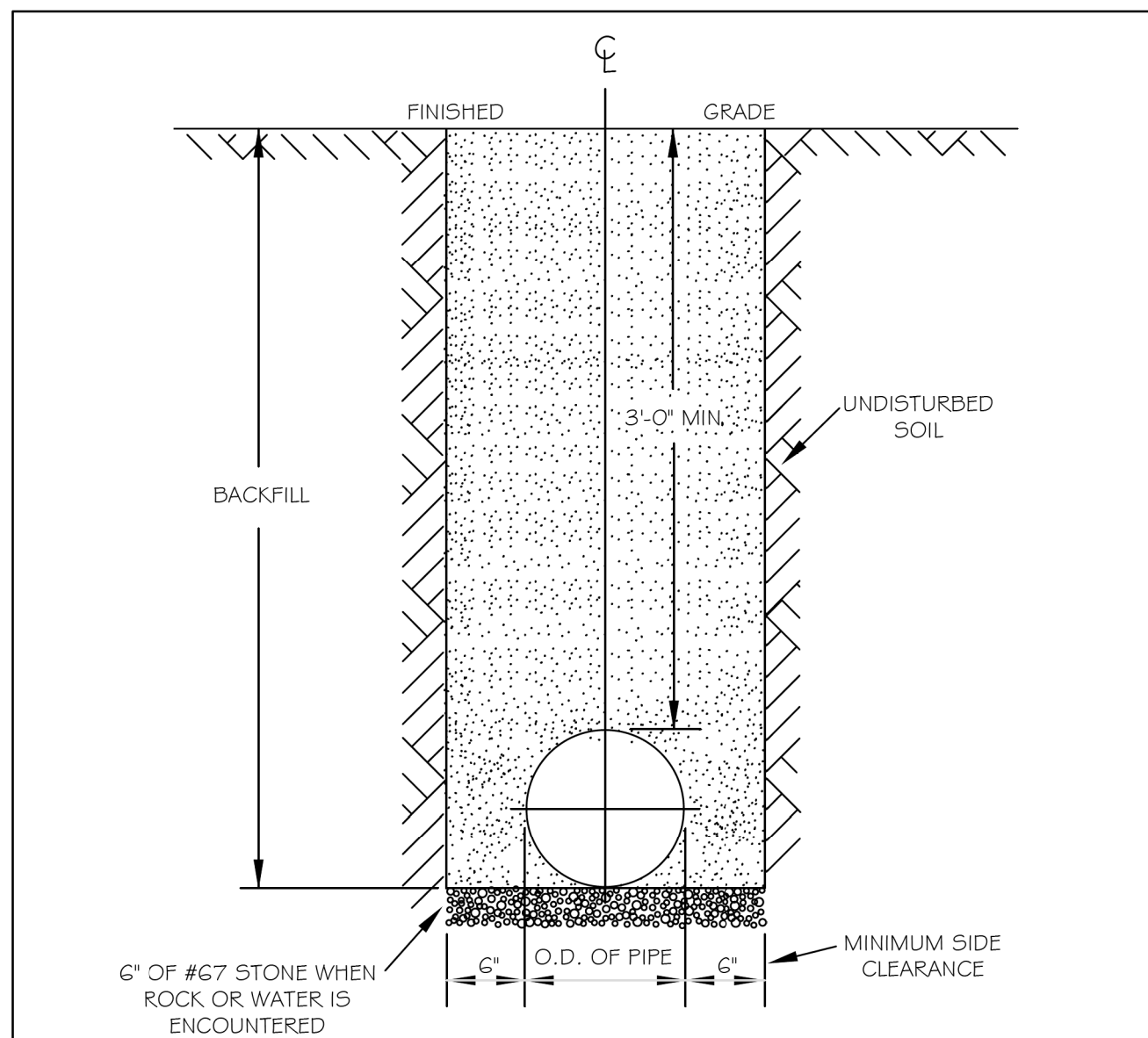


5/14/99

PROJECT TYPICAL DETAILS

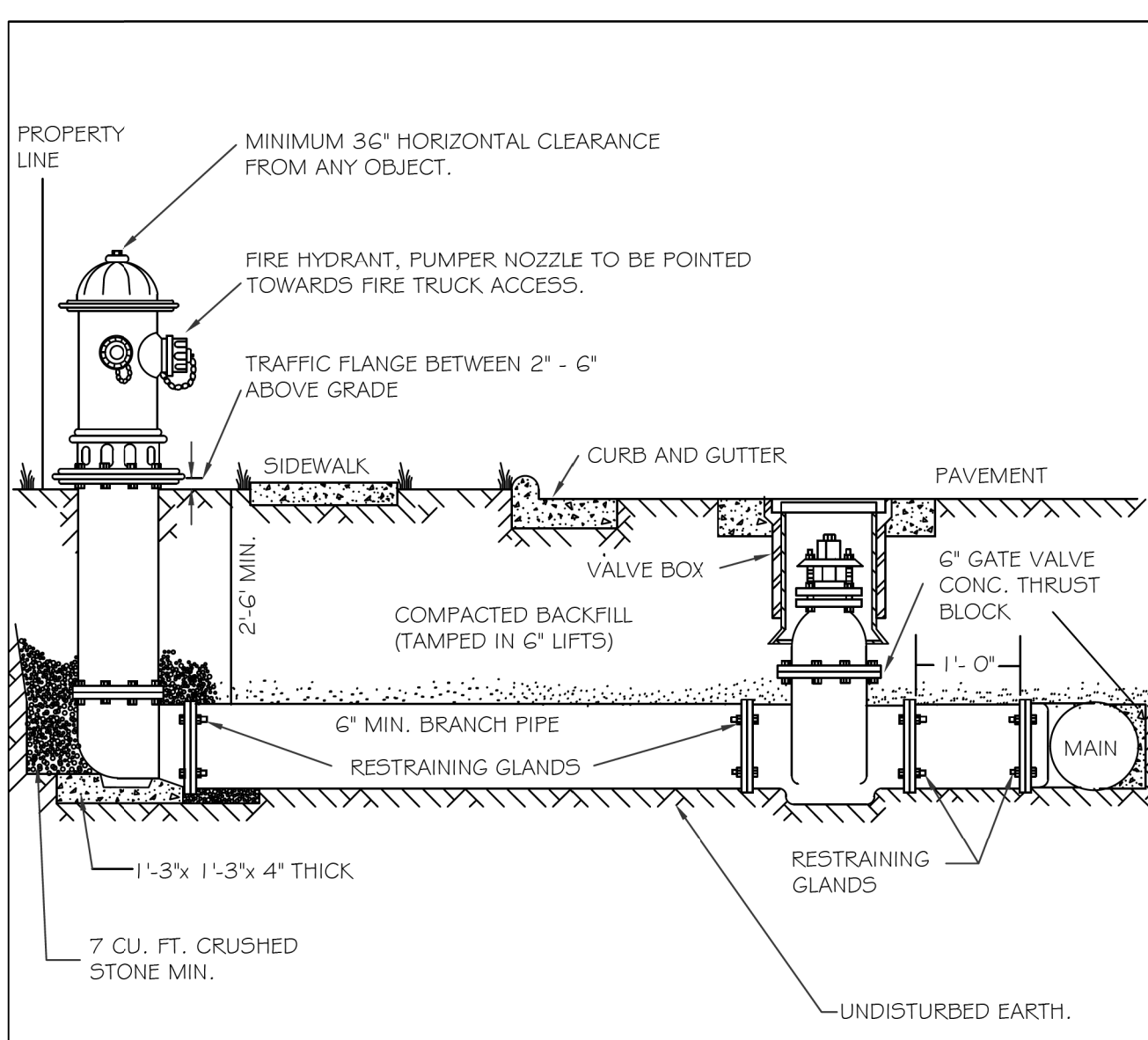
PROJECT REFERENCE NO.	SHEET NO.
U-5826	UC-3A
DESIGNED BY: DK	
DRAWN BY: CS	
CHECKED BY: MM	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



- NOTES:
- TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 - NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN BACKFILL.
 - ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 - BACKFILL SHALL BE TAMPED IN 6" LIFTS.
 - ACHIEVE 95% COMPACTION IN BACKFILL.

