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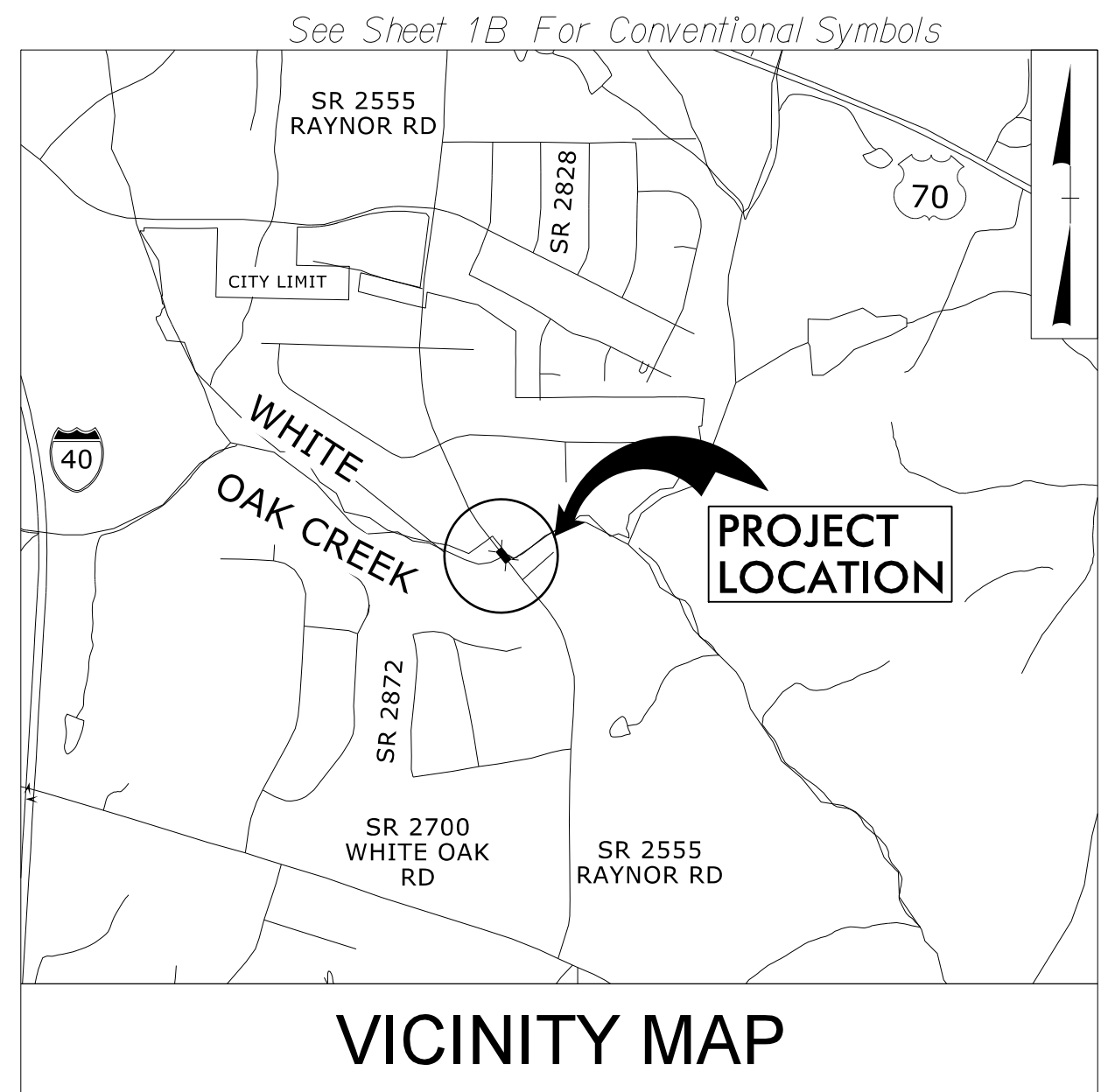
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09/08/19

TIP PROJECT: B-5326

CONTRACT:

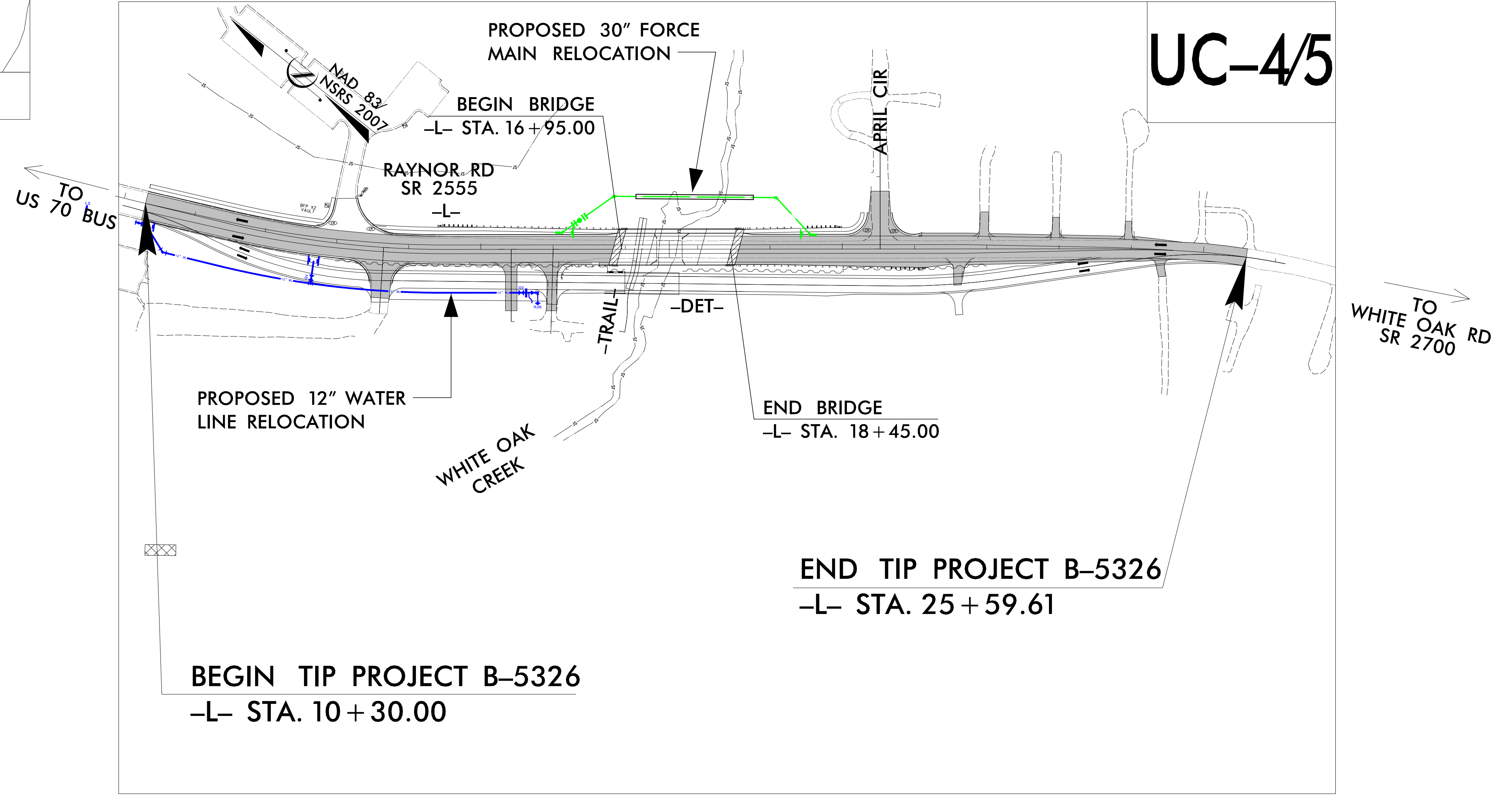
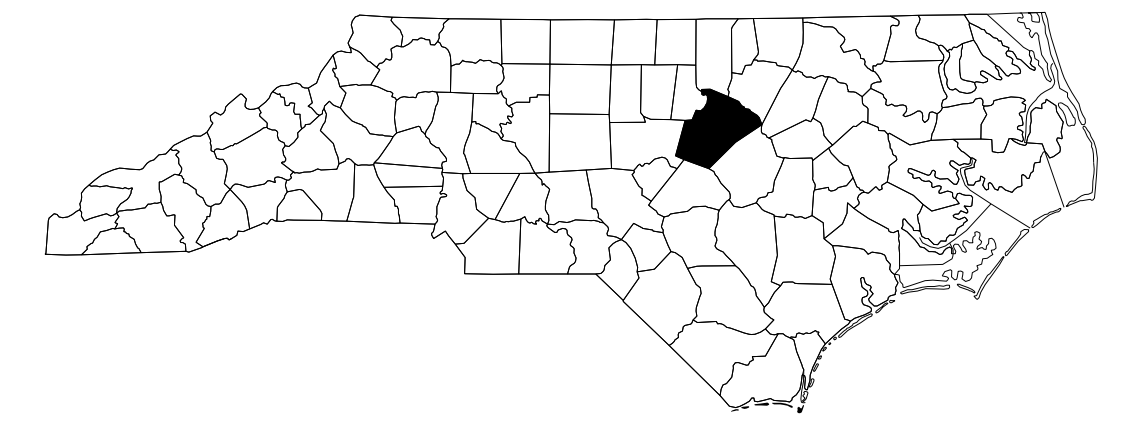


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

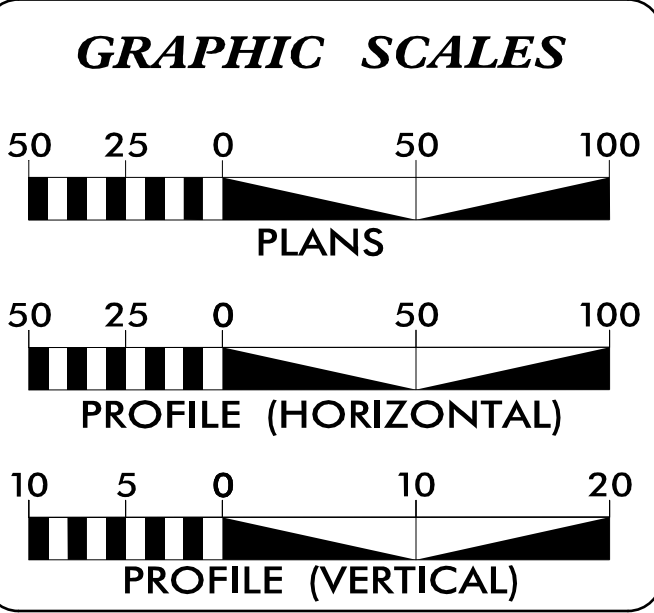
WAKE COUNTY

LOCATION: REPLACE BRIDGE NO. 247 WHITE OAK CREEK ON SR 2555 (RAYNOR RD)
TYPE OF WORK: WATER AND SEWER RELOCATIONS

T.I.P. NO.	SHEET NO.
B-5326	UC-1



DOCUMENT NOT CONSIDERED FINAL
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INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	LEGEND OF SYMBOLS
UC-3	GENERAL NOTES
UC-3A THRU UC-3C	CONSTRUCTION DETAILS
UC-4 THRU UC-5	UTILITY CONST. PLAN SHEETS
UC-6 THRU UC-7	UTILITY CONST. PROFILES

WATER AND SEWER OWNERS ON PROJECT

(A) WATER: CITY OF RALEIGH
(B) SANITARY SEWER: CITY OF RALEIGH

PREPARED IN THE OFFICE OF:

AECOM

AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.
701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F - 0342

2018 STANDARD SPECIFICATIONS

LETTING DATE:
OCTOBER 18, 2022

Steve Scruggs, PE
UTILITIES PROJECT ENGINEER

SEAL

9/8/2022

DocuSigned by:
D. Stephen Scruggs
567A10C305E477...

DIVISION OF HIGHWAYS UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

Amy D.York UTILITIES REGIONAL ENGINEER
Ali Kouchehi, PE UTILITIES ENGINEER
Dayton Martin UTILITIES AREA COORDINATOR
O'Hara Parker UTILITIES COORDINATOR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	12" WL
11¼ Degree Bend	+
22½ Degree Bend	+
45 Degree Bend	+
90 Degree Bend	+
Plug	+
Tee	+
Cross	+
Reducer	▶
Gate Valve	GV
Butterfly Valve	BV
Tapping Valve	TGV
Line Stop	LS
Line Stop with Bypass	LS/BP
Blow Off	BO
Fire Hydrant	PFH
Relocate Fire Hydrant	RFH
Remove Fire Hydrant	REM FH
Water Meter	PWM
Relocate Water Meter	RWM
Remove Water Meter	REM WM
Water Pump Station	PST(W)
RPZ Backflow Preventer	PRPZ
DCV Backflow Preventer	PBFP
Relocate RPZ Backflow Preventer	RRPZ
Relocate DCV Backflow Preventer	RBFP

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	12" SS
Force Main Sewer Line (Sized as Shown)	12" FSS
Manhole (Sized per Note)	•
Sewer Pump Station	PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	⊙
Telephone Pole	⊙
Joint Use Pole	⊙
Telephone Pedestal	TEL PED
Utility Line by Others (Type as Shown)	PROP O/H POW LINES
Trenchless Installation	12" TL INSTALL
Encasement by Open Cut	24" ENCAS BY OC
Encasement	24" ENCASEMENT

Thrust Block	⊥
Air Release Valve	AR
Utility Vault	UV
Concrete Pier	CP
Steel Pier	SP
Plan Note	NOTE
Pay Item Note	PAY ITEM

EXISTING UTILITIES SYMBOLS

Power Pole	⊙	*Underground Power Line	P
Telephone Pole	⊙	*Underground Telephone Cable	T
Joint Use Pole	⊙	*Underground Telephone Conduit	TC
Utility Pole	•	*Underground Fiber Optics Telephone Cable	T FO
Utility Pole with Base	□	*Underground TV Cable	TV
H-Frame Pole	••	*Underground Fiber Optics TV Cable	TV FO
Power Transmission Line Tower	⊠	*Underground Gas Pipeline	G
Water Manhole	⊙	Aboveground Gas Pipeline	A/G Gas
Power Manhole	⊙	*Underground Water Line	W
Telephone Manhole	⊙	Aboveground Water Line	A/G Water
Sanitary Sewer Manhole	•	*Underground Gravity Sanitary Sewer Line	SS
Hand Hole for Cable	⊠	Aboveground Gravity Sanitary Sewer Line	A/G Sanitary Sewer
Power Transformer	⊠	*Underground SS Forced Main Line	FSS
Telephone Pedestal	TEL PED	Underground Unknown Utility Line	?UTL
CATV Pedestal	⊠	SUE Test Hole	•
Gas Valve	◇	Water Meter	⊙
Gas Meter	◇	Water Valve	•
Located Miscellaneous Utility Object	•	Fire Hydrant	◇
Abandoned According to Utility Records	AATUR	Sanitary Sewer Cleanout	⊙
End of Information	E.O.I.		

