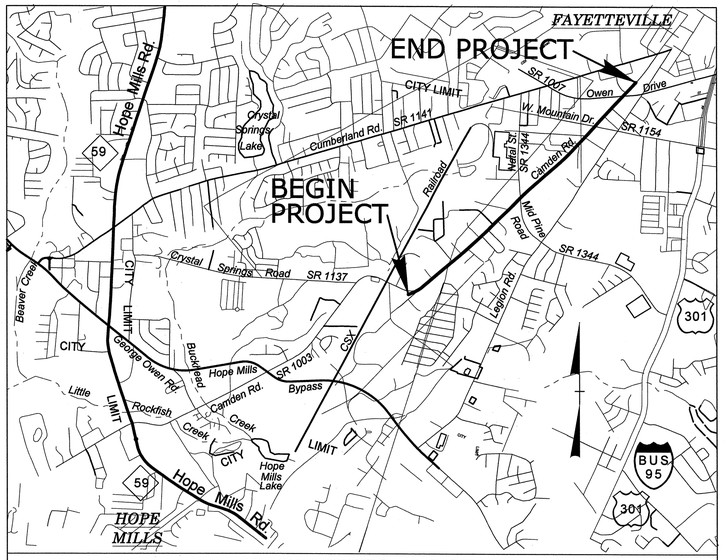
T.I.P. NO.	SHEET NO.
U–2810C	UC–1

TIP PROJECT: U–2810C

CONTRACT:



VICINITY MAP

CAMDEN ROAD

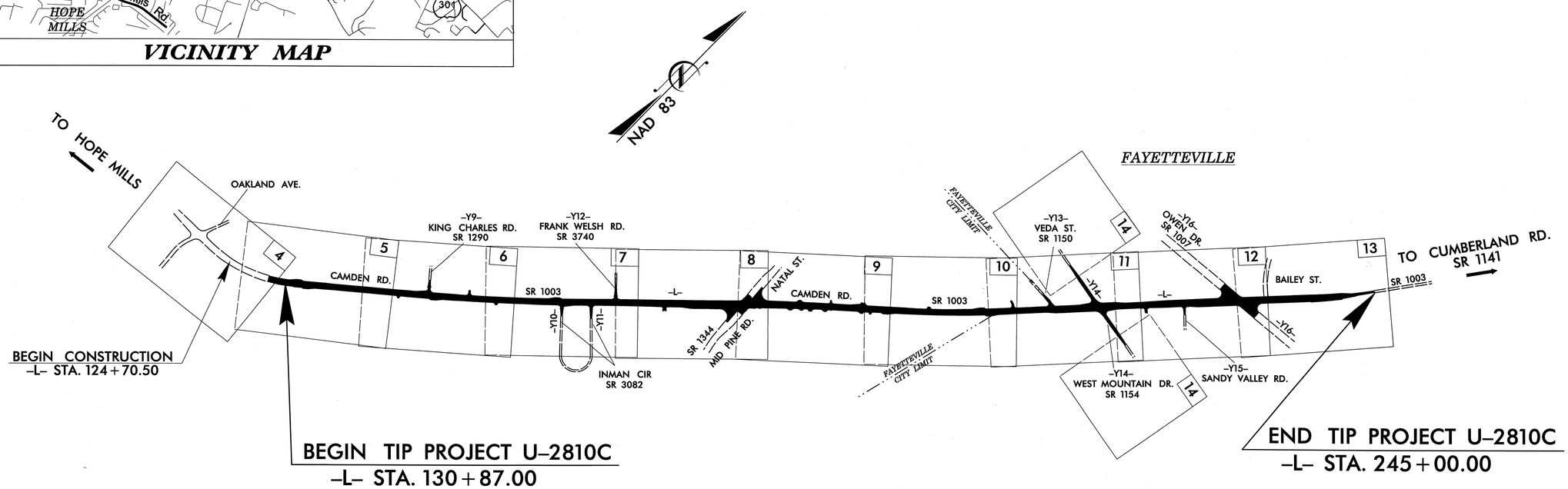
WATER SYSTEM IMPROVEMENTS

August 2013

FOR:

FAYETTEVILLE PWC

955 Old Wilmington Road
Fayetteville, North Carolina 28301



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC–1	TITLE SHEET
UC–2	LEGEND OF SYMBOLS
UC–3	GENERAL NOTES
UC–4 THRU UC–19	UTILITY CONSTRUCTION PLAN & PROFILE SHEETS
UC–20 THRU UC–27	CONSTRUCTION DETAILS

UTILITY OWNERS ON PROJECT

(1) WATER – FAYETTEVILLE PWC

(2) SEWER – FAYETTEVILLE PWC

PREPARED BY:

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F-0342

PREPARED FOR:

DIVISION OF HIGHWAYS
UTILITIES AND ENCROACHMENTS
ENGINEERING UNIT

1555 MAIL SERVICE CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

Roger Worthington, P.E. — UTILITIES SECTION ENGINEER
R. B. Wilkins, P.E. — UTILITIES SQUAD LEADER
AECOM Tech. Services — UTILITY CONSTRUCTION PROJECT DESIGNER

DATE: 9/4/2013
DGN: $$$$

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-2

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

LARRY W. MITCHELL PROFESSIONAL SEAL 023905 ENGINEER 8-29-13

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

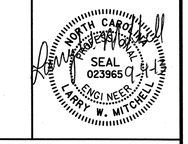
SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-3



UTILITY CONSTRUCTION

UTILITY CONSTRUCTION NOTES

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 2012.

2. THE EXISTING WATER AND SEWER UTILITIES ARE OWNED BY THE FAYETTEVILLE PUBLIC WORKS COMMISSION.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF ENVIRONMENTAL HEALTH. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF WATER QUALITY. 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 OPPROTUNITY 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. ALL WATER MAIN PIPE 6" AND LARGER SHALL BE DUCTILE IRON.

11. ALL 2" WATER MAIN PIPE SHALL BE SDR 21 PVC.

12. ALL 2" WATER MAIN VALVES SHALL BE BALL VALVES AND SHALL BE INSTALLED VERTICAL.

13. ALL WATER MAIN VALVES 6" AND LARGER SHALL BE GATE VALVES AND SHALL BE INSTALLED VERTICAL.

14. ALL VALVES AND FITTINGS 4" TO 12" SHALL BE RESTRAINED BY MANUFACTURED RESTRAINED SYSTEMS AS INDICATED IN DETAIL W.18. CONCRETE BLOCKING SHALL NOT BE USED EXCEPT AT FIRE HYDRANT TEES AS INDICATED ON DETAIL W.13 SHEET UC-22.

15. PIPE WITHIN CASINGS SHALL HAVE A RESTRAINED JOINT SYSTEM DESIGNED AND MANUFACTURED BY THE PIPE SUPPLIER (FACTORY RESTRAINED JOINT PIPE) AS INDICATED IN DETAIL M.6 SHEET UC-24 SUITABLE FOR INSTALLATION WITHIN THE CASING.

16. ALL PIPE 16" AND LARGER WILL REQUIRE FACTORY RESTRAINED JOINTS.

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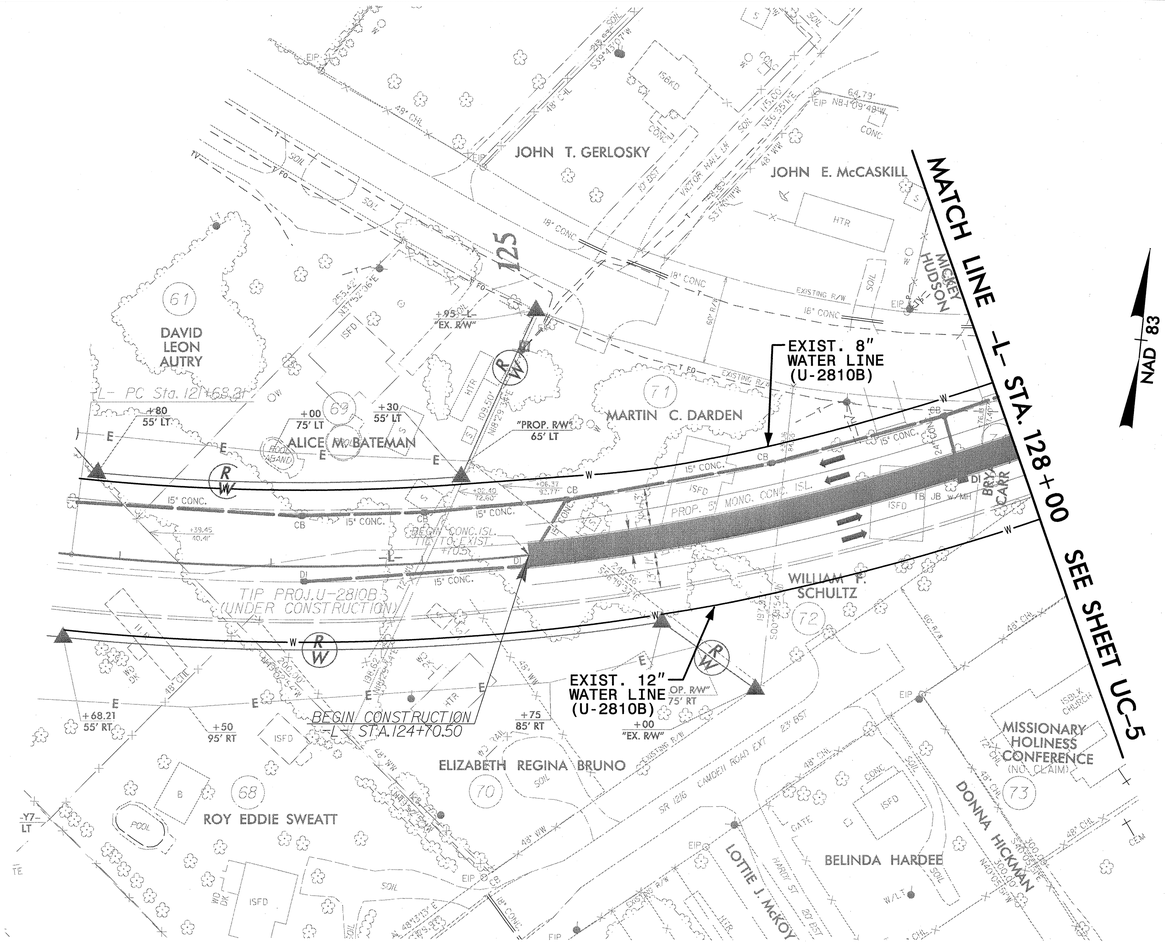
DATE: 9/4/2013
DGN: u2810c_uc_ps03.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-4

SCALE:
25 0 50
HOR: 1" = 50'
5 0 10
VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023969 LARRY W. MITCHELL

UTILITY CONSTRUCTION



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F-0342

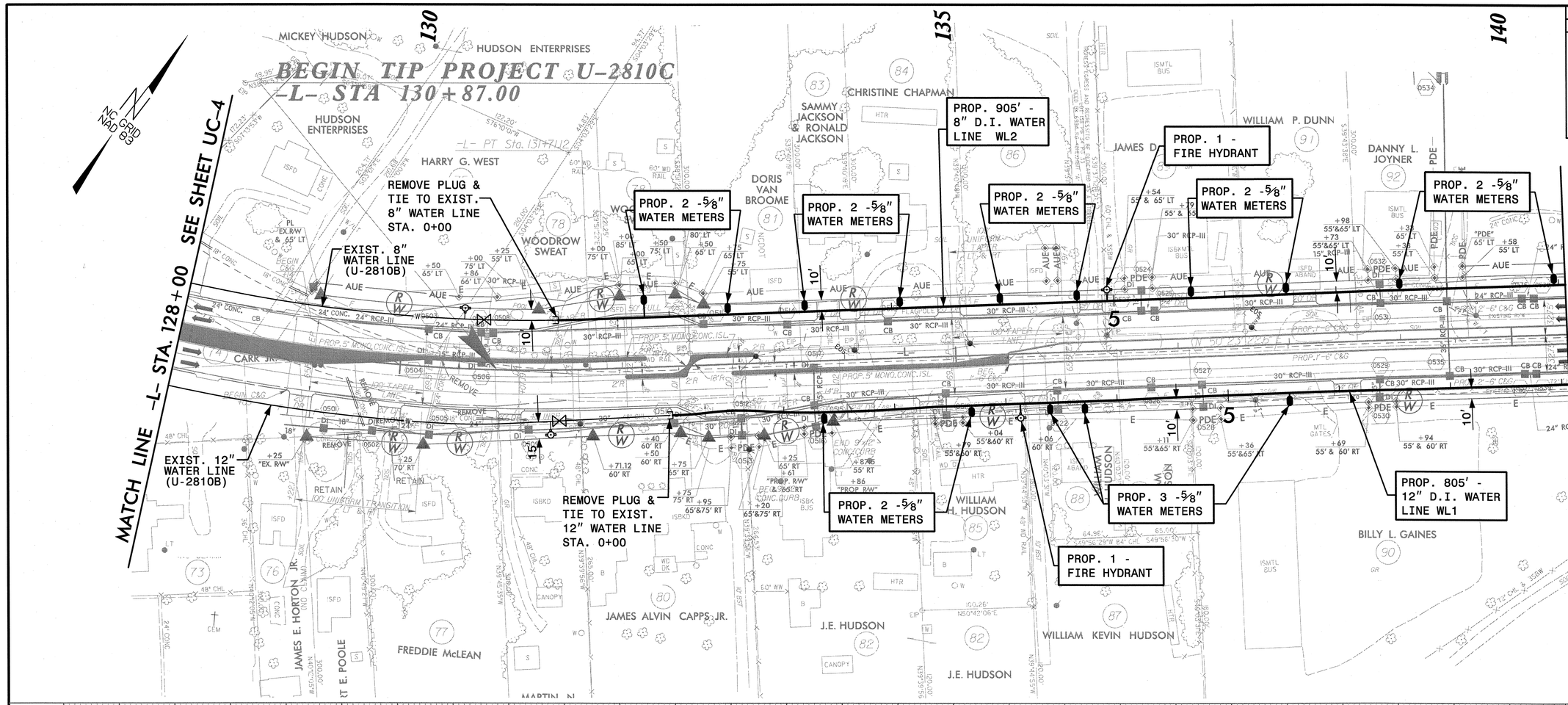
DATE: 6/29/2013
DGN: U2810c_uc_pshtD4.dgn

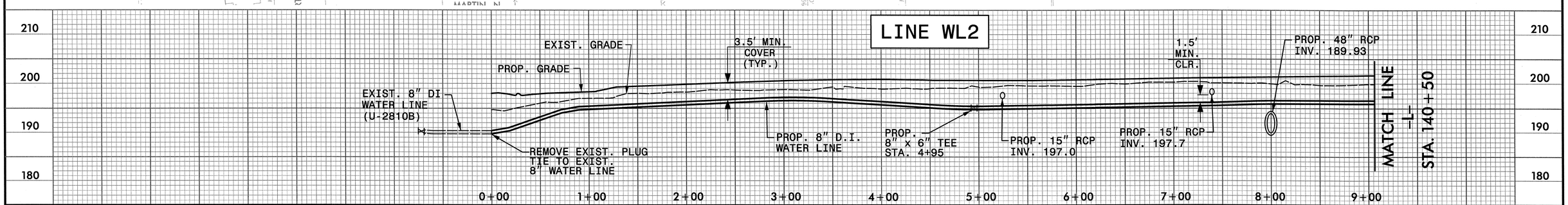
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-5

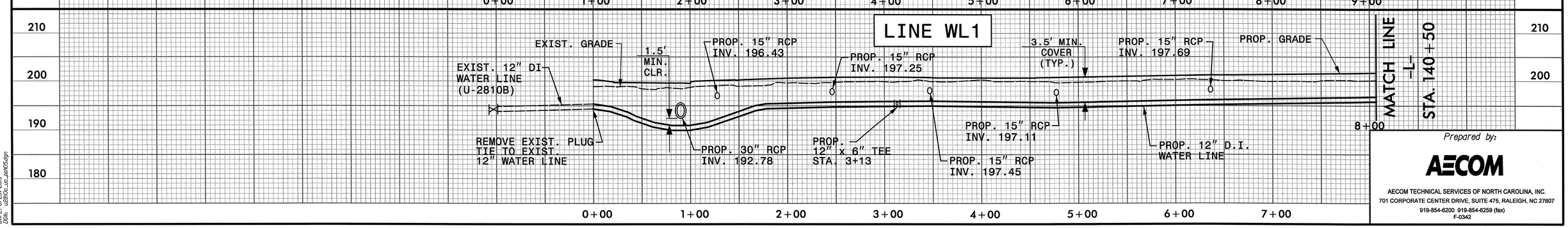
SCALE:
HOR: 1" = 50'
VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023965 LARRY W. MITCHELL

UTILITY CONSTRUCTION







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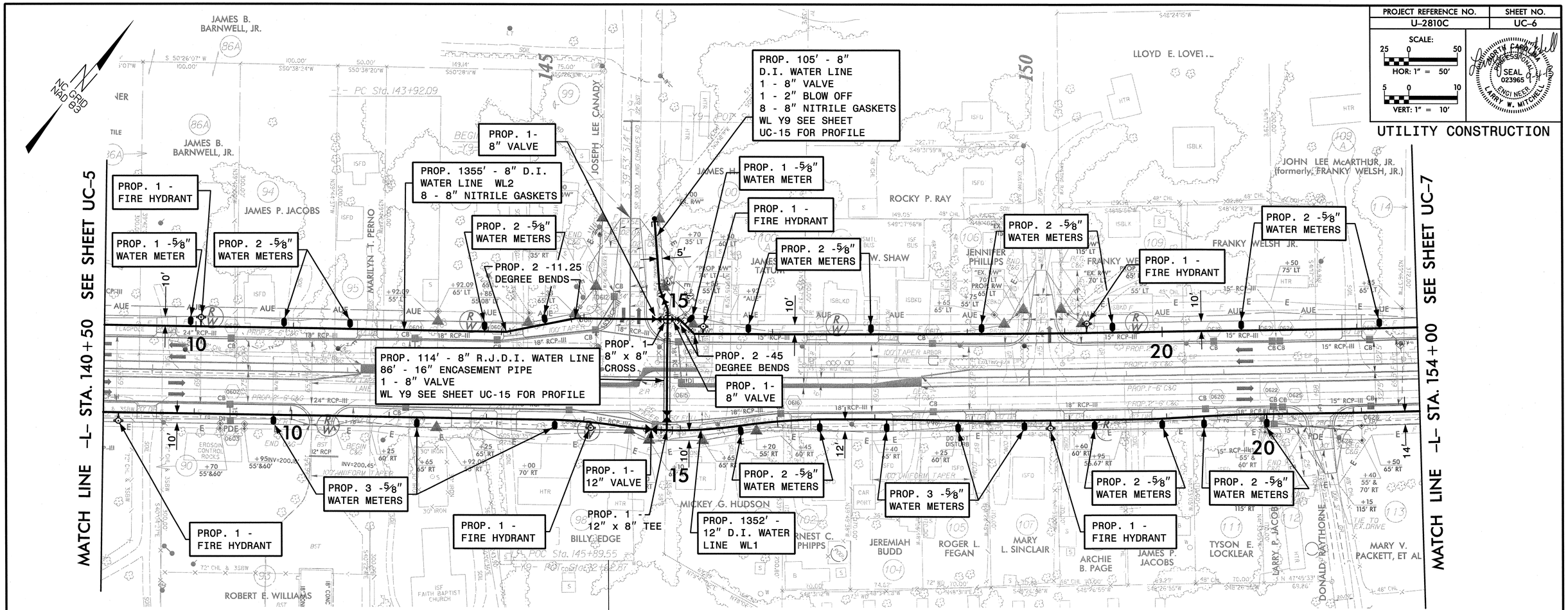
DATE: 8/29/2013
DGN: U2810C_UC_Sht05.dgn

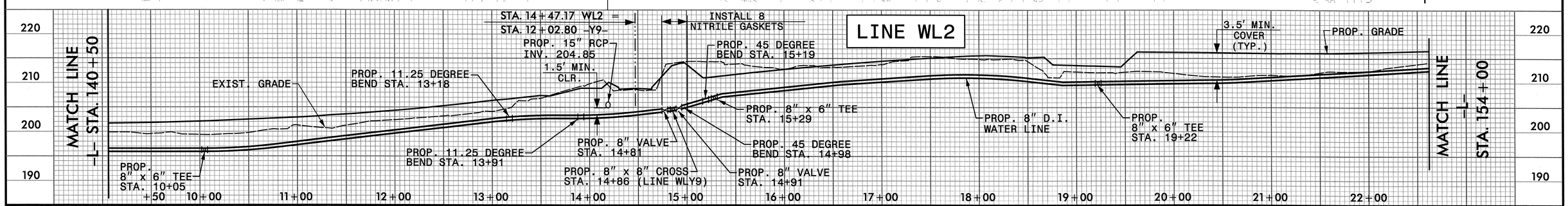
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-6

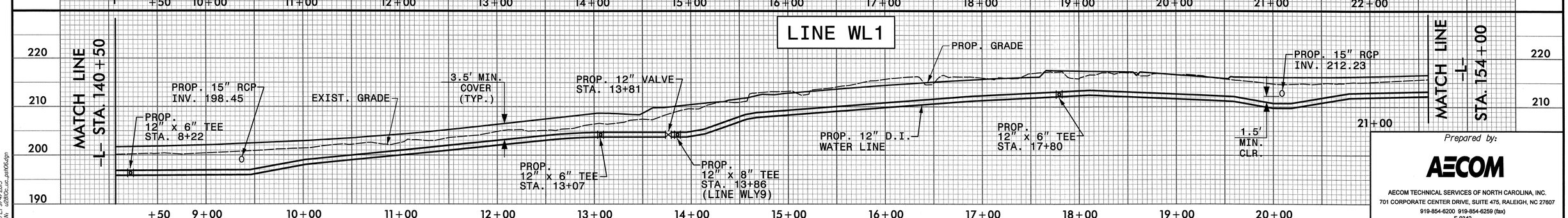
SCALE:
HOR: 1" = 50'
VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION







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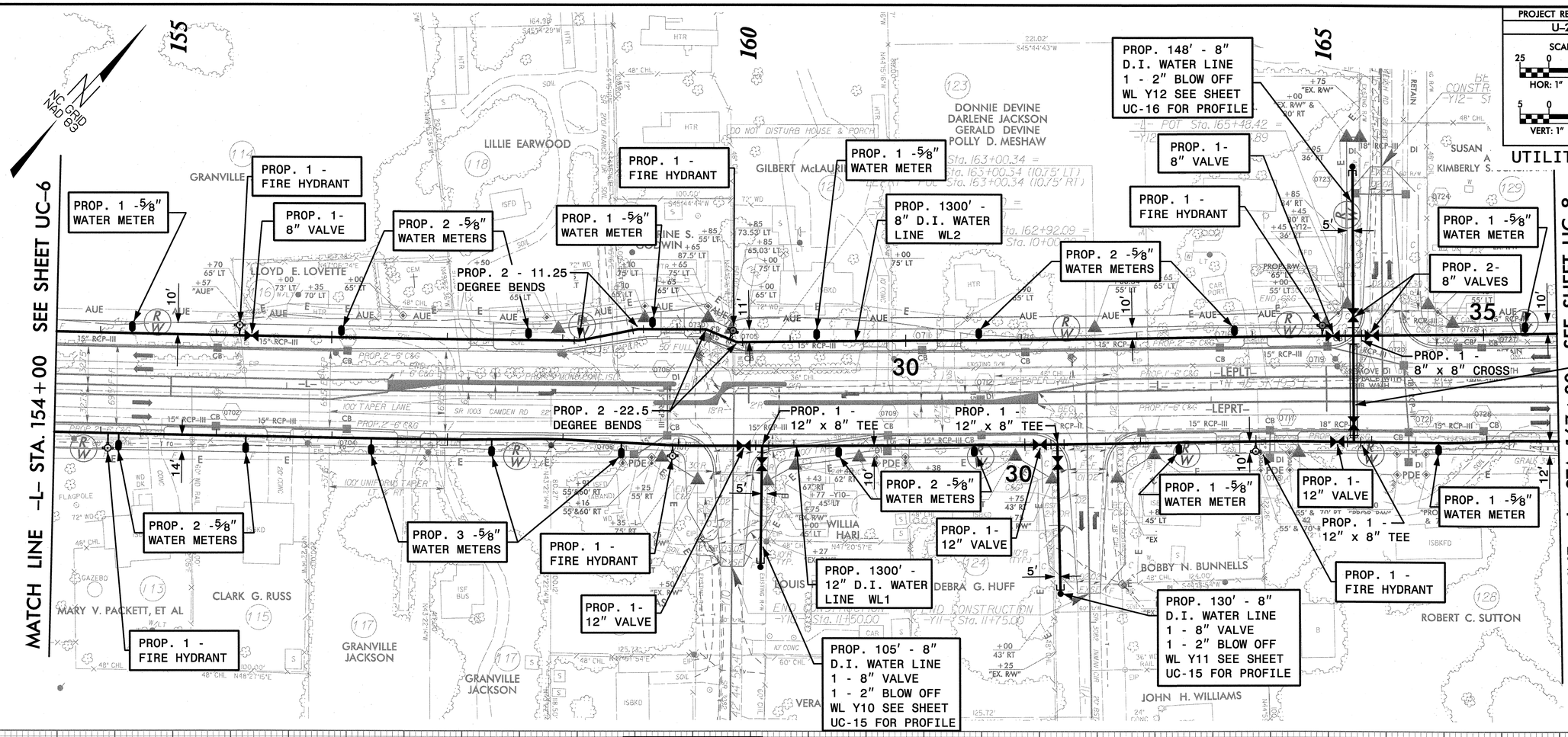
F-0342

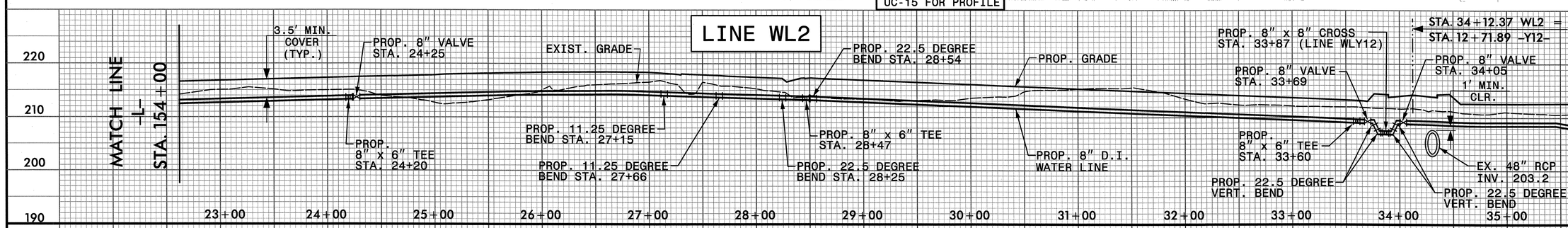
DATE: 9/14/2013
DGN: u2810c_uc_ps06d.dgn

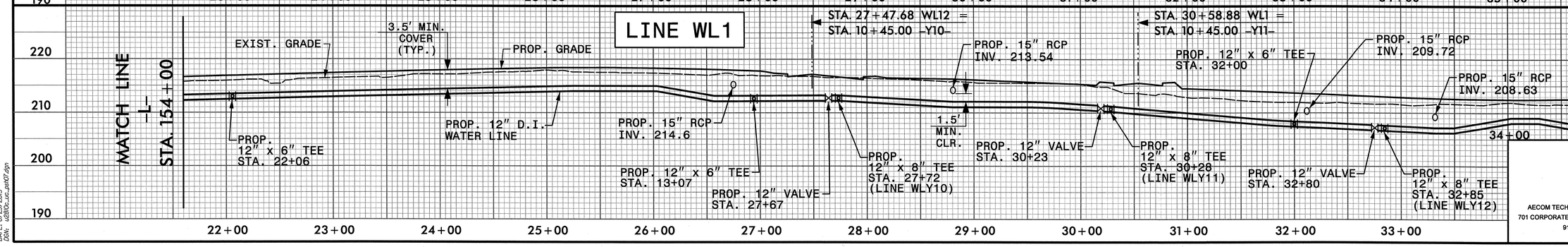
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-7

SCALE: HOR: 1" = 50' VERT: 1" = 10'

UTILITY CONSTRUCTION







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F-0342

DATE: 8/29/2013
DGN: U2810c_uc_pet07.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-8

SCALE: HOR: 1" = 50' VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023965 LARRY W. MITCHELL

UTILITY CONSTRUCTION

MATCH LINE -L- STA. 167+00 SEE SHEET UC-7

MATCH LINE -L- STA. 180+00 SEE SHEET UC-9

PROP. 1 - FIRE HYDRANT

PROP. 1 - RELOCATE WATER METER

PROP. 1 - 8" VALVE

TIE TO EXIST. 2" WATER LINE

PROP. 1 - 2" VALVE

PROP. 1 -5/8" WATER METER

PROP. 1 -8" x 2" TAPPING SADDLE

PROP. 965' - 8" D.I. WATER LINE WL2

PROP. 1 -5/8" WATER METER

PROP. 1 - FIRE HYDRANT

PROP. 2 -5/8" WATER METERS

PROP. 1 -5/8" WATER METER

PROP. 1 - 8" VALVE

PROP. 335' - 16" D.I. WATER LINE WL2

PROP. 1 - RELOCATE FIRE HYDRANT

PROP. 1 - 16" x 8" REDUCER

PROP. 1 - 16" x 16" TEE

PROP. 2 - 22.5 DEGREE BENDS

PROP. 670' - ABANDON 16" UTILITY PIPE (AC WATER)

