



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

DEPARTMENT OF NATURAL RESOURCES

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RETURN RECEIPT REQUESTED

June 18, 2014

Mr. Robert Williams, General Manager
Carthage Water & Electric Plant
P.O. Box 611
Carthage, MO 64836

RE: City of Carthage, MO – Standard Specifications for Sewer Main Construction Carthage Water and Electric Plant, Standard Sewer Specifications and Details Comments

Dear Mr. Williams:

The Missouri Department of Natural Resources' Water Protection Program has finalized the review of the Standard Specifications for Sewer Main Construction Carthage Water and Electric Plant the May 2013 Edition. 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 Standard Specifications for Sewer Main Construction Carthage Water and Electric Plant must be updated to incorporate the following requirements.

1. "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.
2. Incorporate curvilinear alignment of sewers consistent with 10 CSR 20-8.120(5)(E)2.
3. "Ledge rock, boulders, and large stones shall be removed to provide a minimum clearance of four inches (4") (10 cm) below and on each side of all pipe(s)", per 10 CSR 20-8.120(5)(H)2.C.
4. 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.

5. "No pipe shall extend a deflection of five percent (5%). If the deflection exceeds five percent (5%), the pipe shall be excavated", per 10 CSR 20-8.120(5)(H)5.B. Include these requirements in the deflection testing specifications.
6. Update the deflection test requirements to specify that the mandrel must have nine (9) or more odd number of flutes or points in accordance with 10 CSR 20-8.120(5)(H)5.C.
7. Page 02749-4 of the specifications provides an inaccurate citation to the Department's regulations. Update the provided citation of "10 CSR 20-8.120, Paragraph (H)5" to the correct citation 10 CSR 20-8.120(5)(H)5.
8. "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.
9. Incorporate the bench requirements of manholes according to 10 CSR 20-8.120(6)(E).
10. Provide corrosion protection for manholes consistent with 10 CSR 20-8.120(6)(H).
11. 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.
12. Provide the appropriate construction materials for stream crossings in accordance with 10 CSR 20-8.120(8)(B)1.
13. Address the siltation and erosion with stream crossings according to 10 CSR 20-8.120(8)(B)2.
14. Incorporate the aerial stream crossings requirements consistent with 10 CSR 20-8.120(9).
15. Provide the accepted deviation if the horizontal separation distance cannot be met in accordance with 10 CSR 20-8.120(10)(C)1.A. "Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on one (1) side of the sewer and at an elevation so the bottom of the water main is at least eighteen inches (18") (46 cm) above the top of the sewer."
16. Incorporate the requirement to pressure test the sewer in accordance with 10 CSR 20-8.120(10)(C)1.B.

17. “Sewer crossing water mains shall be laid to provide a minimum vertical distance of eighteen inches (18”) (46 cm) between the outside of the water main and the outside of the sewer”, per 10 CSR 20-8.120(10)(C)2.A. Incorporate this vertical distance for the protection of water supplies.

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. The Department observed the American Recovery and Reinvestment Act (ARRA) and Buy American requirements of 2009 included in the provided specifications. These requirements are not necessary for non-funded projects. Also, new State Revolving Fund projects do not require ARRA, and the Buy American conditions have changed. Please note this approval is invalid for funded projects, because of the additional stipulations in 10 CSR 20-4.
2. Pages 02749-3 and 02749-4 of the specifications state an exfiltration or infiltration rate of 200 gallons per inch of pipe diameter per mile per day. 10 CSR 20-8.120(5)(I)4 recommends a leakage rate not exceeding 100 gallons per inch or pipe diameter per mile per day.
3. The provided specifications address vacuum testing of manholes, but do not provide the appropriate ASTM. ASTM C1244 is recommended in accordance with 10 CSR 20-8.120(6)(G)1.
4. The provided specifications address exfiltration testing of manholes, but do not provide the appropriate ASTM. ASTM C969 is recommended in accordance with 10 CSR 20-8.120(6)(G)2.
5. “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.
6. 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. Concrete anchor;

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- d. Typical bore detail;
- e. Stream crossing;
- f. Aerial crossing; and
- g. Horizontal water & 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, of the Water Protection Program, at 573-751-6569, 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: Mr. Rick West, P.E., Anderson Engineering, Inc.
Southwest Regional Office
Mr. Refaat Mefrakis, P.E., Water Protection Program, Engineering Section
Mrs. Emily Carpenter, Water Protection Program, Financial Assistance Center