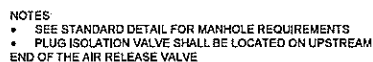


Sewer Force Main Contents

FM-01	Air Release Valve Detail
FM-02	Force Main Tracer Wire Ground Test Station
FM-03	In Ground Tracer Wire Detail
FM-04	Mechanical Joint Restraints
FM-05	Restraining Collar Design Data for Sewer Force Main
FM-06	Standard Main Marker for Sewer FM in Easements
FM-07	Tracer Wire Requirements

[illegible]

12 GAUGE SOLID COPPER TRACER
WIRE PVC COATED (GREEN), WIRE
SHALL EXTEND 5 FEET PAST FINISHED
GRADE. WIRE SHALL BE ROLLED UP
INTO VALVE BOX

PROSELECT 10X9-1/2 IN.
CAST IRON VALVE BOX TOP
OR APPROVED EQUAL

PROSELECT 5-1/4 IN
CAST IRON VALVE BOX
LID FOR SEWER
(SHALL HAVE SEWER MARKED IN TOP)
OR APPROVED EQUAL

4 INCH C-900 PVC
EXTEND 3 INCHES INTO
VALVE BOX TOP

FILL PIPE WITH #57
STONE

18" #57 STONE

12" #57 STONE

12 GAUGE TRACER WIRE
ZIP TIED TO FORCE MAIN
EVERY 5 FT

C-900 OR DIP FORCE MAIN

NOTES:

1. GROUND TRACER WIRE TEST STATION ARE TO BE USED IN SUBDIVISIONS ONLY
2. GROUND TEST STATIONS CAN NOT BE PLACED IN ROADWAYS OR IN DRIVEWAYS

 ANDERSON COUNTY	JOB NAME:		DRAWN BY:TAH	CHK'D BY:DS	
	FORCE MAIN TRACER WIRE GROUND TEST STATION		SCALE: 1=N.T.S.		
			DATE: 9/2022		
			JOB NUMBER	SHEET	
REV	DESCRIPTION	BY	DATE		

12 GAUGE SOLID COPPER TRACER
WIRE PVC COATED (GREEN). WIRE
SHALL EXTEND 5 FEET PAST FINISHED
GRADE. WIRE SHALL BE ROLLED UP
INTO VALVE BOX

PROSELECT 5-1/4 IN
CAST IRON VALVE BOX
LID FOR SEWER
(SHALL HAVE SEWER MARKED IN TOP)
OR APPROVED EQUAL

PROSELECT 10X9-1/2 IN.
CAST IRON VALVE BOX TOP
OR APPROVED EQUAL

4 INCH C-900 PVC
EXTEND 3 INCHES INTO
VALVE BOX TOP

FILL PIPE WITH #57
STONE

18" #57 STONE

12" #57 STONE

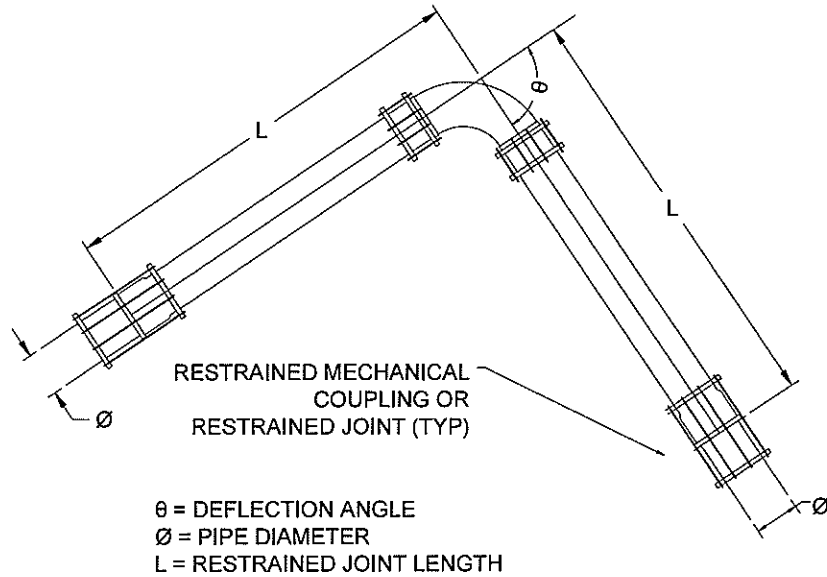
12 GAUGE TRACER WIRE
ZIP TIED TO FORCE MAIN
EVERY 5 FT

