

DIVISION 21 05 05

FIRE SUPPRESSION SYSTEMS NARRATIVE

PART 1 - GENERAL

1.01 INTRODUCTION

A. Section includes:

1. The purpose of this section is to define the design approach upon which the contractor is to base a budget/estimate for bid purposes and establish the design criteria, and design submittals, which will be required in the preparation and execution of the design.
2. All work under this section shall comply with the requirements of general conditions, supplemental conditions, special conditions, and division 1 – general requirements, and shall include all mechanical sections specified herein.

1.02 APPLICABLE CODES AND STANDARDS:

A. Design shall comply with rules and regulations of the following:

1. NFPA 13R (2019) – Standard for the Installation of Fire Sprinkler Systems
2. 2021 International Fire Code (IFC)
3. 2021 International Building Code (IBC)
4. All other applicable local jurisdiction amendments

1.03 ORDER-OF-PRECEDENCE PROVISIONS

- A. In the case of inconsistency or ambiguities in design documents (all specifications and drawings), compliance with the strictest design requirement among conflicting criteria is required.
- B. If provided, alternate pricing for compliance with less strict criteria will be evaluated in addition to the mandatory baseline strictest criteria.
- C. Provide notice upon discovering potential design conflicts prior to bid where possible.

1.04 PROJECT DELIVERY

- A. This project is to be delivered design build. The design build contractors will be the engineers of record and create and stamp fully coordinated design documents for the

project. Project shall be designed and stamped by a NICET certified designer who has attained level III or higher.

- B. The Sprinkler Contractor will provide pricing that covers the complete scope of work required to deliver a fully functional and code compliant project.
- C. Request for proposal (RFP): If there is a conflict between design documents and the RFP, the contractor will identify the discrepancy and request a clarification prior to RFP response.
- D. Bidders are encouraged to provide voluntary alternates beyond the specific scope outlined in this narrative and the accompanying drawings.
- E. Bidders are encouraged to contact the design team (through the channels identified by the issuer of the RFP) with clarification requests during the proposal process.
- F. The architectural floor plans provided are not final. Pricing shall allow for equipment relocations due to minor interior layout modifications.

3

~~G. The bid proposals will identify scope gaps the contractor perceives and provide breakout pricing to cover these gaps.~~

- H. The sprinkler contractor shall submit final CAD as-built drawings to the General Contractor for submittal to owner within two weeks of project completion or unless alternative timing is agreed to.
- I. Operations and Maintenance manuals: Provide hard copy and electronic copies of O&Ms for ALL systems within TWO weeks of substantial completion.
- J. Sprinkler contractor to provide owner training on all systems within the building.
- K. Definitions:
 - 1. Complete system: the contract documents do not attempt to address all materials, devices, equipment, and work that shall be required for completion of the mechanical systems. All materials, devices, equipment, and work not addressed in the contract.
 - 2. The sprinkler contractor is responsible for providing the finished sprinkler work, tested, and ready for normal operation.
 - 3. Sprinkler contractor shall properly store all materials and equipment in order to protect materials from physical damage or damage due to the elements or corrosion.
 - 4. The sprinkler contractor shall make every effort to provide materials from a single manufacturer for any given material type, unless otherwise noted.

5. Materials shall be provided, installed, and/or used in conformance with the manufacturer's recommendations. If manufacturer's recommendations are not in conformance with the intent of the contract documents, obtain clarification from the architect and engineer prior to proceeding.
6. Coordination: check drawings of other trades to verify spaces in which work shall be installed. Establish exact locations of piping and ducts in such a manner as to conform to structure, avoid obstructions, and keep openings and passageways clear. Lines that must pitch or that must have a constant elevation, shall have the right-of-way over lines not so restricted. Maintain maximum headroom. If space conditions appear inadequate, notify the architect before proceeding with the work. Make reasonable modifications in the work without extra cost as needed to prevent conflict with work of other trades and for proper execution of the work.
7. Drawings and narratives shall be considered as a single entity, identified as the contract documents. Consider work indicated in one as required by both.

