DIVISION 15A – PLUMBING

SECTION 15011A – PLUMBING GENERAL PROVISIONS

PART 1 – GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. This Section contains General Provisions related specifically to the Plumbing Work.

1. Quality Assurance
2. Protection
3. Coordination and Sequencing
4. General Completion
5. Painting and Finishing
6. Excavation for Plumbing Work
7. Concrete for Plumbing Work

B. Drawings and General Provisions of Contract, including General and Supplementary Conditions, apply to this section.

1.02 GENERAL

A. This Contractor, as well as sub-contractors for his work, must carefully read the "Instructions to Bidders" and study the plans and specifications.

1. It is the intention of these specifications to provide for the furnishing and installing of the plumbing equipment complete as shown and specified. Any work or changes which may be evidently necessary to complete the installation shall be furnished by the Contractor as being included in this Contract.

2. During the course of the work, should any ambiguities or discrepancies be found in the specifications to which the Contractor has failed to call attention to before submission of his bid, then the Engineer shall interpret the intent of the specifications, and the Contractor hereby agrees to abide by the Engineer's interpretation and agrees to carry out the work in accordance with the decision of the Engineer. It is expressly stipulated that neither the instructions nor the specifications shall take precedence, one over the other, and it is further stipulated that the Engineer may interpret or construe the specifications of the work, and of that question the Engineer shall be the sole judge.

3. Where no specified kind of quality of material is given, a first class standard article as approved by the Engineer shall be furnished. The specifications do not undertake to illustrate or set forth every item necessary for the work.

4. Small details not usually shown or specified but necessary for its proper installation and finishing shall be included in the Contractor's estimate, the same as if hereby specified or shown.

1.03 QUALITY ASSURANCE

A. Laws, Permits, Inspections.

1. Comply with the latest revisions of New York State Uniform Fire Protection and Construction Code, International Plumbing Code, any Local Codes or Regulations that apply.
2. Underwriters Laboratories label required for all electrical materials carrying 50 volts or more.
3. Comply with New York State Energy Conservation Construction Code, as referenced in NYCRR.
4. Comply with N.Y. State Education Department Manual of Planning Standards.
5. Comply to requirements of drawings and specifications that are in excess of governing codes.
6. Comply with section 1621 of the New York State Building Code for seismic requirements.
7. Do not install work as specified or shown if in conflict with governing code. Notify Engineer and request direction.
8. Pay all Inspection and Permit fees.
9. Provide Certificate of Inspection from all governing authorities.

B. Reference to technical society, organization, body or section made in accordance with the following abbreviations:

1. AGA – American Gas Association
2. AIA – American Institute of Architects
3. AMCA – American Moving and Conditioning Association, Inc.
4. ANSI – American National Standards Institute.
5. ASHRAE – American Society of Heating, Refrigeration and Air Conditioning Engineers
6. ASME – American Society of Mechanical Engineers
7. ASTM – American Society of Testing Materials
8. AWSC – American Welding Society Code
9. AWWA – American Water Works Association
10. CS – Commercial Standard
11. FS – Federal Specification
12. IEEE – Institute of Electric and Electronics Engineers
13. NEC – National Electric Code
14. NEMA – National Electrical Manufacturer's Association
15. NFPA – National Fire Protection Association
16. NYBFU – New York Board of Fire Underwriters
17. NYCRR – Codes, Rule and Regulations of the State of New York.
18. NSF – National Sanitation Foundation
19. PDI – Plumbing and Drainage Institute.

20. SMACNA – Sheet Metal and Air Conditioning Contractors National Association
21. USASI – United States of America Standards
22. UL – Underwriters' Laboratories, Inc.

C. Contractor submission of equivalent or substitute items other than those specified is at Contractor convenience only. If a substitution or equivalent is accepted, the Contractor shall coordinate the installation of the substitute or equivalent and make all associated changes required. The Contractor also waives any claim for additional costs associated with the substitute / equivalent which becomes apparent before, during or after installation. The Contractor agrees to bear any and all additional costs to all other contractors or subcontractors which are caused by the incorporation of the substitution / equivalent.

1.04 PROTECTION

A. Protect equipment from damage, including water, chemical, mechanical injury and theft.

B. Replace damaged equipment or components.

C. Close and waterproof between sleeves, openings, pipes and voids in walls, floors and foundations to prevent entrance of water or moisture.

D. Holes made in firewalls, partitions, fire stops, shall be patched to maintain fire rating integrity.

E. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris and moisture.

F. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.

G. Protect flanges, fittings, and piping specialties from moisture and dirt.

H. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.05 COORDINATION AND SEQUENCING

A. Coordinate plumbing equipment installation with other building components.

B. Arrange for chases, slots and openings in building structure during progress of construction, to allow for plumbing installations.

C. Coordinate the installation of required supporting devices set sleeves in poured-in-place concrete and other structural components, as they are constructed.

D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.

E. Coordinate connection of plumbing systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

F. Coordinate requirements for access panels and doors where mechanical items requiring access are concealed behind finished surfaces. Access panels and doors are specified in Section 15052A"Access to Plumbing Work."

G. Coordinate installation of identifying devices after completion of covering and painting, where devices are applied to surfaces. Install identifying devices prior to installation of acoustical ceilings and similar concealment.

H. Coordination with other trades: Right-of-Way as follows:

1. Light Fixtures.
2. Fire Suppression.
3. Steam and condensate piping.
4. Hot water supply and hot water return piping.
5. Drain Pipes and Vents
6. Ductwork
7. HVAC Piping
8. Domestic Water Piping
9. Electrical Conduit

1.06 GENERAL COMPLETION

A. Oiling Equipment.

1. Lubricate equipment and motors in accordance with manufacturer's requirements. Provide lubrication chart in frame mount where directed by Owner.

B. Instructions to Owner's Representative.

1. Give notice to Engineer when all systems are installed and operating.

2. Obtain name of Owner's Representative to receive instructions.

3. Schedule instructions of Owner's Representative by manufacturer's representative and instruct Owner in system

installation and operation for all equipment installed under this contract.

C. Provide Operation and Maintenance manuals in accordance with the Requirements of Division 1 "Contract Closeout" Section.

1.07 PAINTING AND FINISHING

A. Refer to Division 9, Section "Painting" for field painting Requirements.

B. Damage and Touch-up: Repair marred and damaged factory painted finishes with materials and procedures to match original factory finish.

1.08 CUTTING AND PATCHING – SEE SPECIFICATION SECTION 15060A

1.09 EXCAVATION FOR PLUMBING WORK

A. Description of Work: Types of excavation for plumbing related work specified in this section include:

1. Underground plumbing utilities and services.
2. Underground tanks and equipment enclosures.
3. Interior and Exterior water distribution systems to 5 feet outside of the building or where indicated on the plans.
4. Interior and Exterior sanitary and storm drainage systems to 5 feet outside of the building or where indicated on the plans.

B. Project Conditions.

1. Locate and protect existing utilities and other underground work in manner which will ensure that no damage or service interruption will result from excavating and backfilling. Liabilities arising out of performance of work is responsibility of Contractor doing excavation.

2. Protect persons from injury at excavations by barricades, warnings, and illumination.

3. Provide temporary covering or enclosure and temporary heat as necessary to protect bottoms of excavations from freezing and frost action. Do not install plumbing work on frozen excavation bases or sub bases.

1.10 CONCRETE FOR PLUMBING WORK

A. Types of concrete for plumbing related work specified in this section include:

1. Lean concrete backfill to support plumbing work.

2. Encasement of mechanical work.
3. Plumbing equipment foundations and housekeeping pads.
4. Inertia bases for isolation of plumbing work.
5. Rough grouting in and around plumbing work.
6. Patching concrete cuts to accommodate plumbing work.
7. Thrust block.

1.11 REBATES

A. The Division 15A Contractor shall assist the Owner in applying for any available rebates from manufacturer's, utility companies, etc. on equipment or materials installed under the contract. Provide all required documentation and assist in the completion of applications as required to complete the rebate process. All proceeds from rebates remain the property of the Owner.

PART 2 – PRODUCTS

2.01 BACKFILL MATERIALS

A. Sub base Material (Bedding): Graded mixture of gravel, sand crushed stone or crushed slag.

B. Backfill Material: Soil material free of large stones, shale, wood and similar material.

2.02 CONCRETE

A. Concrete installed by this division shall comply with Division 3 Specifications for Concrete.

PART 3 – EXECUTION

3.01 EXCAVATION - GENERAL

A. Do not excavate for plumbing work until work is ready to proceed without delay, so that total time lapse from excavation to completion of backfilling will be minimum.

B. Excavate with vertical sided excavations to greatest extent possible, except where otherwise indicated. Where necessary, provide sheeting and cross bracing to sustain sides of excavation. Remove sheeting and cross bracing during backfilling wherever such removal would not endanger work or other property. Where not removed, cut sheeting off at sufficient distance below finished grade to not interfere with other work.

C. Width: Excavate for piping with 6" to 9" clearance on both sides of pipe, except where otherwise shown or required for proper installation of pipe joints, fittings, valves and other work. Excavate for other mechanical work to provide minimum practical but adequate working clearance.

C. Depth for direct support: For work to be supported directly on undisturbed soil, do not excavate beyond indicated depths, and hand excavate bottom cut to accurate elevations, undercut at pipe hubs.

D. Depth for sub base support: For large piping (6” pipe size and larger), tanks, and where indicated for other plumbing work, excavate for installation of sub base material in depth indicated or, if not otherwise indicated, 6” below bottom of work to be supported.

E. Depth for unsatisfactory soil or rock conditions: Where directed, (because of unsatisfactory conditions at bottom of indicated excavation), excavate additional depth as directed to reach satisfactory conditions. Backfill with sub base material compacted as directed, to indicate excavation depth.

F. Store excavated material (temporarily) near excavation, in manner, which will not interfere with or damage excavation or other work. Do not store under trees (within drip line).

1. Dispose of excavated material, which is either in excess of quantity needed for backfilling, or does not comply with requirements for backfill material.
   a. Remove unused material from project site, and dispose of it in lawful manner.

3.02 WATER CONTROL

A. Maintain dry excavations for plumbing work, by removing water. Protect excavations from inflow of surface water. Pump minor inflow of ground water from excavations, protect excavations from major inflow of ground water, by installing temporary sheeting and waterproofing. Provide adequate barriers which will protect other excavations and below grade property from being damage by water, sediment or erosion from or through plumbing work excavations.

3.03 BACKFILLING

A. Do not backfill until installed plumbing work has been tested and accepted.

B. Install drainage fill where indicated, and tamp to uniform firm density.

C. Backfill with finely graded sub base material to 6” above wrapped, coated and plastic piping and tanks, or as shown on drawngsand to centerline of other tanks.

D. Condition backfill material by either drying or adding water uniformly, to whatever extent may be necessary to facilitate compaction to required densities. Do not backfill with frozen soil materials.

E. Backfill simultaneously on opposite side of plumbing work, and compact simultaneously, do not dislocate work from installed positions.

F. Backfill excavations in 8" high courses of backfill material uniformly compacted to the following densities (% of maximum density, ASTM D1557), using power-driven hand operated compaction equipment.

1. Lawn and landscaped areas: 85% for cohesive soils, 90% for cohesion less soil.

2. Paved areas and roadways: 90% for cohesive soils, 95% for cohesion less soils.

G. Backfill to elevations matching adjacent grades, at time of backfilling excavations for mechanical work. Return surfaces to original condition.

H. After covering piping with 6" layer of approved fill backfill and compact excavations beneath:

1. New foundations.
2. Slabs on grade.
3. Areas to be paved by General Contractor.

3.04 CONCRETE BASES

A. Construct concrete equipment bases of minimum 4 inches higher or as shown on drawings, and not less than 4 inches larger in both directions than supported unit. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations.

