

SECTION 2500 – SANITARY SEWERS

CITY OF BELTON, MISSOURI

STANDARD SPECIFICATIONS

The City of Belton hereby adopts Section 2500 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, current edition. The following additions, deletions and/or revisions are adopted as a part of Section 2500 for use within the City of Belton.

SECTION 2503 MATERIALS

2503.2 Pipe, Fittings, Joints, Coatings and Linings:

Add the following to 2503.2.1 General:

The minimum wall thickness for PVC gravity sewer pipe shall be SDR 35. Where the design burial depth exceeds 13 feet, the minimum wall thickness shall be SDR 26. All pipe over a depth of 22 feet shall be SDR 14, C-900 PVC, or Ductile Iron "Supercoated" pipe.

All service line connections to existing sanitary sewer mains shall use Inserta Tee fittings or an equivalent approved by the City of Belton.

Delete 2503.2.8 Vitrified Clay Pipe and Fittings

2503.3 Pipe Embedment Materials:

Modify Section 2503.3.3.a as follows:

Concrete shall test not less than a twenty-eight (28) day compressive strength of 4000 psi, shall be air-entrained between 5.0 and 8.0 percent, and shall otherwise conform to Section 2510.3.6.

2503.5 Tunneling, Boring and Jacking Materials:

Replace Section 8. Wood Skids with Section 8. Plastic Casing Spacers:

Where the pipe is to be installed inside a casing pipe or tunnel liner, plastic casing spacers manufactured by Ranger II or approved equal shall be attached to each pipe before it is placed in the casing pipe or tunnel liner in accordance with these specifications and as shown on the plans. Sand fill shall be used when shown on the plans or required by the Special Provisions. The ends of each casing pipe or tunnel liner shall be closed with a dry brick wall or as shown on the plans. The closures for each casing pipe or tunnel liner shall not be constructed until all testing of the line has been completed and accepted.

SECTION 2504 SITE PREPARATION:

Delete entire Section 2504 Site Preparation. Site preparation shall conform to APWA Specification 2100 – Grading and Site Preparation and City of Belton Supplemental Specification 2100.

SECTION 2505 EXCAVATION:

2505.8 No Blasting Areas:

Revise this section to read:

No blasting of any kind for rock excavations or any other purpose will be allowed unless otherwise noted on the Plans.

2505.9 Open-Cut Method (Trenching):

Revise Table in Section 5. Trench Widths as follows:

Minimum Trench Widths and Pipe Clearances (Inches)

Nominal Pipe Diameter	Trench Width ¹	Pipe Side Clearance ²	Soil/Incompressible Pipe Bottom Clearance
4	22	6	6/6
6	22	6	6/6
8	22	6	6/6
10	24	6	6/6
12	27	6	6/6
15	30	6	6/6
18	34	6	6/6
21	39	7	6/9
24	43	7	6/9
27	48	8	6/9
30	54	8	6/9

Delete Section 6 Clay Pipe Trench Width Tables and all associated clay tables.

SECTION 2506 INSTALLATION:

Section 2506.2 General:

Revise Section 3. Drainage Course Crossing Encasement as follows:

Sewer pipe shall be concrete encased under all natural or constructed drainage ways. Private services shall also be concrete encased under drainage ways. The concrete encasement should extend into the banks one-fourth of the width of the stream on each side, or as required by the city engineer or approved designee.

Revise Section 6.d. Bedding Installation as follows:

Place pipe that is to be bedded in Class A (concrete) embedment in proper position on temporary supports consisting of concrete blocks or bricks. When necessary, anchor or weight the pipe to prevent flotation when the concrete is placed.

Revise the first sentence of Section 7.a.(1) Class A. Embedment – Concrete Cradle, Arch or Encasement
All Class A embedments require MCIB 618-1-4 concrete except as otherwise specified.

Delete Section 7.b.(1) and Section 7.b.(2) regarding Class B Embedment and **replace** with the following:

All pipes shall be embedded with one-half inch clean rock from six inches below to six inches around and above the pipe. All backfill underneath pavement including streets, driveways, and sidewalks shall be as follows:

- a. Type A flowable fill for trenches \leq 24 inches wide.
- b. Type A flowable fill or dense, well-graded aggregate meeting the requirements for KDOT AB-3 or MoDOT Type 5 in wider trenches.

Other areas of backfill may use segregated, suitable excavated material. The material shall be free of debris, including tree roots and limbs, and free of stones larger than one inch in the first 12 inches of backfill and no stones larger than six inches in its largest axis throughout the backfill.

Delete Section 7.c. Class C Embedment

Revise Section 8 Tees, Wyes and Building Service Lines, paragraph a.

Tees and wyes shall be installed at forty-five (45) degrees with pipe springline for pipe sizes 8 through 16 inch diameter. Tees and wyes shall not be installed in pipe sizes greater than or equal to eighteen (18) inch diameter.

Add Section 8.e. Fittings to Existing Sewer Mains

All service line connections to existing sanitary sewer mains shall use Insert-a-Tee fittings or an equivalent approved by the City Engineer or designee.

Section 2506.3 Detailed Installation Requirements:

Delete Item #3 – Vitrified Clay Pipe

Section 2506.4 Casing and Carrier Conduits:

Revise Section 4. Carrier Conduit Installation as follows:

After completion of the installation of the casing, the carrier conduit shall be carefully pushed or pulled through the casing in a manner that will maintain proper jointing of the pipe joints and provide required gradient and alignment. Where the carrier conduit is to be installed inside a casing pipe, plastic casing spacers manufactured by Ranger II or approved equal shall be attached to each pipe before it is placed in the casing pipe or tunnel liner in accordance with these specifications and as shown on the plans.

