B. Provide all design, materials and installation required to provide a complete fire protection system to protect the specified building in accordance with design requirements.

C. A minimum 10-psi or 10% safety factor, whichever is greater, shall be provided.

D. Provide a complete automatic sprinkler system as defined by the latest edition of NFPA 13. All fire sprinkler systems installed in areas where temperatures may fall below 40 degrees F, are required to have dry pipe systems. The following areas require a dry pipe system to be installed. Antifreeze systems of any size are not permitted on campus. Rooms or areas where it is not desirable to have water filled piping within the room, such as special collections, computer rooms, etc. may utilize double interlock pre-action systems. Use of pre-action systems shall be approved by the University Fire Safety System Specialist prior to system design.

1.03 Related Work: References/Quality Assurance

A. Sam Houston State, International Building Code, National Fire Codes as published by the National Fire Protection Association (NFPA), State Fire Marshal, and SHSU personnel's requirements contain fire protection criteria and requirements for the installation of all fire suppression systems. The contractor shall conform to the following:

1. All materials and performance shall meet the appropriate ANSI, ASME and ASTM Codes.

2. Welding Materials and Procedures shall conform to the ASME Code.

3. Only welders certified in accordance with ANSI/ASME Section 9 shall be employed.

B. Each item of equipment shall be new and listed by Underwriters Laboratories (UL) or approved by FM Global. Each major item of equipment shall bear the manufacturer's name or trademark; serial number, and/or UL/FM label.

1.04 Submittals

PART 2 PRODUCTS

2.01 Pipe

A. Aboveground Pipe

1. ERW Piping is not to be used in any SHSU facility

2. All wet sprinkler system piping shall be seamless with a minimum of schedule 40 black steel with threaded fittings for 1 inch piping , and black schedule 40 steel with grooved fittings for sizes 1 ¼ inch pipe and larger. All dry and preөrhre aor ng(nc)-3.9(h)0.5(f) 1

d. Exposed Areas Painted Pipe: Pipe markers not required (as long as pipe is painted red

B. Underground Pipe:

1. Each underground pipe joint or connection shall include a compression-type joint restraint device (Mega Lug or equal). Any changes in direction of underground piping shall be provided with a thrust block or joint restraint as required. Changes in direction where entering buildings shall be provided with both thrust blocks and joint restraint.

2. Underground pipe shall be installed by either a fire sprinkler contractor or an underground contractor licensed by the State of Texas to install underground fire service mains.

3. All underground pipe connecting sprinkler and standpipe systems shall be rated for the maximum churn, or no flow pressure, of the largest fire pump in the zone plus the maximum static pressure at the suction side of the fire pump. Pipe shall be hydrostatically tested at the highest static pressure rating plus 50 psi, or 200 psi, whichever is greater per NFPA 24.

4. No underground pipe shall be covered until a joint inspection SHSU Plumbing and SHSU FSSS.

SEE JOCKEY PUMP DETAIL IN SECTION 5.21.40

2.02 Mechanical Grooved Couplings

A. When grooved couplings are used, rolled-grooved joints are required with fittings and couplings designed for a working pressure of 300 psi. Malleable iron housing clamps: ASTM A47; UL labeled; engage and lock, designed to permit some angular deflection, contraction, and expansion (Firelock fittings not acceptable).

B. Galvanized couplings are required for galvanized pipe.

C. "C" shaped composition sealing gasket: ASTM D2000.

D. Steel bolts, nuts and washers: ASTM A183 heat treated with a minimum tensile strength of 110,000 psi.

E. Not Used

2.03 Valves

A. Unless s3.9(d f)10.1-.6(D)3whsM Ax.2(ng)10.4(s)3.6(a)-3.6(a)-3.6(A/P <</MCIDd ( )Tj EMC0 -1.BE

1. All indicating valves on the suction side of a fire pump.

2. Where indicated on the contract drawings.

C. All butterfly valves shall have a built in tamper resistant switch for supervision of the open position. The switch shall be contained within a NEMA Type 1, general purpose indoor rated housing. Either unauthorized removal of the switch housing (when the valve is open) or closing the valve, shall cause the switch contacts to change position. The switch shall have four conductors to accommodate connections to Style 4 or Style 6 signaling line circuit devices.