3.05 CONCRETE GENERAL

A. Concrete installed by this division shall comply with Division 3 Specifications for Concrete.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15013A - CODES, STANDARDS, AND PERMITS

1.01 GENERAL

A. The entire installation shall be made in accordance with State rules and regulations and shall also conform with the standards of the National Board of Fire Underwriters for this installation and the local Board of Fire Underwriters having jurisdiction. The installation shall also comply with air pollution requirements of the State of New York and Industrial Code Rule 4 of the State of New York Department of Labor, Board of Standards and Appeals, dated March 31, 1965, and all other ordinances having jurisdiction.

B. The Contractor shall submit to all authorities having jurisdiction all required applications and shall secure all necessary permits, tests, and inspections required for final approval.

C. Certain standard and staple materials are described by reference to standard specifications. These standards are as follows:

AGA	American Gas Association
ASA-B9	Safety Code for Mechanical Refrigeration
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
CGA	Compressed Gas Association
AWWA	American Water Works Association
CS	Commercial Standard
FS	Federal Specification
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
PDI	Plumbing and Drainage Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
USASI	United States of America Standards Institute
UL	Underwriters' Laboratories
	New York State Uniformed Fire Prevention and Building Code
IPC	International Plumbing Code

D. All electric facilities shall receive the Underwriters label and be installed in accordance with the latest issue of the National Electric Code requirements.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15014A - SCHEDULE OF EQUIVALENCY

1.01 GENERAL

A. Wherever a brand name or manufacturer is named in this specification, it indicates the standard of quality or purpose desired. Where one certain kind, type, brand, or manufacturer of materials is named, it shall be regarded as the standard quality. Where two or more are named, these are presumed to be equal, and the Contractor may select one of those items; if the Contractor desires to use any other kind, type, brand, or manufacturer of material other than named in the specifications, he shall submit a list, with his bid, stating what material, equipment, or method is offered as equal and how it affects the contract price.

B. The equivalency of such items is to be judged by the Engineer whenever offered by bidders as equivalent to the Base Bid items and so reported to the Owner for his ultimate decision.

C. The following manufacturers are approved equivalents for those listed in the specifications:

1. Insulation:

   Johns-Mansville Corporation
   Owens-Corning Fiberglass Corporation
   Knauf
   Certainteed

2. Drains, Cleanouts, Flashing Sleeves, Wall Hydrants, Water Hammer Arrestors, Interceptors, and Fixture Supports

   Zurn Manufacturing Company
   Josam Manufacturing Company
   Jay R. Smith Company

3. Plumbing Fixtures

   Zurn
   American Standard
   Crane Company

4. Fixture Trim

   American Standard
   Chicago Faucet Company
   T & S Brass and Bronze Works

5. Flush Valves

   Zurn
   Sloan Valve Company
   American Standard

6. Toilet Seats

American Standard
Olsonite
C.F. Church Company

7. Access Doors

Karp Associates, Inc.
Zurn Manufacturing Company
Wilcox Steel Company

8. Valves

Jenkins Brothers
Lukenheimer Company
Walworth Company

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15015A - MAINTENANCE INSTRUCTIONS

PART 1 - GENERAL

1.01 GENERAL

A. In addition to the requirements outlined in the "General Provisions", the following information shall be incorporated:

1. Manufacturer's plumbing equipment parts list of all functional components including control diagrams and wiring diagrams of controllers.

2. Step by step instructions for each system including preparation for starting, operation, and shutdown. Provide full maintenance manual describing procedures for each new piece of equipment. In addition, provide a video showing / describing step by step instructions for maintenance of each new piece of equipment.

3. Twelve-month maintenance schedule for each type of equipment.

4. Possible breakdowns and repairs for each type of equipment.

5. List of nearest local suppliers for all equipment.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15050A – PLUMBING BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. This Section includes the following basic plumbing materials and methods to complement other Division 15A Sections.

1. Submittals.
2. Pipe joining materials and installation instructions common to piping systems.
3. Piping specialties: Escutcheons, dielectric fittings, sleeves and seals.
4. Non-shrink grout for equipment installations.
5. Drip pans.
6. Pipe supports: Hangers, clamps, support spacing, building attachments, shields and saddles, flashing, miscellaneous materials, and anchors.
7. Field fabricated metal and wood equipment supports.
8. Firestopping.

B. Pipe and pipe fitting materials are specified in piping system sections.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. NSF 372 and ANSI 61

1.03 SUBMITTALS

A. General - Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for following piping specialties:

1. Mechanical sleeve seals.
2. Identification materials and devices.

C. Reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

1.04 STANDARDS FOR MATERIALS AND WORKMANSHIP

A. All materials and workmanship shall, at a minimum be in accordance with (in no order of precedence):

1. New York State Codes – latest edition as adopted by the Authority Having Jurisdiction, unless otherwise noted.

2. State and municipal Building Codes and related subcodes.

3. Occupational and Safety Act (OSHA) Requirements.

4. Rules and Regulations of the Authority Having Jurisdiction applicable to the work.

5. National Electrical Standards Association Standard for Good Workmanship in Electrical Construction (NECA-1)

6. Serving utility's rules and regulations for providing service.

7. Contract Drawings and Specifications.

8. Manufacturer recommended installation instructions, practices and procedures for the products being utilized or installed.

9. Where conflicts arise between the above, the more stringent requirement shall be adhered to.

PART 2 - PRODUCTS

2.01 PIPE AND PIPE FITTINGS

A. Refer to individual piping system specification Sections for pipe and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

C. All fittings NSF 372 ANSI 61.

2.02 PIPE JOINING MATERIALS

A. Refer to individual piping system specification Sections in Division 15A for special joining materials not listed below.

B. Pipe Flange Gasket Materials: Suitable for the chemical and thermal conditions of the piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness, except where thickness or specific material is indicated.

a. Full-Face Type: for flat-face, Class 125 cast-iron and cast-bronze flanges.
b. Narrow-Face Type: for raised-face, Class 250 cast-iron and steel flanges.

2. AWWA C110, rubber, flat face, 1/8-inch-thick, except where other thickness is indicated; and full-face or ring type, except where type is indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, except where

other material is indicated.

2.03 PIPING SPECIALTIES

A. Escutcheons: Manufactured wall, ceiling and floor plates; deep-pattern type, where required to conceal protruding fittings and sleeves.

1. Inside Diameter: Closely fit around pipe, tube and insulation of insulated piping.
2. Outside Diameter: Completely cover opening.
3. Cast Brass: One-piece, with set-screw.

    a. Finish: Rough brass.
    b. Finish: Polished chrome plate.

4. Cast Brass: Split casting, with concealed hinge and set-screw.

    a. Finish: Rough brass.
    b. Finish: Polished chrome plate.

5. Stamped Steel: One-piece, with set screw and chrome plated finish.
6. Stamped Steel: One-piece with spring clips and chrome plated finish.
7. Stamped Steel: Split plate with concealed hinge, set-screw, and chrome plated finish.
8. Stamped Steel: Split plate with concealed hinge, spring clips and chrome plated finish.
9. Cast-Iron Floor Plate: One-piece casting.

B. Dielectric Fittings: Assembly or fitting having insulating material isolating joined dissimilar metals, to prevent galvanic action and stop corrosion.

1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld neck end types and matching piping system materials.
2. Insulating Material: Suitable for system fluid, pressure and temperature.
3. Dielectric Unions: Factory-fabricated, union assembly, for 250 psig minimum working pressure at 180 deg F temperature.
4. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150 or 300 psig minimum pressure to suit system pressures.
5. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers and steel backing washers.

    a. Provide separate companion flanges and steel bolts and nuts for 150 or 300 psig minimum working pressure to suit system pressures.

6. Dielectric Couplings: Galvanized steel coupling, having inert and non-corrosive, thermoplastic lining, with threaded ends and 300 psig minimum working pressure at 225 deg F temperature.
7. Dielectric Nipples: Electroplated steel nipple, having inert and non-corrosive, thermoplastic lining, with combination of plain, threaded or grooved end types and 300 psig working pressure at 225 deg F temperature.

C. Mechanical Sleeve Seals: Modular, watertight, mechanical type. Components include interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve. Connecting bolts and pressure plates cause rubber sealing elements to expand when tightened.

D. Sleeves: The following materials are for wall, floor, slab and roof penetrations.

1. Steel Sheet-Metal: 24 gage or heavier, galvanized sheet metal, round tube closed with welded longitudinal joint.
2. Steel Pipe: ASTM A53, Type E, Grade A, Schedule 40, galvanized, plain ends.
3. Cast-Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, having plain ends and integral water stop, except where other features are specified.
4. Wall Penetration Systems: Wall sleeve assembly, consisting of housing, gaskets and pipe sleeve, with 1 mechanical-joint end conforming to AWWA C110 and 1 plain pipe-sleeve end.

    a. Penetrating Pipe Deflection: 5 percent without leakage.
    b. Housing: Ductile-iron casting having waterstop and anchor ring, with ductile-iron gland, steel studs and nuts, and rubber gasket conforming to AWWA C111 of housing and gasket size as required to fit penetrating pipe.
    c. Pipe Sleeve: AWWA C151, ductile-iron pipe.
    d. Housing-to-Sleeve Gasket: Rubber or neoprene, push-on type, of manufacturer's design.

5. Cast-Iron Sleeve Fittings: Commercially-made, sleeve having integral clamping flange, with clamping ring, bolts and nuts for membrane flashing.

    a. Underdeck Clamp: Clamping ring with set screws.

2.04 VALVES

A. Refer to individual piping system specifications section in Division 15A for special valves not listed below.

B. General

1. Valves shall be installed only in upright vertical or horizontal positions unless specifically otherwise required by the drawings.

2. All valves shall be installed in accessible locations to facilitate easy removal for repair or replacement. Where not possible provide access doors. Refer to 15052A.

3. All gate and globe valves shall be designed for repacking when wide open under pressure.

4. Domestic water system valves 3/4" and smaller and all balancing valves shall be globe type.

5. All valves of the same type shall be the products of a single manufacturer and shall comply with ANSI B31.1.

6. All valves for domestic water use shall be no lead type in accordance with NSF-372 ANSI 61.

C. GATE VALVES

1. Cold, hot, and hot water return, 2" and smaller: Ball type solder end connections. Jenkins, Nibco, or equal Type B. 3" and larger gate valve: Jenkins, Nibco, or equal Type 1, Class "A", Style 3.

D. GLOBE VALVES

1. 3" or smaller: Jenkins, Nibco, or equal. Over 3": Jenkins, Nibco, or equal, Type 1 with cast iron body and bronze trim.

E. CHECK VALVES

1. 3" and smaller: Jenkins, Nibco, or equal, Type IV, Class "A".

2.05 GROUT

A. Nonshrink, Nonmetallic Grout: ASTM C1107, Grade B.

1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000 psi, 28-day compressive strength.
3. Packaging: Premixed and factory-packaged.

2.06 DRIP PANS

A. Provide drip pans fabricated from corrosion resistant sheet metal with watertight joints, and with edges turned up 2-1/2 inches. Reinforce top, either by structural angles or by folding over according to size. Provide hole, gasket, and flange at low point for watertight joint and 1-inch drain line connection.

2.07 HORIZONTAL PIPING HANGERS AND SUPPORTS

A. General: Except as otherwise indicated, provide factory fabricated horizontal piping hangers and supports. Hangers and supports shall be in complete conformance with Chapter 3 of the New York State Plumbing Code. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper plated hangers and supports for copper piping systems.

