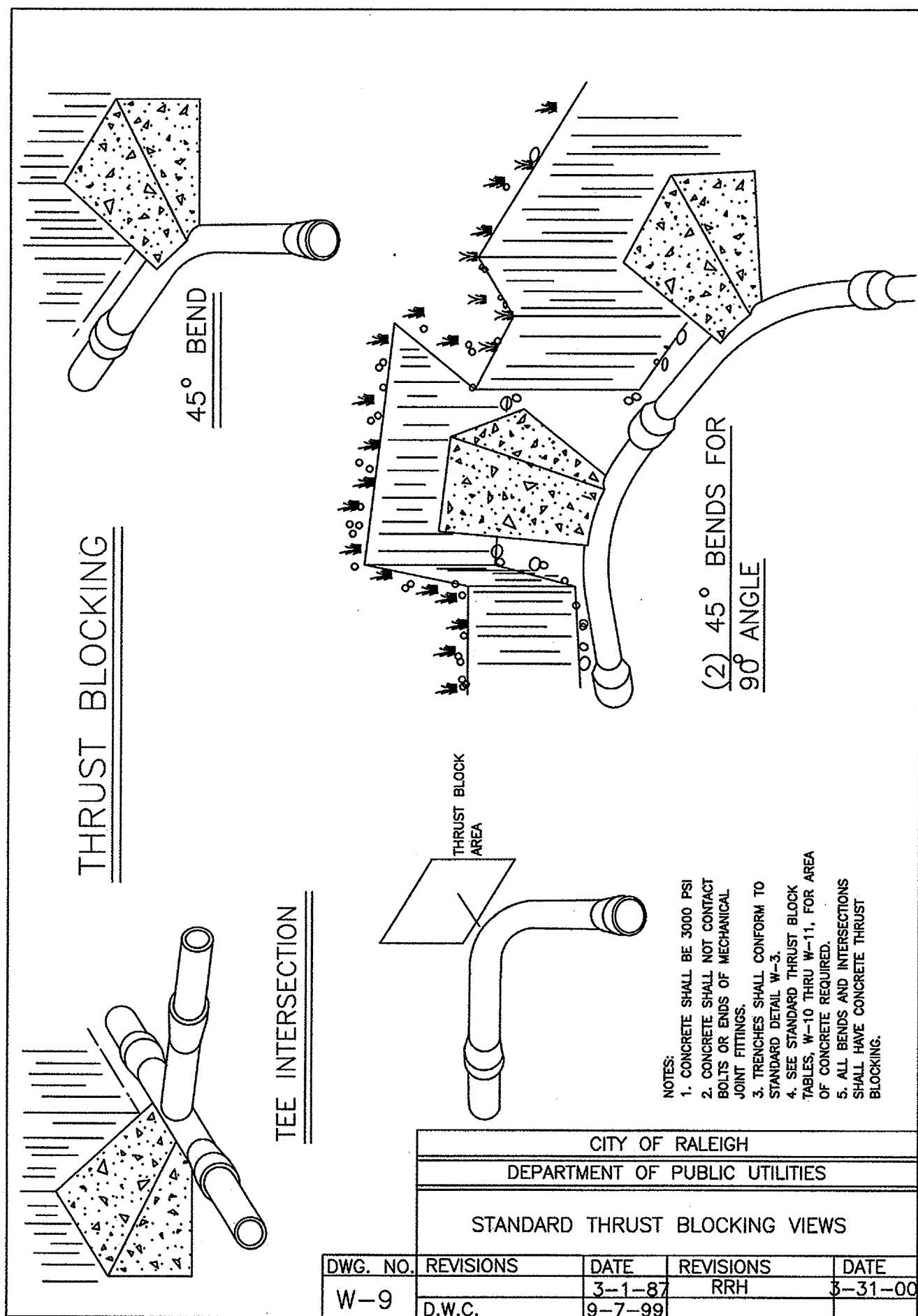


Plotted By: Brewer, Jordan
This document, together with the concepts and designs presented herein, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Sheet Set: Retreat at Raleigh, Layout: C-29 WATER DETAILS, September 21, 2011, 10:37:49am, K:\PROJECTS\LAUNCH\01170001_The Retreat at Raleigh\SP-CO-15_CAD Files\DWG\C-29 WATER DETAILS.dwg
DWG. NO. REVISIONS DATE REVISIONS DATE
W-9 D.W.C. 3-1-87 RRH 3-31-00
9-7-99



REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

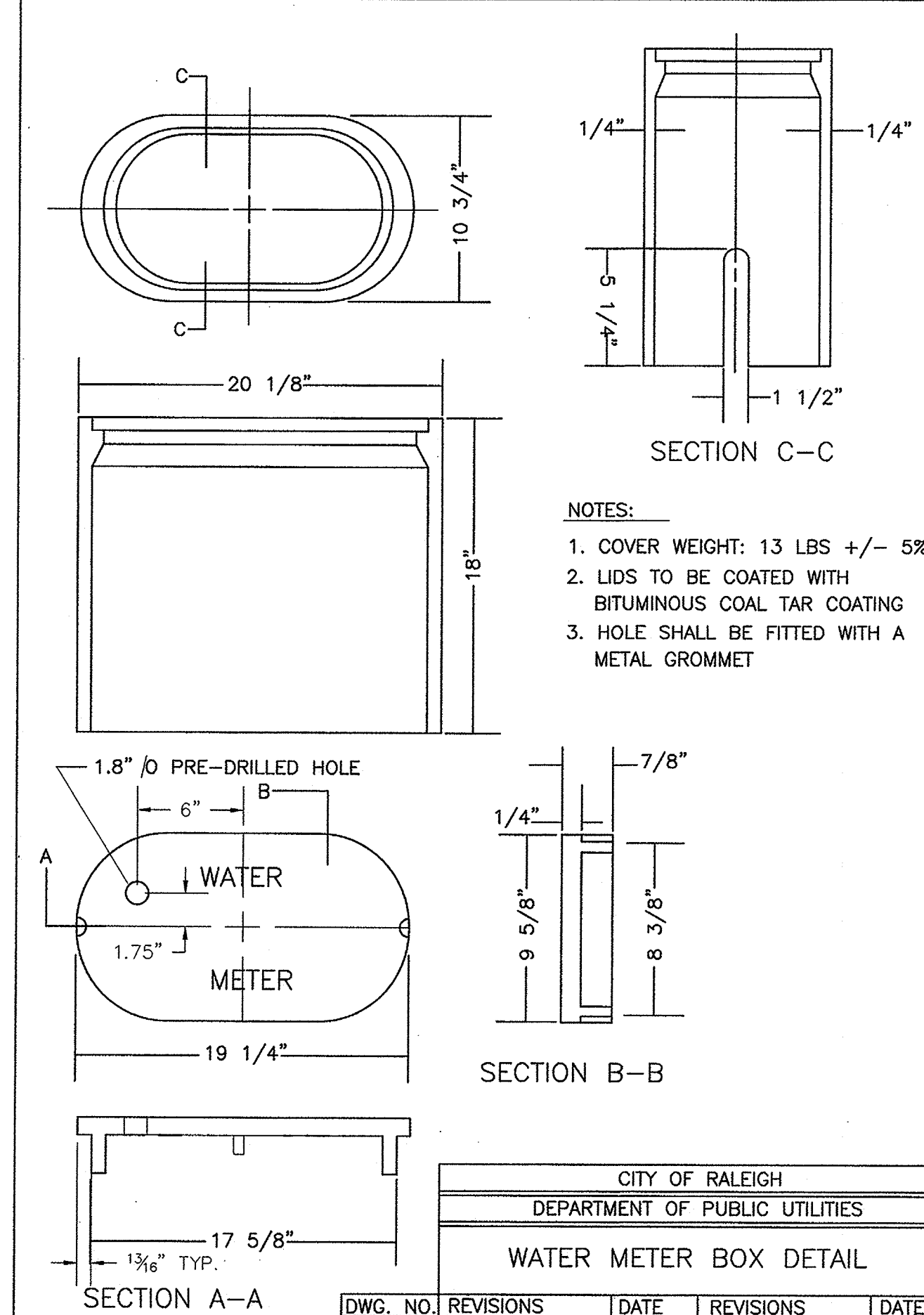
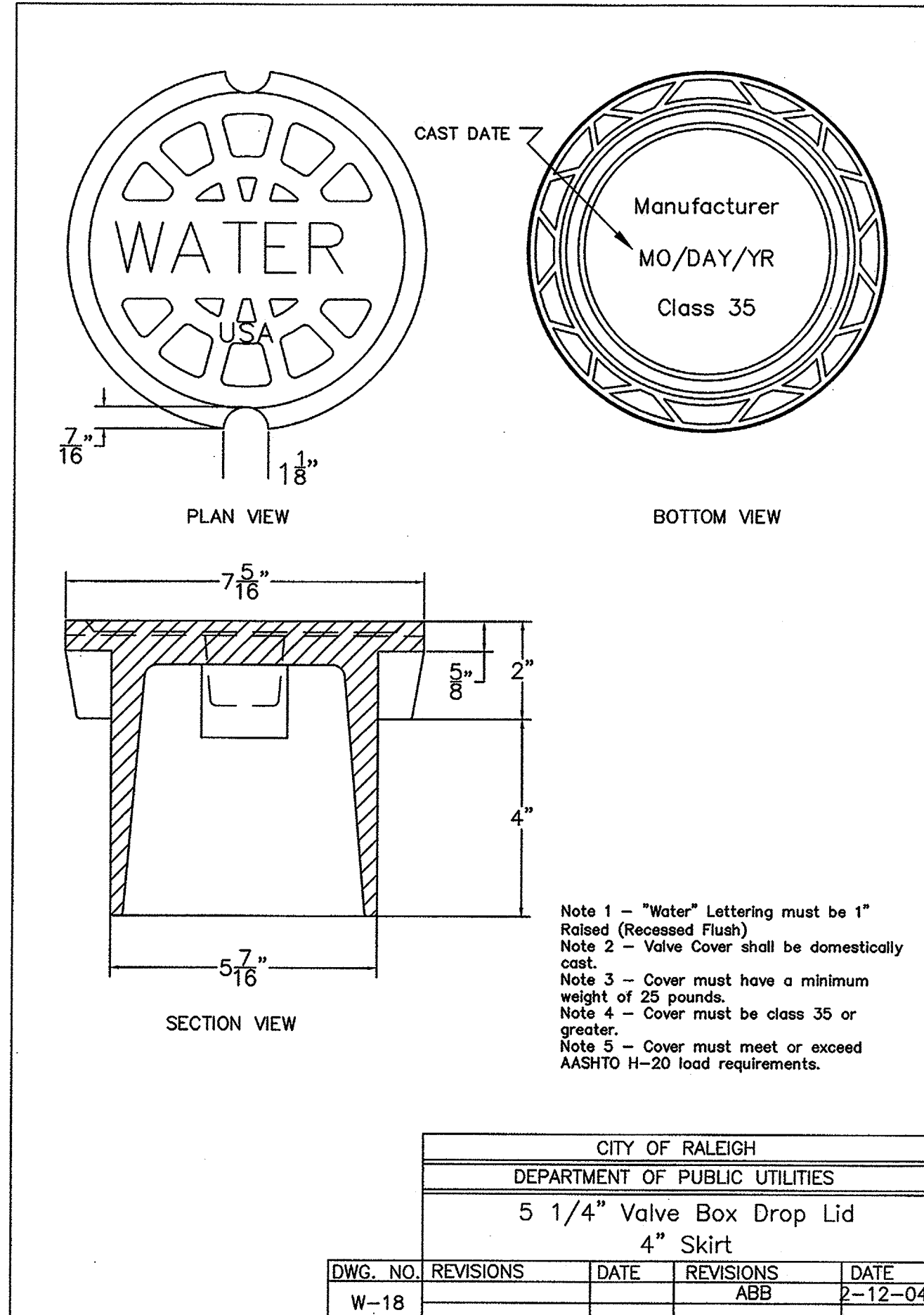
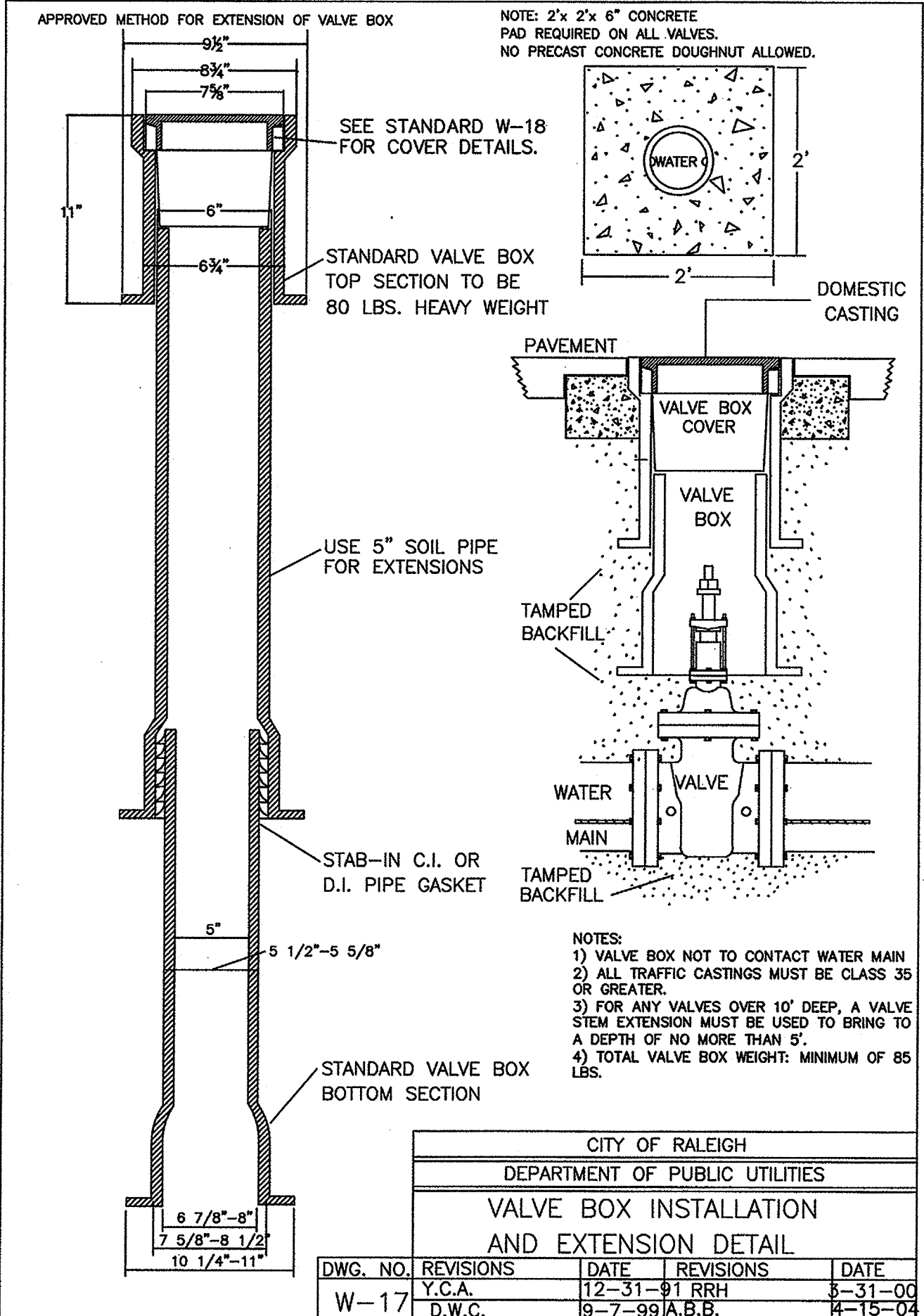
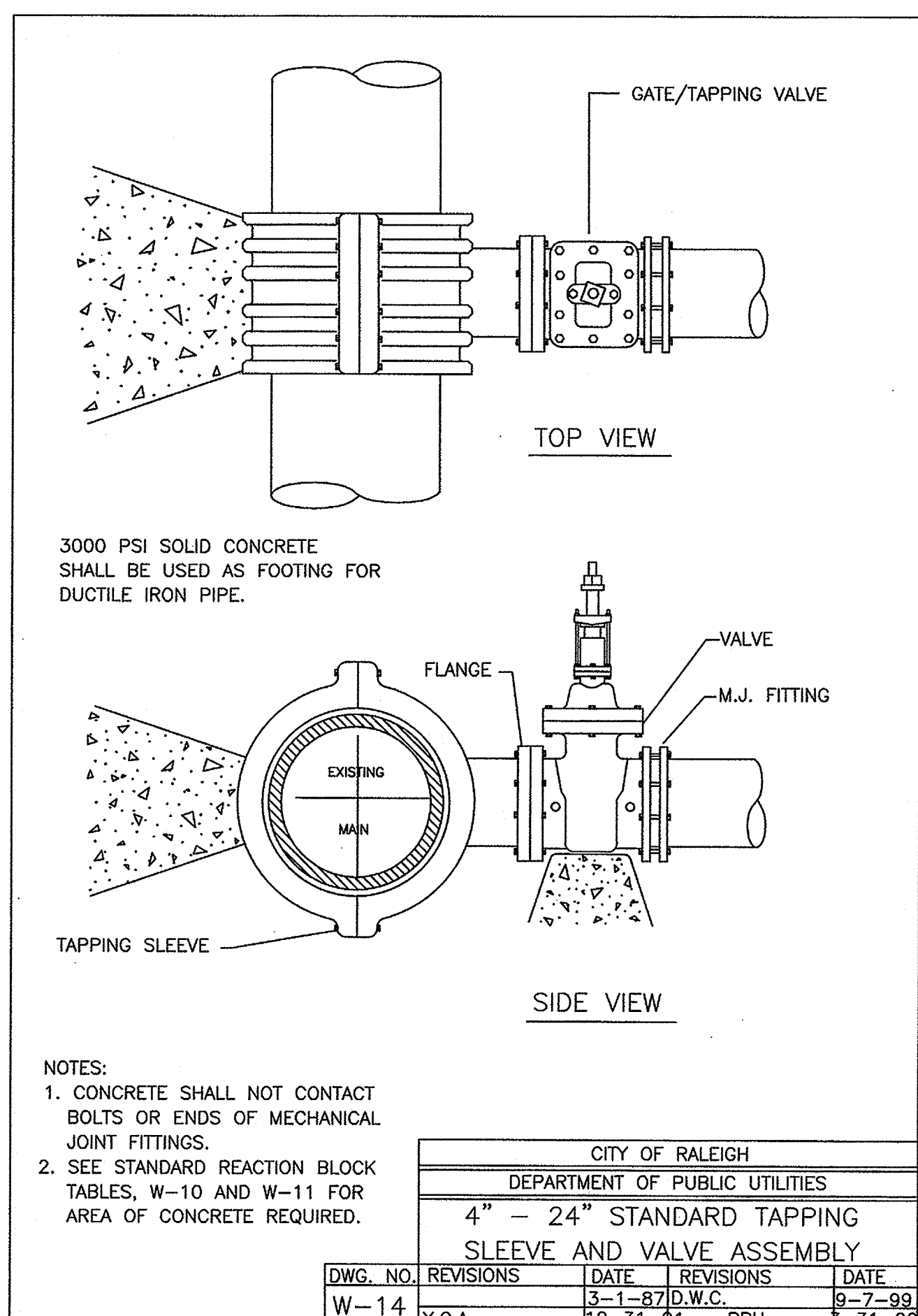
