# PART 1 - GENERAL

* 1. **SUMMARY**
		1. Provisions of Division 01 apply to this section.
		2. Section Includes:
			1. Design, furnish and install fire sprinkler system for protection of buildings.
			2. Furnish and install standpipe system, where shown on drawings.
		3. Related Sections: The requirements of this Section, NFPA 13 and NFPA 14 shall take precedence over requirements found in the following Related Sections:
			1. Section 31 20 00: Excavation, Backfilling and Compacting for Utilities.
			2. Section 33 10 00: Site Water Distribution Systems
			3. Section 09 90 00: Paints and Coatings.
			4. Section 10 44 13: Fire Extinguishers and Cabinets
			5. Section 23 05 00: Basic Mechanical Requirements.
			6. Section 23 05 13: Basic Mechanical Materials and Methods.
			7. Section 23 05 53: Mechanical Identification.
			8. Section 22 10 00: Plumbing.
			9. Section 26 05 00: Basic Electrical Requirements.
			10. Section 28 31 00: Fire Alarm Systems

# DEFERRED APPROVAL SUBMITTAL

* + 1. Deferred Approval Submittal Procedure:
			1. Provide Deferred Approval Submittal including Drawings, Product Data and Hydraulic Calculations of complete automatic wet pipe fire sprinkler system, in compliance with DSA requirements of the “Fire and Life-Safety Plan Review Submittal Guideline for Automatic Fire Sprinkler Systems (AFSS)”. Drawings and Hydraulic Calculations shall be stamped and signed by a Mechanical Engineer or Fire Protection Engineer currently licensed in the State of California.
				1. Submit to the Architect for review:

One (1) CD containing electronic files of Drawings, Hydraulic Calculations and Product Data.

Six (6) sets of Drawings, Product Data and Hydraulic Calculations.

* + - * 1. Submittal and any required resubmittal to the Architect shall be in accordance with Section 01 33 00, Submittals.
				2. Once the Architect marks the submittal “reviewed”, the Architect shall submit the Drawings, Product Data and Hydraulic Calculations to DSA for approval.
				3. If required make necessary corrections to meet DSA approval and resubmit to Architect.
				4. Following DSA review and approval, the Architect shall return to the OAR 4 sets of the DSA approved Drawings, Product Data and Hydraulic Calculations.
		1. Manufacturer’s Data:
			1. Submit complete and detailed equipment and material list of items to be furnished and installed under this section.
			2. Submit manufacturer's specifications and other data required to demonstrate compliance with specified requirements.
		2. Drawings and Hydraulic Calculations:
			1. Design wet pipe fire protection sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, by hydraulic calculations for uniform distribution of water over design area. Pipe Schedule sprinkler systems shall be allowed only per the provisions of NFPA 13.
			2. Drawings shall fully comply with the most stringent provisions of this specification, applicable codes and standards.
			3. Drawings shall be same size as the Contract Drawings and shall be produced using AutoCAD.
		3. Regulatory Requirements:
			1. Installation of fire sprinkler system shall not start until Deferred Approval Drawings have been stamped approved by DSA.
			2. Approval by DSA may include minimum code requirements and does not supersede more extensive requirements of the Contract Documents.
		4. Closeout Submittals: Submit in accordance with Section 01 77 00, Contract Closeout, and as specified herein:
			1. Record Drawings:
				1. Record drawings of installed Work shall be maintained current on the Project site, available for Fire Inspector and the PI to review.
				2. At completion of installation submit to the Architect Record Drawings signed by installing Contractor and Record Drawings in AutoCAD format, including:
			2. Record Specifications.
			3. Record Product Data: Include specific model, type and size for all equipment and material installed.
			4. Record Samples.
			5. Maintenance Manuals.

# QUALITY ASSURANCE

* + 1. Comply with all applicable national or local codes and standards.
		2. Except where exceeded by the requirements of these specifications, the following are made part of this section: approved prints and details, and all provisions of the NFPA 13 Standard for Installation of Sprinkler Systems and NFPA 14 Standard for the Installation of Standpipes and Hose Systems.
		3. Qualifications of Manufacturer: Products used in work of this section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a 5 year history of successful production that is acceptable to the Architect.
		4. Qualifications of Installer: Installer shall have a current C-16 license in the State of California in the installation of fire sprinkler systems.