L. Codes, Permits, Inspections, and Fees:

1. The sprinkler contractor shall obtain all permits and inspections and pay all fees required by state and local authorities, except as noted.
2. All work and materials shall be in accordance with requirements of all applicable local and state codes, statutes, standards and other regulations. Date of regulations shall be as adopted by local authorities at the time of permit intake, unless indicated otherwise.
3. The codes shall be construed as establishing a minimum or base level of requirements.
4. Where the contract documents call for material or construction of a better quality or higher capacity than required by the codes, statutes, standards, and other regulations, the provisions of the contract documents shall take precedence over the requirements of the codes and standards.
5. Material and equipment within the scope of the UL testing laboratory service shall be listed by the underwriters laboratories for the purpose for which they are used and shall bear their listing mark. FM shall be allowed if acceptable to the authorities having jurisdiction.
6. Sprinkler contractor shall call for all inspections by the local code authorities when they become due and shall not cover any work until approved by these authorities.

M. Construction Coordination Drawings

1. It shall be the contractor's responsibility to work out and coordinate all conflicts and to provide all transitions and offsets required to facilitate installation of work. Provide construction coordination drawings for congested areas requiring close coordination with other trades and the general construction.
 - a. Grooved joint couplings and fitting shall be referred to on drawings and product submittals, and be identified by the manufacturer's listed model or series designation.
 - b. Sprinklers shall be referred to on drawings and product submittals, and be specifically identified by the manufacturer's listed model or series designation.
2. The construction coordination drawings shall be submitted to the architect/owner/engineer for review prior to commencement of any related work. The construction coordination drawings shall be updated as needed during the execution of the work.
3. The construction coordination drawings shall show all related trades, structure, and ceiling, walls, and partitions. Provide cross sections of all congested areas.
4. The final as-built drawings shall be submitted at the completion of the project for record purposes in hard copy, pdf, as well as electronic files.

N. Design, Submittals, Trade Coordination

1. The contractor shall coordinate their shop drawings with other trades prior to shop drawing approval and construction.
2. No cutting or drilling of joists or beams will occur without structural engineer approval.
3. Architectural drawings shall be checked for ceiling heights, walls, and cabinets that are intended to conceal work of this section. Where conflicts occur, the architect shall be notified prior to rough-in or installation of the work. Location of exposed work such as diffusers, grilles, and piping outlets shall take precedence over concealed work.
4. Complete equipment, and materials submittals shall be provided in electronic format. PDF bookmarks are required. Submittals shall be complete with all components included and customized to this project's requirements. Where cut sheets include more than one model or option, the sheets shall be marked to indicate the specific model/ options proposed for this project. Include warranty provisions for all equipment. All submittals require owner team approval prior to purchase.

5. Working construction shop drawings: complete equipment and materials submittals shall be provided in electronic format submitted per the time schedule issued by the owner/GC. Submittals shall be complete with all components included, installation manuals, and customized to this project's requirements. All submittals require owner and design team approval prior to purchase.
6. Contractor agrees that shop drawings submittals processed by the architect are not change orders, that the purpose of shop drawing submittals by the contractor is to demonstrate to the architect that the contractor understands the design concept and demonstrate its understanding by indicating which equipment and material it intends to furnish and install and by detailing the fabrication and installation methods it intends to use.
7. Contractor further agrees that if deviations, discrepancies, or conflicts between shop drawings and specifications are discovered either prior to or after shop drawing submittals are processed by the architect, the design drawings and specifications shall control and shall be followed.
8. Shop drawings shall be reviewed by the equipment manufacturers before submitting to architect to determine whether the products are being correctly used.
9. Construction administration: the selected contractor will perform construction administration, including RFI responses, attendance at periodic meetings, formal review and approval of shop drawings and submittals, coordination with other trades, preparation of final punchlist.
10. Warranty period to extend for one year from date the project is occupied by the owner, not from the date of completion of the work. Warranty not applicable to defective items due to faulty work of subsequent trades.
11. As-builts: contractor shall maintain up to date as-built drawings showing all construction installation with any/all design changes. Drawings shall be maintained in the project office for inspection by the architect/owner at any time. Provide owner with reproducible and electronic (AutoCAD and pdf files) as-built drawings within 4 weeks of project substantial completion. Drawings shall include final as-installed locations of all piping, valves, and sprinkler heads.
12. All work contracted for must be accepted by all applicable inspectors including site superintendent, GC quality control personnel, AHJ's, owner's representative (IMEG) or their assignees.
13. Provide manufacturers product, installation and warranty information for all products supplied with signed contract documents per an agreed upon schedule at the time of contract award. This is of particular importance for GC to forward

appropriate information to subcontractors to facilitate coordinated installation of his products.

14. During the construction phase of the project the contractor shall maintain a master punch list for items showing all problems discovered during field inspection, owner inspections, startup testing, functional testing and balancing. This list shall track each item to completion and require engineer signoff after completion is verified. Owner inspection items must be signed off by the owner's representative after completion is verified.

