

5/14/2022

Kimley»Horn

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CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO. 1-5973

SHEET NO. UC-3B

DESIGNED BY: DGB

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APPROVED BY:

REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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UTILITY CONSTRUCTION PLANS ONLY

SEAL

North Carolina Professional Engineer

David G. Babin

12/17/2022

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12/17/2022

UTILITY CONSTRUCTION

PLAN VIEW

ELEVATION VIEW

END VIEW

REBAR DETAIL

NO. DESCRIPTION

- END OF LINE VALVE - BUTTERFLY OR GATE VALVE (MJ X MJ)
- DP - PIPE X PEI - REMOVE BELL - LENGTH = 17 FT - 19 FT
- 1" THICK 3" WIDE STEEL THRUST RING - FACTORY WELDED TO PIPE
- CONCRETE WALL BLOCK (P# = 3600 PSI MIN) 10 FT x 5 FT x WIDTH (W) WHEN REQUIRED
- REBAR - GRADE 60 PER ASTM A615 - SEE REBAR SCHEDULES, CUT WHEN REQUIRED
- MJ CAP - WITH WEDGE ACTION RESTRAINT GLAND, TAP 2" THREADED OUTLET (FNPT)
- 2" RED BRASS NIPPLE SCH 40 (MNPT x MNPT) - LENGTH = 12 INCH
- 2" RED BRASS 90° ELBOW (FNPT x FNPT)
- 2" RED BRASS NIPPLE SCH 40 (MNPT x MNPT) - LENGTH AS REQUIRED
- 2" GALVANNEED MALLEABLE IRON COUPLING (FNPT x FNPT)
- BUTTERFLY GATE VALVE BOX ASSEMBLY (10" + VALVES) - SEE DETAIL
- AWG #12 GAUGE COPPER TRACER WIRE - WITH BLUE INSULATION (DUE HOPE) TERMINATE WITH 24-INCH EXCESS WIRE (COILED) IN VALVE BOX (TYP.)
- 1" SCH 40 PVC ELECTRICAL CONDUIT - LENGTH AS REQUIRED
- UNDISTURBED SOIL
- HIGH DENSITY CROSS LAMINATED POLYETHYLENE FILM TUBE (HDCLPE) AWWA C105 - 4 MILS EACH x 2 LAYER - 8 MILS TOTAL
- HOPE ADHESIVE TAPE OR HOPE JOE LOCK TIES
- STANDARD VALVE BOX ASSEMBLY - SEE DETAIL
- 5" CAST IRON SOIL PIPE - 1-1/2" OR VALVE BOX BOTTOM SECTION
- WEDGE ACTION THRUST RESTRAINT GLAND
- PLYWOOD FORM

NOTES:

A. WHEN DIRECTED BY THE ENGINEER, THE CONCRETE WALL BLOCK SIZE MAY BE ADJUSTED, BASED ON ACTUAL SOIL CLASSIFICATION AND PIPE DIAMETER.

B. FULLY RESTRAINED JOINT PIPE MAY BE USED IN LIEU OF THIS DETAIL - SEE RESTRAINED JOINT PIPE DETAILS.

C. ALTERNATE DETAIL "B" USING A REVERSED BELL MAY BE USED IN LIEU OF DETAIL "A".

D. ALTERNATE DETAIL "C" USING WEDGE ACTION RESTRAINT GLAND MAY BE USED IN LIEU OF DETAIL "A".

NO. ALTERNATE DESCRIPTION

WHEN USING 3/4" HOPE (POLY) BLOW-OFF PIPE WITH STAINLESS STEEL BRASS OR BRONZE MNPT FDS, USE THE FOLLOWING PRODUCTS:

- 2" SDR 9 HOPE (POLY) - IPS PIPE (MNPT x MNPT) - LENGTH AS REQUIRED - 1/2" MINIMUM.
- 2" SDR 9 HOPE (POLY) - IPS PIPE (MNPT x MNPT) - LENGTH AS REQUIRED.

PIPE DIAMETER (INCHES)	TOTAL THRUST (POUNDS)	UNDISTURBED SOIL BEARING AREA (SQUARE FEET)	APPROX. SOIL BEARING PRESSURE (LB/SQ FT)	W (WIDTH) (MINIMUM) INCHES	CONCRETE VOLUME (APPROXIMATE) FT ³ / CY	
14	36,770	30	1,226	14	28	1.34
16	47,558	30	1,585	16	32	1.19
18	60,730	30	2,024	18	36	1.33
20	73,288	30	2,443	20	40	1.48
24	104,558	30	3,485	24	48	1.83
30	160,859	30	5,362	30	60	2.81

REBAR SCHEDULE	PIPE DIAMETER (INCHES)	LENGTH (INCHES)	NUMBER REQUIRED	BAR SIZE	TOTAL REBAR LENGTH (FT)	TOTAL REBAR WEIGHT (LB)
VERTICAL	22	4	6	#10	158	680
HORIZONTAL	112	10	20	#10	158	680
DIAGONAL	48	4	4	#10	158	680

