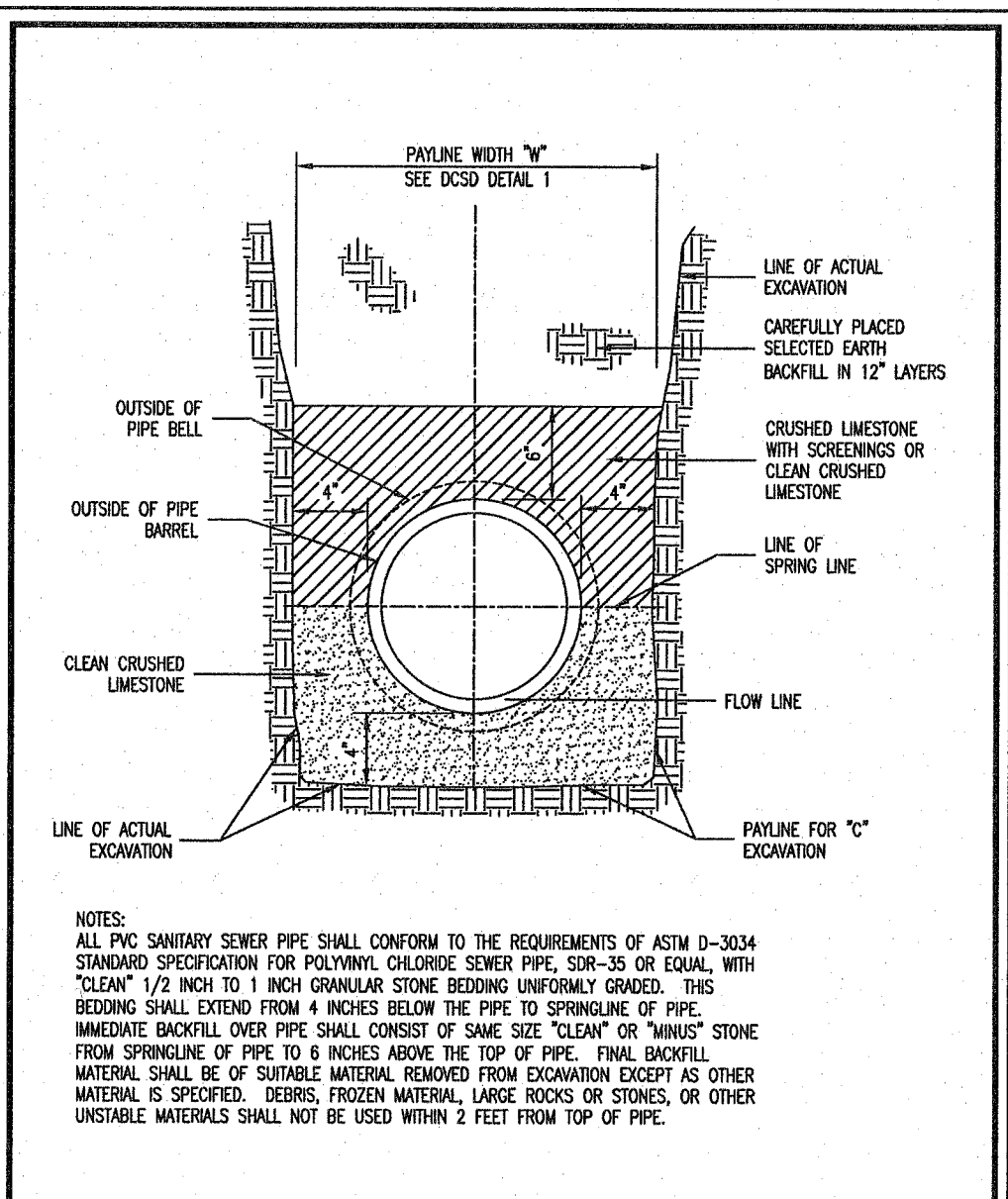
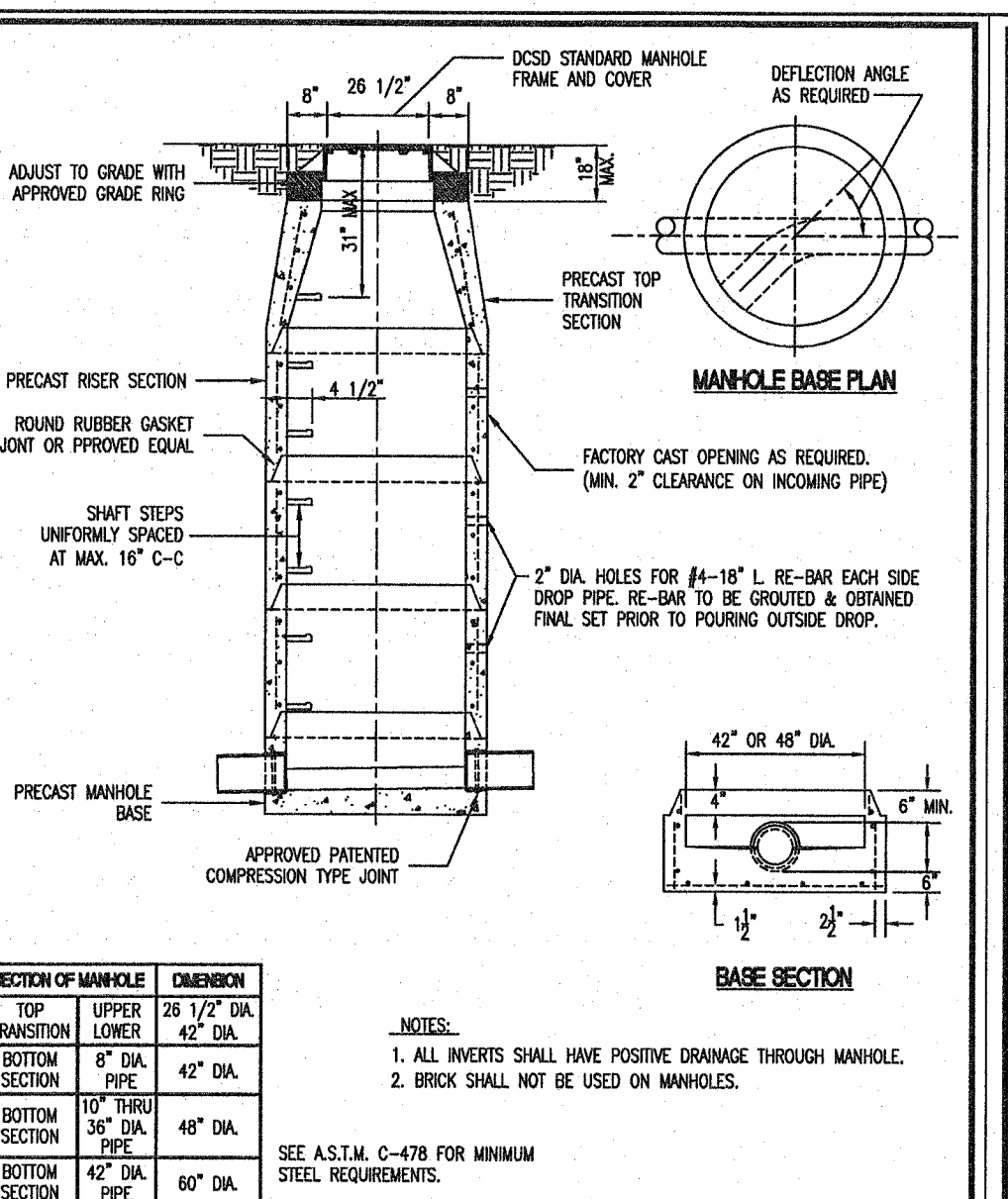