C-900 OR DIP FORCE MAIN

NOTES:

1. GROUND TRACER WIRE TEST STATION ARE TO BE USED IN
SUBDIVISIONS ONLY
2. GROUND TEST STATIONS CAN NOT BE PLACED IN ROADWAYS OR
IN DRIVEWAYS

	JOB NAME:		DRAWN BY:TAH		CHK'D BY:DS	
	FORCE MAIN TRACER WIRE GROUND TEST STATION		SCALE: 1=N.T.S.			
			DATE: 9/2022			
			JOB NUMBER		SHEET	
REV	DESCRIPTION	BY	DATE			



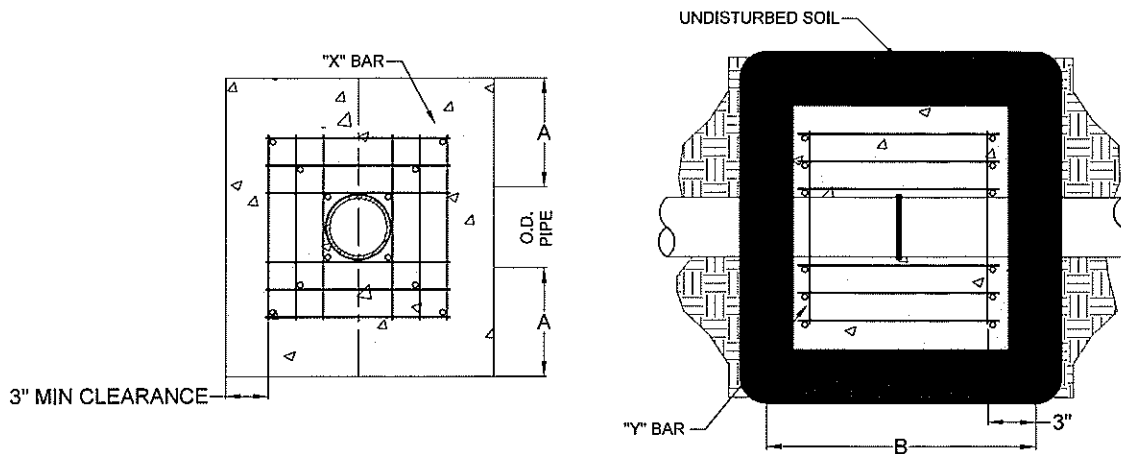
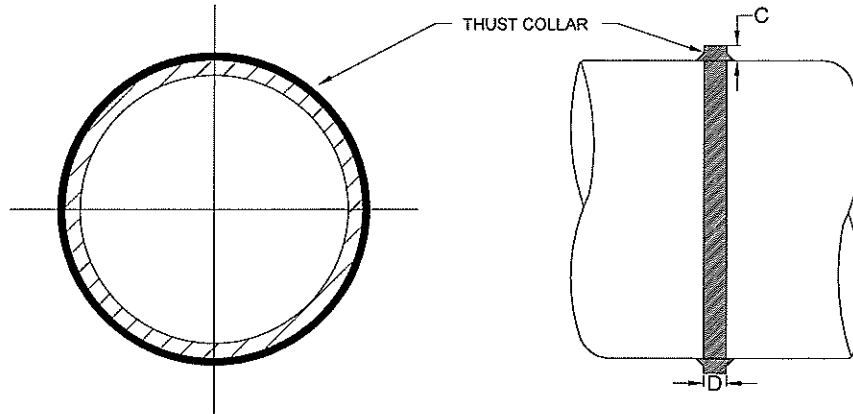
RESTRAINED JOINT TABLE							
RESTRAIN ALL JOINTS WITHIN THESE LENGTHS							
(IN LF EACH SIDE OF THE FITTING)							
SIZE	11 1/4	22 1/2	45	90	TEE BRANCH	DEAD END	REDUCER
4"	2	5	10	24	38	61	44
6"	4	7	14	33	64	85	47
8"	5	9	18	44	91	111	45
10"	6	11	22	52	113	132	46
12"	6	12	25	60	133	155	84

