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# ADDENDUM 01

| | | | |
|---|---|---|---|
| **TO** | All Plan Holders | **ISSUE DATE** | 15-November-2022 |
| | | **PROJECT #** | 17-005.5 |
| **REGARDING** | **Gault Elementary– New Modular Classroom Building** | **TEXT PAGES** | 67 |
| | | **DRAWINGS** | 2 |
| **DISTRICT** | Santa Cruz City Schools District | **TOTAL PAGES** | 69 |

The information contained herein is issued as an Addendum to the Bid Documents for the Project listed above. All information included herein shall become a part of the Bid Documents for that Project.

All bidders are required to acknowledge this Addendum on their Proposal Documents. Failure to acknowledge receipt of this Addendum shall deem the Proposal unresponsive and the proposal shall be disqualified.

| ITEM | REFERENCE | ACTION | ATTACHMENT |
|---|---|---|---|
| 01 | **Section 01 00 00 Project Description** | **ADD:** *Add the following statement to the 1.03 "General Project Description"*<br>**" The general contractor will be responsible for**<br>• Full coordination with the modular contractor including, but not limited to: preparing the site in time for modular delivery, delivery of modules, connection of utilities, installation of low voltage and fire alarm, work completion and final clean,<br>• Encroachment permits for work in public right-of-way<br>• Purchasing and installation of all kitchen and mechanical equipment identified A0.6<br>• Sanitary sewer line beneath building<br>**Clarification: See attached "Responsibility Matrix" for further scope definition.** | |
| 02 | **Section 01 00 00 Project Description** | **ADD:** *Add the following statement to the 1.08 "Schedule"*<br>***The General Contractor is responsible to have the project ready for the following milestones:***<br>• *Building pad ready to begin foundation work:* ***26 January 2023***<br>• *Module delivery:* ***31 March 2023***<br>• *Site Work: Backfill and utility rough-in:* ***8 may 2023 thru 2 June 2023***<br>• *Site Work: Utility connection, flatwork, elevator connection:* ***26 June thru 31 October 2023*** | |
| 02 | **A0.4 Site Demolition Plan** | **Clarification: Demolition**<br>• As noted during job walk, the 3 rectilinear shapes shown to be demolished in the courtyard are concrete. Each of the 3 areas is 900 SF and have 4 trees to be removed.<br>• Assume there is asphalt concrete beneath all 5 existing portable classroom buildings.<br>• Include the disconnection and removal of 3 existing portables as an Addition Alternate in the Bid form.<br>• "Temporary wood construction barrier" to have Pacific Sound Control "Noise Soaker" or approved equal (STC 33). Contractor responsible for providing frame for sound control. | |
| 03 | **C2.0 Grading and Drainage Plan** | **Clarification: Shoring**<br>• Provide full vertical shoring at building excavation as required by code and Geotechnical Report. | |

| ITEM | REFERENCE | ACTION | ATTACHMENT |
|---|---|---|---|
| | | • Submit a shoring plan to the district's Geotechnical Engineer for review (CC Architect). This submittal must be approved prior to beginning any excavations on site. At a minimum provide shoring at excavations adjacent to the EVA (emergency vehicle access drive), the existing electrical transformer, and parallel to the existing portables<br>• Additional costs due to shoring / over excavation requirements will not be entertained. | |
| **04** | **Civil Specifications Div. 31, 32 & 33** | **ADD:** Specification Divisions 31, 32, 33<br>• See attached specifications. | |
| **05** | **Section 00 30 00 Bid Form** | **ADD**: Unit Pricing<br>**Refer to revised bid form**. Provide unit prices as follows:<br>• Credit per cubic yard of class 2 aggregate (fully compacted) to be deleted from scope<br>• Cost per cubic yard of class 2 aggregate (fully compacted) to be added to scope<br>• Credit pre cubic yard of native fill to be deleted from scope<br>• Cost per cubic yard of native fill to be excavated and removed from site | |
| **06** | **A0.5 A0.7 Gates** | **ADD**: Add the following double gate to the schedule on A0.7:<br>• 6'0x8'0 service access gate Keynote 028.4--no panic hardware.<br>• 2'0"x8'0" perforated metal panels on the fence either of gates 1 & 5<br>**REVISION: 14/A.07: Pedestrian Gate**<br>• Gate frame does not have ornamental pickets. It is constructed per specification 32.31.13.2.02.P and able to support perforated metal, panic hardware and kick plate.<br>**CLARIFICATION**: Revise note on Gate ScheduleA0.7<br>"Refer to A0.5 Architectural Site Plan for gate location and sign placement." | |
| **07** | **E2.1 Electrical Floor Plan** | **REVISE:** See the attached revision of sheet E2.1 | |
| **08** | **A0.6 Mechanical Plan** | **REVISE*:*** See the attached revision of sheet A0.6 | |
| **09** | **Addenda Question Deadline** | **REVISE:** Addenda question deadline is extended until 10 AM Thursday 11/17/2022 | |

**END OF ADDENDUM ITEMS**

**ISSUED BY** Brian Anderson
ba@bartosarchitecture.com

**Exhibit B**
**Santa Cruz City Schools**
**Gault Elementary Scool; Two Story DSA Modular Building**
**Responsibility Matrix**
**May 18, 2021**

| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| **Division 1 - General Requirements** | | | | |
| Temporary Facilites: | X | | | |
| Temporary Site Fencing | X | | | |
| Portable Toilets | X | | | |
| Field Office for Inspector and CM | X | | | |
| Temporary Power Service | X | | | |
| Gas and electrical utility charges for startup and testing | | | X | By District |
| Temporary Water and Phone | X | | | |
| Temporary fire water | X | | | |
| Staging area modules on site | X | | X | |
| Site Security | X | | X | |
| **Division 2 - Site Work** | | | | |
| **Storm Drains:** | | | | |
| Site | X | | | |
| Under Bldgs. Fondation Area Drains | X | | | |
| Storm Drains to RWL/Downsouts | X | | | |
| Above grade RWL/Downspout clean-outs | X | | | |
| Connect RW/Downspouts to SD (Building) | X | | | |
| Connect RW/Downspouts to SD Stairs/Balc. | X | | | |
| Provide/install gutters on buildings | | X | | |
| ~~Connect Condensate Drain to Drywell~~ | ~~X~~ | | | |
| ~~Drywells~~ | ~~X~~ | | | |
| ~~Elevator sump pump (if applicable)~~ | ~~X~~ | | | ~~Not Required~~ |
| **Domestic Water:** | | | | |
| Water Service (within 2' of bldgs.) | X | | | Modular Contractor to stub 2 ft. outside foundation stem wall |
| SOV at buildings | X | | | |
| Connect to buildings | X | | | |
| Chlorination - All Lines | X | | | Including Modular Buildings |
| Domestic piping within bldgs. | | X | | |
| **Sanitary Sewer:** | | | | |
| Site POC (within 5' of bldg.) | X | | | |
| Clean-outs at POC | X | | | |
| Waste manifold under buildings | | X | | Stubbed 2' outside stemwall |
| Connect manifolds to site sewer | X | | | |
| **Landscaping:** | | | | |
| Irrigation | X | | | |

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|---|---|---|---|---|
| Planting | X | | | |
| Fencing footings and columns | X | | | |
| Site Accessoreis/Planters | X | | | |
| ~~Marquee Sign - if applicable~~ | X | | | |
| **Division 3 - Concrete** | | | | |
| **Site Concrete:** | | | | |
| Mow strips around building | X | | | |
| Site Flat Work/Expansion Joints | X | | | 2% Fall Away from Building |
| Curb & Gutter | X | | | |
| ~~Condenser pads~~ | X | | | ~~If applicable~~ |
| Concrete flat work/area drains at ground floor | X | | | |
| ~~Covered walkway footings & columns~~ | X | | | ~~if applicable~~ |
| **Building Concrete:** | | | | |
| Foundation Staking | X | | | |
| Off-haul Footing Spoils - on site | X | | | |
| Modular Building Foundation & Stem Walls | | X | | Site contractor must provide concrete clean-out and wash areas for use by modular contractor |
| 2" Min. Slurry Rodent barrier | | X | | |
| Vent Wells/Access Wells | | X | | Formed and Poured after Buildings Craned and set |
| Elevator/Stairs Foundations | | X | | Final grading must be same as building finish floor |
| Provide/install light weight concrete subfloors within building | | X | | |
| **Division 5 - Metals** | | | | |
| | | | | |
| Covered Walkway/Canopies | | X | | |
| Stair canopies | | X | | if applicable |
| Stairs | | X | | Set at finish floor of building |
| Balcony & Guardrail system | | X | | |
| Handrails | | X | | Handrails attached to the building is provided by the modular contractor, all others are provided by the site contractor |

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**May 18, 2021**

| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| Vent well grates & frames | X | | | Verify T.O. grate is at Finish Floor |
| Provide/install gutters on bldgs. | | X | | |
| DI Grates | X | | | |
| ~~DF Rails on New Building~~ | | | | ~~Not applicable~~ |
| DF Rails at site DF's | X | | | |
| **Division 7 - Thermal & Moisture Protection** | | | | |
| | | | | |
| Building dampproofing & waterproofing | | X | | Above grade conditions only |
| **Division 8 - Openings** | | | | |
| | | | | |
| Doors & frames | | X | | |
| Windows & frames | | X | | |
| Door hardware | | X | | |
| Glazing | | X | | |
| Louvers & vents | | X | | |
| Skylights | | X | | |
| **Division 9 - Finishes** | | | | |
| | | | | |
| Stucco | | X | | |
| Doors/Frames | | X | | |
| Window Frames | | | | Not applicable |
| Building Trim | | X | | |
| Tackable wall panels | | X | | |
| Ceramic tile | | X | | If applicable |
| Ceilings | | X | | |
| Floorings & base | | X | | |
| Wall finishes | | X | | |
| Painting & coatings | | X | | |
| Door frames & doors | | X | | If/where applicable |
| Exterior caulking | | X | | Modular buildings only |
| Interior window sils | | X | | |
| Paintings & coatings | | X | | Modular buildings only |
| **Division 10 - Specialties** | | | | |
| | | | | |
| Building & site ADA signage | X | | | |
| **Division 11 - Equipment** | | | | |
| | | | | |
| Kitchen Room Equipment | X | | | |

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| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| Security equipment<br>- If Applicable | | | X | |
| Educational equipment (smart TVs, WAPs, smartboards, etc.) | | | X | |
| **Division 13 - Special Construction** | | | | |
| **Modular Buildings:** | | | | |
| Engineering & DSA Approval | | X | | |
| Manufacture Buildings/Stairs/Balcony | | X | | Guardrails as per scope |
| Set & Install Buildings/Elevator | | X | | |
| Modular Elevator/Machine room | | X | | |
| Elevator check list | X | | X | See Exhibit C |
| DSA Fees | | | X | |
| In Plant inspection fee's | | | X | |
| Interior Finish | | X | | Exterior & Interior as per scope |
| Transport cost to site | | X | | Special fees not included |
| **Division 21 - Fire Supression** | | | | |
| | | | | |
| Fire Lines & Hydrants | X | | | Back flow prevention device, no hydrants |
| Fire sprinkler system within modular buildings | | X | | |
| Fire sprinkler in Elevator/Machine room | | X | | |
| Fire sprinkler Riser in Building | | X | | |
| Fire sprinkler main connection POC | | X | | |
| Fire sprinkler main to elevator | | X | | From main building |
| Fire sprinkler engineering and design including calculations for DSA approval | | X | | |
| Fire water service | X | | | Site contractor to bring FS line to point of connection. If POC outside of building, terminate 12" above finish grade with a flange. If POC inside building, terminate in crawl space +12" above finish crawl space with flange. After module placement, extend as necessary to +6" above finish floor with flange. |
| Connect bell & flow switch to fire alarm system and provide power | X | | | |
| **Division 22 - Plumbing** | | | | |

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| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| **Storm Drains:** | | | | |
| Site | X | | | |
| Under Bldgs. Fondation Area Drains | X | | | |
| Storm Drains to RWL/Downsouts | X | | | |
| Above grade RWL/Downspout clean-outs | X | | | |
| Connect RW/Downspouts to SD (Building) | X | | | |
| Connect RW/Downspouts to SD Stairs/Balc. | X | | | Connect to modular building per POC drawing |
| Provide/install gutters on buildings | | X | | |
| Connect Condensate Drain to Drywell | X | | | connect to SS, no drywells |
| ~~Drywells~~ | X | | | |
| Elevator sump pump (if applicable) | X | | | Not Required |
| **Domestic Water:** | | | | |
| Water Service (within 2' of bldgs.) | X | | | Modular Contractor to stub 2 ft. outside foundation stem wall, Connect to modular building per POC drawing |
| SOV at buildings | X | | | |
| Connect to buildings | X | | | Connect to modular building per POC drawing |
| Chlorination - All Lines | X | | | Including Modular Buildings |
| Domestic piping within bldgs. | | X | | |
| Plumbing fixtures | | X | | |
| **Sanitary Sewer:** | | | | |
| Site POC (within 5' of bldg.) | X | | | |
| Clean-outs at POC | X | | | |
| Waste manifold under buildings | | X | | Stubbed 2' outside stemwall |
| Connect manifolds to site sewer | X | | | Connect to modular building per POC drawing |
| **Landscaping:** | | | | |
| Irrigation | X | | | |
| **Division 23 - HVAC** | | | | |
| | | | | |
| HVAC piping & pumps within the building | | X | | |
| HVAC supply & return ducts & grills | | X | | |
| Run condensate drains to waste per POC | | X | | |
| HVAC exhaust fans | | X | | |
| HVAC air cleaning devices | | X | | Air filter provided at start-up |
| Thermostats | | X | | |

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**May 18, 2021**

| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| EMS System | X | | | Including thermostats/sensors/controls/ conductors |
| EMS wiring, testing, labeling, devices, etc. to ensure EMS is compatible with new HVAC units | X | | | DDC connection--outside air, discharge temp, room temp, CO2, humidity, and fan operation--to existing Trane Tracer head end. |
| Power for EMS | | X | | |
| Backboxes/J-boxes within wall cavity | | X | | Stubbed 6" above T-bar only |
| EMS sensors/thermostats conductors | X | | | Connect to HVAC units |
| **Division 26 - Electrical** | | | | |
| **Electrical Service:** | | | | |
| Trench and conduit to transformer | X | | | |
| Transformer Pad | X | | | |
| Trench and conduit to MSB | X | | | |
| Main switch board | X | | | |
| Conductors to meter | X | | | |
| **Power & Distribution:** | | | | |
| Transformers | X | | | |
| Distribution switch boards | X | | | |
| Power to buildings | X | | | Wire feeders |
| Building electrical sub panels | | X | | (1) per classroom |
| Provide conduit/conductor in crawl space to energize modular subpanels and conductor from sub-panel to subpanel interior of building | X | | | |
| Connect to building panel including ground rod and ground rod test | X | | | |
| Circuit monitoring | X | | | |
| Panel ID/Circuit ID Labeling | | X | | |
| All electrical within buildings - Less conductors from switchgear to sub-panel and from sub panel to sub panel | | X | | Including breakers within sub panels |
| Provide/pull conductors from 2nd floor subpanel to 1st floor subpanels | X | | | |
| Provide/pull conductors from main panel to subpanels | X | | | |
| **Lighting:** | | | | |
| Site Lighting | X | | | |

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| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| Interior (with occupancy sensors) & exterior building LED light fixtures | | X | | |
| EMS Controls Panel | | | | |
| Interior Light Programming | | X | | |
| Exterior Light Programming | X | | | |
| Conduits Connecting Buiding Wings | X | | | |
| 2x4 Interior LED Lights | | X | | |
| Exterior LED Lights | | X | | |
| Int. Occupancy Sensors/Photo Sensors | | X | | |
| Lighting control & integration to AMS | X | | | If applicable |
| **Division 27 - Low Voltage** | | | | |
| | | | | |
| Conduit & Back boxes-in walls | | X | | stubbed 6" above T-bar |
| Clock/Speaker Back Boxes | | | X | |
| Conduit to bldg./ STC Cabinet | X | | | |
| STC at Bldg. | X | | | |
| Wires/Controls/Devices | X | | | |
| IDF cabinet | X | | | Blocking by AMS |
| Door Security Contact Conduit | X | | | |
| Security Devices | X | | | |
| CATV Systems | X | | | If Applicable |
| Cable trays (If applicable) | X | | | |
| All low voltage devices, Wifi, Data, Fire, Voice, Alarm, CCTV, Clocks, etc. | X | | | |
| Dedicated phone line for elevator | X | | | |
| All low voltage conduts in ceilings other then Fire systems | X | | | |
| **Fire Alarm:** | | | | |
| Bldg. Conduit & Back boxes and supports for devices | | X | | |
| Conduit to bldg. STC Cabinet | X | | | |
| All fire alarm control, and annunciattor panels | X | | | |
| Power for FACP/FAEP | | X | | |
| Terminal Cabinets | X | | | |
| Devices/Conductors/Controls | X | | | |