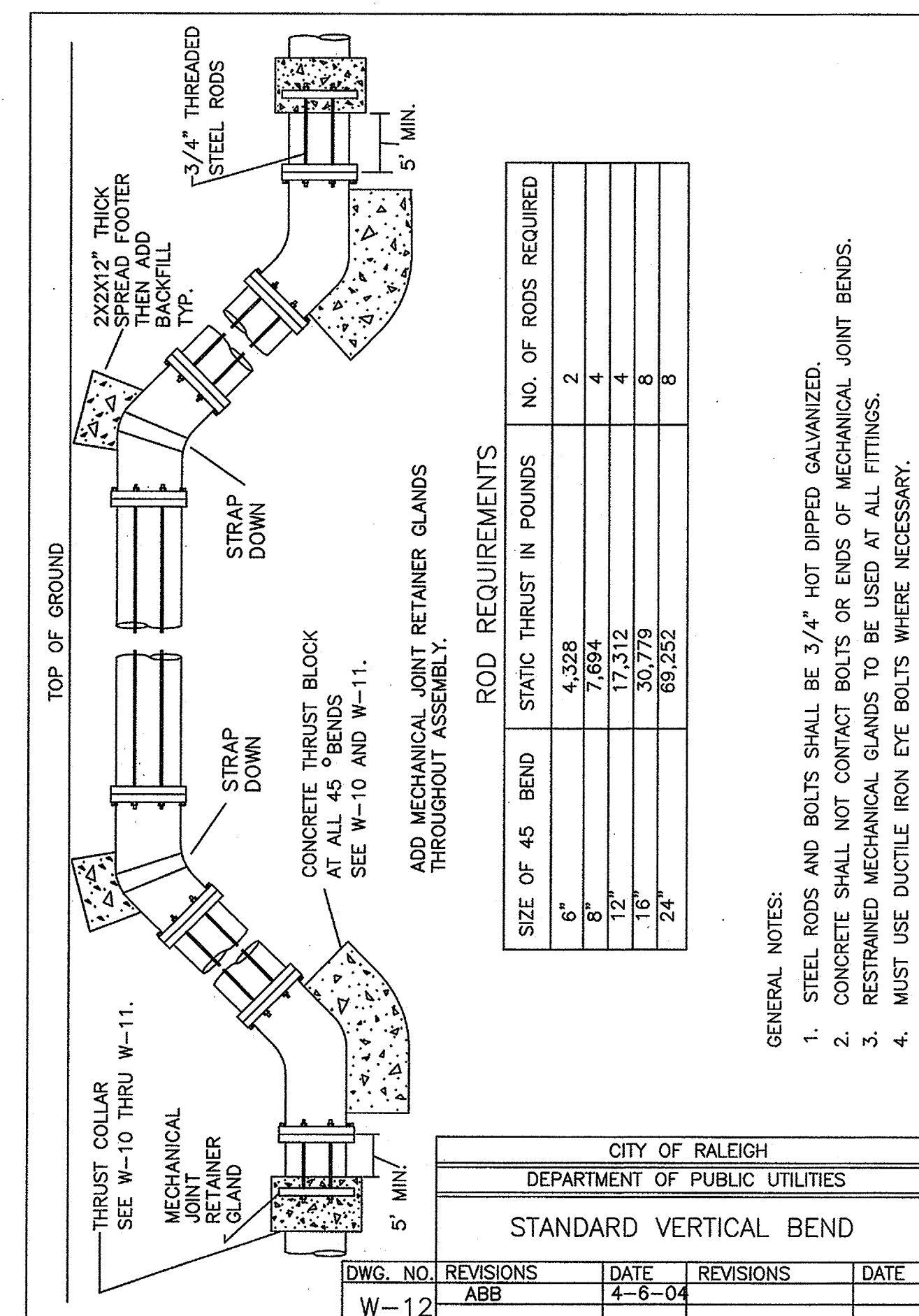
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT ²	SOFT CLAY 2000 LBS/FT ²	GRAVEL 1600 LBS/FT ²	DRY CLAY - ALWAYS DRY 800 LBS/FT ²	SAND 1600 LBS/FT ²	SAND - CLEAN DRY 1600 LBS/FT ²	