ROUND PIPE				HORIZONTAL ELLIPTICAL PIPE			
INSIDE DIAMETER OF PIPE (INCHES)	"W" PAYLINE WIDTH OF TRENCH (INCHES)	"W" PAYLINE WIDTH OF TRENCH (FEET)	MIN. VOLUMES CU. FT. PER FT.	INSIDE DIAMETER OF PIPE (INCHES)	"W" PAYLINE WIDTH OF TRENCH (INCHES)	"W" PAYLINE WIDTH OF TRENCH (FEET)	MIN. VOLUMES CU. FT. PER FT.
4	30	2.50	3.26				
6	30	2.50	3.59				
8	30	2.50	3.87				
10	30	2.50	4.09				
12	30	2.50	4.25				
15	36	3.00	5.55				
18	36	3.00	5.77	14 x 23	41	3.42	5.94
21	39	3.25	6.61				
24	42	3.50	7.39	19 x 30	49	4.08	7.68
27	45	3.75	8.18	22 x 34	53	4.42	8.61
30	48	4.08	9.30	24 x 38	58	4.83	9.70
33	53	4.42	10.53	27 x 42	62	5.17	10.71
36	56	4.67	11.43	28 x 45	66	5.50	11.72
39		DISCONTINUED		32 x 49	71	5.92	13.14
42	63	5.25	13.38	34 x 53	75	6.25	14.05
48	70	5.83	15.67	38 x 60	83	6.92	16.18
54	77	6.42	18.15	43 x 68	92	7.67	18.81
60	84	7.00	20.73	48 x 76	101	8.42	21.59
66	91	7.58	23.45	53 x 83	109	9.08	24.35
72	98	8.17	26.37	58 x 91	118	9.83	27.45
78	105	8.75	29.39	63 x 98	126	10.50	30.50
84	112	9.33	32.57	68 x 106	135	11.25	33.91
90	119	9.92	35.80	72 x 113	143	11.92	36.99
96	126	10.50	39.37	77 x 121	152	12.67	40.69
102	133	11.08	42.99	82 x 128	160	13.33	44.45
108	140	11.67	46.75	87 x 136	168	14.00	47.79
114	147	12.25	50.66	92 x 143	176	14.67	51.70
120	154	12.83	54.72	97 x 151	185	15.42	56.01
126	161	13.42	58.92				
132	168	14.00	63.27	106 x 166	202	16.83	64.48
144	182	15.17	72.40	116 x 180	218	18.17	73.59

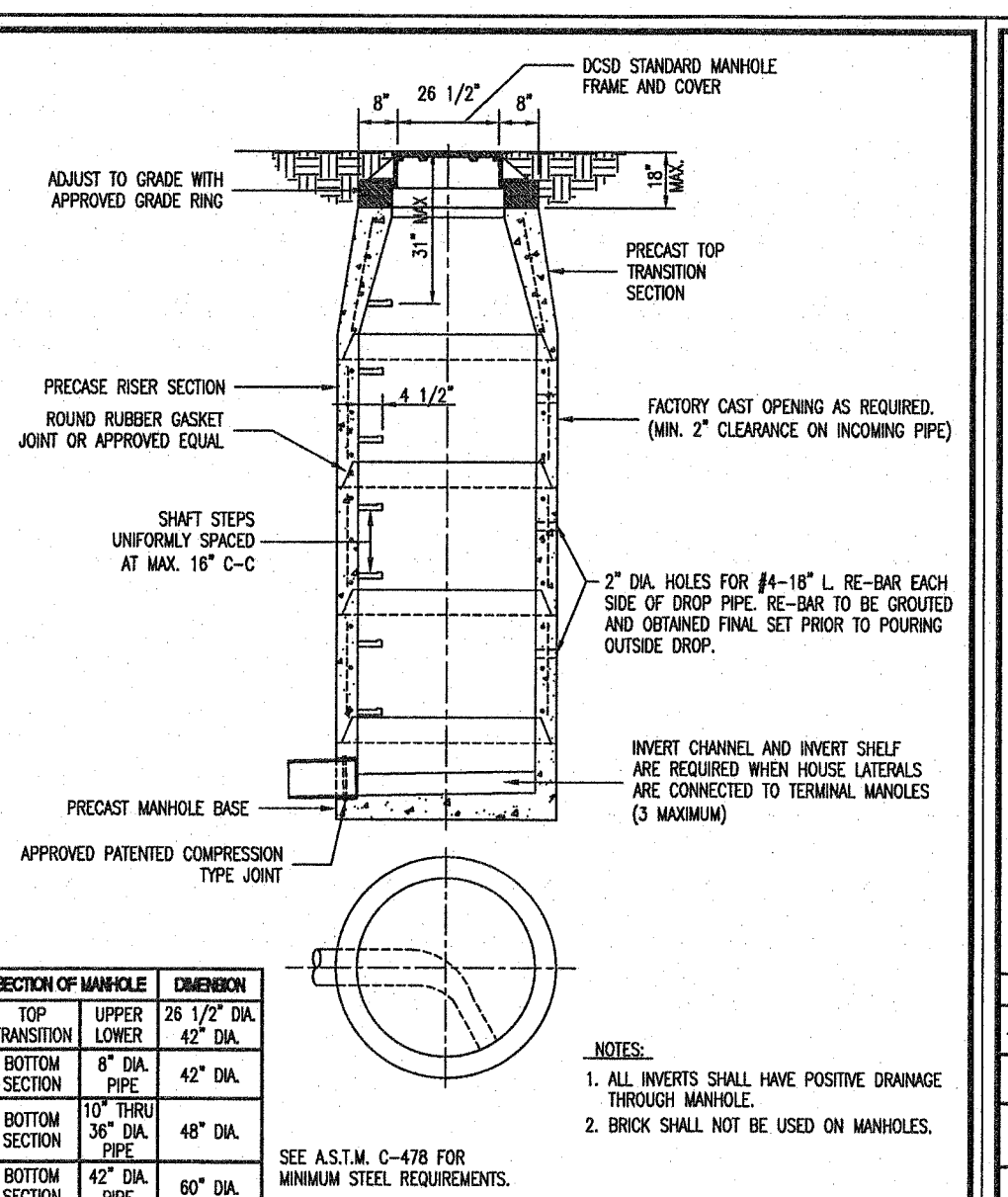
Duckett Creek Sanitary District
 PAYLINE WIDTHS OF TRENCH AND PAY-QUANTITIES OF CONCRETE
 BSM: BSM, KLA: KLA, DATE: MAR. 2015, SHEET NO: 1