*For Existing Utilities
 Utility Line Drawn from Record (Type as Shown) ?UTL
 Designated Utility Line (Type as Shown) ?UTL - - - -

5/14/99

UTILITY CONSTRUCTION

Prepared In the Office of:



AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.
701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F - 0342

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
B-5326	UC-3
DESIGNED BY:	8/20/2019
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
D. Stephen Scruggs UTILITY CONSTRUCTION PLANS ONLY	

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
2. THE EXISTING WATER AND SEWER UTILITIES BELONG TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT (CORPUD).
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

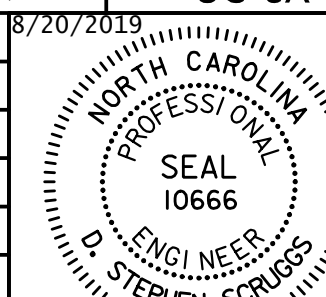
6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

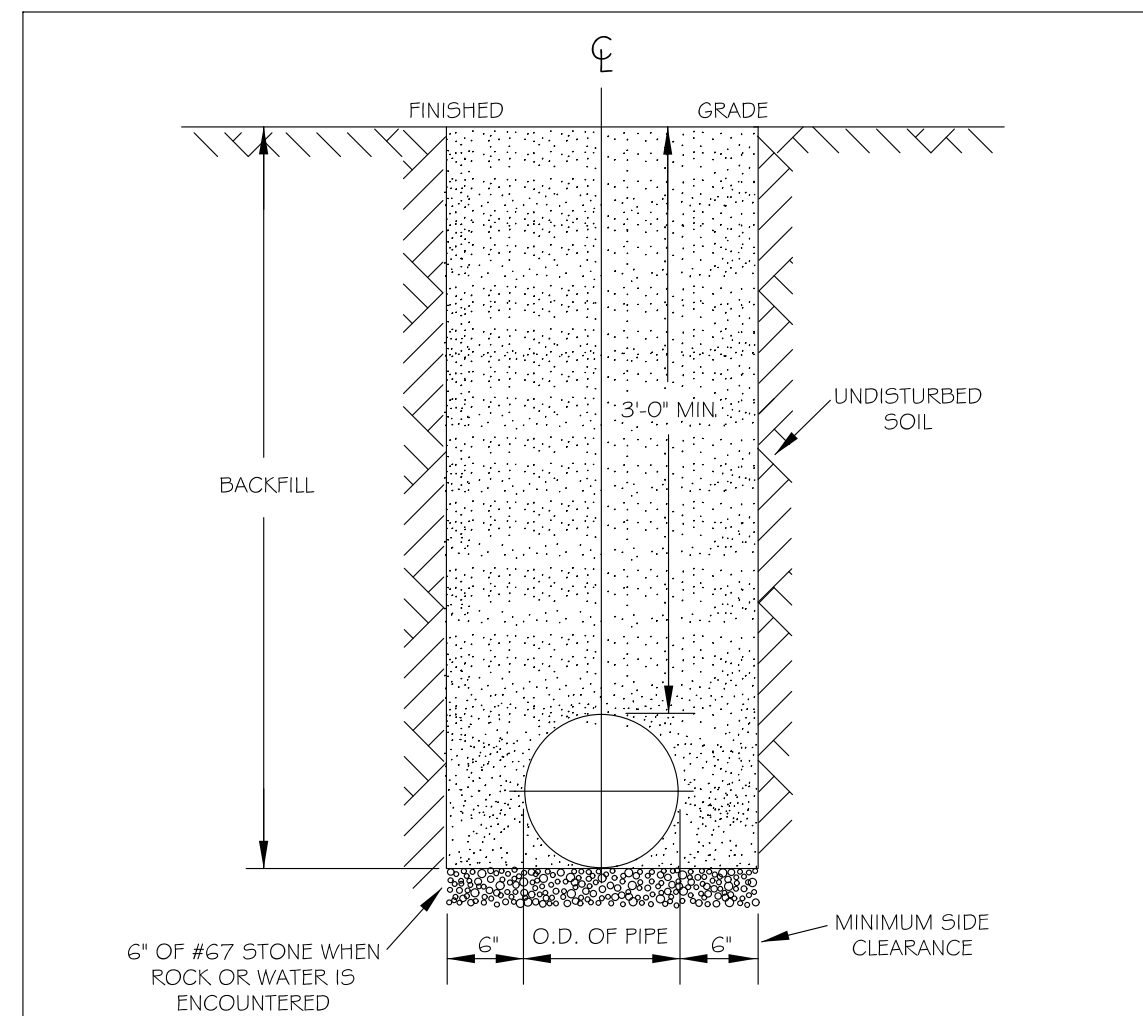
1. THE 30-INCH FORCE MAIN SHALL REMAIN IN SERVICE AT ALL TIMES UTILIZING THE TEMPORARY BY-PASS AND LINE STOPS.
2. MAINTAIN ACCESS TO APRIL CIRCLE AT ALL TIMES.
3. THE EXISTING 14-INCH FORCE MAIN AND PUMP STATION SHALL REMAIN IN SERVICE AT ALL TIMES.

CONSTRUCTION SEQUENCE:

1. INSTALL THE 30-INCH RELOCATED FORCE MAIN UNDER THE STREAM AND TO THE CONNECTION POINTS WITHOUT MAKING THE CONNECTIONS. PRESSURE TEST THE NEW PIPE. BACK FILL THE BORE AND RECEIVING PITS. RESTRAIN THE EXISTING 30-INCH FORCE MAIN WHERE INDICATED WITH BELL RESTRAINT HARNESSSES.
2. INSTALL THE 30-INCH HDPE BY-PASS PIPE, FITTINGS, AND CONNECTIONS. PLACE INTO SERVICE.
3. INSTALL THE TEMPORARY LINE STOPS.
4. MAKE THE FINAL CONNECTIONS BETWEEN THE NEW 30-INCH FORCE MAIN AND EXISTING FORCE MAIN. REMOVE THE LINE STOPS. INSTALL THE PIPE PLUGS ON EACH END OF THE EXISTING 30-INCH PIPE TO BE ABANDONED.
5. CLOSE THE TWO TAPPING VALVES, REMOVE THE HDPE PIPE AND CAP THE VALVES WITH RJ CAPS. REMOVE THE 30-INCH HDPE BY-PASS PIPE. RESTORE THE DISTURBED AREAS.
6. INSTALL THE 12-INCH RELOCATED WATER MAIN TO THE CONNECTION POINT WITHOUT MAKING THE CONNECTION. PRESSURE TEST, FLUSH AND CHLORINATE THE NEW WATER MAIN. ONCE APPROVED, MAKE THE FINAL CONNECTION AND PLUG THE EXISTING PIPE TO BE ABANDONED.

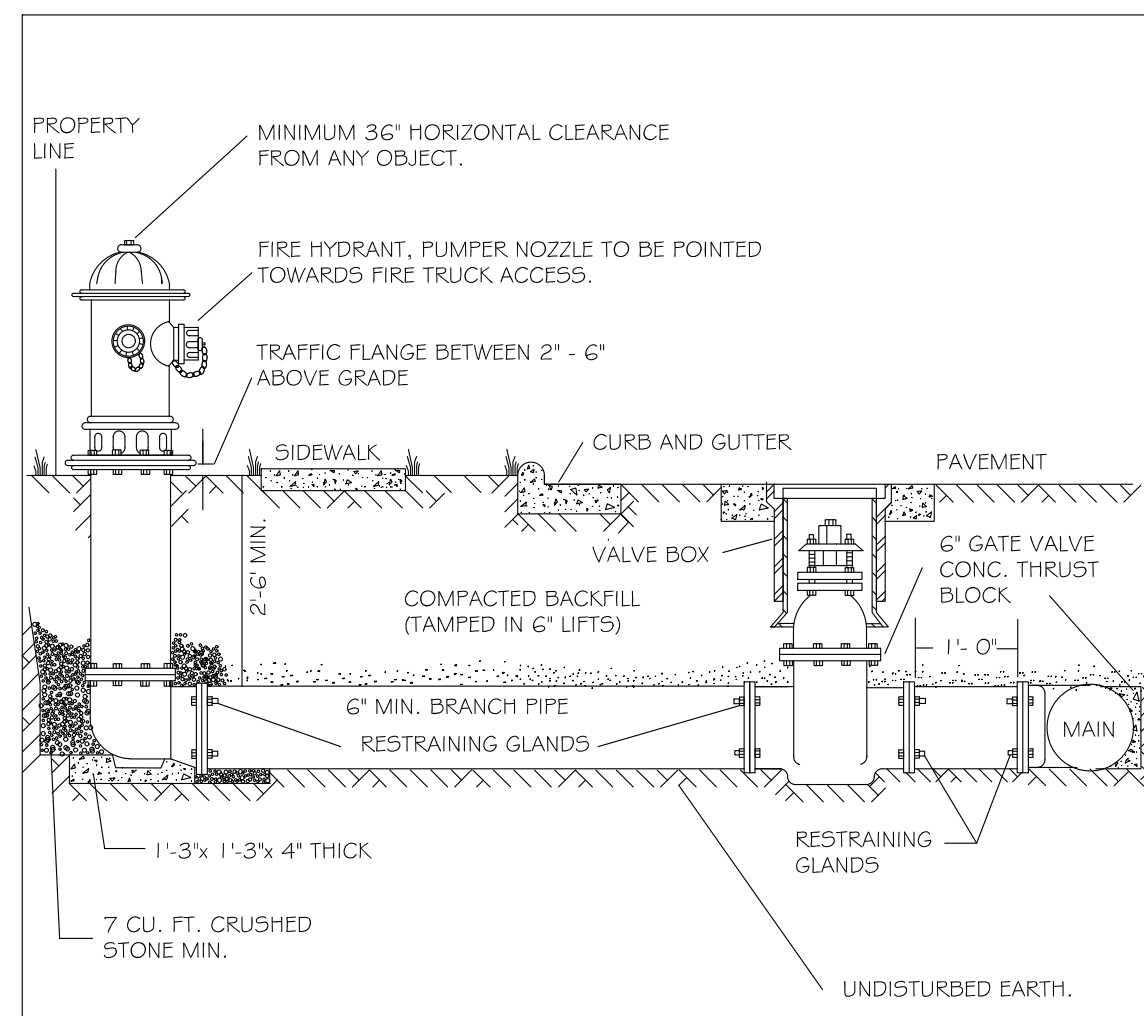


UTILITY CONSTRUCTION



- 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.

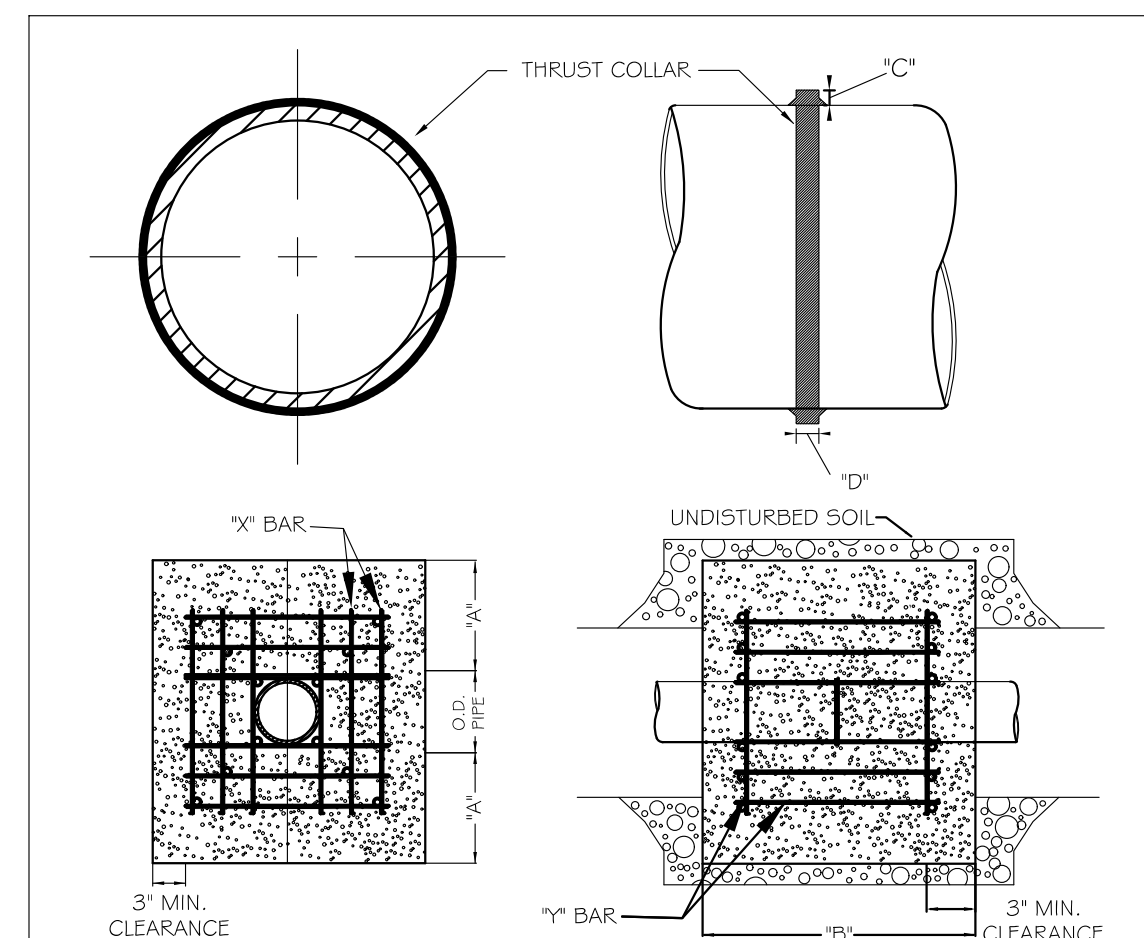
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3	D.W.C.	9-3-99	ABB	2-15-05
	RRH	3-31-00	J.P.S.	10-29-10



