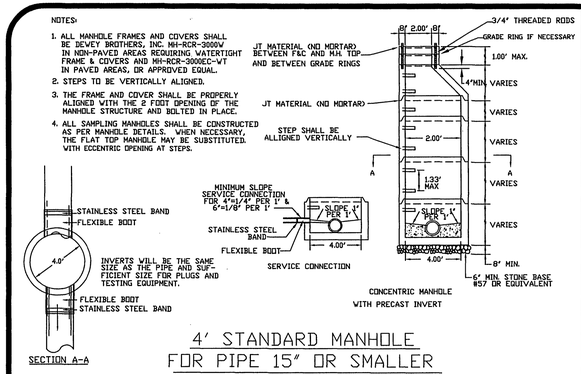
NOTES:

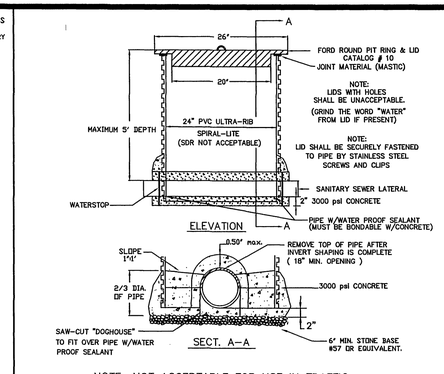
1. ALL MANHOLE FRAMES AND COVERS SHALL BE DEWEY BROTHERS, INC. MH-RCR-3000V IN NON-PAVED AREAS REQUIRING WATERTIGHT FRAME & COVERS AND MH-RCR-3000EC-VT IN PAVED AREAS, OR APPROVED EQUAL.
2. STEPS TO BE VERTICALLY ALIGNED.
3. THE FRAME AND COVER SHALL BE PROPERLY ALIGNED WITH THE 2 FOOT OPENING OF THE MANHOLE STRUCTURE AND BOLTED IN PLACE.
4. ALL SAMPLING MANHOLES SHALL BE CONSTRUCTED AS PER MANHOLE DETAILS. WHEN NECESSARY, THE FLAT TOP MANHOLE MAY BE SUBSTITUTED. WITH ECCENTRIC OPENING AT STEPS.



4' STANDARD MANHOLE FOR PIPE 15" OR SMALLER

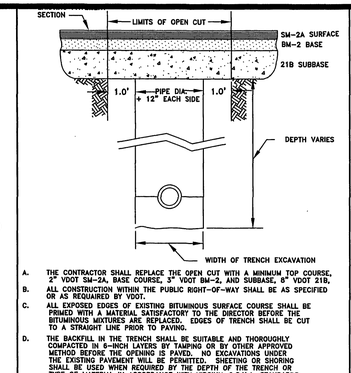
Pipe Diameter (in.)	Min. Time (min:sec)	Length for Min. Time (ft)	Time for Longer Length (sec)	Specified Time for Length (L) Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

MINIMUM SPECIFIED TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015



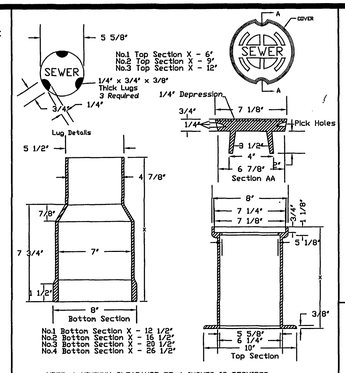
NOTE: NOT ACCEPTABLE FOR USE IN TRAFFIC AREAS OR AREAS SUBJECT TO FLOODING.

SAMPLING STRUCTURE DETAIL



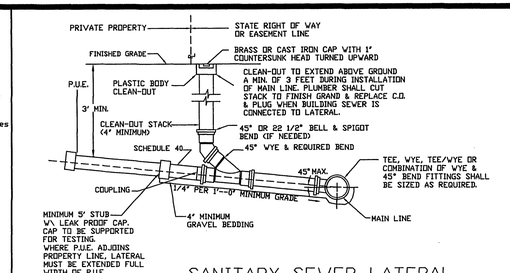
A. THE CONTRACTOR SHALL REPLACE THE OPEN CUT WITH A MINIMUM TOP COURSE, 2" VDOT SM-2A, BASE COURSE, 3" VDOT BM-2, AND SUBBASE, 8" VDOT 21B.
B. ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE AS SPECIFIED OR AS REQUIRED BY VDOT.
C. ALL EXPOSED EDGES OF EXISTING BITUMINOUS SURFACE COURSE SHALL BE PRIMED WITH A MATERIAL SATISFACTORY TO THE DIRECTOR BEFORE THE BITUMINOUS MIXTURES ARE REPLACED. EDGES OF TRENCH SHALL BE CUT TO A STRAIGHT LINE PRIOR TO PAVING.
D. THE BACKFILL IN THE TRENCH SHALL BE SUITABLE AND THOROUGHLY COMPACTED IN 6-INCH LAYERS BY TAMPING OR BY OTHER APPROVED METHOD BEFORE THE OPENING IS PAVED. NO EXCAVATIONS UNDER THE EXISTING PAVEMENT WILL BE PERMITTED. SHEETING OR SHORING SHALL BE USED WHEN REQUIRED BY THE DEPTH OF THE TRENCH OR TYPE OF MATERIAL IN ACCORDANCE WITH VIRGINIA O.S.H.A. STANDARDS.

