

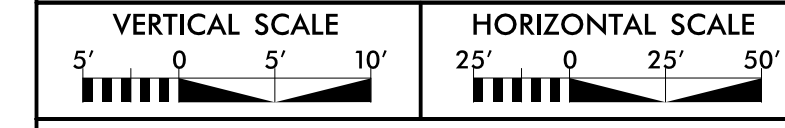
5/14/99

PROJECT WATER DETAILS

FINAL PLANS
RELEASED FOR CONSTRUCTION

PREPARED IN THE OFFICE OF:
THE WOOTEN COMPANY
301 West 14th Street, Greensboro, NC 27404
252.232.6000 Fax: 252.733.0221
Licenses: 7-0103

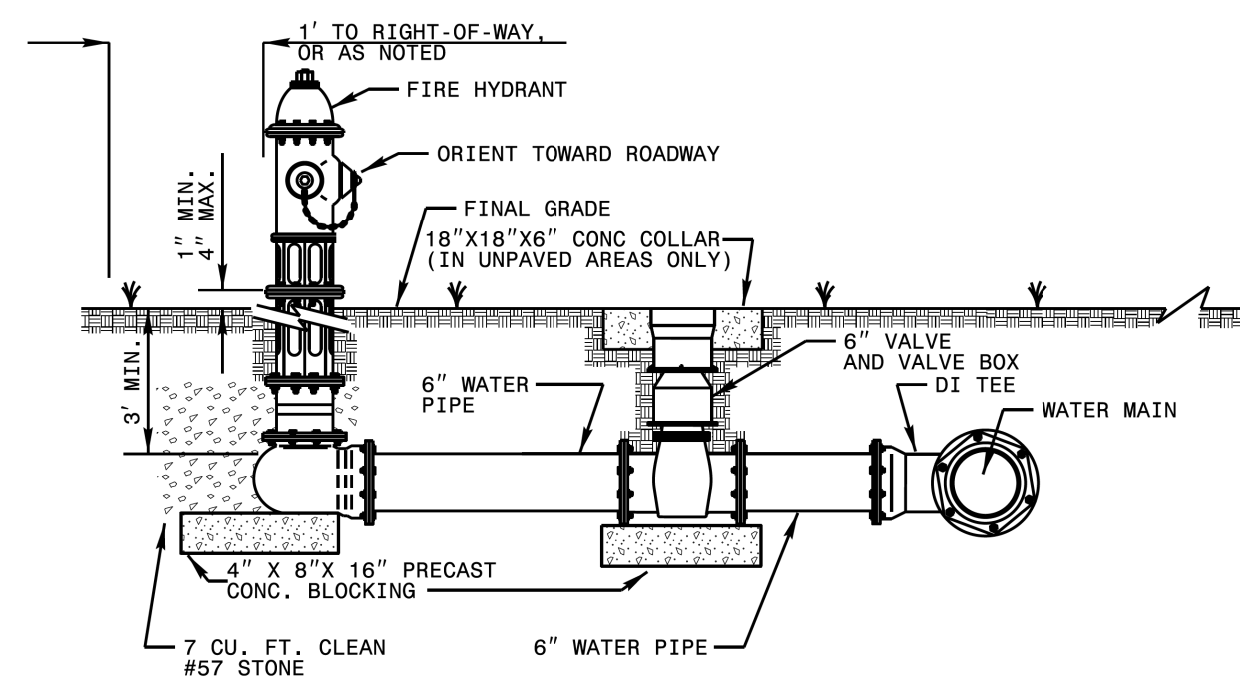
PROJECT REFERENCE NO. R-4705	SHEET NO. UC-3A
DESIGNED BY: DCS	
DRAWN BY: BTH	
CHECKED BY: DCS	
APPROVED BY: DCS	
REVISED: 3-18-2022	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
Document Not Considered Final Unless All Signatures Completed UTILITY CONSTRUCTION PLANS ONLY	