B. Adjustable steel clevises.

1. Material: Carbon steel, copper plated for copper piping.
2. Finish: Black or copper plated.
3. Adjustment: Hanger to be adjustable for vertical height of pipe without removing the pipe.

2.08 VERTICAL PIPING CLAMPS

A. Two bolt riser clamp.

1. Material: Carbon steel copper plated for copper piping.
2. Finish: Black or copper plated.

2.09 HANGER ROD AND SPACING

ROD SIZE AND SPACING SCHEDULE

Pipe Size	Maximum Spacing		Rod Size
	Steel	Copper	
1/2 to 1	6 ft.	6 ft.	3/8"
1-1/4 to 1-1/2	6 ft.	6 ft.	3/8"
2	12 ft.	10 ft.	3/8"
2-1/2 - 3-1/2	12 ft.	10 ft.	1/2"
4 - 5	12 ft.	10 ft.	5/8"
6	12 ft.	10 ft.	3/4"
8 - 12	12 ft.		7/8"
14 - 16	12 ft.		1"

Note: Cast Iron - support at every hub or coupling 5 ft. maximum spacing.

2.10 BUILDING ATTACHMENTS

A. General: Except as otherwise indicated provide factory fabricated building attachments of one of the following types listed, selected by Installer to suit building substrate conditions. Select size of building attachments to suit hanger rods. Provide copper plated building attachments for copper piping systems.

B. On Structural Steel:

1. For pipes 2" and smaller: C clamps with lock nuts similar to Anvil figure 86.
2. For pipes 5" and larger: Use beam clamps similar to Anvil figure 228 or 292.

C. On New Masonry:

1. Use concrete inserts similar to Anvil figure 281.

D. On Existing Concrete:

1. Use expansion case similar to Anvil figure 117.

E. On Wood:

1. Use coach screw rods Anvil figure 142. Ceiling flanges Anvil figure 153, or fabricated angle clips. Use wood drive screws or lag bolts as fasteners.

2.11 SHIELDS AND SADDLES

A. General: For insulated piping.

B. Shields: 16-gauge galvanized metal.

C. Protection saddles:

1. Hardwood block
2. Steel saddle Anvil 160 series

2.12 FLASHING MATERIALS

A. General: Provide flashings for each penetration of plumbing systems through roofs or waterproof membranes.

B. Molded Pipe Flashing: Compatible with single ply membranes with which it is used and manufactured by membrane manufacturer.

C. Coated copper flashing: Provide cold-rolled sheet copper (ANSI/ASTM B 370), of proper temper for applications shown and required forming, coated on one side with not less than 0.06 lbs. per sq. ft. of antimony (ANSI/ASTM B 101, Type I, Class A), weighing 1.06 lbs. per sq. ft., except as otherwise indicated.

D. Bituminous coating: FS TT-C-494, or MIL-C-18480, or SSPC-Paint 12, cold applied solvent type bituminous mastic coating for application in dry film thickness of 15 mils per coat.

2.13 MISCELLANEOUS MATERIALS

A. Metal framing: Provide products complying with NEMA.

B. Steel plates, shapes and bars: Provide products complying with ANSI/ASTM A 36.

C. Heavy duty steel trapezes: Fabricate from steel shapes selected for loads required, weld steel in accordance with American Welding Society (AWS) standards.

D. Pipe guides: Provide factory fabricated guides, of cast semi-steel or heavy fabricated steel, consisting of a bolted two section outer cylinder and base with a two section guiding spider bolted tight to pipe. Size guide and spiders to clear pipe and insulation (if any), and cylinder. Provide guides of length recommended by manufacturer to allow indicated travel.

2.14 ANCHORS

A. Fabricate pipe anchors from 3 x 3 x 1/2" angle.

B. Use pipe protection saddles one size larger than piping.

PART 3 - EXECUTION

3.01 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General: Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 15A specify piping installation requirements unique to the piping system.

B. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing and other design considerations. Install piping as indicated, except where deviations to layout are approved on coordinate drawings.

C. Pitch piping at low points. Provide Manual Blowdown for maintenance.

D. Install piping at indicated slope.

E. Install components having pressure rating equal to or greater than system operating pressure.

F. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.

G. Install piping free of sags and bends.

H. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.

I. Install piping tight to slabs, beams, joists, columns, walls and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

J. Install piping to allow application of insulation plus 1-inch clearance around insulation.

K. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

L. Install fittings for changes in direction and branch connections.

M. Install couplings according to manufacturer's printed instructions.

N. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wallboard partitions and suspended ceilings according to the following:

1. Chrome-Plated Piping: Cast-brass, one-piece, with set-screw and polished chrome-plated finish. Use split-casting escutcheons where required, for existing piping.
2. Uninsulated Piping Wall Escutcheons: Cast-brass or stamped-steel, with set-screw.
3. Uninsulated Piping Floor Plates in Utility Areas: Cast-iron floor plates.
4. Insulated Piping: Cast-brass or stamped-steel, with concealed hinge, spring clips and chrome-plated finish.
5. Piping in Utility Areas: Cast-brass or stamped-steel with set-screw or spring clips.

O. Sleeves are not required for core drilled holes.

P. Permanent sleeves are not required for holes formed by PE plastic (removable) sleeves.

Q. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.

R. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, concrete floor and roof slabs and where indicated.

1. Cut sleeves to length for mounting flush with both surfaces.

    a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring where specified.

2. Build sleeves into new walls and slabs as work progresses.
3. Install large enough sleeves to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:

    a. CPVC Pipe Sleeves: For pipes smaller than 6 inches.
    b. Steel Pipe Sleeves: For pipes smaller than 6 inches.
    c. Steel Sheet-Metal Sleeves: For pipes 6 inches and

larger, penetrating gypsum-board partitions.

d. Cast-Iron Sleeve Fittings: For floors having membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.

e. Seal space outside of sleeve fittings with nonshrink, nonmetallic grout.

4. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants.

S. Above Grade, Exterior Wall, Pipe Penetrations: Seal penetrations using sleeve and mechanical sleeve seals. Size sleeve for 1 inch annular clear space between pipe and sleeve for installation of mechanical seals.

1. Install steel pipe for sleeves smaller than 6 inches.
2. Install cast-iron "wall pipes" for sleeves 6 inches and larger.
3. Assemble and install mechanical seals according to manufacturer's printed instructions.

T. Below Grade, Exterior Wall, Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.

U. Below Grade, Exterior Wall, Pipe Penetrations: Install ductile-iron wall penetration system sleeves according to manufacturer's printed installation instructions.

V. Verify final equipment locations for roughing-in.

W. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

X. Piping Joint Construction: Joint pipe and fittings as follows and as specifically required in individual piping system specification Sections.

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
3. Soldered Joints: Construct joints according to AWS "Soldering Manual", "The Soldering of Pipe and Tube".
4. Brazed Joints: Construct joints according to AWS "Brazing Manual", "Pipe and Tube".
5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:

a. Note the internal length of threads in fittings or valve ends and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
b. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).
c. Align threads at point of assembly.
d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
e. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

Y. Welded Joints: Construct joints according to AWS "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to "Quality Assurance" article.

Z. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

AA. Piping Connections: Except as otherwise indicated, make piping connections as specified below.

1. Install unions, in piping 2 inches and smaller, adjacent to each valve and at final connection to each piece of equipment having 2 inches or smaller threaded pipe connection.
2. Install flanges, in piping 2 1/2 inches and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
3. Dry Piping Systems (Gas, Compressed Air, and Vacuum): Install dielectric unions and flanges to connect piping materials or dissimilar metals.
4. Wet Piping Systems (Water): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.02 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to provide the maximum possible headroom, where mounting heights are not indicated.

B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect.

C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.

D. Install mechanical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.03 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit and place miscellaneous metal supports accurately in location, alignment and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS D1.1 "Structural Welding Code - Steel".

3.04 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.05 GROUTING

A. Install nonmetallic, nonshrink, grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's printed instructions.

B. Clean surfaces that will come into contact with grout.

C. Provide forms for placement of grout, as required.

D. Avoid air entrapment when placing grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases to provide a smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout according to manufacturer's printed instructions

3.06 DRIP PANS

A. Locate drip pans under piping passing over or within 3 feet

horizontally of electrical equipment, and elsewhere as indicated. Hang from structure with rods and building attachments, and weld rods to sides of drip pan. Brace to prevent sagging or swaying. Connect 1-inch drain line to drain connection and run to nearest plumbing drain or elsewhere as indicated. Provide Leak Detection Alarm Floodmaster RS097. Provide power to unit.

3.07 INSTALLATION OF BUILDING ATTACHMENTS

A. Install building attachments at required locations in concrete, in wood or on structural steel for proper piping support. Space attachments within maximum piping span length indicated. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed, fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through openings at top of inserts.

3.08 INSTALLATION OF HANGERS AND SUPPORTS

A. General: Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories. Install hangers and supports of same type and style for grouped piping runs.

C. Support fire water piping independently of other piping.

D. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated.

E. Provisions for movement:

1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
2. Load distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
3. Pipe slopes: Install hangers and supports to provide indicated pipe slopes.

F. Adjust hangers and supports and place grout as required under supports to bring piping to proper levels and elevations.

3.09 SHIELDS AND SADDLES FOR INSULATED PIPING

A. 4" and below use 16 gauge x 12 inch long shield with oversized hanger outside insulation.

B. 6" and above use hardwood protection saddle with 16 gauge x 18 inch long shield with oversized hanger outside insulation.

C. 6" and above use steel protection saddle. Fill void between shield and pipe with insulation. Cover with vapor barrier. Protect barrier with 16 gauge x 18 inch long shield with oversized hanger outside assembly.

3.10 INSTALLATION OF ANCHORS

A. Install anchors at proper locations to prevent stresses and to prevent transfer of loading and stresses to connected equipment.

B. Fabricate and install anchor by welding steel shapes, plates and bars to piping and to structure.

C. Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions, to limit movement of piping and forces to maximums recommended by manufacturer for each unit.

D. Anchor spacings: Where not otherwise indicated, install anchors at ends of principal pipe-runs, at intermediate points in pipe-runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

3.11 FLASHINGS

A. Manufacturer's recommendations: Except as otherwise shown or specified, comply with recommendations and instructions of manufacturer of sheet metal being installed.

B. Coat back side of metal flashings where in contact with concrete and other cementitious substrates, by painting surface in area of contact with heavy application of bituminous coating, or by other permanent separation as recommended by manufacturer of metal.

C. On vertical surfaces, lap flashings minimum of 3".

D. On sloping surfaces, for slopes of not less than 6" in 12", lap unsealed flashings minimum of 6".

E. For embedment of metal flashing flanges in roofing or composition flashing or stripping, extend flanges minimum of 6" for embedment.

3.12 FIRE STOPPING

A. Provide UL listed and tested firestopping material, silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics, and upon exposure to heat above 250 degrees F. shall expand to not less than five times its original volume to form a fireproof envelope UL rated for 2- and 3-hours protection, when applied in accordance with the manufacturer's recommendation.

B. See section 15511 for additional fire stopping requirements.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15052A - ACCESS TO PLUMBING WORK

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. Access doors in walls and ceilings.

1.02 SUBMITTALS

A. Product data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.

1.03 QUALITY ASSURANCE

A. Fire resistance ratings: Where fire resistance rating is required for construction penetrated by access units, provide UL listed and labeled units, except for units which are smaller than minimum requirements.

PART 2 - PRODUCTS

2.01 ACCESS DOORS

A. Where walls and ceilings must be penetrated for access to mechanical work, provide types of access doors indicated. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.