# FIRE SERVICE WATER CONNECTION

* + 1. The Owner shall pay fees and provide for the fire main POC (point of connection), consisting of the installation of a single detector check valve (if one is required) and meter shut off valve inside a meter vault.
		2. All Fire Service Mains shall be provided with approved Meter Service Backflow protection. An approved Reduced Pressure Principle Backflow Prevention Assembly (RP) to meet minimum backflow protection requirements for meter service protection (MSP) shall be provided on the fire main, according to the California and Uniform Plumbing Code (CPC and UPC).

# PRODUCT HANDLING

* + 1. Comply with the provisions specified in Sections 23 05 00 and 23 05 13.

# COORDINATION

* + 1. Coordinate activities in accordance with provisions of Section 23 05 00.

# JOB CONDITIONS

* + 1. Unscheduled utility flow interruptions are not permitted. Schedule all service interruptions in advance, with the OAR.

# EXTRA MATERIALS FOR MAINTENANCE

* + 1. Provide spare sprinkler heads in quantity equal to 2% of total number of each type of sprinkler head installed. There shall be no less than 2 heads of each type and temperature rating provided, and in no case less than 6 spare sprinkler heads per building. There shall be no fewer than 6 spare sprinkler heads for up to 300 sprinkler heads installed; no less than 12 spare sprinkler heads for up to 1,000 sprinkler heads installed; and no less than 24 spare sprinkler heads for the sites with more than 1,000 sprinkler heads installed. Spare sprinkler heads shall be kept inside of spare sprinkler head box(s). A spare sprinkler wrench for each type of sprinkler head shall also be provided inside of each spare sprinkler head box, at each building. Locations of spare sprinkler boxes shall be located at:
			1. Fire Sprinkler Riser, when enclosed and secure.
			2. Administration Office, when Fire Sprinkler Riser is exposed.