1.

K. Pressure reducing valve:

1. Sprinkler systems are required to be provided with a

A. All portions of the system shall be equipped with drains of the size specified in NFPA 13. Design sprinkler system that will drain to the riser. All main drains shall be piped to the exterior of building. Auxiliary drains shall be piped to exterior of the building unless approved by SHSU FSS. All drain piping and threaded fittings to be galvanized (grooved couplings are not required to be galvanized).

B. Every water flow switch shall have an inspector's test connection located downstream and piped to the sanitary sewer system designed to handle full flow from the drain.

2.07 Backflow Preventer

A. A double check backflow prevention assembly shall be installed prior to any sprinkler or standpipe system connected to the water distribution system, including connection of pressure maintenance pumps to the building’s domestic water line utilized to fill sprinkler system piping.

2.08 Express Drains:

A. A remote express drain line is required for all buildings with floor control assemblies in addition to the main / inspectors test drain. This drain line shall be installed in the remote stairwell from the supply standpipe. The drain line shall be piped to a sanitary sewer.

2.09 Sprinklers

A. Sprinklers shall be UL listed or FM approved and shall not include O-ring seals. Any sprinkler that incurs damage, is painted, or is sprayed with any obstructive material during construction shall be replaced at no cost to the University. Installation of sprinklers shall be coordinated with other work, including duct and electric fixture installation, to prevent sprinkler obstructions.
B. Sprinklers located less than eight feet above finished floor or that may be subject to mechanical damage shall be provided with guards listed for use with the model of sprinkler installed.

C. Quick-response sprinklers are required throughout all light-hazard occupancies, and may also be installed in ordinary-hazard occupancies for the quick response hydraulic design area reduction per NFPA 13 for utilizing quick response sprinklers. Extended cover.9(d f)10(l)-3.2(oor or t)-32h(l)-3.3fe10.6(e)6

40 degrees F, as required per NFPA 13

B. In areas subject to freezing that cannot be protected by dry type sprinklers on a wet sprinkler system, a dry pipe system shall be installed. Antifreeze loops are not permitted.

C. Pitch dry pipe system piping a minimum of ¼ inch per 10 feet for dry system mains and minimum of ½ inch per 10 feet for dry system branch lines.

D. Provide full length dry pendent sprinklers that connect directly to the dry system branch line tee fittings in areas with suspended ceilings. Do not install dry pendent sprinklers on drops.

E. Provide a non-riser mounted tank type air compressor listed for fire protection use and sized to refill the entire dry pipe system within 30 minutes as required per NFPA 13.

F. Utilize the compressor manufacturer's listed air maintenance device and supervisory air pressure switch to maintain and monitor the dry pipe system air pressure.

G. All dry pipe valves shall not be externally resettable

H. Install permanent, typed, local labels at devices showing "HIGH AIR" setting, "LOW AIR" setting, "COMPRESSOR ON" setting, "COMPRESSOR OFF" setting, and "TRIP PRESSURE" setting.

2.11 Pre-action Sprinkler System

A. Provide a double interlock pre-action system where the University prefers to eliminate water filled piping within the room, such as special collections, computer rooms, etc.

B. Pitch pre-action system piping a minimum of ¼ inch per 10 feet for pre-action system mains and minimum of ½ inch per 10 feet for pre-action system branch lines.

C. Provide full length dry pendent sprinklers that connect directly to the pre-action system branch line tee fittings in areas with suspended ceilings. Do not install dry pendent sprinklers on drops.

D. Provide a tank or riser-mounted air compressor listed for fire protection use and sized to refill the entire pre-action system within 30 minutes as required per NFPA 13.

E. Utilize the compressor manufacturer's listed air maintenance device and supervisory air pressure switch to maintain and monitor the pre-action system air pressure.

F. Requirements for detection, pre-action system releasing, pre-

PART 3 EXECUTION

3.01 Guarantee

A. The Contractor shall guarantee and service all workmanship and materials to be as represented by him, and shall repair or replace, at no additional cost to the Owner, any part thereof, which may become defective within the period of one (1) year after the date of final acceptance by the Engineer,

END OF STANDARD