QUICKSAND - VERY POOR 1000 LBS/FT ²	ROCK - POOR 10,000 LBS/FT ²
6"									
11 1/4°	1,108	1	1	1	1	1	2	1	
22 1/2°	2,207	1	2	2	1	1	4	1	
45°	4,328	2	3	3	1	1	8	1	
90°	7,996	2	4	5	1	1	16	1	
PLUG	5,655	2	3	4	1	1	6	1	
8"									
11 1/4°	1,970	1	1	2	1	1	2	1	
22 1/2°	3,922	1	2	3	1	1	4	1	
45°	7,694	2	4	5	1	1	8	1	
90°	14,215	4	8	9	2	2	16	2	
PLUG	10,053	3	5	6	2	2	10	1	
12"									
11 1/4°	4,433	2	3	3	1	1	5	1	
22 1/2°	8,826	3	5	6	2	2	9	1	
45°	17,312	5	9	11	3	3	18	2	
90°	31,983	8	16	19	4	4	32	4	
PLUG	22,619	6	12	14	3	3	23	3	
16"									
11 1/4°	7,881	2	4	5	1	1	8	1	
22 1/2°	15,691	4	8	10	2	2	16	2	
45°	30,779	8	16	19	4	4	31	4	
90°	56,861	15	29	35	8	8	57	6	
PLUG	40,213	10	21	25	5	5	41	5	

