SECTION 220100
PLUMBING GENERAL

PART 1 – GENERAL

1.1 DESCRIPTION

A. This Division 22 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown.

B. The General Provisions and Division 1, including the general, supplementary and other conditions and other Divisions, as appropriate, apply to work specified in this Division.

1.2 INTENT OF DRAWINGS AND SPECIFICATIONS

A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable standards for materials, equipment and workmanship, and to provide operable mechanical systems complete in every respect.

B. The engineering drawings are diagrammatic, intended to show general arrangement and sizes of system components, and shall not be scaled. Rather, the architectural and structural drawings shall govern space constraints, dimensions and finishes. All offsets and fittings which will be necessary to accomplish the finished installation shall be provided at no additional cost or increase in the Contract.

1.3 SPACE PRIORITY

A. Ensure optimum use of available space for materials and equipment installed above ceilings. Allocate space in the order of priority as listed below except as otherwise detailed. Items are listed in the order of priority, with items of equal importance listed under a single priority number.
   1. Gravity flow piping systems
   2. Vent piping systems
   3. Recessed lighting fixtures
   4. Concealed HVAC terminals and equipment
   5. Air duct systems
   6. Sprinkler piping systems
   7. Pressurized piping systems
   8. Electrical conduit, wiring, control air tubing

B. Order of space priority does not dictate installation sequence. Installation sequence shall be as required to install all affected trades.

C. The work of this Division 22 shall not obstruct access for installation, operation and maintenance of the work of any other Division.

D. All major items of equipment shall be arranged so as to provide a minimum of 28" clear aisle space. Additional space shall be provided between and around equipment for maintenance and proper operation as shown in the equipment manufacturer's literature.

1.4 COORDINATION

A. Coordinate all work under this Division 22 with work under all other Divisions, providing adjustment as necessary.

B. Coordination of space requirements with respect to Division 26 shall be performed such that:
   1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.
   2. No piping or ductwork which ever operates at a temperature in excess of 120 degrees F. shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

1.5 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 22 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities having jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with the applicable codes and standards as minimum requirements.

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by city, county, state and other authorities having jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.6 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 22 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26.

C. All power wiring and final connections to equipment shall be provided under Division 26.

D. Control components, all interlocks (motor-operated dampers, fire alarm motors, etc.) and control wiring (120 volt, single phase and less) shall be provided under this Division 22 as required to achieve the specified control sequences.

E. All control wiring over 30 volts shall be installed by a Licensed Electrician working under this Division 22.

1.7 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe penetrations of concrete or masonry walls, elevated floors and roofs, except those plumbing piping penetrations for fixtures, vents, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls, underground walls, pit or vault walls and elevated floors shall be packed and sealed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

G. Fire-stops shall be provided as specified herein. All annular spaces between piping and sleeves which do not require fire-stops shall be packed with mineral wool and caulked.

H. Provide round, chrome-plated escutcheons on all exposed piping penetrations passing through walls, floors, partitions and ceilings.

1.8 FIRE-STOPS

A. Where ductwork, piping, conduit, etc. pass through fire partitions, fire walls and floors, a fire-stop shall be provided that will ensure an effective barrier against the spread of fire, smoke and gases. Fire-stop material shall be packed tight and completely fill gaps between the ductwork, piping, conduit, etc. and the perimeter of their rough openings.

B. Fire-stopping material shall maintain its dimensions and integrity while preventing the passage of flame, smoke and gases under conditions of installation and use when exposed to the ASTM E119 time-temperature curve for a time period equivalent to the rating of the assembly penetrated. Fire-stopping material shall be noncombustible as defined by ASTM E136; and, for insulation materials, melt point shall be a minimum of 1700 degrees F. for 1-hour protection and 1850 degrees F. for 2-hour protection. Fire-stopping material shall be Dow-Corning RTV Foam or 3M Fire Barrier Products or Sohio Carborundum Fyre Putty.

C. See Section 224000 for fire-stopping of PVC piping.

1.9 CORE DRILLING

A. Cutting of holes through concrete and masonry shall be by diamond core or concrete saw. Pneumatic hammer, impact electric and hand or manual hammer type drills will not be allowed, except as permitted by the Architect where required by limited working space. Locate holes such that they will not affect structural sections such as ribs or beams. Holes shall be laid out well in advance of the installation. These layout locations shall be approved by the Architect prior to drilling.

