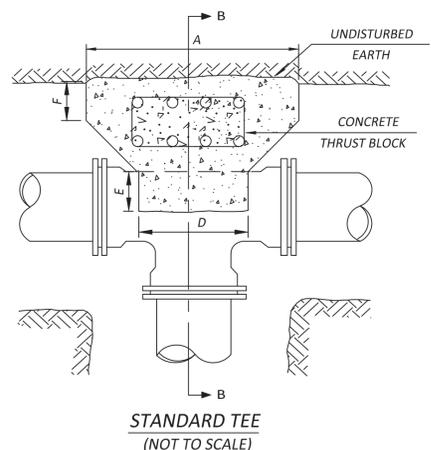
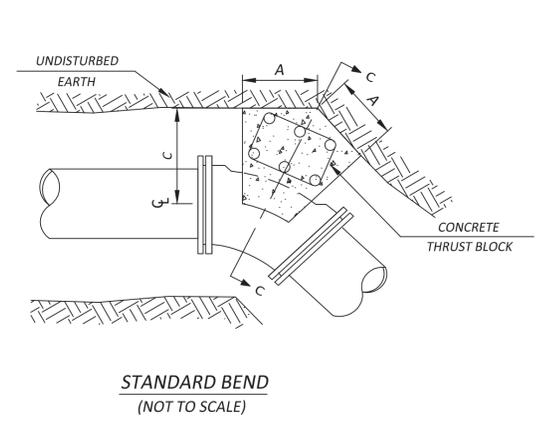


X:\PUBLICWORKS\ENGINEERING\ENGINEERING STANDARDS\DETAILS\CURRENT\DWGS\MSD 2310 WATER MAIN DETAILS (2015-08).DWG

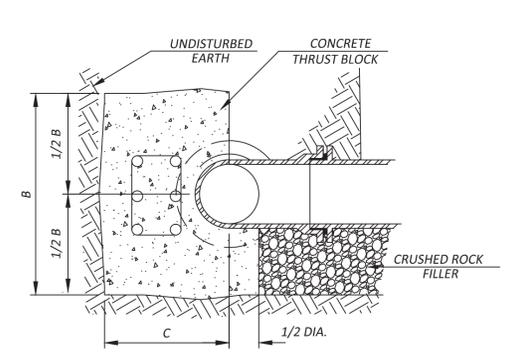
PLOT DATE: 7/30/2015 3:54 PM
PLOTTED BY: RICK PETRIE



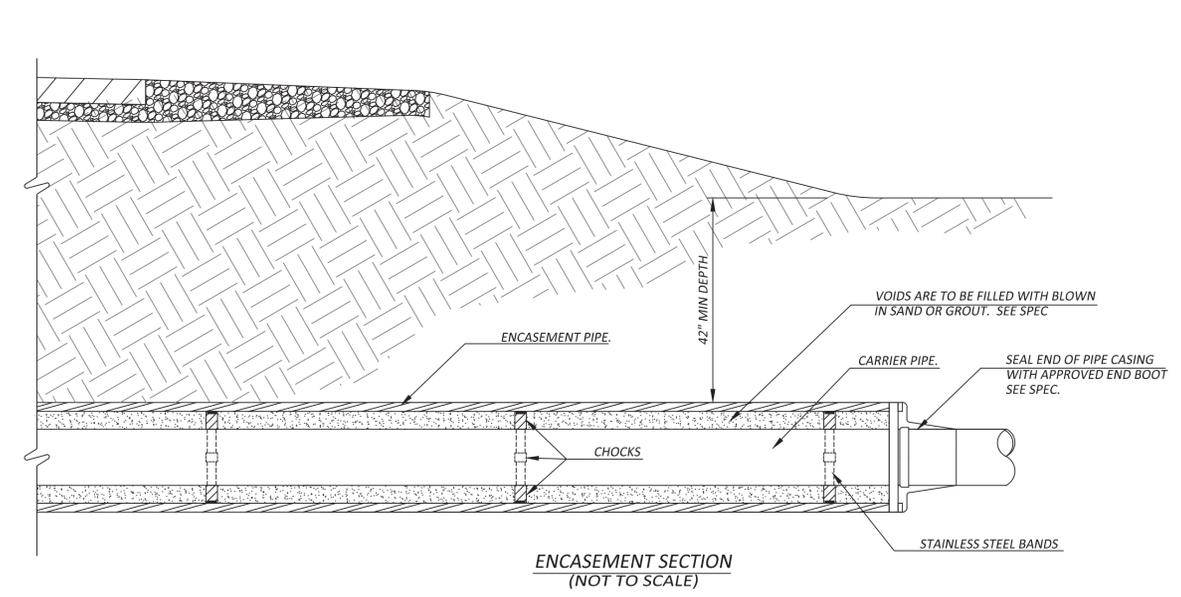
STANDARD TEE
(NOT TO SCALE)