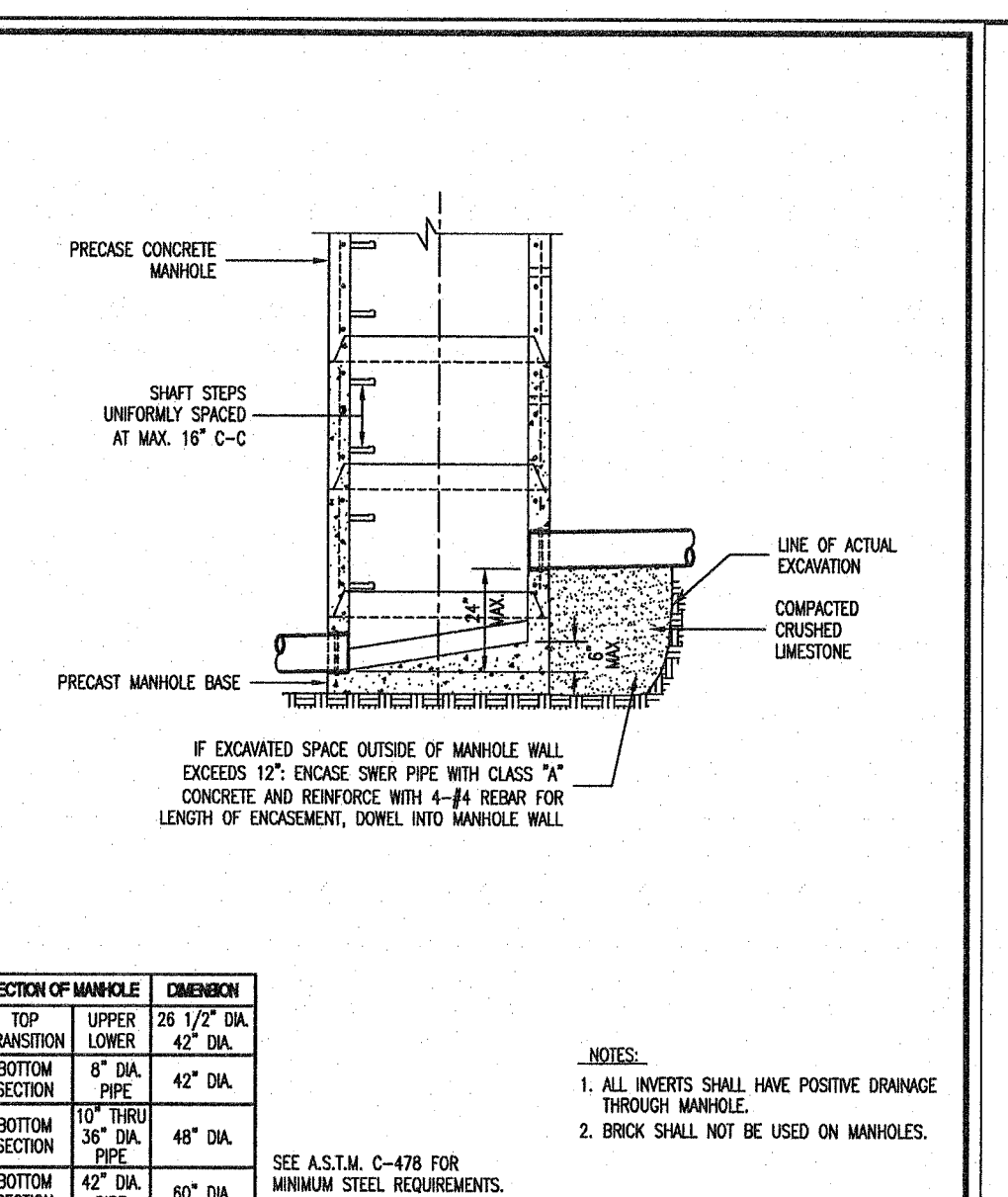
Duckett Creek Sanitary District
 PIPE BEDDING CLASS "C" (FOR ALL EXCEPT REINFORCED CONCRETE PIPE)
 BSM: BSM, KLA: KLA, DATE: JULY 2016, SHEET NO: 3



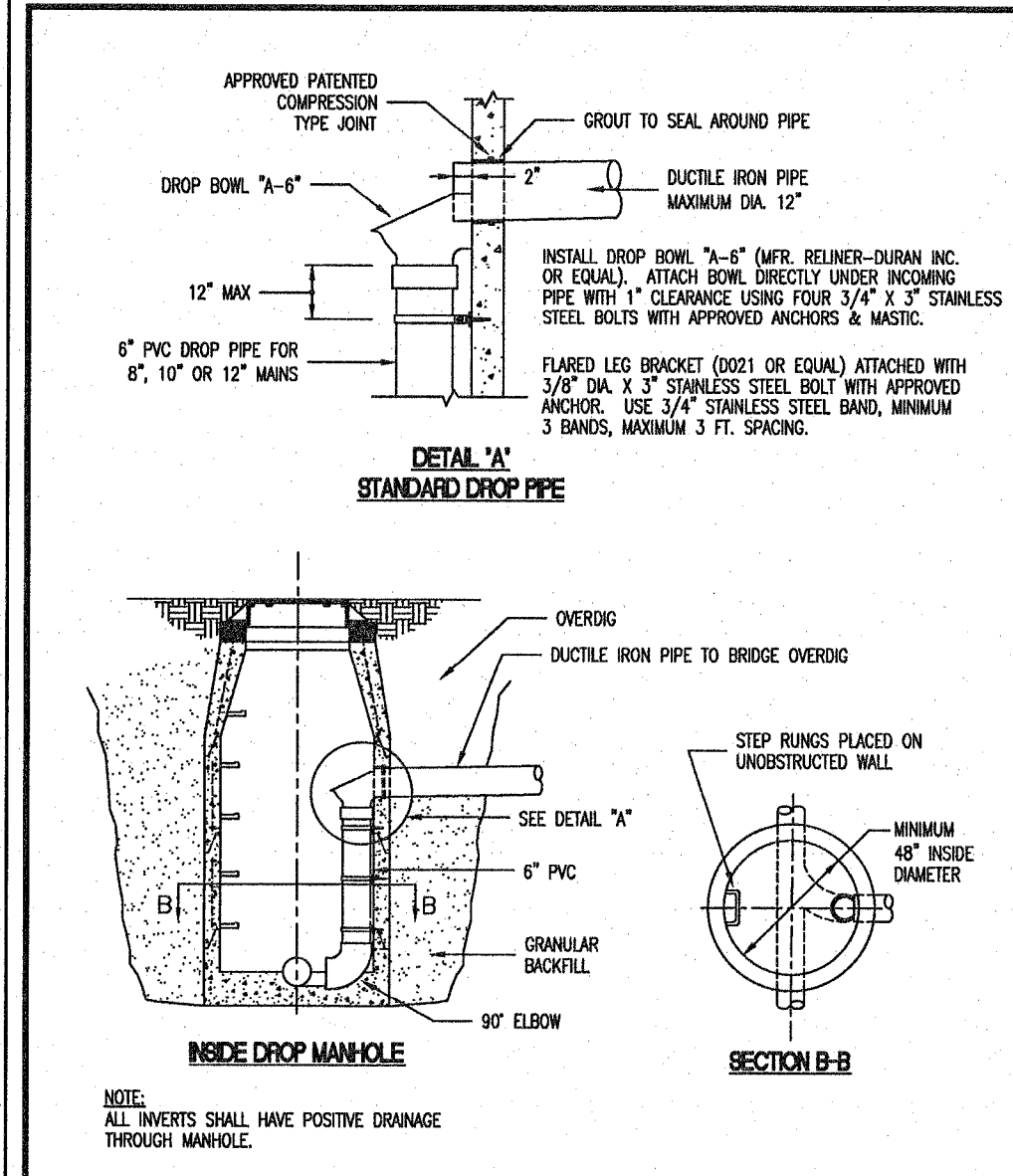
Duckett Creek Sanitary District
 PRECAST CONCRETE MANHOLE FOR SEWERS 8" THROUGH 18" BSM
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 7



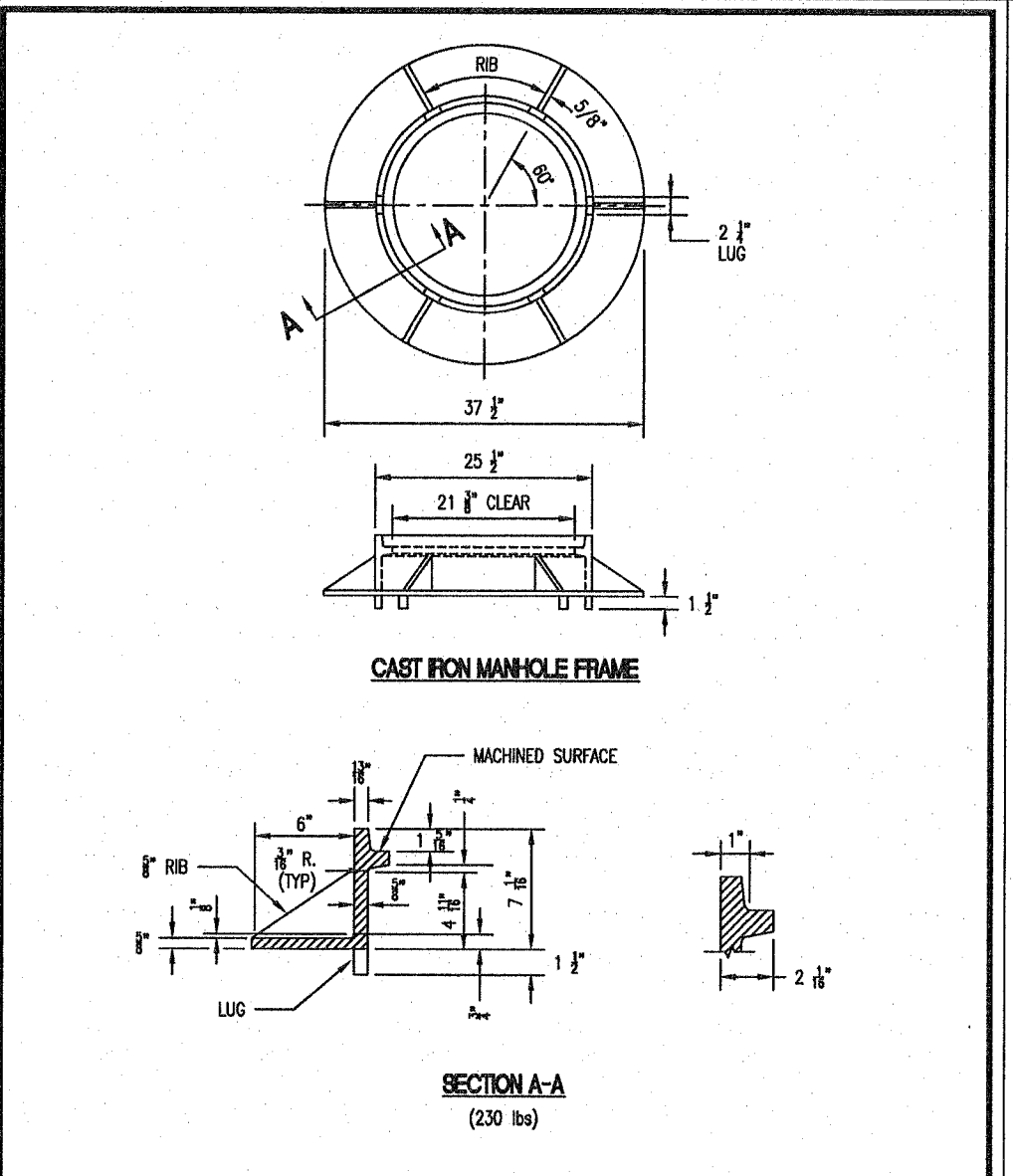
Duckett Creek Sanitary District
 PRECAST CONCRETE MANHOLE FOR SEWERS 8" THROUGH 18" BSM
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 8



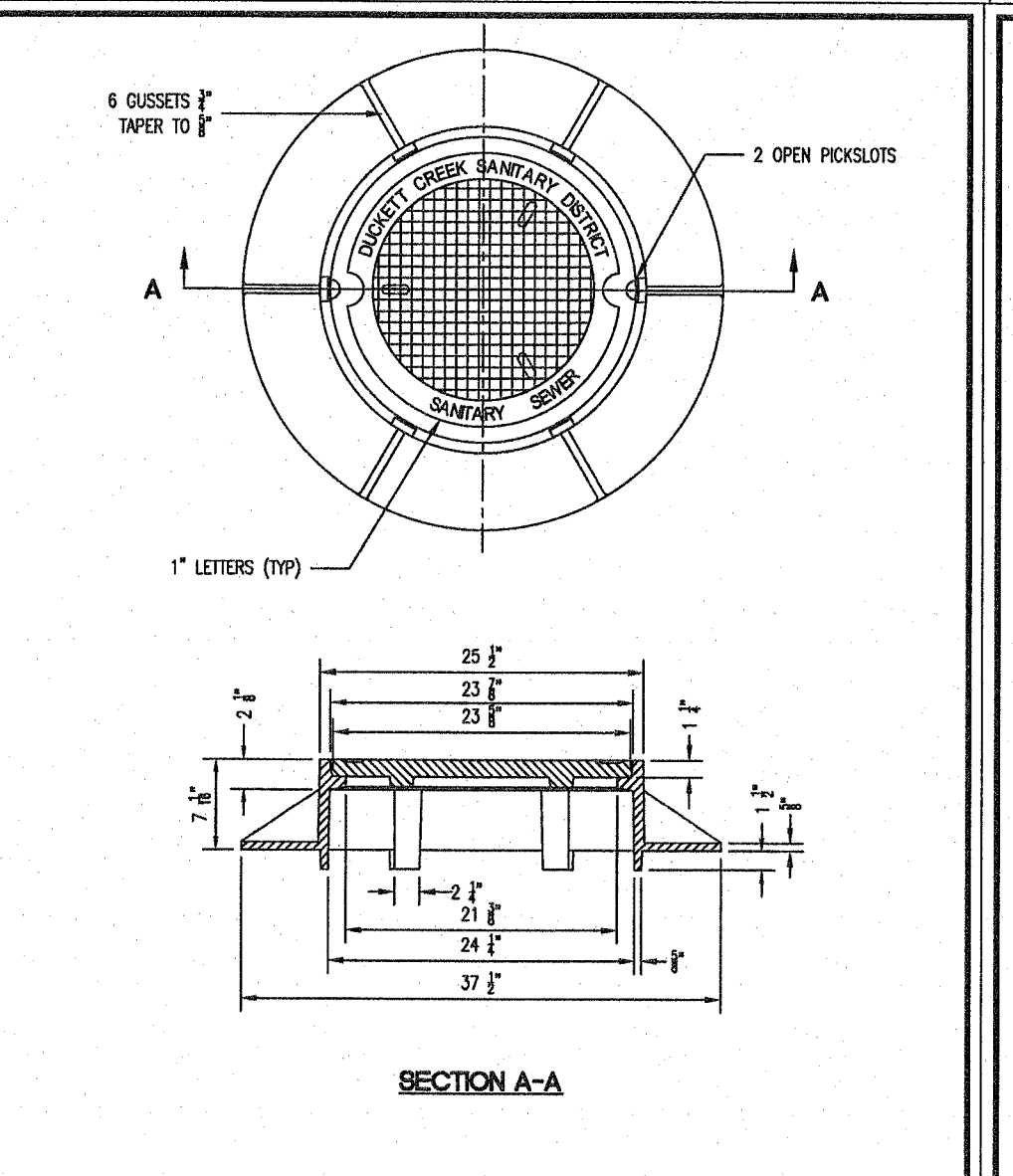
Duckett Creek Sanitary District
 INSIDE FOULWATER DROP MANHOLE (SWEEP INLET)
 BSM: BSM, KLA: KLA, DATE: MAR. 2015, SHEET NO: 9



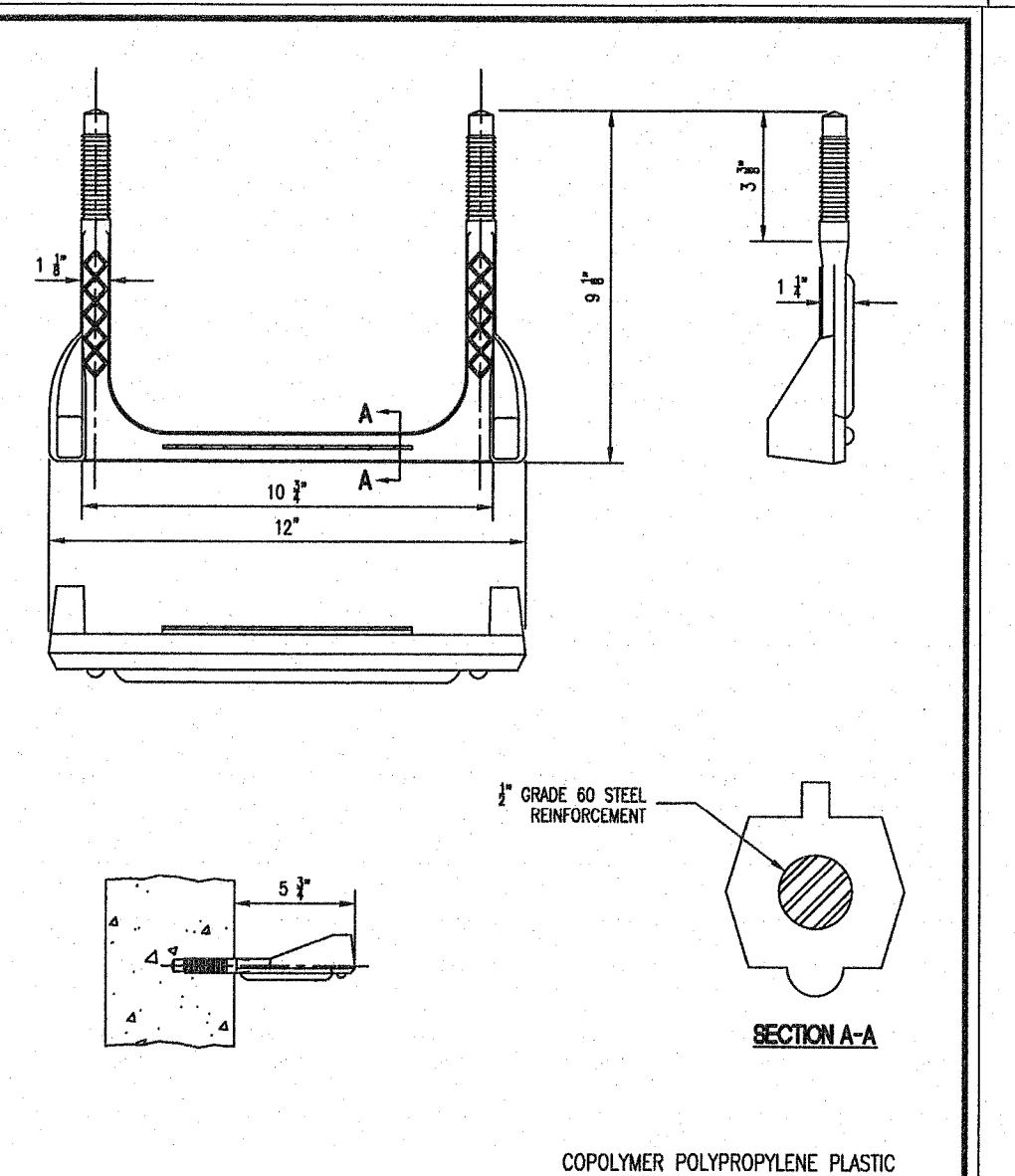
Duckett Creek Sanitary District
 INSIDE DROP MANHOLE
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 10



