



SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section supplements all Sections of this Division and shall apply to all phases of Work required to provide for complete installation of mechanical system. Intent of this specification is to provide complete and fully functional mechanical system.

1.2 QUALITY REQUIREMENTS

- A. General Requirements.
 - 1. All Mechanical Work performed under this Division shall be installed by competent craftsmen, skilled in the trade involved, and shall be installed in conformance with all applicable local codes.
 - 2. Installation of all items shall be performed in strict accordance with all codes and regulations set forth by State, including CALGreen Tier 1 requirements, as well as Local, and Federal authorities.
- B. Requirements of Regulatory Agencies:
 - 1. Codes and Ordinances.
 - a. All Work shall meet the requirements of local codes, ordinances, and utility companies except adhere to the Contract Documents when more strict requirements are specified.
 - b. Codes which govern mechanical Work in this Project are as follows:
 - 1) ASME Boiler Code
 - 2) NFPA Life Safety Code 101
 - 3) NFPA 90A
 - 4) NFPA 13
 - 5) Factory Mutual Standards
 - 6) American Gas Association
 - 7) California State Fire Marshal Regulations.
 - 2. Manufacturer's Tests. All materials shall, so far as possible, be subjected to standard tests by the manufacturer before shipment.

1.3 SUBMITTALS

- A. Shop Drawings and Product Data:
 - 1. General requirements for all shop drawings are specified elsewhere in these specifications. Check individual sections for any specific submittal requirements.
- B. Operation and Maintenance Data:



1. Maintenance Manuals.
 - a. Furnish two sets of maintenance manuals, each containing items specified below. Furnish manuals to LAWA before final acceptance of the mechanical Work.
 - b. Definitions Applicable to the Maintenance Manuals.
 - 1) Literature. Any page (either whole or in part), sheet, drawing, or booklet describing the maintenance, operation, and parts of mechanical equipment, which is furnished either in the shipping carton, attached to the equipment, or otherwise prepared and distributed by the manufacturer for the user, not limited to papers submitted as shop drawings.
 - 2) Mechanical Equipment. All major items shown in the Mechanical Division Drawings and Work for which shop drawings are requested except the following: thermometers, expansion tanks, air separating tanks, insulation materials, vibration isolation equipment, plumbing drains and fixture carriers, and boiler stack.
 - 3) Instructions. An outline written by the Contractor with information necessary to help LAWA apply the maintenance manual and simplify verbal instructions.
 - c. Collection of "Literature." Collect "literature" in like new condition, of all pieces of "mechanical equipment" until two copies of each are obtained. Copies soiled during construction will not be accepted.
 - d. Assembly of "Literature."
 - 1) Assemble "literature" in separate, multiples of two, 3-ring loose leaf binders, 2 inches (50 mm) size, with chrome-plated piano hinges and black hard coated covers.
 - 2) Small or large "literature" not easily inserted in binders shall each be put in heavy manila envelopes.
 - 3) Furnish each binder with plastic enclosed tabs on reinforced paper neatly arranged. Type each of the following on a separate tab.
 - a) Instructions
 - b) Valve Charts
 - c) Accessories
 - d) Lubrication
 - e) Testing and Balancing Reports
 - f) Each Specification and Title in the Project Specification for which "Literature" has been collected.
 - 4) File "instructions" envelopes and "literature" under correct tabs. Clearly identify each piece of "literature" and envelope with equipment name and numbers.
 - e. Valve Charts.
 - 1) Format. Arrange format of valve charts by rooms and sequence all valve numbers starting with mechanical equipment rooms and finishing with "occupied spaces."



- 2) Information. Furnish the following information typed on valve charts for each valve furnished throughout the Project in the Mechanical Division, except check valves and automatic valves.
 - a) Room numbers and name where valve is located, i.e. "ZG boiler room."
 - b) Valve number assigned by Contractor and stamped on brass plate, i.e. "147."
 - c) Service medium using designation assigned to Drawings on mechanical symbols, i.e. "heating hot water supply" or "plumbing cold water."
 - d) Valve types as specified herein.
 - e) Function valve serves, i.e. "strainer shut-off" or "balancing valve."
 - f) Zone identification, i.e. "AHU-2" or "auxiliary heating."
- 3) Insert Charts in Manuals.
 - f. Lubrication Charts. Furnish a chart listing each lubricated piece of equipment, the proper type of oil or grease required, and recommended frequency of lubrication. Insert charts in manuals.
 - g. Accessories.
 - 1) Furnish LAWA with a complete equipment accessory schedule listing each piece of equipment and the related size, type, number required, and manufacturer of the following items.
 - a) Filters
 - b) Fan Belts
 - c) Refrigerant Dryers
 - 2) Insert Schedules in Manuals.
 - h. Insert 2 copies each of correct testing and balancing reports in manuals.
2. Instructions in Operation.
 - a. After all tests and adjustments have been made and the maintenance manual has been completed and given to LAWA, furnish one or more full-time qualified personnel as necessary to put the mechanical Work in continuous operation for a period of not less than two days, during which time the designated personnel's only purpose shall be to give complete operating and maintenance instructions to LAWA.

1.4 JOB CONDITIONS

A. Existing Conditions:

1. Existing Pipe Lines.

- a. If any existing water, gas, or other pipes and appurtenances are encountered which interfere with the proper installation of new Work and which will not be used in connection with new Work, or existing systems, close such pipe in a



proper manner, and if necessary, move or remove the pipes as directed by LAWA.

- b. Where existing Work is to be modified, it shall be done in conformance with the Specifications. Materials used shall be same as existing unless otherwise specified.

B. Sequencing, Scheduling:

1. Coordination of Work.

- a. Plan all Work so that it proceeds with a minimum of interference with other trades. Inform the general Contractor of all openings required in the building construction for the installation of mechanical Work. Provisions shall be made for all special frames, openings, and pipe sleeves as required. The mechanical Contractor shall pay for all extra cutting and patching made necessary by his failure to properly direct such Work at the correct time.
- b. Verify local utility company's inspection requirements and abide by their rights of inspection before covering or otherwise concealing any piping, wiring, or equipment.

PART 2 – PRODUCTS – Not Applicable.

PART 3 - EXECUTION

3.1 INSTALLATION/APPLICATION/PERFORMANCE/ERECTION

A. Installation:

1. General.

- a. Cooperate with all other Contractors in furnishing material and information for correct location, in proper sequence, of all sleeves, bucks, inserts, foundations, wiring, etc.
 - b. All piping connections to equipment shall be made with unions or flanges to permit dismantling. Flanges and unions shall also be installed in the piping systems to permit disassembly consistent with good installation practice and as required for removal of connected equipment from place of installation.
2. All belt drives, flexible couplings, and other exposed rotating or reciprocating parts shall be covered with OSHA approved safety covers. Covers shall be permanent type and easily removable.
 3. All motors and bearings shall be covered with watertight and dust-proof covers during construction period.
 4. Sleeves, frames, and wall pipes shall be furnished and installed for all pipes and ducts, passing through concrete floors and walls and shall be coordinated with other trades. Special sleeves through floors and walls shall be installed in accordance with manufacturers printed instructions and as detailed.