PART 2 – PRODUCTS

2.1 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturers names, series and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving nor allowing the substitution of that manufacturer's standard product in place of the basis of design. No consideration will be given to a product which would require dimensional, spatial or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions or design of any part of the building, it structure, electrical system or any other engineered systems shall be accompanied by a scaled drawing and written description of the required change(s) for approval by the Architect . If deemed necessary by the Architect, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State.

2.2 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:
   1. Factory Mutual Laboratories (FM)
   2. Industrial Risk Insurers (IRI)
   3. Underwriters Laboratories, Inc. (UL)
   4. ADC: Air Diffusion Council
   5. AGA: American Gas Association
   6. AMCA: Air Moving and Conditioning Association, Inc.
   7. ANSI: American National Standards Institute
   8. API: American Petroleum Institute
   9. ARI: American Refrigeration Institute
   10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
   11. ASME: American Society of Mechanical Engineers
   12. ASTM: American Society of Testing and Materials
   13. AWWA: American Water Works Association
   14. IBR: Institute of Boiler and Radiator Manufacturers
   15. MSS: Manufacturers Standardization Society
   16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
   17. NEMA: National Electrical Manufacturer's Association
   18. OSHA: Occupational Safety & Health Administration
   19. PDI: Plumbing Drainage Institute
   20. PPI: Plastic Pipe Institute
   21. SMACNA: Sheet Metal and Air Conditioning Contractors National Association, Inc.

B. All equipment and materials provided under this Section 22 01 00 shall be new and of the best grade commercial quality, shall be of the latest design of the manufacturer, and shall be listed and approved by U.L. and the Underwriter. Materials and equipment manufactured outside of the United States will not be acceptable. All components shall be suitable for the pressures indicated on the flow test.

PART 3 – EXECUTION

3.1 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the contracting firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. No more than four (4) copies of submittal data will be reviewed. Any additional copies will be returned unmarked. The responsibility of copying review comments on any additional copies will rest solely with the Contractor.

D. Submittals will not be accepted for review unless they:
   1. Comply with the requirements of Division 1.
   2. Include complete information pertaining to all appurtenances and accessories.
   3. Are submitted as complete packages which pertain to all related items in Division 22. Separate packages shall be submitted as follows: All plumbing equipment, fixtures and components
   4. Are properly marked with equipment, service or function identification as related to the project and are marked with pertinent specification paragraph number.

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
   1. Piping Specialties
   2. Insulation
   4. Water Heaters
   5. Plumbing Fixtures

3.3 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the equipment manufacturer, as indicated on the Drawings and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the mechanical systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

3.4 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all mechanical equipment, piping, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

C. All control equipment shall be adjusted to the settings required for the performance specified.

D. All coils shall be thoroughly cleaned and combed prior to final inspection.

3.5 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a color selected by the Architect.

B. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.6 PIPING LEAK TESTING AND BALANCING

A. Soil, waste, storm and vent piping shall be tested with water before installing fixtures. Water test shall be applied to the system either in its entirety or to the individual sections. Each opening except the highest opening of the section under test shall be plugged, and the section shall be filled with water and tested with a head of water of at least ten (10) feet above the highest point in the system. The water shall be kept in the portion under test, for at least thirty (30) minutes; no drop in the water level will be acceptable.

B. The water piping systems shall be tested at a minimum pressure of 125 psi and proved tight at this pressure for not less than thirty (30) minutes or longer if required to permit inspection of all joints. No loss in pressure will be permitted.

C. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

3.7 RECORD (AS-BUILT) DRAWINGS

A. At the completion of the project, provide CADD drawings in AutoCad Release 2014 or later and provide a set of PFDs and hard copies to the Architect and Owner which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines.

3.8 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose leaf notebook. Operating instructions shall be provided for each mechanical system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a competent technician for not less than one (1) day to instruct the Owner in the operation of the mechanical systems.

3.9 WARRANTY

A. All work provided under this Division 22 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts and labor. In addition, all reciprocating air conditioning compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

END OF SECTION 220100

SECTION 224000
PLUMBING SYSTEMS

PART 1 – GENERAL

1.1 DESCRIPTION

A. This Section 224000 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:
   1. Sanitary waste and vent systems
   2. Domestic water systems

B. Provide all final plumbing connections to all equipment furnished by Owner.

C. Provide a backflow preventer at those connections required by local plumbing code.

1.2 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems as shown and specified which are free of leaks, properly vented, free of unreasonable noise vibration and sweating, and fabricated so as to fit the space allotted and to exhibit a minimum resistance to fluid flow.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.3 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping connections at each fixture, piece of equipment, valve and accessory.