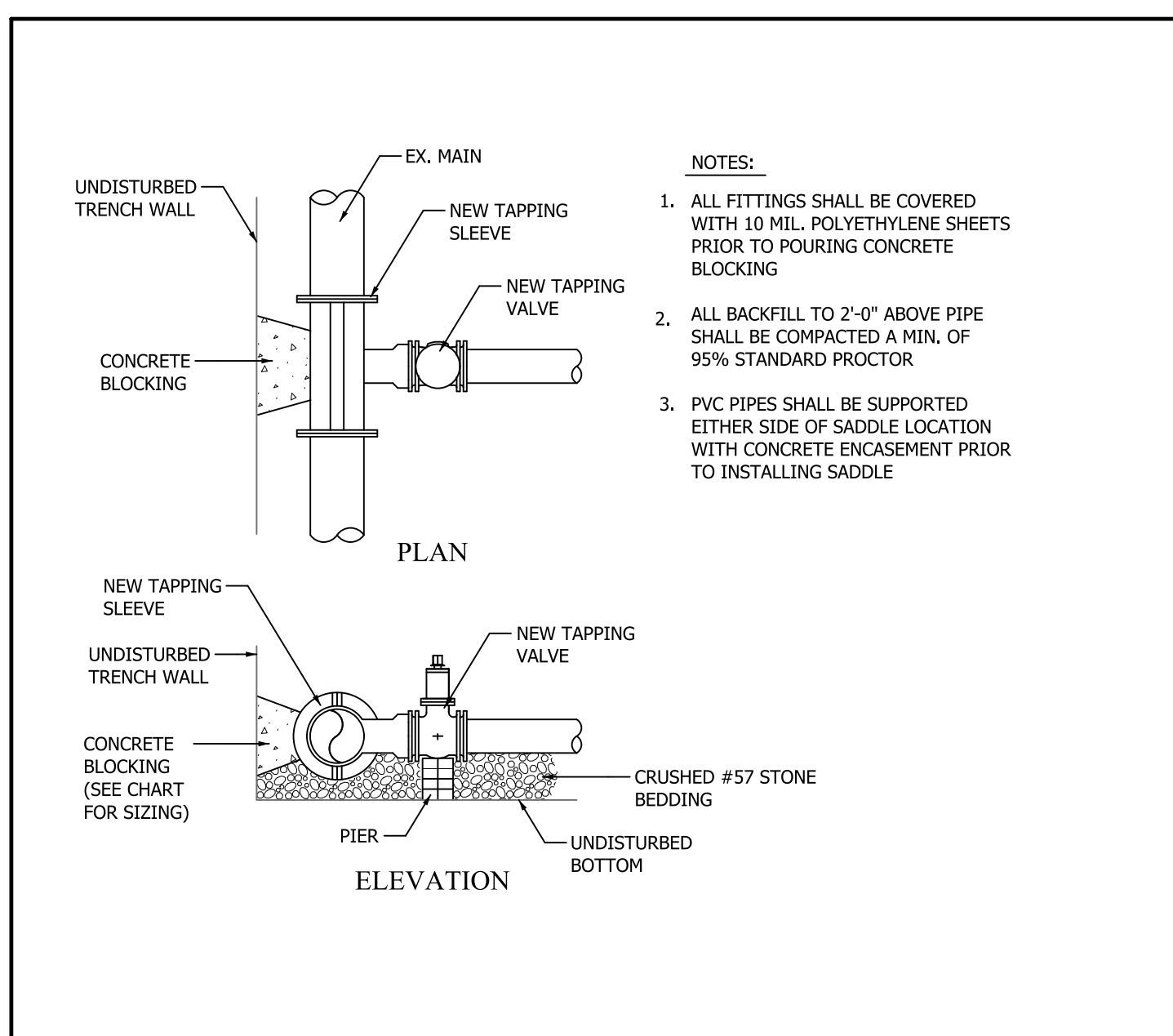
WATER LINE CONSTRUCTION SHOWN ON THIS SHEET