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| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| FS Flow & Tamper Switches at building riser | X | | | |
| FS Flow & Tamper Switches outside buildings (i.e. bacflow device, PIC, etc." | X | | | |
| FS Alarm Bell | X | | | |
| Conduit Wire for FS Devices | X | | | |
| Connect FS Devices to FA | X | | | |
| Fire extinguisher cabinet - Semi recessed | | X | | |
| Fire Alarm Design | | | X | |
| **Division 28 - Electronic Safety & Security** | | | | |
| **Telephone/Data/Clocks/TV/Intercom/Sec** | | | | |
| New building security system | X | | | Connect devices to existing security system. |
| All new to existing security tie-ins (to be coordinated through the school) | X | | | |
| Testing of all security lines | X | | | |
| Training of district employees for all new devices & equipment | | | X | |
| **Division 31 - Earthwork** | | | | |
| | | | | |
| Excavation/backfill/compaction | X | | | |
| Spoils offhaul for pad excavation | X | | | |
| Rough grading at building perimeter | X | | | |
| Finish grade, including slopes to drain (if applicable) within the Bldg. pad area and re-grading after the form work is removed | X | | | |
| Import/Export fill | X | | | |
| Excavate modular Bldg. foundation pad +/- .1' for 18"Min. crawlspace | X | | | Excavate 5 ft. horizontally past bldg perimeter. Crawl space grade to be set for 2'-5.5" from finish grade to finish floor per drawings. |
| Excavate stairs/elevator foundation footings | | X | | |
| Excavate building/foundation footings | | X | | |
| Haul-off of all foundation/form spoils from site | X | | | To include modular building foundations |
| Provide/install engineered fill per soils report | X | | | if applicable |
| **Division 33 - Asphalt Concrete Paving** | | | | |

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| Description | GC | Modular Contractor | District | Comments |
|---|---|---|---|---|
| | | | | |
| Asphalt cvoncrete paving & slurry seal (power wash prior to seal) | X | | | |
| Driveways, parking stalls & accessories, wheel stops, speed bumps, etc. | X | | | |
| Walkways | X | | | |
| Striping | X | | | |
| **Other:** | | | | |
| Modular Bldg. Downspouts | | X | | |
| Provide/install gutters on bldgs. | | X | | |
| Restroom mirror/grab bars | | X | | AMS to provide mirrors and ADA accessories only |
| Restroom/Classroom accessories | | X | | |
| Construction Keying | | X | | |
| Doors, Door Frames, Door Harware | | X | | |
| Permanent/Master Keying | | | X | |
| Temporary Lock Cores | | X | | |
| Permanent Lock Cores | | | X | |
| Door Card Readers (If applicable) | | | X | |
| Provide Unobstructed truck/crane access to building pads -must support 200ton crane | X | | | |
| Establish/maintain building corners/surveying | X | | | |
| Building Floor covering | | X | | |
| Floor Sealing/Waxing | X | | | |
| Window coverings | | | X | |
| Appliances | X | | | |
| Non-Operable windows | | X | | |
| Furniture | | | X | |
| Projection Screens | | | X | |
| Bldg mounted exterior hose bibbs | | X | | |
| Roof hose bibbs | | X | | |
| Building casework and counters | | X | | |
| Markerboards | | X | | |
| Plumbing Fixtures | | X | | |
| Interior Finishes | | X | | |
| Ceiling Systems | | X | | |
| Stucco Waterproofing & Flashings | | X | | |
| 7/8" Stucco W/Dryvit finish | | X | | |

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|---|---|---|---|---|
| Exterior overhangs/Shade structures | | X | | "Attached to Bldgs." |
| 5" thick concrete floors system from factory | | X | | |
| Transport cost to site | | X | | |
| Crane Fee 200-ton | | X | | |
| A/V Systems | X | | | |
| Interior Signage | X | | | |
| Exterior Signage | X | | | |
| Visual Displays | | | X | |
| Sun Shades | | X | | |
| Water Chlorination | X | | | |
| On Site Security | X | | | |
| Off Site Building Stagging | | | X | |
| Dust Control | X | | | |
| Traffic Control | X | | | |

787 Spreckels Avenue
Manteca CA, 95336
P 209.825.1921

**Exhibit "C"**
**Santa Cruz City Schools**
**Gault Elementary School**
**Two Story DSA Relocatable Building**
**District Elevator Check List**

| DESCRIPTION | RESPONSIBILITY |
|---|---|
| • All electrical must be run in EMT or rigid conduit, for both high and low voltage | GENERAL CONTRACTOR, TYPICAL |
| • All electrical to be terminated and hooked up in disconnect and junction boxes which are provided in the elevator | |
| • The controller cannot be used as a pull box | |
| • All electrical circuits must be hot, smoke detector operational and telephone must have dial tone prior to calling to prepare elevator for final inspection | |
| • Conduit and power locations as directed by American Modular | |
| • Conduit and power up for electrical service to the elevator disconnect | |
| • Conduit and power(s) for the three 110v circuits | |
| • Conduit and power for the smoke detector | |
| • Conduit and line for the telephone | |
| • Detector must have two sets of open dry contacts | |
| • Conduit run from smoke detector to the controller | |
| • Telephone line to be run in conduit to jacks supplied above controller | |
| • Telephone number to be supplied for emergency auto dialing | |
| • All circuits to be dedicated and originate outside of the elevator or the equipment room | |
| • Installation of a drain line and tank or other approved means to deal with sump drain discharge | |
| • Elevator F.A. as required, including smoke detector in machine room and AC for machine room (if required) | |
| • Install Ground Rod in bottom of the elevator tower pit. Attach a bond from ground rod to lug on tower frame | |

All items listed above must be completed before sending a crew to adjust and go through the inspection process. A two-week notice is required to schedule appointments after installation is complete.

State elevator regulations require that the District have a Service Contract. This requires that the elevator be serviced each month. This contract can be arranged with TL Shields or any other selected qualified service contractor. Not having a service contract could affect warranty on the elevator.

**DIVISIONS 31, 32, & 33 – CIVIL SPECIFICATIONS**

**TABLE OF CONTENTS**

**DIVISION 31 – EARTHWORK**

**SECTION 31 23 33- TRENCHING, BACKFILLING, AND COMPACTION**

## PART 1 GENERAL

### 1.1 SUMMARY

A. Provide labor, material, equipment, and services necessary to complete the backfilling Concrete formwork accessories.

1. Select Backfill Material.
2. Aggregate Base.
3. Detectable Tape.
4. Trench Excavation.
5. Pipe Bedding.
6. Trench Backfill.
7. Trench Surfacing

### 1.2 ABBREVIATIONS

A. ASTM: American Society for Testing and Materials.

B. CCR: California Code of Regulations.

C. C.D.T.: California Department of Transportation

### 1.3 DEFINITIONS

A. Engineered Fill

1. Soil or soil-rock material approved by the Project Manager and transported to the site by the Contractor in order to raise grades or to backfill excavations.
2. Contractor shall provide sufficient tests, and a written statement that all materials brought onto the project site comply with specification requirements.

B. Excavation: Consists of the removal of material encountered to subgrade elevations.

C. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below base.

D. Base: The layer placed between the subgrade and surface pavement in a paving system.

E. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure American Society for Testing and Materials (ASTM) D1557, latest edition.

1.4 SYSTEM DESCRIPTION

A. Requirements:
   1. Comply with the recommendations of the Geotechnical Engineer.
   2. Protect existing trees to remain. No grading is permitted under the drip line of protected trees unless approved and under the supervision of an arborist.
   3. Excavations for appurtenant structures, including, but not limited to, manholes, transition structures, junction structure, vaults, valve boxes, catch basins, thrust blocks, and boring pits, shall be deemed to be in the category of trench excavation.
   4. Unless otherwise indicated in the Plans, all excavation for pipelines shall be open cut.

1.5 SUBMITTALS

A. Test Reports: Submit the following report for import material directly to the Geotechnical Engineer and any private/public agency with jurisdictional authority from the Contractor's testing services:
   1. Compaction test reports for aggregate base.

B. Submit description of compactors proposed for use when requesting placement of base material.

C. Material Test Reports: From a qualified testing agency which either indicate or interpret test results for compliance of the following requirements indicated:
   1. Classification according to ASTM D2487 of each on-site or borrow soil material for backfill, unless otherwise directed by the geotechnical engineer.
   2. Laboratory compaction curve according to ASTM D698 for each select on-site or borrow soil material proposed for backfill to be reviewed by the geotechnical engineer.

1.6 QUALITY ASSURANCE TESTING

A. Requirements of Regulatory Agencies:
   1. Comply with State of California Business and Transportation Agency, Department of Transportation (Caltrans) latest edition of "Standard Specifications." (CSS).
   2. Comply with State of California Code of Regulations (CCR).
   3. Comply with State of California Construction Safety Orders, Latest Edition (CAL/OSHA).

B. Soil Testing:
   1. Contractor shall work with owner to engage a geotechnical testing agency, to include compaction testing and for quality control testing during fill operations.
   2. Test results will be submitted to the Geotechnical Engineer and any private/public agency with jurisdictional authority for review.

C. Codes and Standards:
   1. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
   2. California Department of Transportation (CDT):
      a. Section 19: Earthwork.

b. Standard Test Methods: No. 202.

3. American Society for Testing and Materials (ASTM):

a. D1556: Density of Soil by the Sand Cone Method.

b. D1557: Moisture Density Relations of Soils and Soil-Aggregate Mixtures

1.7 DELIVERY, STORAGHE AND HANDLING

A. Protect materials before, during and after installation.

1.8 PROJECT CONDITIONS

A. Environmental Requirements:

1. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the District.

2. Protect existing streams, ditches and storm drain inlets during work on this project.

3. Design Team shall provide an Erosion Control plan as part of the Construction Documents.

B. Barricade open excavations and post with warning lights:

1. Comply with requirements of Section 01 51 00 - Temporary Facilities and Controls.

2. Operate warning lights and barricades as required.

3. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations, from damages caused by settlement, lateral movement, undermining, washout, and other hazards.

C. Protection of Subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations, or other areas prepared for project.

D. Transport all excess soils materials by legally approved methods to disposal areas.

1. Coordinate with the Project Manager.

2. Any additional fill requirements shall be the responsibility of the Contractor

1.9 EXISTING UTILITIES

A. Locate existing underground utilities in the areas of work. For utilities that are to remain in place, provide adequate means of protection during excavation operations.

1. Locating of existing underground private utilities shall include, but not be limited to, potholing or contracting with a Utility locating company to locate and mark the utilities in the field prior to the start of construction.

2. Locating of existing underground public utilities shall include but not limited to contacting Underground Service Alert (USA) to locate and mark the public utilities in the field.

B. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult with the Civil Engineer, site construction Manager, site facilities manager, and/or local utility agency immediately for direction.

1. Cooperate with the owner and public/private utility companies in keeping their respective services and facilities in operation.

2. Repair damaged utilities to the satisfaction of the owner or public/private agency with jurisdiction.

C. Do not interrupt existing utilities serving facilities occupied and used by the owner or others, except when permitted in writing by the owner and then only after acceptable temporary utility services have been provided.

1.10 SEQUENCING AND SCHEDULING

A. The sequence of operations shall be reviewed by the Owner and Architect prior to commencement of any work.

## PART 2 PRODUCTS

2.1 MATERIAL

A. General:

1. Import materials will be subject to approval of the Geotechnical Engineer.

2. For approval of imported fill material, notify the Geotechnical Engineer and any private or public agency with jurisdictional authority at least 7 working days in advance of intention to import material.

B. Select backfill material shall be gravel, free of clay or organic matter and shall conform to the following gradation:

| Sieve Size | Percentage Passing |
|---|---|
| 1 inch | 100 |
| ¾ inch | 90 – 100 |
| No. 4 | 35 – 60 |
| No. 200 | 2 - 9 |

C. For gas pipe and fuel piping, select backfill shall be clean, graded building sand conforming to the following gradation:

| Sieve Size | Percentage Passing |
|---|---|
| No. 4 | 100 |
| No. 200 | 0 - 5 |

D. Water: Clean and free from deleterious amounts of acids, alkalis, salts and organic matter.

2.2 BURIED WARNING AND IDENTIFICATION TAPE

A. Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 4 mil minimum thickness, 3 inch width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

1. Warning Tape Color Codes:

    a. Red: Electric.

    b. Yellow: Gas, Oil; Dangerous Materials.

    c. Orange: Telephone and Other Communications.

    d. Blue: Water Systems.

    e. Green: Sewer Systems.

    f. White: Steam Systems.

    g. Gray: Compressed Air.

    h. Green: Storm Drain

2. Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 4 mil. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

3. Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 4 mil. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 920 mm 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.3 DETECTION WIRE FOR NON-METALLIC PIPING

A. Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG.

## PART 3 EXECUTION

3.1 GENERAL

A. Prior to commencement of work, become thoroughly familiar with site conditions.

B. In the event discrepancies are found, immediately notify the Architect, Geotechnical Engineer, site Construction Manager, and Civil Engineer in writing, indicating the nature and extent of differing conditions.

C. Backfill excavations as promptly as work permits.

D. Do not place Engineered fill or backfill until rubbish and deleterious materials have been removed and areas have been approved by the Geotechnical Engineer.

E. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

1. In excavations, use satisfactory excavated or borrow material.

2. Under grassed areas, use satisfactory excavated or borrow material.

## 3.2 COMPACTING

A. Compact by power tamping, rolling or combinations thereof.

1. Where impractical to use rollers in close proximity to walls, stairs, etc., compact by mechanical tamping.

2. Scarify and recompact any layer not attaining compaction until required density is obtained and approved by the Geotechnical Engineer.

3. Relative Compaction percentage shall be per the project Geotechnical report or per the approved Construction Documents whichever is greater.

## 3.3 SITE PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, which are to remain, from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the District.

## 3.4 EXISTING UTILITIES

A. Identity the location of existing utilities.

1. Prior to trenching, the Contractor shall excavate at locations specifically indicated on the Plans, if any, and where new lines cross other utilities of uncertain depth and determine the elevation of the utility in question to ensure that the new line will clear the potential obstruction.

2. The Contractor shall contact Underground Service Alert (USA) at 1-800-227-2600 for assistance in locating existing utilities.

3. If, after the excavation, a crossing utility does present an obstruction, then the line and grade of the new line will be adjusted as directed by the Project Manager to clear the utility.

B. Protect all existing utilities to remain in operation.

C. Movement of construction machinery and equipment over existing pipes and utilities during construction shall be at Contractor's risk.

D. Excavation made with power-driven equipment is not permitted within 2 feet of any known utility or subsurface structure.

1. Use hand or light equipment for excavating immediately adjacent to known utilities or for excavations exposing a utility or buried structure.

2. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured.

3. Support uncovered lines or other existing work affected by excavation until approval for backfill is obtained.

4. Report damage of utility line or subsurface structures immediately to the Project Manager.

E. Backfill trenches resulting from utility removal in lifts of 8 inches maximum.

3.5 TRENCH EXCAVATION

A. General

1. Excavation shall include removal of all water and materials that interfere with construction. The Contractor shall remove any water which may be encountered in the trench by pumping or other methods during the pipe laying, bedding and backfill operations. Material shall be sufficiently dry to permit approved jointing.

2. Excavation shall include the construction and maintenance of bridges required for vehicular and pedestrian traffic, support for adjoining utilities.

3. The Contractor shall be responsible to safely direct vehicular and pedestrian traffic through or around his/her work area at all times.

4. The Contractor shall relocate, reconstruct, replace or repair, at his/her own expense, all improvements which are in the line of construction or which may be damaged, removed, disrupted or otherwise disturbed by the Contractor.

B. Existing Paving and Concrete:

1. Existing pavement over trench shall be sawcut, removed, and hauled away from the job. Existing pavement shall be neatly sawcut along the limits of excavations.

2. Existing concrete over the trench shall be sawcut to a full depth in straight lines either parallel to the curb or at right angles to the alignment of the sidewalk.