# PART 2 - PRODUCTS

* 1. **FIRE PROTECTION SYSTEM DESCRIPTION**
		1. General: Provide systems complete including, but not limited to:
			1. Provide underground and above ground sprinkler and standpipe piping including trenching and backfilling. All materials and equipment shall be UL/FM listed and/or approved as required by NFPA for their application. All required signage shall be provided and installed as required by NFPA 13 and NFPA 14.
			2. Provide overhead sprinkler system with sprinklers installed as required according to type, location and temperature rating.
		2. Sprinkler Heads:
			1. Provide chrome pendant spray type sprinkler heads with matching escutcheons in areas with finished ceilings. Exterior escutcheons shall be poly-coated or concealed type to prevent rusting and oxidation.
			2. Provide upright sprinklers in areas with exposed piping.
			3. Provide poly-coated glass bulb type sprinklers (for corrosion resistance) in areas exposed to a corrosive environment such as parking garages and coastal air.
			4. Sprinklers shall be glass bulb type, with hex-shaped wrench boss integrally cast into the sprinkler body to reduce the risk of damage during installation,
			5. Sprinklers in concealed spaces, exterior locations, and any other areas which will experience over 100 degrees F ambient temperature shall be furnished with 200 to 225 degree rated sprinklers. Sprinkler heads in boiler rooms, furnace rooms, or heater rooms shall be furnished with sprinklers rated at 250 to 290 degrees F. If a sprinkler is directly affected by a spotlight, steam, or other heat source, a 350 degree F or higher sprinkler head shall be furnished. Sprinkler heads in all other locations, unless otherwise noted, shall be 155 to 165 degrees F rated.
			6. Automatic fire sprinkler head type shall be as follows:
				1. In areas with ceiling heights of 9’-0” or lower, sprinkler heads installed shall be recessed or fully concealed.
				2. Ceilings 8’- 0” or lower shall be provided with fully concealed sprinkler heads.
				3. Areas with ceiling height of 9’- 0” or lower, that are not constantly supervised such as corridors, arcades, students restrooms, and other restrooms shall be provided with fully concealed sprinkler heads.
			7. Sprinkler heads in light hazard occupancies are required to be Quick Response sprinklers as required in NFPA 13. Sprinkler heads shall be of the same manufacturer throughout the building/site as indicated. Sprinklers shall typically be ½ inches NPT, standard orifice, minimum 5.6 nominal K factor, UL listed for 175 psi, and listed for light and ordinary hazard occupancies.
			8. Other specialized sprinkler heads such as walk-in refrigerator or freezer heads, side wall, ¾ inches sprinklers above 5.6 K factor, and those sprinklers with a K factor below 5.6, shall only be used where required by project condition. Large drop sprinkler heads and extended coverage sprinkler heads shall not be installed.
			9. Sprinkler head location shall be designed and installed in an aesthetically pleasing manner and should generally be located in center of 24”x24” ceiling tiles and in center of 24”x48” ceiling tiles in the 24” direction and no closer than 12” from the edge in the 48” direction.
			10. UL/FM listed Sprinkler head guards shall be provided on Sprinkler heads installed at 7’- 6” above floor or lower in exposed locations, or that are deemed subject to damage. Sprinkler head guards shall securely fasten with bolt-on feature to the base of the sprinkler or be a factory installed guard. Guards shall also be provided on upright and sidewall heads where sprinklers are installed at 7’-6” heights or lower.
		3. Fire Sprinkler and Standpipe Systems:
			1. Underground piping: Comply with the requirements of Section 33 10 00, Site Water Distribution System.
			2. Provide an underground UL/FM listed PVC or Ductile iron supply line connected to detector check meter or water main as indicated. Install site water mains no closer than 10’- 0” parallel to the building foundations. Underground fire water lines shall be installed 36 inches below grade. Tracer wire shall be installed in accordance with Section 33 10 00: Site Water Distribution Systems.
			3. Fire Department Connection (FDC) with check valve (wafer type) shall be provided after the backflow preventor, and before the building fire sprinkler riser(s), located where the FDC will be accessible to the fire department from the street or sidewalk without obstructions. No shut off valve shall be allowed on the FDC line as per NFPA 13. FDCs shall have a height between 2’- 0” and 4’- 0” above the ground.
			4. PIVs shall be electrically supervised regardless the number of fire sprinkler served (CBC 903.4), and set at a height of 3’- 0” to the top and have the handle locked in place with a break-a-way lock.
			5. Provide a UL listed, FM approved FDC, approved RP type backflow assembly, check valves, shut-off valves, drain valves, ITV, and flow indicator at the locations required. (Test-and-drain combination valves are prohibited.)
			6. Flow indicator shall activate the fire alarm system between 45 and 90 seconds, and activate a local alarm on the outside of the building continuously with water flow. Connection of this switch is a part of the Work of Division 16. All shut-off including valves on the fire main backflow preventor shall be electrically supervised according to CBC 903.4,, NFPA 13 and Section 28 31 00 – “Fire Alarm Systems”.
			7. Pipe through ceilings at head locations shall be furnished with a two piece, or fully concealed escutcheon. Unless otherwise designated, escutcheons shall be identical and match the other escutcheons of the same type throughout the building or site. Piping through walls and ceilings shall have a split ring chrome escutcheon.
				1. Flexible stainless steel sprinkler head drop system may be used. Flexible drops shall be UL listed, FM approved, and shall be compatible with ceiling systems. Flexible drop length shall be included in the Hydraulic Calculations. The drop system shall include the required support bracing.
			8. Furnish and install all required signs, spare heads, special wrenches, and spare sprinkler head boxes as required to satisfy NFPA 13, NFPA 14 and this specification.
			9. Sprinkler system piping shall be provided with complete drainage as required by NFPA. Inspector’s test valve discharge shall be piped away from planters to asphalt areas. Furnish protection of piping against accidental or malicious damage.
			10. Upon completion of the Work of this section, and before Substantial Completion, subject system, including underground supply connection, to tests required. A minimum hydrostatic test shall be two hundred pounds (200 psi) or fifty pounds (50 psi) in excess of the maximum system working pressure, whichever is greater, for two hours with no leaks or loss of pressure per NFPA 13. The PI shall be furnished with a NFPA 13 test certification.
			11. Local fire sprinkler alarm requirements shall be accomplished with a vane or paddle type water flow detector switch and an electrically powered fire sprinkler horn located on the street side of the building and connected to the fire alarm control panel with secondary power provided from the fire alarm batteries. The drilled out disk shall be attached to the mounting U- bolt. Time delay shall be set at 45 to 60 seconds. Mechanically activated water bells with alarm valve and pressure switch are prohibited.
			12. Seismic separation assemblies shall be located between the buildings if space allows accessibility. Otherwise they shall be located inside the building providing the most space. Swing joints may be fabricated on site using flexible groove couplings and 6 (six) grooved (Victaulic) 90 degree elbows in a teepee formation (see NFPA 13, figure A.9.3.3). Seismic separation assemblies can also be made utilizing a manufactured, UL/FM listed swing joint assembly rated at a minimum 175 psi.
			13. Hanging, bracing and support shall utilize only UL/FM listed approved products, and comply with NFPA 13, Chapter 9 requirements for rod and bolt sizes except for the following: 4 and 6 inch pipe shall be supported by a minimum ½ inch hanger rod, 8 inch pipe shall be supported by a minimum 5/8 inch hanger rod, 10 and 12 inch pipe shall be supported by a minimum ¾ inch hanger rod. Hanger rods in exterior locations and in parking structures shall have Electrodeposited Zinc Coating per ASTM B633 to prevent rusting.
			14. Building Fire Sprinkler riser assemblies shall be provided as follows. Every building shall be provided with an accessible and electrically supervised riser shut off valve at a height not to exceed 5’- 0” above the floor. Every building riser assembly shall be equipped with a check valve followed by a main drain valve and then the flow indicating switch and pressure gauge immediately after the shut-off valve. In cases where a riser assembly is provided for each floor in the building, a check valve, main drain and flow switch shall be provided for each floor; the main building shut-off shall not be required. An electrically supervised Post Indicator Valve located outside the building may serve as the building riser shut-off valve.