B. Construction: Except as otherwise indicated, fabricate wall/ceiling door units of welded steel construction with welds ground smooth, 16-gauge frames and 14-gauge flush panel doors, 175 degree swing with concealed spring hinges, flush screwdriver-operated cam locks, factory applied rust-inhibitive prime coat paint finish.

C. Available manufacturers

1. Milcor Div., Inryco Inc.
2. Smith (Jay R.) Mfg. Co.
3. Zurn Industries, Inc.

PART 3 - EXECUTION

3.01 GENERAL

A. Comply with manufacturer's instructions for installation of access doors.

B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.

C. Adjust hardware and panels after installation for proper operation.

D. Remove or replace panels or frames which are warped, bowed, or otherwise damaged.

E. Paint access doors to match surrounding surfaces.

F. In wet and damp locations provide stainless steel doors.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15057A – PLUMBING IDENTIFICATION SYSTEMS

1.01 GENERAL

A. Provide labels for all new pipes including hot water, hot water return, cold water, sanitary drain, storm drain, vent, gas and acid waste piping. Install identifying tags on all valves.

PART 2 – PRODUCTS

2.01 EQUIPMENT LABELS

A. Small: Labels shall be adhesive backed plastic tape with embossed letters in contrasting color. Tape shall be 3/8" wide.

B. Large: Labels shall be adhesive backed plastic tape with embossed letters in contrasting color.

C. Make: Seton Name Plate Corporation.

2.02 PIPING MARKERS

A. Pipe markers shall be snap-on type indicating pipe contents and direction of flow on a color coded background conforming to American National Standards Institute (ANSI) Standard A13.1. Pipe diameter less than 2" and smaller shall be snap-on type. Pipe diameter greater than 2" shall be stick-on type.

1. Hot water – green with white lettering.
2. Cold water – green with white lettering.
3. Sanitary Drain and Vent – green with white lettering.
4. Storm Drain – green with white lettering.
5. Gas – yellow with black lettering.
6. Acid Waste – black with orange lettering.

B. Make: Seton Name Plate Corporation – Setmark, or equal by Dover, Brady.

2.03 VALVE TAGS

A. Tags: Tags shall be 1 3/4" x 3 1/2" laminated with two 0.020" thick plastic sheets with matte finish and with a brass eyelet in the corner. Typed information shall include appropriate alphanumeric code (prefixed with the letter "P"), system designation, the fluid in the pipe, and size and function of the valve.

B. Make: Dover Enterprises, Syracuse, New York or approved equal by Seton Name Plate Company.

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish; including valve tags in finished mechanical spaces, install identification after completion of covering and painting.

3.02 EQUIPMENT

A. General: Install engraved plastic laminate sign or plastic equipment marker on or near each major item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device. Provide signs for the following general categories of equipment and operational devices:

1. Meters, gauges, thermometers and similar units.
2. Fuel-burning units including water heaters.
3. Pumps and similar motor-driven units.
4. Storage tanks and pressure vessels.
5. Strainers, filters, humidifiers, water treatment systems and similar equipment.

B. Lettering Size: Minimum 1/4" high lettering for name of unit where viewing distance is less than 2'-0", 1/2" high for distances up to 6'-0", and proporitionately larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 size of principal lettering.

C. Text of Signs: In addition to name of identified unit, provide lettering to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.03 PIPING

A. After piping has been painted or insulated, apply pipe labels as specified above.

B. Space labels on 15' centers in mechanical rooms, space at 25' centers elsewhere and at each side of partitions and interior walls. Also, at each branch and riser take off and adjacent to each valve (except at fixtures and equipment).

3.04 VALVES IDENTIFICATION

A. General: Provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience hose bibs, and shut-off valves at plumbing fixtures, and similar rough-in connections of end-use fixtures and units. List each tagged valve in valve schedule for each piping system.

B. Provide valve tag chart, framed and securely fastened to the wall, using anchors and fasteners, where directed by owner.

C. Submit list of valve tags, including wording, for approval **BEFORE** ordering.

3.05 ADDITIONAL INFORMATION

A. For additional information see Specification Section 15050A – Plumbing Basic Materials & Methods.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15060A - CUTTING AND PATCHING

PART 1 – GENERAL

1.01 GENERAL

A. Each Contractor shall be responsible for his cutting and patching. The Contractor shall also be responsible for all finish patching and painting.

B. Each Contractor shall replace and patch any surfaces of any structure disturbed by his operations and his work, even if such operations and work are outside the contract limit. Such replacement, repair, and patching shall be with similar material and shall restore surfaces as they exist, or better.

C. Cut and alter existing materials as required to perform the work. Limit cutting to the smallest amount necessary for proper installation of the work.

D. Where the removal of existing building components necessitates the addition of patching in new materials, such work shall be executed to insure the fire resistance rating of the system and visual continuity with adjacent surfaces, whether or not the remedial work is specifically detailed on the drawings.

E. Perform the removal work with such care as may be required to prevent damage to adjoining construction which is to remain.

F. Do not disturb any existing structure, piping, apparatus, or other construction which must remain unless expressly required by the contract. Where cutting or removals are required in existing construction, do the work in a manner that will safeguard and not endanger the structure and as approved by the Engineer.

G. If unforeseen obstructions are encountered, take all precautions necessary to prevent damage and obtain full instructions from the Engineer before proceeding with the work.

H. Remove from the site all debris and other materials resulting from the alterations and removals, subject to the General Requirements.

I. Fill all voids and patch existing construction and finishes damaged within area of alteration work unless otherwise indicated. Provide new materials to match existing corresponding items as closely as practicable.

J. Any pipe penetrations through fire rated areas shall be accomplished using Hilti fire barrier products in sheets, strips, or caulk using ASTM, UL, and FM standards.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15180A - PLUMBING INSULATION

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. Extent of plumbing insulation work required by this section is indicated on Drawings and by requirements of this section.

B. Work includes thermal insulation for the following:

1. Domestic cold water piping.
2. Domestic hot water and hot water circulating piping.
3. Domestic tempered water piping
4. Storm water drainage piping.
5. Roof drain bodies.

1.02 QUALITY ASSURANCE

A. Fire Hazard Classification: In accordance with ASTM E-84, NFPA 255 and UL 723, for insulation systems, including insulation, adhesives and coverings, not to exceed the following:

1. Flame spread 25.
2. Fuel contributed 50.
3. Smoke developed 50.

1.03 SUBMITTALS

A. Product Data: Submit manufacturers specification sheets, installation instructions, fire and smoke ratings. Submit schedule matching insulation type to mechanical systems and equipment.

1.04 INSULATION THICKNESS

A. Insulate domestic hot water supply, tempered water, and hot water recirculating piping with insulation thickness of fiberglass piping insulation as shown below, ASTM C 547 Class 1, with All Service Jacket.

B. Insulate domestic cold water Branches and Mains with insulation thickness as shown below of fiberglass piping insulation, ASTM C 547 Class 1.

C. Insulate storm water piping and roof drains with 1” insulation thickness of fiberglass insulation, ASTM C 547 Class 1.

D. Insulate condensate drain to HVAC units with 1” fiberglass insulation.

To Meet or Exceed Energy Conservation Construction Code of the State of New York

THICKNESS TABLE

	IPS 1-1/4" & Below	IPS 1-1/2" to 4"	IPS Above 4"
Hot Water	1"	1-1/2"	1-1/2"
Hot Water Ret.	1"	1-1/2"	N/A
Cold Water	1"	1"	1"
Storm	1"	1"	1"

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver insulation, coverings, cements, adhesives and coatings to site in containers with manufacturer's stamp or label affixed showing fire hazard indexes of products.

B. Protect insulation against dirt, water and chemical and mechanical damage. Do not install damaged or wet installation, remove from project site.

PART 2 - PRODUCTS

2.01 DOMESTIC COLD WATER, HOT WATER, TEMPERED, AND HOT WATER CIRCULATING PIPING

A. Scope: Insulate all mains, branches, fittings, flanges and valves including those in ceiling spaces, pipe chases or spaces. Terminate insulation at the fixture supply stops. Insulate equipment connections to the equipment stop.

B. Type:

1. Pre-formed sectional type nominal 3# density glass fiber in standard 3' long sections tightly butted together. K factor (Thermal conductivity) of 0.23 at 75^0 mean. Make: Mansville, Owens-Corning, or Knauf.

C. Finish:

1. Main mechanical room piping and exposed risers and runouts in finished rooms: Factory-applied All Service Jacket with self-sealing laps.
2. Valves, fittings and flanges: Equal thickness of fiberglass insulation with Zeston fittings covers or equal by Ham-Fab, Mansville.

2.02 STORM WATER PIPING – ABOVE GROUND

A. Scope: Insulate all horizontal piping above ground including underside of roof drain bodies and all fittings.

B. Type: Pipe insulation shall be preformed sectional type nominal 3 pound density glass fiber in standard 3 foot long sections with a K factor of 0.23 at 75 mean and factory applied All Service

Jackets. Seal joints with 3" All Service Jacket.

C. Fittings & Drain Bodies: Insulate all fittings, hubs, flange and Drain bodies with fiberglass pre-moulded fitting insulation or with 1" resilient fiberglass blanket. (3/4) pcf density minimum) wrapped around the fitting or drain body, tied down with wire or jute. Compress blanket 50% in installation. Coat each fitting or drain body with two 1/8" coats of vapor barrier mastic reinforced with glass fabric extending 2" onto adjacent pipes.

2.03 METAL JACKETED PIPE INSULATION

A. Scope: Pipe exposed to weather or physical abuse shall be insulated with .016" aluminum jacket over fiberglass insulation of the specified thickness. Sections shall be made in 36" lengths.

B. Fire and smoke Hazard Classification shall not exceed flame spread index of 25 or less and smoke developed index of 50 or less as tested by ASTM E-84, NFPA 255 or UL 723.

C. Manville Micro-Lok 650ML.

2.04 EQUIPMENT INSULATION MATERIALS

A. Rigid Fiberglass Equipment Insulation: ASTM C 612, Class 2.

B. Flexible Fiberglass Equipment Insulation: ASTM C 553, Type I, Class B-4.

C. Jacketing Material for Equipment Insulation: Provide pre-sized glass cloth jacketing material, not less than 7.8 ounces per square yard, or metal jacket at Installer's option, except as otherwise indicated.

D. Equipment Insulation Compounds: Provide adhesives, cements, sealers, mastics and protective finishes as recommended by insulation manufacturer for applications indicated.

E. Equipment Insulation Accessories: Provide staples, bands, wire, wire netting, tape, corner angles, anchors and stud pins as recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Apply insulation in accordance with the Schedule of Insulation on the Contract Specifications.

B. Use only insulation and finish materials including adhesives, cements, and mastics which conform to the requirements of all local codes and ordinances.

C. Fire resistant adhesive is highly flammable in liquid form. Eliminate welding, smoking, or other sources of ignition during application.

D. Apply insulation after all piping pressure tests, as described in Piping Installation Procedure, have been completed.

E. Clean surfaces of loose scale, dirt, oil, and other foreign matter and dry prior to insulating.

1. Detail for space @ blowdown
2. Detail for pipe @ insulation penetrating wall.

F. Apply insulation to completely cover piping surface. Do not insulate over weld certification stamps.

G. "Exposed" as used in this section means exposed to view. "Concealed" means concealed to view such as in furred chases or above suspended ceiling. Penthouse and equipment rooms are considered exposed locations.

H. Fill surface imperfections in the insulation such as chipped edges, small joints or cracks, and small voids or holes with appropriate insulation material and smooth with skim coat of hydraulic-setting insulating cement. Vapor barriers shall be continuous and unbroken at hanger installations.

