observation is by authority other than the District, the Contractor shall inform the Project Inspector and the Construction Manager not less than seventy-two (72) hours prior to the date fixed for such inspection, test or observation. The Contractor shall not cover up any portion of the Work subject to tests, inspections or observations prior to the completion and satisfaction of the requirements of such test, inspection or observation. In the event that any portion of the Work subject to tests, inspection or approval shall be covered up by Contractor prior to completion and satisfaction of the requirements of such tests, inspection or approval, Contractor shall be responsible for the uncovering of such portion of the Work as is necessary for performing such tests, inspection or approval without adjustment of the Contract Price or the Contract Time on account thereof.

**5.2.3.** The District will select an independent testing laboratory to conduct the tests. Selection of the materials required to be tested shall be by the laboratory or the District's representative and not by the Contractor. The Contractor shall notify the District's representative a sufficient time in advance of its readiness for required observation or inspection.

**5.2.4.** The Contractor shall notify the District's representative a sufficient time in advance of the manufacture of material to be supplied under the Contract Documents, that must by terms of the Contract Documents be tested, in order that the District may arrange for the testing of same at the source of supply. This notice shall be, at a minimum, seventy-two (72) hours prior to the manufacture of the material that must be tested.

**5.2.5.** Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed required testing and inspection or prior to the receipt of notice from the representative that testing and inspection will not be required, shall not be incorporated into and/or onto the Project.

**5.2.6.** The District will select and pay testing laboratory costs for all tests and inspections. Costs of tests of any materials found to be not in compliance with the Contract Documents shall be paid for by the District and reimbursed by the Contractor or deducted from the Contract Price.

**5.3. Costs for After Hours and/or Off Site Inspections**

**5.3.1.** If the Contractor performs Work outside the Inspector’s regular working hours, over a period of more than eight (8) hours per day by any single person, on weekends/holidays or requests the Inspector to perform inspections off Site, then the costs of any inspections required outside regular working hours, over a period of more than eight (8) hours per day by any single person, on weekends/holidays or off Site, shall be borne by the Contractor and may be invoiced to the Contractor by the District or the District may deduct those expenses from the next Progress Payment.

## 6. CONTRACTOR

Contractor shall construct the Work for the Contract price including any adjustment(s) to the Contract Price pursuant to provisions herein regarding changes to the Contract Price. Except as otherwise noted, Contractor shall provide and pay for all labor, materials, equipment, permits, fees, licenses, facilities, transportation, taxes, and services necessary for the proper execution and Completion of the Work, except as indicated herein.

### 6.1. Status of Contractor

**6.1.1.** Contractor is and shall at all times be deemed to be an independent contractor and shall be wholly responsible for the manner in which it and its Subcontractors perform the services required of it by the Contract Documents. Nothing herein contained shall be construed as creating the relationship of employer and employee, or principal and agent, between the District, or any of the District's employees or agents, and Contractor or any of Contractor's Subcontractors, agents or employees. Contractor assumes exclusively the responsibility for the acts of its employees as they relate to the services to be provided during the course and scope of their employment. Contractor, its Subcontractors, agents, and its employees shall not be entitled to any rights or privileges of District employees. District shall be permitted to monitor the Contractor's activities to determine compliance with the terms of the Contract.

**6.1.2.** As required by law, Contractor and all Subcontractors shall be properly licensed and regulated by the Contractor's State License Board, located at 9821 Business Park Drive, , Sacramento, California 95827, with a mailing address of Post Office Box 26000, Sacramento, California, and with a website at http://www.cslb.ca.gov.

### 6.2. Contractor's Supervision

**6.2.1.** During progress of the Work, Contractor shall keep on the Premises, and at all other locations where any Work related to the Contract is being performed, a competent project manager and construction superintendent who are employees of the Contractor, to whom the District does not object and at least one of whom shall be fluent in English, written and verbal.

**6.2.2.** The project manager and construction superintendent shall both speak fluently the predominant language of the Contractor's employees.

**6.2.3.** Before commencing the Work, Contractor shall give written notice to District of the name of its project manager and construction superintendent. Neither the Contractor's project manager nor construction superintendent shall be changed except with prior written notice to District, unless the Contractor's project manager and/or construction superintendent proves to be unsatisfactory to Contractor, District, any of the District's employees, agents, the Construction Manager, or the Architect, in which case, Contractor shall notify District in writing. District retains the right to reasonably refuse Contractor's replacement personnel The Contractor's project manager and construction superintendent shall each represent Contractor, and all directions given to Contractor's project manager and/or construction superintendent shall be as binding as if given to Contractor.

**6.2.4.** Contractor shall give efficient supervision to Work, using its best skill and attention. Contractor shall carefully study and compare all Contract Documents, Drawings, Specifications, and other instructions and shall at once report to District, Construction Manager, and Architect any error, inconsistency, or omission that Contractor or its employees and Subcontractors may discover, in writing, with a copy to District's Project Inspector(s). The Contractor shall have responsibility for discovery of errors, inconsistencies, or omissions.

**6.2.5.** The Contractor's project manager shall devote sufficient time to the Project on site, and in the

Contractor's home office to pre-plan activities to meet the Construction Schedule and fulfill all Contract obligations. This includes making timely submittals, issuing and disseminating necessary RFI's, promptly processing and distributing bulletins, change orders and payments, keeping required logs current etc. If any of these activities fall behind contract requirements or dates necessary to complete the Project on time, the Contractor must provide a full time project manager on the Project Site dedicated solely to the Project, until the deficiencies are corrected.

**6.2.6.** The Contractor shall verify all indicated dimensions before ordering materials or equipment, or before performing Work. The Contractor shall take field measurements, verify field conditions, and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Project Documents before commencing work. Errors, inconsistencies or omissions discovered shall be immediately reported to the District. Upon commencement of any item of Work, the Contractor shall be responsible for dimensions related to the Work and shall make any corrections necessary to make Work properly fit at no additional cost to District. This responsibility for verification of dimensions is a non-delegable duty and may not be delegated to subcontractors or agents.

**6.2.7.** Omissions from the Drawings or Specifications, or the misdescription of details of Work which are manifestly necessary to carry out the intent of the Drawings and Specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed Work, but they shall be performed as if fully and correctly set forth and described in the Drawings and Specifications.

**6.2.8.** The Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents.

### 6.3. Duty to Provide Fit Workers

**6.3.1.** Contractor and Subcontractor(s) shall at all times enforce strict discipline and good order among their employees and shall not employ or work any unfit person or anyone not skilled in work assigned to that person. It shall be the responsibility of Contractor to ensure compliance with this requirement. District may require Contractor to permanently remove unfit persons from Project Site.

**6.3.2.** **COVID-19**. Contractor shall ensure that all its employees and employees of its subcontractors shall comply with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with COVID-19, and/or any similar virus or derivative strain.

**6.3.3.** Any person in the employ of Contractor or Subcontractor(s) whom District may deem incompetent or unfit shall be excluded from working on the Project and shall not again be employed on the Project except with the prior written consent of District.

**6.3.4.** The Contractor shall furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work.

**6.3.5.** If Contractor intends to make any change in the name or legal nature of the Contractor's entity, Contractor must first notify the District. The District shall determine if Contractor's intended change is permissible while performing the Contract.

**6.3.6.** **Compliance with Immigration Reform and Control Act of 1986.** As required by law, Contractor and all Subcontractors shall employ individuals for the Work in conformity with the Immigration Reform and Control Act of 1986, 8 USC §§1101 et seq.

**6.4. Personnel**

**6.4.1.** All persons working for Contractor and Subcontractor(s) shall refrain from using profane or vulgar language, or any other language that is inappropriate on the job site.

**6.4.2.** The Contractor shall employ a full-time superintendent and necessary assistants who shall have complete authority to represent and act on behalf on the Contractor on all matters pertaining to the Work. The superintendent shall be competent and have a minimum of five (5) years' experience in construction supervision on projects of similar scale and complexity. The superintendent shall be satisfactory to the District and, if not satisfactory, shall be replaced by the Contractor with one that is acceptable to the District. The superintendent shall not be changed without the written consent of the District unless the superintendent ceases to be employed by the Contractor.

**6.4.3.** The Contractor shall employ a competent estimator and necessary assistants, or contact for sufficient services of an estimating consultant and to process proposed change orders. The estimator shall have a minimum of five (5) years' experience in estimating. The estimator shall be satisfactory to the District and, if not satisfactory, shall be replaced by the Contractor with one that is acceptable. The estimator shall not be changed without the written consent of the District unless the estimator ceases to be employed by the Contractor. The Contractor shall submit PCO's requested by the District within fourteen (14) calendar days.

**6.4.4.** The Contractor shall employ a competent scheduler and necessary assistants, or contract for sufficient services of a scheduling consultant. The scheduler shall have a minimum of five (5) years' experience in scheduling. The scheduler shall be satisfactory to the District and, if not satisfactory, shall be replaced by the Contractor with one that is acceptable. The scheduler shall not be changed without the written consent of the District unless the scheduler ceases to be employed by the Contractor.

**6.4.5.** Contractor shall at all times enforce strict discipline and good order among Contractor's employees, and shall not employ on the Project any unfit person or anyone not skilled in the task assigned.

**6.4.6.** If Contractor or any Subcontractor on the Project site fails to comply with any provision herein, the District may have the offending person(s) immediately removed from the Site, and the person(s) shall be replaced within three (3) days, at no additional expense to the District. Contractor, on behalf of it and its Subcontractors, hereby waives any claim that the provisions of this paragraph or the enforcement thereof interferes, or has the potential to interfere, with its right to control the means and methods of its performance and duties under this Contract.

**6.5. Prohibition on Harassment**

**6.5.1.** In addition to the non-discrimination requirements in the Contract Documents, the Contractor and all Subcontractors must comply with these provisions prohibiting harassment at the Site. The District is committed to providing a campus and workplace free of sexual harassment and harassment based on factors such as race, color religion, national origin, ancestry, age, medical condition, marital status, disability or veteran status. Harassment includes without limitation, verbal, physical or visual conduct which creates an intimidating, offensive or hostile environment such as racial slurs; ethnic jokes; posting of offensive statements, posters or cartoons or similar conduct. Sexual harassment includes without limitation the solicitation of sexual favors, unwelcome sexual advances, or other verbal, visual or physical conduct of a sexual nature.

**6.5.2.** Contractor shall take all reasonable steps to prevent harassment from occurring, including without limitation affirmatively raising the subject of harassment among its employees, expressing strong disapproval of any form of harassment, developing appropriate sanctions, informing employees of their

right to raise and how to raise the issue of harassment and informing complainants of the outcome of an investigation into a harassment claim.

**6.5.3.** Contractor shall not permit any person, whether employed by Contractor or a Subcontractor or any other person or entity, performing any Work at or about the Site to engage in any prohibited form of harassment. Any person performing or providing Work on or about the Site engaging in a prohibited form of harassment directed to any student, faculty member or staff of the District or directed to any other person on or about the Site shall be subject to immediate removal and shall be prohibited thereafter from providing or performing any portion of the Work. Upon the District's receipt of any notice or complaint that any person employed directly or indirectly by Contractor on any Subcontractor in performing or providing the Work has engaged in a prohibited form of harassment, the District will promptly undertake an investigation of such notice or complaint. In the event that the District, after such investigation, reasonably determines that a prohibited form of harassment has occurred, the District shall promptly notify the Contractor of the same and direct that the person engaging in such conduct be immediately removed from the Site. Unless the District's determination that a prohibited form of harassment has occurred is grossly negligent or without reasonable cause, District shall have no liability for directing the removal of any person determined to have engaged in a prohibited form of harassment nor shall the Contract Price or the Contract Time be adjusted on account thereof. The indemnity provisions of the Contract Documents apply to any assertion by any person dismissed from performing or providing work at the direction of the District pursuant to this provision; or (ii) the assertion by any person that any person directly or indirectly under the employment or direction of the Contractor has engaged in a prohibited form of harassment directed to or affecting such person. The obligations of the Contractor and the Surety under the preceding sentence are in addition to, and not in lieu of, any other obligation of defense, indemnity and hold harmless whether arising under the Contract Documents, at law or otherwise; these obligations survive completion of the Work or the termination of the Contract.

### 6.6. Conferences and Meetings.

**6.6.1.** In addition to the conference and meeting requirements in the Specifications, Contractor's supervisory personnel for the Work and the Contractor's management personnel shall attend all required meetings as required by the Contract Documents or as requested by the District. The Contractor's personnel participating in conferences and meetings relating to the Work shall be authorized to act on behalf of the Contractor and to bind the Contractor. The Contractor is solely responsible for arranging for the attendance by Subcontractors and Material Suppliers at meetings and conferences relating to the Work as necessary, appropriate or as requested by the District.

**6.6.2. Preconstruction Conference.** The Contractor's representatives (and representatives of Subcontractors as requested by the District) shall attend a preconstruction conference at such time and place as designated by the District. The preconstruction conference will generally address the requirements of the Work and Contract Documents, and to establish construction procedures. Subject matters of the preconstruction conference will include as appropriate: (a) administrative matters, including an overview of the respective responsibilities of the District, Architect, Construction Manager, Contractor, Subcontractors, Project Inspector, and others performing any part of the Work or services relating to the Work; (b) Submittals; (c) Changes; (d) employment practices, including Certified Payroll preparation and submission and prevailing wage rate responsibilities of the Contractor and Subcontractors; (e) Progress Schedule development and maintenance; (f) development of Schedule of Values and payment procedures; (g) implementation of BIM, if applicable; (h) communication procedures, including the handling of Requests for Information; (i) emergency and safety procedures; (j) Site visitor policies; (k) conduct of Contractor/Subcontractor personnel at the Site; and (l) Completion, Punchlist and closeout procedures.

**6.6.3. Progress Meetings.** Progress meetings will be conducted on regular intervals (weekly unless

otherwise expressly indicated elsewhere in the Contract Documents). The Contractor's representatives and representatives of Subcontractors (as requested by the District) shall attend progress meetings. Progress Meetings will be chaired by the District or the Construction Manager and will generally include as agenda items: Site safety, field issues, coordination of Work, construction progress and impacts to timely Completion, if any. The purposes of the progress meetings include: a formal and regular forum for discussion of the status and progress of the Work by all Project participants, a review of progress or resolution of previously raised issues and action items assigned to the Project participants, and reviews of the Progress schedule and submittals. Contractor shall prepare and submit at each progress meeting a three (3) week look-ahead schedule identifying all planned activities for the next three (3) weeks and any deviations from activities in the current Construction Schedule.

**6.6.4. Special Meetings.** As deemed necessary or appropriate by the District, special meetings will be conducted with the participation of the Contractor, Subcontractors and other Project participants as requested by the District.

**6.6.5. Minutes of Meetings.** following conclusion of the preconstruction conference, progress meetings and special meetings, the Architect or the Construction Manager will prepare and distribute minutes reflecting the items addressed and actions taken at a meeting or conference. Unless the Contractor notifies the Architect and the Construction Manager in writing of objections or corrections to minutes prepared hereunder within five (5) days of the date of distribution of the minutes, the minutes as distributed shall constitute the official record of the meeting or conference. No objections or corrections of any Subcontractor or Material Supplier shall be submitted directly to the Architect or the Construction Manager; such objections or corrections shall be submitted to the Architect and the Construction Manager through the Contractor. If the Contractor timely interposes objections or notes corrections, the resolution of such matters shall be addressed at the next scheduled progress meeting.

## 6.7. Purchase of Materials and Equipment

**6.7.1.** The Contractor is required to order and obtain materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from District to assure that there will be no delays.

**6.7.2. Off-Site Storage of Materials and Equipment Only Upon District's Written Consent**. Contractor shall not store materials and/or equipment off site without first obtaining the District's express, written consent. If Contractor receives District's consent to store materials and/or equipment off site ("Stored Materials"), Contractor shall comply with all of the following:

**6.7.2.1. Property of Others Insurance**. Contractor shall procure and maintain, during the entire time Stored Materials are in off-site storage, insurance coverage acceptable to the District that shall protect Contractor and District from all claims for Stored Materials that are lost, stolen, or damaged. The District shall be named as a loss payee for this insurance coverage. The insurance coverage shall include a "loss payable endorsement" stating that all amounts payable will be paid as a joint-check to the Contractor and District. If approved in advance by District, this required insurance may be obtained by an "Employee Theft Protection Insurance Policy" or an "Employee Theft Protection Bond."

**6.7.2.2. Payment for Stored Materials**. District shall only make payment to Contractor for Stored Materials if agreed upon in advance, in writing, by the District and provided that Contractor submits an itemized list of all Stored Materials with Contractor's Application for Payment. Contractor's itemized list of all Stored Materials shall be supported by all of the following:

**6.7.2.2.1.** Itemized breakdown of the Stored Materials for the purpose of requesting partial payment, identifying the serial numbers and exact storage location of each piece of

equipment and material; and

**6.7.2.2.2.** Verified invoices for the Stored Materials; and

**6.7.2.2.3.** Original copy of Property of Others Insurance, Employee Theft Protection Insurance Policy, or an Employee Theft Protection Bond based on the type of insurance required by the District. These documents shall include certificates and endorsements stating the coverage and that the District is a loss payee or obligee, as appropriate.

**6.8. Documents on Work**

**6.8.1.** Contractor shall at all times keep on the Work Site, or at another location as the District may authorize in writing, one legible copy of all Contract Documents, including Addenda and Change Orders, and titles 19 and 24 of the California Code of Regulations, the specified edition(s) of the Uniform Building Code (electronic versions are acceptable), all approved Drawings, Plans, Schedules, and Specifications, and all codes and documents referred to in the Specifications, and made part thereof. These documents shall be kept in good order and available to District, Construction Manager, Architect, Architect's representatives, the Project Inspector(s), and all authorities having jurisdiction. Contractor shall be acquainted with and comply with the provisions of these titles as they relate to this Project. (See particularly the duties of Contractor, title 24, part 1, California Code of Regulations, section 4-343.) Contractor shall also be acquainted with and comply with all California Code of Regulations provisions relating to conditions on this Project, particularly titles 8 and 17. Contractor shall coordinate with Architect and Construction Manager and shall submit its verified report(s) according to the requirements of title 24.

**6.8.2. Daily Job Reports.**

**6.8.2.1.** Contractor shall maintain, at a minimum, at least one (1) set of Daily Job Reports on the Project. These must be prepared by the Contractor's employee(s) who are present on Site, and must include, at a minimum, the following information:

**6.8.2.1.1.** A brief description of all Work performed on that day.

**6.8.2.1.2.** A summary of all other pertinent events and/or occurrences on that day.

**6.8.2.1.3.** The weather conditions on that day.

**6.8.2.1.4.** A list of all Subcontractor(s) working on that day,

**6.8.2.1.5.** A list of each Contractor employee working on that day and the total hours worked for each employee.

**6.8.2.1.6.** A complete list of all equipment on Site that day, whether in use or not.

**6.8.2.1.7.** A complete list of all materials, supplies, and equipment delivered on that day.

**6.8.2.1.8.** A complete list of all inspections and tests performed on that day.

**6.8.2.2.** Each day Contractor shall provide a copy of the previous day's Daily Job Report to the District or the District's Construction Manager.

**6.9. Preservation of Records**

District shall have the right to examine and audit all Daily Job Reports or other Project records of Contractor's project manager(s), project superintendent(s), and/or project foreperson(s), all certified payroll records and/or related documents including, without limitation, payroll, payment, timekeeping and tracking documents; all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports, and other data of the Contractor, any Subcontractor, and/or supplier, including computations and projections related to bidding, negotiating, pricing, or performing the Work or Contract modification, in order to evaluate the accuracy, completeness, and currency of the cost, manpower, coordination, supervision, or pricing data at no additional cost to the District. These documents may be duplicative and/or be in addition to any Bid Documents held in escrow by the District. Contractor shall make available at its office at all reasonable times the materials described in this paragraph for the examination, audit, or reproduction until three (3) years after final payment under this Contract. Notwithstanding the provisions above, Contractor shall provide any records requested by any governmental agency, if available, after the time set forth above.

**6.10. Integration of Work**

**6.10.1.** Contractor shall do all cutting, fitting, patching, and preparation of Work as required to make its several parts come together properly, to fit it to receive or be received by work of other contractors, and to coordinate tolerances to various pieces of work, showing upon, or reasonably implied by, the Drawings and Specifications for the completed structure, and shall conform them as District and/or Architect may direct.

**6.10.2.** All cost caused by defective or ill-timed Work shall be borne by Contractor, inclusive of repair work.

**6.10.3.** Contractor shall not endanger any work performed by it or anyone else by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor except with written consent of District.

**6.11. Obtaining of Permits and Licenses**

**6.11.1.** Contractor shall secure and pay for all permits, licenses, and certificates as indicated in the Special Conditions.

**6.12. Work to Comply with Applicable Laws and Regulations**

**6.12.1.** Contractor shall give all notices and comply with all applicable laws, ordinances, rules, and regulations relating to the Work, including the specific laws, ordinances, rules, and regulations as indicated and specified in the Contract Documents and identified below, including but not limited to the appropriate statutes and administrative code sections. If Contractor observes that Drawings and Specifications are at variance therewith, or should Contractor become aware of the development of conditions not covered by Contract Documents that will result in finished Work being at variance therewith, Contractor shall promptly notify District in writing and any changes deemed necessary by District shall be made as provided in Contract for changes in Work.

**6.12.1.1.** National Electrical Safety Code, U. S. Department of Commerce

**6.12.1.2.** National Board of Fire Underwriters' Regulations

**6.12.1.3.** Uniform Building Code, latest addition, and the California Code of Regulations, title 24, including amendments

**6.12.1.4.** Manual of Accident Prevention in Construction, latest edition, published by A.G.C. of

America

**6.12.1.5.** Industrial Accident Commission's Safety Orders, State of California

**6.12.1.6.** Regulations of the State Fire Marshall (title 19, California Code of Regulations) and Pertinent Local Fire Safety Codes

**6.12.1.7.** Americans with Disabilities Act

**6.12.1.8.** Education Code of the State of California

**6.12.1.9.** Government Code of the State of California

**6.12.1.10.** Labor Code of the State of California, division 2, part 7, Public Works and Public Agencies

**6.12.1.11.** Public Contract Code of the State of California

**6.12.1.12.** California Art Preservation Act

**6.12.1.13.** U. S. Copyright Act

**6.12.1.14.** U. S. Visual Artists Rights Act

**6.12.2.** Contractor shall comply will all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act (Public Resources Code sections 21000 et. seq.)

**6.12.3.** If Contractor performs any Work that it knew, or through exercise of reasonable care should have known, to be contrary to any applicable laws, ordinance, rules, or regulations, Contractor shall bear all costs arising therefrom.

**6.12.4.** Where Specifications or Drawings state that materials, processes, or procedures must be approved by the DSA, State Fire Marshall, or other body or agency, Contractor shall be responsible for satisfying requirements of such bodies or agencies.

### 6.13. Safety/Protection of Persons and Property

**6.13.1.** Contractor will be solely and completely responsible for conditions of the Work Site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours.

**6.13.2. COVID-19.** Contractor is responsible for complying with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with COVID-19, and/or any similar virus or derivative strain. Contractor shall ensure it has supervisor employees onsite that are trained and knowledgeable of all of these requirements to ensure full compliance on Project Site(s).

**6.13.3.** The wearing of hard hats will be mandatory at all times for all personnel on Site. Contractor shall supply sufficient hard hats to properly equip all employees and visitors.

**6.13.4.** Any construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the Work Site.

**6.13.5.** Implementation and maintenance of safety programs shall be the sole responsibility of the Contractor.

**6.13.6.** Contractor shall furnish to the District a copy of the Contractor's safety plan within the time frame indicated in the Contract Documents and specifically adapted for the Project.

**6.13.7.** Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the performance of the Contract and shall take all necessary measures and be responsible for the proper care and completion and final acceptance by District. All Work shall be solely at Contractor's risk with the exception of damage to the Work caused by "acts of God" as defined in Public Contract Code section 7105.

**6.13.8.** Contractor shall take, and require Subcontractors to take, all necessary precautions for safety of workers on the Project and shall comply with all applicable federal, state, local, and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment. Contractor shall furnish, erect, and properly maintain at all times, all necessary safety devices, safeguards, construction canopies, signs, nets, barriers, lights, and watchmen for protection of workers and the public and shall post danger signs warning against hazards created by such features in the course of construction.

**6.13.9.** **Hazards Control**. Contractor shall store volatile wastes in covered metal containers and remove them from the Site daily. Contractor shall prevent accumulation of wastes that create hazardous conditions. Contractor shall provide adequate ventilation during use of volatile or noxious substances.

**6.13.10.** Contractor shall designate a responsible member of its organization on the Project, whose duty shall be to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety, and health of workers. Name and position of person so designated shall be reported to District by Contractor.

**6.13.11.** Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, Contractor shall correct such violation promptly.

**6.13.12.** **Storm Water.** Contractor shall comply with the District's Storm Water Pollution Prevention Plan (SWPPP) and, if indicated in the Special Conditions, shall be the District's Qualified SWPPP Practitioner, at no additional cost to the District.

**6.13.13.** In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization, shall act, at its discretion, to prevent such threatened loss or injury. Any compensation claimed by Contractor on account of emergency work shall be determined by agreement.

**6.13.14.** All salvage materials will become the property of the Contractor and shall be removed from the Site unless otherwise called for in the Contract Documents. However, the District reserves the right to designate certain items of value that shall be turned over to the District unless otherwise directed by District.

**6.13.15.** All connections to public utilities and/or existing on-site services shall be made and maintained in such a manner as to not interfere with the continuing use of same by the District during the entire progress of the Work.

**6.13.16.** Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions, such as extreme heat, cold, rain, snow, dry winds, flooding, or dampness.

**6.13.17.** Contractor shall protect and preserve the Work from all damage or accident, providing temporary roofs, window and door coverings, boxing, or other construction as required by the Architect. Contractor shall be responsible for existing structures, walks, roads, trees, landscaping, and/or improvements in working areas; and shall provide adequate protection therefor. If temporary removal is necessary of any of the above items, or damage occurs due to the Work, the Contractor shall replace same at its expense with same kind, quality, and size of Work or item damaged. This shall include any adjoining property of the District and others.

**6.13.18.** Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property, and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations.

**6.13.19.** Contractor shall confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits, or directions of Architect, and shall not interfere with the Work or unreasonably encumber Premises or overload any structure with materials. Contractor shall enforce all instructions of District and Architect regarding signs, advertising, fires, and smoking, and require that all workers comply with all regulations while on Project Site.

**6.13.20.** Contractor, Contractor's employees, Subcontractors, Subcontractors' employees, or any person associated with the Work shall conduct themselves in a manner appropriate for a school site. No verbal or physical contact with neighbors, students, and faculty, profanity, or inappropriate attire or behavior will be permitted. District may require Contractor to permanently remove noncomplying persons from Project Site.

**6.13.21.** Contractor shall take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed, Contractor shall have a civil engineer, registered as a professional engineer in California, replace them at no cost to District.

**6.13.22.** In the event that the Contractor enters into any agreement with owners of any adjacent property to enter upon the adjacent property for the purpose of performing the Work, Contractor shall fully indemnify, defend, and hold harmless each person, entity, firm, or agency that owns or has any interest in adjacent property. The form and content of the agreement of indemnification shall be approved by the District prior to entering the adjacent property. The Contractor shall also indemnify the District as provided in the indemnification provision herein. These provisions shall be in addition to any other requirements of the owners of the adjacent property.

**6.13.23. Photos, Videos and Use of Drones**. Contractor may photograph or video the progress of the Work and shall provide all of those photos and videos to the District at the District's request. Contractor may utilize drones or similar aerial equipment to photograph, video or monitor the progress of the Work and for security purposes, but Contractor must comply with all legal requirements of the Federal government, the State of California, and the County and City in which the Project is located, applicable to the use of drones or similar aerial equipment. In addition, Contractor shall ensure that no photographs, videos or digital recordings of any kind are taken of District students or staff.

**6.14. Working Evenings and Weekends**

Contractor may be required to work evenings and/or weekends at no additional cost to the District.

Contractor shall give the District seventy-two (72) hours' notice prior to performing any evening and/or weekend work. Contractor shall perform all evening and/or weekend work only upon District's written approval and in compliance with all applicable rules, regulations, laws, and local ordinances including, without limitation, all noise and light limitations. Contractor shall reimburse the District for any Inspector charges necessitated by the Contractor's evening and/or weekend work.

**6.15. Noise and Dust Control**

**6.15.1.** In addition to the noise control, dust control and related requirements in the Specifications, Contractor shall control the noise and dust at the Site as indicated here.

**6.15.2. Noise Control.** The Contractor shall install noise reducing devices on construction equipment. Contractor shall comply with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities. Construction equipment noise at the Site shall be limited as required by applicable law, rule or regulation. If classes are in session at any point during the progress of the Work, and, in the District's reasonable discretion, the noise from any Work disrupts or disturbs the students or faculty or the normal operation of the school at the Site, at the District's request, the Contractor shall schedule the performance of that Work around normal school hours or make other arrangements so that the Work does not cause disruption or disturbance. In no event shall those arrangements result in adjustment of the Contract Price or the Contract Time.

**6.15.3. Dust Control.** The Contractor shall be fully and solely responsible for maintaining and upkeeping all areas of the Site and adjoining areas, outdoors and indoors, free from flying debris, grinding powder, sawdust, dirt and dust as well as any other product, product waste or work waste, that by becoming airborne may cause respiratory inconveniences to persons, particularly to students and District personnel. Additionally, the Contractor shall take specific care to avoid deposits of airborne dust or airborne elements. Those protection devices, systems or methods shall be in accordance with the regulations set forth by the EPA and OSHA, and other applicable law, rule or regulation. Additionally, the Contractor shall be responsible to regularly and routinely clean up and remove any and all deposits of dust and other elements. Damage and/or any liability derived from the Contractor's failure to comply with these requirements shall be exclusively at the cost of the Contractor, including, without limitation, any and all penalties that may be incurred for violations of applicable law, rule or regulation, and any amounts expended by the District to pay such damages shall be due and payable to the District on demand. Contractor shall replace any damages property or part thereof and professionally clean any and all items that become covered or partially covered to any degree by dust or other airborne elements. If classes are in session at any point during the progress of Work, and, in the District's reasonable discretion, flying debris, grinding powder, sawdust, dirt or dust from any Work disrupts or disturbs the students or faculty or the normal operation of the school, at the District's request, the Contractor shall schedule the performance of all that Work around normal school hours and make other arrangements so that the Work does not cause disruption or disturbance. In no event shall those arrangements result in adjustment of the Contract Price or the Contract Time.

**6.15.4. Contractor Failure to Comply.** If the Contractor fails to comply with the requirements for dust control, noise control, or any other maintenance or clean up requirement of the Contract Documents, the District, Architect, Project Inspector, or Construction Manager shall notify the Contractor in writing and the Contractor shall take immediate action. Should the Contractor fail to respond with immediate and responsive action and not later than twenty-four (24) hours from that notification, the District shall have the absolute right to proceed as it may deem necessary to remedy such matter. Any and all costs incurred by the District in connection with those actions shall be the sole responsibility of, and be borne by, the Contractor; the District may deduct those amounts from the Contract Price then or thereafter due the Contractor.

**6.16. Cleaning Up**

**6.16.1.** The Contractor shall provide all services, labor, materials, and equipment necessary for protecting the Work, all school occupants, furnishings, equipment, and building structure from damage until its Completion and final acceptance by District. Dust barriers shall be provided to isolate dust and dirt from construction operations. At Completion of the Work and portions thereof, Contractor shall clean to the original state any areas beyond the Work area that become dust laden as a result of the Work. The Contractor must erect the necessary warning signs and barricades to ensure the safety of all school occupants. The Contractor at all times must maintain good housekeeping practices to reduce the risk of fire damage and must make a fire extinguisher, fire blanket, and/or fire watch, as applicable, available at each location where cutting, braising, soldering, and/or welding is being performed or where there is an increased risk of fire.

**6.16.2.** Contractor at all times shall keep Premises free from debris such as waste, rubbish, and excess materials and equipment caused by the Work. Contractor shall not leave debris under, in, or about the Premises, but shall promptly remove same from the Premises on a daily basis. If Contractor fails to clean up, District may do so and the cost thereof shall be charged to Contractor. If Contract is for work on an existing facility, Contractor shall also perform specific clean-up on or about the Premises upon request by the District as it deems necessary for the continuing education process. Contractor shall comply with all related provisions of the Specifications.

**6.16.3.** If the Construction Manager, Architect, or District observes the accumulation of trash and debris, the District will give the Contractor a 24-hour written notice to mitigate the condition.

**6.16.4.** Should the Contractor fail to perform the required clean-up, or should the clean-up be deemed unsatisfactory by the District, the District will then perform the clean-up. All cost associated with the clean-up work (including all travel, payroll burden, and costs for supervision) will be deducted from the Contract Price, or District may withhold those amounts from payment(s) to Contractor.

## 7. SUBCONTRACTORS

**7.1.** Contractor shall provide the District with information for all Subcontracts as required in the Contractor's Submittals and Schedules Section.

**7.2.** No contractual relationship exists between the District and any Subcontractor, supplier, or sub-subcontractor by reason of the Contract.

**7.3.** Contractor agrees to bind every Subcontractor by terms of the Contract as far as those terms are applicable to Subcontractor's work. If Contractor shall subcontract any part of the Contract, Contractor shall be as fully responsible to District for acts and omissions of any Subcontractor and of persons either directly or indirectly employed by any Subcontractor, as it is for acts and omissions of persons directly employed by Contractor. The divisions or sections of the Specifications are not intended to control the Contractor in dividing the Work among Subcontractors or limit the work performed by any trade.

**7.4.** District's consent to, or approval of, or failure to object to, any Subcontractor under the Contract shall not in any way relieve Contractor of any obligations under the Contract and no such consent shall be deemed to waive any provisions of the Contract.

**7.5.** Contractor acknowledges sections 4100 through 4114 of the Public Contract Code of the State of California, as regards subletting and subcontracting, and shall comply with all applicable requirements therein. In addition, Contractor acknowledges sections 1720 through 1861 of the Labor Code of the State of California, as regards the payment of prevailing wages and related issues, and shall comply with all applicable requirements therein all including, without limitation, section 1775 and the Contractor's and Subcontractors' obligations and liability for violations of prevailing wage law and

other applicable laws.

**7.6.** No Contractor whose Bid is accepted shall, without consent of the awarding authority and in full compliance with section 4100, et seq, of the Public Contract Code, including, without limitation, sections 4107, 4107.5, and 4109 of the Public Contract Code, either:

**7.6.1.** Substitute any person as a Subcontractor in place of the Subcontractor designated in the original Bid; or

**7.6.2.** Permit any Subcontract to be assigned or transferred, or allow any portion of the Work to be performed by anyone other than the original Subcontractor listed in the Bid; or

**7.6.3.** Sublet or subcontract any portion of the Work in excess of one-half of one percent (1/2 of 1%) of the Contractor's total bid as to which his original bid did not designate a Subcontractor.

**7.7.** The Contractor shall be responsible for the coordination of the trades, Subcontractors, sub-subcontractors, and material or equipment suppliers working on the Project.

**7.8.** Contractor is solely responsible for settling any differences between the Contractor and its Subcontractor(s) or between Subcontractors.

**7.9.** Contractor must include in all of its subcontracts the assignment provisions as indicated in the Termination section of these General Conditions.

**8. <u>OTHER CONTRACTS/CONTRACTORS</u>**

**8.1.** District reserves the right to let other contracts, and/or to perform work with its own forces, in connection with other portions of the Project or other construction or operations at or about the Site. Contractor shall afford other contractors reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly coordinate and connect Contractor's Work with the work of other contractors.

**8.2.** In addition to Contractor's obligation to protect its own Work, Contractor shall protect the work of any other contractor that Contractor encounters while working on the Site.

**8.3.** If any part of Contractor's Work depends for proper execution or results upon work of District or any other contractor, Contractor shall inspect and promptly report to the District in writing before proceeding with its Work any defects in District's or any other contractor's work that render Contractor's Work unsuitable for proper execution and results. Contractor shall be held accountable for damages to District for District's or any other contractor's work that Contractor failed to inspect or should have inspected. Contractor's failure to inspect and report shall constitute Contractor's acceptance of all District's or any other contractor's work as fit and proper for reception of Contractor's Work, except as to defects that may develop in District's or any other contractor's work after execution of Contractor's Work.

**8.4.** To ensure proper execution of its subsequent work, Contractor shall measure and inspect work already in place and shall at once report to the District in writing any discrepancy between that executed work and the Contract Documents.

**8.5.** Contractor shall ascertain to its own satisfaction the scope of the Project and nature of District's or any other contracts that have been or may be awarded by District in completion of the Project to the end that Contractor may perform this Contract in light of the other contracts, if any.

**8.6.** Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy of the Site, the Premises, or of the Project. The District shall have complete access to the Project Site for any reasonable purpose at all times. Contractor shall not cause any unnecessary hindrance or delay to the use and/or school operation(s) of the Premises and/or to District or any other contractor working on the Project. If simultaneous execution of any contract or school operation is likely to cause interference with performance of Contractor's Contract, Contractor shall coordinate with those contractor(s), person(s), and/or entity(s) and shall notify the District of the resolution.

## 9. DRAWINGS AND SPECIFICATIONS

**9.1.** A complete list of all Drawings that form a part of the Contract is to be found as an index on the Drawings themselves, and/or may be provided to the Contractor and/or in the Table of Contents.

**9.2.** Materials or Work described in words that so applied have a well-known technical or trade meaning shall be deemed to refer to recognized standards, unless noted otherwise.

**9.3.** Trade Name or Trade Term. It is not the intention of the Contract to go into detailed descriptions of any materials and/or methods commonly known to the trade under "trade name" or "trade term." The mere mention or notation of "trade name" or "trade term" shall be considered sufficient notice to Contractor that it will be required to complete the work so named, complete, finished, and operable, with all its appurtenances, according to the best practices of the trade.

**9.4.** The naming of any material and/or equipment shall mean furnishing and installing of same, including all incidental and accessory items thereto and/or labor therefor, as per best practices of the trade(s) involved, unless specifically noted otherwise.

**9.5.** Contract Documents are complementary, and what is called for by one shall be binding as if called for by all. As such, Drawings and Specifications are intended to be fully cooperative and to agree. However, if Contractor observes that Drawings and Specifications are in conflict, Contractor shall promptly notify District and Architect in writing, and any necessary changes shall be made as provided in the Contract Documents.

**9.6.** In the case of discrepancy or ambiguity in the Contract Documents, the order of precedence in the Agreement shall prevail. However, in the case of discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide District with the functionally complete and operable Project described in the Drawings and Specifications. In case of ambiguity, conflict, or lack of information, District will furnish clarifications with reasonable promptness.

**9.7.** Drawings and Specifications are intended to comply with all laws, ordinances, rules, and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, the laws, ordinances, rules, and regulations shall be considered as a part of the Contract within the limits specified. Contractor shall bear all expense of correcting work done contrary to said laws, ordinances, rules, and regulations.

### 9.8. Ownership of Drawings

**9.8.1.** All copies of the Drawings, Designs, Specifications, and copies of other incidental architectural and engineering work, or copies of other Contract Documents furnished by District, are the property of District. They are not to be used by Contractor in other work and, with the exception of signed sets of Contract Documents, are to be returned to District on request at Completion of Work, or may be used by District as it may require without any additional costs to District. Neither the Contractor nor any Subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings,

Specifications, and other documents prepared by the Architect. District hereby grants the Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers a limited license to use applicable portions of the Drawings prepared for the Project in the execution of their Work under the Contract Documents.

## 10. CONTRACTOR'S SUBMITTALS AND SCHEDULES

Contractor's submittals shall comply with the provisions and requirements of the Specifications including, without limitation Submittals. No submittal, unless approved in writing by the District as acceptable and complete, shall be a Contract Document.

### 10.1. Schedules, Safety Plan and Complete Subcontractor List

**10.1.1.** Within **TEN (10)** calendar days after the date of the Notice to Proceed (unless otherwise specified in the Notice to Proceed or in the Special Conditions), Contractor shall prepare and submit to the District for review, in a form supported by sufficient data to substantiate its accuracy as the District may require:

**10.1.1.1. Schedule of Work.** Contractor shall provide a preliminary schedule of construction indicating the starting and completion dates of the various stages of the Work, including any information and following any form as may be specified in the Specifications. Once approved by District, this shall become the Construction Schedule. This schedule shall include and identify all tasks that are on the Project's critical path with a specific determination of the start and completion of each critical path task, all contract milestones and each milestone's completion date(s) as may be required by the District, and the date of Project Completion.

**10.1.1.1.1. Proposed Advanced Schedule.** The District is not required to accept an early completion ("advanced") schedule; i.e., one that shows early completion dates for the Contract completion or milestones. Contractor shall not be entitled to extra compensation if the District allows the Contractor to proceed performing the Contract on an earlier ("advanced") schedule and Contractor completes the Project, for whatever reason, beyond the date shown in that earlier ("advanced") schedule, but within the Time for Completion indicated in the Contract. A schedule showing the work completed in less than the Time for Completion indicated in the Contract, shall be considered to have Project Float.

**10.1.1.1.2. Float or Slack in the Schedule**. Float or slack is the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any of the activities in the schedule. Float or slack is not for the exclusive use of or benefit of either the District or the Contractor, but its use shall be determined solely by the District.

**10.1.1.2. Schedule of Submittals.** The Contractor shall provide a preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals. Once approved by District, this shall become the Submittal Schedule. All submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those submittals shall be forwarded to the District so as not to delay the Construction Schedule.

**10.1.1.3. Schedule of Values.** The Contractor shall provide a preliminary schedule of values for all component parts of the Work for which progress payments may be requested. The schedule of values must include quantities and prices of items totaling the Contract Price and must subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. The preliminary schedule of values should include, at a minimum, the following information and the following structure:

**10.1.1.3.1.** Divided into at least the following categories:

**10.1.1.3.1.1.** Overhead and profit;
**10.1.1.3.1.2.** Supervision;
**10.1.1.3.1.3.** General conditions;
**10.1.1.3.1.4.** Layout;
**10.1.1.3.1.5.** Mobilization;
**10.1.1.3.1.6.** Submittals;
**10.1.1.3.1.7.** Bonds and insurance;
**10.1.1.3.1.8.** Closeout documentation;
**10.1.1.3.1.9.** Demolition;
**10.1.1.3.1.10.** Installation;
**10.1.1.3.1.11.** Rough-in;
**10.1.1.3.1.12.** Finishes;
**10.1.1.3.1.13.** Testing;
**10.1.1.3.1.14.** Punch List and acceptance.

**10.1.1.3.2.** Divided by each of the following areas:

**10.1.1.3.2.1.** Site work;
**10.1.1.3.2.2.** By each building;
**10.1.1.3.2.3.** By each floor.

**10.1.1.3.3.** The preliminary schedule of values shall not provide for values any greater than the following percentages of the Contract value:

**10.1.1.3.3.1.** Mobilization and layout combined to equal not more than 1%;
**10.1.1.3.3.2.** Submittals, samples and shop drawings combined to equal not more than 3%,
**10.1.1.3.3.3.** Bonds and insurance combined to equal not more than 2%.

**10.1.1.3.4.** **Closeout Documentation**. Closeout Documentation shall have a value in the preliminary schedule of not less than 5%. The value for Closeout Documentation shall be in addition to and shall not be a part of the Contract retention.

**10.1.1.3.5.** All items on the Schedule of Values must have a specific completion date on the Construction Schedule, or District has approved the Construction Schedule and the Construction Schedule is fully cost-loaded and resource-loaded, unless waived by the District in writing, and detailed as required by the Contract Documents

**10.1.1.3.6.** Contractor shall certify that the preliminary schedule of values as submitted to the District is accurate and reflects the costs as developed in preparing Contractor's bid. The preliminary schedule of values shall be subject to the District's review and approval of the form and content thereof. In the event that the District objects to any portion of the preliminary schedule of values, the District shall notify the Contractor, in writing, of the District's objection(s) to the preliminary schedule of values. Within five (5) calendar days of the date of the District's written objection(s), Contractor shall submit a revised preliminary schedule of values to the District for review and approval. The foregoing procedure for the preparation, review and approval of the preliminary schedule of values shall continue until the District has approved the entirety of the preliminary schedule of values.

**10.1.1.3.7.** Once the preliminary schedule of values is approved by the District, this shall become the Schedule of Values. The Schedule of Values shall not be thereafter modified or amended by the Contractor without the prior written consent and approval of the District, which

may be granted or withheld in the sole discretion of the District.

**10.1.1.3.8.** Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision, general conditions costs, and profit, as reflected in the Schedule of Values, shall be paid by the District in equal installments, based on percentage complete, with the disbursement of Progress Payments and the Final Payment.

**10.1.1.3.9.** The Contractor shall not "front-load" the Schedule of Values with false dollar amounts for activities to be performed in the early stages of the Project. The District may, in its sole discretion, utilize the costs listed in the Schedule of Values as the true cost of items to be deducted from the Contract Price through credit or deductive Change Order. The values for each line item shall include the amount of overhead and profit applicable to each item of work and shall include, at a minimum, a breakdown between rough and finish Work for the basic trades as well as individual dollar figures for large dollar equipment and materials to be installed or furnished for the Project. No individual line item or scope of work in the Schedule of Values shall exceed $50,000, except with the express, written consent of the District. Exceptions will be given by the District for a single item of Equipment for which the true cost exceeds $50,000. The Schedule of Values shall be subject to the District's review and approval of the form and content thereof. Upon request, Contractor shall provide District with data and documentation substantiating the accuracy of the proposed line items. In the event that the District shall reasonably object to any portion of the Schedule of Values, within ten (10) days of the District's receipt of the Schedule of Values, the District shall notify the Contractor, in writing of the District's objection(s) to the Schedule of Values together with any request for substantiating data or documentation. Within five (5) days of the date of the District's written objection(s) and request for substantiating data and documentation, Contractor shall submit a revised Schedule of Values to the District for review and approval together with the requested data and documentation. The foregoing procedure for the preparation, review and approval of the Schedule of Values shall continue until the District has approved of the entirety of the Schedule of Values. Once the Schedule of Values is approved by the District, the Schedule of Values shall not be thereafter modified or amended by the Contractor without the prior consent and approval of the District, which may be granted or withheld in the sole reasonable discretion of the District. Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision and general conditions costs and profit, as such items are reflected in the Schedule of Values, shall be made incrementally as included in the activities included in the Approved Construction Schedule.

**10.1.1.4.** **Safety Plan.** The Contractor shall provide a preliminary Contractor's Safety Plan specifically adapted for the Project. Contractor's Safety Plan shall comply with the following requirements:

**10.1.1.4.1.** All applicable requirements of California Division of Industrial Safety ("CalOSHA") and/or of the United States Occupational Safety and Health Administration ("OSHA").

**10.1.1.4.2.** All provisions regarding Project safety, including all applicable provisions in these General Conditions.

**10.1.1.4.3.** Contractor's Safety Plan shall be prepared in both English and in the predominant language(s) of the Contractor's and its Subcontractors' employees.

**10.1.1.5.** **Complete Subcontractor List.** Contractor shall provide a preliminary Subcontractor List stating the name, address, telephone number, facsimile number, California State Contractors License number, classification, and monetary value of all Subcontracts for parties furnishing labor, material,

or equipment for the Project.

**10.1.2.** Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) approved in advance by the District.

**10.1.3.** The District will review the schedules submitted and the Contractor shall make changes and corrections in the schedules as requested by the District and resubmit the schedules until approved by the District.

**10.1.4.** The District shall have the right at any time to revise the Schedule of Values if, in the District's sole opinion, the Schedule of Values does not accurately reflect the value of the Work performed.

**10.1.5.** All submittals and schedules must be approved by the District before Contractor can rely on them as a basis for payment.

**10.2. Monthly Progress Schedule(s)**

**10.2.1.** Contractor shall provide Monthly Progress Schedule(s) to the District. A Monthly Progress Schedule shall update the approved Construction Schedule or the last Monthly Progress Schedule, showing all work completed and to be completed. The Monthly Progress Schedule shall be sent to the District and shall be in a format acceptable to the District and contain a written narrative of the progress of work that month and any changes, delays, or events that may affect the work. The process for District approval of the Monthly Progress Schedule shall be the same as the process for approval of the Construction Schedule.

**10.2.2.** Contractor shall also submit Monthly Progress Schedule(s) with all payment applications.

**10.3. Material Safety Data Sheets (MSDS)**

Contractor is required to ensure Material Safety Data Sheets are available in a readily accessible place at the Work Site for any material requiring a Material Safety Data Sheet per the Federal "Hazard Communication" standard, or employees right to know law. The Contractor is also required to ensure proper labeling on substances brought onto the Project Site and that any person working with the material or within the general area of the material is informed of the hazards of the substance and follows proper handling and protection procedures. Two additional copies of the Material Safety Data Sheets shall also be submitted directly to the District.

**10.4. Logistic Plan**

Contractor shall provide a staging and logistics plan identifying laydown areas, loading and unloading areas, crane locations, fence locations, temporary utility connections, trailer locations, and emergency evacuation meeting area. This Logistics Plan must be approved by the District prior to the Contractor mobilizing on the Site.

**10.5. Information Included in Submittals.**

All Submittals shall be accompanied by a written transmittal and each set of plans shall carry a "wet stamp" or other writing by the Contractor providing an identification of the portion of the Drawings or the Specifications pertaining to the Submittal, with each Submittal numbered consecutively for ease of reference along with the following information: (i) date of submission; (ii) Project name; (iii) name of submitting Subcontractor; and (iv) if applicable, the revision number. The foregoing information is in addition to, and not in lieu of, any other information required for the District's review, evaluation and approval of the Contractor's Submittals. Each Submittal shall be complete with its required number of

copies, no piecemeal documentation is allowed. Any Submittal not bearing the required wet stamp as stated herein, shall be rejected until the appropriate wet stamp information is provided on each submittal.

**10.6. Verification of Submittal Information.**

By approving and submission of Submittals, the Contractor represents to the District and Architect that the Contractor has determined and verified materials, field measurements, field construction criteria, catalog numbers and similar data related thereto and has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents. Each Submittal shall include the following certification duly executed by the Contractor's Superintendent or Project Manager for the Work: "The Contractor has reviewed and approved the field dimensions and construction criteria of the attached Submittal. The Contractor has verified that the Submittal is complete and includes notations of any portion of the Work depicted in the Submittal which is not in strict conformity with the Contract Documents. The information in the attached Submittal has been reviewed and coordinated by the Contractor with information included in other Submittals."

**10.7. Contractor Responsibility for Deviations.**

The Contractor shall not be relieved of responsibility for correcting deviations from the requirements of the Contract Documents by the District's and Architect's review of Submittals unless the Contractor has specifically informed the District in writing of such deviation at the time of submission of the Submittal and the District has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the District's and Architect's review or comments thereon.

**10.8. No Performance of Work Without Architect Review.**

The Contractor shall perform no portion of the Work requiring the District's and Architect's review of Submittals until the District and Architect have completed their review and returned the Submittal to the Contractor indicating "No Exception Taken" to that Submittal. The Contractor shall not perform any portion of the Work forming a part of a Submittal or which is affected by a related Submittal until the entirety of the Submittal or other related Submittal has been fully processed. All Work shall be in accordance with the final action taken by the District and the Architect review in review of Submittals and other applicable portions of the Contract Documents.

**10.9. District and Architect Review of Submittals.**

The purpose of the District's and Architect's review of Submittals and the time for the District's and Architect's return of Submittals to the Contractor shall be as set forth elsewhere in the Contract Documents. If the District and/or Architect return a Submittal as rejected or requiring correction(s) with re-submission, the Contractor, so as not to delay the progress of the Work, shall promptly thereafter resubmit a Submittal conforming to the requirements of the Contract Documents; the resubmitted Submittal shall indicate the portions thereof modified in accordance with the District's and Architect's direction. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the District shall be entitled to rely upon the accuracy and completeness of the Contractor's calculations and certifications accompanying Submittals. The District's and Architect's review of the Submittals is for the limited purposes described in the Contract Documents. The District and Architect will review each Submittal twice. Should additional Submittals be required as a result of failure of the Contractor to address comments, the Contractor will pay for the Architect's services on a time and material basis for each subsequent review.

**10.10. Deferred Approval Items.**

In the event that any portion of the Work is designated in the Contract Documents as a "Deferred Approval" item from DSA, Contractor shall be solely and exclusively responsible for the preparation of Submittals for such item(s) in a timely manner so as not to delay or hinder the completion of the Work within the Contract Time. All work, labor, materials, equipment or services necessary to complete the design, engineering and permitting/approval of the Deferred Approval items shall be provided by the Contractor without adjustment of the Contract Price or the Contract Time.

### 10.11. Contractor Responsibility for Deviations

The Contractor shall not be relieved of responsibility for correcting deviations from the requirements of the Contract Documents by the District's or Architect's review of Submittals unless the Contractor has specifically informed the District and the Architect in writing of such deviation at the time of submission of the Submittal and the District and the Architect have given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the District's or the Architect's review or comments thereon.

## 11. SITE ACCESS, CONDITIONS AND REQUIREMENTS

### 11.1. Site Investigation

Before bidding on the Work, Contractor shall make a careful investigation of the Site and thoroughly familiarize itself with the requirements of the Contract. By the act of submitting a bid for the Work included in the Contract, Contractor shall be deemed to have made a complete study and investigation, and to be familiar with and accepted the existing conditions of the Site.

### 11.2. Soils Investigation Report

**11.2.1.** When a soils investigation report obtained from test holes at Site is available, that report shall be available to the Contractor but shall not be a part of the Contract. Any information obtained from that report or any information given on Drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed, does not form a part of the Contract, and Contractor may not rely thereon. By submitting its bid, Contractor acknowledges that it made visual examination of Site and made whatever tests Contractor deems appropriate to determine underground condition of soil.

**11.2.2.** Contractor agrees that no claim against District will be made by Contractor for damages and hereby waives any rights to damages if, during progress of Work, Contractor encounters subsurface or latent conditions at Site materially differing from those shown on Drawings or indicated in Specifications, or for unknown conditions of an unusual nature that differ materially from those ordinarily encountered in the work of the character provided for in Plans and Specifications, except as indicated in the provisions of these General Conditions regarding trenches, trenching, and/or existing utility lines.

### 11.3. Access to Work

District and its representatives shall at all times have access to Work wherever it is in preparation or progress, including storage and fabrication. Contractor shall provide safe and proper facilities for access so that District's representatives may perform their functions.

### 11.4. Layout and Field Engineering

**11.4.1.** All field engineering required for layout of this Work and establishing grades for earthwork operations shall be furnished by Contractor at its expense. This Work shall be done by a qualified, California-registered civil engineer approved in writing by District and Architect. Any required Record

and/or As-Built Drawings of Site development shall be prepared by the approved civil engineer.

**11.4.2.** Contractor shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the Site and for having satisfied itself as to the conditions under which the Work is to be performed. District shall not be liable for any claim for allowances because of Contractor's error or negligence in acquainting itself with the conditions at the Site.

**11.4.3.** Contractor shall protect and preserve established benchmarks and monuments and shall make no changes in locations without the prior written approval of District. Contractor shall replace any benchmarks or monuments that are lost or destroyed subsequent to proper notification of District and with District's approval.

**11.5. Utilities for Construction**

Utilities necessary to complete the Work and to completely perform all of the Contractors' obligations shall be obtained by the Contractor without adjustment of the Contract Price. The Contractor shall furnish and install necessary or appropriate temporary distributions of utilities, including utilities furnished by the District. Any such temporary distributions shall be removed by the Contractor upon completion of the Work. The costs of all such utility services, including the installation and removal of temporary distributions thereof, shall be borne by the Contractor and included in the Contract Price. Also refer to other utility requirements as indicated in the Specifications.

**11.6. Sanitary Facilities**

At all times during Work at the Site, the Contractor shall obtain and maintain temporary sanitary facilities in conformity with applicable law, rule or regulation. The Contractor shall maintain temporary sanitary facilities in a neat and clean manner with sufficient toilet room supplies. Personnel engaged in the Work are not permitted to use toilet facilities at the Site. Also refer to other Sanitary facility requirements as indicated in the Specifications.

**11.7. Surveys**

Contractor shall provide surveys done by a California-licensed civil engineer surveyor to determine locations of construction, grading, and site work as required to perform the Work.

**11.8. Regional Notification Center**

Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area or in a private easement that is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced and/or carried out by the Contractor unless an inquiry identification number has been assigned to the Contractor or any Subcontractor and the Contractor has given the District the identification number. Any damages arising from Contractor's failure to make appropriate notification shall be at the sole risk and expense of the Contractor. Any delays caused by failure to make appropriate notification shall be at the sole risk of the Contractor and shall not be considered for an extension of the Contract time.

**11.9. Existing Utility Lines**

**11.9.1.** Pursuant to Government Code section 4215, District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction Site at the time of commencement of construction under the Contract with respect to any such utility facilities

that are not identified in the Plans and Specifications. Contractor shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of District or the owner of a utility to provide for removal or relocation of such utility facilities.

**11.9.2.** Locations of existing utilities provided by District shall not be considered exact, but approximate within reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care nor costs of repair due to Contractor's failure to do so. District shall compensate Contractor for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans and Specifications with reasonable accuracy, and for equipment necessarily idle during such work.

**11.9.3.** No provision herein shall be construed to preclude assessment against Contractor for any other delays in completion of the Work. Nothing in this Article shall be deemed to require District to indicate the presence of existing service laterals, appurtenances, or other utility lines, within the exception of main or trunk utility lines, whenever the presence of these utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, meter junction boxes, on or adjacent to the Site.

**11.9.4.** If Contractor, while performing Work, discovers utility facilities not identified by District in Contract Plans and Specifications, Contractor shall immediately, but in no case longer than two (2) Business Days, notify the District and the utility in writing. The cost of repair for damage to above-mentioned visible facilities without prior written notification to the District shall be borne by the Contractor.

### 11.10. Notification

Contractor understands, acknowledges and agrees that the purpose for prompt notification to the District pursuant to these provisions is to allow the District to investigate the condition(s) so that the District shall have the opportunity to decide how the District desires to proceed as a result of the condition(s). Accordingly, failure of Contractor to promptly notify the District in writing, pursuant to the applicable provisions of these General Conditions, shall constitute Contractor's waiver of any claim for damages or delay incurred as a result of the condition(s).

### 11.11. Hazardous Materials

Contractor shall comply with all provisions and requirements of the Contract Documents related to hazardous materials including, without limitation, certifications related to hazardous materials in the document entitled Certifications to be Completed by Contractor.

### 11.12. No Signs

Neither the Contractor nor any other person or entity shall display any signs not required by law or the Contract Documents at the Site, fences trailers, offices, or elsewhere on the Site without specific prior written approval of the District.

## 12. TRENCHES

### 12.1. Trenches Greater Than Five Feet

Pursuant to Labor Code section 6705, if the Contract Price exceeds $25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, promptly submit to the District and/or a registered civil or structural engineer employed by the District or Architect, a detailed plan showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

**12.2. Excavation Safety**

If such plan varies from the Shoring System Standards established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the District or by the person to whom authority to accept has been delegated by the District.

**12.3. No Tort Liability of District**

Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the District or any of its employees.

**12.4. No Excavation without Permits**

The Contractor shall not commence any excavation Work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

**12.5. Discovery of Hazardous Waste, Unusual Conditions and/or Unforeseen Conditions**

**12.5.1.** Pursuant to Public Contract Code section 7104, if the Work involves digging trenches or other excavations that extend deeper than four (4) feet below the surface, the Contractor shall immediately, but in no case longer than two (2) Business Days, and before the following conditions are disturbed, notify the District, in writing, of any:

**12.5.1.1.** Material that the Contractor believes may be material that is hazardous waste, as defined in section 25117 of the Health and Safety Code, and requires removal to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

**12.5.1.2.** Subsurface or latent physical conditions at the Site differing from those indicated.

**12.5.1.3.** Unknown physical conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

**12.5.2.** The District shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, shall issue a Change Order under the procedures described herein.

**12.5.3.** In the event that a dispute arises between District and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled Completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided by the Contract or by law that pertain to the resolution of disputes and protests, which include the requirement that Contractor complies with the notice and PCO provisions of the Contract Documents. Contractor's failure to submit a proposed change order pursuant to the terms of the Contract Documents shall be deemed a waiver of Contractor's right to an adjustment of the Contract Price of Contract Time.

**13. INSURANCE AND BONDS**

**13.1. Insurance**

Unless different provisions and/or limits are indicated in the Special Conditions, all insurance required of Contractor and/or its Subcontractor(s) shall be in the amounts indicated herein and include the provisions set forth herein.

**13.1.1. Commercial General Liability and Automobile Liability Insurance**

**13.1.1.1.** Contractor shall procure and maintain, during the life of the Contract, Commercial General Liability Insurance and Automobile Liability Insurance that shall protect Contractor, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for bodily injury, property damage, personal injury, death, advertising injury, and medical payments arising from operations under the Contract. This coverage shall be provided in a form at least as broad as the Insurance Services Office (ISO) standard form. Contractor shall ensure that Products Liability and Completed Operations coverage, Fire Damage Liability, and any Auto including owned, non-owned, and hired, are included within the above policies and at the required limits, or Contractor shall procure and maintain these coverages separately.

**13.1.1.2.** Contractor's deductible or self-insured retention for its Commercial General Liability Insurance policy shall not exceed $25,000 unless approved in writing by District.

**13.1.2. Umbrella Liability Insurance**

**13.1.2.1.** Contractor shall procure and maintain, during the life of the Contract, an Excess Liability and/or Umbrella Liability Insurance Policy. Any Umbrella Liability Insurance Policy shall protect Contractor, District, State, Construction Manager(s), Project Manager(s), and Architect(s) in the amounts indicated herein, and shall comply with all requirements for Commercial General Liability and Automobile Liability and Employers' Liability Insurance. This coverage shall be provided in a form at least as broad as the Insurance Services Office (ISO) standard form.

**13.1.2.2.** There shall be no gap between the per occurrence amount of any underlying policy and the start of the coverage under the Umbrella Liability Insurance Policy.

**13.1.2.3.** Whether this Excess Liability and/or Umbrella Liability Insurance Policy is written on a "follow form" or "stand alone" form, the coverages shall equal or greater than the Contractor's Commercial General Liability and Automobile Liability and Employers' Liability Insurance with no exclusions that reduce or eliminate coverage items.

**13.1.3. Subcontractor(s):** Contractor shall require its Subcontractor(s), if any, to procure and maintain Commercial General Liability Insurance, Automobile Liability Insurance, and Umbrella Liability Insurance with minimum limits equal to at least fifty percent (50%) of the amounts required of the Contractor.

**13.1.4. Workers' Compensation and Employers' Liability Insurance**

**13.1.4.1.** In accordance with provisions of section 3700 of the California Labor Code, the Contractor and every Subcontractor shall be required to secure the payment of compensation to its employees.

**13.1.4.2.** Contractor shall procure and maintain, during the life of this Contract, Workers' Compensation Insurance and Employers' Liability Insurance for all of its employees engaged in Work under the Contract, on/or at the Site of the Project. This coverage shall cover, at a minimum, medical and surgical treatment, disability benefits, rehabilitation therapy, and survivors' death benefits. Contractor shall require its Subcontractor(s), if any, to procure and maintain Workers' Compensation

Insurance and Employers' Liability Insurance for all employees of Subcontractor(s). Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by Contractor's insurance. If any class of employee or employees engaged in Work under the Contract, on or at the Site of the Project, are not protected under the Workers' Compensation Insurance, Contractor shall provide, or shall cause a Subcontractor to provide, adequate insurance coverage for the protection of any employee(s) not otherwise protected before any of those employee(s) commence work.

**13.1.5. Builder's Risk Insurance: Builder's Risk "All Risk" Insurance.**

Contractor shall procure and maintain, during the life of this Contract, Builder's Risk (Course of Construction), or similar first party property coverage acceptable to the District, issued on a replacement cost value basis. The cost shall be consistent with the total replacement cost of all insurable Work included within the Contract Documents. Coverage is to insure against all risks of accidental physical loss and shall include without limitation the perils of vandalism and/or malicious mischief (both without any limitation regarding vacancy or occupancy), sprinkler leakage, water damage, mold, civil authority, theft, sonic disturbance, earthquake, flood, collapse, wind, fire, war, terrorism, lightning, smoke, and rioting. Coverage shall include debris removal, demolition, increased costs due to enforcement of all applicable ordinances and/or laws in the repair and replacement of damaged and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project, including completed Work and Work in progress, to the full insurable value thereof. Contractor must review the Special Conditions to confirm the scope of this requirement and if the District has modified this provision.

**13.1.6. Proof of Carriage of Insurance and Other Requirements: Endorsements and Certificates**

**13.1.6.1.** Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under the Contract, until Contractor and its Subcontractor(s) have procured all required insurance and Contractor has delivered in duplicate to the District complete endorsements (or entire insurance policies) and certificates indicating the required coverages have been obtained, and the District has approved these documents.

**13.1.6.2.** Endorsements, certificates, and insurance policies shall include the following:

**13.1.6.2.1.** A clause stating:

**13.1.6.2.1.1.** "This policy shall not be amended, canceled or modified and the coverage amounts shall not be reduced until notice has been mailed to District, Architect, and Construction Manager stating date of amendment, modification, cancellation or reduction. Date of amendment, modification, cancellation or reduction may not be less than thirty (30) days after date of mailing notice."

**13.1.6.2.1.2.** In lieu of receiving an endorsement with this clause, the District may, at its sole discretion, accept written notification from Contractor and its insurer to the District of any amendments, modifications, cancellations or reduction in coverage, not less than thirty (30) days prior to such coverage changes occur.

**13.1.6.2.2.** Language stating in particular those insured, extent of insurance, location and operation to which insurance applies, expiration date, to whom cancellation and reduction notice will be sent, and length of notice period.

**13.1.6.3.** All endorsements, certificates and insurance policies shall state that District, its trustees, employees and agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s) and Architect(s) are named additional insureds under all policies except Workers'

Compensation Insurance and Employers' Liability Insurance.

**13.1.6.4.** Contractor's and Subcontractors' insurance policy(s) shall be primary and non-contributory to any insurance or self-insurance maintained by District, its trustees, employees and/or agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s), and/or Architect(s).

**13.1.6.5.** All endorsements shall waive any right to subrogation against any of the named additional insureds.

**13.1.6.6.** All policies shall be written on an occurrence form.

**13.1.6.7.** Unless otherwise stated in the Special Conditions, all of Contractor's insurance shall be placed with insurers **ADMITTED** in California with a current A.M. Best's rating of no less than **A—** or **A:VII.**

**13.1.6.8.** The insurance requirements set forth herein shall in no way limit the Contractor's liability arising out or relating to the performance of the Work or related activities.

**13.1.6.9.** Failure of Contractor and/or its Subcontractor(s) to comply with the insurance requirements herein shall be deemed a material breach of the Agreement.

**13.1.7. Insurance Policy Limits**

Unless different limits are indicated in the Special Conditions, the limits of insurance shall not be less than the following amounts:

| | | |
|---|---|---|
| **Commercial General Liability** | Includes: Personal & Advertising Injury, Product Liability and Completed Operations | $2,000,000 each occurrence; $4,000,000 general aggregate |
| **Automobile Liability – Any Auto** | Combined Single Limit | $2,000,000 per occurrence |
| **Excess Liability (Umbrella)** | | $6,000,000 per occurrence; $6,000,000 aggregate |
| **Workers Compensation** | | Statutory limits pursuant to State law |
| **Employers' Liability** | | $2,000,000 each accident, each disease; $2,000,000 policy limit |
| **Builder's Risk (Course of Construction)** | | Issued for the value and scope of Work indicated herein. |
| **Property of Others** | Combined Single Limit General Aggregate | Issued for the value and scope of Work stored off-site. |

**13.2. Contract Security – Bonds**

**13.2.1.** Contractor shall furnish two surety bonds issued by a California admitted surety insurer as follows:

**13.2.1.1.** **Performance Bond**: A bond in an amount at least equal to one hundred percent (100%)

of Contract Price as security for faithful performance of this Contract.

**13.2.1.2.** **Payment Bond**: A bond in an amount at least equal to one hundred percent (100%) of the Contract Price as security for payment of persons performing labor and/or furnishing materials in connection with the Contract.

**13.2.2.** Cost of bonds shall be included in the Bid and Contract Price.

**13.2.3.** All bonds related to the Project shall be in the forms set forth in the Contract Documents and shall comply with all requirements of the Contract Documents, including, without limitation, the bond forms.

## 14. WARRANTY/GUARANTEE/INDEMNITY

### 14.1. Warranty/Guarantee

**14.1.1.** Contractor shall obtain and preserve for the benefit of the District, manufacturer's warranties on materials, fixtures, and equipment incorporated into the Work.

**14.1.2.** In addition to guarantees required elsewhere, Contractor shall, and hereby does guarantee and warrant all Work against all defects for a period of **ONE (1)** year after the later of the following dates:

**14.1.2.1.** The date of completion as defined in Public Contract Code section 7107, subdivision (c),

**14.1.2.2.** The commissioning date for the Project, if any.

**14.1.3.** At the District's sole option, Contractor shall repair or replace any and all of that Work, together with any other Work that may be displaced in so doing, that may prove defective in workmanship and/or materials within a **ONE (1)** year period from date of Completion as defined above without expense whatsoever to District. In the event of failure of Contractor and/or Surety to commence and pursue with diligence said replacements or repairs within **TEN (10)** days after being notified in writing, Contractor and Surety hereby acknowledge and agree that District is authorized to proceed to have defects repaired and made good at expense of Contractor and/or Surety who hereby agree to pay costs and charges therefore immediately on demand.

**14.1.4.** If, in the opinion of District, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to District or to prevent interruption of operations of District, District will attempt to give the notice required above. If Contractor or Surety cannot be contacted or neither complies with District's request for correction within a reasonable time as determined by District, District may, notwithstanding the above provision, proceed to make all corrections and/or provide attentions the District believes are necessary. The costs of correction or attention shall be charged against Contractor and Surety of the guarantees provided in this Article or elsewhere in the Contract Documents.

**14.1.5.** The above provisions do not in any way limit the guarantees on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish to District all appropriate guarantee or warranty certificates as indicated in the Specifications or upon request by District.

**14.1.6.** Nothing herein shall limit any other rights or remedies available to District.

### 14.2. Indemnity

**14.2.1.** To the furthest extent permitted by California law, Contractor shall indemnify, defend with legal counsel reasonably acceptable to the District, keep and hold harmless the District and its consultants, the Architect and its consultants, the Construction Manager and its consultants, separate contractors, and their respective board members, officers, representatives, contractors, agents, and employees, in both individual and official capacities ("Indemnitees"), against all suits, claims, damages, losses, and expenses, including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, the performance of the Work by Contractor, its Subcontractors, vendors, or suppliers, including, without limitation, any such suit, claim, damage, loss, or expense attributable to, without limitation, bodily injury, sickness, disease, death, alleged patent violation or copyright infringement, or to injury to or destruction of tangible property (including damage to the Work itself) including the loss of use resulting therefrom, except to the extent caused by the sole negligence, active negligence, or willful misconduct of the Indemnitees, and/or to any extent that would render these provisions void or unenforceable. This agreement and obligation of Contractor shall not be construed to negate, abridge, or otherwise reduce any right or obligation of indemnity that would otherwise exist as to any party or person described herein. This indemnification, defense, and hold harmless obligation includes any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms, and without limitation, any stop payment notice actions or liens, including liens by the California Department of Labor Standards Enforcement.

**14.2.2.** Contractor shall give prompt notice to the District in the event of any injury (including death), loss, or damage included herein. Without limitation of the provisions herein, if Contractor's agreement to indemnify, defend, and hold harmless the Indemnitees as provided herein against liability for damage arising out of bodily injury to persons or damage to property caused by or resulting from the negligence of any of the Indemnitees shall to any extent be or be determined to be void or unenforceable, it is the intention of the parties that these circumstances shall not otherwise affect the validity or enforceability of Contractor's agreement to indemnify, defend, and hold harmless the rest of the Indemnitees, as provided herein, and in the case of any such suits, claims, damages, losses, or expenses caused in part by the default, negligence, or act or omission of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, and in part by any of the Indemnitees, Contractor shall be and remain fully liable on its agreements and obligations herein to the full extent permitted by law.

**14.2.3.** In any and all claims against any of the Indemnitees by any employee of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, Contractor's indemnification obligation herein shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

**14.2.4.** The defense and indemnification obligations hereunder shall survive the Completion of Work, including the warranty/guarantee period, and/or the termination of the Agreement.

## 15. TIME

### 15.1. Notice to Proceed

District may issue a Notice to Proceed as indicated in the Instructions to Bidders.

### 15.2. Hours of Work

Work shall be performed during regular working hours as permitted by the appropriate governmental agency except that in the event of an emergency, or when required to complete the Work in accordance

with job progress, Work may be performed outside of regular working hours with the advance written consent of the District and approval of any required governmental agencies. Contractor and Subcontractors shall continuously furnish sufficient forces to ensure the performance of the Work in accordance with the Construction Schedule.

**15.3. Progress and Completion**

**15.3.1.** Time of the Essence

Time limits stated in the Contract Documents are of the essence to the Contract. By executing the Agreement, Contractor confirms that the Contract Time is a reasonable period for performing the Work.

**15.3.2.** No Commencement Without Insurance

**15.3.2.1.** Contractor shall not commence operations on the Project or elsewhere prior to the effective date of insurance and bonds. The date of commencement of the Work shall not be changed by the effective date of such insurance. If Contractor commences Work without insurance and bonds, all Work is performed at Contractor's peril and shall not be compensable until and unless Contractor secures bonds and insurance pursuant to the terms of the Contract Documents and subject to District's claim for damages.

**15.4. Schedule**

Contractor shall provide to District, Construction Manager, and Architect a schedule in conformance with the Contract Documents and as required in the Notice to Proceed and the Contractor's Submittals and Schedules section of these General Conditions.

**15.5. Expeditious Completion**

The Contractor shall proceed expeditiously with adequate forces and shall achieve Completion within the Contract Time.

**16. EXTENSIONS OF TIME – LIQUIDATED DAMAGES**

**16.1. Contractor's Notice of Delay**

**16.1.1.** In addition to the requirements indicated in this subsection, Contractor shall submit any request for an adjustment of the Contract Price or the Contract Time through the Change Order provisions in these General Conditions.

**16.1.2.** Contractor shall, within **FIVE (5)** calendar days of any delay impacting the critical path in completing the Work, notify District in writing of the causes of the delay including documentation and facts explaining the delay.

**16.1.3.** Any request by Contractor for an adjustment of the Contract Price or the Contract Time for a delay shall be submitted in accordance with the provisions in the Contract Documents governing changes in Work. When requesting time, requests must be submitted with full justification and documentation. Such justification must be based on the official Construction Schedule as updated at the time of occurrence of the delay or execution of Work related to any changes to the Scope of Work.

**16.1.4.** Any claim for delay must include the following information as support, without limitation:

**16.1.4.1. Duration.** The duration of the activity relating to the changes in the Work and the resources (manpower, equipment, material, etc.) required to perform the activities within the stated duration.

**16.1.4.2. Logical Ties / Fragnets.** Specific logical ties to the Contract Schedule for the proposed changes and/or delay showing the activity/activities in the Construction Schedule that are affected by the change and/or delay. (A portion of any delay of seven (7) days or more must be provided.) Include a "fragnet" analysis for the portion of the schedule and the activities the Contractor contends are impacted by the delay.

**16.1.4.3. Updated Construction Schedule.** A recovery or updated Construction Schedule must be submitted.

**16.1.5.** District shall review the facts and extent of any noticed delay and may grant Contract Time extension(s) of time for completing Work when, in the District's judgment, the findings of fact justify an extension.

**16.1.6.** Extension(s) of time shall apply only to that portion of Work affected by delay, and shall not apply to other portions of Work not so affected.

**16.1.7.** An extension of time may only be granted if Contractor has timely submitted the updated Construction Schedule as required herein.

**16.1.8.** Following submission of a notice of delay, the District may determine whether the delay is to be considered:

**16.1.8.1.** Excusable and Compensable, Excusable and Non-Compensable, or Unexcused;

**16.1.8.2.** How long the delay continues; and

**16.1.8.3.** To what extent the prosecution and Completion of the Work might be delayed thereby.

**16.1.9.** Contractor's failure to request adjustment(s) of the Contract Time in strict conformity with applicable provisions of the Contract Documents shall be deemed Contractor's waiver of its right to assert a claim for a delay.

**16.1.10. Limitations Upon Adjustment of Contract Time on Account of Delays.** Any adjustment of the Contract Time on account of an Excusable Delay or a Compensable Delay shall be limited as set forth herein. No adjustment of the Contract Time shall be made on account of any Excusable Delays or Compensable Delays unless those delay(s) actually and directly impact Work or Work activities on the critical path of the then current and updated approved Construction Schedule as of the date on which a delay first occurs. The District shall not be deemed in breach of, or otherwise in default of any obligation hereunder, if the District shall deny a request by the Contractor for an adjustment of the Contract Time for any delay that does not actually and directly impact Work on the then current and updated approved Construction Schedule. In submitting a request for an adjustment of Contract Time, and as a condition precedent to the District's review of that request, Contractor shall insert into the then current and updated approved Construction Schedule a "fragnet" analysis representing the event that Contractor claims to result in delay to the critical path as depicted in the updated approved Construction Schedule. If an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first delay to the cessation of the delay that ends last. If an Unexcused Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the maximum extension of the Contract Time shall be the number of days, if any, which the Excusable Delay or the Compensable Delay exceeds the period of time of the Unexcused Delay.

**16.2. Excusable and Compensable Delay(s)**

**16.2.1.** Contractor is **not** entitled to additional compensation for any delay, even a delay caused by Adverse Weather or an Excusable Delay, unless **all** of the following conditions are met:

**16.2.1.1.** The District is responsible for the delay;

**16.2.1.2.** The delay is unreasonable under the circumstances involved and impacts the critical path of the Work and extends the most current Contract Completion date;

**16.2.1.3.** The delay was not within the contemplation of District and Contractor;

**16.2.1.4.** Contractor complies with the Change Order procedures, and if necessary, the Claims procedures of the Contract Documents;

**16.2.1.5.** The delay could not have been avoided or mitigated by the Contractor's care, prudence, foresight, and diligence;

**16.2.1.6.** The delay extends the most current Contract Completion date; and

**16.2.1.7.** The delay is not concurrent with a Contractor-caused delay or other type of Excusable Delay.

**16.2.2.** In accordance with California Public Contract Code section 7102, if the Contractor's progress is delayed by the events described in the preceding subsection, Contractor shall not be precluded from the recovery of damages directly and proximately resulting therefrom. In that event, Contractor's damages, if any, shall be limited to direct, actual and unavoidable additional costs of labor, materials or construction equipment directly resulting from that delay, and shall exclude special, indirect or consequential damages. In no event shall Contractor seek costs or damages for delays, interruptions, hindrances or disruptions to the Work for on-Site or off-Site costs or damages based upon formulas, e.g. Eichleay or other formula. Except as expressly provided for herein, Contractor shall not have any other claim, demand or right to adjustment of the Contract Price arising out of delay, interruption, hindrance or disruption to the progress of the Work. Adjustments to the Contract Price and the Contract Time, if any, on account of Changes to the Work or Suspension of the Work shall be governed by the applicable provisions of the Contract Documents, including without limitation, the "Changes in the Work" section and the percentages in the "Format for Proposed Change" section of these General Conditions.

**16.3. Excusable and Non-Compensable Delay(s)**

**16.3.1.** An "Excusable Delay" shall mean an interruption of the Work beyond the reasonable control of the Contractor and that:

**16.3.1.1.** Could have not been avoided by the Contractor exercising care, prudence, foresight, and diligence, and

**16.3.1.2.** Actually extended the most current Project Completion date.

**16.3.2.** The Contractor may be entitled to an extension of the Project Completion date if there is an Excusable Delay, but the Contractor shall not be entitled to additional compensation for an Excusable Delay.

**16.3.3. Force Majeure.**

**16.3.3.1.** Excusable Delays are limited to interruptions that satisfy the above requirements and that are acts of God; acts of a public enemy; fires; floods; windstorms; tornadoes; earthquakes; wars; riots; insurrections; epidemics; quarantine restrictions; strikes; lockouts; fuel shortages; freight embargoes; and Adverse Weather that satisfies the requirements herein ("**Force Majeure Events**").

**16.3.3.2.** COVID-19. Contractor agrees that the Contract Time is based on the Contractor's full compliance with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with COVID-19, and/or any similar virus or derivative strain. Therefore, any delay associated with COVID-19, or any derivative or similar strain thereof, or any federal, state, or local order relating thereto, shall not be considered a Force Majeure Event unless it materially increases the Contract Time and Contractor has issued a PCO and the District has issued a Change Order pursuant to the "Changes in the Work" provisions herein. If the Parties cannot in good faith and reasonably agree to an increase in the Contract Time, the Parties agree that dispute will be resolved pursuant to the Claims Resolution Process herein.

**16.3.4.** Contractor is aware that governmental agencies and utilities, including, without limitation, the Division of the State Architect, the Department of General Services, gas companies, electrical utility companies, water districts, and other agencies may have to approve Contractor-prepared drawings or approve a proposed installation. Contractor shall include in its bid, time for possible review of its drawings and for reasonable delays and damages that may be caused by such agencies. Contractor is not entitled to make a claim for damages or delays or an Excusable Delay arising from the review of Contractor's drawings or other approvals from the Division of the State Architect, the Department of General Services, gas companies, electrical utility companies, water districts, and other agencies.

**16.3.5.** Neither the financial resources of the Contractor or any person or entity directly or indirectly engaged by the Contractor in performance of any portion of the Work shall be deemed conditions beyond the control of the Contractor. If an event of Excusable Delay occurs, the Contract Time shall be subject to adjustment hereunder only if the Contractor establishes: (i) full compliance with all applicable provisions of the Contract Documents relative to the method, manner and time for Contractor's notice and request for adjustment of the Contract Time; (ii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time are outside the reasonable control and without any fault or neglect of the Contractor or any person or entity directly or indirectly engaged by Contractor in performance of any portion of the Work; and (iii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time directly and adversely impacted the critical path of the Work as indicated in the approved Construction Schedule or the most recent updated approved Construction Schedule relative to the date(s) of the claimed event(s) of Excusable Delay.

**16.3.6. Computation of Time / Adverse Weather**

**16.3.6.1.** The Contractor will only be allowed a time extension for Adverse Weather conditions if requested by Contractor within five (5) calendar days of the Adverse Weather event, and only if **all** of the following conditions are met – thereby making the resulting delay an Excusable Delay.

**16.3.6.1.1.** The weather conditions constitute Adverse Weather, as defined herein and further specified in the Special Conditions;

**16.3.6.1.2.** Contractor can verify that the Adverse Weather caused delays in excess of five (5) hours of the indicated labor required to complete the scheduled tasks of Work on the day affected by the Adverse Weather;

**16.3.6.1.3.** The Contractor's crew is dismissed as a result of the Adverse Weather; and

**16.3.6.1.4.** The number of days of delay for the month exceed those indicated in the Special Conditions.

**16.3.6.2.** A day-for-day extension will only be allowed for those days in excess of those indicated in the Special Conditions.

**16.3.6.3.** The Contractor shall work seven (7) days per week, if necessary, irrespective of inclement weather, to maintain access and the Construction Schedule, and to protect the Work under construction from the effects of Adverse Weather, all at no further cost to the District.

**16.3.6.4.** The Contract Time has been determined with consideration given to the average climate weather conditions prevailing in the County in which the Project is located.

### 16.4. Unexcused Delay(s) – Liquidated Damages

**16.4.1.** Unexcused Delays refer to any delay to the progress of the Work caused by events or factors other than those specifically identified in the "Excusable and Compensable Delay(s)" or the "Excusable and Non-Compensable Delay(s)" sections above. Neither the Contract Price nor the Contract Time shall be adjusted on account of Unexcused Delays.

**16.4.2.** Contractor and District hereby agree that the exact amount of damages for failure to complete the Work within the time specified is extremely difficult or impossible to determine. If the Work is not completed within the time specified in the Contract Documents, it is understood that the District will suffer damage. It being impractical and unfeasible to determine the amount of actual damage, it is agreed the Contractor shall forfeit and pay to District as fixed and liquidated damages, and not as a penalty, the amount set forth in the Agreement for each calendar day of delay in Completion. Contractor and its Surety shall be liable for the amount thereof pursuant to Government Code section 53069.85.

**16.4.3.** Contractor shall not forfeit or pay liquidated damages for an Excusable Delay or an Excusable and Compensable Delay.

## 17. CHANGES IN THE WORK

### 17.1. No Changes Without Authorization

**17.1.1.** There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order, a written Unilateral Change Order, or a written Force Account Directive authorized by the District as herein provided. District shall not be liable for the cost of any extra work, any changes to the Contract Time, or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the District's governing board has authorized the same and the cost thereof has been approved in writing by an executed Change Order, a written Unilateral Change Order, or a written Force Account Directive.

**17.1.2. Verbal Order of Change in the Work.** Any verbal order, direction, instruction, interpretation, or determination from the District, the Project Inspector or the Architect which in the opinion of the Contractor causes any change to the scope of the Work, or otherwise requires an adjustment to the Contract Price or the Contract Time, shall be treated as a Change only if the Contractor gives the Architect written notice within three (3) Business Days of the order, directions, instructions, interpretation or determination and prior to acting in accordance therewith. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to address the order, direction, instruction, interpretation or determination giving rise to Contractor's notice. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice within three (3) Business Days of any verbal order, direction, instruction, interpretation or

determination shall be deemed Contractor's waiver of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of that verbal order, direction, instruction, interpretation or determination. The written notice shall state the date, circumstances, extent of adjustment to the Contract Price or the Contract Time, if any, requested, and the source of the verbal order, directions, instructions, interpretation or determination that the Contractor regards as a Change. Unless the Contractor acts in strict accordance with this procedure, any verbal order, direction, instruction, interpretation or determination shall not be treated as a Change and the Contractor hereby waives any claim for any adjustment to the Contract Price or the Contract Time on account thereof.

**17.1.3.** The Surety, in executing and providing the Performance Bond and the Payment Bond, shall be deemed to have expressly agreed to any change to the Contract and to any extension of time made by reason thereof.

**17.1.4.** No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order, Unilateral Change Order, or Force Account Directive. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications.

**17.1.5.** Contractor shall perform immediately all work that has been authorized by a fully executed Change Order, Unilateral Change Order, or Force Account Directive. Contractor shall be fully responsible for any and all delays and/or expenses caused by Contractor's failure to expeditiously perform this Work and Contractor's failure or refusal to so proceed with that Work may be deemed to be Contractor's default of a material obligation of the Contractor under the Contract Documents.

**17.1.6.** Should any Change Order result in an increase in the Contract Price, the cost of that Change Order shall be agreed to, in writing, in advance by Contractor and District and be subject to the monetary limitations set forth in Public Contract Code section 20118.4. In the event that Contractor proceeds with any change in Work without a Change Order executed by the District, Unilateral Change Order, or Force Account Directive, Contractor waives any claim of additional compensation or time for that additional work.

**17.1.7.** Contractor understands, acknowledges, and agrees that the reason for District authorization is so that District may have an opportunity to analyze the Work and decide whether the District shall proceed with the Change Order or alter the Project so that a change in Work becomes unnecessary.

**17.1.8.** In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization, shall act, at its discretion, to prevent all threatened loss or injury. Any compensation or time claimed by Contractor on account of emergency work shall be determined as indicated herein as a PCO.

**17.1.9.** No payments will be made, nor will District accept proposed change orders until the Contractor has complied with all the requirements of the Escrow of Bid Documentation document (if applicable).

**17.2. Architect Authority**

The Architect will have authority to order minor changes in the Work not involving any adjustment in the Contract Price, or an extension of the Contract Time, or a change that is inconsistent with the intent of the Contract Documents. These changes shall be effected by written Change Order, Unilateral Change Order, or by Architect's response(s) to RFI(s).

**17.3. Change Orders**

**17.3.1.** A Change Order is a written instrument prepared and issued by the District and/or the Architect and signed by the District (as authorized by the District's governing board), the Contractor, the Architect, and approved by the Project Inspector (if necessary) and DSA (if necessary), stating their agreement regarding all of the following:

**17.3.1.1.** A description of a change in the Work;

**17.3.1.2.** The amount of the adjustment in the Contract Price, if any; and

**17.3.1.3.** The extent of the adjustment in the Contract Time, if any.

**17.3.2.** If a Change Order is required to be approved by DSA, the District may call it a Construction Change Document.

**17.3.3.** If the District approves of a Change, the District or the Architect shall provide a written Change Order to the Contractor describing the Change and setting forth the adjustment to the Contract Time and the Contract Price, if any, on account of that Change. All Change Orders shall be full payment and final settlement of all rights for direct, indirect and consequential costs, including without limitation, costs of delays or impacts related to, or arising out of, items covered and affected by the Change Order, as well as any adjustments to the Contract Time. Any demand or request for an adjustment to the Contract Time or the Contract Price relating to any Change incorporated into a Change Order not presented by the Contractor for inclusion in the Change Order shall be deemed waived. The Contractor shall execute the Change Order prepared pursuant to the foregoing. After the Change Order has been prepared and forwarded to the Contractor for execution, the Contractor shall not modify or amend the form or content of such Change Order, or any portion thereof.

**17.4. Unilateral Change Orders**

**17.4.1.** A Unilateral Change Order is a written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work. The District may as provided by law, by Unilateral Change Order and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions. Any dispute as to the sum of the Unilateral Change Order or timing of payment shall be resolved pursuant to the Payment provisions and the Claims and Disputes provisions herein. **A Unilateral Change Order is NOT a Construction Change Document (which is defined above as a Change Order that DSA must approve)**.

**17.4.2.** The District may issue a Unilateral Change Order in the absence of agreement on the terms of a Change Order.

**17.5. Force Account Directives**

**17.5.1.** When work, for which a definite price has not been agreed upon in advance, is to be paid for on a force account basis, all direct costs necessarily incurred and paid by the Contractor for labor, material, and equipment used in the performance of that Work, shall be subject to the approval of the District and compensation will be determined as set forth herein.

**17.5.2.** District will issue a Force Account Directive to proceed with the Work on a force account basis, and a not-to-exceed budget will be established by District.

**17.5.3.** All requirements regarding direct cost for labor, labor burden, material, equipment, and markups on direct costs for overhead and profit described in this section shall apply to Force Account Directives. However, District will only pay for actual costs verified in the field by the District or its authorized

representative(s) on a daily basis.

**17.5.4.** Contractor shall be responsible for all cost related to the administration of Force Account Directive. The markup for overheard and profit for Contractor modifications shall be full compensation to the Contractor to administer Force Account Directive.

**17.5.5.** Contractor shall notify District or its authorized representative(s) at least twenty-four (24) hours prior to proceeding with any of the force account work. Furthermore, the Contractor shall notify the District when it has consumed eighty percent (80%) of the budget, and shall not exceed the budget unless specifically authorized in writing by the District. Contractor will not be compensated for force account work in the event that Contractor fails to timely notify the District regarding the commencement of force account work, or exceeding the force account budget.

**17.5.6.** Contractor shall diligently proceed with the work, and on a daily basis, submit a daily force account report on a form supplied by the District no later than 5:00 p.m. each day. The report shall contain a detailed itemization of the daily labor, material, and equipment used on the force account work only. The names of the individuals performing the force account work shall be included on the daily force account reports. The type and model of equipment shall be identified and listed. District will review the information contained in the reports, and sign the reports no later than the next work day, and return a copy of the report to Contractor for its records. District will not sign, nor will Contractor receive compensation for work District cannot verify. Contractor will provide a weekly force account summary indicating the status of each Force Account Directive in terms of percent complete of the not-to-exceed budget and the estimated percent complete of the work.

**17.5.7.** In the event Contractor and District reach a written agreement on a set cost for the work while the work is proceeding based on a Force Account Directive, the Contractor's signed daily force account reports shall be discontinued and all previously signed reports shall be invalid.

**17.6. Price Request**

**17.6.1.** Definition of Price Request. A Price Request ("PR") is a written request prepared by the Architect or the District, requesting the Contractor to submit to the District and the Architect an estimate of the effect of a proposed change in the Work on the Contract Price and the Contract Time.

**17.6.2.** Scope of Price Request. A Price Request shall contain adequate information, including any necessary Drawings and Specifications, to enable Contractor to provide the cost breakdowns required herein. Contractor shall not be entitled to any additional compensation for preparing a response to a Price Request, whether ultimately accepted or not.

**17.6.3.** Contractor shall not consider Price Requests to be instructions either to stop work in progress or to execute the proposed change.

**17.6.4.** Within the time specified in Price Request after receipt of Price Request, Contractor shall submit a quotation estimating cost adjustments to the Contract Price and the Contract Time necessary to execute the change, with the following documentation and information:

**17.6.4.1.** Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

**17.6.4.2.** Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

**17.6.4.3.** Include costs of labor and supervision directly attributable to the change.

**17.6.4.4.** Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

**17.7. Proposed Change Order**

**17.7.1.** Proposed Change Order. The Contractor may issue a Proposed Change Order ("PCO"), only as a written request prepared by it to the District and the Architect, requesting that the District issue a Change Order based upon a proposed change to the Work.

**17.7.2.** Changes in Contract Price. A PCO shall include breakdowns pursuant to the provisions herein to validate any change in Contract Price and include all reasonable documentation as required herein.

**17.7.3.** Changes in Time. A PCO shall also include any changes in time required to complete the Project. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationships. Use available total float before requesting an extension of the Contract Time. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Construction Schedule as defined in the Contract Documents. If Contractor fails to request a time extension in a PCO, then the Contractor is thereafter precluded from requesting time and/or claiming a delay. If the Contractor is requesting additional time and believes that time is both Excusable and Compensable, then the Contractor must provide detailed documentation that supports its position and that addresses all the components of the "Excusable and Compensable Delay(s)" section above.

**17.7.4.** Unknown and/or Unforeseen Conditions. If Contractor submits a PCO requesting an increase in Contract Price and/or Contract Time that is based at least partially on Contractor's assertion that Contractor has encountered unknown and/or unforeseen condition(s) on the Project, then Contractor shall base the PCO on provable information that, beyond a reasonable doubt and to the District's satisfaction, demonstrates that the unknown and/or unforeseen condition(s) were actually unknown and/or unforeseen and that the condition(s) were reasonably unknown and/or unforeseen. If not, the District shall deny the PCO and the Contractor shall complete the Project without any increase in Contract Price and/or Contract Time based on that PCO.

**17.7.5.** Time to Submit PCO. Contractor shall submit its PCO within five (5) days of the date Contractor discovers, or reasonably should discover, the circumstances giving rise to the proposed change order, unless additional time to submit a proposed change order is granted in writing by the District. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to the address the basis for the PCI. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice (with Supporting Documentation to permit the District's review and evaluation) within this time frame shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of the circumstances giving rise to the PCO.

**17.7.6.** COVID-19.

**17.7.6.1.** Contractor agrees that its bid, the Contract Price and the Contract Time are based on the Contractor's full compliance with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with COVID-19, and/or any similar virus or derivative strain at the time of Contract award. Therefore, any cost or delay associated with COVID-19, or any derivative or similar strain thereof, or

any federal, state, or local order relating thereto, shall not be considered compensable unless:

**17.7.6.1.1.** It occurred after the date of the award of the Contract to Contractor;

**17.7.6.1.2.** It materially increases the Contract Price or the Contract Time; and

**17.7.6.1.3.** Contractor notifies the District within 10 days of notice of any a new derivative, strain, or new public health order(s), including the anticipated increase to the Contract Price or Contract Time due to the new derivative, strain, or new public health order(s), and Contractor substantiates those costs with detailed supporting documentation as required for a PCO.

**17.7.6.2.** If, during the construction of the Project, the applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with COVID-19, and/or any similar virus or derivative strain, are changed or rescinded (e.g., by the reduction of potential exposure or risk due to vaccinations), the Parties agree to reduce the Contract Price and the Contract Time due to the removal of the required efforts. If the Parties cannot mutually agree on the appropriate reduction, the District may issue a Unilateral Change Order for an amount of time and money it determines to be both reasonable and appropriate. The Parties agree that any dispute related to this provision will be resolved pursuant to the Claims Resolution Process herein.

**17.8. Format for Proposed Change Order**

**17.8.1.** The following "Format For Proposed Change For Subcontractor Performed Work" and "Format For Proposed Change For Contractor Performed Work" shall be used as applicable by the District and the Contractor (e.g. Change Orders, PCO's) to communicate proposed additions and deductions to the Contract, supported by attached documentation.

**FORMAT FOR PROPOSED CHANGE FOR <u>SUBCONTRACTOR</u> PERFORMED WORK**

| | | | |
|---|---|---|---|
| | **<u>SUBCONTRACTOR PERFORMED WORK</u>** | | |
| **(A)** | **<u>Labor Charge</u>**<br>1. **Hours.** Attach total itemized hours.<br>2. **Rate.** This shall be no more than the Straight-Time Total Hourly Rate as determined by the Department of Industrial Relations ("DIR") for the applicable labor category. | | |
| **(B)** | **<u>Labor Burden & Worker's Compensation Charge</u>**<br>1. This shall be no more than twenty percent (20%) of **item (A)**, the Labor Charge.<br>2. This shall be the total cumulative charge permitted for all Subcontractors or all labor performed by the Subcontractor or Subcontractor's Subcontractor(s) (i.e., all "lower-tier" Subcontractor(s)). | | |
| **(C)** | **<u>Subtotal (A+B)</u>** | | |
| **(D)** | **<u>Material Charge</u>**<br>Attach itemized quantity and unit cost plus sales tax and invoice(s) from vendor(s). | | |
| **(E)** | **<u>Equipment Charge</u>**<br>Attach invoice(s) from supplier(s). | | |
| **(F)** | **<u>Subtotal (C+D+E)</u>** | | |
| **(G)** | **<u>Subcontractor's Overhead and Profit Charge</u>**<br>1. This shall be no more than eight percent (8%) of **item (F)**.<br>2. This shall be the total cumulative mark-up permitted for the Subcontractor and Subcontractor's Subcontractor(s) (i.e., all "lower-tier" Subcontractor(s)). | | |
| **(H)** | **<u>Subtotal (F+G)</u>** | | |
| **(I)** | **<u>Contractor's Overhead, Profit, Bond and Insurance</u>**<br>1. This shall be no more than six percent (6%) of **Item (F)**.<br>2. This shall be the total mark-up permitted for Contractor. | | |
| **(J)** | **<u>TOTAL (H+I)</u>** | | |
| **(K)** | **<u>Time</u>** | **_____ Days** | |

**FORMAT FOR PROPOSED CHANGE FOR <u>CONTRACTOR</u> PERFORMED WORK**

| | **<u>CONTRACTOR PERFORMED WORK</u>** | *·ADD* | *·DEDUCT* |
|---|---|---|---|
| **(A)** | **<u>Labor Charge</u>**<br>1. **Hours.** Attach total itemized hours.<br>2. **Rate.** This shall be no more than the Straight-Time Total Hourly Rate as determined by the Department of Industrial Relations ("DIR") for the applicable labor category. | | |
| **(B)** | **<u>Labor Burden & Worker's Compensation Charge</u>**<br>1. This shall be no more than twenty percent (20%) of **item (A)**, the Labor Charge.<br>2. This shall be the total cumulative charge permitted for all labor performed by Contractor. | | |
| **(C)** | **<u>Subtotal (A+B)</u>** | | |
| **(D)** | **<u>Material Charge</u>**<br>Attach itemized quantity and unit cost plus sales tax and invoice(s) from vendor(s). | | |
| **(E)** | **<u>Equipment Charge</u>**<br>Attach invoice(s) from supplier(s). | | |
| **(F)** | **<u>Subtotal (C+D+E)</u>** | | |
| **(G)** | **<u>Contractor's Overhead, Profit, Bond and Insurance</u>**<br>1. This shall be no more than six percent (6%) of **Item (F)**.<br>2. This shall be the total mark-up permitted for Contractor. | | |
| **(H)** | **<u>TOTAL (F+G)</u>** | | |
| **(I)** | **<u>Time</u>** | **_____ Days** | |

**17.8.2.** All Proposed Change Order requests by Contractor for a change shall include a complete itemized breakdown with the following detail:

**17.8.2.1. Labor.** Labor breakdown by trade classification, wage rates, and estimated hours. Labor costs shall only include fringe benefits indicated by governing trade organizations. Wages shall not exceed current prevailing wages in the locality for performance of the changes.

**17.8.2.1.1.** The Contractor's or Subcontractors' labor burden and Workers' Compensation premium shall only be charged as indicated herein. In no event shall Contractor include any other charges than as indicated herein without the prior written approval of the District.

**17.8.2.2. Material.** Material quantities, and types of products, and transportation costs, if applicable.

**17.8.2.3. Equipment.** Equipment breakdown by make, type, size, rental rates (if not owned), equipment hours and transportation costs, if applicable.

**17.8.2.3.1.** The equipment costs shall not exceed one hundred percent (100%) of the Association of Equipment Distributors (AED) rental rates or Caltrans rates, whichever is less. Hourly, daily, weekly, or monthly rates shall be used, whichever is lower. Hourly rates including operator shall not be used.

**17.8.2.3.2.** The time to be paid for equipment shall be the actual time that the equipment is in productive operation on the Work or idled as a result of the event or circumstance giving rise to the Proposed Change Order. In computing the hourly rental of equipment, any time less than thirty (30) minutes shall be considered one-half (1/2) hour. No payment will be made for time while equipment is inoperative due to breakdown, or for non-workdays. In addition, the rental time shall not include the time required to move the equipment to and from the project site. No mobilization or demobilization will be allowed for equipment already on site. If such equipment is not moved by its own power, then loading and transportation costs will be paid in lieu of rental time thereof. However, neither moving time nor loading and transportation costs will be paid if the equipment is used on the Project Site in any other way than upon the work directly related to the event or circumstance giving rise to the Proposed Change Order.

**17.8.2.3.3.** Individual pieces of equipment having a replacement value of one thousand dollars ($1,000) or less shall be considered to be small tools or small equipment, and no payment will be made since the costs of these tools and equipment is included as part of the markup for overhead and profit defined herein.

**17.8.2.3.4.** Payment to the Contractor for the use of equipment as set forth above shall constitute full compensation to the Contractor for the cost of fuel, power, oil, lubricants, supplies, small equipment, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, labor (except for equipment operators), and any and all costs to the Contractor incidental to the use of the equipment.

**17.8.2.3.5.** Should Contractor, or any of its owners, officers, directors or agents, hold any ownership interest in any company, organization, association or corporation from whom rental equipment is secured. Contractor shall immediately notify District of such and the price set for any such rental shall be agreed upon in advance by the Contractor and the District.

**17.8.2.4. Overhead, Profit, Bond and Insurance Costs.** Markup for overhead and profit, which shall be used to compensate Contractor for all costs for all administration, general conditions, and supervision, including, without limitation:

**17.8.2.4.1.** All home office overhead, field office overhead, field office personnel including, but not limited to, principals, project managers, superintendents, supervisory foremen, estimators, project engineers, detailers, draftsmen, schedulers, consultants, watchmen, payroll clerks, administrative assistants, labor compliance costs and secretaries.

**17.8.2.4.2.** All field and field office expenses including, but not limited to, field trailers, parking, storage sheds, office equipment and supplies, telephone service and long distance telephone calls, computers, fax machines, temporary utilities, sanitary facilities and services, janitorial services, small tools and equipment with a cost under $1000 each, portable scaffolding, blocking, shores, appliances, job vehicles, security and fencing, conformance to regulatory requirements including compliance to safety regulations, safety programs and meetings, cartage, warranties, As-Built Drawings, as well as any related maintenance costs.

**17.8.2.4.3.** Administrative functions such as, but not limited to, reviewing, coordinating, distributing, processing, posting, recording, estimating, negotiating, expediting, engineering, drawing, detailing, revising shop drawings, carting, cleaning, protecting the work, and other incidental Work related to the change.

**17.8.2.4.4.** All other costs and taxes required to be paid, but not included under direct costs as defined above including, without limitation, payroll taxes, social security, etc.

**17.8.2.4.5.** All costs for Contractor's bonds and insurance.

**17.8.2.4.6.** Taxes: Federal excise tax shall not be included. District will issue an exemption on request.

**17.8.2.5. Contract Time.** Justification for any adjustment in Contract Time including a schedule analysis identifying critical schedule activities delayed by the request. Contract Time shall be extended or reduced by Change Orders, Unilateral Change Orders, or Force Account Directives for a period of time commensurate with the time reasonably necessary to perform a Change. This time must be requested in writing by the Contractor with the Price Request, PCO, or expressly in writing as part of its documentation for Unilateral Change Orders, or Force Account Directives. The Contractor shall justify any Contract Time extension by submittal of a schedule analysis as required in this Changes section of these General Conditions accurately portraying the impact of the change on the critical path of the Construction Schedule. Changes performed within available float shall not justify an extension to the Contract Time. The District shall make the final determination of the amount of Contract Time to allocate to any Change.

**17.8.2.6. Supporting Documentation.** Contractor shall include with each PCO, along with the itemized breakdown as required herein, reasonable documentation substantiating the requested change in the Contract Price and Contract Time. If the District deems Contractor's supporting documentation incomplete or inadequate to substantiate the requested change to the Contract Price and Contract Time, the District may request that Contractor supplement the PCO with additional, reasonable supporting documentation.

## 17.9. Change Order Certification

**17.9.1.** All Change Orders and PCOs shall include the following certification by the Contractor. The Parties acknowledged that if a Change Order is approved that does not include this language, that Change Order shall be deemed to include this certification language:

> ***The Contractor approves the foregoing as to the changes, if any, and the price specified for each item and the extension of time allowed, if any, for***

***completion of the entire Work as stated herein, and agrees to furnish all labor, materials, and service, and perform all work necessary to complete all additional work specified for the consideration stated herein. Submission of sums that have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq. It is understood that the changes herein to the Contract shall only be effective when approved by the governing board of the District. It is expressly understood that the value of the extra Work or changes includes all of the Contractor's costs, expenses, field overhead, home office overhead, profit, both direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project. Any costs, expenses, damages, or time extensions not included are deemed waived.***

**17.10. Determination of Change Order Cost**

**17.10.1.** The amount of the increase or decrease in the Contract Price from a Change Order, if any, shall be determined in one or more of the following ways as applicable to a specific situation and at the District's discretion:

**17.10.1.1.** District acceptance of a PCO;

**17.10.1.2.** By agreement between District and Contractor.

**17.10.1.3.** By unit prices or alternates contained in Contractor's original bid. If the Bid for the Work included proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect to add any such Alternate Bid Item(s) if the that item did not form a basis for award of the Contract or delete any such Alternate Bid Item(s) if that item formed a basis for award of the Contract. If the District elects to add or delete an Alternate Bid Item(s) pursuant to the foregoing, the cost or credit for that Alternate Bid Item(s) shall be as set forth in the Contractor's Bid, at the District's discretion. If any Alternate Bid Item is added or deleted from the Work pursuant to the foregoing, the Contract Time shall be adjusted by the number of days allocated for the added or deleted Alternate Bid Item in the Contract Documents; if days are not allocated for any Alternate Bid Item added or deleted pursuant to the foregoing, the Contract Time shall be equitably adjusted.

**17.10.1.4.** By the District, based upon actual and necessary costs incurred by the Contractor as determined by the District on the basis of the Contractor's records. Promptly upon determining the extent of adjustment to the Contract Price, the District shall notify the Contractor in writing of the same; the Contractor shall be deemed to have accepted the District's determination of the amount of adjustment to the Contract Price on account of a Change to the Work unless Contractor shall notify the District, in writing, not more than fifteen (15) days from the date of the District's written notice, of any objection to the District's determination. Failure of the Contractor to timely notify the District of Contractor's objections to the District's determination of the extent of adjustment to the Contract Price shall be deemed Contractor's acceptance of the District's determination and a waiver of any right or basis of the Contractor to thereafter protest or otherwise object to the District's determination. Notwithstanding any objection of the Contractor to the District's determination of the extent of any adjustment to the Contract Price pursuant to this provision, Contractor shall diligently proceed to perform and complete any such Change.

**17.11. Deductive Change Orders**

If Contractor offers a proposed amount for a deductive Change Order(s), Contractor shall include a minimum of five percent (5%) total overhead and profit to be deducted with the amount of the work of

the Change Order(s). If Subcontractor work is involved, Subcontractors shall also include a minimum of five percent (5%) overhead and profit to be deducted with the amount of its deducted work, for a total minimum of ten percent (10%) total overhead and profit to be deducted. Any deviation from this provision shall not be allowed.

**17.12. Discounts, Rebates and Refunds**

For purposes of determining the cost, if any, of any change, addition, or omission to the Work hereunder, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to the Contractor, and the Contractor shall make provisions so that such discounts, rebates, refunds, and returns may be secured, and the amount thereof shall be allowed as a reduction of the Contractor's cost in determining the actual cost of construction for purposes of any change, addition, or omission in the Work as provided herein.

**17.13. Accounting Records**

With respect to portions of the Work performed by Change Orders, Unilateral Change Orders, or Force Account Directives, Contractor shall keep and maintain cost-accounting records satisfactory to the District, which shall be available to the District on the same terms as any other books and records Contractor is required to maintain pursuant to the Contract Documents.

**17.14. Notice Required**

If Contractor is seeking an adjustment in the Contract Price, or any extension in the Contract Time for Completion, it shall notify District pursuant to the provisions of the Contract Documents. No adjustment in the Contract Price or Contract Time shall be considered unless made in accordance with the Contract Documents. Contractor shall proceed to execute the Work even though the adjustment may not have been agreed upon. Any change in the Contract Price or extension of the Contract Time resulting from such contract adjustment shall only be authorized by a Change Order.

**17.15. Applicability to Subcontractors**

Any requirements under this Article shall be equally applicable to Change Orders, Unilateral Change Orders, or Force Account Directives issued to Subcontractors by the Contractor to the extent as required by the Contract Documents.

**17.16. Alteration to Change Order Language**

Contractor shall not alter Change Orders or reserve time in Change Orders. Contractor shall execute finalized Change Orders and proceed under the provisions herein with proper notice.

**17.17. Failure of Contractor to Execute Change Order**

Contractor shall be in default of the Contract if Contractor fails to execute a Change Order when the Contractor agrees with the addition and/or deletion of the Work in that Change Order.

## 18. REQUEST FOR INFORMATION

**18.1.** Any Request for Information ("RFI") shall reference all applicable Contract Document(s), including Specification section(s), detail(s), page number(s), drawing number(s), and sheet number(s), etc. Contractor shall make suggestions and interpretations of the issue raised by each RFI. An RFI cannot modify the Contract Price, Contract Time, or the Contract Documents.

**18.2.** Contractor shall be liable to the District for all costs incurred by the District associated with the processing, reviewing, evaluating and responding to any RFI, including without limitation, fees of the Architect and any other design consultant to the Architect or the District, that District reasonably determines:

**18.2.1.** Does not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor; or

**18.2.2.** Does not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract; or

**18.2.3.** Requests an interpretation or decision of a matter where the information sought is equally available to the Contractor; or

**18.2.4.** Is not justified for any other reason.

**18.3.** Prior to submitting the RFI, Contractor shall diligently review the Contract Documents for information responsive to the RFI, including information incorporated by reference. Contractor should not issue an RFI regarding information contained in or inferable from the Contract Documents, including information incorporated by reference. An RFI is invalid if the RFI response is contained in or inferable from the Contract Documents.

**18.4.** Contractor shall be responsible for preparing and submitting each RFI so as to not cause delay to the progress of the Work nor to cause any impact to the Contractor's labor productivity. An RFI may be considered untimely if not submitted within **Forty Eight (48) hours** of receipt from a Contractor's subcontractor. Untimely submission of any RFI will preclude Contractor from asserting any claims for delay or for labor impact against the District.

**18.5.** If the Contractor fails to timely notify the Architect in writing of any Conditions encountered and the Contractor proceeds to perform any portion of the Work containing or affected by such Conditions the Contractor shall bear all costs associated with or required to correct, remove, or otherwise remedy any portion of the Work affected thereby without adjustment of the Contract Time or the Contract Price. In requesting information of the District to address and resolve any conditions, the Contractor shall act with promptness in submitting any written request so as to allow the District a reasonable period of time to review, evaluate and respond to any request, taking into account the then current status of the progress and completion of the Work and the actual or potential impact of any conditions upon the completion of the Work within the Contract Time. The Contract Time shall not be subject to adjustment in the event that the Contractor shall fail to timely request information from the District.

## 19. PAYMENTS

### 19.1. Contract Price

**19.1.1.** The Contract Price is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work pursuant to the Contract Documents. If all or a portion of the Project is being funded by funds requiring approval by the State Allocation Board (SAB), payment may be subject to that approval being received, funding by the SAB, and funds being released by the Office of Public School Construction (OPSC).

### 19.2. Applications for Progress Payments

**19.2.1.** Procedure for Applications for Progress Payments

**19.2.1.1.** Application for Progress Payment

**19.2.1.1.1.** Not before the fifth ($5^{th}$) day of each calendar month during the progress of the Work, Contractor shall submit to the District and the Architect an itemized Application for Payment for Work completed in accordance with the Schedule of Values. The Application for Payment shall be notarized, if required, and supported by the following or each portion thereof unless waived by the District in writing:

**19.2.1.1.1.1.** The amount paid to the date of the Application for Payment to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;

**19.2.1.1.1.2.** The amount being requested by the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;

**19.2.1.1.1.3.** The balance that will be due to each of the entities after payment is made;

**19.2.1.1.1.4.** A certification that the As-Built Drawings and annotated Specifications are current;

**19.2.1.1.1.5.** An Itemized breakdown of Work performed;

**19.2.1.1.1.6.** An updated and acceptable construction schedule in conformance with the provisions herein;

**19.2.1.1.1.7.** The additions to and subtractions from the Contract Price and Contract Time;

**19.2.1.1.1.8.** A total of the retention held;

**19.2.1.1.1.9.** The material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the District may require from time to time;

**19.2.1.1.1.10.** The percentage of completion of the Contractor's Work by line item;

**19.2.1.1.1.11.** The Schedule of Values updated from the preceding Application for Payment;

**19.2.1.1.1.12.** A duly completed and executed conditional waiver and release upon progress payment compliant with Civil Code section 8132 from each subcontractor of any tier and supplier to be paid from the current progress payment;

**19.2.1.1.1.13.** A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134 from each subcontractor of any tier and supplier that was paid from the previous progress payment; and

**19.2.1.1.1.14.** A certification by the Contractor of the following:

***The Contractor warrants title to all Work performed as of the date of this payment application. The Contractor further warrants that all Work performed as of the date of this payment application is free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, workers, or other persons***

***or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work, except those of which the District has been informed.***

**19.2.1.1.1.15.** If requested by the District, a third party, or as required by the California Department of Industrial Relations, all requested or required certified payroll record ("CPR(s)") for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work for the period of the Application for Payment.

**19.2.1.1.2.** Except as expressly provided for herein, no payments shall be made by the District on account of any item of the Work, including without limitation, materials or equipment that, at the time of the Contractor's submittal of an Application for Progress Payment, has/have not been incorporated into and made a part of the Work.

**19.2.1.1.3.** Contractor shall be subject to the False Claims Act set forth under Government Code section 12650 et seq., for information provided with any Application for Progress Payment.

**19.2.2.** Prerequisites for Progress Payments

**19.2.2.1.** First Payment Request: The following items, if applicable, must be completed before District will accept and/or process Contractor's first payment request:

**19.2.2.1.1.** Installation of the Project sign;

**19.2.2.1.2.** Installation of field office;

**19.2.2.1.3.** Installation of temporary facilities and fencing;

**19.2.2.1.4.** Schedule of Values;

**19.2.2.1.5.** Contractor's Construction Schedule;

**19.2.2.1.6.** Schedule of unit prices, if applicable;

**19.2.2.1.7.** Submittal Schedule;

**19.2.2.1.8.** Receipt by Architect of all submittals due as of the date of the payment application;

**19.2.2.1.9.** Copies of necessary permits;

**19.2.2.1.10.** Copies of authorizations and licenses from governing authorities;

**19.2.2.1.11.** Initial progress report;

**19.2.2.1.12.** Surveyor qualifications;

**19.2.2.1.13.** Written acceptance of District's survey of rough grading, if applicable;

**19.2.2.1.14.** List of all Subcontractors, with names, license numbers, telephone numbers, and Scope of Work;

**19.2.2.1.15.** All bonds and insurance endorsements; and

**19.2.2.1.16.** Resumes of Contractor's project manager, and if applicable, job site secretary, record documents recorder, and job site superintendent.

**19.2.2.2.** Second Payment Request: District will not process the second payment request until and unless all submittals and Shop Drawings have been accepted for review by the Architect.

**19.2.2.3.** No Waiver of Criteria: Any payment made to Contractor where criteria set forth herein have not been met shall not constitute a waiver of said criteria by District. The approval of any Application for Progress Payment or the disbursement of any Progress Payment to the Contractor shall not be deemed nor constitute acceptance of defective Work or Work not in conformity with the Contract Documents. Instead, such payment shall be construed as a good faith effort by District to resolve differences so Contractor may pay its Subcontractors and suppliers. Contractor agrees that failure to submit such items may constitute a material breach of the Contract by Contractor and may subject Contractor to termination.

**19.3. Progress Payments**

**19.3.1.** District's Approval of Application for Payment

**19.3.1.1.** Upon receipt of an Application for Payment, District shall act in accordance with the following:

**19.3.1.1.1.** Each Application for Payment shall be reviewed by the District as soon as practicable after receipt for the purpose of determining that the Application for Payment is a proper Application for Payment.

**19.3.1.1.2.** Any Application for Payment determined not to be a proper Application for Payment suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. An Application for Payment returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the Application for Payment is not proper. The number of days available to the District to make a payment without being subject to any applicable statute regarding prompt payment or interest accrual, shall be reduced by the number of days by which the District exceeds this seven-day return requirement.

**19.3.1.1.3.** An approved Application for Payment shall be considered payable if funds are available for payment after the deduction of amounts allowed by law and/or pursuant to the section herein entitled "Decisions to Withhold Payment,"

**19.3.1.2.** The District's review of the Contractor's Application for Payment will be based on the District's and the Architect's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the District's and the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to:

**19.3.1.2.1.** Observation of the Work for general conformance with the Contract Documents,

**19.3.1.2.2.** Results of subsequent tests and inspections,

**19.3.1.2.3.** Minor deviations from the Contract Documents correctable prior to

Completion, and

**19.3.1.2.4.** Specific qualifications expressed by the Architect.

**19.3.1.3.** District's approval of each Application for Payment shall be based on Contractor complying with all requirements for a fully complete and valid Application for Payment.

**19.3.2.** Payments to Contractor

**19.3.2.1.** Within thirty (30) days after District's receipt of each undisputed and properly submitted Application for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as verified by Architect and Inspector and certified by Contractor) up to the last day of the previous month, less the aggregate of previous payments and amount to be withheld. The value of the Work completed shall be Contractor's best estimate. No inaccuracy or error in Contractor's estimate shall operate to release the Contractor, or any Surety upon any bond, from damages arising from such Work, or from the District's right to enforce each and every provision of this Contract, and the District shall have the right subsequently to correct any error made in any estimate for payment.

**19.3.2.2.** District shall withhold five percent (5%) retention from all Progress Payments.

**19.3.2.3.** District may withhold ten percent (10%) retention from all Progress Payments pursuant to Public Contract Code section 7201, if the Project is determined to be "substantially complex."

**19.3.2.4.** The Contractor shall not be entitled to have any payment requests processed, or be entitled to have any payment made for Work performed, so long as any lawful or proper direction given by the District concerning the Work, or any portion thereof, remains incomplete.

**19.3.2.5.** In accordance with Public Contract Code §20104.50, in the event that the District shall fail to make any Progress Payment within thirty (30) days after receipt of an undisputed and properly submitted Application for Progress Payment, the District shall pay the Contractor interest on the undisputed amount of such Application for Progress Payment equal to the legal rate of interest set forth in California Code of Civil Procedure §685.010(a).

**19.3.3.** No Waiver

No payment by District hereunder shall be interpreted so as to imply that District has inspected, approved, or accepted any part of the Work. Notwithstanding any payment, the District may enforce each and every provision of this Contract. The District may correct or require correction of any error subsequent to any payment.

**19.3.4.** Warranty of Title

**19.3.4.1.** If a lien or a claim based on a stop notice or stop payment notice of any nature should at any time be filed against the Work or any District property, by any entity that has supplied material or services at the request of the Contractor, Contractor and Contractor's Surety shall promptly, on demand by District and at Contractor's and Surety's own expense, take any and all action necessary to cause any such lien or a claim based on a stop notice or stop payment notice to be released or discharged immediately therefrom.

**19.3.4.2.** If the Contractor fails to furnish to the District within ten (10) calendar days after demand by the District, satisfactory evidence that a lien or a claim based on a stop notice or stop payment notice has been so released, discharged, or secured, the District may discharge such

indebtedness and deduct the amount required therefore, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by District from any sum payable to Contractor pursuant to the Contract.

**19.4. Decisions to Withhold Payment**

**19.4.1.** Reasons to Withhold Payment

District may withhold payment in whole, or in part, to the extent reasonably necessary to protect the District if, in the District's opinion, the representations to the District required herein cannot be made. District may withhold payment, in whole, or in part, to such extent as may be necessary to protect the District from loss because of, but not limited to:

**19.4.1.1.** Defective Work not remedied within **FORTY-EIGHT (48)** hours of written notice to Contractor;

**19.4.1.2.** Stop notices, stop payment notices or other liens served upon the District as a result of the Contract;

**19.4.1.3.** Liquidated damages assessed against the Contractor;

**19.4.1.4.** The cost to complete the Work if there exists reasonable doubt that the Work can be completed for the unpaid balance of the Contract Price or by the Completion Date;

**19.4.1.5.** Damage to the District or other contractor(s);

**19.4.1.6.** Unsatisfactory performance of the Work by Contractor;

**19.4.1.7.** Failure to store and properly secure materials;

**19.4.1.8.** Failure of the Contractor to submit, on a timely basis, proper, sufficient, and acceptable documentation required by the Contract Documents, including, without limitation, a Construction Schedule, Schedule of Submittals, Schedule of Values, Monthly Progress Schedules, Shop Drawings, Product Data and samples, Proposed product lists, executed Change Orders, and/or verified reports;

**19.4.1.9.** Failure of the Contractor to maintain As-Built Drawings;

**19.4.1.10.** Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;

**19.4.1.11.** Unauthorized deviations from the Contract Documents;

**19.4.1.12.** Failure of the Contractor to perform the Work in a timely manner in compliance with the Construction Schedule, established progress schedules, and/or completion dates;

**19.4.1.13.** If requested by the District, or the failure to provide to the DIR, certified payroll records acceptable to the District and the DIR for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work for the period of the Application for Payment;

**19.4.1.14.** Failure to properly pay prevailing wages as defined in Labor Code sections 1720 et seq. and/or failure to comply with any other Labor Code requirements;

**19.4.1.15.** Failure to properly maintain or clean up the Site;

**19.4.1.16.** Failure to timely indemnify, defend or hold harmless the District;

**19.4.1.17.** Any payments due to the District, including but not limited to payments for failed tests, utilities changes, or permits;

**19.4.1.18.** Failure to pay Subcontractor(s) or supplier(s) as required by law and by the Contract Documents;

**19.4.1.19.** Failure to pay any royalty, license or similar fees;

**19.4.1.20.** Failure of the Contractor to submit on a timely basis all Closeout Documentation in a manner and form that is proper, sufficient, and reasonably acceptable to the District, and to not cause a delay in the Completion or approval of the Project; or

**19.4.1.21.** Failure to perform any implementation and/or monitoring required by any SWPPP for the Project and/or the imposition of any penalties or fines imposed therefore against Contractor or District.

**19.4.1.22.** Payment is delayed due to an audit inquiry by the State, the County Office of Education, the County, or any entity with jurisdiction related to the Project.

**19.4.1.23.** Contractor is otherwise in breach, default or in substantial violation of any provision of the Contract;

**19.4.2.** Reallocation of Withheld Amounts

**19.4.2.1.** District may, in its discretion, apply any withheld amount to pay outstanding claims or obligations as defined herein. In so doing, District shall make such payments on behalf of Contractor. If any payment is so made by District, then that amount shall be considered a payment made pursuant to the Contract and District shall not be liable to Contractor for any payment made in good faith. These payments may be made without prior judicial determination of claim or obligation. District will render Contractor an accounting of funds disbursed on behalf of Contractor.

**19.4.2.2.** If Contractor defaults or neglects to perform the Work in accordance with the Contract Documents or fails to perform any provision thereof, District may, after **FORTY-EIGHT (48)** hours written notice to the Contractor and, without prejudice to any other remedy, make good such deficiencies. District shall adjust the total Contract Price by reducing the amount thereof by the cost of making good such deficiencies. If District deems it inexpedient to correct Work that is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract Price (of at least one hundred twenty-five percent (125%) of the estimated reasonable value of the nonconforming Work) shall be made therefor.

**19.4.3.** Payment After Cure

When Contractor cures the grounds for declining approval, payment shall be made for amounts so withheld. No interest shall be paid on any retention or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

**19.5. Subcontractor Payments**

**19.5.1.** Payments to Subcontractors. No later than seven (7) days after receipt, or pursuant to Business

and Professions Code section 7108.5 and Public Contract Code section 7107, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled. Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its Sub-subcontractors in a similar manner.

**19.5.2.** No Obligation of District for Subcontractor Payment. District shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

**19.5.3.** Joint Checks. District shall have the right in its sole discretion, if necessary for the protection of the District, to issue joint checks made payable to the Contractor and Subcontractors and material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the District and a Subcontractor of any tier, any obligation from the District to such Subcontractor, or rights in such Subcontractor against the District.

## 20. COMPLETION OF THE WORK

### 20.1. Completion

**20.1.1.** The Project may only be accepted by action of the governing board of the District.

**20.1.2.** District shall accept the Project and may have a Notice of Completion recorded when Project Completion has been achieved in accordance with the Contract Documents and to the satisfaction of District. For purposes of the payment of Retention, Completion is defined in Public Contract Code section 7107. For purposes of the timely filing of Stop Payment Notices, Completion is defined in California Civil Code section 9200, et seq.

**20.1.3.** Although there is no "substantial completion" for this Project, the District, at its sole option, may accept the Project and record a Notice of Completion when Project Completion has been completed to the satisfaction of District, except for minor corrective items, as distinguished from incomplete items. If Contractor fails to complete all minor corrective items within thirty-five (35) days after the date of the District's acceptance of the Project, District shall withhold from the final payment one hundred fifty percent (150%) of an estimate of the amount sufficient to complete the corrective items, as determined by District, until the item(s) are completed.

**20.1.4.** At the end of the thirty-five (35) day period, if there are any items remaining to be corrected, District may elect to proceed as provided herein related to adjustments to Contract Price, and/or District's right to perform the Work of the Contractor.

### 20.2. Closeout Procedures

**20.2.1.** Punch List

Contractor shall notify the Architect when Contractor considers the Work complete. Upon notification, Architect will prepare a list of minor items to be completed or corrected ("Punch List"). Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**20.2.2.** Closeout Requirements

**20.2.2.1.** Utility Connections

Buildings shall be connected to water, gas, sewer, and electric services, complete and ready for use. Service connections shall be made and existing services reconnected.

**20.2.2.2.** As-Built Drawings

**20.2.2.2.1.** In addition to its requirement to provide monthly As-Built Drawings to the District, the Contractor shall provide a final set of As-Built Drawings, sometimes referred to as "Record Drawings," showing all of the Work as actually constructed upon Completion of the Project as indicated in the Specifications.

**20.2.2.2.2.** Contractor is liable and responsible for any and all inaccuracies in the As-Built Drawings, even if inaccuracies become evident at a future date.

**20.2.2.2.3.** Upon Completion of the Work and as a condition precedent to approval of final payment, Contractor shall obtain the Inspector's approval of the final set of As-Built Drawings.

**20.2.2.3.** Operations & Maintenance Manuals: Contractor shall prepare all operation and maintenance manuals and date as indicated in the Specifications.

**20.2.2.4.** Closeout Documentation: Contractor shall provide all Closeout Documentation, which shall include the following, without limitation:

**20.2.2.4.1.** A full set of final As-Built Drawings, as further defined herein.

**20.2.2.4.2.** All Operations & Maintenance Manuals and information, as further defined herein.

**20.2.2.4.3.** All Warranties, as further defined herein.

**20.2.2.4.4.** Verified report(s) for all scope(s) of work (DSA 6-C, Rev 03/22/13, or more recent revision if available).

**20.3. Final Inspection**

**20.3.1.** Contractor shall comply with Punch List procedures as provided herein, and maintain the presence of a Project Superintendent and Project Manager until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List. Upon receipt of Contractor's written notice that all of the Punch List items have been fully completed and the Work is ready for final inspection and acceptance, Architect and Project Inspector will inspect the Work and shall submit to Contractor and District a final inspection report noting the Work, if any, required in order to complete in accordance with the Contract Documents. Absent unusual circumstances, this report shall consist of the Punch List items not yet satisfactorily completed.

**20.3.2.** Upon Contractor's completion of all items on the Punch List and any other uncompleted portions of the Work, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the Architect finds the Work complete and acceptable under the Contract Documents, the Architect will notify Contractor, who shall then jointly submit to the Architect and the District its final Application for Payment.

**20.3.3.** Final Inspection Requirements

**20.3.3.1.** Before calling for final inspection, Contractor shall determine that the following have

been performed:

**20.3.3.1.1.** The Work has been completed.

**20.3.3.1.2.** All life safety items are completed and in working order.

**20.3.3.1.3.** Mechanical and electrical Work are complete and tested, fixtures are in place, connected, and ready for tryout.

**20.3.3.1.4.** Electrical circuits scheduled in panels and disconnect switches labeled.

**20.3.3.1.5.** Painting and special finishes complete.

**20.3.3.1.6.** Doors complete with hardware, cleaned of protective film, relieved of sticking or binding, and in working order.

**20.3.3.1.7.** Tops and bottoms of doors sealed.

**20.3.3.1.8.** Floors waxed and polished as specified.

**20.3.3.1.9.** Broken glass replaced and glass cleaned.

**20.3.3.1.10.** Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site.

**20.3.3.1.11.** Work cleaned, free of stains, scratches, and other foreign matter, of damaged and broken material replaced.

**20.3.3.1.12.** Finished and decorative work shall have marks, dirt, and superfluous labels removed.

**20.3.3.1.13.** Final cleanup, as provided herein.

**20.4. Costs of Multiple Inspections**

More than two (2) requests of the District to make a final inspection shall be considered an additional service of District, Architect, Construction Manager, and/or Project Inspector, and all subsequent costs will be invoiced to Contractor and if funds are available, withheld from remaining payments.

**20.5. Partial Occupancy or Use Prior to Completion**

**20.5.1.** District's Rights to Occupancy. The District may occupy or use any completed or partially completed portion of the Work at any stage. Neither the District's Final Acceptance, the making of Final Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by District shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and workmanship incorporated therein. The District and the Contractor shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents. Any dispute as to responsibilities shall be resolved pursuant to the Claims and Disputes provisions herein, with the added provision that during the dispute process, the District shall have the right to occupy or use any portion of the Work that it needs or desires to use.

**20.5.2.** Inspection Prior to Occupancy or Use. Immediately prior to partial occupancy or use, the District, the Contractor, and the Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**20.5.3.** No Waiver. Unless otherwise agreed upon, partial or entire occupancy or use of a portion or portions of the Work shall not constitute beneficial occupancy or acceptance of the Work not complying with the requirements of the Contract Documents.

## 21. FINAL PAYMENT AND RETENTION

### 21.1. Final Payment

**21.1.1.** Upon receipt and approval of a valid and final Application for Payment, the Architect will issue a final Certificate of Payment or similar document indicating Architect's agreement that the Project has reached Completion. The District shall thereupon jointly inspect the Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work has not reached Completion to the satisfaction of the District.

**21.1.2.** Upon acceptance of the Work of the Contractor as having reached Completion to the satisfaction of the District (that, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the District may record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of final payment from the District, pay all the amount(s) due to its Subcontractors.

### 21.2. Prerequisites for Final Payment

The following conditions must be fulfilled prior to Final Payment:

**21.2.1.** A full and final waiver or release of all stop notices and stop payment notices in connection with the Work shall be submitted by Contractor, including a release of stop notice or stop payment notice in recordable form, together with (to the extent permitted by law) a copy of the full and final release of all stop notice or stop payment notice rights.

**21.2.2.** A duly completed and executed conditional waiver and release upon final payment compliant with Civil Code section 8136 from each subcontractor of any tier and supplier to be paid from the current progress payment;

**21.2.3.** A duly completed and executed unconditional waiver and release upon final payment compliant with Civil Code section 8138 from each subcontractor of any tier and supplier that was paid from the previous progress payment; and

**21.2.4.** Contractor shall have made all corrections to the Work that are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of District required under the Contract Documents.

**21.2.5.** Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, and bonds required by the Contract Documents for its portion of the Work.

**21.2.6.** Contractor must have completed all requirements set forth under "Closeout Procedures," including, without limitation, submission of an approved set of complete Record Drawings.

**21.2.7.** Architect shall have issued its written approval that final payment can be made.

**21.2.8.** Contractor shall have delivered to the District all manuals and materials required by the Contract Documents.

**21.2.9.** Contractor shall have completed final clean up as provided herein.

**21.3. Retention**

**21.3.1.** The retention, less any amounts disputed by the District or that the District has the right to withhold pursuant to provisions herein, shall be paid:

**21.3.1.1.** After approval of the District by the Architect's Certificate of Payment;

**21.3.1.2.** After the satisfaction of the conditions set forth herein;

**21.3.1.3.** Within sixty (60) days after Completion;

**21.3.1.4.** No earlier than thirty-five (35) days of the recording of the Notice of Completion by District, if a Notice of Completion is recorded by the District.

**21.3.2.** No interest shall be paid on any retention, or on any amounts withheld due to a failure of the Contractor to perform, in accordance with the terms and conditions of the Contract Documents, except as provided to the contrary in any Escrow Agreement between the District and the Contractor pursuant to Public Contract Code section 22300.

**21.4. Substitution of Securities**

The District will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300.

**21.5. Claims Asserted After Final Payment**

Any lien, stop payment notice or other claim filed or asserted after the Contractor's acceptance of the Final Payment by any Subcontractor, of any tier, laborer, Material Supplier or others in connection with or for Work performed under the Contract Documents shall be the sole and exclusive responsibility of the Contractor pursuant to the indemnification obligations of the Contract Documents. In the event any lien, stop payment notice or other claim of any Subcontractor, Laborer, Material Supplier or others performing Work under the Contract Documents remain unsatisfied after Final Payment is made, Contractor shall refund to District all monies that the District may pay or be compelled to pay in discharging any lien, stop payment notice or other claim, including, without limitation all costs and reasonable attorneys' fees incurred by District in connection therewith.

**22. UNCOVERING WORK, CORRECTION OF WORK AND RIGHT TO TAKEOVER WORK**

**22.1. Uncovering of Work**

If a portion of the Work is covered without Project Inspector or Architect approval or not in compliance with the Contract Documents, it must, if required in writing by the District, the Project Inspector, or the Architect, be uncovered for the Project Inspector's or the Architect's observation and be replaced at the Contractor's expense without change in the Contract Price or Contract Time.

**22.2. Rejection of Work**

Prior to the District's Acceptance of the Work, any Work or materials or equipment forming a part of the

Work or incorporated into the Work that is defective or not in conformity with the Contract Documents may be rejected by the District, the Architect or the Project Inspector and the Contractor shall correct all rejected Work without any adjustment to the Contract Price or the Contract Time, even if the Work, materials or equipment have been previously inspected by the Architect or the Project Inspector or even if they failed to observe the defective or non-conforming Work, materials or equipment.

**22.3. Nonconforming Work**

**22.3.1.** Contractor shall promptly remove from Premises all Work identified by District as failing to conform to the Contract Documents whether incorporated or not. Contractor shall promptly replace and re-execute its own Work to comply with the Contract Documents without additional expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by any removal or replacement pursuant hereto and/or any delays to the District or other Contractors caused thereby.

**22.3.2.** If Contractor does not remove Work that District has identified as failing to conform to the Contract Documents within a reasonable time, not to exceed **FORTY-EIGHT (48)** hours, District may remove it and may store any material at Contractor's expense. If Contractor does not pay expense(s) of that removal within ten (10) days' time thereafter, District may, upon ten (10) days' written notice, sell any material at auction or at private sale and shall deduct all costs and expenses incurred by the District and/or District may withhold those amounts from payment(s) to Contractor.

**22.4. Correction of Work**

**22.4.1.** Correction of Rejected Work. Pursuant to the notice provisions herein, the Contractor shall promptly correct the Work rejected by the District, the Architect, or the Project Inspector as failing to conform to the requirements of the Contract Documents, whether observed before or after Completion and whether or not fabricated, installed, or completed. The Contractor shall bear costs of correcting the rejected Work, including additional testing, inspections, and compensation for the Inspector's or the Architect's services and expenses made necessary thereby.

**22.4.2.** One-Year Warranty Corrections. If, within one (1) year after the date of Completion of the Work or a designated portion thereof, or after the date for commencement of warranties established hereunder, or by the terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the District to do so. This period of one (1) year shall be extended with respect to portions of the Work first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation hereunder shall survive acceptance of the Work under the Contract and termination of the Contract. The District shall give such notice promptly after discovery of the condition.

**22.5. District's Right to Takeover Work**

**22.5.1.** If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this Contract, the District, after **FORTY-EIGHT (48)** hours written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

**22.5.2.** If it is found at any time, before or after Completion of the Work, that Contractor has varied from the Drawings and/or Specifications, including, but not limited to, variation in material, quality, form, or finish, or in the amount or value of the materials and labor used, District may require at its option:

**22.5.2.1.** That all such improper Work be removed, remade or replaced, and all work disturbed by

these changes be made good by Contractor at no additional cost to the District;

**22.5.2.2.** That the District deduct from any amount due Contractor the sum of money equivalent to the difference in value between the work performed and that called for by the Drawings and Specifications; or

**22.5.2.3.** That the District exercise any other remedy it may have at law or under the Contract Documents, including but not limited to the District hiring its own forces or another contractor to replace the Contractor's nonconforming Work, in which case the District shall either issue a deductive Change Order, a Unilateral Change Order, or invoice the Contractor for the cost of that work. Contractor shall pay any invoices within thirty (30) days of receipt of same or District may withhold those amounts from payment(s) to Contractor.

**22.5.3. Acceptance of Defective or Non-Conforming Work.** The District may, in its sole and exclusive discretion, elect to accept Work that is defective or that is not in accordance with the requirements of the Contract Documents, instead of requiring its removal and correction, in which case the Contract Price shall be reduced as appropriate and equitable.

## 23. TERMINATION AND SUSPENSION

### 23.1. District's Right to Terminate Contractor for Cause

**23.1.1.** Grounds for Termination. The District, in its sole discretion, may terminate the Contract and/or terminate the Contractor's right to perform the work of the Contract based upon the following:

**23.1.1.1.** Contractor refuses or fails to execute the Work or any separable part thereof with sufficient diligence as will ensure its completion within the time specified or any extension thereof, or

**23.1.1.2.** Contractor fails to complete said Work within the time specified or any extension thereof, or

**23.1.1.3.** Contractor persistently fails or refused to perform Work or provide material of sufficient quality as to be in compliance with Contract Documents; or

**23.1.1.4.** Contractor files a petition for relief as a debtor, or a petition is filed against the Contractor without its consent, and the petition not dismissed within sixty (60) days; or

**23.1.1.5.** Contractor makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency; or

**23.1.1.6.** Contractor persistently or repeatedly refuses fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials to complete the Work in the time specified; or

**23.1.1.7.** Contractor fails to make prompt payment to Subcontractors, or for material, or for labor; or

**23.1.1.8.** Contractor persistently disregards laws, or ordinances, or instructions of District; or

**23.1.1.9.** Contractor fails to supply labor, including that of Subcontractors, that can work in harmony with all other elements of labor employed or to be employed on the Work; or

**23.1.1.10.** Contractor or its Subcontractor(s) is/are otherwise in breach, default, or in substantial

violation of any provision of this Contract.

**23.1.2.** Notification of Termination

**23.1.2.1.** Upon the occurrence at District's sole determination of any of the above conditions, District may, without prejudice to any other right or remedy, serve written notice upon Contractor and its Surety of District's termination of this Contract and/or the Contractor's right to perform the work of the Contract. This notice will contain the reasons for termination. Unless, within three (3) days after the service of the notice, any and all condition(s) shall cease, and any and all violation(s) shall cease, or arrangement satisfactory to District for the correction of the condition(s) and/or violation(s) be made, this Contract and/or the Contractor's right to perform the Work shall cease and terminate. Upon termination, Contractor shall not be entitled to receive any further payment until the entire Work is finished.

**23.1.2.2.** Upon termination, District may immediately serve written notice of tender upon Surety whereby Surety shall have the right to takeover and perform this Contract only if Surety:

**23.1.2.2.1.** Within three (3) days after service upon it of the notice of tender, gives District written notice of Surety's intention to takeover and perform this Contract; and

**23.1.2.2.2.** Commences performance of the Contract within seven (7) days from date of serving of its notice to District.

**23.1.2.3.** If Surety fails to notify District or begin performance as indicated herein, District may takeover the Work and execute the Work to completion by any method it may deem advisable at the expense of Contractor and/or its Surety. Contractor and/or its Surety shall be liable to District for any excess cost or other damages the District incurs thereby. Time is of the essence in the Contract. If the District takes over the Work as herein provided, District may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plan, and other property belonging to Contractor as may be on the Site of the Work, in bonded storage, or previously paid for.

**23.1.2.4.** **Conversion to Termination for Convenience.** In the event the Contract is terminated under this "District's Right to Terminate Contractor for Cause" section and it is finally determined by an arbitrator, court, jury or other tribunal having jurisdiction, for any reason, that the Contractor was not in default under the provisions hereof or that the District's exercise of its rights under this section was defective, deficient, ineffective, invalid or improper for any reason, the termination shall be deemed a termination for convenience of the District under the "Termination of Contractor for Convenience" section herein and thereupon, the rights and obligations of the District and the Contractor shall be determined in accordance with the "Termination of Contractor for Convenience" section herein.

**23.1.3.** Effect of Termination

**23.1.3.1.** Contractor shall, only if ordered to do so by the District, immediately remove from the Site all or any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. District retains the right, but not the obligation, to keep and use any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. Contractor and its Surety shall be liable upon the performance bond for all damages caused the District by reason of the Contractor's failure to complete the Contract.

**23.1.3.2.** In the event that the District shall perform any portion of, or the whole of the Work, pursuant to the provisions of the General Conditions, the District shall not be liable nor account to

the Contractor in any way for the time within which, or the manner in which, the Work is performed by the District or for any changes the District may make in the Work or for the money expended by the District in satisfying claims and/or suits and/or other obligations in connection with the Work.