# MATERIALS

* + 1. Access Panel:

FAP-1 Square, steel, prime-coated, with vandal-proof door lock operated by Allen wrench:

Smith Josam Elmdor

4760 DW – AKL

* + 1. Globe or Angle Valves: UL/FM listed.

AV-1 Bronze angle valve: 2 inches and smaller, screwed-in bonnet, threaded ends, rising stem:

Nibco Kennedy Fairbanks United

T-301W 97 SD 126T

* + 1. Automatic Fire Sprinkler Head, UL/FM listed:

AFSH-1 Brass pendant type for areas with suspended ceilings:

Victaulic Tyco Viking Reliable

V2708 TY 3231 VK302 F1FR56

AFSH-2 Brass upright type for areas with no ceilings:

Victaulic Tyco Viking Reliable

V2704 TY 3131 VK300 F1FR56-300

AFSH-3 Chrome or poly coated semi recessed type with
semi-recessed escutcheon:

Victaulic Tyco Viking Reliable

V2708 TY 3231 VK302 F1FR56-300

AFSH-4 Fully concealed type sprinklers; chrome cover:

Victaulic Tyco Viking Reliable

V38 TY 3531 VK404 F4FR

* + 1. Backflow Prevention Assemblies:

BPV-1 Approved Reduced Pressure Principle Backflow Prevention Assembly (RP) type for meter service protection (MSP) requirements:

Ames Febco Watts Wilkins

4000SS LF860 OS&Y Watts Wilkins

C400 LF880 OS&Y 957 RP 375 RP

M400 994 RP

BPV-2 Approved Reduced Pressure Principle Detector Assembly (RPDA) for MSP requirements:

Ames Febco Watts Wilkins

5000SS LF860 DA 909 RPDA 950DA

C500 LF880 DA 957RPDA 350 DA

M500 994 RPDA

* + 1. Gear Operated Butterfly Valves:

GOBFV-1 Grooved end Gear Operated Butterfly Valve, 300 psi, for fire protection sprinkler risers. UL listed, FM approved, with weatherproof gearbox and double pole/double throw monitor switch, double seal design for bubble tight shut off at 175 psi. Corrosion-resistant, fusion-bonded nylon II body coating, easy to read position indicator:

Kennedy Nibco Victaulic Tyco

G3001G GD-4765-8 705 BFV

300 psi 300 psi 300 psi

GOBFV-2 Wafer Type Gear Operated. Butterfly Valve, same requirements as GOBFV-1:

Kennedy Nibco UL/FM or Equal

WD-3510 300 psi

* + 1. Check Valves:

CV-1 Bronze check valves: 2 inches and smaller, 200 psi WOG, bronze disc, swing type, conforming to MSS-SP-80-97, threaded ends:

Cranea Nibco Stockham United

36 T-433-Y B309Y 62T

CV-2 Check valves: 2-1/2 inches and larger, composition disc, swing type, bolted cap, UL listed, FM approved flanged ends:

Stockham Kennedy Tyco Clow

F-947 1106 TJCV C508

CV-3 Wafer Type Check Valve: United Wafer Check #90, Nibco KW-900-W-LF, Mueller.

CV-4 Grooved Check valve 2 ½ inch and larger:

United Gruvlock Reliable Victaulic Tyco

67 7800 Model “G” Series 717 CV-1F

ES-1 Chrome plated, or white poly-coated, 2-piece canopy (escutcheon), 2.25 to 3.5 inches in extended position:

FPPI Tyco Reliable

01 – 401 No. 401 HBC (chrome)

Chrome or Chrome or HBC (white)

White White

ES-2 Chrome plated or white poly coated, 2-piece recessed:

FPPI Tyco Reliable (semi-recessed)

01 – 400 Chrome of White GF2-C (chrome)

P1 - 402 Chrome or White GF2-W (white)

1. Fire Department Connections:

FDC-1 UL listed, FM approved, type, 4 inch x 2-1/2 inches x 2-1/2 inches bronze body fire department hose connection (FDC):

Croker Potter-Roemer UL/FM Powhaten

6405 or 5710 or or equal 21-201 or

6420 5731 21-202

1. Flow Indicators:

FIA-1 Listed by State Fire Marshal, with double pole, double-throw switch, one normally open and one normally closed, UL listed and FM approved:

Potter-Roemer System Sensor VSRF Series WFD Series

1. Outside Stem and Yoke Gate Valves:

 OS&Y-1 Bronze Gate Valves: 2 inches and smaller, class 175, solid bronze wedge disc, OS&Y, copper silicon alloy stem, UL/FM listed, threaded ends:

|  |  |  |  |
| --- | --- | --- | --- |
| Stockham | Crane | Nibco | United |
|  | 459 | T-104-0 | 18 |

 OS&Y-2 Iron gate valves: 2-1/2 inches and larger, class 175, IBBM, OS&Y, solid wedge disc, Teflon-impregnated packing, UL/FM listed, flanged ends:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stockham | Crane | Kennedy | Mueller | Victaulic |
|  |  |  | R2361-6 | 771 |

OS&Y-3 2 ½ inch and larger, epoxy coated, resilient wedge, 175 lbs. gate valve (for riser valves, P.I.V., and shut off:

|  |  |  |  |
| --- | --- | --- | --- |
| Clow | Nibco | Kennedy | Mueller |
| F-6136 | 617-0 | C509 | A-2360 |

1. Gate Valves:

GV-1 Bronze gate valves: 2 inches and smaller, class 150, solid bronze wedge disc, rising stem copper silicon alloy stem, UL/FM listed, threaded ends:

|  |  |  |  |
| --- | --- | --- | --- |
| Stockham | Crane | Grinnell United | VL/FM Listed |
| B-122 | 431 |  | or equal |

GV-2 Gate valves: 2-1/2 inches and larger, class 200, IBBM, solid wedge disc, Teflon impregnated packing, UL/FM listed, flanged ends:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stockham | Crane | Kennedy | Mueller | Victaulic |
| B-132 | 422 |  |  | 772 |

L. Gear Operated Ball Valves:

GOBV-1 Threaded ball valve for sizes 2” (two inches) and smaller:

Nibco KT-505W-8 Victaulic 728 UL/FM listed or Equal

1. Seismic Swing Joints:

SJ-1 UL/FM Approved flexible seismic connector with grooved, or threaded ends for seismic separation requirements.