PAVEMENT REPLACEMENT OPEN CUT ROADWAY



NOTE: A MINIMUM CLEARANCE OF 4 INCHES IS REQUIRED BETWEEN CLEANOUT CAP AND TOP OF COVER.

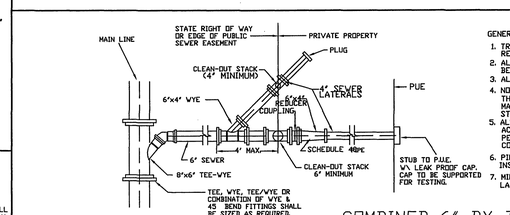
TRAFFIC BEARING CLEANOUT BOX



GENERAL NOTES:

1. TRAFFIC BEARING BOX REQUIRED IN TRAFFIC AREAS.
2. ALL PIPE AND FITTINGS SHALL BE OF SIMILAR MATERIAL.
3. ALL PIPE SHALL BE OF SAME SIZE.
4. NO BENDS ARE ALLOWED IN THE LATERAL FROM THE MAIN TO THE CLEAN-OUT STACK WYE. (EXCEPT AS NOTED)
5. ALL MAIN LINE TAPS ON ACTIVE MAINS WILL BE PERFORMED BY ROANOKE COUNTY UTILITY DEPT.
6. PIPING BEHIND CLEANOUT TO BE INSTALLED PER BOCA CODE.
7. MINIMUM LATERAL SIZE:
   4' FOR RESIDENTIAL SERVICE
   6' FOR NON-RESIDENTIAL SERVICE
8. MINIMUM COVER FOR ALL SEWER LATERALS SHALL BE THREE (3') FEET

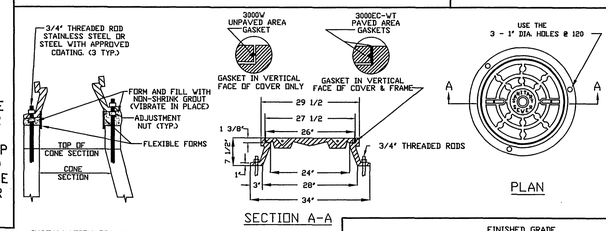
SANITARY SEWER LATERAL



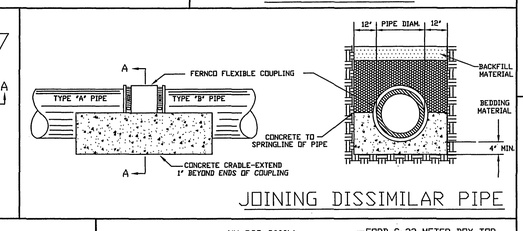
GENERAL NOTES:

1. TRAFFIC BEARING BOX REQUIRED IN TRAFFIC AREAS.
2. ALL PIPE AND FITTINGS SHALL BE OF SIMILAR MATERIAL.
3. ALL PIPE SHALL BE OF SIZE SHOWN.
4. NO BENDS ARE ALLOWED IN THE LATERAL FROM THE MAIN TO THE CLEAN-OUT STACK WYE. (EXCEPT AS NOTED)
5. ALL MAIN LINE TAPS ON ACTIVE MAINS WILL BE PERFORMED BY ROANOKE COUNTY UTILITY DEPT.
6. PIPING BEHIND CLEANOUT TO BE INSTALLED PER BOCA CODE.
7. MINIMUM COVER FOR ALL SEWER LATERALS SHALL BE THREE (3') FEET