**23.1.3.3.** In the event that the Contract is terminated for any reason, no allowances or compensation will be granted for the loss of any anticipated profit by the Contractor or any impact or impairment of Contractor's bonding capacity.

**23.1.3.4.** If the expense to the District to finish the Work exceeds the unpaid Contract Price, Contractor and Surety shall pay difference to District within twenty-one (21) days of District's request.

**23.1.3.5.** **Assignment and Assumption of Subcontracts**. District shall have the right (but shall have no obligation) to assume and/or assign to a general contractor or construction manager or other third party who is qualified and has sufficient resources to complete the Work, the rights of the Contractor under its subcontracts with any or all Subcontractors. In the event of an assumption or assignment by the District, no Subcontractor shall have any claim against the District or third party for Work performed by Subcontractor or other matters arising prior to termination of the Contract. The District or any third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after assumption or assignment. Should the District so elect, the Contractor shall execute and deliver all documents and take all steps, including the legal assignment of its contractual rights, as the District may require, for the purpose of fully vesting in the District the rights and benefits of it Subcontractor under Subcontracts or other obligations or commitments. All payments due the Contractor hereunder shall be subject to a right of offset by the District for expenses and damages suffered by the District as a result of any default, acts, or omissions of the Contractor. Contractor must include this assignment provision in all of its contracts with its Subcontractors.

**23.1.3.6.** The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to District.

**23.2. Emergency Termination of Public Contracts Act of 1949**

**23.2.1.** The Contract is subject to termination as provided by sections 4410 and 4411 of the Government Code of the State of California, being a portion of the Emergency Termination of Public Contracts Act of 1949.

**23.2.1.1.** Section 4410 of the Government Code states:

> In the event a national emergency occurs, and public work, being performed by contract, is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor, as the result of an order or a proclamation of the President of the United States, or of an order of any federal authority, and the circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work, then the public agency and the contractor may, by written agreement, terminate said contract.

**23.2.1.2.** Section 4411 of the Government Code states:

> Such an agreement shall include the terms and conditions of the termination of the contract and provision for the payment of compensation or money, if any, which either party shall pay to the other or any other person, under the facts and circumstances in the case.

**23.2.2.** Compensation to the Contractor shall be determined at the sole discretion of District on the basis of the reasonable value of the Work done, including preparatory work. As an exception to the foregoing

and at the District's discretion, in the case of any fully completed separate item or portion of the Work for which there is a separate previously submitted unit price or item on the accepted Schedule of Values, that price shall control. District, in its sole discretion, may adopt the Contract Price as the reasonable value of the Work performed or any portion thereof.

**23.3. Termination of Contractor for Convenience**

**23.3.1.** District in its sole discretion may terminate the Contract upon three (3) days written notice to the Contractor. Under a termination for convenience, the District retains the right to all the options available to the District if there is a termination for cause. In case of a termination for convenience, Contractor shall have no claims against the District except:

**23.3.1.1.** The actual cost for labor, materials, and services performed that is unpaid and can be documented through timesheets, invoices, receipts, or otherwise, and

**23.3.1.2.** Five percent (5%) of the total cost of work performed as of the date of termination, or five percent (5%) of the value of the Work yet to be performed, whichever is less. This five percent (5%) amount shall be full compensation for all Contractor's and its Subcontractor(s)' mobilization and/or demobilization costs and any anticipated loss profits resulting from termination of the Contractor for convenience.

**23.4. Suspension of Work**

**23.4.1.** District may, without cause, order Contractor in writing to suspend, delay or interrupt the Project in whole or in part for such period of time as District may determine. When the District resumes the Project, the Parties will attempt to negotiate an adjustment in the Contract Price for increases or decreases in the cost of performance of the Project caused by suspense, delay or interruption. If the Parties cannot agree on an adjusted Contract Price, the District may terminate the Contract as permitted herein.

**23.4.2.** In the event the District shall order suspension of the Work, an adjustment shall be made to the Contract Price for increases in the direct cost of performance of the Work of the Contract Documents, actually caused by suspension, delay or interruption ordered by the District; provided however that no adjustment of the Contract Price shall be made to the extent: (i) that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible under the Contract Documents; or (ii) that an equitable adjustment is made or denied under another provision of the Contract Documents. The foregoing notwithstanding, any adjustment of the Contract Price shall not include any adjustment to increase the Contractor's overhead, general administrative costs or profit, all of which will remain as reflected in the Schedule of Values submitted by the Contractor pursuant to the Contract Documents. In the event of the District's suspension of the Work, the Contract Time shall be equitably adjusted.

**23.5. Scope Reduction**

In cases of suspension, partial or complete termination, or at the discretion of the District, the District reserves the right to unilaterally approve a deductive Change Order to reduce scope of work or perform work with other forces or its own forces.

**24. CLAIMS RESOLUTION**

**24.1. Exclusive Remedy**.

**24.1.1.** Compliance with the claim resolution process and timelines described in this Claims Resolution section as well as the notice provisions of the Contract are express conditions precedent to Contractor's right to commence litigation or arbitration, file a claim under the California Government Code, or commence any other legal action related to the Project ("Claims Resolution Process").

**24.1.2.** Contractor acknowledges that its failure, for any reason, to provide written notice and all required supporting documentation to permit the District's review and evaluation within the time frame required by this Claims Resolution Process, shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert, request, or demand any entitlement to an adjustment of the Contract Time or the contract Price on account of any instruction, request, drawings, specifications, action, condition, omission, default or other situation.

**24.1.3.** To the extent any provision(s) of this Claims Resolution Process conflict with or otherwise impair the timeframes and procedures of Public Contract Code section 9204, the provisions of Section 9204 shall control. If provisions of this Claims Resolution Process are supplementary and/or in addition to the requirements of Section 9204, but do not conflict with or otherwise impair the timeframes and procedures of Section 9204, the provisions of this Claims Resolution Process and the Contract shall control.

**24.2. Performance during Claim Resolution Process**.

The Contractor shall diligently proceed with Work on the Project at the same time that Claims are addressed under the Claims Resolution Process. It is the intent of District to resolve Claims with the Contractor as close to the events giving rise to the Claims as possible, and to avoid stale or late Claims and the late documenting of Claims. Contractor's failure to diligently proceed in accordance with the District's instructions or the Contract terms will be considered a material breach of the Contract and a waiver of Contractor's rights under this Contract.

**24.3. Waiver.**

If Contractor fails to timely submit any written notices required under the terms of the Contract or in this Claims Resolution section, Contractor waives and releases its rights regarding further review of its Claim, unless Contractor and District mutually agree in writing to other time limits.

**24.4. Intention.**

The Claims Resolution Process required herein is intended to provide a concise mechanism for resolving Claims as they arise during the Project, while requiring accurate documentation related to contested issues as to those Claims that are not contemporaneously resolved.

**24.5. Other Provisions.**

If portions of the Contract, other than this Claims Resolution Process, establish a specific process regarding a specific subject, then that process shall govern and control the resolutions of any disagreements thereunder. Otherwise, the provisions in this Claims Resolution Process shall control the resolution of all Claims.

**24.6. Claim Presentation**

**24.6.1. Claim**: A claim is a written demand by Contractor (or by Contractor on behalf of a Subcontractor) that the Contractor must submit by **registered mail or certified mail return receipt requested** for:

**24.6.1.1.** An extension to the Contract Time, including relief from damages or penalties assessed

by the District for delay;

**24.6.1.2.** Payment of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract and payment that is not otherwise expressly provided for in the Contract Documents or the Contractor is not otherwise entitled; or

**24.6.1.3.** Payment that is disputed by the District.

("**Claim**")

**24.6.2.** A PCO may be a Claim, but the Parties agree that a PCO shall only be a Claim if:

**24.6.2.1.** The District states in writing that it disagrees with the terms of a PCO and directs the Contractor to utilize the Claim Resolution Process, or

**24.6.2.2.** The District rejects in whole or in part a PCO and the Contractor states in writing that it is utilizing the Claim Resolution Process for the portion of the PCO that the District rejected.

**24.6.3. <u>Subcontractors.</u>**

**24.6.3.1.** Public Contract Code section 9204(d)(5) states that the Contractor may present to the District a Claim on behalf of a Subcontractor or lower tier Subcontractor. A Subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier Subcontractor, that the Contractor present a claim for Work which was performed by the Subcontractor or by a lower tier Subcontractor on behalf of the Subcontractor. The Subcontractor requesting that the Claim be presented to the District shall furnish reasonable documentation to support the Claim. Within 45 days of receipt of this written request, the Contractor shall notify the Subcontractor in writing as to whether the Contractor presented the claim to the District and, if the Contractor did not present the Claim, provide the Subcontractor with a statement of the reasons for not having done so.

**24.6.3.2.** Contractor is responsible for providing this Claims Resolution Process to its Subcontractors and for ensuring that all Subcontractors or others who may assert Claims by and through Subcontractors and/or the Contractor are informed of this Claims Resolution Process. No Claim submitted by any party that fails to follow the provisions of this Claims Resolution Process will be considered. Contractor shall indemnify, keep and hold harmless the District and its consultants, against all suits, claims, damages, losses, and expenses, including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, the failure to provide this Claims Resolution Process to its Subcontractors or others who may assert Claims by and through Subcontractors and/or the Contractor.

**24.6.4. Contractor Must Timely Identify, Present and Document Any Claim**

**24.6.4.1.** Every Claim shall be stated with specificity in writing and signed by Contractor under penalty of perjury and presented to the District within ten (10) calendar days from the date Contractor discovers or reasonably should discover, that an act, error or omission of District, its agents or employees, or action, condition or other situation has occurred that may entitle Contractor to make a Claim. This shall include the Contractor's actual or constructive knowledge of any instruction, request, drawings, specifications, action, condition, omission, default or other situation for which the contractor believes there should an adjustment of the Contract Price or Contract Time. Contractor shall provide this writing even if Contractor has not yet been damaged, delayed, or incurred extra cost when Contractor discovers, or reasonably should discover, the act, error, omission, action, condition or situation giving rise to the incidents giving rise to the Claim. The writing shall:

**24.6.4.1.1.** Identify all of the issues, events, conditions, circumstances and/or causes giving rise to the Claim;

**24.6.4.1.2.** Identify all pertinent dates and/or durations and all actual and/or anticipated effects on the Contract Price, milestones and/or Contract Time adjustments; and

**24.6.4.1.3.** Identify in detail line-item costs if the Claim seeks money.

**24.6.4.1.4.** If the Claim involves extra work, a detailed cost breakdown of the amounts the Contractor is seeking, including actual cost records (including without limitation, payroll records, material and rental invoices and the like) demonstrating that those costs have actually been incurred. To the extent costs have not yet been incurred at the time the Claim is submitted, actual cost records must be submitted on a current basis not less than once a week during any periods costs are incurred. A cost record will be considered current if submitted within seven (7) days of the date the cost reflected in the record is incurred. At the request of District, extra costs may be subject to further verification procedures (such as having an inspector verify the performance of alleged extra work on a daily basis).

**24.6.4.1.5.** If the Claim involves an error or omission in the Contract Documents:

**24.6.4.1.5.1.** An affirmative representation under penalty of perjury by Contractor and any affected Subcontractors and suppliers that the error or omission was not discovered prior to submitting a proposal for the Work, and

**24.6.4.1.5.2.** A detailed statement demonstrating that the error or omission reasonably should not have been discovered, by Contractor, its Subcontractors and suppliers, prior to submitting a proposal for the Work.

**24.6.4.1.6.** If the Claim involves a request for additional compensation for escalation of materials costs, then this provision exclusively governs those request(s) by Contractor and the following are **all** conditions precedent to Contractor's submission of a Change Order Request or Claim for additional compensation for escalation of materials costs.

**24.6.4.1.6.1.** Contractor shall not be entitled to submit a request for compensation for escalation of materials unless the actual cost of materials exceeds ten percent (10%) of the **total** material costs on the Project.

**24.6.4.1.6.2.** The cost escalation is the result of unusual and unforeseeable market conditions not reasonably foreseeable at the time of award of the Contract and was not an escalated cost resulting from any action or inaction of the Contractor.

**24.6.4.1.6.3.** Contractor timely ordered and/or purchased the materials at issue.

**24.6.4.1.6.4.** Contractor's material costs were reasonable at the time of Contractor's bid for the Project.

**24.6.4.1.6.5.** Contractor demonstrates an actual increase in the cost of materials in its Contract Price at the time of award of the Contract and/or as reflected in Contractor's escrowed bid documents compared to Contractor's actual material payment cost paid either at time of purchase or delivery, whichever is earlier.

**24.6.4.1.6.6.** An actual year-to-date price increase has occurred and can be substantiated by the E.N.R. 20-City Average Material Cost Index for the material at issue that demonstrates

the claim for an increase in price of the material at the time of delivery of the higher priced material to the Project.

**24.6.4.2.** The writing shall be accompanied by all documents substantiating Contractor's position regarding the Claim.

**24.6.4.3.** A Claim that asserts an effect on any schedule milestones and/or Contract Time shall include all pertinent scheduling data demonstrating the impact(s) on the critical path(s), milestone(s) and/or Contract Time.

**24.6.4.4.** Contractor agrees that it shall not base its damages, its calculations or its Claim on a "total cost" approach, a "modified total cost" approach or a "jury verdict method" approach.

**24.6.5. Certification.** Each copy of the Claim Documentation shall be certified by a responsible officer of the Contractor in accordance with the requirements of the Contract Documents. This certification shall be under penalty of perjury and must include the following language immediately above or before the Contractor's signature: "***I declare under penalty of perjury under the laws of the State of California that the information provided and statements made in this Claim are true and correct, substantiated and of merit***." The Contractor acknowledges that this requirement is not a mere formality but is intended to ensure that the Contractor only submits Claims that it believes are true and correct, substantiated and have merit. Should Contractor fail to submit the foregoing written statement signed under penalty of perjury, Contractor waives and releases its Claim, including all rights and remedies in connection therewith. This certification must include a certification of any portion of the Claim from Subcontractor(s) or others who are asserting Claims by and through Subcontractors and/or the Contractor

**24.6.6. District's Written Statement/Decision on Claim.** The District shall issue a written statement/decision regarding the Claim to the Contractor within forty-five (45) days of receipt of the written Claim from the Contractor, or three (3) days after the District's first regular governing board meeting after that 45-day period if the District's governing board does not meet within that first 45-day period. If the District fails to timely provide a written statement/decision regarding the Claim, the Claim shall be deemed rejected in its entirety.

**24.6.7. Contractor Must Demand an Informal Meet and Confer Conference if Contractor Pursues Any Claim**

**24.6.7.1. FAILURE OF A CONTRACTOR TO TIMELY DEMAND A MEET AND CONFER CONFERENCE IS A WAIVER OF ITS RIGHT TO PURSUE ALL OR A PORTION OF ITS CLAIM.**

**24.6.7.2. Where There Is No Agreement:** If there is no agreement between Contractor and the District on a Claim, then within ten (10) calendar days of the date of the District's written statement/decision in response to a Claim or PCO, if Contractor pursues that Claim, then Contractor must demand, by **registered mail or certified mail return receipt requested,** a meet and confer conference with District staff. A meet and confer conference with District staff shall be a condition precedent to Contractor seeking any further relief, including a mediation as indicated below.

**24.6.7.3. Where There Is Partial Agreement**: If Contractor and the District partially agree on a Claim but do not reach complete agreement, then the Parties shall complete a Change Order, if applicable, for the issues and/or amounts agreed to. For those issues not agreed to, if Contractor pursues those issues from that Claim, then Contractor must demand, by **registered mail or certified mail return receipt requested,** a meet and confer conference with District staff regarding those issues. A meet and confer conference with District staff shall be a condition precedent to Contractor seeking any further relief, including a mediation as indicated below, in connection with the District's rejection.

**24.6.7.4. Meet and Confer Conference.** District and Contractor shall schedule the meet and confer conference as soon as reasonably possible after Contractor's written demand for a meet and confer conference, but in no case later than thirty (30) days after Contractor's demand.

**24.6.7.5. District's Written Decision.** Within ten (10) **business** days of the meet and confer conference, the District shall issue a written decision. If the District fails to timely provide a written statement/decision after the meet and confer conference, all Claim issues that were part of the meet and confer conference shall be deemed rejected in their entirety.

**24.6.7.5.1.** If the District's decision completely resolves the Claim, then the Parties shall complete a Change Order, if applicable, for the issues and/or amounts agreed to.

**24.6.7.5.2.** If the District rejects the Contractor's Claim in whole or in part or does not issue a timely written response, then the parties shall mediate the remaining issues of the Claim.

**24.6.7.5.3.** Contractor's costs incurred in seeking relief for Claims are not recoverable from District.

**24.6.8. Mediation**.

**24.6.8.1.** At the District's sole discretion, this mediation may be a multiple-party mediation with the Architect, the Construction Manager, the Inspector, and/or other District consultants.

**24.6.8.2.** The District and Contractor shall mutually agree to a mediator within ten (10) **business** days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

**24.6.9. Contractor's Obligation to File a Government Code Claim.** Nothing in this Contract, including this Claims Resolution Process, waives, modifies or tolls the Contractor's obligation to present a timely claim under Government Code section 910, et seq. Therefore, in addition to complying with this Claims Resolution Process, the Contractor is required to present claims to the District pursuant to Government Code section 910, et seq. If after the requirements of this Claims Resolution Process are satisfied, and all or a portion of the Claim remains unresolved, and if the Government Code claim is rejected by the District, the Contractor may proceed under the post-mediation provisions of this Claims Resolution Process.

**24.6.10. Post Mediation Provisions**

**24.6.10.1. Claims of $375,000 or Less:** The provisions of Public Contract Code § 20104.4 shall apply. Pursuant to Public Contract Code § 20104.4(a), within sixty (60) days, but no earlier than thirty (30) days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. Pursuant to Public Contract Code § 9204(d)(2)(D), a mediation conducted pursuant to this Claims Resolution Process shall excuse the obligation under Public Contract Code § 20104.4(a) to mediate after litigation has been commenced unless otherwise agreed to by the parties in writing.

**24.6.10.2. Litigation of Claims in Excess of $375,000**. If, after a mediation as indicated above, the Parties have not resolved the Claim, either Party may commence an action in a court of competent jurisdiction to contest that decision within ninety (90) days following the conclusion of that mediation or one (1) year following the accrual of the cause of action, whichever is later. By mutual agreement,

the Parties can agree to instead resolve the Claim through arbitration.

**24.6.11.** The District shall be entitled to remedy any false claims, as defined in California Government Code section 12650 *et seq*., made to the District by the Contractor or any Subcontractor under the standards set forth in Government Code section 12650 *et seq*. Any Contractor or Subcontractor who submits a false claim shall be liable to the District for three times the amount of damages that the District sustains because of the false claim. A Contractor or Subcontractor who submits a false claim shall also be liable to the District for (a) the costs, including attorney fees, of a civil action brought to recover any of those penalties or damages, and (b) a civil penalty of up to $11,000 for each false claim. In addition, Contractor may be subject to criminal prosecution under California Penal Code §72 and/or civil liability under False Claims Act. If so, the District may be entitled to recover its costs incurred to investigate any False Claim, including but not limited to attorneys' fees and expert fees incurred in connection with that investigation.

**24.7. Documentation of Resolution.**

If a Claim is resolved, the District shall determine if that resolution shall be documented in an Agreement and Release of Any and All Claims form or other document, as appropriate.

**24.8. Claim Resolution Process – Non-Applicability**.

The procedures and provisions in this Claims Resolution section shall **not** apply to:

**24.8.1.** District's determination of what Work is or will be constructed, or whether the Work complies with the Contract Documents for purposes of accepting the Work;

**24.8.2.** District's rights and obligations as a public entity, such as, but without limitation, the revocation of pre-qualified or qualified status, barring a contractor from District contracts, the imposition of penalties or forfeitures prescribed by statute or regulation; provided, however, that penalties imposed against a public entity by statutes such as Public Contract Code section 7107, shall be subject to the mandatory dispute resolution provisions of this Claims Resolution section and the Contract;

**24.8.3.** Personal injury, wrongful death or property damage claims;

**24.8.4.** Latent defect or breach of warranty or guarantee to repair;

**24.8.5.** Stop notices or stop payment notices; or

**24.8.6.** Any other District rights as set forth herein.

**24.9.** The District's failure to respond to a Claim from the Contractor within the time periods described herein or to otherwise meet the time requirements of Public Contract Code section 9204 shall automatically result in the Claim being deemed rejected in its entirety, with no admission by the District as to the merits of the Claim.

**24.10.** If District fails to timely issue payment for any Claim or portion of a Claim as required pursuant to these Claim Resolution Procedures, the Contractor is permitted to assess interest indicated in Public Contract Code section 9204. Notwithstanding this provision, and in accordance with Public Contract Code section 7107, the District is entitled to withhold up to 150% of disputed amounts and the District shall not be liable for payment of interest on such disputed amounts pending final adjudication of such disputes.

**25. LABOR, WAGE & HOUR, APPRENTICE AND RELATED PROVISIONS**

**25.1. Contractor & Subcontractor Registration**

**25.1.1.** Contractor shall comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including furnishing its CPRs to the Labor Commissioner of California and complying with any applicable enforcement by the Department of Industrial Relations. Labor Code section 1771.1(a) states the following:

> "A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded."

**25.1.2.** Contractor acknowledges that, for purposes of Labor Code section 1725.5, all or some of the Work is a public work to which Labor Code section 1771 applies. Contractor shall comply with Labor Code section 1725.5, including without limitation the registration requirements. Additionally, all Contractor's Subcontractors shall comply with Labor Code section 1725.5 to be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of the Contract. Contractor represents that all of its Subcontractors are registered pursuant to Labor Code section 1725.5.

**25.1.3.** The Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractor shall post job site notices, as prescribed by regulation. Contractor shall comply with all requirements of Labor Code section 1771.4, except the requirements that are exempted by the Labor Commissioner for the Project.

**25.2. Wage Rates, Travel and Subsistence**

**25.2.1.** Pursuant to the provisions of article 2 (commencing at section 1770), chapter 1, part 7, division 2, of the Labor Code of California, the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification, or type of worker needed to execute this Contract are on file at the District's principal office and copies will be made available to any interested party on request and are available to any interested party on request or at **www.dir.ca.gov/oprl/statistics_and_databases.html**.. Contractor shall obtain and post a copy of these wage rates at the job site.

**25.2.2.** Holiday and overtime work, when permitted by law, shall be paid for at a rate of at least one and one-half times the above specified rate of per diem wages, unless otherwise specified. The holidays upon which those rates shall be paid need not be specified by the District, but shall be all holidays recognized in the applicable collective bargaining agreement. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code.

**25.2.3.** Contractor shall pay and shall cause to be paid each worker engaged in Work on the Project not less than the general prevailing rate of per diem wages determined by the Director of the Department of Industrial Relations ("DIR") ("Director"), regardless of any contractual relationship which may be alleged to exist between Contractor or any Subcontractor and such workers.

**25.2.4.** If during the period this bid is required to remain open, the Director determines that there has been a change in any prevailing rate of per diem wages in the locality in which the Work under the

Contract is to be performed, such change shall not alter the wage rates in the Invitation to Bid or the Contract subsequently awarded.

**25.2.5.** Pursuant to Labor Code section 1775, Contractor shall, as a penalty to District, forfeit the statutory amount, (currently not to exceed two hundred dollars ($200) for each calendar day, or portion thereof), for each worker paid less than the prevailing rates, as determined by the District and/or the Director, for the work or craft in which that worker is employed for any public work done under Contract by Contractor or by any Subcontractor under it.

**25.2.5.1.** The amount of the penalty shall not be less than forty dollars ($40) for each calendar day, or portion thereof, unless the failure of Contractor was a good faith mistake and, if so, the error was promptly and voluntarily corrected when brought to the attention of Contractor.

**25.2.5.2.** The amount of the penalty shall not be less than eighty dollars ($80) for each calendar day or portion thereof, if Contractor has been assessed penalties within the previous three (3) years for failing to meet Contractor's prevailing wage obligations on a separate contract, unless those penalties were subsequently withdrawn or overturned.

**25.2.5.3.** The amount of the penalty may not be less than one hundred twenty dollars ($120) for each calendar day, or portion thereof, if the Labor Commissioner determines the Contractor willfully violated Labor Code section 1775.

**25.2.5.4.** The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate, shall be paid to each worker by Contractor.

**25.2.6.** Any worker employed to perform Work on the Project, which Work is not covered by any classification listed in the general prevailing wage rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to Work to be performed by him, and such minimum wage rate shall be retroactive to time of initial employment of such person in such classification.

**25.2.7.** Pursuant to Labor Code section 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, subsistence pay, and apprenticeship or other training programs authorized by section 3093, and similar purposes.

**25.2.8.** Contractor shall post at appropriate conspicuous points on the Site of Project, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned. In addition, Contractor shall post a sign-in log for all workers and visitors to the Site, a list of all subcontractors of any tier on the Site, and the required Equal Employment Opportunity poster(s).

**25.3. Hours of Work**

**25.3.1.** As provided in article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code, eight (8) hours of labor shall constitute a legal days work. The time of service of any worker employed at any time by Contractor or by any Subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract shall be limited and restricted by Contractor to eight (8) hours per day, and forty (40) hours during any one week, except as hereinafter provided. Notwithstanding the provisions hereinabove set forth, Work performed by employees of Contractor in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.

**25.3.2.** Contractor shall keep and shall cause each Subcontractor to keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by Contractor in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable hours to the inspection of District and to the Division of Labor Standards Enforcement of the DIR.

**25.3.3.** Pursuant to Labor Code section 1813, Contractor shall as a penalty to the District forfeit the statutory amount (believed by the District to be currently twenty five dollars ($25)) for each worker employed in the execution of this Contract by Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of the provisions of article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code.

**25.3.4.** Any Work necessary to be performed after regular working hours, or on Sundays or other holidays shall be performed without additional expense to the District.

**25.4. Payroll Records**

**25.4.1.** If requested by the District, Contractor shall provide to the District and shall cause each Subcontractor performing any portion of the Work to provide the District and an accurate and certified payroll record ("CPR(s)"), showing the name, address, social security number, work classification, straight time, and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work.

**25.4.1.1.** In addition to any other requirements pursuant to Labor Code sections 1770, et seq., the CPRs enumerated hereunder shall be certified and shall be provided to the District on a weekly basis. The CPRs from the Contractor and each Subcontractor for each week shall be provided on or before Wednesday of the week following the week covered by the CPRs. District shall not make any payment to Contractor until:

**25.4.1.1.1.** Contractor and/or its Subcontractor(s) provide CPRs acceptable to the District, and

**25.4.1.1.2.** The District is given sufficient time to review and/or audit the CPRs to determine their acceptability. Any delay in Contractor and/or its Subcontractor(s) providing CPRs to the District in a timely manner will directly delay the District's review and/or audit of the CPRs and Contractor's payment.

**25.4.2.** All CPRs shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

**25.4.2.1.** A certified copy of an employee's CPR shall be made available for inspection or furnished to the employee or his/her authorized representative on request.

**25.4.2.2.** CPRs shall be made available for inspection or furnished upon request to a representative of District, Division of Labor Standards Enforcement, Division of Apprenticeship Standards, and/or the Department of Industrial Relations.

**25.4.2.3.** CPRs shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the District, Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested CPRs have not been provided pursuant to the provisions herein, the requesting party shall,

prior to being provided the records reimburse the costs of preparation by Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of Contractor.

**25.4.3.** The form of certification for the CPRs shall be as follows:

I, _____ (Name-Print), the undersigned, am the _____ _____ (Position in business) with the authority to act for and on behalf of _____ _____ (Name of business and/or Contractor), certify under penalty of perjury that the records or copies thereof submitted and consisting of _____ (Description, number of pages) are the originals or true, full, and correct copies of the originals which depict the payroll record(s) of actual disbursements by way of cash, check, or whatever form to the individual or individual named, and (b) we have complied with the requirements of sections 1771, 1811, and 1815 of the Labor Code for any work performed by our employees on the Project.

Date: _____ Signature: _____
(Section 16401 of Title 8 of the California Code of Regulations)

**25.4.4.** Each Contractor shall file a certified copy of the CPRs with the entity that requested the records within ten (10) days after receipt of a written request.

**25.4.5.** Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by District, Division of Apprenticeship Standards, or Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor awarded Contract or performing Contract shall not be marked or obliterated.

**25.4.6.** Contractor shall inform District of the location of the records enumerated hereunder, including the street address, city, and county, and shall, within five (5) Business Days, provide a notice of change of location and address.

**25.4.7.** In the event of noncompliance with the requirements of this section, Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying in what respects Contractor must comply with this section. Should noncompliance still be evident after the ten (10) day period, Contractor shall, as a penalty to District, forfeit one hundred dollars ($100) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of Division of Apprenticeship Standards or Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

**25.4.8.** It shall be the responsibility of Contractor to ensure compliance with the provisions of Labor Code section 1776.

**25.5. Apprentices**

**25.5.1.** Contractor acknowledges and agrees that, if this Contract involves a dollar amount greater than or a number of working days greater than that specified in Labor Code section 1777.5, then this Contract is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of Contractor to ensure compliance with this Article and with Labor Code section 1777.5 for all apprenticeship occupations.

**25.5.2.** Apprentices of any crafts or trades may be employed and, when required by Labor Code section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of

the Labor Code.

**25.5.3.** Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he/she is employed, and shall be employed only at the work of the craft or trade to which she/he is registered.

**25.5.4.** Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprentice agreements under chapter 4 (commencing at section 3070), division 3, of the Labor Code, are eligible to be employed. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he/she is training.

**25.5.5.** Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractors employing workers in any apprenticeable craft or trade in performing any Work under this Contract shall apply to the applicable joint apprenticeship committee for a certificate approving the Contractor or Subcontractor under the applicable apprenticeship standards and fixing the ratio of apprentices to journeymen employed in performing the Work.

**25.5.6.** Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractor may be required to make contributions to the apprenticeship program.

**25.5.7.** If Contractor or Subcontractor willfully fails to comply with Labor Code section 1777.5, then, upon a determination of noncompliance by the Administrator of Apprenticeship, it shall:

**25.5.7.1.** Be denied the right to bid on any subsequent project for one (1) year from the date of such determination;

**25.5.7.2.** Forfeit as a penalty to District the full amount as stated in Labor Code section 1777.7. Interpretation and enforcement of these provisions shall be in accordance with the rules and procedures of the California Apprenticeship Council and under the authority of the Chief of the Division of Apprenticeship Standards.

**25.5.8.** Contractor and all Subcontractors shall comply with Labor Code section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

**25.5.9.** Contractor shall become fully acquainted with the law regarding apprentices prior to commencement of the Work. Special attention is directed to sections 1777.5, 1777.6, and 1777.7 of the Labor Code, and title 8, California Code of Regulations, section 200 et seq. Questions may be directed to the State Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California 94102.

**25.5.10.** Contractor shall ensure compliance with all certification requirements for all workers on the Project including, without limitation, the requirements for electrician certification in Labor Code sections 108, et seq.

**25.6. Non-Discrimination**

**25.6.1.** Contractor herein agrees not to discriminate in its recruiting, hiring, promotion, demotion, or termination practices on the basis of race, religious creed, national origin, ancestry, sex, age, or physical handicap in the performance of this Contract and to comply with the provisions of the California Fair Employment and Housing Act as set forth in part 2.8 of division 3 of the California Government Code, commencing at section 12900; the Federal Civil Rights Act of 1964, as set forth in Public Law 88-352, and all amendments thereto; Executive Order 11246, and all administrative rules and regulations found to be applicable to Contractor and Subcontractor.

**25.6.2.** Special requirements for Federally Assisted Construction Contracts: During the performance of this Contract, Contractor agrees to incorporate in all subcontracts the provisions set forth in Chapter 60-1.4(b) of Title 41 published in Volume 33 No. 104 of the Federal Register dated May 28, 1968.

### 25.7. Labor First Aid

Contractor shall maintain emergency first aid treatment for Contractor's workers on the Project which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.) the California Occupational Safety and Health Act of 1973, and all related regulations, including without limitation section 330 et seq. of Title 8 of the California Code of Regulations.

## 26. MISCELLANEOUS

### 26.1. Assignment of Antitrust Actions

**26.1.1.** Section 7103.5(b) of the Public Contract Code states:

> In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commending with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

**26.1.2.** Section 4552 of the Government Code states:

> In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

**26.1.3.** Section 4553 of the Government Code states:

> If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

**26.1.4.** Section 4554 of the Government Code states:

> Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under this part if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action.

**26.1.5.** Under this Article, "public purchasing body" is District and "bidder" is Contractor.

**26.2. Excise Taxes**

If, under Federal Excise Tax Law, any transaction hereunder constitutes a sale on which a Federal Excise Tax is imposed and the sale is exempt from such Federal Excise Tax because it is a sale to a State or Local Government for its exclusive use, District, upon request, will execute documents necessary to show (1) that District is a political subdivision of the State for the purposes of such exemption, and (2) that the sale is for the exclusive use of District. No Federal Excise Tax for such materials shall be included in any Contract Price.

**26.3. Taxes**

Contract Price is to include any and all applicable sales taxes or other taxes that may be due in accordance with section 7051 of the Revenue and Taxation Code; Regulation 1521 of the State Board of Equalization or any other tax code that may be applicable.

**26.4. Shipments**

All shipments must be F.O.B. destination to Site or sites, as indicated in the Contract Documents. There must be no charge for containers, packing, unpacking, drayage, or insurance. The total Contract Price shall be all inclusive (including sales tax) and no additional costs of any type will be considered.

**26.5. Compliance with Government Reporting Requirements**

If this Contract is subject to federal or other governmental reporting requirements because of federal or other governmental financing in whole or in part for the Project which it is part, or for any other reason, Contactor shall comply with those reporting requirements at the request of the District at no additional cost.

**End of Section**

Section 00 71 00

# SPECIAL CONDITIONS

1. **Prequalification N/A**

   All bidders are required to have been prequalified by the District. In addition, if the Project has electrical, mechanical, or plumbing components that will be performed by subcontractors performing under the following license classification(s), then each of those subcontractors that intend to bid as a first-tier subcontractor to a general contractor (prime contractor) are required to have been prequalified by the District: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46. The following Subcontractors have been prequalified by the District:

2. **Mitigation Measures**

   Contractor shall comply will all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act. (Public Resources Code section 21000 et. seq.)

3. **Modernization Projects**

   a. **Access**. Access to the school buildings and entry to buildings, classrooms, restrooms, mechanical rooms, electrical rooms, or other rooms, for construction purposes, must be coordinated with District and onsite District personnel before Contractor commences Work. Unless agreed to otherwise in writing, only a school custodian will be allowed to unlock and lock doors in existing building(s). The custodian will be available only while school is in session. If a custodian is required to arrive before 7:00 a.m. or leave after 3:30 p.m. to accommodate Contractor's Work, the overtime wages for the custodian will be paid by Contractor, unless, at the discretion of District, other arrangements are made in advance.

   b. **Master Key**. Upon request, District may, at its own discretion, provide a master key to the school site for the convenience of Contractor. Contractor agrees to pay all expenses to re-key the entire school site and all other affected District buildings if the master key is lost or stolen or if any unauthorized party obtains a copy of the key or access to the school.

   c. **Maintaining Services**. Contractor is advised that Work is to be performed in spaces regularly scheduled for instruction. Interruption and/or periods of shutdown of public access, electrical service, water service, lighting, or other utilities shall be only as arranged in advance with District. Contractor shall provide temporary services to all facilities interrupted by Contractor's Work.

   d. **Maintaining Utilities**. Contractor shall maintain in operation during term of Contract, drainage lines, storm drains, sewers, water, gas, electrical, steam, and other utility service lines within working area.

   e. **Work During Instructional Time**. By submitting its bid, Contractor affirms that Work may be performed during ongoing instruction in existing facilities. If so, Contractor agrees to cooperate to the best of its ability to minimize any disruption to the school up to, and including, rescheduling specific work activities, at no additional cost to District.

   f. **No Work During Student Testing**. Contractor shall, at no additional cost to District and at District's request, coordinate its Work to not disturb District students including, without limitation, not performing any Work when students at the Site are taking State-required tests.

4. **Badge Policy for Contractors**

Contractor shall provide their workers and all of Subcontractors' workers with identification badges. These badges shall be worn by all members of the Contractor's staff and all of Subcontractors' staff who are working in a District facility.

a. Badges must be filled out in full and contain the following information:

(1) Name of Contractor

(2) Name of Employee

(3) Contractor's address and phone number

b. Badges must be worn when Contractor or his/her employees are on site and must be visible at all times. Contractors must inform their employees that they are required to allow District employees, the Architect, the Construction Manager, the Program Manager, or the Project Inspector to review the information on the badges upon request.

c. Failure to display identification badges as required by this policy may result in the assessment of fines against the Contractor.

5. **Fingerprinting**

Contractor shall comply with the provisions of Education Code section 45125.2 regarding the submission of employee fingerprints to the California Department of Justice and the completion of criminal background investigations of its employees, its subcontractor(s), and its subcontractors' employees. Contractor shall not permit any employee to have any contact with District pupils until such time as Contractor has verified in writing to the governing board of the District, that such employee has not been convicted of a felony, as defined in Education Code section 45122.1. Contractor shall fully complete and perform all tasks required pursuant to the Criminal Background Investigation/ Fingerprinting Certification.

6. **Weather Days**

Delays due to Adverse Weather conditions will only be permitted in compliance with the provisions in the General Conditions and only if the number of days of Adverse Weather exceeds the following parameters:

| | | | |
|---|---|---|---|
| January | **[11]** | July | **[0]** |
| February | **[10]** | August | **[0]** |
| March | **[10]** | September | **[1]** |
| April | **[6]** | October | **[4]** |
| May | **[3]** | November | **[7]** |
| June | **[1]** | December | **[10]** |

7. **Insurance Policy Limits**. Contractor's insurance shall be with insurance companies with an A.M. Best rating of no less than A-. The limits of insurance shall not be less than:

| | | |
|---|---|---|
| **Commercial General Liability** | Includes: Personal & Advertising Injury, Product Liability and Completed | $2,000,000 each occurrence; $4,000,000 general aggregate |

| | | |
|---|---|---|
| | Operations | |
| **Automobile Liability – Any Auto** | Combined Single Limit | $2,000,000 per occurrence |
| **Excess Liability (Umbrella)** | | $6,000,000 per occurrence; $6,000,000 aggregate |
| **Workers Compensation** | | Statutory limits pursuant to State law |
| **Employers' Liability** | | $2,000, 000 each accident, each disease; $2,000,000 policy limit |
| **Builder's Risk (Course of Construction)** | | Issued for the value and scope of Work indicated herein. |
| **Property of Others** | Combined Single Limit General Aggregate | Issued for the value and scope of Work stored off-site. |

8. **Contractor's Risk Insurance: Contractor's Risk "All Risk" Insurance.**

   a. Contractor shall procure and maintain, during the life of the Project, Contractor's Builders Risk (Course of Construction), or similar first party property coverage acceptable to the District, issued on a replacement cost value basis. The cost shall be consistent with the total replacement cost of all insurable Work of the Project included within the Contract Documents.

   b. Coverage is to insure against all risks of accidental physical loss and shall include without limitation the perils of vandalism and/or malicious mischief (both without any limitation regarding vacancy or occupancy), sprinkler leakage, civil authority, sonic disturbance, collapse, wind, fire, lightning, and smoke. Coverage shall include debris removal, demolition, increased costs due to enforcement of all applicable ordinances and/or laws in the repair and replacement of damaged and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project, including completed Work and Work in progress, to the full insurable value thereof.

   c. **Earthquake and Flood Coverage.** The District may require the Contractor to include coverage for "earthquake(s)" and/or "flood" and Contractor shall provide the price for those additional coverages for the District's consideration prior to including or charging the District for those coverages.

   d. The deductible for this insurance shall be paid by Contractor.

9. **Computerized Job Cost Reporting System.**

   a. **Job Cost Reporting.** The Contractor and each Subcontractor with a Subcontract valued at Three Hundred Thousand Dollars ($300,000) or greater shall maintain a computerized job cost reporting system conforming to the requirements set forth herein. The computer program(s) utilized by the Contractor and applicable Subcontractors shall be subject to the review and acceptance by the District. The job cost reporting systems for the Work shall be updated in regular intervals of not more than one (1) calendar month.

   b. **Job Cost Reporting System Requirements.** The computerized job cost programs utilized by the Contractor and applicable Subcontractors shall conform and comply with generally accepted accounting principles applied in a consistent manner and with recognized and generally accepted construction industry accounting standards, guidelines and procedures. The job cost reporting system format and configuration shall follow the general format of the District approved Cost Breakdown (Schedule of Values) and budgets established for each line item shall be traceable to a bid estimate of costs. The job cost reporting systems

utilized by the Contractor and applicable Subcontractors shall be capable of: (a) providing overall cost status on a monthly and cumulative basis; (b) providing comparative analysis of the original budgeted costs, actual costs, remaining budget, and projected cost of completion; the job cost reporting system shall be capable of providing comparative analysis for individual line items and the totality of the Work reflected in the job cost report and; (c) tracking adjustments to original budget amounts for Changes to the Work (including, without limitation, issued, pending and potential Change Orders).

**c. Job Cost System Information.** Upon request of the District, the Contractor and applicable Subcontractors shall make available written job cost reports and provide the District and the Project Manager with the electronic files of the then current or requested job cost report. The Contractor's obligations hereunder are material.

10. **Permits, Certificates, Licenses, Fees, Approval**

a. **Approvals, Certificates, Fees, Inspections, Licenses, Permits, Etc.**

(1) **Permits in Bid Price**. Contractor shall include in its Bid the cost of any approvals, certificates, fees, inspections, licenses, permits or similar requirements necessary for the performance of the Work ("Permits").

a) "Permits" includes, without limitation, any of the following if required: temporary or permanent building, mechanical, electrical or plumbing permits; certificates of occupancy; curb-breaking permits, highway entrance permits; water permits; local inspector fees; etc.

b) "Permits" does not include Project Inspector fees (which will be paid by the District unless otherwise indicated herein), professional licensing, or contractors' licensing.

c) The Contractor shall be required to obtain all Permits. The Contractor shall ensure sufficient time in its Construction Schedule to secure and obtain all permits and shall not be permitted to claim a delay in the Project due to a delay in obtaining a Permit.

b. **Certain Fees Not Part of Permits.** Notwithstanding the above requirements, District shall oversee the obtaining and payment of the following permits, fees or charges, but Contractor shall assist in those efforts as requested by the District at no additional cost to District: **No Fees**

c. **Storm Water Permits**

(1) Contractor shall perform the Work of the Project related to being District's Qualified SWPPP (Storm Water Pollution Prevention Plan) Practitioner ("QSP").

(2) As District's QSP, Contractor shall be responsible for storm water and non-storm water visual observations, sampling, and analysis per the District's SWPPP.

(3) Contractor shall strictly follow the requirements to implement all the provisions of the SWPPP including, without limitation, preparation of monitoring and recording reports and providing those to District.

(4) Contractor's indemnity obligations are applicable to any damages, penalties, fees, charges, or related expenses assessed or charged to the District by any water boards or agencies with jurisdiction related to compliance with the Storm Water Permits.

d. **Project Inspection**

In addition to the requirements in the Contract Documents related to cooperation with and authority of the DSA Project Inspector(s) for the Project, Contractor must comply with the requirements of the most recent versions of DSA document PR 13-01. Below are provisions of this document from PR 13-01 (rev 08/21/17).

(1) The contractor shall carefully study the DSA-approved documents and shall plan a schedule of operations well ahead of time.

(2) If at any time it is discovered that work is being done which is not in accordance with the DSA-approved construction documents, the contractor shall correct the work immediately.

(3) Verify that DSA 152 and, when applicable, DSA 152-IPI forms were issued for the project prior to the commencement of construction.

(4) Meet with the design team, the Laboratory of Record and the project inspector to mutually communicate and understand the structural/material and fire/life safety testing and inspection program, and the methods of communication appropriate for the project.

(5) Notify the project inspector and, when applicable, in-plant inspector, in writing, of the commencement of construction of each and every aspect of the work at least 48 hours in advance by submitting Commencement/Completion of Work Notification (form DSA 156), or other agreed-upon written documents, to the project inspector.

(6) Notify the project inspector and, when applicable, the in-plant inspector, of the completion of construction of each and every aspect of the work by submitting form DSA 156 (or other agreed-upon written documents) to the project inspector.

(7) Consider the relationship of the signed-off blocks and sections of the form DSA 152 and the commencement of subsequent work. Until the project inspector has signed off applicable blocks and sections of the form DSA 152, the contractor may be prohibited from proceeding with subsequent construction activities that cover up the unapproved work. Any subsequent construction activities that cover up the unapproved work will be subject to a “Stop Work Order” from DSA or the school district (see IR A-13 for additional information), and are subject to removal and remediation if found to be in noncompliance with the DSA-approved construction documents.

(8) Submit the final verified report. All prime contractors are required to submit final Contractor Verified Reports (form DSA 6-C).

**End of Section**

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Section 01 00 00

# Project Summary

## Part 1. General

### 1.01 Related Documents

A. Refer to Division 1 Sections for other requirements not included herein. Sections with the most restrictive language shall take precedence.

B. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

C. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

D. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Information Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

- General Project Description
- Specific Components
- Project Information
- Contract Method
- Schedule
- Owner Occupancy

### 1.03 General Project Description

A. Work of this Contract comprises general site construction and alterations including site plumbing and site electrical work.

| Item | Description |
|---|---|
| General Components | • Alteration of existing classroom and corridor to create new offices for counseling<br>• Removal of existing ceiling finishes, lighting<br>• New ceiling finishes and lighting<br>• New room finishes<br>• New Doors with new hardware and paint<br>• Data cable, conduit, outlets and patch panels<br>• Fire Alarm upgrades<br>• New clock speaker/ communication<br>• Interior Painting |

B. Work shall not be limited to the items mentioned above but shall include all components necessary to provide for full and beneficial occupancy of the work area and full function of all systems.

## 1.04 Site Specific Components

A. The following project components are listed for clarity but do not represent the extent of special considerations that may be included in these Specifications. The Contractor shall remain responsible for provision of all labor and materials listed elsewhere.

1. Work period occurs while portions of the areas may be occupied.
2. District may stipulate specific times for parking disruptions.

## 1.05 Assignment of Components

A. All work of this Contract is the responsibility of the Contractor.

B. Work of the Contract is specified in various specifications by CSI division. In some cases various components of related work may be specified across several sections of these specifications.

C. No attempt can be assumed to have been made to assign work by a particular section of these specifications. The Contractor shall assign work according to his best assessment of a strategy for successful completion of the project.

D. The contractor shall insure that sub-contractors have access to, or are made aware of, the entire Contract Document for establishment of their sub-responsibilities.

E. It is the sole responsibility of the Contractor to assign work to various trades and sub-contractors. It is NOT the responsibility of the Architect or these specifications to determine which trades perform selected work.

F. The Contractor shall be responsible for completion of all work regardless of which specifications section may describe that work.

G. Work that is required herein, but is not performed by a sub-contractor shall be performed by the Contractor.

## 1.06 Project Information

A. The Contractor shall utilize the following contacts for Project Communication:

| | |
|---|---|
| **Architect** | **Bartos Architecture** |
| | Mark Bartos, Architect: Architect of Record |
| | Chris Ades, Architect |
| | Phone 650 340 1221 |
| **District** | **Los Gatos – Saratoga joint Union High School District** |
| | Michael Grove, Superintendent |
| | Delores Perley, Assistant Superintendent, CBO |
| | Phone 408 402 6330 |

## 1.07 Contract Information

A. Construct the work under a single lump sum contract.

B. Provide Alternates as may be indicated elsewhere.

C. Provide Unit costs as may be indicated elsewhere

D. Only items noted "NIC" (Not In Contract) or “By District”, will be furnished and installed by Others.

### 1.08 Schedule

A. Work done under this contract shall be bound by the following dates: Refer phasing plan included with drawings.

| | |
|---|---|
| **Construction Start Date** | TBD |
| **Date of Substantial Completion** | TBD |

**B. Contractor will have site access 7 days per week.**

### 1.09 Owner Occupancy

A. Owner will fully occupy adjacent premises for the conduct of normal operations. Contractor shall cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

1. Owner shall provide alternate parking locations for duration of project.
2. Contractor shall provide control of Work Zone to prevent parking by public.

B. Provide all necessary temporary utility connections including, but not limited to:

1. Water
2. Sewer
3. Electricity

C. Shut downs shall be coordinated with the District at least one week in advance. Once a date and time period has been determined in consultation with the District, Inspector and Architect; Contractor shall notify all of these parties in writing of the shut down schedule.

1. Refer to Division 01140: Work Restrictions section for other requirements.

## Part 2. Products

A. Not Used

## Part 3. Execution

A. Not Used

**END OF SECTION**

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# Work Restrictions

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Information Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

B. This section describes construction operations, temporary construction facilities, temporary controls, including

| Item | Description |
|---|---|
| General | • Contractor Use of premises<br>• Work Zone<br>• Construction Staging<br>• Construction Parking<br>• Cleaning during construction<br>• Shutdowns |

*C. The intent of this section is to insure that the occupants are protected to the maximum extent possible, and that inconvenience to the occupants is minimized.*

D. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 References / Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • Comply with NFPA 241, "Standard for Safeguarding Construction, Alterations and Demolition Operations"; ANSI A10 Series standards for "Safety Requirements for Construction and Demolition"; and NECA Electrical Design Library's "Temporary Electrical Facilities."<br>• Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric |

service. Install service in compliance with NFPA 70.

# Part 2. Requirements

## 2.01 Contractor Use of Premises

A. Site access shall occur at designated locations and times. Site access locations are shown in the drawings. The owner may place limitations on the size and type of equipment allowed on site due to safety or durability issues. Modifications of site access locations shall be coordinated with the Owner.

B. Meet all requirements of Specific Conditions Paragraph 6 "Background Checks"

C. Contractor shall coordinate the use of the project site with other contractors who may be engaged in concurrent work on this site.

D. Work zone limits shall accommodate the ongoing operation of the school by the Owner. All passage ways shall remain clear and unobstructed for emergency egress as well as routine circulation.

1. Students will be present during the Construction period. Students will be restricted to access from other portions of the site and shall not be allowed access through the Work Zone. The Contractor shall be responsible to prevent access through the Work Zone.

E. Contractor shall limit access of construction personnel to areas inside the Work Zone.

1. Access outside the Work Zone shall be available only for tasks specifically related to the work of this Contract.
2. Direct supervision of all personnel shall be provided for all tasks performed outside the limits of the Work Zone.
3. Construction personnel shall not have access to areas outside the Work Zone for breaks, toilet use or any other non-construction related use.

## 2.02 Work Zone

A. Contractor shall restrict construction activities to the area of construction within the area of the site as shown on the Drawing. This area shall be defined as the Work Zone.

B. The Work Zone shall include the area of work specifically defined in the Contract Documents as well as a reasonable extent of area adjacent for access required, movement and installation operations.

C. The Work Zone is defined in the Contract Documents and shall include interior areas of buildings, exterior areas where exterior work occurs and exterior access areas.

D. The Work Zone shall be fully enclosed by Construction Fencing and shall be locked and inaccessible to the public.

E. When fully supervised the Work Zone area may be unlocked during regular construction hours to permit access by workers under the control of the General Contractor.

F. The Contractor is fully responsible for control of the work zone and for the prevention of access by the public.

1. Employees of the School Site, Students and Parents shall be prevented from accessing the Work Zone.
2. The Contractor retains the right to remove any person from the Work Zone who is not specifically associated with the Work of this project.

3. Contractor shall coordinate with District and Architect in order to designate a route of work access from exterior Staging Area to interior work area to be reserved for use by the Contractor. This route may change for various phases of the work, therefore coordinate with Architect and Owner for approval of proposed path.

## 2.03 Construction Staging

A. Construction Staging Areas shall be coordinated with District prior to construction. Refer to Architect.

1. Contractor shall provide a complete physical/ visual barricade between staging site and work zone. Workers must be separated from students. Phasing Diagrams provided herein do not include all fencing for the project.

B. Contractor, sub-contractors, suppliers and all other entities working under the control of the General Contractor shall utilize staging areas and access points as shown.

C. Contractor shall restrict storage to the interior construction areas or in secured exterior staging areas as designated on the plans or as directed by the District or Architect.

D. Staging areas shall include equipment and material stockpiles, on-site assembly areas not occurring within the Work Zone, parking and all other construction related tasks.

E. Staging areas shall be fully enclosed with Construction Fencing and shall be locked and inaccessible by the public.

F. When fully supervised, staging areas may remain unlocked during regular construction hours.

G. Alterations to staging areas shall be coordinated with the Architect. Coordination shall occur at such time so as to allow the owner a minimum of 1 week notice prior to alteration of a staging area.

H. Staging areas shall include Caution signage. To be provided by contractor.

I. Security of the staging area is the sole responsibility of the General Contractor.

## 2.04 Construction Parking

A. Construction Parking Areas shall be coordinated with District prior to construction. Refer to Architect.

B. Construction parking areas shall be marked and barricaded by the Contractor using barricades as defined elsewhere in this Section.

C. Additional parking may be obtained when necessary. The Contractor shall coordinate with the Architect at such time as to allow a minimum 1 week notice to the Owner for changes to existing parking areas.

## 2.05 Cleaning During Construction:

A. Control accumulation of waste materials and rubbish. Dispose of construction debris and waste off-site at regular intervals. Debris shall be stored in closed containers out of view from the public. Debris shall not be accessible by the public.

B. Portions of building where construction work occurs within an area occupied for use by the District shall be cleaned by the Contractor on a daily basis so that the degree of cleaning matches adjacent areas which are maintained by Owner janitorial staff.

C. Required exits must remain clear at all times during business hours.

## 2.06 Utility Shutdowns

A. Planned Disruptions/Shutdowns

1. Any work that requires planned shut-down of plumbing, electrical or other service to occupied buildings, or to the entire campus, shall be done after hours or on weekends.
2. Contractor shall make diligent effort to investigate extent of impact of shutdowns based on review of the following:

   (a) Existing documents showing immediate and adjacent structures and systems.
   (b) Physical observation in consultation with the District Contact and Architect to review source of utilities, branch locations or other such circumstance that may result in shutdowns of areas outside the work zone.

3. All planned Utility Disruptions/Shutdowns shall be fully coordinated with the District and the Site Staff prior to occurrence. It is the SOLE responsibility of the General Contractor to comply with this requirement. Utility Shutdown requests will not be coordinated via the Architect, but the Architect must be copied by Contractor on all communications with District contact.

   (a) A utility Disruption Request form will be provided by the District to the Contractor at the Pre-construction conference.

      *(i) Disruption Request form shall be utilized for all Utility Shutdown requests. Request shall be submitted a minimum of **Seven (7) Days** prior to the planned shutdown.*
      *(ii) Disruption Request form shall be submitted to the District Contact noted above.*
      *(iii) No planned Disruptions/Shutdowns shall occur until contractor has received approval of request from District contact.*
      *(iv) Any Disruptions/Shutdowns or utility failures resulting from the work of this contract and where notification was not adequate will cause the District to assess the contractor for damages.*

   (b) Such assessment shall occur in the form of a deductive change order.

B. Accidental Disruptions/Shutdowns

1. In the event that Utilities are accidentally disrupted by Contractor, Contractor shall within one (1) hour notify District contact and Architect of incident.

   (a) Contractor shall provide a plan for re-establishment of disrupted utilities to the District Contact and Architect prior to the close of the work day of the day the incident occurred.
   (b) If Contractor fails to notify District and Architect as described above, damages of $1000.00 per day will be assessed for each day that the disrupted utilities are not restored. Amount to be deducted from final payment
   (c) When District and Architect mutually agree that Contractor would have been able to avoid such disruption with proper supervision, damages of $1000.00 per day will be assessed for each day that the disrupted utilities are not restored. Amount to be deducted from final payment
   (d) Damages in items (b) and (c) above are cumulative where both conditions exist.

2. If Contractor properly notifies District as indicated above and it is determined that the Contractor could not avoid disruption, no damages will be assessed. Contractor will be compensated for Material and Labor in this case. Contract time extension and associated compensation will only be provided if task is proven to be on Critical Path by Contractor, within seven (7) days of occurrence.

## 2.07 Site Communications

A. All communication with School Site Staff, Teachers, Students, Custodial Staff and any member of the Parent Community or Public shall be initiated by the Architect or the District Contact.

B. The Contractor or any Sub-Contractors shall not review the content of any Project meeting with School Site Staff, Teachers, Students, Custodial Staff and any member of the Parent Community or Public or any other persons not either present at the subject meeting or working under the control of the Contractor.

C. The Contractor shall not advise School Site Staff, Teachers, Students, Custodial Staff and any member of the Parent Community or Public regarding project progress, nor shall the Contractor take direction from any person other than the Architect or the District Contact unless specifically instructed to do so by the Architect or the District Contact.

D. In no case shall the Contractor modify the Work of the Project based on the direction of any person other than the Architect.

## Part 3. Execution

A. Not Used

**End of Section**

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Section 01 25 00

# Contract Modification Procedures

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| General | • Modification Methods<br>• Change Proposals<br>• Change Orders<br>• Required Documentation<br>• Authorization<br>• Document Update |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

*C. Construction change procedures described here are contractual requirements. These procedures are essential to facilitate fair and objective processing of additional cost and time incurred on the project. Following and understanding these procedures will simplify the District's review process when determining approval of additional costs and time. If these procedures aren't followed it will result in a less efficient review and approval process.*

### 1.03 Definitions

***Architect's Supplemental Instructions (ASI):*** (Also referred to as a "Bulletin") A written order, instructions, or interpretations, signed by Architect making minor changes in the Work not involving a change in Contract Sum or Contract Time.

***Proposal Request (PR):*** (AIA Document G709) A written request by the Architect requesting a proposal by the General Contractor for a change in the contract sum or time for a given change to the scope of work.

***Proposal:*** A written description by the Contractor of changes in the contract sum or time due to changes requested by the Architect in the Proposal Request.

Contractor's ***Change Order Request (COR):*** A written request by the Contractor requesting that a change in the contract sum or time be considered by the Architect and District due to some change to the scope of work.

***Authorization:*** Authorization by the District and Architect to proceed with the designated changes to the scope of work.

***Change Order:*** (AIA Document G701) A written instrument prepared by the Architect and signed by the District, Contractor and Architect stating their agreement upon all of the following

- A change in the work
- The amount of the adjustment in the Contract Sum, if any
- The extent of the adjustment in the contract time, if any

*A Proposal Request and Contractor's Change Proposal ARE NOT CHANGE ORDERS.*

***Construction Change Directive:*** (AIA Document A714) A written order prepared by the Architect and signed by the District, Architect and Contractor, directing a change in the Work and stating a proposed basis for adjustment, if any in the Contract. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

By signing the Agreement between District and Contractor, The Contractor acknowledges that the issuance of a Construction Change Directive by District and Architect is a contractual right afforded to the District which the Contractor is obliged to honor.

## Part 2. Requirements

### 2.01 Not Used

## Part 3. Execution

### 3.01 General

A. Contractor shall proceed promptly to implement Proposal submittal based on Proposal Requests from the Architect.

1. Provide full written data required to evaluate changes.
2. Maintain detailed records of work done on a time-and-material/labor force account basis.
3. Provide full documentation to the Architect upon request.

B. Designate in writing the member of the Contractor's organization:

1. Who is authorized to accept changes in the Work
2. Who is responsible for informing others in the Contractor's employ of the authorization of changes in the Work.

C. District will designate in writing the Architect as the person who is authorized to execute Change Orders.

### 3.02 Procedures for Initiating Contract Modifications

A. Modifications to the Contract sum or time may be initiated via the following methods:

1. District, through the Architect, may initiate changes by submitting a **Proposal Request** to the Contractor. Request will include:

(a) Detailed description of the Change, Products and location of the change in the Project.
(b) Supplementary or revised Drawings and Specifications.
(c) The projected time span for making the change, and a specific statement as to whether overtime work is to be included in the work.
(d) A specific period of time during which the requested price will be considered valid.

2. Contractor may initiate changes by submitting a written **Change Proposal** to the Architect containing:

(a) Description of the proposed changes.
(b) Statement of the reason for making the changes.
(c) Statement of the effect on the Contract Sum and the Contract Time.
(d) Statement of the effect on the work of separate sub-contractors.
(e) Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

B. Changes to the work shall not proceed until and unless Authorization is granted by the District and Architect.

### 3.03 Construction Change Directive

A. In lieu of Proposal Request, the Architect may issue a Construction Change Directive for the Contractor to proceed with a change for subsequent inclusion in a Change Order.

B. Authorization will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.

C. District and Architect will sign and date the Construction Change Authorization as authorization for the Contractor to proceed with the changes. DSA must approve all changes prior to proceeding.

D. Contractor will sign and date the Construction Change Authorization to indicate agreement with the terms therein.

### 3.04 Documentation of Proposals and Claims

A. Support each price quotation and for each unit price, which has not previously been established, with sufficient substantiating data to allow Architect and/or District Representative to evaluate the price quotation.

B. On request provide additional data to support time and cost computations:

1. Labor required.
2. Materials required.

(a) Recommended source of purchase and unit cost.
(b) Quantities required.

3. Taxes, insurance and bonds.

(a) Insurance and bonds shall be inclusive of the contractor's overhead and profit markup

4. Credit for work deleted from Contract, similarly documented.

5. Overhead and profit.

(a) General Contractor's overhead and profit markup (including bond charges) shall not exceed 15% of subtotal, and

(b) For work performed by subcontractors shall not exceed 5%
(c) Whoever performs the work gets 15%. All tiers above get 5%

6. Justification for any change in Contract Time.

   (a) Mobilization charges are not considered when the contractor's tools and equipment are still onsite.

7. Storage and Delivery required.
8. Overtime required.

C. All changes shall include

1. Labor required.

D. Support each claim for additional costs, and for work done on a time-and-material/labor force account basis, with documentation as required for a lump-sum proposal, plus additional information:

1. Name of the representative of the District or Architect who ordered the work, and the date of the order.
2. Dates and times work was performed, and by whom.
3. Time record, summary of hours worked, and hourly rates paid.
4. Receipts and invoices for:

   (a) Equipment used, listing dates and times of use.
   (b) Products used, listing of quantities. Storage time and delivery charges
   (c) Subcontracts.
   (d) Document requests for substitutions for Products as specified in Section 01630.

E. Tool and Equipment rental: No payment will be made for the use of tools which have a replacement value of $100 or less.

1. Regardless of ownership, the rates to be used in determining rental costs shall not exceed listed prevailing rates at local equipment rental agencies at the time the work is performed.
2. Tools already located on site as part of the contracted work shall not incur additional surcharge rental rates beyond a daily extended use rate.
3. Rental rates paid shall include all incidental costs including fuel, maintenance, oil, supplies, storage, insurance, etc.
4. Delivery and off haul rates shall apply provided the tools are not already located on site. Equipment shall be returned when no longer in use unless determined the Contractor elects to retain such equipment on site at no expense to the Owner.

## 3.05 Timeliness of Change Orders

***A. Claims submitted beyond the time frame indicated herein are not valid:***

*1. For any Change Request, the cost must be provided prior to the work occurring unless previously approved by the Architect or Owner.*

*(a) In the case where work is done prior to final pricing, General Contractor must submit a Change Request for cost and time for review by the Architect and District within 30 days. If no Change Request is submitted in this time frame, the work is considered to have been completed as part of the base contract work and at no additional cost to the District.*

2. *All Change Requests for cost and time related to work completed on a time and material or force account basis must be provided within 30 days of completion of the work. If no Change Request is submitted in this time frame, the work is considered to have been completed as part of the base contract work at no additional cost to the District.*

3. *Any work completed on a time and material or force account basis in which a price quote was requested by the Architect or District prior to performing the work and no price was provided must be submitted within 72 hours of completion of the work. If no Change Request is submitted in this time frame, the work is officially considered to have been completed as part of the base contract work at no additional cost to the District.*
4. *If the Architect or District requests additional information for a specific Change Request, then the Contractor must submit it within 15 days. If the Contractor fails to respond within 15 days, the Change Request is considered rejected by the District.*

### 3.06 Preparation of Change Orders

A. Upon formal or informal Authorization of a Proposal the Architect will prepare each Change Order for the District and Contractor's review and signature.

B. It is mutually agreed and understood that Change Orders may include the summation of multiple Proposals that have been authorized by the District and Architect.

C. Form: Change Order: AIA Document G701.

D. Content of Change Orders will be based on either:

1. Proposal Request and Contractor's responsive Proposal as mutually agreed upon between District and Contractor.
2. Contractor's Change Proposal for a change, as recommended by Architect or District Representative.

E. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

F. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

1. For revisions to contract time, refer elsewhere in Division 1 for Schedule and calculation methods for revisions to schedule. Contractor shall document proposed Schedule revisions per the requirements of the Schedule Section of these Specifications.

G. District and Architect will sign and date the Change Order as authorization for the Contractor to proceed with the changes. DSA must approve all changes prior to proceeding.

H. Contractor will sign and date the Change Order to indicate agreement with the terms therein.

### 3.07 Correlation with Contractor's Submittals

A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Sum.

B. Periodically revise the Construction Schedule as described in Schedule specification section elsewhere in Division 1, to reflect each change in Contract Time.

1. Revise sub-schedules to show changes for other items of work affected by the changes.

C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

## End of Section

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Section 01 29 00

# Payment Application Procedures

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| General | Procedures<br>Forms<br>Methods |

*B. This section describes the procedures and steps to be followed to receive payment for work performed and materials supplied to the project. Following these procedures will result in a timely payment period. If these procedures aren't followed, payment will potentially be delayed.*

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Schedule of Values | • Schedule of Values |
| Payment Applications | • AIA form with updated Schedule of Values |
| Project Schedule | • Updated Project Schedule |
| Lien Releases | • Conditional Waivers from all subcontractors, and Unconditional Waivers from all subcontractor for previously submitted payment application |

## Part 2. Requirements

### 2.01 Schedule of Values

A. Prepare a schedule of values to be used as a basis for all Progress Payments and disputes.

1. Submit a typed schedule of values on AIA Form G703, or approved equal type form.
2. Submit schedule of values for Architect's Review, within three (3) Days after award of contract.
3. The first pay request shall not be considered the schedule of values.

B. Schedule of Values shall include enumeration of all items to be invoiced to the Contract.

1. Schedule of Values shall represent actual amounts based on project estimates and sub-contract amounts.

   (a) Schedule of Values shall not be “front-loaded”. Architect may reject Schedule of Values (and potentially delay Application for Payment) based on inappropriate values for initial project tasks.
   (b) Rejection of Schedule of Values for this reason shall not constitute a basis for delay claim by the Contractor.

2. Schedule of Values shall include representation of all Sub-Contractor amounts so that Payment Applications may be correlated with actual Sub-Contractor progress when necessary. Lump Sum amounts for subcontractors will not be accepted.
3. Schedule of Values shall include all substantial material / product amounts and all General Conditions amounts so that Payment Applications may be correlated with actual project progress when necessary.

C. Include as an attachment a list of every subcontractor or supplier to be employed on the project with corresponding subcontract amounts. This Attachment shall include the following:

1. Subcontractor / Supplier Name, Address, Phone Number, Fax Number, Contact person
2. Subcontractor license number and type of license
3. Subcontractor / Supplier Scope of Work

## 2.02 Submittal of Certified Payroll

A. Contractor shall be required to submit certified payroll to the District monthly as a condition of payment. Certified payroll will be kept in District records. District is not providing a Labor Compliance Program.

## 2.03 Payment Application Format And Data Required:

A. Submit itemized applications typed on AIA Document G702, Application and Certificate for Payment, and Continuation Sheets G702A.

## 2.04 Preparation of Payment Application for Progress Payments

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
3. Execute certification with signature of a responsible officer of Contract firm.

B. Continuation Sheets:

1. Fill in total list of all scheduled component items of Work, with item number and scheduled dollar value for each item.
2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored.
3. List each Change Order executed prior to date of submission, at the end of the continuation sheets.

   (a) List by Change Order Number, and description, as for an original component item of work.

C. Waivers

1. Waivers are required from all subcontractors with each pay request.

2. Refer to *00800-* ***Article 9 (A201) Payments:*** *9.10.B Waivers*

## 2.05 Substantiating Data for Payment Application

A. When the District or the Architect requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project.
2. Application number and date.
3. Detailed list of enclosures.
4. For stored products:

   (a) Item number and identification as shown on application.
   (b) Description of specific material.
   (c) Proof of title transfer to District upon payment
   (d) Proof that off site location is fully bonded for protection of stored material.

B. Submit one copy of data and cover letter for each copy of application.

## 2.06 Preparation of Final Payment Application

A. Fill in Application form as specified for progress payments.

B. Use continuation sheet for presenting the final statement of accounting.

C. General Contractor shall provide and require all Subcontractors and Vendors to provide "Conditional waiver and release upon Final Payment" with Final Application for Payment. The form of this waiver shall be as described in California Civil Code Section 3262

D. Provide Unconditional Waiver and Release for all previously made payments.

E. Upon receipt of application for final payment, Architect will make a determination as to whether or not all requirements are in proper order as required by other Sections of this Specification. When all requirements have been provided, Architect will issue a Final Certificate of Payment.

F. Refer to Project Closeout and Completion Sections for additional requirements.

## 2.07 Submittal Procedure

A. Submit Payment Applications to Architect at the times stipulated in the Agreement.

B. Copies:

1. (3) Three copies of each Application.

## 2.08 Conditions

A. Approval of Application for Payment shall be contingent on the following:

1. Submittal of supporting data required elsewhere in the Specifications
2. Review and acceptance of Construction Progress Documentation specified elsewhere in Division 1.

   (a) This includes but is not limited to, Updated total Project Schedule.

3. Review and acceptance of Construction Progress.
4. Fulfillment of requirements of Pay Application Meeting defined elsewhere in Division 1.

B. Refer to Division 1 for other requirements related to processing and approval of Payment Applications.

C. When Architect finds Application properly completed and correct, it will be transmitted to District, with copy to Contractor.

## Part 3. Execution

### 3.01 Not Used

**End of Section**

Section 01 31 00

# Project Management and Coordination

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulation (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| Contractor Responsibility | Supervision, Project Management, Site Management |
| Project Management | General Project Management and Supervision |
| Project Initiation | Pre-Construction Conference<br>Project Schedule<br>Schedule of Values |
| Project Coordination | Coordination of work of all suppliers, installers, fabricators, manufacturers and labor forces.<br>Coordination throughout the Contract Document set. |
| Project Site Administration | Site staffing and management<br>Site records, information and resources |
| Communications | Limitations |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 Duties of Contractor

A. The following is not intended to limit the responsibilities of the Contractor, but is to provide for a general understanding of the requirements.

B. The Contractor is responsible for all superintendence, project coordination and project management.

C. Sub-Contractor – Supplier Supervision

1. Contractor is explicitly required to oversee and coordinate the work of all sub-contractors and suppliers.
2. Such oversight shall include Quality Assurance prior to the installation of work by a sub-contractor or supplier to ensure that the sub-contractor or supplier is capable of performing the work to the level of quality required and that the sub-contractor or supplier is intending to perform the work to the level of quality required. Refer Quality Assurance section of Division 1 for further requirements.

3. Such oversight shall include Quality Control during the installation of work by any sub-contractor or supplier to ensure that the sub-contractor or supplier is capable of performing the work to the level of quality required and that the sub-contractor or supplier is intending to perform the work to the level of quality required. Refer Quality Control section of Division 1 for further requirements.
4. The Contractor shall provide adequate supervision to prevent sub-contractors and suppliers from performing work in such a manner that may require rejection and re-installation.

    (a) This paragraph explicitly requires to Contractor to act in a pre-emptive manner with regard to sub-contractor and supplier performance.

D. Contractor is responsible to administer all processing of submittals as defined elsewhere in Division 1.

1. This requirement shall explicitly require preliminary review of all submittals to determine their general compliance with the requirements of the Contract Documents prior to submittal to the Architect.
2. Failure to review Submittals for compliance may result in rejection of the submittal without providing any grounds for delay claims.

E. Contractor is responsible for review and coordination of Contract Documents.

1. Contractor is explicitly required to read, study and become familiar with the requirements of the Contract Documents. Such knowledge shall be required to adequately supervise the Work of the Project.
2. Knowledge of the Contract documents developed by the Contractor for the sole purpose of seeking changes to the Contract shall constitute Non-Performance of the requirements of the Contract with regard for successful completion of the work and may serve as grounds for termination.

F. Contractor is responsible to review progress of the work and recommend changes to the work that may be appropriate due to site conditions, constructability issues, procurement issues and logistics issues.

1. Contractor shall recommend necessary or desirable changes to the Architect.
2. Contractor shall review subcontractors' requests for changes and substitutions and submit recommendations to Architect where appropriate.

    (a) Contractor shall analyze all requests from sub-contractors to determine the appropriateness or usefulness of the proposed change and to determine the potential impacts, both in time and costs, on other portions of the work.
    (b) The Contractor shall not be entitled to Contract Changes for peripheral work resulting from a proposed change when that peripheral work was not identified in the original recommendation or proposal.

G. Contractor is responsible for Work Zone security and safety.

1. Refer to other sections in **Division 1** for specific requirements.
2. The Contractor is responsible for the security of partially completed work until the project is finally accepted by the Architect and District.

## 2.02 General Project Management and Coordination

A. Contractor shall provide such management and administrative structure and forces as necessary to complete the Work in a continuous uninterrupted operation.

B. Contractor shall provide all required management systems including, but not limited to,

1. Administrative staff

2. Communications equipment
3. Document access and reproduction capabilities
4. Shipping and handling resources for administrative materials
5. Shelter / Enclosure for management resources
6. Off site management and administrative resources.

C. The Contractor must use sufficient manpower and adequate equipment to complete all the necessary work requirements within a minimum period of time.

## 2.03 Project Initiation

A. Pre-Construction Conference

1. Pre-Project Meetings Section of Division 1.

B. Initial Schedules:

*1.* Submit (4) four copies of initial Construction Progress Schedule and Schedule of Values within 7 days after award of Contract. *The first pay request will not be accepted in lieu of the schedule of values*
2. After review by Architect revise and resubmit where required.
3. Submit revised progress schedules with each Application for Payment reflecting changes since previous submittal.

## 2.04 Construction Progress Schedule

A. Refer to section 01311 “Project Schedule”

## 2.05 Project Coordination

A. Coordinate work of all subcontractors.

1. Verify that adequate services are provided to comply with requirements for Work and climatic conditions.
2. Verify proper maintenance and operation of temporary facilities
3. Administer traffic and parking controls for construction workers.

B. Interpretations of Contract Documents:

1. Consult with Architect to obtain interpretation or clarifications for any portions of the Contract Documents, which contain discrepancies and/or ambiguities.
2. All inquiries shall be submitted via standard Request For Information (RFI).
   (a) RFI’s must include building name, location, schedule impact/ criticality and an adequate description of the issue.
   (b) Contractor may not claim project delays while waiting for a response to a RFI if the District has not been given at least seven (7) days to review request.
   (c) Requests for Information submitted after noon on a Friday will be considered as submitted the following Monday.
3. Assist in answering questions, which may arise from sub-contractors, suppliers, the Architect, District and other parties directly involved with the Work.
4. Transmit written interpretations to involved parties.

C. The Contractor is responsible for shared coordination with other Contractors performing work adjacent to or within the Work Zone. The Contractor shall make all necessary efforts to ensure that work is coordinated where it interfaces with work of this contract. Additionally, the Contractor is required to be available for joint meetings with adjacent Contractors when necessary for coordination.

## 2.06 Project Site Administration

A. Contractor shall provide such site management structure and forces as necessary to complete the work in a continuous, uninterrupted operation and per the terms and schedule of the Construction Contract.

B. The Contractor shall provide all required Site Administration systems including, but not limited to, the following:

1. Site Management Staff including Project Superintendent and Site Superintendents as necessary.
2. Site management facilities
3. Communications equipment- including: Scanner; email; printer
4. Document management and retention equipment and systems.
5. Support staff including administrative, secretarial and laborers as necessary to support the work of this contract.

C. Retain on the work site during its progress, a competent full-time superintendent, satisfactory to the Architect and District. The superintendent shall be in full charge of the work and all instructions given to the superintendent shall be binding.

1. District shall interview and approve superintendent prior to contract execution.
2. The superintendent shall not be changed without consent of the District and Architect.

D. Schedule Management

1. Refer to **Schedule** section above.
2. Manage all aspects of the Project Schedule including phasing, critical construction sequences and interface with District occupied premises and District use schedules.
3. Advise Architect regarding all schedule issues, which may require action or other response on the part of the District.
4. Advise Architect of all schedule issues, which may require action or response on the part of the Architect or any of the Architects consultants.
5. Failure to advise these parties regarding schedule requirements will relieve them of any responsibility for compliance with schedule requirements.

E. Inspections and testing:

1. Request and coordinate all project inspections a required by Division 1, Title 24 and other applicable codes and standards.
2. Refer to Quality Control Procedures section of Division 1.
3. Refer to Title 24 section of Division 1.
4. Inspect work to ensure that it is performed in accord with requirements of the Contract Documents.
5. Arrange with Architect for special inspections or testing when required.
6. Reject work which does not conform to requirements of Contract Documents.
7. Coordinate testing laboratory services:

   (a) Notify laboratory of test schedule.
   (b) Verify that required personnel are present.
   (c) Verify that specified tests are made as scheduled.
   (d) Verify compliance of test results with specified criteria. Determine need for retesting and submit recommendations to Architect. Administer required retesting.

F. Quality Control: Provide quality control over all Construction activities to ensure that all work meets the requirements of the Contract Documents.

1. Refer to Quality Control section of Division 1.

G. Administer processing of shop drawings, product data and samples.

1. Refer to Submittal section of Division 1

H. Maintain reports and records at job site.

1. Refer to Progress Documentation section of Division 1.

I. Ensure that specified cleaning is done during progress of Work and at completion of Contract.

1. Refer to Cleaning section of Division 1.

### 2.07 Communications

A. Establish on-site lines of authority and communication. Schedule and conduct progress meetings among District, Architect, and subcontractors.

B. Communications shall be limited to the immediate Construction team which shall include the following:

1. Contractor
2. Architect
3. District Contact
4. Inspectors.

C. All communication with School Site Staff, Teachers, Students, Custodial Staff and any member of the Parent Community or Public shall be initiated by the Architect or the District Contact.

D. The Contractor or any Sub-Contractors shall not review the content of any Project meeting with School Site Staff, Teachers, Students, Custodial Staff and any member of the Parent Community or Public or any other persons not either present at the subject meeting or working under the control of the Contractor.

E. The Contractor shall not advise School Site Staff, Teachers, Students, Custodial Staff and any member of the Parent Community or Public regarding project progress, nor shall the Contractor take direction from any person other than the Architect or the District Contact unless specifically instructed to do so by the Architect or the District Contact.

F. In no case shall the Contractor modify the Work of the Project based on the direction of any person other than the Architect.

## Part 3. Execution

A. Not Used

**End of Section**

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Section 01 31 20

# Project Meetings

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| Pre-Construction Conference | • Initial Project Meeting prior to start of construction General Table Listing, Requiring bullet points |
| Regular Project Meetings | • Meetings conducted at regular intervals to review project progress and resolve project issues |
| Payment Application Meeting | • Monthly meeting for review of Pay Application |
| Incidental Project Meetings | • Meetings scheduled for special purposes |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 General

A. All project meetings shall be coordinated by the Architect. The Contractor may request a Special meeting by notifying the Architect.

### 2.02 Preconstruction Conference

A. Prior to commencement of Work, a pre-construction conference will be held to discuss procedures to be followed during the process of the Work.

B. Location: Project Site.

C. Attending shall be:

1. Architect
2. Architect's Professional Consultants
3. Contractor
4. Contractor's Superintendent
5. Subcontractors
6. DSA Inspector

## 2.03 Regular Project Meetings

A. Regular Project Meetings shall be held on a weekly basis

B. Attending shall be:

1. Architect / Project Coordinator
2. Architect's Professional Consultants, as appropriate to the Agenda
3. Contractor
4. Contractor's Superintendent
5. Subcontractors, as appropriate to the Agenda
6. DSA Inspector
7. Contractor shall determine additional attendees as required by particular stage of work or based on specific issues requiring attention
8. Architect may request additional attendees as appropriate to subject matter on Agenda.

C. Regular Meeting Agenda / Minutes

1. The Architect will prepare and maintain Agendas / Minutes for All specified meetings.
2. The Architect may request an agenda from the Contractor for incidental meetings requested by the Contractor.
3. Regular Project Meeting Agendas will include the following agenda categories:

(a) Old Business
(b) New Business
(c) Agenda Items

*(i) As submitted by attendees*

(d) Standing Items

*(i) Project Schedule*

*(ii) Project Cost Performance*

(e) Project Walk Through

D. Location: Contractor's field office.

## 2.04 Monthly Meeting for Payment Application

A. One Regular Meeting each month will be allocated for the review of Payment Applications.

1. This meeting will include review of Project Completion and Project Record Documents prior to review of Payment Application.
2. Approval of Payment Application will require the following to occur at this meeting:

(a) Satisfactory review of Project Progress based on Project tour prior to meeting.
(b) Satisfactory review of updated Project Schedule, as defined elsewhere in Division 1.
(c) Satisfactory review or Project Record Data as defined elsewhere in Division 1.

B. Review of Progress Billings will occur at the Regular Project Meeting prior to submittal of Application for Payment.

C. The Contractor shall prepare an itemized draft of the month's proposed billing for review with the Architect at the billing meeting.

D. Following review of the proposed billing, revise as may be required, prepare Application for Payment, and submit to the Architect.

E. Monthly Payment Application Meeting Agenda

1. Agenda: The following specific reviews will occur at the Monthly Payment Application Meeting

| # | Item | Remarks |
|---|---|---|
| 1 | Project Tour | Review progress of Construction |
| 2 | Record Documents (As-Builts) | Review level of completion of Project record Documents for compliance with level of Work observed in field. |
| 3 | Inspector review | Inspector of record issues |
| 4 | Security Review | Review of site security measures in place |
| 5 | Schedule Update Review | Review of published schedule update. |
| 6 | Payment Application Review | Compare against observed completion of Work. |

### 2.05 Incidental Meetings

A. Incidental Meetings shall be convened as necessary to address issues that may not be appropriate for the regular Project Meeting.

B. When required in individual specification Sections, the Contractor shall notify the Architect of the need to convene a pre-installation conference at project site prior to commencing Work of the Section.

C. The Architect or District may request a special meeting at any time.

## Part 3. Execution

### 3.01 Not Used

**End of Section**

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# Construction Progress Documentation

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

B. Project Record Documents are a CONTRACTUAL requirement of this project.

| Item | Description |
|---|---|
| Construction Photographs | • Digital |
| Periodic Site Observation Reports | • Monthly Field report |
| Progress Schedules and Reports | • Monthly Schedule Update |
| Record Document Data | • Regular Mark-Ups and Data Logging for use in Record Documents |
| Record Documents | • Regular input of Record Document Data into Record Documents |

C. *Construction Record Documents also known as "As Built" documents are in important resource for the District, when undertaking future projects or making repairs. These documents must be provided. The Contractor's superintendent is in charge of making sure that all changes are properly documented.*

D. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 General

A. Contractor is responsible to provide documentation describing the progress of the work.

### 2.02 Construction Photographs

A. The Contractor shall photograph the progress of the work throughout the Construction period. Photographs shall be kept in a log on-site and shall be available for inspection by the Architect. If requested by the Architect, submit photographs with Application for Payment.

1. Contractor shall provide digital photographs depicting the ongoing progress of the Work.
2. Digital photos shall include date as part of the digital image.
3. Digital photo filename shall include date and title as part of the filename. Title shall include location, subject and comments.

    (a) Sample: 2002-09-21-q-6-east-framing.jpg
    (Year-Month-Day-Bldg-Rm No-Location-Description).jgp

4. Transmission:

    (a) Digital photos may be provided electronically via e-mail, on CD/DVD, or uploaded to FTP/Website.
    (b) Digital photos shall be transmitted in .jpg or .tif format only.

B. Photographic subjects shall be selected to provide adequate records of progress, attention paid to areas that will eventually be covered or otherwise inaccessible.

C. Identify photographs with date, time, orientation, and project identification.

D. Include construction photographs with Operation and Maintenance manual.

## 2.03 Progress Schedule

A. Contractor shall provide an updated Project Schedule each month prior to submittal of Payment Application. Updated schedule is required prior to approval of payment request.

1. Refer to Payment Application Section of Division 1.

B. Provide Updated “Rolling Three Week Schedule” at each Weekly Project Meeting. Architect will provide blank form for this schedule if so requested by General Contractor.

C. Contractor shall maintain a continuously updated schedule on the project site for review at any time.

## 2.04 Project Record Document Data

A. Project record Data shall be defined as ongoing mark-ups, drawings and notes describing any variation from the Contract Documents that may occur over the course of construction with regard to any aspect of the required Work.

B. Project Record Data shall consist of a stand-alone copy of the Contract Drawings and Specifications for mark-up purposes only. This shall be referred to as the Project Mark-Up Set and shall be accessible to the Architect at all times.

1. Record Data shall include data from sub-contractors who may be keeping data in their possession. All record date must be available for review at all times.
2. Architect or Contractor may require several sets be established to allow for input from various sub-contractors.

## 2.05 Entering Project Record Data

A. Project Mark-Up Set shall be marked up on a regular basis as work is completed.

1. In showing the changes in the work, or added work, use the same legends that are used in the contract Drawings. Indicate exact locations by dimensions and exact elevations. Give dimensions from a permanent point.
2. Mark-ups shall include the following:

    (a) Changes to the scope of work as a result of Change Orders and field discoveries
    (b) Progress of the work and identification of completed areas, assemblies or components
    (c) Ongoing notation describing progress including dates and coordination interfaces.

3. Specification markups shall include the name of equipment when more than one manufacturer is named in the specifications or when substitutions are approved.

### 2.06 Project Record Documents

A. Project record Documents shall be defined as the compilation of Project Record Data, prepared by the Contractor, for presentation to the Architect on a regular basis for review.

B. Project record Data, in the form of the Mark-up Set, shall be translated to Project Record Drawings on a monthly basis to satisfy Payment Application requirements.

1. Contractor shall present Record Document status to Architect prior to submittal of monthly Payment Applications. Payment Applications will not be authorized if Architect determines that Record Documents are not current.
2. Refer to Payment Application Section of Division 1.

C. Hand Drawn As-Built Documents

1. Contractor shall make copies of one clean set of Contract Documents at the start of construction. Copies shall be made on reproducible media suitable for amending via hand drawing. The Architect will assist the Contractor in obtaining copies if so requested by the Contractor.
2. Store drawings, one set of Project Specifications, and one copy of each Change Order separate from documents used for construction, for use as Project Record Documents.
3. Indicate actual work on drawings; indicate actual products used in Project Specification, including manufacturer, model number and options.

D. Digital Record Documents

1. Alternately the Contractor may provide PDF formatted record documents on CD/DVD.

E. Incomplete Project Record Documents or Data may be supplemented by Post Construction investigation to be provided at the expense of the Contractor.

1. Investigation may include, but not be limited to:

(a) Sub grade surveys
(b) Electronic investigation of hidden assemblies
(c) Destructive exploration (to include repairs as necessary)
(d) Any other means necessary to determine extent of variations from Work as shown in Contract Documents.

## Part 3. Execution

### 3.01 Not Used

**End of Section**

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# Project Schedules

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6 of Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. A Critical Path Schedule is required for this project. Payment applications will not be accepted or approved without an updated Critical Path Schedule. *Contractors that DO NOT have the expertise in house to provide a professional CPM schedule per these requirements should hire a consultant to perform these tasks.*

B. The CPM schedule shall be a practical tool utilized to assess the progress of the project and to assess the validity of requested time extensions on change orders. If these requirements are not met, the Contractor will be abrogating his /her right to time extensions and cost increases due to changes required to complete the project, regardless of the causes of such changes.

C. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| **Item** | **Description** |
|---|---|
| General | • Project Construction Schedule Utilizing CPM or the Critical Path Method<br>• Project Construction Schedule Update Procedure<br>• Project Time Modification |

D. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## 1.03 Definitions

A. The following definitions shall be established for use in correspondence and record documents concerning Project Schedules. These terms are established to facilitate clarity in reviewing, coordinating and approving Project Schedules and Updates.

| Term | Remarks |
|---|---|
| Critical Path Network Diagram | Diagram (also known as precedence diagram) indicating flow and priority of tasks with arrows and nodes. Tasks shall be indicated on Nodes. Critical Path(s) shall be indicated as a highlighted/bolded path of arrows. |
| Gantt Chart | Bar Chart developed from CPM Network Diagram. Bars on chart indicate task durations. Indicate Critical Path as a series of bold Red Bars and arrows. |
| Critical Path Method | Analysis of the sequential and time characteristics of projects by the use of networks. Determines the longest path or "Critical Path" through a project. |
| Critical Path | Path of events/tasks with 0 total float. Also the Longest Path (s) through a project. |
| Critical Event or Task | A Task or event that occurs on a Critical Path. |
| Free Float | = (Late Start Time of current task) – (Late Finish Time of previous task) |
| Total Float | = (Late Finish Time of Current task ) – (Early Finish Time of Preceding task) |
| Early Start | The earliest time that a Task can begin |
| Early Finish | The earliest time that a Task can complete |
| Days: Calendar Days | The Schedule shall take into account all weekends, holidays or other non-working days anticipated by the Contractor.<br><br>Any formal requests for contract extensions either for compensated or uncompensated days shall be provided in Calendar Days. |
| "Delay Days" | Delays that cause extension to the overall project duration. Delays must therefore ultimately only affect the "length" of the Critical Path.<br>Concurrent Delays are only counted once. |
| Delay Analysis or Change order Day analysis | Analysis of delays caused or required by a change order, provided by Contractor, indicating affect of delays on: Total Float and Critical Path. Must include analysis of concurrent delays if occur. Must reference all related tasks. |

## Part 2. Requirements

### 2.01 General Schedule Requirements

A. Schedules shall be developed with any industry standard computer scheduling software.

B. Provide schedules in digital format **and** on "D" size or 24"x36" sheets.

C. Schedules shall be developed as an Early Start, Early Finish schedule indicating: Free Float and Total Float for each Event indicated. Schedule shall not use forced late start times for the purpose of creating multiple critical paths. ***Schedules indicating that every task is Critical will be automatically rejected without review***

D. On all schedule formats required (Network Diagram and Gantt Charts) clearly indicate Critical Path. Schedules that do not clearly indicate Critical Path will automatically be rejected without any review

E. Construction may not begin until a schedule has been submitted.

### 2.02 Process

A. A ***Preliminary Schedule*** shall be submitted within 5 calendar days of Award of Bid and Prior to Execution of Contract.

B. Architect shall review Preliminary Schedule (requirements outlined below) for conformance with Project Schedule Requirements as described in this section, the General Conditions, Section 01 00 00 and Section 01 32 00

C. Upon acceptance of Schedule and when all other pre-execution requirements are met, Contract will be executed between District and Contractor.

D. Within 7 Calendar Days of contract Execution, Contractor shall submit a ***Contract Schedule*** (requirements outlined below).

***E. At the District's discretion, failure to submit a Project Schedule within seven (7) days after award of contract shall be grounds for dismissal of contract.***

F. Architect shall review the Contract Schedule (requirements outlined below) for conformance with Project Schedule Requirements as described in this section, the General Conditions and Sections 01 00 00 and Section 01 32 00

G. Contract Schedule shall be updated twice per month (requirements outlined below) and prior to approval of Monthly Pay Request.

### 2.03 Preliminary Schedule Requirements

A. A Gantt chart is acceptable for the preliminary schedule.

B. Critical Path shall be clearly indicated on chart.

C. The entire project shall be indicated

D. All phases shall be indicated

E. Indicate all testing and commissioning periods.

F. Indicate all transition periods required by the District

G. The Number of events indicated is per the contractor's preference.

### 2.04 Contract Schedule Requirements

A. Provide a Gantt chart indicating Critical Path

B. Number all Tasks. This number is used for reference in change order time requests

C. The number of Tasks indicated shall be appropriate to the Job. All trades involved in project shall be indicated. No Tasks Less than one (1) Day. No tasks greater than two (2) weeks. Upon written request Architect may approve longer durations.

D. Total Float Total shall be at least 25 percent of total project time (TF/TT): Indicate this percentage with coversheet attached to Contract Schedule.

E. Free Float shall be 25 percent of total project time (FF/TT). Indicate this percentage with coversheet attached to Contract Schedule.

F. Contractor shall not submit false delay claims in order to diminish project float time.

G. All Tasks shall include appropriate durations. Project schedules with unreasonable or false durations will be rejected.

H. Upon review and Acceptance by Architect and District, Contract schedule shall become an integral part of ***The Contract.***

### 2.05 Project Submittal Requirements

A. Refer to Section 01 32 19 Submittals Procedures

### 2.06 Project Specific Requirements

A. The following are requirements that apply specifically to this project. Refer to The Form of Agreement, General Conditions and other project manual sections for all other contractual requirements related to time.

1. Include (15) Fifteen Calendar Days as one final task in the project schedule to be utilized as the equivalent of Free Float and Total Float solely for the District's use. If this time is not utilized by District, contractor completion date is the date at the start of this task. District may utilize this time in order to compensate for day extensions in change orders.
2. All other float in the project schedule shall be utilized before the above "Final Float Task" is accessed. Only the District has a right to this float time.

### 2.07 Testing Shut Downs

A. Contractor shall include an additional (5) half days (from 8am until 2pm) of free float to accommodate for District testing shutdowns.

B. When notified by the Architect at least 48 hours prior to the date, the Contractor shall cease all noise producing operations during defined testing district testing schedules.

C. When District and Architect mutually agree that Contractor failed to cease operations during the designated testing time period, damages of $1000.00 per day will be assessed for each occurrence. Amount to be deducted from final payment

D. Contractor shall not request additional overtime or delay days for any utilized testing days

## Part 3. Execution

### 3.01 Contract Schedule Time Modification Rules

A. It is the General Contractor's sole responsibility to show that tasks performed as a result of a change order have extended the overall completion date of the project. This means that items must either be shown to be on the current critical path, or they must be shown to cause a revised critical path. *If the work of a change order can be done while other tasks are occurring without causing delay, it is NOT acceptable to extend the contract date resulting in additional "General Conditions".*

B. For each Change order submitted Contractor shall request number of days, if any, for additional total project time. This may be Null.

C. Event or events requiring time extension must be noted in request. Item must be referred to by a numerical reference to the event indicated on the diagram(s)

D. If event has Total Float, the Total Float time shall be deducted from the requested days prior to granting extension of project completion time.

E. If an event is already critical (the path stays the same) the overall project time shall be extended. Free Float and Total float for all other items must be re-calculated.

F. Concurrent Delays are counted only once when calculating overall project delay. Time required to complete the work of a change order will only change the contract completion date if it is shown to affect overall project completion, by ***Change Order Delay Analysis.***

G. Proposals for change orders for which the contractor wishes to be granted additional time shall include reference to any delayed item(s), its event number, original Free Float, original Total Float and revised floats due to the change.

H. Any time extensions approved as a part of a change order are considered to be compensated fully by the change order. No further monetary changes will be allowed. Refer to section on change procedures

I. *Free Float and Total Float are shared by District and Contractor*. By signing the Construction Contract, the Contractor has agreed to this industry standard. Contractor makes schedule updates that are reviewed by Architect. When any Float time is utilized by District or contractor schedule shall be revised, Contract keeps track of District used Float and Contractor used float.

J. Float is used by either District or contractor as long as either is working in good faith. However, Contractor must notify District if it intends to use float provided for an activity/event within one week of the scheduled event

K. "Float" is an asset of the project and not for the exclusive use or benefit of the District or the contractor, with the Exception of The Fifteen (15) Days required weather/District use float task and any days required between project phases, which are for the sole use of District.

L. If contractor provides a schedule indicating completion of the project earlier than the bid document requirements, the resultant Float time shall be shared by both District and Contractor.

## 3.02 Look Ahead Schedules

A. Contractor shall provide three week look ahead schedules for Architect, District, and Contractor review. This short term schedule does not replace any of the other requirements indicated herein.

## 3.03 Monthly Update Requirements

A. Schedule shall be re-submitted for Monthly as a condition of pay request approval.

B. The General Contractor shall be responsible for tracking actual project Process.

C. If project is behind schedule and contractor intends to catch up Contractor shall prepare a "recovery schedule" in order to indicate to Architect and District a plan of action to re-gain the schedule.

**End of Section**

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Section 01 32 19

# Submittal Procedures

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| Submittal Procedures | • General procedural requirements for ongoing submittals of required Project Information: |
| Submittal Types | • Shop Drawings<br>• Product data<br>• Samples<br>• Manufacturers' certificates<br>• Additional Documentation |

B. *Submittal procedures are outlined here so that the Contractor has a clear procedure to follow. Submittals are essential for verification that specified items are actually being provided in the project. A key element is that any items that are substitutions must be clearly noted as such. Substitution items that are not clearly noted as such or do not include proper evidence of equivalence will be returned to Contractor.*

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Submittal Schedule | Provide Schedule of Submittals that will be provided and are required by this Specification |

## Part 2. Part 2 - Requirements

### 2.01 Submittals

A. Refer to A201, General Conditions for detailed information regarding submittals.

B. Submittals shall be defined as any information required to demonstrate to the Architect any of the following:

1. Full understanding of the intent of the Contract Documents.
2. Presentation of available choices for product selections when allowed by the Contract Documents
3. Presentation of available choices for product selections when not previously specified in the Contract Documents
4. Requests for substitutions by the Contractor or the Architect.
5. Specification Sections in these Documents enumerate the minimum number of submittal items required by the Contract. The Architect may request additional submittals for other items at any time when submittals may be required to fully demonstrate product options or understanding of the intent of the Contract Documents.
6. Nothing in these documents shall limit the Architect's ability to request submittals for items not specifically defined as requiring submittals in the Contract Documents.

C. Refer to Product options and Substitutions for requirements for indicating options and requesting approval of Substitutions elsewhere in **Division 1.**

## 2.02 Procedures

A. Submittals: Transmit each item under AIA Form G810 or a similar approved form.

1. Identify project, Contractor, subcontractor, major supplier.
2. Make submittals in accordance with approved Progress Schedule and approved Shop Drawing Submission Schedule in sequence that avoids delaying work and the progress of other Contractors.
3. Identify pertinent drawing sheet and detail number, and specification section number as appropriate.
4. Identify deviations from Contract Documents.
5. Provide space for Contractor and Architect review stamps.

B. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.

C. Contractor transmittal of submittals to Architect represents that field measurements, field construction criteria, materials, catalog numbers and similar data have been determined and verified.

1. Contractor shall stamp each submittal after Contractor review and prior to transmittal to the Architect.
2. Transmittal of submittals that have not been reviewed and stamped by Contractor shall be returned without review.

D. After Architect's review of submittal, revise and resubmit as required, identify changes made since previous submittal.

1. Architect review of submittals shall be for design concept only and shall not be construed as approving departures from Contract Documents.

E. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly review and report any inability to comply.

## 2.03 Submittal Schedule

A. Submit Schedule of Submittal to Architect within 7 days of contract execution.

B. For each event requiring submittal review and approval by Architect, provide date of required submittal return in order to ensure no delays due to ordering process of materials.

C. Provide a separate typewritten ***Submittal Schedule*** consisting of: list of submittals, related specification section, anticipated date of submittal. Include also:

1. “Preferred” date of return (no free float impact)
2. “Required Date” of return. Accounts for sufficient ordering period so that the latest date for which a Task’s Free float will become zero (0)
3. “Will Delay Project” date of return. Accounts for sufficient ordering period so that the latest date for which a Tasks Total float will become zero (0).
4. Submittal Schedule does not have to be updated during the project.
5. Submittal Dates above shall include provision of review period indicated under Submittal Procedures Section.

## 2.04 Time

A. Submittals shall be made by the Contractor such that no delay is caused to the Work.

B. Review time for submittals shall vary based on the complexity of the submittal and the number of parties who will be required to review the submittal.

1. The Contractor shall assess the complexity of each submittal and ensure that submittal occurs at a time prior to construction that allows adequate review time for the submittal.
2. No maximum time is herein stipulated for submittal review.
3. Extended time for submittal review shall not be the basis for delay claims by the Contractor.
4. The Architect shall seek to review submittals in a timely manner and shall provide due diligence to facilitate review by other parties. The Architect shall not be responsible for delays resulting from extended review of submittals when the submittal was not made by the Contractor with adequate time for review by the Architect.

## 2.05 Shop Drawings

A. Submit 2 sets of prints for review.

1. Shop drawings shall include, but not be limited to:

(a) Refer to specific Sections for requirements

B. Contractor shall review prior to submittal and sign Shop Drawings indicating that Contractor has reviewed drawing prior to submittal and that drawings meet Contract Documents and job conditions. Shop drawings not reviewed by General Contractor prior to submittal to Architect will be returned without review by Architect.

## 2.06 Product Information

A. Submit product literature, cut sheets and other descriptive information as required to define and describe subject products or assemblies. Contractor may submit photocopies or scans of color or glossy product information provided a minimum of two copies of color or glossy original is submitted to be retained by the Architect.

1. Product Information shall include, but not be limited to:

(a) Refer to specific Sections for requirements

B. Contractor shall review prior to submittal and sign Product Information indicating that Contractor has reviewed drawing prior to submittal and that drawings meet Contract Documents and job conditions. Product literature not reviewed by General Contractor prior to submittal to Architect will be returned without review by Architect.

## 2.07 Samples

A. Submit full range of manufacturers' standard colors, textures and patterns for Architect's selection. Submit as complete range of materials to be selected at one time so that Color

Schedule can be completed on the basis of coordinating all colors and materials to be selected.

1. Samples shall include, but not be limited to:

   (a) Refer to specific Sections for requirements

B. Submit samples in conjunction with related product information. When product information accompanies samples, provide only one copy of sample for physical review. Selections and comments will be made on multiple copies of accompanying product literature.

### 2.08 Manufacturers' Certificates

A. Submit certificates, in duplicate, in accordance with requirements of specification section.

### 2.09 Paper Waste

A. Minimize paper waste for all submittals. Provide only the information required. Eliminate peripheral information for products and assemblies not specified or not included for use.

B. Submittals requiring extensive comment, coordination, shall be submitted in reproducible form. The Architect will make comments and notation on one copy and provide reproduced copies for interested parties.

## Part 3. Execution

### 3.01 Not Used

**End of Section**

# Title 24, Part 1: Administrative Requirements

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Division of State Architect Requirements and Coordination | • All coordination required to facilitate DSA Required inspection and special inspection<br>• Completion and filing of Verified Field Reports<br>• Change order procedures meeting DSA requirements<br>• All other requirements of CCR-Title 24-Part 1, Administrative Requirements not specifically noted here that are the contractor's responsibility |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 References / Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining "Industry Standards" and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | California Building Code |

## Part 2. Requirements

### 2.01 General

A. The Work of this project is regulated by the California Department of General Services, Division of State Architect. Contractor is responsible to comply with all requirements regarding Inspection, Observation and Documentation for such projects.

B. Contractor recognizes the authority of the jurisdiction in which the project is being constructed and explicitly agrees to perform all work of this project in conformance with that authority.

C. Rejection of any Work by inspectors responsible to the jurisdiction shall not be the basis for Contract Changes.

## 2.02 DSA Forms

A. DSA forms shall be completed as required by Part 1, Title 24 CCR Chapter 4 and DSA PR13-01 found at http://www.documents.dgs.ca.gov/dsa/pubs/PR_13-01.pdf The following forms are listed as a reference. General Contractor is responsible for those forms so noted.

| Form Name | Number | Filer | Frequency |
|---|---|---|---|
| Project Inspector Qualification and Approval | DSA-5 | Project Inspector | Prior to construction |
| Construction Start Notice/Inspection Card Request | DSA-102IC | Architect | Prior to construction |
| Project Inspection Card | DSA-152 | Project Inspector | At completion of each "Section" as noted in the form. Interim/Final forms are required. |
| Project Inspector's Semi-monthly report | DSA-155 | Project Inspector | Semi-monthly |
| Contractor's Verified Report | DSA-6C | Contractor | At project completion |
| Architect's Verified Report | DSA-6AE | Architect | At completion of each "Section" as noted in DSA-152 form. |
| Project Inspector's Verified Report | DSA-6PI | Project Inspector | At completion of each "Section" as noted in DSA-152 form. |
| Verified Laboratory Report | DSA-291 | Testing Agency | At completion of each applicable "Section" as noted in DSA-152 form. |
| In-Progress Test Report | N/A | Testing Agency | Within 14 days after each test |
| Notice of Completion | N/A | District | At project completion |
| Special Inspection Reports | N/A | Special Inspector | Within 14 Days after each test |
| Special Inspection Verified Report | DSA-292 | Special Inspector | At completion of each applicable "Section" as noted in DSA-152 form. |
| Geotechnical Verified Report | DSA-293 | Special Inspector | At completion of each applicable "Section" as noted in DSA-152 form. |

## 2.03 Observation (Ref Part 1, Title 24, CCR: Section: 4-333.a)

A. The Architect will observe the work of construction periodically. The contractor shall facilitate this observation by allowing the architect full access to the work area during normal hours of construction work.

## 2.04 Inspection (Ref Part 1, Title 24, CCR: Section: 4-333.b)

A. The District shall provide for and require competent, adequate and continuous inspection by an Project Inspector (PI) satisfactory to the Architect and approved by DSA

B. The General contractor shall provide the Project Inspector access to all areas of construction at any time during the construction period.

C. The cost of project inspection shall be paid for by the District

D. General Contractor shall provide Project Inspector minimum 48 hours written notification for all required inspections. General contractor shall utilize inspection request form provided by Project Inspector.

E. All Inspection requirements as indicated in DSA form 103 (T&I Form) shall be met and coordinated with the Project Inspector

F. Contractor shall not schedule processes or installations requiring Project Inspector oversight during weekends.

G. Per Title 24 , CCR: Art 5: 4-342.3: "The inspector as a condition of employment shall have and maintain on the job at all times, the edition of title 24 Parts 1,2,3,4,5 and 6 referred to in [these] plans and specifications."

## 2.05 Special Inspection (Ref Part 1, Title 24, CCR: Art. 5: 4-333.c)

A. Special inspection shall be undertaken as noted in the construction documents

B. Special inspection shall be undertaken by Special Inspectors approved by DSA for inspection of particular disciplines of construction

C. If qualified, the Project Inspector may also be designated as a Special Inspector.

D. Special Inspectors shall be employed by the District's Testing Laboratory

E. All deficiencies discovered by the Special inspector shall immediately be reported to the Project Inspector.

F. Contractor shall not schedule processes or installations requiring Special Inspection oversight during weekends.

## 2.06 Supervision by DSA (Ref Part 1, Title 24, CCR: Art. 5: 4-334)

A. During construction, the Field Engineer from the Division of the State Architect may visit the site at any time in order to verify the work is proceeding according to the approved construction documents.

B. The General contractor shall provide the DSA Field Engineer access to all areas of construction at any time during the construction period. Advance notification by DSA should not be expected.

## 2.07 Testing Laboratory Services

A. District will appoint, employ, and pay for services of an independent firm to perform field and laboratory testing per requirements of CCR Title 24 Part 1.

B. The independent firm will perform inspections, tests, and other services as described in the Statement of Structural Testing and Inspection form included in the Contract Documents.

# Part 3. Execution

## 3.01 General

A. It is the duty of the contractor to complete the work covered by this contract in accordance with the approved plans and specifications.

B. If at any time it is discovered that work is being done which is not in accordance with the approved plans and specifications, the contractor shall correct the work immediately.

C. All inconsistencies or items that appear to be in error in the plans and specifications shall be promptly called to the attention of the architect through the inspector for clarification at once.

D. In no case shall the instruction of the architect be construed to cause work to be done that is not in conformity with the approved plans, specifications and change orders.

E. The Contractor shall not carry on work except with the knowledge of the project inspector.

## 3.02 Verified Reports

A. Contractor shall complete final verified field report (form DSA-6) and file two copies at completion of project with the Division of the State Architect.

## 3.03 Inspections

A. For all inspections required as noted in other areas of the construction documents, notify Project Inspector and Special Inspector at least 48 hours in advance. Weekend inspections will not be performed.

B. Project Inspector may require memorial inspections of specific items. These may be reviewed during pre-construction meeting. Although the Project Inspector may be on site continuously, it is still the General Contractor's responsibility to provide proper notification of required inspection.

C. If a particular inspection fails more than twice, the Project Inspector's fees for subsequent inspections will be charged to the general contractor. Prorated based on Inspector Agreement.

D. Project Inspector will keep track of all additional services required due to failed inspections. All fees for these additional services will be deducted from final payment.

## 3.04 Testing Laboratory Services

A. General Contractor shall review the Testing and Inspection form on the Title Sheet of the drawing package and notify all parties (Inspector, Architect, District) seven (7) days prior to any required testing or special inspection.

B. One copy of test reports shall be forwarded to DSA, The Architect, The Structural Engineer and the Project Inspector by the testing agency within 14 days of the date of the test.

C. Re-testing: Contractor shall schedule all required tests with Project Inspector, who will in turn notify the Testing Laboratory or Testing Agency at least 48 hours prior to test. Weekend inspections will not be performed.

D. Re-testing required because of non-conformance to specified requirements will be charged to the Contractor.

E. Any items requiring testing that do not pass tests will be corrected by General Contractor at no expense to District.

F. In the event that the General Contractor requests an inspection by Testing Laboratory or Testing Agency (via the Project Inspector) but the particular item to be tested is not ready

for the inspection or test, the General Contractor shall pay all associated costs assessed by testing agency.

G. Cooperate with independent firm; furnish samples as requested.

H. All charges and payments must be made to the District. No payments from contractor to the testing lab, special inspectors, or project inspector are permitted.

**End of Section**

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Section 01 41 00

# Regulatory Requirements and Trade Standards

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| General | • Applicable References<br>• Trade Standards |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 References / Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

B. Perform the Work in conformance with the latest edition of all applicable regulatory requirements and referenced standards, including, but not limited to, the following:

References

- 2019 Building Standards Administrative Code, Part 1, Title 24 CCR
- 2019 California Building Code (CBC), Part 2, Title 24, CCR(2018 IBC, Volumes 1-2 & 2019 CA Amendments)
- 2019 California Electrical Code, (CEC), Part 3, Title 24 CCR
  - 2017 NEC & 2019 CA AMDT
- 2019 California Mechanical Code, (CEC), Part 4, Title 24 CCR
  - 2018 UMC & 2019 CA AMDT
- 2019 California Plumbing Code, (CEC), Part 5, Title 24 CCR
  - 2018 UPC & 2019 CA AMDT
- 2019 California Energy Code, (CEC) Part 6, Title 24 CCR
- 2019 California Fire Code (CFC), Part 9, Title 24 CCR
  - 2018 IFC & 2019 CA AMDT
- 2019 California Referenced Standards Code, Part 12 Title 24 CCR

- Title 19 CCR Public Safety State Fire Marshall Regulations
- 2007 ASME A17.1 (w/ A17.1a/CSA B44a-08 Addenda)
    - Safety Code for Elevators and Escalators
- ASD Manual of Steel Construction, 15th Edition
- 2018 Revised National Design Specification for Wood Construction
- ACI-318-14
- NFPA 13 Automatic Sprinkler System, 2016 Ed.
- NFPA 14 Installation of Standpipe and Hose Systems (CA AMDT), 2019 Ed.
- NFPA 17 Dry Chemical Extinguishing Systems, 2017 Ed.
- NFPA 17A Wet Chemical Extinguishing Systems, 2017 Ed.
- NFPA 20 Stationary Pumps, 2016 Ed.
- NFPA 24 Installation of Private Fire Service Mains (CA AMDT), 2019 Ed
- NFPA 72 National Fire Alarm Code (CA AMDT), 2019 Ed.
- NFPA 80 Fire Doors and Other Opening Protectives, 2016 Ed.
- NFPA 92 Standard for Smoke Control Systems, 2015 Ed.
- NFPA 2001 Clean Agent Fire Extinguishing Systems, 2015 Ed.
- ADAAG: Americans with Disabilities Act Accessibility Guidelines
- Any Referenced standards noted in the Contract Documents.
- California Labor Code
- Federal Occupational Safety and Health Administration (OSHA).
- California Occupational Safety and Health Act (CAL/OSHA).

## 1.04 Conflicts

A. Notify the Architect in writing to determine proper course of action when conflicts occur:

1. Between Referenced Regulatory Requirements, OR
2. Between Referenced Regulatory Requirements and Contract Documents, OR
3. Between Contract Documents:

## 1.05 Applicable Reference Standards

A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is specified.

C. Obtain copies of standards when required by Contract Documents. Maintain copy at jobsite during progress of the specific work.

## 1.06 Industry Standards

A. The Contractor shall acknowledge that many products, systems and assemblies may not be fully specified herein. For such items, the Architect shall be able to rely on Industry Standards for determination of satisfaction of quality expectations.

B. Refer Quality Control section of Division 1.

C. Refer Quality Assurance section of Division 1.

## Part 2. Products

**2.01 Not Used**

## Part 3. Execution

**3.01 Not Used**

**End of Section**

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# Quality Assurance Procedures

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws Apply To The Work Of This Section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| General Qualifications | • General Quality Assurance<br>• Fabricator Qualifications<br>• Installer Qualifications<br>• Manufacturer Qualifications<br>• Testing Agency Qualifications |

B. Related work may be described in other sections of this project manual. All sections of this Project Manual and all other Contract Documents shall be considered related by the Contractor. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 Quality Expectation

A. Quality expectation shall be defined by these Documents, by References cited herein either directly or indirectly, and by reasonable Industry Standards.

B. Where not explicitly defined herein, levels of Quality required for any product, material, installation or assembly shall be measured against standards expressed or defined in comparable areas of similar industries.

1. Industry Standard shall be determined by any one of the following:

   (a) Explicit Quality standards not included herein but available from manufactures either specified herein or used in comparable situations on other projects of similar nature.
   (b) Implied quality standards based on comparison of similar components on projects of similar nature.
   (c) Basic functional and performance standards that can be reasonably inferred from similar products in dissimilar situations.
   (d) Direct comparison with existing construction either within the District or the region.

## 2.02 General Quality Assurance

A. Quality-control services include inspections, tests, and related actions including reports, performed by Contractor, by independent agencies, and by governing authorities.

B. The Contractor shall provide all necessary materials and labor to insure Quality Control and adherence to the levels of quality defined in the Contract Documents.

C. The District will employ and pay a qualified independent testing agency to perform tests and inspections specified in other Sections, and those required by authorities having jurisdiction.

1. Contractor is responsible for scheduling inspections and tests.
2. Provision by the District of Independent Testing and Inspection does not relieve the Contractor of any responsibility for achieving levels of Quality specified herein prior to Inspection and testing.
3. Retesting: Contractor shall reimburse the school District for retesting where results of inspections and tests prove unsatisfactory and indicate noncompliance with requirements.

D. The Contractor shall be responsible to require and verify the qualifications of all suppliers, subcontractors and material handlers. Qualifications shall be consistent with requirements of all trades, regulatory requirements, related specification sections and industry standards.

E. Contractor shall monitor quality control over fabricators, installers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

1. Contractor shall be required to monitor quality on a pre-emptive basis in order to prevent work from being performed incorrectly.
2. Reliance solely on removal of rejected work shall not meet this requirement nor shall it constitute compliance with the requirements of the Contract.

F. Contractor shall assure that all selected Fabricators, Installers and Manufacturers are qualified to produce their respective portions of the work to level of quality specified or as defined by Industry Standards and Expectations.

1. Contractor shall verify that all elected Fabricators, Installers and Manufacturers intend to install their work according to the requirements of the Contract Documents. Such verification shall be based on preliminary review of methods, means and materials, preliminary verbal and written coordination, preliminary instruction and directive and any other means necessary to assure quality performance.

G. The Architect shall retain the right to cite “Industry Standard” as a basis for required quality for all common materials, assemblies and components used in similar installations throughout the region.

H. Comply fully with manufacturers' instructions.

I. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

J. Whenever a material, article or piece of equipment is identified on the Drawings or in the Specifications by reference to the manufacturer's or vendor's names, trade names, catalog numbers, or the like, it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturer's or vendor's which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article or piece of equipment so proposed is, in the opinion of the Architect, of equal substance, appearance and function. It shall not be purchased or installed by the Contractor without the Architect's written approval.

## 2.03 Qualifications

A. The Contractor shall assure and be responsible for providing Fabricators, Installers, Manufacturers that meet the quality standard defined in, or implied by, the Contract Documents or stated in any referenced regulatory statute, referenced trade standards or any other applicable regulatory instrument.

B. The Contractor shall assure that any testing and inspection agency utilized by the Contractor or any Fabricator, Installer or Manufacturer meets applicable governmental standards for their particular field of expertise and participation.

## 2.04 Fabricators' Installers', Manufacturers' Field Services and Reports

A. When specified in respective specification sections, require material or Product manufacturer or supplier to provide qualified staff personnel to observe site conditions and to initiate instructions when necessary.

B. When specified in individual specification Sections, require suppliers or manufacturers to Observe field conditions, including conditions of surfaces and installation.

1. Observe quality of workmanship.
2. Provide recommendations to assure acceptable installation and workmanship.
3. Where required, start, test, and adjust equipment as applicable.

C. Report observations and site decisions or instructions that are supplemental or contrary to manufacturers' written instructions.

## 2.05 Supervision

A. Field Services shall include, but not be limited to:

1. Field Measurement and Inventory
2. Delivery and Handling Supervision
3. Installation Supervision
4. Start Up and Operation Supervision
5. Commissioning Participation as defined elsewhere in Division 1.

B. All Field Services necessary to provide, install and verify satisfactory operation of any material, assembly, device or installation shall be considered a requirement of this Contract.

C. The Contractor shall provide full time supervision and observation of all construction activities to ensure that Quality standards are being met.

D. The Contractor shall not rely on observation by the District, Architect or Inspectors to maintain Quality Assurance over construction activities. It is the sole responsibility of the Contractor to provide, construct and deliver all project components at quality levels defined in these documents and equal to quality levels defined by, and occurring in, standard industry procedures and processes.

1. Contractor acknowledges that the requirements for supervision defined in the Contract do NOT fix responsibility for Quality Assurance upon the District, Architect, Inspectors or other outside entity. Such Quality Assurance as may be offered by any of these parties is supplemental to the requirements of the Contract and not in lieu of requirement of the Contract.

## 2.06 Inspection and Testing Laboratory Services Provided by District

A. Refer to Section 01 35 00 for specific requirements related to Inspection regulated by the Division of State Architect (DSA).

B. Auxiliary Services: Contractor shall cooperate with agencies and laboratories performing inspections and tests. Provide auxiliary services as requested. Notify lab or agency in

advance of operations requiring tests or inspections, to permit assignment of personnel. Auxiliary services include the following:

1. Access to the Work.
2. Incidental labor and facilities to assist inspections and tests.
3. Adequate quantities of samples of materials that require testing, and assisting in taking samples.
4. Facilities for storage and curing of test samples.
5. Security and protection of samples and test equipment.

C. The Contractor explicitly accepts the jurisdiction of this project as a condition of the Contract and agrees to accept and incorporate the results of all actions taken by personnel of this jurisdiction in administering testing and inspection services.

1. Jurisdiction personnel may include direct employees of the jurisdiction or independent inspectors and testing personnel employed either by the jurisdiction or stipulated for inclusion on this project by the jurisdiction.

## 2.07 Inspection and Testing Laboratory Services Provided by Contractor

A. Not specifically required as part of this Contract. May be required as part of individual Specification Sections or to achieve specific levels of quality defined elsewhere in this specification.

B. Duties of Testing Agency: When provided by Contractor, Testing agency shall cooperate with Architect and Contractor in performing its duties. Agency shall provide qualified personnel to perform inspections and tests.

1. Agency shall notify Architect and Contractor of irregularities or deficiencies observed in the Work during performance of its services.
2. Agency shall not release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
3. Agency shall not perform duties of Contractor.

C. Submittals: Testing agency shall submit a certified written report of each inspection and test to the following:

1. District.
2. Architect.
3. Contractor.
4. Structural Engineer.
5. Authorities having jurisdiction, when authorities so direct.

D. Report Data: Reports of each inspection, test, or similar service shall include at least the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making the inspection or test.
6. Designation of the Work and test method.
7. Identification of product.
8. Complete inspection or test data.
9. Test results and an interpretation of test results.
10. Ambient conditions at the time of sample taking and testing.
11. Comments /Professional Opinion Regarding Tested Work
12. Name and signature of laboratory inspector.

13. Recommendations on retesting or re-inspection.

E. Qualifications for Service Agencies: Engage inspection and testing service agencies that are prequalified as complying with the American Council of Independent Laboratories' "Quality Assurance Manual" and that specialize in the types of inspections and tests to be performed.

1. Each agency shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

### 2.08 Construction Photographs

1. Refer Progress Documentation Section of Division 1.

## Part 3. Execution

### 3.01 Not Used

**End of Section**

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# Temporary Facilities

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

B. This section describes construction operations, temporary construction facilities, temporary controls, including

| Item | Description |
|---|---|
| Construction Operations | • Field office, communication facilities, toilets<br>• Construction Fencing and Barricades<br>• Construction Caution Signage<br>• Ventilation<br>• Electricity and lighting<br>• Water<br>• Removal of Temporary Facilities |

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 References / Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • Comply with NFPA 241, "Standard for Safeguarding Construction, Alterations, and Demolition Operations"; ANSI A10 Series standards for "Safety Requirements for Construction and Demolition"; and NECA Electrical Design Library's "Temporary Electrical Facilities."<br>• Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70. |

# Part 2. Requirements

## 2.01 General

A. Contractor shall provide and maintain such Temporary Facilities to support the work of this Contract.

1. Include facilities necessary to manage the project and support the construction operations
2. Include facilities necessary to maintain operation of the remainder of the building / site for use by the District including temporary utilities, access routes and safety components.

## 2.02 Field Office, Communication Facilities, Toilets

A. Location of Field Office shall be determined with Architect prior to the start of construction.

1. Provide full communication capabilities to project Superintendent as defined below.

B. Contractor shall provide the following capabilities at in at least one site location.

1. Provide minimum work space for review of plans and specifications.
2. Provide a conference table and seating to accommodate Project Meetings.
3. Provide a separated  for use by the Project Inspector.
4. Maintain a minimum of 1 telephone line for voice communications, 1 data line for e-mail. (telephone line and Wifi access will be provided by District)
5. Provide a telephone hand set, computer, scanner and printer
6. Provide posting space for Project Schedules
7. Provide posting space for all required State, Local and Federal publications relating to Labor, Safety and Discrimination.

C. Provide portable toilets for use by all members of the construction crew.

1. Toilets shall meet all state and local requirements regarding Accessibility, Sanitation and Fixture Count.
2. No Construction Personnel may use student toilets on campus for any purpose.

## 2.03 Construction Fencing and Barricades

A. Refer to Security – Safety section of Division 1.

## 2.04 Construction Caution Signage

A. Refer to Security – Safety section of Division 1.

## 2.05 Use of Existing Utilities / Systems

A. The Contractor may request usage of existing systems, utilities and devices that may remain operational in the Work Zone. Such usage may only be granted by the Architect upon written request.

1. All such systems shall become the responsibility of the Contractor. The Contractor shall provide all maintenance, repairs, required safety inspections and related service, and replacement upon failure.
2. For systems designated for abandonment as part of the project, the Contractor may utilize systems with permission. The Contractor assumes responsibility for these systems until such time as they are taken out of service as part of the Work of this Contract.
3. This stipulation applies to all utilities and systems listed below as well as any not identified herein but for which usage is requested by the Contractor.

## 2.06 Electricity and Lighting:

A. Provide service required for construction operations, with branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords.

1. Contractor may use existing power supplied by District for construction operations provided capacity is adequate to maintain existing District operations. Contractor shall verify capacity.
2. Contractor may use existing power supplied by District for construction trailer.
3. All required connections shall be provided by general contractor and shall meet all applicable building codes.

B. Maintain lighting and power at all District-occupied spaces during construction at all times. Any planned interruptions in service must be arranged with District at least 48 hours in advance.

1. Refer to Work Restriction section in Division 1 for shutdown requirements.

C. Permanent lighting may be used during construction where power is adequate and usage will not adversely affect ongoing District operations of the facility.

## 2.07 Water

A. Provide service required for construction operations, with temporary piping as necessary to serve all areas of construction work. Temporary piping shall be installed and assembled so as to prevent leakage or failure during construction operations and after hours.

1. Contractor may use existing water supply for construction operations.

B. Maintain water to all occupied portions of building throughout construction period. Coordinate temporary water shutdowns with District. Provide minimum 48 hrs. Notice to allow District to notify tenants and users prior to shutdowns.

1. Refer to Work Restriction section in Division 1 for shutdown requirements.

C. Coordinate major shutdowns (facility wide) a minimum of (1) week in advance so that occupants may prepare alternate schedules and uses.

1. Refer to Work Restriction section in Division 1 for shutdown requirements.

D. Contractor is responsible for provision of all temporary water lines to bypass construction area. Provision shall include tie-in to existing lines, inclusions of any valves necessary for subsequent control, and coordination with water system as designed.

## 2.08 Fire Protection

A. Refer to Security – Safety section of Division 1.

## 2.09 Removal of Temporary Facilities:

A. Remove temporary facilities and controls before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to District.

1. At the earliest possible time, change over from use of temporary utility services to use of permanent utilities.

B. Remove Contractor provided Cautionary Signage.

C. Clean and repair damage caused by installation or use of temporary facilities.

## Part 3. Execution

### 3.01 Not Used

**End of Section**

# Security and Site Safety

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Site Security / Safety | • Site Safety<br>• Material Safety<br>• Equipment Safety<br>• Public Safety<br>• Construction Fencing and Barricades<br>• Construction Caution Signage<br>• Security Lighting<br>• Fire Protection<br>• Mandated Security Requirements |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 References / Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • Comply with NFPA 241, "Standard for Safeguarding Construction, Alterations, and Demolition Operations"; ANSI A10 Series standards for "Safety Requirements for Construction and Demolition"; and NECA Electrical Design Library's "Temporary Electrical Facilities."<br>• Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70. |

## Part 2. Requirements

### 2.01 Site Safety

A. The Contractor is fully responsible for safety of the Work Zone, Staging Area and all Contractor occupied areas as well as any other areas of the Site occupied by or used for any purposes by the Contractor or Sub-Contractors.

B. The Contractor shall comply with all local, State and Federal requirements for worker safety.

C. The Contractor shall maintain written Safety procedures, methods and shall conduct regular Safety briefings throughout the Construction period.

### 2.02 Material Safety

A. The Contractor is responsible for the safe storage, handling and dispensation of all materials, products and assemblies associated with the Work of this project.

1. Material storage areas shall be fully isolated from the access by the public by means of Security Fencing.

B. The Contractor shall maintain copies of all Material Safety Data Sheets (MSDS) on site at all times.

### 2.03 Equipment Safety

A. The Contractor is responsible for the safe handling, operation and safety required maintenance of all equipment, tools and machinery associated with the Work of this project.

1. Equipment stored on site shall be fully isolated from the public be means of Security Fencing.

### 2.04 Public Safety

A. The Contractor is responsible to protect the Public from harm caused by any aspect of the construction operation.

1. Methods shall include, but not be limited to, fencing, barricades, area closures, signage, announcements, etc.
2. Provide visual screening for all welding operations to ensure that no member of the public can obtain a direct view of the welding arc.
3. Provide barricades for all lifting, craning and other overhead operations, including operations on roofs near occupied areas.
4. Provide pedestrian and traffic control as necessary to restrict access during incidental operations that pose safety risks.

B. The Contractor shall report recurring violations of fencing and barricades by the public to the District immediately and shall use all reasonable means to remove violators from the Work Zone.

C. The Contractor shall observe all workers, sub-contractors, suppliers and equipment operators for unsafe behavior and terminate the behavior immediately.

D. The District maintains a Zero-Tolerance policy for Public Safety Violations and will reserve the right to immediately cease all construction operations if a violation is observed.

1. The District reserves the right to request a safety inspection from the governing authority at any time. Inspection may be requested from Cal-OSHA. If an inspection is requested, the Contractor shall correct any violations and provide the District with certification and clearance.

## 2.05 Construction Fencing and Barricades

A. The Contractor is fully responsible for security of the Work Zone, Staging and Parking Areas. These areas will be determined in conjunction with Architect prior to start of construction. The Contractor shall maintain physical security by providing the following:

1. Construction Fencing:

   (a) Construction fencing shall consist of chain link panels with opaque fabric to block all views of construction activities. Refer documents for locations. (These are located inside the building between areas of student activities and construction activities)
   (b) Fencing shall be provided as indicated in these documents.

      *(i) Fencing shall be required between the Parking lot and the school buildings as necessary to prevent access to the Work Zone by the public. Location of contractor parking area to be determined prior to start of construction.*
      *(ii) Full perimeter fencing is not required. However;*
      *(iii) Fencing shall be installed as necessary to prevent public entry to construction areas and to protect adjacent areas from damage from construction operations.*
      *(iv) Contractors shall provide fencing to ensure complete visual and physical separation between students and workers, at both interior & exterior work areas.*

   (c) Maintenance of the construction fencing is the responsibility of the General Contractor. Contractor shall check the condition of the fencing every day, including weekends and any other days that work is not in progress. Repair any deficiencies found immediately.
   (d) Include construction fencing as required to isolate storage and staging areas from the public. Refer to drawings for specified staging and parking areas.

2. Provide barriers to separate work areas from areas of partial occupancy. Include dust barriers where required. Coordinate installation of all barriers with District.

## 2.06 Construction Caution Signage

A. The Contractor shall post and maintain Caution Signage at all Construction Fences and barricades.

1. Standard Cautionary Signage will be provided by the Contractor. The Contractor will be responsible to post this signage, relocate it when fences are moved and notify the Architect when signage has been damaged or removed.
2. Contractor shall re-install District provided signage when it has been removed or otherwise damaged.

B. The Contractor shall maintain additional signage, tape, lighting and other markings as required by Cal-OSHA and other State and Federal regulations.

## 2.07 Security Lighting:

A. Maintain existing Security Lighting throughout the Work Zone.

B. Where portions of buildings remain unlocked after hours, provide interior and exterior night lighting at all entries and throughout the interior. Lighting levels shall provide the ability to see persons moving in the building at night.

C. Provide additional security lighting where walk ways, corridors or other public ways have been altered in any way as a result of construction.

1. This applies to areas where fencing has intruded into existing walk ways and corridors and existing night lighting is not available.

### 2.08 Fire Protection

A. Provide temporary fire protection until permanent systems supply fire-protection needs.

1. Provide adequate numbers and types of fire extinguishers. Clearly label the extinguishers. Place within 75 feet of any construction operations. Extinguishers shall have current certification tag attached.
2. Store combustible materials in fire-safe containers in fire-safe locations.
3. Prohibit smoking.
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
5. Welding shall comply with CFC Chapter 35 (Hot Work).

B. Barriers described above shall be maintained and placed so that emergency egress from any buildings under construction or occupied by students and faculty is not hindered.

C. Maintain minimum 15 ft. wide corridors or passage ways between fencing and occupied buildings where exits occur at occupied buildings.

D. All construction barriers, material stockpile and equipment shall be placed so as to allow access by Fire Department Vehicles in case of fire.

### 2.09 Mandated Security Requirements

A. Refer to the Specific Conditions item 5 for Fingerprinting requirements.

1. The Contractor shall ensure that contact with students at active school sites is limited per the definitions in Division 1.

B. The District has a strict Tobacco Free policy. All tobacco use, including smoking, chewing or any other means of use is prohibited in any area of the work zone or other District facilities.

1. The District maintains a Zero Tolerance policy regarding Tobacco use. Observation of any such usage may be grounds for work stoppage and termination.

C. The District maintains a Zero Tolerance policy regarding alcohol and drug use. Observation of any such usage may be grounds for work stoppage and termination.

1. The Contractor shall seek to observe any such use on the part of its employees or those of any supplier or subcontractor present on District property. The Contractor shall report any such observation to local authorities and shall so notify the District.
2. The Contractor shall immediately discipline persons observed to have used alcohol or drugs either on District property or prior to arrival on District property. Discipline may include termination.

D. All Contractor and subcontractor employees shall wear bright orange construction vests at all times while on job site.

## Part 3. Execution

### 3.01 General

A. All Site Safety Features shall be in place and operable prior to start of construction.

B. Ongoing Site / Material and equipment Safety practices shall be instituted at appropriate times as required for any particular construction operation.

C. Site Safety features, components, practices and documentation are required to be current and applicable in order to facilitate approval of monthly Application for Payment.

**End of Section**

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Section 01 61 00

# Basic Product Requirements

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Product Requirements | • Expectations regarding product selections |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 General

A. Products include material, equipment, and systems.

B. Comply with Specifications and references standards as minimum requirements.

C. Provide items that are undamaged, and are new at the time of installation.

D. Provide products and equipment complete with accessories, trim, finish, and other devices and components needed for a complete installation and the intended use and effect.

E. Do not attach manufacturer's labels or trademarks, except for required nameplates, on surfaces exposed to view in occupied spaces or on the exterior.

F. All products shall be shipped and handled so as to protect the interests of the District as regards to Product Warranty and longevity.

### 2.02 Selection

A. Select products as follows:

1. Where these Specifications name only a single product or manufacturer, provide the item indicated. No substitutions will be permitted.
2. Where these Specifications name 2 or more products or manufacturers, provide 1 of the items indicated. No substitutions will be permitted.
3. Where products or manufacturers are specified by name, accompanied by the term "or equal," comply with provisions concerning "product substitutions" to obtain approval for use of an unnamed product or manufacturer.

(a) Refer to Product Substitutions section of Division 1.

4. Where these Specifications describe a product and list characteristics required, with or without naming a brand or trademark, provide a product that complies with the characteristics and other requirements.
5. Where these Specifications require compliance with performance requirements, provide products that comply and are recommended in writing by the manufacturer for the application.
6. Where these Specifications require compliance with codes, regulations, or reference standards, select a product that complies with the codes, regulations, or reference standards.

B. Unless otherwise indicated, Architect will select color, pattern, and texture of any product from manufacturer's full range of options.

1. Unless otherwise specified, the Architect shall not be limited to “standard” options. Premium colors, textures or other features may be selected based on any such choice offered by the manufacturer.

### 2.03 Specified Manufacturers

A. In accordance with California Public Contract Code section 3400, any item listed in this Specification with only one manufacturer has been specified in order to match others currently in use by the District, therefore no equals exist.

B. Where multiple manufacturers are listed, substitutions of items with the same function, performance and appearance are acceptable in accordance with Division 1 Sections.

### 2.04 Expectation

A. It is the expectation of this Contract that all materials specified or implied in the Contract Documents will provide the District with the full service life and performance indicated or implied by the manufacturer.

1. This shall require that all products, materials and assemblies are installed properly and according to industry standard and manufacturer instructions on the first installation.
2. Re-installation based on rejection of any work related to this product or to substrate products may be grounds for determination that the service life has been reduced and may result in rejection of the product under this paragraph.

B. It is the expectation of this Contract that no action on the part of the Contractor shall reduce the service life, performance or visual quality of any of the Products specified or implied.

C. The Architect retains the right to reject any product that appears to have been mishandled or otherwise dispatched such that service life appears to have been reduced.

## Part 3. Execution

### 3.01 Not Used

**End of Section**

# Product Options and Substitutions

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Option Procedures | • Identification of Options selected from listed materials and products specified in other Sections of this Specification |
| Substitution Procedures | • Procedures for requesting Substitution of unlisted materials in lieu of materials named in Specification or approved for use in addenda. |

*B. Bidders and selected contractor are required to prove to the Architect, and District that any proposed substitutions are equal to proprietary items specified. If validation is not provided, a substitution will not be approved. Also described below are timelines for submittal and acceptance of substitutions. Meeting these requirements is critical to ensure fairness amongst bidders.*

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

1. Catalog Cuts: Provide manufacturers product information for all components required for manufacture and fabrication, including but not limited to the following:
2. Samples: Provide samples for initial selection purposes in form of manufacturer's color charts, actual units or sections of units, products or assemblies. Provide samples showing full range of colors, textures, and patterns available for each type of material indicated including but not limited to the following:
3. Shop Drawings: Provide shop drawings showing location of each item, dimensioned plans and elevations, installation components, accessories including but not limited to following:
4. Product Data: Provide product data for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation:

5. Schedule: Provide Schedule defining location, installation, sequence or other information including, but not limited to, the following:

| | |
|---|---|
| **Product List** | • Within 30 days after award of Contract, submit a complete list of major products which are proposed for installation, with name of manufacturer, trade name, and model. |
| **Catalog Cuts** | • Per Specification Section describing Options<br>• For all Substitutions |
| **Samples** | • Per Specification Section describing Options<br>• For all Substitutions |
| **Shop Drawings** | • Per Specification Section describing Options<br>• For all Substitutions where appropriate or as directed by Architect |
| **Product Data** | • Per Specification Section describing Options<br>• For all Substitutions |
| **Schedule** | • Provide Schedule of Submittals within 14 Days after award of contract. *THIS IS A REQUIREMENT OF THE CONTRACT. Bidders that do not intend to meet this requirement should not submit a bid.* |

# Part 2. Requirements

## 2.01 Specified Manufacturers

A. In accordance with California Public Contract Code section 3400, any item listed in this Specification with only one manufacturer has been specified in order to match others currently in use by the District, therefore no equals exist.

B. Where multiple manufacturers are listed, substitutions of items with the same function, performance and appearance are acceptable in accordance with Division 1 Sections.

## 2.02 Contractor's Options:

A. For products specified only by reference standard, select product meeting referenced standard.

B. For products specified by naming one or more products or manufacturers, select products of any named manufacturer meeting specifications.

C. For product or manufacturer which is not specifically named submit request for substitution.

D. Where terms "or equal", or “approved equal,” or similar references are made, submit request for substitution for product or manufacturer not specifically named in specifications.

## 2.03 Substitutions During Bidding:

A. During bidding period, Architect will consider formal request from manufacturer's representatives, suppliers, subcontractors and bidding contractors.

B. Contractors shall base proposals on products and systems specified in Contract Documents or listed by name in addenda. Submit request for substitution in writing at least 7 calendar days prior to submission of bids for a particular portion of work.

C. Formal requests shall be in writing and shall provide sufficient information for review.

D. Acceptable substitutions will be listed in addenda.

## 2.04 Substitutions After Award of Contract

A. Reasonable and timely requests for substitutions will be considered. Substitutions include changes proposed by the Contractor after award of the Contract, in products and methods of construction required by the Contract Documents.

B. Within a period of 30 days after award of Contract, Architect will consider formal request for substitutions only from Contractor.

1. After initial period, requests will be considered only when a product becomes unavailable due to no fault of Contractor.

C. Procedure:

1. Do not submit unapproved substitutions on Shop drawings.
2. Submit 4 copies of each request for product substitution. Identify product to be replaced, provide complete documentation showing compliance of proposed substitution with all specified requirements, and include the following:

(a) A full comparison with the specified product.
(b) A list of changes to other Work required to accommodate the substitution. Note effect of substitution on other work, products, or if acceptance of substitution could require revision of drawings, details or specifications.
(c) Any proposed changes in the Contract Sum or Contract Time should the substitution be accepted. Include accurate cost data comparing proposed substitution with products and amount of net change in Contract price.

3. Architect will review the proposed substitution and notify Contractor of its acceptance or rejection.
4. Submit separate request for each product and support each request with product identification with manufacturer's literature and samples where applicable.

D. Substitutions will not be considered for acceptance when:

1. They are indicated or implied on submittals without a formal request from Contractor.
2. They are requested directly by a subcontractor or supplier.
3. Acceptance will require substantial revision of Contract Documents.

E. Substitute products shall not be ordered without written acceptance of Architect.

F. Architect will determine acceptability of proposed substitutions and reserves right to reject proposals due to insufficient information.

## 2.05 Coordination

A. Substitutions requested by the Contractor shall constitute a change to the design in which the Contractor assumes responsibility for the design components related to the substitution.

B. Acceptance of any Substitution proposed by the Contractor shall not imply that responsibility for coordination shall pass to the Architect. Any Substitution proposed by the Contractor shall require that the Contractor has fully reviewed the product in question, its installation and application procedures and its compatibility with related products.

1. The Architect may subsequently reject a Substitution after approval and installation if that substitution results in either failure or reduction in quality of any related material, product or assembly.
2. Rejection for this reason will require that the Contractor revert to the originally specified material, product or assembly and re-install according to the original Contract requirements.

## Part 3. Execution

A. Not Used

**End of Section**

# Owner Furnished Products

**Part 1. General**

**1.01 Summary**

A. Description**:** The Owner shall procure and provide certain products for installation as shown and specified per Contract Documents.

B. Related work specified elsewhere:

1. General: Products furnished and paid for by the Owner are described in the following technical sections and /or in the Drawings.

2. District Supplied Material

(a) Note that this project includes the installation of owner-supplied material; the District has acquired roofing material through the CMAS (California Multiple Award Schedules) program.

**1.02 Definitions**

A. General: The following are used to identify products as noted on the Drawings.

B. Owner Furnished Contractor Installed (O.F.C.I.): Products or equipment furnished by the Owner for installation under this contract.

C. Owner Furnished Owner Installed (O.F.O.I.**):** Products or equipment to be provided and installed by the Owner, but requiring surfacing, backing, utility connections or other preparation under this contract, for proper installation.

D. Not in Contract (N.I.C.): Products or equipment to be provided and installed by Owner, not requiring surfacing, backing, utility connections or other preparation under this contract.

**Part 2. Products**

2.01 **Roofing Material Furnished by Owner (O.F.C.I.):** District supplied material through the CMAS (California Multiple Award Schedules) program. Related specification sections include;

A. Section 07 21 00 Building Insulation

**2.02 Material List**

The following list is intended to provide approximately 75% of the materials required to complete the scope of work defined in these contract documents. Any material or accessories required for the installation of the roof system in excess of the district provided material must be supplied by the Contractor. It is up to the Contractor to determine the precise amount of material required for the completion of this project; and to provide excess material, as required. The cost to handle and break flashing metal from the District provided flat stock is contractor's responsibility.

- 30 – KEE Stone 60 mil FB, 8 sq. roll
- 20 – KEE Stone Flashing FB, 2 sq. roll

- 10 – KEE Stone Utility Roll, 25 sq.ft. roll
- 75 – R-Mer Seal UDL, 2 sq. surface sheet
- 170 – Stressbase 80, 1.5 sq.roll
- 5 – Flashing Bond 5 gal
- 100 – GreenLock Membrane Adhesive 5 gal
- 25 – GreenLock Flashing Adhesive 3.5 gal
- 13 – KEE Foam Box Set
- 5 – Silver Flash 5 gal
- 10 – GarMesh 75ft roll
- 2 – Tuff Stuff Sealant 10.3oz tube case

**Part 3. Execution**

**3.01 Submittals**

Arrange for and deliver necessary shop drawings, product data and samples to Contractor.

