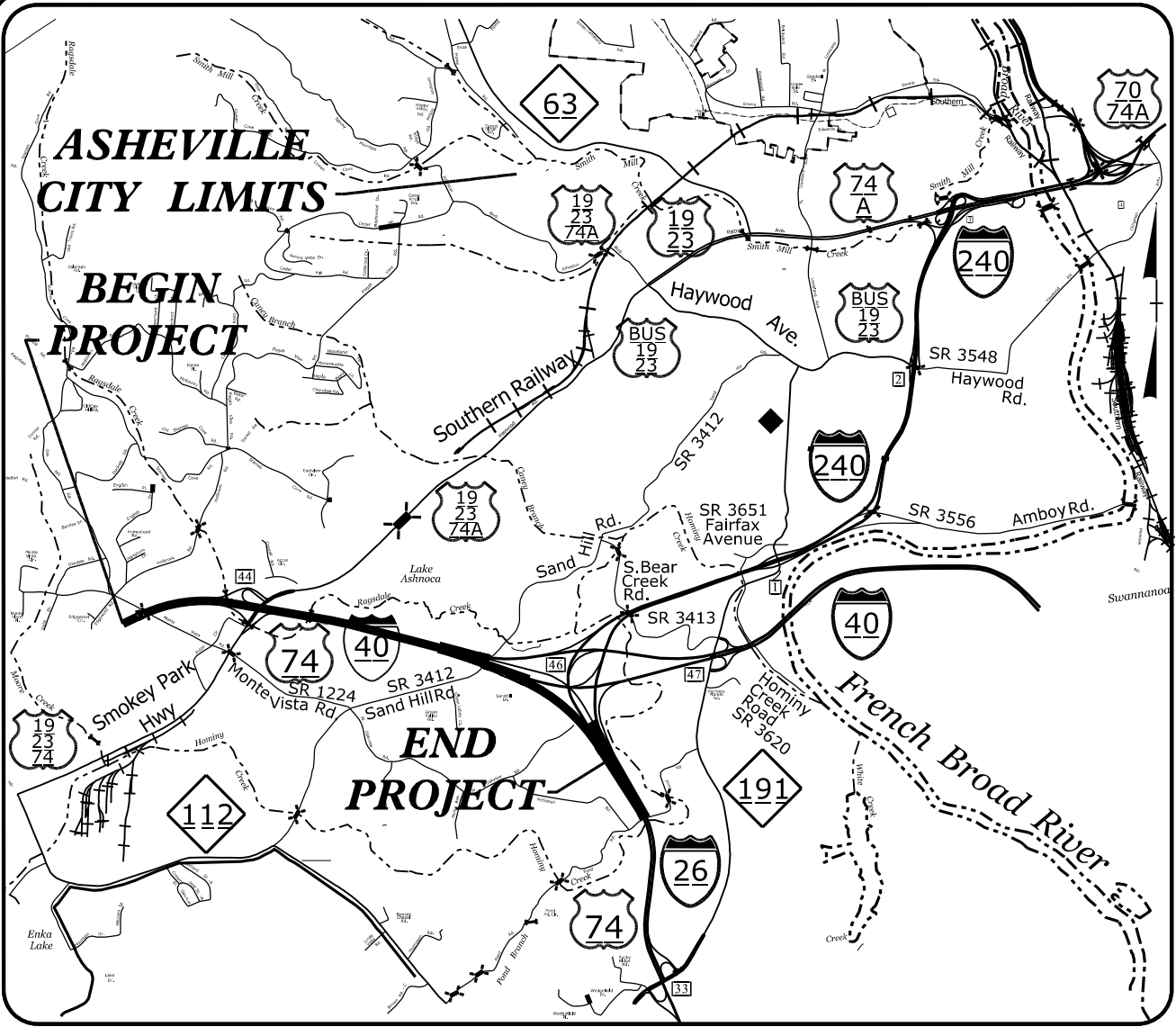


TIP PROJECT: I-2513AA/AB



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

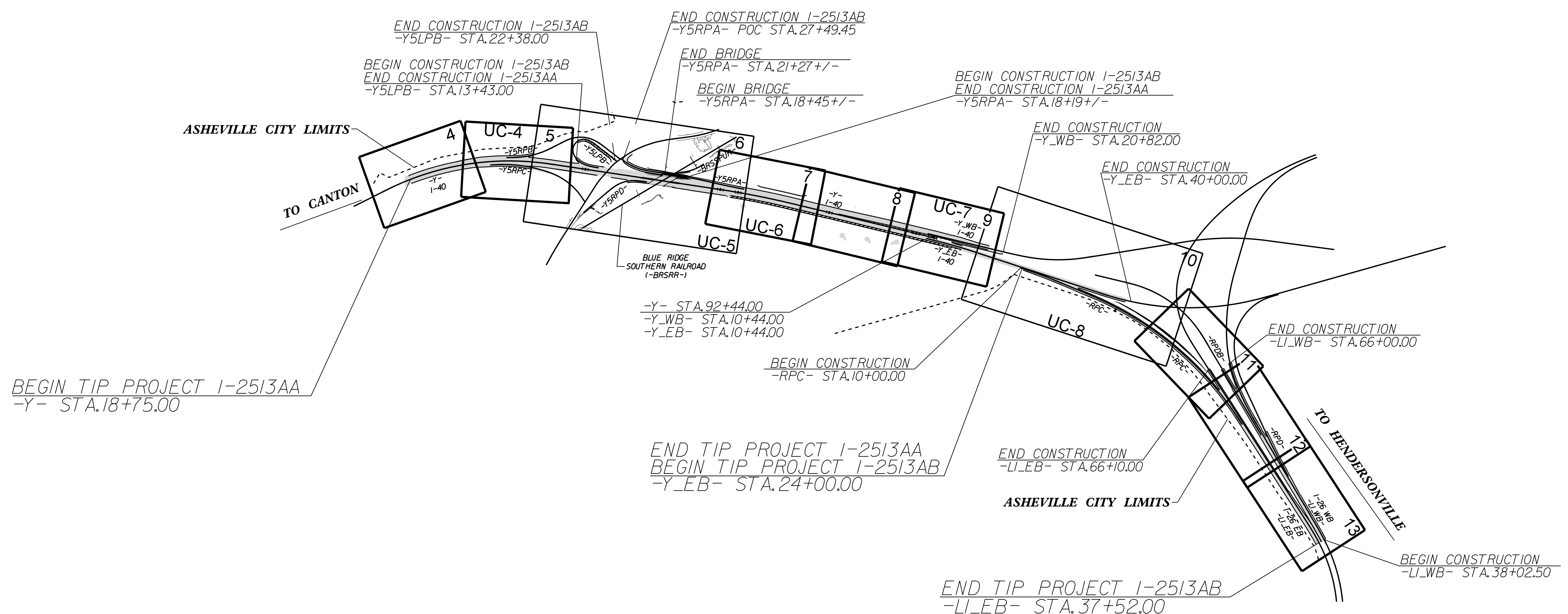
T.I.P. NO.	SHEET NO.
I-2513 AA/AB	UC-1

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

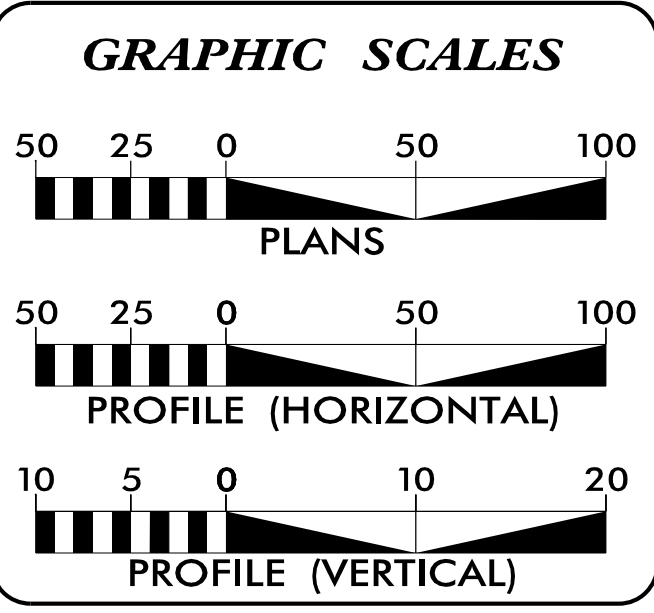
# UTILITY CONSTRUCTION PLANS BUNCOMBE COUNTY

LOCATION: I-40 FROM EAST OF SR 1224 (MONTE VISTA RD) TO WEST OF SR 3412 (SAND HILL RD) AND I-40 AT I-26 AND US 1923 INTERCHANGES

TYPE OF WORK: WATER AND SEWER RELOCATIONS



09-JAN-2024 13:51  
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\$\$\$\$\$USERNAME\$\$\$\$\$



INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A THRU UC-3F	DETAILS
UC-4 THRU UC-8	UTILITY CONSTRUCTION SHEETS
UC-09 THRU UC-14	PROFILE SHEETS

**WATER AND SEWER OWNERS ON PROJECT**

(A) CITY OF ASHEVILLE  
(B) METROPOLITAN SEWER DISTRICT

PREPARED IN THE OFFICE OF:

401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513  
Ph. (919) 653-0001

Clint L. Stevens, P.E. UTILITIES PROJECT MANAGER  
Corey D. Bousquet, P.E. UTILITIES PROJECT ENGINEER  
Jordan K. Chapman UTILITIES PROJECT DESIGNER

SEAL

1/9/2024

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

Donald E. Hampton, P.E. UTILITIES REGIONAL ENGINEER  
Jong-Tae Yoon, P.E. UTILITIES ENGINEER  
Stephen G. Sealy UTILITIES AREA COORDINATOR  
Sunil C. Singh UTILITIES COORDINATOR

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS



PROJECT REFERENCE NO. I-2513 AA/AB	SHEET NO. UC-2
---------------------------------------	-------------------

## UTILITIES PLAN SHEET SYMBOLS

### PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	12" WL
11¼ Degree Bend	++
22½ Degree Bend	+X
45 Degree Bend	+X
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	PS(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	o
Telephone Pole	o-
Joint Use Pole	o-
Telephone Pedestal	TE 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" ENCASUREMENT

Thrust Block	I
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	F 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) ————  
 Designated Utility Line (Type as Shown) - - - - -

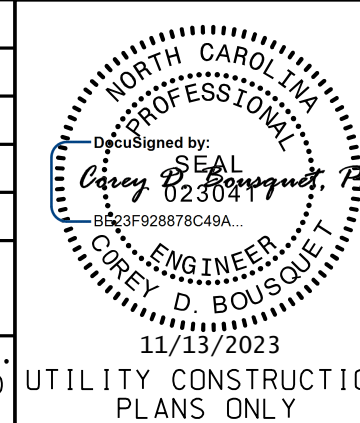
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# UTILITY CONSTRUCTION



**HINDE ENGINEERING**  
 License No. C-2639  
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

**DOCUMENT NOT CONSIDERED FINAL  
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PROJECT REFERENCE NO.	SHEET NO.
I-2513 AA/AB	UC-3
DESIGNED BY: JKC	
DRAWN BY:	
CHECKED BY: CLS	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

## GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO CITY OF ASHEVILLE AND METROPOLITAN SEWERAGE DISTRICT.

CONTACT PERSON FOR THE CITY OF ASHEVILLE IS:

CHAD PIERCE, PE  
 ENGINEERING SERVICES MANAGER  
 PH: 828-646-1281

CONTACT PERSON FOR THE METROPOLITAN SEWERAGE DISTRICT IS:

KEVIN F. JOHNSON, PE  
 PLANNING & DEVELOPMENT MANAGER  
 PH: 828-225-8289

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

10. CONTRACTOR SHALL FIELD VERIFY THE VERTICAL AND HORIZONTAL ALIGNMENTS OF THE PROPOSED UTILITY TIE-IN POINTS SHOWN ON THE PLANS. ONCE THE TIE-IN POINTS AND GRADE OF PROPOSED UTILITY LINES ARE VERIFIED AS CORRECT, THE CONTRACTOR CAN BEGIN CONSTRUCTION ON THE PROPOSED UTILITY LINES.

11. ALL BYPASS PUMPING NECESSARY TO MAINTAIN EXISTING SEWER FLOW DURING THE INSTALLATION OF THE PROPOSED SEWER LINES WILL BE INCIDENTAL TO THE COST OF THE PROPOSED SEWER LINES. THE CONTRACTOR MAY NEED TO INSTALL TEMPORARY MANHOLES ALONG THE EXISTING SEWER LINES FOR BYPASS PUMPING.

12. ALL REQUIRED SHEET PILING WILL BE INCIDENTAL TO THE COST OF THE WATER AND SEWER LINE. ALL SHEET PILING SHALL MEET NCDOT SPECIFICATIONS. THERE MAY BE AREAS WHERE DEWATERING MAY BE REQUIRED.

## UTILITY CONSTRUCTION

## PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE FROM -L- LINE STATION 22+00 TO -L- LINE STATION 25+00 SHALL BE DUCTILE IRON RESTRAINED JOINT PIPE. SEE THE PLANS FOR THE DUCTILE IRON RESTRAINED JOINT SEWER PIPE LOCATIONS.

2. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES. IT'S

3. THE CONTRACTOR IS RESPONSIBLE TO DESIGN THE SHEET PILING NECESSARY FOR SHORING TRENCHES, BORE PITS, AND RECEIVING PITS, ALL SHEET PILING DESIGN SHALL BE SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER.

4. WATER AND SEWER LINE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF ASHEVILLE, METROPOLITAN SEWER DISTRICT STANDARD DETAILS/SPECIAL PROVISIONS AND NCDOT 2018 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES. THE BEDDING DETAILS WILL BE IN ACCORDANCE WITH THE NCDOT DETAILS AND SPECIFICATIONS. ALL PAY ITEMS WILL BE IN ACCORDANCE WITH NCDOT 2018 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES AND THE PROJECT SPECIAL PROVISION.

5. THE THRUST BLOCKING REQUIRED FOR THE 18" WATER LINE TIE-IN SHOWN ON SHEET UC-8 SHALL BE DESIGNED AND SEALED BY A NC PROFESSIONAL ENGINEER. THE CITY OF ASHEVILLE WILL NEED TO APPROVE THE THRUST BLOCKING BEFORE BEING INSTALLED.

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# METROPOLITIAN SEWERAGE DISTRICT DETAILS

**HINDE ENGINEERING**  
 License No. C-2639  
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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

PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-3A</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

## UTILITY CONSTRUCTION

### TRENCH DETAIL

PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

### TYPE "5" (BEDDING FOR D.I. PIPE)

PIPE BEDDED IN LOOSE 6" LAYERS OF GRANULAR MATERIAL COMPACTED TO TOP OF PIPE, 4" MINIMUM UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

**STANDARD DETAIL**  
 Metropolitan Sewerage District  
 of Buncombe County, North Carolina

**BORE & ENCASUREMENT DETAIL**

DATE APPROVED: MARCH 2017 2.14 - 01

Maximum Depth of Cover for Ductile Iron Pipe w/ Cement Lining						
Pipe Size	Class	Type 1	Type 2	Type 3	Type 4	Type 5
4	350	53	61	69	85	100
6	350	26	31	37	47	65
8	350	16	20	25	34	50
10	350	11	15	19	28	45
12	350	10	13	19	28	44
14	250	--	11	15	23	36
14	300	--	13	17	26	42
14	350	--	14	19	27	44
16	250	--	11	15	24	34
16	300	--	13	17	26	39
16	350	--	15	20	28	44
18	250	--	10	14	22	31
18	300	--	13	17	26	36
18	350	--	15	19	28	41
20	250	--	10	14	22	30
20	300	--	13	17	26	35
20	350	--	15	19	28	38
24	200	--	8	12	17	25
24	250	--	11	15	20	29
24	300	--	13	17	24	32
24	350	--	15	19	28	37
30	200	--	8	12	16	24
24	250	--	11	15	19	27
30	300	--	12	16	21	29
30	350	--	15	19	25	33
36	200	--	8	12	15	23
36	250	--	10	14	18	25
36	300	--	13	16	20	28
36	350	--	15	19	24	32
42	200	--	8	12	15	22
42	250	--	10	14	17	25
42	300	--	13	16	20	27
42	350	--	15	19	23	32
48	200	--	8	11	15	22
48	250	--	10	13	17	24
48	300	--	12	15	19	27
48	350	--	15	18	22	30
54	200	--	8	11	14	22
54	250	--	10	13	16	24
54	300	--	13	15	19	26
54	350	--	15	18	22	30
60	200	--	8	11	14	22
60	250	--	10	13	16	24
60	300	--	13	15	19	26
60	350	--	15	18	22	30
64	200	--	8	11	14	21
64	250	--	10	13	16	24
64	300	--	12	15	19	26
64	350	--	15	17	21	29

SOURCE: Ductile Iron Pipe for Wastewater Applications, DIPRA 2006

**STANDARD DETAIL**  
 Metropolitan Sewerage District  
 of Buncombe County, North Carolina

**TYPICAL TRENCH DETAIL FOR DUCTILE IRON PIPE - 2**

DATE APPROVED: MARCH 2017 2.05 - 02

**STANDARD DETAIL**  
 Metropolitan Sewerage District  
 of Buncombe County, North Carolina

**SEWER MAIN FILL**

DATE APPROVED: MARCH 2017 2.01 - 04

**STANDARD DETAIL**  
 Metropolitan Sewerage District  
 of Buncombe County, North Carolina

**BORE & JACK ANNULUS DETAIL**

DATE APPROVED: MARCH 2017 2.14 - 02

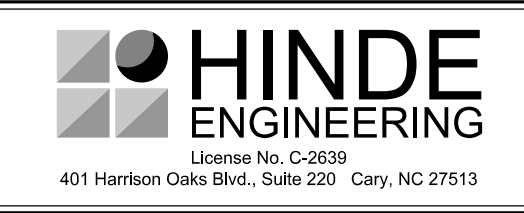
**STANDARD DETAIL**  
 Metropolitan Sewerage District  
 of Buncombe County, North Carolina