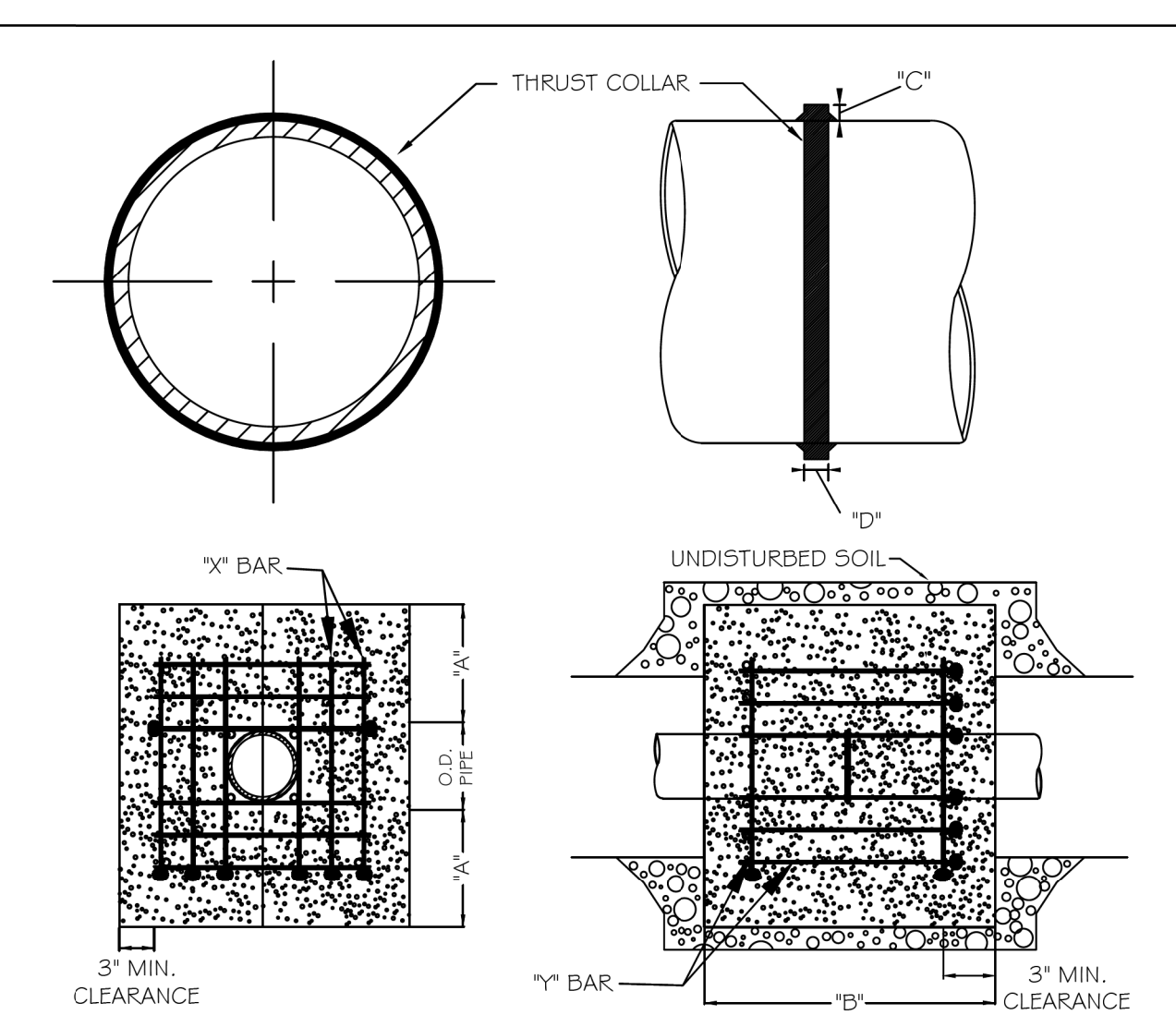
CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
TRENCH BOTTOM DIMENSIONS & BACKFILL REQUIREMENTS FOR DUCTILE IRON					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-3	D.W.C.	9-3-99	ABB	2-15-05	
	RRH	3-31-00	J.P.S.	10-29-10	



- NOTES:
- FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
 - BRANCH PIPE SHALL BE DUCTILE IRON AWMA C150-96
 - 6" GATE VALVE SHALL BE AWMA C500-86 OPEN LEFT
 - STEEL RODS AND BOLTS SHALL BE 1/2" HOT DIPPED GALVANIZED
 - FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION
- RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20 THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
- FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
STANDARD FIRE HYDRANT INSTALLATION DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-4	ABB	4-6-04	F.A.F.	2/17/09	
	D.H.L.	2/14/08			