- NOTES:
- FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARUNG, KENNEDY, MH, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
 - BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
 - 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT
 - STEEL RODS AND BOLTS SHALL BE #1 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 CASE 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 THE WORK IS 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	PAP	2/17/09
	DHL	2/14/08		



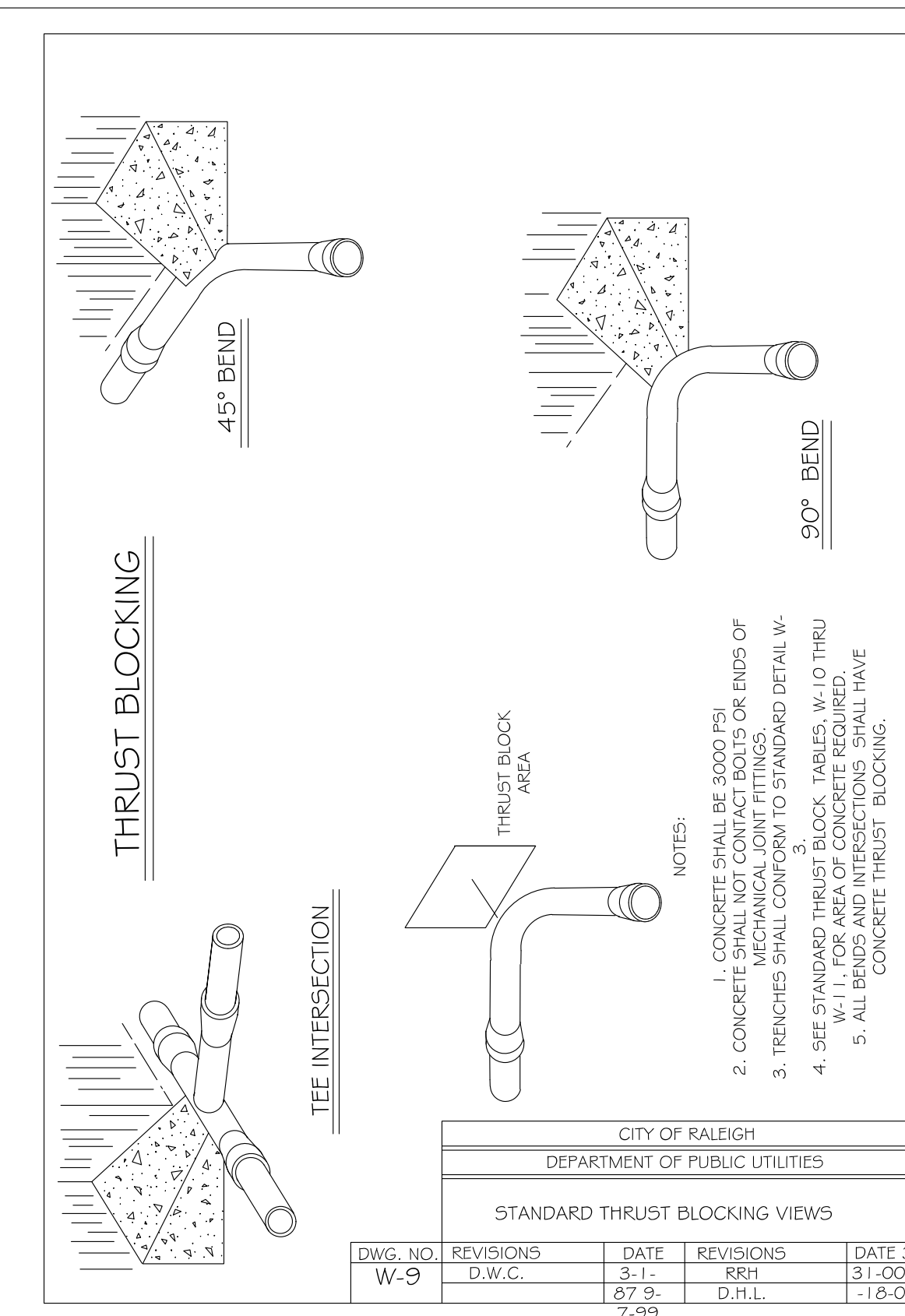
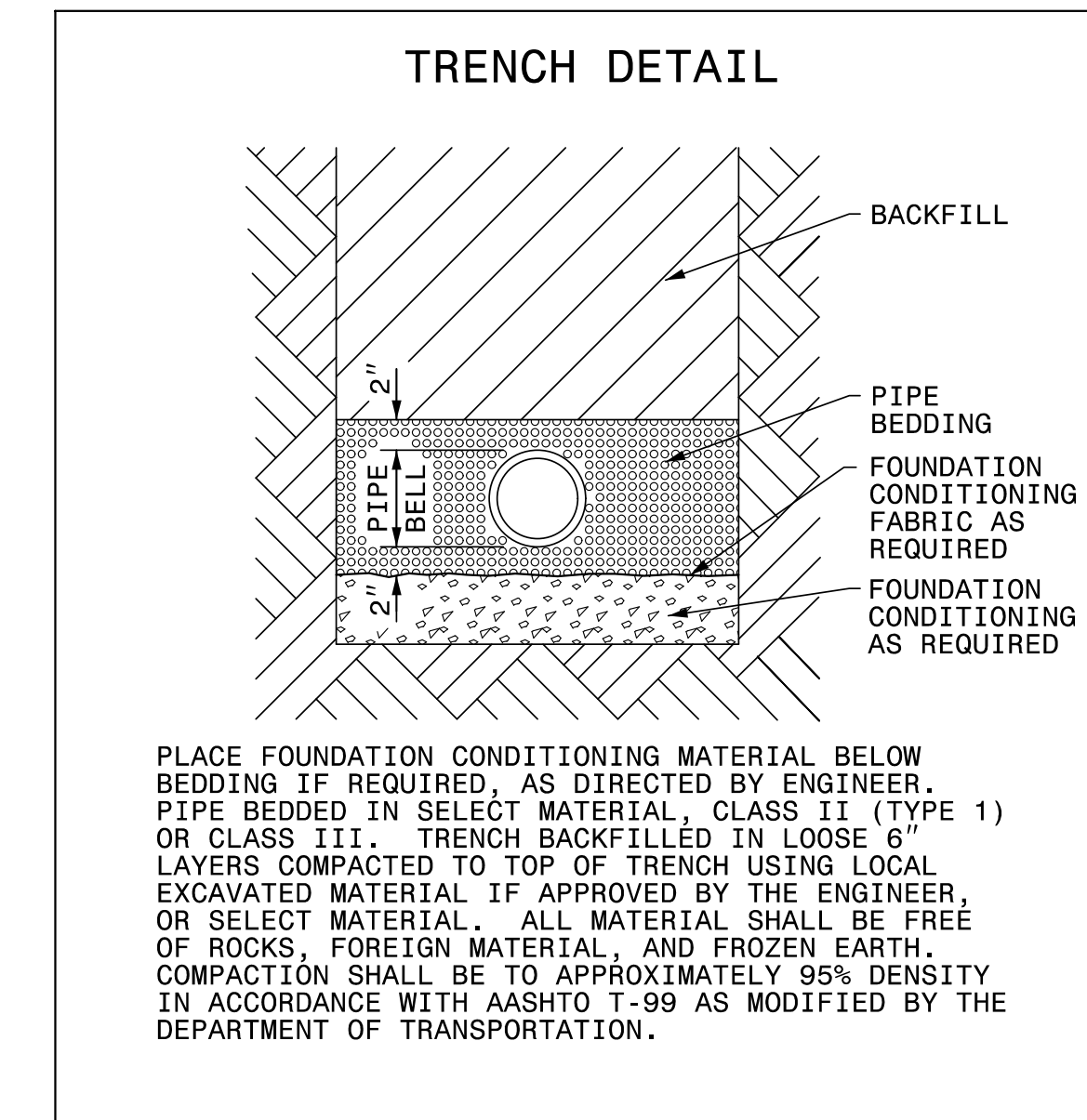
REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6" - 24"	#6	2'-2" O.D. PIPE	1.048 LB/FT	1'-1"	1.1 LB. EACH	X-24, Y-12
48" & greater	#6	3'-0" O.D. PIPE	1.502 LB/FT	1'-3"	1.9 LB. 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. | 11-11-10 |
| | D.H.L. | 6-18-08 | | |



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	MEDIUM DRY CLAY 4000 LB/FT ²	SOFT CLAY 2000 LB/FT ²	LEAKY SAND 1600 LB/FT ²	GRAVEL/CORNER GRAVEL / COARSE SAND 4000 LB/FT ²	ROCK TO ROCK / ATTERING DRY	SAND COMPACT FIRM 2000 LB/FT ²	SAND CLEAN DRY 1000 LB/FT ²	SOIL 1000 LB/FT ² / QUICKSAND / VERY POOR	ROCK TO ROCK / 1000 LB/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	1	2	5	1
90°	7,996	2	4	5	1	1	1	2	8	1
PLUG	5,655	2	3	4	1	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	1	2	8	1
90°	14,215	4	8	9	2	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	2	3	10	1
12"										
11 1/4°	4,433	2	3	3	1	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	2	3	9	1
45°	17,312	5	9	11	3	3	3	5	18	2
90°	31,983	8	16	19	4	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	3	6	23	3
16"										
11 1/4°	7,881	2	4	5	1	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	2	4	16	2
45°	30,779	8	16	19	4	4	4	8	31	4
90°	56,861	15	29	35	8	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	5	10	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.	-23-99		

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

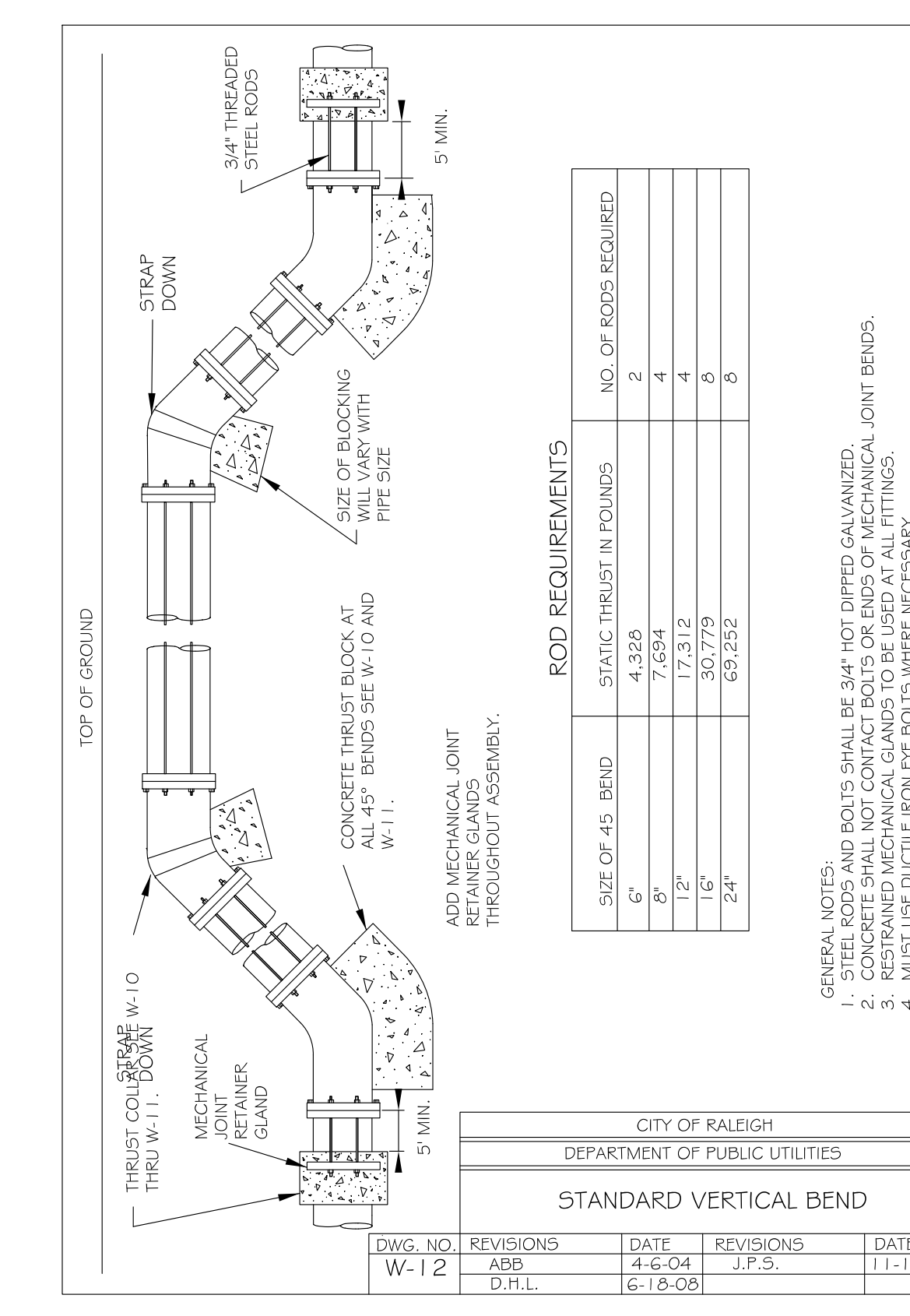
ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MEDIUM DRY CLAY 4000 LB/FT ²	SOFT CLAY 2000 LB/FT ²	LEAKY SAND 1600 LB/FT ²	GRAVEL/CORNER GRAVEL / COARSE SAND 4000 LB/FT ²	ROCK TO ROCK / ATTERING DRY	SAND COMPACT FIRM 2000 LB/FT ²	SAND CLEAN DRY 1000 LB/FT ²	SOIL 1000 LB/FT ² / QUICKSAND / VERY POOR	ROCK TO ROCK / 1000 LB/FT ²
24"										
11 1/4°	17,734	5	9	11	3	3	3	5	18	2
22 1/2°	35,305	9	18	22	5	5	5	9	36	4
45°	69,252	18	35	42	9	9	9	18	70	7
90°	127,936	32	64	77	16	16	16	32	128	13
PLUG	90,478	23	46	55	12	12	12	23	91	10
30"										
11 1/4°	27,709	7	14	17	4	4	4	7	2	3
22 1/2°	55,163	14	28	34	7	7	7	14	56	6
45°	108,206	28	55	65	14	14	14	28	109	11
90°	199,900	50	100	120	25	25	25	50	200	20
PLUG	141,372	36	71	85	18	18	18	36	142	15
36"										
11 1/4°	39,901	10	20	24	5	5	5	10	40	4
22 1/2°	79,439	20	40	48	10	10	10	20	80	8
45°	155,816	39	78	94	20	20	20	39	156	16
90°	287,855	72	144	172	36	36	36	72	288	29
PLUG	203,575	51	102	122	26	26	26	51	204	21
48"										
11 1/4°	70,935	18	36	43	9	9	9	18	71	8
22 1/2°	141,218	36	71	85	18	18	18	36	142	15
45°	277,007	70	139	166	35	35	35	70	277	28
90°	511,742	128	256	320	64	64	64	128	512	52
PLUG	361,911	91	181	217	46	46	46	91	362	37

