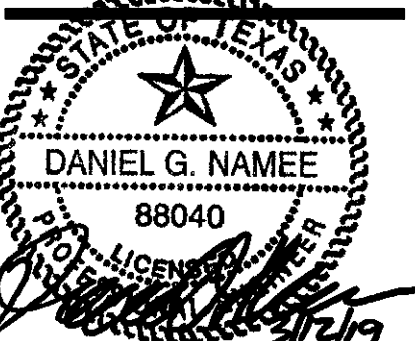
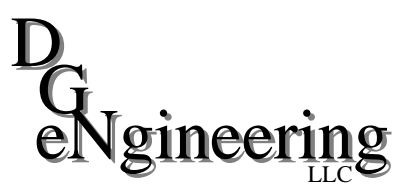


**Project Information:**



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**SHOPS ON GOSLING**  
RETAIL CENTER  
SHELL BUILDING DEVELOPMENT  
24309 GOSLING ROAD  
SPRING, TEXAS 77389

**Sheet Title:**

**PLUMBING  
SPECIFICATIONS**

**Issue:**

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**PLUMBING SPECIFICATIONS**

**SECTION 15400**

**PART 1: GENERAL - PLUMBING**

**1-1 DESCRIPTION:**

All work on these drawings shall be done in strict accordance with these specifications.

The work included under this contract shall consist of furnishing and installing the waste, vent, and sanitary sewer system; domestic cold and hot water supply system; and all fixtures, equipment accessories, and appurtenances.

**1-2 WARRANTY:**

The contractor shall guarantee the work for a period of one year beyond date of final acceptance. During that period, the contractor shall repair or replace, at his own expense, any faults or imperfections that may arise due to defects in material and workmanship, including fixtures and pipe leaks. Defects shall include but not be limited to, noisy operation, loose or missing parts, or noticeable deterioration of finish. During this period, the contractor shall actually perform all service work required.

**1-3 PROJECT CONDITIONS:**

The contractor shall visit the site of the work and fully understand the conditions that affect the work, or the cost thereof, understand the existing utilities from which services will be supplied, verify locations of utility services and determine requirements for connections, and determine in advance that equipment and materials proposed for installation fit into the confines indicated.

**1-4 PERMITS AND FEES:**

The contractor shall arrange and pay for all permits, fees, tests, and all inspections as required by governmental authorities.

**1-5 COORDINATION WITH FIELD CONDITIONS:**

The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. All pipe equipment locations as indicated on the documents do not indicate every offset or exact location. All offsets and exact locations shall be established by actual field measurements, coordination with the structural, architectural, mechanical and electrical. All offsets and relocations as required by actual field conditions shall be performed by the contractor at no additional cost to the owner.

**1-6 SUBMITTALS:**

Contractor shall provide six sets of submittals on all plumbing fixtures and piping accessories. Any deviations from the specified items shall be listed on the cover sheet and clearly itemized for all deviations. The contractor shall provide two copies of owner's manuals to the architect upon completion of the work.

**1-7 QUALITY ASSURANCE:**

All work shall be performed in accordance with all state, local and federal codes and all authorities having jurisdiction.

**1-8 EQUIPMENT IDENTIFICATION:**

All equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal.

**PART 2: PRODUCTS - PLUMBING**

**2-1 SOIL, WASTE, AND VENT PIPE AND FITTINGS, ABOVEGROUND (Inside Bldg.):**

- A. Pipe, 1-1/4" and 1-1/2": ASTM B306-83. Copper drainage tubing (DWV).
- B. Fittings, 1-1/4" and 1-1/2" ANSI B16.23-84. Cast bronze solder drainage fittings.
- C. Pipe, 2" and Larger: CISPI 301-82. Hubless cast iron pipe, service weight (SV), with hubless joints using stainless steel bands or Bell and Spigot cast iron pipe and fittings with compression gaskets.
- D. Exposed Pipe and Fittings:  
Polished chrome over nickel-plated brass.

**2-2 SOIL, WASTE, PIPE AND FITTINGS, BELOW GROUND:**

- A. Pipe, 2" and Larger: ASTM A74-82. Service weight (SV), cast iron, coated spun type, hub and spigot pipe for use with Neoprene Compression Gaskets.
- B. Fittings, 2" and Larger: ASTM A74-82. Cast iron, coated, hub and spigot type, long sweep bends, for use with Neoprene Compression Gaskets.

