
221300 FACILITY SANITARY SEWERAGE

Part 1 – GENERAL

1.1 Description

A. This section details the guidelines and expectations for the design and installation of sanitary waste and vent piping on Johns Hopkins University Homewood Campus. Project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification and approval from the JHFRE Engineering and Energy Department, it is expected that these guidelines will govern the design and specifications.

B. A complete sanitary drainage system shall be provided for all, but not limited to, plumbing fixtures, sanitary floor drains, kitchen equipment and equipment with sanitary, soil or waste drainage/discharge.

C. Chemically treated mechanical discharge from cooling towers, boilers, chillers, blowdown and other mechanical equipment shall discharge to the sanitary drainage system for treatment and protection of the environment and waterways.

1.2 Submittals

A. The drainage fixture unit (DFU) capacity for every interval, branch, stack and total building shall be calculated and submitted to JHFRE as part of Design Development package.

1.3 Quality Assurance

A. All design and components shall comply with governing codes and regulations.

B. The drainage fixture unit (DFU) must be recalculated if any changes to the sanitary waste piping or venting are made during construction due to unforeseen circumstances. This includes verification of the slope every 20' of run and adherence to hydraulic jump code requirements in the NSPC.

1.4 Delivery and storage

A. Material deliveries and storage areas to be approved by Owner.

B. Material storage to comply with manufacturer's recommendations.

Part 2 – PRODUCTS

2.1 For laboratories, use acid resistant piping with mechanical joints.

2.2 Underground soil/waste and vent piping shall be hub and spigot, cast iron soil pipe, service-weight class with hub and spigot or cast iron, soil-pipe fittings and compression joints with elastomeric gasket (by pipe manufacturer).

2.3 Aboveground soil/waste piping shall be CISPI hub-less (“No-Hub”), cast iron pipe with heavy duty, type 304 stainless steel couplings.

2.4 Aboveground vent piping shall be hub-less (“No-Hub”), cast iron pipe, hub-less, cast iron, soil-pipe fittings and heavy duty, type 304 stainless steel couplings or DWV (Drainage, Waste and Vent - Yellow Print).

2.5 Use cast iron hub piping for lines under concrete floor slabs, behind walls, or in other inaccessible areas where high-temperature liquids, such as steam condensate, may be discharged to drain.

2.6 Grease Interceptors

A. Drains and fixtures discharging grease laden waste within 10’ of the cooking battery, mop and service sinks in kitchen areas, and as required by the state health department and local authorities shall discharge to a grease interceptor prior to connecting into the sanitary sewer. Grease interceptors shall be sized compliant with requirements of the local authority and the Plumbing and Drainage Institute PDI-G101 (whichever is larger).

B. Exterior underground gravity grease interceptors shall be sized per manufacturer guidelines or the latest National Standard Plumbing Code Illustrated but shall be reviewed by JHFRE for approval. A central grease interceptor located outside, below-grade with a ladder built into the basin wall in an approved basin shall be provided to the maximum extent practical.

2.7 Sanitary Floor Drains

A. Provide trap primers or trap guards for all sanitary drains (floor drains, receptors, open site drains, hub drains, etc.).

1. Waterless trap primers with ASSE-1072 certification shall be considered for all applications.

B. In general, floor drains shall be cast iron body type, 3” diameter outlet, with 6” diameter nickel-bronze strainers for public toilets, kitchen areas and other public areas.

C. Receptors, open-site drains, hub drains and similar drains shall have dome bottom sediment strainers (in addition to pedestrian/vehicle grate strainers where required) to reduce splashing, increase free area and prevent debris blockage. Drain body, frame and grate strainers shall be rated for expected wheel loading, and shall include drain adapters, extensions, receivers, deck clamps and similar as required. Drain strainer free area shall be equal to or greater than the free area of the calculated outlet pipe size area. Drain strainers in pedestrian areas shall be heel-proof type. Every drain and system opening shall have 1/4” maximum strainer openings for rodent-proofing. Drains accepting indirect waste shall have an appropriately-sized funnel that matches the same material as the drain strainer.

D. Receptor drains outlets shall be twice the area of combined inlet pipe areas. Equipment room areas shall require large diameter cast iron strainers and parking garages shall require large diameter tractor grates rated for expected wheel loading. Ramp drainage shall require either trench drains or roadway inlets when exposed to rainfall.

E. Any floor drain located within a food preparation or disposal area shall have a grinder system installed.

Part 3 – EXECUTION

3.1 All roof drains shall be insulated and covered with a vapor barrier. Starting at the interior side of the roof, at least 10' of insulation shall be installed in a continuous manner.

3.2 All vertical roof drains and sanitary drain lines shall be cast iron to minimize noise.

3.3 PVC plumbing vents that are exposed to sunlight shall be painted with two coats of water based latex paint.

3.4 Cleanouts shall be installed every 45' on any ground level sanitary lines.

3.5 Cleaning, Flushing, Treating and Testing Drainage and Piping

A. Test drainage and vent piping according to procedures of authorities having jurisdiction.

B. Clean interior of piping system. Remove dirt and debris as work progresses.

C. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

D. Place plugs in ends of uncompleted piping at end of day and when work stops.

E. Protect plumbing vents exposed to sunlight with 2 coats of water-based latex paint.

F. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended or repaired, if testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

G. New, altered, extended or replaced drainage and vent piping shall be covered and concealed until it has been tested and approved.

H. Test drainage and vent piping, except outside leaders, on completion of roughing-in.

I. After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Coordinate smoke or peppermint test with the Project Manager.

J. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.

K. Prepare reports for tests and required corrective action.

L. Test force-main piping by leaving uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Cap and subject piping to static-water pressure of 50psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute

defects that shall be repaired. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained. Prepare reports for tests and required corrective action.