ABANDON EXIST. 2" & 4" WATER LINES

PROP. 128' - 16" R.J.D.I. WATER LINE
106' - 30" ENCASEMENT PIPE
2 - 16" VALVES
WL6 SEE SHEET UC-15 FOR PROFILE

PROP. 1 - 16" x 12" TEE

PROP. 2 - 22.5 DEGREE BENDS

PROP. 1- 12" VALVE

PROP. 1 - 22.5 DEGREE BEND

PROP. 1 - 45 DEGREE BEND

PROP. 362' - 8" D.I. WATER LINE WL3 SEE SHEET UC-16 FOR PROFILE

PROP. 1 - FIRE HYDRANT

PROP. 2 - 45 DEGREE BENDS

PROP. 975' - 12" D.I. WATER LINE WL1

PROP. 1 - FIRE HYDRANT

PROP. 1 -5/8" WATER METER

PROP. 136' - 16" D.I. WATER LINE WL6 SEE SHEET UC-15 FOR PROFILE

PROP. 1 - 16" x 8" TEE

PROP. 1 - 22.5 DEGREE BEND

PROP. 1 - 16" VALVE

PLUG

* PWC EASEMENT WILL BE REQUIRED

PROP. 1 - 4' DIA. UTILITY MANHOLE C3
STA. 3+87.48, LINE C
91.12' RT. OF -L- STA. 179+27.28

PROP. 1 -5/8" WATER METER

PROP. 1 - 4' DIA. UTILITY MANHOLE C1
STA. 0+00.00, LINE C
195.14' RT. OF -L- STA. 176+59.52

TIE TO EXISTING 16" A.C. WATER LINE WITH 1 - 16" x 45 DEGREE BEND

PROP. 1 - 8" x 8" TEE

PROP. 2- 8" VALVES

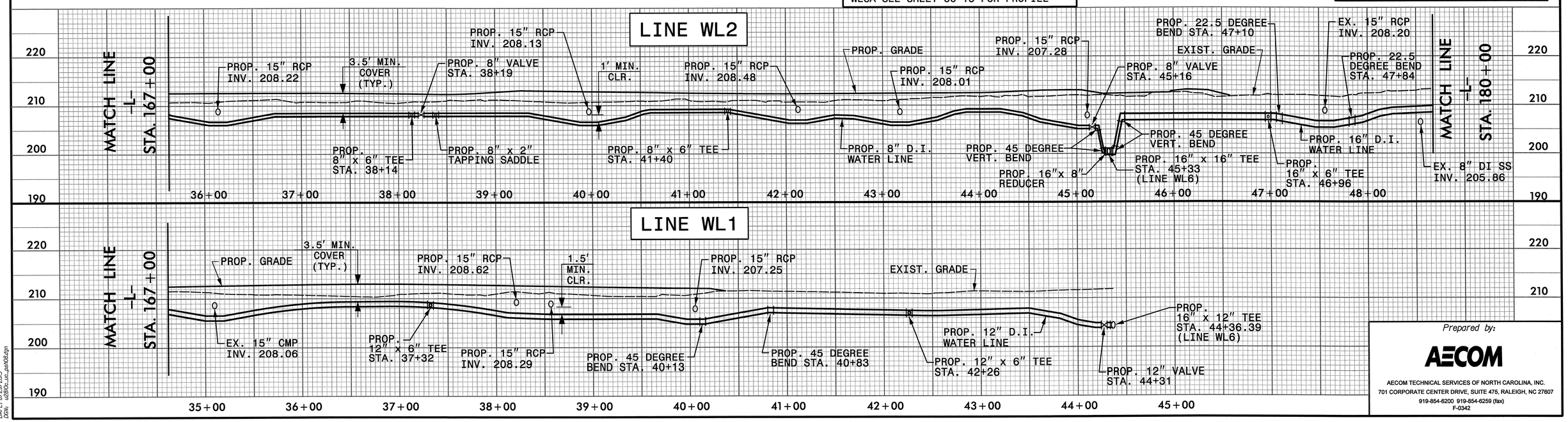
PROP. 325.30' - 12" D.I. SANITARY GRAVITY SEWER (LINE C) SEE SHEET UC-19 FOR PROFILE

PROP. 136.50' - 12" R.J.D.I. SANITARY GRAVITY SEWER (LINE C)
92' - 24" ENCASEMENT PIPE
92' - TRENCHLESS INSTALLATION OF 24" ENCASEMENT PIPE
SEE SHEET UC-19 FOR PROFILE

PROP. 122' - 8" R.J.D.I. WATER LINE
100' - 16" ENCASEMENT PIPE
100' - TRENCHLESS INSTALLATION OF 16" ENCASEMENT PIPE
1 - 8" VALVE
WL6A SEE SHEET UC-15 FOR PROFILE

PROP. 1- 2" BLOW OFF STA. 0+00

PROP. 1 - 4' DIA. UTILITY MANHOLE C2
STA. 1+36.50, LINE C
283.45' RT. OF -L- STA. 177+64.70



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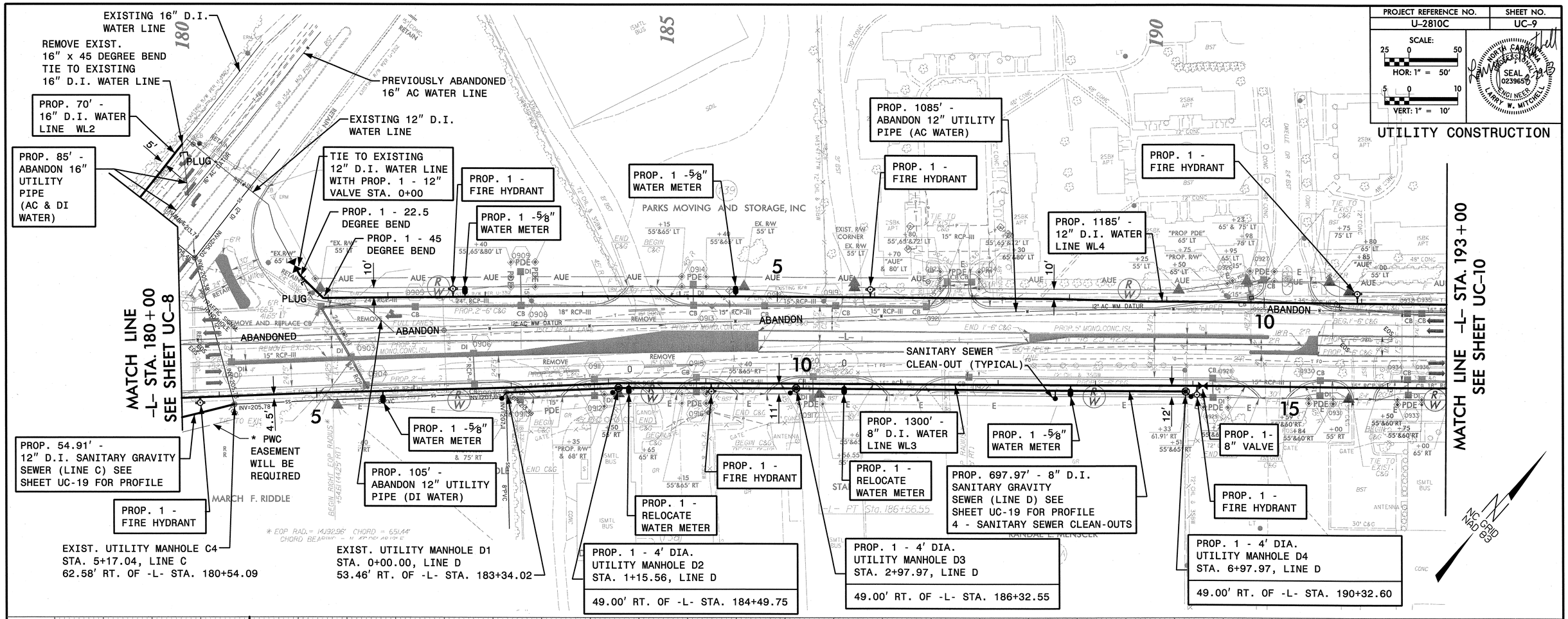
DATE: 8/29/2013
DGN: u2810c_uc_psh08.dgn

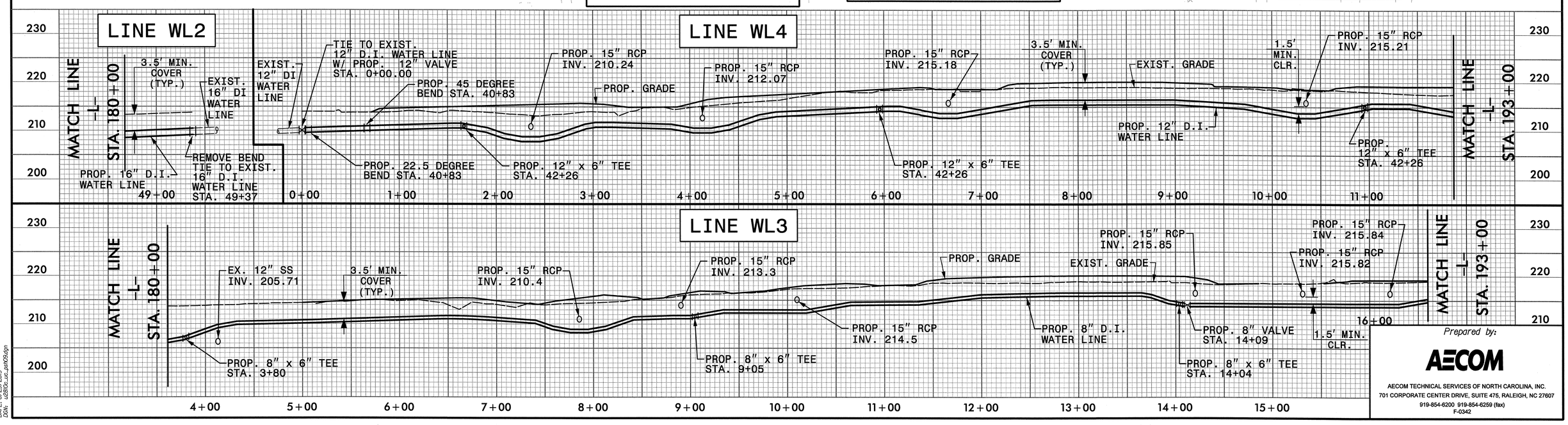
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-9

SCALE:
25 0 50
HOR: 1" = 50'
5 0 10
VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION





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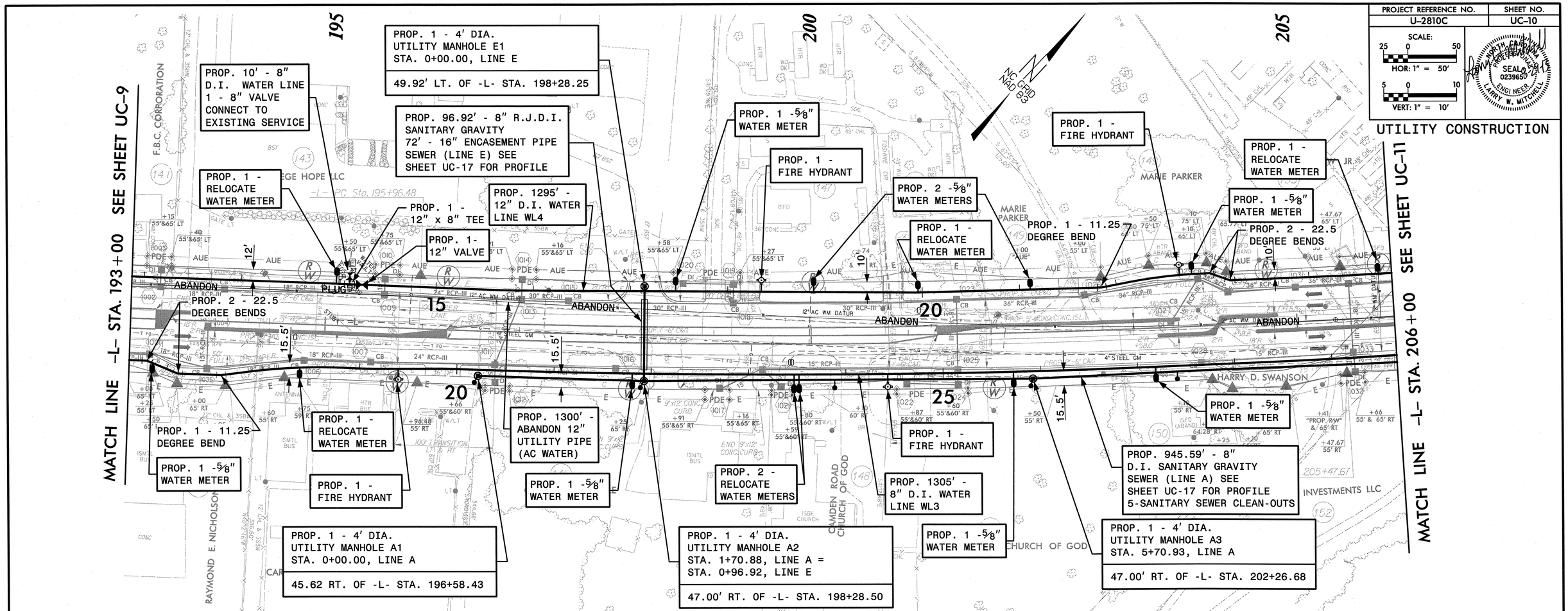
DATE: 6/29/2013
DGN: U2810C_UC_ps09.dgn

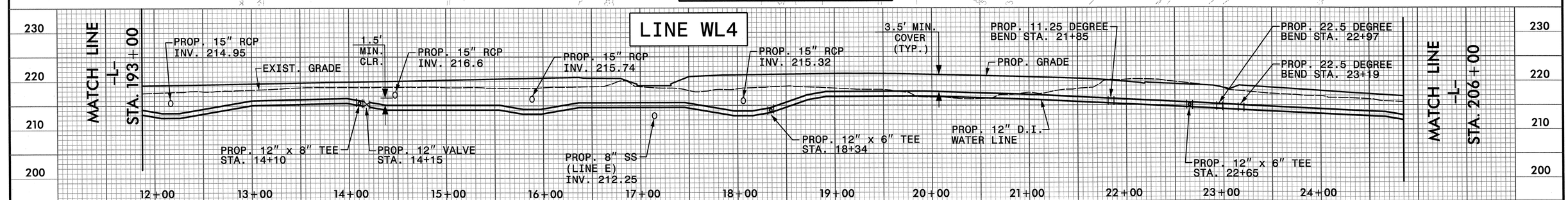
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-10

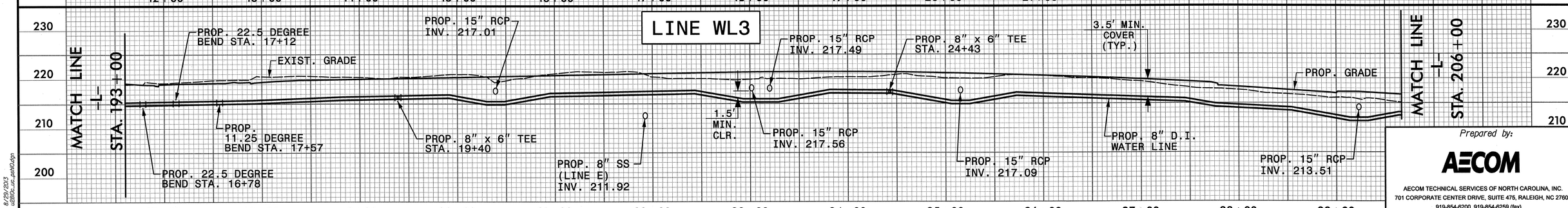
SCALE:
HOR: 1" = 50'
VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION







Prepared by:

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AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.
701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F-0342

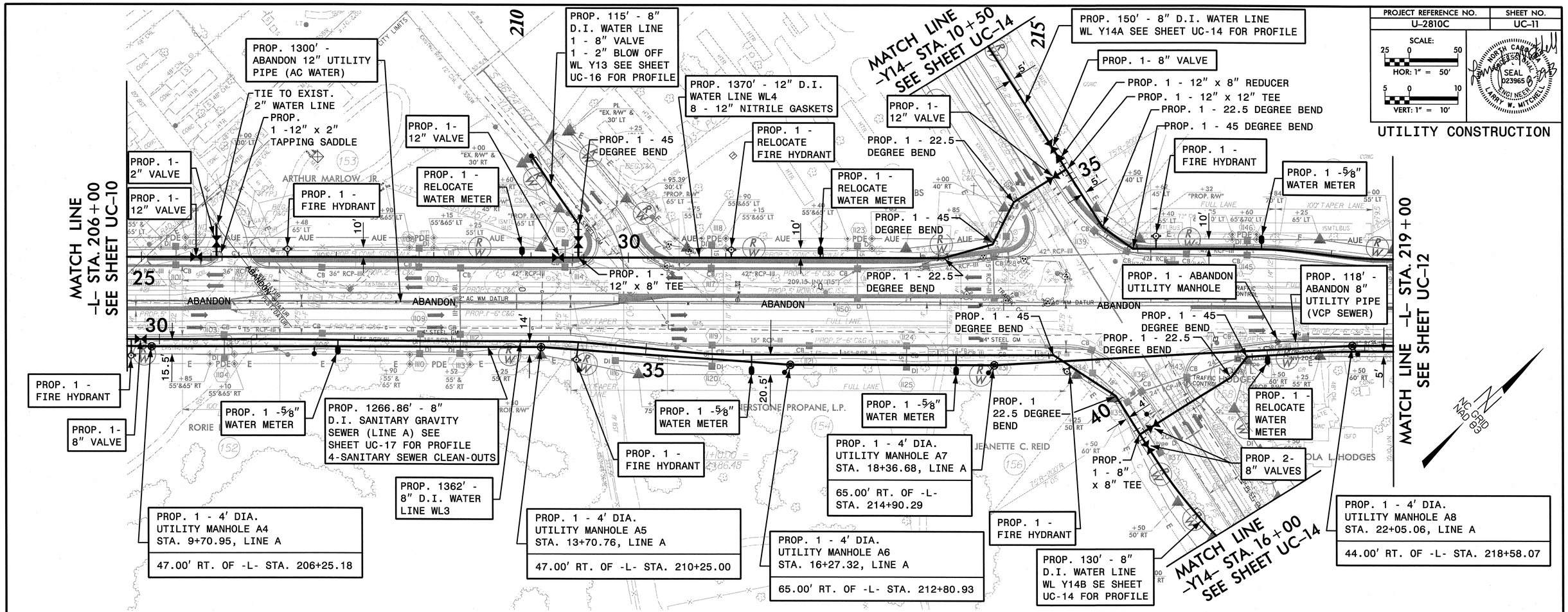
DATE: 8/29/2013
DGN: u2810c_uc_psh0.dgn

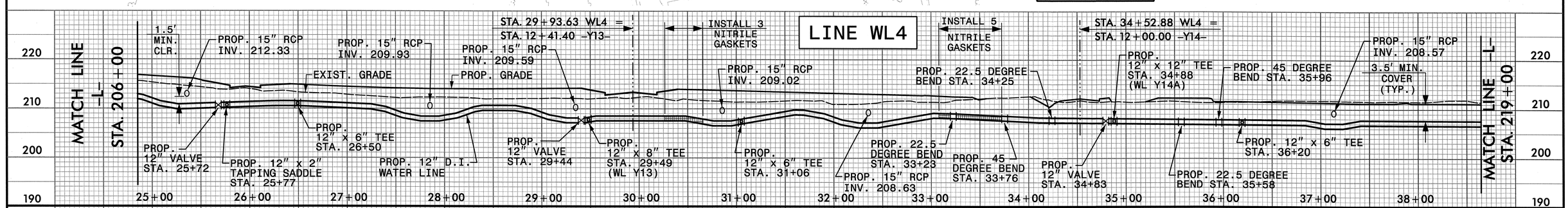
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-11

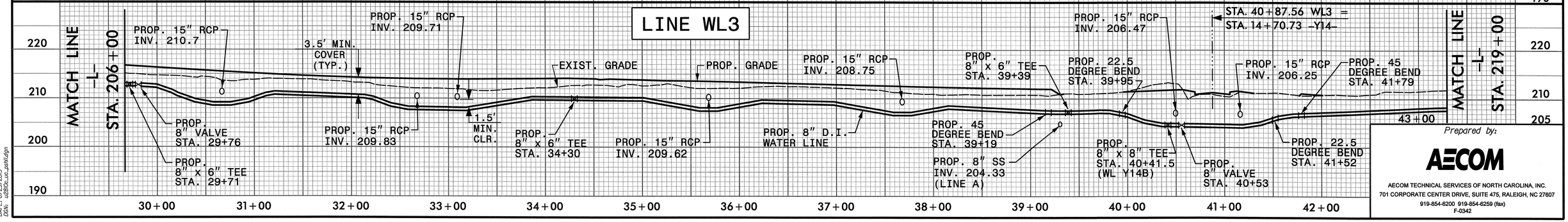
SCALE: HOR: 1" = 50' VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION







DATE: 8/29/2013
DGN: U2810C_sc_sshWL.dgn

Prepared by:

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701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F-0342

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-12

SCALE: HOR: 1" = 50' VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION

MATCH LINE -L- STA. 219+00 SEE SHEET UC-11

MATCH LINE -L- STA. 232+00 SEE SHEET UC-13

PROP. 139.90' - 8" R.J.D.I., 41.52' 8" D.I. SANITARY GRAVITY SEWER (LINE F)
90' - 16" ENCASEMENT PIPE
90' - TRENCHLESS INSTALLATION
SEE SHEET UC-19 FOR PROFILE

PROP. 1 - 4' DIA. UTILITY MANHOLE F1
STA. 0+00.00, LINE F
53.90' LT. OF -L- STA. 225+33.25

PROP. 580'-12" D.I. WATER LINE WL4

PROP. 1 - FIRE HYDRANT

PROP. 1 - 5/8" WATER METER

PROP. 580' - ABANDON 12" UTILITY PIPE (AC WATER)

PROP. 3 - 5/8" WATER METERS

PROP. 1 - FIRE HYDRANT

PROP. 1 - RELOCATE WATER METER

PROP. 1- 12" VALVE

PROP. 1-16"x 12" REDUCER

PROP. 1- 16" x 16" TEE

PROP. 140' - 16" R.J.D.I. WATER LINE WL 4A SEE SHEET UC-16 FOR PROFILE

PROP. 550' - 16" D.I. WATER LINE WL4 3 - 16" NITRILE GASKETS

PROP. 1- 16" x 16" TAPPING VALVE

PROP. 2 - 22.5 DEGREE BENDS

PROP. 1 - RELOCATE WATER METER

PROP. 1 - RELOCATE FIRE HYDRANT

PROP. 5 - ABANDON UTILITY MANHOLES

PROP. 1 - 2" BLOW OFF STA. 0+00

PROP. 1- 16" VALVE

PROP. 1 - 16" x 16" TEE

PROP. 1- 16" VALVE

PROP. 248' - 16" D.I. WATER LINE WL4A (SEE SHT.16)

PROP. 1 - RELOCATE WATER METER

PROP. 1 - FIRE HYDRANT

PROP. 2 - 22.5 DEGREE BENDS

PROP. 1 - 16" x 16" TAPPING VALVE

PROP. 1 - ABANDON UTILITY MANHOLE

PROP. 102' - 16" R.J.D.I. WATER LINE. 86' - 30" ENCASEMENT PIPE
1 - 16" VALVE
WL Y15 SEE SHEET UC-16 FOR PROFILE

PROP. 1 - 16" x 8" CROSS

PROP. 1- 8" VALVE

PROP. 1 - 2" BLOW OFF

PROP. 2 - ABANDON UTILITY MANHOLES

PROP. 1 - 4' DIA. UTILITY MANHOLE A13
STA. 34+73.81, LINE A
86.00' RT. OF -L- STA. 231+18.47

PROP. 1 - 5/8" WATER METER

PROP. 1226.93' - 8" D.I. SANITARY GRAVITY SEWER (LINE A)
SEE SHEET UC-18 FOR PROFILE
8-SANITARY SEWER CLEAN-OUTS

PROP. 1 - FIRE HYDRANT

PROP. 1 - 5/8" WATER METER

PROP. 1 - 4' DIA. UTILITY MANHOLE A10
STA. 27+91.23, LINE A
46.58' RT. OF -L- STA. 224+44.23

PROP. 1 - RELOCATE FIRE HYDRANT

PROP. 1- 8" VALVE

PROP. 1-RELOCATE WATER METER

PROP. 1 - 22.5 DEGREE BEND

PROP. 55' - 16" D.I. WATER LINE
1 - 16" VALVE
WL Y15 SEE SHEET UC-15 FOR PROFILE

PROP. 1145' - 8" D.I. WATER LINE WL3

PROP. 1 - 4' DIA. UTILITY MANHOLE A11
STA. 28+88.59, LINE A =
STA. 1+39.90 LINE F
86.00' RT. OF -L- STA. 225+33.25

PROP. 1 - 4' DIA. UTILITY MANHOLE F2
STA. 1+81.43, LINE F
110.23' RT. OF -L- STA. 224+99.52

PROP. 1 - 8" VALVE

PROP. 2 - RELOCATE WATER METERS

PROP. 1 - FIRE HYDRANT

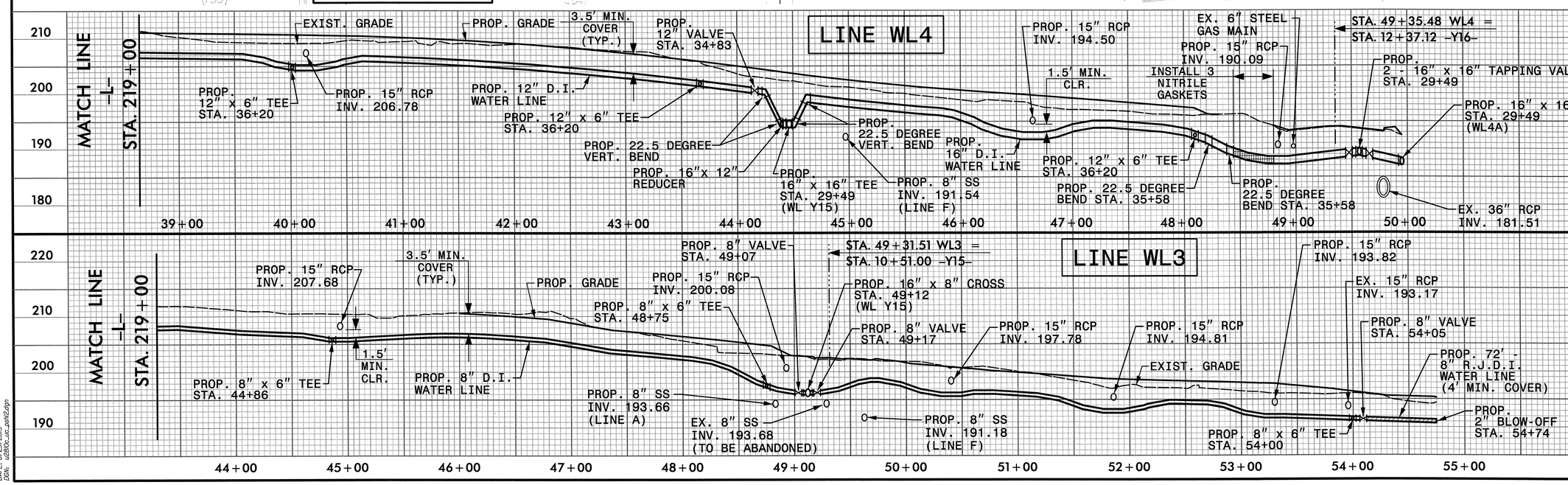
PROP. 1 - 4' DIA. UTILITY MANHOLE A12
STA. 31+73.59, LINE A
44.00' RT. OF -L- STA. 221+05.30

PROP. 1 - 4' DIA. UTILITY MANHOLE A9
STA. 24+52.30, LINE A
44.00' RT. OF -L- STA. 221+05.30

PROP. 1235 - ABANDON 8" UTILITY PIPE (VCP SEWER)
360' - 12" UTILITY PIPE (VCP SEWER)

REMOVE EXIST. BEND TIE TO EXIST. 16" C.I. WATER LINE

PROP. 820 - ABANDON 16" UTILITY PIPE (CI WATER)



Prepared by:

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701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F-0342

DATE: 8/29/2013
DGN: U2810C_UC_Sht12.dgn

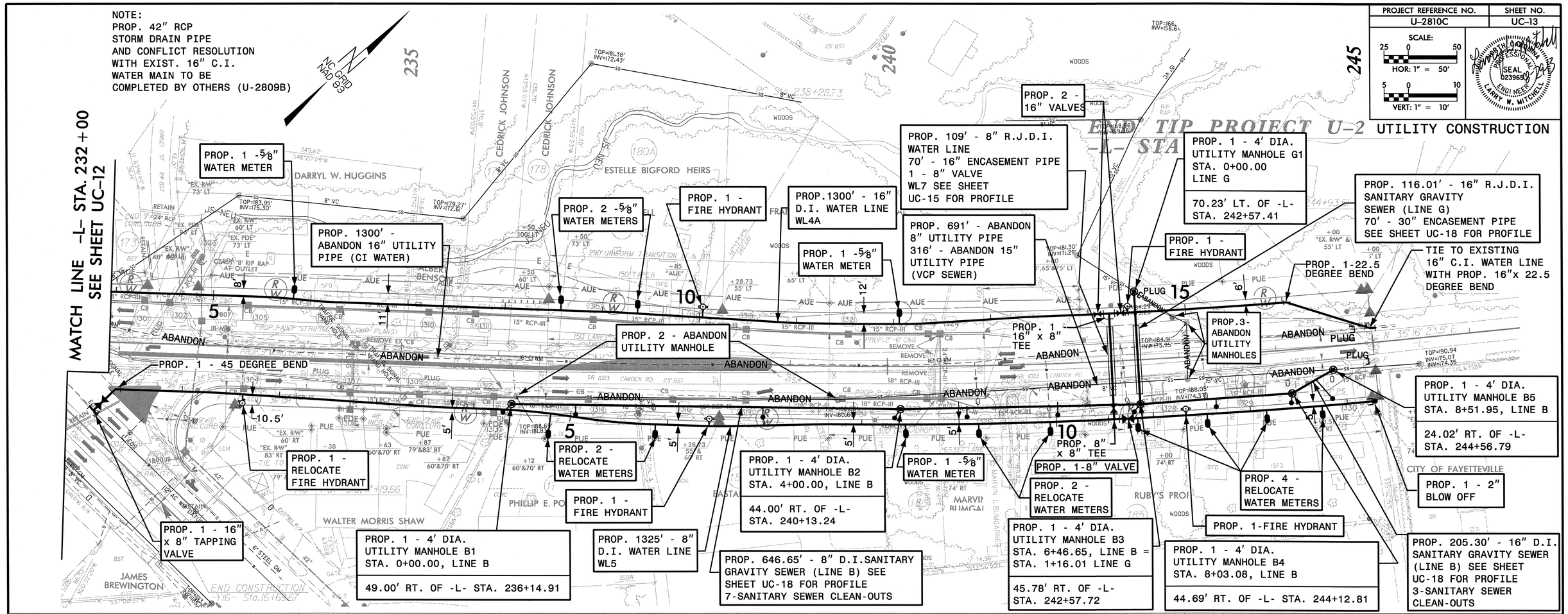
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-13

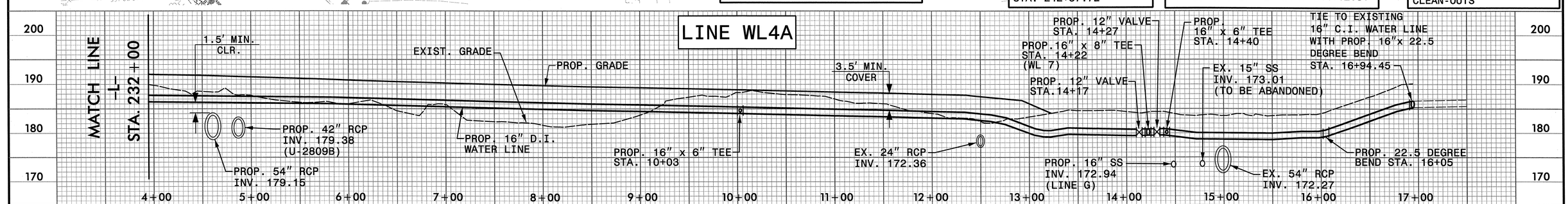
SCALE:
HOR: 1" = 50'
VERT: 1" = 10'

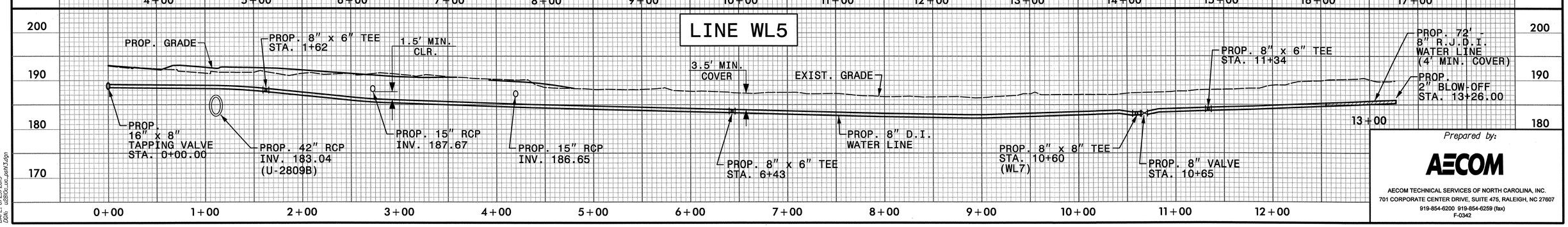
SEAL 023969 ENGINEER LARRY W. MITCHELL

R/W & UTILITY CONSTRUCTION
TIP PROJECT U-2810C -L- STA. 232+00 TO STA. 244+57.72

NOTE:
PROP. 42" RCP
STORM DRAIN PIPE
AND CONFLICT RESOLUTION
WITH EXIST. 16" C.I.
WATER MAIN TO BE
COMPLETED BY OTHERS (U-2809B)







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F-0342

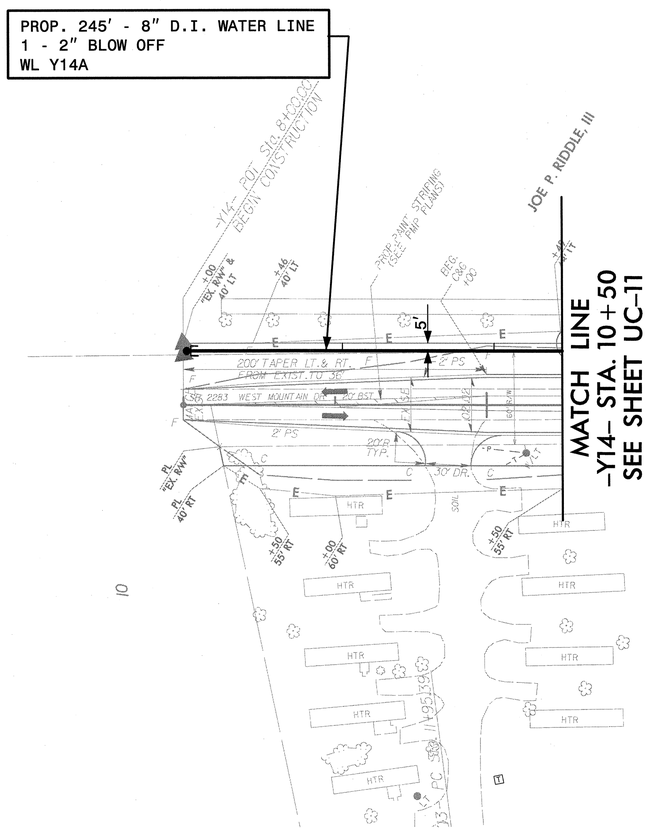
DATE: 8/29/2013
DGN: u2810c_uc_psh13.dgn

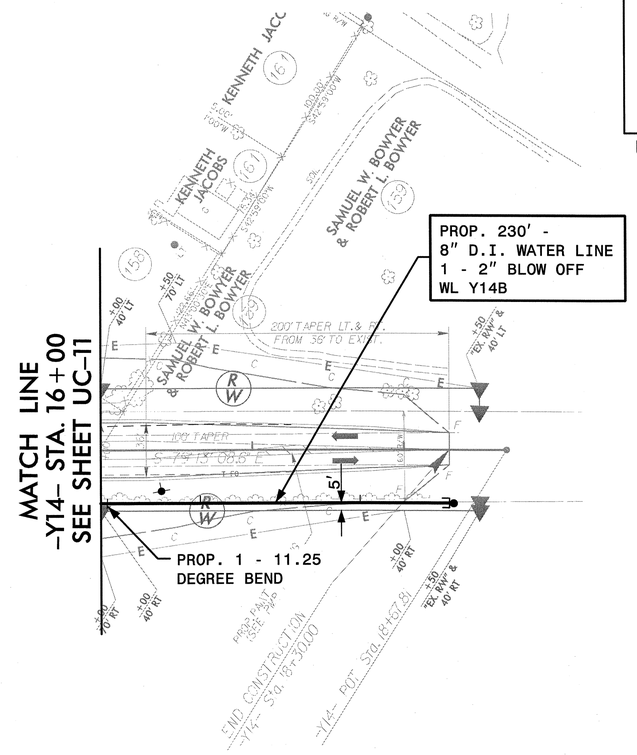
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-14

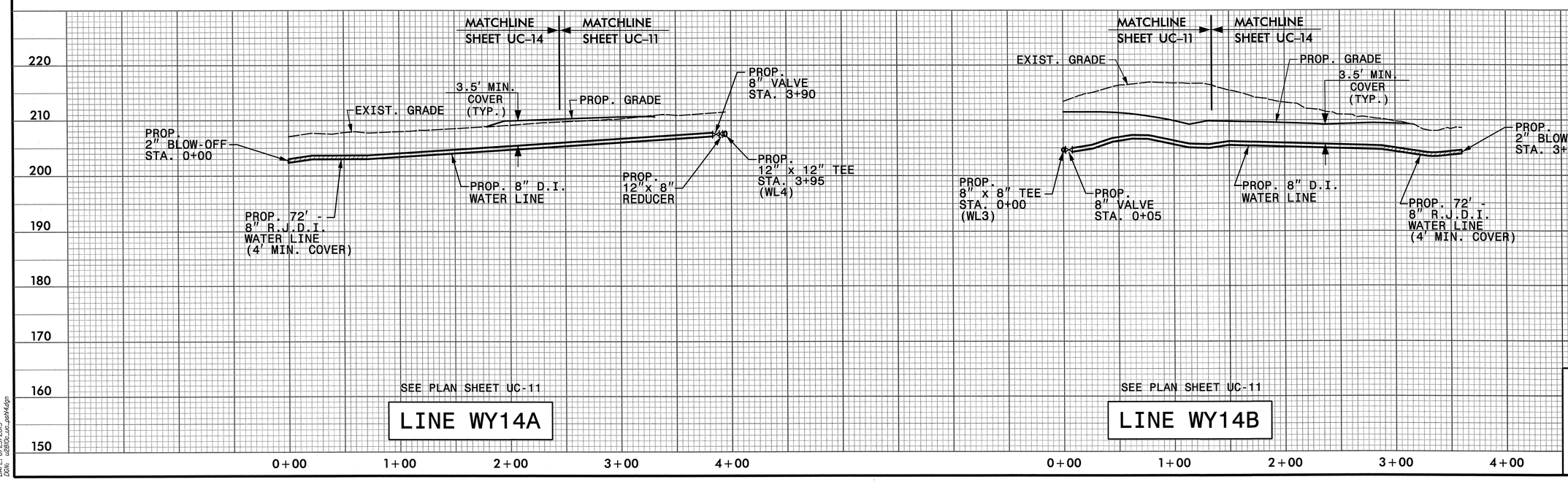
SCALE:
HOR: 1" = 50'
VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL SEAL 023865 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION







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F-0342

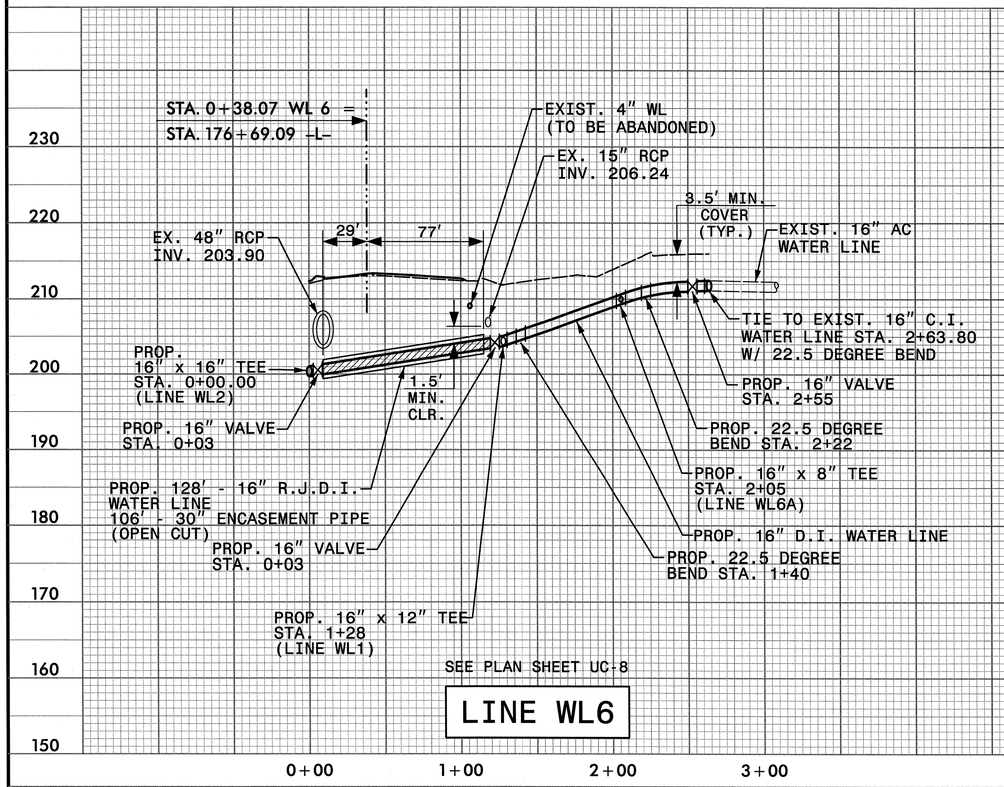
DATE: 8/29/2013
DGN: U2810C_UC_sht14.dgn

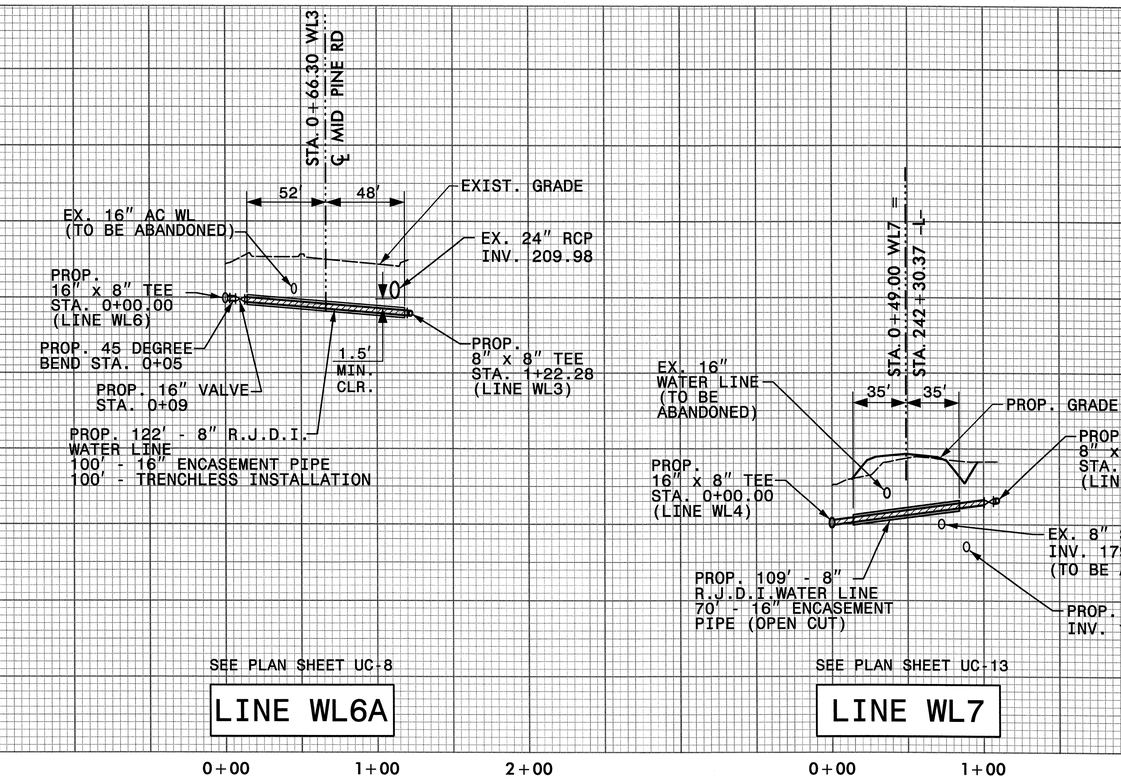
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-15

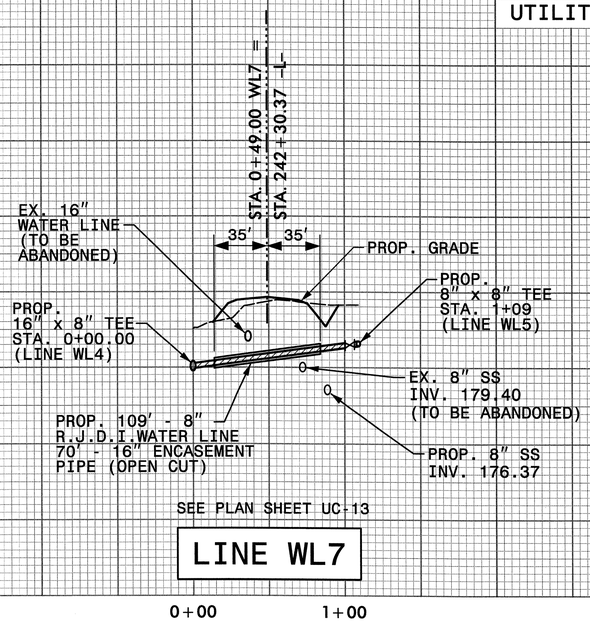
SCALE:
25 0 50
HOR: 1" = 50'
5 0 10
VERT: 1" = 10'

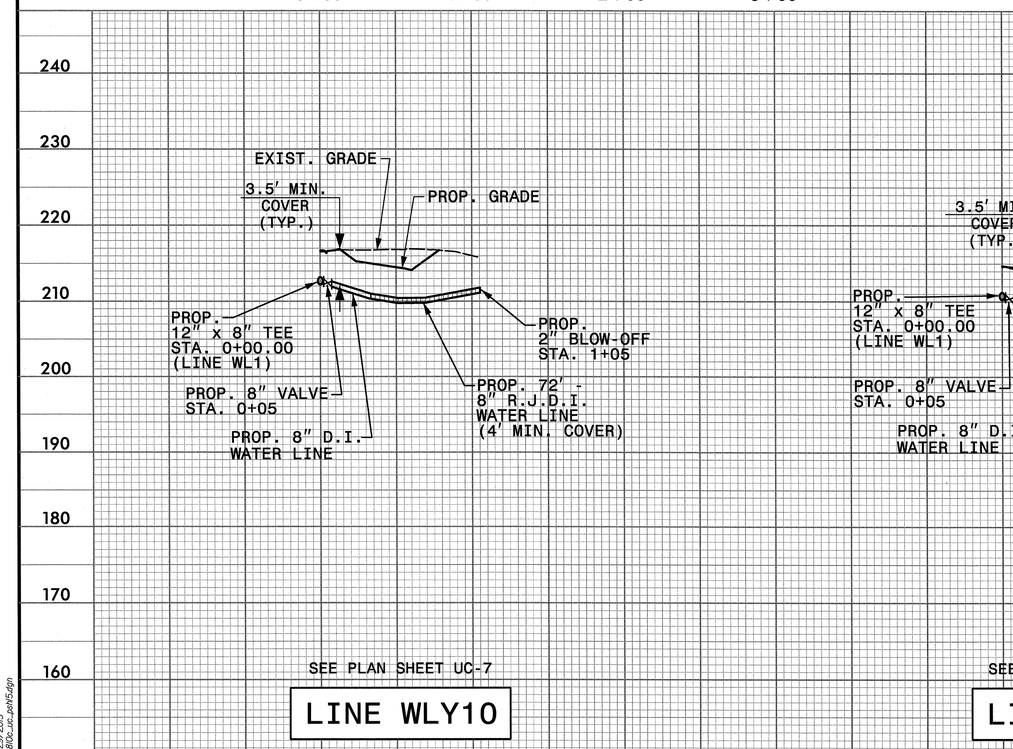
NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

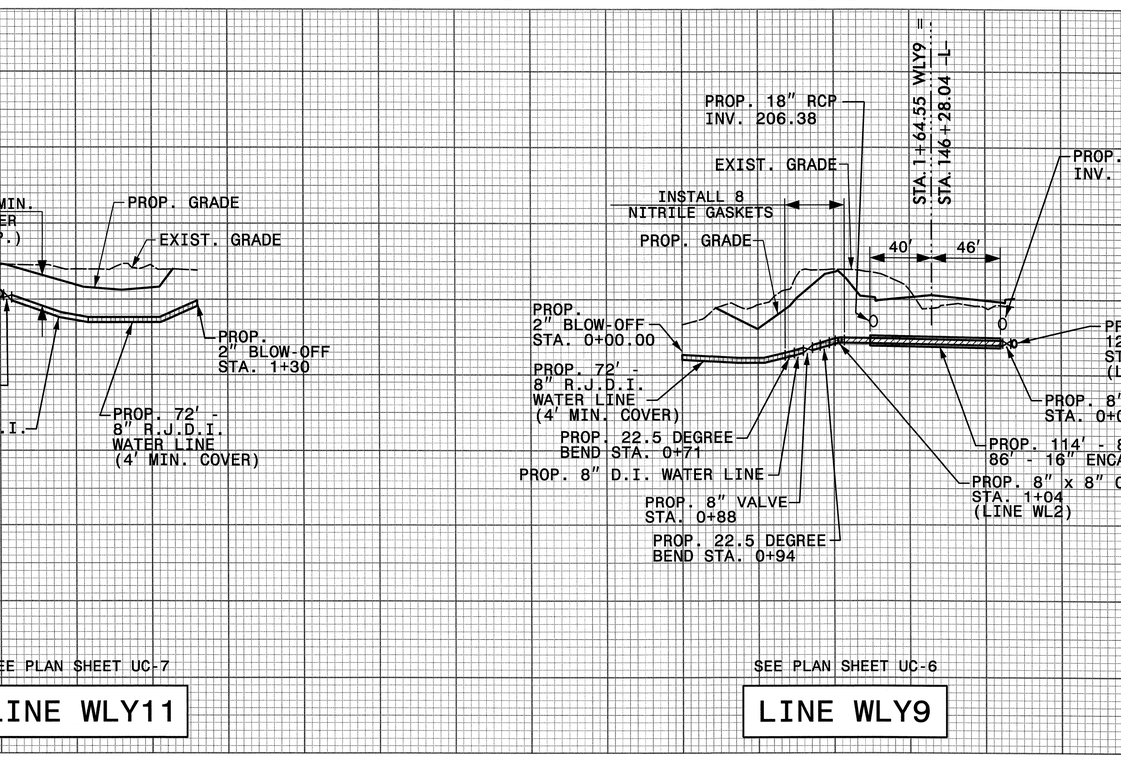
UTILITY CONSTRUCTION

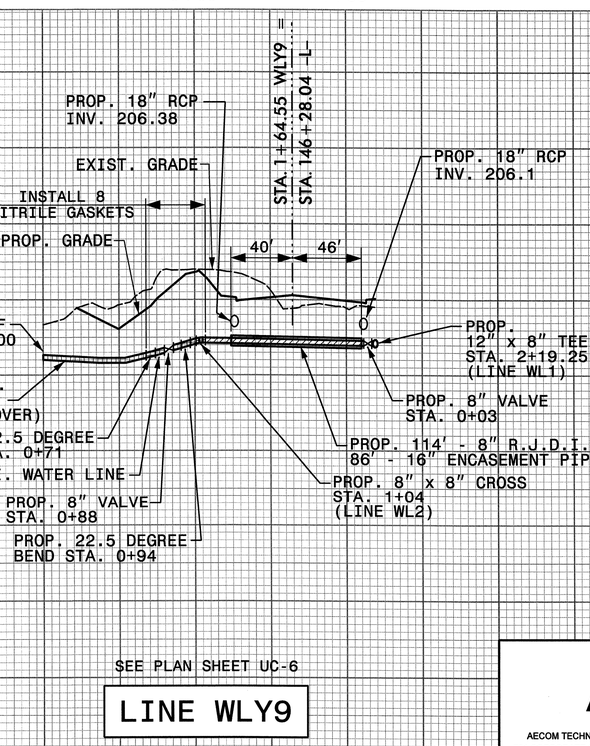












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701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F-0342

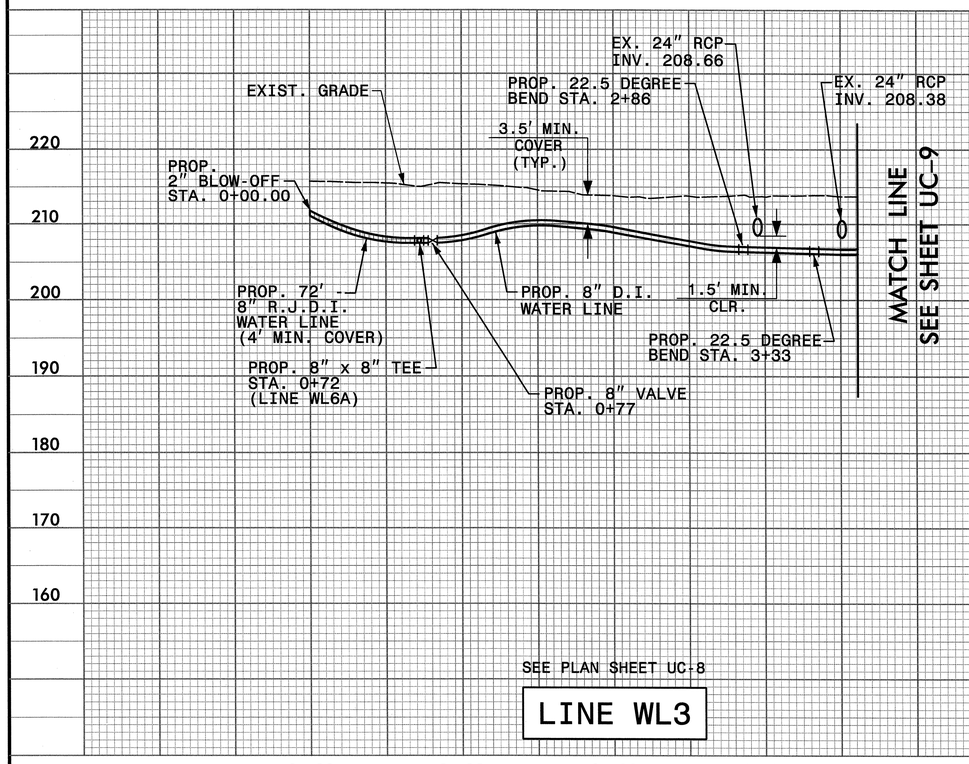
DATE: 8/29/2013
DGN: u2810c_uc_pln15.dgn

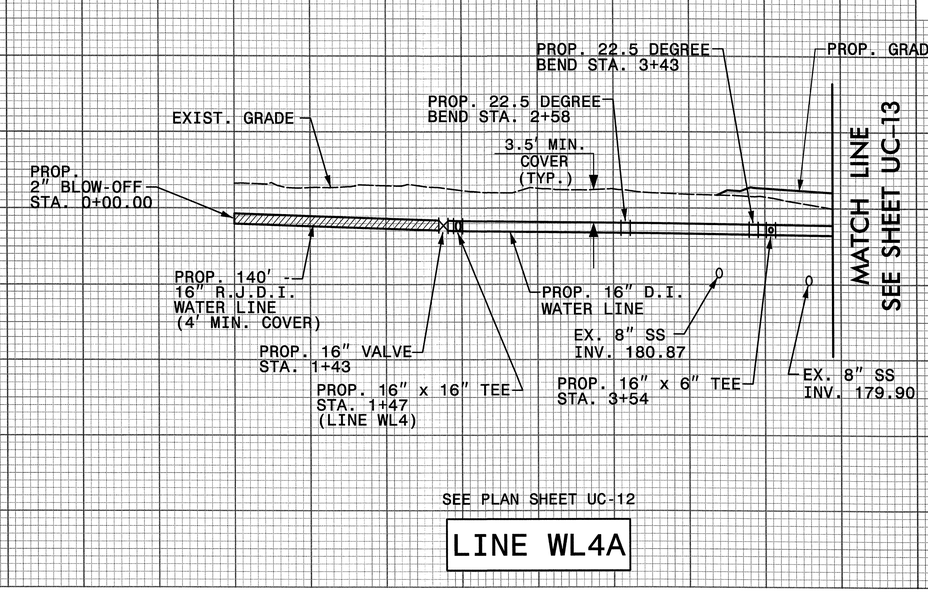
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-16

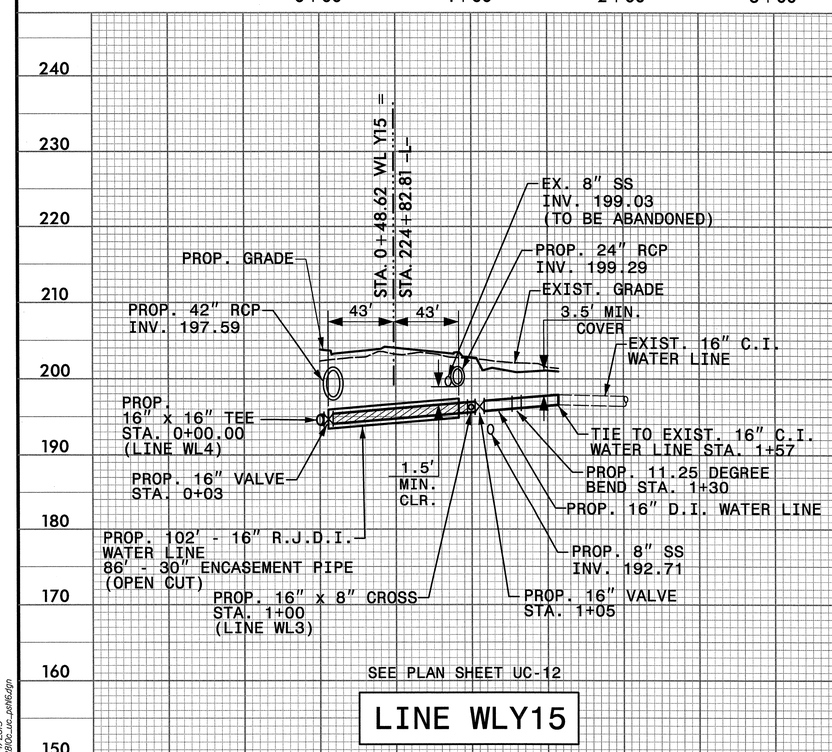
SCALE:
25 0 50
HOR: 1" = 50'
5 0 10
VERT: 1" = 10'

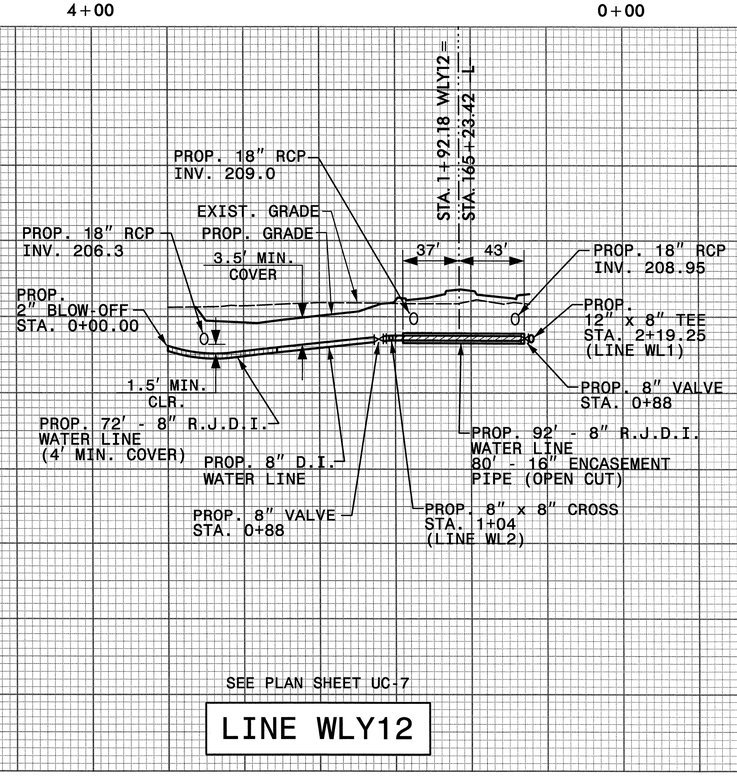
NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

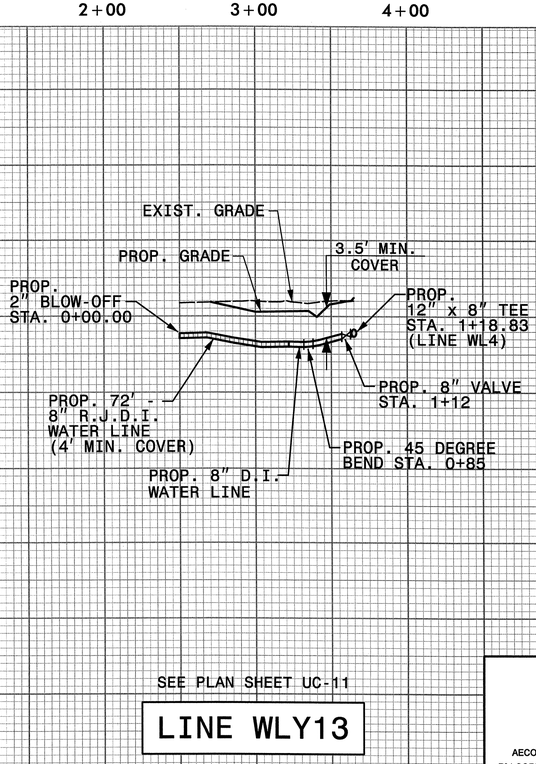
UTILITY CONSTRUCTION











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F-0342

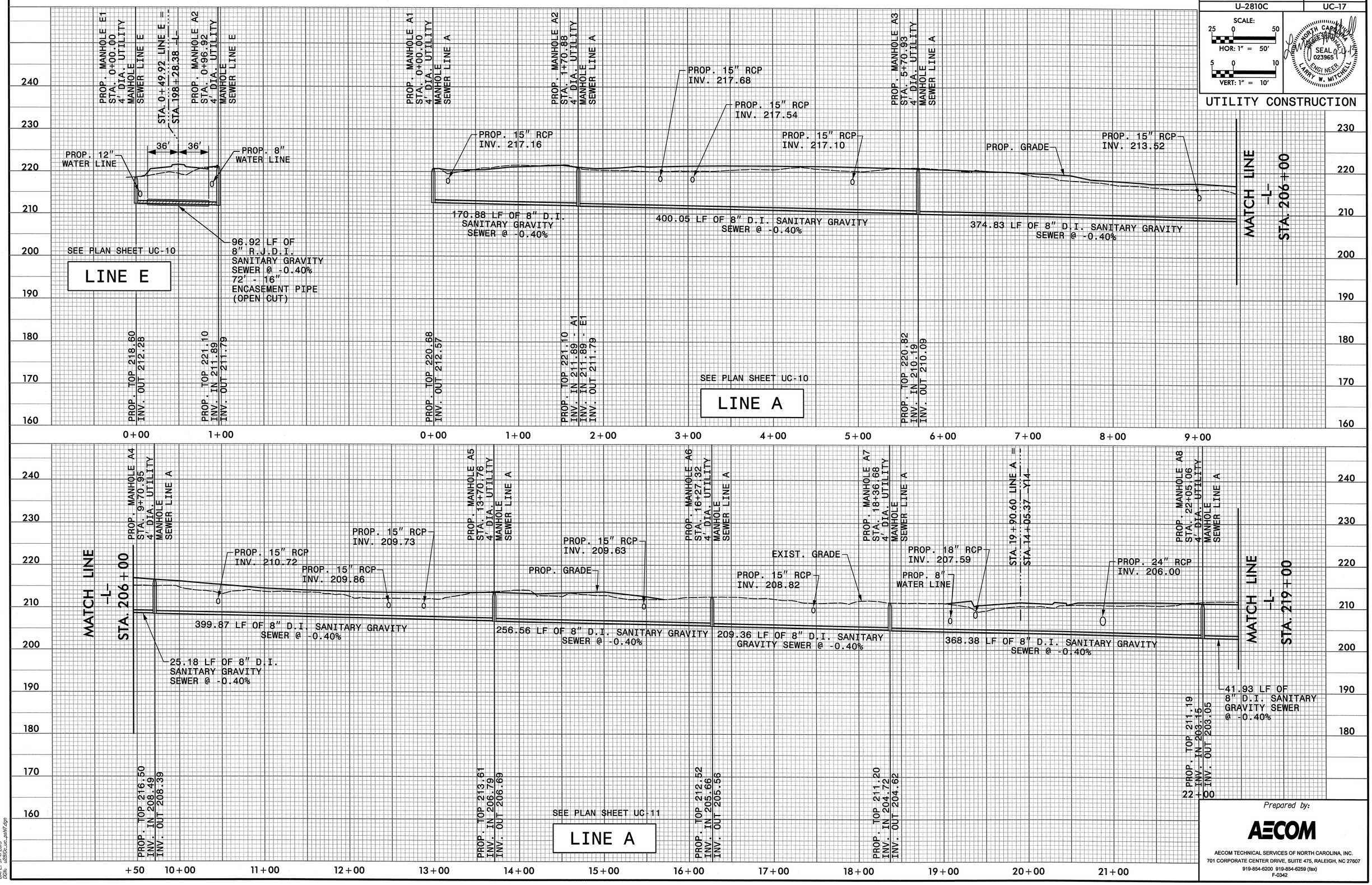
DATE: 9/4/2013
DGN: u2810c_uc_pp16dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-17

SCALE:
25 0 50
HOR: 1" = 50'
5 0 10
VERT: 1" = 10'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023965 LARRY W. MITCHELL

UTILITY CONSTRUCTION



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F-0342

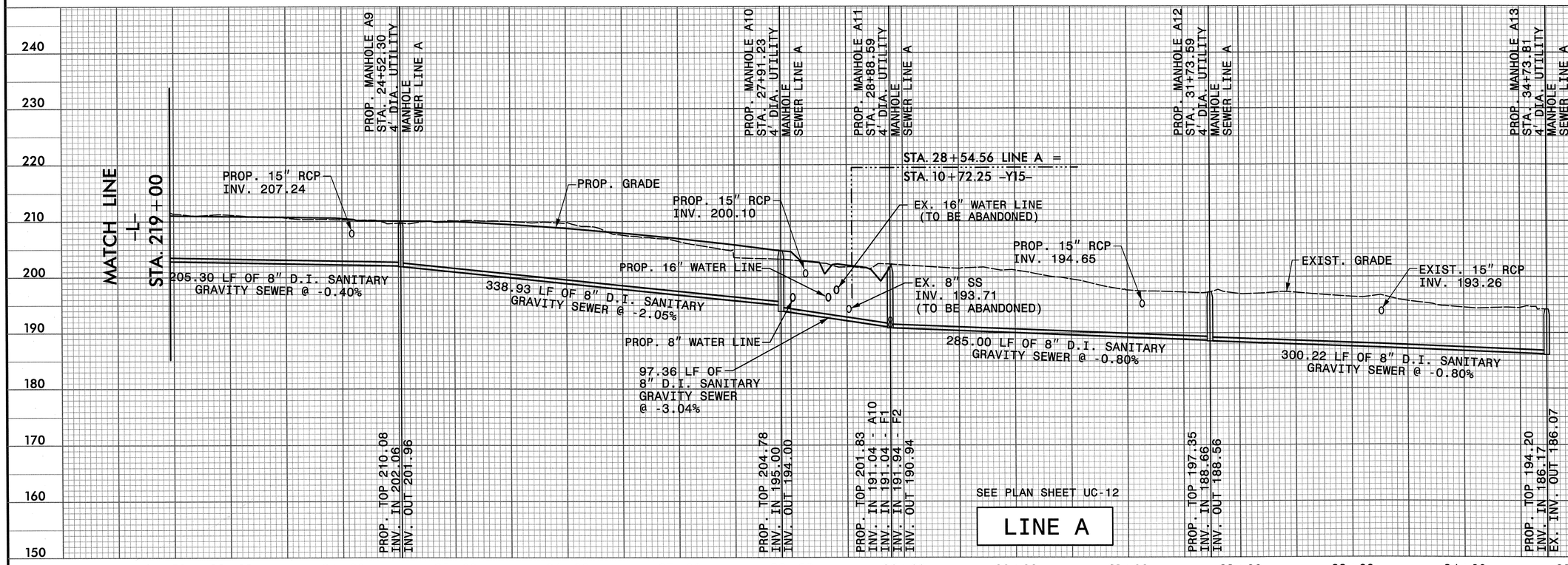
DATE: 9/4/2013
DGN: u2810c_uc_psN7.dgn

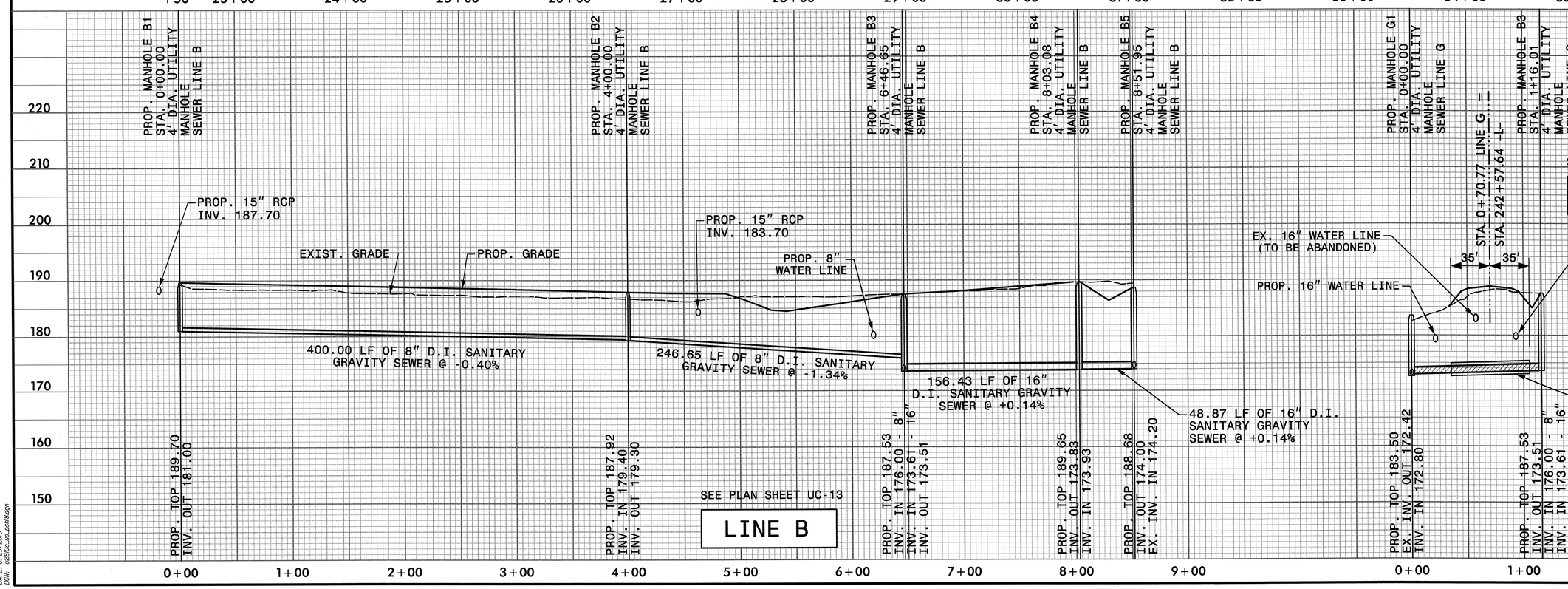
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-18

SCALE:
HOR: 1" = 50'
VERT: 1" = 10'

SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION





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F-0342

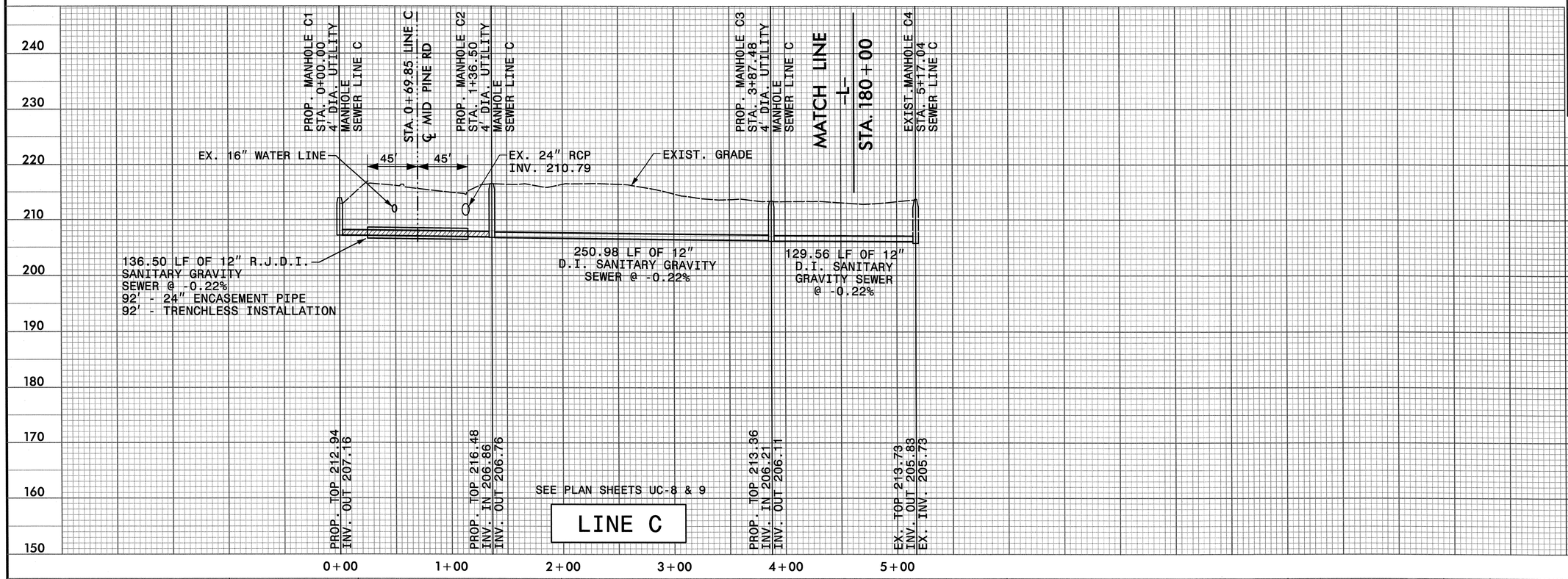
DATE: 8/29/2003
USN: u2810c_uc_psh18.dgn

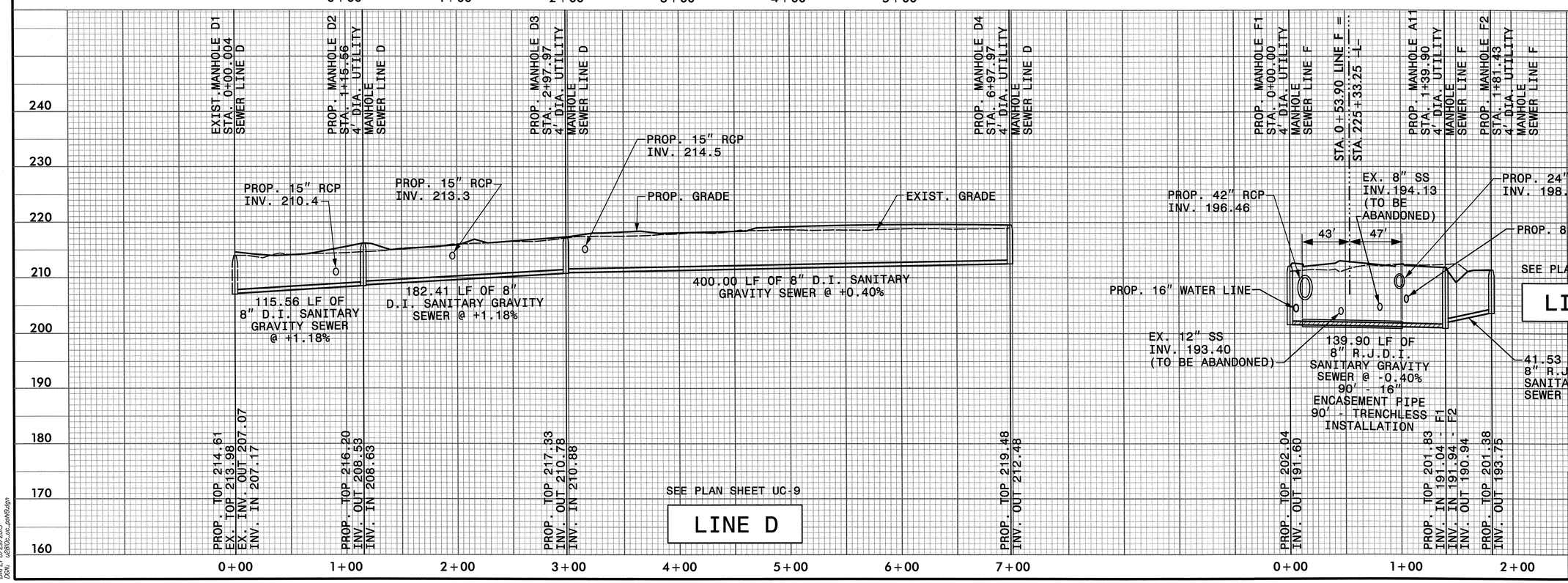
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-19

SCALE:
25 0 50
HOR: 1" = 50'
5 0 10
VERT: 1" = 10'

SEAL 023965 ENGINEERING PROFESSIONAL LICENSE LARRY W. MITCHELL

UTILITY CONSTRUCTION





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919-854-6200 919-854-6259 (fax)
F-0342

DATE: 8/29/2013
DGN: u2810c_uc_pan19.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-20

SCALE: NONE

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION

1. CONTRACTOR SHALL REPAIR ALL WATER LATERALS AND MAINS DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL REPORT IMMEDIATELY ALL WATER MAIN AND LATERAL BREAKS TO THE PWC PROJECT COORDINATOR. THE CONTRACTOR SHALL INITIATE IMMEDIATE REPAIRS IN ACCORDANCE WITH PWC STANDARDS. CONTRACTOR SHALL NOT OPERATE PWC WATER MAIN VALVES WITHOUT PWC APPROVAL AND SHALL COORDINATE ALL VALVE CLOSINGS WITH PWC.

2. THE CONTRACTOR SHALL NOT USE HOUSE HOSE BIBBS OR ANY OTHER METHOD OF BLOW OFF WHICH ALLOWS DOMESTIC WATER CONTAINING SEDIMENTS OR HIGH LEVELS OF CHLORINE TO PASS THRU RESIDENT'S METERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES RESULTING FROM ALLOWING "DIRTY" WATER TO ENTER RESIDENT'S PLUMBING SYSTEM, SUCH AS WATER HEATERS, STAINED CLOTHING, CLOGGED SCREENS, ETC.

3. WATER MAINS AND LATERALS SHALL BE INSTALLED UTILIZING A PWC APPROVED CUT-SHEET INDICATING INSTALLATION DEPTH.

4. TRANSFER OF WATER SERVICES SHALL BE ACCOMPLISHED AS FOLLOWS:
   A. INSTALL, TEST AND STERILIZE NEW MAIN AND LATERALS. LATERALS SHALL BE INSTALLED 18" INSIDE R/W UNLESS OTHERWISE DIRECTED BY PWC.
   B. TRANSFER EXISTING METER TO NEW METER BOX AND TIE NEW WATER LATERAL TO EXISTING DOMESTIC SERVICE UTILIZING BRASS FITTINGS. SAME METER NUMBER SHALL BE INSTALLED ON SAME ADDRESS AND/OR CUSTOMER. BLOW OFF SERVICE AT HOSE BIBB ON HOUSE ONLY AFTER METER HAS BEEN TRANSFERRED.
   C. AFTER ALL SERVICES ARE TRANSFERRED TO THE NEW SYSTEM, SHUT OFF VALVE ON EXISTING SYSTEM AND ABANDON EXISTING MAINS IN ACCORDANCE WITH PWC DETAILS.
   D. CONTRACTOR SHALL SUPPLY NEW METER BOXES AND DISPOSE OF EXISTING METER BOXES.

5. WHEN MAIN IS NOT TO BE ABANDONED, CONTRACTOR SHALL UNCOVER OLD CORPORATION AT MAIN, CLOSE AND PLUG CORPORATION TO ABANDON OLD SERVICE.

6. SEPARATION REQUIREMENTS:
   A. **LATERAL SEPARATION OF SEWERS AND WATER MAINS:** WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY FROM EXISTING OR PROPOSED SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION - IN WHICH CASE:
      i. THE WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL; OR
      ii. THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER MAIN/LATERAL WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL.

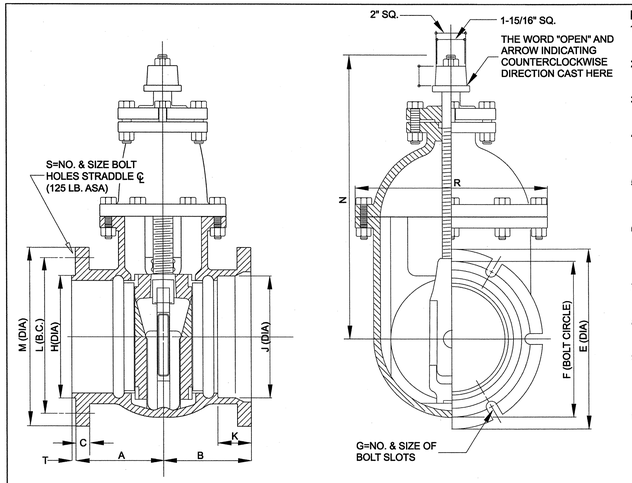
   B. **CROSSING A WATER MAIN OVER A SEWER:** WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER MAIN/LATERAL, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT AN 18 INCH VERTICAL SEPARATION - IN WHICH CASE BOTH THE WATER MAIN AND SEWER MAIN/LATERAL SHALL BE DUCTILE IRON IN ACCORDANCE WITH PWC REQUIREMENTS.

   C. **CROSSING WATER MAIN UNDER A SEWER:** WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER MAIN/LATERAL, BOTH THE WATER MAIN AND THE SEWER MAIN/LATERAL SHALL BE DUCTILE IRON IN ACCORDANCE WITH PWC REQUIREMENTS. A FULL JOINT OF DUCTILE IRON PIPE SHALL BE INSTALLED ON THE WATER MAIN CENTERED AT THE POINT OF CROSSING.

   D. **CROSSING STORM DRAINAGE LINES:** A MINIMUM OF 12-INCHES OF VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN A WATER LINE CROSSING OVER A STORM DRAINAGE LINE UNLESS DUCTILE IRON PIPE IS USED. IN ADDITION, THREE AND A HALF (3.5) FEET OF COVER MUST BE MAINTAINED OVER THE WATER MAIN OR IT SHALL BE DUCTILE IRON. IF DUCTILE IRON PIPE IS USED THEN TWO AN A HALF (2.5) FEET OF COVER MUST BE MAINTAINED OVER THE WATER MAIN AND A MINIMUM OF 4-INCHES OF VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN THE WATER MAIN AND THE STORM DRAINAGE LINE. WHERE A WATER MAIN CROSSES UNDER A STORM DRAINAGE LINE THE MINIMUM OF TWELVE (12) INCHES OF VERTICAL SEPARATION SHALL BE MAINTAINED AND THE WATER MAIN SHALL BE DUCTILE IRON FOR A DISTANCE OF 10-FEET ON EACH SIDE OF THE CROSSING.

WATER UTILITY NOTES			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. W.1	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	JAN 05	REVISED NOTE 5A
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.			2	JUL 11	REVISED NOTES & ADDED NOTE 6

2012-W1 WATER UTILITY NOTES.dwg



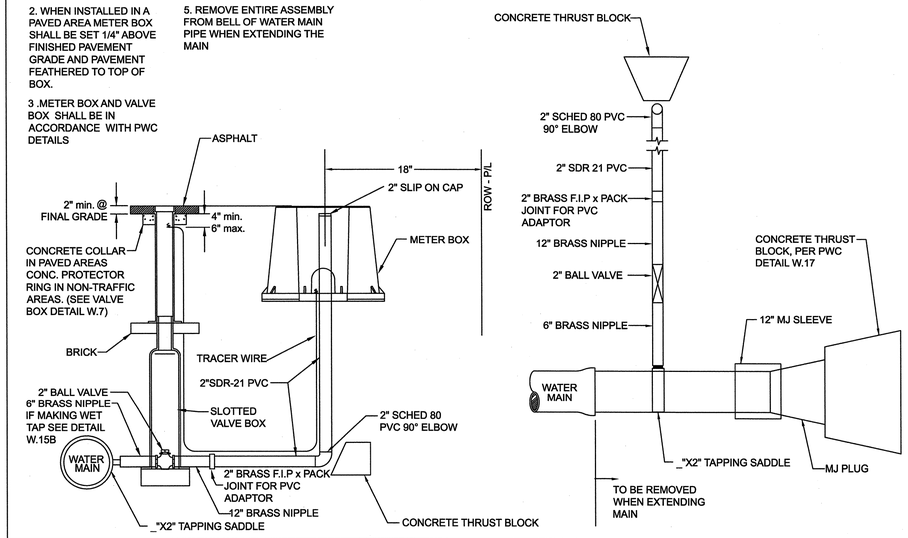
NOTES:
1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH PWC STANDARDS.
2. RAISED MALE FACE SHALL BE REQUIRED TO PROVIDE FOR PROPER ALIGNMENT OF THE TAPPING SLEEVE.
3. ALL VALVES SHALL HAVE 2" SQUARE OPERATING NUT AND SHALL OPEN COUNTERCLOCKWISE.
4. RESILIENT WEDGE GATE VALVE SHALL BE AS MANUFACTURED BY MUELLER CORP., AMERICAN DARLING, CLOW CORP., OR APPROVED EQUAL.
5. VALVE BODY, BONNET AND GATE SHALL BE IN ACCORDANCE WITH AWWA C-509/C-515 AND NSF61.
6. VALVE BODY AND BONNET SHALL BE COATED ON ALL INTERIOR AND EXTERIOR SURFACES WITH A FUSION BONDED EPOXY IN ACCORDANCE WITH AWWA C-550-90.
7. ALL VALVES 24" AND SMALLER SHALL HAVE A SAFE WORKING PRESSURE OF 250 PSI.
8. SEE TAPPING SLEEVE (DETAILS W.10 OR W.11) FOR ADDITIONAL INFORMATION.
9. DIMENSIONS SHOWN ARE FOR REFERENCE AND MAY VARY BASED UPON MANUFACTURER. VALVES SHALL BE SIMILAR IN NATURE TO THAT SHOWN AND SHALL NOT DEVIATE IN ESSENTIAL DETAILS.
10. ALL TAPPING SLEEVES SHALL BE HYDROSTATICALLY PRESSURE TESTED IN ACCORDANCE WITH PWC SPECIFICATIONS. TEST SHALL BE WITNESSED AND APPROVED BY PWC PROJECT COORDINATOR PRIOR TO BEGINNING TAPPING PROCESS.

VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	TURNS TO OPEN	WEIGHT W/ACC
4	4-3/8	5-7/8	15/16	1-1/2	9	7-1/2	4-7/8	4-63/64	4-29/32	2-1/2	7-1/2	9	14-1/8	9	8-3/4	1/4	14	118
6	6-7/8	6-1/4	1	1-5/8	11	9-1/2	6-7/8	6-63/64	7	2-1/2	9-1/2	11	17-5/8	11-3/4	8-7/8	1/4	21	175
8	6-1/2	7-1/4	1-1/8	1-3/4	13-1/4	11-3/4	6-7/8	8-63/64	9-5/32	2-1/2	11-3/4	13-1/2	21	14-1/4	8-7/8	1/4	28	274
12	7	8-1/4	1-1/4	1-3/4	17-7/8	16-1/4	8-7/8	12-63/64	13-5/16	2-1/2	17	19	28-1/4	19-1/8	12-1	1/4	39	570
16	8-1/2	9-1/8	1-7/16	2-1/16	23	21	12-7/8	16-15/16	17-35/64	3-1/2	21-1/4	23-1/2	38-5/8	26-1/8	16-1 1/8	1/4	55	1140
24	10-1/2	14-1/4	1-7/8	2-1/2	31-3/4	30	16-7/8	24-15/16	25-15/16	3-1/2	29-1/2	32	54-5/8	37-5/8	20-1 3/8	5/16	79	3225

TAPPING VALVE (N.T.S.)			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.9	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	7/09	ADDED NOTE 10, REVISED 4 & 5
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.			2	7/13	REVISED NOTES 4, 8, 10

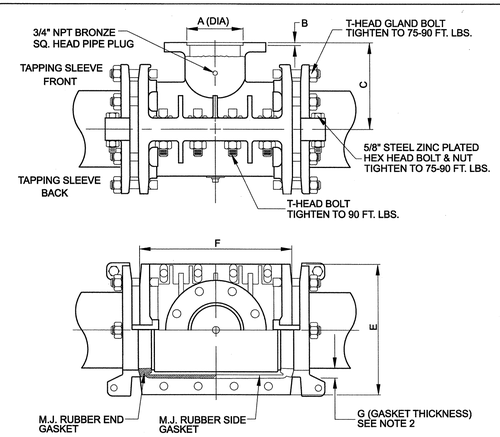
2013-W9 M.J.TAPPING VALVE.dwg

NOTES:
1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH PWC STANDARDS.
2. WHEN INSTALLED IN A PAVED AREA METER BOX SHALL BE SET 1/4" ABOVE FINISHED PAVEMENT GRADE AND PAVEMENT FEATHERED TO TOP OF BOX.
3 .METER BOX AND VALVE BOX SHALL BE IN ACCORDANCE WITH PWC DETAILS
4. BLOW OFF ASSEMBLY NOT TO BE RE-USED UNLESS APPROVED BY PWC.
5. REMOVE ENTIRE ASSEMBLY FROM BELL OF WATER MAIN PIPE WHEN EXTENDING THE MAIN



2" BLOW OFF (N.T.S.)			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.15	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	8/06	CHANGED FITTINGS TO SCHED 80
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.			2	11/06	REVISED CONFIGURATION

2012-W15 2 BLOWOFF.dwg



NOTES:
1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH PWC STANDARDS. SLEEVE BODY SHALL BE DUCTILE IRON ASTM A536.
2. MECHANICAL JOINT TAPPING SLEEVES SHALL BE FURNISHED WITH SPLIT GLANDS, SPLIT END GASKET, BOLTS, ETC. THE OUTLET FLANGE SHALL BE CL 125 PER ANSI B16.1 COMPATIBLE WITH APPROVED TAPPING VALVES.
3. DIMENSIONS SHOWN ARE FOR REFERENCE AND MAY VARY BASED UPON MANUFACTURER. SLEEVES SHALL BE SIMILAR IN NATURE TO THAT SHOWN AND SHALL NOT DEVIATE IN ESSENTIAL DETAILS.
4. PIPE SURFACES SHALL BE CLEANED THOROUGHLY TO PERMIT FOR A GOOD SEAL PRIOR TO INSTALLATION.
5. EXTERIOR OF TAPPING SLEEVE SHALL BE COATED w/2 COATS ASPHALTIC VARNISH MIL-C450.
6. ALL TAPPING SLEEVES SHALL BE HYDROSTATICALLY PRESSURE TESTED IN ACCORDANCE WITH PWC SPECIFICATIONS. TEST SHALL BE WITNESSED AND APPROVED BY PWC PROJECT COORDINATOR PRIOR TO BEGINNING TAPPING PROCESS.
7. SEE DETAILS W.9 AND W.17 FOR ADDITIONAL REQUIREMENTS.

	SLEEVE FOR USE WITH CI OR DI PIPE																			
SLEEVE SIZE PIPE X BRANCH	6X6	8X6	8X8	12X6	12X8	12X12	16X6	16X8	16X12	24X6	24X8	24X12	24X16	24X24	30X6	30X8	30X12	30X16	30X24
A DIA +.031-.000	7.016	7.016	9.016	7.016	9.016	13.016	7.016	9.016	13.016	11.00	13.5	19.0	23.5	32.0	11.00	13.5	19.0	23.5	32.0
B	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31
C	7-7/8	9-1/16	9	11-5/8	11-7/8	12-7/8	14-1/8	14-1/2	14-7/8	19.5	19.5	19.5	20.5	20.5	23.25	23.25	23.25	23.75	23.75
E	11-3/4	13-7/8	13-7/8	18-1/2	18-1/2	18-1/2	23-1/2	23-1/2	23-1/2	35.5	35.5	35.5	35.5	35.5	43.37	43.37	43.37	43.37	43.37
F	13-1/2	15	15	19-1/2	19-1/2	19-1/2	22-1/2	22-1/2	22-1/2	18.0	18.0	24.0	30.0	36.0	24.0	24.0	24.0	36.0	36.0

DUCTILE IRON TAPPING SLEEVE			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.10	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	7/09	REVISED NOTE 6/REMOVED NOTE 8.
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.			2	7/13	REVISED NOTES 6, 7.

2013-W10 TAPPING SLEEVE.dwg

Prepared by:

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F-0342

DATE: 9/14/2013
DGN: u2810c_uc_ps20.dgn

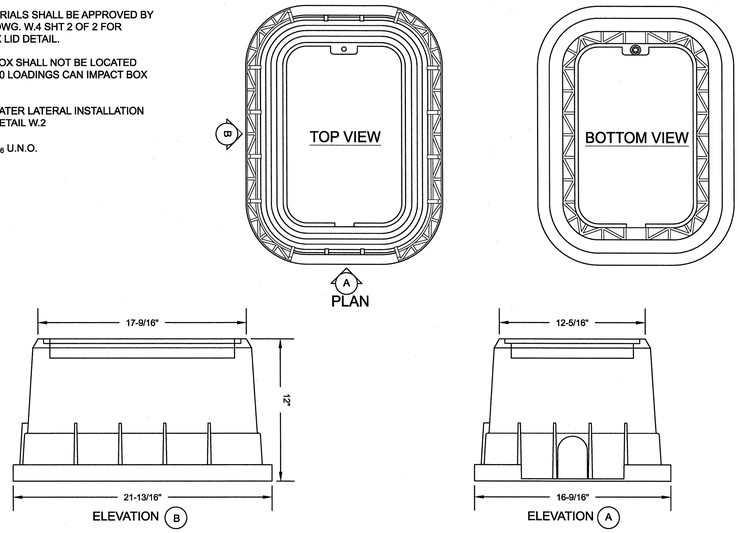
PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-21

SCALE: NONE

SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION

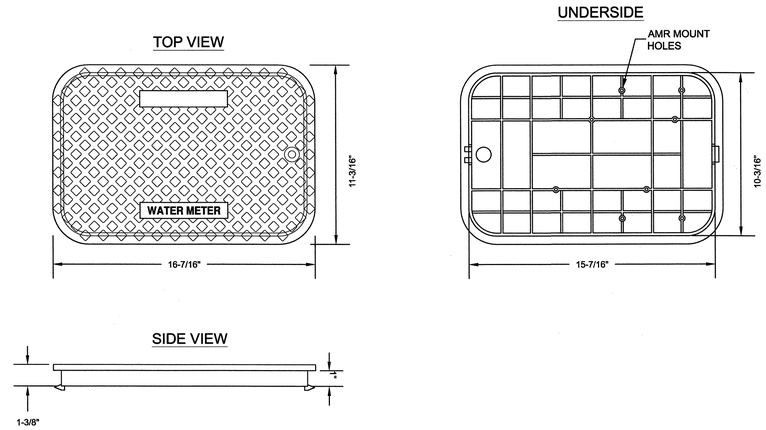
NOTES:
1. ALL MATERIALS SHALL BE APPROVED BY PWC. SEE DWG. W.4 SHT 2 OF 2 FOR METER BOX LID DETAIL.
2. METER BOX SHALL NOT BE LOCATED WHERE H-20 LOADINGS CAN IMPACT BOX OR COVER.
3. FOR 1" WATER LATERAL INSTALLATION SEE PWC DETAIL W.2
4. DIM'S ± 1/16 U.N.O.



ELEVATION VIEW

1-INCH METER BOX DETAILS N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.		NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. W.4	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	PWC	1	3/10	CHANGED BOX DIMENSIONS
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.					

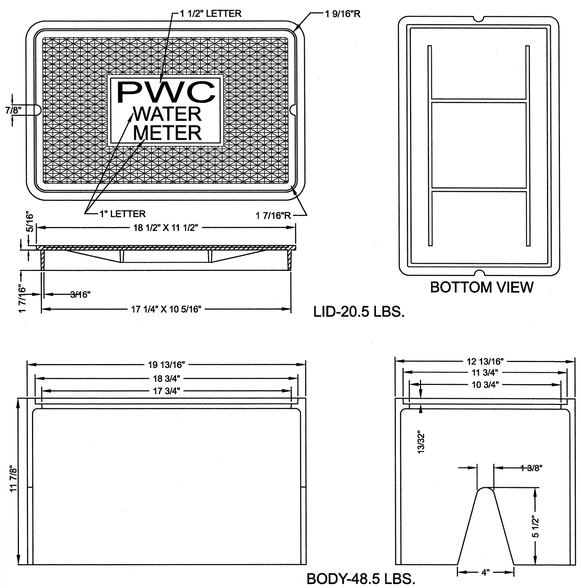
2012-W4 1IN METERBOX.dwg



SOLID LID

1-INCH METER BOX LID N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.		NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. W.4	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	PWC	1	7/07	REVISED LID
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.			1	3/10	CHANGED BOX & LID DIMENSIONS

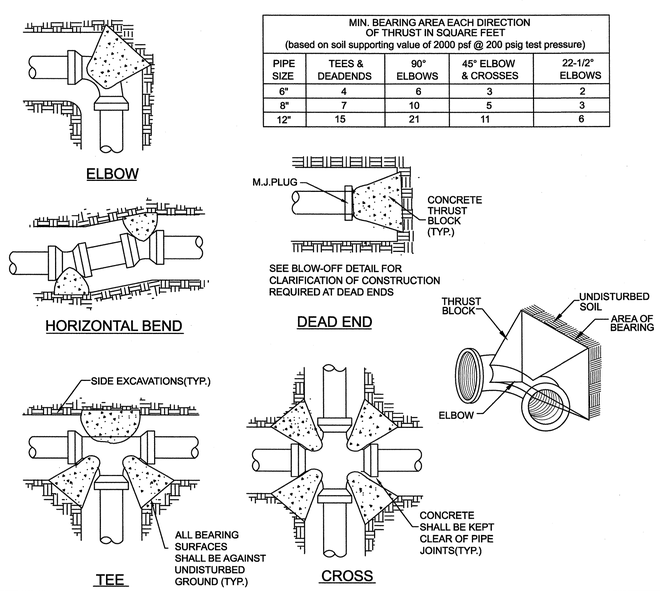
2012-W4 1IN METERBOX.dwg



NOTES:
1. ALL MATERIALS SHALL BE APPROVED BY PWC.
2. FOR 1" WATER LATERAL INSTALLATION SEE PWC DETAIL W.2
3. CAST IRON METER BOX TO BE USED IN TRAFFIC AREAS.

1-INCH CAST IRON METER BOX & COVER N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.		NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.4B	DWG. BY: PWC	WATER RESOURCES DEPARTMENT	PWC	1	3/10	CHANGED BOX & LID DIMENSIONS
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.					

2012-W4B METERBOX&LID.dwg



MIN. BEARING AREA EACH DIRECTION OF THRUST IN SQUARE FEET (based on soil supporting value of 2000 psf @ 200 psig test pressure)

PIPE SIZE	TEES & DEADENDS	90° ELBOWS	45° ELBOW & CROSSES	22-1/2° ELBOWS
6"	4	6	3	2
8"	7	10	5	3
12"	15	21	11	6

NOTES:
1.) THRUST BLOCKS SHALL BE INSTALLED ON PVC WATER DISTRIBUTION LINES 6" THRU 12" DIA. IN THE MANNER SHOWN. SEE PWC STANDARD ALT. RESTRAINING DETAIL W.18 FOR ACCEPTABLE ALTERNATE RESTRAINING SYSTEMS.
2.) PIPE GREATER THAN 12 INCH DIAMETER SHALL REQUIRE RESTRAINT JOINT PIPE FOR THE PROPER LENGTH.
3.) COMPACT FITTINGS ARE NOT ACCEPTABLE. STANDARD FITTINGS SHALL BE USED WITH CONCRETE THRUST BLOCKING.
4.) THRUST BLOCKS SHALL BE INSTALLED ON SEWER FORCE MAIN IN THE MANNER SHOWN.
5.) IF SAC-CRETE IS USED, MIXING MUST BE ON SITE UTILIZING A MECHANICAL MIXER.
6.) NO CONCRETE SHALL BE PLACED ON BOLTS. WRAP JOINT FITTINGS WITH PLASTIC.
7.) CONCRETE SHALL BE A MINIMUM 3,000 psi.
8.) ALL BEARING SURFACES SHALL BE AGAINST UNDISTURBED SOIL AND SHALL BE APPROVED BY PWC PROJ. COORDINATOR PRIOR TO PLACEMENT OF CONCRETE.
9.) USE OF RESTRAINED JOINT DUCTILE IRON WILL BE REQUIRED IF SOIL CONDITIONS DO NOT ALLOW THE USE OF THRUST BLOCKS
10.) ALL VERTICAL BENDS SHALL BE RESTRAINED USING RESTRAINED JOINT DUCTILE IRON PIPE.

CONCRETE THRUST BLOCK DETAIL N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.		NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.17	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	PWC	1	JAN 05	REVISED TABLE, NOTE 1
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.			2	SEPT 05	REVISED TABLE
					3	FEB 07	ADDED NOTES 9&10

2012-W17 THRUSTBLOCK.dwg

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F-0342

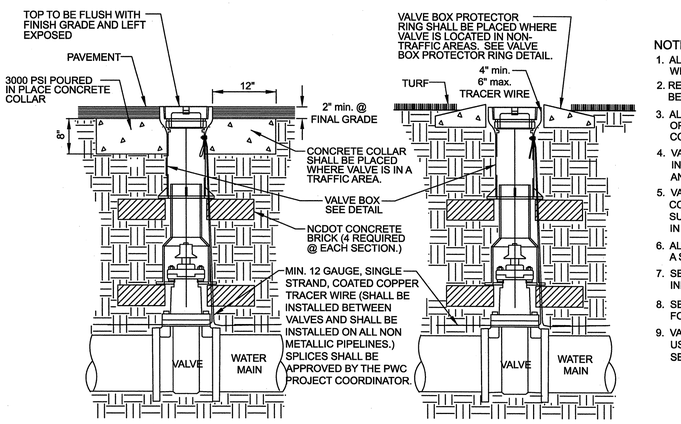
DATE: 8/29/2013
ZONE: u2810c_uc_pd02.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-22

SCALE: NONE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023965 LARRY W. MITCHELL

UTILITY CONSTRUCTION



VALVE IN TRAFFIC AREA

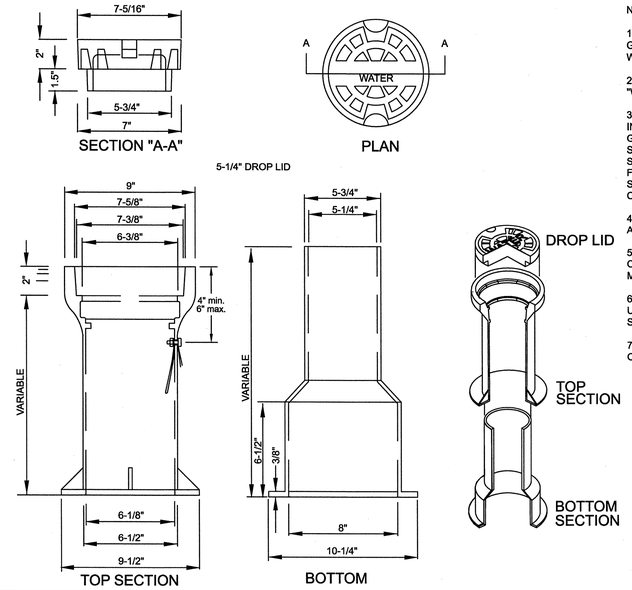
VALVE IN NON-TRAFFIC AREA

NOTES:

1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH PWC STANDARDS.
2. RESILIENT WEDGE GATE VALVE SHALL BE USED.
3. ALL VALVES SHALL HAVE 2" SQUARE OPERATING NUT AND SHALL OPEN COUNTERCLOCKWISE.
4. VALVE BODY, BONNET AND GATE SHALL BE IN ACCORDANCE WITH AWWA C-509/C-515 AND NSF61.
5. VALVE BODY AND BONNET SHALL BE COATED ON ALL INTERIOR AND EXTERIOR SURFACES WITH A FUSION BONDED EPOXY IN ACCORDANCE WITH AWWA C-550-90.
6. ALL VALVES 24" AND SMALLER SHALL HAVE A SAFE WORKING PRESSURE OF 250 PSI.
7. SEE VALVE BOX DETAIL FOR ADDITIONAL INFORMATION.
8. SEE VALVE BOX PROTECTOR RING DETAIL FOR ADDITIONAL INFORMATION.
9. VALVE BOX SECTIONS ARE REQUIRED. THE USE OF PIPE IN LIEU OF VALVE BOX SECTIONS SHALL NOT BE PERMITTED.

GATE VALVE (N.T.S.)		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.6 / DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	6/06	ADDED NOTE #9
	DATE: JULY 01, 2012 / APPROVED BY: J.E.G.			2	7/09	CLARIFIED NOTES

2012-W6 GATEVALVE.dwg

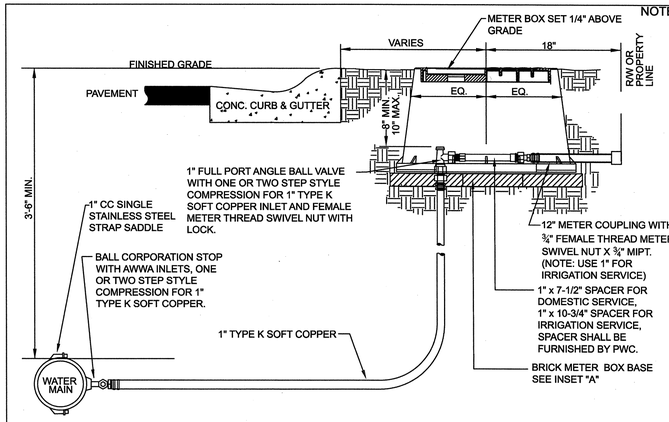


NOTES:

1. VALVE BOX SHALL BE 3-PIECE CLOSE GRAINED CAST IRON SLIP-TYPE VALVE BOX WITH A MINIMUM THICKNESS OF 3/16".
2. VALVE BOX SHALL HAVE RAISED LETTERS "WATER" CAST INTO COVER
3. VALVE BOX SHALL HAVE 3/8" HOLE DRILLED IN TOP SECTION THRU WHICH A 1/4"x1-1/2" GALVANIZED BOLT SHALL BE USED TO SECURE A MINIMUM 12 GAUGE, SINGLE STRAND, COATED COPPER TRACER WIRE FOR NON-FERROUS PIPE. A 1/2" WASHER SHALL BE USED BETWEEN NUT AND INSIDE OF BOX. TIGHTEN HAND TIGHT.
4. SCREW TYPE VALVE BOXES ARE NOT ACCEPTABLE.
5. DIMENSIONS SHOWN ARE FOR INFORMATION ONLY AND VARY BASED UPON THE MANUFACTURER.
6. VALVE BOX SECTIONS ARE REQUIRED. THE USE OF PIPE IN LIEU OF VALVE BOX SECTIONS SHALL NOT BE PERMITTED.
7. TRACING WIRE SHALL BE INSTALLED OUTSIDE OF BOX.

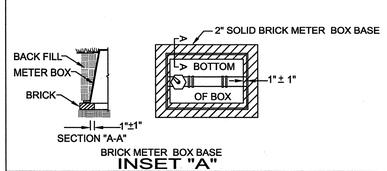
VALVE BOX N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.7 / DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	7/09	ADDED NOTES 7, 8 & CLARIFIED NOTES
	DATE: JULY 01, 2012 / APPROVED BY: J.E.G.					

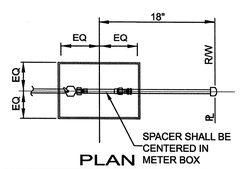
2012-W7 VALVEBOX.dwg



NOTES:

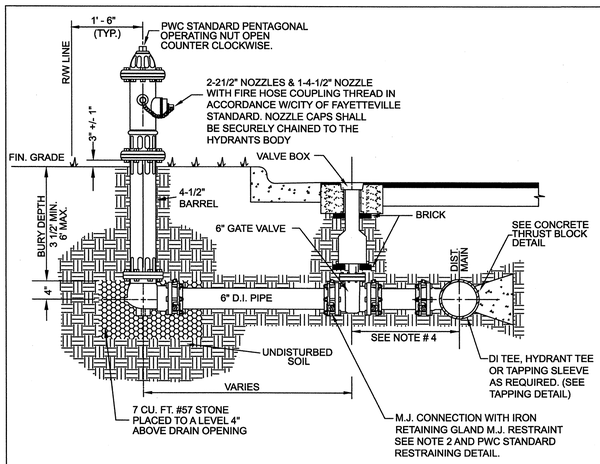
1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH PWC STANDARDS.
2. SERVICE LATERAL SIZE 1" TYPE K SOFT COPPER UNLESS OTHERWISE SPECIFIED.
3. SERVICE LATERAL INSTALLATION SHALL BE APPROVED BY P.W.C.
4. WATER SERVICE LOCK VALVE TO BE LOCATED 18" FROM SANITARY SEWER CLEAN OUT STACK WHEN INSTALLED IN SAME DITCH.
5. WHEN INSTALLED IN A PAVED AREA, METER BOX TO BE SET 1/4" ABOVE FINISHED PAVEMENT GRADES AND PAVEMENT FEATHERED TO TOP OF BOX TO PROVIDE DRAIN AWAY FROM BOX
6. C.I. METER BOXES SHALL BE USED IN TRAFFIC AREAS SEE W.4B.
7. PERIMETER SOLID CONCRETE BRICK BASE WITH NO GAPS, DO NOT LAY BRICK ON PIPE. SEE INSET "A"
8. WHERE ASPHALT CURB OR STRIP PAVEMENT EXIST, THE LOCATION OF BOX SHALL BE AS DIRECTED BY PWC REPRESENTATIVE
9. DISTANCE FROM TOP OF LOCK VALVE OPERATING STEM TO TOP OF BOX SHALL BE 8" MIN. TO 10" MAX.
10. RESIDENTIAL METER BOX SHALL BE SET 18" FROM R/W TO CENTERLINE OF METER BOX PERPENDICULAR TO THE R/W.
11. COMMERCIAL METER BOX LOCATION SHALL BE AS APPROVED (PREFER NO METER BE INSTALLED LESS THAN 5' FROM BLDG. TO EDGE OF BOX).
12. LATERAL SHALL BE CENTERED ON LOT UNLESS OTHERWISE NOTED.
13. LATERAL SHALL NOT BE BACK FILLED UNTIL INSPECTED BY PWC PROJECT COORDINATOR.
14. WATER MAIN AND LATERAL SHALL PASS HYDROSTATIC, LEAKAGE AND STERILIZATION TESTS (200 PSI).
15. SHOULD IT BE NECESSARY TO CRIMP THE WATER SERVICE LATERAL, A FULL CIRCLE REPAIR CLAMP SHALL BE PLACED ON THE CRIMPED AREA.





1" COPPER WATER SERVICE LATERAL		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.24 / DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	MAY 05	VALVE CHANGE
	DATE: JULY 01, 2012 / APPROVED BY: J.E.G.			2	SEPT 05	VALVE CHANGE, ADD NOTE 16.
				3	JULY 06	RESIZED METER COUPLING

2012-W24 COPPER SERVICE LATERAL.dwg



NOTES:

1. ALL VALVES AND HYDRANTS SHALL HAVE M.J. CONNECTIONS WITH IRON RETAINING GLAND M.J. RESTRAINT.
2. FIRE HYDRANT SHALL BE FIELD PAINTED IN ACCORDANCE WITH PWC STANDARDS, BEFORE PROJECT IS ACCEPTED.
3. HYDRANT VALVE SHALL BE PLACED AS CLOSE AS POSSIBLE TO THE MAIN, BUT DO NOT PLACE VALVE IN PROPOSED OR EXISTING CURB AND GUTTER. IF THE STREET IS SOIL AND NO PAVING IS TO BE DONE AT THIS TIME, THE LOCATION OF THE VALVE IS TO BE DETERMINED BY THE PWC PROJECT COORDINATOR.
4. FIRE HYDRANTS SHALL BE PLACED AS DIRECTED BY THE PWC PROJECT COORDINATOR.
5. HYDRANT BRANCH SHALL NOT BE BACK FILLED UNTIL INSPECTED AND APPROVED BY PWC PROJECT COORDINATOR.
6. GATE VALVE AND BOX SHALL BE IN ACCORDANCE WITH PWC STANDARD DETAIL.
7. HYDRANT EXTENSIONS AND/OR OFFSETS SHALL BE APPROVED BY PWC PROJECT COORDINATOR.

FIRE HYDRANT AND VALVE INSTALLATION (N.T.S.)		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.13 / DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	10/23/03	REVISED NOTE #4
	DATE: JULY 01, 2012 / APPROVED BY: J.E.G.			2	7/1/09	REVISED NOTE #2, REMOVED NOTE #3 & ALTERED RESTRAINT DETAIL

2012-W13 FHCC.dwg

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F-0342

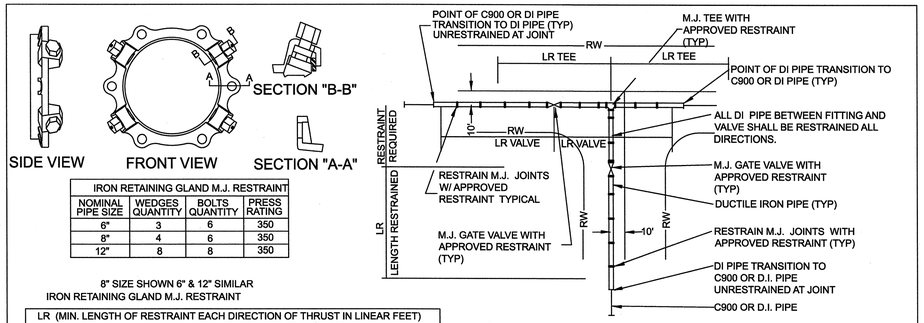
DATE: 9/4/2013
DGN: aecom_uc_psb22.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-23

SCALE: NONE

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION

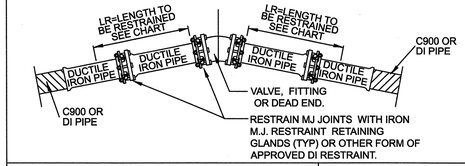


IRON RETAINING GLAND M.J. RESTRAINT			
NOMINAL PIPE SIZE	WEDGES QUANTITY	BOLTS QUANTITY	PRESS RATING
6"	3	6	350
8"	4	6	350
12"	8	8	350

8" SIZE SHOWN 6" & 12" SIMILAR
IRON RETAINING GLAND M.J. RESTRAINT

RESTRAINED JOINT DETAIL FOR TYPICAL TEE INTERSECTION
4 WAY INTERSECTION SIMILARLY RESTRAINED

LR (MIN. LENGTH OF RESTRAINT EACH DIRECTION OF THRUST IN LINEAR FEET) Based on 200 psig pressure, Safety Factor of 2.0:1, BARE DI PIPE AND ML Soil, 3.5' cover Chart does not apply to pipes wrapped in polyethylene wrap						
PIPE SIZE	VALVES DEAD ENDS TEES	90° ELBOWS	45° ELBOW & CROSSES	22-1/2° ELBOWS	REDUCER	
6"	55'	31'	13'	7'	8"X2"	67'
8"	72'	40'	17'	8'	8"X6"	30'
12"	102'	57'	24'	12'	12"X8"	54'
16"	140'	101'	42'	20'	16"X8"	140'



NOTES:

1.) THRUST RESTRAINT SHALL BE INSTALLED ON DUCTILE IRON WATER DISTRIBUTION LINES 6" THRU 12" DIAMETER IN THE MANNER SHOWN. SEE PWC STANDARD THRUST BLOCK DETAIL W.17 FOR PVC RESTRAINT.

2.) IRON RETAINING GLAND M.J. RESTRAINT OR OTHER FORMS OF IRON RESTRAINT SHALL NOT BE USED ON PVC PIPE.

3.) PIPE GREATER THAN 12 INCH DIAMETER SHALL REQUIRE RESTRAINED JOINT PIPE FOR THE PROPER LENGTH.

4.) COMPACT FITTINGS ARE ACCEPTABLE FOR USE WITH IRON RETAINING GLAND M.J. RESTRAINT AND OTHER FORMS OF DI RESTRAINT.

5.) THE MINIMUM LENGTH OF RESTRAINT INDICATED SHALL REQUIRE ALL JOINTS WITHIN THE LR DISTANCE TO BE RESTRAINED.

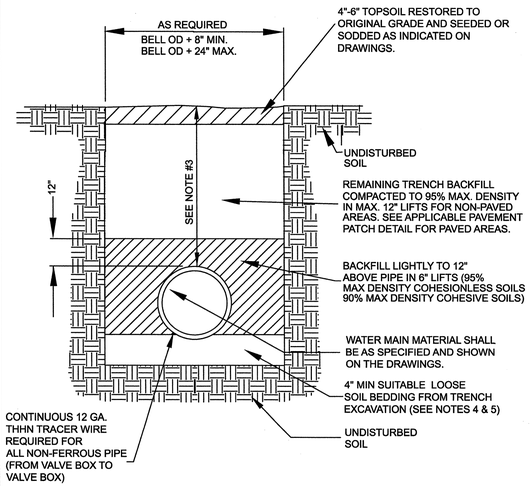
6.) RESTRAINT SYSTEM SHALL BE INSPECTED AND APPROVED PWC PRIOR TO BACKFILLING.

7.) RESTRAINT SYSTEMS MAY VARY BASED UPON THE ENGINEERS' DESIGN AS SHOWN ON THE PLAN AND PROFILE SHEETS.

8) GRIPPER RING AND FIELD LOK GASKETS ARE AN ACCEPTABLE METHOD OF RESTRAINT ON DUCTILE IRON PIPE ONLY.

ALTERNATE RESTRAINT DETAIL (DUCTILE IRON PIPE ONLY) N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.18	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	11/16/2007	REVISED TABLE, ADDED NOTE 8
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.					

2012-W18 RESTRAINT DETAIL.dwg



NOTES:

1. ALL EXCAVATIONS SHALL COMPLY WITH THE TERMS AND CONDITIONS OF THE CONSTRUCTION STANDARDS FOR EXCAVATIONS IN OSHA "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION", CHAPTER XV11 OF TITLE 29, CFR, PART 1926. THE CONTRACTOR SHALL HAVE A COMPETENT PERSON ON SITE AT ALL TIMES DURING EXCAVATION AND BACKFILLING.
2. CONTRACTOR SHALL USE TRENCH BOX SHORING IN ALL OPEN CUTS IN PAVED AREAS. TRENCH WIDTH SHALL BE MAINTAINED AT THE MINIMUM PRACTICAL WIDTH.
3. TYPE 3 TRENCH CONDITIONS AND A MINIMUM OF 4' OF COVER MUST BE MAINTAINED WHERE RESTRAINT JOINT PIPE IS SPECIFIED AND 3.5' OF COVER IN ALL OTHER LOCATIONS UNLESS SHOWN OTHERWISE ON THE PLAN PROFILE.
4. LOOSE SOIL OR SELECT MATERIAL IS DEFINED AS "NATIVE" SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.
5. BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS AND TRENCH BOTTOM. BEDDING MATERIAL WILL NOT BE PAID FOR UNLESS SPECIFICALLY APPROVED BY THE PROJECT REPRESENTATIVE AND ONLY FOR THE AUTHORIZED QUANTITY.
6. BEDDING MATERIAL SHALL BE PROPERLY RODDED AND COMPACTED AROUND THE PIPE HAUNCHES.
7. TEST FOR DENSITY OF COMPACTION MAY BE MADE AT THE OPTION OF THE ENGINEER AND DEFICIENCIES SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. THE ENGINEER MAY HAVE COMPACTION TEST PERFORMED AFTER THE BACKFILL IS COMPLETE. CONTRACTOR SHALL BE REQUIRED TO EXCAVATE TO VARIOUS ELEVATIONS FOR DENSITY TESTING EXCAVATION, BACKFILL AND RECOMPACTION SHALL BE PERFORMED AT NO ADDITIONAL COSTS TO THE OWNER.

TYPE 3 TRENCH WATER MAIN BEDDING DETAIL N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.19	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.					

2012-W19 WATER BEDDING.dwg

1. CONTRACTOR SHALL SAW CUT OR MILL ALL PAVEMENTS STRAIGHT AND TRUE PRIOR TO TRENCHING. CONTRACTOR SHALL SAW CUT PATCH AREAS AGAIN IMMEDIATELY PRIOR TO PATCH PAVING . THE FINAL SAW CUT FOR PATCHES SHALL BE STRAIGHT WITH A NEAT SQUARE EDGE AND OF UNIFORM WIDTH PARALLEL WITH THE EDGE OF PAVEMENT/CURB LINE. THE FINAL PRODUCT SHALL BE SUBJECT TO THE OWNERS APPROVAL..

2. CONTRACTOR SHALL SWEEP STREETS AND PROVIDE DUST CONTROL AT ALL TIMES VIA WATER TRUCK, BROOMS, COMPACTORS, ETC. DEBRIS FROM SWEEPING OPERATIONS SHALL NOT BE DIRECTED TOWARD YARDS. CLEAN UP OF DEBRIS, TRASH, EXCESS MATERIALS ETC. SHALL BE PERFORMED DAILY.

3. ANY TRENCHES OPENED FOR PAVING SHALL BE PAVED BY THE END OF THE SAME DAY. IF WEATHER CONDITIONS CHANGE, EQUIPMENT BREAKS DOWN, OR ANY OTHER OCCURRENCE THAT STOPS THE PAVING OPERATIONS OCCURS, BACKFILL ALL PREPARED AREAS SO THEY ARE PASSABLE BY TRAFFIC.

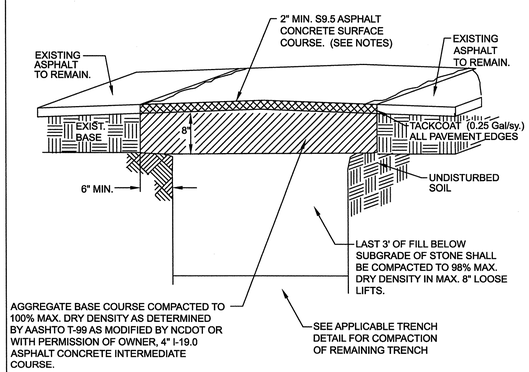
4. THE CONTRACTOR SHALL PATCH PAVE SERVICE LATERALS ON THE SAME DAY THAT MAIN LINE TRENCHES ARE PAVED. LATERALS SHALL BE PATCHED ON BOTH SIDES OF THE STREET AS PAVING PROGRESSES.

5. THE CONTRACTOR SHALL BE REQUIRED TO IMPLEMENT PROPER TRAFFIC CONTROL PROVISIONS AND ANY DEVICES REQUIRED TO IDENTIFY OBSTRUCTIONS OR HAZARDS WITHIN THE RIGHT-OF-WAY TO INCLUDE REFLECTIVE CONES AT EACH SERVICE LATERAL, REFLECTIVE BARRELS ON RAISED MANHOLES, ETC.

6. AT NO TIME SHALL THE CONTRACTOR LEAVE UNATTENDED AND/OR IMPROPERLY SECURE MAIN OR LATERAL TRENCHES WITH A VERTICAL ELEVATION DROP EXCEEDING 1" FROM EXISTING ASPHALT TO TRENCH SUB GRADE UNATTENDED OR OVERNIGHT.

PAVEMENT REPAIR NOTES			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.1	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	07/2010	REVISED, DELETED NOTES
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.					

2012-M1 PAVEMENT_REPAIR_NOTES.dwg



NOTES:

1. CONTRACTOR SHALL PATCH PAVEMENT TO THE SAME PAVEMENT PROFILE AS EXISTED PRIOR TO REMOVING PAVEMENT.
2. WHERE PATCH OF ASPHALT CURBING OCCURS CONTRACTOR SHALL MATCH EXISTING CURB GRADES WITHIN 0.02 FEET. PATCHES THAT ARE ABOVE THE CURB GRADE LINE WILL NOT BE ACCEPTABLE AND SHALL BE REMOVED AND REPLACED. CURB PATCH SHALL BE THE SAME SHAPE/TEMPLATE AS THE EXISTING CURB.
3. CONTRACTOR SHALL BE REQUIRED TO PROVIDE TRAFFIC CONTROL AND DEVICES AS REQUIRED BY THE M.U.T.C.D. OR N.C.SUPPLEMENT. WORK CANNOT PROCEED UNTIL THE MEASURES ARE IN PLACE. CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT NEW PAVEMENT FROM TRAFFIC AND OTHER SOURCES OF DAMAGE UNTIL ASPHALT HAS SUFFICIENTLY COOLED TO PREVENT DAMAGE.
4. CONTRACTOR SHALL SAWCUT EXISTING PAVEMENT STRAIGHT AND TRUE IMMEDIATELY PRIOR TO PAVING. THE FINAL PRODUCT SHALL BE SUBJECT TO THE OWNERS APPROVAL.
5. PATCH PAVING ON N.C.D.O.T. MAINTAINED ROADS SHALL BE IN ACCORDANCE WITH THE APPROVED N.C.D.O.T. ENCROACHMENT.
6. PROVIDE A MINIMUM OF 2" PAVEMENT (S9.5), IF THE EXISTING PAVEMENT IS 2" OR LESS. MATCH EXISTING PAVEMENT THICKNESS IF OVER 2".
7. FOR PATCHES UP TO 4" THICK, PLACE S9.5 IN 2 LIFTS.
8. FOR PATCHES OVER 4" THICK, PLACE BINDER (I-19.0) TO 2" BELOW SURFACE. INSTALL BINDER IN 2" (MAX) LIFTS. THE FINAL 2" SHALL BE SURFACE (S9.5).
9. ALL PATCHES SHALL HAVE A MINIMUM OF 8" ABC UNDER ALL PAVEMENT, INCLUDING CURB AS REQUIRED.

PERMANENT PAVEMENT PATCH N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.2	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	01/2007	CHANGED ASPHALT MIX
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.			2	08/2010	REVISED, DELETED NOTES

2012-M2 PER_PATCH REV.dwg

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F-0342

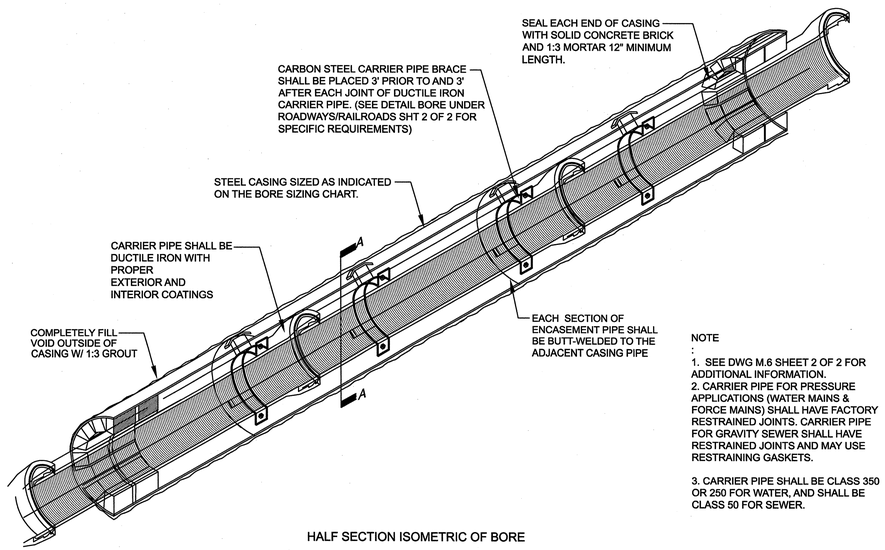
DATE: 8/29/2013
DGN: u2810c_uc_pa23.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-24

SCALE: NONE

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION



HALF SECTION ISOMETRIC OF BORE

NOTE
:
1. SEE DWG M.6 SHEET 2 OF 2 FOR ADDITIONAL INFORMATION.
2. CARRIER PIPE FOR PRESSURE APPLICATIONS (WATER MAINS & FORCE MAINS) SHALL HAVE FACTORY RESTRAINED JOINTS. CARRIER PIPE FOR GRAVITY SEWER SHALL HAVE RESTRAINED JOINTS AND MAY USE RESTRAINING GASKETS.

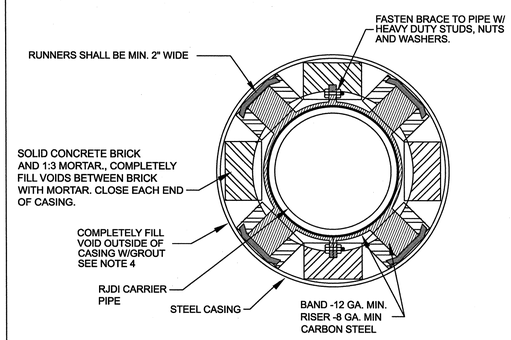
3. CARRIER PIPE SHALL BE CLASS 350 OR 250 FOR WATER, AND SHALL BE CLASS 50 FOR SEWER.

BORE UNDER ROADWAYS/RAILROADS N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. M.6	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1.	JAN 05	ADDED NOTES 2 & 3
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.			2.	OCT 09	Clarified restraint requirements.

2012-M6 BORE_ROAD_RAIL.dwg

BORE SIZING CHART *			
CARRIER PIPE SIZE	MIN. CASING SIZE	ROADWAYS MIN. WALL THICKNESS	RAILROADS MIN. WALL THICKNESS
4"	10"	0.188"	0.188"
6"	12"	0.25"	0.281"
8"	16"	0.25"	0.281"
12"	24"	0.25"	0.375"
16"	30"	0.312"	0.469"
18"	30"	0.312"	0.469"
24"	36"	0.375"	0.532"
30"	42"	0.500"	0.625"
36"	48"	0.500"	0.688"

*CONTRACTOR MAY SUBSTITUTE A LARGER SIZE CASING PIPE HAVING THE MIN. WALL THICKNESS SHOWN FOR SEWER MAINS. ALL ADDITIONAL COSTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BORING AND JACKING.

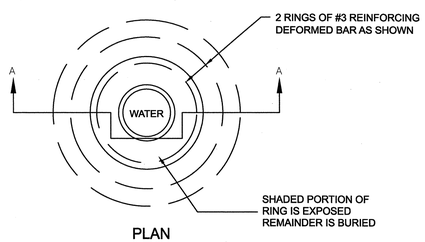


SECTION "A-A" CARBON STEEL CARRIER PIPE BRACE

NOTES:
1. INSTALLATION SHALL BE DRY BORE AND JACKING OF SMOOTH WALL STEEL PIPE. JETTING OR WET BORING WITH WATER SHALL NOT BE ALLOWED.
2. SEE BORE SIZING CHART FOR CARRIER PIPE SIZE AND STEEL CASING SIZE , MIN. DIA. AND WALL THICKNESS.
3. CASING PIPE SHALL BE IN ACCORDANCE WITH ASTM A-53, GRADE B WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI
4. EACH END OF ENCASEMENT TO BE PLUGGED WITH BRICK. ALL VOIDS OUTSIDE THE CASING PIPE SHALL BE COMPLETELY FILLED WITH 1:3 PORTLAND CEMENT GROUT AT SUFFICIENT PRESSURE TO INSURE NO SETTLEMENT OF ROADWAY/ RAILROAD. METHOD OF GROUTING SHALL BE AS APPROVED BY THE PERMITTING AGENCY.
5. IT IS RECOMMENDED THAT THE BORE BE ACCOMPLISHED BEFORE PIPE CONSTRUCTION BEGINS.
6. THE BORING SHALL BE PERFORMED FROM "UPSTREAM" TO "DOWNSTREAM" DIRECTION MAINTAINING THE CRITICAL DOWNSTREAM INVERT ELEVATION. SHOULD THE BORE NOT BE ON GRADE, A REVISED PLAN SHALL BE SUBMITTED TO PWC FOR APPROVAL.
7. THE BORING OPERATION SHALL BE CONDUCTED IN A MANNER THAT THE FLOW OF TRAFFIC IS NOT IMPEDED OR IN SUCH A MANNER SO AS NOT TO CREATE A HAZARD.
8. IF AN OBSTRUCTION IS ENCOUNTERED DURING THE BORING OPERATION, THE AUGER SHALL BE WITHDRAWN THE EXCESS CASING PIPE CUT-OFF, CAPPED AND THE INTERIOR AND EXTERIOR VOIDS SHALL BE COMPLETELY FILLED W/1:3 PORTLAND CEMENT GROUT UNDER PRESSURE. NO SEPARATE PAYMENT FOR UNSUCCESSFUL BORES.
9. CONTRACTOR SHALL FIELD ADJUST AND INSTALL PROPER PIPE BRACES TO ACCOMPLISH GRADE AND INVERTS AS SHOWN ON THE DRAWINGS.
10. A MANUAL CONTROL STEERING HEAD OR OTHER GUIDANCE SYSTEM IS RECOMMENDED FOR BORES 30" DIAM. AND/OR LARGER AND FOR BORES EXCEEDING 100' IN LENGTH OR AS SPECIFIED.
11. SUBCONTRACTORS SHALL ADHERE TO ALL PERMIT REQUIREMENTS AND SHALL PROVIDE APPROVED INSURANCE CERTIFICATES AS REQUIRED.
12. CONTRACTOR SHALL EXECUTE AND PERFORM ALL REQUIREMENTS AND CONDITIONS STIPULATED BY THE PERMITTING AGENCY.
13. SEE DWG. M.6 SHEET 1 OF 2 FOR ADDITIONAL INFORMATION.
14. CARRIER PIPE FOR PRESSURE APPLICATIONS (WATER MAINS & FORCE MAINS) SHALL HAVE FACTORY RESTRAINED JOINTS. CARRIER PIPE FOR GRAVITY SEWER SHALL HAVE RESTRAINED JOINTS AND MAY USE RESTRAINING GASKETS.

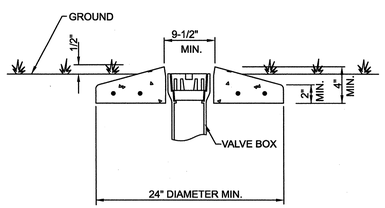
BORE UNDER ROADWAYS/RAILROADS N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. M.6	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1.	2/11/04	ADDED 6" CARRIER PIPE TO BORE SIZING CHART
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.			2	JULY 10	REVISED NOTES, SIZING CHART

2012-M6 BORE_ROAD_RAIL.dwg

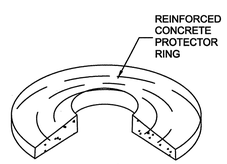


PLAN
N.T.S.

NOTES:
1. CONCRETE PROTECTOR RING SHALL BE 2500 P.S.I. PRECAST REINFORCED CONCRETE
2. VALVE BOX SHALL BE AT GRADE W/PROTECTOR RING EXTENDING 1/2" ABOVE GRADE
3. SEE GATE VALVE AND BOX DETAIL
4. VALVE BOX PROTECTOR RINGS SHALL BE INSTALLED AROUND VALVE BOX IN UNPAVED NON-TRAFFIC AREAS. AND SHALL NOT CREATE A HINDERANCE TO MOWING OPERATIONS.



SECTION A-A
N.T.S.

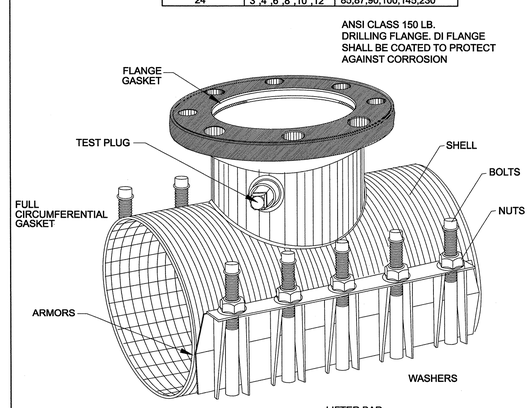


CUT AWAY VIEW
N.T.S.

VALVE BOX PROTECTOR RING			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.8	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JULY 01, 2012	APPROVED BY: J.E.G.					

2012-W8 CONC PROTECTOR RING.dwg

NOMINAL PIPE SIZE (INCH)	BRANCH SIZE	APPROX. WT. LBS.
4"	3",4"	28,30
6"	3",4",6"	36,38,45
8"	3",4",6",8"	42,44,48,66
10"	3",4",6",8",10"	45,48,55,70,80,
12"	3",4",6",8",10",12"	50,52,60,81,96,143
16"	3",4",6",8",10",12"	78,80,85,100,115,172
24"	3",4",6",8",10",12"	85,87,90,100,145,230



NOTES:

1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH PWC STANDARDS.

2. STAINLESS STEEL TAPPING SLEEVE MAY BE UTILIZED FOR ALL TAPPING OF MAINS UP TO AND INCLUDING 24" DIAMETER WITH 12" OR LESS BRANCH. BRANCH GREATER THAN 12" SHALL REQUIRE FULL BODY D.I. M.J. TAPPING SLEEVE (SEE DETAIL W.10).

3. SHELL AND LUGS SHALL BE STAINLESS STEEL PER ASTM A 240, TYPE 304 AND 304L.

4. BOLTS SHALL BE 5/8" UNC ROLLED THREAD, STAINLESS STEEL PER ASTM A 193 TYPE 304 4" NOM. PIPE SIZE SHALL HAVE MIN. 1/2" BOLTS.

5. NUTS SHALL BE HEAVY HEX STAINLESS STEEL PER ASTM A-194, TYPE 304.

6. WASHERS SHALL BE STEEL AND PLASTIC LUBRICATING WASHER.

7. GASKETS SHALL BE VIRGIN SBR PER ASTM D 2000 MAA 610, COMPOUNDED FOR WATER AND SEWER SERVICE.

8. FLANGE SHALL BE DUCTILE IRON PER ASTM 536, GRADE 65-45-12, OR STAINLESS STEEL PER ASTM A-240, TYPE 304.

9. DIMENSIONS SHOWN ARE FOR REFERENCE AND MAY VARY BASED UPON MANUFACTURER. SLEEVES SHALL BE SIMILAR IN NATURE TO THAT SHOWN AND SHALL NOT DEVIATE IN ESSENTIAL DETAILS.

10. PIPE SURFACES SHALL BE CLEANED THOROUGHLY TO PERMIT A GOOD SEAL PRIOR TO INSTALLATION.

11. ALL TAPPING SLEEVES SHALL BE HYDROSTATICALLY PRESSURE TESTED IN ACCORDANCE WITH PWC SPECIFICATIONS. TEST SHALL BE WITNESSED AND APPROVED BY PWC PROJECT COORDINATOR PRIOR TO BEGINNING TAPPING PROCESS.

12. THE NUMBER OF BOLTS, NUTS AND WASHERS SHOWN ARE FOR ILLUSTRATION ONLY, ACTUAL QUANTITY SHALL BE AS RECOMMENDED BY THE SLEEVE MANUFACTURER FOR THE REQUIRED SERVICE.

13. SEE DETAILS W.9 AND W.17 FOR ADDITIONAL REQUIREMENTS.

STAINLESS STEEL TAPPING SLEEVE N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.11	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	7/09	ADDED NOTES 2, 12 & CLARIFIED NOTES
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.			2	7/13	REVISED NOTES 3, 12, 14

2013-W11 SSTAPPING SLEEVE.dwg

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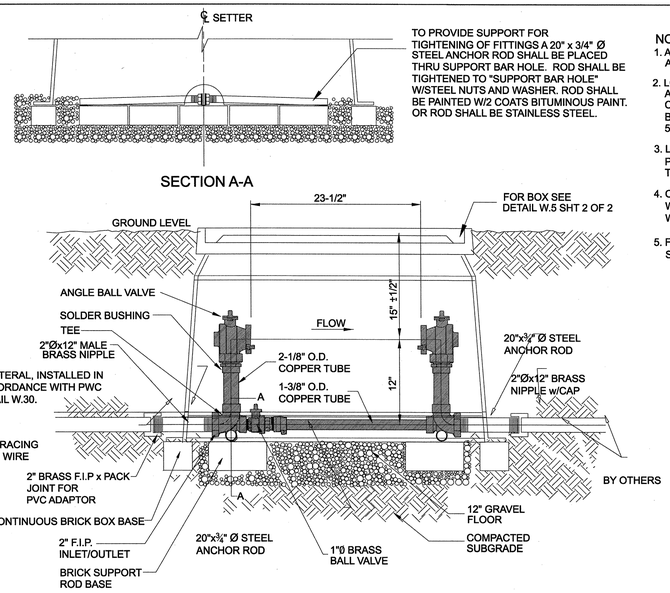
DATE: 9/4/2013
DGN: u2810c_uc_jobs24.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-25

SCALE: NONE

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

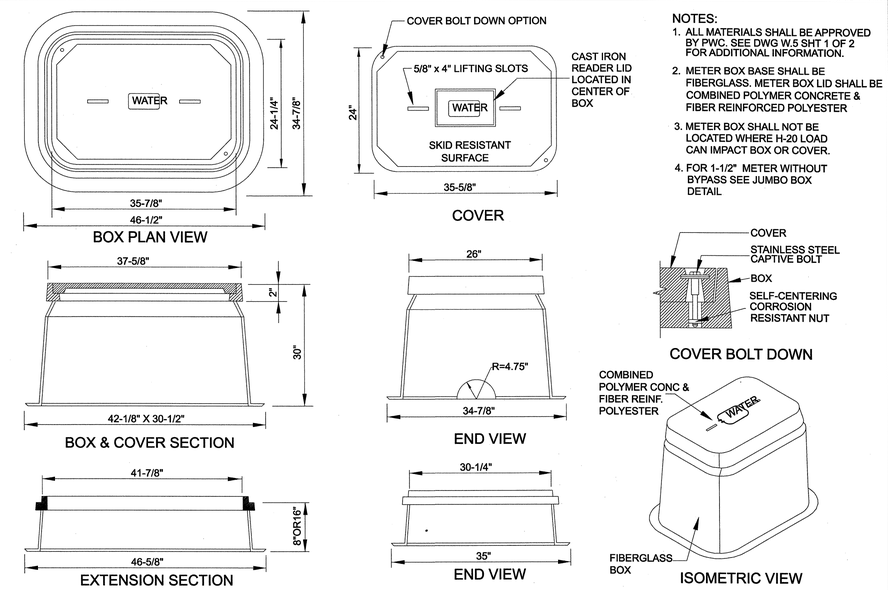
UTILITY CONSTRUCTION



NOTES:
1. ALL MATERIALS SHALL BE APPROVED BY PWC.
2. LOCATION OF BOX SHALL BE AS DETERMINED BY PWC PROJECT COORDINATOR. IN NO CASE SHALL BOX BE INSTALLED CLOSER THAN 5' TO BUILDING.
3. LATERAL SHALL BE APPROVED BY PWC PROJECT COORDINATOR PRIOR TO BACKFILL.
4. CONTRACTOR TO INSTALL TRACING WIRE INTO BOX. PROVIDE MIN. 2' OF WIRE IN BOX.
5. FOR METER BOX SEE dwg. W.5 SHEET 2 OF 2.

2" COPPERSETTER w/BYPASS 23-1/2" METER SPACING			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. W.5	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	07/2013	REVISED, UPDATED NOTES
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.					

2013-W5 2 METER SETTER.dwg



NOTES:
1. ALL MATERIALS SHALL BE APPROVED BY PWC. SEE DWG W.5 SHT 1 OF 2 FOR ADDITIONAL INFORMATION.
2. METER BOX BASE SHALL BE FIBERGLASS. METER BOX LID SHALL BE COMBINED POLYMER CONCRETE & FIBER REINFORCED POLYESTER
3. METER BOX SHALL NOT BE LOCATED WHERE H-20 LOAD CAN IMPACT BOX OR COVER.
4. FOR 1-1/2" METER WITHOUT BYPASS SEE JUMBO BOX DETAIL

1-1/2" & 2" BY-PASS METER BOX			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. W.5	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.					

2013-W5 2 METER SETTER.dwg

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DATE: 9/4/2013
DGN: u2810c_uc_gen25.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-26

SCALE: NONE

NORTH CAROLINA PROFESSIONAL SEAL 023965 ENGINEER LARRY W. MITCHELL

UTILITY CONSTRUCTION

1. CONTRACTOR SHALL REPAIR ALL SEWER LATERALS AND MAINS DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY REPORT ALL SEWER MAIN AND LATERAL BREAKS TO THE PWC PROJECT COORDINATOR. THE CONTRACTOR SHALL INITIATE IMMEDIATE REPAIRS IN ACCORDANCE WITH PWC STANDARDS.

2. SEWER MAINS, LATERALS, AND MANHOLES SHALL BE INSTALLED UTILIZING A PWC APPROVED CUT-SHEET, INDICATING INSTALLATION DEPTH.

3. TRANSFER OF SEWER SERVICES SHALL BE ACCOMPLISHED AS FOLLOWS:
   A. INSTALL AND TEST NEW MAINS, MANHOLES, AND LATERALS. CLEANOUTS SHALL BE INSTALLED 18" INSIDE R/W UNLESS OTHERWISE DIRECTED BY PWC.
   B. CONNECT EXISTING PLUMBING TO NEW LATERAL UTILIZING THE NECESSARY FITTINGS AS DIRECTED BY PWC.
   C. AFTER ALL SERVICES HAVE BEEN TRANSFERRED TO THE NEW MAIN, THE EXISTING SEWER SYSTEM SHALL BE ABANDONED IN ACCORDANCE WITH PWC REQUIREMENTS.

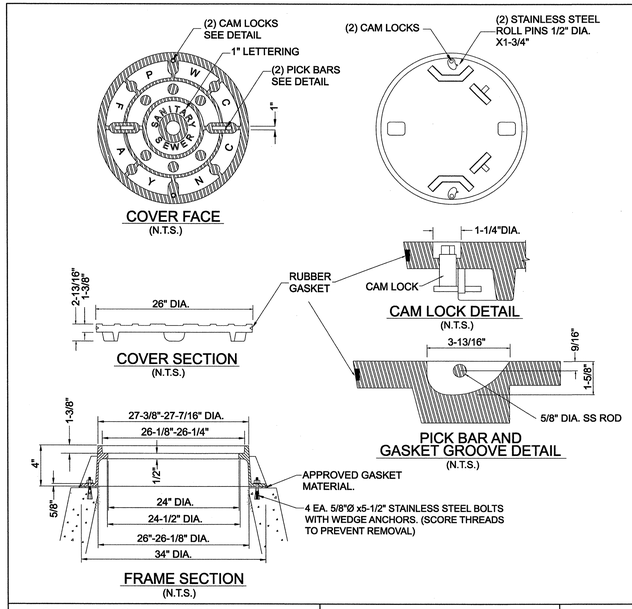
4. WHEN THE EXISTING MAIN IS NOT TO BE ABANDONED, THE CONTRACTOR SHALL UNCOVER THE EXISTING LATERAL AT THE MAIN, CUT AND PLUG BOTH ENDS, REMOVE THE EXISTING CLEANOUT AND COMBINATION, AND PLUG THE LATERAL TO ABANDON THE OLD SERVICE.

5. SEWER PLUGS SHALL BE INSTALLED TO ELIMINATE ANY DEBRIS OR OTHER MATERIAL FROM ENTERING THE ACTIVE SEWER SYSTEM. UPON ACCEPTANCE OF THE NEW SEWER SYSTEM, THE CONTRACTOR SHALL CLEAN THE NEW MAINS, REMOVE ALL DEBRIS, AND THEN REMOVE THE PLUG.

6. SEPARATION REQUIREMENTS:
   A. **LATERAL SEPARATION OF SEWERS AND WATER MAINS:** WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY FROM EXISTING OR PROPOSED SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION - IN WHICH CASE:
      i. THE WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL; OR
      ii. THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER MAIN/LATERAL WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL
   B. **CROSSING A WATER MAIN OVER A SEWER:** WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER MAIN/LATERAL, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT AN 18 INCH VERTICAL SEPARATION - IN WHICH CASE BOTH THE WATER MAIN AND SEWER MAIN/LATERAL SHALL BE CONSTRUCTED OF FERROUS MATERIAL AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
   C. **CROSSING WATER MAIN UNDER A SEWER:** WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER MAIN/LATERAL, BOTH THE WATER MAIN AND THE SEWER MAIN/LATERAL SHALL BE CONSTRUCTED OF DUCTILE IRON MATERIAL AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
   D. **CROSSING STORM DRAINAGE LINES:** A MINIMUM OF 24-INCHES OF VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN A SEWER MAIN/LATERAL CROSSING UNDER A STORM DRAINAGE LINE UNLESS DUCTILE IRON PIPE IS USED. IF DUCTILE IRON PIPE IS USED, A MINIMUM OF SIX(6) INCHES OF SEPARATION SHALL BE MAINTAINED, UNLESS OTHERWISE APPROVED BY PWC.

GENERAL NOTES SANITARY SEWER UTILITY		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.1	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.				

2013-S1 SEWER NOTES.dwg



NOTES:

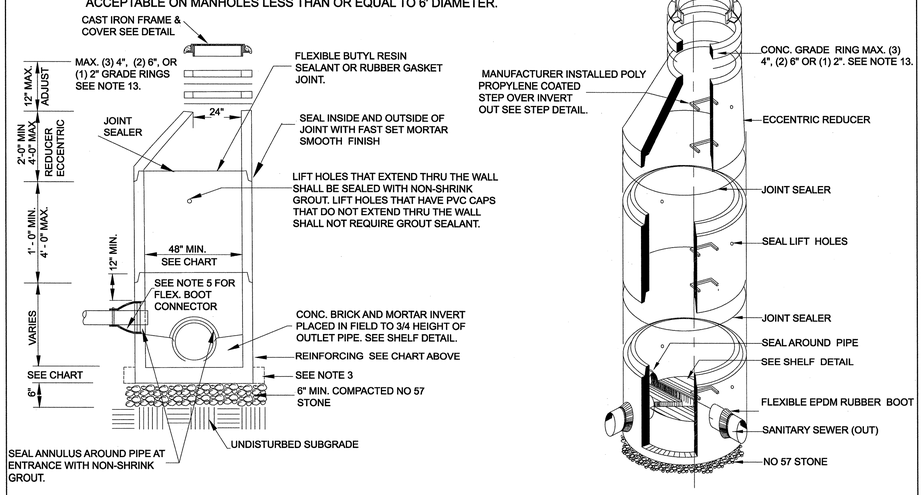
1. MANHOLE FRAME AND COVER TO BE MADE OF GRAY CAST IRON CONFORMING TO ASTM SPEC. A48-83, CLASS 35, MANUFACTURED BY SAME MANUFACTURER. ALL CASTINGS SHALL CONFORM TO THE SHAPE AND DIMENSIONS SHOWN. THEY SHALL BE CLEAN AND PERFECT, WITHOUT BLOW OR SAND HOLES OR DEFECTS OF ANY KIND, TENDING TO IMPAIR THEIR STRENGTH. NO PLUGGING OR STOPPING OF DEFECTIVE HOLES WILL BE PERMITTED.
2. CASTINGS SHALL BE UNPAINTED AND SHALL HAVE THE LETTERS "PWC-FAY-NC" AND "SANITARY SEWER" CAST INTO COVER. LETTERS SHALL BE RAISED AND CLEARLY VISIBLE.
3. MANHOLE RING AND COVER SHALL WITHSTAND H-20 VEHICULAR TRAFFIC.
4. MINIMUM AVERAGE WEIGHT: PLUS OR MINUS 5% RING 155 LBS., COVER 160 LBS., UNIT 315 LBS.
5. PERFORATED COVERS WILL NOT BE ALLOWED.
6. SUPPLY SOCKET FOR TURNING CAM LOCK MECHANISM. ONE SOCKET PER PROJECT.
7. USE OF CONCRETE GRADE RINGS ARE NOT ALLOWED, UNLESS APPROVED BY THE PWC PROJECT COORDINATOR.
8. THIS DETAIL IS TO BE USED ON ALL MANHOLES LOCATED OUTSIDE OF PAVED AREAS, UNLESS OTHERWISE APPROVED.
9. REFER TO DETAIL S.17 FOR INSTALLATION OF VENT STACK.

STANDARD NON-TRAFFIC AREA MANHOLE RING AND COVER WITH WIPER GASKET & CAM LOCK		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.6	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	JUL 08	REVISED NOTE ON FRAME SECTION ADDED NOTE 7, 8
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.		2	DEC 08	REVISED DIMENSIONS ON FRAME SECTION
				3	JUL 09	REVISED NOTES ON FRAME SECTION/REVISED NOTE 3

2013-S6 RING COVER.dwg

PIPE SIZES	MANHOLE SIZE	MIN. WALL THICKNESS	MIN. REINF. STEEL	MIN. BASE THICKNESS
21" & LESS	48" DIAMETER	5"	ASTM A-185 0.12 SQ./IN.	6"
24" - 36"	60" DIAMETER	6"	ASTM A-185 0.15 SQ./IN.	8"
42"	72" DIAMETER	7"	ASTM A-185 0.15 SQ./IN.	8"

MANHOLE DIAMETER SIZES MAY BE ADJUSTED ON THE PLANS TO REFLECT SPECIAL CIRCUMSTANCES. REDUCING SLABS ARE NOT ACCEPTABLE ON MANHOLES LESS THAN OR EQUAL TO 6' DIAMETER.



STANDARD MANHOLE		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. S.2	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	FEB 07	CREATED S.2A ADDED NOTES 13-17
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.		2	JULY 13	ADDED SHEET 2 OF 2

2013-S2 STANDARD MANHOLE.dwg

NOTES:

1. PRECAST REINFORCED CONCRETE MANHOLES SHALL BE IN ACCORDANCE WITH ASTM C-478.

2. MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI.

3. MANHOLES GREATER THAN 12' DEPTH SHALL HAVE MINIMUM 6" EXTENDED BASE.

4. FLEXIBLE BUTYL RESIN JOINT SEALANT SHALL BE IN ACCORDANCE WITH ASTM C990. RUBBER GASKET JOINTS SHALL BE IN ACCORDANCE WITH ASTM C-443.

5. FLEXIBLE EPDM RUBBER BOOT CONNECTORS SHALL BE IN ACCORDANCE WITH ASTM C923, INSTALLED BY MANUFACTURER WITH STAINLESS STEEL COMPRESSION RING AND TAKE-UP CLAMP. CONNECTION TO MAIN SHALL BE BY CONTRACTOR WITH STAINLESS STEEL PIPE CLAMP.

6. CONNECTIONS TO EXISTING MANHOLES SHALL BE BY CORING MANHOLE AND FIELD INSTALLING A FLEX BOOT CONNECTOR. DO NOT ALLOW DEBRIS TO ENTER SYSTEM.

7. MORTAR SHALL BE QUICK SETTING, NON-SHRINK GROUT MIXED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

8. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH ASTM C478 AND OSHA REGULATIONS. ALIGN STEPS WITH INVERT OUT.

9. PRECAST INVERTS ARE NOT ALLOWED. STANDING WATER IN INVERT OF MANHOLE IS NOT ACCEPTABLE.

10. VERTICAL DROPS BETWEEN THE INFLOW PIPES AND OUTFLOW PIPES SHALL REQUIRE THE FOLLOWING:
A. GREATER THAN 2.5' SEE DROP STRUCTURE DETAIL (MIN. 5' DIAMETER MH REQUIRED).
B. 1' TO 2.5' SEE PIPE SLIDE DETAIL.
C. LESS THAN 1' SEE MORTAR SLIDE DETAIL.

11. AN ECCENTRIC CONE SHALL BE UTILIZED ON ALL MANHOLES, UNLESS OTHERWISE APPROVED BY PWC.

12. INVERT ON PLANS IS TO MANHOLE CENTERLINE.

13. CONCRETE GRADE RINGS SHALL NOT BE USED FOR ABOVE GRADE ADJUSTMENTS (i.e., OUTFALL AREAS). USE OF GRADE RINGS ARE ALLOWABLE IN YARD AREAS AND PAVEMENT, WHERE THE RING AND COVER ARE AT GROUND LEVEL.

14. THE MINIMUM SLOPE ACROSS THE INVERT OF THE MANHOLE SHALL BE 1%, UNLESS OTHERWISE APPROVED BY PWC.

15. THE EXTERIOR MANHOLE RISER JOINTS, INCLUDING THE JOINT AT THE CONE, SHALL BE SEALED ON THE OUTSIDE BY AN APPROVED JOINT WRAP. THE WRAP SHALL BE IN ACCORDANCE WITH PWC SPECIFICATIONS.

16. MANHOLE BOOT FOR 4-INCH LATERALS. SHOULD IT BE NECESSARY TO INSTALL A 4-INCH LATERAL INTO A MANHOLE, THE RUBBER BOOT THAT THE LATERAL IS INSERTED INTO SHALL BE SECURELY FASTENED TO THE CORE HOLE BY UTILIZING A STAINLESS STEEL BAND THAT IS TIGHTENED USING A JACK OR A TORQUE WRENCH (DIRECT DRIVE). BOTH STANDARD SIZE AND STEP DOWN BOOTS ARE ALLOWED. THE TORQUE WRENCH SHALL BE SUPPLIED BY THE MANUFACTURER. NO OTHER TYPE BANDS OR METHOD OF SECURING THE BOOT TO THE MANHOLE SHALL BE ACCEPTED.
FOR FOUR (4) INCH SDR 26 LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL BE 3.5 INCHES TO 4.25 INCHES.
FOR FOUR (4) INCH DUCTILE IRON LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL EITHER BE AS FOR VC OR 4.25 INCHES TO 4.81 INCHES.
IN ALL CASES, THE BOOT SHALL BE TIGHTENED ON THE LATERAL BY MEANS OF A SINGLE STAINLESS STEEL STRAP.
THE LATERAL INVERT SHALL BE AT THE TOP OF THE SHELF.

17. NO MORE THAN 4, FOUR INCH LATERALS OR 3, SIX INCH LATERALS SHALL ENTER A 4' DIAMETER TERMINAL MANHOLE. NO MORE THAN 2 LATERALS (REGARDLESS OF SIZE) SHALL ENTER ALL OTHER 4' DIAMETER MANHOLES. ALL LATERALS SHALL HAVE AN INDIVIDUAL TROUGH. 5' DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.

18. NO MORE THAN 5 LATERALS SHALL ENTER A 5' DIAMETER

19. USE OF TEE-WYES ON LATERALS IS NOT ALLOWED.

20. ALL MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH PWC STANDARDS.

STANDARD MANHOLE		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. S.2	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	1/08	CREATED DETAIL, ADDED NOTES 14-20
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.		2	7/13	REVISED NOTES 9, 10, 11, 15. CONVERTED TO S.2 SHEET 2 OF 2

2013-S2 STANDARD MANHOLE.dwg

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DATE: 9/4/2013
DGN: u2810c_uc_pak02.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2810C	UC-27

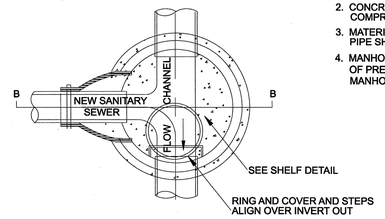
SCALE: NONE

SEAL 023965 NORTH CAROLINA PROFESSIONAL ENGINEER LARRY W. MITCHELL

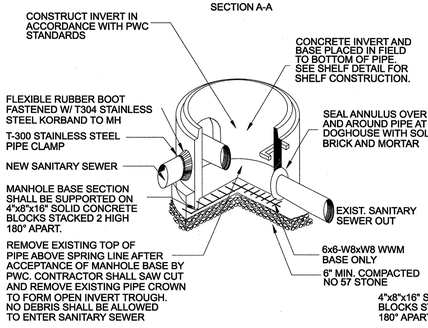
UTILITY CONSTRUCTION

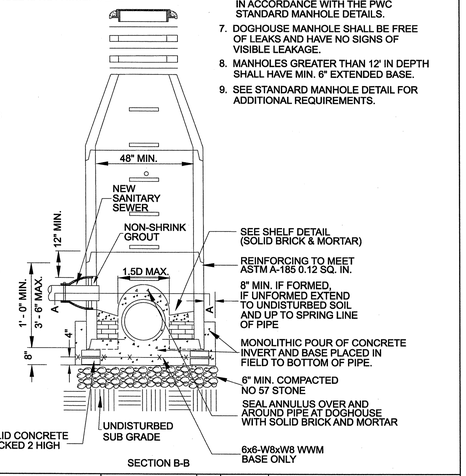
NOTES

1. MANHOLE MEETS ALL REQ. OF ASTM C478.
2. CONCRETE IS MINIMUM 4000 PSI COMPRESSIVE STRENGTH.
3. MATERIAL USED TO SEAL AROUND PIPE SHALL BE NON-SHRINK GROUT.
4. MANHOLE SHALL BE CONSTRUCTED OF PRECAST CONCRETE. FIBERGLASS MANHOLE IS NOT ACCEPTABLE.
5. A DROP STRUCTURE SHALL BE PLACED WHERE PIPE VERTICAL SEPARATION BETWEEN INVERTS EXCEEDS 2.50'. USE 5' DIAMETER MANHOLES WHEN DROP STRUCTURES ARE NEEDED.
6. WITH THE EXCEPTION OF THE MANHOLE BASE SECTION, ALL OTHER MATERIALS, INSTALLATION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE PWC STANDARD MANHOLE DETAILS.
7. DOGHOUSE MANHOLE SHALL BE FREE OF LEAKS AND HAVE NO SIGNS OF VISIBLE LEAKAGE.
8. MANHOLES GREATER THAN 12' IN DEPTH SHALL HAVE MIN. 6" EXTENDED BASE.
9. SEE STANDARD MANHOLE DETAIL FOR ADDITIONAL REQUIREMENTS.



SECTION A-A



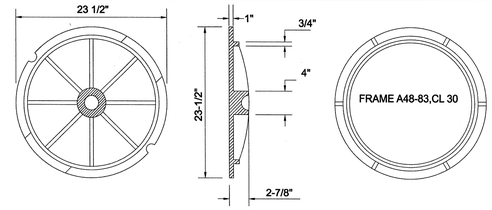


SECTION B-B

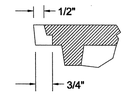
DOGHOUSE MANHOLE N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC
SHEET NO. 1 OF 1	DWG. NO. S.3	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	
	DATE: JULY 01, 2013	APPROVED BY: J.E.G.		

NO.	DATE	REVISION
1	11/25/08	MADE CHANGES TO NOTES

2013-S3 DOGHOUSE MH (REV_1-09).dwg



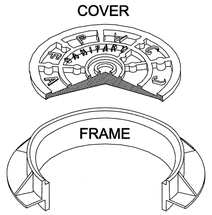
COVER BACK — COVER SECTION — FRAME PLAN



PICK SLOT DETAIL

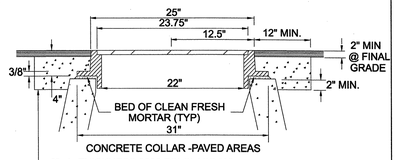
COVER A48-83,CL 35
COVER FACE

COVER



NOTES:

1. DETAIL TO BE USED IN PAVED AREAS ONLY. ALL OTHER MANHOLES SHALL BE IN ACCORDANCE WITH DETAIL S.6, UNLESS OTHERWISE APPROVED.
2. MANHOLE FRAME AND COVER SHALL BE MADE OF GRAY CAST IRON CONFORMING TO ASTM SPEC. A48-83 CL 30/35 RESPECTIVELY, MANUFACTURED BY SAME MANUFACTURER. ALL CASTINGS SHALL CONFORM TO THE SHAPE AND DIMENSIONS SHOWN. THEY SHALL BE CLEAN AND PERFECT, WITHOUT BLOW OR SAND HOLES OR DEFECTS OF ANY KIND, TENDING TO IMPAIR THEIR STRENGTH. NO PLUGGING OR STOPPING OF DEFECTIVE HOLES WILL BE PERMITTED.
3. CASTINGS SHALL BE UNPAINTED AND SHALL HAVE THE LETTERS "PWC-FAY-NC" AND "SANITARY SEWER" CAST INTO COVER. LETTERS SHALL BE RAISED AND CLEARLY VISIBLE.
4. MANHOLE RING AND COVER SHALL WITHSTAND H-20 VEHICULAR TRAFFIC. ROCKING COVERS SHALL NOT BE ACCEPTABLE.
5. MINIMUM AVERAGE WEIGHT: PLUS OR MINUS 5% RING 175 LBS., COVER 135 LBS, UNIT 310 LBS.
6. PERFORATED COVERS WILL NOT BE ALLOWED.



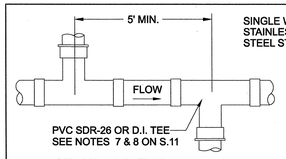
CONCRETE COLLAR -PAVED AREAS

8"min THICKNESS 3000 PSI CLASS "A" CONCRETE COLLAR 3-6% AIR ENTRAINMENT ALL AROUND FRAME. (WHEN UTILIZING CONCRETE GRADE RINGS THE CONCRETE COLLAR SHALL EXTEND TO 2"min BELOW THE TOP OF CONE.)

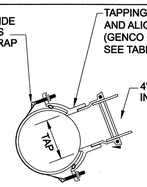
STANDARD TRAFFIC AREA MANHOLE RING AND COVER N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC
SHEET NO. 1 OF 1	DWG. NO. S.7	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	
	DATE: JULY 01, 2013	APPROVED BY: JEG		

NO.	DATE	REVISION
1	JAN 05	CHANGED NON TRAFFIC DETAIL
2	JULY 06	ADDED NOTE ON CONC. COLLAR
3	FEB 07	REMOVED NON TRAFFIC AREA REVISED NOTES
4	JULY 08	REVISED ASPHALT THICKNESS

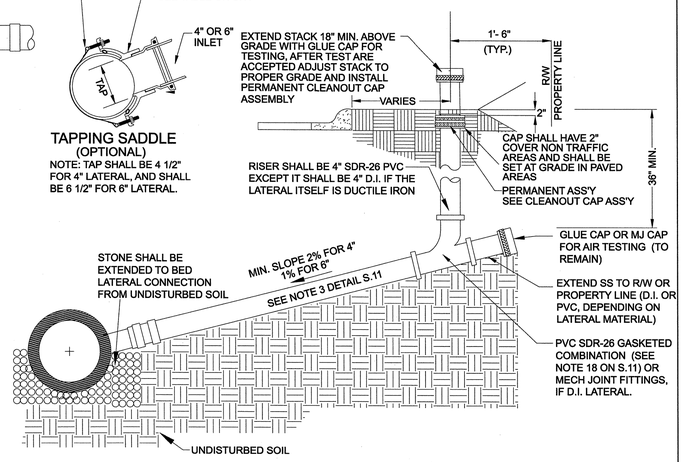
2013-S7 RING COVER.dwg

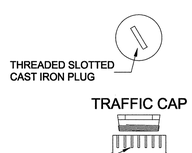


STANDARD TEE CONNECTION

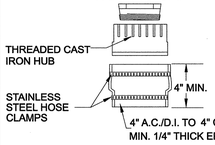


TAPPING SADDLE (OPTIONAL)
NOTE: TAP SHALL BE 4 1/2" FOR 4" LATERAL, AND SHALL BE 6 1/2" FOR 6" LATERAL.





TRAFFIC CAP



C/O CAP ASSEMBLY

FOR SEWER SERVICE LATERAL NOTES SEE DETAIL S.11

SEWER SERVICE LATERAL (4-INCH AND 6-INCH)			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC
SHEET NO. 1 OF 1	DWG. NO. S.10	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	
	DATE: JULY 01, 2013	APPROVED BY: JEG		

NO.	DATE	REVISION
1	JAN 07	REVISED CONNECTION
2	JULY 08	ADDED NOTES FOR 6" LATERALS
3	JAN. 13	REVISED NOTES

2013-S10 resslat.dwg

SEWER SERVICE LATERAL NOTES

1. HOLE IN SANITARY SEWER MAIN MUST BE CUT WITH SHELL CUTTER NO HAMMER TAPS ALLOWED.
2. LATERAL SHALL CONFORM TO ASTM SPECS. D-3034 SDR-26 UNLESS OTHERWISE INDICATED AS D.I.
3. ALL PIPE & FITTINGS SHALL BE 4" OR 6" UNLESS OTHERWISE SPECIFIED.
4. ALL D.I. PIPE SHALL HAVE AN INTERIOR LINING OF CERAMIC EPOXY (PROTECTO 401). THE ENTIRE D.I. LATERAL SHALL BE COMPRISED OF D.I. PIPE & MECHANICAL JOINT FITTINGS.
5. ALL CONNECTIONS SHALL HAVE RUBBER GASKET SEALS INSTALLED.
6. SANITARY SEWER SERVICE C/O STACK SHALL BE LOCATED 18" FROM WATER SERVICE LOCK VALVE WHEN IN THE SAME DITCH.
7. INSTALLATION OTHER THAN AS SHOWN MUST BE APPROVED BY THE PWC.
8. CONNECTIONS TO THE TOP OF MAIN SHALL NOT BE ALLOWED, UNLESS OTHERWISE APPROVED BY THE PWC PROJECT COORDINATOR.
9. SLOPE AND DEPTH OF THE SERVICE LATERAL SHALL BE DETERMINED BY THE TOPOGRAPHY OF THE LOT AS APPROVED BY THE PWC ENGINEER OR AS INDICATED ON THE DRAWINGS.
10. LATERAL SHALL CONFORM TO THE 2% MINIMUM SLOPE FOR THE 4" OR THE 1% MINIMUM SLOPE FOR THE 6". MAXIMUM CLEAN OUT SPACING FOR 4" PIPE 75', 6" PIPE 100'.
11. SEE INTERIOR DROP STRUCTURE OR SLIDE, MORTAR SLIDE & SHELF DETAIL FOR VERTICAL DROPS OF MAINS AND LATERALS.
12. LATERALS LESS THAN 3' IN DEPTH OR GREATER THAN 20' DEPTH SHALL UTILIZE DUCTILE IRON PIPE AND FITTINGS WITH CERAMIC EPOXY (PROTECTO 401)
13. ENTIRE SEWER LATERAL ASSEMBLY SHALL BE AIR TESTED CONCURRENTLY WITH SEWER MAIN.
14. INDIVIDUAL LATERALS SHALL BE CLEANED AND FLUSHED PRIOR TO FLUSHING SANITARY SEWER MAINS.
15. LATERAL SHALL NOT BE BACK-FILLED UNTIL INSPECTED BY THE PWC PROJECT COORDINATOR.
16. WYE CONNECTIONS SHALL NOT BE USED TO TIE LATERALS INTO A MANHOLE.
17. IF BENDS ARE APPROVED BY THE PROJECT COORDINATOR, STONE BEDDING IS REQUIRED TO BE INSTALLED FROM UNDISTURBED (SEE DETAIL S.12) SOIL TO BOTTOM OF BEND.
18. PVC COMBINATION SHALL BE A MOLDED WYE AND BEND, GASKETED, SDR26, AS MANUFACTURED BY HARCO, GPK OR APPROVED EQUAL.
19. NO MORE THAN 4, FOUR INCH LATERALS OR 3, SIX INCH LATERALS SHALL ENTER A 4' DIAMETER TERMINAL MANHOLE. NO MORE THAN 2 LATERALS (REGARDLESS OF SIZE) SHALL ENTER ALL OTHER 4' DIAMETER MANHOLES. ALL LATERALS SHALL HAVE AN INDIVIDUAL TROUGH. 5' DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.
20. ALL LATERALS (4" AND 6") SHALL UTILIZE A 4" RISER (STACK).
21. REFER TO DETAIL S.12 FOR SEPARATION REQUIREMENTS.

THE FOLLOWING TABLE SUMMARIZES THE MATERIALS TO BE UTILIZED FOR SEWER MAIN TO LATERAL CONNECTIONS:

	PVC Main	DI Main
DI Lateral	DI fitting	MJ fitting
PVC Lateral	PVC fitting or saddle	MJ fitting with transition gasket or saddle

SEWER SERVICE LATERAL NOTES (4-INCH AND 6-INCH)			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC
SHEET NO. 1 OF 1	DWG. NO. S.11	DWG. BY: PWC	WATER RESOURCES ENGINEERING DEPARTMENT	
	DATE: JULY 01, 2013	APPROVED BY: JEG		

NO.	DATE	REVISION
1	JULY 08	REVISED NOTES 4 & 8 ADDED NOTES 22, 23
2	OCT 11	REVISED NOTES
3	JAN. 13	REVISED NOTES AND ADDED TABLE

2013-S11 RESSLAT notes.dwg

Prepared by:
AECOM
AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.
701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
F-0342

DATE: 9/14/2013
DGN: u2810c_uc_ps3427.dgn

T.I.P. NO.	SHEET NO.
U-2810C	UO-1

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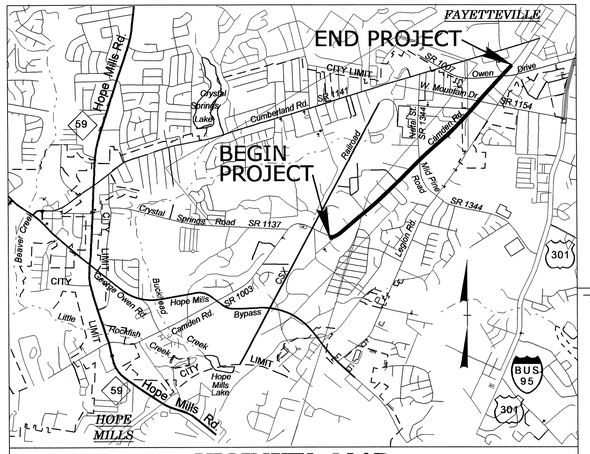


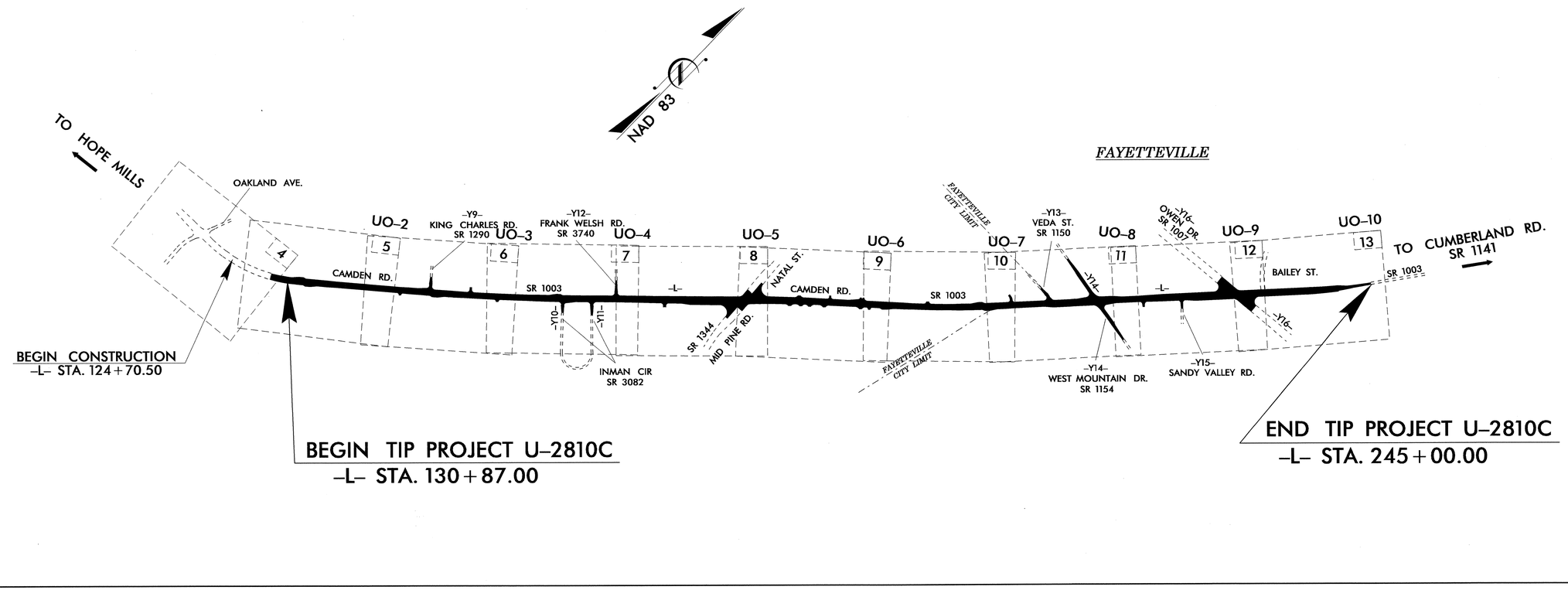
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
CUMBERLAND COUNTY

LOCATION: SR 1003(CAMDEN ROAD) FROM EAST OF OAKLAND AVENUE TO NORTH OF SR 1007 (OWEN DRIVE)

TYPE OF WORK: UTILITIES RELOCATION BY OTHERS



GRAPHIC SCALES

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PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 THRU UO-10	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(1) POWER(ELECTRIC) : PWC OF FAYETTEVILLE
(2) POWER(TRANSMISSION) : PROGRESS ENERGY
(3) POWER(DISTRIBUTION) : PROGRESSs ENERGY
(4) TELEPHONE : CENTURY LINK
(5) TELEPHONE(FIBER OPTIC CABLE) : AT&T
(6) CABLE TV : TIME WARNER CABLE
(7) GAS : PIEDMONT NATURAL GAS

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING
1591 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
PHONE (919) 707-6690
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Roger Worthington, P.E.	UTILITIES SECTION ENGINEER
Ron.B. Wilkin, P.E.	UTILITIES SQUAD LEADER PROJECT ENGINEER
Jong-Tae Yoon	UTILITIES PROJECT DESIGNER

09/08/99
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PROJECT REFERENCE NO.	SHEET NO.
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UTILITIES BY OTHERS

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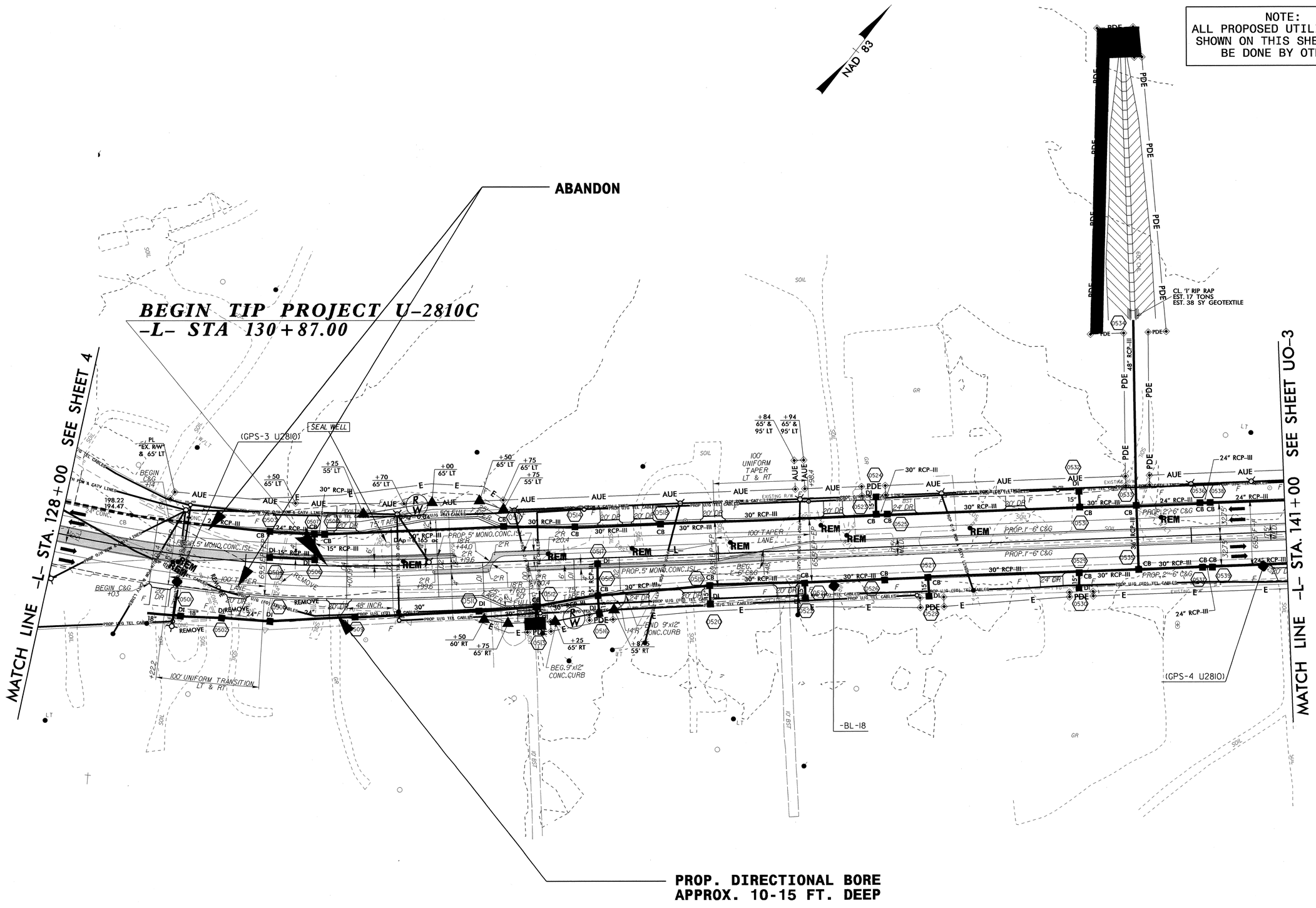

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UTILITIES BY OTHERS

NAD 83

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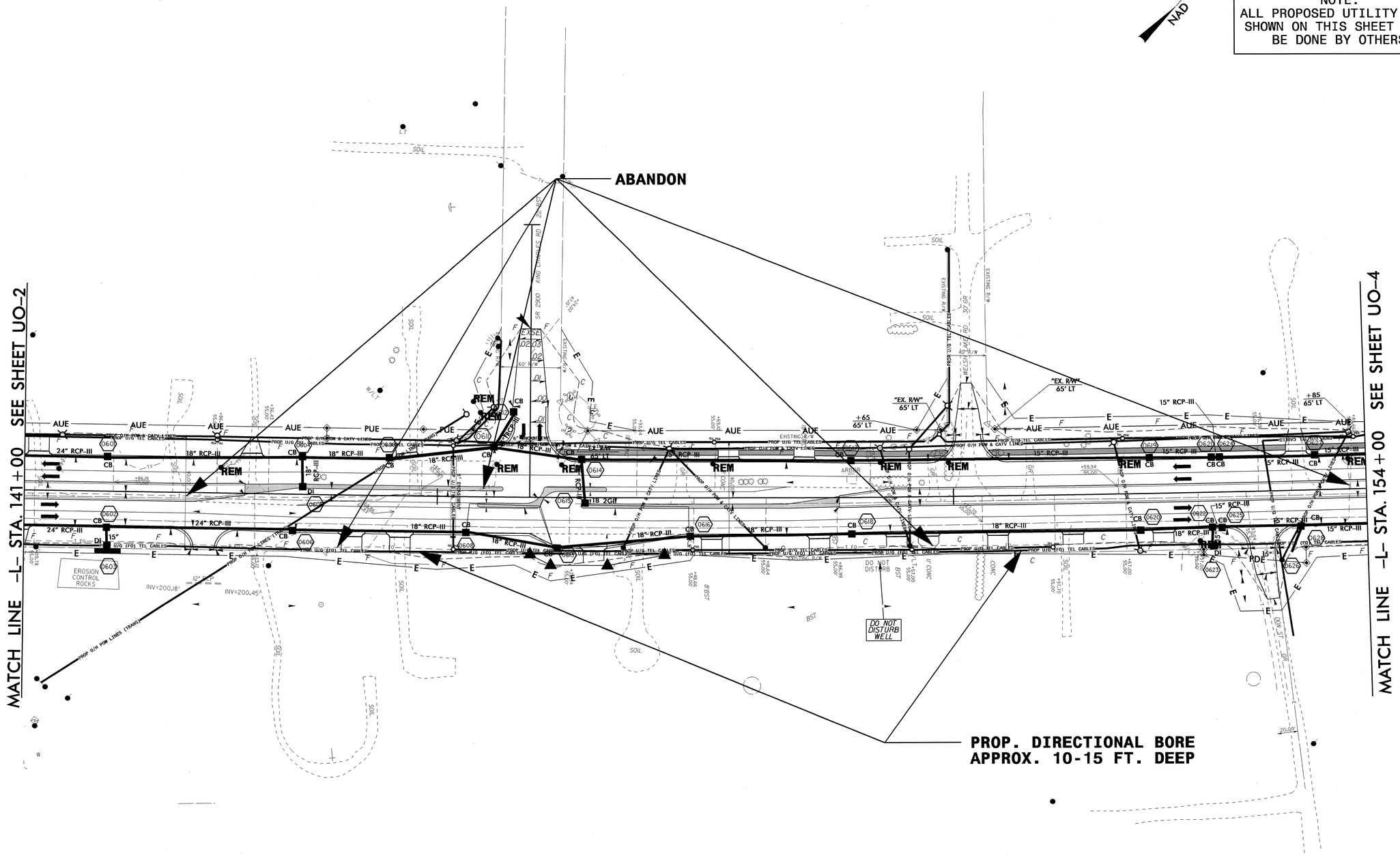

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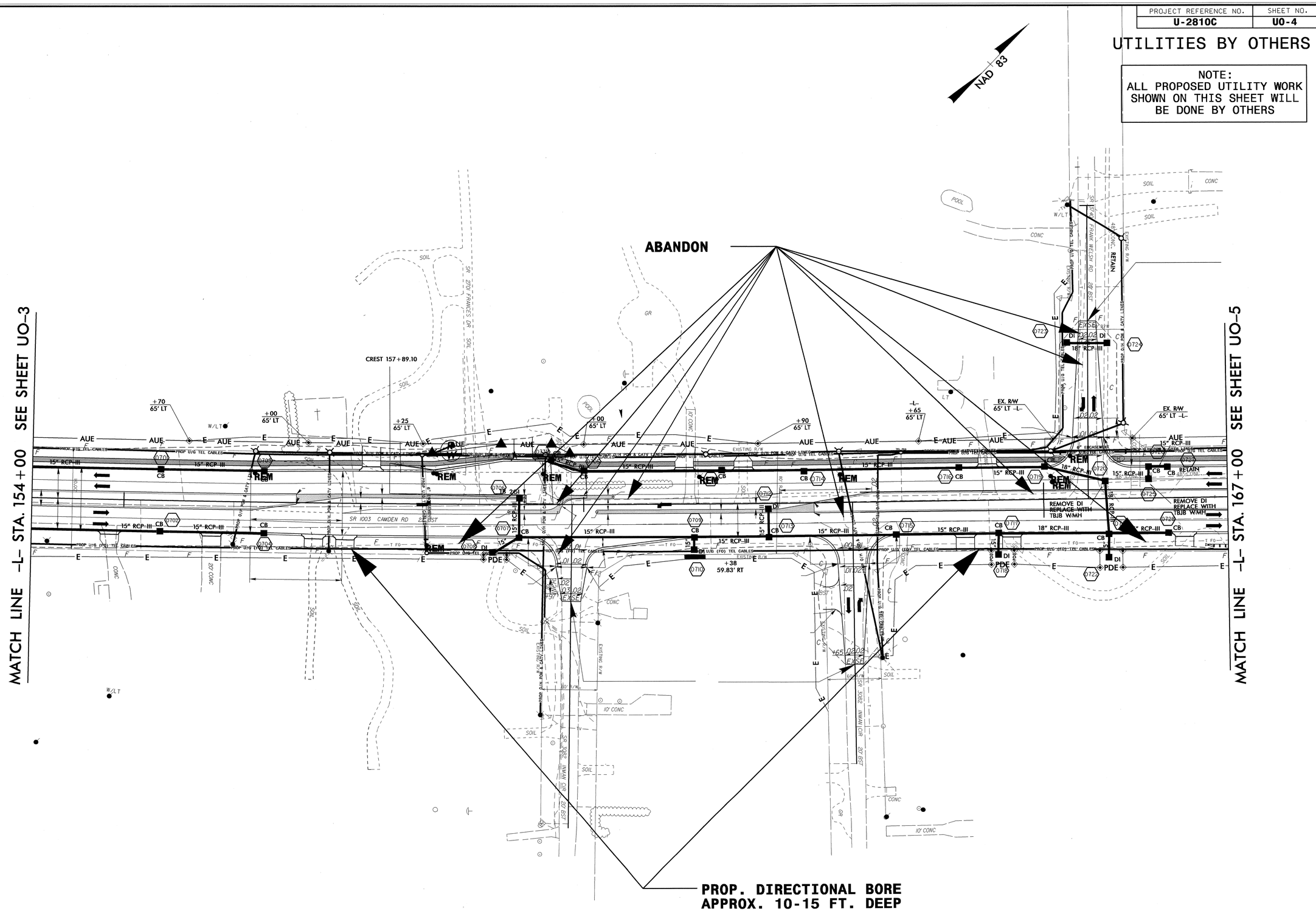

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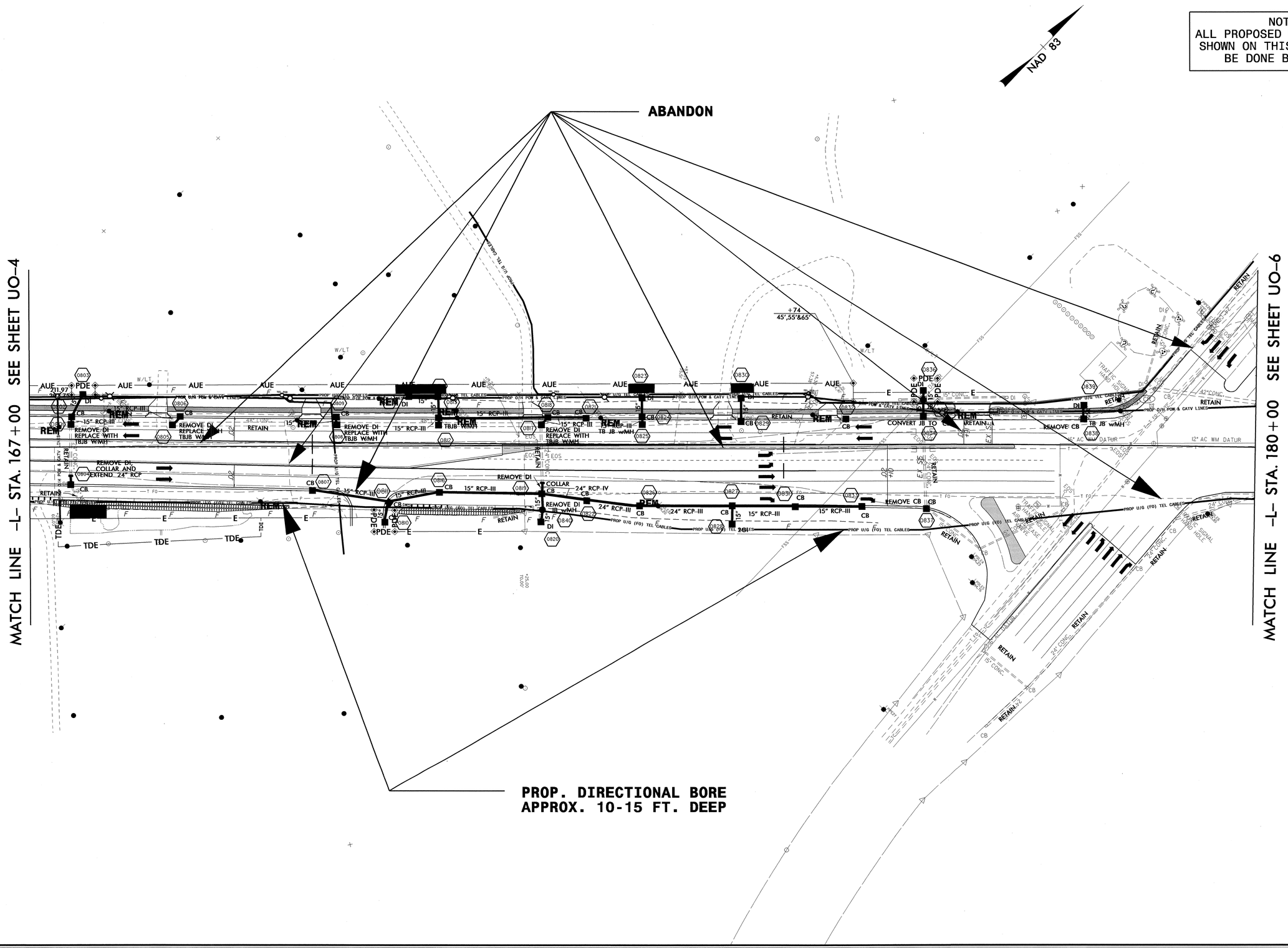

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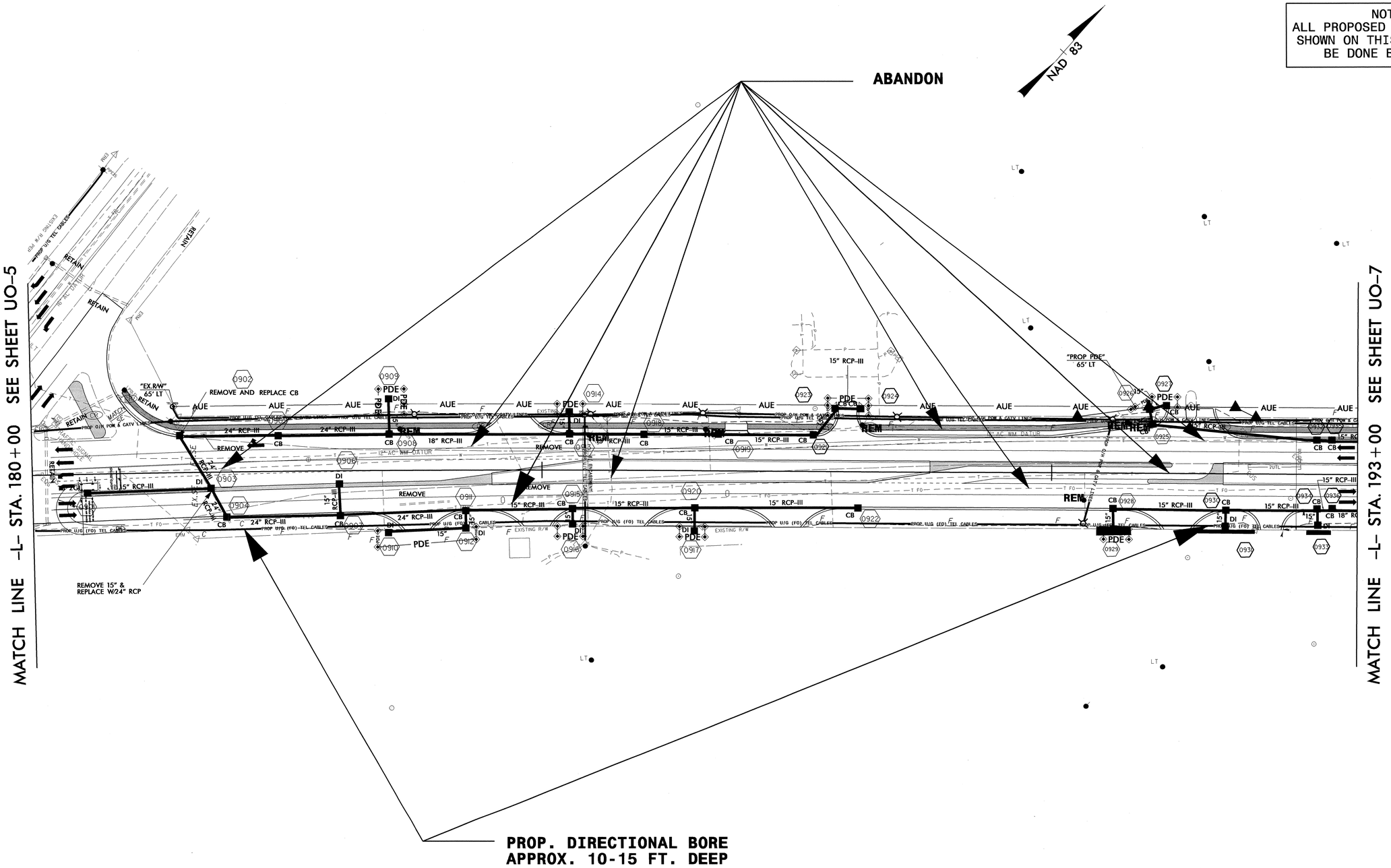

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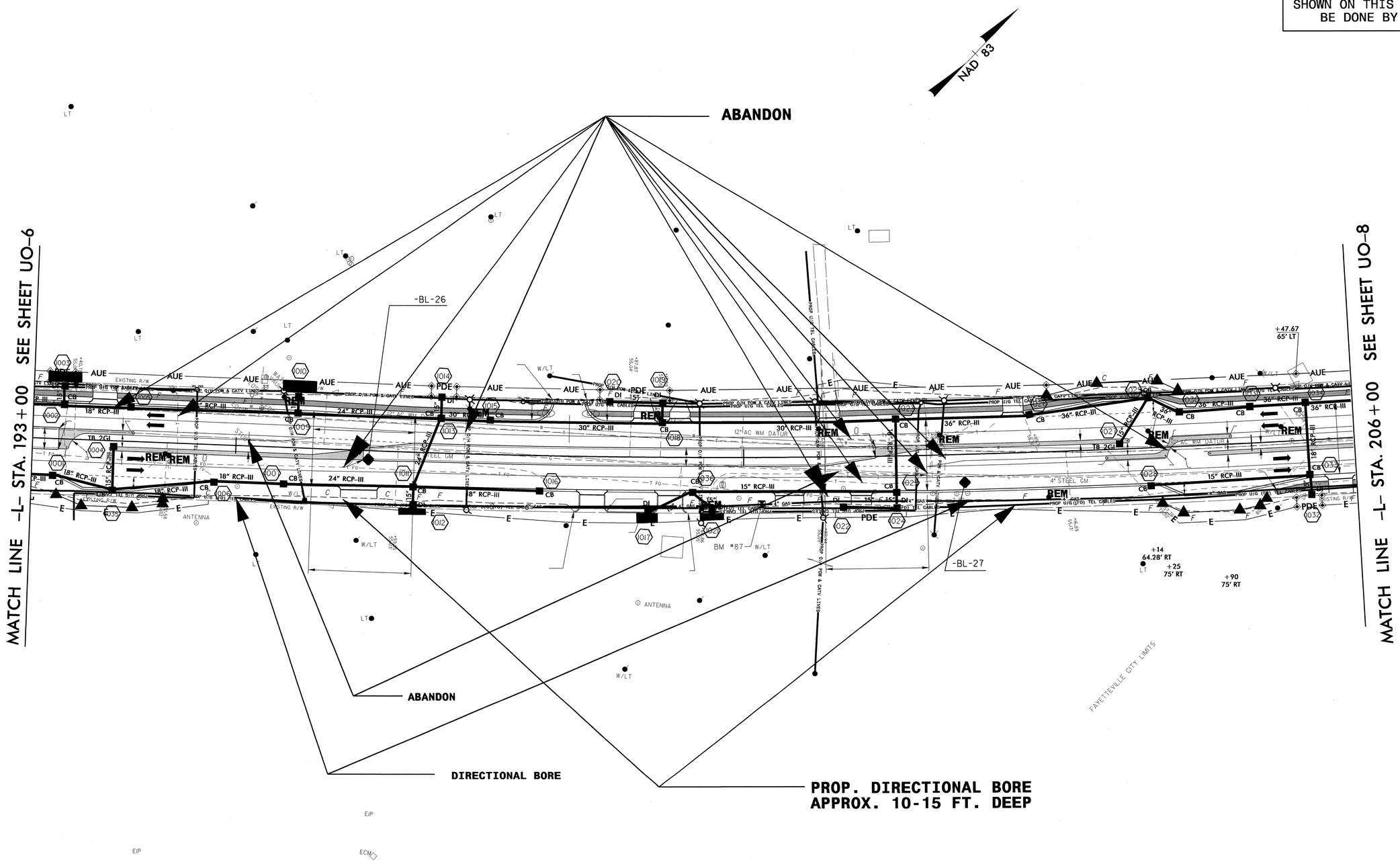

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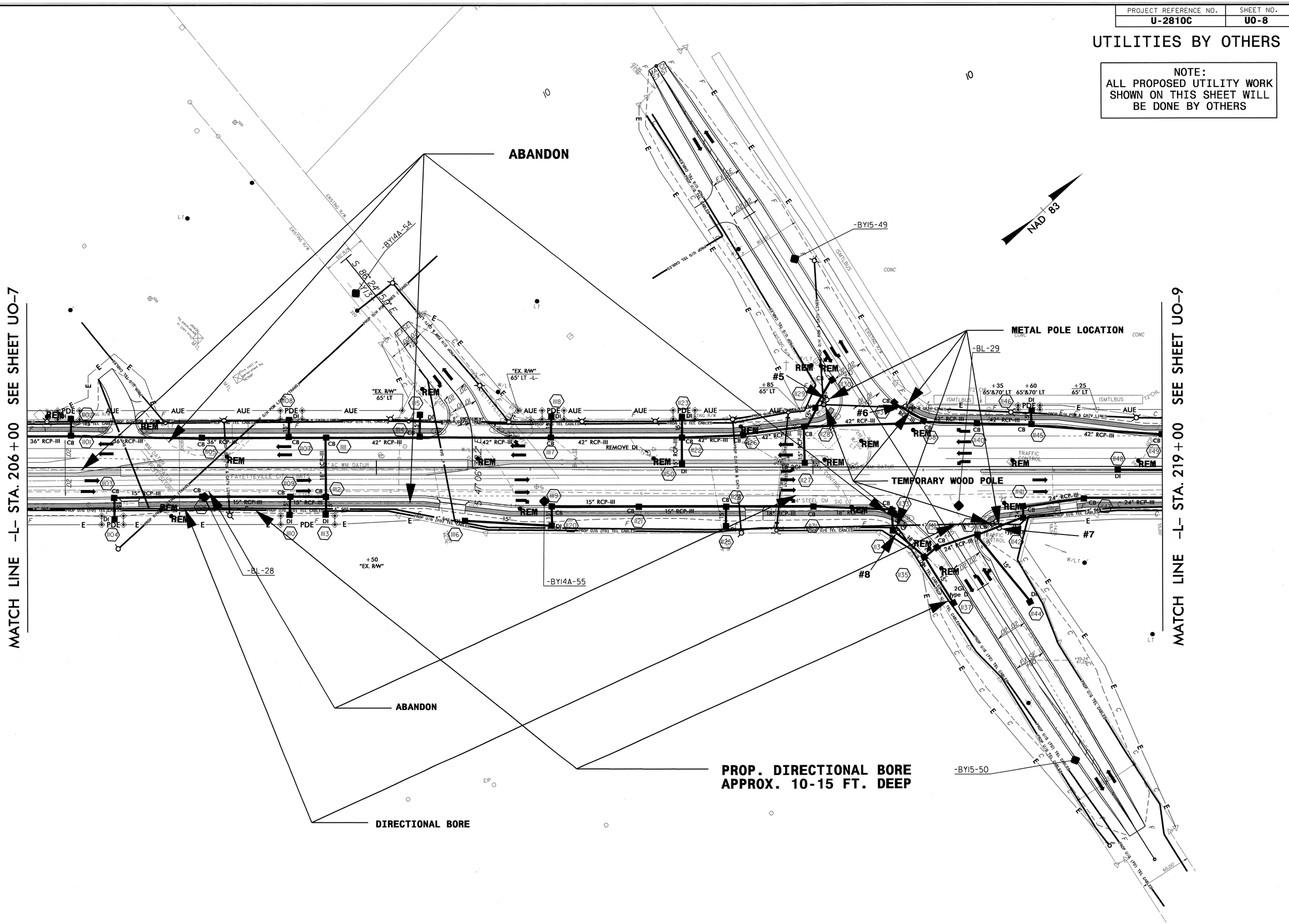

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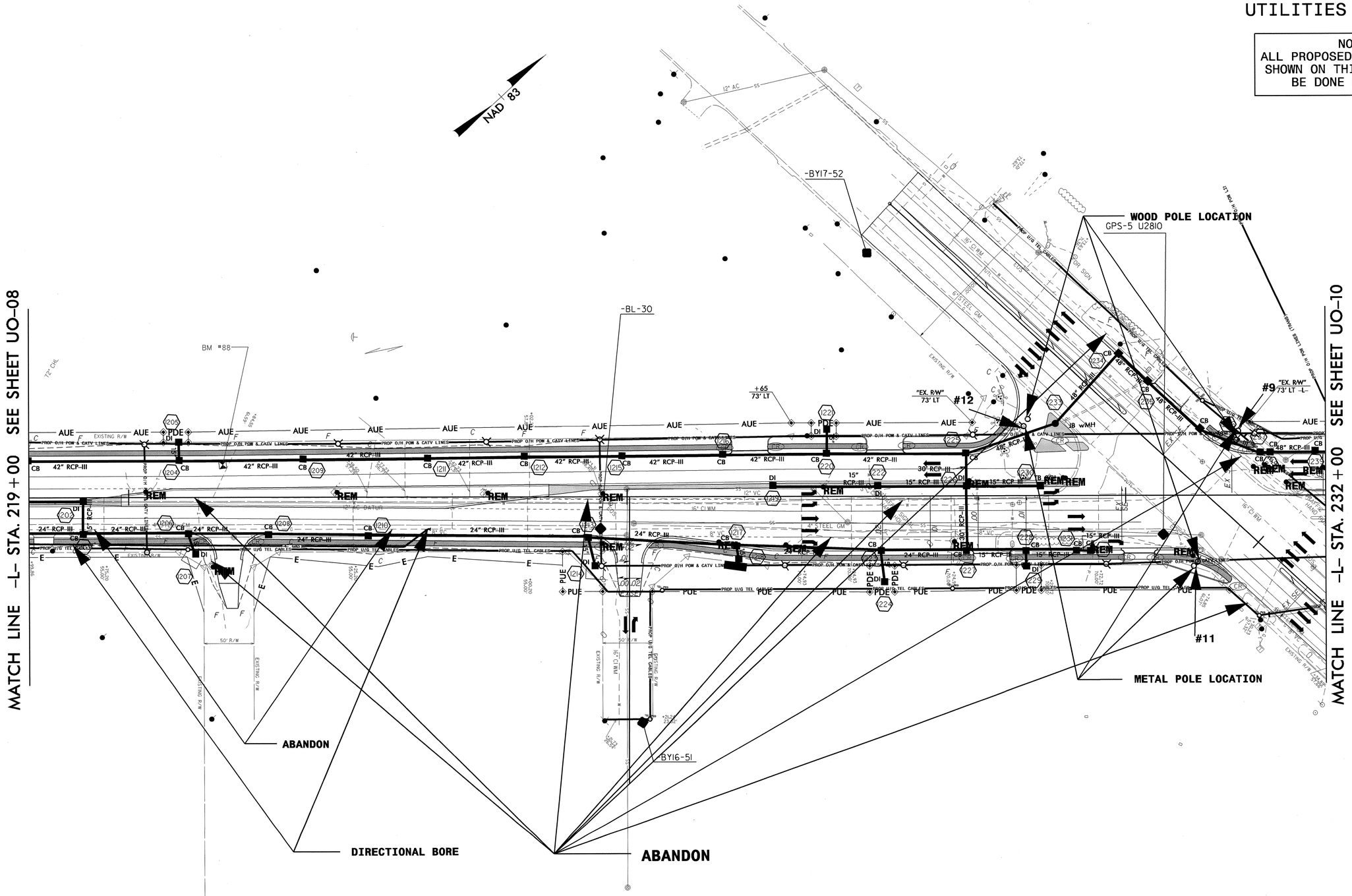

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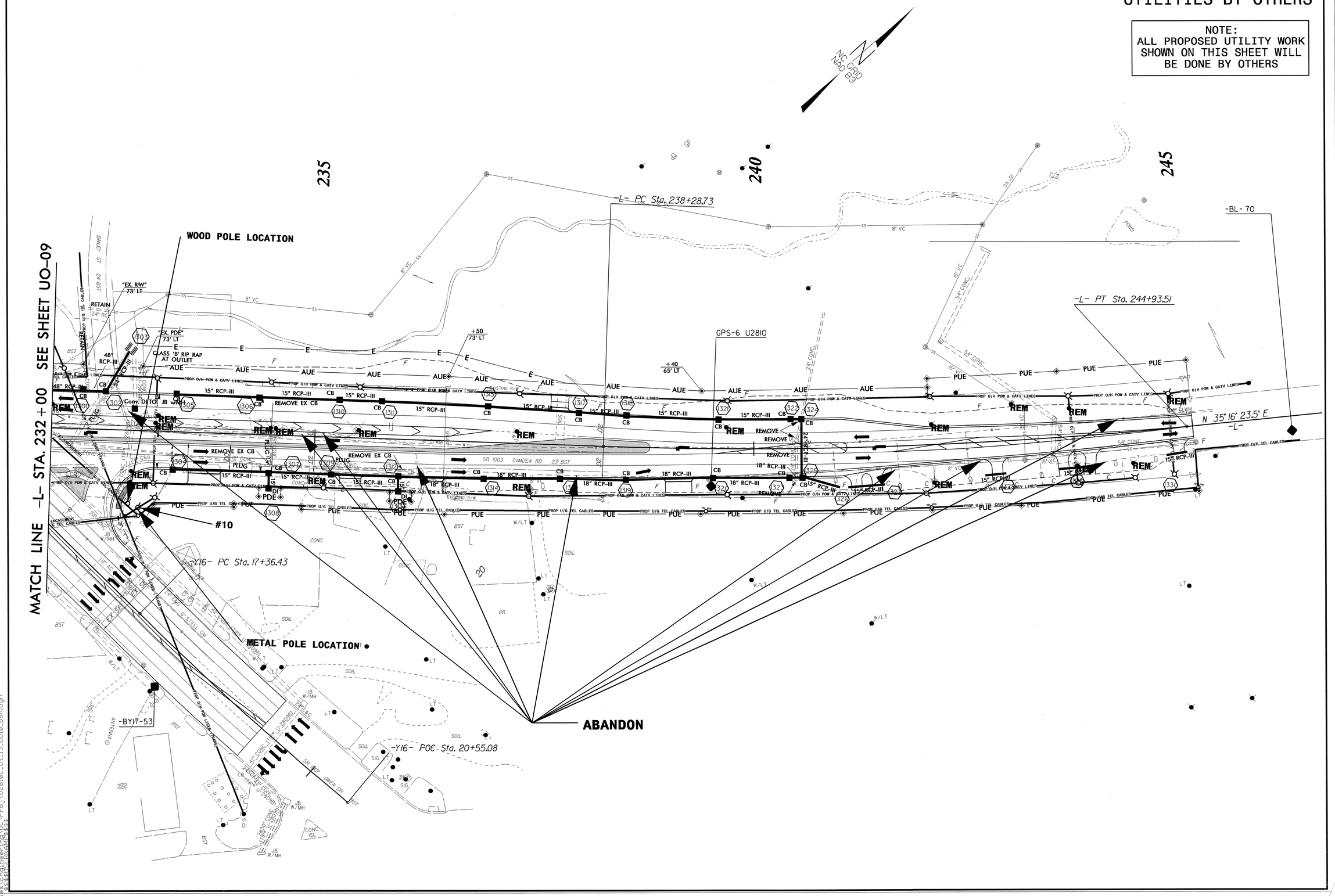

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