

PART III – CSU FACILITIES PLANNING, DESIGN AND CONSTRUCTION STANDARDS

DIVISION 33 – UTILITIES

11. Manhole lids for sanitary service shall have “SEWER” stamped into the lid.
12. Manholes in roadways and sidewalks shall have smooth lids set flush with the paving.
13. Cleanouts in vehicle traffic areas must be a traffic rated two-way type as referenced in Drawings Appendix.

33 40 00 – STORMWATER UTILITIES

- A. During the Conceptual Design and Design Development phases of a Project, the Designer must contact the CSU Floodplain Manager and evaluate the potential impact of the Project to the CSU Floodplain.
- B. If the Project boundary intersects with any portion of the CSU floodplain, the Project is required to retain CSU’s Floodplain Consultant to model the floodplain in the immediate vicinity of the Project, taking into account the Project structures and associated grading, and develop appropriate mitigation.
 1. Upon completion of Work in the CSU floodplain, a final certification survey and letter is required to be prepared and submitted to the Project Representative documenting the final grades and elevations of all exterior portions of the Project and all building openings.
- C. Storm sewer inlets shall be protected from excessive sediment and debris during construction Projects through erosion control efforts such as filter fabric, bales of hay, river rock, barricades, holding ponds, etc.
- D. Erosion Control Plans shall be required and submitted to the Project Representative for all Projects that have the potential for erosion.
 1. For additional information on Temporary Facilities and Controls, refer to Division 01 – General Requirements.
- E. Stormwater Utility Piping:
 1. Acceptable Products:
 - a. PVC DR35 with push-on joints
 - b. Reinforced Concrete Pipe (RCP) with push-on joints
 2. Products not Allowed:
 - a. None listed
 3. Discussion:
 - a. Stormwater main and service lines smaller than 18” nominal size shall be PVC. Lines 18” and larger nominal size shall be RCP.
 - b. All stormwater main and service line materials shall conform to applicable ASTM standards and Manufacturer recommendations for installation.
 - c. All PVC stormwater piping shall be “green” color.
 - d. Plastic gravity stormwater pipe and all fittings shall be manufactured in accordance with ASTM D3034.
 - e. Joints for PVC pipe shall be of the push-on bell and spigot type, and shall be manufactured in accordance with ASTM D3212.
 - f. Gaskets shall be of O-ring type and manufactured in accordance with ASTM F477.
 - g. Bells on PVC pipe shall be formed integrally with the pipe and shall contain a factory installed elastomeric gasket, which is positively retained.
 - h. RCP shall be manufactured in accordance with ASTM C76.

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- i. RCP joints shall incorporate an o-ring or profile type gasket manufactured in accordance with ASTM C443.
 - i. Gaskets shall be pre-lubricated, or lubricated per Manufacturer's instructions.
- j. Coordinate bedding material with FM Utility Services during design.
- k. All water line crossings shall conform to CDPHE "Design Criteria for Potable Water Systems" (e.g. encasement, separation).

F. Service Connections:

1. All service connections shall be made at a manhole.
2. If a manhole does not exist at a connection point, one shall be installed.
3. A two-way cleanout shall be installed at the building entry.

G. Stormwater Utility Catchbasins:

1. Acceptable Products:
 - a. None listed
2. Products not Allowed:
 - a. None listed
3. Discussion:
 - a. Stormwater catch basins and inlets shall be permanently labeled "No Dumping. Drains to River" using either an embossed lid or stamped wording in the surrounding concrete.
 - i. CSU's concrete stamp shall be used for this purpose.

H. Stormwater Utility Pumping Stations:

1. Not preferred. Coordinate with FM Utility Services if pumping stations are unavoidable.

I. Stormwater Detention and Water Quality Infrastructure:

1. Prohibited Elements:
 - a. Due to premature failure likelihood, CSU prohibits the inclusion of permeable concrete.
 - b. Due to maintenance burden, corrosion likelihood and the reduction of pervious surface, CSU prohibits underground stormwater detention facilities.

J. Stormwater Utility Manholes, Covers, and Cleanouts:

1. Manhole bases, benches and inverts shall be true to line and grade and smoothed with a light broom finish.
2. All manhole sections shall have two gaskets per section joint (one inside and one outside).
3. Preformed plastic gaskets shall conform to AASHTO M198 and Federal Specification SS-S-00210(210A).
4. Gaskets must be pliable at the time of installation.
5. Primer is required on all joints. Primer shall be supplied by the Gasket Manufacturer.

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6. Provide manholes at all stormwater line junctions and changes in direction. In some cases, cleanouts shall be allowed for lines 4" and smaller, but only upon specific approval of FM Utility Services.
7. All drop manholes shall conform to standard detail in the CSU Facilities Planning, Design and Construction Standards – Additional Documents.
8. Manhole lids shall have Aurora or Denver pick hole (concealed edge pry) to fit a lifter for removal.
9. Manhole lids for stormwater service shall have "STORM" stamped into the lid.
10. Manholes in roadways and sidewalks shall have smooth lids set flush with the paving.
11. Cleanouts in vehicle traffic areas must be a traffic rated two-way type as referenced in Drawings Appendix.

K. Subdrainage:

1. Permanent groundwater dewatering should be avoided.
2. Systems that require groundwater treatment on a permanent basis are prohibited.
 - a. Alternative construction shall be implemented to avoid permanent groundwater pumping that requires treatment.
 - b. To determine whether treatment shall be required, evaluate the groundwater within the Project Footprint through sampling and analysis, and review the most current State regulations and policies.
3. Groundwater dewatering during construction shall be managed in accordance with Part IV – Regulatory Requirements.

33 50 00 – HYDROCARBON UTILITIES

A. General Information:

1. Operational and building design information for the Main Campus natural gas utility:
 - a. System pressure east of the Center Avenue mall:
 - i. 5 psig
 - b. System pressure west of the Center Avenue mall:
 - i. 20 psig
 - c. Coordinate with FM Utility Services on available capacity.
2. Natural gas utilities on South, Foothills, and ARDEC campuses may or may not be owned by the University.
 - a. Coordinate with FM Utility Services.
3. All new building gas services shall include a meter and a regulator to be provided and installed by the Contractor.

B. Natural Gas Utility Piping:

1. Acceptable Products:
 - a. Polyethylene (MDPE) with butt fused joints
2. Products not Allowed: