

## SECTION 22 0100 - GENERAL PROVISIONS

### PART 1 - GENERAL

#### 1.1 FIRE UNDERWRITER SEAL:

- A. Where applicable, all material shall bear the National Board of Fire Underwriters' Seal of Approval. Certificates to this effect to be furnished to Architect upon request.

#### 1.2 DEFINITION OF WORK RESPONSIBILITY:

- A. All electrical control components including starters required for operation of HVAC and plumbing equipment whether integral or remote shall be furnished and installed under this Contract. Control wiring, conduits and accessories for control devices shall be furnished and installed by the Contractor who provides the HVAC and plumbing equipment. See Division 26 specifications for starters, combination starters, and switches.
- B. Power wiring from panel boards or similar source through all equipment disconnects to motors or heating equipment shall be furnished and installed by the Electrical Contractor.
- C. Equipment disconnect switches, unless otherwise specified or supplied by the equipment supplier as an integral part of the equipment shall be furnished and installed by the Electrical Contractor.
- D. All electrical equipment, components, and wiring furnished and installed under this portion of the specifications shall conform to all requirements of the applicable portions of the Division 26 electrical specifications.
- E. All base flashing, where required, shall be by the General Contractor, with necessary counter-flashing by this contractor. Flashing shall comply with the requirements of Division 07.
- F. All structural work needed for support of mechanical equipment or components shall be provided by this contractor unless shown on structural plans.

#### 1.3 RULES AND REGULATIONS:

- A. Contractor shall be licensed by the Municipality/Township in which the work is performed. Contractor is responsible for meeting all licensing requirements of the Municipality and securing all necessary certifications prior to beginning work.

- B. All work shall be performed in accordance with the rules and regulations of the ICC Codes, local plumbing codes, the utilities having jurisdiction, and the NFPA Code.
- C. All work shall be performed in accordance with the rules and regulations of Pennsylvania Department of Labor and Industry, Federal Department of Labor (Occupational Safety and Health Administration), the Department of Education, and all codes and agencies having jurisdiction.
- D. All construction, design fabrication, tests, rating and installation shall comply with the rules and regulations of all local, state or national codes and agencies having jurisdiction over this project. Any costs involved in complying to these rules and regulations shall be included in original bid of this Contractor.
- E. The Owner will obtain the building permit. Any other fees relative to the contractor's work shall be paid by the contractor as part of his bid.
- F. Contractor must be licensed within the Township which the project is located. Copies of these licenses must be posted within the respective job trailers during construction.

#### 1.4 ANCHOR BOLTS:

- A. Each Contractor shall provide and set in place at the time the foundations, bases, or curbs are poured, all necessary anchor bolts as required for the various equipment specified herein, to be furnished by him under these Specifications. Anchor bolts must be of the hook type and of the proper sizes and length to suit the apparatus. The bolts shall be set in pipe sleeves of approximately twice the bolt diameter and as long as the imbedded length of the bolt.
- B. When the equipment is set in its proper position, the bolt sleeves and the space between the rough foundations, bases or curbs of the equipment shall be completely filled with one inch of non-shrinking cement grout.
- C. Each Contractor shall assume all responsibility for the location of all anchor bolts for the equipment furnished by him under these Specifications, and must have a man present at the time the foundation, bases, or curbs are poured.

#### 1.5 DRAWINGS:

- A. The accompanying drawings are a part of these specifications and are intended to show approximate and relative locations of services and equipment. They shall not be scaled to determine exact positions, locations and clearances.
- B. Due to the diagrammatic layout and small scale of the drawings, certain piping and duct rises, drops, offsets, valves, and related specialties are not shown. The Contractor shall provide all ductwork, piping, fittings, valves, and specialties required to insure a complete installation without additional cost to the Owner.

- C. All drawings and specifications pertaining to general construction, plumbing, HVAC, electrical and other work shall be carefully examined. All work shall be coordinated prior to installation. Where physical interferences with his work occur because of his failure to coordinate with other trades, this Contractor shall rearrange his work at his own expense.