- a. All sleeves and frames through exterior floors and walls above ground and all interior floors and walls shall be black iron pipe unless otherwise noted. Sleeves and frames shall be of a size to accommodate the pipe or duct and insulation. Sleeves and frames shall be grouted in place with installation left smooth and finished to match surrounding surfaces.
- b. Pipes passing through exterior floors and walls below ground, 3 inch (75 mm) and larger, shall utilize cast iron wall pipes unless noted or detailed otherwise. The wall pipe shall be used to convey the liquid or gas through the floor or wall without the use of sleeves. Wall pipes shall be furnished complete with end connections and adapters required to connect to the piping material. Size of wall pipe shall equal or exceed the maximum pipe size connected thereto. Wall pipes shall be integrally cast into floor or wall construction and provide the best possible seal at the exterior exposure.
- c. Pipes passing through exterior floors and walls below ground, 2-1/2 inch (63 mm) and smaller, shall utilize black iron pipe sleeves as specified for aboveground in conjunction with a modular mechanical type seal as hereinafter specified.
 - 1) The modular mechanical type seal shall consist of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. Tightening of the bolts shall cause the rubber sealing elements to expand providing a watertight seal between the pipe and wall sleeve.
 - 2) The required inside diameter of the sleeve and the installation of the seal shall be coordinated with the seal manufacturer to provide a watertight joint. Seals shall be "Link Seal" manufactured by Thunderline Corporation. A seal consisting of a combination of a sleeve and a pressure clamping system manufactured by O. Z. Manufacturing is acceptable.
- d. Cutting of openings and installation of sleeves and frames through exterior floors and walls above grade, and interior floors and walls shall be done in a neat, workmanlike manner. Openings shall be cut only as large as required for the installation.
 - 1) At fire-rated floor and wall penetrations, provide penetration sealant as specified in herein.
- e. Sleeves and frames at floors and walls in concealed locations and in unfinished spaces such as mechanical rooms, etc. shall extend 1 inch (25 mm) from the finished surface. All other sleeves at floors shall extend 1/4 inch (6 mm) from finished floor surface, but shall allow placement of escutcheons. All other sleeves at walls shall be installed flush with finished surface.
- f. Escutcheons for exposed pipe through floors and walls, where exposed to view, shall be provided and shall be chromium plated except where special escutcheons are required under plumbing fixtures. Escutcheons shall be sized sufficiently to conceal the floor or wall opening and sleeve.



5. Interference.
 - a. Wherever piping runs on ceilings, arrange the run of the piping in such a manner that it does not interfere with grilles, light outlets or light fixtures.
6. Valves.
 - a. Valves shall be provided on all piping wherever shown or specified using adapters where required. All removable or replaceable equipment shall be valved. All valves shall have a securely fastened stamped brass metal plate each bearing a different number identified in the maintenance manual.
7. Openings in Pipes.
 - a. All openings in pipes shall be kept closed during the progress of the Work.
8. Lubrication.
 - a. Provide all lubrication for the operation of all equipment until substantial completion of the Project. Run in all bearings, and after they are run in, drain and flush bearings and refill with a new oil change. Refer to maintenance manual specification for lubrication chart.

3.2 ADJUSTMENT AND CLEANING

- A. Safety Devices. Thoroughly check all safety devices to assure proper operation and protection.
- B. Service.
 1. Perform service on all mechanical Work until the date of substantial completion including oiling and greasing, adjustments, cleaning, packing of seals, and other items as recommended by equipment manufacturer in the maintenance manual hereinbefore specified.
 2. Air filters.
 - a. Do not operate air moving equipment having air filters unless temporary filters are in place to protect the mechanical Work.
 - b. Clean or replace these temporary filters before final test and balance Work is begun as necessary for accurate readings. After completing the testing and balancing Work, replace temporary filters with new filter media as specified.
 3. Strainers.
 - a. Remove, clean and reinstall each strainer screen as specified below after systems have been flushed as specified in other sections of Division 23.
 - 1) Clean each strainer after all adjustments have been made and system has operated a minimum of 24 hours, but before final test and balancing operation is started.
 - 2) Clean each strainer again, after final test and balancing operation and before substantial completion of the Project.
 - b. Certain screens may remain out of the strainer body after removal during the final cleaning only as directed by the LAWA.
 4. Purge all air from water systems after each servicing.



- a. Protect all furnishings and finishes during each servicing operation, and repair or replace to original condition, those damaged as a result of servicing.
 5. Replace insulation removed or damaged after each operation. Leave insulation as specified herein.
 6. Contractor may coordinate servicing operations with LAWA's operating personnel so as to coincide with time interval specified for instruction in operation.
 7. Put system in full operating condition before substantial completion of the Project.
- C. Alarms. Test and adjust alarms for satisfactory operation.
- D. Tests and Adjustments. Upon completion of the installation and before substantial completion of the Project, the Contractor shall make all necessary tests and adjustments to place the system in a working condition. Systems shall be balanced as specified herein. The general operating tests shall cover a period of not less than 12 hours after completion of final testing and balancing, and shall demonstrate that the entire equipment is functioning in accordance with the Specifications. Furnish all instruments, test equipment, and competent personnel that are required for the tests.

END OF SECTION 23 05 00