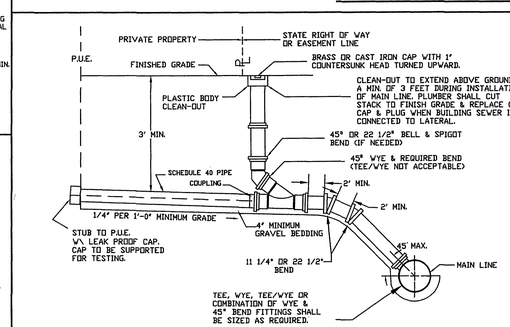
COMBINED 6" BY TWO 4" LATERALS



INSTALLATION DETAIL FOR SLOPE ADJUSTMENT



JOINING DISSIMILAR PIPE



GENERAL NOTES:

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2. ALL PIPE AND FITTINGS SHALL BE OF SIMILAR MATERIAL.
3. ALL PIPE SHALL BE OF SAME SIZE.
4. NO BENDS ARE ALLOWED IN THE LATERAL FROM THE MAIN TO THE CLEAN-OUT STACK WYE. (EXCEPT AS NOTED)
5. ALL MAIN LINE TAPS ON ACTIVE MAINS WILL BE PERFORMED BY ROANOKE COUNTY UTILITY DEPT.
6. PIPING BEHIND CLEANOUT TO BE INSTALLED PER BOCA CODE.
7. MINIMUM LATERAL SIZE:
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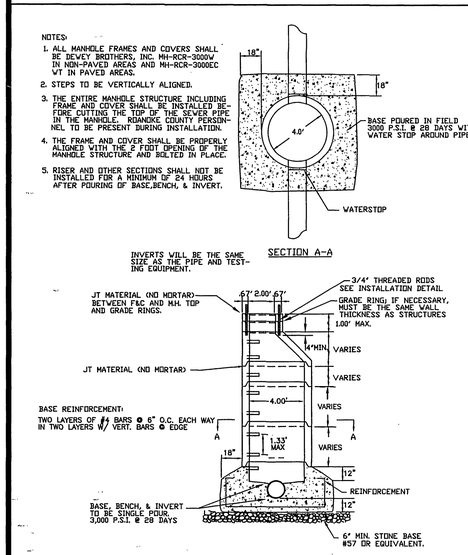
8. MINIMUM COVER FOR ALL SEWER LATERALS SHALL BE THREE (3') FEET

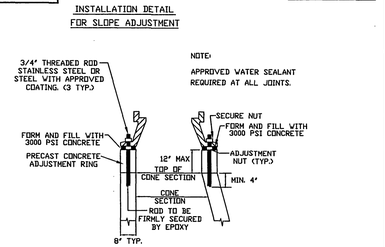
SANITARY SEWER LATERAL FOR DEEP SEWER

NOTES:

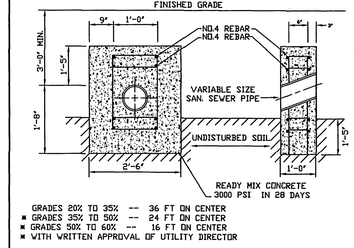
1. ALL MANHOLE FRAMES AND COVERS SHALL BE DEWEY BROTHERS, INC. MH-RCR-3000V IN NON-PAVED AREAS REQUIRING WATERTIGHT FRAME & COVERS AND MH-RCR-3000EC-VT IN PAVED AREAS, OR APPROVED EQUAL.
2. STEPS TO BE VERTICALLY ALIGNED.
3. THE FRAME AND COVER SHALL BE PROPERLY ALIGNED WITH THE 2 FOOT OPENING OF THE MANHOLE STRUCTURE AND BOLTED IN PLACE.



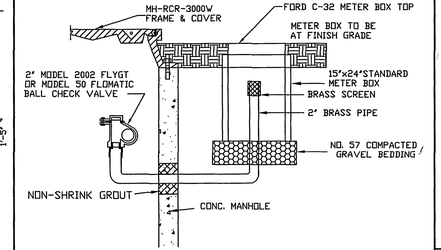
STRADDLE MANHOLE FOR PIPE 15" OR SMALLER



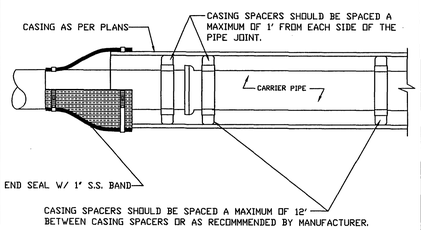
WATERTIGHT MANHOLE FRAME AND COVER



ANCHOR BLOCK



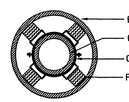
TYPE 2 MANHOLE VENT



ALTERNATE PIPE SUPPORT IN CASING PIPE:

18" LONG TREATED TIMBER SKIDS OF APPROPRIATE WIDTH SO THAT BELLS OR FLANGES DO NOT REST ON CASING WITH MORE THAN 3/4" FREE PLAY. SKIDS TO BE PLACED AT 4'-0" O.C. AND SECURED WITH 2"x 1/4" GALV. STEEL STRAPS OR 1" S.S. BANDS. SOAP-BASED LUBRICANT MAY BE USED FOR SLIDING OF SKID WITH DUCTILE IRON PIPE AND FLAX-BASED LUBRICANT MAY BE USED FOR SLIDING OF SKID WITH PVC PIPE.

