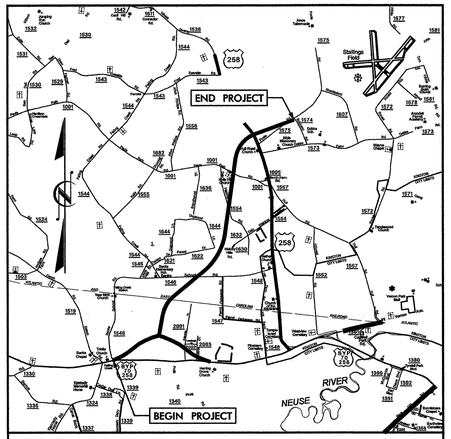
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2719A	UC-1	21

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

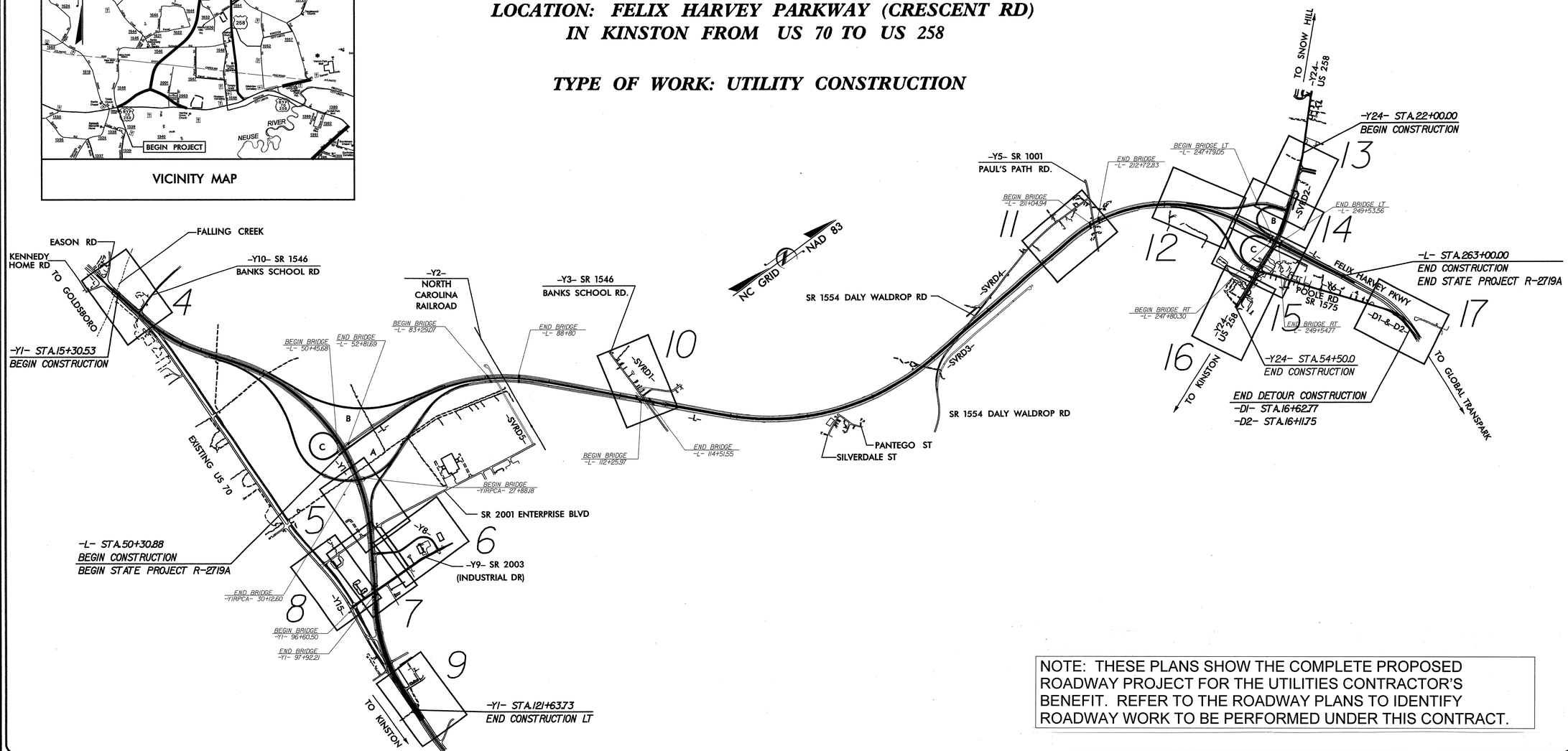
LENOIR COUNTY

LOCATION: FELIX HARVEY PARKWAY (CRESCENT RD) IN KINSTON FROM US 70 TO US 258

TYPE OF WORK: UTILITY CONSTRUCTION



VICINITY MAP



NOTE: THESE PLANS SHOW THE COMPLETE PROPOSED ROADWAY PROJECT FOR THE UTILITIES CONTRACTOR'S BENEFIT. REFER TO THE ROADWAY PLANS TO IDENTIFY ROADWAY WORK TO BE PERFORMED UNDER THIS CONTRACT.

GRAPHIC SCALES

50 25 0 50 100
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

2 1 0 2 4
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	SYMBOLOGY SHEET
UC-3	GENERAL NOTES SHEET
UC-4 TO UC-17	PLAN SHEETS
UC-18	WATER PROFILE: -W1-
UC-19	DETAILS - TRENCH
UC-20 TO UC-21	DETAILS - WATER

UTILITY OWNERS ON PROJECT

WATER - NORTH LENOIR WATER CORPORATION
WATER - NEUSE REGIONAL WATER AND SEWER AUTHORITY (NRWASA)
WATER - CITY OF KINSTON
SANITARY SEWER - CITY OF KINSTON
SANITARY FORCE MAIN - LENOIR COUNTY

NORTH CAROLINA PROFESSIONAL SEAL 027861 ENGINEER KEVIN C. ZDEB

2008-08-22

UTILITY DESIGN BY:

MA Engineering CONSULTANTS, INC.
598 East Chatham Street, Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax. 919.297.0221

NCDOT PROJECT ENGINEER:
CARL A. BARCLAY, P.E.
PREPARED FOR:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT SERVICES UNIT
RALEIGH, NC

90% PLANS
APRIL 15, 2008

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-2

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

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 Marker — RW
- 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 Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Proposed Wheel Chair Ramp Curb Cut — WCC
- Curb Cut for Future Wheel Chair Ramp — CCFR
- 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 — HH
- 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
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-3

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19861 ENGINEER KEVIN C. ZDEB

2008-10-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

GENERAL NOTES:

1. THE LOCATION, SIZE, AND MATERIAL TYPE OF THE EXISTING UTILITIES SHOWN ON THE PLANS HAVE BEEN OBTAINED FROM THE BEST AVAILABLE DATA AT THE TIME. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, ELEVATION, SIZE, DIRECTION, AND MATERIAL TYPE OF ALL EXISTING UTILITIES PRIOR TO ORDERING HIS MATERIALS.
2. CONTRACTOR SHALL NOTIFY NC ONE-CALL AT 1-800-632-4949 PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY SUCH THAT ALL EXISTING UTILITIES CAN BE MARKED. FURTHERMORE, THE CONTRACTOR SHALL MAKE EVERY EFFORT TO CONTACT ANY UTILITY OWNERS THAT ARE NOT MEMBERS OF NC ONE-CALL AND HAVE FACILITIES RESIDING WITHIN THE PROJECT LIMITS.
3. THE EXISTING WATER AND SEWER FACILITIES ARE TO REMAIN IN PLACE AND FUNCTIONING UNTIL THE NEW FACILITIES ARE CERTIFIED AS COMPLETE BY THE NCDOT RESIDENT ENGINEER.
4. ALL WATER AND SEWER IMPROVEMENTS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND STANDARD DRAWINGS OF THE NCDOT, DATED JULY 2006.
5. CONTRACTOR IS REQUIRED TO COMPLY WITH 15A NCAC 18C.906 – RELATION OF WATER MAINS TO SEWERS.
6. WATER AND SEWER IMPROVEMENTS SHALL BE CONSTRUCTED BY A NC LICENSED UTILITY CONTRACTOR.
7. CONTRACTOR SHALL NOTIFY THE UTILITY OWNER 7 BUSINESS DAYS IN ADVANCE OF PERFORMING ANY TIE-IN WORK. CONTRACTOR SHALL NOTIFY ALL AFFECTED CUSTOMERS 24 HOURS IN ADVANCE OF SERVICE INTERRUPTIONS.
8. CONTRACTOR SHALL NOT OPERATE ANY VALVES ON THE EXISTING WATER SYSTEM. CONTRACTOR SHALL CONTACT THE UTILITY OWNER TO CONDUCT STRATEGIC OPERATION OF WATER VALVES FOR SERVICE INTERRUPTION IN ORDER TO PERFORM SPECIFIC TIE-IN OPERATIONS.

WATER MAIN NOTES:

1. ALL WATER SERVICES 2-INCHES AND SMALLER SHALL BE INSTALLED UNDER ACTIVE ROADS BY TRENCHLESS METHOD, AS DIRECTED BY THE RESIDENT ENGINEER.
2. ALL WATER SERVICES, 2-INCHES IN DIAMETER AND SMALLER, SHALL BE COPPER PIPE CONFORMING TO ASTM B 88 SOFT ANNEALED TYPE K.
3. ALL PROPOSED WATER SERVICE LINES SHALL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF PROPOSED WATER METERS.
4. EXISTING WATER METERS TO REMAIN SHALL BE "RECONNECTED" TO THE NEW WATER MAIN WITH NEW WATER SERVICE LINES.
5. ALL PROPOSED WATER METERS SHALL BE LOCATED AT THE RIGHT-OF-WAY LINE.
6. REMOVED HYDRANTS BECOME THE PROPERTY OF THE CONTRACTOR FOR PROPER DISPOSAL. THESE HYDRANTS SHALL NOT BE USED AS NEW HYDRANTS IN THE PROPOSED CONSTRUCTION.
7. CONTRACTOR SHALL CONNECT OUTLET SIDE OF NEW WATER METER TO THE EXISTING CUSTOMER SERVICE LINE OUTSIDE THE RIGHT-OF-WAY LINE.
8. CONTRACTOR SHALL RETURN ALL REMOVED WATER METERS TO THE UTILITY OWNER. CONTRACTOR SHALL PROPERLY DISPOSE OF ALL OTHER PARTS, PIPING AND BOXES.
9. EXISTING WATER SERVICE LINES BETWEEN THE EXISTING WATER MAIN AND THE REMOVED WATER METER SHALL BE ABANDONED IN PLACE OR REMOVED AS NEEDED AS PER NCDOT SPECIFICATIONS. WATER SERVICE SHALL BE CAPPED AT THE WATER MAIN.
10. ANY BENDS OF WATER PIPE NOT SPECIFICALLY CALLED OUT WITH A 90, 45, 22.5, OR 11.25 DEGREE BEND FITTING, SHALL BE CONSTRUCTED BY DEFLECTION OF PIPE JOINTS IN ACCORDANCE WITH THE PIPE MANUFACTURER'S SPECIFICATIONS.
11. ALL FITTINGS (BENDS, TEES, REDUCERS, PLUGS, ETC.) SHALL BE ADEQUATELY RESTRAINED BY THE USE OF RESTRAINED JOINT CONSTRUCTION AND/OR CONCRETE THRUST RESTRAINTS AS DETAILED ON THESE DRAWINGS, OR AS DIRECTED BY THE RESIDENT ENGINEER.
12. CONTRACTOR SHALL TIE-IN PROPOSED DUCTILE IRON PIPE TO EXISTING CAST IRON PIPE USING MECHANICAL JOINT CONNECTION SUCH AS MEGA-LUG, OR APPROVED EQUAL, WHERE NECESSARY.

ABBREVIATIONS:

NR-WASA = NEUSE REGIONAL WATER AND SEWER AUTHORITY
NLWC = NORTH LENOIR WATER CORPORATION
CK = CITY OF KINSTON
LC = LENOIR COUNTY

NOTE SYMBOL:	NOTE DEFINITION:
A	ADJUST WATER VALVE BOX AND COVER TO PROPOSED GRADE.
B	ADJUST MH FRAME AND COVER TO PROPOSED GRADE.
C	PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL RELOCATE UTILITY PIPE AS PER "DITCH CROSSING" DETAIL ON SHEET UC-21.
D	CAP SERVICE LINE AT WATER MAIN.
E	PROPOSED DRAINAGE STRUCTURE AND/OR PIPE IN CONFLICT WITH EXISTING UTILITY PIPE.
F	RELOCATE UTILITY PIPE VERTICALLY AS PER "STORM PIPE CROSSING" DETAIL ON SHEET UC-21. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.
G	RELOCATE UTILITY PIPE HORIZONTALLY AS SHOWN. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.
H	PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL ENCASE UTILITY PIPE AS PER "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL ON SHEET UC-21.
I	PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING 42-INCH UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER WILL BE LESS THAN 4 FEET, CONTRACTOR SHALL EITHER ALTER THE PROPOSED DITCH GRADING, AS PER THE RESIDENT ENGINEER, TO PROVIDE A MINIMUM OF 4 FEET OF COVER OR ENCASE THE 42-INCH UTILITY PIPE AS PER THE "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL ON SHEET UC-21.

REVISIONS

2008-10-22 ADD NOTE "I" TO PLANS.

FILE: $FILES
DATE: $DATES $TIMES

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-4
R/W SHEET NO.	23

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 021681 ENGINEER KEVIN C. ZOES

2008-10-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

GRAPHIC SCALE
50 25 0 50 100
PLANS

(A) ADJUST WATER VALVE BOX AND COVER TO PROPOSED GRADE.

(C) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL RELOCATE UTILITY PIPE AS PER "DITCH CROSSING" DETAIL ON SHEET UC-21.

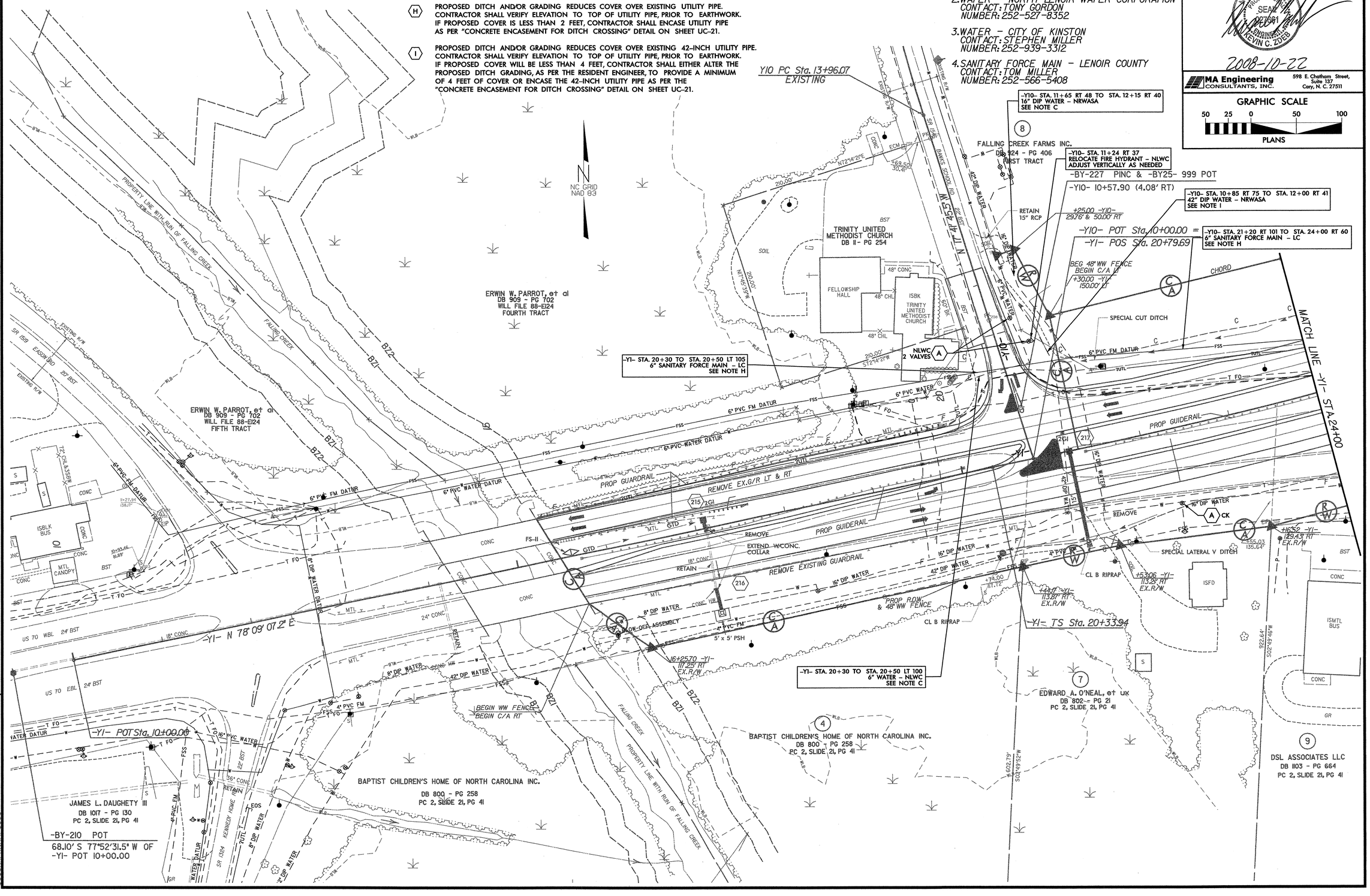
(H) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL ENCASE UTILITY PIPE AS PER "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL ON SHEET UC-21.

(I) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING 42-INCH UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER WILL BE LESS THAN 4 FEET, CONTRACTOR SHALL EITHER ALTER THE PROPOSED DITCH GRADING, AS PER THE RESIDENT ENGINEER, TO PROVIDE A MINIMUM OF 4 FEET OF COVER OR ENCASE THE 42-INCH UTILITY PIPE AS PER THE "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL ON SHEET UC-21.

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER - NEUSE REGIONAL - WASA
   CONTACT: KYLE SMITH
   NUMBER: 252-522-2567
2. WATER - NORTH LENOIR WATER CORPORATION
   CONTACT: TONY GORDON
   NUMBER: 252-527-8352
3. WATER - CITY OF KINSTON
   CONTACT: STEPHEN MILLER
   NUMBER: 252-939-3312
4. SANITARY FORCE MAIN - LENOIR COUNTY
   CONTACT: TOM MILLER
   NUMBER: 252-566-5408



REVISIONS

2008-10-22 ADD NOTE "I" TO PLANS.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-5
R/W SHEET NO.	5

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. ZDEB

2008-08-22

MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137 Cary, N. C. 27511

GRAPHIC SCALE 50 25 0 50 100 PLANS

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS

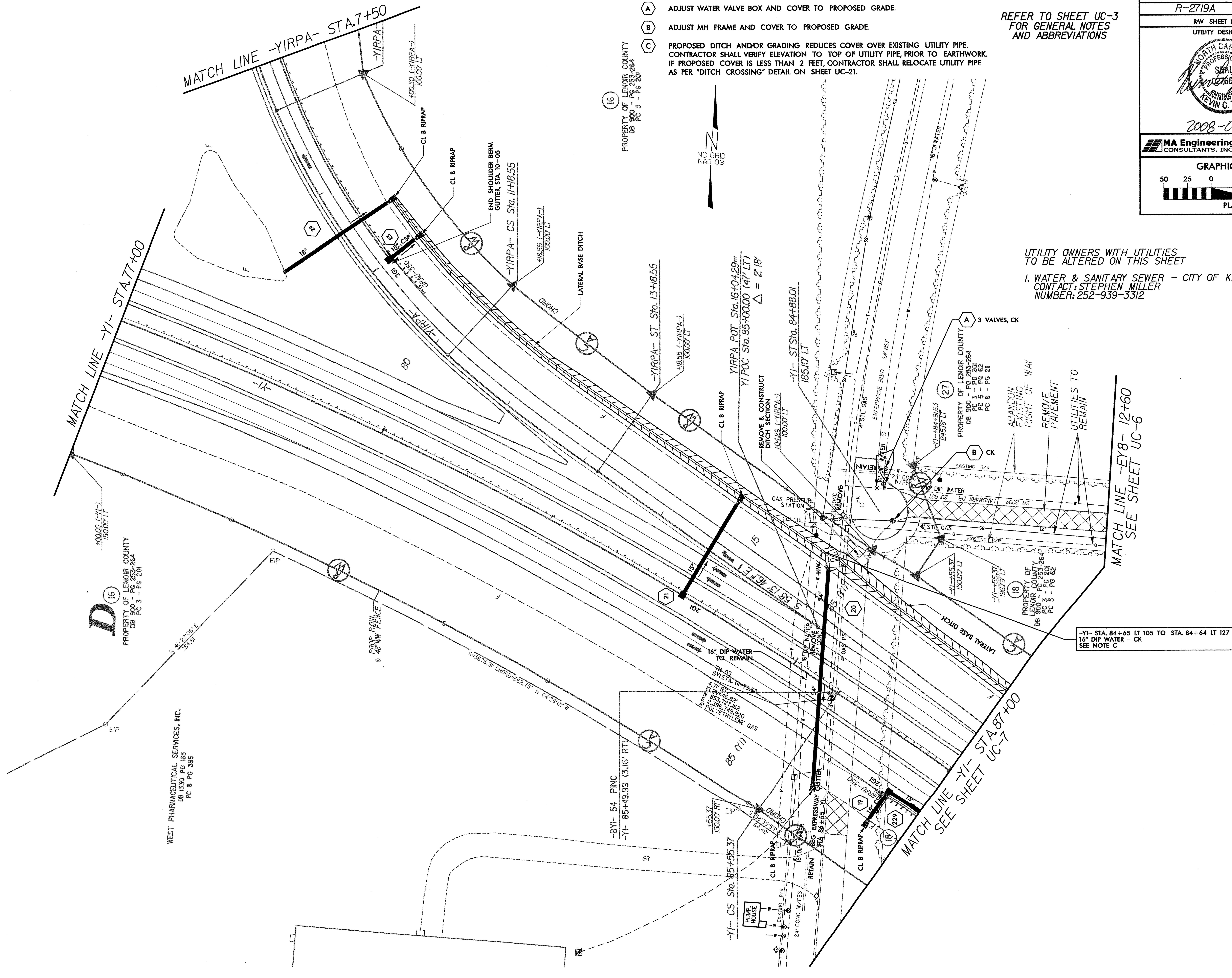
(A) ADJUST WATER VALVE BOX AND COVER TO PROPOSED GRADE.

(B) ADJUST MH FRAME AND COVER TO PROPOSED GRADE.

(C) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL RELOCATE UTILITY PIPE AS PER "DITCH CROSSING" DETAIL ON SHEET UC-21.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER & SANITARY SEWER - CITY OF KINSTON
   CONTACT: STEPHEN MILLER
   NUMBER: 252-939-3312



REVISIONS

8/17/99

$$$$$$SYSTIME$$$$$ $$$$$$$$$$DGN$$$$$$$$$$$$$$ $$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-6
R/W SHEET NO.	34

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. JONES

2009-04-03

MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137 Cary, N. C. 27511

GRAPHIC SCALE

50 25 0 50 100

PLANS

(A) ADJUST WATER VALVE BOX AND COVER TO PROPOSED GRADE.

(B) ADJUST MH FRAME AND COVER TO PROPOSED GRADE.

(F) RELOCATE UTILITY PIPE VERTICALLY AS PER "STORM PIPE CROSSING" DETAIL ON SHEET UC-21. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.

(G) RELOCATE UTILITY PIPE HORIZONTALLY AS SHOWN. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.

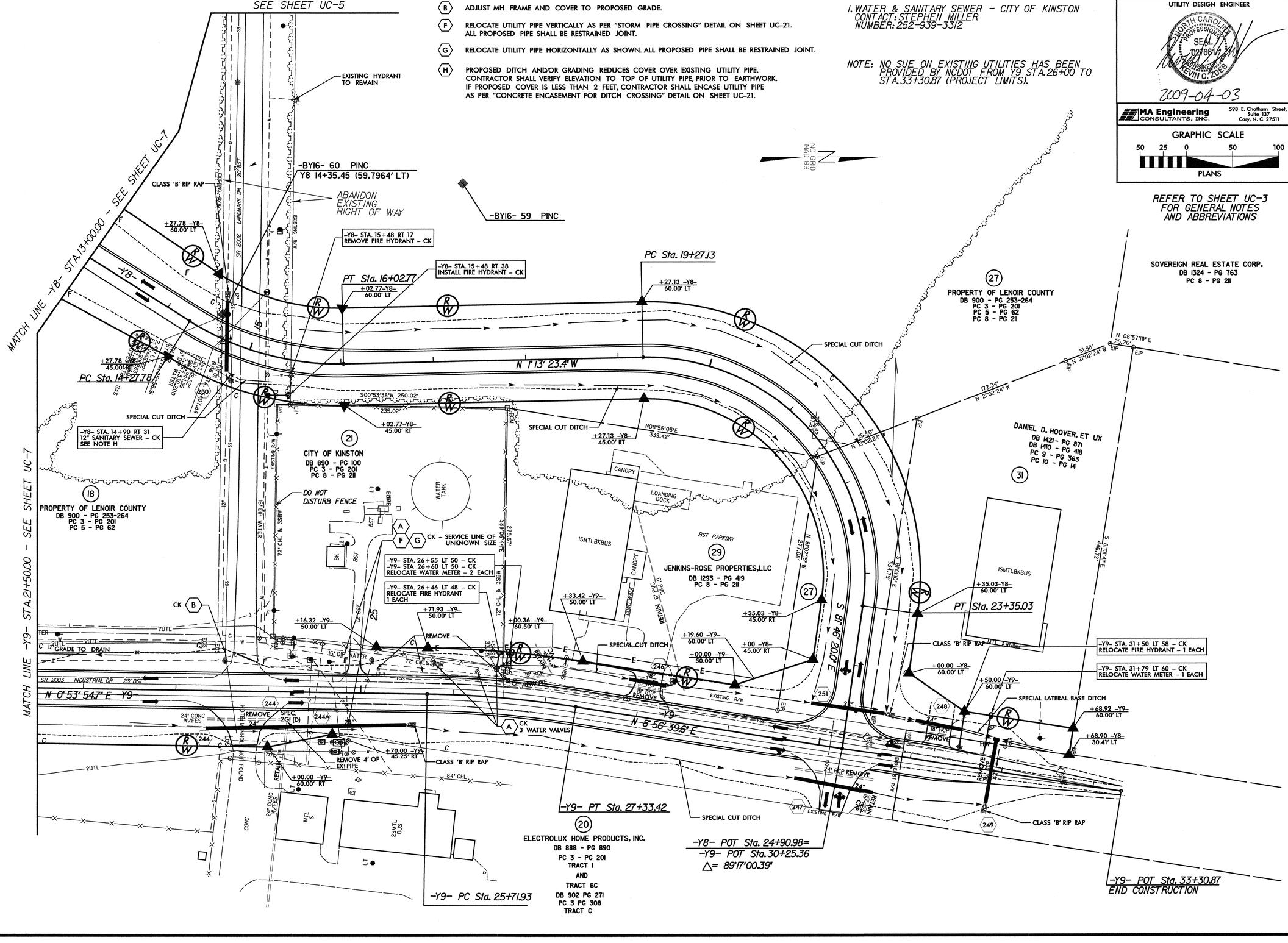
(H) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL ENCASE UTILITY PIPE AS PER "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL ON SHEET UC-21.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER & SANITARY SEWER - CITY OF KINSTON
CONTACT: STEPHEN MILLER
NUMBER: 252-939-3312

NOTE: NO SUE ON EXISTING UTILITIES HAS BEEN PROVIDED BY NCDOT FROM Y9 STA.26+00 TO STA.33+30.87 (PROJECT LIMITS).

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



REVISIONS

2009-04-03 ADD UPDATED SUE DATA WHICH INCLUDES 2" FSS
2008-11-05 ADD UPDATED SUE DATA TO BASE FILE, INCORPORATE RELOCATIONS OF UTILITY ITEMS ALONG Y9 FROM STA. 26+50 TO END OF PROJECT LIMITS.

8/17/99

CSYSTIME$$$$
CDIGN$$$$
CUSERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-7
R/W SHEET NO.	27

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 021861 ENGINEER KEVIN C. ZOEB

2008-08-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

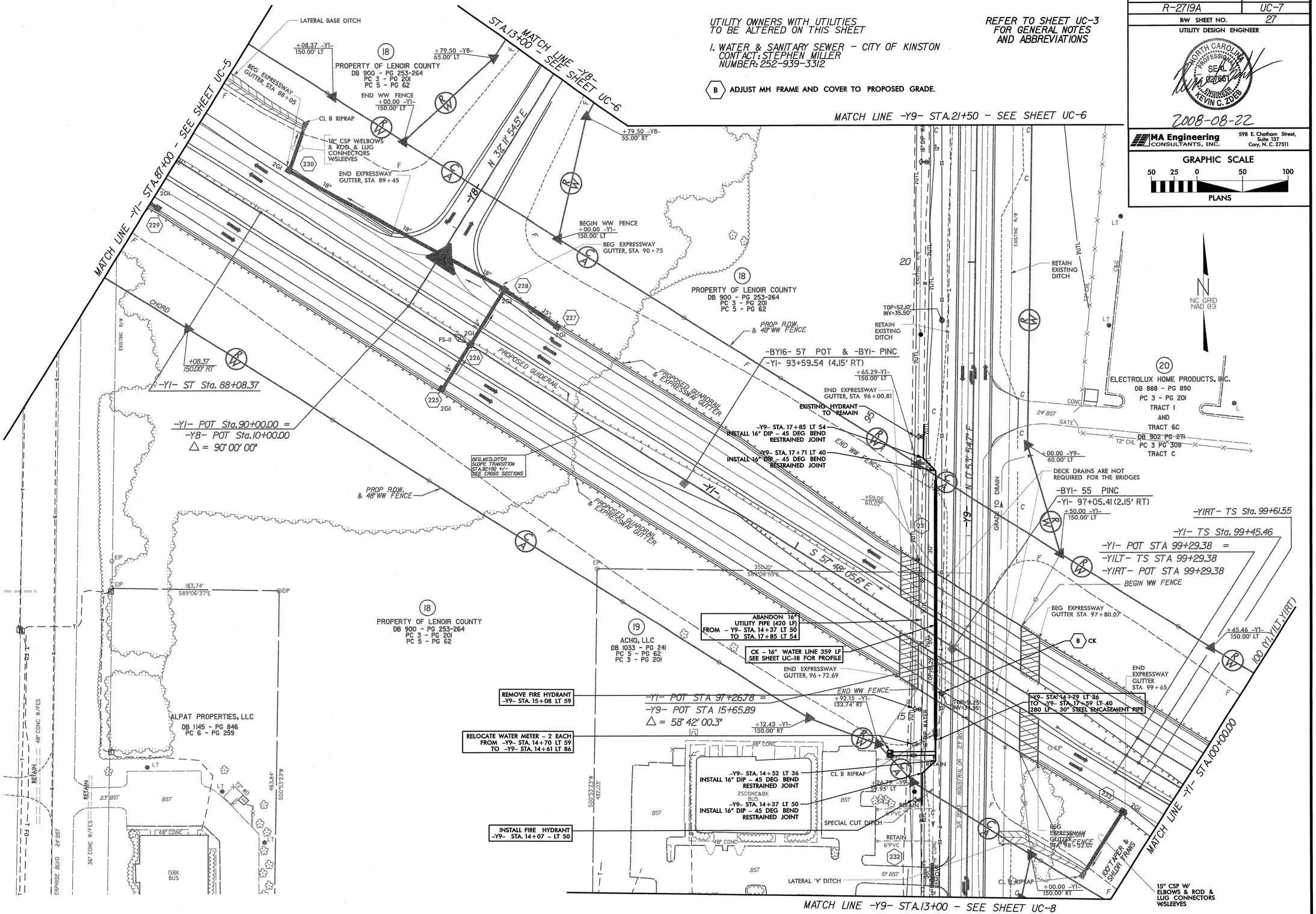
GRAPHIC SCALE
50 25 0 50 100
PLANS

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER & SANITARY SEWER - CITY OF KINSTON
CONTACT: STEPHEN MILLER
NUMBER: 252-939-3312

(B) ADJUST MH FRAME AND COVER TO PROPOSED GRADE.

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



REVISIONS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-8
R/W SHEET NO.	33

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. ZDEB

2008-08-22

MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137 Cary, N. C. 27511

GRAPHIC SCALE

50 25 0 50 100

PLANS

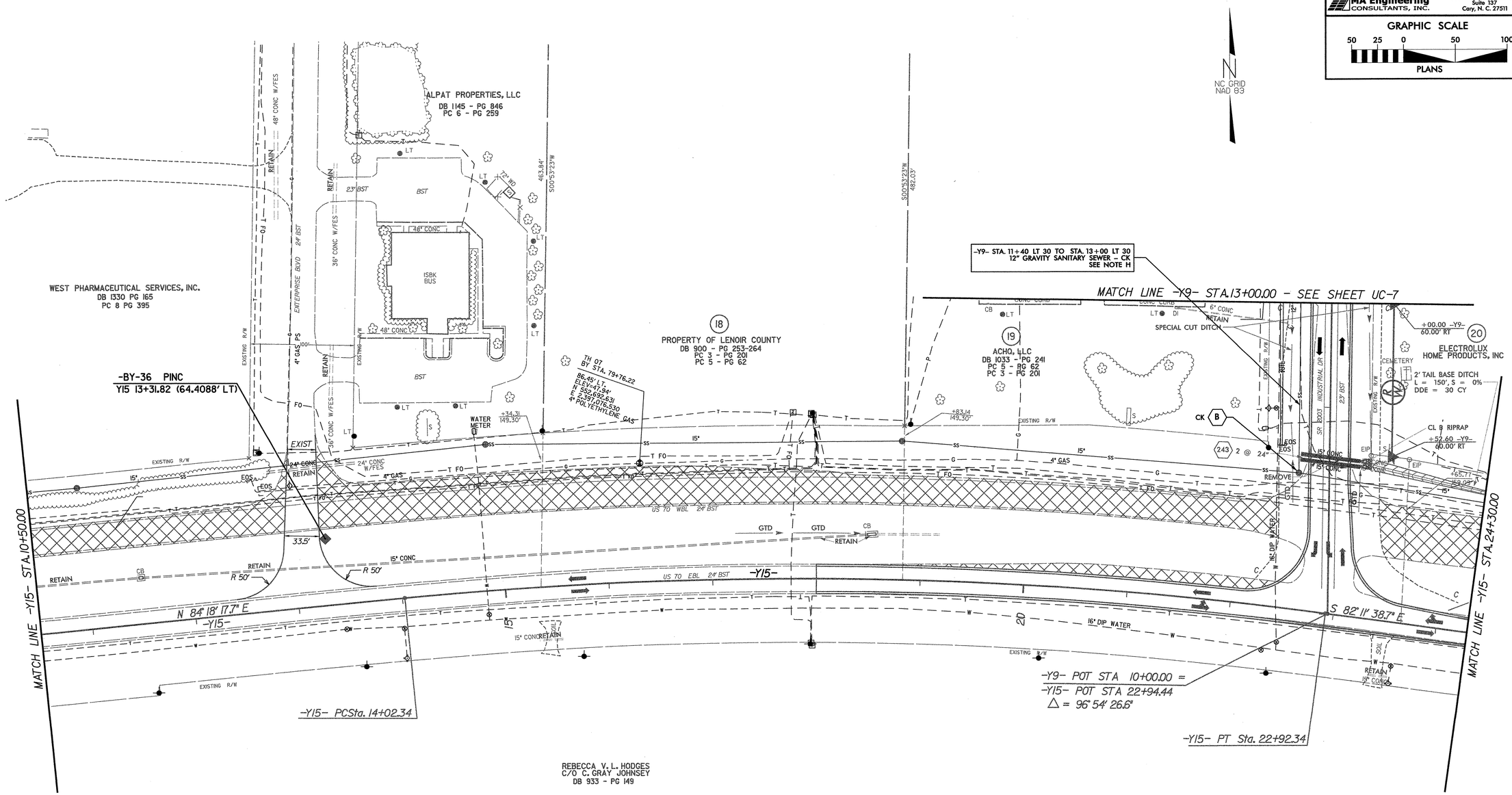
(B) ADJUST MH FRAME AND COVER TO PROPOSED GRADE.

(H) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL ENCASE UTILITY PIPE AS PER "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL ON SHEET UC-21.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET:

1. WATER & SANITARY SEWER - CITY OF KINSTON
CONTACT: STEPHEN MILLER
NUMBER: 252-939-3312

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



REVISIONS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-9
R/W SHEET NO.	29

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027861 ENGINEER KEVIN C. ZOEB

2008-08-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

GRAPHIC SCALE
50 25 0 50 100
PLANS

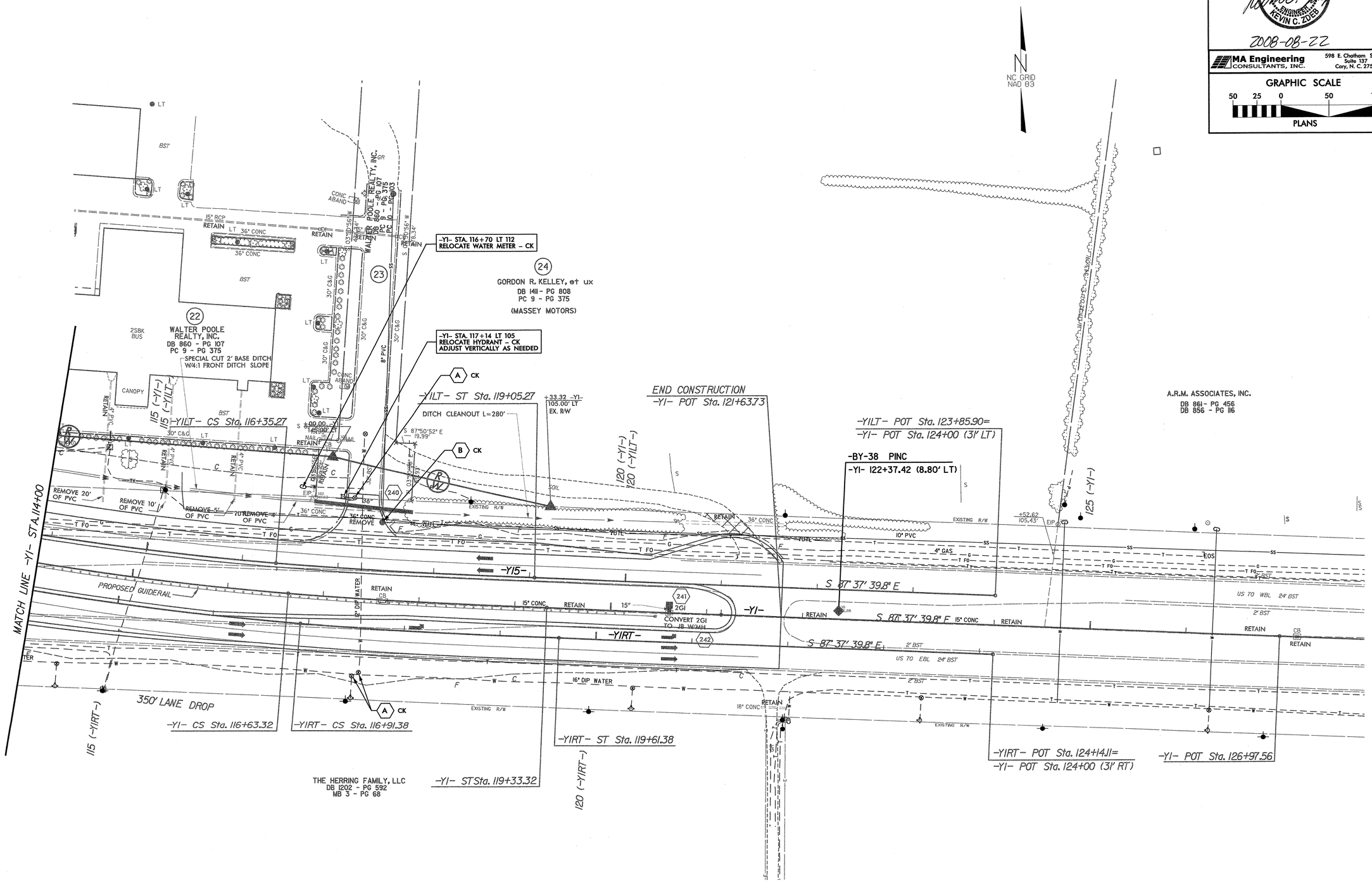
(A) ADJUST WATER VALVE BOX AND COVER TO PROPOSED GRADE.

(B) ADJUST MH FRAME AND COVER TO PROPOSED GRADE.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET:

1. WATER & SANITARY SEWER - CITY OF KINSTON
CONTACT: STEPHEN MILLER
NUMBER: 252-939-3312

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



REVISIONS

8/17/99

MA Engineering CONSULTANTS, INC.	598 E. Chatham Street, Suite 137 Cary, N. C. 27511

GRAPHIC SCALE

50 25 0 50 100

PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-10
R/W SHEET NO.	9

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027861 ENGINEER KEVIN C. ZOREB

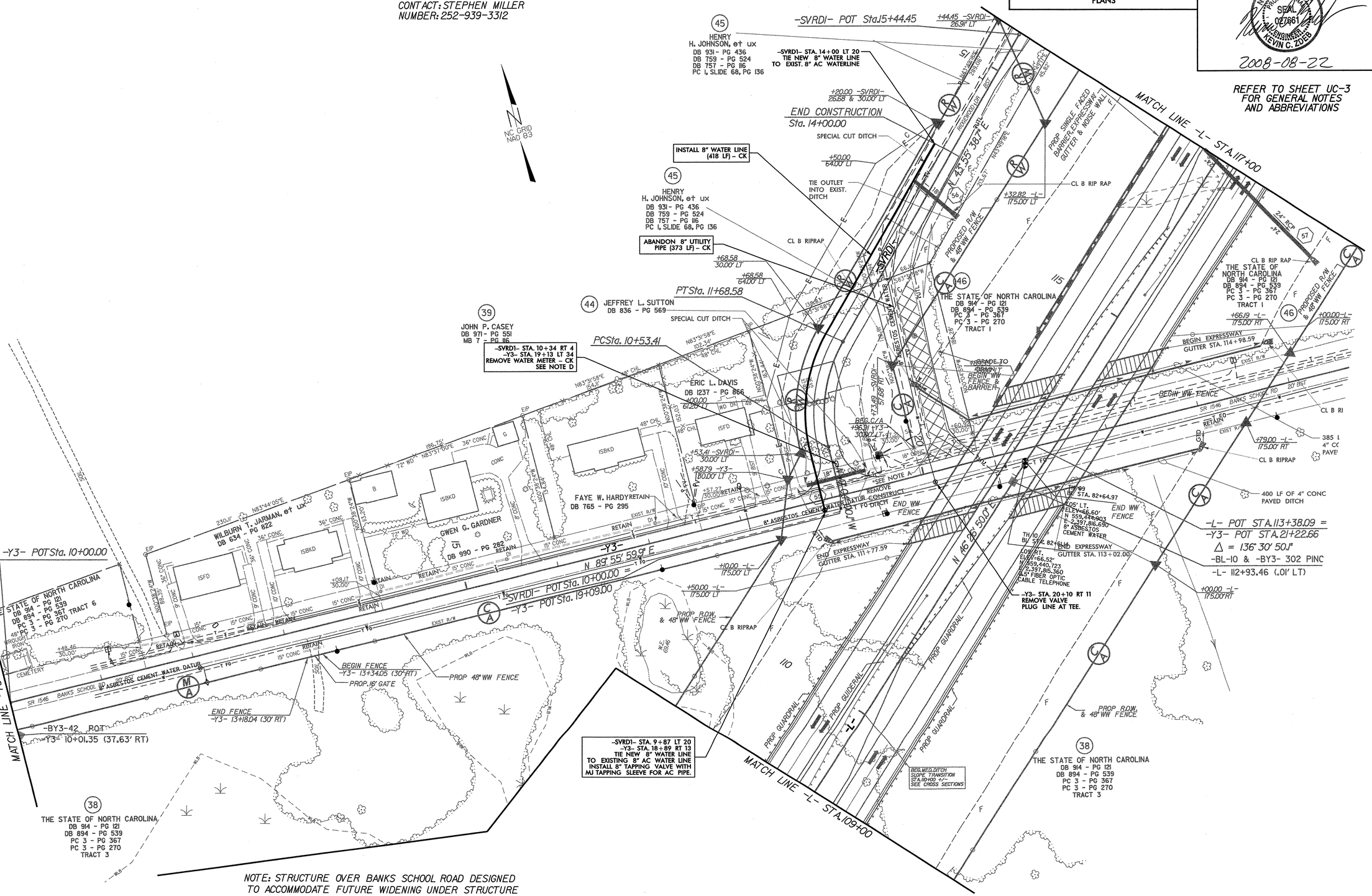
2008-08-22

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS

(D) CAP SERVICE LINE AT WATER MAIN.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET:

1. WATER & SANITARY SEWER - CITY OF KINSTON
CONTACT: STEPHEN MILLER
NUMBER: 252-939-3312



NOTE: STRUCTURE OVER BANKS SCHOOL ROAD DESIGNED TO ACCOMMODATE FUTURE WIDENING UNDER STRUCTURE

REVISIONS

8/17/99

MA Engineering CONSULTANTS, INC.	598 E. Chatham Street, Suite 137 Cary, N. C. 27511

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-11
R/W SHEET NO.	16

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. ZIEB

2008-10-22

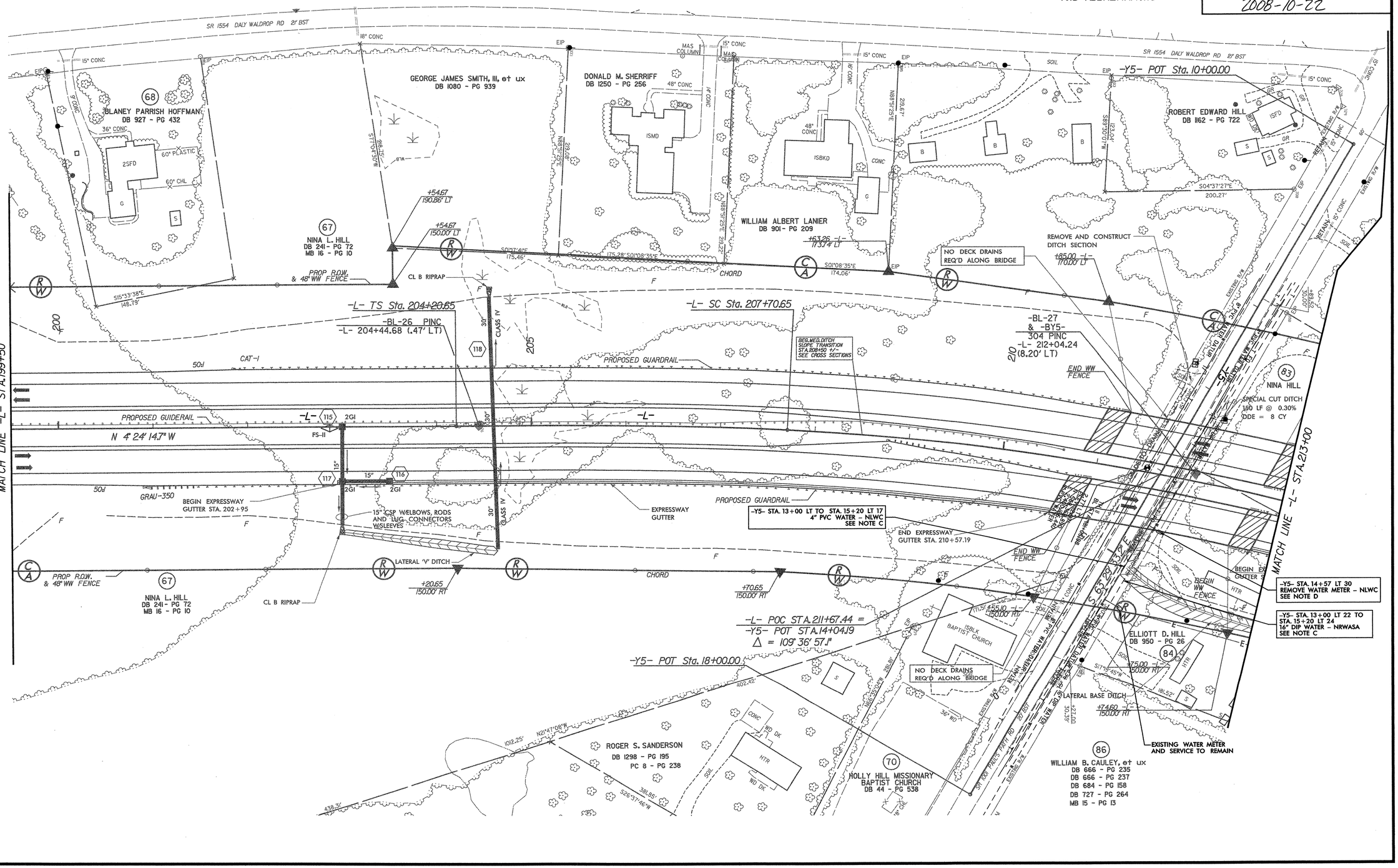
(C) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL RELOCATE UTILITY PIPE AS PER "DITCH CROSSING" DETAIL ON SHEET UC-21.

(D) CAP SERVICE LINE AT WATER MAIN.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET:

1. WATER - NEUSE REGIONAL - WASA
   CONTACT: KYLE SMITH
   NUMBER: 252-522-2567
2. WATER - NORTH LENOIR WATER CORPORATION
   CONTACT: TONY GORDON
   NUMBER: 252-527-8352

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



REVISIONS

2008-10-22 REVISE UTILITY OWNER OF WATER METER TO BE REMOVED.

8/17/99

CYSTLIE
CZIEBELL
DGN
USERNAME

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER – NEUSE REGIONAL – WASA
CONTACT: KYLE SMITH
NUMBER: 252-522-2567

(C) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL RELOCATE UTILITY PIPE AS PER "DITCH CROSSING" DETAIL ON SHEET UC-21.

(I) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING 42-INCH UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER WILL BE LESS THAN 4 FEET, CONTRACTOR SHALL EITHER ALTER THE PROPOSED DITCH GRADING, AS PER THE RESIDENT ENGINEER, TO PROVIDE A MINIMUM OF 4 FEET OF COVER OR ENCASE THE 42-INCH UTILITY PIPE AS PER THE "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL ON SHEET UC-21.

MA Engineering CONSULTANTS, INC.
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Cary, N. C. 27511

GRAPHIC SCALE
50 25 0 50 100
PLANS

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-12
R/W SHEET NO.	18
UTILITY DESIGN ENGINEER	

NORTH CAROLINA PROFESSIONAL SEAL 027867 ENGINEER KEVIN C. ZDEB

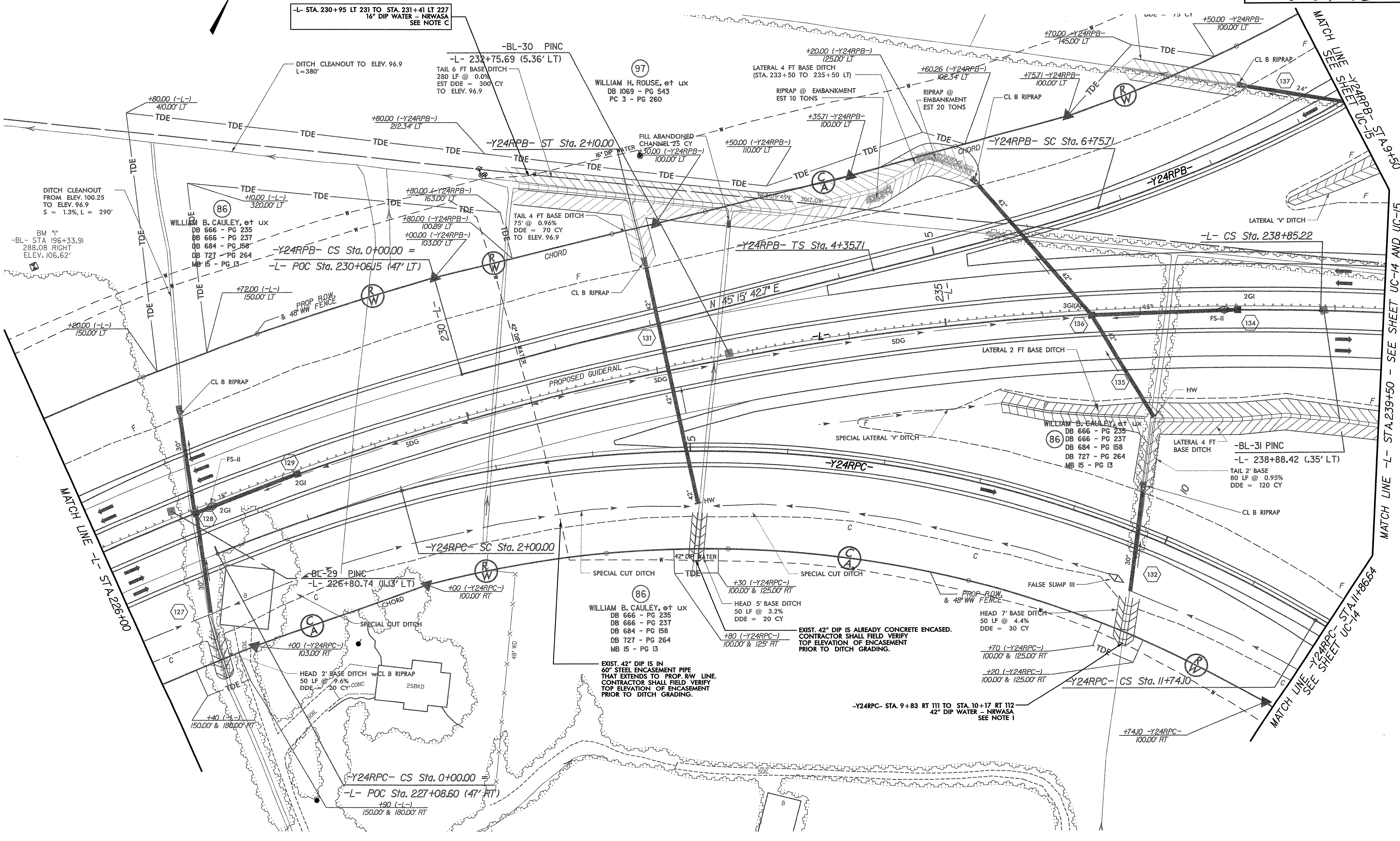
2008-10-22

8/17/99

REVISIONS

2008-10-22 ADD NOTE "I" TO PLANS.

$$$$$SYSTIME$$$$$
$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-13
R/W SHEET NO.	19

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027667 ENGINEER KEVIN C. ZDEB

2008-10-22

MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137 Cary, N. C. 27511

GRAPHIC SCALE

50 25 0 50 100

PLANS

(A) ADJUST WATER VALVE BOX AND COVER TO PROPOSED GRADE.

(C) PROPOSED DITCH AND/OR GRADING REDUCES COVER OVER EXISTING UTILITY PIPE. CONTRACTOR SHALL VERIFY ELEVATION TO TOP OF UTILITY PIPE, PRIOR TO EARTHWORK. IF PROPOSED COVER IS LESS THAN 2 FEET, CONTRACTOR SHALL RELOCATE UTILITY PIPE AS PER "DITCH CROSSING" DETAIL ON SHEET UC-21.

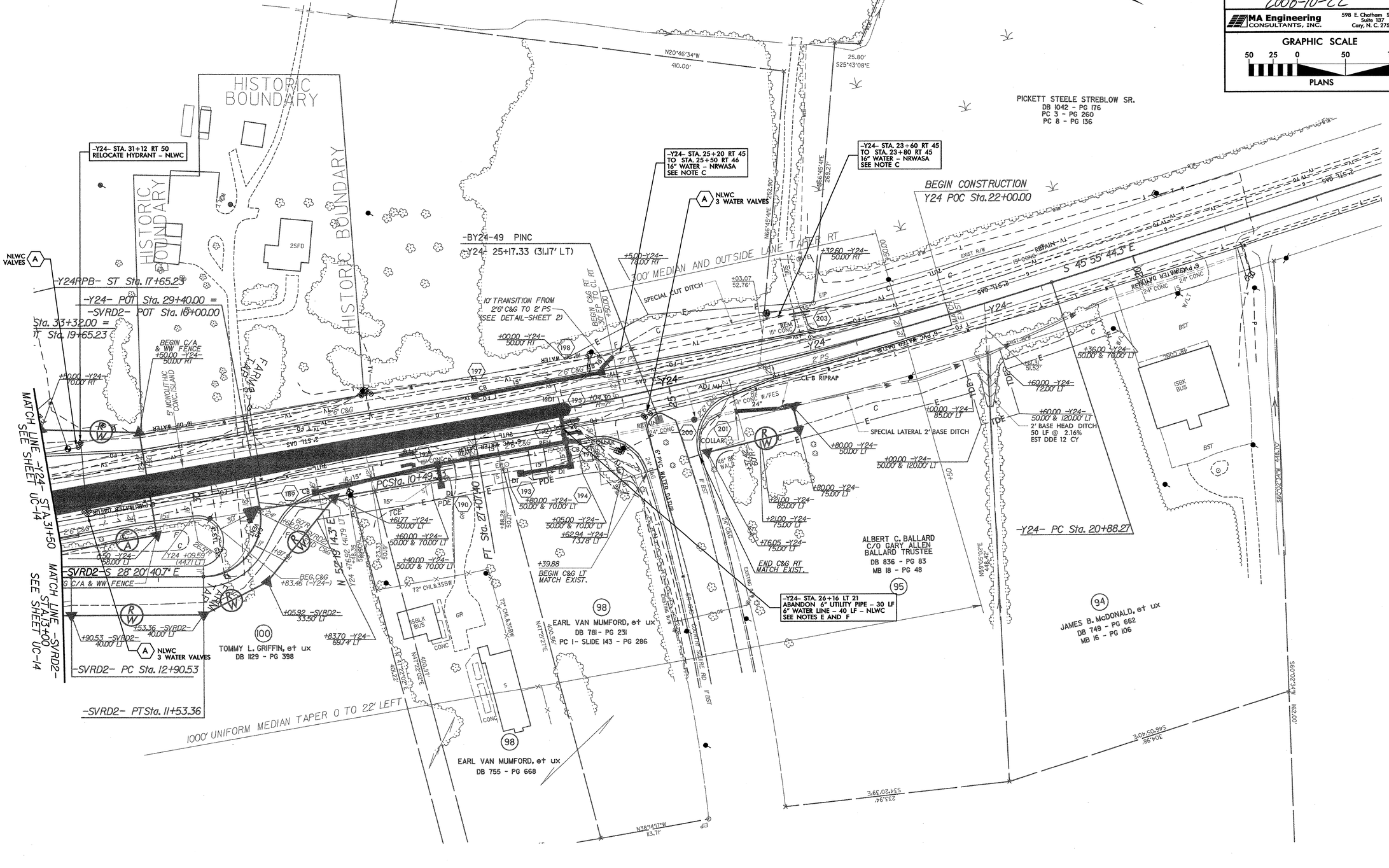
(E) PROPOSED DRAINAGE STRUCTURE AND/OR PIPE IN CONFLICT WITH EXISTING UTILITY PIPE.

(F) RELOCATE UTILITY PIPE VERTICALLY AS PER "STORM PIPE CROSSING" DETAIL ON SHEET UC-21. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER - NEUSE REGIONAL - WASA
   CONTACT: KYLE SMITH
   NUMBER: 252-522-2567
2. WATER - NORTH LENOIR WATER CORPORATION
   CONTACT: TONY GORDON
   NUMBER: 252-527-8352

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



REVISIONS

2008-10-22 REVISE UTILITY OWNER OF 16-INCH WATER LINE AT -Y24- STA. 25+20.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-14
RW SHEET NO.	19

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. ZOEB

2008-10-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 197
Cary, N. C. 27511

GRAPHIC SCALE
50 25 0 50 100
PLANS

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS

(E) PROPOSED DRAINAGE STRUCTURE AND/OR PIPE IN CONFLICT WITH EXISTING UTILITY PIPE.

(F) RELOCATE UTILITY PIPE VERTICALLY AS PER "STORM PIPE CROSSING" DETAIL ON SHEET UC-21. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.

(G) RELOCATE UTILITY PIPE HORIZONTALLY AS SHOWN. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER - NORTH LENOIR WATER CORPORATION
CONTACT: TONY GORDON
NUMBER: 252-527-8352

-Y24- STA. 32+14 RT 45
11.25 DEG BEND 12" DIP - NLWC
RESTRAINED JOINT

-Y24- STA. 32+44 RT 40
22.5 DEG BEND 12" DIP - NLWC
RESTRAINED JOINT

-Y24- STA. 32+74 RT 45
11.25 DEG BEND 12" DIP - NLWC
RESTRAINED JOINT

-Y24- STA. 32+74 RT 45 TO STA. 32+74 RT 45
ABANDON 12" UTILITY PIPE - 60 LF
INSTALL 61 LF OF 12" WATER LINE
(SEE NOTES E AND G - NLWC)

-Y24- STA. 32+84 LT 53
RELOCATE WATER METER
SEE NOTE E - NLWC

-Y24- STA. 33+70 RT 45 TO STA. 34+07 RT 45
ABANDON 12" UTILITY PIPE - 30 LF
12" WATER LINE - 40 LF
SEE NOTES E AND F - NLWC

-Y24- STA. 36+80 RT 45 TO STA. 37+10 RT 44
ABANDON 12" UTILITY PIPE - 30 LF
INSTALL 12" WATER LINE - 40 LF
SEE NOTES E AND F - NLWC

MATCH LINE -Y24- STA. 31+50 SEE SHEET UC-13

MATCH LINE -SVRD2- STA. 13+00 SEE SHEET UC-13

MATCH LINE -Y24RPB- STA. 9+50 - SEE SHEET UC-12

MATCH LINE -L- STA. 239+50 SEE SHEET UC-12

MATCH LINE -Y24LPC- STA. 33+00 SEE SHEET UC-15

MATCH LINE -Y24- STA. 41+00 - SEE SHEET UC-15

MATCH LINE -L- STA. 252+00

WILLIAM H. ROUSE, et ux DB 1069 - PG 543 PC 3 - PG 260

WILLIAM H. ROUSE, et ux DB 1069 - PG 543 PC 3 - PG 260

WILLIAM H. ROUSE, et ux DB 1077 - PG 80 PC 4 - PG 335

WILLIAM H. ROUSE, et ux DB 1077 - PG 84 PC 4 - PG 335

E. RAY HERRING, et ux DB 852 - PG 1

NC DEPARTMENT OF TRANSPORTATION

REVISIONS

2008-10-22 REVISE NOTE CALL OUT FROM "G" TO "F" AT -Y24- STA. 33+70.

8/17/99

8/17/99

REVISIONS

(A) ADJUST WATER VALVE BOX AND COVER TO PROPOSED GRADE.

(E) PROPOSED DRAINAGE STRUCTURE AND/OR PIPE IN CONFLICT WITH EXISTING UTILITY PIPE.

(G) RELOCATE UTILITY PIPE HORIZONTALLY AS SHOWN. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT.

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER - NEUSE REGIONAL - WASA
   CONTACT: KYLE SMITH
   NUMBER: 252-522-2567
2. WATER - NORTH LENOIR WATER CORPORATION
   CONTACT: TONY GORDON
   NUMBER: 252-527-8352

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

GRAPHIC SCALE
50 25 0 50 100
PLANS

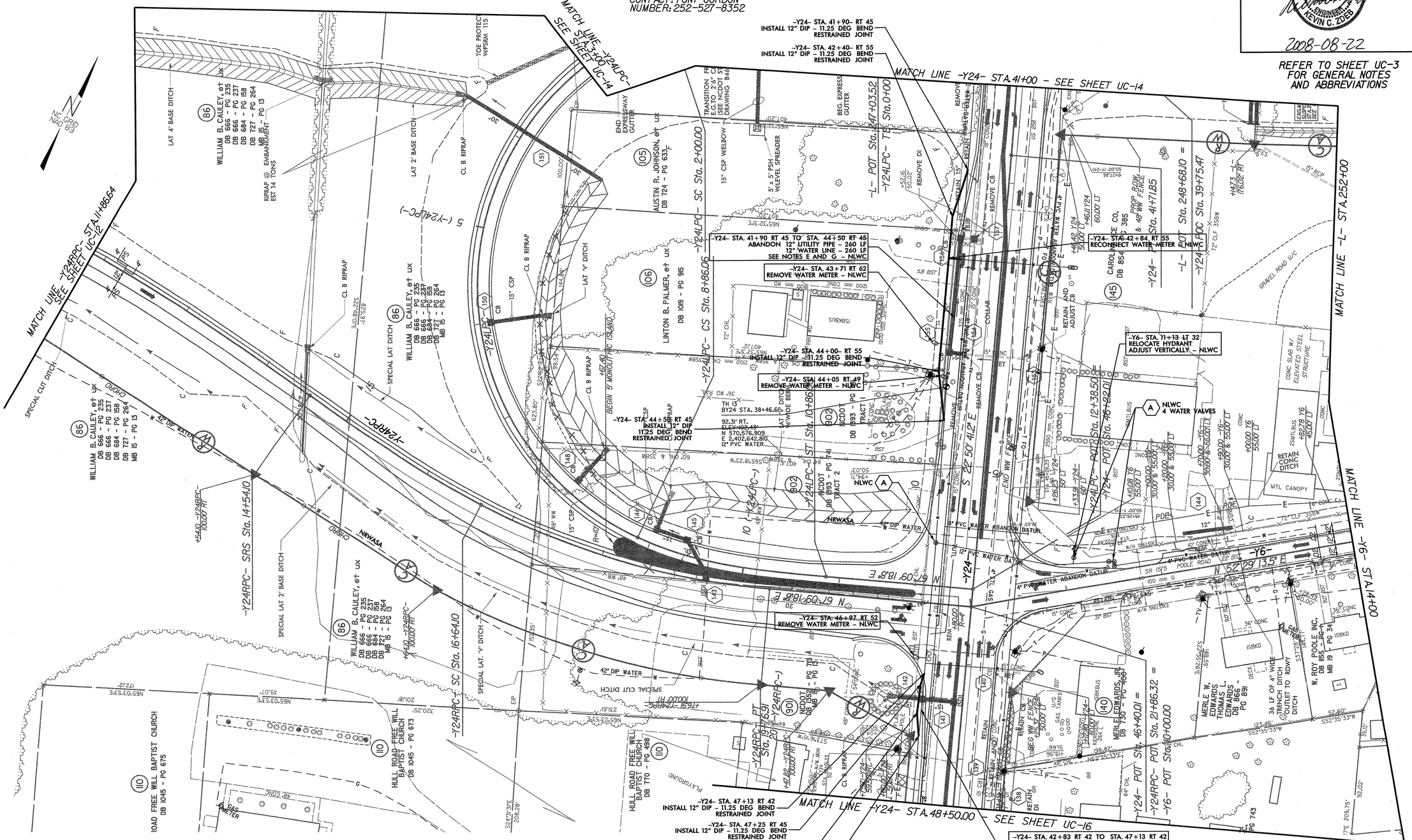
PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-15
R/W SHEET NO.	19

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022961 ENGINEER KEVIN C. ZUEB

2008-08-22

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-16
R/W SHEET NO.	36

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. ZDEB

2008-08-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

GRAPHIC SCALE

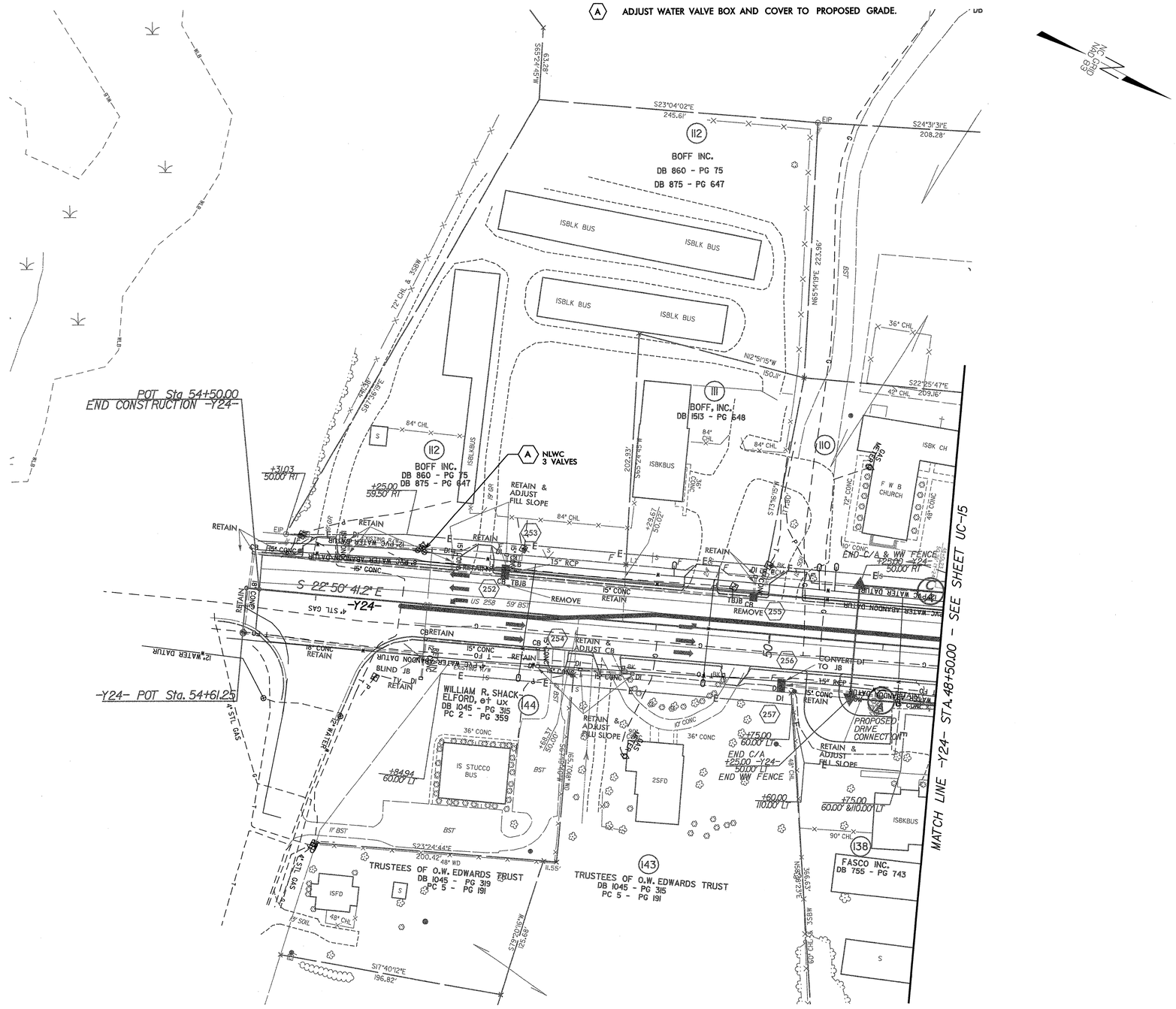
50 25 0 50 100

PLANS

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

2. WATER - NORTH LENOIR WATER CORPORATION
CONTACT: TONY GORDON
NUMBER: 252-527-8352



REVISIONS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-17
R/W SHEET NO.	22

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. ZDEB

2008-08-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

GRAPHIC SCALE

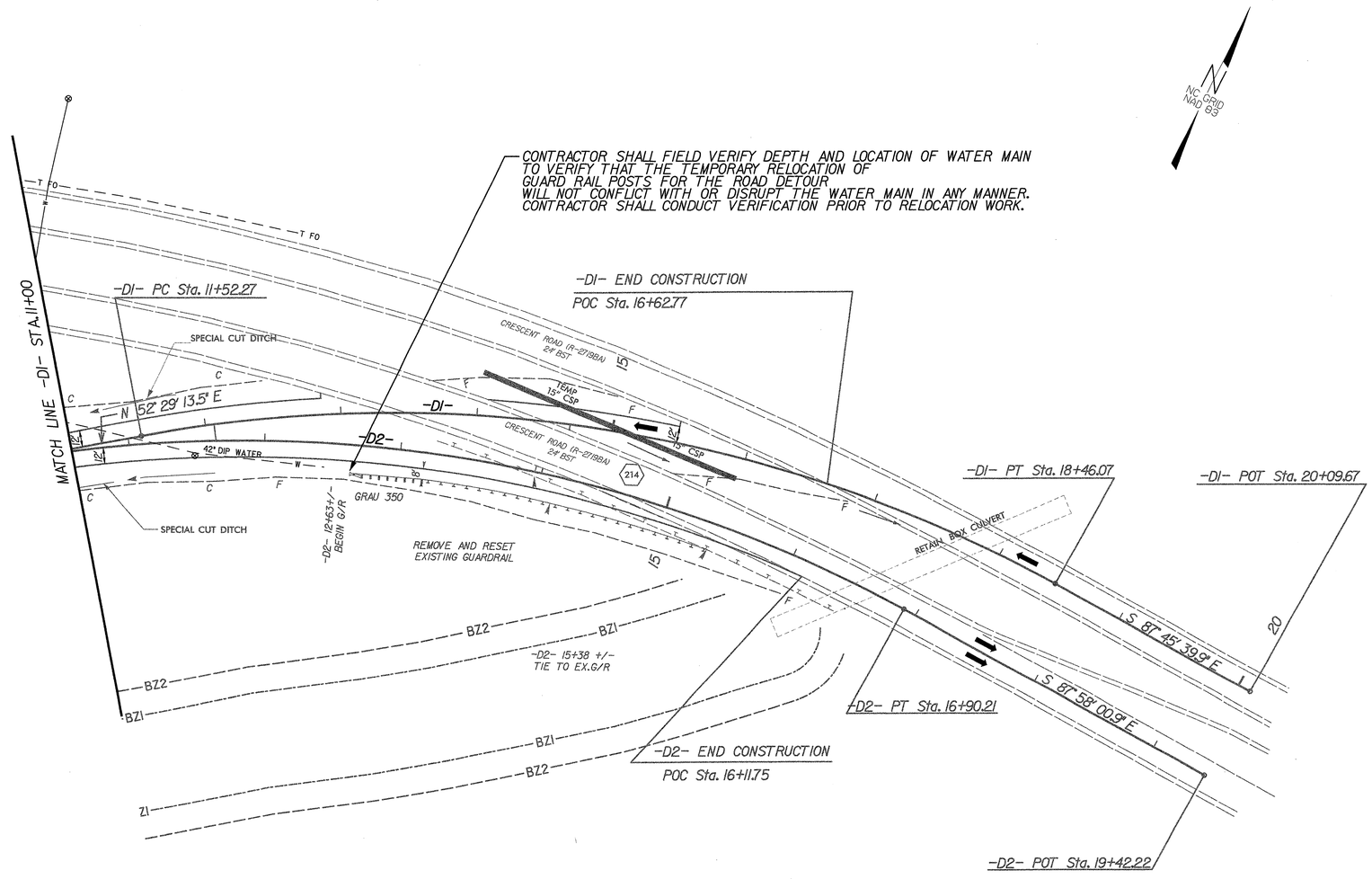
50 25 0 50 100

PLANS

UTILITY OWNERS WITH UTILITIES TO BE ALTERED ON THIS SHEET

1. WATER - NEUSE REGIONAL - WASA
CONTACT: KYLE SMITH
NUMBER: 252-522-2567

REFER TO SHEET UC-3 FOR GENERAL NOTES AND ABBREVIATIONS



REVISIONS

8/17/99

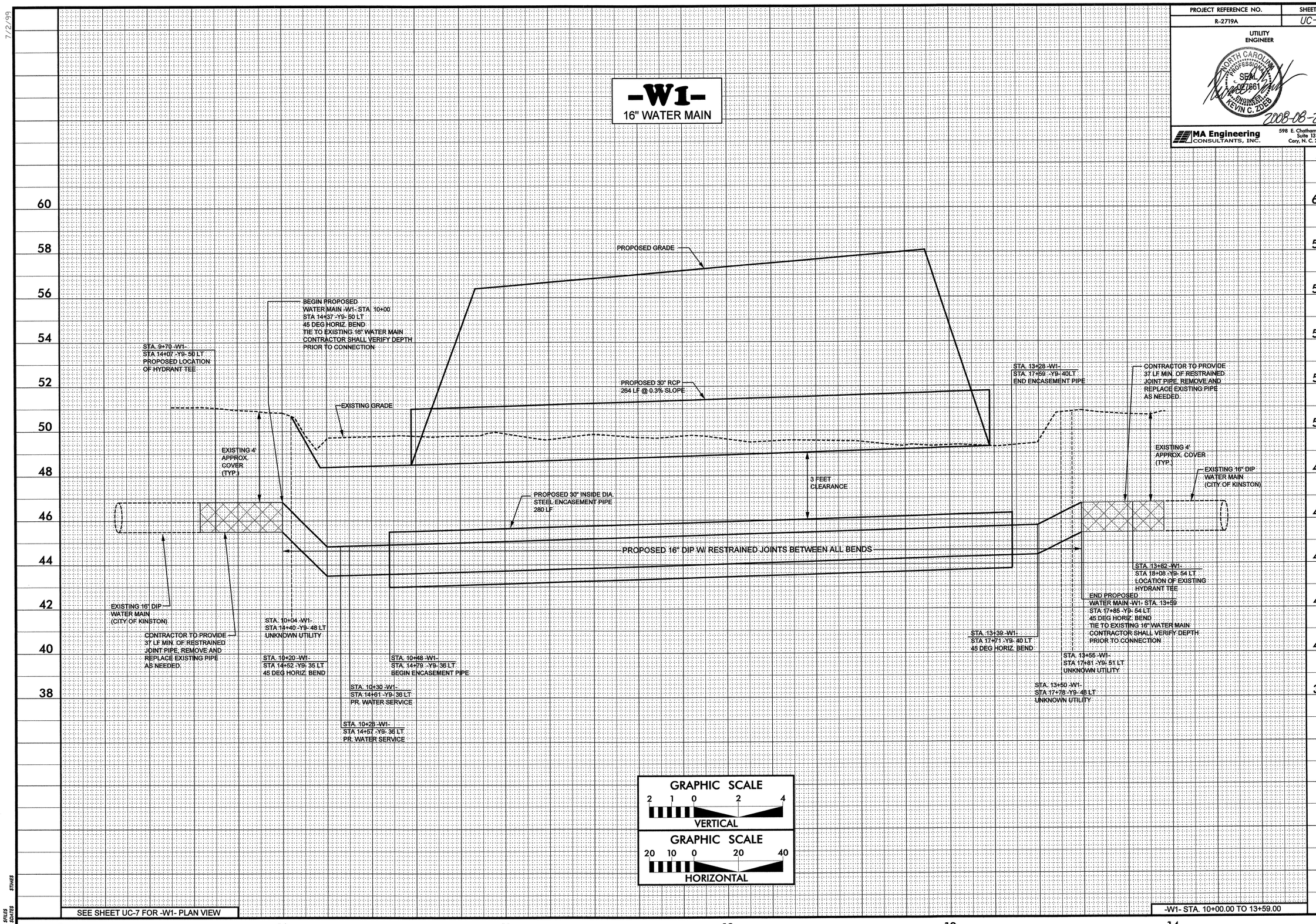
PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-18

UTILITY ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027861 ENGINEER KEVIN C. ZDEB

2008-08-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511



SEE SHEET UC-7 FOR -W1- PLAN VIEW

-W1- STA. 10+00.00 TO 13+59.00

FILE: $FILES
DATE: $DATE$ $TIMES

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-19

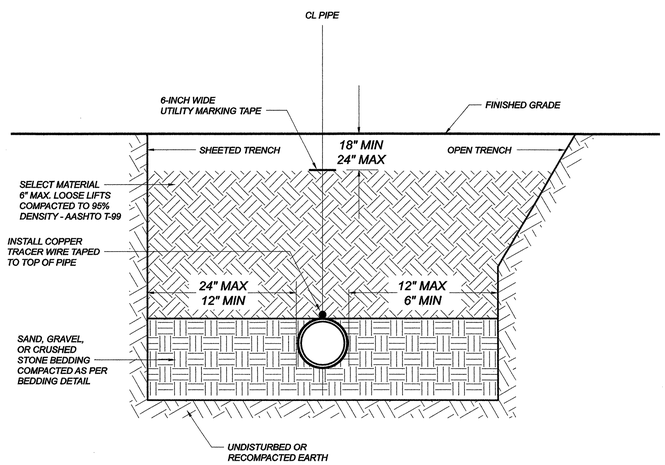
UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027861 ENGINEER KEVIN C. ZOES

2008-08-22

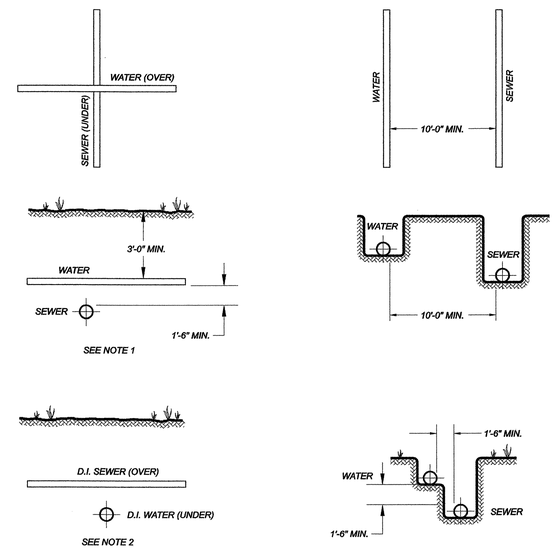
MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

REVISIONS



NOTES:
1. ALL SHORING & TRENCHING SHALL COMPLY WITH OSHA SAFETY STANDARDS FOR THE CONSTRUCTION INDUSTRY.
2. BELL HOLES NOT SHOWN.

GENERAL TRENCH DETAIL
NTS



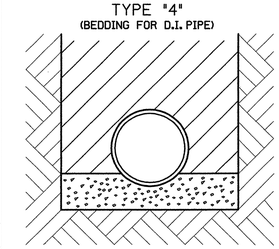
NOTES:
1. WHERE THE WATER MAIN IS INSTALLED ABOVE THE SEWER, BUT LESS THAN 18" CLEAR, BOTH THE WATER AND THE SEWER MAINS SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH WATER MAIN STANDARD JOINTS FOR A LATERAL DISTANCE OF AT LEAST 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
2. WHERE THE WATER PIPE IS LAID UNDER SEWER, BOTH THE WATER AND THE SEWER MAINS SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH WATER MAIN STANDARD JOINTS FOR A LATERAL DISTANCE OF AT LEAST 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
3. "SEWER" SHALL BE CONSIDERED TO MEAN EITHER SANITARY SEWER OR STORM SEWER.

TYPICAL PIPE CROSSING AND PARALLELS
NTS

MAXIMUM TRENCH WIDTH
AT TOP OF PIPE

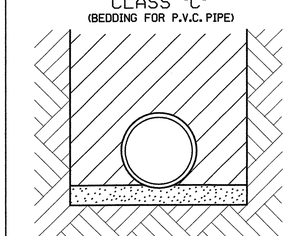
NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

TYPE "4"
(BEDDING FOR D.I. PIPE)



PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF ⅙ PIPE DIAMETER, 4" MINIMUM UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

CLASS "C"
(BEDDING FOR P.V.C. PIPE)



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

FILE: $FILES
DATE: $DATES $TIMES

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-20

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027681 ENGINEER KEVIN C. ZDEB

2008-08-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

BASED ON TEST PRESSURE OF 200 P.S.I.

HORIZONTAL RESTRAINT
(ALL AREAS GIVEN ARE IN SQUARE FEET)

PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	ALLOWABLE SOIL BEARING (PSF) 1000	2000	3000	4000	5000	6000	7000	8000
4"	11 1/4°	616	1	1	1	1	1	1	1	1
	22 1/2°	1,226	1	1	1	1	1	1	1	1
	45°	2,405	2	1	1	1	1	1	1	1
	90°	4,444	4	2	1	1	1	1	1	1
	TEE/PLUG	3,143	3	2	1	1	1	1	1	1
6"	11 1/4°	1,385	2	1	1	1	1	1	1	1
	22 1/2°	2,758	3	2	1	1	1	1	1	1
	45°	5,409	5	3	2	2	1	1	1	1
	90°	9,999	10	5	3	3	2	2	2	1
	TEE/PLUG	7,068	7	4	3	2	2	1	1	1
8"	11 1/4°	2,464	3	1	1	1	1	1	1	1
	22 1/2°	4,904	5	3	2	1	1	1	1	1
	45°	9,619	10	5	3	2	2	2	2	1
	90°	17,773	18	9	6	4	4	3	3	2
	TEE/PLUG	12,568	13	6	4	3	3	2	2	2
10"	11 1/4°	3,846	4	2	2	1	1	1	1	1
	22 1/2°	7,661	8	4	3	2	2	2	1	1
	45°	15,028	15	8	5	4	3	3	2	2
	90°	27,768	28	14	9	7	6	5	4	3
	TEE/PLUG	19,635	20	10	7	5	4	3	3	2
12"	11 1/4°	5,543	6	3	2	2	1	1	1	1
	22 1/2°	11,032	11	6	4	3	2	2	2	2
	45°	21,641	22	11	7	5	4	4	3	3
	90°	39,987	40	20	13	10	8	7	6	5
	TEE/PLUG	28,274	28	14	9	7	6	5	4	4
14"	11 1/4°	7,544	8	4	3	2	2	2	1	1
	22 1/2°	15,015	15	8	5	4	3	3	2	2
	45°	29,455	29	15	10	7	6	5	4	4
	90°	54,426	54	27	18	14	11	9	8	7
	TEE/PLUG	38,485	38	19	13	10	8	6	5	5
16"	11 1/4°	9,854	10	5	3	3	2	2	2	2
	22 1/2°	19,622	20	10	7	5	4	3	3	3
	45°	38,471	38	17	13	10	8	6	5	5
	90°	71,085	71	36	24	18	14	12	10	9
	TEE/PLUG	50,265	50	25	17	13	10	8	7	6

* INCLUDES 1.25 SAFETY FACTOR

VERTICAL RESTRAINT
(ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**

PIPE SIZE	RESTRAINING RODS NO.REQ'D	DIA.	DEGREE OF BEND 11 1/4°	22 1/2°	45°
4"	2	1/2"	0.25	0.50	0.75
6"	2	1/2"	0.50	1.0	1.75
8"	2	5/8"	0.75	1.50	3.0
10"	2	3/4"	1.25	2.25	4.50
12"	2	7/8"	1.75	3.25	6.50
14"	4	5/8"	2.25	4.50	8.75
16"	4	3/4"	3.0	6.0	11.50

**INCLUDES 1.50 SAFETY FACTOR

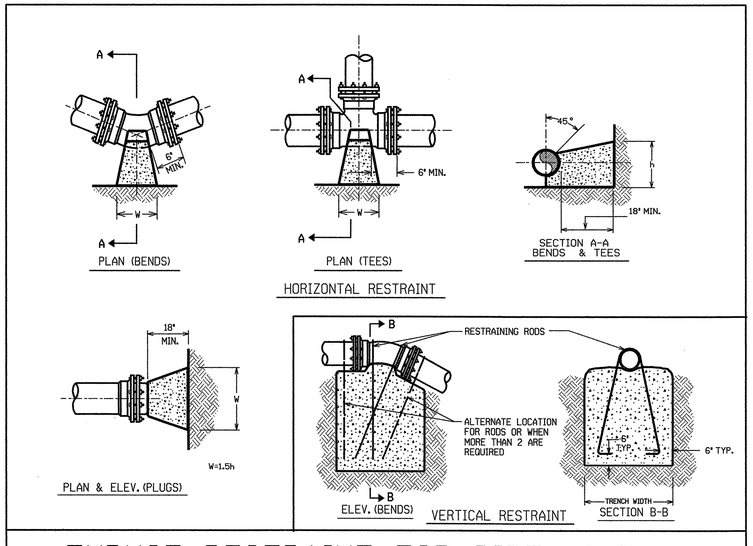
GENERAL NOTES:
1. CONCRETE SHALL BE CLASS "B".
2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS.
3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES. (FOR VERTICAL & HORIZONTAL BENDS)
4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER.

REVISIONS		
NO.	DATE	DESCRIPTION

SHEET 2 OF 2

THRUST RESTRAINT FOR WATER MAINS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RALEIGH, N.C.



THRUST RESTRAINT FOR PIPE LINES

RESTRAINED JOINT DESIGN TABLE

FITTING	REQUIRED RESTRAINED LENGTH (FT) OF BARE D.I. PIPE BY DEPTH OF COVER 3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT
HORIZONTAL BENDS								
4 INCH DIA - 11.25 DEG	2	2	1	1	1	1	1	1
4 INCH DIA - 22.5 DEG	4	3	3	2	2	2	2	2
4 INCH DIA - 45 DEG	7	6	6	5	5	4	4	4
6 INCH DIA - 11.25 DEG	3	2	2	2	2	1	1	1
6 INCH DIA - 22.5 DEG	5	4	4	3	3	3	3	2
6 INCH DIA - 45 DEG	11	9	8	7	7	6	5	5
8 INCH DIA - 11.25 DEG	3	3	2	2	2	2	2	2
8 INCH DIA - 22.5 DEG	7	6	5	5	4	4	3	3
8 INCH DIA - 45 DEG	14	12	10	9	8	8	7	7
12 INCH DIA - 11.25 DEG	5	4	4	3	3	3	2	2
12 INCH DIA - 22.5 DEG	9	8	7	6	6	5	5	5
12 INCH DIA - 45 DEG	20	17	15	13	12	11	10	10
16 INCH DIA - 11.25 DEG	6	5	5	4	4	3	3	3
16 INCH DIA - 22.5 DEG	12	11	9	8	8	7	6	6
16 INCH DIA - 45 DEG	25	22	19	17	16	14	13	12
42 INCH DIA - 11.25 DEG	13	12	11	10	9	8	8	7
42 INCH DIA - 22.5 DEG	27	24	22	20	18	16	15	14
42 INCH DIA - 45 DEG	56	50	45	41	37	34	32	30
VERTICAL DOWN BENDS	**3 FT**	**4 FT**	**5 FT**	**6 FT**	**7 FT**	**8 FT**	**9 FT**	**10 FT**
12 INCH DIA - 11.25 DEG	14	12	10	9	8	8	7	7
12 INCH DIA - 22.5 DEG	28	24	21	19	17	16	14	13
12 INCH DIA - 45 DEG	57	50	44	39	35	32	30	28
16 INCH DIA - 11.25 DEG	18	15	14	12	11	10	9	9
16 INCH DIA - 22.5 DEG	36	31	27	25	22	20	19	17
16 INCH DIA - 45 DEG	74	65	57	51	46	42	39	36
42 INCH DIA - 11.25 DEG	41	36	32	29	26	24	22	21
42 INCH DIA - 22.5 DEG	83	73	65	59	53	49	45	42
42 INCH DIA - 45 DEG	172	151	135	122	111	102	94	88
VERTICAL UP BENDS	**3 FT**	**4 FT**	**5 FT**	**6 FT**	**7 FT**	**8 FT**	**9 FT**	**10 FT**
12 INCH DIA - 11.25 DEG	X	4	4	3	3	3	2	2
12 INCH DIA - 22.5 DEG	X	8	7	6	6	5	5	5
12 INCH DIA - 45 DEG	X	17	15	13	12	11	10	10
16 INCH DIA - 11.25 DEG	X	5	5	4	4	3	3	3
16 INCH DIA - 22.5 DEG	X	11	9	8	8	7	6	6
16 INCH DIA - 45 DEG	X	22	19	17	16	14	13	12
42 INCH DIA - 11.25 DEG	X	12	11	10	9	8	8	7
42 INCH DIA - 22.5 DEG	X	24	22	20	18	16	15	14
42 INCH DIA - 45 DEG	X	50	45	41	37	34	32	30

ASSUMPTIONS
LAYING CONDITION = TYPE 4
SOIL DESIGNATION = GC = COHESIVE-GRANULAR
DESIGN PRESSURE = 200 PSI (TEST PRESSURE)
SAFETY FACTOR = 1.5

NOTES
1. RESTRAINED LENGTH IS MEASURED FROM THE CENTER OF THE BEND AS FOLLOWS:
   A. HORIZONTAL AND VERTICAL BENDS: ALONG EACH SIDE OF BEND.
   B. HORIZONTAL AND VERTICAL BENDS - OFFSET OR COMBINED: ALONG THE OUTER SIDE OF EACH BEND. ALL PIPE BETWEEN THE TWO BENDS SHALL BE RESTRAINED JOINT WHEN THE DISTANCE BETWEEN THEM IS EQUAL TO OR LESS THAN THE REQUIRED RESTRAINED LENGTH. WHEN THE DISTANCE BETWEEN BENDS IS LESS THAN REQUIRED, THE BALANCE OF THE REQUIRED RESTRAINED LENGTH SHALL BE ADDED ON TO THE LENGTH ALONG THE OUTSIDE OF EACH BEND RESPECTIVELY TO MAKE UP FOR THE DEFICIENCY IN THAT DIRECTION. HORIZONTAL BEND EXAMPLE...INSTALL A 12 INCH 45 DEG BEND AND A 22.5 DEG BEND WITH 10 FEET BETWEEN BENDS AND 7 FEET OF COVER - THE CONTRACTOR SHALL PROVIDE AN ADDITIONAL 1 FOOT OF RESTRAINED LENGTH BEYOND THE 45 DEG BEND (FOR A TOTAL OF 13 FEET) AND AN ADDITIONAL 7 FEET OF RESTRAINED LENGTH BEYOND THE 22.5 DEG BEND (FOR A TOTAL OF 13 FEET).
2. WHEN IT IS NOT POSSIBLE TO INSTALL THE RESTRAINED LENGTHS AS NOTED BY THIS TABLE, THE CONTRACTOR SHALL INSTALL THE APPROPRIATE CONCRETE THRUST RESTRAINTS AS PER THE DETAILS HEREIN.

REVISIONS

FILE: $FILES
DATE: $DATES
$TIMES

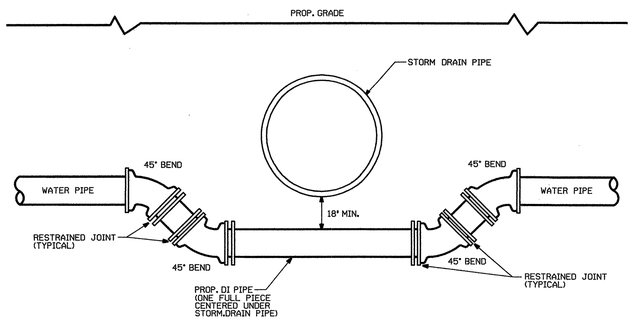
PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UC-21

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027861 ENGINEER KEVIN C. ZOEB

2008-10-22

MA Engineering CONSULTANTS, INC.
598 E. Chatham Street, Suite 137
Cary, N. C. 27511

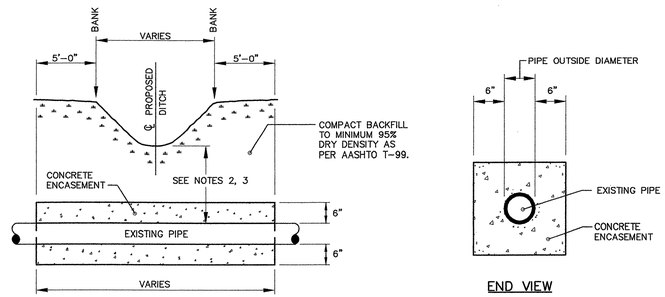


PROFILE

NTS

NOTES:
1. ALL FITTINGS AND JOINTS SHALL BE RESTRAINED JOINT DESIGN.
2. PROVIDE APPROPRIATE RESTRAINED LENGTH AS PER TABLE HEREIN.

PROPOSED WATER LINE CROSSING UNDER STORM DRAIN PIPE



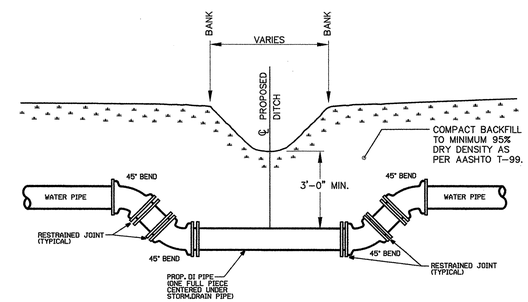
CROSS SECTION

END VIEW

NOTES:

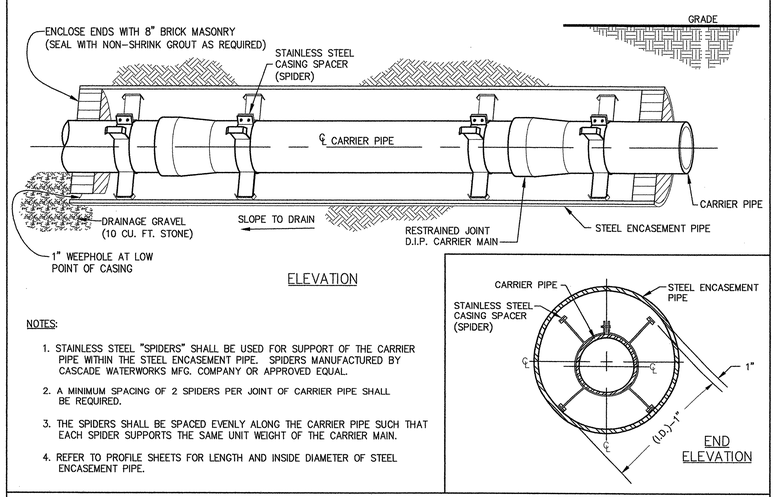
1. CONCRETE SHALL BE CLASS B – 2,500 P.S.I. MIN. COMPRESSIVE STRENGTH.
2. CONCRETE ENCASEMENT IS NOT REQUIRED WHEN 12" DIA PIPE OR LESS HAS AT LEAST TWO (2) FEET OF COVER BELOW CENTERLINE OF PROPOSED DITCH BOTTOM.
3. CONCRETE ENCASEMENT IS NOT REQUIRED WHEN 42" DIA PIPE HAS AT LEAST FOUR (4) FEET OF COVER BELOW CENTERLINE OF PROPOSED DITCH BOTTOM.

CONCRETE ENCASEMENT FOR DITCH CROSSING



CROSS SECTION

DITCH CROSSING



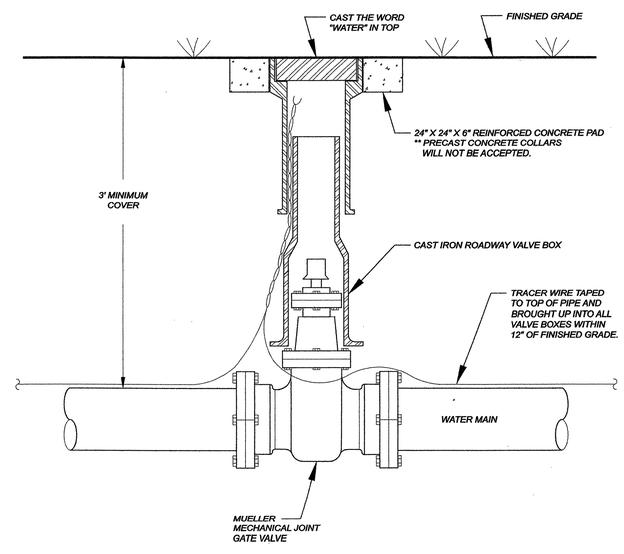
ELEVATION

END ELEVATION

NOTES:

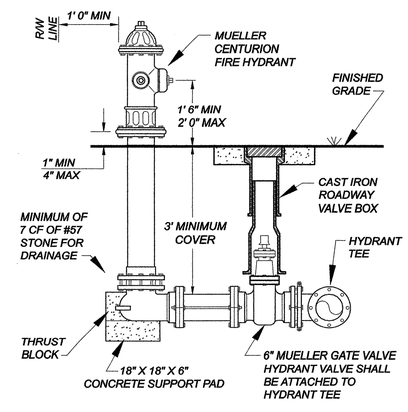
1. STAINLESS STEEL "SPIDERS" SHALL BE USED FOR SUPPORT OF THE CARRIER PIPE WITHIN THE STEEL ENCASEMENT PIPE. SPIDERS MANUFACTURED BY CASCADE WATERWORKS MFG. COMPANY OR APPROVED EQUAL.
2. A MINIMUM SPACING OF 2 SPIDERS PER JOINT OF CARRIER PIPE SHALL BE REQUIRED.
3. THE SPIDERS SHALL BE SPACED EVENLY ALONG THE CARRIER PIPE SUCH THAT EACH SPIDER SUPPORTS THE SAME UNIT WEIGHT OF THE CARRIER MAIN.
4. REFER TO PROFILE SHEETS FOR LENGTH AND INSIDE DIAMETER OF STEEL ENCASEMENT PIPE.

STEEL ENCASEMENT PIPE



GATE VALVE DETAIL

NTS



NOTES:
1. BACK FILL SHALL BE COMPACTED IN MAXIMUM 4" LIFTS AROUND VALVE BOX AND HYDRANT BARREL.
2. HYDRANT SHALL BE SET PLUMB WITH THE PUMPER NOZZLE FACING THE ROAD.
3. HYDRANTS SHALL BE GIVEN A FRESH COAT OF MANUFACTURER'S PAINT IN ACCORDANCE WITH THE UTILITY OWNER'S STANDARD COLOR(S) AFTER INSTALLATION.

FIRE HYDRANT INSTALLATION

NTS

REVISIONS

2008-10-22 ADD NOTE "3" TO "CONCRETE ENCASEMENT FOR DITCH CROSSING" DETAIL.

FILE: $FILES
DATE: $DATES $TIMES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2719A	UO-1	20

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

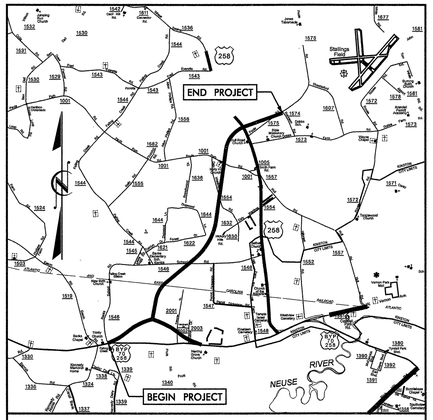
LENOIR COUNTY

LOCATION: FELIX HARVEY PARKWAY (CRESCENT RD) IN KINSTON FROM US 70 TO US 258

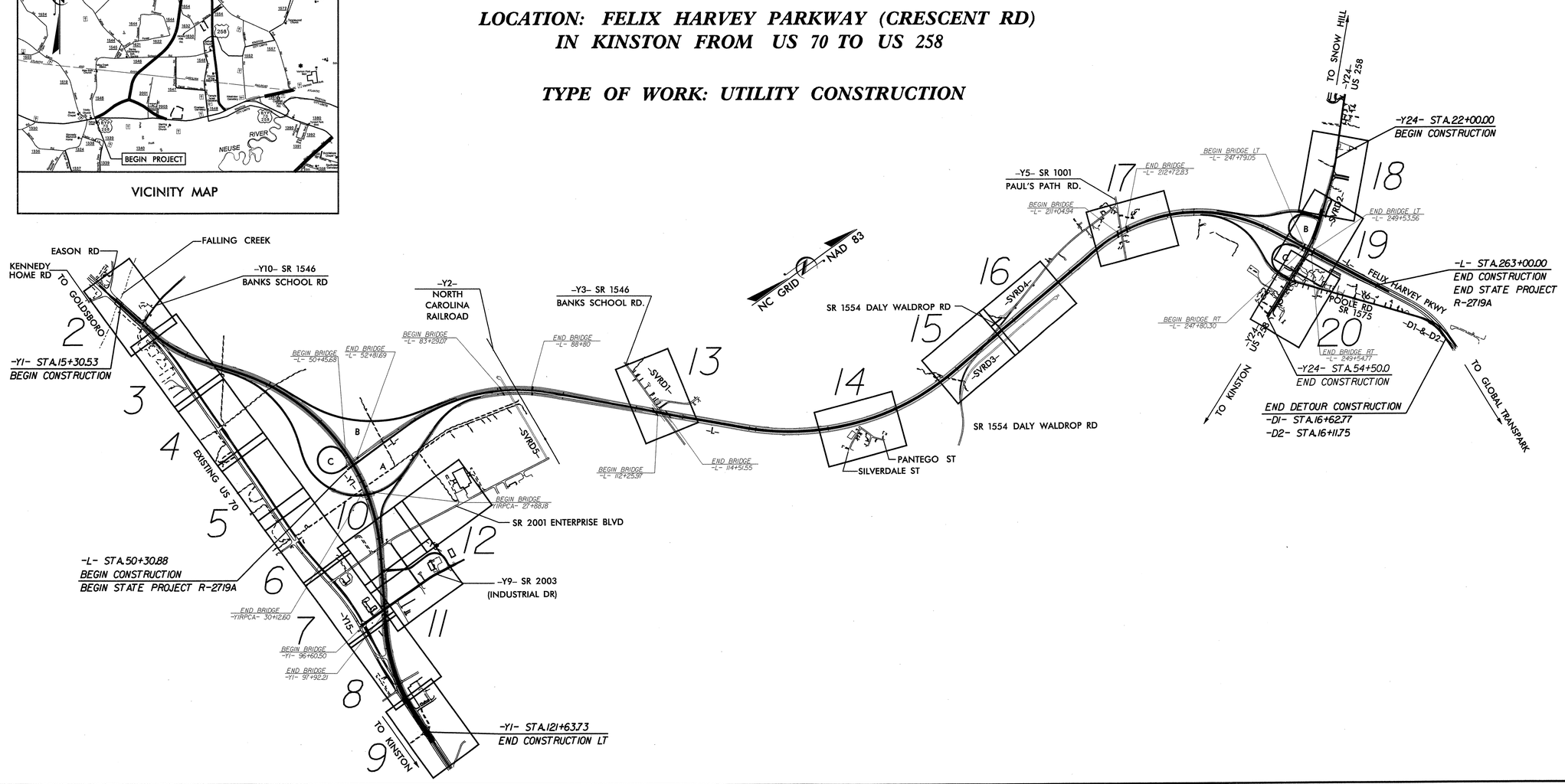
TYPE OF WORK: UTILITY CONSTRUCTION

TIP PROJECT: R-2719A

CONTRACT:



VICINITY MAP



GRAPHIC SCALES

50 25 0 50 100
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

2 1 0 2 4
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 TO UO-20	UO PLAN SHEETS

UTILITY OWNERS ON PROJECT

PROGRESS ENERGY:	J. B. JONES (919) 481-6153 office (919) 206-1966 cell JB.JONES@PGNMAIL.COM	CITY OF KINSTON POWER:	RANDY CROOM (252) 939-3288 office (252) 520-0485 cell RANDY.CROOM@CI.KINSTON.NC.US
EMBARQ:	JOSH STURTZ (910)797-1695 cell JOSH.X.STURTZ@EMBARQ.COM	SUDDEN LINK CABLE TV:	NATHAN BARNHILL (252) 792-9182 office (252) 883-2287 cell NATHAN.BARNHILL@SUDDENLINK.COM
PIEDMONT NATURAL GAS:	DAN ROUSE (252) 639-7225 office WILLIAM.ROUSE@PIEDMONTNG.COM		

UTILITY DESIGN BY:

MA Engineering CONSULTANTS, INC.
598 East Chatham Street, Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax. 919.297.0221

NCDOT PROJECT ENGINEER:
CARL A. BARCLAY, P.E.
PREPARED FOR:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT SERVICES UNIT
RALEIGH, NC

90% PLANS
APRIL 15, 2008

PROJECT REFERENCE NO.	SHEET NO.
R-2719A	U0-2

UTILITIES BY OTHERS

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598 E. Chatham Street, Suite 137
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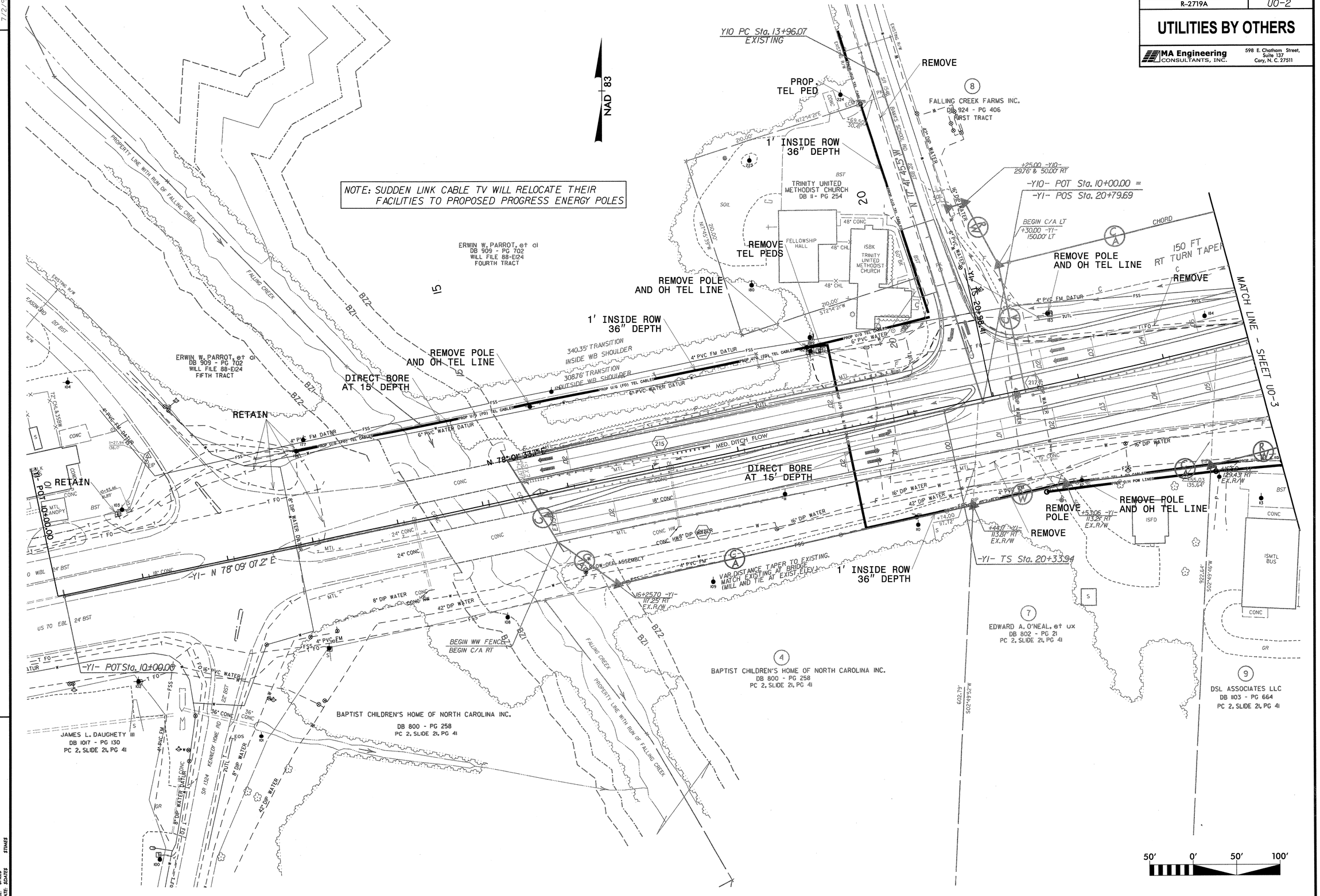

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PROJECT REFERENCE NO.	SHEET NO.
R-2719A	U0-3

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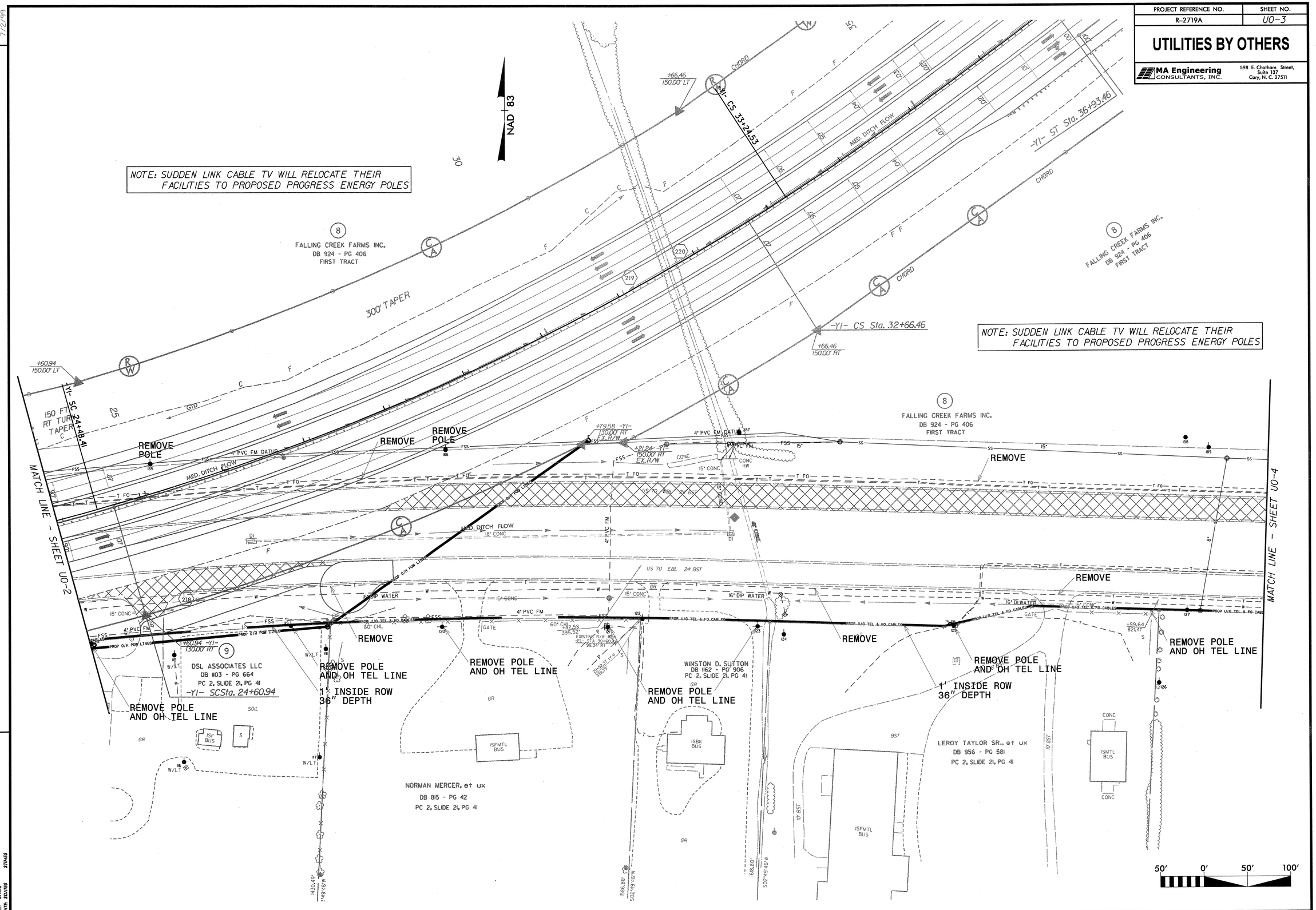

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FILE: SFILES
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PROJECT REFERENCE NO.	SHEET NO.
R-2719A	UO-4

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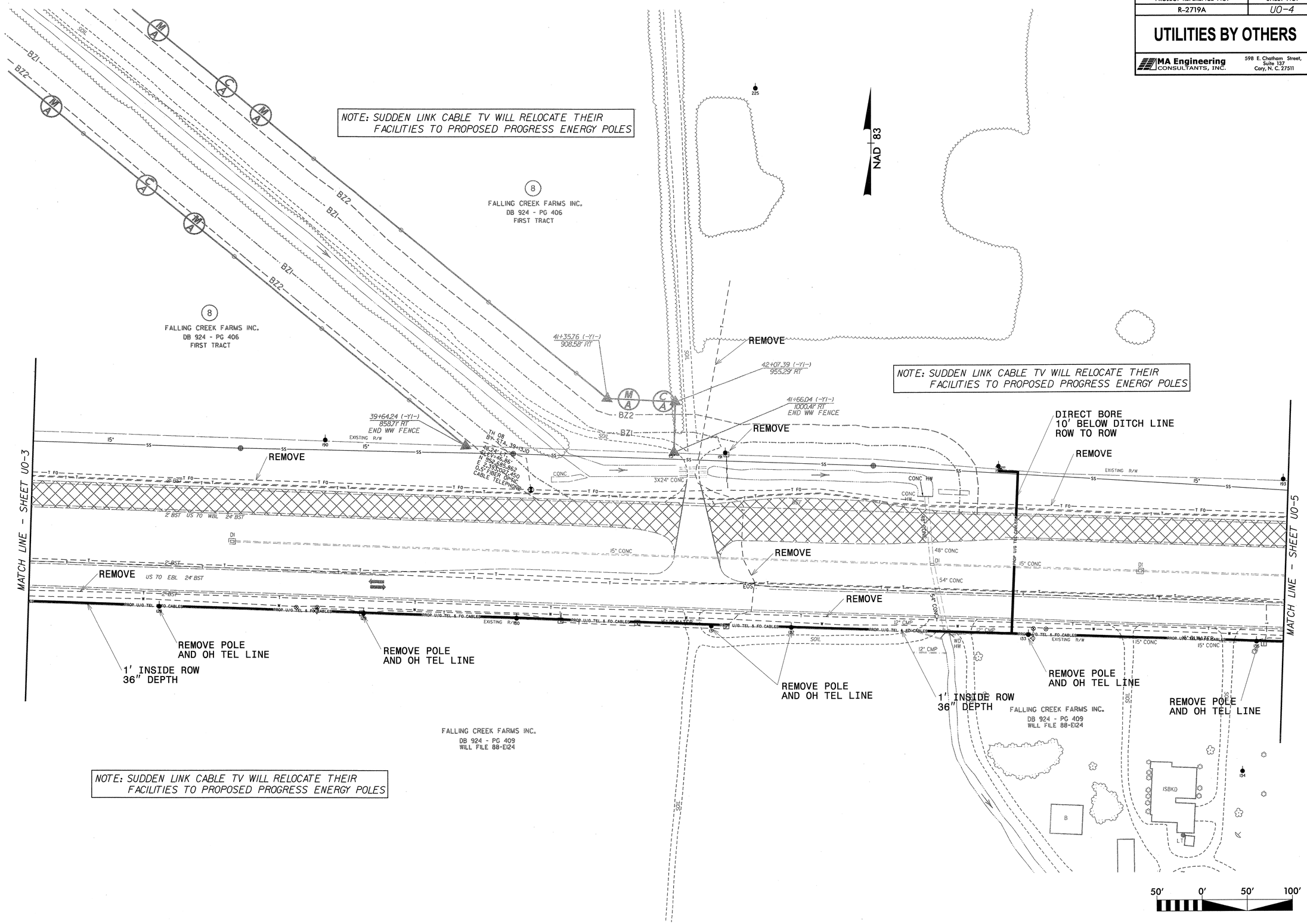

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R-2719A	U0-5

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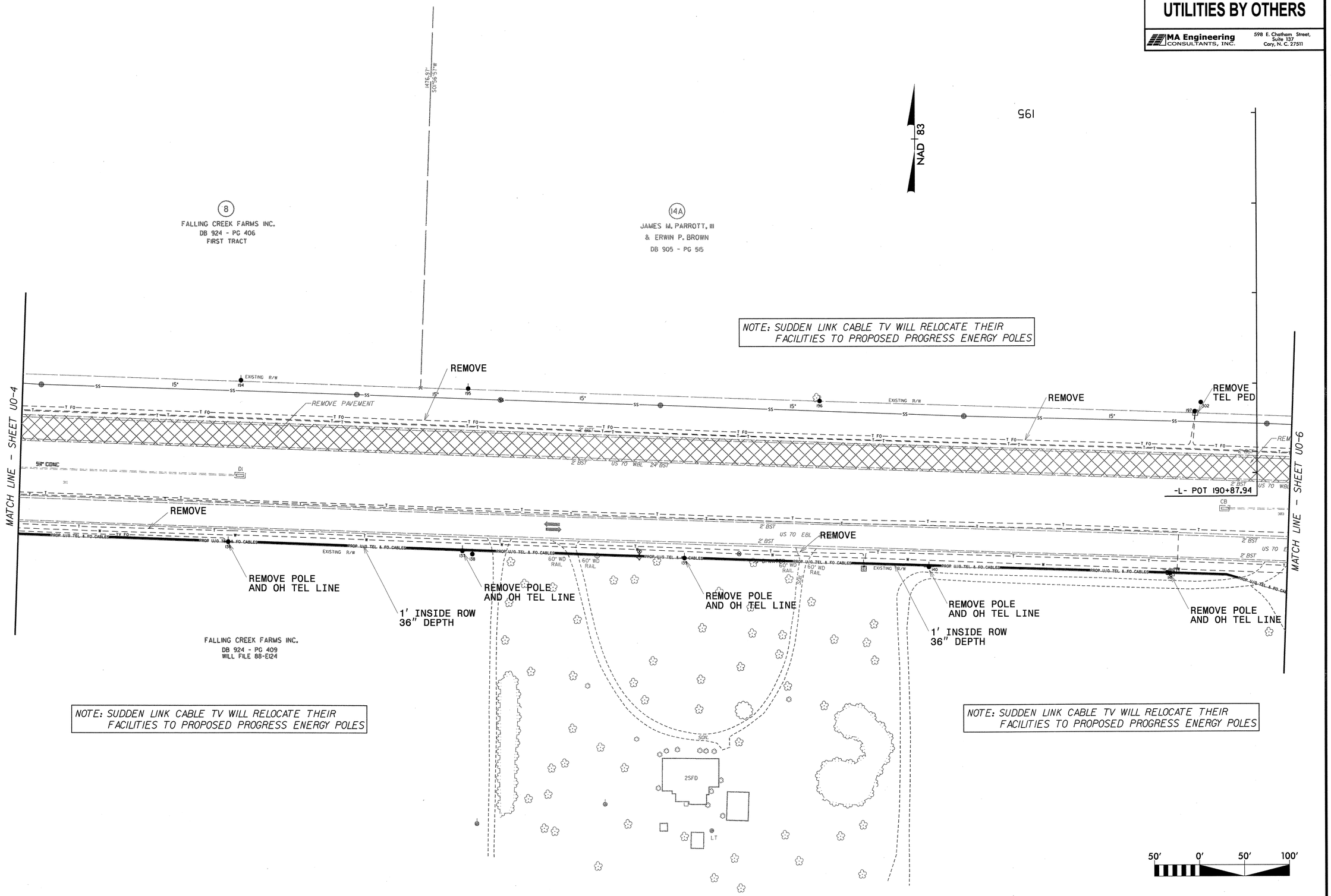

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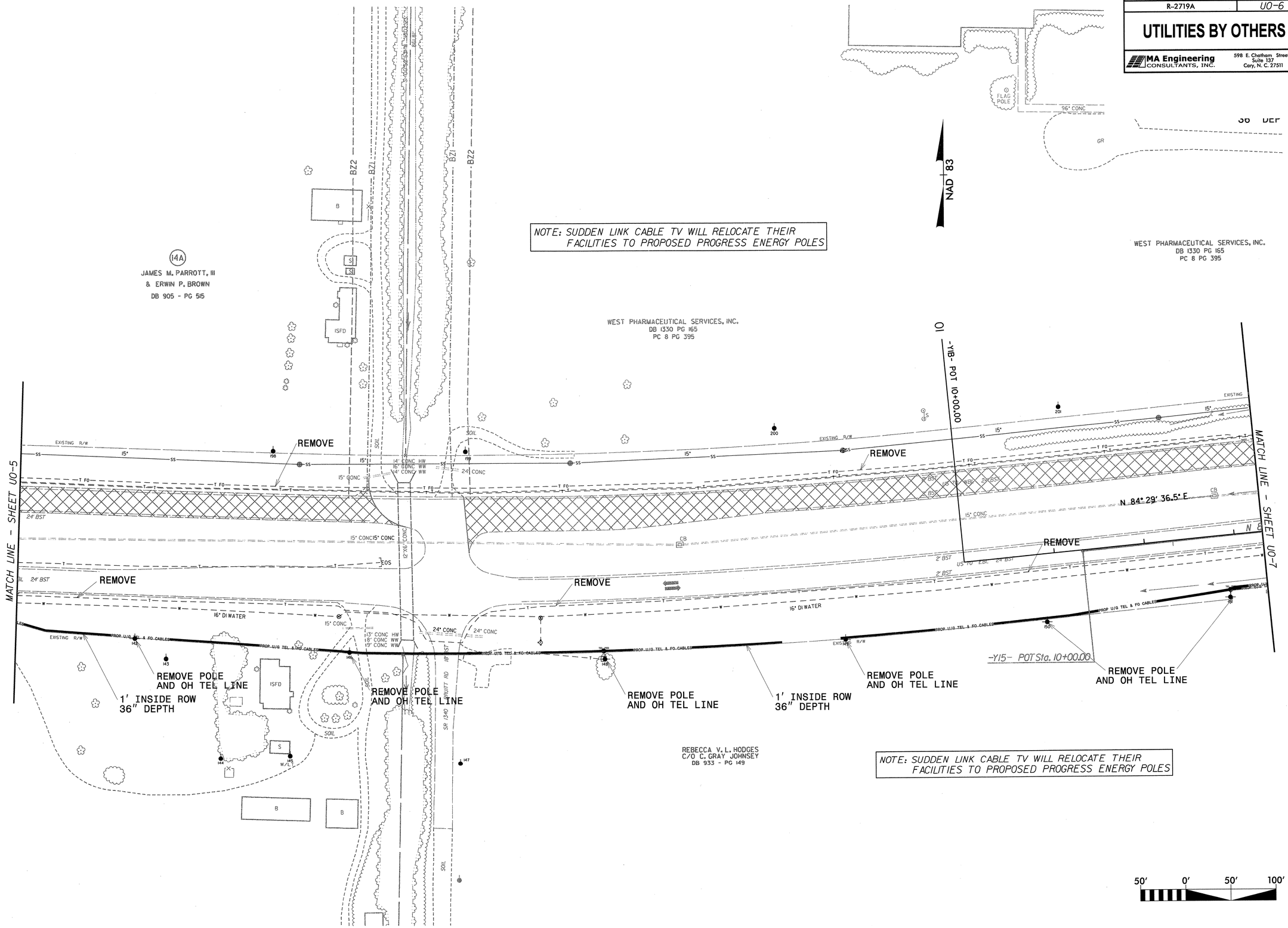

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R-2719A	U0-7

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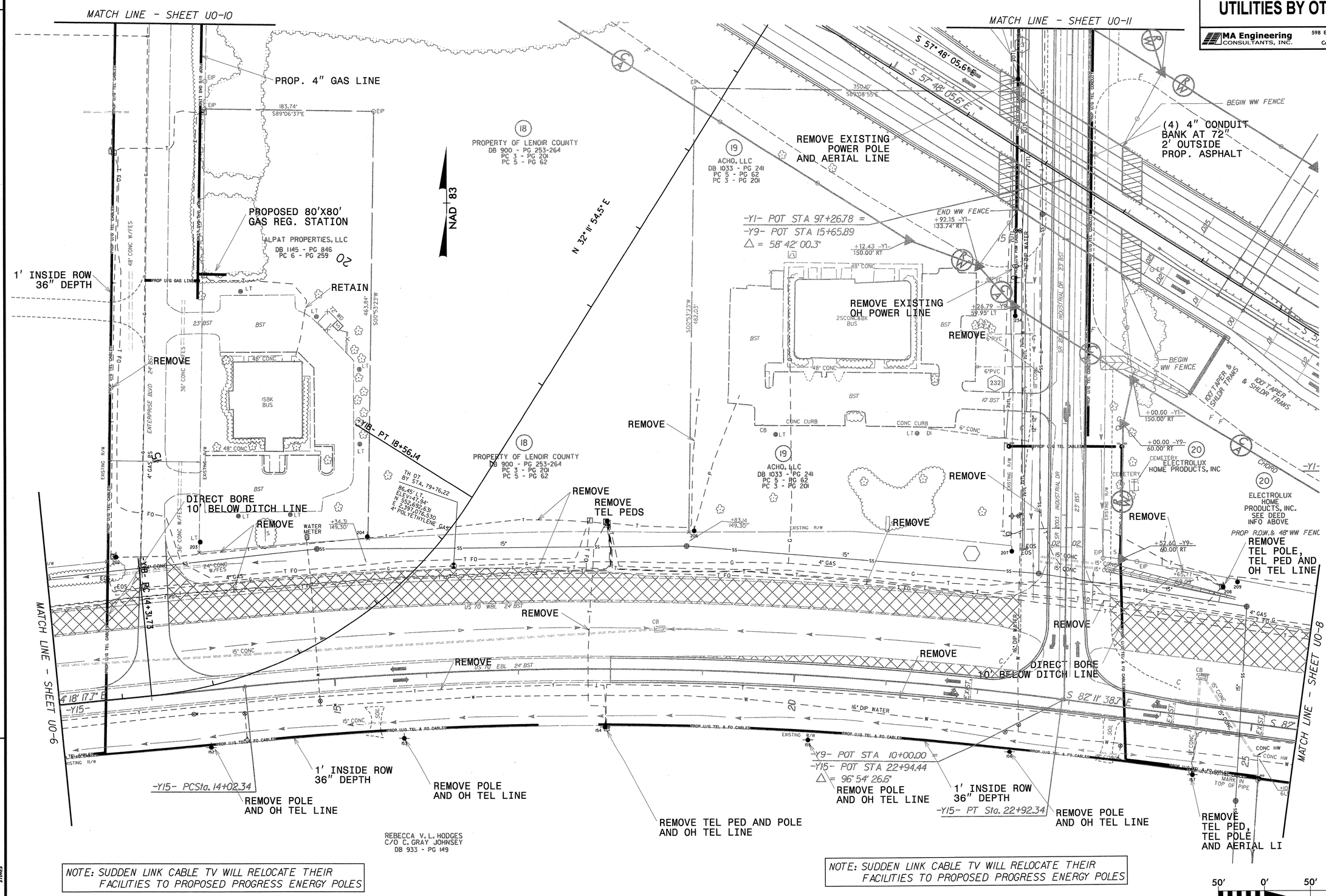

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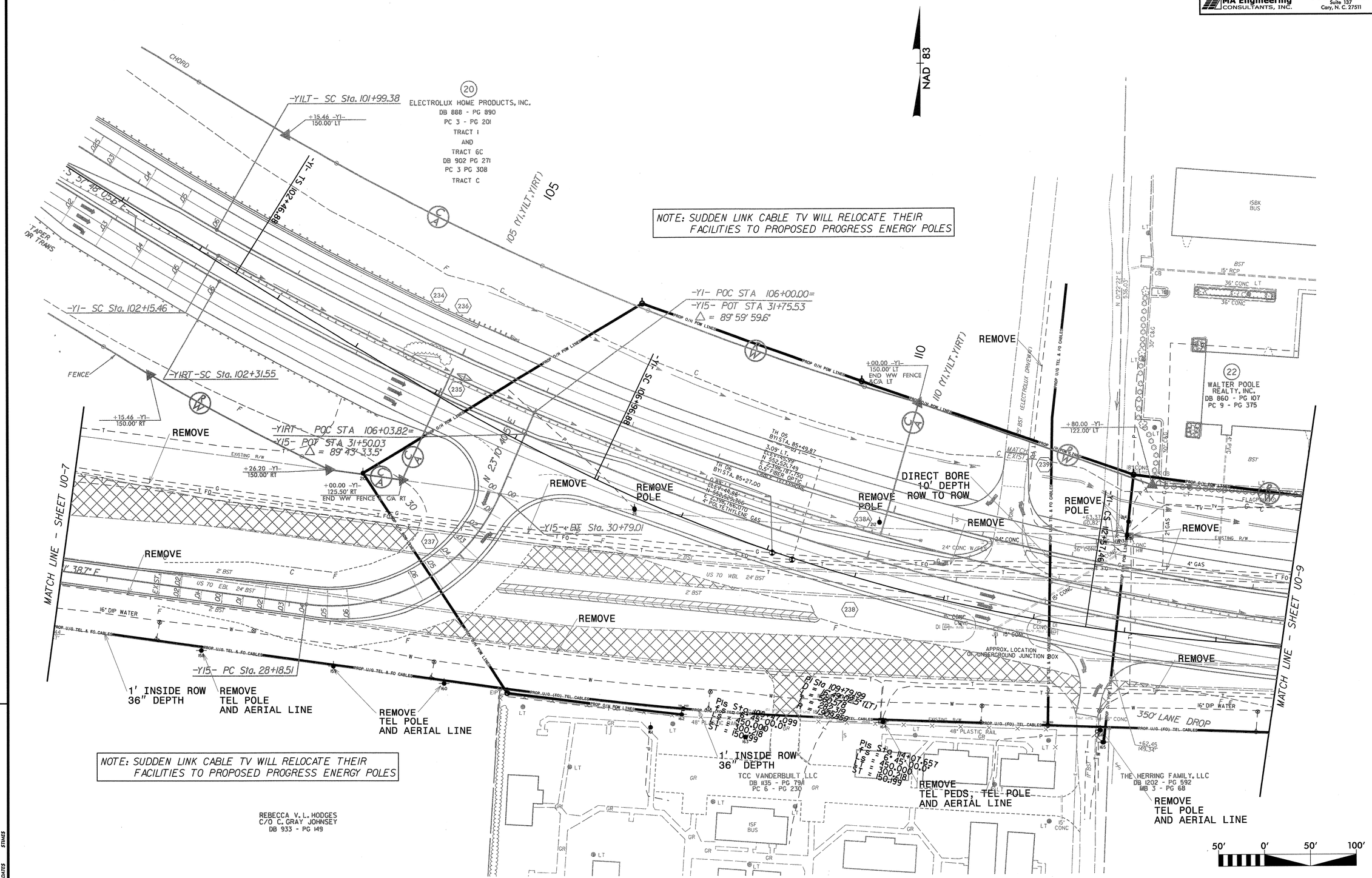

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2719A	U0-9

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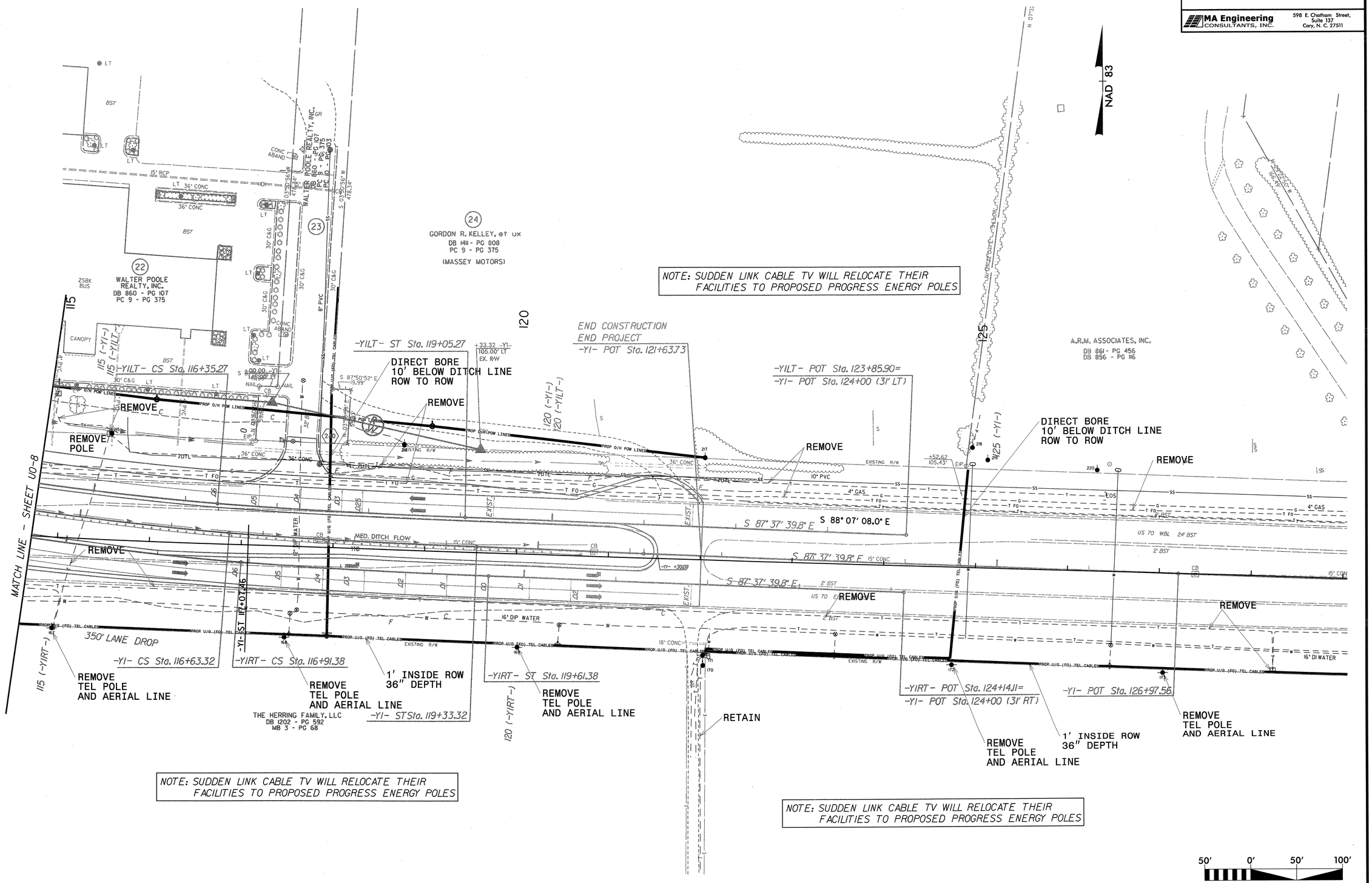

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R-2719A	U0-10

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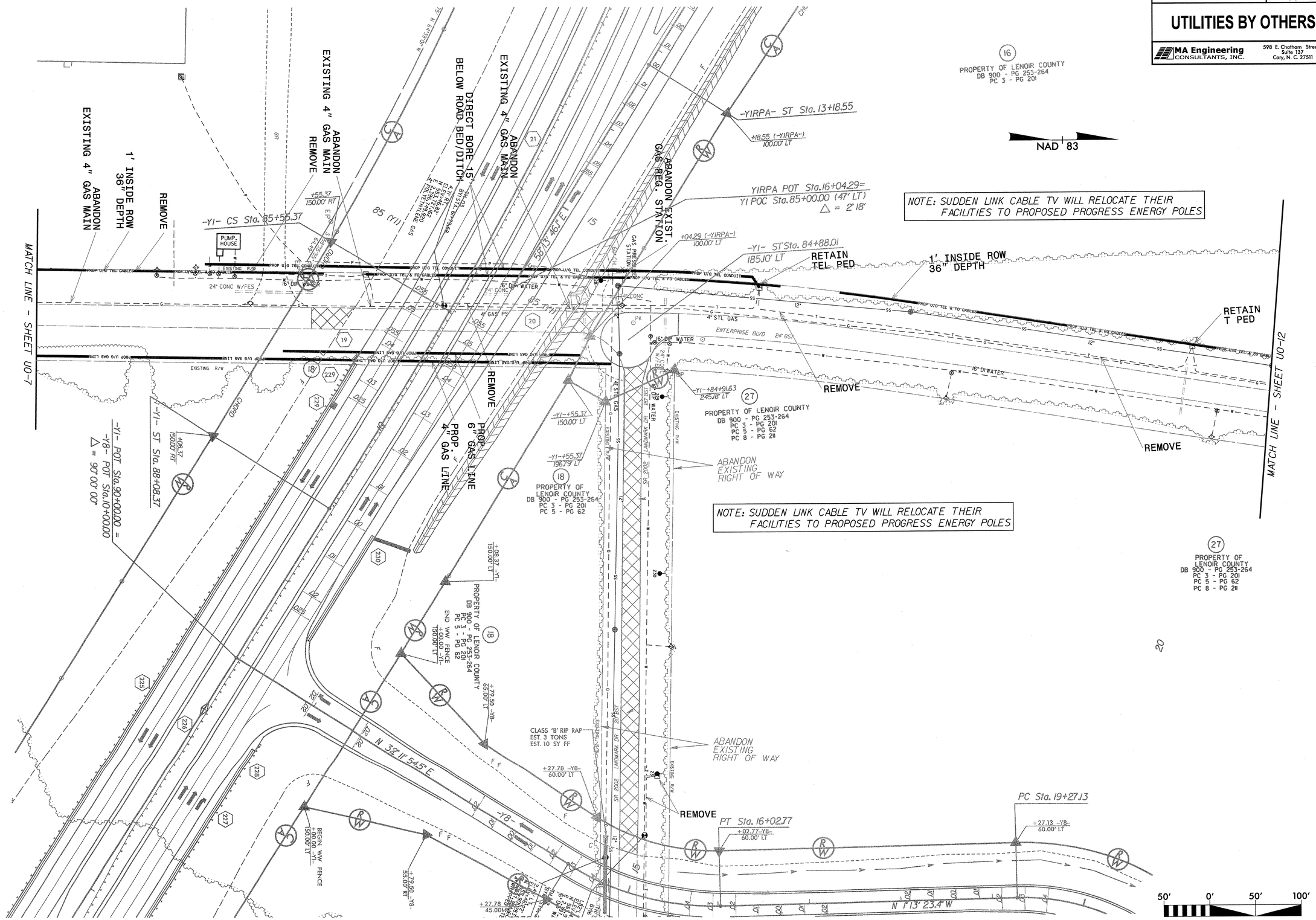

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R-2719A	UO-11

UTILITIES BY OTHERS

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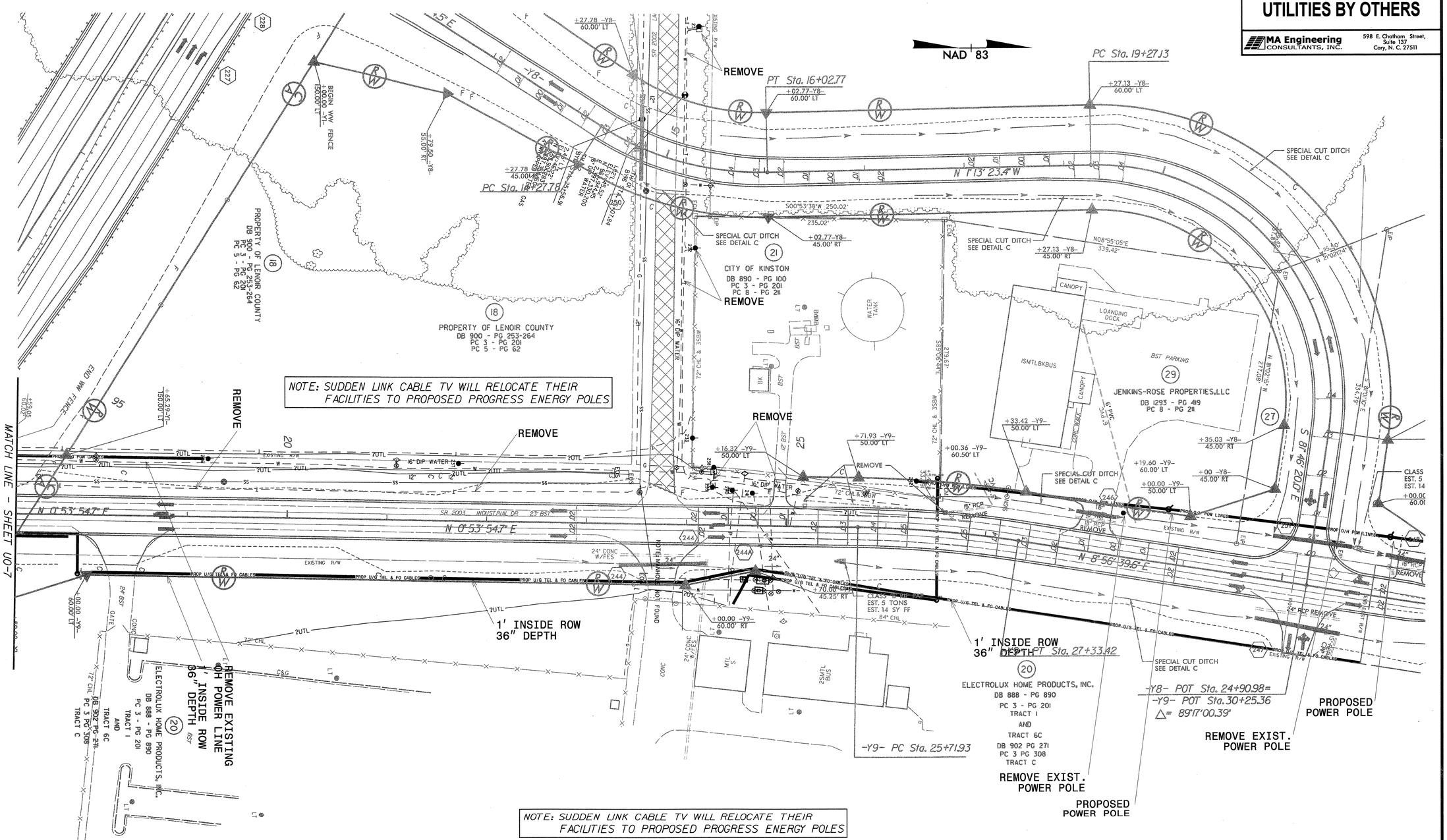
Cary, N. C. 27511



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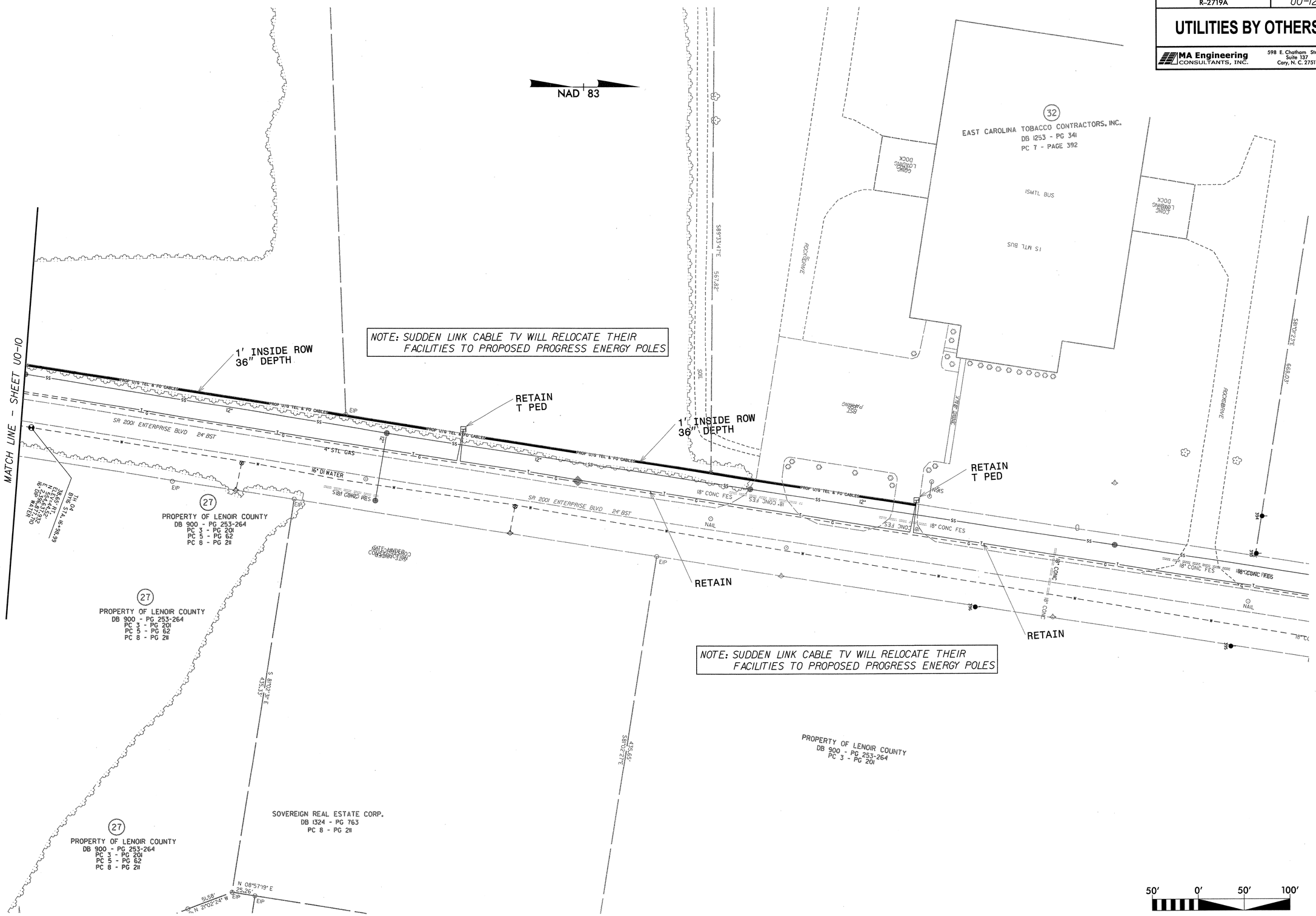

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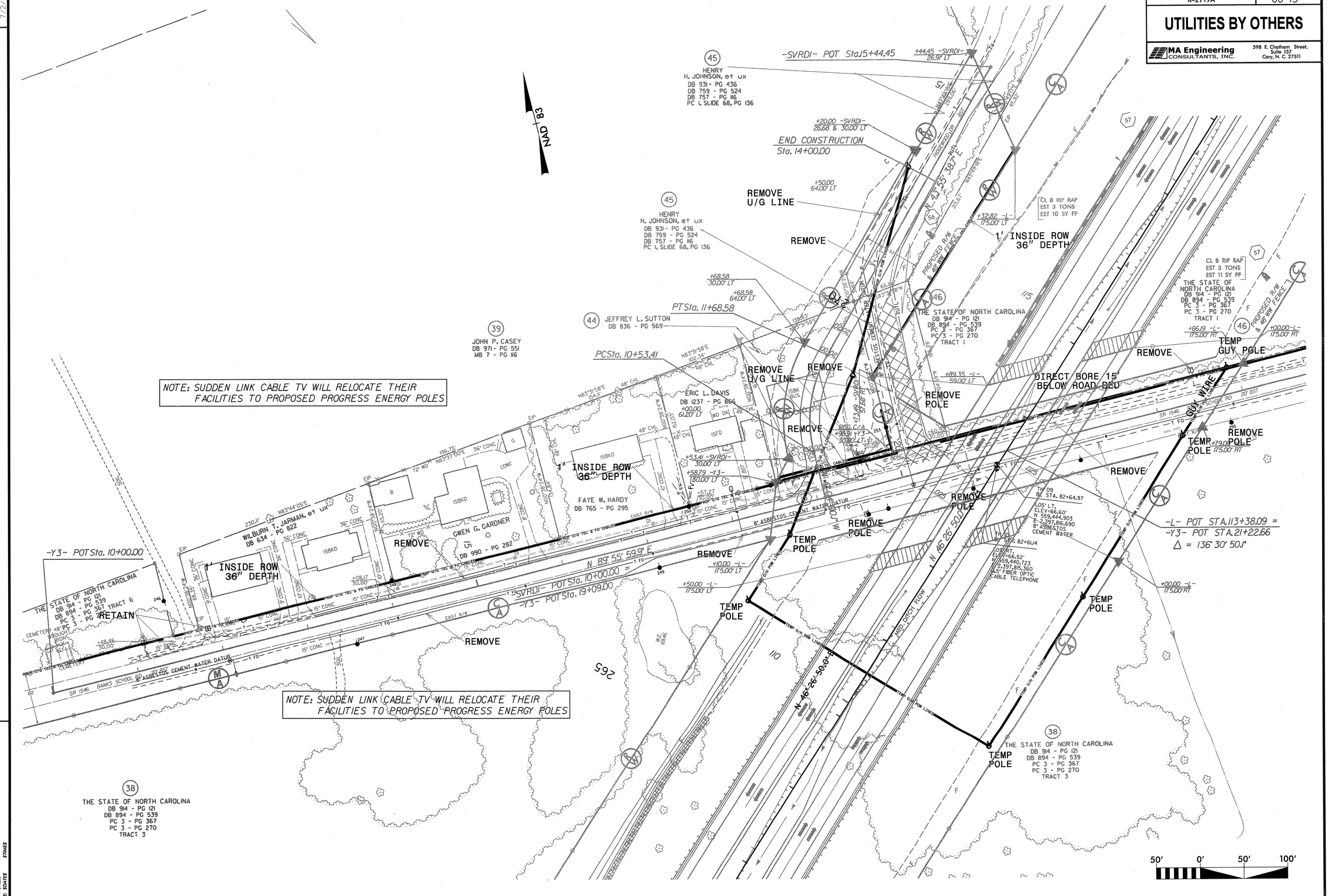

REVISIONS

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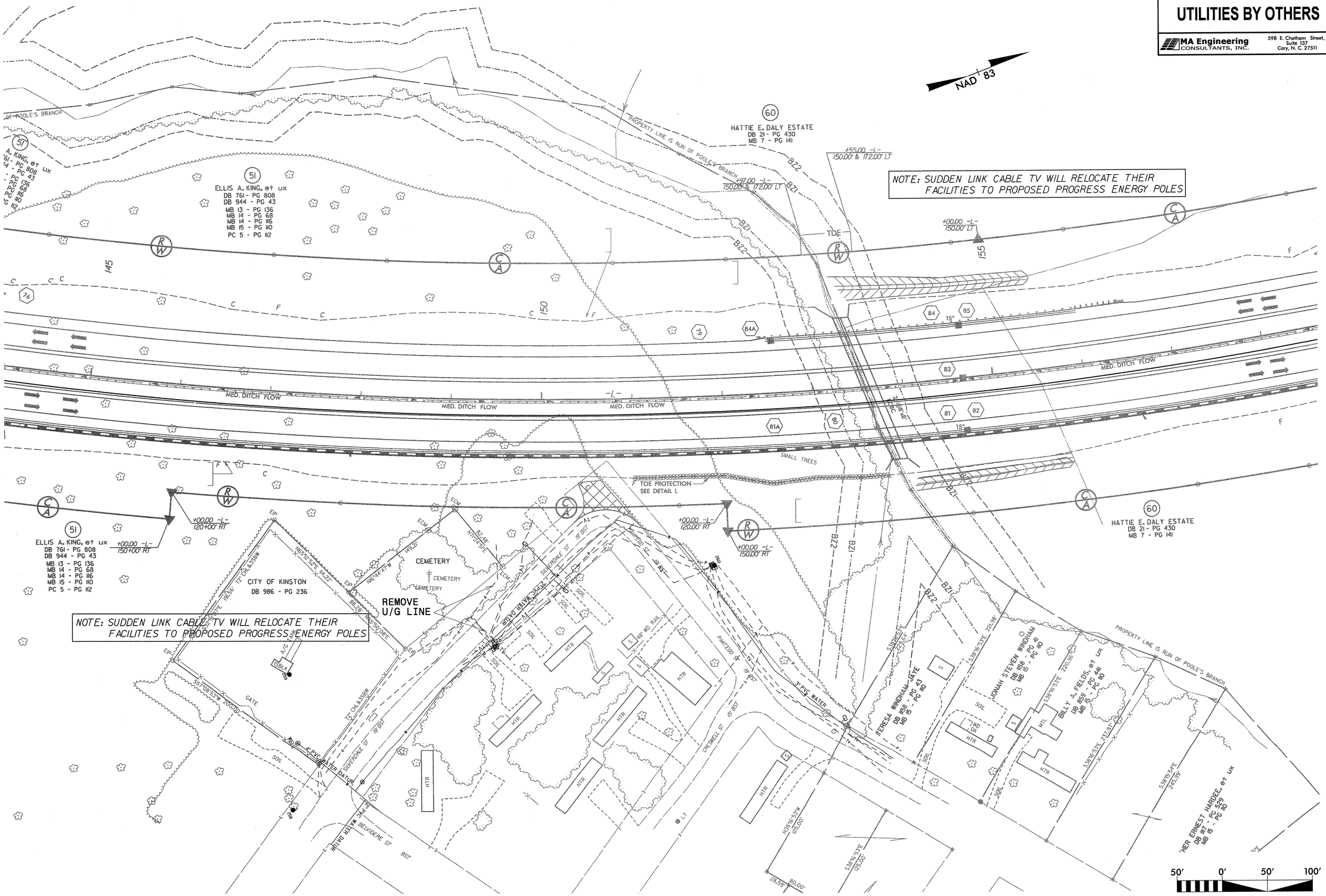

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
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UTILITIES BY OTHERS

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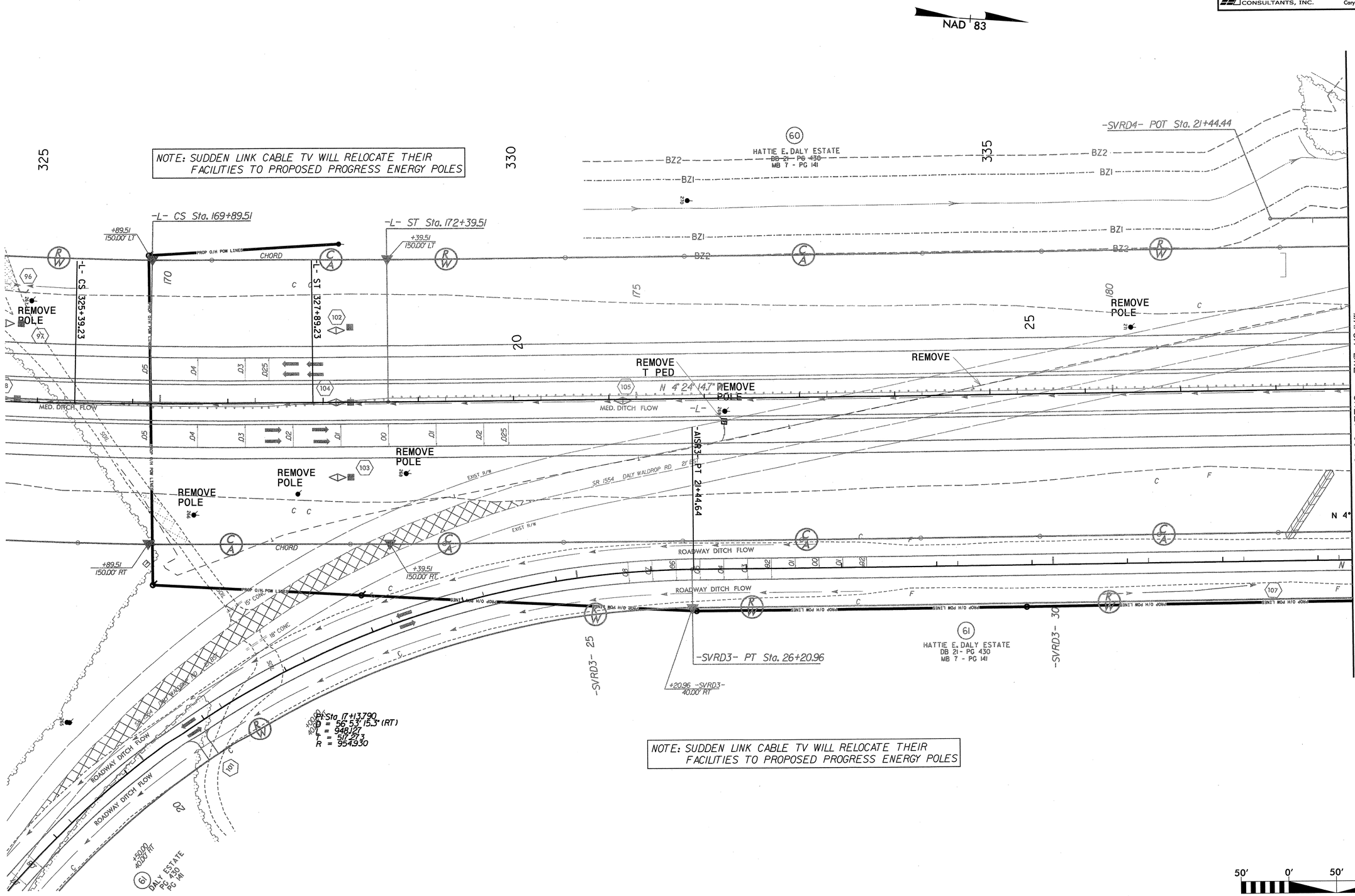

NOTE: SUDDEN LINK CABLE TV WILL RELOCATE THEIR FACILITIES TO PROPOSED PROGRESS ENERGY POLES

REVISIONS

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FILE: $FILES
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PROJECT REFERENCE NO.	SHEET NO.
R-2719A	U0-16

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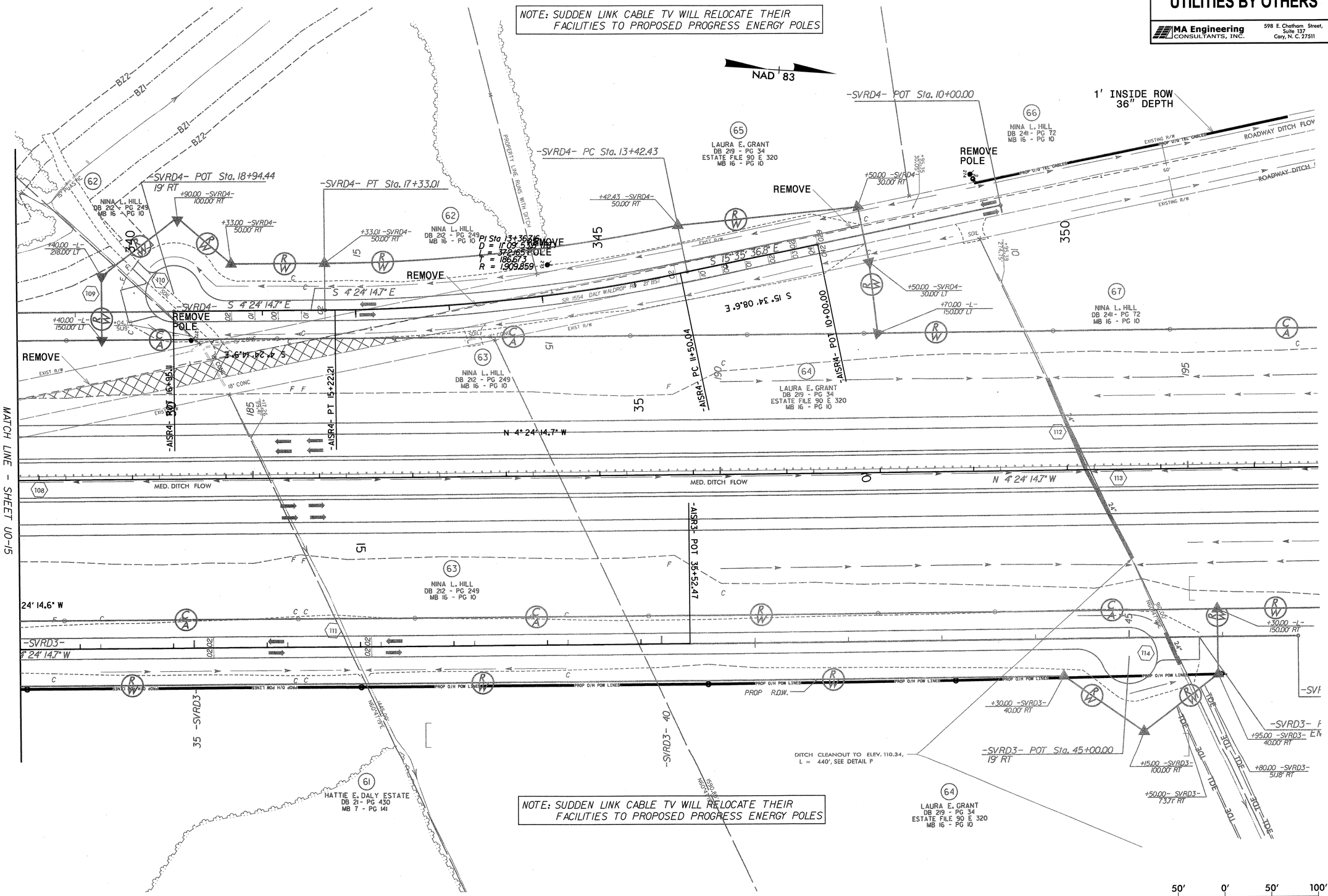
NOTE: SUDDEN LINK CABLE TV WILL RELOCATE THEIR FACILITIES TO PROPOSED PROGRESS ENERGY POLES



REVISIONS

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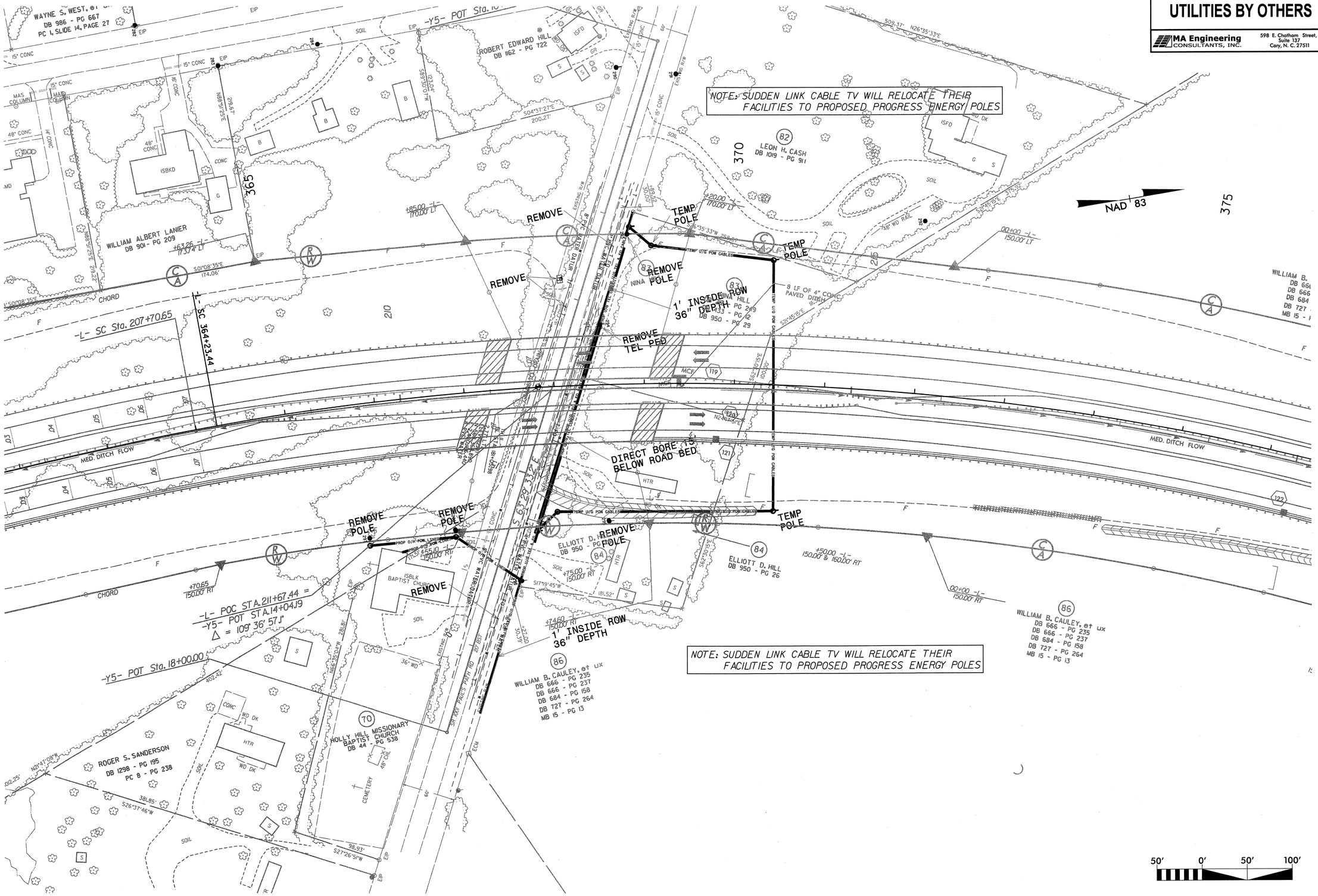

REVISIONS

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UTILITIES BY OTHERS

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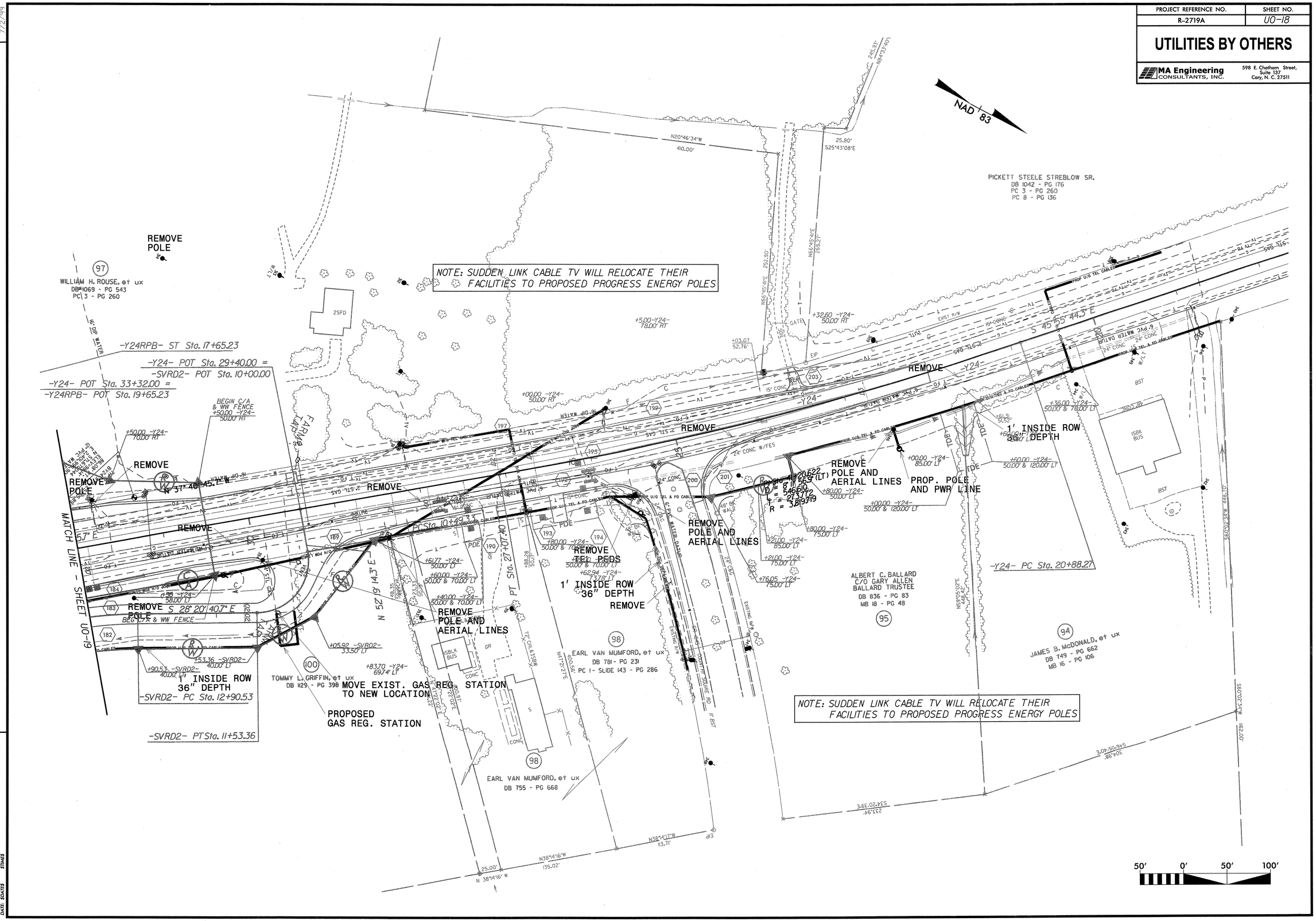
Cary, N. C. 27511



REVISIONS

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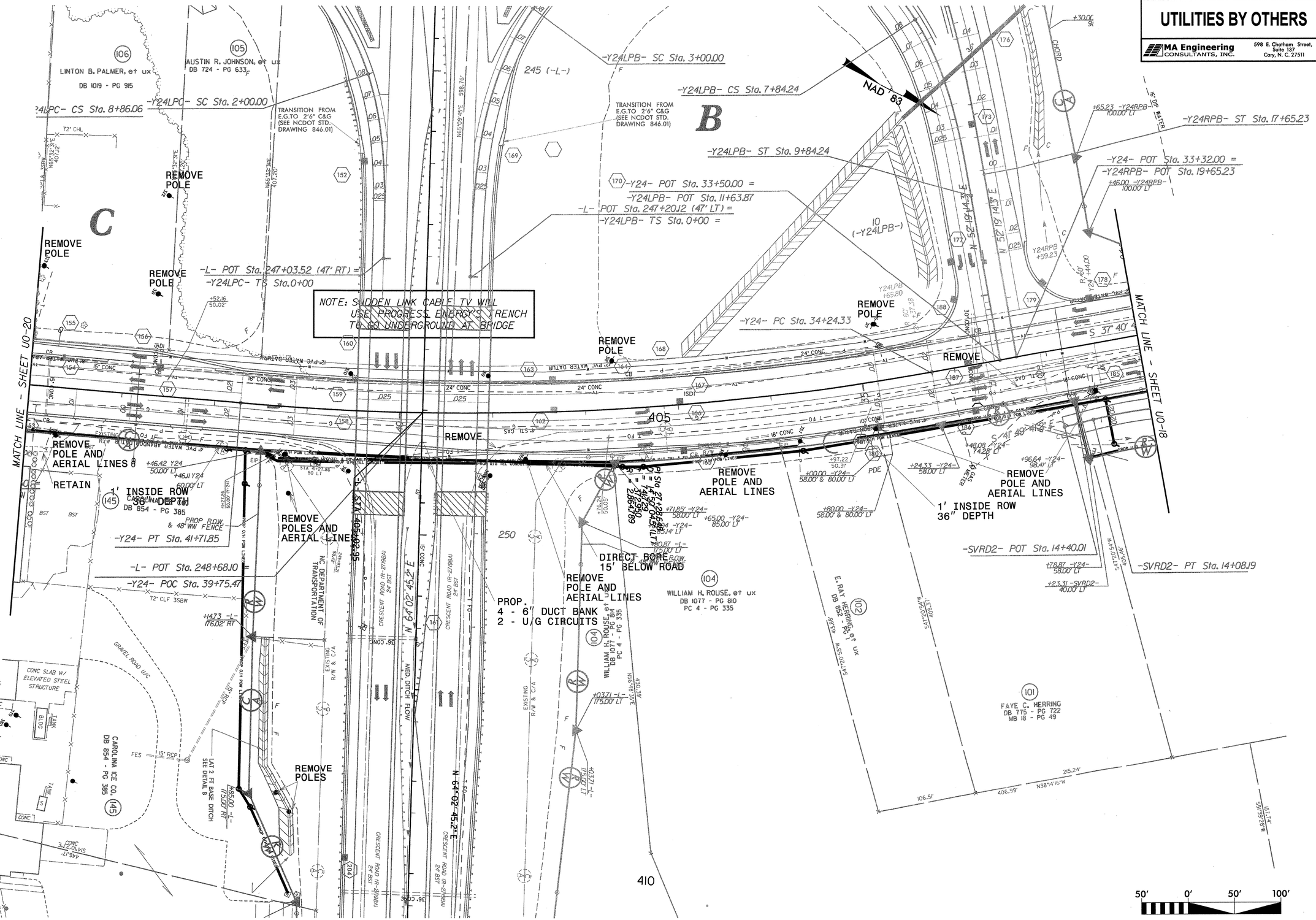

REVISIONS

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FILE: SFILES
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R-2719A	U0-20

UTILITIES BY OTHERS

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Cary, N. C. 27511

REVISIONS

7/2/99

FILE: $FILES
DATE: $DATES $TIMES