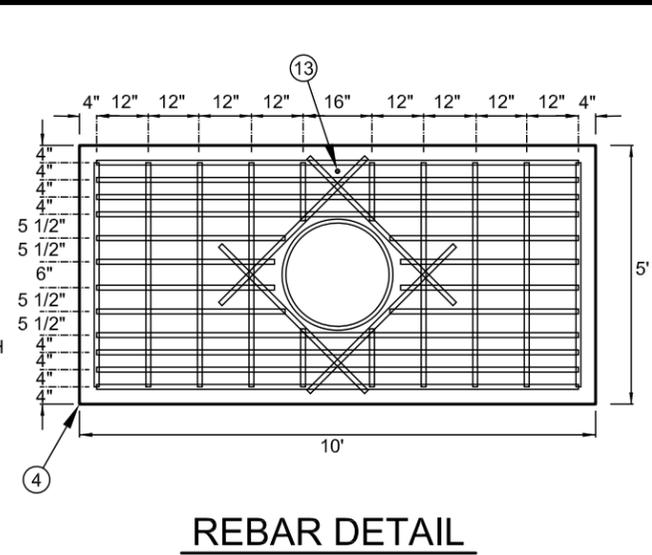
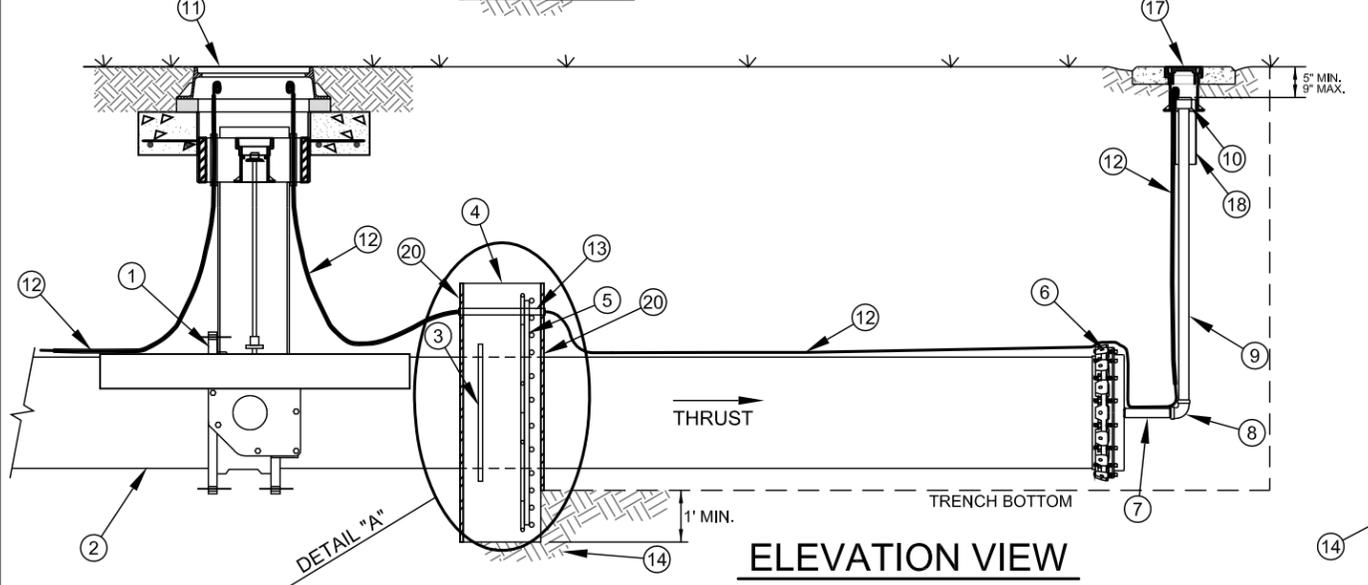


