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TIP PROJECT: R-2915A

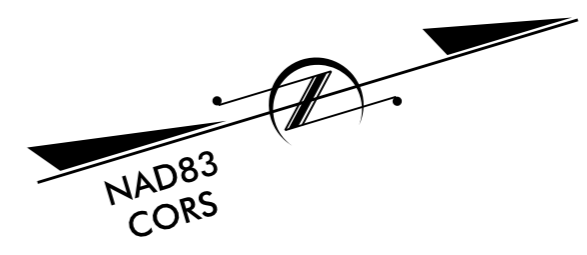
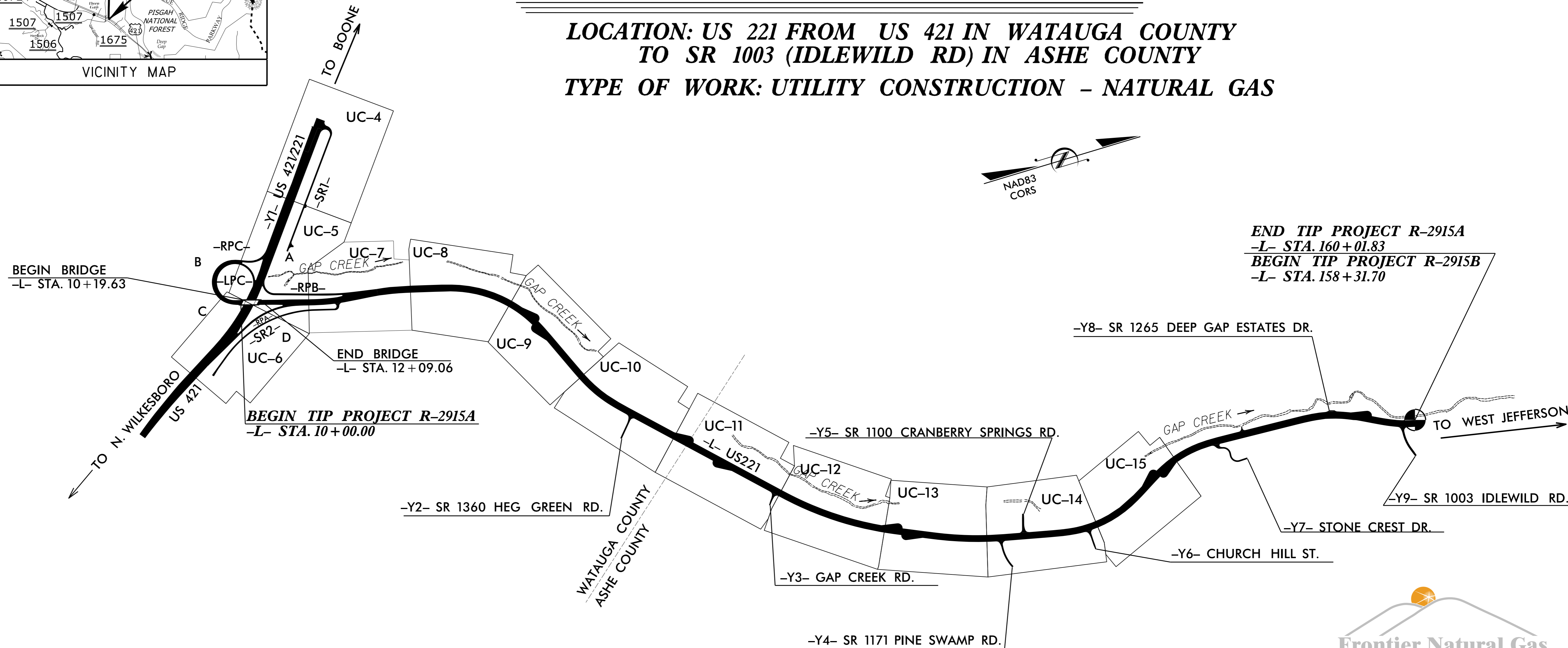
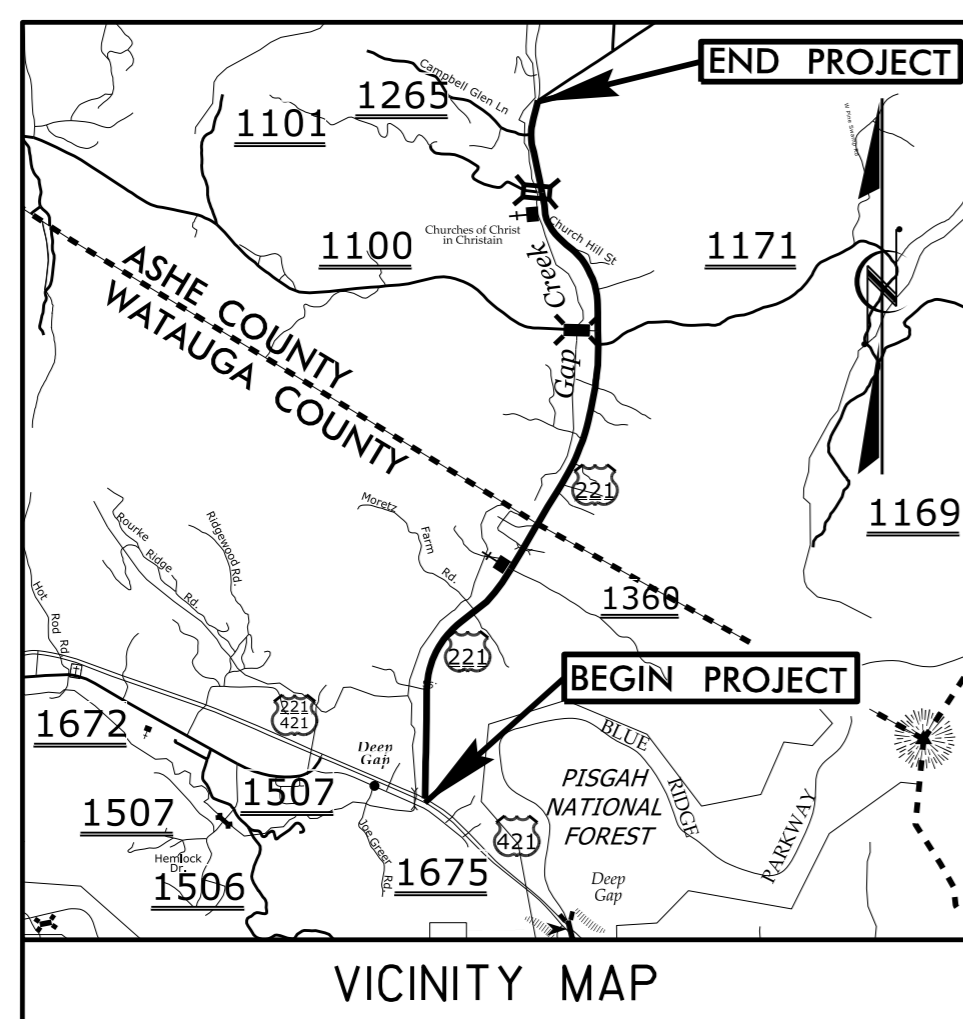
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
R-2915A	UC-1

UTILITY CONSTRUCTION PLANS
WATAUGA & ASHE COUNTY

LOCATION: US 221 FROM US 421 IN WATAUGA COUNTY
TO SR 1003 (IDLEWILD RD) IN ASHE COUNTY

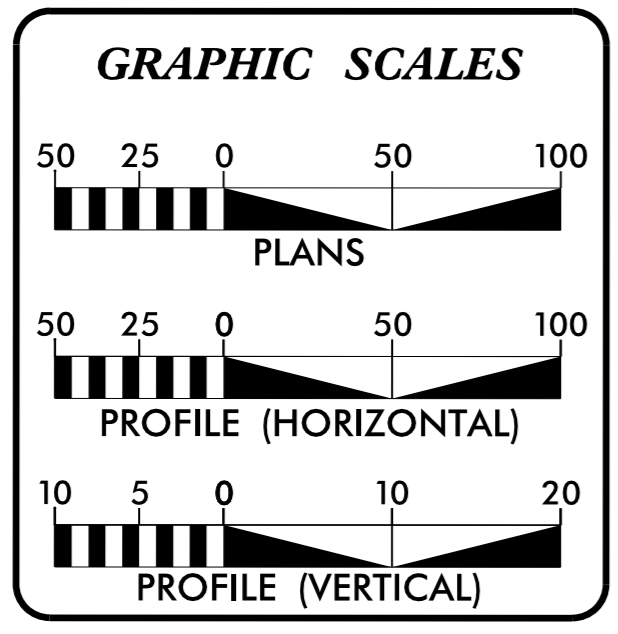
TYPE OF WORK: UTILITY CONSTRUCTION - NATURAL GAS



END TIP PROJECT R-2915A
 -L- STA. 160 + 01.83
 BEGIN TIP PROJECT R-2915B
 -L- STA. 158 + 31.70

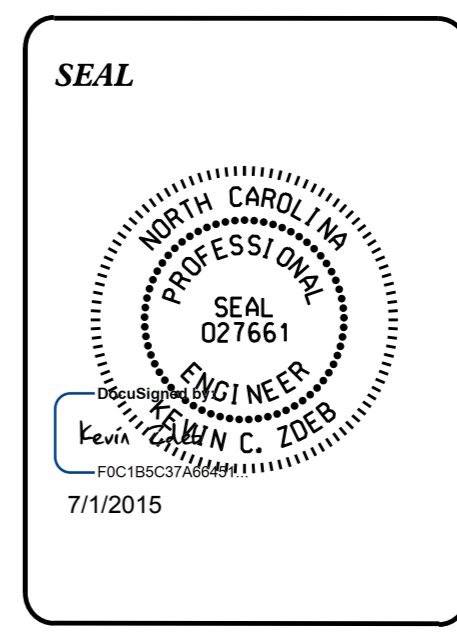


M A Engineering Consultants, Inc. 598 East Chatham Street - Suite 137
 Cary, NC 27511
 Phone: 919.297.0220 Fax: 919.297.0221
 NC License: F-0160



SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	SYMBOLGY SHEET
UC-3 THRU UC-3G	NOTES & DETAIL SHEETS
UC-4 THRU UC-19	PLAN & PROFILE SHEETS
UC-20 THRU UC-22	MECHANICAL DRAWINGS
UC-23	GRADING PLAN

UTILITY OWNER ON PROJECT
 (1) GAS - FRONTIER NATURAL GAS



PREPARED IN THE OFFICE OF:
 DIVISION OF HIGHWAYS
 UTILITIES UNIT
 UTILITIES ENGINEERING

1555 MAIL SERVICES CENTER
 RALEIGH NC 27699-1555
 PHONE (919) 707-6690
 FAX (919) 250-4151

Roger Worthington, P.E. UTILITIES SECTION ENGINEER
 Carl Barclay, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
 James Swinson UTILITIES PROJECT DESIGNER

\$\$\$\$\$ SYSTEM TIME \$\$\$\$\$\$
\$\$\$\$\$ DDN \$\$\$\$\$\$
\$\$\$\$\$ USERNAME \$\$\$\$\$\$

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Table listing proposed water symbols including Water Line (Sized as Shown), various Degree Bends (11 1/4, 22 1/2, 45, 90), 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, Water Meter, Relocate Water Meter, Remove Water Meter, Water Pump Station, RPZ Backflow Preventer, DCV Backflow Preventer, Relocate RPZ Backflow Preventer, Relocate DCV Backflow Preventer.

PROPOSED SEWER SYMBOLS

Table listing proposed sewer symbols including Gravity Sewer Line (Sized as Shown), Force Main Sewer Line (Sized as Shown), Manhole (Sized per Note), Sewer Pump Station.

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Table listing proposed miscellaneous utilities symbols including Power Pole, Telephone Pole, Joint Use Pole, Telephone Pedestal, Utility Line by Others (Type as Shown), Trenchless Installation, Encasement by Open Cut, Encasement.

Table listing miscellaneous utilities symbols including Thrust Block, Air Release Valve, Utility Vault, Concrete Pier, Steel Pier, Plan Note, Pay Item Note.

EXISTING UTILITIES SYMBOLS

Table listing existing utilities symbols including Power Pole, Telephone Pole, Joint Use Pole, Utility Pole, Utility Pole with Base, H-Frame Pole, Power Transmission Line Tower, Water Manhole, Power Manhole, Telephone Manhole, Sanitary Sewer Manhole, Hand Hole for Cable, Power Transformer, Telephone Pedestal, CATV Pedestal, Gas Valve, Gas Meter, Located Miscellaneous Utility Object, Abandoned According to Utility Records (AATUR), End of Information (E.O.I.), *Underground Power Line, *Underground Telephone Cable, *Underground Telephone Conduit, *Underground Fiber Optics Telephone Cable, *Underground TV Cable, *Underground Fiber Optics TV Cable, *Underground Gas Pipeline, Aboveground Gas Pipeline (A/G Gas), *Underground Water Line, Aboveground Water Line (A/G Water), *Underground Gravity Sanitary Sewer Line, Aboveground Gravity Sanitary Sewer Line (A/G Sanitary Sewer), *Underground SS Forced Main Line, Underground Unknown Utility Line, SUE Test Hole, Water Meter, Water Valve, Fire Hydrant, Sanitary Sewer Cleanout.

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

5/14/99
REV: 2/1/2012

5/14/19

GENERAL NOTES:

1. ALL NATURAL GAS PIPELINE CONSTRUCTION SHALL BE PER FRONTIER NATURAL GAS SPECIFICATIONS. CONTRACTOR SHALL REFER TO THE PROJECT SPECIAL PROVISIONS.
2. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
3. BLASTING NOT PERMITTED.
4. THE PLANS DEPICT SITE FEATURES AS ANTICIPATED TO BE UPON THE START OF CONSTRUCTION.
5. THE LOCATIONS OF UNDERGROUND UTILITIES AS INDICATED ON THE PLANS HAVE BEEN OBTAINED FROM EXISTING RECORDS AND A FIELD SURVEY AND ARE APPROXIMATE. THE ENGINEER AND OWNER DO NOT ASSUME ANY RESPONSIBILITY WHATSOEVER WITH THE ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF THE EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED DURING CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES.
6. CONTRACTOR SHALL CONTACT NC ONE CALL AT 811 A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION FOR OTHER UTILITY LOCATIONS.
7. IN THE EVENT THAT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE DESIGNATED REPRESENTATIVE FOR FRONTIER NATURAL GAS (FNG).
8. ANY SUCH MAINS AND/OR SERVICES DISTURBED OR DAMAGED BY THE CONTRACTOR SHALL BE IMMEDIATELY RESTORED AT HIS EXPENSE AND TO THE SATISFACTION OF FNG'S DESIGNATED REPRESENTATIVE.
9. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107 AND 1550 OF THE NCDOT STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS OR BUFFER ZONES.
10. CONTRACTOR SHALL LIMIT ALL EXCAVATIONS, SPOIL PILES, PIPE ASSEMBLY, WORK SPACE, EQUIPMENT SETUP, ETC. TO RESIDE WITHIN THE LIMITS OF THE NCDOT RIGHT OF WAY AND EXISTING/PROPOSED FNG EASEMENTS.
11. ANY CATHODIC PROTECTION MEASURES DEEMED NECESSARY TO PROTECT THE PIPE SHALL BE LOCATED OUTSIDE OF THE HIGHWAY R/W.
12. CATHODIC PROTECTION MEASURES SHALL BE DESIGNED AND INSTALLED BY OTHERS.
13. FRONTIER NATURAL GAS REPRESENTATIVE TO PROVIDE WATCH AND PROTECT OBSERVATION WHILE NCDOT ROADWAY CONTRACTOR IS PERFORMING REMOVAL AND/OR INSTALLATION OF DRAINAGE PIPES AROUND ALL FRONTIER NATURAL GAS MAIN THAT IS TO REMAIN IN PLACE.
14. TEMPORARY FENCING SHALL BE INSTALLED WHERE FARM LAND IS PRESENT TO SECURE CATTLE.
15. TRAFFIC CONTROL MEASURES SHALL BE PROVIDED FOR THE INSTALLATION OF THE GAS MAINS AS PART OF THE ROADWAY PROJECT AND IN ACCORDANCE WITH THE APPLICABLE NCDOT SPECIFICATIONS AND STANDARD DRAWINGS.
16. HOLIDAY DETECTION (JEEPING) SHALL BE CONDUCTED ON THE ENTIRE LENGTH OF THE PROPOSED PIPELINE PRIOR TO INSTALLATION.
17. TYPICAL OPEN TRENCH COVER FOR GAS PIPE SHALL BE 3.0 FEET. CONTRACTOR SHALL MAINTAIN 2.0 FEET OF VERTICAL SEPARATION BETWEEN GAS MAIN AND OTHER UTILITY LINES OR STRUCTURES. GAS LINE INSTALLED UNDER DRAINAGE PIPES SHALL MAINTAIN 4.0 FEET OF VERTICAL SEPARATION. CONTRACTOR SHALL MAINTAIN 1.0 FOOT OF SEPARATION FROM BOTTOM OF PROPOSED GAS PIPE TO TOP OF DRAINAGE PIPE/BOX CULVERT. CONTRACTOR SHALL MAINTAIN 5.0 FEET MINIMUM COVER FROM BOTTOM OF DITCH/STREAM TO TOP OF PROPOSED GAS PIPE.
18. CONTRACTOR SHALL ENSURE THAT ALL EXCAVATIONS ARE PROPERLY SUPPORTED AND ADHERE TO CURRENT OSHA SAFETY STANDARDS.
19. ALL PROPOSED GAS LINE NEEDS TO BE PIGGABLE, AND AS SUCH ALL PROPOSED FITTINGS SHALL BE 5R FITTINGS IN ACCORDANCE WITH FNG REQUIREMENTS.





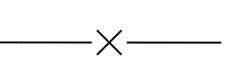
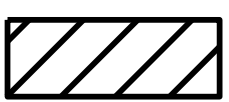

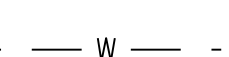
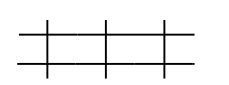
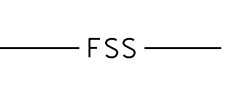
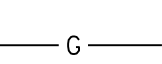


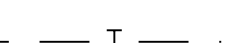
HORIZONTAL DIRECTIONAL DRILL (HDD) NOTES:

1. ALL BEND RADII SHALL BE EQUAL TO OR GREATER THAN THOSE LISTED IN THE PROJECT PLANS.
2. THE CONTRACTOR, SUBJECT TO THE REQUIREMENTS OF THESE PLANS, WILL DETERMINE THE EXACT METHOD AND TECHNIQUES FOR COMPLETING THE HDD CROSSING. EXCAVATED MUD PITS CONSTRUCTED IN THE ENTRY AND EXIT AREAS WILL BE LIMITED TO THE PIPE DRILL HOLE AREA ONLY.
3. AFTER COMPLETION OF THE DIRECTIONAL DRILLING WORK, THE ENTRY AND EXIT PIT LOCATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITIONS.
4. AFTER THE PILOT DRILL HOLE IS ACCEPTED, THE CONTRACTOR SHALL PERFORM A REAM 1.5 TIMES THE O.D. OF THE CARRIER PIPE AHEAD OF THE PRODUCT PIPE PULL.
5. THE MAXIMUM PREREAMING SHALL BE 1.5 TIMES THE CARRIER PIPE O.D. UNLESS OTHERWISE APPROVED BY THE ENGINEER.
6. ENTRY AND EXIT PITS SHOULD BE SUFFICIENT SIZE TO CONTAIN THE DRILLING MUD AND SPOILS.
7. ALL STEEL PIPE USED FOR DIRECTIONAL DRILLS SHALL BE COATED WITH AN ABRASION RESISTANT OVERCOAT. PIPE COATED WITH ONLY FBE MAY BE USED FOR OPEN TRENCH PIPE INSTALLATIONS.
8. PIPE ROLLERS, SKATES, OR OTHER PROTECTIVE DEVICES SHALL BE USED TO PREVENT DAMAGE TO THE PIPE FROM THE EDGES OF THE PIT OR SUB-STRUCTURES DURING PULL-IN. ROLLERS SHALL BE USED UNDER PIPE TO PROTECT THE PIPE FROM GOUGES, ELIMINATE GROUND DRAG, AND REDUCE THE PULL-IN FORCE.
9. AN ADDITIONAL LENGTH OF PIPE SHALL BE PULLED THROUGH THE ENTRY PIT, EXPOSED, AND EXAMINED FOR DAMAGE INCLUDING A BUTT WELD JOINT AND A MINIMUM OF FIFTEEN FEET (15') OF PIPE.
10. INSTALLATION OF THE PIPE SHOULD BE PLANNED SO BOTH THE FINAL BACKREAM AND THE PULL BACK CAN BE COMPLETED IN THE SAME DAY.
11. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF DRILL MUD.

JACK AND BORE NOTES:

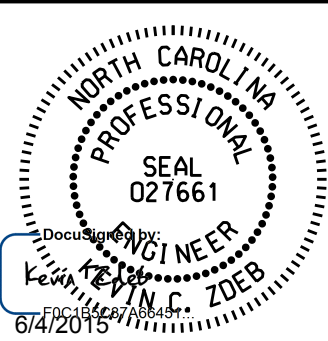
1. THE FRONT OF THE BORE PIPE SHALL BE PROVIDED WITH MECHANICAL ARRANGEMENTS OR DEVICES THAT WILL POSITIVELY PREVENT THE AUGER FROM LEADING THE PIPE SO THAT NO UNSUPPORTED EXCAVATION IS AHEAD OF THE PIPE.
2. THE AUGER AND CUTTING HEAD ARRANGEMENT SHALL BE REMOVABLE FROM WITHIN THE PIPE IN THE EVENT THAT AN OBSTRUCTION IS ENCOUNTERED.
3. THE OVER-CUT BY THE CUTTING HEAD SHALL NOT EXCEED THE OUTSIDE DIAMETER OF THE BORE PIPE BY MORE THAN 1/2 INCH. IF VOIDS SHOULD DEVELOP OR IF THE BORED HOLE DIAMETER IS GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE BY MORE THAN 1 INCH, GROUTING OR OTHER METHODS APPROVED BY CSX SHALL BE EMPLOYED TO FILL SUCH VOIDS.
4. THE FACE OF THE CUTTING HEAD SHALL BE ARRANGED TO PROVIDE A REASONABLE OBSTRUCTION TO THE FREE FLOW OF SOFT OR POOR MATERIAL.

SYMBOLS LEGEND:

	TREE		MISC. STRUCTURE		TEST STATION
	UTILITY POLE		CHAIN LINK FENCE		DRILL PIT / WORK SPACE
	WOODS LINE		EX. WATER LINE		
	RAILROAD TRACK		EX. FORCE MAIN		
	EXISTING U/G GAS LINE		EX. TV LINE		
	PROPOSED U/G GAS LINE		EX. TELEPHONE LINE		

ABBREVIATIONS:

API	AMERICAN PETROLEUM INSTITUTE
APPROX.	APPROXIMATE
CL	CENTERLINE
ESMT	EASEMENT
EX.	EXISTING
FBE	FUSION BONDED EPOXY
MAX.	MAXIMUM
MIN.	MINIMUM
M.P.	MILE POST
N/A	NOT APPLICABLE
NC	NORTH CAROLINA
NCDOT	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
NTS	NOT TO SCALE
O.D.	OUTSIDE DIAMETER
PROP.	PROPOSED
PSIG	POUNDS PER SQUARE INCH GAGE
FNG	FRONTIER NATURAL GAS
RR	RAILROAD
R/W	RIGHT-OF-WAY
S.R.	STATE ROUTE
W.T.	WALL THICKNESS
E.O.P.	EDGE OF PAVEMENT
E.O.S.	EDGE OF SHOULDER
E.O.P.S.	EDGE OF PAVED SHOULDER

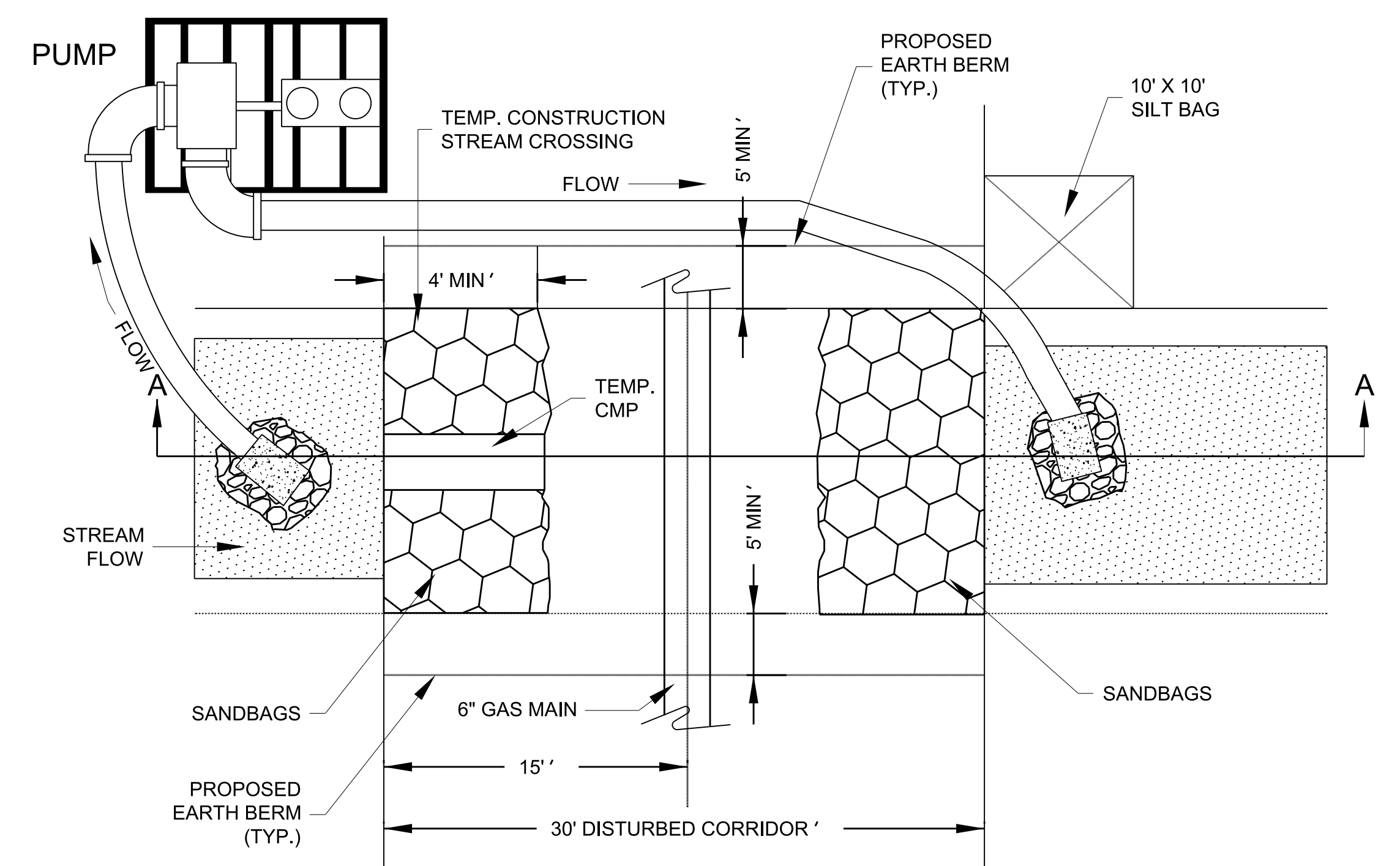
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UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

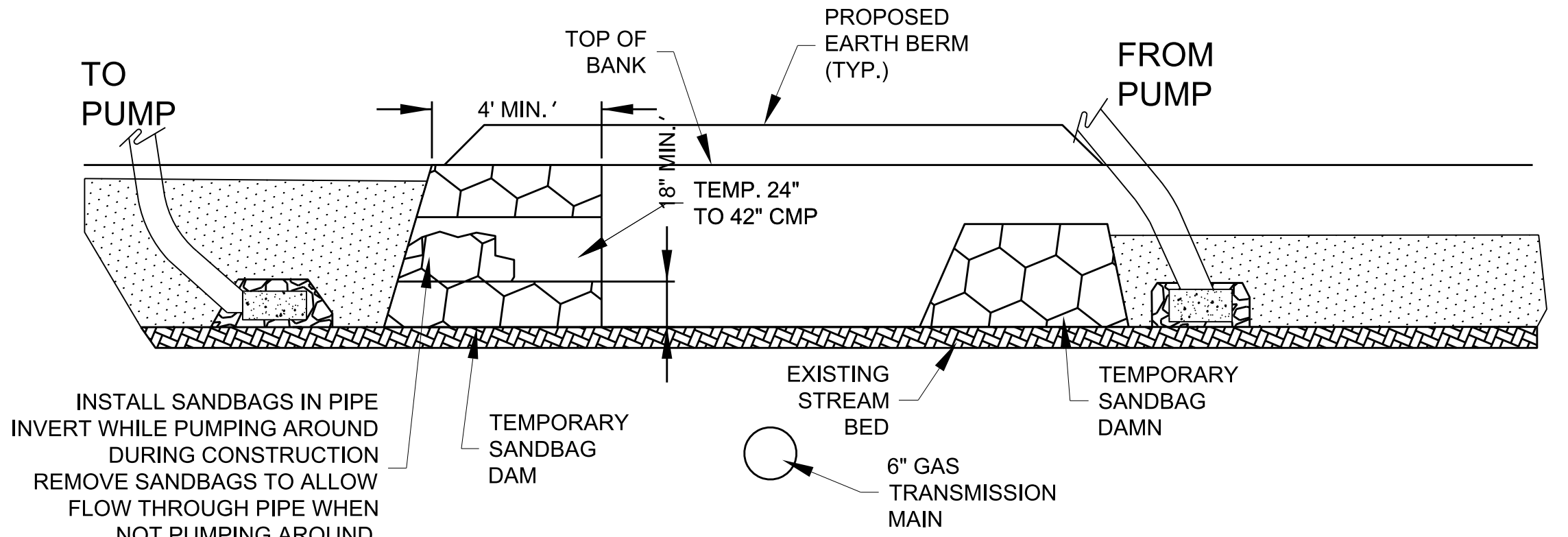
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UTILITY CONSTRUCTION



PLAN



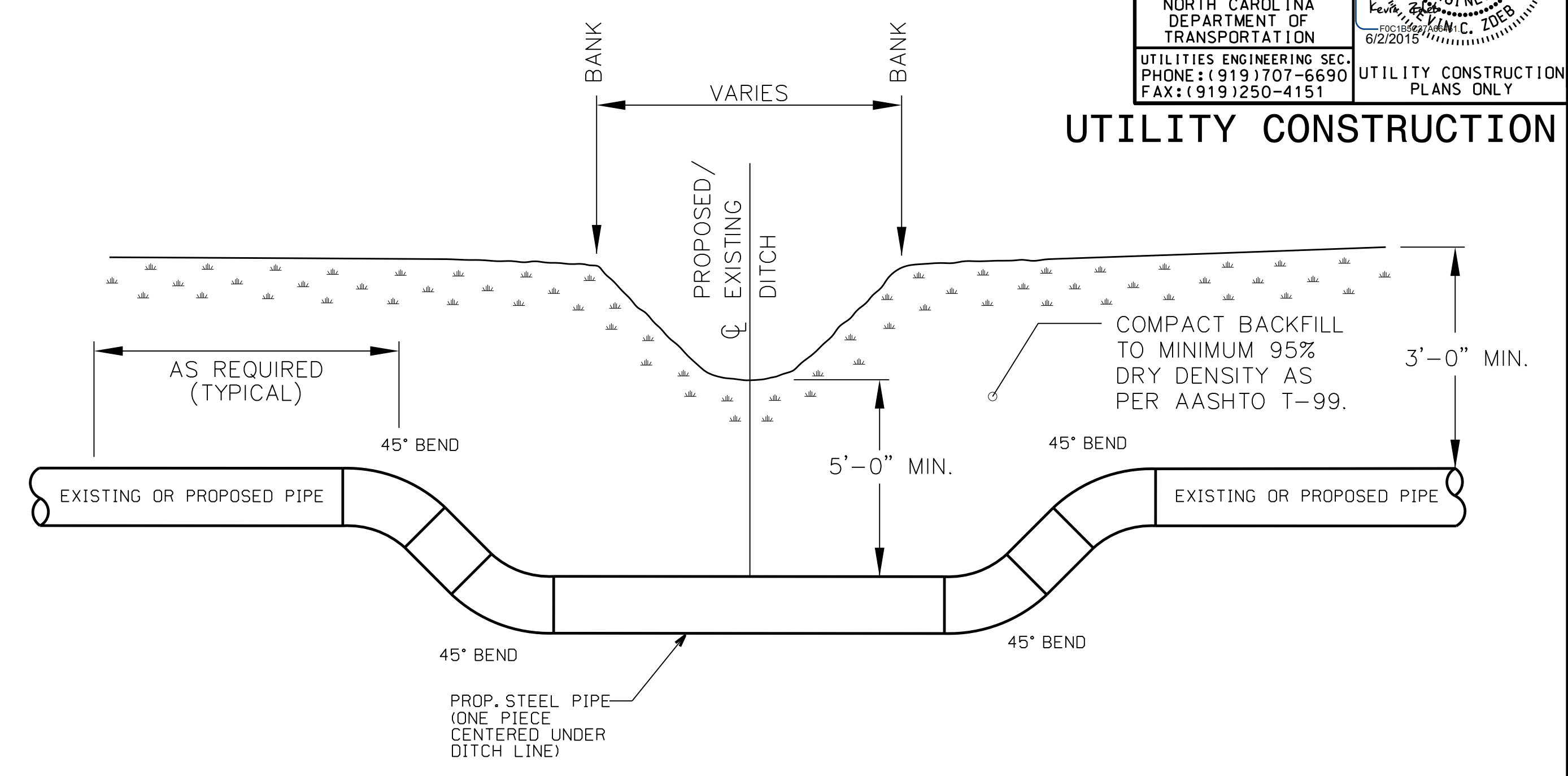
NOTES:

1. PROVIDE BYPASS PUMPING EQUIPMENT OF SUFFICIENT CAPACITY TO HANDLE THE BASE FLOW OF THE STREAM.
2. PROVIDE CLASS B RIP RAP PADS WITH GEOTEXTILE FABRIC UNDERLINER FOR PUMP INTAKE AND DISCHARGE LINES TO PREVENT STREAM BED SCOUR.
3. EFFLUENT FROM DEWATERING BETWEEN COFFER DAMS SHALL BE PUMPED TO A SILT BAG AS SHOWN ON THE DETAIL, AND NOT DIRECTLY TO THE STREAM.
4. THE FLOW THRU PIPE(S) SHALL BE THE SAME SIZE AND NUMBER AS SHOWN FOR THE TEMPORARY STREAM CROSSINGS.

CONST. SEQUENCE FOR BYPASS PUMPING

1. INSTALL PUMP AND LINE TO PUMPED FROM AREA UPSTREAM OF TEMPORARY STREAM CROSSING TO AREA DOWNSTREAM OF CONSTRUCTION AREA. BEGIN PUMPING AND CONTINUE PUMPING WHILE WORKING WITHIN THE STREAM.
2. INSTALL UPSTREAM COFFER DAM AND TEMPORARY CMP. COVER PIPE INLET WITH FABRIC AND SANDBAGS AS SHOWN IN DETAIL WHILE WORKING IN THE STREAM. ALLOW STREAM FLOW THROUGH CMP WHEN NOT WORKING WITHIN THE STREAM.
3. INSTALL DOWNSTREAM TEMPORARY COFFER DAM TO PREVENT BACKFLOW INTO CONSTRUCTION AREA.
4. INSTALL PROPOSED EARTH BERM ALONG TOP OF BANK ON EACH SIDE OF THE CONSTRUCTION AREA.
5. UPON CONSTRUCTION COMPLETION REMOVE COFFER DAMS, PIPE AND OTHER TEMPORARY MEASURES AND INSTALL TEMPORARY STREAM CROSSING IF NEEDED FOR CONSTRUCTION ACCESS TO OTHER SECTIONS OF THE PROJECT. IF NOT NEEDED, PROCEED WITH STREAM BANK RESTORATION. REFER TO NCDOT EROSION AND SEDIMENT CONTROL PLANS FOR STREAMBANK RESTORATION DETAILS.
6. UPON STABILIZATION OF CLEARED AREAS, REMOVE TEMPORARY EARTH BERMS.

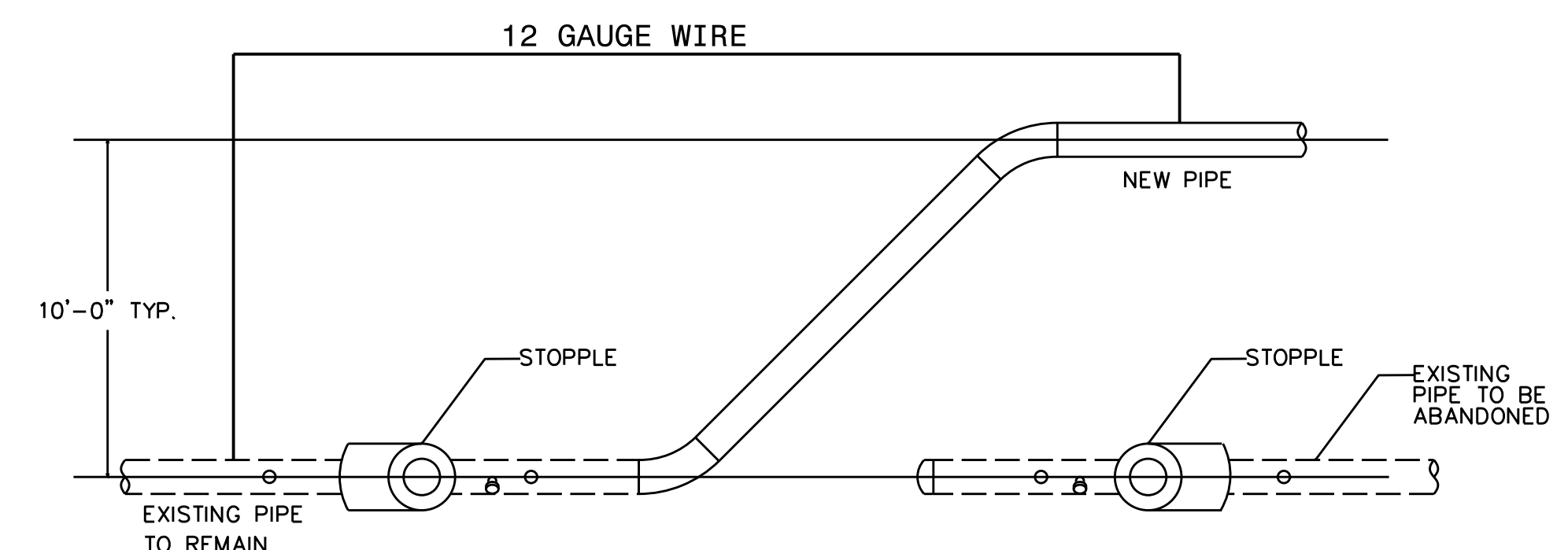
1 TEMPORARY STREAM PUMP AROUND
NTS



CROSS SECTION

2 GAS LINE UNDER DITCH/STREAM CROSSING
NTS

NOTE:
BENDS SHALL BE INSTALLED AS NEEDED DEPENDING ON EXISTING/FINAL GRADE AND PROPOSED PROFILE OF GAS MAIN.

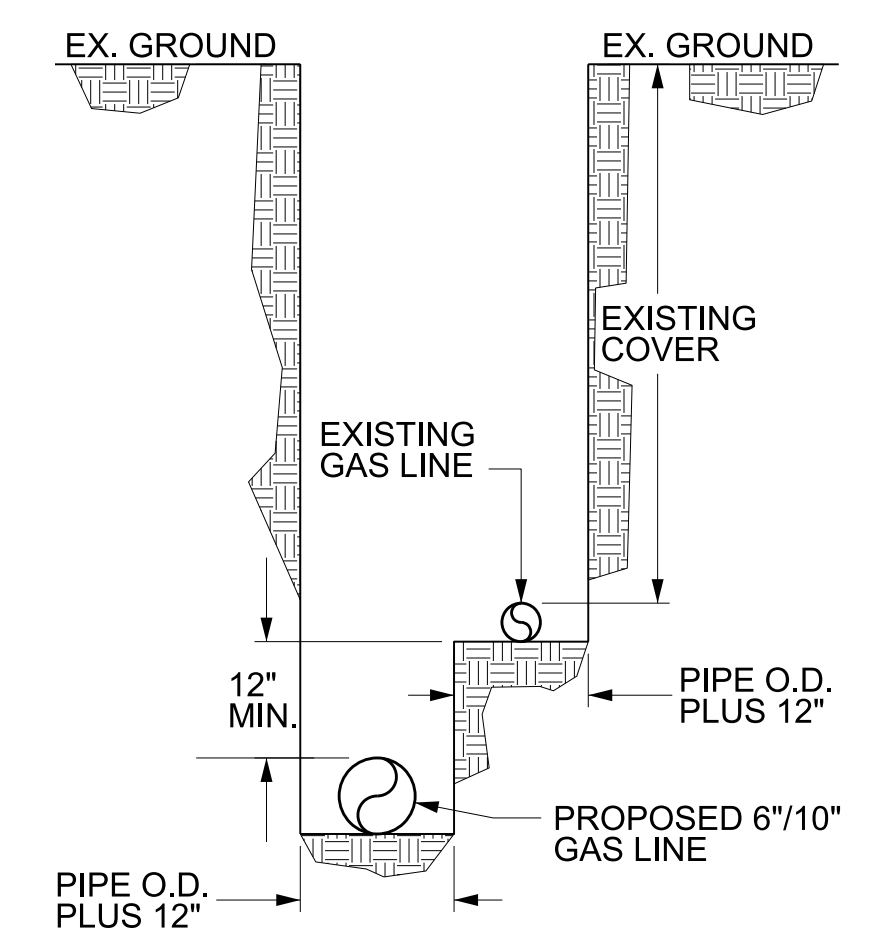


NOTE:
1. CONNECTIONS TO PIPE SHALL BE MADE WITH CAD WELD AND WRAPPED AFTERWARDS TO MAINTAIN CP CONTINUITY.

3 JUMPER DETAIL FOR TIE-INS
NTS

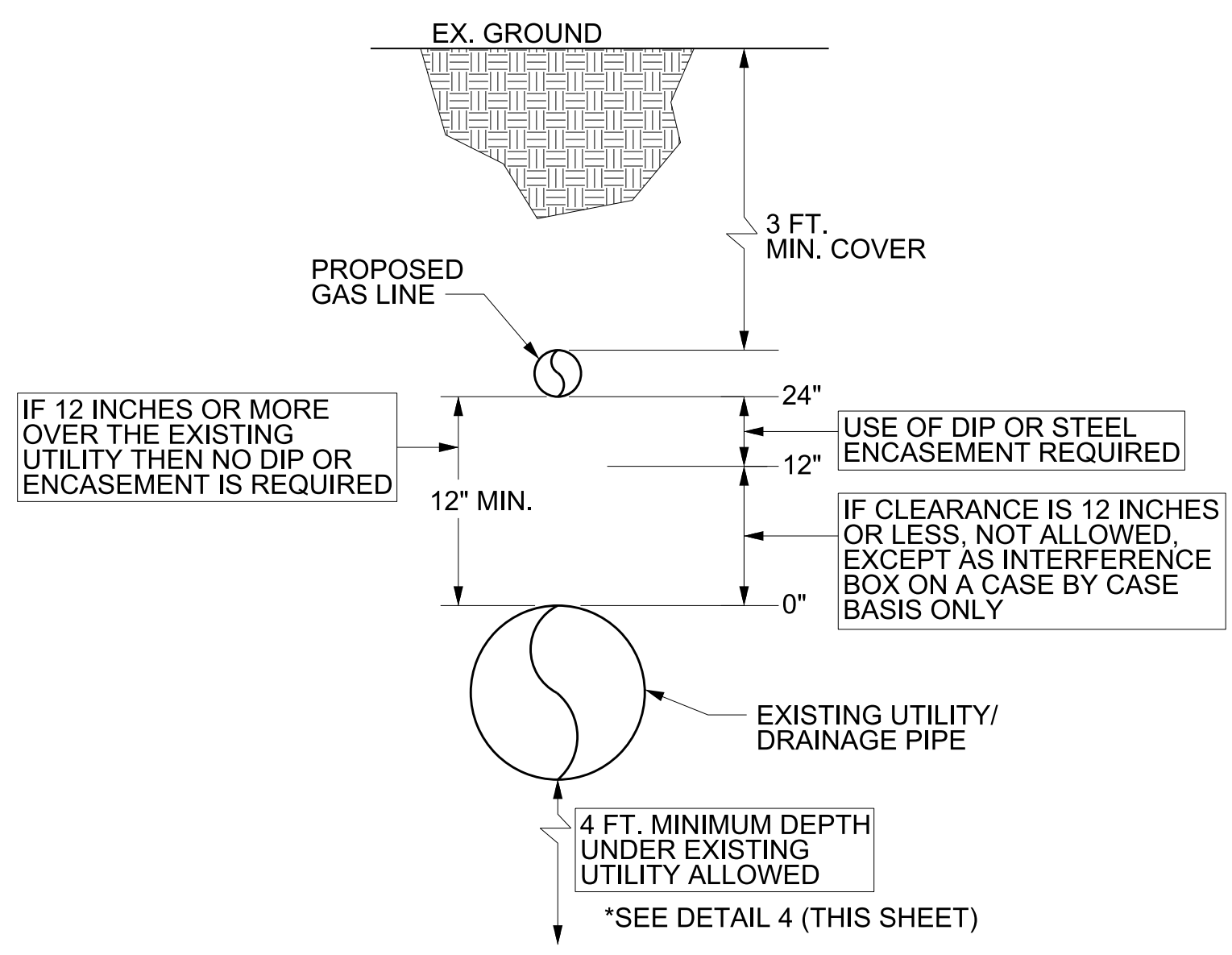
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UTILITY CONSTRUCTION



- NOTES:
- FOR PE PIPE, INSTALL GAS WARNING TAPE APPROXIMATELY 12" ABOVE TOP OF GAS MAIN.
 - SEE LOCATING TEST STATION DETAIL FOR PLACEMENT OF TRACER WIRE FOR PE PIPE.

1 TYPICAL COMBINED PIPE TRENCH
NTS

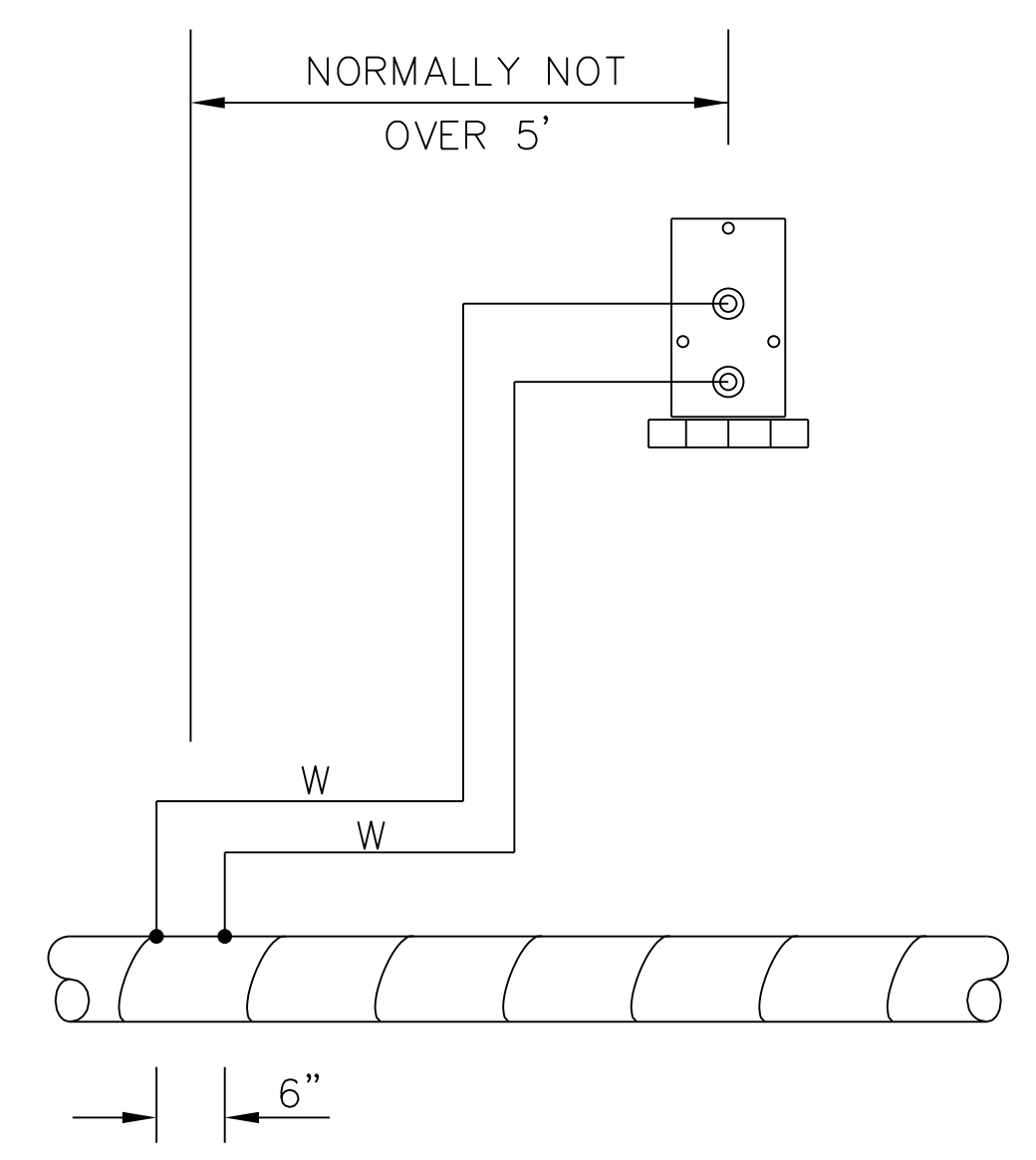


IF 12 INCHES OR MORE OVER THE EXISTING UTILITY THEN NO DIP OR ENCASEMENT IS REQUIRED

USE OF DIP OR STEEL ENCASEMENT REQUIRED

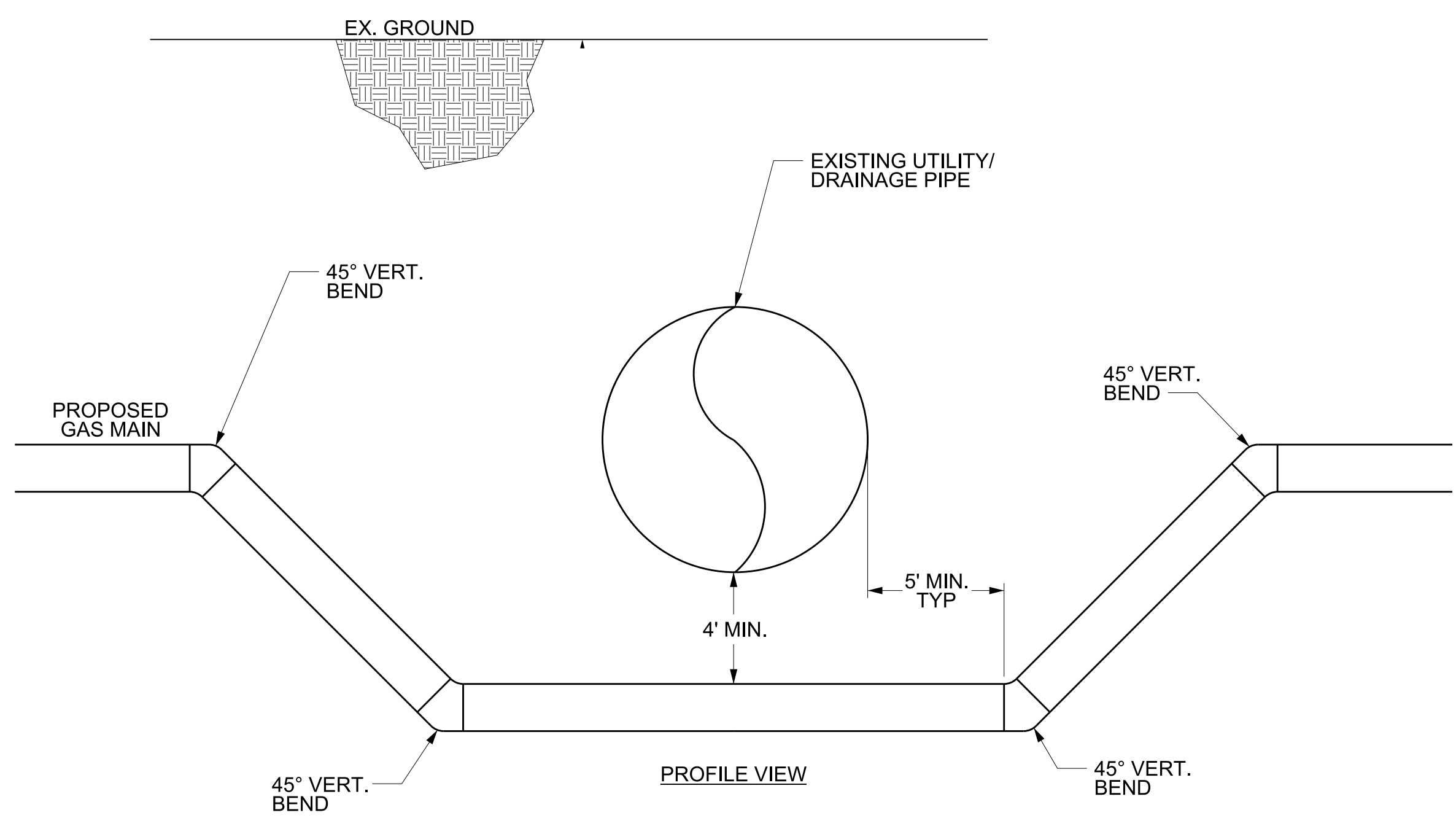
IF CLEARANCE IS 12 INCHES OR LESS, NOT ALLOWED, EXCEPT AS INTERFERENCE BOX ON A CASE BY CASE BASIS ONLY

2 PROPOSED GAS LINE OVER EXISTING UTILITY OR DRAINAGE PIPE
NTS



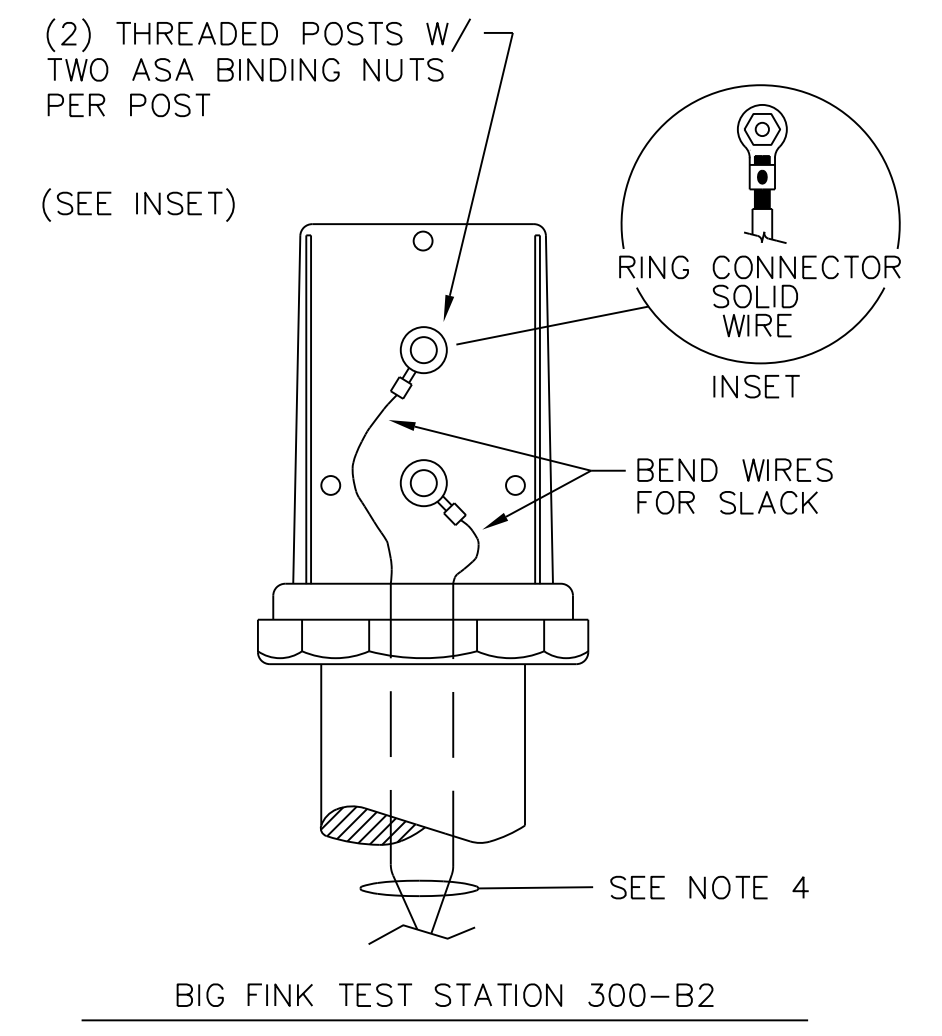
- NOTES:
- ALL PIPE-WIRE CONNECTIONS TO BE CAD WELDED AND COATED WITH 2 PART EPOXY.
 - LEAVE SLACK IN WIRE TO AVOID DAMAGE IN BACKFILLING.
 - ALL PIPE WIRE SHOULD BE NUMBER 12 WHITE WIRE WITH TW INSULATION.

3 CATHODIC TEST STATION DETAIL
NTS



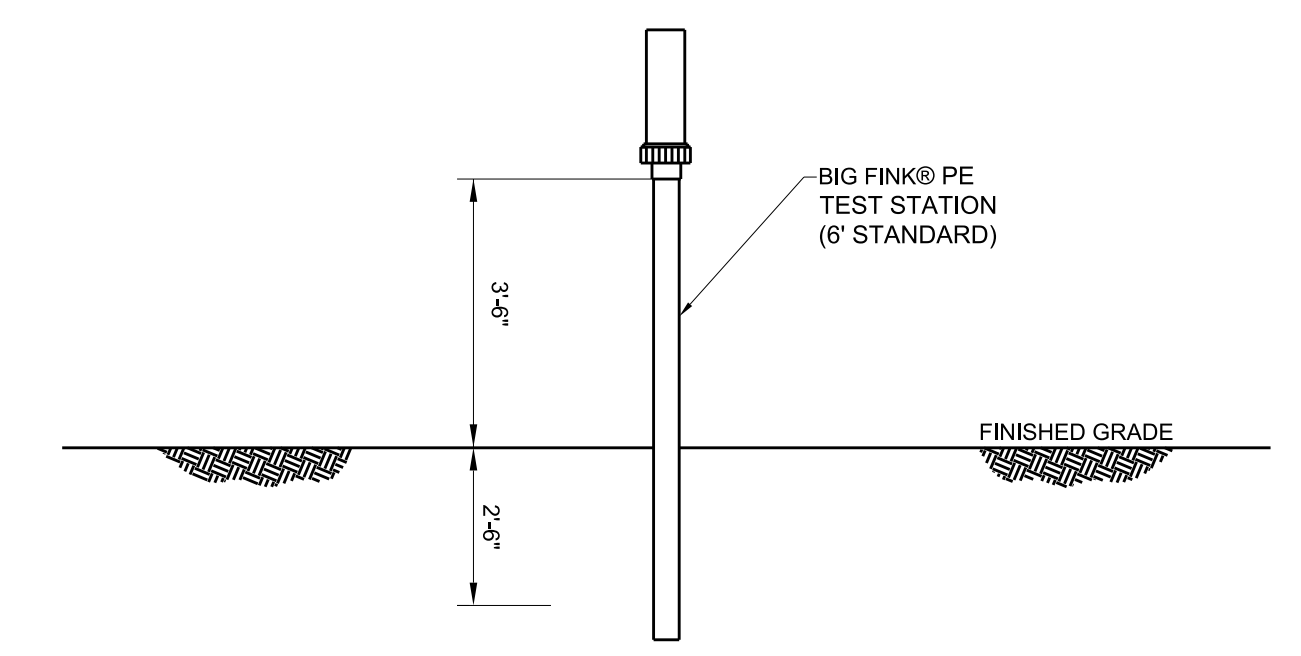
- NOTE:
- DETAIL APPLICABLE FOR BOTH STEEL AND PLASTIC PIPE.

4 PROPOSED GAS LINE UNDER EXISTING UTILITY OR DRAINAGE PIPE
NTS



- NOTES:
- ALLOW TIME FOR BACKFILL COMPACTION BEFORE CONNECTING WIRE TO COVER PLATE TERMINALS.
 - ALLOW APPROX. 18" EXCESS WIRE EXTENDING THROUGH THE FITTING. WHEN BACKFIL IS COMPACTED, TRIM THE WIRES TO LENGTH, ATTACH THE TERMINALS AND INSTALL COVERS.
 - BEFORE TRIMMING, FORCE WIRES INTO CONDUIT FOR SLACK.
 - WIRE COLOR CODE TO BE POSTED IN TEST STATION.

5 CATHODIC TEST STATION WIRING CONNECTIONS
NTS

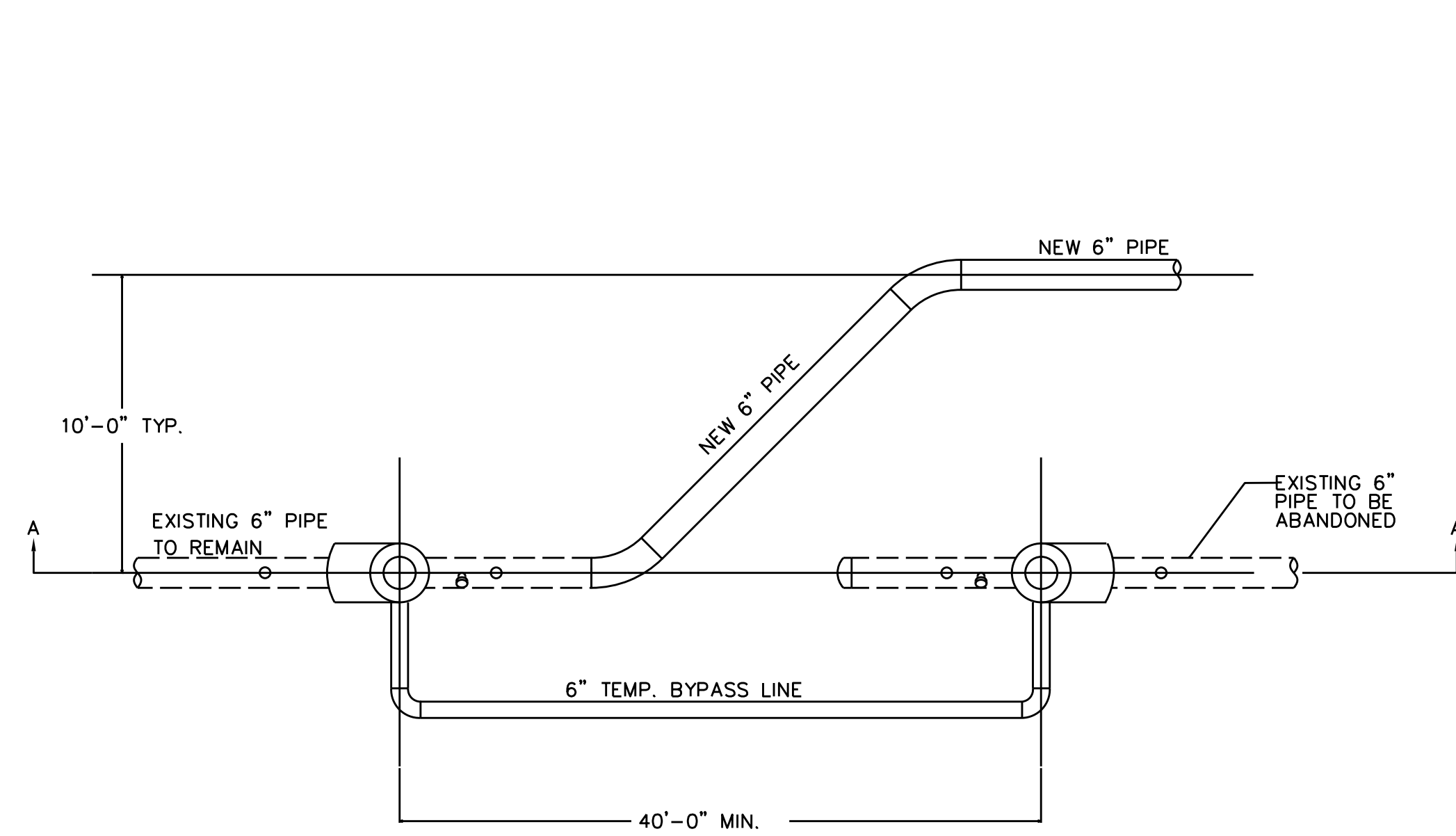


6 TEST STATION POLE INSTALLATION
NOT TO SCALE

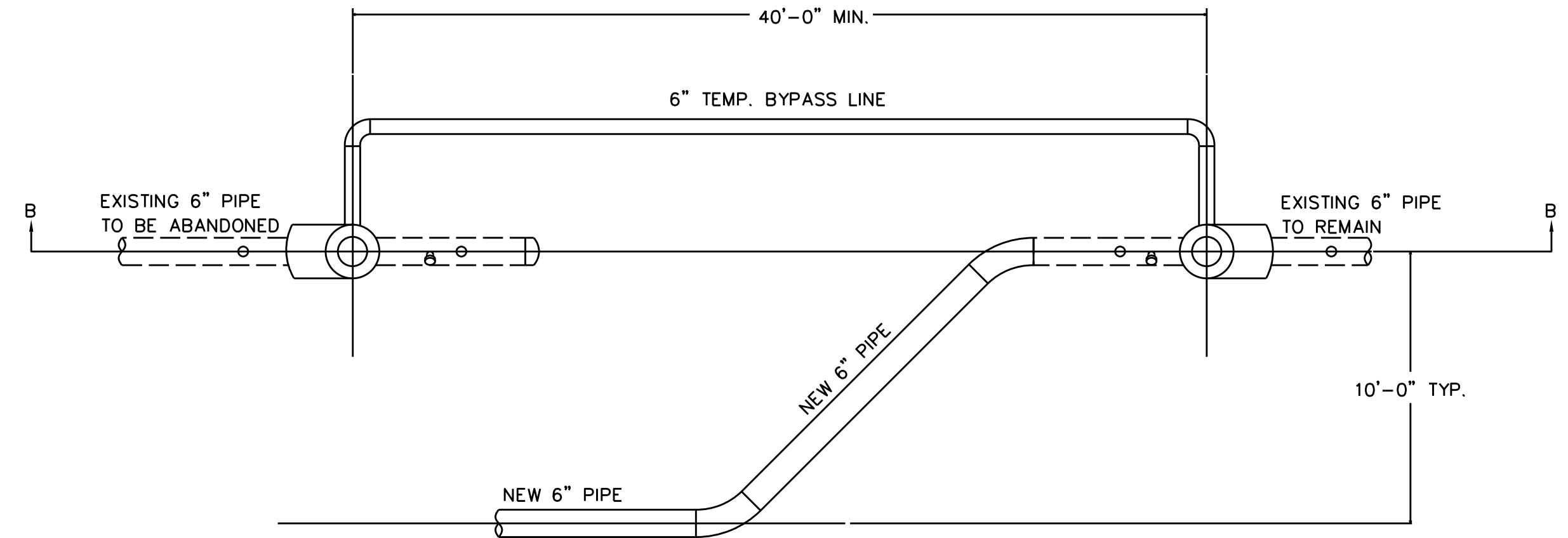
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6" BYPASS DETAILS

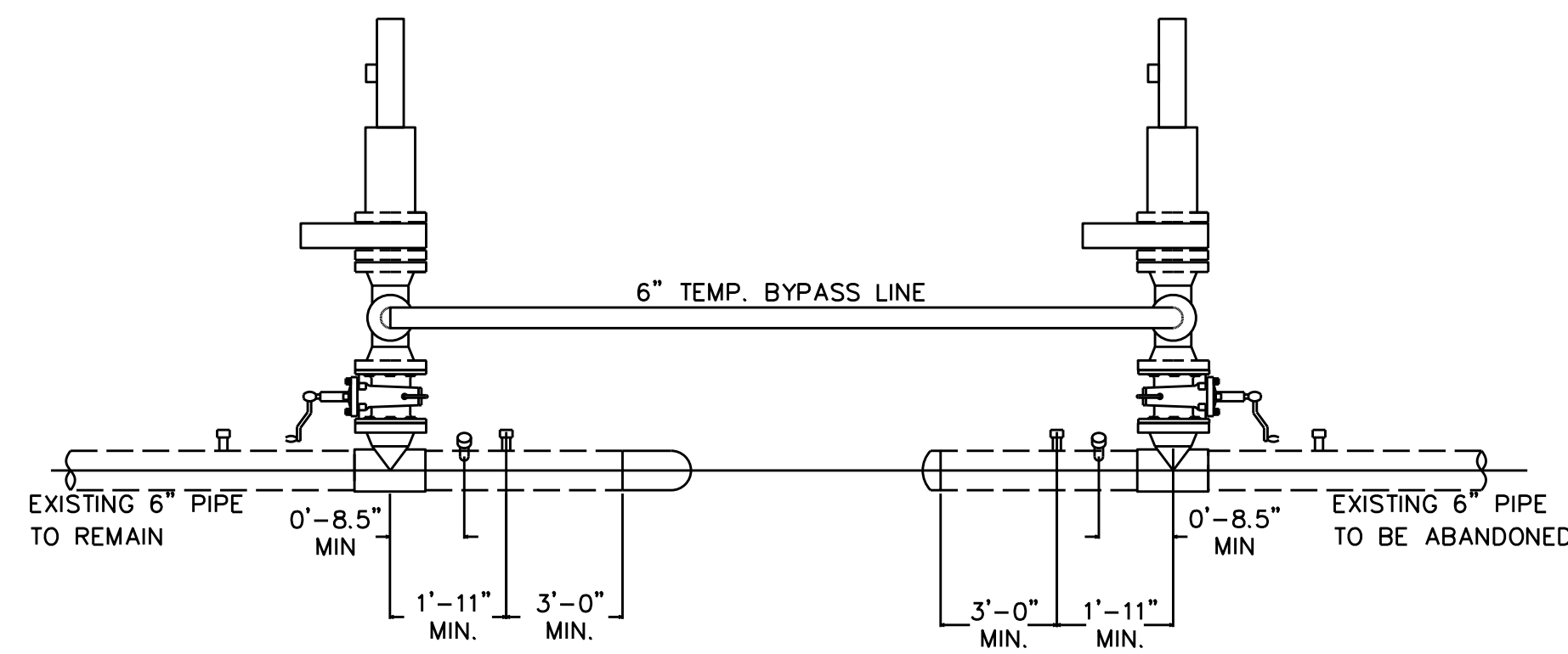
UTILITY CONSTRUCTION



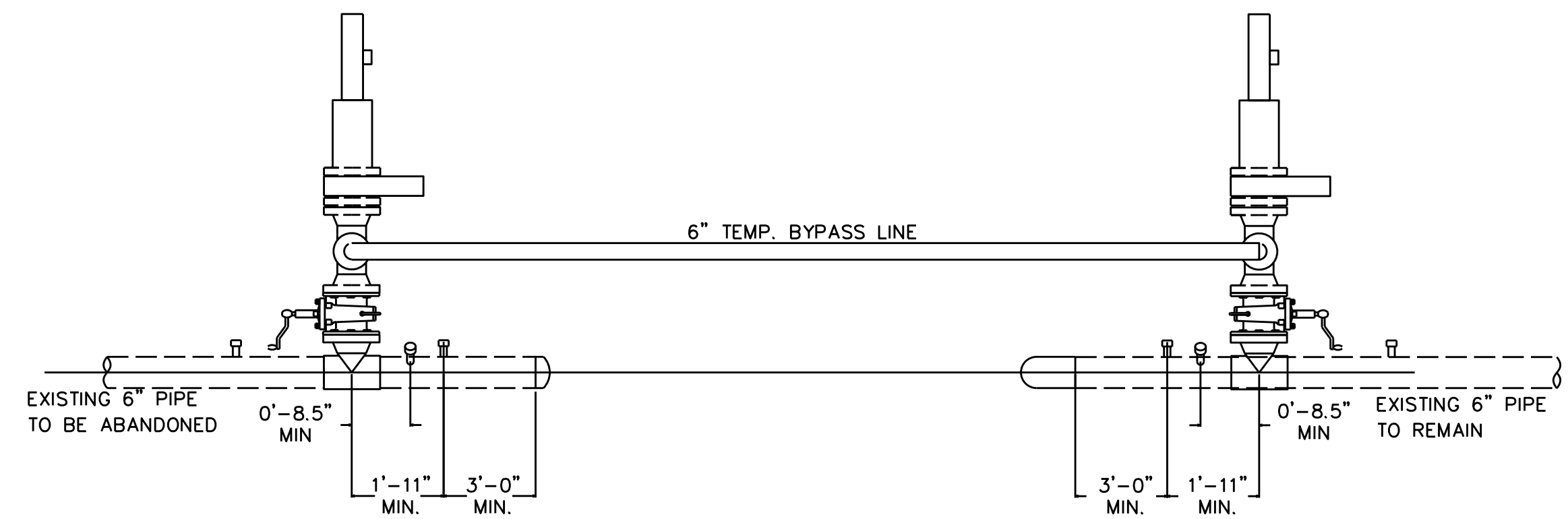
DETAIL-1
PLAN VIEW, NTS



DETAIL-2
PLAN VIEW, NTS

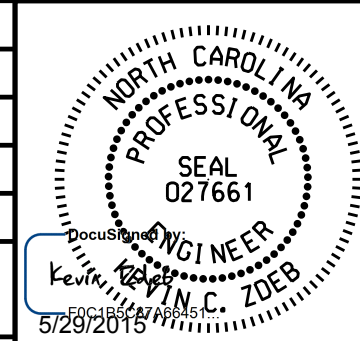


SECTION A-A
NOT TO SCALE
(SEE DETAIL-1, THIS DWG.)



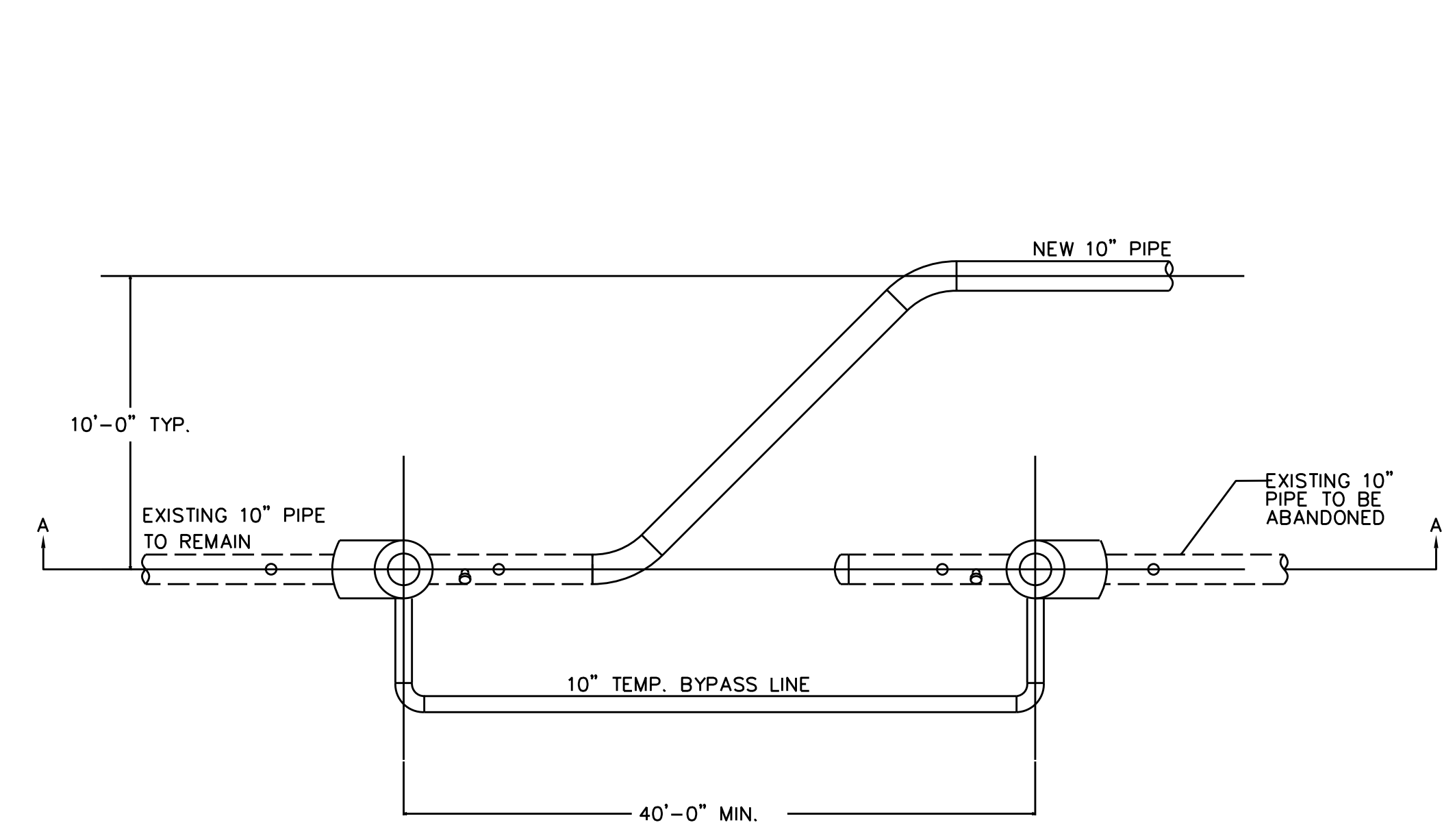
SECTION B-B
NOT TO SCALE
(SEE DETAIL-2, THIS DWG.)

5/14/99

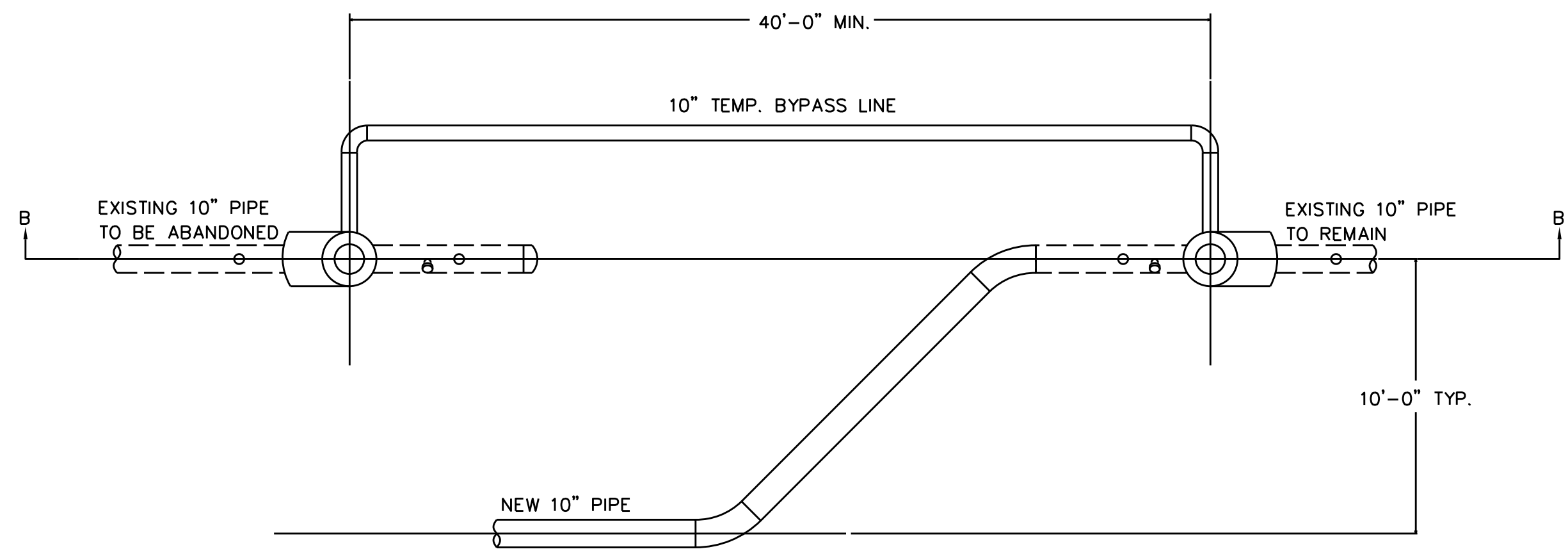
PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-3D
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

10" BYPASS DETAILS

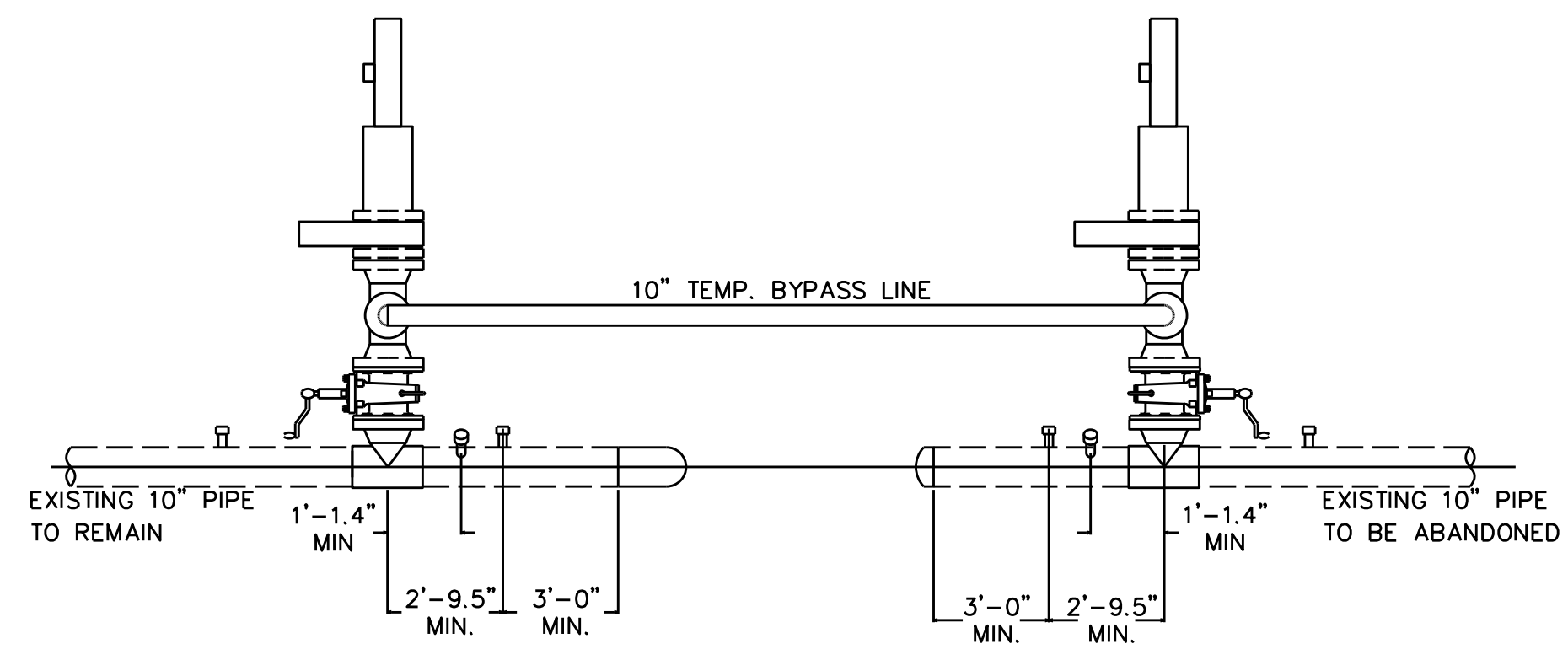
UTILITY CONSTRUCTION



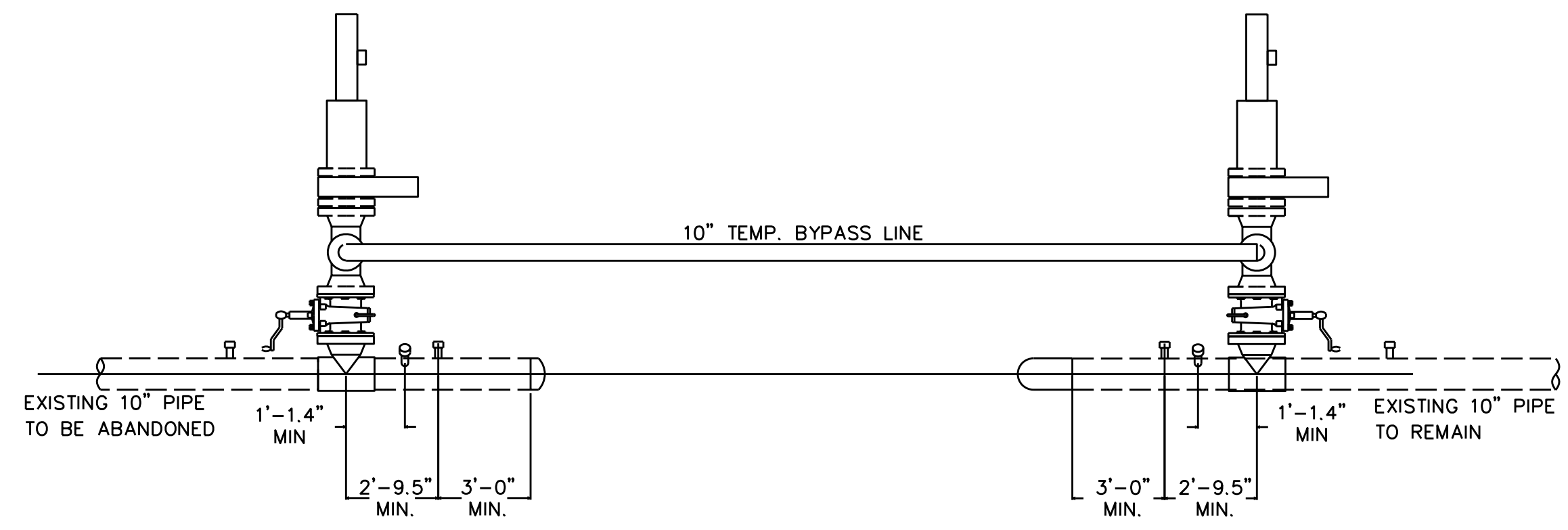
DETAIL-1
PLAN VIEW, NTS



DETAIL-2
PLAN VIEW, NTS



SECTION A-A
NOT TO SCALE
(SEE DETAIL-1, THIS DWG.)



SECTION B-B
NOT TO SCALE
(SEE DETAIL-2, THIS DWG.)

5/14/19

BILL OF MATERIALS

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-3E
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

BILL OF MATERIALS FOR LAUNCHER & RECEIVER STATION

DWG CODE NO.	QTY	UNIT	FNG PART NUMBER	DESCRIPTION	UNIT PRICE	TOTAL
PIPE						
1	5	LF		2" Pipe ERW Bare 2 x .500 X-52 DRL		0.00
2	30	LF		4" Pipe ERW Bare 4 x .237 X-52 DRL		0.00
3	180	LF		6" Steel Pipe - 6.625" OD x .280" W.T., API-5L X-52, 16/18 mil FBE Coating		0.00
4	100	LF		10" Steel Pipe (Non Drill) - 10.75" OD x .219" W.T., API-5L X-52, 16/18 mil FBE Coating		0.00
5	40	LF		6" Steel Pipe - 6.625" OD x .280" W.T., API-5L X-52, Bare Pipe		0.00
6	20	LF		10" Steel Pipe (Non Drill) - 10.75" OD x .219" W.T., API-5L X-52, Bare Pipe		0.00
VALVES						
10	6	EA		VALVE BALL 1 FPT LVR 3000 MWP RP 1" FNPT X FNPT		0.00
11	2	EA		LEVER OPERATED BALL VALVE THREADED END CONNECTION - 2-INCH		0.00
12	3	EA		VALVE PLUG 4 FxF ANSI 600 GEAR 4" RAISED FACE FLANGE X RAISED FACE FLANGE ANSI 600#		0.00
13	4	EA		VALVE BALL 6 WXW ANSI 600 W/7" EXT 12" ANSI 600# WELD X WELD BALL VALVESTANDARD TRIM FULL PORTGEAR		0.00
14	1	EA		VALVE BALL 10 WXW ANSI 600 W/7" EXT 12" ANSI 600# WELD X WELD BALL VALVESTANDARD TRIM FULL PORTGEAR		0.00
15	3	EA		VALVE BALL 1/2 FPT LVR HANDLE 3000MWP		0.00
16	3	EA		CLOSURE WELD 4 600# YALE FIG 500 PAV		0.00
WELD FITTINGS						
20	6	EA		ELL 6" 45 DEGREE 5R		0.00
21	1	EA		ELL 6" 90 DEGREE 5R		0.00
22	3	EA		ELL 10" 45 DEGREE 5R		0.00
23	3	EA		FLANGE BL RF 4 ANSI 600 1480MWP		0.00
24	9	EA		FLANGE RFWN 4 ANSI 600 1480 Y-52		0.00
25	2	EA		FLANGE BL RF 6 ANSI 600 1480MWP		0.00
26	2	EA		FLANGE RFWN 6 ANSI 600 1480 Y-52		0.00
27	1	EA		FLANGE BL RF 10 ANSI 600 1480MWP		0.00
28	1	EA		FLANGE RFWN 10 ANSI 600 1480MWP		0.00
29	2	EA		JOINT INSUL 6 W X W ANSI 600 1440MWP		0.00
30	1	EA		JOINT INSUL 10 W X W ANSI 600 1440MWP X52		0.00
31	2	EA		TEE WELD BBT 6 X 6 X 4 Y-52		0.00
32	2	EA		TEE WELD BBT 6 X 6 X 6 Y-52		0.00
33	1	EA		TEE WELD BBT 10 X 10 X 2 Y-52		0.00
34	1	EA		TEE WELD BBT 10 X 10 X 4 Y-52		0.00
35	2	EA		TEE WELD BBT 10 X 10 X 6 Y-52		0.00
MISC. MATERIAL						
40	1	EA		HEX HEAD PLUG - 2"		0.00
41	6	EA		NIPPLE SMLS 1 X 4 A106 SCH 80 TBE		0.00
42	2	EA		NIPPLE SMLS 1/2 X 4 A106 SCH 80 TBE		0.00
43	2	EA		THREDOLET STANDARD 6-10 X 1 3000# CLASS THREDOLET WITH BASE BEVELED TO WELD TO 6" - 10" NPS HEADER		0.00
44	1	EA		THREDOLET STANDARD 3-8 X 1/2		0.00
45	2	EA		SUPPORT PIPE 6 EZ LINE TYPE CSB		0.00
46	1	EA		SUPPORT PIPE 10 EZ LINE TYPE CSB		0.00
47	1	EA		GASKET SPIRAL 6 ANSI 600 SS BACKED		0.00
48	1	EA		GASKET SPIRAL 10 ANSI 600 SS BACKED		0.00
49	48	EA		NUT A194 HARD STEEL 1" (6" ANSI 600)		0.00
50	32	EA		NUT A194 HARD STEEL 1-1/4" (10" ANSI 600)		0.00
51	24	EA		STUD HARD 1 X 7-1/2 A193 (6" ANSI 600)		0.00
52	16	EA		STUD HARD 1-1/4 X 9 A193 (10" ANSI 600)		0.00
53	6	EA		GASKET SPIRAL 4 ANSI 600 SS BACKED		0.00
54	3	EA		PLUG FS 1 MPT		0.00
55	3	EA		PLUG FS 1/2 MPT		0.00
56	1	EA		NIPPLE SMLS TOE 2 X 6 A106		0.00
57	1	EA		NIPPLE SMLS 2 X 6 A106 SCH 80 TBE		0.00
58	24	EA		STUD HARD 7/8 X 6 A193 (4" ANSI 600)		0.00
59	48	EA		NUT A194 HARD STEEL 7/8 (4" ANSI 600)		0.00

BILL OF MATERIALS FOR PIPE LINE

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
PIPE				
50	LF	10" Steel Pipe (Non Drill) - 10.75" OD x .219" W.T., API-5L X-52, 16/18 mil FBE Coating		
1340	LF	10" Steel Pipe (Drill) - 10.75" OD x .250" W.T., API-5L X-52, Dual Coated		
60	LF	10" BYPASS PIPING		
6106	LF	6" Steel Pipe - 6.625" OD x .280" W.T., API-5L X-52, 16/18 mil FBE Coating		
1420	LF	6" BYPASS PIPING		
WELD FITTINGS				
1	EA	10" CAP		
4	EA	10" 45 DEGREE ELBOW		
4	EA	10" 90 DEGREE ELBOW		
1	EA	10" STOPPLE PLUS FITTING KIT		
1	EA	10" STOPPLE PLUS THROWAWAY FITTING		
2	EA	10" FLANGE		
2	EA	10" GASKET		
24	EA	STUD 1 1/4" X 7 1/2"		
48	EA	NUT 1 1/4"		
20	EA	6" CAP		
56	EA	6" 45 DEGREE ELBOW		
61	EA	6" 90 DEGREE ELBOW		
15	EA	6" STOPPLE PLUS FITTING KIT		
15	EA	6" STOPPLE PLUS THROWAWAY FITTING		
30	EA	6" FLANGE		
30	EA	6" GASKET		
360	EA	STUD 1" X 6 3/4"		
720	EA	NUT 1"		
90	EA	THREAD O RING 2 THREAD O RING FTG 2 CS 3600 PSIG FOR 6.00 AND LARGER PIPE		
MISC. MATERIAL				
21	EA	TEST STATION , BIG FINK STYLE, ABOVE GROUND ON YELLOW POST		

5/14/19

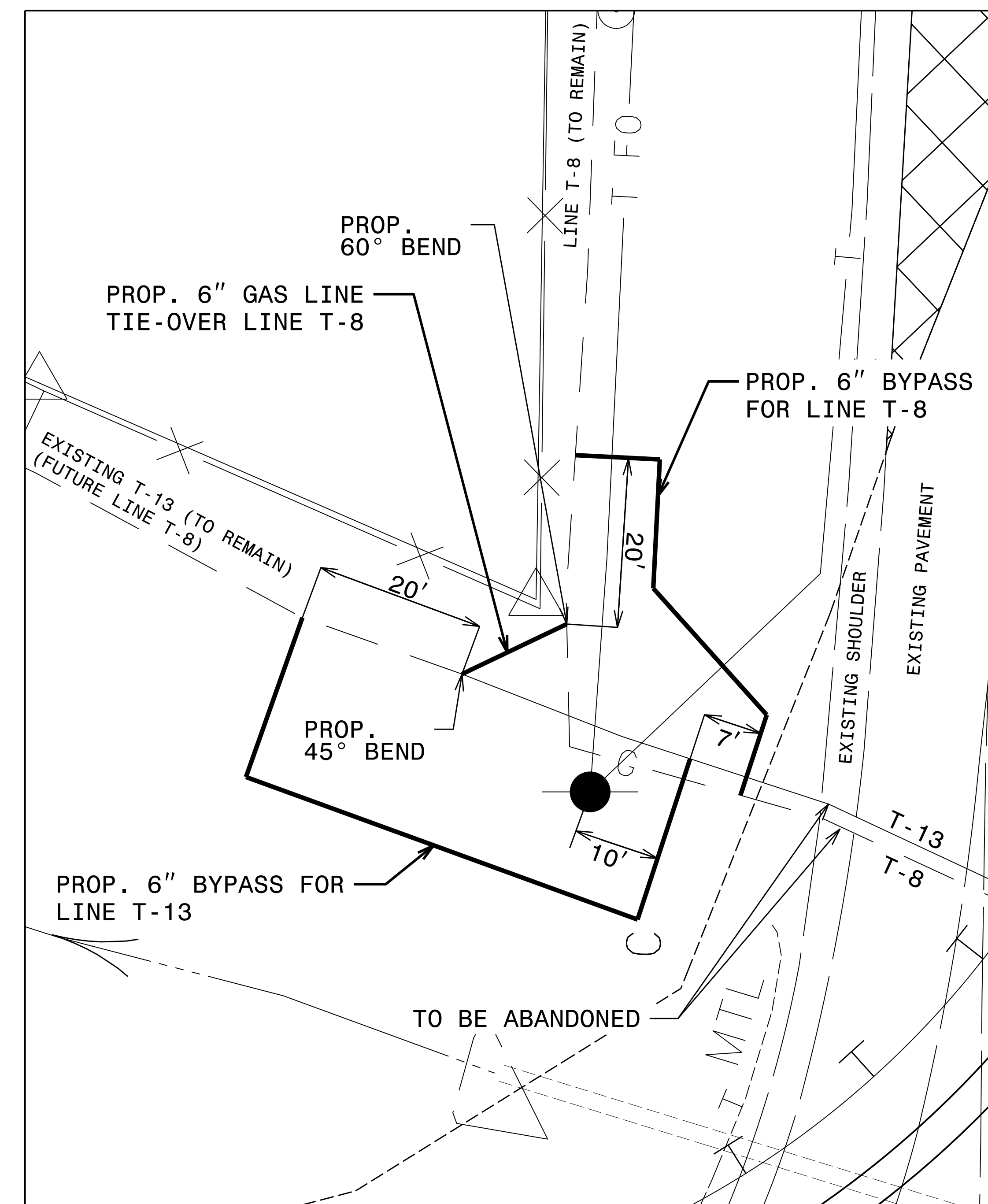
PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-3F
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

PROPOSED SEQUENCE FOR LAUNCHER & RECEIVER STATION CONSTRUCTION:

1. CONDUCT RELOCATIONS OF LINE T-13 WEST OF THE NEW LAUNCHER & RECEIVER STATION AS DEPICTED ON SHEETS UC-4 AND UC-5.
2. CONDUCT HDD INSTALLATION OF 10" GAS MAIN AND TEST PIPING.
3. CONDUCT SITE GRADING FOR LAUNCHER & RECEIVER STATION.
4. FABRICATE, CONSTRUCT, AND TEST LAUNCHER & RECEIVER STATION PIPING.
5. INSTALL 6" BYPASS ON T-13 AROUND STATION TIE-IN POINTS.
6. CUT AND REMOVE EXISTING 6" GAS PIPE (LINE T-13) AT STATION SITE.
7. INSTALL TWO (2) 6" BYPASSES, ONE EACH ON LINE T-8 AND LINE T-13 AT THE TIE-OVER LOCATION. SEE INSET A ON THIS SHEET.
8. CONDUCT TIE-OVER OF LINE T-13 TO LINE T-8. THIS PORTION OF EXISTING LINE T-13 BETWEEN THE NEW LAUNCHER & RECEIVER STATION AND THE TIE-OVER NOW BECOMES T-8.
9. CONDUCT TIE-INS TO LINE T-8 AND LINE T-13 AT THE NEW LAUNCHER & RECEIVER STATION.
10. INSTALL 10" BYPASS AT TIE-IN LOCATION ON SHEET UC-6.
11. TAKE EXISTING LAUNCHER & RECEIVER STATION OUT OF SERVICE. REMOVE BYPASSES AND STOPPLES AT ALL FOUR (4) LOCATIONS.
12. PLACE NEW LAUNCHER & RECEIVER STATION INTO SERVICE.

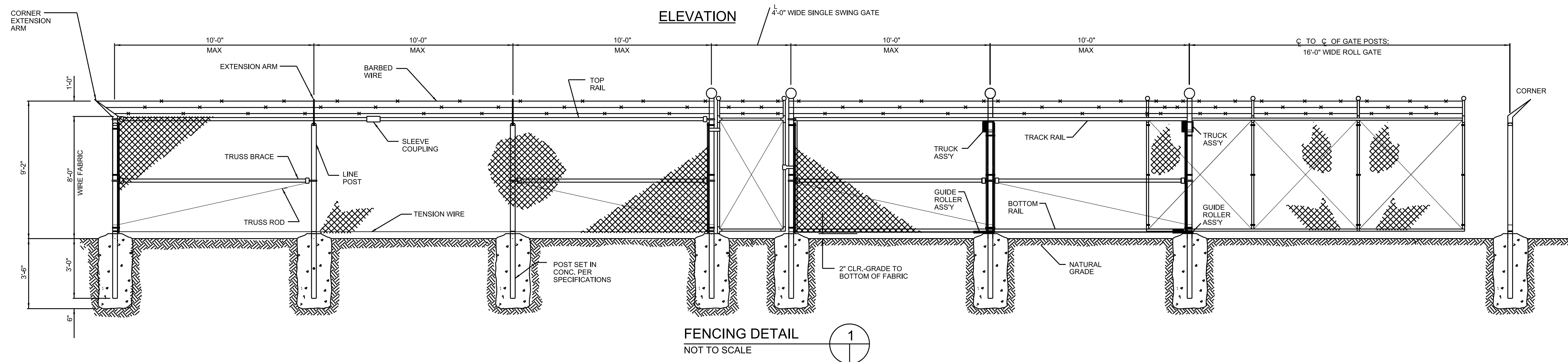
NOTE:
REFER TO SHEETS UC-5 AND UC-6



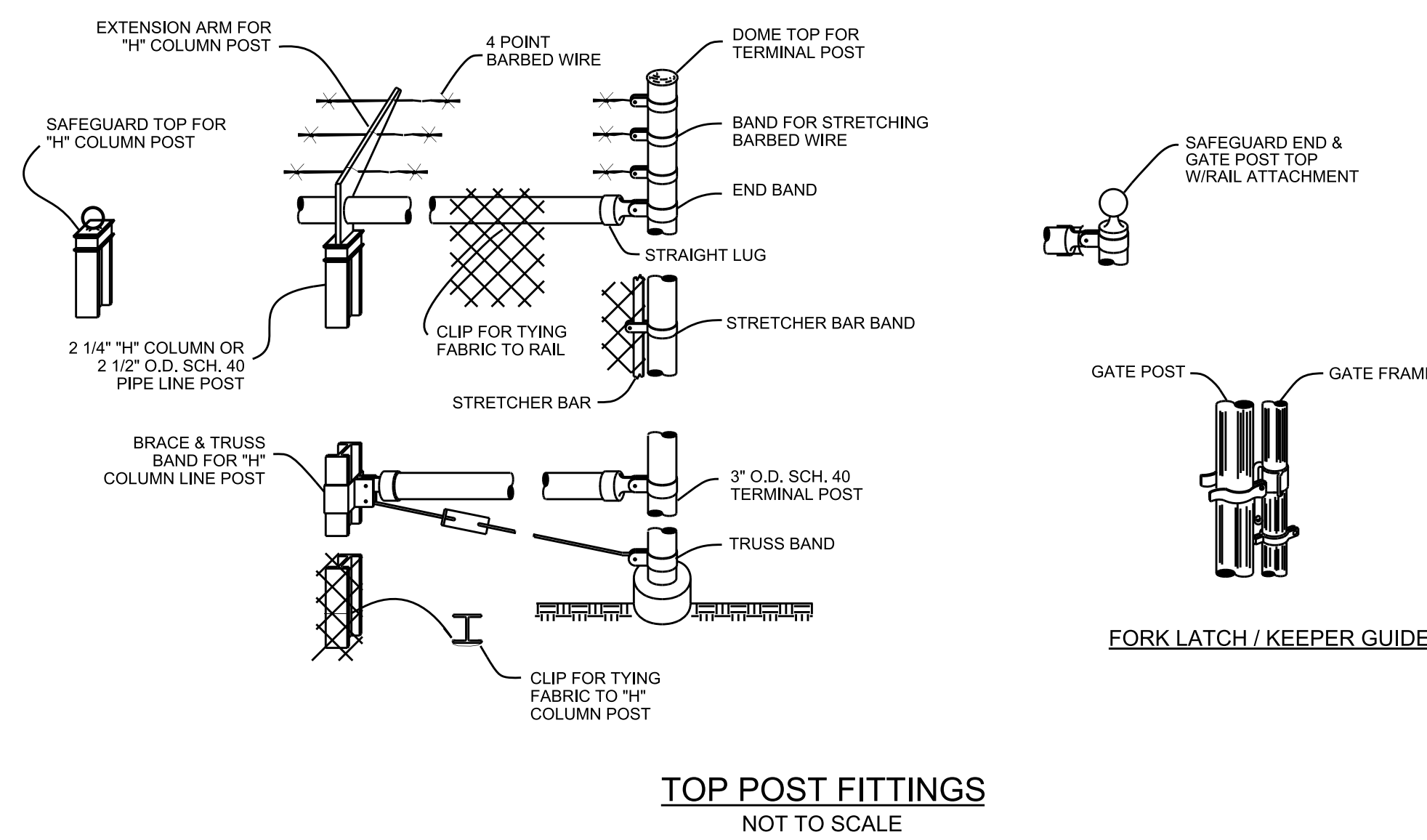
INSET A:
T-8 AND T-13 TIE-OVER WITH BYPASS LOCATIONS
SCALE: 1" = 10'
REFER TO SHEET UC-5

PROJECT REFERENCE NO. <i>R-2915A</i>	SHEET NO. <i>UC-3G</i>
DESIGNED BY: <i>KCZ</i>	
DRAWN BY: <i>SAG</i>	
CHECKED BY: <i>KCZ</i>	
APPROVED BY: <i>KCZ</i>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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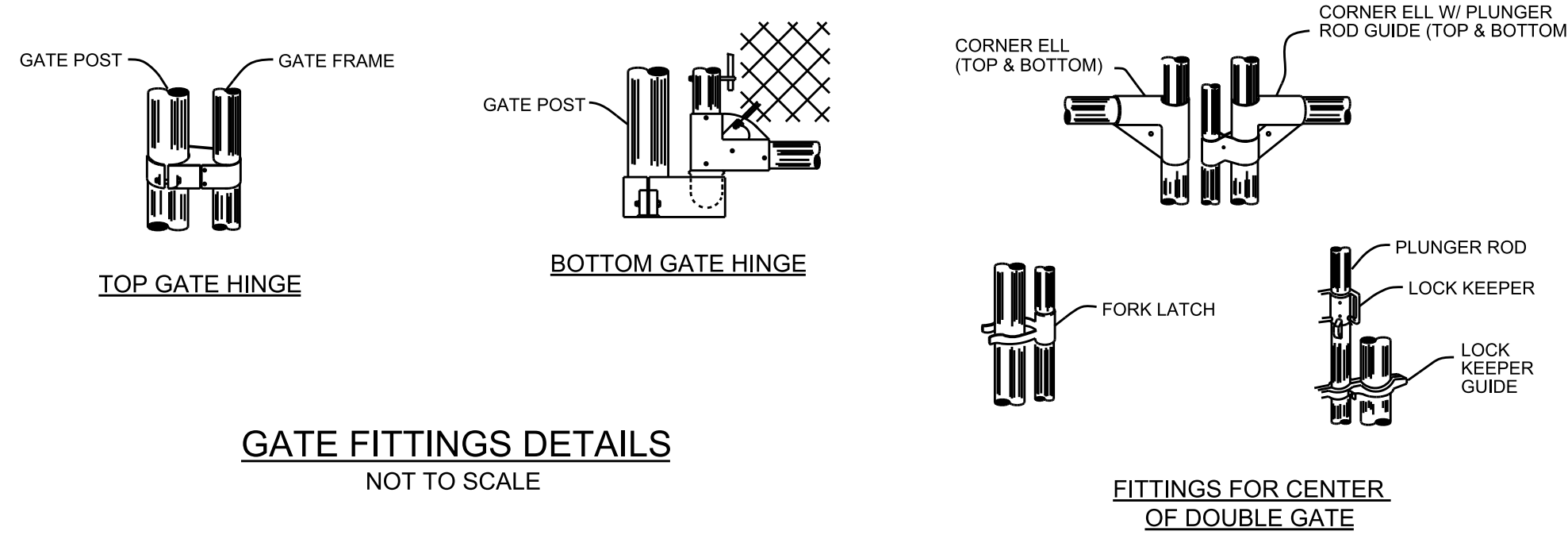
UTILITY CONSTRUCTION



FENCING DETAIL
NOT TO SCALE



TOP POST FITTINGS
NOT TO SCALE



GATE FITTINGS DETAILS
NOT TO SCALE

FITTINGS FOR CENTER
OF DOUBLE GATE

CHAIN LINK FENCE SPECIFICATIONS

1. INSTALLATION:

- FENCE ADDITION SHALL BE PLUMB AND TRUE TO LINE, CHAIN LINK FABRIC SHALL BE TAUT AND PROPERLY SECURED, CORNER BRACES AND DIAGONAL BRACES SHALL BE PROPERLY PLACED TO PREVENT SAGGING. THE COMPLETE INSTALLATION SHALL BE INSTALLED BY SKILLED AND EXPERIENCED FENCE ERECTORS, IN A WORKMANLIKE MANNER, IN ACCORDANCE WITH GOOD CONSTRUCTION PRACTICE AND IN ACCORDANCE WITH ALL LOCAL APPLICABLE CODES.
- ALL DIMENSIONS, ELEVATIONS AND LOCATIONS SHALL BE VERIFIED PRIOR TO STARTING WORK.
- CALL 811 PRIOR TO DIGGING FOR POST FOOTINGS

2. MATERIAL:

- ALL MATERIALS TO BE GALVANIZED (ZINC COATED) OR ALUMINIZED (ALUMINUM COATED), UNLESS SPECIFIED OTHERWISE. GALVANIZED MATERIAL SHALL BE COATED WITH 2 OZ. PER SQUARE FOOT OF HOT-DIPPED ZINC.
- FENCE CHAIN LINK FABRIC TO MEET THE FOLLOWING REQUIREMENTS: #9 GAUGE WIRE, 2" MESH, TOP AND BOTTOM EDGES TWISTED AND BARBED
- RAZOR WIRE TO MEET THE FOLLOWING REQUIREMENTS: 18" DIAMETER LOOP, 6" SPREAD, LOCATE AT TOP AND BOTTOM OF THE FENCE.
- BARBED WIRE TO MEET THE FOLLOWING REQUIREMENTS: #12-1/2 GAUGE STEEL WIRE WITH ALUMINUM COATING, #14 GAUGE, FOUR-POINT BARBS SPACED AT 5" ON CENTER (MAX).
- BOTTOM WIRE SHALL BE #7 GAUGE.
- SINGLE EXTENSION ARMS FOR BARBED WIRE SHALL BE #12 GAUGE AND POINT OUTWARD AT AN ANGLE OF 45 DEGREES.
- LINE POSTS SHALL BE 2-1/2" DIAMETER, SCHEDULE 40 PIPE SPACED AT 10'-0" ON CENTER (MAX).
- TOP RAIL SHALL BE 1-5/8" DIAMETER, SCHEDULE 40 PIPE.
- END, CORNER AND GATE POSTS SHALL BE 3" DIAMETER, SCHEDULE 40 PIPE.
- CONCRETE POST FOOTINGS FOR LINE POSTS SHALL BE INSTALLED TO A MINIMUM DEPTH OF 3'-3" AND HAVE A MINIMUM DIAMETER OF 10". POSTS MUST BE EMBEDDED IN THE CONCRETE FOOTING TO A MINIMUM DEPTH OF 3'-0". THERE SHALL BE A MINIMUM SPACING OF 3" BETWEEN BOTTOM OF THE POST AND BOTTOM OF THE FOOTING. CONCRETE SHALL HAVE STRENGTH OF 3000 PSI AT 28 DAYS.
- CONCRETE POST FOOTINGS FOR GATE AND CORNER POSTS SHALL BE INSTALLED TO A MINIMUM DEPTH OF 3'-6" AND HAVE A MINIMUM DIAMETER OF 1'-4" FOR POSTS ≤ 4" DIAMETER. FOOTINGS FOR POSTS > 4" DIAMETER SHALL HAVE A MINIMUM DIAMETER OF 2'-0". POSTS MUST BE EMBEDDED IN THE CONCRETE FOOTING TO A MINIMUM DEPTH OF 3'-0". THERE SHALL BE A MINIMUM SPACING OF 6" BETWEEN BOTTOM OF THE POST AND BOTTOM OF THE FOOTING. CONCRETE SHALL HAVE STRENGTH OF 3000 PSI AT 28 DAYS.
- BRACING RAILS AT ENDS, CORNERS AND GATES SHALL BE 1-1/2" DIAMETER, SCHEDULE 40 PIPE SPACED EVENLY BETWEEN TOP RAIL AND BOTTOM WIRE.

- TRUSS RODS, IF NECESSARY, SHALL BE 1/2" DIAMETER MINIMUM.
- STRETCHER BAR SHALL ENGAGE EACH FABRIC LINK. BANDS INSTALLED TO SECURE STRETCHER BAR SHALL BE LOCATED WITHIN 4" OF TOP RAIL AND BOTTOM WIRE AND SPACED AT 1'-2" ON CENTER (MAX).
- CLAMPS AND BANDS SHALL UTILIZE 1/2" BOLTING (MIN).
- TIE WIRE FOR POSTS SHALL BE #9 GAUGE WIRE SPACED AT 1'-2" ON CENTER (MAX).
- TIE WIRE FOR TOP AND BRACING RAIL SHALL BE #9 GAUGE WIRE SPACED AT 2'-0" ON CENTER (MAX). WHERE HORIZONTAL RAILS AND POSTS INTERSECT, TIE WIRE MUST BE INSTALLED ON EACH SIDE OF THE POST ALONG THE HORIZONTAL RAIL; MAXIMUM SPACING FROM POST IS 2'-0".

3. FENCE SECTION:

- HEIGHT OF FENCE SHALL BE A MINIMUM OF 9'-0" TOTAL. CHAIN LINK FABRIC MUST BE MINIMUM HEIGHT OF 8'-0" WITH THREE STRANDS OF BARBED WIRE SECURELY ATTACHED TO SINGLE EXTENSION ARMS ALONG TOP OF CHAIN LINK FABRIC; TOP STRAND TO BE 1'-0" ABOVE TOP OF CHAIN LINK FABRIC. THERE SHALL BE LESS THAN 2" OF SPACING BETWEEN GROUND AND CHAIN LINK FABRIC.

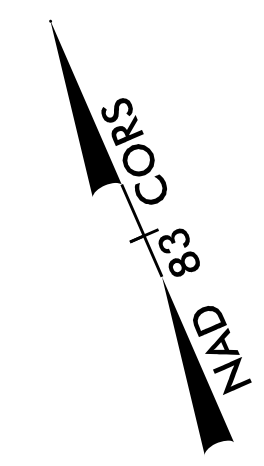
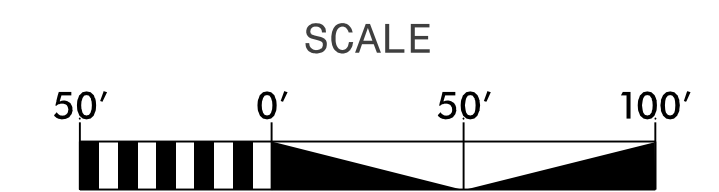
4. GATES:

- GATES CAN BE CUSTOM SIZE. NORMAL ACCESS GATES SHALL BE A MINIMUM WIDTH OF 3'-0". VEHICLE ACCESS GATES SHALL BE A MINIMUM WIDTH OF 16'-0". FINISHED GRADE ALONG ALL GATES SHALL BE LEVEL. SLIDING GATES SHALL HAVE A WHEEL CARRIER TRACK THAT IS 2'-0" (MIN) WIDE CONCRETE.
- ALL WALK GATES SHALL BE EQUIPPED WITH A PANIC BAR EXIT KIT AND A BACKING PLATE TO PREVENT OPERATION OF PANIC BAR FROM OUTSIDE OF FENCE.

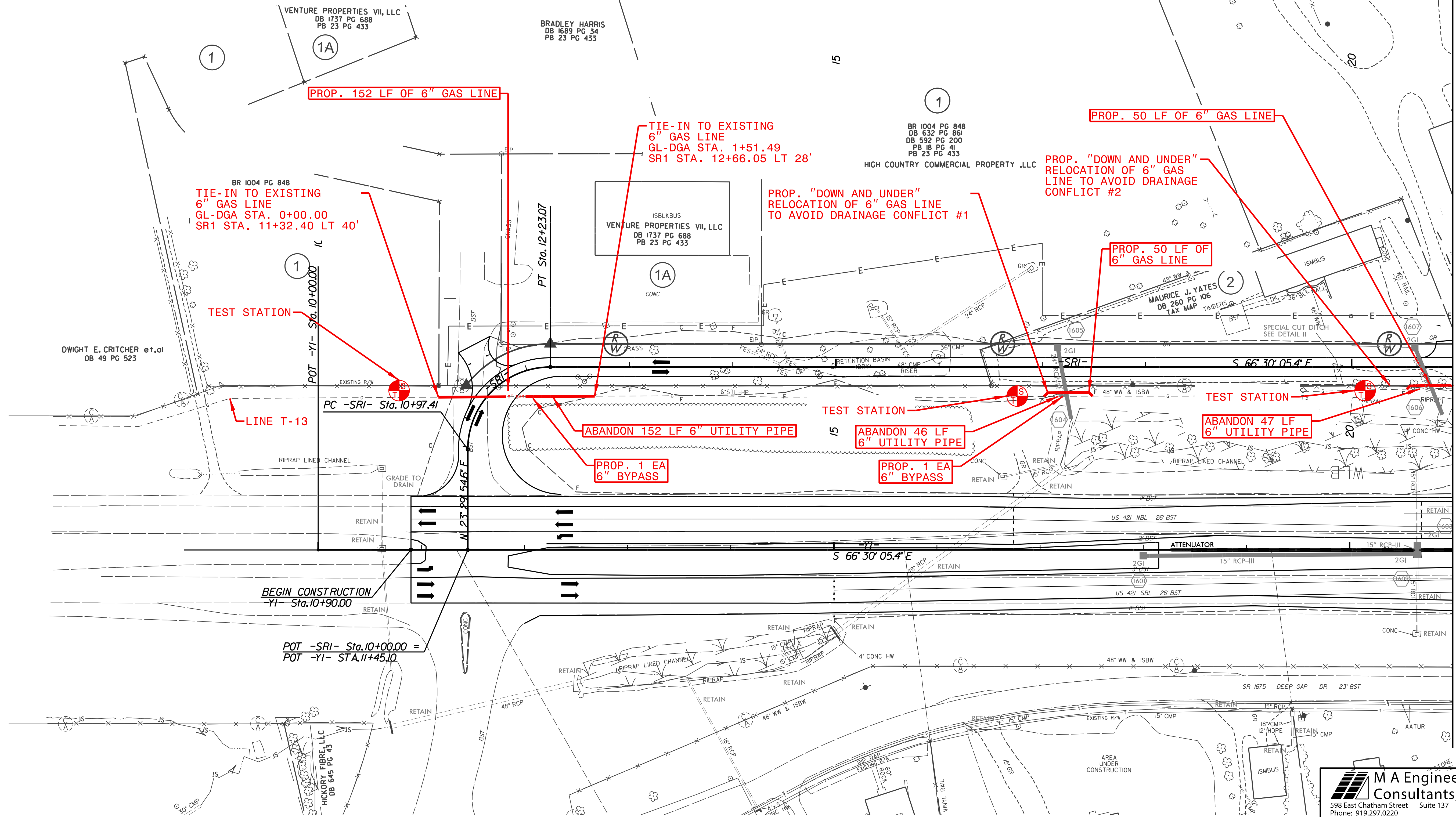
5/14/19
C:\Users\jgibson\OneDrive\Documents\Projects\2019\190511\190511-0000\190511-0000.dwg

- NOTES:**
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. EXISTING DISTRIBUTION 2" GAS MAIN OWNED BY FNG AND LOCATED IN A 20' EASEMENT OUTSIDE OF THE NCDOT R/W SHALL BE RELOCATED BY FNG IN THE AREAS OF CONFLICT WITH -SR1-. CONTRACTOR TO VERIFY LOCATION OF EXISTING 2" GAS MAIN.
 3. EXISTING DRIVEWAY THAT SERVES THE DOLLAR GENERAL STORE AND OTHER PARCELS MUST KEEP ONE LANE OPEN AT ALL TIMES FOR TRAFFIC.
 4. ABANDONED GAS LINES NOTED ON THIS SHEET SHALL BE REMOVED.
 5. SEE SHEET UC-16 FOR GL-DGA PROFILE.
 6. ONE TEMPORARY BYPASS SHALL BE INSTALLED TO ENCOMPASS THE TIE-IN POINTS FOR GL-DGA AND OPEN TRENCHED ACROSS THE DOLLAR GENERAL DRIVEWAY. TEMPORARY BYPASS PIPING SHALL BE REMOVED ONCE NEW GAS MAIN IS PLACED INTO SERVICE.
 7. "DOWN AND UNDER" AND GL-DGA RELOCATIONS SHALL BE INSTALLED IN SAME HORIZONTAL LOCATION AS THE EXISTING PIPE.
 8. ONE TEMPORARY BYPASS SHALL BE INSTALLED TO ENCOMPASS THE WESTERN TIE-IN POINT OF DRAINAGE CONFLICT #1 AND THE EASTERN TIE-IN POINT OF DRAINAGE CONFLICT #2.
 9. RELOCATIONS ON LINE T-13 SHALL BE COMPLETED BEFORE THE NEW LAUNCHER & RECEIVER STATION IS PUT INTO SERVICE.

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-4
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



Conflict	Size	Drainage Pipe			Gas Pipe			Proposed Clearance
		Top	Invert	Bottom	Top	Invert	Bottom	
1	24" RCP	3008.72	3006.47	3006.22	3002.22	3001.69	3001.67	4 ft
2	24" RCP	2999.77	2997.52	2997.27	2993.27	2992.74	2992.72	4 ft

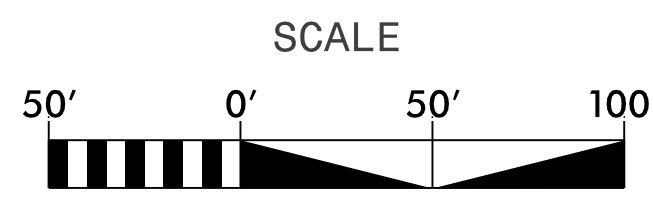


MATCHLINE YI STA. 21+00 SEE SHEET UC-5

M A Engineering Consultants, Inc.
 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 Fax: 919.297.0221

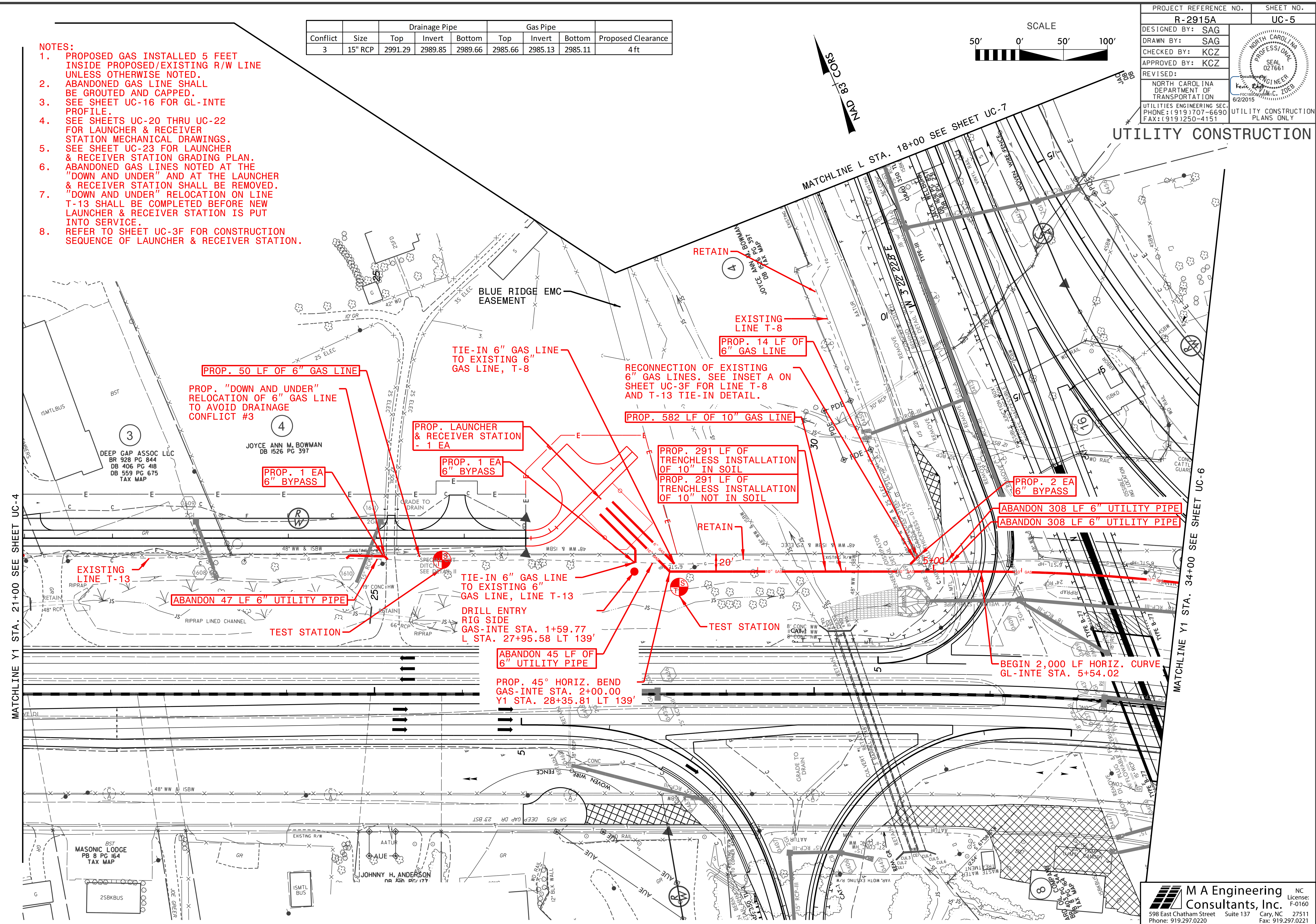
5/14/19

Conflict	Size	Drainage Pipe			Gas Pipe			Proposed Clearance
		Top	Invert	Bottom	Top	Invert	Bottom	
3	15" RCP	2991.29	2989.85	2989.66	2985.66	2985.13	2985.11	4 ft

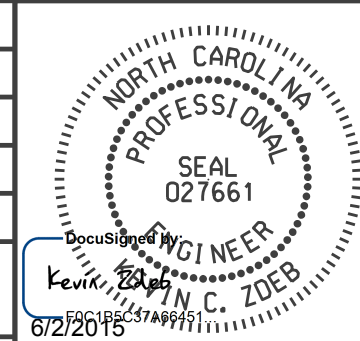


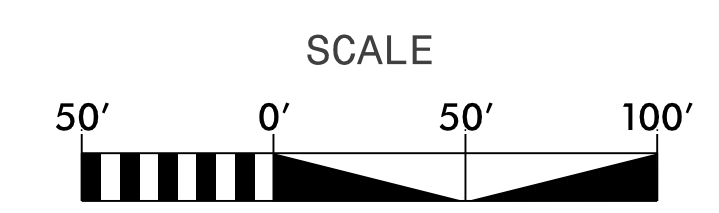
PROJECT REFERENCE NO. R-2915A	SHEET NO. UC-5
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISIONS:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

- NOTES:**
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEET UC-16 FOR GL-INTE PROFILE.
 4. SEE SHEETS UC-20 THRU UC-22 FOR LAUNCHER & RECEIVER STATION MECHANICAL DRAWINGS.
 5. SEE SHEET UC-23 FOR LAUNCHER & RECEIVER STATION GRADING PLAN.
 6. ABANDONED GAS LINES NOTED AT THE "DOWN AND UNDER" AND AT THE LAUNCHER & RECEIVER STATION SHALL BE REMOVED.
 7. "DOWN AND UNDER" RELOCATION ON LINE T-13 SHALL BE COMPLETED BEFORE NEW LAUNCHER & RECEIVER STATION IS PUT INTO SERVICE.
 8. REFER TO SHEET UC-3F FOR CONSTRUCTION SEQUENCE OF LAUNCHER & RECEIVER STATION.

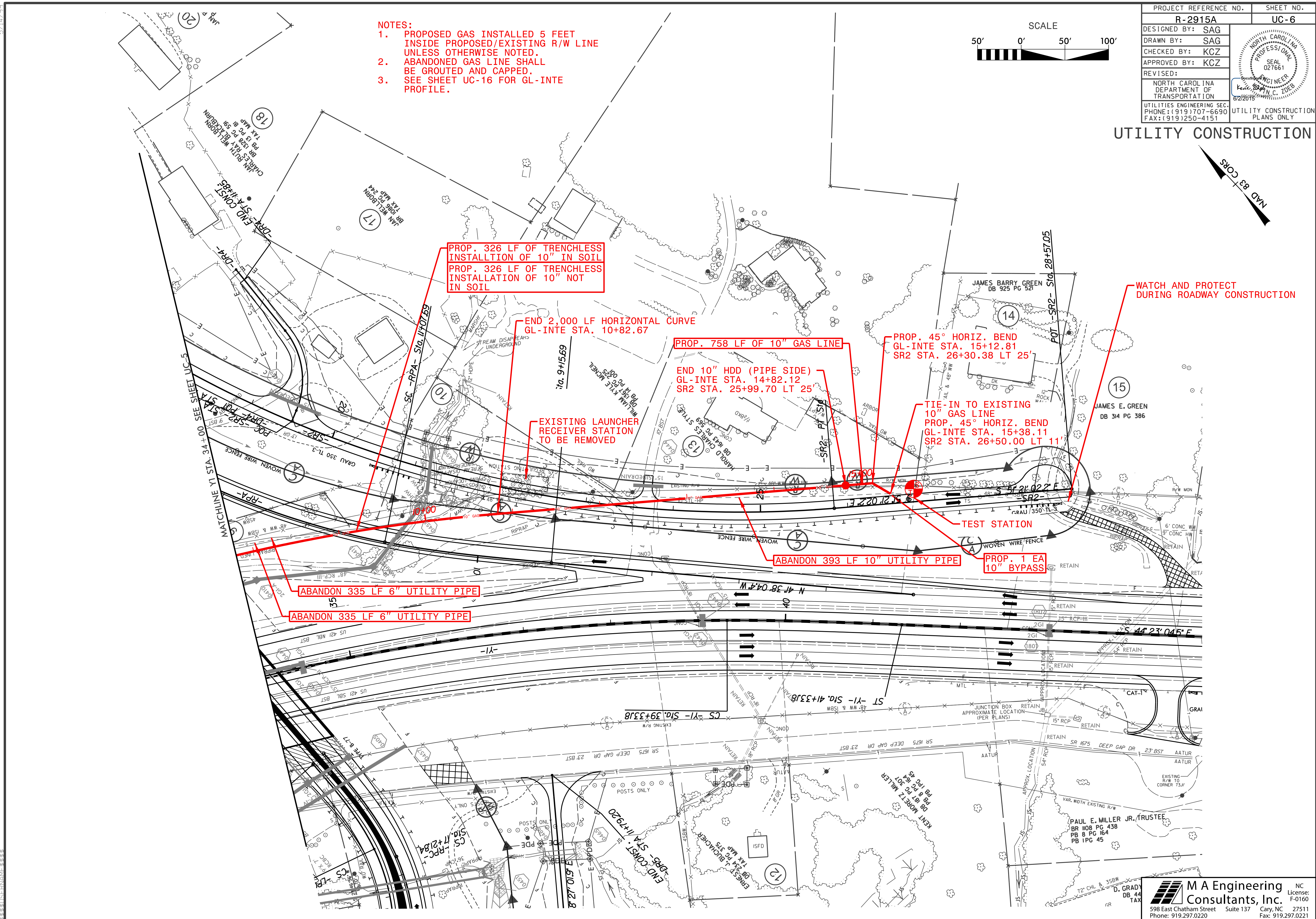


5/14/09

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-6
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY



- NOTES:
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEET UC-16 FOR GL-INTE PROFILE.



UTILITY CONSTRUCTION

MAD 83 CORP

WATCH AND PROTECT DURING ROADWAY CONSTRUCTION

PROP. 326 LF OF TRENCHLESS INSTALLATION OF 10" IN SOIL
PROP. 326 LF OF TRENCHLESS INSTALLATION OF 10" NOT IN SOIL

END 2,000 LF HORIZONTAL CURVE
GL-INTE STA. 10+82.67

PROP. 758 LF OF 10" GAS LINE

END 10" HDD (PIPE SIDE)
GL-INTE STA. 14+82.12
SR2 STA. 25+99.70 LT 25'

PROP. 45° HORIZ. BEND
GL-INTE STA. 15+12.81
SR2 STA. 26+30.38 LT 25'

TIE-IN TO EXISTING 10" GAS LINE
PROP. 45° HORIZ. BEND
GL-INTE STA. 15+38.11
SR2 STA. 26+50.00 LT 11'

EXISTING LAUNCHER RECEIVER STATION TO BE REMOVED

TEST STATION

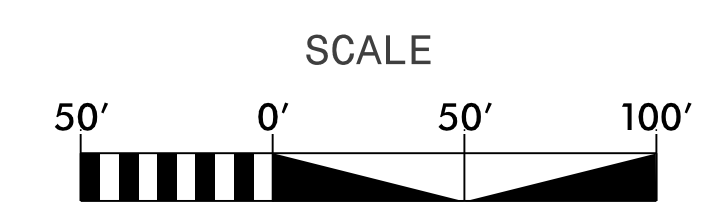
ABANDON 393 LF 10" UTILITY PIPE

PROP. 1 EA 10" BYPASS

ABANDON 335 LF 6" UTILITY PIPE

ABANDON 335 LF 6" UTILITY PIPE

NAD 83 CORS

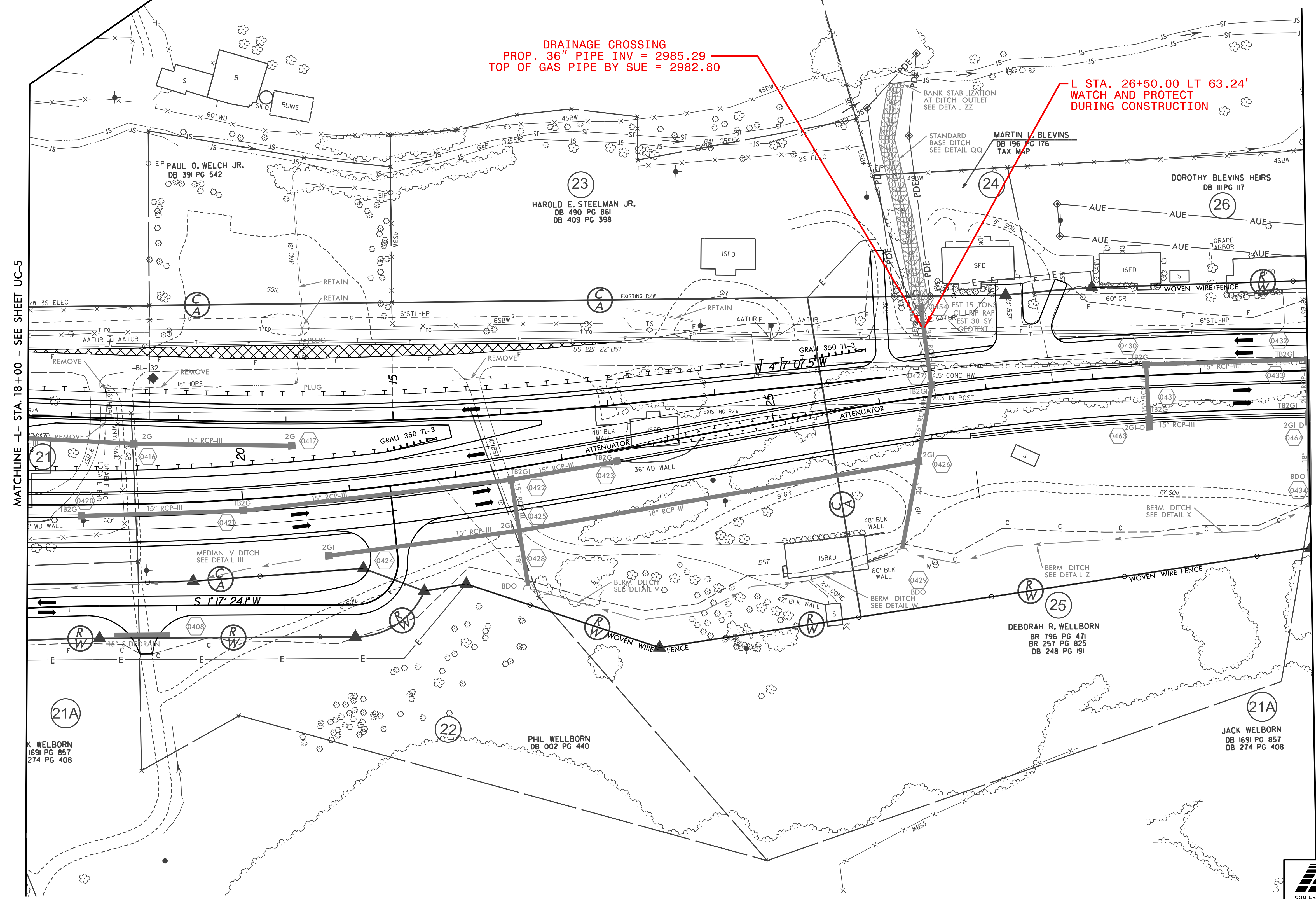


PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-7
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

NOTE:
1. NO GAS MAIN RELOCATION NECESSARY ON THIS SHEET.

DRAINAGE CROSSING
PROP. 36" PIPE INV = 2985.29
TOP OF GAS PIPE BY SUE = 2982.80

L STA. 26+50.00 LT 63.24'
WATCH AND PROTECT
DURING CONSTRUCTION



MATCHLINE -L- STA. 18+00 - SEE SHEET UC-5

MATCHLINE -L- STA. 30+00 - SEE SHEET UC-8

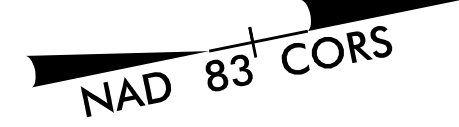
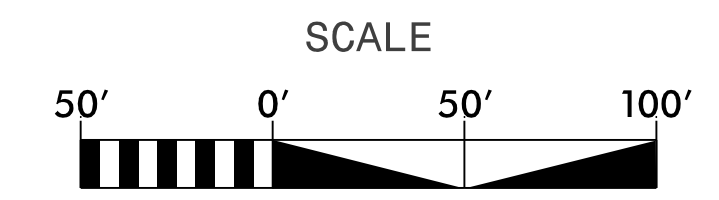
WELBORN
DB 1691 PG 857
DB 274 PG 408

PHIL WELBORN
DB 002 PG 440

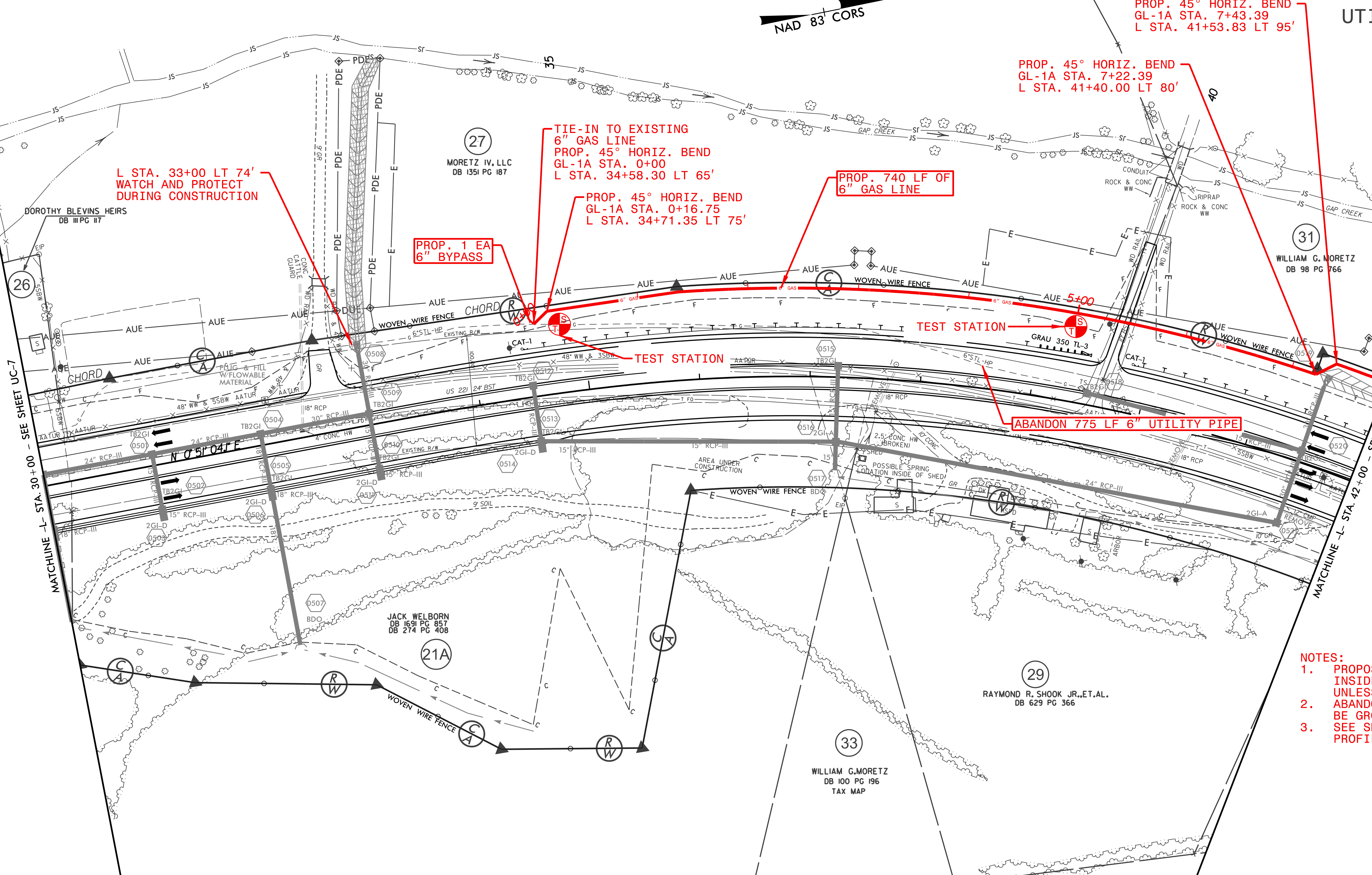
DEBORAH R. WELBORN
BR 796 PG 471
BR 257 PG 825
DB 248 PG 191

JACK WELBORN
DB 1691 PG 857
DB 274 PG 408

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-8
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



UTILITY CONSTRUCTION



L STA. 33+00 LT 74'
WATCH AND PROTECT
DURING CONSTRUCTION

TIE-IN TO EXISTING
6" GAS LINE
PROP. 45° HORIZ. BEND
GL-1A STA. 0+00
L STA. 34+58.30 LT 65'

PROP. 45° HORIZ. BEND
GL-1A STA. 0+16.75
L STA. 34+71.35 LT 75'

PROP. 1 EA
6" BYPASS

PROP. 740 LF OF
6" GAS LINE

PROP. 45° HORIZ. BEND
GL-1A STA. 7+22.39
L STA. 41+40.00 LT 80'

PROP. 45° HORIZ. BEND
GL-1A STA. 7+43.39
L STA. 41+53.83 LT 95'

ABANDON 775 LF 6" UTILITY PIPE

- NOTES:**
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEET UC-17 FOR GL-1A PROFILE.

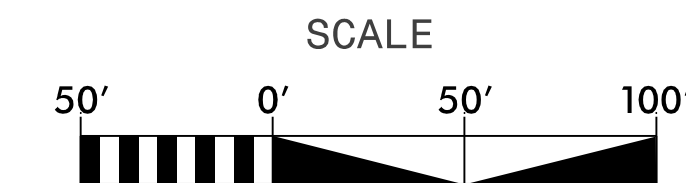
REVISIONS

MATCHLINE -L- STA. 30+00 - SEE SHEET UC-7

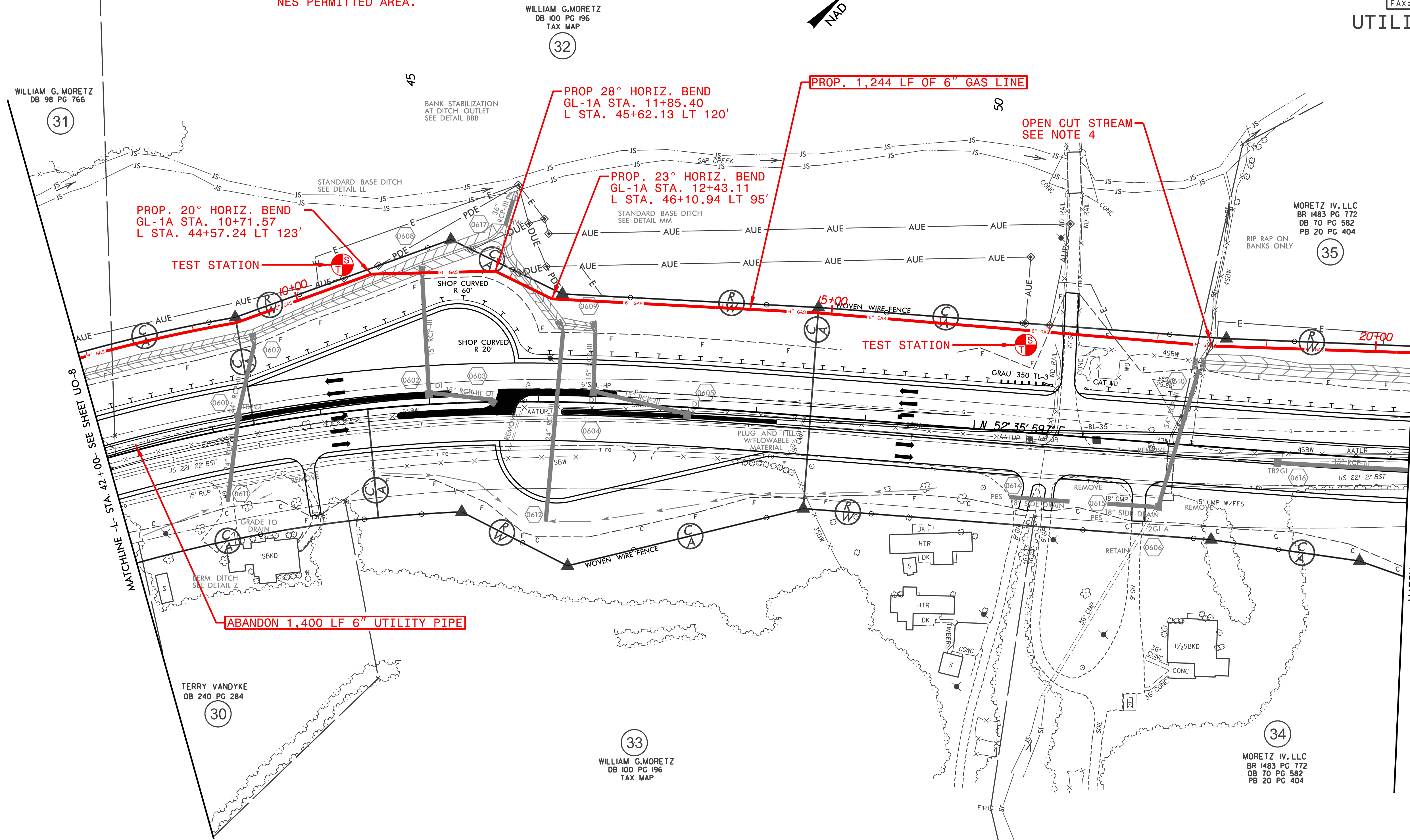
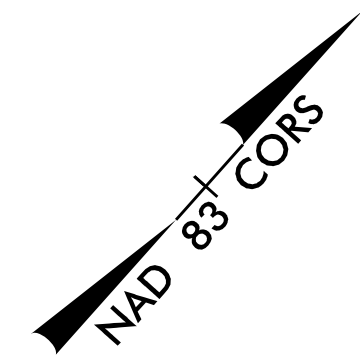
MATCHLINE -L- STA. 42+00 - SEE SHEET UC-9

\$FILE\$
\$DATE\$

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-9
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



- NOTES:**
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEETS UC-17 & UC-18 FOR GL-1A PROFILE.
 4. OPEN TRENCH CONSTRUCTION OF STREAM ONLY WITHIN NES PERMITTED AREA.



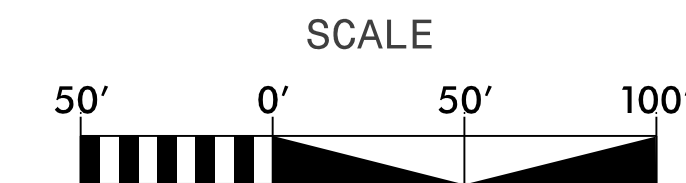
REVISIONS

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\$DATE\$

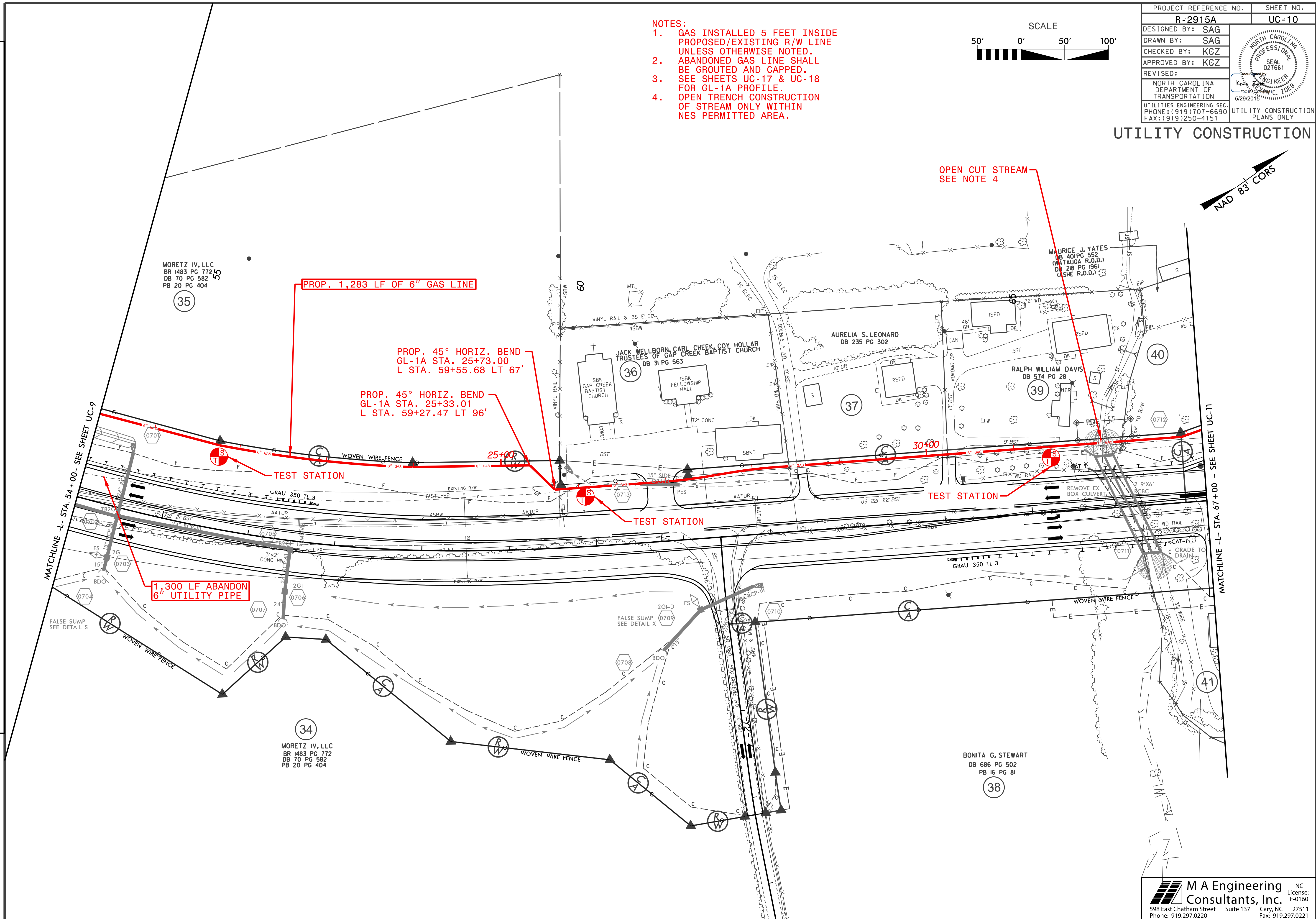
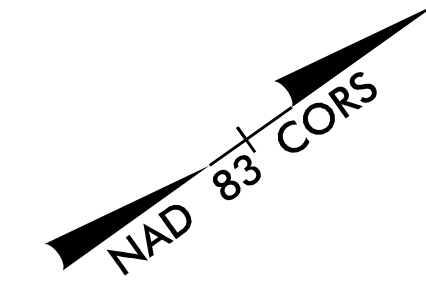
MATCHLINE -L- STA. 54+00 - SEE SHEET UO-10

MATCHLINE -L- STA. 42+00- SEE SHEET UO-8

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-10
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



- NOTES:
1. GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEETS UC-17 & UC-18 FOR GL-1A PROFILE.
 4. OPEN TRENCH CONSTRUCTION OF STREAM ONLY WITHIN NES PERMITTED AREA.



MATCHLINE -L- STA. 54+00- SEE SHEET UC-9

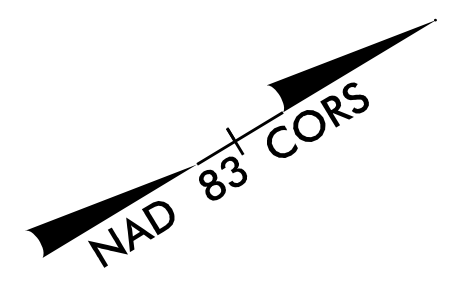
MATCHLINE -L- STA. 67+00 - SEE SHEET UC-11

REVISIONS

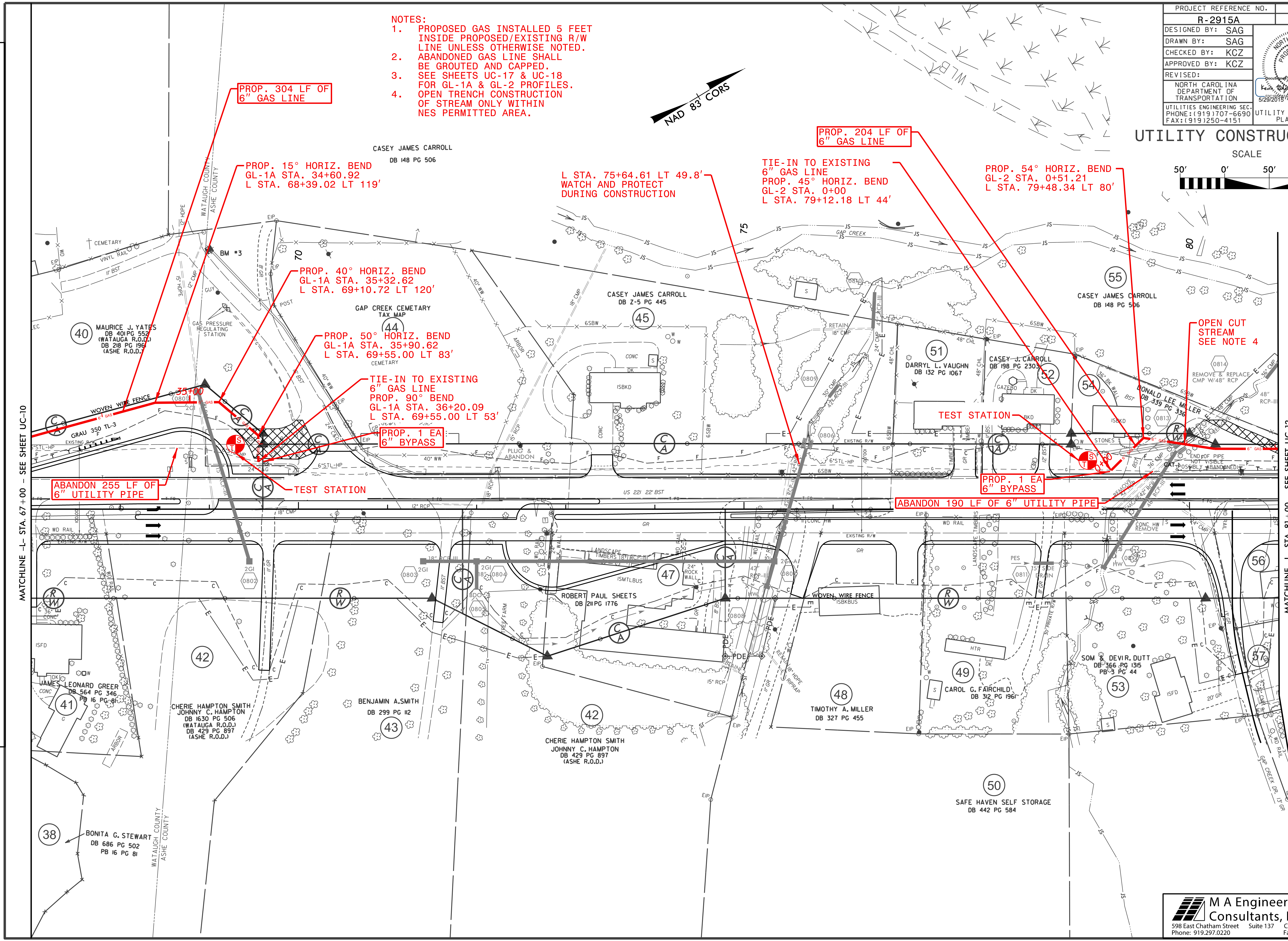
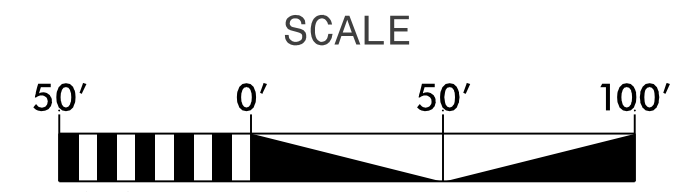
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PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-11
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

- NOTES:
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEETS UC-17 & UC-18 FOR GL-1A & GL-2 PROFILES.
 4. OPEN TRENCH CONSTRUCTION OF STREAM ONLY WITHIN RES PERMITTED AREA.



UTILITY CONSTRUCTION



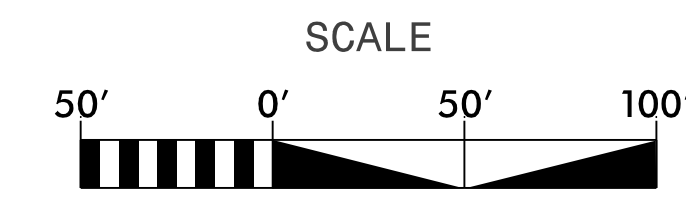
MATCHLINE -L- STA. 67+00 - SEE SHEET UC-10

MATCHLINE -L- STA. 81+00 - SEE SHEET UC-12

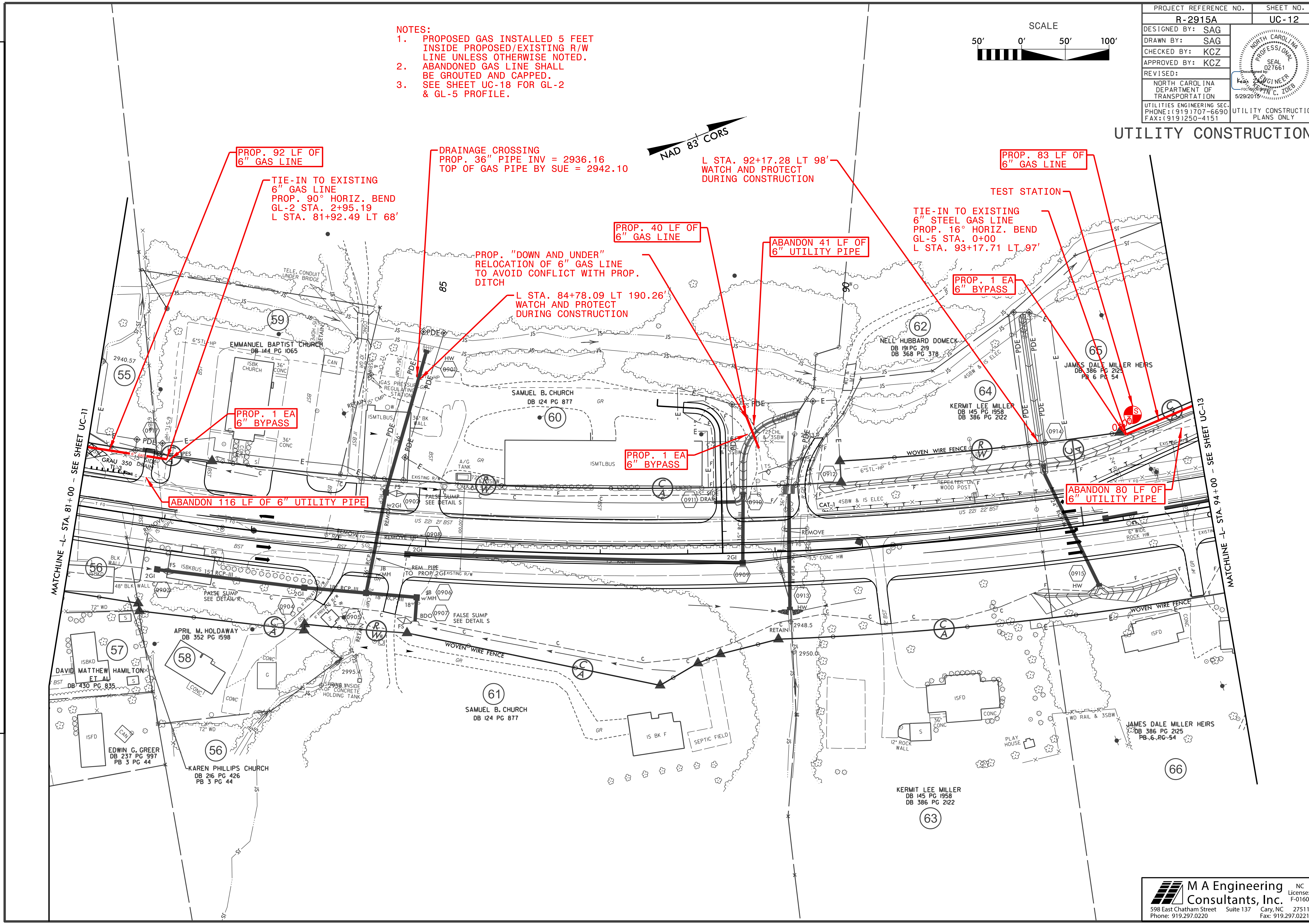
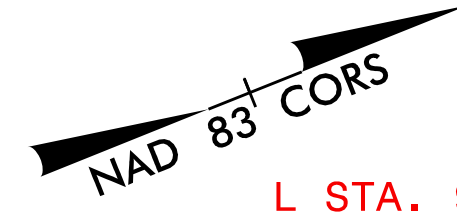
REVISIONS

\$DATE\$

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-12
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY



- NOTES:
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEET UC-18 FOR GL-2 & GL-5 PROFILE.

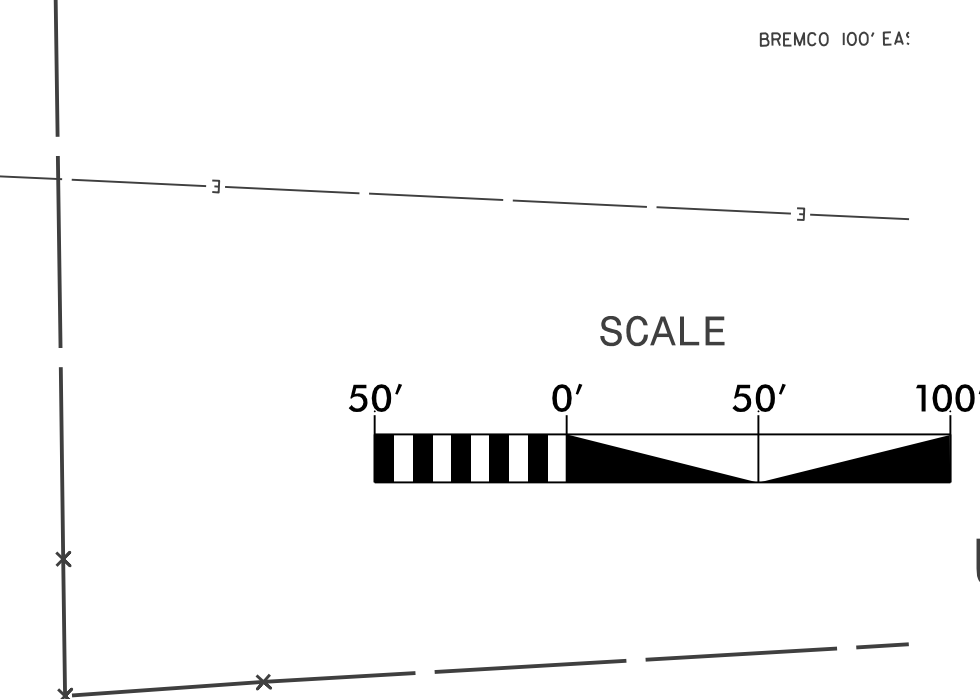


REVISIONS

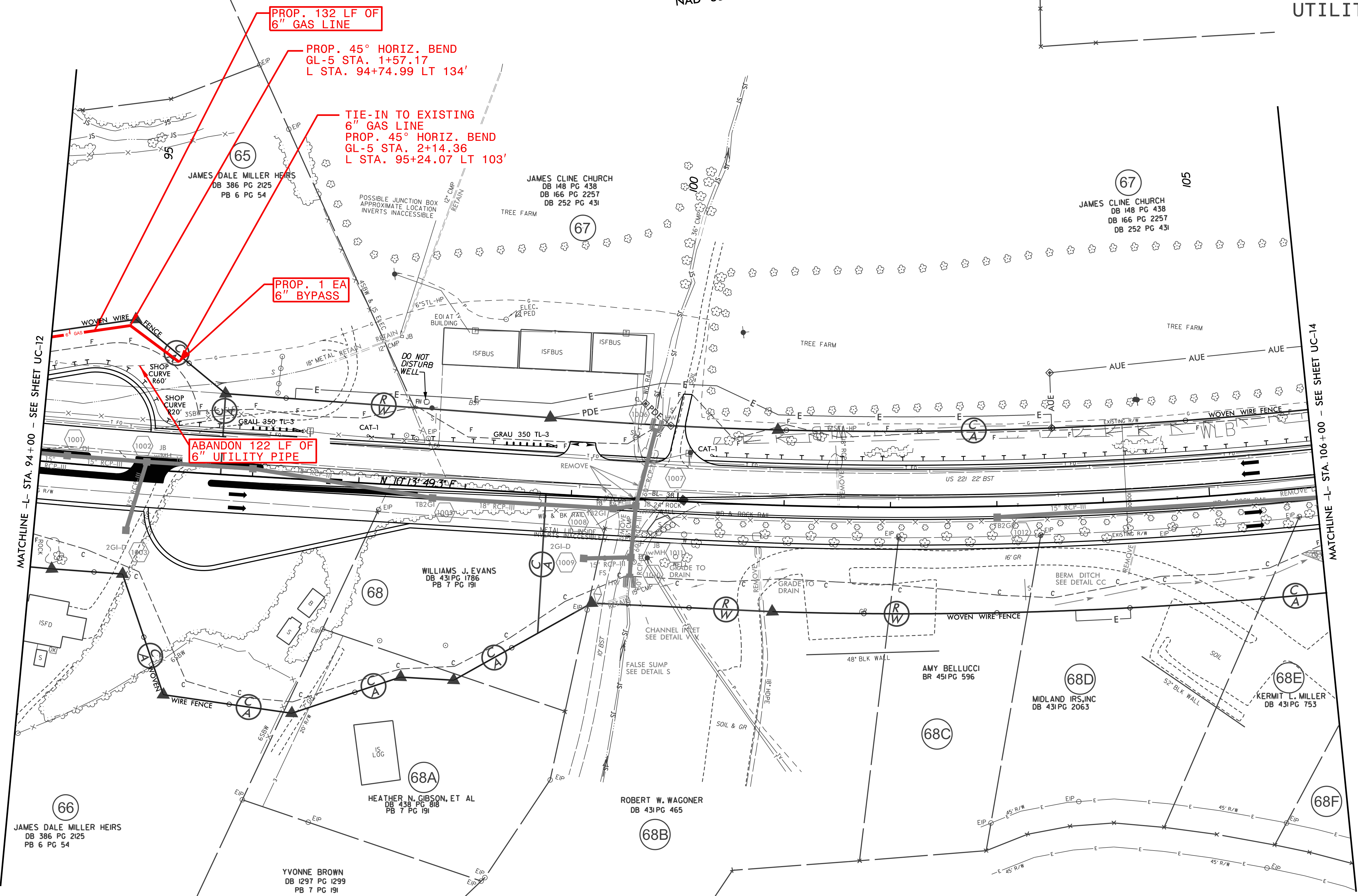
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PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-13
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

- NOTES:**
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEET UC-18 FOR GL-5 PROFILE.



UTILITY CONSTRUCTION

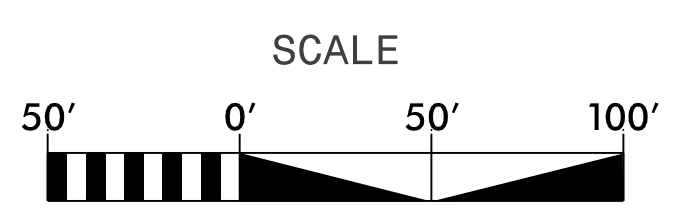


REVISIONS

\$FILE\$
\$DATE\$

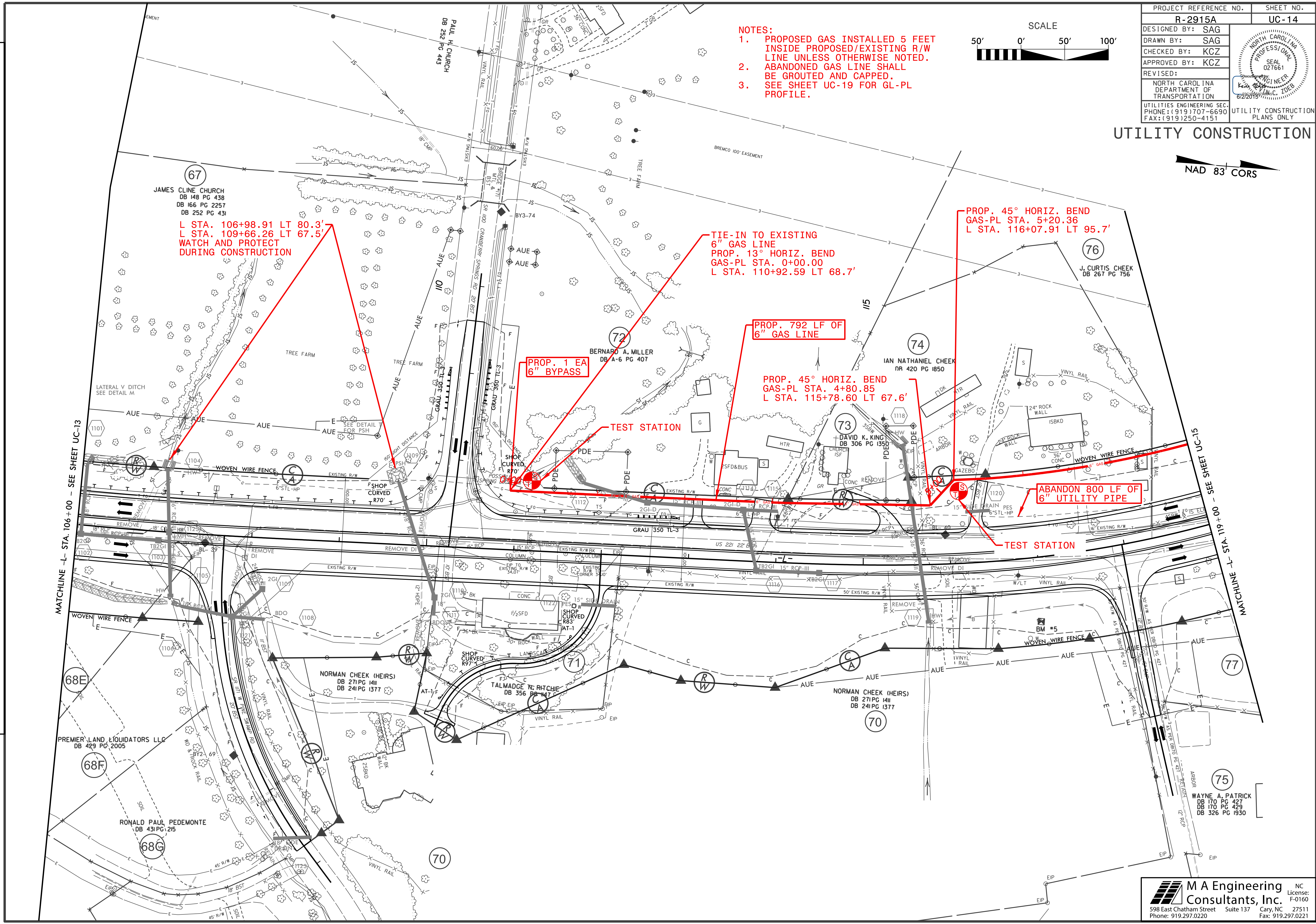
PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-14
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NAD 83 CORS

- NOTES:
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEET UC-19 FOR GL-PL PROFILE.



L STA. 106+98.91 LT 80.3'
 L STA. 109+66.26 LT 67.5'
 WATCH AND PROTECT DURING CONSTRUCTION

TIE-IN TO EXISTING 6" GAS LINE
 PROP. 13° HORIZ. BEND
 GAS-PL STA. 0+00.00
 L STA. 110+92.59 LT 68.7'

PROP. 45° HORIZ. BEND
 GAS-PL STA. 5+20.36
 L STA. 116+07.91 LT 95.7'

PROP. 792 LF OF 6" GAS LINE

PROP. 45° HORIZ. BEND
 GAS-PL STA. 4+80.85
 L STA. 115+78.60 LT 67.6'

PROP. 1 EA 6" BYPASS

ABANDON 800 LF OF 6" UTILITY PIPE

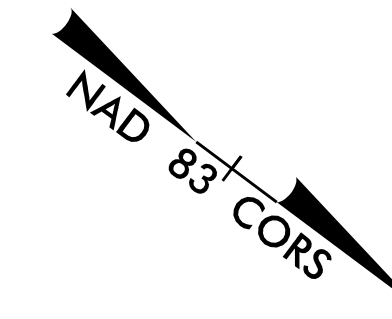
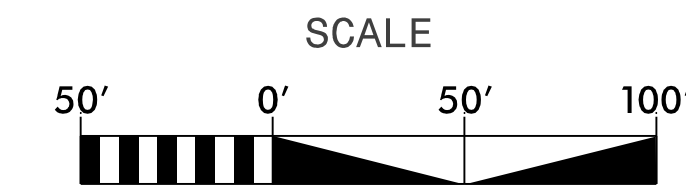
MATCHLINE -L- STA. 106+00 - SEE SHEET UC-13

MATCHLINE -L- STA. 119+00 - SEE SHEET UC-15

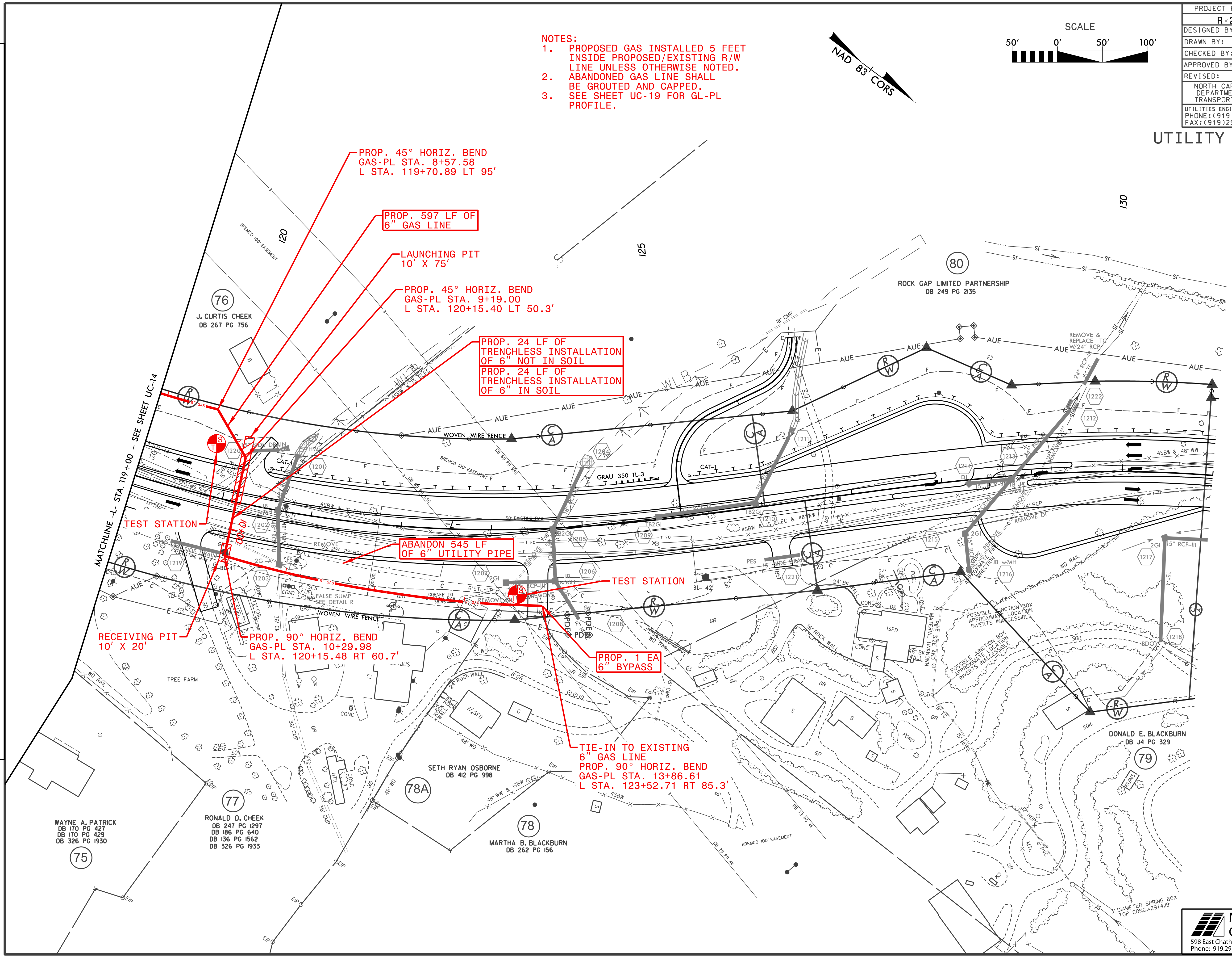
REVISIONS

\$FILE\$
 \$DATE\$

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-15
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY



- NOTES:
1. PROPOSED GAS INSTALLED 5 FEET INSIDE PROPOSED/EXISTING R/W LINE UNLESS OTHERWISE NOTED.
 2. ABANDONED GAS LINE SHALL BE GROUTED AND CAPPED.
 3. SEE SHEET UC-19 FOR GL-PL PROFILE.



PROP. 45° HORIZ. BEND
GAS-PL STA. 8+57.58
L STA. 119+70.89 LT 95'

PROP. 597 LF OF
6" GAS LINE

LAUNCHING PIT
10' X 75'

PROP. 45° HORIZ. BEND
GAS-PL STA. 9+19.00
L STA. 120+15.40 LT 50.3'

PROP. 24 LF OF
TRENCHLESS INSTALLATION
OF 6" NOT IN SOIL
PROP. 24 LF OF
TRENCHLESS INSTALLATION
OF 6" IN SOIL

ABANDON 545 LF
OF 6" UTILITY PIPE

RECEIVING PIT
10' X 20'

PROP. 90° HORIZ. BEND
GAS-PL STA. 10+29.98
L STA. 120+15.48 RT 60.7'

PROP. 1 EA
6" BYPASS

TIE-IN TO EXISTING
6" GAS LINE
PROP. 90° HORIZ. BEND
GAS-PL STA. 13+86.61
L STA. 123+52.71 RT 85.3'

REVISIONS

\$FILE\$
\$DATE\$

WAYNE A. PATRICK
DB 170 PG 427
DB 170 PG 429
DB 326 PG 1930

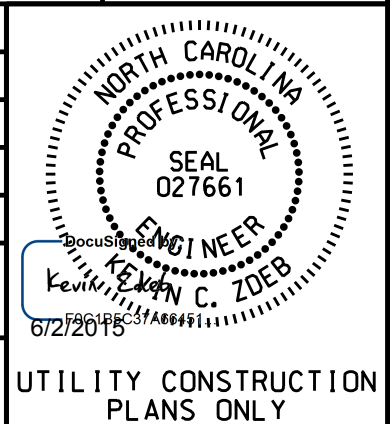
RONALD D. CHEEK
DB 247 PG 1297
DB 186 PG 640
DB 136 PG 1562
DB 326 PG 1933

SETH RYAN OSBORNE
DB 412 PG 998

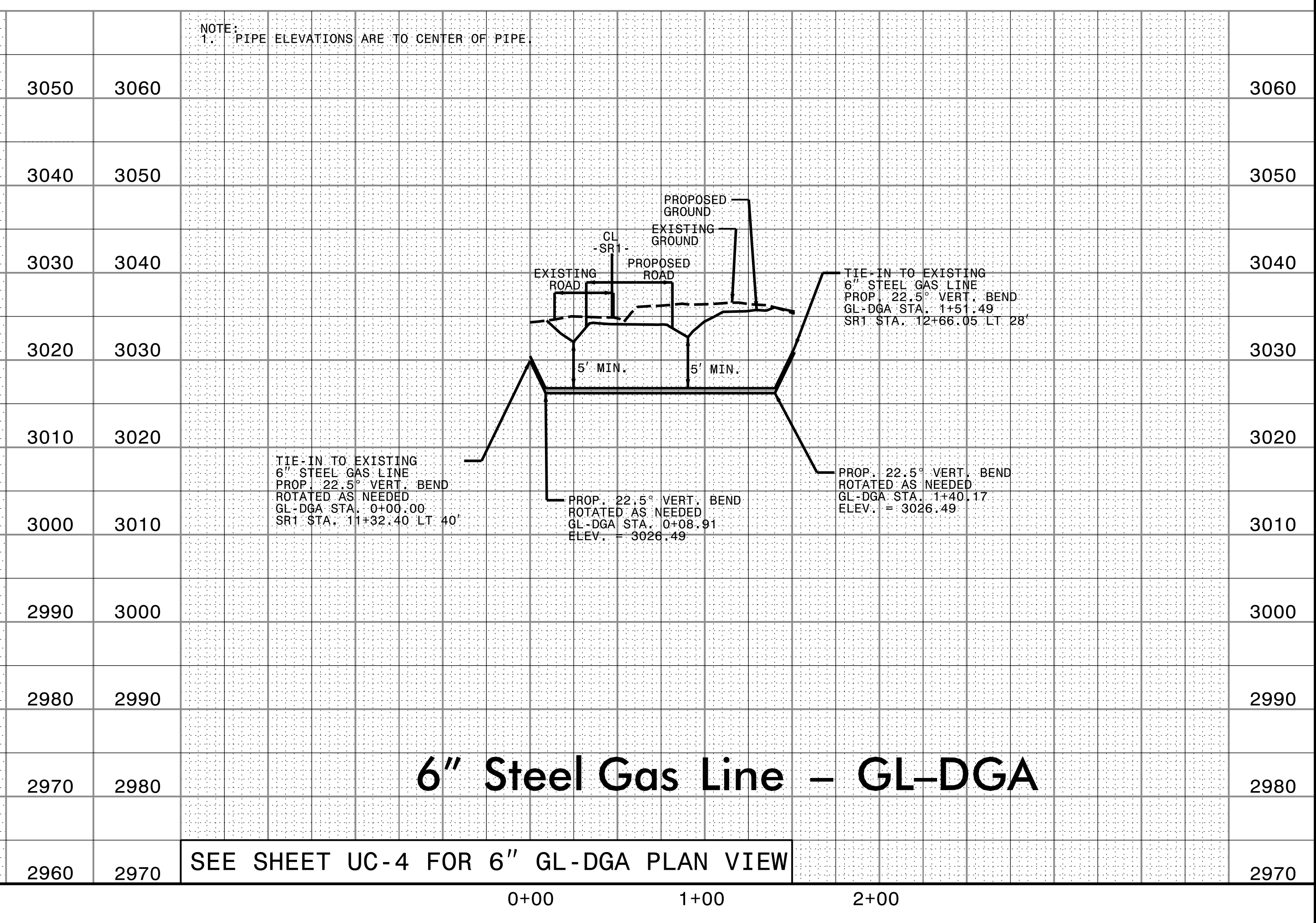
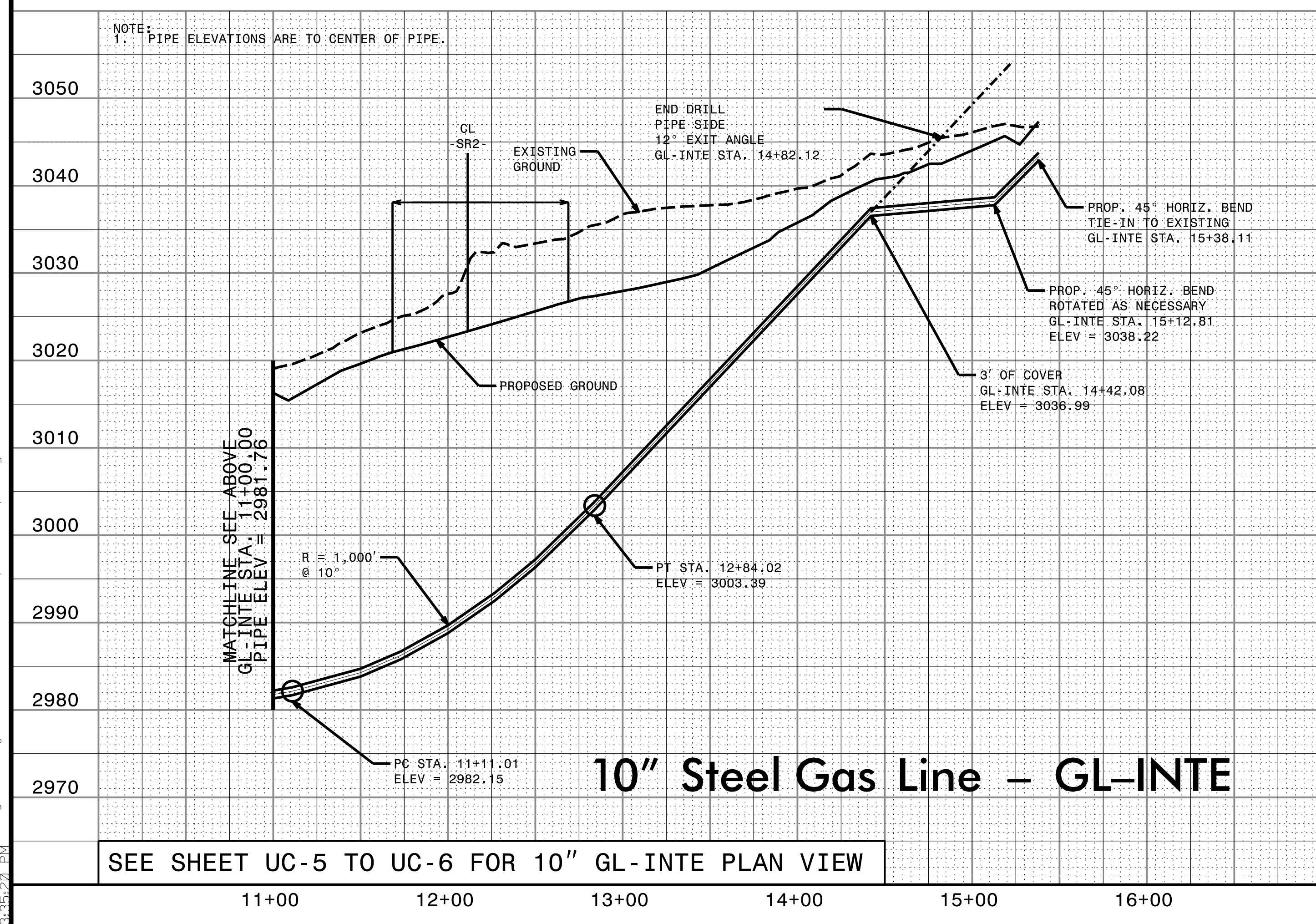
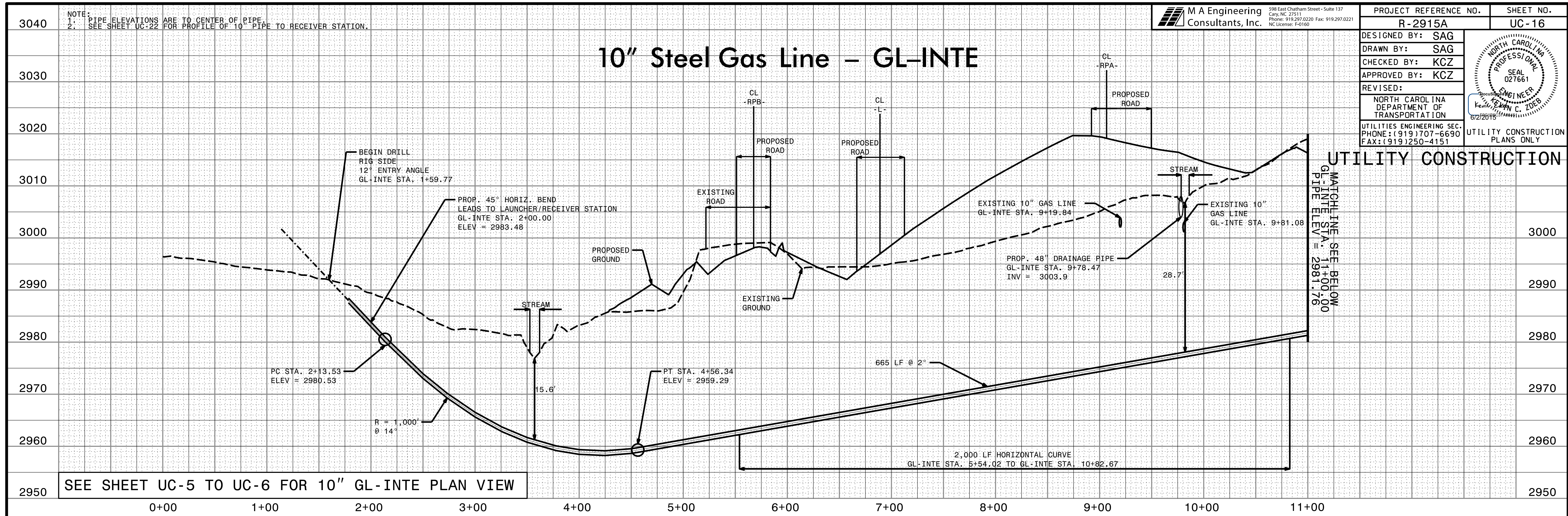
MARTHA B. BLACKBURN
DB 262 PG 156

DONALD E. BLACKBURN
DB J4 PG 329

DESIGNED BY: SAG
 DRAWN BY: SAG
 CHECKED BY: KCZ
 APPROVED BY: KCZ
 REVISED:
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 UTILITIES ENGINEERING SEC.
 PHONE: (919) 707-6690
 FAX: (919) 250-4151



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 3:35:20 PM

5/28/19

NOTE: PIPE ELEVATIONS ARE TO CENTER OF PIPE.

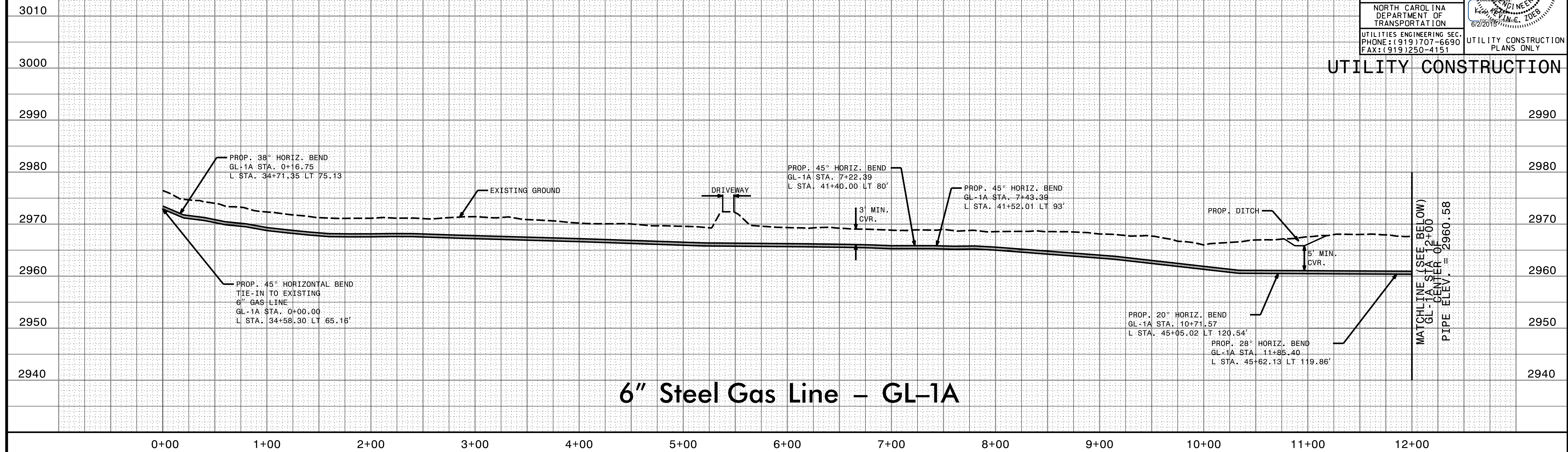
M A Engineering Consultants, Inc. 598 East Chatham Street - Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 NC License: F-0150

PROJECT REFERENCE NO. R-2915A SHEET NO. UC-17

DESIGNED BY: SAG DRAWN BY: SAG CHECKED BY: KCZ APPROVED BY: KCZ REVISED: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151

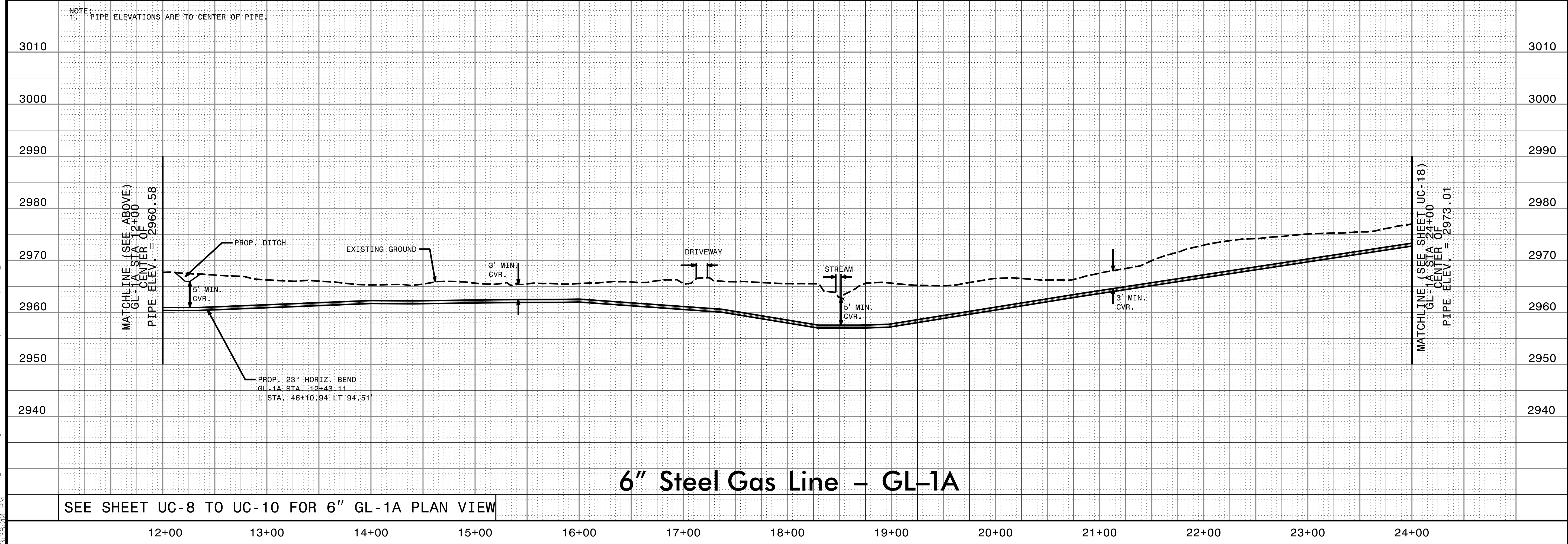


UTILITY CONSTRUCTION PLANS ONLY



6" Steel Gas Line - GL-1A

NOTE: PIPE ELEVATIONS ARE TO CENTER OF PIPE.



6" Steel Gas Line - GL-1A

SEE SHEET UC-8 TO UC-10 FOR 6" GL-1A PLAN VIEW

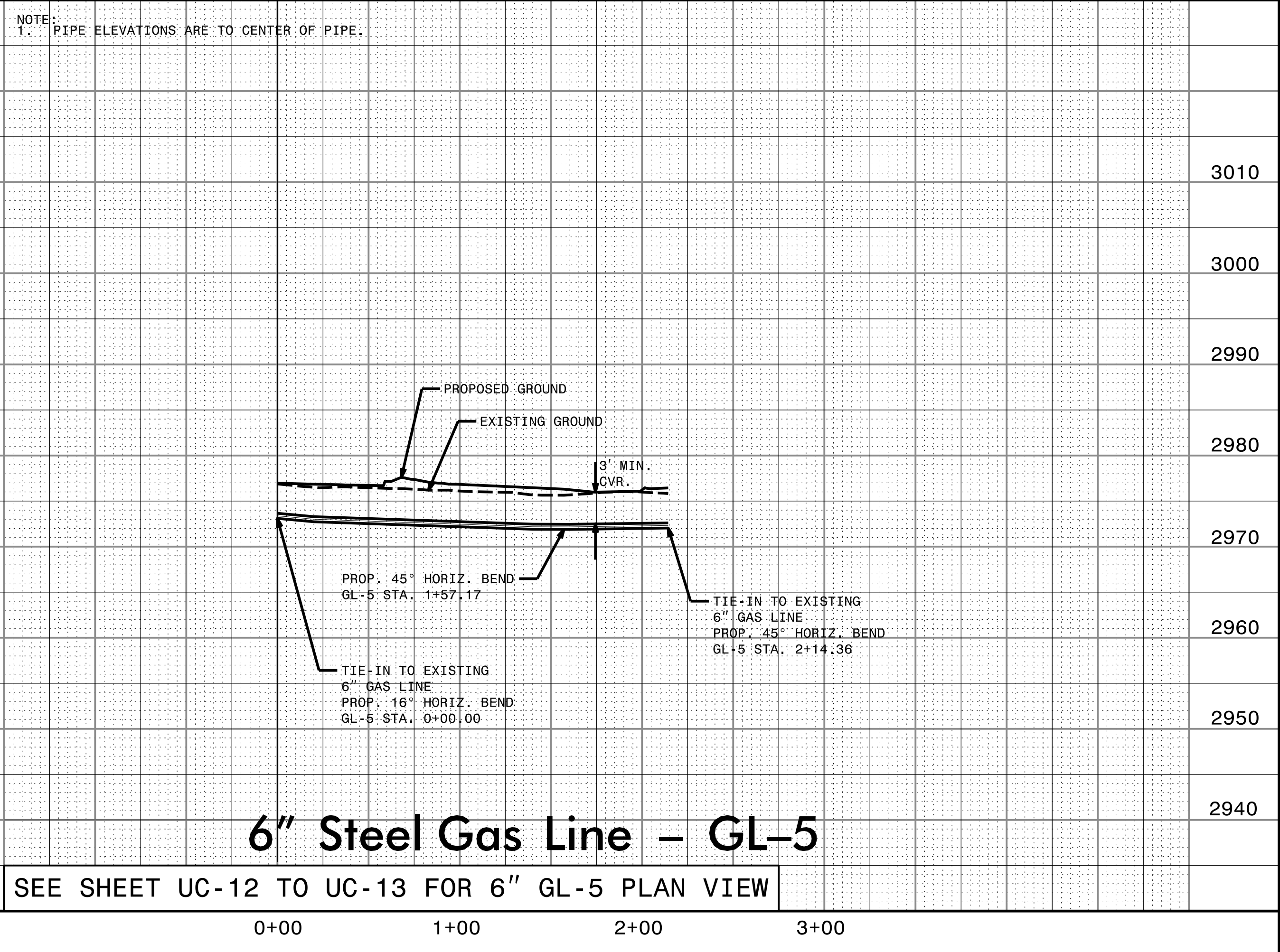
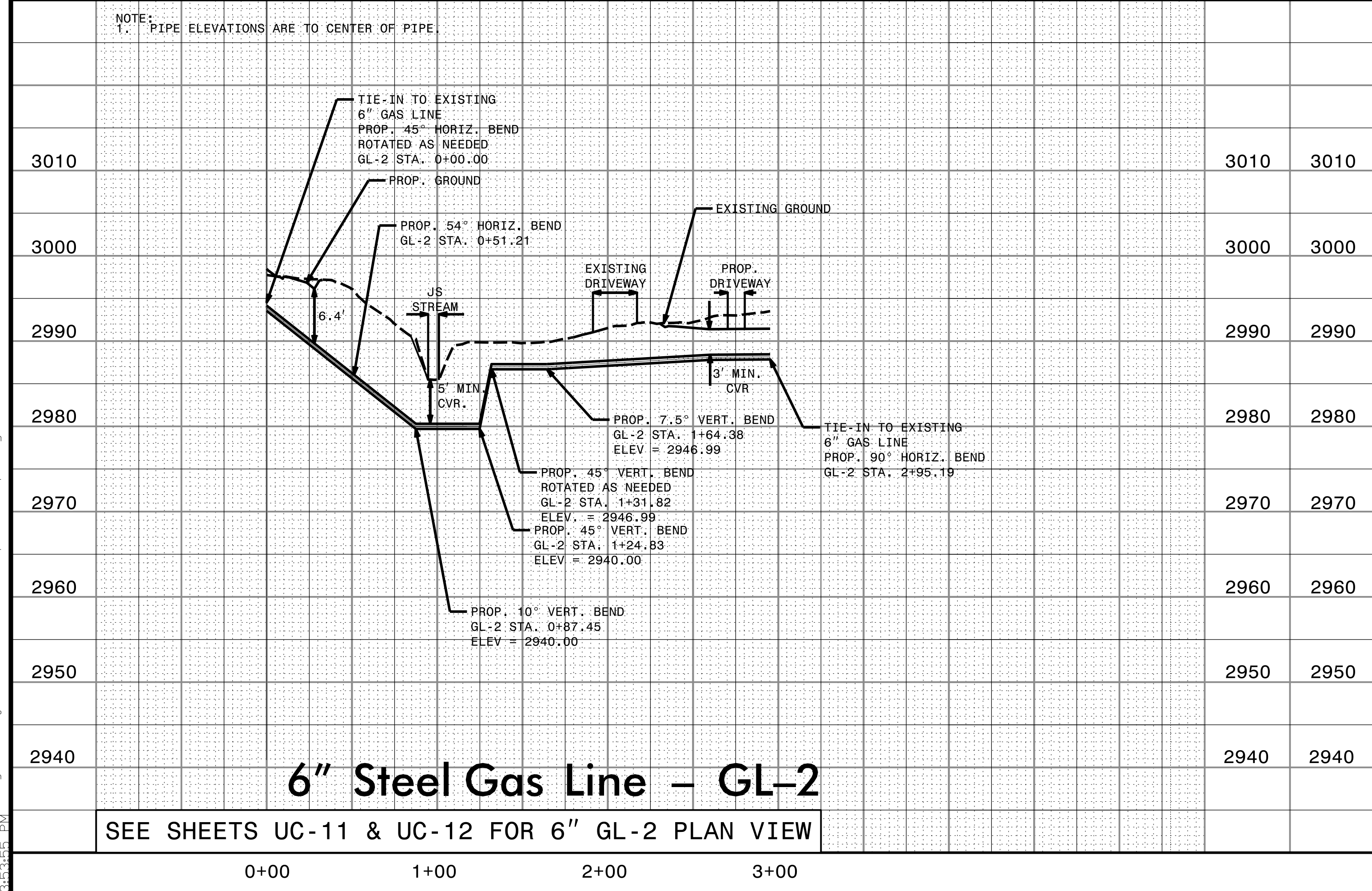
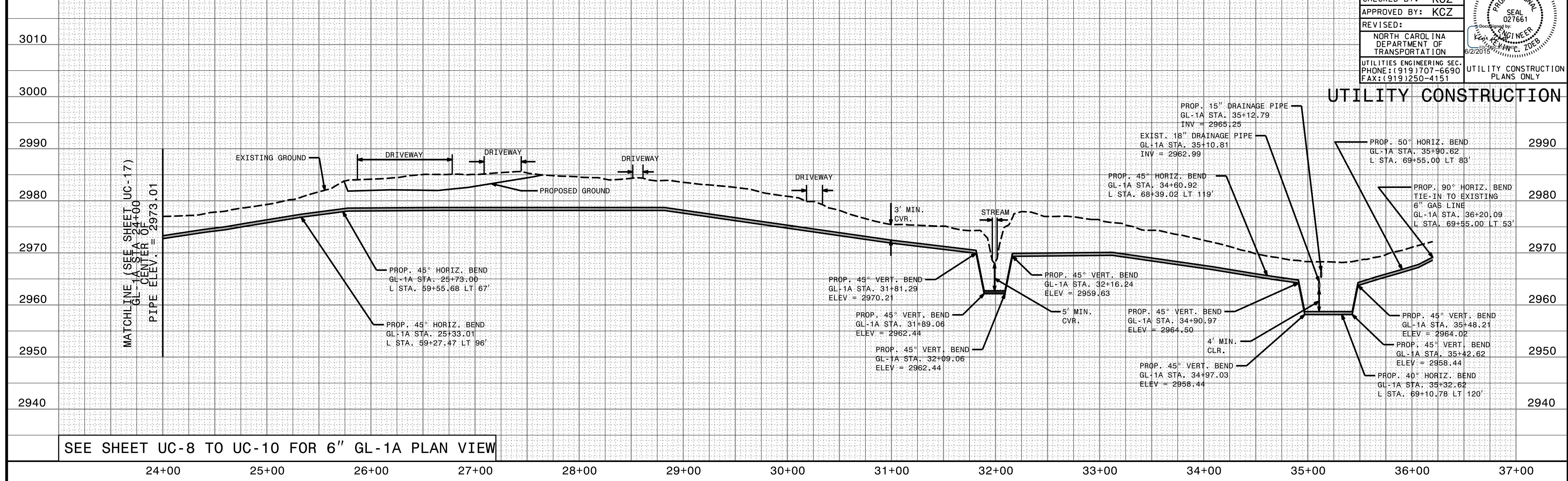
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5/28/15

DESIGNED BY: SAG
DRAWN BY: SAG
CHECKED BY: KCZ
APPROVED BY: KCZ
REVISED:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151



6" Steel Gas Line - GL-1A



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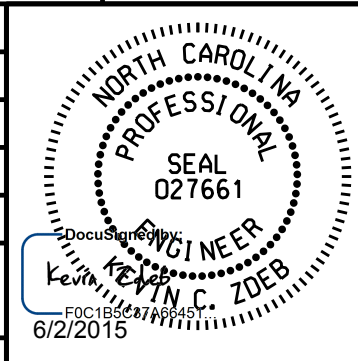
5/28/99

DESIGNED BY: SAG
 DRAWN BY: SAG
 CHECKED BY: KCZ
 APPROVED BY: KCZ
 REVISED:

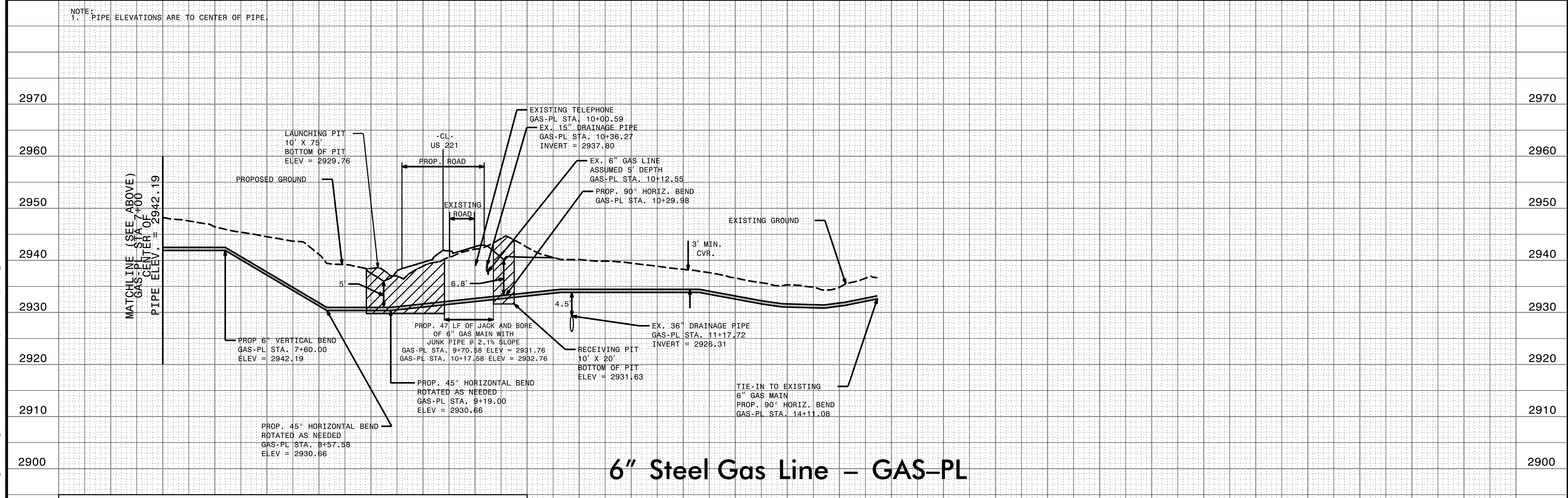
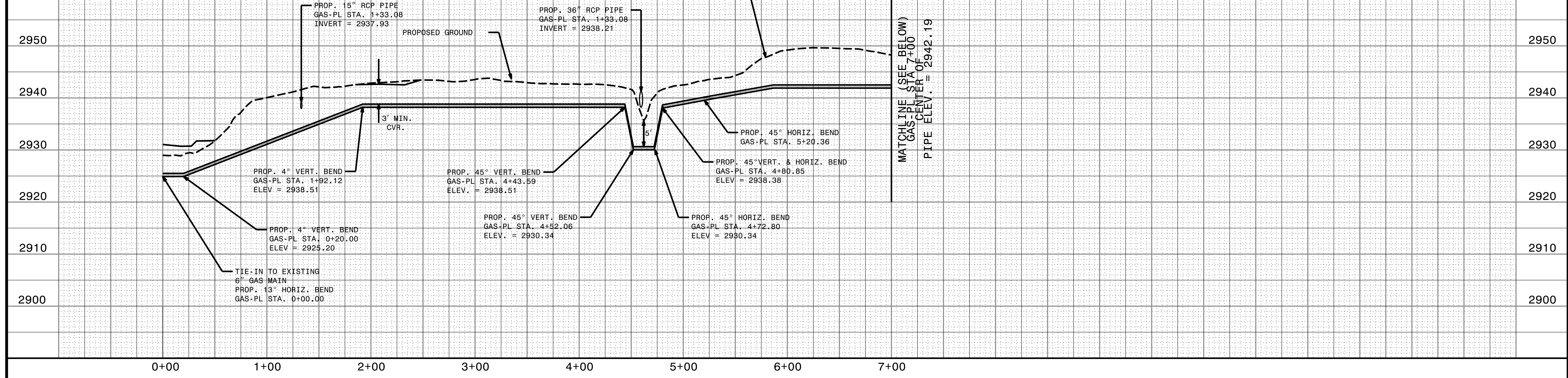
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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 FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

6/2/2015



UTILITY CONSTRUCTION



6" Steel Gas Line - GAS-PL

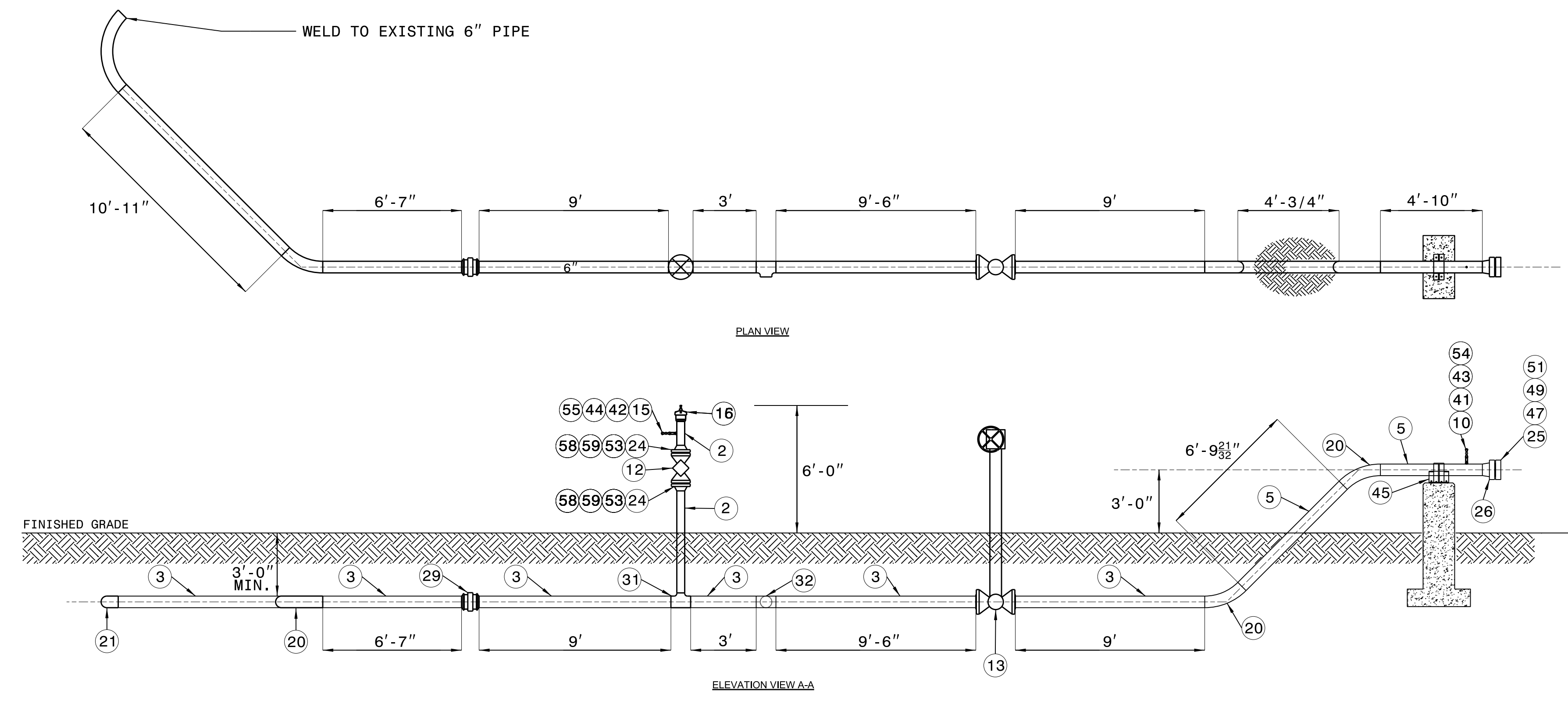
SEE SHEET UC-14 TO UC-15 FOR 6" GAS-PL PLAN VIEW

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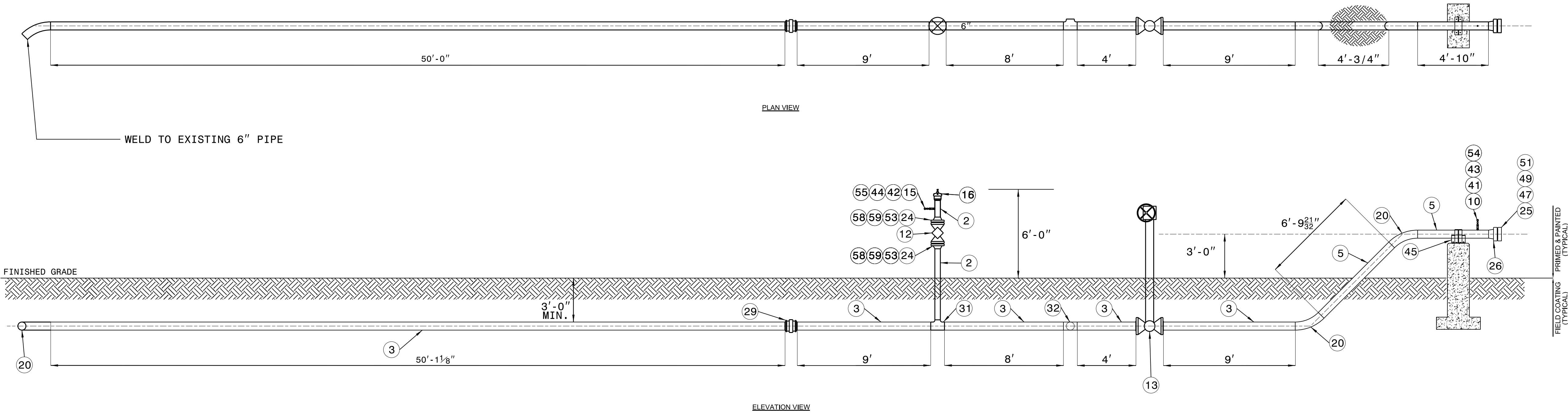
5/14/19

PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-21
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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UTILITY CONSTRUCTION



6" LAUNCHER (T-13)
 SCALE: 1" = 4'-0"
 1 UC-20

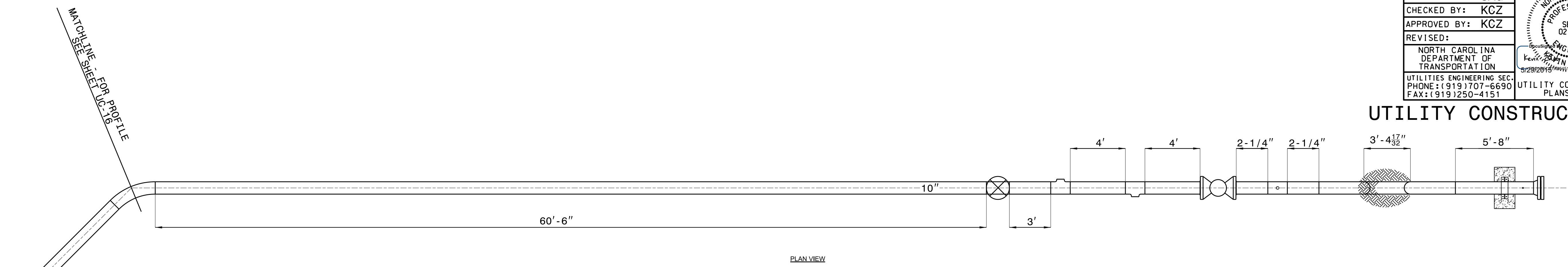


6" LAUNCHER (T-8)
 SCALE: 1" = 4'-0"
 2 UC-20

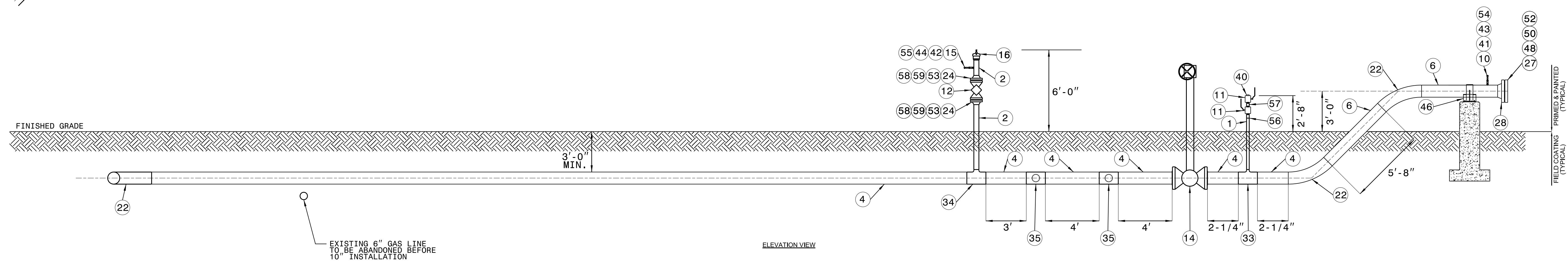
5/14/99

PROJECT REFERENCE NO. R-2915A	SHEET NO. UC-22
DESIGNED BY: SAG	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

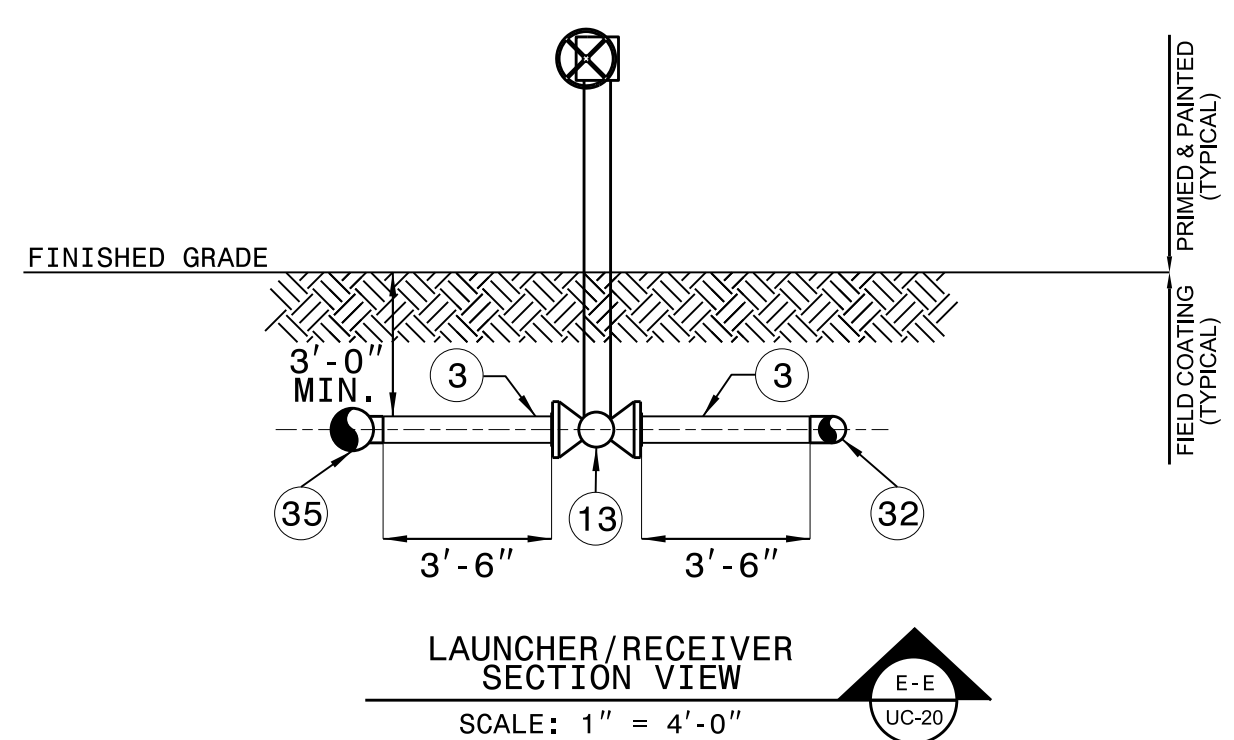


PLAN VIEW

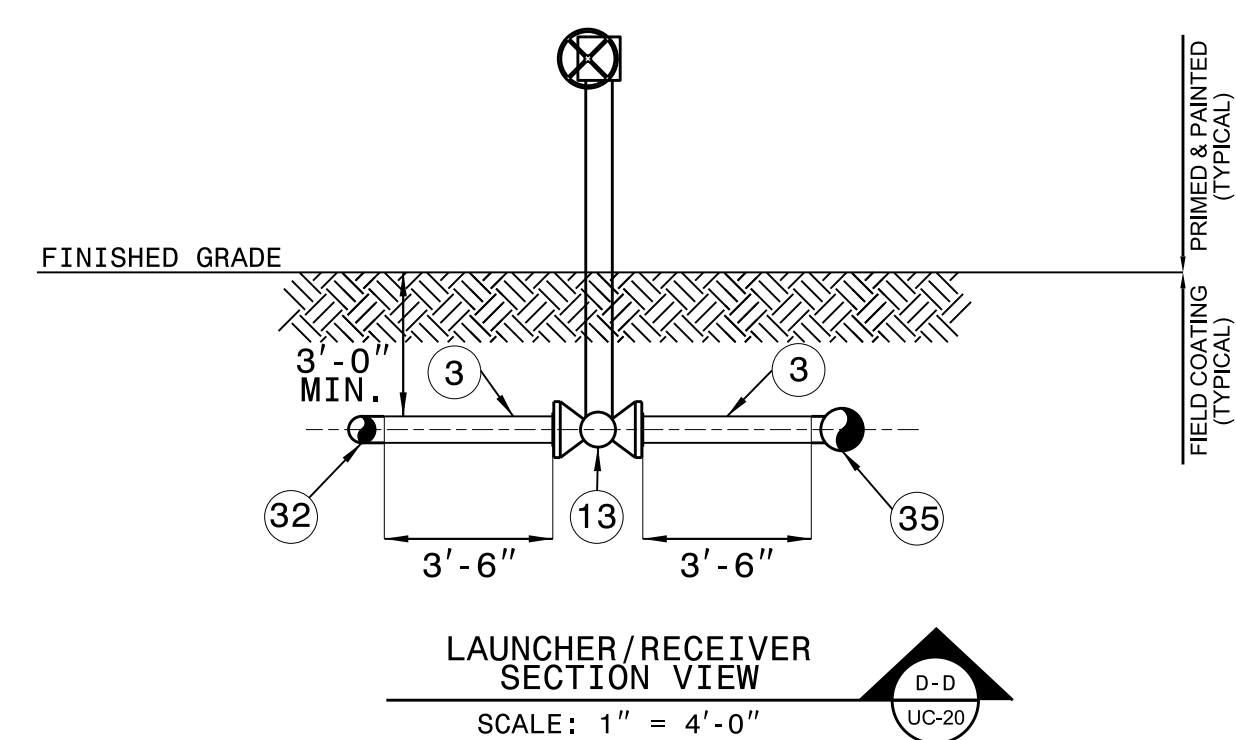


ELEVATION VIEW

10" RECEIVER (T-7)
SCALE: 1" = 4'-0"



LAUNCHER/RECEIVER SECTION VIEW
SCALE: 1" = 4'-0"



LAUNCHER/RECEIVER SECTION VIEW
SCALE: 1" = 4'-0"

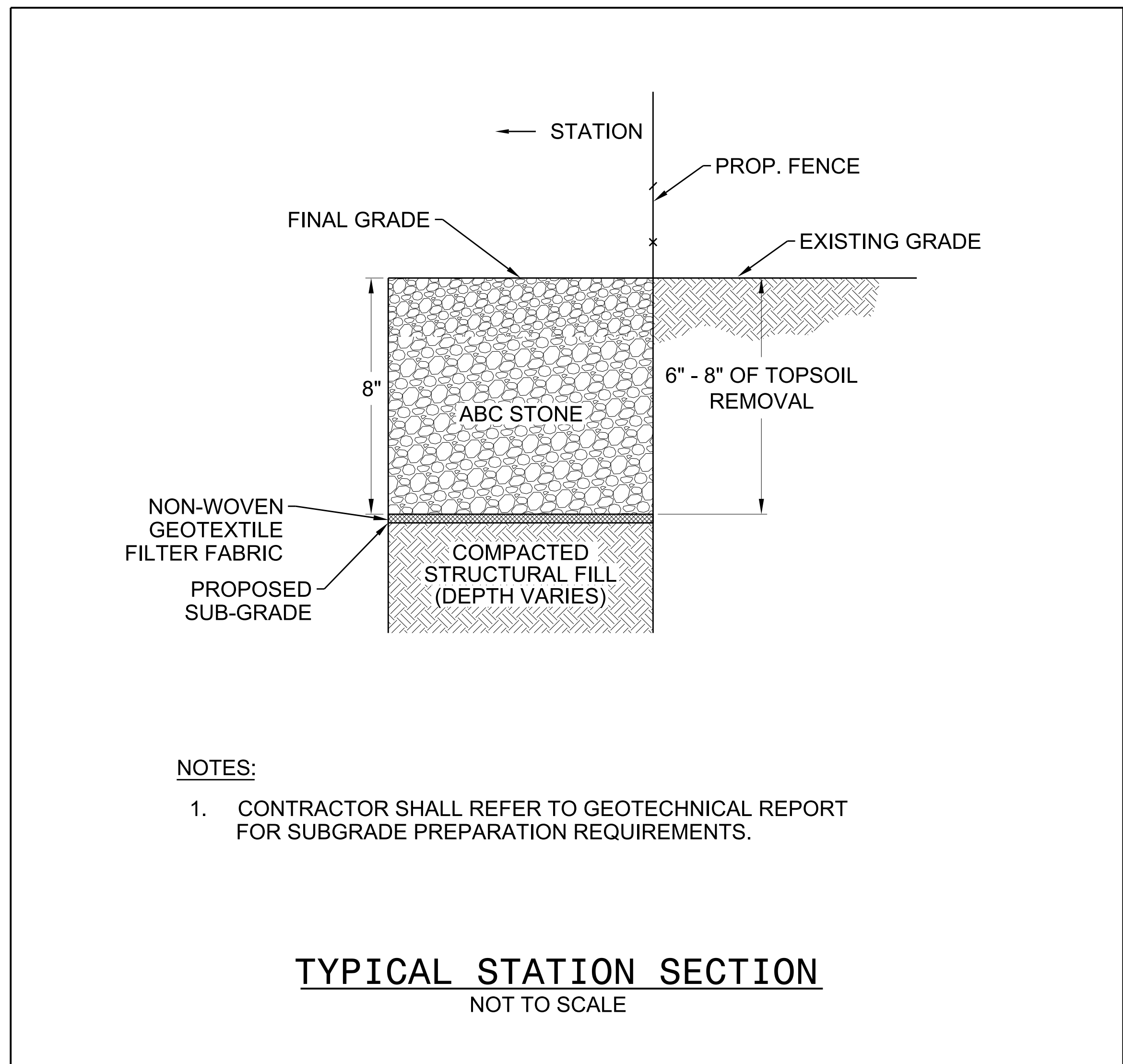
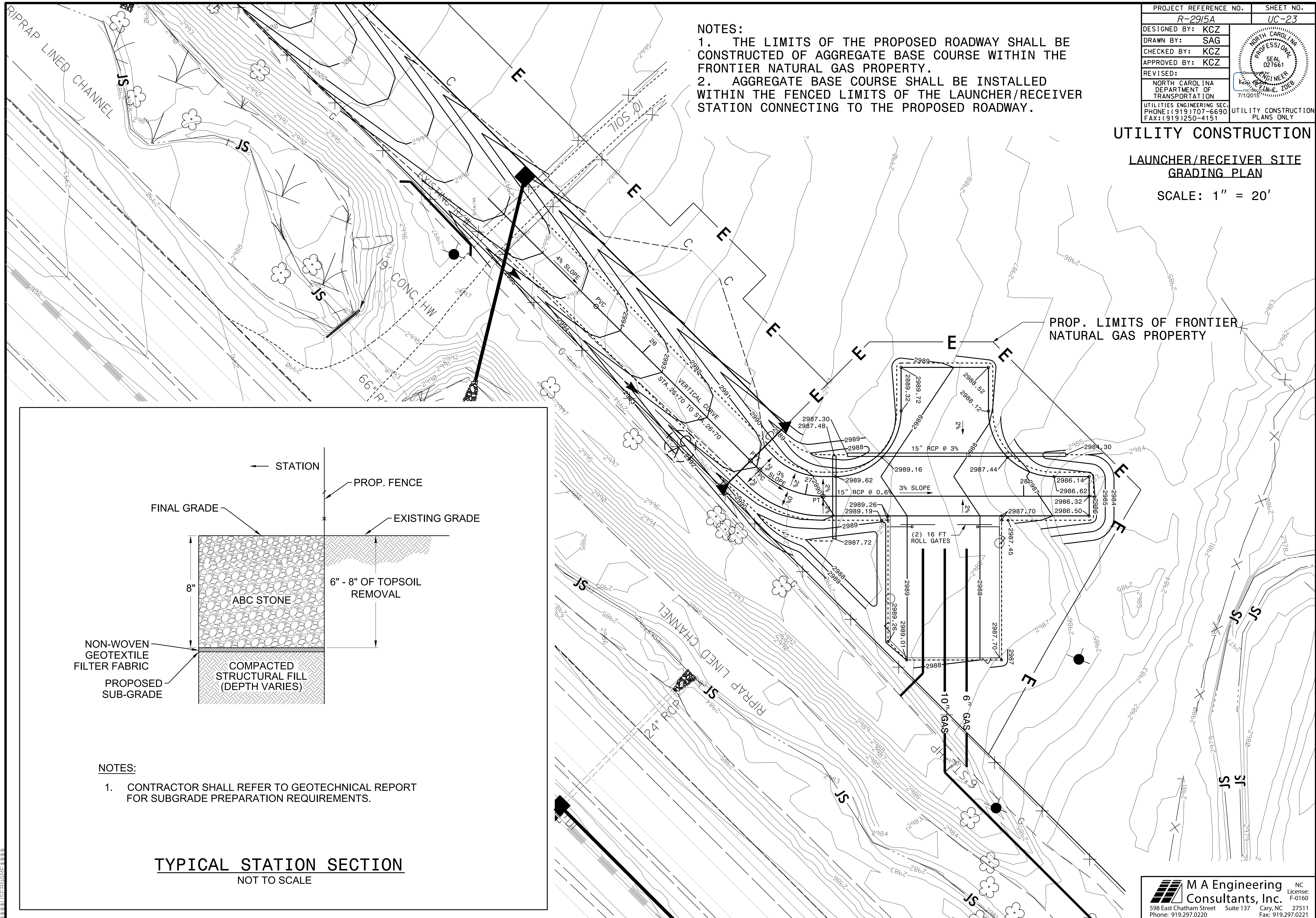
PROJECT REFERENCE NO.	SHEET NO.
R-2915A	UC-23
DESIGNED BY: KCZ	
DRAWN BY: SAG	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

- NOTES:**
1. THE LIMITS OF THE PROPOSED ROADWAY SHALL BE CONSTRUCTED OF AGGREGATE BASE COURSE WITHIN THE FRONTIER NATURAL GAS PROPERTY.
 2. AGGREGATE BASE COURSE SHALL BE INSTALLED WITHIN THE FENCED LIMITS OF THE LAUNCHER/RECEIVER STATION CONNECTING TO THE PROPOSED ROADWAY.

UTILITY CONSTRUCTION

LAUNCHER/RECEIVER SITE GRADING PLAN

SCALE: 1" = 20'



- NOTES:**
1. CONTRACTOR SHALL REFER TO GEOTECHNICAL REPORT FOR SUBGRADE PREPARATION REQUIREMENTS.