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.

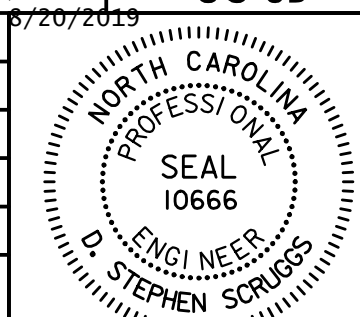
USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
THRUST BLOCKING DESIGN QUANTITY TABLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-11	D.W.C.	23-99		

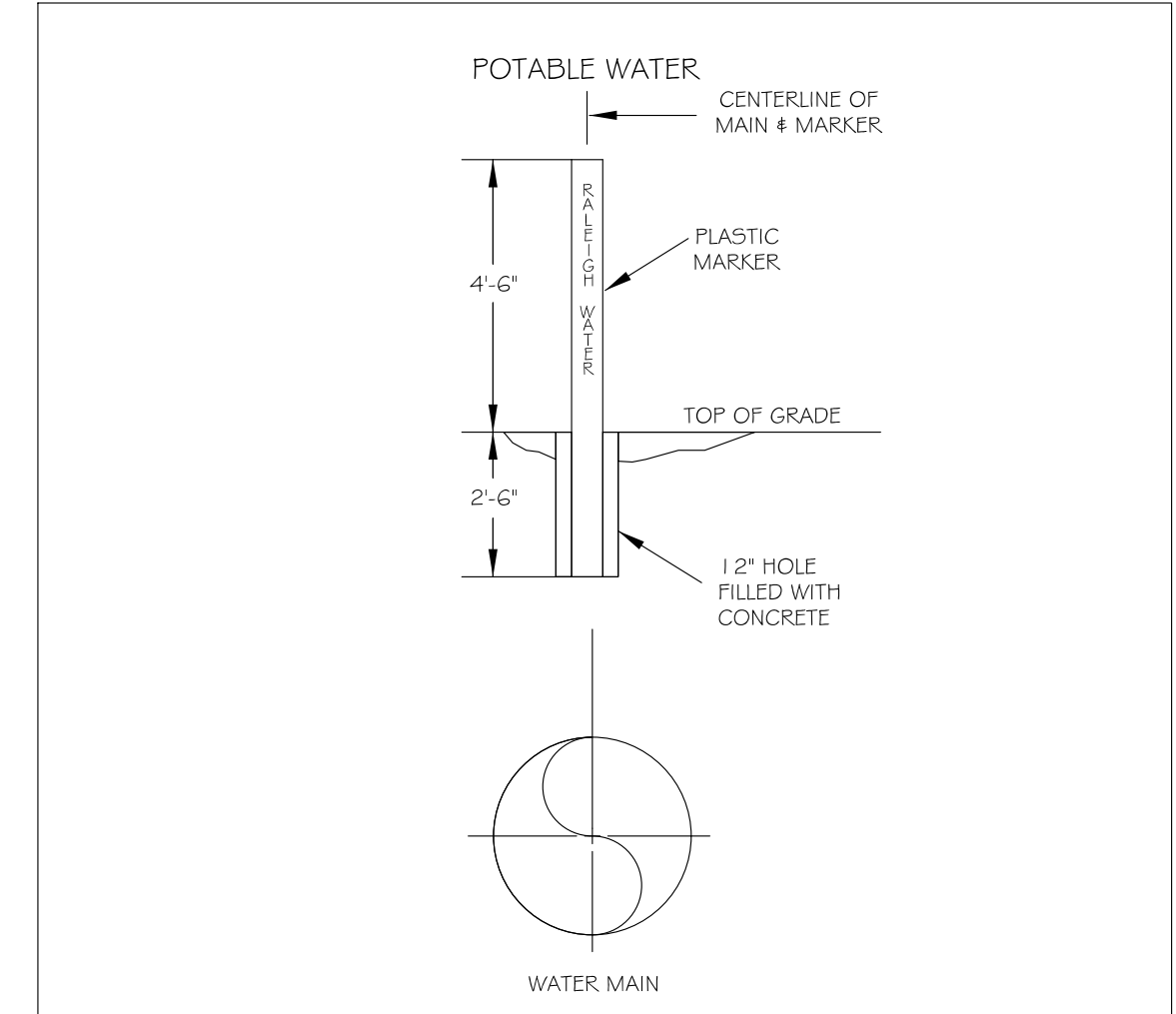


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PROJECT REFERENCE NO.	SHEET NO.
B-5326	UC-3B
DESIGNED BY:	8/20/2019
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION D. Stephen Scruggs PHONE: (919) 707-6690 FAX: (919) 250-4151	

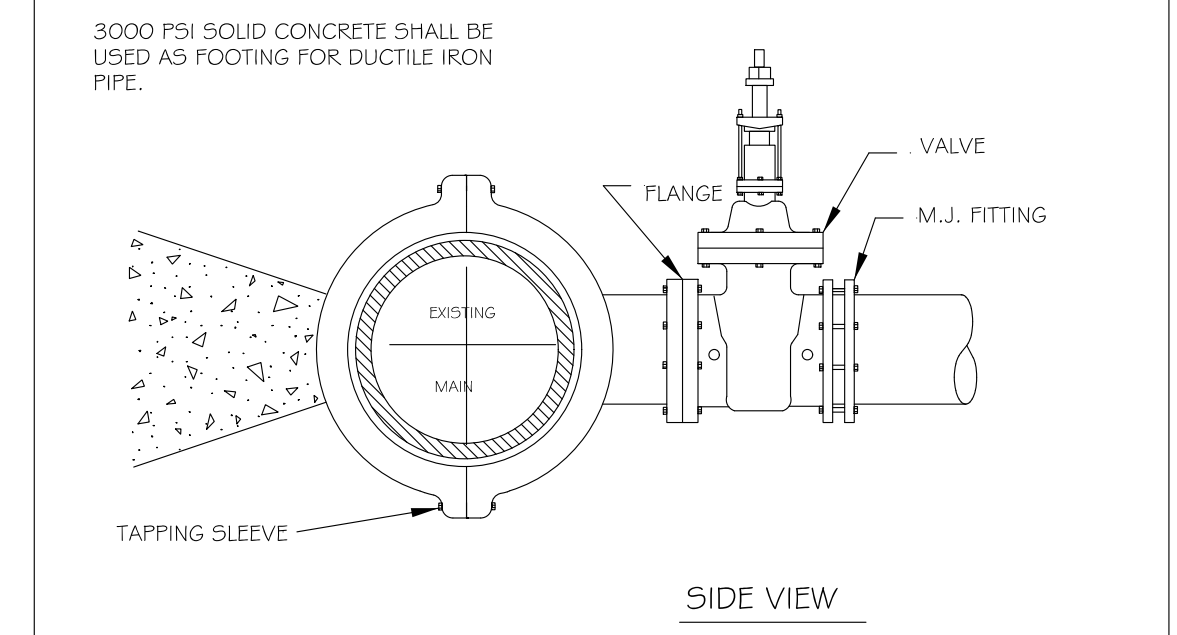
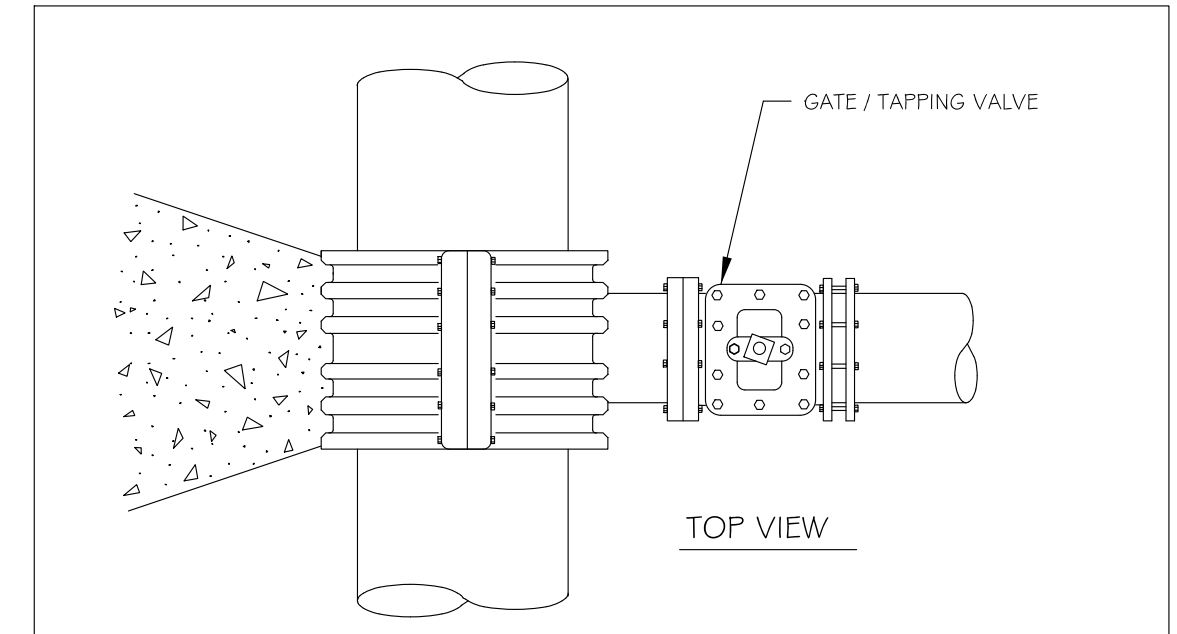


UTILITY CONSTRUCTION



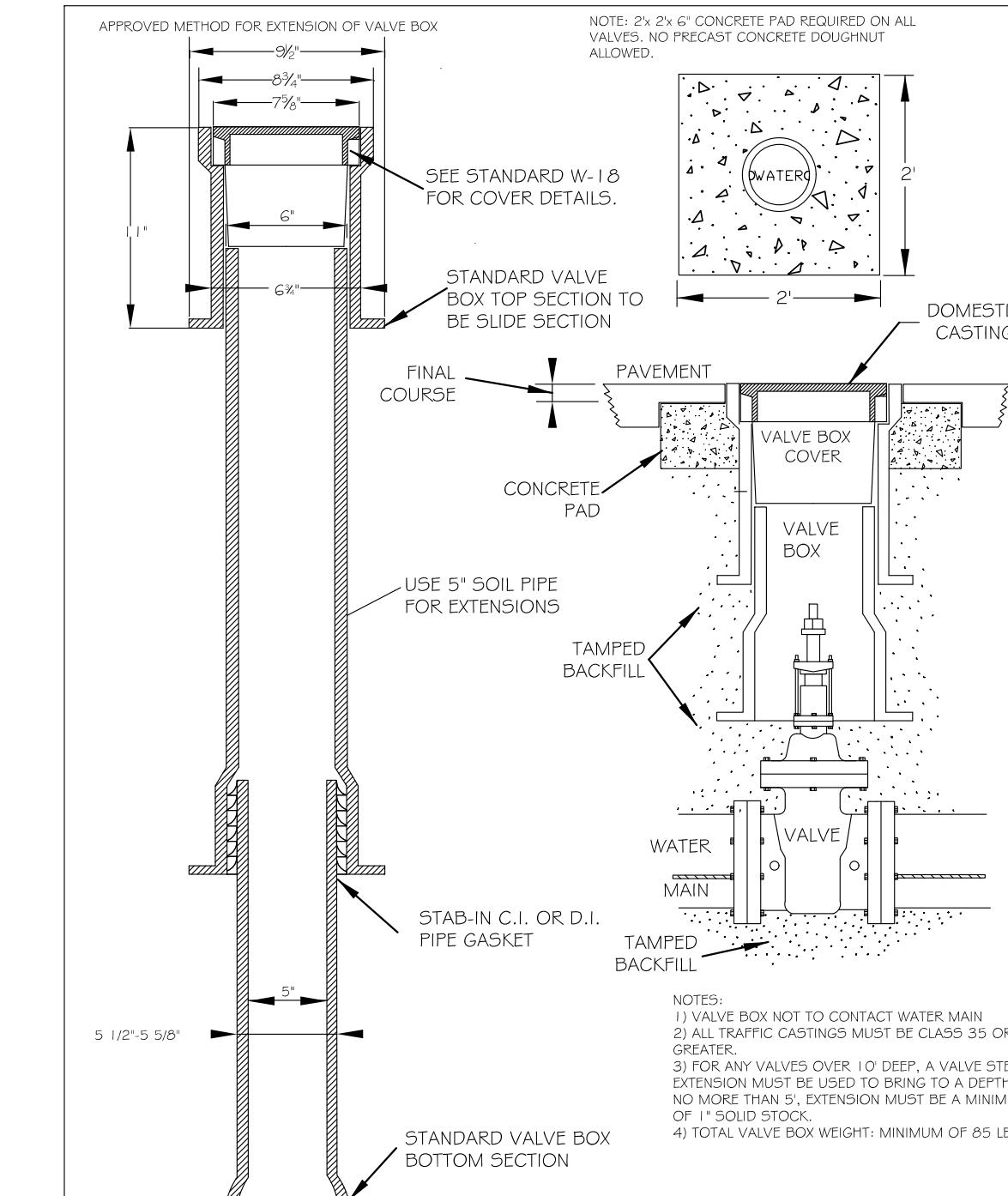
- NOTES:
- POTABLE WATER MARKER TO BE BLUE IN COLOR.
 - POTABLE WATER MARKER TO BE LABELED "RALEIGH WATER".
 - TO BE SPACED ALONG CENTERLINE OF MAIN EVERY 300 FEET.
 - MARKERS TO BE ROUND AND 4" IN DIAMETER.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
STANDARD MAIN & VALVE MARKERS FOR POTABLE & REUSE WATER IN EASEMENTS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-13				
	D.W.C.	9-7-99	DHL	8-16-07
	RRH	3-31-00	J.P.S.	11-1-10