3. Boards or other suitable material shall be placed under equipment outrigging to prevent damage to paved surfaces.

C. Trench Width:

1. Trench widths shall be 4” plus 25% Outside Diameter (O.D.) on each side of the pipe.

a. The maximum trench width shall be inclusive of all shoring.

2. Trench widths larger than the lengths stated above shall be approved by the Civil Engineer.

D. Open Trench:

1. The maximum length of open trench shall be 300 feet or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. No trench shall be left open at the end of the day.

2. Provisions for trench crossings and free access shall be made at all street crossings, driveways, water gate valves, and fire hydrants.

E. Excavation Bracing:

1. The excavation shall be supported and excavation operations shall be conducted in accordance with the California Industrial Accident Commission and CAL/OSHA.

2. The Contractor shall, at his/her own expense, furnish, put in place, and maintain such sheeting and bracing as may be required to support the sides of all excavations (whether above or below the pipe grade), and to prevent any movement which could in any way diminish the required

trench section or otherwise injure or delay the work. The sheeting and bracing shall be withdrawn in a manner such as to prevent any earth movement that might overload the pipe.

F. Excavated Material:

1. All excavated material not required for backfill shall be immediately removed and properly disposed of in a legal manner by the Contractor.

2. Material excavated in streets and roadways shall be laid alongside the trench no closer than 2 feet from the trench edge and kept trimmed to minimize inconvenience to public traffic. Work shall not be performed under rain events without the approval of the local jurisdiction or agency in charge or plan reviews.

3. Provisions shall be made whereby all storm and wastewater can flow uninterrupted in gutters or drainage channels.

## 3.6 PIPE BEDDING

A. Bedding Excavation: The trench shall be excavated below the grade of the pipe bottom to 4" depth unless directed otherwise by the Geotechnical Engineer.

1. Stabilization of Trench Bottom: When the trench bottom is unstable due to wet or spongy foundation, trench bottom shall be stabilized with gravel or crushed rock. The Geotechnical Engineer will determine the suitability of the trench bottom and the amount of gravel or crushed rock needed to stabilize a soft foundation. Soft material shall be removed and replaced with gravel or crushed rock as necessary.

2. Placement of Bedding Material: The trench bottom shall be cleaned to remove all loose native material prior to placing select backfill material. Sufficient select backfill material shall be placed in trench and tamped to bring trench bottom up to grade of the bottom of pipe. The relative compaction of tamped material shall be not less than 90 percent. It is the intention of these requirements to provide uniform bearing under the full length of pipe to a minimum width of 60 percent of the external diameter.

## 3.7 TRENCH BACKFILL

A. Initial Backfill:

1. Prior to trench backfill, the condition of the trench and laying of pipe must be inspected and approved by the Geotechnical Engineer and any private or public agency with jurisdictional authority.

2. Trench bedding material shall be used for initial backfill. After the pipe has been properly laid and inspected, trench bedding material shall be placed on both sides of the pipe per the trench width above and compacted to 6 inches above the pipe as follows:

3. Compaction: Initial backfill compaction shall be by mechanical means. The initial backfill material shall be hand tamped in layers not exceeding 4 inches in uncompacted depth and shall be brought up uniformly on both sides of the pipe to avoid bending or distortional stress. After hand tamping, the relative compaction of the initial backfill material shall be not less than 90 percent unless directed otherwise by the Geotechnical Engineer.

4. Pipe Detection: In trenches containing pressurized plastic pipes, tracer wire shall be placed directly above the pipe and shall be connected to all valves, existing exposed tracer wires, and other appurtenances as appropriate.

B. Subsequent Backfill:

1. Above the level of initial backfill, the trench shall be backfilled with non-expansive native material from trench excavation or with imported select backfill material (Contractor's option). Subsequent backfill shall be free of vegetable matter, stones or lumps exceeding 3 inches in greatest dimension, and other unsatisfactory material. The Geotechnical Engineer and any private or public agency with jurisdictional authority shall approve the backfill material prior to placement.

2. Subsequent backfill compaction shall be by mechanical means with backfill material placed in layers not exceeding 8 inches in loose depth. Each layer shall be thoroughly compacted before succeeding layers are placed. The use of machine tampers, except manually held types, shall not be permitted.

3. Subsequent backfill shall be compacted to a relative compaction of not less than 90 percent except the relative compaction shall not be less than 95 percent within 6 inches of finished non-paved surface grade or 6-inches below the finished road subgrade. If a Geotechnical Engineer and any private or public agency with jurisdictional authority directs otherwise, Contractor shall adhere to their recommendations.

C. Jetting and Ponding:

1. Jetting of trench backfill is not permitted.

D. Compaction Testing:

1. Compaction testing shall be in accordance with California Test Method ASTM D1557 and under the supervision of the Geotechnical Engineer and any private or public agency with jurisdictional authority.

## 3.8 TRENCH SURFACING

A. Unpaved Areas:

1. In unimproved areas, the trench surface shall be restored to its original condition. No mounds of earth shall be left along the trench. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

2. Where completed compacted areas are disturbed by subsequent construction operation or adverse weather, scarify surface, reshape, compact to required density and provide other corrective work, including retesting, prior to further construction.

B. Temporary Surfacing:

1. Temporary surfacing shall be a minimum of 2 inches of cutback asphalt on 10 inches of Class 2 aggregate base and shall be placed at all trench locations subject to vehicular or pedestrian traffic.

2. Temporary surfacing shall be laid within one day after backfilling (except where the Contractor elects to place permanent surfacing within this time period).

3. Before the trenching area is opened for traffic, all excess dirt, rock, and debris shall be removed, the street surface shall be swept clean and the pavement shall be washed down with a water truck and pressure nozzle.

4. Temporary surfacing shall be maintained to prevent the occurrence of mudholes and prevent the surface from settling below 1 inch or rising more than 1 inch from the existing pavement grade.

3.9 FILL AND COMPACTING

A. General Requirements:

1. Backfill excavations as promptly as work permits.

2. Do not place engineered fill or backfill until rubbish and deleterious materials have been removed and areas have been approved by the Geotechnical Engineer.

3. Place acceptable soil material as approved by the Geotechnical Engineer in layers under the direct supervision of the Geotechnical Engineer.

4. In excavated areas, use satisfactory excavated or borrow material.

5. Under grassed areas, use satisfactory excavated or borrow material.

B. After subgrade compaction has been approved by the Geotechnical Engineer, spread the Engineered fill materials in 6 to 8 inch loose lifts and uniformly mixed during the spreading operation.

1. Bring non-expansive fill materials to or slightly above the optimum moisture content and compact to at least 95 percent of the maximum laboratory dry density, pert ASTM D1557 or as directed by the Geotechnical Engineer.

2. Bring non-expansive aggregate fill materials to or slightly above the optimum moisture content and compact to at least 95 percent of the maximum laboratory dry density, per ASTM D1557 or as directed by the Geotechnical Engineer.

3. Do not compact the top 18 inches of soil in the planting areas.

C. Repeat compaction procedure until proper grade is attained.

D. Rocks generated during site earthwork may be used in fill when approved by the Geotechnical Engineer.

3.10 MOISTURE CONTROL

A. Do not resume operations until moisture content and fill density are satisfactory to the Geotechnical Engineer and any private or public agency with jurisdictional authority.

3.11 PROTECTION

A. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operation or adverse weather, scarify surface, reshape, compact to required density and provide other corrective work, including retesting, prior to further construction.

3.12 CLEAN UP

A. Remove all debris, equipment, tools and materials upon completion prior to final inspections to the satisfactions of the construction Project Manager.

B. In unpaved areas without landscaping, cover with straw erosion control blanket. Follow manufacturer's recommendations for installation. Provide and place straw wattles or biodegradable fiber logs across the slope at the midpoint and along the downhill edge of site. No soil is to be left uncovered at the completion of construction.

**END OF SECTION**

**DIVISION 32 – EXTERIOR IMPROVEMENTS**

**SECTION 32 12 33- PAVING AND SURFACING**

## PART 1 GENERAL

1.1 SUMMARY

A. Section Includes (but is not necessarily limited to):

1. Asphalt Concrete Paving.
2. Concrete Paving.
3. Liquid Asphalt and Asphalt Emulsion.
4. Aggregate Base.

1.2 ABBREVIATIONS

A. ASTM: American Society for Testing and Materials.

B. CCR: California Code of Regulations.

C. C.D.T.: California Department of Transportation

1.3 SUBMITTALS

A. Asphalt Concrete Paving:

1. Provide two copies of material certificates signed by the material producer and the Contractor, certifying that each material item complies with or exceeds specified requirements.

2. The Contractor shall furnish a certified weight or load slip for each load of material used in the construction of the asphalt concrete pavement

B. Concrete Paving: The Contractor shall furnish mill test reports on the cement, reinforcement bars, and aggregates, showing compliance with the respective specifications. The Testing Engineer may make concrete test cylinders and slump tests as deemed necessary to determine compliance with the Specifications.

C. Liquid Asphalt.

D. Pavement Reinforcement Fabric.

E. Tack Coat.

F. Pavement Reinforcement Mesh.

G. Structural Geotextile Fabric.

1.4 PROJECT CONDITIONS

A. Liquid Asphalt and Asphalt Emulsion:

1. Prime coat, seal coat, and paint binder shall be applied only when the ambient temperature is above 50 degrees Fahrenheit and when temperature has not been below 35 degrees Fahrenheit for 12 hours immediately prior to application.

2. Prime coat, fog coat, seal coat, and paint binder shall not be applied when base or surfaces are wet or contain excess moisture.

B. Asphalt Concrete Paving: Asphalt concrete surfaces shall be constructed only when ambient temperature is above 50 degrees Fahrenheit and when base is dry.

1.5 GENERAL DESIGN CRITERIA

A. Services Areas: Approach ramps, driveways, and paved work areas in excess of 4 percent slope shall be provided with a rough texture for non-skid surface.

B. Walks and Paths: Concrete exterior walkways shall have a pitch of at least 2 percent. Slopes should not exceed the maximum allowed for ADA paths of travel. See Construction Documents for slopes.

C. Pavement Markings: All traffic control striping and pavement markings shall conform to the standards illustrated in the C.D.T. Standard Plans Book (current edition), General Road Work Section.

## PART 2 PRODUCTS

2.1 PAVING MATERIALS

A. Aggregate Base: Aggregate base shall conform to Caltrans Class 2 (R value 78 min) aggregate base, 3/4" maximum size, as specified in Section 26 of the C.D.T. Standard Specifications.

B. Asphalt Concrete Paving:

1. Paving asphalt to be all purpose, aged residue, steam refined, PG 64-10 grade, in accordance with Section 92 of the Caltrans Standard Specifications.

2. Mineral aggregate shall be Type B mineral aggregate as specified in Section 39 of the C.D.T. Standard Specifications.

3. Maximum aggregate size shall be as follows:

| AC. Thickness | Max. Ag. |
|---|---|
| a. ¾” - 1½ | 1/2" |
| b. 2 & 2½" | 1/2" |
| c. 3” & 4” | 3/4" |

4. Liquid asphalt for prime coat shall be Grade SC-70 in conformance with Section 93 of the C.D.T. Standard Specifications.

5. Asphaltic emulsion for paint binder, fog coat, and seal coat shall be emulsified asphalt, Type SS-1h, conforming to Section 94 of the C.D.T. Standard Specifications.

6. A.C. dikes shall be per Caltrans Standard A87, type B.

C. Portland Cement Concrete

1. Concrete shall be Class A concrete conforming to Section 90 of the C.D.T. Standard Specifications.

2. Cement shall be Type II cement conforming to ASTM C150 as modified by Section 90 of the C.D.T. Standard Specifications.

3. Aggregate shall be 3/4-inch maximum size conforming to Section 90 of the C.D.T. Standard Specifications.

4. Water shall be potable and free of organic matter and injurious amounts of oil, acid, alkali, or other deleterious substances.

5. Reinforcing bars shall be deformed and shall conform to ASTM A615.

6. Filled joints, unless noted otherwise on the Drawings, shall be 1/4-inch thick, the full depth of the concrete section and conforming to Section 51 of the C.D.T. Standard Specifications.

7. Joint filler shall conform to Section 51 of the C.D.T. Standard Specifications for premolded expansion joint filler and expanded polystyrene joint filler.

8. No admixtures will be allowed without prior approval of the civil engineer.

D. Pavement Reinforcement Fabric: Pavement reinforcement fabric shall meet Caltrans Section 88-1.02, BP Petromat or approved equivalent.

E. Crack Sealant

1. Crack sealant shall be rubberized hot-pour type and shall meet ASTM D 3405, Husky 1611 or approved equivalent.

2. Blotting Agent shall be one of: Screened sand, cement, or fly ash.

F. Tack coat: Tack coat shall meet Caltrans Section 39-4.02

G. Pavement reinforcement mesh: Pavement reinforcement mesh for use in Type 2 Overlay shall be Glasgrid Model 8501 or approved equivalent.

H. Structural geotextile fabric: Structural geotextile fabric shall be Mirafi 500X or approved equivalent.

## PART 3 EXECUTION

### 3.1 PREPARATION

A. Subgrade and Aggregate Base:

1. Prepare a subgrade and over excavation paragraph reference 3.4 of Section 31 00 00-EARTHWORK AND GRADING and the geotechnical report.

2. Aggregate base shall be compacted to 95 percent ASTM D1557 under the supervision of a geotechnical engineer. Sections 26-1.04B and 26-1.05 of the C.D.T. Standard Specifications shall apply.

3. Soil sterilant shall be applied to prepared subgrade or after installation of rock or aggregate base uniformly at the rate recommended by the manufacturer.

B. Crack Sealing:

1. Before sealing, cracks shall be cleared of dirt, dust, and all other deleterious materials to a depth of 1/4-inch to 1/2-inch.

2. Cracks 1/8-inch in width and greater shall be sealed.

3. Application of crack sealer shall be in accordance with the manufacturer's recommendations unless otherwise directed.

## 3.2 ASPHALT CONCRETE PAVING

A. General:

1. Asphalt concrete shall be proportioned, mixed, placed, spread, and compacted in conformance with Section 39 of the C.D.T. Standard Specifications.

2. Before placing asphalt concrete on untreated base, a liquid asphalt prime coat shall be applied to the base course in conformance with Section 39 of the C.D.T. Standard Specifications. Prime coat shall be applied at the rate of 0.25 gallons per square yard.

3. Before placing asphalt concrete, an asphalt emulsion tack coat shall be applied to all vertical surfaces of existing pavement, curbs, gutters, construction joints, and all existing pavement to be surfaced, in conformance with Section 39 of the C.D.T. Standard Specifications.

4. Spreading and compacting asphalt concrete shall be performed in accordance with Section 39 of the C.D.T. Standard Specifications.

5. Fog seal shall be applied to all finished surfaces of asphalt concrete pavement at a rate of 0.05 gallons per square yard, in accordance with Section 37 of the C.D.T. Standard Specifications.

6. After fog seal has been applied, ample time shall be allowed for drying before traffic is allowed on the pavement or paint striping is applied.

## 3.3 CONCRETE CONSTRUCTION

A. General

1. All concrete shall be mixed in accordance with applicable provisions of Section 90 of the C.D.T. Standards Specifications.

2. Construction of concrete substructures shall conform to applicable provisions of Section 51 of the C.D.T. Standard Specifications. Unless noted otherwise in the Specifications, all exposed surfaces of structure shall have Class 1 surface finish or finished to match existing adjacent paving.

3. No pigment shall be used in curing compounds for construction of concrete curbs, gutters, and structures.

4. All work shall be subject to field inspection. No concrete shall be placed until the Project Manager has approved the forms and reinforcement.

5. Expansion joints on curbs and gutters shall be placed 20 feet on centers, adjacent to structures and at all returns, and shall be filled with joint filler. Control joints shall be formed 10 feet on centers. The score shall be 1-inch deep minimum.

6. Concrete shall not be dropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than 6 feet. Spouts, elephant trunks, or other approved means shall be used to prevent segregation.

3.4 FIELD QUALITY CONTROL

A. Asphalt Concrete Paving:

1. The specified thickness of the finished pavement on the Construction Documents shall be the minimum acceptable.

2. Conforms shall form a smooth, pond-free transition between existing and new pavement.

3. Depressions in paving between high spots are not to exceed 1/8-inch when measured below a 10 foot long straight edged placed anywhere on surface in any direction.

