

## SECTION 210000 - FIRE PROTECTION GENERAL PROVISIONS

### PART 1 - GENERAL

#### 1.1 GENERAL REQUIREMENTS

- A. Work under this Section as shown or specified shall be in accordance with the requirements of the Contract Documents.

#### 1.2 DEFINITIONS

- A. "Provide": to supply, install and make complete, safe, and operable, the particular work referred to unless specifically indicated otherwise.
- B. "Install": to erect, mount, and make complete with all related accessories.
- C. "Furnish" or "supply": to purchase, procure, acquire, and deliver complete with related accessories.
- D. "Work": labor, materials, equipment, services, and all related accessories necessary for the proper and complete installation of complete systems.
- E. "Piping": pipe, tube, fittings, flanges, valves, controls, strainers, hangers, supports, unions, traps, drains, insulation and all related accessories.
- F. "Wiring": raceway, fittings, wire, boxes and all related accessories.
- G. "Indicated," "shown" or "noted": as indicated, shown, or noted on drawings or specifications.
- H. "Similar" or "equal": of base bid manufacturer, equal in quality materials, weight, size, performance, design, and efficiency of specified product, conforming with "Base Bid Manufacturers".
- I. "Reviewed" "satisfactory," "accepted", or "directed": as reviewed, satisfactory, accepted, or directed by Architect and/or Engineer.
- J. "Motor Controllers": manual or magnetic starters with or without switches, individual pushbuttons or hand-off-automatic (HOA) switches controlling the operation of motors.
- K. "Control or Actuating Devices": automatic sensing and switching devices such as thermostats, pressure, float, flow operation of equipment.
- L. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.

- M. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- N. Exposed, Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- O. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- P. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.
- Q. The following are industry abbreviations for plastic materials:
  - 1. ABS: Acrylonitrile-butadiene-styrene plastic.
  - 2. CPVC: Chlorinated polyvinyl chloride plastic.
  - 3. NP: Nylon plastic.
  - 4. PE: Polyethylene plastic.
  - 5. PVC: Polyvinyl chloride plastic.
- R. The following are industry abbreviations for rubber materials:
  - 1. CR: Chlorosulfonated polyethylene synthetic rubber.
  - 2. EPDM: Ethylene propylene diene terpolymer rubber.

### 1.3 WORK INCLUDED

- A. The work covered by this section includes the construction described in the Contract Documents including all labor necessary to perform and complete such construction, all materials and equipment incorporated or to be incorporated in such construction, and all services, facilities, tools and equipment necessary or used to perform and complete such construction. The work includes, but is not limited to the following:
  - 1. Sprinkler Systems and Equipment.
  - 2. Fire Standpipe System and Equipment.
  - 3. Piping, Valves and Fittings.
  - 4. Identification System.
  - 5. Hydraulic Calculations.

6. Cutting, Patching and Equipment Painting.
7. Hangers, Supports and Guides.
8. Alarm Wiring, except for Fire Alarm.
9. Rigging of Equipment.
10. Furnishing access Doors and Frames to be installed under another section.
11. Fire Stopping for Pipe Penetration.
12. Pipe Penetration.
13. Alarm Initiating Devices.

B. Related Work not Included in this Division but Specified Elsewhere

1. Fire Alarm Wiring.
2. Finish painting, except for pre-finished equipment or as otherwise specified.
3. Base flashing for piping.
4. Waterproofing.
5. Power wiring for motors and motor controllers.
6. Installation of access doors and frames.

1.4 COORDINATION OF WORK

- A. The fire protection drawings show the general arrangement of piping and appurtenances. Follow these drawings as closely as the actual construction will permit. Conform the fire protection work to the requirements shown on the drawings. Provide offsets, fittings, and accessories, which may be required but not shown on the drawings. Investigate the site, structural and finish ground conditions affecting the work, and arrange the work accordingly. Provide such work and accessories as may be required to meet such conditions.
- B. Certain materials will be provided by other trades. Examine the Contract Documents to ascertain these requirements.
- C. Carefully check space requirements with other trades to insure that all material can be installed in the spaces allotted thereto including finished suspended ceilings.
- D. Transmit to other trades all information required for work to be provided under their sections, in ample time for installation.