I. Fit inside diameter of insulation sections or segments to outside curvature of pipe or previous insulation layer.

J. Where standard insulation shapes are not available, cut, score, or miter segments of appropriate block to fit contour of pipe. Stagger joints of adjoining segments. Fit insulation carefully and secure with No. 20 gage galvanized annealed steel wire. Finish with a smoothing coat of hydraulic-setting insulating cement.

K. Insulate valves, strainer, fittings, and flanges with identical material, density, thickness, and surface finish as the piping insulation. All edges shall be filled with filler and finished with a smoothing coat of hydraulic-setting insulating cement.

L. Insulate the entire surface of fittings and strainers. Insulate valves up to and including bonnets, unless authorized otherwise by Project Engineer. Do not cover removable valve bonnets.

M. Insulate strainers to permit removal of the basket without disturbing the insulation of the strainer body. Strainer covers shall be molded and taped to upper section of insulation.

N. Bevel the ends of pipe insulation adjacent to flanges to permit bolt removal. Provide a collar of sectional block insulation over the flanges and extend a minimum of 2 inches over the adjacent pipe insulation. Fasten with staples to permit easy removal. Prior to applying collar fill annular spaces with loose insulation.

O. Insulate all piping through sleeves.

P. Where pipelines pass through masonry walls or floors, completely fill the space between outside of pipe or insulation and the

inside of the sleeve or framed opening with fibrous mineral wool or fiberglass pipe insulation.

Q. When it is unavoidable and hangers for cold lines must be installed directly on the pipe, insulate and finish the entire hanger and the rod for a length of not less than 12 inches above the pipe.

R. Apply insulation to completely cover metal surfaces.

S. Cut, score, or miter insulation to fit shape and contour of equipment. Where surfaces are flat, cylindrical, or regularly curved, use premolded blocks or segments.

T. Where required, provide permanently fastened angles or plates to support insulation.

U. Apply insulation on cover plates, heads and access openings as separate sections, with insulation cut back for access to boltheads and other fasteners.

V. Do not insulate over nameplates. Cut back insulation and line the insulation edges with 24 gage galvanized steel.

W. Surface Finish.

1. Apply surface finish to present a tight, smooth appearance.
2. Do not apply sealant or cement until all previous applications of cement and adhesives have thoroughly dried.
3. Extend surface finish to protect all insulation surfaces. Prevent raw edges or ends of insulation from being exposed.

3.02 INSTALLATION OF PIPING INSULATION

A. Apply to pipes with side and end joints butted tightly per manufacturer's directions.

B. Where joints in insulation occur, and at hangers, take extra precautions to seal the vapor barrier with adhesive BF 95-44 so that no moisture penetration will occur. Notify Engineer when insulation is complete so he may make inspection before walls are closed in or ceilings applied.

C. Where fiberglass insulation is exposed in an occupied room, apply pre-sized glass cloth vapor barrier jacket in same manner using same type of adhesive (or use ASI/SSL).

D. Repair all breaks in the jacket with 4" wide strip of vapor barrier jackets (FRGC or SSL as required) applied smoothly and securely. When applying adhesive at temperature below 75^0F, use staples with an additional brush coat of adhesive over the exterior of the staples.

E. Adhere 4" wide strips of jacket material smoothly and securely over all end joints with vapor barrier adhesive as above to insure a continuous vapor barrier.

F. Apply insulation on all cold surfaces where vapor barrier jackets are used with a continuous, unbroken vapor seal. Insulate and vapor seal hangers, supports, anchors, etc., that are securely directed to cold surfaces to prevent condensation.

3.03 EQUIPMENT INSULATION

A. Cold Equipment (Below Ambient Temperature)

1. Application Requirements: Insulate the following cold equipment:

a. Domestic Hot water expansion tanks

2. Insulate each item of equipment specified above with fiberglass: 2" thick

B. Hot Equipment (Above Ambient Temperature)

1. Application Requirements: Insulate the following hot equipment.

a. Hot water storage tanks
b. Water heaters (not insulated by manufacturer)

2. Insulate each item of equipment specified above with fiberglass: 2" thick.

3.04 SUPPORT OF INSULATED PIPE LINES

A. Scope: Install inserts at each hanger or support for all water lines for sizes 1-1/2" and up, or 16 gauge electro-galvanized carbon steel shields may be used in lieu of inserts. Install supporting devices on insulated lines with hangers with insulation shields.

B. Inserts:

1. Inserts between the pipe and pipe hangers shall consist rigid pipe insulation of equal thickness to the adjoining fiberglass insulation and shall be provided with vapor barrier where required.
2. Insulation inserts shall not be less than the following lengths:

1-1/2" to 2-1/2" pipe size, use 6" length
3" to 6" pipe size, use 9" length

C. Supporting Devices: Use cork stoppers, short lengths of wood dowels or wood blocks of the same thickness as insulation. Curve the support device surfaces to match the curve of the metal shield. Metal shields are provided with the hanger.

3.05 ADHESIVES, MASTIC, AND COATINGS

A. Apply adhesives, mastic and coatings specified at the

manufacturer's recommended coverage per gallon.

3.06 EXPOSED RISERS AND RUNOUTS

A. Finish exposed risers and runouts in occupied rooms with ALL SERVICE JACKET.

B. Occupied areas mean all areas except ceiling spaces, crawl spaces and closed off pipe spaces or chases.

3.07 EXISTING INSULATION REPAIR

A. Repair damaged sections of existing mechanical insulation damaged during this construction period. Use insulation of the same thickness as existing insulation. Install new jacket lapping and seal over existing.

3.08 PROTECTION AND REPLACEMENT

A. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

B. Protection: Insulation installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.

C. Surface Finish: No surface finish required.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15411A – PLUMBING DOMESTIC WATER PIPING SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. Extent of domestic water piping systems work is indicated on drawings and schedules, and by requirements of this section.

B. Applications for domestic water piping systems include the following:

1. Domestic cold water piping.
2. Domestic hot water piping.
3. Domestic recirculating water piping.
4. Water hammer arresters.
5. Valves.
6. Pumps

C. All domestic water piping systems must comply with the "Lead-Free" Division 15A Specifications. The contractor shall provide the required submittals for all equipment that will be part of the system prior to the equipment installation, and confirm on the jobsite that the equipment adheres to "Lead-Free" regulations.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's data for domestic water piping systems, materials and products.

B. Submittals shall include but not be limited to the following:

1. Valves
2. Water hammer arresters
3. Piping
4. Pumps

1.03 QUALITY ASSURANCE

A. Plumbing Code: Comply with applicable portions of New York State Uniform Fire Protection and Building Code, Article 9, Plumbing Requirements, State sanitary code, Department of Health, Division Sanitary Engineering, Bureau of Public Water Supply, any local codes or regulations, and the International Plumbing Code and the International Energy Conservation Code.

B. All piping valves, hydrants, etc. shall comply with all ASME, ANSI, ASTM, AWWA and NFPA regulations that apply to the work.

C. Meters, backflow preventers, hydrants, etc. shall conform to local utility company regulations, ordinances and laws, and the International Plumbing Code (IPC).

D. Obtain all necessary approvals, certificates and arrange for all inspections required by local authorities having jurisdictions. Pay all fees.

E. Perform water sampling upon completion of all piping systems. Samples to be analyzed by a NYS Dept. of Health approved lab for bacteria as well as all other code required chemical / organic analyses. The plumbing contractor will bear all costs associated with the testing procedures / reports. Test reports shall be included as part of the project closeout documents.

PART 2 – PRODUCTS
(All to comply with the 2015 IPC)

2.01 DOMESTIC WATER PIPING

A. Underground Water

1. 3" or larger: Class 52 ductile iron pipe per AWWA C151, with C104 cement lining, and asphaltic coating inside and out. Fittings shall be cast or ductile iron per AWWA C110, with push-on joints with four serrated silicon bronze wedges at each joint for electrical continuity. Underground type plastic line marker: Provide standard permanent bright colored, continuous-printed plastic tape, intended for direct burial service, not less than 6"wide X 4 mils thick, with lettering "WATER SERVICE".

2. 2" and smaller: Type 'K' copper soldered or brazed.

B. Domestic hot water, cold water and tempered water.

1. Type "L" copper, ASTM B88.
2. Make: Anaconda, or equal by Muller, Revere.
3. Fittings shall be wrought or cast solder type pressure fittings.
4. Chrome plated sponge cleanable brass, sch. 40 for exposed piping.

2.02 BALL VALVES

A. Description: Bronze body, ball valve with 600 PSI W.O.G. min. rating, teflon seats, stainless ball, blow-out proof stem, viton-o-ring sealed union, removable operating handle and solder ends. Bronze materials to be "no lead" type, in conformance with the latest edition of NSF 61. ANSI372

2.03 INTERIOR HOSE BIBBS

A. 'No-Lead', Anti-siphon vacuum breaker wall faucet enclosed in a flush mounting wall box, ¾" male hose outlet, loose key opens box and faucet operator, chrome plated casting.
B. Make:
C. Josam or equivalent. Where indicated, install on cold water piping.

2.04 EXTERIOR WALL HYDRANTS

A. 'No lead', Automatic draining, freezeless wall hydrant with an anti-siphon vacuum breaker enclosed in a flush mounting wall box. Cast bronze, ¾" male hose outlet, non-freeze, "water" on cover, key handle, proper length galvanized wall sleeve, vacuum breaker, wall clamp, chrome finish.

B. Where indicated, install on cold water piping.

2.05 SWING CHECK VALVES

A. General: Construct pressure-containing parts as follows:

1. Bronze valves, 125 or 150 psi: ANSI/ASTM B 62. Bronze materials to be "no lead" type, in conformance with the latest edition of NSF 61. ANSI 372.

B. Construct valves with disk seating angle 40° to 45° unless composition disc is specified. Provide stop plug as renewable stop for disc hanger. Construct disc and hanger as separate parts, with disc free to rotate. Support hanger pins on both ends by removable side plugs.

C. Soldered ends 2" and smaller: Class 125, bronze body, screwed cap, horizontal swing, bronze disc.

D. Flanged ends 2 1/2" and larger: Class 125, iron body bronze mounted, bolted cap, horizontal swing, cast iron disc.

E. Manufacturers:

1. Jenkins Bros., A Corp.
2. Kennedy Valve.
3. Lunkenheimer.
4. Stockham Valves and Fittings, Inc.

2.06 SPECIAL VALVES

A. Balance valve:

1. Bronze/Brass Ball valve with pressure readout ports, calibarated nameplate and memory stop. Bronze materials to be "no lead" type, in conformance with the latest edition of NSF 61.
2. Make: Bell & Gossett model CB, Watts

B. Trap Primer Valve:

1. 'No lead', Automatic, large port openings, activates on 10 psig pressure drop at 30-250 psig. Water release is factory set. Chrome plated finish.

2.07 THERMOMETERS AND GAGES

A. Water Pressure Gages: 0-150 psi range, aluminum or brass 4-1/2" case, 1/4" NPT connection. Glass enclosed dial with ¼" ball valve. 1 percent accuracy, ANSI B40.1, Grade A.

B. Glass Thermometers

1. General: Die cast aluminum, baked epoxy enamel finish, glass front, 9" long, adjustable joint, locking device. 1 percent accuracy, shock mounted. Copper plated steel or brass stem. Alcohol based thermometers to be used.
2. Range:
   a. Hot water: 30 to 240°F, 2°F divisions.
   b. Cold water: 30 to 180°F, 2°F divisions.

3. Thermometer wells: No Lead, Brass or stainless steel, 2" extension for insulated piping. Cap nut with chain fastened to thermometer well.

