This master should be used by designers working on Port of Portland construction projects and by designers working for PDX tenants (“Tenants”). Usage notes highlight a few specific editing choices, however the entire section should be evaluated and edited to fit specific project needs.

SECTION 210719 - FIRE SUPPRESSION SYSTEMS INSULATION

1. GENERAL
	* + 1. DESCRIPTION
				1. This section describes insulation for fire suppression piping and equipment.
			2. RELATED WORK SPECIFIED ELSEWHERE
				1. Section 099100 Painting
				2. Section 210529, Hangers and Supports for Fire Suppression Piping and Equipment
			3. REFERENCES
				1. IBC: International Building Code

IBC Chapter 13: Energy Efficiency

* + - * 1. UL: Underwriters Laboratories

UL 723: Standard for Test for Surface Burning Characteristics of Building Materials

* + - 1. SUBMITTALS
				1. Product Data: Submit product data for each type of insulation, including density, conductivity, thickness, jacket, vapor barrier and flame spread and smoke developed indexes.
				2. Shop Drawings: Submit shop drawings detailing installation of insulation for the following:

Removable covers for pump casings, accesses, etc.

Expansion joints.

Acoustical insulation including construction and installation of stainless steel jacket.

* + - 1. QUALITY ASSURANCE
				1. Regulatory Requirements:

Flame and Smoke Ratings: Installed composite flame spread not to exceed 25 and smoke developed not to exceed 50 as tested by UL 723.

Energy Codes: IBC Chapter 13 shall govern where requirements for thickness exceeds thickness specified.

* + - * 1. Protection: Protect against dirt, water, chemical or mechanical damage before, during, and after installation. Repair or replace damaged insulation at no additional cost to the Port.
				2. Source Quality Control:

Service: Use insulation specifically manufactured for service specified.

Labeling: Insulation labeled or stamped with brand name and number.

Insulation and accessories shall not provide any nutritional or bodily use to fungi, bacteria, insects, rats, mice or other vermin, shall not react corrosively with equipment, piping or ductwork and shall be asbestos free.

1. PRODUCTS
	* + 1. GENERAL
				1. All insulation shall be of one manufacturer.
			2. PIPE INSULATION
				1. Fiberglass: Split sectional or snap-on type with 3.5 pcf density 0.23 per inch maximum thermal conductivity (K-factor) at 75ºF mean temperature, 500ºF minimum service rating and white, vapor barrier jacket with pressure sensitive closure system. Owens Corning Fiberglas Pipe Insulation SSL II, or equal.
			3. ACCESSORIES
				1. Adhesives:

Fiberglass: Johns Manville Zeston, Z-Glu, or equal.

Calcium Silicate: Foster 30-36 or equal.

Elastomeric: Armstrong 520 or equal.

Duct Insulation, Internal: Foster 85-20 or equal.

* + - * 1. Weld Pins: Duro-Dyne, with NC-1 nylon stop clips, or equal.
				2. Cements:

Insulating: Ryder Insulation Inc, or equal.

Heat Transfer: Johns Manville Zeston Z-20, or equal.

* + - * 1. Wire Mesh: 1-inch mesh with 20-gauge annealed steel wire.
				2. Pipe Fitting Covers: One-piece PVC insulated pipe fitting covers. Johns Manville Zeston, Ceel-Co, or equal.
				3. Grooved Coupling Insulation: One-piece PVC insulated fitting cover. Johns Manville Zeston, Ceel-Co, or equal.
				4. Insulation Protection Saddles: 12-inch long, 16-gauge steel:

On non-vapor barriered black steel pipe: Anvil 160 through 166, or equal.

All other piping: Anvil 167, galvanized, or equal.

* + - * 1. Mastic:

Vapor Barrier: Design Polymerics 3040, or equal.

Outdoor Mastic: Design Polymerics 3040, or equal.

* + - * 1. Metal Pipe Jacket: 0.016-inch thick aluminum jacket with form-fitting covers, aluminum snap straps and sealant.
				2. Cloth Facing: Presized fiberglass cloth.
				3. Tapes: Pressure sensitive, weather resistant and for temperatures up to 150ºF. Zeston Z-tape, or equal.

Delete or edit cross reference below, as applicable.