4. The finished asphalt pavement shall have positive drainage without ponding.

3.5 CLEANUP

A. General:

1. Surplus material remaining upon completion of paving operations shall become the property of the Contractor, to be removed from the work site and disposed of in a lawful manner.

2. Surfaces shall be left in a clean, neat, and workmanlike condition, and all construction waste, rubbish, and debris shall be removed from the work site and disposed of in a lawful manner.

**END OF SECTION**

**DIVISION 33- UTILITIES**

**SECTION 33 10 00 WATER UTILITIES**

## PART 1 GENERAL

### 1.1 DESCRIPTION

A. This section specifies materials and procedures for construction of underground water distribution for domestic and/or fire supply systems outside the building that are complete and ready for operation. This includes piping, structures, appurtenances and all other incidentals.

### 1.2 ABBREVIATIONS

A. ANSI: American National Standards Institute

B. ASME: American Society of Mechanical Engineers.

C. ASTM: American Society of Testing and Materials.

D. AWWA: American Water Works Association.

E. DIP: Ductile iron pipe

F. NFPA: National Fire Protection Association.

G. PVC: Polyvinyl chloride plastic.

### 1.3 SUBMITTALS

A. Product manufacturer's specification and literature for all materials furnished.

B. Contractor shall submit manufacturer's Certificates of Compliance for all materials furnished from suppliers not specifically listed in this specification or as shown on the contract drawings.

C. Project Record Documents:

1. Record location of pipe runs, connections, valves, thrust restraints, and invert elevations.

2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

D. Results of testing.

### 1.4 DELIVERY, STORAGE AND HANDLING

A. Ensure that valves are dry and internally protected against rust and corrosion. Protect valves against damage to threaded ends and flange faces.

B. Use a sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

C. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

D. Protect stored piping from moisture and dirt by elevating above grade. Protect flanges, fittings, and specialties from moisture and dirt.

E. Store plastic piping protected from direct sunlight and support to prevent sagging and bending.

F. Cleanliness of Piping and Equipment Systems:

1. Care shall be exercised in the storage and handling of equipment and piping material to be incorporated in the work. Debris arising from cutting, threading and welding of piping shall be removed.
2. Piping systems shall be flushed, blown or pigged as necessary to deliver clean systems.

G. Unless otherwise noted, standards, manuals, and codes refer to the latest edition of such standards, manuals, and codes as of the date of issue of these Specifications.

H. Referenced Standards:

1. California Building Code (2016)
2. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.
3. ACI 301 – Specifications for Structural Concrete for Buildings.
4. ACI 318 – Building Code Requirements for Structural Concrete.
5. ACI 347 – Guide to Formwork for Concrete.
6. AHA A135.4 – Basic Hardboard.
7. PS 1 – Construction and Industrial Plywood.
8. WCLIB Rule 17 – Standard Grading Rules for West Coast Lumber.

1.5 COORDINATION

A. Coordinate connection to water main with Public Utility company.

B. Coordinate water service lines with building contractor.

C. Contractor to provide shop drawings of underground fire service line and apparatus to Fire Marshall for approval.

## PART 2 PRODUCTS

2.1 WATERLINES 4 INCH

A. Ductile Iron pipe (DIP): Pipe shall conform to AWWA C151, minimum pressure Class 350 conforming to AWWA C151 with cement lining in conformance with AWWA C104 with standard thickness per AWWA C150. Buried ductile iron pipe and fittings shall be encased in polyethylene in accordance with AWWA C105. Joints shall be either bell and spigot end, push-on type or cast iron mechanical joint type, 250 pound working pressure, with elastomeric ring rubber joints, conforming to AWWA C111. Flanged outlets shall conform to ASME B16.1, 125 pounds. Bolts and nuts for flanges shall be Type 304 stainless steel, ASTM A193, Grade B8M hex head bolts and ASTM A194, Grade 8M, hex head nuts. Washers shall be of the same material as the bolts.

B. Polyvinyl Chloride Pipe (PVC): For 4 inch through 12 inch, pipe shall be bell and spigot, Class 200, DR 14, conforming to AWWA C900, with equivalent cast-iron pipe outer diameter (O.D.). For 14

inch and larger, pipe shall be bell and spigot, Class 165, DR 25, conforming to AWWA C905, with equivalent cast-iron pipe outer diameter (O.D.). Underwriters' Laboratories, Inc. (UL) listed, Factory Mutual, and National Sanitation Foundation (NSF) approved. Joints shall be cast iron mechanical joint type, bell and spigot, or push-on type, 250 pound working pressure. Bell and spigot type shall have elastomeric rubber ring joints, conforming to AWWA C111. Elastomeric ring shall be factory bonded into bell grove and meet requirements of ASTM F477. Flanged outlets shall conform to ASME B16.1, 125 pounds. Bolts and nuts for flanges shall be Type 304 stainless steel, ASTM A193, Grade B8M hex head bolts and ASTM A194, Grade 8M, hex head nuts. Washers shall be of the same material as the bolts.

2.2 WATER SERVICE LINE 3 INCHES AND SMALLER

A. Domestic Water Service: Provide Type K soft or hard copper pipe conforming to ASTM B88.

B. PVC, Schedule 80 Pipe (2" or smaller): ASTM D1785.

C. Irrigation Lines: Pipe shall be polyvinyl chloride Schedule 40, or Class 315, whichever has the highest pressure rating for the size required.

2.3 WATER SERVICE LINE 4 INCHES AND LARGER

A. Fittings for pipe size 4-inches thru 36-inches shall be mechanical joint, AWWA C153, 350 psi working pressure-rated, ductile iron for use with the type of pipe specified. Fittings shall be cement-mortar lined per AWWA C104 and shall have a 1-mil thick exterior petroleum asphaltic coating. T-bolts shall be AWWA C111, high strength, low alloy steel.

B. Fittings used at intersections of water mains where valves are required shall be cement-lined, flanged fittings. Valves at these locations shall have a flange by mechanical joint ends. Flange bolts and nuts at these locations shall be stainless steel.

C. For Copper:

1. Cast copper alloy solder-joint pressure fittings shall conform to ASME B16.18.
2. Wrought copper solder-joint pressure fittings or wrought copper alloy unions shall conform to ASME B16.22.

D. For PVC, Schedule 80:

1. PVC, Schedule 80 Socket Fittings: ASTM D2467.
2. PVC, Schedule 80 Threaded Fittings: ASTM D2464.

E. Mechanical joint fitting restraints for Ductile Iron pipe and PVC pipe sizes 4-inches thru 24 inches shall be rated in accordance with the performance requirements of AWWA/ANSI C111/A21.11 rubber gasket joints for ductile-iron pressure pipe and fittings and meet or exceed the requirements of ASTM F1674 of the latest revision for PVC pipe.

1. Mega Lug type as manufactured by EBAA, Inc. Series 1100 for Ductile Iron pipe and Series 2000PV for PVC pipe, or:
2. MH FIELD LOK Gasket as manufactured by US Pipe and Foundry Series DI for Ductile Iron pipe and Series PV for PVC pipe.

F. Push-on Joints: Provide shape of pipe ends and fitting ends, gaskets, and lubricant for joint assembly conforming to AWWA/ANSI C111/A21.11. Modify bell design fittings, as approved.

G. Provide mechanical pipe restraints at all fittings and changes in angle, alignment, or elevation.

H. Thrust Blocks: Provide thrust blocks in accordance with NFPA 24 Standards. Use concrete conforming to ASTM C94 having a minimum compressive strength of 2,500 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2-1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength. Thrust blocks may not be suitable for poor soil conditions.

I. Where depth or location of existing structures prohibit the use of standard thrust blocks, pipe restraints shall be used.

## 2.4 GATE VALVES AND BALL VALVES

A. Gate Valves: Valves shall open by counter clockwise rotation of the valve stem. Provide valves with ends as appropriate for adjoining pipe.

1. Stuffing boxes shall have O-ring stem seals. Provide stuffing boxes bolted and constructed so as to permit easy removal of parts for repair.
2. Valves (2-1/2 inches and larger):
    a. Provide valves conforming to AWWA C500 or AWWA C509 and of one manufacturer. Valves shall have a non-rising stem, a 2-inch square nut, and double-disc gates. Valves shall be rated for 250 psi maximum working pressure. Mueller 2360 series or ACIPCO.
    b. For the domestic water system, valves shall also conform to ANSI/NSF 61.
    c. For the fire water system, valves 2 inches through 16 inches in size shall also conform to UL 262 and FM 1120 or FM 1130 to a working pressure of 200 psi.
3. Where a post indicator is shown, provide valve with an indicator post flange.

B. Ball Valves: Valves shall open by counterclockwise rotation of the valve stem. Provide valves with ends as appropriate for the adjoining pipe.

1. Valves (2-inches and smaller):
    a. Provide valves conforming to AWWA C800 and of one manufacturer, Mueller 300 series or Ford.

## 2.5 BLOW-OFF VALVES AND AIR RELEASE VALVES

A. Blow-off valves: Provide valve and service size as shown in the Construction Documents. Provide 2-inch valves at low points of the piping system, and 4-inch valves and dead-ends of the piping system, unless otherwise noted.

1. 2-inch blow-off shall have a 2-inch vertical female iron pipe (FIP) inlet and a 2-inch normal pressure and temperature (NPT) nozzle outlet with cap. Valve shall open by counterclockwise rotation of a top-mounted 9/16-inch square operating nut. All working parts shall be serviceable without excavation. Kupferle/Truflo Mode TF-550, or approved equivalent.
2. 4-inch blow-off shall have a 4-inch vertical FIP inlet and a 4-inch male iron pipe (MIP) outlet with cap. Valve shall open by counterclockwise rotation of a top-mounted 9/16 inch square nut. All working parts shall be serviceable without excavation. Kupferle/Truflo Model TF -800, or approved equivalent.

B. Air Release valves: Provide valve and service size as shown on the Construction Documents, and where there is an increase in the downward slope or a decrease in the upward slope of the piping system. Valve shall have cast-iron single valve body, and shall conform to AWWA C512. A compound lever system shall have a maximum operating pressure of 300 psi. Provide a protective cap for the outlet of the valve. Provide universal air-vacuum type valves, Crispin Model UL, Apco, or approved equivalent.

2.6 PRESSURE REDUCING VALVES

A. Pressure Reducing Valves: Valves shall have a cast-iron body, conforming to ASTM A536, with epoxy interior coating conforming to AWWA, and rated to pressure class 300. Cla-Val Model 90-01, Singer, or approved equivalent.

1. Valves shall have flanged ends.
2. Valves sized 3-inches or smaller may have screwed ends.

2.7 VALVE BOXES

A. Water Valve Box: Provide pre-cast concrete valve box for each buried valve. Provide box with steel or cast iron traffic cover marked “WATER”. Christy Model G5 with G5C cover.

2.8 DISINFECTION CHLORINE

A. Liquid chlorine: AWWA B301.

B. Sodium Hypochlorite: AWWA B300 with 5 percent to 15 percent available chlorine.

C. Calcium Hypochlorite: AWWA B300 supplied in granular form of 5 gram tablets, and shall contain 65 percent chlorine by weight.

2.9 DISINFECTION CHLORINE

A. Warning tape shall be standard, 4 mil. Polyethylene, 3 inch (76 mm) wide tape, detectable type, blue with black letters and imprinted with “CAUTION BURIED WATER LINE

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Examine surfaces and areas for suitable conditions where water service is being installed.

B. Do not begin installation until unsatisfactory conditions have been corrected.

3.2 LOCATION OF WATERLINES

A. Where the location of the water line is not clearly defined by dimensions on the Plans, do not lay water line closer than 10 feet horizontally from any sewer line.

B. Where water lines cross under gravity sewer lines, encase sewer line in concrete for a distance of at least 10 feet on each side of the crossing, unless sewer line is made of ductile iron pipe or C900 PVC pipe and no joint is located within 10 feet horizontally of the crossing.

C. Where water lines cross sewer force mains and inverted siphons, install water line at least 2 feet above these sewer lines.

D. When joints in the sewer line are closer than 3 feet horizontally from the water line, encase sewer line joints in concrete.

E. Do not lay water lines in the same trench with other utilities.

F. Install water lines at 3 feet minimum depth or as detailed on the Construction Documents.

3.3 INSTALLATION OF PIPING

A. Inspection:

1. Before placing in position, inspect pipe for noticeable defects. Clean the inside and outside of the pipe, fittings, valves, and accessories, and maintain in a clean condition.
2. Remove fins and burrs from pipe and fittings.

B. Pipe laying and jointing:

1. Provide proper facilities for lowering sections of pipe into trenches.
2. Do not drop or dump pipe, fittings, valves, or any other water line material into trenches.
3. Cut pipe accurately to length established at the site and work into place without springing or forcing. Replace any pipe or fitting that does not allow sufficient space for proper installation of jointing material.
4. Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying.
5. Grade the pipeline in straight lines; avoid the formation of dips and low points.
6. Support pipe at proper elevation and grade.
7. Provide secure firm, uniform support. Wood support blocking will not be permitted.
8. Lay pipe so that the full length of each section of pipe and each fitting rests solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings.
9. Provide anchors and supports where indicated and where necessary for fastening work into place.
10. Make proper provision for expansion and contraction of pipelines.
11. Keep trenches free of water until joints have been properly made.
12. Do not lay pipe when conditions of trench or weather prevent proper installation.
13. All fittings shall be blocked with appropriately sized thrust blocks as shown in the Construction Documents.

C. Installation of Tracer Wire:

1. Install a continuous length of tracer wire for the full length of each run of nonmetallic pipe.
2. Attach wire to top of pipe in such manner that it will not be displaced during construction operations.

D. Connections to Existing Lines:

1. Make connections to existing water lines after approval is obtained and with a minimum interruption of service on the existing line.

2. Make connections to existing lines under pressure in accordance with the recommended procedures of a manufacturer of pipe of which the line being tapped is made.

E. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads to keep out debris and contamination.

## 3.4 INSTALLATION OF DUCTILE IRON PIPING

A. Install pipe and fittings in accordance with requirements of AWWA C600 for pipe installation, joint assembly, valve-and-fitting installation, and thrust restraint.

B. Jointing

1. Provide push-on joints with the gaskets and lubricant specified for this type joint; assemble in accordance with the applicable requirements of AWWA C600 for joint assembly.
2. Provide mechanical joints with the gaskets, glands, bolts, and nuts specified for this type joint; assemble in accordance with the applicable requirements of AWWA C600 for joint assembly and with the recommendations of AWWA C111.
3. Provide flanged joints with the gaskets, bolts, and nuts specified for this type joint.
    a. Install flanged joints up tight; avoid undue strain on flanges, fittings, valves, and other equipment and accessories.
    b. Align bolt holes for each flanged joint.
    c. Use full size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted.
    d. Do not allow adjoining flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without over straining the flange.
    e. Where flanged pipe and fitting have dimensions that do not allow the installation of a proper flanged joint as specified, replace it by one of proper dimensions.
    f. Use setscrewed flanges to make flanged joints where conditions prevent the use of full-length flanged pipe. Assemble in accordance with the recommendations of the setscrewed flange manufacturer.
4. Provide insulating joints with the gaskets, sleeves, washers, bolts, and nuts previously specified for this type joint. Assemble insulating joints as specified for flanged joints. Bolts for insulating sleeves shall be full size for the bolt holes.
5. Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.

C. Exterior Protection: Completely encase buried ductile iron pipelines and underground appurtenances with polyethylene wrap. Install 8-mil linear low-density polyethylene (LLD) film or 4-mil high-density cross-laminated (HDCL) film per manufacturer's recommendations and in accordance with AWWA/ANSI C105/A21.5 and ASTM A674.

D. Pipe Anchorage:

1. Provide concrete thrust blocks or restrained joints for pipe anchorage, except where metal harness is indicated on the Construction Documents.
2. Pipe anchorage shall be in accordance with NFPA 24 Standards.

## 3.5 INSTALLATION OF POLYVINYLE CHLORIDE PIPING

A. Install pipe and fittings in accordance with the requirements of UNI B-3 for the following:

1. The laying of pipe, joining PVC pipe to fittings and accessories.
2. The setting of hydrants, valves, and fittings.

B. Comply with the recommendations for pipe joint assembly and appurtenance installation in AWWA Manual M23, Chapter 7, “Installation”.

C. Comply with the applicable requirements of AWWA C600 for joint assembly, and with the recommendations of Appendix A to AWWA C111.