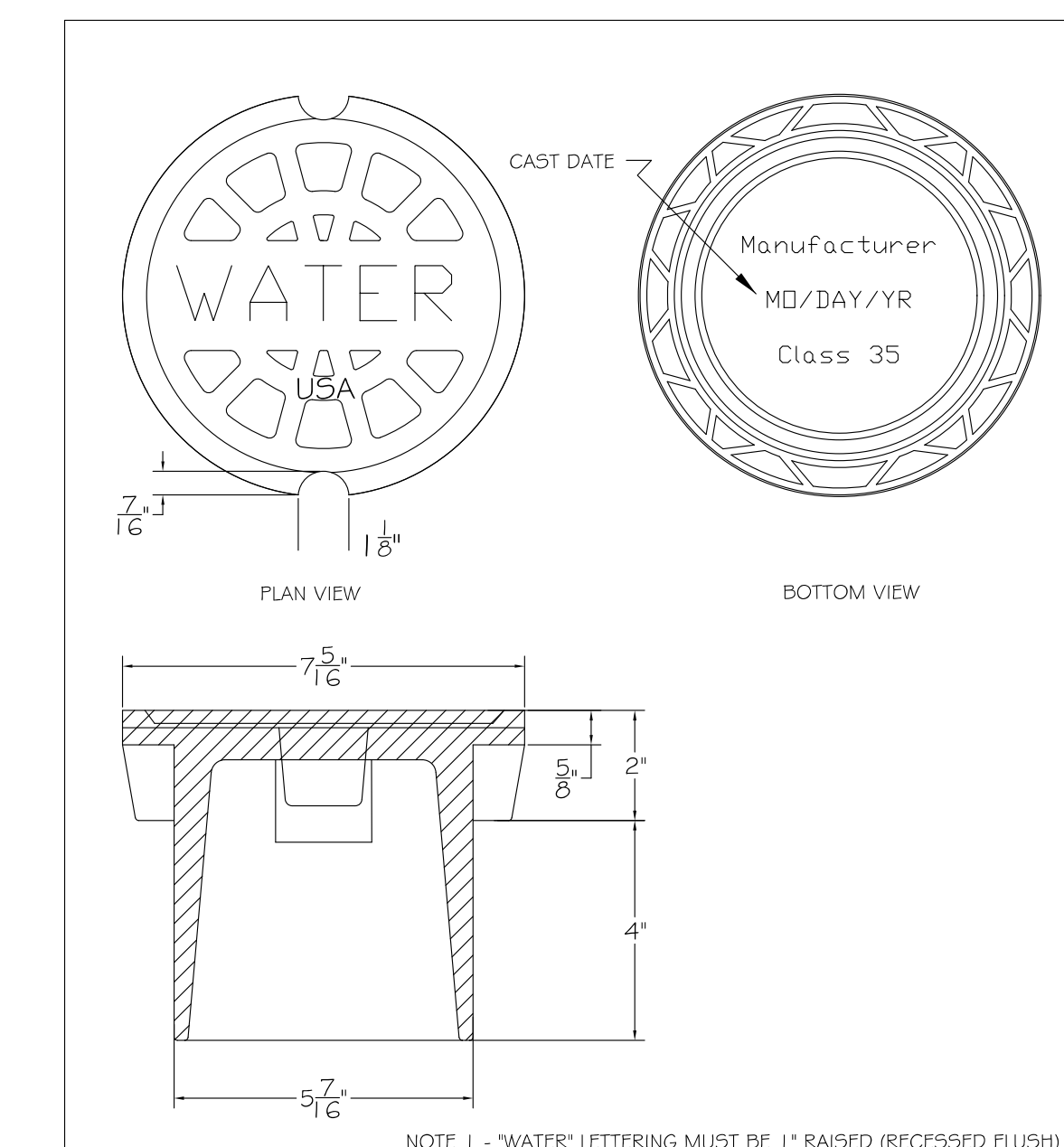


- NOTES:
- CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
 - SEE STANDARD REACTION BLOCK TABLES, W-10 AND W-11 FOR AREA OF CONCRETE REQUIRED.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
4" - 24" STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-14				
	Y.C.A.	12-31-91	RRH	3-31-00
	D.W.C.	9-7-99	J.P.S.	11-1-10

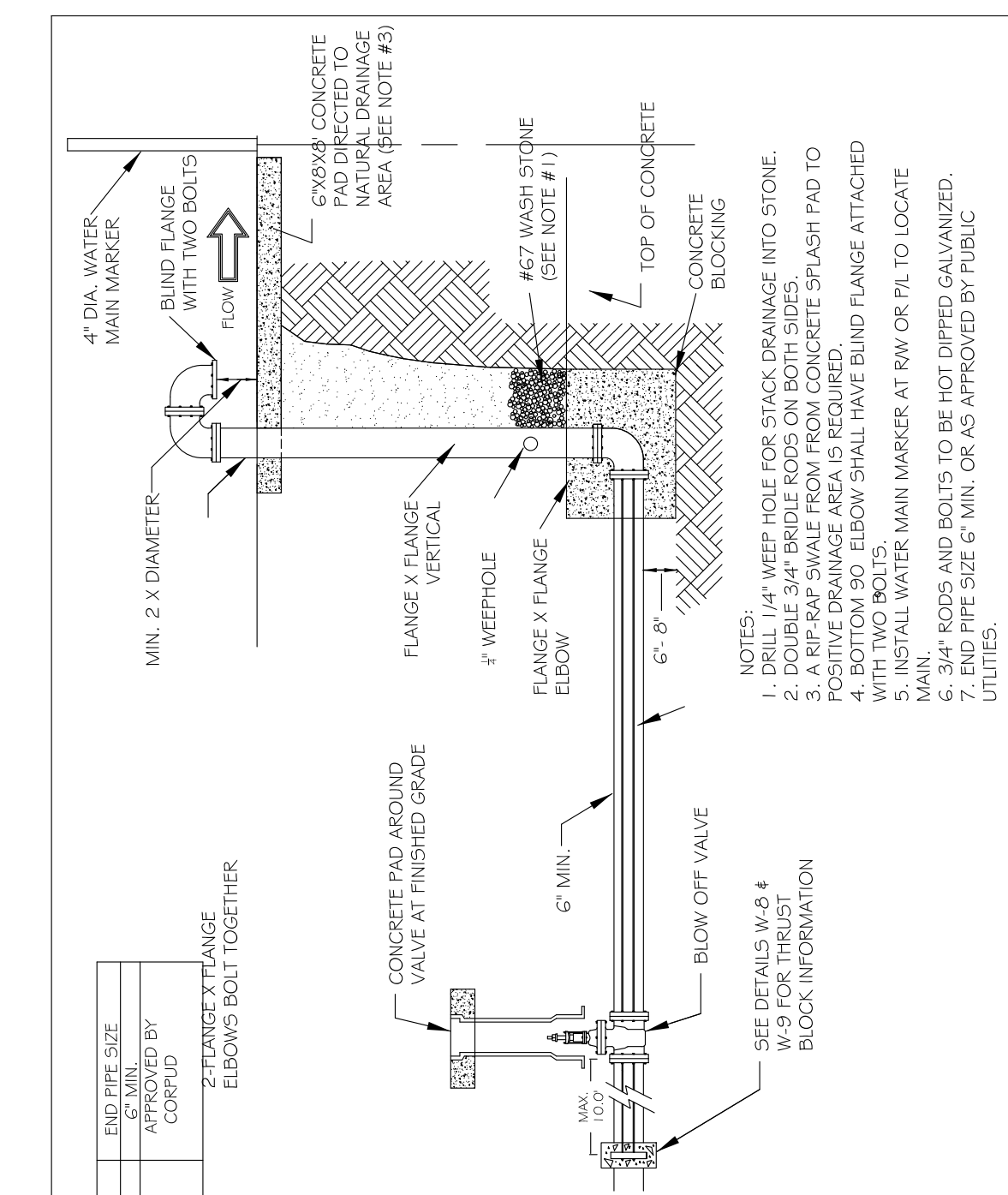


CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
VALVE BOX INSTALLATION AND EXTENSION DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17				
	D.W.C.	7-99-3	A.B.B.	4-15-04
	RRH	3-1-00	DHL	8-16-07

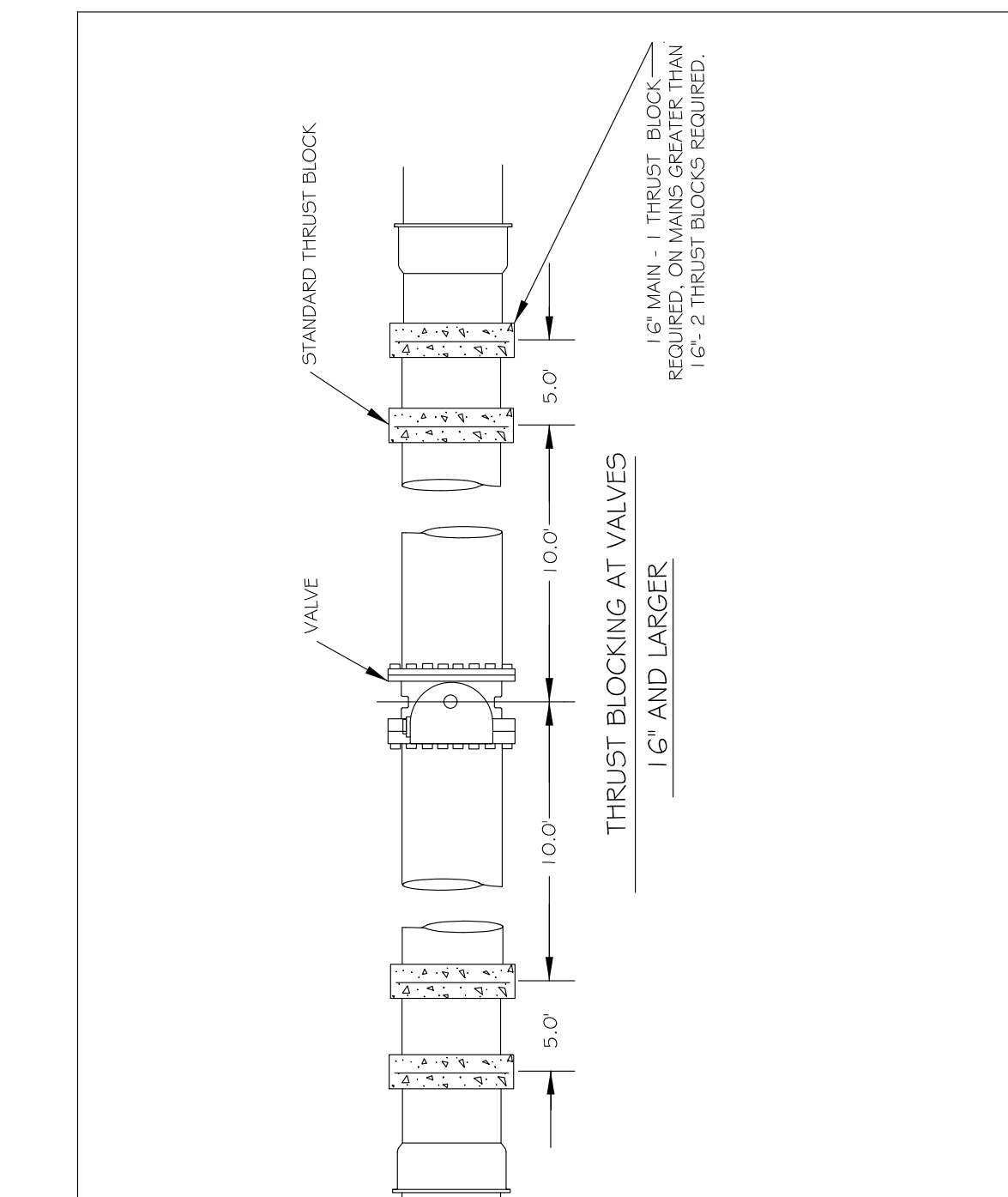


- NOTE 1 - "WATER" LETTERING MUST BE 1" RAISED (RECESSED FLUSH)
NOTE 2 - VALVE COVER SHALL BE DOMESTICALLY CAST
NOTE 3 - COVER MUST HAVE A MINIMUM WEIGHT OF 25 POUNDS.
NOTE 4 - COVER MUST BE CLASS 35 OR GREATER.
NOTE 5 - COVER MUST MEET OR EXCEED AASHTO H-20 LOAD REQUIREMENTS.

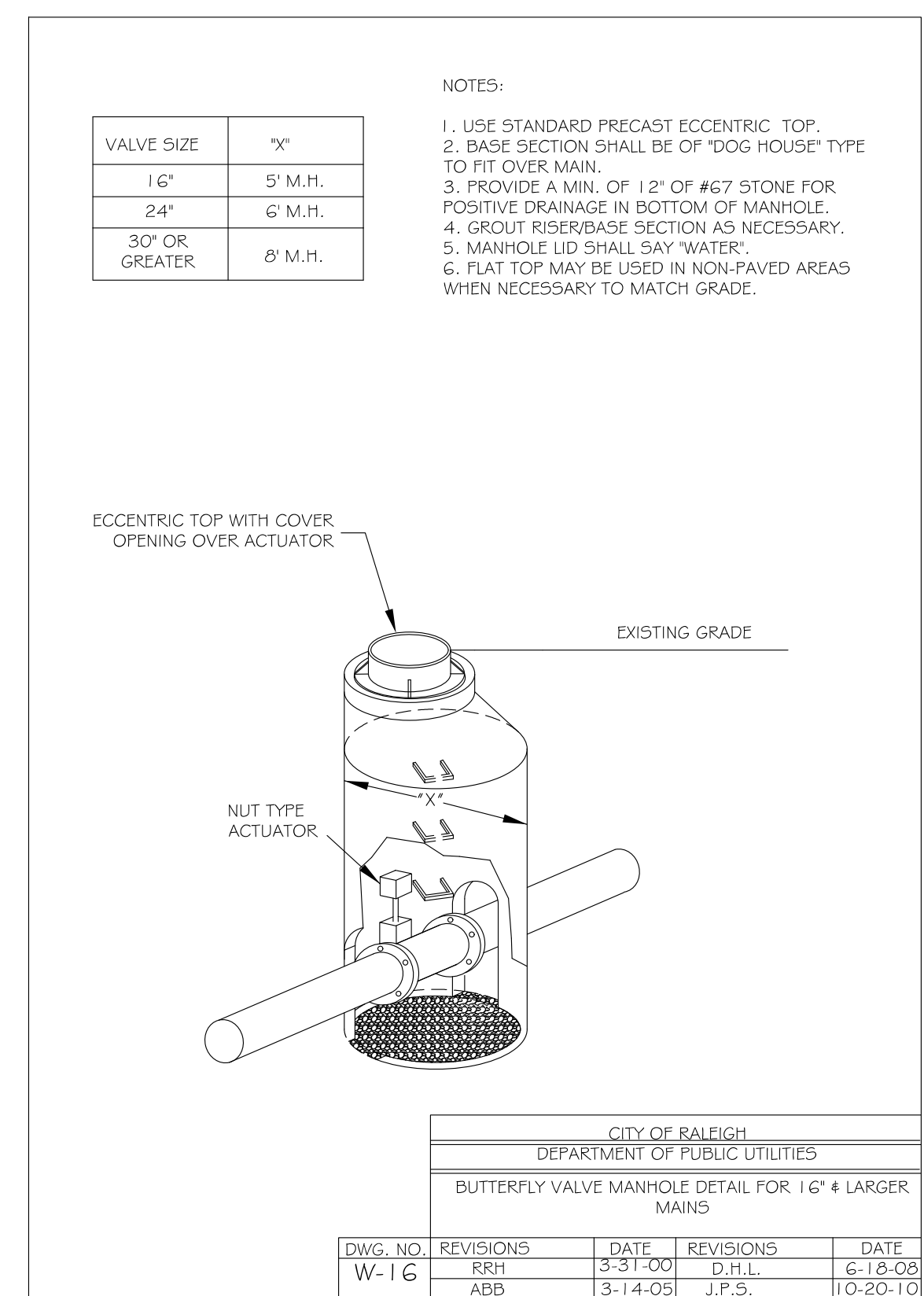
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
5 1/4" VALVE BOX DROP LID WITH 4" SKIRT				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				



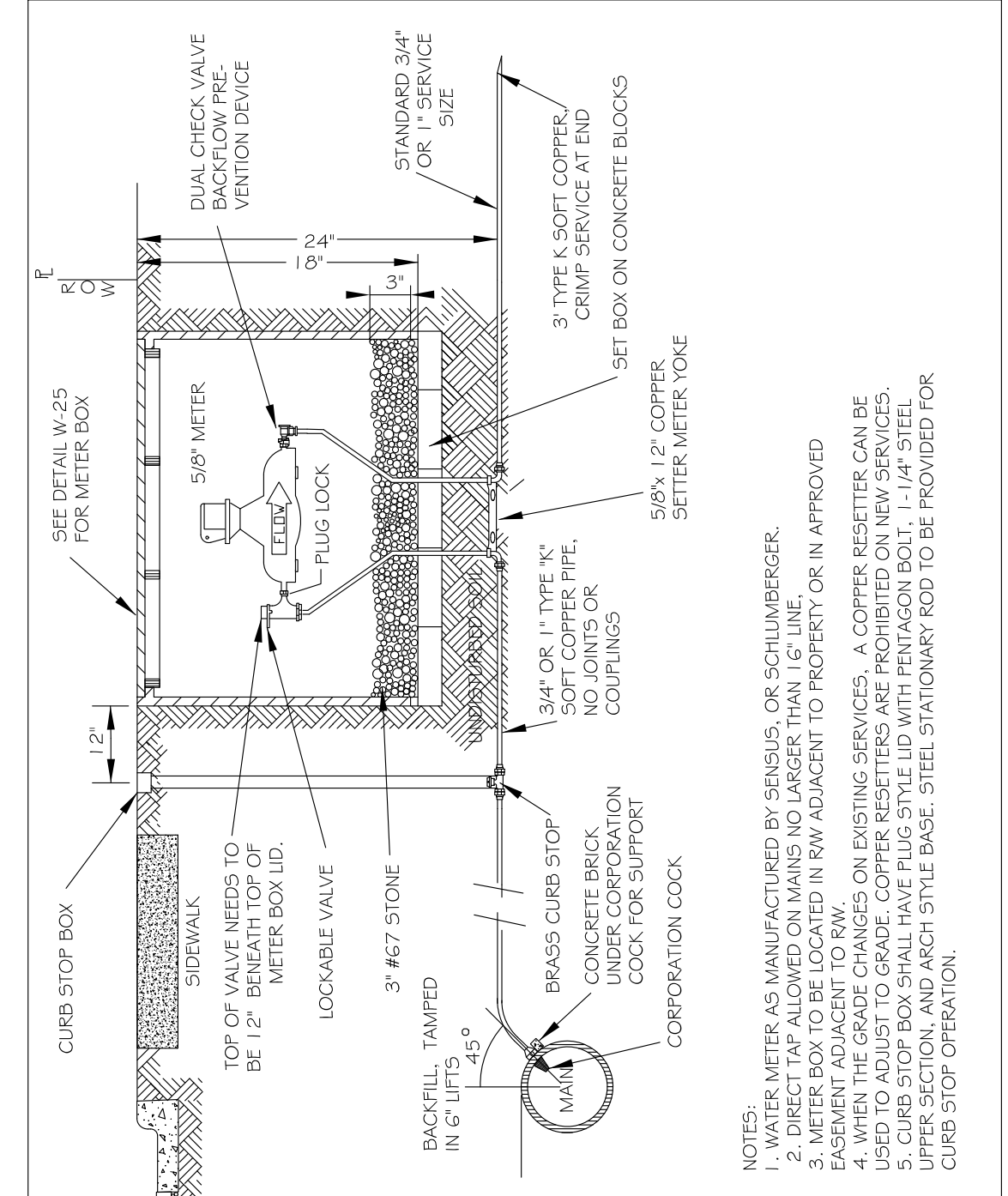
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
PERMANENT WATER MAIN BLOW OFF ASSEMBLY				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-22				
	D.W.C.	28-99	DHL	8-16-07
	A.B.B.	4-13-04		



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCK INSTALLATION FOR 16" AND LARGER VALVES AND DEAD END MAINS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-8				
	Y.C.A.	4-12-90	D.W.C.	9-7-99
		6-92	RRH	3-31-00



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
BUTTERFLY VALVE MANHOLE DETAIL FOR 16" & LARGER MAINS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-16				
	RRH	3-31-00	D.H.L.	6-18-08
	ABB	3-14-05	J.P.S.	10-20-10



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
STANDARD 3/4" x 1" WATER SERVICE INSTALLATION				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-23				
	ABB	4-6-04		
	D.H.L.	6/18/08		

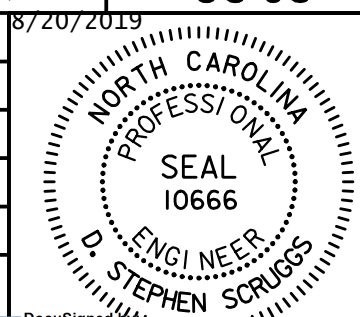
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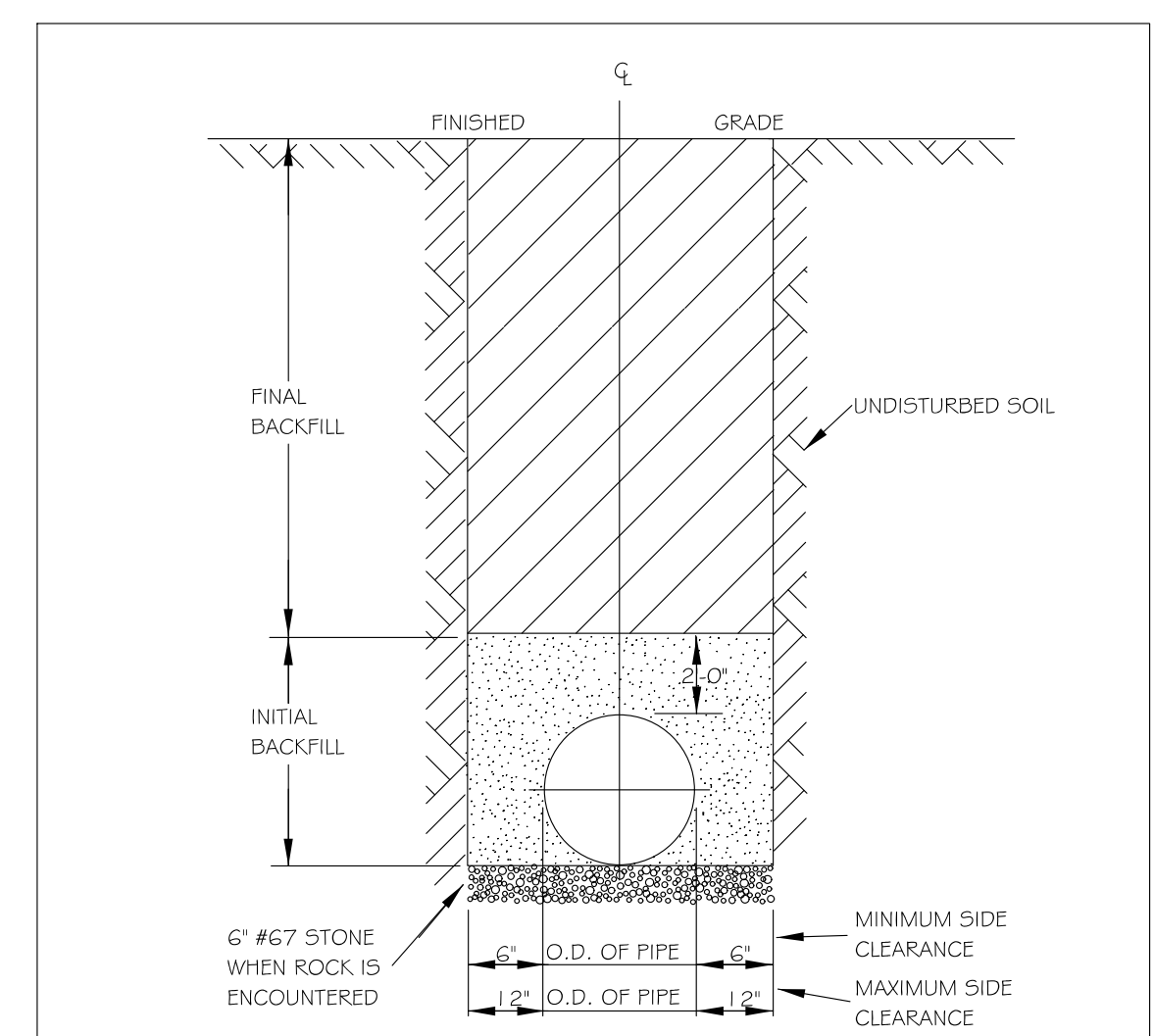
AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.
701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F - 0342

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PROJECT REFERENCE NO.	SHEET NO.
B-5326	UC-3C
DESIGNED BY:	8/20/2019
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SECTION	
D. Stephen Scruggs	
PHONE: (919) 707-6690	
FAX: (919) 250-4151	