#### 1.6 SUBMISSION OF SHOP DRAWINGS, EQUIPMENT AND MATERIALS

- A. Refer to Division 1 for additional submittal requirements.
- B. Contractors shall include with each submittal / shop drawing, a matrix outlining all items that do not match the specified unit. If an item is not listed on the matrix, the submitted unit will be assumed to meet all parts of the specification. Contractors will be responsible to ensure that the specifications are met in full. Items in matrix shall include scheduled performance data vs. submitted performance data, specified components vs. submitted unit components, specified construction weight, warranty, etc. vs. submitted construction, weight, warranty, etc.

#### 1.7 VISIT TO THE SITE:

- A. Prior to submission of his bid, the Contractor shall visit the site to acquaint himself with the existing conditions. Bids as submitted will be interpreted to include all costs and change made necessary by such conditions.

#### 1.8 COORDINATION OF WORK:

- A. Contractor shall coordinate his work with that of other trades. In case of interference or problems the Architect shall decide which work is to be relocated, regardless of which is installed first.
- B. The Prime Contractor shall prepare coordination/arrangement CAD drawings for coordination with all other trades. The contractor shall furnish these coordination drawings to the contractor responsible for project BIM coordination.
- C. This Contractor shall obtain approval of all arrangement drawings before continuing with installation of his work.

#### 1.9 LOCATION OF EQUIPMENT:

- A. All locations of plumbing, HVAC and fire protection equipment and pipe connections there to shall be verified by the Owner and Architect. The contractor shall verify locations sufficiently in advance of the installation to allow uninterrupted progress of the work of all trades.

1.10 MATERIALS AND EQUIPMENT:

- A. All materials and equipment, unless otherwise specified, shall be new and of the best quality, approved for their specific application.
- B. This Contractor shall provide, when required by the Architect, labeled samples of materials to be used on the project. Samples shall be submitted for approval by the Architect prior to their installation.
- C. All materials and equipment installed by the Contractor shall be securely and rigidly supported from or attached to the building structure.

1.11 WORKMANSHIP:

- A. All workmanship shall be done according to the best practices of the trade by qualified and competent tradesmen.

1.12 PROTECTION OF EQUIPMENT:

- A. The Contractor shall protect all material and equipment from damage until final acceptance as installed. He shall close all openings during construction with temporary plugs and replace all damaged items with ones of exact sameness at his expense.
- B. He shall schedule material and systems for deliver in such a pattern that critical pieces of equipment may be stored within the building, protected from weather. Where materials are stored outside, they must be protected from the elements and damage.
- C. This Contractor shall be responsible for coordinating the procurement of specified materials and equipment being supplied by his sub-contractors and suppliers.

1.13 SCAFFOLDING AND HOISTING:

- A. The Contractor shall furnish and erect all scaffolding, hoists, shoring, platforms, railings, ladders, and other devices required by local, state, and federal laws to install his systems and equipment. Scaffolding and all other equipment shall be removed at completion of the work.
- B. Contractor shall hoist or rig his own material and equipment into place, or arrange for the rigging of it by others at his expense.

1.14 FOREMAN:

- A. Contractor must provide a competent foreman, subject to approval of the Owner. The foreman shall be deemed the agent of the Contractor and must be on duty at the building during all working hours.

- B. Any instructions or notices given to the foreman shall have the same force as if given to the Contractor in person.

1.15 SLEEVES:

- A. Each Contractor shall furnish and set all sleeves required for the installation of his work and shall be responsible for their final and permanent locations.
- B. All pipes passing through masonry construction shall be fitted with sleeves. Each sleeve shall extend through its respective floor or wall and shall finish flush with each surface unless otherwise required. Unless otherwise specified or shown, sleeves shall be two pipe size larger than the overall outside diameter of the pipe when insulated. Sleeves in bearing and masonry walls shall be made of standard weight galvanized steel pipe. Sleeves through concrete floor slabs and other partitions shall be 18 ga. galvanized steel or galvanized steel pipe.
- C. Where sleeves pass through foundation walls, the space between such sleeves and passing pipes shall be caulked with graphite packing and an approved plastic and waterproof caulking compound as approved by the Architect. In lieu of caulking materials, Contractor has option of using preassembled "Link-Seals" as manufactured by Thunderline Corporation, 5495 Treadwell, Wayne, Michigan 48184.
- D. All sleeves shall be properly installed and securely cemented in place. Where pipes pass through waterproofed floor or walls, design of sleeves shall be such that the waterproofing can be properly flashed around the sleeves, and of such height that the water will be restrained from entering sleeves and dripping to any finished areas below.
- E. Contractor shall seal all piping penetrations through all walls and floors. Where pipes pass through fire resisting portions of the structure, the annular space between the sleeve and the pipe shall be filled with an approved fireproof material. Refer to Division 1 specifications for fireproofing requirements.