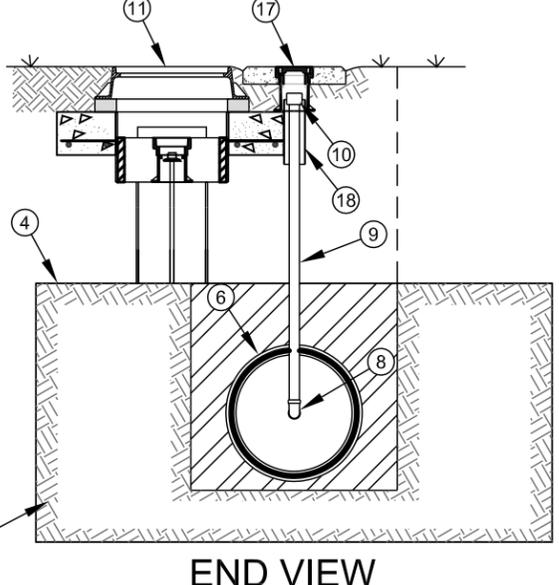
PLAN VIEW



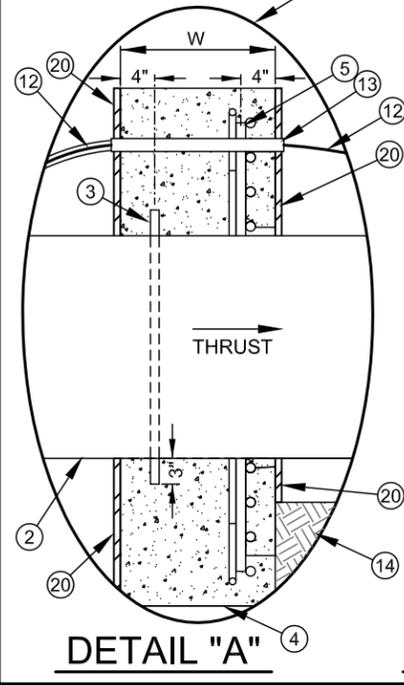
REBAR DETAIL



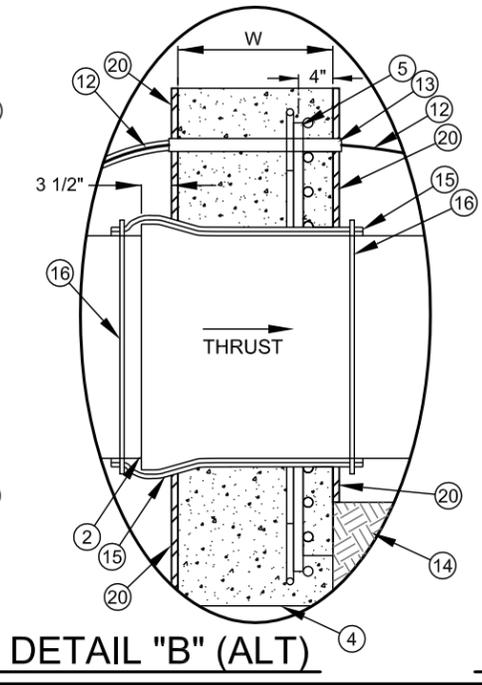
ELEVATION VIEW



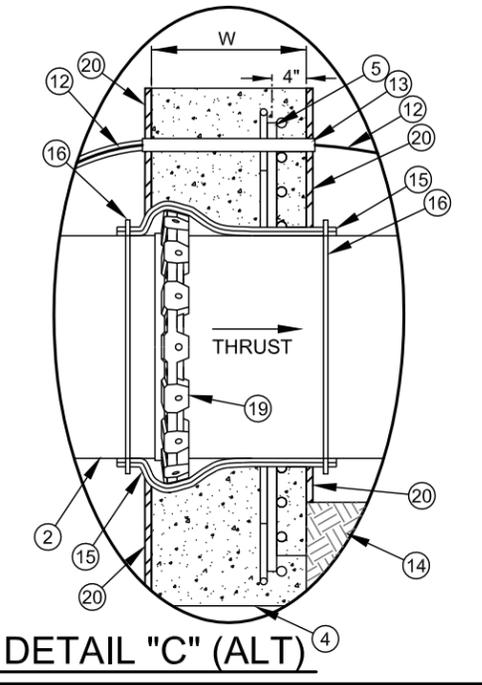
END VIEW



DETAIL "A"



DETAIL "B" (ALT)



DETAIL "C" (ALT)

- NO. DESCRIPTION**
- 1 END OF LINE VALVE - BUTTERFLY OR GATE VALVE (MJ X MJ)
  - 2 DIP - (PE x PE) - REMOVE BELL - LENGTH = 17 FT~ 19 FT
  - 3 1" THICK x 3" WIDE STEEL THRUST RING - FACTORY WELDED TO PIPE
  - 4 CONCRETE WALL BLOCK (F<sub>c</sub> = 3600 PSI MIN) 10 FT x 5 FT x WIDTH (W)
  - 5 REBARS - GRADE 60 PER ASTM A615 - SEE REBAR SCHEDULES, CUT WHEN REQUIRED
  - 6 MJ CAP - WITH WEDGE ACTION RESTRAINT GLAND, TAP 2" THREADED OUTLET (FNPT)
  - 7 2" RED BRASS NIPPLE SCH 40 (MNPT x MNPT) - LENGTH = 12 INCH
  - 8 2" RED BRASS 90° BEND (FNPT x FNPT)
  - 9 2" RED BRASS NIPPLE SCH 40 ( MNPT x MNPT) - LENGTH AS REQUIRED
  - 10 2" GALVANIZED MALLEABLE IRON COUPLING (FNPT x FNPT)
  - 11 BUTTERFLY/GATE VALVE BOX ASSEMBLY (16" + VALVES) - SEE DETAIL
  - 12 AWG #12 GAUGE COPPER TRACER WIRE - WITH BLUE INSULATION (30 MIL HDPE) TERMINATE WITH 24-INCH EXCESS WIRE (COILED) IN VALVE BOX (TYP.)
  - 13 1" SCH 40 PVC ELECTRICAL CONDUIT - LENGTH AS REQUIRED
  - 14 UNDISTURBED SOIL
  - 15 HIGH DENSITY CROSS LAMINATED POLYETHYLENE FILM TUBE (HDCLPE) AWWA C105 - 4 MILS EACH x 2 LAYER - 8 MILS TOTAL
  - 16 HDPE ADHESIVE TAPE OR HDPE ZIP LOCK TIES
  - 17 STANDARD VALVE BOX ASSEMBLY - SEE DETAIL
  - 18 5" CAST IRON SOIL PIPE - L=15" OR VALVE BOX BOTTOM SECTION
  - 19 WEDGE ACTION THRUST RESTRAINT GLAND
  - 20 PLYWOOD FORM