PART 2 - PRODUCTS

2.01 FIRE SPRINKLER SYSTEMS:

- A. Sprinkler system components shall be UL listed or factory mutual approved for all such components that have a listing in the respective agency.
- B. A new 4" water supply service and meter in vault shall be supplied for the fire sprinkler system.
- C. The sizing of the feed main sprinkler piping inside of the building shall be hydraulically calculated based on the static pressure, residual pressure, and flow available. Anticipated size is 4" or smaller.
- D. The sprinkler system shall be calculated with a minimum 10% or 10 psi safety factor (whichever is higher) as required by the local Authority Having Jurisdiction.
- E. Provide a double check type backflow preventer approved by the local authority having jurisdiction. Backflow preventer to be located in the water entry room on level 1 (see architectural plans for location).
- F. All sprinkler piping upstream of the backflow preventer assembly shall be potable pipe acceptable to the authority having jurisdiction.
- G. Current water pressure is not available for this site. A hydrant test for a nearby site dated 2013 indicates to expect 60 psi static pressure with 772 gpm at a residual pressure of 20 psi. Bidding contractor shall verify available water pressure available at the project site.
- H. Based on the expected site water pressure, a fire pump is not anticipated for this project.
- I. Provide 2-way fire department connection on exterior of the building with swing check valve and ball drip. Coordinate location of FDC with architect and local authorities having jurisdiction

- J. Provide electric alarm bell on the exterior of the building in a constantly attended location. Coordinate the bell location with the architect and local authorities having jurisdiction. Coordinate power (line voltage or low voltage) with electrical or controls contractor as necessary. Refer to Division 27/28 narratives for additional Fire Alarm details.
- K. Design a wet-pipe fire sprinkler system for all residential, public spaces, and all other heated areas of the building. Wet pipe fire sprinkler system shall be designed for light hazard occupancy in residential and public areas. System shall be designed for ordinary hazard in mechanical, electrical, and storage rooms in accordance with NFPA 13.
- L. Project is only two stories and does not meet the height limits to require standpipes.
- M. Provide tamper switches at all shut-off valves and coordinate wiring with fire alarm contractor.
- N. Provide a paddle type water flow switch at the sprinkler riser assembly and coordinate wiring with fire alarm contractor. Water flow switch shall be located upstream of the main drain and inspector test valves (or combined test and drain valve) as required by code and manufacturer installation requirements.

3

- ~~Q. Floor controls are not required for wet systems on this project. Provide alternate pricing to include floor controls consisting of shut-off valves with integral tamper switches, paddle type water flow devices, and test and drain valves served from the main riser assembly on level 1.~~
- P. All wet system drains shall be routed back to a hub drain in the fire sprinkler riser room or to a safe location outside of the building by the fire sprinkler contractor if allowed by the AHJ. Drain sizing and termination shall meet the requirements of NFPA 13 and the local AHJ. If drains are routed to the exterior of the building, coordinate routing and termination with architect.
 - 1. If additional drain termination points are required outside of the fire pump room, sprinkler contractor shall be responsible for identifying and coordinating locations with plumbing design.
- Q. Pipe routing to be coordinated by fire sprinkler contractor. Provide heat trace and insulation as required for wet sprinkler main running through unheated areas. Coordinate power requirements with electrical contractor.
- R. Provide sprinkler coverage of all elevator shafts, pits, and machine rooms in accordance with NFPA 13 and local AHJ requirements.