D. Jointing:

1. Provide push-on joints with the elastomeric gaskets specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings.
2. For pipe-to-pipe push-on joint connections, use only pipe with push-on joint ends having factory-made bevel.
3. For push-on joint connections to metal fittings, valves, and other accessories, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint.
4. Use an approved lubricant recommended by the pipe manufacturer for push-on joints.
5. Assemble push-on joints for connection to fittings, valves, and other accessories in accordance with the requirements of UNI B-3 for joining PVC pipe to fittings and accessories and with the applicable requirements of AWWA C600 for joint assembly.
6. Make compression-type joints/mechanical-joints with the gaskets, glands, bolts, nuts, and internal stiffeners previously specified for this type joint. Cut off spigot end of pipe for compression-type joint or mechanical-joint connections and do not re-bevel.
7. Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer using internal stiffeners as previously specified for compression-type joints.

E. Pipe Anchorage:

1. Provide concrete thrust blocks or restrained joints for pipe anchorage, except where metal harness is indicated on the Construction Documents.
2. Anchorage shall be in accordance with the requirements of UNI B-3 and in accordance with NFPA 24 Standards for reaction or thrust blocking and plugging of dead ends, except that size and positioning of thrust blocks shall be as indicated on the Construction

## 3.6 INSTALLATION OF VALVES

A. Install gate valves conforming to AWWA C500 and UL 262 in accordance with the requirements of AWWA C600 for valve-and-fitting installation and with the recommendations of the Appendix (Installation, Operation, and Maintenance of Gate Valves) to AWWA C509.

B. Install gate valves conforming to AWWA C509 in accordance with the requirements of AWWA C600 for valve-and-fitting installation and with the recommendations of the Appendix (Installation, Operation, and Maintenance of Gate Valves) to AWWA C509.

C. Install gate valves on PVC water mains in accordance with the recommendations for appurtenance installation in AWWA Manual M23, Chapter 7, "Installation."

D. Install check valves in accordance with the applicable requirements of AWWA C600 for valve-and-fitting installation, except as otherwise indicated.

E. Provide and assemble joints to gate valves and check valves as specified for making and assembling the same type joints between pipe and fittings.

## 3.7 INSTALLATION OF VALVE BOXES

A. Boxes shall be centered over the appurtenance so as not to transmit shock or stress. Covers shall be set flush with the surface of the finished pavement, or as shown in the Construction Documents. Backfill shall be placed around the boxes and compacted to the specified level in a manner that will not damage or displace the box from proper alignment or grade. Misaligned boxes shall be excavated, plumbed, and backfilled at contractor's expense. .

## 3.8 HYDROSTATIC PIPELINE TESTING

A. Requirements:

1. After the pipe has been laid and backfilled, perform hydrostatic pressure tests.
2. Do not conduct tests until at least 12 hours have elapsed since pipe laying and at least 5 days have elapsed since placing of concrete thrust blocks.
3. Fill the pipe with water which shall remain without external application of pressure for 24 hours before tests are conducted.
4. Prior to hydrostatic testing, flush pipe system with fresh water until piping is free of dirt and foreign matter.
5. Apply pressure by a pump and measured by a test gage. All necessary apparatus and labor for conducting the pressure and leakage tests shall be furnished by the Contractor.
6. Ensure the release of air from the line during filling, and prevent collapse due to vacuum when dewatering the line.
7. For pressure test, use a hydrostatic pressure not less than 200 psi. The duration of the test shall not be less than 4 hours with the variation in pressure of not more than 5 psi for the duration of the test.

B. Leakage Tests:

1. Perform tests at the same time as pressure tests.
2. Leakage rate shall be measured for at least 4 hours with a certified water meter, or other approved method. If requested, meter certification shall be submitted to the District for approval prior to testing.
3. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
4. Leakage at mechanical couplings and joints, tapping sleeves, saddles, flanged joints, and copper piping will not be accepted. Correct any visible leaks.
5. Push-on joints: Test ductile iron pipe for leakage in accordance with AWWA C600 as shown in the following table:

**TABLE 1**

Allowable Leakage per 1000 feet of DIP Pipeline (Gal/Hr)

| Average Test Pressure | Nominal Pipe Diameter - Inches | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| (psi) | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 300 | 0.39 | 0.52 | 0.78 | 1.04 | 1.30 | 1.56 | 1.82 | 2.08 | 2.34 | 2.60 |
| 275 | 0.37 | 0.50 | 0.75 | 1.00 | .124 | 1.49 | 1.74 | 1.99 | 2.24 | 2.49 |
| 250 | 0.36 | 0.47 | 0.71 | 0.95 | 1.19 | 1.42 | 1.66 | 1.90 | 2.14 | 2.37 |
| 225 | 0.34 | 0.45 | 0.68 | 0.90 | 1.13 | 1.35 | 1.58 | 1.80 | 2.03 | 2.25 |
| 200 | 0.32 | 0.43 | 0.64 | 0.85 | 1.06 | 1.28 | 1.48 | 1.70 | 1.91 | 2.12 |

6. When the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.
7. Test polyvinyl chloride pipe for leakage in accordance with the recommendations of the Uni-Bell Plastic Pipe Association (UNI) as shown in the following table:

**TABLE 2**

Allowable Leakage per 1000 feet or 50 joints of PVC Pipeline (Gal/Hr)

| Nominal Pipe Size (inches) | Average Test Pressure in Line (psi.) | |
|---|---|---|
| | 200 | 250 |
| 4 | 0.38 | 0.43 |
| 6 | 0.57 | 0.64 |
| 8 | 0.76 | 0.85 |
| 10 | 0.96 | 1.07 |
| 12 | 1.15 | 1.28 |
| 14 | 1.34 | 1.50 |
| 16 | 1.53 | 1.71 |
| 18 | 1.72 | 1.92 |
| 20 | 1.91 | 2.14 |

8. Should any section of new pipe fail to pass either test, locate and repair the defective pipe and repeat the test.

3.9 STERILIZATION AND FLUSHING

A. General

1. Disinfect domestic water lines, mains, and branches by chlorination in accordance with AWWA C601 and as herein specified.

B. Sterilization Methods:

1. Liquid Chlorine Solution Method:
   a. Flush all foreign matter from mains, branch runs, hydrant runs, and installed services.
   b. Introduce liquid chlorine solution at appropriate locations to assure uniform distribution through the facilities at the proper concentration.
   c. Do not use installed copper service lines to convey the concentrated chlorine solution to the mains.
   d. The sanitizing solution shall be retained in the facilities for a period of 24 hours after which each service, hydrant run, branch run and dead end shall be flushed until:
      1) Residual chlorine is less than 1 part per million.
      2) Residual chlorine is no greater than the concentration of chlorine in the water supplied for flushing.
   e. Chlorine shall be a 1 percent solution (containing 10,000 parts per million available chlorine) or shall be obtained by use of dry chlorine in tablet form firmly attached to inside top of the pipe.
   f. The required concentration of chlorine in the pipe is 50 parts per million. This concentration may be attained by adding 5 gallons of the chlorine solution to 1,000 gallons of water.
   g. The weight of chlorine or chlorine compound required to make a 1 percent chlorine solution is as follows:

**TABLE 3**

One-Percent Chlorine Solution Mix

| AMOUNT OF PRODUCT COMPOUND | | QUANTITY OF WATER (in gallons) |
|---|---|---|
| High-Test Calcium Hypochlorite (65-70% Cl) | 1 pound | 7.50 |
| Chlorinated Lime (32-35% Cl) | 2 pounds | 7.50 |
| Liquid Laundry Bleach (5.25% Cl) | 1 gallon | 4.25 |
| Liquid Chlorine (100% available chlorine) | 0.62 pounds | 7.50 |

2. HTH Tablet Method:

a. The required concentration of chlorine in the mains may be obtained by the use of HTH tablets as produced by Olin Mathieson in the following quantities or approved equivalent.

**TABLE 4**
HTH Tablet (70%) Dosage
Number of Tablets Per Length of Pipe

| LENGTH OF SECTION | DIAMETER OF PIPE | | | | |
|---|---|---|---|---|---|
| | 4 inches | 6 inches | 8 inches | 10 inches | 12 inches |
| 13 feet or less | 1 | 2 | 3 | 4 | 6 |
| 18 feet | 1 | 2 | 3 | 5 | 6 |
| 20 feet | 1 | 2 | 3 | 5 | 7 |
| 30 feet | 2 | 3 | 5 | 7 | 10 |
| 36 feet | 2 | 3 | 5 | 8 | 12 |
| 40 feet | 2 | 4 | 6 | 9 | 14 |
| 100 feet | 4 | 9 | 15 | 23 | 30 |

b. Tablets are to be fastened to the inside top surface of each length of pipe using "Permatex No. 1" no earlier than the day pipe is laid.

c. Tablets shall not be installed in the pipe and left overnight before laying and shall not be accessible at any time for casual pilferage by the general public or by children. Tablets shall be stored in a hermetically sealed container.

d. The new water lines are to be slowly filled with water. Air is to be exhausted from each dead end, branch run, hydrant run, and installed service.

e. Water shall be retained for a period of 24 hours, after which each service, hydrant run, branch run and dead end shall be thoroughly flushed to clear foreign matter and until:

1) Residual chlorine concentration is less than 1 part per million

2) Residual chlorine is no greater than the concentration of chlorine in the water supplied for flushing.

C. Bacteriological Testing:

1. Samples shall be gathered and tests conducted at the expense of the Contractor by a laboratory approved by the Water District.
2. Samples are to be taken at representative points not less than one test per every 500 feet of pipe, plus one test at each end of the pipe; or as required by the District and inspector having jurisdiction.
3. The new water lines shall remain isolated and out of service until satisfactory test results have been obtained that:

a. All samples shall be tested and show the absence of Coliform Organisms, the presence of free chlorine residual (and shall equal to that of source water). Turbidity, PH and Heterotrophic Plate Count shall also match that of the source water.

b. District has accepted the results as indicative of the bacteriological condition of the facilities.

c. If unsatisfactory or doubtful results are obtained from the initial sampling, repeat the chlorination process until acceptable test results are reported.

d. Source water shall be that of the local water purveyor.

**END OF SECTION**

**DIVISION 33 - UTILITIES**

**SECTION 33 30 00 – SANITARY SEWER**

## PART 1 GENERAL

### 1.1 DESCRIPTION

A. This section describes general requirements, products, and methods of execution relating to on-site sanitary sewerage. Any work within the public right-of-way shall be constructed to the standards of the City or County having jurisdictional authority.

B. Contractor shall provide all labor, equipment, and materials, unless otherwise noted.

### 1.2 ABBREVIATIONS

A. ASTM: American Society of Testing and Materials.

B. PVC: Polyvinyl chloride plastic.

### 1.3 SUBMITTALS

A. Product manufacturer's specification and literature for all materials furnished.

B. Contractor shall submit manufacturer's Certificates of Compliance for all materials furnished from suppliers not specifically listed in this specification or as shown on the contract drawings.

C. Project Record Documents.

D. Record location of pipe runs, connections, valves, thrust restraints, and invert elevations.

E. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

F. Results of testing.

G. Pump design.

### 1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

2. Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

B. Handling:

1. Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. When handling lined pipe, take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs. Carry, do not drag, pipe to trench.

## PART 2 PRODUCTS

### 2.1 PIPING

A. Polyvinyl Chloride (PVC) Pipe: PVC pipe 4-inch to 15-inch shall conform to ASTM D3034, SDR 26 with bell-and-spigot type of rubber gasket joints. Bells shall be integral with pipe. Spigot end pipe with separate double hub couplings is not acceptable. PVC pipe 18-inch to 25-inch shall conform to ASTM F679, SDR 26. Integrated bell joints shall conform to ASTM D3212 with sealing gaskets conforming to ASTM F477.

### 2.2 MANHOLES

A. Manholes shall be pre-cast concrete of the size and shape shown on the Plans and shall conform to Sections 70-1.02H of the Caltrans Standard Specifications and to ASTM C478. Equivalent poured-in-place structures may be used at the Contractor's option. Concrete shall consist of Caltrans Type I/II cement. Joints shall be 'O'-ring meeting ASTM C443 or "RAM NEK" by Henry Company.

B. Frames and covers shall be cast iron conforming to Section 55-2.03 and 75-1.02 of the Caltrans Standard Specifications and Federal Specification CID A-A 60005. Manhole covers shall have the words "SANITARY SEWER" in letters not less than 2 inches cast into the cover. The clear opening for all manhole covers shall be 24 inches.

C. All interior concrete surfaces shall be coated with "Xypex Crystalline" or approved equivalent. Use of a water-resistant admix is acceptable, at contractor option.

D. Frames and lids for manholes shall be match-marked in pairs before delivery to the job site. The lids shall fit into their frames without rocking.

E. Reinforcing Bars: Reinforcing bars shall be of intermediate grade billet steel conforming to ASTM A615 and shall be of the size shown on the Standard Details or in the Plans. Bars shall be of the round deformed type, free from injurious seams, flaws, or cracks, and shall be cleaned of all rust, dirt, grease and loose scales.

F. Portland Cement Concrete: Concrete for manhole bases, inlets, and other concrete structures shall conform to the requirements of CDT Section 90 and as herein specified. The concrete shall be Class "A" containing six (6) sacks of Portland Cement per cubic yard of concrete. The grading of the combined aggregate shall conform with the Caltrans requirements of the three-quarter inch maximum. The consistency of the fresh aggregate shall be such that the slump does not exceed four inches, as determined by Test Method No. Calif. 520. The concrete shall have a minimum design compressive strength of 3,000 psi after 28 days.

G. Manhole Steps: Zinc-coated steel conforming to 29 CFR 1910.27. Steps are not required in manholes less than 4 feet deep.

2.3 CLEAN-OUTS

A. Provide a box for each clean-out. Boxes shall be pre-cast concrete with cast iron frame and cover marked “SSCO”; Christy G5 with G5C lid or approved equivalent.

2.4 PIPE TO STRUCTURE CONNECTOR/SEAL

A. A flexible pipe to manhole connector shall be used for all pipe penetrations to pre-cast and/or cast-in-place concrete structures.

1. The seal shall provide a flexible, positive, watertight connection between pipe and concrete wastewater structures. The connector shall assure that a seal is made between (1) the connector and the structure wall, and (2) between the connector and the pipe. The seal between the connector and the manhole wall shall be made by casting the connector integrally with the structure wall during the manufacturing process in such a manner that it will not pull out during coupling. The seal between connector and pipe will be made by way of a stainless steel take down band compressing the gasket against the outside diameter of the pipe.

2. The connector shall be molded from materials whose physical/chemical properties meet or exceed the physical/chemical resistant properties outlined in ASTM C-923. The connector and stainless steel hardware shall meet or exceed the performance requirements proscribed in ASTM C-923.

3. The connector shall be of size specifically designed for the pipe material being used and shall be installed in accordance with recommendations of the manufacturer.

4. Connectors shall be Z-LOK or G3 connectors manufactured by A-LOK Products Inc. or approved equivalent.

**PART 3 EXECUTION**

3.1 PIPE INSTALLATION

A. Pipe shall be installed in conformance with recommendations in the order of precedence beginning with the geotechnical report followed by trench details shown on the Construction Documents, and then manufacturer’s recommendations.

B. Pipe laying:

1. No pipe shall be laid until the Geotechnical Engineer-of-Record inspects and approves the conditions of the bottom of the trench.

2. Pipe laying shall proceed “upgrade” with the spigot section of the bell-and spigot pipe pointing in the direction of the flow.

3. Each section of pipe shall be laid true to line and grade and in such a manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets in the flow line.

4. Pipe shall not be laid when the condition of the trench or the weather is unsuitable.

C. Debris Control:

1. The interior of the sewer pipe shall be kept clean of dirt and debris at all times. When work is not in progress, open ends of pipe and fittings shall be plugged.

2. Where clearing after laying is difficult because of small pipe size, a suitable swab or squeegee shall be kept in the pipe and bulled forward past every joint immediately after joining has been completed.

## 3.2 POURED-IN-PLACE CONCRETE

A. Concrete shall be mixed in accordance with applicable provisions of Section 90 of the Caltrans Standard Specifications.

B. Construction of concrete structures shall conform to applicable provisions of Section 51 of the Caltrans Standards Specifications. Unless otherwise noted herein or in the Plans, exposed surfaces of structures shall be Class 1 surface finish.

C. Curing shall conform to applicable portions in Section 90 of Caltrans Standard Specifications. No pigment shall be used in curing compounds. All work shall be subject to inspection. No concrete shall be placed until the Project Manager has approved the forms and reinforcement.