NOTE: RESTRAINED JOINTS SHALL BE IN ACCORDANCE WITH THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA) STANDARDS FOR ALL FITTING, FITTINGS OF OTHER SIZES, CHANGES IN CONDITIONS, ETC. NOT IN THIS TABLE SHALL BE IN ACCORDANCE WITH DIPRA STANDARDS

NOTES:

- THIS DETAIL DEPICTS A GENERAL CONFIGURATION FOR MECHANICALLY RESTRAINED JOINTS
- JOINT RESTRAINT SHALL BE PROVIDED FOR DEFLECTION ANGLES GREATER THAN OR EQUAL TO 22 1/2° IN EITHER HORIZONTAL OR VERTICAL ORIENTATION. RESTRAINT SHALL ALSO BE PROVIDED AT PIPE END FITTINGS (CAPS OR PLUGS) AND VALVES, WHICH SHALL BE TREATED AS ENDS ON BOTH SIDES OF THE VALVE
- DESIGN ENGINEER SHALL PROVIDE RESTRAINED JOINT CALCULATION BASED ON DIPRA "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE", LATEST EDITION OR EBAA IRON RESTRAINT LENGTH CALCULATOR, LATEST VERSION
- IF RESTRAINED LENGTHS FALL BETWEEN PIPE JOINTS, RESTRAINT SHALL BE EXTENDED TO THE NEXT PIPE JOINT FURTHEST FROM THE FITTING

	JOB NAME:		WWW-		DRAWN BY:TAH	CHK'D BY:DS
			MECHANICAL JOINT RESTRAINTS		SCALE: 1=N.T.S.	
					DATE: 7/2018	
					JOB NUMBER	SHEET
REV	DESCRIPTION			BY	DATE	



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	X BAR LENGTH	X BAR WEIGHT	Y BAR LENGTH	Y BAR WEIGHT	# BARS REQ.
6"-36"	#5	2'-2" + O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS EACH	X=24 Y=12
48" & GREATER	#6	3'-0" + O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS EACH	X=24 Y=12

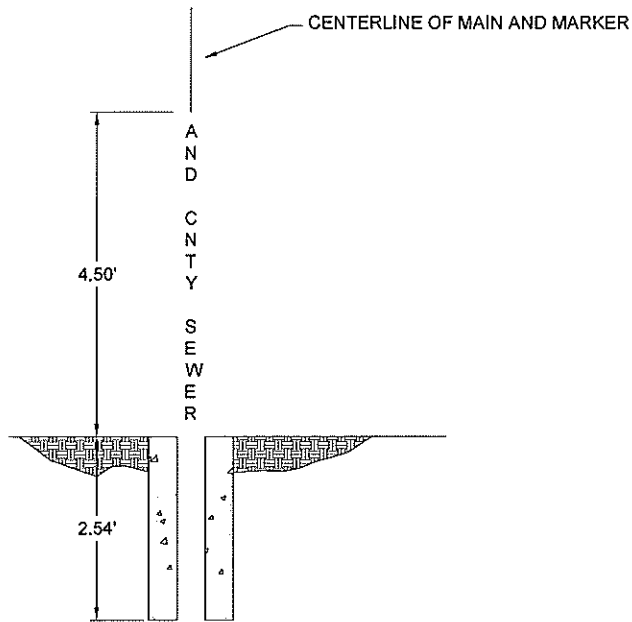
THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	A	B	C	D
6"-16"	1'-4"	1'-7"	2"	3/8"
20"-24"	1'-4"	1'-7"	3"	1/2"
30"-36"	1'-4"	1'-7"	4"	5/8"
48" & GREATER	1'-8"	1'-9"	6"	7/8"