1.16 CONCRETE AND MASONRY WORK:

- A. The General Contractor shall furnish and install all concrete bases, reinforcing, etc. required to install the Mechanical Work, unless otherwise noted.
- B. The Contractor, prior to installing any forms, reinforcing or concrete, shall notify all other Contractors or subcontractors, in ample time for them to install any portion of their work which is to be concealed in the concrete. No such work shall be placed in a manner to interfere with the proper placing of the reinforcement unless so authorized by the Architect.

1.17 ESCUTCHEONS:

- A. All exposed pipes, except as otherwise described, passing through walls, floors, ceilings, etc. in finished spaces, shall be provided with solid pattern heavy ceiling, floor or wall escutcheons with set screw. Escutcheons and plates shall be of steel or malleable iron with prime coat ready for painting. Escutcheons will not be provided where sleeves intentionally extend above finished floor.
- B. All exposed plumbing short branch connections to fixtures and/or equipment passing through wall or floors shall be equipped with pressed brass, chromium plated, solid-type escutcheons.
- C. Provide angle collars at ducts where they pass through finished walls, floors and ceilings.

1.18 ACCESS DOORS AND PANELS:

- A. All ceiling access panels not shown on the Architectural Reflected Ceiling plans and all wall access panels required shall be furnished by this Contractor and set by the General Contractor. The location of these access panels must be approved by the Architect prior to their installation. The Contractor shall furnish an access panel where fire dampers, valves, specialties, junction boxes, and other serviceable items are installed behind plaster, tile, or similar type non-removable surfaces.
- B. Refer to Section 08 3113 - "Access Doors and Frames" for specific requirements.

1.19 CUTTING AND PATCHING:

- A. Each Contractor shall give the General Contractor complete information as to size of openings to be provided by the General Contractor in new floors, and walls, etc., so that such openings may be provided as the project progresses.
- B. If openings are omitted or are incorrect through failure of the prime Contractors to coordinate the required openings, the respective Contractors shall, at their own expense, engage the trade which originally installed the work, to cut and patch to the satisfaction of the Architect.
- C. The Prime Contractor shall be responsible for the cutting of existing floor slabs for the installation/demolition of any underground piping systems required by the documents. The Prime Contractor is responsible for proper bedding, backfill materials and compaction (as outlined in the specifications and on the drawings) to an elevation that is level with the bottom of the existing concrete floor slab.

- D. Cutting and patching of exposed surfaces (other than the floor) of the building shall be the responsibility of each Prime Contractor as required for installation of his work. All holes cut shall be in a manner approved by the Architect. Patching of existing construction and finishes are by the Prime Contractor and must be equivalent to adjacent finishes and materials.
- E. Cutting and patching of concealed surfaces (other than the floor) of the building shall be the responsibility of each Prime Contractor as required for installation of his work. All holes cut shall be in a manner approved by the Architect. Patching of existing construction and finishes are by the Prime Contractor and must be equivalent to adjacent finishes and materials.
- F. Where it becomes necessary to cut out any portions of walls, floors, ceilings, roof or other portions of the building for the installation of work, and as may be required to perform and complete the work under this Contract, the Contractor shall do all necessary cutting and fitting, shall remove all excess material, and shall replace all work damaged so as to leave the entire premises in a finished condition.
- G. No cutting shall be done which may in any way affect the building structurally or architecturally. Any damage incident to cutting or other causes in the performance of this Contract shall be made good by replacement or repairs. Cutting shall be done only with the prior approval of the Architect.
- H. Contractor shall seal all piping penetrations through all walls and floors. Penetrations through fire rated walls or floors shall be sealed with an approved UL Listed fire sealant.