UTILITY CONSTRUCTION

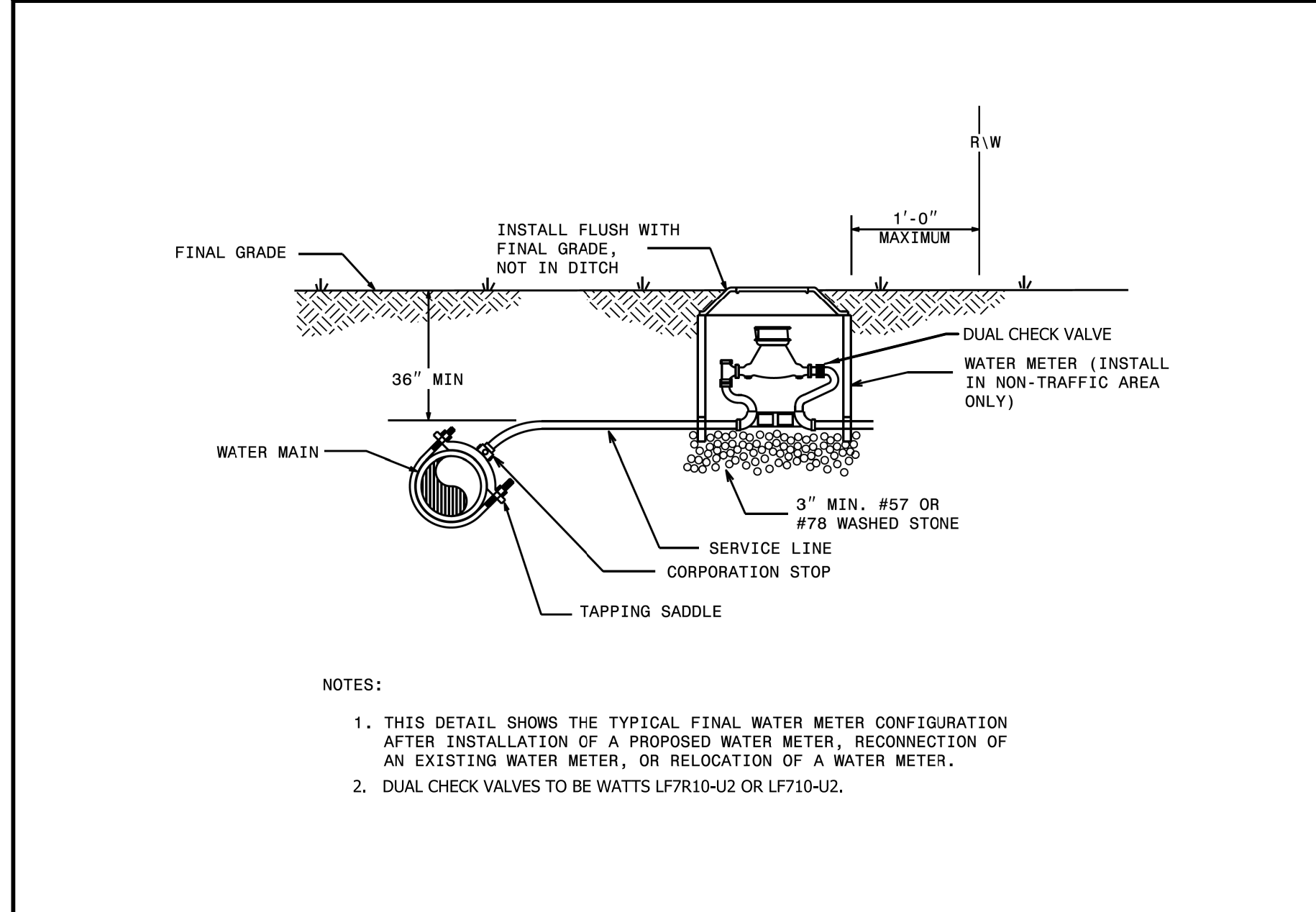
- NOTES:
- THIS DETAIL SHOWS THE TYPICAL FINAL FIRE HYDRANT CONFIGURATION AFTER INSTALLATION OF A PROPOSED FIRE HYDRANT, RECONNECTION OF AN EXISTING FIRE HYDRANT, OR RELOCATION OF A FIRE HYDRANT.
 - KEEP DRAIN PORTS FREE FROM OBSTRUCTION.
 - RESTRAIN ALL PIPE JOINTS AND FITTINGS. ACCEPTABLE TYPES OF RESTRAINT INCLUDE RESTRAINING GLANDS; RESTRAINER, PUSH-ON JOINTS; AND 3/4" BITUMINOUS COATED, ALL-THREAD RESTRAINING RODS. THRUST BLOCKS ARE NOT AN ACCEPTABLE TYPE OF RESTRAINT.
 - FOR RELOCATED OR RECONNECTED FIRE HYDRANTS, VERIFY THE VALVE IS RESTRAINED TO THE MAIN. PROVIDE APPROPRIATE RESTRAINT.
 - HYDRANT LOCATION APPLIES TO PROPOSED AND RELOCATED FIRE HYDRANTS.
 - LOCATE FIRE HYDRANT WITH 3' HORIZONTAL CLEARANCE FROM ABOVE GROUND OBJECTS.
 - PROVIDE A MINIMUM OF 3" COVER OVER ALL SECTIONS OF HORIZONTAL PIPE. USE FITTINGS AS NECESSARY.
 - TAPPING SLEEVES MAY BE USED ON EXISTING MAINS IN LIEU OF DI TEES.
 - LOCATE FIRE HYDRANT OUTSIDE OF THE VEHICLE RECOVERY AREA, ADJACENT TO THE R/W LINE, OR IN A PROTECTED AREA.



