
PART 1 GENERAL**1.1 RELATED DOCUMENTS**

- A. The requirements of the General Conditions, Supplementary Conditions and the following Specification sections apply to all Work herein:
1. Division 22 Specification - All sections

1.2 SUMMARY

- A. The Plumbing Subcontractor shall provide all labor, materials, tools, scaffolding, machinery, equipment, appliances and services necessary to complete the Plumbing Work under this Construction Contract. All systems and equipment shall be complete in every respect and all items of material, equipment and labor shall be furnished and installed for a fully operational system. The Plumbing Subcontractor shall coordinate their Work with the Work of the other trades so as to resolve conflicts without impeding job progress or the Schedule. Provide notice with the bid proposal of any concrete Work required by this Division that is not indicated on the Structural, Architectural, HVAC, Plumbing, Fire Suppression, FDAC, or Electrical Drawings.
- B. The Plumbing Subcontractor shall examine all the Architectural, Structural, HVAC, Plumbing, Fire Suppression, FDAC, and Electrical Drawings, Division 25 "Building Controls" and other Divisions and sections of the Specifications in order to determine the extent of Work required to be completed under this Division. Failure to examine all the Contract Documents for this Project will not relieve the Plumbing Subcontractor of the responsibility to perform all the Work required for a complete, fully operational and satisfactory Plumbing installation.
- C. The Plumbing Work to be performed under this Construction Contract is all in connection with the construction and erection of a Project located in San Francisco, California.

1.3 REFERENCE STANDARDS

- A. All Work required by these Specifications shall comply with the latest applicable standards of the following:
1. Underwriters Laboratories, Inc. (UL)
 2. Electrical Testing Laboratories (ETL)
 3. National Electrical Manufacturers Association (NEMA)
 4. American National Standards Institute (ANSI)
 5. National Fire Suppression Association (NFPA)
 6. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
- B. In addition, all Work required by these Specifications shall comply with the applicable standards listed in the various sections of the Specifications as well as the requirements of the local authorities having jurisdiction.
- C. All equipment and material to be furnished and installed on this Project shall be UL or ETL listed, in accordance with the requirements of the authorities having jurisdiction, and suitable for its intended use on this Project.

1.4 SUBMITTALS

- A. The following submittal data shall be furnished according to the General Conditions and Section 22 00 10 and shall include, but not be limited to:
1. Refer to specific Specification Sections for all submittal requirements.
- B. All items or equipment listed with asterisks (*) shall be certified by the manufacturer using Manufacturer Certification "MCA" as set forth in Section 22 00 10. See Section 22 00 10 for certification requirements.

1.5 WARRANTY

- A. Comply with the requirements of the General Conditions and Section 22 00 10.