- E. Wherever work interconnects with work of other trades, coordinate with the General Contractor to insure that necessary information is presented so all the necessary connections and equipment may be properly installed. Identify all items (valves, piping, equipment, etc.) In order that the General Contractor will know where to install access doors and panels.
- F. Consult with other trades regarding equipment so that, wherever possible, motors, motor controls, pumps and valves are of the same manufacturer.
- G. Furnish and set all sleeves for passage of pipes and conduits through structural masonry and concrete walls and floors and elsewhere as will be required for the proper protection of each pipe passing through building surfaces.
- H. Provide required supports and hangers for piping and equipment, designed so as not to exceed allowable loadings of structures.
- I. Examine and compare the contract drawings and specifications with the drawings and specifications of other disciplines and report any discrepancies between them to the General Contractor and obtain from him written instructions for changes necessary in the work of this section. Install and coordinate the work of this section in cooperation with the General Contractor installing interrelated work. Before installation, take proper provisions to avoid interferences. All changes required in the work of the contractor, caused by his neglect to do so, are to be made by him at his own expense.
- J. Wherever the work is of sufficient complexity, prepare additional detail drawings to scale similar to that of the design drawings, prepared on tracing medium of the same size as contract drawings. With these layouts, coordinate the work with the work of the General Contractor. Such detailed work is to be clearly identified on the drawings as to the area to which it applies. Submit these drawings to the Engineer for review. At completion, however, include a set of such drawings with each set of as-built drawings. When directed by the Engineer, submit drawings for review, clearly showing the work of this section and its relation to the work of other disciplines before commencing shop fabrication or erection in the field.
- K. Before commencing work, examine all adjoining work on which this work is in any way dependent for perfect workmanship and report any conditions, which prevent performance of first class work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.
- L. Provide required anchor bolts, sleeves, inserts and supports. Direct location of anchor bolts, sleeves, inserts and supports to insure that they are properly installed. Any expense resulting from the improper location or installation of anchor bolts, sleeves, inserts and supports to be paid for by the contractor.
- M. Slots, chases, openings and recesses through floors, walls, ceilings, and roofs will be provided by the various trades in their respective materials. Properly locate such openings and be responsible for any cutting and patching caused by the neglect to do so.

- N. Adjust location of pipes, panels, equipment, etc., to accommodate the work to prevent interferences, both anticipated and encountered. Determine the exact route and location of each pipe prior to fabrication.
  - 1. Right-of-Way: Lines that pitch have the right-of-way over those that do not pitch, i.e., plumbing drains. Lines whose elevations cannot be changed have right-of-way over lines whose elevations can be changed.
  - 2. Make offsets, transitions and changes in direction in pipes as required to maintain proper head room and pitch on sloping lines whether or not indicated on the drawings. Furnish and install all air vents, drains, etc., as required to affect these offsets, transitions and changes in direction.
- O. Install all fire protection work to permit removal (without damage to other parts) of all other parts requiring periodic replacement or maintenance. Arrange pipes and equipment to permit access to valves, cocks, starters, motors, and control components, and to clear the openings of swinging doors and access panels.
- P. Provide access panels in equipment as required for inspection and maintenance of internal parts, etc.
- Q. This contractor shall coordinate his work with the work of other trades.
- R. Coordinated Composite Drawings
  - 1. The Contractor shall prepare full coordinated composite drawings for the mechanical, electrical and fire protection trades. The Contractor shall overlay each trade's work (in separate colors) on a sepia set of sheetmetal drawings. All conflicts and potential conflicts shall be clearly identified on the sepia sheetmetal drawings. This shall include but not be limited to conflicts with lights, equipment, piping, ductwork and supports of other trades, as well as conflicts with architectural and structural walls, columns, ceilings and structural beams. Contractor shall have representatives of each trade attend a weekly job site coordination meeting in the Contractor's field office. All trades shall resolve conflicts at these meetings and sign off each sepia sheetmetal drawing indicating acceptance and satisfactory resolution to all conflicts. All conflicts that cannot be resolved shall be brought to the attention of the Engineer for resolution.

