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TIP PROJECT: R-5707

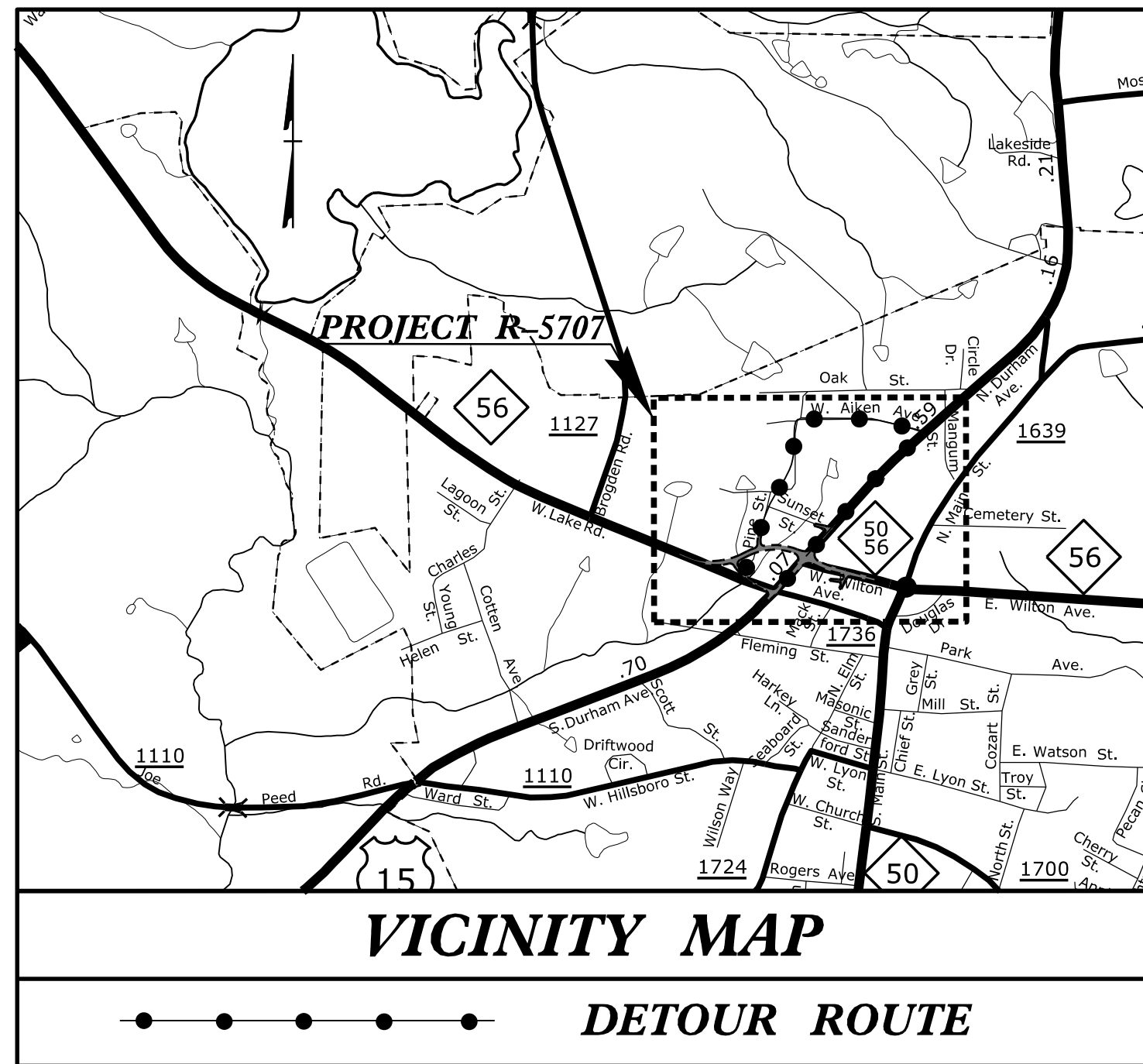
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GRANVILLE COUNTY

**LOCATION: NC 56 (W. LAKE ROAD & W. WILTON AVENUE)
 AT US 15 (N. DURHAM AVENUE) AND NC 50 IN CREEDMOOR**

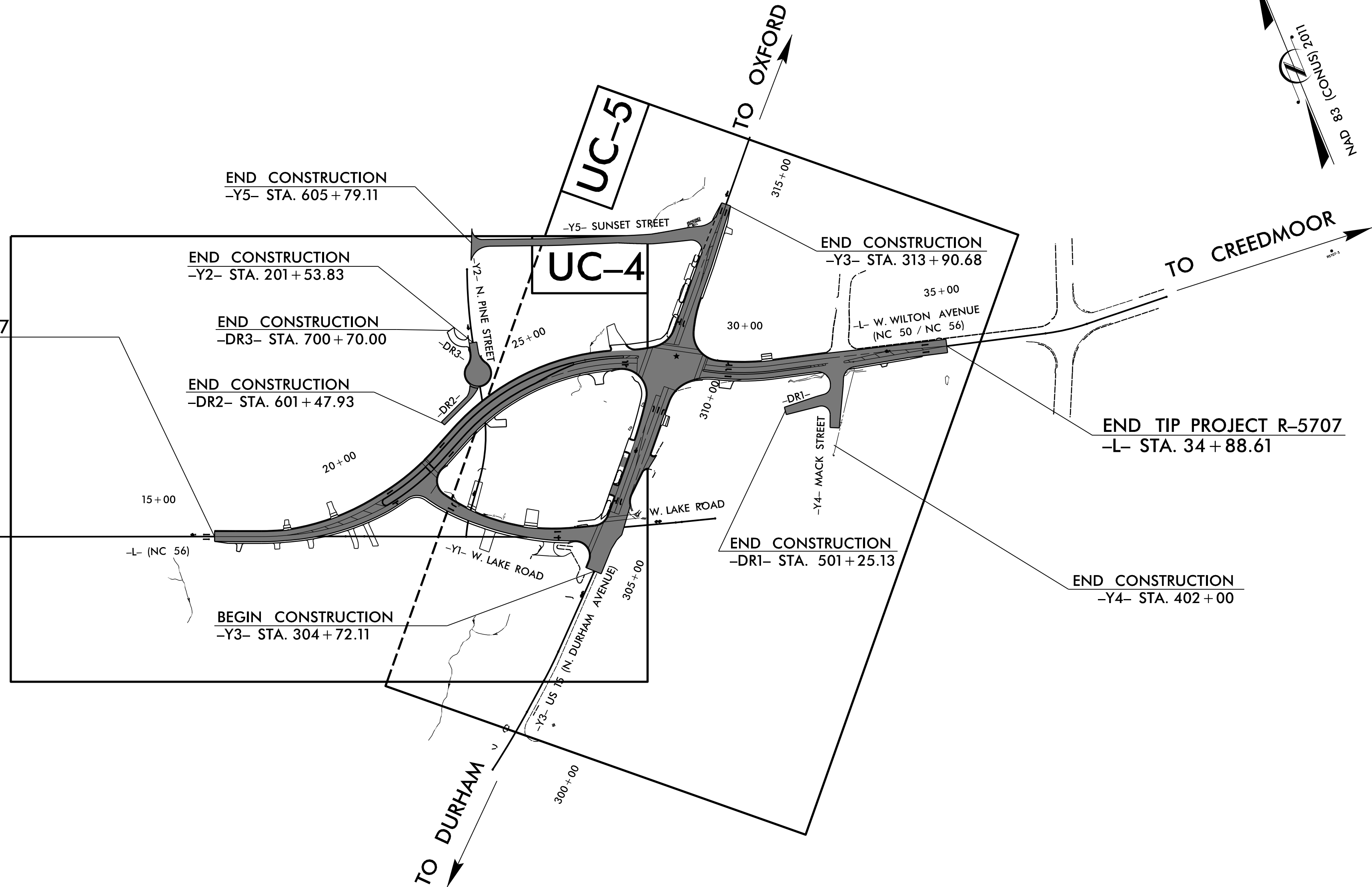
TYPE OF WORK: WATER AND SEWER CONSTRUCTION /RELOCATION

T.I.P. NO.	SHEET NO.
R-5707	UC-1



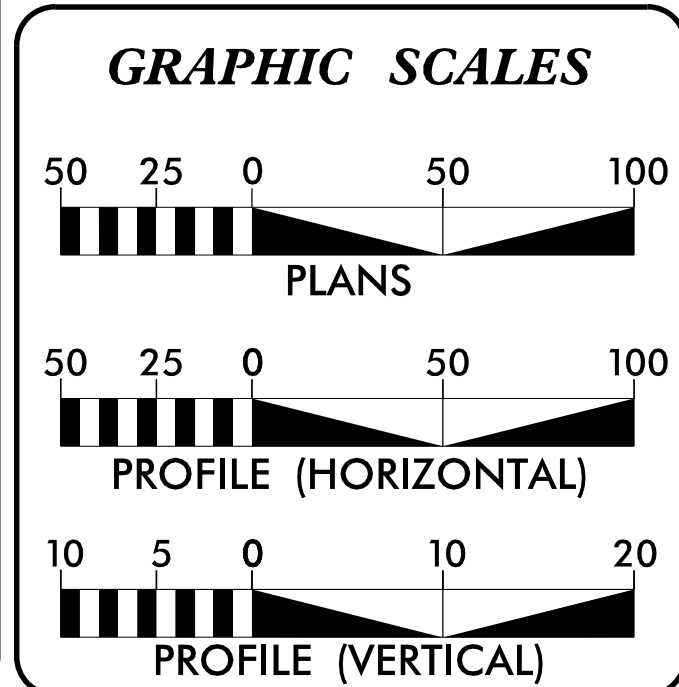
BEGIN TIP PROJECT R-5707
 -L- STA. 16 + 30.00

TO BUTNER 10+00



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF CREEDMOOR.

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3 THRU UC-3B	DETAILS
UC-4 THRU UC-5	UTILITY CONSTRUCTION SHEETS
UC-6	PROFILE SHEET

WATER AND SEWER OWNER ON PROJECT

(A) WATER: S. GRANVILLE WATER & SEWER AUTHORITY

(B) SANITARY SEWER: S. GRANVILLE WATER & SEWER AUTHORITY

PREPARED IN THE OFFICE OF

CH ENGINEERING

3220 GLEN ROYAL RD. RALEIGH, NC 27617
 TELE 919.788.0224 FAX 919.788.0232
 NC LICENSE #P-0189

ERIC TWEED, PE CONSULTANT CONTACT #1
 MARY JO LEE, PE CONSULTANT CONTACT #2
 BRIAN WILES, PE CONSULTANT CONTACT #3

SEAL

**DIVISION OF HIGHWAYS
 DIVISION 5**

PROJECT DELIVERY UNIT
 815 STADIUM DRIVE
 DURHAM, NC 27704

Ben Upshaw, PE TEAM LEAD
 S. Reid Davidson, PE DDC ENGINEER
 Donald Proper DIVISION 5 UTILITIES ENGINEER
 Monroe Brown UTILITY COORDINATOR

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	REM FH
Water Meter	
Relocate Water Meter	
Remove Water Meter	REM WM
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