**2-3 CLEANOUTS:**

Same size as piping up to 4". Minimum of 4" for larger piping.

**A. Interior:**

Adjustable cast iron floor cleanness with inside or outside caulk connection, bronze internal plug, satin top, Nikoloy rim and cover plate for light traffic. Recessed for tile floors with vandal proof, secured cover. Zurn Manufacturing Company, or approved equal.

- 1. Concrete and Resilient Floors: Zurn Series Z-1415-2 or Z-1410-2 or approved equal.
- 2. Quarry and Ceramic Tile Floors: Zurn Series Z-1415-3 or Z-1410-3, or approved equal.
- 3. Partitions: Zurn Series Z-1445-1 with access cover, or approved equal.

**2-4 FLOOR DRAINS:**

Cast iron, two-piece body with double drainage flange, non-puncturing flashing collar, weep holes, bottom outlet, inside caulk connection, sized as shown. Provide an adjustable, satin finished, solid bronze alloy, 6" square or 6" diameter strainer and accessories. Zurn Series Z-415 with type 'B' round or type 'Y' square strainer, or as noted on plans.

**2-5 DOMESTIC WATER PIPING AND FITTINGS, ABOVEGROUND:**

- A. Piping: ASTM B88-83a. Copper tubing, hard drawn, Type L.
- B. Fittings: ANSI B16.22-80. Wrought copper solder joint.
- C. Unions, 2" and Smaller: ANSI B16.22-80. Wrought copper solder joint, ground seat.
- D. Dielectric Connections: Epco Sales, Inc., Cleveland, Ohio, or approved equal. Select gasket materials for compatibility with fluid used, temperature, and pressure.
  - 1. Unions, 2" and Smaller: 175 psi minimum working pressure, ends to match connections.
- E. No foreign pipe or fittings.
- F. Escutcheon Plates: Provide escutcheon plates similar to Grabler "Sure-lock" or Smith Figure "9070" at locations where pipe penetrates finished and semi-finished floors, walls or ceilings.

**2-6 DOMESTIC WATER PIPING, BELOW SLAB:**

- A. Type "k" soft copper with no joints below slab.

**2-7 DOMESTIC WATER VALVES, ABOVEGROUND: All bronze, solder ends, line size.**

- A. Gate: 150-pound SWP saturated, 300-pound WOG, integral seat, solid wedge, rising stem, screw-in bonnet. FS WW-V-54D, Type II, Class B. Nilco/Scott S-131 by Nilco, Inc. Elkhart, Indiana, or approved equal.

**2-8 DOMESTIC WATER ACCESSORIES:**

- A. Pressure Reducing Regulator Valve: Self-contained, bronze body, fast fill, fully adjustable, complete with strainer and pressure relief valve. (To be provided if pressure is in excess of 65 p.s.i.)
- B. Exposed Piping at Plumbing Fixtures: Chrome-plated brass pipe.
- C. Pipe Sleeves and Plates:
  - 1. Provide sleeves made from steel pipe or tubing for all pipes passing through concrete floors or walls. Sleeves for partitions shall be a minimum of 24 USS gauge galvanized iron. Size for outside diameter of insulation.
  - 2. Fit uninsulated pipe passing through or entering from floors, finished walls, or ceilings with heavy cast brass, chrome-plated escutcheons firmly secured to pipes with set screws.
- D. Air Chambers:
  - 1. Branch Air Chambers: Provide air chambers for hot and cold water branch piping of the same materials and the next larger diameter than the supply pipe.
  - 2. Hot and Cold Water Riser Air Chambers: Provide air chambers for hot and cold water riser minimum 1-1/2" pipe trade size x 24 inches high.

**2-9 INSULATION**

- A. Domestic Hot Water
  - 1. Insulate all pipe, fittings, and valves with factory molded fiberglass insulation of density not less than 3 pounds per cubic foot, and conductivity (k) not higher than 0.24 at 75 degrees F, mean temperature difference, with factory applied white vapor barrier jacket.
- B. Domestic Cold Water
  - 1. Same as mentioned above for hot water, in all exterior walls, or other areas subject to freezing.

