



Division 33. Utilities

See Section 32 for requirements on Utility Plan Preparation.

33 10 00. Water Utilities

33 11 00. Water Utility Distribution Piping

1. All underground pipe material, 4 inch diameter and larger shall be HDPE-wrapped class 52 ductile iron pipe conforming to ASA Standard A21.51 and AWWA C105 or HDPE as approved by UW Facilities Planning and Management (FP&M).
2. Pipes under 4 inches in diameter shall be copper, conforming to the requirements of the “Specifications for Seamless Copper Water Tube,” ASTM B88.
3. All abandoned water piping and appurtenances shall be removed from the ground.
4. For new building water services, provide two water services into the building directly from the water main. Include a valve on both new water services and a new valve installed on the main between the two new connections. Coordinate this with interior plumbing and valve design.
5. Hydrants:
 - 5.1. All fire hydrants shall conform to the City of Madison Water Utility standards for manufacturer and placement.
 - 5.2. There shall be no obstructions, including but not limited to: power poles, trees, bushes, fences, posts located, or grade changes exceeding 1½ feet, within 5 feet of a fire hydrant.
 - 5.3. Hydrants shall be located so the front nut is 3 feet behind the back of curb (or 3½ feet from the edge of pavement with no curb)
6. Valves:
 - 6.1. When feasible, building water service valves should be within the pavement and not in street terrace. Valves shall never be into the curb & gutter.

33 30 00. Sanitary Sewerage Utilities

General

1. The design consultant is responsible for identifying and obtaining documentation for all sanitary sewer service permits, approvals, and agreements issued or required by regulatory agencies or municipalities. The design consultant shall provide designs and plans that comply with all said permits, approvals and agreements. Consultant shall apply for and obtain approval from MMSD and/or City of Madison when existing permits are affected or when new sanitary permits are needed.
2. All plans that effect or are adjacent to any MMSD or city of Madison utility shall be submitted to them for approval by the design consultant.



33 39 00. Sanitary Utility Sewerage Structures

33 39 13. Sanitary Utility Sewerage Manholes, Frames, and Covers

1. All sanitary utility sewer manholes lids shall have “sanitary sewer” cast onto them. Casting is the same; however, Neenah’s standard lid with the text shall be used. The lids shall be Type B, self sealing, non-rocking, with concealed pick holes, and are typically gasketed. There should be no additional cost of these lids over the standard type B lid.
2. Eccentric cones shall be used at the top of manholes.
3. Steps shall not be included in sanitary manhole structures.
4. All abandoned sanitary sewers and structures shall be removed from the ground.
5. Sanitary laterals shall be connected directly in to a manhole rather than a wye in the sewer main.
6. Casting shall never be in the curb & gutter.

33 40 00. Storm Drainage Facilities

1. Storm Sewer Pipe: Use minimum 12 inch pipe for all storm sewers.
 - 1.1 Reinforced Concrete Pipe (RCP) shall be used for all storm pipe 12 inches and larger.
 - 1.2 Building storm sewers can be less than 12 inches and shall be PVC. HDPE storm pipe shall not be used unless approved by the UW Plumbing Shop.
 - 1.2 When exterior building downspouts are directed to storm sewer, downspouts shall be directed down inside larger open ended piping at a minimum of 4 inches above grade.
 - 1.3 All pipe apron endwalls shall be reinforced concrete and have epoxy coated pipe grates.
 - 1.4 A minimum of 12 inch RCP shall always be used when an outfall pipe apron is needed.
 - 1.5 Storm sewers shall not contain bends, curves, or siphons. Storm sewers shall not be constructed such that a sump condition is created and cause water to remain standing in the pipe.
 - 1.6 When same size pipes meet at a storm structure, the downstream pipe invert shall be at least 0.1 feet below the upstream pipe inverts.
 - 1.7 When pipe sizes increase in a storm structure, the inside top elevations of the upstream and downstream pipes shall match. However, a larger drop in pipe invert elevations is acceptable when necessary.
 - 1.8 All abandoned storm sewer shall be removed from the ground.