- NOTES:**
- WHEN DIRECTED BY THE ENGINEER, THE CONCRETE WALL BLOCK SIZE MAY BE ADJUSTED, BASED ON ACTUAL SOIL CLASSIFICATION AND PIPE DIAMETER.
  - FULLY RESTRAINED JOINT PIPE MAY BE USED IN LIEU OF THIS DETAIL - SEE RESTRAINED JOINT PIPE DETAILS.
  - ALTERNATE DETAIL "B" (USING A REVERSED BELL) MAY BE USED IN LIEU OF DETAIL "A".
  - ALTERNATE DETAIL "C" (USING WEDGE ACTION RESTRAINT GLAND) MAY BE USED IN LIEU OF DETAIL "A".

- NO. ALTERNATE DESCRIPTION**
- WHEN USING 2-INCH HDPE (IPS) BLOW-OFF PIPE WITH STAINLESS STEEL, BRASS OR BRONZE MNPT ENDS, USE THE FOLLOWING PRODUCTS:
- 7 2" SDR 9 HDPE (POLY) - IPS PIPE (MNPT x MNPT) - LENGTH AS REQUIRED - 12 - INCH MINIMUM.
  - 9 2" SDR 9 HDPE (POLY) - IPS PIPE (MNPT x MNPT) - LENGTH AS REQUIRED.

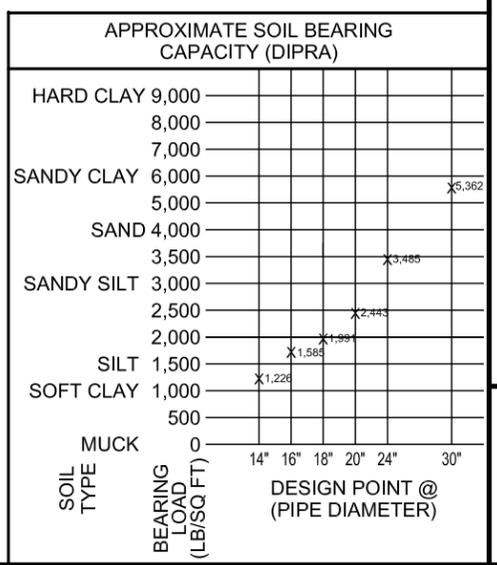
PIPE DIAMETER (INCHES)	APPROX. DEAD END THRUST (DIPRA) AT 200 PSI WATER PRESSURE (POUNDS)	UNDISTURBED SOIL BEARING AREA (SQ. FEET)	APPROX. SOIL BEARING PRESSURE (LB/SQ FT)	W (WIDTH) (MINIMUM) (INCHES)	CONCRETE VOLUME (APPROXIMATE)	
					FT <sup>3</sup>	CY
14	36,770	30	1,226	14	28	1.04
16	47,558	30	1,585	16	32	1.19
18	59,730	30	1,991	16	32	1.19
20	73,288	30	2,443	18	36	1.33
24	104,558	30	3,485	18	36	1.33
30	160,850	30	5,362	20	40	1.48

**REBAR SCHEDULE**

TYPE	LENGTH (INCHES)	NUMBER REQUIRED
VERTICAL	52	6
VERTICAL	20	4
HORIZONTAL	112	10
HORIZONTAL	48	4
DIAGONAL	48	4

**REBAR DIAMETER SCHEDULE**

PIPE DIAMETER	BAR SIZE	TOTAL REBAR LENGTH (FT)	TOTAL REBAR WEIGHT (LB)
14"	#9	158	537
16"	#10	158	680
18"	#10	158	680
20"	#10	158	680
24"	#10	158	680
30"	#11	158	839



**CHARLOTTE-MECKLENBURG UTILITIES**  
**STANDARD DETAILS**  
**WATER**

**DEAD END THRUST - WALL BLOCKING AND 2-INCH BLOW-OFF ASSEMBLY 14-INCH THROUGH 30-INCH MAINS**

STANDARD NO. LL  
 VERSION NO. 1.0  
 VERSION DATE 8.23.2011