NOTE: A 1" DRAIN WILL BE REQUIRED ON THE LOWER END OF THE CASING IF THE CASING ENDS ARE SEALED WITH MORTER AND BRICK.



PIPE SUPPORT IN CASING PIPE

NOTES:

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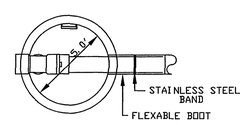
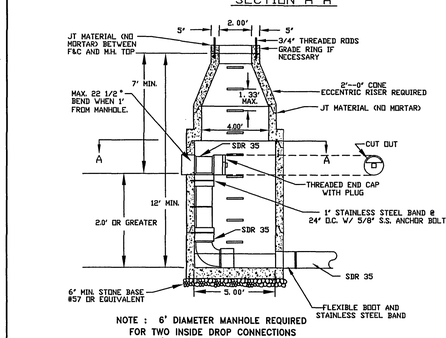
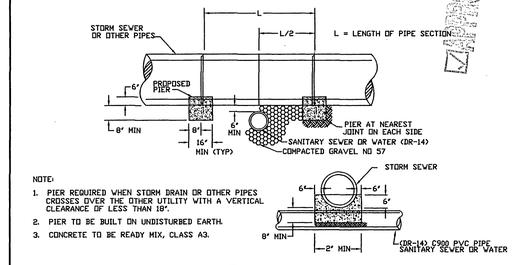


SECTION A-A



NOTE : 6' DIAMETER MANHOLE REQUIRED FOR TWO INSIDE DROP CONNECTIONS (MAIN LINE OR LATERAL)

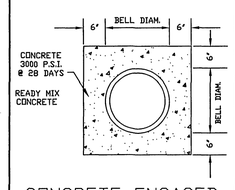
MAINLINE OR LATERAL DROP MANHOLE (FOR USE WITH PVC PIPE)



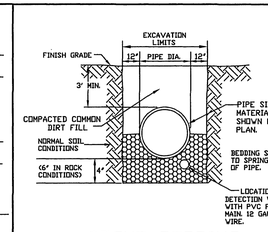
NOTE:

1. PIER REQUIRED WHEN STORM DRAIN OR OTHER PIPES CROSSES OVER THE OTHER UTILITY WITH A VERTICAL CLEARANCE OF LESS THAN 18".
2. PIER TO BE BUILT ON UNDISTURBED EARTH.
3. CONCRETE TO BE READY MIX, CLASS A3.

CONCRETE PIER



CONCRETE ENCASED PIPE



STONE BEDDING

NOTES:

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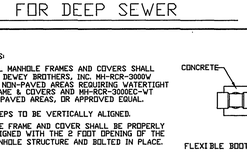
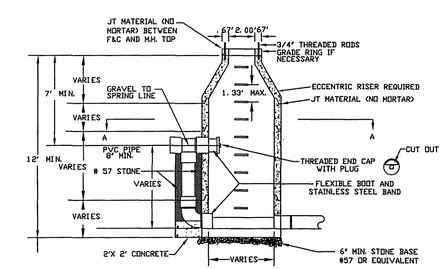


SECTION A-A



NOTE:
REFERENCE DETAIL DRAWINGS IN SPECS FOR DROP CONNECTION USING DUCTILE IRON PIPE.

OUTSIDE DROP MANHOLE (FOR USE WITH PVC PIPE)

FOR ADDITIONAL REFERENCE, SEE DETAIL DRAWINGS IN SEWER STANDARDS.

U:\Drawings\2005.0\Plans\C3D-2005.0-SP-EARLY.dwg, C4-03_SS_DETAILS, 6/1/2009 5:01:27 PM, mtomlinson, DWF6 ePlot.pc3, 1:1

DEPARTMENT OF ENGINEERING AND INSPECTIONS

NO.	REVISIONS	DATE
1	County Review	05/14/09
2	Final Review	05/27/09
3		
4		
5		
6		

COUNTY OF ROANOKE

DATE: 04/03/09
SCALE: NO SCALE
DRAWING BY: MPT
DESIGNED BY: MPT
APPROVED BY:

SEWER DETAILS

SHEET C4-03