**2-10 HANGERS, ANCHORS, AND GUIDES:**

- A. Insulated Pipe: Auto-Grip Insul-Speed hangers, Figure 800, by Fee and Mason Division, A-T-O, Inc., Manasquan, New Jersey, or approved equal. Size to fit outside diameter of insulation.
- B. Uninsulated Pipe: Adjustable band, copper-plated and plastic coated hanger, Figure 361, Fee and Mason Division, A-T-O, Inc., Manasquan, New Jersey, or approved equal.
- C. Anchors and Rods: Support by approved rods and anchors from building members. Perforated metal tape is prohibited.

**2-11 JOINT MATERIALS:**

- A. Hubless Cast Iron Pipe Joints: For aboveground pipe, stainless steel couplings, per CISPI 301-82.
- B. Compression Gaskets: For below ground, cast iron hub and spigot pipe and fittings, as approved.
- C. Solder: ASTM B32-83. 95-5, tin-antimony. The use of solder containing more than 0.20 percent lead will not be permitted.

**2-12 PLUMBING FIXTURES:**

- A. General: Color shall be selected by Architect. Fixtures shall be complete with all required specialties, trim, supports, and related items. Provide screwdriver-operated stops and escutcheons on all piping brass P-trap with tubing drain to wall. Size to match tailpiece with chrome plated escutcheon. Products manufactured by American Standard, Kohler, Eljer, Fiat, Just, are acceptable.
- B. Chair carriers and urinal supports: Provide chair carriers, Smith Figure 110-L, 110-R, 110-D, or Zurn as required for wall hung water closets. Provide Smith #693 wall supports. Provide carriers for wall hung lavatories and drinking fountains.
- C. Refer to Construction Documents for further specifications

**2-13 PIPE IDENTIFICATION:**

- A. Pipe Marking:
  - 1. All visible piping located in accessible spaces such as equipment rooms, attic space, under floor spaces, etc., shall be identified with all temperature pipe markers as manufactured by W.H. Brady Company, 431 West Rock Ave., New Haven, Connecticut, or approved equal.
  - 2. Pipe shall be marked as follows:
 

System	Color
Sanitary Sewer	Green
Domestic Cold Water	Blue
Domestic Hot Water	Yellow

**PART 3: EXECUTION**

**3-1 GENERAL:**

- A. Locate equipment requiring service and maintenance in fully accessible positions. Furnish access doors for this purpose if required.
- B. Runs and arrangement of piping shall be as shown, subject only to such changes and modifications as may be necessary to suit actual conditions at the building, to avoid interference or conflict with work of other sections. Install piping concealed in floor or in wall construction or excavations to prevent delay to other work and to allow ample time for necessary tests and approvals.
- C. Carefully check installations against structural, architectural, and mechanical drawings and note where walls, ceilings, beams, and pipe shafts are furrowed or enclosed. Piping shall not be furrowed in or covered before approval.
- D. Hang horizontal piping runs from ceilings or construction above. Locate as closely as possible to structural members or bottom of slabs or beams to obtain maximum head room. If piping interferes with finished ceiling or wall surfaces, the Engineer shall be notified, and no work shall be installed until approved.
- E. Make joints between dissimilar piping by dielectric unions or flanges.
- F. Use reducing fittings wherever a change in pipe size occurs. The use of bushings will not be permitted.

**3-2 INSTALLATION OF SANITARY SYSTEM:**

- A. Pitch cast iron pipe within the building a minimum of 1/8" per foot in the direction of flow. Make changes in direction of drainage lines with 45-degree wyes, long turn wyes, or sweep bends. Use long turn fittings wherever space conditions permit. Provide waterproofing around all lines penetrating through foundation walls and floor slabs.
- B. Check and verify all inverts of lines at connection points.
- C. Install traps on fixtures and equipment requiring connection to the sanitary system. Traps shall be of same size as the pipe on which they occur. Provide clean outs for all traps. Vent traps as shown and as required by local codes.
- D. Clean outs: Provide at each change in direction, and on a minimum of 90-foot centers at horizontal runs, or as stated in local code. Cleaning screws, deck plates, and other plugs shall be made up with graphite and oil only; use no grease or cement.
- E. Pitch vent lines to allow for condensation drainage.
- F. Where vent piping is run concealed in partitions, obtain exact dimensions and locations of partitions and use special care to ensure that lines are maintained in their proper locations.
- G. Flashing: Flash vents penetrating the roof structure with 6 pound sheet lead. Extend flashing riser beyond top of vent and turn over and roll down inside of pipe vent a minimum of 1/2" with skirt extending on all sides of the vent a minimum of 8".