**3.02 Delivery**

A. General: Arrange and pay for product delivery to site, in accordance with construction schedule.

B. Bill of Materials: Deliver supplier's documentation to Contractor.

C. Inspection: Inspect jointly with Contractor.

D. Claims: Submit for transportation damage and replacement of otherwise damaged, defective, or missing items.

**3.03 Guarantees:**

Arrange for manufacturer's warranties, bonds, service, inspections, as required.

**3.04 Contractor's Responsibilities**

A. Submittals: Review shop drawings, product data and samples and submit to Architect with notification of any discrepancies or problems anticipated in use of product.

## 3.05 Delivery

A. General: Designate delivery date for each product in Progress Schedule.

B. Receiving: Receive and unload products at site. Handle products at site, including uncrating and storage.

C. Inspection: Promptly inspect products jointly with Owner; record shortages, damaged or defective items.

D. Storage: Protect products from damage or exposure to elements.

**3.06 Installation**

A. General: Assemble, install, connect, adjust and finish products, as stipulated in the respective section of Specifications.

B. Repair and Replacement: Items damaged during handling and installation are the responsibility of contractor.

## End of Section

Section 01 66 00

# Product Storage and Handling

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Product Handling | • Transportation and Handling<br>• Storage and Protection<br>• Shipping and Delivery Limitations<br>• Expectation |

B. *The contractor is responsible for storage and handling of materials. If an item has been delivered and contractor shows that it has been and is in a safe / insured location, the contractor may invoice for those items. A contractor should not assume that there is not space on campus for storage of materials. (do not assume space is available either). Contractor shall contact Architect to determine if materials can be stored on site.*

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 Transportation and Handling

A. Deliver, store, and handle products according to manufacturer's written instructions, using means and methods that will prevent damage, deterioration, and loss, including theft.

B. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.

C. Provide equipment and personnel to handle products to prevent spoiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

### 2.02 Storage and Protection

A. Schedule delivery to minimize long-term storage and to prevent overcrowding construction spaces.

1. Products delivered prior to readiness for either installation or proper storage may be rejected by the Architect.

B. Deliver in manufacturer's original sealed packaging with labels and written instructions for handling, storing, protecting, and installing.

C. Inspect to ensure compliance with the Contract Documents and to ensure items are undamaged and properly protected.

D. Store heavy items in a manner that will not endanger supporting construction.

E. Store items subject to damage aboveground, under cover in a weather-tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required.

F. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

G. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

**2.03 Moisture Protection**

A. All materials and products shall be protected from moisture. Moisture includes precipitation, runoff, condensation and atmospheric humidity.

1. Products shall be stored in dry locations and shall be wrapped according to manufacturer’s instructions.
2. Contractor shall reject any delivery of products when dry storage space is not available.

B. Products shall be stored in interior locations where feasible.

1. When interior locations are exposed to the weather, due to open walls, doors or windows, such spaces shall be considered exterior spaces for purposes of this Section.

C. Products exposed to moisture may be rejected without further testing.

1. Products exhibiting any signs of moisture, such as staining, dampness, mold; may be rejected without further testing.

D. Contractor shall adjust storage methods for seasonal changes in site conditions.

1. Contractor shall provide additional protection in winter months.
2. Building interiors that are not weather tight shall be considered exterior spaces in winter months.

E. If any portion of the building or any products are exposed to moisture, the District may require testing for damage and mold growth. Cost of testing, as well as any required mitigation shall be the responsibility of the Contractor.

**2.04 Expectation**

A. It is the expectation of this Contract that all materials specified or implied in the Contract Documents will provide the District with the full service life and performance indicated or implied by the manufacturer.

B. It is the expectation of this Contract that no action on the part of the Contractor shall reduce the service life, performance or visual quality of any of the Products specified or implied.

C. The Architect retains the right to reject any product that appears to have been mishandled or otherwise dispatched such that service life appears to have been reduced.

**Part 3. Execution**

**3.01 Shipping and Delivery Limitations**

A. All products and materials shall be received by the Contractor at the Work Zone or at the Contractors private facilities.

1. No products may be received by the School Site or the District.
2. Suppliers shall be instructed NOT to make deliveries or delivery inquiries at the School Office or District Office unless explicitly instructed to do so by the Architect.

## End of Section

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Section 01 71 00

# Preparation

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Field Engineering | • Construction Layout<br>• Topographic Controls<br>• Ongoing Horizontal and Vertical Control |
| Protection of Adjacent Construction | • Existing Construction Protection and Isolation<br>• Landscape Protection |
| Existing Utility Location | • Provide locator service and marking of all existing site utilities. |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Quality Assurance

A. Provide the following per Division 1

| Item | Description |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>• Provide staff and equipment as required to adequately assess and control all layout and dimensions.<br>• Provide staff adequately trained and experienced in surveying and topographic assessment.<br>• Provide staff qualified to locate underground utilities. |

| | |
|---|---|
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation. |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item. |
| Structural calculations | • Provide structural calculations as required to meet California Building Code. Calculations shall be by a Structural Engineer licensed in the state of California. Fabrication drawings shall be stamped by a California Licensed Structural Engineer. |

**Part 2. Requirements**

**2.01 Field Engineering**

A. All Field Engineering shall utilize the full breadth of the Contract Documents as dimensional resource for establishing layout and dimensional requirements.

B. Field Engineering activities shall include coordination and verification of dimensional requirements throughout the document set and across the documents prepared by the various design disciplines.

C. Establishment of base points

1. Locate building / site layout base point and clearly mark in the field.
2. Provide semi-permanent monument to be utilized for duration of construction

D. Site layout and controls

1. Provide all layout, dimension control and datum location as required to translate the design intentions of the documents to the actual site layout.
2. Provide semi-permanent monuments for all established lines and levels as required to control construction of the building and installations of site utilities.

E. Topographic controls

1. Provide all vertical controls for grading, excavation, utility installation and building construction.
2. Include all controls for underground utilities.

F. Ongoing horizontal controls

1. Provide ongoing horizontal controls for all building layout and dimension control not readily established by routine construction methods.
2. Maintain all building gridlines and layout points for access by all trades as necessary for the completion of their work

**2.02 Protection**

A. Provide all necessary covering, shielding, screening required to protect adjacent construction from damage during the work of this contract.

1. Refer to Security and Safety section of Division 1.

B. Provide all fencing and barricades required to prevent materials and labor forces from damaging existing site and interior areas during construction.

1. Refer to Security and Safety section of Division 1.

C. Provide dust control measures to prevent both exterior and interior construction dust from penetrating adjacent interior areas or from contaminating exterior areas.

1. Dust control shall include, but not be limited to:

(a) Tarps and coverings
(b) Sealing of exterior openings
(c) Restricted work hours for specific tasks.
(d) Temporary ventilation by means of openings or mechanical ventilation.
(e) Other means as necessary to prevent dust from affecting areas outside the Work Zone.

D. Protect existing landscaping from damage during construction. (at areas that may be effected due to deliveries)

1. Provide barriers, tree fencing and temporary irrigation where necessary.
2. Coordinate all site operations with regard for existing landscaping.
3. Remove plants and turf materials where necessary and stockpile for future replacement.

(a) Removal and storage of plant materials shall be directed by the Architect and shall be done in such a manner as to ensure survival.

4. Protect existing storm water catchment and sewer system from erosion and runoff from construction operations by means of sand bags, silt fencing, or filter fabrics as may be most effective.

**2.03 Utility Location and Marking**

A. Contractor shall provide for location of all existing site utilities.

1. Employ a locator service to locate and identify underground utilities by any means necessary.
2. Provide USA service as necessary for utilities belonging to other entities that may occur in the work zone or be affected by the Work of this project.
3. Provide physical location via sensing equipment, excavation or other means to locate utilities.

B. Architect may be able to provide drawings of existing facilities upon written request.

1. Existing drawings shall not be relied upon for accuracy of utility location. They are schematic in nature and have not been verified by filed investigation unless explicitly indicated.
2. Contractor is responsible for locating all utilities as part of this contract. Reliance on the existing drawings shall not constitute adequate provision of location services.
3. Damage to existing utilities based on failure to adequately locate and mark utilities shall be the responsibility of the Contractor.
4. Damage to existing facilities by the Contractor in areas not in the scope of the contract shall be the responsibility of the Contractor.

**Part 3. Execution**

A. Not Used

## End of Section

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# Execution

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Examination and Preparation | • Management of Construction Sequence<br>• Acceptance of Substrate |
| Cutting and Patching | • All incidental cutting and patching |
| Installation | • Installation coordination, sequencing and verification |
| Systems Connection | • Connection of all new or modified utilities and systems to existing |
| Field Verification | • Dimensional and locational management |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 Examination and Preparation

A. Contractor is responsible for examining all areas, surfaces, existing and new construction prior to the installation of any subsequent construction or materials to determine whether these areas are ready to receive subsequent construction.

1. Examine substrates and conditions for compliance with manufacturer's written requirements including, but not limited to, surfaces that are sound, level, and plumb; substrates within installation tolerances; surfaces that are smooth, clean, and free of deleterious substances; and application conditions within environmental limits. Do not proceed with installation until unsatisfactory conditions have been corrected.
2. Installation of work over any substrate by any personnel represents acceptance of that substrate by the trade installing over substrate.
3. Prepare substrates and adjoining surfaces according to manufacturer's written instructions, including, but not limited to, the application of fillers and primers.

B. Contractor is responsible to insure that all construction sequences occur over areas that have been completed and are physically capable of accepting subsequent construction.

C. Contractor is required to insure that all fabricators, installers and labor forces prepare work in proper sequence and method to achieve completed work of quality and durability intended by the Contract Documents.

D. Contractor is responsible for scheduling and obtaining approval from Project Inspector for work that will be covered by subsequent construction.

## 2.02 Coordination

A. Contractor shall provide full coordination with Architect for District installed or provided items

1. Scheduling of District Performed Tasks

(a) Contractor shall include these District performed tasks in contract schedule so that District can mobilize and complete work when needed in order to not hinder Contractor's schedule.

(b) Contractor shall notify Architect two (2) weeks prior to work required by District. For installations requiring longer lead time, contractor shall provide adequate notification to allow ordering of materials.

B. Contractor is responsible for coordination of the physical location of components provided and installed by various trades.

1. Coordination shall be based on the understanding of each trade of the requirements for clearances, access, and functional characteristics of other items. Installation by any trade shall in no way limit the functional performance of any other item.

C. Contractor shall insure that installation locations of trade items do not conflict with the items of other trades and do not prevent the installation of items from other trades as required by these documents.

D. Contractor is responsible for the relocation and re-installation of any item installed without regard for the subsequent installation of work by another trade.

E. For conflicts based on conflicts in these documents, the Contractor shall notify the Architect requesting resolution. For all other conflicts based on erroneous installation by a trade, the Contractor shall take corrective action so as not to delay the progress of the Work at no additional cost.

## 2.03 Cutting and Patching

A. Contractor is responsible for all incidental aspects of the Work which may require cutting and patching but which do not specifically appear elsewhere in the Documents.

B. Contractor shall provide all incidental or required cutting and patching of materials, assemblies and components not covered explicitly or implicitly in other Sections of this Specification.

C. Where incidental cutting and patching is required for the installation of a specific item or piece of equipment (including piping, ductwork, conduit, etc.), all such cutting and patching is considered to be specified as a part of the Section requiring the cutting and patching.

D. Contractor is responsible for all incidental repairs that may be required as part of normal or deficient construction operations not covered elsewhere in these Specifications.

E. Where the work requires that a particular existing building element such as a ceiling, partition, wall, floor, door, window, or similar element of existing building construction be removed, it may be covered in Demolition sections of this Specification.

## 2.04 Protection

A. Provide all necessary covering, shielding, screening required to protect adjacent construction from damage during the work of this contract.

1. Refer to Security & Safety section of Division 1.

B. Provide all fencing and barricades required to prevent materials and labor forces from damaging existing site and interior areas during construction.

1. Refer to Security & Safety section of Division 1.

C. Provide dust control measures to prevent both exterior and interior construction dust from penetrating adjacent interior areas or from contaminating exterior areas.

1. Dust control shall include, but not be limited to:

(a) Watering
(b) Tarps and coverings
(c) Sealing of exterior openings
(d) Restricted work hours for specific tasks.
(e) Other means as necessary to prevent dust from affecting areas outside the Work Zone.

D. Protect existing landscaping from damage during construction.

1. Provide barriers, tree fencing and temporary irrigation where necessary.
2. Coordinate all site operations with regard for existing landscaping.
3. Remove plants and turf materials where necessary and stockpile for future replacement.

(a) Removal and storage of plant materials shall be directed by the Architect and shall be done in such a manner as to ensure survival.

4. The Contractor is responsible for executing all such work whether or not it is specified in the appropriate Section.

## 2.05 Cutting and Removal

A. Contractor shall verify and check all areas to be cut and patched and shall coordinate the work of the various trades involved.

B. Where existing resilient flooring, ceramic tile, and other similar adhesive or thin-set applied finishes are required, or where substrate will remain exposed, all adhesives, mortars, fasteners, etc., shall be ground, stoned, sanded, or removed to the extent that no ridges, lumps, or other protrusions will telegraph through surface of new finish or be apparent when the substrate is left exposed.

C. Where doubt exists as to the size, location, or method of cutting concrete or any other structural element, Contractor shall contact Architect before proceeding.

D. Do not cut structural members without prior written approval of Architect.

## 2.06 Patching and Repairing

A. Unless specifically designated otherwise, existing work, cut, altered, or revised to accommodate new work, shall be patched to duplicate undisturbed adjacent finishes, colors, textures & profiles; new work in existing portions shall also be finished to match adjacent existing work unless noted otherwise.

B. Where alteration or construction work disturbs existing adjacent finishes, replace with like finish matching appearance, quality, and performance.

C. Should any existing finish to be matched be “out-of-production” or otherwise unavailable material, obtain Architect’s specific approval of any substitution.

D. Provide all primers, sealers, underlayment, supports, backing, blocking, furring, suspension systems, etc., required for any purpose in patching existing work.

E. For patching, provide materials whose installed performance will equal or surpass that of existing materials. For exposed surfaces, provide or finish materials to visually match existing adjacent surfaces to the fullest extent possible.

F. Patch closures at former openings of fixtures, etc., match adjacent finish, profiles of undisturbed work.

G. Finish painting in patched areas shall not present a spotty appearance. Carry finish over complete surface plane in each instance.

H. Except where size of patch or fill requires use of concrete mix, do all patching of concrete slab surfaces with epoxy/sand patching mortar of latex based patching and leveling compounds.

I. Patch all holes and voids in existing plaster surfaces where such surfaces are to be exposed in the finished work, where necessary to provide a proper surface for application of new finish materials and/or where necessary to maintain required fire ratings.

## 2.07 Installation

A. Contractor is responsible for proper installation of all materials, systems, equipment and components.

B. Contractor shall provide adequate inspection, observation, supervision and management as necessary to insure that all such components are installed properly and per manufacturers’ instructions.

C. Comply with manufacturer's written instructions for installation. Anchor each product securely in place, accurately located and aligned. Clean exposed surfaces and protect from damage. If applicable, prepare surfaces for field finishing.

D. Comply with NFPA 70 for installation of electrically operated equipment and electrical components and materials.

E. Routing and Location

1. All components shall be located per drawings and specifications.
2. Where location is not clearly indicated, Contractor shall specifically coordinate location with Architect.
3. Contractor shall review the following for specific location coordination when not explicitly shown on the drawings:

   (a) Surface mounted conduits, raceways and other electrical equipment
   (b) Surface mounted communications and data equipment.
   (c) Location of boxes, outlets, connections and terminals
   (d) Location of panels, controllers and enunciators

4. All routing is intended to occur in the least visibly offensive location (as determined by the Architect, not the Contractor). Routing of raceways shall occur in corners, niches, behind cabinets and any other place where it will not stand out.

   (a) The Contractor will be required to remove any raceway, conduit or related appurtenance that is mounted across the middle of a wall for no other reason than convenience for the installer.

F. Removal of Existing Equipment

1. Where existing equipment is being replaced by new equipment, remove all abandoned equipment, raceways, conduits and related boxes and attachments.
2. Repair surfaces where equipment was removed.

G. All new and modified systems, utilities and components shall be fully tied into existing systems and shall be fully operational at the time of Substantial Completion.

1. Contractor is responsible for full connection of communications, data, and energy management, signal and clock systems.
2. Contractor shall coordinate the work of this project to ensure that necessary raceways, routing and building penetrations occur to make successful connections of all systems to other buildings or utility locations.

H. Contractor shall insure that all materials, products and assemblies are installed according to the following:

1. True, level, plumb and securely attached.
2. Properly aligned with substrate, adjacent construction and related products and assemblies.
3. Flush aligned with adjacent materials where indicated.
4. Materials, products and assemblies shall not be installed damaged, warped, deflected, distorted, bent, dented, scratched, smudged, fingerprinted, smeared, binding, jammed, twisted, crammed, forced, loose, hanging, off-kilter, etc. unless specifically instructed to do so by this Specification or by the Architect.

### 2.08 Field Verification

A. Contractor is responsible to achieve all dimensional and location intentions represented anywhere in the Contract Documents. Contractor shall provide adequate observation and supervision to ensure that all installers and labor forces adhere to location requirements shown in the documents.

B. Continually check and compare dimensions at the site with those shown on the Drawings. Immediately bring discrepancies to the attention of the Architect in writing.

C. Mark on shop drawings, prior to submission to the Architect, all relevant field dimensions and note any conflicts with the submitted material.

## Part 3. Execution

A. Not Used

**End of Section**

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Section 01 74 00

# Cleaning

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Progress Cleaning | • General Cleaning<br>• Specific Product and Assembly Cleaning |
| Final Cleaning | • Final Cleaning and Preparation for Occupancy |
| Site Maintenance | • Ongoing Site Maintenance<br>• Maintenance of Partially Completed Site Systems |

*B. The Contractor is responsible for keeping the jobsite clean and organized. A clean and organized jobsite is a component of a safe jobsite. As a public school facility, it is imperative that job debris be kept hidden from public view. Daily cleaning of the job site is a requirement. Schedule or coordination issues is not an adequate excuse for disregarding these requirements.*

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 Progress Cleaning

A. Provide materials and labor as necessary to maintain the site and existing buildings in a neat and orderly manner.

1. Remove trash from Work Zone perimeters on a daily basis.
2. Remove trash from entire Work Zone on a weekly basis.

B. Provide cleaning of all adjacent site and building areas where ongoing construction operations have caused dust or debris to fall on them.

1. Clean up of debris occurring outside the Work Zone shall occur immediately.
2. Debris remaining for more than 24 hours may be removed by the District and the expense shall be back charged to the Contractor.

C. Provide for any incidental cleaning that may be required as the result of specific construction operations causing dust or debris to locate in occupied areas of the site or adjacent buildings.

1. Contractor shall provide weekly inspection of adjacent site areas for dust and debris.

### 2.02 Final Cleaning

A. Provide materials and labor as necessary to complete final cleaning in preparation for Substantial Completion and Final Completion. Final Cleaning shall include all surfaces and assemblies and shall leave the facility, site and adjacent buildings and all areas affected by construction operations in any way clean and ready for use by the District.

1. All areas of the Work Zone shall appear as new.

B. Mechanical System shall be operated prior to Final Cleaning for a period of time sufficient for construction dust to be fully removed from the system.

1. Min 24 hours

### 2.03 Site Maintenance

A. Where Site Amenities and Landscaping exist within the work zone and these amenities or landscaping are intended to remain after the completion of construction, the Contractor shall provide materials and labor as necessary to maintain such items in clean and working conditions.

B. Landscaping shall be maintained, watered, fertilized if necessary, to insure healthy and continued life after completion of construction.

C. Contractor shall provide temporary watering and fertilization as necessary.

D. Contractor shall coordinate with the District regarding specific requirements, access to water an specific materials.

## Part 3. Execution

### 3.01 General Cleaning

A. Follow the recommendation of the manufacturer of the materials and items to be cleaned for all cleaning, polishing, and treatment materials and supplies.

1. Do not use chemicals or cleaners that will damage any surface, finish, or component in any assembly.
2. Damage as a result of cleaning will be the sole responsibility of the Contractor.

B. Cleaning methods for proprietary materials shall be in strict accordance with manufacturer's instructions. Cleaning solutions, agents, solvents, waxes, or other materials shall be only as approved by manufacturer of the material install in the work.

C. Materials for cleaning existing construction shall be approved in writing by the District.

### 3.02 Site Cleaning

A. Remove all construction equipment from site.

B. Remove all remaining demolition materials from site.

C. Remove all construction debris from site.

D. The Contractor shall also clean any areas adjacent to the work zone in which dust or debris has been tracked by building users and employees as a result of inadequate daily cleaning procedures by the Contractor.

1. Daily procedures shall be utilized to prevent the spread of dirt throughout the building. The District will fully exercise all rights under this provision to ensure adequate clean-up.

## 3.03 Dust Control

A. Maintain dust control during entire project duration.

1. Provide site watering during excavation and grading
2. Provide site watering during cleanup and seeping activities.
3. Provide tarps and other enclosures around areas of the work that will generated high levels of dust.
4. Provide plastic enclosure of rooms, windows, doors where dust may carry to other parts of the school site.

B. Maintain dust control during final cleaning. Ensure that exterior clean-up operations, including street sweeping, do not contaminate interior spaces, both existing and new.

1. Provide specific measures to ensure that existing draperies remain free of construction dust.

C. After final cleaning, all existing landscaping shall be washed with clean water to remove surface dust from leaves.

## 3.04 Repairs

A. Repair all building components damaged as a result of construction operations.

1. Repair damage to any new or existing cabinetry, woodwork and interior finishes
2. Repair all surfaces where temporary attachments occurred, such as shoring or temporary barricades. Repairs shall be appropriate to the material damaged and the extent of the damage.
3. The Architect retains the right to reject any repair method not adequate to return the subject material or surface to its original condition.

## 3.05 Site Maintenance

A. Provide temporary irrigation for existing landscaping to remain located within the work zone.

1. Provide coordination with the District to acquire and apply any necessary fertilizers, supplements to insure continued health of plant material.
2. Provide barricades as necessary to protect trees and vegetation.
3. Provide any necessary erosion control measures to prevent the occurrence of silt in the storm water system and to minimize physical damage to existing site grading.

**End of Section**

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# Contract Close-Out Procedures

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Closeout Procedures | • Substantial completion<br>• Final completion<br>• Final cleaning<br>• Systems demonstration |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

## Part 2. Requirements

### 2.01 Substantial Completion

A. Contractor shall be responsible to achieve Substantial Completion per the terms of the Contract regarding time. Substantial completion shall be considered based on beneficial occupancy by the Owner and shall require that the Owner can occupy and utilize the facilities. Beneficial occupancy means that all items required by the contract documents are completed. Owner may occupy the space but this does not necessarily denote “Beneficial” occupancy.

B. When Contractor considers the Work to be Substantially Complete, he shall notify the Architect per the requirements of Part 3.

C. The Architect shall determine if the Work is Substantially Complete based on detailed Review per Part 3 and shall notify the Contractor.

D. Should Architect determine Work is not Substantially Complete, Contractor will be promptly notified in writing, giving reasons. Contractor shall pay for time and direct expenses of District representative and Architect where more than two substantial completion inspections are required. Note that this includes PI time.

E. When Architect determines the Work is Substantially Complete, a Certificate of Substantial Completion will be prepared in accordance with General Conditions. This shall represent the effective completion date of the Work for Contract purposes.

F. Substantial Completion shall include provision of all documents, certifications, tests, manuals and warranties required for Beneficial Occupancy of the project.

### 2.02 Final Completion

A. Final Completion shall represent the termination of the contract and cessation of active work under the contract, except for Commissioning, Warranty and claims work that may occur.

B. Final Completion shall occur only after:

1. Work has been inspected for compliance with Contract Documents.
2. Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected.
3. Equipment and systems have been tested in presence of Owner's representative and are operational.
4. Work is complete and ready for Final Inspection.
5. Required documents have been submitted, including those required by surety, governing agencies and any other provision of the Contract Documents.

C. When Architect finds Work is acceptable and final submittal is complete, a final Change Order will be issued reflecting approved adjustments to Contract sum not previously made by Change Order.

## Part 3. Execution

### 3.01 Closeout Sequence

A. The following describes the sequence of events that comprise project closeout procedures:

| | | |
|---|---|---|
| 1 | Request<br>For Substantial Completion | Submitted by Contractor to Architect<br>Include list of outstanding items requiring completion. |
| 2 | Preliminary Review of Substantial Completion | Determination by Architect as to the readiness of the Work for Substantial Completion Inspection (punch list). |
| 3 | Pre-Substantial Completion Tasks | Cleaning<br>Submittal of Record Documents |
| 4 | Substantial Completion Review<br>(Punch List) | Detailed review of Work by Architect and publication of Punch List defining all remaining Project requirements. |
| 5 | Completion / Correction Period | Completion of all Work listed in Punch List |
| 6 | Substantial Completion | Certificate Issued upon successful completion of Punch list<br>Transfer of Responsibilities to Owner<br>Completion date established for purposes of tracking Liquidated Damages, For start of |

| | | |
|---|---|---|
| | | Warranty period. |
| 7 | Preparation for Final Review | Correction of all deficiencies listed on Certificate of Substantial Completion.<br>Final Cleaning<br>Request for Final Inspection submitted to Architect by Contractor. |
| 8 | Final Inspection | Final Inspection to determine completion of all Contract requirements. |
| 9 | Final Completion | Notices<br>Unconditional Release<br>Consent of Surety<br>Recording of Documents<br>DSA Documentation |
| 10 | Final Payment Application | Application<br>Processing<br>Payment |
| 11 | Post Construction | Maintenance Periods<br>Warranty Monitoring |

## 3.02 Request for Substantial Completion

A. The Contractor shall submit to the Architect a written request for Certification of Substantial Completion. Included as Request For Readiness in the Appendix.

1. Request shall include a list of all outstanding items requiring completion or correction as determined by the Contractor as well as anticipated completion dates for those items.

## 3.03 Determination by Architect

A. The Architect shall review the level of completion of the Work to determine if the Work is ready for Substantial Completion Review.

1. Review shall be based on the contents of the request for Readiness, the Architect's direct knowledge of the progress of the work and any necessary Reviews that may be required.

B. The Architect shall make one of the following determinations. Either finding shall not constitute Substantial Completion for Contract purposes

1. The work appears to be ready for the Substantial Completion Review (Punch List). Architect will issue Notice of Readiness to Contractor.
2. The work does not appear to be ready for the Substantial Completion Inspection. Architect will not issue notice of Readiness. (Request for Readiness will be returned)

C. Punch list will be developed subsequent to Architect's issuance of Notice of Readiness.

D. The Architect will prepare a Punch List for use by the Contractor

1. The Punch List will include general and specific items that will require completion or correction.

2. Upon Completion of all Punch List items Contractor will notify Architect and request final review. More than 2 additional reviews required by Architect will be charged to the Contractor at a rate of $150.00 per hour.

E. Upon verification that all but minor punch list items have been completed, Architect will issue a Certificate of Substantial completion. This signifies the end of Liquidated Damages if they apply and signifies the start of the Warranty period.

## 3.04 Pre-Substantial Completion Tasks

A. Cleaning

1. Execute cleaning prior to Substantial Completion. Refer to Section 01 74 00

B. Project Record Documents

1. Submit Project Record documents to the Architect for review and certifications. Refer to Section 01 78 00 Closeout Submittals.

C. Systems Demonstration

1. Refer to Technical Specifications
2. Prior to Substantial Completion Inspection, demonstrate operation of each system to Architect and Owner.
3. Instruct Owner's personnel in operation, adjustment, and maintenance of equipment and systems, using operation and maintenance data as basis of instruction.
4. Arrange for each installer of equipment that requires operation and maintenance to provide instruction to Owner's personnel.
5. Include a detailed review of the following:

(a) Startup and shutdown.
(b) Emergency operations and safety procedures.
(c) Noise and vibration adjustments.
(d) Maintenance manuals.
(e) Spare parts, tools, and materials.
(f) Lubricants and fuels.
(g) Identification systems.
(h) Control sequences.
(i) Hazards.
(j) Warranties and bonds.

## 3.05 Substantial Completion Review (Punch List)

A. If the Architect determines that the Work is ready for Substantial Completion Review, the Substantial Completion Review shall be performed to identify all remaining items.

B. Publication of Punch List for immediate correction.

C. Request Substantial Completion Review once the following are complete:

1. Advise Owner of pending insurance changeover requirements.
2. Submit Record Drawings and Specifications, maintenance manuals, warranties, and similar record information.
3. Deliver spare parts, extra stock, and similar items.
4. Changeover locks and transmit keys to Owner.
5. Complete startup testing of systems and instruction of operation and maintenance personnel.
6. Remove temporary facilities and controls.
7. Complete final cleanup.
8. Touch up, repair, and restore marred, exposed finishes.

9. Obtain final inspections from authorities having jurisdiction.
10. Obtain certificate of occupancy.

D. Upon receipt of a request for review, Architect will proceed with review (see NOR above) or advise Contractor of unfilled requirements.

E. Architect will conduct Substantial Completion Review (Punch List)

F. The purpose of the review will be to record all remaining deficiencies.

1. There will be no negotiations at the Review. All disagreement regarding quality, completeness or scope will be in writing.

G. The Architect will prepare a written draft version of the Punch List for review by the Contractor and Owner.

1. The Owner and Contractor may request amendment to the Punch List in writing.
2. If amendments are approved by the Architect, the Architect will issue the final Punch List.

H. Upon receipt of the final Punch List, the Contractor shall submit a schedule for completion of the remaining items.

## 3.06 Substantial Completion

A. Architect will prepare the Certificate of Substantial Completion after Final Review and acceptance.

1. Miscellaneous items that remain to be completed or repaired will be attached as a list to the Certificate of Substantial Completion.

B. If punch list is not adequately complete, Architect will advise Contractor of items that must be completed or corrected before the Certificate of Substantial Completion will be issued.

## 3.07 Preparation for Final Inspection

A. Correction of Deficiencies

1. The Contractor shall correct all remaining deficiencies and perform all remedial work according to the Punch List and the requirements of the Contract Documents.

B. Final Cleaning

1. Perform Final Cleaning. Refer Section 01 74 00

C. Conduct final cleaning of all installed or constructed components, all site areas. Include removal of all construction debris.

D. Assemble remaining close out documents and deliver to Architect.

E. All work shall be clean and ready for use upon completion.

F. Damages and Restorations

1. Damage to material and finishes caused by movement of equipment or other operations shall be restored or replaced as specified or directed by the Architect at no additional cost to the Owner.
2. Restoration shall be equal to the original work, and finishes shall match the appearance of existing adjacent work.

G. Remedial Work

1. Any remedial work necessary due to faulty workmanship or materials will be replaced by the Contractor at no cost to the Owner. Work will be done at such time and in such manner so as not to cause any interruption or inconvenience to Owner's operations.

## 3.08 Final Inspection

A. Request inspection for certification of final acceptance and final payment, once the following are complete:

1. Submit final payment request with conditional waivers and supporting documentation. Include insurance certificates.
2. Submit a copy of the List attached to the Certificate of Substantial Completion stating that each item has been completed or otherwise resolved for acceptance.
3. Submit final meter readings for utilities, a record of stored fuel, and similar data as of the date of Substantial Completion.
4. Submit consent of surety to final payment.

B. Architect will re-review the Project upon receipt of notice that the Work has been completed.

1. On completion of re-review, Architect will prepare a certificate of final payment. If the Work is incomplete, Architect will advise Contractor of the Work that is incomplete or obligations that have not yet been fulfilled.

## 3.09 Post Construction

A. Maintenance Period

1. Initiate maintenance periods that have not already been initiated.
2. Contractor shall coordinate 11-month warranty walk for review and acceptance by District and Architect.
3. Contractor shall make all corrections required based on warranty walk prior to and as a condition of release of Bonding obligations.

**End of Section**

Section 01 78 00

# Closeout Submittals

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1, 2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| Closeout Submittals | • The following is a minimum list of Closeout Submittals and may not include all items listed in other specification sections.<br>• Final Site Survey<br>• Maintenance Contracts<br>• Maintenance and Operation Data<br>• Maintenance Materials<br>• Product Bonds<br>• Warranties<br>• Project Record Documents (As-Builts) |
| Preparation | • Binding, assembly and presentation of all submittals |

B. *Final payments will not be made to contractor until all Closeout Submittals have been provided and approved. Cession of construction tasks does not necessarily mean that the project is complete.*

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| | |
|---|---|
| Final Site Survey | • Bound in Project Binder |
| Maintenance Contracts | • Bound in Project Binder |
| Maint and Operations Data | • Bound in Project Binder |
| Maintenance | • Per Specification Section and actual Product / Systems |

| | |
|---|---|
| Materials | Maintenance and Operations Instructions |
| Product Bonds | • Bound in Project Binder<br>• |
| Product Warranties | • Bound in Project Binder |
| Project Record Documents | • Hand or Digital Documents as specified below |

## Part 2. Requirements

### 2.01 Typical Submittal

A. At Contract close-out submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

B. Provide Documents in fully bound, transportable form ready for use by Owner.

1. Submit three sets of all required documents listed above prior to final inspection, bound in 8-1/2" x 11" three-ring binders with durable plastic covers.
2. Arrange by Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers.

C. Binding shall be satisfactory to withstand extended use over the expected life of the project for which they were assembled.

### 2.02 Final Site Survey

A. Not Required

### 2.03 Maintenance Contracts

A. Provide any required maintenance contracts

### 2.04 Maintenance and Operations Data

A. Provide Data for:

1. Electrical equipment and controls
2. Mechanical Equipment and controls
3. Fire Alarm components
4. Signal and communications components
5. Contractor supplied machinery and equipment
6. Contractor supplied accessories

B. Provide Maintenance and Operations Instructions for all systems, assemblies, components and installations.

1. List of equipment and parts lists
2. Operating and maintenance instructions
3. Shop drawings and product data

C. Provide Emergency instructions.

D. Provide Spare parts list.

E. Provide Copies of warranties.

F. Provide Wiring diagrams.

### 2.05 Material and Finish Data

A. Provide data for primary materials and finishes, including:

1. Trade names, model or type numbers
2. Cleaning instructions
3. Product data
4. Safety and hazard data

## 2.06 Maintenance Materials

A. Provide Surplus Materials

B. Provide Spare Parts

C. Provide Special Tools and Proprietary Equipment

D. Provide Software and Documentation

## 2.07 Product Bonds

A. Provide any Product Bonds specified elsewhere in this Specification.

## 2.08 Warranties

A. Warranties shall be provided per the terms of the Contract for all labor and material provided or installed by the Contractor.

1. Submittal: Provide duplicate copies, on Contractor and Manufacturer's letterhead.

   (a) Assemble General Contractor Warranty, all subcontractor warranties and all product, equipment and system warranties.
   (b) Assemble documents executed by subcontractors, installers, suppliers, and manufacturers.
   (c) Provide table of contents
   (d) Bind warranty information in 3-hole binders with durable plastic covers. Arrange in order of coverage, from general to specific.

2. Submit final warranties prior to final application for payment.

B. Statutory Warranty shall be documented by the Contractor and all Sub-Contractors in writing.

C. Warranties shall provide the following minimum protections to the Owner:

1. Protect Owner against failure of work and against deficient, defective and faulty materials and workmanship, regardless of sources.
2. Provide for removal and replacement work which is damaged as result of failure, or which must be removed and replaced to provide access for correction of other warranted work.
3. After correction, reinstatement of warranty for corrected work to date of original warranty expiration, but not less than half original warranty period.
4. Replacement or restoration of failing warranted items without regard to anticipated useful service lives.

D. Warranty Form shall not detract from or confuse interpretations of Contract Documents.

1. Warranty shall be countersigned by manufacturer.
2. Where specified, warranty shall be countersigned by subcontractor and installer.

## 2.09 Project Record Documents (As-Builts)

A. The Contractor shall provide a complete set of Record Drawings and Specifications that clearly show all differences between the contract work as drawn and as installed. This includes all work, concealed or unconcealed. All work added to the contract which is not shown on the Contract Drawings shall be included also. Incorporate all clarification sketches into record documents. The Record Specifications shall include all addenda.

B. Concealed Work shall be defined as work installed in the slab or in an area that cannot be readily inspected by use of access panels, inspection plates, or other removable features.

C. Prepare Final Record Drawings for submittal to the Architect.

1. Refer Progress Documentation Section of Division 1.

D. Before a final payment is authorized, the Contractor shall certify that all changes in the work are included in the Record Drawings and Specifications.

E. Architectural consultants shall review all changes in the documents and provide the Owner with a complete set of reproducible drawings before final payment is authorized.

## Part 3. Execution

A. Not Used.

**End of Section**

Section 02 40 00

# General Demolition

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | • General Demolition Requirements |
| Special Coordination | • Refer to Related Sections for specific project requirements not included herein. |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Catalog Cuts | • n/a |
| Product Data | • n/a |
| Samples | • n/a |
| Shop Drawings | • n/a |
| Schedule | • Include Schedule entry on Gantt Chart for General Demolition |

### 1.04 References/Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • n/a |
| Standard | • n/a |

### 1.05 Quality Assurance

A. Provide the following per Division 1

| Item | Description |
|---|---|
| Supervision | • Full time supervision and observation by the |

| Item | Description |
|---|---|
| | Contractor of all on-site Construction Activities.<br>• Ensure that all items to be retained in good condition and turned over to owner are properly protected. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project. |
| Product Acceptance | • n/a |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item. |

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • n/a |
| Special Inspections | • n/a |
| Mock Ups | • n/a |

## 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

## 1.08 Closeout

A. Provide the following Close Out materials in accordance with Division 1.

| Item | Description |
|---|---|
| Product Manuals | • n/a |
| System Manuals | • n/a |
| Maint. Tools/Materials | • n/a |
| Surplus Materials | • n/a |
| Training | • n/a |

### 1.09 Warranty

A. Provide written warranty in accordance with Division 1.

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1 |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

## Part 2. Products

### 2.01 Not Used

## Part 3. Execution

### 3.01 Demolition Section of Other Disciplines

A. This section shall apply to all demolition work defined under any other section of this Specification. Conflicts between this section and other sections shall be resolved by the Architect with favor to the most restrictive stipulation.

B. All trades shall review all documents to determine the extent to which their demolition work may require support work from other trades.

C. The Contractor shall be responsible to ensure that all trade work required for demolition tasks is provided regardless of the inclusion of that trade in any Plans or Demolition Sections.

1. Contractor shall provide complete service including specified demolition work as well as collateral requirements for repair, closure, termination or re-routing. No claims shall be made for incidental or peripheral demolition work associated with any specified work.

### 3.02 Transfer of Responsibility and Disposition of Materials

A. Contractor shall consult with Owner prior to commencing any demolition and determine which existing items and equipment are of value to the Owner. These items shall be carefully removed to avoid damage and shall be delivered to the Owner as directed.

B. Title to all remaining items, equipment and fixtures required to be removed, shall be vested in the Contractor whereupon the Owner will not be responsible for the condition, loss or damage to said property. All such items shall be removed from the Owner's property.

### 3.03 Supervision Requirements

A. Provide continuous supervision of all demolition activities. All demolition work shall be done in conjunction with the Contract Documents and shall accommodate provisions of all aspects of the Documents.

B. Conduct demolition to minimize interference with adjacent structures.

C. Conduct operations with minimum interference to public or private accesses.

D. Maintain egress and access at all times. Do not close or obstruct roadways without permits.

E. Cease operations immediately if adjacent structures appear to be in danger. Notify Architect.

### 3.04 Site Safety During Demolition Operations

A. Contractor shall provide fire watch for the site or facility during temporary shutdown of fire alarm or fire suppression systems.

B. Contractor shall provide security services for the site or facility during temporary shutdown of the security systems.

C. Contractor shall provide traffic control during disruption of normal traffic flow on site due to temporary alterations in site circulation system.

D. Contractor shall provide pedestrian control during demolition operations to ensure pedestrians are protected from equipment and materials.

E. Contractor shall provide vision shielding to prevent observation by the public of cutting and welding torches or any other source of bright light that may damage vision.

F. Refer to Site Safety Section of this specification.

### 3.05 Demolition Scheduling

A. Contractor acknowledges that Demolition Scheduling shall be coordinated with the Architect for the beneficial operation of the School Site. Contractor shall place no limitation on the extent of coordination of Demolition activities for this purpose.

B. Contractor acknowledges that Demolition work may occur in multiple and repetitive tasks and may occur at different locations at different times, dependent on the needs of the School Site to maintain access, operation, utilities, systems and safety.

1. Demolition tasks may be restricted to certain work times based on any one of the following:

   (a) Occupancy of adjacent areas by District and the need to minimize disruption at particular times.
   (b) Need to maintain operation of critical systems and utilities at particular times

2. Demolition tasks may be restricted to certain work areas based on the nature and scope of the task and its potential affect on the users of adjacent occupied spaces.

C. All Demolition Scheduling shall be reviewed with the Architect prior to commencing operations.

1. Demolition of any items that could affect daily operations of the school shall be scheduled with the District to occur and be replaced with new construction when school is not in session.
2. Demolition Operations may be limited to hours before and after school sessions depending on the time of year and the nature of the demolition work.
3. Demolition Operations may be limited to periods in which school is not in session, such as weekends and holidays.

D. Contractor shall provide allowance for multiple demolition exercises as may be required to facilitate school schedule. Coordination of demolition scheduling with District operational needs shall not be allowed as the basis of delay claims.

### 3.06 Notification of Demolition

A. Provide notification of the commencement of any demolition task or phase 48 hours in advance.

B. Do not commence demolition until the Architect has approved the task or phase and coordinated the schedule with the District.

### 3.07 Demolition Equipment

A. Contractor shall provide all equipment and materials as may be necessary to perform the demolition work within the limitations of this section. No claims shall be made for special equipment or processes based on limitations of this section.

B. Contractor shall provide equipment and tools of appropriate size, operation and function to accomplish demolition tasks within the restrictions described herein.

1. Provide equipment of appropriate size to ensure the protection of existing facilities, materials and systems.

## 3.08 Preparation

A. Provide, erect, and maintain temporary barriers and security devices. Include chain link fence around each phase of construction

1. Include protection of all existing trees.

B. Mark all items to be removed.

C. Provide layout as required to direct slab and wall removal. Identify slab and walls requiring precise cutting and demolition for future fitting of new construction.

## 3.09 Dust Control

A. All demolition activities shall include adequate measures for dust control. Contractor shall provide any and all means necessary to prevent the circulation of dust into adjacent buildings and site areas.

B. Contractor shall provide the following as needed or at the request of the Architect:

1. Watering shall occur over transit areas including equipment routes, equipment loads and parking areas.
2. Opening protection at all areas that may include plastic barriers, fans and other means to prevent dust from spreading throughout building.
3. Dust removal: Sweep or wash down of adjacent site and building areas that will be used by the public.

C. Use all means necessary to prevent the spread of dust during performance of the work of this Section; provide dust curtains of fireproof polyethylene where indicated and where applicable, moisten surfaces as required.

D. Provide sealed membranes with zipper operated doors over corridors and passage ways separating the work zone from occupied spaces. Provide sealed membranes over windows and ventilation openings.

1. Membranes shall not limit operability of windows and ventilation systems in areas occupied by the public.
2. In no case shall barriers obstruct required exit routes.

## 3.10 Demolition

A. Demolish and remove components in an orderly and careful manner, in sequence as indicated on Drawings or as determined by consultation with Architect.

B. Coordinate all structural shoring and demolition to insure that no settling, deflection or other failure occurs as a result of removal or modification of existing elements.

C. Protect existing supporting structural members.

D. Clearly direct demolition work so that items to remain are protected.

E. Disconnect, cap and identify designated utilities.

1. Cap utilities at appropriate locations for future service, reconnection.
2. Architect may require removal of piping and raceway beyond specific work areas in order to achieve appropriate location for utility termination.

F. Execute demolition work to ensure safety of persons and adjacent property against damage by falling debris or other causes in connection of this work.

### 3.11 Termination of Utilities

A. All demolition of utility piping, wring or ductwork shall include functional termination of piping, wiring and ductwork to remain such that:

1. Operation of remaining systems is not affected or disrupted.
2. Terminations can be accessed for reconnection or re-routing either as part of this work or as specified in other projects.

B. Demolition of site and building utilities shall provide for termination and investigation regarding the operation of remaining components in adjacent buildings. Contractor shall explicitly ensure that removal of any component specified herein does not prevent remaining components from operating in occupied spaces.

### 3.12 Re-Installation / Reconstruction

A. Demolition work may require the temporary removal of material, assemblies and equipment that is intended to remain. Demolition work shall require the re-installation of such items to their original condition

1. Reinstallation may affect utility systems and components, electrical systems, communications and data systems and alarm systems.
2. All critical systems shall be maintained in working order for the remainder of the site. No demolition work shall be allowed that will disable and system beyond the extent of a temporary shutdown.
3. Contractor is responsible for returning any system to operation for adjacent areas where work of this contract has interrupted that operation.

### 3.13 Repair and Replacement of Damaged Assemblies, Utilities Systems

A. Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Architect and approved by DSA at no cost to the District.

B. Contractor is responsible for repair, replacement of any system or component damaged by demolition work.

### 3.14 Surface Restoration of Materials to Remain

A. Where surfaces are to remain unfinished, as indicated on the drawings, Contractor shall restore such surfaces to be free of paint, plaster, fasteners, and holes.

1. Contractor shall power-wash and/or sand/bead-blast all masonry and concrete surfaces indicated as to remain unfinished.
2. Contractor shall extract all fasteners, including powder-driven fasteners, expansion anchors, and lead anchors, and patch resulting holes to match adjacent surface. Alternatively, fasteners may be cut off at least 1/2” below surface of remaining material, and patched to match adjacent surface.

B. Unfinished surfaces which are to remain visible when construction is complete shall be restored uniformly, regardless of whether the damage or marks were pre-existing or caused by demolition work.

C. Surfaces receiving new finishes shall be prepared per Specifications and manufacturer’s instructions for the specified finishes.

### 3.15 Disposal of Debris

A. Remove from the site and legally dispose of all debris resulting from demolition operations.

B. Provide certification that all materials have been disposed of at appropriate facilities via appropriate methods.

1. Provide dump receipts describing yardage and material content.
2. Provide certification for all hazardous materials.

### 3.16 Recycling

A. Prepare a recycling plan describing the types and estimated quantities of materials to be removed that can be recycled.

B. Dispose of all recyclable materials at appropriate disposal facilities as required by local regulatory agencies.

C. Provide receipts from all facilities at which material was deposited for recycling purposes.

### 3.17 Cleaning

A. Remove demolished materials from site as work progresses.

1. Provide debris box or trucking as appropriate to task.
2. Remove debris boxes upon filling to capacity.
3. Remove partially filled boxes within one week of delivery.
4. Prevent access to debris boxes by the public.

B. Leave areas of work in clean condition.

1. Provide sweeping, vacuuming, mopping and other janitorial services as required.

## End of Section

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SECTION 02 41 19

# Selective Demolition

## Part 1. GENERAL

### 1.01 SUMMARY

A. This Section includes demolition and removal of the following:

1. Selected portions of a building or structure.
2. Selected site elements.
3. Repair procedures for selective demolition operations.

### 1.02 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to District ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

### 1.03 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain District's property, demolished materials shall become Contractor's property and shall be removed from Project site.

### 1.04 SUBMITTALS

A. Proposed Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate. Include measures for the following:

1. Dust control.
2. Noise control.

B. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.

C. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

### 1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

D. Pre-demolition Conference: Conduct conference at Project site.

### 1.06 PROJECT CONDITIONS

A. District will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so District's operations will not be disrupted. Provide not less than seventy two (72) hours' notice to District of activities that will affect District's operations.

B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. District assumes no responsibility for condition of areas to be selectively demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by District as far as practical.

D. Storage or sale of removed items or materials on-site will not be permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

## Part 2. PRODUCTS

### 2.01 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

## Part 3. EXECUTION

### 3.01 SCOPE

A. Remove existing aluminum windows to allow for installation of new windows. Salvage existing window hardware and retain for district B&G..

B. Removal of Window coverings and shades

C. Remove other items indicated and as needed for salvage, relocation and replacement

### 3.02 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to District.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

## 3.03 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by District and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to District and to authorities having jurisdiction.

1. Provide at least seventy two (72) hours' notice to District if shutdown of service is required during changeover.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. If utility services are required to be removed, relocated, or abandoned, provide temporary utilities before proceeding with selective demolition that bypass area of selective demolition and that maintain continuity of service to other parts of building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

D. Utility Requirements: Refer to Division 15 and 16 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

## 3.04 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from District and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
3. Protect existing site improvements, appurtenances, and landscaping to remain.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction

operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

D. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

E. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

## 3.05 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

1. On an as needed basis wet mop floors to eliminate track-able dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

## 3.06 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to District.
4. Transport items to District's storage area designated by District.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by District, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

## 3.07 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Patching: Comply with Division 1 Section "Cutting and Patching."

C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.

D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

1. Floors and Walls: Where walls or partitions that are demolished extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
2. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

## 3.08 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off District's property and legally dispose of them.

**END OF SECTION**

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Section 02 42 00

# Hazardous Materials Abatement

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| Hazardous Materials Abatement | Removal of Hazardous Materials during demolition, including Asbestos Containing Building Materials, Lead-Containing Waste, PCB-Containing Waste, and Mercury-Containing Waste. *This Section is for Reference Only.* |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Bidding

A. Scope of Work

1. Bids shall be based on quantities given in Appendix A Abatement Scope of Work, tables for Asbestos, Mercury, and PCB and for Lead, and any revisions made by addenda.
2. Quantities provided in Appendix A Abatement Scope of Work are approximate. In the event that actual quantities abated (as determined in conjunction with monitoring performed by HPM) differ from those given in Appendix A, a change order (charge or credit) will be negotiated to account for the difference between actual and approximate quantities. Unit prices may, at the Owner's discretion, be employed in determining the amount of the change.

B. Unit Prices

1. Bidders must submit a completed Abatement Unit Price form with their bid.
2. Quantities given in the unit price list of Appendix B are not intended to reflect actual project scope, but to establish prices for various abatement procedures should the need arrive during construction.

### 1.04 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Submittals upon Award of | Provide all submittals required by **Lead Asbestos and PCB Abatement Project Specifications** (Appendix), including but not |

| | |
|---|---|
| Contract | limited to safety and emergency plans, program information, licenses, registration, insurance, equipment certifications, employee documentation and physician's reports, MSDS, identification of haulers and landfills, regulatory notifications, previous work results |
| Schedule | Include Schedule entry on Gantt Chart for Abatement |

## 1.05 References and Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining "Industry Standards" and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References Standards | • California Code of Regulations (C.C.R.) Title 8, Section 5208<br>• 40 CFR § 61.145: Demolition and Renovation of Structures<br>• 40 CFR § 61.149-150: Disposal of Asbestos-Containing Waste<br>• 40 CFR § 763.90 Subpart E: Asbestos-Containing Materials in Schools<br>• 40 CFR § 763.90 Subpart G: Asbestos Worker Protection<br>Additional References and Standards as listed in **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) |

## 1.06 Quality Assurance

A. Provide the following per Division 1:

| **Item** | **Description** |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities.<br>• General Contractor is responsible for schedule coordination |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>• Certification required by Title 8, California Code of Regulations, Article 2.6, Section 341.15 for individuals who contract to provide health and safety services for asbestos-related work.<br>• Demolition must be performed by a Licensed Asbestos Abatement Contractor using AHERA certified asbestos workers in accordance with all EPA, AHERA, and OSHA regulations.<br>• Additional worker qualifications and Quality Assurance requirements as specified in **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions after abatement prior to proceeding with work. |

## 1.07 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • Per CCR and as specified in **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) |
| Special Inspections | • Per CCR and as specified in **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) |

### 1.08 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector<br>• Hazmat Project Manager (HPM) on site, providing perimeter sampling during demolition and clearance sampling at completion of demolition. |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

### 1.09 Closeout

A. Provide the following Close Out materials in accordance with Division 1.

| Item | Description |
|---|---|
| Certification | Provide closeout submittals per **Lead Asbestos and PCB Abatement Project Specifications** (Appendix), including copies of clearances. |

### 1.10 Warranty

A. Provide written warranty in accordance with Division 1.

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1 |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

## Part 2. Products

### 2.01 Not Used

## Part 3. Execution

### 3.01 Schedule

A. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for specific notification, scheduling, and coordination with Hazmat Project Manager (HPM).

B. The Contractor shall coordinate the abatement schedule with the Owner and the HPM via the Architect prior to commencement of work.

1. Failure to properly coordinate the schedule for abatement work with the Architect, Owner and HPM may result in additional mobilization by the Contractor, Subcontractor or HPM – the cost for which shall be borne by the Contractor and or Subcontractor, but will not represent any additional cost to the Owner.

C. Abatement scheduling may be subject to any one of the following depending on the Contractor's general construction schedule and intended period of abatement:

1. Restrict daily hours outside the normal school operation hours
2. Work restricted to evenings and weekends
3. Work restricted to specific school holidays or breaks to provide for entire abatement procedure occurring while school is not in session.
4. Contractor shall allow for restricted schedule in overall construction schedule and shall not be entitled to delays or cost claims for scheduling reasons.

## 3.02 Preliminary Demolition

A. Shut down all utilities necessary to prepare for Abatement work

B. Remove fixtures, appliances, cabinets and finishes as necessary to comply with requirements of **Lead Asbestos and PCB Abatement Project Specifications** (Appendix).

1. Contractor shall consult with Owner prior to commencing any demolition and determine which existing items and equipment are of value to the Owner. These items shall be carefully removed to avoid damage and shall be delivered to the Owner as directed.

C. Remove finishes as necessary to expose materials requiring abatement.

1. Limit preliminary demolition to materials that will not affect Hazardous Materials in any way. Demolition requiring disturbance of Hazardous Materials shall be performed under containment by the Abatement Contractor.

D. Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Architect and at no cost to the Owner.

## 3.03 Regulation

A. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for notification requirements to local agencies, and coordination with HPM to comply with reporting requirements.

B. Contractor is responsible for timely and proper coordination with the HPM to demonstrate compliance with all applicable regulations.

## 3.04 Preparation for Abatement

A. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for all preparation procedures including but not limited to protection of existing finishes and systems, and for protection of employees and others in the work area.

B. Abatement may not begin until all submittals listed above have been reviewed and approved by the HPM.

C. The Contractor shall coordinate with the HPM for inspection of each containment. No removal shall be performed until each containment is approved by the HPM.

## 3.05 Aesthetic Screening

A. The Contractor shall provide aesthetic screening for the purposes of preventing public observation of the abatement procedure.

B. Aesthetic screening may include visual screening over windows; framed barricades with visual screening or other such means as may be required to prevent view into the abatement area.

C. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for more detailed requirements.

### 3.06 Abatement Demolition

A. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for specific procedures for containment, demolition, and removal.

### 3.07 Clearance Sampling

A. Clearance Sampling will be done at the conclusion of all demolition work. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for required clearance levels.

### 3.08 Cleanup

A. The job site must be left free of hazardous materials contamination at the end of each day. At the completion of the job, the walls and floors shall be wet wiped and/or wet mopped.

B. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for more detailed requirements.

### 3.09 Owner Retention

A. The Owner reserves the right to keep title to all property that has a redeemable value. The items to be salvaged and stored for the Owners benefit will be determined prior to commencement of demolition.

### 3.10 Waste Disposal

A. The Contractor shall provide the proper disposal containers and shall dispose of all asbestos contaminated waste materials in strict accordance with EPA and Cal/OSHA requirements monitoring.

### 3.11 Monitoring

A. Monitoring shall be performed by the Hazmat Project Manager (HPM), who will be provided by the Owner under separate contract.

B. Contractor is responsible for timely and proper coordination with the HPM so allow for proper monitoring and testing. Refer **Lead Asbestos and PCB Abatement Project Specifications** (Appendix) for specific coordination requirements.

## End of Section

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Section 03 10 00

# Formwork

## Part 1. General

### 1.01 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions, Division 1 - General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to work of this Section as fully as if repeated here.

### 1.02 DESCRIPTION:

A. Furnish and install all cast in place concrete formwork as shown and specified, including the following:

1. Design of the formwork, shoring and falsework.
2. Placement of all cast-in anchors, inserts, bolts, sleeves and similar items, including those furnished under other sections.

B. Related work described elsewhere:

1. See other sections of Division 3.

### 1.03 QUALITY ASSURANCE:

A. Comply with the following codes and standards by the California Building Standards Commission and American Concrete Institute (ACI):

1. 2019 California Building Code (CBC) with DSA-SS Amendments.
2. ACI 347, “Recommended Practice for Concrete Formwork”.
3. Applicable jurisdictional agency.

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Design and provide engineering services as required, for all formwork and related items such as bracing and blocking, required for the concrete work to be placed on the Project. Design shall be in accordance with the requirements of ACI 347, the requirements of these Contract Documents, and the applicable Building jurisdiction agency.

### 1.04 SEQUENCING/SCHEDULING:

A. Coordinate installation of forms with other Sections, including but not limited to, Mechanical (Division 15), and Electrical (Division 16), to provide all required sleeves, blockouts, openings, reglets, chases, etc., required.

## Part 2. Products

### 2.01 MATERIALS:

A. Forms: ACI 347, Table 4.1.

B. Miscellaneous Materials

1. Ties and spreaders: Factory fabricated, adjustable length, removable or snap-off metal ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal of forms. MeadowBurke, of a type which does not leave an open hole through the concrete and which permits neat, solid patching at every hole. Any metal shall be a minimum of 1-1/2 inches from the outer concrete surface. Site fabricated ties, wire ties, or wood spreaders are not permitted.
2. Corner forms, recess and chamfer strips: Extruded polyvinyl chloride specially produced for concrete formwork; MeadowBurke, Dayton Superior or approved equal.
3. Form coating and/or form release: VOC compliant, of a type which will not harmfully affect the appearance and/or utility of the concrete surface or the application of sealers, paint, vinyl fabric, or any other finishes; BASF MBT Rheofinish 211, Conspec By Dayton Superior, or approved equal.

## Part 3. Execution

### 3.01 DESIGN & GENERAL CONSTRUCTION:

A. Design and construct all forms, falsework, supports, etc. to be adequate in size and strength for safety, and to resist all loads imposed upon them without deformation, deflection, or settlement.

B. Design and place shoring so the load from successive parts of the structure will be transmitted directly through the falsework to adequate support, without creating bending or shearing stresses in the concrete. Do not remove shores until supported members have attained sufficient strength to carry the imposed loads. Construct forms to permit their removal without disturbing the original shoring. Re-shoring will not be permitted.

C. Use wedges in pairs, or jacks to bring forms, shoring, or falsework for beams, girders, slabs and other parts of the structure to exact elevations, required camber and uniform bearing before pouring concrete.

D. Construct formwork to the shape, lines and dimensions of the concrete members and tight enough to prevent cement paste leakage. Tie, brace shore, and support forms to resist pressure from any source. Deflection of any member shall not exceed one-eighth inch (1/8 inch). Provide camber in formwork as required for anticipated deflections due to weight and pressures of fresh concrete and construction loads. Where possible, brace forms for exposed concrete without using form ties.

E. Arrange formwork to allow erection in the proper sequence and permit removal without hammering, prying or damaging the concrete. Identify exposed surfaces so that plywood panel and form tie spacing can be carefully arranged.

F. Leave temporary openings necessary for inspection and cleaning before depositing concrete.

G. Form release agent:

1. Thoroughly clean forms and coat with release agent prior to initial use and before each re-use.
2. Apply release agent in strict accordance with manufacturer's directions and coverage recommendations.
3. Avoid starved areas or excessive applications.
4. Apply release agent before reinforcing steel is placed.

### 3.02 INSTALLATION

A. Openings, reglets, inserts, etc.:

1. Refer to the entire set of project drawings for locations, sizes, and types of all openings, reglets, inserts, anchors, sleeves, cans, electric boxes, conduit, etc.
2. Frame for all openings.
3. Install all cast-in items such as listed in 1 above which are not specifically required to be installed in other sections. Coordinate the installation of items to be installed by other sections.
4. Install all cast-in items securely and in exact locations required. Verify that all required cast-in items have been installed prior to pouring concrete.

B. Set screeds for leveling of finish on slabs. Depress slabs where required to receive special floor finishes. Slope slabs to drain where required, or as shown. Check screed elevations frequently during the pour, for concrete elevations.

C. Install 3/4-inch chamfer at all vertical and horizontal outside corners, unless shown otherwise.

D. Before depositing concrete, remove all debris from the space to be occupied by the concrete and wet thoroughly. Verify that all reinforcement and inserts are secured in position. Remove all free-standing water. Do not leave wood in concrete, except nailers.

E. During concrete placement, check formwork and related supports to ensure that forms are not displaced and that completed work will be within tolerances specified in ACI 347.

## 3.03 REMOVAL & REUSE OF FORM:

1. Remove forms without damage to the concrete, only after concrete has hardened sufficiently to permit their removal with safety, and the members have attained sufficient strength to safely support the imposed loads. The minimum time before removing forms shall be:

| | |
|---|---|
| Walls, columns, sides of beams and girders | 24 hours* |
| Horizontal forms of joists, beams and girders (Spans 20 ft. and less) | 14 days |
| Horizontal forms of joists, beams and girders (Spans greater than 20 ft) | 21 days |
| Slabs (Spans 20 ft. and less) | 7 days |
| Slabs (Spans greater than 20 ft. | 10 days |

*If forms also support formwork for other members, removal time for the latter will govern.

B. Forms may be stripped in less than the specified days, provided all of the following are met:

1. Tests indicate an adequate strength as designated by the Structural Engineer at an earlier time,
2. The Structural Engineer approves the time of stripping, and
3. Immediately after stripping the concrete is sprayed with a clear sealer.

C. Form material may be re-used providing it is straight, free from nails, hardened concrete, or other injurious matter, and has edges and surfaces in good condition.

D. Clean and re-oil or apply form release to wood forms after each reuse.

E. Upon removal of forms, bolts, wires, clamps, rods, etc., not necessary to the work, shall be removed to minimum of 1-1/2 inches from the surface.

F. Forms for exposed concrete surfaces shall be removed in such manner as to preclude damage to finish. Pinch bars and similar tools shall not be used for prying against exposed surfaces.

## End of Section

Section 03 20 00

# Reinforcing Steel

## Part 1. General

### 1.01 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions, Division 1 - General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to work of this Section as fully as if repeated here.

### 1.02 DESCRIPTION:

A. Furnish and install all steel reinforcement and related items required for concrete work as shown and specified.

B. All concrete shall be reinforced unless specifically marked "not reinforced" on the drawings. If no reinforcement is shown, reinforce in the same manner shown in similar places. Unless otherwise noted, all reinforcement shall be deformed.

### 1.03 QUALITY ASSURANCE:

A. Comply with the following codes and standards by the California Building Standards Commission, American Concrete Institute (ACI), Concrete Reinforcing Steel Institute (CRSI) and American Welding Society (AWS):

1. 2019 California Building Code (CBC) with DSA-SS Amendments.
2. ACI 117 “Standard Specification for Tolerances for Concrete Construction and Materials”.
3. ACI 301 "Specifications for Structural Concrete for Buildings".
4. ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
5. ACI 318 "Building Code Requirements for Structural Concrete".
6. CRSI 63 "Recommended Practice for Placing Reinforcing Bars".
7. CRSI 65 "Recommended Practice for Placing Bar Supports, Specifications and Nomenclature".
8. CRSI "Manual of Standard Practice".
9. AWS B2.1 “Welding Procedure and Performance Qualification”.
10. AWS D1.4 "Structural Welding Code-Reinforcing Steel".

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Comply with the referenced ASTM standards for materials.

C. Qualifications for Welding Work:

1. Qualify welding processes and welding operators in accordance with AWS B2.1.
2. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests, and possess a current card.
3. If re-certification of welders is required, re-testing will be Contractor's responsibility.

D. Testing and Inspection:

1. All material shall bear mill tags showing quantity, grade and heat number identification, mill analysis and test reports.
2. Reinforcement placement shall be checked and inspected by the Project Inspector prior to placement of concrete.

3. Perform tensile tests and bend tests per CBC Section 1910A.2.
4. Reinforcement placement shall be checked and inspected by the Project Inspector prior to placement of concrete. See ACI 318 Section 26.13.3.3(a).

### 1.04 DELIVERY, STORAGE AND HANDLING:

A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size, length and heat number.

B. Store reinforcement off the ground on platforms, skids, or other supports.

C. Store reinforcement in a manner that will avoid excessive rusting and coating with grease, oil, and other deleterious materials.

D. Store reinforcement in separate piles or racks to avoid loss of identification after bundles are broken.

### 1.05 SUBMITTALS:

A. Submit shop drawings showing sizes, grades, schedules, splicing, bending and placing details of reinforcement necessary for complete and accurate location of reinforcement.

B. Details of reinforcement not covered shall be in accordance with ACI 318 and ACI 315.

C. Detailing, fabricating, and spacing of reinforcement shall be equal or superior to ACI 315, unless otherwise indicated.

D. If welding reinforcing bars are indicated on the Drawings, or specified herein, submit the reinforcing bar manufacturer's Certificate of Weldability for each type of reinforcing steel.

E. Contractor shall check all Drawings for anchor bolt sizes and locations, anchors, inserts, conduits, sleeves, and other items, which are required to be cast in concrete.

1. Make necessary provisions as required so that reinforcing steel will not interfere with placement of such embedded items.

F. Reinforcing steel shall not be fabricated or placed before Shop Drawings have been approved and returned to Contractor.

G. Review of shop drawings will not relieve Contractor of responsibility for errors or for failure in accuracy and complete placing of the work.

## Part 2. Products

### 2.01 MATERIALS:

A. General:

1. All reinforcement material: new and free from scale, rust, or coatings, which will reduce bond to concrete.
2. Unless otherwise noted, use only deformed reinforcement.

B. Reinforcing steel: Deformed billet steel bars, ASTM A615, Grade 60, except stirrups and ties #3 or smaller may be Grade 40. ASTM A706 for reinforcement to be welded.

C. Tie wire: 16 gauge or heavier, black annealed steel wire.

D. Welded wire fabric: ASTM A185.

E. Accessories:

1. Chairs, spacers, ties, and other devices: as necessary for proper placement and to adequately support the reinforcing in conformance. Supports shall be steel or precast blocks designed and fabricated in accordance with CRSI standards.

2. Devices such as chairs which will later be exposed: galvanized or otherwise corrosive resistant.

### 2.02 FABRICATION:

A. Fabricate all reinforcement in strict accordance with the approved shop drawings. Do not use bars with kinks or bends not shown on the drawings or on the approved shop drawings.

B. Reinforcing steel shall be cut and bent cold to exact lengths and shapes to comply with Drawings, reviewed shop drawings, and referenced codes and standards.

1. Contractor is responsible to assure that reinforcement will comply with Drawings, reviewed shop drawings, and referenced codes and standards.

C. Do not bend or straighten the reinforcing steel in a manner that will damage the material.

## Part 3. Execution

### 3.01 PREPARATION:

A. Prior to installation, carefully inspect the installed work of all other trades and verify that all such work is complete and to the point where this installation may properly commence. Verify that concrete reinforcement may be installed in strict accordance with all referenced standards, the approved shop drawings, and the drawings.

B. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

C. Before placing new reinforcing, clean all dirt, hardened concrete, loose rust, and all other materials which will hinder bond from existing reinforcing extending into the new work.

### 3.02 INSTALLATION:

A. Prior to placing reinforcing, verify that required formwork is properly and securely installed.

B. Comply with the referenced standards. Place bars as shown, properly secured and supported, in the correct position and so as to prevent movement during concrete pouring. Support bars so that they will not displace when walked upon.

1. Maintain reinforcement at proper distance from form face.
2. Displacement of reinforcement shall be immediately corrected.
3. Tie wires shall be bent away from form.

C. Provide clearances, laps, and splices as shown, and as required in the referenced standards if not shown.

D. Do not bend or straighten the reinforcing steel in a manner that will damage the material.

E. When there has been a delay in placing concrete, reinforcement shall be inspected and, if necessary, cleaned, relocated, and tied at no additional cost to the Owner.

F. Wherever reinforcing bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits, piping, inserts, sleeves, etc., obtain Structural Engineer's approval for method of procedure before concrete is placed.

G. Splices not shown on the Drawings shall be approved by Structural Engineer in writing.

H. Unless permitted in writing by Structural Engineer or these specifications herein, reinforcement shall not be bent after being partially embedded in hardened concrete.

I. Dowels shall be tied securely in place before concrete is deposited.

1. In event there are no bars in position to which dowels may be tied, No. 3 bars (minimum) shall be added to provide proper support and anchorage.
2. Bending of dowels larger than #5 after placement of concrete will not be permitted, unless otherwise indicated on Drawings.

J. Lay welded-wire fabric flat in place. Lap splices shall be made in such a way that the overlapped area equals the distance between outermost crosswires plus two inches. Stagger laps to avoid continuous laps in either direction. Comply with ACI 318 Section 25.5.3 and 25.5.4.

K. In the event of a discrepancy, immediately notify the Structural Engineer. Do not proceed until all such discrepancies are fully resolved.

## End of Section

Section 03 30 00

# Cast In Place Concrete

## Part 1. General

### 1.01 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions, Division 1 - General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to work of this Section as fully as if repeated here.

### 1.02 DESCRIPTION:

1. Furnish and install all cast-in-place concrete and related work as shown and specified.

### 1.03 RELATED WORK:

A. Concrete Formwork: Section 03 10 00.

B. Reinforcing Steel: Section 03 20 00.

### 1.04 QUALITY ASSURANCE:

A. Except where different requirements are specified, comply with the following codes and standards by the California Building Standards Commission, American Concrete Institute (ACI), and American Welding Society (AWS):

1. 2019 California Building Code (CBC) with DSA-SS Amendments.
2. ACI 117 “Standard Specifications for Tolerances for Concrete Construction and Materials”.
3. ACI 211.1 “Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete”.
4. ACI 214R “Evaluation of Strength Test Results of Concrete”.
5. ACI 301 "Specifications for Structural Concrete".
6. ACI 304R "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete".
7. ACI 304.2R "Placing Concrete by Pumping Methods".
8. ACI 305R "Hot Weather Concreting".
9. ACI 306R "Cold Weather Concreting".
10. ACI 308.1 "Standard Specification for Curing Concrete".
11. ACI 318 "Building Code Requirements for Structural Concrete".
12. AWS D1.4 “Structural Welding Code- Reinforcing Steel”

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Comply with the referenced ASTM standards for materials and testing.

C. Coordination: The Contractor shall be responsible for installation of all accessories embedded in concrete and for provision of holes, etc., necessary for execution of the work of other trades.

D. Testing and Inspection:

1. Testing laboratory will be hired and paid for by Owner to:

(a) Review all concrete mixes.
(b) Test all concrete ingredients.

(c) Test all cylinders.
(d) Perform inspection services to meet code requirements for special inspection.
(e) Review certificates of compliance, and samples of materials proposed for use.
(f) Take samples as required from sources designated by Contractor.

2. Contractor shall:

(a) Deliver all cylinders to laboratory carefully and at the proper time.
(b) Use weighmaster at batching plant.
(c) Hire and pay for testing agency to:

*(i) Test extra cylinders for Contractor's use.*

*(ii) Retest when concrete does not meet specifications.*

(d) Assist testing laboratory in making all cylinders and slump tests.

3. Provide the testing laboratory free access to all places where concrete materials are stored, proportioned or mixed. All materials, equipment and methods used shall be subject to its inspection, test and approval.
4. The following tests will be taken. Provide all materials to be tested.

(a) Cement will be tested at place of manufacturer if:

*(i) Certification from cement manufacturer that the cement proposed for use on the project has been manufactured and tested in compliance with the requirements of specification is not available; OR*

*(ii) Affidavit is not provided by the concrete supplier that identifies the cementitious material used for the project by the manufacturer's lot number, date of shipment from the manufacturer, date of receipt of cementitious material.*

(b) Aggregate. See 1.5 below for submittal requirements.

*(i) Sieve Analysis: In accordance with "Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregate", ASTM C-136.*

*(ii) Organic Impurities Test: In accordance with "Standard method of Test for Organic Impurities and Sands for Concrete", ASTM C-40-84.*

*(iii) Fineness Test: In accordance with "Standard Method of Test for Amount of Material Finer No. 200 Sieve in Aggregate", ASTM C-117.*

(c) Compressive Test Cylinders: Comply with CBC Section 1905A.1.16. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls. Additional samples for seven-day compressive strength tests shall be taken for each class of concrete at the beginning of the concrete work or wherever the mix or aggregate is changed.
(d) Slump tests: Take slump tests of concrete in accordance with "Tentative Methods of Test for Consistency of Portland Cement Concrete for Pavements or for Pavement Base", ASTM C 143, taken when cylinders are made and at any other time at testing laboratory's discretion.

E. Record of Work: A record shall be kept by the Contractor listing the time and date of placement of all concrete for the structure. Such record shall be kept until the completion of the Project and shall be available to the Architect for examination at any time.

## 1.05 SUBMITTALS

A. Submit list of all products to be used.

B. Transit-mix delivery slips:

1. Keep record at the job site showing time and place of each pour of concrete, together with transit-mix delivery slips certifying contents of the pour.
2. Make the record available to the Architect for his inspection upon request.
3. Upon completion of this portion of the work, deliver the record and the delivery slips to the Architect.

C. Submit Materials for testing as follows:

1. Aggregates: Submit to the testing laboratory at least 15 days before concrete is required a fifty pound (50 #) sample of fine aggregate and a one hundred pound (100 #) sample of each size of coarse aggregate proposed for use. Select these samples to fairly represent the average quality and grading of the aggregate in question. When aggregates have been approved as acceptable for use, make no change without written permission of the Architect. Maintain stocks of accepted aggregates so that no pour need be interrupted.
2. Cement: Submit mill tests.

D. Prepare on-site samples as specified below.

E. Testing Laboratory will submit design mixes as evidence that the design requirements have been met, but not for formal review and approval.

F. Submit temperature and placement records.

G. Submit design mixes. Prior to pouring any concrete, the Contractor shall submit all concrete mixes to the Architect for approval. Separate mix designs shall be submitted for each type of concrete to be used in the Project. Submittals shall include all information used in designing the mixes. See 2.2 for design procedures.

H. Test Reports: Testing Laboratory will submit reports on tests and inspections performed to Owner, Architect, Contractor, and organization being tested and inspected.

I. Test Reports: "Special Inspection" reports of concrete compression, yield, air content, shrinkage, and slump test by Testing Laboratory.

J. Certificates:

1. Certification that materials meet requirements specified.
2. Certification from vendors that samples originate from and are representative of each lot proposed for use.

## 1.06 SEQUENCING/SCHEDULING:

A. Schedule and coordinate with suppliers and other trades so that the embedment of items in concrete does not delay the project.

B. Take all precautions to maintain alignment and prevent damage of such items during placement of concrete.

C. Cutting and/or patching made necessary by failure or delay in complying with these requirements shall be at no cost to Owner.

### 1.07 DELIVERY, STORAGE, AND HANDLING:

A. Hauling time: Discharge all concrete transmitted in a truck mixer, agitator, or other transportation device within 1-1/2 hours after the mixing water has been added.

B. Extra Water: Deliver concrete to the job in exact quantities required by the design mix. Should extra water be required before depositing the concrete, the Contractor's Superintendent shall have sole authority to authorize the addition of water. Any additional water added to the mix after leaving the batch plant shall be indicated on the truck ticket and signed by the person responsible. Where extra water is added to the concrete, it shall be mixed thoroughly for forty revolutions of the drum or 3-1/2 minutes at mixing speed, whichever is greater. Samples for control tests shall be taken after additional water has been thoroughly mixed.

C. Pre-wet lightweight aggregate and keep stockpiled after wetting for at least 12 hours before using.

## Part 2. Products

### 2.01 MATERIALS:

A. General: Use ready-mix concrete conforming to ASTM C94 and ACI 318 Section 26.4.2 - 26.4.4. No on-job mixed concrete will be allowed.

B. Cement: ASTM C150, Type II. Temperature delivered at plant not to exceed 150 degrees F. Use only one manufacturer for all cement unless approved by Architect.

C. Pozzolan (Fly Ash): ASTM C618 Class F or N. Unless noted otherwise on Drawings, amount, measured by weight, shall not exceed 25% of the total cementitious content. Fly ash is not permitted in mixes receiving integral color additives.

D. Aggregates:

1. Fine aggregate: ASTM C33, natural, washed, clean sand. Use same sand for all concrete. Comply with gradation limits specified in standard.
2. Coarse aggregate: ASTM C33. Footing concrete may use standard local aggregate. All other aggregate: Limestone or granite. Comply with the following:

   (a) Use only hard, durable material from established sources with proven history of successful use in producing concrete with minimum shrinkage, free from harmful amount of clay, shale, or other deleterious substances in amounts greater than those permitted in ASTM C33.
   (b) Use aggregate containing no thin or elongated pieces. Any piece having a major dimension more than 2-1/2 times the average thickness shall be considered thin or elongated.
   (c) Comply with gradation limits specified in ASTM C33.

E. Air-entraining Admixture: Conform to ASTM C260.

F. Water Reducing Admixture: Conform to ASTM C494, Types A or D. High range water reducing admixtures types F & G shall not be used unless approved in writing by the Structural Engineer.

G. Accelerating Admixture: Conform to ASTM C494, Types C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

H. Water: Clean, potable, and free of deleterious substances.

I. Miscellaneous Materials:

1. Curing and sealing compound: ASTM C309, Type 1, Class B clear, dissipating, non-yellowing, resin based. W.R. Meadows 1000 series, BASF Kure-N-Seal WB, or approved equal.
2. Grout: Non-shrink to comply with Corps of Engineers Specification CRD -C621 and ASTM C1107. BASF Embeco 885, Burke by Edoco NF NS Grout, or approved equal.
3. Bonding Agent: Larsen Products Weldcrete, W.R. Meadows Intralok, or approved equal.
4. Expansion Joint filler: Resilient and non-extruding type, pre- molded bituminous impregnated fiberboard units complying with ASTM D1751.
5. Waterstops: Rubber type complying with Corps of Engineers Specification CRD – C513 or polyvinyl chloride (PVC) complying with Corps of Engineers Specification CRD – C572.
6. Joint Sealer: ASTM D6690, hot poured type.
7. Vapor Barrier: Polyethylene sheets not less than 10 mils thickness and are resistant to decay when tested in accordance with ASTM E154.
8. Epoxy grout: Master Builder Concresive Standard Liquid LPL.

## 2.02 DESIGN & MIXES:

A. The quantity of cement and admixture required per cubic yard of concrete is given for estimating purpose only. The contractor shall base his bid on these quantities. The Owner reserves the right to vary the cement content upward or downward, and the contract price shall be adjusted if necessary based on the market price of bulk cement delivered to the batching plant.

B. The exact amount of cement, fine and coarse aggregate, and water to be used shall be determined by the design mix. The actual slump used shall not exceed amounts listed in the table. These proportions shall produce concrete of maximum density, minimum shrinkage and required minimum strength. The concrete shall work readily into the corners and angles of the forms and reinforcement without excessive puddling, spading or vibration and without permitting the materials to segregate or free water to collect on the surface. The amount of water used shall be the minimum consistent with the requirements. In general, the workability shall be improved by adjusting the grading rather than by adding water.

C. A sample load of each of the specified mixes may be poured in the foundation at the earliest possible date to check workability of the concrete. Test cylinders shall be prepared and tested as specified to verify compliance of the concrete with the specifications. All concrete shall develop the specified minimum strength. Adjustments will be made if test results warrant changes.

D. Basis for mix designs shall be as follows:

| Class | Max. Size Aggregate | 28 Day Comp strength fc | Cement Sks/Yd.Min. | Maximum Slump |
|---|---|---|---|---|
| A | 1-1/2 in. | 3,000 | 6.60 | 4 in. |
| B | 3/4 in. | 3,000 | 7.10 | 4 in.* |

* Slump may be increased to 5 in. only if necessary in areas of congested bars.

Note: Listed quantity of cement per yard of concrete is for cost estimation purposes only.

E. Use the various classes of concrete mixes for the following locations:

1. Class A: All footings (at Contractor's option, Class B may be used).
2. Class B: All concrete not otherwise specified.

F. Class B concrete shall include 4% (plus or minus 1%) entrained air.

G. Measure fine and coarse aggregates separately. The method of measuring aggregates shall be subject to the approval of the testing laboratory and shall be such that all ingredients can be uniformly and accurately controlled and easily checked.

H. The batching plant shall be equipped with an electric metering device capable of determining moisture content of sand. This device shall be subject to the approval of the testing laboratory.

I. No admixtures will be allowed, except as specified herein, unless authorized by the Structural Engineer. All requests for approval or substitution must be made by the Contractor and be accompanied by sufficient information and test data for evaluation. No calcium chloride shall be added to concrete. Dosage shall be per manufacturer's recommendation.

## Part 3. Execution

### 3.01 3.1 PREPARATION

A. Examine units of work to be placed and verify that:

1. Construction of formwork is complete.
2. Required reinforcement, inserts, and embedded items are in place.
3. Form ties at construction joints are tight.
4. Areas to receive concrete are free of debris and excess water.

B. Thoroughly clean the areas to ensure proper placement and bonding of concrete.

C. Thoroughly clean all transporting and handling equipment.

D. Notify Architect and Project Representative at least 48 hours before concrete will be placed.

E. Ensure availability of sufficient labor personnel, equipment, and materials to place concrete correctly in accordance with schedule. Adequate scaffolding, ramps, and walkways shall be provided so that personnel and equipment are not supported by in- place reinforcement.

F. Protect finished surfaces adjacent to areas to receive concrete.

### 3.02 MIXING:

A. In general, provide ready mixed concrete in compliance with the referenced ACI standards and ASTM C94, as modified herein.

B. Mix all concrete mixed in transit mixer for a period of not less than 10 minutes at a peripheral drum speed of 200 ft. per minute. At least 3 minutes of the mixing period shall be at the job site.

C. Start the discharge of concrete not more than 45 minutes after the introduction of mixing water. Complete placing of concrete within 90 minutes of the first introduction of water into the mix.

D. Do not add water to the mix after leaving the plant without the specific approval of the Project Representative or Architect. Upon his approval, water may be added as long as slump does not exceed that specified and the designed water/cement ratio is not exceeded.

E. Do not use lightweight concrete for which the fresh bulk density varies by more than four pounds per cubic foot from the required fresh bulk density.

### 3.03 TEMPERATURE CONTROLS:

A. In general, comply with the following temperature limitations:

1. Maximum temperature of concrete at time of placement: 85 degrees F.

2. Minimum temperature of concrete at time of placement: 50 degrees F.

B. Should the ambient temperature at time of concrete placement exceed 85 degrees F, or should it be expected to rise above this temperature for the 3 days following placement, submit a program for hot weather concreting as recommended in ACI 305R. Do not place concrete under these conditions unless such a program has been approved by the Structural Engineer. Do not add cement to the mix at a temperature higher than 150 degrees F. The program may include such treatment as follows:

1. Cooling aggregates.
2. Using cold water or crushed ice for mixing.
3. Limiting mixing speed.
4. Special admixtures or curing procedures.
5. Protecting or cooling reinforcement.

C. Should the ambient temperature at time of concrete placement be below 50 degrees F or should it be expected to drop below this temperature for the 3 days following placement, submit a program for cold weather concreting as recommended in ACI 306R. Do not place concrete under these conditions unless such a program has been approved by the Structural Engineer. Do not permit concrete to freeze for 7 days following placement. The program may include such treatment as follows:

1. Heating aggregates.
2. Heating water.
3. Heating forms.
4. Enclosing area of pour.
5. Special admixtures or curing procedures.

D. Keep accurate and detailed records of concrete pour locations, temperatures of air and concrete, and curing methods. Turn records over to Architect at completion of work.

E. Cure some test cylinders under conditions same as the placed concrete is if so requested by Architect or testing laboratory.

**3.04 PLACING - GENERAL:**

A. Keep a record of the time and date of placing all concrete in each portion of the project. Make this record open to the inspection of the Architect at any time.

B. Carry on concrete placing, once started, as a continuous operation until the section of approved reinforcement, size and shape is completed. Use pour cut offs of approved details and locations.

C. Handle concrete as rapidly as practical from the mixer or transporting unit to the place of final deposit by methods which prevent segregation or loss of ingredients. Deposit it as nearly as practical, in its final position to avoid re-handling or flowing. Do not drop concrete freely where reinforcing bars will cause segregation, no more than five (5) feet. Deposit concrete to maintain a plastic surface approximately horizontal. Do not deposit concrete that has partially hardened.

D. In pouring columns, use openings in the forms, elephant trunks, or other approved devices which will permit the concrete to be placed without segregation and the accumulation of hardening concrete.

E. Install such devices so the concrete will be dropped vertically. Provide pour holes in the forms to the extent necessary to insure filling or to allow necessary inspection.

F. Consolidate all concrete thoroughly using approved mechanical vibrators.

1. Use Mechanical vibrators, having a minimum frequency of 10,000 rpms, at each point of dump, and keep a stand by vibrator in good working condition, but not in use, on the job until all concrete is placed. Vibrators shall not be used to move concrete laterally.
2. Internal vibration must be direct action in the concrete and not against forms or reinforcement. Vibrate each pour until the water shows indications of rising, but not until the water has risen.
3. Along the faces of the forms, use suitable tools during the pour to force large particles away from the forms and bring mortar to the surface of the forms. In addition, when approved by the Structural Engineer, external form vibration may be used. Take all appropriate means to provide fully filled out, smooth, clean and properly aligned surfaces free from pockets and blemishes.
4. Tamp slabs with a jitterbug to depress the rock and push float with a fill float as necessary. Take care at all times that the wet slab meets the screeds accurately and does not rise above or fall below them.
5. Do not vibrate lightweight concrete to the extent that large particles of aggregate float to the surface.

G. In general, place concrete only against firm surfaces which have been sufficiently dampened to prevent rapid absorption of water from freshly poured concrete.

H. Moisten earth and spray forms and reinforcement with water before placing concrete.

I. Keep forms and reinforcement clean above placement line by removing clinging concrete with wire brush before placing next lift.

J. When temporary spreaders are used in the forms, the spreaders shall be removed as their service becomes unnecessary.

## 3.05 CONSTRUCTION/CONTROL JOINTS:

A. Joints shall be located and constructed as indicated on the Drawings or as approved by the Structural Engineer.

B. All reinforcement shall be continuous across joints; except that reinforcement or other fixed metal items shall not be continuous through expansion joints, or through construction joints in slabs on grade unless noted otherwise on the Drawings.

C. Construction Joints:

1. Unit of operation shall not exceed eighty (80) feet in any horizontal location.
2. Sandblast the entire top surface of all horizontal construction joints with coarse sand to clean and roughen the joint for bond to next mortar matrix. Clean away all drippings, sand, debris, etc., so next pour is placed on clean, solid, rough surface.
3. Water-blasting or other means can be used in lieu of sanblasting.
4. Fresh concrete shall not be placed against adjacent hardened concrete until it is at least twenty-four (24) hours old.

D. Control Joints in slabs:

1. Control joints shall be produced by forming a weakened plane in the slab by the use of rigid inserts impressed in the concrete during placement, snap- out plastic joint forming inserts, or concrete sawing. Regardless of method used, it shall be 1/4 the depth of the slab thickness and between 1/8 and 3/16 inch wide.

## 3.06 TOLERANCES:

A. Unless otherwise specified herein or is shown on the Drawings, permissible deviations from established lines, grades, and dimensions shall be those specified in ACI 117.

B. Unless otherwise noted, place slabs to the following tolerance: 1/8 inch in ten (10) feet. Also no more than 1/8-inch maximum deviation above or below the established datum lines.

C. Areas with floor drains: Unless detailed otherwise, pitch floors carefully to floor drains so as to afford an even fall from all parts of the room using screed extending from the flow drain in fan shape.

D. Construct new concrete columns to the following tolerances for all exposed surfaces:

1. In any 10' of length: 1/4" out of plumb.
2. Member thickness: -1/4", +1/2".

## 3.07 GROUTING

A. Grout where required; proportion and install in accordance with manufacturer's recommendations to produce a grout which will not shrink and which will attain a minimum compressive strength of 4000 pounds per square inch at seven (7) days.

B. Where grout will not be encased in concrete, use non-staining, non-metallic type.

C. Grout shall not be re-tempered or subjected to vibration from any source.

## 3.08 SACKING:

A. Perform where required immediately after forms are removed with a mixture of fine sand and cement, thoroughly rubbing the entire surface, filling all small holes and irregularities and producing a uniform appearance throughout the surface.

B. Sacking is in addition to the patching and repair work required for all surfaces in Article 3.11 below.

C. Architect may require sacking any concrete surfaces which he determines are unacceptable, at no extra cost to the Owner.

## 3.09 CURING, PROTECTION & SEALING

A. Protect concrete from injurious action of the elements and defacement of any nature during construction operations. Keep all forms sufficiently wet to prevent drying out of concrete. Protect slabs and exposed corners of concrete from traffic or use which will damage them in any way.

B. Curing: Immediately following placing, keep concrete continuously moist by means of one of the following methods:

1. Interior Slabs: Apply membrane curing compound to freshly poured concrete floors following manufacturer's directions. Surface must be clear and free of oil, grease, dirt or foreign matter. Spray apply to concrete surfaces for curing within approximately one to two hours after completion of finishing operations and/or immediately after disappearance of the "sheen" of surface moisture. Coat surfaces uniformly leaving no pinholes or gaps, at a rate not to exceed 200 sq. ft. per gallon for broom finished surfaces. Do not puddle or leave heavy surface film.

   (a) At integrally colored or trowel applied color hardener curing shall be accomplished using Schofield "Colorwax" at exterior conditions and "Colorcure" at interior conditions, applied in accordance with the manufacturer’s instructions.

2. Interior Slabs, Concrete Finish: Near completion of job, remove dirt, grease, oil, etc., by sanding mopping and wet vacuuming. Allow to dry thoroughly. Apply membrane curing compound for sealing by brush, airless spray or Squeegee following manufacturer's directions. Apply small amount on surface and immediately work it into pores. Do not let it puddle and do not cover more area than can be worked in 10-15 minutes as setting will start. Use without thinning. Apply in two coats at the rate of 600 sq. ft. per gallon each. Allow first coat to dry a minimum of 24 hrs.
3. Interior Slabs to Receive Finish Flooring or Carpet: Complete as in Item 1 above. No additional sealer required near job completion. Clean slabs of oil, grease, dirt, etc.
4. Exterior Slabs: Complete as in Item 1 above. No additional sealer required near job completion. Clean slabs of oil, grease, dirt, etc.
5. Walls, columns and other vertical surfaces of concrete that have had their formwork removed, shall be kept continuously moist for a period of 14 days, by means of water being mist applied a minimum of three times each day, or by application of a membrane as specified above for slabs and flatwork. Concrete that has had the formwork left in place for a minimum of 7 days will not require additional moisture application or membrane treatment.

### 3.10 CONCRETE FINISHES:

A. Slab Finish:

1. General: Uniformly spread, screed and float concrete.
2. Trowel: Apply two (2) steel troweling operations at surfaces to receive carpet, resilient materials, thin-set tile and where left exposed, finished to achieve burnished surface. Follow second troweling with light brooming perpendicular to direction of traffic to form non-slip surface.
3. Broom: Apply at exterior walks, perpendicular to direction of traffic flow.

B. Joints: Mark off exposed joints, where indicated, with ¼ inch radius edging tool. Markings to be clean cut, straight and square with respect to border. Tool edges of exposed expansion and contraction joints, border edges, and wherever concrete adjoins other material or vertical surfaces.

### 3.11 PATCHING:

A. Repair defects in concrete work as follows: Chip voids to depth of at least one (1) inch or to remove all loose material with the edges perpendicular to the surface and parallel to form markings. Fill voids, surface irregularities, chipped areas, etc., by patching, gunite and/or rubbing, as directed. Duplicate the appearance of unpatched work. Prepare a sample of a repaired condition for approval by Architect before proceeding with all of this work.

## End of Section

Section 05 12 00

# Structural Steel

## Part 1. General

### 1.01 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions, Division 1 - General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to work of this Section as fully as if repeated here.

### 1.02 DESCRIPTION:

A. Work Included:

1. All structural steel, shop galvanizing and painting, field touch-up, and cleaning of steel which is not painted.
2. Include all steel items embedded in poured in place concrete such as anchor bolts, nuts, plates, etc.
3. All labor, material and equipment required to supply and install structural steel, as indicated on the drawings and specified herein.
4. Include miscellaneous metals to match existing, such as railings.

### 1.03 RELATED WORK:

A. Cast-in-Place concrete: Section 03 30 00.

B. Paints and Stains: Section 09 91 10

### 1.04 QUALITY ASSURANCE:

A. Except where different requirements are specified, comply with provisions of following codes, specifications and standards by the California Building Standards Commission, American Institute of Steel Construction (AISC), American Welding Society (AWS), and The Society for Protective Coatings (SSPC):

1. 2019 California Building Code (CBC).
2. AISC 303"Code of Standard Practice for Steel Buildings and Bridges".
3. AISC 360“Specification for Structural Steel Buildings", including the Commentary and Supplements thereto as issued.
4. AISC 341 “Seismic Provisions for Structural Steel Buildings”.
5. AISC 358“Pre-qualified Connections for Special and Intermediate Steel Moments Frames for Seismic Applications”.
6. AISC "Specifications for Structural Joints using ASTM A325 or A490 Bolts", approved by the Research Council on Structural Connections.
7. AISC “Architecturally Exposed Structural Steel", (supplement to Modern Steel Construction, May 2003).
8. AWS B2.1 “Welding Procedure and Performance Qualification”.
9. AWS D1.1 "Structural Welding Code- Steel".
10. AWS D1.8 "Structural Welding Code for Seismic Applications”.
11. SSPC PA-1 “Shop, Field, and Maintenance Painting”.
12. SSPC SP-2 “Hand Tool Cleaning”.

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Comply with the referenced ASTM standards for materials and testing.

C. Qualifications for Welding Work:

1. Qualify welding processes and welding operators in accordance with AWS B2.1.
2. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests, and possess a current card.
3. If re-certification of welders is required, re-testing will be Contractor's responsibility.

D. Shop Fabrication:

1. Work shall be fabricated in an approved fabrication plant recognized by the project's local building jurisdiction per CBC Section 1704.2.2.

E. Testing and Inspection:

1. Contractor shall provide testing laboratory with complete identification, mill analysis and test reports of steel to be used. The testing laboratory will verify steel source and mill tests. In case of inadequate identification (judged by the testing laboratory), the contractor shall provide samples and pay for tests that would include tension and elongation test, bend or flattening test, and chemical analysis of unidentified steel material. See Section 2203.1 of the CBC.
2. The contractor shall notify the Owner and testing laboratory well in advance of the shop fabrication of any unit to allow time to arrange testing and inspection.
3. The testing laboratory shall inspect high strength bolting, check shop and field welding and may use any aid to visual inspection it considers necessary.
4. The testing laboratory shall check shop fabrication and field erection for conformance to the drawings and the referenced AISC documents.
5. In case of any failures of any tests made, the Contractor shall pay for further testing until material or work meets requirements.
6. Testing laboratory will inspect prime paint for thickness, coverage and compliance with specifications.

F. Verification of Accuracy:

1. Engage and pay for a registered civil engineer or licensed land surveyor to check the alignment, plumbness, elevation, and overall accuracy of the erected framing at an appropriate stage during construction and at completion of erection. He shall submit written verification that the entire installation is in accordance with the contract documents.

G. Allowable Tolerances:

1. Unless otherwise specified, furnish and install all structural steel to comply with ASTM A6 and AISC Code of Standard Practice.
2. Unless otherwise specified, install all steel which remains exposed to comply with the referenced AISC Specification "Architecturally Exposed Structural Steel."
3. Further, for all columns and beams, the attention of the Contractor is directed to Section 6.4.2 of the referenced "Code of Standard Practice for Steel Buildings and Bridges" which states that *"completed members shall be free of twists, bends, and open joints. Sharp kinks or bends shall be cause for rejection."* Take special care that column base plates are parallel and perpendicular to faces of columns and that bolt holes are accurately placed.

## 1.05 SUBMITTALS:

A. Product data: Submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
2. High-strength bolts (each type), including nuts and washers.
3. Structural steel primer paint.
4. Shrinkage-resistant grout.
5. Load indicating washers at high-strength bolted connections.

B. Shop Drawings:

1. Contractor shall submit shop drawings prepared under supervision of a professional engineer registered in the State of California, including complete details and schedules for fabrication and assembly of structural steel members' procedures and diagrams. No work shall be started until shop drawings have been reviewed and returned.
2. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld.
   (a) Designate members and connections that are specified as "SLRS" on the Drawings.
   (b) Designate locations of shop welds that are specified as "Demand Critical Welds" on the Drawings.
   (c) Designate locations and dimensions of "protected zones".
   (d) Gusset plates shall be drawn to scale.
3. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.

C. Certificates:

1. Structural Steel: Submit certified copies of mill test reports indicating the physical and chemical properties of all structural steel used. Correlate individual heat numbers with each specified structural section.
2. High Strength Bolts (A325): Submit certified copies of inspection test reports for bolts by the Production Lot Method, indicating proof load, tensile load, tensile strength (wedge test), and hardness. Any lot without satisfactory test reports shall be re-tested at the Contractor's expense.
3. Direct tension indicator washers: Submit certified copies of inspection test reports for washers by the Production Lot Method, showing compliance with ASTM F959.
4. Submit 2 copies of certified verification of accuracy.

D. Submit Welding Procedure Specifications (WPS) for all welding, including welding done using AWS pre-qualified procedures.

E. Record Drawings:

1. After all work of this section has been completed, correct or revise the shop drawings and erection diagrams to correspond with the actual installation made. Provide two sets of prints showing the corrected condition to the Architect for the Owner's use.

F. See Section 01 32 19 for Submittal Procedure

## 1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site at such intervals to insure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete, in ample time to not delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.

D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

### 1.07 JOB COORDINATION:

A. Steel contractor shall cooperate and coordinate his work with other contractors for anchor bolts and other required inserts, templates, etc. Align this work prior to installation of other materials.

## Part 2. Products

### 2.01 MATERIALS:

A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, transient and application of surface finishes.

B. Structural Steel Wide-flange Shapes: ASTM A992, Grade 50.

C. Other Rolled Shapes, Plates and Bars: ASTM A36m unless stated otherwise..

D. Structural Tubing: ASTM A500 Grade B.

E. Anchor Bolts: ASTM F1554, Grade 55, unless stated otherwise.

F. Threaded Rods: ASTM A193, Grade B7.

G. High Strength Bolts: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH (ASTM A563M, Class 10S), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1 (Type 8.8-1), compressible-washer type with plain finish

H. Machine Bolts: Where machine bolts (M.B.) are called for, they are to be ASTM A307 with full shank bearing wherever possible. Where this is impracticable, threads of not more than 2/3rds of the thickness of the piece on one side of the shear plane will be permitted.

I. Electrodes for Welding: Comply with AWS Code, E70xx.

J. Structural Steel Primer Paint: Submit fabricator's standard rust-inhibiting primer for approval.

1. Exposed steel: Tnemec V10-99, Rust-Oleum 1069 Heavy Duty Primer, or approved equal. Finish paint color per Owner.

K. Non-shrink Grout: Comply with Corps of Engineers Specification CRD -C621 and ASTM C1107; BASF Embeco 885 or Masterflow 928, Dayton Superior Edoco NF NS Grout, or approved equal.

L. Galvanizing: ASTM A123.

M. Galvanized Steel Bar Grating: As manufactured by McMaster-Carr, McNichols, or approved equal.

N. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, complying with the Military Specification MIL-P-21035 (Ships).

## 2.02 FABRICATION

A. Shop Fabrication and Assembly:

B. Fabricates and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

C. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in connecting welding work.

D. Holes for Other Work:

1. Provide holes required for securing other work to structural steel framing as shown on final shop drawings.
2. Threaded nuts welded to framing, and other specialty items to as indicated to receive other work.
3. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

## 2.03 SHOP PAINTING

A. General: Shop prime paint structural steel, except as follows:

1. Members or portions of members to be embedded in concrete. Paint embedded steel which is partially exposed or exposed portion and initial 2" of embedded areas only.
2. Surfaces to be galvanized.
3. Within 1/2 inch of the toe of welds prior to welding.

B. Surface preparation: After inspection and before shipping, clean steel work to be painted in compliance with SSPC SP-2 "Hand Tool Cleaning", SP-3 "Power Tool Cleaning", or SP-6 “Commercial Blast Cleaning”. Remove oil, grease, and similar contaminates in compliance with SSPC SP-1 “Solvent Cleaning”.

C. Painting: Immediately after surface preparation, apply structural steel primer in accordance with manufacturer's instructions and at a rate to provide a uniform dry film thickness of not less than 2.0 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces.

## 2.04 GALVANIZING

A. Galvanize structural steel units, which will be installed with an exposure to the weather upon completion of fabrication, by the hot- dip method. Provide not less than 1.8 ounces of zinc coating per square foot of surface, in accordance with ASTM A 123, unless otherwise noted. Galvanize all exposed bolts or other connectors. Field repair damaged galvanized surfaces and welds on galvanized work with ZRC Worldwide Gavilite, Clearco Zinc Rich Primer, or approved equal.

## Part 3. Execution

### 3.01 INSPECTION

A. Erector must examine areas and conditions under which structural steel work is to be installed, and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until satisfactory conditions have been corrected in a manner acceptable to the Erector.

B. Erector shall inspect and approve the location and alignment of all structural embedments and templates prior to pouring of concrete.

### 3.02 HOISTING AND ERECTION:

A. Steel contractor shall include provision for all hoisting and erection equipment necessary to complete his operations.

B. Owner will provide electrical power. Steel contractor shall provide any additional electrical devices, equipment, and conductors from that point necessary to perform his work and shall be responsible for their compliance with all regulations.

C. Steel contractor shall provide and maintain any and all safety railings, toe boards, etc. required for the erection of steel framing floor plates and shall leave the safety devices around all perimeters of floor areas for the contractor's use during the remainder of construction as required. Contractor will disassemble and store this material, when not required, for pick-up by the Steel Contractor.

D. Temporary Shoring and Bracing: Steel Contractor shall be responsible for bracing the erected frame in a manner which will assure proper alignment for the steel frame. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds. Remove temporary members and connections when permanent members are in place and final connections are made.

E. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.

F. Anchor Bolts:

1. Furnish anchor bolts and other connections required for securing structural steel to in-place concrete work as indicated on drawings to be part of this contract.
2. Furnish templates and other devices as necessary for pre-setting bolts and other anchors to accurate locations.

G. Setting Bases and Bearing Plates:

1. Clean concrete bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surfaces of base and bearing plates.
2. Set loose and attached base plates and bearing plates for structural member on wedges or other adjusting devices.

H. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

I. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

J. Field Assembly:

1. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastened. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
2. Level and plumb individual members of structure within specified AISC tolerances.
3. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed in service.
4. Splice members only where indicated and accepted on shop drawings.

K. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.

L. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

M. Gas Cutting: Do not use gas-cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only in secondary members which are not under stress, as acceptable to Engineer. Finish gas-cut sections equal to a sheared appearance when permitted.

N. Touch-up Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.
2. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

## 3.03 WORKMANSHIP:

A. Fabrication and erection of all steel shall conform to the tolerances and other provisions of the AISC Code of Standard Practice. Where members are permanently exposed, conform also to the provisions of the AISC Specification for Architecturally Exposed Structural Steel.

B. It is specifically stipulated that burned holes are not acceptable.

C. All details shall conform to details shown on the drawings or, where not shown, shall be consistent with those shown or based on the specifications already referred to and as illustrated in the handbook "Steel Construction" of the American Institute of Steel Construction, latest edition.

D. Provide all temporary bracing, shoring, planking, etc. required to erect the frame. The contractor shall coordinate the work and provide the temporary supports necessary for completing the work safely and without unnecessary delays.

E. E. Damage to members in shipment or handling shall be corrected as directed by the Structural Engineer.

## 3.04 WELDING:

A. Follow applicable sections of A.W.S. specifications.

B. Welds shall be made by operators whose qualifications have been approved by Owner's testing laboratory representative and as prescribed in A.W.S. "Qualification Procedure: (except welds which do not carry calculated stress). Details of joints shall comply with requirements for A.W.S. joints accepted without qualification tests.

C. Unless noted otherwise, weld thickness is minimum size specified in Section J2 of AISC 360. Butt welds are full penetration welds (use back-up plate or chip and back weld). Welds not required to be full penetration welds are specifically noted on drawings.

**End of Section**

Section 06 10 00

# Rough Carpentry

## Part 1. General

### 1.01 Provisions

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions, Division 1 - General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to work of this Section as fully as if repeated here.

### 1.02 Description

A. Work Included: Execution and completion of all rough and finish carpentry as shown and specified including, but not necessarily limited to, the following:

B. Framing in and patching existing holes where items are removed.

1. Furnishing and installing miscellaneous materials not specified elsewhere which are required to complete the work.

### 1.03 Quality Assurance

A. Comply with the referenced standards of the following trade associations:

1. West Coast Lumber Inspection Bureau (WCLIB)
2. Western Wood Products Association (WWPA)
3. American Forest and Paper Association (AF&PA)
4. The Engineered Wood Association (APA)
5. California Redwood Association (CRA)

B. Comply with all referenced requirements of the 2019 California Building Code (CBC).

C. Comply with the referenced preservative treatment requirements of the American Wood Preservers Association (AWPA).

D. Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

E. Discrepancies: In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

F. Lumber may be rejected by the Structural Engineer, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

### 1.04 Delivery & Storage of Material

A. All materials shall be properly packed and handled while in transit so as to arrive at the job site in undamaged condition. Manufactured materials shall be delivered in suitable containers plainly marked with brand and manufacturer's name.

B. Storage arrangements shall be subject to the Architect's approval and shall afford every access for inspection and identification of each item. Lumber shall be piled off the ground, on skids, in a manner that prevents twisting or warping and affords proper ventilation, drainage, and protection from termites and decay, rain and excessive sun. Plywood shall be

protected from dampness. All material shall be protected from the elements and from any and all damage or deterioration. Coordinate material storage area with Owner.

C. Damaged or deteriorated materials or assemblies shall not be used in the work and shall be replaced at no extra cost to the Owner.

### 1.05 Submittals

A. Samples: Submit samples of each wood material which is to receive a transparent or natural finish. Submit 12 inch long samples of full member width and thickness for solid lumber and 12 inch long by 6 inch wide for plywood. Samples will be reviewed by Architect for appearance only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

B. Wood Treatment Data: For informational purposes, submit two copies of the chemical treatment manufacturers' instructions for proper use of each type of treated material. Indicate by means of copy of the letter of transmittal, that copy of each instruction has been distributed to the installer of the material.

1. Dip Treatment: For each type specified, include certification by treating plant, identifying the chemical solutions used, submersion period and conformance with specified standards.
2. Pressure Treatment: For each type specified, include certification by the treating plant, identifying the chemicals and process used, net amount of salts retained and conformance with applicable standards. For water borne preservatives, include statement that moisture content of treated materials was reduced to a maximum of 15% prior to shipment to project site.

C. Fire Retardant Treatment: Include certification by the treating plant that the treatment material complies with the governing ordinances and that treatment will not "bleed" through the surface finish materials scheduled to be used.

## Part 2. Products

### 2.01 Lumber

A. General: All material shall conform to these specifications and to the applicable current editions of the Standard Specifications of the ASTM and the California Building Code.

B. Lumber Grading: Douglas Fir, WCLIB "Standard Grading & Dressing Rules for West Coast Lumber," No.17.

C. Lumber Grade Marking: Each piece of lumber shall bear the official grade mark of an appropriate inspection bureau certified by the Board of Review, American Lumber Standard Committee. Surfaces that are exposed to view shall not bear grade marks, stamps, or any other type of identifying mark.

D. Lumber Size and Patterns: Surfaced four sides, dress sizes to U.S. Product Standard PS 20, work to sizes shown. Sizing and surfacing shall be as required and approved for the particular location. All framing shall be sized and where exposed shall be surfaced.

E. Fir Plywood: U.S. Product Standard PS 1-07 for plywood, Douglas Fir CDX, Douglas Fir Structural I, grade stamped and edge branded to DFPA Standards of the Engineered Wood Association. Use standard sheathing with exterior glue.

F. Boards and dimension lumber 2" or less in thickness shall have an average moisture content of 15% or less, but no portion of a shipment shall be over 19%. Air-dried lumber is desired

but, if necessary, lumber may be kiln-dried. However, the drying process must be slow and regulated to cause only an amount of checking comparable with air-dried stock. All wood thicker than 2½" shall be well seasoned stock, moisture content not to exceed 19% at time of installation.

G. All framing, unless otherwise shown, shall be Douglas Fir, No.1, and for stud, plate, blocking, and backing, No.1.

H. Redwood – No. 1 or better.

2.02 **Lumber Fastenings**

A. Nails and Spikes: ASTM F1667, Common wire, unless otherwise noted.

1. Nailing of wood member shall conform to the California Building Code and/or as indicated. Box nails are not permitted.
2. Penetration: Per Section 2304.10 and Table 2304.10.1 of the CBC or as noted on the Drawings.
3. To connect pieces 2" net in thickness, 16d nails may be used.
4. Do not drive nails closer together than half their length, nor closer to edge of piece of lumber or timber than one-quarter their length.
5. Spacing and size of nails to be such that splitting will not occur. Pre-bore holes for nails wherever necessary to prevent splitting. Bore diameter of holes smaller than diameter of nail or spike (¾ diameter).
6. For plywood nailing, size and spacing as indicated. Nails shall have edge distances of not less than 3/8".
7. Use galvanized nails where exposed to weather.

B. Screws: Bright steel wood screws complying with ANSI/ASME Standard B18.6.1.

1. Screws are to be turned into place, not driven. Self-tapping where required for fastening to metal framing.
2. Countersink where heads will interfere or as required.
3. Screw bore holes the same diameter and depth as shank; bore holes for threaded portion of screws with bit no larger than base of thread.
4. Use galvanized or cadmium-plated screws on all fastenings exposed to weather.

C. Bolts: Standard mild steel, square head machine bolts with square nuts and malleable iron or steel plate washers, conforming to ASTM A307.

1. To be installed in drilled holes the diameter of the bolt, 1/32 inch to 1/16-inch oversize.
2. Bolting of wood members shall conform to CBC requirements and as called for on the drawings.
3. Washers: Provide all bolts bearing on wood, unless noted otherwise on the drawings, with malleable iron or steel plate washers under heads and nuts.
4. Use galvanized bolts, nuts, and washers where exposed to weather.

D. Lag Screws: Conform to "National Design Specifications for Wood Construction", AF&PA, latest edition and ANSI/ASME Standard B18.2.1.

1. Lag screws shall be screwed and not driven into place. Penetration in each timber shall not be less than 2/3 of the length of the lag screw.
2. Hole shall be bored the same diameter and depth as the shank, after which the hole shall be continued to a depth equal to the length of the lag screw with a diameter no larger than ¾ of the shank diameter.
3. Washers: Provide all lag screws bearing on wood with malleable iron or steel plate washers under heads.
4. Use galvanized lag screws and washers where exposed to weather.

E. Metal framing devices shall be as manufactured by Simpson Company, San Leandro, CA or approved equal.

1. For connectors in contact with or connected through pressure-preservative treated wood, they shall be galvanized with Z-Max or HDG coatings as recommended by the manufacturer.
2. Where “Min” and ”Max” options are listed in the product catalog, install per “Max” option unless otherwise noted on the Drawings.

F. Fasteners for pressure-preservative treated and fire-retardant treated wood, galvanized & stainless steel metal framing devices, shall be hot-dipped zinc coated galvanized, stainless steel, silicon bronze or copper. Fasteners required to be corrosion resistant shall be either zinc-coated fasteners, aluminum alloy wire fasteners or stainless steel fasteners.

### 2.03 Materials - Preservative Treatment

A. Preservative Treatment: Water borne type complying with AWPA Standard P5. Acceptable manufacturers and products: Osmose "Naturewood", Arch Wood Protection “Wolmanized Outdoor”, or approved equal. Chromated copper arsenate (CCA) based treatments shall not be used unless approved by the Architect.

1. Apply all preservative treatment to comply with AWPA Standards T1, M4, and the appropriate AWPA Commodity Specification based on the individual member’s Use Category listed in AWPA Standard U1.

B. Provide preservative treatment for all wood at the roof, such as insulation nailers, curbs, plywood backup, etc., all wood in contact with concrete, and all wood exposed to weather.

C. Provide labeling in conformance with CBC Section 2303.1.9.1 on all preservative treated material delivered to the job site.

### 2.04 Materials - Fire Retardant Treatment

A. Fire Retardant Treatment: Water born chemical treatment to comply with AWPA Standard P-5 and achieve a flame spread index of 25 or less when tested in accordance with ASTM E84. Use of ammonium phosphates is prohibited. Acceptable manufacturers and products: Osmose "FirePRO", Hoover "Pyro-Guard" and "Exterior Fire-X", or approved equal.

B. Apply in compliance with the applicable AWPA Standard for type of wood and application.

C. Provide fire retardant treatment for all wood noted on the Drawings to receive it.

D. Where treated items are indicated on the Drawings to receive a transparent or opaque paint finish, use a fire retardant treatment which will not bleed through or adversely affect the bond of the finish material.

E. Provide labeling in conformance with CBC Section 2303.2.4 on all fire treated material delivered to the job site.

## Part 3. Execution

### 3.01 Workmanship

A. General: All rough carpentry shall produce joints true, tight, and well-nailed with all members assembled in accordance with the drawings and with all pertinent codes and regulations. Carefully layout framing to be straight, true, and plumb.

B. Selection of lumber pieces: Carefully select all members; select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making proper connections.

C. Shimming: Do no shim sills, joists, short studs, trimmers, headers, lintels, or other framing components.

## 3.02 General Framing

A. General:

1. In addition to all framing operations normal to the fabrication and erection indicated on the drawings. Install all backing required for the work of other trades. Install furring, stripping, grounds, curbs, cants, etc., indicated, specified, or required.
2. Set all horizontal or sloped members with crown up.
3. Do not notch, bore, or cut members for pipes, ducts, conduits, or for other reasons except as shown on the drawings, or as specifically approved in advance by the Structural Engineer.
4. Joists and beams at same level shall be connected with metal framing devices, "U" type, except as noted on the Drawings.
5. Provide furring as needed to accommodate and/or conceal the various components and equipment of Mechanical, Electrical and Systems of other Divisions of Work.

B. Bearings:

1. Make all bearings full unless otherwise indicated on the drawings. Set headers on edge, supported on each end by cripples.
2. Finish all bearing surfaces on which structural members are to rest so as to give sure and even support; where framing members slope, cut or notch the ends as required to give uniform bearing surface.

C. Wood Grounds and Nailers:

1. Provide wherever shown and where required for screeding, or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
2. Attach wood nailers to steel framing with 1/2" diameter bolts at 4'-0" o.c. unless otherwise noted on drawings.
3. Attach wood nailers to concrete walls with 1/2" diameter expansion shield at 4'-0" o.c. maximum unless otherwise noted on drawings.
4. Attach all other wood grounds and nailers to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Where possible when attachment made to concrete, anchor to formwork before concrete placement.

## 3.03 Blocking

A. Install all blocking as required by governing codes and as required to support all items of finish and to cut off all concealed draft openings, both vertical and horizontal, between ceiling and floor areas.

B. Install 2x blocking at all intersections and edges of finished surface for bearing, and at all points where required to support fixtures, cabinets, hardware, flashing, and equipment of any other trade. Blocking to receive fixtures shall be secured to framing with steel clips.

1. Install 2x blocking at all ceiling or soffits where support spacing for finish material is over 24" o.c. Add blocking at 24" o.c. to support gypsum drywall ceiling and at 16" o.c. to support plaster ceilings.

C. Blocking between joists:

1. Install wood solid blocking between joists where the span exceeds eight feet.
2. The distance between a line of blocking and a bearing wall shall not exceed eight feet.
3. Solid blocking may be omitted for roof and ceiling joists eight inches (nominal) in depth where the omission is permitted by code, except where otherwise indicated on the drawings.
4. Install solid blocking between joists at all points of support and wherever sheathing or flooring is discontinuous.
5. Blocking may be omitted where joists rest on ribbons and are nailed to studs, and where joists are supported on metal joist hangers.

## 3.04 Built-up Beams

A. Use no less than two joists spiked together to support partitions running parallel to the joists, provided however that where necessary to permit passage of pipes such joists may be separated by solid blocking spaced at no more than four feet on center.

## 3.05 Stud Walls and Partitions

A. Studs: Make all studs single length, unspliced, and platform framed. Sill plates, as a minimum, shall be the same size as studs unless otherwise noted.

B. Corners and Intersections: Unless otherwise indicated on the drawings, frame all corners and intersections with three or more studs and all required bearing for wall finish.

## 3.06 Alignment

A. On all framing members to receive a finished wall or ceiling, align the finish subsurface to vary not more than 1/8 inch from the plane of surfaces of adjacent framing and furring members.

## 3.07 Installation of Plywood Sheathing

A. Placement:

1. Place all plywood with face grain perpendicular to supports and continuously over at least two supports, except where otherwise specifically shown on the drawings.
2. Center joists accurately over supports, unless otherwise specifically shown on the drawings, stagger the end joints of plywood panels to achieve a minimum of continuity of joints.
3. Nail all panel edges to framing members or blocking at least 1-1/2" thick and as shown on the drawings. Space nails at panel edges as indicated on drawings, or if not indicated, according to the CBC requirements. Place nails not less than 3/8" from panel edges and driven solidly into the support.
4. Provide 1/8 inch minimum separation at ends and edges of plywood sheathing installed under cement plaster.
5. Sheathing surfaces shall be free of warp, twist, buckles, holes and other defects.

B. Glued Plywood: Install in accordance with APA recommendations. Apply a bead of adhesive to joints and to edges at all floor joists and beams. Apply a bead in a snake-like manner to joists at plywood butt edges.

C. Protection of Plywood: Protect all plywood from moisture by use of all required waterproof coverings until the plywood has in turn been covered with the next succeeding component or finish.

## 3.08 Fastenings

A. Nailing:

1. Use only common wire nails of the dimensions shown on the Nailing schedule, except where otherwise specifically noted in the drawings.
2. All nailing to conform to minimum requirements shown on the drawings and/or as referenced by these specifications.
3. For conditions not covered on the drawings, provide penetration into the piece receiving the point of not less than 1/2 the length of the nail provided, however, that 16d nails may be used to connect two pieces of two inch (nominal) thickness.
4. In diaphragms, the minimum penetrations shall be 1-3/8" for 8d nails and 1-1/2" for 10d nails.
5. Do all nailing without splitting wood, pre-boring as required; replace all split members.

B. Bolts and Screws:

1. Bolts: Drill holes 1/32" larger in diameter than the bolts being used, drill straight and true from one side only. Bolt threads shall not bear on wood.
2. Screws:
   (a) Penetration for wood screws shall not be less than six diameters unless otherwise shown on the Drawings. Penetration (not including length of tapered tip) for lag screws shall not be less than four diameters unless otherwise shown on the Drawings.
   (b) For lag screws and wood screws, pre-bore holes in accordance with A.I.T.C. and with a maximum diameter as root of thread, enlarge holes to shank diameter for length of shank.
   (c) Screw, do not drive, all lag screws and wood screws.
   (d) Bolts with upset threads not permitted.
3. Provide washers under heads and nuts of all bolts and lag screws.
4. Washers for bolts in shear shall have a net area of not less than 16 times the area of bolt or lag screw, and shall be either of steel not less in thickness than 1/10 the length of the washer's longest side, or of malleable iron having a thickness of not less than 1/2 the bolt or screw diameter.
5. Washers shall have a bearing surface for the nut or head that is not less than or equal in diameter to the long diameter of the nut or head.

C. Anchor Bolts:

1. Anchor sills on concrete with 5/8" diameter x 12" anchor bolts at 48" o.c. maximum spacing, minimum 2 each piece and one within 9" of each end, except as noted on the drawings.
2. Provide one anchor bolt within 9" of each side of holes or notches 1-1/8" or larger.

## 3.09 Sealing

A. Seal ends of beam 4" nominal or thicker with two coats of sealer. Seal ends of plywood that will be exposed to weather with three coats of sealer.

## 3.10 Roof Curbs and Sleepers

A. Provide where required for the attachment of other work. Form to the shapes and cut as required for true line and level of work to be attached. Set true to line and level, plumb, with other work involved.

B. Attach to substrates securely as required to support the applied loading.

3.11 **Cleaning up**

A. General: Keep the premises in a neat, safe, and orderly condition at all times during the execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.

B. Sweeping:

1. At the end of each working day, or more often if necessary, thoroughly sweep all surfaces where refuse from this portion of the work has settled.
2. Remove the refuse to the area of the job site set aside for its storage.
3. Upon completion of the work, remove all debris, rubbish, and surplus materials from the site, resulting from work under this section. Do not leave any wood, shavings, sawdust, etc, on the ground or buried in fill or inside framing.

## End of Section

Section 06 20 00

# Finish Carpentry

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,3,4,5,6, Title 24 of the California Code of Regulations(California Building Code) is to be considered an integral part of this section. Items noted here are those specifically related to the General Contractor'

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | ▪ Installation of pre-manufactured items where installation is not specifically covered in other sections<br>▪ Specialties not specifically covered in other sections including installation under their respective sections.<br>▪ Special cabinet and counter installation<br>▪ Finish plumbing, mechanical and electrical components not covered under those sections.<br>▪ Door / window installation |
| Special Coordination | ▪ Coordinate embeds required for cabinet installation. |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1

| Item | Description |
|---|---|
| Catalog Cuts | ▪ n/a |
| Product Data | ▪ n/a |
| Samples | ▪ n/a |
| Shop Drawings | ▪ n/a |
| Schedule | ▪ Include Schedule entry on Gantt Chart for Installation |

### 1.04 References/Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining "Industry Standards" and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other

responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | Woodwork Institute Manual of Woodwork<br>Section 3: Lumber – Hardwood & Softwood<br>Section 4: Plywood – Hardwood & Softwood |
| Standard | ▪ n/a |

## 1.05 Quality Assurance

A. Provide the following per Division 1

| Item | Description |
|---|---|
| Supervision | ▪ Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | ▪ General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>▪ For actual cutting and fitting of trim and finish material, use only journeymen finish carpenters who are thoroughly trained and experienced in the skills required, who are completely familiar with the materials involved and the manufacturer's recommended methods of installation and who are thoroughly familiar with the requirements of this work. |
| Product Acceptance | ▪ General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation. |
| Substrate Acceptance | ▪ General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item. |

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | ▪ Per Division 1<br>▪ Standard Inspections |
| Testing | ▪ As required by DSA Testing and Inspection Forms |
| Special Inspections | ▪ Refer to DSA Testing and Inspection Form |
| Mock Ups | ▪ Install first of any item for Architect/Owner acceptance prior to proceeding. |

### 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | ▪ Per Division 1. |
| Inspection | ▪ Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | ▪ Refer to DSA Testing and Inspection Sheet |
| Special Inspections | ▪ Refer to DSA Testing and Inspection Sheet |

### 1.08 Close Out

A. Provide the following Close Out materials in accordance with Division 1

| Item | Description |
|---|---|
| Product Manuals | ▪ Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | ▪ Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems. |
| Maint. Tools/Materials | ▪ n/a |
| Surplus Materials | ▪ n/a |
| Training | ▪ n/a |

### 1.09 Warranty

A. Provide written warranty in accordance with Division 1

| Item | Description |
|---|---|
| Warranty Form | ▪ Per Division 1<br>▪ Sub Contractor and manufacturer to provide warranty against defects in materials or workmanship. Replacement of repair of such defects shall be repaired or replaced in a timely fashion at no additional cost to the Owner. |
| Warranty Period | ▪ 1 year |
| Warranty Start | ▪ Date of Substantial Completion |

## Part 2. Products

### 2.01 General

A. Products installed under this section may be described in other sections of this Specification. Requirements of those Sections regarding handling and storage shall apply to the work of this Section.

### 2.02 Product Delivery, Handling, and Storage

A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades. ***Work damaged after installation and before substantial completion shall be repaired and/or replaced at no additional cost to the owner.***

B. Products installed under this Section may be specified in other Sections.

## 2.03 Interior Lumber

A. Softwood Lumber

1. PS 20
2. Graded in accordance with the requirements of WI;
3. Maximum moisture content of 15 percent.

B. Hardwood Lumber

1. WI Premium grade unless otherwise noted
2. Match existing species, grain, and sections when repairing or altering existing millwork.

C. Specific Applications:

| Application / Location | Material / Grade |
|---|---|

## 2.04 Exterior Lumber

A. Softwood Lumber

1. PS 20
2. Graded in accordance with the requirements of WI
3. Maximum moisture content of 10 percent.

B. Hardwood Lumber

1. WI Premium grade unless otherwise noted.
2. Match existing species, grain, and sections when repairing or altering existing millwork.

C. Specific Applications:

| Application / Location | Material / Grade |
|---|---|

## 2.05 Sheet Materials

A. Douglas Fir Plywood

1. Graded in accordance with APAS;
2. Core of same material of veneer;

B. Hardwood Plywood:

1. Graded in accordance with WI/HPVA
2. veneer, type of glue as recommended for application;

C. Plastic Laminate: Where plastic laminate is called for on the Drawings, provide Wilsonart, Nevamar, or Formica general purpose grade 10 or an equal approved in advanced by the Architect, in color and finish as selected by the Architect from the Standard colors and finishes of the approved manufacturer.

D. Specific Applications:

| Application / Location | Material / Grade |
|---|---|
| | 3/4" (19mm) Birch veneer plywood, Grade "A" (on visible face), rotary cut, hardwood veneer core. Install in 4'x8' sheets oriented vertically. Align joints per Interior Elevations |

## Part 3. Execution

### 3.01 Surface Conditions

A. Inspection:

1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation is may properly commence.
2. Verify that finish carpentry is in strict accordance with the original design and all pertinent codes and regulations.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Architect.
2. Do not proceed with installation in areas of discrepancies have been fully resolved.

### 3.02 Workmanship

A. General: All misc. installation shall produce joints true, tight, and well nailed, or otherwise attached, with all members assembled in accordance with the Drawings.

1. Contractor is responsible for strength and durability of installation. Installation and attachment methods shall be adequate for Institutional operational conditions.
2. All installation shall be adequately nailed, screwed, glued or otherwise attached to withstand intensive use and abuse.
3. Provide increased nailing and screwing frequency and supplement with glue where appropriate.
4. Commissioning procedures will spot check durability and the Contractor will be required to replace all similar instances of a failed application.

B. Jointing: Make all joints to conceal shrinkage; miter all exterior corners; cope all interior corners; miter or scarf all end-to-end joints.

C. Fastening:

1. Install all items straight, true, level, plumb, and firmly anchored in place; where blocking or backing is required, coordinate as necessary with other trades to ensure placement of all required backing and blocking in a timely manner.
2. On all exposed finish work, set all nails and recess all screw heads for putty.
3. Screw, do not drive, all screws, except that screws may be started by driving and then screwed home.

### 3.03 General Installation

A. Install all other items in strict accordance with the Drawings and the published recommendations of the manufacturer of the item, anchoring firmly in place at the prescribed location, straight, plumb, level and anchored for long life under hard use.

B. Insure that installation methods and materials are compatible with nay substrate over which general installation occurs.

C. Contractor shall insure that installation of any material or product does not damage substrate or cause substrate to fail either in its intended purpose or as a suitable substrate for the material / product being installed.

### 3.04 Accessory Installation

A. Install all accessories, equipment and devices according to manufacturer instructions.

B. Contractor shall insure that installation of any accessory does not damage substrate or cause substrate to fail either in its intended purpose or as a suitable substrate for the accessory being installed.

C. Install all other items in strict accordance with the Drawings and the published recommendations of the manufacturer of the item, anchoring firmly in place at the prescribed location, straight, plumb, level and anchored for long life under hard use.

D. Accessory installation shall not damage or soil existing finishes and substrates.

E. Contractor shall be responsible for cleaning, repair or replacement of any damaged adjacent finish or substrate.

F. Contractor shall observe installation of all accessory items for alignment and plumb and make adjustments prior to inspection by the Architect.

G. When attachment is not specified, Contractor shall provide attachment method. Contractor shall provide adequate attachment for all items to remain in place, level and plumb under Institutional operational conditions.

H. Coordinate location and mounting heights with documents and applicable codes.

I. Mounting heights and locations shall comply with applicable accessibility codes. Contractor shall notify Architect if he becomes aware of any specified height or location that is in conflict with CBC or ADA requirements.

## 3.05 **Cleaning**

A. General

1. Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut ends, and debris.

B. Sweeping

1. At the end of each work day and more often if necessary, thoroughly sweep all surfaces.
2. Remove the refuse to the area of the job site set aside for its storage.
3. Upon completion of this portion of the work, thoroughly broom-clean all surfaces.

## End of Section

Section 07 21 00

# Building Insulation

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, Apply to the work specified in this section.

B. Part 1, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of all work of this Contract.

B. Applications of insulation specified in this section

| Item | Description |
|---|---|
| General | ▪ Incidental replacement of exterior insulation, including at roof and exterior wall locations.<br>▪ All other insulation indicated in plans. |

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Section 01 32 19.

| Item | Description |
|---|---|
| Catalog Cuts | ▪ Manufacturer's information for the specified R-value product |
| Product Data | ▪ Provide product data for each type of product and process specified in this section<br>▪ Manufacturers Specification<br>▪ Certification as required by CCR Title 24n/a |
| Samples/ Shop Drawings | ▪ n/a |
| Schedule | ▪ Include Schedule entry on Gantt Chart |

### 1.04 Quality Control

A. The following procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | ▪ Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |

| | |
|---|---|
| Qualifications of Workers | ▪ General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project. |
| Product Acceptance | ▪ General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation. |
| Substrate Acceptance | ▪ General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item. |

## 1.05 Delivery and Storage of Materials

A. All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

## 1.06 Reference Standards

| | |
|---|---|
| References | ▪ ASTM C-578<br>▪ ASTM C-518<br>▪ ASTM-E136 |
| Standard | ▪ California Energy Commission<br>▪ All insulation materials, including facings, installed within floor-ceiling assemblies, walls, crawl spaces or attics, shall have a **flame-spread rating not to exceed 25 and a smoke density not to exceed 450 when tested in accordance with UBC Standard 8-1(which references ASTME84)** When such materials are installed in concealed spaces, the flame-spread and smoke-developed limitations do not apply to facings, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish. |

## 1.07 Warranty

A. Provide written warranty in accordance with Division 1.

| **Item** | **Description** |
|---|---|
| Warranty Form | ▪ Per Division 1<br>▪ All products shall be warranted for a period of 2 years from date of acceptance of the work. Defects of materials or workmanship occurring during the warranty period shall be corrected to the complete satisfaction of the Architect and Owner |
| Warranty Period | ▪ 2 year |
| Warranty Start | ▪ Date of Substantial Completion |

## Part 2. Products

### 2.01 Acceptable Manufacturers

A. Manufacturers of Glass Fiber Insulation:

1. Owens-Corning Fiberglas Corp. (www.owenscorning.com)
2. Johns Manville (www.jm.com)

### 2.02 Insulating Materials

A. Batt Insulation

1. Walls: R-19
2. Attics: R-30
3. Roof/ceiling assembly:

   (a) R-13 at 2x4 roof joists
   (b) R-19 at 2x6 roof joists
   (c) or an equivalent product providing min. R-25 insulating value as part of completed roof assembly. Refer to specific dimensions in drawings

B. Vapor Retarder

1. FSK (Foil-scrim-kraft) vapor retarder laminated to batts at exterior walls and roof.

### 2.03 Product Requirements

A. Flame spread shall not exceed 25

B. Smoke Density shall not exceed 450 when tested in accordance with UBC standard 8-1

### 2.04 Accessories

A. Provide the following accessory products/materials:

1. Fasteners: Comply with roof board and roofing membrane manufacturer requirements.
2. Adhesive: Comply with roof board and roofing membrane manufacturer requirements.

## Part 3. Execution

### 3.01 Inspection and Preparation

A. Require Installer to examine substrates and conditions under which insulating work is to be performed. Do not proceed with installation of insulation until any unsatisfactory conditions have been corrected.

B. Do not install insulation until the space to be insulated has been inspected and approved by the Project Inspector. Provide minimum 48 hours written notification.

### 3.02 Installation, General

A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

B. Extend insulation full thickness as shown over entire areas to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.

### 3.03 Installation of Thermal Insulation

A. Install thermal insulation in ceiling joist bays. Butt ends of blankets closely together and fill all voids.

B. Insure required air space above batts remains per details at all locations.

C. Insure required airspace is continuous with adjacent airspaces leading to a point of positive ventilation.

### 3.04 Protection

A. Protect installed work from damage due to subsequent construction activity on the site.

## End of Section

Section 08 21 00

# Wood Doors

## Part 1. General Documents

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of ALL work of this Contract.

| Item | Description |
|---|---|
| General | ▪ Standard and fire rated type wood doors<br>▪ Glazed door, tempered glazing provided by door manufacturer |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

| Item | Description |
|---|---|
| Catalog Cuts | ▪ Door Manufacturers door data |
| Product Data | ▪ Door Manufacturer's door info on finishes, swings, prep, etc.. |
| Samples | ▪ n/a |
| Shop Drawings | ▪ n/a |
| Schedule | ▪ Include Schedule entry on Gantt Chart |

### 1.04 References / Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining "Industry Standards" and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | ▪ Comply with the requirements of the following standards, unless otherwise indicated. |
| Standard | ▪ Non-Fire-Rated Wood Doors: NWMA Industry Standard 1.5.1 "Wood Flush Doors", of the National Woodwork Manufacturer's Association.<br>▪ Fire-Rated Wood Doors: Where fire-resistance |

classifications are shown or scheduled for wood door assemblies provide doors which comply with the requirements of NFPA No. 80, "Standards for Fire Doors and Windows", and which have been tested and rated with single-point hardware by UL. Provide UL Labels on each door indicating the rating shown or scheduled.

- ANSI/NWMA I.S.1 - Industry Standard for Wood Flush Doors (Includes Standards I.S.1.1 through I.I.S.1.7).
- ANSI/AHA 135.4 - 1982 and NWWDAI.S.1-86, Sec. 3.7.3(B), Basic Hardboard Product Standard.
- Woodwork Institute (WI), "Manual of Millwork, Latest Edition.
- CPSC 16 CFR 1201 – Safety Glazing

## 1.05 Quality Assurance

A. Provide the following per Division 1

| Item | Description |
|---|---|
| Supervision | ▪ Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | ▪ General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>▪ Minimum five years experience in the installation of wood doors and frames, including institutional and public work.<br>▪ Qualifications of Manufacturers: Qualified to affix each door with National Woodwork Manufacturers' Association (NWMA) Seal of Approval or quality certification stamp. |
| Product Acceptance | ▪ General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.<br>▪ Allowable Tolerances for Fabrication of Doors: Pre-machining for Hardware: NWMA Standard Procedures and Recommendations for Factory Machining Architectural Wood and Plastic Faced Flush Doors for Hardware. |
| Substrate Acceptance | ▪ General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item. |

- Installer shall fully inspect work of other trades prior to commencing installation of any new doors or door frames.

## 1.01 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | ▪ Per Division 1 |
| Testing | ▪ n/a |
| Special Inspections | ▪ Per DSA Testing and Inspection Form |
| Mock Ups | ▪ n/1 |

## 1.02 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | ▪ Per Division 1. |
| Inspection | ▪ Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | ▪ Refer to DSA Testing and Inspection Sheet |
| Special Inspections | ▪ Refer to DSA Testing and Inspection Sheet |

## 1.03 Closeout

A. Provide the following Closeout materials in accordance with Division 1

| Item | Description |
|---|---|
| Product Manuals | ▪ Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | ▪ Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems. |
| Surplus Materials | ▪ n/a |
| Training | ▪ n/a |

## 1.04 Warranty

A. Provide written warranty in accordance with Division 1

| Item | Description |
|---|---|
| Warranty Form | ▪ Per Division 1<br>▪ Two copies of written agreement in door mfr's standard form signed by mfr, installer & contractor, promising to repair or replace defective doors which have warped (bow, cup or twist) or show telegraphing per NWMA Standard Door Guarantee. The NWMA provision for refunding the price |

received by the door manufacturer for any defective door shall not apply. The guarantee shall include refinishing and reinstallation which may be required due to repair or replacement of defective doors.

| | |
|---|---|
| Warranty Period | ▪ 5 years |
| Warranty Start | ▪ Date of Substantial Completion |

### 1.05 Product Delivery, Handling and Storage

A. Protect wood doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Store doors flat, on a level surface, not less than four inches above floor and in a dry, well ventilated area. Use protective covering under bottom door and cover top to keep clean.

B. Do not expose door to abnormal heat, extreme dryness, humid conditions or sudden changes therein. Condition doors to prevailing humidity conditions of the locality before hanging.

## Part 2. Products

### 2.01 Manufacturers

A. Flush Solid and Hollow Core Doors:

1. Western Oregon Door (www.oregondoor.com)
2. Haley Brothers, Inc (www.haleybros.com)
3. Eggers Industries Architectural Door Division (www.eggersindustries.com)
4. Vancouver Door Company (www.vancouverdoorco.com)

or approved equal

B. Substitutions: Items of same function and performance are acceptable in accordance per Division 1

### 2.02 Materials and Components

A. General: Provide wood doors complying with the applicable requirements of NWMA 1.5.1 for the kinds and types of doors indicated and as further specified.

1. Type: Type I Bond at exterior doors,
2. Type II bond at interior doors.

B. Face Veneers: Plain Sliced, natural birch, NWMA "B-Grade", for opaque finish.

C. Thickness: 1-3/4”

D. Glazed doors and vision lights, as scheduled

1. Provide impact safety-rated glazing meeting CBC Section 2406 “Safety Glazing” and CPSC 16 CFR 1201.
2. At fire-rated doors, provide fire-rated, impact-safety rated vision lites meeting the scheduled door fire-rating.

    a. Clear, wireless, laminated ceramic glass.
    b. Use of safety film is not acceptable

E. Fire Rated Doors

1. Provide exposed faces and edges to match non-rated doors in the same area of the building, unless otherwise shown or scheduled.
2. Provide trim for openings (if any) which have been tested and listed for the kind of door and rating indicated
3. Underwriters Laboratory or Warnock Hersey label.
4. Refer to Door Schedule for fire rating label requirements.

### 2.03 Fabrication

A. Construct and install fire rated assemblies to comply with NFPA Standard No. 80 and as specified herein.

B. Fabricate doors in accordance with requirements of above referenced Quality Standard S. Pre-fit wood doors. Shop prepare doors to receive hardware, refer to Section 08 71 00 for hardware requirements and templates.

C. Fabricate fire rated doors in accordance with requirements of Underwriters Laboratories (UL) or Warnock Hersey International.

D. Openings: Cut and trim opening through doors and panels as shown. Comply with the applicable requirements of the reference standards for the kind(s) of doors required.

1. Lite Openings Where Occurs on Door Schedule: Factory cut openings. Trim openings for all doors with metal trim throughout.
2. Bevel strike edge of single-acting doors, 1/8" in 2".

E. Provide astragals and metal edge trim for double doors, in accordance with requirements for fire rated doors.

### 2.04 Shop Priming

A. Before delivery of doors to the project site, shop-prime as follows: Provide transparent sealer at top and bottom and along edges.

B. Sealer shall be compatible with the finishes specified in Section 09 91 10, "Painting".

### 2.05 Pre-fitting and Preparation for Hardware

A. Pre-fit and pre-machine wood doors at the factory.

B. Comply with the tolerance requirements of NWMA for pre-fitting. Machine doors for hardware requiring cutting of doors. Comply with final Hardware requiring cutting of doors. Comply with final Hardware Schedules and Door Frame Shop Drawings and with hardware templates and other essential information required to ensure proper fit of doors and hardware.

C. Take accurate field measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with machining in the factory.

## Part 3. Execution

### 3.01 General

A. This Specification is a referenced standard for work specified elsewhere.

B. Inspection: Examine door frames and verify that frames are of the correct type and have been installed as required for proper hanging of corresponding doors. Notify the Architect, in writing, of conditions detrimental to the proper and time installations of wood doors; do not proceed until satisfactory conditions have been corrected.

C. Install fire-rated doors in corresponding fire-rated frames in accordance with the requirements of NFPA Standard No.80.

### 3.02 Installation

A. Install wood doors in accordance with manufacturer's recommendations and reference standards, plumb and square, and with maximum diagonal distortion of 1/18". Coordinate hardware installation with requirements of Section 08 71 00 - Hardware.

B. Install fire rated wood doors in accordance with requirements of NFPA 80 and UBC Standard 7-2; and requirements for fire ratings indicated. Field cutting of fire rated doors shall not be acceptable.

C. Condition doors to average prevailing humidity in installation area prior to hanging.

D. Hardware: For installation see Section 08 71 00.

E. Manufacturer's Instruction: Install wood doors in accordance with manufacturer's instructions and as shown.

F. Where not otherwise specified or otherwise required, bevel fire-rated doors 1/16" or 2" at lock edge.

G. Pre-fit Doors: Fit to frames and machine for hardware to whatever extent not previously worked at factory as required for proper fit and uniform clearance at each edge.

H. Clearances: For non-rated doors provide clearances of:1/18" at jambs and heads; 1/8" at meeting stiles for pairs of doors; and 1/2" from bottom of door to top of decorative floor finish or covering, except where threshold is shown or scheduled provide 1/4" clearance from bottom of door to top of threshold.

### 3.03 Adjust and Clean

A. Operation: Re-hang or replace doors which do not swing or operate freely, as directed by the Architect at no additional cost to the owner.

B. Protection of Completed Work: Provide proper procedures required for protection of installed wood doors from damage or deterioration until acceptance of the work.

## End of Section

Section 08 71 00

# Door Hardware

## Part 1. General

### 1.01 Related Documents

A. Drawings and general provisions of Contract, including General and Supplementary Conditions of Division 1 Specification Sections, apply to this Section.

### 1.02 Summary

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following, but is not necessarily limited to:

1. Door Hardware, including electric hardware.
2. Storefront and Entrance door hardware.
3. Thresholds, gasketing and weather-stripping.
4. Door silencers or mutes.

C. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing.

1. Division 8: Section - Steel Doors and Frames.
2. Division 8: Section - Wood Doors.
3. Division 28: Section - Fire/Life-Safety Systems & Security Access Systems.

### 1.03 References

A. 2019 California Building Code, CCR, Title 24.

B. BHMA – Builders' Hardware Manufacturers Association

C. CCR – California Code of Regulations, Title 24, Part 2, 2010 ADA Standards for Accessible Design California State Accessibility Standards.

D. DHI – Door and Hardware Institute

E. NFPA - National Fire Protection Association.

1. NFPA 80 - Fire Doors and Other Opening Protectives
2. NFPA 105 - Smoke and Draft Control Door Assemblies

F. UL - Underwriters Laboratories.

1. UL 10C - Fire Tests of Door Assemblies
2. UL 305 - Panic Hardware

G. WHI - Warnock Hersey Incorporated

H. SDI - Steel Door Institute

### 1.04 Submittals & Substitutions

A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.