D. Concrete shall not be dropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than six feet. Spouts, elephant trunks, or other approved means shall be used to prevent segregation.

## 3.3 PIPELINE AIR TESTING AND FLUSHING

A. All new sections of sanitary sewer shall be tested using the following procedures:

1. Test is conducted between two consecutive manholes, or as directed by the Project Manager.

2. The test section of the sewer shall be plugged at each end. One of the plugs used at the manhole shall be tapped and equipped for the air inlet connection for filling the line from an air compressor.

3. All service laterals, stubs, and fittings into the sewer test section shall be properly capped or plugged and carefully braced against the internal pressure to prevent air leakage by slippage and blowout.

4. Connect air hose to tapped plug selected for the air inlet. Connect the other end of the air hose to the portable air control equipment, which consists of valves and pressure gauges used to control the air entry rate into the sewer test section, and to monitor the air pressure in the pipeline. More specifically, the air control equipment includes a shut-off valve, pressure regulating valve, pressure reduction valve, and a monitoring pressure gauge having a pressure range from 0-5 psi. The gauge shall have minimum divisions of 0.10 psi and an accuracy of 0.40 psi.

5. Connect another air hose between the air compressor (or other source of compressed air) and the air control equipment. This completes the test equipment set-up. Test operations may commence.

6. Supply air to the test section slowly, filling the pipeline until a constant pressure of 3.5 psig is maintained. The air pressure must be regulated to prevent the pressure inside the pipe from exceeding 5.0 psig.

7. When constant pressure of 3.5 psig is reached, throttle the air supply to maintain the internal pressure above 3.0 psig for at least 5 minutes. This time permits the temperature of the entering air to equalize with the temperature of the pipe wall. During this stabilization period, it is

advisable to check all capped and plugged fittings with a soap solution to detect any leakage at these connections. If leakage is detected at any cap plug, release the pressure in the line and tighten all leaky caps and plugs. Start the test operation again by supplying air. When it is necessary to bleed off the air to tighten or repair a faulty plug, a new 5 minute interval must be allowed after the pipeline has been refilled.

8. After the stabilization period, adjust the air pressure to 3.5 psig and shutoff or disconnect the air supply. Observe the gauge until the air pressure has reached 3.0 psig. At 3.0 psig, commence timing with a stopwatch until the pressure drops to 2.5 psig, at which time the stop watch is stopped. The time required, as shown on the stopwatch, for a pressure loss of 0.5 psig is used to compute the air loss.

9. If the time, in minutes and seconds, for the air pressure drop from 3.0 to 2.5 psi is greater than that shown in the following table for the designated pipe size, the section undergoing test shall have passed and shall be presumed to be free of defects. The test may be discontinued at any time.

10. If the time, in minutes and seconds, for the 0.5 psig drop is less than that shown in the following table for the designated pipe size, the section of the pipe shall not have passed the test; therefore, adequate repairs must be made and the line retested.

Requirements for Air Testing

| Pipe Size (inches) | Time Minutes | Seconds |
|---|---|---|
| 4 | 2 | 32 |
| 6 | 3 | 50 |
| 8 | 5 | 6 |
| 10 | 6 | 22 |
| 12 | 7 | 39 |
| 14 | 8 | 56 |
| 15 | 9 | 35 |
| 16 | 10 | 12 |
| 18 | 11 | 34 |
| 20 | 12 | 30 |

(For larger diameter pipe use the following: Minimum time in seconds = 462 X pipe diameter in feet).

11. For 8 inch and smaller pipe, only: if, during the 5 minute saturation period, pressure drops less than 0.5 psig after the initial pressurization and air is not added, the pipe section undergoing test shall have passed.

12. Multi-pipe sizes: when the sewer line undergoing test is 8 inch or larger diameter pipe and includes 4 inch or 6 inch laterals, the figures in the table for uniform sewer main sizes will not give reliable or accurate criteria for the test. Where multi-pipe sizes are to undergo the air test, contractor can compute the “average” size in inches which is then multiplied by 38.2 seconds. The results will give the minimum time in seconds acceptable for a pressure drop of 0.5 psig for the “averaged” diameter pipe.

13. Adjustment Required for Groundwater:

a. An air pressure correction is required when the ground water table is above the sewer line being tested. Under this condition, the air test pressure must be increased .433 psi for each foot the ground water level is above the invert of the pipe.

b. Where ground water is encountered or is anticipated to be above the sewer pipe before the air testing will be conducted, the following procedure shall be implemented at the time the sewer main and manholes are constructed.

1) Install a ½ inch diameter pipe nipple (threaded one or both ends, approximately 10 inch long) through the manhole wall directly on top of one of the sewer pipes entering the manhole with threaded end of nipple extending inside the manhole.
2) Seal pipe nipple with a threaded ½ inch cap.
3) Immediately before air testing, determine the ground water level by removing the threaded cap from the nipple, blowing air through the pipe nipple to remove any obstruction, and then connecting a clear plastic tube to the pipe nipple.
4) Hold plastic tube vertically permitting water to rise in it to the groundwater level.
5) After water level has stabilized in plastic tube, measure vertical height of water, in feet, above invert of sewer pipe.
6) Determine air pressure correction, which must be added to the 3.0 psig normal starting pressure of test, by dividing the vertical height in feet by 2.31. The result gives the air pressure correction in pounds per square inch (psi) to be added.
7) Example: if the vertical height of water from the sewer invert to the top of the water column measures 11.55 feet, the additional air pressure required would be:

$$\frac{(11.55)}{(2.31)} = 5.0 \text{ psig}$$

Therefore, the starting pressure of the test would be 3.0 plus 5 or 8.0 psig, and the ½ pound drop becomes 7.5 psig. There is no change in the allowable drop (0.5 psig) or in the time requirements established for the basic air test.

B. After the line has passed the air test, it shall be balled and flushed with water to clean. A metal screen shall be used downstream at the point of connection to the existing system to collect and remove any rock or other debris that is flushed out during cleaning

3.4 DEFLECTION TESTING

A. Upon completion of work, perform a deflection test on entire length of installed plastic pipeline. Completed work includes superimposed loads adjacent to and over the pipeline, such as compacted backfill and earthwork, and does not include paving, concrete curbs and gutters, sidewalks, walkways, and landscaping.

B. Under external loads, deflection of pipe in the installed pipeline shall not exceed 4.5 percent of the average inside diameter of pipe.

C. Determine whether the allowable deflection has been exceeded by use of a pull-through device or a deflection-measuring device.

D. Pull-Through Device:

1. Provide a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft.

    a. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section.

    b. Pull-through device may also be of a design approved by the Uni-Bell Plastic Pipe Association, provided that the device meets the applicable requirements specified in this paragraph, including those for diameter of the device.

2. Ball, cylinder, or circular sections shall conform to the following:

    a. A diameter, or minor diameter as applicable, of 95 percent of the average inside diameter of the pipe; tolerance of plus 0.5 percent will be permitted.

    b. A homogeneous material throughout, with a density greater than 1.0 as related to water at 39.2 degrees F, and a surface Brinell hardness of not less than 150.

    c. Center bored and through bolted with a ¼ inch minimum diameter steel shaft having a yield strength of not less than 70,000 pounds per square inch, with eyes or loops at each end for attaching pulling cables.

    d. Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end.

3. Pull-Through Device:

    a. Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water.

    b. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions as specified.

E. Deflection measuring Device:

1. Sensitive to 1.0 percent of the diameter of the pipe being tested and accurate to 1.0 percent of the indicated dimension.

2. Obtain approval of deflection measuring device prior to use.

F. Deflection Measuring Device Procedure:

1. Measure deflections through each run of installed pipe.

2. If deflection readings in excess of 4.5 percent of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction.

3. If retest continues to show a deflection in excess of 4.5 percent of average inside diameter of pipe, remove pipe which has excessive deflections, replace new pipe, and completely retest in same manner and under same conditions.

G. Warranty Period Test: Pipe found to have a deflection of greater than 5 percent of average inside diameter when deflection test is performed just prior to end of 1 year warranty period shall be replaced with new pipe and tested as specified for leakage and deflection.

## 3.5 CLEANING

A. Thoroughly clean sanitary sewer lines, manholes, cleanouts, and similar structures, of dirt, debris, and obstructions of any kind.

## 3.6 TELEVISION INSPECTION

A. After completion of the pipe installation, service connections, flushing and cleaning, and prior to placement of pavement, the sewer line shall be televised with a color closed-circuit television with tilt-head camera recorded in DVD format. The original Disks and log sheets shall be provided to the Building Inspector for review.

1. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to placement of pavement:

   a. Low spot (1 inch or greater - mainlines only).
   b. Joint separations (3/4 inch or greater opening between pipe sections).
   c. Cocked joints present in straight runs or on the wrong side of pipe curves.
   d. Chips in pipe ends.
   e. Cracked or damaged pipe.
   f. Dropped joints.
   g. Infiltration.
   h. Debris or other foreign objects.
   i. Other obvious deficiencies.
   j. Irregular condition without logical explanation

**END OF SECTION**

**DIVISION 33 - UTILITIES**

**SECTION 33 41 00- STORM UTILITY DRAINAGE PIPING**

## PART 1 GENERAL

### 1.1 DESCRIPTION

A. This Section includes gravity-flow, non-pressure storm drainage outside the building, with the following components:

1. Backwater valves.
2. Cleanouts.
3. Drains.
4. Corrosion-protection piping encasement.
5. Precast concrete Cast-in-place concrete manholes

### 1.2 ABBREVIATIONS

A. AASHTO: American Association of State Highway and Transportation Officials.

B. ACI: American Concrete Institute.

C. ASME: American Society of Mechanical Engineers.

D. ASTM: American Society of Testing and Materials.

E. HDPE: High-density polyethylene.

F. NPS: Nominal pipe size.

G. PVC: Polyvinyl chloride plastic.

### 1.3 SUBMITTALS

A. Product manufacturer’s specification and literature for all materials furnished.

B. Project Record Documents:

1. Record location of pipe runs, connections, valves, thrust restraints, and invert elevations.
2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

### 1.4 DELIVERY, STORAGE AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes according to manufacturer's written rigging instructions.

D. Handle catch basins and stormwater inlets according to manufacturer's written rigging instructions Referenced Standards:

1.5 PROJECT CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Owner's written permission.

B. Field Samples: Provide only as requested by Architect.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following for the entire project:

1. Drop Inlets and Drain Boxes:
   a. Oldcastle Precast (Christy Concrete) Products
   b. Jensen Precast
2. Area Drain (Inline and Drain Basins):
   a. Nyloplast Advanced Drainage Systems, Inc. (ADS).
   b. NDS
3. Manholes:
   a. Oldcastle Precast
   b. Jensen Precast
   c. US Concrete Precast

2.2 PIPING MATERIALS

A. Refer to Part 3 “Piping Applications” Article for applications of pipe, fitting, and joining materials

2.3 POLYETHYLENE PIPE AND FITTINGS

A. Corrugated High Density Polyethylene (HDPE) Plastic Pipe and Fittings NPS 3 to NPS 10 (DN 80 to DN 250); ASTM F714 with smooth waterway for coupling joints.

1. Silt-tight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.

B. Corrugated High Density Polyethylene (HDPE) Plastic Pipe and Fittings NPS 12 to NPS 60 (DN 300 and DN 1500); AASHTO M294, Type S with smooth waterway for coupling joints. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D3350, minimum cell class 335434C.

1. Silt-tight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.

C. Perforated HDPE:

1. Perforated HDPE pipe shall be cleanly cut and uniformly spaced along the length and circumference of the pipe. Piping shall have two or more rows of equal spaced holes from 0.5" to 0.75" at maximum of 5" centers. Rows and spacing shall be parallel to the axis of the pipe and 120° apart.

## 2.4 PVC PIPE AND FITTINGS

A. PVC Sewer Pipe and Fittings, NPS 15 (DN 375) and Smaller: ASTM D 3034, SDR 35, with bell-and-spigot ends for gasketed joints with ASTM F477, elastomeric seals.

## 2.5 CONCRETEE PIPE AND FITTINGS

A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76 (ASTM C 76M), with bell-and-spigot or groove and tongue ends and gasketed joints with ASTM C 443 (ASTM C 443M), rubber gaskets sealant joints with ASTM C 990 (ASTM C 990M), bitumen or butyl-rubber sealant.

1. Class III: Wall B per drawings
2. Class IV: Wall B, Wall C per drawings
3. Class V: Wall B, Wall C per drawings

## 2.6 DUCTILE-IRON PIPE

A. Push-on-Joint Piping:

1. Pipe: AWWA C151, for push-on joints.
2. Standard Fittings: AWWA C110, ductile or gray iron, for push-on joints.
3. Compact Fittings: AWWA C153, for push-on joints.
4. Gaskets: AWWA C111, rubber, of shape matching pipe and fittings.

## 2.7 NONPRESSURE-TYPE PIPE COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Concrete Pipes: ASTM C 443 (ASTM C 443M), rubber.
2. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
3. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

2.8 BACKWATER VALVES

A. Gray-Iron Backwater Valves: ASME A112.14.1, gray-iron body and bolted cover, with bronze seat.

1. Horizontal Type: With swing check valve and hub-and-spigot ends.
2. Combination Horizontal and Manual Gate-Valve Type: With swing check valve, integral gate valve, and hub-and-spigot ends.
3. Terminal Type: With bronze seat, swing check valve, and hub inlet.

B. PVC Backwater Valves: Horizontal type; with PVC body, PVC removable cover, and PVC swing check valve.

2.9 ENCASEMENT FOR PIPING

A. Standard: ASTM A674 or AWWA C105

B. Material: Linear low-density polyethylene film of 8 mil thickness.

C. Form: Sheet or tube.

D. Color: Black.

2.10 DROP INLETS

A. On-site Precast Drop Inlets: All precast drop inlets as indicated on the civil drawings shall be precast, reinforced concrete of size, depth, and type indicated.

1. Oldcastle Precast
2. Jensen Precast

2.11 CATCH BASINS

A. On-site Precast Catch Basins: All precast catch basins as indicated on the civil drawings shall be precast, reinforced concrete of size, depth, and type indicated.

1. Oldcastle Precast (Christy Products)
2. Jensen Precast

B. Grates:

1. Pedestrian Areas: Heel Proof.
2. Traffic Areas: H20 Rated loading.

2.12 AREA DRAINS

A. On-site Area Drains: All area drains of size, depth, and type indicated on the civil drawings shall be:

1. ADS: Nyloplast
2. NDS

2.13 MANHOLES

A. On-site Manholes: All precast manholes shown on the plans, but not limited to the plans shall be precast, reinforced concrete of size, depth, and type indicated.

1. Oldcastle Precast
2. Jensen Precast
3. US Concrete Precast

2.14 CLEANOUTS

A. Plastic Cleanouts shall have PVC body with PVC threaded plug. Pipe fitting and riser to cleanout shall be of same material as main line pipe.

B. Grates in Traffic areas shall be H20 Rated loading.

2.15 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi (27.6 MPa) minimum, compressive strength in 28 days with 0.45 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (420 MPa), deformed steel.

C. Ballast and Pipe Supports: Portland cement design mix, 3000 psi (20.7 MPa) minimum compressive strength in 28 days, with 0.58 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (420 MPa), deformed steel.

D. Manhole Channels and Benches: Channels shall be the main line pipe material. Include benches in all manholes.

1. Channels: Main line pipe material or concrete invert. Height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
2. Bench to be concrete, sloped to drain into channel. Minimum of 6 inch slope from main line pipe to wall sides.

2.16 PIPE OUTLETS

A. Head Walls: Cast-in-place reinforced concrete with a minimum compressive strength of 3000 psi at 28 days. Construct apron and tapered sides.

B. Rock Riprap: Graded stone according to specifications called on drawings.

2.17 WARNING TAPE

A. Standard, 4-mil polyethylene 3 inch (76 mm) wide tape, detectable type, green with black letters, and imprinted with “CAUTION BURIED STORM SEWER BELOW”.

## PART 3 EXECUTION

### 3.1 PIPE BEDDING

A. The bedding surface of the pipe shall provide a firm foundation of uniform density throughout the entire length of pipe. Pipe bedding per civil trench detail and soils report.