B. Union joints, couplings or flanges shall be provided in each pipeline connected to each piece of equipment, fixture and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.
   1. Unions or flanges shall be provided between all copper to steel connections. These unions shall be dielectric, insulating type.

C. All changes in direction and branches shall be made with manufactured fittings.

D. The use of offset-type reducers is strictly prohibited in any piping system.

E. In all water piping systems, changes in horizontal pipe line sizes shall be made with eccentric reducers installed flat on top for proper air venting. Reducing tees, reducing elbows and concentric reducers shall only be allowed in water piping systems for changing pipe sizes in vertical risers and for making connections to equipment and accessories from vertical risers.

F. All pipe joints shall be cut square and all burrs shall be removed.

G. Open ends of pipelines not currently being handled shall be plugged during installation to keep dirt, water and foreign material out of the system.

H. Sanitary waste and storm drainage piping shall slope down in the direction of flow as shown on the drawings or as prescribed by Code, but not less than 1 percent.

1.4 IDENTIFICATION OF PIPING

A. All aboveground plumbing systems piping and valves sized 3/4" and larger which are installed in accessible locations (including piping above removable ceilings and behind access panels) shall be identified in strict conformance with the "Scheme for the Identification of Piping Systems" (ANSI A13.1 – 1981).

B. Each identification marker shall include the following:
   1. Proper color-coded background.
   2. Proper color of legend in relation to background color.
   3. Proper legend letter size.
   4. Proper marker length.
   5. Direction of flow arrow shall be included on each marker.

C. Locations for pipe markers shall be as follows:
   1. Adjacent to each valve and fitting.
   2. At each branch and riser take off.
   3. At each pipe passage through walls, floors and ceilings.
   4. On all straight pipe runs every 25 feet.

D. Identification markers may be stenciled or shall be Setmark Pipe Markers, as manufactured by Seton Name Plate Corporation.

E. All valves shall be identified with the appropriate service designation and valve number brass valve tags. Each valve tag shall be 19 gauge brass with 1/4" black-filled letters over 1/2" black-filled numbers. Tags shall be fastened to valves with brass "S" hooks or brass jack chain. Brass tags and fasteners shall be as manufactured by Seton Name Plate Corporation

F. Provide charts of all valves. Valve charts shall include the following items:
   1. Valve identification Number
   2. Location
   3. Purpose/Material

PART 2 – PRODUCTS

2.1 SANITARY WASTE AND VENT SYSTEMS

A. Cleanouts shall be provided at the locations indicated and, as a minimum, where required by Code.

B. All above ground sanitary, waste and vent piping shall be hubless cast iron soil pipe.

C. Joints on hubless cast iron soil pipe shall be made with no-hub neoprene couplings with Husky type stainless steel bands. All couplings shall be manufactured to the CISPI 310 standard and certified by NSF International. No-hub couplings shall be heavyweight / heavy-duty type. No-hub couplings shall have minimum four (4) bands for pipe sizes 1-1/2" to 4" and minimum six (6) bands for pipe sizes 6" to 15". Bands shall be torqued to 80 inch-pounds. No-hub couplings shall meet the requirements of FM standard 1680 Class I.

D. Floor drains in toilets and finished areas shall be J. R. Smith 2000 Series with 6" Type B square adjustable strainers finished in satin nickel bronze; or equal products by Josam, Wade or Zurn. Provide vandalproof secured tops. All floor drains shall be provided with a trap primer.

E. Floor drains in mechanical rooms and unfinished concrete floors shall be J. R. Smith 2131 Series with round 11 3/4" cast iron grate, sediment bucket and deep-seal P-trap; or equal products by Josam, Wade or Zurn. Provide vandalproof secured tops. All floor drains shall be provided with a trap primer and deep seal trap.

F. All floor drains and hub drains shall be provided with a trap primer. Route water piping from nearest cold water line and as allowed by code.

2.3 DOMESTIC WATER SYSTEM

A. Aboveground domestic water system piping 3" in size and smaller shall be Type L hard drawn copper tubing with wrought copper fittings and soldered joints.