#### 1.5 USE OF SITE AND LOAD LIMITATIONS

- A. The contractor shall review all available data on the location and types of pipelines and other underground utilities. The contractor shall not operate equipment over the facilities and shall take care not to damage them or otherwise impair their use. The contractor shall make investigation to verify the location of these facilities before proceeding with construction and/or operations in their vicinity.

#### 1.6 CONTRACTOR'S RESPONSIBILITY FOR EVALUATION

- A. The Engineer and Owner make no representations, regarding the character or extent of the subsoils, water levels, existing structural, mechanical and electrical installations, above or below ground or other subsurface conditions which may be encountered during the Work. The contractor must make his own evaluation of existing conditions, which may affect methods or cost of performing the Work, based on his own examination of the facility or other information. Failure to examine the drawings or other information shall not relieve the contractor of his responsibility for satisfactory accomplishment of the Work.
- B. The locations of existing services are believed to be as indicated on the drawings. The contractor shall verify the actual location of these services and notify the Engineer of any discrepancies prior to commencing work.

#### 1.7 ACCESS TO FIRE PROTECTION EQUIPMENT

- A. The contractor shall not interfere with access to hydrants, fire exits, fire hose stations, fire extinguishers, and fire alarm pull stations. In no case shall the contractor's material or equipment be within twenty-five (25) feet of a hydrant or fire alarm pull station.

#### 1.8 EQUIPMENT AND MATERIALS

- A. If products and materials are specified or indicated on the drawings for a specific item or system, the contractor shall use those products or materials. If products and materials are not listed in either of the above, use first class products and materials, in accordance with shop drawings.
- B. All products and materials shall be new, clean, free of defects and free of damage and corrosion.
- C. No permanent equipment shall be used to provide temporary services during construction.
- D. Ship and store all products and materials in a manner which will protect them from damage, weather and entry of debris. If items are damaged, do not install, but take immediate steps to obtain replacement or repair.
- E. Make certain that all materials selected directly, or by suppliers, conform to the requirements of the contract drawings and specification. Transmittal of such specifications and drawings, information to persons manufacturing and supplying materials to the project, and rigid adherence thereto, is the contractor's responsibility. Acceptance of a manufacturer's name by the Engineer does not release the contractor of the responsibility for providing materials, which comply in all respects with the requirements in the Contract Documents.
- F. Applicable equipment and materials to be listed by Underwriters' Laboratories and Manufactured in accordance with ASME, AWWA, NFPA or ANSI standards, and as approved by the local authorities having jurisdiction.

- G. Fully lubricate all equipment when installed and prior to final acceptance.
- H. Locate valves, access doors, etc., to be easily accessible, either in mechanical spaces or through access panels specified herein.
- I. Follow manufacturers' instructions for installing, connecting, and adjusting all equipment. Provide one copy of such instructions to the Engineer before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Provide all special valves, piping, wiring and accessories.

#### 1.9 QUALITY ASSURANCE

##### A. Codes Standards and Fees:

##### 1. Codes and Standards:

- a. Comply with all current governing codes, ordinances and regulations, as well as with requirements of NFPA, UL and all other applicable codes.
- b. Comply with the requirements of the State adopted Building Code, NFPA and other agencies or authorities having jurisdiction over any part of the Work and secure all necessary permits.
- c. Where codes or standards are listed herein, the applicable portions apply.
- d. Plans, specifications, codes and standards are all minimum requirements. Where requirements differ, apply the more stringent.
- e. Should any change in plans or specifications be required to comply with governing regulations, the contractor is to notify the Engineer at the time of submitting his bid.
- f. The codes and standards listed in the Specifications can be obtained from the organizations listed as follows:
  - 1) OSHA Occupational Safety and Health Act
  - 2) ANSI American National Standard Institute, Inc.
  - 3) ASME American Society of Mechanical Engineers
  - 4) ASTM American Society for Testing and Materials
  - 5) AWWA American Water Works Association
  - 6) UL Underwriters Laboratories, Inc.