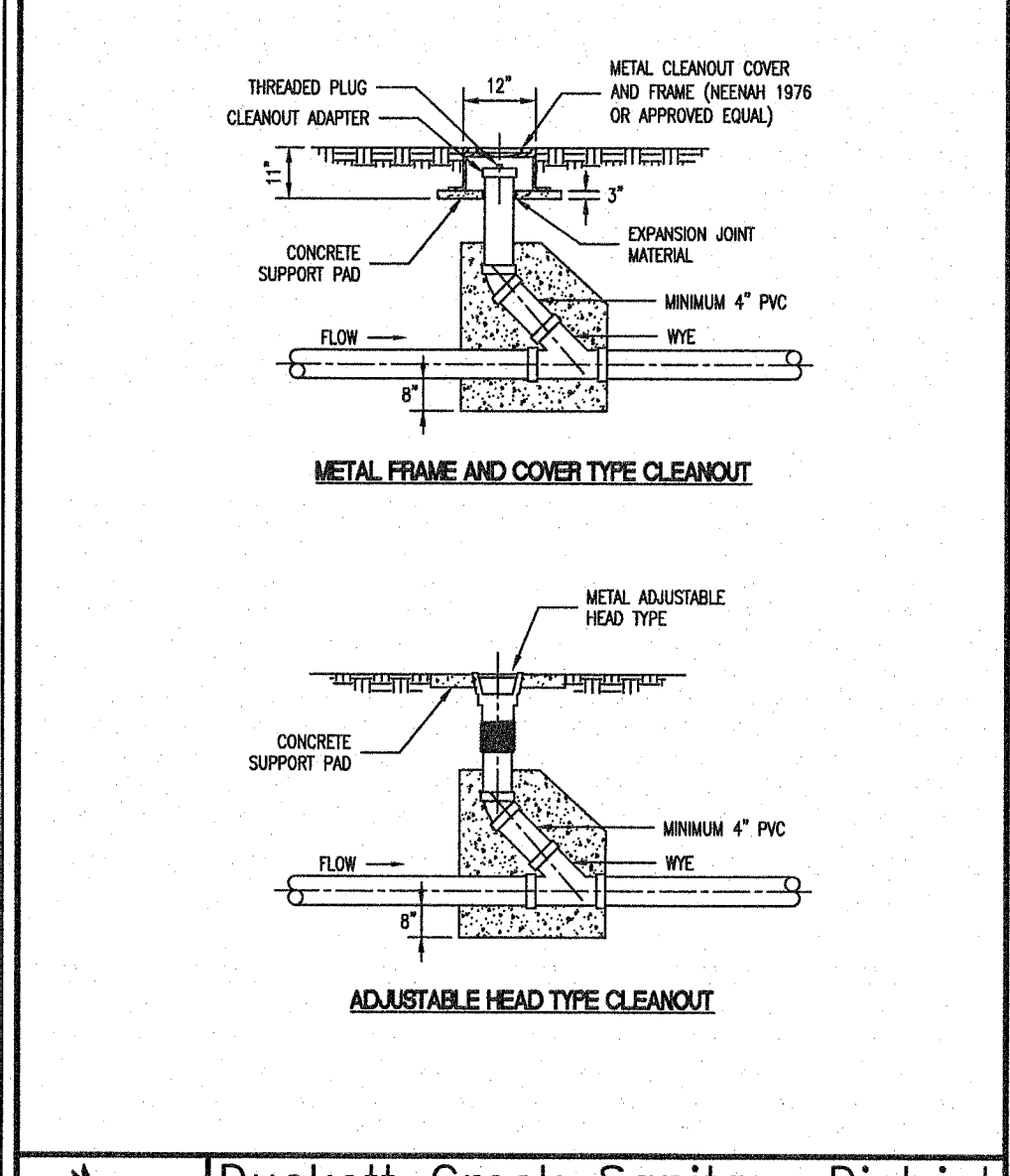
Duckett Creek Sanitary District
 CAST IRON MANHOLE FRAME
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 11



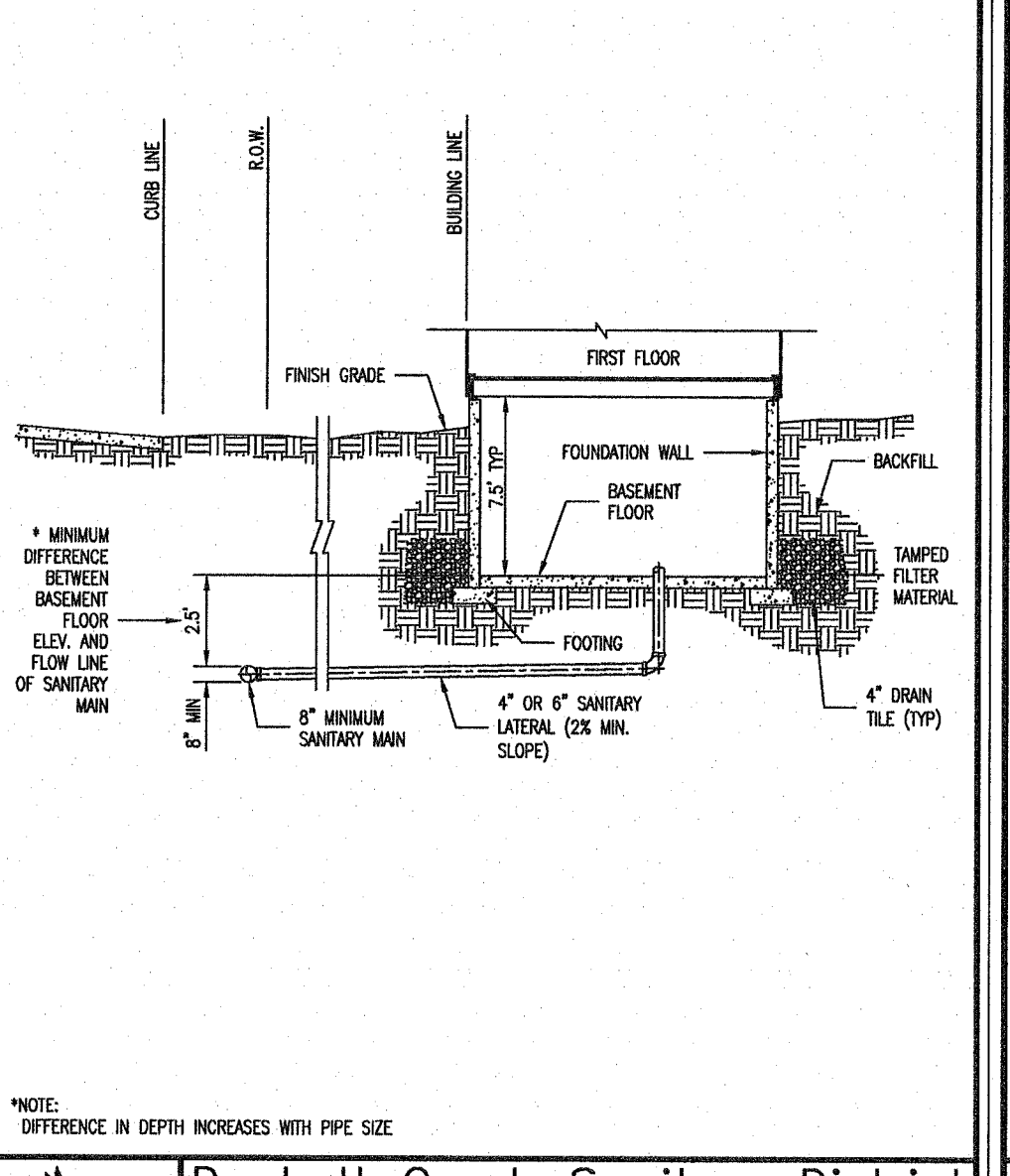
Duckett Creek Sanitary District
 MANHOLE FRAME AND COVER
 BSM: BSM, KLA: KLA, DATE: 1/14/00, SHEET NO: 12