B. Gate valves 3" or less in size shall be constructed with a bronze body, non-rising stem and be as manufactured by Milwaukee, Nibco, Stockham or an approved equal.

C. Backflow preventers shall be Watts Series 909 reduced pressure principle backflow preventers complete with strainer and shut-off valves or approved equal by Apollo. Air gap drains shall be piped into nearest floor drain or outside of building to a concrete splashblock.

D. All water hammer arresters (WHA) shall be PDI Certified, Size A, B, C, D, E or F, as indicated by manufacturer and PDI for the fixture units served; Josam, J. R. Smith or equal.

E. Soldered joints shall be made with tin-antimony-silver solder. Solder containing lead shall not be permitted.

2.4 PLUMBING INSULATION

A. All pipe insulation products shall have a permanent composite insulation, jacket and adhesive fire and smoke hazard rating as tested by procedure ASTM E-84, NFPA 255 and UL 723 not exceeding Flame Spread 25 or Smoke Developed 50.

B. Blanket-type insulation shall have an average thermal conductivity not to exceed [illegible] BTU-in. per sq. ft. per degrees F. per hour at a mean temperature of 75 degrees F. Insulation shall have a minimum density of 1 lb./cu.ft. and shall be 2" thick.

C. Preformed insulation for all domestic hot and cold water piping shall be minimum 1" thick preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum K value of the insulation shall be 0.23 at 70 degrees F.

2.5 PIPE HANGERS AND SUPPORTS

A. Pipe hangers, hanger rods, trapeze type hangers, upper attachments and other supports shall be selected based on pipe size (plus insulation of pipes specified to be insulated) and the weight of the medium being transported or the medium used for testing, whichever is greater. Provide all hangers and rods, turnbuckles, angles, channels, and other structural supports to support the piping systems. Rods for pipe hangers shall be full size of the hanger manufacturer's catalog listed rod size for each type hanger specified. Hangers and supports shall be Michigan, ITT Grinnell or B-Line.

B. All material utilized for the hanging and support of the piping systems shall be manufactured products which are specifically intended for the purpose of hanging piping systems. The use of wire, steel straps, plastic ties, etc. is strictly prohibited.

C. Pipe hangers selected for supporting horizontal insulated piping shall be sized to fit around the outside of the pipe insulation. Insulated piping shall be supported on galvanized shields.
   1. Shields shall be as follows:
      a. Pipes 2" and smaller: 18 gauge x 12" long.
      b. Pipes 2 1/2" and larger: 16 gauge x 18" long.
   2. Shields shall be 180 degrees around the lower half of the pipe at all pipe hangers, except that on trapeze hangers, pipe racks and floor supported horizontal pipes, shields shall be 360 degrees around the entire pipe.

D. Pipe hangers for copper piping shall be copper plated or the piping shall be dielectrically isolated from any steel hangers or clamps which are used.

E. Steel rods, framing and clamps shall be plated or primed to prevent rust formation.

PART 3 – EXECUTION

3.1 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets. Water hammer arresters shall be installed per the manufacturer's recommendations and PDI.

3.3 MINIMUM HANGER SPACING

A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and at not more than 10 ft. spacings along horizontal runs of straight, plain piping.

3.4 INSULATION INSTALLATION

A. Provide insulation over all above ground hot and cold water piping, except that no insulation is required on cold water lines installed inside interior plumbing chases (those chases with no exterior wall).
   1. All joints and tears shall be sealed with matching white vapor barrier tape.

3.5 DISINFECTION

A. All domestic water piping installed under this Division shall be disinfected with chlorine before it is placed into operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB-C-120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period, all valves shall be opened and closed at least four times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths parts per million (0.2 PPM). Submit certification to the Architect that the system was disinfected.

END OF SECTION 224000

SECTION 224240
WATER HEATERS AND ACCESSORIES

PART 1 – GENERAL

1.1 DESCRIPTION

A. This Section 224240 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the water heating systems as specified herein and as shown. These systems include, but are not limited to, the following:
   1. Water heaters

PART 2 – PRODUCTS

2.1 POINT-OF-USE WATER HEATER

A. The water heaters shall be A.O. Smith with size and capacity noted on the drawings.

B. Water heater shall have an approved working pressure of 150 psi. The tank shall be glass-lined and shall have a magnesium anode to provide electrolytic protection. The entire heater shall be UL listed, shall meet or exceed the ASHRAE Standard 90 for energy efficiency and shall be insulated with high density polyurethane foam insulation for maximum heat retention.