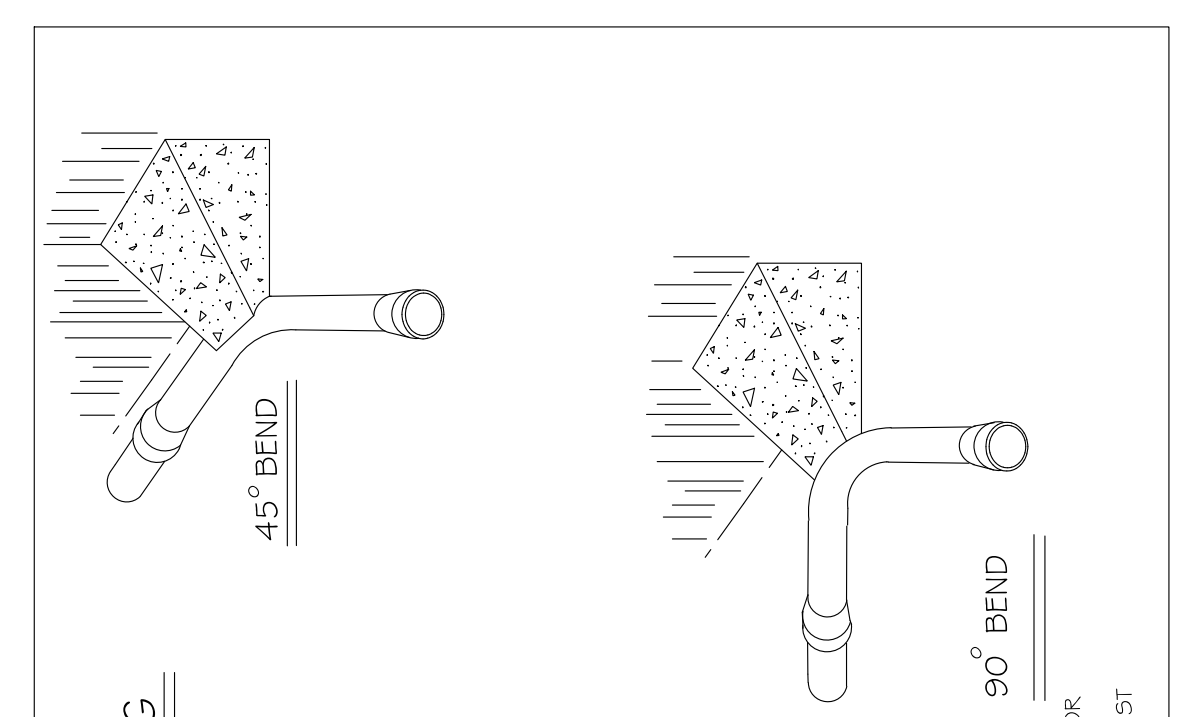


UTILITY CONSTRUCTION



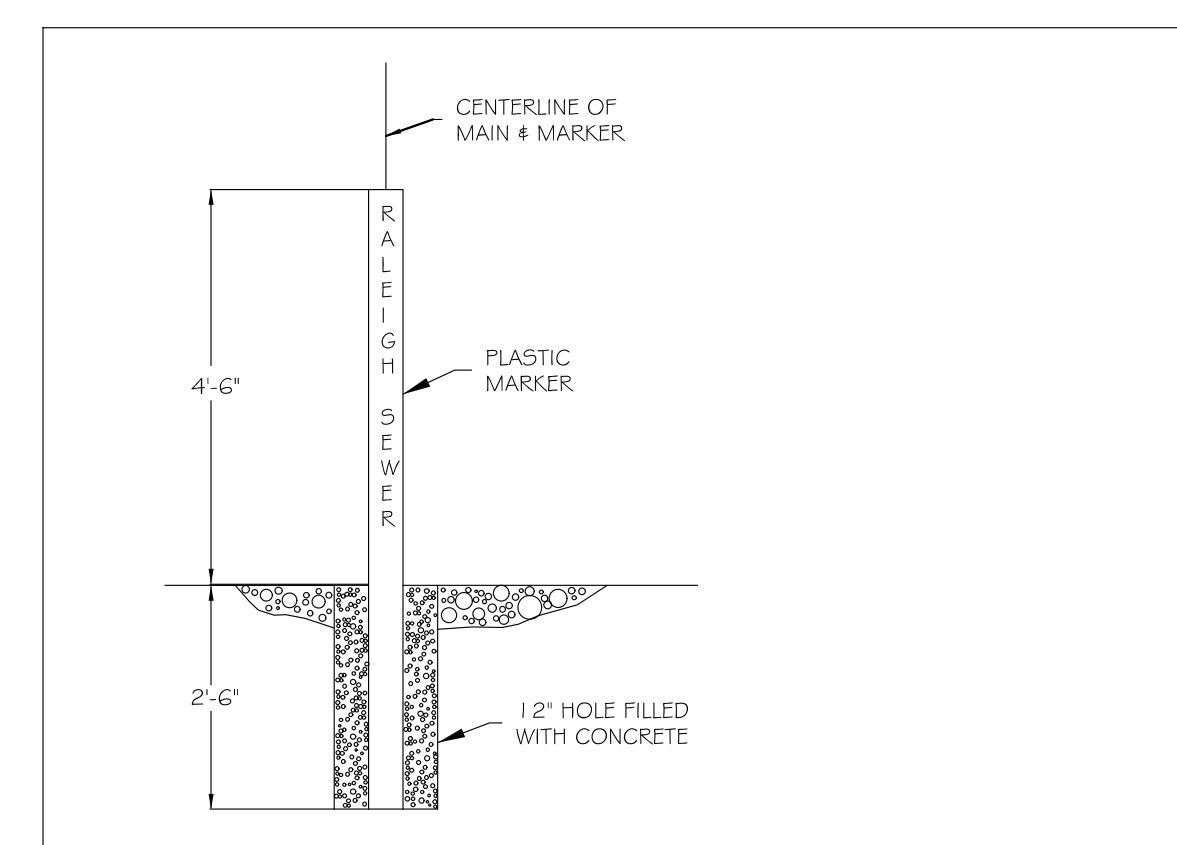
- NOTES:
- TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 - NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
 - ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 - BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
 - ACHIEVE 80% COMPACTION IN NON-TRAFFIC AREAS, AND 95% COMPACTION IN TRAFFIC AREAS.
 - IF IN EASEMENT 4" TOPSOIL, AND 12" CLEAN SELECT FILL MAY BE REQUIRED.
 - NO BOULDERS 8" IN DIAMETER OR GREATER ALLOWED IN FINAL BACKFILL.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-4	D.W.C.	9-3-99		
	RRH	3-30-00		



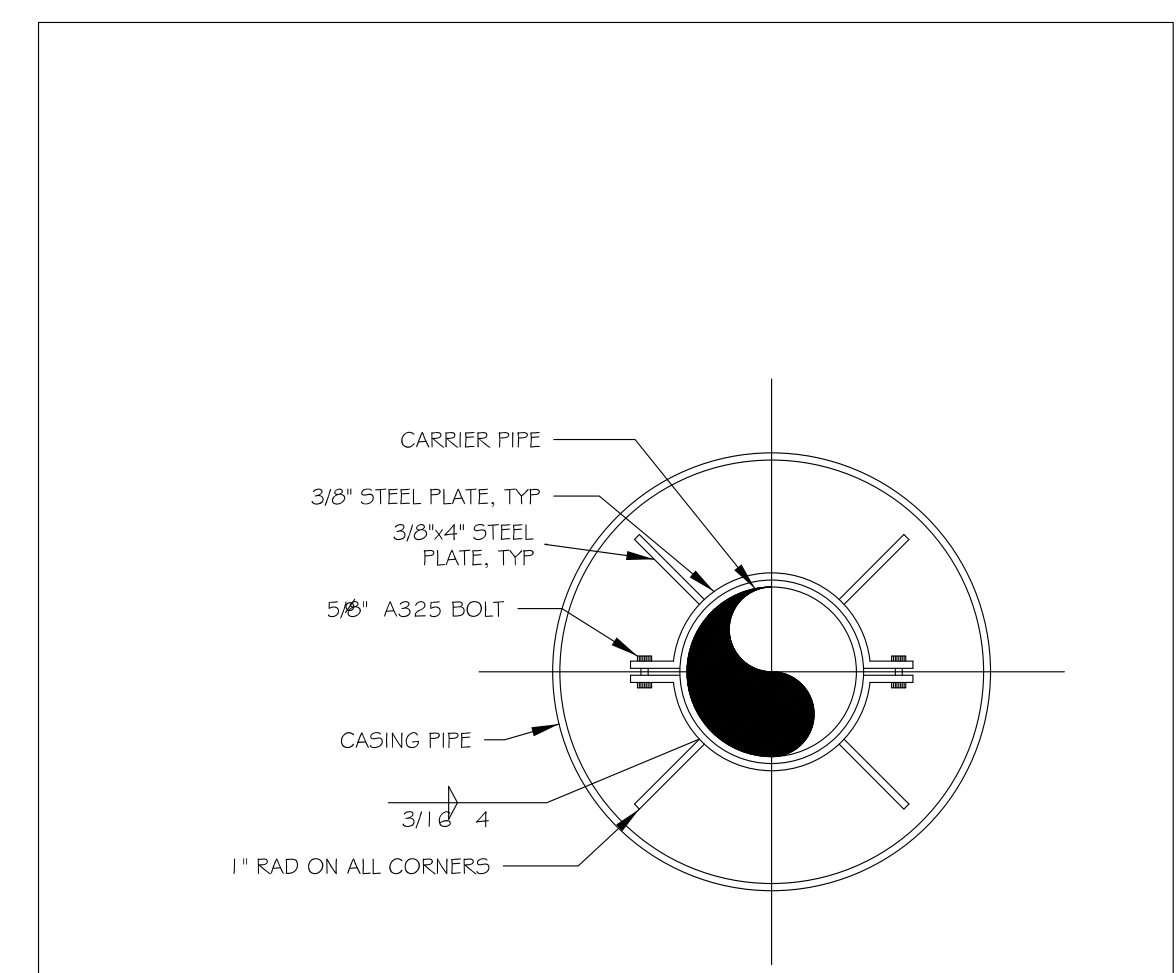
- NOTES:
- CONCRETE SHALL BE 3000 PSI
 - CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
 - SEE STANDARD THRUST BLOCK TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
 - ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCKING VIEWS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-7	D.W.C.	3-1-87	RRH	3-31-00
		9-7-99	D.H.L.	6-18-08



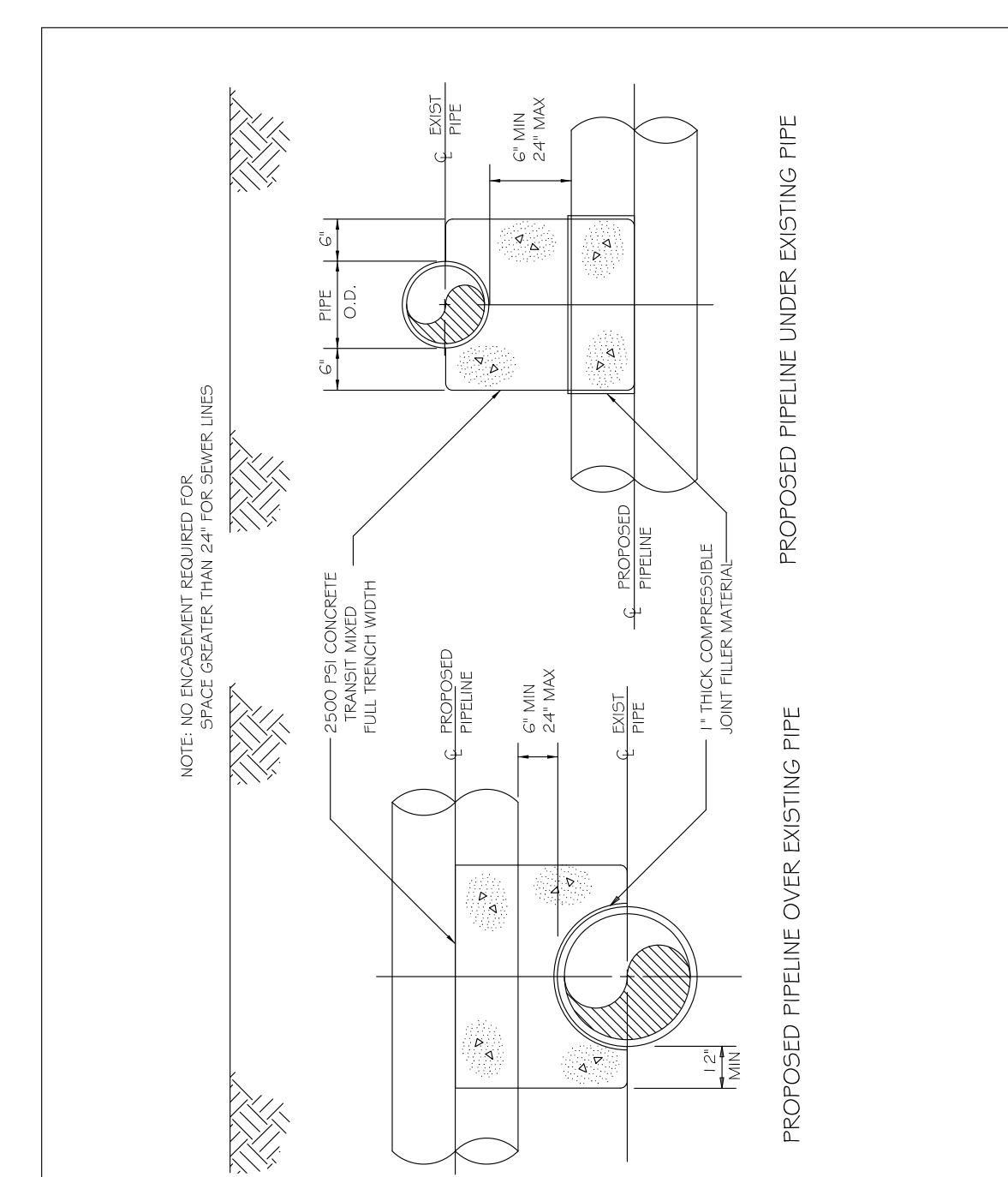
- NOTES:
- PLASTIC MARKER SHALL BE GREEN IN COLOR.
 - MARKERS SHALL BE LABELED "RALEIGH SEWER"
 - TO BE SPACED EVERY 300 FEET ON EACH SIDE OF ANY ROADWAY OR JUNCTION.
 - MARKERS SHALL BE ROUND 4" IN DIAMETER.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD MAIN MARKER FOR SEWER FORCE MAINS IN EASEMENTS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-8	RRH	1-21-00		
	DHL	6-18-08		



