SECTION 211000-FIRE PROTECTION SYSTEMS

PART 1-GENERAL

- 1.1 SECTION INCLUDES
 - A. Piping systems
 - B. Sprinkler equipment

1.2 REFERENCES

- A. ASME B16.1 Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
- B. ASME B16.3 Malleable Iron Threaded Fittings, Class 150 and 300.
- C. ASME B16.4 Cast Iron Threaded Fittings, Class 125 and 250.
- D. ASME B16.5 Pipe Flanges and Flanged Fittings.
- E. ASME B16.9 Factory-made Wrought Steel Buttwelding Fittings.
- F. ASME B16.11 Forged Steel Fittings, Socket-welding and Threaded.
- G. ASME B16.25 Buttwelding Ends.
- H. ASTM A120 Pipe, Steel, Black and Hot-Dipped, Zinc-coated (Galvanized) Welded and Seamless, for Ordinary Uses.
- I. NFPA 13 Installation of Sprinkler Systems.

1.3 SUBMITTALS

- A. Submit under provisions of Applicable Division I Specifications.
- B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals.
- C. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
- D. Manufacturer's Field Report: Submit under provisions of Applicable Division I Specifications.
- E. Manufacturer's Field Report: Indicate time of start-up of treatment systems and include analysis of system water after cleaning and treatment.

1.4 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Applicable Division I Specifications.

B. Maintenance Instructions: Include installation instructions, spare parts lists, procedures, and treatment programs.

1.5 QUALITY ASSURANCE

- A. Sprinkler Systems: Perform work to NFPA 13.
- B. Welding Materials and Procedures: Perform to ASME Code.
- C. Valves: Bare UL label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- D. Maintain one copy of each document on site.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver, store, protect, and handle products to site under provisions of Applicable Division I Specifications.
 - B. Deliver and store valves in shipping containers, with labeling in place.
 - C. Provide temporary protective coating on cast iron and steel valves.
 - D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

1.7 WARRANTY

A. Contractor shall warranty entire systems and equipment for a period of one (1) year.

PART 2-PRODUCTS

2.1 SPRINKLER PIPING, BURIED

- A. Steel Pipe: ASTM A153; Schedule 40 black; with ANSI/ASME C105 polyethylene jacket, or double layer, half-lapped 10 mil polyethylene tape.
 - 1. Steel Fittings: ASME B16.9, wrought steel, buttwelded; ASTM A234, wrought carbon steel and alloy steel; ASME B16.5, steel flanges and fittings
 - 2. Cast Iron Fittings: ASME B16.1, flanges and fittings.
 - 3. Joints: ANSI/AWS D1.1, welded.
 - 4. Casing: Polyurethane insulation with high-density polyethylene jacket and heat shrink sleeves.

2.2 SPRINKLER PIPING, ABOVE GROUND

- A. Steel Pipe: ASTM A120; Schedule 40 black or as accepted by NFPA 13.
 - 1. Steel Fittings: ASME B16.9, wrought steel, buttwelded; ANSI/ASME B16.25, steel flanges and fittings; ASME B16.11, forged steel socket welded and threaded.

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- 2. Cast Iron Fittings: ASME B16.1, flanges and fittings; ANSI/ASME B16.4, screwed fittings.
- 3. Malleable Iron Fittings: ASME B16.3, screwed type.
- 4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock ,"C" shaped composition sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.3 SPRINKLER EQUIPMENT

- A. The types of heads shall be used in the following locations;
 - 1. Unfinished exposed spaces and mechanical space brass heads, upright.
 - 2. Finished spaces with ceiling concealed head assemblies, color to match ceiling color.
 - 3. Finished spaces in storage room and janitors closets white pendant heads.
 - 4. Corridors, locker/shower rooms, restroom concealed head assemblies, color to match ceiling color.
 - 5. Heads in the gym shall have wire guards.
- B. Provide vane type water flow indicator with tamper switch and electronic retard.
- C. Provide valve position supervisory switch for monitoring all valves.
- D. Provide test station with valve and drain assembly for testing sprinkler system.
- E. Install water motor gong on building and alarm bell on inside of building at riser area.
- F. Fire Department Connection
 - 1. Type: Wall mounted with rough chrome plated finish (See Fire Protection plan for approximate location).
 - 2. Outlets: 4" Siamese storz outlet (verify with Fire Department)
 - 3. Labeled: Automatic Sprinkler Fire Department Connection.
- G. Provide wall indicator valve for sprinkler system shut-off. Valve shall be supervised with a tamper switch, not to alarm. Provide flashing strobe light, connected to flow switch, on exterior wall above Fire Department Connection

2.4 GATE VALVES

- A. Manufacturers:
 - 1. Grinnell.
 - 2. Viking.
 - 3. Nibco.
- B. Up to and including 2 Inches: Bronze body, bronze trim, rising stem, handwheel, inside screw, single wedge or disc, threaded ends.
- C. Over 2 Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, single wedge, flanged or grooved ends.