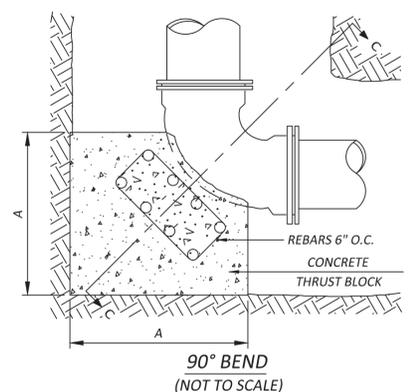
STANDARD BEND
(NOT TO SCALE)



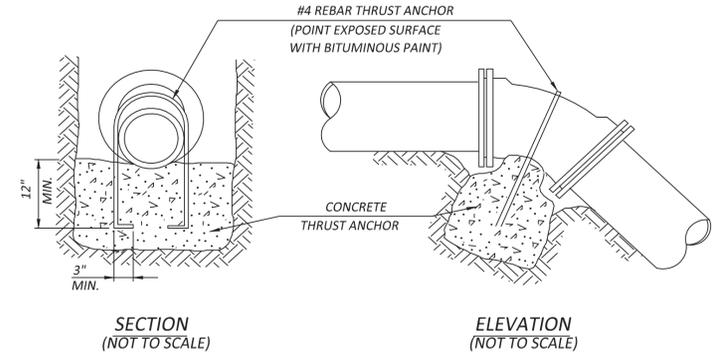
SECTION B-B
(NOT TO SCALE)



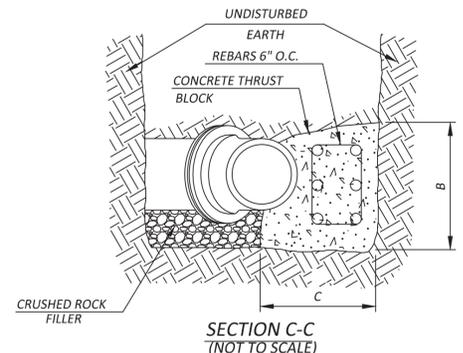
ENCASEMENT SECTION
(NOT TO SCALE)



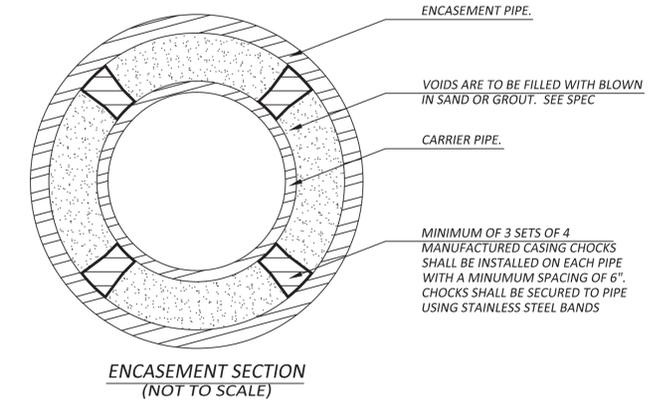
90° BEND
(NOT TO SCALE)



VERTICAL CHANGE IN DIRECTION
(NOT TO SCALE)



SECTION C-C
(NOT TO SCALE)



