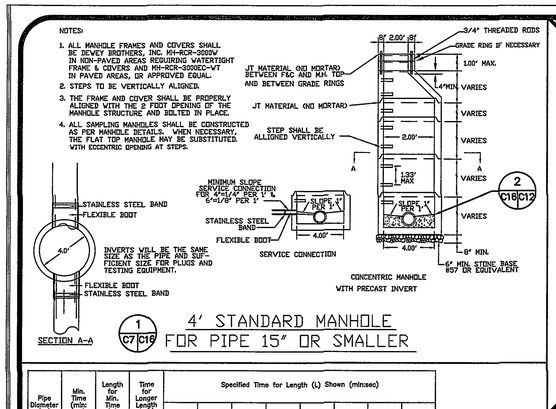
NOTES:

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-3000C-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.

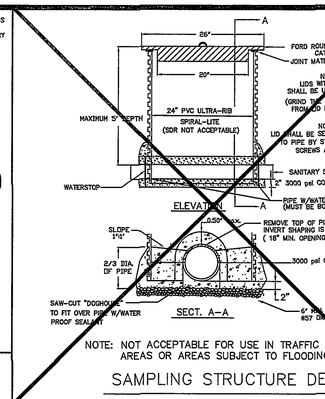


4' STANDARD MANHOLE FOR PIPE 15" OR SMALLER

(1 C7 C16)

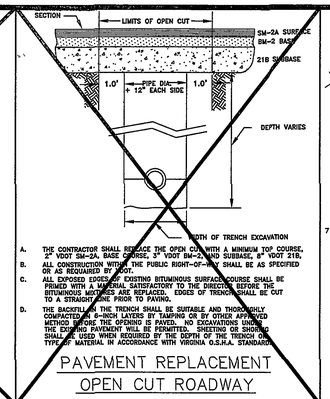
Pipe Diameter (in.)	Min. Time (min: sec)	Length for Min. Time (ft)	Time for Longer Length (sec)	Specified Time for Length (L) Shown (minsec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	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	69:46	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



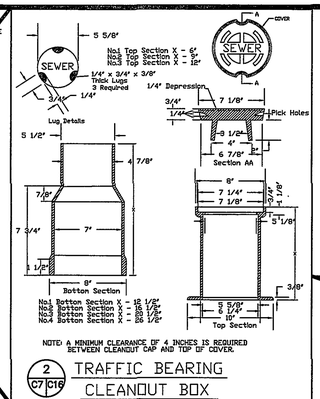
NOTE: NOT ACCEPTABLE FOR USE IN TRAFFIC AREAS OR AREAS SUBJECT TO FLOODING.

SAMPLING STRUCTURE DETAIL



A. THE CONTRACTOR SHALL REPLACE THE OPEN CUT WITH A MINIMUM TOP COURSE, 2" VDOT SM-2A, BASE COURSE, 3" VDOT SM-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.

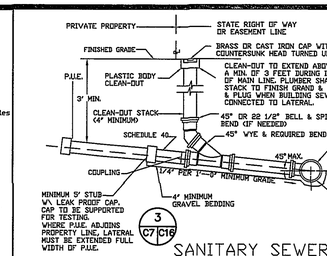
PAVEMENT REPLACEMENT OPEN CUT ROADWAY



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

TRAFFIC BEARING CLEANOUT BOX

(2 C7 C16)

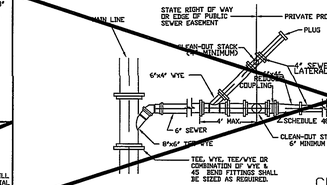


GENERAL NOTES:

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

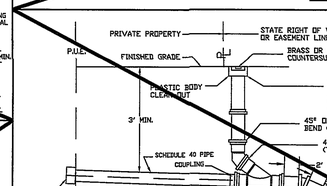
(3 C7 C16)



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

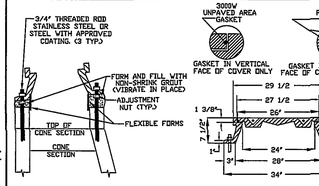
COMBINED 6" BY TWO 4" LATERALS



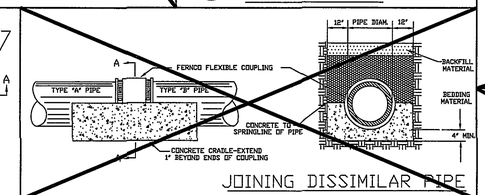
GENERAL NOTES:

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 FOR DEEP SEWER



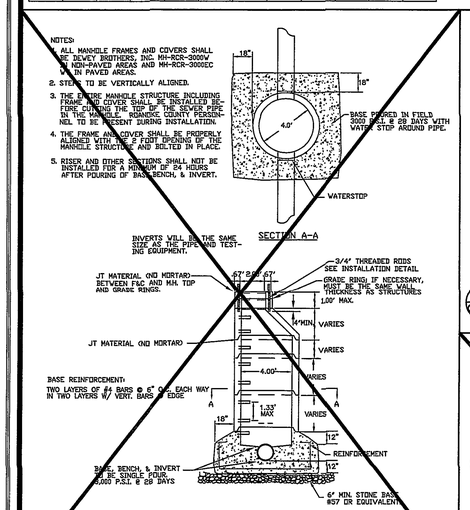
INSTALLATION DETAIL FOR SLOPE ADJUSTMENT



JOINING DISSIMILAR PIPE

NOTES:

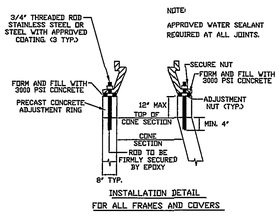
1. ALL MANHOLE FRAMES AND COVERS SHALL BE DEWEY BROTHERS, INC. MH-RCR-3000V IN NON-PAVED AREAS AND MH-RCR-3000EC IN PAVED AREAS.
2. STEPS TO BE VERTICALLY ALIGNED.
3. THE ENTIRE MANHOLE STRUCTURE INCLUDING FRAME AND COVER SHALL BE INSTALLED BEFORE CUTTING THE TOP OF THE SEWER PIPE IN THE MANHOLE. ROANOKE COUNTY PERSONNEL TO BE PRESENT DURING INSTALLATION.
4. THE FRAME AND COVER SHALL BE PROPERLY ALIGNED WITH THE 2 FOOT OPENING OF THE MANHOLE STRUCTURE AND BOLTED IN PLACE.
5. RISER AND OTHER SECTIONS SHALL NOT BE INSTALLED FOR A MINIMUM OF 24 HOURS AFTER POURING OF BASE BENCH, & INVERT.



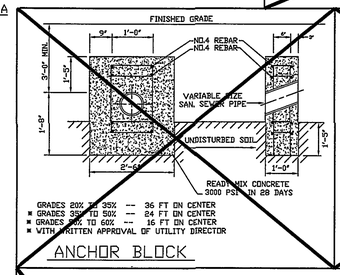
STRADDLE MANHOLE FOR PIPE 15" OR SMALLER

WATERTIGHT MANHOLE FRAME AND COVER

(4 C16 C16)

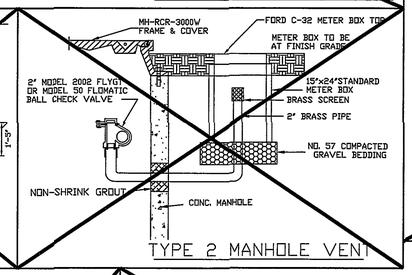


INSTALLATION DETAIL FOR ALL FRAMES AND COVERS



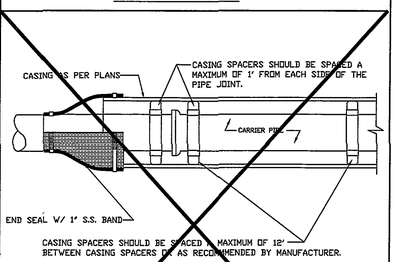
GRADES 20% TO 35% -- 36 FT ON CENTER
* GRADES 35% TO 50% -- 24 FT ON CENTER
* GRADES 50% TO 60% -- 16 FT ON CENTER
* WITH WRITTEN APPROVAL OF UTILITY DIRECTOR

ANCHOR BLOCK



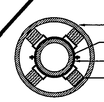
TYPE 2 MANHOLE VENT

STRADDLE MANHOLE FOR PIPE 15" OR SMALLER



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.

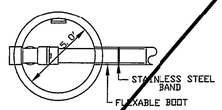
NOTE: A 1" DRAIN HOLE BE REQUIRED ON THE LOWER END OF THE CASING IF THE CASING ENDS ARE SEALED WITH MORTER AND BRICK.