TYPE A
USING CAST IRON SOIL PIPE

TYPE B
USING PVC PIPE

NO. DESCRIPTION

- CONCRETE PAD - CAST IN PLACE.
- FINAL ASPHALT SURFACE COURSE.
- VALVE BOX COVER.
- TOP SECTION VALVE BOX.
- EXTENSION STEM AS REQUIRED.
- BOTTOM SECTION VALVE BOX.
- 6" PVC PIPE (C900 OR SDR26).
- STANDARD CONCRETE BLOCK - 2 EACH.
- GATE VALVE (OR BALL VALVE, AS APPLICABLE).
- 5" DIA. CAST IRON SOIL PIPE - BELL OF PIPE WILL RECEIVE BOTTOM SECTION OF VALVE BOX.
- EXISTING OR NEW PAVEMENT.
- COMPACTED AGGREGATE BASE COURSE (CABC).
- COMPACTED SUBGRADE.
- AWG #12 GAUGE COPPER TRACER WIRE (THWN) WITH BLUE INSULATION, TERMINATE WITH 24 INCH EXCESS WIRE (COILED) AT METER BOX AND VALVE BOX (TYP.).

NOTES:

A. WATER VALVE ADJUSTMENTS WILL BE COMPLETED AT LEAST 36 HOURS BEFORE RESURFACING.

B. 12" MINIMUM WIDTH OF EXCAVATION AROUND VALVE BOX.

C. DISTURBED AREAS AROUND STRUCTURE ADJUSTMENTS ARE TO BE TAMPED AND FILLED WITH 4000 PSI HIGH EARLY PORTLAND CEMENT CONCRETE.

D. ALL DAMAGED OR MISALIGNED VALVE BOXES ARE TO BE REPORTED TO INSPECTOR. OTHERWISE CONTRACTOR ASSUMES RESPONSIBILITY FOR DAMAGE OR MISALIGNMENT.

E. IF THE VERTICAL ADJUSTMENT CAUSES LESS THAN ONE INCH OVERLAP BETWEEN TOP SECTION AND RISER PIPE, CONTRACTOR WILL REMOVE AND REPLACE RISER PIPE FROM BOTTOM SECTION TO TOP TO PROVIDE 3 INCHES OF OVERLAP IN TOP SECTION FOR TYPE A OR IF THE VERTICAL ADJUSTMENT CAUSES LESS THAN ONE INCH OVERLAP BETWEEN TOP SECTION AND BOTTOM SECTION, CONTRACTOR WILL REMOVE AND RESET BOTTOM SECTION TO PROVIDE A MINIMUM OF 3 INCHES OVERLAP AT TOP SECTION/BOTTOM SECTION JOINT SECTION & BOTTOM SECTION/RISER PIPE JOINT FOR TYPE B.

F. ALL CONCRETE SHALL BE VIBRATED IN ACCORDANCE WITH N.C. DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

G. TOP & BOTTOM SECTION TO BE CENTERED OVER NUT, NOT TO BEAR ON VALVE BODY.

H. PROVIDE CLEARANCE BETWEEN VALVE BOX/BRICK AND THE VALVE.

I. VALVE BOX ASSEMBLY SHALL CONSIST OF NO MORE THAN 3 VERTICAL SECTIONS - 1 TOP SECTION, 1 BOTTOM SECTION AND 1 PIPE RISER SECTION.

WATER COVER - TOP VIEW

SEWER COVER - TOP VIEW

RECLAIMED WATER - TOP VIEW

CATHODIC PROTECTION COVER - TOP VIEW

NO. DESCRIPTION

- TYPE I ADJUSTMENT RISER.
- VALVE BOX - TOP SECTION.
- 18" x 18" PRECAST (OR CAST IN PLACE) CONCRETE PAD OR 24" DIAMETER PRECAST PAD, NON-SHRINK GROUT - IN ANNULAR SPACE.
- VALVE BOX COVER.
- TOP SECTION VALVE BOX.
- EXTENSION STEM AS REQUIRED. SEE NOTES
- BOTTOM SECTION VALVE BOX.
- 6" PVC PIPE (C900 OR SDR 26).
- PRECAST CONCRETE FOOTING - TYPE II - SEE DETAIL.
- GATE VALVE (OR BALL VALVE, AS APPLICABLE).
- 5" DIA. CAST IRON SOIL PIPE - BELL OF PIPE WILL RECEIVE BOTTOM SECTION OF VALVE BOX.
- AWG #12 GAUGE COPPER TRACER WIRE (THWN) WITH BLUE INSULATION, TERMINATE WITH 24 INCH EXCESS WIRE (COILED) AT METER BOX AND VALVE BOX (TYP.).
- 1/4" OR 3/8" ID CONDUIT - SDR 9 PEX TUBING - ASTM F 876.
- CONCRETE (ROADWAY, DRIVEWAY OR SIDEWALK) ASPHALT PAVEMENT.
- COMPACTED AGGREGATE BASE COURSE (CABC) OR ASPHALT BASE COURSE.
- COMPACTED SUBGRADE.
- NONWOVEN GEOTEXTILE FABRIC - 18" x 18" - 2 LAYERS - MIRAFIX #140N OR CARTHAGE MILLS # FX - 40HS.
- PRECAST CONCRETE FOOTING - TYPE I - SEE DETAIL.