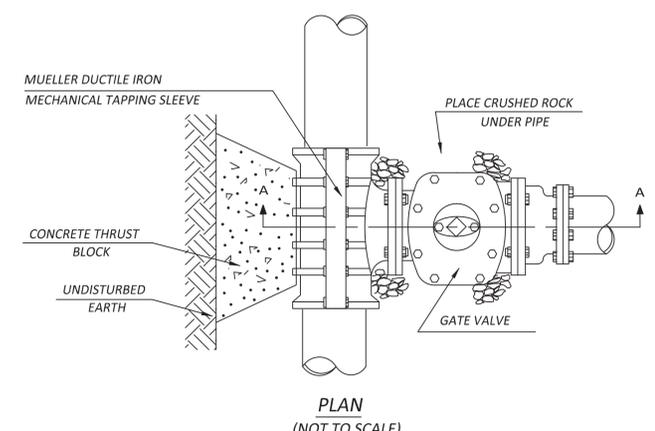
ENCASEMENT SECTION
(NOT TO SCALE)

CROSSING ENCASEMENT	
PIPE SIZE	CROSSING ENCASEMENT
1 1/2" DIP	3" STEEL
2" DIP	4" STEEL
2 1/2" DIP	6" STEEL
3" DIP	6" STEEL
4" DIP	8" STEEL
6" DIP	12" STEEL
8" DIP	14" STEEL
10" DIP	16" STEEL
12" DIP	20" STEEL
18" DIP	24" STEEL
24" DIP	30" STEEL

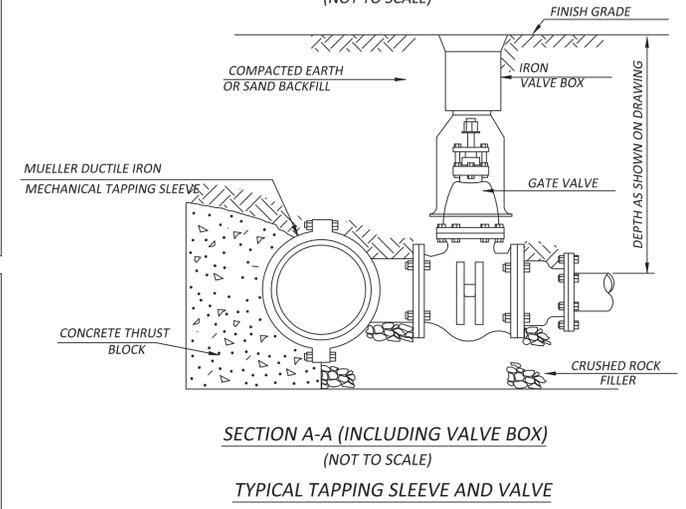
1. THE CONCRETE AND STEEL REQUIRED FOR ALL FITTINGS NOT LISTED SHALL BE THE SAME AMOUNT AS REQUIRED FOR THE 22 1/2° BENDS, CONCRETE AND STEEL ARE SUBSIDIARY TO OTHER ITEMS OF WORK. THE SPACING FOR MULTIPLE REBAR ANCHORS SHALL BE 2" C.C.
2. ALL BENDS ARE TO HAVE MEGALUG OR APPROVED EQUIVALENT JOINT RESTRAINTS.
3. ALL FITTINGS SHALL BE WRAPPED IN 6 MIL HEAVY PLASTIC.
4. BLOCKING OF TEES IS TO BE PLACED OPPOSITE THE BRANCH & AREA IS BASED ON BRANCH SIZE. ALL MATERIAL, LABOR, AND EQUIPMENT REQUIRED TO CONSTRUCT CONCRETE THRUST BLOCKS SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS OF WORK.
5. 12 GAUGE TRACER WIRE SHALL BE INSTALLED AND CONSIDERED SUBSIDIARY TO ALL WATER LINE INSTALLATIONS.
6. 2" DETECTABLE FOIL WARNING TAPE READING WITH THE WORDS "CAUTION" AND "WATER LINE" ON A BLUE BACKGROUND SHALL BE INSTALLED 12" ABOVE THE PIPE AND IS SUBSIDIARY TO ALL WATER LINE INSTALLATIONS.