2.08 PLUMBING INSULATION

A. General: Comply with Division 15A Section "15180A, Plumbing Insulation".

2.09 UNIONS

A. Description: "No lead" Cast Brass with Solder Ends. Working pressure: 200 PSI W.O.G.
B. Make: Nibco, or equal by Mueller, Revere.

2.10 SOLDER AND FLUX

A. Solder shall be in solid wire form of Type II 95-5 tin antimony solder conforming to ASTM B-32, Grade 5A. Flux shall be a zinc chloride or a mixture of zinc and ammonium chlorides. Solders containing lead shall not be used. 96.5 – 3.5 and 95-5 tin/silver solders may be used.

2.11 SHOCK ARRESTER

A. Construction:
1. Type 1: Stainless steel body with stainless steel bellows, an air or argon gas cushion and with or without hydraulic displacement fluid.
2. Type 2: "No lead" Hard drawn copper body, polypropylene piston with EPDM O ring seal and brass NPT threaded connection.
3. Contractor may use either Type 1 or Type 2.

B. Code Compliance: Shock absorbers shall comply with the following codes:

1. P.D.I. – WH201 latest issue.
2. ASSE 1010 latest issue.

C. Make:
1. Type 1: J.R.Smith 5000 Series.

2. Type 2: Watts LF15M2 -DR Series

PART 3 - EXECUTION

3.01 INSTALLATION OF DOMESTIC WATER PIPING MATERIALS AND PRODUCTS

A. General: Install the following in accordance with Division 15A Section "Basic Materials and Methods".

1. Identification.
2. Piping specialties.
3. Supports, anchors and seals.

3.02 INSTALLATION OF PIPE, TUBE AND FITTINGS

A. General: Install in accordance with Division 15A Section "Basic materials and Methods".
B. Install in accordance with recognized industry practices, which will achieve permanently leak proof piping systems. Install each run with minimum joints and couplings. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance. Comply with ANSI B31 Code for pressure piping.
C. Hose faucets at low points. Cap with hose caps.
D. Carry headers for groups of fixtures full size through their length.
E. Swing joints as follows:

1. From water mains to risers.
2. From riser to branch connections to fixtures.
3. From riser to mains.

3.03 INSTALLATION OF SHOCK ARRESTORS

A. General: Upright position, locations and sizes indicated in accordance with PDI Standard WH-201.

3.04 INSTALLATION OF STRAINERS

A. General: Install full size of pipeline, in accordance with manufacturers installation instructions. Install pipe nipple and shutoff valve in strainer blow down connection, full size of connection, except for strainers 2" and smaller installed ahead of control valves feeding individual terminals. Where indicated, provide drain line from shutoff valve to plumbing drain, full size of blow down connection.

1. Locate plate-type strainer in supply line ahead of the water meter.

3.05 INSTALLATION OF VALVES

A. General: Install where required for proper operation of piping and equipment, including all branch lines to isolate sections of piping. Locate to be accessible and separate support can be provided.
B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward for

horizontal plane unless unavoidable.

C. Insulation: Where insulation is indicated, install extended stem valves, arranged in proper manner to receive insulation.

D. Drain Valves: Each plumbing equipment item. Located to completely drain equipment for service or repair. Base of each riser, base of each rise or drop in piping system, at all low points, and where indicated or required to completely drain system. Provide hose caps on hose bibbs.

E. Check Valves: Horizontal position with hinge pin horizontally perpendicular to center line of pipe. Install for proper direction of flow.

3.06 INSTALLATION OF SPECIAL VALVES

A. Balance Valves: Each hot water recirculating loop, and where indicated.

B. Trap Primer Valves: Install in upright, vertical position in a convenient cold water line where indicated for floor drain primer supply.

3.07 INSTALLATION OF THERMOMETERS AND GAGES

A. General: Install in accordance with manufacturer's instructions.

B. Locations: Where indicated on Drawings.

3.08 INSTALLATION OF PLUMBING INSULATION

A. Install in accordance with Division 15A Section "Plumbing Insulation".

3.09 EQUIPMENT CONNECTIONS

A. Piping Runouts to Fixtures: Hot and cold water runouts of sizes indicated, no smaller than required by the Plumbing Code.

B. Mechanical Equipment Connections:

1. Connect hot and cold water piping system to plumbing equipment as indicated.
2. Comply with equipment manufacturer's installation instructions.
3. Provide shutoff valve and union for each connection.
4. Provide drain valve on drain connection.
5. Exposed piping shall be sch. 40 chrome plated brass, sponge cleanable surface.

3.10 WALL HYDRANT AND HOSE BIBB INSTALLATION

A. Wall hydrant: Install approximately 24” above finished grade or as noted on the plans. Install a stop and drain valve on each wall hydrant branch.

B. Hose Bibbs for toilet and finished rooms: In rooms where shown with lavatories, install approximately 18” above finished floor under lavatory where indicated. Elsewhere, install 36” above the finished floor where shown. Install stop on branch. Hose bibbs to be furnished with loose key handles.

3.11 WATER SYSTEM DISINFECTION

A. Scope: All newly installed lines carrying potable water and parts of existing systems which have been altered, extended or repaired prior to use.

B. Before any use of system is made for domestic purposes, disinfect by one of the following methods as specified in the New York State Uniform Fire Prevention and Building Code. All water samples are to be sent to / tested by a New York State Department of Health approved lab for bacteria analysis. All test results shall be sent to the engineer for review prior to placing the systems in service.

1. The system shall be filled with a water solution containing 50 parts per million of available chlorine and allowed to stand for 24 hours before flushing and returning to service.
2. The system shall be filled with a water solution containing 200 parts per million of available chlorine and allowed to stand one hour before flushing and returning to service.
3. For a potable water storage tank, where it is not practicable to disinfect by the foregoing methods, the entire interior of the tank shall be swabbed with a water solution containing 200 parts per million of available chlorine and allowed to stand for two hours before flushing and returning to service.

C. Contractor shall provide test kit for residual chlorine.

D. After contact period flush system with clear water until system tests no more than 0.2 PPM residual chlorine.

3.12 DOMESTIC WATER SYSTEM TEST

A. Test in accordance with the requirements of Section 15985A – "Plumbing, Testing, Adjusting and Balancing."

3.13 SPARE PARTS

A. Furnish to Owner, with receipt, one valve key for each key operated hydrant, bib, or faucet installed.

3.14 ADD LEAD TESTING NOTE

A. Following the completion of the P.C. work scope, the owner shall have the water conditions tested for lead containments by a third-party testing firm to regulation 67.4 of the Department of Health regulations as part of Section 1417 of the Federal Safe Water Act to determine "Lead-Free" compliance and SED guidelines of less then 15 parts per billion.

B. If the system does not comply with Sub-Part Regulation 67.4 of the DOH Section 1417 of the Federal Safe Water Act, the P.C. shall provide replacements at no additional cost, to then repeat the installation and testing requirements. The P.C. shall absorb the fee for the first lead testing procedure as well as the following confirmation procedures at no additional cost to the owner.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15412A – PLUMBING SANITARY PIPING SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of soil, waste and vent piping system work, is indicated on drawings and schedules, and by requirements of this section.
B. Applications for soil, waste and vent piping systems include the following:

1. Above ground soil, waste and vent piping within buildings including soil stacks, vent stacks, horizontal branches, traps, and connections to fixtures and drains.
2. Underground building drain piping including mains, branches, traps, connections to fixtures and drains, and connections to stacks, terminating at connection to sanitary sewer, 5’-0” from building wall, or where shown on drawing. Coordinate with site contractor.

C. Trenching and backfilling is required in conjunction with underground and building drain piping is specified in applicable Division 15A sections, and is included as work of this section.

1.03 QUALITY ASSURANCE

A. Plumbing code compliance - comply with applicable portions of New York State Uniform Fire Protection and Building Code, especially Article 9, Plumbing Requirements, State Sanitary Code, Department of Health, Division Sanitary Engineering, Bureau of Public Water Supply, any local codes or regulations that apply pertaining to plumbing materials, and the 2015 IPC especially Chapter 7.
B. ANSI compliance - comply with applicable American National Standards pertaining to products and installation of soil and waste piping systems.
C. PDI compliance - comply with applicable Plumbing and Drainage Institute Standards pertaining to products and installation of soil and waste piping systems.

1.04 SUBMITTALS

A. Product data - submit manufacturer's data for soil and waste piping systems materials and products on the following:

1. Pipe and Couplings
2. Clean outs
3. Floor drains

B. Acceptable Manufacturers

1. Floor Drains
   a. Jay R. Smith
   b. Josam
   c. Zurn
   d. Watts

2. Couplings for no-hub pipe
   a. Anaco
   b. Tyler

3. Soil Pipe
   a. Eastern Foundry
   b. Tyler Pipe
   c. Charlotte Pipe

PART 2 – PRODUCTS
(All to comply with the 2015 IPC)

2.01 SOIL AND WASTE PIPING MATERIALS AND PRODUCTS

A. General - provide piping materials and factory fabricated piping products of sizes, types, pressure ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections, provide fittings of materials which match pipe materials used in soil and waste piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.

2.02 BASIC IDENTIFICATION

A. General - provide identification complying with Specification Section 15057A, in accordance with the following listing:

1. Above ground soil, waste and vent piping - pipe markers.
2. Underground building drain piping - underground type plastic line markers.

2.03 PIPE

A. Below Ground:
   1. Service weight cast iron with push-on gaskets, hub and spigot. Compression Gaskets shall conform to the requirements of ASTM Standard C564-14 and CISPI310.

B. Above Ground:
   1. Service weight C.I. soil pipe and fittings with no-hub joints. Make: Tyler pipe or equal by Eastern Foundry Co. Anaheim Foundry Co.
   2. Copper drainage tubing, type DWV, shall not be used on site.
   3. Exposed: Sch. 40 chrome plated brass, threaded, sponge cleanable.

2.04 COUPLINGS FOR NO-HUB PIPE

A. Description: Type 304 stainless steel shield and 3/8” slot head 304 stainless steel screws. All other component metal parts shall be 304 stainless steel. The coupling sealing gasket shall be made of Neoprene as the sole elastomer. A cast iron coupling may be used.

Do not use under ground. Coupling shall meet or exceed CISPE Standard 310.

B. Make: Anaheim Co., Tyler Pipe.

2.05 BASIC PIPING SPECIALTIES

A. General - provide piping specialties complying with Division 15A Basic Materials and Methods section, in accordance with the following listing:

1. Pipe escutcheons.
2. Mechanical sleeve seals.
3. Pipe sleeves.

2.06 BASIC SUPPORTS AND ANCHORS

A. General - provide supports, anchors and seals complying with Division 15A Basic Materials and Methods section "Supports and Anchors".

2.07 CLEANOUTS

A. General

1. Units shall meet all design parameters shown on the drawings.
2. Units shall be complete with all design features and accessories necessary to provide a coordinated installation (such as carpet markers, tile recesses, etc.).
3. Units shall be of the following sizes:

   a. Line size for piping to 4”.
   b. 4” for piping from 5” to 8”.
   c. 6” for piping 10” and larger.

4. Location:

   a. At each bend of more than 45 degrees.
   b. At bottom of soil or waste stacks and rainwater leaders.
   c. At 50’ intervals or less on horizontal pipe lines 4” or smaller.
   d. At 50’intervals or less horizontal pipe lines 5” or larger.
   e. At exit of sanitary and storm drains from building.
   f. Wherever shown on the drawings.
   g. At the end of each branch line serving more than two fixtures.

5. Placement: must be located where they will be accessible. Check general construction drawings for location of lockers or other equipment which may prevent access.