**3-3 INSTALLATION OF COLD WATER SYSTEM:** Install cold water system as shown. Piping shall traverse the building at the locations shown, or as required to service fixtures requiring cold water, and with the pipe sizes shown or specified. The service shall be valved at the point shown. Locate underground service a minimum of 3' below grade. Fit pipe connections to mechanical equipment with unions for ease of dismantling. Conceal cold water piping in finished areas.

**3-4 INSTALLATION OF HOT WATER SYSTEM:** Begin the installation of the hot water piping system at the water heater and traverse the building at the locations shown, or as required to service fixtures requiring hot water, and with the pipe sizes indicated. Fit piping around the heater and equipment with sufficient number of unions to ensure easy dismantling for maintenance. Conceal hot water piping in finished areas.

**3-5 HANGERS, ANCHORS, GUIDES:**

- A. Support piping to maintain required grading and pitching of lines, to prevent vibration, and to secure piping in place. Arrange to provide for expansion and contraction.
- B. The spacing of hangers shall be not greater than 10 feet on center for pipe larger than 1 inch; 8 feet for 1 inch pipe; 6 feet for pipe 3/4" and smaller. Same spacing shall apply to gas piping on roof.
- C. Support vertical lines at bases by an approved hanger placed in the horizontal line near the riser.
- D. Do not hang piping from the ductwork or piping of other trades. A common trapeze, properly supported and pitched, may be used.
- E. Make pipe sleeves watertight with 25-year siliconized sealant joints on both sides of foundation wall.

**3-6 INSTALLATION OF PLUMBING FIXTURES:**

- A. Protect fixtures and equipment during construction. Replace if damaged.
- B. Set fixtures level and square with relation to interior finish, floor, and wall lines. Space toilet room fixtures equidistant and at the same height from floor as shown.
- C. Cover metal fixture trimmings with noncorrosive grease or approved protective tape and maintain until construction work is complete. Upon completion, remove protection and labels; clean and polish fixtures and trimmings.

**3-7 TESTING OF PLUMBING PIPING SYSTEMS:**

- A. During the progress of the work and upon completion, tests shall be made as specified herein and as required by Architect and Engineer. The Architect and Engineer shall be notified in writing at least 2 working days prior to each test.
- B. Tests shall be conducted as part of this work and shall include all necessary equipment and qualified personnel.
- C. Tests shall be performed before piping of various systems have been covered.
- D. All piping systems shall be tested and proved absolutely tight for a period of not less than 24 hours. Tests shall be witnessed by the Architect or an authorized representative.
- E. Leaks, damage or defects discovered or resulting from test shall be repaired or replaced to a like new condition.
- F. Wherever conditions permit, each piping system shall thereafter be subjected to its normal operating pressure and temperature for a period of no less than 5 days. During that period, it shall be kept under the most careful observation. The piping systems must demonstrate the propriety of their installation by remaining absolutely tight during this period.
- G. Domestic Water:
  - 1. Pressure test at one and one half times the normal working pressure or 125 psig, whichever is the greater, for 24 hours.
- H. Sanitary Soil, Waste and Vents:
  - 1. After the rough-in; soil, waste and vent and other parts of the sanitary sewer including branch laterals, from the lowest level, at point of connection to existing utility line, to the vent terminus, all outlets shall be temporarily plugged or capped, except as are required for testing as described herein. The piping shall be readied as described herein and completely filled with water, and held for a period of no less than 12 hours.
  - 2. Should the completion of these tests leave any reasonable question or doubt of the integrity of the installation, additional tests including peppermint smoke, or other measures shall be performed to demonstrate the reliability of these systems to the complete satisfaction of the Owner's duly authorized representative.

END OF SECTION