PART 1: GENERAL

1.01 The design guidelines contained herein include the requirements for drainage and vent systems utilized at The University of Texas at Austin. It is the intention of this document to provide a standard for drainage and vent systems at The University that represent the highest level of quality and consistency possible; it is not intended to be a guide specification.

PART 2: PRODUCTS

2.01 Manufacturers

A. Standard manufacturers for Drainage Piping Specialties, including expansion joints, drains, trap primers, and vandal-proof vent caps:

3. Tyler Pipe; Subs. of Tyler Corp.
4. Zurn Industries Inc; Hydromechanics Div.

B. Freeze-proof vent caps:


C. Non-Metallic Trench Drains:

1. ACO Drain Inc.
2. Quazite Corp.

2.02 Above Ground Drainage And Vent Pipe And Fittings

A. Cast-Iron Soil Pipe: ASTM A74, Service weight, hub-and-spigot soil pipe and fittings with 125# Clamp all or equivalent clamps.

B. Polypropylene Pipe and Fuseal Fittings (or Engineer-approved equal): use for acid waste and vent piping in laboratories

2.03 Underground Building Drain Pipe And Fittings

A. Cast-Iron Soil Pipe: ASTM A74, Service weight, hub-and-spigot soil pipe and fittings. Pipe and fittings shall have a heavy coating of coal tar varnish or asphaltum on both inside and outside surfaces.

B. Neoprene Compression Gaskets: ASTM C564.
A. **Expansion Joints**: Cast-iron body with adjustable bronze sleeve, bronze bolts with wing nuts.

B. **Cleanout Plugs**: Cast-bronze or brass, threads complying with ANSI B2.1, countersunk head.

C. **Floor Cleanouts**: Cast-iron body and frame, with cleanout plug and adjustable round top.

D. **Wall Cleanouts**: Cast-iron body adaptable to pipe with cast-bronze or brass cleanout plug; stainless steel cover including screws.

### 2.05 Floor Drains

A. **Floor drains** shall be provided with deep seal “P” traps at all floor drains.

B. **Floor Drain (Basement and air handler rooms)** 12" x 12" floor sink with half-grate strainer, caulked outlet, dura-coated. Similar to Zurn Z-567. There shall be adequate floor drains to provide drain for all equipment requiring same; one per piece of equipment, to eliminate excessive drain piping across floors.

C. **Floor Drain (for boiler rooms)**: Cast-iron body and tractor grate, flashing flange and collar.

D. **Galvanized body, ductile iron grate, solid bucket; hinged bar grate**

   **Floor Drain (Corridors and Hallways)** Cast-iron body and flashing collar with closure plug, nickel bronze adjustable strainer head with secured square hole grate.

E. **Floor Drain (mechanical rooms and other remote areas)** shall be provided with a central piped primer system which automatically primes traps building wide using a single timed valve for one minute every 24 hours (or adjustable.)

### 2.06 Depressed Area Drains

A. **Floor Drain (depressed area drains)**: Cast-iron body for horizontal mounting secured grate.

B. **Floor Drain (medium traffic and drainage)**: Cast-iron body and flashing collar with adjustable top, and tractor grate

C. **Floor Drain (heavy traffic, light drainage)**: Cast-iron body and flashing collar with cast-iron tractor grate
D. **Floor Drain (shower and toilet rooms):** Cast-iron body and flashing collar with the following features: closure plug, nickel bronze adjustable strainer head with secured square hole grate.

2.07 **Trench Drains**
A. Cast-iron shallow hub body and grate with end plates and gaskets, assembled in standard lengths for total length and width as indicated

2.08 **Roof Drains**
A. **Roof drain (Type designations and sizes):** As indicated on Drawings.
B. **Roof Drain (General Purpose)** Cast-iron body with combined flashing collar and gravel stop, cast-iron dome.
C. **Roof Drain (controlled flow)** Cast-iron body, combined flashing collar and gravel stop, cast-iron dome with adjustable flow rate control assembly
D. **Roof Drain (steel roof decks)** Cast-iron body, combined flashing collar and gravel stop, cast-iron dome
E. **Roof Drain (parapet roofs)** Cast-iron body, flashing device, loose set grate

PART 3: EXECUTION

3.01 **Dye Testing Of Sanitary Drains**
A. Contractor shall dye-test all floor, hub, sink and equipment drains to verify that they are not connected to the storm sewer system. Prior to testing, contractor shall notify UT Utilities to notify private and public agencies of potential color in the creek.
B. On a day when water in the downhill creek is clear, contractor shall introduce 1 fluid ounce of 50% uranine dye into each such "sanitary" drain, followed immediately by a gallon or more of water. Contractor shall station a non-color-blind employee at the creek to watch for signs of dye, from the time the dye is first introduced until an hour after the last dye addition. This time period may be extended by the Inspector, depending upon local conditions.
C. Contractor shall certify in writing to the University Project Manager that there was no evidence of dye entering the creek.

3.02 **Examination**
A. **Verify existing grades, inverts, utilities, obstacles, and topographical conditions prior to installations.**

3.03 **Pipe Applications - Above Ground, Within Building**
A. **Install hubless, service weight, cast-iron soil pipe and fittings for drainage and vent pipe.**
SECTION 15420 - DRAINAGE AND VENT SYSTEMS
CONSTRUCTION STANDARD

3.04 Pipe Applications - Below Ground, Within Building
   A. Install hub-and-spigot, extra-heavy weight, cast-iron, soil pipe and fittings with
gasketed joints for 15 inch and smaller drainage pipe.