- S. Sprinkler body shall be die-cast, with a wrench boss integrally cast into the sprinkler body to reduce the risk of damage during installation. Wrenches shall be provided by the sprinkler manufacturer that directly engage the wrench boss.
- T. Sprinkler heads in residential finished ceilings shall be white semi-recessed pendent or sidewall type heads. Provide glass bulb standard temperature quick response heads throughout.
- U. Sprinkler heads in non-residential finished ceilings shall be chrome plated semi-recessed pendent or sidewall type heads. Provide glass bulb standard temperature quick response heads throughout.
- V. Sprinkler heads in occupied spaces without finished ceilings shall be brass upright, pendent, or sidewall type heads as appropriate. Provide head guards where required by code or where there is a risk of mechanical damage to the sprinklers. Provide glass bulb standard temperature quick response heads throughout.
- W. Sprinkler heads in mechanical rooms and other back of house spaces shall be brass upright, pendent, or sidewall type heads as appropriate. Provide head guards where required by code or where there is a risk of mechanical damage to the sprinklers. Provide glass bulb standard temperature quick response heads throughout.
- X. Provide a durable metallic box in the riser room with an acceptable stock of spare sprinkler heads and installation wrenches as required by code. The box shall contain at least one (1) of each type of sprinkler installed within the building.
- Y. All exterior overhangs deeper than 4'-0" shall be sprinkled per NFPA 13. Provide dry-barrel type freezeless sprinklers or separate dry system to protect these areas as necessary.
- Z. Exposed piping 2 1/2" and larger shall be schedule 10 or schedule 40 black steel, joints shall be welded or roll-grooved. NFPA 13 compliant thin wall pipe (Allied brand Dyna-Flow or approved equal) is an acceptable alternate.
 - 1. Mechanical Grooved Couplings shall be cast iron and comply with ASTM F1476 – Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications. Gaskets shall be pressure-responsive synthetic rubber with grade to suit the intended service.
- AA. Exposed piping 2" and smaller shall be schedule 40 black steel. Joints shall be threaded or roll grooved. NFPA 13 compliant light weight threadable pipe (Allied brand Dyna-Thread or approved equal) is an acceptable alternate.

- BB. UL listed CPVC piping may be utilized on residential floors where it is concealed and installed in accordance with applicable code and manufacturer listings.
- CC. Mechanical branch tees are not appropriate for new construction and are not allowed on this project. Contractor shall use groove-o-let and thread-o-let welded outlets or standard reducing tees.
- DD. Provide all hangers/ supports and seismic restraints in accordance with NFPA 13R and all local AHJ requirements. Contractor is responsible for providing seismic restraint calculations as required per code to the AHJ as part of their submittal package.
- EE. Piping shall be run concealed in all areas with finished ceilings and locations must be coordinated with architect and interiors drawings.
- FF. Design build sprinkler contractor to coordinate pipe routing and head locations with the architect, interiors architect, design team, and construction team with special attention to interior reflected ceiling and acoustical plans. Shop drawings shall be submitted with the above information for review and coordination prior to construction.
- GG. In areas open to structure, sprinkler piping shall be routed tight to structure. Piping shall not be run in front of windows or beneath skylights where applicable. Contractor to pay special attention to routing in lobby areas.
- HH. Provide pipe escutcheons at all public areas where sprinkler pipe penetrates walls.
 - 1. Escutcheons and guards shall be listed, supplied, and approved for use with the sprinkler by the sprinkler manufacturer.
 - II. The fire sprinkler contractor shall fire stop all locations where the sprinkler piping penetrates a fire rated wall. Fill all voids with mineral wool and caulk with Intumescent fire caulking.
- JJ. Provide heat trace and insulation of wet sprinkler main running through unheated areas of the building at minimum 5 watts/ foot. Heat trace is to be listed for use with fire protection equipment. Coordinate with electrical contractor for wiring of heat trace.

PART 3 - EXECUTION

3.01 PREPARATION AND INSTALLATION

- A. Install all materials in accordance with code and manufacturer requirements and best industry practices.

- B. Receive and store all materials on site in such a way as to protect uninstalled items from damage. Additional care shall be taken to ensure that CPVC pipe and fittings are protected from exposure to direct sunlight.
- C. Contractor shall have an ongoing employee training and quality control program that includes periodic documented training updates from manufacturer's representatives for all aspects of installation for contractor's field personnel. This shall be paired with a field QC program including periodic inspection of work installed in the field
- D. Grooved joints shall be installed in accordance with the manufacturer's latest published installation instructions. Grooved ends shall be clean and free from indentations, projections, and roll marks. Gaskets shall be molded and produced by the coupling manufacturer and shall be verified as suitable for the intended service.
- E. A factory-trained field representative (direct employee) of the CPVC manufacturer shall provide on-site training (either on the job site or contractor's office) for contractor's field personnel in the proper handling and installation of CPVC piping products. The factory-trained representative shall periodically review the product installation and ensure best practices are being followed. Contractor shall remove and replace and improperly installed products. A distributor's representative is not considered qualified to conduct the training.
- F. Do not install any sprinklers that have been dropped, damaged, or show a visible loss of fluid. Never install any sprinkler with a cracked bulb.

3.02 TEST AND INSPECTION

- A. System shall be tested and inspected. Sprinkler contractor is responsible for all required startup and testing. Coordinate with local authority having jurisdiction and all other authorities having jurisdiction for inspection and acceptance.
- B. Provide copies of all sprinkler system test certificates, including all signatures, to owner for building records.

END OF SECTION