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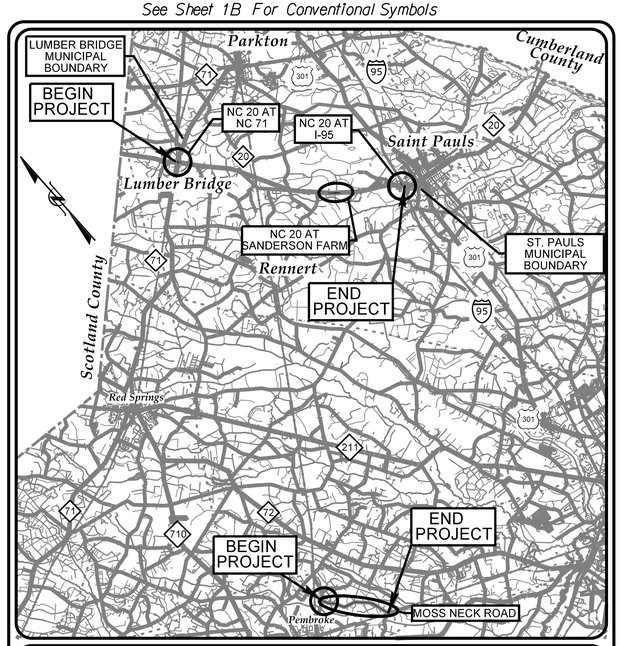
9/09/99

CONTRACT: DF00122 TIP PROJECT: R-5754 / W-5601AP

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



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

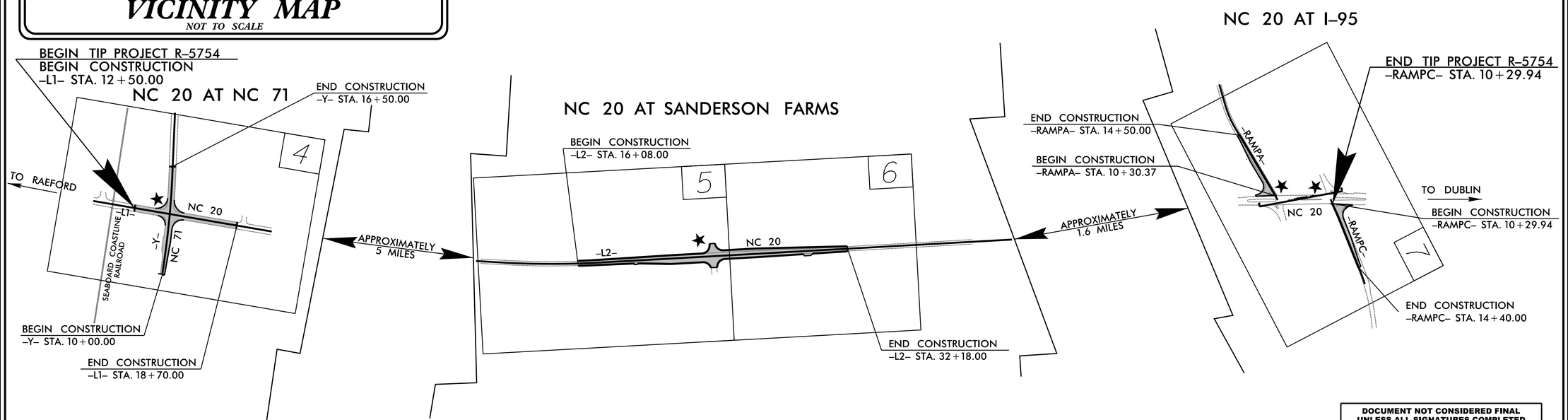
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5754 / W-5601AP	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
R-5754 46414.1.1		P.E.
R-5754 46414.2.1		R/W, UTIL.
R-5754 46414.3.1		CONST.
W-5601AP 50138.1.43	HSIP-1003 (141)	P.E.
W-5601AP 50138.2.43	HSIP-1003 (141)	R/W, UTIL.
W-5601AP 50138.3.43	HSIP-1003 (141)	CONST.

LOCATION: *NC 20 AT NC 71, SANDERSON FARMS ON NC 20, I-95 AT NC 20, AND MOSS NECK ROAD SR 1673*

TYPE OF WORK: *GRADING, PAVING, WIDENING, DRAINAGE, SIGNALS, AND PAVEMENET MARKINGS*

NC GRID
NAD 83 NA 2011



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GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = 6,580
ADT 2036 = 12,060
DHV = N/A
D = 50%
T = 13% *
V = 60 MPH
* (TTST 6% + DUAL 7 %)
FUNC. CLASS = RURAL MINOR ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5754	=	0.422 MILES
LENGTH BRIDGE TIP PROJECT R-5754	=	0.000 MILES
TOTAL LENGTH OF TIP PROJECT R-5754	=	0.422 MILES
TOTAL LENGTH OF TIP PROJECT W-5601AP	=	2.26 MILES

Prepared in the Office of:
AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
December 09, 2015

LETTING DATE:
April 20, 2016

ED EDENS, PE
PROJECT ENGINEER

KEVIN J. VANMETRE, PE
PROJECT DESIGN ENGINEER

SEAN P. MATUSZEWSKI
PROJECT ENGINEER
NCDOT DIVISION DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM T. STEPHENS, JR.
DocuSigned by: William T. Stephens
2/23/2016
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER EDWARD GLENN EDENS, JR.
DocuSigned by: Edward Glenn Edens Jr.
2/23/2016
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2/23/2016
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mmcuser

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8/17/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R–5754	1A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER GLENN E. CUMMINGS, JR.

Glenn E. Cummings Jr., P.E.

2/19/2016

INDEX OF SHEETS

1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARDS
1B	CONVENTIONAL SYMBOLS
1D	CENTERLINE COORDINATE LIST
2A–1 THRU 2A–2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3B	ROADWAY SUMMARIES
3D	DRAINAGE SUMMARIES
4 THRU 7	PLAN SHEETS
8 THRU 10	PROFILE SHEETS
TMP–1 THRU TMP–11	TRANSPORTATION MANAGEMENT PLANS
PMP–1 THRU PMP–5	PAVEMENT MARKING PLANS
EC–1 THRU EC–11	EROSION CONTROL PLANS
SIG–1.0 THRU SIG–5.2	SIGNAL PLANS
M1 THRU M9	METAL POLE STANDARD DRAWINGS
ITS–1.0	INTELLIGENT TRANSPORTATION PLANS
UC–1 THRU UC–7	UTILITY CONSTRUCTION PLANS
UO–1 THRU UO–7	UTILITY BY OTHERS PLANS
X–1A	CROSS–SECTION SUMMARY SHEET
X–1 THRU X–19	CROSS–SECTIONS

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01–17–12
REVISED: 08/31/11

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE–IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 AND NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Water–Robeson County;

Water and Sewer–Town of St. Pauls; Telecom– Century Link; CATV–Time Warner Cable;

Gas–Piedmont Natural Gas; Power– Lumbee River EMC; Power– Duke Energy;

Lighting–City of St. Pauls

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT–OF–WAY MARKERS:

ALL RIGHT–OF–WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO. TITLE

DIVISION 2 - EARTHWORK
200.02 Method of Clearing - Method II
225.02 Guide for Grading Subgrade - Secondary and Local
225.04 Method of Obtaining Superelevation - Two Lane Pavement

DIVISION 3 - PIPE CULVERTS
300.01 Method of Pipe Installation
310.10 Driveway Pipe Construction

DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I

DIVISION 6 - ASPHALT BASES AND PAVEMENTS
654.01 Pavement Repairs

DIVISION 8 - INCIDENTALS
840.00 Concrete Base Pad for Drainage Structures
840.01 Brick Catch Basin - 12" thru 54" Pipe
840.02 Concrete Catch Basin - 12" thru 54" Pipe
840.03 Frames, Grates and Hood - for Use on Standard Catch Basin
840.17 Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18 Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19 Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20 Frames and Wide Slot Flat Grates
840.22 Frames and Wide Slot Sag Grates
840.25 Anchorage for Frames - Brick or Concrete
840.26 Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27 Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28 Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.34 Traffic Bearing Junction Box - for use with Pipes 42" and Under
840.45 Precast Drainage Structure
840.54 Manhole Frame and Cover
840.66 Drainage Structure Steps
840.72 Pipe Collar
846.01 Concrete Curb, Gutter and Curb & Gutter
850.01 Concrete Paved Ditches
876.02 Guide for Rip Rap at Pipe Outlets

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04/16/11

PROJECT REFERENCE NO.	SHEET NO.
R-5754	1B

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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

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PROJECT REFERENCE NO.	SHEET NO.
R-5754	ID

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L1	12+00.00	414594.6905	1978144.4164
2	L1	13+00.00	414516.5052	1978206.7626
3	L1	14+00.00	414438.3198	1978269.1088
4	L1	15+00.00	414360.1345	1978331.4551
5	L1	16+00.00	414281.9492	1978393.8013
6	L1	17+00.00	414203.7638	1978456.1475
7	L1	18+00.00	414125.5785	1978518.4938
8	L1	19+00.00	414047.3932	1978580.8400
9	Y	10+00.00	414148.2046	1978034.1849
10	Y	11+00.00	414212.9170	1978110.4233
11	Y	12+00.00	414278.1008	1978186.2574
12	Y	13+00.00	414344.7785	1978260.7808
13	Y	14+00.00	414412.9597	1978333.9312
14	Y	15+00.00	414482.6162	1978405.6782
15	Y	16+00.00	414553.7171	1978475.9941
16	Y	17+00.00	414625.4586	1978545.6587
17	L2	16+00.00	393069.2481	1994374.2108
18	L2	17+00.00	393005.5721	1994451.3151
19	L2	18+00.00	392943.1422	1994529.4332
20	L2	19+00.00	392880.8628	1994607.6718
21	L2	20+00.00	392818.5835	1994685.9105
22	L2	21+00.00	392756.3041	1994764.1491
23	L2	22+00.00	392694.0248	1994842.3877
24	L2	23+00.00	392631.7455	1994920.6264
25	L2	24+00.00	392569.4661	1994998.8650
26	L2	25+00.00	392507.1868	1995077.1036
27	L2	26+00.00	392444.9074	1995155.3422
28	L2	27+00.00	392382.6281	1995233.5809
29	L2	28+00.00	392320.3487	1995311.8195
30	L2	29+00.00	392258.0694	1995390.0581
31	L2	30+00.00	392195.7900	1995468.2968
32	L2	31+00.00	392133.5107	1995546.5354
33	L2	32+00.00	392071.2313	1995624.7740
34	L2	33+00.00	392008.9520	1995703.0126
35	RAMPA	10+00.00	386263.8850	2004031.1519
36	RAMPA	11+00.00	386362.0189	2004050.3804
37	RAMPA	12+00.00	386460.1528	2004069.6088
38	RAMPA	13+00.00	386558.2868	2004088.8373
39	RAMPA	14+00.00	386656.4207	2004108.0657
40	RAMPA	15+00.00	386754.5536	2004127.2991
41	RAMPC	10+00.00	386058.1455	2004269.6305
42	RAMPC	11+00.00	385962.7465	2004239.6478
43	RAMPC	12+00.00	385868.4657	2004206.3312
44	RAMPC	13+00.00	385774.4583	2004172.2342
45	RAMPC	14+00.00	385680.4509	2004138.1371
46	RAMPC	15+00.00	385586.6952	2004103.3703

REVISIONS

8/17/95

2/17/2016
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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-5754	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER

2/24/2016

Prepared in the Office of: AECOM

NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27610
(919) 854-6200 - (919) 854-6259 (FAX)

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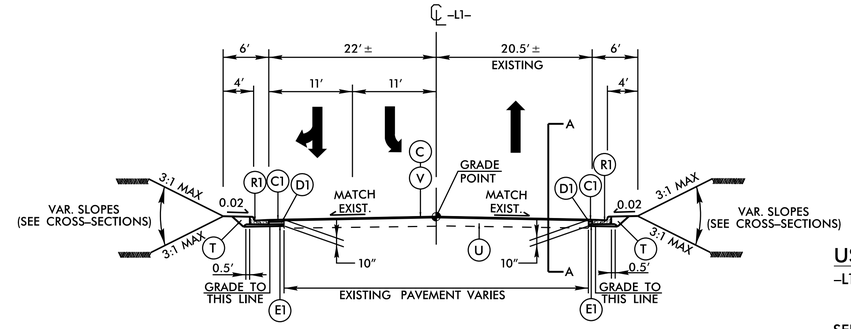
PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 3″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D3	PROP. APPROX. 5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E1	PROP. APPROX. 3″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E2	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
M	MILLING SHOULDER MATERIAL, 5″ DEPTH, OR AS DIRECTED BY THE ENGINEER
R1	2′-6″ CONCRETE CURB AND GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT 1.5″.
V1	MILLING BITUMINOUS PAVEMENT, VARIABLE DEPTH (0 - 1½″).
V2	TIE-IN MILLING (SEE DETAILS - SHEET 2A-2)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

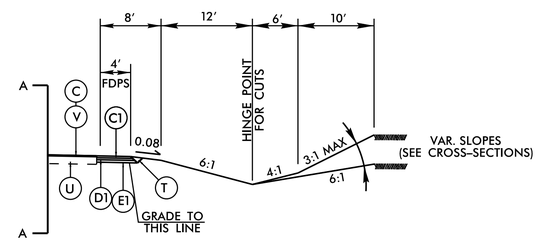


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

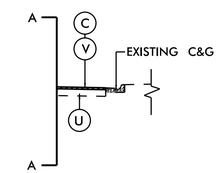
-L1- NC 20 (MAIN ST.) STA. 12+50.00 TO 18+70.00

SEE PLANS FOR LOCATIONS OF AUXILLIARY LANES AND TAPERS



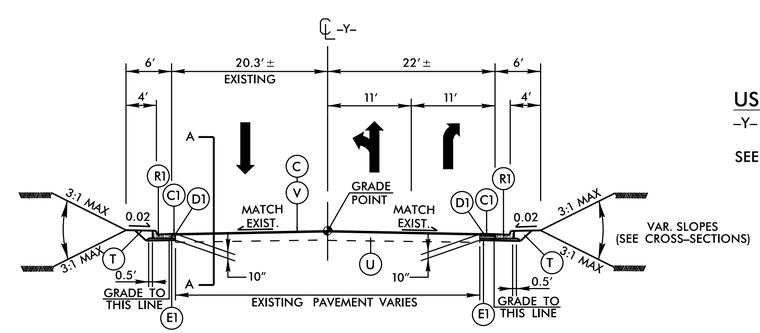
SECTION A-A (RIGHT SIDE ONLY)

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION NO. 2
-Y- NC 71 STA. 10+00.00 TO 12+00.00 RT



SECTION A-A (LEFT & RIGHT SIDE)

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION NO. 1 & 2
-L1- NC 20 (MAIN ST.) STA. 12+50.00 TO 13+71.22 LT
-L1- NC 20 (MAIN ST.) STA. 12+50.00 TO 13+94.04 RT
-L1- NC 20 (MAIN ST.) STA. 15+49.65 TO 18+70.00 LT
-L1- NC 20 (MAIN ST.) STA. 15+52.74 TO 18+70.00 RT
-Y- NC 71 STA. 10+00.00 TO 12+94.31 LT
-Y- NC 71 STA. 14+58.84 TO 16+50.00 LT
-Y- NC 71 STA. 14+51.38 TO 16+50.00 RT



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-Y- NC 71 STA. 10+00.00 TO 16+50.00

SEE PLANS FOR LOCATIONS OF AUXILLIARY LANES AND TAPERS

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pbell

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-5754	2A-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER EDWARD GLENN EDGERTON, JR.

Edward Glenn Edgerton Jr., P.E.

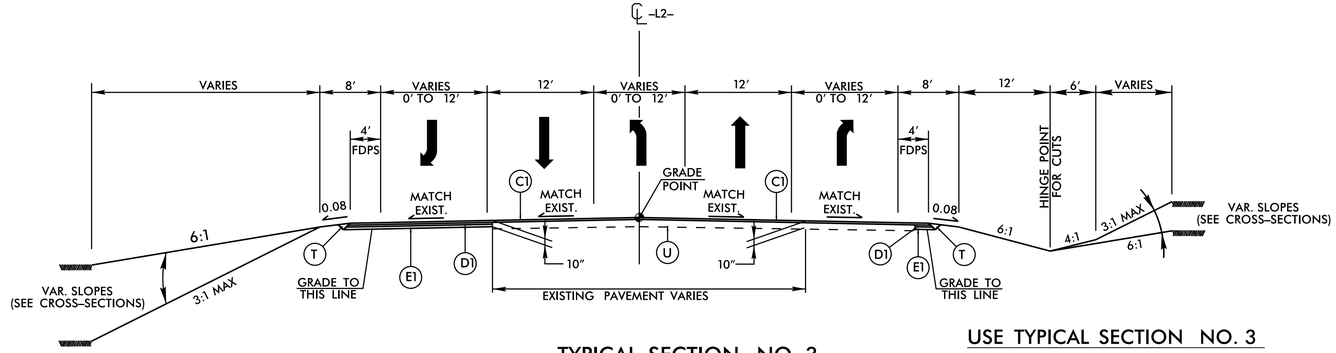
SADDITIONAL ENGINEER

2/29/2016

Prepared in the Office of: AECOM

NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27610
(919) 854-6200 - (919) 854-6259 FAX

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

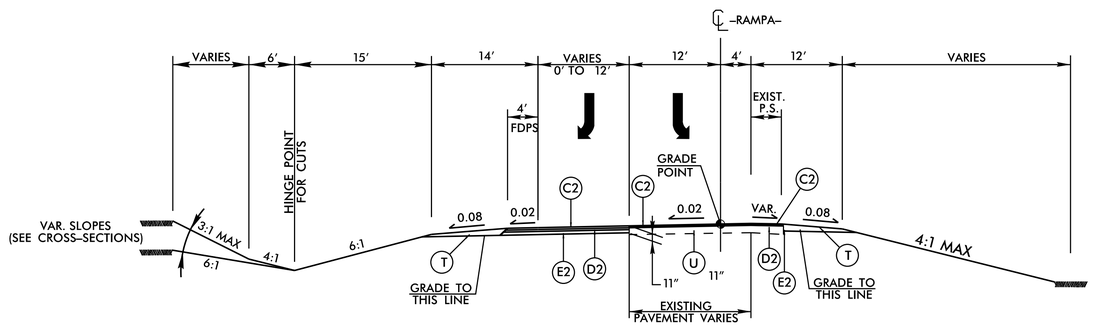


TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L2- NC 20 STA. 16+08.00 TO 32+18.00

SEE PLANS FOR LOCATIONS OF AUXILLIARY LANES AND TAPERS

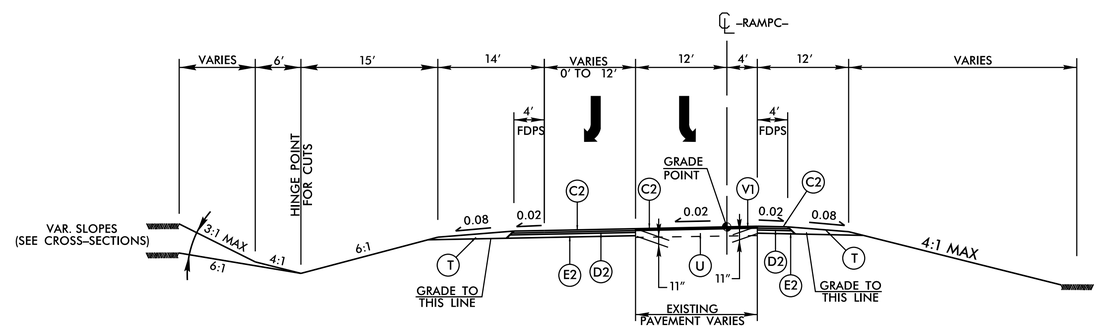


TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

-RAMPA- STA. 10+30.37 TO 14+50.00

SEE PLANS FOR LOCATIONS OF AUXILLIARY LANES AND TAPERS



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-RAMPC- STA. 10+29.94 TO 14+40.00

SEE PLANS FOR LOCATIONS OF AUXILLIARY LANES AND TAPERS

PAVEMENT DESIGN	
C	1.5" S9.5B
C1	3" S9.5B
C2	3" S9.5C
D1	4" I19.0B
D2	3" I19.0C
D3	5" I19.0B
E1	3" B25.0B
E2	5" B25.0C
M	MILLING 5"
R1	2'-6" C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	MILLING 1.5"
V1	VAR. MILLING (0 - 1½")
V2	TIE-IN MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

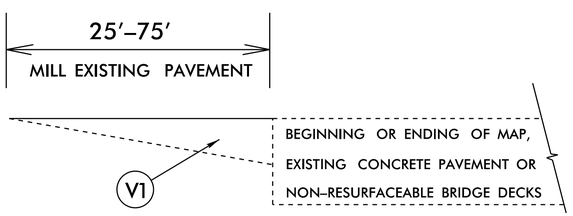
TIE-IN MILLING DETAIL
(USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 3 & 4)

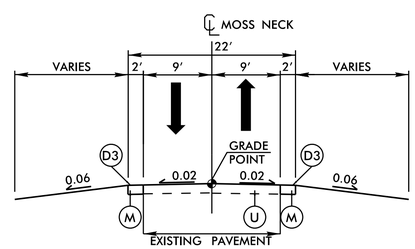
NOTES TO CONTRACTOR

For surface mixes over 1" in thickness, mill the existing pavement in accordance with the following sketch as directed by the Engineer.

Locations shall include ties into existing concrete pavement, at bridge approaches where the bridge will not be resurfaced, and at the beginning and ending point of each resurfacing map.

Perform the work in accordance with Section 607 of the January 2012 North Carolina Department of Transportation Standard Specifications for Roads and Structures. Resurfacing will be accomplished at the same time as the milling operation.





TYPICAL SECTION MOSS NECK

FROM UNION CHURCH ROAD (SR 1563) TO CHICKEN ROAD (SR 1030)

2/29/2016
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Design

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L1- 13+71.23	14+20.00	43	0		43
-L1- 15+00.00	15+52.74	52	3		49
-Y- 10+00.00	13+20.00	81	51		30
-Y- 14+10.00	14+58.84	49	0		49
SUMMARY NO. 1	**SUBTOTAL**	**225**	**54**		**171**
-L2- 16+08.00	32+18.00	724	1,479	755	
SUMMARY NO. 2	**SUBTOTAL**	**724**	**1,479**	**755**	
-RAMPA- 10+30.37	14+50.00	184	474	290	
SUMMARY NO. 3	**SUBTOTAL**	**184**	**474**	**290**	
-RAMPC- 10+29.94	14+40.00	169	111		58
SUMMARY NO. 4	**SUBTOTAL**	**169**	**111**	**0**	**58**
	TOTAL:	**1,302**	**2,118**	**1,045**	**229**
MATERIAL FOR SHOULDER CONSTRUCTION					
LOSS DUE TO CLEARING & GRUBBING					
ADDITIONAL UNDERCUT					
ROCK WASTE TO REPLACE BORROW					
ADJUST FOR ROCK WASTE					
WASTE IN LIEU OF BORROW				-229	-229
PROJECT TOTALS:		1,302	2,118	816	0
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				41	
GRAND TOTALS:		**1,302**	**2,118**	**857**	
SAY:		**1,350**		**900**	
			SR 1673 Moss Neck Widening:	50	
			TOTAL:	**950**	
EST. DDE = 90 CY					

Note: Approximate quantities only. Clearing and Grubbing, Unclassified Excavation, Borrow Excavation, and Fine Grading will be paid for at the contract lump sum price for 'Grading.'

REVISIONS

8/17/99

2/18/2016
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jmcguire

8/17/99

REVISIONS

1612LP-M70334

COMPUTED BY: C. Lee DATE: 2/29/2016

CHECKED BY: N. Dean DATE: 2/29/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
TIP R-5754	3-D

**Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".**

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	R. C. PIPE CLASS III 12	15	18	24	R. C. PIPE CLASS IV 12	15	18	42	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	SPRING BOX STD. 840.41	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L1 14+07	34 LT	0401		193.28																		1			1	1																																																	New minimum depth CB; Remove existing OTCB
L2 20+80	36 LT	0502		172.23																		1	2.3												1						1																																		Remove existing DI
		0502	0503		164.97	164.00									116																																																														
L2 19+44	37 RT	0504														30																																																												
RAMPA 11+03	55 LT	0702		158.15	156.15																																																																			0.4456			
		0702	0701		156.15	156.00				24																																																																	
RAMPA 10+97	100 LT	0705		163.36																		1			1			1																																															
		0705	0706		160.36	159.07			20																																																																					
RAMPC 10+79	57 LT	0753		164.34																		1	0.2																											1							1																		Remove existing CB
RAMPC 10+88	55 LT	0754		164.27																		1	0.1													1			1																																				
		0754	0753		159.17	159.12								8																																																														
RAMPC 11+30	50 LT	0755		162.30																		1															1				1																																				
		0755	0754		160.38	160.15			44																																																																					
L1 14+01	28 LT																																																																										14	
L2 20+44	31 LT																																																																										32	
L2 21+15	32 LT																																																																										26	
RAMPA 10+98	65 LT																																																																										19	
SHEET TOTALS									64	24				8	116	30						6	2.6		2	1		1							1	1	1		1		2									1							1															0.4456		91	
PROJECT TOTALS									64	24				8	116	30						6	2.6		2	1		1							1	1	1		1		2									1							1															0.4456		91	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

2/29/2016
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neil dean

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8/17/99

REVISIONS

-Y-
PI Sta 13+58.49
Δ = 5° 30' 58.8" (LT)
D = 1° 10' 00.0"
L = 472.83'
T = 236.60'
R = 4,911.07'
DS = 40 MPH
Se = Match Existing
Runoff = N/A

GRAPHIC SCALE
50 25 0 50 100
PLANS

NAD 83 NA 2011
NC GRID

PROJECT REFERENCE NO.	SHEET NO.
R-5754	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER EDWARD GLENN
2/19/2016
NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM STEPHENS JR.
2/19/2016

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

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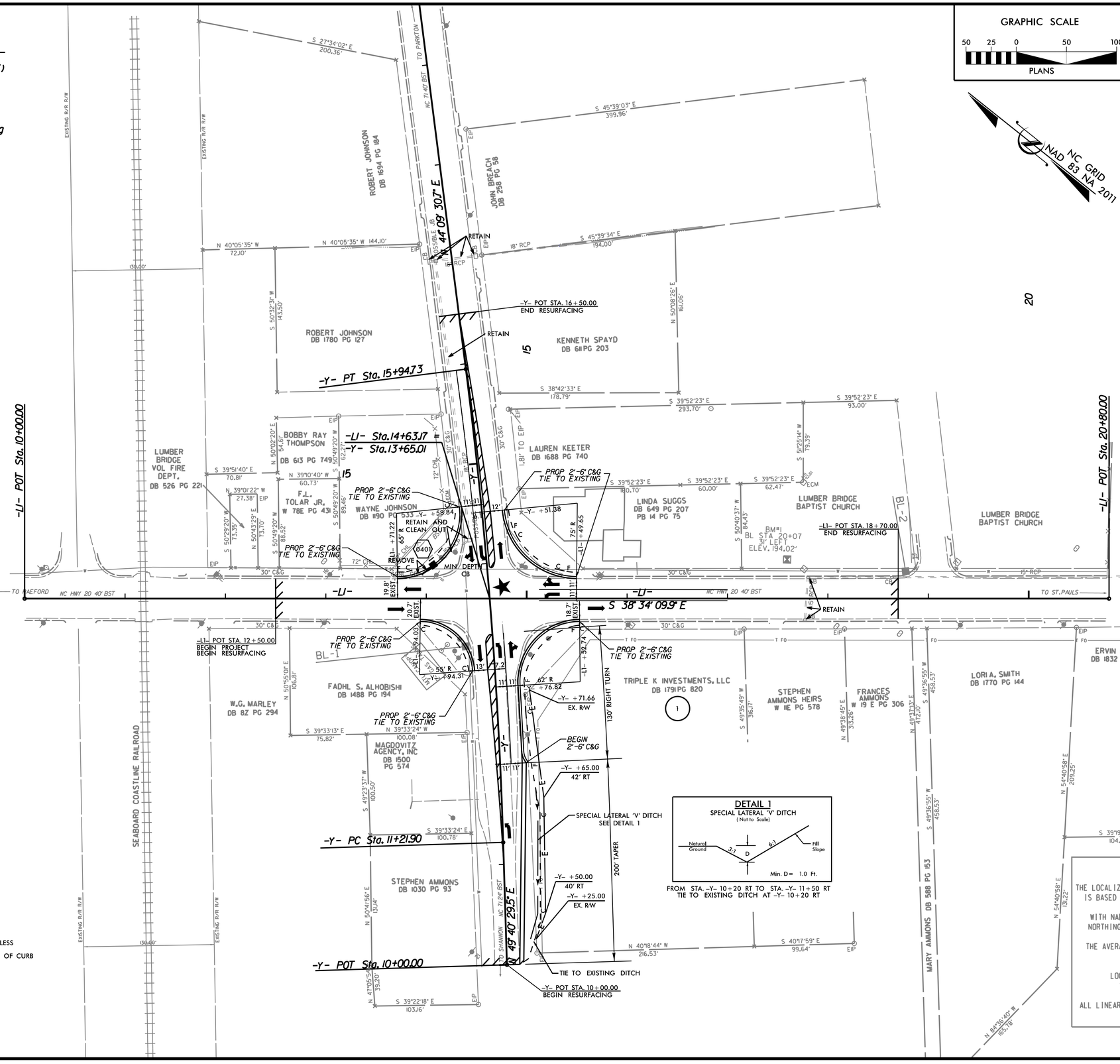
MODIFY TRAFFIC SIGNAL

FOR -L1- PROFILE, SEE SHEET NO. 8
FOR -Y- PROFILE, SEE SHEET NO. 8



NOTE: ALL DRIVEWAY RADII ARE 3' UNLESS OTHERWISE NOTED.
ALL RADII ARE LABELED TO THE FACE OF CURB

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "SAND-3"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 398226.473(ft) EASTING: 1989311.860(ft)
ELEVATION: 181.98(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989590
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SAND-3" TO -L- STATION 12+50.00 IS S°34 17' 37" E/19765.041(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

2/19/2016
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kim klotz

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-5754	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER GLENN E. ELLIS JR. — 2/19/2016

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM T. STEPHENS — 2/19/2016

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27607, (919) 854-6200 - (919) 854-6259(FAX)

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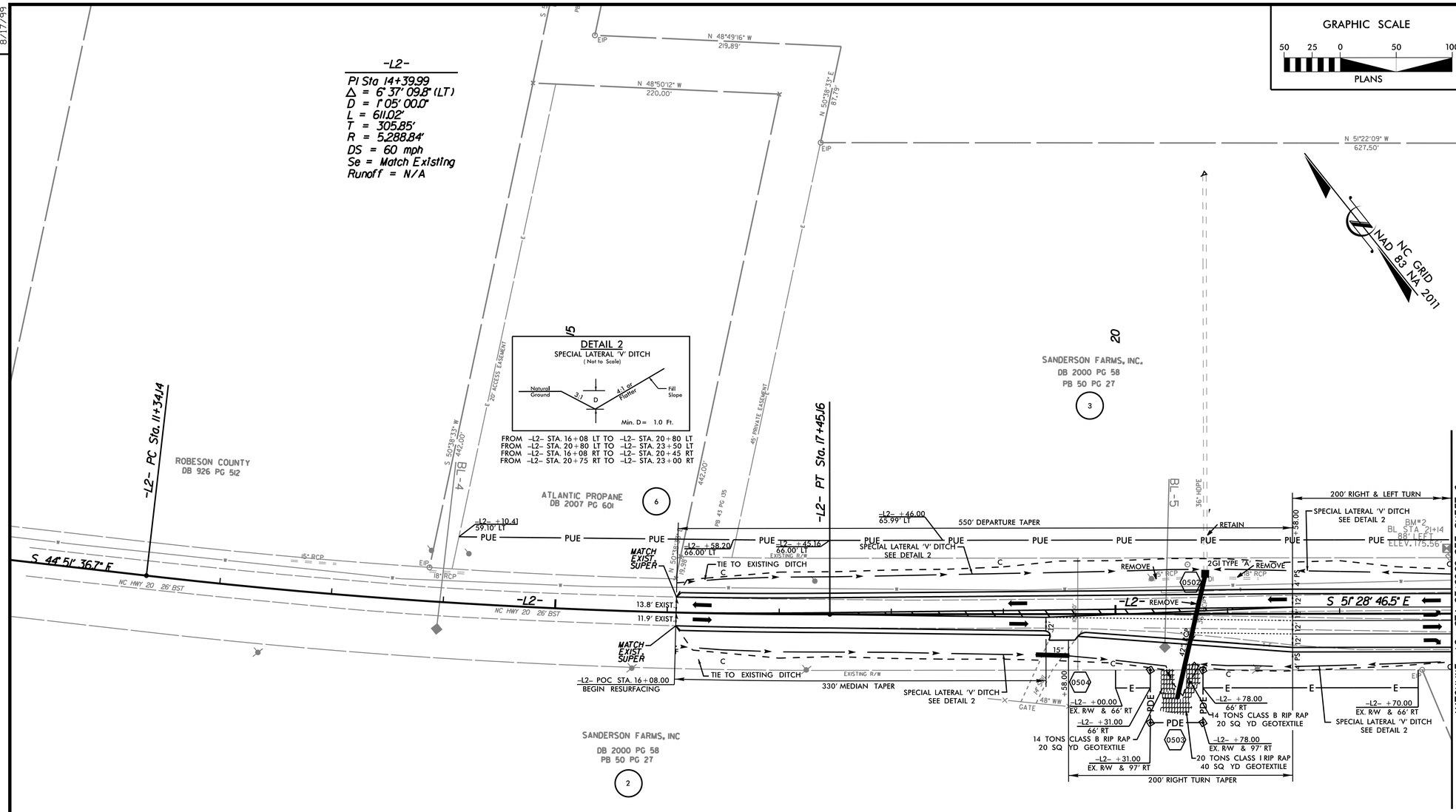
GRAPHIC SCALE: 50 25 0 50 100 — PLANS



FOR -L2- PROFILE, SEE SHEET NO. 9

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PROJECT REFERENCE NO.	SHEET NO.
R-5754	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER GLENN E. EDWARDS JR. — 2/19/2016

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM STEPHENS — 2/19/2016

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27607, (919) 854-6200 - (919) 854-6259(FAX)

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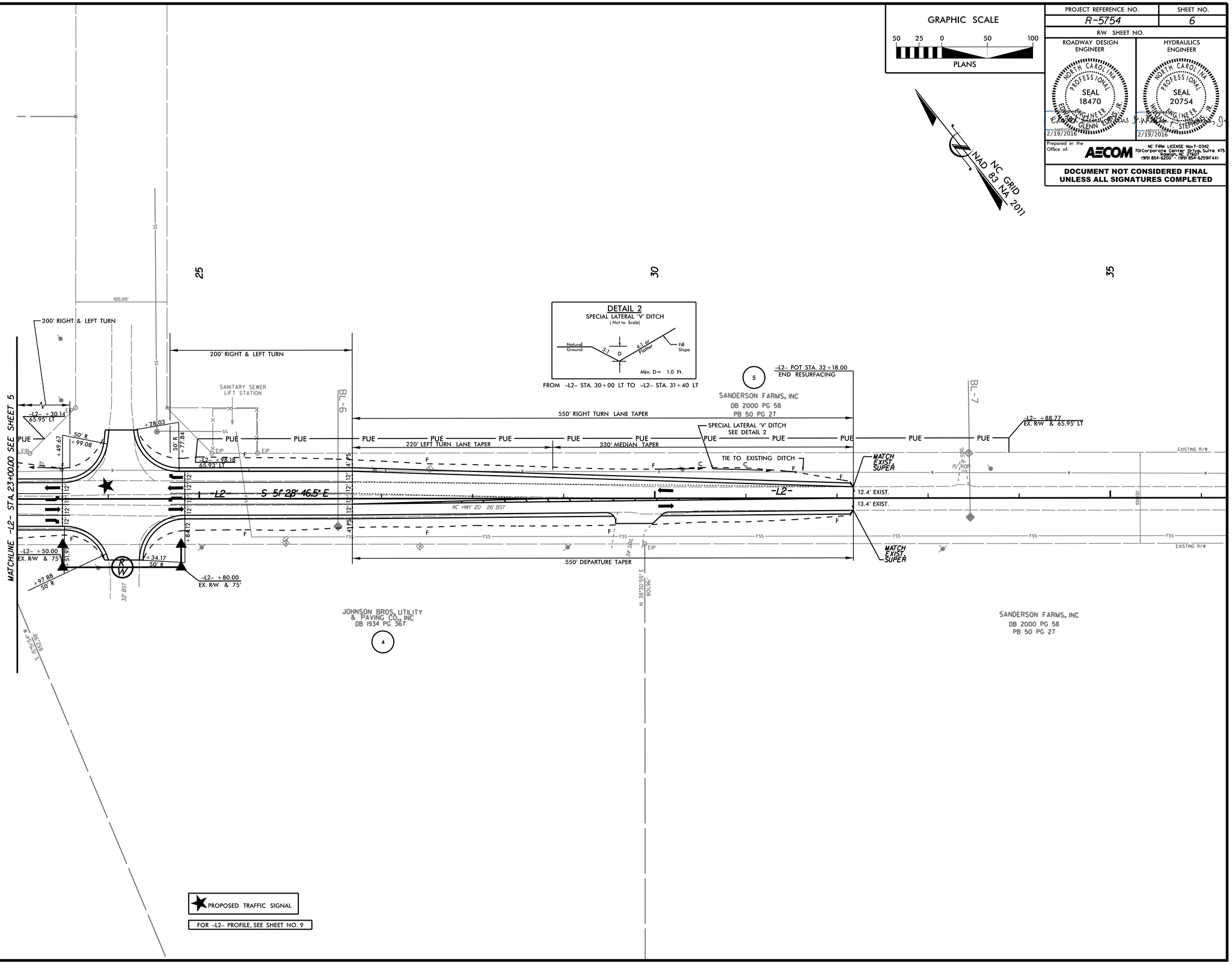
GRAPHIC SCALE: 50 25 0 50 100 — PLANS

NAD 83 NA 2011 NC GRID

REVISIONS 8/17/99



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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-5754	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER GLENN E. DAVIS, JR. 5AED1C0C-0A0A-4... 2/29/2016

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER W. STEPHEN WILKER, JR. 4883171C-0A0A-4... 2/29/2016

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GRAPHIC SCALE: 50 25 0 50 100 — PLANS

NC GRID NAD 83 NA 2011

-RAMPA-

PI Sta 15+74.94
Δ = 14° 41' 54.3" (RT)
D = 9° 32' 57.5"
L = 153.92'
T = 77.39'
R = 600.00'
DS = 35 mph
Se = 0.04
Runoff = N/A

-RAMPC-

PI Sta 11+16.54
Δ = 2° 32' 32.3" (RT)
D = 3° 49' 11.0"
L = 66.56'
T = 33.28'
R = 1,500.00'
DS = 35 mph
Se = MATCH EXIST.
Runoff = N/A

PI Sta 15+02.16
Δ = 4° 09' 43.1" (RT)
D = 4° 46' 28.7"
L = 87.17'
T = 43.60'
R = 1,200.00'
DS = 35 mph
Se = 0.03
Runoff = N/A

PROJECTED TRAFFIC VOLUMES

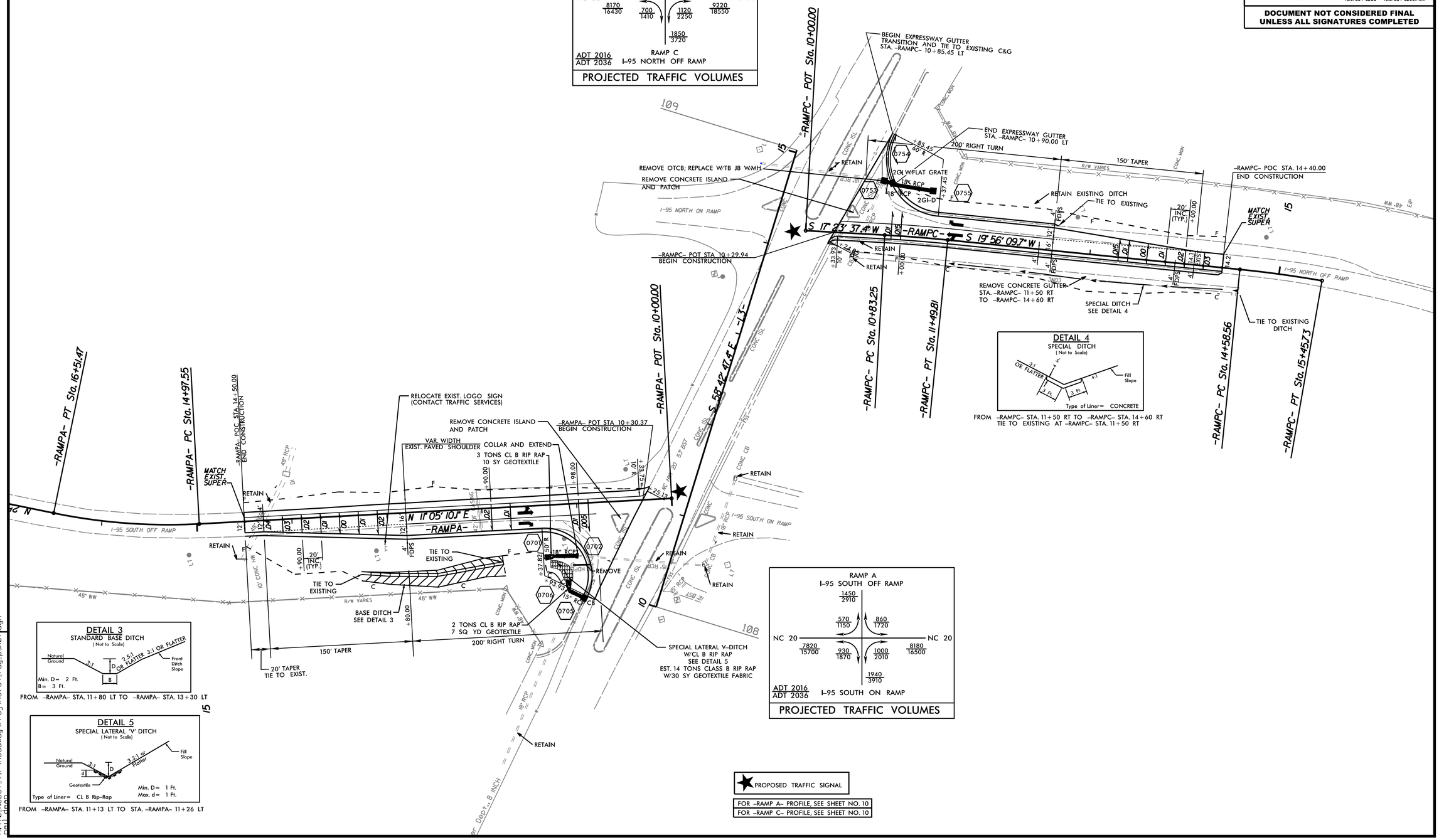
I-95 NORTH ON RAMP

NC 20 — NC 20

1500 / 3020	1050 / 2110	430 / 860	9220 / 18550
8170 / 16430	700 / 1410	1120 / 2250	1850 / 3720

RAMP C

ADT 2016 / ADT 2036 — I-95 NORTH OFF RAMP



DETAIL 3
STANDARD BASE DITCH
(Not to Scale)

Natural Ground — 3:1 — D — B — 3:1 OR FLATTER — 3:1 OR FLATTER — Front Ditch Slope

Min. D = 2 Ft.
B = 3 Ft.

FROM -RAMPA- STA. 11+80 LT TO -RAMPA- STA. 13+30 LT

DETAIL 4
SPECIAL DITCH
(Not to Scale)

3:1 OR FLATTER — 4 in. — 3 Ft. — 3 Ft. — 4:1 — Fill Slope

Type of Liner = CONCRETE

FROM -RAMPC- STA. 11+50 RT TO -RAMPC- STA. 14+60 RT
TIE TO EXISTING AT -RAMPC- STA. 11+50 RT

DETAIL 5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground — 3:1 — D — d — 3:1 or Flatter — Fill Slope — Geotextile

Type of Liner = CL B Rip-Rap

Min. D = 1 Ft.
Max. d = 1 Ft.

FROM -RAMPA- STA. 11+13 LT TO STA. -RAMPA- 11+26 LT

PROJECTED TRAFFIC VOLUMES

RAMP A
I-95 SOUTH OFF RAMP

NC 20 — NC 20

1450 / 2910	860 / 1720	570 / 1150	8180 / 16500
7820 / 15700	1000 / 2010	930 / 1870	1940 / 3910

ADT 2016 / ADT 2036 — I-95 SOUTH ON RAMP

★ PROPOSED TRAFFIC SIGNAL

FOR -RAMP A- PROFILE, SEE SHEET NO. 10
FOR -RAMP C- PROFILE, SEE SHEET NO. 10

2/29/2016
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5/28/99

GRAPHIC SCALE

50 25 0 50 100

PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5754	8

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER EDWARD CARLTON ELLIS, JR.

DocuSigned by: Edward Carlton Ellis, Jr.

5A8D1C4A0A7B4A0...

2/19/2016

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM GLENN STEPHENS, JR.

DocuSigned by: William Glenn Stephens, Jr.

F8B3D5A...