C. Controls shall include an operating thermostat and manual reset high limit control. All controls shall be factory-wired and require no external power source.

D. Water heater shall be provided with access door and ASME T&P relief valve.

E. Water heater shall be a balanced electric load.

F. Water heater shall be complete with mounting shelf.

G. Acceptable manufacturers are State and A.O. Smith.

PART 3 – EXECUTION

3.1 INSTALLATION

A. The water heaters and accessories shall be installed in strict accordance with the manufacturer's recommendations and the Contract Documents.

B. All temperature and pressure relief valves shall be piped full size to an indirect waste such as the nearest service sink or hub drain.

END OF SECTION 224240

SECTION 224500
PLUMBING FIXTURES AND TRIM

PART 1 – GENERAL

1.1 DESCRIPTION

A. All work specified in this section is governed by the Mechanical General Section 230100.

B. This Section 224500 and the accompanying drawings cover the provisions of all labor, fixtures, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the plumbing fixtures and trim as specified herein and as shown.

C. All exposed piping, valves, stops, P-traps, etc. shall be chrome-plated. Also, all exposed piping penetrations through walls, floors or ceilings shall be provided with chrome-plated cast brass escutcheons.

D. All P-traps shall be minimum 17-gauge brass.

E. Provide all final connections to all equipment and fixtures furnished by Owner.

F. Unless otherwise specified in an individual fixture description, all enameled cast-iron and porcelain fixtures shall be white.

1.2 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted, clean plumbing fixtures as shown and specified, which are free of leaks, noise, air, vibration and water flow fluctuations.

1.3 BASIS OF DESIGN

A. The basis of design is as outlined for each fixture in the PART 2 – PRODUCTS subsection. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design.

1.4 ACCEPTABLE MANUFACTURERS

A. Acceptable fixture manufacturers are American Standard, Toto, Eljer and Kohler provided that their units are equal in all respects for this specific project. Faucets and trim may be equal products as manufactured by Rubbermaid, Chicago, Toto, Delany, T&S Bronze and Brass Works or Speakman. Stainless steel sinks and drinking fountains shall be as manufactured by those companies specified for each specific item outlined under subsection 2.4 and 2.5.

B. All fixtures shall comply with the lead free requirement of the safe drinking water act of 1986 and the lead contamination control act of 1988 where applicable and shall be certified by WQA to lead free compliance per NSF/ANSI-61-Annex G.

PART 2 – PRODUCTS

2.1 Refer to fixture schedule on sheet P-0.0 for Plumbing Fixture Specifications.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Units shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

B. All plumbing fixtures shall be free of leaks, provided completely finished, trimmed, adjusted, cleaned and ready for use. They shall be properly secured to the structure by the use of thru-bolting, backplates, carriers, expansion shields (for floor mounting only) or toggle bolts.

C. Wall hung fixtures supported on chair carriers shall be bolted to the floor slab. Carefully coordinate space requirements and fixture mounting height requirements with supports being furnished.

D. Fixtures supported with wall hangers on masonry chase walls shall be fastened to the wall with not less than 3/8" bolts which shall pass through the wall and through a 1/4" x 4" wide steel backplate on the unfinished chase wall side.

E. Where fixtures are hung on single masonry walls without a pipe chase behind, they shall be mounted with 3/8" toggle bolts.

F. Fixtures on steel stud walls shall have a 1/4" x 4" wide steel backplate wired with 1/16" steel wire to the studs. Bolts not less than 3/8" shall secure the fixtures through the fixture hanger and the backplate.

G. All mounting holes provided in fixtures shall be used for support. In addition to the main hangers, 1/4" toggle bolts shall secure the bottom of all wall hung fixtures at each drilling provided for this purpose.

H. Mount wall-hung fixtures at the heights indicated on the architectural Drawings or as prescribed by local code. Special attention is called to the installation requirements of the ANSI Handicap Code.

3.2 CLEANING AND ADJUSTMENT

A. The units shall be cleaned, tested and field-adjusted to provide optimum flow and drainage.

END OF SECTION 224500

SECTION 215250
SPRINKLER SYSTEMS

PART 1 – GENERAL

1.1 DESCRIPTION

A. All work specified in this Section is governed by the Mechanical General SECTION 230100.

B. This Section 215250 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of sprinkler systems as specified herein and as shown.