B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

C. Submit six (6) copies of schedule organized vertically into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:

1. Include a Cover Sheet with:

   (a) Job Name, location, telephone number.
   (b) Architects name, location and telephone number.
   (c) Contractors name, location, telephone number and job number.
   (d) Suppliers name, location, telephone number and job number.
   (e) Hardware consultant's name, location and telephone number.

2. Job Index information included:

   (a) Numerical door number index including; door number, hardware heading number and page number.
   (b) Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
   (c) Manufacturers' names and abbreviations for all materials.
   (d) Explanation of abbreviations, symbols, and codes used in the schedule.
   (e) Mounting locations for hardware.
   (f) Clarification statements or questions.
   (g) Catalog cuts and manufacturer’s technical data and instructions.

3. Vertical schedule format sample:

| | | | | | |
|---|---|---|---|---|---|
| Heading Number 1 (Hardware group or set number - HW Group #1) | | | | | |
| | | | | | |
| | | (a) 1 Single - Door #101 - Exterior from Corridor 101 | | (b) 90° | (c) RH |
| | | | | | |
| | | (d) 3'-0" x 7'-0" x 1-3/4" - WD Door x HM Frame - 20 Minute | | | |
| | | | | | |
| (e) 1. | (f) | (g) 3 ea | (h) Hinges - (i) 5BB1HW 4.5 x 4.5 NRP (j) ½ TMS | (k) 626 | (l) IVE |
| 2. | 6AA | 1 ea | Lockset - ND80P6D x RHO x RH x 10-025 x JTMS | 626 | SCH |
| 3. | | 1 ea | Closer - 4040XP x EDA x TBSRT | 689 | LCN |

   (a) Single or pair of doors with opening number and location.
   (b) Degree of opening.
   (c) Hand of door(s).
   (d) Door/frame dimensions and material; Label requirements, if any.
   (e) Hardware item line # (Optional).
   (f) Keyset symbol.
   (g) Quantity.
   (h) Product description.
   (i) Product part number.
   (j) Fastenings and other pertinent information.
   (k) Hardware finish codes per BHMA/ANSI A156.18.
   (l) Manufacturer abbreviation.

D. Make substitution requests in accordance with Division 1. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.

E. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.

F. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

G. Furnish as-built/as-installed schedule with close-out documents, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.

H. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

I. LEED Certification Points: Submit information and certifications necessary to achieve maximum points for LEED certification; coordinate and cooperate with Owner and Architect in providing information necessary for required LEED rating.

## 1.05 Quality Assurance

A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1. Responsible for detailing, scheduling and ordering of finish hardware.
2. Stock parts for products supplied and can repair and replace hardware items found defective within warranty periods.

C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.

1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

## 1.06 Delivery, Storage and Handling

A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.

C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

### 1.07 Warranty

A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:

1. Mechanical Locksets: Ten (10) years.
2. Closers: Thirty (30) years.
3. Exit devices: Three (3) years.
4. Electronic: Two (2) years.
5. All other hardware: Two (2) years.

### 1.08 Maintenance

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

### 1.09 Pre-Installation Conference

A. Convene a pre-installation conference at least one week prior to beginning work of this section.

B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, and Key District Personnel.

C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work.

## Part 2. Products

### 2.01 Manufacturers

| Item | Manufacturer | Acceptable Substitutes |
|---|---|---|
| Hinges | Ives | Hager, Stanley, McKinney |
| Locks, Latches & Cylinders | Schlage | None – Owner Standard |
| Elec Locks & Exit Device Trim | SecureALL | None – Owner Standard |
| Exit Devices | Von Duprin | None – Owner Standard |
| Closers | LCN | None – Owner Standard |
| Push, Pulls & Protection Plates | Ives | Trimco, BBW, DCI |
| Flush Bolts | Ives | Trimco, BBW, DCI |
| Dust Proof Strikes | Ives | Trimco, BBW, DCI |
| Door Stops | Ives | Trimco, BBW, DCI |
| Overhead Stops | Glynn-Johnson | Or Approved Equal |
| Thresholds | National Guard | Pemko, Zero |
| Seals & Bottoms | National Guard | Pemko, Zero |

## 2.02 Materials

A. Hinges: Exterior out-swinging door butts shall be non-ferrous material and shall have stainless steel hinge pins. All doors to have non-rising pins.

1. Hinges shall be sized in accordance with the following:

   (a) Height:
   *(i) Doors up to 42" wide: 4-1/2" inches.*
   *(ii) Doors 43" to 48" wide: 5 inches.*
   (b) Width: Sufficient to clear frame and trim when door swings 180 degrees.
   (c) Number of Hinges: Furnish 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.
2. Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.

B. Continuous Hinges:

1. Provide aluminum geared continuous hinges fabricated from 6063-T6 aluminum conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
3. Provide continuous hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
4. Provide continuous hinges 1” shorter in length than nominal height of door, unless otherwise noted, with symmetrical hole pattern.
5. On fire-rated doors, provide continuous hinges that are UL listed for use on fire-rated doors.
6. Install continuous hinges with fasteners supplied by manufacturer.

C. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" lever design.

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3 hour fire doors.
2. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:

   (a) Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
   (b) Offset lever pull – minimum 1,600 foot pounds without gaining access
   (c) Vertical lever impact – minimum 100 impacts without gaining access
   (d) Cycle Test - tested to minimum 16 million cycles with no visible lever sag or use of performance aids such as set screws or spacers.
3. Cylinders: Refer to “KEYING” article, herein.
4. Provide locks with standard 2-3/4” backset, unless noted otherwise, with ½” latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
9. Provide levers with vandal resistant technology as scheduled for use at abusive applications.

D. Closers: LCN 4040XP Series as scheduled.

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Provide certificate by independent testing laboratory that door closers have completed over 10,000,000 cycles and can still meet ANSI/BHMA A156.4 standards.
4. Cylinder Body: 1-1/2" diameter with ¾" diameter double heat-treated pinion journal.
5. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120° F to -30° F.
6. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
7. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
8. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
9. Pressure Relief Valve (PRV) Technology: Not permitted.
10. Provide door closers powder coated to match balance of door hardware. Powder coating finish shall be certified to exceed 100 hours salt spray testing as described in ANSI/BHMA A156.4 and ASTM B117.
11. Provide special rust inhibitor (SRI) in highly corrosive areas, and where noted in hardware sets.
12. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
13. Place closers inside building, stairs, room, etc. Closers shall be installed to permit doors to swing 180 degrees or maximum allowable by conditions.
14. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. Per CBC Section 11B-404.2.8.1, door shall take at least 5 seconds to move from an open position of 90 degrees to a position of 12 degrees from the latch jamb.

E. Door Stops:

1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.
2. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 11B-307).
3. Overhead stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

F. Protection Plates:

1. Provide kick, mop, and/or armor plates minimum of 0.050” thick, with four beveled edges. Furnish with sheet metal or wood screws, finished to match plates.
2. Kick plates shall be sized 10" high and 2" less door width (LDW) at single doors and 10” high and 1” LDW at pairs or doors.
3. Provide mop and armor plates with sizes as scheduled in hardware sets.

G. Thresholds: As Scheduled and per details.

1. Thresholds shall not exceed 1/2" in height, with a beveled surface of 1:2 maximum slope.
2. Set thresholds in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 “Thermal and Moisture Protection”.
3. Use ¼” fasteners, red-head flat-head sleeve anchors (SS/FHSL).
4. Thresholds shall comply with CBC Section 11B-404.2.5.

H. Seals: Provide silicone gasket at all rated and exterior doors.

1. Fire-rated Doors, Resilient Seals: UL10C Classified complies with NFPA 80 & NFPA 252. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements.
2. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C Classified complies with NFPA 80 & NFPA 252. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required.
3. Smoke & Draft Control Doors: Provide UL10C Classified complies with NFPA 80 & NFPA 252 for use on “S” labeled Positive Pressure door assemblies.

I. Door Shoes & Door Top Caps: Provide door shoes at all exterior wood doors and top caps at all exterior out-swing doors.

J. Silencers: Furnish silencers for interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where sound or light seals occurs, or for fire-resistive-rated door assemblies.

## 2.03 Keying

A. Provide one (1) SA-UKN (U-Key) with each SA-CDR lock unit. Additional U-Keys to be purchased separately.

B. Furnish a Proprietary Schlage masterkey system as directed by the owner or architect. Key system to be designated and combinated by the Schlage Master Key Department even if pinned by the Authorized Key Center, Authorized Security Center or a local authorized commercial dealer.

C. A detailed keying schedule is to be prepared by the owner and/or architect in consultation with a representative of Allegion or an Authorized Key Center or Authorized Security Center. Each keyed cylinder on every keyed lock is to be listed separately showing the door #, key group (in BHMA terminology), cylinder type, finish and location on the door.

D. Furnish all cylinders in the Schlage Full Size Interchangeable Core (FSIC). Furnish PrimusXP Patent Protected Schlage permanent cores in the “Everest 29 S” keyway to match existing school standard. Pack change keys independently (PKI).

E. Furnish construction keying for doors requiring locking during construction.

F. Furnish all keys with visual key control.

1. Stamp key “Do Not Duplicate”.
2. Stamp (BHMA) key symbol on key.
3. Stamp unique owner identifier from the key bow.

G. Furnish all cylinders with visual key control.

1. Stamp (BHMA) key symbol on side of cylinder (CKC).

H. Furnish mechanical keys as follows:

1. Furnish 2 cut change keys for each different change key code.
2. Furnish 1 uncut key blank for each change key code.
3. Furnish 6 cut masterkeys for each different masterkey set.
4. Furnish 3 uncut key blanks for each masterkey set.
5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
6. Furnish 1 cut control key cut to each SKD combination.

I. Furnish Schlage Padlocks and the cylinders to tie them into the masterkey system for gates, storage boxes, utility valve security, roof hatches and roll-up doors keyed as directed in the keying schedule.

1. Furnish KS43F3200 padlock for use with FSIC Schlage cylinders. Furnish 20-740-XP PrimusXP core with above.

J. Furnish one Schlage cabinet lock for each cabinet door or drawer so designated on the drawings or keying schedule to match the masterkey system.

1. Furnish CL777R for use with FSIC Schlage cylinders.

## 2.04 Finishes

A. Generally to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.

B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.

C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.

D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

## 2.05 Fasteners

A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.

B. Screws for butt hinges shall be flathead, countersunk, full-thread type.

C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.

D. Provide expansion anchors for attaching hardware items to concrete or masonry.

E. All exposed fasteners shall have a phillips head.

F. Finish of exposed screws to match surface finish of hardware or other adjacent work.

G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

## Part 3. Execution

### 3.01 Inspection

A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

C. Fire-Rated Door Assembly Inspection: Upon completion of the installation, all fire door assemblies shall be inspected to confirm proper operation of the closing device and latching device and that only the manufacturer's furnished fasteners are used for installation and that it meets all criteria of a fire door assembly per NFPA 80 (Standard for Fire Doors and Other Opening Protectives) 2013 Edition. A written record shall be maintained and transmitted to the Owner to be made available to the Authority Having Jurisdiction (AHJ). The inspection of the swinging fire doors shall be performed by a certified FDAI (Fire Door Assembly Inspector) with knowledge and understanding of the operating components of the type of door being subjected to the inspection. The record shall list each fire door assembly throughout the project and include each door number, an itemized list of hardware set components at each door opening, and each door location in the facility.

### 3.02 Installation

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 34" and 44" AFF.

D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.

G. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

H. Hardware Installer shall coordinate with security contractor to route cable to connect SecureALL routers (a POE switch and CAT5 cabling required), electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

I. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.

J. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.

K. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.

L. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer's technical documentation.

### 3.03 Adjust and Clean

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

### 3.04 Hardware Locations

A. Conform to CCR, Title 24, Part 2; and the drawings for access-compliant positioning requirements for the disabled.

### 3.05 Field Quality Control

A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

### 3.06 Schedule

A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.

B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction; otherwise, list will be considered Complete. No extras will be allowed for omissions.

C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

## End of Section

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Section 09 25 00

# Gypsum Wallboard

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | • Gypsum Wallboard at Interior walls, ceilings, soffits and other surfaces where indicated |
| Special Coordination | • Coordinate installation with all trades that will penetrate gypsum wallboard.<br>• Coordinate installation with tile or other surface installation where indicated |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Catalog Cuts | • n/a |
| Product Data | • Gypsum wallboard products and accessories |
| Samples | • n/a |
| Shop Drawings | • n/a |
| Schedule | • Include Schedule entry on Gantt Chart for Installation |

### 1.04 References and Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • Published specifications, standard tests, or recommended methods of trade, industry or government organizations apply to work of this |

| | |
|---|---|
| | Section where cited by abbreviations noted below<br>• Federal Specifications (FS).<br>• American Society for Testing and Materials (ASTM)<br>• State of California, California Administrative Code, Title 17, Public Health (CAC Title 17) |
| Standard | • Codes and Standards: Comply with applicable requirements of ANSI A97.1, unless otherwise indicated or otherwise required by governing authorities or codes<br>• Construction Tolerances for Gypsum Drywall Work: Shim work as required to comply with specific tolerances. Do not exceed 1/16" offset between planes of abutting sheets (at edges or ends). Do not exceed the following tolerances for bow or out-of-plane for plumb, level, incline, or curvature as indicated:<br>• Tolerance: 1/4" in 8'-0", all locations and directions |

## 1.05 Quality Assurance

A. Provide the following per Division 1:

| Item | Description |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>• Minimum five years experience in installation of gypsum products and related systems |
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.<br>• Perform gypsum wallboard systems work in accordance with recommendations of ASTM C-754 and ASTM C-840 unless otherwise specified |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.<br>• Installer shall fully inspect related work by other trades prior to commencing installation of gyp board, plaster and related drywall systems. |

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • n/a |
| Special Inspections | • Per DSA Testing and Inspection Form |
| Mock Ups | • n/a |

## 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

## 1.08 Closeout

A. Provide the following Close Out materials in accordance with Division 1.

| Item | Description |
|---|---|
| Product Manuals | • Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | • Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems. |
| Surplus Materials | • n/a |
| Training | • n/a |

## 1.09 Warranty

A. Provide written warranty in accordance with Division 1.

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1<br>• Describe Warranty requirements |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

## 1.10 Product Delivery, Storage, and Handling

A. Coordinate delivery with installation to minimize storage periods at the project site. Deliver in manufacturer's unopened bundles or packages, fully identified with manufacturer's name, brand, type, and grade. Protect from weather, soiling and damage using handling equipment and storage techniques recommended by the manufacturer.

## 1.11 Job Conditions

A. Examine all parts of the supporting structure to which gypsum drywall is to be applied and other conditions under which gypsum drywall is to be installed and notify the Architect, in writing, or any conditions detrimental to proper and timely completion of the work. Do not proceed with the installation until unsatisfactory conditions have been corrected.

B. Examine all parts of the supporting structure and the conditions under which studs will be installed and notify the Architect, in writing, of any conditions detrimental to the proper and

timely completion of the work. Do not proceed with the installation of steel studs until unsatisfactory conditions have been corrected.

## Part 2. Products

### 2.01 Manufacturers

A. Gypsum Wallboard products and Accessories: Manufacturer's offering products to comply with the requirements for Gypsum Wallboard products include the following:

1. Celotex Corporation
2. Flintkote Company
3. Georgia-Pacific Corporation
4. Johns-Manville
5. Kaiser Gypsum Company, Inc.
6. National Gypsum Company
7. U.S. Gypsum Company

B. Manufacturers: For all gypsum wallboard work throughout the Project, provide drywall materials, including accessories and fasteners produced by one manufacturer.

### 2.02 Gypsum Wallboard

A. Provide gypsum board ASTM C1396 or C630 as applicable to the type of drywall board shown and specified, 4 feet wide x lengths as required to minimize end joints, beveled edge, tapered. Match thicknesses of existing adjacent conditions to assure level finish surfaces.

B. Gypsum Board Types: 5/8 inch thick, maximum permissible length; ends square cut, tapered edges; unless noted otherwise as follows:

1. Standard Type: ASTM C1396.
2. Fire Rated Type: ASTM C1396 fire resistive, UL rated Type X.
3. Water Resistant Type: ASTM C630 water-resistant.
4. Water Resistant – Fire Rated Type: ASTM C630 water-resistant.

### 2.03 Accessories

A. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board

B. Fastenings:

1. Gypsum Panels To Steel Framing: Metal Screws, Type S Bugle Head, self-drilling/tapping, sheet metal type with rust-inhibitive treatment, and lengths as required.
2. Single Layer Gypsum Panels to Wood Studs Metal Screws, 1 ¼" Type W Bugle Head, with rust-inhibitive treatment, lengths as required.

C. Accessories: 26-gauge, electro-galvanized steel, knurled surfaces for bedding cement. Provide corner beads with 1-1/4" legs at external corners and angle-shaped trim pieces where gypsum board meets dissimilar materials and/or is exposed. Coordinate trim accessories with Section 09 25 50

D. Sealant: Presstite #579-64 or approved equal.

## Part 3. Execution

### 3.01 Installation

A. Install gypsum board in accordance with manufacturer's instructions and as described herein.

B. Manufacturer's Instructions: Unless otherwise shown or specified, install gypsum drywall, including accessories, in accordance with manufacturer's printed instructions.

C. Provide drywall of the thickness indicated, or if not indicated, provide not less than the minimum thickness recommended by the drywall manufacturer for the application shown.

D. Use board of maximum lengths to minimize end butt joints as far from center of walls or ceilings as possible, and stagger not less than 1'-4" in alternate courses of board.

E. Install gypsum drywall board with free side out. Do not install imperfect, damaged, damp, or wet drywall boards. Butt boards together for a light corridor at edges or ends with not more than 1/16" open space between boards. Do not force into place.

F. Locate edges or end joints over supports except in horizontal applications or where intermediate support or gypsum board back-blocking is provided behind end joints. Position boards so that both tapered edge joints and mill cut or field cut end joints and mill cut or field cut end joints abutt. Do not place tapered edges against cut edges or ends.

G. Attach drywall to framing/blocking as req'd for additional support at openings and cutouts.

H. Fasten gypsum board to furring or framing with screws.

I. Cutting, Fitting and Trimming: Accurately measure and precut gypsum drywall units prior to installation. Make all cuts from face side or by sawing. Completely cut paper on back face; do not break paper by tearing. Maintain close tolerances for accurate fit at joints between sheets and at framed openings, and allow for covering of edges of cutouts with plates and escutcheons. Cut edges smooth as required for neat and accurate fit.

J. Do not locate joints within 8 inches or corners of openings, except where control joints are shown at jamb lines or where openings occur at adjacent exterior or interior angles of an area. Whenever possible, cut boards so that a single vertical joint occurs over center of door openings.

K. Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

L. Isolation of Drywall from Other Construction: Provide perimeter relief where non-load-bearing drywall partitions at structural decks or ceilings or vertical structural elements and other areas indicated. Allow not more than 1/4" gap between gypsum drywall and structure. Finish edges of drywall face layer with square-nose metal casing bead. Seal space between casing bead. Seal space between casing bead and structure with continuous sealant bead where exposed.

M. Install gypsum wallboard on fire rated walls as required by CBC and NFPA 80.

N. Installation of Fasteners:

1. Begin fastening from center portion of sheet and work toward edges and end. Ensure contact of drywall with supports by applying pressure on surface adjacent to fasteners. Install screws no closer than 3/8" from edges or ends of sheets. Drive with shank approximately perpendicular to drywall surface.
2. Drive screws with power screwdriver recommended by drywall manufacturer. Do not hammer drive screws. Set screw heads slightly below surface of drywall, but do not break or strip paper face around screw. Stagger screws on edges and ends of adjacent sheets.

3. Metal Trim: At locations where metal edge trim will be installed after gypsum drywall, omit drywall fasteners at framing members adjacent to edges, as required, to allow for subsequent installation of trim. Refer to Section 09 25 50, Drywall Finishing", for trim to be installed prior to, or subsequent to, drywall.
4. After installation of drywall, check for loose fasteners and, if detected, drive tight. Where paper face is torn or punctured, install another fastener approximately 1-1/2 inches away and remove faulty fastener.

O. Maximum Variation from True Flatness: 1/4 inch in 8 feet in any direction.

**End of Section**

Section 09 25 50

# Gypsum Wallboard Finishing

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

B. This Section does not include required painting and other field-applied decoration of gypsum drywall work

| Item | Description |
|---|---|
| General<br>Gypsum Board Finishing | • Metal trim accessories for drywall, including external corner reinforcement, reveal trims, and casing beads<br>• Joint compound treatment of joints, interior angles, metal trim flanges, and head fasteners<br>• Fire-taping only of unexposed drywall applications |

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Catalog Cuts | • n/a |
| Product Data | • Submit two copies of manufacturer's specifications and installation instructions for each type of drywall-finishing material required<br>• Submit cut sheet for all trims, with dimensioned sections |
| Samples | • Texture Finish Sample (if other than Smooth) |
| Shop Drawings | • n/a |
| Schedule | • Include Schedule entry on Gantt Chart |

### 1.04 References and Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references,

the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | USG Gypsum Construction Handbook |
| Standard | **American Society for Testing and Materials (ASTM)**<br>C475 : Joint Compound and Joint Tap for Finishing Gypsum Board<br>C1047: Accessories for Gypsum Wallboard and Gypsum Veneer Base<br>**Gypsum Association**<br>GA-214-07: Recommended Levels of Gypsum Board Finish<br>GA-216-07: Application and Finishing of Gypsum Panel Products |

## 1.05 Quality Assurance

A. Provide the following per Division 1

| Item | Description |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>• Minimum five years of experience in installation of gypsum finish systems |
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.<br>• Fire-Resistance Ratings: Whenever a fire-resistance classification is shown or scheduled for drywall construction, provide drywall-finishing materials and application procedures which have been tested and listed for the type of construction indicated |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.<br>• Installer shall fully inspect related work by other trades prior to commencing installation of gyp board finish systems<br>• Examine the substrate to which gypsum drywall finishing materials are to be applied, and the conditions under which drywall finishing work is to be installed, and notify the Architect, in writing, of conditions detrimental to the proper and timely |

completion of the work. Do not proceed with the installation until unsatisfactory conditions have been corrected.

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • n/a |
| Special Inspections | • Per DSA Testing and Inspection Form |
| Mock Ups | • n/a |

## 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

## 1.08 Closeout

A. Provide the following Close Out materials in accordance with Division 1

| Item | Description |
|---|---|
| Product Manuals | • Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | • Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems. |

## 1.09 Warranty

A. Provide written warranty in accordance with Division 1

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1<br>• Describe Warranty requirements |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

## 1.10 Product Delivery, Handling, and Storage

A. Delivery and storage of Materials: Deliver drywall finishing materials in manufacturer's unopened containers, packages, or bundles identified with manufacturer's name, brand, type and grade. Store inside dry areas and protect from dampness and deterioration. Protect ready-mix products (if any) from freezing and protect metal accessories from rusting.

### 1.11 Job Conditions

A. Temperature and Humidity Conditions: Do not install joint treatment compounds unless installation areas comply with the minimum temperature and ventilation requirements recommended by the drywall manufacturer.

## Part 2. Products

### 2.01 Finish

A. All exposed gypsum wall board surfaces shall receive a smooth finish. GA-214.

### 2.02 Materials

A. Joint Treatment Materials:

1. Joint Tapes: Plain or perforated complying with ASTM C475.
2. Joint Compound: Adhesives with or without fillers compounding with ASTM C475. Provide in dry powder form or premixed ready for application, and of the following type:
   (a) Single-Compound Treatment: Provide manufacturer's single component compound suitable for both bedding and finishing of joints.
   (b) Two-Compound Treatment: Provide compatible joint compounds, one compound being suitable for bedding and the other compound suitable for finishing of joints.
   (c) For exposed-to-view work where drywall abuts or intersects dissimilar construction, provide square-edge, semi-finishing casing bead (no joint compound treatment required).

### 2.03 Accessories

A. Corner Beads: ASTM C1047, metal or metal and paper combination.

B. Edge Trim: ASTM C1047, GA 216

1. J-Trim at exposed ends of panels.
2. Z-Reveal Trim at transitions to masonry, concrete, or other dissimilar material, as detailed. Paint trim (color to match that of adjacent painted gypsum board) prior to installation.
   (a) Fry Reglet DRMZ-625-50 (typical, for 5/8” gypsum board and 1/2” reveal) or other dimension as required
   (b) or approved equal

C. Joint Materials: ASTM C475, GA 216, reinforcing tape, joint compound, adhesive, and water.

D. Fasteners: ASTM C1002 Type W or S; ASTM C954 Type S12

E. Adhesive: ASTM C557, GA 216.

## Part 3. Execution

### 3.01 Installation

A. General: Finish exposed drywall surfaces with joints, corners, and exposed edges reinforced or trimmed as specified, and with all joints, fastener heads, trim accessory flanges, and surface defects filled with joint compound in accordance with drywall manufacturer's recommendations for a smooth, flush surface. Form true, level, or plumb lines, without joints, fastener heads, and flanges of trim accessories or defects visible after application of field applied decoration.

B. Use joint tape to reinforce joints formed by tapered edges or butt ends of drywall units and at interior corners and angles. Set tape in joint compound and apply skim coat over tape in one application. Do not use topping or refinishing compounds for setting of tapes.

C. Reinforce external corners of drywall work with specified type of corner bead. Securely fasten metal corner beads as recommended by the manufacturer. Use fasteners which will be fully concealed by joint compound fill applied over flanges.

D. Edge Trim: Provide specified type of metal casing bead trim. Install in single, un-jointed lengths, unless run exceeds longest available stock length.

E. Miter corners of semi-finishing-type trim.

F. Coordinate installation of trim with drywall installation where type of trim or application requires installation of trim prior to, or progressively with, installation of drywall.

G. Application of Joint Compounds: After mixing, do not use joint compounds if recommended pot-life time has expired. Allow drying time between applications of joint compound in accordance with manufacturer's recommendations for the relative humidity and temperature levels at the time of application. In no case, allow less than 24 hours drying time between applications of joint compound. Apply not less than 3 separate coats of joint compound over joints, fastener heads, and metal flanges.

H. Modify the above requirements to provide fire taping only at joints of unexposed drywall applications or as required to provide acceptable surface for adhesively applied acoustic tile.

I. Where fire rated walls are not exposed, tape all joints, fill all fasteners and fill all joints between gyp board and existing walls, ceilings, and floors. Knock down and sand all ridges where required.

### 3.02 Protection of Finished Work

A. Provide proper procedures for the protection of completed drywall work from damage or deterioration until substantial completion.

## End of Section

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Section 09 51 20

# Suspended Acoustical Tile Ceiling

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | • Installation new suspended ceiling shown in drawings<br>• All suspension, framing, diagonal support and accessories |
| Special Coordination | • Mechanical / electrical system for fixture placement<br>• Coordination with all other trades for installation, interface and penetrations |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Catalog Cuts | • Provide catalogue cut sheets of product to be installed. This assists in verification that correct system is being utilized |
| Product Data | • Submit two copies of manufacturer's specifications for each acoustic tile required including certified laboratory test reports and other data as required to show compliance with these Specifications |
| Samples | • Submit three sets of 12-inch-square samples for acoustic tile required. Sample submittal and Architect's review will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor<br>• Submit three samples of tile with edge trimmed to match factory edges, for cases where tiles are less than 2 feet or 4 feet as applies<br>• Submit three 12-inch-long samples of each exposed runner and molding. Architect's review will cover |

| | |
|---|---|
| | color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor |
| Shop Drawings | • Submit Shop Drawing details and related ceiling plans of suspension system specified in this Section<br>• Show location of ceiling units and other items of work (including but not limited to pendant light fixture support points) which are to be coordinated with ceiling, and show framing and support details for work supported by the suspension system<br>• Certify compliance with ASTM C635 and other specified requirements and indicate structural classification |
| DSA Submittal of Revised Details and Structural Calculations | • Submit any and all revised details and calculations for approval by DSA. Architect will facilitate change order with DSA, but Contractor shall provide all required design materials for submittal to DSA in a timely manner so that the schedule of the project is not affected. Refer “Suspended Ceiling Notes” on Drawings. |
| Schedule | • Include Schedule entry on Gantt Chart for Installation |

## 1.04 References and Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • Performance Data, Acoustical Materials, and Insulating, Materials Association (AIMA) Bulletin, "Performance Data Architectural Acoustical Materials". Flame-Spread Range: ASTM E84. (25)<br>• Ceilings shall be designed and detailed to comply with ASCE 7-16, Section 13.5.6.<br>• Ceilings and support system shall comply with Division of the State Architect, Office of Regulatory Services, and the requirements of the California State Manual – refer to DSA Interpretation of Regulations Document IR 25-2.13. |

## 1.05 Quality Assurance

A. Provide the following per Division 1

| **Item** | **Description** |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |

| | |
|---|---|
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>• ***The Contractor that installs the tiles shall install the suspension system***<br>• Minimum five years experience in installation of suspended tile systems and assemblies. |
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation. |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.<br>• Deflection criteria<br>• Suspension system components, hangers, and fastening devices supporting light fixtures, ceiling grilles, and acoustical units: Maximum deflection: 1/360 of span<br>• Design Criteria<br>  • Ceilings shall meet all applicable requirements and codes for the construction of public school facilities in the State of California<br>  • Edges of tile at perimeter that must be field cut to size and revealed at the perimeter shall be reviewed and accepted by the Architect. GC shall ensure the highest level of workmanship for this task.<br>  • Deflection Test: ASTM C635<br>  • Allowable tolerance of finished acoustical ceiling system: Level within 1/8” in 12 feet |
| Structural calculations | • Provide structural calculations as required to meet California Building Code. Calculations shall be by a Structural Engineer licensed in the state of California. Fabrication drawings shall be stamped by a California Licensed Structural Engineer. |

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| **Item** | **Description** |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • Describe Testing |
| Special Inspections | • Per DSA Testing and Inspection Form |
| Mock Ups | • Describe special mock ups |

## 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

## 1.08 Closeout

A. Provide the following Close Out materials in accordance with Division 1.

| Item | Description |
|---|---|
| Product Manuals | • Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | • Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems.<br>• Submit manufacturer's recommendations for cleaning and refinishing acoustic tile, including precautions against materials and methods which may be detrimental to finishes and acoustic efficiency |
| Surplus Materials | • 5 boxes of the of each specified ceiling tile<br>• When work is completed, deliver stock of replacement materials to the Owner. Furnish full-size units matching the material installed packaged and marked for identification. |

## 1.09 Warranty

A. Provide written warranty in accordance with Division 1.

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1 |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

## 1.10 Product Delivery, Storage, and Handling

A. Deliver acoustic tile to the Project site in original unopened packages bearing manufacturer's name and labeled to identify each type of acoustic unit.

B. Storage: Advise Contractors of acoustic material manufacturer's recommendations for storage of acoustic tiles to be used in the work.

C. Protect all metal suspension parts from damage.

## Part 2. Products

### 2.01 Acceptable Manufacturers

A. Armstrong World Industries, Inc. (armstrong.com/ceilings) *ESR 1308*

B. USG Interiors, Inc. (usg.com) *ESR 1222*

### 2.02 Materials

A. Suspension System:

1. Products:

   (a) Armstrong Prelude XL *Catalog numbers: main runner: 7301: Cross runner: XL 73283*
   (b) USG Donn DX/DXL *Catalog numbers: main runner : DX 24: Cross runner: DX 216*

2. Comply with ASTM C635
3. ASTM Structural Classification: Heavy-duty system,
4. Main and cross members

   (a) 15/16" Exposed Tee.
   (b) 2'-0" x 4'-0" module w/ Illusion Two/24 panels
   (c) Electro galvanized cold rolled steel, double weld design with rolled steel cap.

5. Wall angle molding

   (a) Electro galvanized cold-rolled steel, minimum .020 inch thick steel channel or angle
   (b) Minimum flange width of 2"

6. Splices, end connections, clips and other accessories:

   (a) Electro galvanized Steel.
   (b) Design to provide strong, rigid, lock type connections preventing movement or displacement of joined components and permitting disassembly without damage to component parts.

7. Rough Suspension:

   (a) Hanger wires and bracing wire: Minimum 12 gauge, galvanized, soft annealed, mild steel wire.
   (b) Provide screw eyes and other accessories to meet state code requirements for hanging and cross bracing with wires. Refer details in Drawings.
   (c) Exposed surfaces of components shall have factory applied semi gloss enamel finish, color as selected by architect.

8. Support Bars: Direct hung exposed grid.
9. Compression Struts: Light-gauge steel C-stud per Drawings
10. Color: White
11. Refer to reflected ceiling plan for locations and layout.

B. Acoustical Units:

1. Products

   (a) USG Eclipse ClimaPlus Illusion 78785, SQ (square) edge

      *(i) 2'-0" x 4'-0"x 3/4" panels*
      *(ii) or approved equal from Armstrong*
      *(iii) Acoustical units shall conform to FS SS-0S-1188,*
      *(iv) Type III (Mineral Fiber) class A*

*(v) Fire resistance: Flame spread of 25 or less (UL Label).*
*(vi) Noise Reduction Class (NRC): 0.70 mininum*
*(vii) Color: White*
*(viii) Refer to reflected ceiling plan for location and layout.*

(a) "USG Ceilings® Kitchen Lay-In Panel".
*(i) or approved equal from Armstrong*
*(ii) Classification: Provide ceiling panels complying with ASTM E 1264 for type, form and pattern as follows*
*(iii) Type: IX, mineral base with scrubbable pigmented or clear finish*
*(iv) Form: 2, Water Felted*
*(v) Pattern: G, Smooth.*
*(vi) Color: Flat White 050.*
*(vii) LR: Not less than 0.90.*
*(viii) NRC: Not less than N/A*
*(ix) CAC: Not less than 35.*
*(x) Edge/Joint Detail: SQ Square.*
*(xi) Suspension Grid Width: DX/DXL, 15/16 inch (24 mm)*
*(xii) Panel Thickness: 5/8 inch (15.9 mm).*
*(xiii) Modular Size: 24 inches by 48 inches (610 by 1220 mm)as indicated on Drawings*
*(xiv) Recycled Content: Up to [24%].*
*(xv) ClimaPlus 30 year limited System Warranty. Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.*

## Part 3. Execution

### 3.01 Inspection

A. Examine the conditions under which the suspended ceiling work is to be performed and notify the Architect, in writing, of any unsatisfactory conditions. Do not proceed with suspension ceiling work until unsatisfactory conditions have been corrected.

B. Consult other trades and contractors involved prior to start of ceiling work, to determine areas of potential interference. Do not start installation until interferences have been resolved.

C. Coordinate layout with other work which penetrates or is supported by ceiling suspension system

### 3.02 Installation

A. Suspension system: ASTM C636

B. Rough Suspension

1. Hangers:

(a) Space hanger wire no more than 4 feet on center, each direction.
(b) Install additional hangers at ends of each suspension member, at all corners of all light fixtures, and 8 inches maximum from vertical surfaces.
(c) Do not splay wires more than 5 inches in a 4 foot vertical drop.
(d) Wrap wire a minimum three tight turns for hanger wire, and 4 tight turns for bracing wires according to state code requirements.

(e) Secure hanging wires to structure above with four way wire splays as components and to meet applicable building code requirements for lateral design. Use ¼" diameter screw eyes into bottom or sides of solid wood structural members.
(f) Do NOT attach hangers or bracing wires to (E) 2x4 roof joists.

2. Main runners:

(a) Space main runners at 4 feet on center.
(b) Level and square to adjacent walls.
(c) Space additional cross runners, in parallel to main runners, at 2 feet on center.

3. Cross Runners

(a) Space cross runners at 2 feet on center

4. Wall moulding:

(a) Install wall moulding at intersection of suspended ceiling and vertical surfaces.
(b) Miter corners where mouldings intersect.
(c) Attach to vertical surface with mechanical fasteners.

5. Provide additional diagonal lateral bracing and compression struts as shown on the drawings and as required by code to support ceiling and partitions.

C. Lay In Acoustical Units

1. Install in grid system in accordance with manufacturer's instructions and recommendations.
2. Installation of tile shall not commence until the heating and ventilating system is in operation. All interior wet or dust-producing work shall be complete and dry.
3. At completion of the work, all surfaces shall present true, level and plane surfaces. All surfaces of tile ceiling and walls shall be clean and perfectly adhered over all areas and shall present a finished appearance
4. Provide trim moulding at recessed light fixtures and HVAC registers as required.
5. Provide hold down clips.
6. Layout shall be approved by Architect prior to commencement of installation.
7. Coordinate lay in system with all electrical and mechanical work to be integrated into the ceiling.
8. Where tegular tiles are specified, field-trim all perimeter tiles and profile to match factory edge. Tile shall lay-in level and in contact with wall angle or runner on all edges. Ensure consistent depth of reveal at all edges. Provide widest possible lay-in edges all around tile.

### 3.03 Acceptance

A. Defective and Damaged Work: all chipped, nicked, scratched, soiled and otherwise defective tile and tile damaged during or after installation and prior to final acceptance of the building Project shall be removed and replaced at no additional cost to the Owner.

## End of Section

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Section 09 51 40

# Applied Acoustic Tile Ceiling

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | • Manufacture and Installation of new tiles over gyp bd at framed ceilings<br>• Installation of new tile over furring strips or gypsum wallboard substrate. |
| Special Coordination | • Add new ceiling furring strips as needed for new acoustic ceiling tile |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

| Item | Description |
|---|---|
| 06 10 00 | Rough Carpentry |
| 09 25 00 | Gypsum Board |

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Catalog Cuts | • Provide catalogue cut sheets of product to be installed. This assists in verification that correct system is being utilized |
| Product Data | • Submit two copies of manufacturer's specifications for each acoustic tile required including certified laboratory test reports and other data as required to show compliance with these Specifications |
| Samples | • Submit three sets of 12-inch-square samples for acoustic tile required. Sample submittal and Architect's review will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor<br>• Submit three samples of tile with edge trimmed to match factory edges, for cases where tiles are less |

| | |
|---|---|
| | than 12”x12” |
| | • Submit three 12-inch-long samples of each exposed runner and molding. Architect's review will cover color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor |
| Shop Drawings | • Submit Shop Drawing details and related ceiling plans of suspension system specified in this Section<br>• Show location of ceiling units and other items of work (including but not limited to pendant light fixture support points) which are to be coordinated with ceiling, and show framing and support details for work supported by the suspension system<br>• Certify compliance with ASTM C635 and other specified requirements and indicate structural classification |
| DSA Submittal of Revised Details and Structural Calculations | • Submit any and all revised details and calculations for approval by DSA. Architect will facilitate change order with DSA, but Contractor shall provide all required design materials for submittal to DSA in a timely manner so that the schedule of the project is not affected. Refer “Suspended Ceiling Notes” on Drawings. |
| Schedule | • Include Schedule entry on Gantt Chart for Installation |

## 1.04 References and Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • Performance Data, Acoustical Materials, and Insulating, Materials Association (AIMA) Bulletin, "Performance Data Architectural Acoustical Materials". Flame-Spread Range: ASTM E84. (25) |

## 1.05 Quality Assurance

A. Provide the following per Division 1

| **Item** | **Description** |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers |

| | |
|---|---|
| | from the project.<br>• ***The Contractor that installs the tiles shall install the suspension system***<br>• Minimum five years of experience in installation of tile systems and assemblies. |
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation. |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.<br>• Allowable tolerance of finished acoustical ceiling system: Level within 1/8" in 12 feet |

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • Describe Testing |
| Special Inspections | • Per DSA Testing and Inspection Form |
| Mock Ups | • Describe special mock ups |

## 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

## 1.08 Closeout

A. Provide the following Close Out materials in accordance with Division 1.

| Item | Description |
|---|---|
| Product Manuals | • Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | • Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems.<br>• Submit manufacturer's recommendations for cleaning and refinishing acoustic tile, including precautions against materials and methods which may be detrimental to finishes and acoustic efficiency |
| Surplus Materials | • 5 boxes of the of each specified ceiling tile |

- When work is completed, deliver stock of replacement materials to the Owner. Furnish full-size units matching the material installed packaged and marked for identification.

### 1.09 Warranty

A. Provide written warranty in accordance with Division 1.

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1 |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

### 1.10 Product Delivery, Storage, and Handling

A. Deliver acoustic tile to the Project site in original unopened packages bearing manufacturer's name and labeled to identify each type of acoustic unit.

B. Storage: Advise Contractors of acoustic material manufacturer's recommendations for storage of acoustic tiles to be used in the work.

C. Protect all metal suspension parts from damage.

## Part 2. Products

### 2.01 Acceptable Manufacturers

A. Armstrong World Industries, Inc. (armstrong.com/ceilings)

B. USG Interiors, Inc. (usg.com)

### 2.02 Materials

A. Provide and install Armstrong Fissured Tile (12”x12”x1/2”) (item 741), USG 2570, or approved equivalent for a staple up installation.

A. Provide “L” Molding at all ceiling edges or abutments with vertical elements.

B. Provide units not less than 5/8" thick, density not less than 10 lbs., per cu. ft., NRC 0.50 to 0.60, STC 35 to 39, light reflectance over 75%.

C. All ceiling tiles, shall have a flame-spread rating not to exceed 25 and a smoke density not to exceed 450 when tested in accordance with CBC Section 803 (which references ASTM E84) [Ceiling tiles in an E occupancy require a Class III Flame spread rating per CBC table 803.9.]

1. Color: White
2. Refer to reflected ceiling plan for locations and layout.
3. Fire resistance: Flame spread of 25 or less (UL Label).
4. Noise Reduction Class (NRC): 0.70 minimum
5. Color: White
6. Refer to reflected ceiling plan for location and layout.

## Part 3. Execution

### 3.01 Inspection

A. Examine the conditions under which the suspended ceiling work is to be performed and notify the Architect, in writing, of any unsatisfactory conditions. Do not proceed with suspension ceiling work until unsatisfactory conditions have been corrected.

B. Consult other trades and contractors involved prior to start of ceiling work, to determine areas of potential interference. Do not start installation until interferences have been resolved.

C. Coordinate layout with other work which penetrates or is supported by ceiling suspension system

### 3.02 Installation

A. Install acoustical panels according to manufacturer's recommendations.

B. Cut all perimeter tiles to provide sharp clean edges. Install “L” mold at all edges; provide mitered corners at all molding intersections.

C. At completion of the work, all surfaces shall present true, level and plane surfaces. All surfaces of tile ceiling and walls shall be clean and perfectly adhered over all areas and shall present a finished appearance.

D. When work is completed, deliver stock to replacement materials to the Owner. Furnish full-size units matching the material installed packaged and marked for identification

### 3.03 Acceptance

A. Defective and Damaged Work: all chipped, nicked, scratched, soiled and otherwise defective tile and tile damaged during or after installation and prior to final acceptance of the building Project shall be removed and replaced at no additional cost to the Owner.

## End of Section

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Section 09 65 10

# Resilient Base

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | • Rubber resilient base<br>• Occurs at walls and cabinets<br>• Includes all substrate preparation, patching, leveling |

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Catalog Cuts | • Description |
| Product Data | • manufacturer's specifications and installation instructions for resilient flooring and accessories required |
| Samples | • Submit 12”-long samples of each type, color and finish of resilient base and moulding required.<br>• Submit color selector with full range of base color and pattern variations |
| Shop Drawings | • n/a |
| Schedule | • Include Schedule entry on Gantt Chart for Installation |

### 1.04 References / Standard

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • ASTM F-1861 Specification for Resilient Wall Base<br>• Americans with Disabilities Act (ADA), Section 4.5<br>• 2010 California Building Code (CBC), Section 1124B |

## 1.05 Quality Assurance

A. Provide the following per Division 1:

| Item | Description |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project. |
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.<br>• Wherever possible, provide resilient accessories produced by a single manufacturer |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item. |

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • n/a |
| Special Inspections | • Per DSA Testing and Inspection Form |
| Mock Ups | • n/a |

## 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

### 1.08 Commissioning

A. Provide Commissioning procedures and products per requirements of Division 1.

### 1.09 Close Out

A. Provide the following Close Out materials in accordance with Division 1.

| Item | Description |
|---|---|
| Product Manuals | • Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | • Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems.<br>• Submit two copies of manufacturer's written instructions for recommended maintenance practices for each type of resilient flooring and accessories |
| Surplus Materials | • Provide replacement product equal to 5% of the total amount installed in this project |

### 1.10 Warranty

A. Provide written warranty in accordance with Division 1.

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1<br>• Describe Warranty requirements |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

## Part 2. Products

### 2.01 Rubber Wall Base

A. Product: BurkeBase, by Burke Flooring, www.burkeflooring.com

(District Standard, no substitutions)

B. Material: Molded Thermoset (vulcanized) rubber,

C. Profile: Cove Base

D. Height: as shown on the drawings.

1. At casework, coordinate height to completely cover toekick, provide excess height and trim in field.

E. Thickness: 1/8”

F. Finish: Satin

G. Use pre-molded inside and outside corners at all corner conditions.

H. Color to be selected by Architect from Manufacturer's entire line of solid colors, including “Additional Color Palettes”

## Part 3. Execution

### 3.01 Inspection

A. Examine the areas and conditions under which resilient flooring accessories are to be installed. Notify the Architect, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

### 3.02 Preparation

A. Prior to applying base, brush-clean or vacuum surfaces to be covered and inspect substrate. Start of base installation will indicate acceptance of substrate conditions and full responsibility for completed work.

B. Continuously heat areas to receive base to 70 degrees F. for at least 48 hours prior to installation, when Project conditions are such that heating is required. Maintain 70 degrees F. temperature continuously during and after installation as recommended by flooring manufacturer, but for not less than 48 hours.

### 3.03 Installation

A. Install resilient base after finishing operations, including painting, have been completed, and permanent heating system is operating. Moisture content of concrete slabs, building air temperature, and relative humidity must be within limits recommended by flooring manufacturer.

B. Rubber Wall Base

1. Apply resilient base to walls, columns, pilasters, casework, and other permanent fixtures in rooms or areas where base is required. Install base in as long lengths as practicable, with performed units for exterior and interior corners. Tightly bond base to backing throughout the length of each piece, with continuous contact at horizontal and vertical surfaces.
2. Compress bottom cove edge of coved base for firm contact with flooring. Maintain top edge level. Base shall be without gaps to floor and wall surface.
3. Place base with adhesive cement in strict compliance with manufacturer's recommendations. Butt tightly to vertical surfaces, thresholds, nosing, and edgings. Scribe as necessary around obstructions and to produce neat hairline joints, laid tight, even, and straight. Extend base into toe spaces, door reveals, and into closets and similar openings.
4. Match edges at all seams or double cut adjoining lengths Install with tight hairline butt joints between adjoining lengths.
5. Apply resilient base to walls, casework, and other permanent fixtures in rooms or areas where base is required. Install base in as long lengths as practicable, with preformed units for exterior and interior corners. Tightly bond base to backing throughout the length of each piece, with continuous contact at horizontal and vertical surfaces.

### 3.04 Cleaning and Protection

A. Remove any excess adhesive or other surface blemishes, using neutral-type cleaners as recommended by flooring manufacturer. Protect installed flooring from damage by covering.

**End of Section**

Section 09 91 10

# Painting – New and Existing Construction

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | • Provision and installation of all painted coatings regardless of location on project<br>• All preparation, surface cleaning, sanding, filling, de-glossing and priming required. |

### 1.03 Submittals

A. Provide the following submittals:

| Item | Description |
|---|---|
| Catalog Cuts | • n/a |
| Samples | • Submit samples for Architect's review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor. Provide a listing of the materials and application for each coat of each finish sample<br>• On 12" x 12" hardboard, provide two samples of each color and material, with texture to simulate actual conditions. Resubmit each sample as requested until required sheen, color, and texture is achieved<br>• Include samples of proposed **Tinted Primer Color**. Refer **PART 2 – Products** For Primer Color Requirements<br>• Samples shall be created utilizing the same process that will be used in the field. If painting is to be sprayed, then samples shall be sprayed. If painting is to be brushed, then samples shall be brushed. If painting is to be rolled, then samples shall be rolled. |
| Product Data | • Submit two copies of the manufacturer's MSDS and PDS sheets which will include paint-label analysis and application instructions for each material specified |
| Paint Schedule | • Submit a paint schedule that includes manufacturer and paint system for each type of surface and substrate to be painted. Do not begin work until this schedule is approved by the Architect in writing. |
| Shop Drawings | • n/a |

| | |
|---|---|
| Schedule | • Include Schedule entry and conclusion on Gantt Chart for Installation of all coatings for this project.<br>• Provide a Schedule of the products to be used on each building component. Include Manufacturer, product, sheen, number of coats and proposed method for installation as well as the intended preparation to successfully install the coating systems. |

**1.04 References / Standards**

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining "Industry Standards" and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • In addition to compliance with all pertinent codes and regulations, meet or exceed "Standard Type 1", as defined by the Painting and Decorating Contractors of America in the "Modern Guide to Paint Specifications", latest edition<br>• Meet or exceed requirements of SSPC for all steel surfaces<br>• MPI – Master Painters Institute, Architectural Painting Specifications Manual http://www.specifypaint.us |
| Standard | • EPA Method 24 – Determination of Volatile Matter Content, water Content, Density, Volume Solids, and Weight Solids of surface coating.<br>• ASTM E2129, Standard Practice for Data Collection for Sustainability Assessment of Building Products<br>• ASTM D3960, Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.<br>• ASTM D5116, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products<br>• ASTM D6670, Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products. |

**1.05 Quality Assurance**

A. Provide the following:

| **Item** | **Description** |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site.<br>• **Superintendent:** Contractor shall provide knowledgeable personnel – Superintendent or Foreman – familiar with the scope of the Project and capable of communicating the status of the Work on a daily basis to the Architect and at all Required Inspections. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. All workers will have at least two years of training from the supplying contractor. Documentation will be required. |

| | |
|---|---|
| | • Use only qualified journeymen painters for the mixing and applications of paint on exposed surfaces; in the acceptance or rejection of installed painting, no allowance will be made for lack of skill.<br>• General Contractor shall require subcontractors to remove any unqualified workers from the project. |
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.<br>• Architect reserves the right to reject any material not installed per current industry standards or recommended installation instructions of the Manufacturer, or not installed per these Specifications. |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any primer, finish system or patching/repair product.<br>• Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Refer Part 3 – Execution for more detailed Contractor Inspection requirements.<br>• Moisture levels of all surfaces will be tested and documented by the painting contractor and the General Contractor. Additionally, all exposed masonry surfaces will be tested for PH and documented. All PH levels tested will be below: 10 PH before any repair, priming or painting will begin.<br>• All existing coatings will be tested and verified to be lead free before any work can begin. |

**1.06 Quality Control by Contractor**

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| **Item** | **Description** |
|---|---|
| Supervision | • Per Part 1.05 |
| Testing | • n/a |
| Special Inspections | • n/a |
| Mock Ups | • Provide mock-up for each color and sheen selection on each building component on the project. Use the same primer, paint, number of coats, and installation method that will be used for the final installation<br>• Coordinate exact location for mock up in field with the Architect<br>• Designated surface shall be the standard of quality for related surfaces upon review and acceptance by Architect.<br>• |

**1.07 Quality Control by Owner**

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Review by Architect | • Contractor shall notify Architect at the following milestones so that Architect may review the condition of the work. Failure to coordinate these reviews may result in later work being removed for corrections in the earlier work:<br>  • After power washing, cleaning, de-glossing, and preparation of all surfaces to receive paint<br>  • After completed application of prime coat<br>  • After application of final coat<br>  • After final post application site clean-up operations are completed<br>  • Prior to release of final payment |

**1.08 Close Out**

A. Provide the following Close Out materials:

| Item | Description |
|---|---|
| Product Manuals | • Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | • Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems. |
| Surplus Materials | • Provide (5) gallons of each type and color of paint used on the project |
| Training | • n/a |

**1.09 Warranty**

A. Provide written warranty, as follows:

| Item | Description |
|---|---|
| Warranty Form | • Sub-Contractor and manufacturer to provide warranty against defects in materials or workmanship. Replacement or repair of such defects shall be repaired or replaced in a timely fashion at no additional cost to the Owner. |
| Warranty Period | • 3 years |
| Warranty Start | • Date of Substantial Completion |

**1.10 Painting Scope**

A. General

1. Painting and finishing of exposed items and surfaces throughout the Project, except as herein specified.
2. Study Drawings and Schedules and Specifications of other trades and include priming and preparation where no other is specified. Be responsible for total mil thickness of coating systems as specified herein, including others' shop coats
3. "Paint", as used herein, means all coating systems materials, including primers, emulsions, enamels, sealers and fillers, stains and other applied materials, whether used as prime, intermediate or finish coats.
4. Paint all exposed *paintable* surfaces, whether or not colors are designated in "schedules", except where the natural finish of the material is obviously intended to be exposed and not painted. (Obviously, do not paint window glass, masonry, fire equipment, etc.)
5. Paint all wood and steel fences and gates (Excludes steel chain link fences).
6. Paint all steel chipping containers identified on plans, including stenciled signage.

B. Colors:

1. To match existing adjacent surfaces.

2. Unless otherwise noted, provide all materials from a single manufacturer.
3. The contractor shall allow for a range of colors and shall anticipate the possibility of a different color on each type of material included in the project. No limits shall be assumed regarding numbers of colors, including selection of deep tones, except that colors will not be changed within the bound of a given material.
4. Generally and unless otherwise specified herein or noted on Finish Schedules the quantity of colors and finishes shall be based on the following criteria:

   (a) Color selection will be based on (1) base color and up to (4) accent colors, which may be deep or bright colors.

C. Existing Construction: Renovated Finish

1. Where existing clear finishes occur on wood surfaces and are scheduled for "Renovated Finishes", provide preparation, surface repair, stripping (where required) and new finishes
2. In some cases, existing finish may be adequate as base for new finish
3. All areas requiring renovated finish will be reviewed in the field with the Architect prior to execution. Areas deemed to be heavily damaged may be re-designated for painted finish at the discretion of the Architect

D. Floor Coatings

1. Refer to other sections of this Project Manual for floors to receive paint, sealer, or similar coatings.

E. Specific Items Included: The following is intended to clarify items requiring paint. This list does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of all work of this Contract. The general contractor shall make all new surfaces, existing surfaces and repaired surfaces "ready for paint." Once the Painting contractor has applied primer or paint to a surface he/she has assumed complete responsibility for the "readiness" of that substrate.

Interior Paint

- Building walls
- Building posts, columns, and pilasters.
- Acoustical wood panels on walls
- Fire extinguisher cabinets on walls
- Other cabinets on walls
- Lockers, where indicated
- Exposed roof structure members
- Exposed roof decking
- Mechanical system components at ceiling
- Doors
- Steel fence and gates, where indicated
- Metal structure of basketball backstops, where indicated
- Exposed conduit, pipes, and wires

**1.11 Painting / Renovation Not Included**

A. The following categories of work are not included as part of the painter-applied finish work, unless otherwise shown or specified. No finish on the following

Do Not Paint:

- Stainless steel and nonferrous metals when used for metal doors and windows, counters, hardware, electrical plates, lighting fixtures, etc.
- Galvanized surfaces identified per plans to remain unpainted.
- Soffit vent screens that are currently unpainted
- Electrical, mechanical, and plumbing equipment and ductwork, except noted electrical conduits, ceiling registers, grilles, and diffusers which shall be field painted over manufacturer's prime coat
- Acoustical surfaces
- Fire alarm equipment: Smoke detectors, heat detectors, strobes, horns. Including protective cages or enclosures around such equipment.
- Factory-finished surfaces, equipment, etc
- Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, and shafts
- Existing concrete or masonry surfaces not specifically indicated as to receive paint, including concrete columns and masonry walls. These surfaces are to be renovated per Project Manual Section 09912.
- Operating Parts and Labels
- Where necessary to gain access or protect surfaces the painting contractor shall remove and replace at no extra cost removable items such as fittings, awnings, shutters, cover plates, doors and handles.
- Any surface where a coating will interfere with movement and fit such as threads and hinges
- Glass, porcelain, plastic, textiles and other materials not suitable to be painted
- Shop coated, powder coated and baked enamel surfaces
- School name, logo, or mascot. Unless otherwise noted on the plans, these are to be cleaned and graffiti coated.

B. Do not paint any moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, door closers, sensing devices, motor and fan shafts, unless otherwise indicated.

C. Do not paint over any code-required labels, such, as UL and, fire ratings, Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

D. All masking, tape, paper, and plastic adhered to these items shall be removed by the Painting Contractor upon completion of paining and after required drying time. Absolutely no tape residue will be left on any surface. No tape will remain on an exterior surface for more that (14) days.

## Part 2. Products

**2.01 Paint**

A. Paint, surface treatments, and finishes are shown in the Finish Schedules, Elevations, or indicated in the Specifications of the Contract Documents. Paint colors will be selected from the manufacturer's mixed colors prior to installation.

1. All surfaces shall receive a paint finish, except the exclusions in 1.10 and 1.11. If no finish is particularly indicated, the finish shall be the minimum coating specified in the paint finish schedule of this Section, for the particular substrate involved. It is the responsibility of the Painting Contractor to verify the exact coating choice, color, and sheen, as it relates to each and every substrate before a coating or primer is applied to any surface.

B. All paints shall comply with Flame Spread limitations defined in 2010 CBC Table 803.9. Refer to Drawings for specific requirements based on usage.

C. Final acceptance of colors will be from brush-out samples applied *in situ*.

D. Proprietary names used to designate colors or materials are not intended to imply that products of the manufacturer's are required to the exclusion of equivalent products of other manufacturer's.

E. Bids are to be based on specified coatings as manufactured by Benjamin Moore & Co., except as otherwise specified.

F. Requests for changes or variations must be made in writing by the Contractor to the Architect detailing the reasons, extra cost or savings per hour of labor and/or per gallon of paint. It is the burden of the Painting Contractor to prove the equivalency of any intended substitution of primers or coatings four weeks before beginning the project.

G. Paint Coordination: Provide finish coats and primers that are compatible and manufactured by the same manufacturer, except as otherwise specified. Review other Sections of these Specifications in which prime paints are to be provided to ensure compatibility of total coating systems for various substrates. Upon request from other trades, furnish information on characteristics of specified finish materials, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Architect, in writing, of any anticipated problems using specified coating systems with substrates primed by others.

H. **Primer:** All primers and undercoats are to be tinted to the approximate shade of the selected finish coat, but the tint shall be sufficiently different to allow easy determination of the boundaries between coats. Where the color schedule calls for the use of deep tones, it is the responsibility of the Painting Contractor to utilize the appropriate Deep Base Primers as Manufactured by Benjamin Moore & Co. (or equal) for use on the surface for which they are intended.

**2.02 Surface Repair / Stabilization Materials**

A. Hardener for wood that is damaged, slightly decayed, softened, or weathered:

1. Quick drying, Solvent-borne resin hardener, such as Minwax High Performance Wood Hardener, System 3 End Rot, Abatron Liquid Wood, or approved equal.

B. Filler for defects in wood.

1. 2-part Epoxy filler such as Minwax High Performance Wood Filler, System 3 Wood Putty, Abatron Wood Filler, or approved equal.
2. 2 component filler such as 3m Bondo or approved equal.

C. Metal Etch / rust converter for rusty surfaces:

1. Phosporic Acid metal etch and prep such as Jasco Prep n' Prime, Ospho Rust Treatment, or approved equal.

**2.03 Material Quality**

A. Provide premium quality grade of the various types of coatings as regularly manufactured by approved paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, premium-grade product will not be acceptable.

B. Provide undercoat paint (Primer) produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

**2.04 Materials**

A. Unless otherwise specified, the products indicated under "Painting" are products of "Benjamin Moore & Co.;" comparable-quality products of Dunn-Edwards, ICI, Kelly-Moore, Pratt & Lambert or approved equivalent will be acceptable. Proof of equivalence is required in writing by the Painting Contractor.

B. Colors used shall be selected for their permanence and non-fading qualities. In addition, colors that are used over concrete and plaster shall not be applied if the concrete or plaster surface has a Ph rating higher than 13.

C. All paint and coatings must be delivered to the job site in the manufacturer's original and unopened containers, plainly marked with the proper designation of the product, as well as the name of the manufacturer. All coating materials at the job site shall be subject to inspection by the Architect.

D. The contractor shall retain sufficient quantities of paint of the same batch until completion of the entire project to permit uniform touch-up. Normal minor damages to painted areas by other trades during the course of the construction project shall be touched-up by the Painting Contractor at no extra cost.

E. It is to be understood by the General Contractor and the Painting Contractor that all coatings must conform to all state and local regulations including VOC rules at the time of application.

## Part 3. Execution

**3.01 Contractor's Inspection**

A. It is the General Contractor and Painting Contractors responsibility to examine the areas and conditions under which painting work is to be applied. Notify the Architect, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected and inspected by the Architect.

B. All surfaces to be painted must be free of dirt, rust, scale, grease, moisture, scuffed surfaces, glossy, or conditions otherwise detrimental to the formation of a durable paint film.

C. Any surface which has been primed or painted constitutes acceptance of the surfaces and the conditions within any particular area.

D. Surfaces not being painted shall be protected from drips, spatter, over-spray and other paint contamination by means of masking, drop sheets and protective covers.

**3.02 Surface Preparation**

A. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instruction and as herein specified for each particular substrate condition.

1. The Painting Contractor shall be wholly responsible for the quality of his work, and is not to commence any part of it until the surface is in proper condition.
2. If the Painting Contractor considers a surface unsuitable for proper finishing, he shall notify the Architect in writing. The Painting Contractor is not to apply any material until corrective measures have been taken, or the Architect has instructed them to proceed.
3. If the Painting Contractor has been instructed by the General Contractor to begin painting under conditions and circumstances he believes could result In poor performance and early failure of the coating, he shall immediately inform the Architect in writing and request from the Architect for a decision in writing.

B. General, Existing Construction:

1. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.
2. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease or waxes prior to mechanical cleaning. Schedule the cleaning and painting so that containments from the cleaning process will not fall onto wet, or newly painted surfaces.
3. Refer to the manufacture’s Technical Data Sheet for specified product and comply with the requirements regarding application such as: mixing of the components, thinning, pot life, and application equipment such as: roller type and nap length, brush type, tip size and gun type, air and fluid pressure, hose length and hose I.D., etc.
4. Ensure that expectations of humidity, precipitation and temperature (substrate, ambient and material) during application and curing of paints are within the range permitted by the manufacturer.
5. When substrate temperatures are high, care must be taken while applying the paint to prevent formation of voids, pinholes, and bubbles due to the rapid evaporation of solvent.

C. Wood:

1. Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, solvent, and sandpaper, as required. Sand smooth all finished surfaces and remove dust. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac other approved sealer before application of the priming coat multiple thin coats of white shellac may be necessary to “seal” the knot from “bleeding”. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dried. Spot prime over all exposed fillers. Preapproval from the Architect in writing is required before any wood surfaces can be pressure washed. **All wood surfaces that are intended to be power washed will need to be identified and agreed upon in advance by the painting contractor, Architect and General Contractor.**

2. Repair of defects, decay, and stabilization of soft areas: On all wood not identified to be replaced, all imperfections, divots, soft and weathered wood, and minor damaged areas shall be repaired before painting. All end grain shall be treated with wood hardener prior to repair and painting. All "butt" joints will be caulked with a Urethane base caulking to ensure a flexible joint to allow for the lateral expansion and contraction of the joint. The repair areas shall blend seamlessly into the surrounding surface.

    a. Scrape and remove all loose material from the damaged area.

    b. Treat the area with wood hardener per manufacturer's instructions

    c. Fill with epoxy filler. Multiple coats may be required

    d. Sand smooth and blend into surrounding area. Inspect and apply additional filler if required.

    e. Spot prime over patched and repaired surfaces.

3. Fill all cracks, joints, seams with caulk and allow to cure (see caulking manufacturer recommendations as it pertains to "cure: times.
4. Multiple coats of paint that are in an advanced state of deterioration and prior applications of cement-based paints must be removed by scraping, sanding or by the use of mechanical grinder. These areas will be referenced by the Architect and General Contractor during the "walk through".
5. New Wood must be dry, free of grease, oil mildew, mortar and asphalt spatters and mill glaze. Rough surfaces are to be sanded smooth. Cracks are to be caulked ; door and window trim and joints are to be caulked after surfaces have been primed so as to create a "sandwich" effect between the caulking/putty and the primed substrate. Nail holes are not to be filled. Painting is not to be done during or immediately following foggy, rainy or frosty weather, nor when the temperature is expected to go below 50°F before the coating has dried. Avoid painting surfaces while they are exposed directly to the hot sun, and refrain from painting during windy or threatening weather. Pressure treated wood (PTW) must be tested prior to coating to determine proper penetration of coating. Surface must be sprinkled with water to determine absorption into substrate. If water drops remain on PTW surface, do not paint. If water penetrates immediately into the surface, prepare surface as you would any wood and then prime. Smooth planed clapboards or siding must be sanded thoroughly with 80 grit sandpaper to remove the "mill glaze" to allow proper penetration and adhesion of the paint coating. If mildew is evident, it must be removed by scrubbing with a commercial mildew wash formulated for this purpose. Caution: Follow manufacturer's directions; wear rubber gloves, work goggles and protective clothing.

    (a) All timber delivered to the job site shall be tested with a moisture meter. All wood testing at or below 18% moisture content shall be immediately primed.
    (b) Prime edges, ends, face, undersides, and backsides of such wood surfaces. When transparent finish is required, use spar varnish for back priming.
    (c) Timber surfaces to be embedded in plaster or masonry shall be fully primed prior to installation. All timber end grain is to receive one extra primer coat.
    (d) Back prime all new exterior wood.
    (e) If more than (14) days have expired since the time of original priming all surfaces to be top- coated shall be lightly sanded or re-primed before a finish coat can be applied.

6. Previously Painted Wood must have all blistered, peeling, scaling and deteriorating paint removed to a clean, sound substrate, by scraping, grinding, sanding and/or wire brushing. Spot prime where bare wood is exposed. Chalk must be thoroughly removed to a sound substrate by wire brushing, sanding or by power washing. Remove all loose or split caulking, putty or glazing
7. Previously stained exterior wood:

   (a) After ensuring that wood is dry, free of grease, oil mildew, mortar and asphalt spatters and mill glaze, sand with 80 grit sand paper to achieve an adequate profile for complete primer adhesion.
   (b) Prime with a stain blocking acrylic primer.

D. New Exterior Cement Plaster:

1. Surfaces are to be dry, free of greasy residue, mortar and asphalt spatters. Thoroughly brush with a stiff fiber brush to remove loose particles.
2. Remove form release agents with appropriate solvents.
3. Remove laitance deposits by hand or power wire brushing, or other appropriate means.
4. Allow poured concrete and precast concrete to cure for 60-90 days; block and stucco surfaces 30-60 days. Fill all structural cracks and crevices with the appropriate caulking/patching compound. If efflorescence is present, first dampen the surface with water, and then scrub the surface with a 10% solution of muriatic acid. Caution: Wear rubber boots and gloves, work goggles, and protective clothing. After treatment, thoroughly flush the surface with clean water to remove all acid and allow to dry thoroughly before painting. If mildew is evident, it must be removed by scrubbing with a commercial mildew wash formulated for this purpose. Caution: Follow manufacturer's directions; use rubber gloves, work goggles and wear protective clothing.

E. Previously painted Exterior Cement Plaster:

1. Remove all peeling, scaling and deteriorating paint and chalk to a sound substrate by hand scraping, use of mechanical grinders or high-pressure washing. Fill all structural cracks and crevices with the appropriate caulking/patching compound. If mildew is present, remove by scrubbing with a commercial mildewcide wash formulated for this purpose.
2. Caution: Follow manufacturer's directions; wear rubber gloves, work goggles, and wear protective clothing.

F. Ferrous Metals:

1. Thoroughly clean New steel surfaces to remove all grease in accordance with SSPC-SP1 "Solvent Cleaning"
2. Remove rust, mill scale, etc., in accordance with SSPC-SP2-63 "Hand Tool Cleaning" or SSPC-SP3-63 "Power Tool Cleaning". Particular care is to be exercised to remove welding flux, slag and fume deposits as is possible by blast cleaning, washing with water, Phosphate rinsing, or power tool cleaning. Weld Spatters and burs must be removed. Primer coats should be applied immediately after the surface is dry and within the same day as the acid wash was applied so that rust does not reappear do to overnight moisture. Factory applied "shop coat" primers must be re-primed with a rust inhibitive 2 component epoxy primer before finish coats are applied.

G. Previously painted steel:

1. Thoroughly clean following SSPC-SP1-63 to remove all grease, oil and dirt.
2. All loose, peeling and scaling paint is to be removed by hand scraping or power tool cleaning. Rusted surfaces should be cleaned in accordance with SSPC-SP2_63" Hand Tool Cleaning" or SSPC-SP3-63 "Power Tool Cleaning".

3. Surfaces are to be thoroughly cleaned after sanding, scraping, hand and tool cleaning, etc. Dull all glossy surfaces by sanding.
4. Removal of multiple coats of paint that are in an advanced state of deterioration shall be accomplished by sandblasting or by the use of a mechanical grinder.

H. New galvanized metals:

1. Thoroughly clean to remove all grease, oil dirt and contaminants in accordance with SSPC-SP1 “Solvent Cleaning”.

I. Metal Downspouts and Structural Posts:

1. Remove all foreign material including but not limited to tape and previous painted coatings that are flaking or chipped.
2. All existing paint shall be removed completely down to bare metal prior to installation of new primer and paint. All rust areas shall be sanded smooth and treated with metal etch / rust converter.

J. Weathered previously painted galvanized metal:

1. Remove all peeling and scaling paint, rust and chalk by scraping, sanding and wire brushing.
2. After scraping, sanding, and wire brushing thoroughly clean the surface, re-prime exposed metal with a 95% zinc primer by Rustoleum or other pre-approved manufacturer, and finish as specified.

K. Painting of special assemblies

1. Existing louvers, vents, and screens:

a. Clean all sides of all fixed and operating louvers. Clean all aluminum frames of louvers, if existing.

**b. Remove screens on the exterior of louvers, if equipped, and strip down to bare metal as specified by the Architect.**

c. Clean all excess paint from operable louvers if interfering with their operation. Clean all chains, gears, and all moving parts.

d. Paint louvers and screens separately and reassemble when dry.

2. Doors and frames

a. Remove all paint if it will interfere with adhesion of the new coating system.

b. Fill all dents, holes, and other surface imperfections with epoxy filler.

c. Sand smooth all chipped areas and apply several coats of primer to build up the surface until smooth.

d. Finish coats of paint shall be sprayed or brushed. NOT ROLLED. Rolled-on paint or any paint applied otherwise with a rough or “stippled/orange peeled” final texture will be rejected.

e. Carefully paint doors which will touch adjoining surfaces when closed. To prevent blocking (fusing of uncured coating), the doors are not to be closed until the coating is cured enough as to not allow the door and jam to fuse together. Where excessive coating film thickness impacts the operation, previous paint and excess

film thickness shall be removed by sanding, grinding or stripping and the item repainted.

3. Wood Windows
    a. Refer to section 08 81 10 Glass and Glazing for glass replacement and glazing compound spot repair.
    b. Carefully paint operable wood windows which will touch adjoining surfaces when closed. To prevent blocking (fusing of uncured coating), the windows are not to be closed until the coating is cured enough as to not allow the door and jam to fuse together. Where excessive coating film thickness prevents windows from closing, previous paint and excess film thickness shall be removed and the item repainted.
4. Lockers – as indicated on plans
    a. Thoroughly clean all lockers, remove all stickers and other foreign matter.
    b. Repair minor dents and surface imperfections with a 2 component plastic filler.
    c. Remove all staples, tacks, and other foreign items from the wood end caps at the ends of the banks. Fill all imperfections with epoxy and sand smooth.
    d. Mask all hardware and tags on the door faces before painting.
    e. Lockers shall be painted by airless, conventional or HVLP sprayer.

**3.03 Materials Preparation**

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue. Store materials not in actual use out of the direct sun at all times.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film, and if necessary, strain the material before using.

**3.04 Application**

A. General:

1. See Operations and Sequence section below for the definition of a “Coat” of paint or finish.
2. Apply paint in accordance with the Manufacturer's directions paying particular attention to recommended square feet per gallon. Use applicators and techniques best suited for the type of material being applied and that will provide a smooth professional, brush mark free finished surface.
3. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color, and appearance.
4. Paint surfaces behind moveable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only. **Re-set all moveable equipment or furnishings in their original location upon completion and inspection by Architect.**
5. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
6. Paint the backside of access panels and removable or hinged covers to match the exposed surfaces in the coating specified for the substrate.
7. Finish exterior doors on tops, bottoms, and side edges the same as the exterior faces, unless otherwise indicated.

8. Sand lightly between each succeeding enamel or varnish coat and remove all sanding dust before work commences.
9. No spraying to be done without prior written approval of the Architect or Owner.

B. Minimum Coating Thickness

1. Provide a total dry-film thickness as recommended by manufacturer, but not less than 4.5 mils for the entire coating system of prime the finish coat for three-coat work.
2. Prime Coats: Apply a prime coat to material which is required to be painted, and which has not been prime-coated by others.
3. Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn through or other defects due to insufficient sealing.
4. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.
5. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections are not acceptable and shall be repaired and re-painted.
6. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Always apply the first two coats in gloss and the final coat in the referenced final finish sheen. Provide a finish free of laps, cloudiness, color, irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.

   (a) Provide finish for final coats, unless other- wise indicated.(Unnecessary)

**3.05 Clear Finish Renovation**

A. Repairs

1. Do not begin finish renovation until all repairs have been made. Repairs may include patching, insertion of new panels or wood parts and spot wood repair.

B. Preparation:

1. Do not accept substrates in which panels, trims or other materials are loose, bowed or otherwise not in full contact with substrate.
2. Fill all nail holes and small cracks with permanent hardening putty to match final finish. **Do NOT fill originally existing joints between panels.**
3. Sand after putty has hardened to remove all residues and produce a smooth finish.
4. Light sand all wood surfaces prior to application of first coat. Sanding shall knock down all previous stubble and residue from previous finishes.
5. Clean with tack cloth to remove sanding dust.
6. Fully clean area and ensure that dust will not become airborne from movement of or air infiltration.

C. Application

1. Apply gloss clear finish with high quality brush or spray. Stroke parallel to grain and pull stroke full length to avoid brush ends and runs.
2. After first coat is dry, and per manufacturer specification, light sand completed finish to knock down all stubble, dust and residue.
3. Apply second coat of clear gloss fully covering all areas applied by the first coat. Allow to dry and inspect.
4. All areas that remain rough, or stubbled or include dust shall be sanded, cleaned and final coated again with the referenced final sheen.

**3.06 Operations and Sequence**

A. All work is conditioned on adequate coating and finishing of all visible surfaces. Contractor shall provide all equipment necessary to meet this requirement. Equipment shall include lifts, scaffolding, ladders and any other appurtenances required to access surfaces.

B. Sequence of operations shall be determined by the requirements of the paint manufacturer and the finish requirements of this specification. Finish quality shall not be compromised by limitations resulting from equipment movement or setup.

C. Multiple setups may be required to apply different coatings or colors.

D. Multiple passes at each surface will be required to allow for multiple coatings and interim curing time. Contractor shall allow for as many passes as necessary to adequately coat each surface.

E. Contractor shall allow for multiple passes where the requirements of one finish component are different than those of another.

F. **Drying Time between coats:** Time between coats of primer and finish coats shall be dictated by the Required Inspections (refer to PART 1.) Each coat shall be allowed to dry completely before application of next coat.

1. **"Coat"** shall constitute a complete covering of any surface according to mfr. instructions for application of the particular coating specified and shall include manufacturer's specified drying time between coats. If mfr. specified curing time has not accrued prior to a subsequent coat, then the subsequent coat shall be considered a part of the previous coat and shall not constitute a required coat per these specifications. Multiple passes of any application device used for any coating shall not be considered multiple coats.

**3.07 Cleanup and Protection**

A. Cleanup:

1. During the progress of the work, remove from the Project daily all discarded paint materials, rubbish, cans, and rags.

   (a) Comply with local regulations for disposal of all paint materials including paint, stain, wood preservative finishes, solvents, and other related materials.
   (b) Recycle paint as available in jurisdiction. Separate materials by type. Where paint recycling is not available, materials shall be treated as hazardous waste and disposed in an appropriate manner.

2. Upon completion of painting work, clean all window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damaged finished surfaces. Cut and face all operating windows. All operable windows need to be shown to work correctly to the Architect before the project will be considered complete.

B. Protections: Protect the work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damages by cleaning, repairing, or replacing and repainting as directed by Architect.

1. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

**3.08 Product Delivery, Handling and Storage**

A. Delivery all materials to the job site in original, new, and unopened packages and containers bearing manufacturer's name and label.

**3.09 Job Conditions**

A. Do not apply water-base paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 50 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.

B. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog, or mist or when the relative humidity exceeds 85% or to damp or wet surfaces, unless permitted by the paint manufacturer's printed instructions. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying period.

## Part 4. Coating Systems

**4.01 Materials**

A. For purposes of scheduling, the products indicated under Painting Systems are products of Benjamin Moore & Co.

B. Products used shall be selected for their permanence and non-fading qualities.

C. Colors and Finishes: Paint colors, surfaces treatments, and finishes are shown on the Drawings and indicated in the Schedules of the Contract Documents.

D. Use only vinyl acrylic or 100% acrylic paint; no oil (alkyd) based paints are allowed unless otherwise specified.

**4.02 Paint Schedule**

A. This schedule is comprehensive, there may be items listed here that are not within the scope of this project.

**End of Section**

Section 10 05 00

# Signage

## Part 1. General

### 1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section. Items noted here are those specifically related to the General Contractor'

C. All California Prevailing Wage Laws apply to the work of this section.

### 1.02 Signage

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

| Item | Description |
|---|---|
| General | • Custom Room Identification and Wayfinding Signs<br>• ADA Signage |

*B. Refer to signage schedule included in drawings for specific layout requirements of signs. This section is intended to ensure that all signage provided on the project meets all of the latest accessibility code requirements.*

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

### 1.03 Submittals

A. Provide the following submittals per the requirements of Division 1.

| Item | Description |
|---|---|
| Catalog Cuts | • Signage cut sheets |
| Samples | • Example signs of each type |
| Shop Drawings | • Sign Layouts, and Key plans<br>• Signage Schedule indicating exact text of each sign |
| Schedule | • Include Schedule entry on Gantt Chart for Installation |

### 1.04 References and Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining "Industry Standards" and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

| | |
|---|---|
| References | • Comply with California Building Code Sections 11B-703, Table 11B-703.5.5, 11B-703.4<br>• Comply with Americans with Disabilities Act |

## 1.05 Quality Assurance

A. Project inspector shall inspect all signage installations and identification devices, per CBC §11B-703.1.1.2.:
Signs and identification devices shall be field inspected after installation and approved by the enforcing agency prior to the issuance of a final certificate of occupancy per Chapter 1, Division II, Section 111, or final approval where no certificate of occupancy is issued. The inspection shall include, but not be limited to, verification that Braille dots and cells are properly spaced and the size, proportion and type of raised characters are in compliance with these regulations.

B. Provide the following per Division 1

| Item | Description |
|---|---|
| Supervision | • Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. |
| Qualifications of Workers | • General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.<br>• Installer: Firm shall have a minimum of five years' experience in installation of systems similar to those required by this project and acceptable to the manufacturer |
| Product Acceptance | • General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.<br>• Architect will reject any material not installed per current industry standards or recommended installation instructions of the Manufacturer |
| Substrate Acceptance | • General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item. |

## 1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

| Item | Description |
|---|---|
| Supervision | • Per Division 1 |
| Testing | • Describe Testing |
| Special Inspections | • Per DSA Testing and Inspection Form |
| Mock Ups | • Provide one of each type of sign to Architect for review prior to proceeding<br>• Install first sign for Owner and Architect review prior to proceeding with remainder |

### 1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

| Item | Description |
|---|---|
| Observation | • Per Division 1. |
| Inspection | • Per CCR Title 24: Continuous Inspection by DSA Certified inspector |
| Testing | • Refer to DSA Testing and Inspection Sheet |
| Special Inspections | • Refer to DSA Testing and Inspection Sheet |

### 1.08 Closeout

A. Provide the following Close Out materials in accordance with Division 1.

| Item | Description |
|---|---|
| Product Manuals | • Maintenance and Operations instructions / manuals provided by all product / material manufacturers. |
| System Manuals | • Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems. |
| Surplus Materials | • n/a |
| Training | • n/a |

### 1.09 Warranty

A. Provide written warranty in accordance with Division 1.

| Item | Description |
|---|---|
| Warranty Form | • Per Division 1 |
| Warranty Period | • 1 year |
| Warranty Start | • Date of Substantial Completion |

## Part 2. Products

### 2.01 Manufacturers

1. Window Graphics Sign Company, Campbell, CA (www.windowgraphics.net)
2. or approved equal

### 2.02 Custom Signage

A. Sign dimensions, layout, text sizes, symbols, and fonts shall be as shown on the Drawings.

1. Text indicated on Sign Schedule in the Drawings is provisional. Contractor shall submit sign schedule with all text for Architect's final approval prior to fabrication.

B. Signage shall also conform to the following requirements of the California Building Code. Note that California's standards for signage are more stringent than Section 4.30 of the ADAAG.

C. The following specific code requirements are compiled from 2019 CBC for reference. This list does not limit Contractor's responsibility for compliance with all terms of the 2019 CBC. Contractor shall refer to 2019 CBC for the complete requirements.

1. Character Proportion: Letters and numbers shall be selected from fonts where the width of the uppercase "0" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "i" (CBC 11B-703.2.4).
2. Raised Characters and Pictograms:

   (a) Letters and numerals shall be raised 1/32 inch, minimum, sans serif, uppercase, accompanied with Grade 2 (Contracted) Braille (CBC 11B-703.6)
   (b) Height of raised characters shall 5/8 in. min., 2 inch max. (CBC 11B-703.2.5)
   (c) Pictograms shall be accompanied by the verbal description places directly below the pictogram. The height of the pictogram field shall be 6 inches min. (CBC 11B-703.6)
   (d) Characters and Braille shall be in horizontal format. Braille shall be placed 3/8 inch min and 1/2 inch max below the characters. Characters and text shall be justified flush left, or centered. When multiple lines of tactile text occur, all Braille shall be placed below all lines of text. (CBC 11B-703.3)

3. Braille (CBC 11B-703.3)

   (a) Contracted (Grade 2) Braille
   (b) Domed or rounded Braille dots
   (c) Spacing between dots within cell: 0.1 inch o.c.
   (d) Spacing between cells: 0.2 inch from center of second column of one cell to first column of next cell
   (e) Dots raised 0.025 inch min above background

4. Finish and Contrast: Characters, symbols, and background shall have non-glare (eggshell, matte) finish. Characters shall contrast with background – light on dark or dark on light (CBC 11B-703.5.1)
5. Mounting Location and Height (Table 11B-703.4)

   (a) Room identification signs shall be mounted on the wall adjacent to the latch side of the door. Where there is no wall space to the latch side of the door, signs shall be placed on nearest adjacent wall.
   (b) Mounting height: 60 inches above finish floor to centerline of sign
   (c) Located such that a person may approach within 3 inches of sign without encountering protruding objects or door swings.

6. Toilet Room Signage

   (a) In addition to typical room identification signage, doorways to sanitary facilities shall be identified by geometric symbols centered horizontally on the door at a height of 60 inches above finish floor to centerline of symbol (CBC 11B-703.7.2.6)
   (b) Men's accommodations shall be identified by an equilateral triangle measuring 12 inches on each side, vertex pointing up. (CBC 11B-703.7.2.6.1)
   (c) Women's accommodations shall be identified by a circle measuring 12 inches in diameter. (CBC 11B-703.7.2.6.2)
   (d) Unisex accommodations shall be identified by a circle measuring 12 inches in diameter, with an equilateral triangle inscribed within. (CBC 11B-703.7.2.6.3)

## 2.03 Signs

A. Colors:
   1. Text and symbols shall be White
   2. Background color shall be selected by Architect from Pantone Matching System colors

B. Graphic Process
   1. Sign shall be 1/8" thick melamine plastic, fire retardant and self-extinguishing.
   2. Text and symbols shall be blast-etched integral to the material of the sign.

(a) Applied, glued-on, etched or chemically welded characters are not acceptable.

## Part 3. Execution

### 3.01 Installation

A. Install signage per manufacturer's recommendations and in compliance with ADA/Title 24 requirements.

B. Install signage at the locations indicated on the Drawings. In the event the indicated locations is not feasible, coordinate with Architect to determine alternate location.

1. Signs shall not be mounted to glass sidelites; instead, mount the sign on the wall adjacent to the sidelite.
2. Signs shall be mounted such that a person may approach within 3 inches of the sign without encountering a protruding object or a door swing.
3. All signs shall be mounted such that the centerline of the sign is 60 inches above the finished floor.
4. Where multiple signs are installed adjacent to each other, and they are of varying heights, the signs shall be top-aligned.
5. Where signs are indicated adjacent to a door or window frame, they shall be mounted such that the edge of the sign nearest the frame is 4 inches from the frame.

C. Use manufacturer-specified adhesives and fasteners as indicated on the Drawings.

1. Exterior signs shall be attached with mechanical fasteners
2. Mechanical fasteners shall be tamper-proof (#6 spanner flathead screws)

D. Remove all excess adhesive and clean signage upon completion.

**End of Section**

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Section 23 05 00

# Mechanical Common Work

## Part 1. General

### 1.01 Section Includes

A. General Requirements
B. Submittals
C. Miscellaneous Steel, Bolts, Nuts, and Washers
D. Concrete Anchors
E. Pipe and Pipe Supports
F. Seismic Restraints
G. Fire rated Pipe Penetrations
H. Wall Penetrations
I. Accessibility requirements

### 1.02 General Requirements

A. Related Documents: Drawings and general provisions of Contract, including General Conditions and Supplementary General Conditions and Division 1, apply to work of this Section.

B. Other Sections of the Specification, as listed in Table of Contents, are included in and made a part of this Section. Consult these Sections to determine extent and character of related work of other Sections and provide proper coordination of work specified herein with that specified elsewhere to produce a completely finished and fully operable installation. This Section applies to other Sections of Division 23.

C. Provide complete and fully operational systems with facilities and services to meet requirements indicated and in accord with applicable codes and ordinances.

D. Drawings indicate general arrangement and location of piping and equipment. Do not scale drawings for exact location of items. Should it be necessary to deviate from arrangement or locations indicated in order to meet architectural, structural, electrical or site conditions, or due to interference with other work, deviations such as offsets, risers and drops in piping that may be necessary, where shown or not, shall be made at no additional cost to the Owner. Extreme accuracy of the data given herein and on the Drawings is not guaranteed. The Drawings and Specifications are for the assistance and guidance of this Section and exact locations, distances, and elevations will be governed by actual site conditions.

E. Construction documents have been designed to meet or exceed minimum requirements of Codes; therefore, unless before signing Contract, Contractor has notified Owner's Representative, in writing, of any items in conflict with said codes, Contractor shall thereafter make any minor adjustments necessary to meet said Codes at no cost to Owner.

F. Visit site of work, take measurements, examine existing areas where work is to be performed and get such other information as necessary for proper execution of work. Ascertain and check conditions with Drawings and Specifications, other trades, existing conditions and determine the means by which work will be performed. No allowance shall subsequently be made for any extra expense due to failure or neglect to make such examination and correlation. Where revisions or changes are required to permit installation of new work, they shall be made at no additional cost to the Owner. No allowance shall be subsequently made for any error or omission on part of Contractor in this connection.

G. Manufacturer's Directions: Follow manufacturer's directions covering points not shown on drawings or specified herein. Manufacturer's directions do not take precedence over drawings and specifications. Where these are in conflict with drawings and specifications, notify Architect for clarifications, before installing the work.

H. Codes: Work and materials shall be in full accordance with applicable local and State codes and ordinances. Whenever drawings and specifications require larger sizes or higher standards than are required by regulations, drawings and specifications govern. Whenever drawings and specifications require something which will violate regulations, regulations govern. No extra charge will be paid for furnishing items required by regulations but not specified or shown on drawings

I. Examine Drawings and other Sections of Specifications for requirements therein affecting work of this trade. Contractor shall coordinate work with that of other trades to avoid interference. Plans are diagrammatic and show generally locations of equipment, and piping and are not to be scaled; dimensions and existing conditions shall be determined at building.

J. Every effort has been made in design to meet or exceed minimum requirements of Codes; therefore, unless before signing Contract, Contractor have notified Architect, in writing, of any items in conflict with said codes, Contractor shall thereafter make any minor adjustments necessary to meet said Codes at no cost to Owner

K. Intent of specifications: Work not explicit in Specifications or Drawings, but clearly implied as necessary to complete systems, shall be included as though fully specified and drawn

L. Interruption of electrical services or existing mechanical systems shall be scheduled at least 24 hours in advance and only at times approved by Owner. Contractor shall minimize such interruptions by carefully planning work and by using existing shutoff valves when making connections to existing systems.

## 1.03 Submittals

A. Provide submittals in accordance with provisions of Division 1.

B. Material Lists: submit lists of material, equipment, and apparatus intended for use, identifying manufacturer's name and type and/or model number.

C. Description: submit complete descriptions of material, equipment, and apparatus intended for use. Include manufacturer's names, trade names, model numbers, sizes, capacities, operating weights, and other data necessary for complete and prompt identification and review. Refer to Specification page, Drawing, or both wherein the material or equipment is specified, scheduled, or otherwise indicated. Include statement that equipment or apparatus submitted complies with applicable standards specified.

D. Shop Drawings: Submit manufacturer's Certified Shop Drawings for equipment. Include manufacturer's names, trade names, model numbers, sizes, capacities, operating weights, and other data necessary for complete and prompt identification and review. Clearly mark submittals to show actual items proposed for installation.

E. Record "As-built" Drawings:

1. Provide and keep up-to-date a complete "as-built" record set of prints. Mark up these drawings daily to show every change from original drawings and specifications. Show exact "as-built" locations, sizes and kinds of equipment. Keep these drawings on job site and use only for record set.
2. Upon completion of work, obtain complete set of AutoCAD drawings from Owner’s Representative. Transfer neatly, using competent draftsperson, changes entered on the above “red lined” set. Submit to Owner’s Representative for approval. Comply with Operations and Maintenance Manuals specification sections.

F. Maintenance and Operating Instructions:

1. Furnish operating instructions, maintenance instruction, parts lists, and other bulletins and brochures pertinent to operation and maintenance of major equipment provided, in accordance with Operations and Maintenance Manuals specification sections.
2. Properly instruct Owner's personnel in operation and maintenance of material, equipment and apparatus provided.

G. Written guarantees in accordance with Specification Section on Warranties. Submit written guarantee that work has been performed in accordance with Drawings and Specifications and that Contractor shall replace or repair, to satisfaction of Owner and tenant, any portion of work that fails within a period of one year after final acceptance, provided that such failure is due to defects in material or workmanship.

### 1.04 Fees and Permits

A. Procure and pay for licenses and permits, and pay fees, deposits, assessments and tax charges required to perform installation of material, equipment, and systems herein specified and indicated.

### 1.05 Material Delivery, Storage and Handling

A. Deliver materials in timely manner to insure uninterrupted progress of work. Manufactured materials shall be delivered in unopened original containers with brand and maker's name marked thereon. Materials in broken containers or showing evidence of damage will be rejected and must be immediately removed from site.

B. Store materials, immediately upon receipt, at location designated by Owner so as to preclude damage thereto and permit ready access for identification and inspection of each shipment.

## Part 2. Materials and Products

### 2.01 General

A. Material, equipment, and apparatus hereinafter specified shall be new, unless specifically noted otherwise. Material, equipment, and apparatus may be taken from stock, but submittal shall include manufacturer's identification and statement indicating conformance with specified Codes, Regulations, Standards, referenced Specifications, and requirements specified herein. Material, equipment and apparatus shall be identified by manufacturer's name, nameplate and pertinent data.

B. Electrical material, equipment, and apparatus specified herein, shall conform to requirements of NEC

### 2.02 Miscellaneous Steel, Bolts, Nuts and Washers

A. Miscellaneous steel angles, channels, brackets, rods, clamps, etc., shall be of new materials conforming to ASTM A36. Steel parts exposed to weather or where noted shall be stainless steel or hot dipped galvanized after fabrications.

B. Bolts and nuts, except as otherwise specified, shall conform to ASTM "Standard Specifications for Low Carbon Steel Externally and Internally Threaded Standard Fasteners", Designation A307. Bolts shall have heavy hexagon heads, and nuts shall be of hexagon heavy series. Bolts, washers, nuts, anchor bolts, screws and other hardware, located outdoors or in air intake plenums shall be hot-dipped galvanized, or stainless steel, and galvanized nuts shall have a free running fit. Cadmium plated not acceptable in these locations. Bolts shall be of ample size and strength for purpose intended.

### 2.03 Concrete Anchors

A. Hilti, B-Line, Mason Industries, or equal, wedge anchors, U.L. Listed. Powder actuated devices are not permitted.

B. Maximum loading on inserts and rods shall not exceed 75 percent of rating.

### 2.04 Seismic Restraints

A. Anchorage and seismic restraint of permanent equipment and associated systems shall be installed to comply with Section 1616A of the 2016 California Building Code. See drawings for additional information.

### 2.05 Fire-rated Pipe Penetrations

A. Provide State Fire Marshall approved assemblies at penetrations of floors, fire-rated walls and partitions, and smoke-rated walls and partitions. Fill annular space with UL listed incombustible intumescent putty. Seal both sides of penetrations at walls and floor slabs with incombustible sealant.

B. Piping penetrating floors, fire-rated walls and partitions, and smoke-rated walls and partitions shall be metallic.

### 2.06 Wall Penetrations

A. Provide metal sleeves where pipes pass through walls, partitions, floors, ceilings or structural members unless otherwise noted.

B. Sleeves in Plaster Walls and Partitions: 18-gauge galvanized sheet steel, both ends flush with finished surface. Pack with mineral fiber and caulk, or per "Fire-Rated Pipe penetration" where required.

C. Clearance: Size sleeves and core drilled holes to provide 1/2" minimum annular clearance around pipe.

D. Plates: Hinged, or chromium plated steel with spring and snap.

## Part 3. Execution

### 3.01 Installation

A. Provide miscellaneous equipment and supplies, at no additional cost to Owner, if required to make systems operable as specified or shown in Drawings.

B. Connect Mechanical systems to existing utilities where applicable.

C. Store, protect, uncrate, hoist, and set into place equipment and material.

D. Provide carpentry, steel fabrication, and backings involved in making stands and supports required for equipment, where such supports are not specified in work of other Sections.

E. Building will be in use while work of this Contract is in progress. Contractor shall be responsible for Owner's equipment, furnishings and materials of any condition. Contractor shall be responsible for moving and storing Owner's equipment, furnishings and materials as required to perform work of this Contract. Damage to any of Owner's equipment, furnishings and materials shall be repaired or replaced to Owner's satisfaction. This paragraph includes Owner's equipment, furnishings and materials stored in buildings, mechanical spaces and in crawl spaces under buildings

F. Provide material, equipment and systems indicated on Drawings, but not mentioned in this Division, and vice versa, as though specifically indicated by both Specifications and Drawings. Install material, equipment, and systems generally as indicated. However, accomplish minor changes as directed by Owner's Representative in order to accommodate installation of other material, equipment, and systems without additional expense to Owner.

G. Do not permit or cause any work to be covered or enclosed until it has been inspected, tested, and approved. Should any work be enclosed or covered before such inspection and test, uncover work and after it has been inspected, tested and approved, make repairs with such materials as may be required to restore this work and that of other Sections to its original and proper condition.

H. Properly adjust, repair, or replace any equipment producing objectionable noise or vibration in any occupied areas of building, including providing additional brackets, bracing, vibration isolators, etc., to prevent objectionable noise or vibration from equipment installed under this Division.

I. Protect materials, equipment, and apparatus, both in storage and after installation, until date of acceptance by Owner. Provide temporary storage facilities for material and equipment as necessary. Material, equipment, or apparatus damaged because of improper storage or protection will be rejected, removed from site and replaced at no additional cost to Owner with new, duplicate, material, equipment, or apparatus.

J. Repair damage to premises due to poor workmanship, defective material or equipment. Restore premises to their condition prior to damage and provide new material, equipment or apparatus to replace that damaged. Included is restoration of damage caused by leaks and system failures. Work and material used shall be at no additional cost to Owner.

K. Coordinate height of accessible fixtures with those indicated in construction drawings.

L. Interruption of electrical services or existing plumbing systems shall be scheduled at least 24 hours in advance and only at times approved by Owner's Representative. Contractor shall minimize such interruptions by carefully planning work and by using existing shutoff valves when making connections to existing systems.

### 3.02 Coordination and Clearance

A. Installations depicted on Drawings are, in many locations, designed to fit tightly into work under other Divisions, that is, without any remaining clearance between work under this Division and work under other Divisions. Completely coordinate work with other Divisions so that lines, grades, slopes and vertical and horizontal location of pipes, invert elevations, equipment, and ducts shall be exactly determined in field and cleared with other Divisions before installation of these items is begun. No extra compensation will be made for failure to observe this clause. Piping and equipment shall be installed allowing for work of other Divisions both above and below work of this Division.

B. Piping and ductwork shall be concealed in ceilings, furred walls, partitions and pipe spaces except where specifically noted otherwise.

C. Adequate clearance for protection of equipment, access to operable devices, automatic devices, and for access to lubrication points shall be maintained. Provide minimum 18-inch clear passageway. Unless otherwise shown, piping shall be installed as high as possible to provide maximum headroom.

D. Schedule work in advance and avoid delays and interferences. Conform to construction schedule and make installation when and where directed.

### 3.03 Accuracy of Data

A. General arrangement and location of ductwork, piping, apparatus, etc., is shown on Drawings. Minor changes may be necessary to accommodate other work. Should it be necessary to deviate from arrangement or location indicated due to interference with new and/or existing work, make such deviations, such as offsets in piping and ducts that may be necessary, whether shown or not, without extra expense to Owner.

### 3.04 Painting

A. Factory finished equipment shall be primed and painted with two coats of semi-gloss enamel, unless specified otherwise, color of finish coat as selected by Owner.

B. Other painting required for the work, such as patching, shall be provided as required under this Section.

### 3.05 Installation Workmanship

A. Workmanship shall be of highest standards of the trades and shall result in a neat, clean, orderly and coordinated installation according to latest practices and consistent with

intent of these Contract Documents. Entire installation shall be accomplished by personnel especially trained and qualified in their respective trades.

B. Install material, equipment, and apparatus with like elements and appurtenances in similar location, position, and elevation. Do not install any diagonal or otherwise irregular work without written approval from Owner.

C. Should any part of installation result in an incomplete or inoperable system, or systems, provide additional material or equipment necessary to complete installation as required.

D. Install material, equipment, and apparatus entirely out of way of lighting fixtures, doors, and other interferences.

E. Inspect material, equipment, and apparatus upon delivery and do not install any that may be subject to rejection as a result of damage or other defect and do not install any that are damaged or otherwise defective.

F. Advise Owner, in writing, in event a conflict occurs in location or connection of equipment. Assume all costs for relocation of equipment resulting from failure to properly coordinate installation.

G. Following review of submittals, rough-in for material, equipment and apparatus. Rectify any installation resulting from failure to properly rough-in for equipment.

H. Hangers and Supports

1. Securely fasten ductwork to building construction by means of hangers, supports, guides, anchors, and sway braces to maintain pipe alignment, to prevent sagging, and to prevent noise and excessive strain on ductwork due to movement under operating conditions. Additionally, anchor and support lines subject to expansion and contraction as necessary to control excessive movement.
2. Ductwork support systems shall comply with requirements of 2016 California Building Codes.
3. Ductwork shall be level and properly supported, unless otherwise noted on the drawings.
4. Do not support ductwork from fans or other equipment.
5. Do not use wire, plumbers' tape or other make-shift devices for hangers.
6. Do not burn or weld any structural member without approval of Owner's Representative.

## 3.06 Identification

A. Signs and Labels

1. Fasten a red-headed tack to each T-bar suspended ceiling pushout tile at valves, control devices, etc.

B. Pipe Identification

1. Identify and color-code all piping including piping in furred ceiling spaces. Provide directional arrows on circulating systems. Identification shall be in accordance with ANSI A13.1-2007, Scheme for Identification of Piping Systems (OSHA) and as specified herein.
2. Plastic Markers: Seton "Setmark" Snap-Around Pipe Marker, Brady or approved equal. Each marker must show approved color-coded background, proper color of legend in relation to background color, approved legend letter size, approved marker length.
3. Signs and Labels:
   a. Install signs in accordance with manufacturer's recommendations and installation instructions, free from distortions and defects.
   b. A printed sign shall be posted at each automatically started equipment stating, "WARNING THIS MACHINE IS AUTOMATICALLY CONTROLLED AND MAY START AT ANY TIME".

C. Equipment Identification

1. Properly identify each piece of equipment and its controls using engraved laminated plastic descriptive nameplates, attached to equipment and controls using round head brass machine screws, pop rivets or contact cement. Cardholders in any form not acceptable.

## 3.07 Testing

A. Provide tests specified hereinafter and as otherwise directed by Engineer. Provide test equipment including test pumps, gauges, instruments, etc. Pressure gauges used shall be graduated in increments not greater than 5 pounds per square inch and shall have a range not more than twice test pressure. Test rotational equipment for proper direction of rotation.

B. Where testing is specified, or directed, complete installation shall comply with requirements hereinafter specified. Provide replacement materials and additional labor as may be required to accomplish this compliance.

C. Tests shall be performed in presence of Owner's Representative. Owner shall be notified of testing schedule three working days prior to tests.

D. Upon completion of testing, certify in writing, that specified tests have been performed and that installation complies with specified requirements.

E. Hangers and Supports: With systems in normal operation, test hangers, supports, and rods to insure that they are plumb and supporting their proper share of load. Provide additional supports for systems and equipment that sway, crawl, or vibrate, as required or as directed by Owner's Representative to eliminate unsatisfactory conditions.

F. When various systems are completed, operation tests shall be run on equipment to demonstrate proper operating conditions. These tests shall be run under observation of Owner's Representative. Systems shall be operated through possible cycles of operation for a period of three consecutive days. Operation tests shall be performed under actual service conditions. Installations must operate smoothly, efficiently, quietly, and without undue noise, vibration, surging or cycling under design conditions. Should any piece of equipment, apparatus, material or work fail in any of these tests, it shall be immediately removed and replaced with new, and portion of work replaced shall again be tested.

G. See Section 23 05 93 Testing Adjusting and Balancing for additional information.

## 3.08 Lubrication

A. Equipment shall be thoroughly lubricated before operating and again at time work is accepted. Contractor shall obtain proper type of lubricants to be used from equipment manufacturer.

B. No equipment shall be put into running condition without first checking for proper lubrication, rotation, alignment, support, bracing, safety, blockage and connections and areas affected by running of such equipment.

## 3.09 Cleaning

A. Thoroughly clean exterior and interior of piping, equipment and materials before systems are put in operation. Cleaning period shall be of sufficient duration to properly clean systems.

C. Clean plenums and air ducts so that no dirt or dust is present. Seal ductwork until time of installation.

D. Remove dirt and debris, including wire and blocking, from throughout building including crawl spaces and pipe spaces. Clean piping access areas of dirt and debris.

E. Equipment and material shall be completely dust free, clean and rust free or polished when final acceptance is made.

**END OF SECTION 23 05 00**

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Section 23 05 93

# Testing, Adjusting and Balancing

## Part 1. General

### 1.01 Section Includes

A. Air systems.

### 1.02 Submittals

A. Draft reports – submit electronic copy in PDF for review prior to final acceptance of project.

B. Test Reports: Submit prior to final acceptance of project and for inclusion in operating and maintenance manuals. Provide in soft cover, letter size, 3-ring binder, with index page and tabs, and cover identification. Include reduced scale drawings with air outlets and equipment identified to correspond with data sheets and indicating thermostat locations. Provide minimum six copies of Final report and electronic copy in PDF.

C. Report Forms: AABC National Standards for Total System Balancing

## Part 2. Products – not used

## Part 3. Execution

### 3.01 Agencies (or approved equal)

A. RS Analysis, Inc. (916) 358-5672

B. Circo System Balance, Inc. (916) 387-5100.

### 3.02 Examination and Preparation

A. Before commencing work, verify that systems are complete and operable.

B. Report any defects, deficiencies, or abnormal conditions in mechanical systems which prevent system balance.

C. Beginning of work means acceptance of existing conditions.

D. Recorded data shall represent actually measured or observed condition.

E. Permanently mark settings of valves, dampers, and other adjustment devices. Set and lock memory stops.

### 3.03 Installation Tolerance

A. Air Handling Systems: Adjust to within plus or minus 10 percent of design for supply and exhaust systems of design.

B. Air Outlets and Inlets: Adjust to within plus or minus 5 percent of design.

### 3.04 Air System Procedure

A. Adjust air handling and distribution systems to provide required or design supply, and exhaust air quantities.

B. Make air quantity measurements in ducts by traverse of entire cross-sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct dampers

E. Make allowance for air filter resistance at the time of the tests. The main air supplies shall be at design air quantities and at an air resistance across the filter bank midway between the design specifications for clean and dirty filters.

F. Kitchen Exhaust Systems.

1. Following installation, test ventilators for compliance with specified requirements and those of authority having jurisdiction. Perform testing after air handling systems have been balanced and adjusted.
2. Smoke test: perform tests with cooking equipment served by ventilators turned off. Perform tests with supply and exhaust fans serving the food service kitchen area turned on.
3. Procedure: move a smoke bomb around the perimeter of cooking equipment at the top surface. No visible smoke shall escape the ventilator canopy into the room.

**END OF SECTION**

Section 23 07 00

# Mechanical Insulation

## Part 1. General

### 1.01 Section Includes

A. Ductwork insulation, jackets and accessories

### 1.02 Submittals

A. Product Data: Provide product description, list of materials and thickness for each service or equipment scheduled, locations, and manufacturer's installation instructions

### 1.03 Environmental Requirements

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

## Part 2. Products

### 2.01 Ductwork Insulation

A. Manufacturers:
   1. Johns Manville
   2. Owens-Corning Insulating Systems, LLC.
   3. Knauf Insulation.

B. Glass Fiber: Owens Corning® SOFTR Duct Wrap insulation or approved equal.
   1. Duct Wrap: Rigid, resin bonded fibrous glass blanket with a damage-resistant, flame retardant, reinforced aluminum foil (FRK) facing.
   2. Duct Wrap Insulation: ASTM C1290, Type III, to maximum service temperature of 250°F (121°C), and ASTM C1136, Type II, facing material.
   3. Portions of supply-air and return-air ducts ductwork conveying heated or cooled air located in one or more of the following spaces shall be insulated to a minimum installed level of R-8: outdoors, in a space between the roof and an insulated ceiling, in a space directly under a roof with fixed vents or openings to the outside or unconditioned spaces.
   4. Portions of supply-air and return-air ducts ductwork conveying heated or cooled air located in one or more of the following spaces shall be insulated to a minimum installed level of R-4.2: not in one of the spaces listed in 2.1.B.3 or enclosed in directly conditioned space (if not any higher level required by CMC Section 605). In addition, the following is required.
      a) Mechanically fasten connections between metal ducts and the inner core of flexible ducts.
      b) Joint and Seal openings with mastic, tape, aerosol sealant or other duct closure system that meets the applicable requirements of UL 181, UL 181A, UL 181B or UL 723 (aerosol sealant).

C. Duct Liner: Johns Manville Linacoustic RC-HP Fiberglass Duct Liner with reinforced Coating System, or approved equal
   1. Rigid, resin bonded fibrous glass blankets or board with a damage-resistant, flame retardant veil faced airstream surface.
      a) Adhesives For Indoor Applications: VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

b) Fabricate duct insulation and liner board products with a black pigmented coating on the airstream side, to resist damage during installation and in service. Factory coat edges with the same coating, to comply with SMACNA HVAC DCS.

## Part 3. Execution

### 3.01 Examination and Preparation

A. Verify that piping has been tested and is complete before applying insulation materials.
B. Verify that surfaces are clean, foreign material removed, and dry.

### 3.02 Installation

A. Install materials in accordance with manufacturer's instructions.
B. Continue insulation vapor barrier through penetrations.
C. Duct liner:
1. Completely cover duct designated to receive duct liner. Neatly butt transverse joints without interruptions or gaps. Install the black pigmented surface of the duct liner facing the airstream.
2. Complying with requirements of ASTM C916, adhere duct liner to the sheet metal with 90% coverage of adhesive.
3. In addition to the adhesive, secure duct liner with mechanical fasteners, either weld-secured or impact-driven, which shall compress the duct liner sufficiently to hold it firmly in place. Adhesive bonded pins are not permitted due to long-term adhesive aging characteristics.
4. Space mechanical fasteners in accordance with SMACNA HVAC DCS.

### 3.03 Ductwork Insulation Schedule

| | | Thickness |
|---|---|---|
| A. | Glass Fiber Insulation: | |
| | Supply Ducts | as required to meet 2.01.B.3 or 4 |
| | Return Ducts | as required to meet 2.01.B.3 or 4 |
| B. | Duct Liner: | |
| | Where indicated | as required to meet 2.01.B.3 or 4 |

**END OF SECTION**

Section 23 31 13

# Air Distribution

## Part 1. General

### 1.01 Section Includes

A. Ductwork and accessories
B. Volume control dampers
C. Flexible duct connections
D. Diffusers and grilles

### 1.02 Submittals

A. Product Data: Provide product data for products described in Part 2.

## Part 2. Products

### 2.01 Ductwork

A. Materials:
   1. Steel Ductwork: Galvanized sheet steel, lock-forming quality.
   2. Sealant: UL Listed, non-hardening, water resistant, fir-resistive, used alone or with tape.

B. Metal ductwork
   1. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible, except as indicated.
   2. Construct T's, bends, and elbows with radius of 1-1/2 times width of duct on center line. Where not possible provide turning vanes.
   3. Increase duct sizes gradually, not exceeding 30 degrees divergence and 45 degrees convergence.
   4. Connect flexible ducts to metal ducts with stainless steel draw bands.
   5. Round duct shall be spiral lock seams and joints shall be beaded sleeve or crimp. Elbows shall be full radius, die stamped type. Duct and fittings shall be United McGill “Uni-Seal”, MinnieMetal, or equal.
   6. Rectangular duct longitudinal seams shall be Pittsburg lock. Transverse joints shall be pocket lock sealed with canvas and adhesive, or Ductmate (no Ductmate Jr.).
   7. Duct and plenum joints and field formed seams shall be sealed for air tightness. Tape shall be of 6 oz. canvas saturated with Arabol or Hardcast “Versa-Grip 181” duct sealant without tape. Tape or sealant shall be extended a minimum of one inch beyond joint or seam openings. Tape or sealant shall also be applied at duct connection to diffusers and grilles.
   8. Where internal insulation is applied, duct sizes as shown on drawings shall be inside clear dimensions.
   9. Pressure sensitive duct tape not permitted.

C. Kitchen Exhaust ductwork
   1. Black steel, 16 gage, welded leak-tight, in conformance with NFPA 96 and CMC. Slope ductwork back to hood. Where ducts are not self-draining, provide low-

point drain pocket with copper drain to sanitary sewer. Provide access doors or panels for duct cleaning inside of horizontal duct at drain pocket, at every 20 feet intervals, and at each change in direction. Access doors or panels shall be of the same material and thickness of the duct with gaskets and sealants that are rated for 1500°F and shall be grease tight.

2. Wrap grease exhaust duct with 3M Fire Barrier Duct Wrap 615+ to meet the equivalent shaft rating required by CBC. Install wrap in conformance with manufacturer's instructions and as required to meet Code requirements.
   a. Color: White blanket, aluminum foil encapsulated.
   b. Weight: 0.9 psf
   c. Density: 6 pcf nominal.
   d. Thermal conductivity (k-value) at 500°F (ASTM C411, ASTM C 518): 0.48 Btu/(ft2 x h x F)
   e. R-value per ASTM C 518 at ambient (77°F) at least 6.3 (F-ft2-hr/Btu)
   f. Service range up to 2000°F
   g. Fire Resistance: for use in 2-hour fire resistant system
   h. Product complies with ISO 6944 test standard, ASTM E 2336 test standard
   i. Through-penetration per ASTM E 814 (UL 1479)
   j. Non-combustible per ASTM E 136.
   k. Tape: High performance filament tape, 3M No. 898 1-inch wide, or equal
3. As an alternative, provide double-wall, factory-built grease duct for use with Type I kitchen hoods and conform to the requirements of NFPA 96. Products shall be ETL listed to UL 1978 and UL 2221 for venting air and grease vapors from commercial cooking operation. Double-wall grease ducts shall be listed for a continuous internal temperature of 500°F and intermittent temperatures of 2000°F.
   a. Duct sections shall be constructed of an inner duct wall and an outer duct wall with insulation in between. The inner duct wall shall be constructed of 0.036 inch thick, type 430 type stainless steel and available in diameters 8 inch through 24 inch. The outer wall shall be constructed of stainless steel of a minimum 0.024 inch thickness.
   b. Clearance to combustibles shall be zero inches.

## 2.02 Volume Control Dampers

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

B. Fabricate single blade dampers for duct sizes to 12 x 30 inch.

C. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inches. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware

D. Provide end bearings, except in round ductwork 12 inches and smaller.

E. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where width exceeds 30 inches provide regulator at both ends.

### 2.03 Flexible Duct Connectors

A. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, approximately 3 inches wide, crimped into metal edging strip. Suitable for outdoor installation.

### 2.04 Duct Access Doors

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

B. Access doors smaller than 12 inches square may be secured with sash locks. Access doors with sheet metal screw fasteners are not acceptable.

### 2.05 Flexible Ductwork

A. Manufacturers: Wiremold, Thermaflex.

B. Product shall bear UL Class 1 Air Duct label as tested under UL 181 and required NFPA 90A as an air duct or connector and shall meet a C of 0.23. Flexible duct shall be installed in accordance with the installation instructions as shown in the SMACNA HVAC Duct Construction Standards Manual. Flexible Air Duct Connectors installation shall be in accordance with CMC Chapter 6, and length shall not exceed 5 ft. and angular deflection shall not exceed 15 degrees.

C. Use only the minimum length required to make the connection. In no case shall any section of flexible duct have unnecessary bends or kinks. Flexible duct shall only be installed where shown, and only over T-bar ceilings

### 2.06 Diffusers and Grilles

A. Manufacturers: Titus, Krueger, or approved equal

B. Air supply, return and exhaust outlets: Suitable for surface mounting, exposed T-bar or special tile ceilings, off-white finish, square or round neck connection as shown on the schedules. Provide mounting frame for units in gyp board ceilings.

C. Provide opposed blade dampers as noted in schedules.

D. Models, sizes and accessories: as noted in schedules.

## Part 3. Execution

### 3.01 Installation

A. Install products in accordance with manufacturer's instructions.

B. Install flexible connections specified between fan inlet and discharge ductwork. Flexible connectors shall not be in tension while fan is operating.

C. Provide backdraft dampers on discharge of exhaust fans and as indicated.

D. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with hole plugs to ensure against air leakage.

E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

F. Connect diffusers on accessible ceilings to low pressure ducts with 5 feet maximum length of flexible duct. Hold in place with screwdriver operated, stainless steel draw bands.

G. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

H. Provide duct access doors for inspection at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access.

I. Check location of air outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

J. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, regardless of whether dampers are specified as part of the diffuser or register assembly.

K. Ductwork visible behind air outlets and inlets shall be painted matte black. Refer to 09 91 10 painting- New and Existing Construction.

L. Ductwork shall be constructed to meet Pressure Classification of STV per SMACNA HVAC Duct Construction Standards Table 1-1.

M. Duct sealing shall meet requirements of Seal Classification C of SMACNA HVAC Duct Construction Standards Table 1-2.

N. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.

**END OF SECTION**

# General Requirements of Electrical Systems

## PART 1 GENERAL

### 1.01. Description of Work:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment (except equipment furnished by the Owner to be installed by the Contractor) to satisfactorily complete the work shown on the drawings and/or specified in all Sections of Division 26 and all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for a complete and fully operating facility. The work shall include but not be limited to the following:

1. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

### 1.02. Related Work:

A. This Section provides the basic Electrical Requirements which supplement the General Requirements of Division 1 and apply to all Sections of Division 26.

### 1.03. Standards and Codes:

A. All work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes:

1. California Electrical Code (CEC)
2. American National Standards Institute (ANSI) Publications:
   a. C2-02 National Electrical Safety Code
3. Code of Federal Regulations (CFR):
   a. 29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)
4. Electronics Industries Association (EIA)
5. Institute of Electrical and Electronics Engineers (IEEE)
6. National Electrical Testing Association (NETA):
   a. Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, Standard ATS
7. National Electrical Manufacturers Association (NEMA)
8. Occupational Safety and Health Act (OSHA) Standards
9. State of California Public Utilities Commission:
   a. General Order 128 Rules for Construction of Underground Electric Supply and Communication Systems

B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

C. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Safety labeling and listing by other organizations, such as ETL Testing Laboratories, may be substituted for UL labeling and listing if acceptable to the Owner. Provide service entrance labels for all equipment required by the NEC to have such labels.

## 1.04. Submittals:

A. As specified in Division 1. Submit to the Engineer shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Obtain approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review.

B. Submittals are required for all items, regardless of whether they are furnished as specified or are substituted.

C. Information to be submitted includes manufacturer's name, trade name, equipment model number, nameplate data, equipment drawings including: size, layout dimensions and capacity, manufacturer's descriptive literature of cataloged products, diagrams, fault and coordination study, seismic calculations, test data, and performance and characteristic curves as applicable. Furnish project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contract compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

D. If submittal information includes multiple products, items being submitted for approval shall be clearly identified and Items not to be used on the project shall be clearly marked out.

E. Organize submittals for equipment and items related to each specification section together as a package.

F. Submit submittal packages in three ring binders. Fold drawings and insert into pockets in three ring binders.

1. Certificates of Conformance: Submit manufacturer's certifications as required on products, materials, finish, and equipment indicated in the technical sections. Certifications shall be documents prepared specifically for this contract. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements that imply the item does not meet requirements specified, such as "as good as", "achieve the same end use and results as materials formulated in accordance with the referenced publications;" or "equal or exceed the service and performance of the specified material." Certifications shall state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official, authorized to sign certificates of conformance.

**G. Substitutions:**

1. The equipment included in the Contract Documents is used to establish standards of quality, utility, and appearance. Equipment which in the opinion of the Engineer is equal in quality, utility, and appearance will be approved as substitutions to that specified.

a. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are approved by the Engineer prior to bidding.

2. Substitutions will be accepted for review where there is a reasonable reason for the substitution. Reasonable reasons include:

    a. Cost savings to the owner. Include deductive change order with submittal.

    b. A product with features providing additional benefits to the end user.

    c. Improved finished environment / Lay out of the final installation.

    d. Delivery considerations.

    e. Owner's specific requests.

3. Where items are noted as "or equal", a product of equal design, construction and performance will be considered.

4. Any item proposed as a substitute shall be accompanied by drawings and/or data giving sizes, capacities, all pertinent test data, catalog cut sheets, product information, and all other necessary information required to substantiate that the product is equal or exceeds that specified.

5. Substitutions shall be equal, in the opinion of the Engineer, to the specified equipment. The burden of proof of such shall rest with the Contractor. When the Engineer in writing accepts a substitution, it is with the understanding that the Contractor guaranteed the substituted equipment to be equal to the one specified and dimensioned to fit within the construction. Approved substitutions shall not relieve the Contractor of responsibilities for the proper execution of the work, or from any provisions of the Plans or Specifications.

6. Only one substitution will be considered for each product specified.

7. Alternate manufacturers must be submitted for approval 10 days prior to bid date unless noted otherwise in Division 1.

8. The Contractor shall be responsible for all expenses in connection with the substitution materials, process, and equipment, including the effect of his/her substitution on him/her, his/her subcontractor's or other Contractor's work. No substitution shall be permitted without written authorization of the Engineer. Any assumptions on the acceptability of a proposed substitution prior to acceptance by the Engineer are at the sole risk of the Contractor.

**H. Closeout Submittals:**

1. Cost analysis: Submit final cost information including original bid and any change orders broken down by system, material and labor costs (as applicable):

    a. Power distribution

    b. Lighting and lighting controls

    c. Photovoltaic system

    d. Emergency generator system

2. Operation and Maintenance Manuals: Furnish O & M Manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 1. Electrical O & M Manuals shall include as a minimum:

    a. Copies of equipment supplied on the project.

    b. Instruction manuals including operation instructions and maintenance requirements/recommendations.

    c. List of suppliers for all equipment with addresses and telephone numbers.

d. List of service support for all equipment with addresses and telephone numbers.

e. Copies of all test reports required in Division 26 specification sections.

f. Spare Parts: For each piece of equipment, submit a list of recommended spare parts. Include part numbers and the name, address, and telephone number of the supplier.

g. Other closeout documentation and test results as required under other sections of the specifications.

h. Provide in a single transmittal.

i. Warranty for all work, including contractor's general warranty.

j. All warranties begin as per the Contract, Division 1 or final acceptance of the Work by the Owner, Architect, Engineer, and Authority Having Jurisdiction, which ever is later.

i. Lamps and ballasts are to be covered as per specification 26 51 19

ii. Manufacturer's Warrantees and Guarantees that are longer than the base contract/specified amount are to be provided with the manuals.

iii. The Contractor is responsible for all Warranty and Guarantee work whether or not the Manufacturer also Warrantees and Guarantees the product.

## 1.05. Contract Documents:

A. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for the installations.

1. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Engineer for favorable review.

2. All drawings and divisions of these specifications shall be considered as whole. This contractor shall report any apparent discrepancies prior to submitting bids.

3. Should there be a conflict or discrepancy between the drawings and specifications, or between different drawings sheets, or between different specification sections, the most expensive option shall be required, at the discretion of the Engineer.

B. Drawings:

1. The Drawings shall govern the general layout of the completed construction:

a. Locations of equipment, inserts, anchors, panels, pullboxes, manholes, conduits, stub-ups, fittings, power and convenience outlets, lighting fixtures and ground connections are approximate unless dimensioned; verify locations with the Engineer prior to installation. Field verify scaled dimensions on Drawings.

b. The general arrangement and location of existing conduits, piping, apparatus, etc., is shown as existing on drawings or specified. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Extreme accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be

necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Engineer.

## 1.06. Coordination:

A. Coordinate the electrical work with the other trades, code authorities, utilities and the Engineer:

1. Failure to accomplish this coordination is not a basis for additional cost reimbursement to the Contractor.

2. Coordinate does not mean to only send a Request For Information. Coordinate implies that the contractor is to take the lead in bringing all of the necessary organizations together to coordinate the work and to provide for the associated costs.

B. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities:

1. Include costs for work during non-normal working hours and temporary facilities as may be required.

2. Include costs as necessary for sub-contractors as necessary to accomplish the specified work.

C. When two trades join together in an area, make certain that no electrical work is omitted. Failure to accomplish this coordination is not a basis for additional cost reimbursement to the Contractor.

**D. Operations:**

1. Perform all work in compliance with Division 1:

a. Keep the number and duration of power shutdown periods to a minimum.

b. Show all proposed shutdowns and their expected duration on the construction schedule.

i. If the construction schedule is created and maintained by others, make sure that the associated information is incorporated.

ii. Failure by the Contractor to properly schedule and plan for such activities is not a basis for additional compensation.

c. Carry out shutdown only after the Engineer has favorably reviewed the schedule. Submit power/communications interruption schedule 15 days prior to date of interruption. Failure to provide schedule with adequate review time may result in rescheduling of the work at the Contractor's expense.

**E. Construction Power:**

1. See Division 1 Temporary Utilities.

**F. Storage:**

1. Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from sun, weather, condensation, dust, water, or construction operations.

**G. Damaged Products:**

1. Notify the Engineer in writing in the event that any equipment or material is damaged. Obtain approval from the Engineer before making repairs to damaged products.

H. Order material in such a timely manner and after approval of the same so as to insure that the approved material is available to be installed on site in a timely manner. Additional costs or substitutions necessitated because the Contractor failed to order material in a timely manner are not reimbursable. Costs associated with processing of paperwork by the owner and design consultants resultant of such failures to coordinate the work by the Contractor shall have such costs reimbursed by the Contractor.

### 1.07. Locations:

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.

1. Dry Locations:

a. All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.

2. Wet Locations:

a. All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

### 1.08. Safety and Indemnity:

A. Lock out Requirements:

1. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147

B. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and properly during performance of the work. This requirement will apply continually and not be limited to normal working hours.

1. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.

2. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the engineer, their Consultants or their officers, agents and employees.

## PART 2 PRODUCTS

### 2.01. Standard of Quality:

A. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar

size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

B. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

C. Manufacturer's Recommendations: Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

### 2.02. Nameplates:

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.

B. Additionally, identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 1 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel screws or, where favorably reviewed by the Engineer, with epoxy cement. Where no inscriptions are indicated on the Drawings, furnish nameplates with appropriate inscriptions furnished by the Engineer upon prior request by the Contractor.

C. Each control device, including push buttons, control switches, and indicating lights, shall have an integral legend plate or nameplate indicating the device function. These shall be inscribed as indicated on the Drawings or as favorably reviewed by the Engineer.

### 2.03. Fasteners:

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

### 2.04. Finish requirements:

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which as been damaged or is otherwise unsatisfactory, to the satisfaction of the Engineer.

B. In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

## PART 3 EXECUTION

### 3.01. Installation:

A. Ensure that all equipment and materials fit properly in their installation.

B. Perform any required work to correct improperly fit installation at no additional expense to the owner.

C. Equipment Installation:

1. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

2. In all rooms with concrete floors, install all floor mounted equipment on reinforced concrete pads as shown. Insure that pads are seismically secured to the building structure. The Contractor, suppliers, and fabricators shall take this requirement into consideration when designing, fabricating, and installing panels and other enclosures so that height above the floor of the operating handles of electrical devices meets the requirements of these Specifications and applicable codes.

3. Mount all metal panels which are mounted on or abutting concrete walls or any outside walls ¼ inch from the wall, and paint the back sides of the panels with Mobil Hi-Build Bituminous Coating 35-J-10, Kopper Bitumastic Super Tank Solution, or equal. Film thickness shall be 10 mils minimum.

**D. Cutting, Drilling and Welding:**

1. Provide the required cutting, drilling welding that is required for the electrical construction work. Comply with Division 1 requirements.

2. Structural members shall not be cut or drilled, except after approval by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry.

3. Provide the required welding for equipment supports. Conduits and fittings shall not be welded to structural steel. Where welding is required, it shall be accomplished by tradesmen certified to do such work. Provide fire and other protection as appropriate.

## 3.02. Field Tests:

A. Test shall be in accordance with Acceptance Testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Perform each operational check three times to ensure the circuit and components are working properly. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Engineer prior to any test so that the tests may be witnessed.

C. Provide instruments, other equipment, temporary facilities as may be necessary, and material required for the tests. These shall be of the type designed for the type of tests to be performed and shall be calibrated by a recognized testing laboratory within three months prior to testing.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Engineer. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Perform calibration and adjustment on all equipment. Where the values for adjustment are not shown on the Drawings, obtain the proper values from the Engineer.

G. Maintain records of each test and submit five copies to the Engineer when testing is complete. All tests shall be witnessed by the Engineer. These records shall include:

1. Name of equipment tested.

2. Date of report.

3. Date of test.

4. Description of test setup.

5. Identification and rating of test equipment.

6. Test results and data.

7. Name of person performing test.

8. Owner or Engineer's initials.

H. Items requiring testing as a minimum:

1. Ground field grid.

2. Circuit Breakers.

## 3.03. Fault and Coordination Study:

A. Obtain a letter from the serving utility company that indicates the available fault current.

B. At the Contractor's expense, obtain from a registered professional engineer licensed in the State of California a Fault and Coordination Study:

1. That provides settings for all adjustable overcurrent devices.

2. That reflects the actual size and length of all feeders as installed.

3. That reflects all overcurrent devices individually mounted.

4. That reflects all overcurrent devices group mounted.

5. That reflects all motors in excess of 10 horsepower.

6. That reflects each elevator

7. That reflects each generator, automatic transfer switch, photovoltaic cell and / or other source of power.

8. That confirms that equipment furnished under other sections of the specifications will sustain the associated available fault currents.

9. That identifies any potential problems

10. Transmit five copies for review and comment prior to or with the distribution equipment submittals.

C. Furnish, at no additional expense to the Owner, overcurrent protective devices that meet or exceed the fault values determined by the study, regardless of other requirements listed on the drawings or in other areas of the specification. Series rated devices may be used at the Contractor's discretion.

D. Coordinate all devices, wherever possible, to meet the recommendations of the ANSI/IEEE Standard 242 Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.

## 3.04. Painting of Equipment:

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.

B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria.

## 3.05. Signage:

**A. Nameplate Mounting:**

1. Provide number, location and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two stainless steel sheet-metal screws or two rivets.

## 3.06. Records:

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the record "as built" condition. After completion of the work, the Contractor shall neatly and carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Cable Size and Type: Provide the size and type of each cable installed on the project.

2. Substructure: Where the location of duct lines, adjacent utilities, cable boxes, and manholes are found to different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.

3. Record (As Built) Drawings: At the completion of the Work the Contractor shall provide a set of record "as built" drawings over to the Owner for his use.

   a. Record drawings are required to be transmitted within 30 days of beneficial occupancy.

   b. Transmittal and approval process:

      i. Contractor is to transmit one printed copy for review and comment.

      ii. After acceptance of the above, the Contractor is to transmit three printed sets and one reproducible set.

      iii. Contractor to provide information on their company in the margin of record drawings along with the date of the revisions and the associated revision number.

## 3.07. Posted Operating Instructions:

A. Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:

1. Single line diagrams, wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment at each major piece of distribution equipment.

2. Start up, proper adjustments, operating, lubrication and shutdown procedures.

3. Safety precautions.

4. The procedure in the event of equipment failure.

5. Other items of instruction as recommended by the manufacturer of each system or item of equipment.

## 3.08. Instruction to Owner's Personnel:

A. Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or systems has been accepted and turned over to the Owner for regular operation. The number of man-days (8 hours per

day) of instruction furnished shall be as specified in the individual section. When more than 4 man-days of instruction are specified, use approximately half of the time for classroom instruction. Use other time for instruction with equipment or system. When significant changes or modifications in the equipment or system are made under the terms of the contract, provide additional instructions to acquaint the operating personnel with the changes or modifications.

B. Contractor shall maintain an attendance sheet from each session which contains the following information:

1. Attendees with associated arrival and departure time.
2. Topics covered.
3. Information provided.
4. Signatures of attendees taken at the completion of the session.

**3.09. Clean Up:**

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

B. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Engineer.

## END OF SECTION

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Section 26 05 19

# Low-Voltage Electrical Power Conductors and Cables

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Owner's Bidding Instructions, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
   1. Building wires and cables rated 600 V and less.
   2. Connectors, splices, and terminations rated 600 V and less.

### 1.3 DEFINITIONS

A. VFC: Variable frequency controller.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

### 1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

### 1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.
   1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

## PART 2 - PRODUCTS

### 2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Belden Inc.
   2. Encore Wire Corporation.

3. General Cable Technologies Corporation.
4. General Cable; General Cable Corporation.
5. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN/THWN-2 Type XHHW-2 Type UF Type USE and Type SO.

### 2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. 3M.
2. AFC Cable Systems, Inc.
3. Hubbell Power Systems, Inc.
4. Ideal Industries, Inc.
5. ILSCO.
6. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
7. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

### 2.3 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. XHHW insulation for feeders, THHN/THWN-2 for branch circuits

B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

C. Feeders Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.

D. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

F. Branch Circuits Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.

G. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

H. #8 and larger, stranded

## 3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 26 0533 “Raceways and Boxes for Electrical Systems” prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer’s recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed conduits parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible. Contractor shall coordinate locations that are acceptable to run exposed conduits with architect prior to submitting their final bid.

F. Support cables according to Section 26 0529 “Hangers and Supports for Electrical Systems.”

## 3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer’s published torque-tightening values. If manufacturer’s torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

## 3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 26 0553 “Identification for Electrical Systems.”

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

## 3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 “Sleeves and Sleeve Seals for Electrical Raceways and Cabling.”

## 3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

## 3.8 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections:
   1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors and conductors feeding the following critical equipment and services for compliance with requirements.

C. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.

D. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

E. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

F. Test and Inspection Reports: Prepare a written report to record the following:
   1. Procedures used.
   2. Results that comply with requirements.
   3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

G. Cables will be considered defective if they do not pass tests and inspections.

**END OF SECTION**

# Grounding and Bonding for Electrical Systems

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Owner's Bidding Instructions apply to this Section.

### 1.2 SUMMARY

A. Section includes grounding and bonding systems and equipment.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

### 1.4 INFORMATIONAL SUBMITTALS

A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
   1. Test wells.
   2. Ground rods.
   3. Ground rings.
   4. Grounding arrangements and connections for separately derived systems.

B. Qualification Data: For testing agency and testing agency's field supervisor.

C. Field quality-control reports.

### 1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.
   1. In addition to items specified in Owner's Bidding Instructions include the following:
      a. Instructions for periodic testing and inspection of grounding features at test wells grounding connections for separately derived systems based on NETA MTS
         1) Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
         2) Include recommended testing intervals.

### 1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.
   1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

C. Comply with UL 467 for grounding and bonding materials and equipment.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Burndy; Part of Hubbell Electrical Systems.
   2. ERICO International Corporation.
   3. ILSCO.
   4. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.

### 2.2 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

### 2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
   1. Solid Conductors: ASTM B3.
   2. Stranded Conductors: ASTM B8.
   3. Tinned Conductors: ASTM B33.
   4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
   5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
   6. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

### 2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

### 2.5 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet.

## PART 3 - EXECUTION

### 3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

D. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Connections to Ground Rods at Test Wells: Bolted connectors.
   3. Connections to Structural Steel: Welded connectors.

### 3.2 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

### 3.3 GROUNDING SEPARATELY DERIVED SYSTEMS

A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

### 3.4 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

C. Water Heater: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

D. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

E. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

F. Metallic Fences: Comply with requirements of IEEE C2.
   1. Grounding Conductor: Bare copper, not less than No. 8 AWG.
   2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
   3. Barbed Wire: Strands shall be bonded to the grounding conductor.

## 3.5 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
   2. Retain subparagraph below if grounding installation requirements are not detailed on Drawings. Subparagraph exceeds CEC requirements.
   3. For grounding electrode system, install at least three rods spaced at least two-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:
1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

## 3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
    a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method according to IEEE 81.
4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
5. Substations and Pad-Mounted Equipment: 5 ohms.

### 3.7 EXCESSIVE GROUND RESISTANCE

A. If resistance to ground exceeds specified values, notify architect promptly and include recommendations to reduce ground resistance

## END OF SECTION

Section 26 05 29

# Hangers and Supports for Electrical Systems

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Owner's Bidding Instructions, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
   1. Hangers and supports for electrical equipment and systems.
   2. Construction requirements for concrete bases.

### 1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Suspended ceiling components.
   2. Structural members to which hangers and supports will be attached.
   3. Items penetrating finished ceiling, including the following:
      a. Lighting fixtures.
      b. Air outlets and inlets.
      c. Speakers.
      d. Sprinklers.
      e. Access panels.
      f. Projectors.

B. Seismic Qualification Certificates: For hangers and supports for electrical equipment and systems, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

## PART 2 - PRODUCTS

### 2.1 DESIGN AND PERFORMANCE CRITERIA

### 2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design hanger and support system.

B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
   1. The term “withstand” means “the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event.”
   2. Component Importance Factor: 1.5.

## 2.3 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.; a division of Cooper Industries.
      c. ERICO International Corporation.
      d. Unistrut; an Atkore International company.
   2. Material: Galvanized steel.
   3. Channel Width: 1-5/8 inches (41.25 mm).
   4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
   5. Channel Dimensions: Selected for applicable load criteria.

B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
   1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
      a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
         1) Hilti, Inc.
         2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
   2. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
   3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
   4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A325.
   5. Toggle Bolts: Stainless-steel springhead type.
   6. Hanger Rods: Threaded steel.

### 2.4 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with structural engineering requirements for steel shapes and plates.

## PART 3 - EXECUTION

### 3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.

B. Comply with requirements for raceways and boxes specified in Section 26 0533 “Raceways and Boxes for Electrical Systems.”

C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 50 percent in future without exceeding specified design load limits.
   1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.

### 3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMTs, IMCs, and RMCs may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
   1. To Wood: Fasten with lag screws or through bolts.
   2. To New Concrete: Bolt to concrete inserts.
   3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
   4. To Existing Concrete: Expansion anchor fasteners.
   5. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
   6. To Light Steel: Sheet metal screws.
   7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and

other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

## 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with structural engineering installation requirements for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

## 3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 03 3000 “Cast-in-Place Concrete.”

C. Anchor equipment to concrete base as follows:
   1. Place and secure anchorage devices. Use supported equipment manufacturer’s setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install anchor bolts to elevations required for proper attachment to supported equipment.
   3. Install anchor bolts according to anchor-bolt manufacturer’s written instructions.

## 3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
   1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

## 3.6 GALVANIZED SURFACES

A. Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

**END OF SECTION**

# Raceways & Boxes

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Owner's Bidding Instructions, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
   1. Metal conduits, tubing, and fittings.
   2. Nonmetal conduits, tubing, and fittings.
   3. Metal wireways and auxiliary gutters.
   4. Surface raceways.
   5. Boxes, enclosures, and cabinets.

### 1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

### 1.4 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

C. Samples: For wireways and surface raceways and for each color and texture specified, 12 inches long.

### 1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
   1. Structural members in paths of conduit groups with common supports.
   2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
   4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.

D. Source quality-control reports.

## PART 2 - PRODUCTS

### 2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. AFC Cable Systems, Inc.
   2. Allied Tube & Conduit.
   3. FSR Inc.
   4. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
   5. Robroy Industries.
   6. Thomas & Betts Corporation, A Member of the ABB Group.
   7. Western Tube and Conduit Corporation.
   8. Wheatland Tube Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. IMC: Comply with ANSI C80.6 and UL 1242.

E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
   1. Comply with NEMA RN 1.
   2. Coating Thickness: 0.040 inch, minimum.

F. EMT: Comply with ANSI C80.3 and UL 797.

G. FMC: Comply with UL 1; zinc-coated steel.

H. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

I. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
   2. Fittings for EMT:
      a. Material: Steel.
      b. Type: Setscrew or compression.
   3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

J. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
2. AFC Cable Systems, Inc.
3. Arnco Corporation.
4. CANTEX INC.
5. Electri-Flex Company.
6. RACO; Hubbell.
7. Thomas & Betts Corporation, A Member of the ABB Group.

B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. ENT: Comply with NEMA TC 13 and UL 1653.

D. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

E. LFNC: Comply with UL 1660.

F. Rigid HDPE: Comply with UL 651A.

G. Continuous HDPE: Comply with UL 651B.

H. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D3485.

I. RTRC: Comply with UL 1684A and NEMA TC 14.

J. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

K. Fittings for LFNC: Comply with UL 514B.

L. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

M. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Cooper B-Line, Inc.; a division of Cooper Industries.
3. Hoffman; a brand of Pentair Equipment Protection.
4. MonoSystems, Inc.
5. Square D.

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 3R unless otherwise indicated, and sized according to NFPA 70.
   1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Hinged type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

## 2.4 SURFACE RACEWAYS

A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Wiremold 4000 series.

C. Surface Aluminum Raceways: Alloy 6063-T5 extruded aluminum, minimum thickness 0.050 inches. Satin, No. 204 clear anodized, 0.004-inch-thick, Class R1 Mil-Spec finish. Device cover plates suitable to mount commercially available duplex devices, single 1.40 inch and 1.59-inch-diameter receptacles, GFCI, surge receptacles and other rectangular faced devices, and voice and data jacks. Devices shall be mounted to cover plates held in place by extruded protrusions. Cover plates shall be removable using standard screwdriver without marring the finish.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Wiremold AL4000 series
      b. Hubbel 4750 series

## 2.5 BOXES, ENCLOSURES, AND CABINETS

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
2. Adalet.
3. Cooper Technologies Company.
4. EGS/Appleton Electric.
5. Erickson Electrical Equipment Company.
6. FSR Inc.
7. Hoffman; a brand of Pentair Equipment Protection.
8. Hubbell Incorporated.
9. MonoSystems, Inc.
10. Christy (Oldcastle Enclosure Solutions.)
11. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
12. RACO; Hubbell.
13. Robroy Industries.
14. Spring City Electrical Manufacturing Company.
15. Thomas & Betts Corporation, A Member of the ABB Group.
16. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

G. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.
   1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

J. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

K. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

L. Gangable boxes are prohibited.

M. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1, Type 3R, Type 4, Type 12 with continuous-hinge cover with flush latch unless otherwise indicated.
   1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
   2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

N. Cabinets:
   1. NEMA 250, Type 1, Type 3R, Type 4, Type 12 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
   2. Hinged door in front cover with flush latch and concealed hinge.
   3. Key latch to match panelboards.
   4. Metal barriers to separate wiring of different systems and voltage.
   5. Accessory feet where required for freestanding equipment.

