D.C.S.D. Detail & Construction Notes

WINGHAVEN CENTRE

AUG 02 — 02-620

SANITARY SEWER CONSTRUCTION

I. GENERAL

1. No area shall be cleared without authorization from the project engineer.
2. All existing site improvements disturbed, damaged or destroyed shall be repaired or replaced to closely match preconstruction conditions.
3. The sanitary sewer contractor shall perform a complete installation as shown on the plans, stated in these notes, or reasonably implied there from, all in accordance with the plans and notes as interpreted by the project engineer.
4. Before sewer construction begins, the owner shall employ a competent, licensed surveyor to establish the lines and grades of the sanitary sewers being constructed. The contractor shall pick up the cut sheets at the office of the surveyor.
5. The contractor shall notify the following at least two days prior to the start of sewer construction.
   D.C.S.D., at telephone 636.441.1244.
   St. Charles Co. Hwy. Dept., at telephone 636.949.7305.

II. SPECIFICATIONS

1. All materials used shall meet the following specifications:

   Plastic Pipe: Polyvinyl Chloride pipe conforming to the requirements of ASTM D-3034 Standard Specifications for the PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, SDR 35.

   Fittings: Fittings for PVC Pipe shall be of the same material and strength requirements as the sewer, as well as monolithic in construction.

Manholes: Precast reinforced concrete manholes conforming to the standard specifications for precast reinforced concrete manhole sections, ASTM-C478 and the approved Standard Details of Sewer Construction of of D.C.S.D. The Portland cement used shall be Type II. Manhole cones shall be concentric and base sections shall have the base riser section integral with the floor. Manhole steps shall be cast into the full depth of the wall section. Connections for inlet and outlet pipes shall be of an approved patented compression type connection. The inside diameter for riser sections shall be 42 inches for pipe sizes 8 inch through 15 inch and be 48 inches for pipe sizes larger and for inside drop manholes. No brick allowed.

Manhole Frames and Covers: Gray Iron Castings conforming to the requirements of the specifications for Gray Iron Castings, ASTM A48. All castings shall be clean and free of scale, adhesions or inclusions. They shall be fabricated of Class 30B cast iron. Bearing surfaces between manhole frames and covers shall be such that the cover shall seat in any position onto the frame without rocking.

Joints: Type D joints shall be used with PVC pipes and shall be elastomeric gasket joints providing a water tight seal. They shall conform to the requirements of the Specifications for Joints for Drain and Sewer Plastic Pipes and Fittings Using Flexible Elastomeric Seals, ASTM C-3212.

Bedding Aggregate: Bedding Aggregate shall conform to the following, and have a maximum percentage of "Fines" as follows:

Sieve	% by Weight, Passing Maximum	Minimum
1 inch	100	100
3/4 inch	100	90
1/2 inch	60	35
# 100	10	0

Backfill Aggregate: Backfill Aggregate shall be crushed limestone and screenings and be 3/4 inch minus.