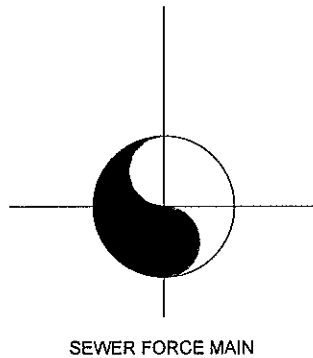
NOTES:

1. CONCRETE SHALL BE 3000 PSI AND TRANIT MIXED
2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER
3. BACKFILL TAMPED IN 6" LIFTS PER STANDARD
4. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE

 ANDERSON COUNTY SOUTH CAROLINA	JOB NAME: WW-34 RESTRAINING COLLAR DESIGN DATA FOR SEWER FORCE MAIN		DRAWN BY: TAH SCALE: 1=N.T.S. DATE: 12/2018	CHK'D BY: DS
			JOB NUMBER	SHEET
REV	DESCRIPTION	BY	DATE	



- NOTES:
1. PLASTIC MARKER SHALL BE GREEN IN COLOR.
 2. MARKERS SHALL BE LABELED "ANDERSON SEWER"
 3. TO BE SPACED EVERY 300 FEET ON EACH SIDE OF ANY ROADWAY OR JUNCTION.
 4. MARKERS SHALL BE ROUND 4" IN DIAMETER.



 ANDERSON COUNTY SOUTH CAROLINA	JOB NAME: WW-13 STANDARD MAIN MARKER FOR SEWER FORCE MAINS IN EASEMENTS		DRAWN BY:TAH SCALE: 1=N.T.S. DATE: 12/2018	CHK'D BY:DS
			JOB NUMBER	SHEET
REV	DESCRIPTION	BY	DATE	 QUALITY PROGRESS ANDERSON COUNTY SOUTH CAROLINA PRIDE