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.
USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO. REVISIONS DATE REVISIONS DATE
W-10 D.W.C. 6-23-99



S-5-11

UTILITY INSTALLATIONS AND OTHER PUBLIC FACILITIES, INCLUDING SIDEWALKS AND HANDICAP RAMPS ARE TO BE CONSTRUCTED ON ALL STREETS AS SPECIFIED BY CITY CODE. THESE FACILITIES HAVE BEEN APPROVED BY THE CITY OF RALEIGH AND SHALL BE SO INSTALLED UNLESS A CHANGE IS AUTHORIZED BY WRITTEN APPROVAL. PUBLIC SANITARY SEWER EASEMENTS ARE TO BE RECORDED PRIOR TO FINAL ACCEPTANCE.

SIGNATURE:

TRANSPORTATION SERVICES: H/A

PUBLIC UTILITIES: CS 10/14/11

CONSERVATION ENGINEER: SPL 10/13/11

PLANNING: N/A

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL CITY OF RALEIGH AND/OR NCDOT STANDARDS AND SPECIFICATIONS.

Kimley-Horn and Associates, Inc.

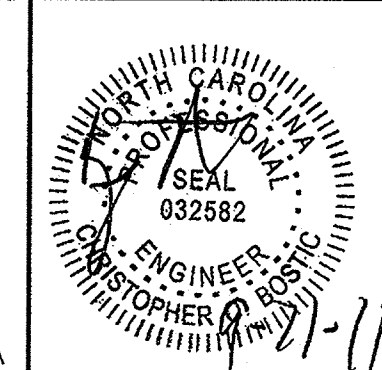
© 2011 KIMLEY-HORN AND ASSOCIATES, INC.
333 FAYETTEVILLE STREET, SUITE 600, RALEIGH, NC 27601
PHONE: 919-835-1494 FAX: 919-653-5847
WWW.KIMLEY-HORN.COM

NC CERTIFICATE OF AUTHORIZATION: F-0102

KHA PROJECT
011170001
DATE
7/29/11
SCALE AS SHOWN
DESIGNED BY COB
DRAWN BY WJB
CHECKED BY PAB

THE RETREAT AT RALEIGH

PREPARED FOR
LANDMARK PROPERTIES



WATER DETAILS

SHEET NUMBER
C-29

No.	REVISIONS	DATE	BY
1	CITY OF RALEIGH 1ST REVIEW COMMENTS	9/21/11	WJB