1.20 GUARANTEE:

- A. Each Contractor shall unconditionally guarantee in writing all materials, equipment, and workmanship for a period of two years from date of acceptance by Owner. The Contractor shall provide free service for all equipment involved in his Contract during this guarantee period. Compressors shall have an additional 4-year warranty.
- B. The guarantee shall include restoration to its original condition of all adjacent work that must be disturbed in fulfilling this guarantee.
- C. All such repairs and/or replacements shall be made without delay and at the convenience of the Owner.

1.21 CLEANING OF SYSTEMS:

- A. The Contractor shall thoroughly clean all pipe systems to remove all grease, oil scale, core, sand and other foreign material after tests have been made and before the building is turned over to the Owner.

- B. All strainers shall be opened and cleaned thoroughly.
- C. Should the Contractor put any substance into any system to aid in the cleaning of it, all trace of such material shall be removed before the system is considered clean. All such substances, if used, shall be free from any acid that will set or injure valve seats in any way.

1.22 INSTRUCTION TO EMPLOYEES:

- A. At the completion of the work, and before final acceptance of the building by the Owner, each Contractor, together with the representatives of the manufacturers of the equipment installed by the Contractor, shall instruct the designated employees of the Owner in the care, adjustment, maintenance and operation of equipment installed by him.
- B. Three copies of factory maintenance schedules shall be furnished for each piece of equipment. Acceptance of materials and equipment is conditional upon receipts of maintenance manuals.
- C. A representative of the manufacturer of each piece of equipment shall inspect his respective pieces of equipment, make final adjustments, and put them in a satisfactory working condition.

1.23 SUBSTITUTIONS:

- A. Substitutions, if permitted, must comply with the requirements of the Instruction to Bidders for pre-bid substitutions and with Division 01 Section "Product Requirements" for post-bid substitutions.
- B. Various items of equipment and materials that have been used as the basis for mechanical system design have been specified by a manufacturer's name and model number. Another manufacturer's product may be submitted for consideration as a substitute. The Architect shall be the sole judge as to the comparability of an item of equipment that is submitted for approval as a substitute for that which is specified. Each of the Contractor's substitute proposals shall include all labor and materials that will be required to install the equipment and make it operate satisfactorily in accordance with the original design concept. He shall include such things as changes in piping, valves, supports, fittings, ductwork, motors, controls, electrical wiring, and thermal insulation. It shall be the responsibility of the Contractor to make certain that substitute equipment, which has been accepted by the Architect will fit into the designated spaces. He shall make the necessary field measurements in order to determine that there is adequate space for the equipment, taking into consideration the clearances that are required for connections and servicing.



- C. If any changes are required in the installation of mechanical or electrical services to any mechanical equipment accepted as substitutions to the basis of design, Plumbing Contractor shall be responsible for any additional costs incurred to the Owner, Engineer, other prime contractors and costs incurred for changes to the coordination drawings.

1.24 ALTERNATES:

- A. Various items of equipment and materials that have been used as a basis for mechanical system design have been specified by a manufacturer's name and model number. Where another manufacturer's product has been specified as an alternate to this equipment the proposed cost for this alternate shall include all labor and materials that will be required to install the equipment and make it operate satisfactorily in accordance with the original design concept. He shall include such things as changes in piping, valves, supports and supporting structure, fittings, ductwork, motors, controls, electrical wiring and thermal insulation. It shall be the responsibility of the contractor to make certain the alternate equipment will fit into the designated spaces. He shall make the necessary field measurements in order to determine that there is adequate space for the equipment, taking into consideration the clearances that are required for connections and servicing.

1.25 ALIGNMENT:

- A. Where several receptacles, devices, bells, alarms, thermostats, switches, handles, etc., are to be installed in a common location, this equipment shall be lined up in a vertical plane. It is the Contractor's responsibility to confer with the Architect on this alignment.
- B. The Prime Contractors shall carefully check all the Drawings and coordinate their work with all trades to provide for a symmetrical and coordinated ceiling. Ceiling T-bars, lights, registers, and other equipment shall all be symmetrically installed with provisions made for integrating the T-bars and this equipment. Failure to coordinate will result in relocation of ceiling components as directed by the Architect at the Contractor's expense.