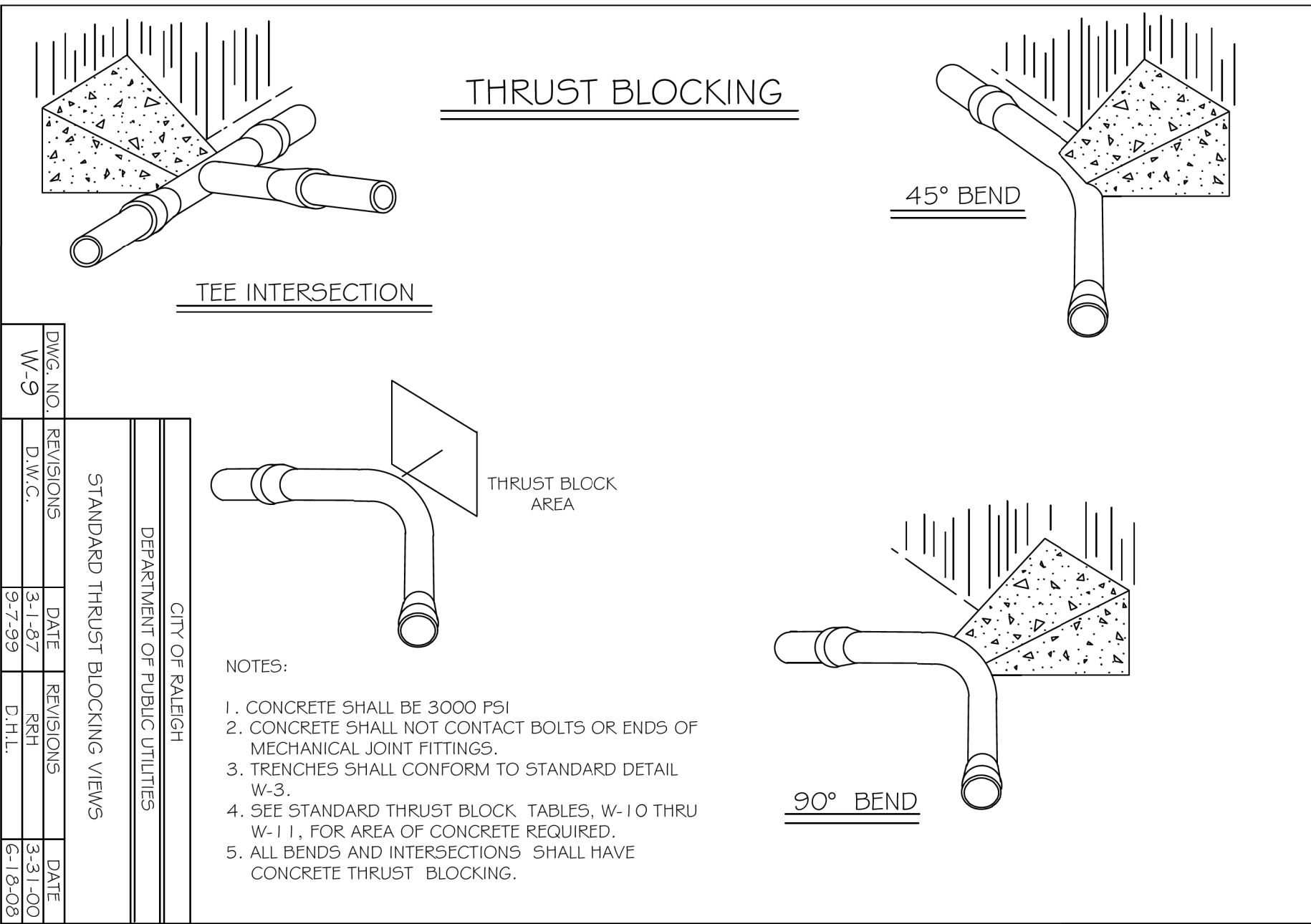


REINFORCING REQUIREMENTS						
I.D. PIPE	REBAR SIZE	X" BAR LENGTH	X" BAR WEIGHT	Y" BAR LENGTH	Y" BAR WEIGHT	NO. REQUIRED
6" - 30"	#5	2'-2" + O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0" + O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

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:
- SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
 - CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED
 - REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
 - TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
 - BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
 - THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
THRUST BLOCKING DESIGN DATA FOR WATER MAINS					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-7	RRH	1-21-00	J.P.S.	11-1-10	
	D.H.L.	6-18-08			

