



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

## DEPARTMENT OF NATURAL RESOURCES

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RETURN RECEIPT REQUESTED

August 1, 2014

Mr. Robert Fischer, P.E., District Engineer  
PWSD No. 2 of St. Charles County  
100 Water Drive  
O'Fallon, MO 63368

RE: Public Water Supply District (PWSD) No. 2 of St. Charles County – Sanitary Sewer  
Collection System Specifications, Standard Sewer Specifications and Details Comments

Dear Mr. Fischer:

The Missouri Department of Natural Resources' Water Protection Program has finalized the review of the Sanitary Sewer Collection System Specifications revised July 2013. We expect a response to the following requirements and recommendations below within 30 days receipt of this letter:

### REQUIREMENTS:

The following items are required to be in compliance with 10 CSR 20-8. The Sanitary Sewer Collection System Specifications must be updated to incorporate the following requirements.

1. Provide steep slope protection in accordance with 10 CSR 20-8.120(5)(D)6.
2. "Sewers twenty-four inches (24") (61 cm) or less shall be laid with straight alignment between manholes. Straight alignment shall be checked by either using a laser beam or lamping", per 10 CSR 20-8.120(5)(E)1. Include this requirement for straight alignment.
3. Incorporate curvilinear alignment of sewers consistent with 10 CSR 20-8.120(5)(E)2.
4. "Bedding Classes A, B, C, or crushed stone, as described in ASTM C12, shall be used and carefully compacted for all rigid pipe provided the proper strength pipe is used with the specified bedding to support the anticipated load based on the type of soil encountered and potential groundwater conditions", per 10 CSR 8.120(5)(H)3.A. Include this ASTM standard for rigid piping.
5. Address the bedding, haunching, and initial backfill of plastic pipe and composite pipe according to 10 CSR 20-8.120(5)(H)3.C and 10 CSR 20-8.120(5)(H)3.D respectively.



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6. "Debris, frozen material, large clods, stones, organic matter, or other unstable materials shall not be used for final backfill within two feet (2') (0.6 m) of the top of the pipe", per 10 CSR 8.120(5)(H)4.A. Include this requirement for final backfill.
7. "The test shall be conducted after the final backfill has been in place at least thirty (30) days to permit stabilization of the soil-pipe system", per 10 CSR 8.120(5)(H)5.A. Incorporate the 30 day requirement for deflection tests.
8. Update the deflection test requirements to specify that the mandrel must have nine or more odd number of flutes or points in accordance with 10 CSR 20-8.120(5)(H)5.C.
9. "When using precast manholes, drop connections must not enter the manhole at a joint," per 10 CSR 20-8.120(6)(B)3. Include this requirement for all drop type manholes.
10. "Due to unequal earth pressures that would result from the backfilling operation in the vicinity of the manhole, the entire outside drop connection shall be encased in concrete", per 10 CSR 8.120(6)(B)4. Detail C depicts compacted crushed limestone surrounding the drop connection. Revise this detail to concrete encasement of the drop connection.
11. Incorporate the bench requirements of manholes according to 10 CSR 20-8.120(6)(E).
12. "Precast manholes shall conform to the design and test methods specified in ASTM C478 and C497", per 10 CSR 20-8.120(6)(F)1. Revise Section 2.02 to include ASTM C497.
13. "Manhole lift holes, grade adjustment rings, precast section joints, and any additional areas potentially subject to infiltration shall be sealed watertight", in accordance with 10 CSR 8.120(6)(F)2. Include this provision to ensure a watertight manhole.
14. Provide corrosion protection for manholes consistent with 10 CSR 20-8.120(6)(H).
15. Per 10 CSR 20-8.120(8)(A)3, manholes shall be located so they do not interfere with the free discharge of flood flows of a stream. Specify this requirement with stream crossings.
16. Provide the appropriate construction materials for stream crossings in accordance with 10 CSR 20-8.120(8)(B)1.
17. Address the siltation and erosion with stream crossings according to 10 CSR 20-8.120(8)(B)2.
18. Incorporate the aerial stream crossings requirements consistent with 10 CSR 20-8.120(9).

19. "If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to one hundred fifty pounds per square inch (150 psi) (1,034 kPa) to assure watertightness", per 10 CSR-8.120(10)(C)1.B. Incorporate this requirement for the protection of water supplies.
20. "The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade", 10 CSR 8.120(10)(C)2.A. Include these requirements in Section 1.06.
21. When it is impossible to obtain proper vertical separation, the sewer shall be designed to be equal to water pipe and pressure tested or continuously encased or enclosed to assure watertightness in accordance with 10 CSR 8.120(10)(C)2.B.(I) and 10 CSR 8.120(10)(C)2.B.(II). Revise Section 1.06 to incorporate these crossing conditions.
22. Page IV:1 of the specifications states, "...MoDNR Design Guide per 10 CSR 10.8.120." This citation is incorrect and should be amended to 10 CSR 20-8.110.

#### **RECOMMENDATIONS:**

The Department is providing the following recommendations to improve the provided standard specifications and details. These recommendations are not required actions, but will allow for a more well-rounded standard specifications and details.

1. Recommend the addition of high velocity protection of pipes in accordance with 10 CSR 20-8.120(5)(D)5.
2. The current specifications include an air test for gravity sewers, but do not include the appropriate ASTMs for clay pipe, concrete pipe, and plastic, composite, and ductile iron pipe according to 10 CSR 20-8.120(5)(I)5. Please include the appropriate ASTMs for leakage air testing.
3. The addition of a watertight or bolt down manhole cover is recommended consistent with 10 CSR 20-8.120(6)(F)4.
4. The addition of the manhole exfiltration testing specified by ASTM C969 in accordance with 10 CSR 8.120(6)(G)2 is recommended.
5. "The bottom of the pipe should be placed no lower than the elevation of the fifty (50)-year flood", per 10 CSR 20-8.120(9)(C). Detail 304.04 states "bottom of casing pipe to be at a minimum of 1' above the 25 year flood elevation." Consider revising this detail note.

Mr. Robert Fischer, P.E., District Engineer  
August 1, 2014  
Page 4

6. "Manholes should be located at least ten feet (10') (3.0 m) horizontally from any existing or proposed water main", per 10 CSR 20-8.120(10)(C)1.C. This is a recommended addition to protect drinking water supplies.
7. Details can clearly demonstrate what the expectation is in certain instances often better than words. The following details are a suggested addition:
  - a. Shallow manhole;
  - b. Doghouse manhole;
  - c. Service connection;
  - d. Stream crossing;
  - e. Aerial crossing; and
  - f. Standard water and sewer separation.

Construction, installation, expansion or modification of any collection system or wastewater treatment facility is prohibited until a construction permit is issued by the Department, per 10 CSR 20-6.010(4)(A).

If you have any questions concerning this matter, please contact Mrs. Emily Carpenter at 573-751-6569, [emily.carpenter@dnr.mo.gov](mailto:emily.carpenter@dnr.mo.gov), or Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176. Thank you.

Sincerely,

WATER PROTECTION PROGRAM



Byron F. Shaw, Jr., P.E., SRF Engineering Unit Chief  
Financial Assistance Center

BFS:ecc

- c: St. Louis Regional Office  
Mr. Refaat Mefrakis, P.E., Water Protection Program, Engineering Section  
Mr. Byron Shaw, Jr., P.E., Water Protection Program, Financial Assistance Center  
Ms. Emily Carpenter, Water Protection Program, Financial Assistance Center

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