2/19/2016

Prepared in the Office of: AECOM

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Raleigh, NC 27607
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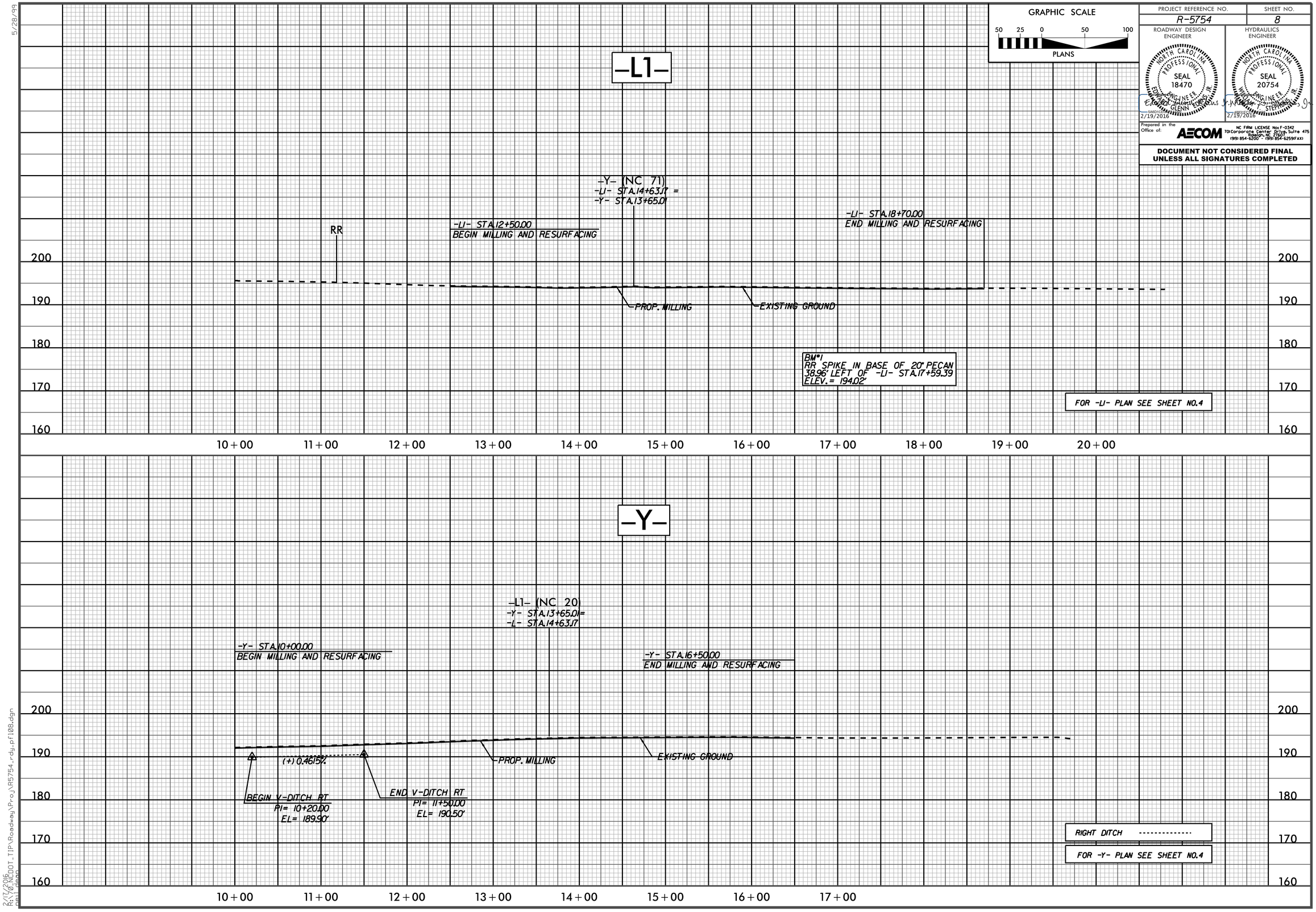

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5/28/99

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5754	9

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER EDWARD THOMAS LEWIS, JR.
2/19/2016

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM TRUETT STEPHENS, JR.
2/19/2016

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(919) 854-6200 - (919) 854-6259(FAX)

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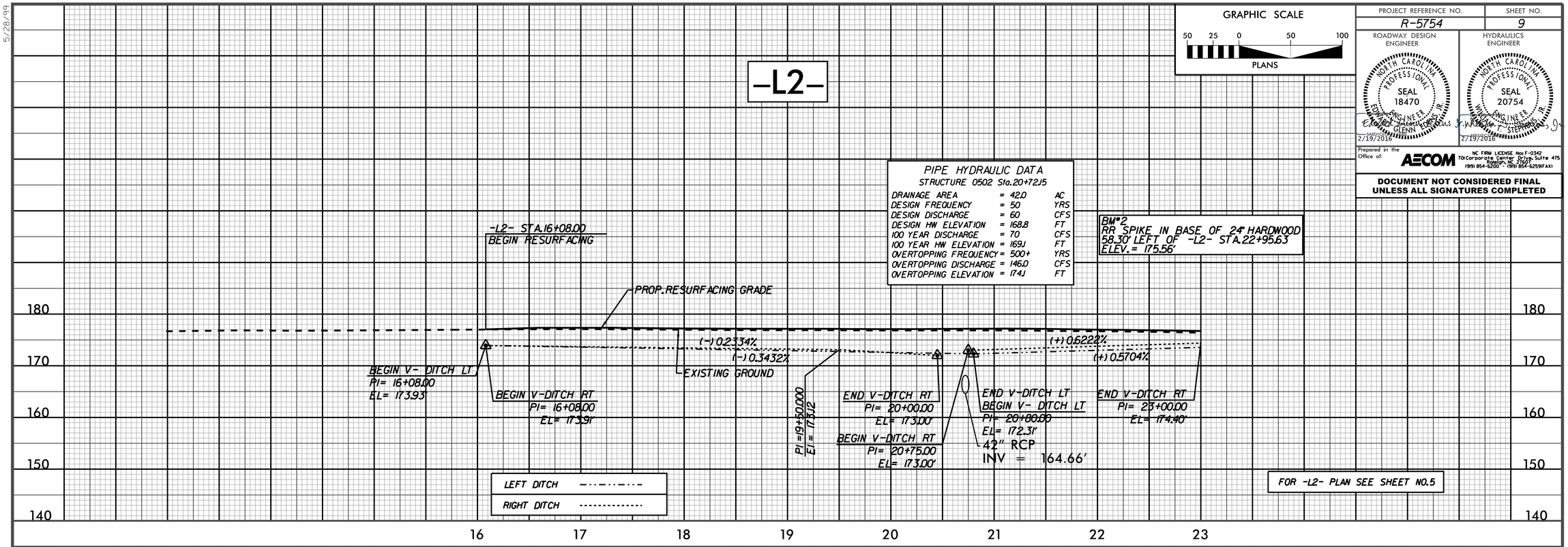

BM#2
RR SPIKE IN BASE OF 24" HARDWOOD
58.30' LEFT OF -L2- STA.22+95.63
ELEV.= 175.56'

PIPE HYDRAULIC DATA
STRUCTURE 0502 Sta.20+72.5

DRAINAGE AREA	= 42.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 60	CFS
DESIGN HW ELEVATION	= 168.8	FT
100 YEAR DISCHARGE	= 70	CFS
100 YEAR HW ELEVATION	= 169.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 146.0	CFS
OVERTOPPING ELEVATION	= 174.1	FT

FOR -L2- PLAN SEE SHEET NO.5

FOR -L2- PLAN SEE SHEET NO.6

2/17/2016
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GRAPHIC SCALE

50 25 0 50 100

PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5754	10

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18470 ENGINEER EDWARD THOMAS KEBLER, JR.

2/19/2016

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM THOMAS STEPHENS, JR.

2/19/2016

Prepared in the Office of: AECOM

NC FIRM LICENSE No: F-0342
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Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

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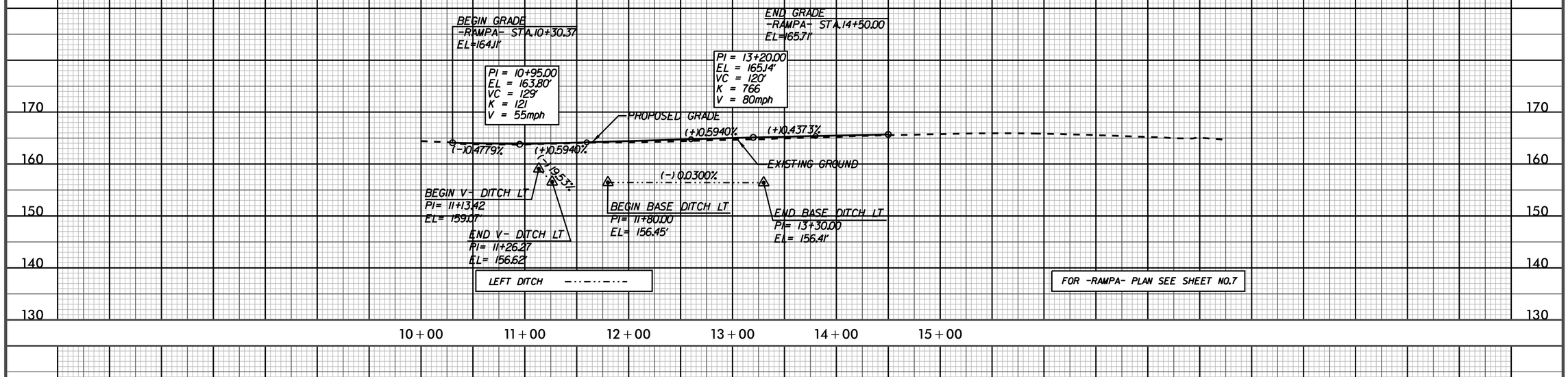
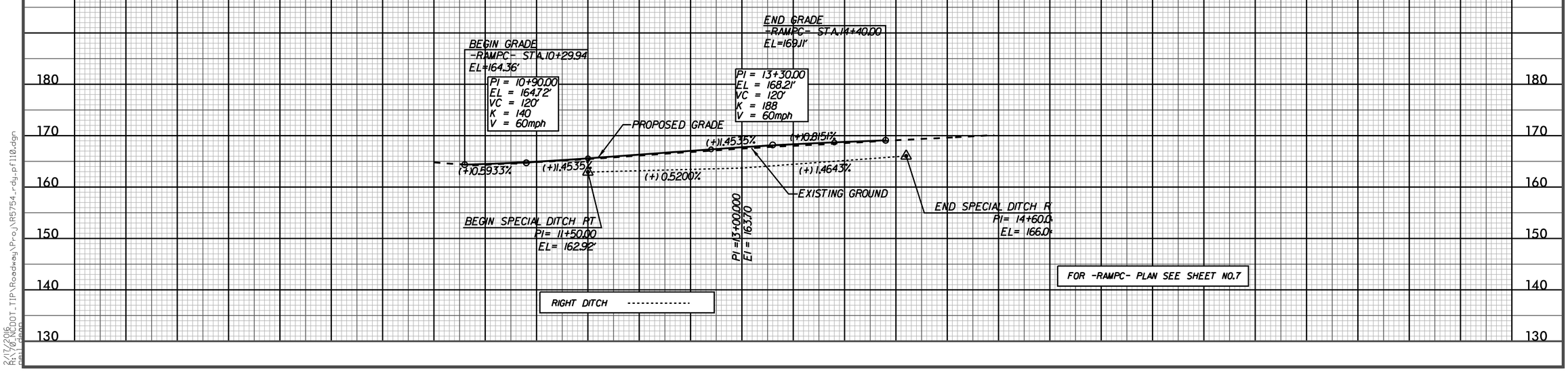
-RAMP A-



FOR -RAMPA- PLAN SEE SHEET NO.7

-RAMP C-



FOR -RAMPC- PLAN SEE SHEET NO.7

RIGHT DITCH

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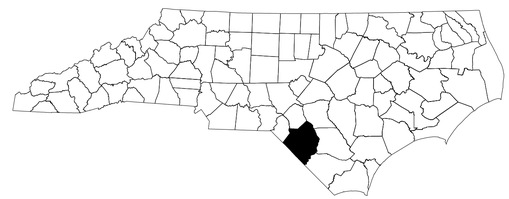
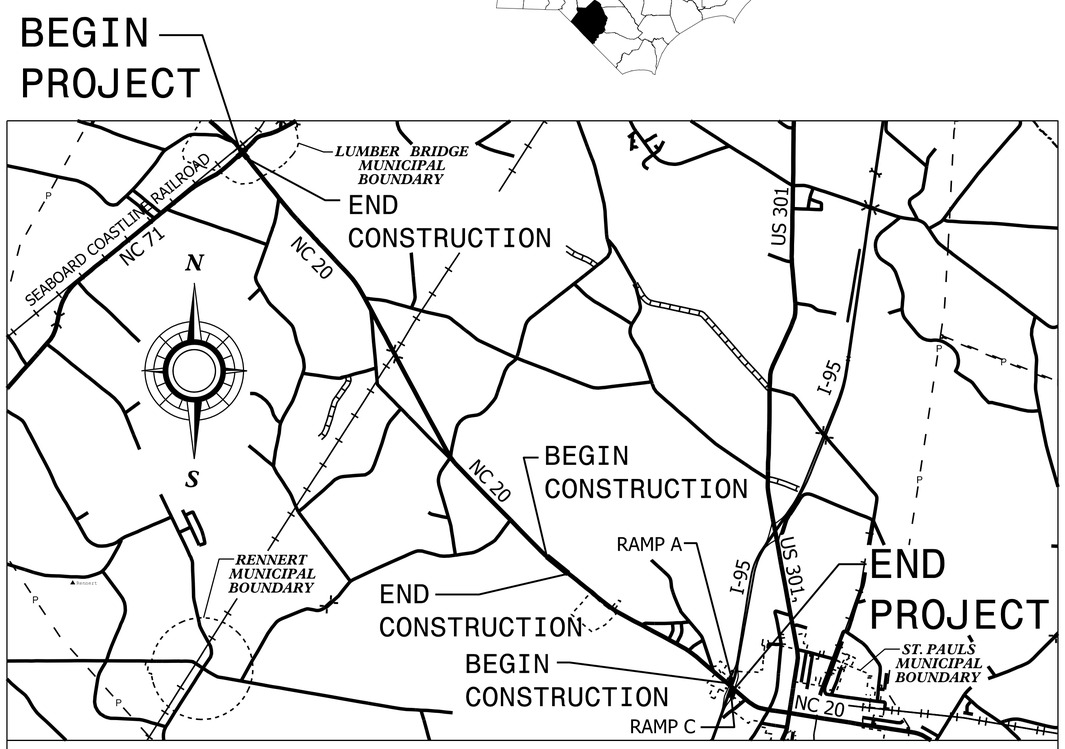
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ROBESON COUNTY





SKETCH MAP SHOWING THE VICINITY OF STATE PROJECT R-5754

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	GENERAL NOTES
TMP-2	PHASING
TMP-3	PHASE I OVERVIEWS
TMP-4 THRU TMP-6	PHASE I DETAILS
TMP-7	OFF-SITE DETOUR
TMP-8	PHASE II OVERVIEWS
TMP-9 THRU TMP-11	PHASE II DETAILS

SHEET NO.
TMP-1

02/19/16 DATE SUBMITTED
SUBMITTAL:
- [ ] STAGING CONCEPT
- [ ] MIDPOINT
- [ ] PRE-FINAL
- [x] FINAL

TIP PROJECT: R-5754

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

J. STUART BOURNE, PE — STATE TRAFFIC MANAGEMENT ENGINEER
FRANK D. WEST, JR — TRAFFIC CONTROL PROJECT ENGINEER
L. KENT LANGDON — TRAFFIC CONTROL PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

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NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

KEVIN J. VAN METRE, PE
PROJECT ENGINEER

HERB RIDGEWAY
PROJECT DESIGN ENGINEER

APPROVED: DocuSigned by: Kevin J. VanMetre, P.E. — FFDE3A769537447...
DATE: 2/19/2016
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 18187 ENGINEER KEVIN J. VAN METRE

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PROJ. REFERENCE NO.	SHEET NO.
R-5754	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD.NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1170.01	POSITIVE PROTECTION
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL
- TEMPORARY PAVEMENT

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

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DATE: 2/19/2016
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 18187 ENGINEER KEVIN J. VAN METRE

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

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PROJ. REFERENCE NO.	SHEET NO.
R-5754	TMP-1B

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
NC 20	MONDAY THROUGH FRIDAY, 7:00 AM-9:00 AM & 4:00 PM-6:00 PM
NC 71	MONDAY THROUGH FRIDAY, 7:00 AM-9:00 AM & 4:00 PM-6:00 PM
I-95 RAMPA	MONDAY THROUGH FRIDAY, 7:00 AM-9:00 AM & 4:00 PM-6:00 PM
I-95 RAMPC	MONDAY THROUGH FRIDAY, 7:00 AM-9:00 AM & 4:00 PM-6:00 PM

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME

NC 20
NC 71
I-95 RAMPA
I-95 RAMPC

HOLIDAY

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.

2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 7:00 A.M. DECEMBER 31st TO 6:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 6:00 P.M. THE FOLLOWING TUESDAY.

3. FOR EASTER, BETWEEN THE HOURS OF 7:00 A.M. THURSDAY AND 6:00 P.M. MONDAY.

4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 7:00 A.M. FRIDAY TO 6:00 P.M. TUESDAY.

5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 7:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 7:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

6. FOR LABOR DAY, BETWEEN THE HOURS OF 7:00 A.M. FRIDAY AND 6:00 P.M. TUESDAY.

7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 7:00 A.M. TUESDAY TO 6:00 P.M. MONDAY.

8. FOR CHRISTMAS, BETWEEN THE HOURS OF 7:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 6:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

C) DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE HAULING OPERATION IS PROTECTED BY BARRIER OR GUARDRAIL OR AS DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

D) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

   WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

G) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

H) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

I) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

   BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

   BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

   BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

J) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

K) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

L) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

M) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

   PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

N) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

O) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

P) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

Q) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
NC 20	PAINT	TEMPORARY RAISED
NC 71	PAINT	TEMPORARY RAISED
I-95 RAMPA	PAINT	TEMPORARY RAISED
I-95 RAMPC	PAINT	TEMPORARY RAISED

R) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

S) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

T) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

U) LAW ENFORCEMENT MAY BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.

V) ALL CURB RAMP LOCATIONS SHALL BE DERIVED FROM STATIONING SHOWN ON PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER IN COORDINATION WITH THE SIGNING AND DELINEATION UNIT.

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APPROVED DocuSigned by: Kevin J. VanMetre, P.E. FFDE3A769537447...
DATE: 2/19/2016
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 18187 ENGINEER KEVIN J. VAN METRE

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

GENERAL NOTES

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PROJ. REFERENCE NO.	SHEET NO.
R-5754	TMP-2

PROJECT PHASING

MAINTAIN THE INGRESS AND EGRESS TO ALL DRIVEWAYS AND ALL SIDE ROADS AT ALL TIMES. MAINTAIN CLOSE COORDINATION WITH ANY/ALL UTILITY CONTRACTORS ON SITE IF PRESENT. DO NOT OVERLAP OR PLACE CONFLICTING TRAFFIC CONTROL DEVICES IF ANY UTILITY CONSTRUCTION IS ONGOING. COORDINATION SHALL BE CONTINUOUS THROUGHOUT THE ENTIRE PROJECT CONTRACT.

PHASE I

NOTE: CONSTRUCTION ACTIVITIES MAY TAKE PLACE AT ANY OF THE THREE AREAS (1, 2 OR 3) THAT MAKE UP THE PROJECT. COORDINATE THE WORK WITH THE ENGINEER IF THERE WILL BE SIMULTANEOUS CONSTRUCTION ACTIVITIES IN MORE THAN ONE AREA AT A TIME. NO AREA IS DEPENDENT ON ANOTHER AREA FOR ANY OF THE SEQUENCES IN THESE PLANS.

ALL AREAS

STEP 1: PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, INSTALL WORK ZONE ADVANCED WARNING SIGNS IN ALL THREE AREAS AS SHOWN IN ROADWAY STANDARD DRAWING 1101.01. THIS INCLUDES NC 20, NC 71 AND ALONG I-95 FOR THE CONSTRUCTION OF THE RAMPS AT THE NC 20 INTERCHANGE.

AREA 1

STEP 2: USING FLAGGERS AS NECESSARY, PLACE TRAFFIC CONTROL DEVICES ALONG NC 71 AND NC 20 AS SHOWN. THIS INCLUDES PLACING SIGNING, DRUMS AND TEMPORARY PAVEMENT MARKINGS (PAINT) AND MARKERS AS SHOWN ON TMP-4. OBLITERATE ANY CONFLICTING MARKINGS. WHEN DEVICES AND MARKINGS ARE IN PLACE, SHIFT TRAFFIC IN THE TEMPORARY PATTERNS SHOWN ON TMP-4.

STEP 3: USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AS NEEDED, CONSTRUCT THE FOLLOWING SECTIONS OF ROADWAY UP TO, BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON TMP-4:

FROM STA. 10+00 -Y- TO STA. 15+53 -L1-
FROM STA. 15+50 -L1- TO STA. 15+75 -Y-

AREA 2

NOTE: AREA 2, PHASE I, STEP 2 WILL BE DONE WITH AN INTERMEDIATE CONTRACT TIME FROM A FRIDAY AT 6:00 PM UNTIL THE FOLLOWING MONDAY AT 7:00 AM. SEE PROJECT DOCUMENTS FOR LIQUIDATED DAMAGES.

STEP 2: PRIOR TO ANY WIDENING CONSTRUCTION, INSTALL THE 42" RCP ON NC 20 USING THE OFF SITE DETOUR. PLACE ALL TEMPORARY SIGNING CLOSE NC 20 AS SHOWN ON TMP-7 AND COVER AS NECESSARY. WHEN ALL SIGNING IS IN PLACE, UNCOVER ALL SIGNS AND PLACE THE TRAFFIC CONTROL DEVICES (BARRICADES) IN PLACE TO CLOSE NC 20. INSTALL 42" RCP. WHEN INSTALLATION IS COMPLETE, REMOVE ALL TRAFFIC CONTROL DEVICES AND RE-OPEN NC 20

PHASE I, AREA 2 CONTINUED

STEP 3: USING FLAGGERS AS NECESSARY, PLACE TRAFFIC CONTROL DEVICES ALONG NC 20 AS SHOWN. THIS INCLUDES PLACING SIGNING AND DRUMS AS SHOWN ON TMP-5. OBLITERATE ANY CONFLICTING MARKINGS. WHEN DEVICES AND MARKINGS ARE IN PLACE, SHIFT TRAFFIC IN THE TEMPORARY PATTERNS SHOWN ON TMP-5.

STEP 4: USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AS NEEDED, CONSTRUCT THE FOLLOWING ROADWAY UP TO, BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON TMP-5:

FROM STA. 16+08 -L2- (LT.) TO STA. 32+18 -L2- (LT.)

AREA 3

STEP 2: USING FLAGGERS AS NECESSARY, PLACE TRAFFIC CONTROL DEVICES ALONG THE I-95 RAMPS AND NC 20 AS SHOWN ON TMP-6. THIS INCLUDES PLACING SIGNING AND DRUMS AS SHOWN ON TMP-6.

STEP 3: USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AS NEEDED, CONSTRUCT THE FOLLOWING SECTIONS OF THE RAMPS UP TO, BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON TMP-6:

FROM STA. 10+30 -RAMPA- TO STA. 14+50 -RAMPA-
FROM STA. 10+30 -RAMPC- TO STA. 14+40 -RAMPC-

PHASE II

AREA 1

STEP 1: UPON COMPLETION OF THE EASTERN SIDE WIDENING ALONG NC 71 CONSTRUCTED IN PHASE I, PLACE TRAFFIC CONTROL DEVICES ALONG THE WESTERN SIDE AS SHOWN TMP-9. THIS INCLUDES PLACING SIGNING, DRUMS AND TEMPORARY PAVEMENT MARKINGS (PAINT) AND MARKERS AS SHOWN ON TMP-9. OBLITERATE ANY CONFLICTING MARKINGS.

WHEN DEVICES AND MARKINGS ARE IN PLACE, SHIFT THE NC 71 TRAFFIC IN THE TEMPORARY PATTERN SHOWN ON TMP-9.

STEP 2: USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AS NEEDED, CONSTRUCT THE FOLLOWING SECTIONS OF ROADWAY UP TO, BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON TMP-9:

FROM STA. 12+94 -Y- TO STA. 13+94 -L1-
FROM STA. 13+71 -L1- TO STA. 14+59 -Y-

PHASE II CONTINUED

AREA 2

STEP 1: USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AS NECESSARY, PLACE TRAFFIC CONTROL DEVICES ALONG NC 20 AS SHOWN ON TMP-10. THIS INCLUDES PLACING SIGNING AND DRUMS AS SHOWN ON TMP-10.

STEP 2: USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AS NEEDED, CONSTRUCT THE FOLLOWING ROADWAY UP TO, BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSEAS SHOWN ON TMP-10:

FROM STA. 16+08 -L2- (RT.) TO STA. 32+18 -L2- (RT.)

AREA 3

STEP 1: USING FLAGGERS AS NECESSARY, PLACE TRAFFIC CONTROL DEVICES ALONG -I-95 RAMP C AS SHOWN ON TMP-11. THIS INCLUDES PLACING SIGNING AND DRUMS AS DEPICTED.

STEP 2: USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AS NEEDED, CONSTRUCT THE FOLLOWING SECTION OF RAMP C AS SHOWN ON TMP-11:

FROM STA. 10+30 -RAMPC- TO STA. 14+40 -RAMPC-

PHASE III (NOT DEPICTED)

ALL AREAS

STEP 1: INSTALL THE NEW PROPOSED SIGNALS AT ALL LOCATION THROUGHOUT THE PROJECT.

STEP 2: UPON COMPLETION OF ALL PREVIOUS WORK IN PHASES I AND II, AND USING FLAGGERS AND ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, PLACE TEMPORARY PAVEMENT MARKINGS (PAINT) AND MARKERS IN THE FINAL TRAFFIC PATTERN AS SHOWN IN THE PAVEMENT MARKING PLANS. OBLITERATE ANY CONFLICTING MARKINGS AND REMOVE ALL TRAFFIC CONTROL DEVICES PREVIOUSLY PLACED.

STEP 3: USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, AND FLAGGERS AS NEEDED, PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS (THERMOPLASTIC) AND MARKERS THROUGHOUT THE ENTIRE PROJECT.

STEP 4: OPEN PROJECT TO FINAL TRAFFIC PATTERNS IN ALL AREAS.

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Phone: 919-854-6200

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DATE: 2/19/2016
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 18187 ENGINEER KEVIN J. VAN METRE

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASING

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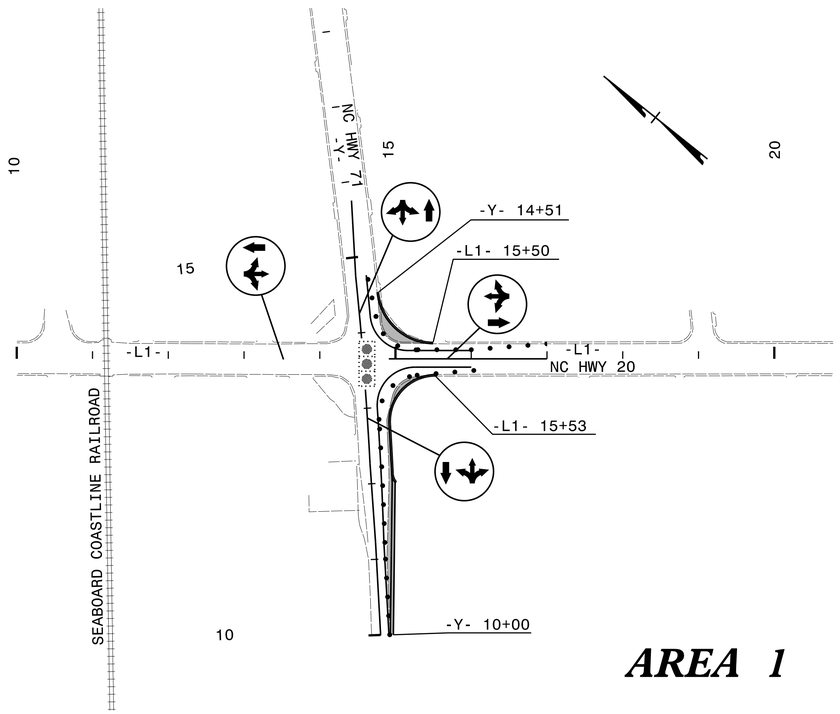
R-5754	TMP-3



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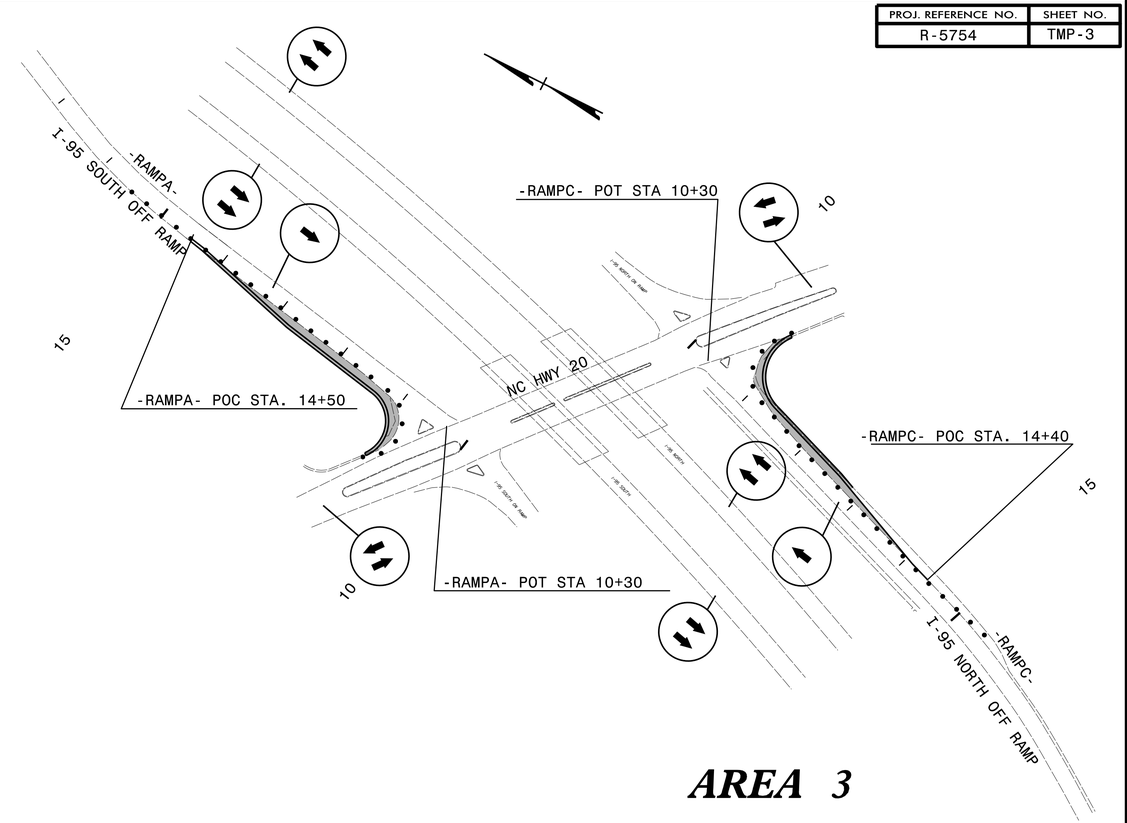

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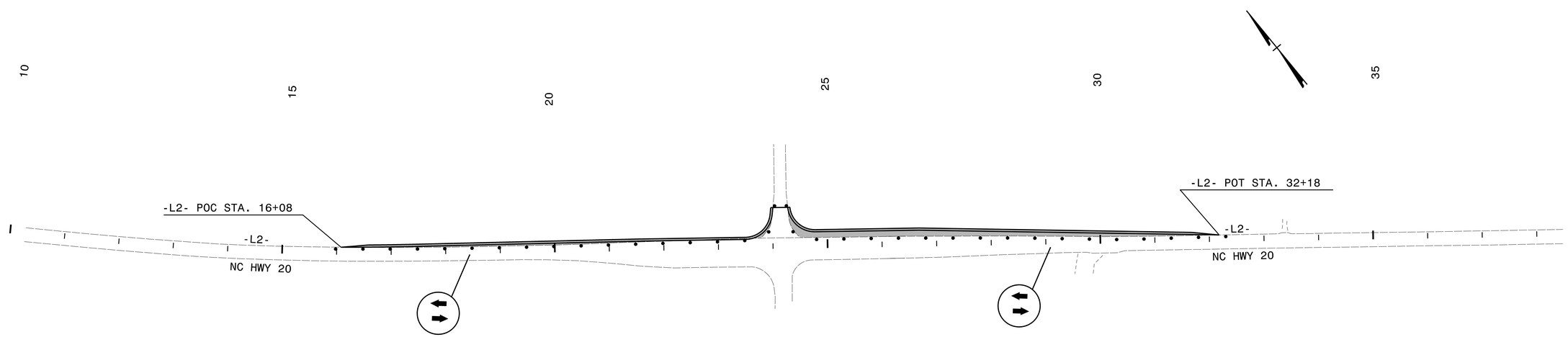

AREA 2

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
- TEMPORARY PAVEMENT
- COMPLETED CONSTRUCTION
- SIGNALS (EXISTING, PROPOSED, TEMPORARY)

GRAPHIC SCALE
100 50 0 100 200
PLANS

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PHASE I OVERVIEW

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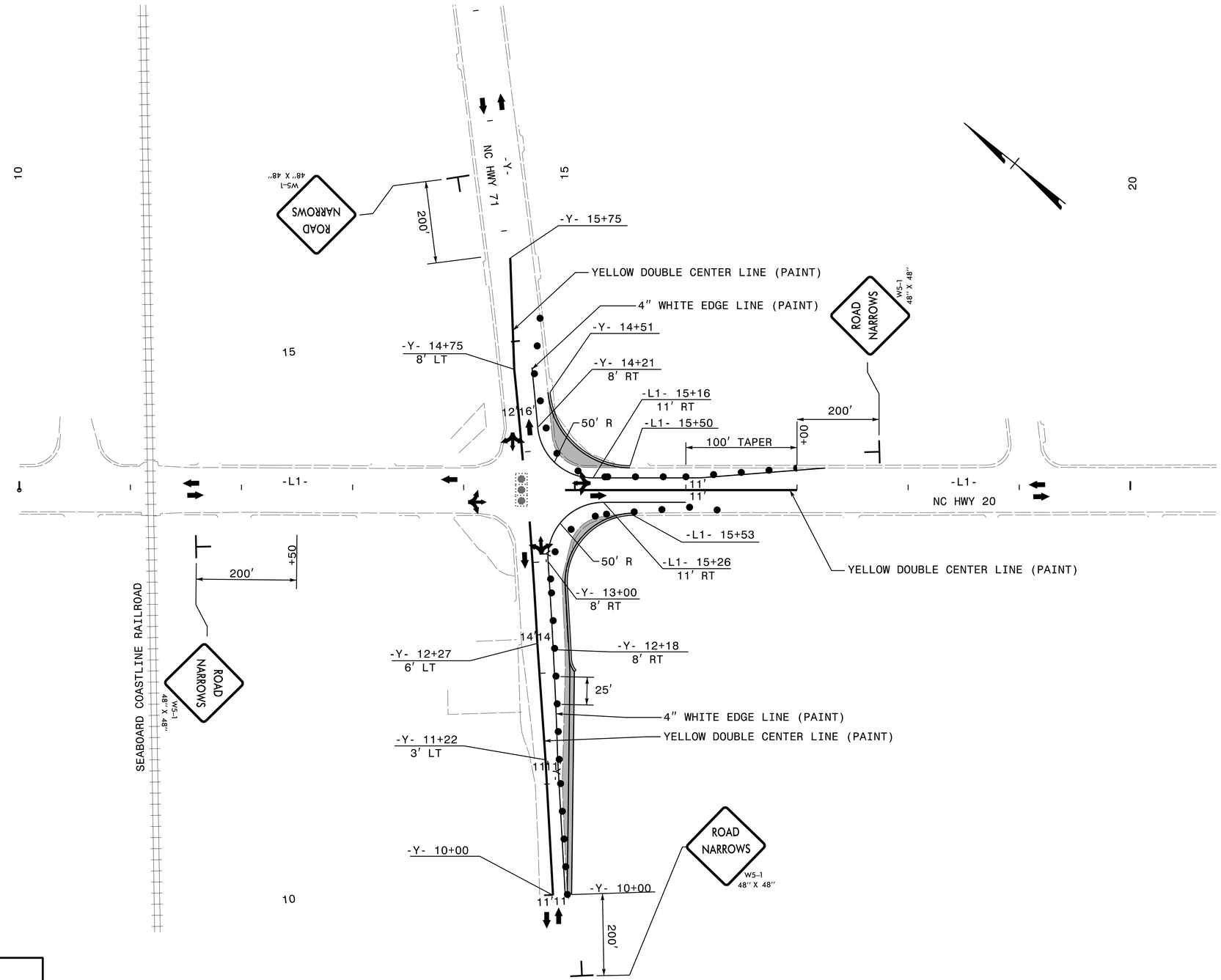

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
- TEMPORARY PAVEMENT
- COMPLETED CONSTRUCTION
- SIGNALS (EXISTING, PROPOSED, TEMPORARY)

GRAPHIC SCALE
50 25 0 50 100
PLANS

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PHASE I DETAIL

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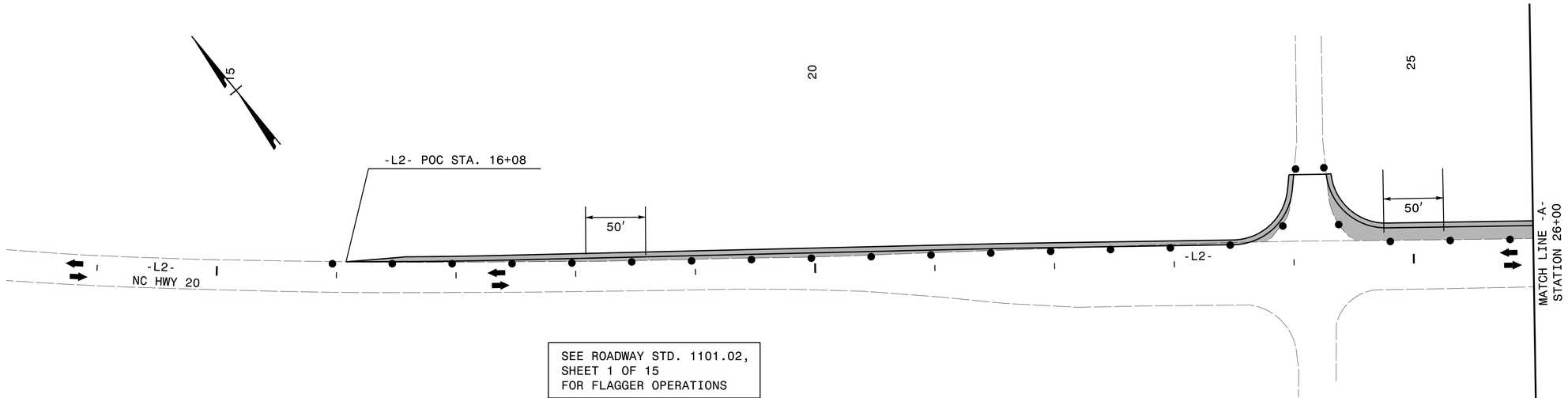
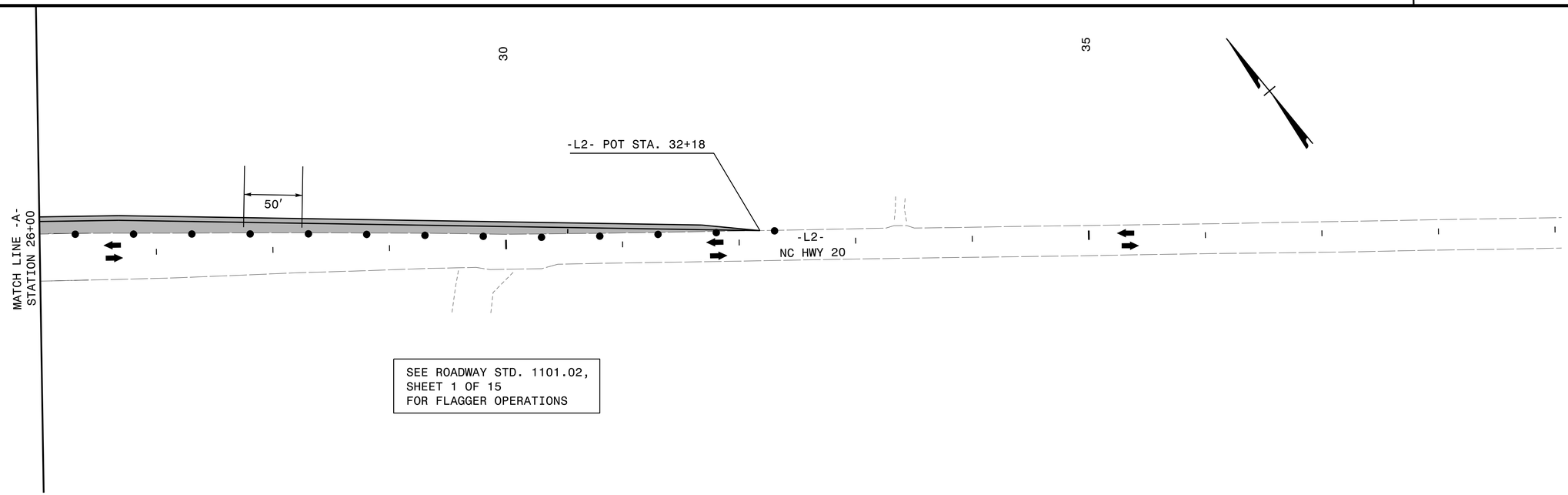


SEE ROADWAY STD. 1101.02,
SHEET 1 OF 15
FOR FLAGGER OPERATIONS



SEE ROADWAY STD. 1101.02,
SHEET 1 OF 15
FOR FLAGGER OPERATIONS

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
- TEMPORARY PAVEMENT
- COMPLETED CONSTRUCTION
- SIGNALS — EXISTING, PROPOSED, TEMPORARY

GRAPHIC SCALE
50 25 0 50 100
PLANS

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PHASE I DETAIL

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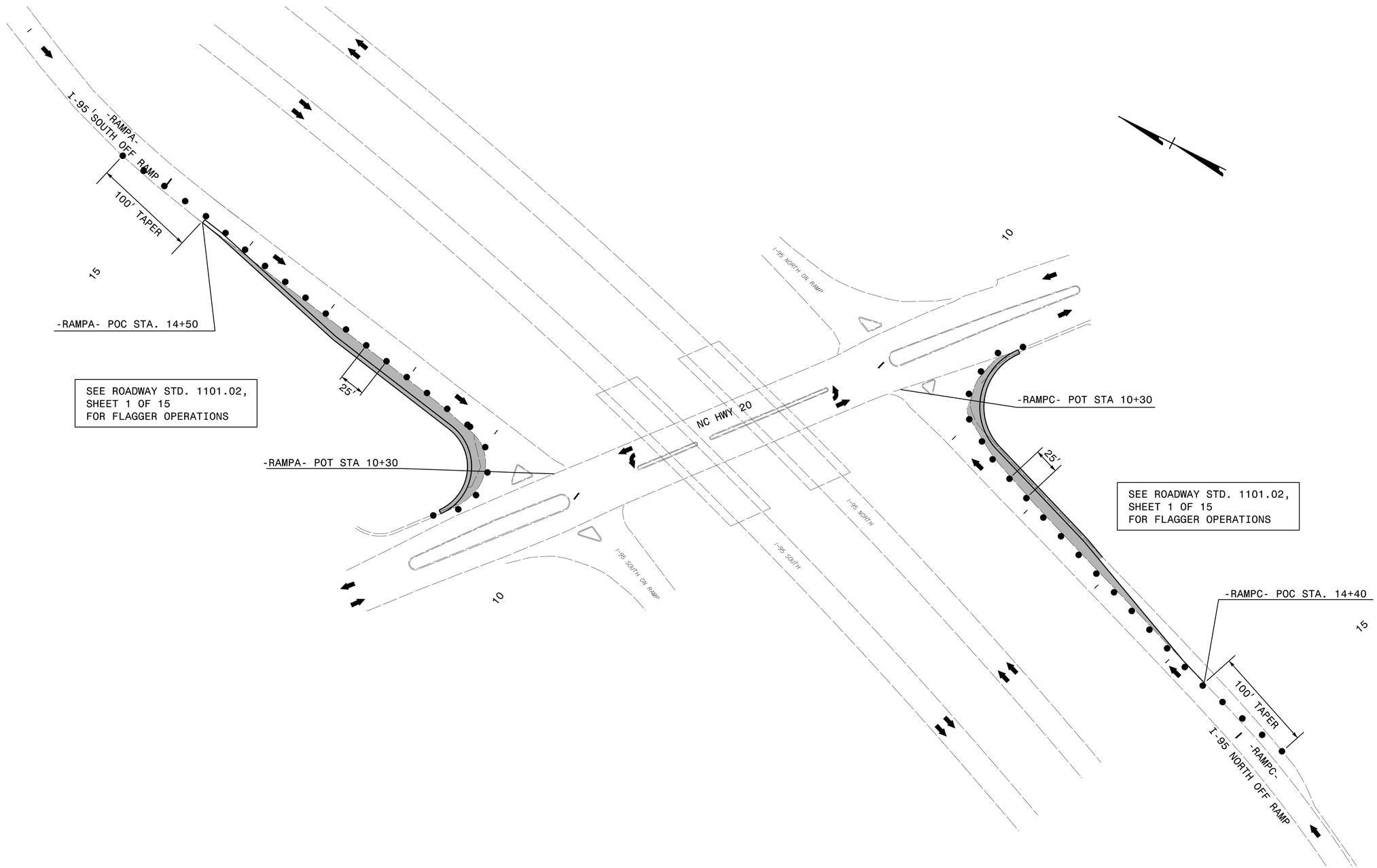

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
- TEMPORARY PAVEMENT
- COMPLETED CONSTRUCTION
- SIGNALS (EXISTING, PROPOSED, TEMPORARY)

GRAPHIC SCALE

50 25 0 50 100

PLANS

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PHASE I DETAIL

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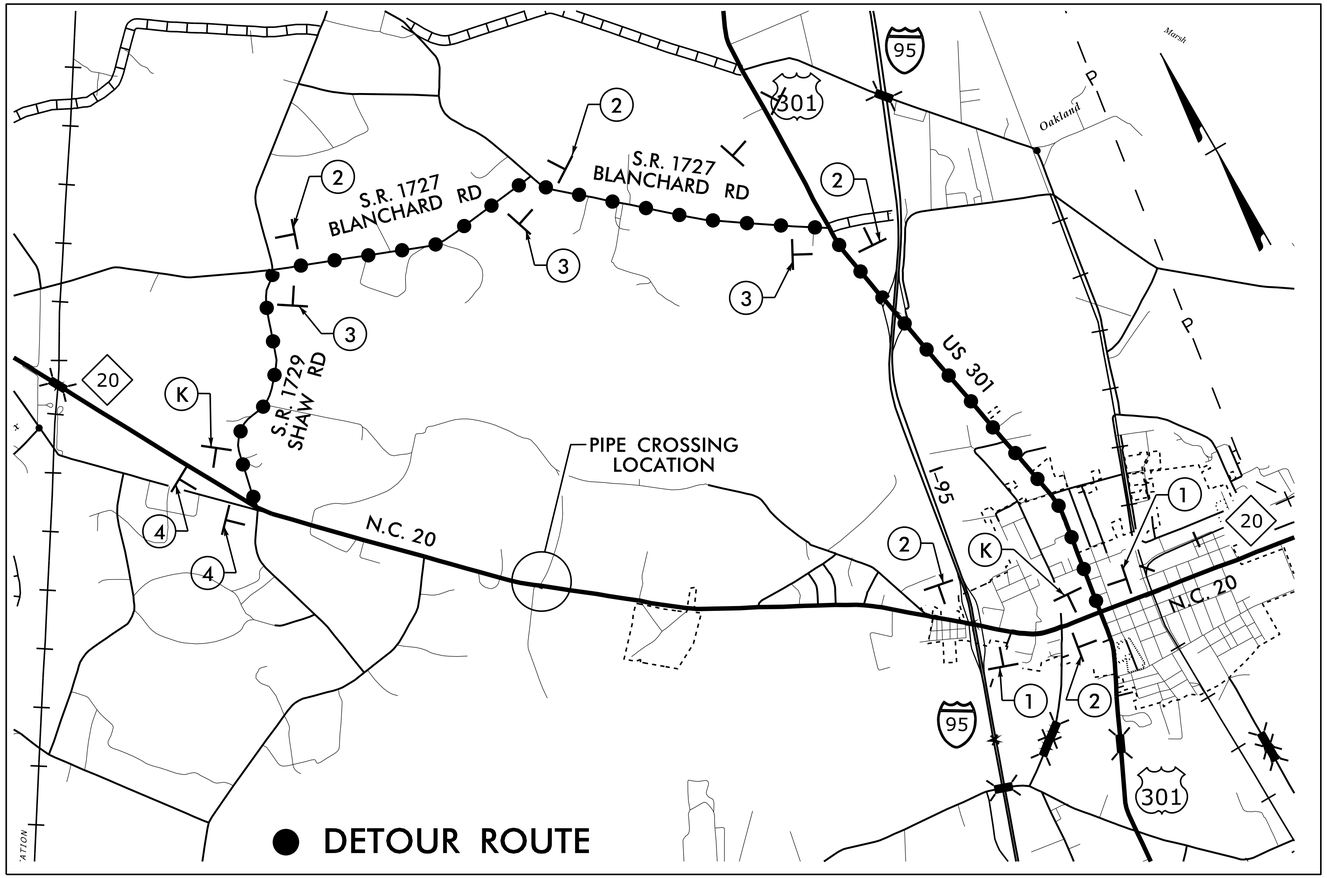

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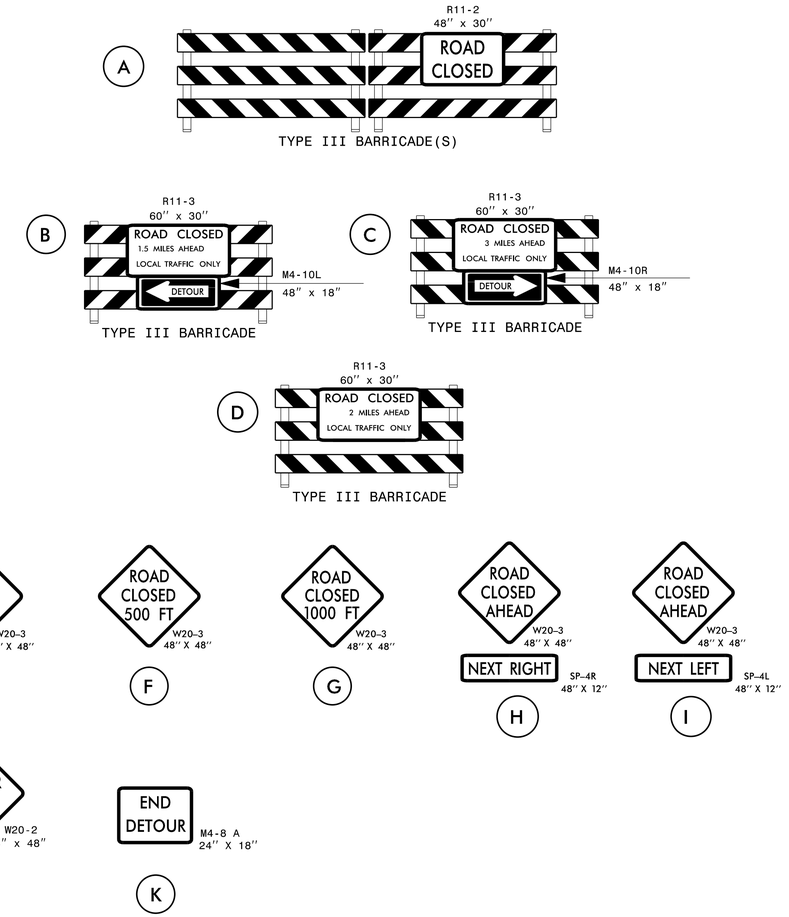

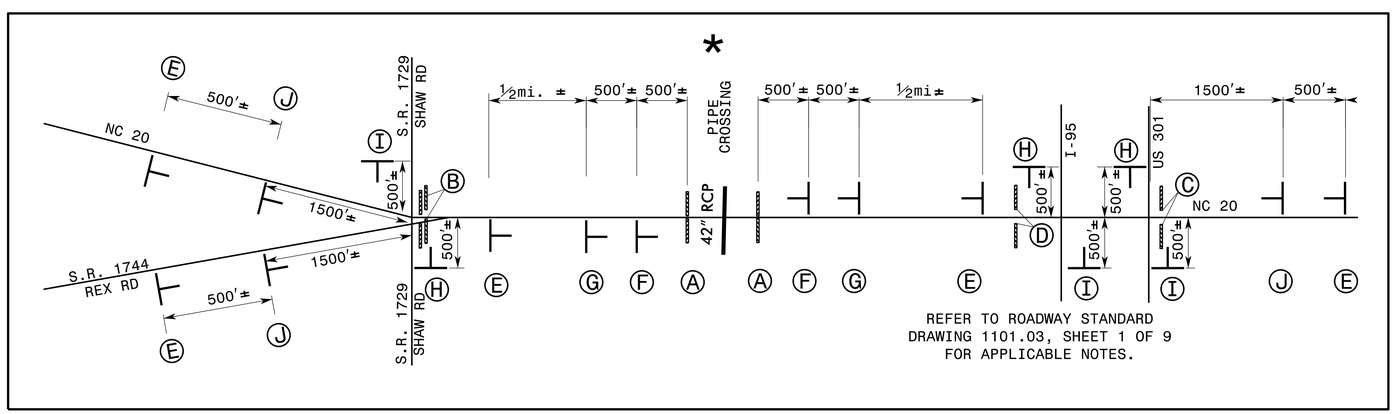

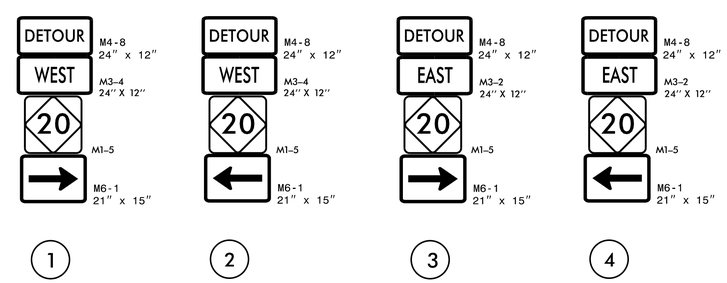

NOTES:
1. SEE SHEET SD-? FOR THE SPECIAL SIGN DESIGNS.
2. ALL DETOUR SIGN LOCATIONS ARE APPROXIMATE.

* USE CHANGEABLE MESSAGE SIGNS (SHORT TERM) TO ADVERTISE CLOSURE BEGINNING THE MONDAY PRIOR TO THE CLOSURE WITH THE FOLLOWING MESSAGE:

NC 20	RE-OPEN
CLOSED	MONDAY
FRI PM	MORNING

AECOM
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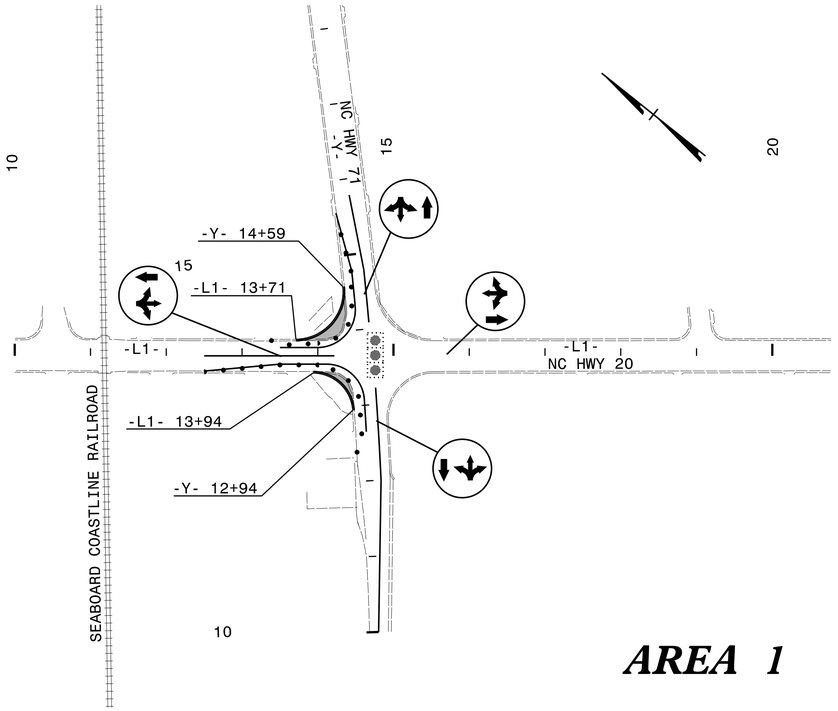

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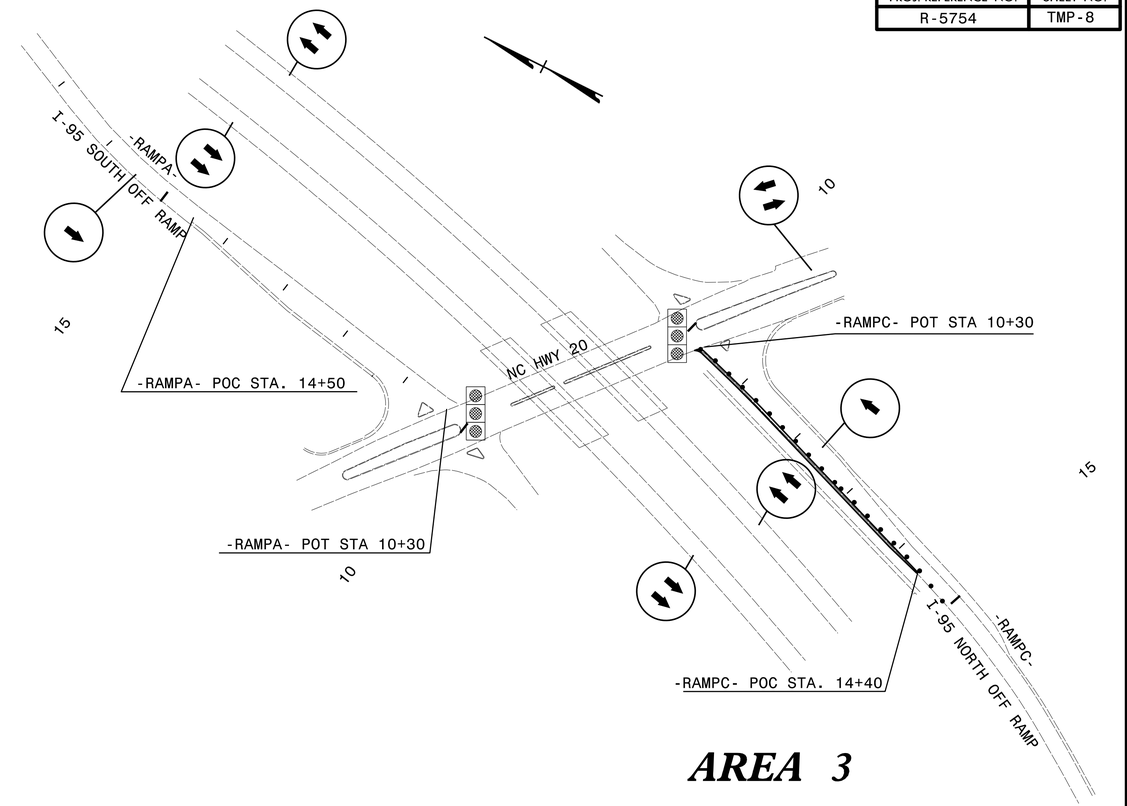

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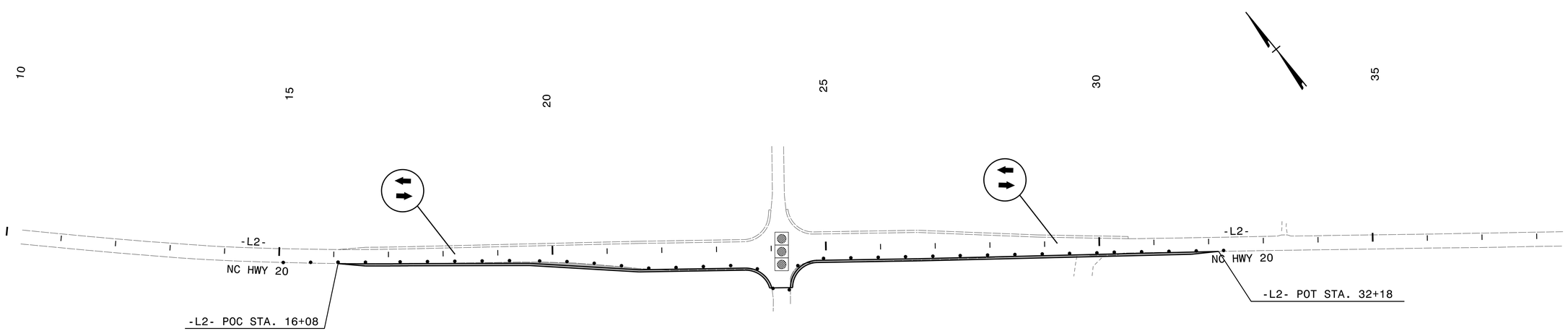

AREA 2

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
- TEMPORARY PAVEMENT
- COMPLETED CONSTRUCTION
- SIGNALS (EXISTING, PROPOSED, TEMPORARY)

GRAPHIC SCALE
100 50 0 100 200
PLANS

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PHASE II OVERVIEW

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pridgewood

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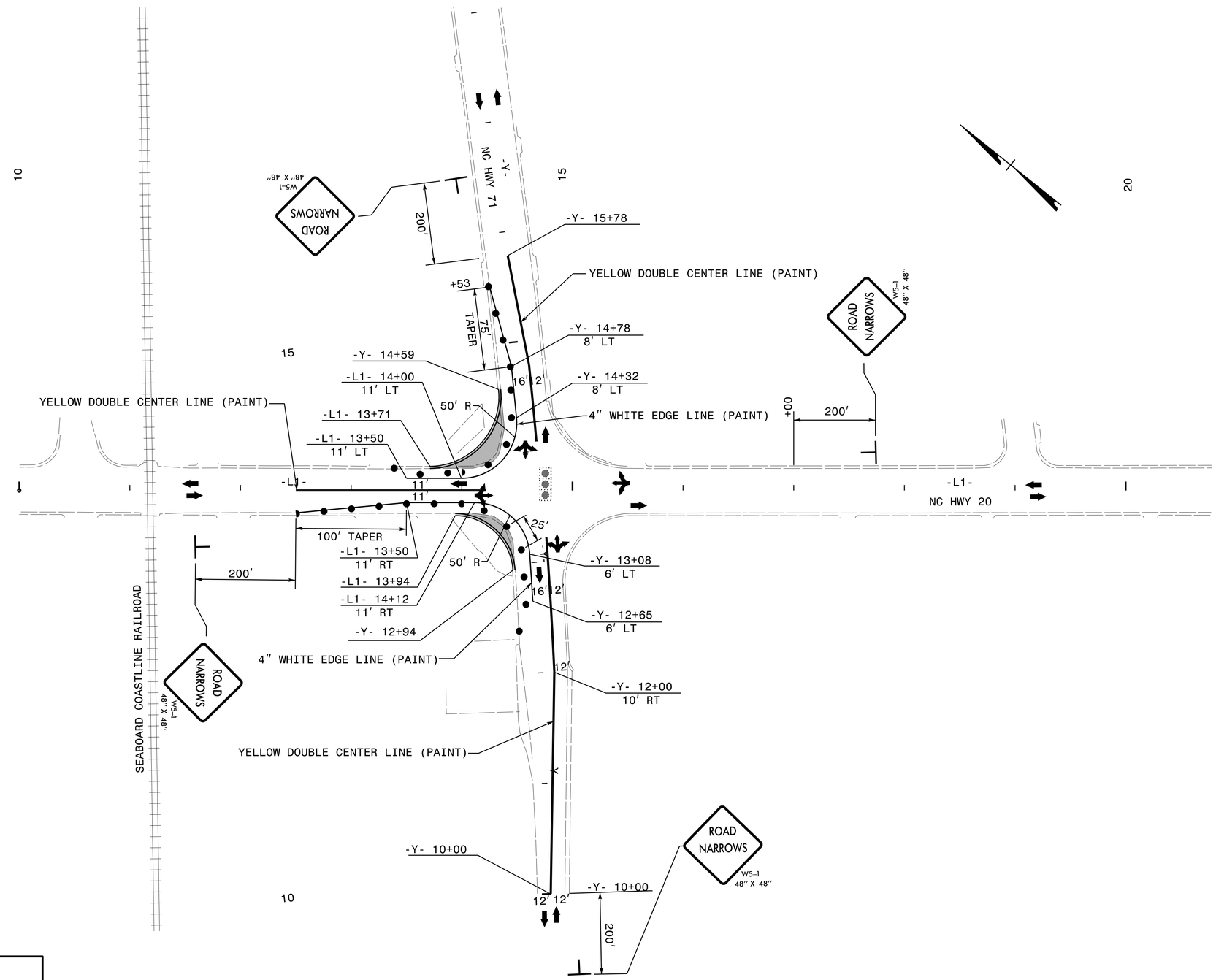

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
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- SIGNALS (EXISTING, PROPOSED, TEMPORARY)

GRAPHIC SCALE
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PLANS

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PHASE II DETAIL

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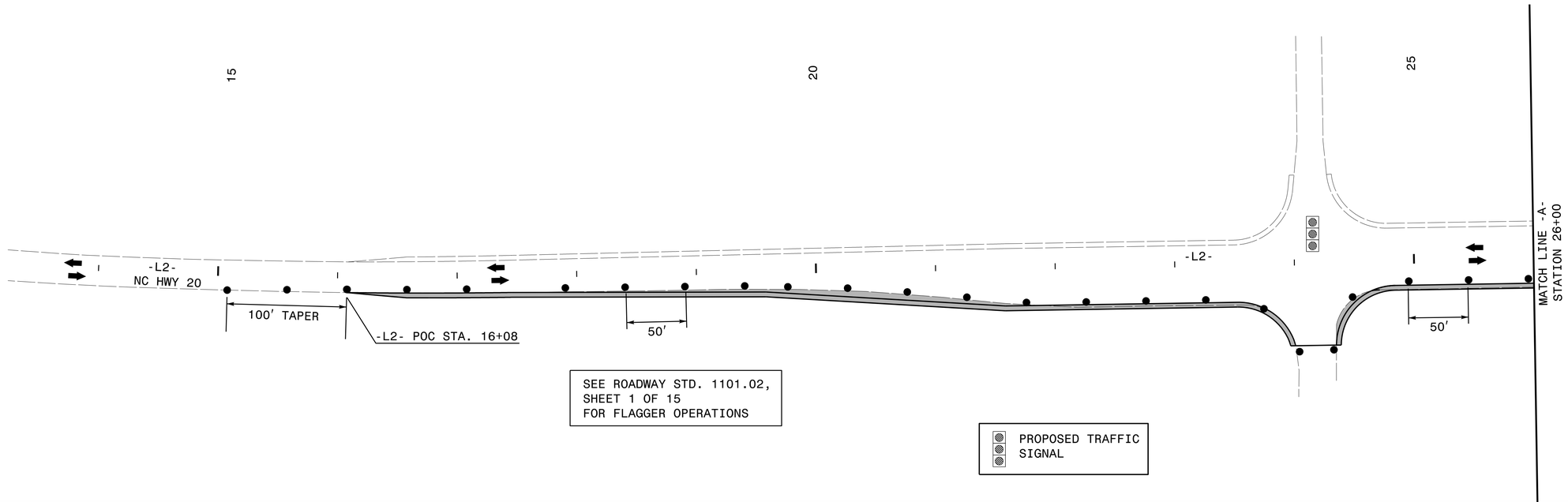

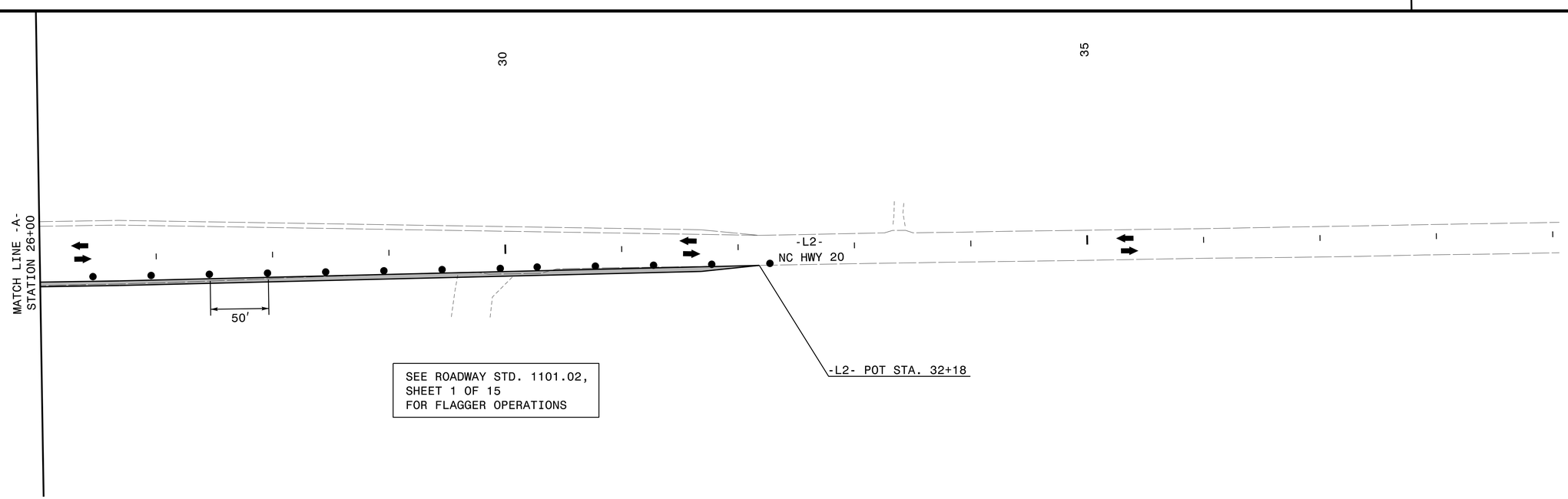

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
- TEMPORARY PAVEMENT
- COMPLETED CONSTRUCTION
- SIGNALS (EXISTING, PROPOSED, TEMPORARY)

GRAPHIC SCALE

50 25 0 50 100

PLANS

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DATE: 2/19/2016

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PHASE II DETAIL

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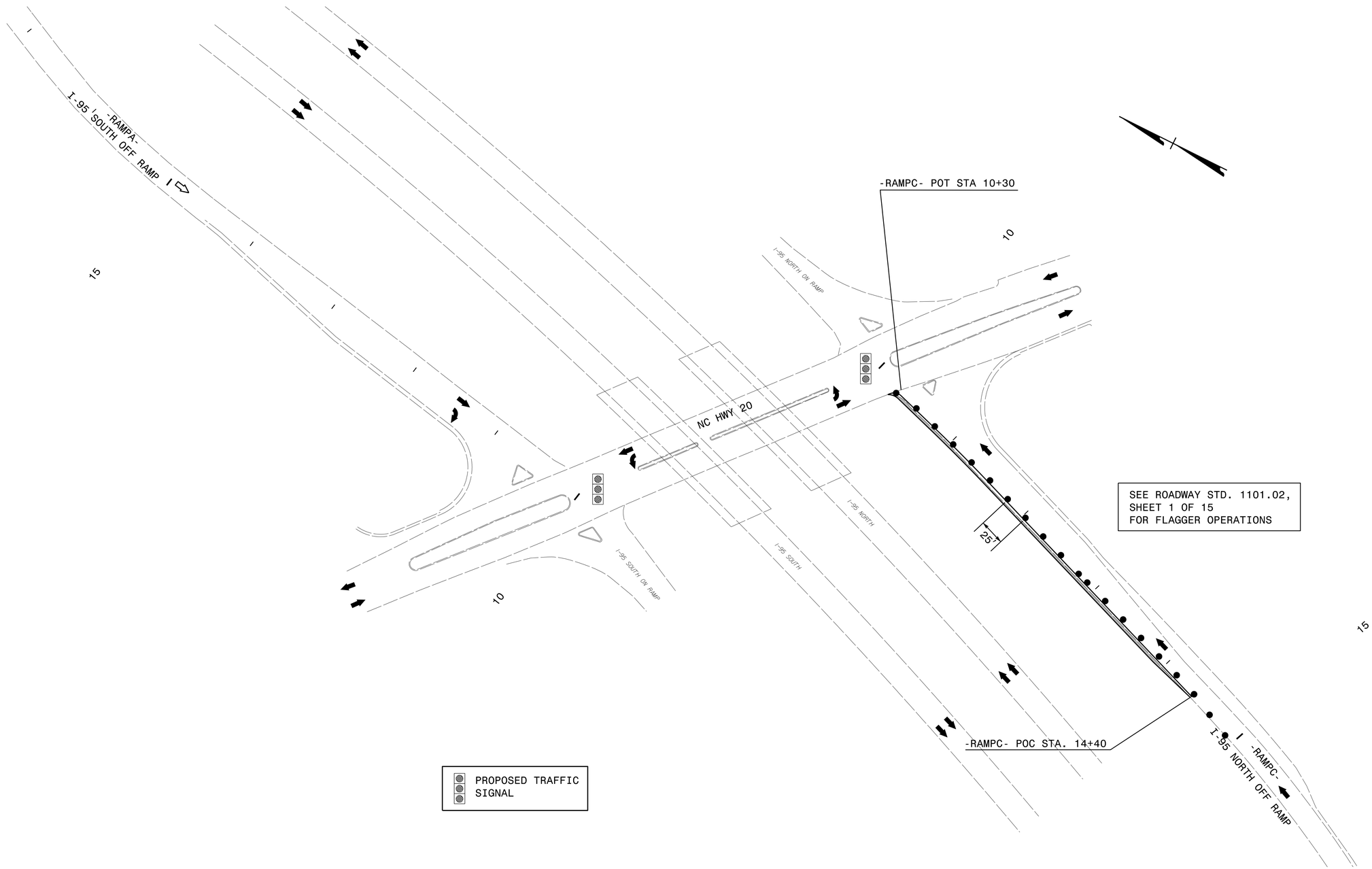

LEGEND

- EXISTING ROADWAY
- WEDGING
- UNDER CONSTRUCTION
- TEMPORARY PAVEMENT
- COMPLETED CONSTRUCTION
- SIGNALS

EXISTING PROPOSED TEMPORARY

GRAPHIC SCALE

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PLANS

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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE II DETAIL

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T.I.P.: R-5754

CONTRACT:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
ROBESON COUNTY

TIP NO.	SHEET NO.
R-5754	PMP-1

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026453 ENGINEER NEIL J. DEAN

DocuSigned by: Neil Dean 26DEA81A0...
2/18/2016

INDEX

SHEET NO.	DESCRIPTION
PMP-1	TITLE SHEET
PMP-2 THRU PMP-5	PAVEMENT PARKING PLAN

PAVEMENT MARKING GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
NC 20	THERMOPLASTIC	PERMANENT RAISED
NC 71	THERMOPLASTIC	PERMANENT RAISED
I-95 RAMP A	THERMOPLASTIC	PERMANENT RAISED
I-95 RAMP C	THERMOPLASTIC	PERMANENT RAISED

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXIT AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1264.01	OBJECT MARKERS - TYPES

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	THERMOPLASTIC (16", 120 MILS)
T1	WHITE LINE, RR X
	THERMOPLASTIC (24", 120 MILS)
T2	WHITE STOPBAR
	THERMOPLASTIC (4", 120 MILS)
TD	3 FT.-9 FT./SP WHITE MINISKIP
TE	WHITE SOLID LANE LINE
TI	YELLOW DOUBLE CENTER
	THERMOPLASTIC (6", 120 MILS)
TK	3 FT.-9 FT./SP WHITE MINISKIP
TL	WHITE SOLID LANE LINE
	THERMOPLASTIC (4", 90 MILS)
TA	WHITE EDGELINE
	THERMOPLASTIC (6", 90 MILS)
T6	WHITE EDGELINE
T7	YELLOW EDGELINE
	THERMOPLASTIC (8", 90 MILS)
TP	YELLOW DIAGONAL
	THERMOPLASTIC (12", 90 MILS)
TS	WHITE GORE LINE
TU	WHITE DIAGONAL
TV	YELLOW DIAGONAL
	THERMOPLASTIC PAVEMENT MARKING SYMBOLS(90 MILS)
UA	LEFT TURN ARROW
UB	RIGHT TURN ARROW
UC	STRAIGHT ARROW
UD	COMBO STRAIGHT/LEFT
UE	COMBO STRAIGHT/RIGHT
UG	COMBO LEFT/RIGHT/STRAIGHT
	THERMOPLASTIC PAVEMENT MARKING CHARACTER(120 MILS)
UI	ALPHANUMERIC CHARACTER
	PERMANENT RAISED PAVEMENT MARKERS
MA	YELLOW & YELLOW
MB	CRYSTAL & RED

PLAN REVIEWED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

FRANK WEST — SIGNING & DELINEATION STANDARDS ENGINEER

KENT LANGDON — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY

Ed Edens, P.E. — AECOM PROJECT ENGINEER

Neil Dean, P.E. — AECOM SIGNING AND DELINEATION ENGINEER

AECOM

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701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

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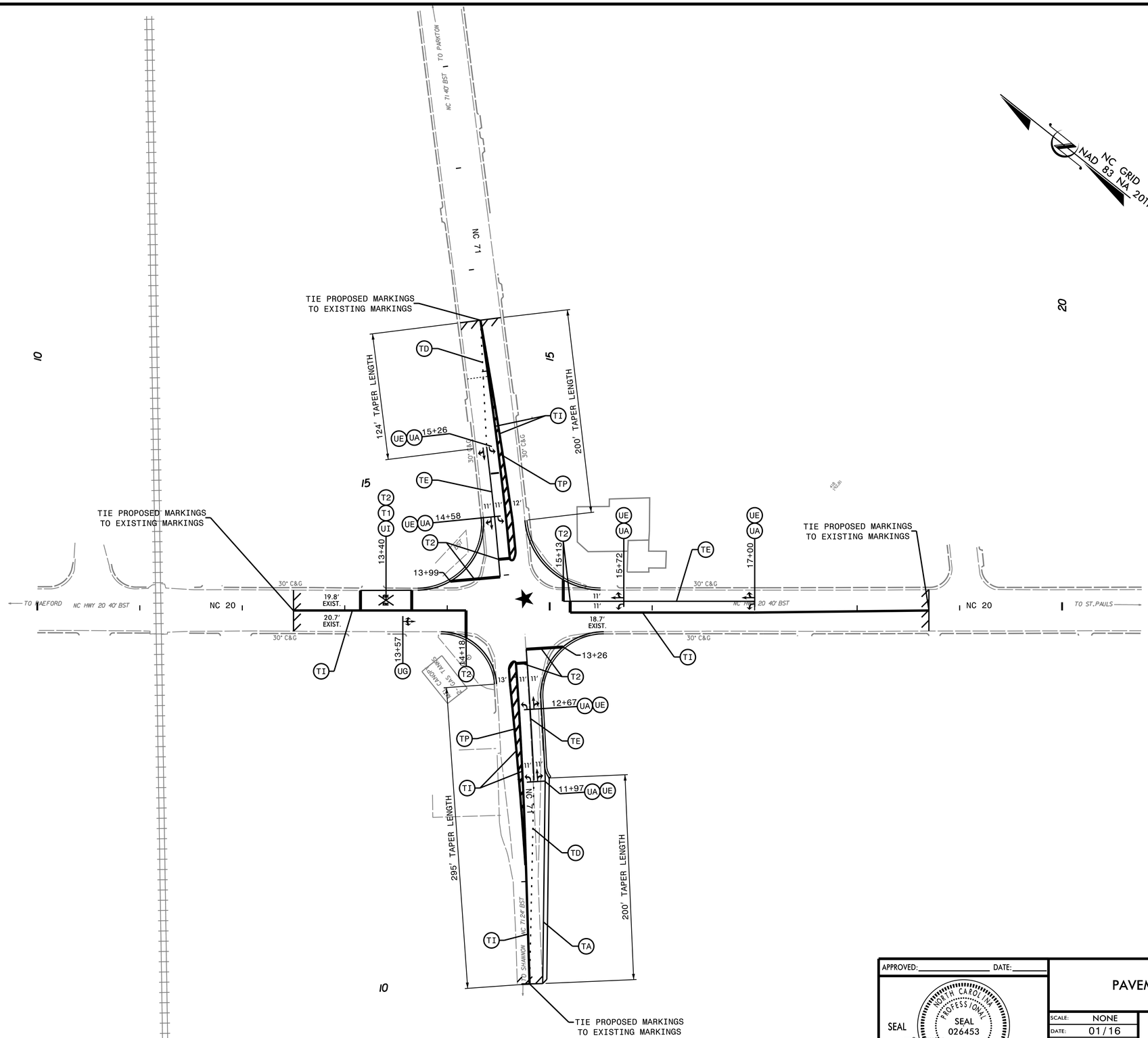

APPROVED: _____ DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026453 ENGINEER OWEN J. DEAN

Docu Signed by: Owen Dean 26DEA0F... 2/18/2016

PAVEMENT MARKING PLAN

SCALE:	NONE
DATE:	01/16
DWG. BY:	MKW
DESIGN BY:	MKW
REVIEWED BY:	NJD

REVISIONS

CADD FILE

2/18/2016
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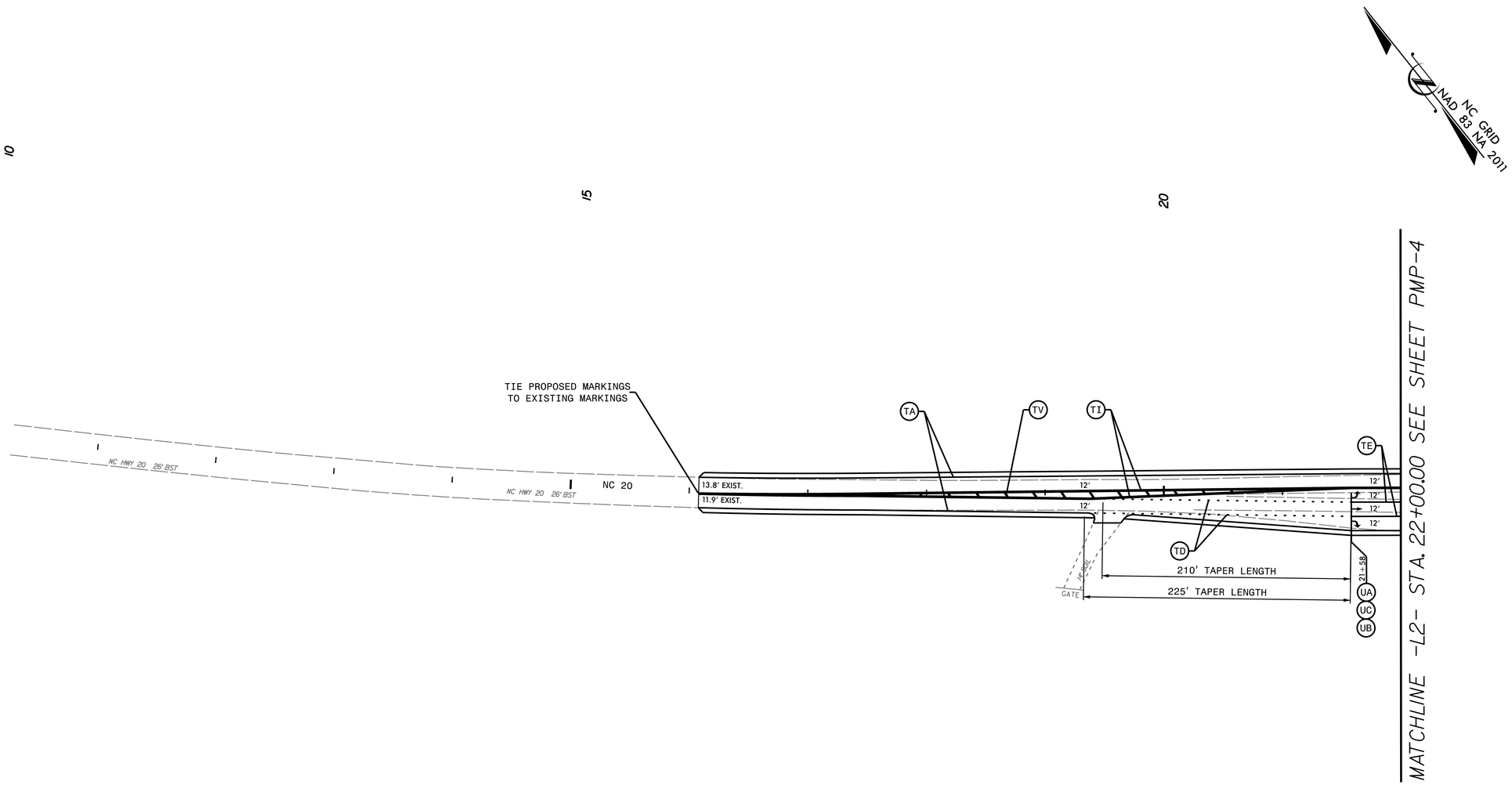

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026453 ENGINEER ONEIL J. DEAN

DocuSigned by: Neil Dean
2/18/2016

PAVEMENT MARKING PLAN

SCALE:	NONE
DATE:	01/16
DWG. BY:	MKW
DESIGN BY:	MKW
REVIEWED BY:	NJD

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · TRAFFIC ENGINEERING

REVISIONS

CADD FILE

2/18/2016
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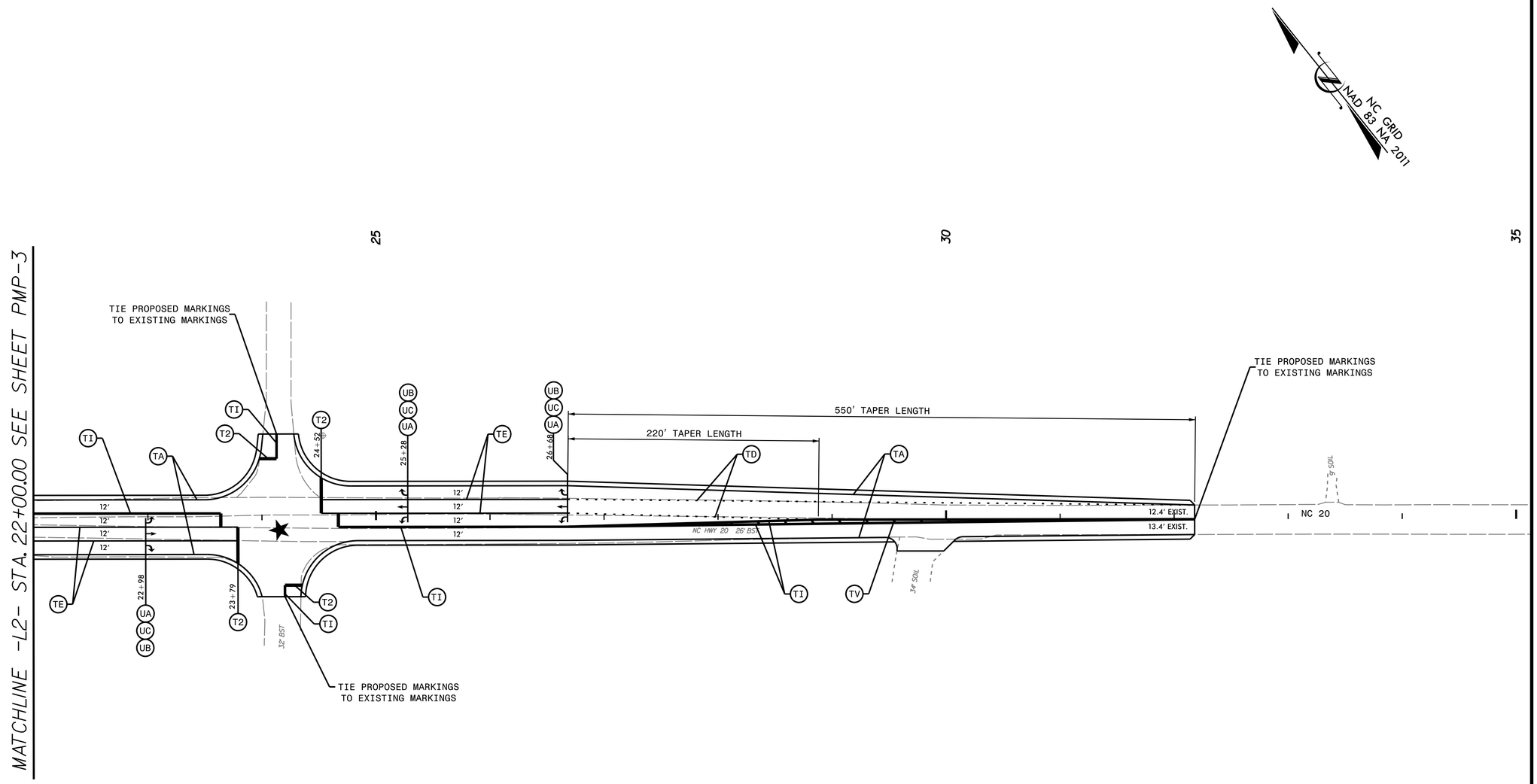
tim_klotz

DocuSign Envelope ID: A89C0E4E-2410-4BF4-AF02-278CCE17E8B3

PROJ. REFERENCE NO.	SHEET NO.
R-5754	PMP-4



PROPOSED TRAFFIC SIGNAL

APPROVED: _____ DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026453 ENGINEER OWEN J. DEAN

DocuSigned by: Owen Dean
2/18/2016

PAVEMENT MARKING PLAN

SCALE:	NONE
DATE:	01/16
DWG. BY:	MKW
DESIGN BY:	MKW
REVIEWED BY:	NJD

REVISIONS

CADD FILE

2/18/2016
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tim_klotz

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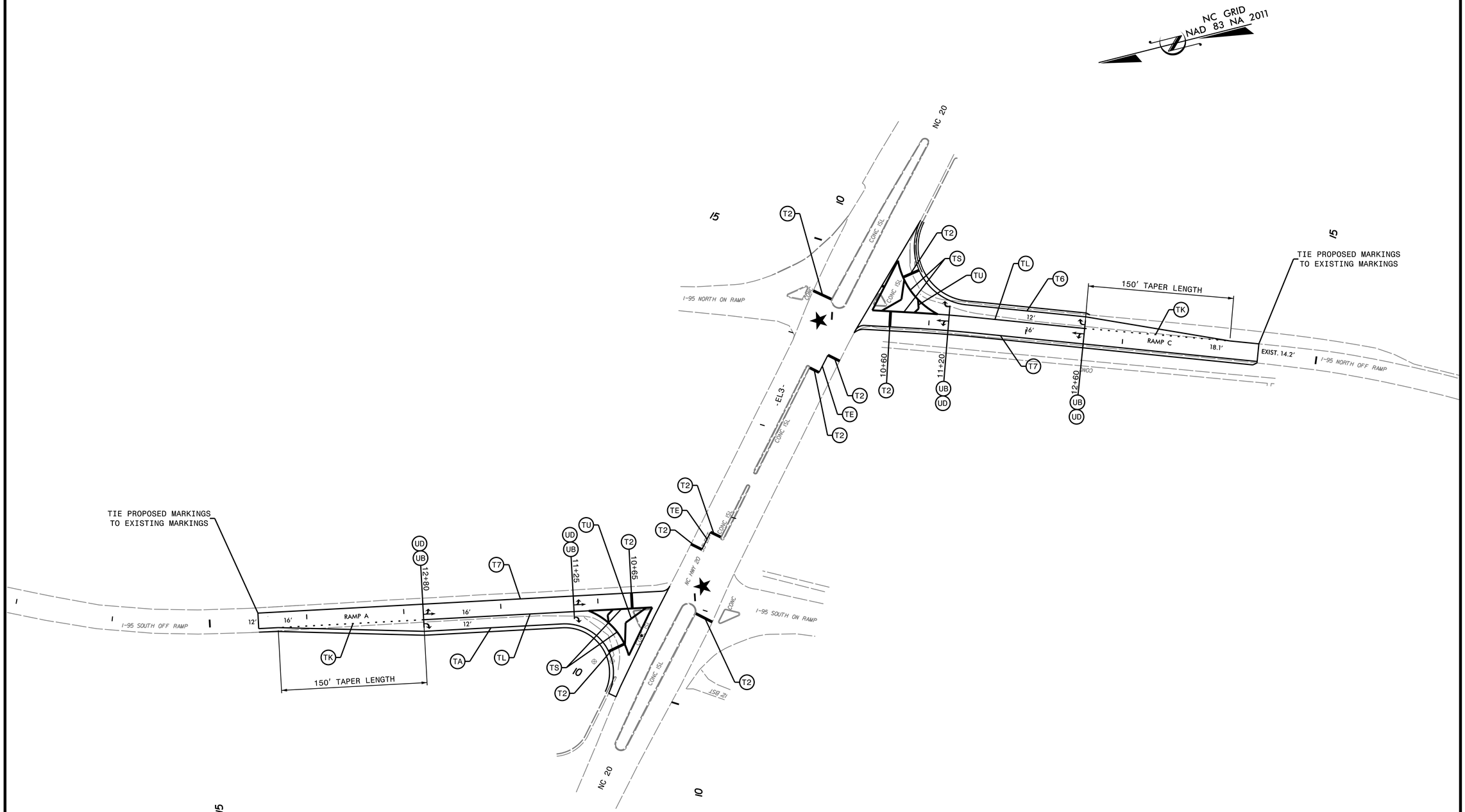
PROJ. REFERENCE NO.	SHEET NO.
R-5754	PMP-5



★ PROPOSED TRAFFIC SIGNAL

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026453 ENGINEER DANIEL J. DEAN

DocuSigned by: Dan Dean
2/18/2016

PAVEMENT MARKING PLAN

SCALE:	NONE
DATE:	01/16
DWG. BY:	MKW
DESIGN BY:	MKW
REVIEWED BY:	NJD

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · TRAFFIC ENGINEERING

REVISIONS

CADD FILE

2/18/2016
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tim_klotz

PROJECT: R-5754

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5754	EC-1	13

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION

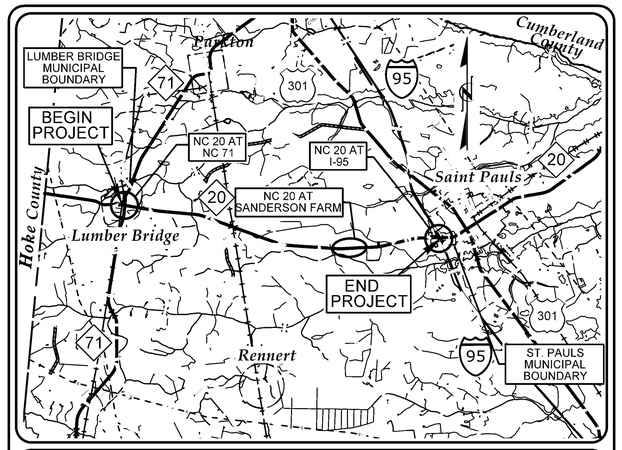
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ROBESON COUNTY

LOCATION: NC 20 AT NC 71, SANDERSON FARMS, AND I-95

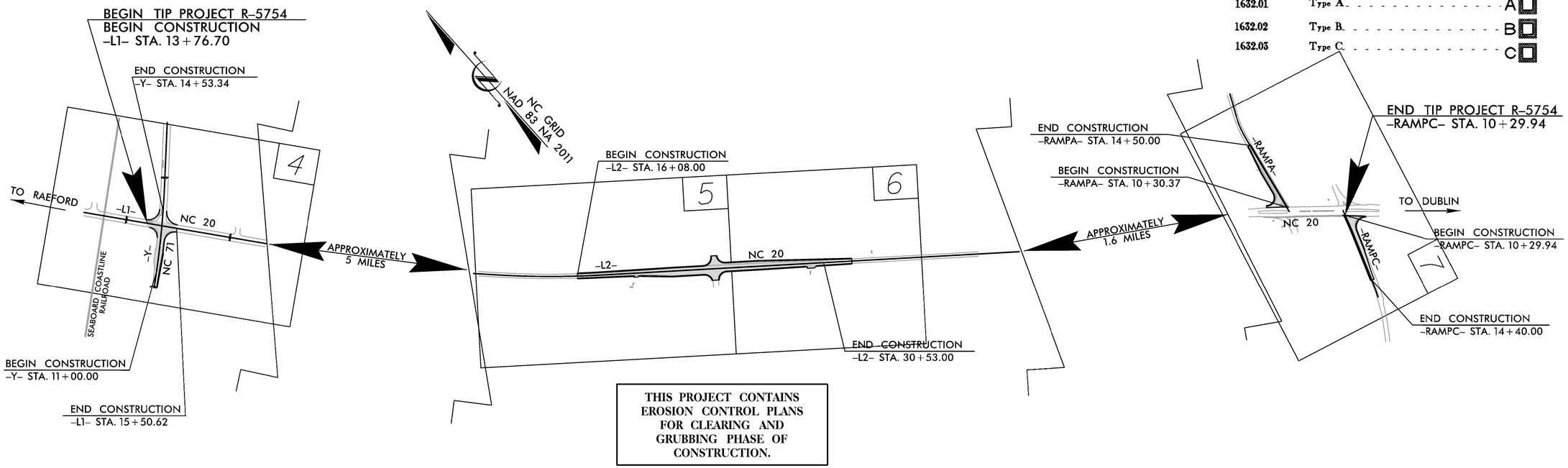
TYPE OF WORK: GRADING, PAVING, WIDENING, DRAINAGE AND SIGNALS



VICINITY MAP
NOT TO SCALE

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TRD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C



THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

GRAPHIC SCALE

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:

AECOM
701 Corporate Center Drive, Suite 475
Raleigh NC 27607
(919) 854-6200 (919) 854-6259 (Fax)

2012 STANDARD SPECIFICATIONS

Designed by:

RENE REMY — ***3135***
NAME — *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Reviewed by:

JEREMY GOODWIN, PE

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

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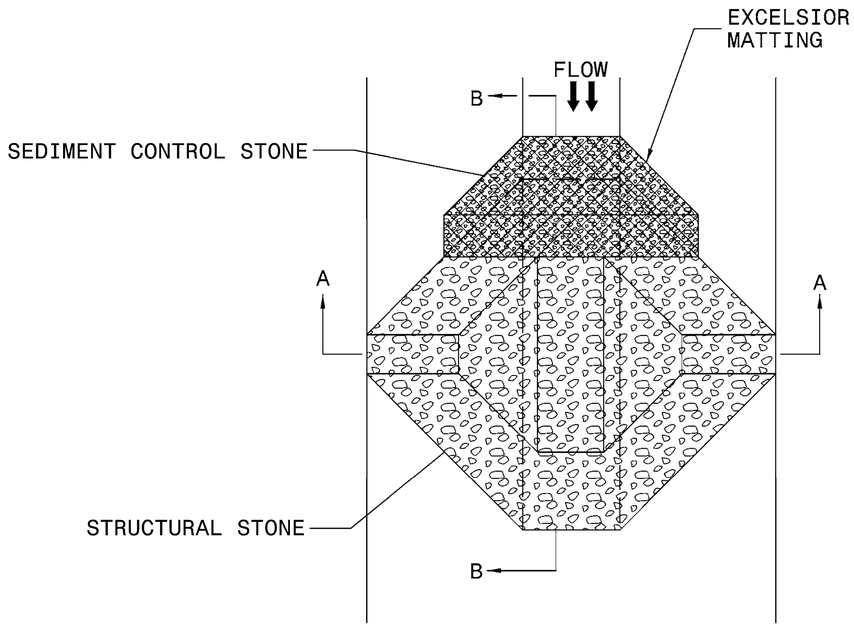
remyr

PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-02
R/W SHEET NO.	

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 (919) 854-6259(FAX)

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN

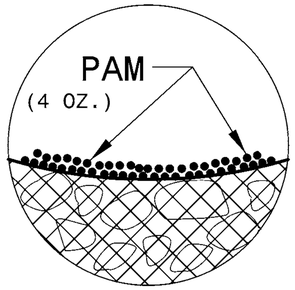
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

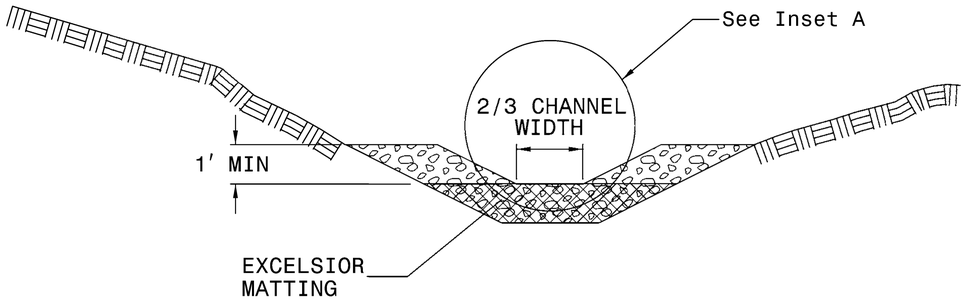
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

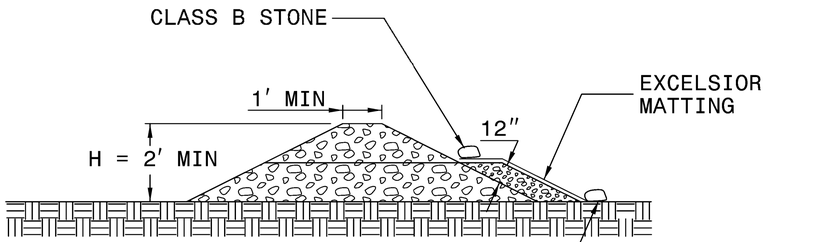
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

REVISIONS

8/17/99

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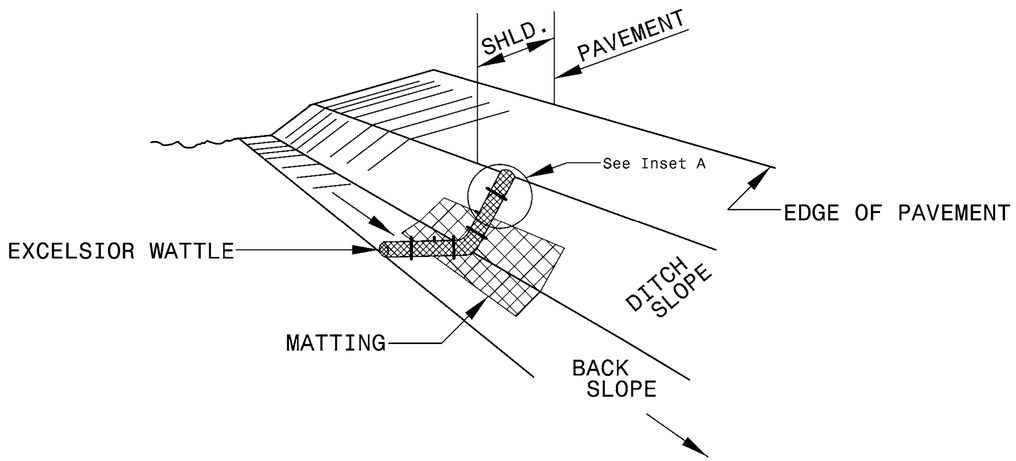
Remote

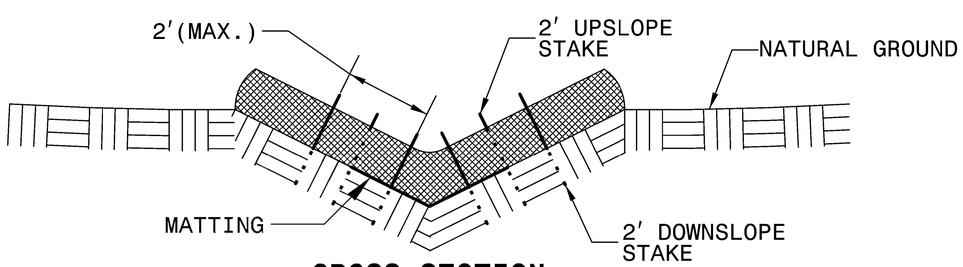
PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-02A
R/W SHEET NO.	

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

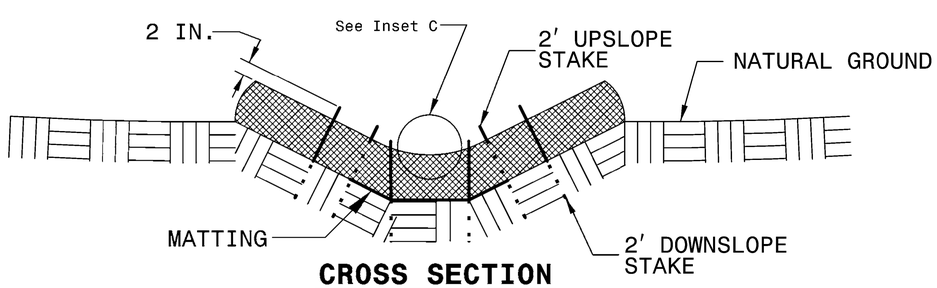
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

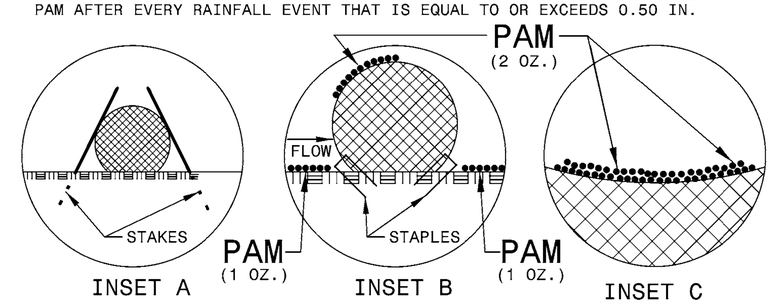
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

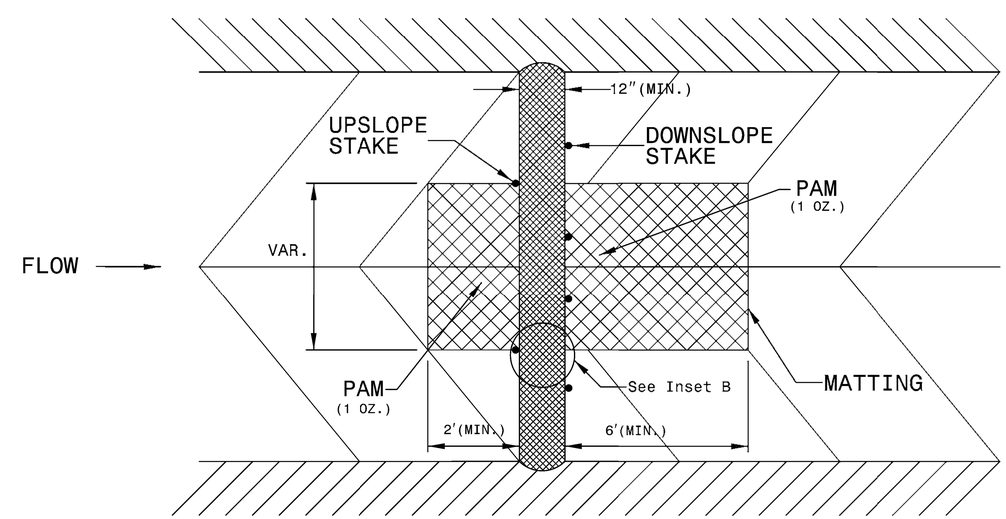
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

REVISIONS

8/17/99

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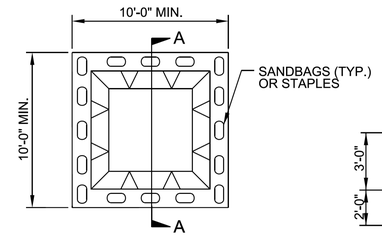
Bemis, Kevin

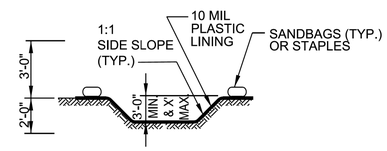
PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-02B
R/W SHEET NO.	

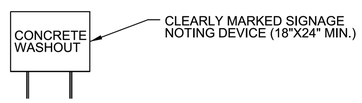
Prepared in the Office of: AECOM NC FIRM LICENSE Nos F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

WITH LINER, NO GRAVEL APPROACH

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER







SECTION A-A

PLAN

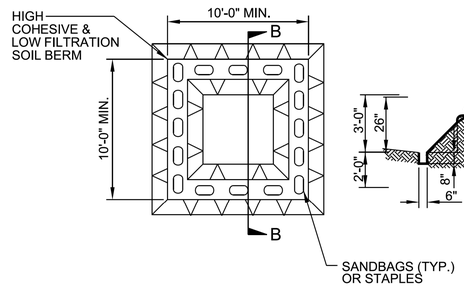
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

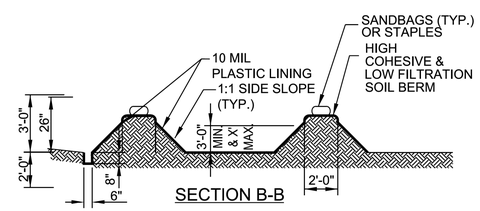
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

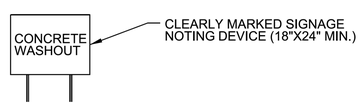
BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE





SECTION B-B



PLAN

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION

REVISIONS

8/17/99

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Revit

PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-03
R/W SHEET NO.	

Prepared in the Office of: AECOM
NC FIRM LICENSE Nos F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

REVISIONS

8/17/99

5/9/23 PM
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Renuk

PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-04/CONST.04
R/W SHEET NO.	

GRAPHIC SCALE
30 15 0 30 60
PLANS

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NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 (919) 854-6259(FAX)

8/17/99

REVISIONS

-Y-
PI Sta 13+58.49
Δ = 5° 30' 58.8" (LT)
D = 1° 10' 00.0"
L = 472.83'
T = 236.60'
R = 4,911.07'
DS = 40 MPH
Se = Match Existing
Runoff = N/A

POT Sta. 19+70.00

NC GRID
NAD 83/NA 2011

MODIFY TRAFFIC SIGNAL

FOR -L1- PROFILE, SEE SHEET NO. 8
FOR -Y- PROFILE, SEE SHEET NO. 8

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OR ROCK INLET SEDIMENT TRAP, TYPE C IN AREAS WHERE SEDIMENT TRAP CANNOT BE INSTALLED PROPERLY OR MAY IMPOUND RUNOFF IN ACTIVE TRAVEL LANES.

-Y- POT STA. 16+50.00
END RESURFACING

-Y- PT Sta. 15+94.73

-L- POT Sta. 10+00.00

-L- POT Sta. 20+80.00

-L- Sta. 14+63.17 =
-Y- Sta. 13+65.01

-Y- POT Sta. 11+21.90

-Y- POT Sta. 10+00.00

S 38°34'09.9" E

N 44°09'30.7" E

N 49°40'29.5" E

L1- POT STA. 12+50.00
BEGIN PROJECT
BEGIN RESURFACING

L1- POT STA. 18+70.00
END RESURFACING

-Y- POT STA. 10+00.00
BEGIN RESURFACING

TO MAEFORD NC HWY 20 40' BST
TO ST. PAULS NC HWY 20 40' BST
TO PARKTON NC 71 40' BST
NC 71 24' BST
SEABOARD COASTLINE RAILROAD
EXISTING R/W
130' RIGHT TURN
200' TAPER
HIGH POINT
RETAIN
REMOVE
PROP 2'-6" C&G TIE TO EXISTING
BEGIN 2'-6" C&G
SPECIAL LATERAL 'V' DITCH SEE DETAIL 1
TIE TO EXISTING DITCH
ROBERT JOHNSON DB 1694 PG 184
JOHN BREACH DB 258 PG 58
ROBERT JOHNSON DB 1780 PG 127
KENNETH SPAYD DB 611 PG 203
BOBBY RAY THOMPSON DB 613 PG 749
LUMBER BRIDGE VOL FIRE DEPT. DB 526 PG 221
F.L. TOLAR JR. W 78E PG 431
WAYNE JOHNSON DB 1190 PG 533
LAUREN KEETER DB 1688 PG 740
LINDA SUGGS DB 649 PG 207 PB 14 PG 75
LUMBER BRIDGE BAPTIST CHURCH
FADHL S. ALHOBISHI DB 1488 PG 194
W.C. MARLEY DB 82 PG 294
MAGDOVITZ AGENCY, INC DB 1500 PG 574
STEPHEN AMMONS DB 1030 PG 93
TRIPLE K INVESTMENTS, LLC DB 1791 PG 820
STEPHEN AMMONS HEIRS W 11E PG 578
FRANCES AMMONS 19E PG 306
LORITA SMITH DB 1770 PG 144
ERVIN CANADY DB 1832 PG 645
MARY AMMONS DB 568 PG 153

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground; 3:1; D; 6:1; Fill Slope
Min. D = 1.0 Ft.

FROM STA. -Y- 10+20 RT TO STA. -Y- 11+50 RT
TIE TO EXISTING DITCH AT -Y- 10+20 RT

DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "SAND-3"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 398226.473(ft) EASTING: 1989311.860(ft)
ELEVATION: 181.98(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989590
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SAND-3" TO -L- STATION 12+50.00 IS S°34 17' 37" E/19765.041(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

8:29:11 PM
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Revised

PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-05/CONST.05
R/W SHEET NO.	

GRAPHIC SCALE
30 15 0 30 60
PLANS

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

8/17/99

REVISIONS

-L2-
PI Sta 14+39.99
Δ = 6° 37' 09.8" (LT)
D = 1° 05' 00.0"
L = 611.02'
T = 305.85'
R = 5,288.84'
DS = 60 mph
Se = Match Existing
Runoff = N/A

NAD 83 NA 2011
NC GRID

N 48°49'16" W 219.89'
N 48°50'12" W 220.00'
N 51°22'09" W 627.90'
N 50°28'33" E 87.79'
S 50°28'33" W 442.00'

DETAIL 2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Fill Slope
Min. D = 1.0 Ft.

FROM -L2- STA. 16+08 LT TO -L2- STA. 20+80 LT
FROM -L2- STA. 20+80 LT TO -L2- STA. 23+50 LT
FROM -L2- STA. 16+08 RT TO -L2- STA. 20+45 RT
FROM -L2- STA. 20+75 RT TO -L2- STA. 23+00 RT

ROBESON COUNTY
DB 926 PG 512

ATLANTIC PROPANE
DB 2007 PG 601

SANDERSON FARMS, INC.
DB 2000 PG 58
PB 50 PG 27

SANDERSON FARMS, INC
DB 2000 PG 58
PB 50 PG 27

-L2- POT Sta. 10+00.00
-L2- PC Sta. 11+34.14
-L2- PT Sta. 17+45.16
-L2- POC STA. 16+08.00 BEGIN RESURFACING
-L2- +10.41 59.10' LT
-L2- +68.20 66.00' LT
-L2- +46.00 65.99' LT
-L2- +58.00 66.00' LT
-L2- +78.00 66' RT
-L2- +00.00 EX. R/W & 66' RT
-L2- +31.00 66' RT
-L2- +31.00 EX. R/W & 97' RT
-L2- +78.00 EX. R/W & 97' RT
-L2- +70.00 EX. R/W & 66' RT

S 44° 51' 36.7" E
S 44° 47' 59.5" E
S 49° 59' 23.2" E
S 51° 28' 46.5" E

NC HWY 20 26' BST
15" RCP
18" RCP
13.8' EXIST.
11.9' EXIST.
MATCH EXIST SUPER
TIE TO EXISTING DITCH
EXISTING R/W
330' MEDIAN TAPER
550' DEPARTURE TAPER
200' RIGHT & LEFT TURN
200' RIGHT TURN TAPER
SPECIAL LATERAL 'V' DITCH SEE DETAIL 2
14 TONS CLASS B RIP RAP
20 SQ. YD. GEOTEXTILE
20 TONS CLASS I RIP RAP
40 SQ. YD. GEOTEXTILE
REMOVE
RETAIN
PUE
PDE
TOP=172.23'
INV.=165.23'
TYPE 'A'
18" RCP
BM#2
STA 21+14
88' LEFT
ELEV. 175.66
MATCHLINE -L- STA. 23+00.00 SEE SHEET 6

FOR -L2- PROFILE, SEE SHEET NO. 9

5/5/2010 PM
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Bamie

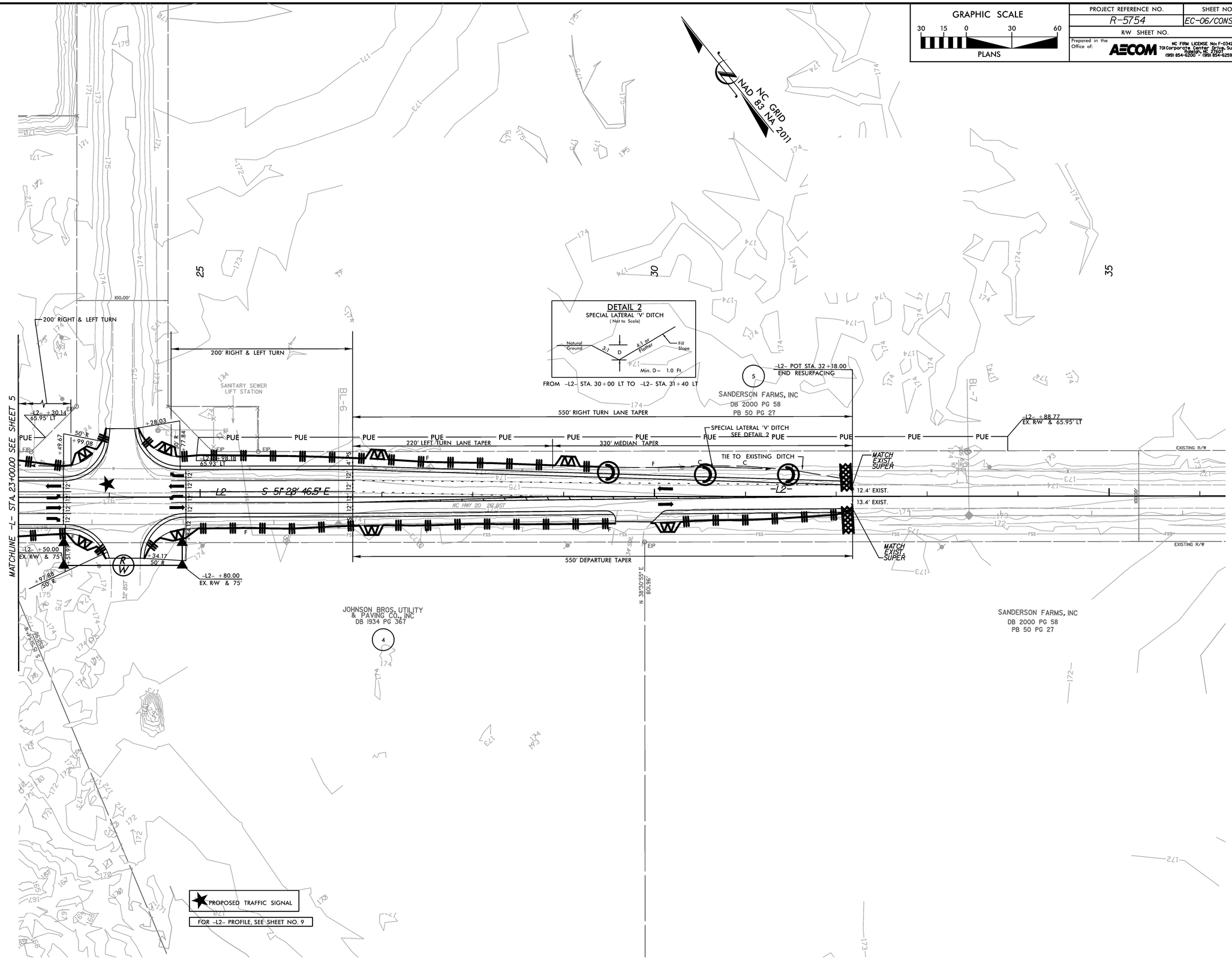
PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-06/CONST.06
R/W SHEET NO.	

GRAPHIC SCALE
30 15 0 30 60
PLANS

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

8/17/99

REVISIONS



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PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-07/CONST.07
R/W SHEET NO.	

GRAPHIC SCALE
30 15 0 30 60
PLANS

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 (919) 854-6259(FAX)

8/17/99

REVISIONS

NC GRID NAD 83 NA 2011

-RAMPA-

PI Sta 15+74.94
Δ = 14° 41' 54.3" (RT)
D = 9° 32' 57.5"
L = 153.92'
T = 77.39'
R = 600.00'
DS = 35 mph
Se = 0.04
Runoff = N/A

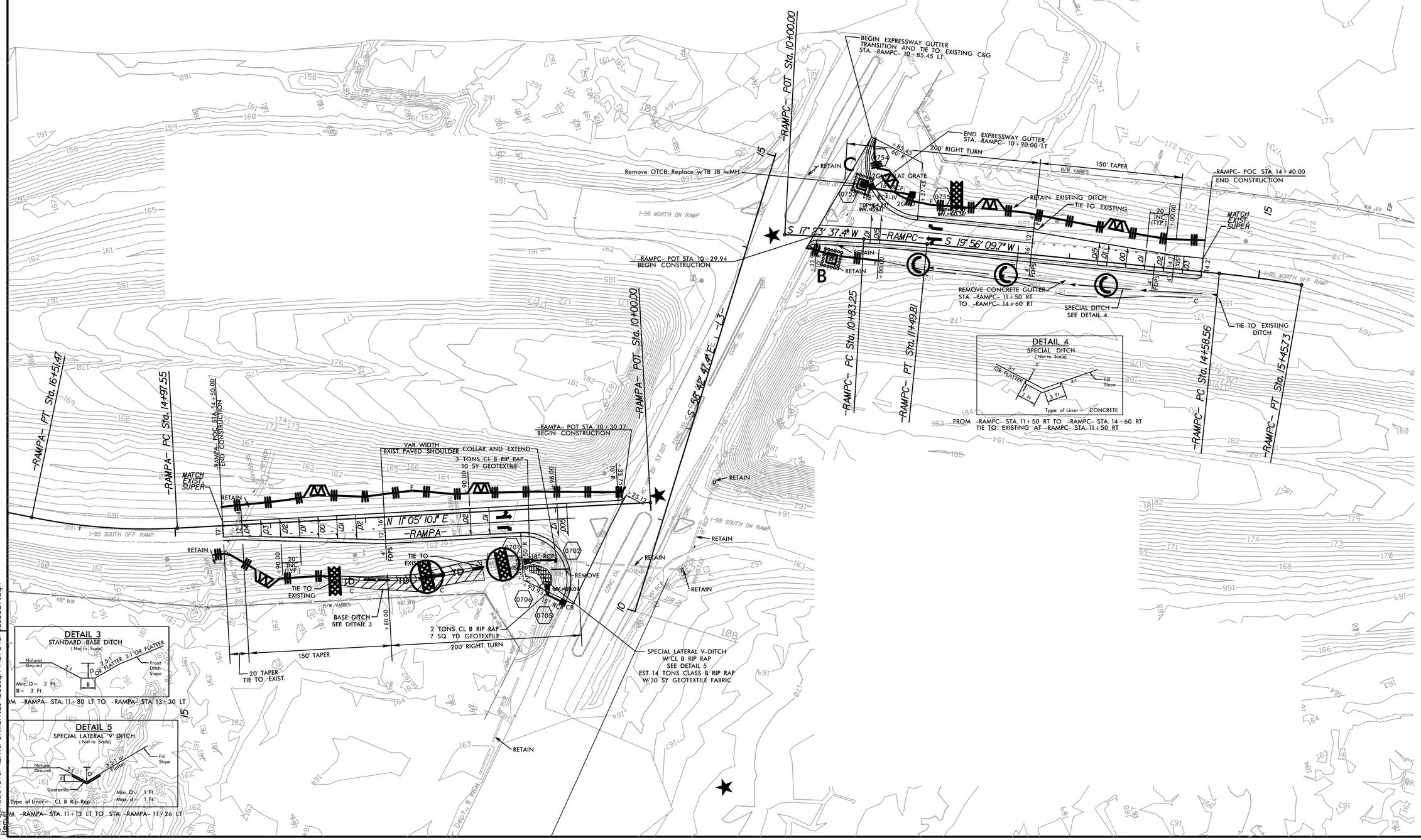
-RAMPC-

PI Sta 11+16.54
Δ = 2° 32' 32.3" (RT)
D = 3° 49' 11.0"
L = 66.56'
T = 33.28'
R = 1,500.00'
DS = 35 mph
Se = MATCH EXIST.
Runoff = N/A

PI Sta 15+02.16
Δ = 4° 09' 43.1" (RT)
D = 4° 46' 28.7"
L = 87.17'
T = 43.60'
R = 1,200.00'
DS = 35 mph
Se = 0.03
Runoff = N/A

NOTE:

UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OR ROCK INLET SEDIMENT TRAP, TYPE C IN AREAS WHERE SEDIMENT TRAP CANNOT BE INSTALLED PROPERLY OR MAY IMPOUND RUNOFF IN ACTIVE TRAVEL LANES.



EC2346.DM
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GRAPHIC SCALE	PROJECT REFERENCE NO.	SHEET NO.
30 15 0 30 60 PLANS	R-5754	EC-08/CONST.04
	R/W SHEET NO.	
	Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)	

REVISIONS

8/17/99

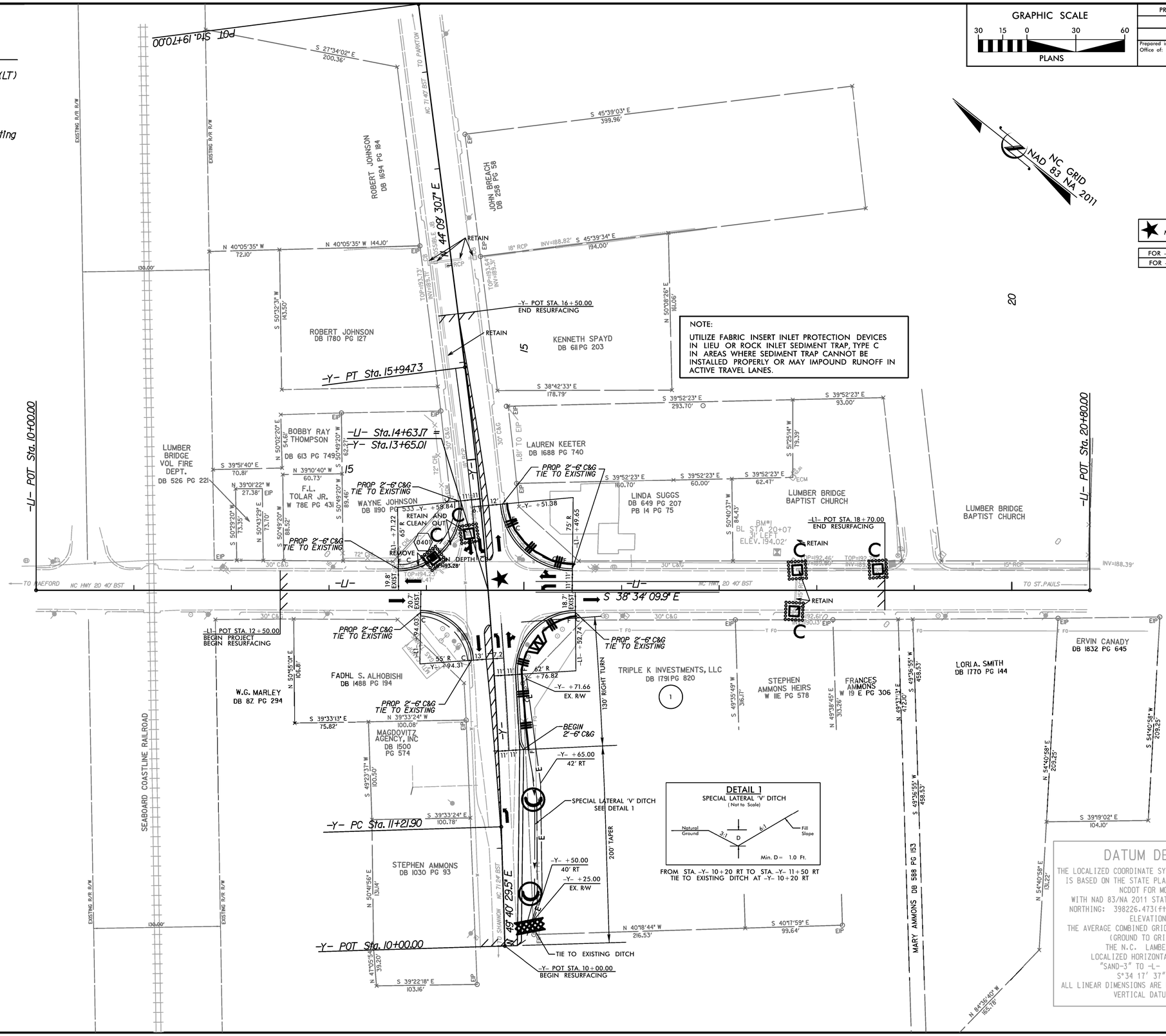
-Y-
PI Sta 13+58.49
Δ = 5° 30' 58.8" (LT)
D = 1° 10' 00.0"
L = 472.83'
T = 236.60'
R = 4,911.07'
DS = 40 MPH
Se = Match Existing
Runoff = N/A

NC GRID NAD 83 NA 2011

MODIFY TRAFFIC SIGNAL

FOR -L1- PROFILE, SEE SHEET NO. 8
FOR -Y- PROFILE, SEE SHEET NO. 8

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OR ROCK INLET SEDIMENT TRAP, TYPE C IN AREAS WHERE SEDIMENT TRAP CANNOT BE INSTALLED PROPERLY OR MAY IMPOUND RUNOFF IN ACTIVE TRAVEL LANES.



DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 6:1, Fill Slope
Min. D = 1.0 Ft.
FROM STA. -Y- 10+20 RT TO STA. -Y- 11+50 RT TIE TO EXISTING DITCH AT -Y- 10+20 RT

DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "SAND-3"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 398226.473(ft) EASTING: 1989311.860(ft)
ELEVATION: 181.98(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989590
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SAND-3" TO -L- STATION 12+50.00 IS S°34 17' 37" E/19765.041(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

5/2/2016 RJN
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Remix

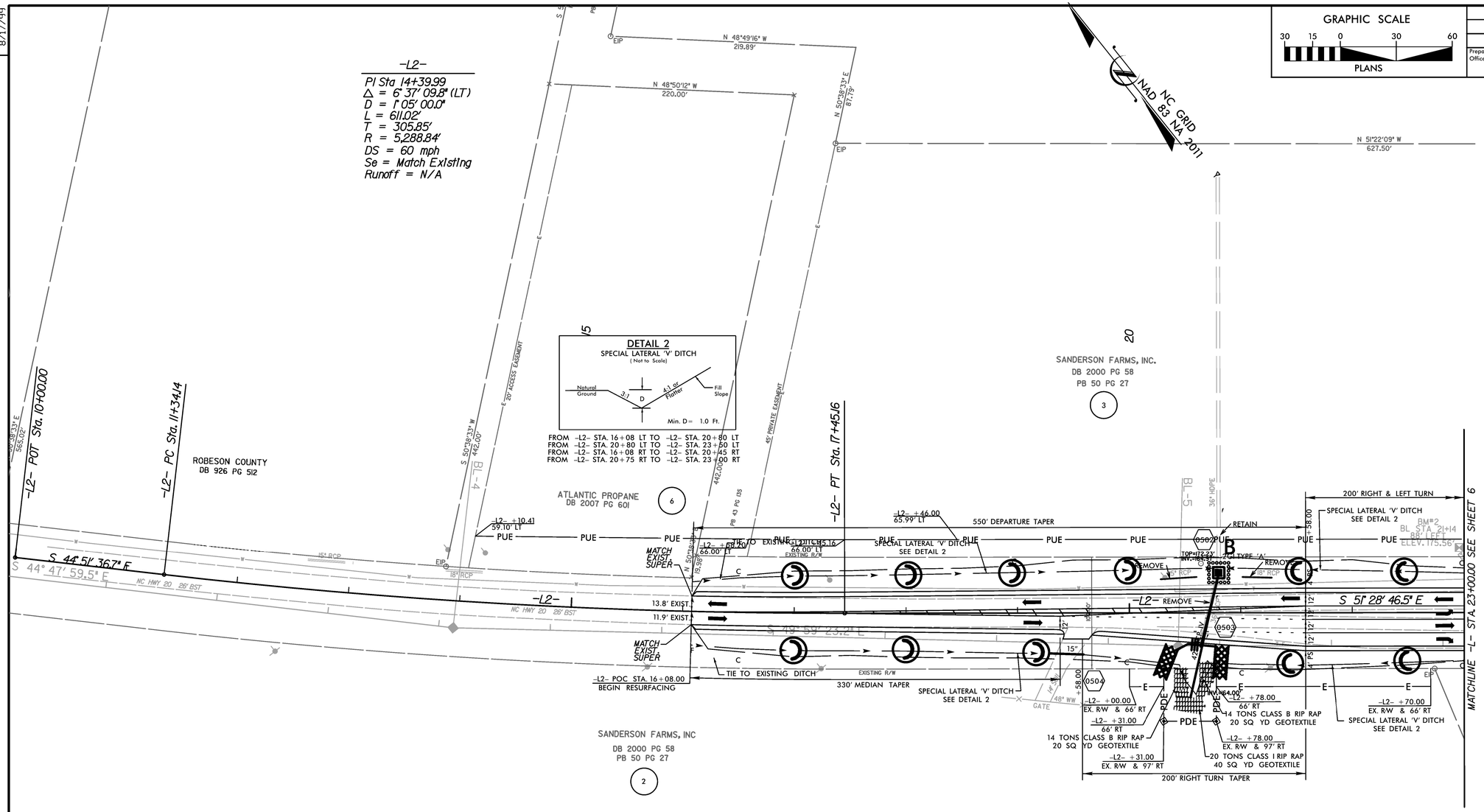
PROJECT REFERENCE NO.	SHEET NO.
R-5754	EC-09/CONST.05
R/W SHEET NO.	

GRAPHIC SCALE
30 15 0 30 60
PLANS

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

8/17/99

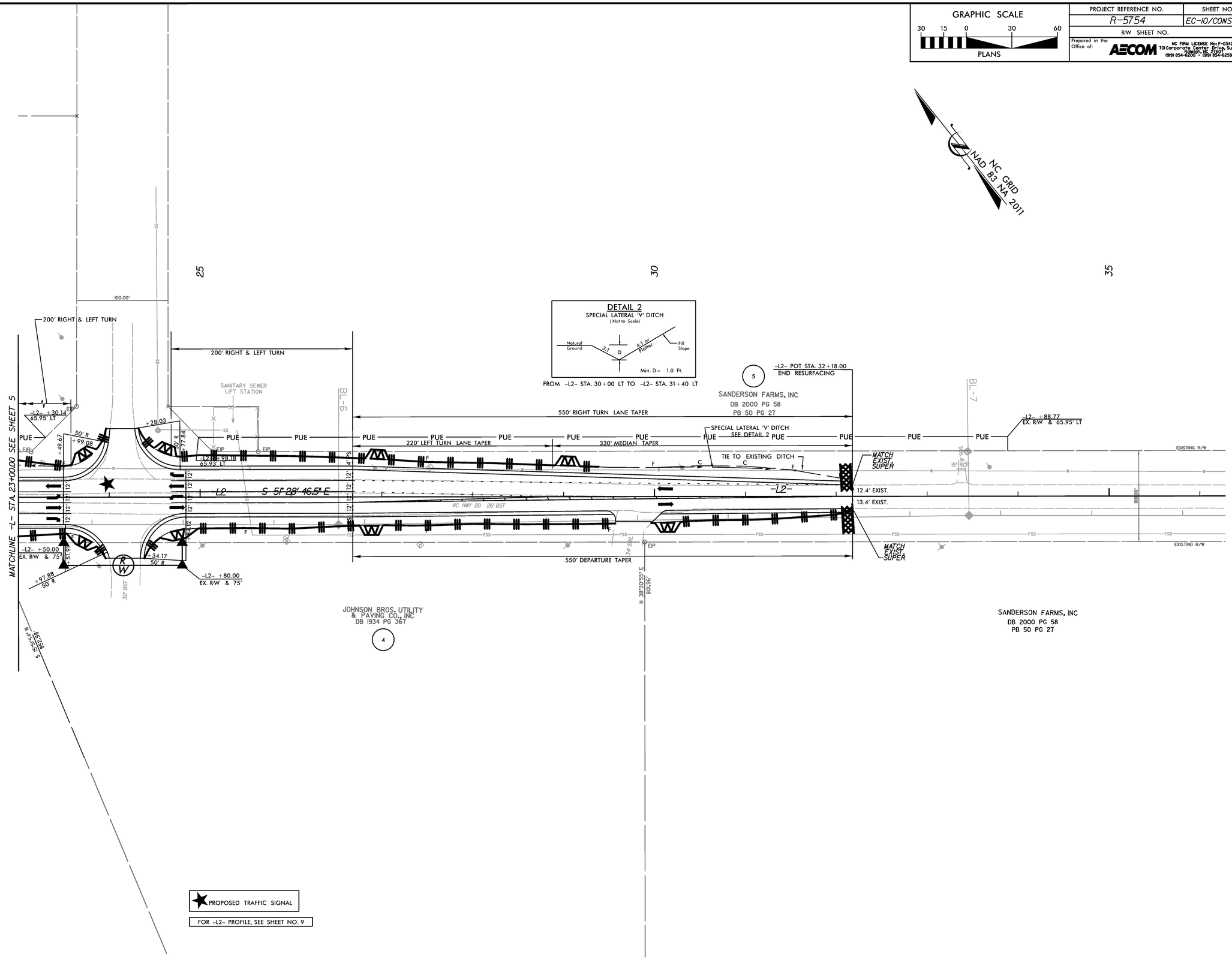
REVISIONS



FOR -L2- PROFILE, SEE SHEET NO. 9

R5754_RW
R5754_NCDOT_TIP\Environmental\Design\R5754_rpu_ec09.dgn
Bentley

GRAPHIC SCALE	PROJECT REFERENCE NO.	SHEET NO.
30 15 0 30 60	R-5754	EC-10/CONST.06
PLANS	R/W SHEET NO.	
	Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)	



REVISIONS

8/17/99

5/5/09 2:24PM
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GRAPHIC SCALE	PROJECT REFERENCE NO.	SHEET NO.
30 15 0 30 60 PLANS	R-5754	EC-11/CONST.07
	R/W SHEET NO.	
	Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)	

NC GRID NAD 83 NA 2011

8/17/99

REVISIONS

-RAMPA-

PI Sta 15+74.94
Δ = 14° 41' 54.3" (RT)
D = 9° 32' 57.5"
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-RAMPC-

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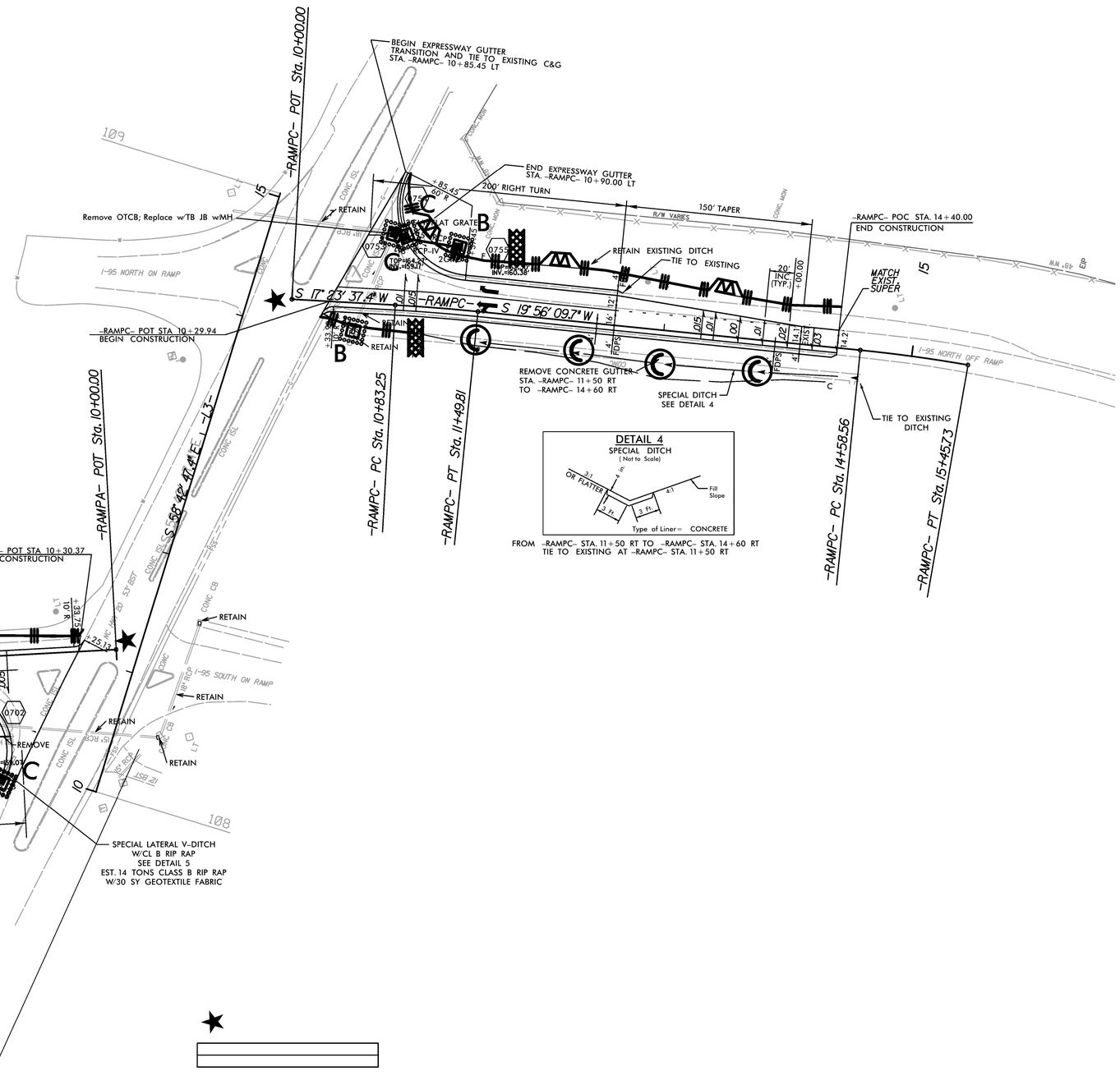
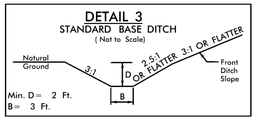


DETAIL 4
SPECIAL DITCH
(Not to Scale)

Type of Liner = CONCRETE

FROM -RAMPC- STA. 11+50 RT TO -RAMPC- STA. 14+60 RT
TIE TO EXISTING AT -RAMPC- STA. 11+50 RT

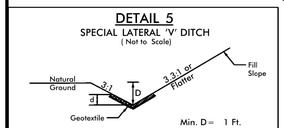
DETAIL 3
STANDARD BASE DITCH
(Not to Scale)



Min. D = 2 Ft.
B = 3 Ft.

FROM -RAMPA- STA. 11+80 LT TO -RAMPA- STA. 13+30 LT

DETAIL 5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner = CL B Rip-Rap
Min. D = 1 Ft.
Max. d = 1 Ft.

FROM -RAMPA- STA. 11+13 LT TO STA. -RAMPA- 11+26 LT

15

15

10

13

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Ramp R

Project No.	Sheet No.
R–5754	Sig. 1.0

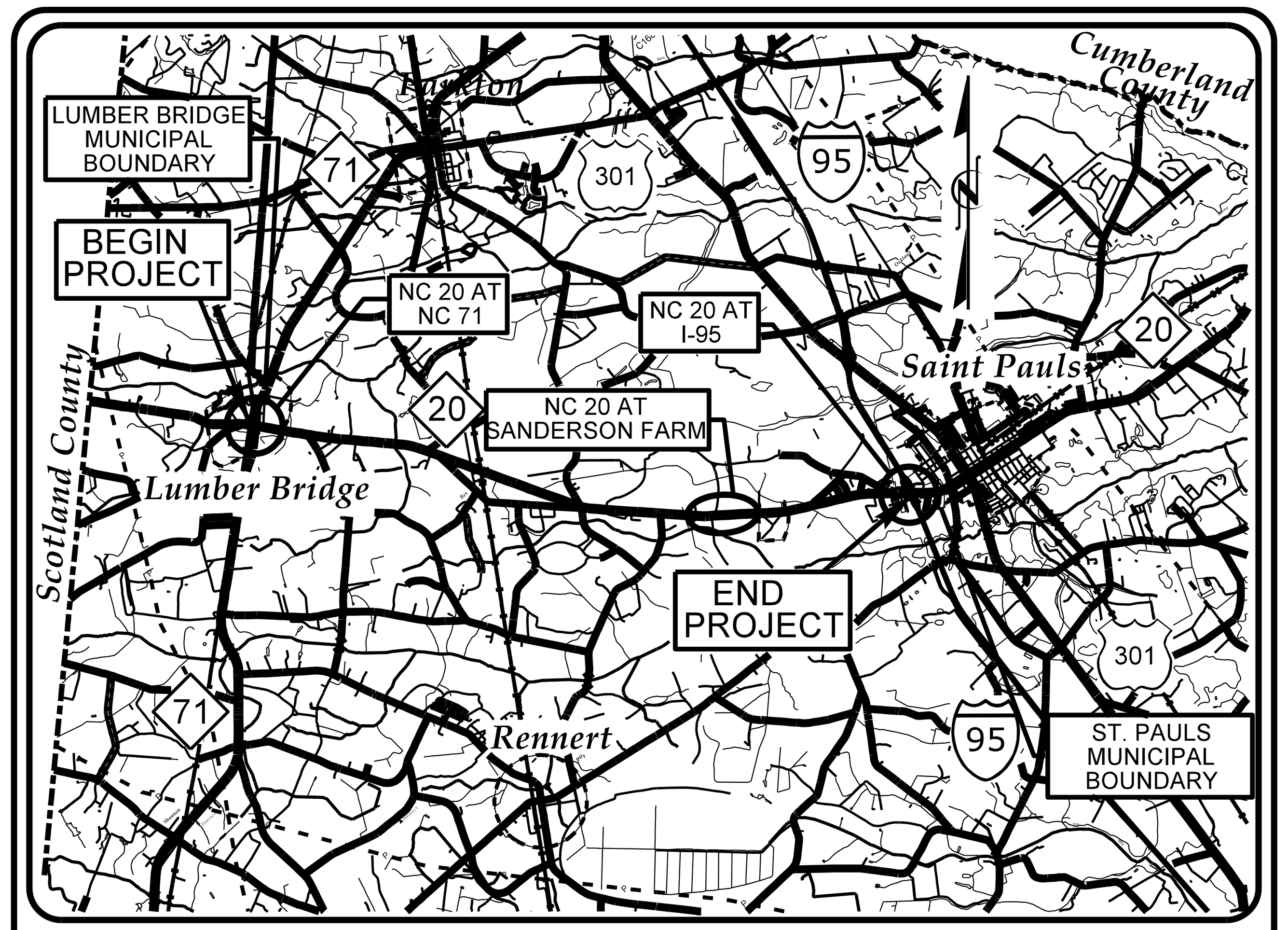
Project: R–5754

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

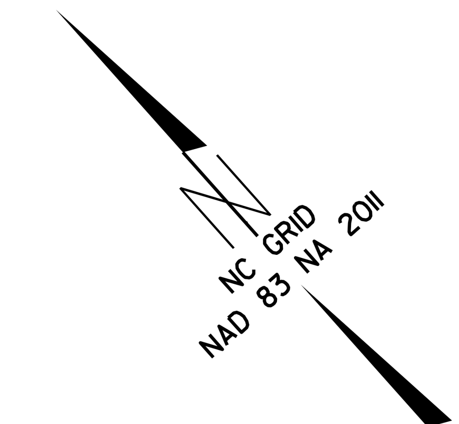
ROBESON COUNTY

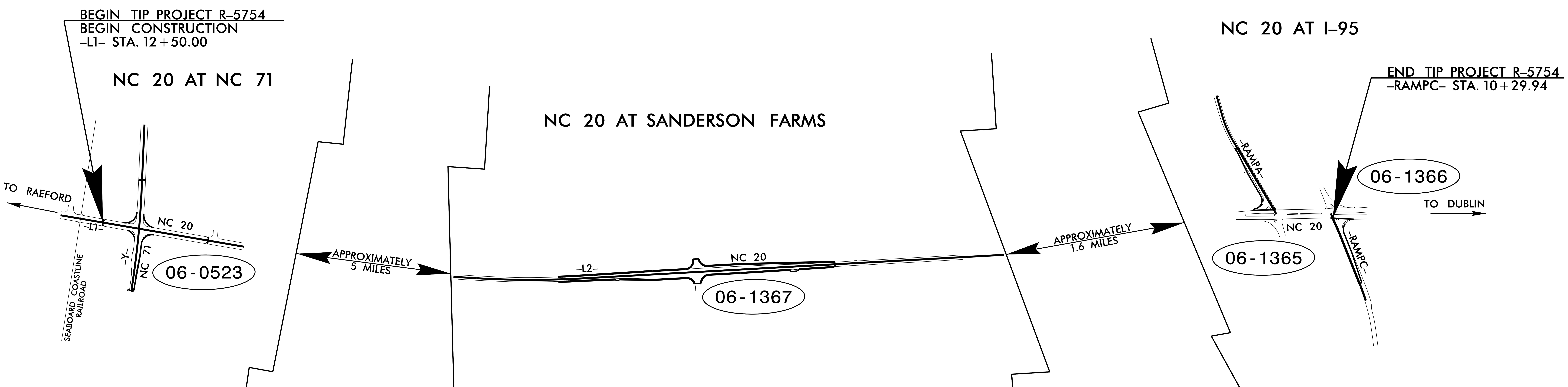
LOCATION: NC 20 AT NC 71, SANDERSON FARMS ON NC 20, AND I–95 AT NC 20

TYPE OF WORK: SIGNALS AND ITS



VICINITY MAP
NOT TO SCALE





Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	N/A	Title Sheet
Sig. 2.0–2.2	06–0523	NC 71 (Fayetteville Street) at NC 20 (Main Street)
Sig. 3.0–3.2	06–1367	NC 20 at Sanderson Farms/Johnson Brothers Asphalt Plant
Sig. 4.0–4.2	06–1365	NC 20 (W Broad St) at I–95 SB Ramps
Sig. 5.0–5.2	06–1366	NC 20 (W Broad St) at I–95 NB Ramps
Sig. M1–M9	N/A	Metal Pole Standard Drawings
ITS 1.0	N/A	NC 20 (W Broad St) at I–95 Ramps Wireless Communication Plan

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Jason P. Galloway, PE – Eastern Region Signals Project Engineer
D. Todd Joyce, PE – Signal Equipment Design Review Engineer
I. Neil Avery – Signal Communications Project Engineer

Prepared in the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

Transportation Mobility and Safety Division · State of North Carolina · Department of Transportation · ITS and Signals Unit

750 N. Greenfield Parkway, Garner, NC 27529

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

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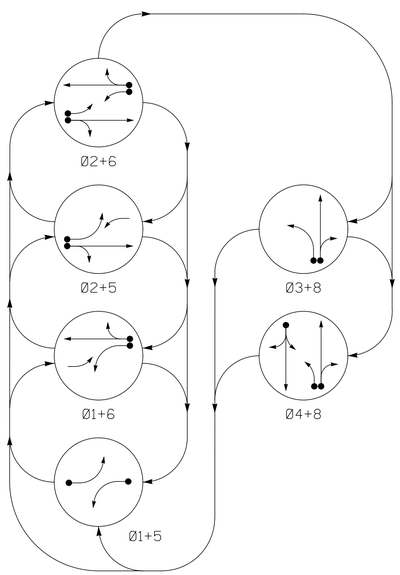
PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+8	Ø4+8	FLASH
11	←	←	~~F Y~~	~~F Y~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←	~~F Y~~	~~R~~
41,42	R	R	R	R	R	G	R
51	←	~~F Y~~	←	~~F Y~~	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	R	Y
81,82	R	R	R	R	G	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

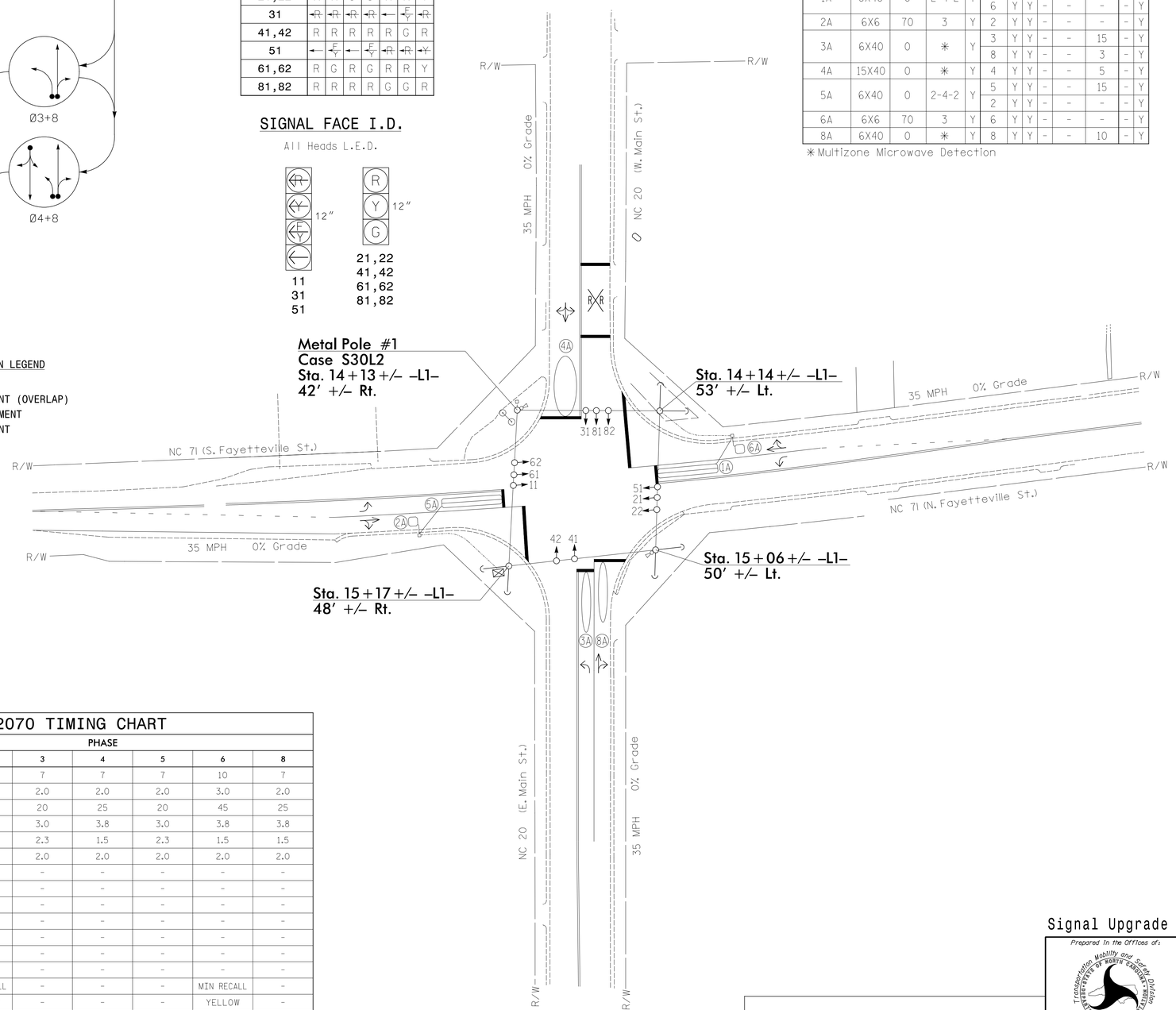
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
2A	6X6	70	3	Y	2	Y	Y	-	-	-	-	Y
3A	6X40	0	✳	Y	3	Y	Y	-	-	15	-	Y
					8	Y	Y	-	-	3	-	Y
4A	15X40	0	✳	Y	4	Y	Y	-	-	5	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
6A	6X6	70	3	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	✳	Y	8	Y	Y	-	-	10	-	Y

✳ Multizone Microwave Detection

6 Phase Fully Actuated (Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or 5 may be lagged.
4. Omit phase 3 during phase 4 on.
5. Set all detector units to presence mode.
6. Locate new cabinet as not to obstruct sight distance of vehicles turning right on red.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Out of Pavement Detector	
	Out of Pavement Detection Zone	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	8
Min Green 1 *	7	10	7	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	2.0	3.0	2.0
Max Green 1 *	20	45	20	25	20	45	25
Yellow Clearance	3.0	3.8	3.0	3.8	3.0	3.8	3.8
Red Clearance	2.3	1.5	2.3	1.5	2.3	1.5	1.5
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 71 (Fayetteville Street) at NC 20 (Main Street)

Division 6 Robeson County Lumber Bridge

PLAN DATE: January 2016 REVIEWED BY: C. Lawson

PREPARED BY: J. Kopaskie REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 029669 ENGINEER JOSEPH B. KOPASKIE

DocuSigned by: Joseph Kopaskie 9CD0EAEF80A4FA... 2/19/2016
SIGNATURE DATE

SIG. INVENTORY NO. 06-0523

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

2/19/2016
G:\Traffic\TIP\R-5754 Division 6 Signals\Traffic\Signals\Design\Signals\SIG_01_06-0523(G)_dgn
jkopaskie

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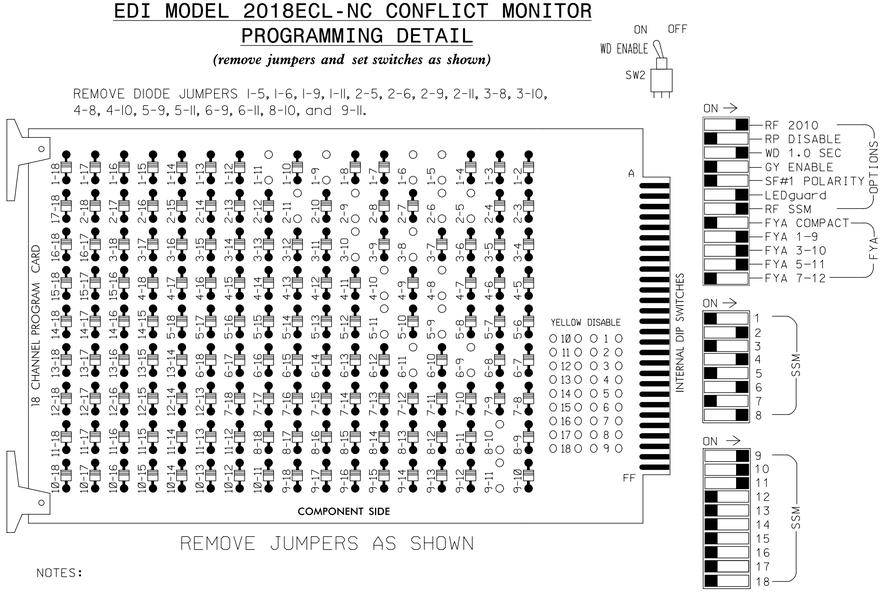
PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 2.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-9, I-11, 2-5, 2-6, 2-9, 2-11, 3-8, 3-10, 4-8, 4-10, 5-9, 5-11, 6-9, 6-11, 8-10, and 9-11.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash and overlaps 1 and 2 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S11
AUX S1,AUX S2,AUX S4.
PHASES USED.....1,2,3,4,5,6,8.
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....5+6
OVERLAP "D".....Not Used

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	31★	41,42	NU	51★	61,62	NU	NU	81,82	NU	11★	31★	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	✳	129		✳	102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127			118			133											
✋																		
🚶																		

NU = Not Used

✳ Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	Ø3 3A ✳	Ø4 4A ✳	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED			NOT USED	NOT USED								ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A ✳	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card.

✳ For Zones 3A, 4A and 8A, install a multizone microwave detector zone for vehicle detection. Perform installation according to manufacturer's direction and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

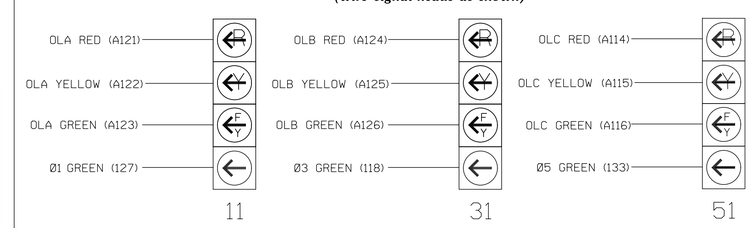
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y	-	-	15
		J4U	48	10	26	6	Y	Y	-	-	-
2A	TB2-5,6	I2U	39	1	2	2	Y	Y	-	-	-
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y	-	-	15
		I4U	47	9	22	2	Y	Y	-	-	-
6A	TB3-5,6	J2U	40	2	6	6	Y	Y	-	-	-

[1] Add jumper from I1-W TO J4-W, on rear of input file.
[2] Add jumper from J1-W TO I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA-PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

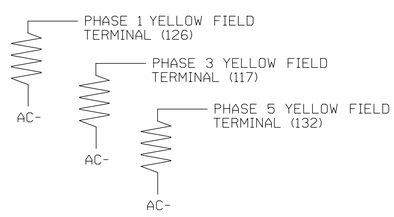


NOTE

1. The sequence display for these signals require special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0523
DESIGNED: January 2016
SEALED: 2/19/2016
REVISED:

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

Signal Upgrade Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of: Transportation Mobility and Safety Division, State of North Carolina, Department of Transportation, Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 71 (Fayetteville Street) at NC 20 (Main Street)

Division 6 Robeson County Lumber Bridge

PLAN DATE: January 2016 REVIEWED BY: J Kopaskie
PREPARED BY: C Lawson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL NORTH CAROLINA PROFESSIONAL SEAL 029669 ENGINEER JOSEPH B. KOPASKIE

DocuSigned by: Joseph Kopaskie 9CD8EAEF80A54FA... 2/19/2016
SIGNATURE DATE

SIG. INVENTORY NO. 06-0523

2/19/2016
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jkopaskie

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PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 2.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8 AND 9.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #1  IS ON
AND RED CLEAR ON PHASE #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #5  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #7  (+/-COMMAND#)
IF  ACTIVE PHASE       #3  IS ON
AND RED CLEAR ON PHASE #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #47 ON
SET OUTPUT  ASSIGNMENT #48 OFF
```

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #8  (+/-COMMAND#)
IF  ACTIVE PHASE       #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #49 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #9  (+/-COMMAND#)
IF  YELLOW ON PHASE    #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #48 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          |12345678910111213141516
VEH OVL PARENTS:|XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
PHASE:          |12345678910111213141516
VEH OVL PARENTS:|  XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          |12345678910111213141516
VEH OVL PARENTS:|    XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1306
DESIGNED: January 2016
SEALED: 2/19/2016
REVISED:

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

Signal Upgrade — Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 71 (Fayetteville Street)
at
NC 20 (Main Street)

Division 6 — Robeson County — Lumber Bridge

PLAN DATE: January 2016 — REVIEWED BY: J Kopaskie
PREPARED BY: C Lawson — REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 029669 ENGINEER JOSEPH B. KOPASKIE

DocuSigned by: Joseph Kopaskie 9CD8EAEF80A54FA... 2/19/2016
SIGNATURE DATE

SIG. INVENTORY NO. 06-0523

2/19/2016
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jkopaskie

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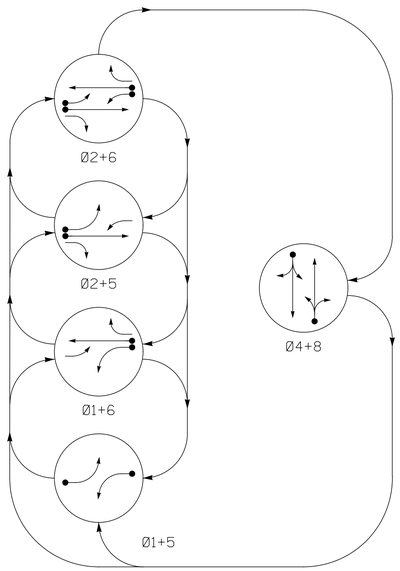
PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 3.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	F Y	F Y	R	Y
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	F Y	←	F Y	R	Y
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

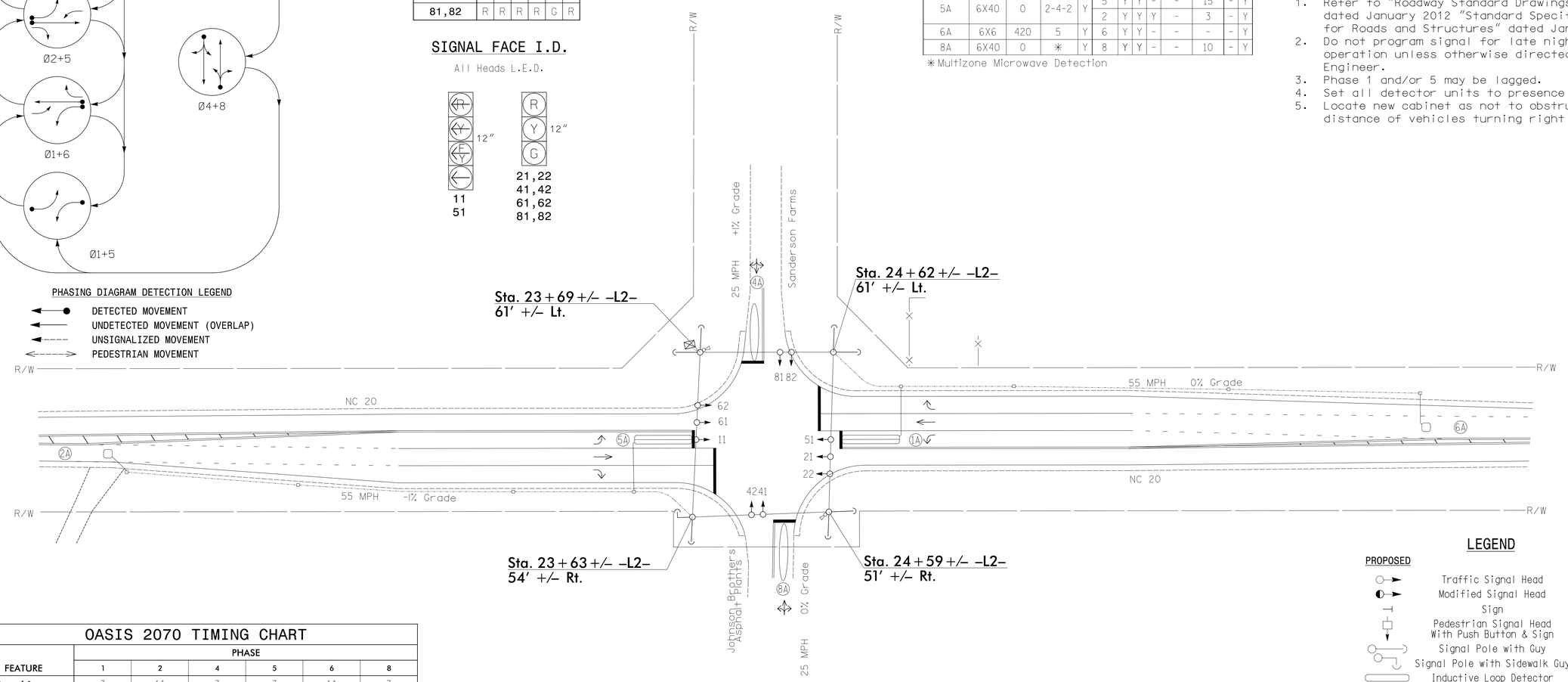
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
					6	Y	Y	Y	-	3	-	Y
2A	6X6	420	5	Y	2	Y	Y	-	-	-	-	Y
4A	6x40	0	*	Y	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
6A	6X6	420	5	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	*	Y	8	Y	Y	-	-	10	-	Y

* Multizone Microwave Detection

5 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet as not to obstruct sight distance of vehicles turning right on red.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Out of Pavement Detector	
	Out of Pavement Detection Zone	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	14	7	7	14	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	90	25	20	90	25
Yellow Clearance	3.0	5.3	3.1	3.0	5.3	3.2
Red Clearance	2.1	1.0	2.4	2.3	1.0	2.5
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	2.5	-
Max Variable Initial *	-	46	-	-	46	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.4	-	-	3.4	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

Prepared In the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

NC 20
at
Sanderson Farms / Johnson Brothers Asphalt Plant

Division 6 Robeson County St. Pauls

PLAN DATE: January 2016 REVIEWED BY: J. Kopaskie
PREPARED BY: C. Lawson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 029669 ENGINEER JOSEPH B. KOPASKIE

DocuSigned by: Joseph Kopaskie
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SIGNATURE 2/19/2016 DATE

SIG. INVENTORY NO. 06-1367

2/19/2016
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JKopaskie

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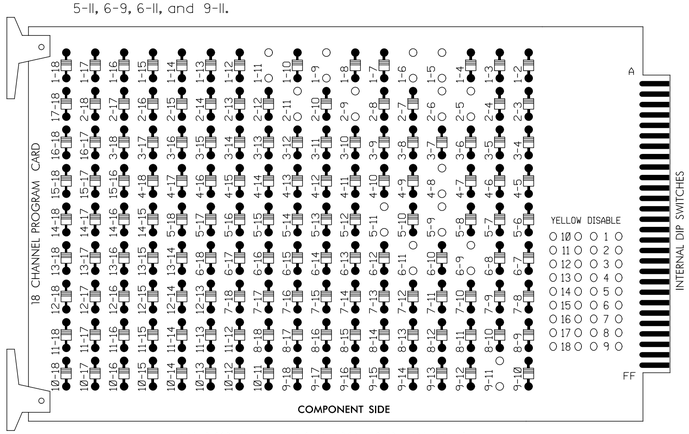
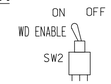
PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 3.1

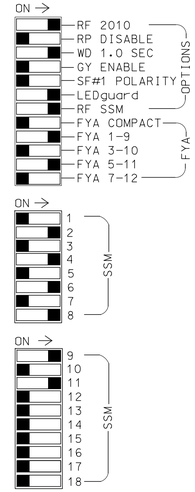
EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9 5-11, 6-9, 6-11, and 9-11.







■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
AUX S1,AUX S4.
PHASES USED.....1,2,4,5,6,8.
OVERLAP "A".....1+2
OVERLAP "B".....Not Used
OVERLAP "C".....5+6
OVERLAP "D".....Not Used

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	51★	61,62	NU	NU	81,82	NU	11★	NU	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	✳	129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133											
✋																		
🚶																		

NU = Not Used

✳ Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A ✳	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED				NOT USED								ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A ✳	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card.

✳ For Zones 4A and 8A, install a multizone microwave detector zone for vehicle detection. Perform installation according to manufacturer's direction and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y	-	-	15
		J4U	48	10	26	6	Y	Y	Y	-	3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y	-	-	-
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y	-	-	15
		I4U	47	9	22	2	Y	Y	Y	-	3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y	-	-	-

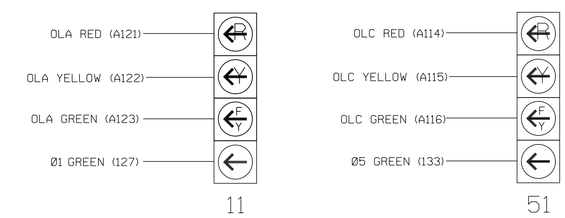
[1] Add jumper from I1-W TO J4-W, on rear of input file.

[2] Add jumper from J1-W TO I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA-PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

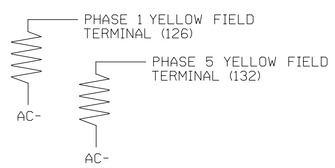


NOTE

1. The sequence display for these signals require special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Ø6-XXXX
DESIGNED: January 2016
SEALED: 2/19/2016
REVISED: N/A

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

New Installation — Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of: Transportation Mobility and Safety Division, Signals Management Section, State of North Carolina Department of Transportation

750 N.Greenfield Pkwy,Garner,NC 27529

NC 20
at
Sanderson Farms /
Johnson Brothers Asphalt Plant

Division 6 — Robeson County — St. Pauls

PLAN DATE: January 2016 — REVIEWED BY: J Kopaskie
PREPARED BY: C Lawson — REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL NORTH CAROLINA PROFESSIONAL SEAL 029669 ENGINEER JOSEPH B. KOPASKIE

DocuSigned by: Joseph Kopaskie 9CD8EAEF80A54FA... 2/19/2016
SIGNATURE — DATE

SIG. INVENTORY NO. 06-1367

2/19/2016
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jkopaskie

DocuSign Envelope ID: 7079E3D4-940C-4509-A3D7-2F200712C838

PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 3.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE        #1  IS ON
AND RED CLEAR ON PHASE  #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE        #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE     #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  ACTIVE PHASE        #5  IS ON
AND RED CLEAR ON PHASE  #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #5  (+/-COMMAND#)
IF  ACTIVE PHASE        #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE     #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          |123456789101112131415 16
VEH OVL PARENTS:|XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          |123456789101112131415 16
VEH OVL PARENTS:|    XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-XXXX
DESIGNED: January 2016
SEALED: 2/19/2016
REVISED: N/A

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
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License: C-2197

New Installation — Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 20
at
Sanderson Farms /
Johnson Brothers Asphalt Plant

Division 6 — Robeson County — St. Pauls

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

PLAN DATE:	January 2016	REVIEWED BY:	J Kopaskie
PREPARED BY:	C Lawson	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 029669 ENGINEER JOSEPH B. KOPASKIE

DocuSigned by: Joseph Kopaskie
9CDEEAEF80A54FA...
SIGNATURE — DATE 2/19/2016

SIG. INVENTORY NO. 06-1367

2/19/2016
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jkopaskie

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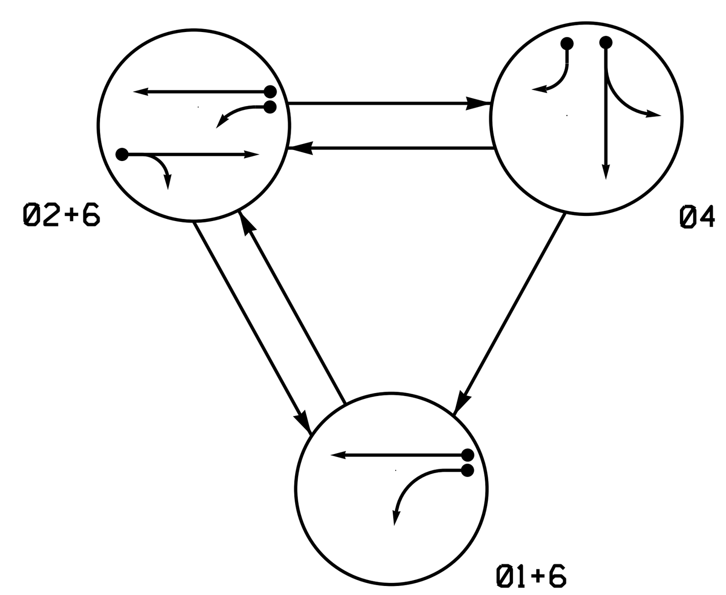
PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 4.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

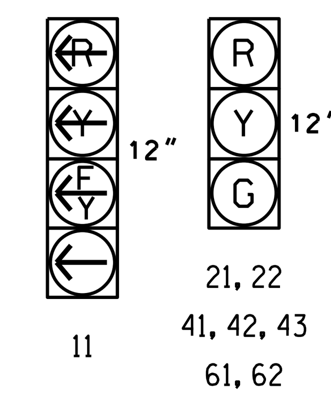
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø4	FLASH
11	←	F/Y (flashing yellow arrow)	R (red arrow)	Y (yellow arrow)
21, 22	R	G	R	Y
41, 42, 43	R	R	G	R
61, 62	G	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
2A/S4	6X6	70	3	Y	2	Y	Y	-	-	-	Y	Y
4A	6X40	0	✳	Y	4	Y	Y	-	-	-	-	✳
4B	10X40	0	✳	Y	4	Y	Y	-	-	15	-	✳
6A/S7	6X6	70	4	Y	6	Y	Y	-	-	-	Y	Y

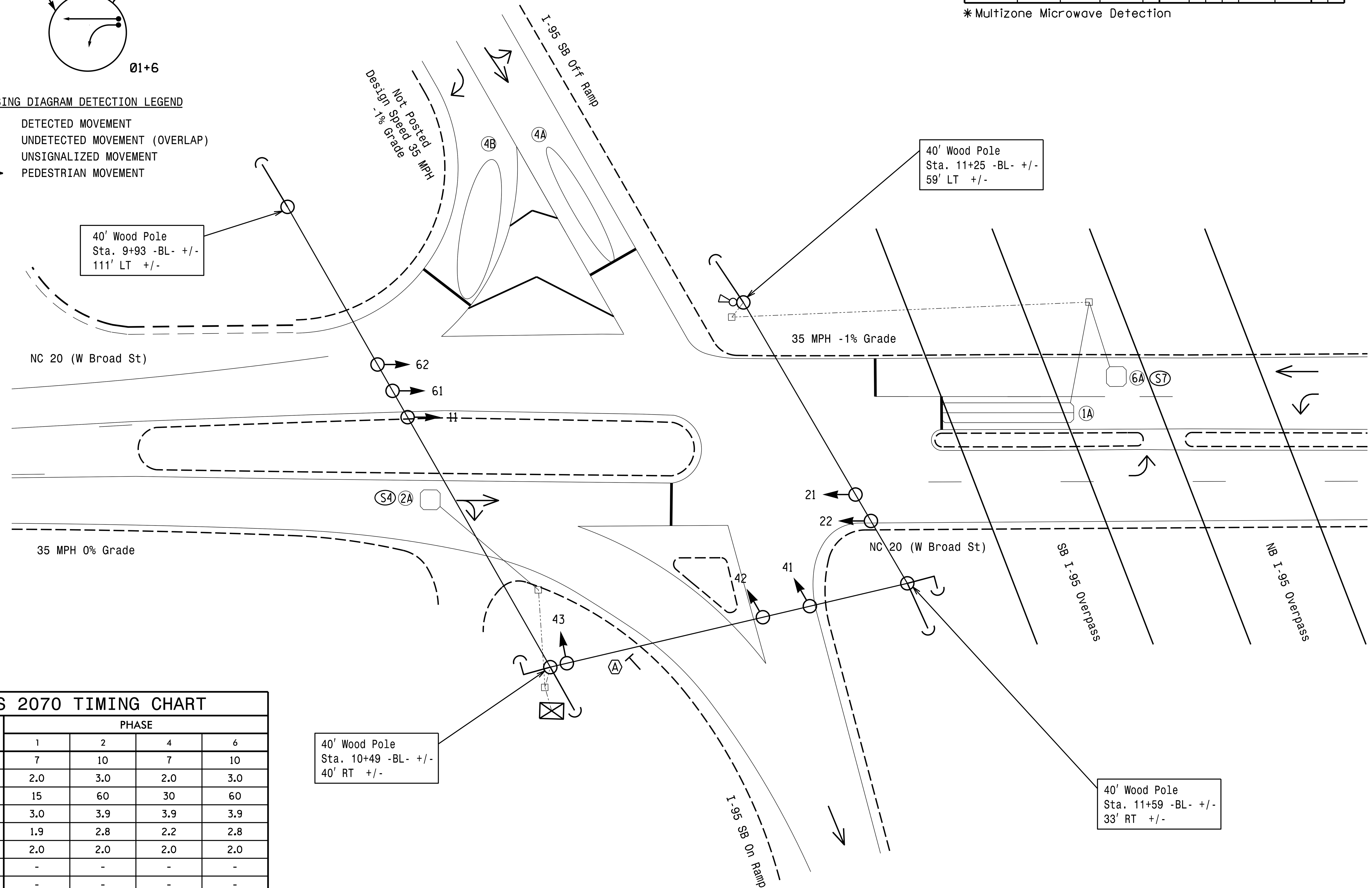
(INDUCTIVE LOOPS: LOOP through NEW LOOP; DETECTOR PROGRAMMING: PHASE through DELAY TIME)

✳ Multizone Microwave Detection

3 Phase
Fully Actuated
NC 20 (Broad St) Closed Loop System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset #1365.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Multizone Microwave Detector	
	Microwave Detection Zone	
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	6
Min Green 1 *	7	10	7	10
Extension 1 *	2.0	3.0	2.0	3.0
Max Green 1 *	15	60	30	60
Yellow Clearance	3.0	3.9	3.9	3.9
Red Clearance	1.9	2.8	2.2	2.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

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

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of: Transportation Mobility and Safety Division, Signal Design Section, State of North Carolina Department of Transportation
750 N.Greenfield Pkwy.Garner.NC 27529

SCALE 0 20
1" = 20'

NC 20 (W Broad St)
at
I-95 SB Ramps

Division 6	Robeson County	St. Pauls
PLAN DATE: January 2016	REVIEWED BY: C.L. Kalencik	
PREPARED BY: S.W.C.	REVIEWED BY:	

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 040715 ENGINEER COURTNEY L. KALENCIK

DocuSigned by: Courtney L. Kalencik
0FE9158CE2B64FE...
2/19/2016

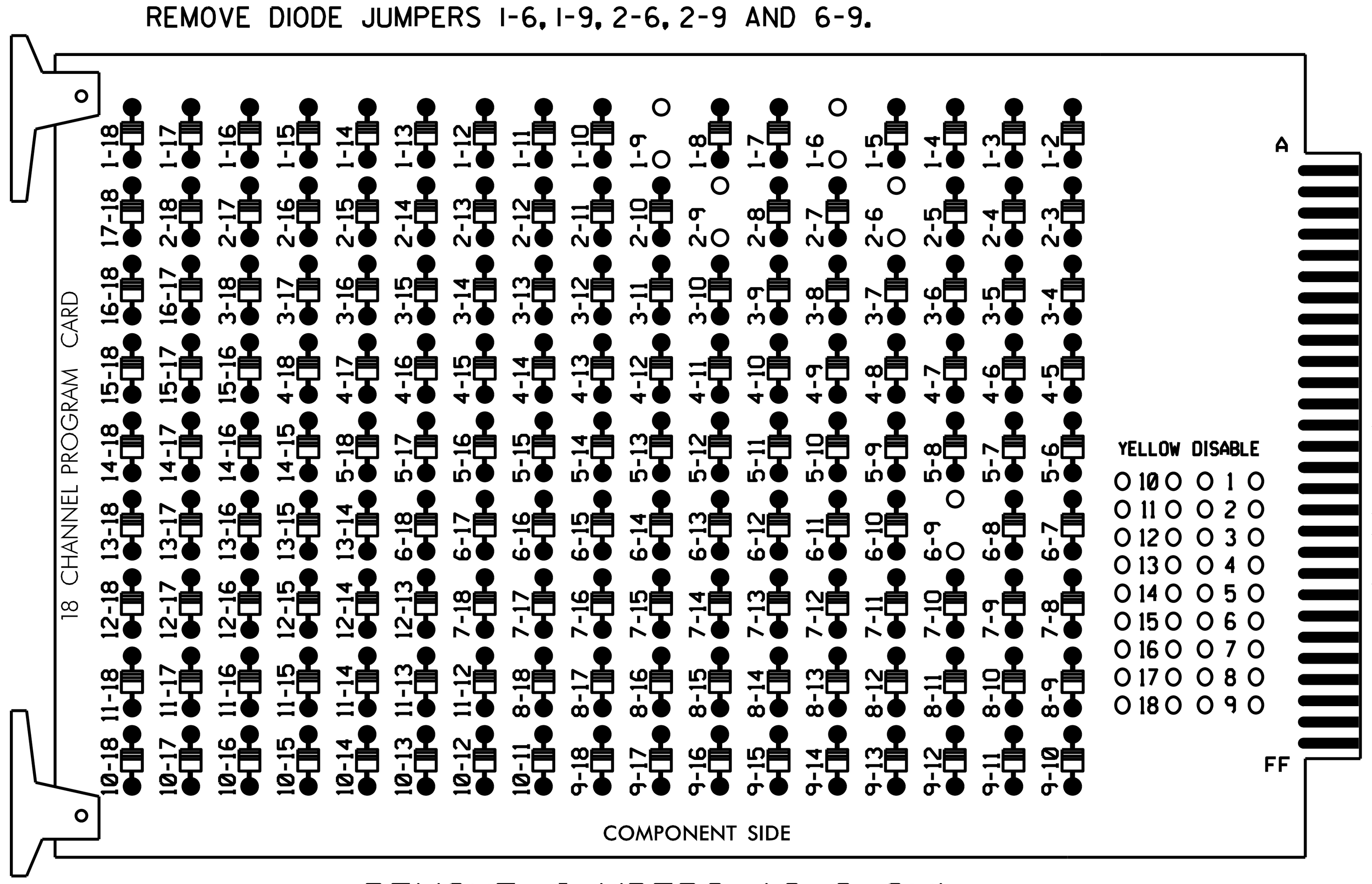
SIG. INVENTORY NO. 06-1365

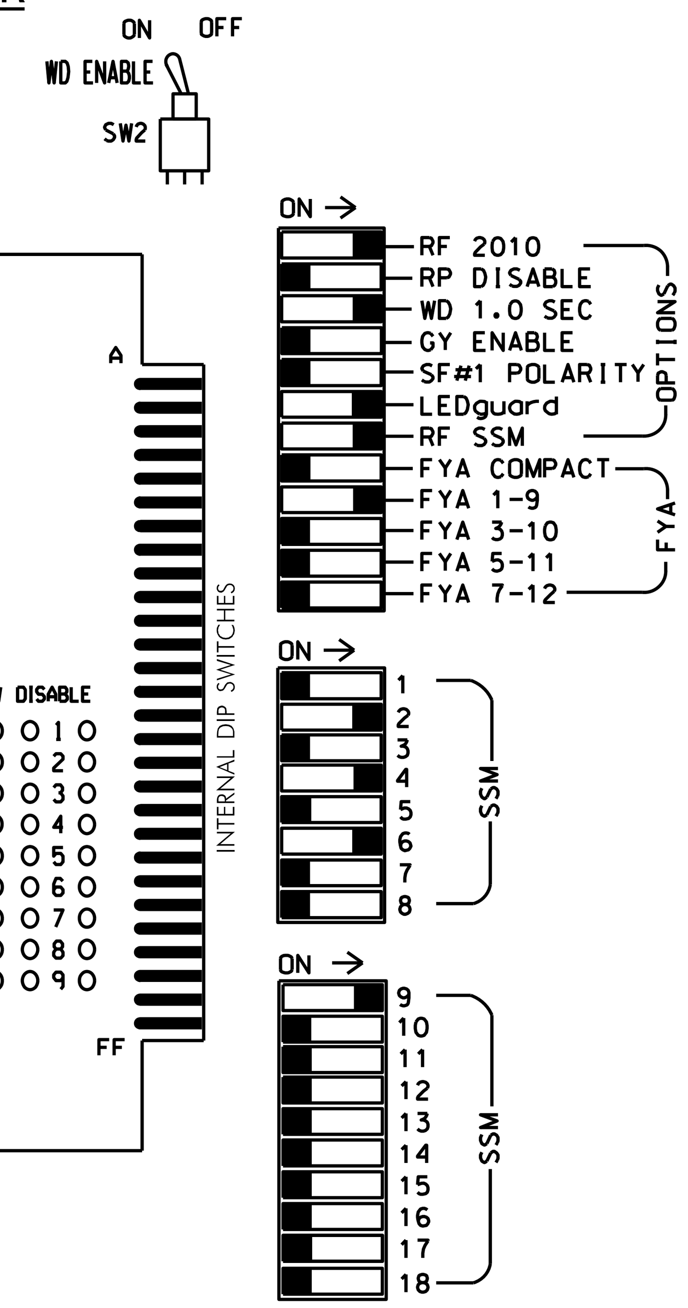
DocuSign Envelope ID: 9FAF4EC8-67DF-46C6-9871-54B9972E3B8B

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 2-6, 2-9 AND 6-9.





■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
5. The cabinet and controller are part of the NC 20 (Broad St) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER..............2070
CABINET.................332 /W/ AUX
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S1,S2,S5,S8,AUX S1
PHASES USED.............1,2,4,6
OVERLAP "A".............1+2
OVERLAP "B".............NONE
OVERLAP "C".............NONE
OVERLAP "D".............NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42,43	NU	NU	61,62	NU	NU	NU	NU	11★	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	✻	129			102			135										
GREEN		130			103			136										
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	
(hand)																		
(walk)																		

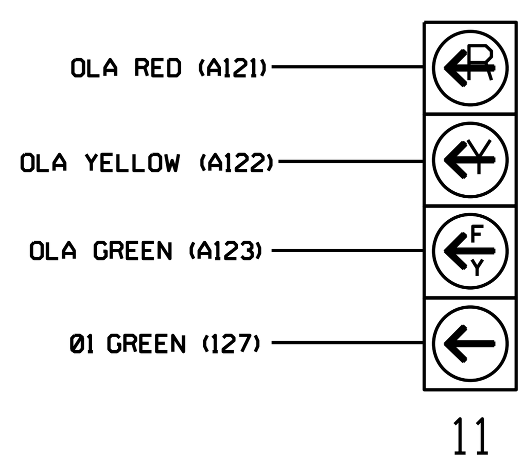
NU = Not Used

✻ Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail below.

FYA-PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

1. The sequence display for this signal requires special logic programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø2/SYS 2A/S4	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4-4A MULTIZONE MICROWAVE DETECTION SYSTEM ✻ Ø4-4B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED												ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6/SYS 6A/S7	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A/S4	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
6A/S7	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			

[1] Add jumper from I1-W to J4-W, on rear of input file.

✻ MULTIZONE MICROWAVE DETECTION SYSTEM

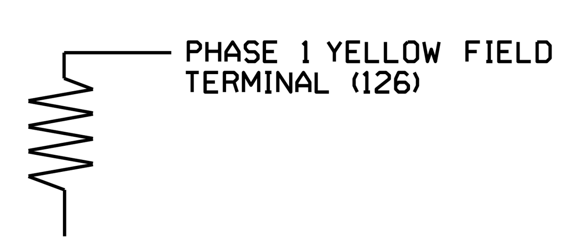
For Zones 4A and 4B:
Install a multizone microwave detection zone for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365
DESIGNED: January 2016
SEALED: 02/19/2016
REVISED:

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

New Signal Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of: Transportation Mobility and Safety Division, Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 20 (W Broad St)
at
I-95 SB Ramps

Division 6 Robeson County St. Pauls

PLAN DATE: January 2016	REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton, P.E.
40FF8AC430BD40F...
2/29/2016

SIGNATURE DATE

SIG. INVENTORY NO. 06-1365

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

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LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE      #1  IS ON
AND RED CLEAR ON PHASE #1  IS ON

        SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE      #1  IS ON

        SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE   #1  IS ON

        SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:         |12345678910111213141516
VEH OVL PARENTS:|XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365
DESIGNED: January 2016
SEALED: 02/19/2016
REVISED:

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

New Signal Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of: Transportation Mobility and Safety Division, State of North Carolina Department of Transportation, Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 20 (W Broad St)
at
I-95 SB Ramps

Division 6 Robeson County St. Pauls

PLAN DATE: January 2016	REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton, P.E.
40FF8AC430BD40F... 2/29/2016
SIGNATURE DATE

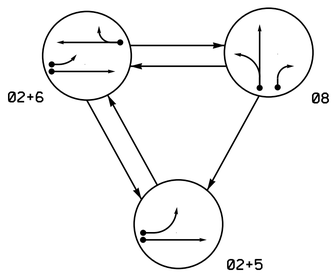
SIG. INVENTORY NO. 06-1365

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

DocuSign Envelope ID: 24D4F87F-445D-4003-A6CC-6EFF27BA9E0D

PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 5.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

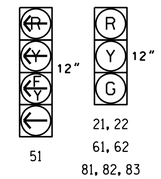
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 08	FLASH
21, 22	G	G	R	Y
51	—	F Y	R	Y
61, 62	R	G	R	Y
81, 82, 83	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

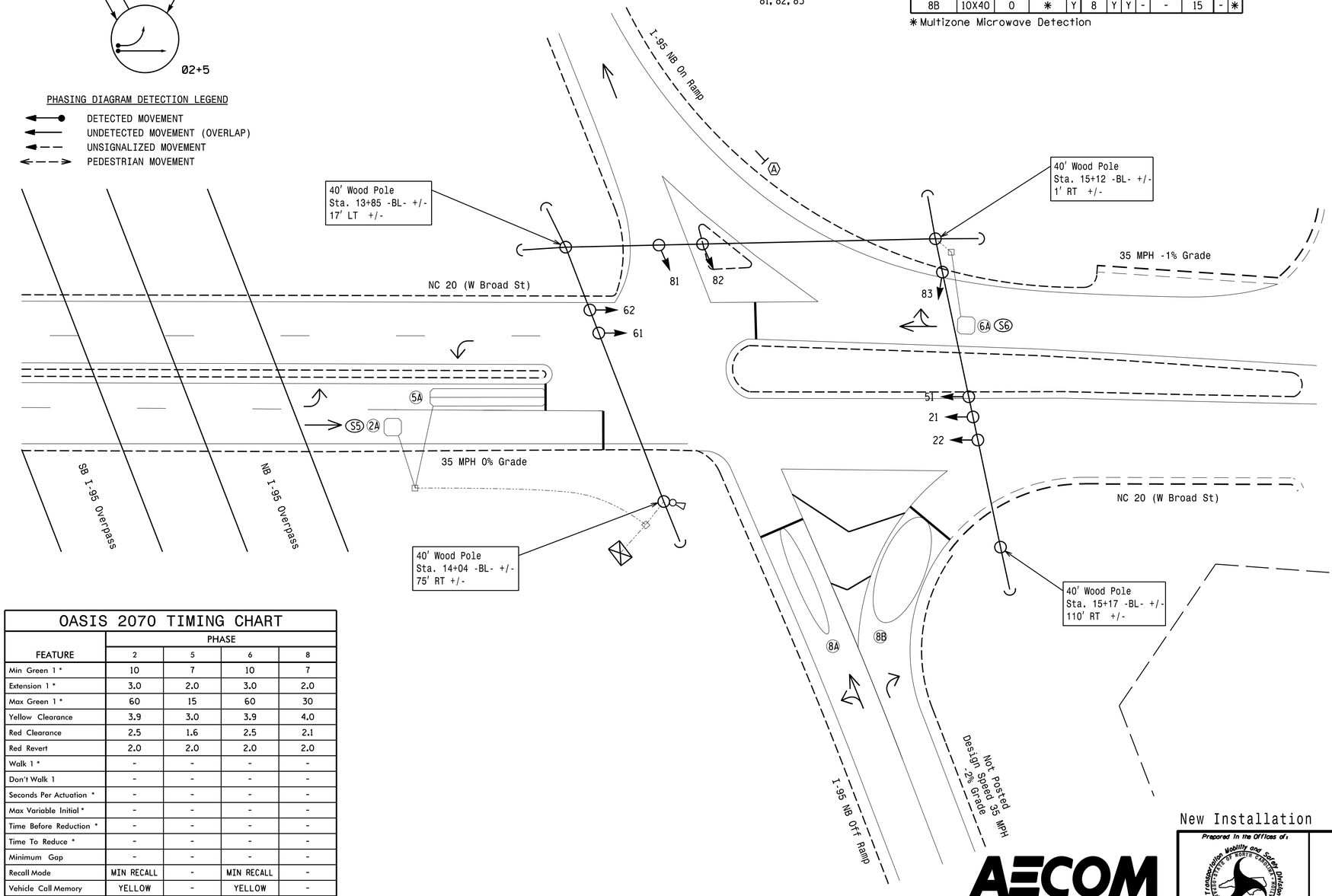
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S5	6X6	70	3	Y	2	Y	Y	-	-	-	Y	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
6A/S6	6X6	70	4	Y	6	Y	Y	-	-	-	Y	Y
8A	6X40	0	*	Y	8	Y	Y	-	-	-	-	*
8B	10X40	0	*	Y	8	Y	Y	-	-	15	-	*

*Multizone Microwave Detection

3 Phase
Fully Actuated
NC 20 (Broad St) Closed Loop System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset #1366.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Multizone Microwave Detector	
	Microwave Detection Zone	
	"YIELD" Sign (R1-2)	

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	60	15	60	30
Yellow Clearance	3.9	3.0	3.9	4.0
Red Clearance	2.5	1.6	2.5	2.1
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

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

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NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

New Installation

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Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 20 (W Broad St)
at
I-95 NB Ramps

Division 6 Robeson County St. Pauls

PLAN DATE:	January 2016	REVIEWED BY:	C.L. Kalencik
PREPARED BY:	S.W.C.	REVIEWED BY:	

SCALE 0 20 1" = 20'

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 040715 ENGINEER CORTNEY L. KALENCIK

DocuSigned by: Courtney L. Kalencik
0FE9158CE2864FE... 2/19/2016

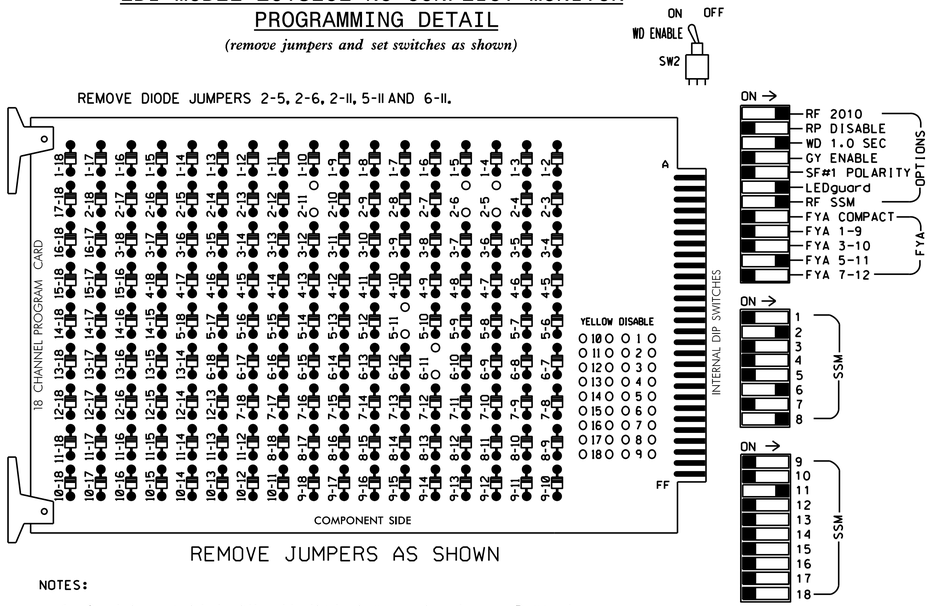
SIG. INVENTORY NO. 06-1366

DocuSign Envelope ID: 9FAF4EC8-67DF-46C6-9871-54B9972E3B8B

PROJECT REFERENCE NO.	SHEET NO.
R-5754	Sig. 5.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the NC 20 (Broad St) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S7,S8,S11,AUX S4
PHASES USED.....2,5,6,8
OVERLAP "A".....NONE
OVERLAP "B".....NONE
OVERLAP "C".....5+6
OVERLAP "D".....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51★	61,62	NU	NU	81,82, 83	NU	NU	NU	NU	51★	NU	NU
RED		128						134			107							
YELLOW		129					✱	135			108							
GREEN		130						136			109							
RED ARROW																A114		
YELLOW ARROW																A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW							133											
✋																		
🚶																		

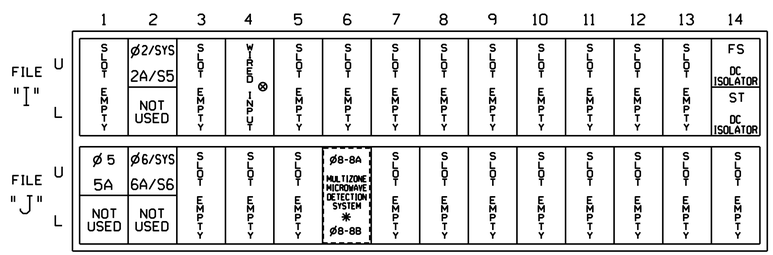
NU = Not Used

✱ Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S5	TB2-5,6	12U	39	1	2	2/SYS	Y	Y			
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	14U	47	9	22	2	Y	Y			
6A/S6	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			

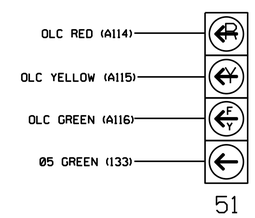
[1]Add jumper from J1-W to 14-W, on rear of input file.

✱ MULTIZONE MICROWAVE DETECTION SYSTEM

For Zones 8A and 8B:
Install a multizone microwave detection zone for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.

FYA-PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

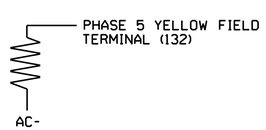
1. The sequence display for this signal requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1366
DESIGNED: January 2016
SEALED: 02/19/2016
REVISED:

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

New Signal Electrical Detail - Sheet 1 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of: Transportation Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section, State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

NC 20 (W Broad St)
at
I-95 NB Ramps

Division 6 Robeson County St. Pauls

PLAN DATE:	January 2016	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton, P.E.
40FF8AC430BD40F...
2/29/2016
SIGNATURE DATE

SIG. INVENTORY NO. 06-1366

$$$$$SYSTIME$$$$$
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$$$$$USERNAME$$$$$

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LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF   ACTIVE PHASE        #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF   ACTIVE PHASE        #5  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
  LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF   YELLOW ON PHASE     #5  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

PRESS '+'

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE.

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS:|     XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
-----------------------------------------
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH (arrow pointing to FLASH COLORS line)

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1366
DESIGNED: January 2016
SEALED: 02/19/2016
REVISED:

New Signal   Electrical Detail - Sheet 2 of 2

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AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of: Transportation Mobility and Safety Division — State of North Carolina Department of Transportation — Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

NC 20 (W Broad St)
at
I-95 NB Ramps

Division 6 Robeson County St. Pauls

PLAN DATE: January 2016	REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton, P.E.
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2/29/2016

SIGNATURE DATE

SIG. INVENTORY NO. 06-1366

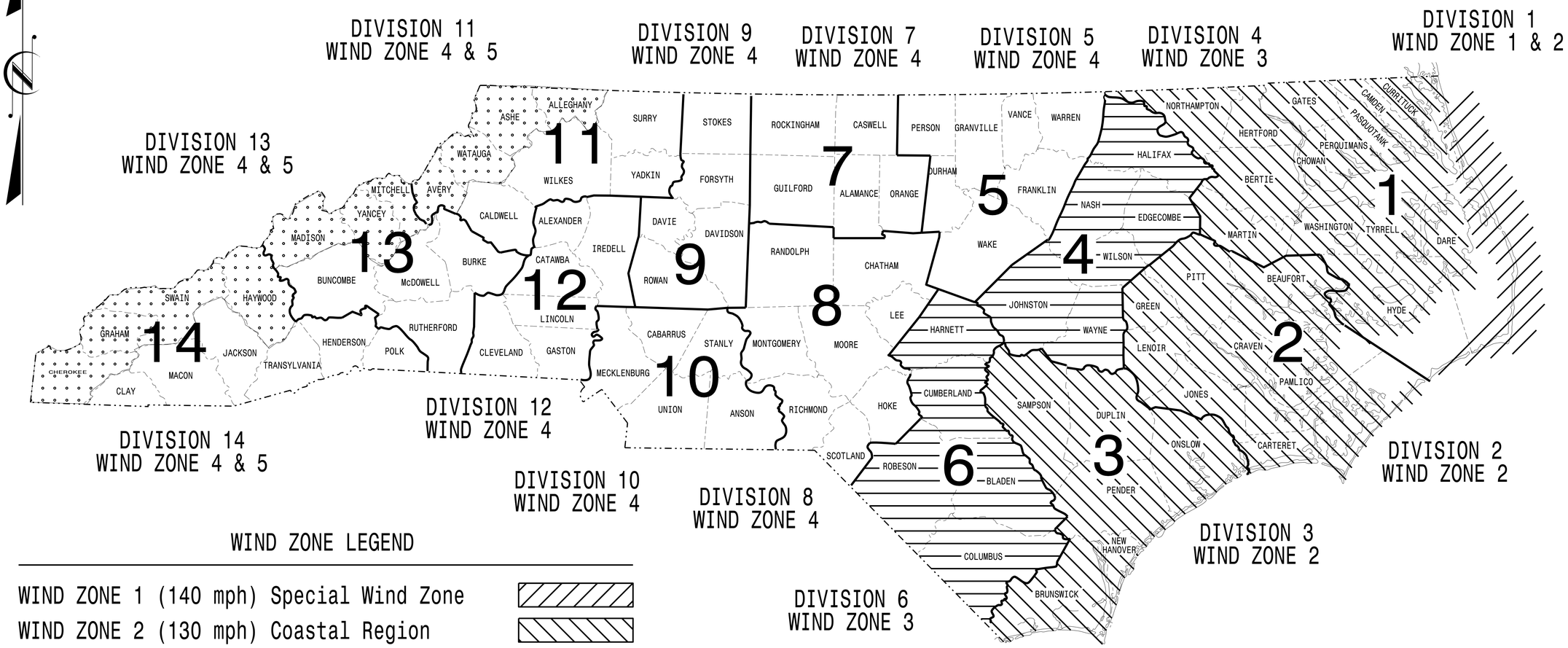
$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT NO.	SHEET NO.
	Sig. M1

NCDOT METAL POLE STANDARDS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR METAL POLES



WIND ZONE LEGEND

- WIND ZONE 1 (140 mph) Special Wind Zone
- WIND ZONE 2 (130 mph) Coastal Region
- WIND ZONE 3 (110 mph) Eastern Region
- WIND ZONE 4 (90 mph) Central & Mtn. Region
- WIND ZONE 5 (120 mph) Special Wind Zone

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

Prepared in the Offices of:

Transportation Mobility and Safety Division
Signal Design Section
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy.Garner.NC 27529

Designed in conformance with the latest 2012 Interim to the 5th Edition 2009

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminares, and Traffic Signals

INDEX OF PLANS

DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details – All Poles
M 3	Fabrication Details – Strain Poles
M 4,5	Fabrication Details – Mast Arm Poles
M 6	Construction Details – Strain Poles
M 7	Construction Details – Foundations
M 8,9	Standard Strain Pole Foundations

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

G. A. FULLER, P.E. – STATE ITS AND SIGNALS ENGINEER

G. G. MURR, JR., P.E. – STATE SIGNALS ENGINEER

D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

C.F. ANDREWS – ITS AND SIGNALS JOURNEY STRUCTURAL ENGINEER

SEAL

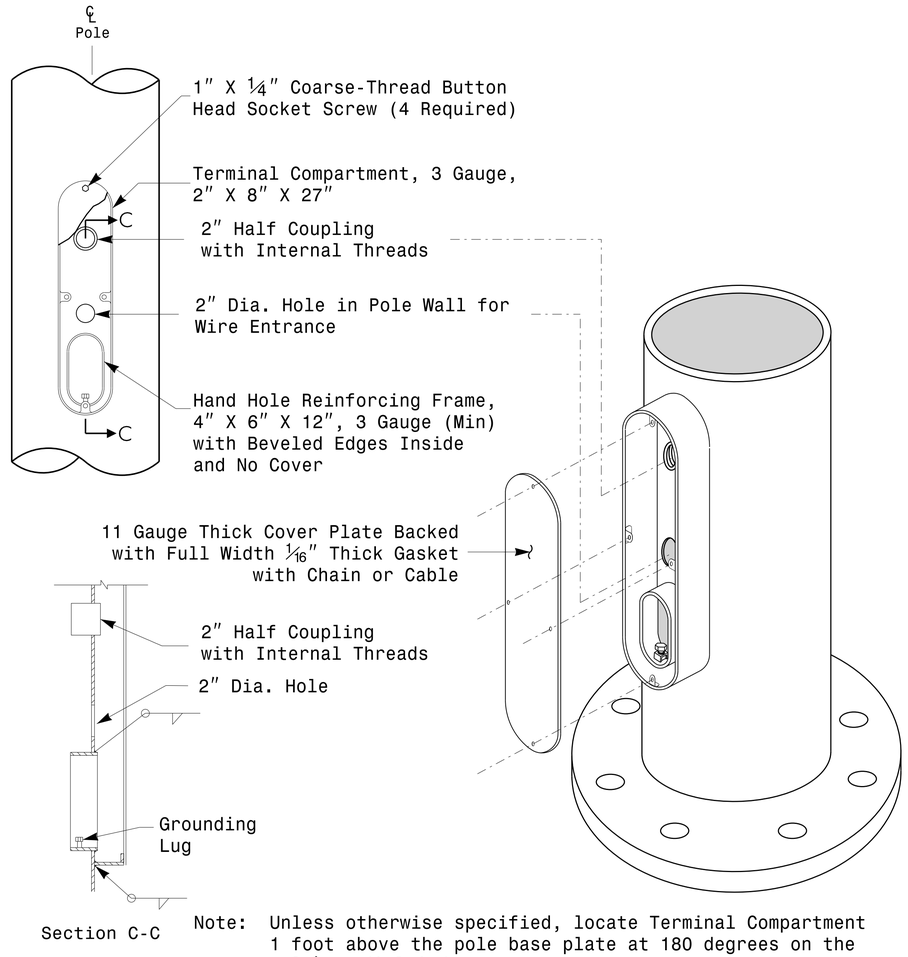
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44E8E32E147E4C4...

8/26/2014

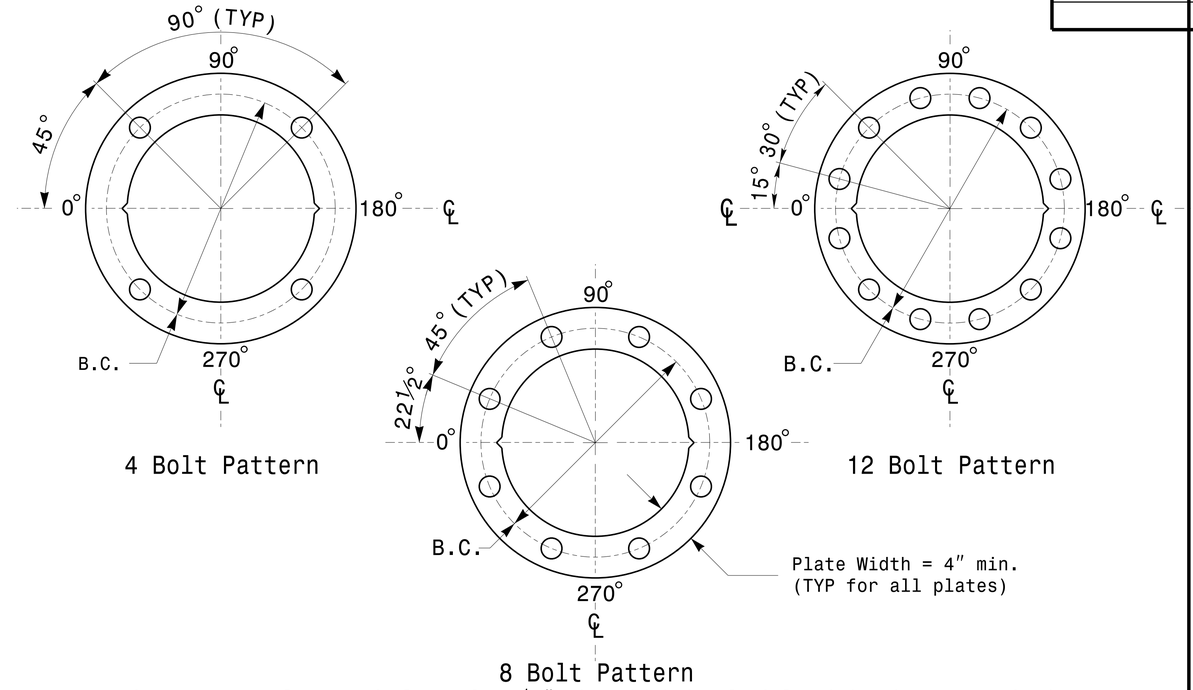
DATE

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M2



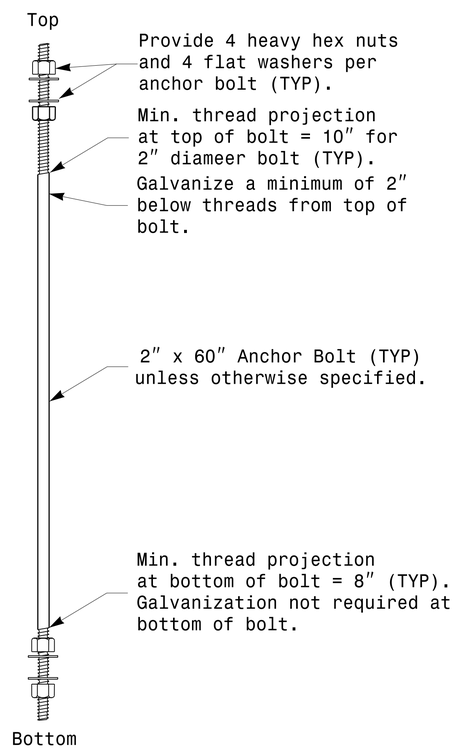
Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail



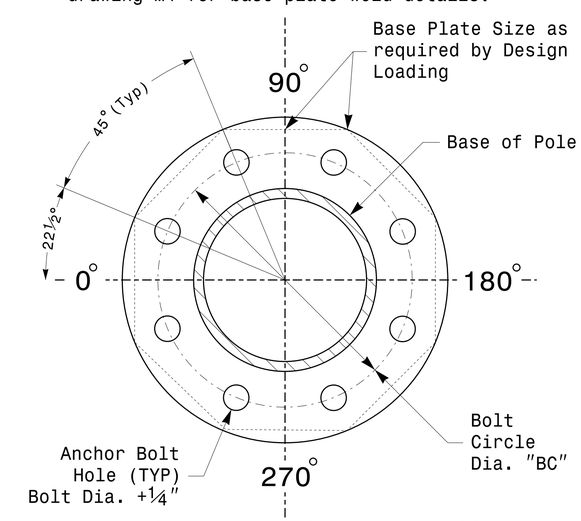
Construct Templates and Plates from ¼″ min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details



Anchor Bolt Detail

Note: See Strain Pole drawing M3 and Mast arm drawing M4 for base plate weld details.



8 Bolt Base Plate Detail

MFG _____	MFG. DATE: MM/YY
SHAFT D/T/L/Y	----/----/----/----
ARM-A D/T/L/Y	----/----/----/----
	----/----/----/----
ARM-B D/T/L/Y	----/----/----/----
	----/----/----/----
A.B. DIA./B.C./L/Y	----/----/----/----
NCDOT STANDARD	----------

Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

MFG _____	MFG. DATE: MM/YY
SECTION D/T/L/Y	----/----/----/----
NCDOT STANDARD	----------

Arm I.D. Tag
(Provide on each section of a multi-section mast arm)

Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for pole I.D. number and Signal Inv. Number.
5) See drawing M4 for mounting positions of I.D. tags.

Identification Tag Details

Fabrication Details – All Poles

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

Typical Fabrication Details Common To All Metal Poles

PLAN DATE: AUGUST 2013	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR

SCALE 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

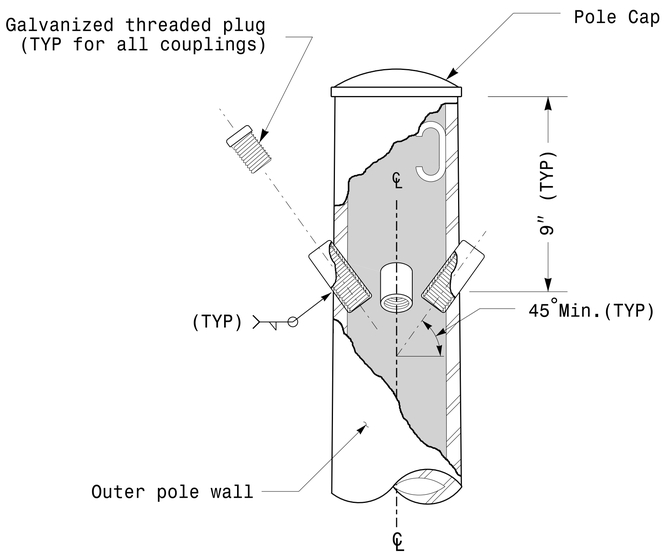
DocuSigned by: Debesh C. Sarkar 44EBE32E147E4C4... 8/26/2014 DATE

SIG. INVENTORY NO.

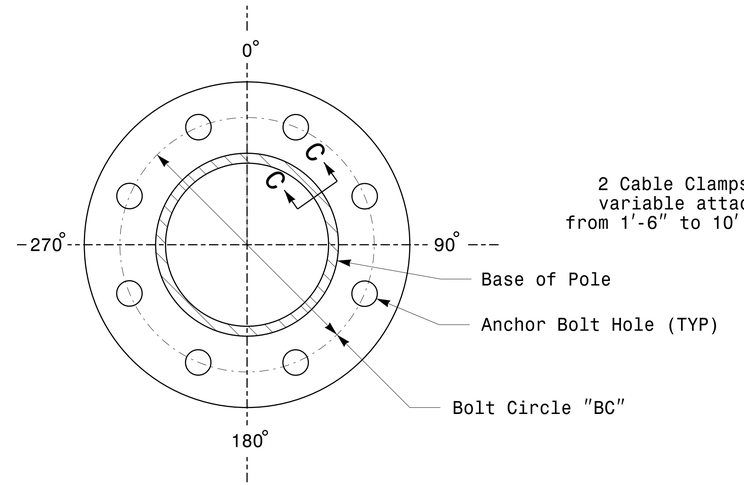
26-AUG-2014 09:55
S:*HTS\SDW\TIS\Signals\Signal Design Section\Eastern Region\M Sheets\2012_M2_Fab Details All Poles.dgn
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M3

Fabrication Details – Strain Poles



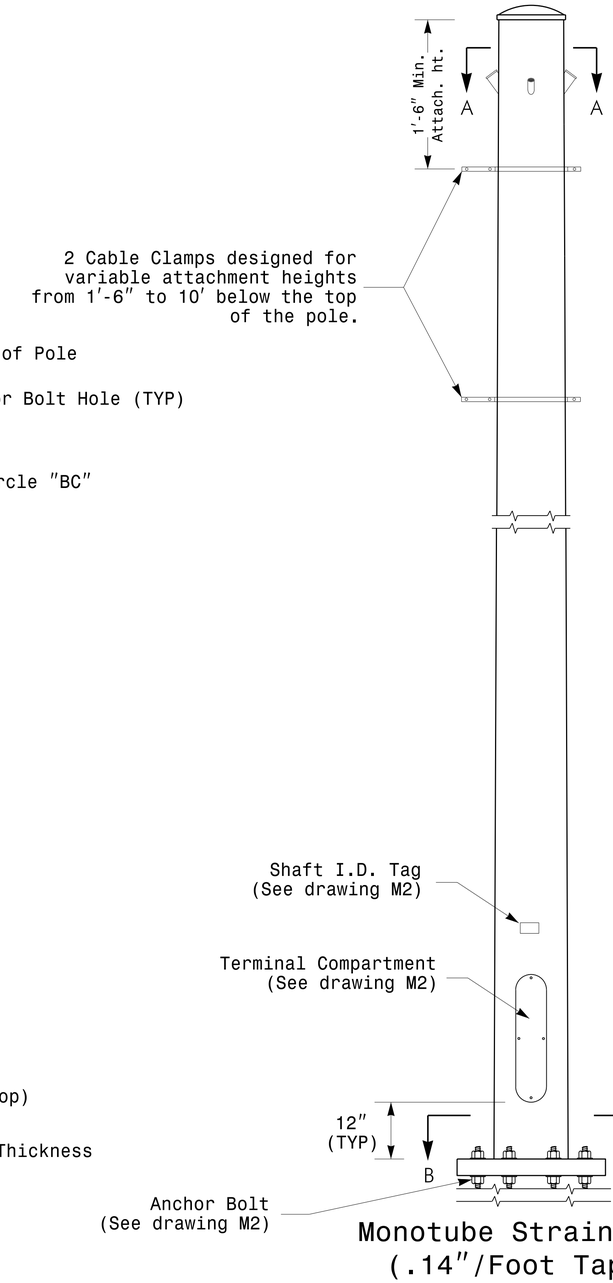
Cable Entrances at Top of Pole



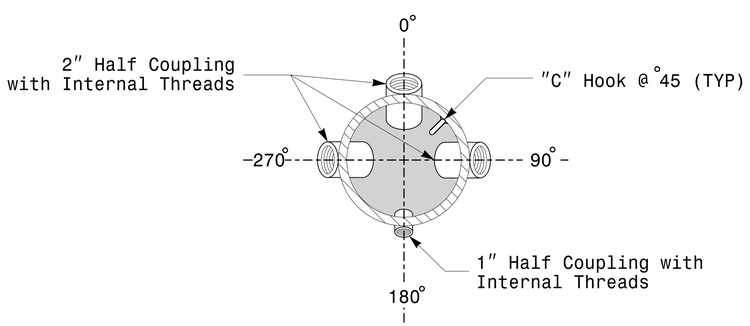
Section B-B

(See drawing M2)

Pole Base Plate

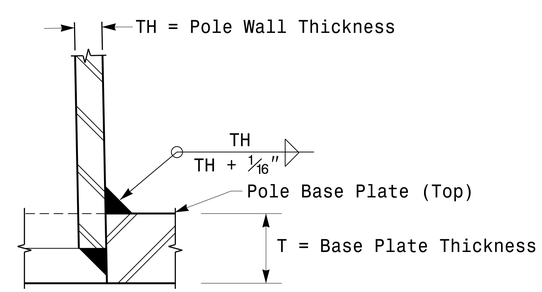


Monotube Strain Pole
(.14″/Foot Taper)



Section A-A

Radial Orientation for Factory Installed Accessories at Top of Pole



Section C-C

Socket Connection Weld Detail

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

Typical Fabrication Details
For Strain Poles

PLAN DATE:	AUGUST 2013	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE3E147E4C4... 8/26/2014
DATE

SIG. INVENTORY NO.

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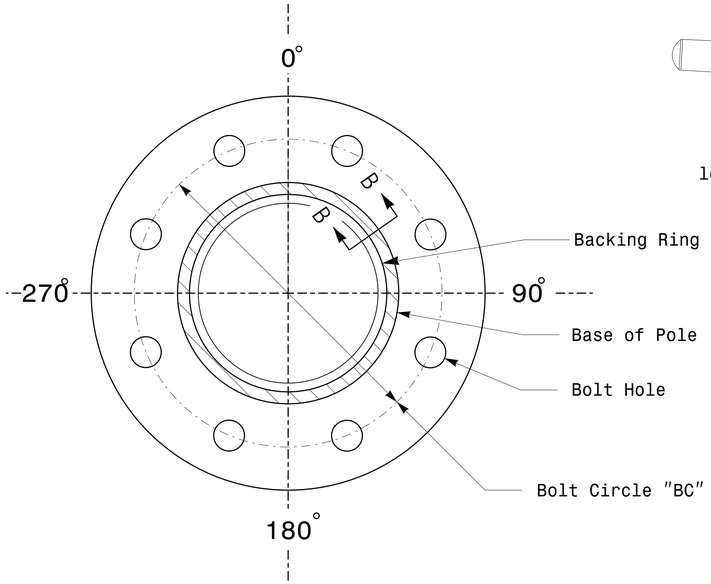
jgallaway

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M4

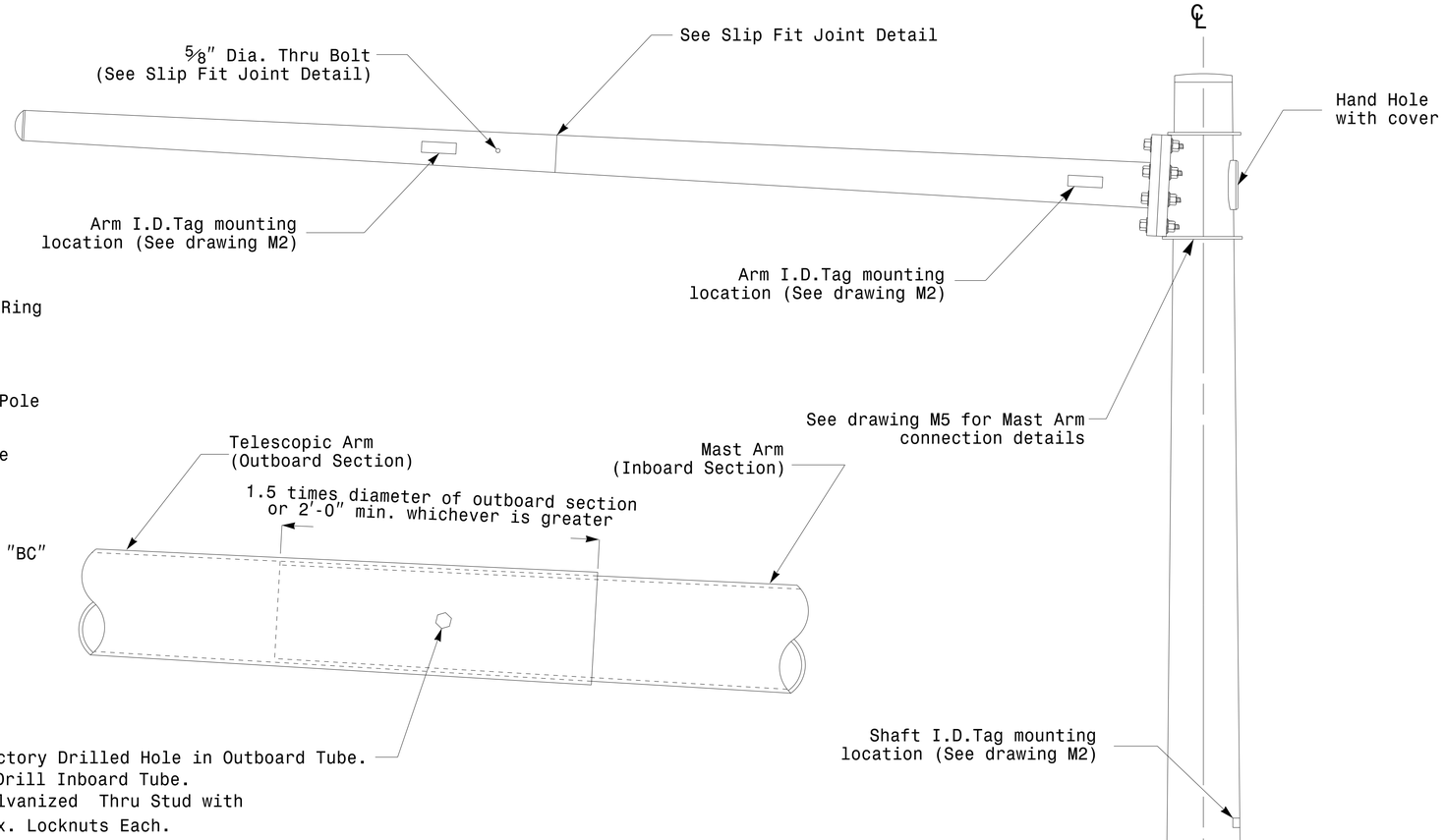
Fabrication Details – Mast Arm Poles



Section A-A

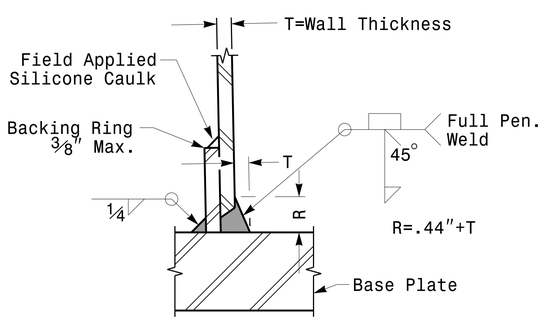
(See drawing M 2)

Pole Base Plate



Slip Fit Joint Detail for Mast Arm

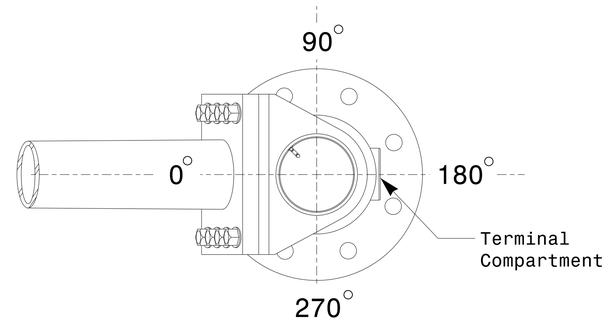
Monotube Mast Arm Pole
(.14in./ft. taper)



Section B-B

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

Typical Fabrication Details
for Mast Arm Poles

PLAN DATE:	AUGUST 2013	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE3E147E4C4... 8/26/2014
DATE

SIG. INVENTORY NO.

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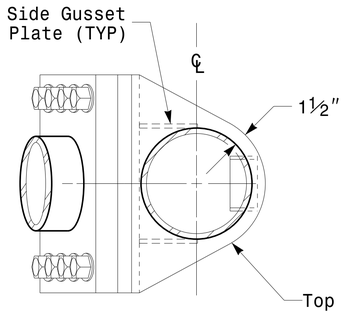
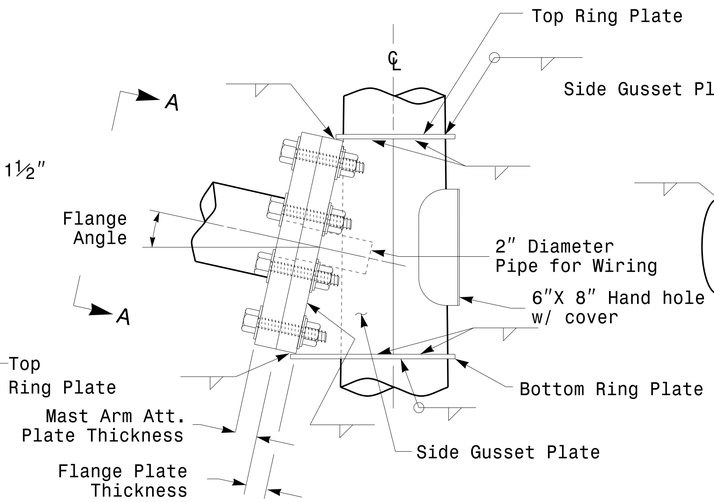
jgallaway

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M5

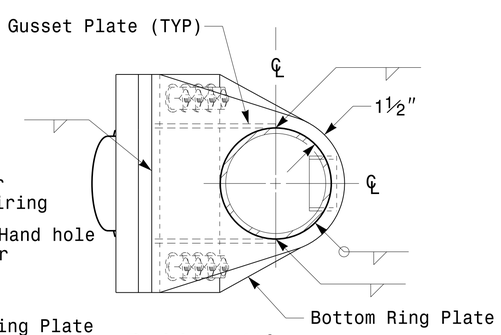
Welded Ring Stiffened Mast Arm Connection



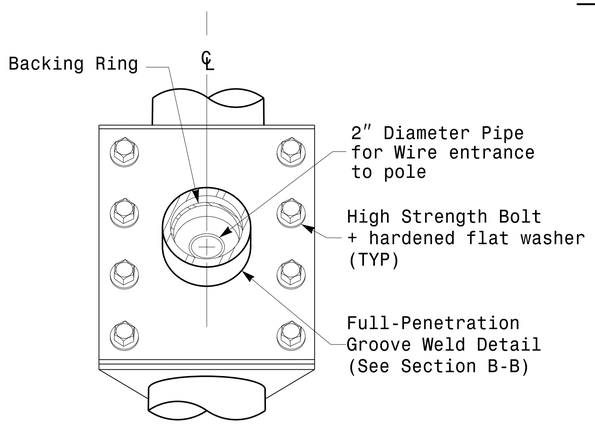
Plan View



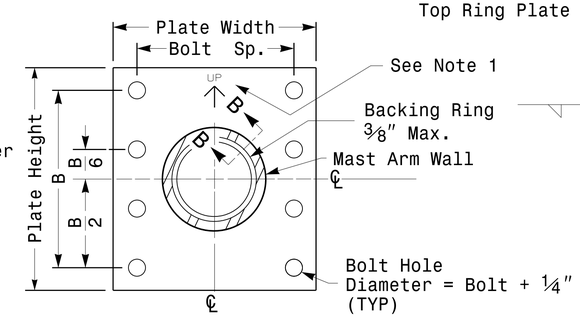
Side Elevation View



Bottom View

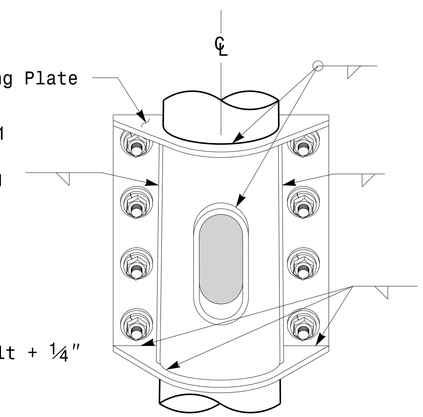


Front Elevation View

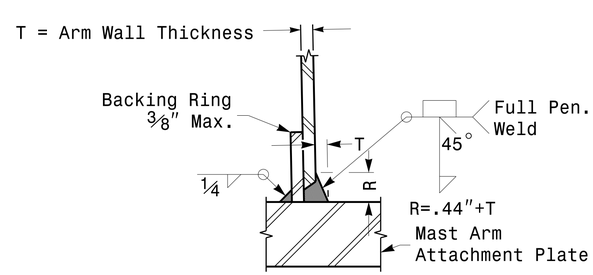


Section View A-A

Mast Arm Attachment Plate



Back Elevation View



Section B-B

Full-Penetration Groove Weld Detail

Notes:

1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Designer is responsible for providing appropriate drainage points.

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

Fabrication Details For Mast Arm Connection To Pole

PLAN DATE:	AUGUST 2013	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE: 0 NA — NONE

REVISIONS | INIT. | DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE3E147E4C4... 8/26/2014 DATE

SIG. INVENTORY NO.

Fabrication Details – Mast Arm Poles

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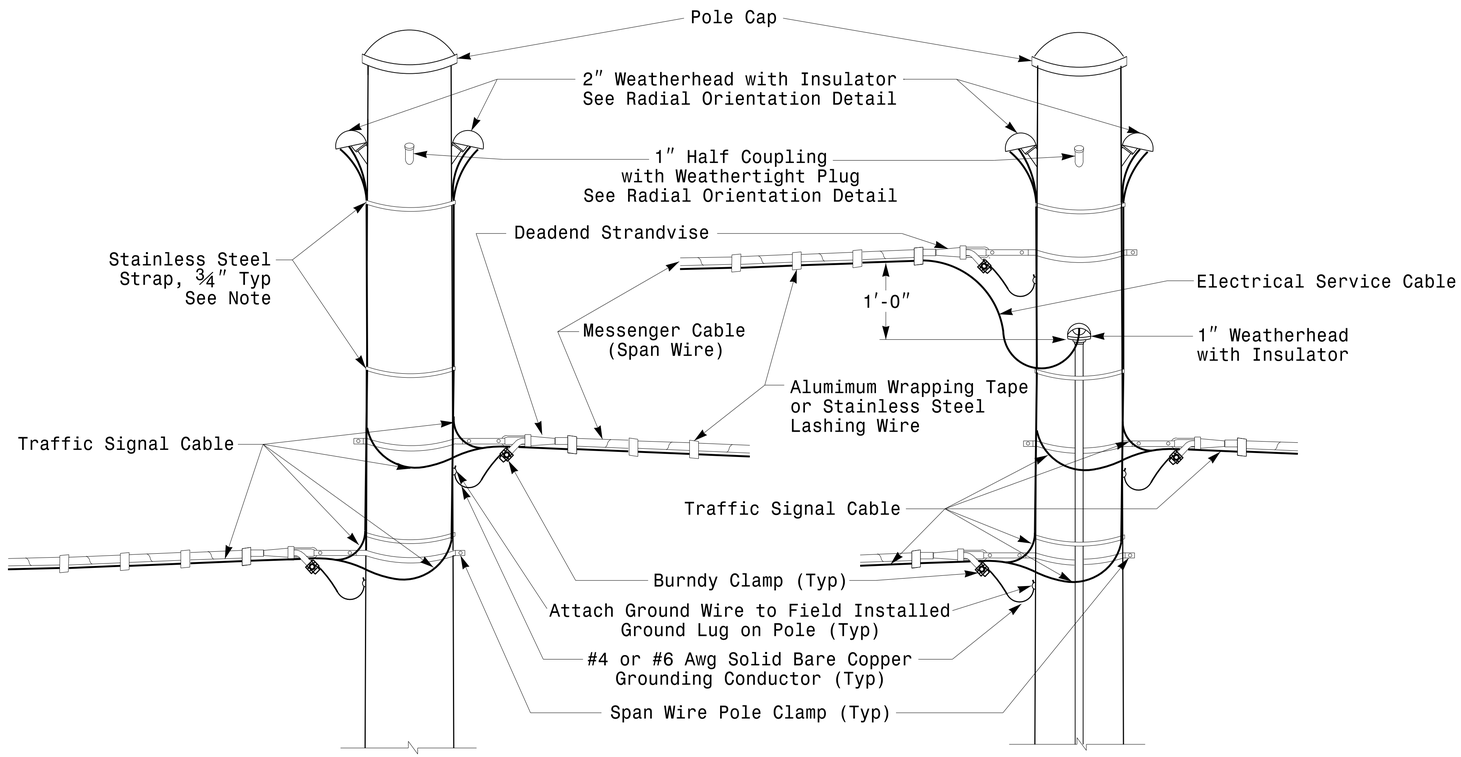
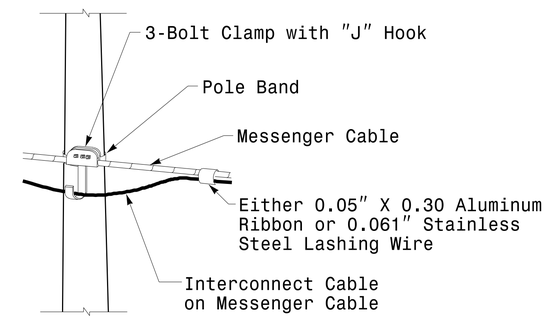
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M6

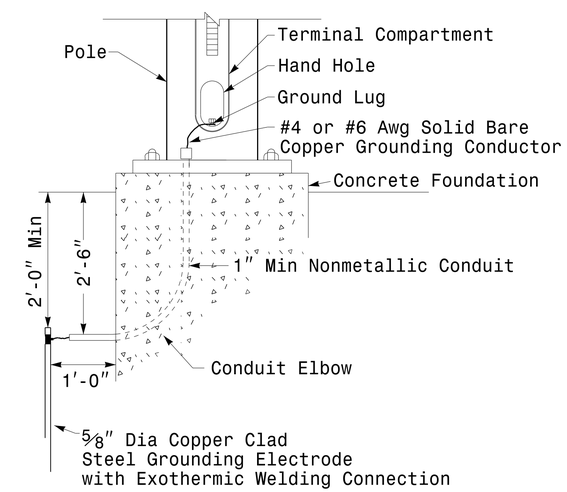


Strain Pole Attachments

Note: Strap all signal cables to the side of the pole with 3/4″ stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36″



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail

Construction Details – Strain Poles

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

Construction Details
Strain Poles

PLAN DATE:	AUGUST 2013	REVIEWED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 8/26/2014
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DATE

SIG. INVENTORY NO.

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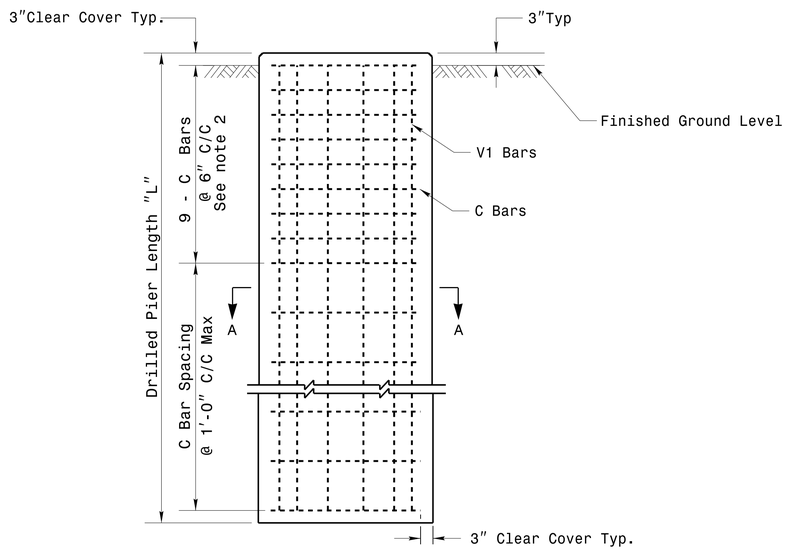
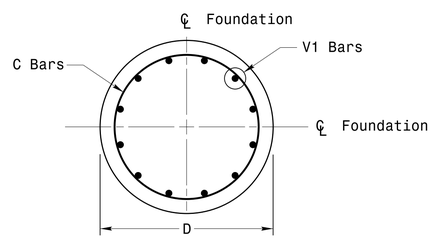
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M7

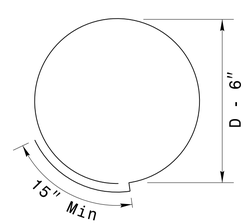
Construction Details – Foundations

Reinforcing Steel Bars





Section A-A



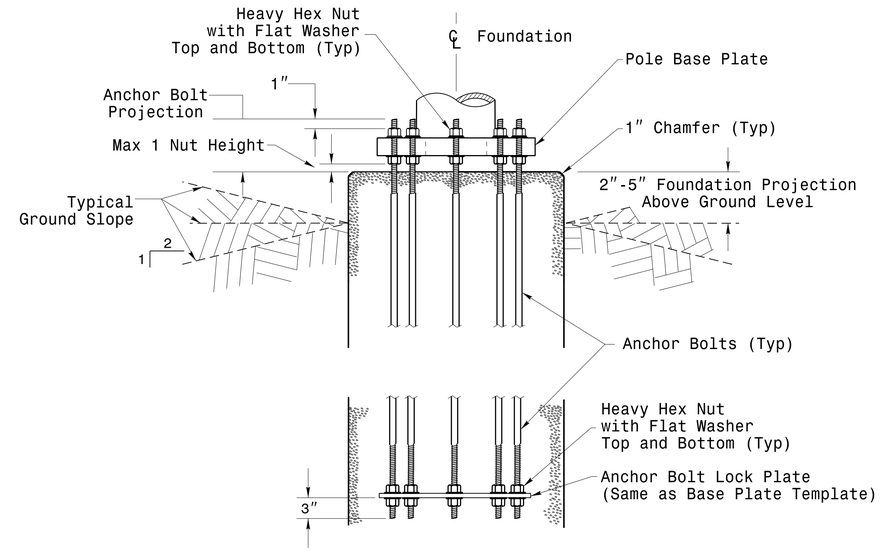
Typical "C" Bars

REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4'–0" DIAMETER)						
Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	MIN.	Size	Type	Length
48"	.465 x L	V1	***	#8	STR.	**
		C	*	#4	CIR.	12'-6"

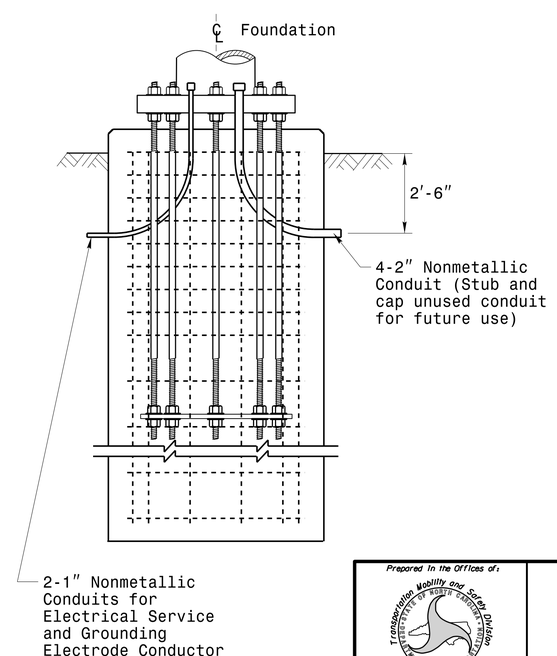
* See Note No. 1
** See Note No. 3
*** See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



Notes

1. The number of C-bars is based on foundation depth and/or as required. For standard foundations, see sheets M 8 and M 9 for details.
2. Circular tie reinforcing rings may be vertically adjusted by +/- 3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
3. The length of V1-bars is based on foundation depth. For standard foundations, see sheets M 8 and M 9 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/-3"to facilitate the installation of electrical conduit entering into the cage.
4. Provide vertical reinforcement as required per design. See sheets M 8 and M9 for details.

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE
0 NA
NONE

Construction Details
Foundations

PLAN DATE:	AUGUST 2013	DESIGNED BY:	K.C. DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE3E147E4C4... 8/26/2014
DATE

SIG. INVENTORY NO.

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jgallaway

SATURATED SOIL CONDITION

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M8

		STANDARD STRAIN POLES						STANDARD FOUNDATIONS 48" Diameter Drilled Pier Length (L) – Feet							Reinforcement			
					Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups	
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Axial (kip)	Shear (kip)	Moment (ft–kip)	Medium N–Value 4–8	Stiff N–Value 9–15	Very Stiff N–Value 16–30	Hard N–Value >30	Loose N–Value 4–10	Medium N–Value 11–30	Dense N–Value >30	Bar Size (#)	Quantity	Bar Size (#)	Spacing (in.)
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	19	13	9	8	17	14.5	12.5	8	13	4	12
		S30L3	30	25	2	11	300	20	13.5	9	8	17.5	15	13	8	14	4	12
		S35L3	35	25	3	11	320	20	13.5	9.5	8	17.5	15	13	8	15	4	12
	HEAVY	S30H3	30	29	3	16	450	24.5	17	13	11	21	17.5	15	8	18	4	12
		S35H3	35	29	4	16	515	26	17.5	12	8.5	22	18.5	16	8	20	4	12
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	18	12.5	8.5	8	16.5	14	12	8	13	4	12
		S30L2	30	23	2	10	270	19	12.5	9	8	16.5	14	12.5	8	13	4	12
		S35L2	35	23	3	10	300	19.5	13	9	8	17	14.5	13	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	25.5	15.5	11	8	20	17	14.5	8	17	4	12
		S35H2	35	29	4	15	475	25	16.5	11.5	8	21	17.5	15.5	8	19	4	12
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	18	12.5	8.5	8	16.5	14	12	8	13	4	12
		S30L2	30	23	2	10	270	19	12.5	9	8	16.5	14	12.5	8	13	4	12
		S35L2	35	23	3	10	300	19.5	13	9	8	17	14.5	13	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	25.5	15.5	11	8	20	17	14.5	8	17	4	12
		S35H2	35	29	4	15	475	25	16.5	11.5	8	21	17.5	15.5	8	19	4	12
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	16	11	8	8	15	12.5	11	8	12	4	12
		S30L1	30	22	2	8	205	16.5	11.5	8	8	15	13	11.5	8	12	4	12
		S35L1	35	22	3	8	230	17	12	8	8	15.5	13.5	11.5	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	20.5	14	9.5	8	18	15	13.5	8	15	4	12
		S35H1	35	25	4	12	350	21	14.5	10	8	18.5	15.5	13.5	8	16	4	12
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	18	12.5	8.5	8	16.5	14	12	8	13	4	12
		S30L2	30	23	2	10	270	19	12.5	9	8	16.5	14	12.5	8	13	4	12
		S35L2	35	23	3	10	300	19.5	13	9	8	17	14.5	13	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	25.5	15.5	11	8	20	17	14.5	8	17	4	12
		S35H2	35	29	4	15	475	25	16.5	11.5	8	21	17.5	15.5	8	19	4	12

48" Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Foundation Depth

Fabrication Design Notes:

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Min. base plate thickness (T) is 2.0 inches.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case.
   The foundation depth is the value where the column and the row intersect.
6. Reference Drilled Shafts: Construction Procedures and Design Methods, FHWA -IF-99-025

S30H1 - Hard Clay-Stirrup Spacing: 6 in. c/c
S30H2 - Hard Clay-Stirrup Spacing: 6 in. c/c
S30H3 - Hard Clay-Stirrup Spacing: 6 in. c/c
- Dense Sand-Stirrup Spacing: 6 in. c/c
S35H1 - Hard Clay - Stirrup Spacing: 6 in. c/c
S35H2 - Very Stiff Clay-Stirrup Spacing: 6 in. c/c
- Hard Clay- Stirrup Spacing: 6 in. c/c
- Dense Sand- Stirrup Spacing: 6 in. c/c
S35H3 - Very Stiff Clay-Stirrup Spacing: 6 in. c/c
- Dense Sand-Stirrup Spacing: 6 in. c/c

Standard Strain Pole Foundation–Saturated Soil Condition

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

Standard Strain Pole Foundation for Saturated Soil Condition

PLAN DATE: SEPTEMBER 2013	DESIGNED BY: C.B COGDELL
PREPARED BY: N. BITTING	REVIEWED BY: D. SARKAR

SCALE 0 NA None

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 8/26/2014
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DATE

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jgalloway

DRY SOIL CONDITION

PROJECT REFERENCE NO.	SHEET NO.
	Sig. M9

		STANDARD STRAIN POLES						STANDARD FOUNDATIONS 48" Diameter Drilled Pier Length (L) – Feet							Reinforcement			
					Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups	
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Axial (kip)	Shear (kip)	Moment (ft-kip)	Medium N-Value 4-8	Stiff N-Value 9-15	Very Stiff N-Value 16-30	Hard N-Value >30	Loose N-Value 4-10	Medium N-Value 11-30	Dense N-Value >30	Bar Size (#)	Quantity	Bar Size (#)	Spacing (in.)
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	18	12.5	9	8	14.5	11	10	8	13	4	12
		S30L3	30	25	2	11	300	18.5	13	9	8	15	11.5	10	8	14	4	12
		S35L3	35	25	3	11	320	19	13.5	9.5	8	15	11.5	10.5	8	15	4	12
	HEAVY	S30H3	30	29	3	16	450	23	16	11	8	17.5	13.5	11.5	8	18	4	12
		S35H3	35	29	4	16	515	24.5	16.5	12	8.5	18.5	14	12	8	20	4	12
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	17	12	8.5	8	14	11	9.5	8	13	4	12
		S30L2	30	23	2	10	270	18	12.5	8.5	8	14.5	11	10	8	13	4	12
		S35L2	35	23	3	10	300	18.5	13	9	8	14.5	11.5	10	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	22	15	10.5	8	17	13	11.5	8	17	4	12
		S35H2	35	29	4	15	475	23.5	16	11.5	8	18	13.5	12	8	19	4	12
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	17	12	8.5	8	14	11	9.5	8	13	4	12
		S30L2	30	23	2	10	270	18	12.5	8.5	8	14.5	11	10	8	13	4	12
		S35L2	35	23	3	10	300	18.5	13	9	8	14.5	11.5	10	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	22	15	10.5	8	17	13	11.5	8	17	4	12
		S35H2	35	29	4	15	475	23.5	16	11.5	8	18	13.5	12	8	19	4	12
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	15.5	10.5	8	8	13	10	9	8	12	4	12
		S30L1	30	22	2	8	205	15.5	11	8	8	13	10	9	8	12	4	12
		S35L1	35	22	3	8	230	16.5	11.5	8	8	13.5	10.5	9	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	19.5	13.5	9.5	8	15	12	10.5	8	15	4	12
		S35H1	35	25	4	12	350	20	14	10	8	15.5	12	10.5	8	15	4	12
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	17	12	8.5	8	14	11	9.5	8	13	4	12
		S30L2	30	23	2	10	270	18	12.5	8.5	8	14.5	11	10	8	13	4	12
		S35L2	35	23	3	10	300	18.5	13	9	8	14.5	11.5	10	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	22	15	10.5	8	17	13	11.5	8	17	4	12