### 3.2 PIPING APPLICATIONS

A. Gravity-Flow, Nonpressure Sewer Piping: Use any of the following pipe materials for each size range:

1. NPS 3 (DN 80): Corrugated PE drainage pipe and fittings, silt-tight couplings, and coupled joints.
2. NPS 4 and NPS 6 (DN 100 and DN 150): Corrugated PE drainage pipe and fittings, silt-tight couplings, and coupled joints.
3. NPS 4 and NPS 6 (DN 100 and DN 150): PVC sewer pipe and fittings, gaskets, and gasketed joints.
4. NPS 8 to NPS 12 (DN 200 to DN 300): Corrugated PE drainage pipe and fittings in NPS 8 and NPS 10 (DN 200 and DN 250) and corrugated PE pipe and fittings in NPS 12 (DN 300), silt-tight couplings, and coupled joints.
5. NPS 8 to NPS 12 (DN 200 to DN 300): PVC sewer pipe and fittings, gaskets, and gasketed joints.
6. NPS 15 (DN 375): Corrugated PE pipe and fittings, silt-tight couplings, and coupled joints.
7. NPS 15 (DN 375): PVC sewer pipe and fittings, gaskets, and gasketed joints.
8. NPS 15 (DN 375): Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
9. NPS 18 to NPS 36 (DN 450 to DN 900): Corrugated PE pipe and fittings, silt-tight couplings, and coupled joints.
10. NPS 18 to NPS 36 (DN 450 to DN 900): Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
11. NPS 42 to NPS 60 (DN 1050 to DN 1500): Corrugated PE pipe and fittings, silt-tight couplings, and coupled joints.
12. NPS 42 to NPS 60 (DN 1050 to DN 1500): Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
13. NPS 66 to NPS 144 (DN 1650 to DN 3600): Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.

### 3.3 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings or bends are indicated. Use fittings for branch connections unless direct tap into existing storm sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.

F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.

2. Install piping NPS 6 (DN 150) and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.

3. Install piping with 36-inch (915-mm) minimum cover.

4. Install PE corrugated sewer piping according to CPPA's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

5. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

6. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

## 3.4 PIPE JOINT CONSTRUCTION

A. Follow piping manufacturer's written instructions.

B. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join corrugated PE piping according to CPPA 100 and the following:

2. Use silt-tight couplings for Type 2, silt-tight joints.

3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric seal joints or ASTM D 3034 for elastomeric gasket joints.

4. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.

5. Join dissimilar pipe materials with nonpressure-type flexible or rigid couplings.

## 3.5 BACKWATER VALVE INSTALLATION

A. Install horizontal-type backwater valves in piping where indicated.

B. Install combination horizontal and manual gate valve type in piping and in manholes where indicated.

C. Install terminal-type backwater valves on end of piping and in manholes where indicated.

3.6 CLEANOUT INSTALLATION

A. Install horizontal-type backwater valves in piping where indicated.

B. Install combination horizontal and manual gate valve type in piping and in manholes where indicated.

C. Install terminal-type backwater valves on end of piping and in manholes where indicated.

3.7 AREA DRAIN INSTALLATION

A. Installation per manufacturer's instructions.

B. Set frames and grates to elevations indicated on civil plans.

C. Set drain frames and covers with tops flush with surface prior to paving.

D. Fasten pour ring to drains prior to backfill or pouring of Portland cement concrete.

E. Embed trench sections in 4-inch (102-mm) minimum concrete around bottom and sides CLEANUP

3.8 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections according to ASTM C 891.

C. Construct cast-in-place manholes as indicated on the Construction Drawings.

D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches (76 mm) above finished surface elsewhere, unless otherwise indicated.

3.9 CATCH BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

3.10 STORMWATER INLET AND OUTLET INSTALLATION

A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.

B. Construct rip-rap of broken stone, as indicated.

C. Install outlets that spill onto grade, anchored with concrete, where indicated.

D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.

E. Construct energy dissipators at outlets, as indicated.

3.11 POURED-IN-PLACE CONCRETE

A. Concrete shall be mixed in accordance with applicable provisions of Section 90 of the CDT Standard Specifications. Concrete shall consist of Type I/II cement. B.

B. Construction of concrete structures shall conform to applicable provisions of Section 51 of the CDT Standards Specifications. Unless otherwise noted herein or in the Construction Drawings, exposed surfaces of structures shall be Class 1 surface finish.

C. Curing shall conform to applicable portions in Section 90 of CDT Standard Specifications. No pigment shall be used in curing compounds. All work shall be subject to inspection. No concrete shall be placed until the Construction Manager has approved the forms and reinforcement.

D. Concrete shall not be cropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than six feet. Spouts, elephant trunks, or other approved means shall be used to prevent segregation.

## 3.12 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch- (203-mm-) thick, brick masonry bulkheads.

2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:

1. Remove manhole or structure and close open ends of remaining piping.

2. Remove top of manhole or structure down to at least 36 inches (915 mm) below final grade. Fill to within 12 inches (300 mm) of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

C. Backfill to grade according to Division 31 Section "Earth Moving."

## 3.13 FIELD QUALITY CONTROL

A. Clear interior of piping and structures of dirt and superfluous material as the work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.

1. Place plug in end of incomplete piping at end of day and whenever work stops.

2. Flush piping between manholes and other structures to remove collected debris.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.

2. Test completed piping systems according to authorities having jurisdiction.

3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

4. Submit separate report for each test. Retain test in first subparagraph and associated subparagraphs below only if required.

5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

    a. Exception: Piping with soil-tight joints unless required by authorities having jurisdiction.

    b. Option: Test plastic piping according to ASTM F 1417.

    c. Option: Test concrete piping according to ASTM C 924 (ASTM C 924M).

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

E. Inspect the interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of project.

1. Submit separate reports for each system inspection.

2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.

    b. Deflection: Flexible piping with deflection that prevents passage of a ball of cylinder of a size not less than 92.5 percent of piping diameter.

    c. Crushed, broken, cracked, or otherwise damaged piping.

3. Replace defective piping using new materials and repeat inspections until defects are within allowances specified.

4. Re-inspect and repeat procedure until results are satisfactory.

**END OF SECTION**

# Bid Form

For

**Commons Modernization**

Gault New Modular Classroom Building

## Bid Opening Location

Santa Cruz City Schools District
536 Palm Street
Santa Cruz, California, 95060

## Bid Opening Date & Time

22 November 2022 at 11:00 am Unless modified by addendum

*Refer also to "Notice to Contractors" for Proposal due dates, Pre-Proposal Conference dates and other pertinent schedule information. Information contained in those documents has not been repeated herein.*

**Dear Board Members**:

The undersigned doing business under the firm name of: _____ hereby propose and agree to enter into a Contract, with Santa Cruz City Schools ("Owner"), to furnish any and all labor, materials, applicable taxes, equipment and services for the completion of Work as described hereinafter and in the Contract Documents:

In accordance with the Plans and Specifications prepared by:

**Bartos Architecture**
1730 S. Amphlett Blvd. Suite 225
San Mateo, CA 94402
Architect's Project Number: **17-005.5**

To:

The Board of Trustees

## Santa Cruz City School District

Therefore, the undersigned hereby proposes to furnish all labor and materials for completion of said work in strict accordance with said Plans, and Specifications for the following sum:

**Bidder:**

Company Name

Address

Telephone

## Base Bid:

The Winning Bidder will be selected based on the **Lowest Base Bid plus additive alternates**.

For all Labor and Materials required to complete the Work of this Project as shown on the Drawings, Specifications and Addenda. **NOTE: PROPOSER SHALL NOT STRIKE OUT OR MODIFY THIS FORM IN ANY WAY INTENDED TO QUALIFY THE BID REQUIREMENTS**

Form: **LUMP SUM PROPOSAL**

Amount:

| | ($ ) |
|---|---|
| Text | Dollars |

After Award of Contract, the District will determine whether to proceed with the work defined by Alternate Prices. The Construction Contract will be executed based on Base Price plus the sum of District chosen Alternate Prices.

### Additive Alternate Price 1: Removal of 3 Existing Portable Building

Complete utility disconnection and removal of 3 existing portable buildings identified at job walk.

Amount:

| | ($ ) |
|---|---|
| Text | Dollars |

### Total Proposal

Sum of **Base Bid** plus **Alternate Prices.**
**Basis of Selection**

Amount:

| | ($ ) |
|---|---|
| Text | Dollars |

This amount includes all allowances and contingency funds identified in the Agreement form or other documents in the bid package.

The following unit prices will **not** be utilized as a basis for selection of the lowest responsive bid. These unit prices may be utilized by District – at District's **option** to determine a

| | | |
|---|---|---|
| CREDIT: Cubic Yard Class II Aggregate | Unit Price: Text | Unit Price: Dollars |
| COST: Cubic Yard Class II Aggregate | Unit Price: Text | Unit Price: Dollars |
| Credit: Cubic yard of Native Fill to Be removed From Scope | Unit Price: Text | Unit Price: Dollars |
| Cost: Cubic yard of Native Fill to Be removed From Scope | Unit Price: Text | Unit Price: Dollars |

If written notice of the Award of Contract is mailed, faxed, or delivered to the undersigned at any time before this bid is withdrawn, the undersigned shall, within ten (10) days after the date of such mailing, faxing, or delivering of such notice, execute and deliver an agreement in the form of agreement present in these Contract Documents and give Performance and Payment Bonds in accordance with the specifications and bid as accepted.

The undersigned hereby designates as the office to which such Notice of Award of Contract may be mailed, faxed, or delivered:

I

Our Public Liability and Property Damage Insurance is placed with:

Our Workers' Compensation Insurance is placed with:

Circular letters, bulletins, addenda, etc., bound with the specifications or issued during the time of bidding are included in the bid, and, in Completing the Contract, they are to become a part thereof.

## Addenda

The following individual acknowledges receipt of all Addenda. A list of published Addenda is available from the Architect. All Addenda shall be reviewed and acknowledges for Proposal to be considered responsive.

Addenda Received:

| | | | Initials |
|---|---|---|---|
| Addendum | ..... | Date | _____ ..... |
| Addendum | ..... | Date | _____ ..... |
| Addendum | ..... | Date | _____ ..... |
| Addendum | ..... | Date | _____ ..... |
| Addendum | ..... | Date | _____ ..... |
| Addendum | ..... | Date | _____ ..... |
| Addendum | ..... | Date | _____ ..... |

..... _____ _____

**Bidder (Signature)**

This bid may be withdrawn at any time prior to the scheduled time for the opening of bids or any authorized postponement thereof.

A bidder shall not submit a bid unless the bidder's California contractor's license number appears clearly on the bid, the license expiration date and class are stated, and the bid contains a statement that the representations made therein are made under penalty of perjury. Any bid submitted by a contractor who is not licensed pursuant to Business and Professions Code section 7028.15 shall be considered nonresponsive and shall be rejected. Any bid not containing the above information may be considered nonresponsive and may be rejected

Each bid must give the full business address of the bidder and be signed by bidder with bidder's usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.

The undersigned bidder declares that this Proposal is not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization or corporation; that the proposal is genuine and not collusive or sham; that the undersigned bidder has not directly or indirectly induced, solicited, colluded, or agreed with any bidder or anyone else to put in a sham proposal or to refrain from bidding; that the undersigned bidder has not directly or indirectly sought by agreement, communication or conference with anyone else to fix his bid price or the bid price of any other bidder, or to secure any advantage against the Owner or anyone interested in this proposal as principals are those named herein; that all statements named in this proposal are true, that the undersigned bidder has not directly or indirectly submitted his bid price or any breakdown thereof or the contents thereof, or divulged information or data relative thereto, to any other person, partnership, corporation, or association, except to such person or persons as have a direct financial interest in the bidder's general business.

In accordance with California Contractor licensing procedures, the prime contractor shall possess the required valid contractor's license at the time of contract award.

**Bidder (Signature)** _____

## Proposal Security

Cashier's Check or Certified Check or bidder's bond drawn payable to the order of the Santa Cruz City School District in the sum of:

($ )

_____

Text Dollars

In the amount equal to ten percent (10%) of the proposal bid, as required by Instructions To Bidders, is enclosed.

The undersigned agrees that the bid amount stated shall remain valid for a period as defined in Section 00 10 00 from the bid opening date. All bid documents shall be retained until the contract has been awarded or until all bids have been rejected.

If awarded the Contract the undersigned hereby agrees to commence work within a maximum of ten (10) days after execution of the contract unless defined elsewhere in the Instructions to Bidders or the Contract Documents.

## Required Documents

This Proposal is not valid unless accompanied by the documents defined in Instructions to Bidders section 00 20 00 and required documents section 00 20 01.

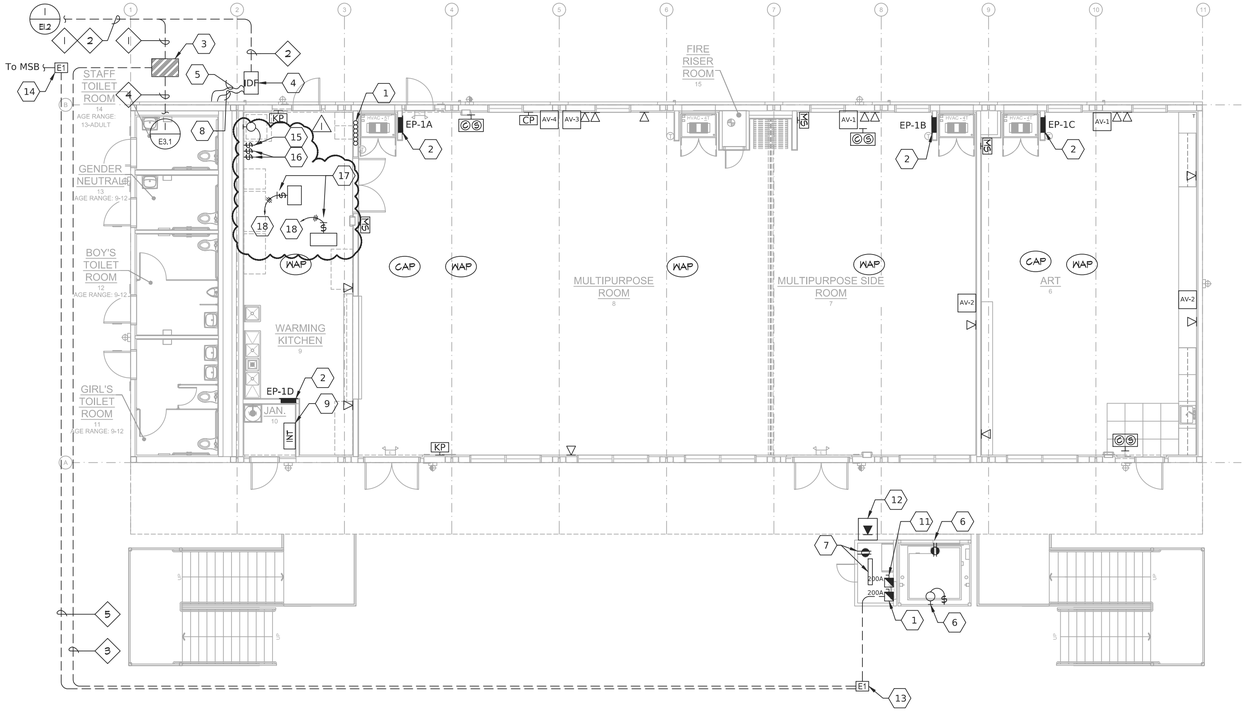
## Execution

The undersigned has examined the location of the proposed work and is familiar with the local conditions at the place where the work is to be performed and has carefully examined the plans and specifications and acknowledges their sufficiency for purposes of completing this proposal.

| | |
|---|---|
| Signed | _____ |
| Print | _____ |
| Company Name | _____ |
| Address | _____ |
| Contractor's License Number | _____ |
| Class and Date of Expiration | _____ |
| Public Works Contractor DIR Registration Number | _____ |
| Phone Number for Verification of Authority | _____ |
| Dated | _____ |