1.26 OPERATION AND MAINTENANCE INSTRUCTIONS:

- A. Refer to Division 01 "Close-out Procedures" as well as the following.
- B. The Contractor shall prepare for the Owner, 3 hard bound volumes, each containing all operating instructions and information necessary for the care and maintenance of the system. These volumes shall be complete in every respect, and shall include detailed operating instructions for each piece of equipment and diagrams for control wiring and piping so arranged and detailed that the maintenance staff may trace the control in the event of operational malfunctioning.

- C. The Contractor shall submit 1 of the hard-bound volumes to the Architect for approval prior to presenting same to Owner.
- D. The purpose of this manual is to assist the Owner in routine operation, maintenance, servicing, troubleshooting and procurement of replacement parts. All information in the manual shall be as-built and only material pertinent to the project shall be included.
- E. The operating manual shall be considered a part of the final inspection and shall be submitted for approval at least 30 days in advance of a request for final inspection. The manual shall include:
  - 1. A copy of all final corrected equipment submittals, control diagrams, descriptive brochures, and a list of all parts of each piece of mechanical and electrical equipment which has been furnished and installed.
  - 2. Complete and detailed typewritten operating and maintenance instructions for all major operating equipment. The operating and start-up instructions shall be written in a concise, step by step manner. Maintenance instructions shall include such things as periodic checks, adjustments and troubleshooting techniques.
  - 3. A listing of all items of mechanical and electrical equipment, a compilation of the nameplate data for this same equipment, the name, address and telephone number of the nearest service organization.
  - 4. Copies of all A.S.M.E. pressure vessel certifications, state police approved tank permits, complete additional valve tag schedules, all electrical inspection permits and all additional mechanical and electrical permits required for occupancy by the Owner.
  - 5. All of the materials shall be indexed, arranged categorically and be bound in a rigid, plastic covered, three ring binder.
- F. The Contractor shall provide Project Record (As-Builts) documents in accordance with requirements of Division 1.
- G. O & M manuals must be provided prior to equipment being turned over to the Owner.
- H. Warranty period shall begin starts when Owner takes over that phase/space.

1.27 PAINTING:

- A. Refer to Division 09 Section "Paintings and Coatings" for painting requirements as well as the following.
- B. Provide corrosion inhibiting prime coating on all ferrous materials.
- C. Paint all metal laid underground with one heavy coat of corrosion protective materials.
- D. All exposed piping, iron work, and equipment installed in the mechanical equipment rooms under this contract shall be painted 1 prime coat and 2 coats of best quality oil paint of color as selected by the Architect.

- E. All exposed gas piping within boiler rooms and mechanical rooms shall be painted yellow and identified as required in Division 22 specifications.
- F. Unless specifically noted, insulation and galvanized piping in ceiling cavity area shall not be painted.
- G. Painting of piping within exposed finished areas shall be by the G.C. Installation of piping by the prime contractor shall include

1.28 EARTHWORK:

- A. Refer to Division 31 as well as the following.
- B. Provide all excavating, backfilling, shoring, sheeting, pumping, bailing, etc., required for the installation of the work of this Section.
- C. Trench depths shall allow adequate cover over piping, walls shall be vertical and bottoms shall be instrument graded. Earth shall be scooped out under pipe hubs to provide a solid bearing for the barrel of the pipe on undisturbed earth. Concrete or other approved supports shall be provided for all pipes installed in fill.
- D. Carry pipe trenches in rock below the pipe invert at least 1/4 the nominal diameter of the pipe or a minimum of 4" below the bottom of the pipe whichever is the greater. Backfill space below pipe with crushed stone or gravel ranging in size from 1/4" to 3/4".
- E. Excavation under footings or foundations and deeper than the angle of repose from footings or foundations as determined by the Architect shall be backfilled solidly with 3,000-pound concrete, to such angle of repose and bottom of such footing or foundation. Where excavation damages existing lawns, sidewalks, roadways etc., such surfaces shall be restored to their original condition by the Contractor performing the excavation.
- F. All excavated material remaining after the backfilling operation shall be removed from the site by this Contractor.
- G. Any settlement in trench backfill shall be brought to grade, and damage to pavement or slabs caused by such settlement shall be repaired at the Contractor's expense.
- H. All repair of macadam or concrete paving made necessary by work done under this contract shall be performed by General Contractor at the expense of this contractor. All such repairs shall match surrounding paving in materials and workmanship.

END OF SECTION