- 7) ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers
- 8) NFPA National Fire Protection Association
- 9) NEMA National Electrical Manufacturers Association
- 10) AIA American Insurance Association
- 11) AWS American Welding Society
- 12) ASA American Standards Association
- 13) IEEE Institute of Electrical and Electronics Engineers
- 14) NEC National Electrical Code

g. The particular specification will be identified by appropriate prefix and number only with the latest revision being applicable unless otherwise noted.

2. Fees

- a. Pay all required permit and/or inspection fees.
- b. Pay royalties or fees required in connection with the use of patented devices and systems.

3. Furnish all materials and equipment new, free from defects and with listings or labels of Underwriter's Laboratories, Inc. or other nationally approved testing laboratory.

4. All items of a given type shall be the product of the same manufacturer.

5. All materials and equipment shall be the product of manufacturers regularly engaged in their manufacture.

1.10 SHOP DRAWINGS

- A. Prepare and submit detailed shop drawings for piping work and other distribution services, including locations and sizes of all openings in floor walls and roofs.
- B. The work described in any shop drawing submission to be carefully checked for all clearances (including those required for maintenance and servicing), field conditions, maintenance of architectural conditions and proper coordination with all trades on the job.
- C. Each submitted shop drawing to include a certification that all related job conditions have been checked and that no conflict exists.



- D. All drawings are to be submitted sufficiently in advance of field requirements to allow ample time for checking. All submittals to be complete and contain all required and detailed information. Shop drawings with multiple parts to be submitted as a package.
- E. If submittals differ from the Contract Document requirements, make specific mention of such difference in a letter of transmittal, with request for substitution, together with reasons for same.
- F. Review of any submitted data or shop drawings for material, equipment, apparatus, devices, arrangement and layout shall not relieve the contractor from responsibility of furnishing same of proper dimensions and weight, capacities, sizes, quantity, quality and installation details to efficiently perform the requirements and intent of the Work. Such review shall not relieve the contractor from responsibility for errors, omissions or inadequacies of any sort on submitted data or shop drawings.
- G. Each shop drawing to contain job title, the names and phone numbers of the General Contractor and the contractor reference to the applicable design drawing or specification article, date and scale.
- H. Within 15 days after award of Contract, submit for review, a list of all material and equipment manufacturers whose products are proposed, as well as names of all subcontractors whom the General Contractor proposes to employ.
- I. Within three (3) weeks after award of Contract, submit a list of all shop drawings, which will be submitted in the course of the project. List to show disposition of each item, including date of submission, review, and the like. List to be kept up-to-date throughout entire construction period.
- J. Submit shop drawings and manufacturer's data for the following items in accordance with the Contract Documents:
  - 1. Coordinated, detailed shop layout drawings of all mechanical rooms, services and distribution systems, including plans, profiles and sections.
  - 2. Details of piping supports, elbows, anchors and miscellaneous appurtenances.
  - 3. Hangers, supports, inserts, anchors, guides and foundations.
  - 4. Valves.
  - 5. Pressure gauges.
  - 6. Corrosion protective coatings.
  - 7. Equipment and piping layouts at 3/8 in. scale for the building.
  - 8. Location and size of sleeves for openings in floors and walls.
  - 9. Schedule of pipe and fittings, materials and application, valves, escutcheons, air vents, valve tags and schedules, strainers, and water specialties.

10. Access doors.
11. Equipment identification and certificates.
12. Sprinkler heads and accessories.
13. Other shop drawings and submittals as requested within the specification.

#### 1.11 SAMPLES

- A. Submit samples of all items with exposed finishes for review.
- B. Allow sufficient time for consideration without interfering with job schedule.
- C. Duplicate quality and finish to type to be supplied under contract.
- D. Identify similar to shop drawings.