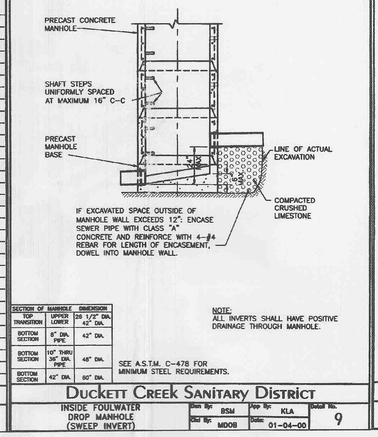
2. Pipe and appurtenances shall be new and unused. The type of pipe to be installed shall be as shown on the drawings. Pipe and appurtenances shall be handled in such a manner as to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken to prevent damage to any pipe coating.
3. The interior of the pipe shall be thoroughly cleaned of foreign material before being lowered into the trench and shall be kept clean during construction operations. When work is not in progress, the open ends of pipe shall be securely closed so that no foreign materials will enter the pipe. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe, or repaired in a satisfactory manner.
4. Pipe shall be laid to line and grade as shown on the plans and as staked in the field. When connections are are to be made to any existing manhole, pipe, or other improvement, the actual elevation or position of which cannot be determined without excavation, the contractor shall excavate for and expose the existing improvement before laying the connecting pipe or conduit. When existing underground improvements may reasonably be expected to conflict with the line or grade established for the new sewer line, the contractor shall excavate as necessary to expose and locate such potentially conflicting underground improvements prior to laying the new pipe. Any adjustment in line or grade which may be necessary to accomplish the intent of the plans shall be made.
5. Pipe shall be laid upgrade in a continuous operation from structure to structure, with the socket or collar ends of the pipe upgrade.
6. All PVC Sanitary Sewer Pipe shall be bedded with Bedding Aggregate. The bedding aggregate shall extend from 4 inches below the pipe to the pipe springline. All PVC Sanitary Sewer Pipe shall be backfilled with Aggregate Backfills for non-paved areas, the Aggregate Backfill shall extend from spring line of pipe to 6 inches over the pipes for paved areas the Aggregate Backfill shall extend from spring line of pipe to the ground surface. Refer to detail "PIPE BEDDING CLASS "C" (FOR ALL PIPE EXCEPT REINFORCED CONCRETE PIPE".
7. All trench backfills under paved areas shall be compacted to 90% of the maximum density as determined by the "Modified AASHTO T-180 Compaction Test", (ASTM-D-1557). All other trench backfills shall be water jetted.
8. All sanitary sewer construction shall be performed in accordance with D.C.S.D. specifications.
   The contractor shall assist the D.C.S.D. personnel in the inspection and testing of the sanitary sewers.
9. All manhole tops shall be built to the elevations shown on the plans. If no top elevation is shown, contact the engineer for such information.
10. Provide clean-out on all laterals over 100 L.F. and at all major angle points in laterals.

DUCKETT CREEK SANITARY DISTRICT CONSTRUCTION NOTES

1. 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 located prior to any grading or construction of improvements.
2. 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.
3. All existing site improvements disturbed, damaged or destroyed shall be repaired or replaced to closely match preconstruction conditions.
4. 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.
5. The contractor shall prevent all storm, surface water, mud and construction debris from entering the existing sanitary sewer system
6. All sanitary sewer flowlines and tops built without elevations furnished by the engineer will be the responsibility of the sewer contractor.
7. Easements shall be provided for all sanitary sewers, storm sewers and all utilities on the record plat.
8. All construction and materials shall conform to the current construction standards of the Duckett Creek Sanitary District.
9. The Duckett Creek Sanitary District shall be notified at least 48 hours prior to construction for coordination of inspection.
10. 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.
11. All sanitary sewer manholes shall be waterproofed on the exterior in accordance with Missouri Dept. of Natural Resources specification 10 CSR-8.120(7)(E).
12. 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. Immediate backfill over pipe shall consist of same size "clean" or "minus" stone from springline of pipe to 6 inches above the top of pipe.
13. All sanitary and storm sewer trench backfills shall be water jetted. Granular backfill will be used under pavement areas.
14. All pipes shall have positive drainage through manholes. No flat invert structures are allowed.
15. All creek crossings shall be grouted rip-rap as directed by District inspectors. (All grout shall be high slump ready-mix concrete).
16. Brick shall not be used on sanitary sewer manholes.
17. Existing sanitary sewer service shall not be interrupted.
18. Maintain access to existing residential driveways and streets.
19. Pre-manufactured adapters shall be used at all PVC to DIP connections. Rubber boot / Mission-type couplings will not be allowed.
20. Any permits, licenses, easements, or approvals required to work on public or private properties or roadways are the responsibility of the developer.
21. 'Type N' Lock-Type Cover and Locking Device (Lock-Lug) shall be used where lock-type covers are required.