## PART 3 - EXECUTION

### 3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed Conduit: GRC.
   2. Concealed Conduit, Aboveground: GRC IMC EMT.
   3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFNC.
   4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed, Not Subject to Physical Damage: EMT.
   2. Exposed, Not Subject to Severe Physical Damage: EMT.
   3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
      a. Loading dock.
      b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
      c. Mechanical rooms.
      d. Gymnasiums.
   4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
   5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
   6. Damp or Wet Locations: IMC.
   7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
   2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
   3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
   4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

G. Install surface raceways only where indicated on Drawings.

H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F

## 3.2 RACEWAY SEPARATION OF SYSTEM WIRING

A. Provide minimum separations between power and wiring and signal system wiring as indicated in table below. Where minimum separation cannot be maintained due to existing conditions obtain written permission for closer spacing.

| | **Power Raceways (70 Volts or More)** | **Transformers, Motors and Motor Starters** | **Power Raceways with Dimming Circuits** | **Lighting Fixtures** |
|---|---|---|---|---|
| Telephone | 5” | 12” | 24” | 12” |
| DATA | 5” | 12” | 24” | 12” |
| Paging / Sound | 5” | 12” | 24” | 5” |
| Security | 5” | 12” | 24” | 5” |
| CCTV | 5” | 12” | 24” | 5” |

| | Power Raceways (70 Volts or More) | Transformers, Motors and Motor Starters | Power Raceways with Dimming Circuits | Lighting Fixtures |
|---|---|---|---|---|
| Monitoring and Control | 5” | 12” | 24” | 5” |
| Fire Alarm | 5” | 12” | 24” | 5” |
| Cable Tray | 12” | 24” | 24” | 12” |

## 3.3 RACEWAY APPLICATIONS

| ENVIRONMENT | RACEWAYS | BOXES, ENCLOSURES, AND CABINETS |
|---|---|---|
| Dry locations, concealed | RMC, IMC, EMT, FMC, LFMC, WW | SM, FS/FD; NEMA 1 |
| Dry locations, exposed, subject to damage* | RMC, IMC | SM, FS/FD; NEMA 1 |
| Dry locations, exposed, not subject to damage* | RMC, IMC, EMT, FMC, LFMC, WW | SM, FS/FD; NEMA 1 |
| Wet locations, subject to damage[9]* | RMC[3], IMC[3] | FS/FD; NEMA 4, 4X |
| Wet locations, not subject to damage[9] | RMC3, IMC[3], EMT[3], LFMC, WW[7] | FS/FD; NEMA 4, 4X |
| Outdoor locations, exposed to rain, sleet, windblown dust, and external icing | RMC[3], IMC[3], WW[7], LFMC[12] | FS/FD; NEMA 3, 3R, 3S |
| Outdoor locations, submerged[9] | RMC[3], IMC[3], PVC | NEMA 6, 6P |
| Outdoor locations, embedded in concrete[9] | RMC, IMC, EMT[4], PVC | FS/FD |
| Under concrete slab[9] | RMC, IMC, PVC | N/A |
| Embedded burial[9] | RMC, IMC, PVC | N/A |
| Industrial location, general | RMC, IMC, EMT, FMC, LFMC, WW | FS/FD, SM; NEMA 12, 12K |
| Industrial location, subject to corrosion[9] | RMC[3], IMC[3], LFMC | NEMA 4X, 11 |
| Industrial location, subject to oil and vapors | RMC, IMC, LFMC | FS/FD; NEMA 13 |
| Hazardous Class I, Division 1 | RMC, IMC | NEMA 7, 8 |
| Hazardous Class I, Division 2[8] | RMC, IMC, LFMC, FMC[11], WW[5] | FS/FD; NEMA 1, 7, 8, 12 |
| Hazardous Class II, Division 1 | RMC, IMC, LFMC | NEMA 9 |
| Hazardous Class II, Division 2[8] | RMC, IMC, LFMC, WW[6] | FS/FD; NEMA 1, 9, 12 |
| Hazardous Class III[8] | RMC, IMC, LFMC, WW[6] | FS/FD; NEMA 12 |

| | |
|---|---|
| Legend:<br>EMT Electrical metallic tubing<br>ENT Electrical nonmetallic tubing | Notes:<br>1. Building finishes must provide a barrier with a 15-minute fire rating. |

| ENVIRONMENT | RACEWAYS | BOXES, ENCLOSURES, AND CABINETS |
|---|---|---|
| FMC Flexible metal conduit<br>FS/FD Cast-metal box<br>HDPE High-density polyethylene conduit<br>IMC Intermediate metal conduit<br>LFMC Liquidtight flexible metal conduit<br>LFNC Liquidtight flexible nonmetallic conduit<br>N/ANot applicable<br>NEMA Refers to NEMA 250, type classification<br>NM Nonmetallic box<br>PVC Rigid polyvinyl chloride conduit<br>RMC Rigid metal conduit<br>RTRC Reinforced thermosetting resin conduit<br>SM Sheet-metal box<br>WW Wireway | 2. For buildings not more than three stories above grade.<br>3. Corrosion protection is required.<br>4. With fittings for purpose.<br>5. Enclosed and gasketed.<br>6. Dust-tight wireway only.<br>7. Raintight wireway only.<br>8. Nonincendive and intrinsically safe wiring are allowed in any wiring method permitted for unclassified locations.<br>9. Aluminum materials are permitted only with approved supplementary corrosion protection.<br>10. Schedule 80.<br>11. Only as specifically permitted under the environmental condition.<br>12. Subject to temperature limitations where exposed to sunlight.<br>* “Subject to damage” denotes environments where exposed raceways may be impacted by traffic, by cleaning or maintenance operations, or by similar influences. | |

## 3.4 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Comply with requirements in Section 26 0529 “Hangers and Supports for Electrical Systems” for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

H. Support conduit within 12 inches of enclosures to which attached.

I. Raceways Embedded in Slabs:
   1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
   2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
   3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
   4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
   5. Change from RNC, Type EPC-40-PVC, to GRC, IMC or EMT before rising above floor.

J. Stub-ups to Above Recessed Ceilings:
   1. Use EMT, IMC, or RMC for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

P. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

R. Surface Raceways:
   1. Install surface raceway with a minimum 2-inch radius control at bend points.
   2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

S. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

T. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
   2. Where otherwise required by NFPA 70.

U. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

V. Expansion-Joint Fittings:
   1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of

aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.

2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
   a. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
   b. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
   c. Attics: 135 deg F temperature change.
3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

W. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
   1. Use LFMC in damp or wet locations subject to severe physical damage.
   2. Use LFMC in damp or wet locations not subject to severe physical damage.

X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

AA. Locate boxes so that cover or plate will not span different building finishes.

BB. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

CC. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

DD. Set metal floor boxes level and flush with finished floor surface.

EE. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

## 3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

## 3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

## 3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

B. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

**END OF SECTION**

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# Sleeves & Sleeve Seals for Electrical Raceways & Cabling

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Owner's Bidding Instructions, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
   1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
   2. Sleeve-seal systems.
   3. Sleeve-seal fittings.
   4. Grout.
   5. Silicone sealants.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

## PART 2 - PRODUCTS

### 2.1 SLEEVES

A. Wall Sleeves:
   1. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:
   1. Material: Galvanized sheet steel.
   2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

## 2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Advance Products & Systems, Inc.
b. Pipeline Seal and Insulator, Inc.
2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, Stainless steel of length required to secure pressure plates to sealing elements.
5. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. HOLDRITE.

## 2.3 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

## 2.4 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
2. Sealant shall have VOC content of 700 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
   1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
      a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Owner's Bidding Instructions.
      b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
   2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
   3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
   4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
   5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
   1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
   2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

### 3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

**END OF SECTION**

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# Identification for Electrical Systems

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Bands and tubes.
4. Tapes and stencils.
5. Tags.
6. Signs.
7. Cable ties.
8. Paint for identification.
9. Fasteners for labels and signs.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Comply with NFPA 70.

B. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

C. Comply with ANSI Z535.4 for safety signs and labels.

D. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

### 2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:
   1. Black letters on an orange field.
   2. Legend: Indicate voltage and system or service type.

B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
   1. Color shall be factory applied.
   2. Colors for 208/120-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
   3. Colors for 240-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
   4. Colors for 480/277-V Circuits:
      a. Phase A: Brown.
      b. Phase B: Orange.
      c. Phase C: Yellow.
   5. Color for Neutral: White or gray.
   6. Color for Equipment Grounds: Green.
   7. Colors for Isolated Grounds: Green with white stripe.

C. Raceways and Cables Carrying Circuits at More Than 600 V:
   1. Black letters on an orange field.
   2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."

D. Warning Label Colors:
   1. Identify system voltage with black letters on an orange background.

E. Warning labels and signs shall include, but are not limited to, the following legends:
   1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
   2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

F. Equipment Identification Labels:
   1. Black letters on a white field.

## 2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Brady Corporation.
      b. Panduit Corp.

c. Seton Identification Products.

B. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Brady Corporation.
b. Panduit Corp.
c. Seton Identification Products.

C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil-thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Brady Corporation.
b. Brother International Corporation.
c. Ideal Industries, Inc.
d. Panduit Corp.
e. Seton Identification Products.
2. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

D. Self-Adhesive Labels: Polyester / Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
1. Manufacturers:
a. A'n D Cable Products
b. Brady Corporation
c. Brother International Corp.
d. emedco
e. Grafoplast Wire Markers
f. HellermannTyton
g. Ideal Industries, Inc.
h. LEM Products Inc.
i. Marking Services, Inc.
j. Panduit Corp
k. Seton Identification Products
2. Minimum Nominal Size:
a. 1-1/2 by 6 inches for raceway and conductors.
b. 3-1/2 by 5 inches for equipment.
c. As required by authorities having jurisdiction.

## 2.4 BANDS AND TUBES

A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches

long, with diameters sized to suit diameters and that stay in place by gripping action.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    a. Brady Corporation.
    b. Marking Services, Inc.
    c. Panduit Corp.

B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at a maximum of 200 deg F. Comply with UL 224.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    a. Brady Corporation.
    b. Panduit Corp.

## 2.5 TAPES AND STENCILS

A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    a. Brady Corporation.
    b. Carlton Industries, LP.
    c. Marking Services, Inc.

B. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and is 12 inches wide. Stop stripes at legends.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    a. LEM Products Inc.
    b. Marking Services, Inc.
    c. Seton Identification Products.

C. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    a. Carlton Industries, LP.
    b. Seton Identification Products.

D. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

## 2.6 TAGS

A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Brady Corporation.
      b. Carlton Industries, LP.
      c. Marking Services, Inc.
      d. Seton Identification Products.

B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.023 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Brady Corporation.
      b. Marking Services, Inc.
      c. Panduit Corp.
      d. Seton Identification Products.

C. Write-on Tags:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Carlton Industries, LP.
      b. Seton Identification Products.
   2. Polyester Tags: 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment.
   3. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
   4. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

## 2.7 SIGNS

A. Baked-Enamel Signs:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Carlton Industries, LP.
      b. Marking Services, Inc.
   2. Preprinted aluminum signs, high-intensity reflective, punched or drilled for fasteners, with colors, legend, and size required for application.
   3. 1/4-inch grommets in corners for mounting.
   4. Nominal Size: 7 by 10 inches.

B. Laminated Acrylic or Melamine Plastic Signs:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Brady Corporation.
      b. Carlton Industries, LP.
      c. Marking Services, Inc.
   2. Engraved legend.
   3. Thickness:
      a. For signs up to 20 sq. in., minimum 1/16 inch thick.
      b. For signs larger than 20 sq. in., 1/8 inch thick.
      c. Engraved legend with black letters on white face.
      d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.
      e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

### 2.8 CABLE TIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Ideal Industries, Inc.
   2. Marking Services, Inc.
   3. Panduit Corp.

B. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self- locking.
   1. Minimum Width: 3/16 inch.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 7000 psi.
   3. UL 94 Flame Rating: 94V-0.
   4. Temperature Range: Minus 50 to plus 284 deg F.
   5. Color: Black.

### 2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

## 3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
   1. Secure tight to surface of conductor, cable, or raceway.

H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.
   1. Secure tight to surface of conductor, cable, or raceway.

I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

J. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

K. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

L. Accessible Fittings for Raceways: Identify the covers of each junction and pull box of the following systems with the wiring system legend and system voltage. System legends shall be as follows:
   1. "EMERGENCY POWER."
   2. "POWER."

M. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.

N. Self-Adhesive Wraparound Labels: Secure tight to surface at a location with high visibility and accessibility.

O. Self-Adhesive Labels:
1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.

P. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.

Q. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.

R. Marker Tapes: Secure tight to surface at a location with high visibility andaccessibility.

S. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

T. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.

U. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.

V. Metal Tags:
1. Place in a location with high visibility and accessibility.
2. Secure using plenum-rated cable ties.

W. Nonmetallic Preprinted Tags:
1. Place in a location with high visibility and accessibility.
2. Secure using plenum-rated cable ties.

X. Write-on Tags:
1. Place in a location with high visibility and accessibility.
2. Secure using plenum-rated cable ties.

Y. Baked-Enamel Signs:
1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

AA. Laminated Acrylic or Melamine Plastic Signs:
1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high sign; where two lines of text are required, use labels 2 inches high.

BB. Cable Ties: General purpose, for attaching tags, except as listed below:
1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

## 3.3 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil. Stencil legend "DANGER - CONCEALED HIGH-VOLTAGE WIRING" with 3- inch-high, black letters on 20-inch centers.
1. Locate identification at changes in direction, at penetrations of walls and floors, and at 10-foot maximum intervals.

D. Accessible Raceways and Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

E. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive labels containing the wiring system legend and system voltage. System legends shall be as follows:
1. "EMERGENCY POWER."
2. "POWER."
3. “FIRE ALARM”

F. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use snap-around color-coding bands to identify the phase.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

G. Power-Circuit Conductor Identification, More Than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic preprinted tags colored and marked to indicate phase, and a separate tag with the circuit designation.

H. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with the conductor or cable designation, origin, and destination.

I. Control-Circuit Conductor Termination Identification: For identification at terminations, provide heat-shrink preprinted tubes with the conductor designation.

J. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.

K. Auxiliary Electrical Systems Conductor Identification: Marker tape that is uniform and consistent with system used by manufacturer for factory-installed connections.
   1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

L. Concealed Raceways and Duct Banks, More Than 600 V, within Buildings: Apply floor marking tape to the following finished surfaces:
   1. Floor surface directly above conduits running beneath and within 12 inches of a floor that is in contact with earth or is framed above unexcavated space.
   2. Wall surfaces directly external to raceways concealed within wall.
   3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.

M. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush- mounted panelboards and similar equipment in finished spaces.

N. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

O. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs.
   1. Apply to exterior of door, cover, or other access.
   2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
      a. Power-transfer switches.
      b. Controls with external control power connections.

P. Arc Flash Warning Labeling: Self-adhesive labels.

Q. Main Electrical Room: Framed with glass protective cover a full size drawing of project electrical single line diagram including all Project Record changes wall. Where multiple drawings are included in construction documents provide one for each sheet.

R. Operating Instruction Signs: Self-adhesive labels.

S. Emergency Operating Instruction Signs: Baked-enamel warning signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

T. Equipment Identification Labels:
   1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
   2. Outdoor Equipment: Stenciled legend 4 inches high.
   3. Equipment to Be Labeled:
      a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form ofa engraved, laminated acrylic or melamine label.
      b. Enclosures and electrical cabinets.

c. Access doors and panels for concealed electrical items.
d. Switchboards.
e. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
f. Emergency system boxes and enclosures.
g. Enclosed switches.
h. Enclosed circuit breakers.
i. Enclosed controllers.
j. Variable-speed controllers.
k. Push-button stations.
l. Power-transfer equipment.
m. Contactors.
n. Remote-controlled switches, dimmer modules, and control devices.
o. Power-generating units.
p. Monitoring and control equipment.

**End of Section**

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# LIGHTING CONTROL SYSTEM (WATTSTOPPER DLM)

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Digital Lighting Controls
2. Relay Panels
3. Emergency Lighting Control

B. Related Sections:

1. Sections 26 51 19 for LED Interior Lighting

C. Control Intent – Control Intent includes, but is not limited to:

1. Defaults and initial calibration settings for such items as time delay, sensitivity, fade rates, etc.
2. Initial sensor and switching zones
3. Initial time switch settings
4. Emergency Lighting control

### 1.3 QUALITY ASSURANCE

A. Manufacturer: Minimum 10 years experience in manufacture of lighting controls.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Show installation details for the following:

a. Occupancy sensors.

b. Vacancy sensors.

c. Daylighting sensors.

d. Inwall controls.

2. Interconnection diagrams showing field-installed wiring.

3. Include diagrams for power, signal, and control wiring.

## 1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and elevations, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.

2. Structural members to which equipment will be attached.

3. Items penetrating finished ceiling, including the following:

a. Luminaires.

b. Air outlets and inlets.

c. Speakers.

d. Sprinklers.

e. Access panels.

f. Control modules.

B. Field quality-control reports.

C. Sample Warranty: For manufacturer's warranties.

## 1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.

2. Program Software Backup: On USB media and On manufacturer's website. Provide names, versions, and website addresses for locations of installed software.

3. Device address list.

4. Printout of software application and graphic screens.

### 1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Faulty operation of lighting control software.

b. Faulty operation of lighting control devices.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION AND OPERATION

A. The Lighting Control and Automation system as defined under this section covers the following equipment:

1. Digital Occupancy Sensors – Self-configuring, digitally addressable and calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications.

2. Digital Switches – Self-configuring, digitally addressable pushbutton on/off, dimming, and scene switches with two-way active infrared (IR) communications.

3. Handheld remotes for personal control – One-button dimming, two-button on/off, or five-button scene remotes provide control using infrared communications. Remote may be configured in the field to control selected loads or scenes without special tools.

4. Digital Daylighting Sensors – Single-zone closed loop, multi-zone open loop and single-zone dual-loop daylighting sensors with two-way active infrared (IR) communications can provide switching, bi-level, tri-level or dimming control for daylight harvesting.

5. Digital Room Controllers – Self-configuring, digitally addressable one, two or three relay plenum-rated controllers for on/off control. Selected models include 0-10 volt or line voltage forward phase control dimming outputs and integral current monitoring capabilities.

6. Configuration Tools – Handheld remote for room configuration and relay panel programming provides two-way infrared (IR) communications to digital devices and allows complete configuration and reconfiguration of the device / room from up to 30 feet away. Unit to have Organic LED display, simple pushbutton interface, and allow bi-directional communication of room variables and occupancy sensor settings. Computer software also customizes room settings.

7. Digital Lighting Management (DLM) local network – Free topology, plug-in wiring system (Cat 5e) for power and data to room devices.

8. Digital Lighting Management (DLM) segment network – Linear topology, BACnet MS/TP network (1.5 twisted pair, shielded,) to connect multiple DLM local networks for centralized control

9. Network Bridge – provides BACnet MS/TP-compliant digital networked communication between rooms, panels and the Segment Manager or building automation system (BAS) and automatically creates BACnet objects representative of connected devices.

10. Segment Manager – provides web browser-based user interface for system control, scheduling, power monitoring, room device parameter administration and reporting.

11. Programming and Configuration software – Optional PC-native application capable of accessing DLM control parameters within a room, for the local network, via a USB adapter, or globally, for many segment networks simultaneously, via BACnet/IP communication.

12. Emergency Lighting Control Unit (ELCU) – allows a standard lighting control device to control emergency lighting in conjunction with normal lighting in any area within a building

## 2.2 LIGHTING CONTROL APPLICATIONS

A. Unless relevant provisions of the applicable local Energy Codes are more stringent, provide a minimum application of lighting controls as follows:

1. Space Control Requirements – Provide occupancy/vacancy sensors with Manual- or Partial-ON functionality in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and Automatic-ON occupancy sensors are more appropriate. Provide Manual-ON occupancy/vacancy sensors for any enclosed office, conference room, meeting room, open plan system and training room. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling- or corner-mounted sensors and Manual-ON switches.

2. Bi-Level Lighting – Provide multi-level controls in all spaces except toilet rooms, storerooms, library stacks, or applications where variable dimming is used.

3. Daylit Areas – Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by relevant local building energy code:

    a. All luminaires within code-defined daylight zones shall be controlled separately from luminaires outside of daylit zones.

    b. Daytime setpoints for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes.

    c. Multiple-leveled switched daylight harvesting controls may be utilized for areas marked on drawings.

    d. Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.

## 2.3 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Watt Stopper DLM or a comparable product by one of the following:

1. Acuity nLight
2. Lutron Quantum
3. Crestron

## 2.4 DIGITAL LIGHTING CONTROLS

A. Furnish the Company's system which accommodates the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories which suit the lighting and electrical system parameters.

## 2.5 DIGITAL WALL SWITCH OCCUPANCY SENSORS

A. Wallbox mounted passive infrared PIR or dual technology (passive infrared and ultrasonic) digital occupancy sensor with 1 or 2 switch buttons.

B. Digital Occupancy Sensors shall provide scrolling LCD display for digital calibration and electronic documentation. Features include the following:

1. Digital calibration and pushbutton configuration for the following variables:
    a. Sensitivity – 0-100% in 10% increments
    b. Time delay – 1-30 minutes in 1-minute increments
    c. Test mode – Five second time delay
    d. Detection technology – PIR, Dual Technology activation and/or re-activation.
    e. Walk-through mode
    f. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network.
2. Programmable control functionality including:
    a. Each sensor may be programmed to control specific loads within a local network.
    b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.
    c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically during the configurable period of time (default 10 seconds) after turning off.

d. On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:

1) Ultrasonic and Passive Infrared

2) Ultrasonic or Passive Infrared

3) Ultrasonic only

4) Passive Infrared only

3. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.

4. Two RJ-45 ports for connection to DLM local network.

5. Two-way infrared (IR) transceiver to allow remote programming through handheld configuration tool and control by remote personal controls.

6. Device Status LEDs including:

a. PIR detection

b. Ultrasonic detection

c. Configuration mode

d. Load binding

7. Assignment of occupancy sensor to a specific load within the room without wiring or special tools.

8. Assignment of local buttons to specific loads within the room without wiring or special tools

9. Manual override of controlled loads.

10. All digital parameter data programmed into an individual wall switch sensor shall be retained in non-volatile FLASH memory within the wall switch sensor itself. Memory shall have an expected life of no less than 10 years.

C. BACnet object information shall be available for the following objects:

1. Detection state

2. Occupancy sensor time delay

3. Occupancy sensor sensitivity, PIR and Ultrasonic

4. Button state

5. Switch lock control

6. Switch lock status

D. Units shall not have any dip switches or potentiometers for field settings.

E. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required.

F. Two-button wall switch occupancy sensors, when connected to a single relay dimming room controller, shall operate in the following sequence as a factory default:

1. Left button

a. Press and release – Turn load on

b. Press and hold – Raise dimming load

2. Right button

a. Press and release – Turn load off

b. Press and hold – Lower dimming load

G. Low voltage momentary pushbuttons shall include the following features:

1. Load/Scene Status LED on each switch button with the following characteristics:

a. Bi-level LED

b. Dim locator level indicates power to switch

c. Bright status level indicates that load or scene is active

2. The following button attributes may be changed or selected using a wireless configuration tool:

a. Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa).

b. Individual button function may be configured to Toggle, On only or Off only.

c. Individual scenes may be locked to prevent unauthorized change.

d. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.

e. Ramp rate may be adjusted for each dimmer switch.

f. Switch buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple loads.

H. WattStopper part numbers: LMPW, LMDW. Available in white, light almond, ivory, grey, red and black; compatible with wall plates with decorator opening.

## 2.6 DIGITAL WALL OR CEILING MOUNTED OCCUPANCY SENSOR

A. Wall or ceiling mounted (to suit installation) passive infrared (PIR), ultrasonic or dual technology digital (passive infrared and ultrasonic) occupancy sensor.

B. Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:

1. Digital calibration and pushbutton configuration for the following variables:

a. Sensitivity – 0-100% in 10% increments

b. Time delay – 1-30 minutes in 1-minute increments

c. Test mode – Five second time delay

d. Detection technology – PIR, Ultrasonic or Dual Technology activation and/or re-activation.

e. Walk-through mode

f. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network.

2. Programmable control functionality including:

a. Each sensor may be programmed to control specific loads within a local network.

b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.

c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period of time (default 10 seconds) after turning off.

d. On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:

1) Ultrasonic and Passive Infrared

2) Ultrasonic or Passive Infrared

3) Ultrasonic only

4) Passive Infrared only

3. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.

4. One or two RJ-45 port(s) for connection to DLM local network.

5. Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls.

6. Device Status LEDs, which may be disabled for selected applications, including:

    a. PIR detection

    b. Ultrasonic detection

    c. Configuration mode

    d. Load binding

7. Assignment of occupancy sensor to a specific load within the room without wiring or special tools.

8. Manual override of controlled loads.

9. All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.

C. BACnet object information shall be available for the following objects:

1. Detection state

2. Occupancy sensor time delay

3. Occupancy sensor sensitivity, PIR and Ultrasonic

D. Units shall not have any dip switches or potentiometers for field settings.

E. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required.

F. WattStopper product numbers: LMPX, LMDX, LMPC, LMUC, LMDC

## 2.7 DIGITAL WALL SWITCHES

A. Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 8 button configuration. Wall switches shall include the following features:

1. Two-way infrared (IR) transceiver for use with personal and configuration remote controls.

2. Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.

3. Configuration LED on each switch that blinks to indicate data transmission.

4. Load/Scene Status LED on each switch button with the following characteristics:

    a. Bi-level LED

    b. Dim locator level indicates power to switch

    c. Bright status level indicates that load or scene is active

5. Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps.

6. Programmable control functionality including:

   a. Button priority may be configured to any BACnet priority level, from 1-16, corresponding to networked operation allowing local actions to utilize life safety priority

   b. Scene patterns may be saved to any button other than dimming rockers. Once set, buttons may be digitally locked to prevent overwriting of the preset levels.

7. All digital parameter data programmed into an individual wall switch shall be retained in non-volatile FLASH memory within the wall switch itself. Memory shall have an expected life of no less than 10 years.

B. BACnet object information shall be available for the following objects:

   1. Button state

   2. Switch lock control

   3. Switch lock status

C. Two RJ-45 ports for connection to DLM local network.

D. Multiple digital wall switches may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration shall be required to achieve multi-way switching.

E. The following switch attributes may be changed or selected using a wireless configuration tool:

   1. Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa).

   2. Individual button function may be configured to Toggle, On only or Off only.

   3. Individual scenes may be locked to prevent unauthorized change.

   4. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.

   5. Ramp rate may be adjusted for each dimmer switch.

   6. Switch buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple loads.

F. WattStopper product numbers: LMSW-101, LMSW-102, LMSW-103, LMSW-104, LMSW-105, LMSW-108, LMDM-101. Available in white, light almond, ivory, grey, red and black; compatible with wall plates with decorator opening.

## 2.8 HANDHELD REMOTE CONTROLS

A. Battery-operated handheld devices in 1, 2 and 5 button configurations for remote switching or dimming control. Remote controls shall include the following features:

1. Two-way infrared (IR) transceiver for line of sight communication with DLM local network within up to 30 feet.

2. LED on each button confirms button press.

3. Load buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple loads.

4. Inactivity timeout to save battery life.

B. A wall mount holster and mounting hardware shall be included with each remote control

C. WattStopper part numbers: LMRH-101, LMRH-102, LMRH-105.

## 2.9 DIGITAL DAYLIGHTING SENSORS

A. Digital daylighting sensors shall work with room controllers to provide automatic switching, bi-level, or tri-level or dimming daylight harvesting capabilities for any load type connected to a room controller. Daylighting sensors shall be interchangeable without the need for rewiring.

1. Closed loop sensors measure the ambient light in the space and control a single lighting zone.

2. Open loop sensors measure incoming daylight in the space, and are capable of controlling up to three lighting zones.

3. Dual loop sensors measure both ambient and incoming daylight in the space to esure that proper light levels are maintained as changes to reflective materials are made in a single zone.

B. Digital daylighting sensors shall include the following features:

1. The sensor's internal photodiode shall only measure lightwaves within the visible spectrum. The photodiode's spectral response curve shall closely match the entire photopic curve. The photodiode shall not measure energy in either the ultraviolet or infrared spectrums. The photocell shall have a sensitivity of less than 5% for any wavelengths less than 400 nanometers or greater than 700 nanometers.

2. Sensor light level range shall be from 1-6,553 footcandles (fc).

3. The capability of ON/OFF, bi-level or tri-level switching, or dimming, for each controlled zone, depending on the selection of room controller(s) and load binding to room controller(s).

4. For switching daylight harvesting, the photosensor shall provide a field-selectable deadband, or a separation, between the "ON Setpoint" and the "OFF Setpoint" that will prevent the lights from cycling excessively after they turn off.

5. For dimming daylight harvesting, the photosensor shall provide the option, when the daylight contribution is sufficient, of turning lights off or dimming lights to a field-selectable minimum level.

6. Photosensors shall have a digital, independently configurable fade rate for both increasing and decreasing light level in units of percent per second.

7. Photosensors shall provide adjustable cut-off time. Cut-off time is defined by the number of selected minutes the load is at the minimum output before the load turns off. Selectable range between 0-240 minutes including option to never cut-off.

8. Optional wall switch override shall allow occupants to reduce lighting level to increase energy savings or, if permitted by system administrator, raise lighting levels for a selectable period of time or cycle of occupancy.

9. Integral infrared (IR) transceiver for configuration and/or commissioning with a handheld configuration tool, to transmit detected light level to wireless configuration tool, and for communication with personal remote controls.

10. Configuration LED status light on device that blinks to indicate data transmission.

11. Status LED indicates test mode, override mode and load binding.

12. Recessed switch on device to turn controlled load(s) ON and OFF.

13. BACnet object information shall be available for the following daylighting sensor objects, based on the specific photocell's settings:

    a. Light level

    b. Day and night setpoints

    c. Off time delay

    d. On and off setpoints

    e. Up to three zone setpoints

    f. Operating mode – on/off, bi-level, tri-level or dimming

14. One RJ-45 port for connection to DLM local network.

15. A choice of accessories to accommodate multiple mounting methods and building materials. The photosensors may be mounted on a ceiling tile, skylight light well, suspended lighting fixture or backbox. Standard tube photosensors accommodate mounting materials from 0-0.62" thickness (LMLS-400, LMLS-500). Extended tube photosensors accommodate mounting materials from 0.62"-1.25" thickness (LMLS-400-L, LMLS-500-L). Mounting brackets are compatible with J boxes (LMLS-MB1) and wall mounting (LMLS-MB2). LMLS-600 photosensor to be mounted on included bracket below skylight well.

16. Any load or group of loads in the room can be assigned to a daylighting zone

17. Each load within a daylighting zone can be individually enabled or disabled for discrete control (load independence).

18. All digital parameter data programmed into a photosensor shall be retained in non-volatile FLASH memory within the photosensor itself. Memory shall have an expected life of no less than 10 years.

C. Closed loop digital photosensors shall include the following additional features:

1. An internal photodiode that measures light in a 100-degree angle, cutting off the unwanted light from bright sources outside of this cone.

2. Automatic self-calibration, initiated from the photosensor, a wireless configuration tool or a PC with appropriate software.

3. Automatically establishes application-specific setpoints following self-calibration. For switching operation, an adequate deadband between the ON and OFF setpoints shall prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of loads.

4. WattStopper Product Number: LMLS-400, LMLS-400-L.

D. Open loop digital photosensors shall include the following additional features:

1. An internal photodiode that measures light in a 60-degree angle cutting off the unwanted light from the interior of the room.

2. Automatically establishes application-specific setpoints following manual calibration using a wireless configuration tool or a PC with appropriate software. For switching operation, an adequate deadband between the ON and OFF setpoints for eacHzone shall prevent the lights from cycling; for dimming operation, a proportional control algorithm shall maintain the design lighting level in eacHzone.

3. Each of the three discrete daylight zones can include any non-overlapping group of loads in the room.

4. WattStopper Product Number: LMLS-500, LMLS-500-L.

E. Dual loop digital photosensors shall include the following additional features:

1. Close loop portion of dual loop device must have an internal photodiode that measures light in a 100-degree angle, cutting off the unwanted light from sources outside of this con

2. Open loop portion of dual loop device must have an internal photodiode that can measure light in a 60-degree angle, cutting off the unwanted light from the interior of the room.

3. Automatically establishes application-specific set-points following self-calibration. For switching operation, an adequate deadband between the ON and OFF setpoints shall prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of load.

4. Device must reference closed loop photosensor information as a base line reference. The device must be able to analyze the open loop photosensor information to determine if an adjustment in light levels is required.

5. Device must be able to automatically commission setpoints each night to provide adjustments to electrical lighting based on changes in overall lighting in the space due to changes in reflectance within the space or changes to daylight contribution based on seasonal changes.

6. Device must include extendable mounting arm to properly position sensor within a skylight well.

7. WattStopper product number LMLS-600

## 2.10 DIGITAL ROOM CONTROLLERS

A. Digital controllers for lighting automatically bind the room loads to the connected devices in the space without commissioning or the use of any tools. Room controllers shall be provided to match the room lighting requirements. The controllers will be simple to install, and will not have dip switches or potentiometers, or require special configuration for standard Plug n' Go applications. The control units will include the following features:

1. Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room.

2. Simple replacement – Using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf.

3. Multiple room controllers connected together in a local network must automatically prioritize each room controller, without requiring any configuration or setup, so that loads are sequentially assigned using room controller device ID's from highest to lowest.

4. Device Status LEDs to indicate:

    a. Data transmission

    b. Device has power

    c. Status for each load

    d. Configuration status

5. Quick installation features including:

    a. Standard junction box mounting

    b. Quick low voltage connections using standard RJ-45 patch cable

6. Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power:

    a. Turn on to 100%

    b. Remain off

    c. Turn on to last level

7. Each load shall be configurable to operate in the following sequences based on occupancy:

    a. Auto-on/Auto-off (Follow on and off)

    b. Manual-on/Auto-off (Follow off only)

8. The polarity of each load output shall be reversible, via digital configuration, so that on is off and off is on.

9. BACnet object information shall be available for the following objects:

    a. Load status

    b. Electrical current

    c. Total watts per controller

    d. Schedule state – normal or after-hours

    e. Demand response control and cap level

    f. Room occupancy status

    g. Total room lighting and plug loads watts

    h. Total room watts/sq ft

    i. Force on/off all loads

10. UL 2043 plenum rated

11. Manual override and LED indication for each load

12. Dual voltage (120/277 VAC, 60 Hz), or 347 VAC, 60 Hz (selected models only). 120/277 volt models rated for 20A total load, derating to 16A required for some dimmed loads (forward phase dimming); 347 volt models rated for 15A total load; plug load controllers carry application-specific UL 20 rating for receptacle control.

13. Zero cross circuitry for each load

14. All digital parameter data programmed into an individual room controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.

B. On/Off Room Controllers shall include:

1. One or two relay configuration

2. Efficient 150 mA switching power supply

3. Three RJ-45 DLM local network ports with integral strain relief and dust cover

4. WattStopper product numbers: LMRC-101, LMRC-102

C. On/Off/Dimming enhanced Room Controllers shall include:

1. Real time current monitoring

2. Multiple relay configurations

    a. One, two or three relays (LMRC-21x series)

    b. One or two relays (LMRC-22x series)

3. Efficient 250 mA switching power supply

4. Four RJ-45 DLM local network ports with integral strain relief and dust cover

5. One dimming output per relay

    a. 0-10V Dimming – Where indicated, one 0-10-volt analog output per relay for control of compatible ballasts and LED drivers. The 0-10-volt output shall automatically open upon loss of power to the Room Controller to assure full light output from the controlled lighting. (LMRC-21x series)

    b. Line Voltage, Forward Phase Dimming – Where indicated, one forward phase control line voltage dimming output per relay for control of compatible two-wire or three-wire ballasts, LED drivers, MLV, forward phase compatible ELV, neon/cold cathode and incandescent loads. (LMRC-22x series)

    c. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected ballast or driver.

    d. The LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim.

    e. Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100% dimming range defined by the minimum and maximum calibration trim.

    f. Calibration and trim levels must be set per output channel.

    g. Devices that set calibration or trim levels per controller are not acceptable.

    h. All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable.

6. Each load shall have an independently configurable preset on level for Normal Hours and After Hours events to allow different dimmed levels to be established at the start of both Normal Hours and After Hours events.

7. Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value.

8. The following dimming attributes may be changed or selected using a wireless configuration tool:

    a. Establish preset level for each load from 0-100%

    b. Set high and low trim for each load

c. Set lamp burn in time for each load up to 100 hours

9. Override button for each load provides the following functions:

a. Press and release for on/off control

b. Press and hold for dimming control

10. WattStopper product numbers: LMRC-211, LRMC-212, LRMC-213, LMRC-221, LMRC-222

## 2.11 DLM LOCAL NETWORK (Room Network)

A. The DLM local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building.

B. Features of the DLM local network include:

1. Plug n' Go® automatic configuration and binding of occupancy sensors, switches and lighting loads to the most energy-efficient sequence of operation based upon the device attached.

2. Simple replacement of any device in the network with a standard off the shelf unit without requiring commissioning, configuration or setup.

3. Push n' Learn® configuration to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network.

4. Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver.

C. Digital room devices connect to the local network using pre-terminated Cat 5e cables with RJ-45 connectors, which provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide serial communication data from individual end devices are not acceptable.

D. If manufacturer's pre-terminated Cat 5e cables are not used for the installation, the contractor is responsible for testing each cable following installation and supplying manufacturer with test results.

E. WattStopper Product Number: LMRJ-Series

## 2.12 DLM SEGMENT NETWORK (Room to Room Network)

A. The segment network shall be a linear topology, BACnet-based MS/TP subnet to connect DLM local networks (rooms) for centralized control.

1. Each connected DLM local network shall include a single network bridge (LMBC-300), and the network bridge is the only room-based device that is connected to the segment network.

2. Network bridges, relay panels and segment managers shall include terminal blocks, with provisions for separate "in" and "out" terminations, for segment network connections.

3. The segment network shall utilize 1.5 twisted pair, shielded, cable supplied by the lighting control manufacturer. The maximum cable run for each segment is 4,000 feet. Conductor-to-conductor capacitance of the twisted pair shall be less than 30 pf/ft and have a characteristic impedance of 120 Ohms.

4. Network signal integrity requires that each conductor and ground wire be correctly terminated at every connected device.

5. Substitution of manufacturer-supplied cable must be pre-approved: Manufacturer will not certify network reliability, and reserves the right to void warranty, if non-approved cable is installed, and if terminations are not completed according to manufacturer's specific requirements.

6. Segment networks shall be capable of connecting to BACnet-compliant BAS (provided by others) either directly, via MS/TP, or through NB-ROUTERs, via BACnet/IP or BACnet/Ethernet. Systems whose room-connected network infrastructure require gateway devices to provide BACnet data to a BAS are unacceptable.

B. WattStopper Product Number: LM-MSTP, LM-MSTP-DB

## 2.13 CONFIGURATION TOOLS

A. A wireless configuration tool facilitates optional customization of DLM local networks using two-way infrared communications, while PC software connects to each local network via a USB interface.

B. Features and functionality of the wireless configuration tool shall include but not be limited to:

1. Two-way infrared (IR) communication with DLM IR-enabled devices within a range of approximately 30 feet.

2. High visibility organic LED (OLED) display, pushbutton user interface and menu-driven operation.

3. Must be able to read and modify parameters for room controllers, occupancy sensors, wall switches, daylighting sensors, network bridges and relay panels, and identify room devices by type and serial number.

4. Save up to eight occupancy sensor setting profiles, and apply profiles to selected sensors.

5. Temporarily adjust light level of any load(s) on the local network, and incorporate those levels in scene setting. Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings.

6. Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls.

7. Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings.

8. Verify status of building level network devices.

C. WattStopper Product Numbers: LMCT-100, LMCI-100/LMCS-100

## 2.14 NETWORK BRIDGE

A. The network bridge module connects a DLM local network to a BACnet-compliant segment network for communication between rooms, relay panels and a segment manager or BAS. Each local network shall include a network bridge component to provide a connection to the local network room devices. The network bridge shall use industry standard BACnet MS/TP network communication and an optically isolated EIA/TIA RS-485 transceiver.

1. The network bridge shall be provided as a separate module connected on the local network through an available RJ-45 port.

2. Provide Plug n' Go operation to automatically discover room devices connected to the local network and make all device parameters visible to the segment manager via the segment network. No commissioning shall be required for set up of the network bridge on the local network.

3. The network bridge shall automatically create standard BACnet objects for selected room device parameters to allow any BACnet-compliant BAS to include lighting control and power monitoring features as provided by the DLM room devices on each local network. BACnet objects will be created for the addition or replacement of any given in-room DLM device for the installed life of the system. Products requiring that an application-specific point database be loaded to create or map BACnet objects are not acceptable. Systems not capable of providing BACnet data for control devices via a dedicated BACnet Device ID and physical MS/TP termination per room are not acceptable. Standard BACnet objects shall be provided as follows:

    a. Read/write the normal or after hours schedule state for the room

    b. Read the detection state of each occupancy sensor

    c. Read the aggregate occupancy state of the room

    d. Read/write the On/Off state of loads

    e. Read/write the dimmed light level of loads

    f. Read the button states of switches

    g. Read total current in amps, and total power in watts through the room controller

    h. Read/write occupancy sensor time delay, PIR sensitivity and ultrasonic sensitivity settings

    i. Activate a preset scene for the room

    j. Read/write daylight sensor fade time and day and night setpoints

    k. Read the current light level, in footcandles, from interior and exterior photosensors and photocells

    l. Set daylight sensor operating mode

    m. Read/write wall switch lock status

    n. Read watts per square foot for the entire controlled room

o. Write maximum light level per load for demand response mode

p. Read/write activation of demand response mode for the room

q. Activate/restore demand response mode for the room

B. WattStopper product numbers: LMBC-300

## 2.15 SEGMENT MANAGER

A. For networked applications, the Digital Lighting Management system shall include at least one segment manager to manage network communication. It shall be capable of serving up a graphical user interface via a standard web browser utilizing either unencrypted TCP/IP traffic via a configurable port (default is 80) or 256 bit AES encrypted SSL TCP/IP traffic via a configurable port (default is 443).

B. Each segment manager shall have integral support for at least three segment networks. Segment networks may alternately be connected to the segment manger via external routers and switches, using standard Ethernet structured wiring. Each router shall accommodate one segment network. Provide the quantity of routers and switches as shown on the plans.

C. Operational features of the Segment Manager shall include the following:

1. Connection to PC or LAN via standard Ethernet TCP/IP via standard Ethernet TCP/IP with the option to use SSL encrypted connections for all traffic.

2. Easy to learn and use graphical user interface, compatible with Internet Explorer 8, or equal browser. Shall not require installation of any lighting control software to an end-user PC.

3. Log in security capable of restricting some users to view-only or other limited operations.

4. Automatic discovery of DLM devices and relay panels on the segment network(s). Commissioning beyond activation of the discovery function shall not be required to provide communication, monitoring or control of all local networks and lighting control panels.

5. After discovery, all rooms and panels shall be presented in a standard navigation tree format. Selecting a device from the tree will allow the device settings and operational parameters to be viewed and changed by the user.

6. Ability to view and modify room device operational parameters. It shall be possible to set device parameters independently for normal hours and after hours operation including sensor time delays and sensitivities, and load response to sensor including Manual-On or Auto-On.

7. Ability to set up schedules for rooms and panels, view and override current status of panel channels and relays, and assign relays to groups. Schedules shall automatically set controlled zones or areas to either a normal hours or after hours mode of operation. Support for a minimum of 100 unique schedules, each with up to four time events per day. Support for annual schedules, holiday schedules and unique date-bound schedules.

8. Ability to group rooms and loads for common control by schedules, switches or network commands.

9. Ability to monitor connected load current and display power consumption for areas equipped with room controllers incorporating the integral current monitoring feature.

10. Provide capabilities for integration with a BAS via BACnet protocol. At a minimum, the following points shall be available to the BAS via BACnet IP connection to the segment manager: room occupancy state; room schedule mode; room switch lock control; individual occupancy sensor state; room lighting power; room plug-load power; load ON/OFF state; load dimming level; panel channel schedule state; panel relay state; and Segment Manager Group schedule state control.

11. The Segment Manager shall allow access and control of the overall system database via Native Niagara AX FOX connectivity. Systems that must utilize a Tridium Niagara controller in addition to the programming, scheduling and configuration server are not acceptable.

D. Segment Manager shall support multiple DLM rooms as follows:

1. Support up to 120 network bridges and 900 digital in-room devices (LMSM-3E).

2. Support up to 300 network bridges and 2,200 digital in room devices, connected via network routers and switches (LMSM-6E).

E. WattStopper Product Numbers: LMSM-3E, LMSM-6E, NB-ROUTER, NB-SWITCH, NB-SWITCH-8, NB-SWITCH-16.

## 2.16 PROGRAMMING, CONFIGURATION AND DOCUMENTATION SOFTWARE

A. PC-native application for optional programming of detailed technician-level parameter information for all DLM products, including all parameters not accessible via BACnet and the handled IR configuration tool. Software must be capable of accessing room-level parameter information locally within the room when connected via the optional LMCI-100 USB programming adapter, or globally for many segment networks simultaneously utilizing standard BACnet/IP communication.

1. Additional parameters exposed through this method include but are not limited to:

a. Occupancy sensor detection LED disable for performance and other aesthetic spaces where blinking LEDs present a distraction.

b. Six occupancy sensor action behaviors for each controlled load, separately configurable for normal hours and after hours modes. Modes include: No Action, Follow Off Only, Follow On Only, Follow On and Off, Follow On Only with Override Time Delay, Follow Off Only with Blink Warn Grace Time, Follow On and Off with Blink Warn Grace Time.

c. Separate fade time adjustments per load for both normal and after hours from 0 – 4 hours.

d. Configurable occupancy sensor re-trigger grace period from 0 – 4 minutes separate for both normal hours and after hours.

e. Separate normal hours and after hours per-load button mode with modes including: Do nothing, on only, off only, on and off.

f. Load control polarity reversal so that on events turn loads off and vice versa.

g. Per-load DR (demand response) shed level in units of percent.

h. Load output pulse mode in increments of 1second.

i. Fade trip point for each load for normal hours and after hours that establishes the dimmer command level at which a switched load closes its relay to allow for staggered On of switched loads in response to a dimmer.

2. Generation of reports at the whole file, partial file, or room level. Reports include but are not limited to:

a. Device list report: All devices in a project listed by type.

b. Load binding report: All load controller bindings showing interaction with sensors, switches, and daylighting.

c. BACnet points report: Per room Device ID report of the valid BACnet points for a given site's BOM.

d. Room summary report: Device manifest for each room, aggregated by common BOM, showing basic sequence of operations.

e. Device parameter report: Per-room lists of all configured parameters accessible via hand held IR programmer for use with O&M documentation.

f. Scene report: All project scene pattern values not left at defaults (i.e. 1 = all loads 100%, 2 = all loads 75%, 3 = all loads 50%, 4 = all loads 25%, 5-16 = same as scene 1).

g. Occupancy sensor report: Basic settings including time delay and sensitivity(ies) for all occupancy sensors.

3. Network-wide programming of parameter data in a spreadsheet-like programming environment including but not limited to the following operations:

a. Set, copy/paste an entire project site of sensor time delays.

b. Set, copy/paste an entire project site of sensor sensitivity settings.

c. Search based on room name and text labels.

d. Filter by product type (i.e. LMRC-212) to allow parameter set by product.

e. Filter by parameter value to search for product with specific configurations.

4. Network-wide firmware upgrading remotely via the BACnet/IP network.

a. Mass firmware update of entire rooms.

b. Mass firmware update of specifically selected rooms or areas.

c. Mass firmware upgrade of specific products.

B. WattStopper Product Number: LMCS-100, LMCI-100

### 2.17 EMERGENCY LIGHTING CONTROL DEVICES

A. Emergency Lighting Control Unit – A UL 924 listed device that monitors a switched circuit providing normal lighting to an area. The unit provides normal ON/OFF control of emergency lighting along with the normal lighting. Upon normal power failure the emergency lighting circuit will close, forcing the emergency lighting ON until normal power is restored. Features include:

1. 120/277 volts, 50/60 Hz, 20 amp ballast rating
2. Push to test button
3. Auxiliary contact for remote test or fire alarm system interface

B. WattStopper Product Numbers: ELCU-100, ELCU-200.

## PART 3 - EXECUTION

### 3.1 PRE-INSTALLATION MEETING

A. A factory authorized manufacturer's representative shall provide the electrical contractor a functional overview of the lighting control system prior to installation. The contractor shall schedule the pre-installation site visit after receipt of approved submittals to review the following:

1. Confirm the location and mounting of all digital devices, with special attention to placement of occupancy and daylighting sensors.
2. Review the specifications for low voltage control wiring and termination.
3. Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
4. Discuss requirements for integration with other trades.

### 3.2 EXAMINATION

A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.

B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 SENSOR INSTALLATION

A. Comply with NECA 1.

B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.

C. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

## 3.4 CONTACTOR INSTALLATION

A. Comply with NECA 1.

B. Mount electrically held lighting contactors with elastomeric isolator pads to eliminate structure-borne vibration unless contactors are installed in an enclosure with factory-installed vibration isolators.

## 3.5 WIRING INSTALLATION

A. Comply with NECA 1.

B. Wiring Method: Comply with Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 3/4 inch (13 20 mm).

C. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

D. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.

E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

## 3.6 IDENTIFICATION

A. Identify components and power and control wiring according to Section 26 0553 "Identification for Electrical Systems."

1. Identify controlled circuits in lighting contactors.

2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

B. Label time switches and contactors with a unique designation.

## 3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate lighting control devices and perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.

2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Lighting control devices will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

## 3.8 FACTORY SERVICES

A. Upon completion of the installation, the manufacturer's factory authorized representative shall start up and verify a complete fully functional system.

B. The electrical contractor shall provide both the manufacturer and the electrical engineer with three weeks written notice of the system start up and adjustment date.

C. Upon completion of the system start up, the factory-authorized technician shall provide the proper training to the owner's personnel on the adjustment and maintenance of the system.

## 3.9 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.

2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.

3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

## 3.10 ACCEPTANCE TESTING SUPPORT SERVICES

A. On all California projects, a certified lighting controls acceptance test technician (CLCATT) must verify the installation of the lighting control system. Manufacturer should include an extra day of factory technician's time to assist the CLCATT review the functionality and settings of the lighting control hardware per the requirements in the California State forms. It will be the CLCATT's responsibility to create and complete any forms required for the commissioning process, although the manufacturer or contractor may offer spreadsheets and/or printouts to assist the CLCATT with this task.

## 3.11 COMMISSIONING SUPPORT SERVICES

A. On this project, a commissioning agent will be hired to verify the installation and programming of all building systems, which includes the lighting control system. Manufacturer should include an extra day of technician's time to review the functionality and settings of the lighting control hardware with the commissioning agent, including reviewing submittal drawings and ensuring that instructions on how to configure each device are readily available. Manufacturer is NOT responsible for helping the commissioning agent inspect the individual devices. It will be the commissioning agent's responsibility to create and complete any forms required for the commissioning process, although the manufacturer or contractor may offer spreadsheets and/or printouts to assist the agent with this task.

B. The commissioning agent shall work with the electrical contractor during installation of the lighting control hardware to become familiar with the specific products. The agent may also accompany the manufacturer's technicians during their start-up work to better understand the process of testing, calibration and configuration of the products. However, the contractor and manufacturer shall ensure that interfacing with the agent does not prevent them from completing the requirements outlined in the contract documents.

## 3.12 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

   1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

## 3.13 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

**End of Section**

# Wiring Devices

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
1. Straight-blade convenience, hospital-grade, isolated-ground, and tamper-resistant receptacles.
2. GFCI receptacles.
3. SPD receptacles.
4. Hazardous (classified) location receptacles.
5. Twist-locking receptacles.
6. Pendant cord-connector devices.
7. Cord and plug sets.
8. Toggle switches.
9. Wall plates.
10. Floor service outlets.
11. Poke-through assemblies.
12. Prefabricated multioutlet assemblies.

### 1.3 DEFINITIONS

A. Abbreviations of Manufacturers' Names:
1. Cooper: Cooper Wiring Devices; Division of Cooper Industries, Inc.
2. Hubbell: Hubbell Incorporated: Wiring Devices-Kellems.
3. Leviton: Leviton Mfg. Company, Inc.
4. Pass & Seymour: Pass& Seymour/Legrand.

B. BAS: Building automation system.

C. EMI: Electromagnetic interference.

D. GFCI: Ground-fault circuit interrupter.

E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

F. RFI: Radio-frequency interference.

G. SPD: Surge protective device.

H. UTP: Unshielded twisted pair.

### 1.4 ACTION SUBMITTALS

A. Samples: One for each type of device and wall plate specified, in each color specified.

### 1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

### 1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

## PART 2 - PRODUCTS

### 2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
   1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
   2. Devices shall comply with the requirements in this Section.

D. Devices for Owner-Furnished Equipment:
   1. Receptacles: Match plug configurations.
   2. Cord and Plug Sets: Match equipment requirements.

E. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

### 2.2 STRAIGHT-BLADE RECEPTACLES

A. Duplex Convenience Receptacles: Decorative “square” face, industrial grade, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

B. Isolated-Ground, Duplex Convenience Receptacles: Decorative "square" face, industrial grade, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

2. Description: Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

C. Tamper-Resistant Convenience Receptacles: Decorative "square" face, industrial grade, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

## 2.3 GFCI RECEPTACLES

A. General Description:
1. Decorative "square" face, industrial grade, 125 V, 20 A, straight blade, non-feed-through type.
2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. Duplex GFCI Convenience Receptacles:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

C. Tamper-Resistant, Duplex GFCI Convenience Receptacles:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hubbell Incorporated; Wiring Device-Kellems.
b. Pass & Seymour/Legrand (Pass & Seymour).

## 2.4 SPD RECEPTACLES

A. General Description: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 1449, and FS W-C-596, with integral SPD in line to ground, line to neutral, and neutral to ground.
1. 125 V, 20 A, straight-blade type.
2. SPD Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
3. Active SPD Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."

B. Duplex SPD Convenience Receptacles:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

C. Isolated-Ground, Duplex SPD Convenience Receptacles:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

2. Grounding: Equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

## 2.5 HAZARDOUS (CLASSIFIED) LOCATION RECEPTACLES

A. Hazardous (Classified) Locations Receptacles: Comply with NEMA FB 11 and UL 1010.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Eaton (Arrow Hart).
b. EGS/Appleton Electric.
c. Killark.

## 2.6 TWIST-LOCKING RECEPTACLES

A. Twist-Lock, Single Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration L5-20R, and UL 498.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Eaton (Arrow Hart).
    b. Hubbell Incorporated; Wiring Device-Kellems.
    c. Leviton Manufacturing Co., Inc.
    d. Pass & Seymour/Legrand (Pass & Seymour).

B. Twist-Lock, Isolated-Ground, Single Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration L5-20R, and UL 498.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Eaton (Arrow Hart).
    b. Hubbell Incorporated; Wiring Device-Kellems.
    c. Leviton Manufacturing Co., Inc.
    d. Pass & Seymour/Legrand (Pass & Seymour).

2. Grounding: Equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

## 2.7 PENDANT CORD-CONNECTOR DEVICES

A. Description:
1. Matching, locking-type plug and receptacle body connector.
2. NEMA WD 6 Configurations L5-20P and L5-20R, heavy-duty grade, and FS W-C-596.
3. Body: Nylon, with screw-open, cable-gripping jaws and provision for attaching external cable grip.
4. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

## 2.8 CORD AND PLUG SETS

A. Description:
1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.
3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

## 2.9 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.
1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: 0.035-inch-thick, satin-finished, Type 302 stainless steel.
3. Material for Unfinished Spaces: Galvanized steel.

4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

## 2.10 FLOOR SERVICE FITTINGS

A. Type: Modular, flush-type, dual-service units suitable for wiring method used.

B. Compartments: Barrier separates power from voice and data communication cabling.

C. Service Plate: Round, die-cast aluminum with satin finish.

D. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.

E. Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 jacks for twisted pair cable complying with requirements in Section 27 1513 "Communications Copper Horizontal Cabling."

## 2.11 POKE-THROUGH ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Hubbell Incorporated; Wiring Device-Kellems.
2. Pass & Seymour/Legrand (Pass & Seymour).
3. Square D; by Schneider Electric.
4. Wiremold / Legrand.

B. Description:
1. Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.
2. Comply with UL 514 scrub water exclusion requirements.
3. Service-Outlet Assembly: Flush type with four simplex receptacles and space for four RJ-45 jacks complying with requirements in Section 27 1513 "Communications Copper Horizontal Cabling."
4. Size: Selected to fit nominal 8-inch cored holes in floor and matched to floor thickness.
5. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
6. Closure Plug: Arranged to close unused cored openings and reestablish fire rating of floor.
7. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of two, four-pair cables that comply with requirements in Section 27 1513 "Communications Copper Horizontal Cabling."

## 2.12 PREFABRICATED MULTIOUTLET ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Incorporated; Wiring Device-Kellems.
2. Wiremold / Legrand.

B. Description:
   1. Two-piece surface metal raceway, with factory-wired multioutlet harness.
   2. Components shall be products from single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.

C. Raceway Material: Metal, with manufacturer's standard finish.

D. Multioutlet Harness:
   1. Receptacles: 20-A, 125-V, NEMA WD 6 Configuration 5-20R receptacles complying with NEMA WD 1, UL 498, and FS W-C-596.
   2. Receptacle Spacing: 18 inches.
   3. Wiring: No. 12 AWG solid, Type THHN copper, multi circuit, connecting alternating receptacles.

### 2.13 FINISHES

A. Device Color:
   1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
   2. Wiring Devices Connected to Emergency Power System: Red.
   3. SPD Devices: Blue.
   4. Isolated-Ground Receptacles: As specified above, with orange triangle on face.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:
   1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
   2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
   3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
   4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:
   1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
   2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
   3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
   4. Existing Conductors:
      a. Cut back and pigtail, or replace all damaged conductors.
      b. Straighten conductors that remain and remove corrosion and foreign matter.

c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:
1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:
1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

## 3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

## 3.3 IDENTIFICATION

A. Comply with Section 26 0553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

## 3.4 FIELD QUALITY CONTROL

A. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Perform the following tests and inspections:
   1. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Tests for Convenience Receptacles:
   1. Line Voltage: Acceptable range is 105 to 132 V.
   2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
   3. Ground Impedance: Values of up to 2 ohms are acceptable.
   4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
   5. Using the test plug, verify that the device and its outlet box are securely mounted.
   6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

D. Wiring device will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

**End of Section**

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Section 265119

# LED Interior Lighting

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Interior solid-state luminaires that use LED technology.
2. Lighting fixture supports.

B. Related Requirements:
1. Section 26 09 23 "Lighting Control System" for automatic control of lighting, occupancy sensors, photo sensors, dimmers, and switches.

### 1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color Rendering Index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. LED: Light-emitting diode.

F. Lumen: Measured output of lamp and luminaire, or both.

G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaires.
4. Include emergency lighting units, including batteries and chargers.
5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.

B. Product Schedule: For luminaires and lamps.

## 1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Lighting luminaires.
2. Suspended ceiling components.
3. Partitions and millwork that penetrate the ceiling or extend to within 12 inches (300 mm) of the plane of the luminaires.
4. Structural members to which equipment and/or luminaires will be attached.
5. Initial access modules for acoustical tile, including size and locations.
6. Items penetrating finished ceiling, including the following:

    a. Other luminaires.
    b. Air outlets and inlets.
    c. Speakers.
    d. Sprinklers.
    e. Access panels.
    f. Ceiling-mounted projectors.

7. Moldings.

B. Qualification Data: For testing laboratory providing photometric data for luminaires.

C. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

D. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

E. Product Certificates: For each type of luminaire.

F. Product Test Reports: For each luminaire, for tests performed by manufacturer and witnessed by a qualified testing agency.

G. Sample warranty.

### 1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

### 1.7 QUALITY ASSURANCE

A. Provide luminaires from a single manufacturer for each luminaire type.

B. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

### 1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

### 1.9 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

B. Warranty Period: Minimum five year(s) from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.

1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."

### 2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Standards:

1. ENERGY STAR certified.
2. California Title 24 compliant.
3. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
4. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
5. UL Listing: Listed for damp location.
6. Recessed luminaires shall comply with NEMA LE 4.
7. User Replaceable Lamps:
    a. Bulb shape complying with ANSI C78.79.
    b. Lamp base complying with ANSI C81.61 or IEC 60061-1.

C. Lamps dimmable from 100 percent to 10 percent of maximum light output.

D. Internal driver.

E. Internal emergency battery pack per Luminaire Schedule shown on Drawings.

F. Nominal Operating Voltage: 277 V ac.

1. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless otherwise indicated.

G. Housings:

1. Extruded-aluminum housing and heat sink, unless indicated per Luminaire Schedule shown on Drawings.

H. Metal Parts:

1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

I. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

J. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:

    a. "USE ONLY" and include specific lamp type.
    b. Lamp diameter, shape, size, wattage, and coating.
    c. CCT and CRI for all luminaires.

### 2.3 LUMINAIRE FIXTURE SUPPORT COMPONENTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.

C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).

D. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.

E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before fixture installation. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 TEMPORARY LIGHTING

A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

### 3.3 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Install lamps in each luminaire.

D. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Provide support for luminaire without causing deflection of ceiling or wall.
4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.

E. Flush-Mounted Luminaire Support:

1. Secured to outlet box.
2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
3. Trim ring flush with finished surface.

F. Ceiling-Mounted Luminaire Support:

1. Ceiling mount with two 5/32-inch- (4-mm-) diameter aircraft cable supports adjustable to 120 inches (6 m) in length.
2. Ceiling mount with pendant mount pendant mount with 5/32-inch- (4-mm-) diameter aircraft cable supports adjustable to 120 inches (6 m) in length.
3. Ceiling mount with hook mount.

G. Ceiling-Grid-Mounted Luminaires:

1. Secure to any required outlet box.
2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

H. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

## 3.4 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

## 3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

## 3.6 STARTUP SERVICE

A. Comply with requirements for startup specified in Section 26 09 23 "Lighting Control System".

## 3.7 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of the Architect.

**End of Section**

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# Pathways for Communications Systems

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
   1. Metal conduits and fittings.
   2. Nonmetallic conduits and fittings.
   3. Optical-fiber-cable pathways and fittings.
   4. Metal wireways and auxiliary gutters.
   5. Nonmetallic wireways and auxiliary gutters.
   6. Surface pathways.
   7. Boxes, enclosures, and cabinets.

B. Related Requirements:
   1. Section 26 05 33 "Raceways and Boxes for Electrical Systems" for conduits, wireways, surface raceways, boxes, enclosures, cabinets, handholes, and faceplate adapters serving electrical systems.

### 1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

## 1.4 ACTION SUBMITTALS

A. Product Data: For surface pathways, wireways and fittings, floor boxes, enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

C. Samples: For wireways, nonmetallic wireways, and surface pathways and for each color and texture specified, 12 inches long.

## 1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
   1. Structural members in paths of pathway groups with common supports.
   2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Certificates: For pathway racks, enclosures, cabinets, equipment racks and their mounting provisions, including those for internal components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which certification is based and their installation requirements.
   4. Detailed description of conduit support devices and interconnections on which certification is based and their installation requirements.

**D.** Source quality-control reports.

# PART 2 - PRODUCTS

## 2.1 METAL CONDUITS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. AFC Cable Systems
   2. Allied Tube and Conduit.
   3. Alpha Wire.
   4. Anamet Electrical.
   5. Electri-Flex.

6. O-Z/Gedney.
7. Picoma Industries.
8. Republic Conduit.
9. Robroy Industries.
10. Southwire.
11. Thomas and Betts.
12. Western Tube and Conduit.
13. Wheatland Tube.

B. General Requirements for Metal Conduits and Fittings:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. ARC: Comply with ANSI C80.5 and UL 6A.

E. IMC: Comply with ANSI C80.6 and UL 1242.

F. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
   1. Comply with NEMA RN 1.
   2. Coating Thickness: 0.040 inch, minimum.

G. EMT: Comply with ANSI C80.3 and UL 797.

H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
   2. Fittings for EMT:
      a. Material: Steel or die cast.
      b. Type: compression.
   3. Expansion Fittings: PVC or steel to match conduit type, complying with UL-467, rated for environmental conditions where installed, and including flexible external bonding jumper.
   4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

I. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. AFC.

2. Allied Tube and Conduit.
3. Anamet Electrical.
4. CANTEX.
5. Carlon.
6. CertainTeed.
7. Condux.
8. Dura-Line.
9. Electri-Flex.
10. Kraloy.
11. Niedax.
12. Raco
13. Thomas and Betts

B. General Requirements for Nonmetallic Conduits and Fittings:
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

D. Rigid HDPE: Comply with UL 651A.

E. Continuous HDPE: Comply with UL 651B.

F. RTRC: Comply with UL 1684A and NEMA TC 14.

G. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

H. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

I. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.3 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Alpha Wire.
2. Carlon.
3. Dura-Line.
4. Endot Industries
5. IPEX USA

B. Description: Comply with UL 2024; flexible-type pathway, approved for plenum installation unless otherwise indicated.
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

## 2.4 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. B-Line
   2. Hoffman
   3. MonoSystems
   4. Square D

B. Thomas and Betts

C. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R, Type 4, or Type 12 unless otherwise indicated, and sized according to NFPA 70.
   1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

D. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

E. Wireway Covers: Hinged type, Screw-cover type, or Flanged-and-gasketed type unless otherwise indicated. Coordinate with City.

F. Finish: Manufacturer's standard enamel finish.

## 2.5 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Allied Moulded Products
   2. Carlon
   3. Hoffman
   4. Niedax

B. General Requirements for Nonmetallic Wireways and Auxiliary Gutters:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

C. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.

D. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.

E. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold- down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

F. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.6 SURFACE PATHWAYS

A. General Requirements for Surface Pathways:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

B. Surface Metal Pathways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.

C. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. MonoSystems
   2. Niedax
   3. Panduit
   4. Wiremold/Legrand

D. Surface Nonmetallic Pathways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors. Product shall comply with UL-94 V-0 requirements for self-extinguishing characteristics.

E. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Carlon
   2. MonoSystems

3. Panduit
4. Quazite (Hubbell)
5. Wiremold/Legrand

## 2.7 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Adalet
   2. Carlon
   3. Crouse-Hinds (Eaton)
   4. EGS/Appleton Electric
   5. Erickson Electrical Equipment
   6. FSR
   7. Hoffman
   8. Milbank Manufacturing
   9. Molex
   10. MonoSystems
   11. Oldcastle Enclosure
   12. O-Z/Gedney
   13. Quazite (Hubbell)
   14. RACO (Hubbell)
   15. Robroy Industries
   16. Spring City Electrical Manufacturing
   17. Stahlin Non-Metallic Enclosures
   18. Thomas and Betts
   19. Wiremold/Legrand

B. General Requirements for Boxes, Enclosures, and Cabinets:
   1. Comply with TIA-569-B.
   2. Boxes, enclosures and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet-Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy or aluminum, Type FD, with gasketed cover.

E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

F. Metal Floor Boxes:
   1. Material: Cast metal or sheet metal.
   2. Type: Fully adjustable; or Semi-adjustable.
   3. Shape: Rectangular.
   4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Nonmetallic Floor Boxes: Nonadjustable, rectangular.
   1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum, or galvanized cast iron with gasketed cover.

J. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

K. Gangable boxes are allowed.

L. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

## PART 3 - EXECUTION

### 3.1 PATHWAY APPLICATION

A. Outdoors: Apply pathway products as specified below unless otherwise indicated:
   1. Exposed Conduit: GRC, RNC, Type EPC-40-PVC RNC.
   2. Concealed Conduit, Aboveground: GRC, EMT, or RNC Type EPC-40-PVC.
   3. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R or Type 4.

B. Indoors: Apply pathway products as specified below unless otherwise indicated:
   1. Exposed, Not Subject to Physical Damage: EMT.
   2. Exposed, Not Subject to Severe Physical Damage: EMT.
   3. Exposed and Subject to Severe Physical Damage: GRC. Pathway locations include the following:
      a. Loading dock.
      b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
      c. Mechanical rooms.
   4. Concealed in Ceilings and Interior Walls and Partitions: EMT, RNC, Type EPC- 40-PVC, or innerduct.
   5. Damp or Wet Locations: GRC.
   6. Pathways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: Plenum-type, communications-cable pathway or EMT.
   7. Pathways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: Riser-type, optical-fiber-cable pathway, Riser-type, communications-cable pathway, or EMT.
   8. Pathways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: Plenum-type, optical-fiber-cable pathway; Plenum-type, communications-cable pathway, or EMT.
   9. Boxes and Enclosures: NEMA 250 Type 1, except use NEMA 250 Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Pathway Size: 3/4-inch trade size. Minimum size for optical-fiber cables is 1 inch.

D. Pathway Fittings: Compatible with pathways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
   2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
   3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface pathways only where indicated on Drawings.

G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

## 3.2 INSTALLATION

A. Comply with NECA 1, NECA 101, and TIA-569-B for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum pathways. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.

B. Keep pathways at least 6 inches away from parallel runs of flues and steam or hot- water pipes. Install horizontal pathway runs above water and steam piping.

C. Complete pathway installation before starting conductor installation.

D. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Comply with City, TIA/EIA-569, NEC and CEC.

F. Arrange stub-ups so curved portions of bends are not visible above finished slab.

G. Install no more than the equivalent of two 90-degree bends in any pathway run. Support within 12 inches of changes in direction. Utilize long radius ells for all optical- fiber cables.

H. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

I. Support conduit within 12 inches of enclosures to which attached.

J. Conceal interior conduit under floor slabs and within finished walls, ceilings, and floors where possible. Run conduits in crawl spaces and under floor slabs as if exposed. Install conduit parallel with or at right angles to ceilings, walls, and structural members

where located above accessible ceilings and where conduit is visible after completion of project. Keep conduit minimum 6 inches away from parallel runs of electrical power equipment, flues, steam, and hot water pipes. Install no more than two 90-degree bends for a single horizontal cable run.

K. All conduits shall be properly reamed and bushed with pull ropes installed.

L. Conduits terminating inside of building through floor shall be installed so that the conduit extends a minimum of 4" above finished floor. Conduits terminating inside of building through wall shall terminate in appropriately sized junction box.

M. Provide all coring, patching and painting as needed for Intra-Building and Inter-Building pathways. Caulking is not an acceptable patching method for conduit penetrations into exterior walls. Coordinate with City for acceptable patching methods.

N. Pathways Embedded in Slabs:
1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure pathways to reinforcement at maximum 10-foot intervals.
2. Arrange pathways to cross building expansion joints at right angles with expansion fittings.
3. Arrange pathways to keep a minimum of 2 inches of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
5. Change from ENT to RNC, Type EPC-40-PVC, or GRC before rising above floor.

O. Stub-ups to Above Recessed Ceilings:
1. Use EMT, IMC, or RMC for pathways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
3. In suspended ceiling areas where duct, cable trays or conduit are not available, the Contractor shall bundle, in bundles of 48 or less, station wiring with cable ties snug, but not deforming the cable geometry. Cable bundles shall be supported via "J" hooks attached to the existing building structure and framework at a maximum of four-foot intervals. Properly rated cable ties will be used in all appropriate areas. The Contractor shall adhere to the manufacturers' requirements for bending radius and pulling tension of all data and voice cables. Cables shall not be attached to lift out ceiling grid supports or laid directly on the ceiling grid. Cables shall not be attached to or supported by fire sprinkler lines, HVAC ducting, electrical EMT, lighting fixture or any environmental sensing device located in the ceiling air space. All cable shall be run in transverse or longitudinal paths.

P. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of pathway and fittings before making up joints. Follow compound manufacturer's written instructions.

Q. Coat field-cut threads on PVC-coated pathway with a corrosion-preventing conductive compound prior to assembly.

R. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.

S. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

T. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

U. Cut conduit perpendicular to the length. For conduits of 2-inch trade size and larger, use roll cutter or a guide to ensure cut is straight and perpendicular to the length.

V. Install pull wires in empty pathways. Use polypropylene or monofilament plastic line with not less than 200-lbtensile strength. Leave at least 12 inchesof slack at each end of pull wire.

W. Empty conduits shall be plugged with mechanical type seals to ensure that foreign matter does not enter the building. All empty conduits shall be equipped with mechanical type seal plugs in all pull boxes, junction boxes and within all buildings.

X. All conduits, sleeves and other penetrations will be firestopped and shall be implemented in accordance with UL design guidelines for fire-rated assemblies.

Y. Surface Pathways:
1. Install surface pathway for surface telecommunications outlet boxes only where indicated on Drawings.
2. Install surface pathway with a minimum 2-inch radius control at bend points.
3. Secure surface pathway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight pathway section. Support surface pathway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

Z. Pathways for Optical-Fiber and Communications Cable: Install pathways, metal and nonmetallic, rigid and flexible, as follows:
1. 3/4-Inch Trade Size and Smaller: Install pathways in maximum lengths of 50feet.
2. 1-Inch Trade Size and Larger: Install pathways in maximum lengths of 75 feet.
3. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

AA. Install pathway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install pathway sealing fittings according to NFPA70.

BB. Install devices to seal pathway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all pathways at the followingpoints:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

CC. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.

DD. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F, and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
   c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
   d. Attics: 135 deg F temperature change.
3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

EE. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

FF. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surface to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

GG. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

HH. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

II. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

JJ. Set metal floor boxes level and flush with finished floor surface.

KK. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

## 3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 27 05 44 "Sleeves and Sleeve Seals for Communications Pathways and Cabling."

### 3.4 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

### 3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage or deterioration.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

**End of Section**

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# Communication Building Pathways

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section Includes: Cable tray, conduit, and flexible multi-cell innerduct systems as pathways within buildings to support telecommunications, audio visual, paging, and other signal (low voltage) systems.

B. Related Sections
   1. Comply with the Related Sections.

### 1.2 REFERENCES

A. Comply with the References requirements of Related Sections.

B. In additional to those codes, standards, etc., listed in related sections, products (including fabrication process) and installation shall comply with the latest edition of the following applicable specifications and standards:
   1. ASTM International
      a. ASTM A 123, “Specification for Zinc (Hot Galvanized) Coatings on Iron and Steel”
      b. ASTM A 510, “Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel”
      c. ASTM A 525, “General Requirements for Steel Sheet, Zinc-Coated Galvanized by the Hot-Dip Process”
      d. ASTM A 591, “Specifications for Electrodepositing Coatings of Zinc on steel wire or sheets”
      e. ASTM A 653, “Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process”
      f. ASTM B 633, “Specification for Electrodeposited Coatings of Zinc on Iron and Steel”
      g. ASTM D 769, “Standard Specification for Black Oxide Coatings”
      h. ASTM D3451, “Standard Guide for Testing Coating Powders and Powder Coatings”
   2. National Electrical Manufacturer Association (NEMA)
      a. NEMA FG 1, “Fiberglass Cable Tray Systems”
      b. NEMA VE 1 (also CAN/CSA C22.2 No. 126.1-09), “Metal Cable Tray Systems”
      c. NEMA VE 2, “Cable Tray Installation Guidelines”
   3. National Fire Protection Agency (NFPA)
      a. NFPA 70B, “Recommended Practice for Electrical EquipmentMaintenance”
      b. NFPA 70E, “Standard For Electrical Safety In The Workplace”
   4. Underwriters Laboratories (UL)
      a. UL 467, “Grounding and Bonding Equipment”

## 1.3 DEFINITIONS

A. Definitions in Related Sections apply to this Section.

B. In addition to those Definitions in Related Sections, the following list of terms as used in this Section defined as follows:
   1. "Basket Cable Tray": A cable support and management system fabricated of continuous, rigid, welded steel wire mesh; available in many sizes with attachment hardware suiting multiple installation methods; falls under NFPA 70's definition as cable tray
   2. "Flexible Textile Innerduct Raceway": A multi-cell flexible innerduct system allowing multiple cables to be pulled through a single duct in a duct bank without individual cable twisting around one another.

## 1.4 SYSTEM DESCRIPTION

A. Wire Mesh Cable Tray Systems (Basket Tray):
   1. Provide a complete cable tray system in accordance with CEC Article 392 and Article 250 (for Grounding and Bonding), NEMA VE 1, NEMA VE 2, manufacturer's instructions, and compliant to local inspections and seismic restraint requirements, UL listing requirements, NFPA 70E, NECA's "Standards of Installation" pertaining to general electrical installation practices, and recognized industry practices. Cable tray system shall conform to ANSI/TIA-569-B standard and BICSI TDMM guidelines. Complete shall include straight sections, connectors/splices, bonding straps, supports, etc., necessary for a complete installation. Routes shown on the Drawings are diagrammatic in nature. Field verify route prior to installation.
   2. Supports: Provide supports at each connection point (junction of 2 or more straight sections), direction transitions, at the end of each run, and at other locations necessary to attain a fully supported and seismically braced cable tray system using a structurally-approved anchoring system and in accordance with NEMA VE 2.
      a. Allowable Support Methods:
         1) Trapeze (NEMA VE 2, Figure 4.1G)
         2) Single hanger clip (NEMA VE 2, Figure 4.2)
      b. Disallowable Support Methods:
         1) Center hung (NEMA VE 2, Figure 4.3A)
   3. Seismic Bracing: Provide seismic bracing to supports and tray system. Seismic bracing shall be approved by a structural engineer licensed in the state of California.
   4. Splices: Provide UL classified splice systems by the same manufacturer as the straight sections.
      a. Allowable Splice Methods: washer splice, splice plate, splice bar, wing splice (all splice methods shall be UL Classified)
   5. Bend Radius: Cable tray system shall maintain a 12" (minimum) bend radius throughout
   6. Provide radius shields at each bend/corner of "T" type intersections and cross intersections.
   7. Vertical Offsets: At vertical offsets 36 inch or less, provide a cable dropout on the higher level tray section. At vertical offsets greater than 36 inches, provide a section of tray installed vertically between the upper and lower tray levels.
   8. Bonding and Grounding:
      a. Cable tray shall be electrically continuous maintaining minimum metal area requirements per NFPA 70 Table 392.7 (for use as an equipment grounding conductor). Where straight sections or field fittings have been modified during installation such that wires have been removed, provide bonding straps or other approved accessories to maintain

minimum continuous area per electrical code.

b. Provide external bonding strap at connections, expansion joints, sleeves, crossovers, and at other locations where system continuity is interrupted.

c. Bond cable tray system to approved ground, as per CEC Article 250, using approved connection means.

9. Dropouts:
   a. Provide dropouts as shown on the drawings. If not shown on the drawings provide cable dropouts above each server and network cabinet.
   b. In locations that require 18" wide or 24" wide dropouts, combine one 12" wide dropout with one 6" wide dropout to create an 18" wide dropout, or two 12" wide dropouts to create a 24" wide dropout.
10. Provide blind ends where tray termination is exposed (e.g., not at a wall).

B. Penetrations:
   1. Penetrate partitions and other construction assemblies, including fire rated assemblies, smoke barriers, smoke partitions, acoustic rated assemblies, etc., using approved methods.
   2. When penetrating concrete walls (including shear walls) and/or floors, scan the area to be penetrated and core openings using methods approved by the structural engineer and by the AHJ. Obtain written approval for locations and means when not using methods included in the contract documents.

C. Provide multi-cell textile flexible innerduct system allowing multiple cables to be pulled through a single duct in a duct bank without individual cable twisting around one another. Refer to Site Plan for conduit locations and quantity of cells in a duct.

D. Provide flexible corrugated split duct from floor boxes to system furniture baseboards.

E. Provide the appropriate duct plugs in all OSP conduit entering both buildings in the MDF and MPOE rooms.

## 1.5 SUBMITTALS

A. General: Conform to Submittal requirements as described in Related Sections.

B. Quantity: Furnish quantities of each submittal as noted in Related Sections.

C. Submittal Requirements Prior to the Start of Construction:
   1. Product Data: Submit product data showing manufacturers, part numbers, dimensions, fabrications materials, fabrication details, finishes, capacities, and accessories; also include certifications (factory-certified test reports of specified products, complying with IEC 61537, CEC, and NEMA VE 1).
      a. Submittal should include manufacturer's certification indicating ISO 9001 quality certified
   2. Shop Drawings: Submit shop drawings consisting of the following:
      a. Cable tray layout/routes, supports locations, support details
      b. Highlight proposed changes to pathways (routes, types, sizes, etc.) compared to the contract documents
      c. Clearance variations and/or requests for exceptions
      d. Seismic bracing details (also see "Seismic Calculations" below)

e. Instances of penetrations through fire and smoke rated barriers, including calling out firestopping type/UL System, size, quantity, and other relevant information

3. Seismic Calculations: Submit seismic calculations for support systems in conformance to Related Sections. Structural Calculations shall be prepared and signed by a California Registered Structural Engineer. If used, specify proof loads for drilled-in anchors.

D. Submittal Requirements at Close Out:
1. As-Built Drawings, showing the routes, dimensions, types, sizes, quantities, etc. (minimum)
2. O&M Manual, including as-builts, parts list, repair information, and maintenance requirements

E. Substitutions
1. Requests for substitutions shall conform to the general requirements and procedure outlined in Related Sections.

### 1.6 QUALITY ASSURANCE

A. Comply with Quality Assurance requirements of Related Sections.

B. Manufacturer shall make available test reports witnessed by an independent testing laboratory of the "worst case" loading conditions and performed in accordance with the latest revision of NEMA VE 1

C. Materials and installation shall comply with CEC – construction and installation of cable tray and cable channel systems per Article 318, bonding per Article 250, and other articles as applicable per instance.

D. Installation shall comply with NFPA 70B, "Recommended Practice for Electrical

E. Equipment Maintenance".

### 1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with Delivery, Storage and Handling requirements of Related Sections.

### 1.8 WARRANTY

A. Comply with Warranty requirements of Related Sections.

## PART 2 - PRODUCTS

### 2.1 BASKET CABLE TRAY-COLUMN CAP BRIDGE

A. Application: Suitable for the support and management of communications cables overhead.

B. Tray shall be manufactured in accordance with NEMA VE1.

C. Material: Straight sections shall be fabricated from high strength steel wires and formed into a 2-inch by 2-inch (or 2-inch by 4-inch) wire mesh pattern with welded wire intersections. Wires shall meet the minimum mechanical properties of ASTM A51. Longitudinal wires shall be straight (with no bends). Wires diameter should be approximately 0.16" (4mm). Wire ends shall be rounded during manufacturing (for safety of cables and installers) or T-welded to the top wire along sides (flanges).

D. Finish: Electroplated Zinc Galvanized Finish.

E. Splicing assemblies shall be the bolted-type using serrated flange locknuts. Hardware shall be powder coated white

F. Size: Refer to Drawings for sizes.

G. Manufacturers:
   1. B-Line Flextray
      a. #FT4X20X10; 4" x "20 wire mesh cable tray, Zinc Galvanized
      b. #FTA2FS; 1-5/8" floor stand
      c. #WBUFA; floor stand adhesive
   2. Or approved equal

## 2.2 EZ-PATH" FIRE RATED ASSEMBLIES

A. Application: Suitable for the support and management of communications (and other low voltage) cables through walls and floors in the telecom rooms and throughout the user space as a "fire rated assembly".
   1. Cables passing through fire-rated floors or walls shall pass through fire-rated wiring devices, which contain an intumescent insert material that adjusts automatically to cable additions or subtractions.

   2. The device shall have an F Rating equal to the rating of the barrier in which the device is installed.
   3. Wiring devices shall be capable of allowing a 0 to 100-percent visual fill of cables.
   4. Wire devices shall be of a sufficient size to accommodate the quantity and size of electrical wires and data cables required.
   5. Wire devices to be provided with steel wall plates allowing for single or multiple devices to be ganged together.

B. Manufacturer:
   1. STI
      a. #EZDP44; EZ-Path MAX pathway kit
      b. #EZP544W; multi-gang wall bracket for 1 to 5 pathways
      c. #SSS100; SpecSeal In tumescent sealant 10.1 oz. tube
      d. #PEN300; Pensil Silicone sealant 10.3 oz. tube
      e. Or approved equal

## 2.3 MULTI-CELL TEXTILE FLEXIBLE INNERDUCT SYSTEM

A. Flexible optical fiber/copper communication raceway.

B. Provide wire management in a building for fiber optic / copper communications cabling.

C. A non-metallic raceway, usually circular, placed within a larger raceway. (Sub duct)
   1. White Polyester and Nylon resin polymer
   2. Standard Outdoor Textile Innerduct: Micro (33mm), 4-inch single three-cell polyester/nylon textile innerduct containing 1250lb polyester flat woven pull tape.

D. Manufacturer:
   1. MaxCell
      a. #MXC4003XX; 4" three-cell textile flexible innerduct
      b. No known equal

## 2.4 CONSOLIDATION POINT BOXES: (UNDERFLOOR)

A. Consolidation boxes shall be suitable for mounting multiple patch panels, terminating and organizing cables into groups extending out to furniture pods and user outlet locations.

B. Boxes shall be 24" x 24" underfloor enclosures and accessible by removing the raised floor tile.

C. Enclosure will have fabric socks to seal around cables entering and exiting consolidation points.

D. Enclosures will have cable entry pathways that block air movement from leaking in.
   1. Consolidation will be drop-in type, utilizing the floor tile as a cover
   2. Enclosures will have cable entry pathways that block air movement from leaking in.

E. Manufacturer:
   1. Leviton
      a. #Z1000-PF2: Raised Floor Enclosure, 8" depth, 8RU
   2. Or approved equal by Systimax
   3. Or approved equal by Panduit

## 2.5 SPIRAL WRAP

A. Application: Suitable for an indoor installation for the support of telecommunications cables from a feed pathway to furniture systems or similar.

B. Designed and manufactured as a continuously extruded corrugated pipe. Material shall be flame retardant polyethylene (UL94V-0), or equivalent.

C. Color: Black.

D. Size: As required to support the cable bundle. Minimum size 3/4".

E. Manufacturers:
   1. Panduit
   2. Or approved equal

### 2.6 DUCT PLUGS

A. Application: Duct plugs suitable for installation into duct ends) for sealing ducts against water ingress and for securing innerducts and cables against recoil.

B. Manufacturers:
   1. Tyco
      a. #377850 (JM-BLA-40D402U); blank plug for 4-inch duct (3.94”-4.17”)
      b. #40B167S; “triplex” duct plug for 4-inch conduit with 3 ports
      c. #40Q136S; “quadplex’ duct plug for 4-inch conduit with 4 ports
      d. #187308 (JM-BLA-12D148U); blank plug for 1.25-inch duct (1.14”-1.48”)
      e. #10S035S; simplex/port plug for 1 cable in 1-inch (ID) port
      f. #11S057SB; “simplex” duct plug for 1¼-inch (ID) port
   2. Or equal by Carlon

## PART 3 - EXECUTION

### 3.1 GENERAL

A. Comply with the Execution requirements of Related Sections.

B. Install cable tray systems in accordance with manufacturers’ instructions, with NEMA VE2 and with recognized industry practices, Install cable tray systems compliant to requirements of CEC, applicable portions of NFPA 70B, and to NECA's “Standards of Installation” pertaining to general electrical installation practices.

### 3.2 PREPARATION

A. Plan routes and locations of pathway systems and coordinate with other trades/systems (ductwork, plumbing, electrical raceways, wall construction, ceilings, etc.). Pathway systems shall not unnecessarily cross other trade’s work, shall not prevent removal of ceiling tiles or panels, and shall not block access to mechanical or electrical equipment. Provide offsets as required to avoid obstruction of pathway systems with other trades.

B. Prior to installation, examine areas to receive pathways systems to verify conditions are ready for work and to verify conformance with manufacturer and specification tolerances. Notify the Owner’s Representative in writing of conditions that would adversely affect the installation, or subsequent utilization, of the system. Proceed with installation when unsatisfactory conditions are corrected.

## 3.3 INSTALLATION

A. Do not anchor supports from ductwork, piping, or other equipment hangers. Attach supports to the exterior of the cable tray. Do not install brackets, rods, etc., through the inside of the cable tray

B. Ensure no other trades/building systems conflict with cable tray systems and clearances. Other building infrastructure, such as columns, pipes, valves, etc., shall not route inside or through cable tray. Either relocate/alter other building infrastructure (preferred) or, if other building infrastructure cannot be altered, adjust the cable tray route to avoid conflicts other building infrastructure, remaining accessible for maintenance type of work.

C. Install cable trays parallel or at right angles to the centerlines of columns and beams.

D. Round edges and smooth surfaces to eliminate sharp edges and spurs that could damage (cut, puncture, etc.) cable jackets

E. Thoroughly clean surfaces receiving connections for bonding.

F. Clearances: Ensure clearance and access requirements to cable tray – above, below, and side – as shown on the drawings are met. Coordinate with other trades to avoid other building infrastructure encroaching on access/clearance.

G. Fabricate fittings (tee, cross, reducers, and 90-degree turns) in the field according to the manufacturer's instructions and to ensure the pathway system remains UL listed. Fabricate fittings by cutting wires with a cutting device approved by the manufacturer. Cut wires in a manner that minimizes sharp edges and projections to prevent damage to cables (such as cut outer jacket) or harm to installation personnel. Provide corner connectors that provide a radius on the inside corner of bends for horizontal 90 degree bends, tees, and crosses. Bends shall have a minimum of a 12-inch bend radius.

H. At transition to and/or interface with conduit, align conduit directly over cable tray.

I. Flexible textile Standard Outdoor Textile Innerduct:
   1. Provide continuous textile flexible innerduct in conduit, between maintenance holes, pull boxes and/or termination points as indicated on the site drawings.
   2. Make a 2" incision, approximately 18" from the end of textile innerduct. Pull out and cut off approximately 2 feet of pull-tape. Thus allowing the pull tape ends to retract back into the cells.
   3. Using approximately 6 feet of pull tape, tie a non-slip knot to the incision. Then tie 3 to 6 half-hitch knots down to the end of textile innerduct. Apply black vinyl tape over all knots and the end of textile innerduct. Using a Bow Line knot tie a swivel to the end of 3 feet pull tape.
   4. Using a Bow Line knot, attach the pull rope located in the rigid conduit to the other end of the swivel.
   5. Provide suitable textile innerduct slack in the maintenance holes, hand holes, pull boxes, and at turns to ensure there is no kinking or binding of the product.

J. Bonding and Grounding:
   1. Bond system per "System Description" requirements.
   2. For aluminum cable tray, apply anti-oxidant compound to tray surface before contact with bonding accessories.

K. Protection: Protect installed system until completion of project. Touch-up, repair or replace damaged products before punch walk.

## 3.4 PRE-FUNCTIONAL TESTING

A. After installing cable tray systems, perform the following pre-functional testing.

B. Visually inspect the completed cable tray system for intrusion of items such as pipe, hangers, or other equipment. If found, notify Engineer (explain in detail the conflict and suggest means to eliminate the conflict). Adjust cable tray as approved to eliminate spatial conflict and to ensure clearance.

C. Visually inspect the completed cable tray system for mechanical continuity at each cable tray joint, fitting, junction, attachment to supports (e.g., hold-down clips), etc. Check the hardware for missing or damaged bolts, bolt heads, or nuts – if found, replace with specified hardware Check bolted connections between sections for corrosion. Clean and retorque in suspect areas.

D. Visually inspect seismic bracing. Ensure each instance complies with approved methods and is complete (anchors, stiffeners, hardware, etc). Check the hardware for missing or damaged bolts, bolt heads, or nuts – if found, replace with specified hardware Check bolted connections between sections for corrosion. Clean and retorque in suspect areas.

E. Visually inspect the barriers to ensure they have been installed per dimensions specified

F. Visually inspect the cover to ensure they have been installed as require

G. Visually inspect the completed cable tray system for vibration. If excessive vibration is found, provide vibration isolation apparatus as needed to eliminate vibration.

H. Visually inspect the completed cable tray system for thermal expansion and contraction conditions. If thermal expansion is identified, provide expansion fittings and other apparatus necessary to eliminate (or mitigate) expansion (and/or contraction).

I. Visually inspect the completed cable tray system for electrical continuity at each cable tray joint and each ground connection. Ensure adequacy of cable tray grounding. Verify that takeoff raceways are bonded to cable tray.

J. Visually inspect the completed cable tray system for sharp edges and corners. If found, grind or file edges and corners to smooth.

K. Visually inspect the completed cable tray system for deflections and protuberances; correct any not within specifications

L. Clean cable tray system: Remove deposits of dust, scrap materials, trash of any description, and any blockage of tray ventilation

M. Record results of visual inspections. Submit pre-functional report to Engineer.

## 3.5 TESTING

A. Test cable tray systems in accordance with NFPA 70B Chapter 21 for electrical continuity and connection to approved ground. Measure ground resistance; verify cable tray is bonded to approved ground with a total resistance less than 5 ohms. Adjust bondingas needed to meet this requirement.

## 3.6 PROTECTION

A. Protect installed products until completion of project
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by cable tray manufacturer.
   2. Repair damage to paint finishes with matching touchup coating recommended by cable tray manufacturer.
   3. Install temporary protection for cables in open trays to protect exposed cables from falling objects or debris during construction. Temporary protection for cables and cable tray can be constructed of wood or metal materials until the risk of damage is over.

B. Touch-up, repair or replace damaged products before Substantial Completion.

## 3.7 DUCT PLUGS

A. Provide blank duct plugs in each unused duct at each building entrance, and MPOE/MDF to seal ducts.

B. Provide the appropriate duct plug at conduit entrance in the MPOE and MDF to secure cable/innerducts and seal ducts.

## 3.8 FINAL INSPECTION AND CERTIFICATION

A. Punch the work of this section compliant to the requirements of Related Sections.

B. Comply with system acceptance and certification requirements of Related Sections.

**End of Section**

# Sleeves & Sleeve Seals for Comm Pathways and Cabling

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
1. Sleeves for pathway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

## PART 2 - PRODUCTS

### 2.1 SLEEVES

A. Wall Sleeves:
1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:
   1. Material: Galvanized-steel sheet.
   2. Minimum Metal Thickness:
      a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
      b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

## 2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Advance Products and Systems
   2. CALPICO
   3. HOLDRITE
   4. Metraflex
   5. Pipeline Seal and Insulation
   6. Proco Products
   7. Sealing Elements: EPDM or Nitrile (Buna N) rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   8. Pressure Plates: Carbon steel, Plastic, or Stainless steel.
   9. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating or Stainless steel of length required to secure pressure plates to sealing elements.

## 2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. HOLDRITE

## 2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non- fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

## 2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
   1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
   2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

# PART 3 - EXECUTION

## 3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
   1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
      a. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint.
      b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
   2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and pathway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between pathway or cable and sleeve for installing sleeve-seal system.

## 3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at pathway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

## 3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

**END OF SECTION**

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# Conductors and Cables for Electronic Safety and Security

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
   1. RS232 Cable
   2. RS485 Cable
   3. Fire alarm wire and cable.
   4. Identification products.

### 1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. IDC: Insulation displacement connector.

C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.

D. Open Cabling: Passing telecommunications cabling through open space (e.g., between the studs of a wall cavity).

E. RCDD: Registered Communications Distribution Designer.

### 1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate layout and installation of electronic safety and security cabling with Owner's telecommunications and LAN equipment and service suppliers.

B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

### 1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Installation data for cables or conductors.
B. Shop Drawings:
   1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
   2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
   3. Cabling administration drawings and printouts.
   4. Wiring diagrams to show typical wiring schematics, including the following:
      a. Cross-connects.
   5. Cross-connects. Detail mounting assemblies, and show elevations and physical relationship between the installed components.

### 1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

B. Source quality-control reports.

C. Field quality-control reports.

### 1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: An NRTL.
   1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

### 1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.
   1. Test optical-fiber cable to determine the continuity of the strand, end to end. Use optical-fiber flashlight or optical loss test set.
   2. Test optical-fiber cable on reels. Use an optical time domain reflectometer to verify the cable length, and locate cable defects, splices, and connector; include the loss value of each. Retain test data and include the record in maintenance data.
   3. Test each pair of UTP cable for open and short circuits.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or 450, or less. Coordinate with City.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.2 BACKBOARDS

A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements for plywood backing panels in Division 6.

## 2.3 RS-232 CABLE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Allied Wire & Cable, Inc.
2. Belden, Inc.
3. General Cable Technologies
4. Genesis Cable Products
5. Southwire

B. Standard Cable: NFPA 70, Type CM.
1. Nine, No. 22 AWG, stranded (7x30) tinned copper conductors.
2. Polypropylene insulation.
3. Aluminum foil-polyester tape shield with 100 percent shield coverage.
4. PVC jacket.
5. Conductors are cabled on common axis with No. 24 AWG, stranded (7x32) tinned copper drain wire.
6. Flame Resistance: Comply with UL 1581.

C. Plenum-Rated Cable: NFPA 70, Type CMP.
1. Nine, No. 22 AWG, stranded (7x30) tinned copper conductors.
2. PE insulation.
3. Aluminum foil-polyester tape shield with 100 percent shield coverage.
4. Fluorinated ethylene propylene jacket.
5. Conductors are cabled on common axis with No. 24 AWG, stranded (7x32) tinned copper drain wire.
6. Flame Resistance: Comply with NFPA 262.

## 2.4 RS-485 CABLE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Allied Wire & Cable, Inc.
2. Belden, Inc.
3. General Cable Technologies
4. Genesis Cable Products
5. Southwire

B. Standard Cable: NFPA 70, Type CM or Type CMG.
   1. Paired, two pairs, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors.
   2. PVC insulation.
   3. Unshielded.
   4. PVC jacket.
   5. Flame Resistance: Comply with UL 1581.
   6.

C. Plenum-Rated Cable: NFPA 70, Type CMP.
   1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned copper conductors.
   2. Fluorinated ethylene propylene insulation.
   3. Unshielded.
   4. Fluorinated ethylene propylene jacket.
   5. Flame Resistance: NFPA 262, Flame Test.

## 2.5 FIRE ALARM WIRE AND CABLE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Allied Wire & Cable, Inc.
   2. CommScope
   3. Comtran Corporation
   4. Draka Cableteq USA
   5. Genesis Cable Products
   6. Rockbestos-Suprenant Cabling
   7. Superior Essex
   8. West Penn Wire

B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.

C. Signaling Line Circuits: Twisted, shielded pair, not less than No. 18 AWG or size as recommended by system manufacturer.
   1. Circuit Integrity Cable: Twisted shielded pair, NFPA 70, Article 760, Classification CI, for power-limited fire alarm signal service Type FPL. NRTL listed and labeled as complying with UL 1424 and UL 2196 for a two-hourrating.

D. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.
   1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
   2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.
   3. Multiconductor Armored Cable: NFPA 70, Type MC, copper conductors, Type TFN/THHN conductor insulation, copper drain wire, copper armor with outer jacket with red identifier stripe, NTRL listed for fire alarm and cable tray installation, plenum rated.

## 2.6 IDENTIFICATION PRODUCTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that

may be incorporated into the Work include, but are not limited to the following:

1. Brady Corporation
2. Hellermann Tyton
3. Kroy LLC
4. Panduit Corp

B. Comply with TIA-606-B and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

C. Comply with requirements in Section 26 0553 "Identification for Electrical Systems."

### 2.7 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test UTP and optical-fiber cables on reels according to TIA-568-C.1.

C. Factory test UTP cables according to TIA-568-C.2.

D. Factory test multimode optical fiber cables according to TIA-526.14-B and TIA-568-C.3.

E. Factory sweep test coaxial cables at frequencies from 5 MHz to 1 GHz. Sweep test shall test the frequency response, or attenuation over frequency, of a cable by generating a voltage whose frequency is varied through the specified frequency range and graphing the results. Structural Return Loss shall be less than 20 db.

F. Cable will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF HANGERS AND SUPPORTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for installation of supports for cables.

### 3.2 WIRING METHOD

A. Install wiring in metal pathways and wireways.
   1. Minimum conduit size shall be 3/4 inch. Control and data-transmission wiring shall not share conduits with other building wiring systems.

B. Install cable, concealed in accessible ceilings, walls, and floors when possible.

C. Wiring on Racks and within Enclosures:
   1. Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM's "Cabling Termination Practices" chapter. Cable ties shall not be excessively tightened such that the transmission characteristics of the cable are altered.
   2. Install lacing bars and distribution spools.
   3. Separate power-limited and non-power-limited conductors as recommended in writing by manufacturer.
   4. Install conductors parallel with or at right angles to sides and back of enclosure.
   5. Connect conductors associated with intrusion system that are terminated, spliced, or interrupted in any enclosure onto terminal blocks.
   6. Mark each terminal according to system's wiring diagrams.
   7. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

## 3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with NECA 1 and NFPA 70.

B. Conductors: Size according to system manufacturer's written instructions unless otherwise indicated.

C. Do not install conductors and cables that are wet, moisture damaged, or mold damaged.

D. Install UTP, optical-fiber, and coaxial cables and connecting materials after spaces are complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

E. General Requirements for Cabling:
   1. Comply with TIA-568-C.1.
   2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
   3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels. Leave a minimum of 6 inches of slack at outlet terminations and coil loosely into box after termination on outlet fitting.
   4. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
   5. Maintain minimum cable bending radius during installation and termination of cables.
   6. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
   7. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
   8. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions. Do not exceed manufacturer's rated cable-pulling tension.
   9. Riser Cable: Riser cable support intervals shall be in accordance with manufacturer's recommendations.

F. UTP Cable Installation: Install using techniques, practices, and methods that are consistent with Category

6 rating of components and that ensure Category 6 performance of completed and linked signal paths, end to end.

1. Comply with TIA-568-C.2.
2. Install 110-style IDC termination hardware unless otherwise indicated.
3. Do not untwist UTP cables more than 1/2 inch from point of termination to maintain cable geometry.

G. Installation of Cable Routed Exposed under Raised Floors:

1. Install plenum-rated cable only.
2. Install cabling after the flooring system has been installed in raised floor areas.
3. Cable 72 inches long shall be neatly coiled not less than 12 inches in diameter below each feed point.

H. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA-569-C recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communication cables or cables in nonmetallic pathways and unshielded power conductors and electrical equipment shall be as follows:
   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
3. Separation between communication cables in grounded metallic pathways and unshielded power lines or electrical equipment shall be as follows:
   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
4. Separation between cables in grounded metallic pathways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
5. Separation between Cables and Electrical Motors and Transformers, 5 kVA or hp and Larger: A minimum of 48 inches.
6. Separation between Cables and Fluorescent Fixtures: A minimum of 5 inches.

## 3.4 FIRE ALARM WIRING INSTALLATION

A. Comply with NECA 1 and NFPA 72.

B. Wiring Method: Install wiring in metal pathway according to Section 280528 "Pathways for Electronic Safety and Security."

1. Install plenum cable in environmental air spaces, including plenum ceilings.
2. Fire alarm circuits and equipment control wiring associated with the fire alarm system shall be installed in a dedicated pathway system. This system shall not be used for any other wire or cable.

C. Wiring Method:

1. Cables and pathways used for fire alarm circuits, and equipment control wiring associated with the fire alarm system, may not contain any other wire or cable.

2. Fire-Rated Cables: Use of two-hour, fire-rated fire alarm cables, NFPA 70, Types MI and CI, is not permitted unless approved by the district.
3. Signaling Line Circuits: Power-limited fire alarm cables shall not be installed in the same cable or pathway as signaling line circuits unless approved by the district.

D. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points

with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp- on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

E. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.

F. Color Coding: Color code fire alarm conductors differently from the normal building power wiring. Use one color code for alarm circuit wiring and another for supervisory circuits. Color code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire alarm system junction boxes and covers red.

G. Risers: Install at least two vertical cable risers to serve the fire alarm system. Separate risers in close proximity to each other with a minimum one-hour-rated wall, so the loss of one riser does not prevent the receipt or transmission of signals from other floors or zones.

H. Wiring to Remote Alarm Transmitting Device: 1-inch conduit between the fire alarm control panel and the transmitter. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

## 3.5 POWER AND CONTROL-CIRCUIT CONDUCTORS

A. 120-V Power Wiring: Install according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables" unless otherwise indicated.

B. Minimum Conductor Sizes:
1. Class 1 remote-control and signal circuits, No. 14 AWG.
2. Class 2 low-energy, remote-control and signal circuits, No. 16 AWG.
3. Class 3 low-energy, remote-control, alarm and signal circuits, No. 12 AWG.

## 3.6 CONNECTIONS

A. Comply with requirements in Section 28 3111 "Digital, Addressable Fire-Alarm System" for connecting, terminating, and identifying wires and cables.

## 3.7 FIRESTOPPING

A. Comply with requirements in Division 07.

B. Comply with TIA-569-C, "Firestopping" Annex A.

C. Comply with BICSI TDMM, "Firestopping Systems" Article.

## 3.8 GROUNDING

A. For communication wiring, comply with J-STD-607-A and with BICSI TDMM's "Grounding, Bonding, and Electrical Protection" chapter.

B. For low-voltage wiring and cabling, comply with requirements in Section 280526 "Grounding and Bonding for Electronic Safety and Security."

## 3.9 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA-606-B. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

## 3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests andinspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
   1. Visually inspect UTP and optical-fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations to confirm color coding for pin assignments, and inspect cabling connections to confirm compliance with TIA- 568-C.1.
   2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
   3. Test UTP cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross connection.
      a. Test instruments shall comply with or exceed applicable requirements in TIA-568-C.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
   4. Optical-Fiber Cable Tests:
      a. Test instruments shall comply with or exceed applicable requirements in TIA-568-C.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
      b. Link End-to-End Attenuation Tests:
         1) Multimode Link Measurements: Test at 850 or 1300 nm in one direction according to TIA-526-14-B, Method B, One Reference Jumper.
         2) Attenuation test results for links shall be less than 2.0 db. Attenuation test results shall be less than that calculated according to equation in TIA-568-C.1.

5. Coaxial-Cable Tests:
   a. Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements.
   b. Replace malfunctioning or damaged items.
   c. Retest until satisfactory performance and conditions are achieved.
   d. Use an agile receiver and signal strength meter or spectrum analyzer for testing.
   e. CCTV Sources: Connect receiver to the output of each CCTV signal source or the distribution amplifier associated with it.
   f. Test Schedule: Schedule tests after pretesting has successfully been completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.
   g. Operational Tests: Perform tests of operational system to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.
   h. Distribution System Acceptance Tests:
      1) Field-Strength Instrument: Rated for minus 40-db mV measuring sensitivity and a frequency range of 54 to 812 MHz, minimum. Provide documentation of recent calibration against recognized standards.
      2) Signal Level and Picture Quality: Use a field-strength meter or spectrum analyzer, as well as a standard television receiver, to measure signal levels and check picture quality at all user-interface outlets.
         a) Test the signal strength in db mV at 55, 151, 547, and 750 MHz.
         b) Minimum acceptable signal level is zero db mV (1000 mV).
         c) Maximum acceptable signal level over the entire bandwidth is 15 db mV.
         d) Television receiver shall show no evidence of cross-channel intermodulation, ghost images, or beat interference.
   i. Signal-to-Noise-Ratio Test: Use a field-strength meter to make a sequence of measurements at the output of the last distribution amplifier or of another agreed-on location in system. With system operating at normal levels, tune meter to the picture carrier frequency of each of the designated channels in turn, and record the level. With signal removed and input to corresponding headend amplifier terminated at 75 ohms, measure the level of noise at same tuning settings. With meter correction factor added to last readings, differences from first set shall not be less than 45 db.
   j. Qualitative and Quantitative Performance Tests: Demonstrate reception quality of color-television program transmissions at each user interface from each designated channel and source. Quality shall be equal or superior to that obtained with performance checks specified below, using a standard, commercial, cable-ready, color-television receiver. Level and quality of signal at each outlet and from each service and source shall comply with the following Specifications when tested according to 47 604- 12 76:
      1) RF video-carrier level.
      2) Relative video-carrier level.
      3) Carrier-level stability, during 60-minute and 24-hour periods.
      4) Broadband frequency response.
      5) Channel frequency response.
      6) Carrier-to-noise ratio.
      7) RF visual signal-to-noise ratio.
      8) Antenna combiner insertion loss.
      9) Signal power splitter loss.
      10) Cable connector attenuation.
      11) Cross modulation.
      12) Carrier-to-echo ratio.

13) Composite triple beat.
14) Second order beat.
15) Terminal isolation.
16) Terminal isolation between television and FM.
17) Hum modulation.
18) RF FM carrier level.
19) FM frequency response.
20) FM carrier-to-noise ratio.

D. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in BICSI TDMM as a guide, or transfer the data from the instrument to the computer, save as text files, print, and submit.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

**End of Section**

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# Pathways for Electronic Safety and Security

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
1. Metal conduits, tubing, and fittings.
2. Nonmetallic conduits, tubing, and fittings.
3. Optical-fiber-cable pathways and fittings.
4. Metal wireways and auxiliary gutters.
5. Nonmetallic wireways and auxiliary gutters.
6. Surface pathways.
7. Boxes, enclosures, and cabinets.
8. Handholes and boxes for exterior underground cabling.

B. Related Requirements:
1. Section 26 0533 "Raceways and Boxes for Electrical Systems" for conduits, wireways, surface raceways, boxes, enclosures, cabinets, handholes, and faceplate adapters serving electrical systems.
2. Section 27 0528 "Pathways for Communications Systems" for conduits, surface pathways, innerduct, boxes, and faceplate adapters serving communications systems.

### 1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

### 1.4 ACTION SUBMITTALS

A. Product Data: For surface pathways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Sustainable Design Submittals:

C. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

D. Samples: For wireways, nonmetallic wireways, and, surface pathway and for each color and texture specified, 12 inches long.

### 1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
   1. Structural members in paths of pathway groups with common supports.
   2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Certificates: For pathway racks, enclosures, cabinets, and equipment racks and their mounting provisions, including those for internal components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which certification is based and their installation requirements.
   4. Detailed description of conduit support devices and interconnections on which certification is based and their installation requirements.

D. Source quality-control reports.

## PART 2 - PRODUCTS

### 2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. AFC Cable Systems
   2. Allied Tube and Conduit.
   3. Alpha Wire.
   4. Anamet Electrical.
   5. Electri-Flex.
   6. O-Z/Gedney.
   7. Picoma Industries.
   8. Republic Conduit.
   9. Robroy Industries.
   10. Southwire.

11. Thomas and Betts.
12. Western Tube and Conduit.
13. Wheatland Tube.

B. General Requirements for Metal Conduits and Fittings:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. ARC: Comply with ANSI C80.5 and UL 6A.

E. IMC: Comply with ANSI C80.6 and UL 1242.

F. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
   1. Comply with NEMA RN 1.
   2. Coating Thickness: 0.040 inch, minimum.

G. EMT: Comply with ANSI C80.3 and UL 797.

H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
   2. Fittings for EMT:
      a. Material: Steel or die cast.
      b. Type: compression.
   3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 467, rated for environmental conditions where installed, and including flexible external bonding jumper.
   4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

I. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. AFC.
   2. Allied Tube and Conduit.
   3. Anamet Electrical.
   4. CANTEX.
   5. Carlon.
   6. CertainTeed.
   7. Condux.
   8. Dura-Line.
   9. Electri-Flex.
   10. Kraloy.
   11. Niedax.

12. Raco
13. Thomas and Betts

B. General Requirements for Nonmetallic Conduits and Fittings:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

D. Rigid HDPE: Comply with UL 651A.

E. Continuous HDPE: Comply with UL 651B.

F. RTRC: Comply with UL 1684A and NEMA TC 14.

G. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

H. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

I. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.3 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Alpha Wire.
   2. Carlon.
   3. Dura-Line.
   4. Endot Industries
   5. IPEX USA

B. Description: Comply with UL 2024; flexible-type pathway, approved for plenum installation unless otherwise indicated.
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

## 2.4 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. B-Line
   2. Hoffman
   3. MonoSystems
   4. Square D

B. Thomas and Betts

C. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R, Type 4, or Type 12 unless otherwise indicated, and sized according to NFPA 70.
   1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

D. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

E. Wireway Covers: Hinged type, Screw-cover type, or Flanged-and-gasketed type unless otherwise indicated. Coordinate with Sacred Heart.

F. Finish: Manufacturer's standard enamel finish.

## 2.5 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Allied Moulded Products
   2. Carlon
   3. Hoffman
   4. Niedax

B. General Requirements for Nonmetallic Wireways and Auxiliary Gutters:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

C. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.

D. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.

E. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

F. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.6 SURFACE PATHWAYS

A. General Requirements for Surface Pathways:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Comply with TIA-569-B.

B. Surface Metal Pathways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.

C. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. MonoSystems
   2. Niedax
   3. Panduit
   4. Wiremold/Legrand

D. Surface Nonmetallic Pathways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors. Product shall comply with UL-94 V-0 requirements for self-extinguishing characteristics.

E. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Carlon
   2. MonoSystems
   3. Panduit
   4. Quazite (Hubbell)
   5. Wiremold/Legrand

## 2.7 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Adalet
   2. Carlon
   3. Crouse-Hinds (Eaton)
   4. EGS/Appleton Electric
   5. Erickson Electrical Equipment
   6. FSR
   7. Hoffman
   8. Milbank Manufacturing
   9. Molex
   10. MonoSystems
   11. Oldcastle Enclosure
   12. O-Z/Gedney
   13. Quazite (Hubbell)
   14. RACO (Hubbell)
   15. Robroy Industries
   16. Spring City Electrical Manufacturing

17. Stahlin Non-Metallic Enclosures
18. Thomas and Betts
19. Wiremold/Legrand

B. General Requirements for Boxes, Enclosures, and Cabinets:
   1. Comply with TIA-569-B.
   2. Boxes, enclosures and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet-Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy or aluminum, Type FD, with gasketed cover.

E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

F. Metal Floor Boxes:
   1. Material: Cast metal or sheet metal.
   2. Type: Fully adjustable; or Semi-adjustable.
   3. Shape: Rectangular.
   4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Nonmetallic Floor Boxes: Nonadjustable, rectangular.
   1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum, or galvanized cast iron with gasketed cover.

J. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

K. Gangable boxes are allowed.

L. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

M. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1, Type 3R, Type 4, or Type 12 with continuous-hinge cover with flush latch unless otherwise indicated.
   1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
   2. Nonmetallic Enclosures:
      a. Material: Plastic.
      b. Finished inside with radio-frequency-resistant paint.
   3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

N. Cabinets:
   1. NEMA 250, Type 1, Type 3R, or Type 12, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
   2. Hinged door in front cover with flush latch and concealed hinge.
   3. Key latch to match panelboards.
   4. Metal barriers to separate wiring of different systems and voltage.

5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.8 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND CABLING

A. General Requirements for Handholes and Boxes:
   1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
   2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   3. Comply with TIA-569-B.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Armorcast Products
      b. Carson Industries
      c. NewBasis
      d. Oldcastle Precast
      e. Quazite (Hubbell)
      f. Synertech Moulded Products
   2. Standard: Comply with SCTE 77.
   3. Configuration: Designed for flush burial with open, closed, or integral closed bottom unless otherwise indicated.
   4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
   5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
   6. Cover Legend: Molded lettering, "SAFETY/SECURITY".
   7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
   8. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of polymer concrete, reinforced concrete, cast iron, hot-dip galvanized-steel diamond plate, or fiberglass.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Armorcast Products
      b. Carson Industries
      c. NewBasis
      d. Nordic Fiberglass
      e. Oldcastle Precast
      f. Quazite (Hubbell)
      g. Synertech Moulded Products

   2. Standard: Comply with SCTE 77.
   3. Color of Frame and Cover: Gray or Green. Coordinate with Sacred Heart.

4. Configuration: Designed for flush burial with open, closed, or integral closed bottom unless otherwise indicated.
5. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
6. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
7. Cover Legend: Molded lettering, "SAFETY/SECURITY".
8. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
9. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.9 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
1. Tests of materials shall be performed by an independent testing agency.
2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

## PART 3 - EXECUTION

### 3.1 PATHWAY APPLICATION

A. Outdoors: Apply pathway products as specified below unless otherwise indicated:
1. Exposed Conduit: GRC, RNC, Type EPC-40-PVC RNC.
2. Concealed Conduit, Aboveground: GRC, EMT, or RNC Type EPC-40-PVC.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried, or concrete encased. Coordinate with Civil drawings.
4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R or Type 4.

B. Indoors: Apply pathway products as specified below unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Pathway locations include the following:
a. Loading dock.
b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
c. Mechanical rooms.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT, RNC, Type EPC-40-PVC, or innerduct.
5. Damp or Wet Locations: GRC.
6. Pathways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: Plenum-type, communications-cable pathway or EMT.
7. Pathways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: Riser-type, optical-fiber-cable pathway, Riser-type, communications-cable pathway, or EMT.

8. Pathways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: Plenum-type, optical-fiber-cable pathway; Plenum-type, communications-cable pathway, or EMT.
9. Boxes and Enclosures: NEMA 250 Type 1, except use NEMA 250 Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Pathway Size: 3/4-inch trade size. Minimum size for optical-fiber cables is 1 inch.

D. Pathway Fittings: Compatible with pathways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface pathways only where indicated on Drawings.

G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

H. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

## 3.2 INSTALLATION

A. Comply with NECA 1, NECA 101, and TIA-569-B for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum pathways. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.

B. Keep pathways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal pathway runs above water and steam piping.

C. Complete pathway installation before starting conductor installation.

D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications wiring conduits for which only two 90-degree bends are allowed. Support within 12 inches of changes in direction.

G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

H. Support conduit within 12 inches of enclosures to which attached.

I. Pathways Embedded in Slabs:
   1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure pathways to reinforcement at maximum 10-foot intervals.
   2. Arrange pathways to cross building expansion joints at right angles with expansion fittings.
   3. Arrange pathways to keep a minimum of 2 inches of concrete cover in all directions.
   4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
   5. Change from ENT to RNC, Type EPC-40-PVC, or GRC before rising above floor.

J. Stub-ups to Above Recessed Ceilings:
   1. Use EMT, IMC, or RMC for pathways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of pathway and fittings before making up joints. Follow compound manufacturer's written instructions.

L. Coat field-cut threads on PVC-coated pathway with a corrosion-preventing conductive compound prior to assembly.

M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.

N. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to conduit assembly to assure a continuous ground path.

P. Cut conduit perpendicular to the length. For conduits of 2-inch trade size and larger, use roll cutter or a guide to ensure cut is straight and perpendicular to the length.

Q. Install pull wires in empty pathways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground pathways designated as spare above grade alongside pathways in use.

R. Surface Pathways:
   1. Install surface pathway for surface electrical outlet boxes only where indicated on Drawings.
   2. Install surface pathway with a minimum 2-inch radius control at bend points.
   3. Secure surface pathway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight pathway section. Support surface pathway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

S. Pathways for Optical-Fiber and Communications Cable: Install pathways, metal and nonmetallic, rigid and flexible, as follows:
   1. 3/4-Inch Trade Size and Smaller: Install pathways in maximum lengths of 50 feet.
   2. 1-Inch Trade Size and Larger: Install pathways in maximum lengths of 75 feet.

3. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

T. Install pathway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install pathway sealing fittings according to NFPA 70.

U. Install devices to seal pathway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all pathways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service pathway enters a building or structure.
3. Where otherwise required by NFPA 70.

V. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.

W. Expansion-Joint Fittings:
1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F, and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
   c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
   d. Attics: 135 deg F temperature change.
3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surface to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

AA. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

BB. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

CC. Set metal floor boxes level and flush with finished floor surface.

DD. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

## 3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:
   1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 31 for pipe less than 6 inches in nominal diameter.
   2. Install backfill as specified in in Division 31.
   3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in in Division 31.
   4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of elbow.
   5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
      a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
      b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
   6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits, but a minimum of 6 inches below grade. Align planks along centerline of conduit.
   7. Underground Warning Tape: Comply with requirements in Section 26 0553 "Identification for Electrical Systems."

## 3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install handholes with bottom below frost line.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.

F. Field cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

## 3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 27 0544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling."

## 3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Division 07.

## 3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

**End of Section**

# Sleeves and Sleeve Seals for Electronic Safety and Security Pathways and Cabling

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:
   1. Sleeves for pathway and cable penetration of non-fire-rated construction walls and floors.
   2. Sleeve-seal systems.
   3. Sleeve-seal fittings.
   4. Grout.
   5. Silicone sealants.

B. Related Requirements:
   1. Refer to Division 07 for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

## PART 2 - PRODUCTS

### 2.1 SLEEVES

A. Wall Sleeves:
   1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
   2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:
   1. Material: Galvanized-steel sheet.
   2. Minimum Metal Thickness:
      a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
      b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

## 2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Advance Products and Systems
   2. CALPICO
   3. HOLDRITE
   4. Metraflex
   5. Pipeline Seal and Insulation
   6. Proco Products
   7. Sealing Elements: EPDM or Nitrile (Buna N) rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   8. Pressure Plates: Carbon steel, Plastic, or Stainless steel.
   9. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating or Stainless steel of length required to secure pressure plates to sealing elements.

## 2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. HOLDRITE

## 2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

### 2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
   1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
   2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
   1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
      a. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with Division 07 Joint and Sealant requirements**.**
      b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
   2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
   3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and pathway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
   4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
   5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
   1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
   2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between pathway or cable and sleeve for installing sleeve-seal system.

## 3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at pathway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

## 3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

**End of Section**

# DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Existing Theater fire alarm system: Existing Fire alarm system for Existing Theater shall be verified and upgraded as needed.

### 1.2 SUMMARY

A. Section Includes:
1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Air-sampling smoke detectors.
5. Nonsystem smoke detectors.
6. Heat detectors.
7. Notification appliances.
8. Device guards.
9. Firefighters' two-way telephone communication service.
10. Firefighters' smoke-control station.
11. Magnetic door holders.
12. Remote annunciator.
13. Graphic annunciator.
14. Addressable interface device.
15. Digital alarm communicator transmitter.
16. Radio alarm transmitter.
17. Network communications.
18. System printer.

B. Related Requirements:
1. Section 28 05 13 "Conductors and Cables for Electronic Safety and Security" for cables and conductors for fire-alarm systems.

### 1.3 DEFINITIONS

A. EMT: Electrical Metallic Tubing.

B. FACP: Fire Alarm Control Panel.

C. HLI: High Level Interface.

D. NICET: National Institute for Certification in Engineering Technologies.

E. PC: Personal computer.

## 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including furnished options and accessories.
   1. Include construction details, material descriptions, dimensions, profiles, and finishes.
   2. Include rated capacities, operating characteristics, and electrical characteristics.

B. Shop Drawings: For fire-alarm system.
   1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
   2. Include plans, elevations, sections, details, and attachments to other work.
   3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
   4. Detail assembly and support requirements.
   5. Include voltage drop calculations for notification-appliance circuits.
   6. Include battery-size calculations.
   7. Include input/output matrix.
   8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
   9. Include performance parameters and installation details for each detector.
   10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
   11. Provide program report showing that air-sampling detector pipe layout balances pneumatically within the airflow range of the air-sampling detector.
   12. Include plans, sections, and elevations of heating, ventilating, and air- conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
      a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
      b. Show field wiring required for HVAC unit shutdown on alarm.
      c. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' control system.
      d. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' smoke-evacuation system.
      e. Locate detectors according to manufacturer's written recommendations.
      f. Show air-sampling detector pipe routing.
   13. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic,

amplifier power calculation, and single-line connection diagram.

14. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to- point wiring diagrams.

C. General Submittal Requirements:
1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:
a. Trained and certified by manufacturer in fire-alarm system design.
b. NICET-certified, fire-alarm technician; Level III minimum.
c. Licensed or certified by authorities having jurisdiction.

## 1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Seismic Qualification Certificates: For fire-alarm control unit, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field quality-control reports.

D. Sample Warranty: For special warranty.

## 1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Division 1, include the following and deliver copies to authorities having jurisdiction:
a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.

d. Riser diagram.
e. Device addresses.
f. Air-sampling system sample port locations and modeling program report showing layout meets performance criteria.
g. Record copy of site-specific software.
h. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
    1) Equipment tested.
    2) Frequency of testing of installed components.
    3) Frequency of inspection of installed components.
    4) Requirements and recommendations related to results of maintenance.
    5) Manufacturer's user training manuals.
i. Manufacturer's required maintenance related to system warranty requirements.
j. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:
1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no less than one unit.
2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no less than one unit.
3. Smoke Detectors, Fire Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
4. Detector Bases: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
5. Keys and Tools: One extra set for access to locked or tamperproofed
Audible and Visual Notification Appliances: One of each type installed.
6. Fuses: Two of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.
7. Filters for Air-Sampling Detectors: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
8. Air-Sampling Fan: Quantity equal to one for every five detectors, but no fewer than one unit of each type.

## 1.8 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire- alarm Level II technician.

C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

D. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

## 1.9 PROJECT CONDITIONS

A. Perform a full test of the existing system prior to starting work. Document any equipment or components not functioning as designed.

B. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:
   1. Notify Owner no fewer than seven days in advance of proposed interruption of fire-alarm service.
   2. Do not proceed with interruption of fire-alarm service without Owner's written permission.

C. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

## 1.10 SEQUENCING AND SCHEDULING

A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.

B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

## 1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
   1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
   2. Warranty Period: Five years from date of SubstantialCompletion.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.

B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.

C. Automatic sensitivity control of certain smoke detectors.

D. All components provided shall be listed for use with the selected system.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

### 2.2 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
1. Manual stations.
2. Heat detectors.
3. Smoke detectors.
4. Duct smoke detectors.
5. Carbon monoxide detectors.
6. Combustible gas detectors.
7. Automatic sprinkler system water flow.
8. Preaction system.
9. Fire-extinguishing system operation.
10. Fire standpipe system.
11. Dry system pressure flow switch.

B. Fire-alarm signal shall initiate the following actions:
1. Continuously operate alarm notification appliances.
2. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
3. Transmit an alarm signal to the remote alarm receiving station.
4. Unlock electric door locks in designated egress paths.
5. Release fire and smoke doors held open by magnetic door holders.
6. Activate voice/alarm communication system.
7. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
8. Activate smoke-control system (smoke management) at firefighters' smoke- control system panel.
9. Close smoke dampers in air ducts of designated air-conditioning duct systems.
10. Activate preaction system.
11. Recall elevators to primary or alternate recall floors.

12. Activate elevator power shunt trip.
13. Activate emergency lighting control.
14. Activate emergency shutoffs for gas and fuel supplies.
15. Record events in the system memory.
16. Record events by the system printer.
17. Indicate device in alarm on the graphic annunciator.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:
1. Valve supervisory switch.
2. High- or low-air-pressure switch of a dry-pipe or preaction sprinkler system.
3. Elevator shunt-trip supervision.
4. Independent fire-detection and -suppression systems.
5. User disabling of zones or individual devices.
6. Loss of communication with any panel on the network.

D. System trouble signal initiation shall be by one or more of the following devices and actions:
1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal- initiating devices.
3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
4. Loss of primary power at fire-alarm control unit.
5. Ground or a single break in internal circuits of fire-alarm control unit.
6. Abnormal ac voltage at fire-alarm control unit.
7. Break in standby battery circuitry.
8. Failure of battery charging.
9. Abnormal position of any switch at fire-alarm control unit or annunciator.
10. Voice signal amplifier failure.
11. Hose cabinet door open.

E. System Supervisory Signal Actions:
1. Initiate notification appliances.
2. Identify specific device initiating the event at fire-alarm control unit, connected network control panels, off-premises network control panels, and remote annunciators.
3. Record the event on system printer.
4. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.
5. Transmit system status to building management system.
6. Display system status on graphic annunciator.

## 2.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event.

## 2.4 FIRE-ALARM CONTROL UNIT

A. Manufacturers: Fire Alarm Control Unit is an existing unit. Refer to Fire Alarm Drawings for manufacturer and model number information.

B. General Requirements for Fire-Alarm Control Unit:
   1. Contractor shall re-program and provide and install all parts and pieces necessary to connect the new Fire Alarm devices indicated in the Fire Alarm drawings and maintain all existing Fire Alarm equipment devices connected to the Fire Alarm system and restore it to a fully functional status at end of the project.

## 2.5 PREACTION SYSTEM

A. Initiate Presignal Alarm: This function shall cause an audible and visual alarm and indication to be provided at the FACP. Activation of an initiation device connected as part of a preaction system shall be annunciated at the FACP only, without activation of the general evacuation alarm.

## 2.6 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
   1. Single-action mechanism, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
   2. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type; with integral or attached, addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
   3. Station Reset: Key- or wrench-operated switch.
   4. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation.
   5. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

B. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information.

## 2.7 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:
   1. Comply with UL 268; operating at 24-V dc, nominal.
   2. Detectors shall be four two-wire type.
   3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
7. Remote Control: Unless otherwise indicated, detectors shall be digital- addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire- alarm control unit.
    a. Rate-of-rise temperature characteristic of combination smoke- and heat- detection units shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
    b. Fixed-temperature sensing characteristic of combination smoke- and heat- detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
    c. Multiple levels of detection sensitivity for each sensor.
    d. Sensitivity levels based on time of day.

B. Photoelectric Smoke Detectors:
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).
3. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project.

C. Ionization Smoke Detector:
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).
3. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

D. Duct Smoke Detectors: Photoelectric type complying with UL 268A.
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
    a. Primary status.

b. Device type.
c. Present average value.
d. Present sensitivity selected.
e. Sensor range (normal, dirty, etc.).

3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.
4. Each sensor shall have multiple levels of detection sensitivity.
5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor- control circuit.
7. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.8 PROJECTED BEAM SMOKE DETECTORS

A. Projected Beam Light Source and Receiver: Designed to accommodate small angular movements and continue to operate and not cause nuisance alarms.

B. Detector Address: Accessible from fire-alarm control unit and able to identify the detector's location within the system and its sensitivity setting.

C. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
1. Primary status.
2. Device type.
3. Present average value.
4. Present sensitivity selected.
5. Sensor range (normal, dirty, etc.).

D. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.9 CARBON MONOXIDE DETECTORS

A. General: Carbon monoxide detector listed for connection to fire-alarm system.
1. Mounting: Adapter plate for outlet box mounting.
2. Testable by introducing test carbon monoxide into the sensing cell.
3. Detector shall provide alarm contacts and trouble contacts.
4. Detector shall send trouble alarm when nearing end-of-life, power supply problems, or internal faults.
5. Comply with UL 2075.
6. Locate, mount, and wire according to manufacturer's written instructions.
7. Provide means for addressable connection to fire-alarm system.
8. Test button simulates an alarm condition.

B. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.10 MULTICRITERIA DETECTORS

A. Mounting: Adapter plate for outlet box mounting.

B. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

C. Automatically adjusts its sensitivity by means of drift compensation and smoothing algorithms. The detector shall send trouble alarm if it is incapable of compensating for existing conditions.

D. Test button tests all sensors in the detector.

E. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
   1. Primary status.
   2. Device type.
   3. Present sensitivity selected.
   4. Sensor range (normal, dirty, etc.).

F. Sensors: The detector shall be comprised of four sensing elements including a smoke sensor, a carbon monoxide sensor, an infrared sensor, and a heat sensor.
   1. Smoke sensor shall be photoelectric type as described in "System Smoke Detectors" Article.
   2. Carbon monoxide sensor shall be as described in "Carbon Monoxide Detectors" Article.
   3. Heat sensor shall be as described in "Heat Detectors" Article.
   4. Each sensor shall be separately listed according to requirements for its detector type.

G. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.11 NONSYSTEM SMOKE DETECTORS

A. General Requirements for Nonsystem Smoke Detectors:
   1. Nonsystem smoke detectors shall be listed as compatible with the fire-alarm equipment installed or shall have a contact closure interface listed for the connected load.
   2. Nonsystem smoke detectors shall meet the monitoring for integrity requirements in NFPA 72.
   3. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.12 HEAT DETECTORS

A. General Requirements for Heat Detectors: Comply with UL 521.
   1. Temperature sensors shall test for and communicate the sensitivity range of the device.

B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F (57 deg C) or a rate of rise that exceeds 15 deg F (8 deg C) per minute unless otherwise indicated.
   1. Mounting: Adapter plate for outlet box mounting.
   2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

3. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F (88 deg C).
   1. Mounting: Adapter plate for outlet box
   2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
   3. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

D. Continuous Linear Heat-Detector System:
   1. Detector Cable: Rated detection temperature 155 deg F (68 deg C) Listed for "regular" service and a standard environment. Cable includes two steel actuator wires twisted together with spring pressure, wrapped with protective tape, and finished with PVC outer sheath. Each actuator wire is insulated with heat- sensitive material that reacts with heat to allow the cable twist pressure to short circuit wires at the location of elevated temperature.
   2. Control Unit: Two-zone or multizone unit as indicated. Provide same system power supply, supervision, and alarm features as specified for fire-alarm control unit.
   3. Signals to Fire-Alarm Control Unit: Any type of local system trouble shall be reported to fire-alarm control unit as a composite "trouble" signal. Alarms on each detection zone shall be individually reported to central fire-alarm control unit as separately identified zones.
   4. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
   5. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.13 NOTIFICATION APPLIANCES

A. General Requirements for Notification Appliances: Individually addressed, connected to a signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.

B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
   1. Combination Devices: Factory-integrated audible and visible devices in a single- mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
   2. Provide Notification Appliances in ADA areas where required.
   3. Strobes in ADA Spaces shall be a minimum 177 candela strobe.
   4. Strobes shall have synchronized flashing as required by ADA.

C. Chimes, Low-Level Output: Vibrating type, 75-dBA minimum rated output.

D. Chimes, High-Level Output: Vibrating type, 81-dBA minimum rated output.

E. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a

sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.

F. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch-high letters on the lens.
   1. Rated Light Output: as required.
   2. Mounting: Wall mounted unless otherwise indicated.
   3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
   4. Flashing shall be in a temporal pattern, synchronized with other units.
   5. Strobe Leads: Factory connected to screw terminals.
   6. Mounting Faceplate: Factory finished, red.

G. Voice/Tone Notification Appliances:
   1. Comply with UL 1480.
   2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
   3. High-Range Units: Rated 2 to 15 W.
   4. Low-Range Units: Rated 1 to 2 W.
   5. Mounting: Flush or surface mounted and bidirectional.
   6. Matching Transformers: Tap range matched to acoustical environment of speaker location.

H. Exit Marking Audible Notification Appliance:
   1. Exit marking audible notification appliances shall meet the audibility requirements in NFPA 72.
   2. Provide exit marking audible notification appliances at the entrance to all building exits.
   3. Provide exit marking audible notification appliances at the entrance to areas of refuge with audible signals distinct from those used for building exit marking.

I. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.14 ADDRESSABLE MODULES

A. Addressable Relay Modules:
   1. Provide address-setting means on the module. Store an internal identifying code for control panel use to identify the module type.
   2. Allow the control panel to switch the relay contacts on command.
   3. Have a minimum of two normally open and two normally closed contacts available for field wiring.
   4. Listed for controlling HVAC fan motor controllers.

B. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.15 MAGNETIC DOOR HOLDERS

A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.
   1. Electromagnets: Require no more than 3 W to develop 25-lbf holding force.
   2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
   3. Rating: 24-V ac or dc.
   4. Rating: 120-V ac.

B. Material and Finish: Match door hardware.

C. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.16 ADDRESSABLE INTERFACE DEVICE

A. General:
   1. Include address-setting means on the module.
   2. Store an internal identifying code for control panel use to identify the module type.
   3. Listed for controlling HVAC fan motor controllers.

B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.

C. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall to circuit-breaker shunt trip for power shutdown
   1. Allow the control panel to switch the relay contacts on command.
   2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

D. Control Module:
   1. Operate notification devices.
   2. Operate solenoids for use in sprinkler service.

E. Manufacturer: Refer to Fire Alarm Drawings for manufacturer and model number information if applicable to project

## 2.17 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.
   1. Factory fabricated and furnished by device manufacturer.
   2. Finish: Paint of color to match the protected device.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
   1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.

B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 EQUIPMENT INSTALLATION

A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
   1. Devices placed in service before all other trades have completed cleanup shall be replaced.
   2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.

B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.
   1. Comply with requirements for seismic-restraint devices specified in Division 26 and as indicated on the Fire Alarm drawings.

C. Manual Fire-Alarm Boxes:
   1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
   2. Mount manual fire-alarm box on a background of a contrasting color.
   3. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.

D. Smoke- or Heat-Detector Spacing:
   1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
   2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
   3. Smooth ceiling spacing shall not exceed 30 feet (9 m).
   4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A in NFPA 72.
   5. HVAC: Locate detectors not closer than 36 inches (910 mm) from air-supply diffuser or return-air opening.
   6. Lighting Fixtures: Locate detectors not closer than 12 inches (300 mm) from any part of a lighting

fixture and not directly above pendant mounted or indirect lighting.

E. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.

F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.
   1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

G. Air-Sampling Smoke Detectors: If using multiple pipe runs, the runs shall be pneumatically balanced.

H. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.

I. Single-Station Smoke Detectors: Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound.

J. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.

K. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.

L. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.

M. Device Location-Indicating Lights: Locate in public space near the device theymonitor.

N. Antenna for Radio Alarm Transmitter: Mount to building structure where indicated. Use mounting arrangement and substrate connection that resists 100-mph wind load with a gust factor of 1.3 without damage.

## 3.3 PATHWAYS

A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
   1. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.

B. Pathways shall be installed in EMT.

C. Exposed EMT shall be painted red enamel.

## 3.4 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 08 71 00 "Door Hardware." Connect hardware and

devices to fire-alarm system.

1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

1. Alarm-initiating connection to smoke-control system (smoke management) at firefighters' smoke-control system panel.
2. Alarm-initiating connection to stairwell and elevator-shaft pressurization systems.
3. Smoke dampers in air ducts of designated HVAC duct systems.
4. Magnetically held-open doors.
5. Electronically locked doors and access gates.
6. Alarm-initiating connection to elevator recall system and components.
7. Alarm-initiating connection to activate emergency lighting control.
8. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
9. Supervisory connections at valve supervisory switches.
10. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
11. Supervisory connections at elevator shunt-trip breaker.
12. Data communication circuits for connection to building management system.
13. Data communication circuits for connection to mass notification system.
14. Supervisory connections at fire-extinguisher locations.
15. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.
16. Supervisory connections at fire-pump engine control panel.

## 3.5 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

B. Install framed instructions in a location visible from fire-alarm control unit.

## 3.6 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

B. Ground shielded cables at the control panel location only. Insulate shield at device location.

## 3.7 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by authorities having jurisdiction.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

D. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Visual Inspection: Conduct visual inspection prior to testing.
   a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
   b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

F. Fire-alarm system will be considered defective if it does not pass tests andinspections.

G. Prepare test and inspection reports.

H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

I. Annual Test and Inspection: One year after date of Substantial Completion, test fire- alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

## 3.8 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of manufacturer's designated service organization.

Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

## 3.9 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
   1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

## 3.10 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarmsystem.

**End of Section**

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Appendix A

# Fire Alarm Cutsheets

California State Fire Marshal

# CODE INTERPRETATION

| Date Issued | January 5, 2018 | Interpretation | 18-001 |
|---|---|---|---|
| Topic | Additions to an existing fire alarm panel | | |
| Code Section(s) | 2016 CBC §907.1.3 | | |
| Requested by | Marcus Claudius<br>JJJ Enterprises | | |
| Date Received | June 26, 2017 | | |

**Question:**

Consider the following: An existing building has an existing fire alarm control panel. The panel was listed at the time of the installation, but the California State Fire Marshal's [CSFM] listing has expired. In a small tenant improvement, devices with current CSFM listings and compatibility listings need to be added to the existing panel.

Does section 907.1.3 of the 2013 and 2016 California Fire Code prohibit adding the devices to the existing fire alarm control panel because the panel does not have a current CSFM listing?

**NO**

If the fire alarm panel was listed at the time of installation and is not being replaced, the panel can still be used if it is capable of handling additional components. However, the components to be added to the existing system must be CSFM listed and approved for use with that fire alarm panel.

HARRINGTON SIGNAL INC
FIRE ALARM

# HSPS Series
## Non-Coded Manual Pull Stations

Harrington Signal Inc.
2519 4th Avenue, Moline, Illinois 61265
P.O. Box 590, Moline, Illinois 61266-0590
Phone: (800) 577-5758 Local: (309) 762-0731 Fax: (309) 762-8215
Internet: www.harringtonfire.com

## Description

The Harrington model number HSPS Series Non-Coded Manual Pull Stations provide the most reliable manually activated input signal for early warning signaling on supervised or non-supervised alarm systems.

The HSPS stations are constructed of a die cast housing which is connected to a 14 gauge plated steel back plate at the lower bottom corners. The "T" pull lever, mounted on the die cast housing, is constructed of die cast steel and is painted white with raised lettering painted red that reads "PULL DOWN." When the "T" pull lever is activated (Pulled), it allows the plunger on the contact arrangement to be activated. The HSPS series stations come standard with an allen wrench for locking, resetting and testing. With the "KL" option, a key is used to lock, reset or test the station. When the "T" pull lever has been pulled, it remains protruding out from the HSPS series station at a 90 degree angle until the die cast housing is opened by either the allen wrench or key (depending on the model being used). When the die cast housing is opened, the "T" pull lever may be reset to the normal operating position. The HSPS series stations can be tested without the need to pull the "T" pull lever by using the allen wrench or key (depending on the model being used) to open the die cast housing. Opening the die cast housing allows the plunger on the contact arrangement to be activated, thus sending a signal to the control panel. The HSPS series station can be used with or without a break glass rod positioned in front of the "T" pull lever. The glass rod is not needed to hold the "T" pull lever in its normal operating position. The HSPS series stations have an optional Dual Action feature. The Dual Action option is a metal cover that lies over the "T" pull lever. The Dual Action cover is painted red with the words "LIFT & PULL silk screened in white.

To activate the HSPS series dual action station, the Dual Action cover needs to be lifted and then the "T" pull lever can be pulled. The Dual Action cover has a brass knob located at the bottom center which is used to lift it up.

## Features

- UL and CSFM Listed
- Durable Die Cast Housing
- 14 GA Plated Steel Back Plate
- Corrosion Inhibit Surfaces
- Terminal Block or Pigtail Connection
- Single Gang Mounting
- Surface (use of HSPS-BB) or Sem
- Flush Wall Mounting

## Ordering Information

| Model Number | Part Number | Description |
|---|---|---|
| HSPS-1P | 238-0075 | Single action with pig tail connections (1) NO (normally open) contact |
| HSPS-1T | 238-0089 | Single action with terminal connections (1) NO (normally open) contact |
| HSPS-2T | 238-0091 | Single action with terminal connections (2) NO (normally open) contacts |
| HSPS-6T | 238-0092 | Single action with terminal connections (2) NO/COM/NC (form C) contacts |
| HSPS-1T-KO | 238-0090 | Single action pull station, key operated metal station with terminal connections, (1) NO (normally open) contact |
| | | |
| | | |
| | | |
| | | |

HARRINGTON SIGNAL INC
FIRE ALARM

# HSPS Series
## Non-Coded Manual Pull Stations

- 10 Amp Snap Action Switch Contacts
- Single or Double Action
- "T" Pull Handle or Key Operate
- Institutional Models
- Red Enamel Color
- Allen Wrench or Key Access

## Applications

The HSPS series pull stations have a wide variety of features which makes it ideal for uses in office buildings, apartment complexes, schools, correctional facilities, nursing homes, hospitals, and many more applications.

## Special Applications

The HSPS series stations can be used in applications where a weather proof enclosure is needed. Most HSPS series stations can be used in weather proof applications by using the weather proof back box, the "WP" option. Check with the factory for applicable models that UL will allow to be used in weather proof applications. The HSPS series stations can also be used in Hazardous atmospheres (Explosion Proof) by adding the "EXP" option to the HSPS series station. See the Explosion Proof HSPS series manual pull station data sheet for more details.

| AVAILABLE OPTIONS - Add at time of order | |
|---|---|
| KL | Key Lock/Reset/Test (Cat 15 is standard key size) |
| KO | Key Operated (Institutional Manual Station) |
| PJ | Fire fighter's phone jack, mounts on the front of the station |
| PS | Pre-signal key switch |

| ACCESSORIES | |
|---|---|
| LP | Dual Action Adapter |
| DAH | Dual Action Adapter, Break Glass Type w/hmmer |
| HAD | Halon dual action adapter (Special Order) |
| WP | Weather proof back box, UL approved |
| BB | Surface back box for indoor use |
| AY | Cover plate for New York |

| ELECTRICAL RATING | |
|---|---|
| Contact Rating | 10 Amps @ 125/250VAC |
| Wire Guage | 12 to 22 AWG |

| HSPS DIMENSIONS | | | | |
|---|---|---|---|---|
| Type | Width | Length | Depth | Weight |
| Single Action | 3.2" | 4.75" | .875" | 15.5 oz. |
| Dual Action (LP) | 3.325" | 4.75" | 1.5" | 1 lb. 4 oz. |
| Dual Action, Break Glass (DAH) | 3.25" | 4.75" | 1.625" | 1 lb. 9 oz. |

NOTICE: The information contained in this document is intended only as a summary and is subject to change without notice. The devices described in this document have specific instruction sheets which cover various technical, limitation and liability information. Copies of these instruction sheets and the General Product Warning and Limitations Document, which also contains important information are provided with the product and are available from Harrington Signal Inc. Fire Alarm. Information contained in these documents should be consulted before specifying or using the product. For further information or assistance concerning particular problems contact Harrington Signal Inc. Harrington Signal Inc. Fire Alarm reserves the right to change specifications without notice.