SJ-2 Fabricated swing joint as per NFPA 13 using six groove 90 degree elbows and flexible groove couplers such as Victaulic style 75.

1. Post Indicator Valves:

PIV-1 Vertical Indicator Posts: Furnished for underground valves, post must provide a means of knowing if the valve is open or shut, UL/FM listed. (Where a backflow assembly is provided, the shutoff valves on the backflow preventer satisfy the requirement for a post indicator valve to control the fire main and FD Connection):

Kennedy Clow Mueller

2945 2945 A-20806

 A-20808

PIV-2 Posts Indicator valve: Furnished for underground valves. Ductile iron fusion bonded epoxy coated resilient wedge gate valves: 4 inches and larger, class 175 lb, non-rising stem, mounting plate for indicator post, UL/FM listed, flanged or mechanical ends (in accordance with NSF 61).

|  |  |  |
| --- | --- | --- |
| Kennedy | Clow | Mueller |
| C509 | F-6100 | RWGV |

1. Sprinkler Guards:

SPG-1 Sprinklers installed at 7’- 6” above floor or lower in exposed locations, or that are deemed subject to damage shall be equipped with a UL/FM listed, head guard. Guards shall be listed, supplied and approved for use with the sprinkler by the sprinkler manufacturer. Sprinkler head guards shall securely fasten with bolt-on feature to the base of the sprinkler or be a factory installed guard. Guards shall also be provided on upright and sidewall heads where sprinklers are installed at 7’-6” heights or lower.

Reliable Viking Tyco FPPI Victaulic

1. Sprinkler Horn:

SPH-1 UL/FM approved, surface-mounted, weatherproof and red finished:

Horn:

Bell: Wheelock equal HRK System Sensor

 SSM-24-10 System Sensor

24 V-DC 24 V-DC

Weatherproof with Weatherproof with BBS-2 back-box for WBB box for surface mount surface mount installation

1. Hangers, Supports, Bracing:

HSB-1 Tolco products or UL listed and FM approved equal.

1. Threaded fittings:

TF-1 Ductile iron, 300 psi rated, UL listed, FM approved and/or NFPA approved

TF-2 Cast iron fittings, 175 psi rated, UL listed, FM approved and/or NFPA approved:

Anvil Ward Equal

TF-3 Mallable Iron, 300 psi rated, UL, Listed, FM approved and/or NFPA approved

TF-4 Galvanized, 175 psi rated, UL Listed, FM approved, and/or NFPA approved

1. Fire Sprinkler Pipes and Standpipes:

FSP-1 Fire sprinkler pipe – 1” thru 8” Schedule 40 black and /or galvanized steel meeting ASTM Standards A53, A135, and/or A795. Pipe Corrosion Resistance Ratio (CRR) shall be 1.00 or greater. Pipe may be threaded or grooved.

* 1. Piping 2 inches and smaller shall have threaded joints and fittings in all concealed, non-accessible locations. Groove coupler connections (Victaulic or equal) on pipe sizes 1 inch through 2 inches are acceptable in all accessible areas with all required seismic bracing provided. Plain end connections such as “Plainlock” and “FIT” are prohibited.
	2. For pipe sizes 2 ½ inches and larger, grooved type (Victaulic or equal), welded, threaded and flanged connections may be used. Any connection that does not utilize a threaded, welded or grooved connection is prohibited, except for mechanical tee bolt-on branch outlet fittings sizes 2 inches and smaller (Victaulic 920 and the 920N).
	3. Submit Verification from manufacturer stating that piping material furnished meets above criteria; (i.e.: threadable pipe has a UL assigned CRR of 1.00 minimum, that it meets ASTM A53, A135 or A795, and it is UL listed, FM approved, and/or NFPA approved.)

FSP-2 Dyna-Thread, Eddythread, or Super 40, commonly referred to as Schedule 30 threadable, meeting ASTM A135, A795, and/or A53, may be used for pipe sizes 2” and smaller. Pipes shall provide a CRR of 1.00 or greater per UL Listing. Pipes 2” and smaller shall be by only one manufacturer.

FSP-3 Ductile iron pipe, AWWA C151 (for pipes below grade). Gasketed self-retaining joints per ASME/ANSI B16.4.

FSP-4 Plastic, PVC, thickwall (cast iron OD sized), DR 14 (200 PSI). UL listed for fire main service (underground). Gasketed self-retaining joints - Johns Manville Blue Brute AWWA C900, or equal.

FSP-5 Fire Sprinkler Pipe – 1” Thru 3” Copper meeting NFPA 13 Standards. Pipe may be grooved.

FSP-6 Flexible Fire Sprinkler Head Connectors – 1” pipe size flexible stainless steel fire sprinkler head connectors “Flex Head Industries” Models 2024, 2036, 2048, 2060 and 2072.

# ACCESSORIES AND APPURTENANCES

* + 1. Escutcheons: Polished chrome plated split-ring type for exposed piping at every penetration inside finished rooms.
		2. Guards: Provide sprinklers with guards as required in 7’- 6” ceilings and where required by the Architect.
		3. Miscellaneous: Provide all other accessories and appurtenances required for a complete system.

# FIRE HOSE VALVES

* + 1. Schedule Numbers:

SPV-1 Valve, Fire Hose, cast brass angle valve, UL listed and Factory Mutual approved; 1-1/2 inch size at 175 psi, female NPT outlet with 1-1/2 inch male NPT by 1-1/2 inch male NST adapter nipple.

|  |  |  |
| --- | --- | --- |
| POTTER-ROEMER | POWHATAN | UNITED |
| 4070 | 500 | UL/FM Listed |

SPV-2 Valve, Standpipe for 2-1/2 inches for 150 or higher psig working pressure, male NST outlet for fire department hose connection. Cast brass, replaceable composition disc, and rough chromium-plated body (unless provided inside UL listed valve cabinet) with hand wheel.

|  |  |  |
| --- | --- | --- |
| POWHATAN | UNITED | POTTER-ROEMER |
| DMWDGV-250FDXAV5-250F | UL/FM LISTED | 4065 |

# STANDPIPE VALVE CABINETS

* + 1. Schedule Numbers:

SPVC-1 Cabinet semi-recessed type center break door with lock.

|  |  |
| --- | --- |
| POTTER-ROEMER | GUARDIAN |
| 1810 Series, DVL or E |  |

SPVC-2 Surface mounted cabinet for masonry walls, same as SPVC-1.

# PART 3 - EXECUTION

* 1. **EXAMINATION**
		1. Examine areas and conditions under which Work of this section shall be performed. Correct conditions detrimental to proper and timely completion of Work. Do not proceed until unsatisfactory conditions have been corrected.

# PREPARATION

* + 1. Ream pipe and tube ends. Remove all burrs. Bevel or groove all plain end ferrous pipe ends.
		2. Remove scale and foreign matter, from inside and outside of pipes, before assembly.
		3. Provide piping connections to equipment with flanged or grooved connections.