ROUND PIPE				HORIZONTAL ELLIPTICAL PIPE			
INSIDE DIAMETER OF PIPE (INCHES)	"W" PAYLINE WIDTH OF TRENCH (INCHES)	"W" PAYLINE WIDTH OF TRENCH (FEET)	PAY-VOLUMES CU. FT. PER FT. CONCRETE ENCASEMENT	INSIDE DIAMETER OF PIPE (INCHES)	"W" PAYLINE WIDTH OF TRENCH (INCHES)	"W" PAYLINE WIDTH OF TRENCH (FEET)	PAY-VOLUMES CU. FT. PER FT. CONCRETE ENCASEMENT
4	30	2.50	3.28				
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 x30	49	4.08	7.68
27	45	3.75	8.18	22 x 34	53	4.42	8.61
30	49	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	29 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	35.90	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
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 12-21-99 | Detail No. 1

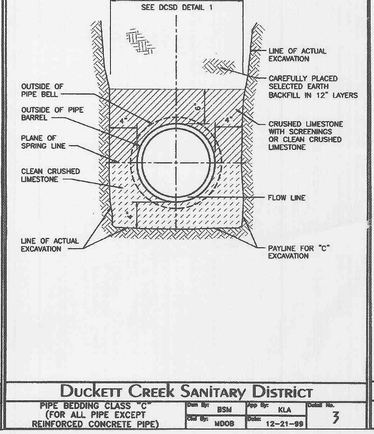


SECTION OF MANHOLE	DIMENSION
TOP TRANSITION	UPPER LOWER 26 1/2" DIA. 42" DIA.
BOTTOM SECTION	8" DIA. PIPE 42" DIA.
BOTTOM SECTION	10" THRU 36" DIA. PIPE 48" DIA.
BOTTOM SECTION	42" DIA. 60" DIA.

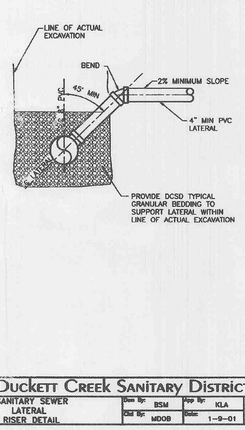
NOTE: ALL INVERTS SHALL HAVE POSITIVE DRAINAGE THROUGH MANHOLE.

SEE A.S.T.M. C-478 FOR MINIMUM STEEL REQUIREMENTS.

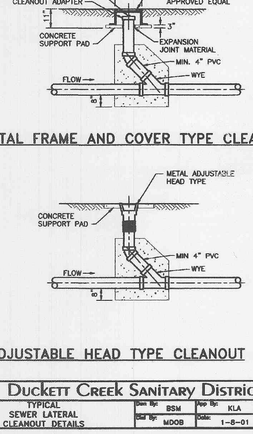
Duckett Creek Sanitary District
INSIDE FOULWATER DROP MANHOLE (SWEEP INVERT)
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 01-04-00 | Detail No. 9



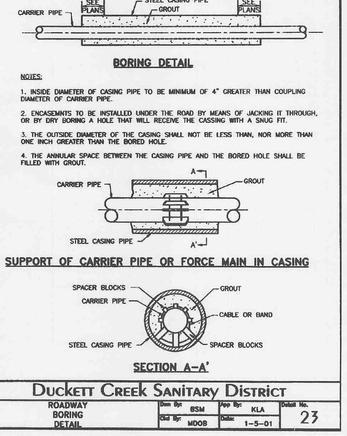
Duckett Creek Sanitary District
PIPE BEDDING CLASS "C" (FOR ALL PIPE EXCEPT REINFORCED CONCRETE PIPE)
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 12-21-99 | Detail No. 3



Duckett Creek Sanitary District
SANITARY SEWER LATERAL RISER DETAIL
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 1-9-01 | Detail No. 27



Duckett Creek Sanitary District
TYPICAL SEWER LATERAL CLEANOUT DETAILS
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 1-8-01 | Detail No. 25



Duckett Creek Sanitary District
ROADWAY BORING DETAIL
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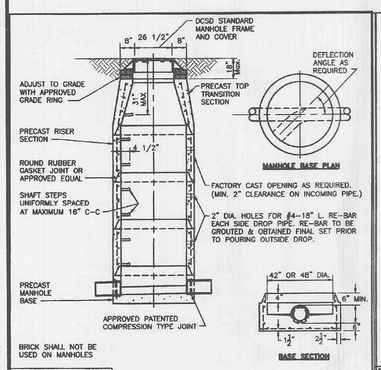
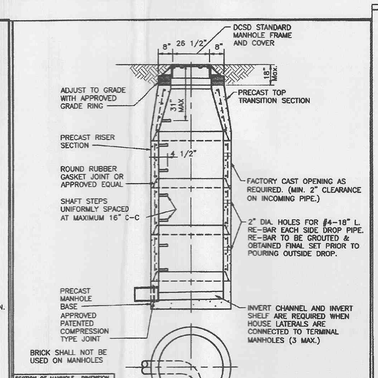