EXISTING UTILITIES SYMBOLS

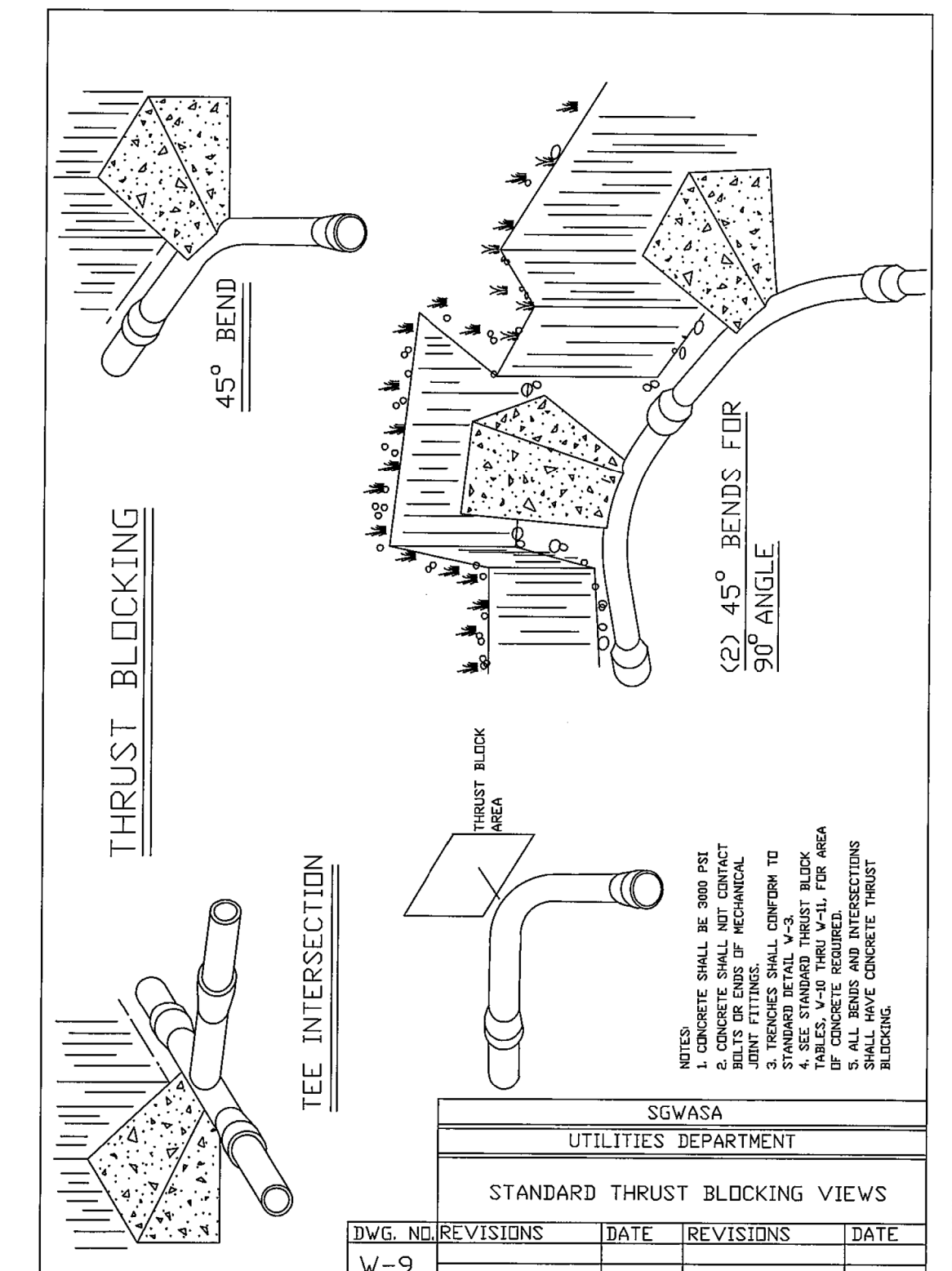
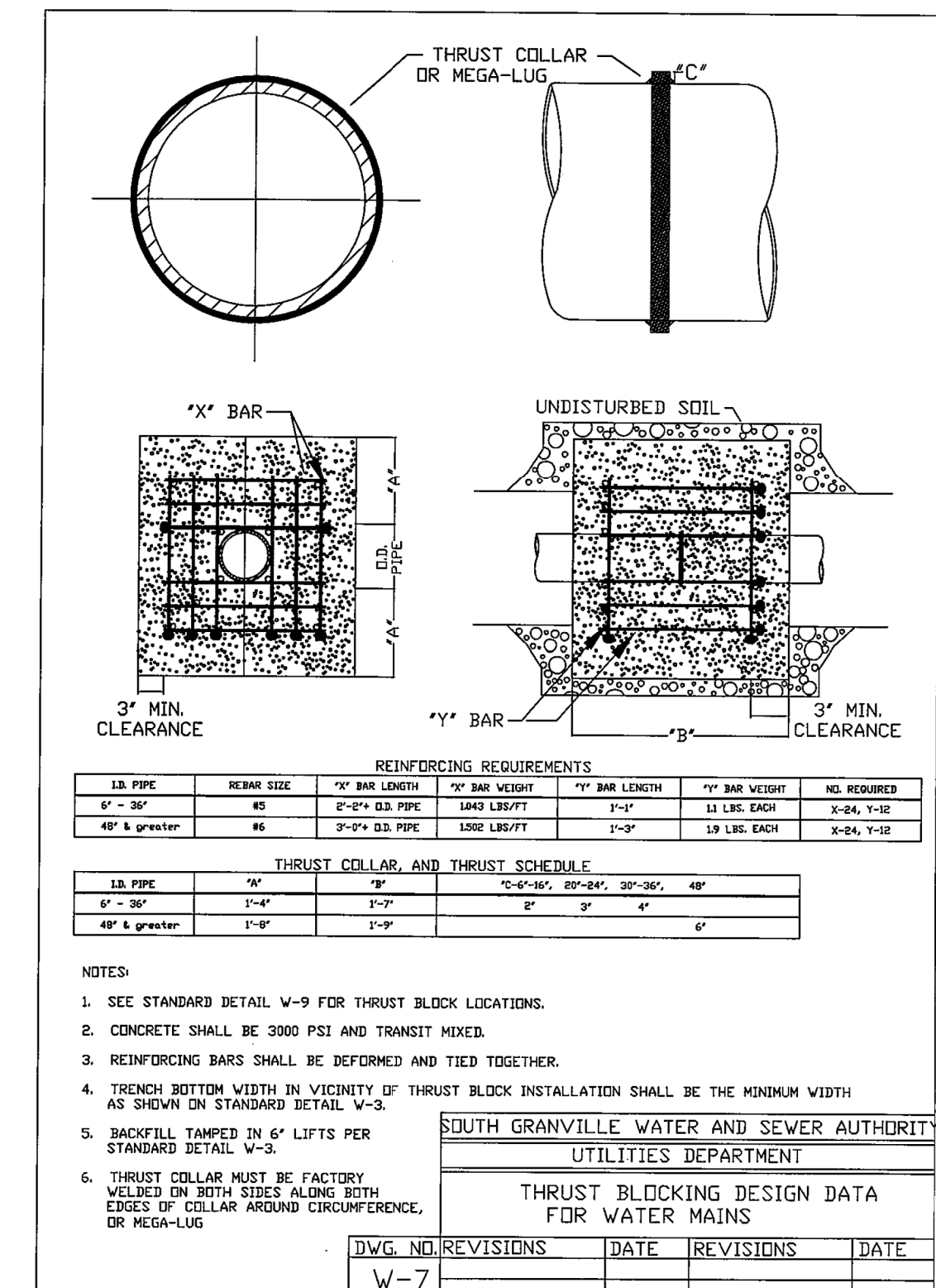
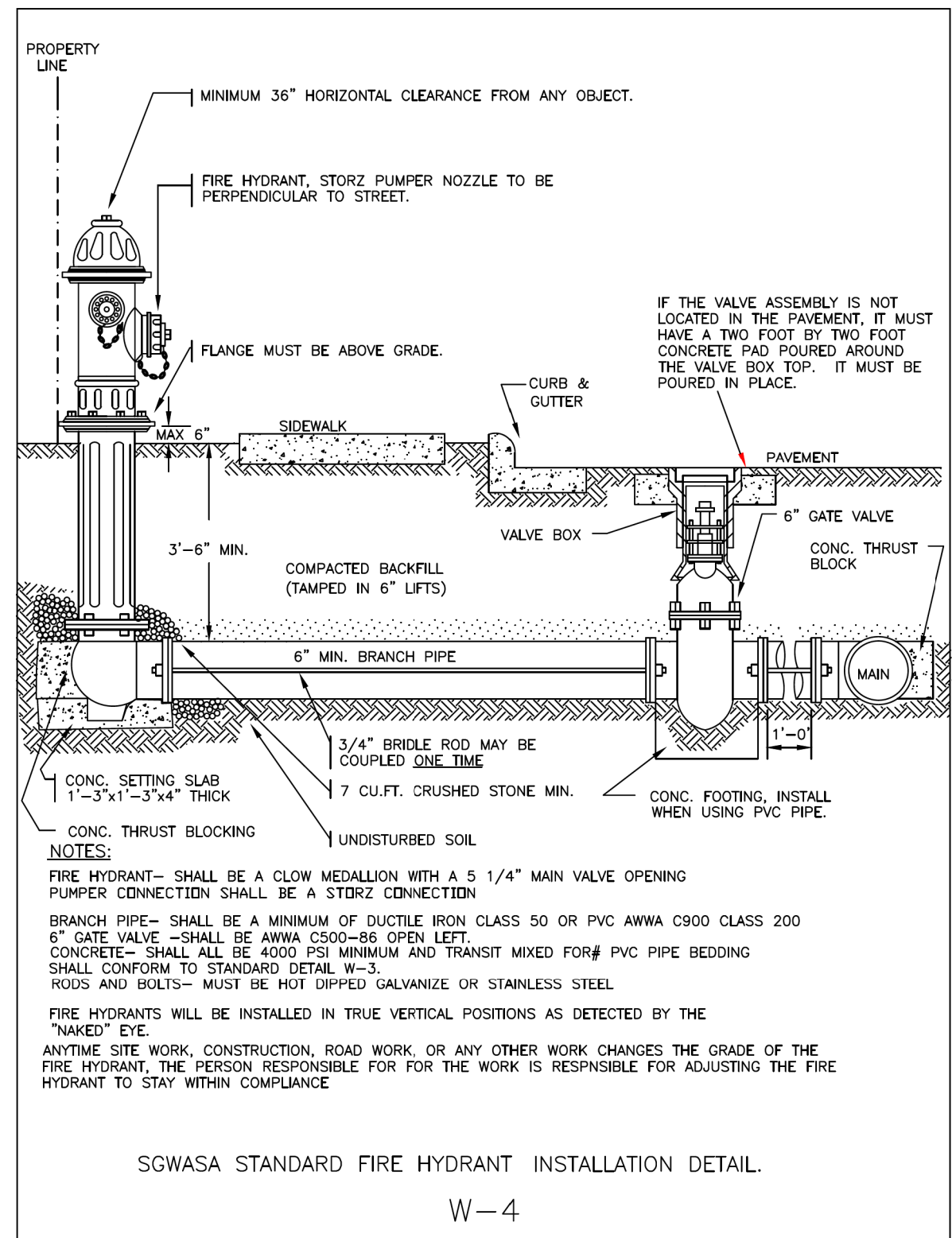
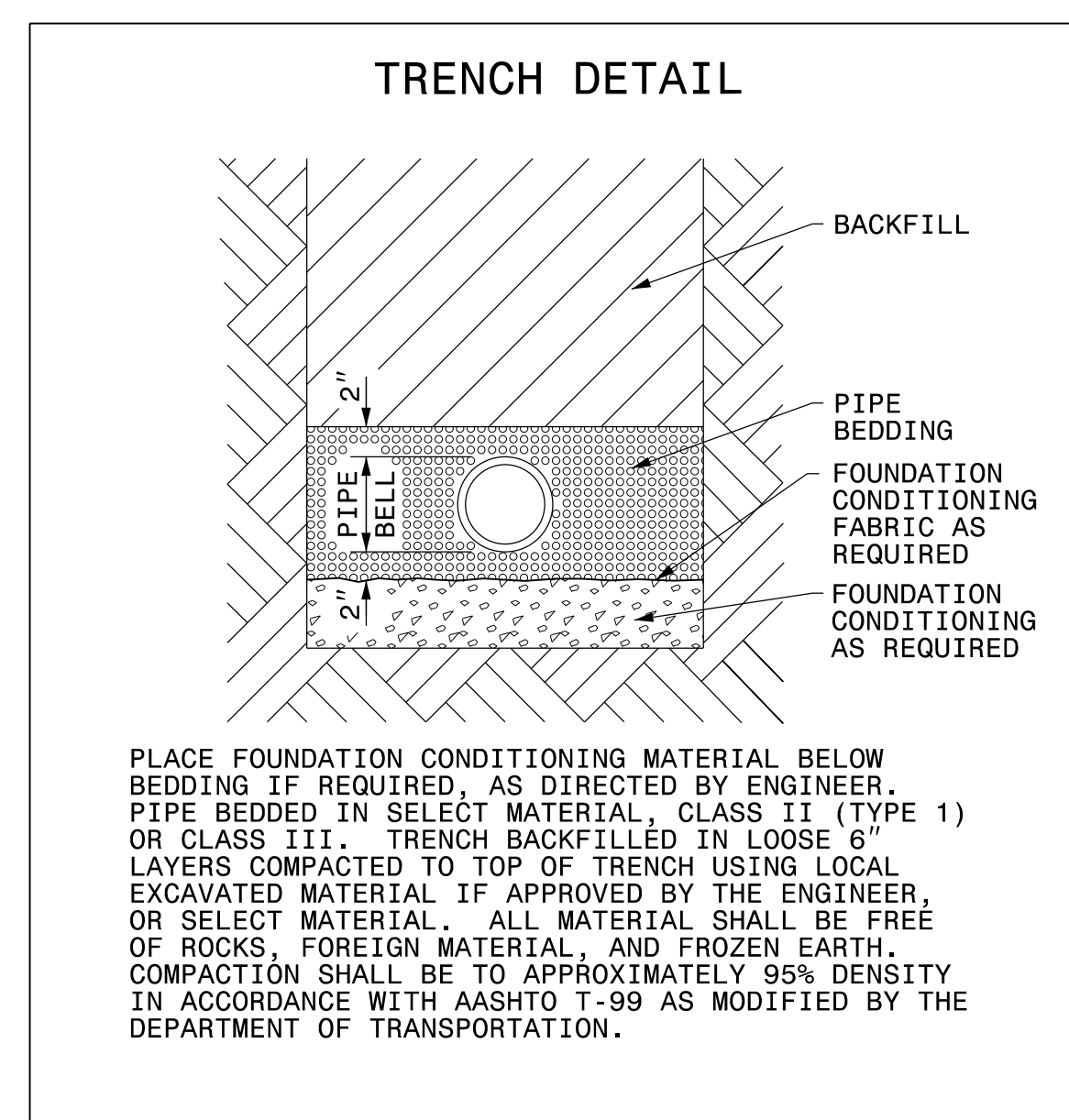
Power Pole		*Underground Power Line	
Telephone Pole		*Underground Telephone Cable	
Joint Use Pole		*Underground Telephone Conduit	
Utility Pole		*Underground Fiber Optics Telephone Cable	
Utility Pole with Base		*Underground TV Cable	
H-Frame Pole		*Underground Fiber Optics TV Cable	
Power Transmission Line Tower		*Underground Gas Pipeline	
Water Manhole		Aboveground Gas Pipeline	A/G Gas
Power Manhole		*Underground Water Line	
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	
Telephone Pedestal		Underground Unknown Utility Line	
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)
 Designated Utility Line
 (Type as Shown)

5/14/99
1/15/2018 \\UCVProJ\R5707_ut_sym_uc02.psh.dgn
REV: 2/1/2012

PROJECT TYPICAL DETAILS

UTILITY CONSTRUCTION



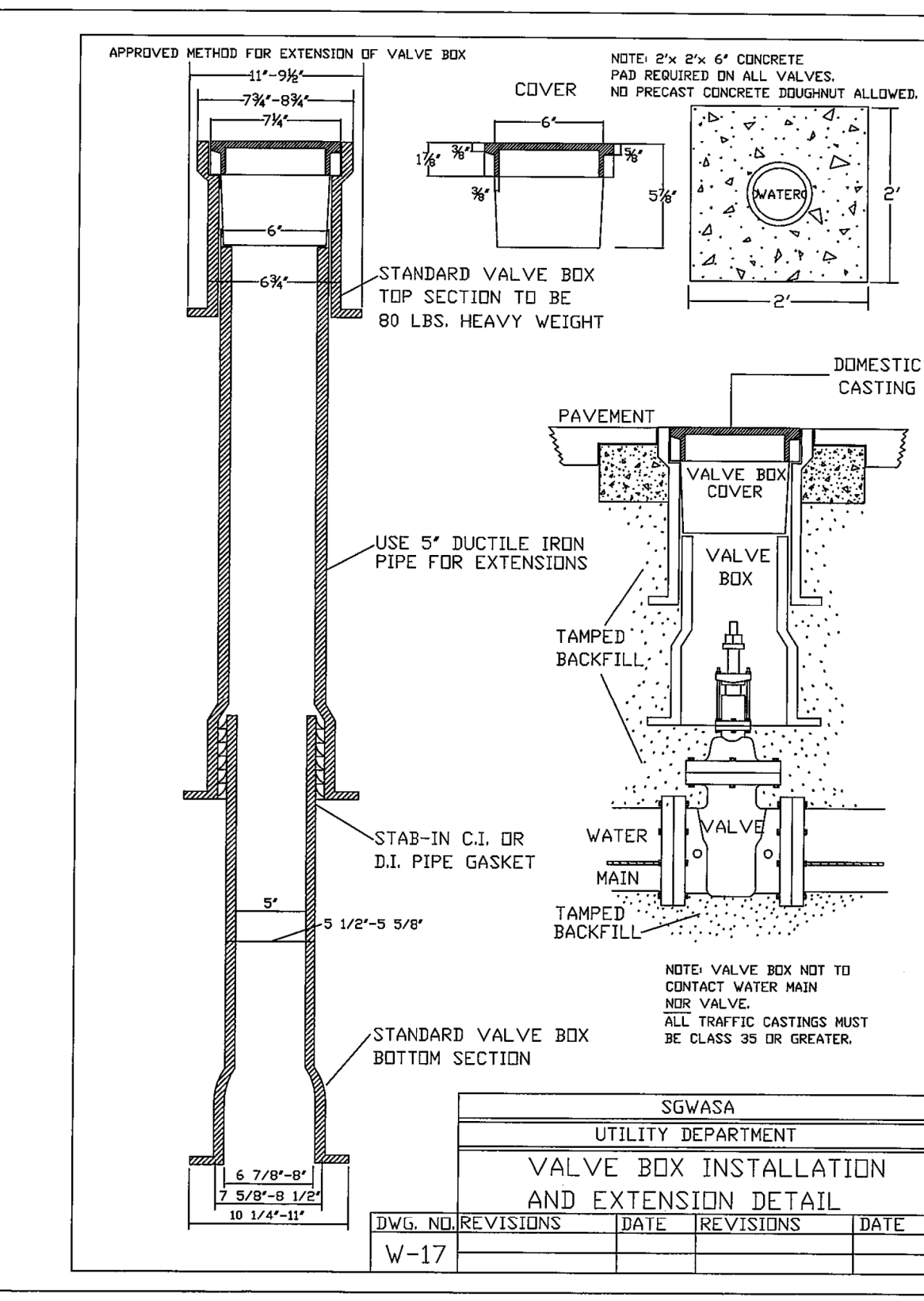
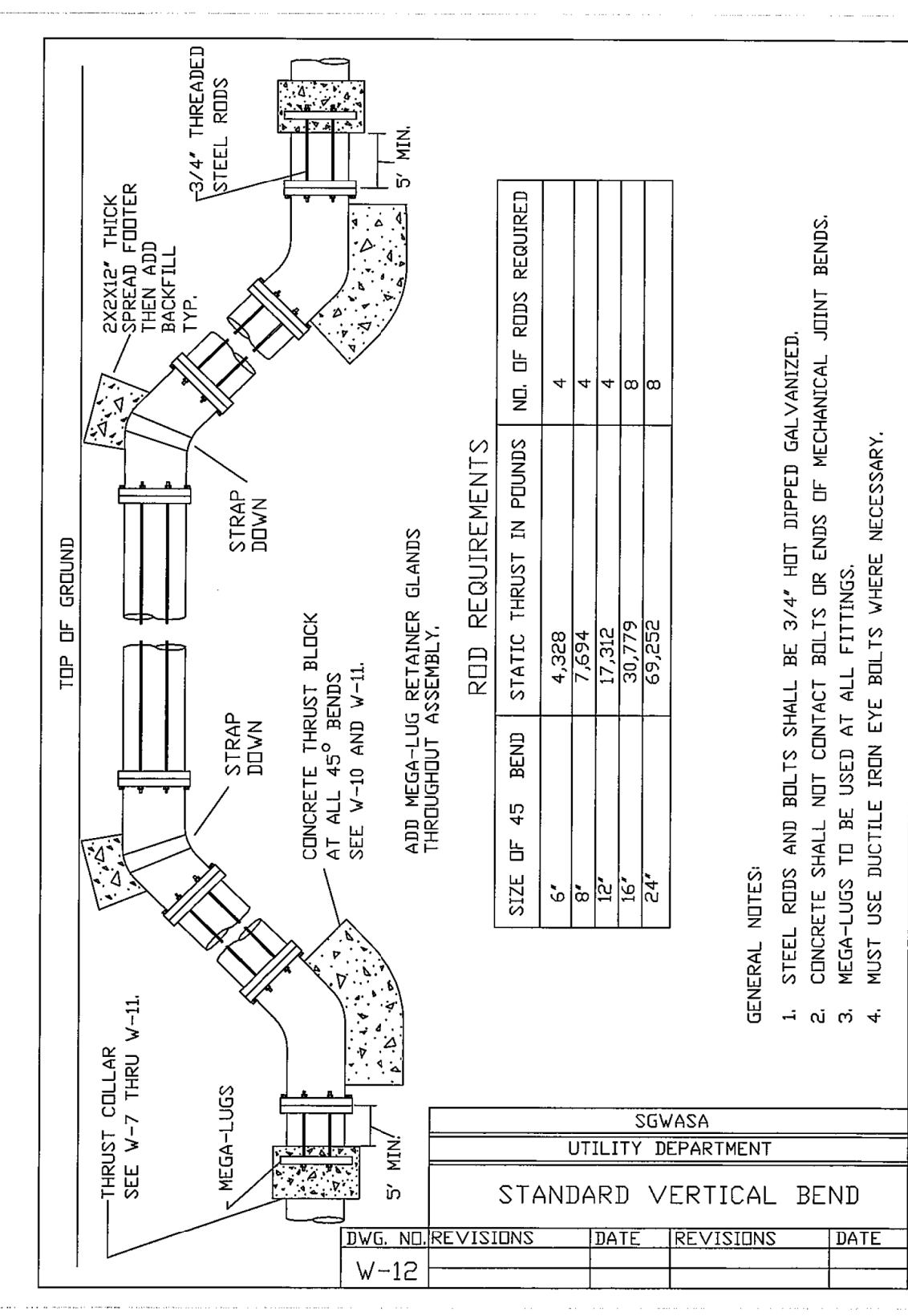
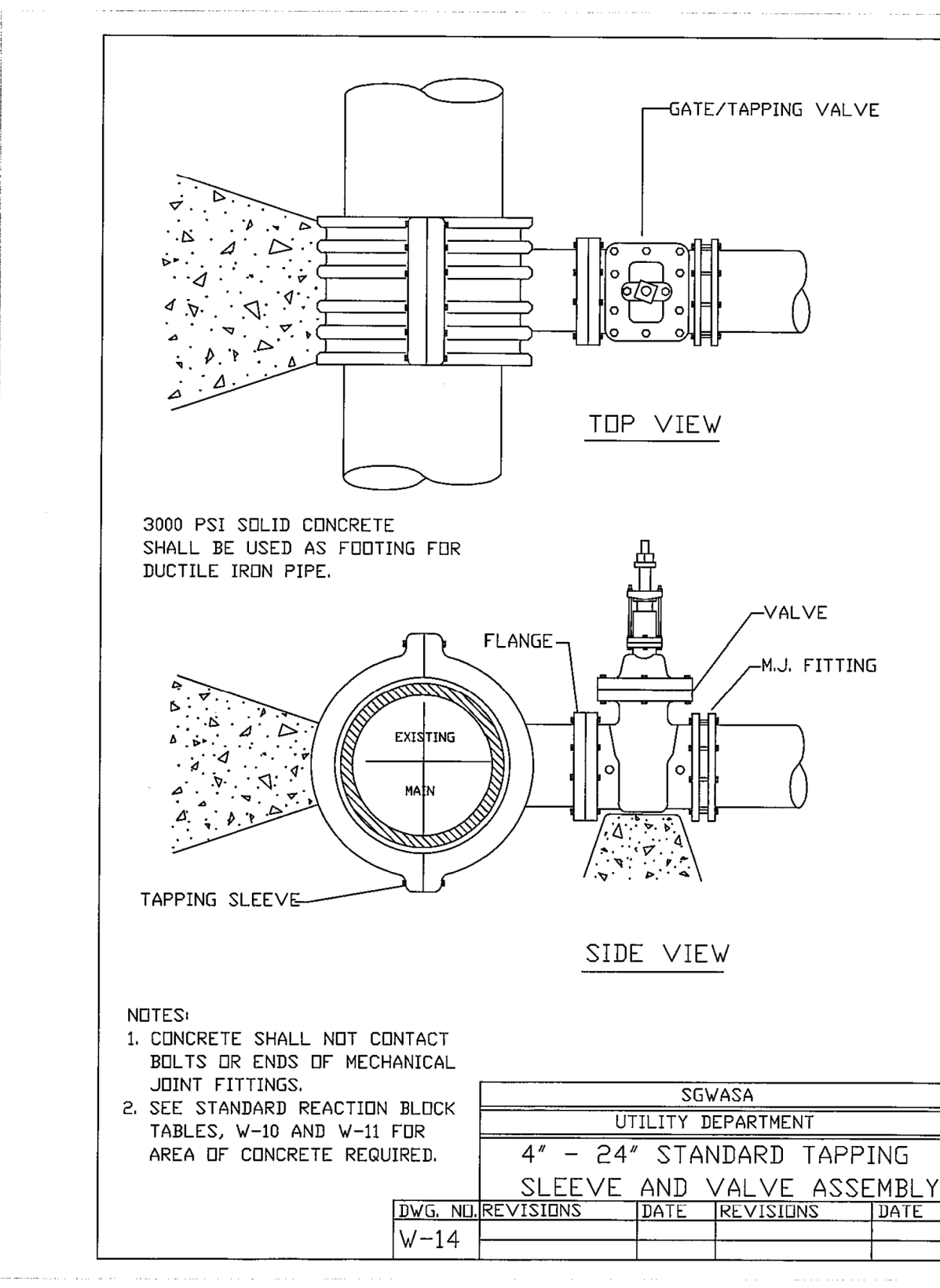
REACTION BEARING AREAS FOR WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.
ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS							
	MODERATELY DRY CLAY	SOFT CLAY	GRAVEL / COARSE SAND	DRY CLAY - ALL WAYS DRY	SAND - COMPACT FIRM	SAND - CLEAN DRY	BLICKSAND - VERY POOR	BLACK - POOR
6"								
11 1/4°	1,108	1	1	1	1	1	2	1
22 1/2°	2,207	1	2	2	1	1	3	1
45°	4,328	2	3	3	1	1	5	1
90°	7,996	2	4	5	1	1	8	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	15	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	19	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 PLANE IN THE TRENCH AT AN ANGLE OF 90° TO THE THRUST VECTOR.
 USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

SGWSA
 UTILITY DEPARTMENT
THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10				



PROJECT TYPICAL DETAILS

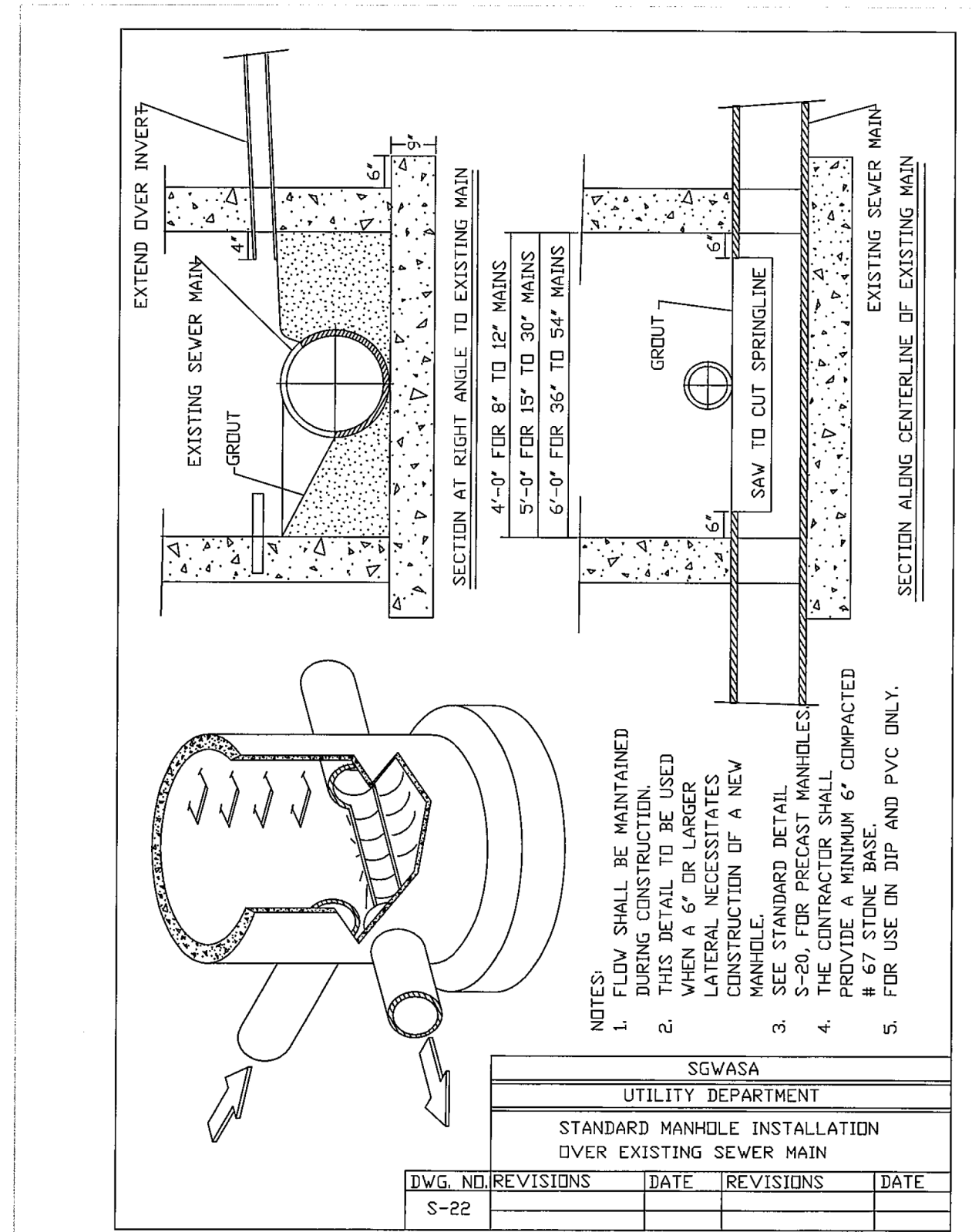
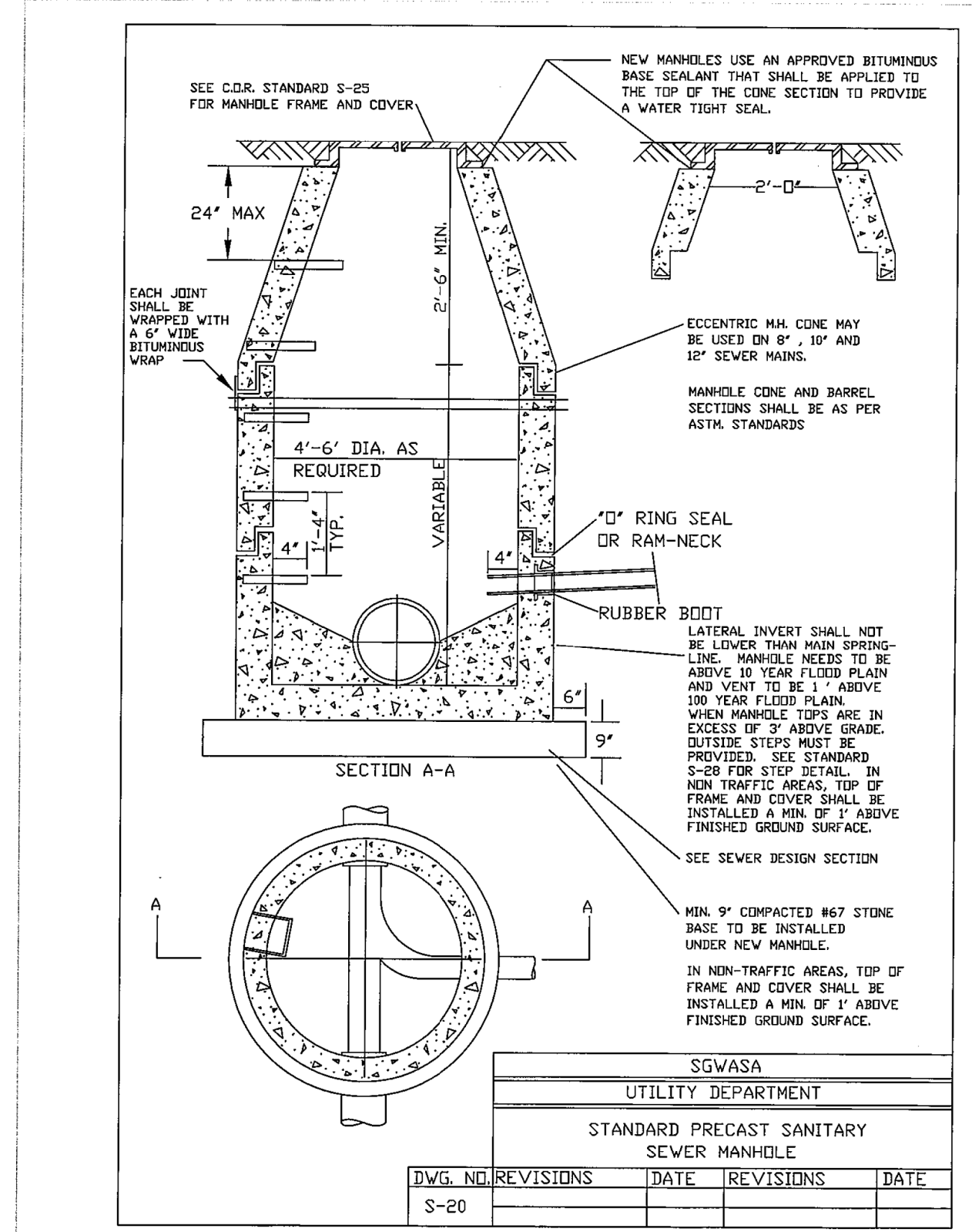
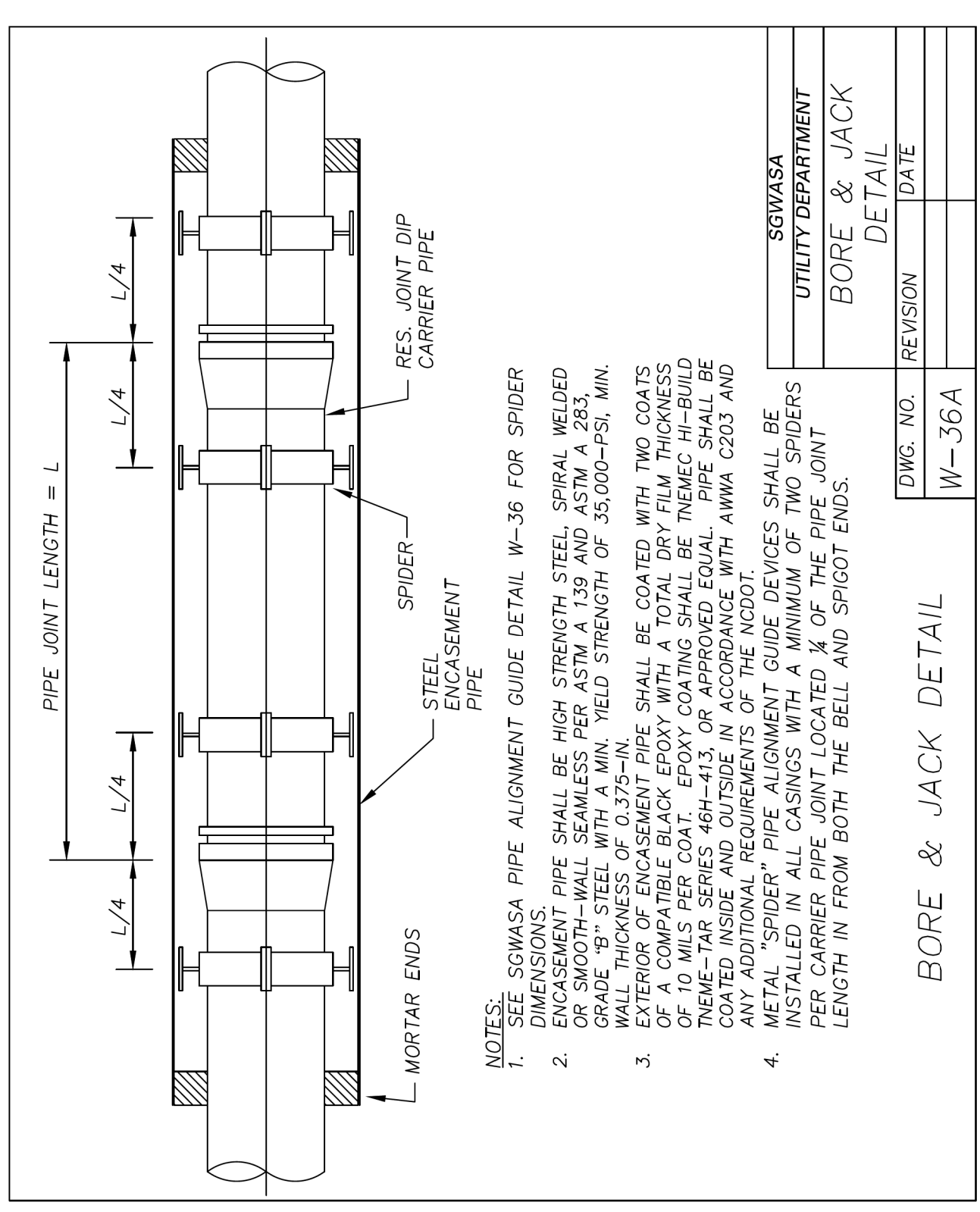
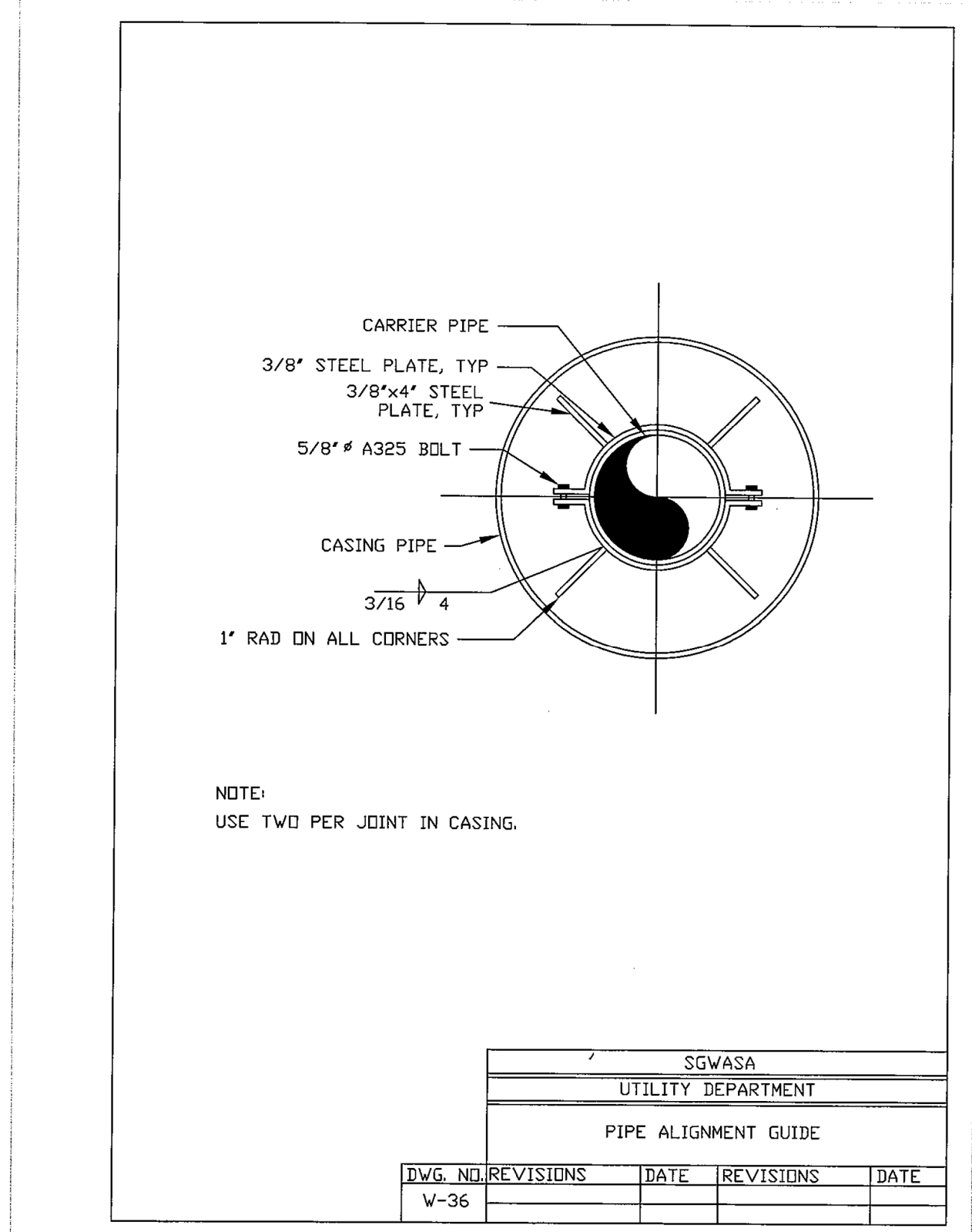
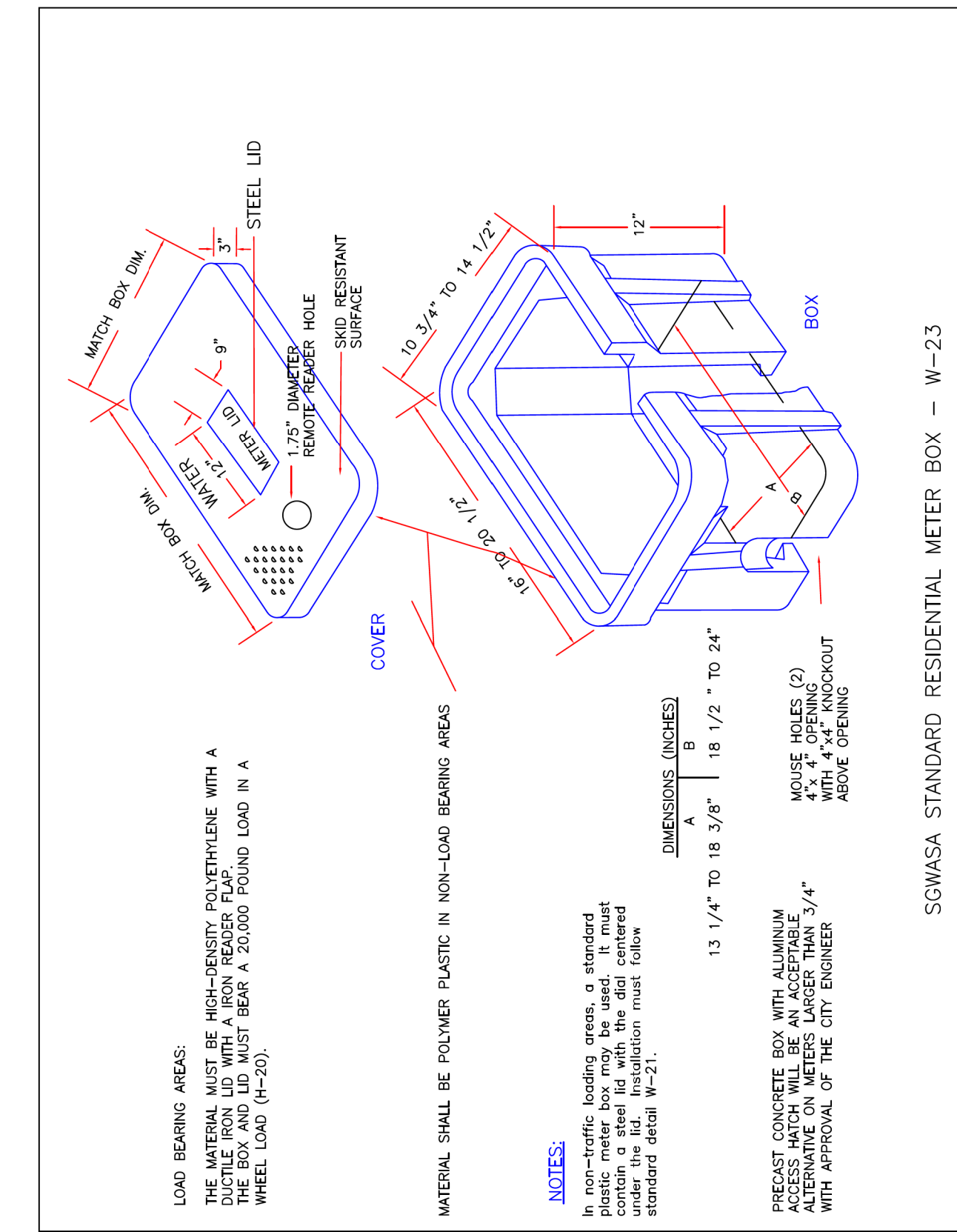
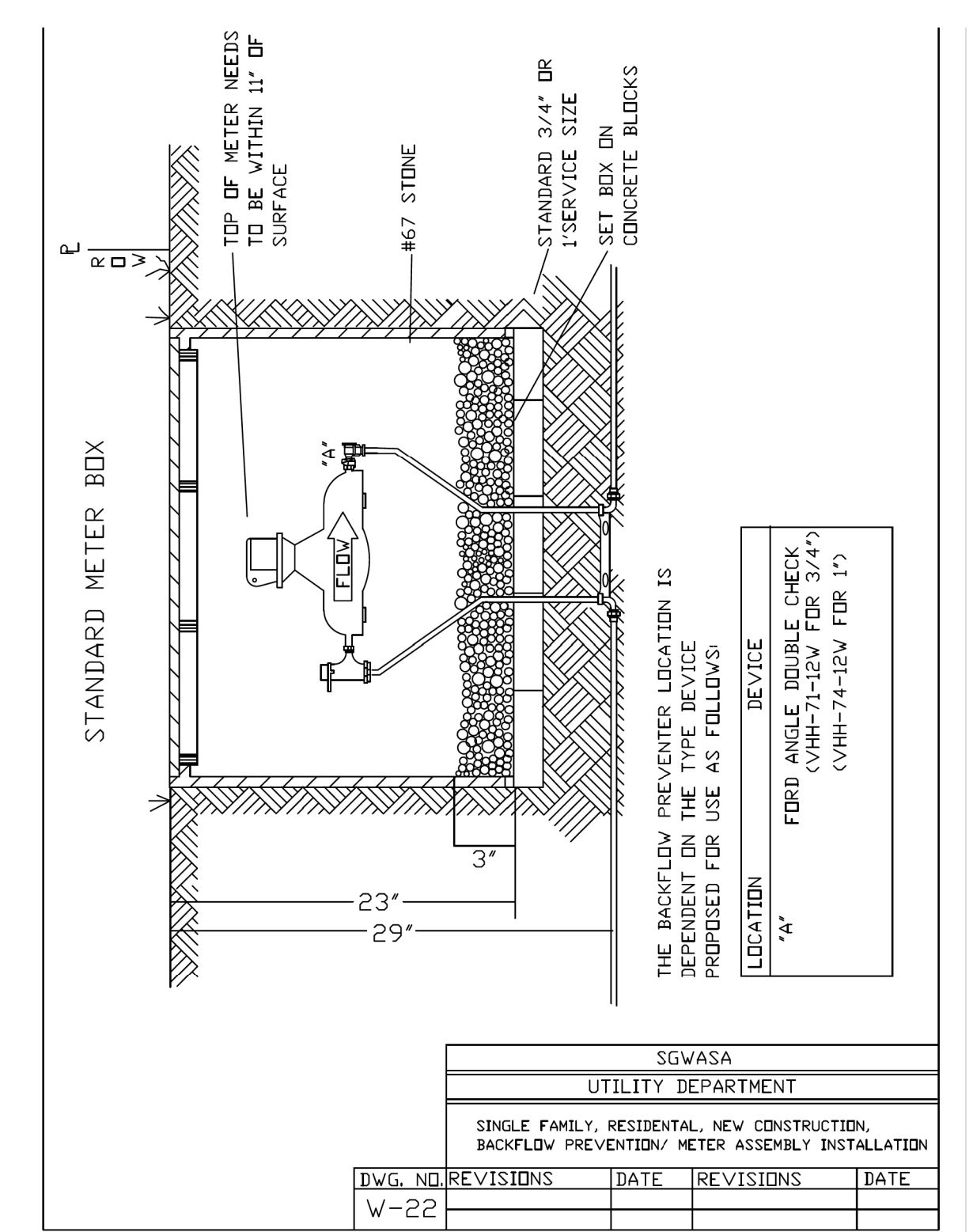
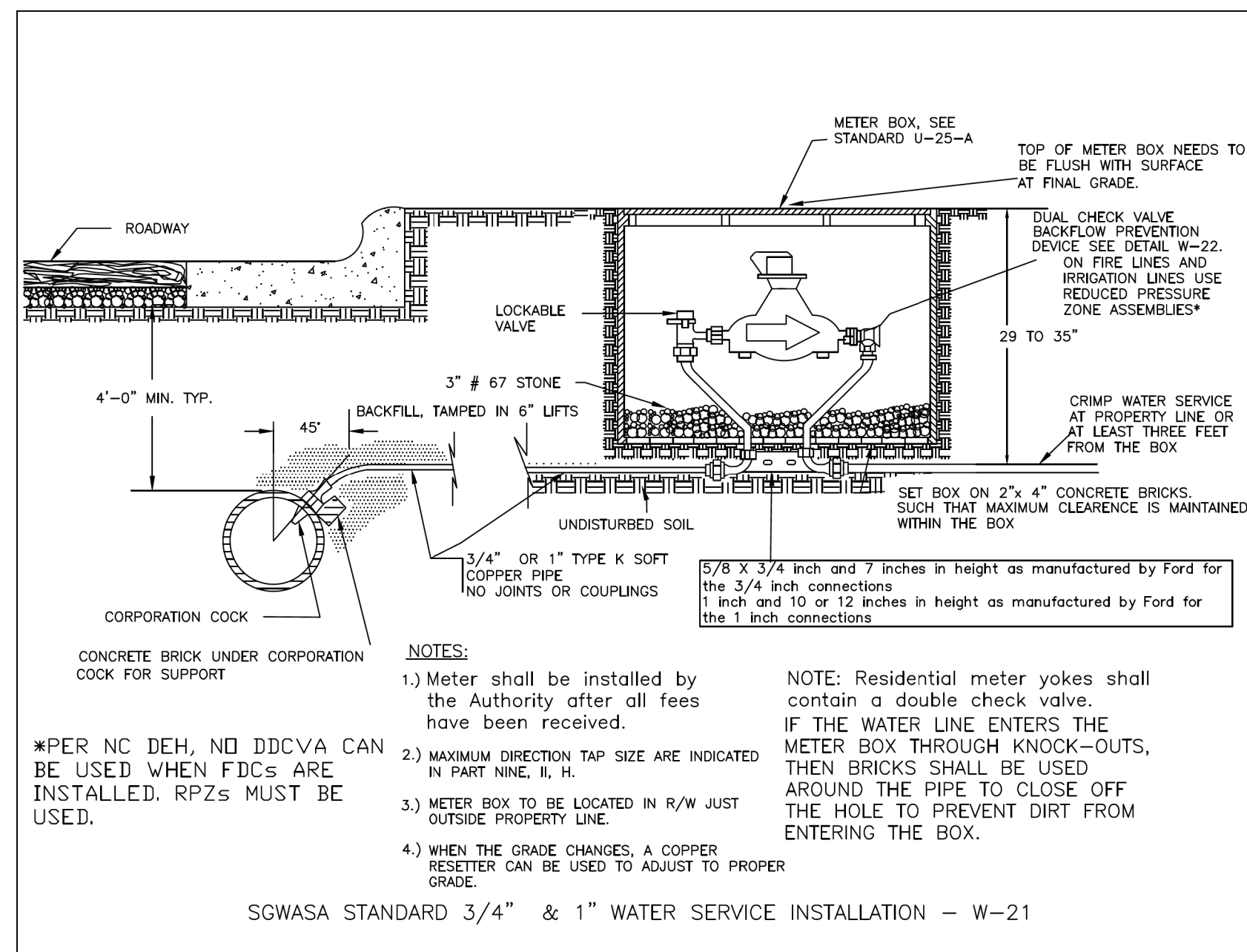
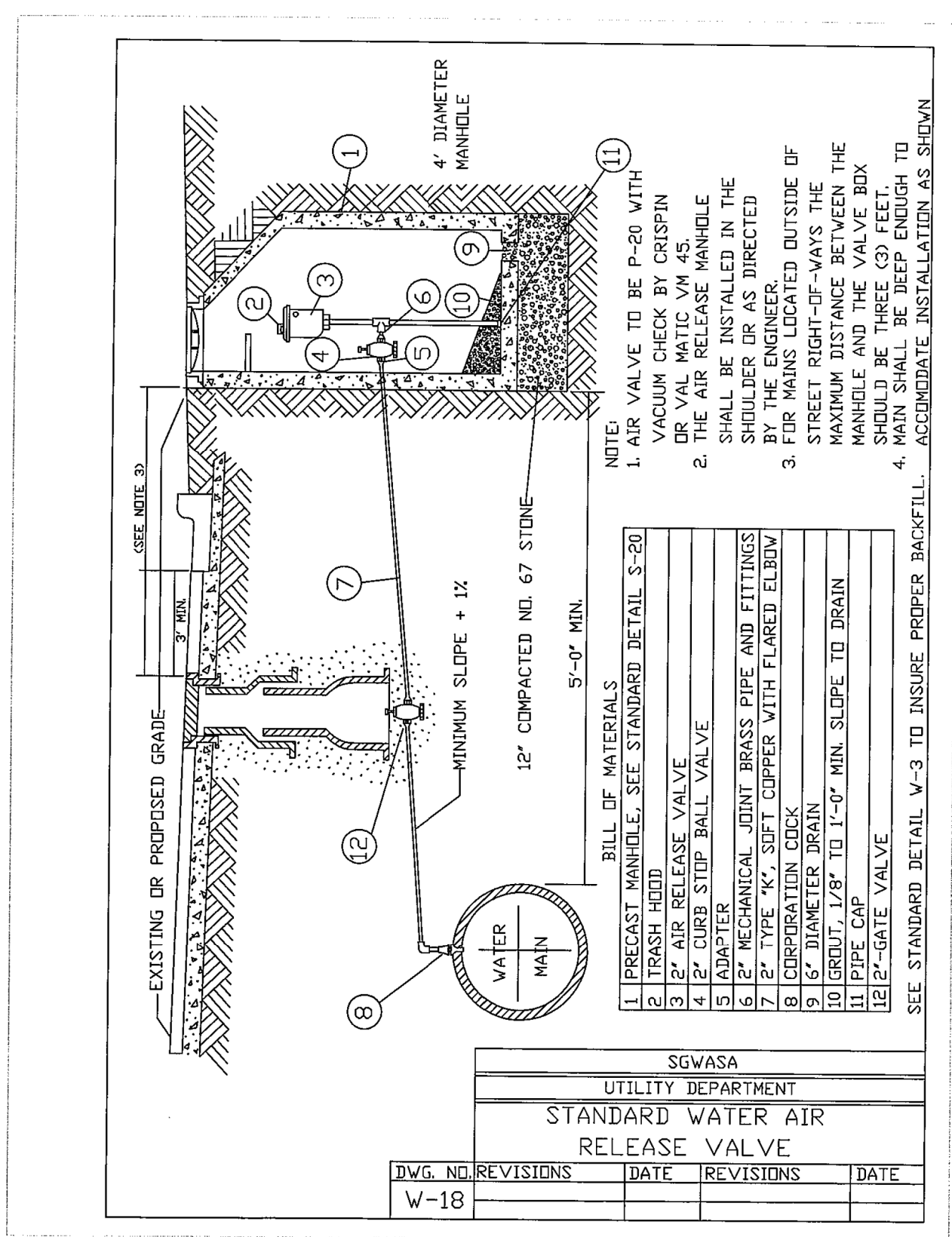
CH ENGINEERING
 3220 GLEN ROYAL RD. RALEIGH, NC 27617
 TELE 919.788.0224 FAX 919.788.0232
 NC LICENSE #P-0189

PROJECT REFERENCE NO. **R-5707** SHEET NO. **UC-3A**

DESIGNED BY: EMT
 DRAWN BY: EMT
 CHECKED BY: MJL
 APPROVED BY: [Signature]
 REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
 SEAL 028812
 ERIC M. TWEED
 1/25/2019
 UTILITY CONSTRUCTION PLANS ONLY

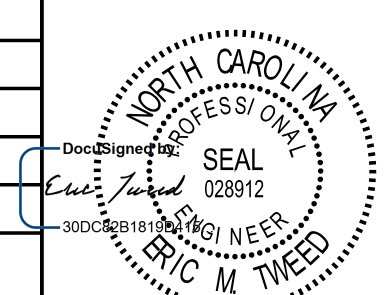
UTILITY CONSTRUCTION



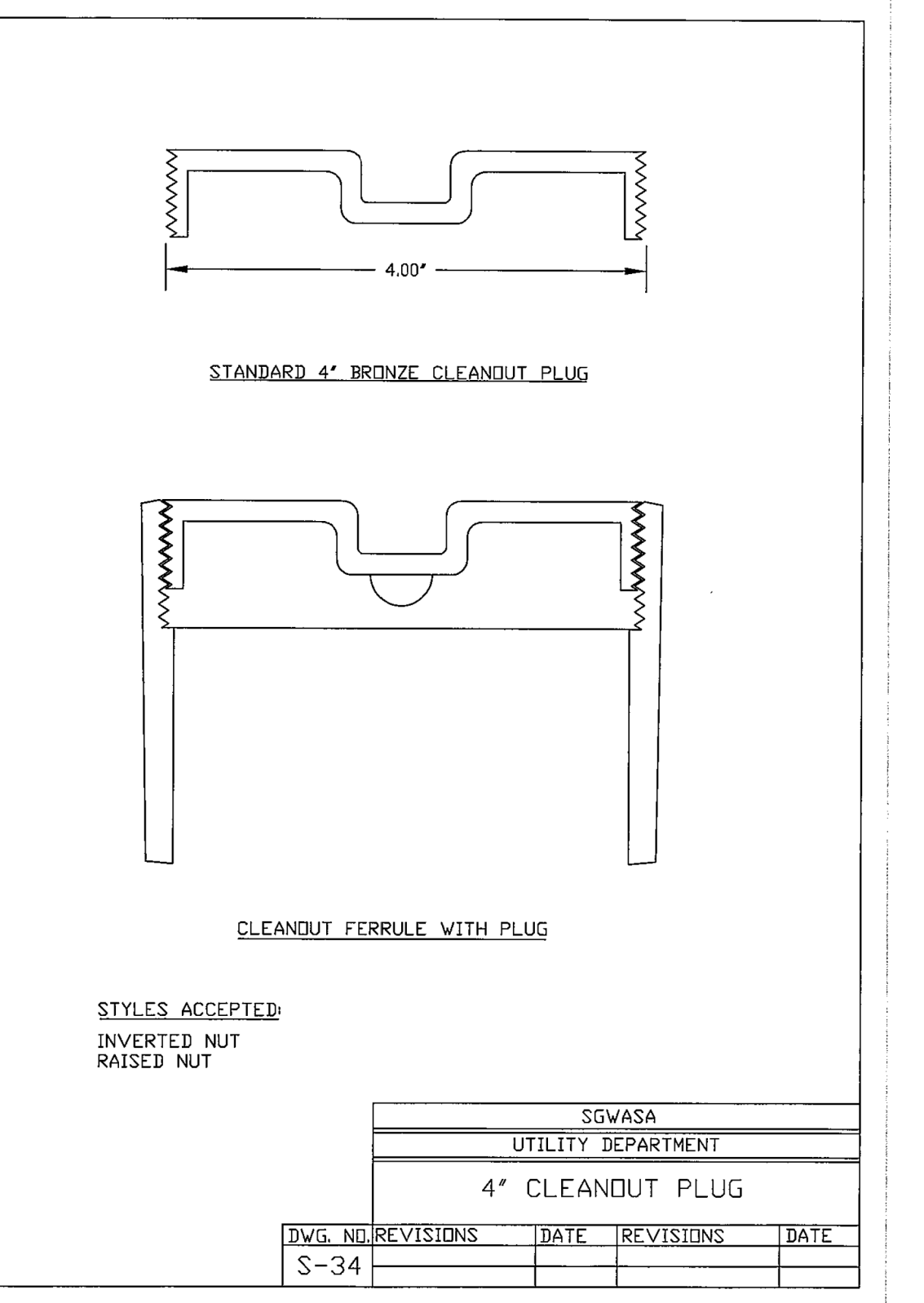
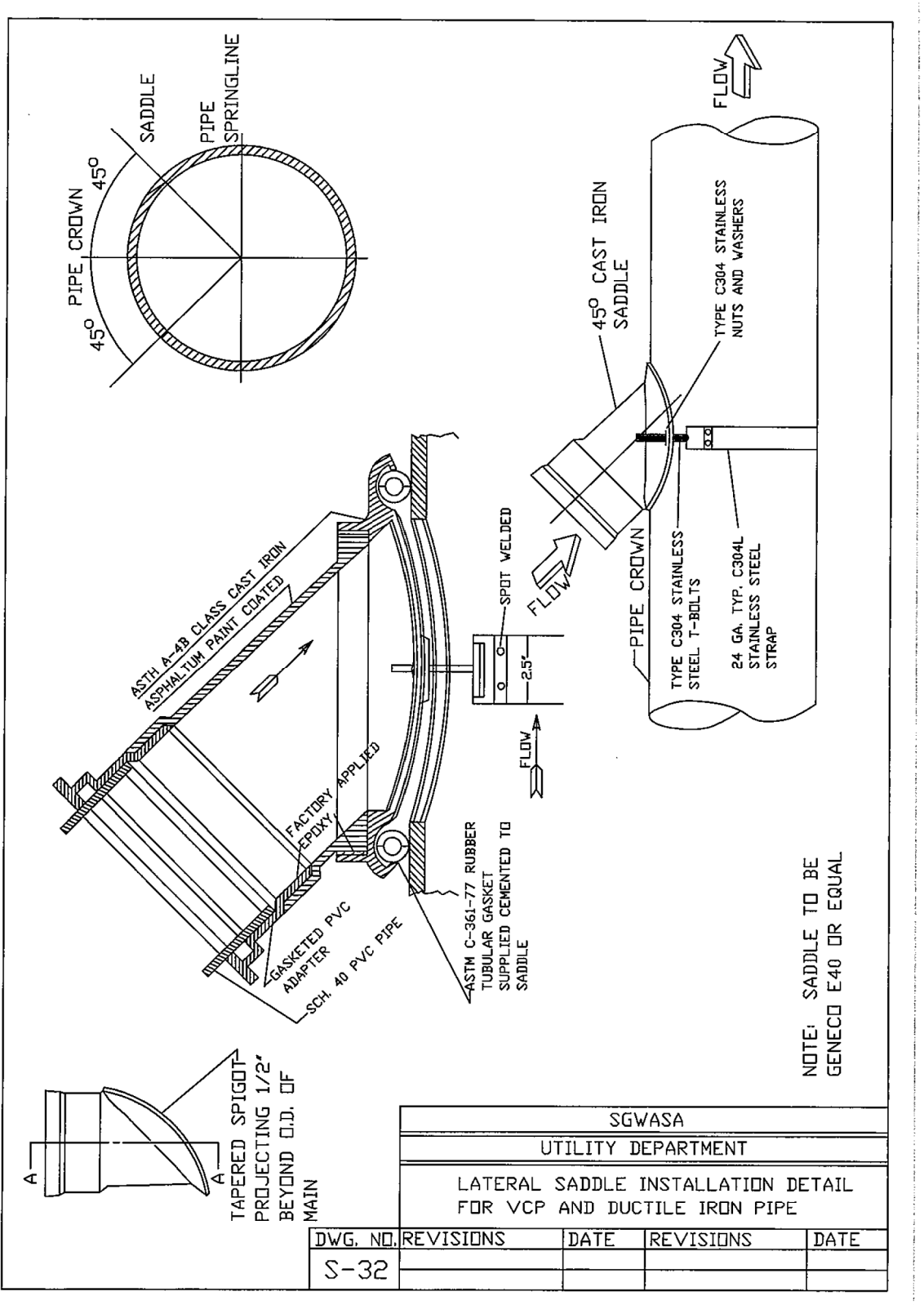
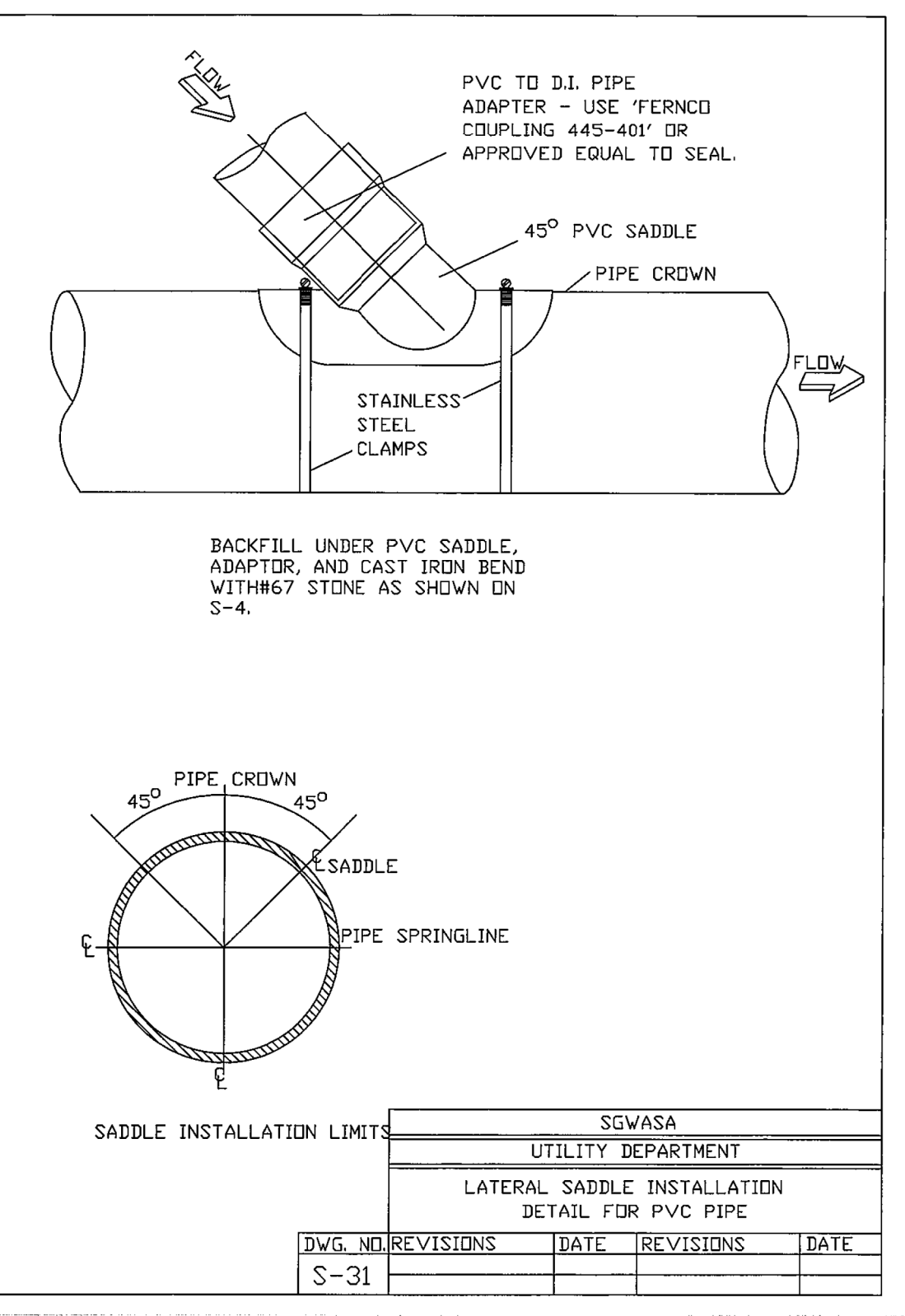
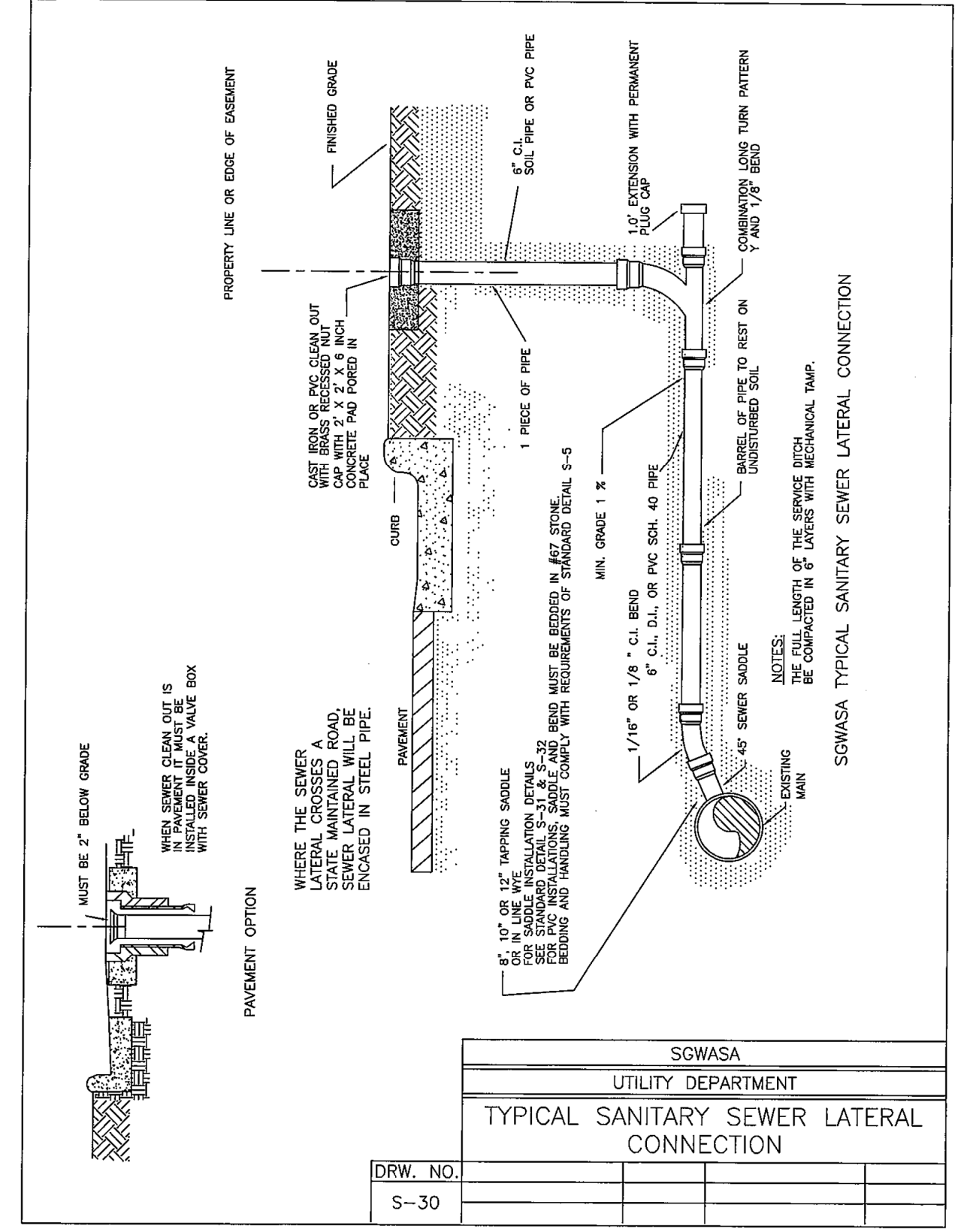
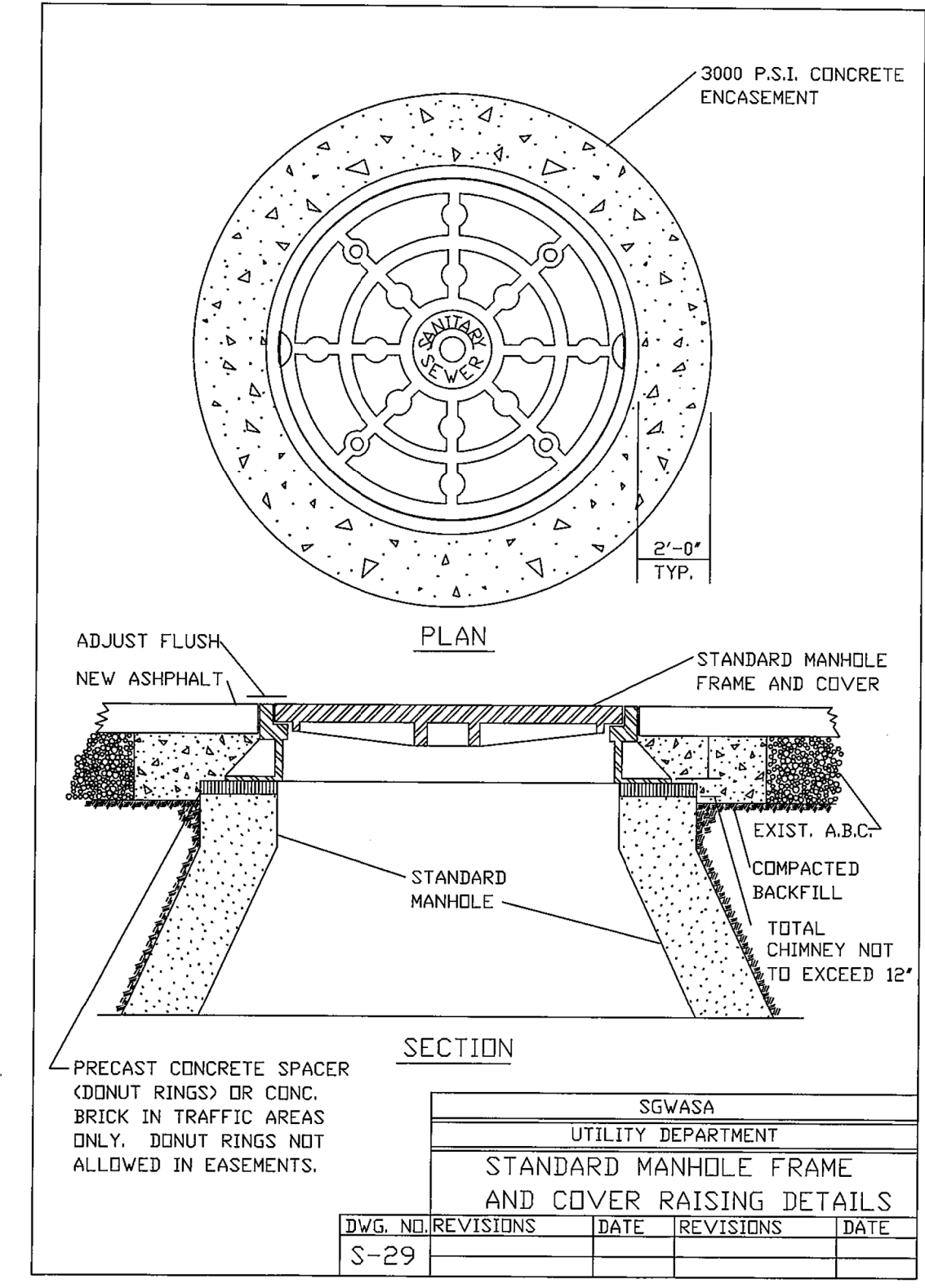
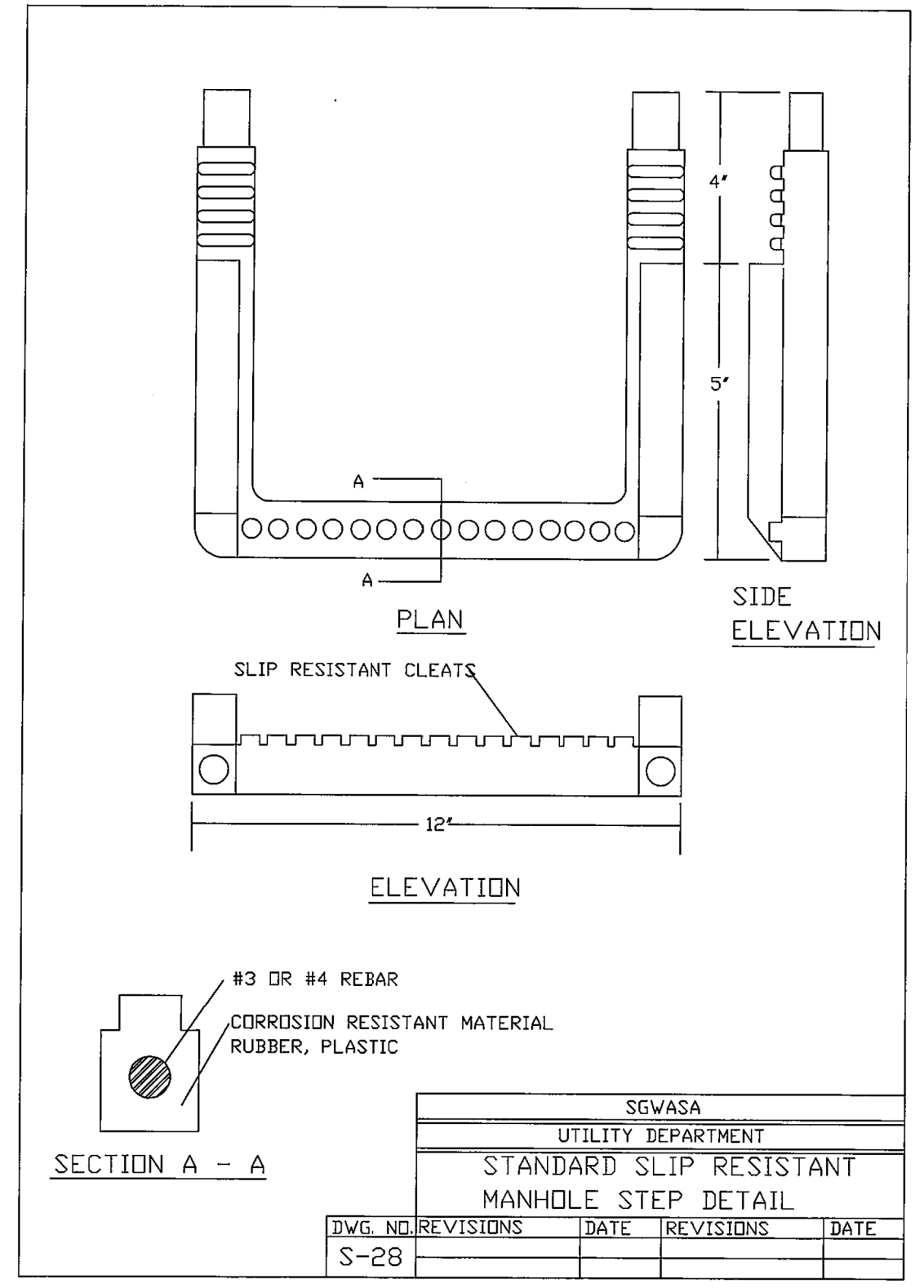
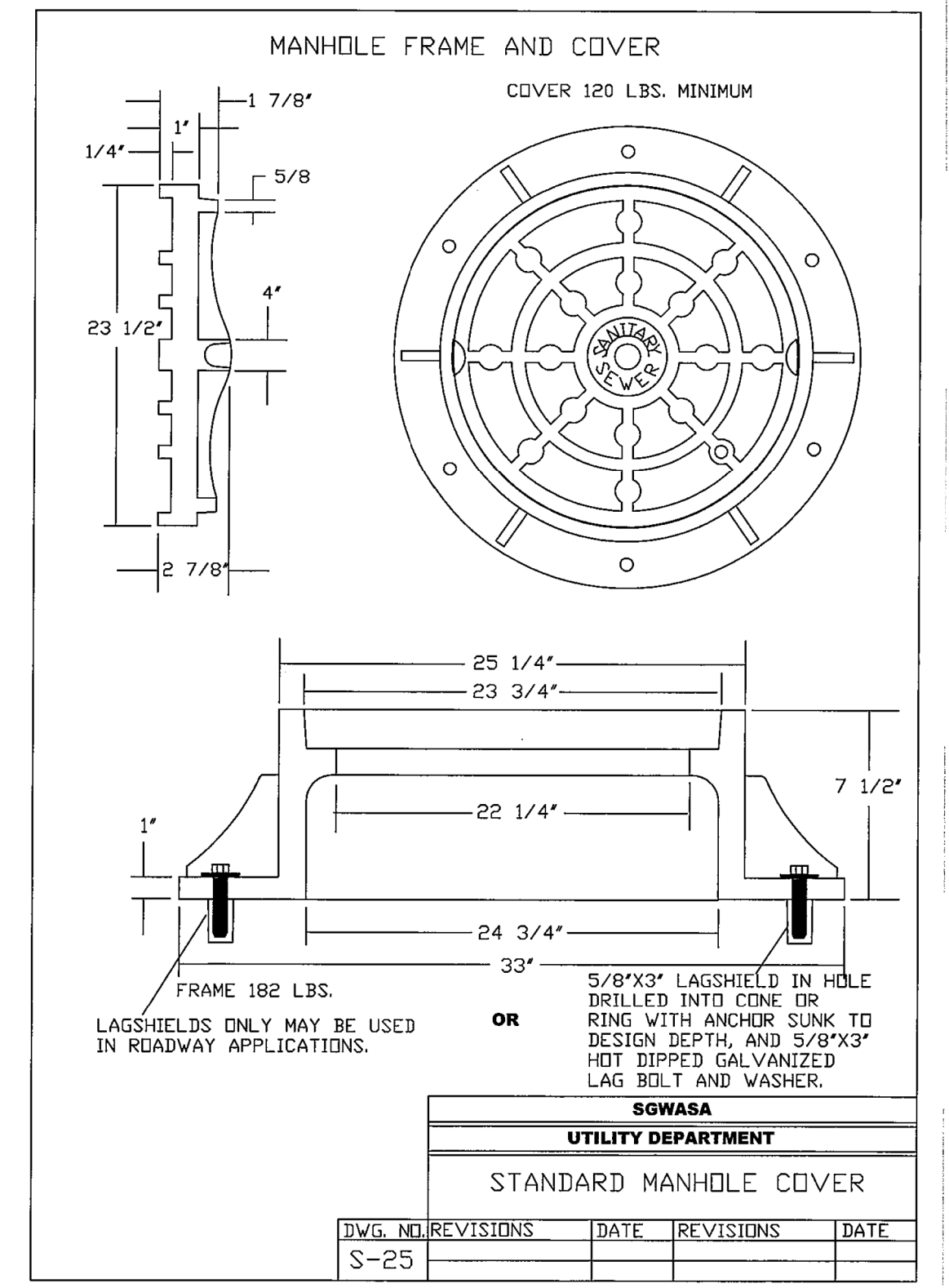
5/14/19

PROJECT TYPICAL DETAILS

CH ENGINEERING
 3220 GLEN ROYAL RD. RALEIGH, NC 27617
 TELE 919.788.0224 FAX 919.788.0232
 NC LICENSE #P-0189

PROJECT REFERENCE NO. R-5707	SHEET NO. UC-3B
DESIGNED BY: EMT	
DRAWN BY: EMT	
CHECKED BY: MJL	
APPROVED BY:	
REVISER:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 1/25/2019 UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION



1/25/2019 UC-Proj\N-5707-ut-dtl\UC03B_psh.dgn

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

SEAL
028812
ERIC M. TWEED

NORTH CAROLINA
DEPARTMENT OF
TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

2/1/2019
UTILITY CONSTRUCTION
PLANS ONLY

UTILITY CONSTRUCTION

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3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

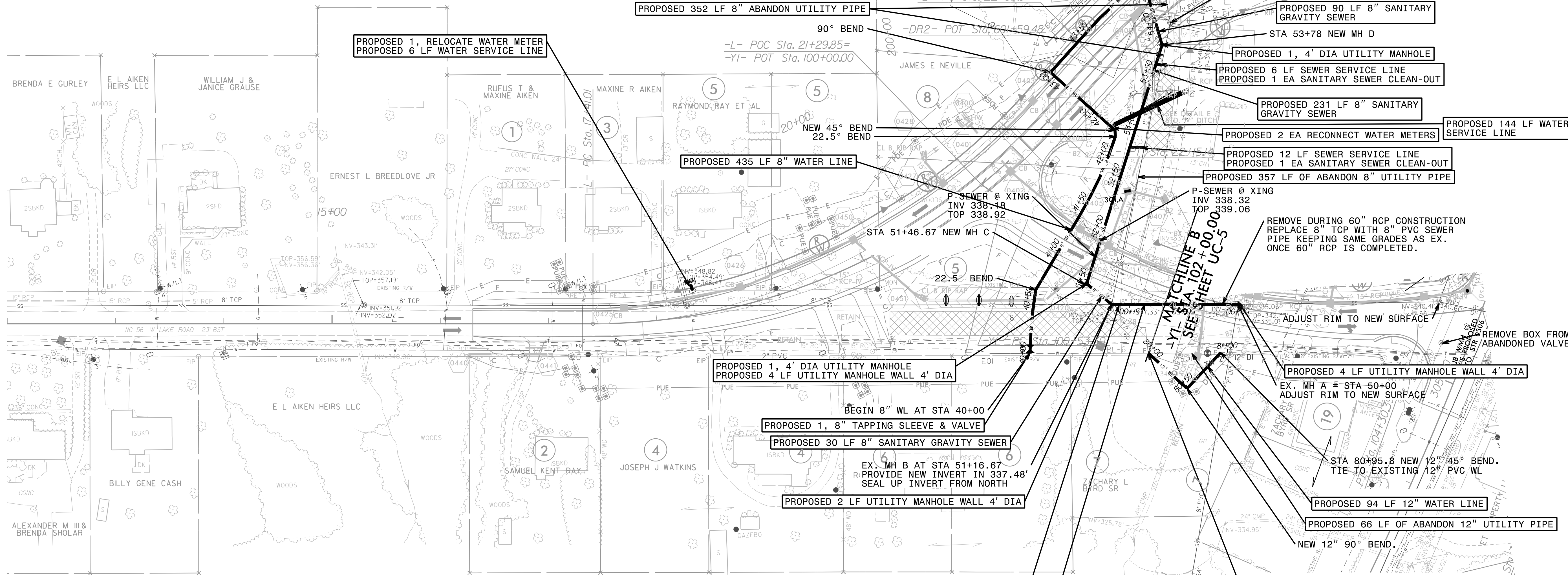
CONTRACTOR TO COORDINATE WITH THE OWNER FOR TURNING OF VALVES. PROVIDE SEVEN DAYS NOTICE TO OWNER BEFORE PERFORMING TIE-IN WORK. OWNER MAY REQUIRE OFF-HOURS WORK TO PERFORM TIE-INS.

THRUST COLLARS SHALL HAVE 24 HRS TO SET UP PRIOR TO TIE-IN WORK.

UTILITIES SHOWN ON PLANS MAY NOT FULLY ENCOMPASS ALL UTILITIES THAT ARE ON SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING UTILITIES PRIOR TO CONSTRUCTION.

PROVIDE 1" DIAMETER SERVICES FOR THE TWO WATER SERVICES AT STATIONS 42+27 AND 42+30.

CONC 18x31
11/20/19



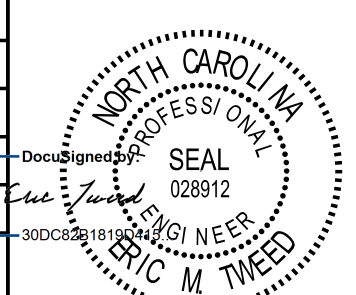
PAY ITEMS THIS SHEET:

- 94 LF 12" WATER LINE
- 435 LF 8" WATER LINE
- 184 LF WATER SERVICE LINE
- 1 EA 8" WATER VALVES
- 1 EA 8" TAPPING SLEEVE & VALVE
- 2 EA RECONNECT WATER METER
- 3 EA RELOCATE WATER METER
- 493 LF 8" SANITARY GRAVITY SEWER
- 18 LF SEWER SERVICE LINE
- 2 EA SANITARY SEWER CLEAN-OUT
- 4 EA 4' DIA UTILITY MANHOLE
- 12 LF UTILITY MANHOLE WALL 4' DIA
- 826 LF OF ABANDON 8" UTILITY PIPE
- 66 LF OF ABANDON 12" UTILITY PIPE
- 1 EA OF ABANDON UTILITY MANHOLE

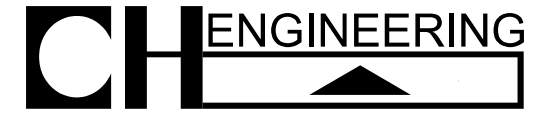
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER FITTINGS ON THIS PLAN SHEET IS 1,665 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS

SEWER RELOCATION PERMITTED BY 15A NCAC 02T .0303(a) 4 D

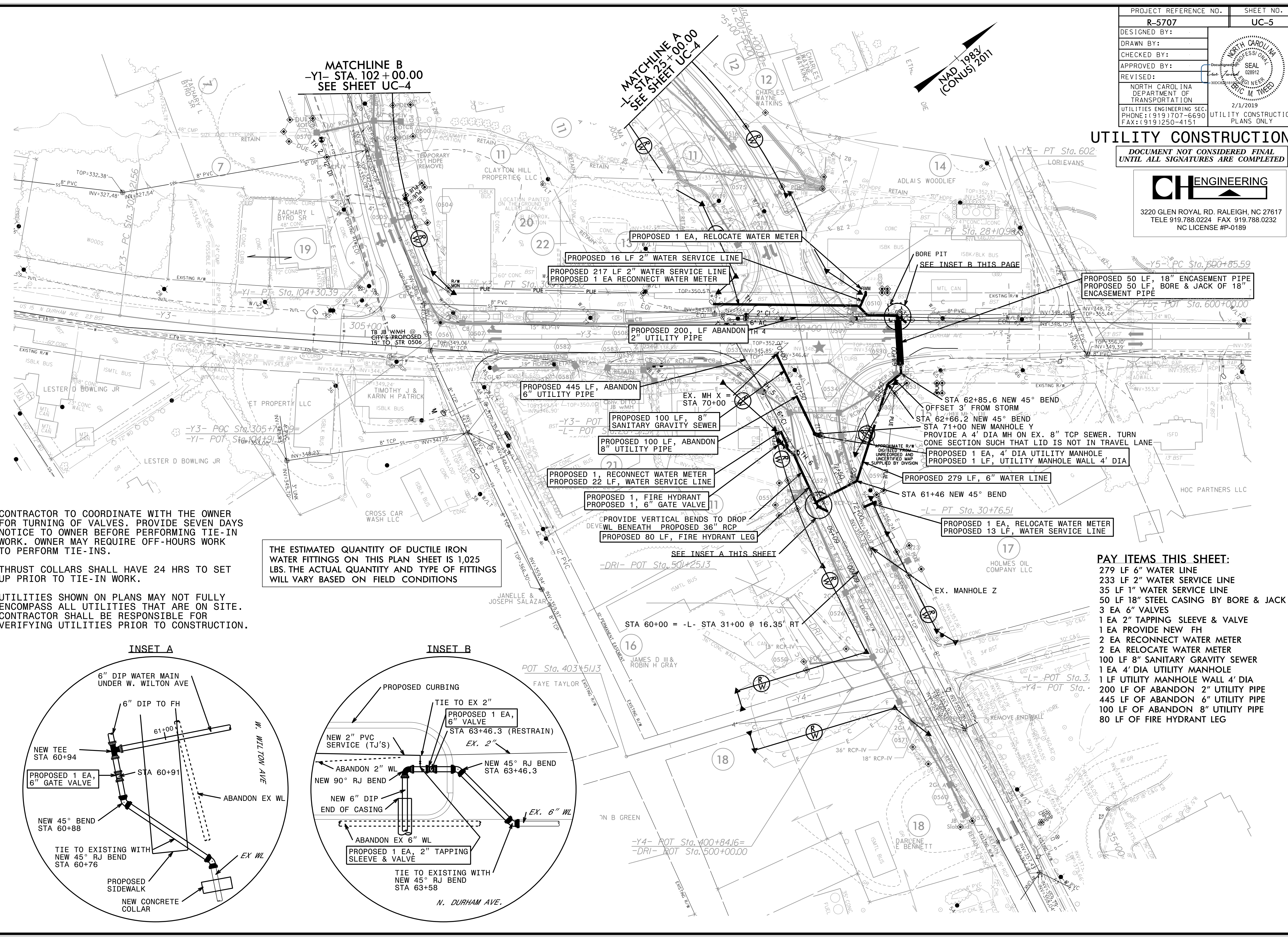
WATER RELOCATIONS FOR PROJECT ARE PERMITTED BY PUBLIC WATER SUPPLY UNDER SERIAL NO. 18-00056 (2-16-18)

PROJECT REFERENCE NO.	SHEET NO.
R-5707	UC-5
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	DATE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PLANS ONLY	
PHONE: (919) 707-6690 FAX: (919) 1250-4151	

UTILITY CONSTRUCTION
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TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189



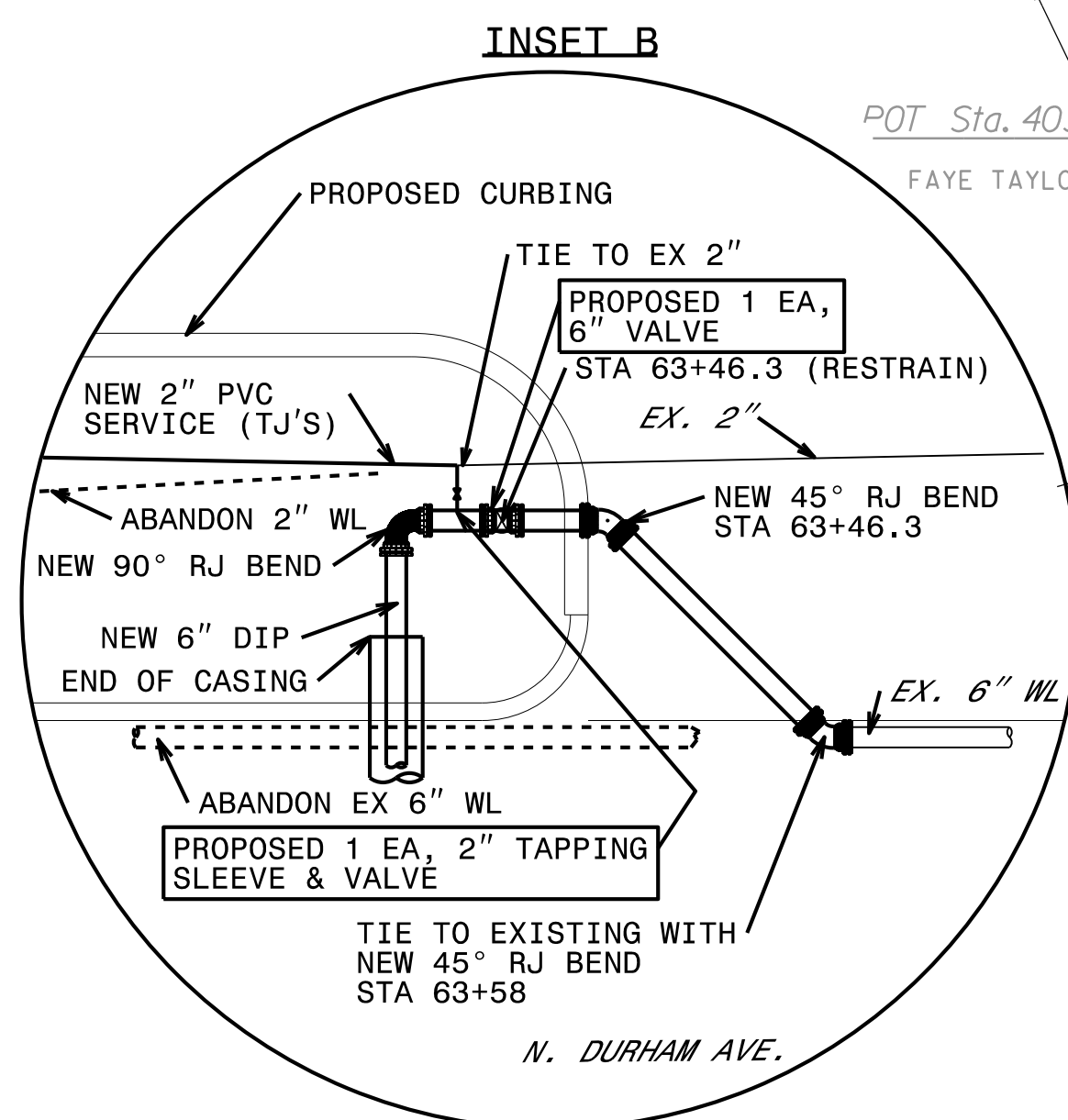
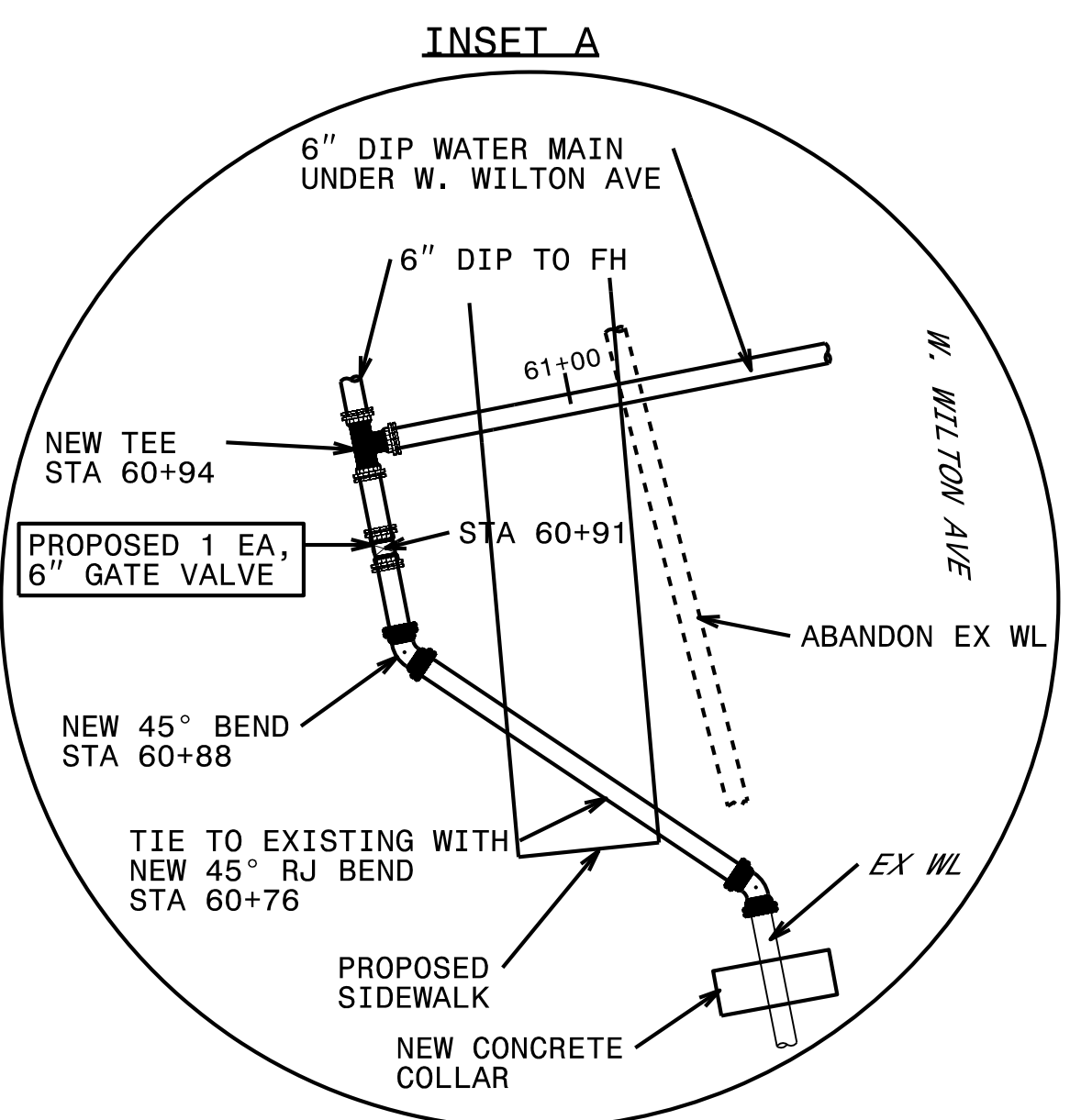
CONTRACTOR TO COORDINATE WITH THE OWNER FOR TURNING OF VALVES. PROVIDE SEVEN DAYS NOTICE TO OWNER BEFORE PERFORMING TIE-IN WORK. OWNER MAY REQUIRE OFF-HOURS WORK TO PERFORM TIE-INS.

THRUST COLLARS SHALL HAVE 24 HRS TO SET UP PRIOR TO TIE-IN WORK.

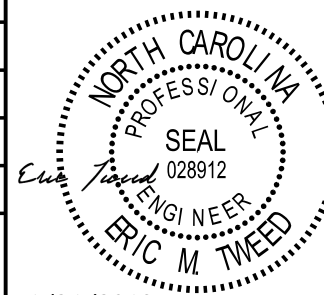
UTILITIES SHOWN ON PLANS MAY NOT FULLY ENCOMPASS ALL UTILITIES THAT ARE ON SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING UTILITIES PRIOR TO CONSTRUCTION.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER FITTINGS ON THIS PLAN SHEET IS 1,025 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS

- PAY ITEMS THIS SHEET:**
- 279 LF 6" WATER LINE
 - 233 LF 2" WATER SERVICE LINE
 - 35 LF 1" WATER SERVICE LINE
 - 50 LF 18" STEEL CASING BY BORE & JACK
 - 3 EA 6" VALVES
 - 1 EA 2" TAPPING SLEEVE & VALVE
 - 1 EA PROVIDE NEW FH
 - 2 EA RECONNECT WATER METER
 - 2 EA RELOCATE WATER METER
 - 100 LF 8" SANITARY GRAVITY SEWER
 - 1 EA 4' DIA UTILITY MANHOLE
 - 1 LF UTILITY MANHOLE WALL 4' DIA
 - 200 LF OF ABANDON 2" UTILITY PIPE
 - 445 LF OF ABANDON 6" UTILITY PIPE
 - 100 LF OF ABANDON 8" UTILITY PIPE
 - 80 LF OF FIRE HYDRANT LEG

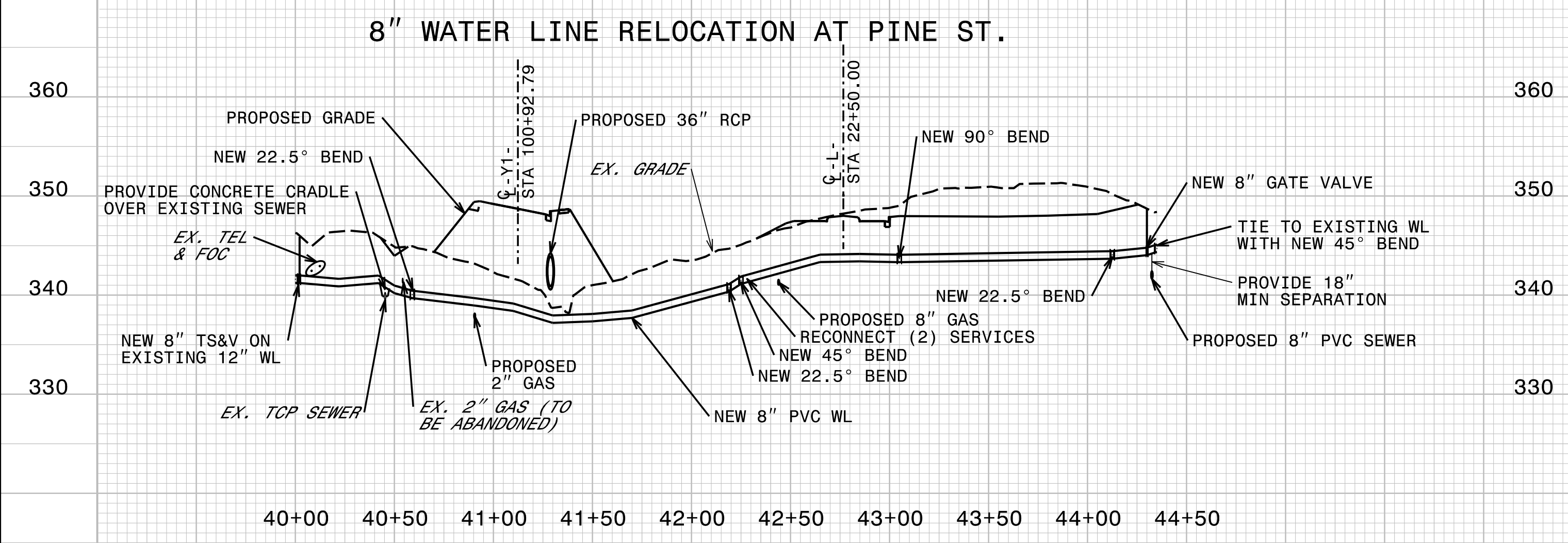


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 3220 GLEN ROYAL RD. RALEIGH, NC 27617
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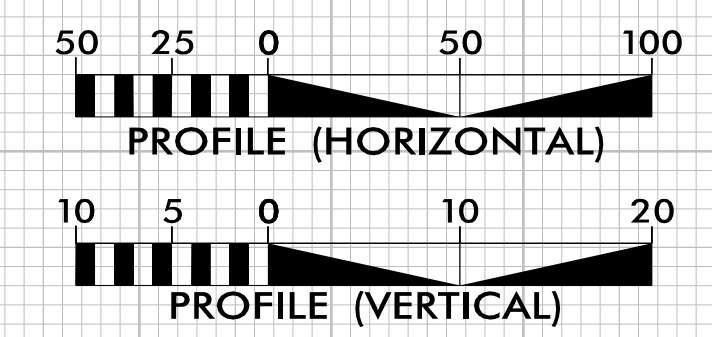
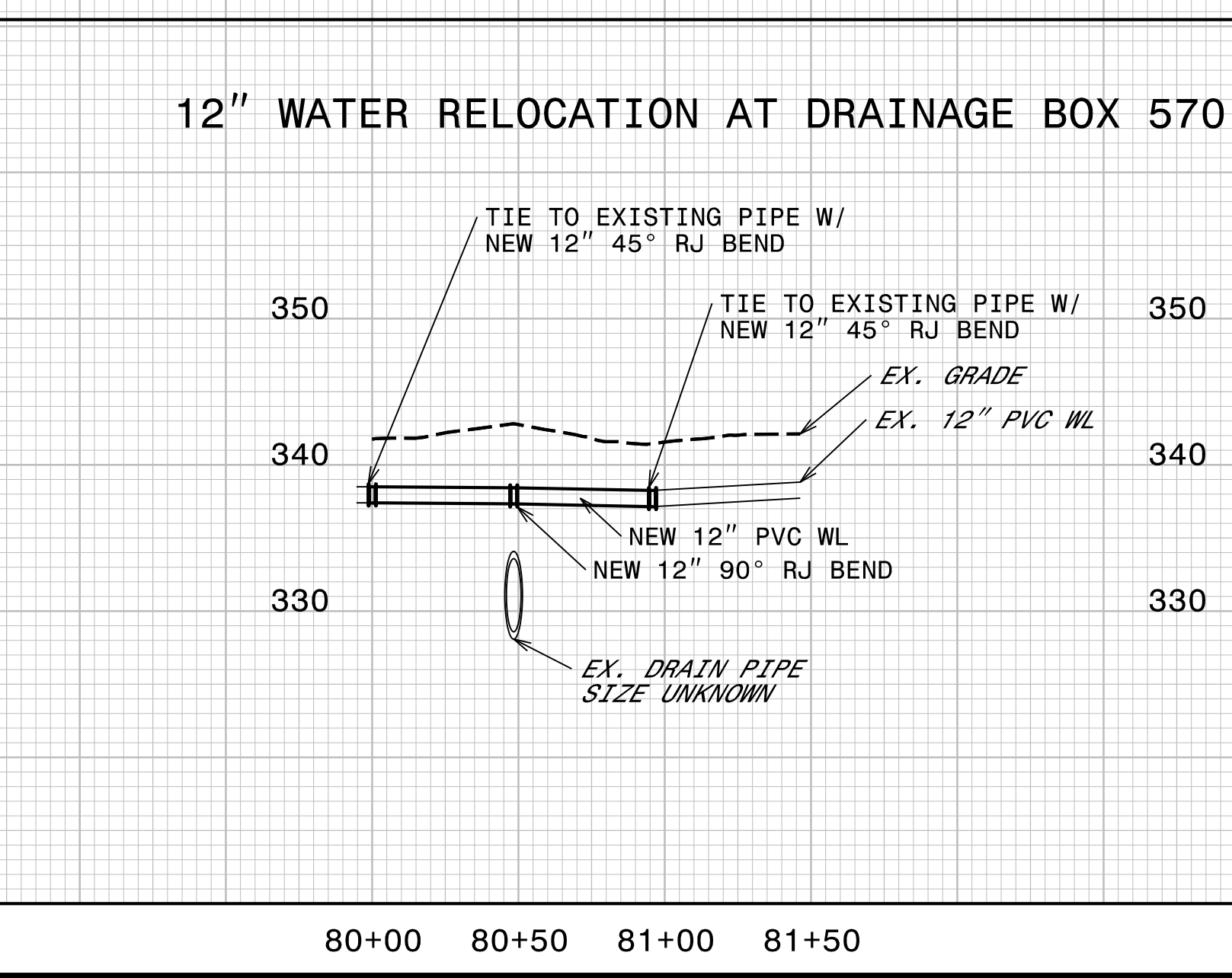
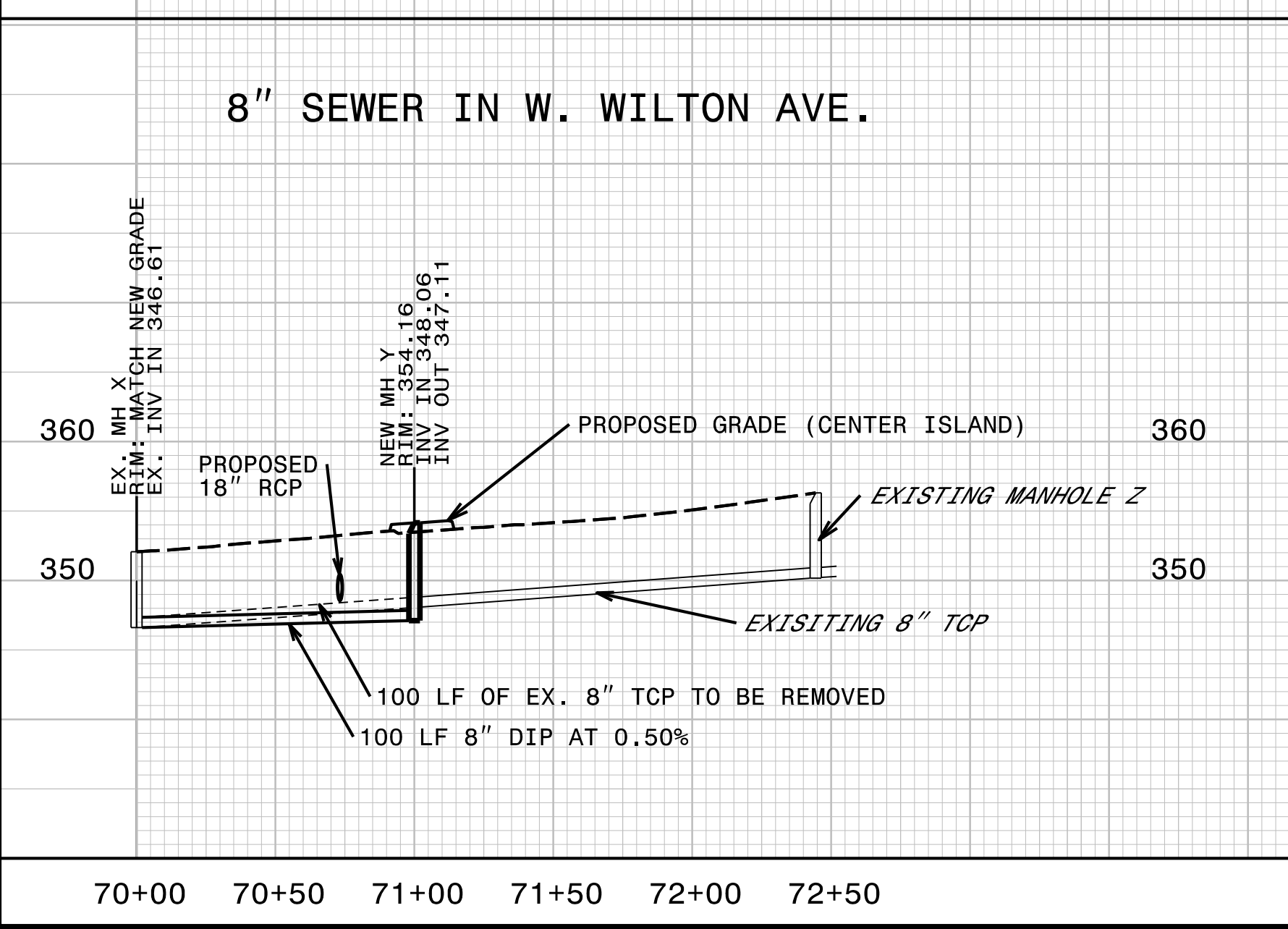
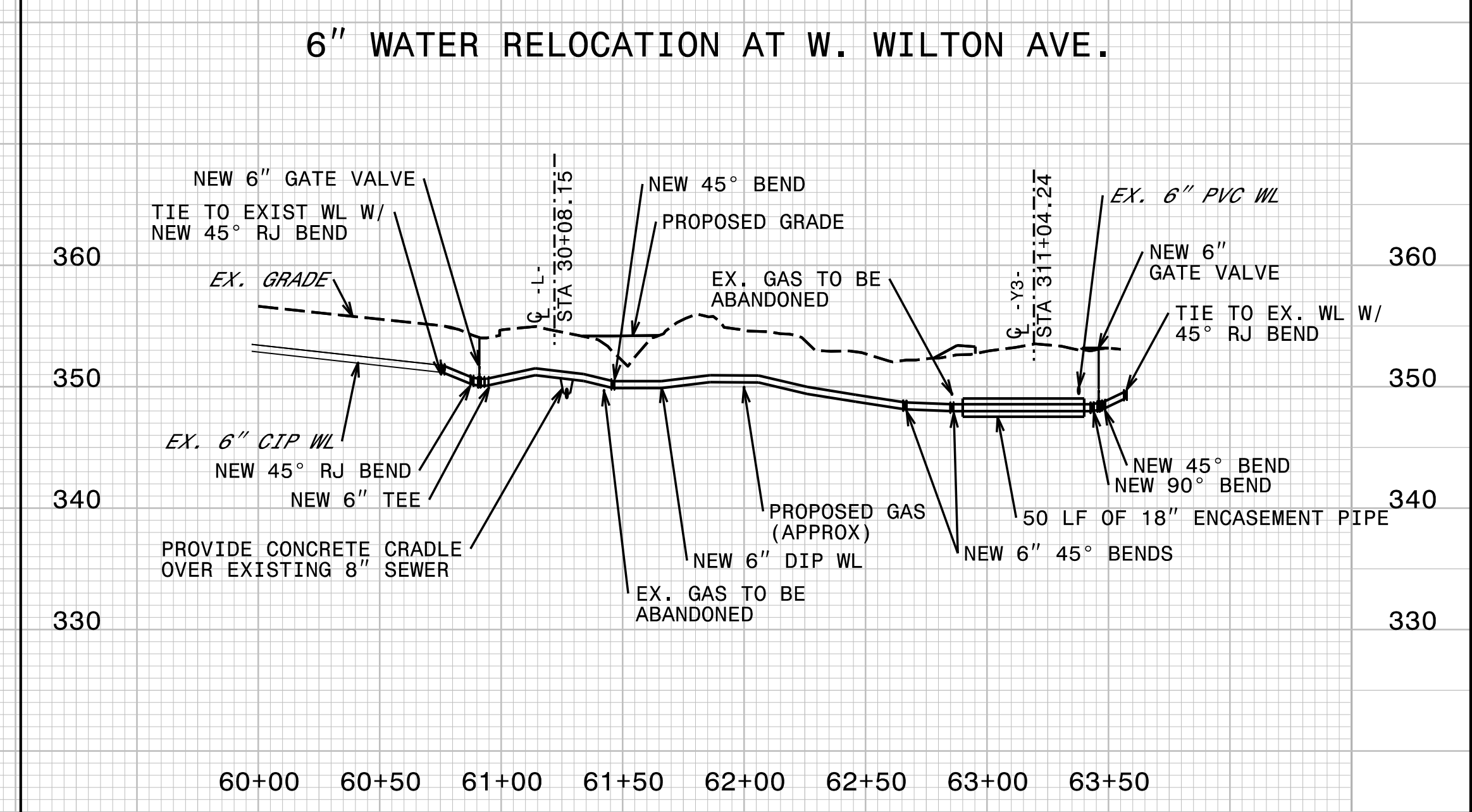
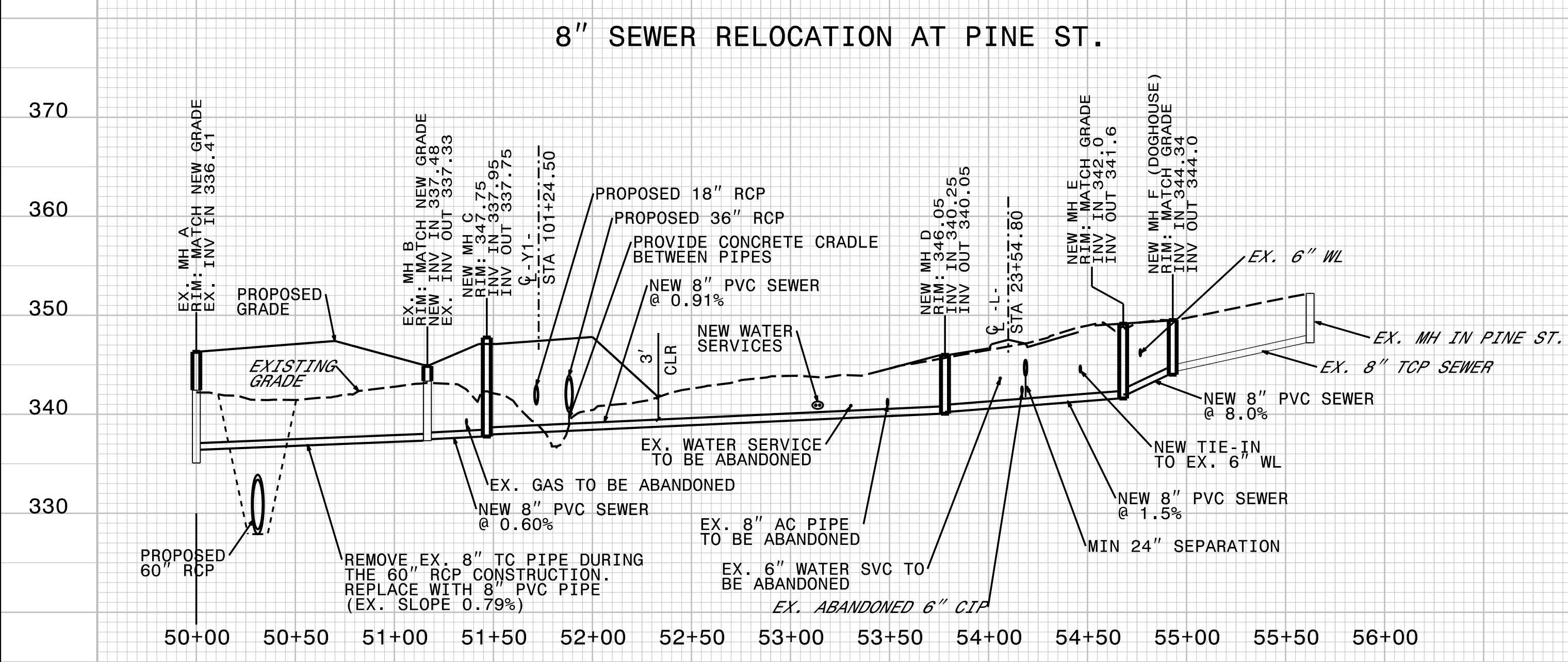
PROJECT REFERENCE NO.	SHEET NO.
R-5707	UC-6
DESIGNED BY: EMT	
DRAWN BY: EMT	
CHECKED BY: BAW	
APPROVED BY:	
REVISED:	1/21/2019
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

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UTILITY CONSTRUCTION



- NOTES:
1. MAINTAIN 36" MINIMUM COVER OVER WATER LINE.
 2. PVC WATER LINES SHALL BE C-900
 3. SERVICE LINES SHALL BE TYPE K COPPER
 4. EXISTING UTILITIES SHOWN ARE APPROXIMATE AND CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND DEPTH. DEPTHS ARE UNKNOWN AND MAY REQUIRE ADJUSTMENTS TO THE WATER LINE DEPTH TO AVOID THE EXISTING UTILITIES.



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