1.6 WORK INCLUDED

- A. The Work includes but is not limited to the following systems, equipment and services:
1. Plumbing system consisting of all items indicated on the Drawings and/or specified herein, such as:
 - a. Plumbing fixtures and their supports
 - b. Domestic hot and cold water supply piping
 - c. Drinking water fountains
 - d. Sanitary waste piping
 - e. Storm drain piping
 - f. Vent piping
 - g. Electric domestic hot water heaters
 - h. Domestic water booster pumps, circulating pumps and controls
 - i. Potable water storage tanks
 - j. Roof drains and roof overflow drains
 - k. Floor drains
 - l. Sewer and water main extensions to 5'-0" outside foundation walls
 - m. Insulation, controls, safety devices, vibration isolation, etc.
 - n. Pressure regulating devices
 - o. Sewage ejector pumps and controls
 - p. Natural gas service and main extensions to 5'-0" outside foundation walls
 2. Connection of all equipment furnished under other Divisions and/or by the Owner, and installations of control devices required by Division 25 and Division 26.
 3. All domestic and fire protection system water services for the building including all required fees except that water access charges are paid by the Owner.
 4. All sewer services for the building including all required fees except that sewer access charges are paid by the Owner.
 5. All natural gas services for the building including all required fees.
 6. Furnish and install all miscellaneous supports for Division 22 Work and equipment.
 7. Furnishing of Coordination Drawings as specified herein.
 8. Furnishing of Project Record Documents as specified herein.
 9. Furnishing of Shop Drawings, Product Data and Samples.
 10. Furnishing of Test Procedures, Test Reports, and Certifications as specified and required for all Division 26 Work.
 11. Balancing and adjusting of plumbing systems as specified herein.
 12. Performance and acceptance testing of equipment and systems as specified herein and as required by authorities having jurisdiction. Refer to Section 22 05 93 titled "Testing, Balancing and Adjusting" for additional requirements. Participate in and provide labor as required for "off hour" testing of equipment and systems if required by job conditions or by the authorities having jurisdiction and as required to obtain the "Temporary Certificates of Occupancy (TCO)".
 13. Furnishing of operating and maintenance books.
 14. Miscellaneous items as required for complete and functioning systems as specified herein and as indicated on the Drawings.
 15. All systems, equipment and services specified herein shall be furnished and installed complete and ready for use.
 16. Provide all excavation and backfill required for Division 22 Work.
 17. Furnish and install all sleeves for the Plumbing Work complete with seals and firestop as specified herein and as required by the authorities having jurisdiction.
 18. ~~Furnish and install insulation for freeze protection, over the cable wrap type heat tracing provided by Division 26, on all piping as indicated on the Drawings.~~
 19. Patching or replacement of all fireproofing if it is damaged or removed during the installation of the Division 22 Work.
 20. Provide software communication interfaces between selected equipment and the BMCS.
 21. Participate in and provide equipment, materials and labor as required to construct at the Project Site a complete plumbing "mock-up", in or out of sequence, of one (1) typical floor and the associated air handling unit room. See Architectural Specification Section 09000 for details and construction requirements. The field "mock-up" will remain in place for use in the completed building systems. The "mock-up" will be reviewed and will serve as a model for the plumbing installation and other similar typical floors.
 22. Participate in and provide equipment, materials, and labor as required to construct at the Project Site, one (1) complete plumbing toilet room "mock-up", in or out of sequence. See Architectural Specification Section 09000 for details and construction requirements. The field "mock-up" will remain in place for

use in the completed building systems. The “mock-up” will be reviewed and will serve as a model for the plumbing installation and other similar typical floor toilet rooms.

1.7 PARTIAL LIST OF WORK NOT INCLUDED IN DIVISION 22

- A. Electrical connections for motors and mounting of loose motors.
- B. Individual motor controllers except motor controllers furnished as integral parts of pieces of equipment.
- C. Motor control centers.
- D. Individual disconnect switches except those furnished as integral parts of equipment.
- E. All concrete Work indicated on the Structural, Architectural, Mechanical or Electrical Drawings.
- F. Concrete equipment pads, concrete thrust blocks and concrete fill for equipment and inertia bases. The Mechanical Subcontractor shall be responsible for providing the Contractor with the correct dimensions, layout, etc. for all equipment.
- G. Metal architectural louvers (except as indicated on the Division 23 Drawings).
- H. Painting, except touch up painting and as otherwise specified herein.
- I. Installing access doors in General Construction.
- J. Wiring for Building Management and Control System and interlocks.
- K. Subsurface and landscape drainage.
- L. Utility mains and piping 5' beyond the foundation walls unless indicated otherwise by the Drawings.
- M. Building Management and Control System: Division 25.

1.8 PROPOSALS AND ALTERNATES

- A. See Contractor's or Owner's "Instructions to Bidders" and Section 01 for additional proposal requirements and for additional information related to Allowances, Unit Prices and Alternates.
- B. Compliance Reviews: The Subcontractor and equipment vendor shall provide a Compliance Review with the bid proposal of the applicable Drawings, Specifications and Addenda for each "Equipment Alternate" listed hereinafter for this Project. The Compliance Review will be a paragraph-by-paragraph review of the Specifications with the following information, "C", "D", or "N/A", marked for each Specification section paragraph in the margin of the Specification and any applicable Addenda.
 - 1. "C": Comply with no exceptions.
 - 2. "D": Deviation. Equipment, product or material does not comply. For each and every deviation, provide a numbered footnote with reasons for the deviation for the Owner's consideration and possible alternatives.
 - 3. "N/A": The Specification paragraph does not apply to the proposed equipment, material or product.
 - 4. The compliance review is intended to be a confirmation that the proposed equipment is in complete compliance with the requirements of the Contract Documents. In the event that a listed manufacturer cannot meet the requirements of the Contract Documents because of limitations of their manufacturing process or their equipment, such deviations must be detailed for review by the Owner. Any and all deviations to the requirements of these Specifications must be identified and may impact the Owner's acceptance of the Alternate.
 - 5. Unless a deviation is specifically noted in the Compliance Review, it is assumed that the equipment proposed is in complete compliance with the Contract Documents. Deviations taken in cover letters, subsidiary documents, by omission or by contradiction do not release the Subcontractor from being in