SECTION 2507 BACKFILL

Section 2507.3 Backfilling In Street or Alley Right-of-way and Under Pavement:

Delete Paragraph 1 and replace with the following:

All backfill underneath pavement including streets, driveways, and sidewalks shall be as follows:

- a. Type A flowable fill for trenches \leq 24 inches wide.
- b. Type A flowable fill or dense, well-graded aggregate meeting the requirements for KDOT AB-3 or MoDOT Type 5 in wider trenches.

2509.3 Alignment and Grade

Revise Item 2 Television Inspection as follows:

Sewer lines installed under this project shall be inspected by closed circuit television at the Contractor's expense.

2509.5 Deflection Test

Revise the chart in item d as follows:

D and L Dimensions for
9 Arm Mandrel

Nominal Diameter	L	D		
		SDR 35	SDR 26	SDR 21
8"	8"	7.28"	7.11"	7.11"
10"	10"	9.08"	8.87"	8.87"
12"	12"	10.79"	10.55"	10.55"
15"	15"	13.20"	12.90"	12.90"
18"	18"	16.13"	15.76"	15.76"
21"	21"	19.00"	18.57"	18.57"
24"	24"	21.36"	20.87"	20.87"
27"	27"	24.06"	23.51"	23.51"

2509.6 Soil Density Tests:

Modify Section b.1 with the following:

- i. A minimum of one Proctor test shall be required for each type of material used on a project. Proctor tests must be completed and test results submitted to a representative of the owner prior to beginning backfill operations.
- ii. A minimum of one compaction test shall be taken for each lift of backfill for each road crossing or each 50 feet of trench length under pavement. Testing shall be performed by a qualified testing lab hired by the contractor.
- iii. Test reports shall be submitted to the representative of the owner. The reports shall clearly indicate the location of all tests by street name, station and/or lot number, type of backfill material, utility type, and depth of test. The reports shall include the results of all tests (pass or fail) and all retests. Failure to submit reports in a timely manner may result in the representative of the owner delaying subgrade approval for curb and/or pavement placement until reports are provided.

2510.2 General:

Delete brick masonry from the list of available options.

2510.3 Manhole Materials:

Delete Section 1

Delete Section 2

Modify Section 5.1 as follows:

In all cases, wall thickness shall not be less than one-twelfth of inside diameter, or 5 inches, whichever is greater.

Modify Section 5.f as follows:

Joints between manhole sections, adjustment rings, and below the ring and cover shall be sealed with a minimum of two one-inch beads of bitumastic installed on each joint of the manhole. The minimum size of the mastic shall not be less than one inch square. All new manholes shall include heat shrinkable wraparound bitumastic sleeves on the joints, such as Wrapid-Seal or a city engineer or designee approved equivalent.

Modify Section 6.a as follows:

Standard Concrete: Standard concrete used for concrete encasements and embedments, thrust blocks, pipe anchors, pipe collars, etc., shall be MCIB Mix Number A 618-1-4 (4000 psi 28-day strength), unless otherwise specified.

Modify Section 6.b as follows:

Structural Concrete: Structural concrete used for aerial crossing piers, wetwell walls, manhole walls, bases, invert, and flat slabs, etc. shall be MCIB Mix Number A 618-1-4 (4000 psi 28-day strength), unless otherwise specified.

Modify Section 6.c as follows:

Admixtures: Air-entraining admixtures shall provide air content ranging from 5 to 7 percent by volume as measured by the pressure method (ASTM C 231). The air entraining admixtures shall meet the requirements of ASTM C 260.

Add Section 8.a.1.5:

Ring and cover: The ring and cover shall be a Clay and Bailey 2008 casting, East Jordan Iron Works (EJIW) V-1383 frame and cover, or approved equal by the City Engineer, and in conformance with the City's standard details, and stamped "City of Belton - Sanitary Sewer."

Delete Section 8.b.1

The City of Belton uses only steel core, plastic coated steps.

Add the following to Paragraph H. Metal Castings to APWA Section 2509.3:

The following approved list of castings shall be used: Neenah R-1670-A, Neenah R-1736, East Jordan Iron Works (EJIW) V-1383 frame and cover, EJIW 1501-Z frame with 1501-A or 1502-A cover, or approved equal by the City Engineer, and shall be stamped "City of Belton - Sanitary Sewer."

2510.6 Manhole Installation:

Delete Section 3

Modify Section 10.b to read:

In non-pavement areas, the top of the casting shall be flush with finished grade ensuring water will not pond over the manhole cover.

Add the following to Section 12:

All new joints between casting and adjustment rings shall include heat shrinkable wraparound bitumastic sleeves on the joints, such as Wrapid-Seal or a City Engineer approved equivalent.

2510.9 Manhole Testing:

Replace Section 2 with the following:

All sanitary sewer manholes shall be vacuum tested after backfilling for period of not less than two (2) minutes. The vacuum test apparatus shall be placed inside or on top of the casting and the seal inflated in accordance with the manufacturer's directions. A vacuum of 10 inches of mercury shall be drawn, then the vacuum pump shall be shut off and the valves closed. The CONTRACTOR shall measure the time required for the vacuum to drop to 9.5 inches of mercury based on the manhole depth.

- 10 feet or less – 120 seconds
- 10 to 15 feet – 150 seconds
- 15 to 25 feet – 180 seconds
- 25 feet or greater – 210 seconds

The manhole shall be considered acceptable if the time required for the vacuum to drop from 10 inches to 9.5 inches is greater than 120 seconds for all manhole diameters. If the manhole fails the initial test, repairs shall be made with non-sag Thiokol sealant conforming to Federal Specification TT-S-00227, two component polysulfide rubber, Bostik "Chem-Calk 400", Pecora "Synthacalk GC-2", or approved equal.

END OF SECTION