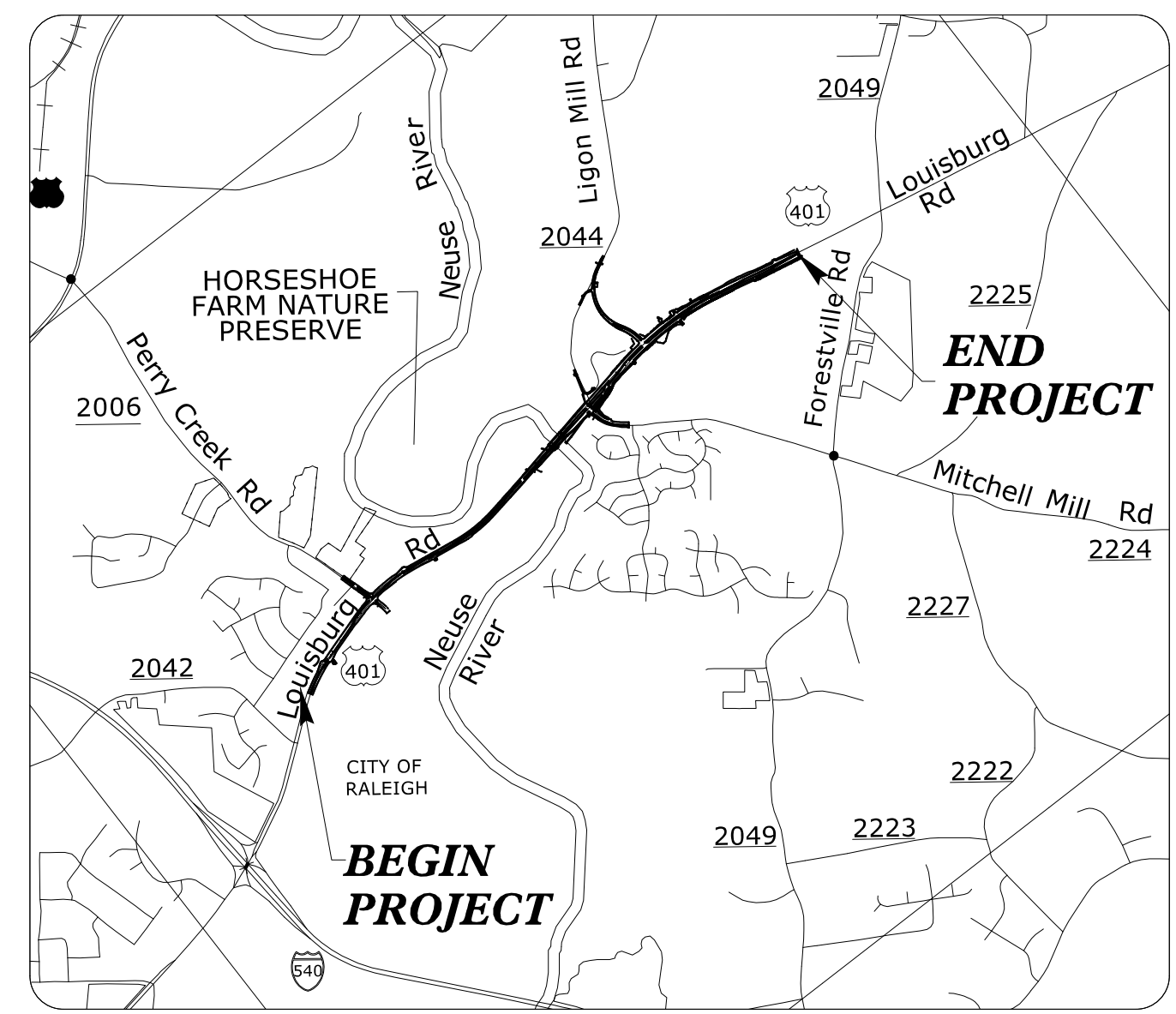


T.I.P. NO.	SHEET NO.
U-5748	UC-1

TIP PROJECT: U-5748



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

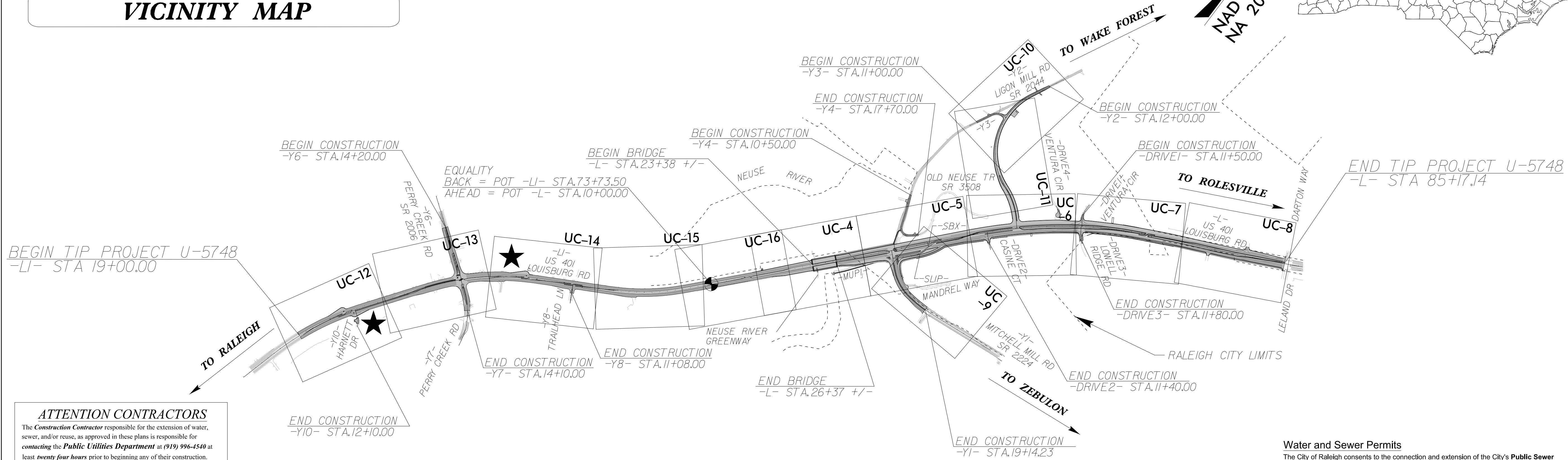
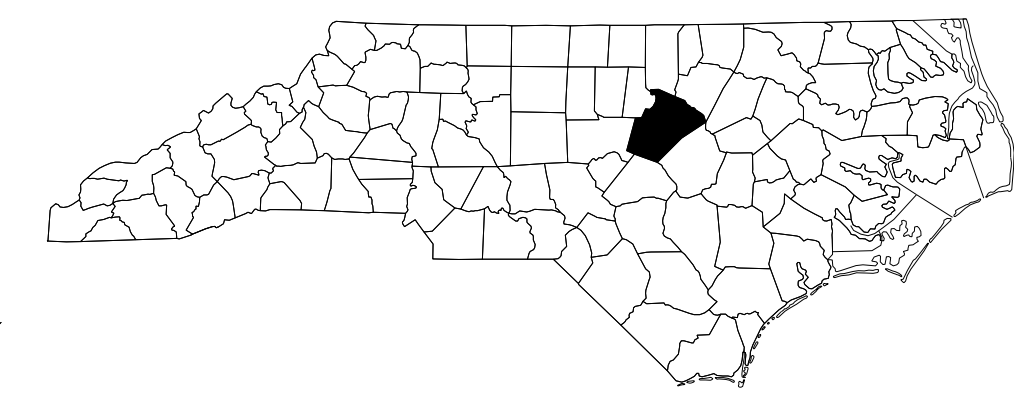
# UTILITIES CONSTRUCTION PLANS WAKE COUNTY

LOCATION: US 401 (LOUISBURG RD) AT SR 2044 (LIGON MILL RD) /  
SR 2224 (MITCHELL MILL RD) AND SR 2006 (PERRY CREEK  
ROAD) INTERSECTION IMPROVEMENTS

TYPE OF WORK: WATER AND SEWER RELOCATIONS

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION  
Electronic Approval: This approval is being issued electronically.  
This approval is valid only upon the signature of a City of Raleigh  
Review Officer below. The City will retain a copy of the approved  
plans. Any work authorized by this approval must proceed in  
accordance with the plans kept on file with the City. This electronic  
approval may not be edited once issued. Any modification to this  
approval once issued will invalidate this approval.

City of Raleigh Development Approval \_\_\_\_\_  
Raleigh Water Review Officer \_\_\_\_\_



**ATTENTION CONTRACTORS**  
The Construction Contractor responsible for the extension of water, sewer, and/or reuse, as approved in these plans is responsible for contacting the Public Utilities Department at (919) 996-4540 at least twenty four hours prior to beginning any of their construction.

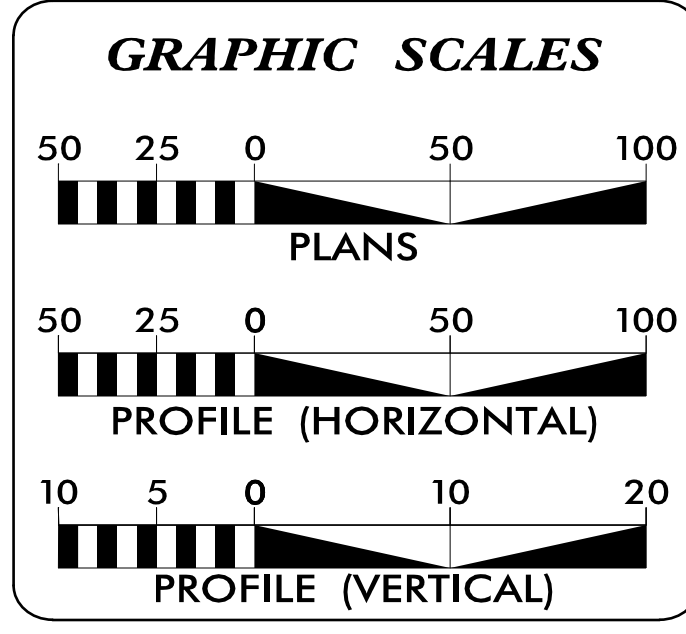
**Failure** to notify both City Departments in advance of beginning construction, will result in the issuance of monetary fines, and require reinstallation of any water or sewer facilities not inspected as a result of this notification failure.

**Failure** to call for Inspection, Install a Downstream Plug, have Permitted Plans on the Jobsite, or any other Violation of City of Raleigh Standards will result in a Fine and Possible Exclusion from future work in the City of Raleigh.

**Water and Sewer Permits**  
The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.  
City of Raleigh Public Utilities Department Permit # S-5186

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.  
City of Raleigh Public Utilities Department Permit # W-4013

DOCUMENT NOT CONSIDERED FINAL  
UNTIL ALL SIGNATURES ARE COMPLETED



**INDEX OF SHEETS**

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A THRU UC-3B	DETAILS
UC-4 THRU UC-16	UTILITY CONSTRUCTION SHEETS
UC-17 THRU UC-18	PROFILE SHEETS

**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.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F - 0342

Joseph Turner, PE UTILITY PROJECT MANAGER  
Gary Swinson PROJECT UTILITY COORDINATOR

SEAL  
2/24/2023  
NORTH CAROLINA PROFESSIONAL SEAL 040486  
JOSEPH C. TURNER  
448F36172FE427

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

Amy York UTILITIES REGIONAL ENGINEER  
Ali Kochecki, PE UTILITIES ENGINEER  
Dayton Martin UTILITIES AREA COORDINATOR  
Tanga Sampson 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	⊗	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 - - - - -

5/14/95

Prepared in the Office of:



AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F - 0342

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UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. <b>U-5748</b>	SHEET NO. <b>UC-3</b>
DESIGNED BY:	2/24/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

### 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 WATER DEPARTMENT.
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

## UTILITY CONSTRUCTION

- 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.

### STANDARD UTILITY NOTES:

1. ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE: CORPUD HANDBOOK, CURRENT EDITION).
2. TILITY SEPARATION REQUIREMENTS:
  - A) A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
  - B) WHEN INSTALLING WATER &/OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER & MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.

- C) WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS.
- D) 5.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
- E) MAINTAIN 18"MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS; MAINTAIN 18"MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6"MIN. CLEARANCE (PER CORPUD DETAILS W-41 & S-49).
- F) ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18"MIN. VERTICAL SEPARATION REQUIRED.
3. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
4. DEVELOPER SHALL PROVIDE 30 DAYS ADVANCE WRITTEN NOTICE TO OWNER FOR ANY WORK REQUIRED WITHIN AN EXISTING CITY OF RALEIGH UTILITY EASEMENT TRAVERSING PRIVATE PROPERTY.
5. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
6. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
7. IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.

8. INSTALL 3/4" COPPER\* WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE.
9. INSTALL 4" PVC\* SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM.
10. PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
11. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE &/OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND &/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
12. NCDOT / RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION.
13. GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT STEPHEN CALVERLEY AT (919) 996-2334 OR STEPHEN.CALVERLEY@RALEIGHNC.GOV FOR MORE INFORMATION.
14. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR

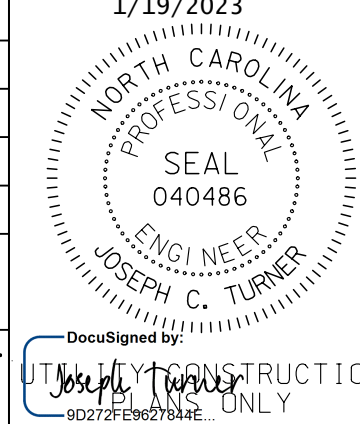
### UTILITY CONSTRUCTION

JOANIE.HARTLEY@RALEIGHNC.GOV  
FOR MORE INFORMATION.

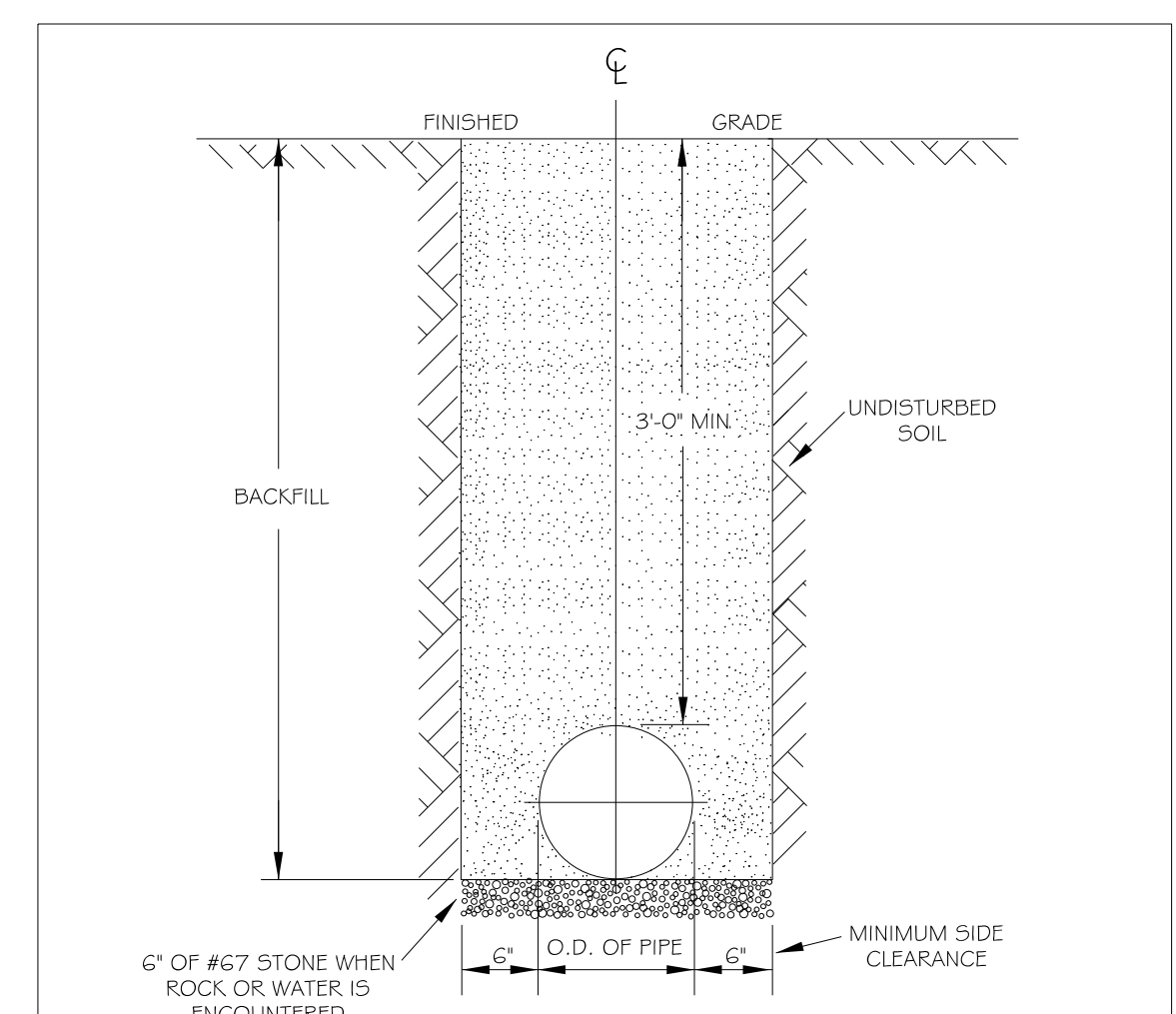
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**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

PROJECT REFERENCE NO.	SHEET NO.
<b>U-5748</b>	<b>UC-3A</b>
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

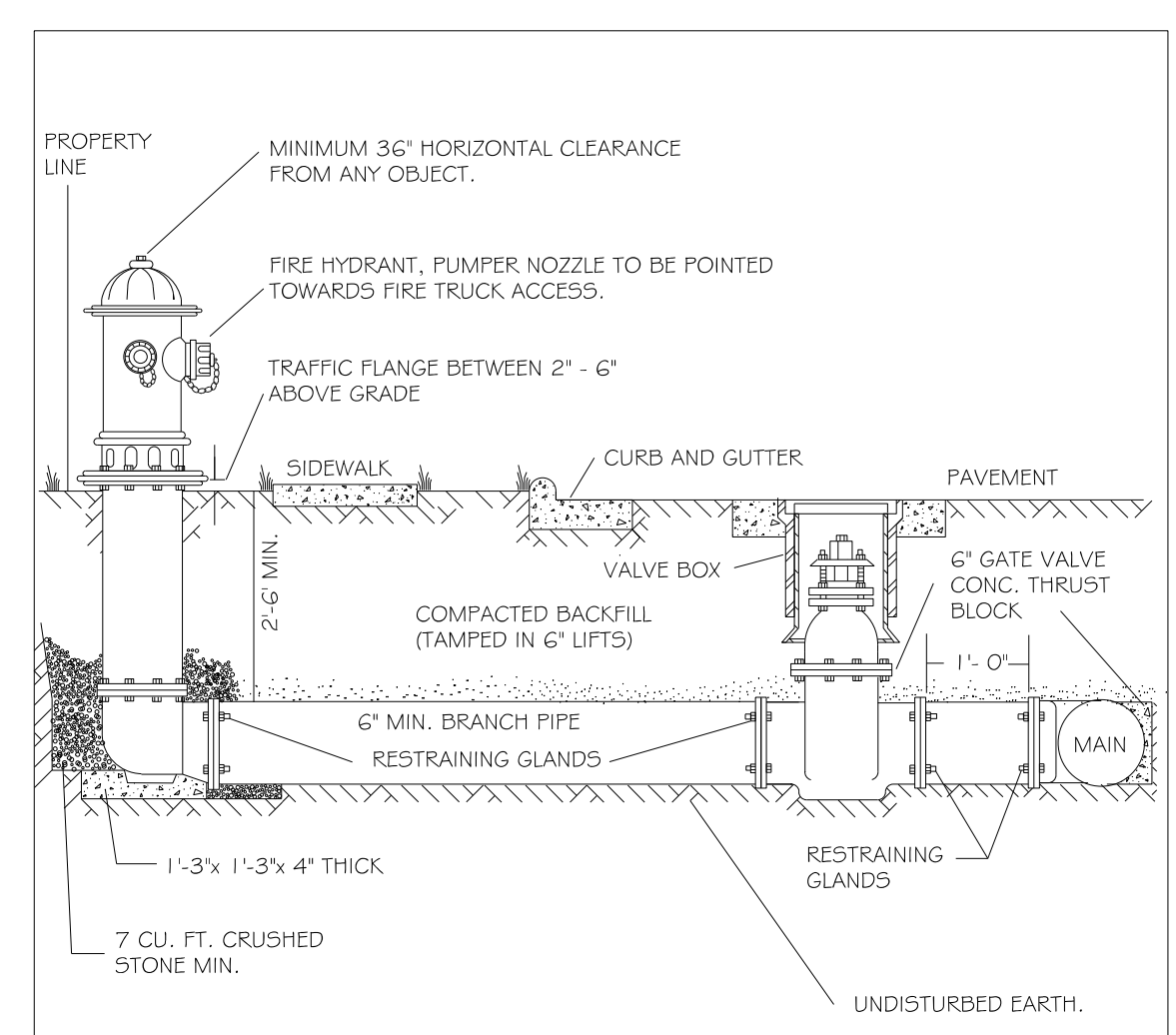


**UTILITY CONSTRUCTION**



- 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 BACKFILL.
  - ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
  - BACKFILL SHALL BE TAMPED IN 6" LIFTS.
  - ACHIEVE 95% COMPACTION IN BACKFILL.

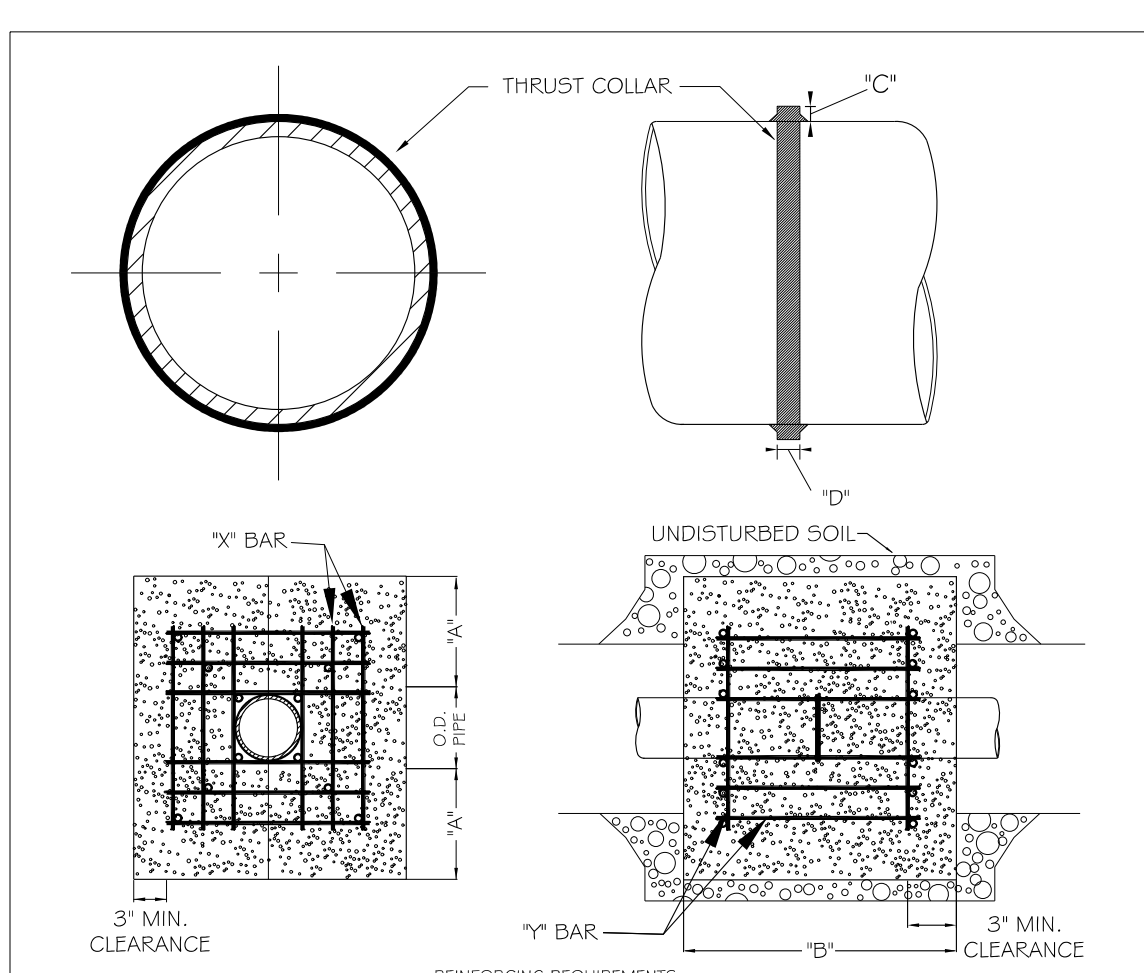
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS & BACKFILL REQUIREMENTS FOR DUCTILE IRON				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3	D.W.C.	9-3-99	ABB	2-15-05
	RRH	3-31-00	J.P.S.	10-29-10



- NOTES:
- FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARING, 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 C500-96 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 CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE
  - FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

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

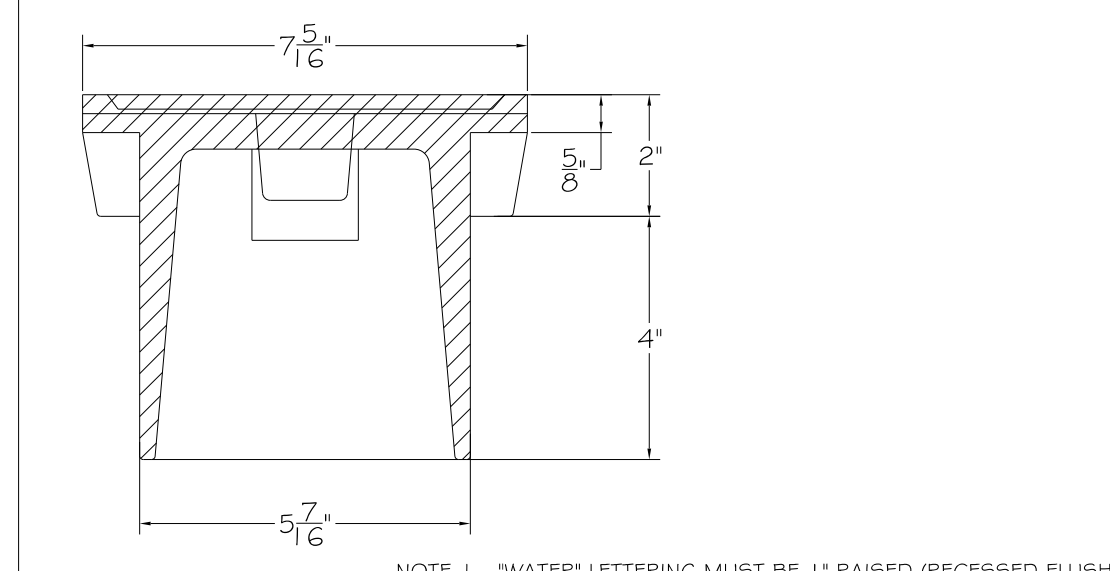
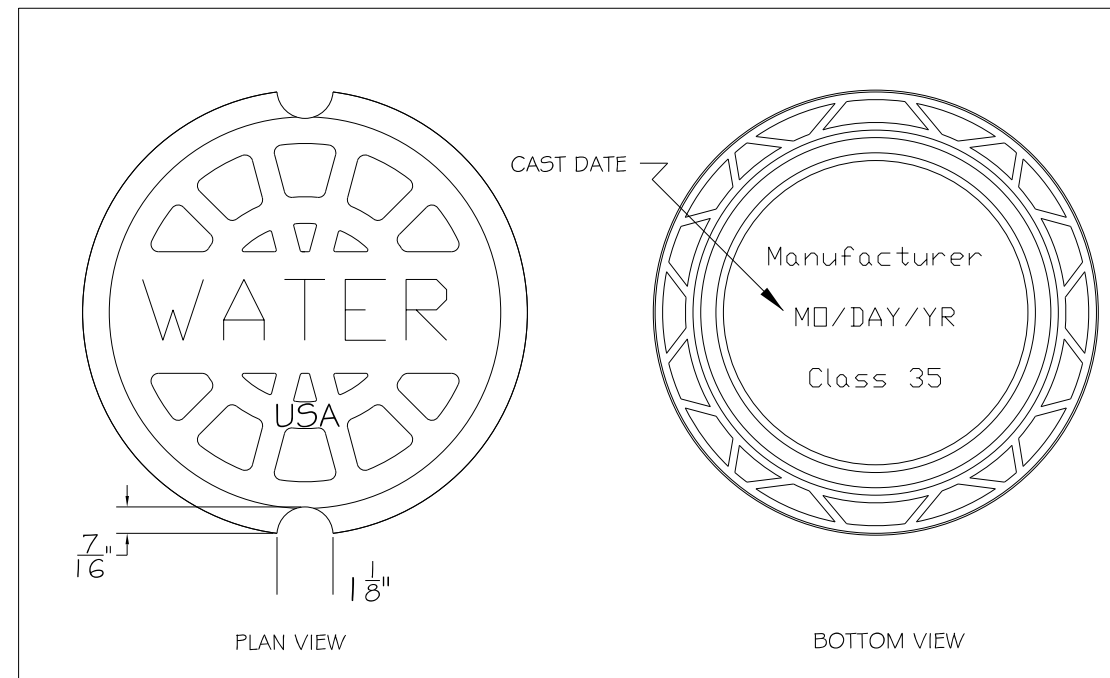
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD FIRE HYDRANT INSTALLATION DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04	FAP	2/17/09
	DHL	2/14/08		



REINFORCING REQUIREMENTS					
I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT
6" - 36"	#4	2'-2" O.D. PIPE	1.502 LBS/FT	1'-3"	1.1 LBS EACH
40" & greater	#6	3'-0" O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS EACH

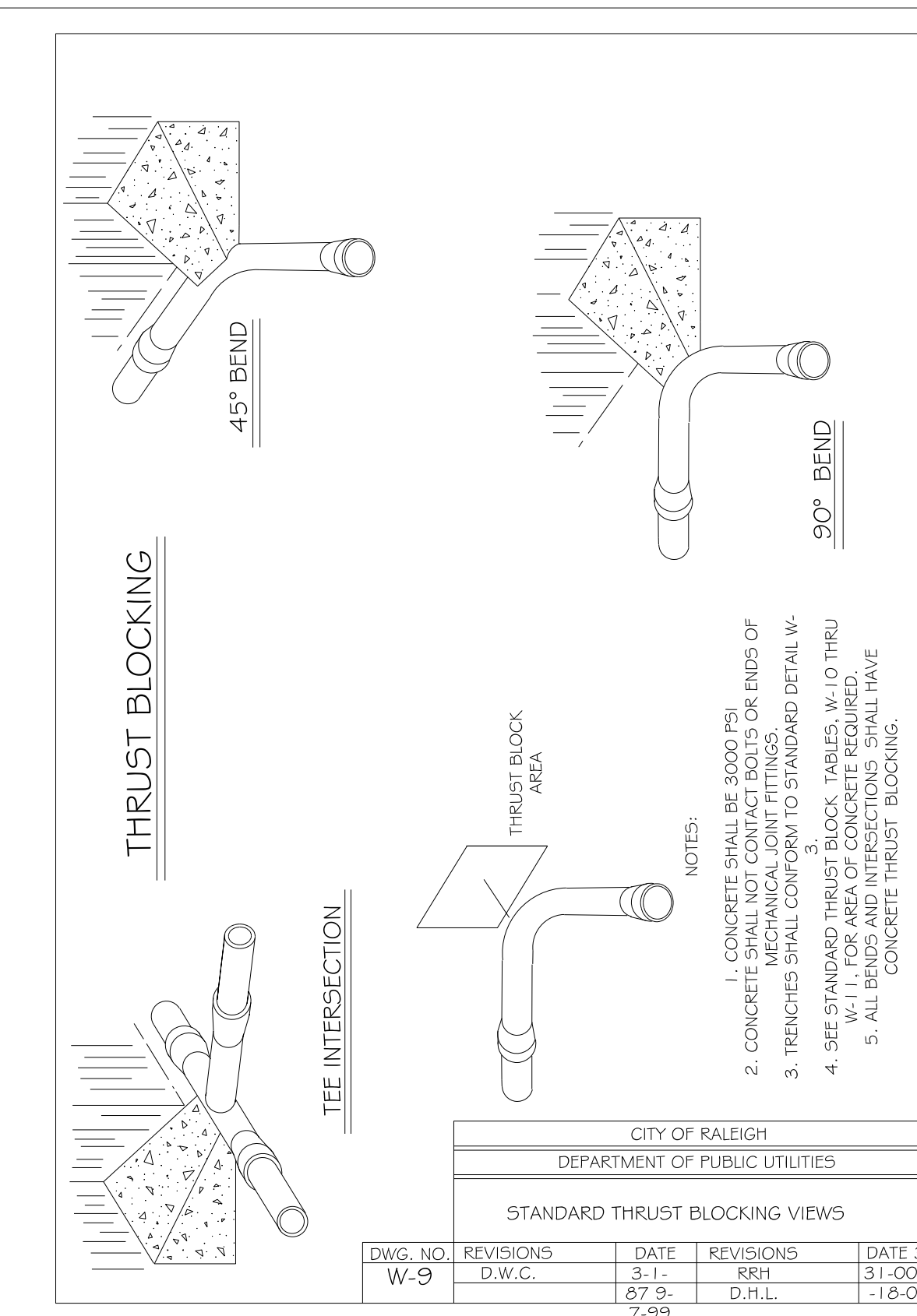
- NOTES:
- SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
  - CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
  - REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
  - TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
  - BACKFILL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

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



- 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 COVER DROP LID WITH 4" SKIRT				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				



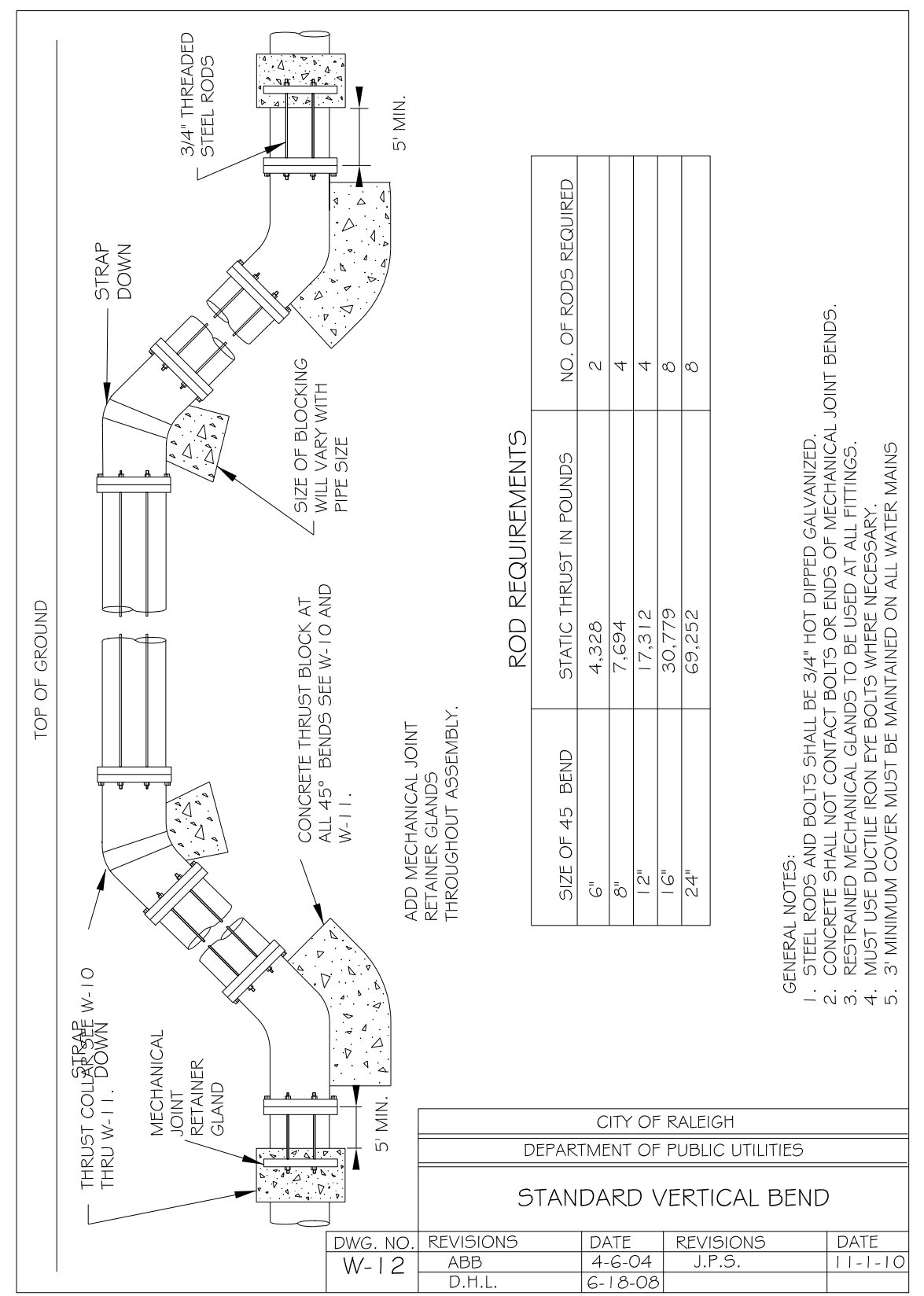
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCKING VIEWS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9	D.W.C.	3-1-	RRH	31-00-6
		87-9-	D.H.L.	-18-08
		7-99		

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	MODERATELY DRY CLAY	SOFT CLAY	GRAVEL	COARSE SAND	ADDED LIME	DRY CLAY	SAND	COMPACT FIRM	SAND	CLEAN DRY
6"											
11 1/4"	1,108	1	1	1	1	1	1	1	2	1	
22 1/2"	2,207	1	2	2	1	1	1	1	3	1	
45°	4,328	2	3	3	1	1	2	5	1		
90°	7,996	2	4	5	1	1	2	8	1		
PLUG	5,655	2	3	4	1	1	2	6	1		
8"											
11 1/4"	1,970	1	1	2	1	1	1	2	1		
22 1/2"	3,922	1	2	3	1	1	1	4	1		
45°	7,694	2	4	5	1	1	2	8	1		
90°	14,215	4	8	9	2	2	4	15	2		
PLUG	10,053	3	5	6	2	2	3	10	1		
12"											
11 1/4"	4,433	2	3	3	1	1	2	5	1		
22 1/2"	8,826	3	5	6	2	2	3	9	1		
45°	17,312	5	9	11	3	3	5	18	2		
90°	31,983	8	16	19	4	4	8	32	4		
PLUG	22,619	6	12	14	3	3	6	23	3		
16"											
11 1/4"	7,881	2	4	5	1	1	2	8	1		
22 1/2"	15,691	4	8	10	2	2	4	16	2		
45°	30,779	8	16	19	4	4	8	31	4		
90°	56,861	15	29	35	8	8	15	57	6		
PLUG	40,213	10	21	25	5	5	10	41	5		

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
THRUST BLOCKING DESIGN QUANTITY TABLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10	D.W.C.	-23-99		

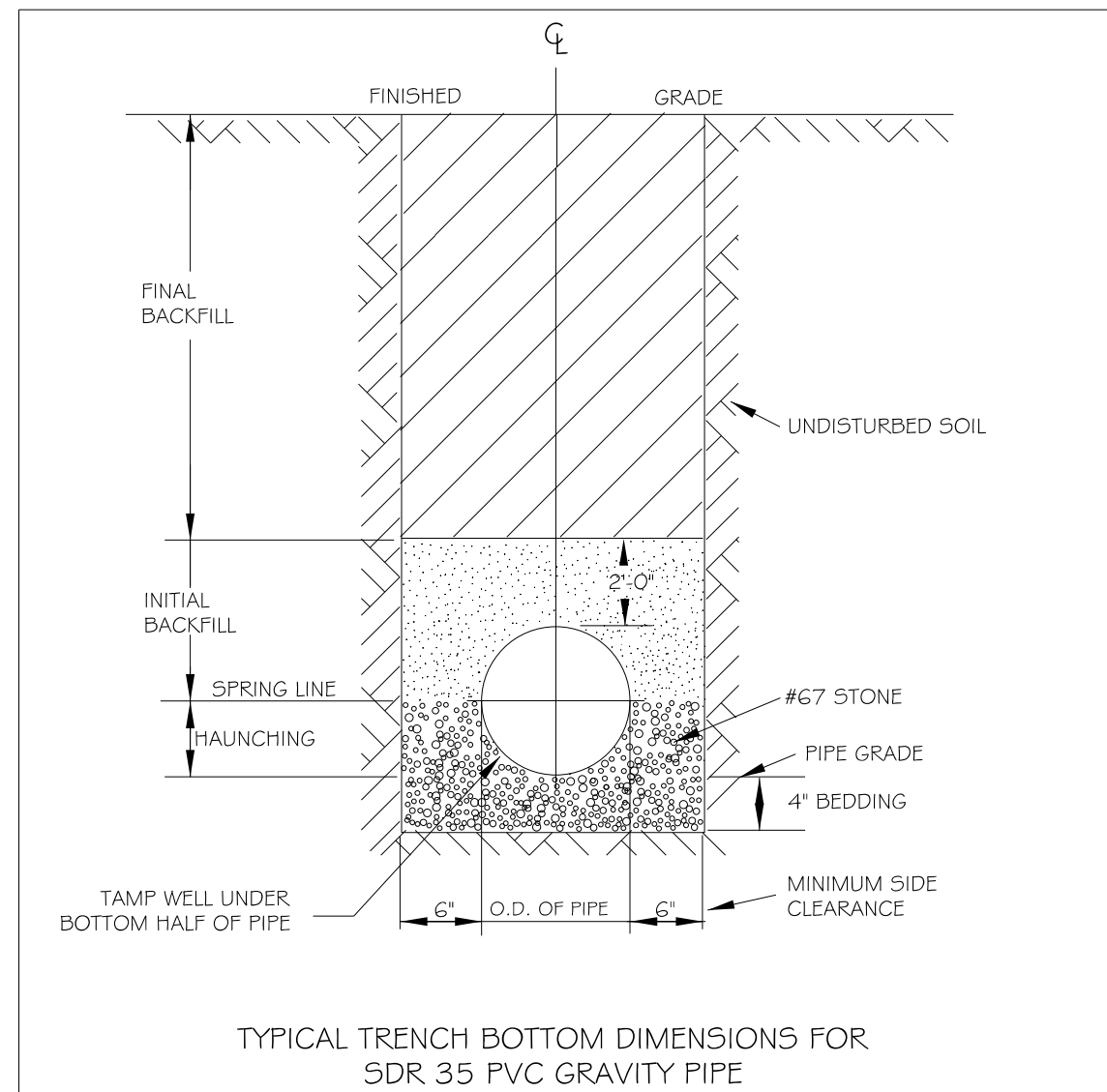
REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS											
BASED ON TEST PRESSURE OF 200 P.S.I.											
ALL AREAS GIVEN IN SQUARE FEET.											
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY	SOFT CLAY	GRAVEL	COARSE SAND	ADDED LIME	DRY CLAY	SAND	COMPACT FIRM	SAND	CLEAN DRY
24"											
11 1/4"	17,734	5	9	11	3	3	5	18	2		
22 1/2"	35,305	9	18	22	5	5	9	36	4		
45°	69,252	18	35	42	9	9	18	70	7		
90°	127,936	32	64	77	16	16	32	128	13		
PLUG	90,478	23	46	55	12	12	23	91	10		
30"											
11 1/4"	27,709	7	14	17	4	4	7	2	3		
22 1/2"	55,163	14	28	34	7	7	14	56	6		
45°	108,206	28	55	65	14	14	28	109	11		
90°	199,900	50	100	120	25	25	50	200	20		
PLUG	141,372	36	71	85	18	18	36	142	15		
36"											
11 1/4"	39,901	10	20	24	5	5	10	40	4		
22 1/2"	79,439	20	40	48	10	10	20	30	8		
45°	155,816	39	78	94	20	20	39	156	16		
90°	287,855	72	144	172	36	36	72	288	29		
PLUG	203,575	51	102	122	26	26	51	204	21		
48"											
11 1/4"	70,935	18	36	43	9	9	18	71	8		
22 1/2"	141,218	36	71	85	18	18	36	142	15		
45°	277,007	70	139	166	35	35	70	277	28		
90°	511,742	128	256	320	64	64	128	512	52		
PLUG	361,911	91	181	217	46	46	91	362	37		

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		



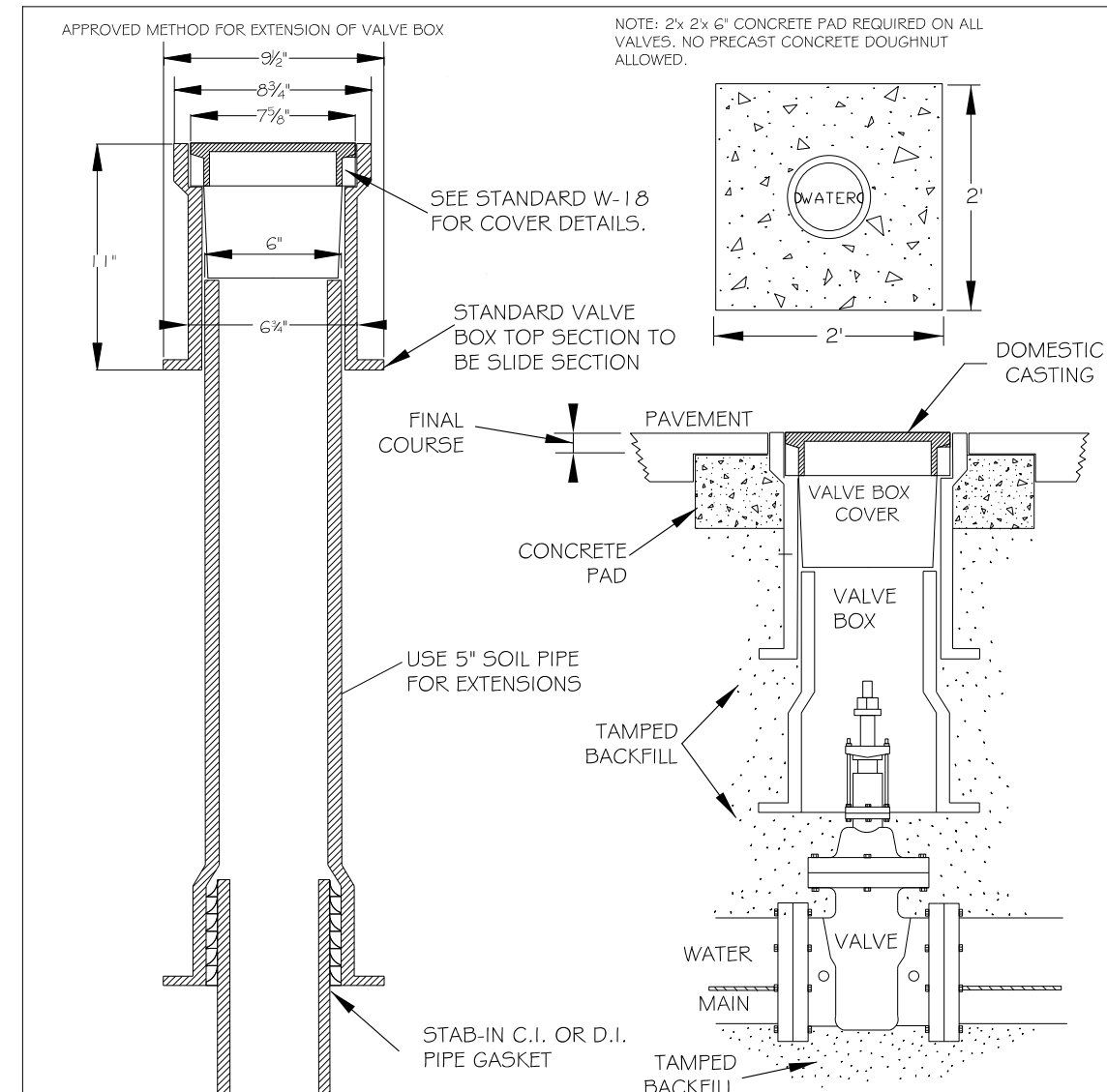
ROD REQUIREMENTS		
SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,779	6
24"	69,252	6

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCKING				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ABB	4-6-04	J.P.S.	11-1-10
	D.H.L.	6-18-08		



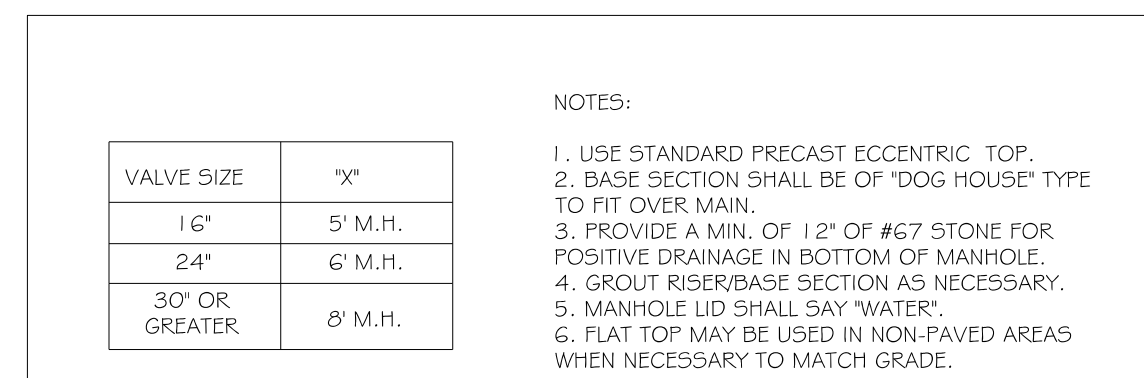
- NOTES:
1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
  2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
  3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
  4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-5	TO NOTES	3-1-87	D.W.C.	9-3-99	
		7-2-82	RRH	3-30-00	



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

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



- NOTES:
1. USE STANDARD PRECAST ECCENTRIC TOP TO FIT OVER MAIN.
  2. BASE SECTION SHALL BE OF "DOG HOUSE" TYPE FOR POSITIVE DRAINAGE IN BOTTOM OF MANHOLE.
  3. PROVIDE A MIN. OF 12" OF #67 STONE FOR POSITIVE DRAINAGE IN BOTTOM OF MANHOLE.
  4. GROUT RISER/BASE SECTION AS NECESSARY.
  5. MANHOLE LID SHALL SAY "WATER".
  6. FLAT TOP MAY BE USED IN NON-PAVED AREAS WHEN NECESSARY TO MATCH GRADE.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES					
BUTTERFLY VALVE MANHOLE DETAIL FOR 12" & 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.F.S.	10-20-10	

Prepared in the Office of:

# AECOM

AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

PROJECT REFERENCE NO. **U-5748** SHEET NO. **UC-3B**

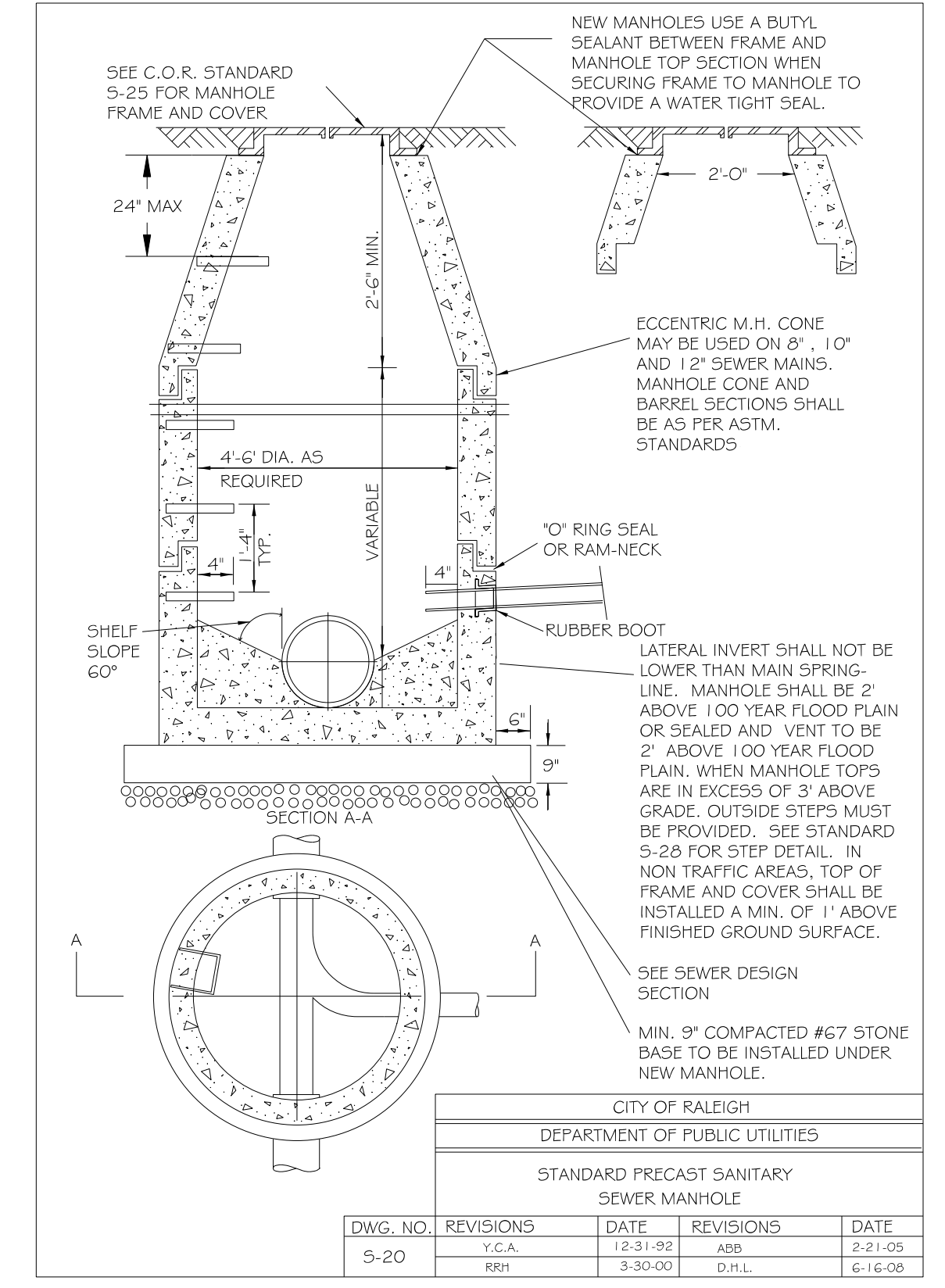
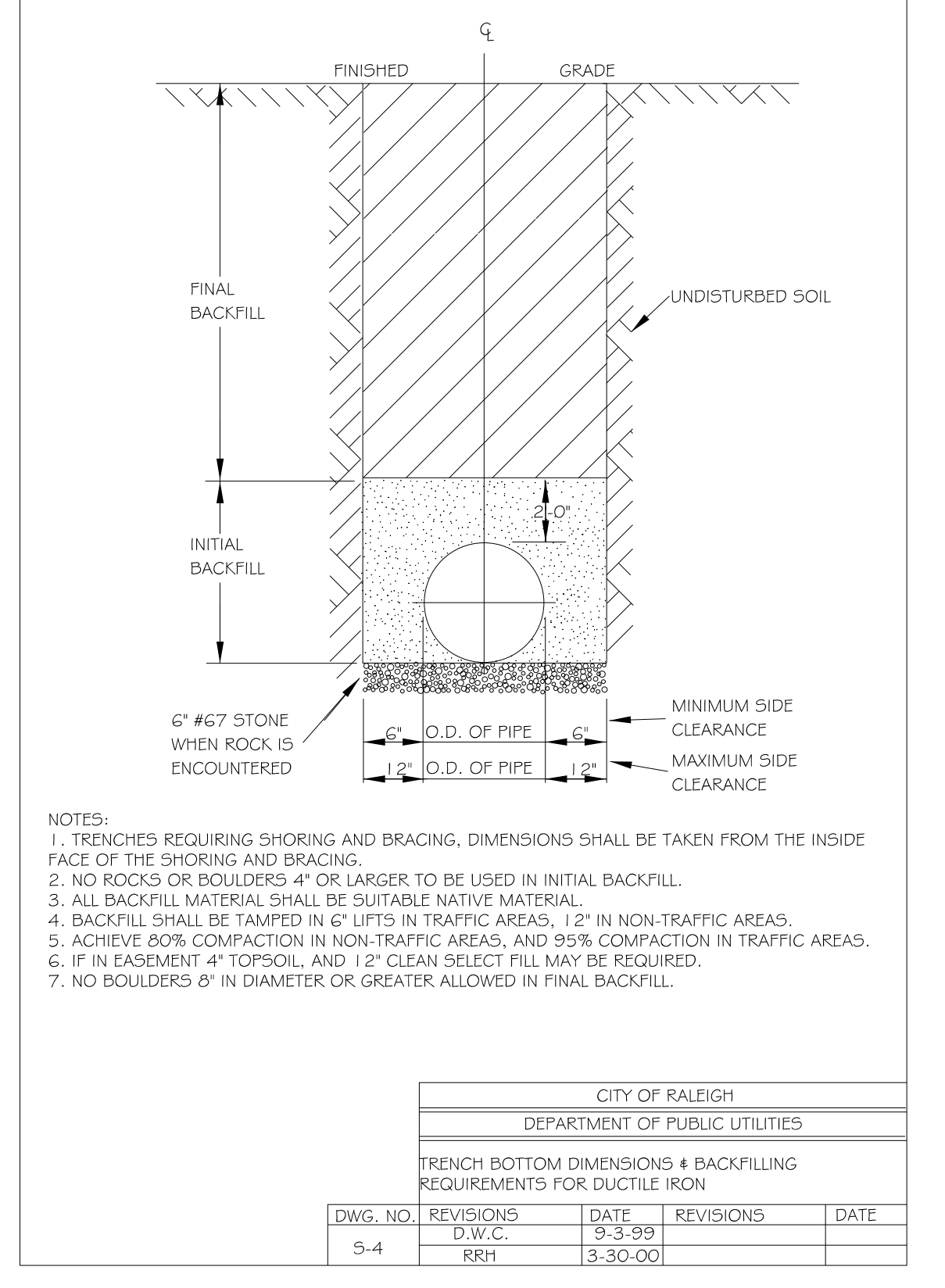
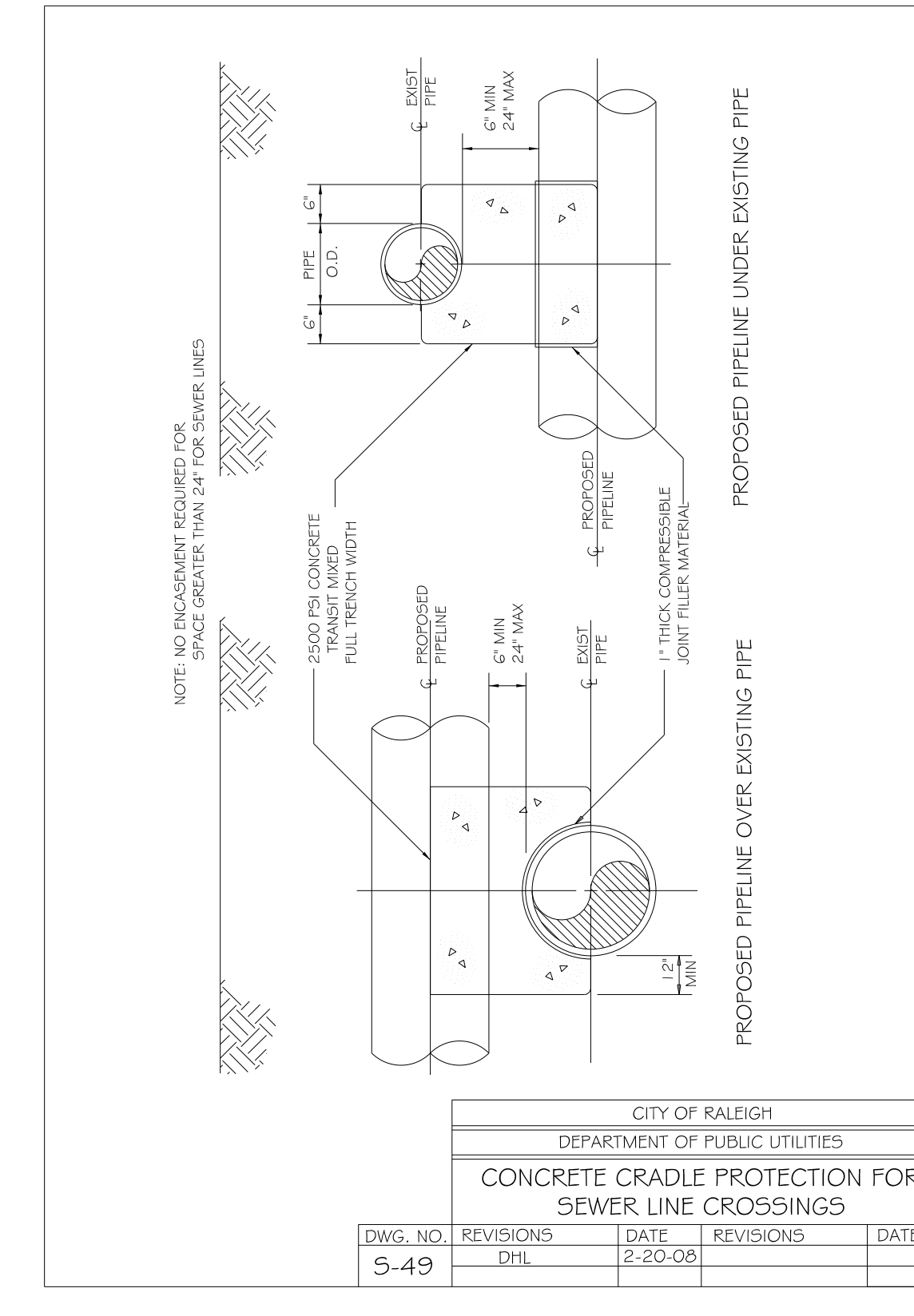
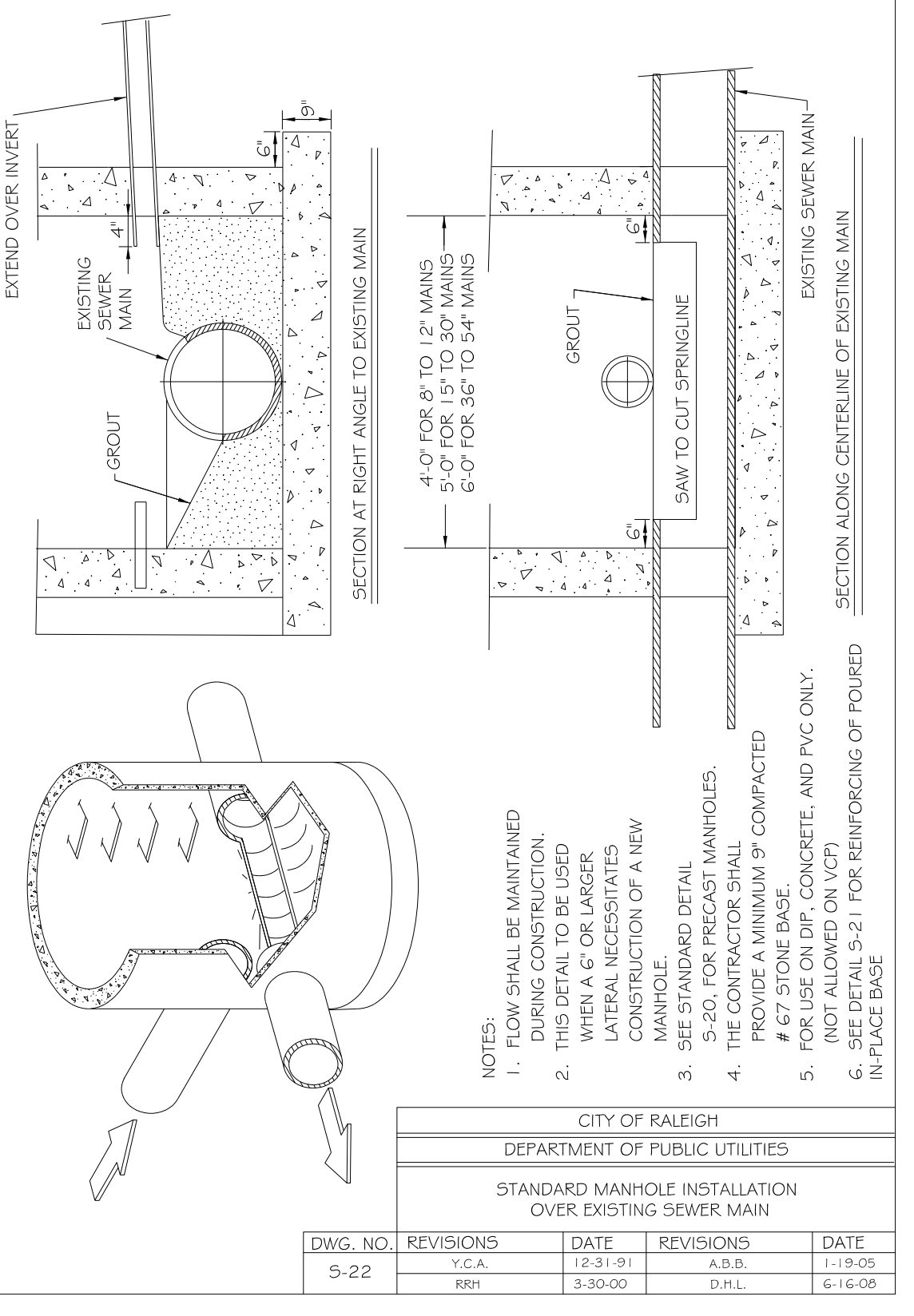
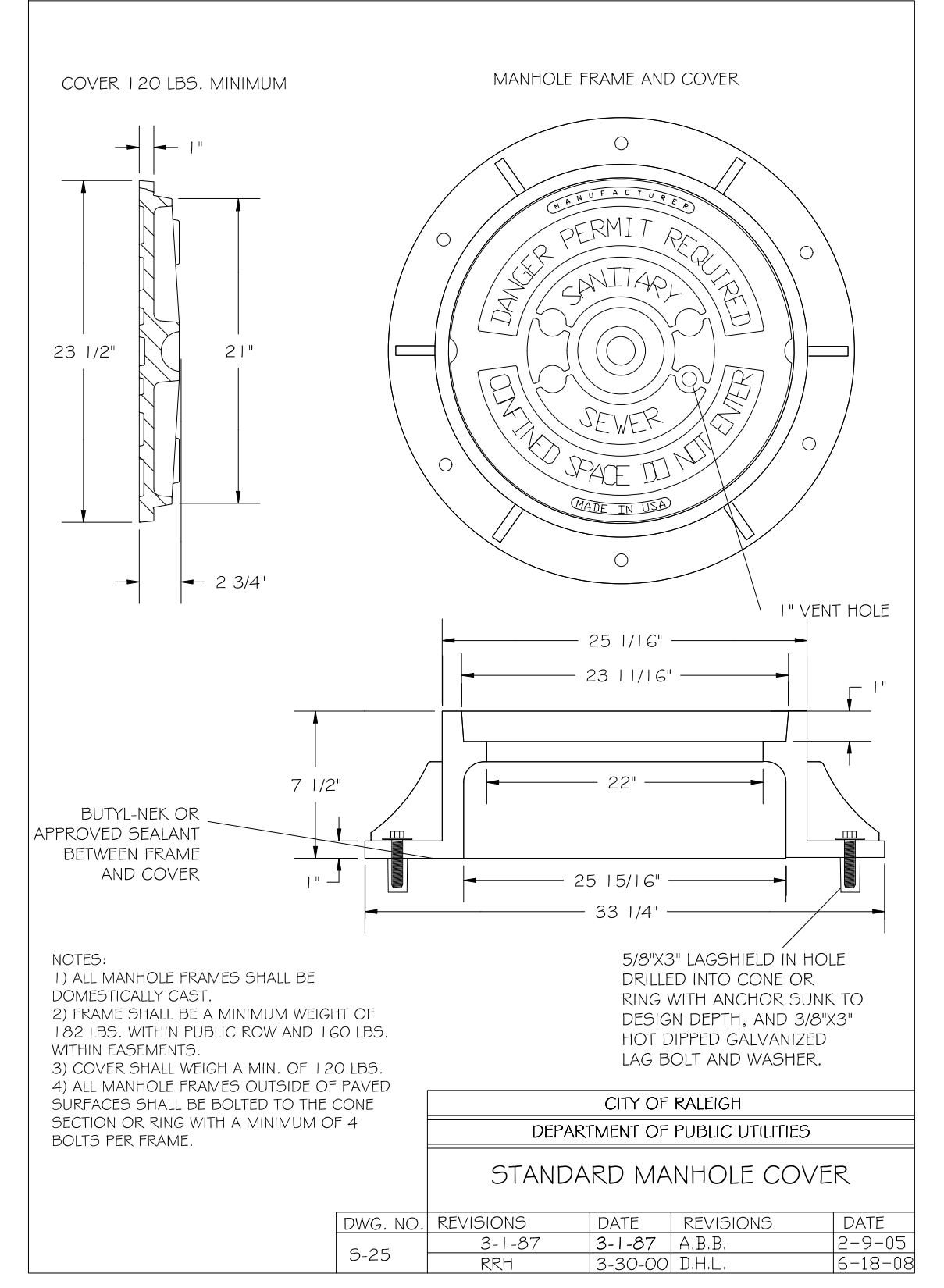
DESIGNED BY: \_\_\_\_\_  
DRAWN BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
APPROVED BY: \_\_\_\_\_  
REVISED: \_\_\_\_\_

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

SEAL 040486  
NORTH CAROLINA PROFESSIONAL ENGINEER JOSEPH C. TURNER  
DocuSign Envelope ID: 05B9623C-99FF-4EBF-9932-80B9328507FE

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## UTILITY CONSTRUCTION



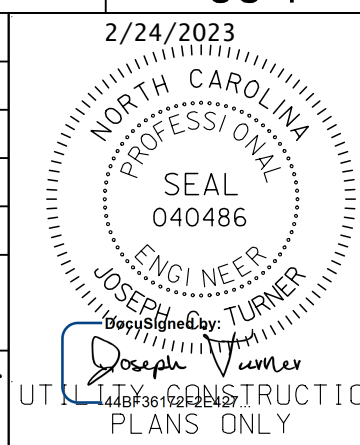
Prepared in the Office of:



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5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

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PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-4
DESIGNED BY:	2/24/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	

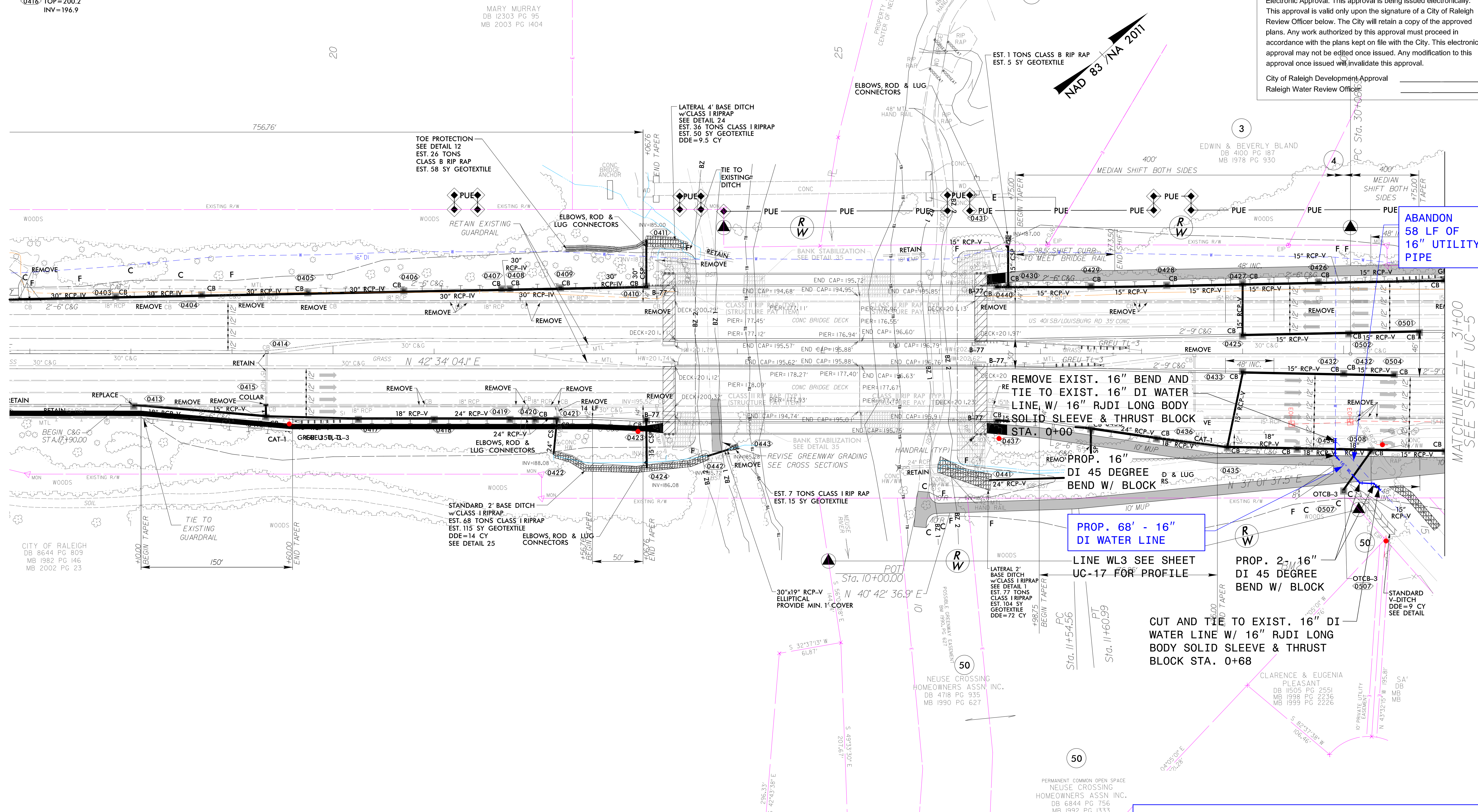


### UTILITY CONSTRUCTION

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval  
Raleigh Water Review Officer

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0414 TOP=201.2 INV=198.2						
0415 INV=197.4						
0416 TOP=200.2 INV=196.9						



ABANDON  
58 LF OF  
16" UTILITY  
PIPE

PROP. 68" - 16"  
DI WATER LINE  
LINE WL3 SEE SHEET  
UC-17 FOR PROFILE

CUT AND TIE TO EXIST. 16" DI  
WATER LINE W/ 16" RJD  
LONG BODY SOLID SLEEVE &  
THRUST BLOCK STA. 0+68

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1490 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

DATE: 2/24/2023  
TIME: 2:58:45 PM  
DGN: c:\pwworking\aecom\jsetl\_no\_2020\ms846\5748\_uc\_18304.dgn



AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD., SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

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PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-5
DESIGNED BY:	2/24/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

### UTILITY CONSTRUCTION

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City of Raleigh Development Approval  
Raleigh Water Review Officer

0501 TOP=203.1 INV=200.1	0511 TOP=203.6 INV=199.8	0520 TOP=202.3 INV=199.3	0533 TOP=203.6 INV=200.6	0545 TOP=202.3 INV=199.0	0562 TOP=216.1 INV=213.0
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			0549 INV=188.0		

CUT AND TIE TO EXIST.  
16" WATER LINE W/  
16" RJDI LONG BODY  
SOLID SLEEVE & THRUST  
BLOCK STA. 0+00.00

PROP. 5' DIA.  
UTILITY MANHOLE  
4' - UTILITY MANHOLE  
WALL, 5' DIA  
1- 16" VALVE

PROP. 396' - 16"  
DI WATER LINE  
LINE WL1/ SEE SHEET  
UC-17 FOR PROFILE

PROP. 2- 16"  
DI 45 DEGREE  
BEND W/ BLOCK

PROP. 1- FIRE HYDRANT  
5' - FIRE HYDRANT LEG  
1- REMOVE FIRE HYDRANT

PROP. 1- FIRE HYDRANT  
8' - FIRE HYDRANT LEG  
1- REMOVE FIRE HYDRANT

PROP. 1- 16"  
INSERTION VALVE  
LOCATE 100'  
MIN. FROM  
PIPE CUT

PROP. 16" x 16"  
DI TEE W/ BLOCK

PROP. 2- 16"  
DI 11.25 DEGREE  
BEND W/ BLOCK

CUT AND TIE TO EXIST.  
16" WATER LINE W/  
16" RJDI LONG BODY  
SOLID SLEEVE & THRUST  
BLOCK STA. 3+85

MATCHLINE -L- 3+00  
SEE SHEET UC-4

PROP. 20' - 16"  
DI WATER LINE

PROP. 388' - ABANDON  
16" UTILITY PIPE

PROP. 1 - REMOVE &  
REPLACE BLOW-OFF  
VALVE

TIE TO EXIST. 16" VALVE  
WITH RJDI PIPE

PROP. 1 - ABANDON  
UTILITY MANHOLE

PROP. 1 -  
REMOVE FIRE HYDRANT

CUT AND TIE TO EXIST. 8"  
WATER LINE W/ 8" RJDI LONG  
BODY SOLID SLEEVE & THRUST  
BLOCK STA. 0+00

PROP. 145' - ABANDON  
8" UTILITY PIPE

PROP. 2- 8" DI 45 DEGREE  
BEND W/ BLOCK

PROP. 1 - FIRE HYDRANT  
1- 6" VALVE  
18' - FIRE HYDRANT LEG

PROP. 150' - 8"  
DI WATER LINE  
LINE WL2 SEE SHEET  
UC-17 FOR PROFILE

PROP. 8" DI 11.25 DEGREE BEND  
W/ BLOCK

CUT AND TIE TO EXIST. 8" DI WATER LINE W/ 8" RJDI  
LONG BODY SOLID SLEEVE & THRUST BLOCK STA. 1+50.2

PROP. 8" x 6" TEE  
W/ BLOCK

PROP. 1- 8"  
INSERTION VALVE

LOCATE 100' MIN.  
FROM PIPE CUT

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE  
FITTINGS ON THIS PLAN SHEET IS 3570 POUNDS. THE  
ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY  
BASED ON FIELD CONDITIONS.

DATE: 2/24/2023  
TIME: 3:07:01 PM  
DGN: c:\powerking\work\04621\_no\_2020\04621\_no\_2020\04621\_no\_2020\04621\_no\_2020.dgn

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PROP. 1- FIRE HYDRANT 8' - FIRE HYDRANT LEG 1- REMOVE FIRE HYDRANT

PROP. 1 - 2" AIR RELEASE VALVE 30' - 2" WATER SERVICE LINE 1 - 4' DIA UTILITY MANHOLE 2' - UTILITY MANHOLE WALL 4' DIA 1 - REMOVE UTILITY MANHOLE

PROP. 1- FIRE HYDRANT 12' - FIRE HYDRANT LEG 1- REMOVE FIRE HYDRANT

PROP. 1- FIRE HYDRANT 14' - FIRE HYDRANT LEG 1- REMOVE FIRE HYDRANT

PROP. 156' - ABANDON 8" UTILITY PIPE, 1- UTILITY MANHOLE

PROP. 4' DIA. UTILITY MANHOLE A3 4.3' - UTILITY MANHOLE WALL, 4' DIA.

PROP. 174.47' - 8" SANITARY GRAVITY SEWER

PROP. 4' DIA. UTILITY MANHOLE A1

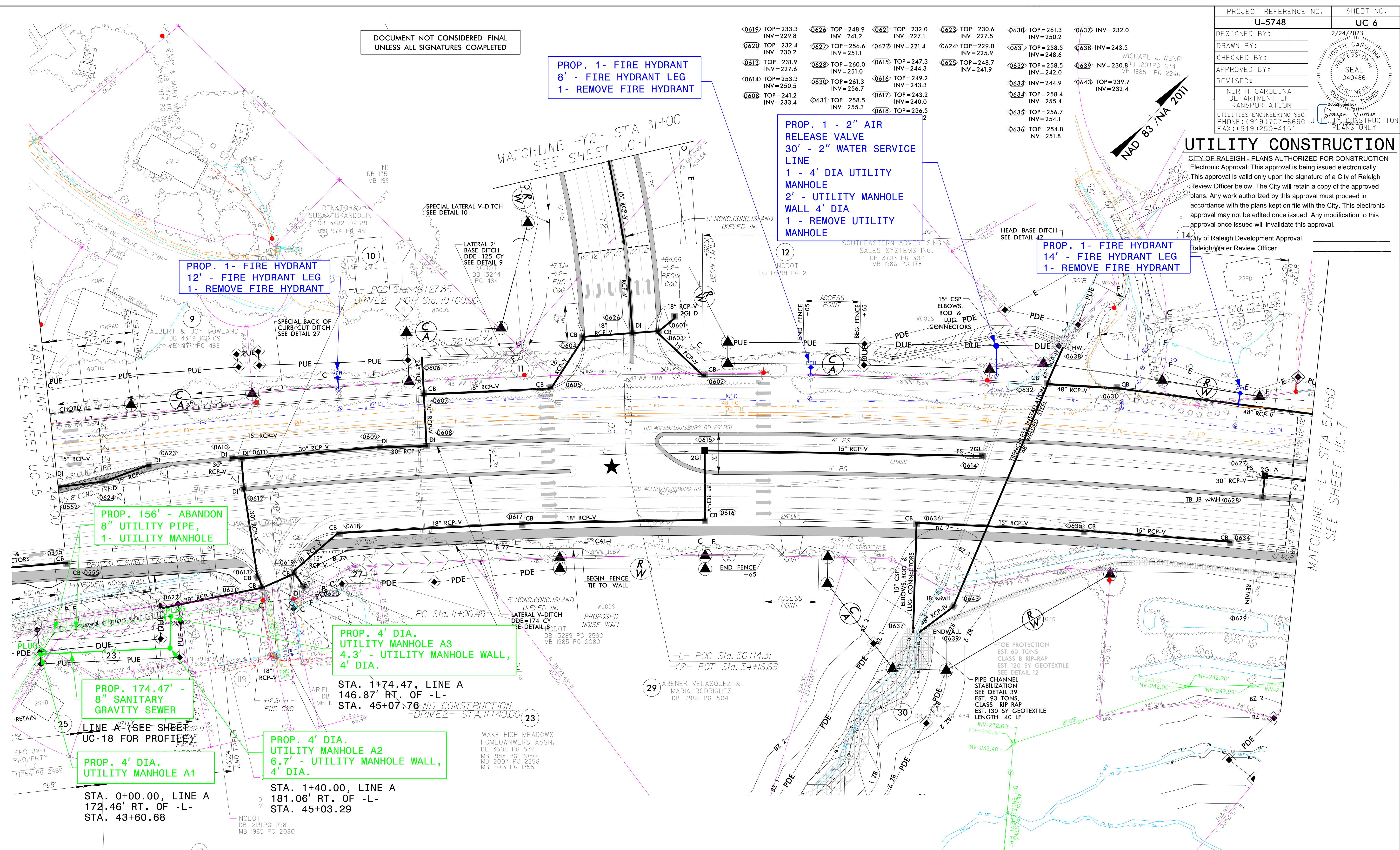
PROP. 4' DIA. UTILITY MANHOLE A2 6.7' - UTILITY MANHOLE WALL, 4' DIA.

Bypass Pumping Operations

**Sewer Bypass Pumping:**  
A bypass plan sealed by a NC Professional Engineer must be submitted to Public Utilities prior to pumping operations to coordinate with administration engineering staff. Pumps should be sized to handle the peak daily flow (2.5 times the average daily flow with a minimum of 50 gpm) for the line or area of work. The contractor shall secure pumps from a pump supplier according to the provided flow information. Pumping operations must be monitored 24-hours a day for each day of the pumping operation by qualified personnel in order to respond to problems or failures. 100% redundancy is required for pumping operations. In addition, back up pumps are to be connected to the bypass force main to facilitate immediate use upon failure of the primary pumps.

- 0601 TOP=248.1 INV=245.9
- 0602 TOP=251.2 INV=248.2
- 0603 TOP=249.8 INV=245.8
- 0604 TOP=246.5 INV=241.0
- 0605 TOP=246.4 INV=240.6
- 0606 TOP=248.1 INV=245.9
- 0609 TOP=239.4 INV=233.2
- 0610 TOP=233.8 INV=230.6
- 0611 TOP=234.3 INV=229.3
- 0612 TOP=234.4 INV=229.1
- 0607 TOP=242.0 INV=233.7

- 0619 TOP=233.3 INV=229.8
- 0620 TOP=232.4 INV=230.2
- 0613 TOP=231.9 INV=227.6
- 0614 TOP=253.3 INV=250.5
- 0608 TOP=241.2 INV=233.4
- 0626 TOP=248.9 INV=241.2
- 0627 TOP=256.6 INV=251.1
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- 0621 TOP=232.0 INV=227.1
- 0622 TOP=256.6 INV=221.4
- 0615 TOP=247.3 INV=244.3
- 0616 TOP=249.2 INV=243.3
- 0617 TOP=243.2 INV=240.0
- 0618 TOP=236.5 INV=236.5
- 0623 TOP=230.6 INV=227.5
- 0624 TOP=229.0 INV=225.9
- 0625 TOP=248.7 INV=241.9
- 0630 TOP=261.3 INV=250.2
- 0631 TOP=258.5 INV=248.6
- 0632 TOP=258.5 INV=242.0
- 0633 INV=244.9
- 0634 TOP=258.4 INV=255.4
- 0635 TOP=256.7 INV=254.1
- 0636 TOP=254.8 INV=251.8
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DATE: 2/24/2023 TIME: 3:34:43 PM DGN: c:\powerking\work\com\_dsl\_rn\_2020\ms\_8416151748\_uc\_ast06.dgn

Prepared in the Office of:



AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC. 5438 WADE PARK BLVD, SUITE 200, SUITE 475, RALEIGH, NC 27607 919-461-1100 F-0342





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5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
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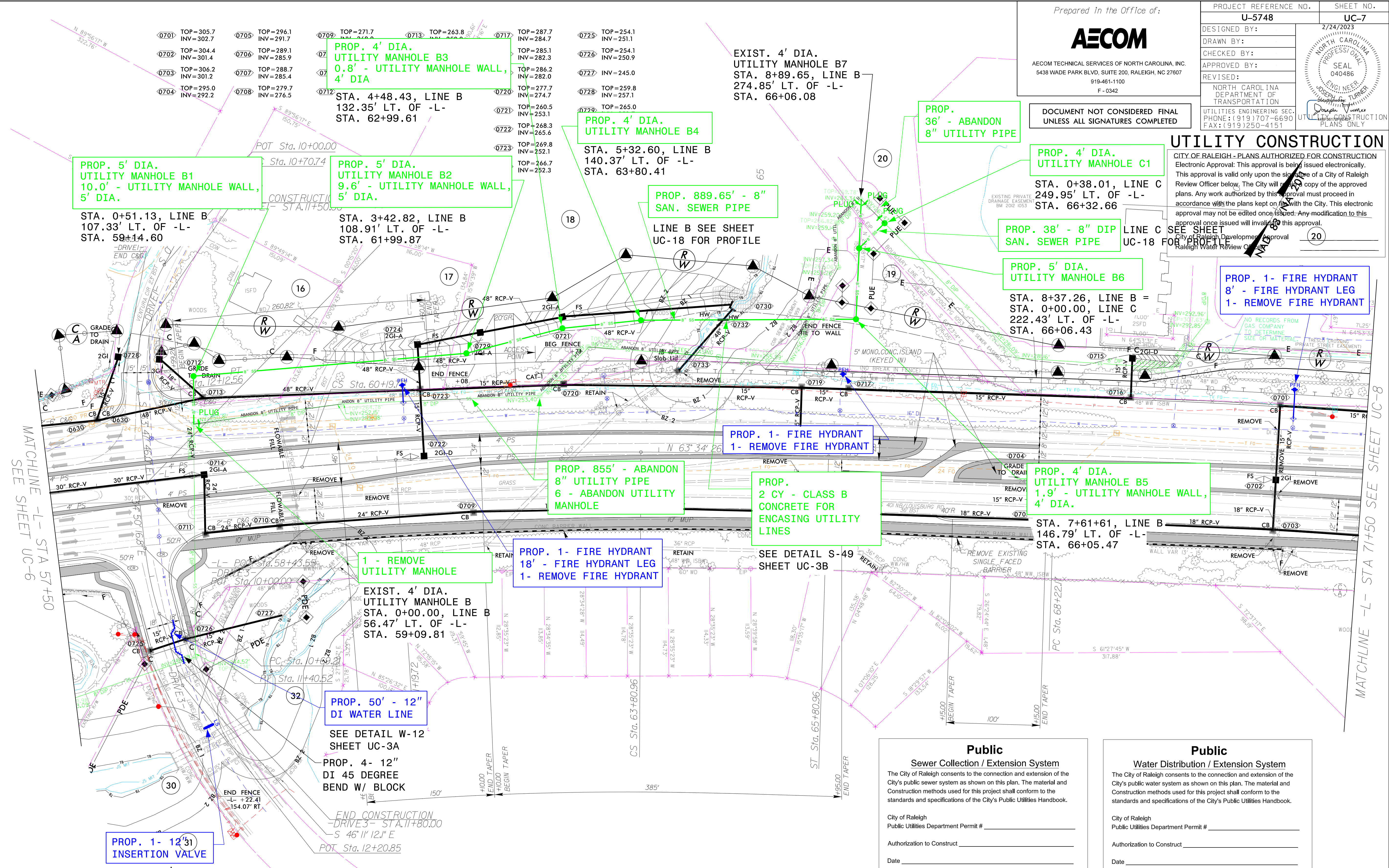
PROJECT REFERENCE NO.	U-5748	SHEET NO.	UC-7
DESIGNED BY:		2/24/2023	
DRAWN BY:		SEAL 040486	
CHECKED BY:		NORTH CAROLINA PROFESSIONAL ENGINEER	
APPROVED BY:		JAMES TURNER	
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
		UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

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### UTILITY CONSTRUCTION

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City of Raleigh Development Approval  
Raleigh Water Review Officer



**Public**  
Sewer Collection / Extension System  
The City of Raleigh consents to the connection and extension of the City's public sewer system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh  
Public Utilities Department Permit # \_\_\_\_\_  
Authorization to Construct \_\_\_\_\_  
Date \_\_\_\_\_

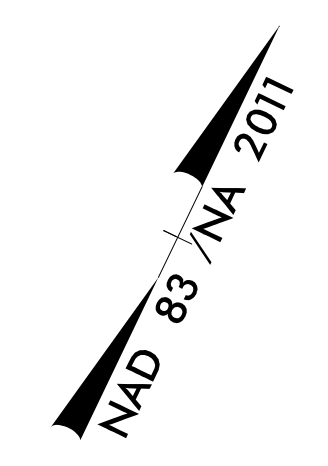
**Public**  
Water Distribution / Extension System  
The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh  
Public Utilities Department Permit # \_\_\_\_\_  
Authorization to Construct \_\_\_\_\_  
Date \_\_\_\_\_

**THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 860 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.**

DATE: 2/24/2023  
TIME: 3:50:47 PM  
DGN: c:\pwworking\aecom\user\j...\_20230220\jms.88415148\_uc\_pst07.dgn

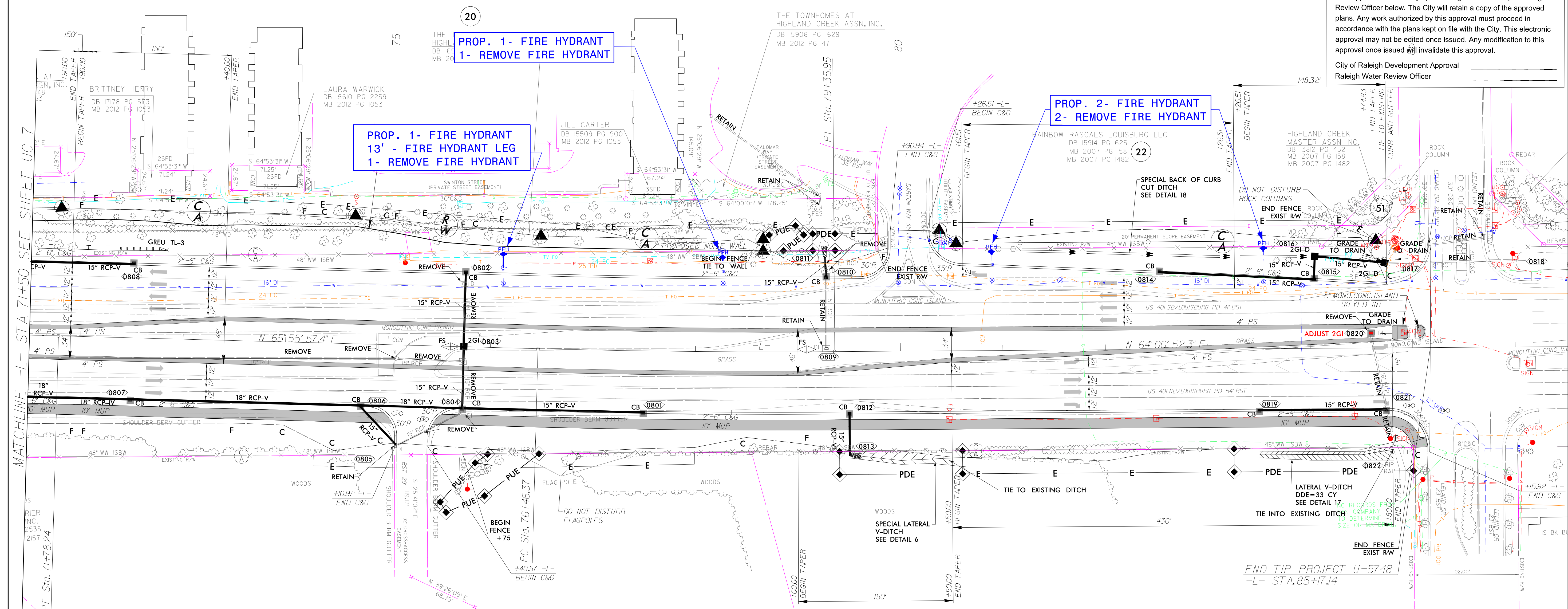
**Bypass Pumping Operations**  
Sewer Bypass Pumping:  
A bypass plan sealed by a NC Professional Engineer must be submitted to Public Utilities prior to pumping operations to coordinate with administration engineering staff. Pumps should be sized to handle the peak daily flow (2.5 times the average daily flow with a minimum of 50 gpm) for the line or area of work. The contractor shall secure pumps from a pump supplier according to the provided flow information. Pumping operations must be monitored 24 hours a day for each day of the pumping operation by qualified personnel in order to respond to problems or failures. 100% redundancy is required for pumping operations. In addition, back up pumps are to be connected to the bypass force main to facilitate immediate use upon failure of the primary pumps.



## UTILITY CONSTRUCTION

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION  
Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval \_\_\_\_\_  
Raleigh Water Review Officer \_\_\_\_\_



0801	TOP= 328.7 INV= 325.7
0802	TOP= 324.6 INV= 321.6
0803	TOP= 322.2 INV= 319.5
0804	TOP= 325.0 INV= 318.9
0805	TOP= 323.9 INV= 321.2
0806	TOP= 322.2 INV= 318.4

0807	TOP= 313.7 INV= 310.5
0808	TOP= 313.2 INV= 310.2
0809	TOP= 328.7 INV= 325.8

0810	TOP= 331.1 INV= 325.2
0811	INV= 324.9
0812	TOP= 331.5 INV= 328.5
0813	INV= 327.2
0814	TOP= 331.2 INV= 328.2
0815	TOP= 330.3 INV= 327.3

0816	TOP= 329.0 INV= 327.1
0817	TOP= 328.4 INV= 326.3
0819	TOP= 330.9 INV= 327.9
0820	TOP= 329.6 INV= 324.6
0821	TOP= 330.0 INV= 323.7

**Public Sewer Collection / Extension System**

The City of Raleigh consents to the connection and extension of the City's public sewer system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh  
Public Utilities Department Permit # \_\_\_\_\_

Authorization to Construct \_\_\_\_\_

Date \_\_\_\_\_

**Public Water Distribution / Extension System**

The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh  
Public Utilities Department Permit # \_\_\_\_\_

Authorization to Construct \_\_\_\_\_

Date \_\_\_\_\_

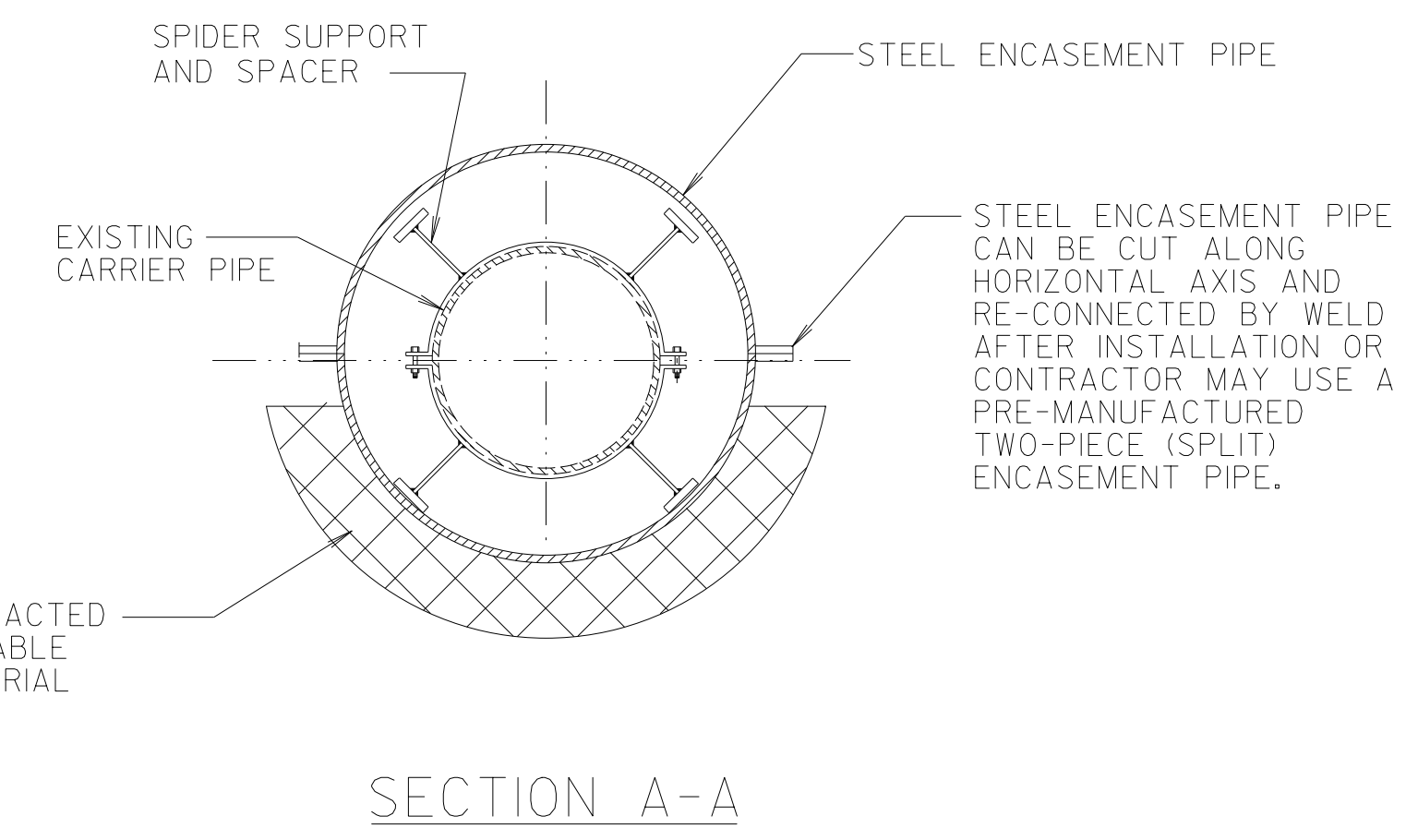
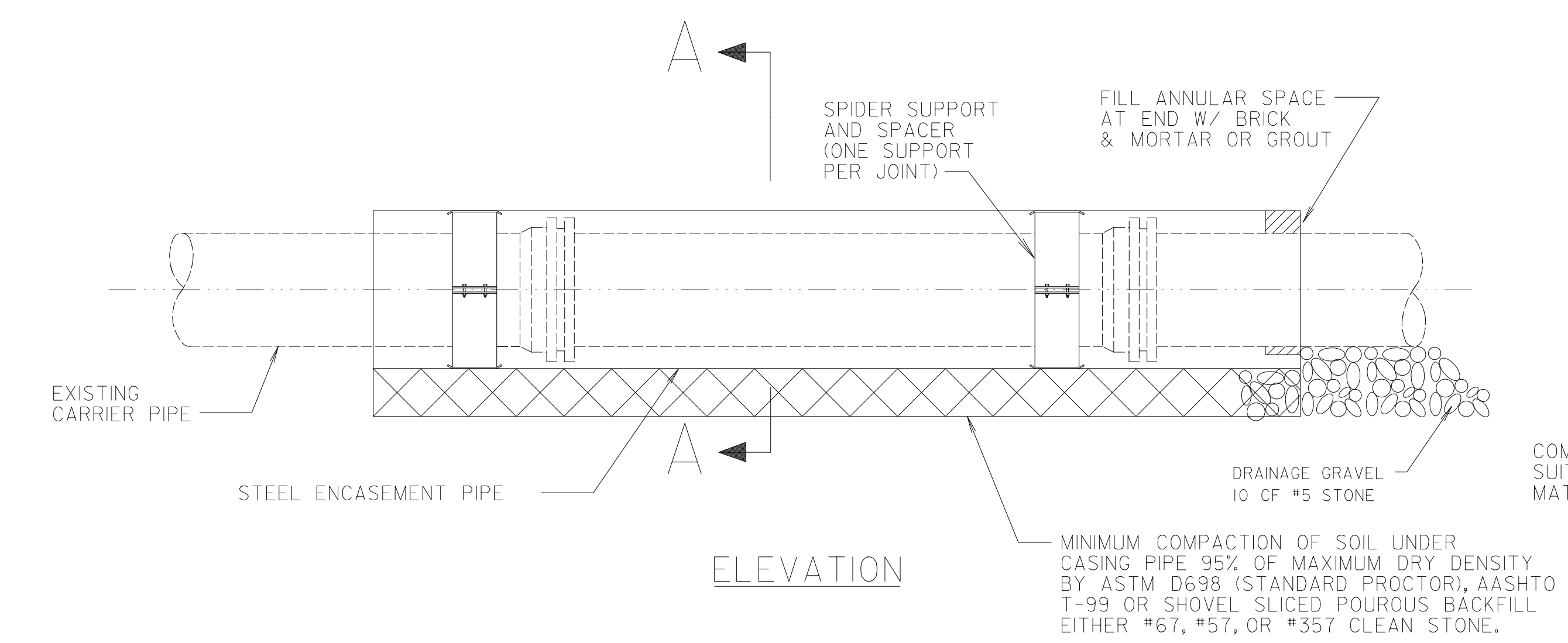
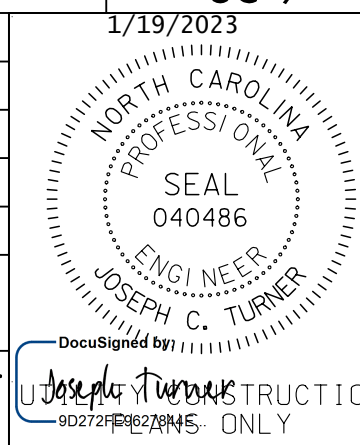
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AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-9
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	



# STEEL ENCASEMENT PIPE FOR SPLIT INSTALLATION

NTS

### NOTES:

1. CASING PIPE SHALL BE STEEL WITH MIN. YIELD STRENGTH OF 35,000 PSI.
2. NO MORE THAN ONE JOINT OF EXISTING WATER OR FORCE MAIN SHALL BE EXPOSED AT ONE TIME.
3. INSTALLATION OF CASING PIPE SHALL BE BY OPEN TRENCH.

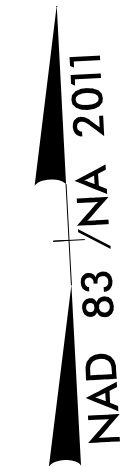
EXIST. 4" DIP FORCE MAIN SEWER

PROP. 20' - 10" SPLIT ENCASEMENT PIPE

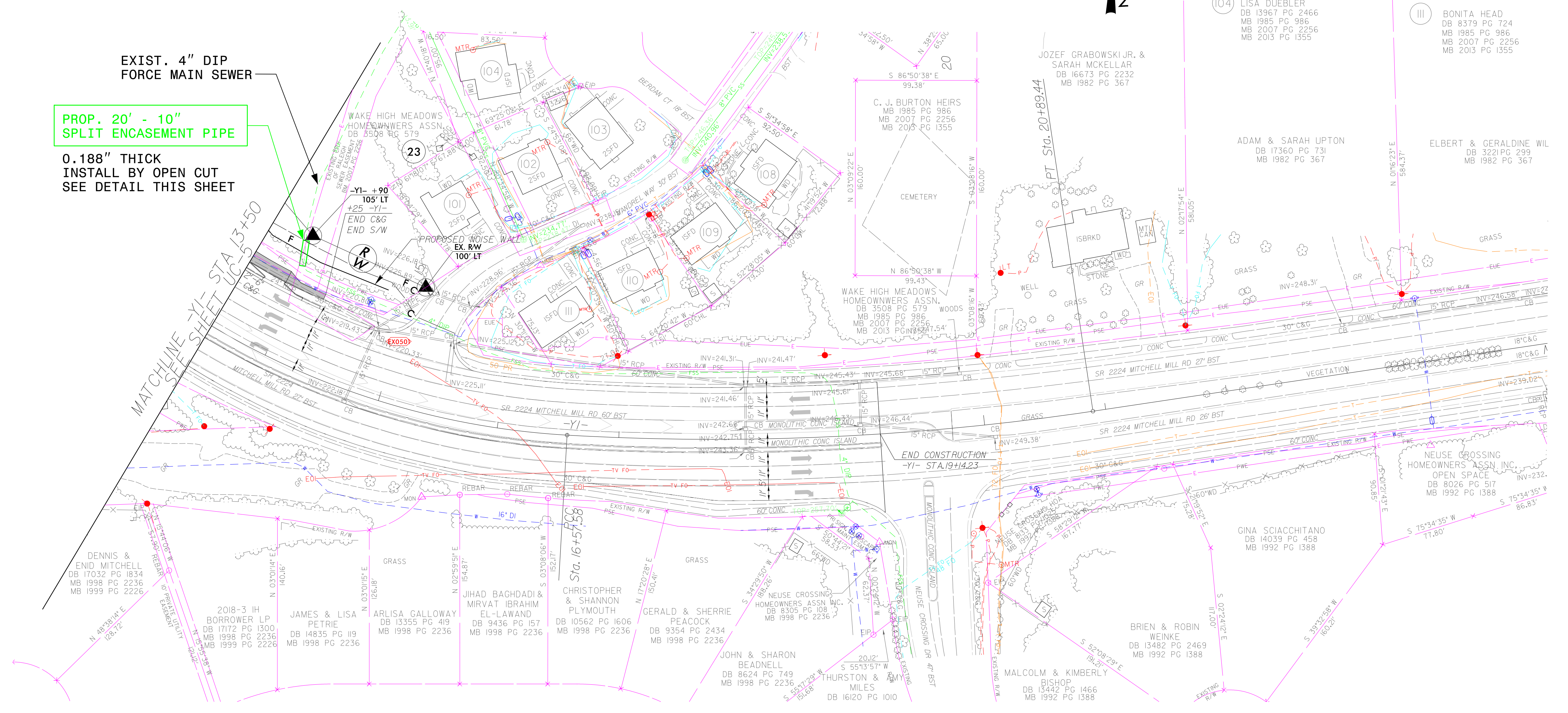
0.188" THICK

INSTALL BY OPEN CUT

SEE DETAIL THIS SHEET



- 101 MARIA HERNANDEZ  
DB 1551 PG 1137  
MB 1985 PG 986  
MB 2007 PG 2256  
MB 2013 PG 1355
- 102 NAT HUNT, JR. FAMILY TRUST  
DB 16204 PG 2354  
MB 1985 PG 986  
MB 2007 PG 2256  
MB 2013 PG 1355
- 103 ANGELA GUNN  
DB 8293 PG 1462  
MB 1985 PG 986  
MB 2007 PG 2256  
MB 2013 PG 1355
- 104 LISA DUEBLER  
DB 13967 PG 2466  
MB 1985 PG 986  
MB 2007 PG 2256  
MB 2013 PG 1355
- 108 GLENN LISSNER  
DB 12954 PG 1463  
MB 1985 PG 986  
MB 2007 PG 2256  
MB 2013 PG 1355
- 109 KATHERINE BRICKELL  
DB 7766 PG 356  
MB 1985 PG 986  
MB 2007 PG 2256  
MB 2013 PG 1355
- 110 VICTOR CARAPIA & ANGELA ROMERO  
DB 15519 PG 1481  
MB 1985 PG 986  
MB 2007 PG 2256  
MB 2013 PG 1355
- 111 BONITA HEAD  
DB 8379 PG 724  
MB 1985 PG 986  
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MB 2013 PG 1355



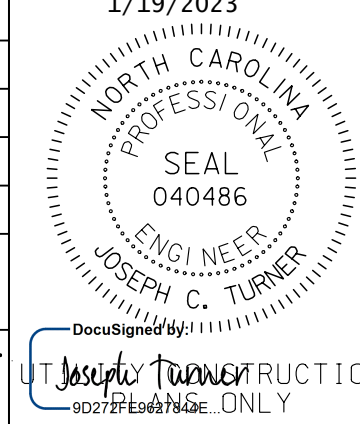
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5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

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PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-10
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	



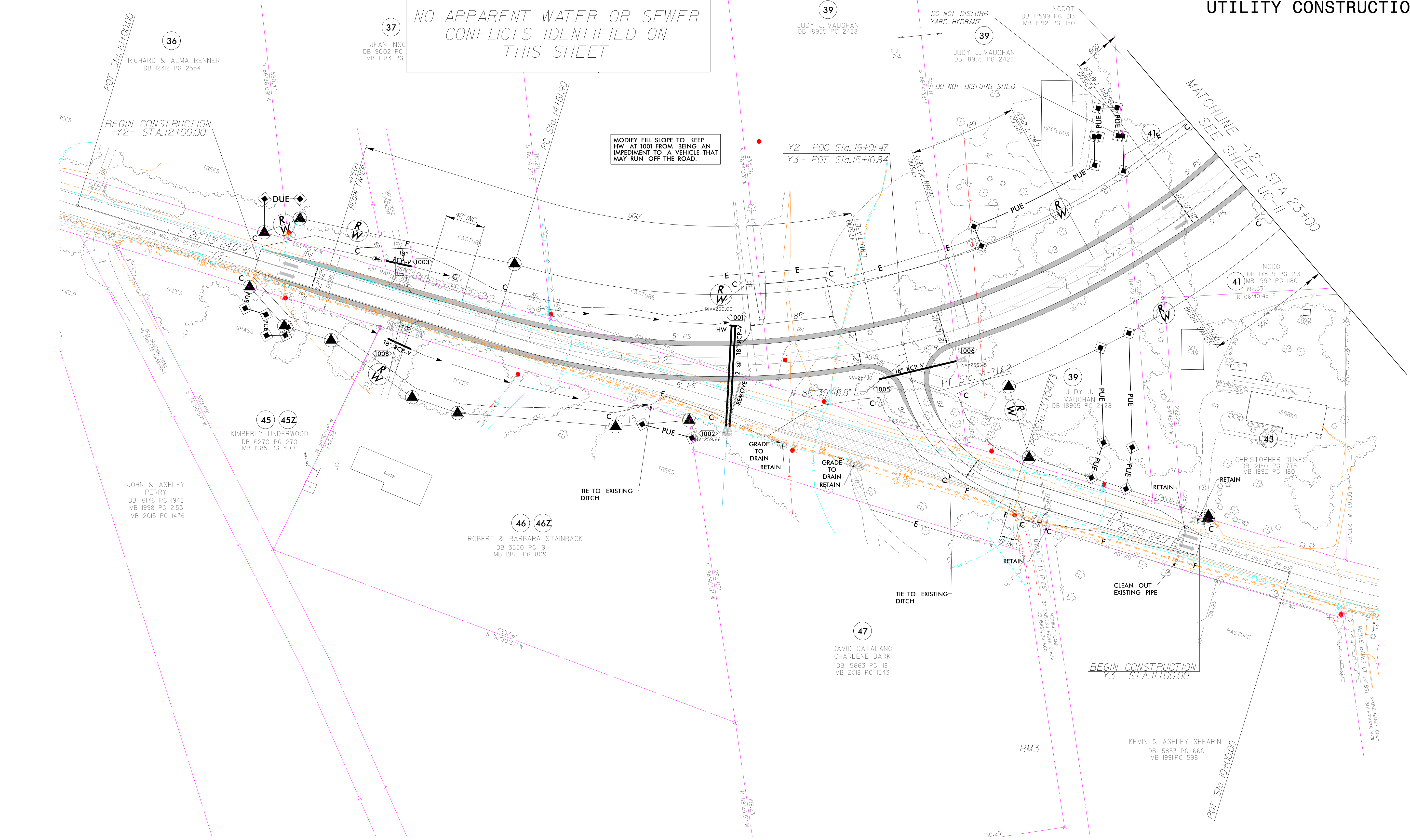
# UTILITY CONSTRUCTION

- 1001 INV = 260.0
- 1002 INV = 259.7
- 1005 INV = 257.1
- 1006 INV = 256.5

NAD 83 / NA 2011

NO APPARENT WATER OR SEWER CONFLICTS IDENTIFIED ON THIS SHEET

MODIFY FILL SLOPE TO KEEP HW AT 1001 FROM BEING AN IMPEDIMENT TO A VEHICLE THAT MAY RUN OFF THE ROAD.



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TIME: 10:24:48 AM  
DGN: c:\pwworking\aecom\dsel\_no\_2020\ms84\US1748\_uc\_astm02.dgn

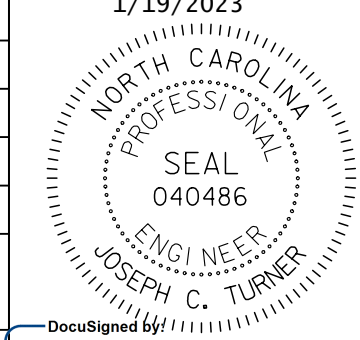
Prepared in the Office of:



AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F - 0342

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

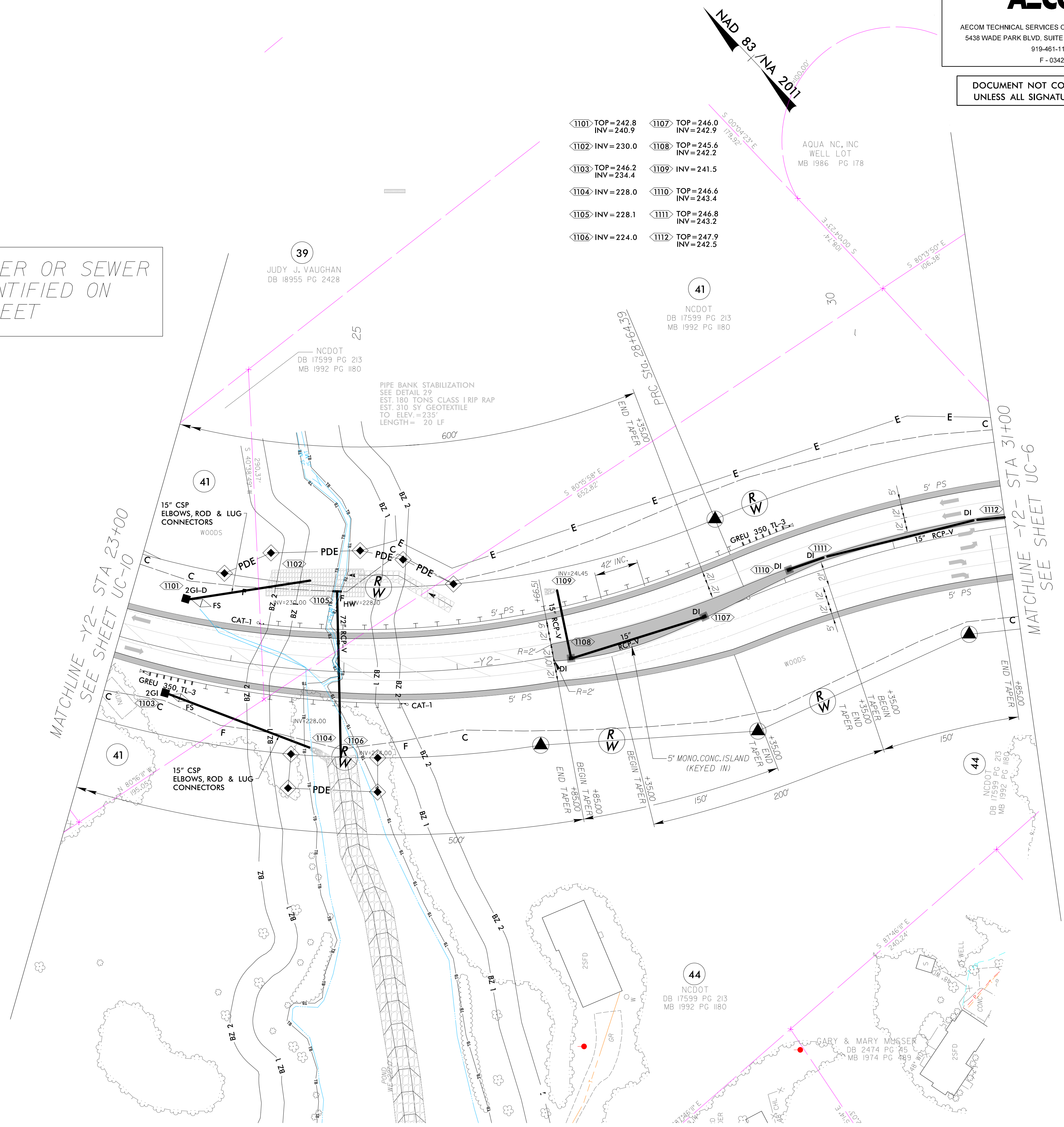
PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-11
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SECTION	
PHONE: (919) 707-6690	
FAX: (919) 250-4151	



# UTILITY CONSTRUCTION

NO APPARENT WATER OR SEWER CONFLICTS IDENTIFIED ON THIS SHEET

- 1101 TOP=242.8 INV=240.9
- 1102 INV=230.0
- 1103 TOP=246.2 INV=234.4
- 1104 INV=228.0
- 1105 INV=228.1
- 1106 INV=224.0
- 1107 TOP=246.0 INV=242.9
- 1108 TOP=245.6 INV=242.2
- 1109 INV=241.5
- 1110 TOP=246.6 INV=243.4
- 1111 TOP=246.8 INV=243.2
- 1112 TOP=247.9 INV=242.5



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TIME: 10:51:3 AM  
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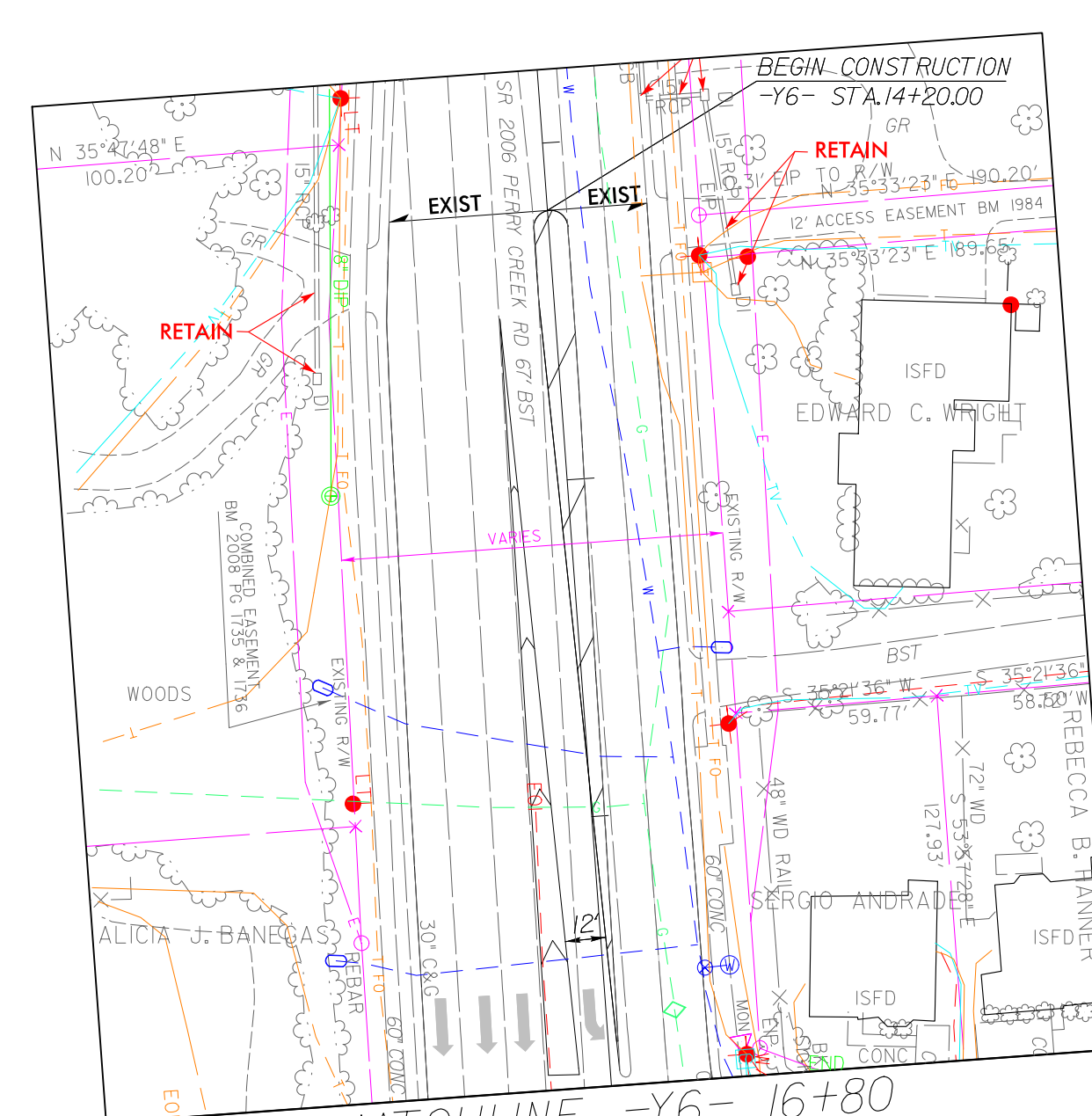
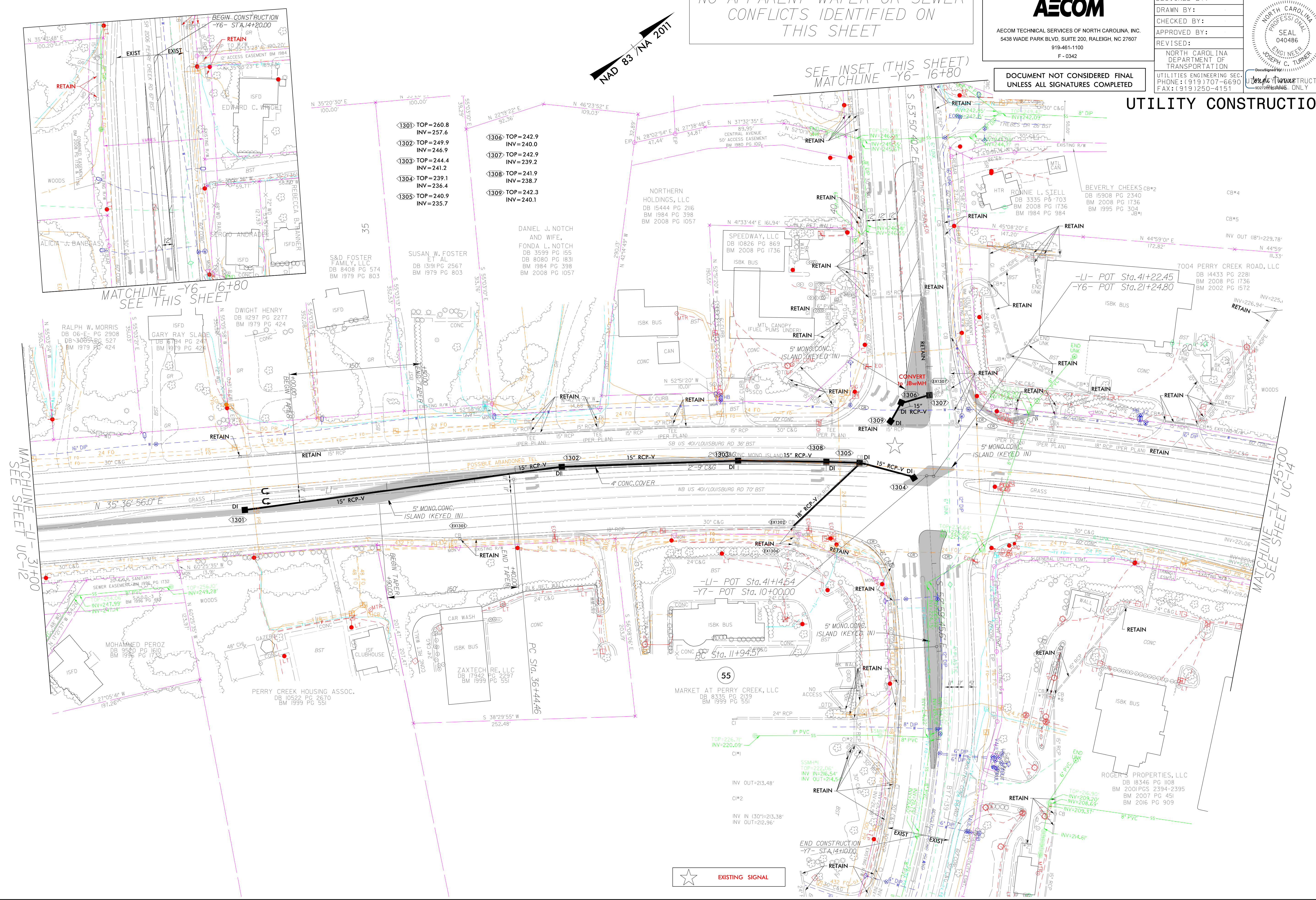
AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-13
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SEAL 040486 ENGINEER JOSEPH C. TURNER	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

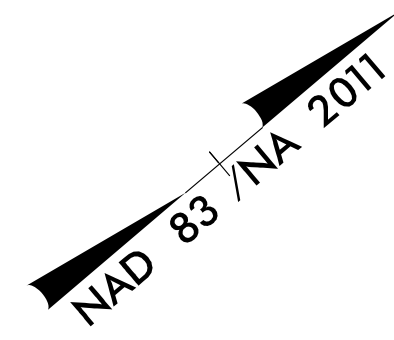
NO APPARENT WATER OR SEWER CONFLICTS IDENTIFIED ON THIS SHEET

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

### UTILITY CONSTRUCTION



- 1301 TOP=260.8 INV=257.6
- 1302 TOP=249.9 INV=246.9
- 1303 TOP=244.4 INV=241.2
- 1304 TOP=239.1 INV=236.4
- 1305 TOP=240.9 INV=235.7
- 1306 TOP=242.9 INV=240.0
- 1307 TOP=242.9 INV=239.2
- 1308 TOP=241.9 INV=238.7
- 1309 TOP=242.3 INV=240.1



SEE INSET (THIS SHEET) MATCHLINE -Y6- 16+80

MATCHLINE -Y6- 16+80 SEE THIS SHEET

MATCHLINE -U- 31+00 SEE SHEET UC-12

MATCHLINE -LI- 45+00 SEE SHEET UC-14



EXISTING SIGNAL

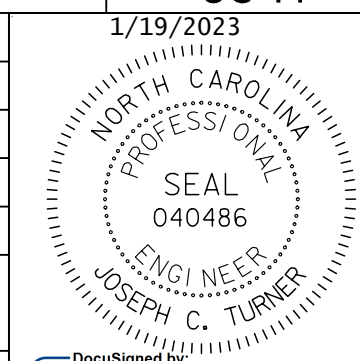
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TIME: 10:25:15 AM  
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AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

PROJECT REFERENCE NO.	UC-14
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

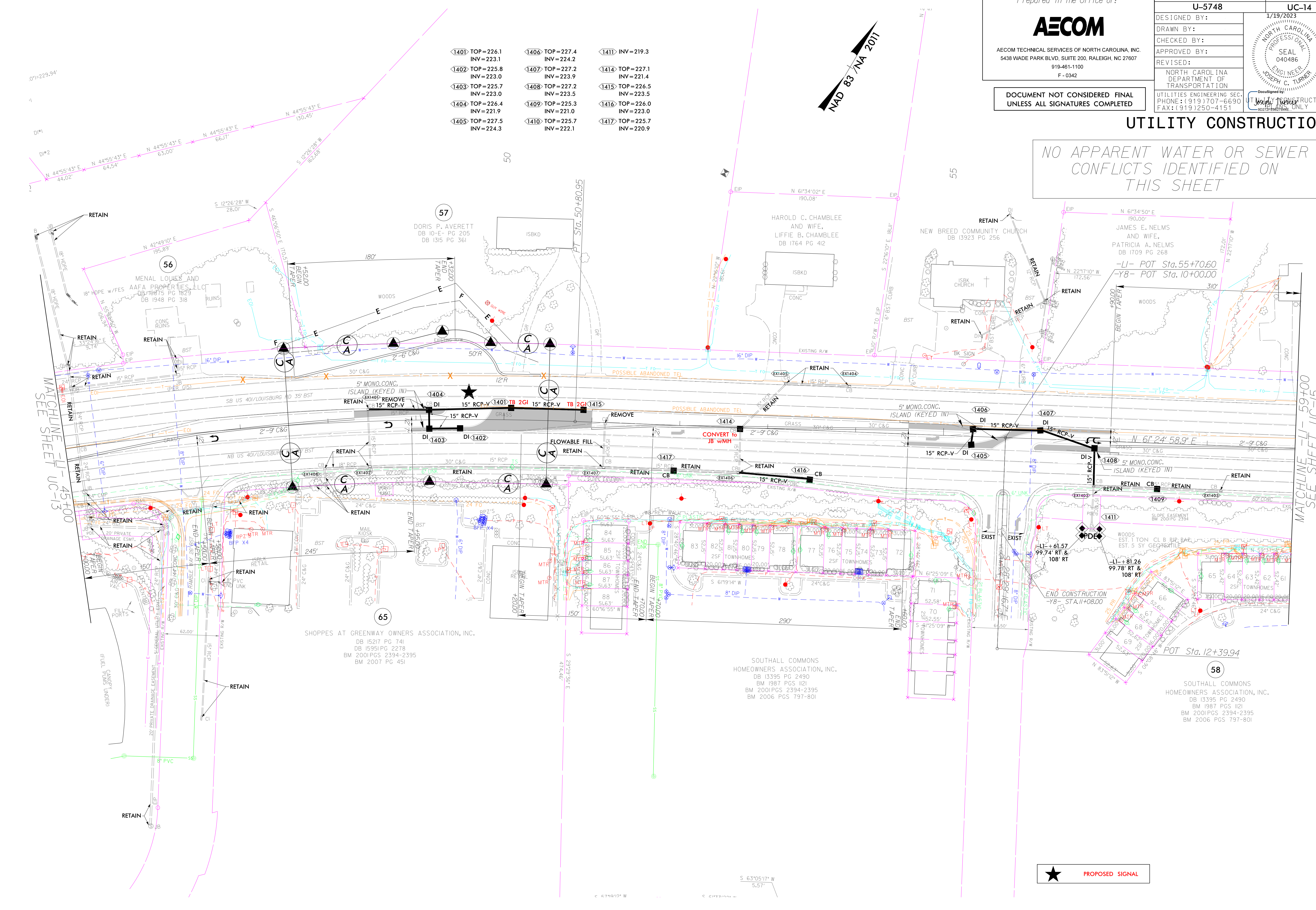
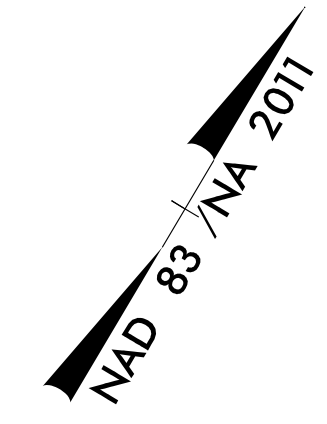


DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

### UTILITY CONSTRUCTION

NO APPARENT WATER OR SEWER CONFLICTS IDENTIFIED ON THIS SHEET

1401 TOP=226.1 INV=223.1	1406 TOP=227.4 INV=224.2	1411 INV=219.3
1402 TOP=225.8 INV=223.0	1407 TOP=227.2 INV=223.9	1414 TOP=227.1 INV=221.4
1403 TOP=225.7 INV=223.0	1408 TOP=227.2 INV=223.5	1415 TOP=226.5 INV=223.5
1404 TOP=226.4 INV=221.9	1409 TOP=225.3 INV=221.0	1416 TOP=226.0 INV=223.0
1405 TOP=227.5 INV=224.3	1410 TOP=225.7 INV=222.1	1417 TOP=225.7 INV=220.9



MATCHLINE - LI-45+400  
SEE SHEET UC-13

MATCHLINE - LI-59+00  
SEE SHEET UC-15

★ PROPOSED SIGNAL

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TIME: 10:26:23 AM  
DGN: c:\pwworking\aecom\jsetl\_no\_2020\jms384\US15748\_uc\_13.dgn



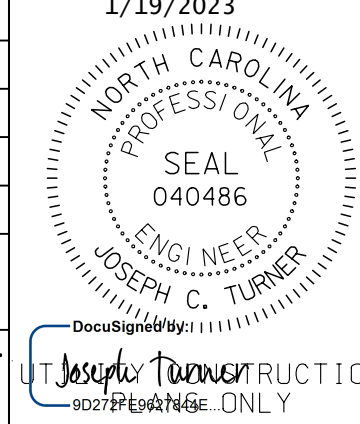
Prepared in the Office of:



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5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

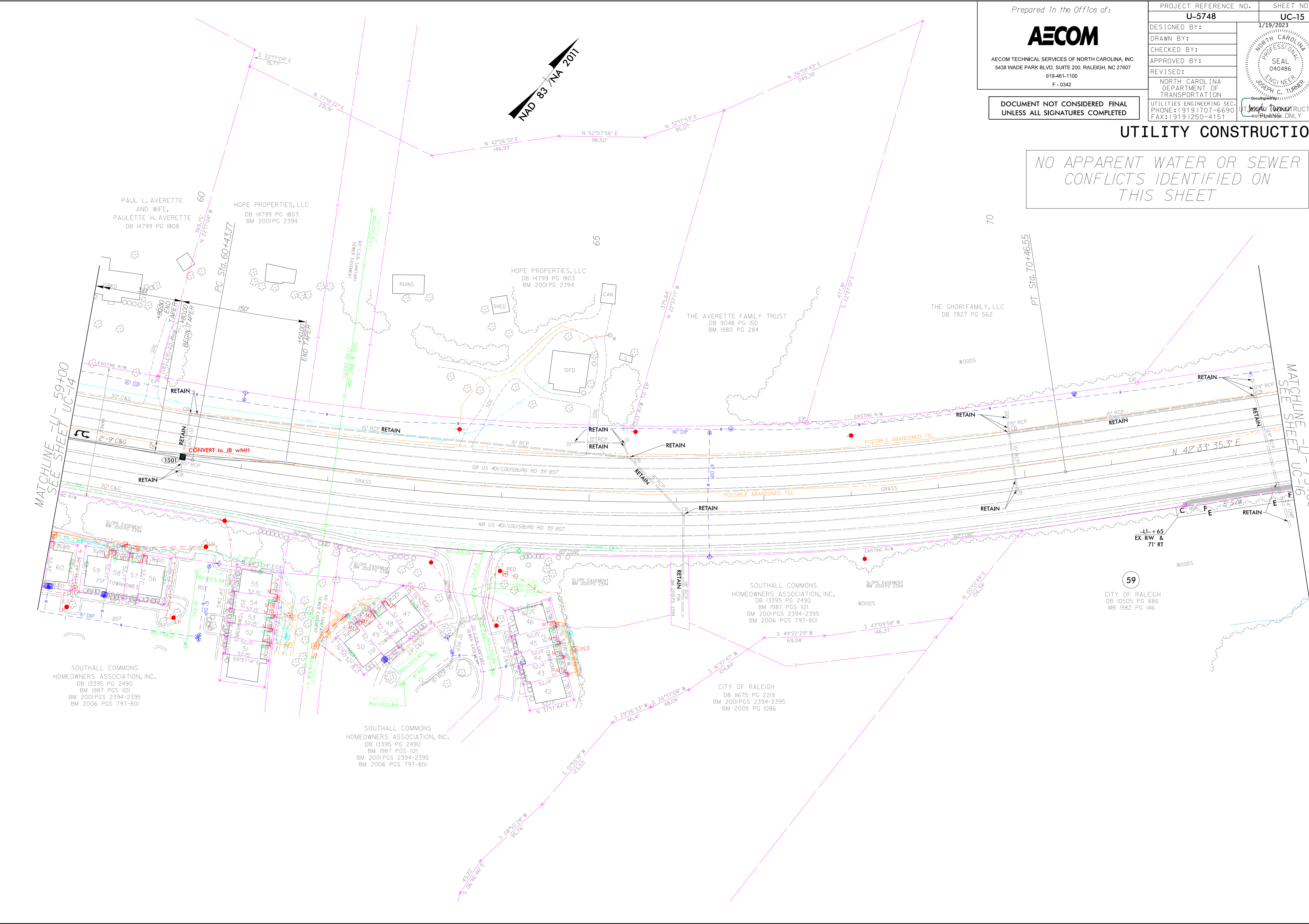
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-15
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	



# UTILITY CONSTRUCTION

NO APPARENT WATER OR SEWER CONFLICTS IDENTIFIED ON THIS SHEET



MATCHLINE - LI-59+00  
SEE SHEET UC-14

MATCHLINE - LI-73+00  
SEE SHEET UC-16

SOUTHALL COMMONS HOMEOWNERS ASSOCIATION, INC.  
DB 13395 PG 2490  
BM 1987 PGS 1121  
BM 2001 PGS 2394-2395  
BM 2006 PGS 797-801

SOUTHALL COMMONS HOMEOWNERS ASSOCIATION, INC.  
DB 13395 PG 2490  
BM 1987 PGS 1121  
BM 2001 PGS 2394-2395  
BM 2006 PGS 797-801

CITY OF RALEIGH  
DB 11675 PG 2219  
BM 2001 PGS 2394-2395  
BM 2005 PG 1086

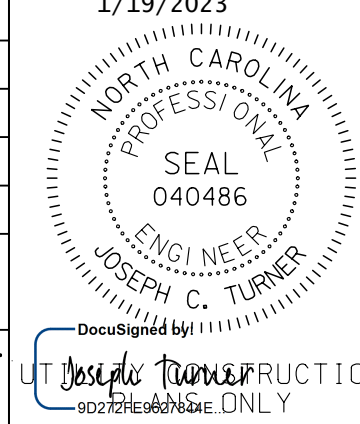
59  
CITY OF RALEIGH  
DB 10505 PG 886  
MB 1982 PG 146

Prepared in the Office of:



AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

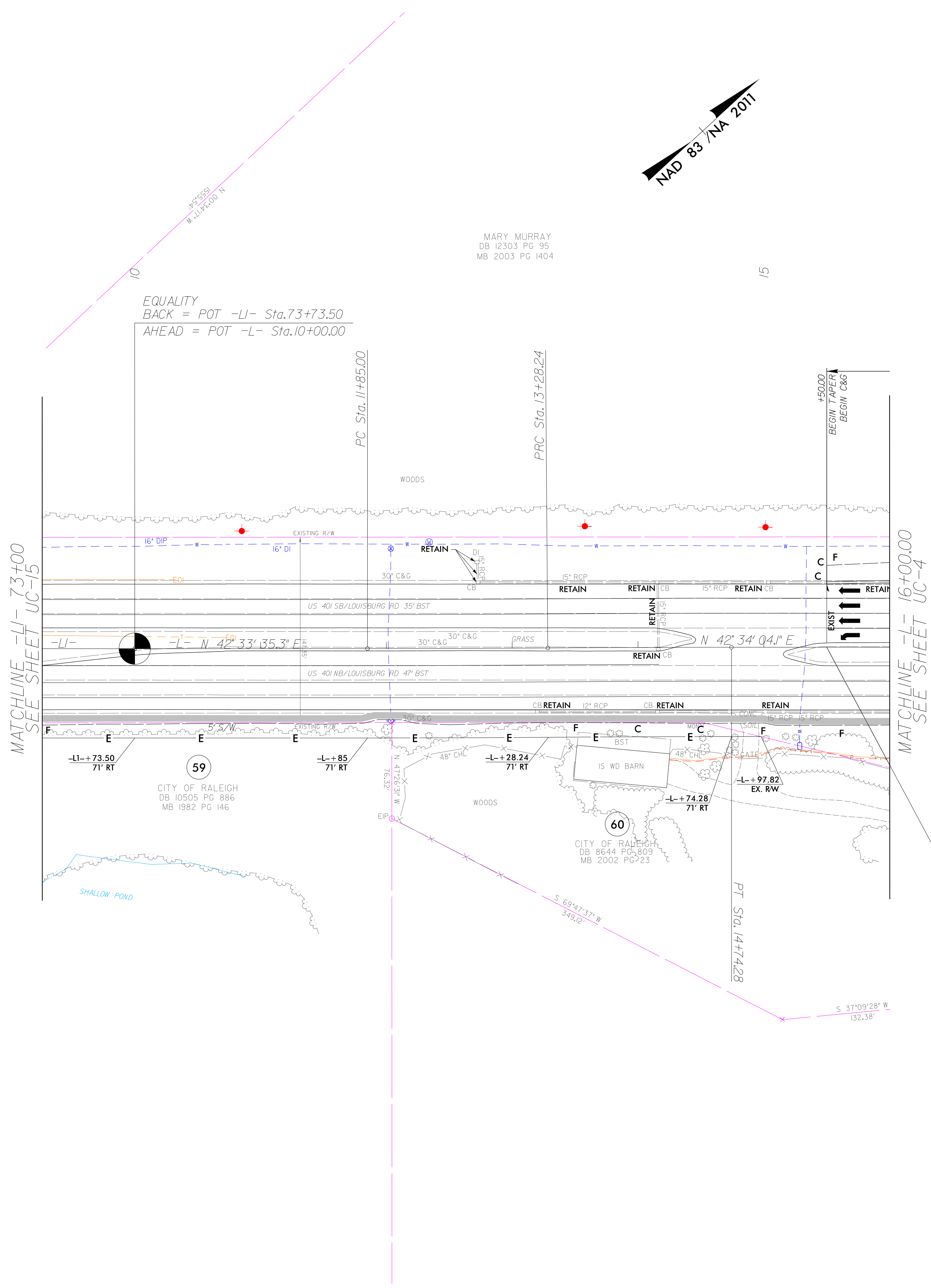
PROJECT REFERENCE NO.	SHEET NO.
U-5748	UC-16
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

### UTILITY CONSTRUCTION

NO APPARENT WATER OR SEWER  
CONFLICTS IDENTIFIED ON  
THIS SHEET



MATCHLINE -L- 73+00  
SEE SHEET UC-15

MATCHLINE -L- 16+00.00  
SEE SHEET UC-4

BEGIN TIP PROJECT U-5748  
-L- STA 15+50.00

DATE: 1/12/2023  
TIME: 10:55:25 AM  
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DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

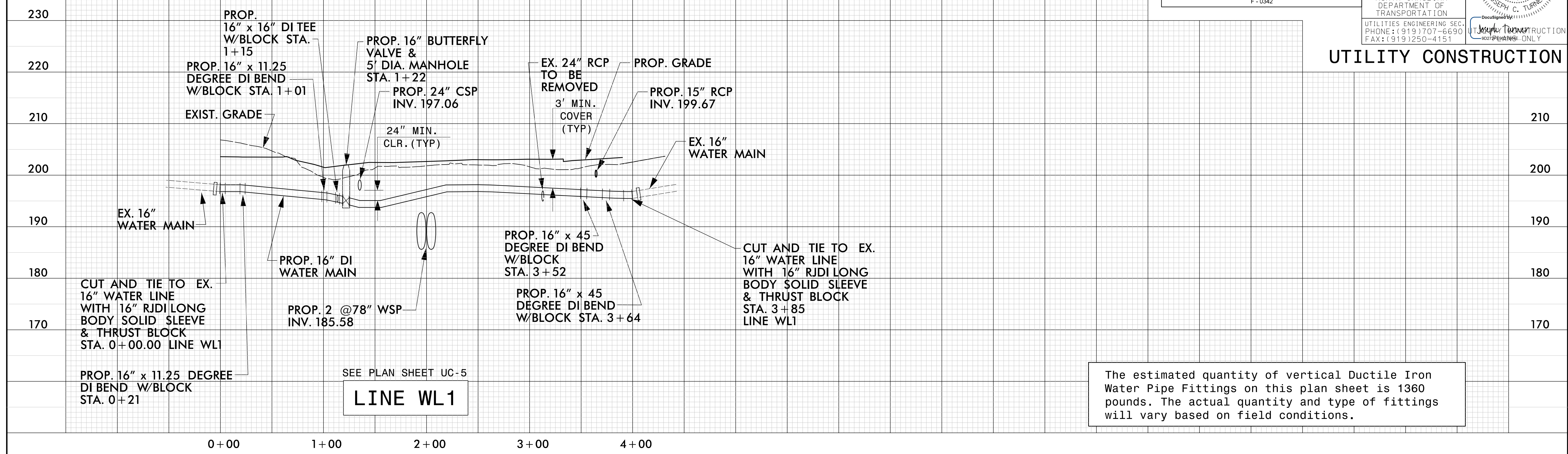
Prepared in the Office of:



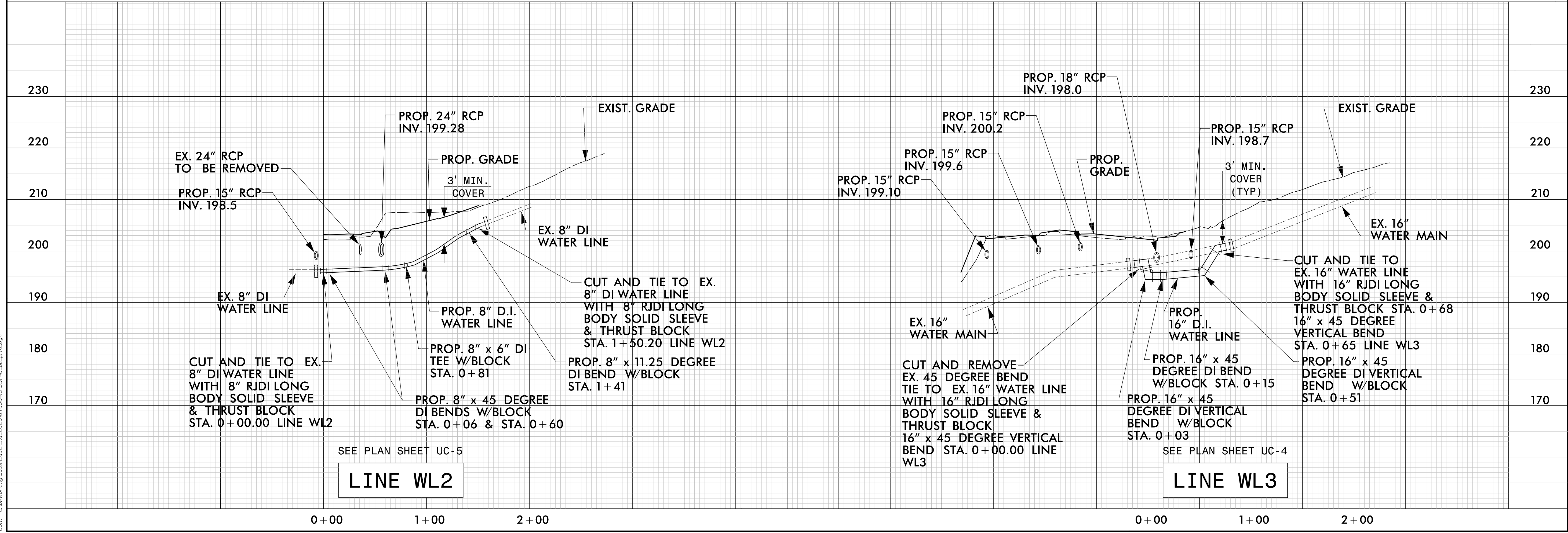
AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F - 0342

PROJECT REFERENCE NO. <b>U-5748</b>	SHEET NO. <b>UC-17</b>
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

### UTILITY CONSTRUCTION



The estimated quantity of vertical Ductile Iron Water Pipe Fittings on this plan sheet is 1360 pounds. The actual quantity and type of fittings will vary based on field conditions.



DATE: 1/18/2023  
TIME: 11:30:51 AM  
DWG: c:\pwworking\aecom\6621\_no\_2020\mcs364\515748\_uc\_17\12.dgn

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

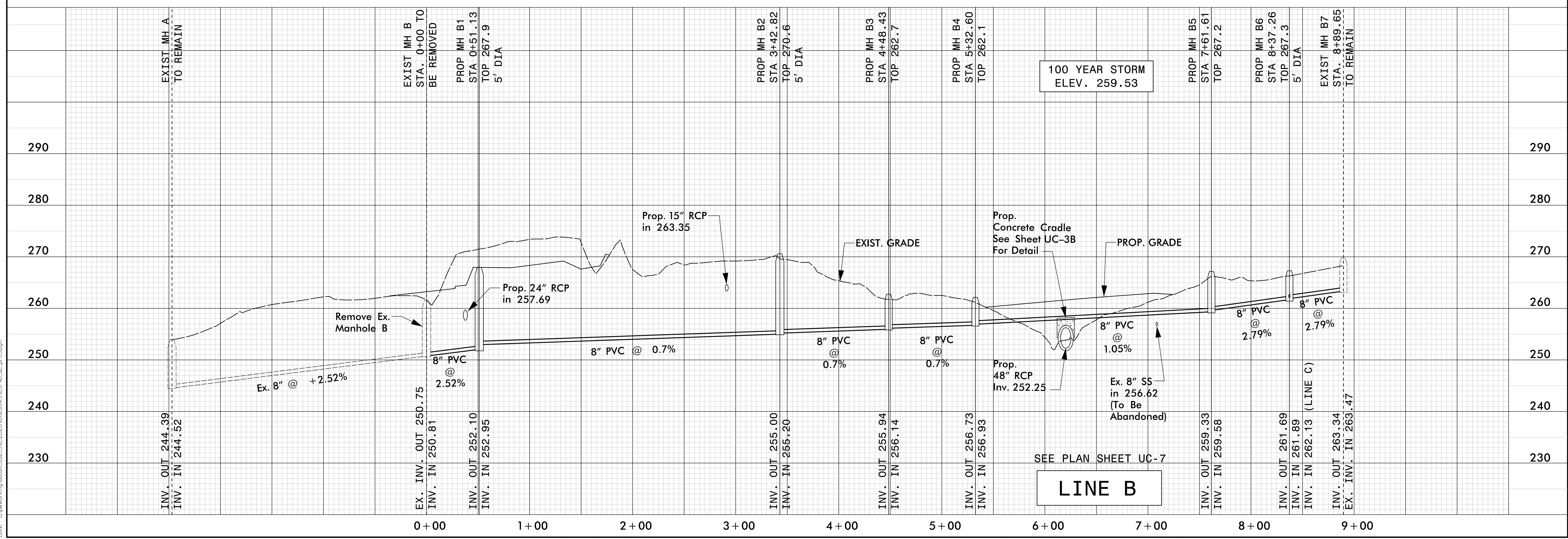
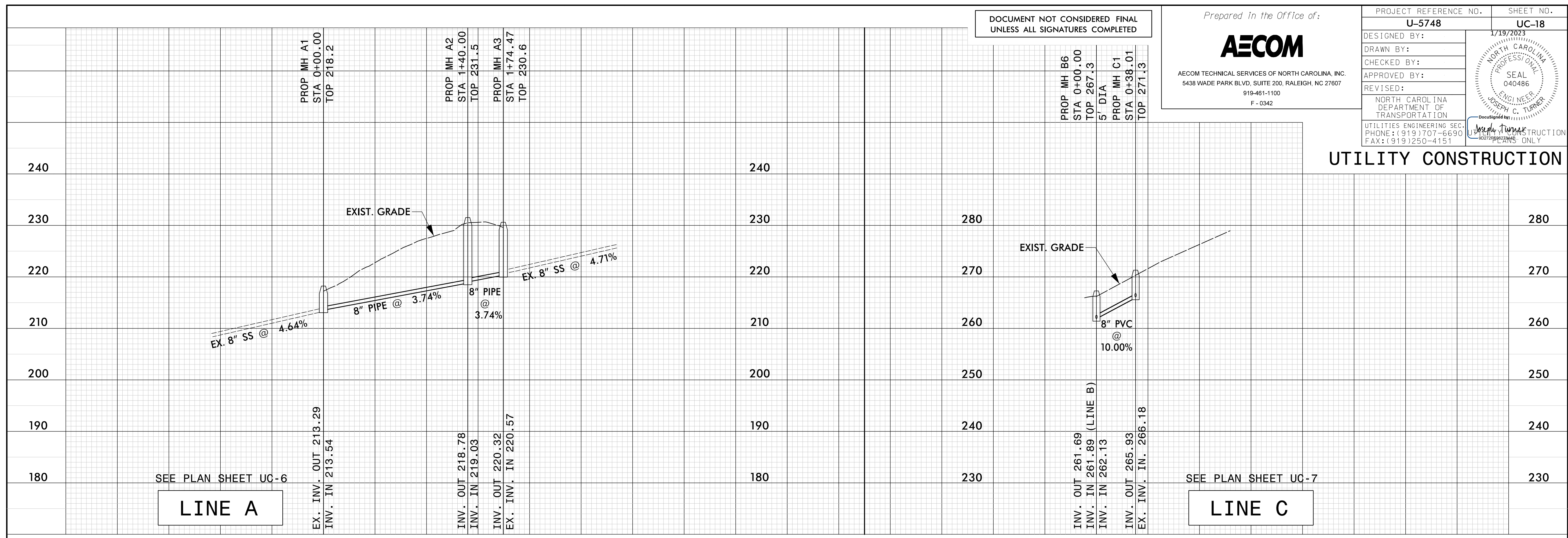
Prepared in the Office of:



AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.  
5438 WADE PARK BLVD, SUITE 200, RALEIGH, NC 27607  
919-461-1100  
F-0342

PROJECT REFERENCE NO. <b>U-5748</b>	SHEET NO. <b>UC-18</b>
DESIGNED BY:	1/19/2023
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

### UTILITY CONSTRUCTION



DATE: 1/12/2023  
TIME: 11:16:00 AM  
DWG: 230work\king\acem\_4621\_no\_2020\ms-3845\U5748\_uc\_18.dgn