B. Cleanout Types

1. Deck Plate Cleanout:

   a. Adjustable cast iron floor cleanout with inside caulk outlet, adjustable ABS housing, clamp device, internal tapered bronze cleanout plug, secured round scoriated nickel alloy cover plate. Jay R. Smith Figure 4020.

2. Wall Plate Cleanout:

a. Exposed installation: Cast iron 'T' branch cleanout tee with bronze tapered plug. Jay R. Smith Fig. 4510
b. Concealed installation behind plaster, dry or masonry walls: Provide cleanout tee with bronze plug tapped for center screw similar to exposed installation with polished vandalproof stainless steel access plate.

3. Cleanout:

a. Cast iron cleanout with straight body for caulking into soil pipe hub and fitted with bronze plug countersunk or raised head as required.

4. Exterior Cleanout:

a. Round coated cast iron access frame, heavy duty scoriated (vandalproof), secured cover. Coated cast iron cleanout ferrule with inside caulk connection and recessed tapered thread bronze plug.

2.08 FLOOR DRAINS

A. Drains and traps shall be same size as waste pipes. Provide clamping devices for drain flashing. Provide P-trap in outlet from each drain, or as shown on drawings.
B. Drain bodies to be cast iron.
C. Floor drains shall be by Jay R. Smith, Zurn, Watts or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION OF BASIC IDENTIFICATION

A. General - install plumbing identification in accordance with Specification Section 15057A.

3.02 INSTALLATION OF SOIL WASTE AND VENT PIPING

A. General - install soil and waste piping in accordance with Division 15A Basic Materials and Methods section "Pipe, Tube and Fittings" and with Plumbing Code having jurisdiction.

B. Solder joints use Type 1 solder.

C. Insulate vent piping within three feet of passage through roof.

3.03 INSTALLATION DRAINAGE PIPING - SANITARY

A. Changes in direction long sweep bends or 1/8 and/or 1/16 bends.

B. Connections of branches to mains with "Y" fittings and 1/8 and/or 1/16 bends.

C. All connections of horizontal into vertical piping with long turn sanitary "T-Y's".

D. Grade the "horizontal" piping 1/4" per foot, minimum for 2 1/2 ” or less, 1/8” per foot minimum for 3” and larger.

3.04 TURNS AND OFFSETS

A. Turns:

1. From vertical to horizontal:
   a. Less than 3”: Use long sweep or extra-long turn elbow.
   b. 3” and larger: Use short sweep or 90° short turn fittings.
   c. Horizontal piping: Use 45° wyes, long sweeps: 1/4, 1/6, 1/8 and 1/16 bends or any combination of same.
   d. For vents in any direction; Use quarter bends or 90° short turn fittings.

B. Offsets:

1. Make offsets at no less than 45° angle to the horizontal in the following cases:

   a. Offsets in stack vent portion of soil and waste stacks (above the highest fixture drainage connection).
   b. Offset in vent stacks.
   c. Grade the “horizontal” piping 1/4" per foot.
   d. Connect all plumbing fixtures into sanitary house drain. No case shall soil or waste pass through more than one trap before entering house drain.

3.05 INSTALLATION OF VENT PIPING

A. Provide vents shown and required by Plumbing Code.

B. Grade vents to discharge water of condensation.

C. Make offsets at 45 degree angle.

D. Connect upper ends of drainage lines to vent system or extend through roof without decreasing size.

E. Arrange vents and connections except wet vents, so not to carry drainage.

C. Connect bottom to drains so drainage will wash out rust and scale.

D. Extend vents above floor line to not less than 6" above flood rim of highest fixture before running horizontally.

E. Terminate vents 18 inches above roof line.

F. Increase pipes smaller than 3" to 3" from 18 inches below roof to terminus, using standard length tapered increasers.

3.06 INSTALLATION OF PIPING SPECIALTIES

A. Install piping specialties in accordance with Division 15A Basic Materials and Methods section.

3.07 INSTALLATION OF SUPPORTS AND ANCHORS

A. Install supports, anchors and seals in accordance with Division 15A Basic Materials and Methods section.

3.08 INSTALLATION OF DRAINAGE PIPING PRODUCTS

A. Cleanouts - install in sanitary above ground piping and sanitary building drain piping as indicated, as required by Plumbing Code, and at each change in direction of piping greater than 45 degrees, at minimum intervals of 50' for piping 4" and smaller and 50' for larger piping, and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping.
B. Flashing flanges - install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.

3.09 INSTALLATION OF FLOOR DRAINS

A. General - install floor drains in accordance with manufacturer's written instructions and in locations indicated.
B. Coordinate with soil and waste piping as necessary to interface floor drains with drainage piping systems.
C. Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.
D. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.
E. Position drains so that they are accessible and easy to maintain.

3.10 FLASHING

A. General

1. Flash openings with 6 lb. copper flashing.
2. Make watertight, allow for expansion and contraction.

B. Vent pipes

1. Extend not less than 12" from base of pipe.
2. Turn flashing over edge on cast iron; extend into same one (1) inch.
3. Ream coupling screw down over flashing at least one (1) inch screwed pipe.
4. Copper flashing assembly acceptable.

C. Waterproof pipes through waterproof walls or floors: See details on drawings.

3.11 EQUIPMENT CONNECTIONS

A. Piping runouts to fixtures - provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but in no case smaller than required by Plumbing Code. Traps and tailpieces shall be chrome plated brass. Waste stubs out of wall (exposed) shall be sch. 40 threaded chrome plated brass. All exposed surfaces shall be sponge cleanable.

3.12 INSPECTION AND TEST

A. New drainage piping shall be subjected to hydrostatic pressure test, see requirements in Section 15985, "Plumbing Testing, Adjusting and Balancing".

3.13 PROTECTION

A. Protect drains during remainder of construction period, to avoid clogging with construction materials and debris and to prevent damage from traffic and construction work.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15440A - PLUMBING FIXTURES AND TRIM

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. Extent of plumbing fixtures and trim work is indicated by drawings and by requirements of this section.

B. Types of plumbing fixtures required for the project including but not limited to, the following:

1. Water closets.
2. Urinals.
3. Lavatories.
4. Sinks.
5. Mop sinks.
6. Electric water coolers.
7. Specialty faucets.
8. Showers
9. Floor Drain
10. Hose Bibbs
11. Emergency Eye Wash/Showers
12. Drinking Fountains
13. Bathtubs
14. Shower Bases

C. Refer to Division 16 sections for electrical connections to following plumbing fixtures, not work of this section.

1. Electric water coolers.
2. Electronic flush valves and faucets.

1.02 SUBMITTALS

A. Product Data: Submit Product Data and installation instructions for each fixture, faucet, specialties, accessories, trim etc.

1. Clearly indicate rated capacities of selected models of water coolers.
2. Identify compliance with specified ANSI, UL, ASHRAE and New York State Standards, Codes and Listings and Lead Free Standards. (NSF)

B. Shop Drawings: Submit rough-in drawings. Detail dimensions, rough-in requirements, required clearances and methods of assembly of components and anchorages. Coordinate requirements with Architectural Woodwork shop drawings for fixtures installed in countertops and cabinets. Furnish templates for use in woodwork shop.

C. Wiring Diagrams: Submit manufacturer's electrical requirements and wiring diagrams for power supply to units. Clearly differentiate

between portions of wiring that are factory installed and field installed portions.

D. Color Charts: Submit manufacturer's standard color charts for fixture colors.

1.03 QUALITY ASSURANCE

A. Plumbing code compliance: Comply with applicable portions of New York State Uniform Fire Protection and Building Code, especially Article 9, Plumbing Requirements, and any local codes or regulations that apply pertaining to plumbing material, and 2015 IPC.

B. New York State Law plumbing fixtures to comply with New York State Conservation Law 15-0314.

1. Lavatory faucets: 0.5 gpm self-closing faucet, or a metering faucet which limits discharge to a maximum of 0.25 gallons per cycle.
2. Sink faucets: 2.2 gpm.
3. Urinal flush valves: .5 gal. per flush.
4. Water closets: 1.3 gal. per flush.
5. Shower Head: 2.0 gpm

C. Plumbing fixture standards: Comply with applicable portions of National Standard Plumbing Code pertaining to materials and installation of plumbing fixtures.

D. Codes and Standards

1. ASHRAE Standard 18: "Method of Testing for Rating Drinking Water Coolers with Self-Contained Mechanical Refrigeration Systems.
2. Add NSF Lead Free
3. ARI Standard 1010: "Self-Contained Mechanically-Refrigerated Drinking-Water Coolers".
4. ICC Standard A117.1-09: "Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People".
5. Public Law 90-480: "Architectural Barriers Act of 1968".
6. UL Standard 399: Standard for "Drinking-Water Coolers".
7. Public Law 101-336: "Americans with Disabilities Act".
8. ANSI A117.1 – Accessible and Usable Buildings and Facilities
9. ASHRAE Std 18 – Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008.
10. ASME A112.6.1M – Supports for Off-the Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2002).
11. ASME A112.18.1 – Plumbing Supply Fittings; 2012.
12. ASME A112.19.2 – Ceramic Plumbing Fixtures; 2013.
13. ASME A.112.19.3 – Stainless Steel Plumbing Fixtures (Designed for Residential Use); 2008 (R2013).
14. ASME A112.19.5 – Flush Valves and Spuds for Water Closets,

Urinals, and tanks; 2011
15. NSF 61 – Drinking Water System Components – Health Effects; 2014 (Errata 2015).
16. NSF 372 – Drinking Water System Components – Lead Content; 2011

1.04 DELIVERY, STORAGE AND HANDLING

A. Store fixtures where environmental conditions are uniformly maintained within the manufacturer's recommended temperatures to prevent damage.

B. Store fixtures and trim in the manufacturer's original shipping containers. Do not stack containers or store in such a manner that may cause damage to the fixture on trim.

1.05 SEQUENCE AND SCHEDULING

A. Schedule rough-in installations with the installation of other building components.

PART 2 - PRODUCTS

2.01 PLUMBING FIXTURES

A. General: Type, style, and material indicated, including stops, valves, faucets, strainers, wastes, escutcheons, bolts, screws, bushings, etc.

B. Fixtures of same type must be furnished by single manufacturer.

2.02 MATERIALS

A. Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, foundry sand holes, stains, decoloration, or other surface imperfections on finished units are not acceptable.

B. Fittings, trim and accessories to be copper or brass unless otherwise noted.

1. Exposed or semi-exposed: Bright chrome-plated units.
2. Escutcheons: Cast brass, bright chrome-plated with set screw.

C. Stainless steel sheets: ANSI/ASTM A 167, Type 302/304, hardest workable temper.

1. Finish: No. 4, bright, directional polish on exposed surfaces.

D. Steel sheets for baked enamel finish: ANSI/ASTM A 591, coating Class C, galvanized bonderized.

E. Steel sheets for porcelain enamel finish: ANSI/ASTM A 424, commercial quality, Type I.

F. Galvanized steel sheet: ANSI/ASTM A 526, except ANSI/ASTM A 527 for extensive forming, ANSI/ASTM A 525, G90 zinc coating, and chemical treatment.

G. Vitreous china: High quality, free from fire cracks, spots, blisters, pinholes and specks, glaze exposed surfaces, and test for crazing resistance in accordance with ANSI/ASTM C 554.

H. Fiberglass: ANSI Z 124, smooth surfaced, with color selected by Architect/Engineer.

I. Synthetic stone: High quality, free from defects, glaze on exposed surfaces, stain resistant.

J. Manufacturer

1. Fixtures: American Standard, Crane, Kohler, Eljer.
2. Flush valves: American Standard, Sloan.
3. Closet seats: Church, Beneke, Bemis.
4. Chair carriers: Josam, Smith, Zurn.
5. Supplies and traps: Fixture manufacturer or McGuire, Eastman Central D, Brass Craft, Bridgeport Brass.
6. Master mixing valves: Powers, Symmons, Leonard.