#### 1.12 ELECTRONIC COPIES OF AKF DRAWINGS

- A. Upon award of contract, contractor shall submit list of drawings that they will require. AKF will provide drawings in (.PDF) format only.
- B. If the contractor requires (.dwg) format, there will be a charge of \$200 for each drawing supplied plus shipping and handling for preparation and processing. After preparation the drawings will be forwarded only upon receipt of signed acceptance of terms form. Permission from the architect must first be obtained for AKF to include the architectural background as reference. The contractor is to obtain the architects latest drawings directly from the architect.
- C. These files are being issued for the convenience of the contractor and the contractor remains responsible for all contract requirements related to the normal shop drawing preparation process.

#### 1.13 SUBMISSIONS:

- A. Provide all coordination drawings and shop drawings in 'AutoCad" format, version compatible with owner. All catalog cuts and submittals to be provided in electronic "PDF" format the architect will forward all submissions to the engineer.
- B. If paper submissions are to be provided the following shall be adhered to.
  1. Submissions 11 in. X 17 in. or smaller: If the submission is a catalog cut, then the contractor shall submit one original and one copy. Otherwise, they shall submit two copies. The architect will forward the original and one copy (two copies when no original is received) to the engineer. All catalog cuts shall be complete.

2. Submissions larger than 11 in. X 17 in.: submit two copies to the architect. The architect will forward to the engineer.
- C. Indicate on each submission: project name and location, architect and engineer, item identification and approval stamp of prime contractor, subcontractor names and phone numbers, reference to the applicable design drawing or specification article, date and scale.
- D. The work described in all shop drawing submission shall be carefully checked for all clearances (including those required for maintenance and servicing), field conditions, maintenance of architectural conditions and proper coordination with all trades on the job.
- E. Each submitted shop drawing is to include a certification that all related job conditions have been checked and verified and that there are no conflicts.
- F. All shop drawings are to be submitted to allow ample time for checking in advance of field requirements. All submittals to be complete and contain all required and detailed information. Shop drawings with multiple parts shall be submitted as a package.
- G. If submittals differ from the contract document requirements, make specific mention of such difference in a letter of transmittal, with request for substitution, together with reasons for same.

#### 1.14 AS-BUILTS AND EQUIPMENT OPERATION INSTRUCTIONS

- A. Provide all coordination drawings and shop drawings in AutoCad format, version compatible with owner. All catalog cuts and submittals to be provided in electronic "PDF" format the architect will forward all submissions to the engineer.
- B. On completion and acceptance of work, this contractor shall furnish written instructions, equipment manuals and demonstrate to the owner the proper operation and maintenance of all equipment and apparatus furnished under this contract.
- C. The contractor shall give one copy of the instructions to the owner and one copy to the engineer.
- D. Final "as-built" drawings indicating as installed conditions shall be provided to the architect and engineer after completion of the installation.

#### 1.15 START-UP

- A. Check and clean all pipes of dirt and debris.
- B. Prepare each piece of equipment in accordance with manufacturer's installation instructions and have a copy at the equipment.

- C. Have representatives of each manufacturer present when hereinafter specified, so that equipment will be started up by manufacturer.

#### 1.16 ACCESS DOORS IN FINISHED CONSTRUCTION

- A. Furnish access doors as required for operation and maintenance of concealed equipment and coordinate their delivery with the installing trade.
- B. Coordinate and prepare a location, size and function schedule of access doors required and deliver to the General Contractor and the Architect for review.
- C. Doors shall be of a size required for operating and repacking valves, and shall be as manufactured by Karp Associates, Nystrom Inc. or Mifab.
- D. Unless otherwise indicated, minimum size to be 18" x 18".
- E. Furnish color coded buttons or tabs to indicate location of valves or other equipment located above removable type ceilings where access doors are not required.

#### 1.17 SYSTEMS IDENTIFICATION

- A. Piping:
  - 1. All exposed fire protection piping shall be finish painted red in color unless otherwise directed.
  - 2. All piping, exposed or concealed, shall be identified as to its service in accordance with OSHA and ANSI Standards by one of the following methods:
    - a. Installation of manufactured adhesive band type identification markers, similar to "Quick-Label" by W.H. Brady Company.
  - 3. Piping identification markings shall be installed as follows:
    - a. In each room.
    - b. All valve locations.
    - c. At shaft walls.
    - d. Every 40 feet on continuous runs.
- B. Valves:
  - 1. Valves shall be identified by tag system utilizing brass tags at 2-inch minimum diameter and attached to the valves using brass chain.