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR FIRE HYDRANT
SHEET 1 OF 1
1515.02



- NOTES:
- ALL FITTINGS SHALL BE COVERED WITH 10 MIL. POLYETHYLENE SHEETS PRIOR TO POURING CONCRETE BLOCKING
 - ALL BACKFILL TO 2'-0" ABOVE PIPE SHALL BE COMPACTED A MIN. OF 95% STANDARD PROCTOR
 - PVC PIPES SHALL BE SUPPORTED EITHER SIDE OF SADDLE LOCATION WITH CONCRETE ENCASUREMENT PRIOR TO INSTALLING SADDLE



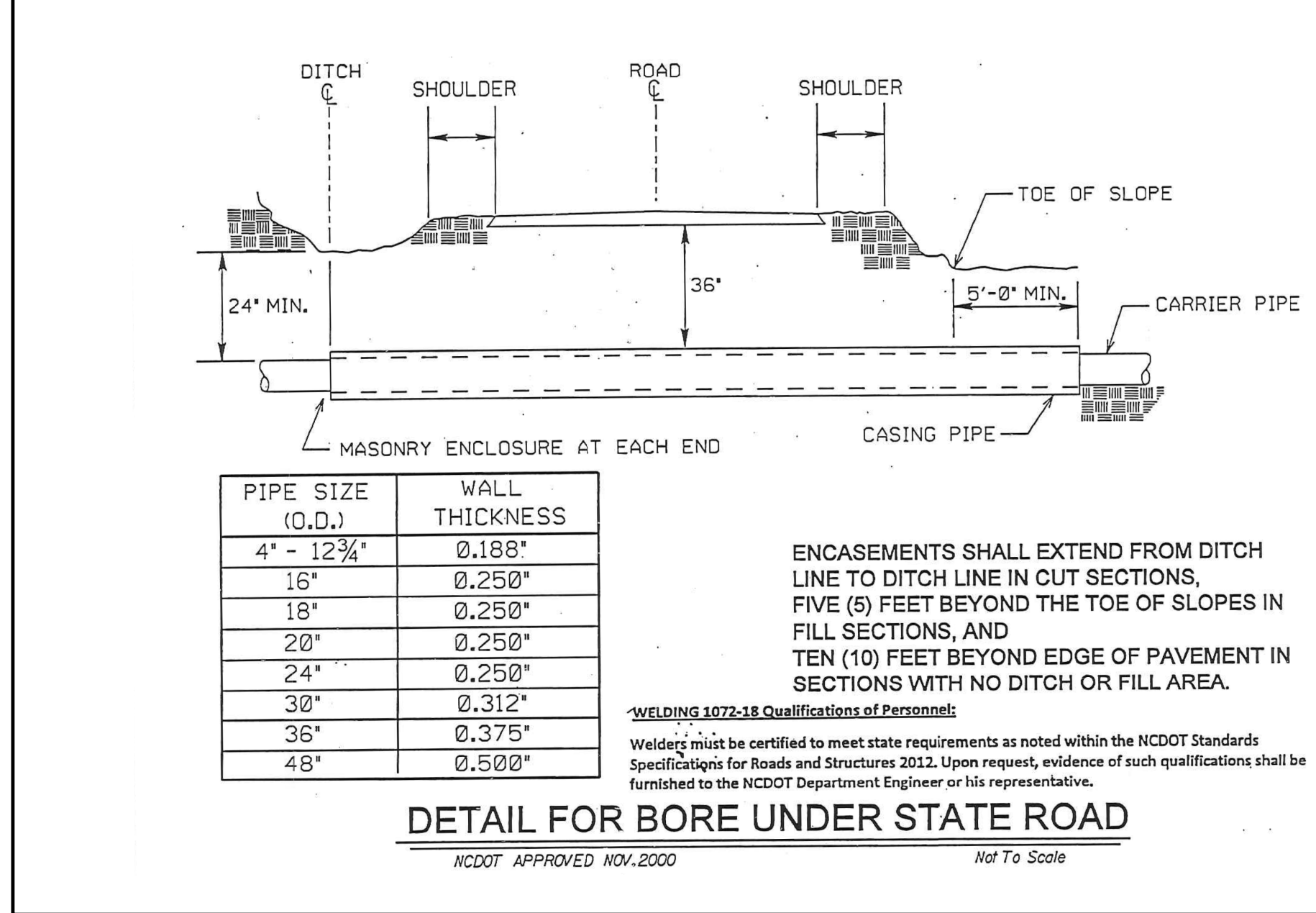
- NOTES:
- THIS DETAIL SHOWS THE TYPICAL FINAL WATER METER CONFIGURATION AFTER INSTALLATION OF A PROPOSED WATER METER, RECONNECTION OF AN EXISTING WATER METER, OR RELOCATION OF A WATER METER.
 - DUAL CHECK VALVES TO BE WATTS LF710-U2 OR LF710-U2.