2.03 PLUMBING FITTINGS, TRIM & ACCESSORIES

A. Refer to the "Plumbing Fixture Schedule" on the contract drawings for plumbing fixture manufacturer / model number information.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify all dimensions by field measurements. Verify that all plumbing fixtures may be installed in accordance with pertinent codes and regulations, the original design and the referenced standards.

B. Examine rough-in for potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures.

C. Examine walls, floors and cabinets for suitable conditions where fixtures are to be installed.

D. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install plumbing fixtures level and plumb in accordance with fixture manufacturer's written instructions, rough-in drawings and pertinent codes and regulations, the original design and the referenced standards.

B. Comply with the installation requirements of ICC Standard A117.1, Public Law 90-480 and Public Law 101-336 with respect to plumbing fixtures for the physically handicapped.

1. Water closets flush valve handle on open side of fixtures.
2. Insulate water supply and drain pipes under wheelchair accessible lavatories and sinks or as otherwise shown on drawings.

C. Fasten plumbing fixtures securely to supports or building structure. Secure supplies behind or within wall construction to provide rigid installation.

D. Set following in a leveling bed of cement grout.

1. Mop sinks.
2. Tubs.

E. Install a Lead Free stop valve in an accessible location in the water connection to each fixture.

F. Install escutcheons at following locations:

1. Wall penetrations, exposed finished locations.
2. Floor penetrations, exposed finished locations.
3. Ceiling penetrations, exposed finished locations.
4. Within cabinets and millwork.

G. Seal fixtures to walls and floors using silicone sealants or latex caulking. Match sealant color to fixture color.

H. Install a sediment trap at each sink or grouping of sinks in Art Rooms. Install so that trap may be easily serviced and removed.

3.03 EQUIPMENT TO BE FURNISHED BY OTHERS

A. Make complete plumbing connections to fixtures and equipment to be furnished by others. Secure exact locations and roughing-in dimensions before beginning work.
B. Provide approved supplies with stops and escutcheons, cast brass traps and wastes with CO plug and escutcheon.
C. All exposed piping chrome plated.
D. Equipment shall be chrome plated except piping located below equipment.

3.04 FIELD QUALITY CONTROL

A. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized.
B. Inspect each installed unit for damage and operation. Replace damaged or faulting operating fixtures.

3.05 CLEANING

A. Clean fixtures, trim and strainers using manufacturer’s recommended cleaning methods and materials.

3.06 PROTECTION

A. Provide protective covering for installed fixtures, water coolers and trim.
B. Do not allow use of fixtures for temporary facilities unless expressly approved in writing by the Owner.

3.07 SPARE PARTS

A. Furnish special wrenches, water filters and other devices necessary for servicing plumbing fixtures and trim to Owner with receipt in a quantity of one device for each 10 fixtures.

B. Furnish faucet repair kits complete with all necessary washers, springs, pins, and retainers, packings, O-rings, sleeves and seats in a quantity of 1 kit for each 40 faucets.

END OF SECTION

DIVISION 15a - PLUMBING

SECTION 15511a – FIRE STOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Section, apply to work specified in this section.

1.02 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in/ joints between fire rated wall and floor assemblies.

1.03 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. Only tested fire stop systems shall be used in specific locations as follows:

1. Penetrations for the passage of ductwork, cable, cable tray, conduit, piping, electrical bus ways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

B. Safing slot gaps between edge of floor slabs and curtain walls.

C. Openings between structurally separate sections of wall or floors.

D. Gaps between the top of walls and ceilings or roof assemblies.

E. Expansion joints in walls and floors.

F. Openings and penetrations in fire-rated partitions or walls containing fire doors.

G. Openings around structural members which penetrate floors or walls.

1.04 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

1. Section 03300 - Cast-In-Place Concrete
2. Section 07900 - Joint Sealers
3. Section 04200 - Masonry Work
4. Section 09200 - Lath and Plaster
5. Section 09250 - Gypsum Drywall Systems
6. Section 13080 - Sound, Vibration and Seismic Control
7. Section 13900 - Fire Suppression and Supervisory Systems

8. Section 15050 - Basic Mechanical Materials and Methods
9. Section 15250 - Mechanical Insulation
10. Section 15300 - Fire Protection
11. Section 15400 - Plumbing
12. Section 16050 - Basic Electrical Materials and Methods

1.05 REFERENCES

A. Test Requirements: ASTM E-814-02, "Standard Method of Fire Tests of Through Penetration Fire Stops"

B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

1. UL Fire Resistance Directory:

a. Fire stop Devices (XHJI)
b. Fire Resistance Ratings (BXUV)
c. Through-Penetration Fire stop Systems (XHEZ)
d. Fill, Voids, or Cavity Material (XHHW)
e. Forming Materials (XHKU)

2. Alternate “Omega Point Laboratories Directory” (updated annually)

C. Test Requirements: UL 2079, “Tests for Fire Resistance of Building Joint Systems” (July 1998.)

D. Test Requirements: ASTM E 1966-01, “Standard test method for Fire Resistive Joint Systems”

E. Inspection Requirements: ASTM E 2174 – 01, “Standard Practice for On-site Inspection of Installed Fire Stops.”

F. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

G. ASTM E-84-01, Standard Test Method for Surface Burning Characteristics of Building Materials.

H. All major building codes: ICBO, SBCCI, BOCA, and IBC.

I. NFPA 101 - Life Safety Code

J. NFPA 70 - National Electric Code

1.06 QUALITY ASSURANCE

A. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

B. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994, as may be amended from time to time).

1.07 SUBMITTALS

A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 1300.

B. Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineer judgment must include both project name and contractor’s name who will install firestop system as described in drawing.

C. Submit material safety data sheets provided with product delivered to job-site.

1.08 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer’s products per specified requirements. A supplier’s willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.
D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.01 FIRESTOPPING GENERAL

A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

C. Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

2.02 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ) and joint systems (XHBN) listed in Volume 2 of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:

1. Hilti, Inc., Tulsa, Oklahoma (or equal)
800-879-8000

2.03 MATERIALS

A. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type,

annular space requirements, and fire-rating involved for each separate instance.

B. Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:

1. Hilti CP 680 Cast-In Place Firestop Device
   a. Add Aerator adaptor when used in conjunction with aerator ("sovent") system.

2. Hilti CP 681 Tub Box Kit for use with tub installations.

C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

1. Hilti FS-ONE Intumescent Firestop Sealant
2. Hilti CP 604 Self-leveling Firestop Sealant
3. Hilti CP 620 Fire Foam
4. Hilti CP 606 Flexible Firestop Sealant
5. Hilti CP 601s Elastomeric Firestop Sealant

D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:

1. Hilti CP 601s Elastomeric Firestop Sealant
2. Hilti CP 606 Flexible Firestop Sealant
3. Hilti FS-ONE Intumescent Firestop Sealant

E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:

1. Hilti CP 672 Speed Spray
2. Hilti CP 601s Elastomeric Firestop Sealant
3. Hilti CP 606 Flexible Firestop Sealant
4. Hilti CP 604 Self-leveling Firestop Sealant

F. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.

1. Hilti CP 677 Speed Plugs
2. Hilti CP 767 Speed Strips

G. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

1. Hilti FS-ONE Intumescent Firestop Sealant

H. Foams, intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti FS-ONE Intumescent Fire stop Sealant
2. Hilti CP 618 Fire stop Putty Stick
3. Hilti CP 620 Fire Foam
4. Hilti CP 601s Elastomeric Fire stop Sealant
5. Hilti CP 606 Flexible Fire stop Sealant

I. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti CP 618 Fire stop Putty Stick

J. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

1. Hilti CP 617 Fire stop Putty Pad

K. Fire stop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

1. Hilti CP 642 Fire stop Collar
2. Hilti CP 643 Fire stop Collar
3. Hilti CP 645 Wrap Strips

L. Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical bus ways in raceways, the following products are acceptable:

1. Hilti CP 637 Trowelable Fire stop Compound
2. Hilti FS 657 FIRE BLOCK
3. Hilti CP 620 Fire Foam

M. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical bus ways in raceways, the following products are acceptable:

1. Hilti FS 657 FIRE BLOCK

N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:

1. Hilti CP 672 Speed Spray
2. Hilti CP 601s Elastomeric Fire stop Sealant
3. Hilti CP 606 Flexible Fire stop Sealant
4. Hilti CP 604 Self-Leveling Fire stop Sealant

O. Provide a fire stop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

P. Provide a fire stop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify penetrations are properly sized and in suitable condition for application of materials.

2. Surfaces to which fire stop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

5. Do not proceed until unsatisfactory conditions have been corrected.

3.02 COORDINATION

A. Coordinate location and proper selection of cast-in-place Fire stop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.

B. Responsible trade to provide adequate spacing of field run pipes to allow for installation of cast-in-place fire stop devices without interferences.

3.03 INSTALLATION

A. Regulatory Requirements: Install fire stop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL fire stop systems that might hamper the performance of fire dampers as it pertains to duct work.

3. Protect materials from damage on surfaces subjected to traffic.

3.04 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.

D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing fire stop systems already installed by other trades.

3.05 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess fire stop materials and soiling as work progresses.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15985A - PLUMBING, TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provision of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of testing, adjusting and balancing work is indicated by requirements of this section, and also by drawings and schedules.

B. Component types of testing, adjusting and balancing specified in this section includes the following:

1. Rough sanitary and storm piping.
2. Water supply system.
3. Gas system – Refer to 15488A

1.03 QUALITY ASSURANCE

A. Installer - a firm with at least 3 years of successful testing, adjusting and balancing experience on projects with testing and balancing requirements similar to those required for this project.

1.04 REQUIREMENTS

A. No system shall be covered or concealed until tested, approved.

B. Pay for Permit and Inspection Fees required by Authority having jurisdiction.

C. Test in presence of Owner's Representative and Plumbing Inspector.

D. Prove tight for period stated or longer if required.

E. Tests may be made in sections.

1.05 CODES AND REQUIREMENTS

A. Comply with latest editions and applicable portions of International Plumbing Code, Local Plumbing Standards, New York State Building Code, especially Article 9, Plumbing Requirements and Plumbing Code.

B. Comply with applicable portions of Standards for Waste Treatment Works, New York State.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide test equipment and materials necessary for tests.

PART 3 - EXECUTION

3.01 GENERAL

A. Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned and is operable.

B. Test, adjust and balance systems and components as indicated, in accordance with procedures outlined below and in applicable standards. Test which follows shall be considered minimum standards.

3.02 TESTS & INSPECTIONS TO BE

A. Rough Sanitary and Storm Piping.

1. Stop openings, fill with water to top of highest vent. Water shall hold constant for two (2) hours.
2. May be tested in sections using water pressure test.
3. Test pressure shall be equal to at least 10 ft. water column at all points.
4. Retest at least upper 10 ft. of next lower section.
5. Compliance with the Department of Health Lead in Water Regulation is located on Drawings.

B. Water Supply System.

1. Fill, subject to 125 psig hydrostatic pressure at lowest level for two (2) hours.
2. Fixtures shall not be connected into system during test.
3. After fixtures are connected, test system for two (2) hours, at 75 PSIG or prevailing water pressure, whichever is higher.
4. Regulate flow of water to each fixture.
5. Adjust balancing valves on hot water system.
6. Faucets, flush valves shall operate satisfactorily without waste of water, without objectionable noise.

END OF SECTION