- a. The new valve tag identification numbers shall be permanently added to all existing valve tag charts.
  2. The service and function of all fire protection valves shall be identified at the valve by signs, similar to Potter Roemer Series 6300, attached to the valves by brass chains.
- C. Equipment:
1. Identify all controls such as motor starters not in motor control centers, float switches, and alarms.

#### 1.18 OPERATING & MAINTENANCE INSTRUCTION

- A. Prepare an operating and maintenance instruction manual which includes the following:
1. Alphabetical list of all system components, with the name, address, and 24-hour phone number of the company responsible for servicing each item during the first year of operation.
  2. Operating instructions for complete system, including:
    - a. Normal starting, operating, and shut-down.
  3. Maintenance instructions, including:
    - a. Valve tag list and equipment tag list.
    - b. Required cleaning, replacement and/or adjustment schedule.
  4. Manufacturer's data on each piece of equipment, including:
    - a. Installation instructions.
    - b. Drawings and specifications.
    - c. Parts list, including recommended items to be stocked.
    - d. Marked or revised prints locating all concealed parts and all variations from the original system design.
    - e. Test and inspection certificates.
  5. Specific equipment data including, but not limited to, the following:
    - a. Piping.
    - b. Valves.

- c. Accessories.
  - d. Sprinkler heads.
  - e. Tamper switches.
  - f. Flow switches.
- B. Provide instruction of operating personnel.
- 1. Instruct Owner's operating personnel in proper starting sequences, operation, shutdown, and maintenance procedures, including normal and emergency procedures.
  - 2. Instruction to be by personnel skilled in operation of equipment. Instructions for major equipment to be by equipment manufacturers' representatives.
  - 3. Make arrangements to give instructions by system and not by building areas.
  - 4. Provide five (5) instruction sessions not to exceed six (6) hours each.
  - 5. Instructions on automatic controls to be by manufacturer's representative.
- C. Submittals.
- 1. Shop Drawings: Submit three copies for review prior to final issuance.
  - 2. Provide 6 copies of each operation and maintenance manual.
    - a. Manuals to be 8-1/2" x 11" size in hard-back, 3-ring loose-leaf binders. Use more than one volume if required. Do not overfill binders.
    - b. Manuals to be completed and delivered to the Engineer for approval at least 20 days prior to instruction of operating personnel.
  - 3. Prepare separate manuals for the fire protection systems.
- 1.19 TOOLS FOR OPERATION, ADJUSTMENT AND MAINTENANCE
- A. Deliver to Owner's representative all special tools needed for proper operation, adjustment and maintenance of equipment.
- 1.20 RECORD DRAWINGS
- A. The contractor shall maintain a complete set of "Record Drawings" reflecting an accurate dimensional record of all work. These drawings shall be marked up to show the precise location of concealed work and equipment, including concealed piping and valves and all changes and deviations in the plumbing work from that shown on the contract drawings. This requirement shall not be construed as

authorization for the contractor to make changes in the layout or work without written definite instruction from the Architect or Engineer.

- B. Record dimensions shall clearly and accurately delineate the work as installed; location shall be suitably identified by at least two dimensions to permanent structures.
- C. The contractor shall stamp all "Record Drawings" and certify for correctness by signing and dating them.
- D. Record drawings submitted to Owner shall consist of 1 set of mylars and 1 set of compact disk's (CD's) with all work provided on Autocad 2000 format.
- E. Prior to final acceptance, contractor shall submit certified "Record Drawings" to the Architect/Engineer for review and make changes, corrections or additions as noted by Architect/Engineer. After this review, the drawing shall be delivered to the Owner.

PART 2 - PRODUCTS

(NOT APPLICABLE)

PART 3 - EXECUTION

(NOT APPLICABLE)

END OF SECTION