**Bidder (Signature)** _____

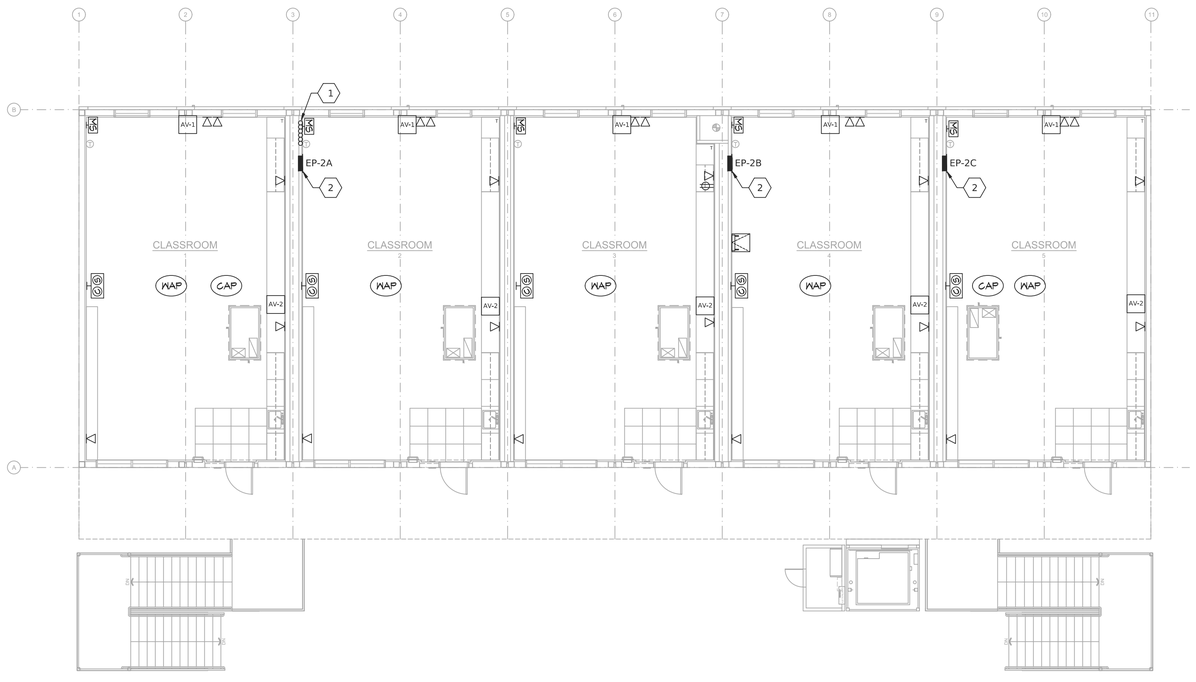
**End of Section**




## 1 Electrical Floor Plan - Floor 1

E2.1

SCALE: 1/8" = 1'-0"




## 2 Electrical Floor Plan - Floor 2

E2.1

SCALE: 1/8" = 1'-0"

## Sheet Notes:

1. (6) 2" conduit from 1st floor t-bar ceiling to 2nd floor t-bar ceiling by Modular Manufacturer.
2. New panel provided by Modular Manufacturer.
3. New DIstribution Panel 'DPN'.
4. New outdoor IDF cabinet.
5. Provide (6) 2" liquid-tight flexible metal conduit to IDF from the IDF cabinet to the building. Connect to exterior pull box provided by the Modular Manufacturer.
6. Pit receptacle and lighting fixture provided by the Modular Manufacturer. Provide 20A circuit to connect. Provide (2) #10 + #10 GND to panel 'EP-1B' for connection.
7. Receptacle and lighting fixture for the machine room provided by the Modular Manufacturer. Provide 20A circuit to connect. Provide (2) #10 + #10 GND to panel 'EP-1B' for connection.
8. Provide (1) 40A-1P circuit for free standing IDF cooling system and (1) 20A circuit for free standing IDF network equipment. Provide (2) #8 + #10 GND and (2) #10 + #10 GND in 1¼"C liquid-tight flexible metal conduit from the IDF rack to the power box on the exterior of thie building. Connect to circuits provided by the Modular Manufacturer at this location.
9. New Intrusion control panel.
10. Elevator disconnect switch to be provided by the Modular Manufacturer. Connect per the Single Line Diagram. Coordinate location with Modular Manufacturer.
11. Elevator cab lighting/power disconnect switch to be provided by the Modular Manufacturer. Provide (2) #10 + #10 GND to panel "EP-1B' for the connection of the disconnect switch. Coordinate location with Modular Manufacturer.
12. Provide Viking #E-1600A ADA emergency elevator phone in the hallway with ADA STI cover. Provide telephone line connection. Coordinate exact requirements with the district. See detail 6/E6.1.
13. Route spare conduit to pull box. If there is not additional room in pull box, stub and cap conduit 5' away.
14. Provide new pull box to accommodate new spare conduit.
15. Provide new wall switch for kitchen hood lights. Provide conduit and conductors to hood light as required. Home run circuit to new 20A-1P circuit breaker in panel 'EP-1D'. Match circuit breaker frame style and AIC rating.
16. Provide new wall switches for kitchen exhaust fan and make-up air fan in ceiling. Provide pilot light for each switch for use indication. Provide conduit and conductors to mechanical units as required.
17. Provide motor-rated switch for mechanical unit. Coordinate exact location and termination requirements with mechanical installer. Connect to wall switch by hood as required.
18. Home run circuit to new 20A-1P circuit breaker in panel 'EP-1D'. Match circuit breaker frame style and AIC rating.

## Conduit Schedule:

1. (N) (2) 4"C - Distribution panel 'DPN'
2. (N) (3) 2"C - Signal
3. (N) (1) 2½"C - Elevator motor power
4. (N) (1) 2½"C - Panel 'EP-1D'
   (N) (1) 2½"C - Panel 'EP-2A'
   (N) (1) 2½"C - Panel 'EP-2B'
   (N) (1) 2½"C - Panel 'EP-2C'
5. (N) (1) 2"C - Spare

## Pullbox Schedule:

E1 - NEW B2436 ELECTRIC / POWER PULLBOX WITH TRAFFIC RATED LID. LABEL LID 'POWER'.

BARTOS ARCHITECTURE
1730 S. AMPHLETT BLVD, SUITE 225
SAN MATEO, CALIFORNIA 94402
www.bartosarchitecture.com

**Santa Cruz City Schools**
133 Mission Street
Suite 100
Santa Cruz, CA 95060

Gault Elementary
1320 Seabright Avenue
Santa Cruz, CA 95062

New Modular Classroom Building.

# Gault Elementary School

REGISTERED PROFESSIONAL ENGINEER
SAMMY S. FERNANDEZ
E16890
Exp. 06/30/23
ELECTRICAL
STATE OF CALIFORNIA

American Consulting Engineers Electrical, Inc.
1590 The Alameda, Suite 200
San Jose, CA 95126
JOB # EK2100A.00
408/236-2312
Fax: 408/236-2316

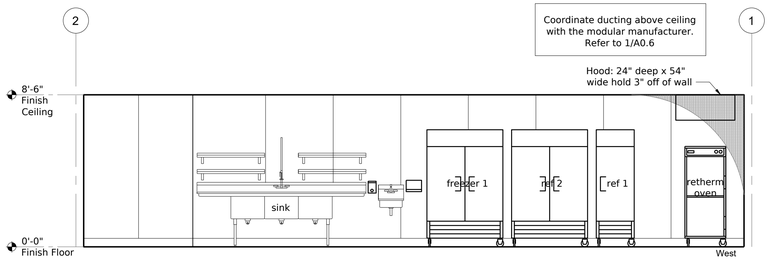
Electrical Floor Plans

**E2.1**

BA 17-005.5

# Equipment List

| Warming Kitchen | | | | | | | |
|---|---|---|---|---|---|---|---|
| Item No. | Description | Manufacturer | Model | Qty | Amps | Vlts. | Phase |
| 1 | Retherm oven | CresCor | RO-151-FW-1332DX | 1 | N/A | 208 | three |
| 2 | Reach-in Refrigerator - double door | True | TS-49-HC | 1 | 5.4 | 115 | single |
| 3 | Reach-in Refrigerator - single door | True | TS-23-HC | 1 | 2.2 | 115 | single |
| 4 | Reach-in Freezer - double door | True | TS-49F-HC | 1 | 9.6 | 115 | single |
| 5 | Reach-in Milk Cooler | True | TMC-58-S-SS-HC | 1 | 2.7 | 115 | single |
| 6 | Salad Bar Servery | N/A | N/A | 1 | N/A | N/A | N/A |
| 7 | Soap dispenser | N/A | N/A | 1 | N/A | N/A | N/A |
| 8 | Towel dispenser | N/A | N/A | 1 | N/A | N/A | N/A |
| 9 | Handle holder | Bobrick | B0223 | 1 | N/A | N/A | N/A |
| 10 | Wall mounted stainless steel shelf | Broadway | BWS-6012 | 2 | N/A | N/A | N/A |
| 11 | Wall mounted food storage shelf | Broadway | BWS-3612 | 2 | N/A | N/A | N/A |
| 12 | Wall mounted utensil rack | Broadway | BWDPR-6012 | 1 | N/A | N/A | N/A |
| 13 | Exhaust Hood - Type 2 | Captive-Aire | VHB Series | 1 | N/A | N/A | N/A |
| 14 | Wire Shelving - Dry Storage | Metro | MX-series: MX2436G | 1 | N/A | N/A | N/A |
| 15 | Wire Shelving - Dry Storage | Metro | MX-series: MX2472G | 1 | N/A | N/A | N/A |




Interior Elevation
Warming Kitchen
1/4"=1'-0" 12

# Keynotes

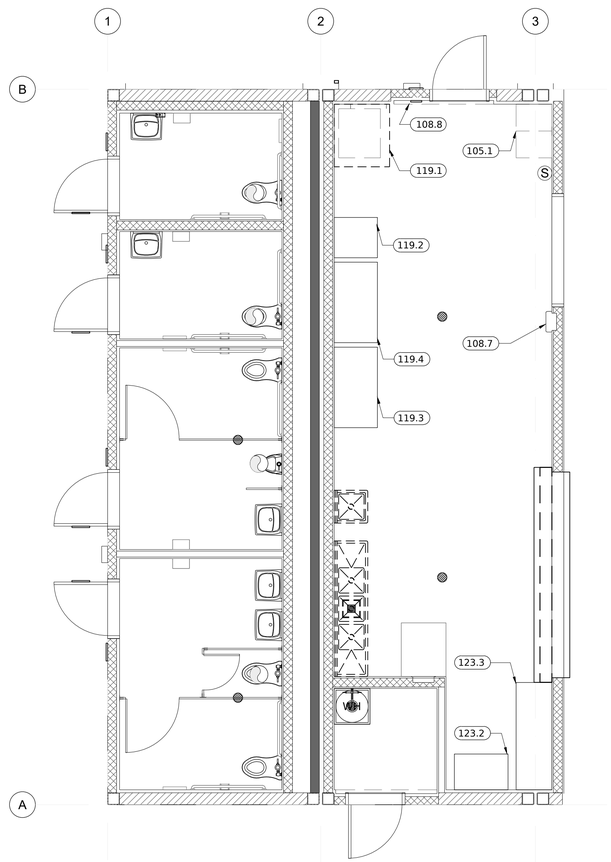
123.1 Keynotes are arranged by CSI section. Refer Specifications for additional information.

**10 Specialties**
105.1 Metal Lockers
108.5 Paper Towel Dispenser
108.6 Soap Dispenser
108.7 Fire Exitiguisher location (supplied by Modular contractor). Refer to Modular sheets A1.0 & A1.1
108.8 Signage: KITCHEN TO BE USED FOR WARMING ONLY. NO COMMERCIAL COOKING ALLOWED. Refer to sheet A0.2

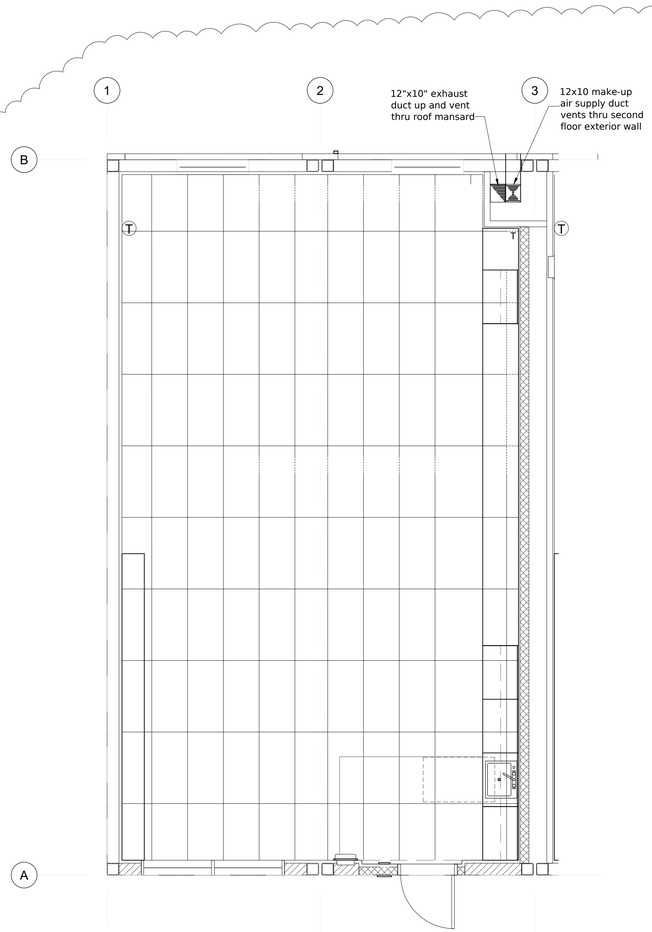
**11 Equipment**
119.1 Warming Oven
119.2 27"W x 29"D Refrigerator
119.3 54"W x 29"D Refrigerator
119.4 54"W x 29"D Freezer

**12 Furnishings**
Refer Casework Schedule
123.2 Wireshelving 36"Lx24"D
123.3 Wireshelving 72"Lx24"D

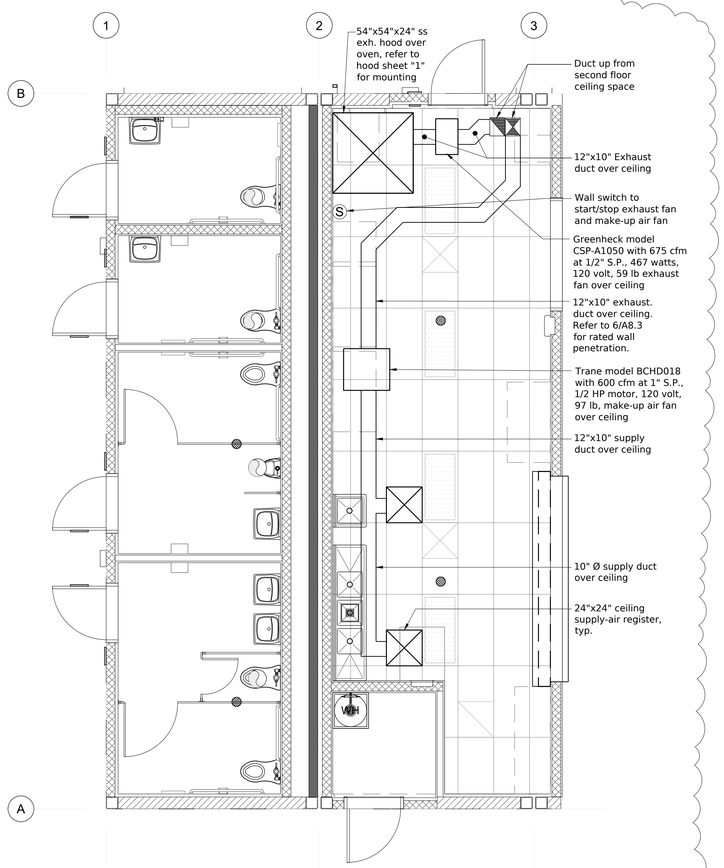
**15 Mechanical / Plumbing**
Refer Mechanical, Plumbing Drawings
154.0 Hand washing sink
154.1 3 compartment sink
154.2 Floor sink
154.4 Custodian sink




Warming Kitchen/Equipment Plan
First Floor
17




Mechanical Plan
Second Floor
1/4"=1'-0" 9




Mechanical Plan
First Floor
1/4"=1'-0" 1


BARTOS ARCHITECTURE
300 8th Avenue
Suite 202 San Mateo
California 94401
www.bartosarchitecture.com


**Santa Cruz City Schools**
133 Mission Street
Suite 100
Santa Cruz, CA 95060

Gault Elementary
1320 Seabright Avenue
Santa Cruz, CA 95062

New Modular Classroom Building
Building Site Package

# Gault Elementary School

| REVISION | DATE |
|---|---|
| DSA Submittal | 3/8/2022 |
| DSA Backcheck | 9/15/2022 |
| ADDENDUM 01 | 11/15/2022 |

2 4 8
1/4"=1'-0"

Kitchen/Mechanical Plan

**A0.6**

BA 17-005.5