C. The work included under this Section 215250 shall include, but is not limited to, the following:
   1. Piping and sprinkler heads
   2. Hydraulic design computations
   3. Shop drawings and procurement of all approvals

1.2 STANDARDS AND APPROVALS

A. The sprinkler systems shall be designed and installed in conformance with the standards of NFPA 13, NFPA 72A, 72B, 72C, 72D, NFPA 231, the standards of the Underwriter (IRI/FM/ISO, etc.) and local codes.

B. The sprinkler design and installation shop drawings shall be submitted and approved by the Owner's underwriter and the Fire Marshall.

C. The sprinkler systems shall be installed by a firm which is duly licensed to install such systems in the State of Georgia.

1.3 RECORD DRAWINGS

A. Upon completion of the work, provide three (3) sets of "record" drawings of the fire protection systems as actually installed to the Owner. Drawings shall be to scale, and shall include all details required to accurately indicate the system as installed.

PART 2 – PRODUCTS

2.1 MINIMUM QUALITY LEVEL

A. All equipment and materials provided under this Section 15500 shall be new and of the best grade commercial quality, shall be of the latest design of the manufacturer, and shall be listed and approved by U.L. and the Underwriter. Materials and equipment manufactured outside of the United States will not be acceptable. All components shall be suitable for the pressures indicated on the flow test.

2.2 SPRINKLER HEADS

A. All sprinkler heads shall be automatic, closed-type standard spray heads, selected to match existing.

B. Sprinkler Heads in Ceilings:
   1. **All areas with gypsum ceilings shall have fully concealed type heads.**
   2. **All areas with exposed/open to structure shall have upright pendant type heads.**
   3. **All areas with ACT ceilings shall have semi-recessed type heads to match existing.**

C. Sprinkler heads installed in storage, utility, mechanical equipment rooms and similar "back-of-house" areas without ceilings shall be bronze heads in the upright position unless otherwise noted.

D. The temperature rating of the sprinkler heads shall be in accordance with the recommendations of the Underwriter.

E. Sprinkler guards shall be provided for all heads within seven feet of the floor, in mechanical, electrical and storage rooms, and elsewhere as required by the Underwriter.

F. All heads installed in areas with tile ceilings shall have the heads centered in the tile.

2.3 PIPING

A. All piping shall be Schedule 40, grade A53 or A120.

2.4 PIPE HANGERS AND SUPPORTS

A. Provide all necessary hangers, supports, bracing, accessories, etc., as required for proper installation of the work, and only approved type hangers shall be used. All sprinkler piping shall be supported from building structure; sprinkler lines under ducts shall not be supported from ductwork but shall be supported from building structure with trapeze hangers where necessary.

B. Piping supported from floors shall be provided with steel support bases.

PART 3 – EXECUTION

3.1 DESIGN AND INSTALLATION

A. The design and installation of the sprinkler system shall be based on the actual occupancy.

3.2 SCOPE OF WORK

A. The Contractor shall relocate all existing sprinkler heads in coordination with the new floor plan and ceiling. Coordinate final locations with all trades. New sprinkler heads shall be provided as required for new floor plan.

END OF SECTION 215250

END OF PLUMBING SPECIFICATIONS

BW&A Barrett, Woodyard & Associates, Inc.
3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800

©This drawing is copyrighted. It may not be reproduced nor used in any other form or on any other project.
BWA Job # 2019-1477

Hendrick
1201 Peachtree Street, NE
400 Colony Square
Suite 1900
Atlanta, GA 30361

T: 404.261.9383
F: 404.240.9398
www.hendrickinc.com

GEORGIA REGISTERED PROFESSIONAL ENGINEER ALLIE MELISSA HEAPY

No.	Date	Description
	01/08/2020	ISSUED/RELEASED FOR CONSTRUCTION

Project Name

FranklinStreet

FRANKLIN STREET
3384 PEACHTREE ROAD
NE, SUITE 650
ATLANTA, GA 30326

ISSUE
ISSUED/RELEASED FOR CONSTRUCTION

PLUMBING SPECIFICATIONS

AH Drawn	
GJ Checked	
As indicated Scale	P-0.1
01/08/2020 Date	
142-001-01 Project No.	Drawing Number

This drawing and all reproductions are the property of Hendrick, Inc. and may be used or reproduced only with the written permission of Hendrick, Inc.

Order Plans @ www.LDIILine.com