TIP PROJECT: R-4047

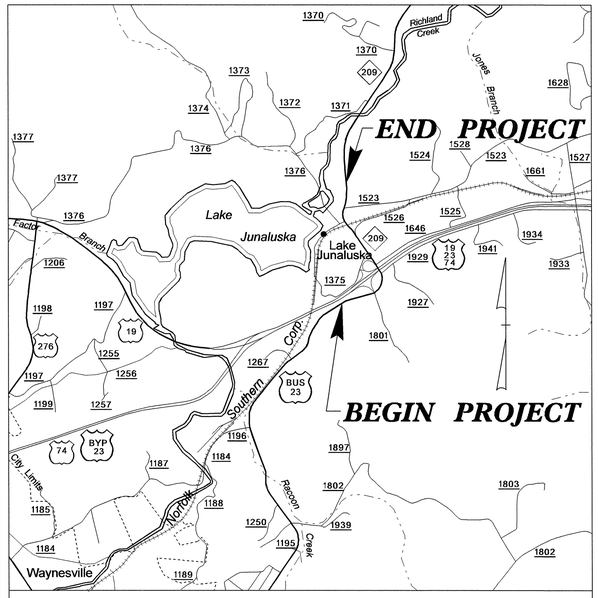
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

T.I.P. NO.	SHEET NO.
R-4047	UC-1

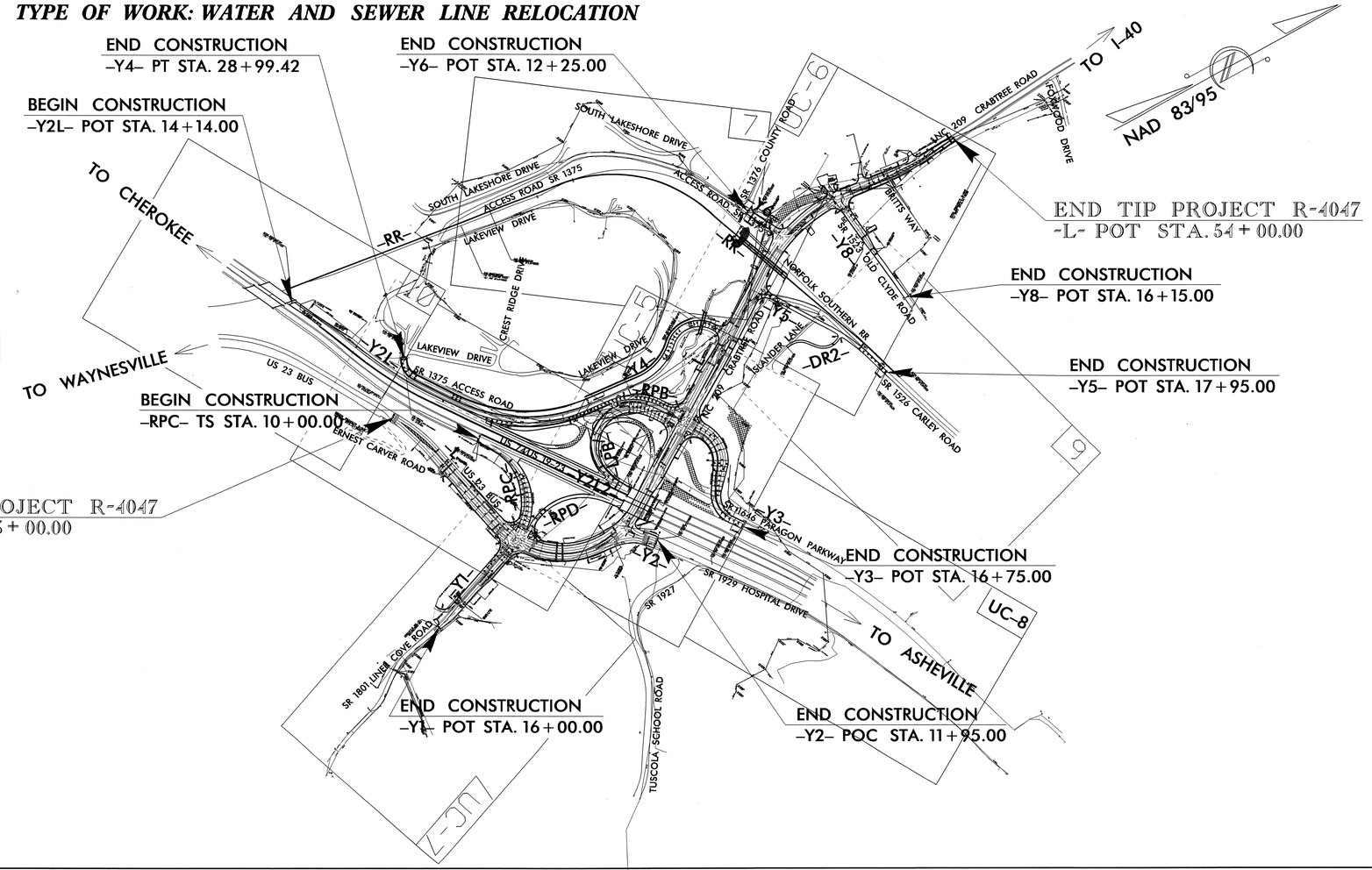
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
HAYWOOD COUNTY

LOCATION: NC 209 FROM US 23 BUS. TO NORTH OF SR 1523 (OLD CLYDE RD.)
TYPE OF WORK: WATER AND SEWER LINE RELOCATION



VICINITY MAP



ALL SEWER AND WATER PIPES SHALL BE DUCTILE IRON

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50' 50 100' 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A	DETAILS
UC-4 THRU UC-8	UTILITY CONSTRUCTION SHEETS
UC-9 THUR UC-30	PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) WATER JUNALUSKA SANITARY DISTRCIT
(2) SANITARY SEWER JUNALUSKA SANITARY DISTRICT

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI
11/1/2014

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

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

Roger Worthington, P.E.	UTILITIES SECTION ENGINEER
Carl Barclay, P.E.	UTILITIES SQUAD LEADER PROJECT ENGINEER
Ali Koucheki, PE	UTILITIES PROJECT DESIGNER

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown)
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — RFH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown)
- Force Main Sewer Line (Sized as Shown)
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown)
- Trenchless Installation
- Encasement by Open Cut
- Encasement
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

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

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown)
- Designated Utility Line (Type as Shown)

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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-3
DESIGNED BY: ARK	
DRAWN BY: ARK	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KALDERI 9/17/20

UTILITY CONSTRUCTION

UTILITY CONSTRUCTION

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 UTILITIES BELONG TO JUNALUSKA SANITARY DISTRICT .

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

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

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

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

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

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

10. CONTRACTOR SHALL PROVIDE ADEQUATE RESTRAIN FOR PROPOSED FITTINGS. ALL RESTRAINT SHALL BE CALCULATED USING 200 PSI

PROJECT SPECIFIC NOTES:

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

LIST OF STANDARD DRAWINGS

1515.01 WATER METER

1515.02 FIRE HYDRANT

1520.01 SEWER CLEAN OUT

1525.06 PRECAST CONCRETE SANITARY SEWER MANHOLE WITH CAST-IN-PLACE BOTTOM

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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-3A
DESIGNED BY: ARK	
DRAWN BY: ARK	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
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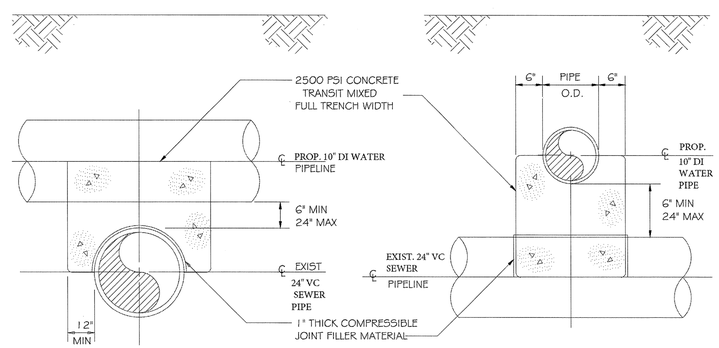
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KULKHEL 4/24/2014

PROJECT TYPICAL DETAILS

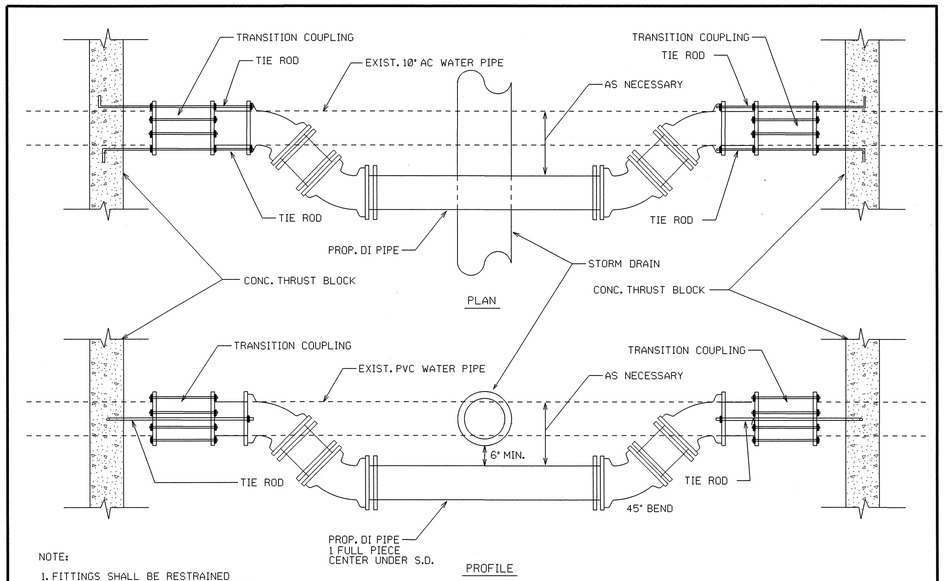
UTILITY CONSTRUCTION

5/14/99

CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS



PROP 10" DI WATER PIPE OVER EXIST. 24" VC SEWER PIPE



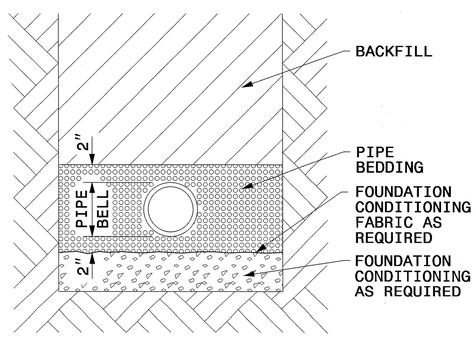
NOTE:

1. FITTINGS SHALL BE RESTRAINED USING RESTRAINED RETAINER GLANDS, TIES RODS OR AS APPROVED BY ENGINEER.
2. CONC. THRUST BLOCK SHALL BE PLACED AND CURED THREE DAYS PRIOR TO CUTTING EXISTING PIPE.

•NTS

TEMPORARY RELOCATION OF 8" PVC WATER PIPE AT PROP. STORM DRAINAGE AS SHOWN ON PLANS

TRENCH DETAIL



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

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-4

DESIGNED BY: ARK
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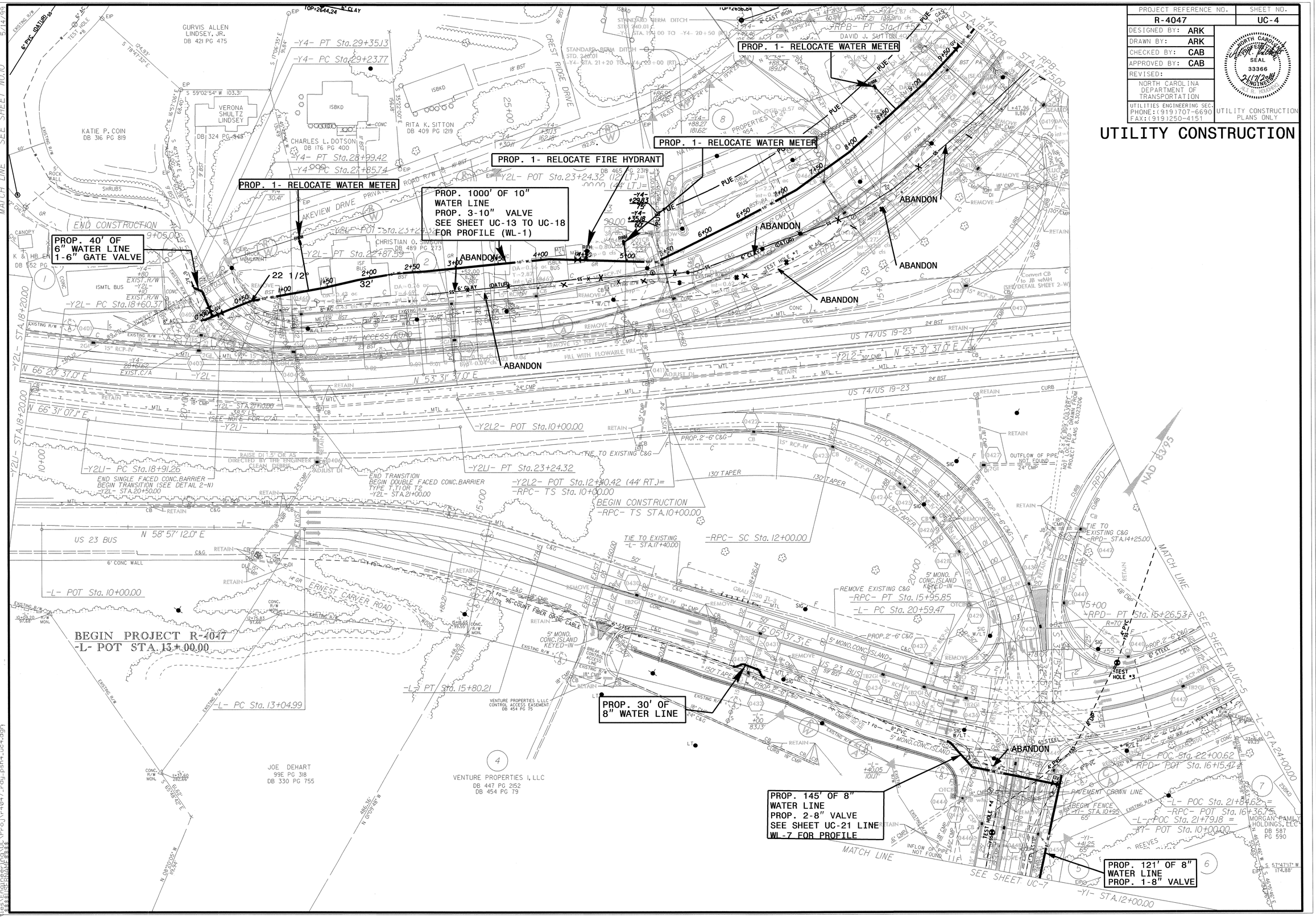
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-5

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NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOLDAS 7/24/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

SEE SHEET UC-22 TO UC-26 FOR SL-1 PROFILE

PROP. 116' OF 16" ENCASEMENT PIPE
PROP. 58' OF 16" TRENCHLESS INSTALLATION IN SOIL
PROP. 58' OF 16" TRENCHLESS INSTALLATION NOT IN SOIL

PROP. 102' OF 16" TRENCHLESS INSTALLATION IN SOIL
PROP. 102' OF 16" TRENCHLESS INSTALLATION NOT IN SOIL

PROP. 782' OF 10" WATER LINE
PROP. 1-10" VALVE
SEE PROFILE UC-13 TO UC-18 FOR WL-2 PROFILE

PROP. 4' DIA MANHOLE "H1"
STA. 15+41 LINE SL-1
STA. 32+13 LINE -L-, LT 52.34'

PROP. 218' OF 8" GRAVITY SEWER LINE

PROP. 276' OF 8" SEWER LINE

PROP. 4' DIA MANHOLE "G1"
STA. 12+64 LINE SL-1
STA. 34+90 LINE -L-, LT 44'

PROP. 4' DIA MANHOLE "F1"
STA. 10+04 LINE SL-1
STA. 37+50 LINE -L-, LT 40'

PROP. 4' DIA MANHOLE "B2"
STA. 4+73 LINE SL-2
STA. 10+55 LINE -Y2-, RT 81'

PROP. 90' OF 8" GRAVITY SEWER LINE

PROP. 384' OF 8" GRAVITY SEWER LINE

PROP. 157' OF 8" WATER LINE
PROP. 2-8" VALVE
SEE SHEET UC-21 LINE WL-6 FOR PROFILE

PROP. 1- RELOCATE WATER METER

PROP. 4' DIA MANHOLE "A2"
STA. 3+83 LINE SL-2
STA. 11+44 LINE -Y2-, RT 62'

PROP. 294' OF 16" ENCASEMENT PIPE
SEE SHEET UC-11 AND UC-12 FOR PROFILE

PROP. 147' OF 16" TRENCHLESS INSTALLATION IN SOIL

PROP. 147' OF 16" TRENCHLESS INSTALLATION NOT IN SOIL

PROP. 412' OF 6" WATER LINE
PROP. 1-6" VALVES
SEE SHEET UC-9 TO UC-10 FOR WL-1 PROFILE

PROP. 288' OF 12" ENCASEMENT PIPE

PROP. 144' TRENCHLESS INSTALLATION OF 12" IN SOIL

PROP. 144' TRENCHLESS INSTALLATION OF 12" NOT IN SOIL

PROP. 5' DIA MANHOLE "EQ2"
STA. 17+58 LINE SL-1/
STA. 0+00 LINE SL-2
STA. 13+85 LINE -Y3-, RT 180'

PROP. 268' OF 8" SEWER LINE

PROP. 261' OF 8" SEWER LINE

PROP. 1167' OF 10" WATER LINE
PROP. 3- 10" VALVES
SEE SHEET UC-19 TO UC-21 FOR WL-3 PROFILE

AMH=ABANDON UTILITY MANHOLE

PROP. 5' MANHOLE "I1"
STA. 20+26 LINE SL-1
STA. 15+48 LINE -Y3-, 25' RT

PROP. 280' OF 8" SEWER LINE

MATCH LINE SEE SHEET NO. UC-4

MATCH LINE SEE SHEET NO. UC-6

MATCH LINE SEE SHEET NO. UC-8

DAVID J. SUTTON DB 463 PG 2365

DRY DETENTION BASIN SEE DETAIL "J"

PROPOSED 5'x5' MICROPOOL SEE DETAIL "K"

SEE DETAIL SHEET 2-Q

BERM "V" DITCH SEE DETAIL "F"

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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-6
DESIGNED BY: ARK	
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
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NORTH CAROLINA PROFESSIONAL SEAL 33396 ENGINEER ALT R. KALLEN 5/13/2014

UTILITY CONSTRUCTION

NAD 83/95

SEE SHEET UC-22 TO UC-26 FOR 8" SEWER LINE (SL-1) PROFILE

AMH=ABANDON UTILITY MANHOLE

PROP. 223' OF 16" ENCASEMENT PIPE

PROP. 1- RELOCATE WATER METER

PROP. 4' DIA MANHOLE "D1"
STA. 7+10 LINE SL-1
STA. 40+43 LINE -L-, 41.38' LT

PROP. 167' OF 8" GRAVITY SEWER LINE

PROP. 4' DIA. MANHOLE "E1"
STA. 8+37 LINE SL-1
STA. 39+03 LINE -L-, 41.1 LT

PROP. 126' OF 8" GRAVITY SEWER LINE

PROP. 4' DIA. MANHOLE "C1"
STA. 5+71 LINE SL-1
STA. 41+83 LINE -L-, 51.7 LT

PROP. 139' OF 8" GRAVITY SEWER LINE

ABANDON 210' OF 8" EXIST. SEWER LINE

ABANDON 210' OF 8" EXIST. WATER PIPE

PROP. 265' OF 8" GRAVITY SEWER LINE

PROP. 4' DIA. MANHOLE "B1"
STA. 3+06 LINE SL-1
STA. 44+27 LINE -L-, 93.44 LT

PROP. 131' OF 8" GRAVITY SEWER LINE

PROP. 5' DIA. MANHOLE "EQ1"
STA. 1+75 LINE SL-1/STA. 0+00 LINE SL-3
STA. 45+34 LINE -L-, 35.33 LT

PROP. 12' OF 6" WATER LINE
PROP. 1-6" VALVE

PROP. 175' OF 8" GRAVITY SEWER LINE

PROP. 122' OF 8" GRAVITY SEWER LINE

PROP. 4' DIA. MANHOLE "A1"
STA. 0+00 LINE SL-1
STA. 47+02 LINE -L- 43.86 LT

PROP. 221' OF 24" ENCASEMENT PIPE, BY OPEN CUT

PROP. 4' DIA. MANHOLE "A3"
STA. 1+22 LINE SL-3
STA. 45+25 LINE -L-, 86' RT

PROP. 1087' OF 10" WATER LINE
PROP. 5-10" VALVE
SEE SHEET UC-13 THRU UC-18
FOR WL-1 PROFILE

PROP. 43' OF 6" WATER
2-6" VALVE

PROP. 775' OF 2" WATER LINE
PROP. 1-2" VALVE

PROP. 478' OF 10" WATER LINE
PROP. 2-10" VALVE
SEE SHEET UC-27
FOR WL-4 PROFILE

PROP. 1-RELOCATE WATER METER

PROP. 1-RECONNECT WATER METER

PROP. 1- RECONNECT WATER METER

PROP. 1- RELOCATE FIRE HYDRANT

PROP. RECONNECT 2" WATER LINE
1-2" VALVE

PROP. 2- RELOCATE WATER METER

PROP. RECONNECT 1" WATER LINE.