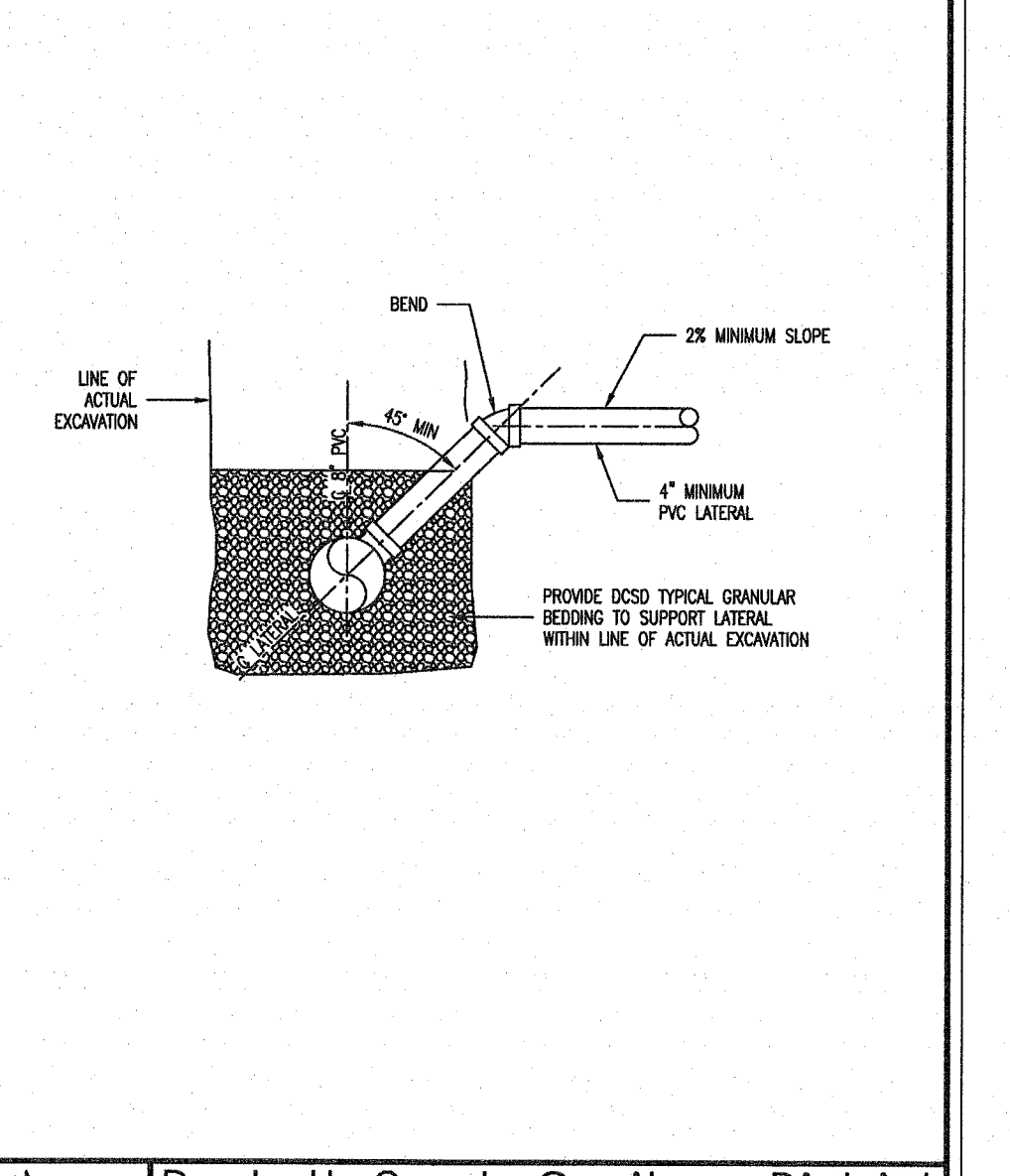
Duckett Creek Sanitary District
 MANHOLE STEP FOR PRECAST MANHOLE
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 18



Duckett Creek Sanitary District
 TYPICAL SEWER LATERAL CLEANOUT DETAIL
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 25



Duckett Creek Sanitary District
 TYPICAL SANITARY SEWER LATERAL PROFILE
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 26



Duckett Creek Sanitary District
 SANITARY SEWER LATERAL RISER DETAIL
 BSM: BSM, KLA: KLA, DATE: DEC. 2015, SHEET NO: 27

LINK-SEAL® MODULAR SEALS INSTALLATION INSTRUCTIONS

1. Center the pipe, cable or conduit in well opening or casing. Make sure the pipe will be adequately supported on both ends. LINK-SEAL® modular seals are not intended to support the weight of the pipe.

2. Loosen rear pressure plate with nut just enough so links move freely. Connect both ends of belt around the pipe.

3. Check to be sure all belt heads are facing the installer. Extra slack or sag is normal. Do not remove links if extra slack exists. NOTE: On smaller diameter pipe, links may need to be stretched.

4. Slide belt assembly into annular space. For larger size belts, start inserting LINK-SEAL® modular seal assembly at the 6 o'clock position and work both sides up toward the 12 o'clock position in the annular space.

5. LS-200 through LS-915 Using a hand opening or casing. Make sure the pipe will be adequately supported on both ends. LINK-SEAL® modular seals are not intended to support the weight of the pipe.

6a. LS-920 through LS-650 Using a hand socket or off-set wrench ONLY, start at 12 o'clock. Do not tighten any bolt more than 4 turns at a time. Continue in a clockwise manner until links have been uniformly compressed (Approx. 2 or 3 rotations).

6b. LS-920 through LS-650 Using a hand socket or off-set wrench ONLY, start at 12 o'clock. Do not tighten any bolt more than 4 turns at a time. Continue in a clockwise manner until links have been uniformly compressed (Approx. 2 or 3 rotations).

6c. Make 2 or 3 more passes at 4 turns per bolt. MAXIMUM tightening all bolts clockwise until all sealing elements "bulge" around all pressure plates. On type 310 stainless steel bolts, hand tighten ONLY without power tool.

7. If the seal doesn't appear to be correct using the instructions provided, call GPT at 1-800-429-2410.

Installation Notes: The LINK-SEAL® modular seal belt heads are usually recessed below the wall opening or the edge of casing pipe and therefore a socket or offset wrench must be used.

LINK-SEAL® Modular Seal - Do's

- Make sure pipe is centered.
- Install the belt with the pressure plates evenly spaced.
- Install the exact number of links indicated in sizing charts.
- Check to make sure pipe is supported properly during backfill operations. NOTE: LINK-SEAL® modular seals are not intended to support the weight of the pipe.
- Make sure seal assembly and pipe surfaces are free from dirt.
- For tight fits, use non-pumping liquid detergent to assist installation.