2.5 GLOBE OR ANGLE VALVES

- 1. Grinnell.
- 2. Viking.
- 3. Nibco.
- B. Up to 2 Inches: Bronze body, bronze trim, rising stem and handwheel, inside screw, renewable composition disc, solder or screwed ends, with backseating capacity repackable under pressure.
- C. Over 2 Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

2.6 BALL VALVES

- A. Manufacturers:
 - 1. Grinnel.
 - 2. Viking.
 - 3. Nibco.
- B. Up to and including 2 Inches: Bronze one piece body, stainless steel ball, teflon seats and stuffing box ring, lever handle and balancing stops, solder or threaded ends with union.
- C. Over 2 Inches: Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle or gear drive handwheel for sizes 10 inches and over, flanged.

2.7 BUTTERFLY VALVES

- A. Manufacturers:
 - 1. Grinnell.
 - 2. Viking.
 - 3. Nibco.
- B. Bronze body, stainless steel disc, resilient replaceable seat, threaded ends, extended neck, handwheel and gear drive and integral indicating device and built-in tamper proof switch rated 10 amp at 115 volt AC.
- C. Cast or ductile iron body, chrome plated ductile iron disc, resilient replaceable EPDM seat, wafer or lug ends, extended neck, handwheel and gear drive and integral indicating device and built-in tamper proof switch rated 10 amp at 115 volt AC.

2.8 FIRE PUMP

A. The pump furnished for fire protection service shall be supplied with the specified driver, controls and pump accessories by the pump manufacturer. The pump driver and controller shall be UL listed and FM approved for fire protection service. The fire pump shall be designed to deliver 500 GPM at total discharge pressure of 50 PSI, measured at the discharge flange.

The pump shall be a Patterson Pump Co. vertical in-line type specifically labeled for fire service, Model #5X3 VIP. The water supply shall be a 6" main from water company. The pump discharge assembly shall be cast iron and fitted with 6" discharge connections

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with ANSI 125# rating dimension. Pump shall have a non-ferrous metal inlet strainer. Unit shall connect to 25 HP motor.

- B. Electric Motor
 1-25 HP, 3600 RPM, 460/60/3 phase open drip proof motor (verify voltage with electrical plans).
- C. Controller

The electric motor controller shall conform to the requirements of NFPA 20 and be specifically approved for fire pump service. All control equipment shall be mounted on a drip proof moisture resistant housing and shall be labeled fire pump controller. The control equipment shall be completely assembled, wired, and factory tested. The controller shall be a Y- Δ Closed transition Eaton model FD-30 across-the-line controller UL/FM labeled designed for a wye delta, closed transition reduced voltage start. The controller shall be combined manual and automatic type controller and shall automatically start the pump when the system pressure drops 10 PSI lower than the jockey pump setting. The circuit breaker shall be rated for 100,000 AIC at 460 volts. The unit shall be listed with UL/FM as "Suitable For Use As Service Equipment". The fire pump automatic transfer switch shall be electrically operated – mechanically held on both the emergency and normal power source sides, and rated for fire pump service and be UL 1008 listed and FM Approved, and shall be electronically controlled for automatic switching and capable of manual operation.

D. Jockey Pump & Controller

Furnish 1- pressure make-up pump. The pump shall be capable of delivering 10 GPM at a total net head of 100 PSI by Grundfos model CR1. The pump shall operate automatically by utilizing a controller capable of automatic starting and stopping the pump through use of a pressure switch. The controller shall contain an across-the-line starter with a fusible disconnect switch, adjustable pressure switch, H-O-A selector switch, control circuit transformer. The motor and controller shall be suitable for operation on a 3 phase, 60 Hertz, 460-volt power (verify voltage with electrical plans).

- E. Fire Pump Fittings Pump manufacturer to supply the following fittings in accordance with NFPA 20, concentric discharge increaser, 2" air release valve, test header, 2 ¹/₂" valves with caps and chains.
- F. Coupling Alignment

Coupling alignment is the responsibility of the pump supplier. Prior grouting, factory authorized representative shall check for parallel and angular alignments which shall be with 0.0004" T.I.R. per inch of radius.

G. Grouting

The pump must be grouted according to the installation instructions supplied by the pump manufacturer. Failure to grout would void the product warranty.

H. Start-Up

The fire pump manufacturer's representative shall be licensed by the State of Ohio to supervise a fire pump acceptance test.

PART 3-EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends to full inside diameter. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

3.2 INSTALLATION

- A. Install piping in accordance with NFPA 13 for sprinkler systems.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, and not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- G. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- H. Do not penetrate building structural members unless indicated.
- I. Provide sleeves when penetrating footings, floors and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- J. Die cut screw joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.
- K. Install valves with stems upright or horizontal, not inverted. Remove protective coatings prior to installation.
- L. Provide butterfly valves for shut-off or isolating service.

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- M. Provide drain valves at main shut-off valves, low points of piping, and apparatus.
- N. Flush entire piping system of foreign matter.
- O. Hydrostatically test entire system.
- P. Require test be witnesses by Fire Marshall, authority having jurisdiction, Owner's insurance underwriter and Architect.
- Q. All underground pipe joints to be exposed until tested and inspected by the Fire Department.

3.3 TRAINING

- A. Fire protection system training to be provided by a trained service technician for a total of four (4) hours. These hours of training are to be "bankable hours" used within one full warranty year.
- B. All training and start-up shall be videotaped with a professional videographer and present two (2) copies of the training on DVD format to the Construction Manager within one (1) week of the training session. This DVD will be provided to the owner.

END OF SECTION 211000

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