NOTES:

A. CONCRETE FOOTING TO BE CENTERED OVER VALVE NUT, AND SHALL NOT BEAR ON VALVE BODY.

B. PROVIDE CLEARANCE BETWEEN VALVE FOOTING AND THE VALVE.

C. WHEN OPERATING NUT DEPTH EXCEEDS 3'-0" BELOW FINISHED GRADE, PROVIDE EXTENSION STEM WITH STANDARD 2" SQUARE OPERATING NUT IN TOP SECTION OF VALVE BOX. SEE STANDARD DETAIL.

D. VALVE BOX ASSEMBLY SHALL CONSIST OF NO MORE THAN 3 VERTICAL SECTIONS - 1 TOP SECTION, 1 BOTTOM SECTION, AND 1 PIPE RISER SECTION.

E. CONCRETE PADS SHALL NOT BE USED IN PAVEMENT (CONCRETE OR ASPHALT), SIDEWALKS OR DRIVEWAYS.

TH - TOTAL HEIGHT	AH - ADJUSTMENT HEIGHT	H	MINIMUM WEIGHT - LBS
< 4 1/2"	< 2 1/2"	NOT APPROVED	NOT APPROVED
4 1/2"	2 1/2"	0	16
5"	3"	1 1/2"	20
6"	4"	1 1/2"	22.5
7"	5"	2 1/2"	25
8"	6"	3 1/2"	27
10"	8"	5 1/2"	32

TH - TOTAL HEIGHT	AH - ADJUSTMENT HEIGHT	MIN. WEIGHT LBS
3"	1 1/2"	7
4"	2"	9
5"	2 1/2"	11
6"	3"	13
> 6"	NOT APPROVED	N/A

TYPE 1
USING PVC PIPE

TYPE 2
USING CAST IRON SOIL PIPE

NO. DESCRIPTION

- 18" x 18" PRECAST (OR CAST IN PLACE) CONCRETE PAD OR 24" DIAMETER PRECAST PAD, NON-SHRINK GROUT - IN ANNULAR SPACE.
- VALVE BOX COVER.
- TOP SECTION VALVE BOX.
- EXTENSION STEM AS REQUIRED. SEE NOTES
- BOTTOM SECTION VALVE BOX.
- 6" PVC PIPE (C900 OR SDR 26).
- PRECAST CONCRETE FOOTING - TYPE II - SEE DETAIL.
- GATE VALVE (OR BALL VALVE, AS APPLICABLE).
- 5" DIA. CAST IRON SOIL PIPE - BELL OF PIPE WILL RECEIVE BOTTOM SECTION OF VALVE BOX.
- AWG #12 GAUGE COPPER TRACER WIRE (THWN) WITH BLUE INSULATION, TERMINATE WITH 24 INCH EXCESS WIRE (COILED) AT METER BOX AND VALVE BOX (TYP.).
- 1/4" OR 3/8" ID CONDUIT - SDR 9 PEX TUBING - ASTM F 876.
- CONCRETE (ROADWAY, DRIVEWAY OR SIDEWALK) ASPHALT PAVEMENT.
- COMPACTED AGGREGATE BASE COURSE (CABC) OR ASPHALT BASE COURSE.
- COMPACTED SUBGRADE.
- NONWOVEN GEOTEXTILE FABRIC - 18" x 18" - 2 LAYERS - MIRAFIX #140N OR CARTHAGE MILLS # FX - 40HS.
- PRECAST CONCRETE FOOTING - TYPE I - SEE DETAIL.

NOTES:

A. CONCRETE FOOTING TO BE CENTERED OVER VALVE NUT, AND SHALL NOT BEAR ON VALVE BODY.

B. PROVIDE CLEARANCE BETWEEN VALVE FOOTING AND THE VALVE.

C. WHEN OPERATING NUT DEPTH EXCEEDS 3'-0" BELOW FINISHED GRADE, PROVIDE EXTENSION STEM WITH STANDARD 2" SQUARE OPERATING NUT IN TOP SECTION OF VALVE BOX. SEE STANDARD DETAIL.

D. VALVE BOX ASSEMBLY SHALL CONSIST OF NO MORE THAN 3 VERTICAL SECTIONS - 1 TOP SECTION, 1 BOTTOM SECTION, AND 1 PIPE RISER SECTION.

E. CONCRETE PADS SHALL NOT BE USED IN PAVEMENT (CONCRETE OR ASPHALT), SIDEWALKS OR DRIVEWAYS.

REVISIONS

8/17/2022