



Division 33 Utilities

33 05 00 Common Work Results for Utilities

32 05 10 General Requirements for Exterior Improvements

1. Utility Work for all UW Madison facilities shall comply with all the provisions of the latest version of the Division of Facilities Development (DFD) Civil, Site, and Utility Design Guidelines, Deaerator Heater and Storage Tank Inspection Policy, and Weld Filler Metal Selection Guideline for Various Metal Combinations, which are available from the DFD website.
2. References within the DFD Guidelines regarding the DFD Project Manager shall apply to the UW-Madison Project Manager on UW-Madison Managed Projects.
3. Project Specifications shall use as their basis all appropriate sections of the latest edition of the DFD Master Specifications.
4. Deviations from DFD's Minimum Design Guidelines or the DFD Master Specification sections shall be made only upon approval from the UW-Madison Project Manager.
5. The Guideline for Planning and Design of UW-Madison Facilities shall take precedence over DFD Guidelines, but the A/E shall discuss all conflicts within the guidelines and specifications with the UW Project Manager.
6. The goals and guiding principles of the UW-Madison Campus Master Plan (latest edition) shall be considered and referenced as part of the planning, design, detailing, and material section for every project.
7. When determining the placement of all utilities, locate them to minimize current and future impact to identified building sites in the campus master plan, historic buildings and archeological sites, existing mature trees, trees of importance (i.e. teaching trees or donor trees), programed outdoor spaces, and other planting areas of significance whenever possible. Coordinate in preplanning phase and initial design phase with UW-Madison Campus Planning & Landscape Architecture.

33 05 20 Drawing Requirements for Utilities

See Section 32 05 20 Drawing Requirements for Exterior Improvements.

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-Madison Facilities Planning and Management (FP&M).
2. Pipes under 4" shall be Type K copper water tube, O (annealed) temper, ASTM B88; with cast copper pressure fittings, ANSI B16.18, wrought copper pressure fittings, ANSI B16.22; with copper-phosphorous-silver brazing.



3. All abandoned water piping and appurtenances shall be removed from the ground.
4. Building water services shall terminate with a threaded flange on the ductile iron service pipe. Bolt on or quick flanges shall not be allowed.
5. 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.
6. Hydrants:
 - 6.1. All fire hydrants shall conform to the City of Madison Water Utility standards for manufacturer and placement.
 - 6.2. There shall be no obstructions, including but not limited to: power poles, trees, shrubs, fences, posts located, or grade changes exceeding 1½ feet in height, within 5 feet of a fire hydrant.
 - 6.3. 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)
7. Valves:
 - 7.1. 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 into 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-Madison 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.
 - 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, 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-Madison 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 UW-Madison Campus Planning & Landscape Architecture (CPLA) prior to issuing Bid Documents.

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), the latest edition of the UW-Madison Campus Master Plan, and incorporate stormwater sediment and nutrient controls as needed.



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- 4.3 A draft of the design computations for storm sewers and stormwater management facilities shall be submitted to the UW-Madison 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-Madison FP&M - Civil Engineer with 100% review documents.
 - 4.5 Sustainable stormwater facilities and best practices 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 concrete, 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 Regulated or the Non-Regulated Wisconsin DNR Invasive Species lists and shall not spread aggressively. Native plant species shall be used when site conditions allow.
 - 4.6 Raingardens, Bioswales, Bioretention Basins (Green Infrastructure):
 - 4.6.1 The proposed use, implementation, and design of these facilities shall be coordinated with UW-Madison FP&M, CP&D, and CPLA prior to the 35% review.
 - 4.6.2 Engineered soils shall be designed for the specific project and coordinated with UW-Madison FP&M. The design shall take into consideration the latest Wisconsin DNR guidelines as well as the engineered soils effect on increase nutrient loading to groundwater. (i.e increase phosphorus caused by compost).
 - 4.6.3 Consider and incorporate design features that will allow for easier removal of accumulated sediment within the green infrastructure.
 - 4.6.4 When vegetated slopes of green infrastructure are too steep for safe use or to maintain, consider stone retaining walls and seat walls to manage slopes and get depth required for stormwater collection.
 - 4.6.5 Consider how to make green infrastructure multifunctional and how people can safely interact with these features and learn about stormwater management. (i.e., incorporate seating, pollinator habitat, interpretive signs, seat walls, etc.)
 - 4.7 Sediment sumps and vortex separator style sediment structures shall not be used on UW-Madison projects unless preapproved by UW-Madison FP&M, CP&D, and the UW Plumbing Shop.



33 61 10 Underground Chilled Water Piping, Valves and Access

The latest version of DFD Standard Specification Section 33 61 10 shall be used for all applicable utility work.

33 63 03 Utility Tunnel, Steam Pits and Box Conduits

1. DFD Standard Specification Section 33 63 03.90 shall be used for all applicable utility work. It can be obtained from DFD or UW-Madison Facilities Planning & Management.
2. Veneer for raised utility and steam tunnel access hatches shall match nearby building façade and existing adjacent steam tunnel access hatches. Samples shall be provided to UW-Madison Project Manager and Campus Planning and Landscape Architecture 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, outdoor events, and the programming of outdoor spaces. Existing raised hatch locations to be reconstructed shall be evaluated and relocated if they are inhibiting the use of the site or pose a safety risk to those using the space.
4. Locations of all raised steam tunnel hatches and other raised utility hatches shall be reviewed by UW-Madison Campus Planning & Landscape Architecture.

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.