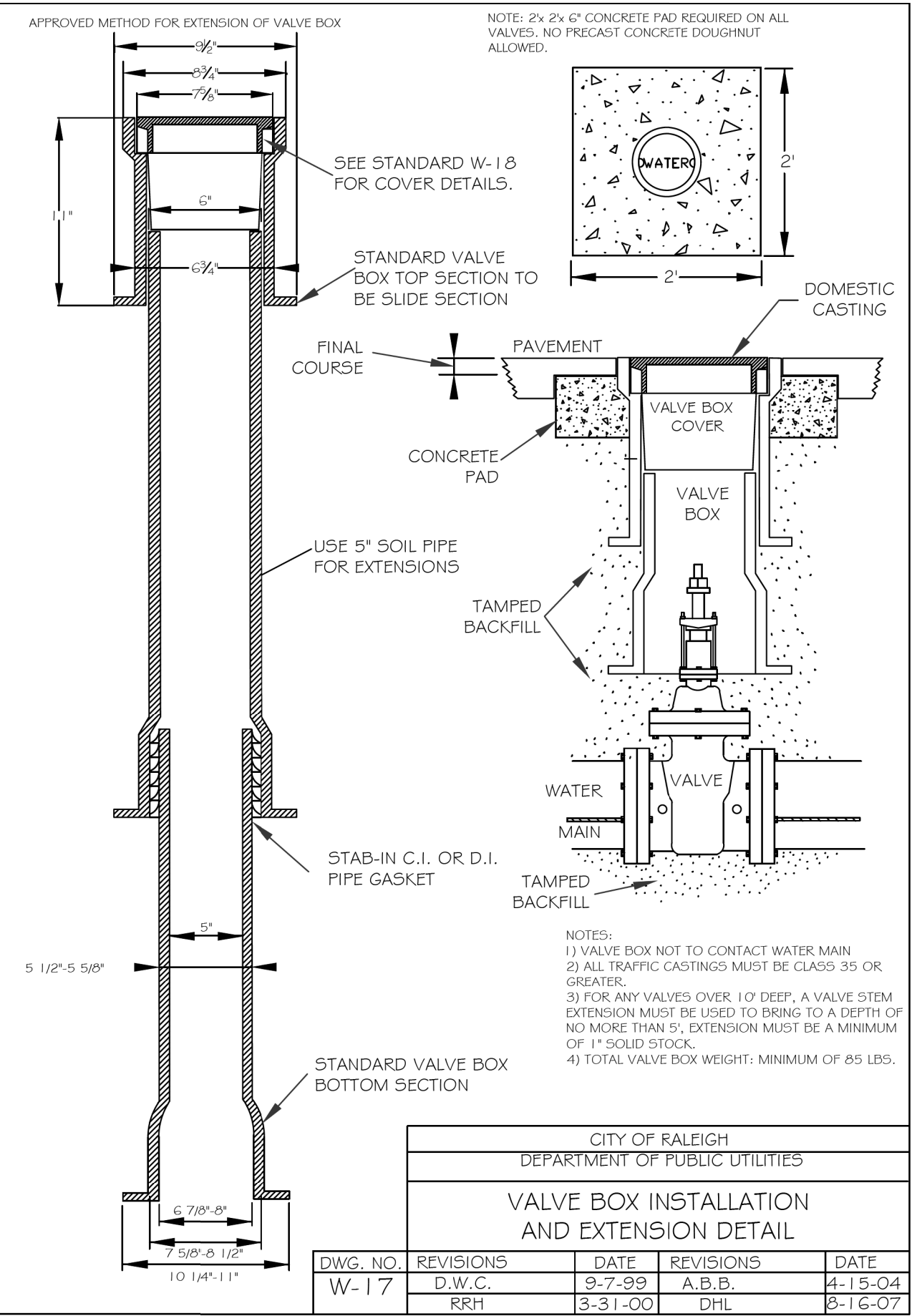


CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
STANDARD THRUST BLOCKING VIEWS					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-9	D.W.C.	3-11-07	RRH	3-31-00	
	D.H.L.	9-7-99		6-18-05	

- NOTES:
- CONCRETE SHALL BE 3000 PSI
 - CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
 - TRENCHES SHALL CONFORM TO STANDARD DETAIL W-3.
 - SEE STANDARD THRUST BLOCK TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
 - ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

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

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			



- NOTES:
- VALVE BOX NOT TO CONTACT WATER MAIN
 - ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
 - FOR ANY VALVES OVER 10' DEEP, A VALVE STEM EXTENSION MUST BE USED TO BRING TO A DEPTH OF NO MORE THAN 5'. EXTENSION MUST BE A MINIMUM OF 1" SOLID STOCK.
 - TOTAL VALVE BOX WEIGHT: MINIMUM OF 85 LBS.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
VALVE BOX INSTALLATION AND EXTENSION DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
W-17	D.W.C.	9-7-99	A.B.B.	4-15-04	
	RRH	3-31-00	D.H.L.	8-16-07	

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