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ROADWAY STANDARD DRAWING FOR WATER METER
SHEET 1 OF 1
1515.01

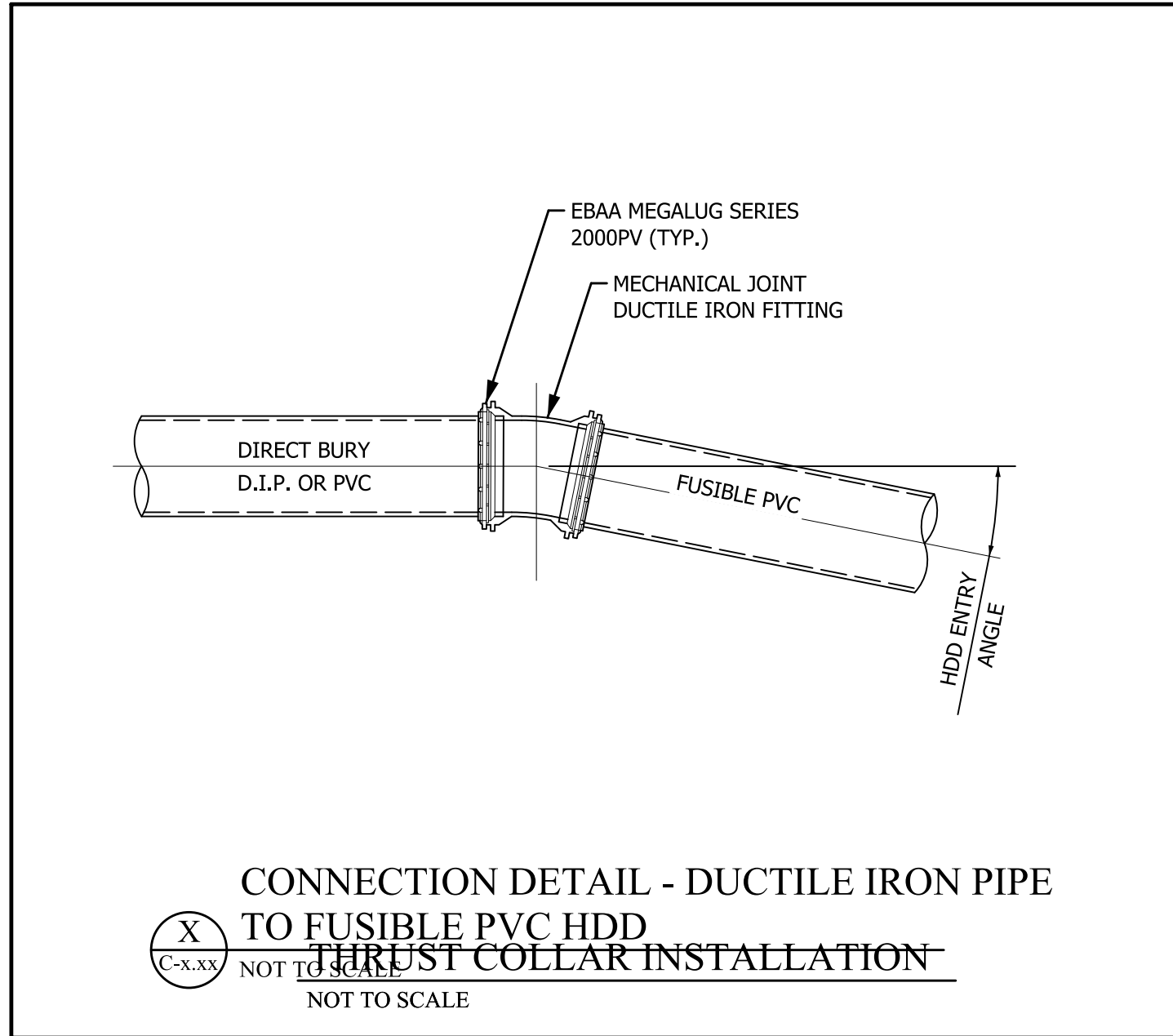
PIPE DIA.	CONCRETE THRUST COLLAR	ANCHOR RING	RINGS REQUIRED
6"-12"	A	B	C
16"	1'-0"	1'-0"	2"
20"	1'-4"	1'-0"	2"
24"	1'-4"	1'-0"	3"
30"	1'-4"	1'-2"	4"
36"	1'-4"	1'-4"	4"