SECTION OF MANHOLE	DIMENSION
TOP TRANSITION	UPPER LOWER 26 1/2" DIA. 42" DIA.
BOTTOM SECTION	8" DIA. PIPE 42" DIA.
BOTTOM SECTION	10" THRU 36" DIA. PIPE 48" DIA.
BOTTOM SECTION	42" DIA. 60" DIA.

NOTE: ALL INVERTS SHALL HAVE POSITIVE DRAINAGE THROUGH MANHOLE.

SEE A.S.T.M. C-478 FOR MINIMUM STEEL REQUIREMENTS.

Duckett Creek Sanitary District
PRE-CAST CONCRETE MANHOLE FOR SEWERS 8" THROUGH 18"
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 12-30-99 | Detail No. 7

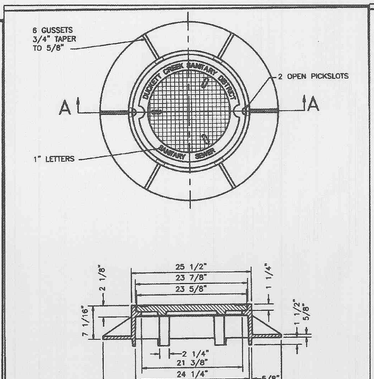


SECTION OF MANHOLE	DIMENSION
TOP TRANSITION	UPPER LOWER 26 1/2" DIA. 42" DIA.
BOTTOM SECTION	8" DIA. PIPE 42" DIA.
BOTTOM SECTION	10" THRU 36" DIA. PIPE 48" DIA.
BOTTOM SECTION	42" DIA. 60" DIA.

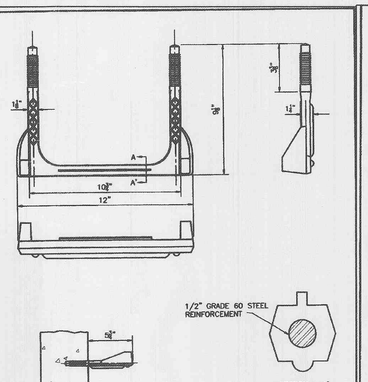
NOTE: ALL INVERTS SHALL HAVE POSITIVE DRAINAGE THROUGH MANHOLE.

SEE A.S.T.M. C-478 FOR MINIMUM STEEL REQUIREMENTS.

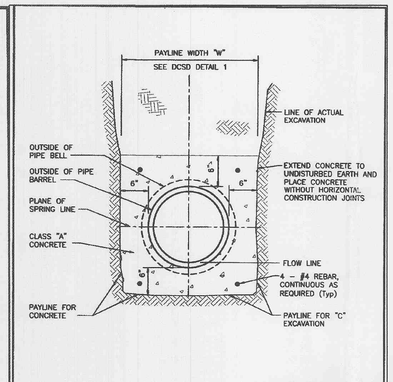
Duckett Creek Sanitary District
TERMINAL MANHOLE FOR SEWERS 8" THROUGH 18"
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 01-03-00 | Detail No. 8



Duckett Creek Sanitary District
MANHOLE FRAME AND COVER
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 01-14-00 | Detail No. 12



Duckett Creek Sanitary District
MANHOLE STEP PRECAST MANHOLE
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 1-3-01 | Detail No. 18



NOTE: SUPPORT PIPE TO PREVENT DISPLACEMENT DURING PLACEMENT OF CONCRETE.

Duckett Creek Sanitary District
TYPICAL CONCRETE ENCASEMENT
Drawn By: BSM | Chkd By: MDOB | App By: KLA | Date: 12-21-99 | Detail No. 4