# INSTALLATION

* + 1. Install underground supply line connected to detector check or water main indicated. Braced or clamped bends shall be in accordance with requirements of NFPA 24. Provide vertical clamp rods at flange and spigot piece of risers, long enough to pass through riser's base flange where required. Furnish concrete thrust blocks where required. Tracer wire shall be installed as per Section 23 05 53: Mechanical Identification on all PVC underground piping.
		2. Install FDCs, check valves, shut-off valves, gauges, inspectors test and drain assemblies and flow indicator as per Deferred Approval Drawings. F.D.C. must be installed so that it is unobstructed and accessible for the Fire Department’s first response unit.
		3. Pipe through floors, wall, and ceilings, at head locations, shall be furnished with required sleeves, and escutcheons and fire caulking where indicated and/or required by code. Escutcheons shall be polished chrome plated unless other finish is selected by the Architect.
		4. Sprinkler system shall be provided with complete drainage facilities in accordance with CBC standards. Drain discharge may discharge into a sewer, storm drain, sump pit or street gutter. Fire sprinkler drains shall not discharge onto a playground or across a sidewalk. Discharge to any plumbing fixture is prohibited due to the inability of a plumbing fixture to receive a full flow of water from a fire sprinkler drain valve under working pressure.
		5. Upon completion of the Work of this section, and before Substantial Completion, subject the entire system, including underground supply connections, to tests as required by NFPA 13, and CBC standards and furnish the Owner with a certificate of compliance as required.
		6. Close nipples are prohibited. Threaded unions are prohibited. Where a threaded union or coupling is needed, a groove type fitting (Victaulic or equal) shall be used instead. If a groove style coupling is used in a concealed area, an access panel allowing full access to that connection shall be provided.
		7. Fire sprinkler systems piping hangers, seismic bracing, anchors and supports shall conform to all NFPA 13, CBC and all other applicable codes and the requirements of this specification.
		8. 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 in the area from pipe end to groove. Gaskets shall be of an elastomer grade suitable for the intended service, and shall be molded and produced by the coupling manufacturer.
		9. Tee branch outlets on fire sprinkler mains shall be by the use of a threaded ductile iron tee fitting, a groove type tee fitting, (Victaulic or equal), or by the use of a thread-a-let welded on by a certified welder as required by NFPA. Mechanical tee bolted branch outlet fittings are prohibited except for branch outlet sizes 2 inches and smaller.
		10. Sprinkler lines within the building shall be concealed within the structure. Risers shall be installed in utility, supply rooms or similar service areas whenever possible, and shall not obstruct access, or maintenance of other equipment within the space. Mains and risers shall be located within the area protected by the sprinkler system unless otherwise approved by fire authorities having jurisdiction.
		11. Sprinklers that have been dropped, damaged, have cracked bulbs, or show a visible loss of fluid shall not be installed.
		12. Sprinkler bulb protectors shall be removed by hand after sprinkler installation. Tools or any other device to remove the protector that could damage the bulb in any way shall not be used.
		13. Routing of piping in non-concealed exposed areas shall be subject to the Architect’s approval in the final shop drawings.
		14. Underground piping shall have a minimum of 36 inches of cover to grade. Underground pipe shall be installed on a flat undisturbed sand bed. After required pressure-leak test, pipe shall be covered with sand not less than 6 inches thick, before backfilling. Comply with all NFPA Standards.
		15. Provide approved backflow prevention assemblies as required. Installations of backflow prevention assemblies shall be tested and certified by backflow prevention device tester prior to Substantial Completion. Tests shall be performed in the presence of the PI. Test reports shall be turned over to the PI for mailing to proper agency.
		16. Provide shunt trip when sprinklers are installed in the elevator machine rooms and elevator hoist way unless the sprinklers are located 2 feet or less from the hoist way pit floor.
		17. Inspectors test valve (ITV) shall be located at the opposite end of the sprinkler system from the supply. Test-and-drain type combination valves are prohibited. ITV discharge and main drain lines shall be piped to a sump pit or to the outside of the building to within a foot from the ground where it will drain away from the building to an exterior storm drain.
		18. Each building with a sprinkler riser shall be furnished with an accessible shut off riser valve installed no higher than five feet from the finish floor. Each floor shall have a separate shut off valve with flow switch, and shall be securely enclosed or secured with a chain and break-a-way lock. Also see section 2.01- C-12 of this specification.

# PROTECTION

* + 1. Protect the Work of this section until Substantial Completion.

# CLEANUP

* + 1. Remove rubbish, debris, and waste materials and legally dispose at off-project site.

# END OF SECTION