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- 1.9 Storm sewer shall have a minimum of 12 inch cover above top of pipe and shall never have the top of pipe into the pavement gravel base course or pavement.
 - 1.10 When a project requires connecting to a City of Madison or MMSD sewer, the A/E is responsible for determining the permitting/approval requirements, designing systems that meet those requirements, and obtaining the permit/approval.
 2. Pipe Culverts
 - 2.1 Material for new or replaced culverts, on or off campus, shall be RCP.
 3. Storm Drainage Structures, Frames, and Covers
 - 3.1 Castings:
 - 3.1.1 All storm drainage manholes lids shall have “storm” cast onto them. Casting is the same; however, Neenah’s standard lid with the text shall be used. The lids shall be Type B, self sealing, non-rocking, with concealed pick hole, and are typically not gasketed. There should be no additional cost of these lids over the standard type B lid.
 - 3.1.2 Use Neenah casting R-3067 (per DFD Standard) for storm curb inlets in both 18 inch and 30 inch Curb & Gutter except as stated below.
 - 3.1.3 Use Neenah R-3170 casting for storm curb inlets in 18 inch curb & gutter when it runs parallel to a bike lane or abutting concrete pavement. This is a smaller inlet so it may require additional inlets.
 - 3.1.4 Use Neenah Casting R-3067 for storm curb inlets in parking lots.
 - 3.1.5 Since most storm inlets drain to the lake, then all inlets shall have a cast logo on it that says “Dump No Waste Drains to Lake”
 - 3.1.6 Manhole castings shall never be in the curb & gutter.
 - 3.1.7 Round castings, rather than square, shall be used for catch basins, pavement inlets, and yard inlets unless approved by UW FP&M.
 - 3.1.8 Exterior trench drain castings shall be cast iron.
 - 3.2 Structures:
 - 3.2.1 Integral steps shall not be included in storm structures.
 - 3.2.2 Inlet detail drawings shall be based on City of Madison Type H inlet standards.
 - 3.2.3 All abandoned sanitary sewer structures shall be removed from the ground.
 - 3.3 Submit the storm water management plan, maintenance plan, any storm water computations, storm sewer computations, pre & post development runoff rates/volumes, Notice of Intent, USLE worksheet, and other storm related documents and computations to Campus Planning & Landscape Architecture (CP&LA) prior to issuing Bid Documents.



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4. Stormwater Management Facilities
 - 4.1 The design consultant is responsible for identifying and obtaining all new and existing stormwater management permits, approvals, and agreements issued by regulatory agencies. Consultant shall provide designs and plans that comply with all said permits, approvals and agreements.
 - 4.2 In addition to regulatory requirements, site designs for newly developed and redeveloped campus areas shall address the *UW – Madison Policy* on stormwater runoff (2003) and incorporate stormwater sediment and nutrient controls as needed.
 - 4.3 A draft of the design computations for storm sewers and stormwater management facilities shall be submitted to the UW FP&M - Civil Engineer with the 35% review documents.
 - 4.4 Submit the storm water management plan, maintenance plan and any storm water computations, pre & post development runoff rates/volumes, Notice of Intent, Chapter 30 permits, USLE worksheet, and other storm related documents and computations to the UW FP&M - Civil Engineer with 100% review documents.
 - 4.5 Sustainable stormwater facilities that promote filtration and/or infiltration and reduce the amount of water entering storm drains are strongly encouraged.
 - 4.5.1 Examples include, but are not limited to, rain gardens, bio-retention areas, cisterns, green roofs, pervious pavers, porous surfaces, dense tree canopies, etc.
 - 4.5.2 Facilities that promote infiltration shall be at least 20 feet from building foundations to reduce risk of water entering basements.
 - 4.5.3 Where these facilities incorporate vegetation and are designed such that water may eventually enter Lake Mendota or the Lakeshore Nature Preserve, the plants selected shall not be on the Wisconsin DNR Invasive Species list and shall not spread aggressively. Native plant species shall be used.
 - 4.6 Raingardens, Bioswales, Bioretention Basins:
 - 4.6.1 The proposed use, implementation, and design of these types of facilities shall be coordinated with UW FP&M- CP&D and Campus Planning and Landscape Architecture (CP&LA) prior to the 35% review.
 - 4.6.2 Engineered soils shall be designed for the specific project and coordinated with UW FP&M. The design shall take into consideration the latest WDNR guidelines as well as the engineered soils effect on increase nutrient loading to groundwater. (i.e increase phosphorus caused by compost).
 - 4.7 Sediment sumps and vortex separator style sediment structures shall not be used on UW projects unless preapproved by UW FP&M- CP&D and the Plumbing Shop.

33 61 10.90 Underground Chilled Water Piping, Valves and Access

This is a DFD Standard Specification and shall be used for all applicable utility work.



33 63 03.90 Utility Tunnel, Steam Pits and Box Conduits

1. This is a DFD Standard Specification and shall be used for all applicable utility work. It can be obtained from DFD or UW Facilities Planning & Management.
2. Veneer for raised utility and steam tunnel access hatches shall match nearby building façade and samples shall be provided to UW CP&LA for approval.
3. Raised hatches shall be located at the edge of a site so they do not inhibit, obstruct, or limit maintenance activities, student activities or any other outdoor activities. Existing raised hatch locations to be reconstructed shall be evaluated and relocated if they are inhibiting the use of the site.
4. Locations of all raised steam tunnel hatches and other raised utility hatches shall be reviewed by UW CP&LA.

33 70 00. Electrical Utilities

33 71 00. Electrical Utility Transmission and Distribution

33 71 19. Electrical Underground Ducts and Manholes

1. All underground electrical and signal manholes shall have water proofing membrane applied to the outside with a sump. A sump pump shall be installed at locations as deemed necessary. All electrical manholes shall have 120v power outlet and lights inside the manhole.
2. All cast-in-place or pre-cast concrete manholes shall be reinforced with epoxy coated reinforcing steel.