3.05 Pipe And Tube Joint Construction:
   A. Copper Tubing: Solder joints in accordance with the procedures specified in
      ASW "Soldering Manual".
   B. Cast-Iron Soil Pipe: Make all joints in accordance with the CISPI Cast Iron Soil
      Pipe and Fittings Handbook, Chapter IV.
   C. PVC DWV Pipe: Joining and installation of PVC drainage pipe and fittings
      shall conform to ASTM D2665.

3.06 Installation
   A. General Locations and Arrangements: Drawings (plans, schematics, and
      diagrams) indicate the general location and arrangement of the piping systems.
      Location and arrangement of piping layout take into account many design
      considerations. So far as practical, install piping as indicated.
   B. Use fittings for all changes in direction and all branch connections.
   C. Install exposed piping at right angles or parallel to building walls. Diagonal
      runs are not permitted, unless expressly indicated.
   D. Install piping free of sags or bends and with ample space between piping to
      permit proper insulation applications.
   E. Conceal all pipe installations in walls, pipe chases, utility spaces, above
      ceilings, below grade or floors, unless indicated to be exposed to view.
   F. Install piping tight to slabs, beams, joists, columns, walls, and other permanent
      elements of the building. Allow sufficient space above removable ceiling
      panels to remove panel.
   G. Exterior Wall Penetrations: Seal pipe penetrations through exterior walls using
      sleeves and mechanical sleeve seals. Pipe sleeves smaller than 6 inch shall be
      steel; pipe sleeves 6 inch and larger shall be sheet metal.
   H. Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions,
      ceilings, and floors, maintain the fire rated integrity. Refer to Division 7 for
      special sealers and materials.
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I. Make changes in direction for drainage and vent piping using appropriate 45
degree wyes, half-wyes, or long sweep quarter, sixth, eighth, or sixteenth bends.
Sanitary tees or short quarter bends may be used on vertical stacks of drainage
lines where the change in direction of flow is from horizontal to vertical, except
use long-turn tees where two fixtures are installed back to back and have a
common drain. Straight tees, elbows, and crosses may be used on vent lines.
No change in direction of flow greater than 90 degrees shall be made. Where
different sizes of drainage pipes and fittings are connected, use proper size,
standard increasers and reducers. Reduction of the size of drainage piping in
the direction of flow is prohibited.

J. Install underground building drains to conform with the uniform plumbing
code, and in accordance with the Cast Iron Soil Pipe Institute Engineering
Manual. Lay underground building drains beginning at low point of systems,
true to grades and alignment indicated with unbroken continuity of invert.
Place bell ends of piping facing upstream. Install required gaskets in
accordance with manufacturer's recommendations for use of lubricants,
cements, and other special installation requirements. Maintain swab or drag in
line and pull past each joint as it is completed.

K. Install building drain pitched down at minimum slope of 1/4 inch per foot (2
percent) for piping 3 inch and smaller, and 1/8 inch per foot (1 percent) for
piping 4 inch and larger.

L. Extend building drain to connect to sewer piping, of size and in location
indicated in construction standards. Sewer piping is specified in a separate
section of Division 2.

M. Install sleeve and mechanical sleeve seal through foundation wall for watertight
installation.

N. Install 1-inch thick extruded polystyrene over underground building drain
piping that’s not under building. Width of insulation shall extend a minimum of
12 inches beyond each side of pipe. Install directly over, and center on pipe
centerline.

3.07 Hangers And Supports

A. General: Hanger, supports and anchor devices are specified in Division 15
Section "Basic Mechanical Materials and Methods". Conform to the table
below for maximum spacing of supports:

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal runs less than 20
feet in length.

C. Install hangers at the following intervals:

| PIPE MATERIAL | MAX HORIZ | MAX VERT |
SECTION 15420 - DRAINAGE AND VENT SYSTEMS
CONSTRUCTION STANDARD

<table>
<thead>
<tr>
<th>SPACING IN FEET</th>
<th>SPACING IN FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS Pipe</td>
<td>4</td>
</tr>
<tr>
<td>Cast-Iron Pipe</td>
<td>5</td>
</tr>
<tr>
<td>Copper Tubing 1-1/4&quot; and smaller</td>
<td>6</td>
</tr>
<tr>
<td>Copper Tubing 1-1/2&quot; and larger</td>
<td>10</td>
</tr>
<tr>
<td>PVC Pipe</td>
<td>4</td>
</tr>
</tbody>
</table>

3.08 Installation Of Piping Specialties

A. Do not install backwater valves in sanitary building drain piping.

B. Install expansion joints on vertical risers as indicated, and as required by the plumbing code.

C. Above Ground Cleanouts: Install in above ground piping and building drain piping as indicated, and:

   1. as required by plumbing code;
   2. at each change in direction of piping greater than 45 degrees;
   3. at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping.
   4. at the base of each vertical soil or waste stack.

3.9 Installation Of Floor Drains

A. Set drain elevation depressed below finished slab elevation as listed below:

   DEPRESSION IN INCHES RADIUS OF AREA DRAINED - FEET
   1/2         5
   3/4         10
   1          15
   1-1/4      20
   1-1/2      25

B. Prior to trapping drains connected to the sanitary sewer, coordinate requirements with Owners representative.

END OF STANDARD 15420