**STANDARD MANHOLE**

DATE APPROVED: MARCH 2017 2.11 - 01

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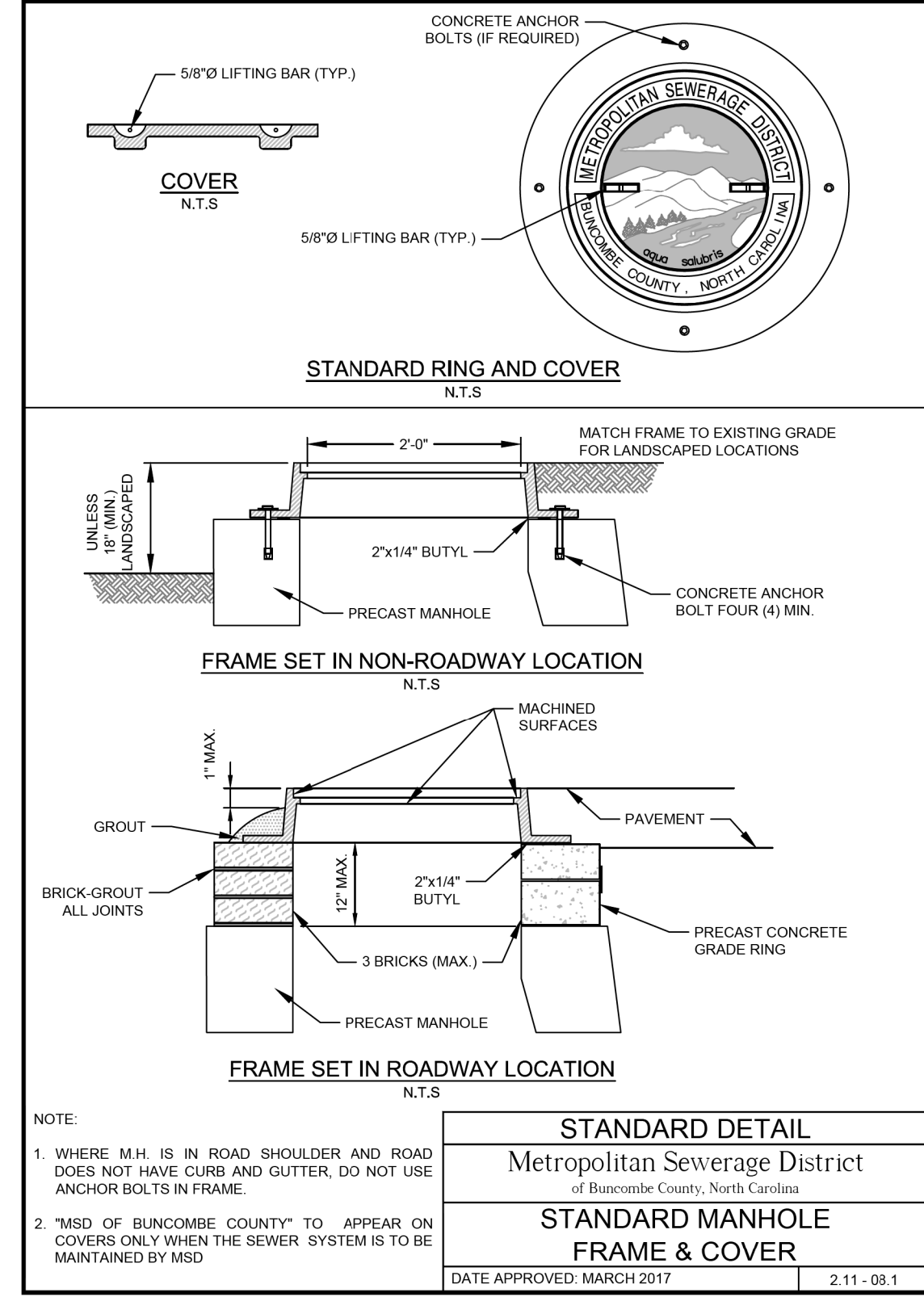
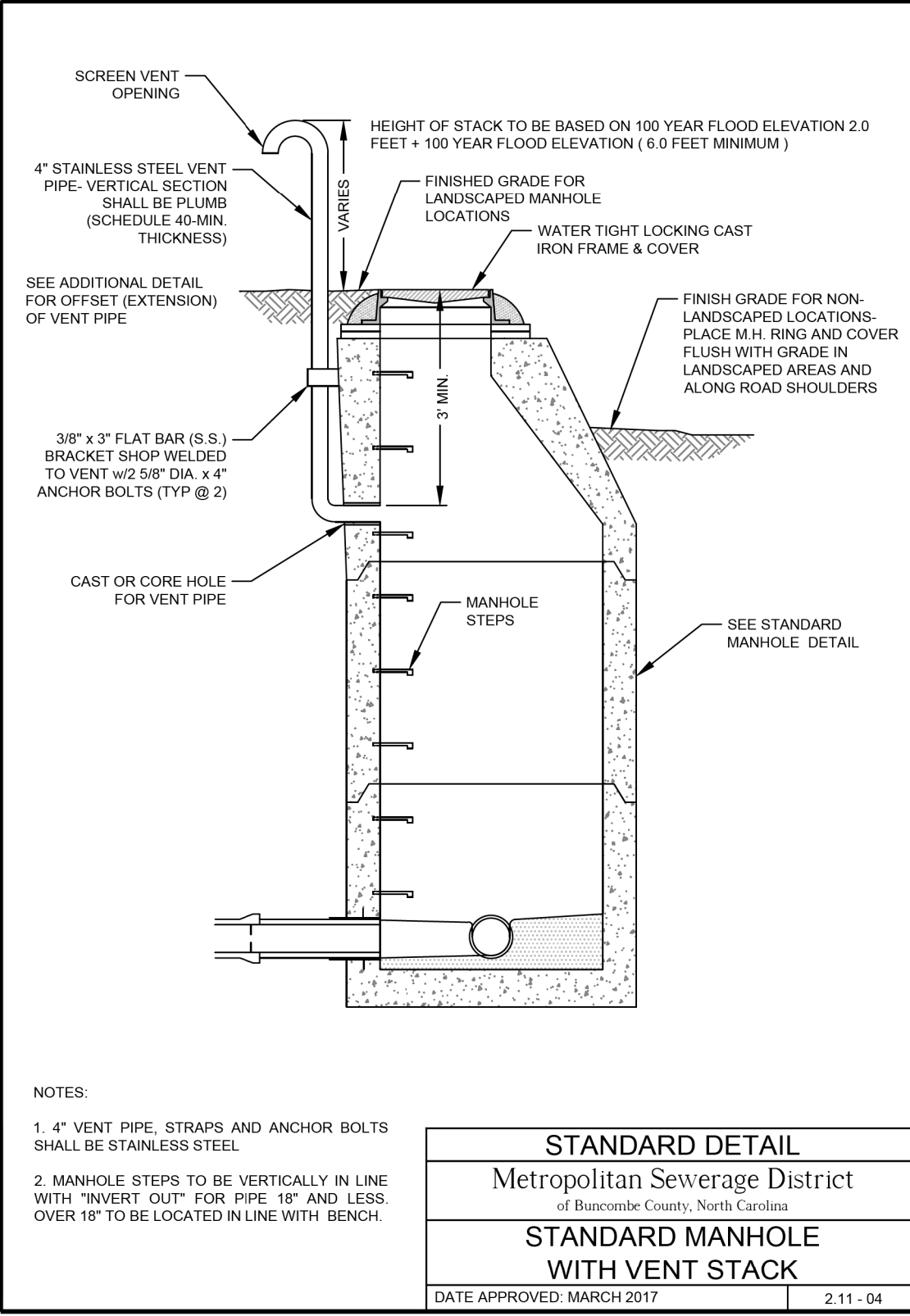
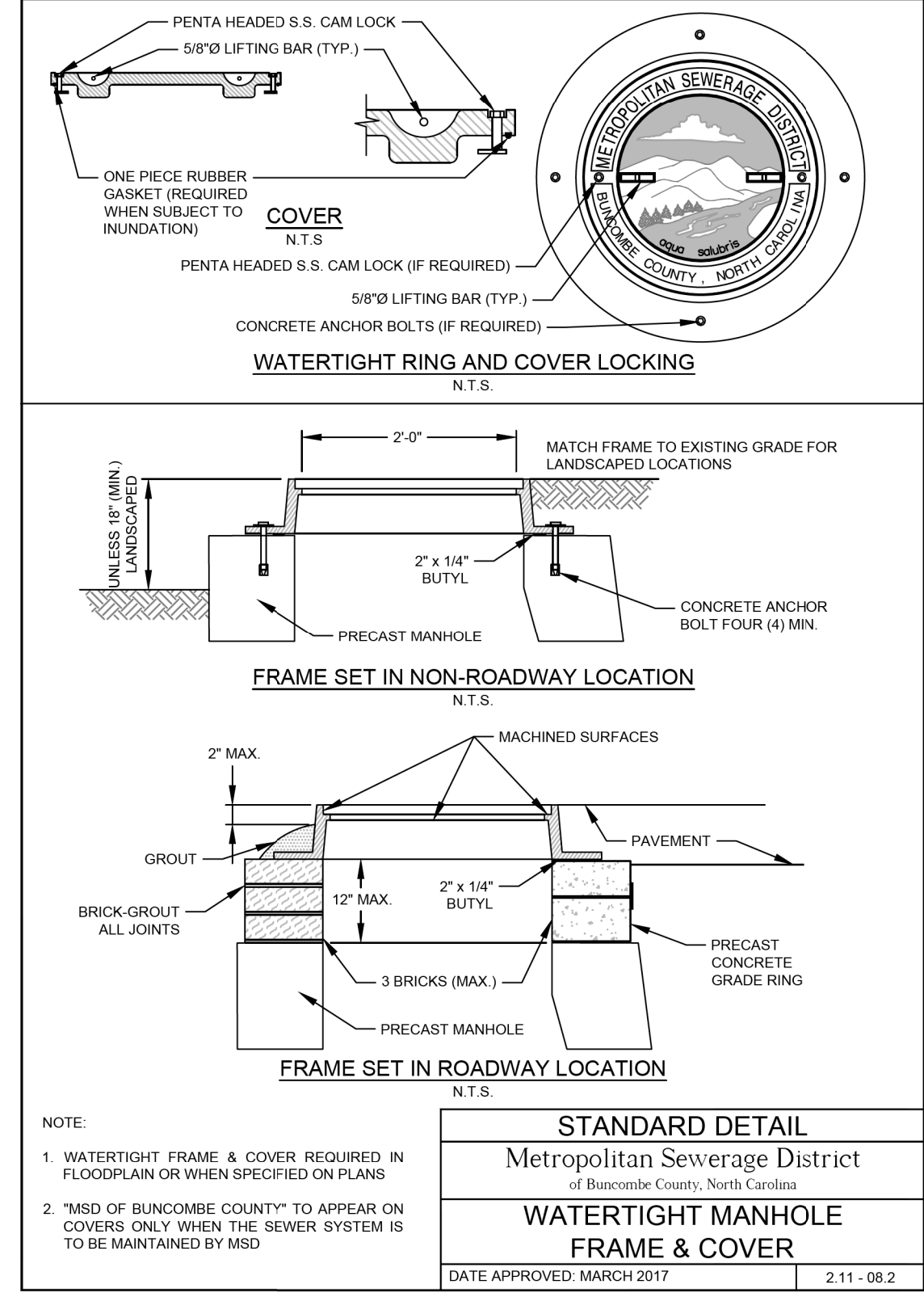
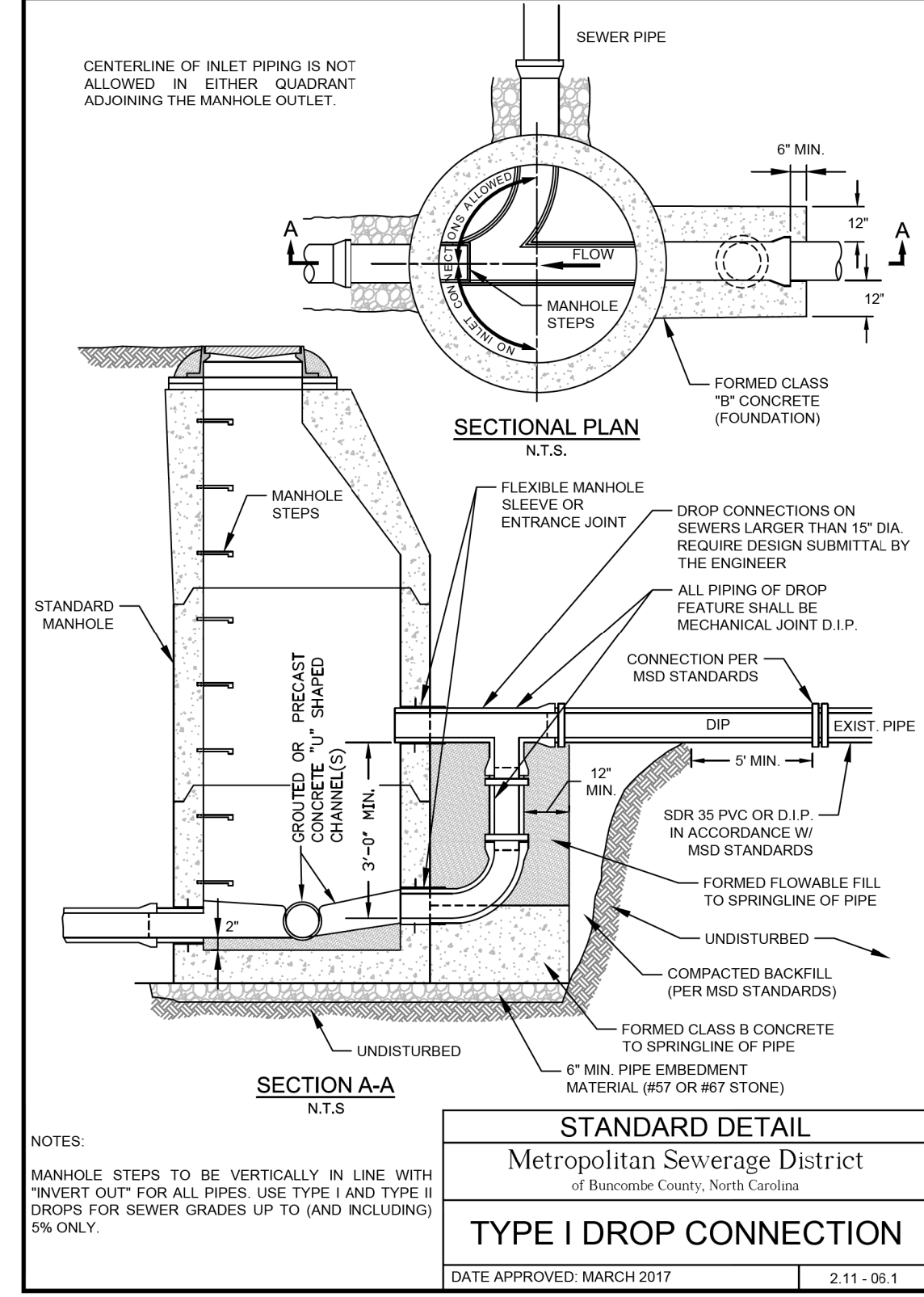
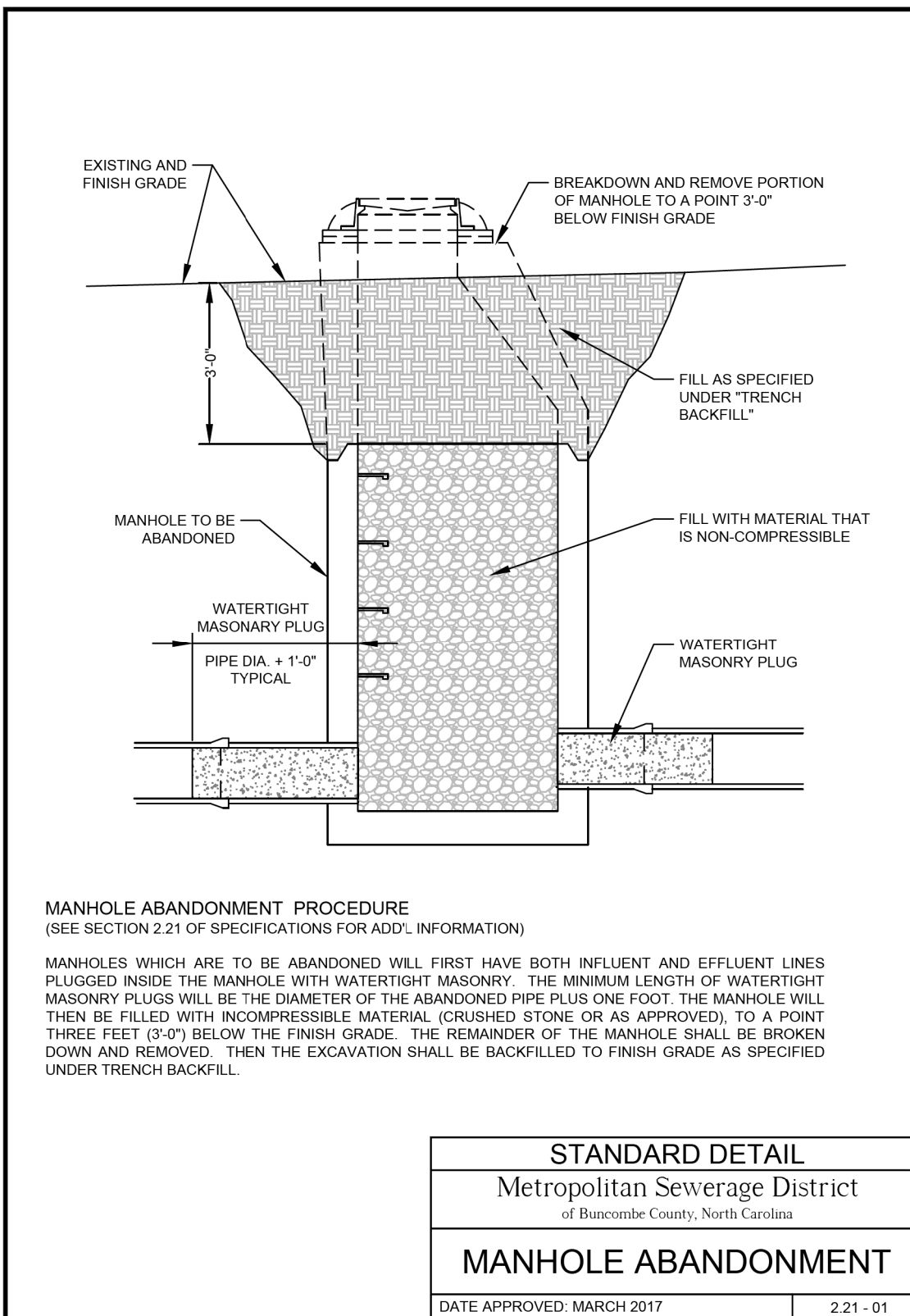
# METROPOLITAN SEWERAGE DISTRICT DETAILS



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PROJECT REFERENCE NO.	I-2513 AA/AB	SHEET NO.	UC-3B
DESIGNED BY:	JKC		
DRAWN BY:	JKC		
CHECKED BY:	CLS		
APPROVED BY:	CDB		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
9/20/2023 UTILITY CONSTRUCTION PLANS ONLY			

## UTILITY CONSTRUCTION



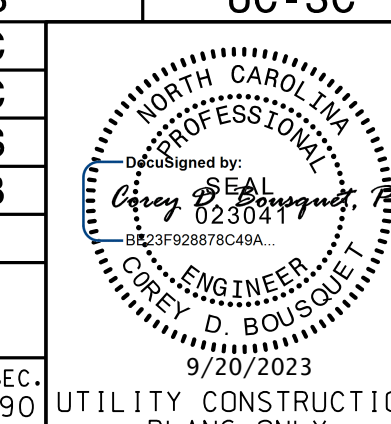
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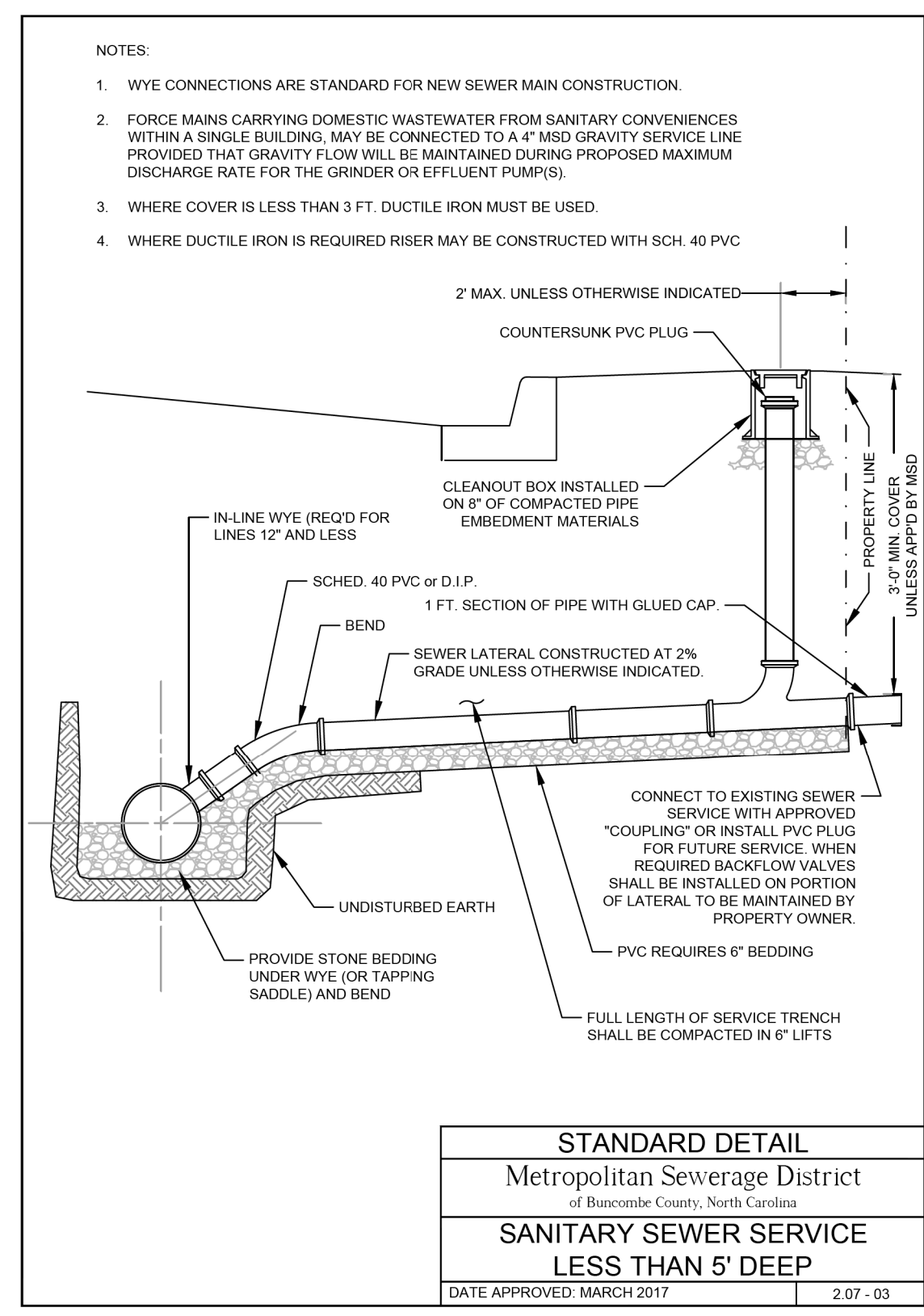
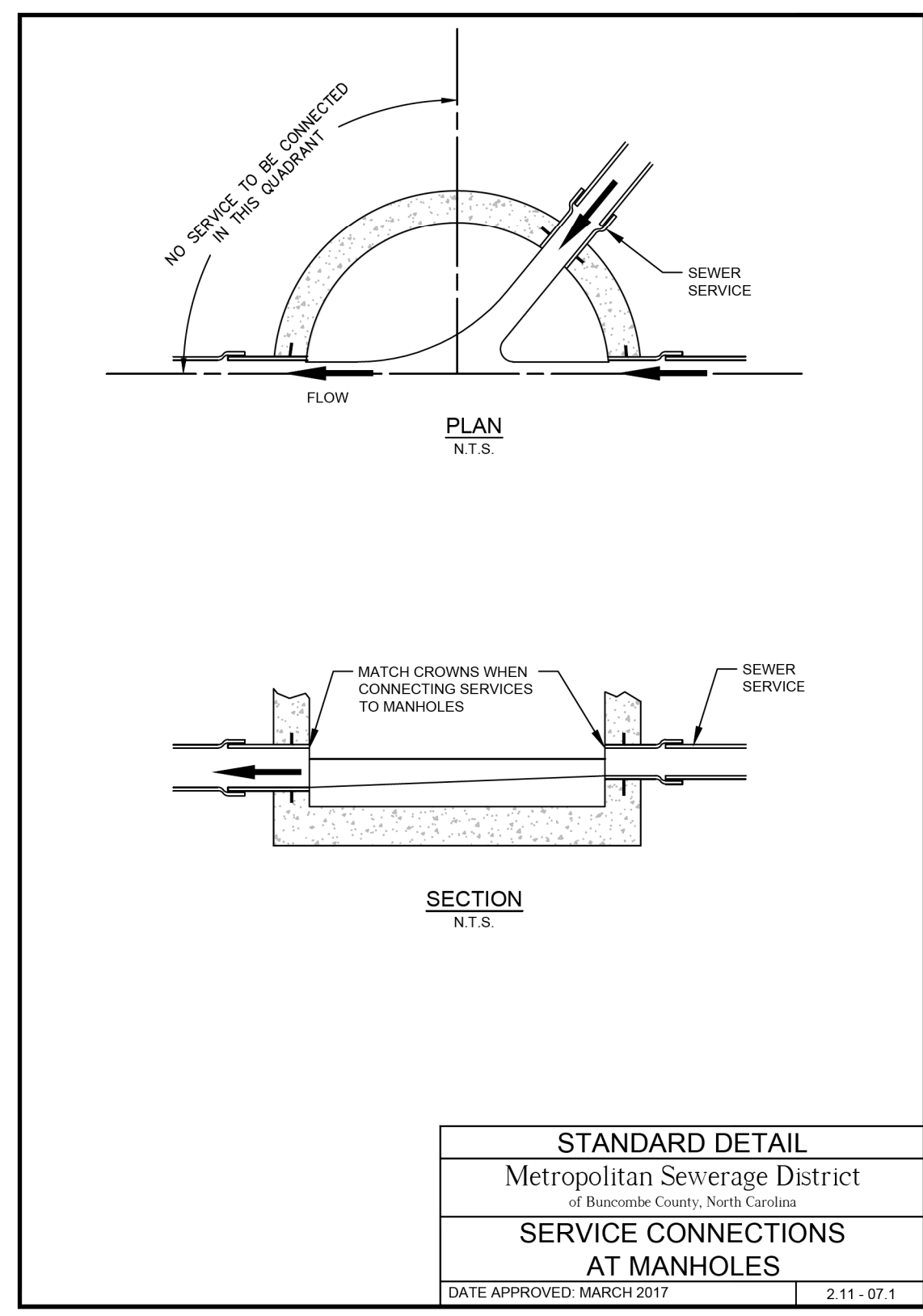
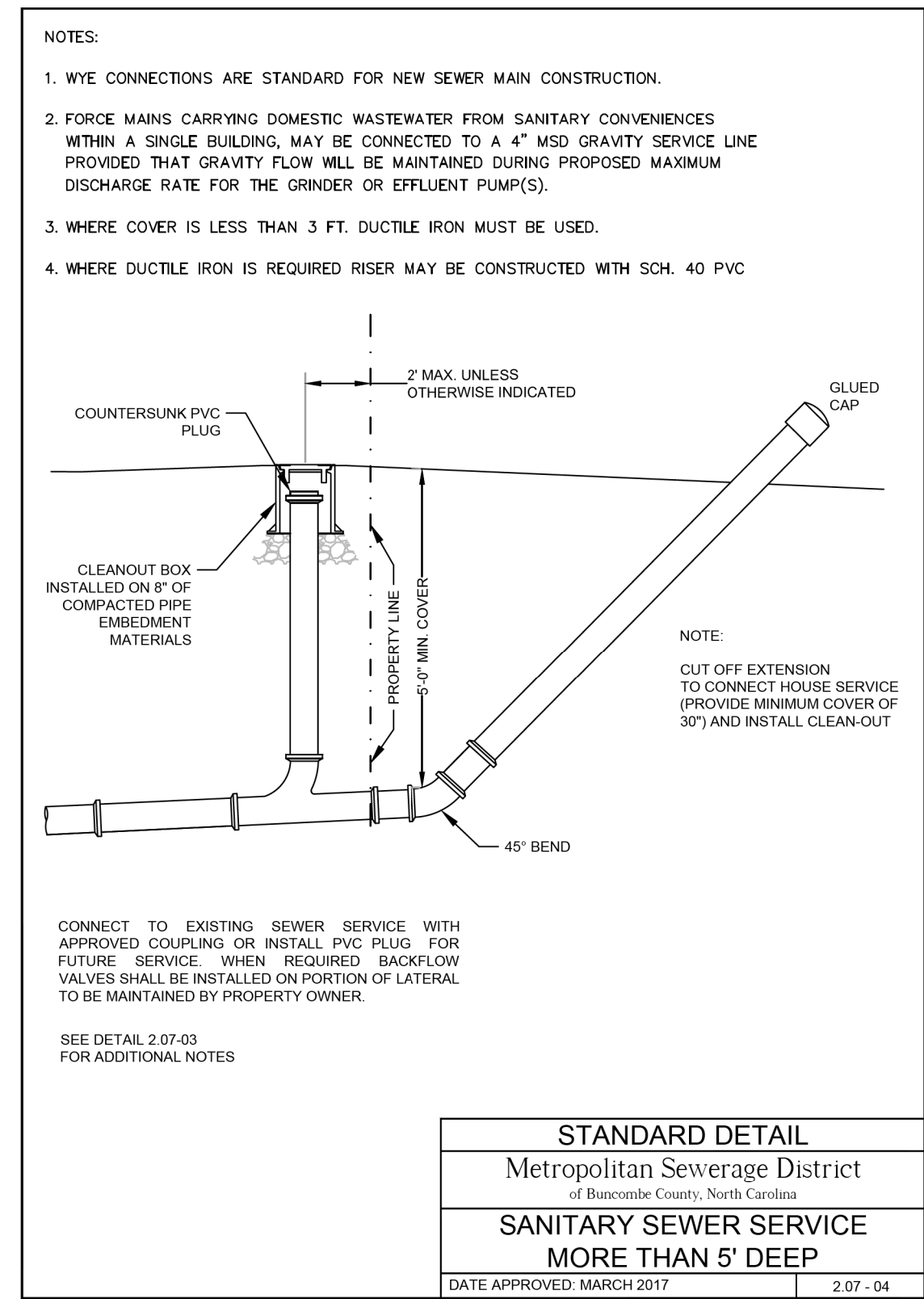
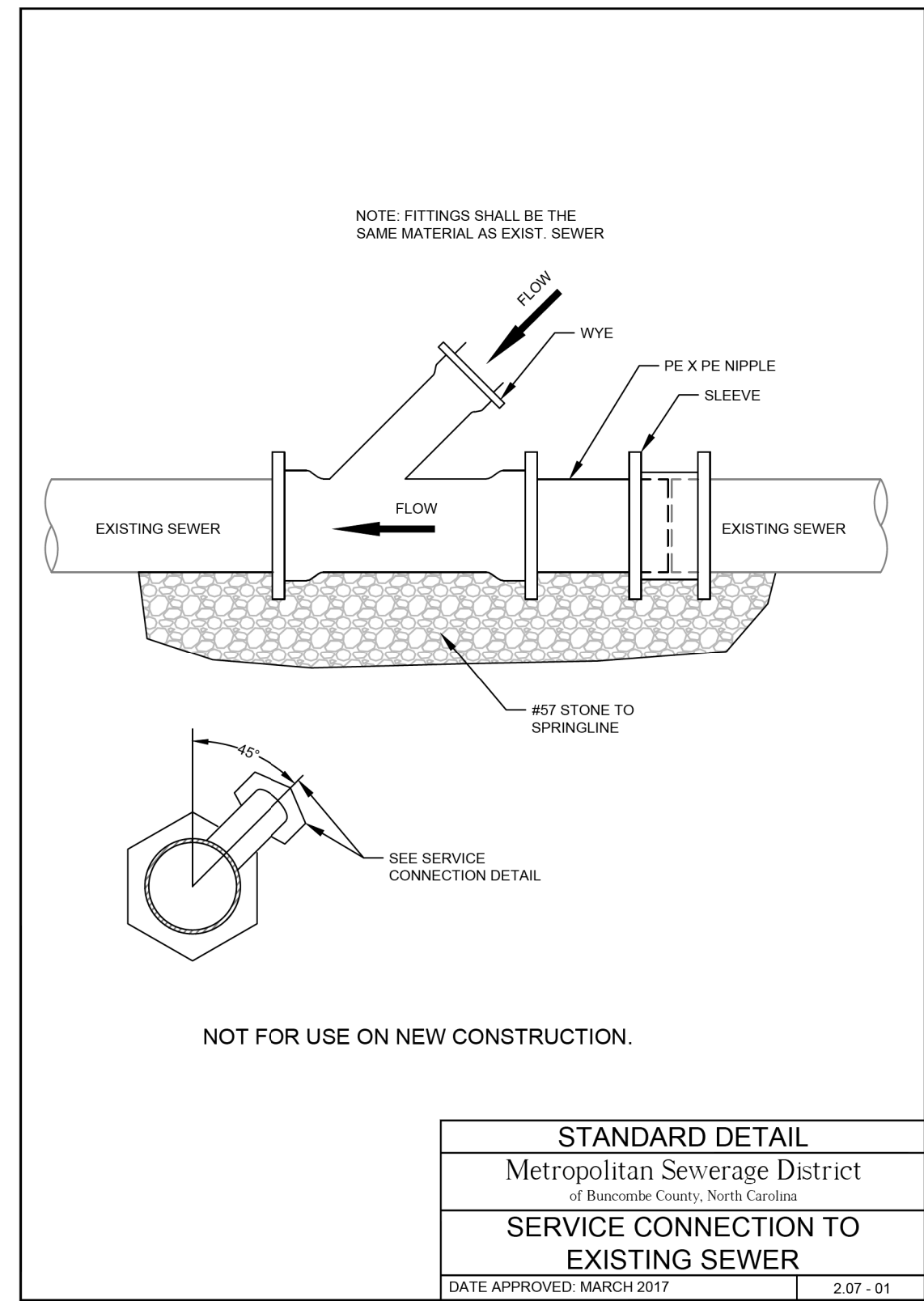
# METROPOLITAN SEWERAGE DISTRICT DETAILS



**HINDE ENGINEERING**  
License No. C-2639  
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-3C</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



## UTILITY CONSTRUCTION

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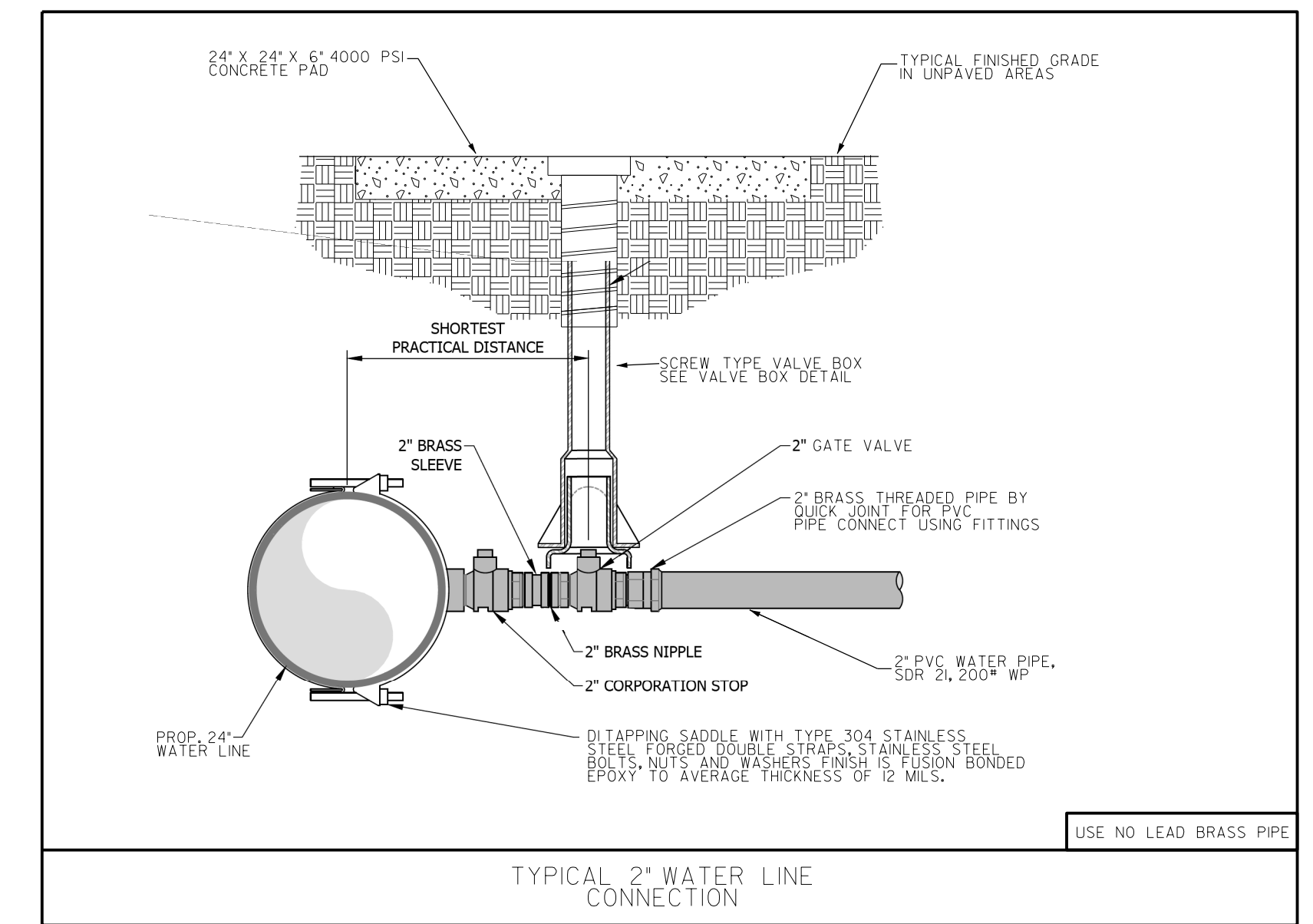
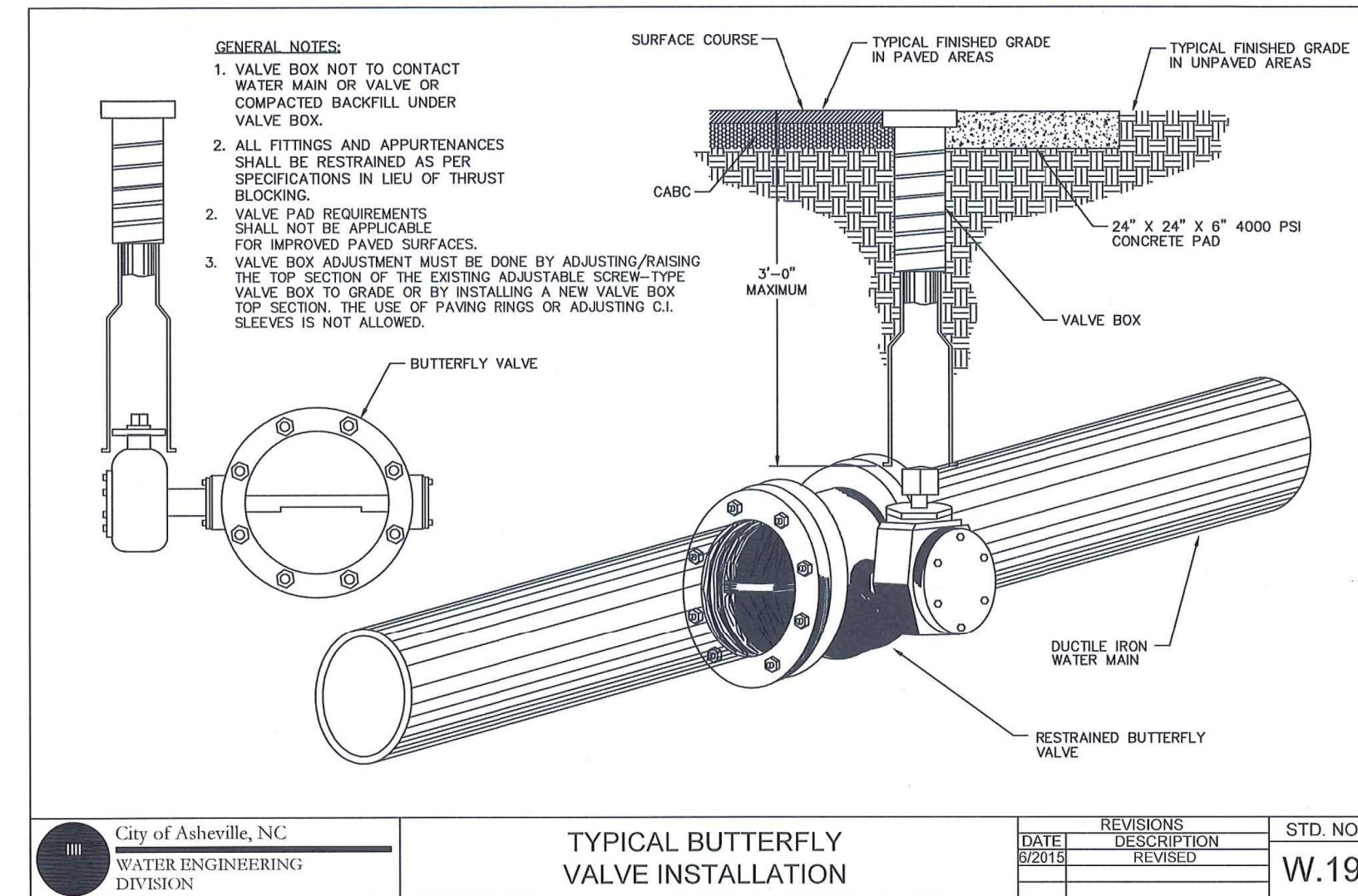
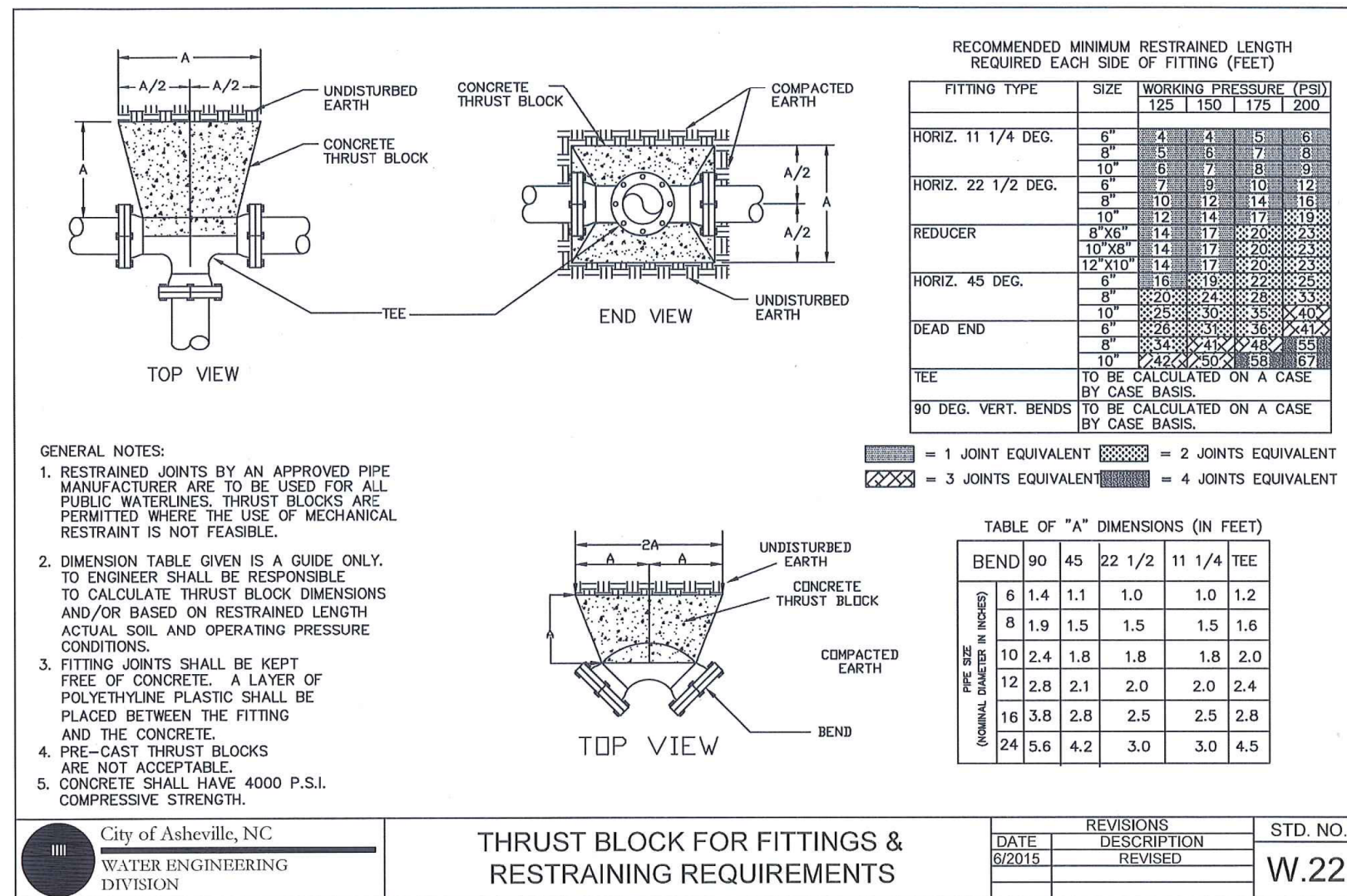
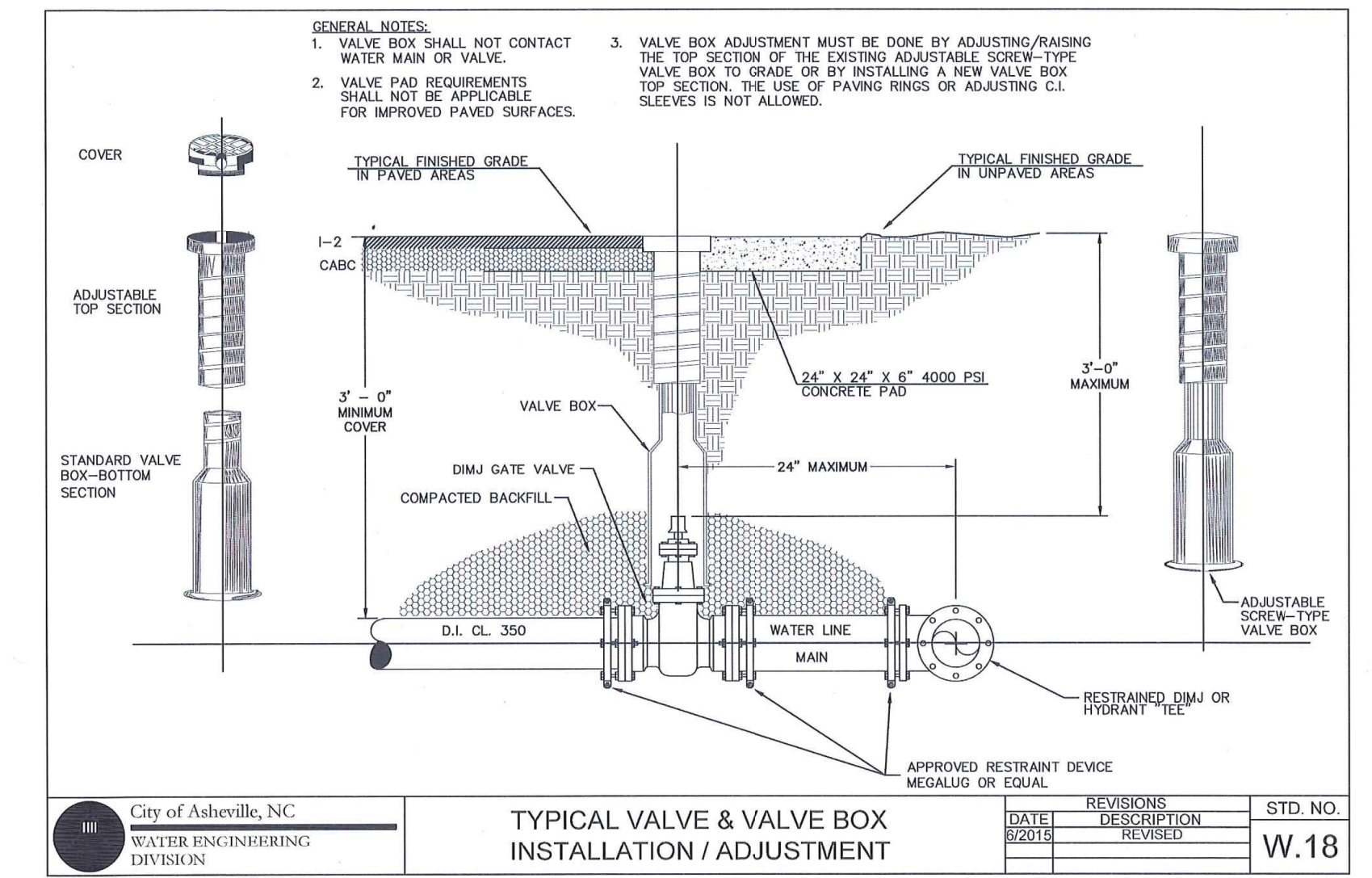
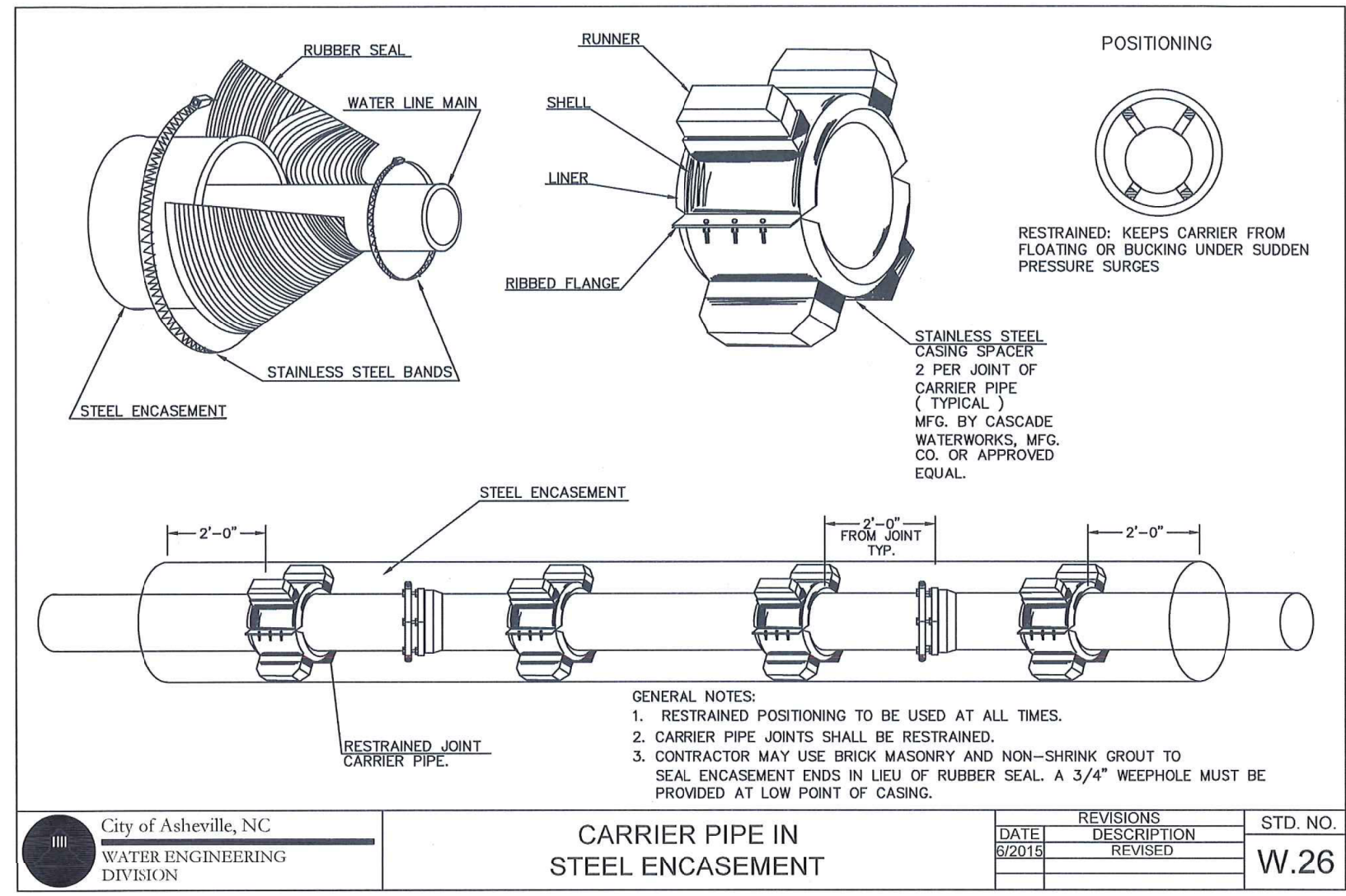
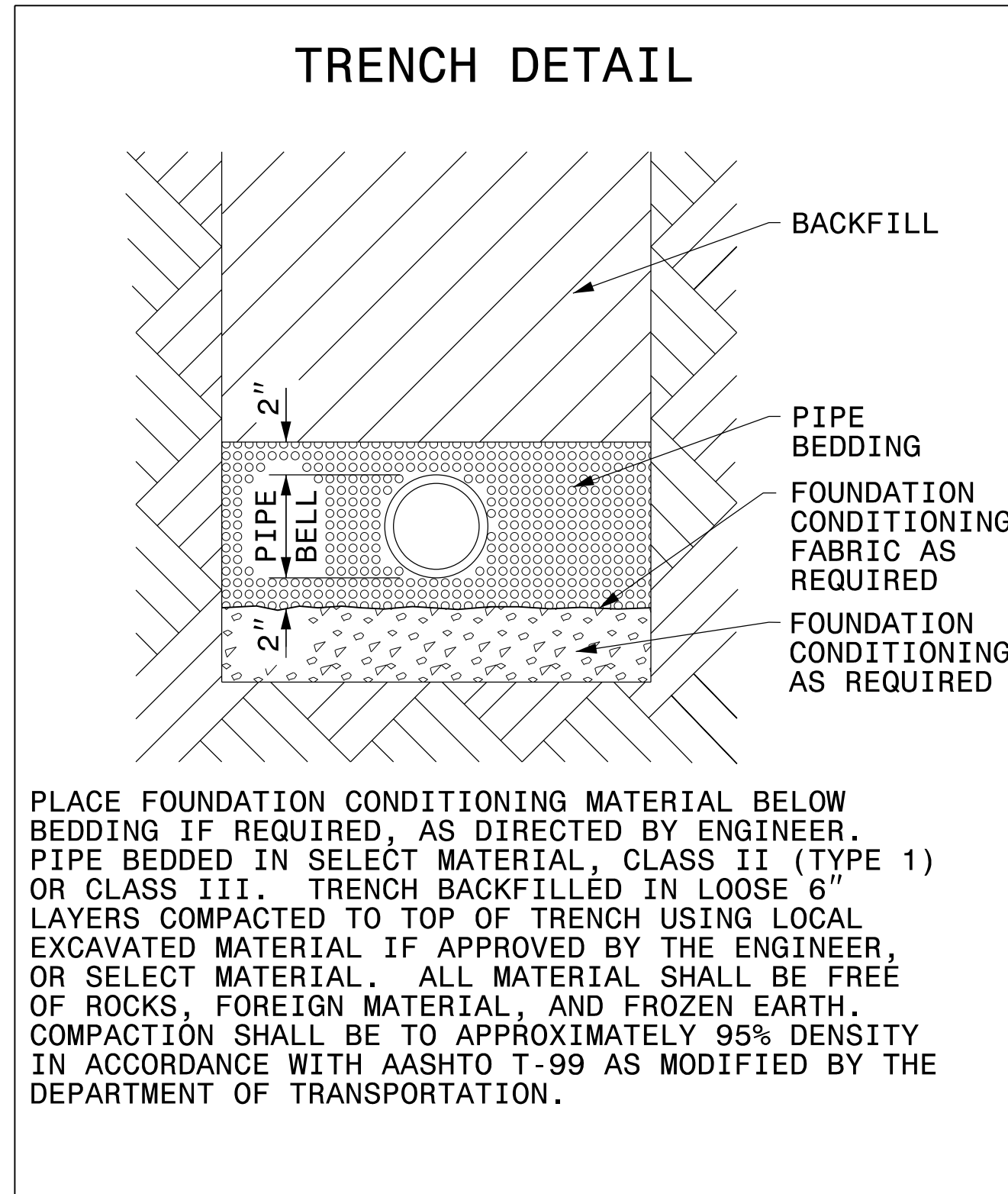
# CITY OF ASHEVILLE DETAILS



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

PROJECT REFERENCE NO.	I-2513 AA/AB	SHEET NO.	UC-3D
DESIGNED BY:	JKC		
DRAWN BY:	JKC		
CHECKED BY:	CLS		
APPROVED BY:	CDB		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

## UTILITY CONSTRUCTION



20 SEP 2023 12:45 PM PROJECTS\2020\A2020901\00\_AECOM\_I-2513AA&AB\Design\Utilities\Engineering\UC\ProJ\I2513AA\_ut.dtl UC3D\_psh.dgn  
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# PROJECT TYPICAL DETAILS

NOT TO SCALE



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WATER AND SEWER PLANS

## PAY ITEMS - (1 SIGN)

- S 4025000000 901 CONTRACTOR FURNISHED, TYPE D SIGN 2 SF
- S 4072000000 903 SUPPORTS, 3-LB STEEL U-CHANNEL 9 LF
- S 4096000000 904 SIGN ERECTION, TYPE D 1 EA

PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-3E</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
9/20/2023 UTILITY CONSTRUCTION PLANS ONLY	

SIGN NUMBER: SP23009 TYPE: D QUANTITY: <b>1</b> SIGN WIDTH: 1'-0" HEIGHT: 1'-6" TOTAL AREA: 1.5 Sq.Ft. BORDER TYPE: FLUSH RECESS: 0" WIDTH: 0.38" RADII: 1.5" NO. Z BARS: LENGTH:	BACKG COLOR: White COPY COLOR: Black <table border="1"> <tr><th>SYMBOL</th><th>X</th><th>Y</th><th>WID</th><th>HT</th></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table> MAT'L: 0.125" (3.2 mm) ALUMINUM	SYMBOL	X	Y	WID	HT																																									DESIGN BY: EEW PROJECT ID: I-2513 AA/AB CHECKED BY: LOCATION: AUG 16, 2023 DIV: 13
SYMBOL	X	Y	WID	HT																																											

Spacing Factor is 1 unless specified otherwise

USE NOTES:

- Legend and border (except those that are colored black) shall be direct applied Grade C sheeting.
- Background shall be Grade C reflective sheeting.

Letter spacings are to start of next letter																										Series/Size	Text Length				
		P	I	P	E	L	I	N	E																	B 2000	9.8				
	1.1	1.5	0.7	1.5	1.4	1.3	0.7	1.6	1.1	1.1																					
		1	6		S	O	U	T	H		M	A	I	N		S	T	R	E	E	T						B 2000	5.8			
		3.1	0.2	0.2	0.5	0.3	0.3	0.3	0.2	0.5	0.3	0.3	0.2	0.2	0.5	0.3	0.3	0.3	0.2	0.2	3.1										
			T	O	W	N		O	F		W	A	Y	N	E	S	V	I	L	L	E					B 2000	5.7				
			3.2	0.2	0.3	0.4	0.2	0.5	0.3	0.2	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	3.2										
			1	2	"		D	I			W	A	T	E	R		M	A	I	N	(	1	5	0		P	S	I	)		
			2.1	0.2	0.3	0.2	0.5	0.3	0.1	0.5	0.3	0.3	0.3	0.2	0.5	0.3	0.3	0.2	0.2	0.5	0.2	0.2	0.3	0.2	0.5	0.3	0.3	0.1	0.2	2.2	
				W	A	Y	N	E	S	V	I	L	L	E	,		N	C			2	8	7	8	6						
			3	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.1	0.5	0.3	0.2	0.5	0.3	0.3	0.3	0.2	3							
				4	'	-	O	"			B	E	L	O	W		G	R	A	D	E										
			3.5	0.3	0.1	0.2	0.3	0.2	0.5	0.3	0.3	0.2	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.2	3.5										
				F	O	R		I	N	F	O	R	M	A	T	I	O	N		O	R		I	N							
			2.9	0.2	0.3	0.2	0.5	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.5	0.3	0.2	0.5	0.2	0.2	2.9							
				C	A	S	E		O	F		R	U	P	T	U	R	E		C	A	L	L								
			3	0.3	0.3	0.3	0.2	0.5	0.3	0.2	0.5	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.5	0.3	0.3	0.3	0.2	3							
				W	E	E	K	D	A	Y		(	8	2	8	)		4	5	6	-	3	7	0	6						
			2.8	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.2	0.3	0.2	0.3	0.1	0.5	0.3	0.3	0.2	0.3	0.3	0.3	2.8							
				W	E	E	K	E	N	D		(	8	2	8	)		4	5	6	-	5	3	6	3						
			2.9	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.5	0.2	0.3	0.3	0.3	0.1	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.2	2.9						
				E	V	E	N	I	N	G		(	8	2	8	)		4	5	6	-	5	3	6	3						
			3	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.5	0.2	0.3	0.3	0.3	0.1	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.2	3						

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# RAILROAD SHORING DETAIL

**HINDE ENGINEERING**  
 License No. C-2639  
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-3F</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

## UTILITY CONSTRUCTION

1-5-104

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**AREMA Manual for Railway Engineering**

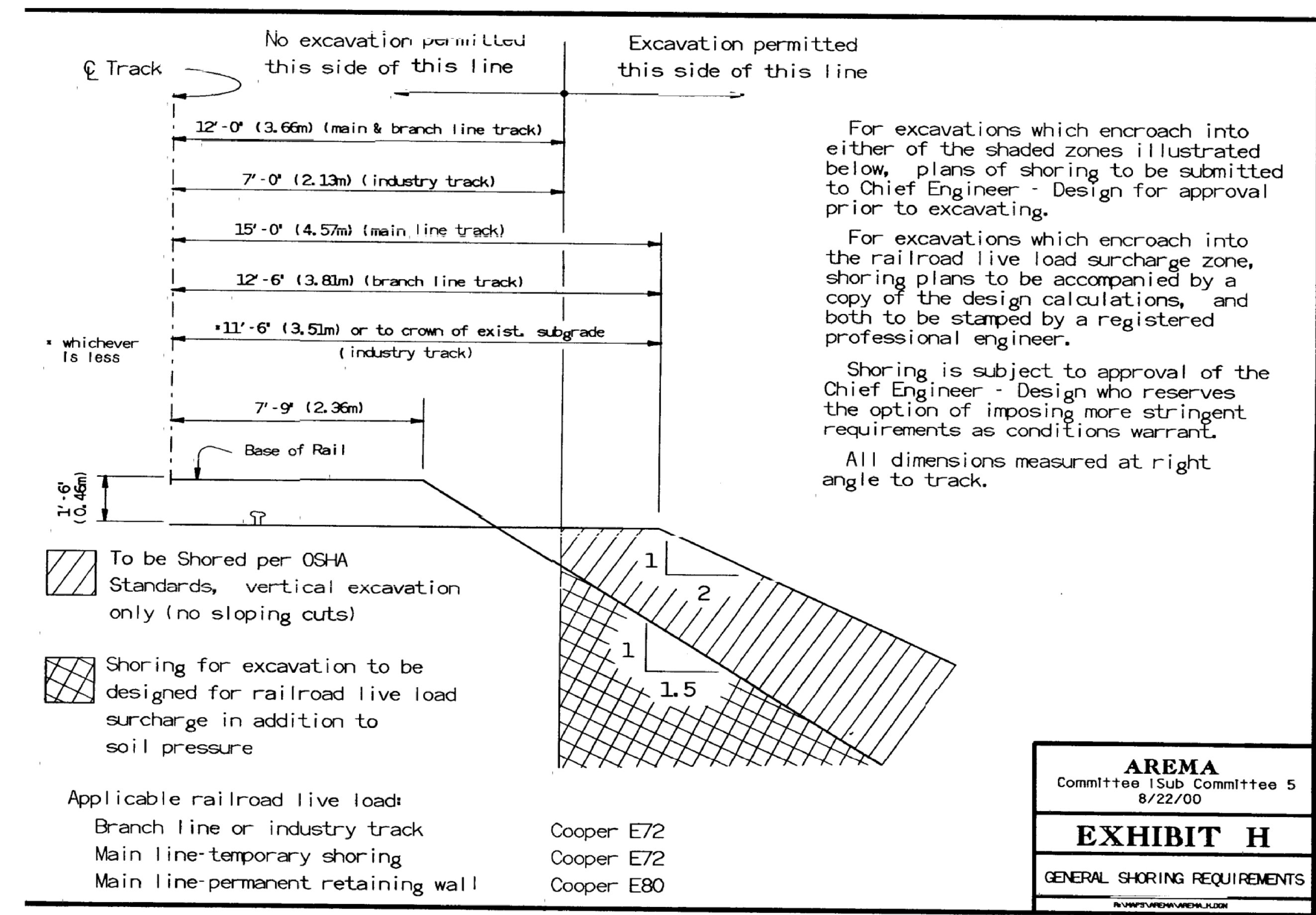


Figure 1-5-22. General Shoring Requirements

Roadway and Ballast

20 NOV 2023 16:14 PROJECTS\2020\A2020\001\00\_AECOM\_I-2513AA&AB\Design\Utilities\Engineering\UC\Proj\I2513AA\_ut-dtl\_UC3F\_psh.dgn  
 11/20/2023 11:20:23 AM

SEE SHEET UC-09  
FOR SEWER LINE 1 PROFILE

NAD 83

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DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
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**UTILITY CONSTRUCTION**

**5' DIA. UTILITY MANHOLE B1  
STA. 7+02.82, LINE 1  
171.29' LT OF LINE -Y5RPB-,  
STA. 16+01.35  
8' OF UTILITY MANHOLE WALL  
4' DIA  
REMOVE 1 MANHOLE**

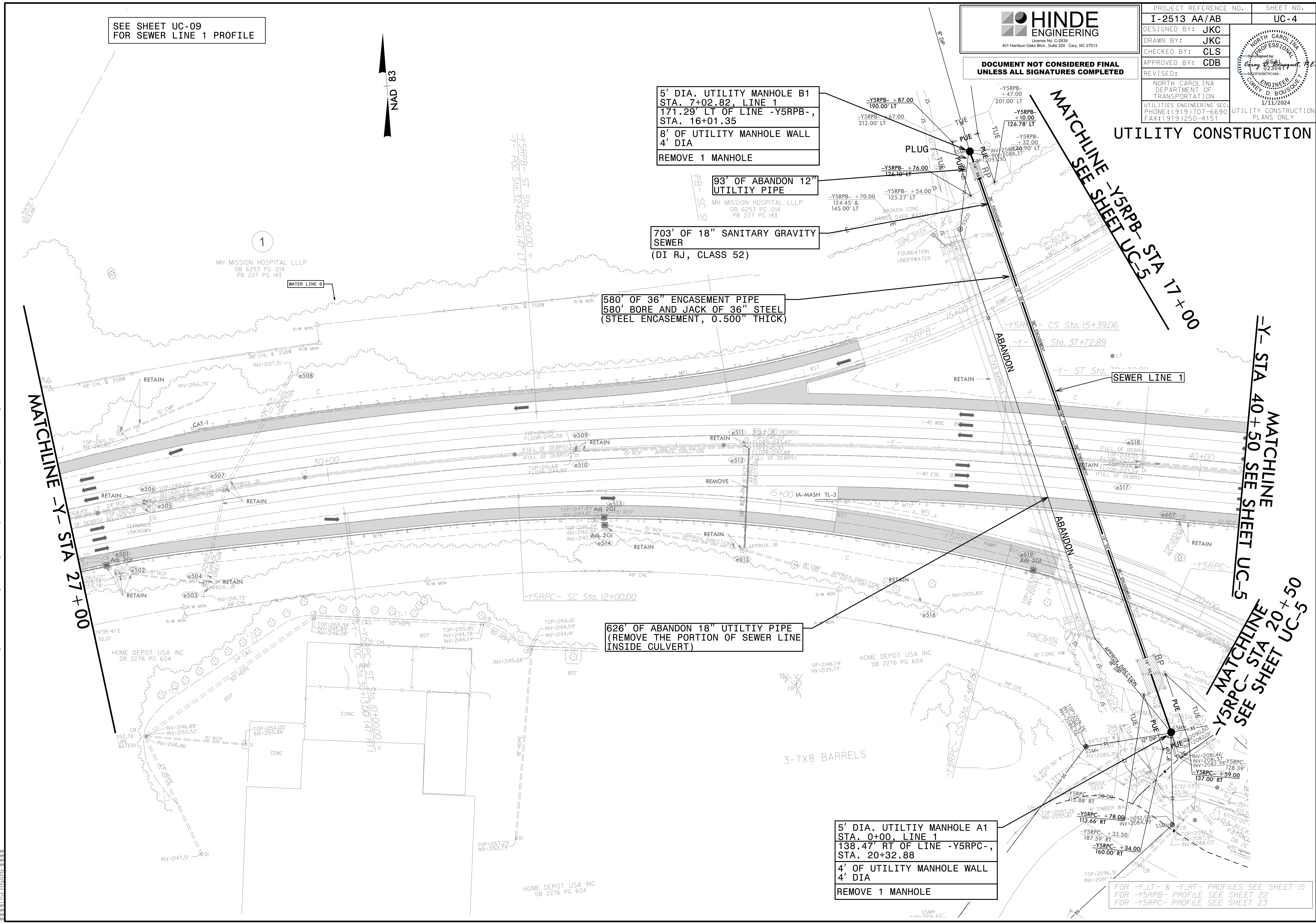
**93' OF ABANDON 12"  
UTILITY PIPE**  
 MH MISSION HOSPITAL LLLP  
 DB 6253 PG 124  
 PB 227 PG 143

**703' OF 18" SANITARY GRAVITY  
SEWER  
(DI RJ, CLASS 52)**

**580' OF 36" ENCASEMENT PIPE  
580' BORE AND JACK OF 36" STEEL  
(STEEL ENCASEMENT, 0.500" THICK)**

**626' OF ABANDON 18" UTILITY PIPE  
(REMOVE THE PORTION OF SEWER LINE  
INSIDE CULVERT)**

**5' DIA. UTILITY MANHOLE A1  
STA. 0+00, LINE 1  
138.47' RT OF LINE -Y5RPC-,  
STA. 20+32.88  
4' OF UTILITY MANHOLE WALL  
4' DIA  
REMOVE 1 MANHOLE**



MATCHLINE -Y- STA 27+00

MATCHLINE -Y5RPB- STA 17+00  
SEE SHEET UC-5

MATCHLINE -Y- STA 40+50 SEE SHEET UC-5  
MATCHLINE -Y5RPC- STA 20+50  
SEE SHEET UC-5

FOR -Y-LT- & -Y-RT- PROFILES SEE SHEET 15  
FOR -Y5RPB- PROFILE SEE SHEET 22  
FOR -Y5RPC- PROFILE SEE SHEET 23

I:\AN-2024\10-49\_PROJECTS\2020\A2020\901.00\_AECOM\I-2513AA&AB\Design\Utilities\Engineering\UC\Proj\I2513AA-ut-ldj5\_UC04\_psh.dgn

SEE SHEET UC-10  
FOR SEWER LINE 2 PROFILE  
SEE SHEET UC-11  
FOR SEWER LINE 3 PROFILE



PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-5</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
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140' OF 24" ENCASEMENT PIPE  
140' BORE AND JACK OF 24" STEEL  
(STEEL ENCASEMENT, 0.375" THICK)

163' OF 8" SANITARY GRAVITY  
SEWER  
(DI RJ, PC 350)

134' OF 8" SANITARY GRAVITY  
SEWER  
(DI, PC 350)

4' DIA. UTILTIY MANHOLE D3  
STA. 4+17.28, LINE 3  
200.62' RT OF LINE -Y5RPA-,  
STA. 18+75.65  
8' OF UTILITY MANHOLE WALL  
4' DIA

140' OF 8" SANITARY GRAVITY  
SEWER  
(DI RJ, PC 350)

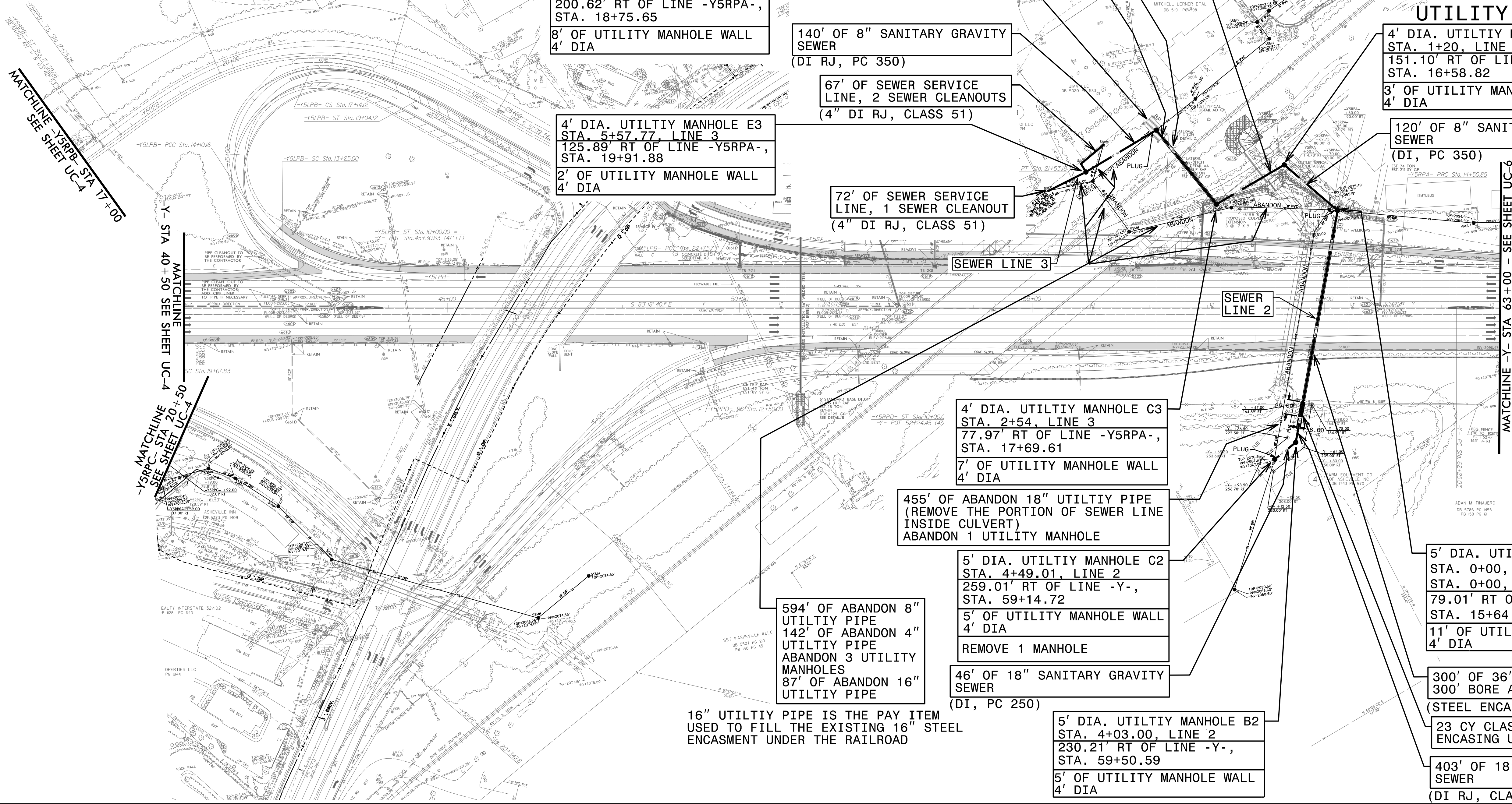
67' OF SEWER SERVICE  
LINE, 2 SEWER CLEANOUTS  
(4" DI RJ, CLASS 51)

4' DIA. UTILTIY MANHOLE B3  
STA. 1+20, LINE 3  
151.10' RT OF LINE -Y5RPA-,  
STA. 16+58.82  
3' OF UTILITY MANHOLE WALL  
4' DIA

4' DIA. UTILTIY MANHOLE E3  
STA. 5+57.77, LINE 3  
125.89' RT OF LINE -Y5RPA-,  
STA. 19+91.88  
2' OF UTILITY MANHOLE WALL  
4' DIA

72' OF SEWER SERVICE  
LINE, 1 SEWER CLEANOUT  
(4" DI RJ, CLASS 51)

120' OF 8" SANITARY GRAVITY  
SEWER  
(DI, PC 350)



MATCHLINE -Y5RPA- STA 17+00  
SEE SHEET UC-4

MATCHLINE -Y- STA 40+50  
SEE SHEET UC-4

MATCHLINE -Y5RPA- STA 20+50  
SEE SHEET UC-4

MATCHLINE -Y- STA 63+00 - SEE SHEET UC-6

SEWER LINE 3

SEWER LINE 2

4' DIA. UTILTIY MANHOLE C3  
STA. 2+54, LINE 3  
77.97' RT OF LINE -Y5RPA-,  
STA. 17+69.61  
7' OF UTILITY MANHOLE WALL  
4' DIA

455' OF ABANDON 18" UTILTIY PIPE  
(REMOVE THE PORTION OF SEWER LINE  
INSIDE CULVERT)  
ABANDON 1 UTILITY MANHOLE

5' DIA. UTILTIY MANHOLE C2  
STA. 4+49.01, LINE 2  
259.01' RT OF LINE -Y-,  
STA. 59+14.72  
5' OF UTILITY MANHOLE WALL  
4' DIA  
REMOVE 1 MANHOLE

46' OF 18" SANITARY GRAVITY  
SEWER  
(DI, PC 250)

594' OF ABANDON 8"  
UTILTIY PIPE  
142' OF ABANDON 4"  
UTILTIY PIPE  
ABANDON 3 UTILITY  
MANHOLES  
87' OF ABANDON 16"  
UTILTIY PIPE

16" UTILTIY PIPE IS THE PAY ITEM  
USED TO FILL THE EXISTING 16" STEEL  
ENCASMENT UNDER THE RAILROAD

5' DIA. UTILTIY MANHOLE B2  
STA. 4+03.00, LINE 2  
230.21' RT OF LINE -Y-,  
STA. 59+50.59  
5' OF UTILITY MANHOLE WALL  
4' DIA

5' DIA. UTILTIY MANHOLE EQ1  
STA. 0+00, SEWER LINE 2  
STA. 0+00, SEWER LINE 3  
79.01' RT OF LINE -Y5RPA-,  
STA. 15+64.16  
11' OF UTILITY MANHOLE WALL  
4' DIA

300' OF 36" ENCASEMENT PIPE  
300' BORE AND JACK OF 36" STEEL  
(STEEL ENCASEMENT, 0.500" THICK)

23 CY CLASS B CONCRETE FOR  
ENCASING UTILITY LINES

403' OF 18" SANITARY GRAVITY  
SEWER  
(DI RJ, CLASS 52)



PROJECT REFERENCE NO.	I-2513 AA/AB	SHEET NO.	UC-6
DESIGNED BY:	JKC		
DRAWN BY:	JKC		
CHECKED BY:	CLS		
APPROVED BY:	CDB		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. DB 118 PG 116 PB 19 PG 87		PHONE: (919) 707-6690 FAX: (919) 250-4151	

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SEE SHEET UC-12 FOR SEWER LINE 4 PROFILE  
SEE SHEET UC-13 FOR SEWER LINE 5 PROFILE

**NOTE:**  
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 400 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

4' DIA. UTILITY MANHOLE A4  
STA. 0+00, LINE 4  
238.74' LT OF LINE -Y-,  
STA. 71+51.93  
4' OF UTILITY MANHOLE WALL  
4' DIA  
REMOVE 1 MANHOLE

728' OF ABANDON 8" UTILITY PIPE  
ABANDON 2 UTILITY MANHOLES

87' OF 6" WATER LINE (DI RJ, PC 350) USE CONCRETE BLOCKING AT TIE-IN POINTS. SEE DETAIL SHEET UC-3D MAINTAIN 2' BELOW PROPOSED DRAINAGE PIPE

116' OF 8" SEWER (DI, PC 350)

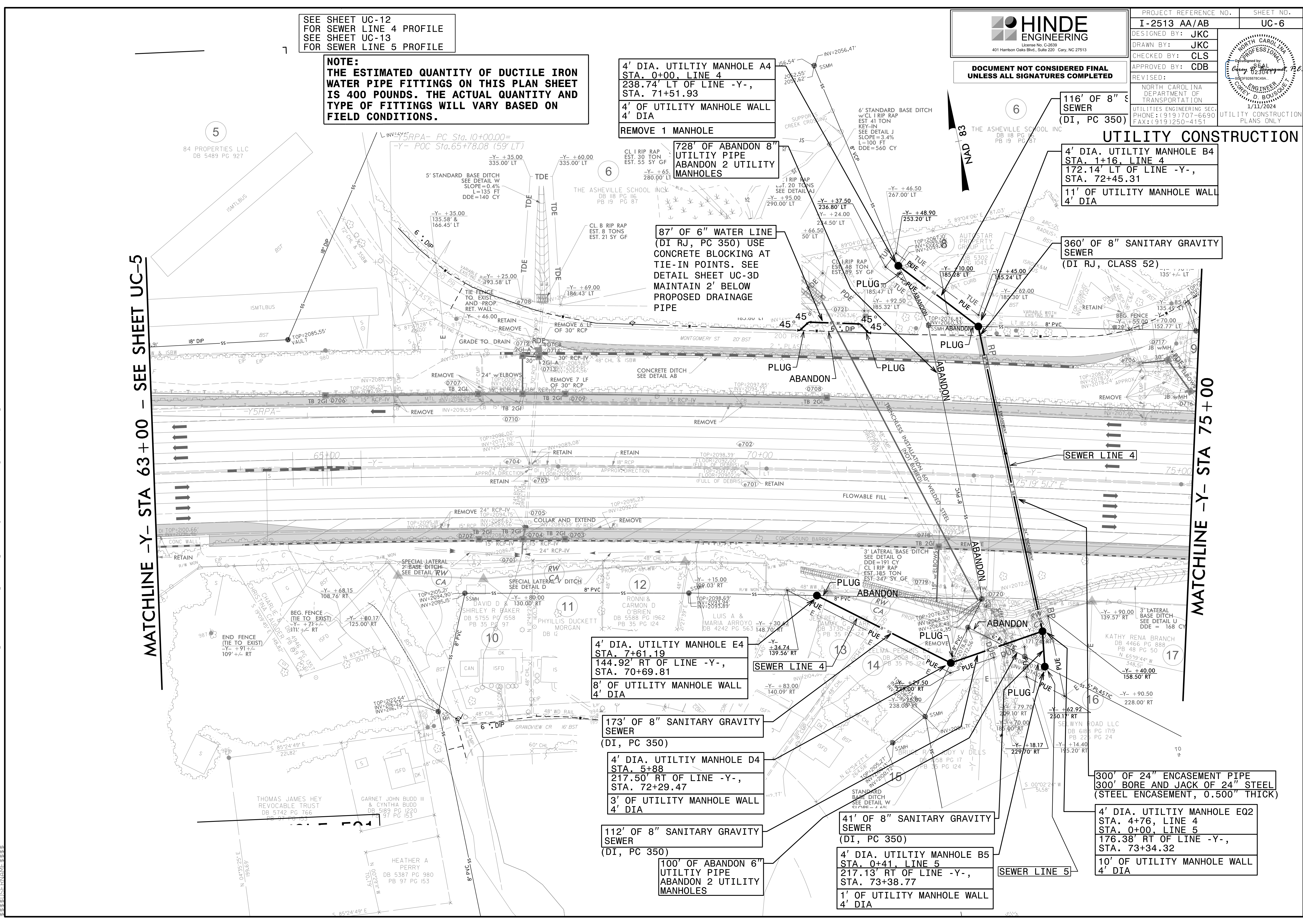
4' DIA. UTILITY MANHOLE B4  
STA. 1+16, LINE 4  
172.14' LT OF LINE -Y-,  
STA. 72+45.31  
11' OF UTILITY MANHOLE WALL  
4' DIA

360' OF 8" SANITARY GRAVITY SEWER (DI RJ, CLASS 52)

MATCHLINE -Y- STA 63+00 - SEE SHEET UC-5

MATCHLINE -Y- STA 75+00

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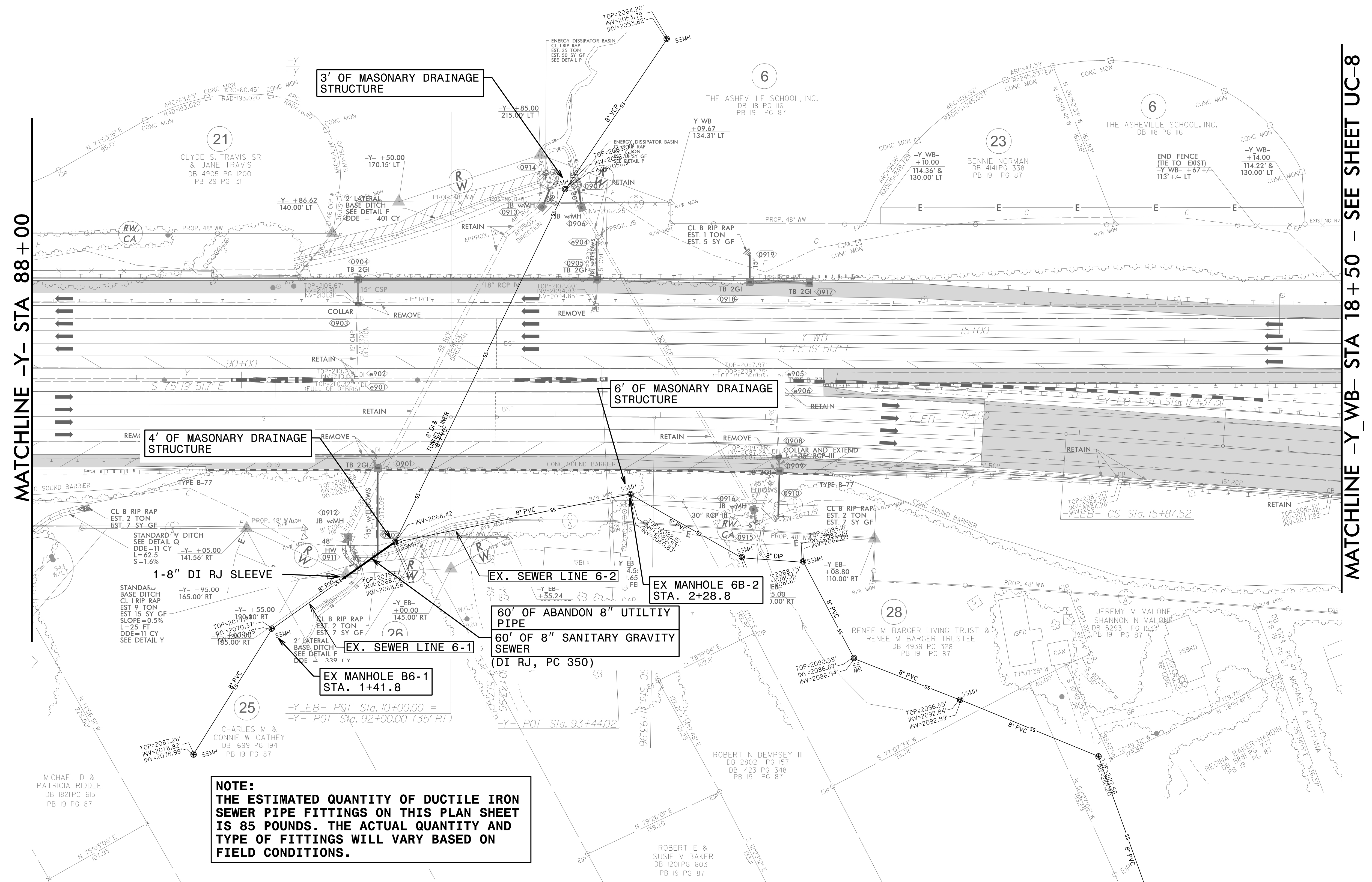
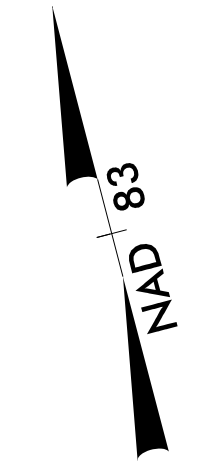
SEE SHEET UC-13  
FOR SEWER LINE 6

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PROJECT REFERENCE NO.	I-2513 AA/AB	SHEET NO.	UC-7
DESIGNED BY:	JKC		
DRAWN BY:	JKC		
CHECKED BY:	CLS		
APPROVED BY:	CDB		
REVISED:		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	1/11/2024
UTILITIES ENGINEERING SEC.		UTILITY CONSTRUCTION PLANS ONLY	
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# UTILITY CONSTRUCTION



MATCHLINE -Y- STA 88+00

MATCHLINE -Y\_WB- STA 18+50 - SEE SHEET UC-8

**NOTE:**  
THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 85 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

I:\AN-2024\051\PROJECTS\2020\A2020\901.00\_AECOM\I-2513AA&AB\Design\Utilities\Engineering\UC\Pro\I-2513AA-ut-rd\9\_UC07\_psh.dgn  
 1/11/2024 10:51 AM PROJECTS\2020\A2020\901.00\_AECOM\I-2513AA&AB\Design\Utilities\Engineering\UC\Pro\I-2513AA-ut-rd\9\_UC07\_psh.dgn

SEE SHEET UC-14  
FOR WATER LINE 1 PROFILE

5' OF 18" WATER LINE  
(DI RJ, PC 250)

703' OF 24" WATER LINE  
(DI RJ, PC 250)

347' OF 48" ENCASEMENT PIPE  
347' BORE AND JACK OF 48" STEEL  
(STEEL ENCASEMENT, 0.625" THICK)

MATCHLINE -Y WB- STA 18+50 - SEE SHEET UC-7

4' OF 18" WATER LINE  
(DI RJ, PC 250)

**NOTE:**  
THE ESTIMATED QUANTITY OF DUCTILE IRON  
WATER PIPE FITTINGS ON THIS PLAN SHEET  
IS 9000 POUNDS. THE ACTUAL QUANTITY AND  
TYPE OF FITTINGS WILL VARY BASED ON  
FIELD CONDITIONS.

24" X 18" REDUCER  
1-24" VALVE  
(BV, 250# WP)

765' OF ABANDON 18" UTILITY PIPE

1-2" VALVE  
36' OF 2" WATER LINE  
(PVC RJ, SDR 21)

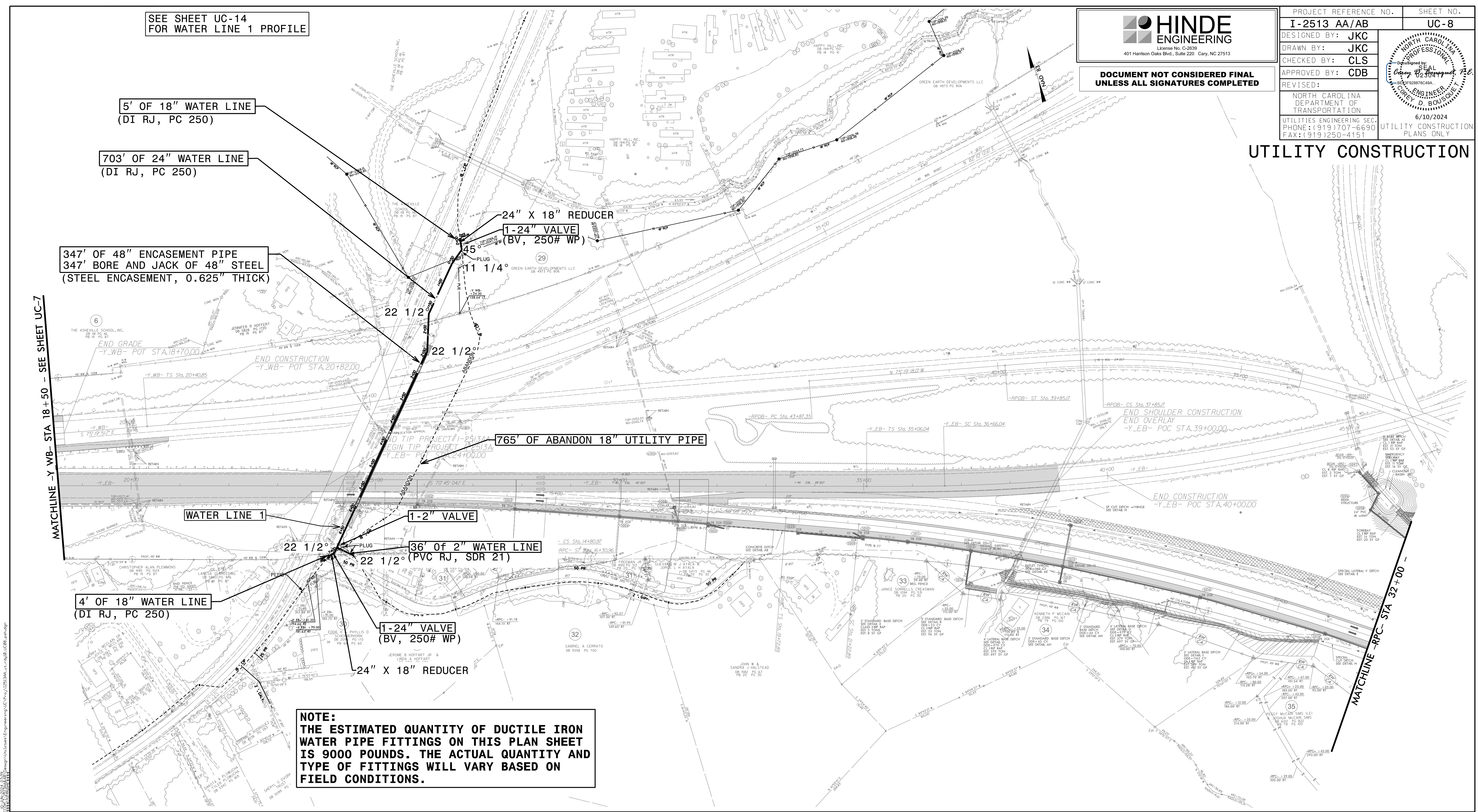
1-24" VALVE  
(BV, 250# WP)  
24" X 18" REDUCER

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PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-8</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
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UTILITY CONSTRUCTION PLANS ONLY	

# UTILITY CONSTRUCTION




MATCHLINE -RPC- STA 32+00

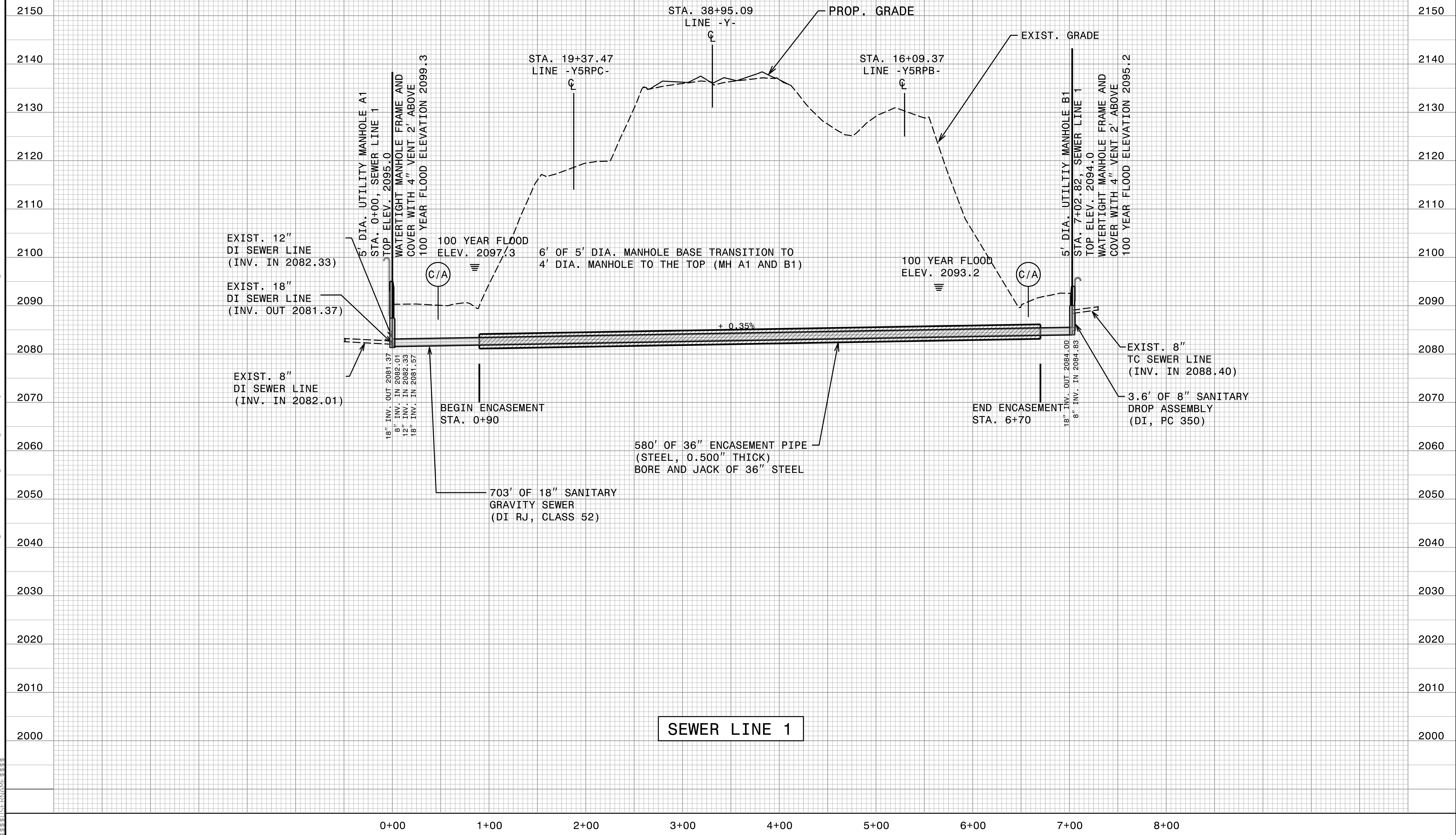
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PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-9</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
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### UTILITY CONSTRUCTION



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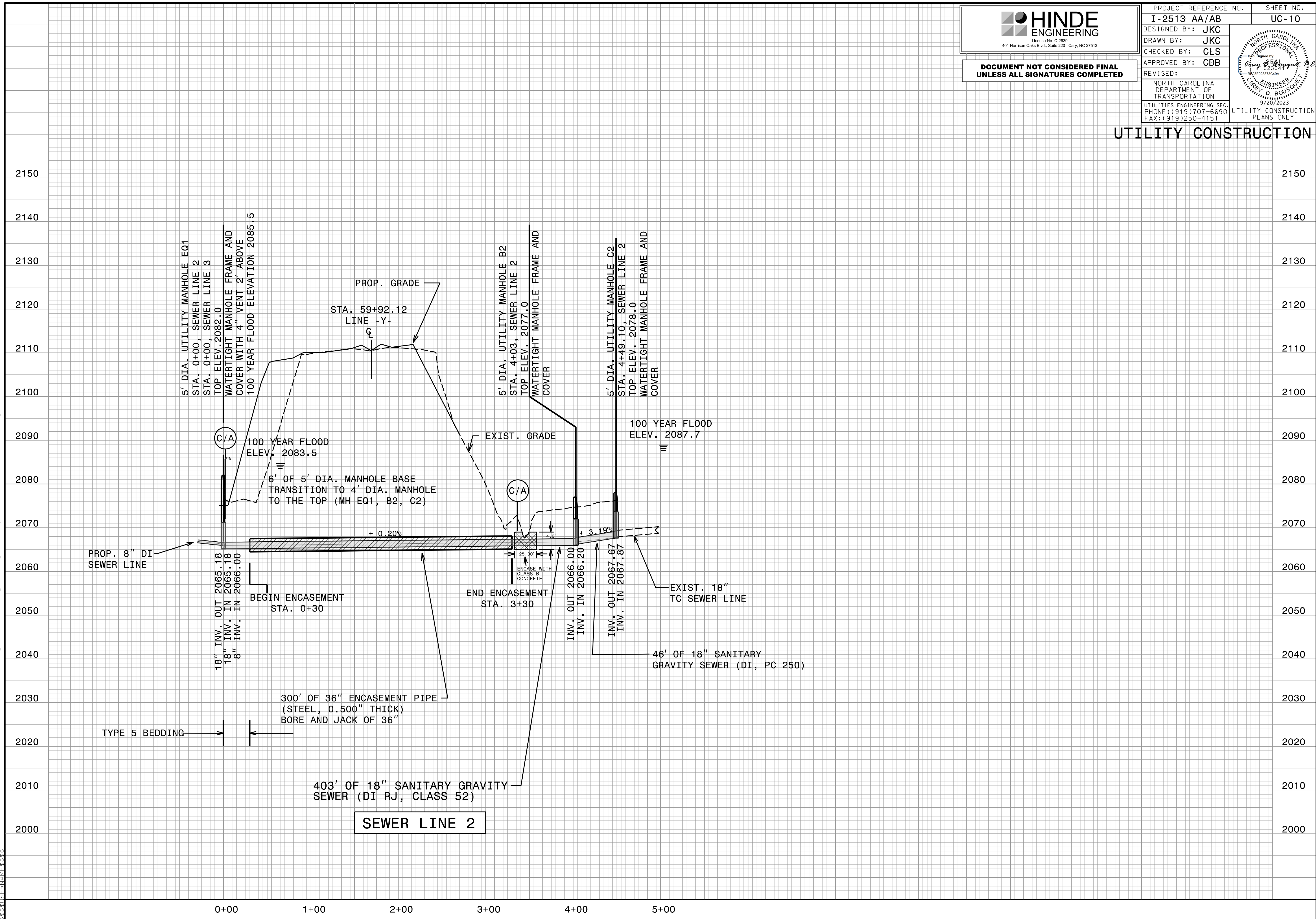
**SEWER LINE 1**



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PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-10</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
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### UTILITY CONSTRUCTION



20 SEP 2023 16:52 C:\PROJECTS\2020\A2020\901.00.AECCOM\I-2513AA&AB\Design\Utilities\Engineering\UC\Proj\I2513AA\_ut\_pfl\_UC10\_psh.dgn

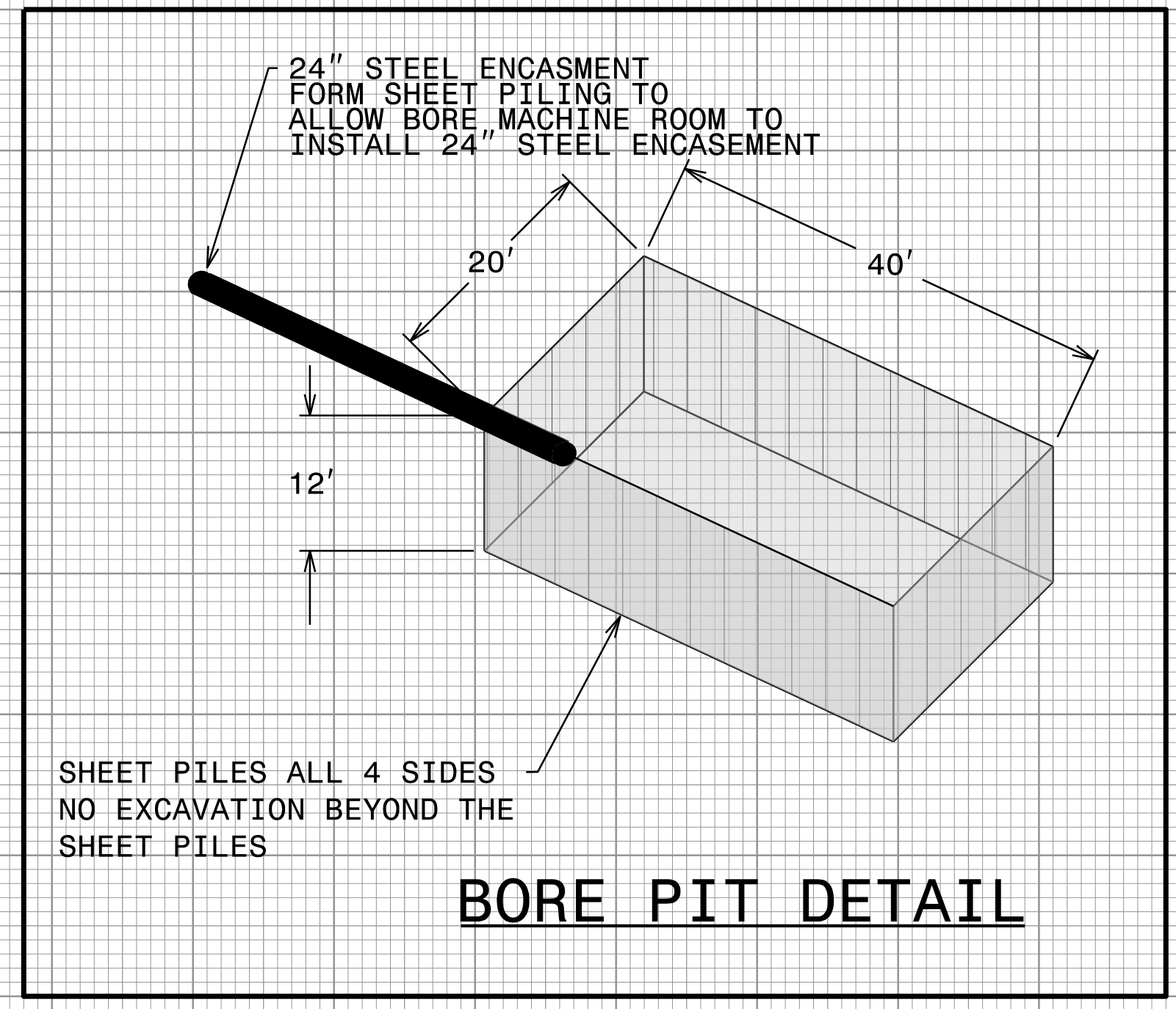
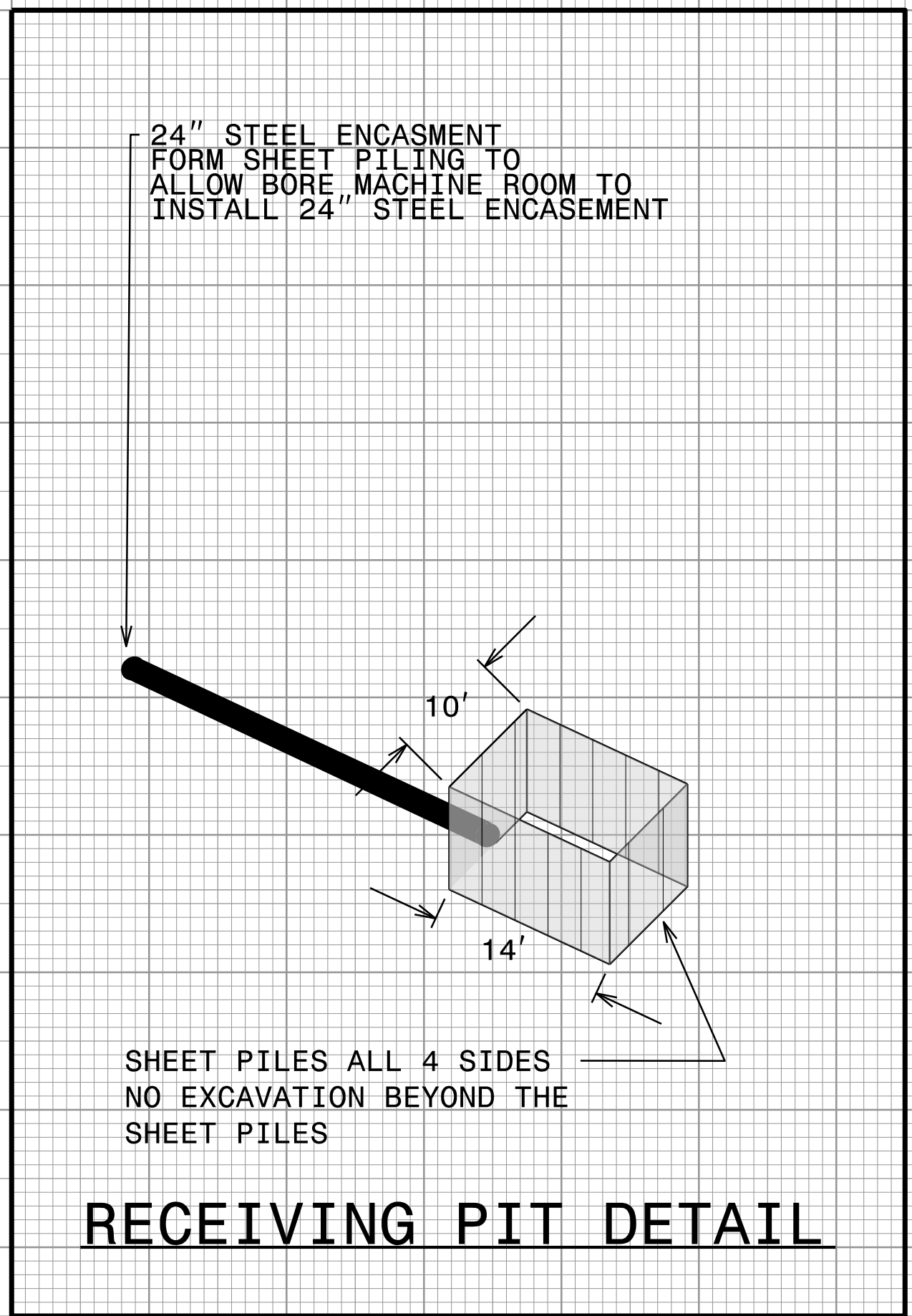
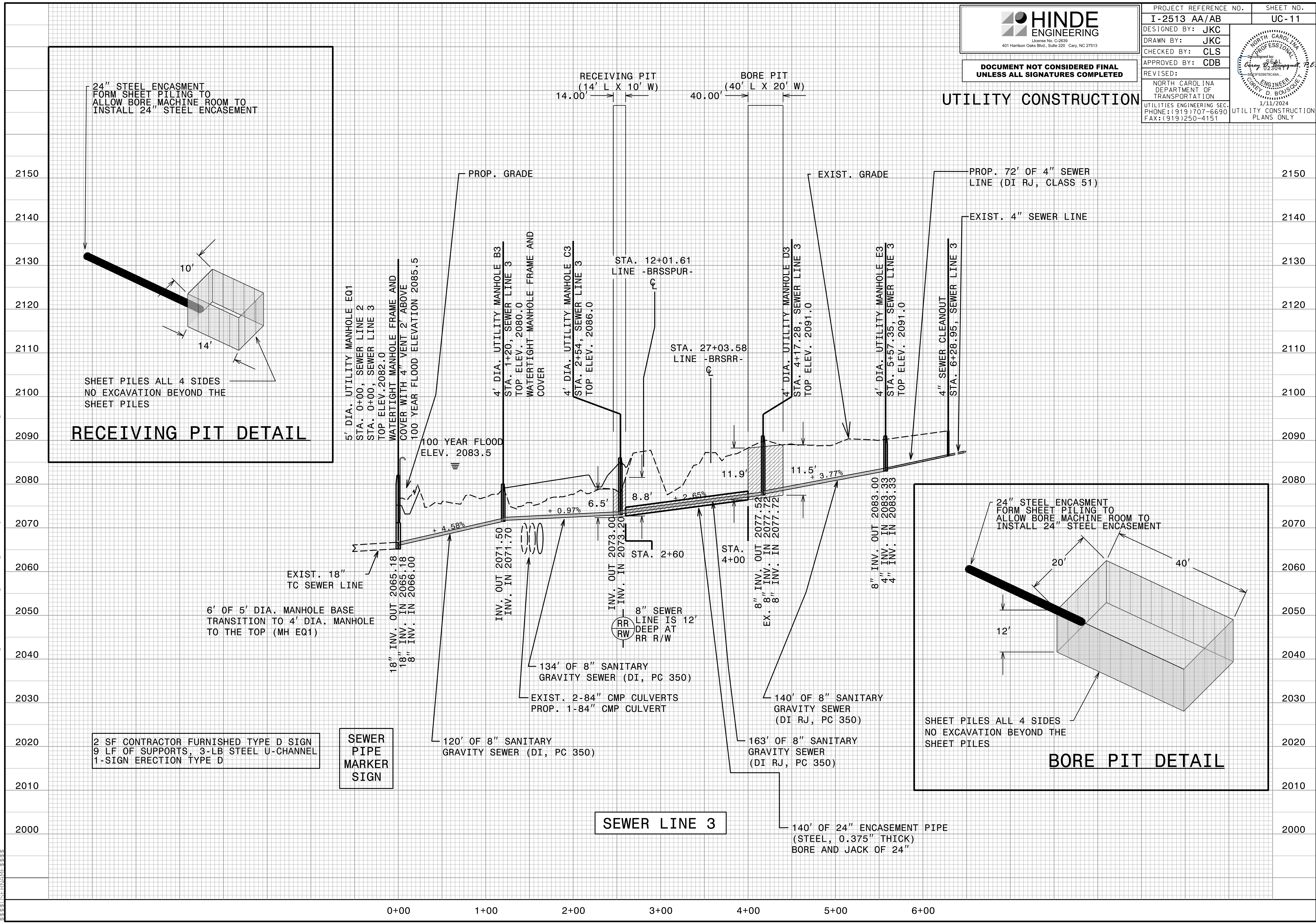


**HINDE ENGINEERING**  
 License No. C-2639  
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	SHEET NO.
I-2513 AA/AB	UC-11
DESIGNED BY: JKC	
DRAWN BY: JKC	
CHECKED BY: CLS	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

# UTILITY CONSTRUCTION



2 SF CONTRACTOR FURNISHED TYPE D SIGN  
 9 LF OF SUPPORTS, 3-LB STEEL U-CHANNEL  
 1-SIGN ERECTION TYPE D

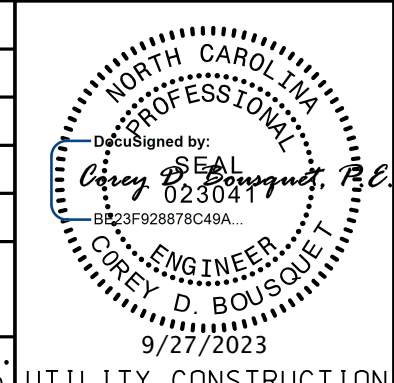
SEWER PIPE MARKER SIGN

SEWER LINE 3

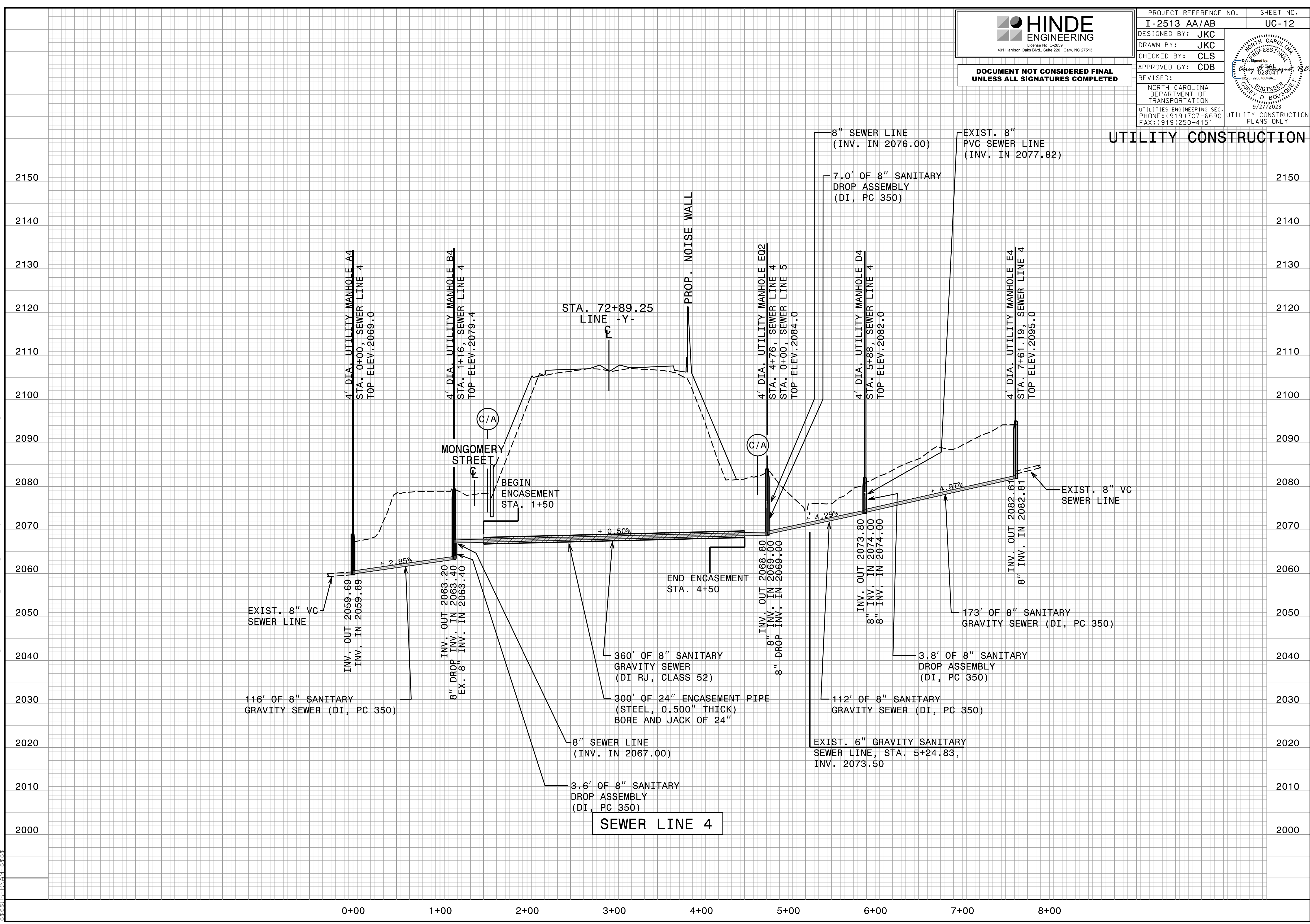
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 1/11/2024 10:51 AM  
 1/11/2024 10:51 AM

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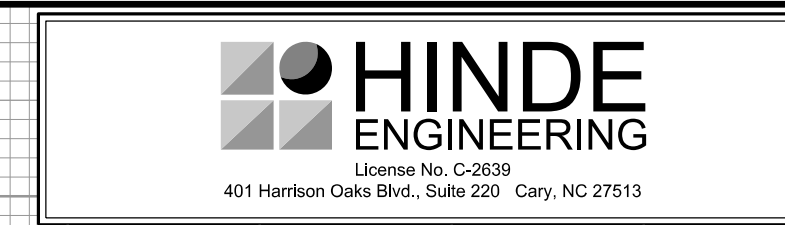
**DOCUMENT NOT CONSIDERED FINAL  
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PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-12</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

### UTILITY CONSTRUCTION



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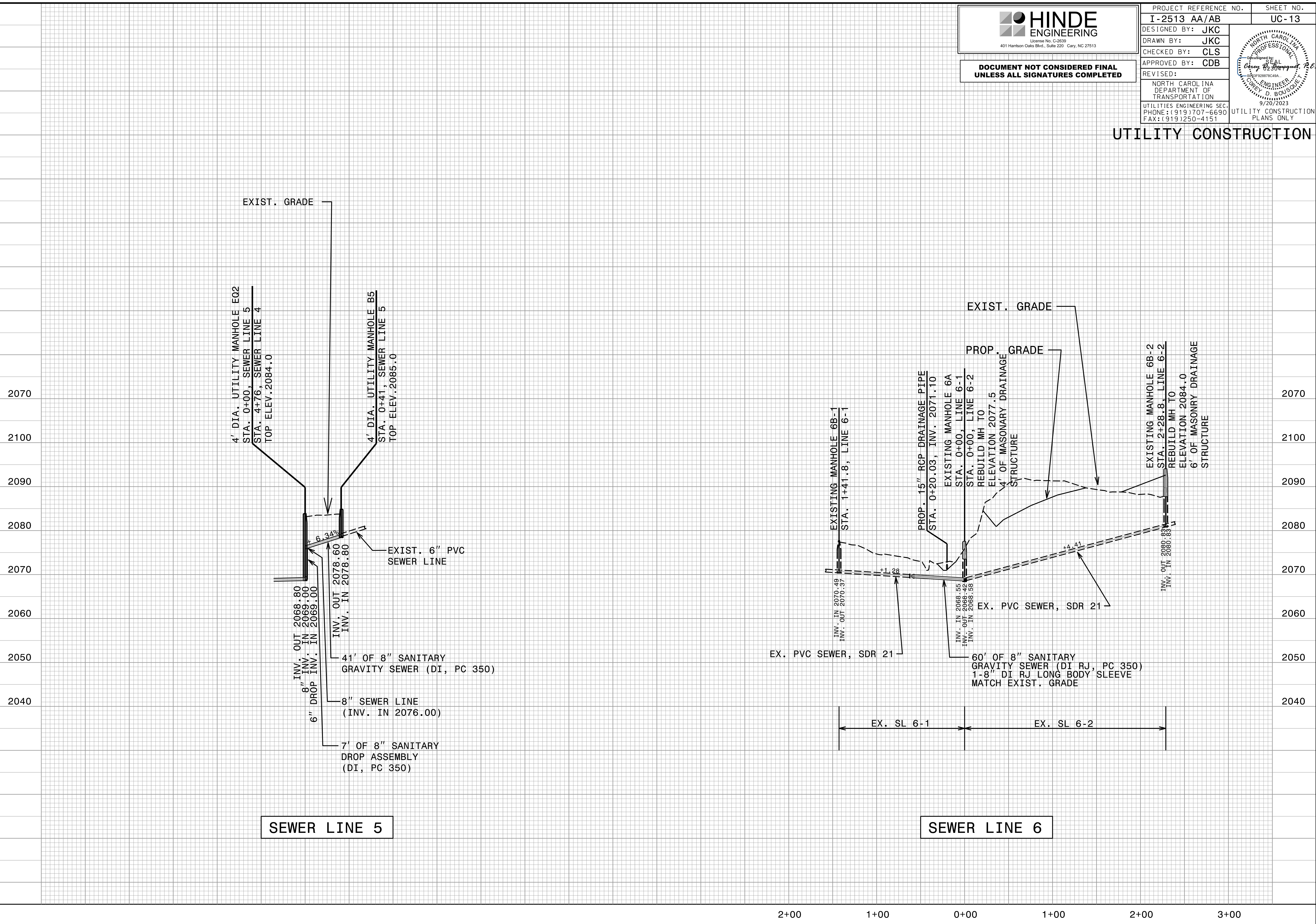


PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-13</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITY ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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**UTILITY CONSTRUCTION**

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PROJECT REFERENCE NO. <b>I-2513 AA/AB</b>	SHEET NO. <b>UC-14</b>
DESIGNED BY: <b>JKC</b>	 NORTH CAROLINA PROFESSIONAL ENGINEER Clifton D. Boush License No. 023024 5/23/2024
DRAWN BY: <b>JKC</b>	
CHECKED BY: <b>CLS</b>	
APPROVED BY: <b>CDB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

ALL DI FITTINGS SHALL HAVE RESTRAINED RETAINER GLANDS AND CONCRETE THRUST BLOCKING. SEE CONCRETE THRUST BLOCKING DETAIL ON SHEET UC-3D

**UTILITY CONSTRUCTION**

23 MAY 2024 08:55  
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