PIPE DIA	THRUST BLOCK BEARING AREA																	
	TEES					90° BEND			45° BEND			22.5° BEND			11.25° BEND			
	A	B	C	D	E	F	A	B	C	A	B	C	A	B	C	A	B	C
4"	13"	22"	9"	13"	-	-	18"	12"	9"	9"	12"	12"	6"	12"	12"	-	-	-
6"	24"	30"	16"	16"	6"	6"	24"	18"	16"	10"	24"	12"	7"	18"	12"	-	-	-
8"	34"	32"	21"	18"	7"	6"	30"	26"	21"	13"	36"	18"	9"	24"	18"	9"	24"	18"
10"	40"	42"	23"	22"	8"	6"	35"	34"	24"	18"	38"	27"	12"	30"	27"	12"	30"	27"
12"	48"	52"	27"	24"	9"	6"	42"	42"	30"	21"	48"	33"	14"	36"	30"	10"	42"	24"
16"	54"	54"	32"	30"	12"	6"	50"	42"	36"	24"	48"	40"	15"	42"	34"	10"	42"	24"
18"	60"	60"	34"	32"	12"	6"	54"	48"	38"	27"	54"	44"	17"	46"	37"	10"	42"	24"
20"	72"	66"	36"	36"	24"	10"	72"	66"	54"	36"	66"	48"	18"	66"	42"	15"	48"	30"
24"	96"	72"	36"	44"	19"	8"	82"	60"	60"	44"	60"	72"	22"	60"	54"	15"	48"	36"
30"	108"	96"	60"	50"	20"	12"	108"	72"	84"	54"	72"	84"	28"	72"	64"	17"	60"	36"
36"	108"	108"	60"	56"	23"	12"	108"	108"	80"	68"	84"	96"	34"	84"	69"	20"	72"	36"

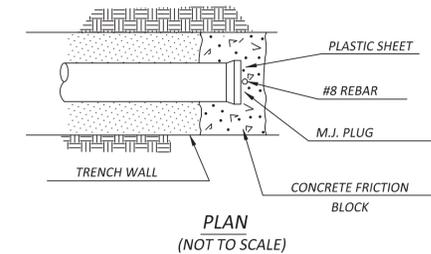
PIPE SIZE	VERTICAL CHANGE ANCHORS							
	90° BEND		45° BEND		22.5° BEND		11.25° BEND	
	CONCRETE	NO.	CONCRETE	NO.	CONCRETE	NO.	CONCRETE	NO.
	C.Y.	BAR	C.Y.	BAR	C.Y.	BAR	C.Y.	BAR
6"	2.0	2	1.0	1	1.0	1	1.0	1
8"	3.5	4	2.0	2	1.0	1	1.0	1
10"	5.5	6	3.0	3	1.5	2	1.0	1
12"	8.0	8	4.5	5	2.5	3	2.0	2



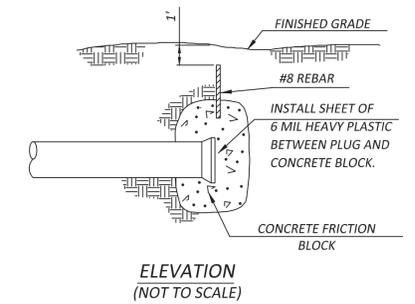
PLAN
(NOT TO SCALE)



SECTION A-A (INCLUDING VALVE BOX)
(NOT TO SCALE)
TYPICAL TAPPING SLEEVE AND VALVE



PLAN
(NOT TO SCALE)



ELEVATION
(NOT TO SCALE)

LINE PLUG & FRICTION BLOCK DETAIL



NO.	DATE	DESCRIPTION	BY
<p>City of Manhattan Kansas PUBLIC WORKS 1101 POYNTZ AVE., MANHATTAN, KS 66502 (785) 587-2415</p>			
<p>MANHATTAN STANDARD DETAILS MSD 2310 WATER MAIN DETAILS</p>			
CITY ENGINEER: BRIAN JOHNSON, P.E.		DESIGN BY:	
CITY PROJ. #:		PAGE OF	
DATE:	DRAWN BY:	PAGE OF	