- NOTE:
- USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
PIPE ALIGNMENT GUIDE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-39	RRH	3-31-00		
	A.B.B.	4-16-04		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-49	DHL	2-20-08		

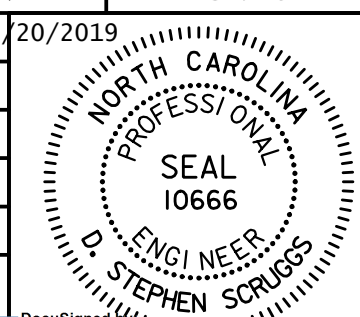
THIS SHEET IS TO SHOW DETOUR ONLY
SEE SHEET UC-4 FOR UC RELOCATION NOTES

Prepared In the Office of:



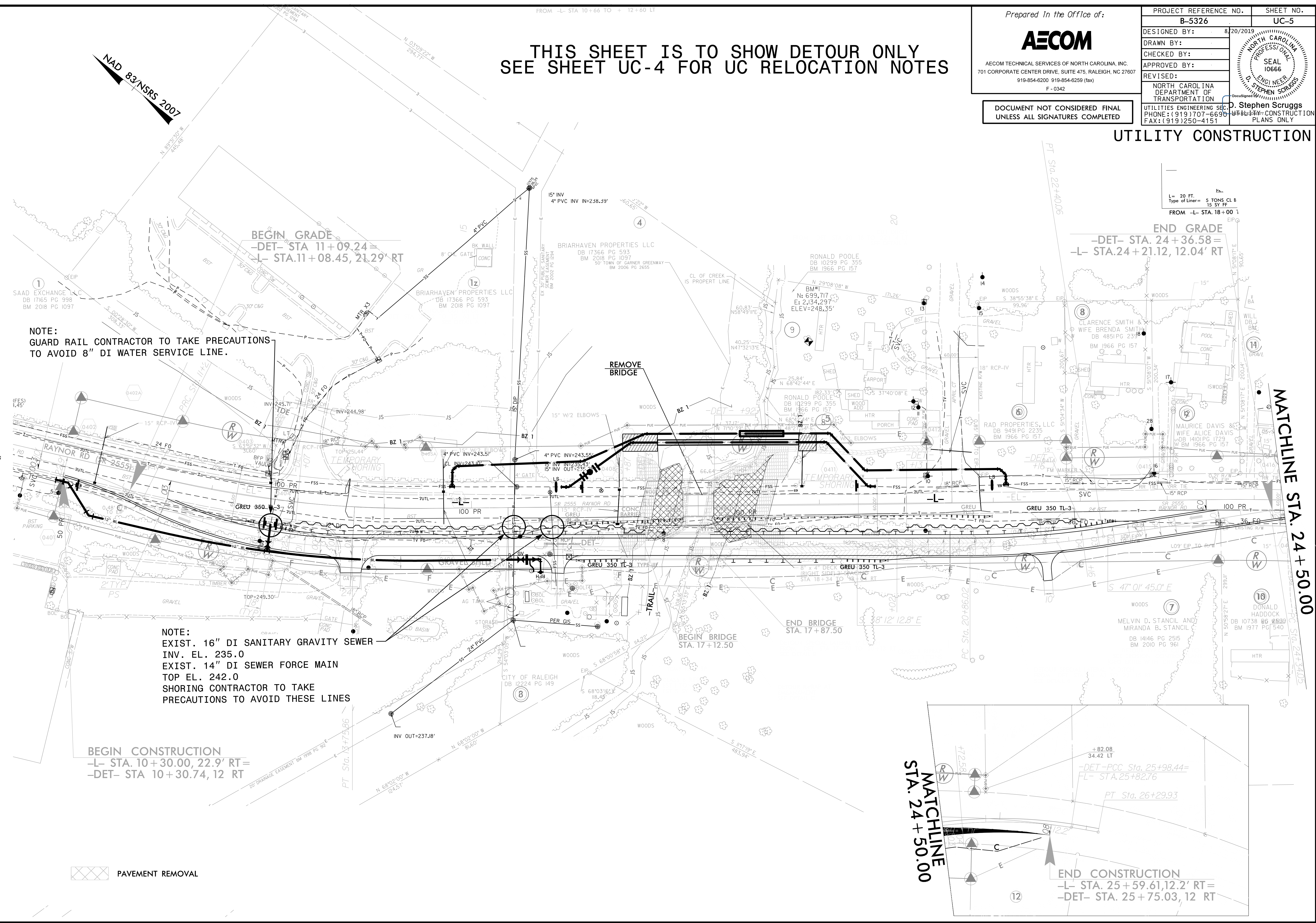
AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.
701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F - 0342

PROJECT REFERENCE NO.	SHEET NO.
B-5326	UC-5
DESIGNED BY:	8/20/2019
DRAWN BY:	
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REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SECTION	
D. Stephen Scruggs	
PHONE: (919) 707-6690	
FAX: (919) 250-4151	



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UTILITY CONSTRUCTION



NOTE:
GUARD RAIL CONTRACTOR TO TAKE PRECAUTIONS
TO AVOID 8" DI WATER SERVICE LINE.

NOTE:
EXIST. 16" DI SANITARY GRAVITY SEWER
INV. EL. 235.0
EXIST. 14" DI SEWER FORCE MAIN
TOP EL. 242.0
SHORING CONTRACTOR TO TAKE
PRECAUTIONS TO AVOID THESE LINES

BEGIN CONSTRUCTION
-L- STA. 10+30.00, 22.9' RT=
-DET- STA 10+30.74, 12 RT

END GRADE
-DET- STA. 24+36.58=
-L- STA.24+21.12, 12.04' RT

MATCHLINE
STA. 24+50.00

END CONSTRUCTION
-L- STA. 25+59.61, 12.2' RT=
-DET- STA. 25+75.03, 12 RT

PAVEMENT REMOVAL

DATE: 8/19/2019
TIME: 3:03:06 PM
DGN: B5326_UC.dwg

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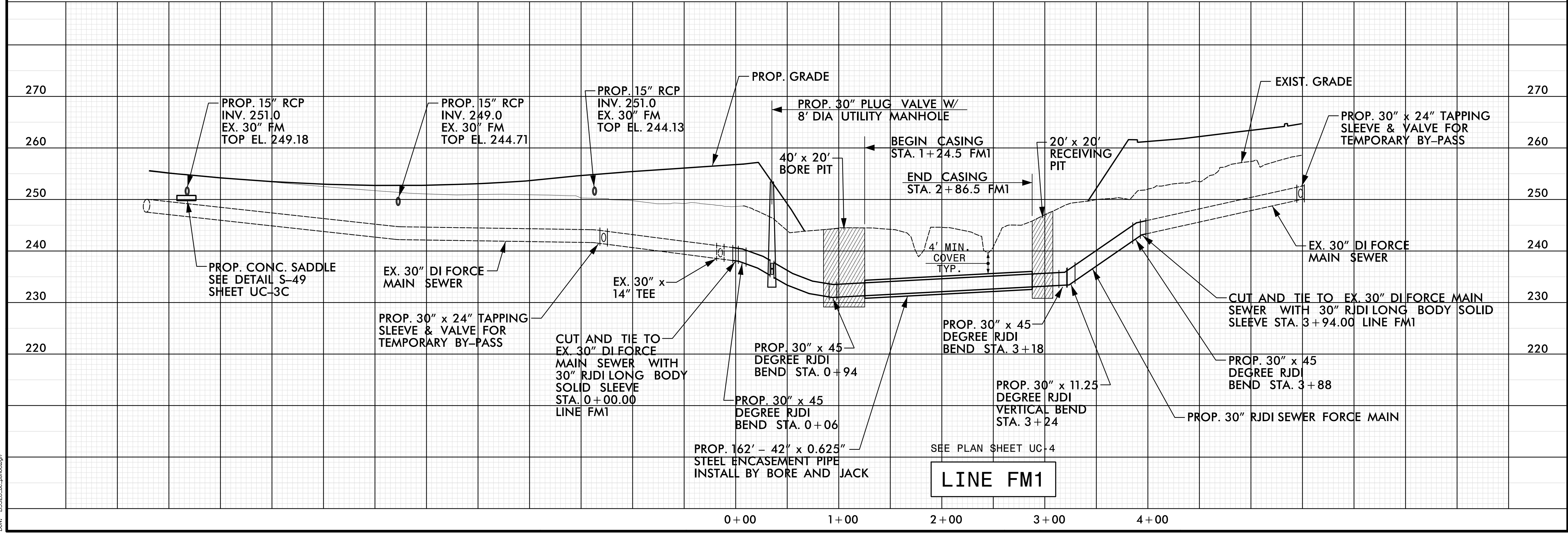
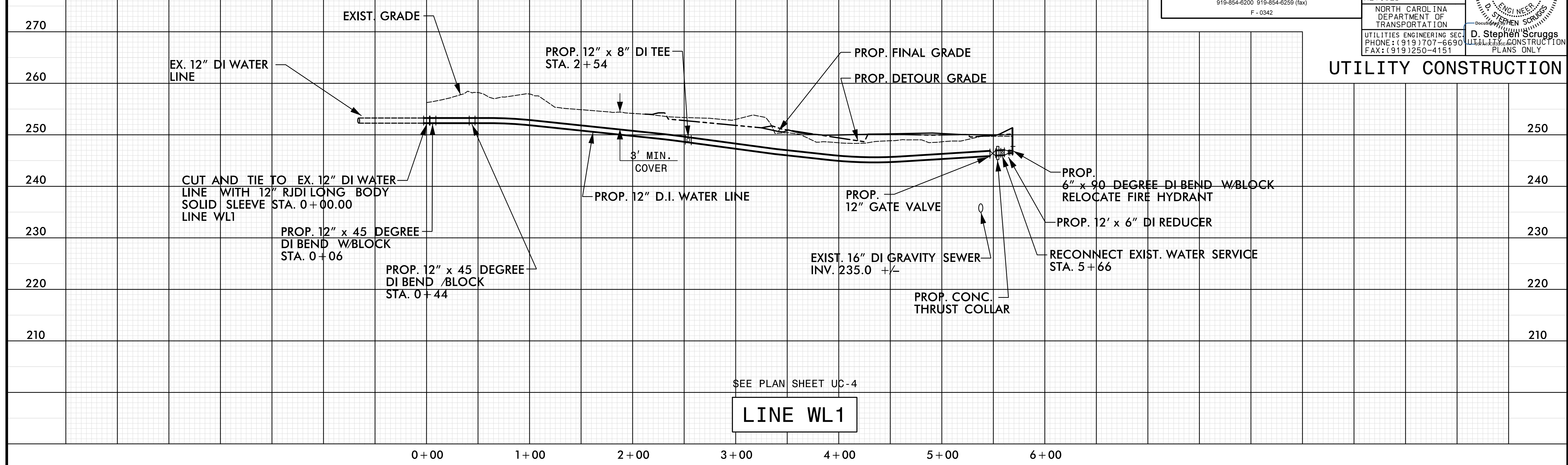
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701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F-0342

PROJECT REFERENCE NO.	SHEET NO.
B-5326	UC-6
DESIGNED BY:	8/22/2019
DRAWN BY:	
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APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SECTION	
PHONE: (919) 707-6690	D. Stephen Scruggs
FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



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TIME: 10:06:36 AM
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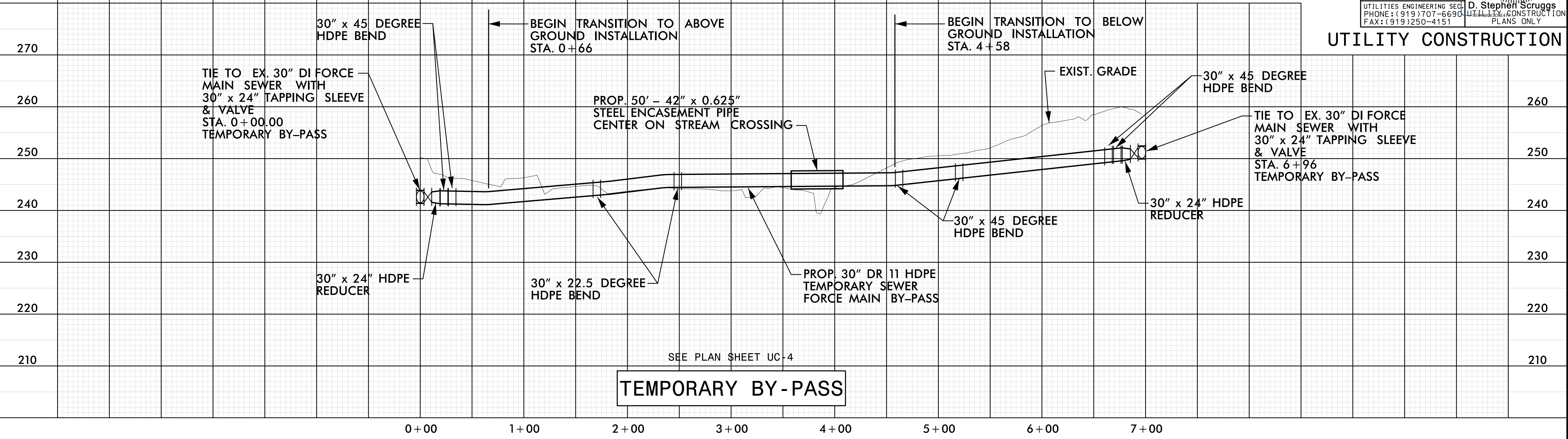
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701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F-0342

PROJECT REFERENCE NO. B-5326	SHEET NO. UC-7
DESIGNED BY:	8/22/2019
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REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	D. Stephen Scruggs UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



DATE: 8/22/2019
TIME: 10:00 AM
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