HARRINGTON SIGNAL INC
FIRE ALARM

# Model HS-3030

## Analog Addressable Fire Alarm Control Panel

Harrington Signal Inc.
2519 4th Avenue, Moline, Illinois 61265
P.O. Box 590, Moline, Illinois 61266-0590
Phone: (800) 577-5758 Local: (309) 762-0731 Fax: (309) 762-8215
Internet: www.harringtonfire.com

MEA

ISO 9001 Certified Management System

## General Description

The HS-3030 is a sophisticated microprocessor-based Fire Alarm Control Panel. It has the capability to network with multiple HS-3030 and annunciators to suit the various needs of residential, commercial, industrial and institutional applications. The HS-3030 fire panel provides capability for up to 24 input circuits, 4 general purpose form "C" relays, 3 system operated relays (for Alarm, Trouble and Supervisory indication), 8 class B (style Y) or 4 class A (style Z) output bell circuits and 2 auxiliary power outputs. Input circuit modules are available for conventional or addressable inputs in class A (styles D or 6) or class B (styles B or 4).

Field Programming

The HS-3030 panel's database can be downloaded or optional uploaded in the field from a computer connected to service terminal using Network Plus software. All information is stored in non-volatile flash memory.

Networking

The HS-3030 can be networked to multiple HS-3030s, 3100s, and 3200 annunciators to provide additional input circuits, relays, bells and LEDs. One HS-3030 is designated the master panel for the network. All other HS-3030 panels will operate independently if communications with the master panel is lost.

## Features

- UL/FM/CSFM #7165-0476:110 Listed
- Sophisticated Capabilities yet Simple to Operate
- Conventional and Addressable Detection Circuits
- Two Stage Alarm Capability
- One Person System Test Capability
- Field Programmable via Computer, download, and optional upload of database
- History Log Approximately 1000 Events
- Separate LED for Alarm, Supervisory, and Trouble Indication for Each Zone
- LCD Supertwist Backlit 80 Character (4 x 20) Display
- Ground Fault Indication by Input Circuit
- Software Definable Conventional Input Circuits

Sprinkler Supervision

- Optional Conventional Input Circuits Class B (Style B) or Class A (Style D) Available by Special Order
- Input Circuits Programmable for N.O. or N.C. Contacts

Class B (Style Y) or Optional Class A (Style Z) Bell Circuits Available by Special Order

DCLR (Style 7) Network Communication Option

Detector Sensitivity Adjustments, Manually

Maintenance Alert for Dirty Sensors

Day/Night Sensitivity Adjustments, Automatic

Built in Printer Available

## Ordering Information

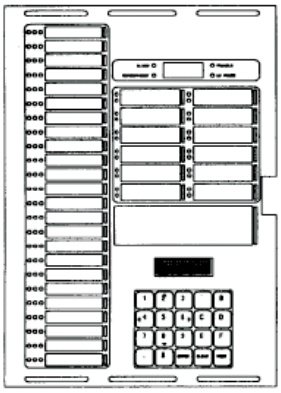
| Model Number | Part Number | Description |
|---|---|---|
| HS-3030AB | 345-1281 | Basic control unit package, (8) Addressable class "B" (style 4) |
| HS-3030AA | 345-0397 | Basic control unit package, (4) Addressable class "A" (style 6) |
| HS-3238 | 345-0433 | Conventional input circuit module, (8) software selectable 10 or 80mA Class B |
| HS-3338 | 345-0434 | Conventional input circuit module, 4 circuits, "Class A" (Style D), 80mA |
| HS-3039 | 345-0284 | Addressable input circuit module, 8 circuits, "Class B" (Style 4) |
| HS-3139 | 345-0407 | Addressable input circuit module, 4 circuits, "Class "A" (Style 6) |
| HS-3130 | 345-0285 | Network Communication Module |
| HS-3109-3 | 345-559 | Communications Module |
| HS-3140 | 222-0046 | 80 character LCD Annunciator w/Back Box & front cover |
| HS-3035 | 345-0378 | Replacement Power Supply Board |
| HS3644 | 222-0064 | Remote Annunciator |

HARRINGTON
SIGNAL INC
FIRE ALARM

# Model HS-3030

Analog Addressable Fire Alarm Control Panel

## HS-3030 Inner Door



The system controls and visual indications are contained on the Mother Board, which also contains the system processor, programming port, printer port, and nonvolatile memory for system firmware. Custom software is installed on the main board for functions such as function relays, zone LED annunciation, and custom zone and device messages. The HS-3030 consist of 12 system switches ("Hot Keys"), and a 20 position alpha-numeric keypad. The 12 system switches are factory defined for operations such as acknowledge, signal silence, and system reset. The 20 position keypad is used for technical functions, system/detector maintenance, history recall, device bypass, and manual operation of addressable output modules, relay modules, and bell circuits.

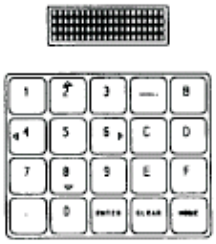
## Additional Features

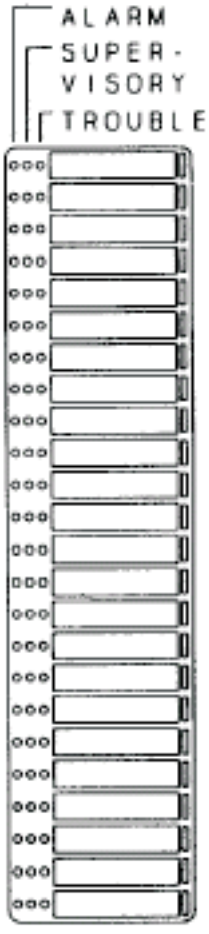
- Totally Software Driven
- Display of Real Time
- Power Limited Circuits
- Passcode Protection
- System Alarm, Trouble, and Supervisory LEDs
- Signal Silence Inhibit
- Alarm Verification by Zone or Device
- System Alarm, Supervisory, and Trouble Relays
- Communication Ports for Expansion, Network, Printer
- Remote Alarm, Supervisory, and Troubl
- Annunciation
- Addressable & Conventional Input Modules
- Custom Labels Per Zone
- Bell Coding by Device

## Display

The visual display consists of a series of LEDs for common system indication of power, alarm, supervisory, and trouble. An LED clock display is provided to display a real time. The flashing colon on the clock provides visual indication of system processor operation.

An 80 character supertwist backlit LCD alphanumeric display is provided for address location of addressable devices, zone indication for conventional input circuits, display of history files, first/last device in alarm, custom messages, etc. It is possible to assign custom alpha-numeric messages on a per zone basis for either conventional or addressable devices. The keypad can be used to scroll through the display. The keypad and the display are also used for maintenance functions, such as testing, etc. Individual LEDs are provided to display alarm, supervisory, and trouble conditions by zone. The HS-3030 contains 24 sets of zone indicating LEDs. The LEDs will flash when activated, then go to steady when acknowledged. The trouble LEDs will indicate both open circuit and ground fault. The LCD display is used to determine the exact nature of the current system status. Addressable input circuits have the capability of being configured to map individual detectors or groups of detectors to turn-on specific zone indicating lamps.






Addressable devices are also indicated on the LCD display, which provides device number, addressable input circuit number, and custom message.

HARRINGTON SIGNAL INC
FIRE ALARM

# Model HS-3030

Analog Addressable Fire Alarm Control Panel

## Input Circuits

The HS-3030 motherboard has the capacity for up to three input circuit modules, not all modules need to be installed. Module 1 - Can only be conventional, 8 "class B" (style B) circuits using the card HS-3238 or 4 "class A" (style D) circuits using the card HS-3338. Module 2 - Can be one of the two conventional cards or it can be addressable, 8 class B (style 4) circuits using the card HS-3039 or 4 class A (style 6) circuits using the card HS-3139. Module 3 - Can be one of the two conventional cards or it can be addressable, 8 class B (style 4) circuits using the card HS-3039 or 4 class A (style 6) circuits using the card HS-3139.

## Output Circuits

The HS-3030 includes 8 class B (style Y) or optional 4 class A (style Z) supervised bell circuits, 4 general purpose Form "C" relays, 3 system Form "C" relays and 2 auxiliary power outputs.
Terminal Board

All input and output wires are terminated on the terminal board, this allows separation from the main control board for ease in servicing.

## Communication Ports

The HS-3030 has 6 communication ports available: Port 1 - Is out going to the network (proprietary) Port 2 Is in coming from the network (proprietary) Networking allows multiple panels (Control and/or Annunciator) to be connected together. Port 3 - (RS232) Can be connected to the Hs3644 Annunciator, GRID Computer Graphics or HSRT-2000 Radio Transmitter. Port 4 - Service Terminal (RS232) Allows downloading and optional uploading of databases, and maintenance access terminal window. Port 5 - Printer Interface (IBM/Centronics) A 25 pin parallel printer port providing an interface to any standard parallel printer. Port 6 - Printer Interface (RS232) A serial printer port providing an interface for the optional factory install serial printer.

## Power Supply

The HS-3035 power supply is rated at 10 amp unregulated DC power. Complete with 2 amp battery charger and battery supervisory circuit. The supervisory circuit simulates a load condition approximately every 90 seconds to ensure that the battery is capable of handling the load requirements upon loss of AC power.

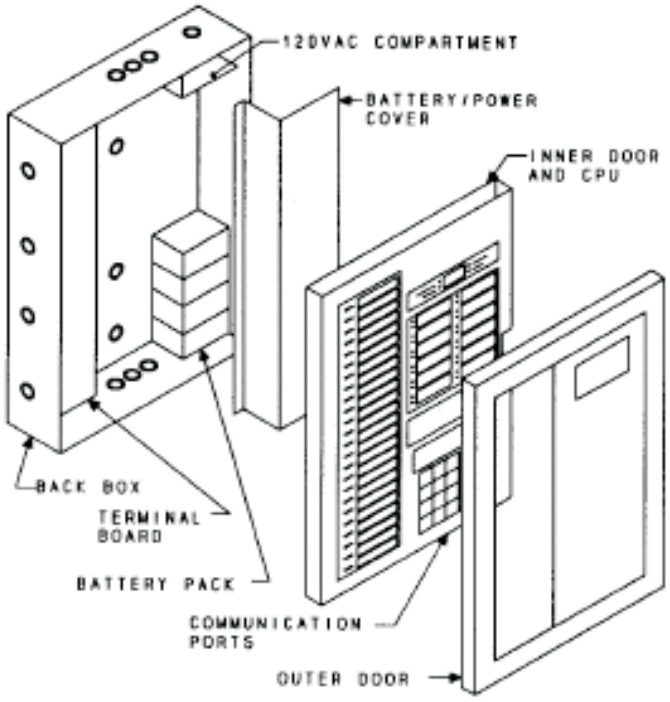
HARRINGTON SIGNAL INC
FIRE ALARM

# Model HS-3030

## Analog Addressable Fire Alarm Control Panel

## Enclosure

The enclosure for HS-3030 consists of a back box complete with power supply, inner door assembly with main board, and outer door assembly. The back box and door assemblies are fabricated from 1/16" steel. The front door includes tempered glass window, hinge, and lock assembly. The back box provides necessary "knock out" type openings for conduit entry. The enclosure dimensions are 14-1/2" Wide x 20-1/2" High Deep. The inner door assembly is 14" Wide x 20" High x 1" Deep. Space for battery set is 4" x 7-1/2" x 3".




| **Technical Data** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| Imput Circuits | Conventional (24) | Addressable (16) | Bell Circuits (8) | Conventional | | |
| Voltage | 20-28VDC | 20-28VDC | Supervisory Current | 1.0mA | | |
| Supervisory Current: | | | Alarm Current | 1 amp standard | | |
| Contact Devices | 10mA | N.A. | Voltage | 24VDC (Unfiltered) | | |
| Smoke Detectors | 10mA | N.A. | End of Line Device | 10 K W Resistor | | |
| Alarm Current: | | | Note: The control Panel is limited to 8 A | | | |
| Contact Devices | 10mA | N.A. | total bell current | | | |
| Smoke Detectors | 80mA max | N.A. | Auxillary Power Output (2) | 150mA | | |
| Max. No. of Devices | 50 (Smoke Detectors) | 99 Detectors/ 99 Modules (System Sensor) | | | | |
| Compatible Devices | Hochiki, Apollo, System Sensor | System Sensor | System Relays (3) | 1.0 A @ 30VDC | | |
| End of Line Resistor: | | | | and .5 A @ 120VAC | | |
| Contact Circuit | 470 W Resistor | N.A. | Alarm, Supervisory, Trouble | | | |
| Smoke Detectors | 3.9 K Ω | N.A. | | | | |
| Combination Smoke and Contact | 3.9 K Ω | N.A. | General Purpose Relays (4) | | | |
| Total Line Resistance | 200 Ω | 40 Ω | | 2.0 A @ 30VDC | | |
| Total Line Capacitance | N.A. | .5 µF | | and .6 A @ 120 VAC | | |
| T-Tapping | NO | YES Style 4 Only | | | | |
| Wire Type | N.A. | Twisted Pair | Battery Capacity | | | |
| Capacitance | N.A. | 18 pf/ft | Optional | 10Ah, 25Ah, 40Ah | | |
| Resistance | N.A. | 4.1µ/m' | Maximum | 48Ah | | |
| Jacket | N.A. | Non-Shielded | | | | |
| AWG | 14 to 22 | 14 to 18 | HS-3109 Communications Board | | | |
| Velocity of Propagation | N.A. | Not less than 65% | **Model** | **Wire Type** | **Wire Gauge** | **Distance** |
| | | | HS-3109-3 | Twisted Pair | 22-28 AWG | 33,000 ft. |
| | | | | | | |

NOTICE: The information contained in this document is intended only as a summary and is subject to change without notice. The devices described in this document have specific instruction sheets which cover various technical, limitation and liability information. Copies of these instruction sheets and the General Product Warning and Limitations Document, which also contains important information are provided with the product and are available from Harrington Signal Inc. Fire Alarm. Information contained in these documents should be consulted before specifying or using the product. For further information or assistance concerning particular problems contact Harrington Signal Inc. Harrington Signal Inc. Fire Alarm reserves the right to change specifications without notice.

# 200 Series Intelligent Low-Profile Plug-In Detectors

*The System Sensor 200 Series intelligent plug-in smoke detectors with integral communication provide point location for alarm communication and selective maintenance.*

## Features

- Sleek, low-profile design
- Analog communications
- Low standby current
- Rotary address switches
- Superior EMI protection
- Dual LEDs for 360° visibility

200 Series smoke detectors are intelligent (addressable) detectors with point ID capability that enable each detector address to be set with decade address switches to provide exact detector locations. The sensitivity of 200 Series detectors can be programmed using the control panel software to suit the environment. In addition, detector sensitivity is continually monitored and reported to the panel.

The **System Sensor 2251B** photoelectric detector's unique optical sensing chamber is engineered to sense smoke produced by a wide range of combustion sources. Dual electronic thermistors add 135°F fixed temperature thermal sensing on the **2251TB** model. The **2251BR** is a remote test capable detector for use with DNR(W) duct smoke detectors.

The **Acclimate® 2251TMB** photoelectric detector includes thermal detection at 135°F. It uses advanced onboard software to combine the signals from the photo and thermal elements to create a true multi-criteria detector capable of rejecting nuisance sources, but still responding quickly to real fires. Separate photo and thermal elements also allow the Acclimate detector to provide different responses to smoke or heat. In addition, the Acclimate detector can adjust its sensitivity according to its environment.

The **1251B** ionization detector incorporates a unique single-source, dual-chamber design to respond quickly and dependably to a broad range of fires.

Both the **5251B** and **5251RB** detectors use an innovative thermistor sensing circuit to produce 135°F fixed and rate-of-rise thermal detection in low-profile packages. The **5251H** model provides fixed high-temperature detection at 190°F. These thermal detectors provide cost-effective, intelligent property protection in a variety of applications.

## Agency Listings

UL LISTED · ULC · FM APPROVED · MSFM approved

For exact certification listings for each model, please reference the respective agency Web site.

## 200 Series Intelligent Detector Specifications

| Physical/Operating Specifications | |
|---|---|
| **Height** | 2.0 inches (51 mm) |
| **Diameter** | 6.1 inches (155 mm) installed in B210LP base; 4.1 inches (104 mm) installed in B501 base |
| **Shipping Weight** | Heat: 4.8 oz (136 g); Photo/Photo with Heat: 5.2 oz (147 g); Ion: 5.4 oz (153 g) |
| **Operating Temperature Range** | Ion/Photo: 32°F to 120°F (0°C to 49°C)<br>Photo with Thermal: 32°F to 100°F (0°C to 38°C)<br>Thermal: –4°F to 100°F (–20°C to 38°C)<br>High Temperature: –4°F to 150°F (–20°C to 66°C) |
| **UL-Listed Velocity Range** | Ion: 0 to 1,200 fpm (0 to 6.1 m/sec)<br>Photo/Photo with Thermal: 0 to 4,000 fpm (0 to 20 m/sec) (suitable for installation in ducts) |
| **Operating Humidity Range** | 10% to 93% non-condensing |
| **Thermal Ratings** | Fixed Temperature Setpoint: 135°F (57°C)<br>Rate-of-Rise Detection: 15°F/min. (8.3°C/min.)<br>High Temperature Heat: 190°F (88°C) |
| **Electrical Specifications** | |
| **Voltage Range** | 15 to 32 VDC peak |
| **Standby Current (max. avg.)** | 300 μA @ 24 VDC (one communication every 5 seconds with LED enabled)<br>Photo/Photo with Thermal: 300 μA @ 24 VDC (one communication every 5 seconds with LED enabled) |
| **LED Current (max.)** | 6.5 mA @ 24 VDC (on) |

## Ordering Information

| Part No. | Description |
|---|---|
| 2251B* | Photoelectric smoke detector |
| 2251BR* | Photoelectric smoke detector, remote test capable, for use with DNR(W) duct smoke detectors |
| 2251TB* | Photoelectric smoke detector with thermal |
| 2251TMB* | Acclimate multi-criteria smoke detector |
| 1251B* | Ionization smoke detector |
| 5251B* | Fixed temperature thermal detector |
| 5251RB* | Rate-of-rise thermal detector |
| 5251H* | High temperature thermal detector |
| **Bases** | |
| B501* | 4" Flangeless mounting base |
| B501BP* | 4" Flangeless mounting base bulk pack |
| B210LP* | 6" Flanged mounting base |
| B210LPBP* | 6" Flanged mounting base bulk pack |
| B200SR* | Standard sounder base (compatible with B501BH series) |
| B200S* | Intelligent addressable sounder base |
| B224RB* | Relay base |
| B224BI* | Isolator base |
| **Accessories** | |
| SMB600 | Surface Mounting Kit (flanged) |
| F110 | Accessory Flange Ring for 6" Base |
| F110BP | Accessory Flange Ring for 6" Base Bulk Pack |
| F210 | Accessory New Smaller Flange Ring for 6" Base |
| RA100Z | Remote LED annunciator |
| M02-04-01 | Detector test magnet |
| M02-09-00 | Telescoping test magnet |
| XR2B | Detector removal tool (T55-127-000 included) |
| XP-4 | Extension for XR2B (5 to 15 ft) |
| T55-127-000 | Detector removal head |
| BCK-200B | Black detector kit (10 pack)** |
| WCK-2008 | White detector kit (10 pack)** |

## Accessories

* Add "A" for ULC listed product (e.g., 2251BA)

** The BCK-200B and WCK-200B are only applicable to the B210LP flanged style mounting base and may only be used with 2251B (photoelectric) and 1251B (ionization) smoke detectors.


SYSTEM SENSOR

3825 Ohio Avenue • St. Charles, IL 60174
Phone: 800-SENSOR2 • Fax: 630-377-6495



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SPDS10601 • 8/12

CUTSHEET OF FOR NEW & EXISTING SMOKE DETECTORS

# 200 Series Intelligent Low-Profile Plug-In Detectors

*The System Sensor 200 Series intelligent plug-in smoke detectors with integral communication provide point location for alarm communication and selective maintenance.*

## Features

- Sleek, low-profile design
- Analog communications
- Low standby current
- Rotary address switches
- Superior EMI protection
- Dual LEDs for 360° visibility

200 Series smoke detectors are intelligent (addressable) detectors with point ID capability that enable each detector address to be set with decade address switches to provide exact detector locations. The sensitivity of 200 Series detectors can be programmed using the control panel software to suit the environment. In addition, detector sensitivity is continually monitored and reported to the panel.

The **System Sensor 2251B** photoelectric detector's unique optical sensing chamber is engineered to sense smoke produced by a wide range of combustion sources. Dual electronic thermistors add 135°F fixed temperature thermal sensing on the **2251TB** model. The **2251BR** is a remote test capable detector for use with DNR(W) duct smoke detectors.

The **Acclimate® 2251TMB** photoelectric detector includes thermal detection at 135°F. It uses advanced onboard software to combine the signals from the photo and thermal elements to create a true multi-criteria detector capable of rejecting nuisance sources, but still responding quickly to real fires. Separate photo and thermal elements also allow the Acclimate detector to provide different responses to smoke or heat. In addition, the Acclimate detector can adjust its sensitivity according to its environment.

The **1251B** ionization detector incorporates a unique single-source, dual-chamber design to respond quickly and dependably to a broad range of fires.

Both the **5251B** and **5251RB** detectors use an innovative thermistor sensing circuit to produce 135°F fixed and rate-of-rise thermal detection in low-profile packages. The **5251H** model provides fixed high-temperature detection at 190°F. These thermal detectors provide cost-effective, intelligent property protection in a variety of applications.

## Agency Listings

UL LISTED · ULC · FM APPROVED · MSFM approved

For exact certification listings for each model, please reference the respective agency Web site.

## 200 Series Intelligent Detector Specifications

| Physical/Operating Specifications | |
|---|---|
| **Height** | 2.0 inches (51 mm) |
| **Diameter** | 6.1 inches (155 mm) installed in B210LP base; 4.1 inches (104 mm) installed in B501 base |
| **Shipping Weight** | Heat: 4.8 oz (136 g); Photo/Photo with Heat: 5.2 oz (147 g); Ion: 5.4 oz (153 g) |
| **Operating Temperature Range** | Ion/Photo: 32°F to 120°F (0°C to 49°C)<br>Photo with Thermal: 32°F to 100°F (0°C to 38°C)<br>Thermal: –4°F to 100°F (–20°C to 38°C)<br>High Temperature: –4°F to 150°F (–20°C to 66°C) |
| **UL-Listed Velocity Range** | Ion: 0 to 1,200 fpm (0 to 6.1 m/sec)<br>Photo/Photo with Thermal: 0 to 4,000 fpm (0 to 20 m/sec) (suitable for installation in ducts) |
| **Operating Humidity Range** | 10% to 93% non-condensing |
| **Thermal Ratings** | Fixed Temperature Setpoint: 135°F (57°C)<br>Rate-of-Rise Detection: 15°F/min. (8.3°C/min.)<br>High Temperature Heat: 190°F (88°C) |
| **Electrical Specifications** | |
| **Voltage Range** | 15 to 32 VDC peak |
| **Standby Current (max. avg.)** | 300 μA @ 24 VDC (one communication every 5 seconds with LED enabled)<br>Photo/Photo with Thermal: 300 μA @ 24 VDC (one communication every 5 seconds with LED enabled) |
| **LED Current (max.)** | 6.5 mA @ 24 VDC (on) |

## Ordering Information

| Part No. | Description |
|---|---|
| 2251B* | Photoelectric smoke detector |
| 2251BR* | Photoelectric smoke detector, remote test capable, for use with DNR(W) duct smoke detectors |
| 2251TB* | Photoelectric smoke detector with thermal |
| 2251TMB* | Acclimate multi-criteria smoke detector |
| 1251B* | Ionization smoke detector |
| 5251B* | Fixed temperature thermal detector |
| 5251RB* | Rate-of-rise thermal detector |
| 5251H* | High temperature thermal detector |
| **Bases** | |
| B501* | 4" Flangeless mounting base |
| B501BP* | 4" Flangeless mounting base bulk pack |
| B210LP* | 6" Flanged mounting base |
| B210LPBP* | 6" Flanged mounting base bulk pack |
| B200SR* | Standard sounder base (compatible with B501BH series) |
| B200S* | Intelligent addressable sounder base |
| B224RB* | Relay base |
| B224BI* | Isolator base |
| **Accessories** | |
| SMB600 | Surface Mounting Kit (flanged) |
| F110 | Accessory Flange Ring for 6" Base |
| F110BP | Accessory Flange Ring for 6" Base Bulk Pack |
| F210 | Accessory New Smaller Flange Ring for 6" Base |
| RA100Z | Remote LED annunciator |
| M02-04-01 | Detector test magnet |
| M02-09-00 | Telescoping test magnet |
| XR2B | Detector removal tool (T55-127-000 included) |
| XP-4 | Extension for XR2B (5 to 15 ft) |
| T55-127-000 | Detector removal head |
| BCK-200B | Black detector kit (10 pack)** |
| WCK-2008 | White detector kit (10 pack)** |

## Accessories

* Add "A" for ULC listed product (e.g., 2251BA)

** The BCK-200B and WCK-200B are only applicable to the B210LP flanged style mounting base and may only be used with 2251B (photoelectric) and 1251B (ionization) smoke detectors.

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SPDS10601 • 8/12

# Wheelock® Exceder™ Series

COOPER Notification

EXCEDER™

## Strobe, Horn Strobe, and Horn Notification Appliances

***Description:***

The Wheelock® Exceder™ Series of notification appliances feature a sleek modern design that will please building owners with reduced total cost of ownership. Installers will benefit from its comprehensive feature list, including the most candela options in one appliance, low current draw, no tools needed for setting changes, voltage test points, 12/24 VDC operation, universal mounting base and multiple mounting options for both new and retrofit construction.

The Wheelock® Exceder™ Series incorporates high reliability and high efficiency optics to minimize current draw allowing for a greater number of appliances on the notification appliance circuit. All strobe models feature an industry first of 8 candela settings on a single appliance. Models with an audible feature 3 sound settings (90, 95, 99 dB). All switches to change settings, can be set without the use of a tool and are located behind the appliance to prevent tampering. Wall models feature voltage test points to take readings with a voltage meter for troubleshooting and AHJ inspection.

The Wheelock® Exceder™ Series of wall and ceiling notification appliances feature a Universal Mounting Base (UMB) designed to simplify the installation and testing of horns, strobes, and combination horn strobes. The separate universal mounting base can be pre-wired to allow full testing of circuit wiring before the appliance is installed and the surface is finished. It comes complete with a Contact Cover for protection against dirt, dust, paint and damage to the contacts. The Contact Cover also acts as a shunting device to allow pre-wire testing for common wiring issues. The Contact Cover is polarized to prevent it from being installed incorrectly and prevents the appliance from being installed while it is on the UMB. When the Contact Cover is removed the circuit will show an open until the appliance is installed. The UMB allows for consistent installation and easy replacement of appliances if required. Wall models provide an optional locking screw for extra secure installation, while the ceiling models provide a captivated screw to prevent the screw from falling during installation.

- Save up to 48% in current draw*
- Up to 9 models now in 1 appliance
- Save up to 14% cost of installation**

- Sleek Modern Aesthetics
- Finger Slide Switches
- Voltage Test Points
- Multiple Voltages
- 3 Audible Settings
  90, 95, 99 dB
- 8 Candela Settings ***
  Wall - 15/1575/30/75/95/110/135/185
  Ceiling - 15/30/60/75/95/115/150/177
- Universal Mounting Base ***
  Ceiling and Wall
  Mounts to 5 Backbox Types
- Environmentally Friendly
  Low Current Draw

Compatibility and Requirements

- Synchronize using the Wheelock® Sync Modules or panels with built-in Wheelock® Patented Sync Protocol
- Compatible with UL "Regulated Voltage" using filtered VDC or unfiltered VRMS input voltage
- Strobes produce 1 flash per second over the "Regulated Voltage" range

* Compared to competitive models
** Compared to previous models
*** Patented

**NOTE: All CAUTIONS and WARNINGS are identified by the symbol ⚠. All warnings are printed in bold capital letters.**

**⚠ WARNING: PLEASE READ THESE SPECIFICATIONS AND ASSOCIATED INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. VISIT WWW.COOPERNOTIFICATION.COM OR CONTACT COOPER NOTIFICATION FOR THE CURRENT INSTALLATION INSTRUCTIONS. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS OR WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

## *General Notes:*

General Notes:

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range".
- All candela ratings represent minimum effective strobe intensity based on UL Standard 1971.
- Series Exceder Strobe products are Listed under UL Standards 1971 and 464 for indoor use with a temperature range of 32°F to 120°F (0°C to 49°C) and maximum humidity of 93% (± 2%) UL 464 (85% UL 1971).
- Series Exceder horns are under UL Standard 464 for audible signal appliances (Indoor use only).

## Low Current Draw = Fewer Power Supplies

Strobe Ratings per UL Standard 1971

| | | UL Max Current* | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 VDC / 24 FWR | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| ST | 8.0-33.0 | 0.057 | 0.070 | 0.085 | | 0.135 | 0.163 | 0.182 | | 0.205 | | | 0.253 | 0.110 | 0.140 |
| STC | 8.0-33.0 | 0.061 | | 0.085 | 0.103 | 0.135 | 0.163 | | 0.182 | | 0.205 | 0.253 | | 0.110 | |

Horn Strobe Ratings per UL 1971 & Anechoic at 24 VDC

| | | UL Max Current* at Anechoic 99 dBA | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 VDC | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| HS | 8.0-33.0 | 0.082 | 0.095 | 0.102 | | 0.148 | 0.176 | 0.197 | | 0.242 | | | 0.282 | 0.125 | 0.159 |
| HSC | 8.0-33.0 | 0.082 | | 0.102 | 0.141 | 0.148 | 0.176 | | 0.197 | | 0.242 | 0.282 | | 0.125 | |
| | | UL Max Current* at Anechoic 95 dBA | | | | | | | | | | | | |
| | | 24 VDC | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| HS | 8.0-33.0 | 0.073 | 0.083 | 0.087 | | 0.139 | 0.163 | 0.186 | | 0.230 | | | 0.272 | 0.122 | 0.153 |
| HSC | 8.0-33.0 | 0.073 | | 0.087 | 0.128 | 0.139 | 0.163 | | 0.186 | | 0.230 | 0.272 | | 0.122 | |
| | | UL Max Current* at Anechoic 90 dBA | | | | | | | | | | | | |
| | | 24 VDC | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| HS | 8.0-33.0 | 0.065 | 0.075 | 0.084 | | 0.136 | 0.157 | 0.184 | | 0.226 | | | 0.267 | 0.120 | 0.148 |
| HSC | 8.0-33.0 | 0.065 | | 0.084 | 0.120 | 0.136 | 0.157 | | 0.184 | | 0.226 | 0.267 | | 0.120 | |

Horn Ratings per UL Anechoic

| Model | Regulated Voltage Range VDC | 99 dB | 95 dB | 90 dB |
|---|---|---|---|---|
| HN | 16-33.0 | 0.064 | 0.044 | 0.022 |
| HNC | 16-33.0 | 0.084 | 0.044 | 0.022 |
| HN | 8.0-17.5 | 0.047 | 0.026 | 0.017 |
| HNC | 8.0-17.5 | 0.047 | 0.026 | 0.017 |

* UL max current rating is the maximum RMS current within the listed voltage range (16-33 VDC for 24 VDC units). For strobes the UL max current is usually at the minimum listed voltage (16 VDC for 24 VDC units). For audibles the max current is usually at the maximum listed voltage (33 VDC for 24 VDC units). For unfiltered ratings, see installation instructions.

## Specification & Ordering Information

Easy to remember model codes

8 candelas on 1 device

1 gang, 2 gang, 4" sq, 3.5" octal & 4" octal boxes

| Model | Strobe Candela | Sync w/ DSM or Wheelock Power Supplies | 12/24 VDC* | Mounting Options |
|---|---|---|---|---|
| **Horn Strobes** | | | | |
| HSR | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| HSW | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| HSRC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| HSWC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| **Strobes** | | | | |
| STR | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| STW | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| STRC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| STWC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| **Horn** | | | | |
| HNR | | X | X | UMB** |
| HNW | | X | X | UMB** |
| HNRC | | X | X | UMB** |
| HNWC | | X | X | UMB** |

*12 VDC models feature 15 & 15/75 settings

**UMB = Universal Mounting Base

Model Legend

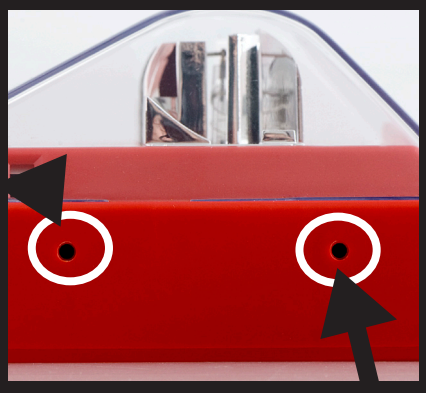
HN = Horn
ST = Strobe
HS = Horn Strobe
C = Ceiling Mount
W = White
R = Red

A = Agent Lettering (Strobes only)
AL = Alert Lettering (Strobes only)
N = No Lettering (Strobes only)

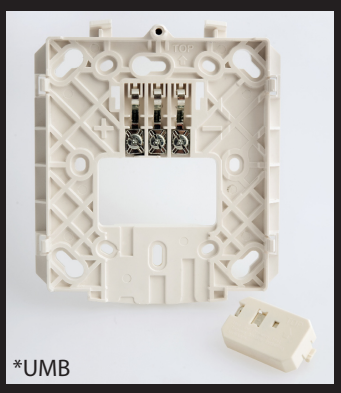
Example 1: STRC = Strobe, Red, Ceiling Mount
Example 2: HSR = Horn Strobe, Red, Wall Mount
Example 3: HSW = Horn Strobe, White, Wall Mount
Example 4: STW-AL = Strobe, White, Wall Mount, Alert Lettering

Example: HSR

Example: HSWC


Voltage test points for quick troubleshooting and easy spot checking (wall models only)

8 candela settings


*UMB

Contact Cover

Common base for wall and ceiling with 5 mounting options

**NOTE: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Cooper Wheelock Inc., dba Cooper Notification standard terms and conditions.**

## Architects and Engineers Specifications

The notification appliances shall be Wheelock® Exceder™ Series HS Audible Strobe appliances, Series ST Visual Strobe appliances and Series HN Audible appliances or approved equals. The Series HS and ST Strobes shall be listed for UL Standard 1971 (Emergency Devices for the Hearing-Impaired) for Indoor Fire Protection Service. The Series HS and HN Audibles shall be UL Listed under Standard 464 (Fire Protective Signaling). All Series shall meet the requirements of FCC Part 15 Class B. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP) with the ability to operate from 8 to 33 VDC. Indoor wall models shall incorporate voltage test points for easy voltage inspection.

The Series HS Audible Strobe and ST Strobe appliances shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Xenon flashtube enclosed in a rugged Lexan® lens. The Series shall be of low current design. Where Multi-Candela appliances are specified, the strobe intensity shall have 8 field selectable settings at 15, 15/75, 30, 75, 95, 110, 135, 185 candela for wall mount and 15, 30, 60, 75, 95, 115, 150, 177 candela for ceiling mount. The selector switch for selecting the candela shall be tamper resistant. The 15/75 candela strobe shall be specified when 15 candela UL Standard 1971 Listing with 75 candela on-axis is required (e.g. ADA compliance). Appliances with candela settings shall show the candela selection in a visible location at all times when installed.

The audible shall have a minimum of three (3) field selectable settings for dBA levels and shall have a choice of continuous or temporal (Code 3) audible outputs.

The Series HS Audible Strobe, ST Strobe and Series HN Audible shall incorporate a patented Universal Mounting Base that shall allow mounting to a single-gang, double-gang, 4-inch square, 3.5-inch octal, 4-inch octal or 100mm European type back boxes. Two wire appliance wiring shall be capable of directly connecting to the mounting base. Continuity checking of the entire NAC circuit prior to attaching any notification appliances shall be allowed. Product shall come with Contact Cover to protect contact springs. Removal of an appliance shall result in a supervision fault condition by the Fire Alarm Control Panel (FACP). The mounting base shall be the same base among all horn, strobe, horn strobe, wall and ceiling models. All notification appliances shall be backwards compatible.

The Series HS and ST wall models shall have a low profile measuring 5.24” H x 4.58” W x 2.19” D. Series HN wall shall measure 5.24” H x 4.58” W x 1.6” D. The Series HSC and STC shall been round and have a low profile with a diameter of 6.68” x 2.63” D. Series HNC ceiling shall have a diameter of 6.68” x 1.50” D.

When synchronization is required, the appliance shall be compatible with Wheelock®’s DSM Sync Modules, Wheelock® Power Supplies or other manufacturer’s panels with built-in Wheelock® Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync protocol fails to operate, the strobe shall revert to a non-synchronized flash-rate and still maintain (1) flash per second over its Regulated Voltage Range. The appliance shall also be designed so that the audible signal may be silenced while maintaining strobe activation when used with Wheelock® synchronization protocol.

**Wall Appliances** – UL Standard 1971, UL Standard 464, California State Fire Marshal (CSFM), ULC, FM
**Ceiling Appliances** – UL Standard 1971, UL Standard 464, California State Fire Marshal (CSFM), ULC, FM

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3 YEAR WARRANTY

**Exceder - Spec Sheet 6/11**

NJ Location
273 Branchport Ave.
Long Branch, NJ 07740
P: 800-631-2148
F: 732-222-8707
www.coopernotification.com

Cooper Notification is Wheelock® MEDC SAFEPATH WAVES Roam Secure

COOPER Notification

COOPER Wheelock

# Series NS Horn Strobes and Series NH Horns

Series NS

Series NH

***Description:***

The Series NS Horn Strobe Appliances are designed for indoor, wall and ceiling mount applications.

The Series NH Horn and the horn portion of the Series NS include a selectable continuous horn tone or temporal pattern (Code 3) with selectable dBA settings of 90 or 95 dBA.

Strobe options include 1575cd or the Wheelock patented Multi-Candela strobe with field selectable candela settings of 15/30/75/110cd for wall mount and 15/30/75/95cd and 115/177cd for ceiling mount.

These versatile Horn Strobe Appliances can be synchronized using the Wheelock SM, DSM Sync Modules or the PS-24-8MC Power Supply with the Wheelock patented Sync Protocol. Additionally, the audible may be silenced while maintaining strobe activation.

All models of the Series NS and NH are designed for maximum performance, reliability and cost-effectiveness while meeting or exceeding the latest requirements of NFPA 72/ANSI 117.1/UFC and UL Standards 1971 and 464 as well as meeting ADA requirements concerning photosensitive epilepsy.

The Wheelock patented 2-Wire Series NS Horn Strobes and Series NH Horns offer more features with lower current draw than competitors.

***Features:***

- Approvals include: UL Standard 1971, UL Standard 464, New York City (MEA), California State Fire Marshal (CSFM), Factory Mutual (FM) and Chicago (BFP). See approvals by model number in Specifications and Ordering Information
- ADA/NFPA/UFC/ANSI compliant
- Complies with OSHA 29, Part 1910.165
- Wall mount model Field Selectable Candela Setting 15/30/75/110cd (24 VDC Multi-Candela models) or 1575cd in 12 or 24 VDC
- Ceiling mount model Field Selectable Candela Setting 15/30/75/95cd and 115/177cd (24 VDC Multi-Candela models)
- Selectable Continuous Horn or Temporal (Code 3)
- 2 Selectable dBA settings of 90 and 95 dBA in both tones
- Patented Universal Mounting Plate
- 12 and 24 VDC models with UL “Regulated Voltage” using filtered DC or unfiltered VRMS input voltage
- Wall and Ceiling Mount
- Ceiling models with same look as Wheelock round ceiling strobes and speakers
- NH horn is selectable 12 or 24 VDC in 1 appliance
- The strobes can be synchronized using the Wheelock sync modules or power supplies with built in Sync Protocol
- Fast installation with IN/OUT screw terminals using #12 to #18 AWG wires

NS and NH Ceiling Mount Appliances will be available July 2006.

E5946
S5391

151-92-E

7125-0785:142

FM APPROVED

**NOTE: All CAUTIONS and WARNINGS are identified by the symbol ⚠. All warnings are printed in bold capital letters.**

**⚠ WARNING: PLEASE READ THESE SPECIFICATIONS AND ASSOCIATED INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. VISIT WWW.COOPERWHEELOCK.COM OR CONTACT COOPER WHEELOCK FOR THE CURRENT INSTALLATION INSTRUCTIONS. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS OR WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

## *General Notes:*

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range". Note that NFPA-72 specifies a flash rate of 1 to 2 flashes per second and ADA Guidelines specify a flash rate of 1 to 3 flashes per second.
- All candela ratings represent minimum effective Strobe intensity based on UL Standard 1971.
- Series NS Strobe products are listed under UL Standard 1971 for indoor use with a temperature range of 32°F to 120°F (0°C to 49°C) and maximum humidity of 93% (± 2%).
- Series NH horns are listed under UL Standard 464 for audible signal appliances (Indoor use only).
- **"Regulated Voltage Range" is the newest terminology used by UL to identify the voltage range. Prior to this change UL used the terminology "Listed Voltage Range".**

**Table 1: Ratings Per UL Standard 1971**

| Model | Input Voltage VDC | Regulated Voltage Range VDC/FWR | Strobe Candela (CD) |
|---|---|---|---|
| NS-24MCW | 24 | 16.0 - 33.0 | 15/30/75/110 |
| NS-241575W | 24 | 16.0 - 33.0 | 15 (75 on Axis) |
| NS-121575W | 12 | 8.0 - 17.5 | 15 (75 on Axis) |
| NS-24MCC | 24 | 16.0 - 33.0 | 15/30/75/95 |
| NS-24MCCH | 24 | 16.0 - 33.0 | 115/177 |

**Table 2: dBA Ratings for Series NS/NH Horn**

| Description | Volume | Reverberant dBA @ 10ft per UL 464 | | Anechoic dBA @ 10 ft | |
|---|---|---|---|---|---|
| | | 12 VDC | 24 VDC | 12 VDC | 24 VDC |
| Continuous Horn | High | 83 | 87 | 89 | 95 |
| | Low | 76 | 81 | 84 | 90 |
| Code 3 Horn | High | 79 | 82 | 89 | 95 |
| | Low | 72 | 76 | 84 | 90 |

**Table 3: UL Max Current***

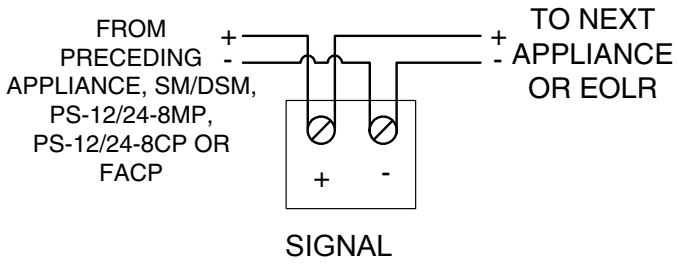
| Series NS/NH 24 VDC | | Audible | Wall Mount Strobe Models | | | | | Ceiling Mount Strobe Models | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NH-12/24 | NS-241575W | NS-24MCW | | | | NS-24MCC | | | | NS-24MCCH | |
| | | @24VDC | 15/75cd | 15cd | 30cd | 75cd | 110cd | 15cd | 30cd | 75cd | 95cd | 115cd | 177cd |
| High (95) dBA | 24VDC | 0.044 | 0.104 | 0.074 | 0.107 | 0.184 | 0.244 | 0.082 | 0.124 | 0.209 | 0.275 | 0.350 | 0.477 |
| Low (90) dBA | 24VDC | 0.018 | 0.096 | 0.066 | 0.101 | 0.177 | 0.232 | 0.071 | 0.114 | 0.201 | 0.261 | 0.306 | 0.429 |

| Series NS/NH 12VDC | | Audible | Wall Mount |
|---|---|---|---|
| | | NH-12/24 | Aud/Strobe |
| | | @12V | NS-121575W |
| High (89) dBA | 12 VDC | 0.021 | 0.220 |
| Low (84) dBA | 12VDC | 0.012 | 0.210 |

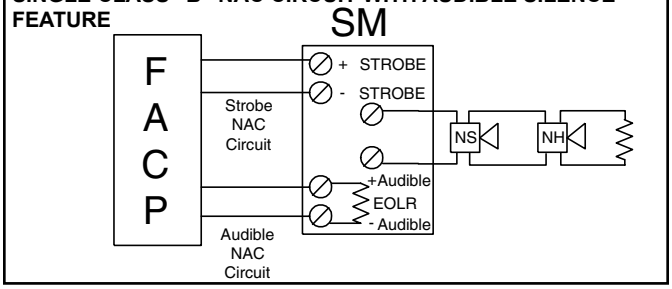
* RMS current ratings are per UL average RMS method. UL max current rating is the maximum RMS current within the listed voltage range (16-33v for 24v units). For strobes the UL max current is usually at the minimum listed voltage (16v for 24v units). For audibles the max current is usually at the maximum listed voltage (33v for 24v units). For unfiltered FWR ratings, see installation instructions.

## *Wiring Diagrams#*

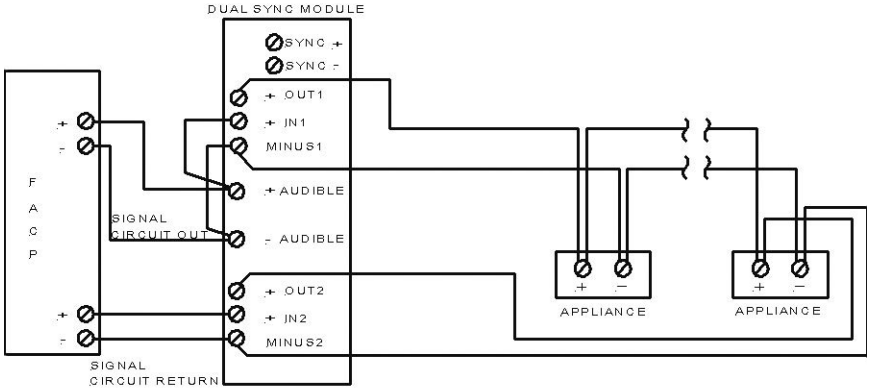
**NS/NH APPLIANCE**




**NS AND NH APPLIANCES SYNCHRONIZED WITH SM MODULE SINGLE CLASS "B" NAC CIRCUIT WITH AUDIBLE SILENCE FEATURE**




**NS AND NH APPLIANCES SYNCHRONIZED WITH DSM MODULE DUAL CLASS "A" NAC CIRCUIT WITH NO AUDIBLE SILENCE FEATURE**




**NOTE: NS/NH must be set on Code 3 horn tone to achieve synchronized temporal (Code 3) tone. Refer to installation instruction (P83983, P83600 respectively).**

# For detail using SM or DSM Sync Module refer to Data Sheet S3000 or Installation Instructions P83123 for SM and P83177 for DSM. For wiring information on the power supplies refer to Installation Instructions P84515 for PS-12/24-8CP and P84333 for PS-12/24-8MP.

## *SPECIFICATION & ORDERING INFORMATION*

| Model Number | Order Code | Strobe Candela | Sync w/ SM, DSM or PS-24-8MC | 24 VDC | 12 VDC | Mounting Options# | Agency Approvals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UL | MEA | CSFM | FM | BFP |
| NS-24MCW-FR | 9404 | 15/30/75/110 | X | X | - | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-24MCW-FW | 9405 | 15/30/75/110 | X | X | - | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-241575W-FR | 7806 | 15 (75 on Axis) | X | X | - | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-241575W-FW | 7811 | 15 (75 on Axis) | X | X | - | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-121575W-FR | 7816 | 15 (75 on Axis) | X | -- | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-121575W-FW | 7818 | 15 (75 on Axis) | X | - | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NH-12/24-R | 7449 | - | X | X | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NH-12/24-W | 7500 | - | X | X | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-24MCC-FR | 3754 | 15/30/75/95 | X | X | - | E | X | * | * | X | * |
| NS-24MCC-FW | 3753 | 15/30/75/95 | X | X | - | E | X | * | * | X | * |
| NS-24MCCH-FR | 3756 | 115/177 | X | X | - | E | X | * | * | X | * |
| NS-24MCCH-FW | 3755 | 115/177 | X | X | - | E | X | * | * | X | * |
| NH-12/24R-R | 3752 | - | X | - | X | B,D,E,F,G,H,J,N,O,R,X | X | * | * | X | * |
| NH-12/24R-W | 3751 | - | X | - | X | B,D,E,F,G,H,J,N,O,R,X | X | * | * | X | * |

NS and NH Ceiling Mount Appliances will be available July 2006. *Pending

Note: Models are available in Red or White. Contact Customer Service for Order Code and Delivery.
**#Refer to Data Sheet S7000 for Mounting Options**

**NOTE: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Wheelock Inc. standard terms and conditions.**

## *ARCHITECTS AND ENGINEERS SPECIFICATIONS*

The audible/visual notification appliances shall be Wheelock Series NS Horn Strobe appliances and Series NH Horn appliances or approved equals. The Series NS appliances shall meet and be listed for UL Standard 1971(Emergency Devices for the Hearing-Impaired for Indoor Fire Protection Service). The Series NH Horn shall be UL Listed under Standard 464 (Fire Protective Signaling). The horn strobe shall be listed for indoor use and shall meet the requirements of FCC Part 15 Class B. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by the Fire Alarm Control Panel (FACP).

The audible portion of the appliance shall have a minimum of two (2) field selectable settings for dBA levels (90 and 95 dBA) and shall have a choice of continuous or temporal (Code 3) audible outputs.

The strobe portion of the appliance shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Xenon flashtube enclosed in a rugged Lexan lens. The Series NS shall be of low current design. Where wall mount, Multi-Candela appliances are specified, the strobe intensity shall have field selectable settings and shall be rated per UL Standard 1971 for 15/30/75/110 candela. Where ceiling mount, Multi-Candela appliances are specified, the strobe intensity shall have field selectable settings and shall be rated per UL Standard 1971 for 15/30/75/95 candela or 115/177 candela. The selector switch for selecting the candela setting shall be tamper resistant. The 1575 candela strobe shall be specified when 15 candela UL Standard 1971 Listing with 75 candela on-axis is required (e.g. ADA compliance).

When synchronization is required, the appliance shall be compatible with the Wheelock SM, DSM Sync Modules or the Wheelock PS-24-8MC Power Supplies with built-in Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync module or Power Supply fails to operate, (i.e., contacts remain closed), the strobes shall revert to a non-synchronized flash-rate. The appliance shall also be designed so that the audible signal may be silenced while maintaining strobe activation.

The Series NS Horn Strobes and NH horn shall incorporate a Patented Universal Mounting Plate that shall allow mounting to a single-gang, double-gang, 4-inch square, 100mm European type backboxes, or the SHBB Surface Backbox. If required, an NATP (Notification Appliance Trimplate) shall be provided.

All notification appliances shall be backward compatible.

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# Cooper-Wheelock NS Series Horn Strobes & NH Series Horns

**NS Horn Strobe**

**NH Horn**

**Multi-Candela Indicator (bottom of Strobe Lens)**

## Description

The Cooper-Wheelock Series NS Horn Strobe Appliances will satisfy virtually all requirements for indoor, wall mount applications.

The Series NH Horn and the horn portion of the Series NS include a selectable continuous horn tone or temporal pattern (Code 3) with selectable dBA settings of 90 or 95 dBA.

Strobe options include 15/75cd or Cooper-Wheelock's patented Multi-Candela strobe with field selectable candela settings of 15/30/75/110cd.

These versatile Horn Strobe Appliances may be synchronized when used in conjunction with the Wheelock SM or DSM Sync Modules or a Power Supply with the Cooper-Wheelock patented Sync Protocol. Additionally, the audible may be silenced while maintaining strobe activation.

All models of the Series NS and NH are designed for maximum performance, reliability and cost-effectiveness while meeting or exceeding the latest requirements of NFPA 72/ANSI 117.1/UFC and UL Standards 1971 and 464 as well as meeting ADA requirements concerning photosensitive epilepsy.

## General Notes

- Strobes are designed to flash once per second minimum over their "Regulated Voltage Range". Note that NFPA-72 specifies a flash rate of 1 to 2 flashes per second and ADA Guidelines specify a flash rate of 1 to 3 flashes per second.
- All candela ratings represent minimum effective Strobe intensity based on UL Standard 1971.
- Series NS Strobe products are listed under UL Standard 1971 for indoor use with a temperature range of 32°F to 120°F (0°C to 49°C) and maximum humidity of 93% (± 2%).
- Series NH horns are listed under UL Standard 464 for audible signal appliances (Indoor use only).
- **"Regulated Voltage Range" is the newest terminology used by UL to identify the voltage range. Prior to this change UL used the terminology "Listed Voltage Range".**

## Features

- Field Selectable Candela Settings 15/30/75/110cd (24 VDC Multi-Candela models) or 15/75cd in 12 or 24 VDC
- Selectable Continuous Horn or Temporal (Code 3)
- 2 Selectable dBA settings of 90 and 95 dBA in both tones
- 12 and 24 VDC models with UL "Regulated Voltage" using filtered DC or unfiltered VRMS input voltage
- Patented Universal Mounting Plate
- Wall Mount
- ADA/NFPA/UFC/ANSI compliant
- Complies with OSHA 29, Part 1910.165
- NH horn is selectable 12 or 24 VDC in 1 unit
- Synchronize with Wheelock SM or DSM Sync Module or a Power Supply with built-in sync protocol
- Patent pending Universal Mounting Plate for single-gang, double-gang, 4" (10.16 cm) square, or 100 mm European backboxes, or Wheelock's SHBB shallow surface backbox.
- Fast installation with IN/OUT screw terminals using #12 to #18 AWG wires

## Listings

Listings and approvals below apply to the basic NS Series Strobes and NH Series Horns. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- UL Listed: file E5946.
- ULC Listed: files CS243 & CS356.
- FM approved.
- MEA approved: file 151-92-E.
- CSFM approved: file 7125-0785:142

Gamewell FCI FIRE CONTROL INSTRUMENTS
by Honeywell

# Engineer's Specifications

The audible/visual notification appliances shall be Cooper-Wheelock Series NS Horn Strobe appliances and Series NH Horn appliances or approved equals. The Series NS appliances shall meet and be listed for UL Standard 1971(Emergency Devices for the Hearing-Impaired for Indoor Fire Protection Service). The Series NH Horn shall be UL Listed under Standard 464 (Fire Protective Signaling). The horn strobe shall be listed for indoor use and shall meet the requirements of FCC Part 15 Class B. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by the Fire Alarm Control Panel (FACP).

The audible portion of the appliance shall have a minimum of two (2) field selectable settings for dBA levels (90 and 95 dBA) and shall have a choice of continuous or temporal (Code 3) audible outputs.

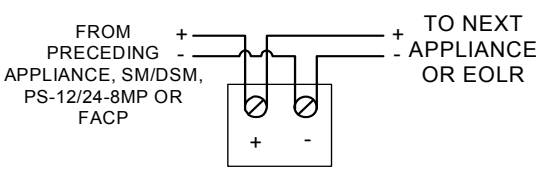
The strobe portion of the appliance shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Xenon flashtube enclosed in a rugged Lexan lens. The Series NS shall be of low current design. Where wall mount, Multi-Candela appliances are specified, the strobe intensity shall have field selectable settings and shall be rated per UL Standard 1971 for 15/30/75/110 candela. The selector switch for selecting the candela setting shall be tamper resistant. The 15/75 candela strobe shall be specified when 15 candela UL Standard 1971 Listing with 75 candela on-axis is required (e.g. ADA compliance).

When synchronization is required, the appliance shall be compatible with Cooper- Wheelock's SM, DSM Sync Modules or a Power Supply with Cooper-Wheelock's built-in Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync module or Power Supply fails to operate, (i.e., contacts remain closed), the strobes shall revert to a non-synchronized flash-rate. The appliance shall also be designed so that the audible signal may be silenced while maintaining strobe activation.

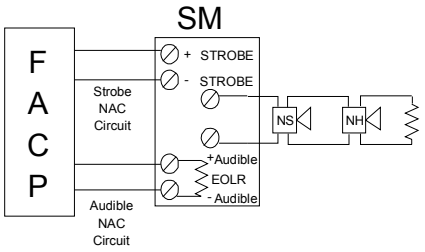
The Series NS Horn Strobes and NH horn shall incorporate a Patented Universal Mounting Plate that shall allow mounting to a single-gang, double-gang, 4-inch square, 100mm European type backboxes, or the SHBB Surface Backbox. If required, an NATP (Notification Appliance Trimplate) shall be provided.

All notification appliances shall be backward compatible.

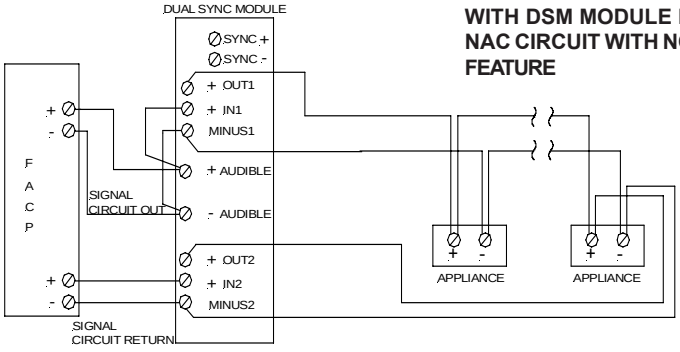
# Wiring Diagram




**NS/NH APPLIANCE**




**NS AND NH APPLIANCES SYNCHRONIZED WITH SM MODULE SINGLE CLASS "B" NAC CIRCUIT WITH AUDIBLE SILENCE FEATURE**




**NS AND NH APPLIANCES SYNCHRONIZED WITH DSM MODULE DUAL CLASS "A" NAC CIRCUIT WITH NO AUDIBLE SILENCE FEATURE**

**NOTE**: NS/NH must be set on Code 3 horn to achieve synchronized temporal (Code 3) tone. Refer to instruction (P38983, P83600 respectively).

**⚠ WARNING: CONTACT COOPER-WHEELOCK FOR THE CURRENT INSTALLATION INSTRUCTIONS (P83983) SERIES NS-24MCW, (P84234) SERIES NS-12 AND 24 VDC SINGLE CANDELA MODELS, (P83600) SERIES NH AND "GENERAL INFORMATION" SHEET (P82380) ON THESE PRODUCTS. THESE DOCUMENTS UNDERGO PERIODIC CHANGES. IT IS IMPORTANT THAT YOU HAVE CURRENT INFORMATION ON THESE PRODUCTS. THESE MATERIALS CONTAIN IMPORTANT INFORMATION THAT SHOULD BE READ PRIOR TO SPECIFYING OR INSTALLING THESE PRODUCTS, INCLUDING:**

- TOTAL CURRENT REQUIRED BY ALL APPLIANCES CONNECTED TO SYSTEM SECONDARY POWER SOURCES.
- FUSE RATINGS ON NOTIFICATION APPLIANCE CIRCUITS TO HANDLE PEAK CURRENTS FROM ALL APPLIANCES ON THOSE CIRCUITS.
- COMPOSITE FLASH RATE FROM MULTIPLE STROBES WITHIN A PERSON'S FIELD OF VIEW.
- ADDING, REPLACING OR CHANGING APPLIANCES OR CHANGING CANDELA SETTINGS WILL AFFECT CURRENT DRAW.
- RECALCULATE CURRENT DRAW TO INSURE THAT THE TOTAL AVERAGE CURRENT AND TOTAL PEAK REQUIRED BY ALL APPLIANCES DO NOT EXCEED THE RATED CAPACITY OF THE POWER SOURCES OR FUSES.
- THE VOLTAGE APPLIED TO THESE PRODUCTS MUST BE WITHIN THEIR "REGULATED VOLTAGE RANGE".
- INSTALLATION OF 110 CANDELA STROBE PRODUCTS IN SLEEPING AREAS.
- INSTALLATION IN OFFICE AREAS AND OTHER SPECIFICATION AND INSTALLATION ISSUES.
- THESE APPLIANCES ARE NOT DESIGNED TO BE USED ON CODED SYSTEMS IN WHICH THE APPLIED VOLTAGE IS CYCLED ON AND OFF.
- FAILURE TO COMPLY WITH THE INSTALLATION INSTRUCTIONS OR GENERAL INFORMATION SHEETS COULD RESULT IN IMPROPER INSTALLATION, APPLICATION, AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.
- CONDUCTOR SIZE (AWG), LENGTH AND AMPACITY SHOULD BE TAKEN INTO CONSIDERATION PRIOR TO DESIGN AND INSTALLATION OF THESE PRODUCTS, PARTICULARLY IN RETROFIT INSTALLATIONS.

# Specification & Ordering Information

| MODEL | STROBE CANDELA | NON-SYNC | SYNC W/SM, DSM | 24 VDC | 12 VDC | 2 WIRE | MOUNTING OPTIONS*** | AGENCY APPROVALS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | UL | MEA | CSFM | FM | BFP |
| NS-24MCW-FR | 15/30/75/110 | X | X | X | - | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-24MCW-FW | 15/30/75/110 | X | X | X | - | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-241575W-FR | 15 (75 on axis) | X | X | X | - | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NS-121575W-FR | 15 (75 on axis) | X | X | - | X | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |
| NH-12/24-R | 12V<br>24V | X | X | X | X | X | B,D,E,F,G,H,J,N,O,R,X | X | X | X | X | X |

**Table 1: Ratings Per UL Standard 1971**

| Model | Input Voltage VDC | Regulated Voltage Range VDC/FWR | Strobe Candela (CD) |
|---|---|---|---|
| NS-24MCW | 24 | 16.0 - 33.0 | 15/30/75/110 |
| NS-241575W | 24 | 16.0 - 33.0 | 15 (75 on Axis) |
| NS-121575W | 12 | 8.0 - 17.5 | 15 (75 on Axi) |

**Table 2: *Average RMS Current Ratings**

**NS-24MCW with High (95 dBA) Setting**

| Voltage | 15cd | 30cd | 75cd | 110cd |
|---|---|---|---|---|
| 16.0 VDC | .077 | .113 | .195 | .268 |
| 24.0 VDC | .060 | .087 | .140 | .174 |
| 33.0 VDC | .069 | .082 | .117 | .134 |

**NS-24MCW with Low (90 dBA) Setting**

| Voltage | 15cd | 30cd | 75cd | 110cd |
|---|---|---|---|---|
| 16.0 VDC | .070 | .106 | .188 | .261 |
| 24.0 VDC | .052 | .072 | .126 | .158 |
| 33.0 VDC | .045 | .060 | .097 | .114 |

**Table 3: *Average RMS Current Ratings**

**NS-241575W**

| Voltage | High (95) dBA | Low (90) dBA |
|---|---|---|
| 16.0 VDC | .120 | .116 |
| 24.0 VDC | .094 | .093 |
| 33.0 VDC | .102 | .078 |

**NS-121575W**

| Voltage | High (95) dBA | Low (90) dBA |
|---|---|---|
| 8.0 VDC | .341 | .324 |
| 12.0 VDC | .251 | .265 |
| 17.5 VDC | .216 | .188 |

**Table 4: *Average Mean Current Ratings NH Horn 24 Volt Models**

| Voltage | High (95) dBA | Low (90) dBA |
|---|---|---|
| 16.0 VDC | .019 | .017 |
| **24.0 VDC** | **.028** | **.022** |
| 33.0 VDC | .039 | .027 |

*Average RMS Current is per UL average RMS method and Average Mean Current is per UL average mean method. NH models use average mean current. For rated In Rush and Peak current across the UL listed voltage range for both filtered DC and unfiltered VRMS (FWR), see installation instructions.
*** Refer to mounting options.

Table 5: dBA Ratings for Series NS/NH Horn

| Description | Volume | Reverberant dBA @ 10 ft. per UL 464 | | Anechoic dBA @ 10 ft. | |
|---|---|---|---|---|---|
| | | 12 VDC | 24 VDC | 12 VDC | 24 VDC |
| Continous Horn | High | 83 | 87 | 89 | 95 |
| | Low | 76 | 81 | 84 | 90 |
| Code 3 Horn | High | 79 | 82 | 89 | 95 |
| | Low | 72 | 76 | 84 | 90 |

**SYNC MODELS/POWER SUPPLY**

| MODEL NUMBER | INPUT VOLTAGE (VDC) | AVERAGE MEAN CURRENT @ 24 VDC | MOUNTING OPTIONS |
|---|---|---|---|
| SM-12/24-R | 24 | .028 | W |
| DSM-12/24-R | 24 | .035 | W |

NOTES:
SM Sync Module is rated for 3.0 amperes @ 24 VDC;
DSM Sync Module is rated for 3.0 amperes per circuit. The maximum number of interconnected DSM Modules is twenty (20).

Specifications and wiring information are provided for information only and are believed to be accurate. Gamewell-FCI assumes no responsibility for their use. Data and design are subject to change without notice. Installation and wiring instructions shipped with the product shall always be used for actual installation. For more information, contact Gamewell-FCI.

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# POWERPATH
# PS-12/24-8
# (108114)
# POWER BOOSTER
# POWER SUPPLY

273 Branchport Avenue, Long Branch, NJ 07740-6899 Ph: (800) 631-2148 Fax: (732) 222-8707
Web Site: www.wheelockinc.com e-mail: info@wheelockinc.com

P83862 M

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**NOTE:** All **CAUTIONS** and **WARNINGS** are identified by the symbol ⚠. All **WARNINGS** are printed in bold capital letters.

⚠**WARNING: READ THIS INSTRUCTION MANUAL CAREFULLY. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS, AND WARNINGS COULD RESULT IN IMPROPER APPLICATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

## 1.0 INTRODUCTION AND SPECIFICATIONS

### 1.1 INTRODUCTION

The PS-12/24-8 **POWER**PATH is an 8 AMP, 12/24VDC, filtered and regulated, supervised remote power supply/charger used for supervision and expanded power driving capability for Fire Alarm Notification Appliance Circuits. The PS-12/24-8 may be connected to any 12 or 24VDC Fire Alarm Control Panel (FACP) by using a Notification Appliance Circuit (NAC) or a "Dry Contact". Primary applications include NAC expansion (supports ADA requirements) and auxiliary power to support system accessories. This unit provides filtered and regulated 12 or 24VDC, 8 AMP supply to up to four (4) Class B, two (2) Class "A", or two (2) Class "B" and one (1) Class "A" Notification Appliance Circuits. Additionally, an auxiliary power output that can be reset is provided. The PS-12/24-8 also contains a battery charger capable of charging either 7 or 12 AMP/Hour (AH) of battery backup. The PS-12/24-8 can only provide a maximum load of 8 amperes for 5 minutes with a 7AH battery or 15 minutes with a 12AH battery.

Two FACP NAC circuits or two "Dry" contact closures can be connected to the **POWER**PATH inputs. These inputs can then be directed to control supervision and power delivery to any combination of the four (4) outputs.

***Each output is rated at 2 AMPS (either Class "A" or Class "B") and can be programmed to generate a steady or Code 3 Temporal horn sound and a strobe output under alarm condition. A maximum 4 AMP output is achieved by paralleling 2 outputs (Class "B" only).***

The PS-12/24-8 under non-alarmed condition provides independent loop supervision for Class "A" and Class "B" FACP NAC circuits. In the event of a loop trouble, the FACP will be notified via the **POWER**PATH steered input (IN1 or IN2). In addition there are common trouble output terminals (used to indicate a loop trouble) and common trouble input terminals (used generically by any initiating circuit).

Wheelock horns/strobes, strobes and horns with synchronizing capability can be utilized with the PS-12/24-8. Audibles can be silenced with only two wires. Additionally, the **POWER**PATH can provide a temporal coded signal for appliances that can utilize it.

## 1.2 SPECIFICATIONS

**Approvals:**

- UL Listed 864 Control for use with Fire Protective Signaling
- MEA approved – NYC Dept. of Buildings
- California State Fire Marshall (CSFM) approved
- NFPA 72 compliant

**Inputs:**

- 115VAC, 60Hz, 3.2 AMP Operating Power in Alarm
- 12/24VDC Battery Backup Connection
- Two (2), 12 or 24VDC NAC Initiating Circuits (9-30VDC at 5mA)
- Two (2) "Dry" Contact initiating Circuits
- Accepts two Class "A" or two Class "B" circuit inputs
- Built in battery charger for sealed lead acid or gel type batteries

**Outputs:**

- Switch selectable 12VDC or 24VDC power limited outputs
- 8 AMP continuous supply current at 12VDC or 24VDC for 5 minutes with 7AH battery or 15 minutes with 12AH battery.
- Capable of four (4), Class "B" circuits (2 Amps each)
- Two outputs may be paralleled for a maximum output of 4 AMPS on a circuit (Class "B" only)
- Capable of two (2) Class "A" circuits (2 Amps each).
- Capable of one (1) Class "A" circuit (2 Amps) and two (2) Class "B" circuits (2 Amps each)
- Code 3 or constant voltage output generation
- Built-in Wheelock synchronization mode that can be fed to any or all of the output circuits
- Input and output can be synchronized with "IN>OUT SYNC" mode (SM, DSM or 2nd PS-12/24-8 is required)
- Audible silence capability
- Filtered and electronically regulated output
- 50mA auxiliary output with reset capability

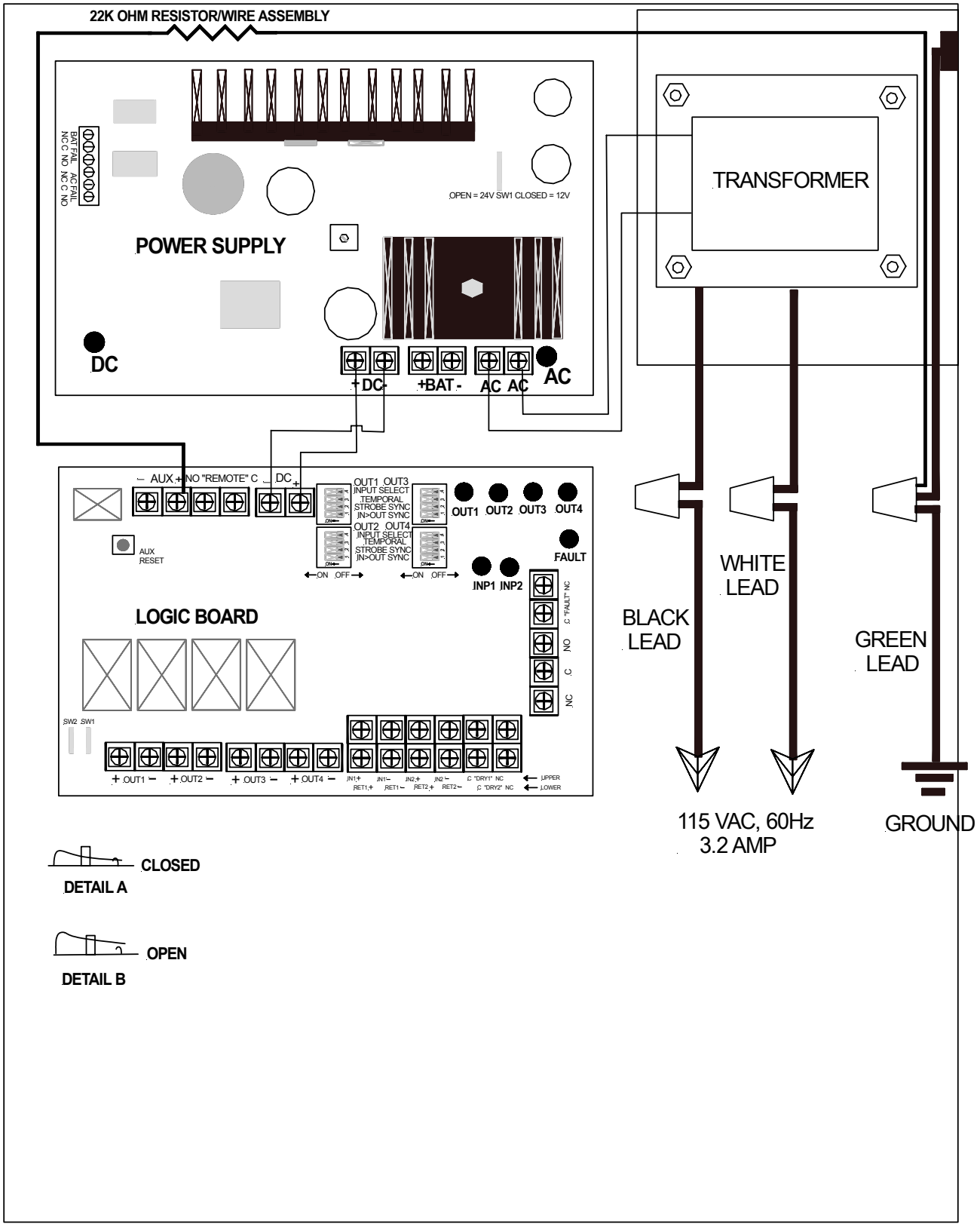
**Supervision:**

- Compatible with 12 or 24VDC FACP
- Signaling appliance loops are supervised and steered to either IN1 or IN2
- 22K OHM, ¼ Watt End-of-Line-Resistor (EOLR) for supervision of all outputs
- Common input and output trouble circuits
- Automatic switchover to standby battery when AC fails
- Thermal and short circuit protection with auto reset
- Input and output status LED indicators
- AC fail supervision (Form "C" contact, 1 AMP 28VDC)
- Battery presence and low battery supervision (Form "C" contact, 1 AMP 28VDC)
- Auxiliary output fail supervision (Form "C" contact, 1 AMP 28VDC)
- Ground Fault Detection (factory installed UL Listed 22K OHM resistor /wire assembly connected from positive (+) AUX to chassis ground)

## 1.3 TERMINOLOGY

CLASS "A" = STYLE Z
CLASS "B" = STYLE Y
FACP = Fire Alarm Control Panel
EOLR = End-of-Line Resistor
NAC = Notification Appliance Circuit
SM = Wheelock Sync Module with single output.
DSM = Wheelock Sync Module with two outputs.
C = Common
NC = Normally Closed
NO = Normally Open
AH = Ampere/Hour

***Figure 1:***
***POWERPATH PS-12/24-8***



COOPER Notification

# Series RSS and RSSP Strobes and Strobe Plates

Series RSS

Series RSS

Series RSSWP

## *Description*

The Wheelock patented Series RSS Strobe Appliances and Series RSSP Strobe Plates have lower current draw while maintaining outstanding performance, reliability and cost effectiveness. These versatile appliances will satisfy virtually all requirements for indoor, wall or ceiling mount applications.

Strobe options for wall mount models include 1575 or the Wheelock Patented MCW multi-candela strobe with field selectable candela settings of 15/30/75/110cd or the high intensity MCWH strobe with field selectable 135/185cd. Ceiling mount models include the patented MCC multi-candela ceiling strobe with field selectable intensities of 15/30/75/95cd or the high intensity MCCH strobe with field selectable 115/177cd.

All models may be synchronized using the Wheelock DSM Sync Modules, Wheelock Power Supplies or other manufacturers panels incorporating the Wheelock Patented Sync Protocol. Synchronized strobes can eliminate possible restrictions on the number of strobes in the field of view. Wheelock's synchronized strobes offer an easy way to comply with ADA recommendations concerning photosensitive epilepsy as well as meeting the requirements of NFPA 72.

The Wheelock Series RSS Strobes employ a Patented Integral Strobe Mounting Plate that can be mounted to a single gang, double gang, 4" square, 100mm European backboxes or the SHBB surface backbox. If the flush backbox has side or top space between it and the finished wall, the NATP (Notification Appliance Trimplate) may be used. It provides an additional .65" of trim for the Appliance. An attractive cover plate is provided for a clean, finished appearance on all models.

The Series RSSP Multi-Candela Strobe Plates are a cost effective way to retrofit required wall strobe appliances to bells, horns, chimes, multitones or speakers and easily mounts to standard 4" backboxes or for surface mount use with the Wheelock SBL2 surface backbox.

## *Features*

- Approvals include: UL Standard 1971, New York City (MEA), California State Fire Marshal (CSFM), Factory Mutual (FM), and Chicago (BFP) See approvals by model in Specifications and Ordering Information
- ADA/NFPA/UFC/ANSI compliant. Meets OSHA 29 Part 1910.165
- Wall mount Multi-Candela models are available with Field Selectable Candela Settings of 15/30/ 75/110cd or 135/185cd. Single Candela models are available in 1575cd
- Ceiling mount Multi-Candela models are available with field selectable candela settings of 15/30/75/95cd or 115/177cd. (Square)
- Strobes produce 1 flash per second over the regulated voltage range
- 12 and 24 VDC models with wide UL "Regulated Voltage" using filtered (DC) or unfiltered VRMS input voltage
- Synchronize using the Wheelock sync modules or panels with built-in Wheelock Patented Sync Protocol
- Fast installation with IN/OUT screw terminals using #12 to #18 AWG wire

*For Weatherproof Series RSS See Datatsheet S9004*

S5391 151-92-E 7125-0785:141 7300-0785:154

**NOTE: All CAUTIONS and WARNINGS are identified by the symbol ⚠. All warnings are printed in bold capital letters.**

⚠ **WARNING: PLEASE READ THESE SPECIFICATIONS AND ASSOCIATED INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. VISIT WWW.COOPERNOTIFICATION.COM OR CONTACT COOPER WHEELOCK FOR THE CURRENT INSTALLATION INSTRUCTIONS. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS OR WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

## *General Notes:*

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range". Note that NFPA-72 specifies a flash rate of 1 to 2 flashes per second and ADA Guidelines specify a flash rate of 1 to 3 flashes per second.
- All candela ratings represent minimum effective Strobe intensity based on UL Standard 1971.
- **"Regulated Voltage Range" is the newest terminology used by UL to identify the voltage range. Prior to this change UL used the terminology "Listed Voltage Range".**

**Table 1: Average RMS Current***

| RSS/RSSP 24VDC Models | RSS/RSSP - Wall Mount | | | | | | | Ceiling Mount | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 241575W | 24MCW | | | | 24MCWH | | 24MCC | | | | 24MCCH | |
| | 1575cd | 15cd | 30cd | 75cd | 110cd | 135cd | 185cd | 15cd | 30cd | 75cd | 95cd | 115cd | 177cd |
| UL max* | 0.090 | 0.060 | 0.092 | 0.165 | 0.220 | 0.300 | 0.420 | 0.065 | 0.105 | 0.189 | 0.249 | 0.300 | 0.420 |

| RSS/RSSP 24VDC Models | RSS/RSSP Wall Mount |
|---|---|
| | 121575W |
| **12 vdc** | **0.152** |
| UL max* | 0.255 |

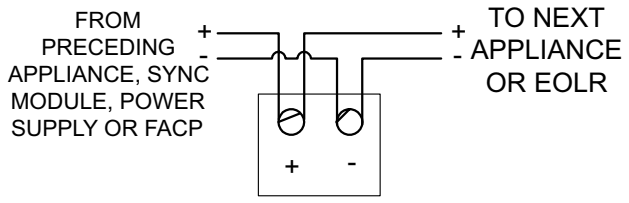
* RMS current ratings are per UL average RMS method. UL max current rating is the maximum RMS current within the listed voltage range (16-33v for 24v units). For strobes the UL max current is usually at the minimum listed voltage (16v for 24v units). For audibles the max current is usually at the maximum listed voltage (33v for 24v units). For unfiltered FWR ratings, see installation instructions.

**Table 2: Audibles/Speakers for RSSP Strobe Plate**

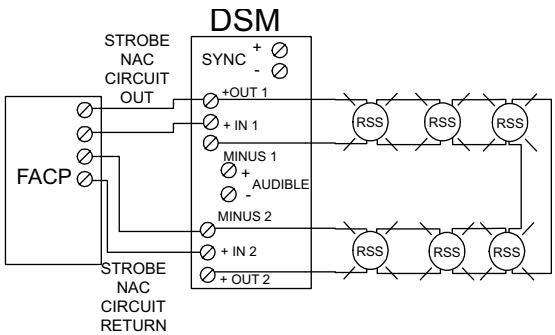
| Product | Series |
|---|---|
| Multitone Appliances | AMT, MT |
| Horns | AH, NH, HS |
| Motor Bells | MB-G6/G10 |
| Speakers | ET-1010/1080, E70, ET70 |
| Chimes | CH70 |

## *Wiring Diagrams* #

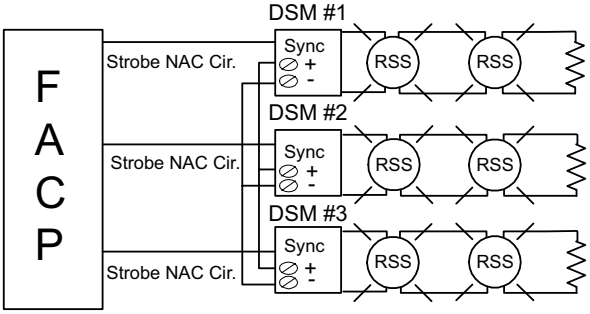
**SERIES RSS/RSSP APPLIANCE**




**SERIES RSS/RSSP APPLIANCES SYNCHRONIZED WITH DSM MODULE SINGLE CLASS "A" NAC CIRCUIT**

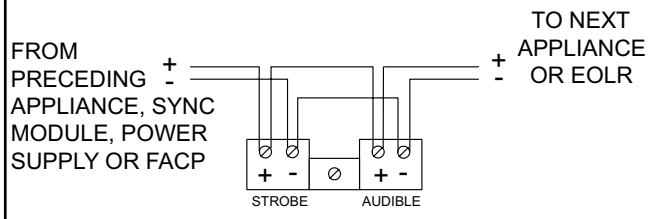



**SERIES RSS/RSSP APPLIANCES SYNCHRONIZED WITH MULTIPLE DSM MODULES**

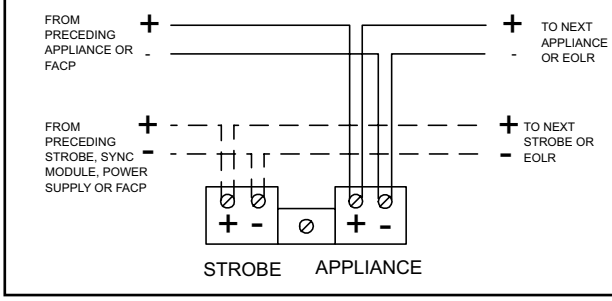



DSM Interconnecting wiring shown. Maximum of twenty (20)

**STROBE/PLATE ASSEMBLY**
AUDIBLE & VISIBLE APPLIANCE OPERATE IN UNISON

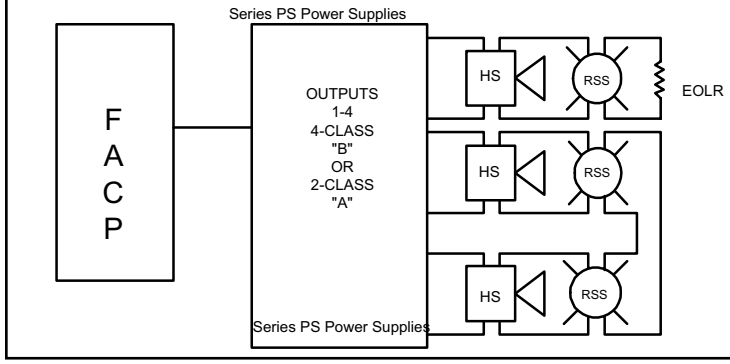



**STROBE/PLATE ASSEMBLY**
AUDIBLE & VISIBLE APPLIANCE OPERATE INDEPENDENTLY




# For detail using DSM Sync Module refer to Data Sheet S3000 or Installation Instructions P83177 for DSM. For wiring information on the power supplies refer to Wheelock Power Supplies.

**SERIES RSS/RSSP APPLIANCES SYNCHRONIZED WITH WHEELOCK POWER SUPPLIES**




## *Specifications and Ordering Information*

| Model | Order Code | Wall Mount | Ceiling Mount | Non-Sync | Strobe Candela | 24 VDC | 12 VDC | Color RED | Color WHITE | Mounting Options*** | Square or Round | Agency Approvals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | UL | MEA | CSFM | FM | BFP |
| RSS-24MCW-FR | 940 | X | - | X | 15/30/75/110 | X | - | X | - | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | X |
| RSS-24MCW-FW | 9401 | X | - | X | 15/30/75/110 | X | - | - | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | X |
| RSS-24MCW-AR**** | 9773 | X | - | X | 15/30/75/110 | X | - | - | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | X |
| RSS-241575W-FR | 7471 | X | - | X | 15 (75 on Axis) | X | - | X | - | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | X |
| RSS-241575W-FW | 7788 | X | - | X | 15 (75 on Axis) | X | - | - | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | X |
| RSS-121575W-FR | 7476 | X | - | X | 15 (75 on Axis) | - | X | X | - | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | X |
| RSS-121575W-FW | 7468 | X | - | X | 15 (75 on Axis) | - | X | - | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | X |
| RSS-24MCC-FW | 3158 | - | X | X | 15/30/75/95 | X | - | - | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | - |
| RSS-24MCC-FR | 3157 | - | X | X | 15/30/75/95 | X | - | X | - | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | - |
| RSS-24MCCH-FW | 3461 | - | X | X | 115/177 | X | - | - | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | - |
| RSS-24MCWH-FR | 3465 | X | | X | 135/185 | X | | X | | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | - |
| RSS-24MCWH-FW | 3464 | X | | X | 135/185 | X | | | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | - |
| RSSWP-2475W-FR** | 9013 | X | - | X | 180@ 77°F 75@ -31°F | X | - | X | - | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | - |
| RSSWP-2475W-FW** | 3034 | X | - | X | 180@ 77°F 75@ -31°F | X | - | - | X | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | X | - |
| RSSP-121575W-FR | 7798 | X | - | X | 15 (75 on Axis) | - | X | X | - | D,E,Z | Square | X | - | X | X | X |
| RSSP-24MCW-FR | 9402 | X | - | X | 15/30/75/110 | X | - | X | - | D,E,Z | Square | X | X | X | X | X |
| RSSP-241575W-FR | 7793 | X | - | X | 15 (75 on Axis) | - | - | X | - | D,E,Z | Square | X | X | X | X | X |
| RSSP-24MCWH-FR | 9482 | X | | X | 135/185 | X | | X | | B,D,E,F,G,H,J,N,O,R,X | Square | X | X | X | - | - |

All models sync with Wheelock DSM or Wheelock Power Supplies.
**#** Models are available in either Red or White. Call Customer Service for Order Code & Delivery.
**For Weatherproof Series RSS Strobe specifications see data sheet S9004.
***Refer to data sheet S7000 for mounting options.
**** "A" stands for Agent Lettering.

### *Architects and Engineers Specifications*

The visual notification appliances shall be Wheelock Series RSS Strobe Appliances or approved equals. The Series RSS shall meet and be listed for UL Standard 1971 (Emergency Devices for the Hearing-Impaired) for Indoor Fire Protection Service. The strobe shall be listed for indoor use and shall meet the requirements of FCC Part 15 Class B. The strobe appliances shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Xenon flashtube enclosed in a rugged Lexan® lens. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP). When Strobe Plates are to be installed, they shall be the Wheelock Series RSSP Strobe Plate and shall have the same electronic circuitry as the Wheelock Series RSS.

The Series RSS Strobe shall be of low current design. Where Multi-Candela appliances are specified, the strobe intensity shall have field selectable settings and shall be rated per UL Standard 1971 at 15/30/75/110cd or 135/185cd for wall mount and 15/30/75/95cd or 115/177cd for ceiling mount. The selector switch for selecting the candela shall be tamper resistant. The 1575 candela strobe shall be specified when 15 candela UL Standard 1971 Listing with 75 candela on axis is required (e.g. ADA compliance).

When synchronization is required, the appliance shall be compatible with Wheelock's DSM Sync Modules, Wheelock Power Supplies or other manufacturers panels with built-in Wheelock Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync module or Power Supply fails to operate, (i.e., contacts remain closed), the strobe shall revert to a non-synchronized flash rate. The strobes shall be designed for indoor surface of flush mounting.

The Series RSS Strobe Appliances shall incorporate a Patented, Integral Strobe Mounting Plate that shall allow mounting to single-gang, double-gang, 4-inch square, 100mm European type backboxes, or the SHBB Surface Backbox. If required, an NATP (Notification Appliance Trimplate) shall be provided. An attaching cover plate shall be provided to give the Appliance and attractive appearance. The Appliance shall not have any mounting holes or screw heads visible when the installation is completed.

The Series RSSP Multi-Candela or single candela Strobe Plate shall mount to either a standard 4 inch square backbox for flush mounting, or the Wheelock SBL2 backbox for surface mounting.

All notification appliances shall be backward compatible.

NOTE: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Wheelock, Inc. standard terms and conditions.

NEMA Member

WE ENCOURAGE AND SUPPORT NICET CERTIFICATION
3 YEAR WARRANTY

**S0410 RSS/RSSP 07/11**

**NJ Location**
273 Branchport Ave.
Long Branch, NJ 07740
P: 800-631-2148
F: 732-222-8707
www.coopernotification.com

Cooper Notification is Wheelock® MEDC SAFEPATH® WAVES Roam Secure

COOPER Notification

# Wheelock® Exceder™ Series

COOPER Notification

EXCEDER™

## Strobe, Horn Strobe, and Horn Notification Appliances

***Description:***

The Wheelock® Exceder™ Series of notification appliances feature a sleek modern design that will please building owners with reduced total cost of ownership. Installers will benefit from its comprehensive feature list, including the most candela options in one appliance, low current draw, no tools needed for setting changes, voltage test points, 12/24 VDC operation, universal mounting base and multiple mounting options for both new and retrofit construction.

The Wheelock® Exceder™ Series incorporates high reliability and high efficiency optics to minimize current draw allowing for a greater number of appliances on the notification appliance circuit. All strobe models feature an industry first of 8 candela settings on a single appliance. Models with an audible feature 3 sound settings (90, 95, 99 dB). All switches to change settings, can be set without the use of a tool and are located behind the appliance to prevent tampering. Wall models feature voltage test points to take readings with a voltage meter for troubleshooting and AHJ inspection.

The Wheelock® Exceder™ Series of wall and ceiling notification appliances feature a Universal Mounting Base (UMB) designed to simplify the installation and testing of horns, strobes, and combination horn strobes. The separate universal mounting base can be pre-wired to allow full testing of circuit wiring before the appliance is installed and the surface is finished. It comes complete with a Contact Cover for protection against dirt, dust, paint and damage to the contacts. The Contact Cover also acts as a shunting device to allow pre-wire testing for common wiring issues. The Contact Cover is polarized to prevent it from being installed incorrectly and prevents the appliance from being installed while it is on the UMB. When the Contact Cover is removed the circuit will show an open until the appliance is installed. The UMB allows for consistent installation and easy replacement of appliances if required. Wall models provide an optional locking screw for extra secure installation, while the ceiling models provide a captivated screw to prevent the screw from falling during installation.

- Save up to 48% in current draw*
- Up to 9 models now in 1 appliance
- Save up to 14% cost of installation**

- Sleek Modern Aesthetics
- Finger Slide Switches
- Voltage Test Points
- Multiple Voltages (12/24 VDC)
- 3 Audible Settings
  90, 95, 99 dB
- 8 Candela Settings ***
  Wall - 15/1575/30/75/95/110/135/185
  Ceiling - 15/30/60/75/95/115/150/177
- Universal Mounting Base ***
  Ceiling and Wall
  Mounts to 5 Backbox Types
- Environmentally Friendly
  Low Current Draw

Compatibility and Requirements

- Synchronize using the Wheelock® Sync Modules or panels with built-in Wheelock® Patented Sync Protocol
- Compatible with UL "Regulated Voltage" using filtered VDC or unfiltered VRMS input voltage
- Strobes produce 1 flash per second over the "Regulated Voltage" range

* Compared to competitive models
** Compared to previous models
*** Patented

**NOTE: All CAUTIONS and WARNINGS are identified by the symbol ⚠. All warnings are printed in bold capital letters.**

**⚠ WARNING: PLEASE READ THESE SPECIFICATIONS AND ASSOCIATED INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. VISIT WWW.COOPERNOTIFICATION.COM OR CONTACT COOPER NOTIFICATION FOR THE CURRENT INSTALLATION INSTRUCTIONS. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS OR WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

## *General Notes:*

General Notes:

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range".
- All candela ratings represent minimum effective strobe intensity based on UL Standard 1971.
- Series Exceder Strobe products are Listed under UL Standards 1971 and 464 for indoor use with a temperature range of 32°F to 120°F (0°C to 49°C) and maximum humidity of 93% (± 2%) UL 464 (85% UL 1971).
- Series Exceder horns are under UL Standard 464 for audible signal appliances (Indoor use only).

## Low Current Draw = Fewer Power Supplies

Strobe Ratings per UL Standard 1971

| | | UL Max Current* | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 VDC / 24 FWR | | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| ST | 8.0-33.0 | 0.057 | 0.070 | 0.085 | | 0.135 | 0.163 | 0.182 | | 0.205 | | | 0.253 | 0.110 | 0.140 |
| STC | 8.0-33.0 | 0.061 | | 0.085 | 0.103 | 0.135 | 0.163 | | 0.182 | | 0.205 | 0.253 | | 0.110 | |

Horn Strobe Ratings per UL 1971 & Anechoic at 24 VDC

| | | UL Max Current* at Anechoic 99 dBA | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 VDC | | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| HS | 8.0-33.0 | 0.082 | 0.095 | 0.102 | | 0.148 | 0.176 | 0.197 | | 0.242 | | | 0.282 | 0.125 | 0.159 |
| HSC | 8.0-33.0 | 0.082 | | 0.102 | 0.141 | 0.148 | 0.176 | | 0.197 | | 0.242 | 0.282 | | 0.125 | |
| | | UL Max Current* at Anechoic 95 dBA | | | | | | | | | | | | | |
| | | 24 VDC | | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| HS | 8.0-33.0 | 0.073 | 0.083 | 0.087 | | 0.139 | 0.163 | 0.186 | | 0.230 | | | 0.272 | 0.122 | 0.153 |
| HSC | 8.0-33.0 | 0.073 | | 0.087 | 0.128 | 0.139 | 0.163 | | 0.186 | | 0.230 | 0.272 | | 0.122 | |
| | | UL Max Current* at Anechoic 90 dBA | | | | | | | | | | | | | |
| | | 24 VDC | | | | | | | | | | | | 12 VDC | |
| Model | Regulated Voltage Range VDC | 15 | 15/75 | 30 | 60 | 75 | 95 | 110 | 115 | 135 | 150 | 177 | 185 | 15 | 15/75 |
| HS | 8.0-33.0 | 0.065 | 0.075 | 0.084 | | 0.136 | 0.157 | 0.184 | | 0.226 | | | 0.267 | 0.120 | 0.148 |
| HSC | 8.0-33.0 | 0.065 | | 0.084 | 0.120 | 0.136 | 0.157 | | 0.184 | | 0.226 | 0.267 | | 0.120 | |

Horn Ratings per UL Anechoic

| Model | Regulated Voltage Range VDC | 99 dB | 95 dB | 90 dB |
|---|---|---|---|---|
| HN | 16-33.0 | 0.064 | 0.044 | 0.022 |
| HNC | 16-33.0 | 0.084 | 0.044 | 0.022 |
| HN | 8.0-17.5 | 0.047 | 0.026 | 0.017 |
| HNC | 8.0-17.5 | 0.047 | 0.026 | 0.017 |

* UL max current rating is the maximum RMS current within the listed voltage range (16-33 VDC for 24 VDC units). For strobes the UL max current is usually at the minimum listed voltage (16 VDC for 24 VDC units). For audibles the max current is usually at the maximum listed voltage (33 VDC for 24 VDC units). For unfiltered ratings, see installation instructions.

## Specification & Ordering Information

Easy to remember model codes

8 candelas on 1 device

1 gang, 2 gang, 4" sq, 3.5" octal & 4" octal boxes

| Model | Strobe Candela | Sync w/ DSM or Wheelock Power Supplies | 12/24 VDC* | Mounting Options |
|---|---|---|---|---|
| **Horn Strobes** | | | | |
| HSR | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| HSW | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| HSRC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| HSWC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| **Strobes** | | | | |
| STR | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| STW | 15/1575/30/75/95/110/135/185 | X | X | UMB** |
| STRC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| STWC | 15/30/60/75/95/115/150/177 | X | X | UMB** |
| **Horn** | | | | |
| HNR | | X | X | UMB** |
| HNW | | X | X | UMB** |
| HNRC | | X | X | UMB** |
| HNWC | | X | X | UMB** |

*12 VDC models feature 15 & 15/75 settings

**UMB = Universal Mounting Base

Model Legend

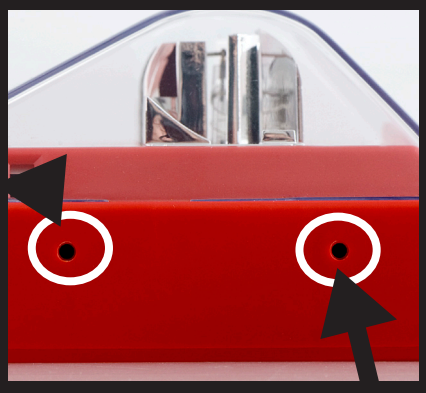
HN = Horn
ST = Strobe
HS = Horn Strobe
C = Ceiling Mount
W = White
R = Red

A = Agent Lettering (Strobes only)
AL = Alert Lettering (Strobes only)
N = No Lettering (Strobes only)

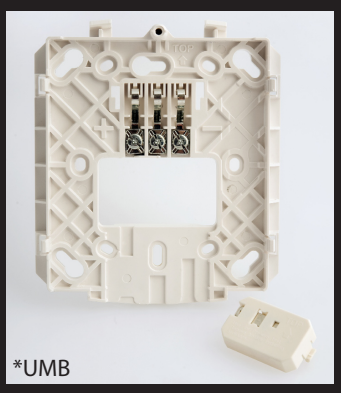
Example 1: STRC = Strobe, Red, Ceiling Mount
Example 2: HSR = Horn Strobe, Red, Wall Mount
Example 3: HSW = Horn Strobe, White, Wall Mount
Example 4: STW-AL = Strobe, White, Wall Mount, Alert Lettering

Example: HSR

Example: HSWC


Voltage test points for quick troubleshooting and easy spot checking (wall models only)

8 candela settings


*UMB

Contact Cover

Common base for wall and ceiling with 5 mounting options

**NOTE: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Cooper Wheelock Inc., dba Cooper Notification standard terms and conditions.**

## Architects and Engineers Specifications

The notification appliances shall be Wheelock® Exceder™ Series HS Audible Strobe appliances, Series ST Visual Strobe appliances and Series HN Audible appliances or approved equals. The Series HS and ST Strobes shall be listed for UL Standard 1971 (Emergency Devices for the Hearing-Impaired) for Indoor Fire Protection Service. The Series HS and HN Audibles shall be UL Listed under Standard 464 (Fire Protective Signaling). All Series shall meet the requirements of FCC Part 15 Class B. All inputs shall be compatible with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP) with the ability to operate from 8 to 33 VDC. Indoor wall models shall incorporate voltage test points for easy voltage inspection.

The Series HS Audible Strobe and ST Strobe appliances shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall incorporate a Xenon flashtube enclosed in a rugged Lexan® lens. The Series shall be of low current design. Where Multi-Candela appliances are specified, the strobe intensity shall have 8 field selectable settings at 15, 15/75, 30, 75, 95, 110, 135, 185 candela for wall mount and 15, 30, 60, 75, 95, 115, 150, 177 candela for ceiling mount. The selector switch for selecting the candela shall be tamper resistant. The 15/75 candela strobe shall be specified when 15 candela UL Standard 1971 Listing with 75 candela on-axis is required (e.g. ADA compliance). Appliances with candela settings shall show the candela selection in a visible location at all times when installed.

The audible shall have a minimum of three (3) field selectable settings for dBA levels and shall have a choice of continuous or temporal (Code 3) audible outputs.

The Series HS Audible Strobe, ST Strobe and Series HN Audible shall incorporate a patented Universal Mounting Base that shall allow mounting to a single-gang, double-gang, 4-inch square, 3.5-inch octal, 4-inch octal or 100mm European type back boxes. Two wire appliance wiring shall be capable of directly connecting to the mounting base. Continuity checking of the entire NAC circuit prior to attaching any notification appliances shall be allowed. Product shall come with Contact Cover to protect contact springs. Removal of an appliance shall result in a supervision fault condition by the Fire Alarm Control Panel (FACP). The mounting base shall be the same base among all horn, strobe, horn strobe, wall and ceiling models. All notification appliances shall be backwards compatible.

The Series HS and ST wall models shall have a low profile measuring 5.24” H x 4.58” W x 2.19” D. Series HN wall shall measure 5.24” H x 4.58” W x 1.6” D. The Series HSC and STC shall been round and have a low profile with a diameter of 6.68” x 2.63” D. Series HNC ceiling shall have a diameter of 6.68” x 1.50” D.

When synchronization is required, the appliance shall be compatible with Wheelock®’s DSM Sync Modules, Wheelock® Power Supplies or other manufacturer’s panels with built-in Wheelock® Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync protocol fails to operate, the strobe shall revert to a non-synchronized flash-rate and still maintain (1) flash per second over its Regulated Voltage Range. The appliance shall also be designed so that the audible signal may be silenced while maintaining strobe activation when used with Wheelock® synchronization protocol.

**Wall Appliances** – UL Standard 1971, UL Standard 464, California State Fire Marshal (CSFM), ULC, FM
**Ceiling Appliances** – UL Standard 1971, UL Standard 464, California State Fire Marshal (CSFM), ULC, FM

NEMA Member

WE ENCOURAGE AND SUPPORT NICET CERTIFICATION
3 YEAR WARRANTY

**Exceder - Spec Sheet 6/11**

NJ Location
273 Branchport Ave.
Long Branch, NJ 07740
P: 800-631-2148
F: 732-222-8707
www.coopernotification.com

Cooper Notification is Wheelock® MEDC SAFEPATH WAVES Roam Secure

COOPER Notification

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

# LISTING SERVICE



**LISTING No.** 7165-0476:0110

**CATEGORY:** 7165 -- FIRE ALARM CONTROL UNIT (COMMERCIAL)

**LISTEE:** Harrington Signal Inc 2519 4th Avenue, Moline, IL 61265
Contact: (800) 577-5758 Fax (309) 762-8215

**DESIGN:** Models HS-3030 and HS-3400 fire alarm control units. Models may be followed by R (120 VAC input, red), B (120 VAC input, beige), R2 (240 VAC input, red), or B2 (240 VAC input,beige). Local, auxilary, remote station (PPU), and central station. Refer to listee's data sheet for additional detailed product description and operational considerations. System components:

**RATING:**

| | | |
|---|---|---|
| R or B | = | 120VAC, 60 Hz, 2 A |
| R2 or B2 | = | 240VAC, 50 Hz, 1 A |

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

**MARKING:** Listee's name, model number, electrical ratings, and UL Label

**APPROVAL:** Listed as a fire alarm control unit for use with separately listed compatible initiating and indicating devices. Refer to listee's Installation Instruction Manual for details
These control units do not generate a temporal pattern signal. If the distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) per NFPA 72, 2002 Edition is required, the control unit must be used with audible appliances that can generate the temporal pattern signal.
This control unit meets the requirements of UL Standard-864, 8th Edition.

**NOTE:** For Fire Alarm Verification Feature (delay of fire alarm signal), the maximum Retard/Reset/Restart period shall not exceed 30 se

**XLF:** 7165-1656:0115

EXISTING FIRE ALARM DEVICE OR EQUIPMENT CSFM PROVIDED FOR REFERENCE ONLY

This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2008** *Listing Expires* **June 30, 2009**

Authorized By: ***BEN HO,*** *Chief*

*Fire Engineering Division*

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

# LISTING SERVICE



**LISTING No.** 7150-0476:0113

**CATEGORY:** 7150 -- FIRE ALARM PULL BOXES

**LISTEE:** Harrington Signal Inc1609 Park 370 Place, Hazelwood, MO 63042
Contact: Brad Serangeli (314) 595-6731 Fax (309) 762-8215
Email: brads@pottersignal.com

**DESIGN:** Model HSPS-1P, HSPS-1T, HSPS-2T, HSPS-6T, with or without suffixes DAH, KL and WP non-coded manual pull stations. Refer to listee's data sheet for detailed product description and operational considerations.

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

**MARKING:** Listee's name, model number, electrical rating and UL label.

**APPROVAL:** Listed as fire alarm manual pull stations for use with separately listed compatible control units. Models with suffix -WP are suitable for outdoor use.

* These manual pull boxes do not meet the requirements of UL Standard 38, 1999 Edition and California amendments.

**XLF:** 7150-1039:0101

*Updated 6-22-2009 fm

This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2021** *Listing Expires* **June 30, 2022**

Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

*Fire Engineering Division*

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

# LISTING SERVICE



**LISTING No.** 7300-1653:0109

**CATEGORY:** 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

**LISTEE:** System Sensor, Unincorporated Div of Honeywell Int'l Inc.3825 Ohio Ave, St. Charles, IL 60174
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

**DESIGN:** Models B401, B401B, B401R, B401BR, B401BR-750, B401R-750, B402B, B404B, B404BT, B406B, B501, B501B, 14506587-002, B501BH, B501BHT, B401BH, B110LP, B110RLP, B110RLP750, B112LP, B114LP, B114LPBT, B116LP, B210LP, B501-BL, B501-IV, *B501-WHITE, B300-6, B300-6-IV, B300-6-IS detector bases. Refer to listee's data sheet for detailed product description and operational considerations.

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

**MARKING:** Listee's name, *model number, *electrical rating and UL label.

**APPROVAL:** Listed as detector bases for use with separately listed compatible detectors. *Refer to Manufacturers Installation Instruction Manual for details.

**NOTE:** Formerly 7300-1209:128

*Rev 04-03-18 gt

This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2021** *Listing Expires* **June 30, 2022**

Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

*Fire Engineering Division*

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

# LISTING SERVICE



**LISTING No.** 7270-1653:0137

**CATEGORY:** 7270 -- HEAT DETECTOR

**LISTEE:** System Sensor, Unincorporated Div of Honeywell Int'l Inc.3825 Ohio Ave, St. Charles, IL 60174
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

**DESIGN:** Models 5251P, 5251B and 5251H (fixed temperature) and 5251RP and 5251RB (fixed temperature with Rate-of-Rise) electronic heat detectors. Refer to listee's data sheet for additional detailed product description and operational considerations.

**RATING:**

| | |
|---|---|
| 5215P, 5215RP, 5251B and 5251RB | 135° F fixed temperature |
| 5251H | 190° F fixed temperature |

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.

**MARKING:** Listee's name, model number, electrical ratings, and UL Inc. Label

**APPROVAL:** Listed as heat detectors for use with Model B501 or B210LP base (CSFM Listing No. 7300-1653:109) and separately listed compatible fire alarm control units.

**NOTE:** Formerly 7270-1209:193

06-20-05 JW

This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2021** *Listing Expires* **June 30, 2022**

Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

*Fire Engineering Division*

**CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION**
**OFFICE OF THE STATE FIRE MARSHAL**
**FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM**

# LISTING SERVICE

**LISTING No.** 7300-1653:0109 

**CATEGORY:** 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

**LISTEE:** System Sensor, Unincorporated Div of Honeywell Int'l Inc.3825 Ohio Ave, St. Charles, IL 60174
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

**DESIGN:** Models B401, B401B, B401R, B401BR, B401BR-750, B401R-750, B402B, B404B, B404BT, B406B, B501, B501B, 14506587-002, B501BH, B501BHT, B401BH, B110LP, B110RLP, B110RLP750, B112LP, B114LP, B114LPBT, B116LP, B210LP, B501-BL, B501-IV, *B501-WHITE, B300-6, B300-6-IV, B300-6-IS detector bases. Refer to listee's data sheet for detailed product description and operational considerations.

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

**MARKING:** Listee's name, *model number, *electrical rating and UL label.

**APPROVAL:** Listed as detector bases for use with separately listed compatible detectors. *Refer to Manufacturers Installation Instruction Manual for details.

**NOTE:** Formerly 7300-1209:128

*Rev 04-03-18 gt

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Date Issued: **July 01, 2021** *Listing Expires* **June 30, 2022**

Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

*Fire Engineering Division*

**CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION**
**OFFICE OF THE STATE FIRE MARSHAL**
**FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM**

# LISTING SERVICE

**LISTING No.** 7272-1653:0123



**CATEGORY:** 7272 -- SMOKE DETECTOR-SYSTEM TYPE-PHOTOELECTRIC

**LISTEE:** System Sensor, Unincorporated Div of Honeywell Int'l Inc.3825 Ohio Ave, St. Charles, IL 60174
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

**DESIGN:** Models 2251, 2251B, 2251BR*, 2251T, Filtrex FTX-P1, 2251TM, 2251TB and 2251TMB photoelectric smoke detector. Models 2251T, 2251TM, 2251TB and 2251TMB employ a 135°F supplement integral heat sensor which only assists in a fire situation. This thermal circuitry is NOT approved for use in lieu of a required heat detector. Refer to listee's data sheet for detailed product description and operational considerations.

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

**MARKING:** Listee's name, model number, electrical rating and UL label.

**APPROVAL:** Listed as photoelectric smoke detectors when used in conjunction with listee's separately listed compatible fire alarm control units and bases. Models 2251, 2251B, 2251BR*, 2251TB and 2251TMB are suitable for open areas and inside duct installation with air velocities between 0-4000 fpm. Models 2251B and 2251BR are also approved for installations inside System Sensor Duct Housing DNR and DNRW (CSFM Listing No. 3242-1653:209).

**NOTE:**

1. The photoelectric type detectors are generally more effective at detecting slow, smoldering fires which smolder for hours before bursting into flame. Sources of these fires may include cigarettes burning in couches or bedding. The ionization type detectors are generally more effective at detecting fast, flaming fires that consume combustible materials rapidly and spread quickly. Sources of these fires may include paper burning in a waste container or a grease fire in the kitchen.

2. Formerly 7272-1209:160

*Rev. 01-11-2010 fm

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# LISTING SERVICE



**LISTING No.** 7125-0785:0168

**CATEGORY:** 7125 -- FIRE ALARM DEVICES FOR THE HEARING IMPAIRED

**LISTEE:** Cooper Wheelock Inc.7246 16th St. E., Ste. 105, Sarasota, FL 34243
Contact: Thomas Conover (941) 487-2336
Email: thomaslconover@eaton.com

**DESIGN:** Exceder Series: Models ST strobe, HS horn strobe and HN horn. Model ST is a synchronous and non-synchronous strobe light. Model HS a visual/audible appliance and Model HN is an audible signal appliance. All units followed by R (red) or W (white). Additionally, a 'C' may be added for ceiling models and/or a '-NR' may be added for non-resettable models. For non -NR models and optional 'S' for silver fascia may be added*. Refer to listee's data sheet for additional detailed product description and operational considerations.

**RATING:** Electrical: 12 VDC/24VDC/FWR
Candela (wall)*: 15, 15/75, 30, 75, 95, 110, 135 & 185
Candela (ceiling)*: 15, 30, 60, 75, 95, 115, 150, & 177

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction. All models are for indoor use and for wall mount only or ceiling mount only*

**MARKING:** Listee's name, model number, electrical/candela rating, and UL label.

**APPROVAL:** Listed as horn for fire alarm signaling and strobe, horn/strobe for the hearing impaired when used with separately listed electrically compatible fire alarm control units. Refer to listee's Installation Instructions Manual for details.

*Rev. 9-24-09 fm

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# LISTING SERVICE



**LISTING No.** 7125-0785:0142

**CATEGORY:** 7125 -- FIRE ALARM DEVICES FOR THE HEARING IMPAIRED

**LISTEE:** Cooper Wheelock Inc.7246 16th St. E., Ste. 105, Sarasota, FL 34243
Contact: Thomas Conover (941) 487-2336
Email: thomaslconover@eaton.com

**DESIGN:** Models NH-12/24, NH-12/24R, and ZNH horns and Models NS-1215W, NS-121575W, NS-2415W, NS-241575W, NS-2430W, NS-2475W and NS-24110W; NS4-1215W, NS4-121575W, NS4-2415W, NS4-241575W, NS4-2430W, NS4-2475W and NS4-24110W, NS-24MCW, NS4-24MCW, NS-24MCC, NS-24MCCH, ZNS-MCW, ZNS-MCC, ZNS-MCWH and ZNS-MCCH horn strobes. Model number may be followed by any two-alpha/numeric characters indicating lens, lettering and color. Units are synchronized or non-synchronized strobes. Models NH-12/24R, NS-24MCC, NS-24MCCH, ZNS-MCC and ZNS-MCCH are ceiling mount only. Refer to listee's data sheet for additional detailed product description and operational considerations.

**RATING:** Electrical-Strobe Horn: 8-17.5 VDC/FWR and 16-33 VDC/FWR
Horn: 8-17.5 VDC/FWR and 16-33 VDC/FWR
Candela:15=15cd, 1575=15/75cd on axis, 30=30cd, 75=75cd, 110=110cd (Wall)
NS-24MCW, NS4-24MCW, ZNS-MCW: Selectable 15cd, 30cd, 75cd, 110cd
NS-24MCC, ZNS-MCC: Selectable 15cd, 30cd, 75cd, 95cd
NS-24MCCH, ZNS-MCCH: Selectable 115cd, 177cd
ZNS-MCWH: Selectable 135cd, 185cd
Flash rate: 60 Flashes/minute

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction. All units are for wall mount except for *Models NH-12/24R, NS-24MCC, NS-24MCCH, ZNS-MCC and ZNS-MCCH are for ceiling mount only.

**MARKING:** Listee's name, model number, electrical/candela rating and UL label.

**APPROVAL:** Listed as audible and audible/visual signaling devices for use with separately listed electrically compatible fire alarm control units. Models with strobe lights are suitable for the hearing impaired. For indoor use only except for model NH-12/24 horn. All synchronization strobes shall be used with Models SM-12/24, SMX-12/24, DSM-12/24 or DSMX-12/24 Sync Control Module (CSFM Listing No. 7300-0785:132). Refer to manufacturer's installation manual for details.

**NOTE:** These appliances can produce a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 2002 Edition.

*Corrected 07-25-08 bh

EXISTING FIRE ALARM DEVICE OR EQUIPMENT CSFM PROVIDED FOR REFERENCE ONLY

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# LISTING SERVICE



**LISTING No.** 7125-0785:0142

**CATEGORY:** 7125 -- FIRE ALARM DEVICES FOR THE HEARING IMPAIRED

**LISTEE:** Cooper Wheelock Inc.7246 16th St. E., Ste. 105, Sarasota, FL 34243
Contact: Thomas Conover (941) 487-2336
Email: thomaslconover@eaton.com

**DESIGN:** Models NH-12/24, NH-12/24R, and ZNH horns and Models NS-1215W, NS-121575W, NS-2415W, NS-241575W, NS-2430W, NS-2475W and NS-24110W; NS4-1215W, NS4-121575W, NS4-2415W, NS4-241575W, NS4-2430W, NS4-2475W and NS4-24110W, NS-24MCW, NS4-24MCW, NS-24MCC, NS-24MCCH, ZNS-MCW, ZNS-MCC, ZNS-MCWH and ZNS-MCCH horn strobes. Model number may be followed by any two-alpha/numeric characters indicating lens, lettering and color. Units are synchronized or non-synchronized strobes. Models NH-12/24R, NS-24MCC, NS-24MCCH, ZNS-MCC and ZNS-MCCH are ceiling mount only. Refer to listee's data sheet for additional detailed product description and operational considerations.

**RATING:** Electrical-Strobe Horn: 8-17.5 VDC/FWR and 16-33 VDC/FWR
Horn: 8-17.5 VDC/FWR and 16-33 VDC/FWR
Candela:15=15cd, 1575=15/75cd on axis, 30=30cd, 75=75cd, 110=110cd (Wall)
NS-24MCW, NS4-24MCW, ZNS-MCW: Selectable 15cd, 30cd, 75cd, 110cd
NS-24MCC, ZNS-MCC: Selectable 15cd, 30cd, 75cd, 95cd
NS-24MCCH, ZNS-MCCH: Selectable 115cd, 177cd
ZNS-MCWH: Selectable 135cd, 185cd
Flash rate: 60 Flashes/minute

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction. All units are for wall mount except for *Models NH-12/24R, NS-24MCC, NS-24MCCH, ZNS-MCC and ZNS-MCCH are for ceiling mount only.

**MARKING:** Listee's name, model number, electrical/candela rating and UL label.

**APPROVAL:** Listed as audible and audible/visual signaling devices for use with separately listed electrically compatible fire alarm control units. Models with strobe lights are suitable for the hearing impaired. For indoor use only except for model NH-12/24 horn. All synchronization strobes shall be used with Models SM-12/24, SMX-12/24, DSM-12/24 or DSMX-12/24 Sync Control Module (CSFM Listing No. 7300-0785:132). Refer to manufacturer's installation manual for details.

**NOTE:** These appliances can produce a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 2002 Edition.

*Corrected 07-25-08 bh

EXISTING FIRE ALARM DEVICE OR EQUIPMENT CSFM PROVIDED FOR REFERENCE ONLY

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Date Issued: **July 01, 2021** *Listing Expires* **June 30, 2022**

Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

*Fire Engineering Division*

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# LISTING SERVICE



**LISTING No.** 7135-0785:0149

**CATEGORY:** 7135 -- POWER UNITS

**LISTEE:** Wheelock Inc. 273 Branchport Ave, Long Branch, NJ 07740
Contact: (800) 631-2148
Email: info@wheelockinc.com

**DESIGN:** Models POWERPATH ™ PS-12/24-8, PS-12/24-8CP, and PS-12/24-8MP remote notification appliance circuit extender power supplies. Model PS-EXP notification appliance circuit extender power accessory. Refer to listee's data sheet for additional detailed product description and operational considerations.

**RATING:** 120 VAC for PS-12/24-8, PS-12/24-8CP, and PS-12/24-8MP

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction

**MARKING:** Listee's name, model number, electrical rating and UL label.

**APPROVAL:** Listed as power supply units for use with separately listed compatible fire alarm control units and notification appliances. Authority having jurisdiction should be consulted prior to installation. The unit can be programmed to generate the three-pulse temporal fire alarm evacuation signal (for total evacuation) in accordance with NFPA 72, 2002 edition.

EXISTING FIRE ALARM DEVICE OR EQUIPMENT CSFM PROVIDED FOR REFERENCE ONLY

*Rev 08-14-2006 jw

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Date Issued: **JUNE 6, 2008** *Listing Expires **June 30, 2009***

*Authorized By:* ***BEN HO**, Chief*
*Fire Engineering Division*

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

# LISTING SERVICE



**LISTING No.** 7125-0785:0140

**CATEGORY:** 7125-- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

**LISTEE:** Wheelock Inc. 273 Branchport Ave, Long Branch, NJ 07740
Contact: (800) 631-2148
Email: info@wheelockinc.com

**DESIGN:** Models RSS-24MCW and RSS-24MCWC synchronous or non-synchronous strobe light. Model may be followed by two alpha or numeric characters indicating lettering and color, followed by W for wall mount or C for ceiling mount. Refer to listee's data sheet for additional detailed product description and operational considerations.
Models RSS-24MCWH (wall mount) & RSS-24MCCH (ceiling mount) audible/strobes for the hearing impaired followed by two alpha/numeric characters indicating lens lettering and product color.

**RATING:** Electrical: 16-33 VDC/VFWR
Flash rate: 60 flashes/min.
Candela (wall): 15, 15/75, 30, 75, 95, 110, 135 & 185
Candela (ceiling): 15, 30, 60, 75, 95, 115, 150, & 177

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction. Model can be used outdoors when used with WPSBB back box only.

**MARKING:** Listee's name, model number, electrical rating and UL label.

**APPROVAL:** Listed as a strobe light for use with separately listed electrically compatible fire alarm control units. For indoor or outdoor use. Intended for wall mount or ceiling mount. Lens color may be white, red, blue, green or amber.

For synchronized strobes, Models SM-12/24, SMX-12/24 Sync Modules, DSM-12/24 or DSMX-12/24 Duel Sync Modules (CSFM Listing No. 7300-0785:1323) or power supply PS-12/24-8 (CSFM Listing No. 7315-0785:149) must be used.

**NOTE:**

EXISTING FIRE ALARM DEVICE OR EQUIPMENT CSFM PROVIDED FOR REFERENCE ONLY

*Rev. 10-01-07

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Date Issued: **JUNE 6, 2008** *Listing Expires **June 30, 2009***

*Authorized By:* ***BEN HO**, Chief*
*Fire Engineering Division*

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# LISTING SERVICE



**LISTING No.** 7125-0785:0168

**CATEGORY:** 7125 -- FIRE ALARM DEVICES FOR THE HEARING IMPAIRED

**LISTEE:** Cooper Wheelock Inc.7246 16th St. E., Ste. 105, Sarasota, FL 34243
Contact: Thomas Conover (941) 487-2336
Email: thomaslconover@eaton.com

**DESIGN:** Exceder Series: Models ST strobe, HS horn strobe and HN horn. Model ST is a synchronous and non-synchronous strobe light. Model HS a visual/audible appliance and Model HN is an audible signal appliance. All units followed by R (red) or W (white). Additionally, a 'C' may be added for ceiling models and/or a '-NR' may be added for non-resettable models. For non -NR models and optional 'S' for silver fascia may be added*. Refer to listee's data sheet for additional detailed product description and operational considerations.

**RATING:** Electrical: 12 VDC/24VDC/FWR
Candela (wall)*: 15, 15/75, 30, 75, 95, 110, 135 & 185
Candela (ceiling)*: 15, 30, 60, 75, 95, 115, 150, & 177

**INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction. All models are for indoor use and for wall mount only or ceiling mount only*

**MARKING:** Listee's name, model number, electrical/candela rating, and UL label.

**APPROVAL:** Listed as horn for fire alarm signaling and strobe, horn/strobe for the hearing impaired when used with separately listed electrically compatible fire alarm control units. Refer to listee's Installation Instructions Manual for details.

*Rev. 9-24-09 fm

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Authorized By: ***DAVID CASTILLO,**, M.E., F.P.E.*

*Fire Engineering Division*

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Appendix B

# Door Hardware Cutsheets

LCN®

Surface mounted closer

# 4040XP Series

## Overview

The 4040XP is LCN's most durable and flexible heavy duty closer designed for institutional and other demanding high traffic applications.

## Cylinder

**4040XP-3071**
Cast iron cylinder assembly

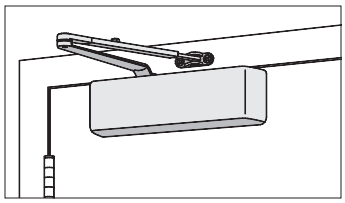
**Handing**
Non-handed

**Sizing**
Adjustable spring size 1-6, includes patented Green Dial

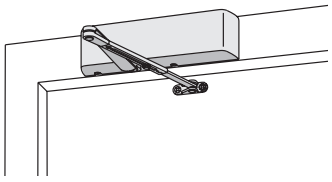
### Available cylinder options

| | |
|---|---|
| DEL | Delayed action cylinder |

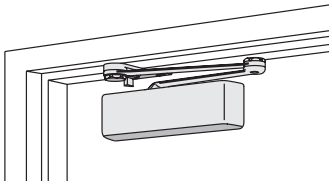
## Mounting



Hinge (pull side)



Top jamb (push side)



Parallel arm (push side)

ALLEGION™

## Finishes

### Powder coat finishes

**689**
Aluminum

**690**
Statuary Bronze

**691**
Light Bronze

**693**
Black

**695**
Dark Bronze

**696**
Brass

150+ additional custom colors available using the RAL numbering system

### Metal plated finishes

**632**
Bright Brass

**633**
Satin Brass

**639**
Satin Bronze

**616**
Satin Bronze, Blackened

**646**
Satin Nickel

**651**
Bright Chrome

**652**
Satin Chrome

### Available finish options

| | |
|---|---|
| MTLPC | Brite metallic: Custom powder coat finish, which resembles that of 651 or 652 plated finish. |
| SRI | For installations where a higher level of protection against weather conditions, or the effects of a potentially corrosive atmosphere is required, LCN offers a special rust inhibiting (SRI) process. Ferrous metal components receive an SRI pretreatment and a standard powder coat finish of your choice, or a custom powder coat finish for a nominal additional cost. Closers treated with the SRI process exceed the 100 hour protection level available with standard LCN powder coated finishes. |

## Covers

### Standard cover

**4040XP-72**
**Plastic cover**
- Non-handed
- Includes 4040XP-54 snap-on cover clip

### Optional cover

**4040XP-72MC**
**Metal cover**
- Handed
- Required for plated finishes and custom powder coat finishes
- Optional

## Arms

**4040XP-3077**
**Regular arm**
- Non-handed
- Mounts pull side or top jamb with shallow reveal P4041 closer includes PA SHOE, 4040XP-62PA required for parallel arm mounting

**4040XP-3077L**
**Long arm**
- Non-handed
- Includes LONG ROD AND SHOE, 4040XP-79LR for top jamb mount
- Optional

**4040XP-3077ELR**
**Extra long arm**
- Non-handed
- Includes EXTRA LONG ROD AND SHOE, 4040XP-79ELR for top jamb mount with deep reveal
- Optional

**4040XP-3049**
**Hold-open arm**
- Non-handed
- Mounts pull side or top jamb with shallow reveal, hold-open adjustable shoe
- 4040XP closer includes 4040XP-62PA shoe required for parallel arm mounting
- Optional

**4040XP-3049L**
**Long hold-open arm**
- Non-handed
- Includes LONG HEAD AND TUBE, 4040XP-3048L for top jamb mount
- Optional

**4040XP-3077EDA**
**Extra duty arm**
- Non-handed
- Features forged, solid steel main and forearm for potentially abusive installations
- Optional

**4040XP-3049EDA**
**Hold-open extra duty arm**
- Handed
- Parallel arm features forged, solid steel main and forearm for potentially abusive installations
- Hold-open function is adjusted at the shoe
- Optional

**4040XP-3077EDA/62G**
**Extra duty arm with 62G**
- Non-handed
- Features forged, solid steel main and forearm for potentially abusive installations
- 62G shoe provides additional blade stop clearance
- Optional

**4040XP-3049EDA/62G**
**Hold-open extra duty arm with 62G**
- Handed
- Features forged, solid steel main and forearm for potentially abusive installations
- 62G shoe provides additional blade stop clearance. Hold-open function is adjusted at the shoe
- Optional

**4040XP-3077CNS**
**Cush-N-Stop® Arm**
- Non-handed
- Features solid forged steel main arm and forearm with stop in soffit shoe.
- Optional

**4040XP-3049CNS**
**HCUSH arm**
- Non-handed
- Hold-open function with templated stop/hold-open points
- Handle controls hold-open function
- Optional

**4040XP-3077SCNS**
**Spring CUSH arm**
- Non-handed
- For potentially abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Optional

## Arms

**4040XP-3049SCNS**
**Spring HCUSH arm**

- Non-handed
- For potentially abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Handle controls hold-open function
- Optional

## Installation accessories

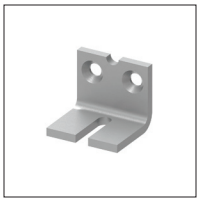
**4040XP-18**
**Plate**
- Required for hinge side mount where top rail is less than 3 3/4″ (95 mm)
- Requires minimum 2″ (51 mm) minimum top rail

**4040XP-18G**
**Plate**
- Locates top jamb mounted closer flush with top of head frame face in flush ceiling condition
- Requires 1 3/4″ (44 mm) minimum head frame

**4040XP-18TJ**
**Plate**
- Centers top jamb mounted closer vertically on head frame where face is less than 3 1/2″ (89 mm). Plate requires 1 3/4″ (44 mm) minimum head frame

**4040XP-18PA**
**Plate**
- Required for parallel arm mounting where top rail is less than 5 1/2″ (140 mm), measured from the stop
- Requires 2″ (51 mm) minimum top rail

**4040XP-62PA**
**PA shoe**
- Required for parallel arm mounting



**4040XP-30**
**CUSH shoe support**
- Provides anchorage for fifth screw used with CUSH arms, where reveal is less than 3 1/16″ (78 mm)
- Optional

**4040XP-61**
**Blade stop spacer**
- Required to lower parallel arm shoe to clear 1/2″ (13 mm) blade stop
- Optional

**4040XP-419**
**PA flush panel adapter**
- Provides horizontal mounting surface for parallel arm shoe on single rabbeted or flush frame
- Optional

## Installation accessories

**4040XP-62A**
**Auxiliary shoe**
- Requires a top rail of 7″ (178 mm)
- Shoe replaces -62PA for parallel arm mounting of regular arm with overhead holder/stop
- Optional

**4040XP-54**
**Snap-on cover clip**
- Used to secure 4040XP-72 plastic cover to cylinder body

## Fasteners

Self-reaming and tapping screws included standard

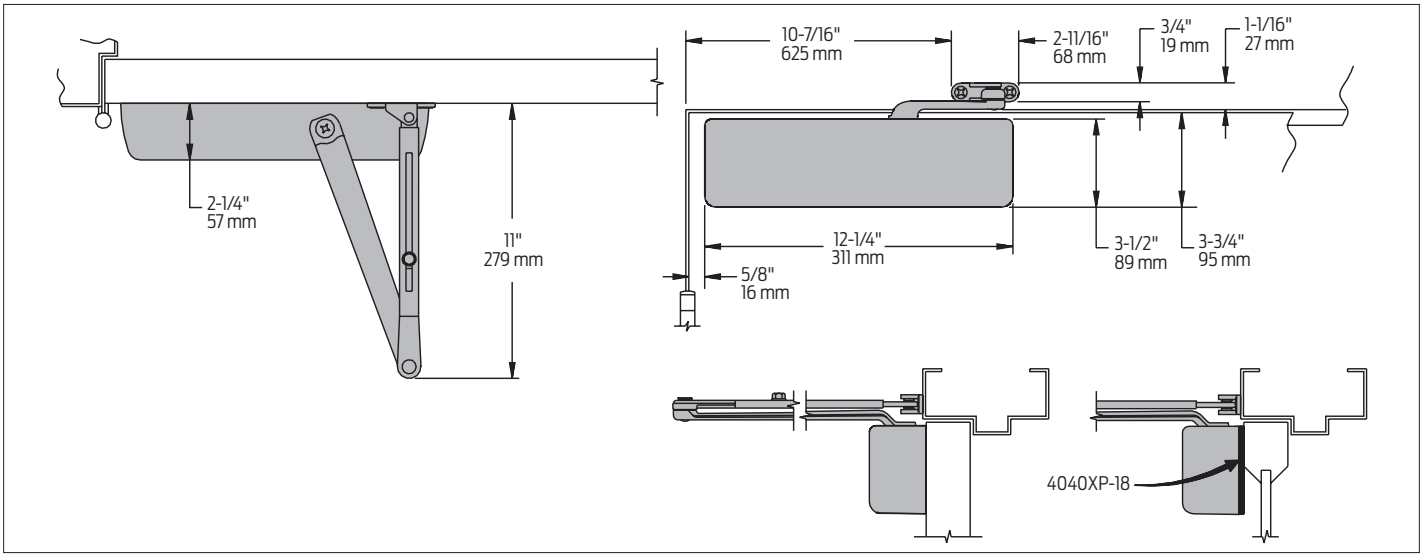
**Fastener pack options**

| | |
|---|---|
| TBSRT | TB[1] with self-reaming and tapping screws |
| WMS | Wood and machine screw |
| TBWMS | TB[1], wood and machine screw |
| TORX | TORX machine screw |
| TBTRX | TB[1] and TORX machine screw |

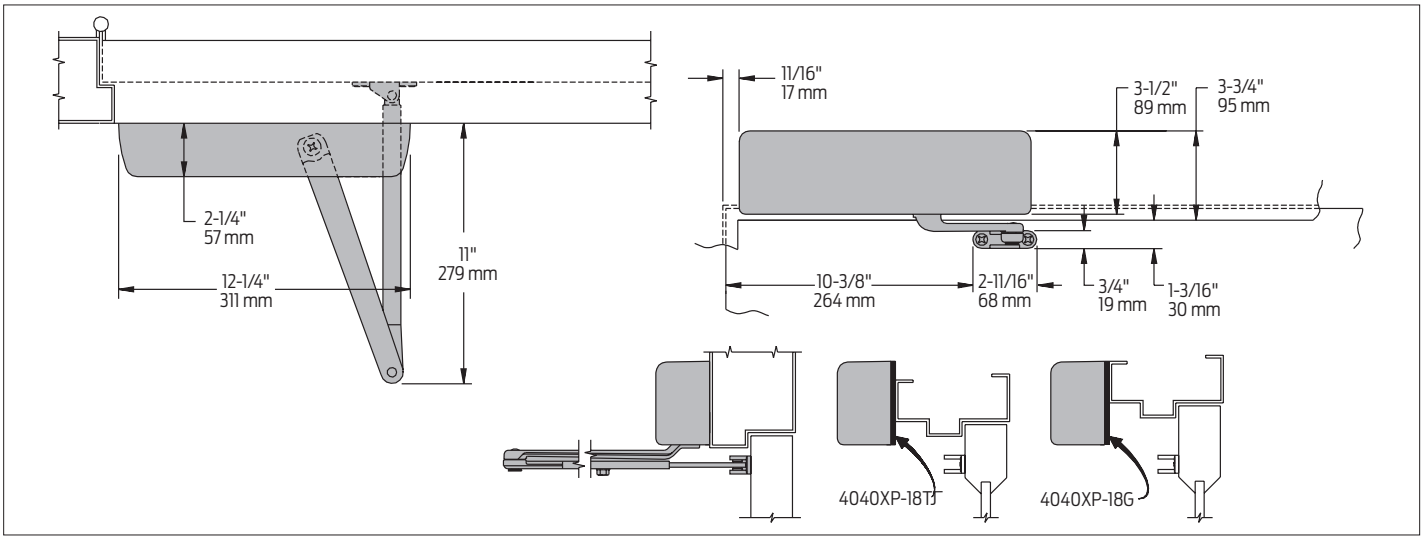
1 Specify door thickness if other than 1 3/4"

## Dimensions and mounting

### Hinge (pull) side mounting

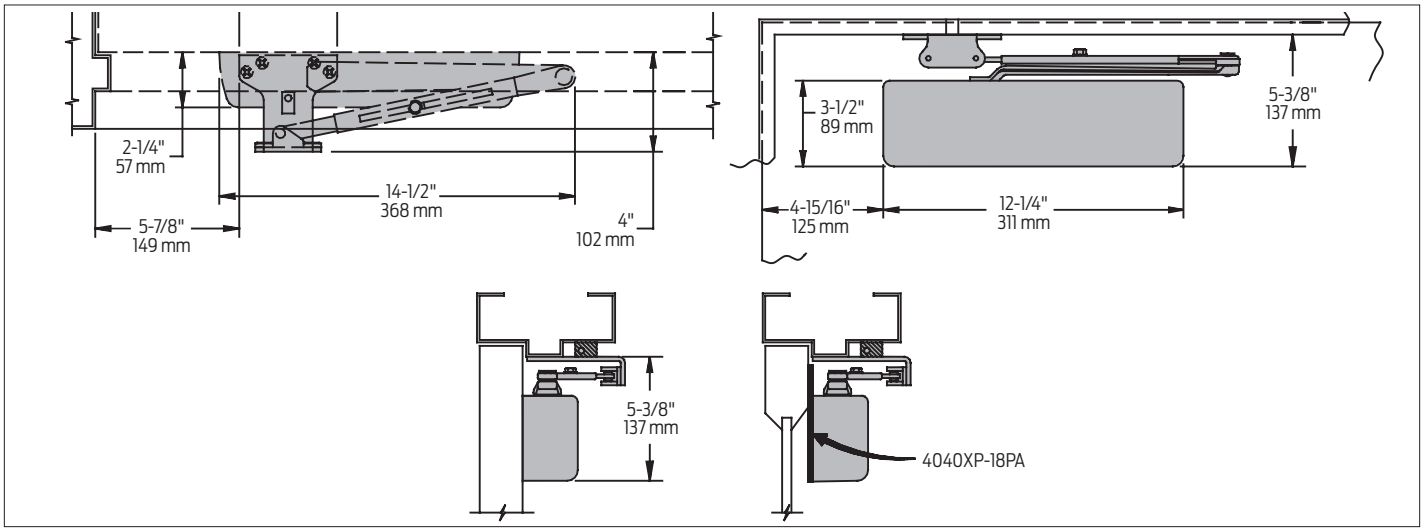



### Top jamb (push side) mounting

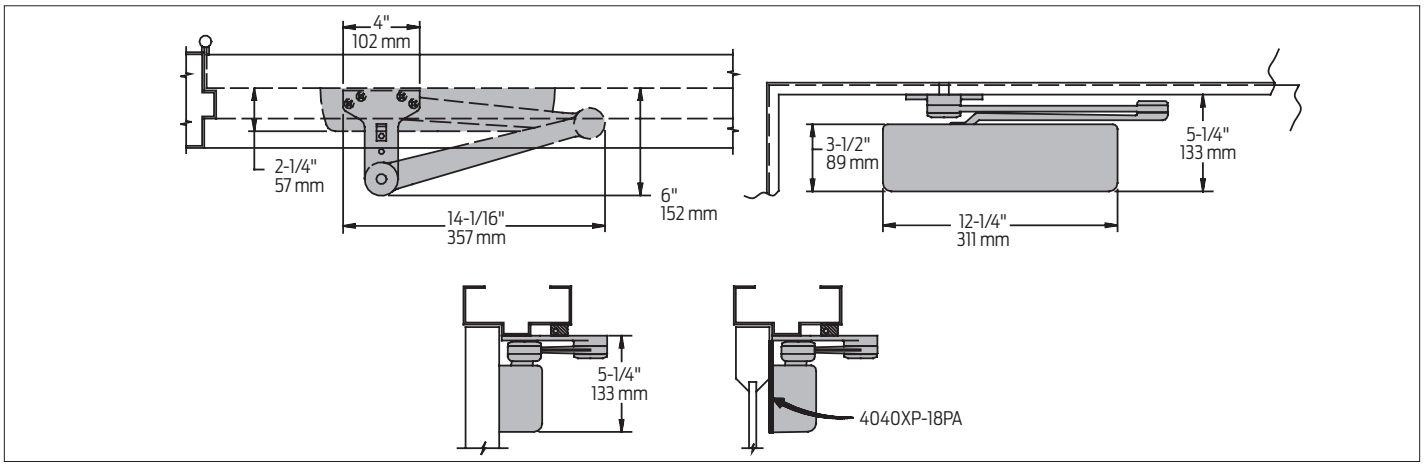


## Dimensions and mounting

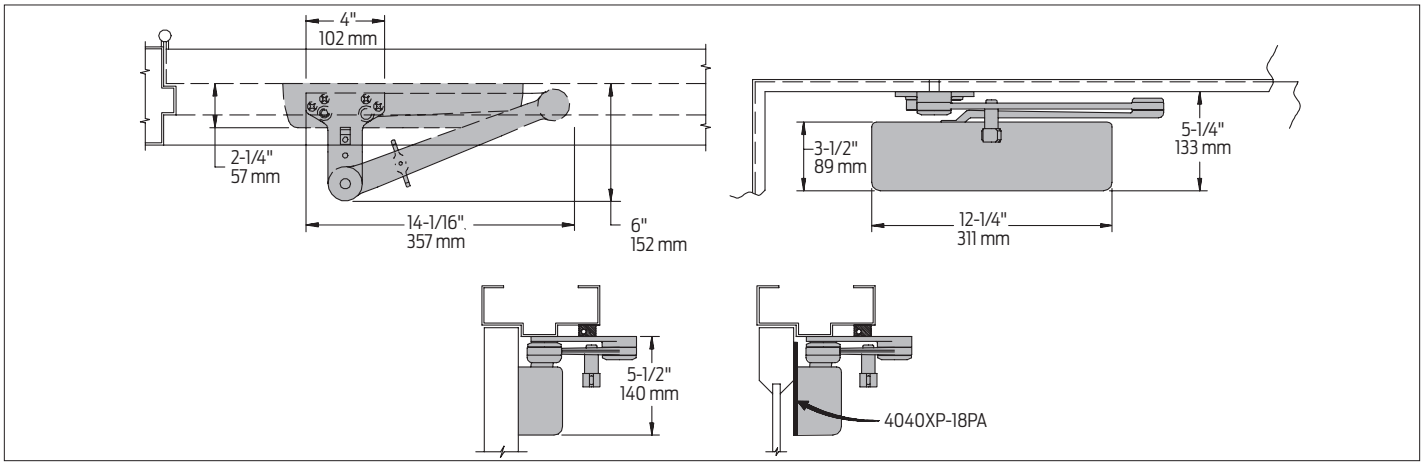
### Parallel arm (push side) mounting




### EDA mount




### CUSH mount



## Specifications

| | |
|---|---|
| Accessibility | Available with less than 5.0 lbs. opening force on 36" door |
| Certifications/ approvals | ▪ Grade 1 - ANSI A156.4<br>▪ UL 10C<br>▪ Meets BAA - Buy American Act |
| Degree of operation | Hinge (pull) side<br>Max opening: 120°<br>Hold open: 90-120°<br><br>Top jamb (push side) mount<br>Max opening: 120°<br>Hold open: 85-120°<br><br>Parallel arm with 62PA<br>Max opening: 180°<br>Hold open: 180°<br><br>EDA<br>Max opening: 180°<br>Hold open: 180°<br><br>Cush and spring cush<br>Max opening: 110°<br>Hold open: 110° |
| Environmental conditions | ▪ Approved for interior use<br>▪ Approved for exterior use (SRI coated only)<br>▪ LCN's standard all weather fluid performs to temperature ranges from 120°F (49°C) to -30°F (-35°C)<br>▪ LCN's powder coat finish surpasses 100 hours of salt spray which is over four times the ANSI standard for corrosion resistance. |
| Warranty | 30 years |
| Standard features | ▪ Cast iron body<br>▪ Full complement bearing<br>▪ 1 1/2" diameter piston<br>▪ 11/16" diameter double heat treated pinion journal |

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## 8400 Commercial protection plates
## 8402 UL Commercial protection plates

- Door protection plates are available in .050" thick brass, stainless steel or aluminum; and 1/8" thick high impact polyethylene in clear or black.
- All plates, metal and plastic, come standard with four beveled edges and countersunk mounting holes (B-CS).
- Protection plates must be ordered in 1/2" increments. Available in other sizes, consult customer service
- *For 8402 UL Plates, UL mark appears in upper right corner. Not available on plastic protection plates.*

### Certifications
- Meets ANSI A156.6 for J301
- UL protection plates certified to UL10C

### Mounting
- Standard mounting package, 16 per pack
  - #6 X 5/8 oval head screws
- Optional TEK/TORX package, specify TK-TX
  - #6 X 5/8 Self-drilling, Self-tapping screws
  - #6 X 5/8 Torx screws

### Finishes
- Aluminum 5005 Series, Brass C26800 Series, Stainless Steel 300 Series, Plastic

| BHMA | Description | Substrate | Finish | Max sizes |
|---|---|---|---|---|
| 605 | Bright Brass | Brass | US3 | 24"X48" |
| 606 | Satin Brass | Brass | US4 | 24"X48" |
| 612 | Satin Bronze | Brass | US10 | 24"X48" |
| 613 | Oil rubbed Bronze | Brass | US10B | 36"X48" |
| 619 | Satin Nickel | Brass | US15 | 24"X48" |
| 625 | Bright Chrome | Brass | US26 | 36"X48" |
| 626 | Satin Chrome | Brass | US26D | 24"X48" |
| 628 | Satin Aluminium | Aluminium | US28 | 48"X48" |
| 629 | Bright Stainless Steel | Stainless Steel | US32 | 48"X48" |
| 630 | Satin Stainless Steel | Stainless Steel | US32D | 48"X48" |
| 654 | Satin Stainless Steel | Stainless Steel | US32D | 48"X48" |
| BLK | Matte black | Stainless Steel | BLK | 24"X48" |
| P-BLK | Black | Plastic | P-BLK | 48"X48" |
| CLR | Clear | Plastic | CLR | 48"X48" |

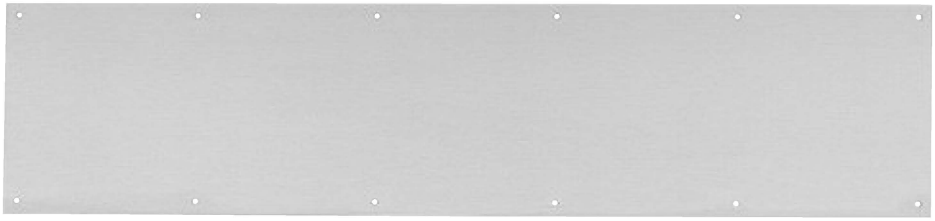
Number of screw packs required by plate size (specify TEK Screws or TORK screws)

| | 22"-25" | 26"-33" | 34"-41" | 42"-48" |
|---|---|---|---|---|
| 4"-8" | 1 | 1 | 1 | 1 |
| 9"-16" | 1 | 1 | 1 | 1 |
| 17"-24" | 1 | 1 | 1 | 2 |
| 25"-32" | 1 | 1 | 2 | 2 |
| 33"-40" | 1 | 2 | 2 | 2 |
| 41"-48" | 2 | 2 | 2 | 2 |

- Custom finishes are available as engineering special, consult customer service.

### Available options
- Specify B-NH for no mounting holes. (Not available on 8402. Available only with US32D, US32, US3, US4, US28, Clear, Black only)
- Specify B-NHA for no mounting holes with adhesive.
- Specify ERS prepped with extra row of screws.
- Special Cut-outs are available as engineering special, consult customer service.

### Available accessory
- Gasket tape kit tape is recommended when using a brass plate on a metal door to reduce tarnishing from electrolytic oxidation. One tape pack will cover an the perimeters of a 8" x 34" kickplate. Order 8401 gasket tape.

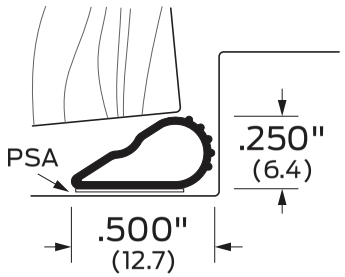


2720 Tobey Drive, Indianapolis, IN 46219
Tel 1-877-671-7011 ▪ Fax 800-851-0000
Zero.Customer.Support@allegion.com
**www.zerointernational.com**

| Part No: | Part description: |
|---|---|
| 188S | Self-adhesive weatherstripping |

| Notes: | Provided by: | |
|---|---|---|
| Customer name: | Job no: | Date: |

Image may not be shown to scale




Notes:
PSA standard. 20-minute fire rating.

## Certifications:

- Fire rated-UL10c
- Smoke and draft control
- Air Infiltration
- Sound

## ANSI/BHMA:

188S R0E151

BHMA CERTIFIED

## Finishes:

| | |
|---|---|
| **BK** | Black |
| **BR** | Brown |
| **CL** | Clear |
| **GY** | Gray |
| **WH** | White |

## Options:

| | |
|---|---|
| **ZAG** | Ligature resistant gasketing |

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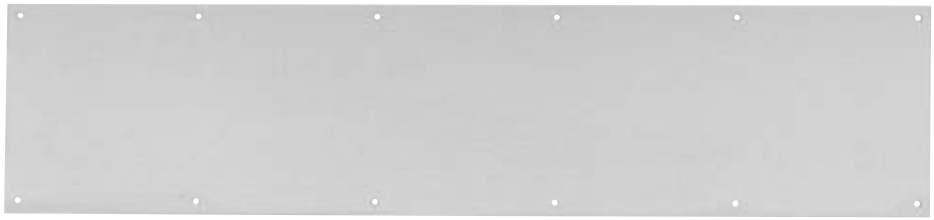
## 8400 Series Protection Plates

- Door protection plates are available in .050" thick brass, stainless steel or aluminum; and 1/8" thick high impact polyethylene in clear or black.
- Bevel edge options; specify B4E for all four edges.
- Mounting screw pack furnished standard, 16 screws per pack. Optional screw packs are available for TEK or TORK screw heads. Refer to the following chart for ordering.
- Specify NMH for no mounting holes. (Not available on 8402)
- Specify NMH-A for no mounting holes with adhesive. (Not available on 8402)
- Specify CS for counter sunk mounting holes.
- Specify ERS prepped with extra row of screws.

**Kickplate Gasket Tape** Tape is recommended when using a brass plate on a metal door to reduce tarnishing from electrolytic oxidation. One tape pack will cover an the perimeters of a 8" x 34" kickplate. Order 8401 Gasket Tape.



**8400 Protection Plate**
**8402 (UL)* Protection Plate**

**UL mark appears in upper right corner. Factory supplied screws must be used.*

Number of screw packs required by plate size (specify TEK Screws or TORK screws).

| | 22"-25" | 26"-33" | 34"-41" | 42"-48" |
|---|---|---|---|---|
| 4"-8" | 1 | 1 | 1 | 1 |
| 9"-16" | 1 | 1 | 1 | 1 |
| 17"-24" | 1 | 1 | 1 | 2 |
| 25"-32" | 1 | 1 | 2 | 2 |
| 33"-40" | 1 | 2 | 2 | 2 |
| 41"-48" | 2 | 2 | 2 | 2 |

**Finishes** *brass 24" x 48" max. size*

| US Number | US3 | US4 | US10 | US10B | US15 | US26 | US26D |
|---|---|---|---|---|---|---|---|
| BHMA | 605 | 606 | 612 | 613 | 619 | 625 | 626 |

**Finishes** *stainless steel*

| US Number | US32 | US32D |
|---|---|---|
| BHMA | 629 | 630 |

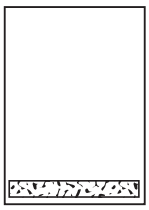
**Finishes** *aluminum*

| US Number | US28 |
|---|---|
| BHMA | 628 |

**Finishes** *plastic*

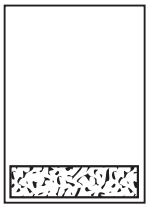
| Clear and Black |
|---|

*Residential Grade Kickplates available Carded only, finishes PA28, PA3, PA619, PA716, B3, B505, B619, B716*



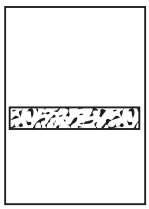
## Mop Plates

- Protect the bottom of the pull side of door subject to cleaning and mopping procedures.
- Size Ranges:4" to 6" high, 22" to 48" wide



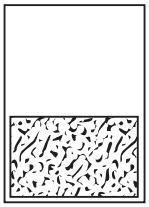
## Kick Plates

- Protect the bottom of the push side of doors subject to scuffing from foot traffic.
- Recommended for all doors subject to normal use (especially doors using a closer).
- Size Ranges: 8" to 24" high, 22" to 48" wide



## Stretcher Plates

- Protect doors at specific areas where consistent contact is made by stretchers, service carts or other equipment.
- Usually applied to push side of doors.
- Specify "B4E" Option for beveled edges.
- Size Ranges: 6" to 8" high, 22" to 48" wide



## Armor Plates

- Protect lower half of doors from abuse by hard carts, trucks and rough usage.
- Usually applied to push side of single doors and both sides of double acting doors.
- Size Ranges: 26" to 48" high, 22" to 48" wide

Meets ANSI/BHMA A156.1
A8133 – Steel
A5133 – Stainless Steel
A2133 – Brass

## 5PB1 5 Knuckle, Plain Bearing Full Mortise Hinge

- For standard weight doors
- Low frequency usage
- Packed with wood and metal screws

*Not for use with a door closer.*

**Options**

- NRP, Non-Removable Pin
- SH, Security Stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

**Dimensions**

| Size (Inches) | Size (mm) | Gauge |
|---|---|---|
| 3.5 x 3.5 | 89 x 89 | 0.123 |
| 4 x 4 | 102 x 102 | 0.134 |
| 4.5 x 4 | 114 x 102 | 0.134 |
| 4.5 x 4.5 | 114 x 114 | 0.134 |
| 5 x 4.5 | 127 x 114 | 0.134 |

Meets ANSI/BHMA A156.1
A8112 – Steel
A5112 – Stainless Steel
A2112 – Brass

## 5BB1 5 Knuckle, Ball Bearing Full Mortise Hinge

- For standard weight doors
- Medium frequency usage
- 2 ball bearing
- Packed with wood and metal screws

**Options**

- NRP, Non-Removable Pin
- SH, Security Stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

**Dimensions**

| Size (Inches) | Size (mm) | Gauge | Size (Inches) | Size (mm) | Gauge |
|---|---|---|---|---|---|
| 3.5 x 3.5 | 80 x 102 | 0.130 | 5 x 4.5 | 127 x 114 | 0.146 |
| 4 x 4 | 102 x 102 | 0.130 | 5 x 5 | 127 x 127 | 0.146 |
| 4.5 x 4 | 114 x 102 | 0.134 | | | |
| 4.5 x 4.5 | 114 x 114 | 0.134 | | | |

**Finishes** *brass*

| Ives Finish | US3 | US4 | US10 | US10B | US10A | US11 | US15 | US26 | US26D |
|---|---|---|---|---|---|---|---|---|---|
| BHMA | 605 | 606 | 612 | 613 | 614 | 616 | 619 | 625 | 626 |

**Finishes** *steel*

| Ives Finish | USP | US3 | US4 | US10 | US10B | US10A | US11 | US15 | US26 | US26D |
|---|---|---|---|---|---|---|---|---|---|---|
| BHMA | 600 | 632 | 633 | 639 | 640 | 641 | 643 | 646 | 651 | 652 |

**Finishes** *stainless steel*

| Ives Finish | US32 | US32D |
|---|---|---|
| BHMA | 629 | 630 |

SCHLAGE

Grade 1 cylindrical locks

# ND Series

## Overview

The Schlage® ND Series is ANSI/BHMA Grade 1 certified and performs beyond the Grade 1 standards. The lock withstands 3,100 in-lb. of abusive lever torque, as well as 1,600 lbs. of offset lever pull for protection against pry bar attacks. The lock is not only strong from attacks, but it also shows nearly zero droop or wobble after 16 million cycles.

All ND Series locks come in 10 finishes, nine lever designs and use an ANSI 161 door preparation, commonly used with cylindrical locks. They are ideal for all new construction and retrofit applications.

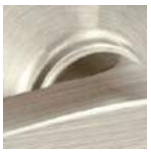
## Finishes

**605**
Bright Brass

**606**
Satin Brass

**612**
Satin Bronze

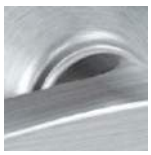
**613**
Oil Rubbed Bronze



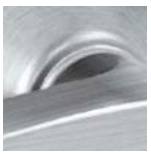
**619**
Satin Nickel

**622**
Matte Black

**625**
Bright Chrome



**626**
Satin Chrome



**626AM**
Satin Chrome, Antimicrobial

**643e**[1]
Aged Bronze

[1] e = an equivalent finish to the BHMA standard

ALLEGION™

## Lever styles

**Athens (ATH)**
**Athens with milled tactile warning (8AT)**

**Boardwalk (BRK)**
**Boardwalk with knurled tactile warning (8BK)**

**Broadway (BRW)**
**Broadway with knurled tactile warning (8BY)**

**Latitude (LAT)**
**Latitude with milled tactile warning (8LT)**

**Longitude (LON)**
**Longitude with milled tactile warning (8LN)**

**Omega (OME)**

**Rhodes (RHO)[1]**
**Rhodes with milled tactile warning (8RO)[1]**

**Sparta (SPA)**
**Sparta with milled tactile warning (8SP)**

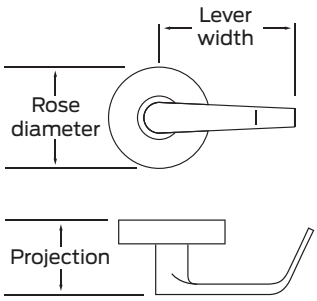
**Tubular (TLR)**
**Tubular with knurled tactile warning (8TR)**

### Dimensions

| Lever | Width | Projection |
|---|---|---|
| Athens (ATH) | 4 9/16" | 3 5/16" |
| Boardwalk (BRK) | 4 15/16" | 3 1/16" |
| Broadway (BRW) | 4 1/2" | 3 1/16" |
| Latitude (LAT) | 4 1/2" | 3 1/8" |
| Longitude (LON) | 4 15/16" | 3 1/8" |
| Omega (OME) | 5 1/16" | 3 5/16" |
| Rhodes (RHO) | 4 9/16" | 2 15/16" |
| Sparta (SPA) | 4 15/16" | 3 1/2" |
| Tubular (TLR) | 4 15/16" | 3" |

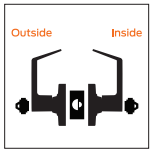
| Rose | Diameter |
|---|---|
| Standard | 3 7/16" |

Return to door meets 1/2" requirement for Boardwalk (BRK), Longitude (LON), Omega (OME), Rhodes (RHO), Sparta (SPA) and Tubular (TLR) levers




[1] Optional break away lever available

## Mechanical keyed functions

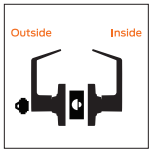



**Schlage** **ND75**
**ANSI** **-**

### Classroom security lock

- Key in either lever locks or unlocks outside lever.
- Inside lever always free for immediate egress.

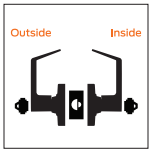
Comes standard with an indicator rose that clearly identifies key rotation direction for rapid lockdown. 626 finish only. Other finishes receive a standard rose.




**Schlage** **ND80**
**ANSI** **F86**

### Storeroom lock

- Outside lever is fixed.
- Entrance by key only.
- Inside lever always free for immediate egress.
- Available with Request to Exit (RX) function.

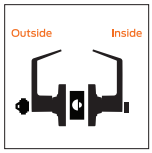



**Schlage** **ND82**
**ANSI** **F87**

### Institution lock

- Both levers always fixed.
- Entrance by key in either lever.

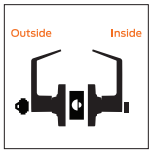
Caution: Double cylinder locks on any door, in any structure, which is used for egress can create a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.




**Schlage** **ND85**
**ANSI** **-**

### Faculty restroom lock

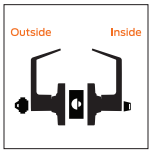
- Outside lever is fixed.
- Entrance by key only.
- Visual occupancy indicator, allowing only emergency key to operate.
- Turn inside lever or close door to unlock.
- Rotation of inside spinner-button enables lock-out feature.
- Inside lever always free for immediate egress.
- Not available with interchangeable core cylinders.




**Schlage** **ND91**
**ANSI** **F82**

### Entrance/office lock with Vandlgard

- Push-button locking.
- Push-button disengages outside lever until unlocked with key or by turning inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.




**Schlage** **ND92**
**ANSI** **F109**

### Entrance lock with Vandlgard

- Turn/push-button locking: Pushing and turning button disengages outside lever, requiring using of key until button is manually unlocked.
- Push-button locking: Pushing button disengages outside lever until unlocked by key or by turning inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

ALLEGION™

SCHLAGE®

# ND Series

## Grade 1 cylindrical locks

**Mechanical**
**Wired electrified**
**Wireless electronic**

Mechanical

Wired electrified

Wireless electronic

# The Schlage® ND Series cylindrical locks

Walter Schlage invented the cylindrical lock in 1920. Since then, Schlage Lock Company has consistently delivered innovation and continuous improvement. In that tradition, we are extremely proud to introduce the redesigned ND Series cylindrical lock.

Most manufacturers' approach to locks ends with simply meeting industry standards like Grade 1. With the Schlage ND, Grade 1 is just the beginning.

**Performance beyond Grade 1**
The Schlage® ND family significantly exceeds BHMA Grade 1 requirements for cycle, lever torque, hammer blow, lever pull and other tests. This means confidence that the lock will last—whether the application calls for high abuse resistance or just operation over millions of cycles—without any degradation in performance.

**Comprehensive offering for every opening**
Mechanical, wired electrified and wireless electronic solutions allow a common aesthetic and consistent user experience throughout the building while lowering the total cost of ownership.

**World-class design**
A proven, easy to install product with extensive function, keying, trim and finish capabilities that work in nearly any applications.

# ND mechanical

## Applications

The Schlage ND is extremely versatile and is regularly used in healthcare, education, government, office, retail and other commercial applications.

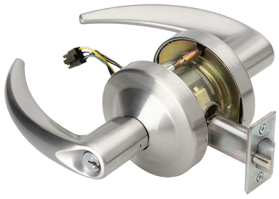
With 31 mechanical functions, the ND's range spans from the simple (non-locking passage) to complex (double-cylinder security) to specialized (school time-out lock).

Because the ND uses an ANSI 161 door prep, commonly used across cylindrical locks, it is ideal for both new construction and retrofit applications.

## Key features

- Significantly exceeds ANSI/BHMA A156.2 requirements for Grade 1 cylindrical locks
- 31 mechanical functions (see adjacent columns for wired electrified and electronic options)
- Nine lever designs, two rose designs
- 10 available finishes
- Supports standard, SFIC and FSIC cylinder formats
- Multiple key systems available – open, patented, restricted, geographic exclusive, UL437
- Support for 10 non-Schlage cores (see cylinder section)

# ND wired electrified



## Applications

Wired electrified locks complement the mechanical offering and are typically incorporated into a wired access control system or used independently with a remote access switch (e.g. switch behind a receptionist desk).

The electrified ND is ideally used in:

- high traffic areas, where line power ensures continuous operation
- new construction, where electrified door prep, hinges and wiring can easily be incorporated into the building

## Key features

All mechanical features plus:

- auto-detecting 12-24VDC input
- selectable EL/EU operation
- low 0.23 amp max current draw that allows multiple locks on a single power supply
- low 0.010 amp holding current that eliminates “hot levers” in electrically locked applications
- modular Request to Exit (RX) that can be added at any time
- inventory friendly–one lock supports 12-24V, EL or EU, with or without RX
- six electrified functions for application flexibility

# NDE wireless electronic

## Applications

Wireless electronic locks complete the offering by delivering all of the access control system hardware components required at the door in a single integrated design.

NDE wireless lock applications include:

- retrofit applications where electronic credentials can be used for improved visibility and control
- new construction to expand the scope of access control to interior openings
- low to medium traffic areas, where battery power delivers long life

## Key features

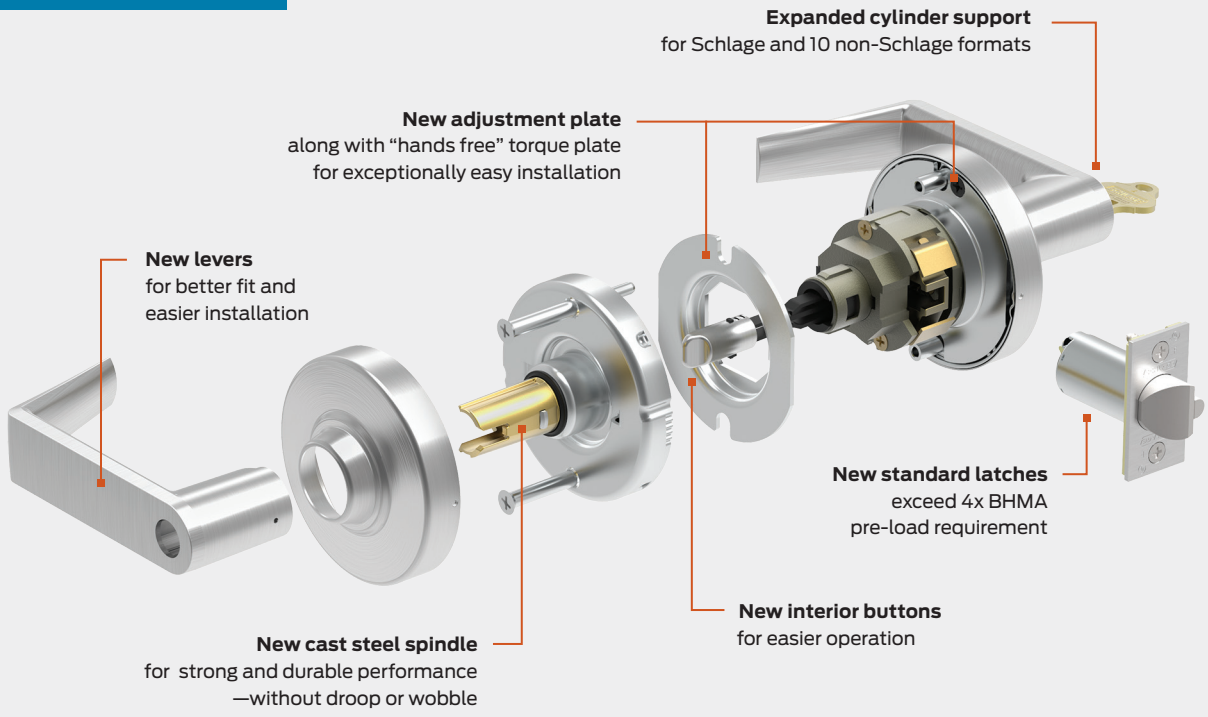
All mechanical features[1] plus:

- Fits standard ANSI 161L mechanical door prep
- Installs in minutes with only a Phillips screwdriver
- Integrated card reader, door position sensor and Request to Exit (RX) switch
- Built-in Bluetooth® enables wireless configuration from smart phones and tablets
- Built-in Wi-Fi enables automatic updates to access rights
- Capable of networked real-time communication[2]
- Up to 2 years of battery life (4 AA)

1 NDE wireless electronic lock available in seven lever designs, one rose design, and nine finishes only.
2 Requires ENGAGE™ Gateway and alliance access control software.

## A detailed look...

### ND mechanical




### ND wired electrified

**All mechanical features +**

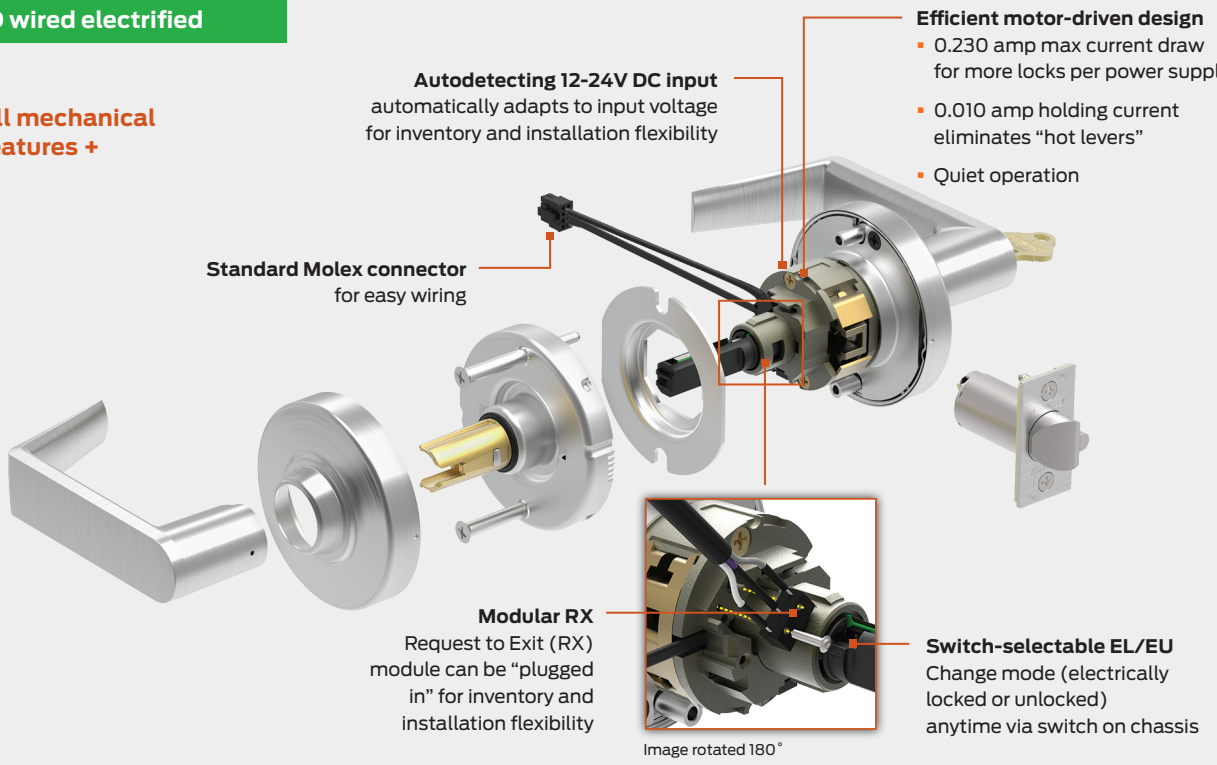



Image rotated 180°

## NDE wireless electronic

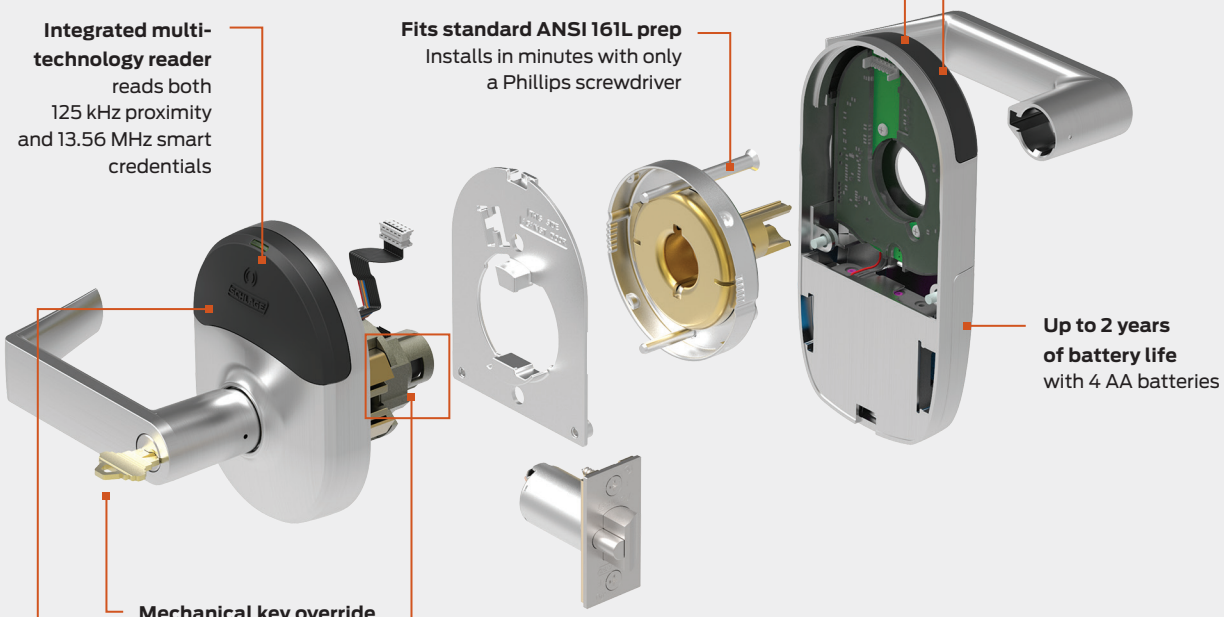
### All mechanical features +

**Built-in Bluetooth**
enables wireless configuration from smart phones and tablets

**Built-in Wi-Fi**
enables automatic updates to access rights

**Integrated multi-technology reader**
reads both 125 kHz proximity and 13.56 MHz smart credentials

**Fits standard ANSI 161L prep**
Installs in minutes with only a Phillips screwdriver



**Up to 2 years of battery life**
with 4 AA batteries

**Mechanical key override**
compatible with most popular key systems

**Built-in No-Tour**
eliminates the need to visit the locks by using smart credentials to update access rights

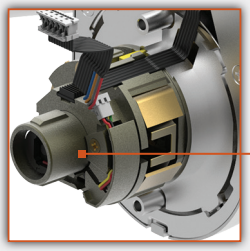
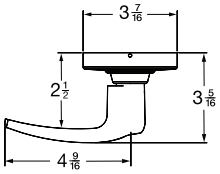


Image rotated 180°

**Integrated door position sensor**
requires no additional prep

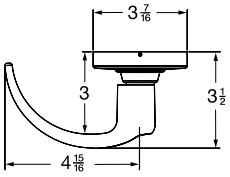
# Lever designs and finishes

## Athens (ATH)[2]



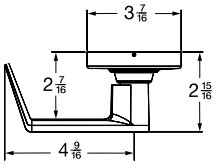

Mechanical | Wired electrified | Wireless electronic

## Sparta (SPA)[1, 2]



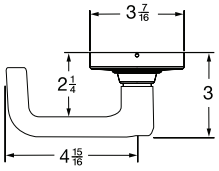

Mechanical | Wired electrified | Wireless electronic

## Rhodes (RHO)[1, 2]



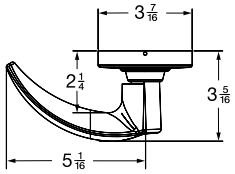

Mechanical | Wired electrified | NDE wireless electronic

## Tubular (TLR)[1, 2]



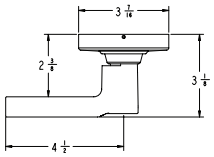

Mechanical | Wired electrified | Wireless electronic

## Omega (OME)[1]



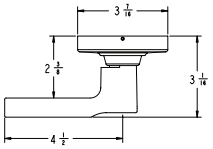

Mechanical | Wired electrified | Wireless electronic

## Latitude (LAT)



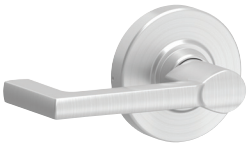
Mechanical | Wired electrified | Wireless electronic

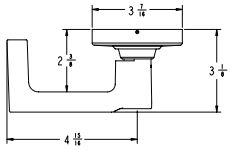
## Broadway (BRW)



Mechanical | Wired electrified | Wireless electronic

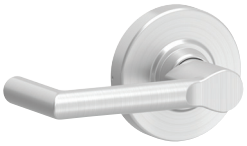
## Longitude (LON)

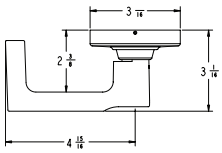




Mechanical | Wired electrified | Wireless electronic

## Boardwalk (BWK)





Mechanical | Wired electrified | Wireless electronic

All levers comply with the Americans with Disabilities Act (ADA).

1 Boardwalk, Longitude, Omega, Rhodes, Sparta and Tubular levers comply with California State code for return within ½" of door face.

2 Athens, Rhodes, Sparta and Tubular levers support cylinders from other manufacturers, see cylinder section on page 24 for details.

| Finish options | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Color | Bright brass | Satin brass | Satin bronze | Oil rubbed bronze | Satin nickel | Matte black | Bright chrome | Satin chrome | Aged bronze |
| ANSI/BHMA number | 605 | 606 | 612 | 613 | 619 | 622 | 625 | 626/626AM | 643e |
| US number | US3 | US4 | US10 | US10B | US15 | US19 | US26 | US26D | US11 |
| Mechanical | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Wired electrified | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Wireless electronic | ■ | ■ | ■ | — | ■ | ■ | ■ | ■ | ■ |

Product information and specifications contained in this catalog are subject to change without notice. Please consult the factory.

# Accessibility and life safety

Door hardware should be as effective in helping people go about their lives as it is in securing their environments. The Schlage ND is designed with this requirement in mind.

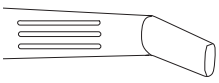
## Accessibility

All Schlage ND levers comply with the Americans with Disabilities Act (ADA), which requires that "Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum."

## Tactile warning for the visually impaired

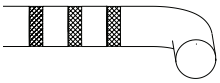
Tactile warning is a special texture applied to the outside lever to alert the visually impaired to a potential hazard on the opposite side of the door (exit to street, a workshop or other hazardous area, etc). Tactile warning is typically applied to the outside lever only, and is specified by an 8 prefix on the lever design.

Milled



Order as follows:
8AT for Athens
8RO for Rhodes
8SP for Sparta
8LT for Latitude
8LN for Longitude

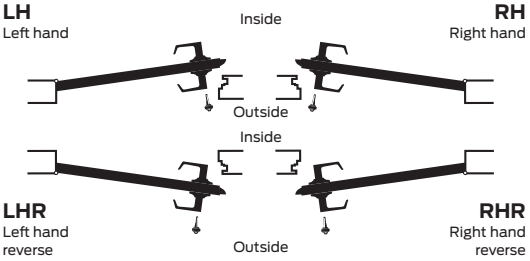
Knurled



Order as follows:
8TR for Tubular
8BW for Broadway
8BK for Boardwalk

## Door handing

The ND lock family can be configured during installation to support any door handing. As a result, it is not necessary to specify handing during the ordering process.




## Life safety

The Schlage ND is UL listed for use on 3-hour fire doors up to 4'0" x 10'0". The Boardwalk, Longitude, Omega, Rhodes, Sparta and Tubular levers levers comply with the California State fire code for return to within ½" of the door face.

Additionally, the Schlage ND exceeds the BHMA warped door test by 4x. The BHMA standard requires that the latch be able to retract with a 50lb pre-load; the ND can retract the latch with a 200lb preload - providing more range to open the door in the event the opening becomes bound or otherwise compromised.

## Classroom security indicator rose

Schlage ND classroom security functions come standard with an indicator rose that clearly identify key rotation direction for rapid lockdown. For ND mechanical classroom security function only.

# ND Series mechanical lock

The ND mechanical lock, along with being Schlage's best selling mechanical lock, is the foundation for both the wired electrified and NDE wireless electronic lock. Not only did Schlage invent the cylindrical lock, but we continue to make it better with capabilities such as:

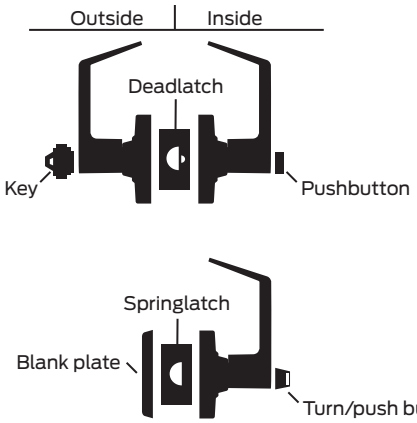
- Unparalleled strength - the lock prevents access even when subjected to torque loads up to 3,100 in-lbs (2.6x BHMA[1]), withstands pry bar attacks of 1,600 lbs (8x BHMA requirements[1]), and withstands 100 hammer blows (20x BHMA requirements[1, 2])
- Exceptional durability - cycle tested to over 16M cycles (16x BHMA requirements[1]) with near zero droop or wobble - without the use of set screws or O-rings
- Improved feel - improved strength and durability are more than numbers, you can actually feel it in the lock
- Improved installation - installation is even easier than before (and withoutany set screws or O-rings)

All this is in addition to what you know and expect with the Schlage ND: 31 mechanical functions (plus wired electrified and wireless electronic) to meet the needs of any application; nine lever designs that suite with otherSchlage locks and Von Duprin exit devices; renowned sales, customer and technical support.

1 Beyond grade 1 performance for ND locks with Schlage cylinders only (standard, FSIC & SFIC). Performance with non-Schlage cylinders will exceed BHMA grade 1 requirements but may be less than the performance of products with Schlage cylinders.

2 Vertical impact testing stopped after 100 blows with no sign of failure or stress.

## Legend



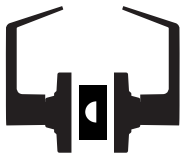

Schlage ANSI

### ND10S F75

**Passage latch**

- Both levers always unlocked.

Inside



Available with RX

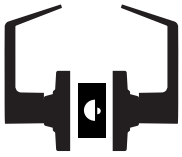
Schlage ANSI

### ND12D F89

**Exit lock**

- Outside lever always fixed.
- Inside lever always free for immediate egress.

Outside Inside



Available with RX

Schlage ANSI

### ND25D -

**Exit lock**

- Blank plate outside.
- Inside lever always free for immediate egress.

Outside Inside

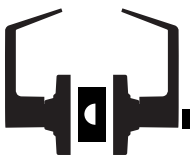
Schlage ANSI

### ND40S F76

**Bath/bedroom privacy lock**

- Push-button locking.
- Unlocked from outside with a small screwdriver.
- Turn inside lever or close door to release button.
- Inside lever always free for immediate egress.

Outside Inside



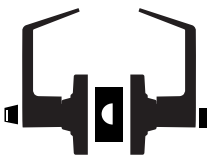
Schlage ANSI

### ND44S -

**Hospital privacy lock**

- Push-button locking.
- Unlocked from outside by turning emergency turn-button.
- Turn inside lever or close door to release button.
- Inside lever always free for immediate egress.

Outside Inside



Schlage ANSI

### ND170 -

**Single dummy trim**

- Dummy trim for one side of door.
- Used for door pull or as matching inactive trim.

Outside/Inside

## ND Series mechanical lock
## Keyed function list

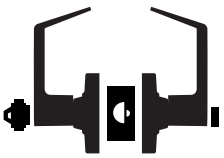
Schlage ANSI

**ND50PD F82**

### Entrance/office lock

- Push-button locking.
- Push-button locks outside lever until it is unlocked with key or by turning inside lever.
- Inside lever always free for immediate egress.

Outside Inside



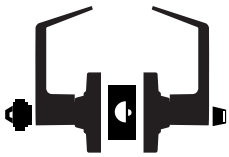
Schlage ANSI

**ND53PD F109**

### Entrance lock

- Turn/push-button locking: Pushing and turning the button locks the outside lever, requiring use of a key until the button is manually unlocked.
- Push-button locking: Pushing button locks outside lever until unlocked by key or by turning the inside lever.
- Inside lever always free for immediate egress.

Outside Inside



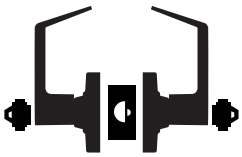
Schlage ANSI

**ND60PD F88**

### Vestibule lock

- Latch retracted by key from outside when outside lever is locked by key in inside lever.
- Inside lever always free for immediate egress.

Outside Inside



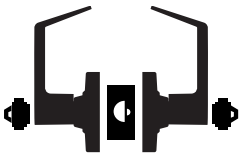
Schlage ANSI

**ND66PD F91**

### Store lock†

- Key in either lever locks or unlocks both levers.

Outside Inside



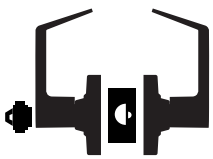
Schlage ANSI

**ND70PD F84**

### Classroom lock

- Outside lever locked and unlocked by key.
- Inside lever always free for immediate egress.

Outside Inside



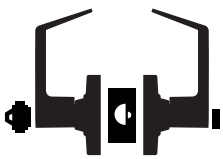
Schlage ANSI

**ND73PD F90**

### Corridor lock

- Locked or unlocked by key from outside.
- Push-button locking from inside.
- Turn inside lever or close door to release button.
- When outside lever is locked by key it can only be unlocked by key.
- Inside lever always free for immediate egress.

Outside Inside



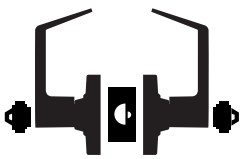
Schlage ANSI

**ND75PD -**

### Classroom security lock

- Key in either lever locks or unlocks outside lever.
- Inside lever always free for immediate egress.

Outside Inside



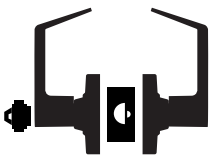
Schlage ANSI

**ND80PD F86**

### Storeroom lock

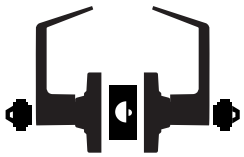
- Outside lever is fixed.
- Entrance by key only.
- Inside lever always free for immediate egress.

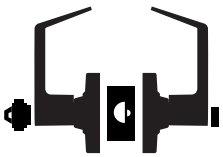
Outside Inside



Available with RX

## ND Series mechanical lock
## Keyed function list

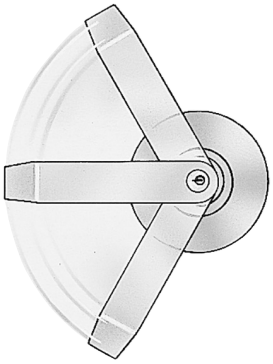
| Schlage | ANSI |
|---|---|
| **ND82PD** | **F87** |
| **Institution lock†** | |
| · Both levers always fixed.<br>· Entrance by key in either lever. | |
| **Outside** | **Inside** |
|  | |

| Schlage | ANSI |
|---|---|
| **ND85PD** | **-** |
| **Faculty restroom lock** | |
| · Outside lever is fixed.<br>· Entrance by key only.<br>· Visual occupancy indicator, allowing only emergency key to operate.<br>· Turn inside lever or close door to unlock.<br>· Rotation of inside spinner-button enables lock-out feature.<br>· Inside lever always free for immediate egress.<br>· Not available with interchangable core cylinders. | |
| **Outside** | **Inside** |
|  | |

**Electrified locks can be found in the electrified section of the catalog (page 19).**

## ND Series mechanical lock
## Vandlgard™ function list

Vandlgard™ trim is specifically designed for highly abusive environments. The outside lever rotates freely up and down when locked, limiting the ability of vandals to apply excessive force to the chassis



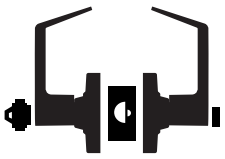
Schlage ANSI

**ND91PD F82**

**Entrance/office lock**

- Push-button locking.
- Push-button disengages outside lever until unlocked with key or by turning inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

**Outside** **Inside**



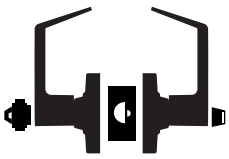
Schlage ANSI

**ND92PD F109**

**Entrance lock**

- Turn/push-button locking: Pushing and turning button disengages outside lever, requiring using of key until button is manually unlocked.
- Push-button locking: Pushing button disengages outside lever until unlocked by key or by turning inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

**Outside** **Inside**



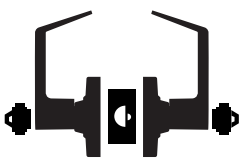
Schlage ANSI

**ND93PD F88**

**Vestibule lock**

- Latch retracted by key from outside when outside lever is disengaged by key in inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

**Outside** **Inside**



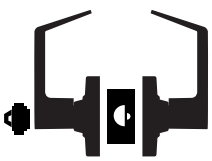
Schlage ANSI

**ND94PD F84**

**Classroom lock**

- Outside lever disengaged and unlocked by key.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

**Outside** **Inside**



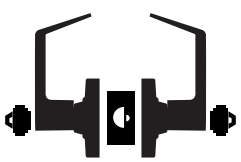
Schlage ANSI

**ND95PD -**

**Classroom security lock**

- Key in either lever locks or unlocks outside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

**Outside** **Inside**



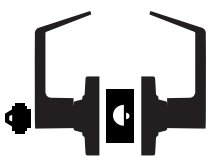
Schlage ANSI

**ND96PD F86**

**Storeroom lock**

- Outside lever always disengaged.
- Entrance by key only.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

**Outside** **Inside**



Available with RX

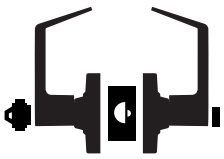
Schlage ANSI

**ND97PD** **F90**

**Corridor lock**

- Locked or unlocked by key from outside.
- Push-button locking from inside.
- Turning inside lever or closing door releases button.
- When outside lever is locked by key it can only be unlocked by key.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

**Outside** **Inside**



Schlage ANSI

**ND45** **-**

**Time out lock**

- Pushing and holding outside button disengages inside spindle, allowing inside lever to free-wheel without retracting latch. Release of outside button allows free egress from inside.

**Outside** **Inside**

# ND Series other special functions

**ND30D**
**Patio lock**

Push button locking. Turning inside lever or closing door releases button, preventing a lock-out. Inside lever always free for immediate egress. Specify per XN12-007.

**ND25 x 80PD**
**Storeroom exit lock**

Blank plate outside. Key in fixed inside lever retracts latch. Specify per XN12-005.

**ND25 x 70PD**
**Classroom exit lock**

Blank plate outside. Key locks or unlocks inside lever. Specify per XN12-004.

**ND60PD**
**Vestibule with closed outside lever**

Same as ND60 except outside lever is closed. Inside lever always free for immediate egress. Specify per XN12-001.

**ND70 x 80PD**
**Classroom by storeroom lock**

Key locks and unlocks outside lever. Key in fixed inside lever retracts latch. Specify per XN12-006.

**ND72PD**
**Communicating lock**

Key in either lever locks and unlocks respective lever. Specify per XN12-002.

**ND72PD**
**Vandlgard communicating lock**

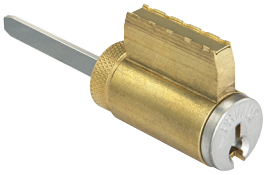
Communicating, ND72, lock with Vandlgard. Key in either lever locks and unlocks own lever. Both inside and outside levers are clutching. Specify per XN12-003.

**Electrified locks can be found in the electrified section of the brochure (page 18).**

# Cylinders and key systems

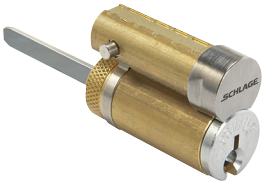
A strong lock is only part of the security solution—proper key control is equally important. Schlage offers extensive options to meet the security needs of the specific project.

## Cylinders



### Conventional KIL cylinder options[1]

- 6-pin length (standard)
- 7-pin length in SL cylinder
- Available in Schlage Classic and Everest 29™ open and restricted keyways
- Primus® XP security features and geographic exclusivity
- Primus XP UL 437 listed high security features
- Hotel cylinder (for use in faculty restroom function)




### Full size interchangeable core (FSIC) options[1]

- 6-pin length
- Available in Schlage Classic and Everest 29 open and restricted keyways
- Interchangeable core compatible with conventional cylinder key systems
- Primus XP security features and geographic exclusivity

### Small format interchangeable core (SFIC) options[2]

- 7-pin combinated Everest 29 R restricted keyways[3]
- 6 or 7-pin uncombinated Falcon®/ Best® keyways[4]

1 Available in 606, 622, 626 and 643 plug face finishes; Everest 29 S123 keyway standard.
2 Available 606, 613 (simulated), 622, 626 and 643e finish only.
3 Restricted keyway cores require authorization from the end user.
4 Must be ordered separately from lock; not available factory keyed.

## Key systems

### Classic keyway

- Open keyway—keys are duplicated and available without ordering formalities
- Upgradeable to Primus XP and UL 437 levels of security

### Everest 29

- Patented through 2029
- Key duplication is restricted providing a higher level of security for the cylinder
- Can be integrated to an existing Everest B, C, or D system
- Upgradeable to Primus XP and UL 437 levels of security

### Primus XP

- Independent, dual locking mechanisms
- Unique side bit milling on key makes unauthorized duplication highly enforceable
- Allows creation of geographically exclusive keys in a thousand available combinations
- Provides patent protection when applied to Schlage Classic keyways
- Compatible to all Everest and Everest 29 keyways

### Everest 29 SL

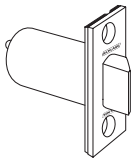
- A high security conventional (KIL) cylinder pinned on an A2 system compatible with the Schlage Everest B and Everest 29 R keyways
- Users can expand existing Everest B and Everest 29 R key systems
- Enables Primus XP and UL 437 upgrades on SFIC keyways

# Latches

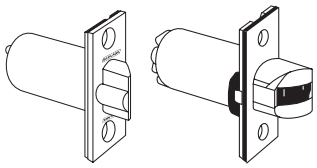
ND latches are adjustable for flat or beveled edge doors, and are finished to match the lock trim. All ND Series latches have 1/2" throw and 1" housings except the anti-friction fire door latch, which has a 3/4" throw. Please see the Schlage pricebook for more options including extended backset strikes (up to 5") and rabbited latch and strike kits.

| | Part number | Backset | Description |
|---|---|---|---|
| Springlatch | 13-248 | 2 3/4" | Square corner, 1 1/8" x 2 1/4" (default springlatch) |
| | 14-010 | 3 3/4" | Square corner, 1 1/8" x 2 1/4" |
| Deadlatch | 14-047 | 2 3/8" | Square corner, 1 1/8" x 2 1/4" |
| | 14-048 | 2 3/8" | Square corner, 1" x 2 1/4" |
| | 13-247 | 2 3/4" | Square corner, 1 1/8" x 2 1/4" (default deadlatch) |
| | 14-042 | 2 3/4" | Anti-friction fire door latch (3/4" throw) |
| | 14-028 | 3 3/4" | Square corner, 1 1/8" x 2 1/4" |

**Springlatch**



**Deadlatch**



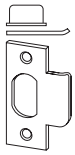
3/4" throw anti-friction deadlatch for pairs of fire doors

# Strikes

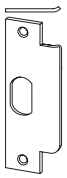
The ND Series is available with both T-Strike and ANSI strikes in a variety of lip lengths to accommodate different door preps.

| | Part number | Description |
|---|---|---|
| T-strike | 10-013 xx | T-strike, square corner, with strike box, 1 1/8" x 2 3/4". Specify lip length (xx) as 1 1/8" or 1 1/2". For ND and wired ND only. |
| | 10-016 | T-strike, square corner, with deep strike box, for fire door latch. 1 1/8" x 2 3/4" w/ 1 1/8"" lip. For ND and wired ND only. |
| | 10-132 xx | T-strike, square corner, with strike box, DPS magnet, 1 1/8" x 2 3/4". Specify lip length (xx) as 1 1/8" or 1 1/2". For NDE only. |
| | 10-133 xx | T-strike, square corner, with deep strike box, DPS magnet, for fire door latch. 1 1/8" x 2 3/4" w/ 1 1/8" lip. For NDE only. |
| ANSI | 10-025 xx | ANSI, no box, 1 1/4" x 4 7/8". Specify lip length (xx) as 1 3/16", 1 3/8" or 1 1/2" (1 3/16" lip is default strike). For ND and wired ND only. |
| | K510-066 | Box for ANSI strike. |
| | 10-130 xx | ANSI, no box, DPS magnets, 1 1/4" x 4 7/8". Specify lip length (xx) as 1 3/16", 1 3/8" or 1 1/2" (1 3/16" lip is default strike). For NDE only. |

**T-strike**
(10-013)
1 1/8" x 2 3/4" x 3/32"



**ANSI strike - standard**
(10-025)
1 1/4" x 4 7/8" x 3/32"



# Non-Schlage cylinders

The ND lock can accommodate cylinders from a variety of manufacturers, provided it is specified when ordering the lock.

| Cylinder type | Cylinder code |
|---|---|
| Sargent KIL[1] | L-SAR |
| Sargent FSIC[1] | J-SAR |
| CR KIL[1] | L-CO6 |
| CR FSIC[1] | J-CO6 |
| CR FSIC 7-pin[2] | J-CO7 |

| Cylinder type | Cylinder code |
|---|---|
| Yale FSIC[1] | J-YA6 |
| Yale FSIC 7-pin[2] | J-YA7 |
| Medeco 31[1] | J-YA6 |
| Medeco 32[1] | J-MED |
| Best | see SFIC cylinder instructions page 25 |

[1] Available in ATH, RHO, SPA, TLR lever designs only.
[2] CR and Yale FSIC 7-pin available RHO only.

# Ordering instructions

## Example

| | | Outside | | Inside | | Door | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Function + cylinder | Lever | Finish | Lever | Finish | Latch | Strike | Thickness | Extension | Dimension |
| Mechanical | ND53PD | ATH | 626 | | | | | | | |
| Wired electrified | ND80EUL | RHO | 605 | SPA | 619 | 14-048 | 10-013 | 214 | EE | 118 |
| Wireless electronic | NDE80BD | SPA | 619 | | | | | | | |

## Detail

| | | | |
|---|---|---|---|
| Function | Mechanical: See pages 12-17<br>Wired electrified: See pages 18-19<br>Wireless electronic: NDE80; see pages 20-21 | | |
| Cylinder | Standard:<br>P (Patented Everest 29)<br>L (less cylinder)<br>C (less double cylinder)<br>Z (Everest SL) | Full size Interchangeable (FSIC):<br>R (FSIC, Patented Everest29)<br>J (FSIC, less core)<br>T (FSIC, Construction Core) | Small format Interchangeable:<br>GD (SFIC, Patented Everest 29)<br>BD (SFIC, less core)<br>BDC (SFIC, disposable core)<br>HD (SFIC, construction core) |
| | For non-Schlage cylinders please see page 24 | | |
| Outside lever | ATH (Athens), RHO (Rhodes), SPA (Sparta), TLR (Tubular), OME (Omega), LAT (Latitude), LON (Longitude), BRW (Broadway), BRK (Boardwalk)<br>Note: Specify tactile as: 8AT (Athens), 8RO (Rhodes), 8SP (Sparta), 8TR (Tubular), 8LT (Latitude), 8LN (Longitude), 8BY (Broadway), 8BK (Boardwalk) | | |
| Outside finish | 605 Bright brass (US3)<br>606 Satin brass (US4)<br>612 Satin bronze (US10)<br>613 Oil rubbed bronze (US10B)[1]<br>619 Satin nickel (US15)<br>622 Matte black (US19)<br>626 Satin chrome (US26D)<br>626AM Satin chrome anti-microbial<br>625 Bright chrome (US26)<br>643e Aged bronze (US11)<br><br>[1] Not available NDE wireless electronic | | |
| Inside lever | Specify only if different from outside lever. Same options as outside lever. | | |
| Inside finish | Specify only if different from outside finish. Same options as outside finish. | | |
| Latch | Specify only if different from standard latch; see page 24 for options. | | |
| Strike | Specify only if different from standard strike; see page 24 for options. | | |
| Door thickness | Specify only if outside standard door range (1 5/8"-2 1/8"). Extended door thickness not available NDE wireless electronic. | | |
| Extension | Specify only for doors 2 1/8" or greater.<br>Example: EE = Extended Equally, EI = Extended Inside, EO = Extended Outside, ED = Extended Differently | | |
| Dimension | Specify only for non-standard strike lip length. | | |
| Options | Specify any additional requirements or options. Example: KA = Keyed Alike, KD = Keyed Different, 0bit, etc. | | |

## Product specifications

| | | ND mechanical and ND wired electrified | NDE wireless electronic |
|---|---|---|---|
| Chassis | Material | Modular design of zinc and steel components plated for corrosion protection | |
| | Door thickness | Standard: 1 5/8" to 2 1/8"<br>Optional: 1 3/8" - 6" EE, EO, EI, ED configurations | Standard - 1 5/8" to 2" |
| Trim | Handing | Non-Handed | Default to Right Hand, configurable without tools |
| | Levers | Standard: Nine designs, pressure cast zinc, plated to match product finish specification<br>Optional: Tactile feature - Athens (ATH), Rhodes (RHO), Sparta (SPA), Tubular (TLR), LAT (Latitude), LON (Longitude), BRW (Broadway), BRK (Boardwalk) | |
| | Roses | Wrought brass, bronze, or zinc, plated to match product finish specification | Zinc, plated to match product finish specification |
| | Finishes | 10 available (605, 606, 612, 613, 619, 622, 625, 626, 626AM, 643e) | 9 available (605, 606, 612, 619, 622, 625, 626, 626AM, 643e) |
| Latches | Backset | Standard: 2 3/4"<br>Optional: 2 3/8", 3 3/4", 7 3/4" | Standard: 2 3/4"<br>Optional: 2 3/8" |
| | Faceplate | Standard : 1 1/8" x 2 1/4"<br>Optional: 1" x 2 1/4" for 2 3/8" backset doors | Standard: 1 1/8" x 2 1/4" |
| | Bolt | Standard : 1/2" throw via Oil Impregnated Stainless Steel<br>Optional : 3/4" throw anti-friction bolt available for pairs of doors | |
| | Strike | Standard: ANSI Curved Lip: 1 1/4" x 4 7/8" x 1 3/16"<br>Optional: T Strike, ANSI strikes with alternative lip lengths, dust box options | |
| Keying | Formats | Standard: 3 Schlage (KIL or FSIC or SFIC)<br>Optional: 10 Non-Schlage including cylinders from Best, Corbin Russwin, Medeco, Sargent and Yale | |
| | Access security | Standard : 6-Pin Patented Everest 29<br>Optional: Open, Restricted, Primus, master keying, construction keying | |
| Wired electrified | Input voltage | Autodetecting 12-24V DC, + 10% | — |
| | Operating mode | Fail Safe or Fail Secure via switch on chassis | — |
| | Current draw | 0.23 amps maximum; 0.01 amps holding | — |
| | Request to Exit | Modular - 3A @ 125VAC / 2A @ 30VDC | — |
| Wireless electronic | Input voltage | — | 4 AA batteries |
| | Operating mode | — | Selectable - secured, as-is, or passage |
| | Communication | — | 2.4 GHz Wi-Fi (IEEE 802.11b/g)<br>Bluetooth low energy (version 4.0) |
| | Request to Exit | — | Integrated into chassis |
| | Door position sensor | — | Integrated magnetometer with strike and magnet assembly. Includes magnetic tamper alert. |
| | Tamper sensor | — | Integrated interior cover tamper |
| Warranty | Mechanical | 10 years mechanical, 1 year wired electrified | 1 year wireless electronic |
| Certifications | ANSI/BHMA | All ND Series comply with A156.2 performance requirements for grade 1 cylindrical locks. Wired electrified complies with A156.25 (indoor), wireless electronic complies with A156.25 (indoor/outdoor) requirements for electrified locking devices | |
| | ICC | Complies with ICC A117.1 Accessible and Usable Buildings and Facilities | |
| | UL/cUL | All locks 3 hour A label single firedoor 4'0" x 10'0"; pair doors 3 hour firedoor 8'0" x 8'0" with 3/4" latch option; pair doors 90 minute fire 8'0" x 10'0" with 3/4" latch option | |
| | CA Fire Code | All levers with a return to door of 1/2" (64 mm) or less comply (Rhodes, Sparta, Tubular, Omega, Longitude and Boardwalk) | |
| | FL Building Code | Complies with Florida Building Code (ASTM E330, E1886, E1996) and Miami Dade (TAS 201, 202, 203) requirements for hurricanes | |
| | Federal | Meets FF-H-106C Series 161 | — |
| | Other | — | UL294, CSA C22.2 No. 205-M1983, FCC Part 15, IC RSS-210, RoHS |

## General specifications - applies to mechanical, wired electrified & NDE wireless electronic

1. Provide Schlage ND Series cylindrical locks conforming to the following standards and requirements:
   a. ANSI/BHMA A156.2 Series 4000, Grade 1
   b. UL10C for 4'0" x 10'0" 3-hour firedoor
   c. Florida Building Code (ASTM E330,E1886, E1996) and Miami Dade (TAS 201, 202, 203) requirements for hurricanes
2. Provide cylindrical locks **exceeding** the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security and durability in the categories below[1]:
   a. **Abusive locked lever torque** – minimum 3,100 inch-pounds without gaining access
   b. **Offset lever pull** – minimum 1,600 foot pounds without gaining access
   c. **Vertical lever impact** – minimum 100 impacts without gaining access
   d. **Cycle life** – minimum 16 million cycles
      1 With no visible lever sag
      2) Without the use of performance aids (i.e. – set screws, spacers, etc.)
3. Provide locksets with **solid cast levers** and **wrought roses** on both sides. **(ND mechanical, ND wired electrified)**
   a. Lever design: Rhodes, Athens, Sparta, Tubular, Omega, Latitude, Longitude, Broadway or Boardwalk
   b. Rose design: Rhodes (used with Rhodes, Athens, Sparta, Tubular, Latitude, Longitude, Broadway or Boardwalk levers) or Omega (used with Omega lever)
   c. **OPTION** (where required by Authority Having Jurisdiction)- Provide tactile warning on levers on exterior (secure side) of doors serving rooms or areas considered to be hazardous.
   d. **OPTION** - Provide break away Rhodes levers for an additional level of security
4. Provide locksets with **solid cast levers** and **cast escutcheons** on both sides **(NDE wireless electrified)**
   a. Lever design: Rhodes, Athens, Sparta, Latitude, Longitude, Broadway or Boardwalk
   b. **OPTION** (where required by Authority Having Jurisdiction)- Provide tactile warning on levers on exterior (secure side) of doors serving rooms or areas considered to be hazardous.
   c. OPTION - Provide break away Rhodes levers for an additional level of security
5. Provide locksets with **solid steel anti-rotation** through bolts and posts to control excessive lever rotation
6. Provide **independently operating levers** with two external return spring cassettes mounted under roses to prevent lever sag.
7. **OPTION/Standard NDE wireless electrified** – Provide Vandlgard/Free-Wheeling levers with vandal resistant technology for use at heavy traffic or abusive applications.
8. **OPTION** - Provide cylindrical locks with an inside indicator feature on a 626 finish for the Rhodes and Omega roses that provides clear direction for users to safely and quickly secure the room
   a. **ND75 and ND95 – Standard**
   b. **ND60 and ND93 – OPTION**
9. Provide locks with **standard latches** featuring a 2 3/4" (70 mm) backset and a 1/2" latch throw capable of UL listing of 3 hours on a 4.0 x 10.0 opening. Provide proper latch throw for UL listing at pairs.
10. Provide standard **ASA strikes** unless extended lip strikes are required to protect trim.
11. **OPTION ND mechanical** – Provide reconfigurable lockset chassis that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts

**Add for ND wired electrified**

12. Provide wired electrified options as scheduled in the hardware sets.
    a. 12 through 24V DC operating capability, autodetecting
    b. Selectable EL (Fail Safe)/EU (Fail Secure) operating mode via switch on chassis
    c. 0.230A (230mA) maximum current draw
    d. 0.010A (10mA) holding current
    e. Modular / "plug in" Request to Exit switch

**Add for NDE wireless electronic**

12. Provide lockset with additional standard compliance:
    a. Listed, UL 294 - standard of Safety for Access Control System Units
    b. Compliant with ANSI/BHMA A156.25 Grade 1 Operation and Security
    c. Certified to FCC Part 15
13. Provide credential reader module in the following configuration, as indicated in the door hardware sets. Multi-technology contactless reader shall be NFC-Compatible, including NFC Peer to Peer compatibility, and read access control data from both 125 kHz and 13.56MHz contactless smart cards.
14. Provide lockset with the following switches/monitors standard:
    a. Door Position Sensor (DPS)
    b. Interior cover tamper guard
    c. Request to Exit (RX) switch
15. Provide locksets with the following features
    a. Ability to communicate unit's communication status
    b. Visual tri-colored LED indicator that indicates activation, oerational systems status, system error conditions and low power conditions
    c. Audible feedback that can be enabled or disabled
    d. Tamper resistant torx screw on inside escutcheon
16. Provide lockset with open architecture characteristcs capable of handling new and existing access control software and credential reading technology
17. Provide lockset powered by four AA batteries
    a. Provide locksets able to communicate battery status and battery voltage level by means of application on mobile device at the door or remotely via integrated software

1 Beyond grade 1 performance for ND locks with Schlage cylinders only (standard, FSIC and SFIC). Performance with non-Schlage cylinders will exceed BHMA Grade 1 requirements but may be less than the performance of products with Schlage cylinders.

## About Allegion

Allegion (NYSE: ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN®, Schlage®, SimonsVoss® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a $2 billion company, with products sold in almost 130 countries.

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Appendix C

# Product Cutsheets

OWENS CORNING®

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# Sound Attenuation Batt Insulation

## Product Data Sheet

### Description

Sound Attenuation Batts (SAB's) are unfaced, lightweight, flexible fiberglass insulation batts, designed to deliver noise control in metal stud wall cavities of interior partitions. Manufactured to fit metal framing, they come in 2½", 3½" and 5½" thicknesses, with lengths up to 9'.

### Product Attributes

#### Excellent Acoustical Performance

Sound Attenuation Batts provide excellent acoustical performance for metal framed interior partitions. Depending on the construction method and components used, SAB's can improve STC (Sound Transmission Class) ratings by 4-10 points over an empty cavity.

#### Easy to Install and Fabricate

Sound Attenuation Batts are ⅛" wider than stud spacing for easy friction-fit installation. No adhesives or fasteners are required. Supplementary support should be provided when the SAB's do not fill the cavity or if one side of the cavity is left open and the partition is 8' or higher. SAB's are easily cut to fit around wires, outlets, junction boxes, pipes and other obstructions. Friction fit installation and easy fabrication, improves installation speed and workmanship. Acoustic performance of a wall assembly can be affected by workmanship and attention to detail while constructing a wall. Data on acoustic performance of specific wall assemblies is available on page 2.

#### Acoustic Comparison of Cavity Insulation Types

| Gypsum Board | Insulation Type | Test Number | STC |
|---|---|---|---|
| One layer each side. | | | |
| ⅝" | None | TL-92-618 | 38 |
| ⅝" | Glass fiber | TL-93-325 | 49 |
| ⅝" | Mineral fiber | TL-93-327 | 47 |
| ⅝" | Cellulose (spray) | TL-93-049 | 45 |
| One layer one side, two layers the other side | | | |
| ⅝" | Glass fiber | TL-92-420 | 52 |
| ⅝" | Mineral fiber | TL-93-329 | 53 |
| ⅝" | Cellulose (spray) | TL-93-050 | 49 |
| ⅝" | Cellulose (blown) | TL-92-437 | 49 |

3⅝" 25 Gauge Non Load Bearing Studs at 16" on center NRC-CNRC Internal Report IRC-IR-693, October 1995

#### Available Sizes

| Thickness | Width | Length |
|---|---|---|
| 2½" | 16"/24" (406mm/609mm) | 96" |
| 2½" | 16" (406mm) | 108" |
| 3½" | 16"/24" (406mm/609mm) | 96" |
| 3½" | 16" (406mm) | 108" |
| 5½" | 16" (406mm) | 93" |

#### Reality of Sound Transmission Class (STC).

STC is a method of rating airborne sound transmission performance of a wall or floor assembly. It is intended as a quick screening tool to compare different wall or floor assemblies. STC ratings are determined in a laboratory under controlled conditions. Even then, differences of 1-2 points STC can occur for the same assembly in the same laboratory. In the field, flanking noise, quality of material and construction practices can lead to widely varied STC's for the same assembly. Typically a two (2) or more point change in STC is necessary to notice an audible difference.

#### Product Comparison

Independent ASTM E90-1990 testing was used to determine Sound Transmission Class in accordance with ASTM E413 for several types of building insulation. All the testing was done at the same lab, using the same individually tested components, to give the most reproducible results. The results show that insulating the cavity is critical to acoustic performance. It also shows that the type of insulation does not significantly affect the performance of the assembly.

#### Design Considerations

Acoustical performance of metal stud interior partitions can be substantially affected by a number of important design and construction details. Important details include:

1. Seal the bottom plate and any wall penetrations with non-hardening permanently resilient sealant.

2. Location and attachment of outlets, ducts and mechanical equipment. Plumbing should be designed to allow for expansion and contraction. Pipes should also be isolated from structure using resilient mounts.

3. Use solid core wood or metal doors for best noise control. Depending on HVAC requirements, weather-stripping may be used around the door to reduce sound transmission.

### Fire Safety

Sound Attenuation Batts are considered non-combustible and have are classified 10/10 when tested in accordance with ASTM E84. When installed in approved wall systems, SAB's can achieve up to a 2 hour rating when tested according to ASTM E119.

### Special

Due to the potential for skin irritation Sound Attenuation Batts should not be used in open cavities that will be subject to human contact. If specifying for an open cavity, remember to use supplemental support for heights over 8'.

Product should be kept dry during shipping, storage and installation.

## Applicable Standards

Sound Attenuation Batt Insulation complies with ASTM C665 Type I, ASTM E 136 and the MEA 332-83-m requirements of New York City. Federal Specification HH-I-521F has been canceled and is replaced by ASTM C665.

## Surface Burning Characteristics/Building Code Construction Classification[1]

| Products | Flame Spread | Smoke Developed | ICBO | BOCA | SBCCI | ICC |
|---|---|---|---|---|---|---|
| Unfaced | 10 | 10 | All Types | All Types | All Types | All Types |

[1]Sound Attenuation Batt Insulation complies with ICBO (Uniform Building Code), BOCA (National Building Code) and SBCCI (Standard Building Code) and ICC (International Building Code) model code requirements for building costruction types listed above. Products are tested in accordance with Surface Burning Characteristics ASTM E 84.

| Water Absorption | |
|---|---|
| Maximum by Volume | Less than 0.05% |

| Dimensional Stability | |
|---|---|
| Linear Shrinkage | Less than 0.1% |

## Acoustic and Fire Ratings for Typical Steel Stud Partitions

| STC | Test No. | Construction Description | Fire Test | Fire Rating |
|---|---|---|---|---|
| **Double Layer Wall System** | | | | |
| 56 | W02184 | ½" Type "X" gypsum; 3⅝" SS, 3½" thick, Sound Attenuation Batt Insulation | WP 1521† | 2 Hr. |
| 54 | W03084 | ½" Type "X" gypsum; 2½" SS, 2 ½" thick, Sound Attenuation Batt Insulation | WP 1546 | 2 Hr. |
| **Unbalanced Wall System (2 layer/1 layer gypsum)** | | | | |
| 55 | W02484 | Unbalanced ⅝" Type "X" gypsum; 3⅝" SS, 3½" thick, Sound Attenuation Batt Insulation | WP 1052 | 1 Hr. |
| 52 | W02884 | Unbalanced ⅝" Type "X" gypsum; 2½" SS, 2½" thick, Sound Attenuation Batt Insulation | UL U494 | 1 Hr.* |
| **Unbalanced with Resilient Channel Wall System** | | | | |
| 58 | RAL-TL90-345 | ⅝" Type "X" gypsum single layer, resilient channel, one side; double layer other side; 3⅝" SS, 3½" thick, Sound Attenuation Batt Insulation | UL U465 | 1 Hr.* |
| **Single Layer Wall System** | | | | |
| 51 | RAL-TL89-288 | Single Layer ⅝" Type "X" gypsum; 6" SS, 5½" thick, Sound Attenuation Batt Insulation | | 1 Hr. |
| 50 | RAL-TL89-157 | Single Layer ⅝" Type "X" gypsum; 3⅝" SS, 3½" thick, Sound Attenuation Batt Insulation | UL U465 | 1 Hr. |
| 47 | W05182 | Single Layer ⅝" Type "X" gypsum; 2½" SS, 2½" thick, Sound Attenuation Batt Insulation | UL U494 | 1 Hr. |
| **Single Layer with Resilient Channel Wall System** | | | | |
| 54 | RAL-TL90-344 | Single layer, resilient channel, one side only; ⅝" Type "X" gypsum; 3⅝" SS, 3½" thick, Sound Attenuation Batt Insulation | UL U465 | 1 Hr.* |

†Listed in the Gypsum Association "Fire Resistance Design Manual"
Key: SS = Steel Stud

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ICC EVALUATION SERVICE

# ICC-ES Evaluation Report

**ESR-1308**

*Reissued December 2019*
*Revised March 2020*
*This report is subject to renewal December 2020.*

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**DIVISION: 09 00 00—FINISHES**
**Section: 09 22 26—Suspension Systems**
**Section: 09 53 00—Acoustical Ceiling Suspension Assemblies**

**REPORT HOLDER:**

**WORTHINGTON ARMSTRONG VENTURE (WAVE)**

**EVALUATION SUBJECT:**

**FIRE- AND NONFIRE-RESISTANCE-RATED SUSPENDED CEILING FRAMING SYSTEMS**

**ADDITIONAL LISTEE:**

**ARMSTRONG WORLD INDUSTRIES, INC.**

## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2018, 2015, 2012, and 2009 *International Building Code®* (IBC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see ESR-1308 LABC Supplement.

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see ESR-1308 CBC Supplement.

**Properties evaluated:**

- Interior finish
- Fire resistance
- Structural

## 2.0 USES

The Worthington Armstrong Venture (WAVE) ceiling framing systems described in this report are suspended, exposed framing systems of ceiling assemblies used in fire-resistance-rated and nonfire-resistance-rated construction for interior applications.

## 3.0 DESCRIPTION

### 3.1 Grid Components:

**3.1.1 Main Runners, Nonfire-resistance-rated:** Main runners for use in nonfire-resistance-rated ceiling assemblies include the 6100, AL7200, SS7200, 7300, 7302, 7305, 7500, 7502, 6500B, EA7900, 7600, and 76008 7602, 76028, 7603, 76038, 76068, 7607, series. All members are classified as intermediate-duty in accordance with ASTM C635, except the following, which are classified as heavy-duty: 6501, ES7901, EA7903, 6101, 6121A, 6127A, 6132, 6195A, 7301, 7306, 7307, 7501, 7504, 7507, 7508, 7509, 7601, 7604, 7605, 7612, 76128, 76018, 76048 and 76058. Profiles of runners are shown in Figure 1.

The 7300 and 7500 runners are cold-formed from ASTM A568 steel. The runners have a hot-dipped galvanized coating and a factory-installed polyester-painted steel cap or aluminum cap along the entire length of the bottom flange. The 6100, 6101, 6500B, 6501, ES7901,7600, and 7601 series have a painted coating in addition to the hot-dipped galvanized coating, and have no cap. The AL 7200, EA7900 and EA7903 runners are cold-formed from 3003-H14 aluminum and have a baked polyester paint coating. The 6500B, 6501 and ES7901, EA7900 and EA7903 runners have a polyurethane-filled upper bulb in addition to a polyurethane-coated lower flange.

The ES7901C runners are cold-formed from ASTM A568 steel; have a painted coating in addition to the hot-dipped galvanized coating; a factory-installed polyester-painted steel cap ; and include an integral extruded PVC gasket. The ES7901C main runners are classified as heavy-duty in accordance with ASTM C635 and shall be used in conjunction with ES7920C and ES7940C cross runners listed in Table 3 of this report.

The EA7900C runners are cold-formed from 3105-H24 aluminum and have a baked polyester paint coating and include an integral extruded PVC gasket. The EA7900C main runners are classified as intermediate-duty in accordance with ASTM C635 and shall be used in conjunction with EA7920C and EA7940C cross runners listed in Table 3 of this report.

The SS 7200 runners are cold-formed from 300 series stainless steel complying with ASTM A480. Table 2 specifies dimensions, lengths, and allowable transverse loads.

**3.1.2 EAC Main Runners, Low Voltage, Nonfire-resistance-rated:** Main runners for use with low voltage powered lighting systems include the following: EAC Prelude Main Runners: DC730112, DC730110, DC730108, and DC730106; non-powered 730106; EAC Suprafine Main Runners: DC750112, DC750110, DC750108, and DC750106; the non-powered 750106; EAC Silhouette Main Runners: DC760112, DC760110, DC760108, and DC760106; and the non-powered 760106. The EAC Prelude, EAC Silhouette, and EAC Suprafine are classified

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as heavy-duty in accordance with ASTM C635. See Table 2 for the listed runners, and Figure 1 for a profile of these runners.

The EAC main runners are cold-formed from ASTM A568 steel. The runners have a hot-dipped galvanized coating and a factory-installed, polyester-painted steel cap along the entire length of the bottom flange. The EAC Silhouette series has a painted coating in addition to the hot-dipped galvanized coating and have no cap on the bottom flange.

The EAC Prelude, EAC Silhouette, and EAC Suprafine main runners have a snap-on upper polymerprofile that supports two tin-plated copper conducted strips that serve to carry the low voltage current. The EAC Silhouette main runners also have a lower conductive snap-on polymer conductive strip in the lower box profile in addition to the upper conductive snap-on polymer profile. The snap-on polymer has a flame-spread index of 25 or less and a smoke-developed index of 50 or less, when tested in accordance with ASTM E84.

The EAC main runners are used in conjunction with the XL 7300 (Prelude), XL 7500 (Suprafine) and XL 7600 (Silhouette) cross runners listed in Table 3 of this report.

**3.1.3 Main Runners, Gravity Loaded, and Nonfire-resistance-rated:** Main runners for use to support gravity loads only in non-fire-resistance-rated ceiling assemblies include 730145 series. The suspended ceiling framing system must be installed in accordance with the IBC Section 808 for ceiling systems up to 4 psf (19.5 kg/m$^2$) of uniform gravity load. The 730145 main runners are cold-formed from ASTM A568 steel. The runners have a hot-dipped galvanized coating and a factory-installed, polyester-painted steel cap along the entire length of the bottom flange. The 730145 main runners are used in conjunction with XL7325 and XL 7345 cross runners listed in Table 3 of this report. Profiles of the runners are shown in Figure 1.

**3.1.4 Cross Runners, Nonfire-resistance-rated:** Cross runners for use in nonfire-resistance-rated ceiling assemblies are the XL6100 series (Interlude), XL6500 series (Sonata), XL7100 series (Prelude), XLAL7200 series (Aluminum Prelude), XLSS7200 series (Stainless Prelude), XL7300 series (Prelude), XL7500 series (Suprafine), XL7600 series (Silhouette), XL76008 series (Silhouette), EA7900 series (Aluminum $^{15}/_{16}$ inch Clean Room), EA7903 series (Aluminum $1^{1}/_{2}$ inch Clean Room), and ES7900 series (Steel $^{15}/_{16}$ inch Clean Room).

The XL 6100 series, XL6500 series, XL7100 series, XL 7300 series, XL7500 series, XL7600 series and XL76008 series ES7900 series cross runners are cold-formed from ASTM A568 steel. The cross runners have a hot-dipped galvanized coating and a factory-installed polyester-painted steel cap or aluminum cap along the entire length of the bottom flange. The XL 6100 XL6500, ES7900 and XL 7600and XL 76008 series have a baked polyester painted coating in addition to the hot-dipped galvanized coating, and have no capping on the lower flange. The XLAL 7200, EA7900 and EA7903 series runners are cold-formed from 3003-H14 aluminum and have a baked polyester painted coating. The XL6500 series, ES7900 series, EA7900 series and EA7903 series runners have a polyurethane-filled upper bulb in addition to a polyurethane-coated lower flange. The XLSS 7200 runners are cold-formed from 300 series stainless steel complying with ASTM A480. Table 3 specifies dimensions, lengths, and allowable transverse loads.

**3.1.5 Main Runners, Fire-resistance-rated:** Main runners for use in fire-resistance-rated ceiling assemblies are the HD 8201, 8300, 8301, 8500 and 8501 runners listed in Table 2. The 8300 and 8500 runners are classified structurally as intermediate-duty in accordance with ASTM C635; Models 8301, 8501, and HD 8201 main runners are classified as heavy-duty. Profiles of runners are shown in Figure 1.

All members have an inverted T-shape. Members are cold-formed from ASTM A568 steel with a hot-dipped galvanized coating.

Models 8300, HD 8201 and 8301 have a factory-installed steel cap along the entire length of the bottom flange. The HD 8201 member has a hot-dipped galvanized coating and a bottom flange cap made from either 3003-H16 or 3105-H16 aluminum. Table 2 specifies dimensions, lengths and allowable transverse loads.

**3.1.6 Cross Runners, Fire-resistance-rated:** Cross runners for use in fire-resistance-rated ceiling assemblies are the XL 8200 series (Prelude Plus Fire Guard), XL 8300 series (Prelude Fire Guard), and XL 8500 (Prelude Suprafine Fire Guard) series runners listed in Table 3. Profiles of runners are shown in Figure 1. Members are cold-formed from ASTM A568 steel with a hot-dipped galvanized coating. The XL 8300 and XL 8500 series have a factory-installed steel cap along the entire length of the bottom flange. The XL 8200 series members have a hot-dipped galvanized coating and a bottom flange cap made from either 3003-H16 or 3105-H-16 aluminum. Table 3 specifies dimensions, lengths and allowable transverse loads.

**3.1.7 Cross Runners, Gravity Loaded, and Nonfire-resistance-rated:** Cross runners for use to support gravity loads only and in non-fire-resistance rated ceiling assemblies are the XL 7325 and XL 7345 series runners listed in Table 3. The suspended ceiling framing system must be installed in accordance with the 2015, 2012, and 2009 IBC Section 808 for ceiling systems up to 4 psf (19.5 kg/m$^2$) of uniform gravity load. Profiles of the runners are shown in Figure 1. Members are cold-formed from ASTM A568 steel with a hot-dipped galvanized coating and a factory-installed, polyester-painted steel cap along the entire length of the bottom flange. Table 3 specifies dimensions, lengths, and allowable transverse loads.

**3.1.8 Materials:** Steel runners are cold formed from ASTM A653 CS Type B steel and have a hot-dipped galvanized minimum protective zinc coating of G30, G60, or G90. The steel runners have a carbon steel composition that conforms to ASTM A568 and a zinc protective coating that conforms to ASTM A653. Aluminum runners are cold-formed from 3003-H14 and 3105-H24 aluminum, and the stainless steel runners are cold formed from 300 series stainless steel.

**3.2 Hanger Wire:**

Hanger wire for suspended ceilings, framing members, and any fixtures must comply with Section 13.5.6 of ASCE 7 and IBC Section 2506.2.1.

**3.3 BERC Clip:**

The BERC (Beam End Retaining Clip) System is illustrated in Figure 3. The BERC clip is used to connect main and cross runners to wall molding at the ceiling perimeter. The clip is similar to the BERC-2 clip, described below, except the horizontal leg of the BERC clip is shorter than that of the BERC-2.

**3.4 BERC-2 and AL BERC-2 Clips:**

The BERC-2 and AL BERC-2 clips are illustrated in Figure 2. The clips are used to connect main and cross runners to wall molding at the ceiling perimeter. The BERC-2 clip is manufactured from 0.034-inch-thick (0.864 mm), hot-dipped galvanized, cold-rolled steel complying with ASTM A568. The AL BERC-2 clip is fabricated from 0.034-inch-thick (0.864 mm) 3003-H16 or 3105 H16 Aluminum.

### 3.5 STAC Clip:

The Single Tee Adapter Clip (STAC) is illustrated in Figure 4. The STAC clip is used to connect cross runners to main runners in off-module and staggered grid installations. The cross runners must have a minimum steel substrate thickness of 0.015-inch. The connection capacity between main runner and cross runner exceed 180 lbf (81.5 kg). The STAC clip is manufacturered from 0.046-inch thick (1.17 mm), hot-dipped galvanized, cold-rolled steel compling with ASTM A568.

### 3.6 Accessories:

Each framing system has accessory items that include support angles and corner caps. Steel for accessory items is manufactured from hot-dipped galvanized, cold-rolled steel complying with ASTM A568 and ASTM A653.

#### 3.6.1 TechZone Yoke (TZYK):

The TechZone Yoke (TZYK) is illustrated in Figure 5. The TZYK is used in ceiling framing systems with continuous lighting and diffuser configurations; each yoke assembly requires 2 single yokes and when assembled create either 4-inch (101.6 mm), 6-inch (152.4 mm), or 8-inch (203.2 mm) widths. The TZYK is manufactured from 0.050-inch thick (1.27 mm) hot-dipped galvanized, extruded steel complying with ASTM A653.

## 4.0 DESIGN AND INSTALLATION

### 4.1 General:

The suspended ceiling framing system must be installed in accordance with this report and the manufacturer's published installation instructions. The suspended ceiling framing system must be installed in accordance with IBC Sections 808, 1613 and 2506.2.1 for ceiling systems up to 4 psf (19.5 kg/m$^2$).

### 4.2 Main Runners:

Main runners must be installed and leveled to within $^1/_4$ inch in 10 feet (6.4 mm in 3048 mm), with the supporting wire taut. Vertical support hanger wire must be installed within 3 inches (51 mm) of the main runner fire expansion relief. The design loads for main runners must be less than or equal to the capacities allowed in Table 2 of this report. Supports for the main runners that consist of vertical hangers, perimeter hangers, and lateral force bracing must be installed in accordance with the applicable code.

### 4.3 Cross Runners:

Main runners, or other cross runners, must support cross runners to within $^1/_{32}$ inch (0.80 mm) of the required center-to-center spacing. This tolerance must be noncumulative beyond 12 feet (3658 mm). Intersecting runners must be installed to form a right angle to the supporting members.

The maximum design load capacities for cross runners must be less than or equal to the capacities allowed in Table 3 of this report.

### 4.4 Seismic Design:

**4.4.1 Seismic Design Requirements:** Seismic design and installation details of the ceiling systems, excluding 730145 main runner, and XL7325 and XL7345 cross runners, must be in accordance with Section 13.5.6 of ASCE 7-16 for the 2018 IBC [ASCE 7-10 for the 2015 and 2012 IBC and ASCE 7-05 for the 2009 IBC]; as referenced in IBC Section 1613, except as noted in Section 4.4.2 of this report. Systems classified as intermediate-duty are limited to use in Seismic Design Categories A, B and C.

**4.4.2 Ceiling Framing Systems with BERC, BERC-2,and AL BERC-2 Clips:**

**4.4.2.1 Alternate Installation with BERC-2 and AL BERC-2 Clips,, for Seismic Design Categories D, E and F:** Under this installation, the main runner must be rated heavy-duty and have a minimum simple span allowable uniform load of 16.35 pounds per lineal foot (238 N/m); with a maximum ceiling weight permitted for systems with BERC-2 clips at 4 pounds per square foot (19.5 kg/m$^2$); with a maximum celling weight permitted for systems with AL BERC-2 clip at 2 pounds per square foot (9.75 kg/m$^2$). With this installation under Section 4.4.2.1, the main and cross runners must be as described in Table 2 and 3 of this report. The BERC-2 and AL BERC-2 clips are used to secure the main runners and cross runners to the wall molding, as detailed below and shown in Figure 2. A nominally $^7/_8$-inch (22 mm) wall molding is used in lieu of the 2-inch (51 mm) perimeter supporting closure angle required by Section 5.2.2 of ASTM E580 and Section 13.5.6.2.2 of ASCE 7-16 for the 2018 IBC [ASCE 7-10 for the 2015 and 2012 IBC and Section 13.5.6.2.2 (b) of ASCE 7-05 for the 2009 IBC] for Seismic Design Categories D, E and F. The ceiling system must be as prescribed by the applicable code except for the use of the BERC-2 and AL BERC-2 clips and the $^7/_8$-inch (22 mm) wall molding and elimination of spreader bars.

The BERC-2 and AL BERC-2 clips are attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding (see Figure 2). The AL BERC-2 clip requires an additional No. 7 by $^7/_{16}$-inch long (minimum) self-piercing sheet metal screw connecting the AL BERC-2 clip to the wall molding as shown in Figure 2. BERC-2 and AL BERC-2 clips installed on the two adjacent walls where the runners must be fixed (attached wall), are attached to the runner by a No. 7 by $^7/_{16}$-inch long (minimum) self-piercing sheet metal screw through the fixed hole in the clip and the top flange bulb of the runner. BERC-2 and AL BERC-2 clips installed on opposite walls where the runners must not be fixed to the clips (unattached walls), the clips must not be mechanically connected to the runner by any fastener and must allow the terminal runner end to move $^3/_4$ inch (19.1 mm) towards and away from the wall, and installation of a No. 7 by $^7/_{16}$-inch long (minimum) self-piercing sheet metal screw through the horizontal slotted hole is optional, as shown in Figure 2. Under the 2018 IBC, as required by Section 13.5.6.2.2 of ASCE 7-16, either BERC-2 or AL BERC-2 clips must be screwed to the wall molding with a total of two (2) screws, and the wall molding must be positively attached to the wall studs or other supporting structure.

BERC-2 and AL BERC-2 clips installed in this manner are an acceptable means of preventing runners from spreading in lieu of spacer bars (stabilizer bars) required in Section 5 of ASTM E580 for the 2018, 2015 and 2012 IBC (CISCA 3-4 for the 2009 IBC). ASTM E580 is referenced in ASCE 7, which is referenced in the 2018, 2015 and 2012 IBC Section 1613 (CISCA 3-4 is referenced in ASCE 7-05, Section 13.5.6.2.2, which is referenced in 2009 IBC Section 1613). The assemblies described in in this Section 4.4.2.1 are equivalent to that required by CISCA 3-4 and Section 5 of ASTM E580. See Figure 2.

A single $^1/_8$-inch-diameter (3.175 mm) steel pop rivet complying with Industrial Fastener Institue Standard IFI-114 may be used in lieu of BERC-2 and AL BERC-2 perimeter clips to secure the main runners and cross runners to the wall molding on two adjacent walls (attached walls). The center of the rivet must be 0.25 inch (6.35 mm) from the edge of the wall angle. See Figure 2.

**4.4.2.2 Alternate Installation with BERC-2 and TechZone Yoke (TZYK) for Seismic Design Categories D, E and F:** Under this installation, the 7501 main runner

must be used, with a maximum ceiling weight permitted for systems with BERC-2 clips at 3.35 pounds per square foot (16.4 kg/m$^2$), The BERC-2 clips are used to secure the main runners and cross runners to the wall molding, as detailed below and shown in Figure 2. A nominally $^7/_8$-inch (22 mm) wall molding is used in lieu of the 2-inch (51 mm) perimeter supporting closure angle required by Section 5.2.2 of ASTM E580 and Section 13.5.6.2.2 of ASCE 7-16 for the 2018 IBC [ASCE 7-10 for the 2015 and 2012 IBC and Section 13.5.6.2.2 (b) of ASCE 7-05 for the 2009 IBC] for Seismic Design Categories D, E and F. The ceiling system must be as prescribed by the applicable code except for the use of the BERC-2 clips and the $^7/_8$-inch (22 mm) wall molding and elimination of spreader bars.

The BERC-2 clips are attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding (see Figure 2). BERC-2 clips installed on the two adjacent walls where the runners must be fixed (attached wall), are attached to the runner by a No. 7 by $^7/_{16}$-inch long (minimum) self-piercing sheet metal screw through the fixed hole in the clip and the bulb of the runner. BERC-2 clips installed on opposite walls where the runners must not be fixed to the clips (unattached walls), the clips must not be mechanically fastened to the runner and must allow the terminal runner end to move $^3/_4$ inch (19.1 mm) towards and away from the wall. Installation of a No. 7 by $^7/_{16}$-inch long (minimum) self-piercing sheet metal screw through the horizontal slotted hole is optional, as shown in Figure 2. Under the 2018 IBC, as required by Section 13.5.6.2.2 of ASCE 7-16, BERC-2 clips must be screwed to the wall molding with a total of two (2) screws, and the wall molding must be positively attached to the wall studs or other supporting structure.

Each TZTK yoke assembly must be suspended from structure with a vertical 12 gauge steel wire through the center hole of the top of the yoke assembly. Alternativey, the yoke assembly can be suspended from two hanger wires secured through the holes at the corners of the yoke assembly. The yoke assembly must be attached to the main runners and to the cross tees using a single 1/8-inch-diameter (3.175 mm) steel pop rivet complying with Industrial Fastener Institute Standard IFI-114 at 24 inches (609.6 mm) from the perpendicular end of the main runner and spaced at every 48 inches (1219.2 mm) on center. All lighting fixtures must be installed in accordance with Section 5.3 of ASTM E580.

In lieu of splay wire bracing in accordance with Section 5.2.8 of ASTM E580, rigid bracing members composed of 2½-inch (63.5 mm) wide by 25 gage steel studs must be attached to the web of the main runner using self-tapping screws. The two rigid bracing members splayed 90 degres from each other at an angle of 45 degrees from the plan of the ceiling. The location and spacing of the rigid bracing members must comply with Section 5.2.8 of ASTM E580. In addition to the rigid bracing members, a compression post composed of a 2 ½-inch (63.5 mm) wide 25 gage steel stud connected to the main runner. The length of the bracing members must be designed by a registered design professional.

**4.4.2.3 Alternate Installation with BERC, BERC-2and AL BERC-2 Clips, for Seismic Design Category C:** Terminal ends of the runners are secured by attaching either the BERC, BERC-2 or AL BERC-2 clip to the wall molding and attaching the runners to the clip. The runners have zero clearance at the perimeter on two adjacent walls (attached walls) and $^3/_8$-inch (9.5 mm) clearance on the opposite walls (unattached walls), as detailed in this section and shown in Figure 3. The clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding; the AL BERC-2 clip also requires an additional No. 7 by $^7/_{16}$-inch long (minimum) self-piercing sheet metal screw through the clip and into the wall molding. When the runners must be fixed (attached walls) at two adjacent walls, attach a No.7 by $^7/_{16}$-inch long self-piercing screw through the fixed hole of a BERC-2 or AL BERC-2 clip and the top flange bulb of the runner, or through the fixed hole of a BERC clip and into the web of the runner. BERC-2, AL BERC-2, or BERC clips installed on opposite walls where the runners must not be fixed to the clips (unattached walls), the clips must not be mechanically connected to the runner by any fastener and must allow the terminal runner end to move $^3/_8$-inch (9.5 mm) towards and away from the wall, and installation of a No. 7 by $^7/_{16}$-inch long (minimum) self-piercing sheet metal screw through the horizontal slotted hole is optional, as shown in Figure 2.

BERC or BERC-2 or AL BERC-2 clips installed in this manner are an acceptable means of preventing runners from spreading, in lieu of spacer bars (stabilizer bars) required in Section 4 of ASTM E580, which is referenced in Section 13.5.6.2.1 of ASCE 7-16 under the 2018 IBC Section 1613 [ASCE 7-10 under the 2015 and 2012 IBC Section 1613; and Section 13.5.6.2.1 and CISCA 0-2 as referenced in ASCE 7-05 under the 2009 IBC Section 1613]. Except for the use of the BERC or BERC-2 or AL BERC-2 clip as noted above, installation of the ceiling system must be as prescribed by the applicable code. The maximum ceiling weight permitted is 2.5 pounds per square foot (12.2 kg/m$^2$) for ceiling systems using BERC or BERC-2 clips and 2 psf (9.75 kg/m$^2$) for ceiling systems using the AL BERC-2 clip. With this installation, the main and cross runners must be as described in Tables 2 and 3 of this report, except for CleanRoom AL series (EA7900C, EA7920C, and EA7940C) and CleanRoom Steel series (ES7901C, ES7920C and ES7940C).

The assemblies described in this Section 4.4.2.3 are equivalent to that required by Section 4 of ASTM E580, which is referenced in Section 13.5.6.2.1 of ASCE 7-16 under 2018 IBC Section 1613 [ASCE 7-10 under the 2015 and 2012 IBC Section 1613; and Section 13.5.6.2.1 and CISCA 0-2, as referenced in ASCE 7-05 under the 2009 IBC Section 1613] A single $^1/_8$-inch-diameter (3.175 mm) steel pop rivet complying with Industrial Fastener Institue Standard IFI-114 may be used in lieu of BERC-2, AL BERC-2, and BERC perimeter clips to secure the main runners and cross runners to the wall molding on two adjacent walls (attached walls). The center of the rivet must be 0.25 inch (6.35 mm) from the edge of the wall angle. See Figures 2 and 3.

**4.5 Lighting Fixtures:**

Lighting fixtures must be installed in accordance with Section 13.5.6 of ASCE 7-16 and ASCE 7-10. Lighting fixtures may also be attached to the grid with clips complying with the ICC-ES Acceptance Criteria for Attachment Devices for Recessed Lighting Fixtures (Luminaires) in Suspended Ceiling Systems (AC184). The lighting fixtures may also be attached to the framing members with sheet metal screws having a minimum allowable shear strength of 314 lbf (1395 N) and minimum allowable tension strength of 137 lbf (609.6 N) for a No. 20/20 gage metal-to-metal connection.

**4.6 Partitions:**

Partitions must be laterally supported as required by Section 13.5.8 of ASCE 7, as referenced by the applicable IBC Section 1613.

**4.7 Two-hour Fire-resistance-rated Floor-ceiling Assembly:**

The floor-ceiling assembly described in Section 4.7 has a two-hour fire-resistance rating (refer to Figure 7 for details):

**4.7.1 Structural Beams:** The structural floor beams supporting the floor-ceiling assembly are minimum W8×15, or an equivalent-sized steel beam having a minimum weight-to-heated-perimeter ratio, W/D, of 0.54.

In accordance with Section 704.3 of the 2015, 2012, and 2009 IBC, structural steel floor beams need not be individually fire-protected when the suspended ceiling forms the protective membrane for the fire-resistance-rated assembly. However, structural floor beams must be individually protected on all sides for the full length with materials having the required fire-resistance rating, when they support directly applied loads from a floor and roof or more than one floor, or where the required fire-resistance rating of such members is greater than two hours.

**4.7.2 Floor Joists:** Floor joists are minimum 10K1 steel bar joists, spaced a maximum of 24 inches (610 mm) on center. Each joist must be welded to end supports, and must have $^1/_2$-inch-diameter (12.7 mm) steel bar bridging members welded to top and bottom chords of each joist at midspan.

**4.7.3 Steel-floor Decking:** The concrete deck is either supported by minimum No. 22 gage [0.0299 inch (0.759 mm)] galvanized steel deck panels with $1^{19}/_{32}$-inch-deep (32.5 mm) flutes spaced 6 inches (152 mm) on center, or is supported by minimum No. 20 gage [0.0359 inch (0.91 mm)] galvanized steel cellular panels having 3-inch-deep (76 mm) flutes.

When a blend of fluted and cellular steel deck panels is used, the concrete topping thickness is measured from the top plane of the cellular deck panels. The steel deck panels must be welded to supports at 12 inches (305 mm) on center. Adjacent deck panels must be button-punched or welded together at 36 inches (914 mm) on center at side joints.

Where fluted and cellular floor deck panels are installed end-to-end, galvanized steel angles must be tack-welded to the cellular floor deck panels in such a manner as to cover the cells.

**4.7.4 Concrete Floor:** The concrete floor must be a minimum of $2^1/_2$ inches (63.5 mm) thick, measured from the top of the metal deck panels, and normal-weight concrete with carbonate or siliceous aggregates. The concrete must have a minimum density of 150 ± 3 pcf (2400 ± 48 kg/m$^3$), and a minimum compressive strength of 3,000 psi (20.7 MPa). The middle of the slab must be reinforced with 6×6–W1.4×W1.4 welded wire fabric.

**4.7.5 Suspended Ceiling Members:**

**4.7.5.1 Main Runners:** Main runners are either the 8300, 8301 or HD 8201. The main runners are 12 feet (3657.6 mm) long and spaced a maximum of 4 feet (1219.2 mm) on center. The design loads for main runners must be less than or equal to the capacities shown in Table 2. Vertical hangers, perimeter hangers, and lateral-force bracing for the main runners are installed in accordance with the code. The distance from the bottom side of the floor decking to the bottom side of the main runners is a minimum of $19^3/_4$ inches (502 mm).

**4.7.5.2 Cross Runners:** Cross runners are either the XL 8200 series (Prelude Plus Fire Guard) or XL 8300 series (Prelude Fire Guard). Main runners must be located within $^1/_{32}$ inch (0.79 mm) of the required center distances, and this tolerance must be noncumulative beyond 12 feet (3657.6 mm). Intersecting runners must be installed to form a right angle to the supporting members. The design loads for cross runners must be less than or equal to the capacities shown in Table 3. A cross runner that supports another cross member must have a minimum uniformly distributed load capacity of 12 pounds per linear foot (175 N/m).

**4.7.5.3 Hanger Wire:** The suspended ceiling is supported by No. 12 SWG [0.105 inch (2.7 mm) in diameter] galvanized steel wire that is attached to the concrete slab through the steel floor units, before concrete placement, or attached to hanger clips. The hanger clips are minimum 0.045-inch-thick (1.14 mm), 2-inch-wide (51 mm), $3^1/_2$-inch-long (90 mm), galvanized steel clips that are hooked at one end, for attachment over the male leg of steel floor units, and spaced as required for hanger wire attachment.

Hanger wires are spaced a maximum of 48 inches (1219 mm) on center or must be located at every other main runner/cross-tee intersection, whichever dimension is less along main runners. Hanger wire must be located at all four corners of light fixtures, at mid-span of cross tees next to 4- and 5-foot-long (1219 and 1524 mm) light fixtures and air duct outlets, and next to each main runner splice. Additional hanger wires are required at the mid-span of those cross tees running parallel and nearest to the walls and those near the end of cut cross tees longer than 2 feet (610 mm) that abut walls.

**4.7.6 Acoustical Material:** Acoustical lay-in ceiling panels used with the suspended ceiling system are the nominal panel sizes and types shown in Table 1. Panels are nominally $^5/_8$ inch (15.9 mm) or $^3/_4$ inch (19.1 mm) thick. Border panels are supported at walls by 24 MSG painted steel channels, 1 inch (25 mm) deep, with a 2-inch (23.8 mm) bottom flange. Optional support method consists of BERC-2 clip at wall attached to $^{15}/_{16}$ inch × $^{15}/_{16}$ inch No. 24 MSG painted steel channels.

**4.7.7 Hold-down Clips:** Hold-down clips, produced from No. 24 gage spring steel, must be used for ceiling panels weighing less than one pound per square foot. When the ceiling is composed of nominally 24-by-24-inch (610 by 610 mm), 24-by-36-inch (610 by 914 mm), or 30-by-30-inch (762 by 762 mm) lay-in panels, one clip is placed over bulbs of cross tees near cross tee midpoints. When the ceiling is composed of 20-by-60 inch (508 by 1524mm), 36-by-36-inch (914 by 914 mm), 24-by-48-inch (610 by 1219 mm), 30-by-60-inch (762 by 1524 mm), 36-by-60-inch (914 by 1524 mm) or 48-by- 48-inch (1219 mm) lay-in panels, two clips are placed over bulbs of each cross tee near cross tee quarter-points. One leg of each clip is cut off when placement is over bulbs of cross tees adjacent to the long side of light fixtures.

**4.7.8 Recessed Light Fixtures:** Fluorescent-lamp-type, steel housing fixtures can be used in the fire-resistance-rated assembly, provided the fixtures measure 1 by 4 feet (305 by 1219 mm), 2 by 2 feet (610 by 610 mm), 2 by 4 feet (610 by 1219 mm), 20 by 48 inches (508 by 1219 mm) or 20 by 60 inches (508 by 1524 mm). The nominally 1-by-4-foot (305 by 1219 mm), 2-by-2-foot (610 by 610 mm) and 2-by-4-foot (610 by 1219 mm) fixtures may include vented sides for air boots and vented tops for air-return purposes. Linear air diffusers and linear air returns must be used with nominally 20-by-48-inch (508 by 1219 mm) fixtures. When nominally 20-by-60-inch (508 by 1524 mm) fixtures are used, fixture stabilizers are used to supplement the hanger wires occurring at the mid-span of the 5-foot-long (1524 mm) cross tees.

When nominally 1-by-4-foot (305 by 1219 mm) fixtures are used, the aggregate number of fixtures must not exceed four per 100 square feet (9.3 m$^2$) of ceiling area. When nominally 2-by-2-foot (610 by 610 mm) fixtures are used, the aggregate number of fixtures must not exceed five per 100 square feet (9.3 m$^2$) of ceiling area. When nominally 2-by-4-foot (610 by 1219 mm), 20-by-48-inch (508 by

1219 mm), or 20-by-60-inch (508 by 1524 mm) fixtures are used, the aggregate number of fixtures must not exceed three per 100 square feet (9.3 $m^2$) of ceiling area. The fixtures must be wired in conformance with an approved electrical code.

The recessed light fixture must be protected on the topside with acoustical ceiling tile panel material having a minimum thickness of $^5/_8$ inch (15.9 mm). The panels are cut into pieces to form a five-sided enclosure which is rectangular or trapezoidal in cross section, depending upon fixture type, and which is approximately $^1/_2$ inch (12.7 mm) longer and wider than the fixture, with sufficient depth to provide at least 1 inch (12.7 mm) of clearance between the fixture and the enclosure. The pieces are held together with 8d nails. Spacers provide the $1^1/_4$-inch (31.7 mm) clearances when placed on top of fixtures located away from the ballasts. When no air-handling or air-return fixtures are used, a maximum $1^1/_4$-inch (31.7 mm) separation must be maintained between the long fixture protection sidepieces and the top piece. When air supply light fixtures with air boots are used, fixtures and air boots must be fully enclosed except for the nominally 28-square-inch (18 064 $mm^2$) opening needed for the connection to air-supply ducts.

**4.7.9 Air Duct:** Air ducts are permitted in the assembly provided the ducts are constructed of minimum No.22 MSG galvanized steel and aggregate duct opening area is less than or equal to 113 square inches (72 903 $mm^2$) per 100 square feet (9.2 $m^2$) of ceiling area. The maximum air duct-opening dimension is 12 inches (305 mm).

**4.8 8500 (Prelude SupraFine Fire Guard) Series One-hour Fire-resistance-rated Roof-ceiling System:**

This exposed grid system consists of the 8500 series main runners and the XL 8520 or XL 8540 cross runners, and is part of a one-hour fire-resistance-rated floor-ceiling system. The rating applies to restrained and unrestrained assemblies as described in ASTM E119. See Figure 6 for assembly details. General requirements in 2015 and 2012 IBC Section 711 and 2009 IBC Section 712 must be observed.

**4.9 Special Inspection:**

Where special inspections are required by the building official, the suspended ceilings in Seismic Design Categories C, D, E and F shall be subject to periodic special inspections during the installation of the suspended ceiling systems and their anchorage in accordance with the following requirements:

- For installations in accordance with Section 4.4.2 of this report, special inspection must be conducted as required by the building official during enforcement of the 2018 and 2015 IBC Sections 1704.5, 1705.1.1 and 1705.13.2 [2012 IBC Sections , 1705.1.1, 1705.11.4 and Item 3 of Section 1705.12; and 2009 IBC Section 1704.15, Item 3 of Section 1708.1, and 1708.4], as applicable.
- For installation in accordance with Section 4.4.1 of this report, special inspection must must be in compliance with the following: Section 13.5.6.2.2 (h) of ASCE 7-05, and 2009 IBC Section 1705.3.4, Item 3 for the 2009 IBC; Section 13.5.6.2.2 (h) of ASCE 7-05, as applicable.
- The special inspector must verify that the ceiling framing systems are as described in this report, and comply with the this report and the approved construction documents.

Where special inspections are required by the building official, a statement of special inspection must be provided as required by 2018, 2015 and 2012 IBC Section 1704.3 (Sections 1705.2 and 1705.3 for the 2009 IBC).

## 5.0 CONDITIONS OF USE

The suspended ceiling systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

**5.1** The ceiling suspension main runners, cross runners, BERC, BERC-2,AL BERC-2, STAC and XTAC clips, and accessories must be fabricated and installed in accordance with this report and the manufacturer's published installation instructions. In the event of a conflict between the manufacturer's installation instructions and this report, this report governs.

**5.2** Design loads and spans of main and cross runners must comply with Tables 2 and 3 of this report.

**5.3** Suspended ceiling systems must be designed and installed in accordance with ASCE 7 Section 13.5.6 as referenced by the applicable IBC Section 1613. The documents must be prepared by a registered design professional where required by statutes of the jurisdiction in which the project is to be constructed.

**5.4** Special inspections must be provided in accordance with Section 4.9 of this report.

**5.5** For Seismic Design Category C, D, E or F, a quality assurance plan complying with IBC Chapter 17, including 2015 and 2012 IBC Section 1704.3 (2009 IBC Sections 1705.2 and 1705.3) must be submitted to the code official.

**5.6** The ceiling framing systems must not be used to provide lateral support for walls or partitions, except as provided for in ASCE 7, Section 13.5.8.1 as referenced in the applicable IBC Section 1613.

**5.7** The ceiling systems must be braced to resist seismic forces as determined from Section 1613 of the IBC.

**5.8** The systems are limited to ceilings not considered accessible in accordance with Item 28 of 2018, 2015 and 2012 IBC Table 1607.1 (Item 31 of 2009 IBC Table 1607.1).

**5.9** The supporting construction for the ceiling system has not been evaluated and is outside the scope of this report. The code official must approve the floor or roof construction supporting the suspended ceiling system.

**5.10** The ceiling systems recognized in this report have been evaluated for use in interior applications. For exterior ceiling systems must be designed for wind loads and with due consideration of atmospheric conditions.

**5.11** Lay-in ceiling panels must be justified to the satisfaction of the code official as complying with the interior finish requirements of Chapter 8 of the applicable code.

**5.12** The electrical safety of the EAC main runners is outside the scope of this report. EAC main runners must be installed in accordance with the applicable provisions of the National Electrical Code.

**5.13** Suspended ceiling system with 730145 main runner, and XL7325 and XL7345 cross runners have only been evaluated for gravity loads only. Seismic design is outside the scope of this report.

## 6.0 EVIDENCE SUBMITTED

**6.1** Data in accordance with the ICC-ES Acceptance Criteria for Suspended Ceiling Framing Systems (AC368), dated November 2019.

**6.2** Reports of fire-resistance tests in accordance with ASTM E119.

**6.3** Reports of comparative seismic qualification tests in accordance with the ICC-ES Acceptance Criteria for Seismic Certification by Shake-table Testing of Nonstructural Components (AC156), dated October 2010 (editorially revised September 2019).

## 7.0 IDENTIFICATION

**7.1** Cartons of framing members, clips and accessories are identified with the name and address of Armstrong World Industries, Inc.; the acronym "WAVE"; number designations specifying gage of steel, depth of section and length; and the evaluation report number (ESR-1308).

**7.2** The report holder's contact information is the following:

**WORTHINGTON ARMSTRONG VENTURE (WAVE)**
**101 LINDENWOOD DRIVE, SUITE 350**
**MALVERN, PENNSYLVANIA 19355**
**(610) 722-1218**
**www.armstrong.com**
**jrameen@armstrongceilings.com**

**7.3** The Additional Listee's contact information is the following:

**ARMSTRONG WORLD INDUSTRIES, INC.**
**POST OFFICE BOX 3001**
**LANCASTER, PENNSYLVANIA 17604**

**TABLE 1—ACOUSTICAL MATERIALS**

| ACOUSTICAL PANEL SIZE (inches) | ACOUSTICAL MATERIAL TYPE[1] | STEEL FLOOR DECK PANEL TYPE[2] |
|---|---|---|
| 0 by 60 | P(S OR P) OR PC(S) | F, C or B |
| 20 by 60 | P(S OR P) OR PC(S) | F or B1 |
| 24 by 24 | BF(S) | F, C or B |
| 24 by 24 | BF(S) | F |
| 24 by 24 or 36 | P(S) | F, C or B |
| 24 by 24 or 36 | PC(S) | C or B |
| 24 by 24 or 36 | P(S) | F |
| 24 by 48 or 60 | P(S OR P) OR PC(S) | F, C or B |
| 24 by 48 or 60 | P(S OR P) OR PC(S) | F or B1 |
| 30 by 30 | P(S) | F, C or B |
| 30 by 30 | PC(S) | C or B |
| 30 by 30 | P(S) | F |
| 30 by 60 | P(S) OR PC(S) | F, C or B |
| 36 by 36 | PC(S) | F, C or B |
| 36 by 36 | PC(S) | F or B1 |
| 36 by 60 | PC(S) | F, C or B |
| 48 by 48 | PC(S) | F, C or B |

For **SI:** 1 inch = 25.4 mm.

[1](S) = surface perforations, (P) = through perforations.
[2](F) = all fluted steel deck panels, (C) = all cellular steel floor deck panels, (B) = any blend of fluted and cellular floor deck panels, ($B_1$) = blend of one cellular floor deck panels and one or more fluted deck panels.

**TABLE 2—DIMENSIONS AND ALLOWABLE LOADS FOR MAIN RUNNERS**

| CATALOG NUMBER | NOTE | TYPE (SEE FIGURE 1) | LENGTH (inches) | METAL THICKNESS (inch) | MAXIMUM SPAN (feet) | ALLOWABLE LOADS |
|---|---|---|---|---|---|---|
| | | | | | | Simple Span Uniform Load (lb./lin. ft.) |
| 6100 | 1 | M | 144 | 0.013 | 4 | 12.6 |
| 6101 | 1 | M | 144 | 0.019 | 4 | 16.79 |
| 6121A | 1 | M | 144 | 0.019 | 4 | 16.79 |
| 6127A | 1 | M | 120 | 0.019 | 4 | 16.79 |
| 6132 | 1 | M | 132 | 0.019 | 4 | 16.79 |
| 6195A | 1 | M | 126 | 0.019 | 4 | 16.79 |
| 6500B | 5 | P | 144 | 0.015 | 4 | 15.92 |
| 6501 | 1, 5 | P | 144 | 0.018 | 4 | 19.42 |
| Al 7200 | 1 | B | 144 | 0.021 | 3 | 13.47 |
| SS 7200 | 3 | B | 144 | 0.015 | 4 | 12.23 |
| 7300 | 1 | A | 144 | 0.010 | 4 | 13.5 |
| 7301 | 1 | A | 144 | 0.015 | 4 | 16.73 |
| 730106 | 1, 8 | S | 72 | 0.017 | 4 | 17.35 |
| 730145 | 1, 7 | U | 144 | 0.0195 | 4 | 40.16 |
| 7302 | 1 | A | 120 | 0.010 | 4 | 13.5 |
| 7305 | 1 | A | 140 | 0.010 | 4 | 13.5 |
| 7306 | 1 | A | 132 | 0.015 | 4 | 17.25 |
| 7307 | 1 | A | 126 | 0.015 | 4 | 17.25 |
| 7500 | 1 | H | 144 | 0.013 | 4 | 12.75 |
| 7501 | 1 | H | 144 | 0.018 | 4 | 16.86 |
| 7502 | 1 | H | 120 | 0.013 | 4 | 12.38 |
| 7504 | 1 | H | 120 | 0.018 | 4 | 16.28 |
| 7507 | 1 | H | 144 | 0.018 | 4 | 16.28 |
| DC730112 | 1, 8 | S | 144 | 0.017 | 4 | 17.35 |
| DC730110 | 1, 8 | S | 120 | 0.017 | 4 | 17.35 |
| DC730108 | 1, 8 | S | 96 | 0.017 | 4 | 17.35 |
| DC730106 | 1, 8 | S | 72 | 0.017 | 4 | 17.35 |
| 7508 | 1 | H | 132 | 0.018 | 4 | 16.28 |
| 7509 | 1 | H | 126 | 0.018 | 4 | 16.28 |
| DC750112 | 1 | N | 144 | 0.019 | 4 | 16.83 |
| DC750110 | 1 | N | 120 | 0.019 | 4 | 16.83 |
| DC750108 | 1 | N | 96 | 0.019 | 4 | 16.83 |
| DC750106 | 1 | N | 72 | 0.019 | 4 | 16.83 |
| 750106 | 1 | N | 72 | 0.019 | 4 | 16.83 |
| 7600 | 1 | K | 144 | 0.013 | 4 | 13.10 |
| 76008 | 1 | L | 144 | 0.013 | 4 | 13.10 |
| 7601 | 1 | K | 144 | 0.017 | 4 | 16.35 |
| 76018 | 1 | L | 144 | 0.017 | 4 | 16.35 |
| 7602 | 1 | K | 120 | 0.017 | 4 | 13.10 |
| 76028 | 1 | L | 120 | 0.013 | 4 | 13.10 |
| 7603 | 1 | K | 144 | 0.013 | 4 | 12.28 |
| 76038 | 1 | K | 144 | 0.013 | 4 | 12.28 |
| 7604 | 1 | K | 120 | 0.017 | 4 | 16.35 |
| 76048 | 1 | L | 120 | 0.017 | 4 | 16.35 |
| 7605 | 1 | K | 120 | 0.017 | 4 | 16.35 |
| 76058 | 1 | L | 120 | 0.017 | 4 | 16.35 |
| 7606 | 1 | K | 120 | 0.013 | 4 | 13.07 |
| 76068 | 1 | L | 120 | 0.013 | 4 | 13.07 |
| 7607 | 1 | K | 120 | 0.013 | 4 | 12.8 |
| 7612 | 1 | K | 144 | 0.018 | 4 | 16.48 |
| 76128 | 1 | K | 144 | 0.018 | 4 | 16.48 |
| DC760112 | 1 | O | 144 | 0.015 | 4 | 16.44 |
| DC760110 | 1 | O | 120 | 0.015 | 4 | 16.44 |
| DC760108 | 1 | O | 96 | 0.015 | 4 | 16.44 |
| DC760106 | 1 | O | 72 | 0.015 | 4 | 16.44 |
| 760106 | 1 | O | 72 | 0.015 | 4 | 16.44 |
| EA7900 | 5 | Q | 144 | 0.026 | 4 | 12.26 |
| EA7900C | 6, 8 | T | 144 | 0.021 | 4 | 14.09 |
| EA7903 | 5 | R | 144 | 0.022 | 4 | 16.74 |
| ES7901 | 5 | Q | 144 | 0.015 | 4 | 18.33 |
| ES7901C | 6,8 | V | 144 | 0.017 | 4 | 20.39 |
| HD 8201 | 1, HD | A | 144 | 0.015 | 4 | 16.73 |
| 8300 | 1 | A | 144 | 0.010 | 4 | 13.5 |
| 8301 | 1 | A | 144 | 0.015 | 4 | 16.73 |
| 8500 | 1 | H | 144 | 0.013 | 4 | 13.31 |
| 8501 | 1 | H | 144 | 0.018 | 4 | 16.86 |

For **SI:** 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lb./lin. ft. = 14.6 N/m, 1 lb. = 4.44 N.

**NOTES:**

1 = Single stitched web
2 = Double stitched web
3 = Available stitched or unstitched
4 = Hanger wire support at mid-span
5 = Polyurethane filled upper bulb / polyurethane coated lower flange
6 = Integral PVC gasket.
7 = Limited to gravity usage. Seismic design is outside the scope of evaluation. 8 = Lateral support/bracing is required at 24 inches on center.
HD = Hot-dipped galvanized finish

**TABLE 3—DIMENSIONS AND ALLOWABLE LOADS FOR CROSS RUNNERS**

| CATALOG NUMBER | NOTE | TYPE | LENGTH (Inches) | METAL THICKNESS (inch) | MAXIMUM SPAN (feet) | SIMPLE SPAN UNIFORM LOAD (lb./lin. ft.) |
|---|---|---|---|---|---|---|
| **6100 Series** | | | | | | |
| XL 6104 | 2 | M | 4 | 0.013 | 0.3 | 66.89 |
| XL 6106 | 2 | M | 6 | 0.013 | 0.5 | 66.89 |
| XL 6110 | 2 | M | 12 | 0.013 | 1 | 66.89 |
| XL 6161 | 2 | M | 21 | 0.013 | 1.75 | 66.89 |
| XL 6120 | 2 | M | 24 | 0.013 | 2 | 66.89 |
| XL 6167 | 2 | M | 27 | 0.013 | 2.25 | 49.32 |
| XL 6170 | 2 | M | 30 | 0.013 | 2.5 | 38.8 |
| XL 6162 | 2 | M | 42 | 0.013 | 3.5 | 20 |
| XL 6140 | 2 | M | 48 | 0.013 | 4 | 12.6 |
| XL 6164 | 2 | M | 54 | 0.013 | 4.5 | 9.2 |
| XL 6150 | 2 | M | 60 | 0.013 | 5 | 5.8 |
| XL 6190 | 2, 4 | M | 72 | 0.013 | 4 | 12.6 |
| XL 6180 | 2, 4 | M | 96 | 0.013 | 4 | 12.6 |
| **6500 Series** | | | | | | |
| XL6521 | 5 | P | 24 | 0.014 | 2 | 42.00 |
| XL6541 | 5 | P | 48 | 0.014 | 4 | 15.88 |
| **7100 Series** | | | | | | |
| XL 7128 | 1 | E | 24 | 0.010 | 2 | 33 |
| XL 7148 | 1 | E | 48 | 0.010 | 4 | 6 |
| **AL 7200 Series** | | | | | | |
| XLAL7220 | 2 | B | 24 | 0.021 | 2 | 44.45 |
| XLAL7240 | 2 | B | 48 | 0.021 | 4 | 6.33 |
| **SS 7200 Series** | | | | | | |
| XLSS7220 | 3 | B | 24 | 0.015 | 2 | 61.66 |
| XLSS7240 | 3 | B | 48 | 0.015 | 4 | 10.4 |
| **7300 Series** | | | | | | |
| XL 7304 | 2 | D | 4 | 0.009 | 0.3 | 36.00 |
| XL 7306 | 2 | D | 6 | 0.009 | 0.5 | 36.00 |
| XL 7318 | 2 | D | 12 | 0.009 | 1 | 36.00 |
| XL 7398 | 2 | D | 18 | 0.009 | 1.5 | 36.00 |
| XL 7368 | 2 | D | 20 | 0.009 | 1.67 | 36.00 |
| XL 7328 | 2 | D | 24 | 0.009 | 2 | 36.00 |
| XL 7320 | 2 | A | 24 | 0.011 | 2 | 61.33 |
| XL 7325 | 2, 7 | U | 24 | 0.0195 | 2 | 46.72 |
| XL 7378 | 2 | D | 30 | 0.009 | 2.5 | 16.54 |
| XL 7330 | 2 | D | 36 | 0.010 | 3 | 20.83 |
| XL 7348 | 2 | D | 48 | 0.009 | 4 | 6.78 |
| XL 7345 | 2, 7 | U | 48 | 0.0195 | 2 | 46.72 |
| XL 7342 | 2 | C | 48 | 0.009 | 4 | 7.80 |
| XL 7340 | 2 | A | 48 | 0.010 | 4 | 12.25 |
| XL 7341 | 2 | A | 48 | 0.015 | 4 | 16.89 |
| XL 7357 | 2 | A | 60 | 0.015 | 5 | 7.61 |
| XL 7358 | 2 | A | 60 | 0.015 | 5 | 7.61 |
| XL 7390 | 2 | A | 72 | 0.010 | 6 | 3.3 |
| XL 7390 | 2, 4 | A | 48 | 0.010 | 4 | 12.24 |
| XL 7380 | 2 | A | 96 | 0.010 | 8 | 1.57 |
| XL 7380 | 2, 4 | A | 96 | 0.010 | 4 | 12.12 |
| **7500 Series** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| XL 7504 | 1 | H | 4 | 0.010 | 0.3 | 51.83 |
| XL 7506 | 1 | H | 6 | 0.010 | 0.5 | 51.83 |
| XL 7510 | 1 | H | 12 | 0.010 | 1 | 51.83 |
| XL 7561 | 1 | H | 21 | 0.010 | 1.75 | 51.83 |
| XL 7560 | 1 | H | 20 | 0.010 | 1.67 | 51.83 |
| XL 7520 | 1 | H | 24 | 0.010 | 2 | 51.83 |
| XL 7567 | 1 | H | 27 | 0.010 | 2.25 | 28.67 |
| XL 7570 | 1 | H | 30 | 0.010 | 2.5 | 28.67 |
| XL 7530 | 1 | H | 36 | 0.010 | 3 | 21.03 |
| XL 7562 | 1 | H | 42 | 0.010 | 3.5 | 12.67 |
| XL 7540 | 1 | H | 48 | 0.010 | 4 | 10.34 |
| XL 7541 | 1 | H | 48 | 0.013 | 4 | 12.73 |
| XL 7549 | 1 | H | 48 | 0.018 | 4 | 16.42 |
| XL 7564 | 1 | H | 54 | 0.010 | 4.5 | 6.72 |
| XL 7558 | 1 | H | 60 | 0.013 | 5 | 5.8 |
| XL 7590 | 1, 4 | H | 72 | 0.013 | 4 | 12.73 |
| XL 7580 | 1, 4 | H | 96 | 0.013 | 4 | 12.73 |

For **SI:** 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lb./lin. ft. = 14.6 N/m, 1 lb. = 4.44 N.

**TABLE 3—DIMENSIONS AND ALLOWABLE LOADS FOR CROSS RUNNERS (Continued)**

| CATALOG NUMBER | NOTE | TYPE | LENGTH (Inches) | METAL THICKNESS (Inch) | MAXIMUM SPAN (feet) | SIMPLE SPAN UNIFORM LOAD (lb./lin. ft.) |
|---|---|---|---|---|---|---|
| **7600 Series** | | | | | | |
| XL 7604 | 1 | I | 4 | 0.015 | 0.3 | 71.66 |
| XL 7606 | 1 | I | 6 | 0.015 | 0.5 | 71.66 |
| XL 7610 | 1 | I | 12 | 0.015 | 1 | 71.66 |
| XL 7660 | 1 | I | 20 | 0.015 | 1.67 | 71.66 |
| XL 7620 | 1 | I | 24 | 0.015 | 2 | 71.66 |
| XL 7670 | 1 | I | 30 | 0.015 | 2.5 | 39.86 |
| XL 7640 | 1 | I | 48 | 0.015 | 4 | 13.53 |
| XL 7646 | 1 | I | 48 | 0.015 | 4 | 13.21 |
| XL 7645 | 1 | I | 48 | 0.015 | 4 | 12.85 |
| XL 7650 | 1 | I | 60 | 0.015 | 5 | 6.09 |
| XL 7655 | 1 | I | 60 | 0.015 | 5 | 5.71 |
| XL 7657 | 1 | I | 60 | 0.015 | 5 | 5.90 |
| XL 7690 | 1, 4 | K | 72 | 0.013 | 4 | 12.59 |
| XL 7680 | 1, 4 | K | 96 | 0.013 | 4 | 12.59 |
| **76008 Series** | | | | | | |
| XL76108 | 1 | J | 12 | 0.015 | 1 | 69.69 |
| XL 76608 | 1 | J | 20 | 0.015 | 1.67 | 69.69 |
| XL 76208 | 1 | J | 24 | 0.015 | 2 | 69.69 |
| XL 76708 | 1 | J | 30 | 0.015 | 2.5 | 47.76 |
| XL 76408 | 1 | J | 48 | 0.015 | 4 | 14.11 |
| XL 76468 | 1 | J | 48 | 0.015 | 4 | 13.01 |
| XL 76458 | 1 | J | 48 | 0.015 | 4 | 12.6 |
| XL 76508 | 1 | J | 60 | 0.015 | 5 | 9 |
| XL 76558 | 1 | J | 60 | 0.015 | 5 | 7 |
| XL 76578 | 1 | J | 60 | 0.015 | 5 | 7 |
| XL 76908 | 1, 4 | L | 72 | 0.013 | 4 | 12.6 |
| XL 76808 | 1, 4 | L | 96 | 0.013 | 4 | 12.6 |
| **EA7900 Series** | | | | | | |
| EA 7920 | 5 | Q | 24 | 0.026 | 2 | 66.62 |
| EA 7920C | 6 | T | 24 | 0.021 | 2 | 41.92 |
| EA 7940 | 5 | Q | 48 | 0.026 | 4 | 15.32 |
| EA 7940C | 6, 8 | T | 48 | 0.021 | 4 | 12.67 |
| **EA7903 Series** | | | | | | |
| EA 7927 | 5 | R | 24 | 0.022 | 2 | 60.55 |
| EA 7947 | 5 | R | 48 | 0.022 | 4 | 17.66 |
| **ES7901 Series** | | | | | | |
| ES 7920 | 5 | Q | 24 | 0.015 | 2 | 60.83 |
| ES 7920C | 6 | V | 24 | 0.017 | 2 | 89.53 |
| ES 7940 | 5 | Q | 48 | 0.015 | 4 | 16.83 |
| ES 7940C | 6.8 | V | 48 | 0.017 | 4 | 17.26 |
| **XL8200 Series** | | | | | | |
| XL 8223 | 2, HD | B | 24 | 0.013 | 2 | 38.63 |
| XL 8240 | 2, HD | B | 48 | 0.013 | 4 | 12.75 |
| **8300 Series** | | | | | | |
| XL 8313 | 2 | D | 12 | 0.009 | 1 | 45.4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| XL 8323 | 2 | D | 24 | 0.009 | 2 | 40.45 |
| XL 8320 | 2 | A | 24 | 0.011 | 2 | 61.33 |
| XL 8378 | 2 | A | 30 | 0.011 | 2.5 | 20.84 |
| XL 8330 | 2 | A | 36 | 0.011 | 3 | 23.11 |
| XL 8340 | 2 | A | 48 | 0.011 | 4 | 12.25 |
| XL 8341 | 2 | A | 48 | 0.015 | 4 | 16.89 |
| XL 8357 | 2 | A | 60 | 0.015 | 5 | 7.47 |
| XL 8358 | 2 | A | 60 | 0.015 | 5 | 7.53 |
| **8500 Series** | | | | | | |
| XL 8520 | 1 | H | 24 | 0.013 | 2 | 58.5 |
| XL 8540 | 1 | H | 48 | 0.013 | 4 | 12.73 |

For **SI:** 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lb./lin. ft. = 14.6 N/m, 1 lb. = 4.44 N.

**NOTES:**

1 = Single stitched web
2 = Double stitched web
3 = Available stitched or unstitched
4 = Hanger wire support at midspan
5 = Polyurethane filled upper bulb / polyurethane coated lower flange
6 = Integral PVC Gasket
7 = Limited to gravity usage. Seismic design is outside the scope of evaluation.
8 = Lateral support/bracing is required at 24 inches on center.

HD = Hot-dipped galvanized finish

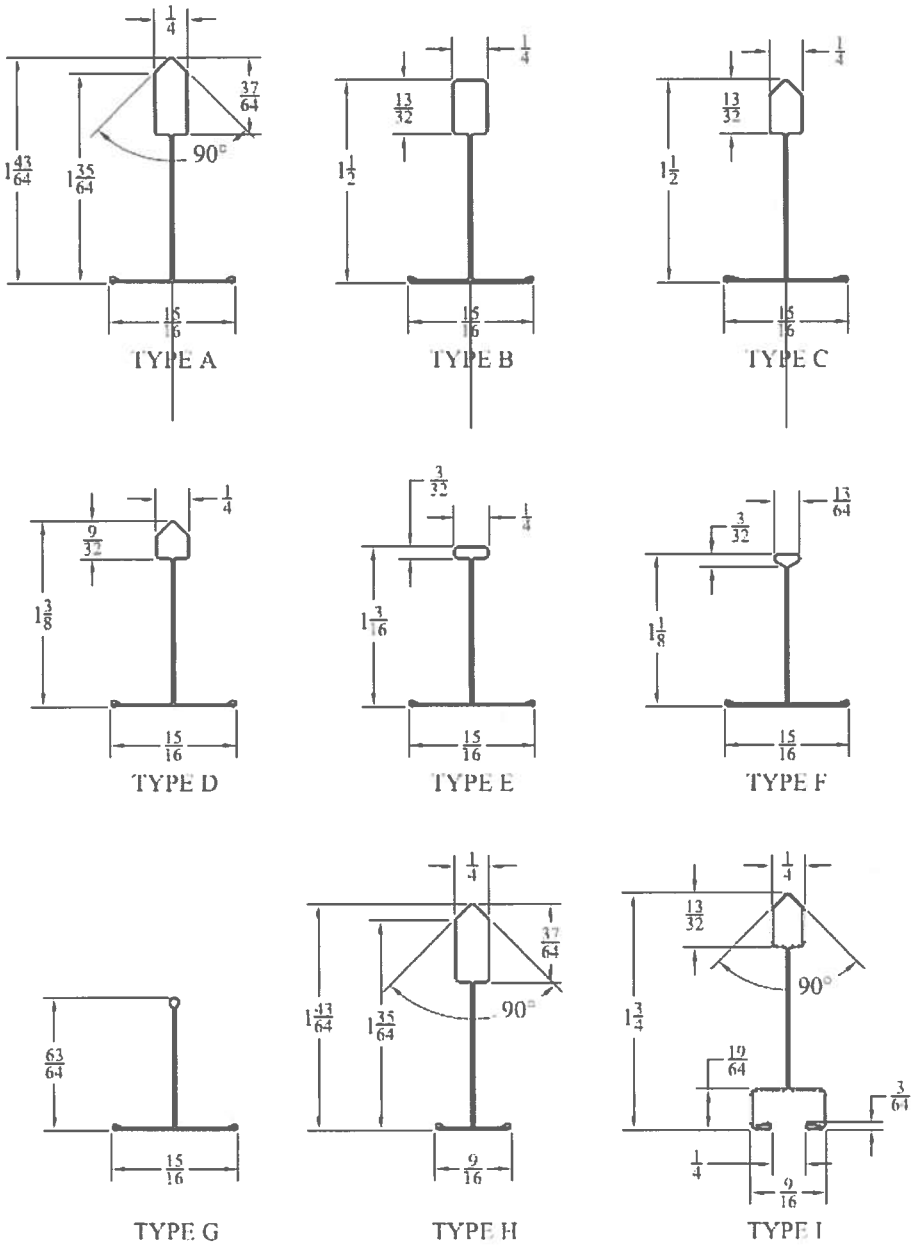



**FIGURE 1—RUNNER PROFILES**

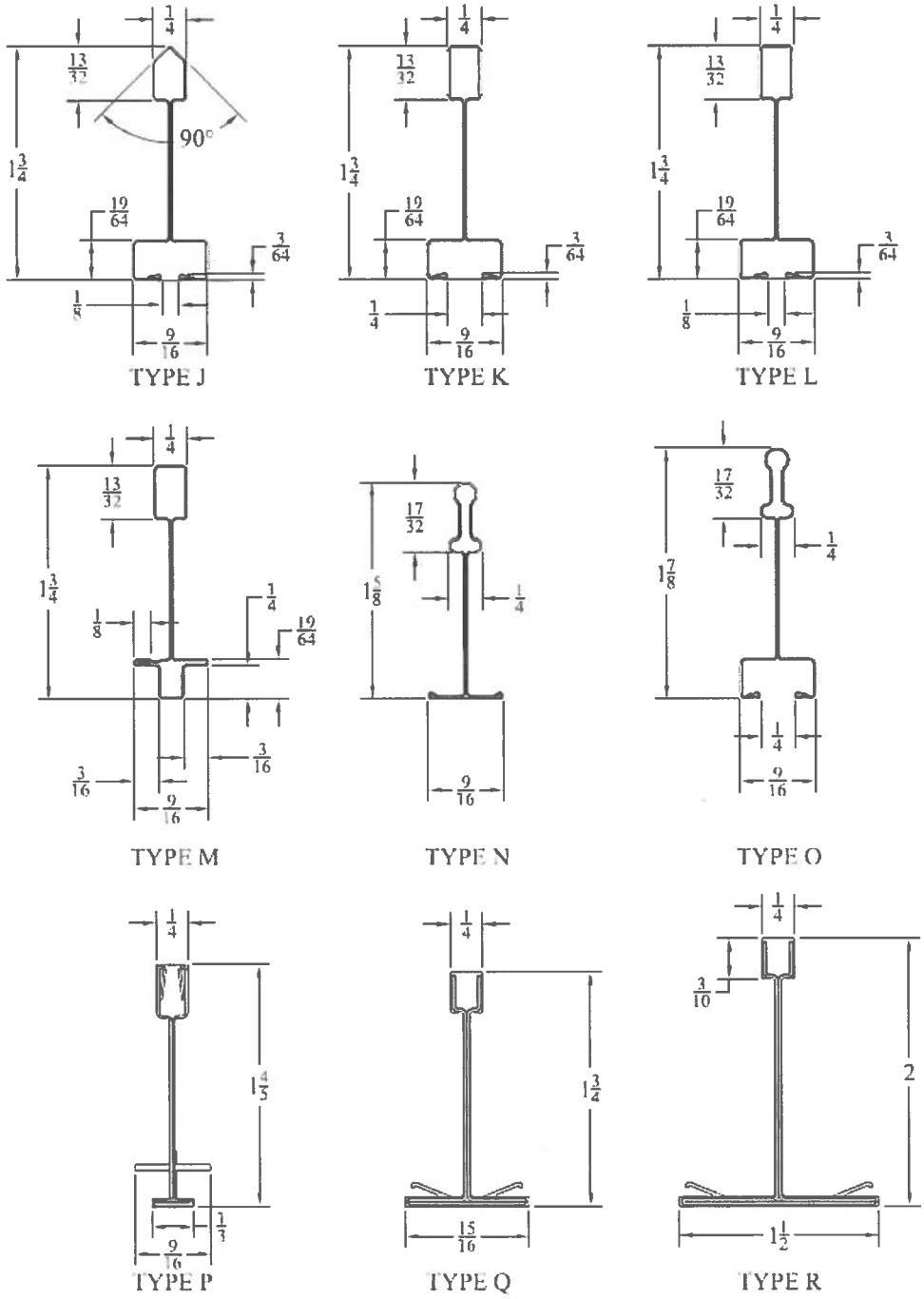



**FIGURE 1—RUNNER PROFILES (Continued)**

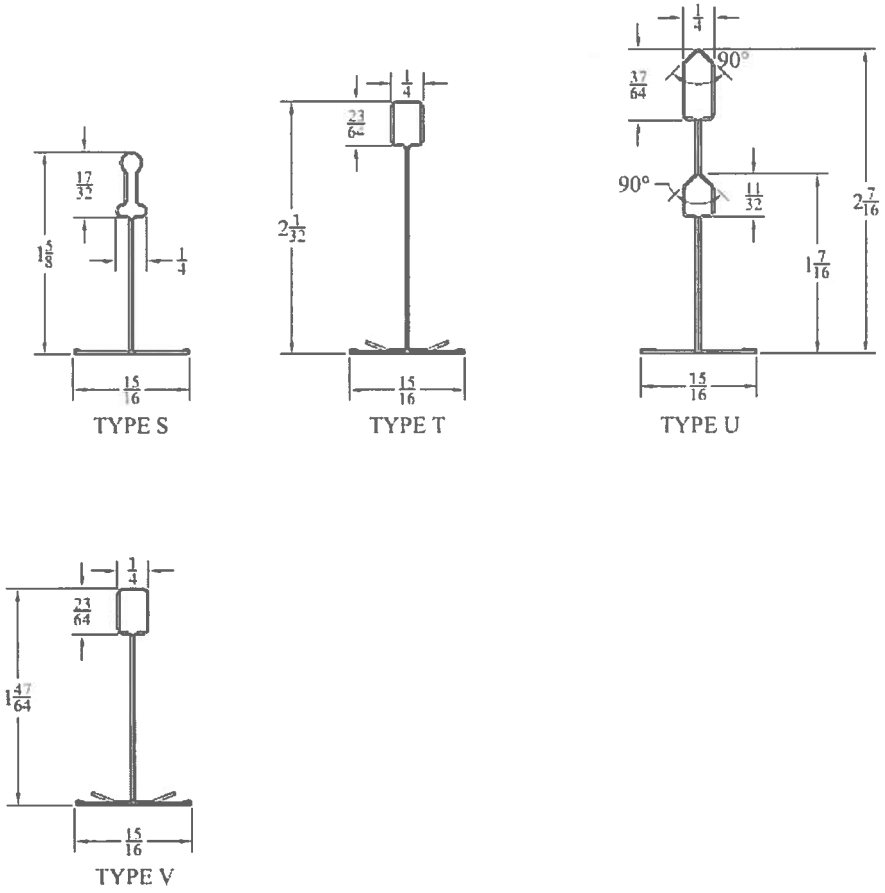



**FIGURE 1—RUNNER PROFILES (Continued)**

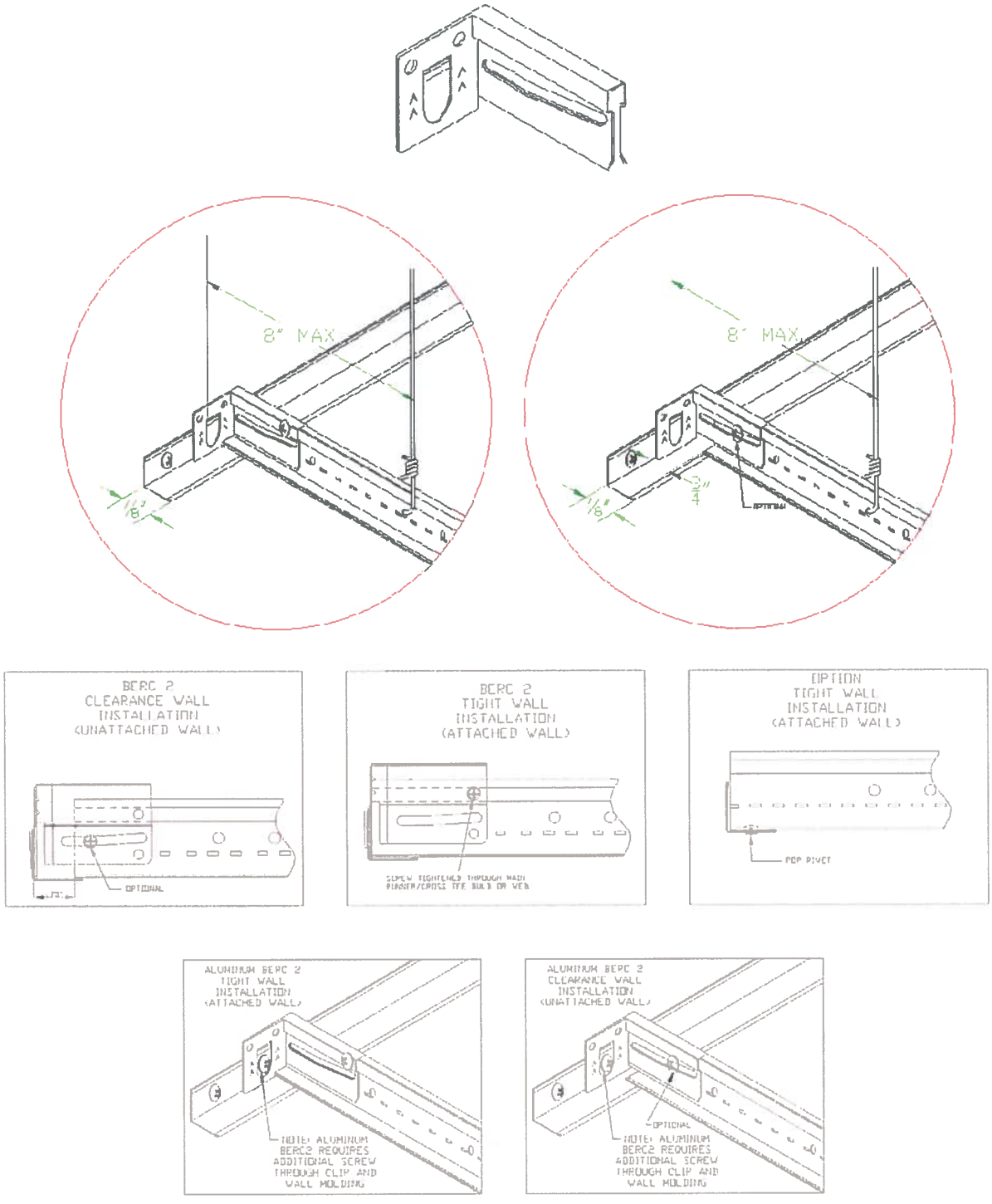
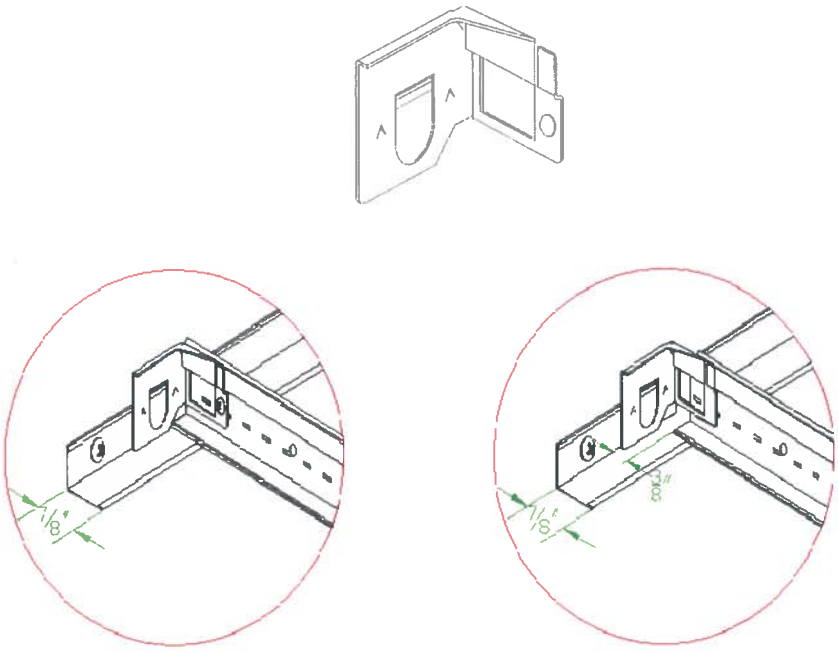



**FIGURE 2—BERC-2 AND AL BERC-2 CLIPS**



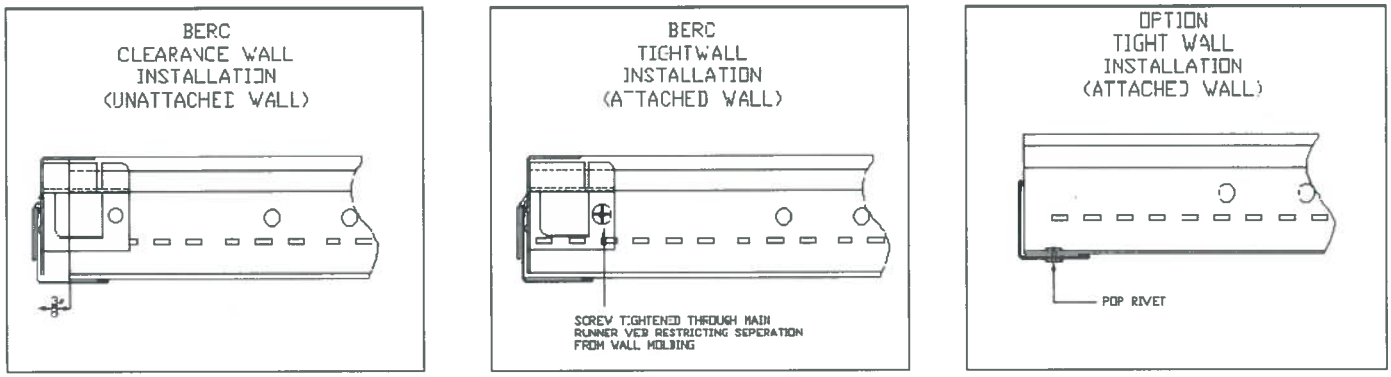




**FIGURE 3—BERC CLIP**

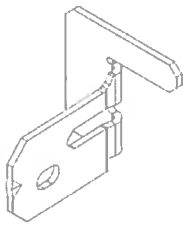


**FIGURE 4—SINGLE TEE ADAPTER CLIP (STAC)**

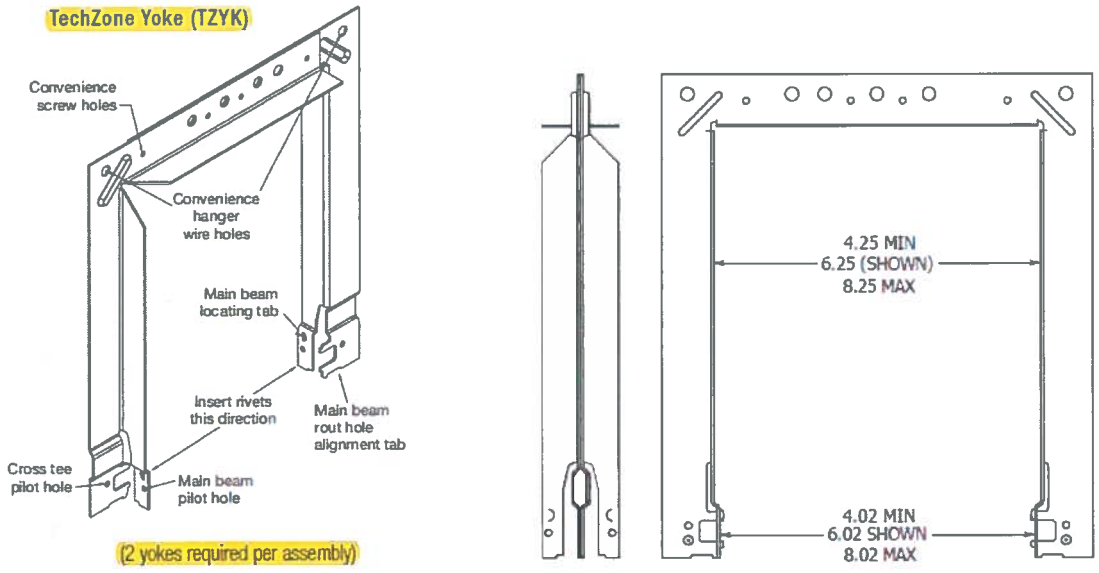
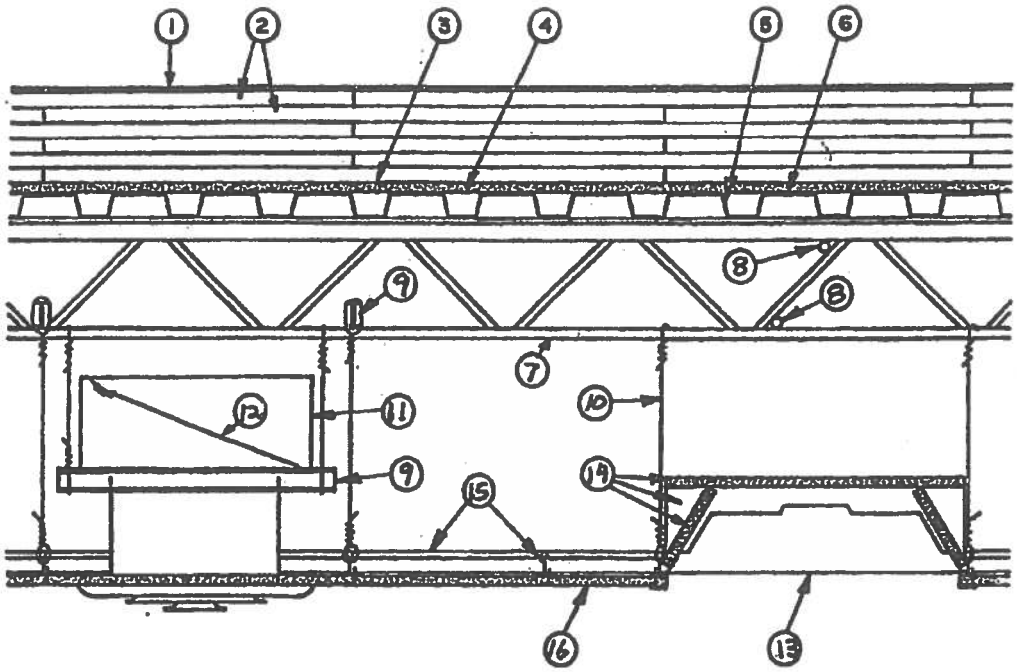



**FIGURE 5—TECHZONE YOKE (TZYK)**




For **SI:** 1 inch = 25.4 mm, 1 foot =304.8 mm, 1 psf = 4.88 kg/m$^2$, 1 gallon = 3.81 L, 1 sq. ft. = 0.0929 m$^2$, 1 psi = 6.89 kPa, 1 lbm = 0.45 kg, 1 sq. in. = 645.16 mm$^2$.

1. **Roof Covering:** Roof covering consisting of hot-mopped or cold application materials compatible with insulation(s) described in Item 2 that provide Class A, B or C coverings.
2. **Roof Insulation—Mineral and Fiber Boards:** The boards must comply with ASTM C612, Type 1A or 1B; 24-by-48-inch minimum size, maximum size 48 by 96 inches, to be applied in six layers. Boards to be installed perpendicular to gypsum wallboard direction, with end joints staggered 2 feet in adjacent rows. Each layer of board must be offset, in both directions, from layer below a minimum of 12 inches in order to lap all joints. Minimum board thickness is 1 inch (No limit on maximum overall thickness.)
3. **Sheathing Material (Optional):** Vinyl film vapor barrier, applied with adhesive to the gypsum wallboard. Adjacent sheets overlapped 2 inches.
4. **Gypsum Sheathing:** Water-resistant core gypsum sheathing complying with ASTM C79. Supplied in sheets nominally 2 by 4 feet to 4 by 12 feet, by nominal $^5/_8$ inch thick. Minimum weight is 2.0 psf. Applied perpendicular to the steel roof deck direction with adhesive, or laid loosely. End joints to occur over crests of steel roof deck, with end joints staggered 2 feet in adjacent rows.
5. **Steel Roof Deck:** Minimum 0.019-inch-thick (26 gage), minimum 1-inch-deep, minimum 25-inch-wide, painted or galvanized, fluted steel deck. Flutes must be approximately 4 inches on center, crests approximately $2^3/_4$ inches wide. As an alternate, $1^1/_2$-inch-deep, minimum 18-inch-wide fluted galvanized steel deck is permitted. Minimum 0.029-inch-thick (22 gage) flutes must be 6 inches on center, crest width ranging from $3^1/_2$ to 5 inches. Deck must be welded to supports with welding washers spaced 12 inches on center. Side lap joints of adjacent units welded or secured together with No. 12 by $^1/_2$-inch self-drilling, self-tapping steel screws midway between steel joists.
6. **Fasteners:**
   A. **Adhesive (Optional): BMCA Insulation Products Inc.:** May be applied between crests of steel roof deck and gypsum sheathing in $^1/_2$-inch-wide ribbons, 8 inches on center, at 0.4 gallon per 100 square feet. May also be applied in $^1/_2$-inch-wide ribbons, 6 inches on center, at 0.4 gallon per 100 square feet, between gypsum sheathing and vapor barrier, and between gypsum boards and roof insulation when vapor barrier is omitted. May also be applied at the same rate between layers of roof insulation.
   B. **Mechanical Fastener:** (Not shown) Any steel nail or steel clip designed for the purpose may be used to attach one or more layers of insulation to steel roof deck (through gypsum sheathing). The gypsum sheathing may also be attached directly to the steel roof deck with the mechanical fasteners.
   C. **Hot Asphalt or Coal Tar Pitch:** (Not shown) May be used as an alternate to adhesive between layers of roof insulation, at a rate not to exceed 35 pounds per 100 square feet.
7. **Steel Joists:** Type 10J4 or 12K1 minimum size. 10K1 size may be used when limited to a span of 12 feet 0 inches, maximum. As an alternate, any LH Series steel joists spanning no greater than 60 feet may be used. For spans greater than 60 feet, LH Series joists may be used, provided their vertical deflection under total load must not be greater than $^1/_{244}$ of the joist span.
8. **Bridging:** Steel bars, $^1/_2$ inch in diameter, welded to top and bottom chords of each joist.
9. **Cold-rolled Channels:** Number 16 MSG cold-rolled steel channels, $1^1/_2$ inches deep with $^9/_{16}$-inch flanges must be placed on lower chord of joists and secured with 18 SWG galvanized steel wire. Installed perpendicular to joists, the channels must be located as required to provide hanger wire attachment points.

   When steel joists are spaced more than 5 feet on center, two cold-rolled channels must be placed back to back and tied together with a double strand of 18 SWG galvanized steel wire at 24 inches on center. The double channels installed perpendicular to the joists and spaced a maximum of 48 inches on center may be placed on top of the joists' bottom chord and tied to each joist with a double strand of 18 SWG galvanized steel wire, or suspended below the joists with 12 SWG galvanized steel wire wrapped around the cold-rolled channels and with the other end wrapped around the bottom chord of the joists.

**FIGURE 6—8500 SERIES ONE-HOUR FIRE-RESISTANCE-RATED ASSEMBLY**

10. **Hanger Wire:** Number 12 SWG galvanized wire must be twist-tied to steel joists or cold-rolled steel channels. When the ceiling consists of nominal 24-by-24-inch panels or 24-by-48-inch panels, hanger wires must be spaced a maximum of 48 inches on center on main runners adjacent to cross tee intersections. Hanger wires must occur at all four corners of light fixtures, at midspan of cross tees adjacent to 4-foot light fixtures and air duct outlets, and adjacent to each main runner splice. When the ceiling consists of nominal 20-by-60-inch panels, hanger wires must be spaced 40 inches on center along main runners, and one wire must occur at each corner of light fixtures, at midspan of all cross tees, and adjacent to each main runner splice.

11. **Air Duct:** Minimum 0.019-inch-thick (26 gage) galvanized steel. Total area of duct openings must not exceed 576 square inches per each 100 square feet of ceiling area. Area of individual duct openings must not exceed 576 square inches. Maximum opening dimension is 18 inches. Inside and outside faces of duct throat must be protected with $^{1}/_{16}$-inch-thick ceramic fiber paper, laminated to the metal. Maximum dimension of opening is 30 inches. Duct supported by $1^{1}/_{2}$-inch-deep, minimum 0.053-inch-thick (16 gage) cold-rolled steel channels spaced not over 48 inches on center, suspended by No. 12 SWG galvanized steel wire.

12. **Damper:** Minimum 0.056-inch-thick (16 gage) galvanized steel, sized to overlap duct opening a minimum of 2 inches. Protected on both sides with $^{1}/_{16}$-inch-thick ceramic fiber paper, laminated to the metal, and held open with a fusible link.

13. **Fixtures, Recessed Light:** Fluorescent-lamp-type steel housing, nominally 2 by 4 feet or 20 by 60 inches in size. Fixtures must be spaced so their total area does not exceed 24 square feet per each 100 square feet of ceiling area. When 20-by-60 inch fixtures must be used, fixture stabilizers formed from No. 16 gage steel channels, must be used in addition to the hanger wires at midspan of the cross tees. Fixture must be wired in conformance with the National Electrical Code. Fixture and ballasts must be considered for ambient temperature conditions before installation.

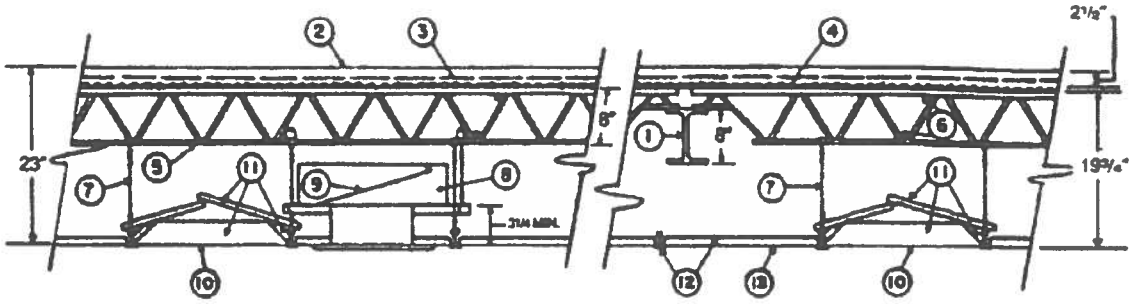
14. **Fixture Protection—Acoustical Material—Armstrong World Industries, Inc.:** Type $^{5}/_{8}$-inch P (S) or $^{5}/_{8}$-inch PC (S) is cut to form a five-sided enclosure, trapezoidal in cross section, approximately $^{1}/_{2}$ inch longer and wider, and $^{5}/_{8}$ inch higher, than the light fixture housing. For 2-by-4-foot fixtures, the protection consists of a $23^{3}/_{4}$-by-$47^{3}/_{4}$-inch top piece, two $5^{7}/_{8}$-by-$47^{3}/_{4}$-inch side pieces, and two $4^{1}/_{2}$-by-$23^{3}/_{4}$-inch end pieces. For 20-by-60-inch fixtures, the protection consists of a nominal 20-by-60-inch top piece, two nominal 6-by-60-inch side pieces, and two nominal $4^{1}/_{2}$-by-20-inch end pieces. The top edge of each fixture protection side piece may be provided with a 1-inch-deep-by-maximum-20-inch-long notch near its midpoint. The side and top pieces must be laid in place and the end pieces must be held in place with three 8d nails spaced 8 inches on center. (S) - Surface perforations.

15. **Steel Framing Members—Armstrong World Industries, Inc.:** Type 8500 systems with a $^{15}/_{16}$-inch-wide flange grid must be used. Main runners, nominally 12 feet long, must be spaced 4 feet on center. Cross tees, nominally 4 feet long, must be installed perpendicular to main runners and spaced 2 feet on center. Cross tees, nominally 2 feet long, must be installed perpendicular to 4-foot cross tees and spaced 4 feet on center. Grid modules containing light fixtures must employ a fixture-centering clip at each corner. The No. 24 gage electrogalvanized steel clip is nested on the flange of the intersecting grid tees, has two $1^{7}/_{16}$-inch-long legs with their sides perpendicular to each other, and has a U-shaped return at the top of each leg for engaging over the bulb of the intersecting grid tees.

16. **Acoustical Material:** Nominal 24-by-24-inch or -48-inch lay-in panels. Border panels must be supported at walls by minimum 0.016-inch-thick (26 gage) painted steel angles with $^{7}/_{8}$-inch legs; or, minimum 0.016-inch-thick (26 gage) painted steel channels, $1^{1}/_{8}$ inches deep with $^{7}/_{8}$-inch flanges.

17. **Hold-down Clips:** (Not shown) Number 24 MSG spring steel, placed over cross tees at 2 feet on center.

**FIGURE 7—8500 SERIES ONE-HOUR FIRE-RESISTANCE-RATED ASSEMBLY (Continued)**




1. Beam:
2. Normal-weight Concrete
3. Welded Wire Fabric
4. Steel Form Units
5. Steel Joists
6. Bridging
7. Hanger Wire
8. Air Duct
9. Damper: No. 16 MSG minimum galvanized steel, sized to overlap duct opening 2 inches, minimum. Protected on both sides with $^{1}/_{16}$-inch-thick ceramic fiber paper laminated to the metal with adhesive and held open with a listed fusible link.
10. Fixtures, Recessed Light
11. Fixture Protection—Batts and Blankets
12. Steel Framing Members—Worthington Armstrong Venture
13. Acoustical Material
14. Hold-down Clips (Not illustrated)

For **SI:** 1 inch = 25.4 mm.

**FIGURE 7—TWO-HOUR FIRE-RESISTANCE-RATED FLOOR-CEILING ASSEMBLY (REFER TO SECTION 4.6 OF THIS REPORT)**

**DIVISION: 09 00 00—FINISHES**
**Section: 09 22 26—Suspension Systems**
**Section: 09 53 00—Acoustical Ceiling Suspension Assemblies**

**REPORT HOLDER:**

**WORTHINGTON ARMSTRONG VENTURE (WAVE)**

**EVALUATION SUBJECT:**

**FIRE- AND NONFIRE-RESISTANCE-RATED SUSPENDED CEILING FRAMING SYSTEMS**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems, described in ICC-ES evaluation report ESR-1308, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

**Applicable code editions:**

- 2020 *City of Los Angeles Building Code* (LABC)

## 2.0 CONCLUSIONS

The Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems described in Sections 2.0 through 7.0 of the evaluation report ESR-1308, comply with the LABC Chapters 8, 16 and 25, and the LARC, and are subject to the conditions of use described in this supplement.

## 3.0 CONDITIONS OF USE

The Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-1308.
- The design, installation, conditions of use and identification of the Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems are in accordance with the 2018 *International Building Code®* (IBC) provisions noted in the evaluation report ESR-1308.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Main runners shall be identified by indentation or by nontransferable decal with letter not less than $^1/_4$–inch high and shall include manufacturer's name and runner designation.

This supplement expires concurrently with the evaluation report, reissued December 2019 and revised on March 2020.

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**DIVISION: 09 00 00—FINISHES**
**Section: 09 22 26—Suspension Systems**
**Section: 09 53 00—Acoustical Ceiling Suspension Assemblies**

**REPORT HOLDER:**

**WORTHINGTON ARMSTRONG VENTURE (WAVE)**

**EVALUATION SUBJECT:**

**FIRE- AND NONFIRE-RESISTANCE-RATED SUSPENDED CEILING FRAMING SYSTEMS**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Fire- and Nonfire-Resistance-Rated Suspended Ceiling Systems, recognized in ICC-ES evaluation report ESR-1308, have also been evaluated for compliance with the codes noted below.

**Applicable Code Edition:**

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1 and 2.2 below.

## 2.0 CONCLUSIONS

The Fire- and Nonfire-Resistance-Rated Suspended Ceiling Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-1308, comply with CBC Chapters 8, 16, 17 and 25, provided the design and installation are in accordance with the 2018 International Building Code (IBC) provisions, as applicable, noted in the evaluation report, and the additional requirements of CBC Chapters 8, 16, 17 and 25, as applicable.

### 2.1. OSHPD:

The Fire- and Nonfire-Resistance-Rated Suspended Ceiling Systems, described in Section 2.0 through 7.0 of the evaluation report ESR-1308, comply with CBC Chapters 8, 16, 17 and 25, with applicable amendments, and Chapters 16A and 17A, provided the design and installation are in accordance with the 2018 International Building Code (IBC) provisions noted in the evaluation report, and the additional requirements in Sections 2.1.1 through 2.1.2 of this supplement:

#### 2.1.1. Conditions of Use:

1. All loads applied shall be determined by a registered structrural engineer and shall comply with applicable loads from CBC Chapter 16 and its amendments, and Chapter 16A.
2. Section 13.5.6.2 of ASCE 7 shall be revised in accordance with CBC Section 1617A.1.21 [OSHPD 1 & 4].
3. Design and installation shall comply with the requirements of OSHPD Preapproved Details (OPD) OPD-0002-13 and OPD-0003-13, as applicable.

#### 2.1.2. Special Inspection Requirements:

1. Periodic special inspection is required, in accordance with Section 1705A.12.5 of the CBC [OSHPD 1 & 4].
2. Where gypsum wallboard is used in suspended ceiling installations, additional inspection shall be in accordance with CBC Section 2503.2 [OSHPD 1, 1R, 2, 4 & 5].

### 2.2. DSA:

The Fire- and Nonfire-Resistance-Rated Suspended Ceiling Systems, described in Section 2.0 through 7.0 of the evaluation report ESR-1308, comply with CBC Chapters 8, 16, 17 and 25, with applicable amendments, and Chapters

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16A and 17A, provided the design and installation are in accordance with the 2018 International Building Code (IBC) provisions noted in the evaluation report, and the additional requirements in Sections 2.2.1 through 2.2.2 of this supplement:

**2.2.1. Conditions of Use:**

1. All loads applied shall be determined by a registered structrural engineer and shall comply with applicable loads from CBC Chapter 16 and its amendments, and Chapter 16A.
2. Section 13.5.6.2 of ASCE 7 shall be revised in accordance with CBC Section 1617.11.16 [DSA-SS/CC] and Section 1617A.1.21 [DSA-SS].
3. Design and installation shall comply with the requirements of DSA Interpretation of Regulations (IR) DSA IR 25-2.13 and DSA IR 25-3.13 as applicable.

**2.2.2. Special Inspection Requirements:**

1. Periodic special inspection is required, in accordance with Section 1705A.12.5 of the CBC [DSA-SS & DSA-SS/CC].
2. Where gypsum wallboard is used in suspended ceiling installations, additional inspection shall be in accordance with CBC Section 2503.2 [DSA-SS, DSA-SS/CC].

This supplement expires concurrently with the evaluation report, reissued December 2019 and revised March 2020.

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# ICC-ES Evaluation Report
# ESR-1222

*Reissued December 2021*

*Revised February 2022*

*This report is subject to renewal December 2022.*

**DIVISION: 09 00 00—FINISHES**
**Section: 09 22 26—Suspension Systems**
**Section: 09 53 00—Acoustical Ceiling Suspension Assemblies**

**REPORT HOLDER:**

**USG INTERIORS, LLC**

**EVALUATION SUBJECT:**

**USG DONN® (DX/DXL, DXLA, DXW, DXWCE, DXCE, SDX/SDXL, ZXLA), DONN FINELINE® (DXF), DONN FINELINE 1/8 (DXFF), DONN CENTRICITEE™ (DXT) AND DONN IDENTITEE® (DXI) SUSPENDED CEILING FRAMING SYSTEMS; USG CELEBRATION™ SNAP-IN; USG CELEBRATION™ TORSION SPRING; USG CEILINGS PLUS® ILLUSIONS® AND USG CEILING PLUS® EXPANSE®; USG DONN PARALINE® (DXP AND DXLP) SUSPENDED CEILING SYSTEM; ACM7 AND MAC2 CEILING ATTACHMENT CLIPS; AND PERIMETER SYSTEM: CURTAIN POCKETS**

## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2021, 2018, 2015, 2012, 2009 and 2006 *International Building Code®* (IBC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see ESR-1222 LABC Supplement.

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see ESR-1222 CBC Supplement.

**Properties evaluated:**

- Interior finish
- Fire resistance
- Structural

## 2.0 USES

The USG suspended ceiling framing systems described in this report are suspended, exposed framing, concealed ceiling assemblies used in fire-resistance-rated and non-fire-resistance-rated construction for applications as noted in this report. The ACM7 or MAC2 ceiling attachment clip is used to connect main and cross runners to wall molding.

## 3.0 DESCRIPTION

### 3.1 Ceiling Framing and Ceiling Systems:

**3.1.1 Acoustical Tile Ceiling Framing Systems:** The Donn, Donn Fineline, Donn Centricitee and Donn Identitee acoustical suspended ceiling framing systems consist of main and cross runner framing members for use with acoustical tiles.

**3.1.2 Donn Paraline Suspended Ceiling System:** The Donn Paraline suspended ceiling system consists of main and cross runner framing systems and Paraline metal pans used as ceiling tiles.

**3.1.3 USG Celebration Snap-In System:** The USG Celebration Snap-In suspended ceiling system consists of main and cross runner framing systems and USG Celebration Snap-In metal panels sued as ceiling tiles.

**3.1.4 USG Celebration Torsion Spring, USG Ceilings Plus Illusions and USG Ceilings Plus Expanse Systems:** The USG Celebration Torsion Spring, USG Ceilings Plus Illusions and USG Ceilings Plus Expanse suspended ceiling systems consist of main and cross runner framing systems and metal panels used as ceiling tiles. The metal panels are secured to the framing members using torsion springs.

**3.1.5 USG Curtain Pockets:** The USG Curtain Pockets are installed along the perimeter of the ceiling system to allow for concealment of window curtains. The framing members are attached to the curtain pocket members using clips and the curtain pocket members are attached to the supporting structure.

### 3.2 ACM7 and MAC2 Clips:

The clips are manufactured from 0.028-inch-thick (0.711 mm), hot-dipped galvanized, cold-rolled steel complying with ASTM A568.

### 3.3 Accessories:

Each suspended ceiling system is available with a variety of wall angles, moldings, access angles and corner caps.

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**3.4 Materials:**

**3.4.1 Framing Members:** Main runners and cross runners are described in Table 1 of this report, which provides the cross-sectional dimensions, lengths and allowable transverse loads. Main runners are classified as either Intermediate or Heavy-Duty as shown in Table 1 in accordance with ASTM C635. The steel body of the suspension system members are hot-dipped galvanized in accordance with ASTM A653 with a coating designation G30, except that DXFEV and ZXLA members have a G90 coating prior to being painted. The exposed surface of the bottom flange of the framing members is covered with a pre-painted flange capping of either steel or aluminum. The end clips of DX cross tees are high-strength, low alloy steel complying with ASTM A568 and ASTM A879. The end clips of the DXFEV and ZXLA cross tees are formed from Type 300 series stainless steel complying with ASTM A480.

**3.4.1.1 Donn Fineline, Centricitee, Identitee and Paraline Exposed and Concealed Ceiling Suspension Systems for Use with Acoustical Tiles and Metal Pans:** The cross tees, main tees and Paralock® main tees are formed from steel meeting ASTM A653 CS Type B. Carbon steel composition conforms to ASTM A568, and zinc coating conforms to ASTM A653.

**3.4.2 Hanger Wire:** Hanger wire for suspended ceiling framing members, and fixtures, must comply with ASTM C636 as referenced in 2018, 2015, 2012 and 2009 IBC Section 808.1.1.1 (2006 IBC Section 803.9.1.1) and Section 13.5.6 of ASCE 7 as referenced in IBC Section 2506.2.1.

## 4.0 DESIGN AND INSTALLATION

**4.1 General:** The suspended ceiling framing systems installed with acoustical tiles, the Paraline metal pans or Celebration metal panels must be designed and installed in accordance with 2021, 2018, 2015, 2012 and 2009 IBC Sections 808, 1613, and 2506.2.1 (2006 IBC Sections 803.9, 1613 and 2506.2.1). The minimum tension and compression capacity of framing member connections is 180 pounds (800 N).

**4.1.1 Main Runners:** The maximum design loads for main runners must be less than or equal to the allowable capacities noted in Table 1 of this report.

**4.1.2 Cross Runners:** The maximum design load for cross runners must be less than or equal to the allowable capacities shown in Table 1 of this report.

**4.1.3 Seismic Design:**

**4.1.3.1 General:** Seismic design and installation details of the ceiling system, including lighting fixtures and mechanical services, must be in accordance with Section 13.5.6 of of ASCE 7-16 for the 2021 and 2018 IBC (ASCE 7-10 for the 2015 and 2012 IBC and ASCE 7-05 for the 2009 and 2006 IBC) as referenced in IBC Section 1613, except as noted in Section 4.1.4 of this report. Systems with main runners classified as Intermediate-duty are limited to use in Seismic Design Categories A, B and C. Lighting fixtures may also be attached to the grid with clips complying with the ICC-ES Acceptance Criteria for Attachment Devices for Recessed Lighting Fixtures (Luminaires) in Suspended Ceiling Systems (AC184).

**4.1.3.2 Partitions:** Partitions must be laterally supported as required by Section 13.5.8 of ASCE 7-16 for 2021 and 2018 IBC (ASCE 7-10 for the 2015 and 2012 IBC andASCE 7-05 for the 2009 and 2006 IBC, as referenced by IBC Section 1613.

**4.1.4 Alternate Suspended Ceiling Framing Systems for Acoustical Tiles:**

**4.1.4.1 Alternate Installation for Seismic Design Categories D, E and F:** With this installation, the Donn, Centricitee, Fineline, Identitee and Aluminum Cap or Exposed Systems (DX/DXL, DXW, DXT, DXF, DXFF, DXI, DXLA, and ZXLA), main must be heavy duty as described in Section 3.5.1. Maximum total ceiling weight permitted is 4.0 lb/ft$^2$ (19.5 kg/m$^2$). The ACM7 clips, MAC2 clips or pop rivets are used to secure the main runners and cross runners to the perimeter members (wall closures or wall moldings) on two adjacent walls and to allow free movement of the runners on the two opposing walls. See Figures 1, 2, 2B and 2C. A nominally $^7/_8$-inch-wide wall closure angle (molding) is used in lieu of the 2-inch-wide (50.8 mm) perimeter wall molding required by ASTM E580 and Section 13.5.6.2.2 of ASCE 7-16 for the 2021 and 2018 IBC (ASCE 7-10 for the 2015 and 2012 IBC andSection 13.5.6.2.2 of ASCE 7-05 for the 2009 and 2006 IBC) for Seismic Design Categories D, E and F. Except for the use of the ACM7 clips, MAC2 clips or pop rivets and the nominally $^7/_8$-inch-wide wall molding and the elimination of spacer bars (stabilizer bars), installation of the ceiling system must be as prescribed by the applicable code.

The ACM7 clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. On the two adjacent walls where the runners are fixed, the clips are attached to the runner by a sheet metal screw through the clip into the bulb of the tee (See Figure 2). The MAC2 clip is attached by fastening to the wall molding with one sheet metal screw. An additional screw is fastened through one of the side holes of the MAC2 into the top bulb of the runner (See Figure 2C). Instead of fixed connections (or restrained connections) provided by ACM7 clip (See Figure 2) or by MAC2 clip (see Figure 2c), a $^1/_8$-inch (3 mm) diameter pop rivet may be used to connect the runner end to the wall molding for a fixed connection (See Figure 2B). On the walls where the runners are not fixed (or runners are unrestrained), the ACM7 clips allow the terminal runner end to move $^3/_4$ inch (19.1 mm) towards and away from the wall (See Figure 1). Under the 2021 and 2018 IBC, as required by Section 13.5.6.2.2 of ASCE 7-16, the ACM7 clips and MAC2 clips must be screwed to the wall molding with two (2) sheet metal screws and the wall molding must be positively attached to the wall studs or other supporting structure. The ACM7 clips, MAC2 clips or pop rivets installed in this manner are used in lieu of the spacer bars (stabilizer bars) required in Section 5 of ASTM E580 for the 2021, 2018, 2015 and 2012 IBC (CISCA for Seismic Zones 3-4 for the 2009 and 2006 IBC). ASTM E580 is referenced in Section 13.5.6.2.2 of ASCE 7-16 under the 2021 and 2018 IBC and ASCE 7-10 under the 2015 and 2012 IBC, in which ASCE 7 is referenced in 2021, 2018, 2015 and 2012 IBC Section 1613 (CISCA for Seismic Zones 3-4 is referenced in ASCE 7-05, Section 13.5.6.2.2, which is referenced in 2009 and 2006 IBC Section 1613). The assemblies described in this Section 4.1.4.1 are equivalent to that required by CISCA 3-4 and Section 5 of ASTM E580.

**4.1.4.2 Alternate Installation with ACM7 clips and USG Logix Yoke for Seismic Design Categories D, E and F:** With this installation, the Donn Systems (DX/DXL), main must be heavy duty as described in Section 3.5.1. Maximum total ceiling weight permitted is 4.0 lb/ft$^2$ (19.5 kg/m$^2$). The ACM7 clips are used to secure the main runners and cross runners to the wall molding, as detailed below and shown in Figures 1 and 2. A nominally 7/8-inch (22 mm) wall molding is used in lieu of the 2-inch (51 mm) perimeter supporting closure angle required by Section 5.2.2 of ASTM E580 and Section 13.5.6.2.2 of ASCE 7-16 for the 2021 and 2018 IBC [ASCE 7-10 for the 2015 and 2012 IBC and Section 13.5.6.2.2 (b) of ASCE 7-05 for the 2009 IBC] for Seismic Design Categories D, E and F. The ceiling system must be

as prescribed by the applicable code except for the use of the ACM 7 clips and the 7/8-inch (22 mm) wall molding and elimination of spreader bars.

The ACM7 clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. On the two adjacent walls where the runners are fixed, the clips are attached to the runner by a sheet metal screw through the clip into the bulb of the tee (See Figure 2). On the walls where the runners are not fixed (or runners are unrestrained), the ACM7 clips allow the terminal runner end to move 3/4 inch (19.1 mm) towards and away from the wall (See Figure 1). Under the 2021 and 2018 IBC, as required by Section 13.5.6.2.2 of ASCE 7-16, the ACM7 clips must be screwed to the wall molding with two (2) sheet metal screws and the wall molding must be positively attached to the wall studs or other supporting structure. The ACM7 clips installed in this manner are used in lieu of the spacer bars (stabilizer bars) required in Section 5 of ASTM E580 for the 2021, 2018, 2015 and 2012 IBC (CISCA for Seismic Zones 3-4 for the 2009 and 2006 IBC). ASTM E580 is referenced in Section 13.5.6.2.2 of ASCE 7-16 under the 2021 and 2018 IBC and ASCE 7-10 under the 2015 and 2012 IBC, in which ASCE 7 is referenced in 2021, 2018, 2015 and 2012 IBC Section 1613 (CISCA for Seismic Zones 3-4 is referenced in ASCE 7-05, Section 13.5.6.2.2, which is referenced in 2009 and 2006 IBC Section 1613). The assemblies described in this Section 4.1.4.2 are equivalent to that required by CISCA 3-4 and Section 5 of ASTM E580.

Each USG Logix yoke assembly must be suspended from the structure above with a vertical 12 gauge steel wire through the center hole of the top of the yoke assembly. The yoke assembly must be attached to the main runners and to the cross tees using a single 1/8-inch-diameter (3.175 mm) steel pop rivet complying with Industrial Fastener Institute Standard IFI-114 at 24 inches (609.6 mm) from the perpendicular end of the main runner and spaced at every 48 inches (1219.2 mm) on center. All lighting fixtures must be installed in accordance with Section 5.3 of ASTM E580

**4.1.4.3 Alternate Installation with ACM7 Clips and BP Clips Attached to USG Curtain Pocket for Seismic Design Categories D, E and F:** With this installation, the Donn System (DX/DXL), main runner must be heavy duty as described in Section 3.5.1. Maximum total ceiling weight permitted is 4.0 lb/ft$^2$ (19.5 kg/m$^2$). On the two adjacent fixed walls, the ACM7 clips are used to secure the main runners and cross runners to the perimeter members (wall closures or wall moldings) as shown in Figure 1. On the two adjacent floating walls, the BP clips are used to secure the main and runners to the Curtain Pockets to allow free movement of the runners on the two opposing walls. The USG Curtain Pocket must be rigidly attached to the supporting structure. See Figure 2D. A nominally $^7/_8$-inch-wide wall closure angle (molding) on the adjacent fixed walls and BP clips secured to USG Curtain Pocket on the flotating adjacent walls are used in lieu of the 2-inch-wide (50.8 mm) perimeter wall molding required by ASTM E580 and Section 13.5.6.2.2 of ASCE 7-16 for the 2021 and 2018 IBC (ASCE 7-10 for the 2015 and 2012 IBC andSection 13.5.6.2.2 of ASCE 7-05 for the 2009 and 2006 IBC) for Seismic Design Categories D, E and F. Except for the use of the ACM7 clips attached to $^7/_8$-inch-wide wall molding, BP clips attached to USG Curtain Pocket and the elimination of spacer bars (stabilizer bars), installation of the ceiling system must be as prescribed by the applicable code.

The ACM7 clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. On the two adjacent walls where the runners are fixed, the clips are attached to the runner by a sheet metal screw through the clip into the bulb of the tee (See Figure 2). On the walls where the runners are not fixed (or runners are unrestrained), the BP clips are secure to the USG Curtain Pocket to allow the terminal runner end to move $^3/_4$ inch (19.1 mm) towards and away from the wall (See Figure 2D). Under the 2021 and 2018 IBC, as required by Section 13.5.6.2.2 of ASCE 7-16, the ACM7 clips and BP clips must be screwed to the wall molding and USG Curtain Pocket, respectively, with two (2) sheet metal screws, and the wall molding or USG Curtain Pocket must be positively attached to the wall studs or other supporting structure. The ACM7 clips or BP clips installed in this manner are used in lieu of the spacer bars (stabilizer bars) required in Section 5 of ASTM E580 for the 2021, 2018, 2015 and 2012 IBC (CISCA for Seismic Zones 3-4 for the 2009 and 2006 IBC). ASTM E580 is referenced in Section 13.5.6.2.2 of ASCE 7-16 under the 2021 and 2018 IBC and ASCE 7-10 under the 2015 and 2012 IBC, in which ASCE 7 is referenced in 2021, 2018, 2015 and 2012 IBC Section 1613 (CISCA for Seismic Zones 3-4 is referenced in ASCE 7-05, Section 13.5.6.2.2, which is referenced in 2009 and 2006 IBC Section 1613). The assemblies described in this Section 4.1.4.3 are equivalent to that required by CISCA 3-4 and Section 5 of ASTM E580.

**4.1.4.4 Alternate Installation for Seismic Design Category C:** The ACM7 clip may be used in lieu of spacer bars (stabilizer bars) in suspended ceiling installations regulated by ASTM E580 for the 2021, 2018, 2015 and 2012 IBC (CISCA for Seismic Zones 0-2 for the 2009 and 2006 IBC). The ACM7 clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. The ACM7 clips are placed at the intersections of all runners and the wall angle (molding) on the floating/unrestrained walls (See Figure 1), except where pop rivets or the MAC2 clips are used on the fixed or restrained walls as shown in Figures 2B and 2C. The ACM7 clips must be positioned to allow a minimum $^3/_8$-inch (9.5 mm) movement in both directions (towards and away from the wall) on two adjacent walls while the terminated ends of the main and cross runners are fixed tight to the perimeter on the two opposite walls (See Figures 2B and 2C). The maximum ceiling weight permitted is 2.5 lb/ft$^2$ (12.19 kg/m$^2$). Except for the use of the ACM7 clip, MAC2 clip or pop rivet and the elimination of spacer bars (stabilizer bars), installation of the ceiling system must be as prescribed by the applicable code. The assemblies described in this Section 4.1.4.4 are equivalent to that required by Section 4 of ASTM E580, referenced in Section 13.5.6.2.1 of ASCE 7-16 under the 2021 and 2018 IBC, ASCE 7-10 under the 2015 and 2012 IBC; in which ASCE 7 is referenced in 2021, 2018, 2015 and 2012 IBC Section 1613 (CISCA for Seismic Zones 0-2, referenced in ASCE 7-05, Section 13.5.6.2.1, which is referenced in 2009 and 2006 IBC Section 1613).

**4.1.4.5 Alternate Suspended Ceiling Framing Systems for USG Celebration Snap-In System in Seismic Design Categories D, E and F:** With this installation, the USG Celebration Snap-In System (DXFH), main runner must be heavy duty as described in Section 3.5.1. Maximum total ceiling weight permitted is 4.0 lb/ft$^2$ (19.5 kg/m$^2$). The ACM7 clips and MAC2 clips are used to secure the main runners and cross runners to the perimeter members (wall closures or wall moldings) on two adjacent walls and to allow free movement of the runners on the two opposing walls. See Figures 1, 2 and 2C. A nominally $^7/_8$-inch-wide wall closure angle (molding) is used in lieu of the 2-inch-wide (50.8 mm) perimeter wall molding required by ASTM E580 and Section 13.5.6.2.2 of ASCE 7-16 for the 2021 and 2018 IBC (ASCE 7-10 for the 2015 and 2012 IBC andSection 13.5.6.2.2 of ASCE

7-05 for the 2009 and 2006 IBC) for Seismic Design Categories D, E and F. Except for the use of the ACM7 clips or MAC2 clips and the nominally $^{7}/_{8}$-inch-wide wall molding and the elimination of spacer bars (stabilizer bars), installation of the ceiling system must be as prescribed by the applicable code.

The ACM7 clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. On the two adjacent walls where the runners are fixed, the clips are attached to the runner by a sheet metal screw through the clip into the bulb of the tee (See Figure 2). The MAC2 clip is attached by fastening to the wall molding with one sheet metal screw. An additional screw is fastened through one of the side holes of the MAC2 into the top bulb of the runner (See Figure 2C). On the walls where the runners are not fixed (or runners are unrestrained), the ACM7 clips allow the terminal runner end to move $^{3}/_{4}$ inch (19.1 mm) towards and away from the wall (See Figure 1). Under the 2021 and 2018 IBC, as required by Section 13.5.6.2.2 of ASCE 7-16, the ACM7 clips and MAC2 clips must be screwed to the wall molding with two (2) sheet metal screws and the wall molding must be positively attached to the wall studs or other supporting structure. The ACM7 clips or MAC2 clips installed in this manner are used in lieu of the spacer bars (stabilizer bars) required in Section 5 of ASTM E580 for the 2021, 2018, 2015 and 2012 IBC (CISCA for Seismic Zones 3-4 for the 2009 and 2006 IBC). ASTM E580 is referenced in Section 13.5.6.2.2 of ASCE 7-16 under the 2021 and 2018 IBC and ASCE 7-10 under the 2015 and 2012 IBC, in which ASCE 7 is referenced in 2021, 2018, 2015 and 2012 IBC Section 1613 (CISCA for Seismic Zones 3-4 is referenced in ASCE 7-05, Section 13.5.6.2.2, which is referenced in 2009 and 2006 IBC Section 1613). The assemblies described in this Section 4.1.4.5 are equivalent to that required by CISCA 3-4 and Section 5 of ASTM E580. The Celebration Snap-In Metal panels must be interlocked with the framing members.

**4.1.4.6 Alternate Suspended Ceiling Framing System for USG Celebration Torsion Spring, USG Ceilings Plus Illusions and USG Ceilings Plus Expanse Systems in Seismic Design Categories D, E and F:** With this installation, the USG Celebration Torsion Spring, USG Ceilings Plus Illusions and USG Ceilings Plus Expanse Systems (DX/DXL/TSCP), main must be heavy duty as described in Section 3.5.1. Maximum total ceiling weight permitted is 4.0 lb/ft$^2$ (19.5 kg/m$^2$). The ACM7 clips are used to secure the main runners and cross runners to the perimeter members (wall closures or wall moldings) on two adjacent walls and to allow free movement of the runners on the two opposing walls. Two sets of 2-inch-wide wall closure angles (molding) must be installed along the perimeter. The upper molding is used to connect the main and cross runners on fixed and floating sides using ACM7 clips. The lower molding is used to support the Celerbration Torsion Spring metal panels along the perimeter. See Figures 2E and 2F. Except for the use of the ACM7 clips and the elimination of spacer bars (stabilizer bars), installation of the ceiling system must be as prescribed by the applicable code.

The ACM7 clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. The ACM7 clip must be attached to wall molding using one screw. On the two adjacent walls where the runners are fixed, the clips are attached to the runner by a sheet metal screw through the clip into the bulb of the tee (See Figure 2F). On the walls where the runners are not fixed (or runners are unrestrained), the ACM7 clips allow the terminal runner end to move $^{3}/_{4}$ inch (19.1 mm) towards and away from the wall (See Figure 2E). Under the 2021 and 2018 IBC, as required by Section 13.5.6.2.2 of ASCE 7-16, the ACM7 clips must be screwed to the wall molding with two (2) sheet metal screws and the wall molding must be positively attached to the wall studs or other supporting structure. The ACM7 clips installed in this manner are used in lieu of the spacer bars (stabilizer bars) required in Section 5 of ASTM E580 for the 2021, 2018, 2015 and 2012 IBC (CISCA for Seismic Zones 3-4 for the 2009 and 2006 IBC). ASTM E580 is referenced in Section 13.5.6.2.2 of ASCE 7-16 under the 2021 and 2018 IBC and ASCE 7-10 under the 2015 and 2012 IBC, in which ASCE 7 is referenced in 2021, 2018, 2015 and 2012 IBC Section 1613 (CISCA for Seismic Zones 3-4 is referenced in ASCE 7-05, Section 13.5.6.2.2, which is referenced in 2009 and 2006 IBC Section 1613). The assemblies described in this Section 4.1.4.6 are equivalent to that required by CISCA 3-4 and Section 5 of ASTM E580. The Celebration Torsion Spring Metal panels must be supported by engaging torsion springs with the framing members.

### 4.2 Fire-resistance-rated Ceiling Assemblies:

#### 4.2.1 Donn (DXL and SDXL) Fire-resistance-rated Ceiling Systems:

**4.2.1.1 Two-hour Fire-resistance-rated Exposed Floor-ceiling System:** The DXL and SDXL systems consist of a bulb tee with $^{15}/_{16}$-inch-wide (23.8 mm) lower flange and main and cross-tee sizes shown in Table 1. The main tees are spaced 4 feet (1219 mm) on center and the cross tees are spaced 2 feet (610 mm) on center. The main tees are supported 48 inches (1219 mm) on center with No. 12 gage galvanized steel wires. Additionally, the same wires support the four corners of light fixtures and the center of each cross tee adjacent to the fixtures and air outlet ducts. The structural framing system consists of a minimum W8 × 15 steel beam that supports a minimum No. 18 gage, $1^{1}/_{2}$-inch-deep (38.1 mm) steel deck with flutes spaced 6 inches (152.4 mm) on center. The deck is welded to supports at 12 inches (604.8 mm) on center with welded or button-punched seams spaced 36 inches (914.4 mm) on center. Cellular steel decks may also be used. The decks are covered with normal-weight concrete having a minimum compressive strength of 3,500 psi (24.13 MPa) to a thickness of $2^{1}/_{2}$ inches (63.5 mm) over the top flute. Approved, recessed, 2-foot-by-4-foot (610 mm by 1219 mm) light fixtures may be used in the ceiling when spaced at up to 16 square feet per 100 square feet of ceiling area. The light fixtures must be independently supported by hanger wires. Approved air duct openings with approved dampers with a maximum opening dimension of 12 inches (305 mm) may be used in the ceiling, provided they are spaced at up to 113 square inches per 100 square feet of ceiling area. The lay-in acoustical material is USG Interiors, LLC $^{5}/_{8}$-inch-thick (15.8 mm), Type FR-83 nonperforated tile. The acoustical material is also used for protection of recessed light fixtures and consists of a three-sided enclosure cut to provide a 1-inch (25.4 mm) clearance around the fixture. The pieces are held together with three 6d nails on each side. Light fixtures located below or adjacent to a beam must have an additional piece of acoustical material laid on top of the enclosure. Hold-down clips spaced 2 feet (610 mm) on center are used to anchor the acoustical material weighing less than 1 psf (4.9 kg/m$^2$). The overall assembly depth is $24^{3}/_{8}$ inches (619 mm). The restrained and unrestrained rating of the assembly is two hours. The unrestrained beam rating is four hours. See Table 1 for allowable loads.

**4.2.1.2 One-hour Fire-resistance-rated Exposed Roof-ceiling System:** The DXL and SDXL systems consist of a bulb tee with $^{15}/_{16}$-inch-wide (23.8 mm) lower flange and

main and cross-tee sizes as shown in Table 1. The main tees are spaced 4 feet (1219 mm) on center and the cross tees are spaced 2 feet (610 mm) on center. The main tees are supported 4 feet (1219 mm) on center with No. 12 gage galvanized steel wires. Additionally, the same size wires support the framing members at the four corners of light fixtures and the center of each cross tee adjacent to the fixtures and air outlet ducts. Approved, recessed, 2-foot-by-4-foot (610 mm by 1219 mm) light fixtures may be used in the ceiling when spaced at up to 24 square feet per 100 square feet of ceiling area. The light fixtures must be independently supported by hanger wires. Approved air duct openings with approved dampers may be used in ceilings that have a maximum opening dimension of 30 inches (762 mm), and these are spaced at up to 576 square inches (0.371 $m^2$) per 100 square feet (9.25 $m^2$) of ceiling area for steel ducts. The lay-in acoustical material is USG Interiors, LLC, $^5/_8$-inch-thick (15.8 mm), Type FR-83 ceiling panel tiles. The acoustical material is also used for protection of recessed light fixtures and consists of a three-sided rectangular enclosure cut to provide a 1-inch (25.4 mm) clearance around the fixture. The pieces are held together with three 6d nails on each side. Light fixtures located below or adjacent to a beam must have an additional piece of acoustical material laid on top of the enclosure. The overall assembly depth is 24 inches (50.8 mm). The restrained and unrestrained assembly rating is one hour. For additional support and installation details, see Figure 3. The roof consists of minimum No. 22 gage (0.020 inch thick), 1-inch-deep (25.4 mm), galvanized steel deck, with 1-inch-wide (25.4 mm) flutes at $3^1/_2$ inches (89 mm) on center. Steel joists, 10 inches (254 mm) deep, are spaced 48 inches (1219 mm) on center. Decking is secured to the joists with $^1/_2$-inch-diameter (12.7 mm) puddle welds through weld washers at 12 inches (305 mm) on center. United States Gypsum Company Type SCX gypsum wallboard, 4 feet (1219 mm) wide and $^5/_8$ inch (15.8 mm) thick, is placed with the long dimension perpendicular to the deck. Board end joints must be staggered a minimum of 1 foot (304.8 mm) from adjacent courses. A layer of vinyl vapor barrier is laminated over the wallboard. One or more layers of mineral and fiber insulation boards comprise the roof insulation. The boards are a minimum of 24 inches by 48 inches (610 mm by 1219 mm) by 1 inch (25.4 mm) thick. The first layer is placed perpendicular to the gypsum sheathing with end joints staggered a minimum of 2 feet (610 mm) from adjacent courses. Subsequent insulation board layers must have all joints staggered from adjacent layers a minimum of 12 inches (305 mm). The first two layers are secured through the gypsum sheathing into the decking with mechanical fasteners. Additional insulation board layers are adhered with hot asphalt or coal tar pitch at a rate not exceeding 25 pounds (11.3 kg) per square. A Class A, B or C built-up roof covering is applied over the insulation. The suspended ceiling grid system is hung by No. 12 gage galvanized steel wires, 48 inches (1219 mm) on center, tied to main runners and bottom chord of steel joists. The ceiling must be suspended a minimum of 24 inches (610 mm) below the bottom of the roof deck and a minimum of 12 inches (305 mm) below steel joists.

**4.2.1.3 One-hour Fire-resistance-rated Concealed Floor-ceiling Systems:** These systems support an approved $^3/_4$-inch-thick (19.05 mm), 12-inch (305 mm) square non-ventilating acoustical mineral tile with kerfed edges. Hold-down clips are used for each tile around the perimeter. The galvanized steel DXL24 or SDXL24 main tee and DXL424 or SDXL424 cross-tee framing members support 2-foot-by-4-foot (610 mm-by-1219 mm) approved recessed light fixtures having slotted air openings on each side for $34^1/_2$-inch-long-by-$1^1/_4$-inch-wide (876 mm by 31.7 mm) air boots. All air boots are provided with approved fire dampers. The stabilizer bars oppose the cross tees that support the long edge of the light fixtures, and are connected to the main tee. Light fixture framing members are supported at each corner of the fixture and at midspan of the cross tees along the long edge of the fixture. The light fixtures must be independently supported by hanger wires. Hanger wires are No. 12 gage galvanized steel. All main runners are supported with the hanger wires at 48 inches (1219 mm) on center, except at light fixtures where the supports are at the fixture corners. For additional support and installation details, see Figure 3. All light fixtures are protected above by a rectangular-shaped box consisting of $^5/_8$-inch-thick (15.8 mm), approved mineral fiber board. Each side of the box is fastened to the top with four 7d coated nails. The structural framing system consists of open web steel joists spaced at 24 inches (610 mm) on center and supported by steel beams. The top and bottom of the joists are braced with $^1/_2$-inch-diameter (12.7 mm) steel bars spaced at 7 feet (2.1 m) on center and welded to each joist. Expanded 3.4 lb/$yd^2$ (1.8 kg/$m^2$), $^3/_8$-inch (9.52 mm) ribbed metal lath is placed over the joists with ribs transverse to the joists. Normal-weight concrete with a 28-day compressive strength of 3,000 psi and an average thickness of $2^3/_4$ inches (70 mm) is placed over the metal lath. The entire assembly is $21^1/_2$ inches (546 mm) deep, including the ceiling and concrete.

The approved light fixtures may occupy a maximum of 16 square feet (1.48 $m^2$) per 100 square feet (9.25 $m^2$) of ceiling area. See Table 1 for allowable loads.

**4.2.2 Paraline™ (DXLP) Linear Metal Ceiling Systems in Two-hour Restrained or Unrestrained Floor-ceiling Systems:** The Paraline™ (DXLP) linear metal ceiling system is a suspended ceiling consisting of $3^1/_4$-inch-wide (82 mm), channel-shaped Paraline pans of 0.018-inch to 0.024-inch (0.45 mm to 0.60 mm) aluminum that are snap-locked to the bottom of DXP or DXLP Paralock™ main tees. The system may be used as two-hour fire-resistance-rated assembly as described below. See Table 1 for allowable loads.

The ceiling system consists of the DXLP $1^1/_2$-inch-deep (38.1 mm), bulb-shaped steel main tees spaced at 48 inches (1219 mm) on center with $1^1/_2$-inch-deep (38.1 mm), DXL steel cross tees spaced at 24 inches (610 mm) on center, suspended by No. 12 gage galvanized steel hanger wires, 19 inches (482.6 mm) below minimum No. 20 gage fluted, or No. 22/22 gage cellular, $1^1/_2$-inch-deep (38.1 mm) steel decks. The decks must have $3^1/_2$-inch-wide (89 mm) flutes spaced at 6 inches (152.4 mm) on center. Allowable loading on the steel decks must be based on noncomposite design. When the deck is covered with $2^1/_2$-inch-thick (63.5 mm), 4,500 psi (31 MPa), normal-weight concrete, the assembly has a two-hour fire-resistive rating. The steel decks are supported by minimum W8 × 15 steel beams. The hanger wires are spaced a maximum of 48 inches (1219 mm) on center along each main runner adjacent to the intersection with cross tees; at the four corners of grid framing modules containing light fixtures and/or air boots; the main runners, at all four corners of air boots; at the center of all cross tees located adjacent to and parallel with walls; and within 6 inches (152.4 mm) of each main runner splice location. The following light fixtures may be used individually or mixed, as described below:

1. Nominally 24-inch-by-48-inch (610 mm by 1219 mm) fixtures spaced so that the area does not exceed 20 square feet (1.85 $m^2$) per 100 square feet (9.25 $m^2$) of ceiling area.

2. Nominally 9-inch-by-48-inch (228.6 mm by 1219 mm) fixtures spaced so that the number of fixtures does not exceed nine per 200 square feet (18.6 $m^2$) of ceiling area.
3. Nominally 5-inch-by-48-inch (127 mm by 1219 mm) fixtures spaced so that the number of fixtures does not exceed six per 100 square feet (9.25 $m^2$) of ceiling area.

Nominally 4-foot-long (1219 mm) Donn Paraline air boots with 6-inch-diameter (152.4 mm) inlets may also be used in the system. Spacing of air boots must not exceed one per 100 square feet (9.25 $m^2$) of ceiling area.

All light fixtures must be completely enclosed with $^5/_8$-inch-thick (15.8 mm), Type FR-83 (s) acoustical boards manufactured by USG Interiors, LLC, that are held together with three 6d nails on each side. The same acoustical board, 24 inches by 48 inches (610 mm by 1219 mm), is laid in between all cross tees and main runners.

Hold-down clips are placed over the cross tees symmetrically at 2 feet (610 mm) on center when the acoustical material weighs less than 1 psf (4.9 kg/$m^2$). Access clips may be used in lieu of hold-down clips, where required.

The Paraline plain or perforated metal pans Types PAR, PASP and PARP (aluminum pans) are for use with the two-hour fire rating.

**4.2.3 Donn Fineline (DXLF) Ceiling Suspension System:**

**4.2.3.1 One-hour Fire-resistance-rated Floor-ceiling System:** The Donn Fineline suspension system is designed to support acoustical panels in one-hour fire-resistive floor-ceiling assemblies as noted in Figure 4. The main runners, 4-foot-long (1219 mm) cross tees and 2-foot-long (610 mm) cross tees are designated DXLF-29, DXLF-429 and DXLF-229, respectively. The overall depths and thicknesses of the runners and cross tees are described in Table 1.

**4.2.3.2 One-hour Fire-resistance-rated Roof-ceiling System:** The same framing members described in Section 4.2.3.1 of this report may be used as part of a one-hour fire-resistive, restrained, roof-ceiling assembly that may be described as follows: The main runners are spaced 4 feet (1219 mm) on center. Cross tees, 4 feet (1219 mm) long, are spaced 2 feet (610 mm) on center and inserted into main runners. Cross tees 2 feet (610 mm) long are inserted perpendicular to the 4-foot (1219 mm) cross tees and spaced to provide 24-inch-by-24-inch (610 mm by 610 mm) modules. Ceiling panels are USG Interiors, LLC, GR-1(s) perforated, with dimensions of 24 inches by 24 inches by $^3/_4$ inch thick (610 by 610 by 19.05 mm). Panels at walls are supported by No. 26 gage steel angles with $^{13}/_{16}$-inch (30.16 mm) and $^5/_8$-inch (15.8 mm) legs.

The roof consists of minimum No. 22 gage, 1$^1/_2$-inch-deep (38.1 mm), galvanized steel deck, with flutes at 6 inches (152.4 mm) on center. Steel joists, 10 inches (254 mm) deep, are spaced 48 inches (1219 mm) on center. Decking is secured to the joists with $^1/_2$-inch-diameter (12.7 mm) puddle welds through weld washers at 12 inches (305 mm) on center. Water-resistant core gypsum sheathing complying with ASTM C1396, 4 feet (1219 mm) wide and $^5/_8$ inch (15.8 mm) thick, is placed with the long dimension perpendicular to the deck.

Board end joints must be staggered a minimum of 1 foot (305 mm) from adjacent courses. Optional mineral and fiber insulation boards manufactured by Manville comprise the roof insulation. The boards are a minimum of 24 inches by 48 inches by 1 inch thick (610 by 1219 by 25.4 mm). The first layer is placed perpendicular to the gypsum sheathing with end joints staggered a minimum of 2 feet (610 mm) from adjacent courses. Subsequent insulation board layers must have all joints staggered from adjacent layers a minimum of 12 inches (305 mm). The first two layers are secured through the gypsum sheathing into the decking with 3$^1/_4$-inch-long (82.55 mm) screws having 0.203-inch-diameter (5.15 mm) shanks. The screws have a special tip that locks against the steel deck underside. The screws are placed through 2$^1/_8$-inch-diameter (54 mm), 0.030-inch-thick (0.76 mm) steel discs at each board corner. Additional insulation board layers are adhered with hot asphalt or coal-tar pitch at a rate not exceeding 25 pounds per square. A Class A, B or C built-up roof covering is applied over the insulation. The suspended ceiling framing system is hung by No. 12 gage galvanized steel wires, 48 inches (1219 mm) on center, tied to main runners and bottom chord of steel joists. The soffit of the ceiling must be suspended a minimum of 20 inches (508 mm) below the bottom of the roof deck and a minimum of 10 inches (254 mm) below the steel joists.

**4.2.4 Donn Centricitee (DXLT) One-hour Fire-resistance-rated System:** The Donn DXLT Centricitee exposed grid system is designed to support lay-in acoustical panels in a one-hour fire-resistive floor-ceiling assembly. See Figure 4 for a description. The main runners, 4-foot-long (1219 mm) cross tees and 2-foot-long (610 mm) cross tees are designated as DXLT-24, DXLT-424, DXLT-218 and DXLT-222, respectively. The overall depths and thicknesses of the runners and cross tees are described in Table 1.

**4.3 Special Inspection:**

Where special inspections are required by the building official, suspended ceilings in Seismic Design Categories C, D, E and F, shall be subject to periodic special inspections during the installation of the suspended ceiling systems and their anchorage, in accordance with the following requirements: For installations in accordance with Section 4.1.4 of this report, special inspection must be conducted as required by the building official during enforcement of the 2012 IBC Sections 1705.1.1, 1705.11.4 and Section 1705.12; 2009 IBC Section 1704.15, 1708.4 and Item 3 of Section 1708.1; 2006 IBC Section 1704.13, 1708.5 and Item 3 of Section 1708.2, as applicable. For installations in accordance with Section 4.1.4 of this report, special inspections must be conducted as required by the building official during enforcement of the 2021, 2018 and 2015 IBC sections 1705.1.1, 1704.5 and 1705.13.2. For installations in accordance with Section 4.1.3, there must be compliance with the following: Section 13.5.6.2.2 (h) of ASCE 7-05, and 2009 IBC Section 1705.3.4, Item 3 for the 2009 IBC; Section 13.5.6.2.2 (h) of ASCE 7-05, and 2006 IBC Section 1705.3, Item 4.3 for the 2006 IBC, as applicable. The special inspector must verify that the ceiling system is as described in this report, and complies with the installation instructions in this report, and with the approved construction documents.

Where special inspections are required by the building official, a statement of special inspections must be provided as required in 2021, 2018, 2015 and 2012 IBC Section 1704.3 (2009 IBC Section 1705.3.4, Item 3; and 2006 IBC Section 1705.3, Item 4.3).

## 5.0 CONDITIONS OF USE

The USG suspended ceiling framing systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

**5.1** The ceiling suspension main runners, cross runners, ACM7 clips, MAC2 clips and seismic compression post

are fabricated and installed in accordance with this report and the manufacturer's published installation instructions. In the event of a conflict between the manufacturer's installation instructions and this report, this report governs.

**5.2** Design loads and spans of main and cross runners must comply with Table 1 of this report.

**5.3** Suspended ceiling systems must be designed in accordance with ASCE 7, Section 13.5.6, as referenced by IBC Section 1613. The documents must be prepared by a registered design professional where required by statutes of the jurisdiction in which the project is to be constructed.

**5.4** Where required by the building official, special inspections must be provided in accordance with Section 4.3 of this report.

**5.5** The ceiling framing systems must not be used to provide lateral support for walls or partitions, except as provided for in ASCE 7, Section 13.5.8.1, as referenced in IBC Section 1613.

**5.6** The ceiling systems must be braced to resist seismic forces as determined from Section 1613 of the IBC.

**5.7** The supporting construction for the ceiling system has not been evaluated and is outside the scope of this report. The code official must approve the floor or roof construction supporting the suspended ceiling system.

**5.8** The ceiling systems are limited to ceilings not considered accessible in accordance with Item 29 of 2021 IBC Table 1607.1, Item 28 of 2018, 2015 and 2012 IBC Table 1607.1 (Item 31 of 2009 IBC Table 1607.1, Item 32 of 2006 IBC Table 1607.1), as applicable.

**5.9** The ceiling systems are limited to interior application. For exterior ceiling installations, the ceiling systems must be designed for wind loads and with due consideration of atmospheric conditions.

**5.10** Lay-in ceiling panels must be justified to the satisfaction of the code official as complying with the interior finish requirements of Chapter 8 of the applicable code.

**5.11** Lighting fixtures and mechanical services must be as described in Section 4.1.3.

## 6.0 EVIDENCE SUBMITTED

**6.1** Data in accordance with the ICC-ES Acceptance Criteria for Suspended Ceiling Framing Systems (AC368), dated November 2019 (editorially revsed March 2021).

**6.2** Data in accordance with the ICC-ES Acceptance Criteria for Seismic Certification by Shake-table Testing of Nonstructural Components (AC156), dated October 2010 (editorially revised December 2020).

**6.3** Reports of fire-resistance tests in accordance with ASTM E119.

## 7.0 IDENTIFICATION

**7.1** Cartons of framing members, ACM7 clips, MAC2 clips, seismic compression posts and accessories are identified with the name and address of USG Interiors, LLC, the manufacturing location, the framing member designations and the evaluation report number (ESR-1222).

**7.2** The report holder's contact information is the following:

**USG INTERIORS, LLC**
**550 WEST ADAMS STREET**
**CHICAGO, ILLINOIS 60661**
**(800) 874-4968**
**www.usg.com**
**usg4you@usg.com**

**TABLE 1—DIMENSIONS AND ALLOWABLE LOADS FOR FRAMING MEMBERS**

| Item Number | Profile Type (figure 6) | Part Number | Member | Load Classification | Length of Member (inches) nominal | Height of Member (inches) | Maximum Span (inches) | Simple Span (pounds per lineal foot) | Required Lateral Support (inches on center) |
|---|---|---|---|---|---|---|---|---|---|
| **DONN® Brand Exposed and Concealed Ceiling Suspension Systems** | | | | | | | | | |
| 1[1] | A | DX-24 SDX-24 | Main Tee | Intermediate Duty | 144 | 1.64 | 48 | 12 | 24 |
| 1a*[1] | A | DXL-24 SDXL-24 | Main Tee | Intermediate Duty | 144 | 1.64 | 48 | 12 | 24 |
| 2[2] | A | DX-26 | Main Tee | Heavy Duty | 144 | 1.64 | 48 | 16 | 24 |
| 2a*[2] | A | DXL-26 | Main Tee | Heavy Duty | 144 | 1.64 | 48 | 16 | 24 |
| 3[3] | C | DX-216 SDX-216 | Cross Tee | | 24 | 1.00 | 24 | – | |
| 3a*[3] | C | DXL-216 SDXL-216 | Cross Tee | | 24 | 1.00 | 24 | – | |
| 4 | C | DX-416 SDX-416 | Cross Tee | | 48 | 1.00 | 48 | 4.2 | |
| 5 | B | DX-422 SDX-422 | Cross Tee | | 48 | 1.50 | 48 | 9.1 | |
| 6[4] | B | DX-424 SDX-424 | Cross Tee | | 48 | 1.50 | 48 | 12 | |
| 6a*[4] | B | DXL-424 SDXL-424 | Cross Tee | | 48 | 1.50 | 48 | 12 | |
| 7 | B | DX-426 | Cross Tee | | 48 | 1.50 | 48 | 16 | |
| 8 | B | DX-522 | Cross Tee | | 60 | 1.50 | 60 | 4.3 | 60 |
| 9*[5] | B | DXL-524 | Cross Tee | | 60 | 1.50 | 60 | 7.15 | 60 |
| **DONN® Brand Exposed Ceiling Suspension Systems with Aluminum Cap or Environmental** | | | | | | | | | |
| 10* | A | DXLA-24 | Main Tee | Intermediate Duty | 144 | 1.64 | 48 | 12 | 24 |
| 11* | A | DXLA26 | Main Tee | Heavy Duty | 144 | 1.64 | 48 | 16 | 24 |
| 12* | C | DXLA-216 | Cross Tee | | 24 | 1.00 | 24 | – | 24 |
| 13* | B | DXLA-424 | Cross Tee | | 48 | 1.50 | 48 | 12 | |
| 14* | A | ZXLA-24 | Main Tee | Intermediate Duty | 144 | 1.64 | 48 | 12 | 24 |
| 15* | A | ZXLA-26 | Main Tee | Heavy Duty | 144 | 1.64 | 48 | 16 | 24 |
| 16* | B | ZXLA-224 | Cross Tee | | 24 | 1.50 | 24 | – | |
| 17* | B | ZXLA 424 | Cross Tee | | 48 | 1.50 | 48 | 12 | |
| **DONN® PARALINE™ Brand Linear Metal Ceiling Suspension System** | | | | | | | | | |
| 18*[6] | | DXLP | Main Tee | Heavy Duty | 145 | 1.51 | 48 | 12 | 24 |
| **DONN® FINELINE® Brand Exposed Ceiling Suspension Systems** | | | | | | | | | |
| 19 | F | DXFF-2924 | Main Tee | Intermediate Duty | 144 | 1.80 | 48 | 12 | 24 |
| 20 | G | DXFFH-2924 | Main Tee | Heavy Duty | 144 | 1.80 | 48 | 16 | 24 |
| 21 | F | DXFF-229 | Cross Tee | | 24 | 1.80 | 24 | – | 24 |
| 22 | F | DXFF-429N | Cross Tee | | 48 | 1.80 | 48 | 12 | 48 |
| 23 | F | DXFF-529N | Cross Tee | | 60 | 1.80 | 60 | 7.2 | 30 |
| 24 | D | DXF-2930 | Main Tee | Intermediate Duty | 144 | 1.80 | 48 | 12 | 24 |
| 25 | E | DXFH-2930 | Main Tee | Heavy Duty | 144 | 1.80 | 48 | 16 | 24 |
| 26[7] | D | DXF-129 | Cross Tee | | 12 | 1.80 | 12 | – | 12 |
| 27[7] | D | DXF-229 | Cross Tee | | 24 | 1.80 | 24 | – | 24 |
| 28[7] | D | DXF-30 | Cross Tee | | 30 | 1.80 | 30 | – | 30 |
| 29[7] | D | DXF-429N | Cross Tee | | 48 | 1.80 | 48 | 12 | 24 |
| 30[7] | D | DXF-529N | Cross Tee | | 60 | 1.80 | 60 | 6.9 | 30 |
| 31*[7] | D | DXLF-2924 | Main Tee | Intermediate Duty | 144 | 1.80 | 48 | 12 | 24 |
| 32*[7] | D | DXLF-229 | Cross Tee | | 24 | 1.80 | 24 | – | 24 |
| 33*[7] | D | DXLF-429N | Cross Tee | | 48 | 1.80 | 48 | 12 | 24 |

**TABLE 1—DIMENSIONS AND ALLOWABLE LOADS FOR FRAMING MEMBERS (Continued)**

| Item Number | Profile Type (figure 6) | Part Number | Member | Load Classification | Length of Member (inches) nominal | Height of Member (inches) | Maximum Span (inches) | Simple Span (pounds per lineal foot) | Required Lateral Support (inches on center) |
|---|---|---|---|---|---|---|---|---|---|
| **DONN® CENTRICITEE® Brand Exposed Ceiling Suspension Systems** | | | | | | | | | |
| 34 | H | DXT-24 | Main Tee | Intermediate Duty | 144 | 1.50 | 48 | 12 | 24 |
| 35* | H | DXLT-24 | Main Tee | Intermediate Duty | 144 | 1.50 | 48 | 12 | 24 |
| 36 | I | DXT-26 | Main Tee | Heavy Duty | 144 | 1.64 | 48 | 16 | 24 |
| 37 | H | DXT-524 | Cross Tee | | 60 | 1.50 | 60 | 6.7 | 30 |
| 38[8] | H | DXT-424 | Cross Tee | | 48 | 1.50 | 48 | 12 | 24 |
| 38a*[8] | H | DXLT-424 | Cross Tee | | 48 | 1.50 | 48 | 12 | 24 |
| 39 | H | DXT-422 | Cross Tee | | 48 | 1.50 | 48 | 3.8 | 48 |
| 40[10] | H | DXT-222 | Cross Tee | | 24 | 1.50 | 24 | – | 24 |
| 40a*[10] | H | DXLT-222 | Cross Tee | | 24 | 1.50 | 24 | – | 24 |
| **DONN® Identitee™ Brand Exposed Ceiling Suspension System** | | | | | | | | | |
| 41 | L | DXI-24HRC | Main Tee | Intermediate Duty | 144 | 1.82 | 48 | 12 | 12 from center |
| 42 | L | DXI-26HRC | Main Tee | Heavy Duty | 144 | 1.82 | 48 | 16 | 12 from center |
| 43 | L | DXI-424HRC | Cross Tee | | 48 | 1.82 | 45 | 9.9 | |
| **DONN® Brand Non-Rated Exposed Suspended Ceiling Systems** | | | | | | | | | |
| 44 | K | DXW 26 | Main Tee | Heavy Duty | 144 | 1.50 | 48 | 16 | 24 |
| 45 | K | DXW 224 | Cross Tee | | 24 | 1.50 | 24 | – | 24 |
| 46 | K | DXW 424 | Cross Tee | | 48 | 1.50 | 48 | 13.4 | 48 |
| 47 | K | DXCE-24 | Main Tee | Intermediate Duty | 144 | 1.64 | 48 | 12 | 24 |
| 48 | K | DXCE-224 | Cross Tee | | 24 | 1.50 | 24 | – | N/A |
| 49 | K | DXCE-424 | Cross Tee | | 48 | 1.50 | 48 | 12 | N/A |
| 50 | K | DXWCE 26 | Main Tee | Heavy Duty | 144 | 1.50 | 48 | 16 | 24 |
| 51 | K | DXWCE 224 | Cross Tee | | 24 | 1.50 | 24 | – | 24 |
| 52 | K | DXWCE 424 | Cross Tee | | 48 | 1.50 | 48 | 13.4 | 48 |
| **USG CELEBRATION TORSION SPRING, USG CEILINGS PLUS ILLUSIONS AND USG CEILINGS PLUS EXPANSE SYSTEMS** | | | | | | | | | |
| 53 | A | DXL-26 | Main Tee | Heavy Duty | 144 | 1.64 | 48 | 16 | 24 |
| 54[10] | B | TSCP26 | Main Tee | Heavy Duty | 144 | 1.50 | 48 | 16 | 24 |
| 55 | A | DX 24 | Main Tee | Intermediate Duty | 144 | 1.64 | 48 | 12 | 24 |
| 56 | A | DXL-24 | Main Tee | Intermediate Duty | 144 | 1.64 | 48 | 12 | 24 |
| 57 | A | TSCT22 | Cross Tee | | 24 | 1.64 | 21 | – | N/A |
| 58 | A | TSCT 44 | Cross Tee | | 48 | 1.64 | 45 | 11.2 | N/A |
| 59 | A | TSCT 66 | Cross Tee | | 72 | 1.64 | 69 | 4.4 | N/A |
| **USG CELEBRATION SNAP-IN SYSTEM** | | | | | | | | | |
| 60 | D | DXF-29 | Main Tee | Intermediate Duty | 144 | 1.80 | 48 | 12 | 24 |
| 61 | E | DXFH-29 | Main Tee | Heavy Duty | 144 | 1.80 | 48 | 16 | 24 |
| 62 | D | DXF-229 | Cross Tee | | 24 | 1.80 | 24 | – | 24 |
| 63 | D | DXF-30 | Cross Tee | | 30 | 1.80 | 30 | – | 30 |
| 64 | D | DXF-329 | Cross Tee | | 36 | 1.80 | 36 | – | 18 |
| 65 | D | DXF-429N | Cross Tee | | 48 | 1.80 | 48 | 12 | 24 |

For **SI:** 1 inch = 25.4 mm; 1 plf = 14.6 N/m.

| | |
|---|---|
| 1 | Items 1 & 1a will be sold as **DX/DXL 24 & SDX/SDXL 24** |
| 2 | Items 2 & 2a will be sold as **DX/DXL 26** |
| 3 | Items 3 & 3a will be sold as **DX/DXL 216 & SDX/SDXL 216** |
| 4 | Items 6 & 6a will be sold as **DX/DXL 424 & SDX/SDXL 424** |
| 5 | Item 9 will be sold as **DX/DXL 524** |
| 6 | Item 18 will be sold as **DXP/DXLP 26** |
| 7 | Items 26-33 can also be found as **DXFEV** with a galvanization Type G90 |
| 8 | Items 38 & 38a will be sold as **DXT/DXLT 424** |
| 9 | Items 40 & 40a will be sold as **DXT/DXLT 222** |
| 10 | Item 54 main runner may be used in USG Ceilings Plus Barz, USG Ceilings Plus Blades and USG Celings Plus Radians suspended ceiling systems. Installation of these systems must be designed by registered design professional. |
| * | Fire-Resistant-Rated |

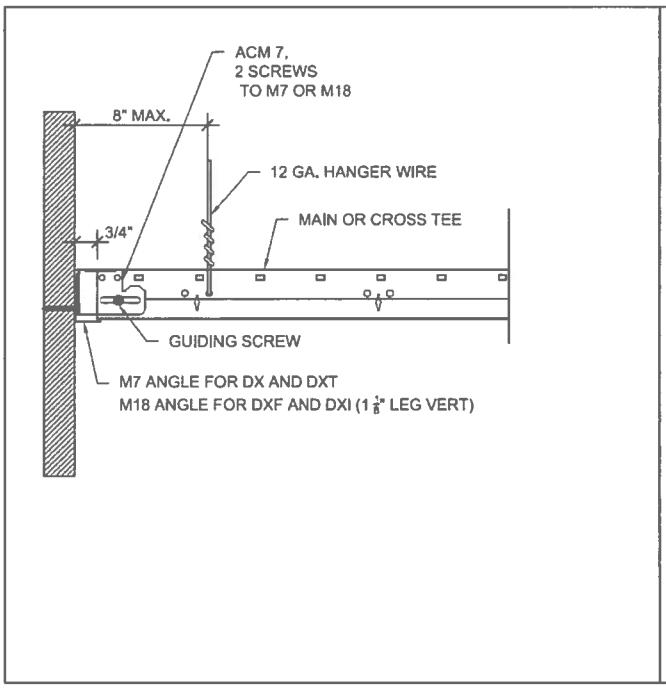



**FIGURE 1—ACM7 CLIP UNRESTRAINED**

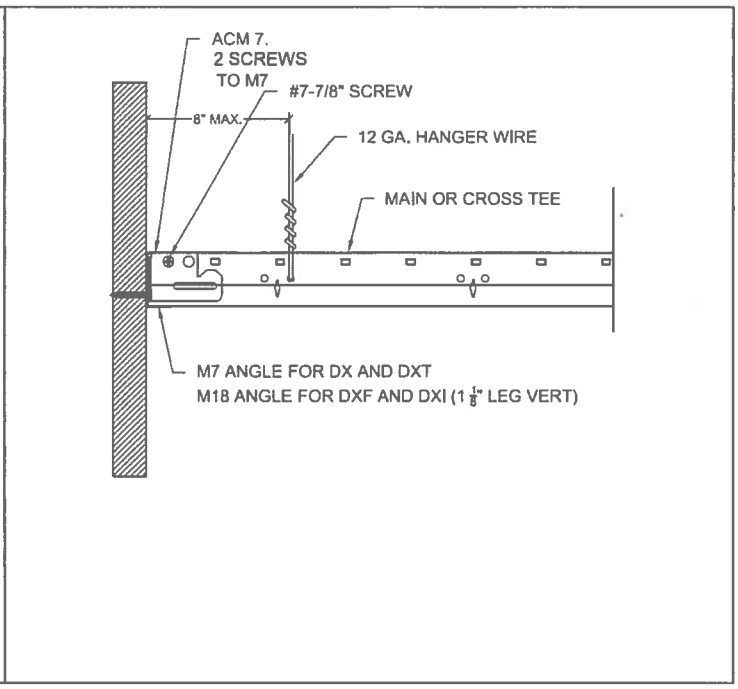



**FIGURE 2—ACM7 CLIP RESTRAINED**

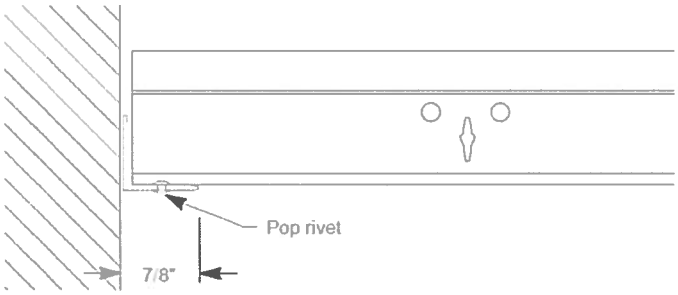



**FIGURE 2B—POP RIVET RESTRAINED (FIXED)**

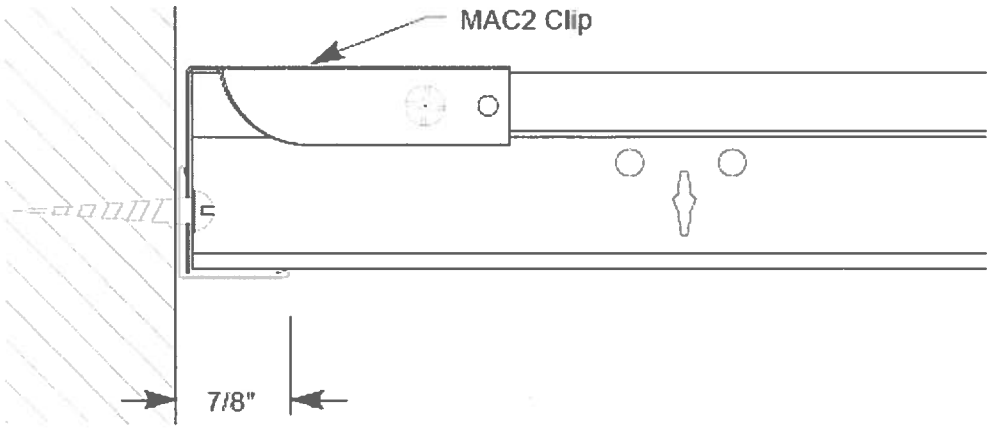



**FIGURE 2C—MAC 2 CLIP RESTRAINED (FIXED)**

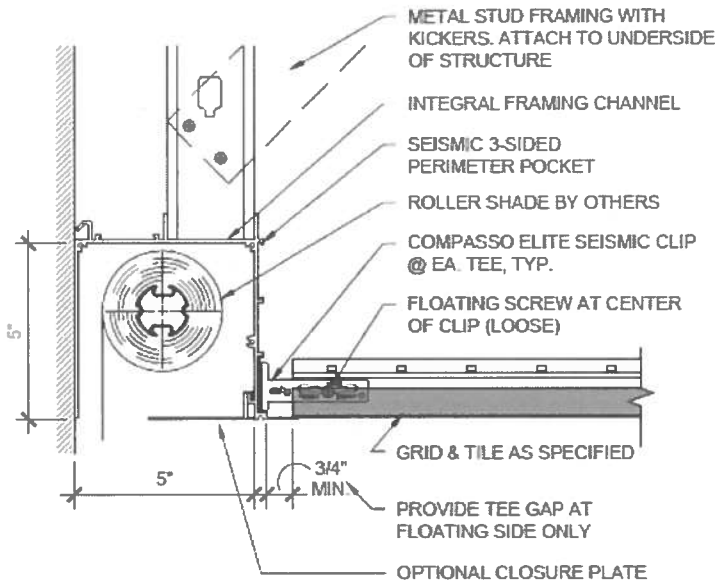



**FIGURE 2D- USG CURTAIN POCKET DETAIL (FLOATING WALL SIDE)**

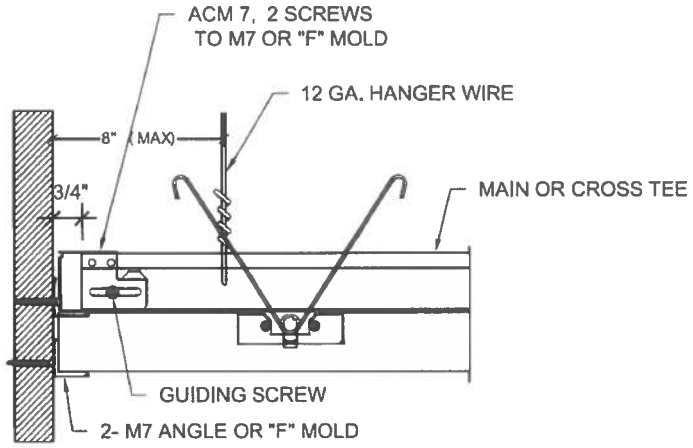



**FIGURE 2E- FLOATING SIDE CELEBRATION TORSION SPRING CEILINGS PLUS ILLUSIONS AND CELINGS PLUS EXPANSE SYSTEMS**

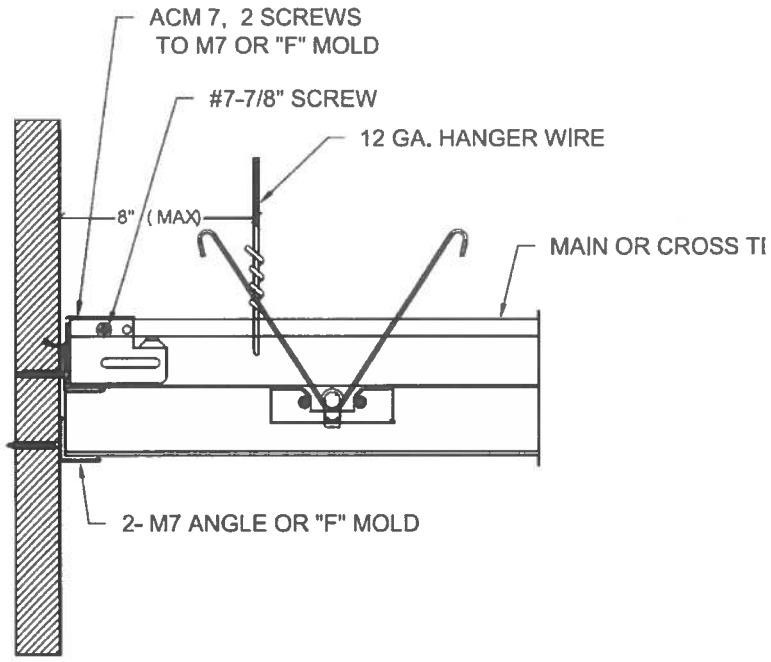



**FIGURE 2F-FIXED SIDE CELEBRATION TORSION SPRING ,CEILINGS PLUS ILLUSIONS AND CEILINGS PLUS EXPANSE SYSTEMS**

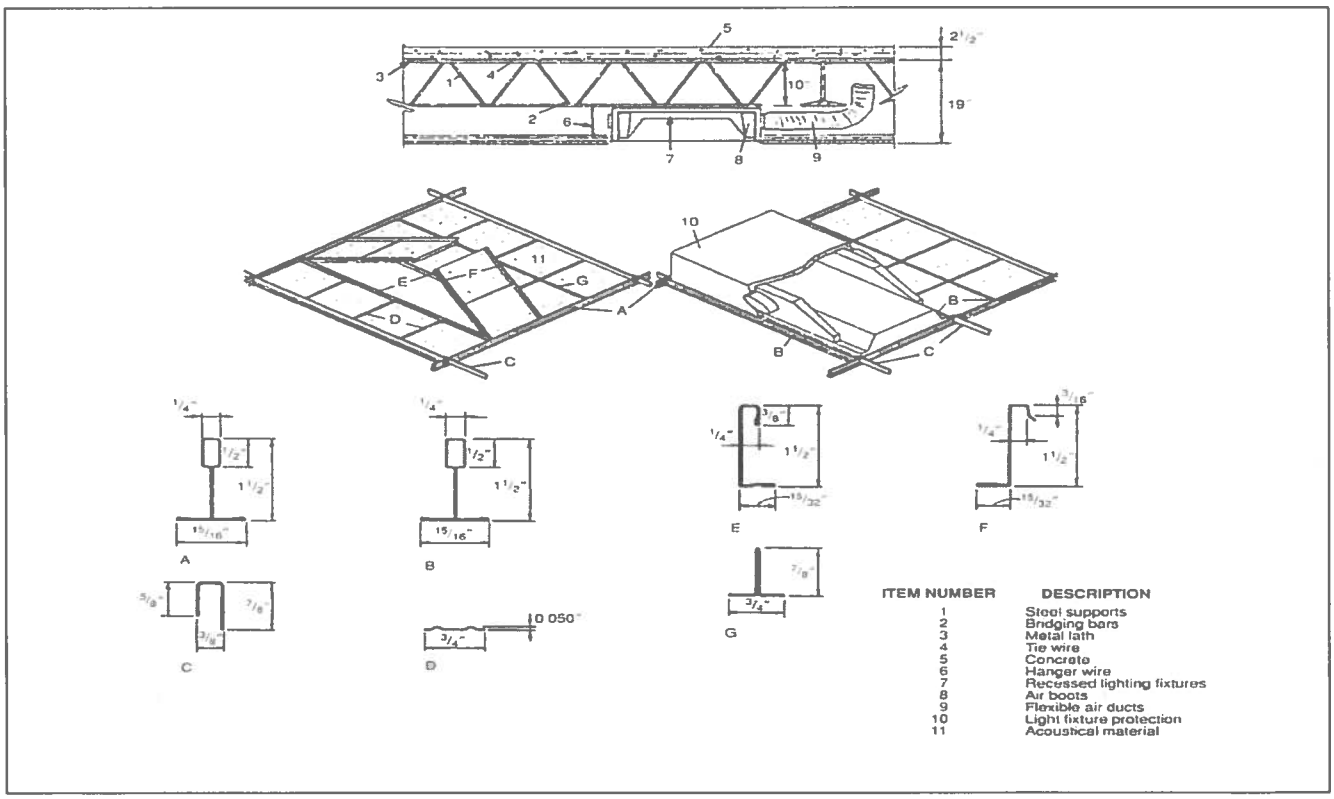
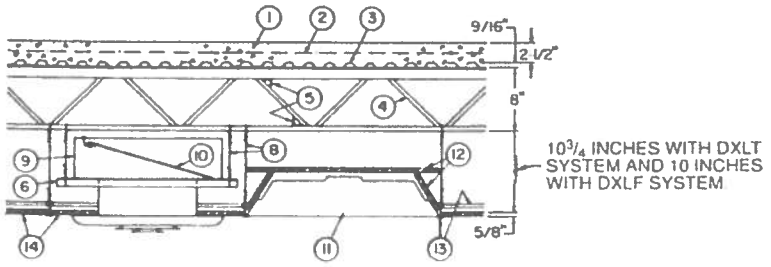



**FIGURE 3—DONN DXL ONE-HOUR FIRE-RESISTANT-RATED AND CONCEALED CEILING SYSTEMS**




1 **Normal-weight Concrete.** Carbonate or siliceous aggregate, 150 ± 3-pcf unit weight, 3,500-psi compressive strength with DXLT system and 2,500 psi with DXLF system.

2 **Welded Wire Fabric.** 6 x 6-W1.4 x W1.4 or heavier.

3 **Steel Form Units.** Minimum $^{9}/_{16}$-inch-deep corrugated unites of minimum No. 24 MSG galvanzied steel, welded to supports with $^{1}/_{2}$-inch puddle welds through welding washers. Welds located at each joist. Adjacent units overlapped one corrugation at the sides.

4 **Steel Joists.** Type 8H3 minimum size; spaced 24 inches on center, welded to end supports.

5 **Bridging.** One by 1-inch steel angles, welded to top and bottom chord of each joist.

6 **Duct Supports.** Nominal 1 by 1 by $^{1}/_{8}$-inch-thick steel angles or No. 16 MSG cold-rolled steel channels, $1^{1}/_{2}$ inches deep, suspended from lower chord of joists with No. 12 SWG galvanized steel wire to form a trapeze. Duct supports must be spaced at 48 inches on center maximum along length of duct and at air duct outlets.

7 **Cold-rolled Channels.** (Not shown)—No. 16 MSG cold-rolled steel channels, $1^{1}/_{2}$ inches deep with $^{9}/_{16}$-inch flanges, located as needed to provide means of attachment for hanger wires located away from steel joists. Placed on top and secured to lower chord of joists with No. 18 SWG galvanized steel wire.

8 **Hanger Wire.** No. 12 SWG galvanized steel wire, twist-tied to lower chord of joists, spaced not over 48 inches on center along main runners adjacent to cross-tee intersections. If not already present, hanger wires shall also be provided at the four corners of light fixtures, at center of cross tees supporting the long sides of light fixtures and at center of cross tees adjacent to air duct outlets.

9 **Air Duct.** No. 22 MSG minimum galvanized steel. Total area of duct openings not to exceed 113 square inches per each 100 square feet of ceiling area. Area of individual duct opening not to exceed 113 square inches. Maximum dimension of opening 12 inches.

10 **Damper.** No. 16 MSG galvanized steel, sized to overlap duct opening 1 inch minimum. Protected on both surfaces with $^{1}/_{16}$-inch-thick ceramic fiber paper and held open with a fusible link.

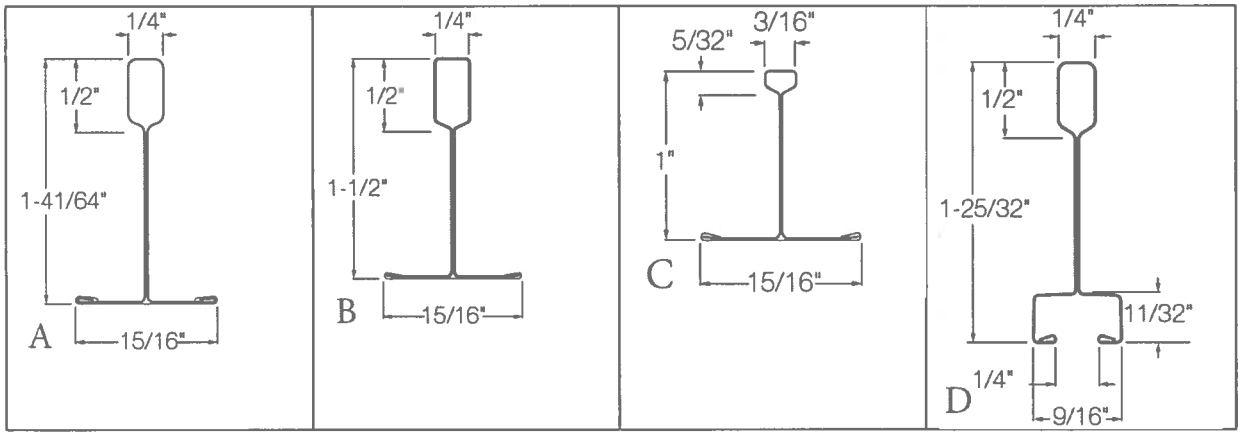
11 **Fixtures, Recessed Light.** Fluorescent lamp-type, steel housing, 2 by 4 foot size with DXLT system and 2 by 2 foot size with DXLF system. Fixtures spaced so their area does not exceed 24 square feet per each 100 square feet of ceiling area. Wired in conformance with the National Electrical Code.

12 **Fixture Protection—Acoustical Materials.** $^{5}/_{8}$-inch-thick USG Acoustical Products Co. GR-1(s) tiles having surface perforations cut into pieces to form a three-sided enclosure with open ends and trapezoidal in cross-section. Fixture protection consists of a $23^{3}/_{4}$-by-$47^{3}/_{4}$-inch top piece, with DXLT system and $23^{3}/_{4}$-by-$23^{3}/_{4}$-inch top piece with DXLF system, two side pieces of a width which will provide a minimum $^{5}/_{8}$ inch clearance between top piece and the fixture housing and are $47^{3}/_{4}$ and $23^{3}/_{4}$ inches long for the DXLT and DXLF systems, respectively. The side pieces are placed against the sides of the fixture and the top piece is placed on top of the side pieces. The pieces are held together by 6d nails near the center and near the ends on each long side of the fixture.

13 **Steel Framing Members.** DXLT or DXLF main runners, nominal 12 feet long spaced 4 feet on center. Cross tees, nominal 4 feet long installed perpendicular to main runners and spaced 2 feet on center. Cross tees, nominal 2 feet long, installed perpendicualr to the 4-foot cross tees and spaced 2 feet on center.

14 **Acoustical Material.** Nominal 24 by 24 by $^{5}/_{8}$-inch-thick USG Acoustical Products Co. GR-1(s) or GR-2(s). Border panels supported at walls by No. 26 MSG painted steel angles with $^{3}/_{4}$-inch and 1-inch legs or channels $1^{5}/_{8}$ inches deep with 1-inch bottom and $^{3}/_{4}$-inch top flanges. (S) = Surface perforations.

**FIGURE 4—DONN DXLT AND DXLF ONE-HOUR FIRE-RATED SYSTEMS**



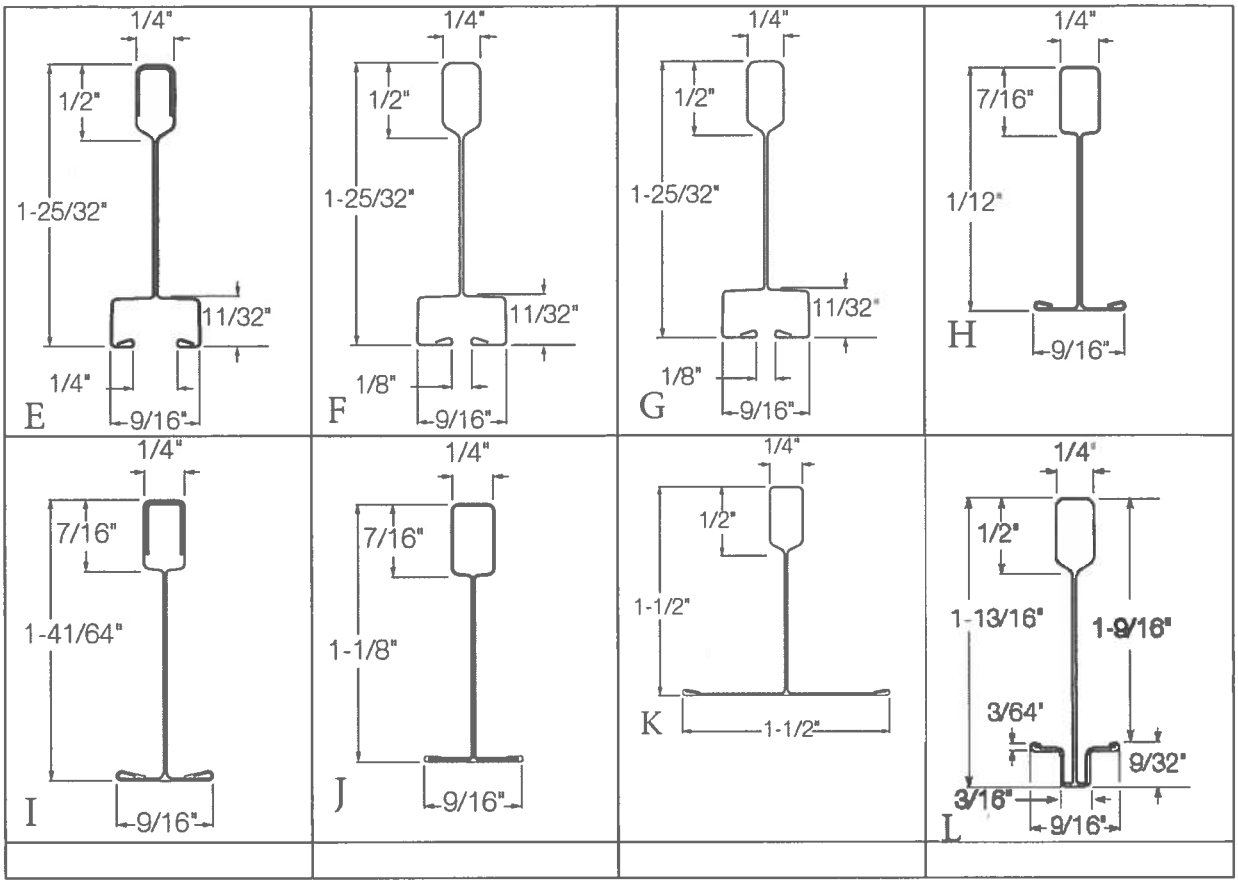



**FIGURE 5—SUSPENSION SYSTEM PROFILES**

# ICC-ES Evaluation Report

# ESR-1222 LABC Supplement

*Reissued December 2021*
*Revised February 2022*
*This report is subject to renewal December 2022.*

www.icc-es.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

**DIVISION: 09 00 00—FINISHES**
**Section: 09 22 26—Suspension Systems**
**Section: 09 53 00—Acoustical Ceiling Suspension Assemblies**

**REPORT HOLDER:**

**USG INTERIOR, LLC**

**EVALUATION SUBJECT:**

**USG DONN® (DX/DXL, DXLA, DXW, DXWCE, DXCE, SDX/SDXL, ZXLA), DONN FINELINE® (DXF), DONN FINELINE 1/8 (DXFF), DONN CENTRICITEE™ (DXT) AND DONN IDENTITEE® (DXI) SUSPENDED CEILING FRAMING SYSTEMS; USG CELEBRATION™ SNAP-IN; USG CELEBRATION™ TORSION SPRING; USG CEILINGS PLUS® ILLUSIONS® AND USG CEILING PLUS® EXPANSE®; USG DONN PARALINE® (DXP AND DXLP) SUSPENDED CEILING SYSTEM; ACM7 AND MAC2 CEILING ATTACHMENT CLIPS; AND PERIMETER SYSTEM: CURTAIN POCKETS**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that the USG Suspended Ceiling Framing Systems, described in ICC-ES evaluation report ESR-1222, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

**Applicable code edition:**

- 2020 *City of Los Angeles Building Code* (LABC)

## 2.0 CONCLUSIONS

The Suspended Ceiling Framing Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-1222, comply with the LABC Chapters 7, 8, 16 and 25, and are subject to the conditions of use described in this supplement.

## 3.0 CONDITIONS OF USE

The USG Suspended Ceiling Framing Systems described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-1222.
- The design, installation, conditions of use and identification of the USG Suspended Ceiling Framing Systems are in accordance with the 2018 *International Building Code®* (IBC) provisions noted in the evaluation report ESR-1222.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Main runners shall be identified by indentation or by nontransferable decal with letters not less than $^1/_4$–inch high, and shall include the company name, runner designation and load rating.

This supplement expires concurrently with the evaluation report, reissued December 2021 and revised February 2022.

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# ICC-ES Evaluation Report

# ESR-1222 CBC Supplement

*Reissued December 2021*
*Revised February 2022*
*This report is subject to renewal December 2022.*

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**DIVISION: 09 00 00—FINISHES**
**Section: 09 22 26—Suspension Systems**
**Section: 09 53 00—Acoustical Ceiling Suspension Assemblies**

**REPORT HOLDER:**

**USG INTERIORS, LLC**

**EVALUATION SUBJECT:**

**USG DONN®(DX/DXL, DXLA, DXW, DXWCE, DXCE, SDX/SDXL, ZXLA), DONN FINELINE®(DXF), DONN FINELINE 1/8 (DXFF), DONN CENTRICITEE™(DXT) AND DONN IDENTITEE® (DXI) SUSPENDED CEILING FRAMING SYSTEMS; USG CELEBRATION™ SNAP-IN; USG CELEBRATION™ TORSION SPRING; USG CEILINGS PLUS® ILLUSIONS® AND USG CEILING PLUS® EXPANSE®; USG DONN PARALINE® (DXP AND DXLP) SUSPENDED CEILING SYSTEM; ACM7 AND MAC2 CEILING ATTACHMENT CLIPS; AND PERIMETER SYSTEM: CURTAIN POCKETS**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that USG suspended ceiling systems, described in ICC-ES evaluation report ESR-1222, have also been evaluated for compliance with the code noted below.

**Applicable code edition:**

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see section 2.1 and 2.2 below

## 2.0 CONCLUSIONS

The USG suspended ceiling systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-1222, comply with CBC Chapters 7, 8, 16 and 25 provided the design and installation are in accordance with the 2018 *International Building Code®* (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 7, 8, 16, 17 and 25, as applicable.

### 2.1. OSHPD:

The USG suspended ceiling systems, described in Section 2.0 through 7.0 of the evaluation report ESR-1222, comply with CBC Chapters 7, 8, 16, 17 and 25, with applicable amendments, and Chapters 16A and 17A, provided the design and installation are in accordance with the 2018 International Building Code (IBC) provisions noted in the evaluation report, and the additional requirements in Sections 2.1.1 through 2.1.2 of this supplement:

**2.1.1.** Conditions of Use:

1. All loads applied shall be determined by a registered structrural engineer and shall comply with applicable loads from CBC Chapter 16 and its amendments, and Chapter 16A.
2. Section 13.5.6.2 of ASCE 7 shall be revised in accordance with CBC Section 1617A.1.21 [OSHPD 1 & 4].
3. Design and installation shall comply with the requirements of OSHPD Preapproved Details (OPD) OPD-0002-13

**2.1.2.** Special Inspection Requirements:

1. Periodic special inspection is required, in accordance with Section 1705A.12.5 of the CBC [OSHPD 1 & 4].

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**2.2. DSA:**

The USG suspended ceiling systems, described in Section 2.0 through 7.0 of th with CBC Chapters 7, 8, 16, 17 and 25, with applicable amendments, and Chap and installation are in accordance with the 2018 International Building Code (II report, and the additional requirements in Sections 2.2.1 through 2.2.2 of this sup

**2.2.1.** Conditions of Use:

1. All loads applied shall be determined by a registered struct applicable loads from CBC Chapter 16 and its amendments, an
2. Section 13.5.6.2 of ASCE 7 shall be revised in accordance with and Section 1617A.1.21 [DSA-SS].
3. Design and installation shall comply with the requirements of DSA IR 25-2.13.

**2.2.1** Special Inspection Requirements:

1. Periodic special inspection is required, in accordance with Sect DSA-SS/CC].

This supplement expires concurrently with the evaluation report, reissued December 20

# DESIGNATED PRE-MODERNIZATION/RENOVATION ASBESTOS AND LEAD SURVEY REPORT

## LOS GATOS HIGH SCHOOL
## 20 HIGH SCHOOL COURT
## LOS GATOS, CA 95030

## LIBRARY BUILDING (BUILDING 300) – WELLNESS CENTER (ROOMS L4 AND L5)

## LGSUHSD – LGHS WELLNESS CENTER MODERNIZATION PROJECT

**Prepared for:**
**LOS GATOS-SARATOGA UNION HIGH SCHOOL DISTRICT**
**17421 FARLEY ROAD WEST**
**LOS GATOS, CA 95030**

APRIL 20, 2022

HazMat Doc Project # 22-055

Prepared by:
HAZMAT DOC
3080 OLCOTT STREET • SUITE 135 D
SANTA CLARA, CA 95054
Tel: 408.748.0055

HazMat Doc

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2. **OBSERVATIONS AND WORK PERFORMED**
3. **SUMMARY OF RESULTS AND RECOMMENDATIONS**

**PART – II**

1. **ASBESTOS SAMPLE RESULTS**
2. **ASBESTOS CHAINS OF CUSTODY**
3. **XRF REPORT**

# PART – I

**OVERVIEW**

HazMat Doc (HMD) has completed a Designated Pre-Modernization/Renovation Asbestos and Lead Survey project at Los Gatos High School (LGHS), located at 50 High School Court, Los Gatos, CA 95030. This work was performed in response to a request by Ms. Sara Wetzel, Project Manager, of Greystone West Company (Greystone), Construction Project Managers to the Los Gatos-Saratoga Union High School District (LGSUHSD), as part of the LGSUHSD – Los Gatos High School – Wellness Center Modernization Project.

The purpose of the Survey was to determine if any materials that may be impacted, (indicated by the Project Managers), as a part of the Modernization/Renovation, would require controls as specified in Title 8, California Code of Regulations (OSHA), sections 1529 (Asbestos) and 1532.1 (Lead). HazMat Doc personnel visited the Site on April 13, 2022. Ms. Wetzel, our Site Contact for this Survey, made all the necessary arrangements for access.

**OBSERVATIONS AND WORK PERFORMED**

This Designated Survey is for a section of one (1) two-story, wood- and steel-framed building on the LGHS campus, identified as the Library Building (Building 300). The Survey was performed for materials/surfaces in the Wellness Center (Classrooms L4-L5 and Hallway) areas, as directed by Ms. Wetzel.

**Asbestos Bulk Sampling**

Eleven (11) suspect bulk asbestos samples were collected during the Survey. Samples were collected from various locations within the above referenced Wellness Center areas. The samples were appropriately bagged, labeled and prepared for delivery. All samples were transported and delivered under chain of custody to EMSL Analytical, Inc., in San Leandro, CA, for Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy (PLM). Sample analysis generated twenty-eight (28) individual layers to be analyzed. Original Laboratory results are enclosed for review and inclusion with the District's records for this Site. Asbestos was not detected in any of the samples analyzed. No Asbestos Abatement Scope of Work was required or developed for this Project.

This Survey is limited to and covers only the accessible materials and surfaces in selected areas, as designated by the District's Project Managers, that could be impacted as part of the Modernization/Renovation Project. However, materials may be present in inaccessible areas and/or not shown on the architectural drawings or in the directions from the Project Managers as surfaces scheduled to be impacted, and therefore are not included in this Report.

**Lead by XRF Readings**

Non-invasive/non-destructive readings were collected from suspect materials/surfaces using a NITON X-Ray Fluorescence Spectrometer (XRF) instrument model XLp-300 during the Survey. Readings were collected from various finishes in and on the Building(s). Paints or coatings found to contain Lead in a concentration equal to or greater than 1.0 micrograms per centimeter squared ($mg/cm^2$) as measured by XRF, are considered Lead-based paints by the Environmental Protection Agency (EPA). No items were found at or exceeding this threshold. No Lead Scope of Work was required or generated for the items identified in the Lead by XRF Report. The XRF Report for this Project is enclosed for review and inclusion with the District's records for this Site.

## OBSERVATIONS AND WORK PERFORMED

### Lead by XRF Readings *(continued)*

This Survey is limited to and covers only the accessible materials and surfaces in selected areas, as designated by the District's Project Managers, that could be impacted as part of the Modernization/Renovation Project. However, materials may be present in inaccessible areas and/or not shown on the architectural drawings or in the directions from the Project Managers as surfaces scheduled to be impacted, and therefore are not included in this Report.

### Hazardous Materials Observations

Additionally, the following known and/or suspect hazardous materials were observed during the Survey, (or the possible presence of concealed materials in relation to visible fixtures):

- Seventy each (70 EA.) fluorescent light fixtures, all with suspect Mercury vapor (gas) containing light tubes and suspect PCB and/or non-PCB containing ballasts in each fixture (L4, L5, and Hallway).

## SUMMARY OF RESULTS AND RECOMMENDATIONS

Since the property is currently occupied, HazMat Doc did NOT perform a destructive survey of the property, i.e., our inspector(s) did not tear into walls or destroy other finishes in order to determine what material, if any, might exist in wall cavities, etc. It is however, recommended that an attempt be made to discover potentially "concealed" material(s) prior to construction activity.

### Asbestos Bulk Sampling

No asbestos was detected in any of the bulk samples collected. However, if any concealed suspect asbestos containing materials are discovered during further investigations prior to demolition/construction activities, they should be tested for asbestos content by appropriately licensed personnel prior to being disturbed to determine removal and disposal requirements. Any friable material, (or materials rendered friable by mechanical removal method), having greater than 1% of asbestos fiber content is considered to be a Regulated Asbestos Containing Material (RACM) by EPA. These materials should be handled by a licensed asbestos abatement contractor, prior to any demolition/modernization/renovation activity that might disturb these materials. Please note, however, that disturbance or abatement of any asbestos containing material (even less than 1%) should be performed by trained, certified, licensed and protected personnel who perform this work in accordance with applicable Regulations.

### Lead by XRF Readings

None of the readings collected from suspect materials/surfaces by XRF indicated the presence of Lead Based Paint or components. However, if any concealed suspect Lead containing materials are discovered during further investigations prior to demolition/construction activities, they should be tested for Lead content by appropriately licensed personnel prior to being disturbed to determine removal and disposal requirements.

The Occupational Safety and Health Administration (OSHA) states that the disturbance of any Lead containing/coated material(s), regardless of the concentration of Lead, is considered a potential hazard. Any trades that might impact these surfaces must be made aware of the presence of Lead. These materials should be handled by appropriately trained and protected personnel who perform this work in accordance with applicable Regulations.

**SUMMARY OF RESULTS AND RECOMMENDATIONS *(continued)***

**Lead Notification**

As directed by the California Department of Public Health (CDPH) in their Lead Hazard Evaluation – Reporting Requirements Reminder dated June 5, 2006 we have submitted the requisite CDPH form 8552 to the Childhood Lead Poisoning Prevention Branch in Richmond, California. A copy of the same CDPH form 8552 is attached to this report for your records.

Please note, this is not a complete survey of asbestos containing materials or of materials/surfaces that may be coated with Lead containing paint for this Site. This Survey has been exclusively focused on those accessible materials/surfaces that are in the areas designated to be impacted as a part of the Modernization/Renovation Project by Ms. Wetzel.

**HazMat Doc**

**Zen Doctor,**
**Project Manager**

# PART – II

# EMSL Analytical, Inc.

**464 McCormick Street San Leandro, CA 94577**

Tel/Fax: (510) 895-3675 / (510) 895-3680

http://www.EMSL.com / sanleandrolab@emsl.com


| | |
|---|---|
| **EMSL Order:** | 092207604 |
| **Customer ID:** | HAZM63 |
| **Customer PO:** | 22-055 |
| **Project ID:** | |

| | | | |
|---|---|---|---|
| **Attention:** | Maheen B. Doctor | **Phone:** | (408) 748-0055 |
| | HazMat Doc | **Fax:** | |
| | 3080 Olcott Street | **Received Date:** | 04/14/2022 9:45 AM |
| | Suite D135 | **Analysis Date:** | 04/16/2022 |
| | Santa Clara, CA 95054 | **Collected Date:** | 04/13/2022 |

**Project:** 22-055 - LGSHSD - LOS GATOS HIGH SCHOOL - LIBRARY BUILDING - WELLNESS CENTER

## *Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy*

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| 055-01-Vinyl Floor Tile<br>*092207604-0001* | HALLWAY 218 / BLUE-GRAY 12" VINYL FLOOR TILE | Blue<br>Non-Fibrous<br>Homogeneous | | 30% Ca Carbonate<br>50% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-01-Mastic 1<br>*092207604-0001A* | HALLWAY 218 / BLUE-GRAY 12" VINYL FLOOR TILE | Yellow<br>Non-Fibrous<br>Homogeneous | | 80% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-01-Leveler<br>*092207604-0001B* | HALLWAY 218 / BLUE-GRAY 12" VINYL FLOOR TILE | Gray<br>Non-Fibrous<br>Homogeneous | 7% Cellulose | 60% Ca Carbonate<br>33% Non-fibrous (Other) | None Detected |
| 055-01-Mastic 2<br>*092207604-0001C*<br>*Result includes a small amount of inseparable attached material* | HALLWAY 218 / BLUE-GRAY 12" VINYL FLOOR TILE | Tan<br>Non-Fibrous<br>Homogeneous | 3% Cellulose | 60% Matrix<br>37% Non-fibrous (Other) | None Detected |
| 055-02-Vinyl Floor Tile<br>*092207604-0002* | HALLWAY 218 / YELLOW AND BROWN ADHESIVE FOR BLUE-GRAY 12" VINYL FLOOR TILE | Blue<br>Non-Fibrous<br>Homogeneous | | 30% Ca Carbonate<br>50% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-02-Mastic 1<br>*092207604-0002A* | HALLWAY 218 / YELLOW AND BROWN ADHESIVE FOR BLUE-GRAY 12" VINYL FLOOR TILE | Yellow<br>Non-Fibrous<br>Homogeneous | | 80% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-02-Leveler<br>*092207604-0002B* | HALLWAY 218 / YELLOW AND BROWN ADHESIVE FOR BLUE-GRAY 12" VINYL FLOOR TILE | Brown/Gray<br>Non-Fibrous<br>Homogeneous | 8% Cellulose | 60% Ca Carbonate<br>32% Non-fibrous (Other) | None Detected |
| 055-02-Mastic 2<br>*092207604-0002C*<br>*Result includes a small amount of inseparable attached material* | HALLWAY 218 / YELLOW AND BROWN ADHESIVE FOR BLUE-GRAY 12" VINYL FLOOR TILE | Tan<br>Non-Fibrous<br>Homogeneous | 2% Cellulose | 70% Matrix<br>28% Non-fibrous (Other) | None Detected |
| 055-03<br>*092207604-0003* | HALLWAY 218 / ADHESIVE FOR 4" RUBBER BASEBOARD | White<br>Non-Fibrous<br>Homogeneous | | 25% Ca Carbonate<br>55% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-04-Ceiling Tile<br>*092207604-0004* | CLASSROOM 220 (L4) / 1' X 1' CEILING TILE | Gray/White<br>Fibrous<br>Homogeneous | 45% Cellulose<br>15% Min. Wool | 20% Perlite<br>20% Non-fibrous (Other) | None Detected |
| 055-04-Adhesive<br>*092207604-0004A* | CLASSROOM 220 (L4) / 1' X 1' CEILING TILE | Yellow<br>Non-Fibrous<br>Homogeneous | | 10% Ca Carbonate<br>70% Matrix<br>20% Non-fibrous (Other) | None Detected |

Initial report from: 04/16/2022 17:09:44

**EMSL Analytical, Inc.**
**464 McCormick Street San Leandro, CA 94577**
Tel/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com / sanleandrolab@emsl.com

| | |
|---|---|
| **EMSL Order:** | 092207604 |
| **Customer ID:** | HAZM63 |
| **Customer PO:** | 22-055 |
| **Project ID:** | |

## *Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy*

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| 055-05-Ceiling Tile<br>*092207604-0005* | CLASSROOM 220 (L4) / YELLOW ADHESIVE FOR 1' X 1' CEILING TILE | Gray<br>Fibrous<br>Homogeneous | 40% Cellulose<br>20% Min. Wool | 20% Perlite<br>20% Non-fibrous (Other) | None Detected |
| 055-05-Adhesive<br>*092207604-0005A* | CLASSROOM 220 (L4) / YELLOW ADHESIVE FOR 1' X 1' CEILING TILE | Yellow<br>Non-Fibrous<br>Homogeneous | | 15% Ca Carbonate<br>65% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-05-Drywall<br>*092207604-0005B* | CLASSROOM 220 (L4) / YELLOW ADHESIVE FOR 1' X 1' CEILING TILE | White<br>Non-Fibrous<br>Homogeneous | | 70% Gypsum<br>30% Non-fibrous (Other) | None Detected |
| 055-06-Drywall Board<br>*092207604-0006* | CLASSROOM 220 (L4) / CEILING - DRYWALL BOARD | White<br>Non-Fibrous<br>Homogeneous | | 70% Gypsum<br>30% Non-fibrous (Other) | None Detected |
| 055-06-Adhesive<br>*092207604-0006A* | CLASSROOM 220 (L4) / CEILING - DRYWALL BOARD | Yellow<br>Non-Fibrous<br>Homogeneous | | 10% Ca Carbonate<br>70% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-07-Drywall Board<br>*092207604-0007* | CLASSROOM 220 (L4) / CEILING - JOINT TAPE AND JOINT COMPOUND FOR DRYWALL BOARD | White<br>Non-Fibrous<br>Homogeneous | | 70% Gypsum<br>30% Non-fibrous (Other) | None Detected |
| 055-07-Joint Tape<br>*092207604-0007A* | CLASSROOM 220 (L4) / CEILING - JOINT TAPE AND JOINT COMPOUND FOR DRYWALL BOARD | Brown/Beige<br>Fibrous<br>Homogeneous | 95% Cellulose | 5% Non-fibrous (Other) | None Detected |
| 055-07-Joint Compound<br>*092207604-0007B* | CLASSROOM 220 (L4) / CEILING - JOINT TAPE AND JOINT COMPOUND FOR DRYWALL BOARD | White<br>Non-Fibrous<br>Homogeneous | | 80% Ca Carbonate<br>20% Non-fibrous (Other) | None Detected |
| 055-08<br>*092207604-0008* | CLASSROOM 220 (L4) / WALL - DRYWALL BOARD (UNDER VINYL WALL COVER) | White<br>Non-Fibrous<br>Homogeneous | | 70% Gypsum<br>30% Non-fibrous (Other) | None Detected |
| 055-09-Drywall Board<br>*092207604-0009* | CLASSROOM 220 (L4) / WALL - JOINT TAPE AND JOINT COMPOUND FOR DRYWALL BOARD (UNDER VINYL WALL COVER) | White<br>Non-Fibrous<br>Homogeneous | | 70% Gypsum<br>30% Non-fibrous (Other) | None Detected |
| 055-09-Joint Tape<br>*092207604-0009A* | CLASSROOM 220 (L4) / WALL - JOINT TAPE AND JOINT COMPOUND FOR DRYWALL BOARD (UNDER VINYL WALL COVER) | Brown/Beige<br>Fibrous<br>Homogeneous | 95% Cellulose | 5% Non-fibrous (Other) | None Detected |

Initial report from: 04/16/2022 17:09:44

**EMSL Analytical, Inc.**
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Tel/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com / sanleandrolab@emsl.com

| | |
|---|---|
| **EMSL Order:** | 092207604 |
| **Customer ID:** | HAZM63 |
| **Customer PO:** | 22-055 |
| **Project ID:** | |

## *Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy*

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| 055-09-Joint Compound<br>*092207604-0009B* | CLASSROOM 220 (L4) / WALL - JOINT TAPE AND JOINT COMPOUND FOR DRYWALL BOARD (UNDER VINYL WALL COVER) | White<br>Non-Fibrous<br>Homogeneous | | 80% Ca Carbonate<br>20% Non-fibrous (Other) | None Detected |
| 055-10-Adhesive<br>*092207604-0010* | CLASSROOM 220 (L4) / OFF-WHITE ADHESIVE FOR 4" RUBBER BASEBOARD (ON VINYL WALL COVER) | Beige<br>Non-Fibrous<br>Homogeneous | | 15% Ca Carbonate<br>60% Matrix<br>25% Non-fibrous (Other) | None Detected |
| 055-10-Vinyl Wall Cover<br>*092207604-0010A* | CLASSROOM 220 (L4) / OFF-WHITE ADHESIVE FOR 4" RUBBER BASEBOARD (ON VINYL WALL COVER) | White/Beige<br>Fibrous<br>Homogeneous | 30% Cellulose | 50% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-10-Compound<br>*092207604-0010B* | CLASSROOM 220 (L4) / OFF-WHITE ADHESIVE FOR 4" RUBBER BASEBOARD (ON VINYL WALL COVER) | White<br>Non-Fibrous<br>Homogeneous | | 80% Ca Carbonate<br>20% Non-fibrous (Other) | None Detected |
| 055-11-Adhesive<br>*092207604-0011* | CLASSROOM 220 (L4) / YELLOW ADHESIVE FOR CARPET (ON WOOD) | Tan<br>Non-Fibrous<br>Homogeneous | | 80% Matrix<br>20% Non-fibrous (Other) | None Detected |
| 055-11-Wood<br>*092207604-0011A* | CLASSROOM 220 (L4) / YELLOW ADHESIVE FOR CARPET (ON WOOD) | Beige<br>Fibrous<br>Homogeneous | 100% Cellulose | | None Detected |

Analyst(s)
*Brianne Franquelin (28)*

Cecilia Yu, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 “Interim Method”) but augmented with procedures outlined in the 1993 (”final”) version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 04/16/2022 17:09:44

OrderID: 092207604

092207604

**HazMat Doc**

# CHAIN-OF-CUSTODY

JOB # 22-055

CLIENT NAME: LGSHSD

PROJECT LOCATION: Los Gatos High School – Library Building - Wellness Center

SAMPLED BY: ZBD DATE: April 13, 2022

TURNAROUND TIME

T-A-T: 72Hour

| Sample # | Location/Type | PLM |
|---|---|---|
| 055-01 | Hallway 218 / Blue-Gray 12" Vinyl Floor Tile | X |
| 055-02 | Hallway 218 / Yellow and Brown Adhesive for Blue-Gray 12" Vinyl Floor Tile | X |
| 055-03 | Hallway 218 / Adhesive for 4" Rubber Baseboard | X |
| 055-04 | Classroom 220 (L4) / 1' x 1' Ceiling Tile | X |
| 055-05 | Classroom 220 (L4) / Yellow Adhesive for 1' x 1' Ceiling Tile | X |
| 055-06 | Classroom 220 (L4) / Ceiling – Drywall Board | X |
| 055-07 | Classroom 220 (L4) / Ceiling – Joint Tape and Joint Compound for Drywall Board | X |
| 055-08 | Classroom 220 (L4) / Wall – Drywall Board *(under vinyl wall cover)* | X |
| 055-09 | Classroom 220 (L4) / Wall – Joint Tape and Joint Compound for Drywall Board*(under vinyl wall cover)* | X |
| 055-10 | Classroom 220 (L4) / Off-White Adhesive for 4" Rubber Baseboard *(on vinyl wall cover)* | X |
| 055-11 | Classroom 220 (L4) / Yellow Adhesive for Carpet *(on wood)* | X |
| | | |



Relinquished By: _____ Date & Time: 4/13/22 Received By: _____ Date & Time: 4/14/22

Relinquished By: _____ Date & Time: _____ Received By: _____ Date & Time: _____

*3080 Olcott Street • Suite 135D • Santa Clara, CA 95054• Tel 408.748.0055*

HazMat Doc
3080 Olcott St. # D135
Santa Clara, CA 95054

**LGSUHSD**
**Los Gatos HS**
Welness Center

HMD Job # 22-055
Apr. 13, 2022

| Reading No | Results | BUILDING | ROOM | LOCATION | SIDE | COMPONENT | SUBSTRATE | COLOR | CONDITION | Pb mg/cm$^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | SHUTTER | | CALIBRATE | | | | | 1.97 |
| 2 | Positive | | INSTRUMENT | | CALIBRATE | | | | | 1.10 |
| 3 | Positive | | INSTRUMENT | | CALIBRATE | | | | | 1.20 |
| 4 | Positive | | INSTRUMENT | | CALIBRATE | | | | | 1.10 |
| 5 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | CEILING VENT | METAL | WHITE | FAIR | 0.00 |
| 6 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | CEILING VENT | METAL | WHITE | FAIR | 0.00 |
| 7 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | 1' x 1' CEILING TILE | FIBER BOARD | WHITE | FAIR | 0.00 |
| 8 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | PROJECTOR SCREEN BOX | METAL | WHITE | FAIR | 0.00 |
| 9 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | PROJECTOR SCREEN BOARD | WOOD | PINK | FAIR | 0.00 |
| 10 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | WALL | VINYL | PINKISH | FAIR | 0.00 |
| 11 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | WALL TRIM | WOOD | WHITE | FAIR | 0.00 |
| 12 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 13 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 14 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 15 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | CABINET | LAMINATE | LT. GRAY | FAIR | 0.00 |
| 16 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | CABINET | LAMINATE | WHITE | FAIR | 0.00 |
| 17 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | CABINET | LAMINATE | BLACK | FAIR | 0.00 |
| 18 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | CABINET DOOR | LAMINATE | LT. GRAY | FAIR | 0.00 |
| 19 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | CABINET DOOR | LAMINATE | WHITE | FAIR | 0.00 |
| 20 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | SOUTH | COUNTERTOP | LAMINATE | BLACK | FAIR | 0.00 |
| 21 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WALL | VINYL | PINKISH | FAIR | 0.00 |
| 22 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WINDOW | METAL | BLACK | FAIR | 0.00 |
| 23 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WINDOW | METAL | BLACK | FAIR | 0.00 |
| 24 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WINDOW SILL | WOOD | WHITE | FAIR | 0.00 |
| 25 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WINDOW TRIM | WOOD | WHITE | FAIR | 0.12 |
| 26 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WINDOW TRIM | WOOD | WHITE | FAIR | 0.07 |
| 27 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WIREMOLD | PLASTIC | BEIGE | FAIR | 0.00 |
| 28 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | COUNTERTOP | LAMINATE | BLACK | FAIR | 0.00 |
| 29 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | CABINET | LAMINATE | LT. GRAY | FAIR | 0.00 |
| 30 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | CABINET | LAMINATE | WHITE | FAIR | 0.00 |
| 31 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | CABINET DOOR | LAMINATE | WHITE | FAIR | 0.00 |
| 32 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | CABINET DOOR | LAMINATE | LT. GRAY | FAIR | 0.00 |
| 33 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WALLBASE | VINYL | BLACK | FAIR | 0.00 |
| 34 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | CEILING LIGHT UNIT | METAL | WHITE | FAIR | 0.00 |
| 35 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | CEILING BEAM COVERED | DRYWALL | WHITE | FAIR | 0.00 |
| 36 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | WEST | WIREMOLD | PLASTIC | WHITE | FAIR | 0.00 |
| 37 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | WIREMOLD | PLASTIC | BEIGE | FAIR | 0.00 |
| 38 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | WALL | VINYL | PINKISH | FAIR | 0.00 |
| 39 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | WINDOW OPERABLE PANEL | METAL | BLACK | FAIR | 0.00 |
| 40 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | WINDOW | METAL | BLACK | FAIR | 0.00 |
| 41 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | WINDOW SILL | WOOD | WHITE | FAIR | 0.09 |
| 42 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | WINDOW TRIM | WOOD | WHITE | FAIR | 0.01 |
| 43 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | WINDOW TRIM | WOOD | WHITE | FAIR | 0.00 |
| 44 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | COUNTERTOP | LAMINATE | BLACK | FAIR | 0.00 |
| 45 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | CABINET | LAMINATE | LT. GRAY | FAIR | 0.00 |
| 46 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | NORTH | CABINET | LAMINATE | WHITE | FAIR | 0.00 |
| 47 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | WALL | VINYL | PINKISH | FAIR | 0.00 |
| 48 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | WALLBASE | VINYL | BLACK | FAIR | 0.00 |
| 49 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | DOOR | WOOD | GRAY-BLACK | FAIR | 0.00 |

Tech:_____
CDPH-ELRC00000728
Pb = Lead
milligrams per sq. cm = mg/cm$^2$

Inst: Niton XLp300
Sr # 110707

Results at or over 1.00 mg/cm$^2$ are deemed lead based paint by HUD/EPA (24 CFR Part 35)

HazMat Doc
3080 Olcott St. # D135
Santa Clara, CA 95054

**LGSUHSD**
**Los Gatos HS**
Welness Center

HMD Job # 22-055
Apr. 13, 2022

| Reading No | Results | BUILDING | ROOM | LOCATION | SIDE | COMPONENT | SUBSTRATE | COLOR | CONDITION | Pb mg/cm$^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | DOORFRAME | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 51 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | WALL | VINYL | PEACH | FAIR | 0.00 |
| 52 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 53 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | CLOCK & SPEAKER UNIT | METAL | WHITE | FAIR | 0.00 |
| 54 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | DOORFRAME | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 55 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | DOOR | WOOD | GRAY-BLACK | CHIPPING | 0.00 |
| 56 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 219 | INTERIOR | EAST | ELECT. PANEL | METAL | GRAY | FAIR | 0.00 |
| 57 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | EAST | ELECT. PANEL | METAL | GRAY | FAIR | 0.00 |
| 58 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | EAST | DOOR | WOOD | GRAY-BLACK | CHIPPING | 0.00 |
| 59 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | EAST | DOORFRAME | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 60 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | EAST | WALL | VINYL | PINKISH | FAIR | 0.00 |
| 61 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | EAST | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 62 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | EAST | CLOCK & SPEAKER BOX | METAL | WHITE | FAIR | 0.00 |
| 63 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WALL | VINYL | PINKISH | FAIR | 0.00 |
| 64 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WALLBASE | VINYL | BLACK | FAIR | 0.00 |
| 65 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WIREMOLD | PLASTIC | BEIGE | FAIR | 0.07 |
| 66 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | CONDUIT PIPE | METAL | OFF-WHITE | FAIR | 0.00 |
| 67 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW | METAL | BLACK | FAIR | 0.00 |
| 68 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW SILL | WOOD | WHITE | FAIR | 0.19 |
| 69 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW TRIM | WOOD | WHITE | FAIR | 0.03 |
| 70 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW TRIM | WOOD | WHITE | FAIR | 0.00 |
| 71 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW TRIM | WOOD | WHITE | FAIR | 0.00 |
| 72 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW TRIM | WOOD | WHITE | FAIR | 0.09 |
| 73 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW SILL | WOOD | WHITE | CHIPPING | 0.00 |
| 74 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW OPERABLE PANEL | WOOD | WHITE | CHIPPING | 0.00 |
| 75 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WINDOW | WOOD | WHITE | CHIPPING | 0.00 |
| 76 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 77 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | SOUTH | WIREMOLD | PLASTIC | WHITE | FAIR | 0.00 |
| 78 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | CONDUIT PIPE | METAL | OFF-WHITE | FAIR | 0.00 |
| 79 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | WALL | VINYL | PINKISH | FAIR | 0.00 |
| 80 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | WALL TRIM | WOOD | WHITE | FAIR | 0.00 |
| 81 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | WALL TRIM | WOOD | WHITE | FAIR | 0.00 |
| 82 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | COUNTERTOP | LAMINATE | BLACK | FAIR | 0.00 |
| 83 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | CABINET | LAMINATE | LT. GRAY | FAIR | 0.00 |
| 84 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | CABINET DOOR | LAMINATE | LT. GRAY | FAIR | 0.00 |
| 85 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | CABINET DOOR | LAMINATE | WHITE | FAIR | 0.00 |
| 86 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | CABINET | LAMINATE | WHITE | FAIR | 0.00 |
| 87 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 88 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 89 | Negative | WELLNESS CENTER BLDG. | CLASSROOM 220 | INTERIOR | NORTH | MARKER BOARD | METAL | WHITE | FAIR | 0.00 |
| 90 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | SOUTH | DOOR | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 91 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | SOUTH | DOORFRAME | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 92 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | SOUTH | WINDOW | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 93 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | SOUTH | 12" x 12" FLOOR TILE | VINYL | BLUE-GRAY | FAIR | 0.00 |
| 94 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | WALL | DRYWALL | WHITE | FAIR | 0.00 |
| 95 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | LOCKER | METAL | LT. BROWN | FAIR | 0.00 |
| 96 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | LOCKER DOOR | METAL | LT. BROWN | FAIR | 0.00 |
| 97 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | DOOR | WOOD | GRAY-BLACK | CHIPPING | 0.00 |
| 98 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | DOORFRAME | METAL | GRAY-BLACK | CHIPPING | 0.01 |

Tech:_____
CDPH-LRC00000728

Inst: Niton XLp300
Sr # 110707

Results at or over 1.00 mg/cm$^2$ are deemed lead based paint by HUD/EPA (24 CFR Part 35)



Pb = Lead
milligrams per sq. cm = mg/cm$^2$

HazMat Doc
3080 Olcott St. # D135
Santa Clara, CA 95054

**LGSUHSD**
**Los Gatos HS**
Welness Center

HMD Job # 22-055
Apr. 13, 2022

| Reading No | Results | BUILDING | ROOM | LOCATION | SIDE | COMPONENT | SUBSTRATE | COLOR | CONDITION | Pb mg/cm$^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 99 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | WALL | DRYWALL | WHITE | FAIR | 0.00 |
| 100 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | LOCKER | METAL | LT. BROWN | FAIR | 0.01 |
| 101 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | LOCKER | METAL | BEIGE | FAIR | 0.00 |
| 102 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | WEST | LOCKER DOOR | METAL | LT. BROWN | FAIR | 0.00 |
| 103 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | NORTH | WALL | DRYWALL | WHITE | FAIR | 0.00 |
| 104 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | NORTH | DOOR | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 105 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | NORTH | DOORFRAME | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 106 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | DOORFRAME | METAL | GRAY-BLACK | CHIPPING | 0.00 |
| 107 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | DOOR | WOOD PANEL | GRAY-BLACK | CHIPPING | 0.00 |
| 108 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | WALL | DRYWALL | WHITE | FAIR | 0.00 |
| 109 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | COLUMN | DRYWALL | WHITE | FAIR | 0.00 |
| 110 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | 1' x 1' CEILING TILE | FIBER BOARD | WHITE | FAIR | 0.01 |
| 111 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | LOCKER | METAL | LT. BROWN | FAIR | 0.00 |
| 112 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | LOCKER | METAL | BEIGE | FAIR | 0.00 |
| 113 | Negative | WELLNESS CENTER BLDG. | HALLWAY 218 | INTERIOR | EAST | LOCKER DOOR | METAL | LT. BROWN | FAIR | 0.01 |
| 114 | Positive | | INSTRUMENT | | CALIBRATE | | | | | 1.20 |
| 116 | Positive | | INSTRUMENT | | CALIBRATE | | | | | 1.10 |
| 117 | Positive | | INSTRUMENT | | CALIBRATE | | | | | 1.10 |

Tech: _____
CDPHERC06000728
Pb = Lead
milligrams per sq. cm = mg/cm$^2$

Inst: Niton XLp300
Sr # 110707

Results at or over 1.00 mg/cm$^2$ are deemed lead based paint by HUD/EPA (24 CFR Part 35)

State of California—Health and Human Services Agency | California Department of Public Health

# LEAD HAZARD EVALUATION REPORT

**Section 1 — Date of Lead Hazard Evaluation** Apr-13-22 (22-055)

**Section 2 — Type of Lead Hazard Evaluation (Check one box only)**

☑ Lead Inspection ☐ Risk assessment ☐ Clearance Inspection ☐ Other (specify) _____

**Section 3 — Structure Where Lead Hazard Evaluation Was Conducted**

| Address [number, street, apartment (if applicable)] | City | County | Zip Code |
|---|---|---|---|
| Los Gatos HS, 20 High School Court | Los Gatos | Santa Clara | 95030 |

Construction date (year) of structure

Type of structure (check one box only)

☐ Multi-unit building ☑ School or daycare ☐ Single family dwelling

☐ Other (specify)_____

**Section 4 — Owner of Structure (if business/agency, list contact person)**

| Name | Telephone number |
|---|---|
| Los Gatos-Saratoga Union High School District | 408-354-2520 |

| Address [number, street, apartment (if applicable)] | City | State | Zip Code |
|---|---|---|---|
| 17421 Farley Road West | Los Gatos | CA | 95030 |

**Section 5 — Results of Lead Hazard Evaluation (check all that apply)**

☑ No lead-based paint detected. ☐ Lead-based paint detected.

☑ No lead hazards detected. ☐ Lead hazards detected.

**Section 6 — Individual Conducting Lead Hazard Evaluation**

| Name | Telephone number |
|---|---|
| Zen B. Doctor | (408) 748-0055 |

| Address [number, street, apartment (if applicable)] | City | State | Zip Code |
|---|---|---|---|
| 3080 Olcott Street, # 135 D | Santa Clara | CA | 95054 |

| CDPH certification number | Signature | Date |
|---|---|---|
| LRC00000728 I/A | | Apr-20-2022 |

Name and CDPH certification number of any other individuals conducting sampling or testing (if applicable)

**Section 7 — Attachments**

A. A foundation diagram or sketch of the structure indicating the specifc locations of each lead hazard or presence of lead-based paint;
B. Each testing method, device, and sampling procedure used;
C. All data collected, including quality control data, laboratory results, including laboratory name, address, and phone number.

*First copy and attachments retained by inspector*

*Second copy and attachments retained by owner*

*Third copy only (no attachments) mailed or faxed to:*

California Department of Public Health
Childhood Lead Poisoning Prevention Branch Reports
850 Marina Bay Parkway, Building P, Third Floor
Richmond, CA 94804-6403
Fax: (510) 620-5656

CDPH 8552 (6/07)

April 20, 2022

Childhood Lead Poisoning Prevention Branch
Reports
850 Marina Bay Parkway, Building P, 3rd Floor
Richmond, CA 94804

**Re: CDPH Form 8552 – Lead Hazard Evaluation Report**

Sir/Madam:

The attached CDPH Form 8552 is being submitted for the XRF Readings and Bulk Chip Samples collected on April 13, 2022, as directed by the "Lead Hazard Evaluation – Reporting Requirements Reminder" dated June 5, 2006 issued by the Lead Hazard Reduction Section, Childhood Lead Poisoning Prevention Branch of the CDPH.

Please note, the work performed was exclusively restricted to those building surfaces that the Owner and/or their Designees have determined would be impacted during the course of the planned renovation. The scope of services was restricted to the designated areas of the school buildings at this Site. All data submitted as part of the attached CDPH form 8552 is restricted to the areas/surfaces inspected. No other inspection has been performed at any other location at this site by the undersigned as part of this project.

Sincerely,

Zen Doctor
CDPH LRC00000728 I/A