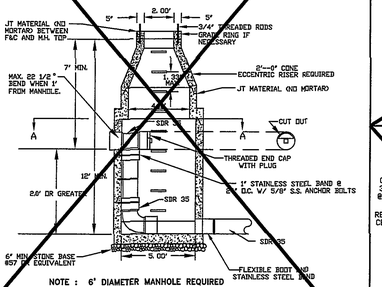
PIPE SUPPORT IN CASING PIPE

NOTES:

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.

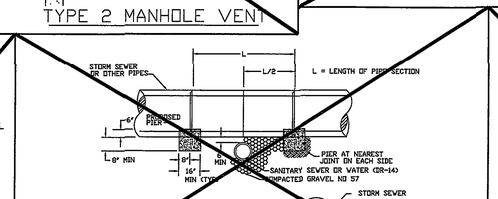


SECTION A-A



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

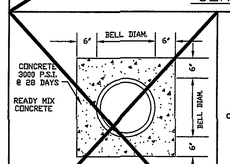
MAINLINE OR LATERAL DROP MANHOLE (FOR USE WITH PVC PIPE)



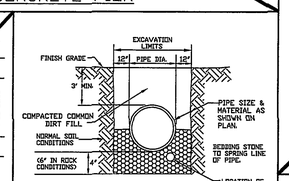
NOTE:

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

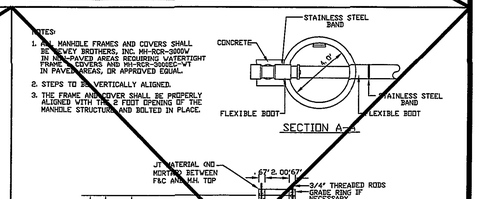


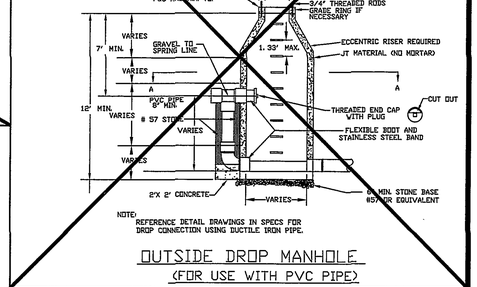
CONCRETE ENCASED PIPE



(5 C7 C16)

STONE BEDDING





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.

KEYPLAN

Draper Aden Associates
Engineering • Surveying • Environmental Services
2206 South Main Street, Blacksburg, VA 24060, 540-552-0444 Fax: 540-552-0291
Richmond, VA, Charlottesville, VA, Hampton Roads, VA

PROJECT TITLE

COX COMMUNICATIONS RENOVATIONS AND ADDITIONS

COX COMMUNICATIONS
ROANOKE COUNTY, VIRGINIA

SFCS Architecture Engineering Planning Interiors
SFCS Inc. ▪ 305 South Jefferson Street
Roanoke, Virginia 24011.2003
540.344.6664 ▪ Fax 540.343.6925
www.sfcs.com

PROJECT DESIGNER	:
PROJECT ARCHITECT	:
PROJECT ENGINEER	: STEVEN P. SOUPIR, P.E.
DESIGNED BY	: SPS
DRAWN BY	: SPS
CHECKED BY	: CAH

NO.	REVISION DESCRIPTION	DATE
	CONSTRUCTION DRAWING SUBMITTAL	3/14/06
	COUNTY COMMENT REVISIONS	4/06/06
	COUNTY COMMENT REVISIONS	5/01/06

DRAWING TITLE

ROANOKE COUNTY SEWER DETAILS

COMM. NO.	DATE
5515.00	MARCH 14, 2006
DRAWING C16	SHEET 17 OF 19

MENU

CADD VERSION	2006
PLOT SCALE	
PLOT DATE	May 02, 2006
COMM NO.	
DRAWING NO.	C16

P:\505000\505300\505326-02\CAD\505-0206\Dwg\505326-D - DETAILS.dwg May 02, 2006 12:09pm

DEPARTMENT OF ENGINEERING AND INSPECTIONS

NO.	REVISIONS	DATE
1		
2		
3		
4		
5		
6		

COUNTY OF ROANOKE

DATE:	12/95
SCALE:	NO SCALE
DRAWING BY:	ROANOKE COUNTY ENGINEERING DEPT.
DESIGNED BY:	ROANOKE COUNTY UTILITY DEPT.
APPROVED BY:	

SEWER DETAILS

SHEET 17 OF 19

APPROVED:

COUNTY ENGINEER DATE

COUNTY PLANNER DATE