complete compliance, unless the deviation has been specifically noted (explicitly, not by implication) in the Compliance Review.

- C. **Alternates:** The Equipment Alternates P-1 through P-3 costs shall include the equipment cost, complete material and labor installation costs including testing and service, sales tax, warranty cost, startup costs and the Subcontractor's markup and fee.

1. **Alternate P-1:** Provide separate sewer risers to collect gray water from all showers (8) at Level 2 & 5 and Lavatories from level 2 to 27. The system shall be capable of collecting and treating 2600 GPD gray water . The gray water drained from the showers at level 2 & 5 and lavatories from levels 2 to 27 will be collected in the 6000 gallon gray water storage tank located at level P1. The gray water collected in the collection tank will be treated by recycled water system located at level P1 and will be stored in a 6000 gallon treated recycled water storage tank located at P2 level. Refer to drawings P2.P1, P2.P2, P4.04C-Rev1, P4.07 and specification section 22 11 30 for more details.The recycled water booster pump set and recycled water supply piping will be part of base building scope.Treated Gray water shall meet the California Department of Public Health statewide uniform criteria for disinfected tertiary recycled water as provided in California Code of Regulations, Title 22 Section 60301.230 and contractor shall be responsible for obtaining city approval of the proposed system. All rooms using recycled water using recycled water for water closets and urinals shall be identified with signs that contain the following text "TO CONSERVE WATER, THIS BUILDING USES RECYCLED WATER TO FLUSH TOILETS AND URINALS". Each sign shall contain one half (1/2) inch letters of highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users.
2. **Alternate P-2:** Provide one (1) 1 1/2" gas pipe riser from gas meter room to level 3 for connecting to 30 kW Capstone Turbine Cogeneration System. Terminate with gas isolation valve for connection by Cogeneration System supplier.
3. **Alternate P-3:** Provide Non recessed, High/low drinking fountain similar to Filtrine model 107-14-HL one quantity at each floor with required drain, vent and cold water supply.
4. **Alternate P-4**
Provide 6000 Gallon Recycled Water Buffer tank, Chlorine Injection System, Chlorine monitoring System.

Rainwater Disinfection Skid

- a. **General: Furnish and install a prefabricated, pre-wired dual pump Rainwater treatment and disinfections system. The system shall be capable of automatically providing a constant system residual of no greater than 1.0 PPM and no less than 0.1 PPM of chlorine residual, measured by the ORP Controller on the skid. Refer to plumbing equipment scheduled drawing for capacities of pumps and motors.**
- b. **The main control panel and all electrical devices, connections etc. shall be rated to comply with a NEMA 4X environment and shall be mounted on the skid in a manner, which allows easy access and maintenance. The skid mounted main control panel will include a main power disconnect and HOA switch for each pump. In automatic, the pumps will be operated via a supplied enable/disable run contact and a 4-20ma pump pacing signal generated by the Siemens 887 oxidant controller. The 887-controller will also receive a 4-20ma input signal representing ORPstatus. The control panel will also include output contacts for pump status (On/Off). All components will be mounted on a containment skid that will include a 50-gallon chemical solution day tank.**
- c. **The chemical feed skid shall be supplied with a recirculation pump, which will remove water from the Rain Water Storage Tank and pump the rainwater through a flow cell, injection point for chlorine, and then back to the rainwater day tank. This pump shall be capable of continuous duty and operate only when the storage tank**

suppliers level switch(s) allow for operation. This pump shall be supplied with its own control panel and be integrated into the chemical feed skid for safe and ease in maintenance and operation. The completed panel assembly shall have the UL listing mark for industrial control panels.