PROP. 605' OF 10" WATER LINE
PROP. 4-10" VALVES

PROP. 1- RECONNECT WATER METER

A-MH

ABANDON

SEE SHEET NO.5

SEE SHEET NO.9

MATCH LINE

NC 209 CRABTREE ROAD

N 33° 08' 41.0" W

-L- POT Sta. 38+39.25 = REMOVE DI

-Y4- POT Sta. 10+00.00

-L- POC Sta. 42+60.93 =

-RR- POT Sta. 18+81.73

-L- POC Sta. 44+15.77 =

-L- PC Sta. 49+96.44

-L- PT Sta. 53+04.91

-DR2- PT Sta. 13+09.90

-DR2- POT Sta. 14+00.92

-DR2- PC Sta. 11+96.07

-DR2- PT Sta. 11+49.89

-Y5- PC Sta. 14+31.40

-Y5- POC Sta. 15+00.00 =

-DR2- POT Sta. 10+00.00

-RR- ST Sta. 13+24.00

-RR- CS Sta. 12+62.00

-Y5- PT Sta. 16+95.59

-RR- SC Sta. 11+62.00

-Y8- POT Sta. 16+52.52

-Y8- PINC Sta. 14+54.94

-Y5- STA. 17+30.00

HAYWOOD CONTRACTING COMPANY, INC. DB 277 PG 43

WALTER A. BLANTON DB 476 PG 596

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DB 428 PG 1057

HAYWOOD CONTRACTING CO INC DB 219 PG 281

TOOTHLAND LLC DB 632 PG 1788 DB 751 PG 431

TOOTHLAND LLC DB 632 PG 1788

CHRISTIAN O. SIMSON DB 491 PG 1105

RONALD D. RAMBONE DB 1635 PG 1 DB 1635 PG 4 DB 1635 PG 7

VIRGINIA B. MEDFORD DB 316 PG 162

THOMAS H. MCLEOD DB 739 PG 1039

BARBARA POTTS ENLOE SAMUEL POTTS 200E PG 01 DB 172 PG 87

HAYWOOD COUNTY, A BODY POLITIC AND CORPORATE DB 790 PG 1285

SOUTHERN RAILWAY CO. PG 55

NORFOLK SOUTHERN CORPORATION DB 6 PG 55

LONG'S CHAPEL UNITED METHODIST CHURCH DB 796 PG 204 DB 600 PG 2137

LAKE JUNALUSKA FIRE DIST., INC. DB 300 PG 305 DB 1525 PG 1

SALLY FULTZ MARGARET ELAINE DB 1475 PG 267 DB 1475 PG 262

MICHAEL EL DAGGY DB 468 PG 2270

BRIAN K. NOLAND DB 720 PG 1681

PATSY MEDFORD DB 367 PG 890

UNITED METHODIST CHURCH DB 796 PG 193 DB 165 PG 415

WOODLAND MISSIONARY BAPTIST CHURCH DB 720 PG 1957

CHURCH OF JESUS CHRIST OF THE LATTER DAY SAINTS DB 357 PG 740 DB 402 PG 953

REVISIONS

12-MAY-2014 16:45
Utilities Engineer@FOLUC\Proj\r4047_rdy_psh6_uc6.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-7

DESIGNED BY: ARK
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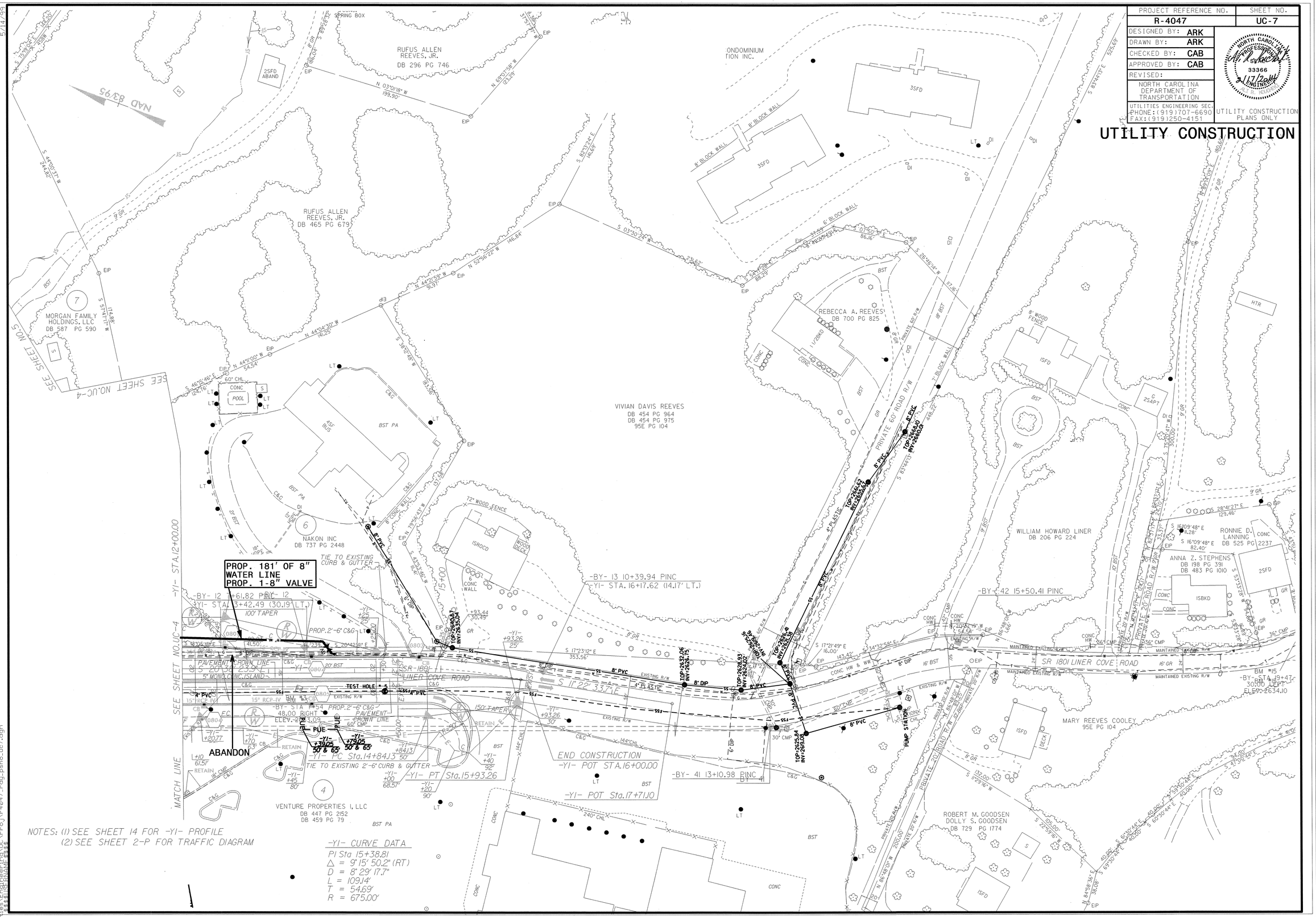
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER
2/17/2014
ALI R. KOUCHEK

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NOTES: (1) SEE SHEET 14 FOR -Y1- PROFILE
(2) SEE SHEET 2-P FOR TRAFFIC DIAGRAM

-Y1- CURVE DATA
PI Sta 15+38.81
Δ = 9° 15' 50.2" (RT)
D = 8° 29' 17.7"
L = 109.14'
T = 54.69'
R = 675.00'

5/14/99

11-FEB-2014 10:19

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-8
DESIGNED BY: ARK	
DRAWN BY: ARK	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER

UTILITY CONSTRUCTION

SEE SHEET UC-22 TO UC-26
FOR SEWER LINE (SL-1) PROFILE

PROP. SANITARY SEWER MANHOLE "J1"
STA. 23+12 LINE SL-1

STA. 18+01 LINE -Y3-, 54' LT

ABANDON

INV=2639.70
INV=2640.47
TOP=2649.77
INV=2639.87
TOP=2657.46
INV=2653.52
TOP=2676.57
INV=2670.85
TOP=2696.66
INV=2688.94
TOP=2706.95
INV=2698.55
INV=2699.69
TOP=2725.32
INV=2720.05
TOP=2737.47
INV=2730.2

8" PVC
8" CLAY

-Y3- POT Sta.18+00.50
-Y2- POT Sta.17+88.30
-Y2L2- PC Sta.28+07.06
-Y2L2- PT Sta.40+88.4
-Y2L2- PCC Sta.37+64.47

-Y2L2- CURVE DATA
PI Sta 30+86.50
Δ = 11°08' 32.1" (RT)
D = 2°00' 00.0"
L = 557.11'
T = 279.44'
R = 2,864.79'

-Y2L2- CURVE DATA
PI Sta 37+86.79
Δ = 7°14' 34.0" (RT)
D = 1°00' 00.0"
L = 724.28'
T = 362.62'
R = 5,729.58'

N 53°31' 57.0" E

PARAGON PARKWAY 35' BST
SR 1929 HOSPITAL DRIVE 22' BST
US 74/US 19-23 24' BST
US 74/US 19-23
SCHOOL BUS ACCESS ROAD
MAINTAINED EXISTING R/W
EXISTING R/W
OUTFLOW OF PIPE NOT FOUND
A BODY POLITIC AND CORPORATE
HAYWOOD COUNTY
DB 75 PG 265
STATE EMPLOYEES CREDIT UNION
DB 358 PG 101
DB 436 PG 370
HAZEL R. HIPPS ESTATE
DB 115 PG 438
DB 164 PG 535
DB 173 PG34
DB 204 PG 37
ISMTL BUS
BM #10
BM #8
TEST HOLE #6
TEST HOLE #7
N 04°03' 37" W 406.38'
S 46°05' 15" E 39.83'
N 02°24' 47" E 113.81'
S 72°37' 49" W 113.81'
29°47' 46" E 346.31'

5/14/99
11-FEB-2014 10:20
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-9

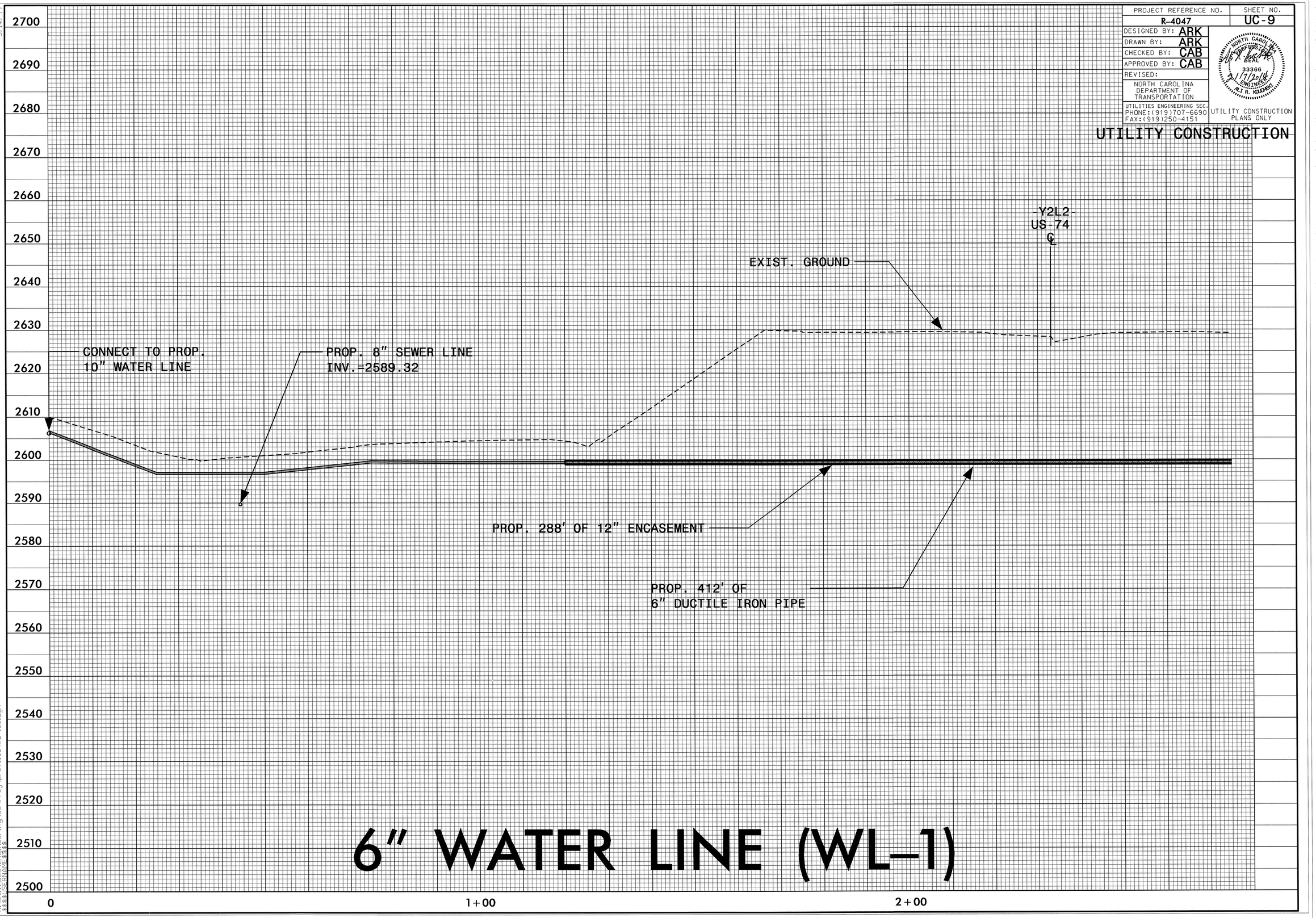
DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



6" WATER LINE (WL-1)

5/14/99

04-FEB-2014 12:49
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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-10

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

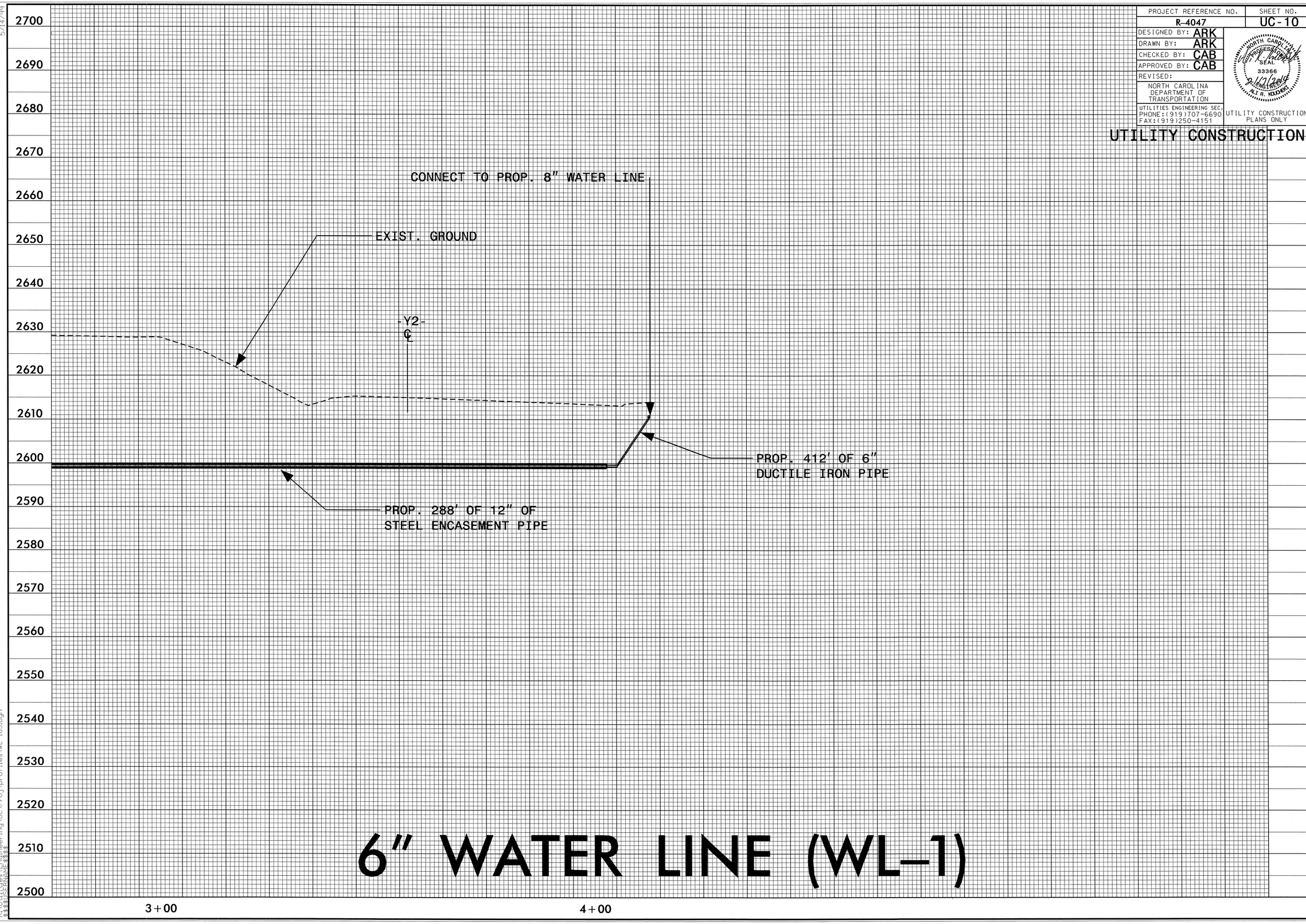
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KILDEE

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



6" WATER LINE (WL-1)

5/14/99

04-FEB-2014 12:48
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-11

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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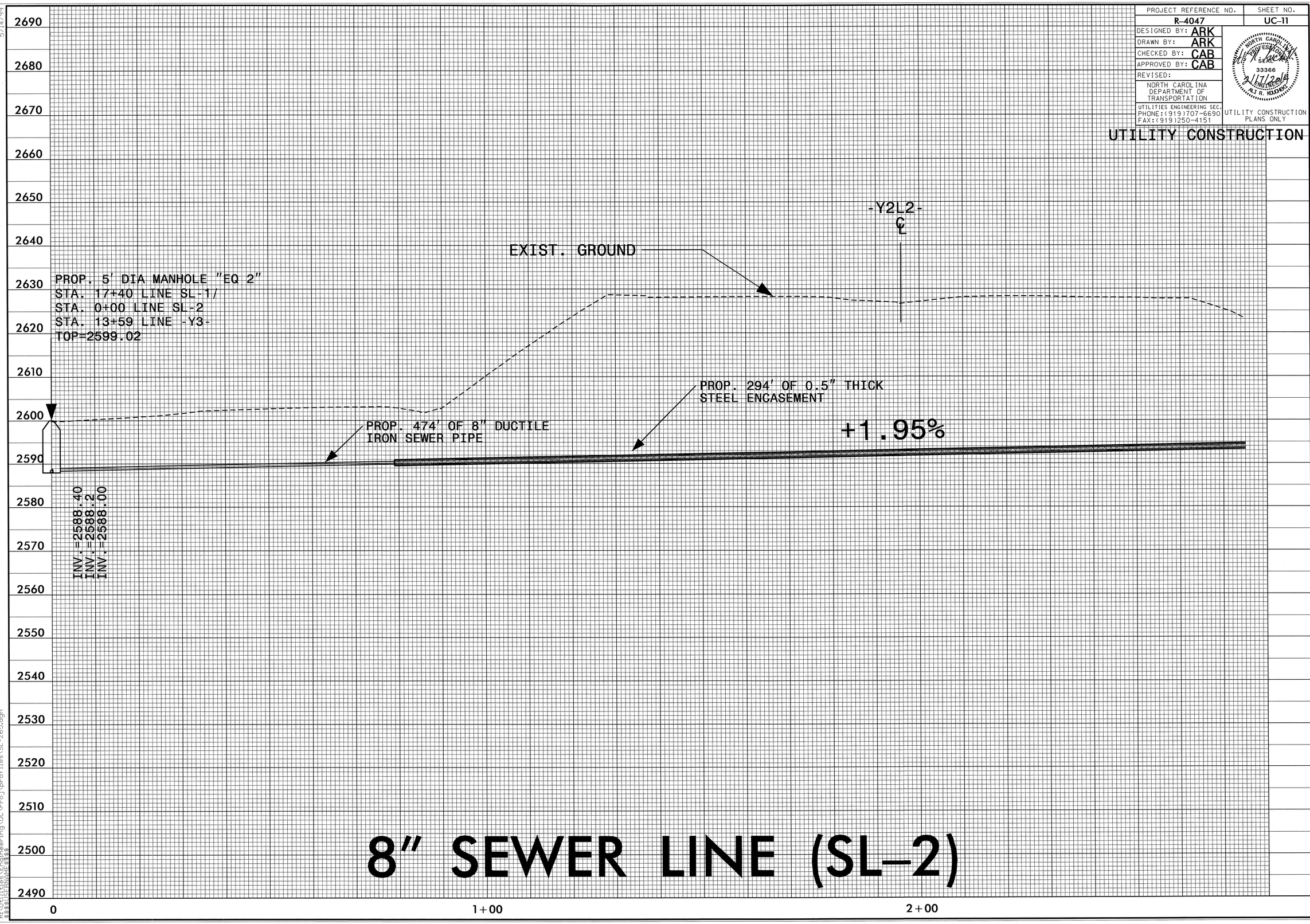
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 2/17/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



8" SEWER LINE (SL-2)

5/14/99

04-FEB-2014 13:05
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-12

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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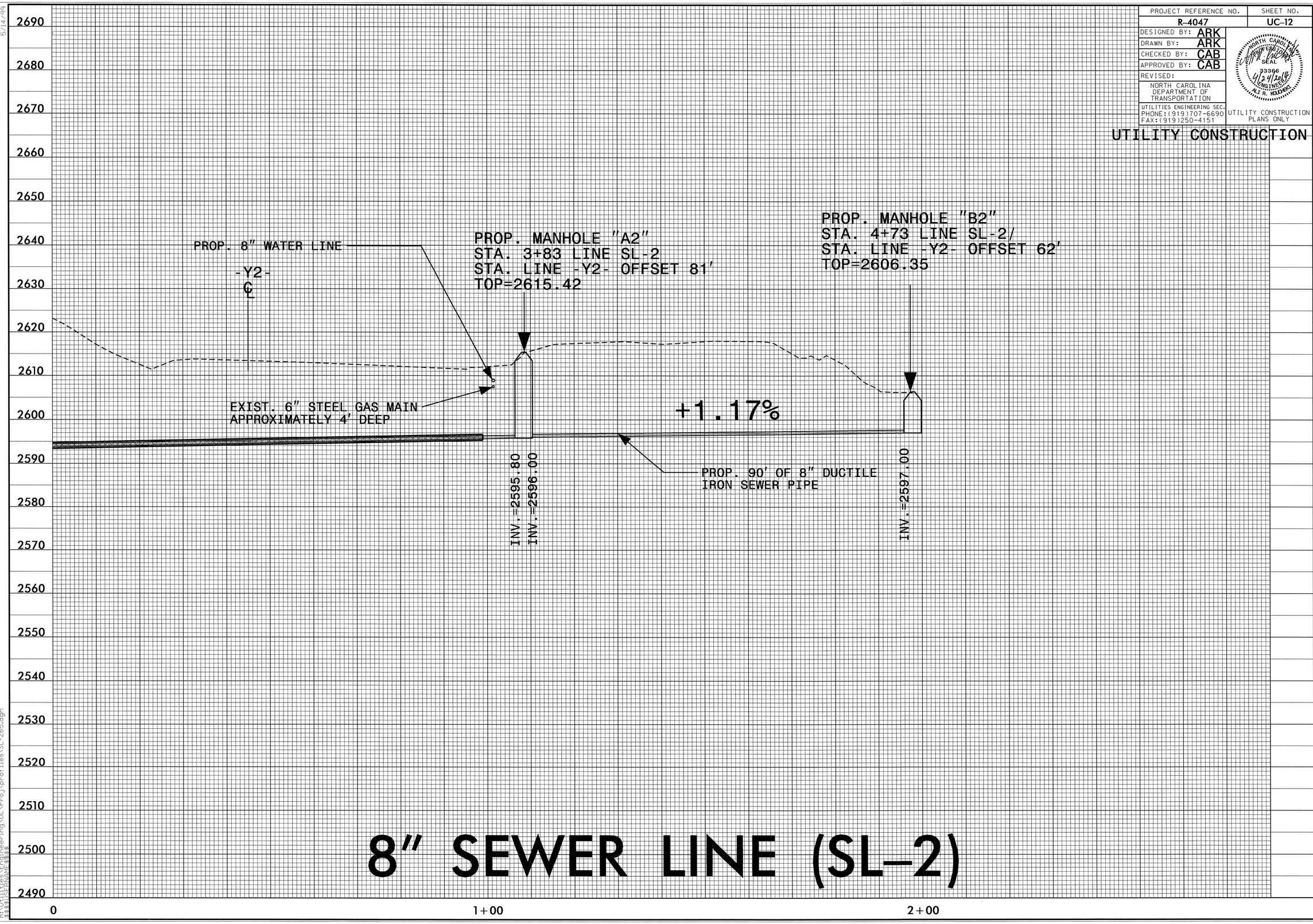
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 4/24/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



8" SEWER LINE (SL-2)

5/14/99

16-APR-2014 13:52
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-13

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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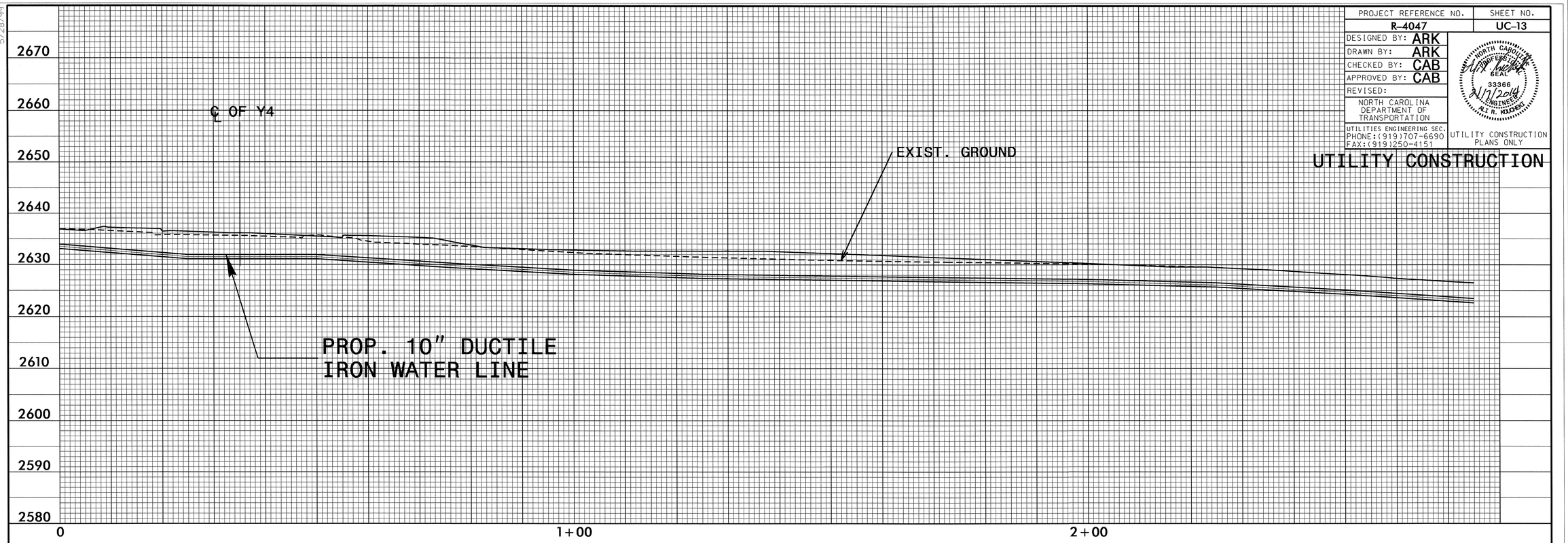
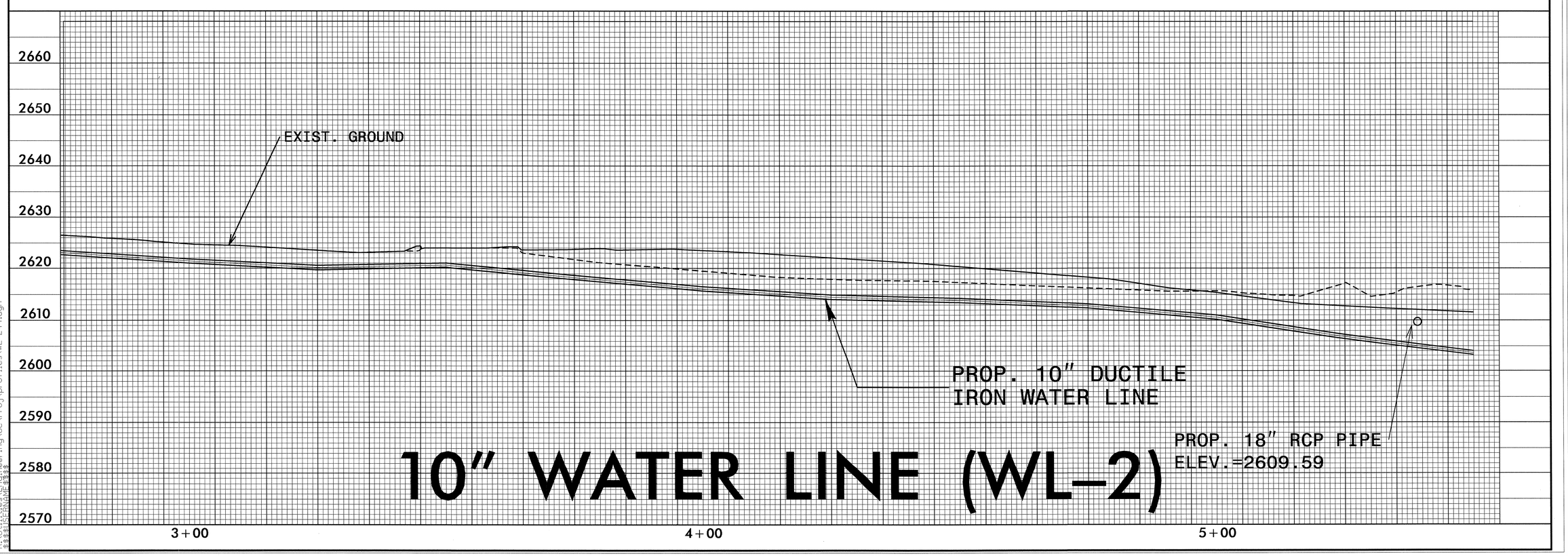
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KUCHEKI 2/7/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION





10" WATER LINE (WL-2)

05-FEB-2014 08:14
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-14

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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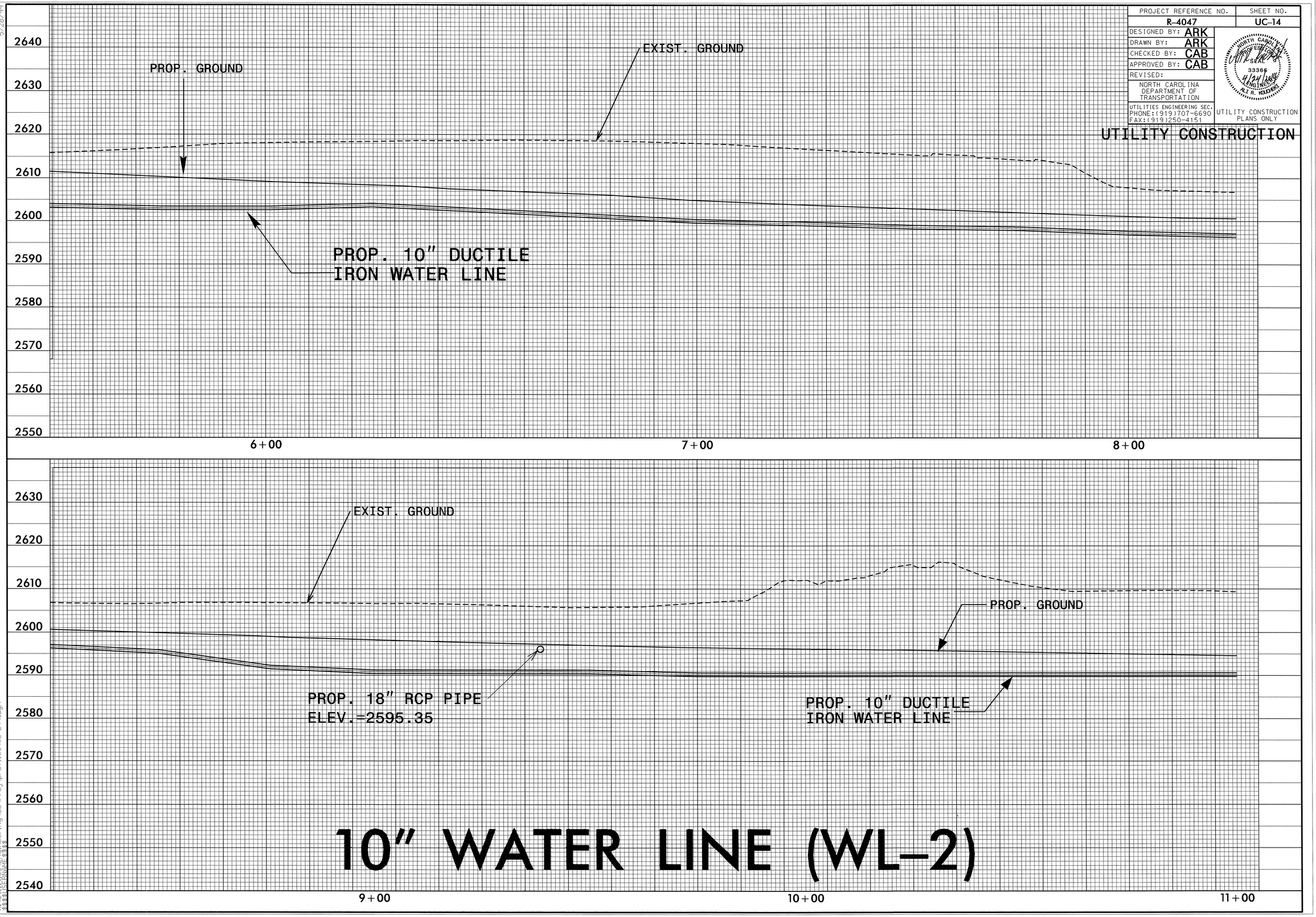
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 4/24/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



10" WATER LINE (WL-2)

5/28/99

16-APR-2014 14:22
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-15

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
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UTILITIES ENGINEERING SEC.
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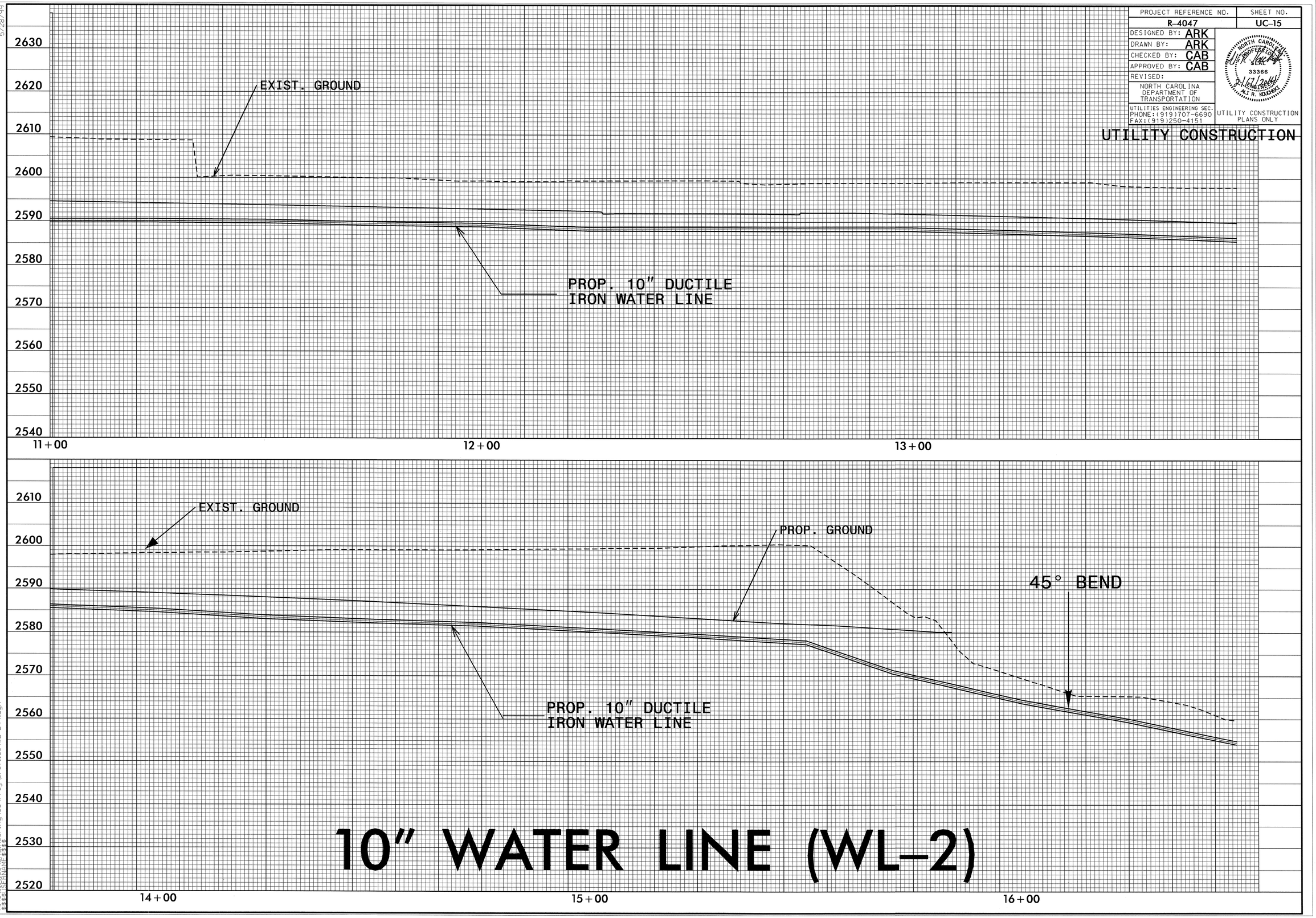
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKY

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



10" WATER LINE (WL-2)

5/28/99

05-FEB-2014 08:22
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-16

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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UTILITIES ENGINEERING SEC.
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NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI
21/7/2014

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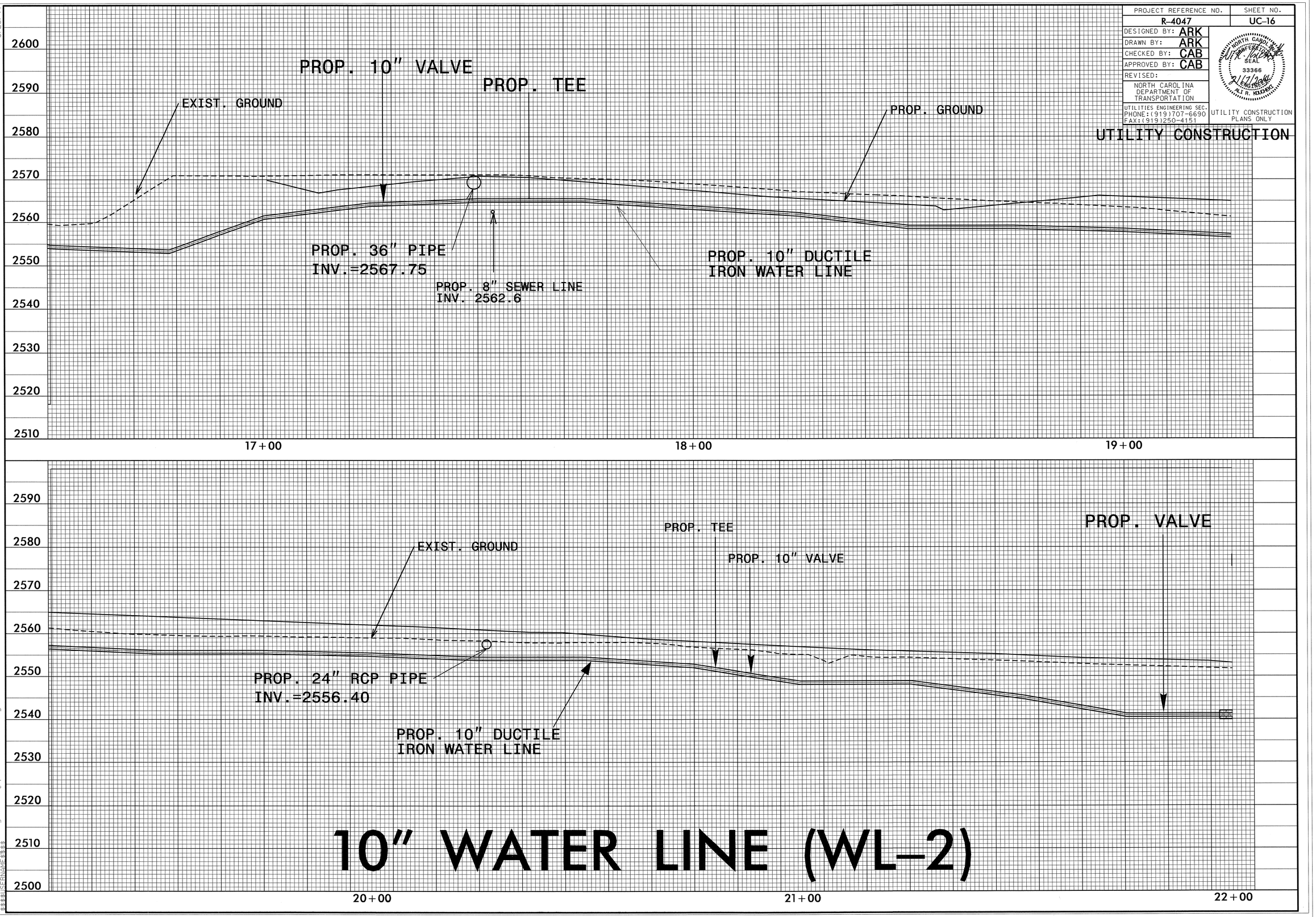

10" WATER LINE (WL-2)

5/28/99

04-FEB-2014 16:55
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-17

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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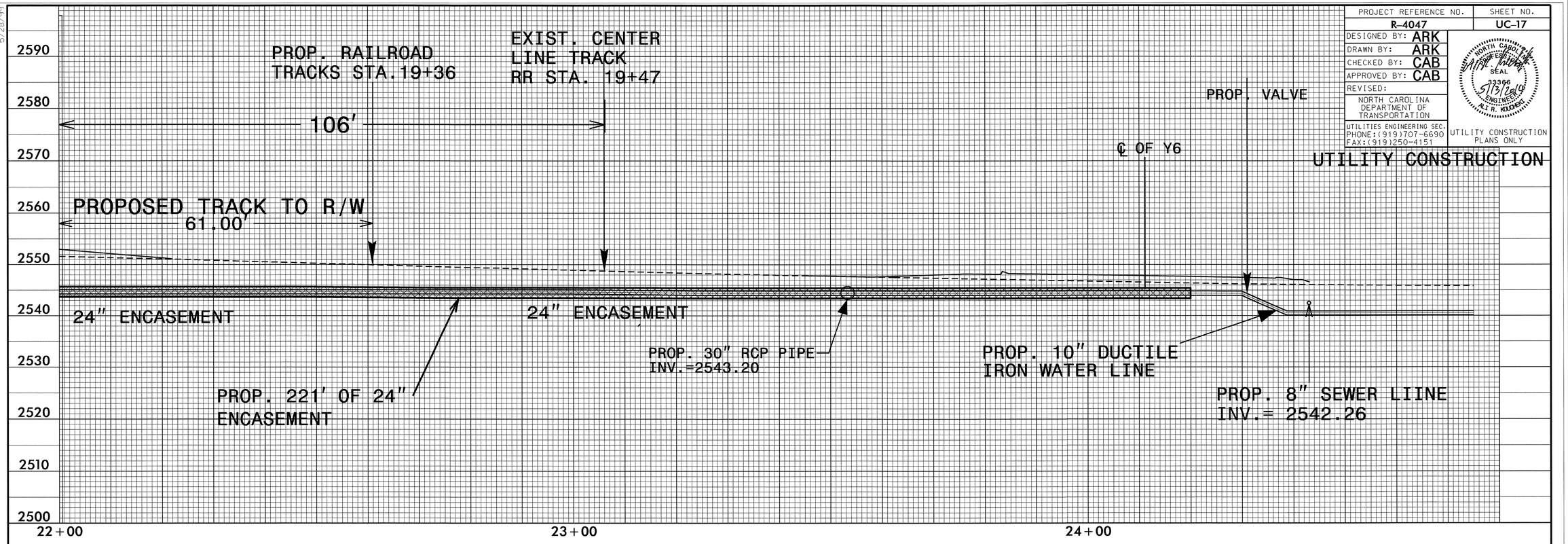
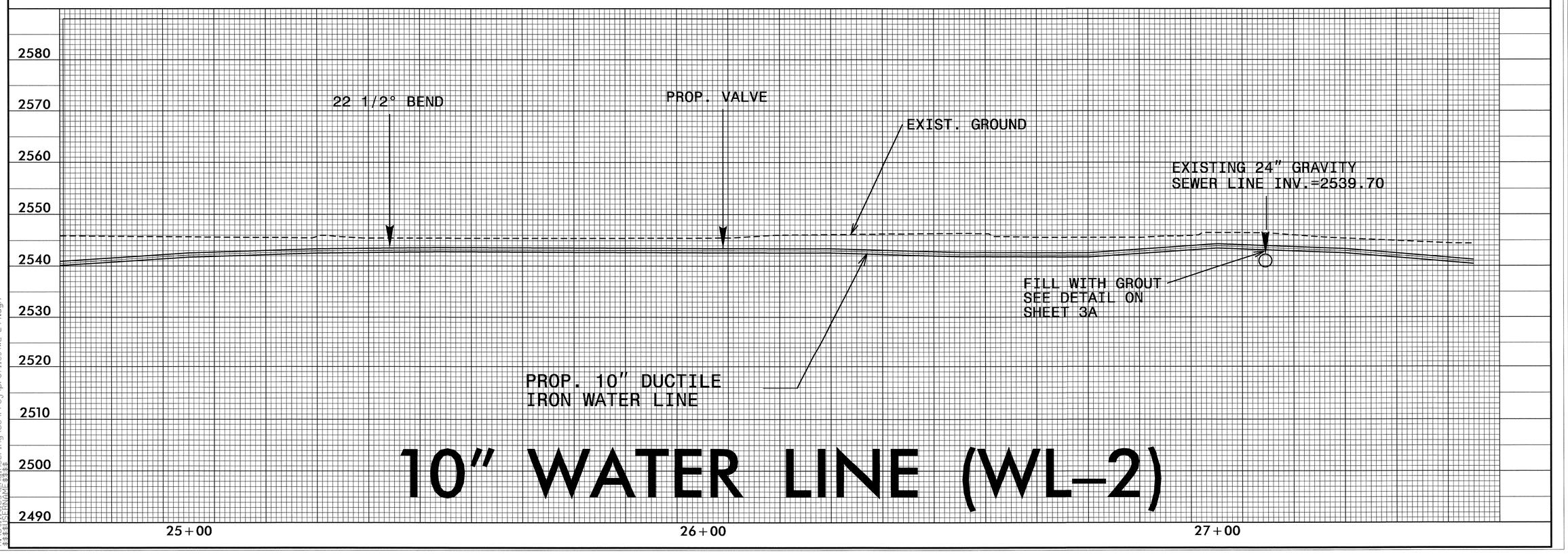
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 5/13/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION





10" WATER LINE (WL-2)

5/28/99

13-MAY-2014 11:45
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-18

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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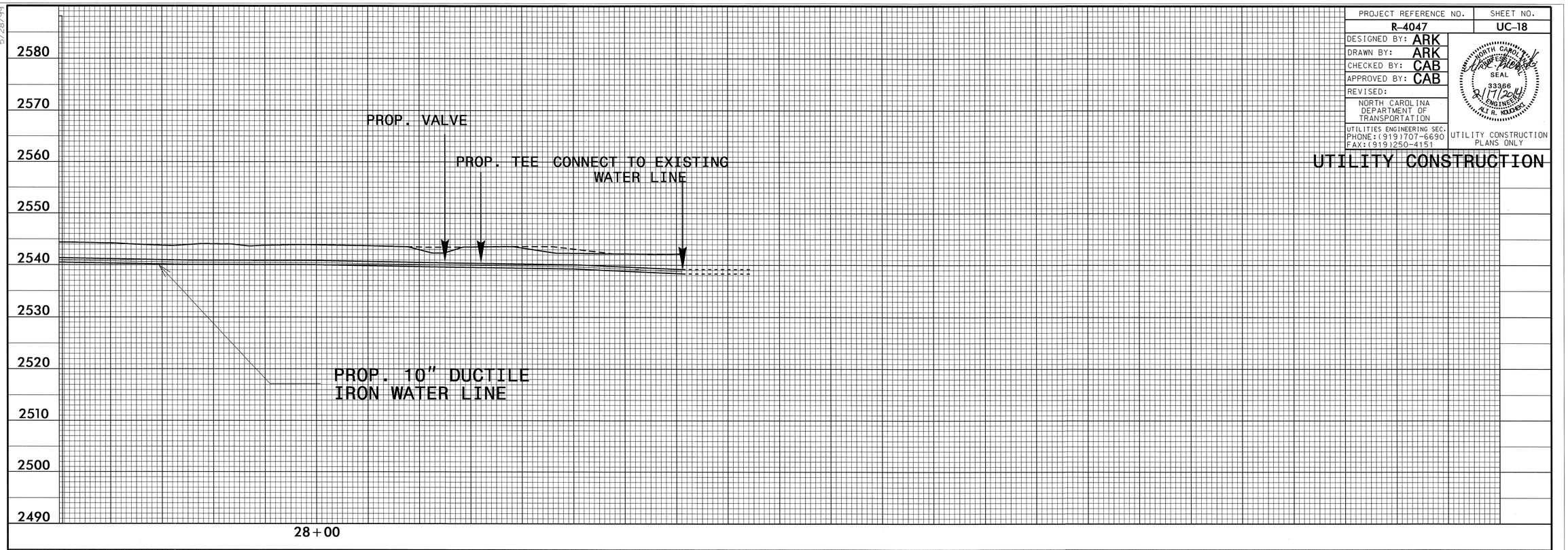
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 2/17/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



10" WATER LINE (WL-2)

5/28/99

04-FEB-2014 16:58
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-19

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
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NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 2/17/2014

UTILITY CONSTRUCTION PLANS ONLY

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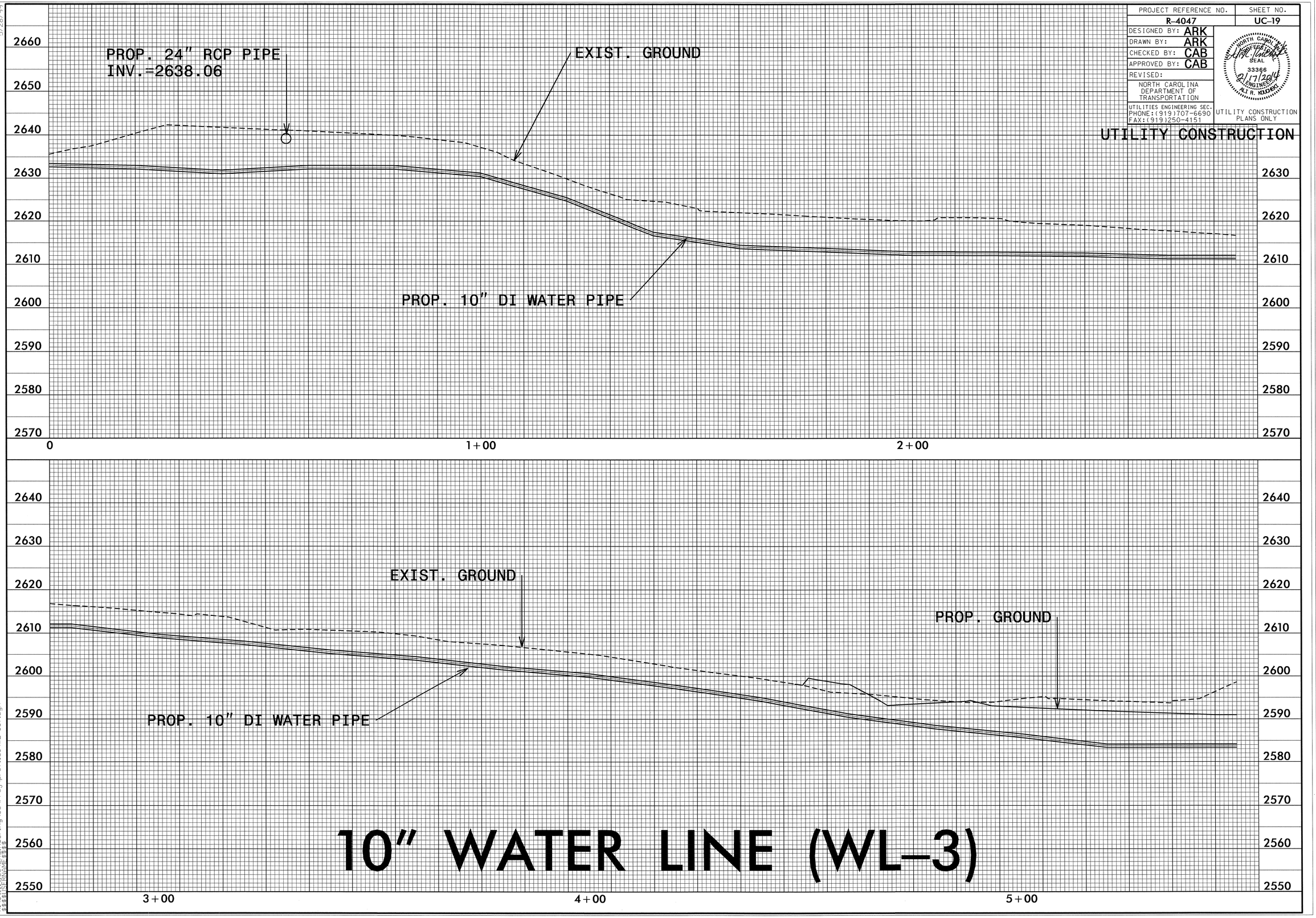

10" WATER LINE (WL-3)

5/28/99

05-FEB-2014 07:54
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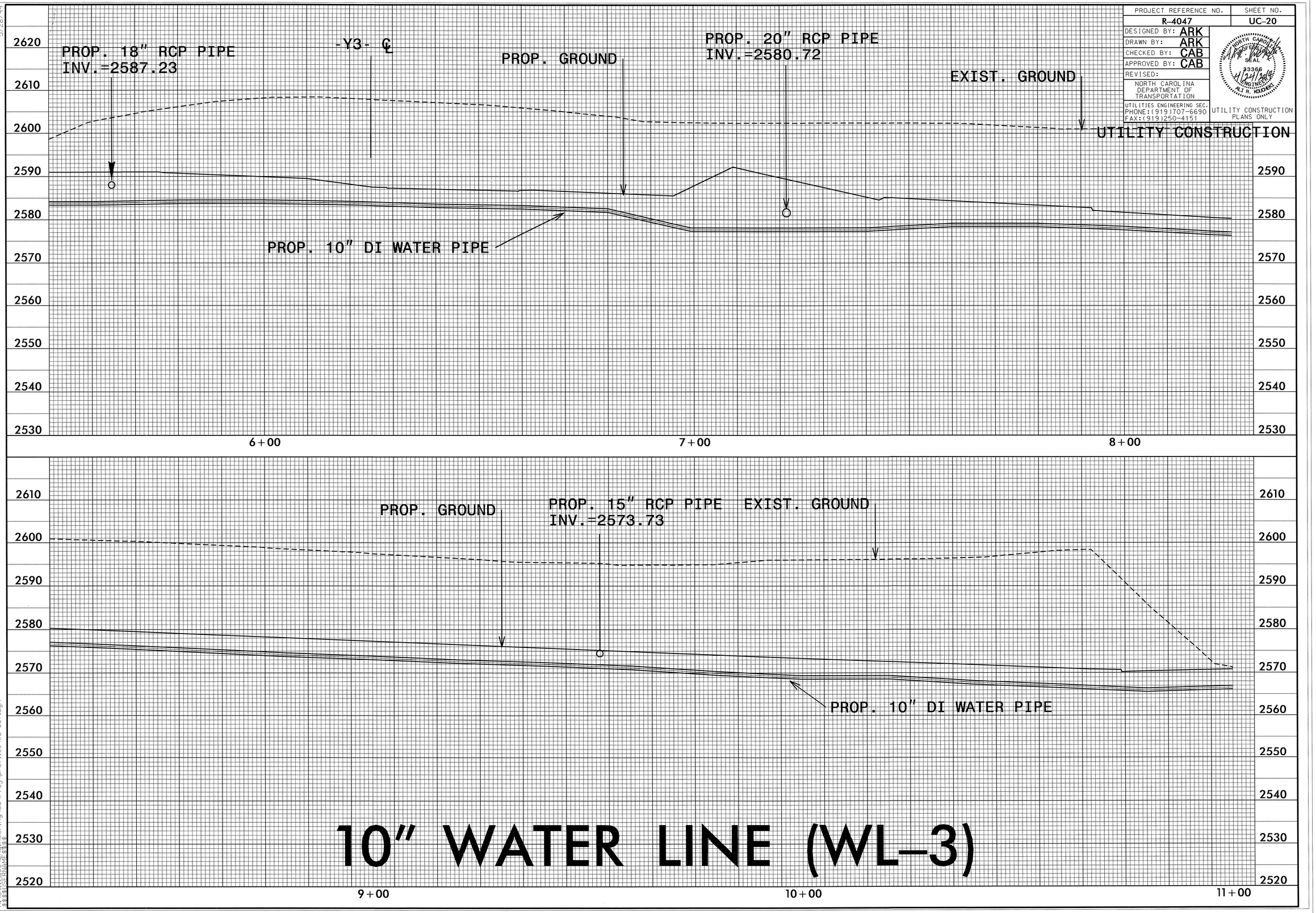
$$$$USERNAME$$$$



10" WATER LINE (WL-3)

5/28/99

16-APR-2014 13:46
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-21

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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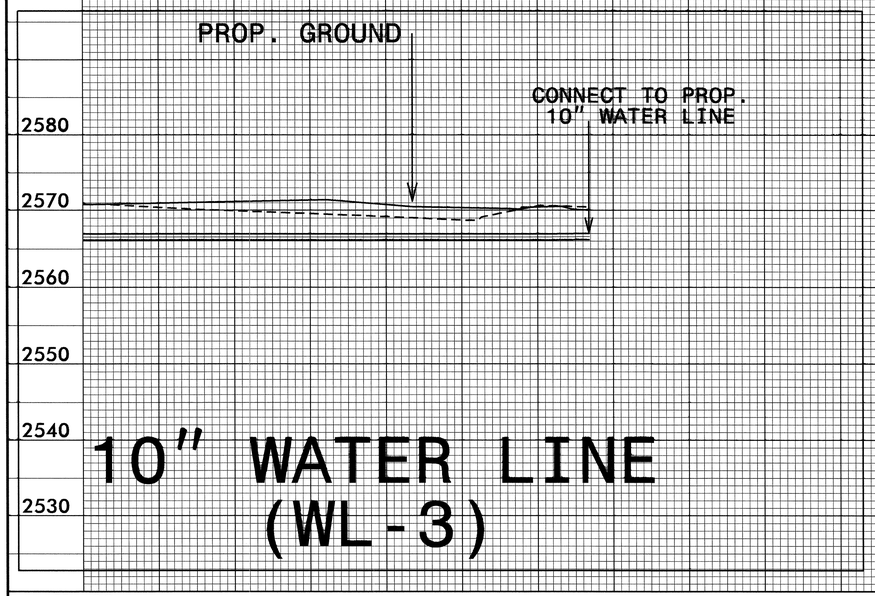
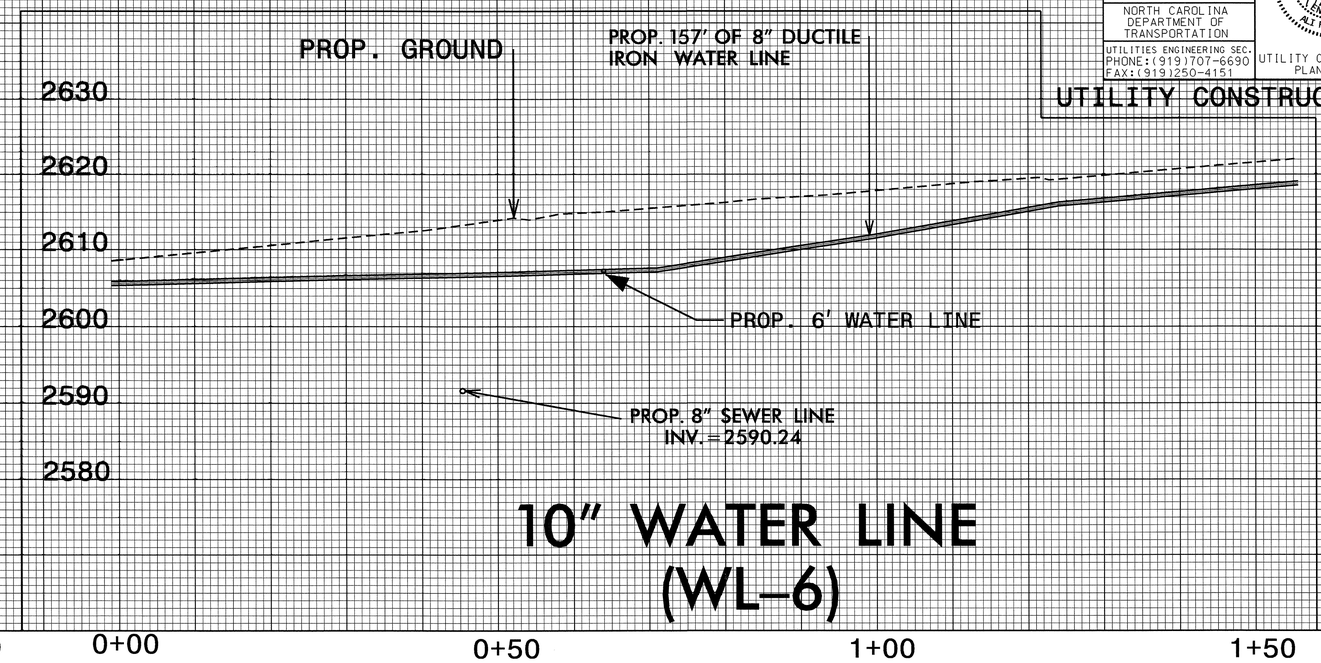
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

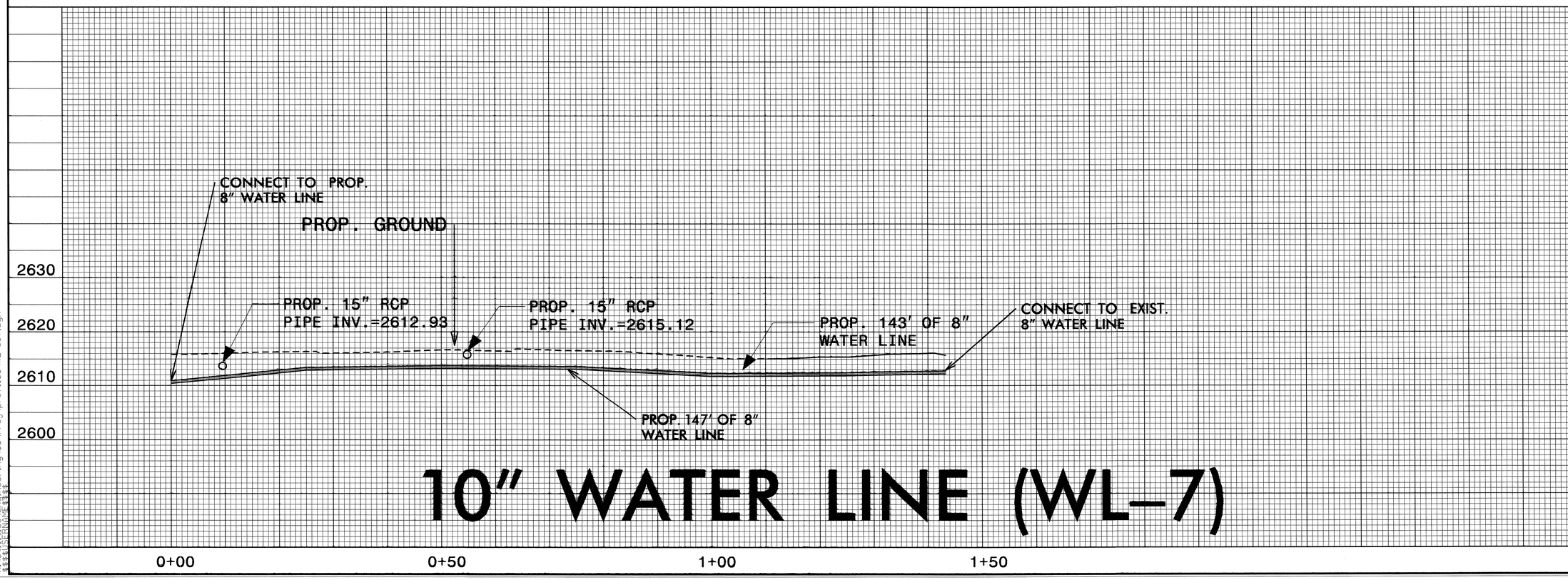
NORTH CAROLINA PROFESSIONAL SEAL 38366 ENGINEER ALI R. KOUCHEKI 4/24/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION







5/28/99

16-APR-2014 3:48
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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-22

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
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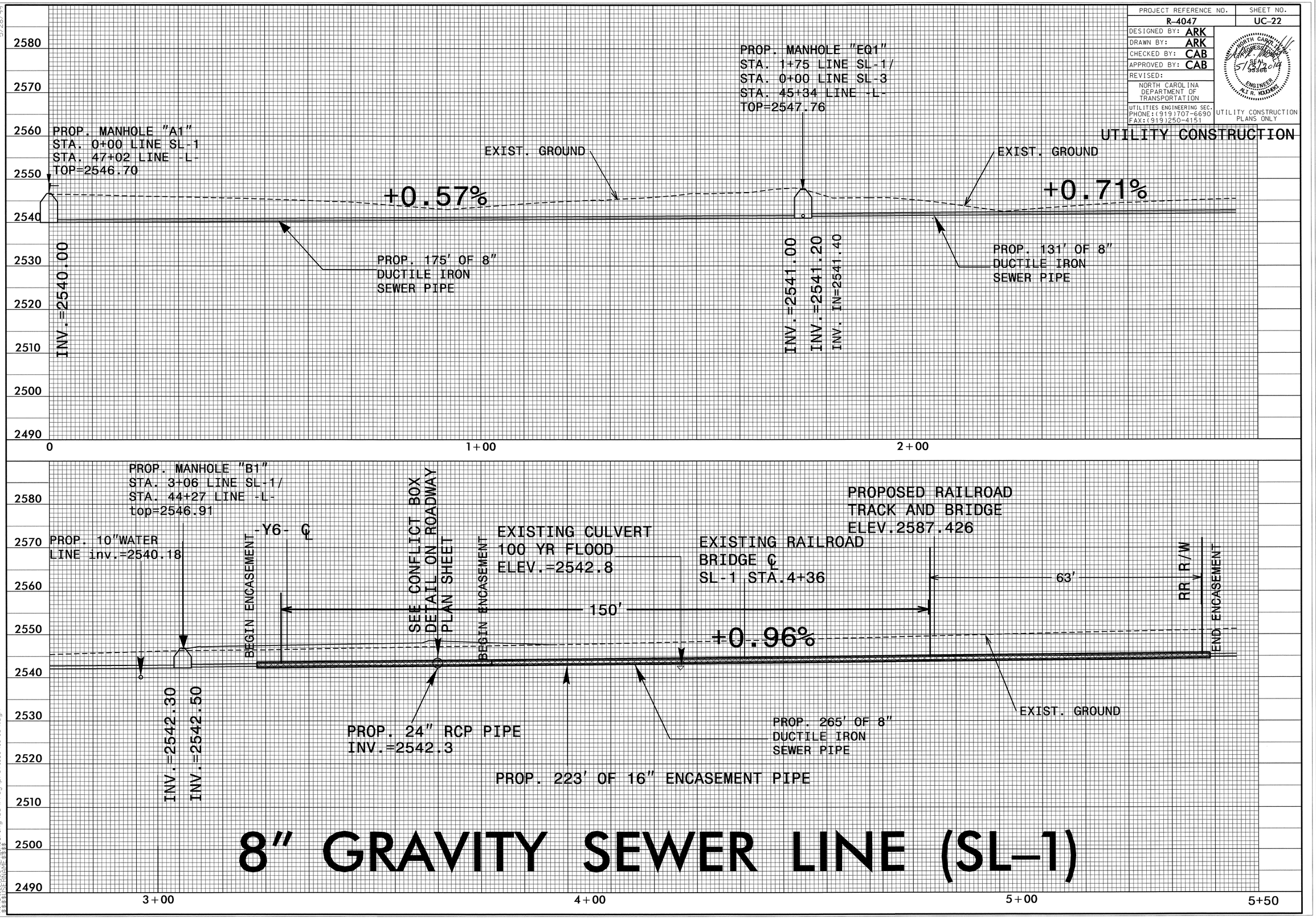
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33366 ALI R. KUCHEK 5/12/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



8" GRAVITY SEWER LINE (SL-1)

5/28/99

13-MAY-2014 12:08
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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-23

DESIGNED BY: ARK
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CHECKED BY: CAB
APPROVED BY: CAB
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FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI

UTILITY CONSTRUCTION PLANS ONLY

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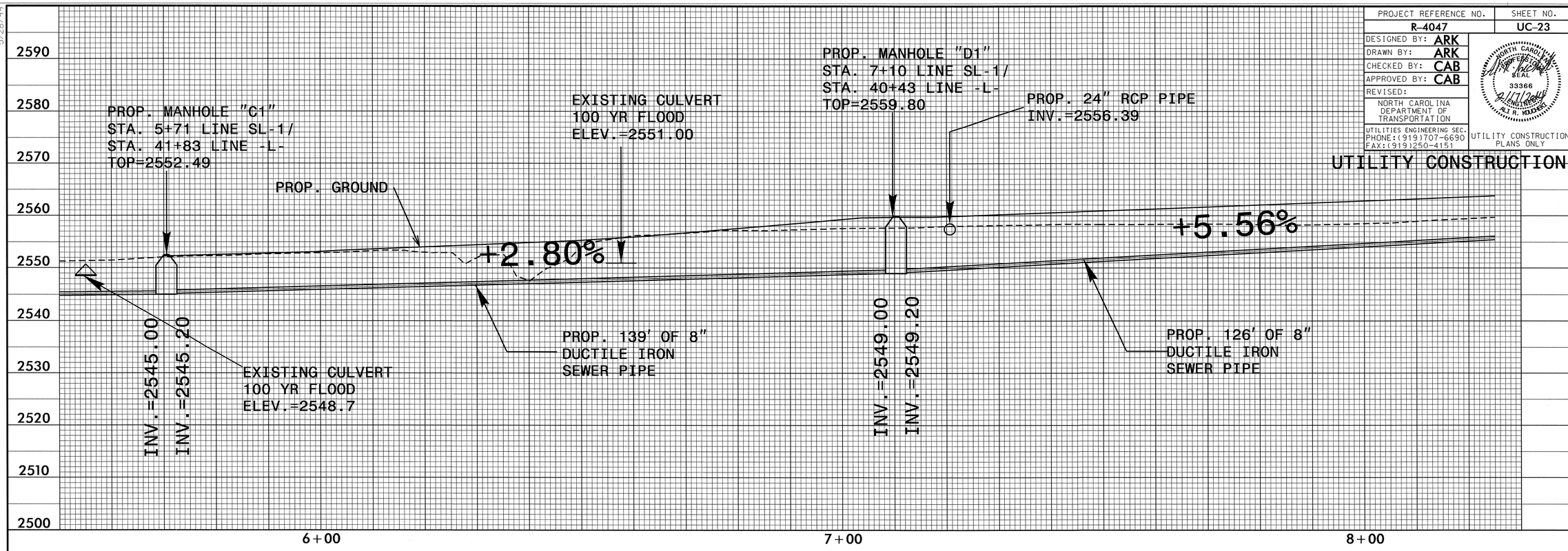

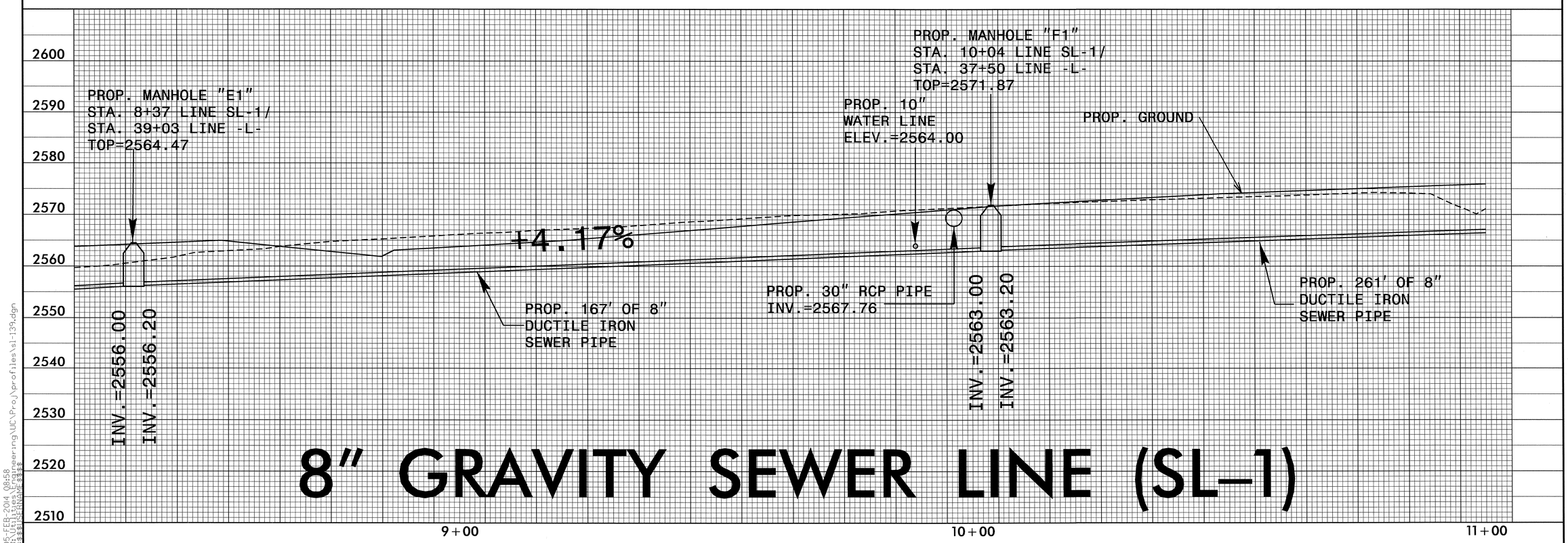

8" GRAVITY SEWER LINE (SL-1)

5/28/99

05-FEB-2014 08:58
R:\Utilities\Engineering\UC\Proj\profiles\sl-139.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-24

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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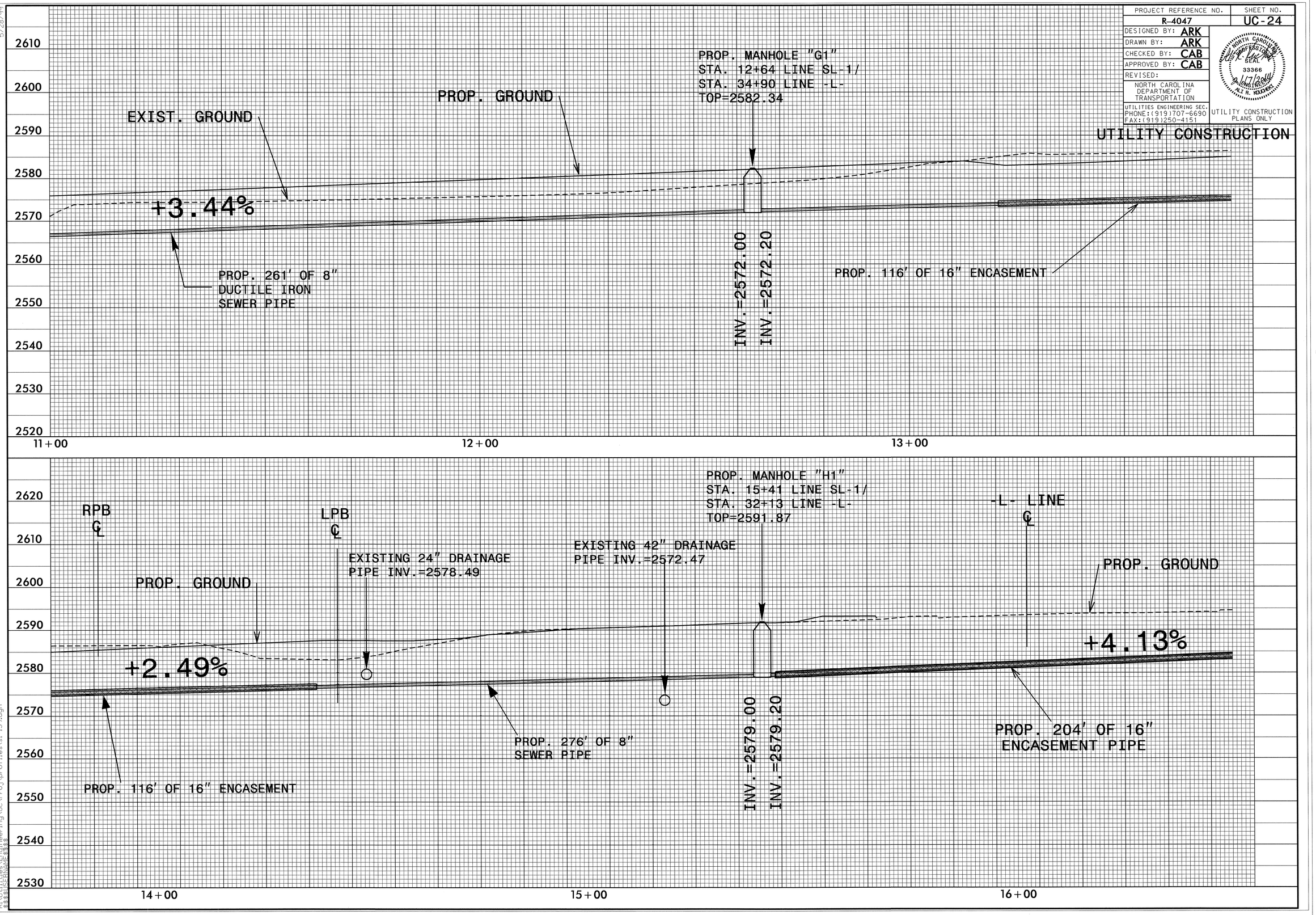
NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 2/17/2014

UTILITY CONSTRUCTION



5/28/99

12-FEB-2014 07:25
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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-25

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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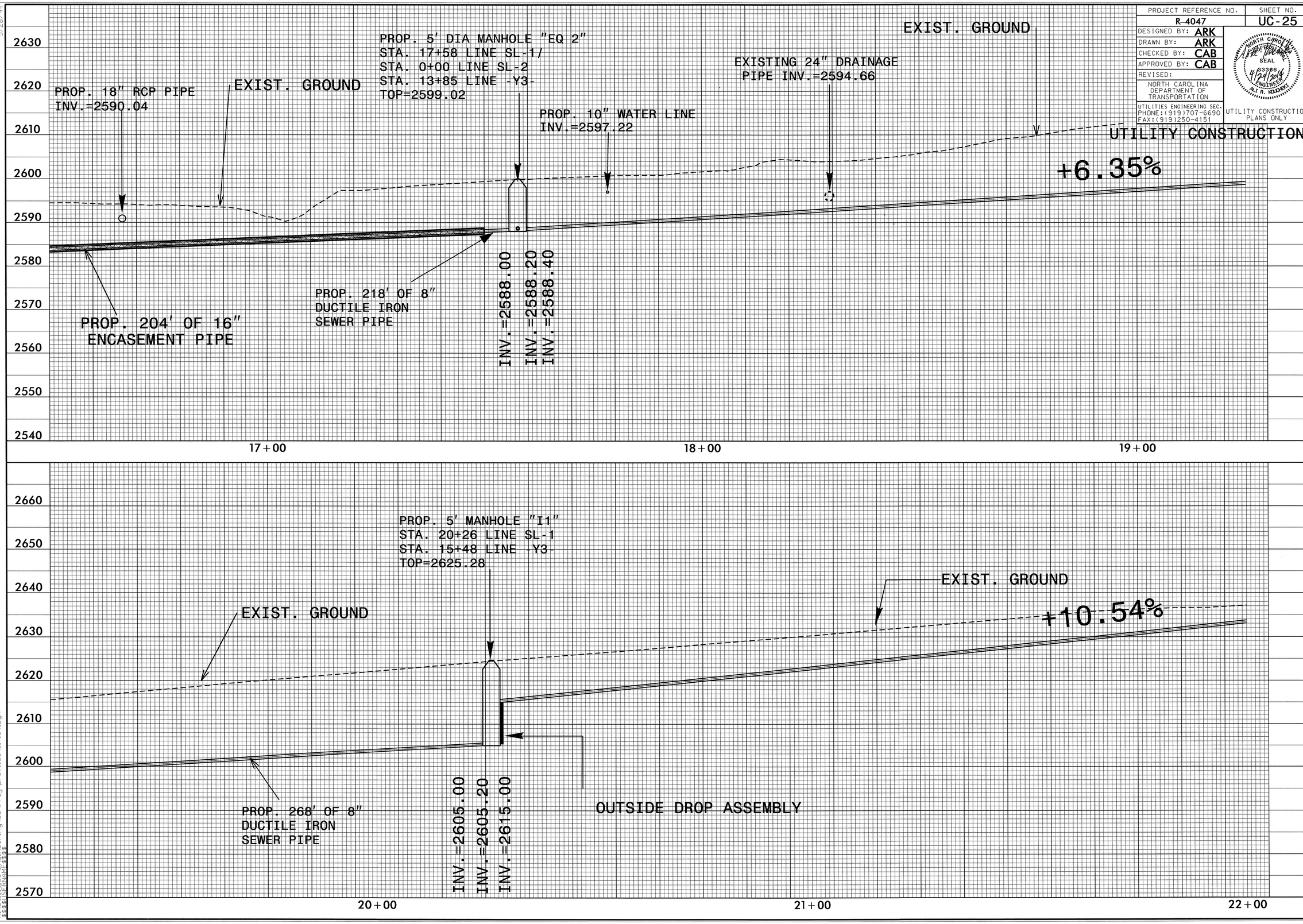
UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 03386 ENGINEER ALI R. KOUDEH 4/24/2014

UTILITY CONSTRUCTION



5/28/99

16-APR-2014 09:48
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PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-26

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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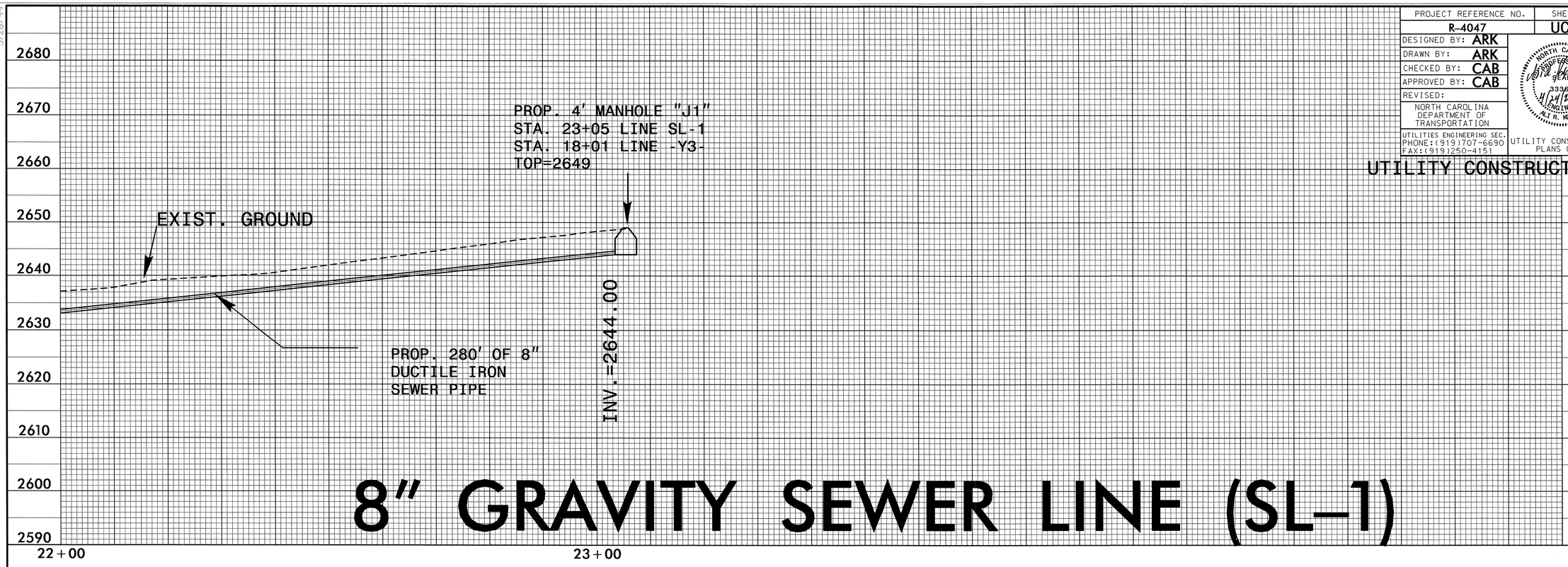
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



8" GRAVITY SEWER LINE (SL-1)

5/28/99

16-APR-2014 09:52
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-27

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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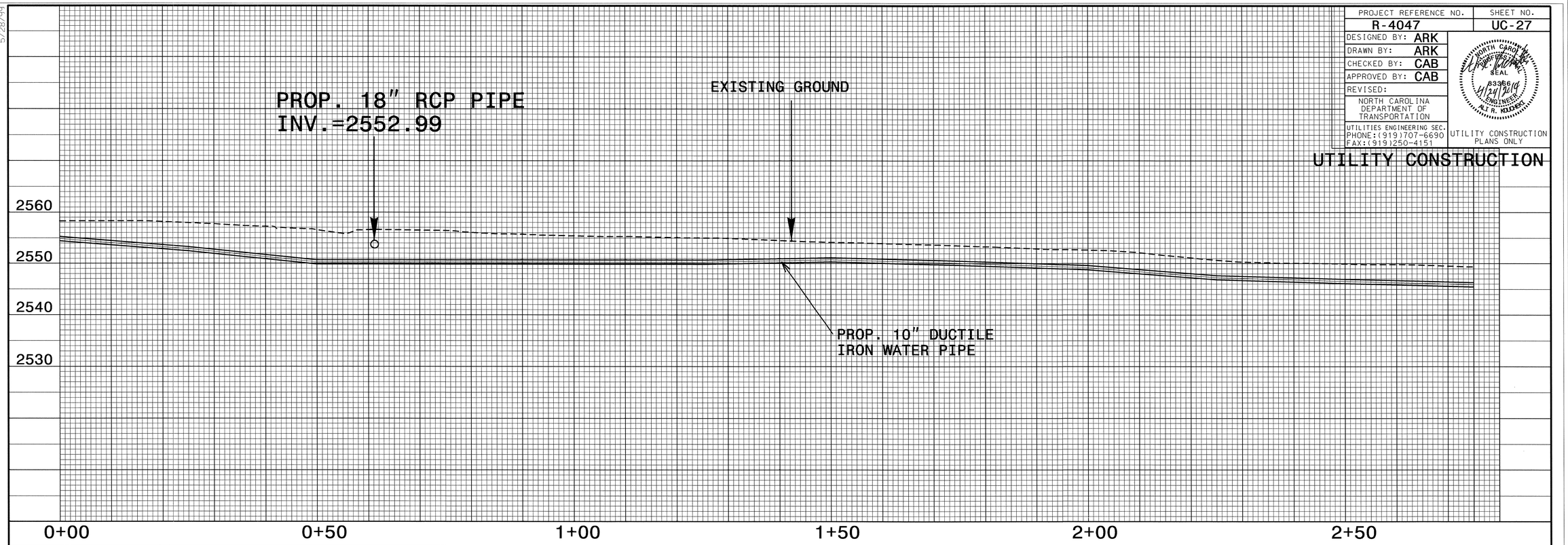
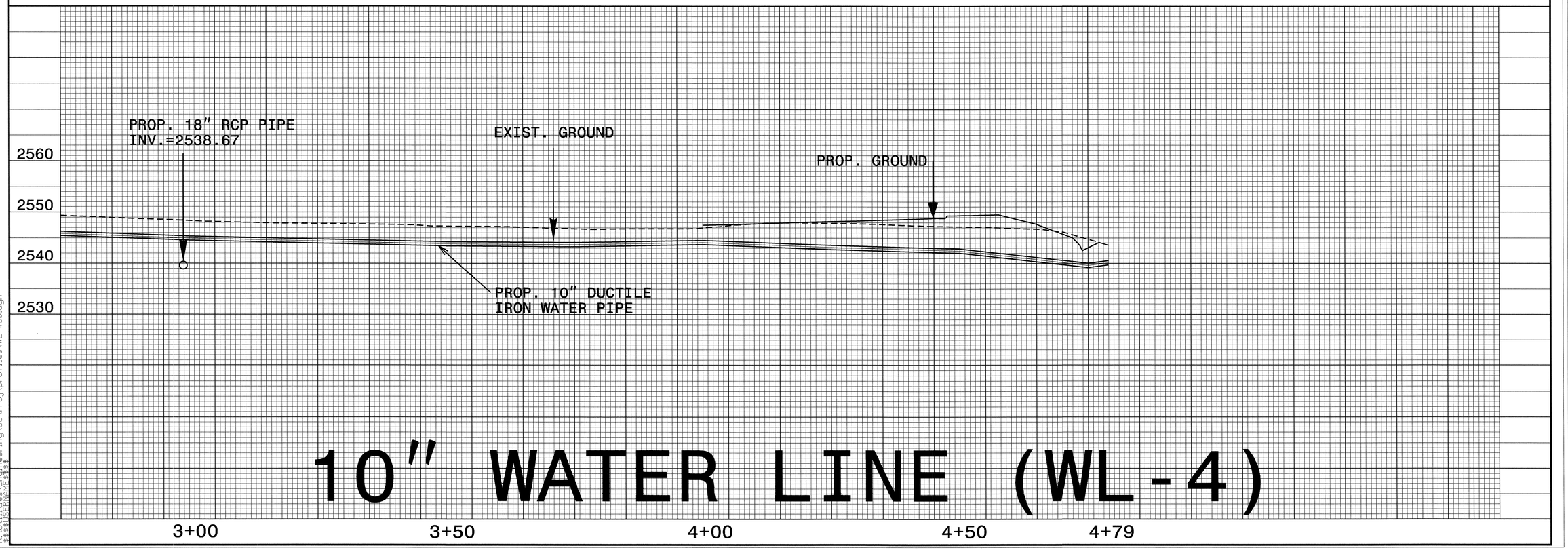
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 83366 ENGINEER ALI R. KOUCHEKI 4/24/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION





10" WATER LINE (WL-4)

5/28/99

21-APR-2014 07:38
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-28

DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKI 4/24/2014

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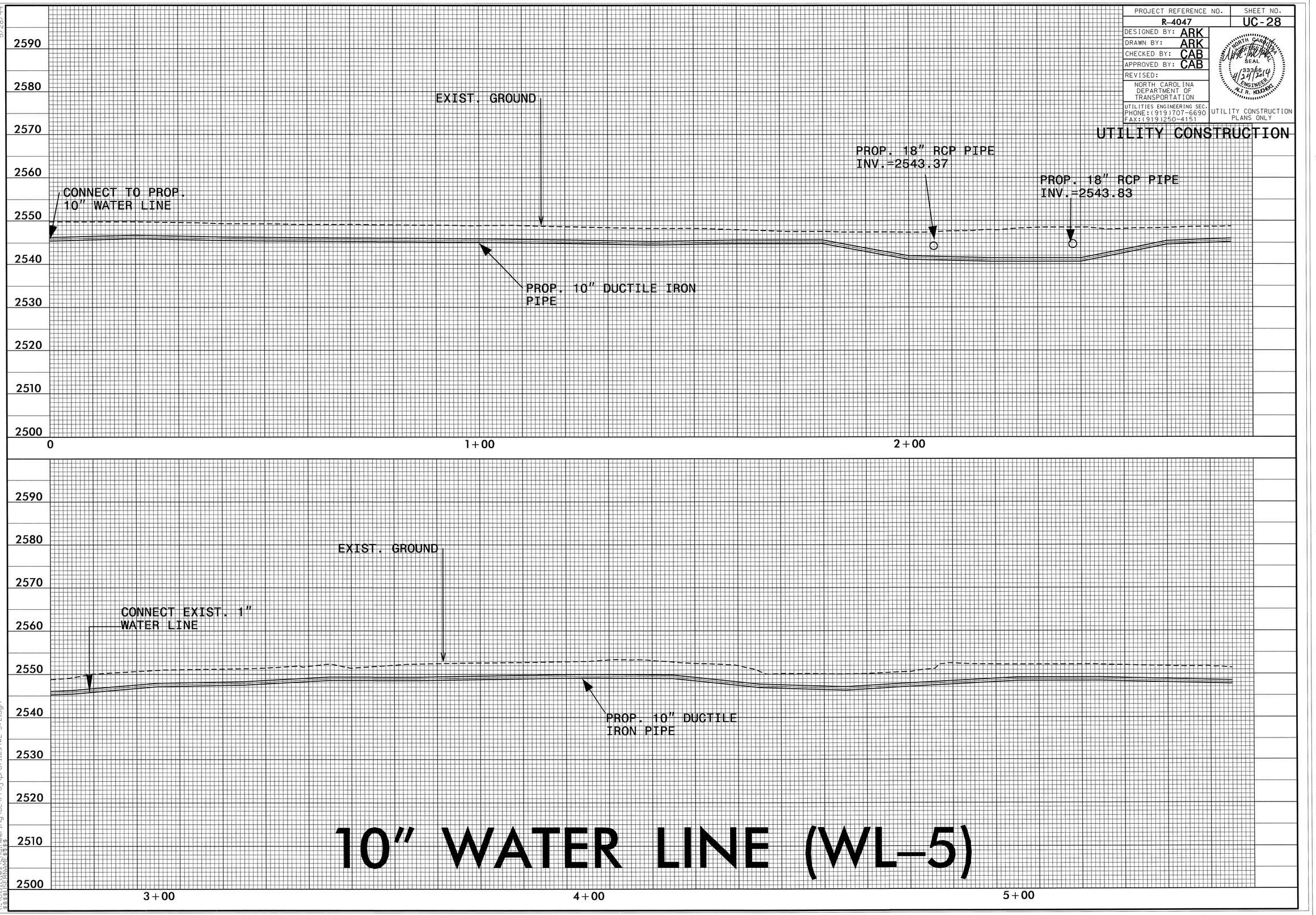


10" WATER LINE (WL-5)

5/28/99

16-APR-2014 09:58
R:\Utilities\Engineering\UC\Proj\profiles\WL-572.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-29

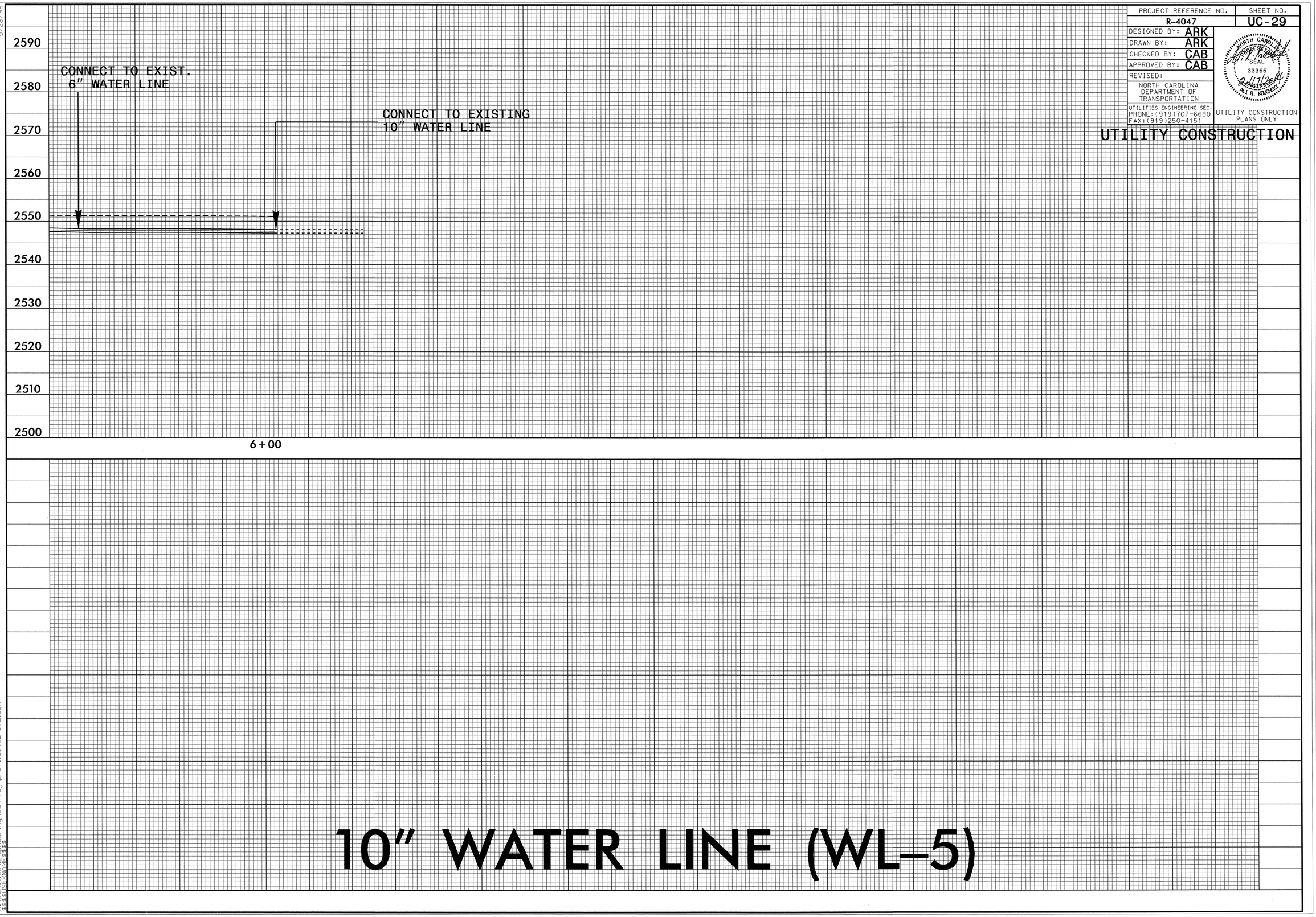
DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

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

NORTH CAROLINA PROFESSIONAL SEAL 33366 ENGINEER ALI R. KOUCHEKY 2/17/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



10" WATER LINE (WL-5)

5/28/99

05-FEB-2014 11:54
R:\Utilities\Engineering\UC\Proj\profiles\WL-572.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	UC-30

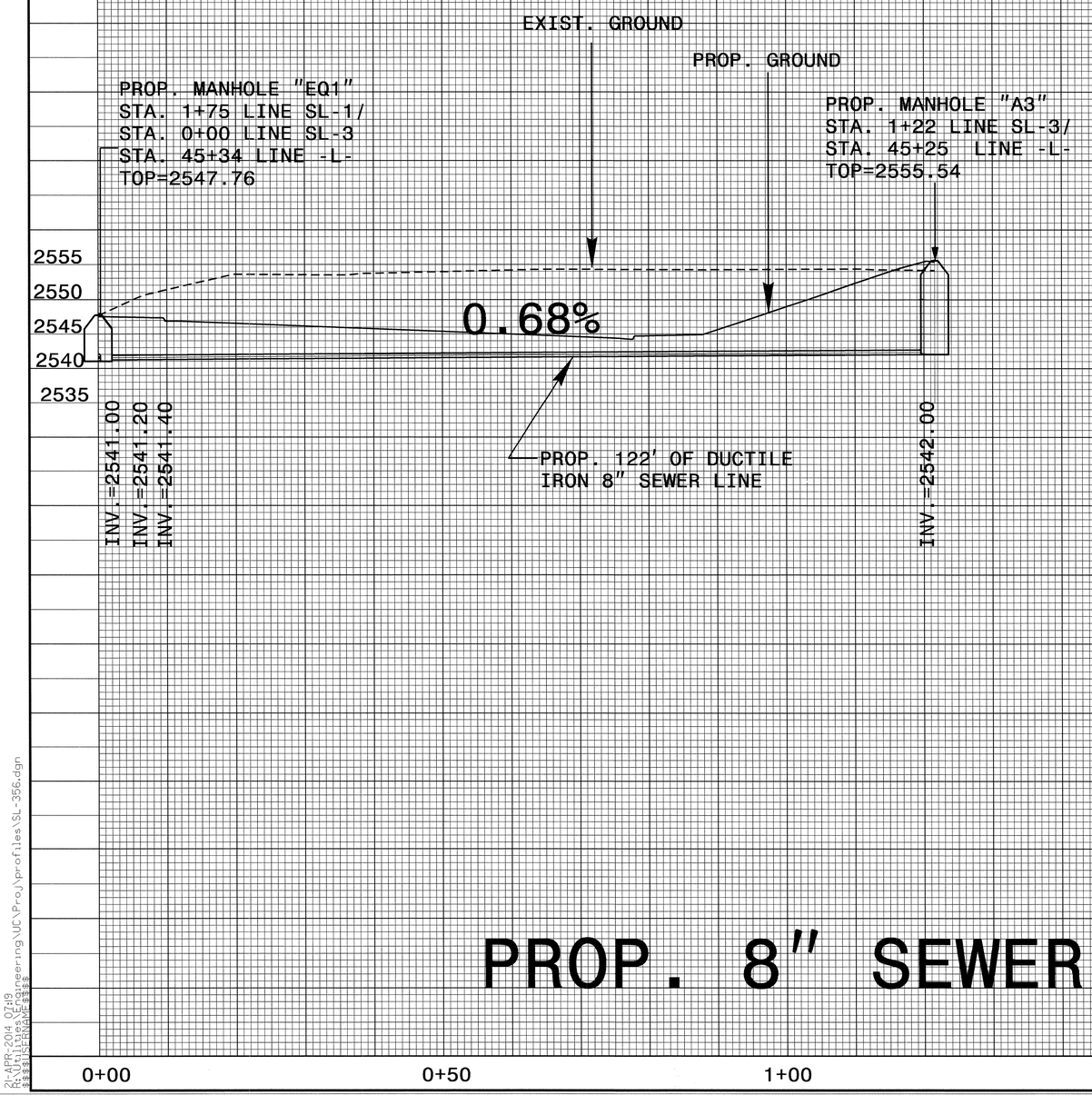
DESIGNED BY: ARK
DRAWN BY: ARK
CHECKED BY: CAB
APPROVED BY: CAB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.

NORTH CAROLINA PROFESSIONAL SEAL 4/29/2014 ENGINEER ALI R. KOUCHEKI

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



PROP. 8" SEWER LINE (SL-3)

5/14/99

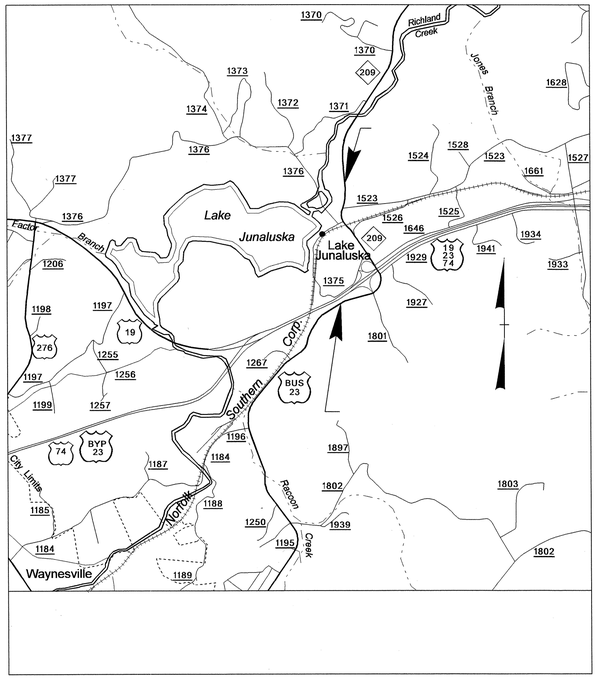
21-APR-2014 07:19
R:\Utilities\Engineering\UC\Proj\profiles\SL-356.dgn
$$$$USERNAME$$$$

TIP PROJECT: R-4047

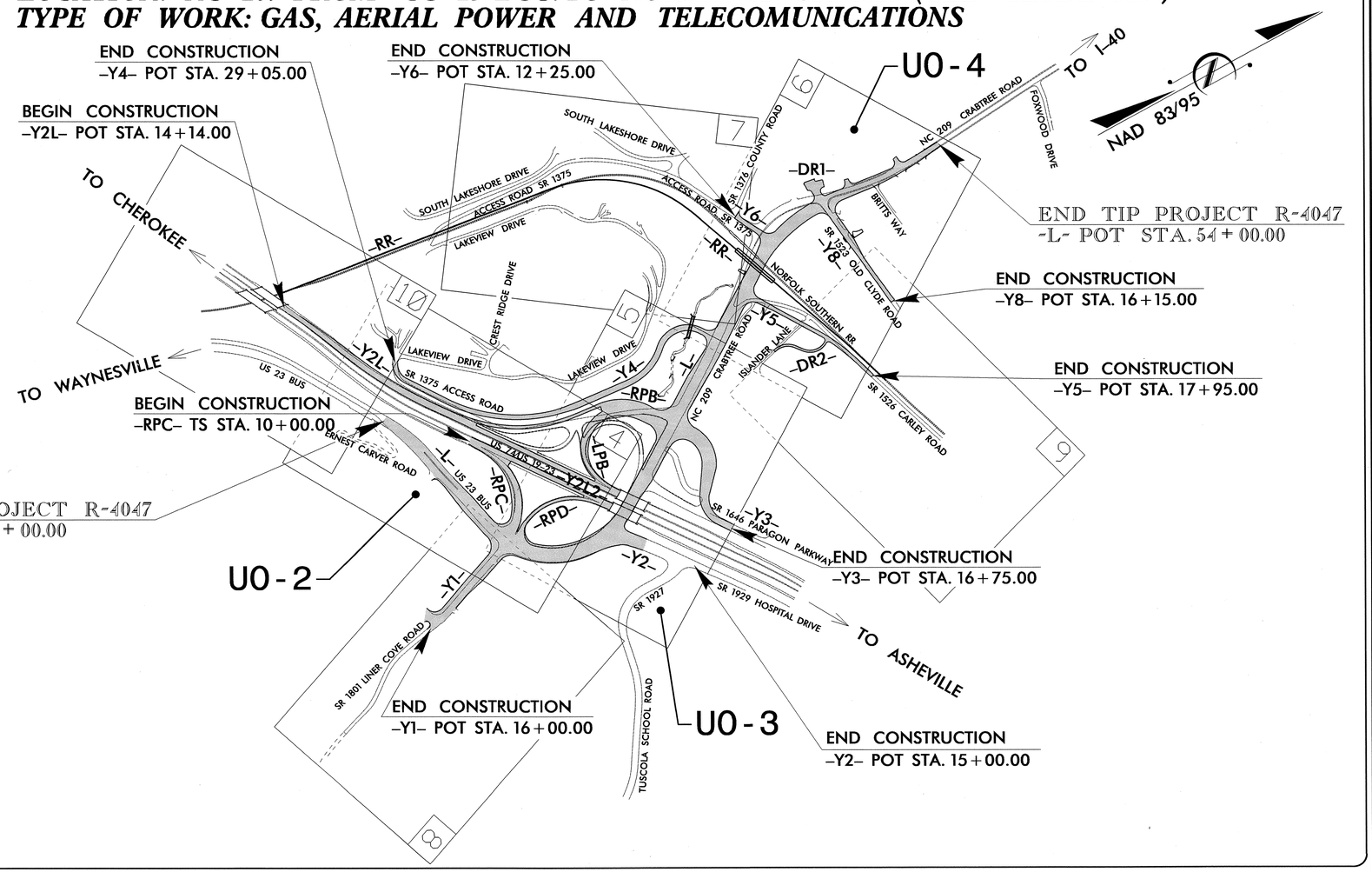
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
R-4047	UO-1

UTILITIES BY OTHERS PLANS
HAYWOOD COUNTY



LOCATION: NC 209 FROM US 23 BUS. TO NORTH OF SR 1523 (OLD CLYDE RD.)
TYPE OF WORK: GAS, AERIAL POWER AND TELECOMUNICATIONS



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
UO-1	TITLE SHEET
UO-2 THRU UO-5	UTILITIES BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(A) DUKE ENERGY – DISTRIBUTION POWER
(B) AT&T – TELECOMMUNICATIONS
(C) CHARTER COMMUNICATIONS – TELECOMMUNICATIONS
(D) PSNC – GAS

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

Roger Worthington, P.E.	UTILITIES SECTION ENGINEER
Carl Barclay, P.E.	UTILITIES SQUAD LEADER PROJECT ENGINEER
Ali Kouchecki, P.E.	UTILITIES PROJECT DESIGNER

09/08/99
11-FEB-2014 14:26
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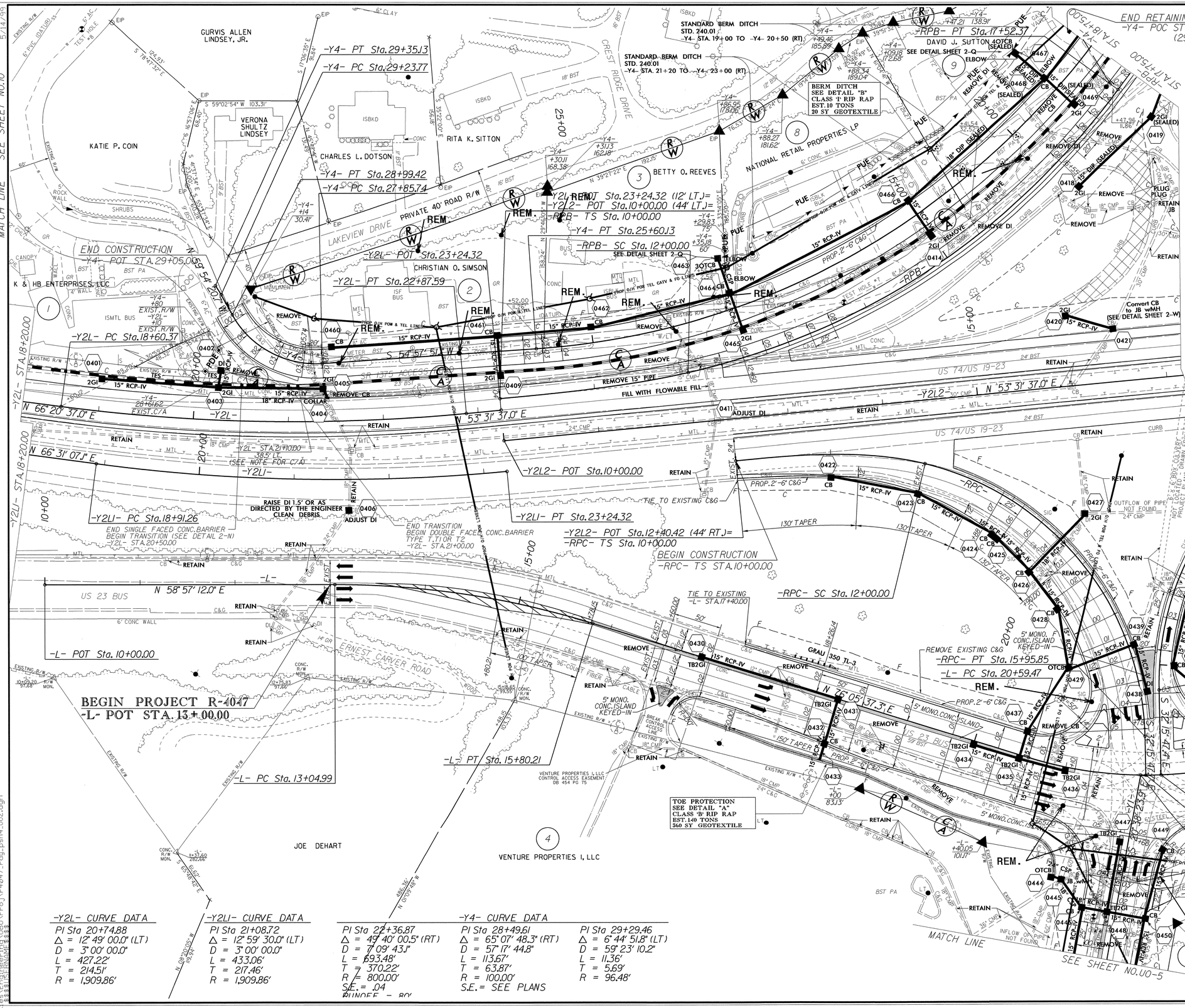
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	U0-2

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



-L- CURVE DATA

PI Sta 14+43.63	PI Sta 26+50.89
Δ = 17° 08' 25.3" (RT)	Δ = 109° 14' 18.3" (LT)
D = 6° 13' 40.1"	D = 13° 38' 30.7"
L = 275.22'	L = 800.76'
T = 138.65'	T = 591.42'
R = 920.00'	R = 420.00'
S.E. = EXISTING	S.E. = .04
	RUNOFF = 200'

-RPB- CURVE DATA

PIs Sta 11+33.45	PI Sta 14+88.50
Θs = 7° 23' 34.8"	Δ = 40° 50' 11.6" (LT)
Ls = 200.00'	D = 7° 23' 34.8"
LT = 133.45'	L = 552.37'
ST = 66.77'	T = 288.50'
	R = 775.00'
	S.E. = SEE PLANS

-RPC- CURVE DATA

PIs Sta 11+34.11	PI Sta 14+32.27
Θs = 18° 59' 59.3"	Δ = 75° 12' 36.1" (RT)
Ls = 200.00'	D = 18° 59' 59.3"
LT = 134.11'	L = 395.85'
ST = 67.37'	T = 232.27'
S.E. = SEE PLANS	R = 301.56'
	S.E. = SEE PLANS

-RPD- CURVE DATA

PI Sta 13+67.25
Δ = 71° 32' 24.9" (LT)
D = 18° 59' 59.3"
L = 376.53'
T = 217.25'
R = 301.56'
S.E. = SEE PLANS

-Y2L- CURVE DATA

PI Sta 20+74.88
Δ = 12° 49' 00.0" (LT)
D = 3° 00' 00.0"
L = 427.22'
T = 214.51'
R = 1,909.86'

-Y2LI- CURVE DATA

PI Sta 21+08.72
Δ = 12° 59' 30.0" (LT)
D = 3° 00' 00.0"
L = 433.06'
T = 217.46'
R = 1,909.86'

-Y4- CURVE DATA

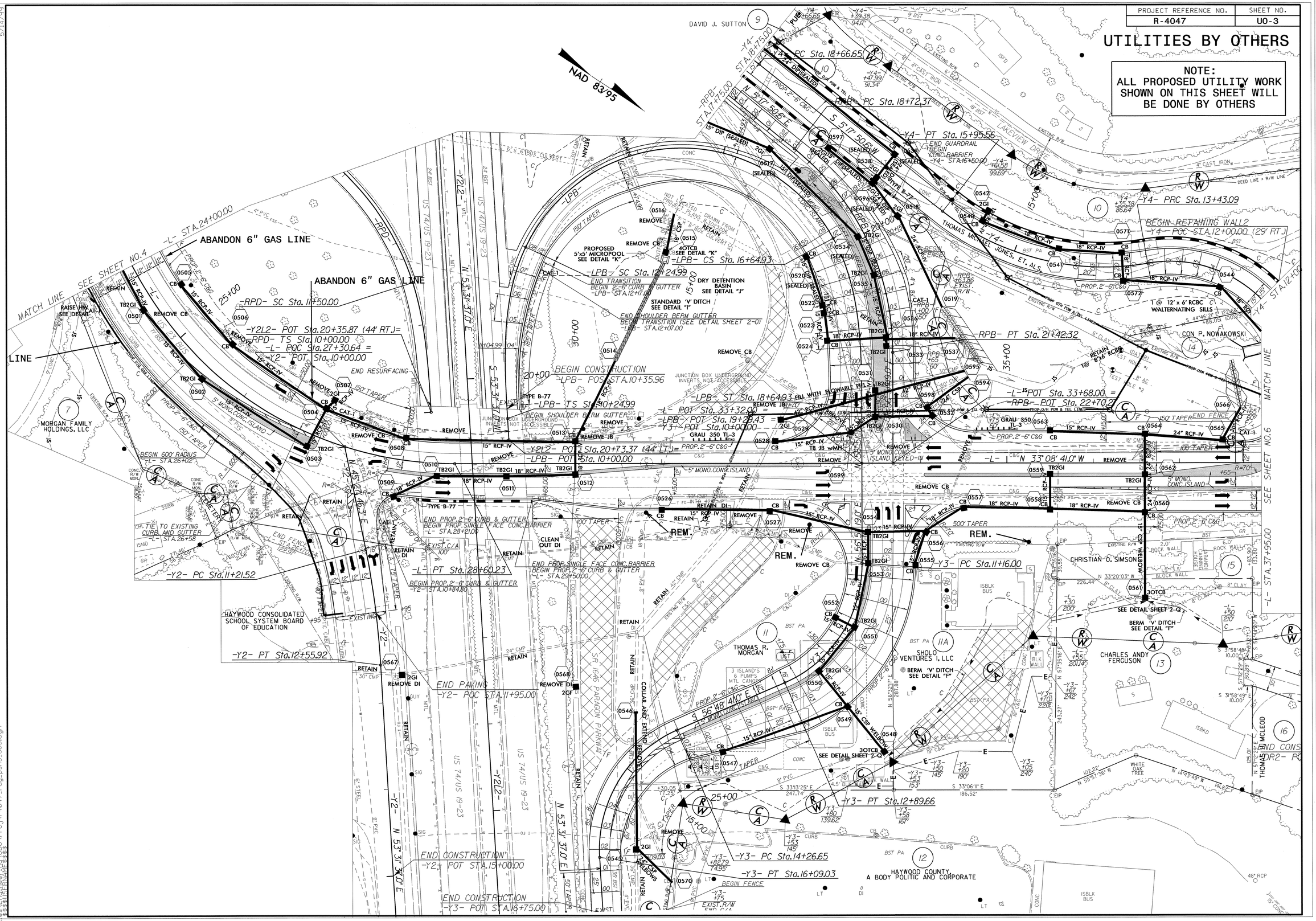
PI Sta 22+36.87	PI Sta 28+49.61	PI Sta 29+29.46
Δ = 49° 40' 00.5" (RT)	Δ = 65° 07' 48.3" (RT)	Δ = 6° 44' 51.8" (LT)
D = 7° 09' 43.1"	D = 57° 17' 44.8"	D = 59° 23' 10.2"
L = 693.48'	L = 113.67'	L = 11.36'
T = 370.22'	T = 63.87'	T = 5.69'
R = 800.00'	R = 100.00'	R = 96.48'
S.E. = .04	S.E. = SEE PLANS	
RUNOFF = 80'		

12-MAY-2014 16:22
s:\Engineering\UBOL\Proj\r4047_rdy_psh4_U02.dgn
$$$$USER NAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-4047	U0-3

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



5/14/99

12-MAY-2014 16:36
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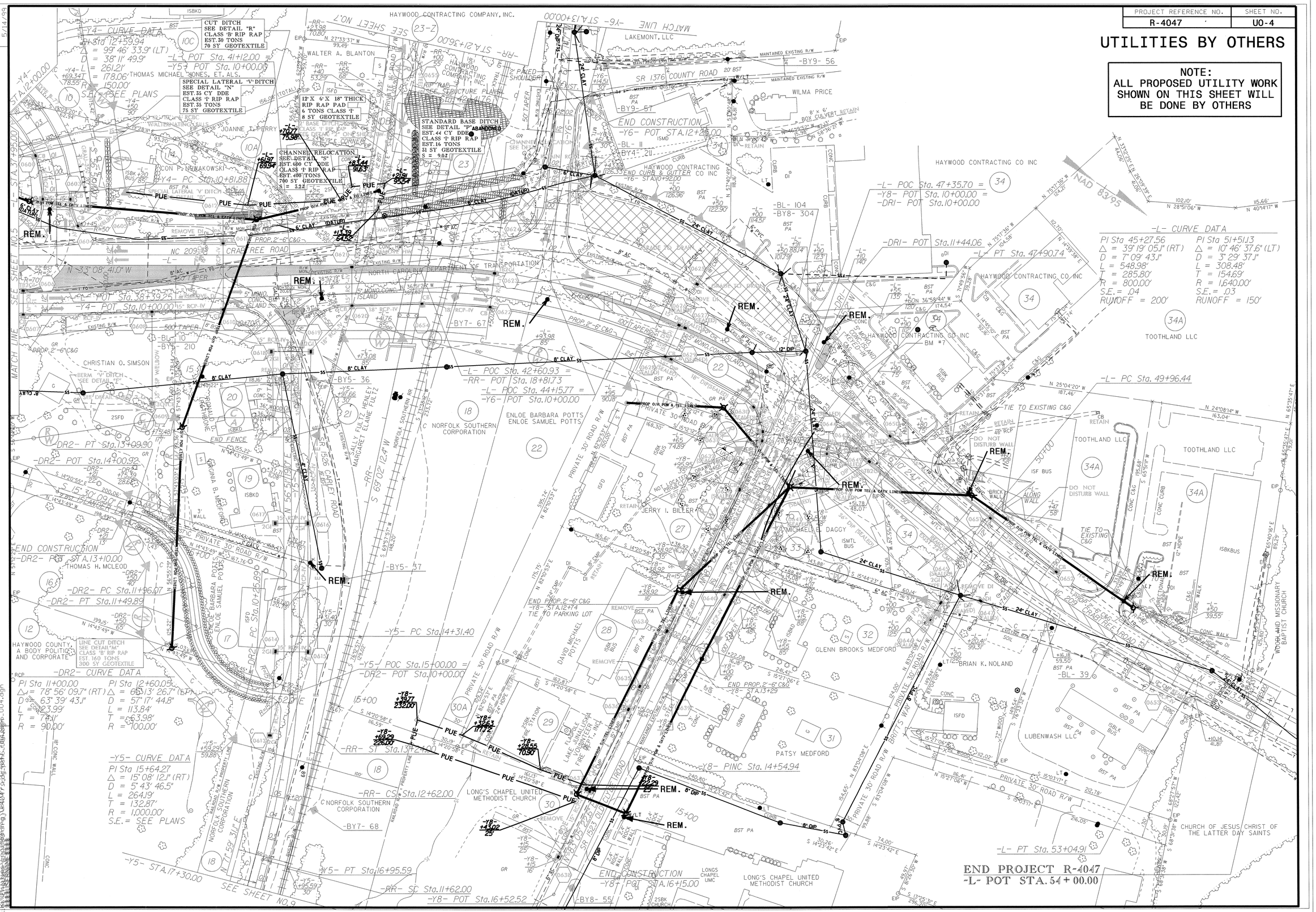
PROJECT REFERENCE NO.	SHEET NO.
R-4047	U0-4

UTILITIES BY OTHERS

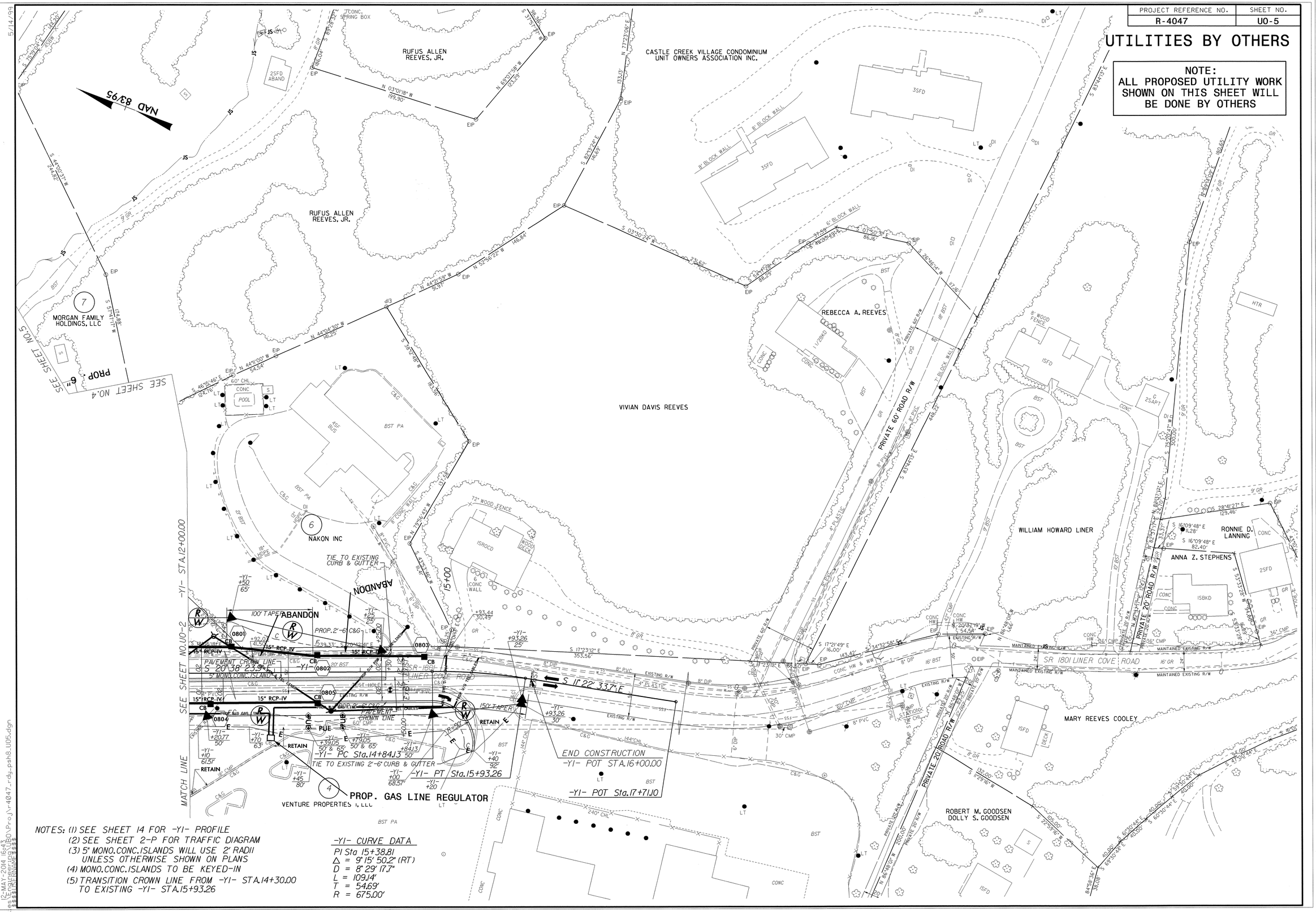
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



PROJECT REFERENCE NO.	SHEET NO.
R-4047	U0-5

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



NOTES: (1) SEE SHEET 14 FOR -Y1- PROFILE
(2) SEE SHEET 2-P FOR TRAFFIC DIAGRAM
(3) 5' MONO.CONC.ISLANDS WILL USE 2' RADII UNLESS OTHERWISE SHOWN ON PLANS
(4) MONO.CONC.ISLANDS TO BE KEYED-IN
(5) TRANSITION CROWN LINE FROM -Y1- STA.14+30.00 TO EXISTING -Y1- STA.15+93.26

-Y1- CURVE DATA

PI Sta 15+38.81
Δ = 9° 15' 50.2" (RT)
D = 8° 29' 17.7"
L = 109.14'
T = 54.69'
R = 675.00'

5/14/99

12-MAY-2014 16:43
$$$$USERNAME$$$$
utilities\Engineering\UBO\Proj\r4047_rdy_psh8_U05.dgn