NOTES:
6" TO 16" MAINS=(12) No.7 BARS
20" TO 36" MAINS=(12) No.8 BARS
BARS PLACED AS SHOWN

TAPPING SLEEVE AND VALVE
NOT TO SCALE



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR BORE UNDER STATE ROAD
SHEET 1 OF 1
1515.01



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH STANDARD DRAWING FOR METHOD OF PIPE INSTALLATION FLEXIBLE PIPE
SHEET 1 OF 3
300.01

GENERAL NOTES:
I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE ENCASUREMENT AT THAT POINT.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BRACED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE I BELOW SPINDLINE.

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL.

SELECT MATERIAL CLASS IV OR VE FOR FOUNDATION CONDITIONING, ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH STANDARD DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE
SHEET 2 OF 3
300.01

GENERAL NOTES:
I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE ENCASUREMENT AT THAT POINT.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BRACED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE I BELOW SPINDLINE.

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPINDLINE.

UNDISTURBED EARTH MATERIAL.

SELECT MATERIAL CLASS IV OR VE FOR FOUNDATION CONDITIONING, ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH STANDARD DRAWING FOR METHOD OF PIPE INSTALLATION FILL HEIGHT TABLES
SHEET 3 OF 3
300.01

Diameter (Inches)	Minimum cover (Inches)	Maximum height of cover (feet)			
		10	12	14	16
12	12	204	256	308	360
15	12	162	204	246	288
18	12	135	169	209	252
21	12	145	204	246	288
24	12	100	126	178	210
27	12	79	100	142	181
30	12	65	83	117	152
36	12	55	70	100	130
42	12	48	61	87	113
48	12	48	61	87	113
54	12	48	61	87	113
60	12	48	61	87	113
66	12	48	61	87	113
72	12	48	61	87	113
78	12	48	61	87	113
84	12	48	61	87	113

Diameter (Inches)	Minimum cover (Inches)	Maximum height of cover (feet)			
		10	12	14	16
12	12	123	155	218	281
15	12	98	123	174	224
18	12	81	102	144	187
21	12	69	87	123	160
24	12	60	76	108	139
27	12	50	65	93	118
30	12	42	54	78	101
36	12	35	45	63	84
42	12	30	38	54	71
48	12	27	33	48	63
54	12	24	30	42	54
60	12	21	27	36	48
66	12	18	24	30	39
72	12	16	21	27	33
78	12	14	18	24	30
84	12	12	16	21	27

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS:
CSP - AASHTO M36
CAAP - AASHTO M196
HDP - AASHTO M254
PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH STANDARD DRAWING FOR METHOD OF PIPE INSTALLATION FILL HEIGHT TABLES
SHEET 3 OF 3
300.01

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS:
RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS