

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

09/08/19

5/22/2019 R:\Utilities\Engineering\UC\Proj\U5827_ut_tsh_UC01.psh.dgn USERNAME:

TIP PROJECT: U-5827

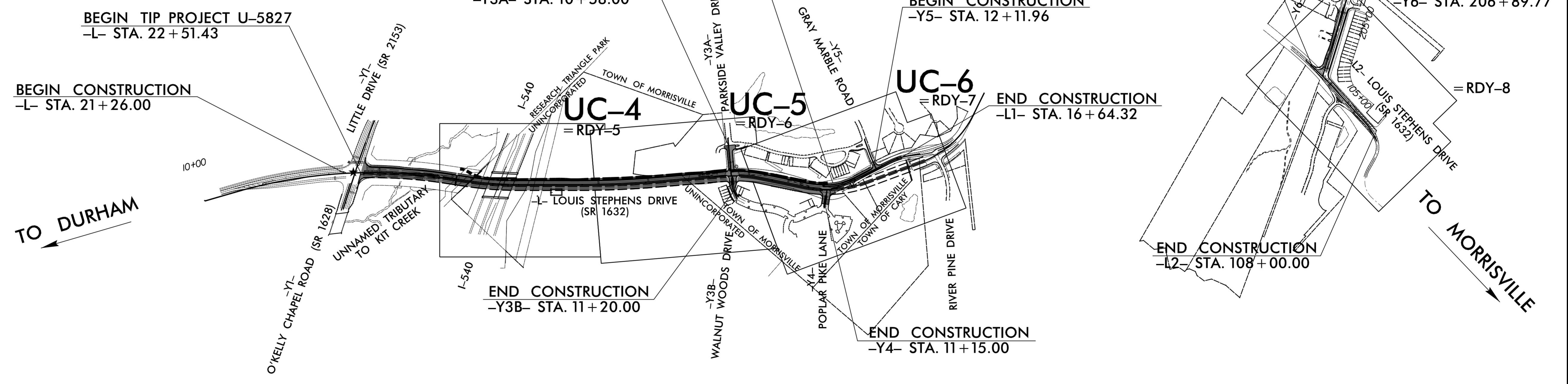
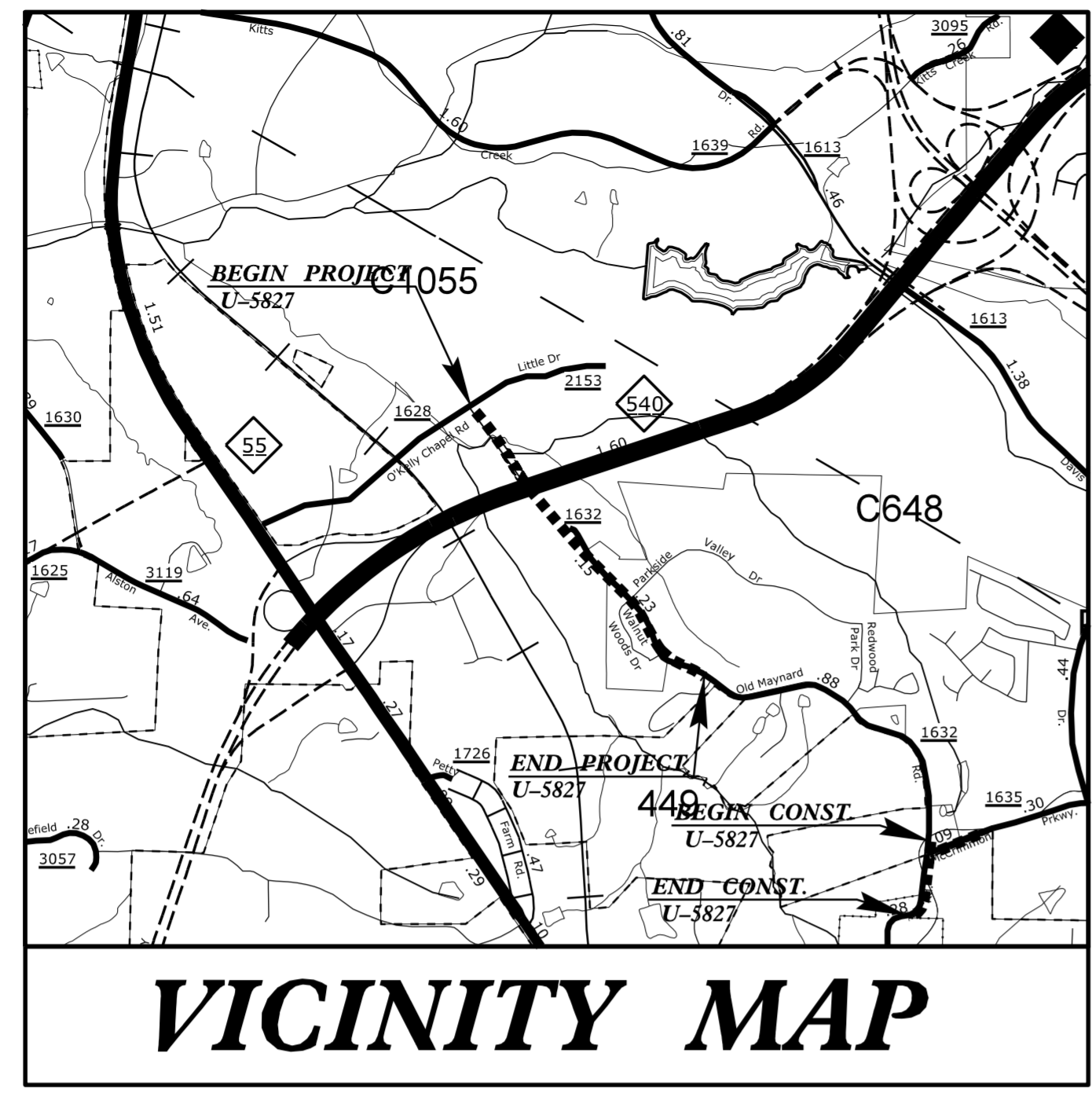
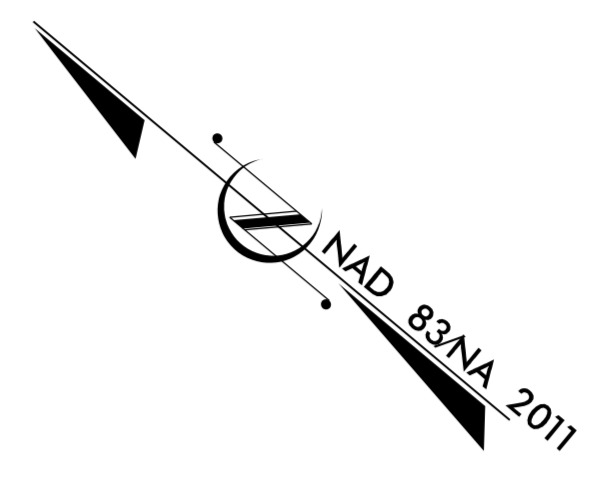
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
U-5827	UC-1

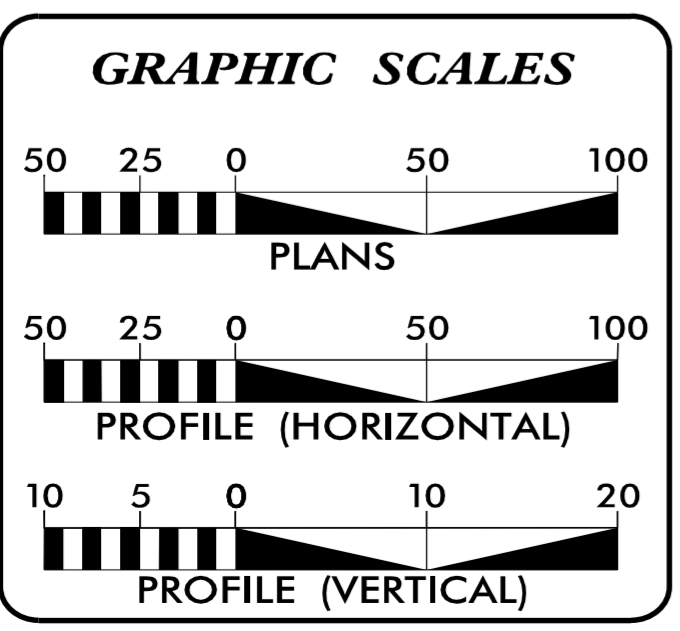
UTILITY CONSTRUCTION PLANS WAKE COUNTY

**LOCATION: LOUIS STEPHENS DRIVE EXTENSION (SR 1632)
FROM O'KELLY CHAPEL ROAD (SR 1628)/LITTLE
DRIVE (SR 2153) IN RESEARCH TRIANGLE PARK
TO POPLAR PIKE LANE IN MORRISVILLE**

TYPE OF WORK: WATER LINE CONSTRUCTION



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	DETAILS
UC-4 THRU UC-6	UTILITY CONSTRUCTION SHEETS
UC-7 THRU UC-8	PROFILE SHEETS

WATER OWNER ON PROJECT

(A) WATER -TOWN OF CARY

PREPARED IN THE OFFICE OF

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

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

SEAL

DIVISION OF HIGHWAYS
DIVISION 5
PROJECT DELIVERY UNIT
2612 N. DUKE STREET
DURHAM, NC 27704

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown) 12" WL

11 ¼ Degree Bend +•+

22 ½ Degree Bend +•*

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 ∅

Telephone Pole -O-

Joint Use Pole -O-

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" ENCASUREMENT

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 •

Telephone Pole •

Joint Use Pole •

Utility Pole •

Utility Pole with Base ◻

H-Frame Pole •—•

Power Transmission Line Tower ⊠

Water Manhole ⊕

Power Manhole ⊕

Telephone Manhole ⊕

Sanitary Sewer Manhole ⊕

Hand Hole for Cable ⊠

Power Transformer ⊠

Telephone Pedestal ⊠

CATV Pedestal ⊠

Gas Valve ◇

Gas Meter ◇

Located Miscellaneous Utility Object ◦

Abandoned According to Utility Records AATUR

End of Information E.O.I.

*Underground Power Line _____

*Underground Telephone Cable _____

*Underground Telephone Conduit _____

*Underground Fiber Optics Telephone Cable _____

*Underground TV Cable _____

*Underground Fiber Optics TV Cable _____

*Underground Gas Pipeline _____

Aboveground Gas Pipeline _____ A/G Gas

*Underground Water Line _____

Aboveground Water Line _____ A/G Water

*Underground Gravity Sanitary Sewer Line _____ ss

Aboveground Gravity Sanitary Sewer Line _____ A/G Sanitary Sewer

*Underground SS Forced Main Line _____

Underground Unknown Utility Line _____

SUE Test Hole •

Water Meter ◻

Water Valve ⊕

Fire Hydrant ◇

Sanitary Sewer Cleanout ⊕

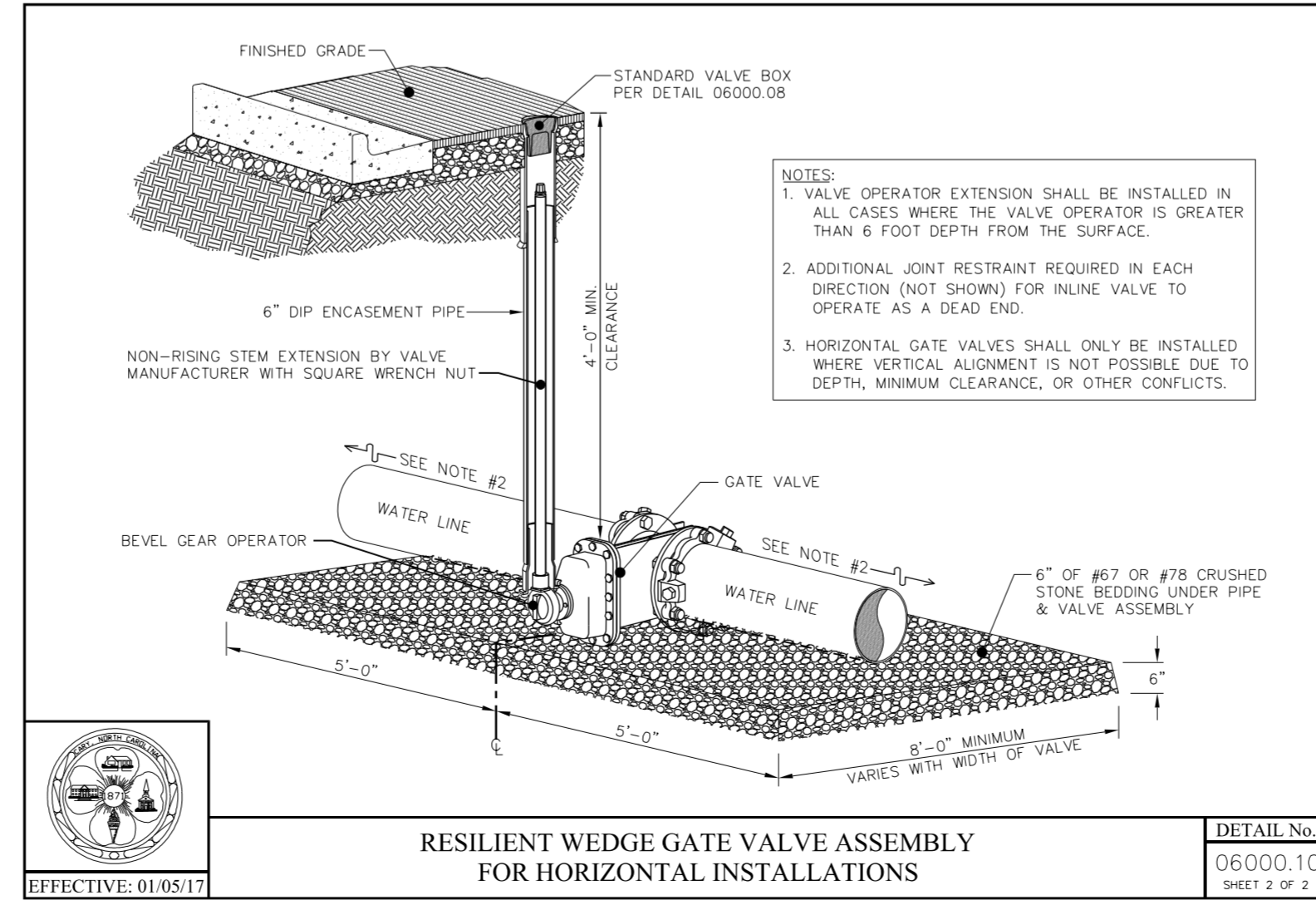
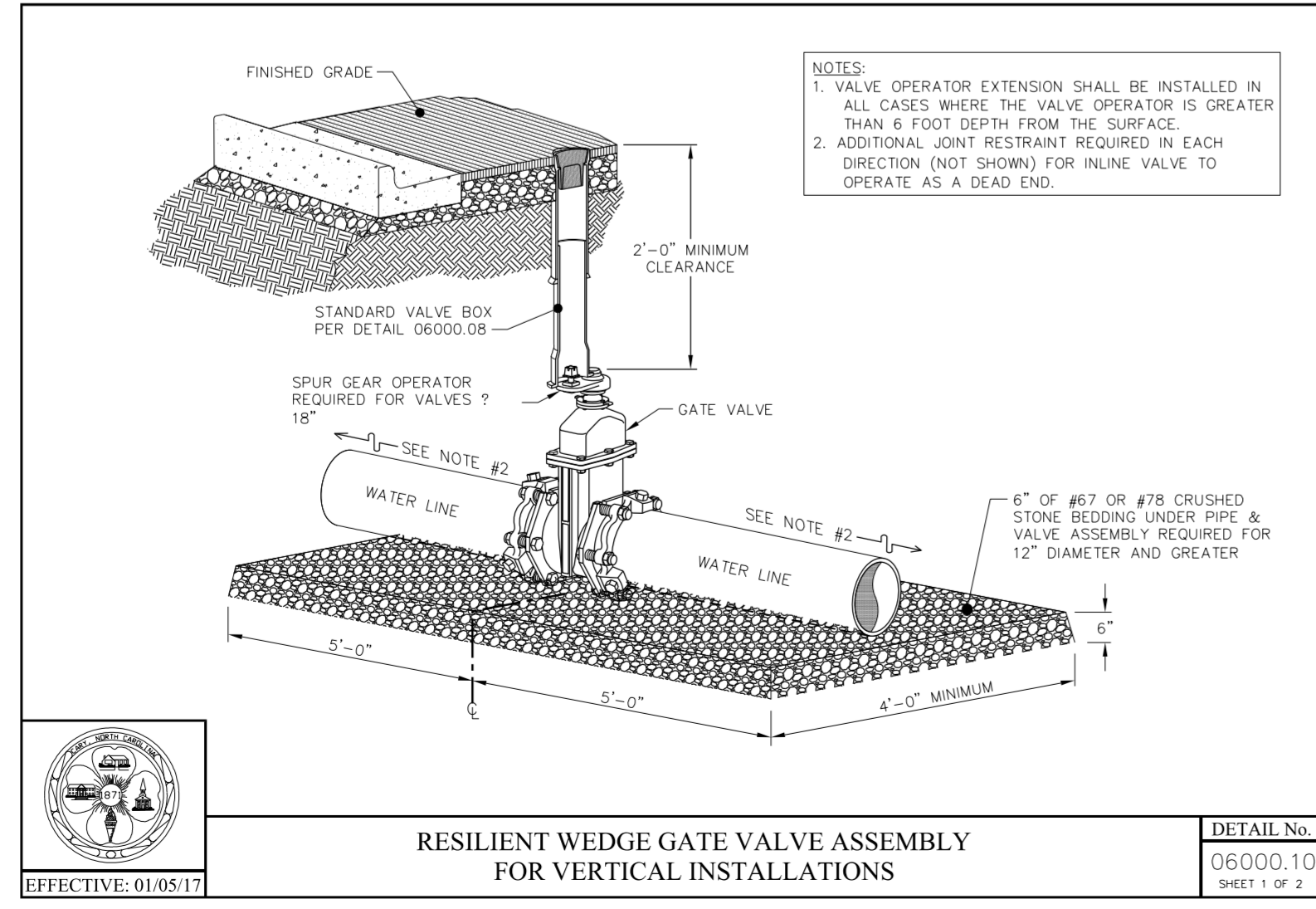
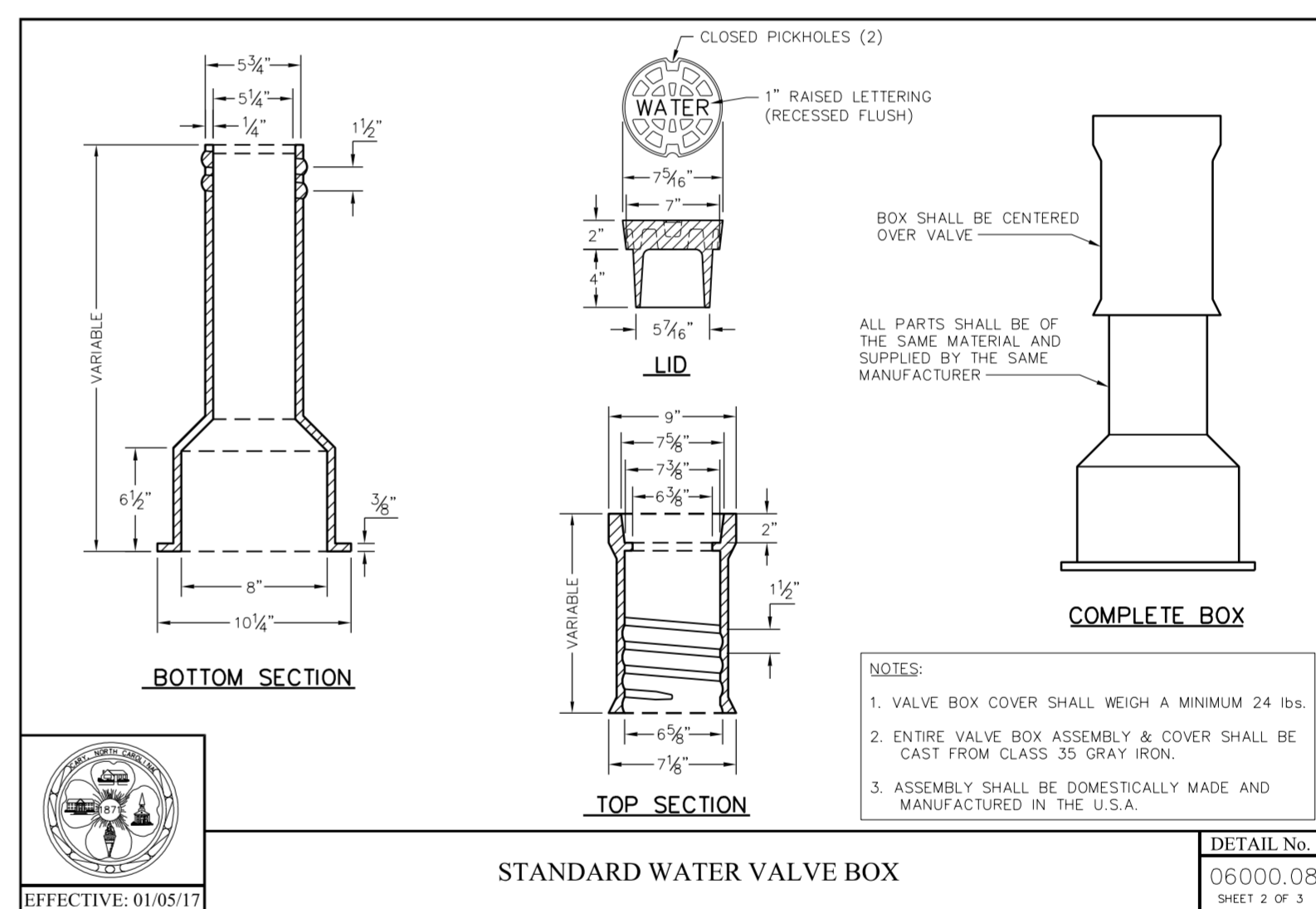
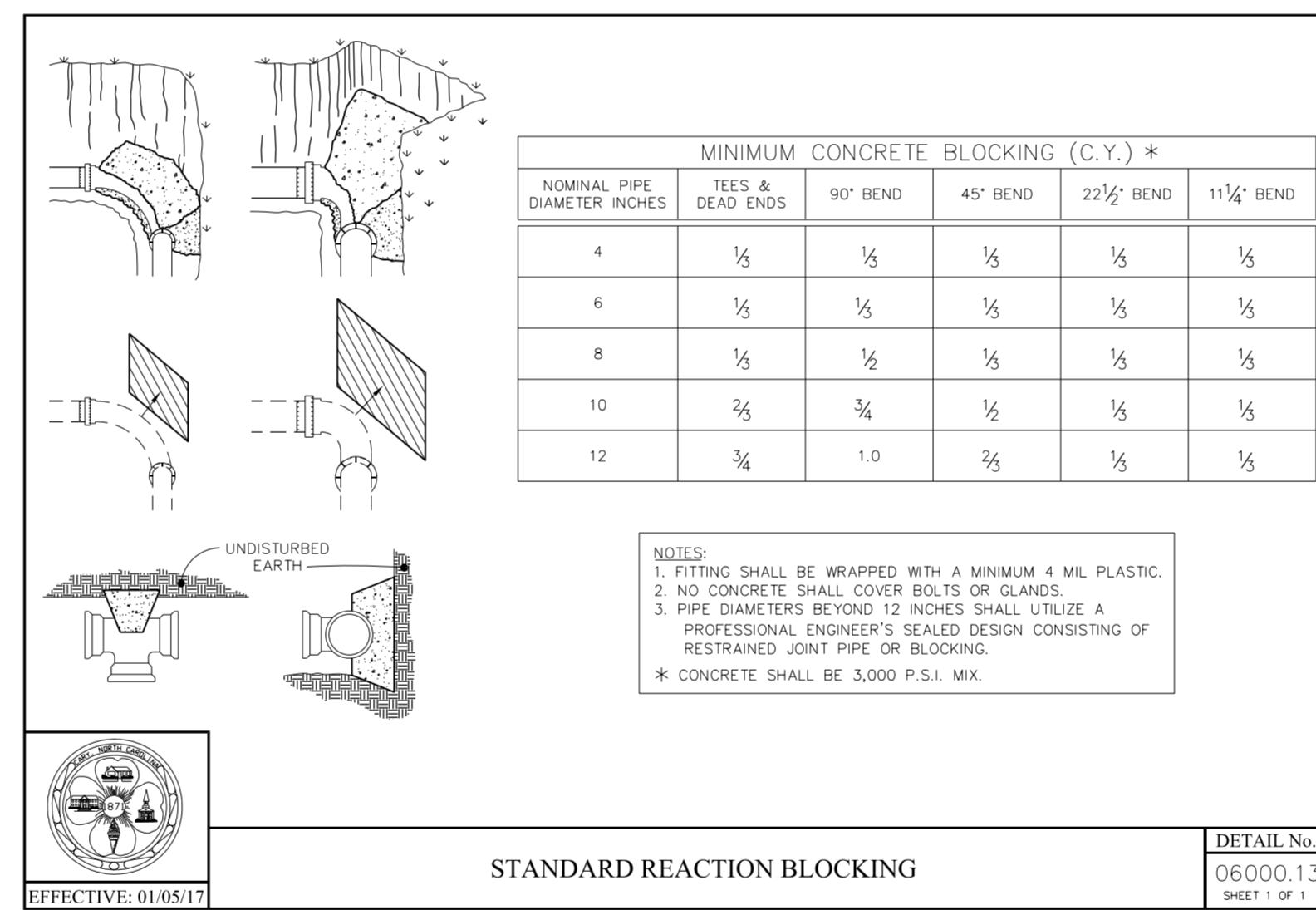
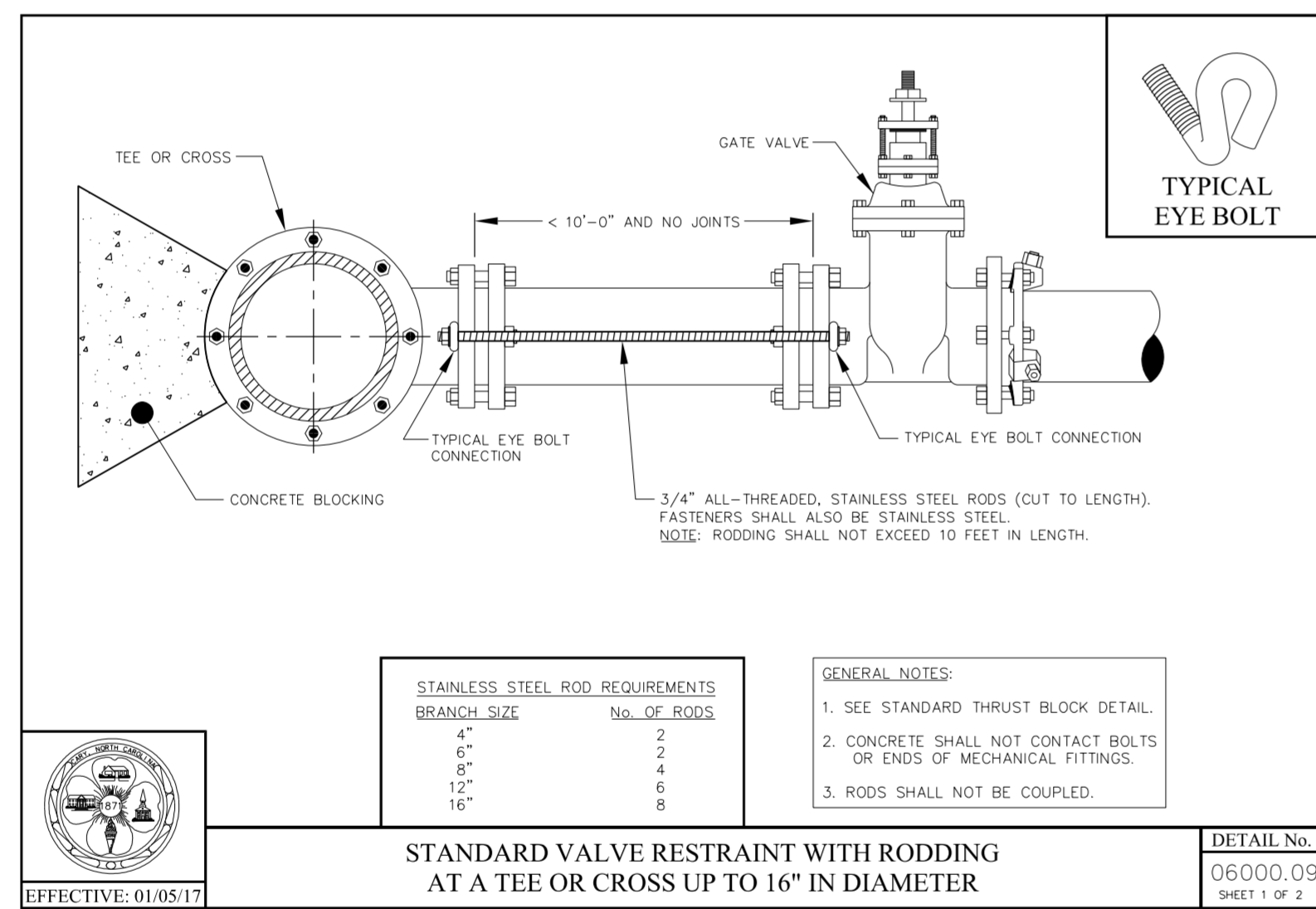
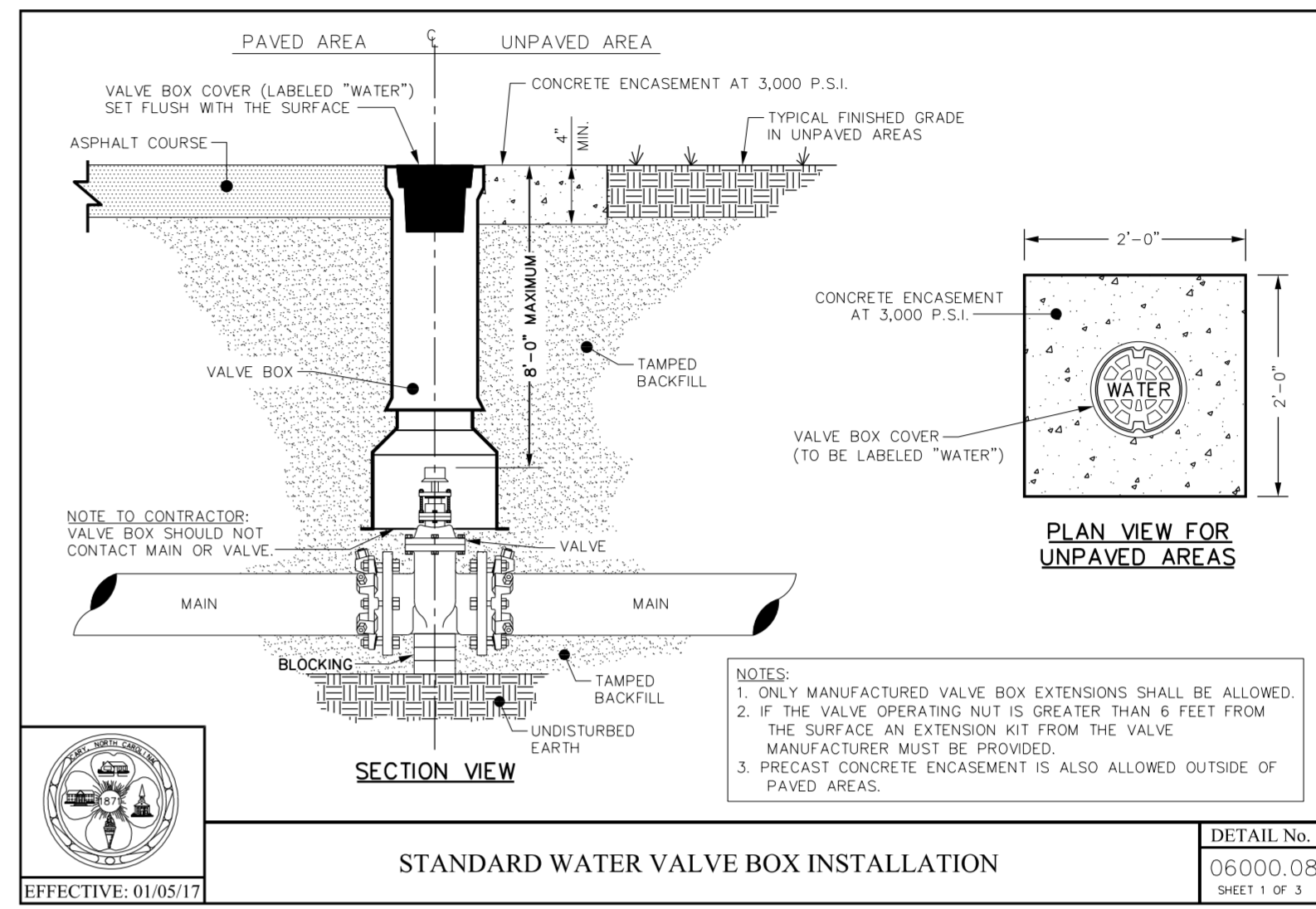
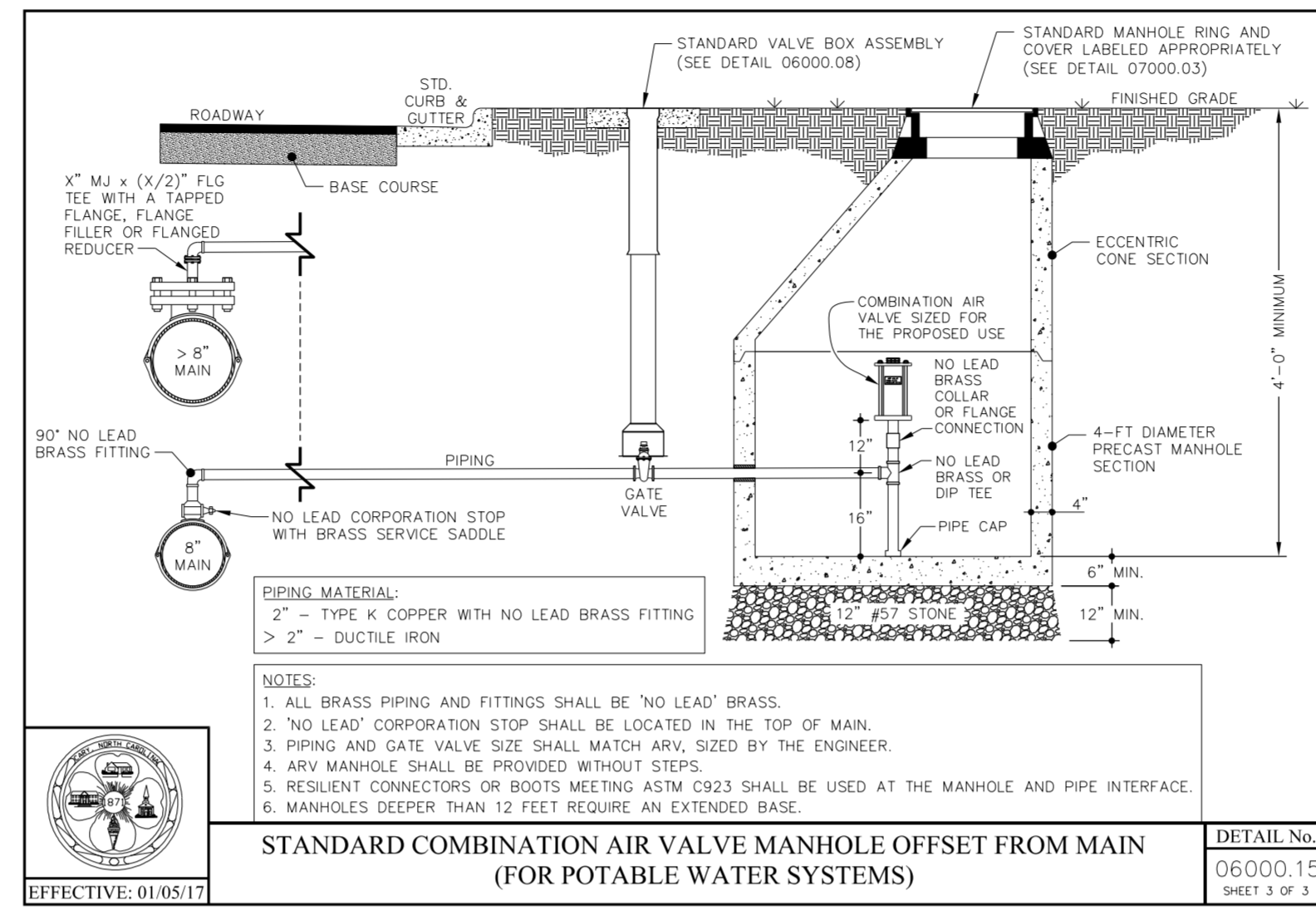
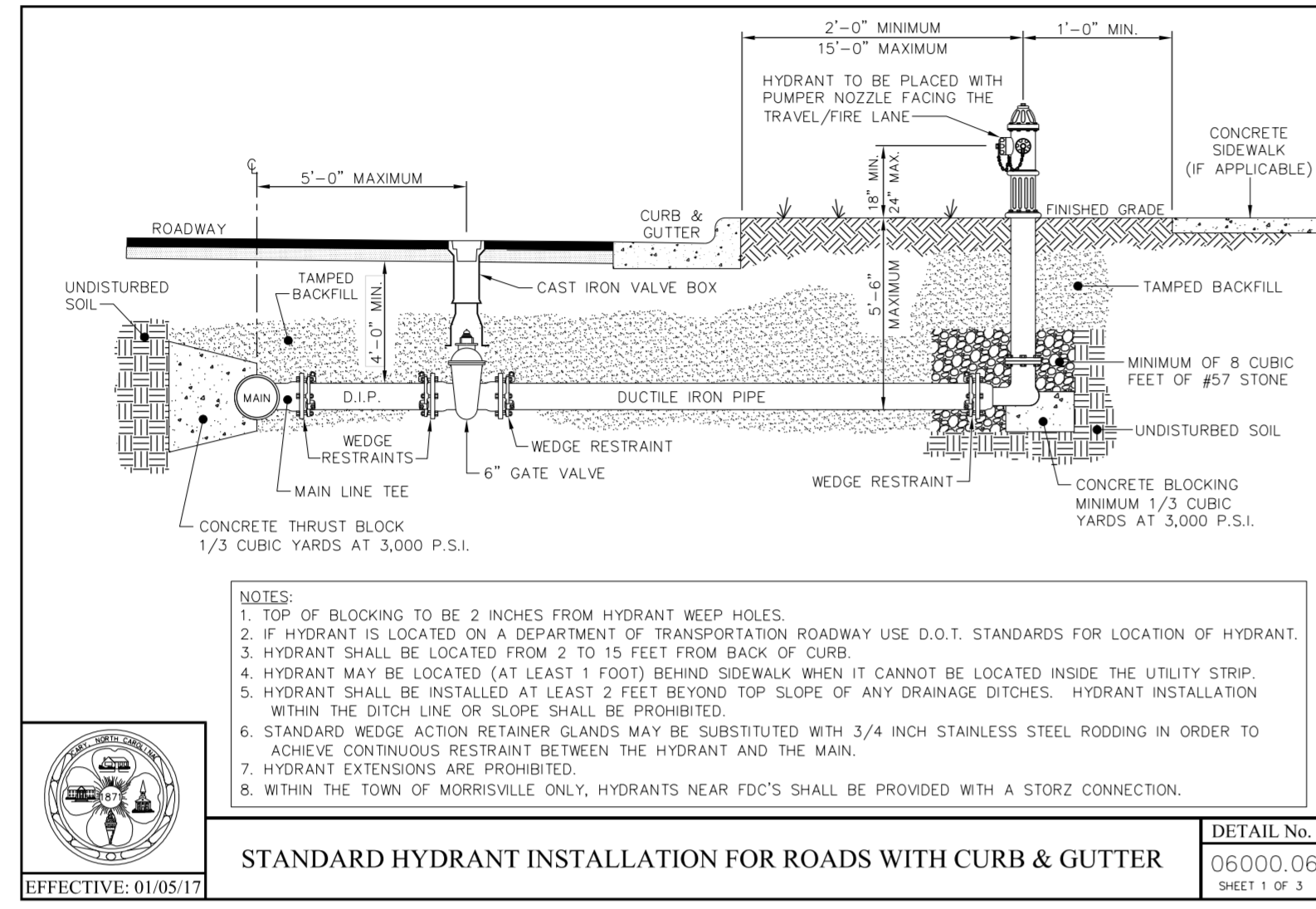
*For Existing Utilities

Utility Line Drawn from Record (Type as Shown) _____

Designated Utility Line (Type as Shown) _____

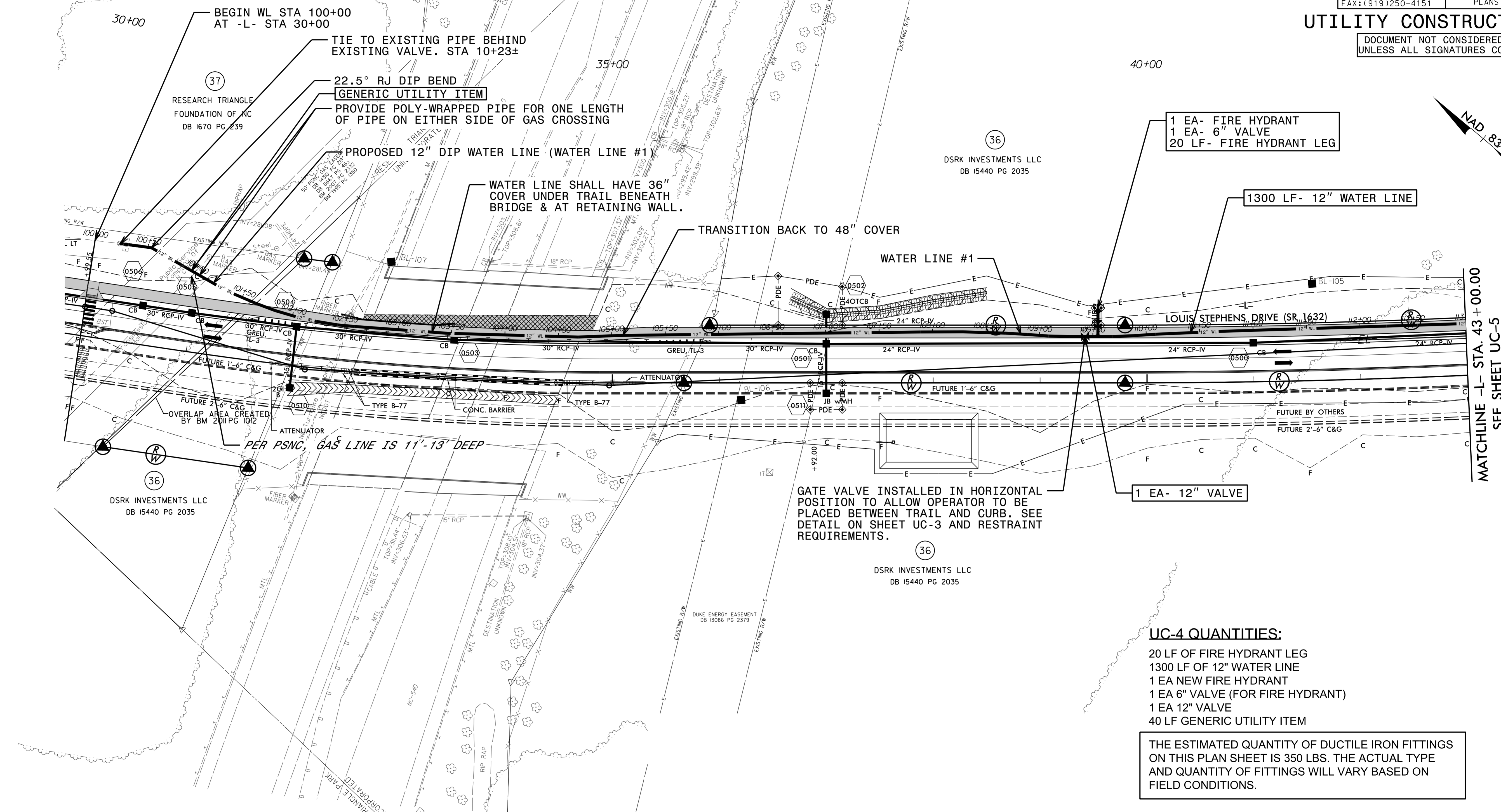
PROJECT TYPICAL DETAILS

UTILITY CONSTRUCTION



5/14/19
 06000.06
 06000.15
 06000.08
 06000.09
 06000.13
 06000.08
 06000.10
 06000.10

UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



- UC-4 QUANTITIES:**
- 20 LF OF FIRE HYDRANT LEG
 - 1300 LF OF 12" WATER LINE
 - 1 EA NEW FIRE HYDRANT
 - 1 EA 6" VALVE (FOR FIRE HYDRANT)
 - 1 EA 12" VALVE
 - 40 LF GENERIC UTILITY ITEM

THE ESTIMATED QUANTITY OF DUCTILE IRON FITTINGS ON THIS PLAN SHEET IS 350 LBS. THE ACTUAL TYPE AND QUANTITY OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

RESTRAINED JOINT CALCULATIONS:
 PROVIDE RESTRAINT OF ALL JOINTS ON EACH SIDE OF BEND OR VALVE PER THE LIST BELOW:

- 11 1/4° BEND= 5'
- 22 1/2° BEND= 9'
- 45° BEND= 18'
- 90° BEND= 43'
- VALVE = 59'

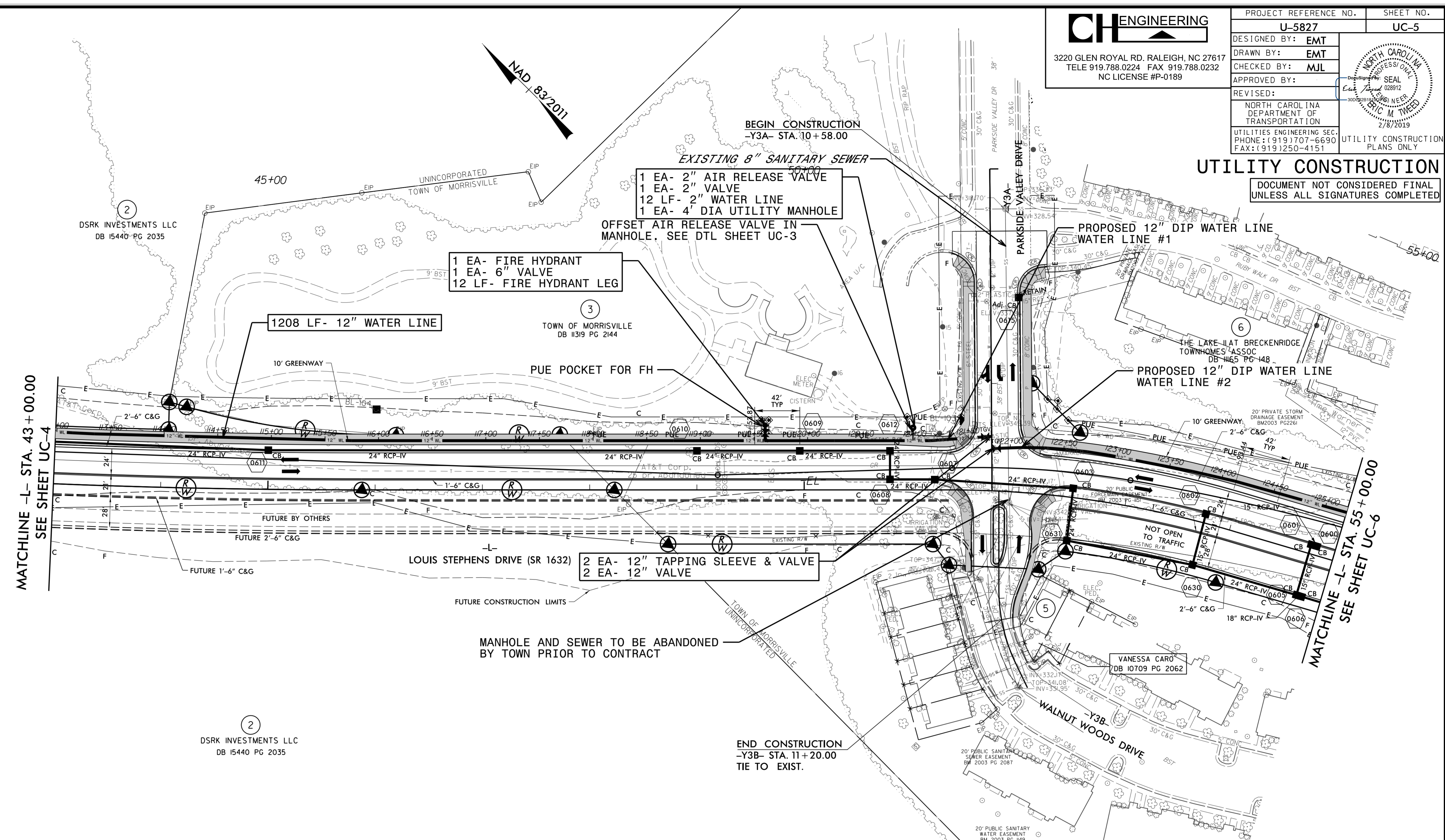
DESIGN BASED ON 12" DIP BURIED 36" DEEP AT 200 PSI WITH 1.5:1 SAFETY FACTOR. FOR AREAS WITH DEEPER BURY, A LESSER LENGTH OF RESTRAINED JOINT PIPE MAY BE USED IF APPROVED BY ENGINEER.

COORDINATE WITH THE TOWN OF CARY FOR VALVE OPERATION AND FOR CONNECTIONS.

NOTE: CONTRACTOR SHALL FIELD LOCATE ALL PROPOSED CONNECTION POINTS AND ADVISE OF ANY DEVIATIONS FROM APPROVED DESIGN PRIOR TO ANY CONSTRUCTION.

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

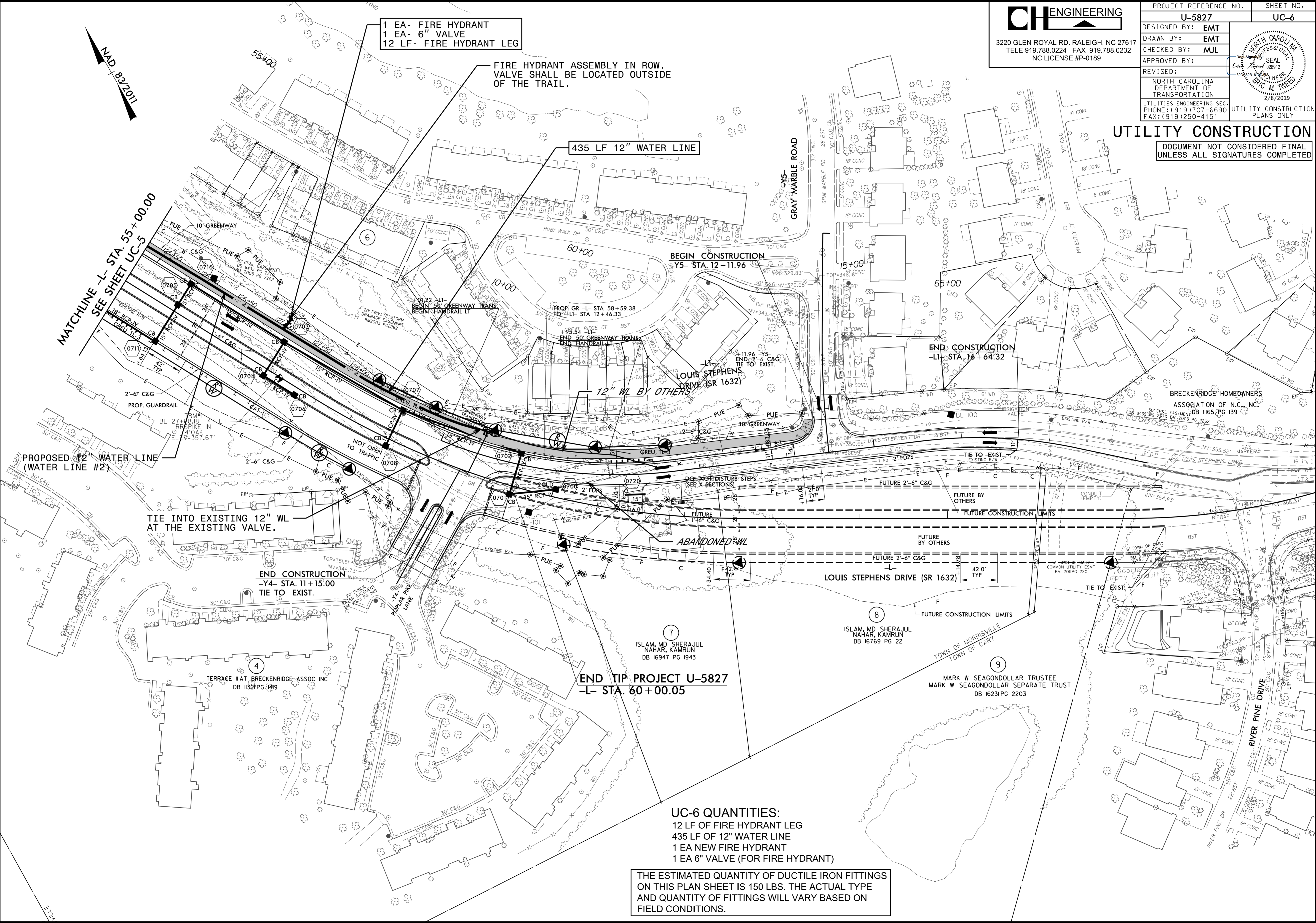
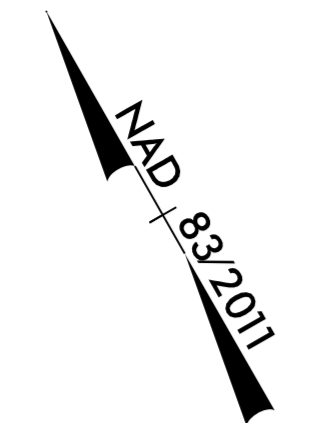


- UC-5 QUANTITIES:**
- 12 LF OF 2" WATER LINE (FOR AIR RELEASE)
 - 12 LF OF FIRE HYDRANT LEG
 - 1208 LF OF 12" WATER LINE
 - 1 EA NEW FIRE HYDRANT
 - 2 EA 12" TAPPING SLEEVE & VALVE
 - 1 EA 2" AIR RELEASE VALVE
 - 1 EA 2" VALVE (FOR AIR RELEASE)
 - 1 EA 6" VALVE (FOR FIRE HYDRANT)
 - 2 EA 12" VALVE (AT TAPPING SLEEVE & VALVES)
 - 1 EA OF 4' DIA UTILITY MANHOLE (FOR AIR RELEASE)

THE ESTIMATED QUANTITY OF DUCTILE IRON FITTINGS ON THIS PLAN SHEET IS 150 LBS. THE ACTUAL TYPE AND QUANTITY OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



1 EA- FIRE HYDRANT
 1 EA- 6" VALVE
 12 LF- FIRE HYDRANT LEG

FIRE HYDRANT ASSEMBLY IN ROW.
 VALVE SHALL BE LOCATED OUTSIDE
 OF THE TRAIL.

435 LF 12" WATER LINE

MATCHLINE -L- STA. 55+00.00
 SEE SHEET UC-5

BEGIN CONSTRUCTION
 -Y5- STA. 12+11.96

END CONSTRUCTION
 -L1- STA. 16+64.32

PROPOSED 12" WATER LINE
 (WATER LINE #2)

TIE INTO EXISTING 12" WL
 AT THE EXISTING VALVE.

END CONSTRUCTION
 -Y4- STA. 11+15.00
 TIE TO EXIST.

END TIP PROJECT U-5827
 -L- STA. 60+00.05

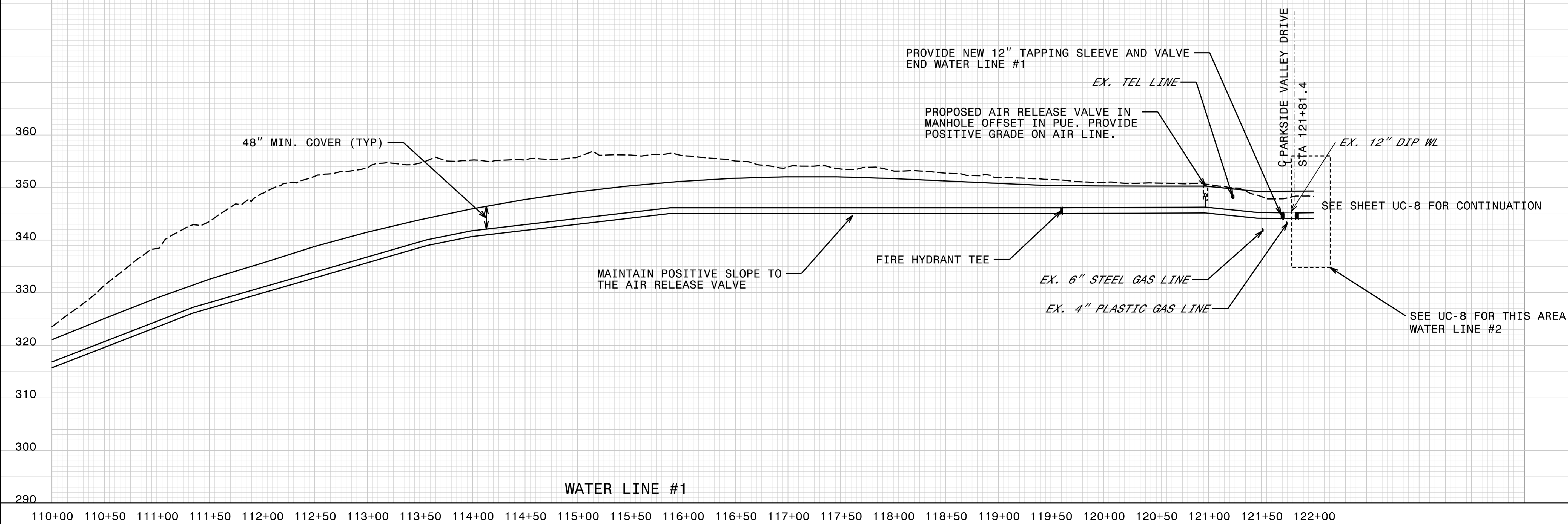
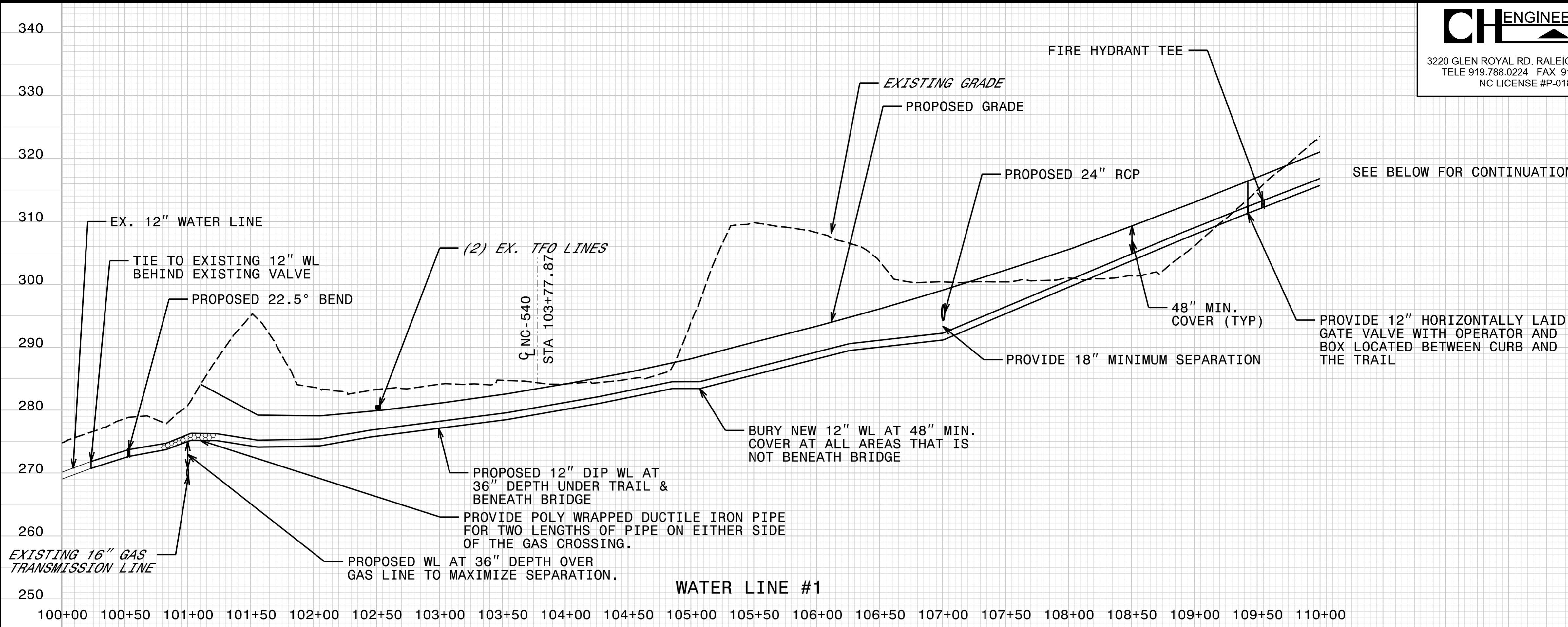
UC-6 QUANTITIES:
 12 LF OF FIRE HYDRANT LEG
 435 LF OF 12" WATER LINE
 1 EA NEW FIRE HYDRANT
 1 EA 6" VALVE (FOR FIRE HYDRANT)

THE ESTIMATED QUANTITY OF DUCTILE IRON FITTINGS
 ON THIS PLAN SHEET IS 150 LBS. THE ACTUAL TYPE
 AND QUANTITY OF FITTINGS WILL VARY BASED ON
 FIELD CONDITIONS.

5/14/19

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

PROJECT REFERENCE NO.	SHEET NO.
U-5827	UC-7
DESIGNED BY: EMT	
DRAWN BY: EMT	
CHECKED BY: MJL	
APPROVED BY:	
REVISED:	UTILITY CONSTRUCTION PLANS ONLY



UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

2/8/2019 11:58 AM C:\Users\james\Engineering\UC\Projects\U-5827\out\pfl_UC07_psh.dgn

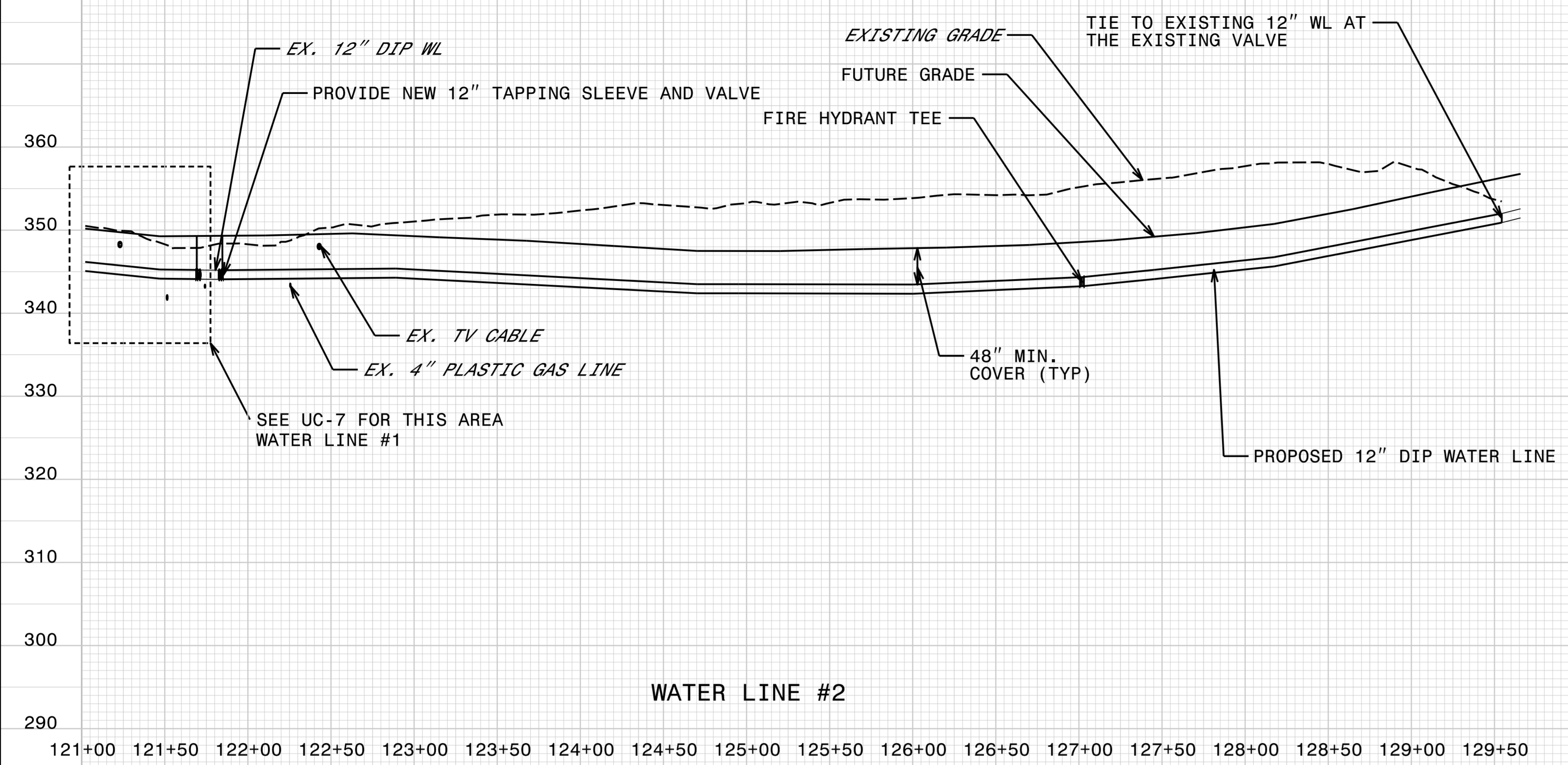
5/14/09

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

PROJECT REFERENCE NO.	SHEET NO.
U-5827	UC-8
DESIGNED BY: EMT	
DRAWN BY: EMT	
CHECKED BY: MJL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY 2/8/2019	

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



WATER LINE #2

R:\6\2009\PROJECTS\Engineering\UC\Proj\5827_out.pfl_UC08.psh.dgn