* + - * 1. Paint: Ultraviolet resistant latex paint with special adherence capabilities to the PVC fitting covers, elastomeric, aluminum facing, Kraft paper, tapes, and adhesives.
1. EXECUTION
	* + 1. GENERAL
				1. Applicators: Applicators shall be employed by a firm that specializes in insulation work.
				2. Preparation: Surfaces of piping, equipment, and ductwork shall be clean, free of oil or dirt, and dry before insulation is applied.
				3. Stamps: Do not cover ASME stamps, UL labels, and similar stamps and labels.
			2. PIPE AND EQUIPMENT INSULATION APPLIED LOCATIONS
				1. Insulate the following piping systems with glass fiber insulation, all purpose jacket in thickness listed and cover with metal pipe jacket:

Fire sprinkler/fire protection (where shown on the drawings) 1-inch thick over heat trace cable.

* + - * 1. Valves and irregular fittings shall be insulated with section of pipe insulation and insulating cement, securely fastened, and finished with 6 oz. canvas and Foster 30-36, or equal, lagging adhesive. The Contractor shall have the option on all flanges, valves, and strainers not requiring a vapor barrier to insulate with removable replaceable pads fabricated of 1-inch layer of Pittsburgh Corning Temp Mat, or equal, sandwiched between inner and outer layer of 8 ounce glass cloth, held together with stainless staples with sufficient stainless lacing hooks to hold pad firmly to flange or valve with minimum 3-inch overlap onto adjacent pipe insulation using 18-gauge stainless steel lacing wire.
				2. Flexible Connectors: Pipe insulation of same material and thickness as adjacent piping.
			1. PIPING INSTALLATION
				1. General:

Joints: Coat both sides of complete joining area with applicable adhesive.

Longitudinal Joints: Make joints on top or back of pipe to minimize visibility. Except for foam plastic, seal with closure system or 3-inch-wide tape.

Butt Joints: Butt tightly together and, except for foam plastic, seal with 3-inch-wide tape or butt straps.

Multiple Layered Insulation: Joints shall be staggered.

Access: Strainer and other items requiring service or maintenance with easily removable and replaceable section of insulation to provide access.

Voids: Fill all voids, chipped corners, and other openings with insulating cement or material compatible with insulating material. In insulation with vapor barrier, coat with vapor barrier mastic.

Heat Tracing: Where piping is shown or specified to be heat traced, bed heat tape into heat transfer cement with insulation over heat tape and cement. FG or FP not allowed.

Seal joints, seams, and fittings of metal watertight jackets at exterior locations.

* + - * 1. Fiberglass Insulation: Exterior insulation encased in metal jacket.
				2. Fittings: Fittings covered with insulation to the same level of the adjoining insulation or fill with insulating cement. Finish with pipe fitting covers or cloth facing and tape.
				3. Unions, Flanges, Mechanical Joints, Valves, Etc:

General:

As specified for fittings.

Minimum thickness same as specified for piping.

Unions: Build up insulation at least 1/2 inch beyond adjoining insulation.

Flanges: With square corners. Where flanges are not insulated, terminate adjacent insulation so flange bolts can be removed.

Flanged Valves: Insulation with square corners.

* + - * 1. Non-Vapor Barriered Insulation:

Delete or edit cross reference below, as applicable.

Piping not requiring a vapor barrier shall be supported as specified above except at piping requiring roller hangers. Provide saddle as specified in Section 210529.

On piping 1-1/2-inch and smaller, insulation may pass through hanger. Provide shield or rigid insulation at hanger.

Tack weld saddles on black steel pipe to pipe. Fill void between saddle and pipe with insulation.

* + - 1. EQUIPMENT INSTALLATION
				1. General: Install true and smooth. Insulation over curved surfaces shall conform to curves of surface.

Access: Access, etc., that requires service, inspection, or maintenance shall be provided with covers or sections that are easily removable and replaceable. Reinforce openings in adjacent insulation with metal beading. In vapor barriered insulation, coat joints with vapor barrier mastic.

Voids, Depressions, and Cavities: Fill all voids, chipped corners, and other openings with insulating cement or material compatible with insulating material.

Non-Vapor Barriered Insulation:

Tears, etc. shall be patched with insulation facing or tape.

Cover all raw edges and bevel neatly to the equipment surface.

Multi-layered Insulation: Joints shall be staggered.

* + - 1. FIELD QUALITY CONTROL
				1. Field Test: All systems shall be tested and approved prior to installation of insulation.
				2. Existing Insulation:

Repair existing insulation damaged during construction.

Make neat connections where new and existing insulation meet.

Where existing piping or equipment is removed, cover existing surfaces neatly to match existing.

END OF SECTION 210719