- d. ***The solenoid-actuated diaphragm metering pumps (2) shall be capable of pumping into a line pressure of 80 PSI and have a daily output rating of no less than 10 GPD. The system to be supplied with one pump which will operate as lead pump and be supplied with a second pump that will operate as the lag pump. The control panel for these pumps shall be capable of transferring the lead and lag status to either pump. The skid shall be supplied with a 50 gallon chemical solution tank and lid for mixing of the sanitization chemical. A calibration chamber shall also be incorporated into the system design.***

5.

PART 2 PRODUCTS

2.1 GENERAL

- A. Refer to the specific sections of the Specifications for equipment requirements.

PART 3 EXECUTION

3.1 GENERAL

- A. Installation shall be in accordance with the Specification section pertaining to the individual equipment.

3.2 SUBCONTRACTOR SCHEDULING PROCEDURES

- A. The following is a summary of the scheduling described in the text of the Specifications:
1. Immediately after Notice to Commence, the Contractor, together with the major Subcontractors, shall have a preconstruction meeting with the Architect, Engineer, and Owner.
 2. An expedited submittal review process shall be utilized on this Project. The Subcontractor shall prepare the following upon receiving Notice to Commence.
 - a. On or before two (2) weeks after Notice to Commence, the major Subcontractors shall submit to the Engineer a complete, typed list of the manufacturers and suppliers for the equipment and materials intended to be furnished on this Project that will be provided for review at the expedited submittal review meetings.
 - b. Approximately six (6) to eight (8) weeks after Notice to Commence, the expedited submittal review meetings will be conducted with the Owner, Architect, Engineer, Contractor, and all major Subcontractors. Subcontractors shall provide complete, certified, documented, and coordinated Product Data submittals for the equipment and material intended to be reviewed and processed at the expedited submittal review meetings. It is anticipated that the majority, if not all, of the equipment and material submittals that will be furnished on this Project will be processed at these meetings.
 3. Shop Drawings, Product Data, Samples, Test Procedures, Test Reports, Certifications, Composite Wiring Diagrams, and Coordination Drawing submissions not included in the expedited submittal review process will follow a normal sequential review by the Engineer as detailed in Section 22 00 10.
 4. On or before two (2) months after Notice to Commence, the Subcontractor shall submit a Log of all Division 22 Shop Drawings, Product Data, Samples, Test Procedures, Test Reports, Certifications, Composite Wiring Diagrams, and Coordination Drawings for the Project including all that were processed at the expedited Submittal review meetings.
 5. On or before two (2) months after Notice to Commence, the Division 22 Subcontractor shall furnish Composite Wiring Diagrams to the Division 25 and Division 28 Subcontractor.

6. The Division 25 and Division 28 Subcontractor shall complete its Work on the Composite Wiring Diagrams and shall return them within [one (1)] month after receiving them from the Division 22 Subcontractor.
7. On or before four (4) months after Notice to Commence, the Contractor shall submit Coordination Drawings to the Architect and Engineer for review.
8. On or before six (6) months after Notice to Commence, the Subcontractor shall provide a detailed schedule of completion indicating when each system is to be completed and outlining when tests will be performed.
9. Submit two (2) initial copies of the operation and maintenance books to the Owner on or before six (6) months after Notice to Commence.
10. Submit proposed test procedures, recording forms, test equipment, and personnel and qualifications for review six (6) months prior to execution of testing.
11. Submit balancing and performance testing procedures and recording forms for all testing at least six (6) months prior to commencing any air and/or water balance Work.
12. Submit air and water testing and balance reports for each individual system within two (2) weeks after completion of the testing and balancing.
13. Submit a proposed schedule of Owner instruction and training as required in specific specification sections for review by the Architect and Engineer six (6) months before Substantial Completion.
14. Submit four (4) final copies of the Operation and Maintenance books to the Engineer for review at least ten (10) weeks before Final Review of the Project.
15. Submit testing reports for each individual system within two (2) weeks after completion of the testing.

END OF SECTION