LINK-SEAL® Modular Seal - Don'ts

- Don't install "belts" with the pressure plates aimed in irregular directions. (Sloppers)
- Don't install LINK-SEAL® modular seals where walls/bottoms or other irregular surfaces exist without consideration of the sealing requirements.
- Don't torque each bolt completely before moving on to the next.
- Don't use high speed power tools (4500rpm or more).
- Don't use power tools on LINK-SEAL® modular seal 316 stainless steel bolts.
- Don't use grease installing LINK-SEAL® modular seals.

Hand Tools: Review provided chart below. (Tools not provided) Tools can be purchased from hardware store, auto parts store, or home improvement store.

LINK-SEAL® Model	Tool Size Type	Bolt Head Type
LS-200, LS-275	4mm Allen	Hex
LS-300, LS-315	6mm Allen	Hex
LS-325, LS-340, LS-360	1/8" Hex	Hex
LS-400, LS-310, LS-405, LS-475	1/2" Hex	Hex
LS-500, LS-525, LS-575	1/2" Hex	Hex
LS-615	3/8" Hex	Hex
LS-680	1/2" Hex	Hex

Always wear PPE when using LINK-SEAL® modular seals.

DUCKETT CREEK SANITARY DISTRICT CONSTRUCTION NOTES

- Underground utilities have been plotted from available information and therefore location shall be considered approximate only. The verification of the location of all underground utilities, either shown or not shown on these plans, shall be the responsibility of the contractor and shall be completed prior to any grading or construction of improvements.
- Gas, water and other underground utilities shall not conflict with the depth or horizontal location of existing or proposed sanitary and storm sewers, including house laterals.
- All existing site improvements disturbed, damaged or destroyed shall be repaired or replaced to closely match preconstruction conditions.
- All fill including places under proposed storm and sanitary sewer lines and paved areas including trench backfills within and off the road right-of-way shall be compacted to 90 percent of maximum density as determined by the Modified AASHTO T-180 Compaction Test (ASTM D1557). All tests shall be verified by a Soils Engineer concurrent with grading and backfilling operations. The compacted fill shall be free of rutting and shall be non-yielding and non-pumping during proofrolling and compaction.
- The contractor shall prevent all storm, surface water, mud and construction debris from entering the existing sanitary sewer system. The contractor will be required to install a brick bulkhead on the downstream side of the first new manhole constructed when connecting to existing sewers.
- All sanitary sewer flowlines and tops built without elevations furnished by the engineer will be the responsibility of the sewer contractor.
- It is the responsibility of the contractor to adjust all sanitary sewer manholes (that are affected by the construction) to finish grade.
- Easements shall be provided for all sanitary sewers, storm sewers and all utilities on the record plat.
- All sanitary sewer construction and materials shall conform to the current construction standards of the Duckett Creek Sanitary District.
- The Duckett Creek Sanitary District shall be notified at least 48 hours prior to construction for coordination of inspection.
- All sanitary sewer building connections shall be designed so that the minimum vertical distance from the low point of the basement to the flowline of a sanitary sewer at the corresponding building connection shall not be less than the diameter of the pipe plus the vertical distance of 2 1/2 feet.
- All sanitary sewer manholes shall be watertight in accordance with Missouri Dept. of Natural Resources specification 10 CSR 20-6.120(C)(F) 1.
- All PVC sanitary sewer pipe shall conform to the requirements of ASTM D-3034 Standard Specification for PSM Polyvinyl Chloride Sewer Pipe, SDR-35 or equal, with "clean" 1/2 inch to 1 inch granular stone bedding uniformly graded. This bedding shall extend from 4 inches below the pipe to springline of pipe. Final backfill material shall be of suitable material removed from excavation except as other material is specified. Debris, frozen material, large rocks or stones, or other unstable materials shall not be used within 2 feet from top of pipe.
- All sanitary sewer trench backfills shall be water jetted. Granular backfill will be used under pavement areas.
- All pipes shall have positive drainage through manholes. Flat invert structures not allowed.
- Epoxy Coating shall be used on all sanitary sewer manholes that receive pressurized mains.
- All creek crossings shall be lined with rip-rap as directed by District inspectors.
- Brick shall not be used on sanitary sewer manholes.
- Existing sanitary sewer service shall not be interrupted.
- Maintain access to existing residential driveways and streets.
- Pre-manufactured adapters shall be used at all PVC to DIP connections. Rubber boot / Mission-type couplings will not be allowed.
- Any permits, licenses, easements, or approvals required to work on public or private properties or roadways are the responsibility of the developer.
- Type N' Lock-Type Cover and Locking Device (Lock-Lug) shall be used where lock-type covers are required.
- All sanitary sewer system work shall be conducted under the inspection of a representative of the District. All work not require inspection but the District's representative may designate specific areas that must be inspected before the work is backfilled. All testing must be witnessed by the District's Inspector and the Contractor shall furnish all testing equipment as approved by the District. Testing shall include:
 - A mandrel test of all gravity sewers using a mandrel with a diameter that has a diameter 95% of the inside pipe diameter. If the mandrel test fails on any section of pipe, that section of pipe shall be uncovered and replaced. No expansion devices will be allowed to be used to "force" the pipe that is deformed back into round. Any string lines used in mandrel testing shall be removed after testing is completed. Deflection testing cannot be conducted prior to 30 days after final backfill.
 - An air pressure test of all gravity sewers to a pressure of 5 PSI with no observed drop in pressure during a test period of 5 minutes.
 - A vacuum test of all manholes for a period of 1 minute and the vacuum shall be 10" of mercury and may not drop below 9" of mercury at the end of the 1 minute test.

Revised October 2016
 25. Contact DCS.D Inspection Department, at 636-441-1244 to schedule inspection.
 48 hours of advanced notice is required.

Duckett Creek Sanitary District
 BSM: BSM, KLA: KLA, DATE: MAR. 2015, SHEET NO: 1

DISCLAIMER OF RESPONSIBILITY
 I hereby specify that the documents intended to be authenticated by my seal are limited to this sheet, and I hereby disclaim any responsibility for all other Drawings, Specifications, Estimates, Reports or other documents or instruments relating to or intended to be used for any part or parts of the architectural or engineering project or survey.

REVISIONS

DATE	DESCRIPTION
08/08/19	D.C.S.D. P.W.S.D. #2 & CLIENT COMMENTS
08/30/19	D.C.S.D. P.W.S.D. & CITY COMMENTS
09/25/19	CITY COMMENTS
10/22/19	CITY COMMENTS
11/08/19	CITY COMMENTS
11/22/19	CITY COMMENTS

Developer / Owner:
 STRAQR, L.L.C.
 9645 Clayton Road
 St. Louis, MO 63124
 314-667-9400

P+Z No. #18-012166
Approval Date: 06/27/2019
City No. #RSP-19-000010
Page No. 21 of 25

PROJECT TITLE:
 WYNDGATE MEADOWS

ENGINEERING PLANNING SURVEYING
 221 Point View Blvd.
 St. Charles, MO 63301
 636-928-5562
 FAX 928-1718

Issue Date: 07/09/2019

SANITARY SEWER DETAILS

ENGINEERS SEAL DOES NOT APPLY TO DETAILS ON THIS SHEET.