1. TRACER WIRE SHALL BE 12AWG COPPER CLAD STEEL-GREEN
2. WIRE SHALL BE INSTALLED ON THE BOTTOM SIDE OF THE PIPE, BELOW THE SPRINGLINE
3. WIRE SHALL BE FASTENED TO PIPE WITH PLASTIC TIES AT 5' INTERVALS
4. ALONG ROADWAYS. EVERY 500 FT A BOX SHALL BE INSTALLED AND TRACER WIRE CONNECTED TO TERMINALS. TERMINAL BOX SHALL BE RHINO TRIVIEW FLEX MARKING POSTS 66" GREEN WITH INTERNAL TESTING STATION OR APPROVED EQUAL TRACER WIRE MUST BE PROPERLY GROUNDED AT ALL DEAD ENDS/STUBS
5. GROUNDING OF TRACER WIRE SHALL BE ACHIEVED BY USE OF A DRIVE-IN MAGNESIUM GROUNDING ANODE ROD WITH A MINIMUM OF 20FT OF #14 READ HDPE INSULATED COPPER CLAD STEEL WIRE CONNECTED TO ANODE SPECIFICALLY MANUFACTURED FOR THIS PURPOSE, AND BURIED AT THE SAME ELEVATION AS THE UTILITY
6. WHEN GROUNDING THE TRACER WIRE AT DEAD ENDS/STUBS, THE GROUNDING ANODE SHALL BE INSTALLED IN A DIRECTION 180 DEGREES OF THE TRACE WIRE, AT THE MAXIMUM POSSIBLE DISTANCE
7. WHEN GROUNDING THE TRACER WIRE IN AREAS WHERE THE TRACER WIRE IS CONTINUOUS AND NEITHER THE MAINLINE TRACER WIRE OR THE GROUNDING ANODE WIRE WILL BE TERMINATE AT/ABOVE GRADE, INSTALL GROUNDING ANODE DIRECTLY BENEATH AND IN-LINE WITH THE TRACER WIRE. DO NOT COIL EXCESS WIRE FROM GROUNDING ANODE. IN THIS INSTALLATION METHOD, THE GROUNDING ANODE WIRE SHALL BE TRIMMED TO AN APPROPRIATE LENGTH BEFORE CONNECTING TO TRACER WIRE WITH A MAINLINE TO LATERAL LUG CONNECTOR
8. WHERE THE ANODE WIRE WILL BE CONNECTED TO A TRACER WIRE ACCESS BOX, A MINIMUM OF 2FT OF EXCESS/SLACK WIRE IS REQUIRED AFTER MEETING FINAL ELEVATION
9. TRACER WIRE INSTALLATION SHALL BE PERFORMED IN SUCH A MANNER THAT ALLOWS PROPER ACCESS FOR CONNECTION OF LINE TRACING EQUIPMENT, PROPER LOCATING OF WIRE WITHOUT LOSS OR DETERIORATION OF LOW FREQUENCY (512Hz) SIGNAL FOR DISTANCES IN EXCESS OF 500 LINEAR FEET, AND WITHOUT DISTORTION OF SIGNAL CAUSED BY MULTIPLE WIRES BEING INSTALLED IN CLOSE PROXIMITY TO ONE ANOTHER.
10. TRACER WIRE SYSTEMS MUST BE INSTALLED AS A SINGLE CONTINUOUS WIRE, EXCEPT WHERE USING APPROVED CONNECTORS. NO LOOPING OR COILING OF WIRE IS ALLOWED
11. ANY DAMAGE OCCURRING DURING INSTALLATION OF THE TRACER WIRE MUST BE IMMEDIATELY REPAIRED BY REMOVING THE DAMAGED WIRE, AND INSTALLING A NEW SECTION OF WIRE WITH APPROVED CONNECTORS. TAPING AND/OR SPRAY COATING SHALL NOT BE ALLOWED.
12. AT ALL MAINLINE DEAD-ENDS, TRACER WIRE SHALL GO TO GROUND USING AN APPROVED CONNECTION TO A DRIVE-IN MAGNESIUM GROUNDING ANODE ROD, BURIED AT THE SAME DEPTH AS THE TRACER WIRE
13. MAINLINE TRACE WIRE SHALL NOT BE CONNECTED TO EXISTING CONDUCTIVE PIPES. TREAT AS A MAINLINE DEAD-END, GROUND USING APPROVED WATERPROOF CONNECTION TO A GROUNDING ANODE BURIED AT THE SAME DEPTH AS THE TRACER WIRE
14. IN OCCURRENCES WHERE AN EXISTING TRACER WIRE IS ENCOUNTERED ON AN EXISTING UTILITY THAT IS BEING EXTENDED OR TIED INTO, THE NEW TRACER WIRE AND EXISTING TRACER WIRE SHALL BE CONNECTED USING APPROVED SPLICE CONNECTORS, SNA DS SHALL BE PROPERLY GROUNDED AT THE SPLICE LOCATION AS SPECIFIED
15. UNINSULATED TRACER WIRE SHALL NOT BE ACCEPTED
16. TRACER WIRE INSULATION MUST BE HDPE
17. NON LOCKING, FRICTION FIT, TRIST ON OR TAPED CONNECTORS WILL NOT BE ACCEPTED
18. GROUNDING RODS MUST BE MAGNESIUM, BRASS OR COPPER WILL NOT BE ACCEPTED
19. ALL NEW TRACER WIRE INSTALLATION SHALL BE LOCATED USING TYPICAL LOW FREQUENCY (512 HZ) LINE TRACING EQUIPMENT, WITNESSED BY THE CONTRACTOR, ENGINEER AND FACILITY OWNER AS APPLICABLE, PRIOR TO ACCEPTANCE OF OWNERSHIP
20. THE VERIFICATION SHALL BE PERFORMED UPON COMPLETION OF ROUGH GRADING AND AGAIN PRIOR TO FINAL ACCEPTANCE OF THE PROJECT
21. CONTINUITY TESTING IN LIEU OF ACTUAL LINE TRACING SHALL NOT BE ACCEPTABLE

[illegible]