		S35H2	35	29	4	15	475	23.5	16	11.5	8	18	13.5	12	8	19	4	12

48" Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Foundation Depth

Fabrication Design Notes:

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Min. base plate thickness (T) is 2.0 inches.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case.
   The foundation depth is the value where the column and the row intersect.
6. Reference Drilled Shafts: Construction Procedures and Design Methods, FHWA -IF-99-025

S30H1 - Hard Clay-Stirrup Spacing: 6 in. c/c
- Dense Sand-Stirrup Spacing: 6 in. c/c

S30H2 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S30H3 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S35H1 - Hard Clay: tirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S35H2 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S35H3 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

Standard Strain Pole Foundation–Dry Soil Condition

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

Standard Strain Pole Foundation for Dry Soil Condition

PLAN DATE: SEPTEMBER 2013	DESIGNED BY: C.B COGDELL
PREPARED BY: N. BITTING	REVIEWED BY: D. SARKAR

SCALE: 0 NA — None

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 8/26/2014 DATE
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S:\TIMS\M115\Signals\Signal Design Section\Eastern Region\M Sheets\2012_M9_Standard Foundations Dry.dgn
jgalloway

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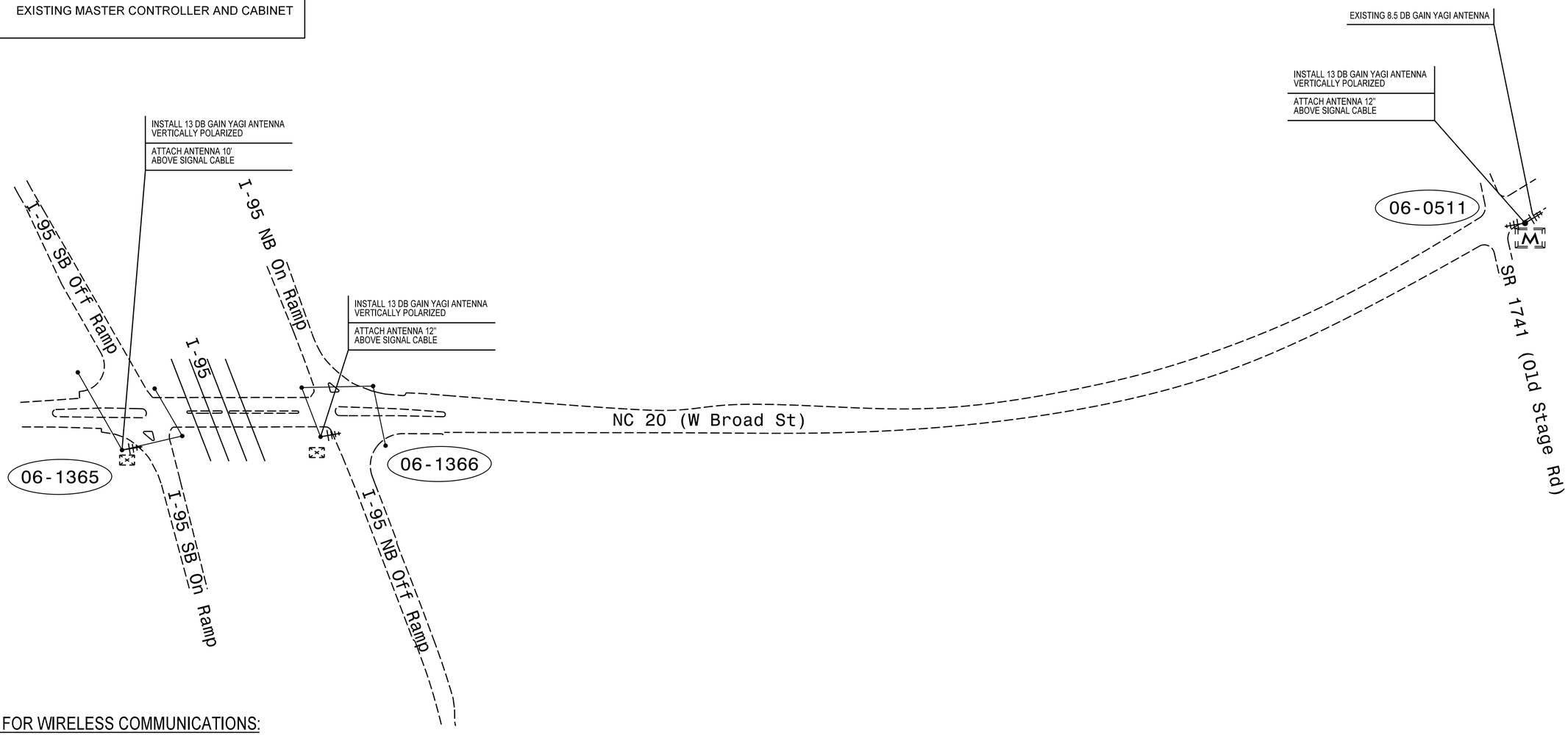
PROJECT REFERENCE NO.	SHEET NO.
R-5754	ITS 1.0

LEGEND

- YAGI ANTENNA (SINGLE)
- XX-XXXX SIGNAL INVENTORY NUMBER
- EXISTING WOOD POLE
- EXISTING CONTROLLER AND CABINET
- EXISTING MASTER CONTROLLER AND CABINET



NOTES FOR WIRELESS COMMUNICATIONS:

1. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2"RISER WITH WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   B. ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A 1/2"HOLE UP THROUGH THE BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
   C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   D. BETWEEN THE POINT OF EXITING THE RISER AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING 3/4" STAINLESS STEEL STRAPS EVERY 12".
2. IF AN EXISTING 2"SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
   (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
5. INSTALL WIRELESS SERIAL RADIO MODEM WITH EXTERIOR DISCONNECT SWITCH LOCATED ON CABINET.
   (NOTE: RF ANTENNA DISCONNECT SWITCH AND DECAL ARE NOT REQUIRED WHEN THE ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
6. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS."
7. ANTENNA LOCATIONS ARE PRELIMINARY AND A REPEATER MAY BE REQUIRED. FINAL LOCATIONS AND NEED FOR REPEATER SHALL BE DETERMINED BY THE CONTRACTOR DURING THE RADIO PATH SITE SURVEY TEST.
8. MODIFICATIONS AT THE EXISTING MASTER WILL BE NECESSARY TO INTERGRATE 06-1365 AND 06-1366 INTO THE ST. PAULS CLOSED LOOP SYSTEM.
9. ALL WIRELESS EQUIPMENT SUPPLIED SHALL BE COMPATIBLE WITH EXISTING ST. PAULS SIGNAL SYSTEM EQUIPMENT AND APPROVED BY THE MAINTAINING AGENCY.

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 100
1" = 100'

NC 20 (W BROAD ST)
AT I-95 RAMPS

WIRELESS COMMUNICATION PLAN

DIVISION 6 ROBESON COUNTY ST. PAULS

PLAN DATE:	JANUARY 2016	REVIEWED BY:	C.L. KALENCIK
PREPARED BY:	S.W.C.	REVIEWED BY:	

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 040715 ENGINEER COURTNEY L. KALENCIK

DocuSigned by: Courtney L. Kalencik
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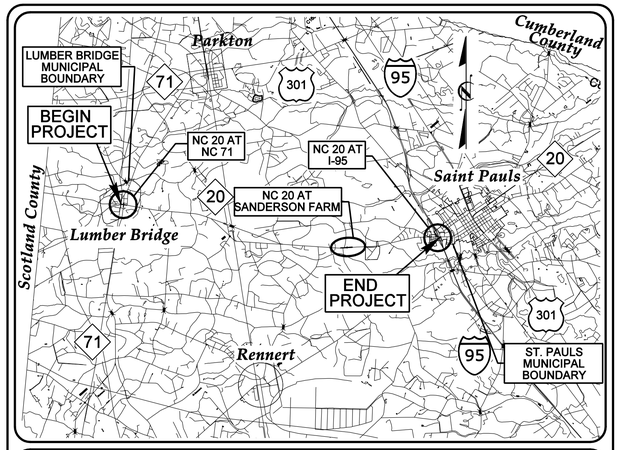
9/09/99

TIP PROJECT: R-5754

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
R-5754	UC-1

UTILITY CONSTRUCTION PLANS
ROBESON COUNTY

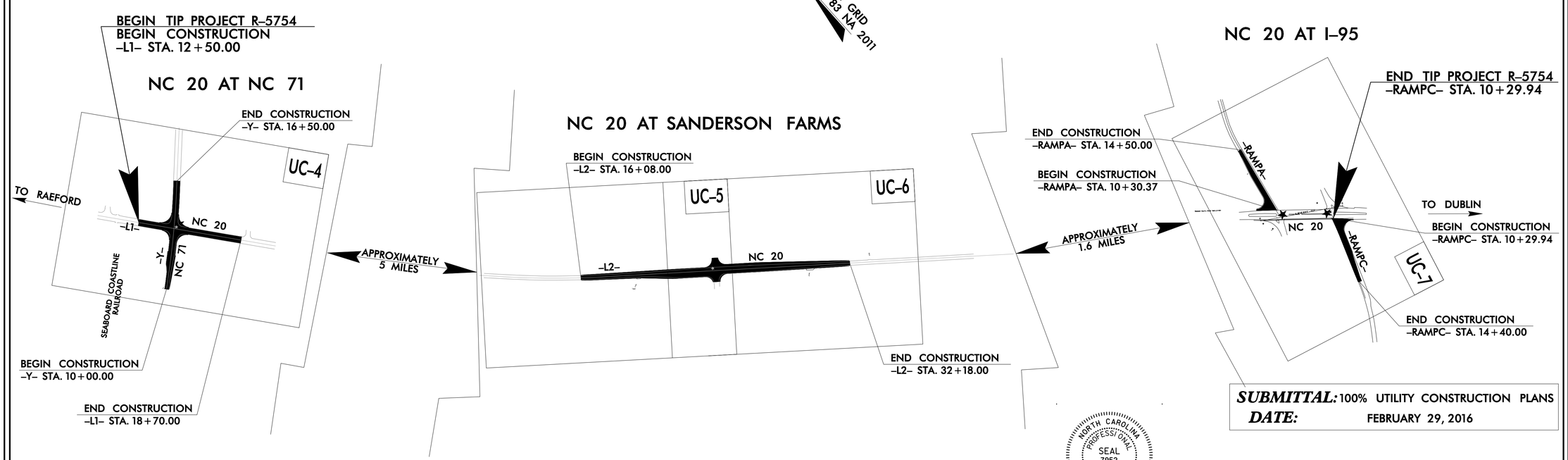


VICINITY MAP
NOT TO SCALE

LOCATION: NC 20 AT NC 71, SANDERSON FARMS ON NC 20, AND I-95 AT NC 20

TYPE OF WORK: UTILITY CONSTRUCTION

NC GRID NAD 83 NA 2011



SUBMITTAL: 100% UTILITY CONSTRUCTION PLANS
DATE: FEBRUARY 29, 2016

NORTH CAROLINA PROFESSIONAL SEAL 7952 ENGINEER JOHN DAVID POETZSCH
DocuSigned by: John David Poetzsch
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2/29/2016

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CONTRACT:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	LEGEND OF SYMBOLS
UC-3	GENERAL NOTES
UC-3A	CONSTRUCTION DETAILS
UC-4 THRU UC-7	UTILITY CONSTRUCTION PLAN SHEETS

UTILITY OWNERS ON PROJECT

(A) Water – Robeson Co., Town of St. Pauls
(B) Sewer – Town of St. Pauls

Prepared in the Office of:
AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: December 31, 2015

LETTING DATE: April 20, 2016

ED EDENS, PE
PROJECT ENGINEER

JOHN D. POETZSCH, PE
PROJECT UTILITY DESIGN ENGINEER

SEAN P. MATUSZEWSKI
PROJECT ENGINEER
NCDOT DIVISION DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SYSTIME$$$$ SYSLEVEL$$$$ DGN$$$$ 9/09/99

PROJECT REFERENCE NO.	SHEET NO.
R-5754	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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

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PROJECT REFERENCE NO.	SHEET NO.
R-5754	UC-3

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

NORTH CAROLINA PROFESSIONAL SEAL 7952 ENGINEER

DocuSigned by: Julie M. Morris, P.E.
2/29/2016

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

UTILITY CONSTRUCTION NOTES

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.

2. THE EXISTING WATER UTILITIES ARE OWNED BY ROBESON COUNTY AND TOWN OF ST. PAULS.

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

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

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

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

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

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

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

PROJECT SPECIFIC NOTES:

1. THE PROPOSED WATER LINE SHALL BE PVC SDR-21.

2. ALL WATER LINE FITTINGS FOR PVC PIPE, 4-INCHES THRU 12-INCHES IN DIAMETER, SHALL BE DUCTILE IRON.

3. ALL FITTINGS (BENDS, TEES, CROSSES, REDUCERS, PLUGS, ETC.) SHALL BE ADEQUATELY RESTRAINED BY THE USE OF CAST IN PLACE CONCRETE THRUST RESTRAINTS AS DETAILED ON THESE DRAWINGS, OR AS DIRECTED BY THE RESIDENT ENGINEER.

4. FOR WATER LINE TIE-INS TO EXISTING A.C. PIPE, USE TRANSITION COUPLINGS THAT MEET NCDOT SPECIFICATIONS. REFER TO NCDOT STANDARDS SECTION 1036-8 ARTICLE (B) TRANSITION SLEEVES AND COUPLINGS.

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

DATE: 2/29/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-5754	UC-3A

DESIGNED BY: ·
DRAWN BY: ·
CHECKED BY: ·
APPROVED BY: ·
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

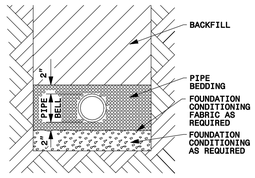
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 7952 ENGINEER JOHN DAVID POGGENSEE
2/29/2016

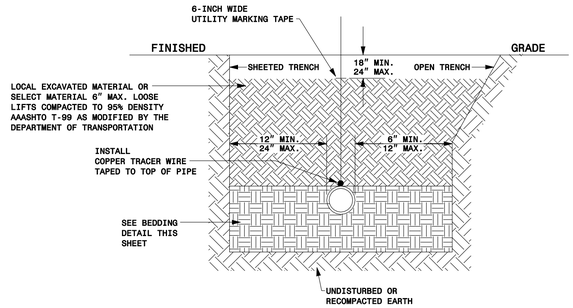
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

BEDDING 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.



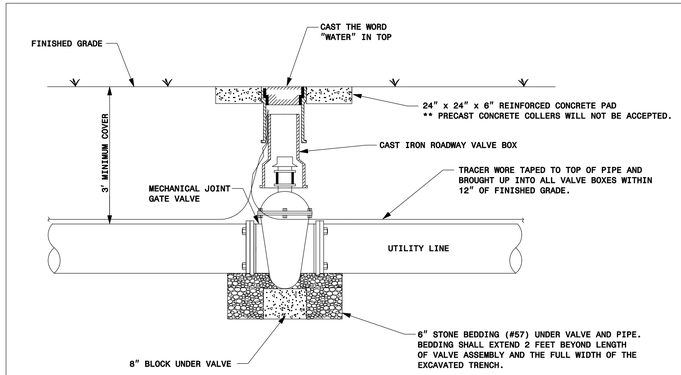
NOTES:

1. ALL SHORING & TRENCHING SHALL COMPLY WITH OSHA SAFETY STANDARDS FOR THE CONSTRUCTION INDUSTRY.
2. BELL HOLES NOT SHOWN.
3. ALL BACKFILL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.

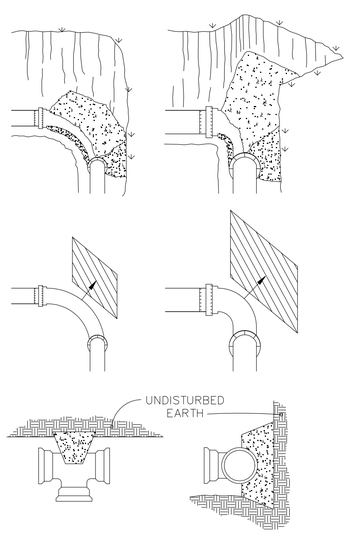
GENERAL TRENCH DETAIL
NTS

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		



GATE VALVE DETAIL
NTS



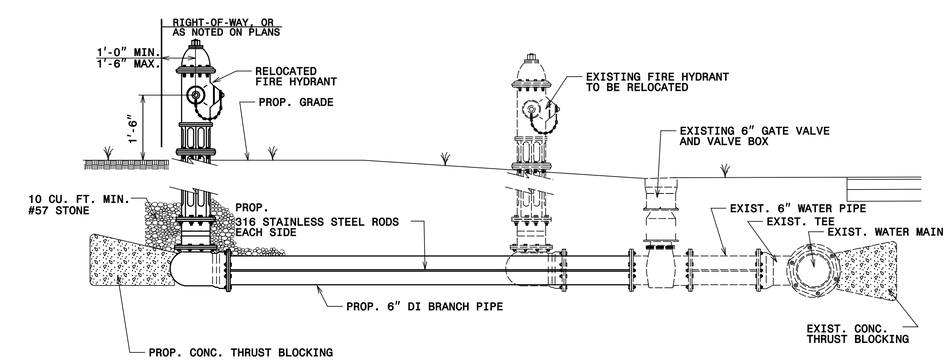
MINIMUM CONCRETE BLOCKING (C.Y.) *					
NOMINAL PIPE DIAMETER INCHES	TEES & DEAD ENDS	90° BEND	45° BEND	22½° BEND	11¼° BEND
4	⅓	⅓	⅓	⅓	⅓
6	⅓	⅓	⅓	⅓	⅓
8	⅓	½	⅓	⅓	⅓
10	⅔	¾	½	⅓	⅓
12	¾	1.0	⅔	⅓	⅓
14	1.0	1½	¾	½	⅓
16	1⅓	2.0	1.0	½	⅓
18	1⅔	2⅓	1⅓	⅔	⅓
20	2.0	3.0	1⅔	¾	½
24	3.0	4⅓	2⅓	1⅓	⅔

NOTES:

1) FITTING SHALL BE WRAPPED WITH A MINIMUM 4 MIL PLASTIC.
2) NO CONCRETE SHALL COVER BOLTS OR GLANDS.

* CONCRETE SHALL BE 3000 P.S.I. MIX.

STANDARD REACTION BLOCKING
NTS



FIRE HYDRANT RELOCATION DETAIL
NTS

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

DATE: 2/29/2016
TIME: 3:01:01 PM
DGN: R5754_uc_pa903A.dgn

DocuSign Envelope ID: 73607101-3174-4755-8B4E-C140DD1E9A2E

UTILITY OWNERS ON THIS PROJECT:

1. ROBESON COUNTY
UTILITY: 8" WATER LINE
UTILITY: 6" WATER LINE
CONTACT: ED EVERETTE
PHONE: 910-671-3485

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
R-5754	UC-4

DESIGNED BY: ·
DRAWN BY: ·
CHECKED BY: ·
APPROVED BY: ·
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

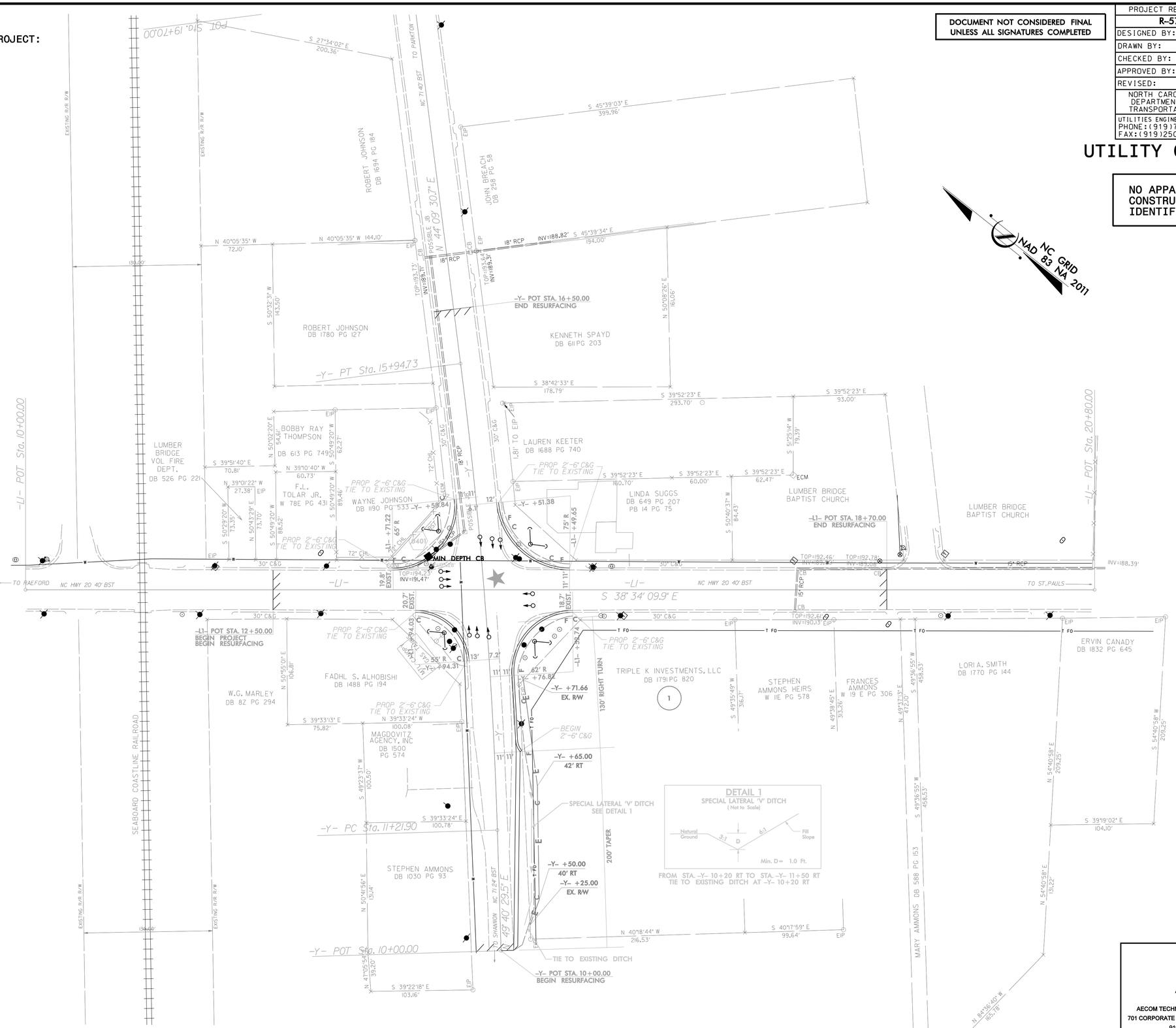
NORTH CAROLINA PROFESSIONAL SEAL 7952 ENGINEER JOHN DAVID POGESICH

DocuSigned by: John David Pogesich, P.E. EA0978B5A6B9411... 2/29/2016

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

NO APPARENT UTILITY CONSTRUCTION CONFLICTS IDENTIFIED THIS SHEET



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TIME: 3:62:00 PM
DGN: R5754_uc_psh04.dgn

Prepared by:

AECOM

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

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PROJECT REFERENCE NO.	SHEET NO.
R-5754	UC-5
DESIGNED BY: ·	
DRAWN BY: ·	
CHECKED BY: ·	
APPROVED BY: ·	
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 7952 ENGINEER JULIUS A. ROBINSON, JR.

DocuSigned by: Julius A. Robinson, Jr. E4D97B9C0B8C4D2... 2/29/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

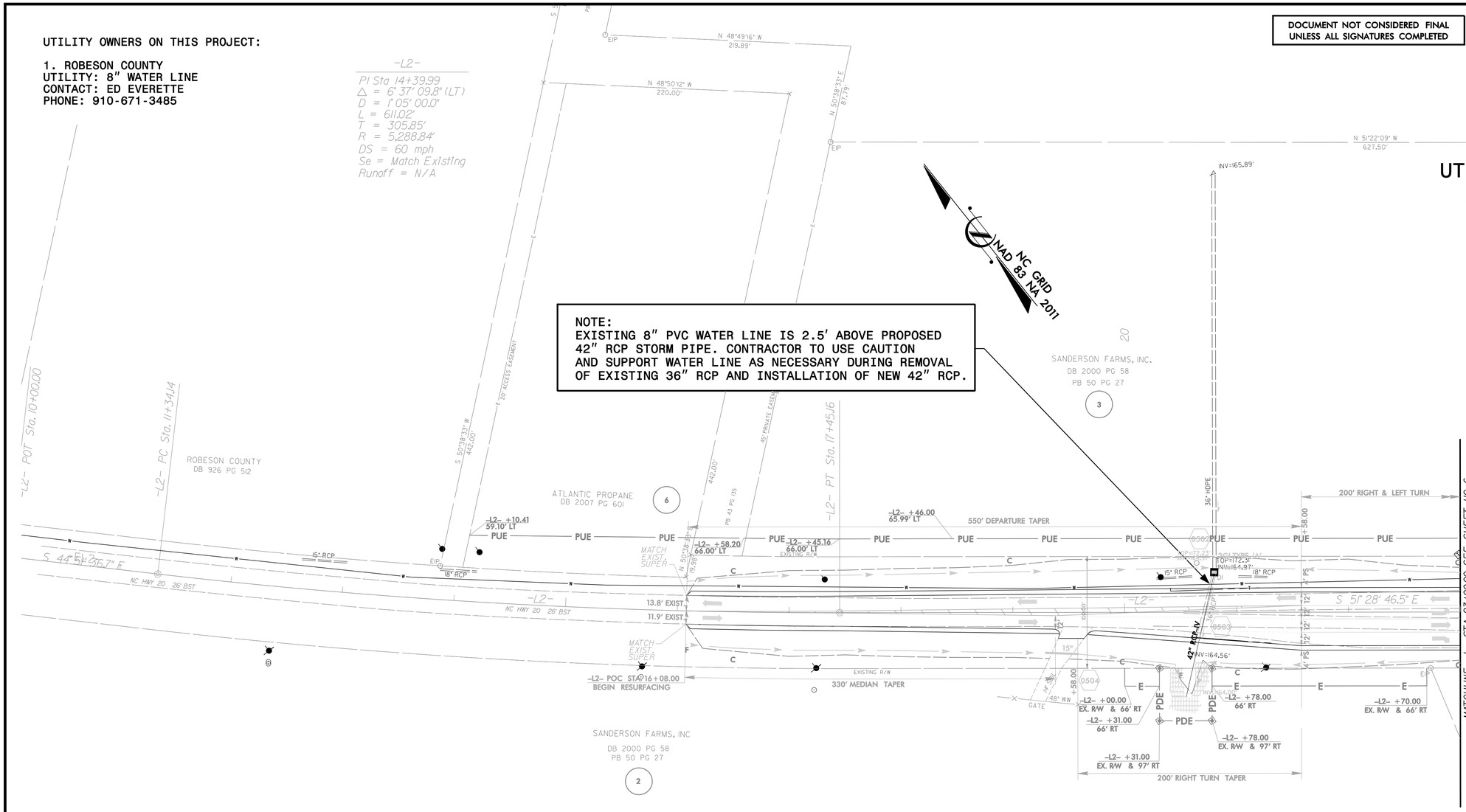
UTILITY CONSTRUCTION

NO APPARENT UTILITY CONSTRUCTION CONFLICTS IDENTIFIED THIS SHEET

UTILITY OWNERS ON THIS PROJECT:

1. ROBESON COUNTY
UTILITY: 8" WATER LINE
CONTACT: ED EVERETTE
PHONE: 910-671-3485

NOTE:
EXISTING 8" PVC WATER LINE IS 2.5' ABOVE PROPOSED 42" RCP STORM PIPE. CONTRACTOR TO USE CAUTION AND SUPPORT WATER LINE AS NECESSARY DURING REMOVAL OF EXISTING 36" RCP AND INSTALLATION OF NEW 42" RCP.



Prepared by:

AECOM

AECOM TECHNICAL SERVICES OF NORTH CAROLINA, INC.
701 CORPORATE CENTER DRIVE, SUITE 475, RALEIGH, NC 27607
919-854-6200 919-854-6259 (fax)
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TIME: 3:32:23 PM
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NOTES:
1. ALL PIPE FOR OPEN TRENCH CONSTRUCTION SHALL BE PVC SDR-21.
2. REFER TO SHEET UC-3 FOR PROJECT SPECIFIC NOTES.
3. EXISTING GRAVITY SANITARY SEWER NOT EXPECTED TO BE IN CONFLICT. CONTRACTOR SHALL ADJUST MANHOLES TO GRADE AS NECESSARY.
4. WATER LINE SHALL BE INSTALLED WITH A MINIMUM OF 3 FEET OF COVER.

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

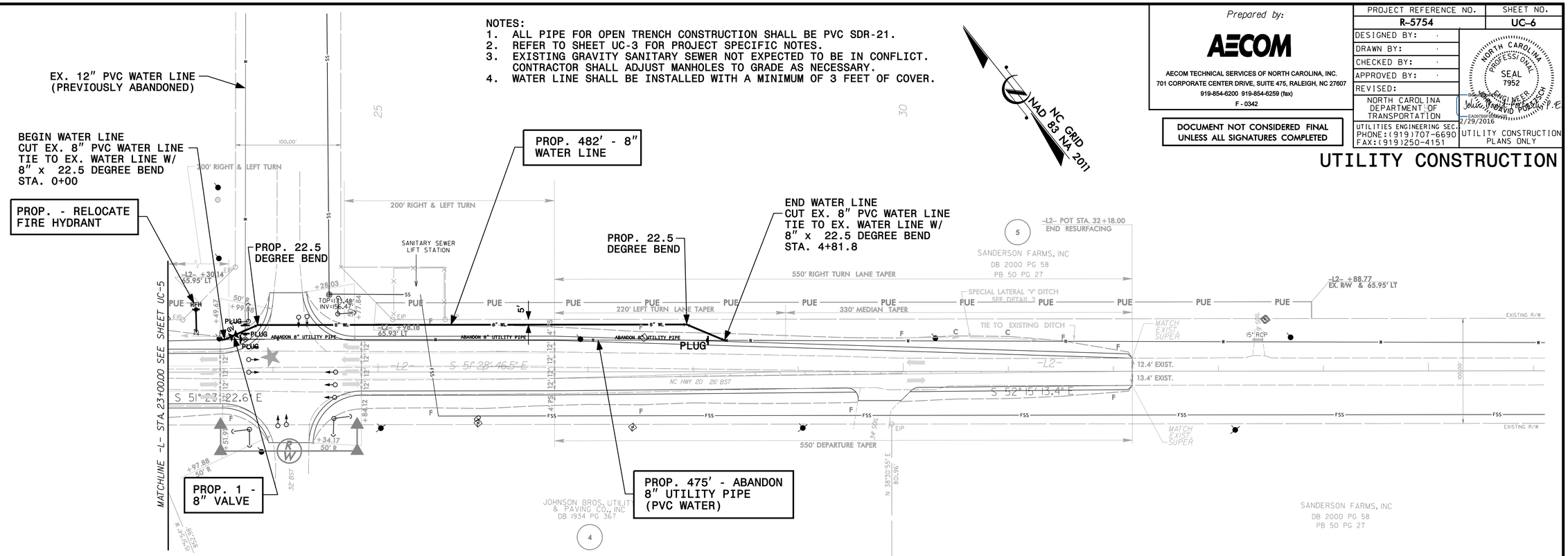
PROJECT REFERENCE NO.	SHEET NO.
R-5754	UC-6
DESIGNED BY: ·	
DRAWN BY: ·	
CHECKED BY: ·	
APPROVED BY: ·	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 7952 ENGINEER DAVID POLLARD

DocuSigned by: DAVID POLLARD, P.E. 2/29/2016 E4D07B5C4B6E4F1...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

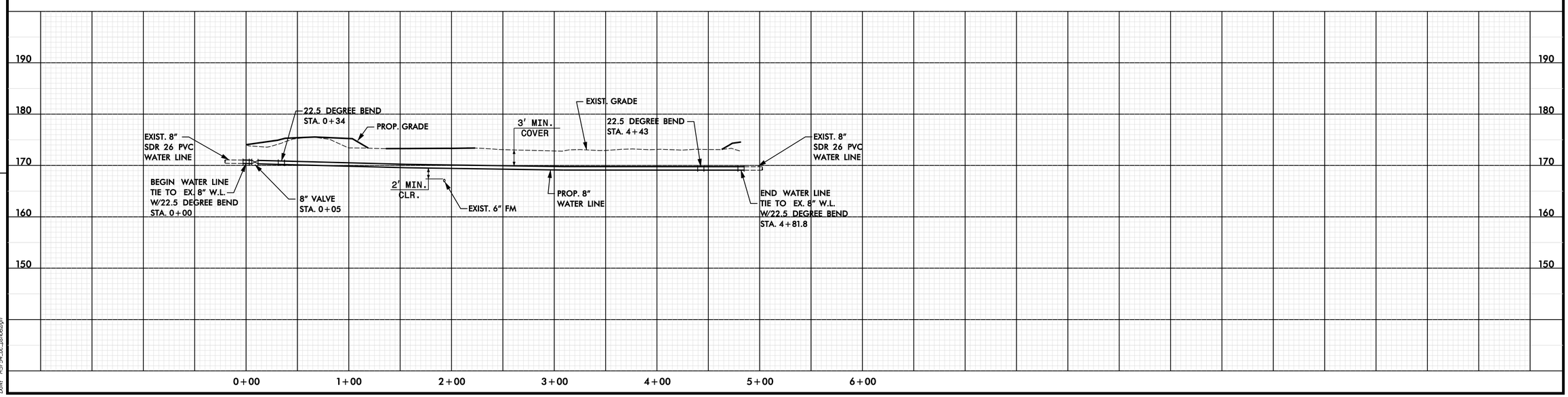
UTILITY CONSTRUCTION



UTILITY OWNERS ON THIS PROJECT:

1. ROBESON COUNTY
UTILITY: 8" WATER LINE
CONTACT: ED EVERETTE
PHONE: 910-671-3485

2. TOWN OF ST. PAULS
UTILITY: 8" SANITARY GRAVITY SEWER, SEWER PUMP STATION, 6" FORCE MAIN SEWER
CONTACT: JR STEIGERWALD
PHONE: 910-865-5164



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-5754	UC-7

DESIGNED BY: ·
DRAWN BY: ·
CHECKED BY: ·
APPROVED BY: ·
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

NORTH CAROLINA PROFESSIONAL SEAL 7952 ENGINEER JULIUS C. WOODARD, JR.

DocuSigned by: Julius C. Woodard, Jr. 2/29/2016

UTILITY CONSTRUCTION PLANS ONLY

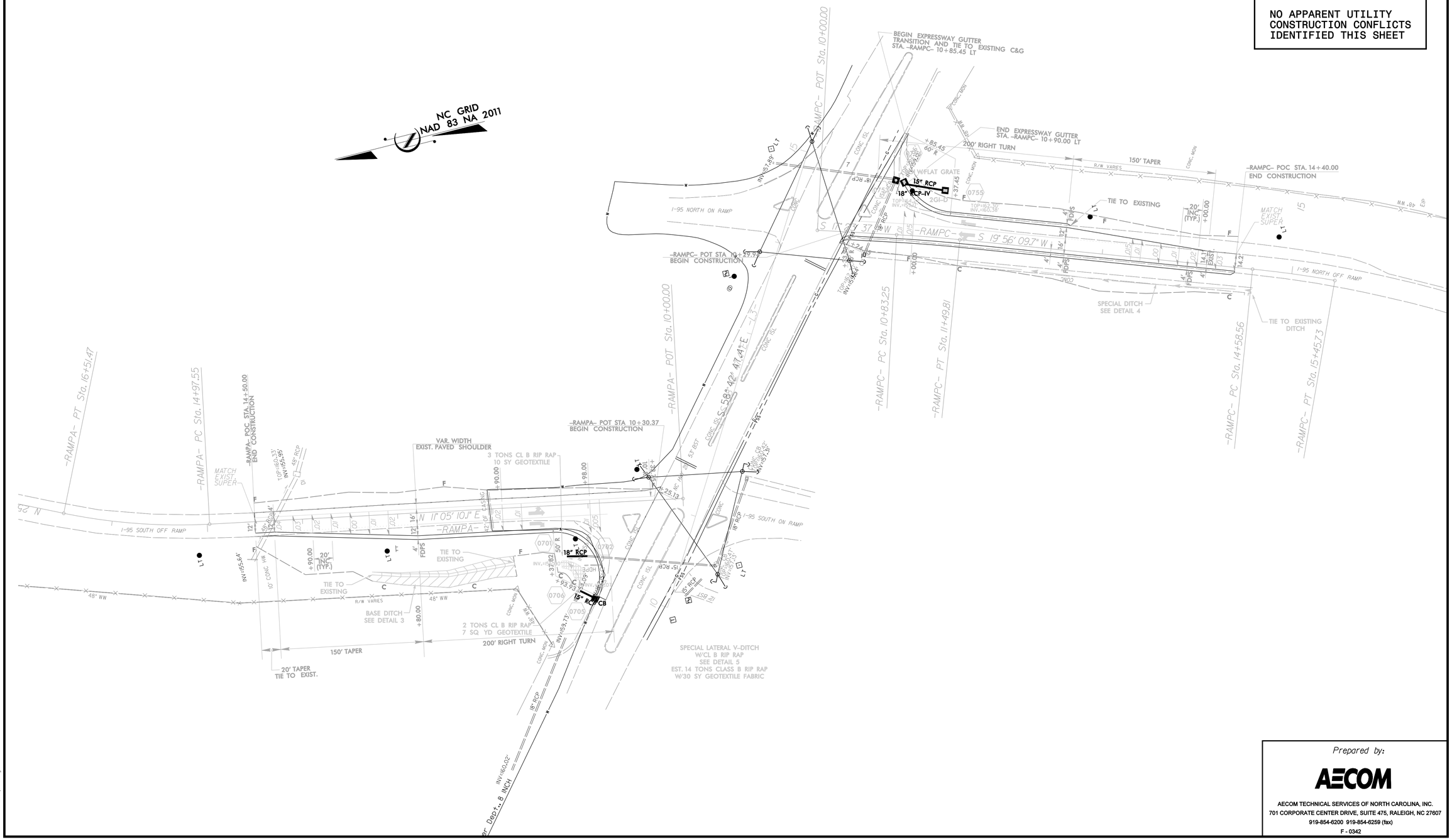
UTILITY CONSTRUCTION

UTILITY OWNERS ON THIS PROJECT:

1. TOWN OF ST. PAULS
UTILITY: 8" WATER LINE
CONTACT: JR STEIGERWALD
PHONE: 910-865-5164

2. TOWN OF ST. PAULS
UTILITY: 6" FOERCE MAIN SEWER
CONTACT: JR STEIGERWALD
PHONE: 910-865-5164

NO APPARENT UTILITY CONSTRUCTION CONFLICTS IDENTIFIED THIS SHEET



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TIME: 3:15:31 PM
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Prepared by:

AECOM

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

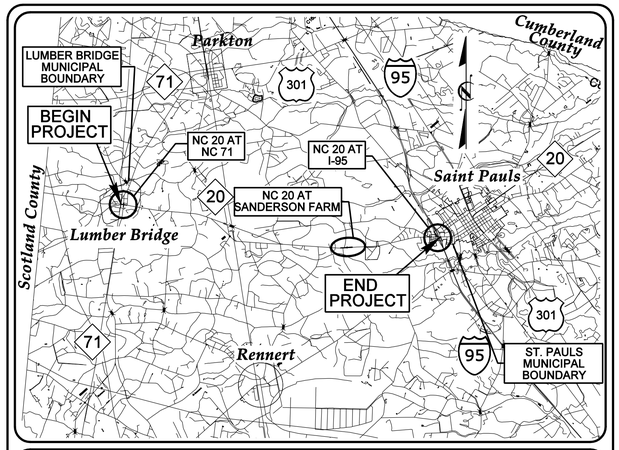
9/09/99

TIP PROJECT: R-5754

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
R-5754	UO-1

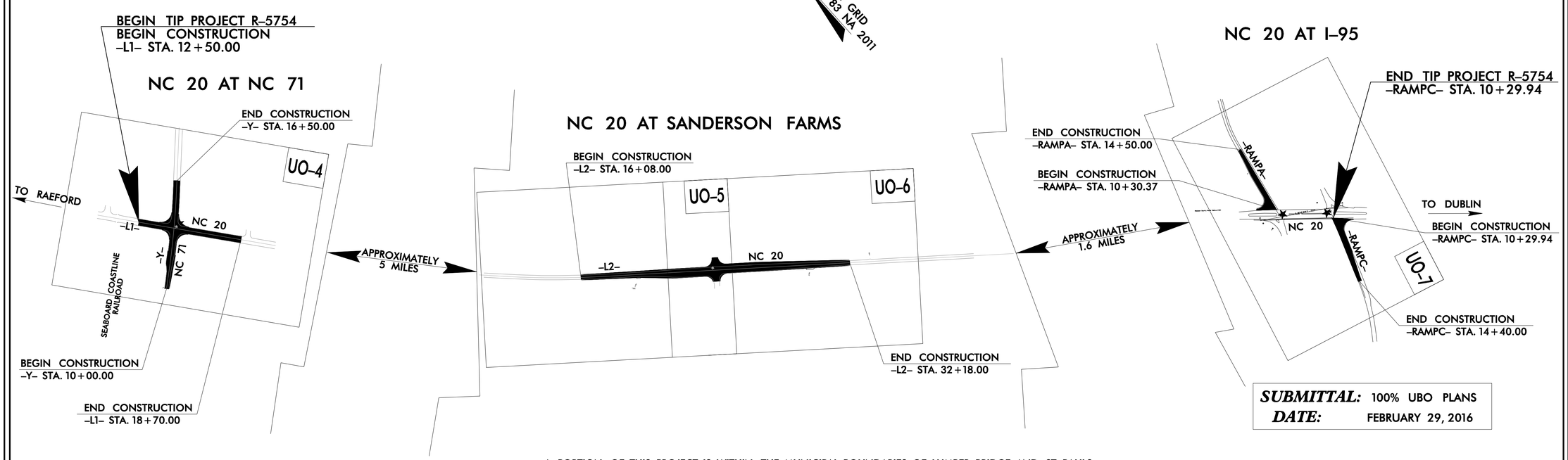
UTILITIES BY OTHERS PLANS
ROBESON COUNTY



VICINITY MAP
NOT TO SCALE

LOCATION: NC 20 AT NC 71, SANDERSON FARMS ON NC 20, AND I-95 AT NC 20

TYPE OF WORK: UTILITIES BY OTHERS RELOCATIONS



SUBMITTAL: 100% UBO PLANS
DATE: FEBRUARY 29, 2016

A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LUMBER BRIDGE AND ST. PAULS.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

CONTRACT:

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	LEGEND OF SYMBOLS
UO-3	(OMITTED)
UO-4 THRU UO-7	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(A) Duke Energy – Power Distribution
(B) Lumbee River EMC – Power Distribution
(C) CenturyLink – Telecom
(D) TWC – CATV
(E) PNG – Gas Distribution
(F) Town of St. Pauls – Street Lighting

Prepared in the Office of:
AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: December 31, 2015

LETTING DATE: April 20, 2016

ED EDENS, PE
PROJECT ENGINEER

JOHN D. POETZSCH, PE
PROJECT UTILITIES DESIGN ENGINEER

SEAN P. MATUSZEWSKI
PROJECT ENGINEER
NCDOT DIVISION DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
R-5754	UO-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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
R-5754	UO-4

UTILITIES BY OTHERS

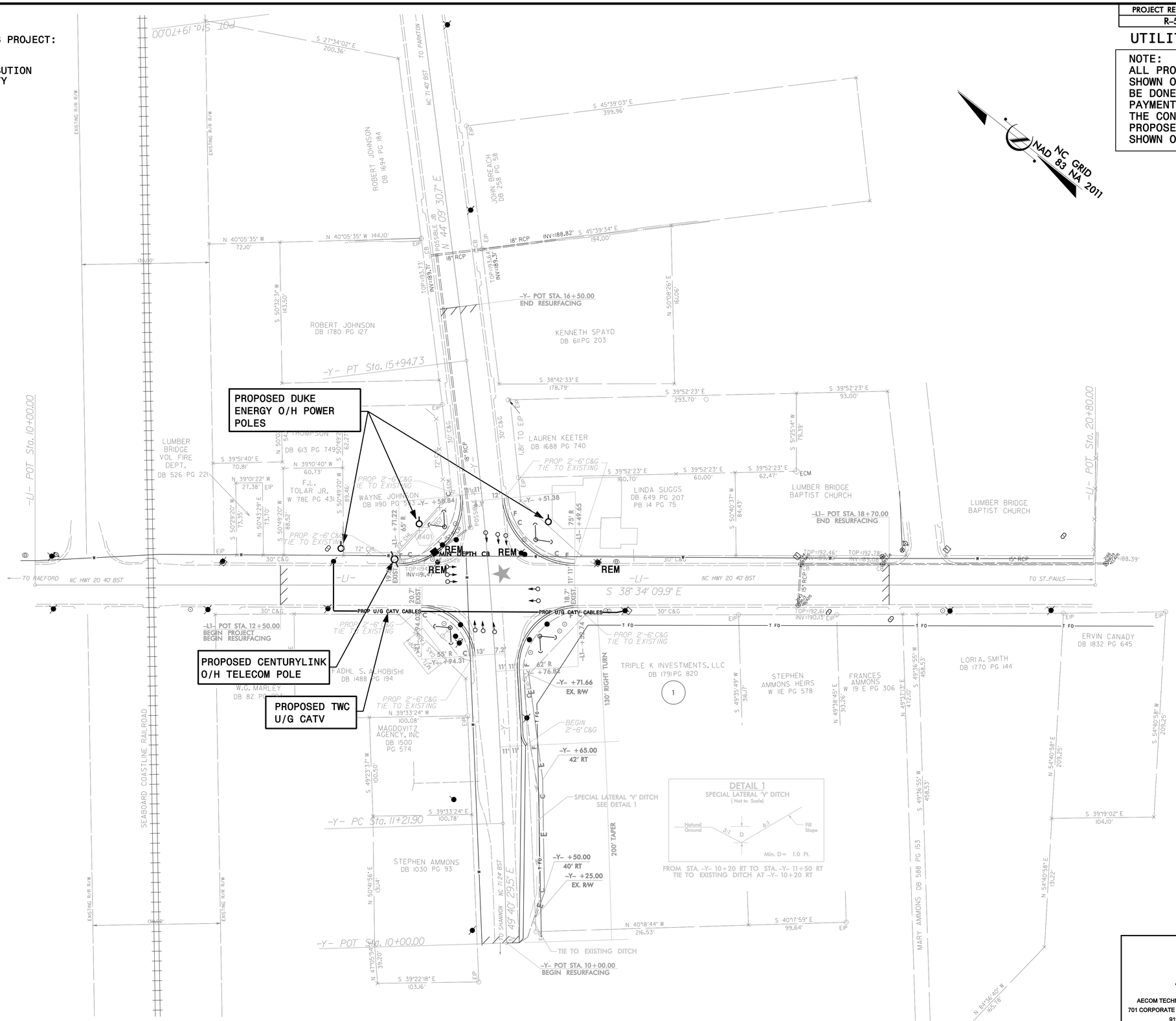
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

UTILITY OWNERS ON THIS PROJECT:

1. DUKE ENERGY
UTILITY: POWER DISTRIBUTION
CONTACT: CYNTHIA ROARTY
PHONE: 919-431-4738

2. CENTURYLINK
UTILITY: TELECOM
CONTACT: KEVIN GODWIN
PHONE: 910-366-2142

3. TIME WARNER CABLE
UTILITY: CATV
CONTACT: JACK CRABB
PHONE: 910-401-5034



Prepared by:

AECOM

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

REVISIONS

DATE: 2/29/2016
TIME: 1:52:47 PM
DGN: R5754_uo_sp04.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-5754	UO-5

UTILITIES BY OTHERS

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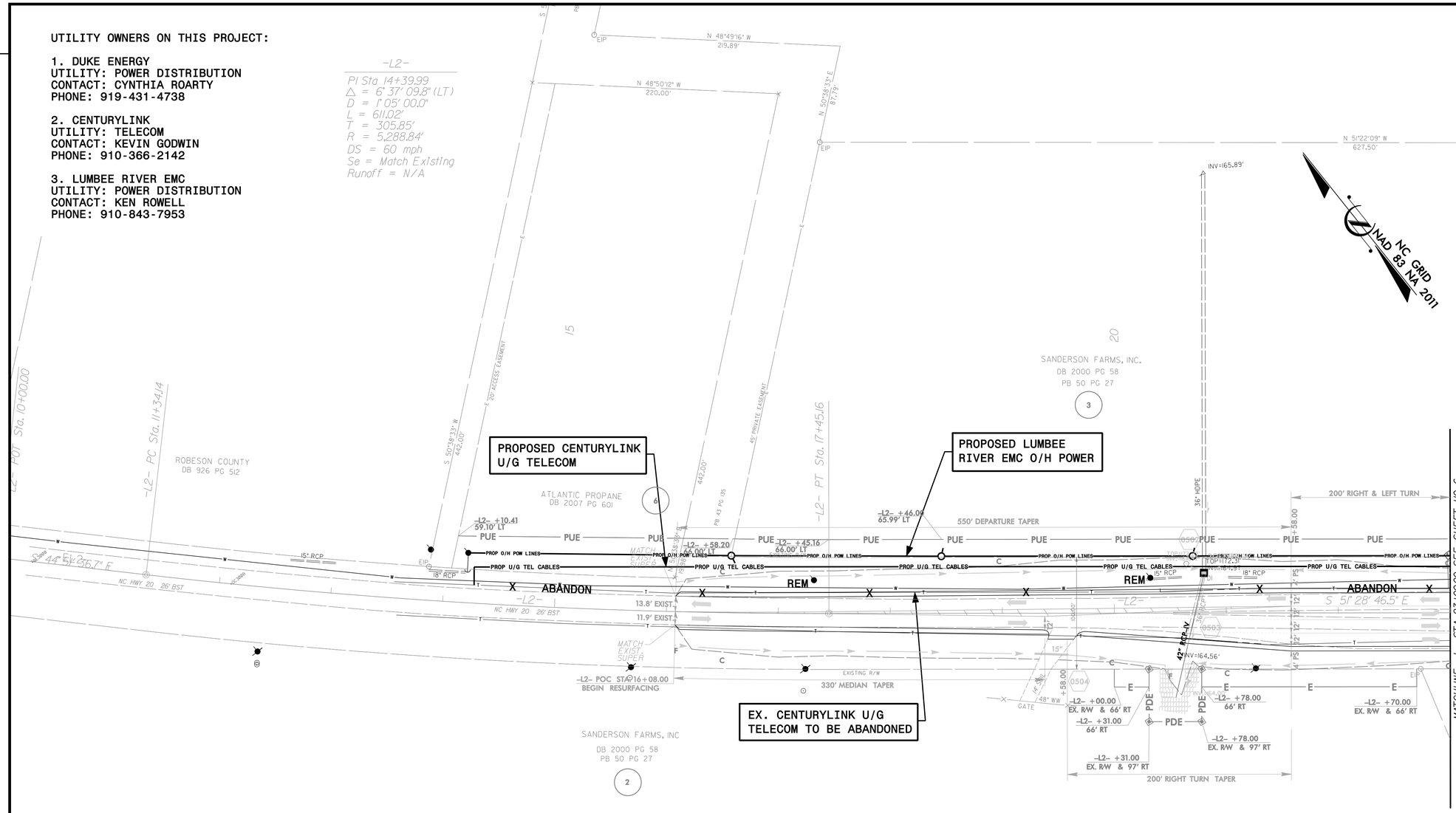
UTILITY: POWER DISTRIBUTION
CONTACT: CYNTHIA ROARTY
PHONE: 919-431-4738

2. CENTURYLINK
UTILITY: TELECOM
CONTACT: KEVIN GODWIN
PHONE: 910-366-2142

3. LUMBEE RIVER EMC
UTILITY: POWER DISTRIBUTION
CONTACT: KEN ROWELL
PHONE: 910-843-7953



REVISIONS

DATE: 2/29/2016
TIME: 1:53:53 PM
DGN: R5754-uo-sht05.dgn

Prepared by:

AECOM

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

PROJECT REFERENCE NO.	SHEET NO.
R-5754	UO-6

UTILITIES BY OTHERS

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UTILITY OWNERS ON THIS PROJECT:

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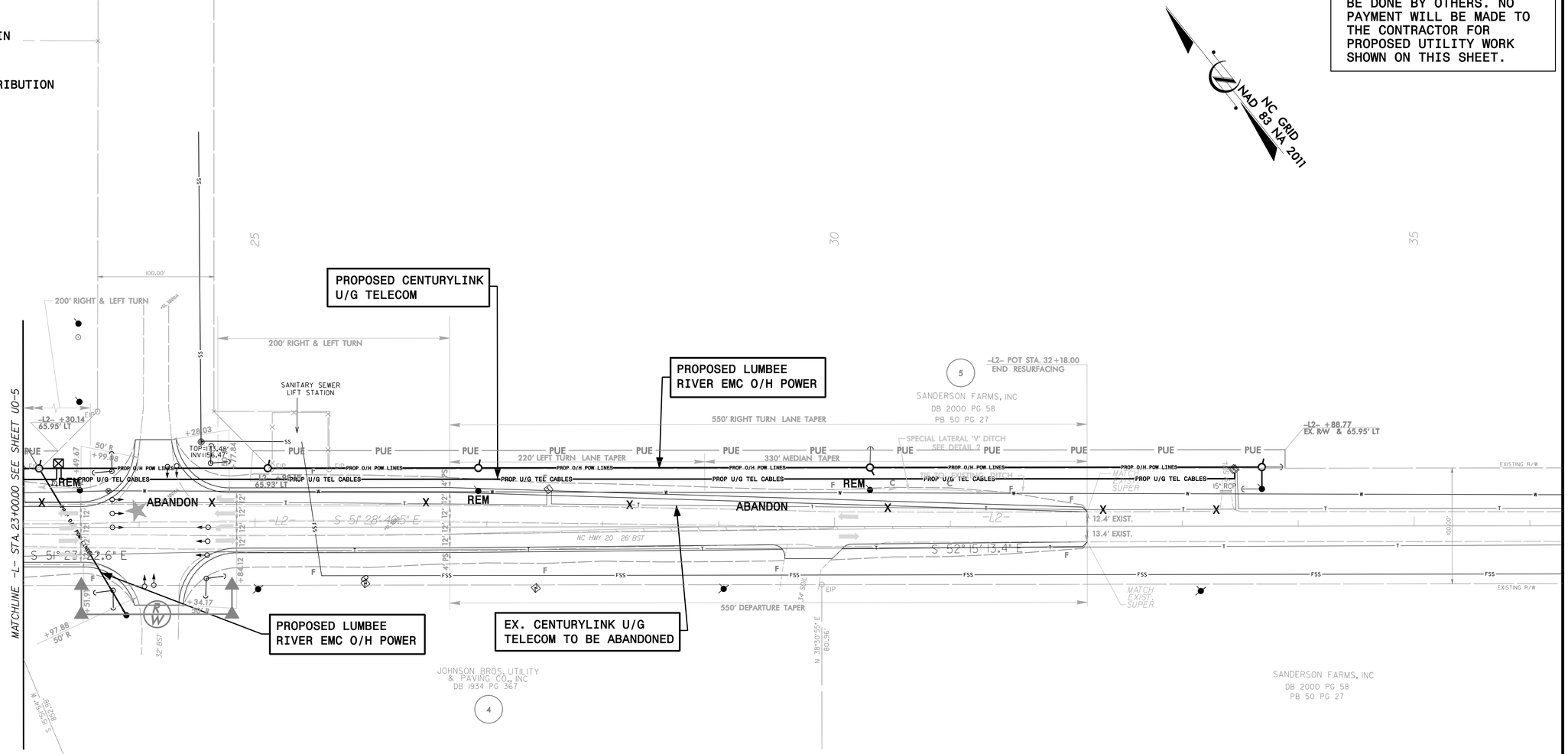
UTILITY: POWER DISTRIBUTION
CONTACT: CYNTHIA ROARTY
PHONE: 919-431-4738

2. CENTURYLINK
UTILITY: TELECOM
CONTACT: KEVIN GODWIN
PHONE: 910-366-2142

3. LUMBEE RIVER EMC
UTILITY: POWER DISTRIBUTION
CONTACT: KEN ROWELL
PHONE: 910-843-7953



REVISIONS

DATE: 2/29/2016
TIME: 4:54:56 PM
DGN: R5754_uo_ps06.dgn

Prepared by:

AECOM

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

PROJECT REFERENCE NO.	SHEET NO.
R-5754	UO-7

UTILITIES BY OTHERS

NOTE:
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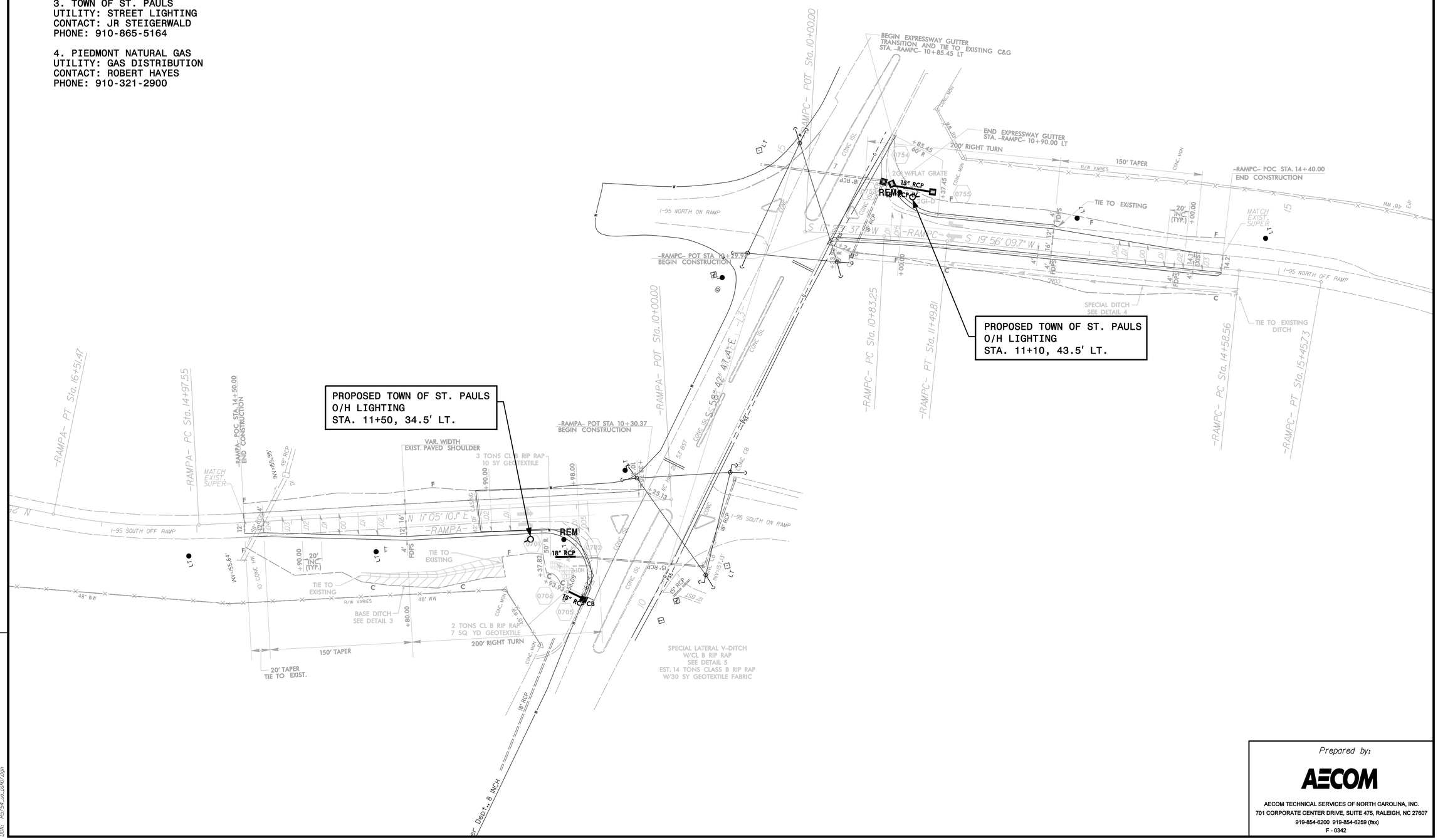
UTILITY OWNERS ON THIS PROJECT:

1. DUKE ENERGY
UTILITY: POWER DISTRIBUTION
CONTACT: CYNTHIA ROARTY
PHONE: 919-431-4738

2. CENTURYLINK
UTILITY: TELECOM
CONTACT: KEVIN GODWIN
PHONE: 910-366-2142

3. TOWN OF ST. PAULS
UTILITY: STREET LIGHTING
CONTACT: JR STEIGERWALD
PHONE: 910-865-5164

4. PIEDMONT NATURAL GAS
UTILITY: GAS DISTRIBUTION
CONTACT: ROBERT HAYES
PHONE: 910-321-2900



REVISIONS

DATE: 8/29/2016
TIME: 08:04 PM
DGN: R5754_uo_sp007.dgn

Prepared by:

AECOM

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

INDEX TO CROSS SECTIONS

ALIGNMENT	ROAD NAME	NO. OF SHEETS	SHEET NO.	
			FROM	TO
-L1-	NC 20 (MAIN ST.)	3	X-1	X-3
-Y-	NC 71	3	X-4	X-6
-L2-	NC 20	7	X-7	X-13
-RAMPA-	RAMP A (I-95 SOUTH OFF RAMP)	3	X-14	X-16
-RAMPC-	RAMP C (I-95 NORTH OFF RAMP)	3	X-17	X-19

2/17/2016
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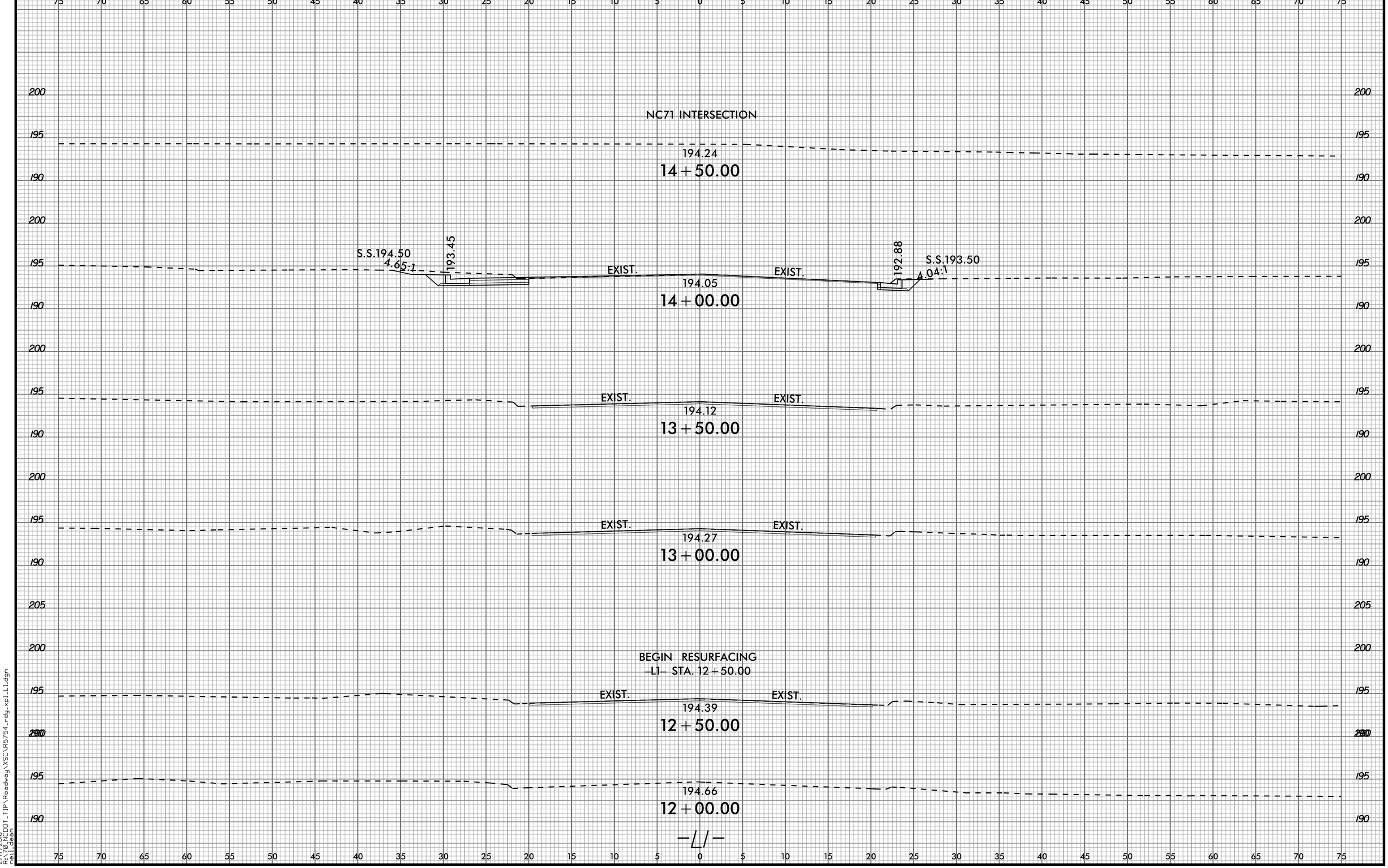

8/23/99

2/17/2016
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8/23/99

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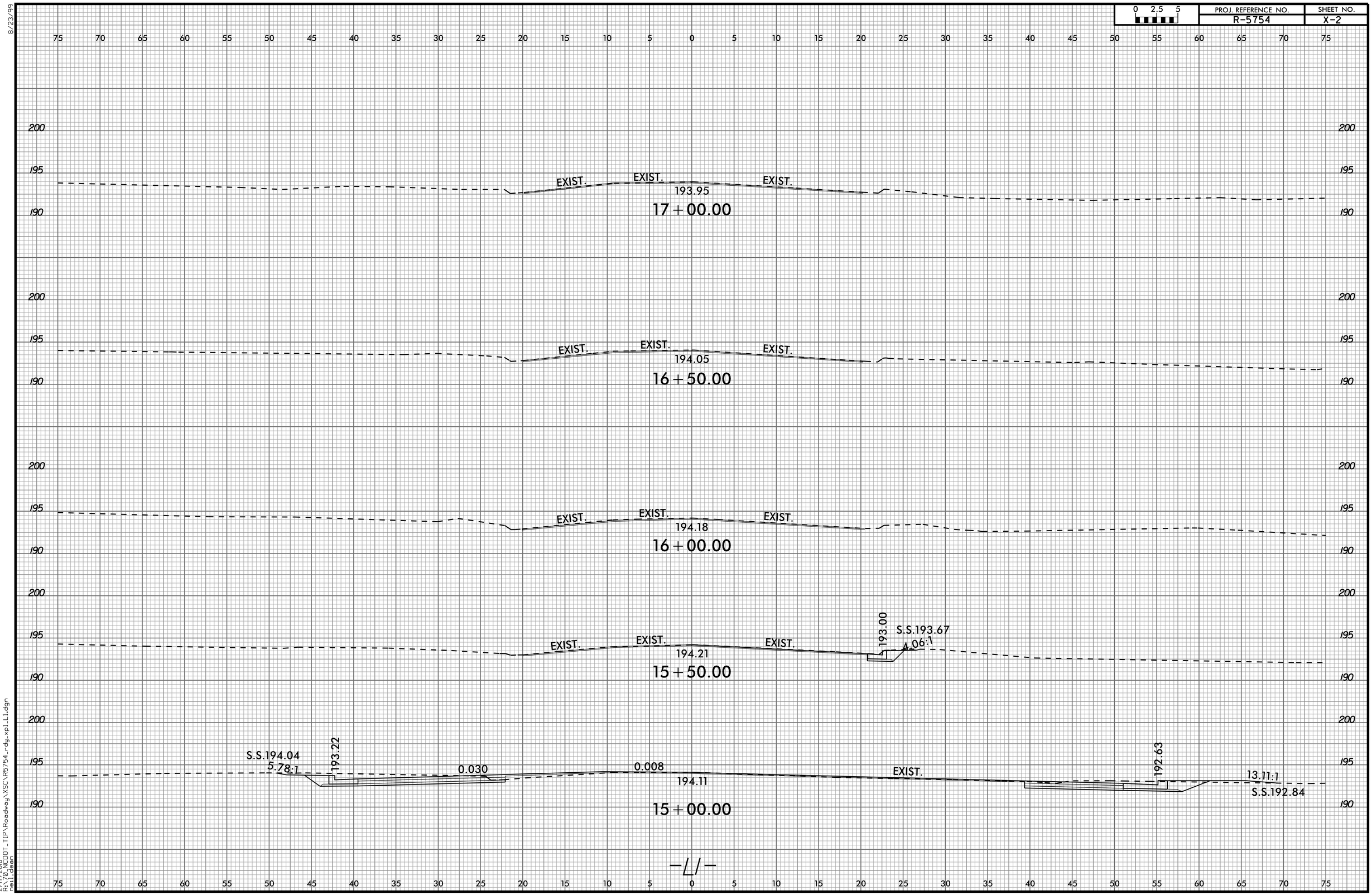
	R-5754	X-2



2/17/2016
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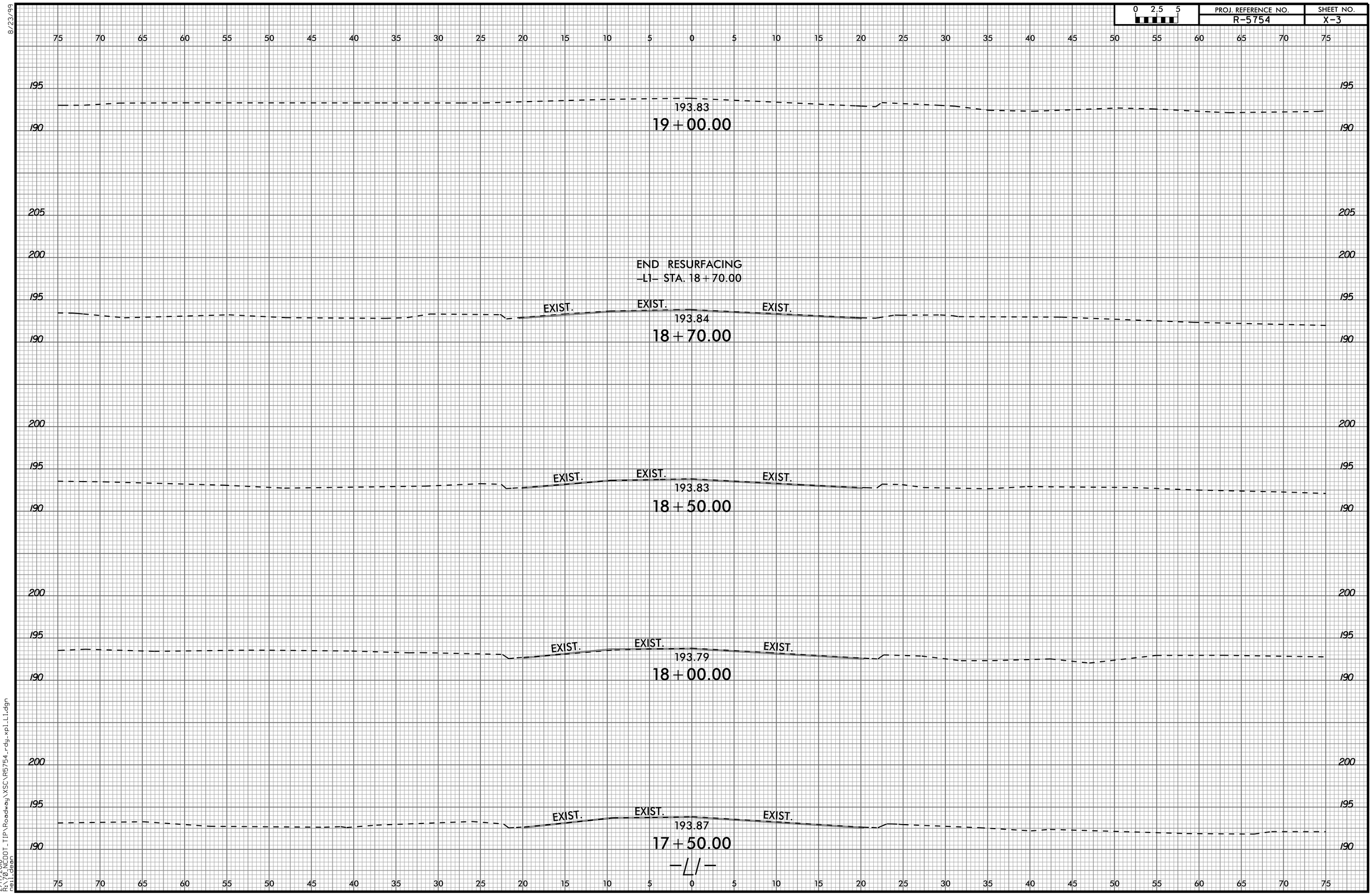

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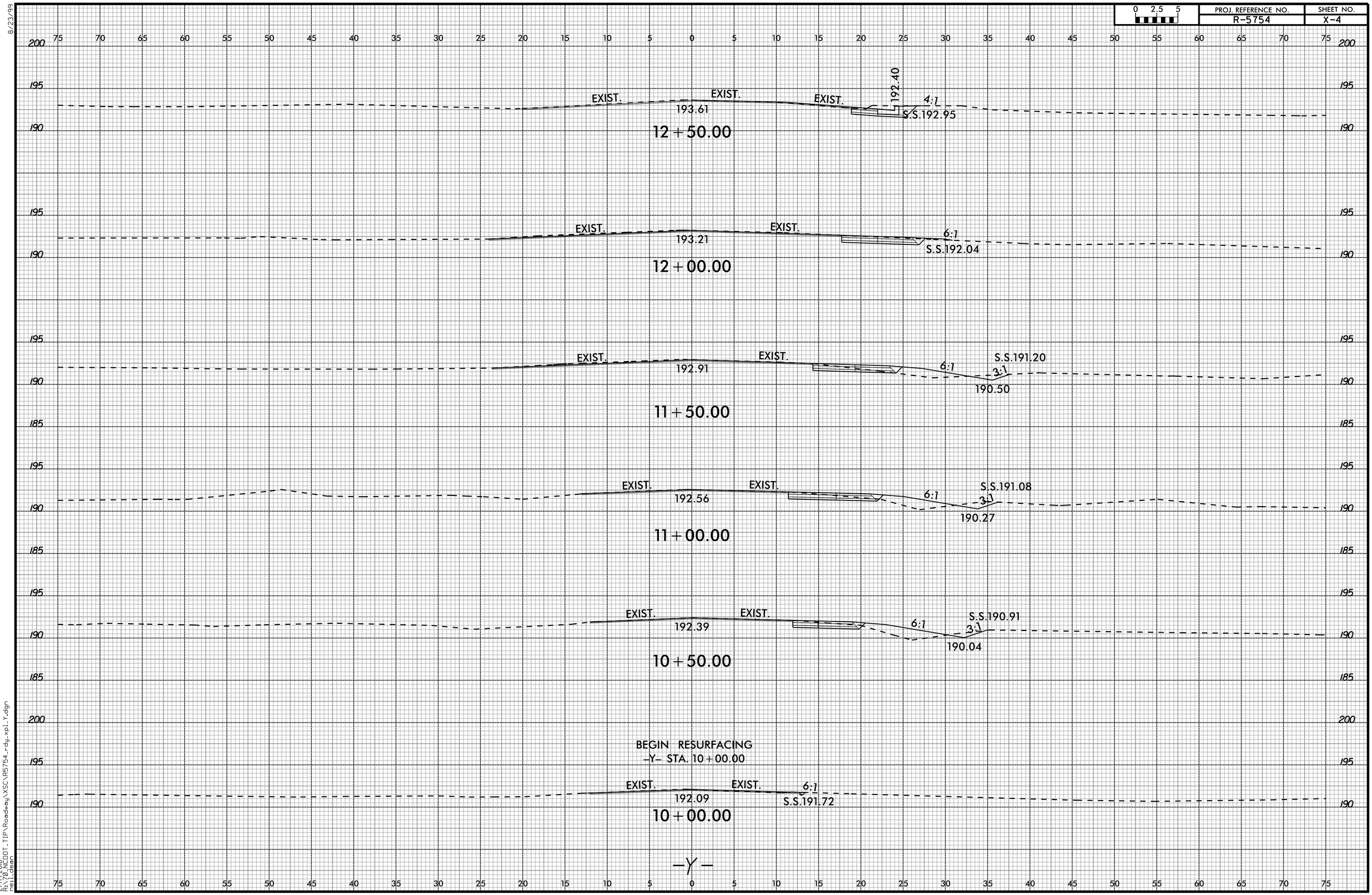

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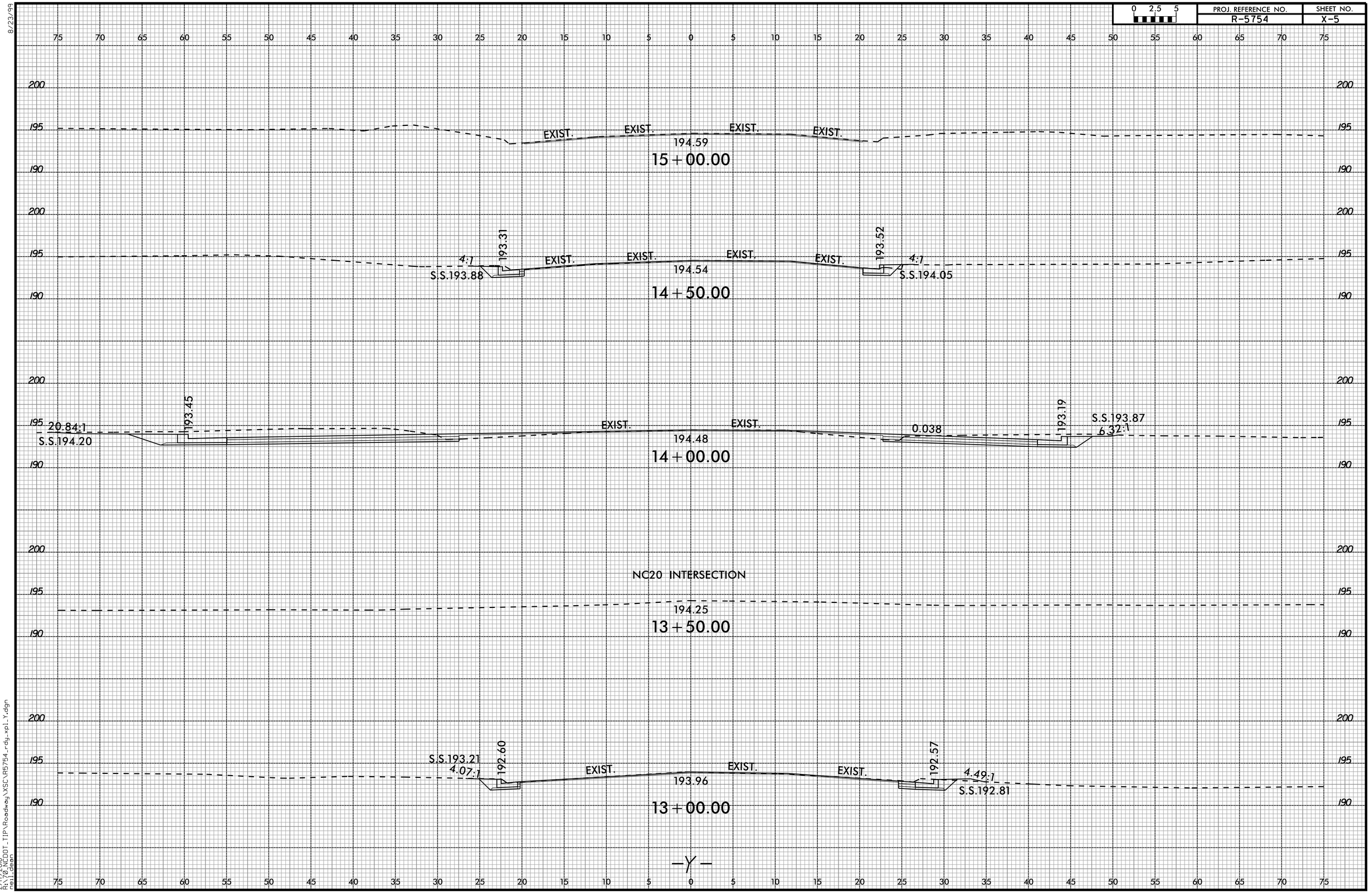

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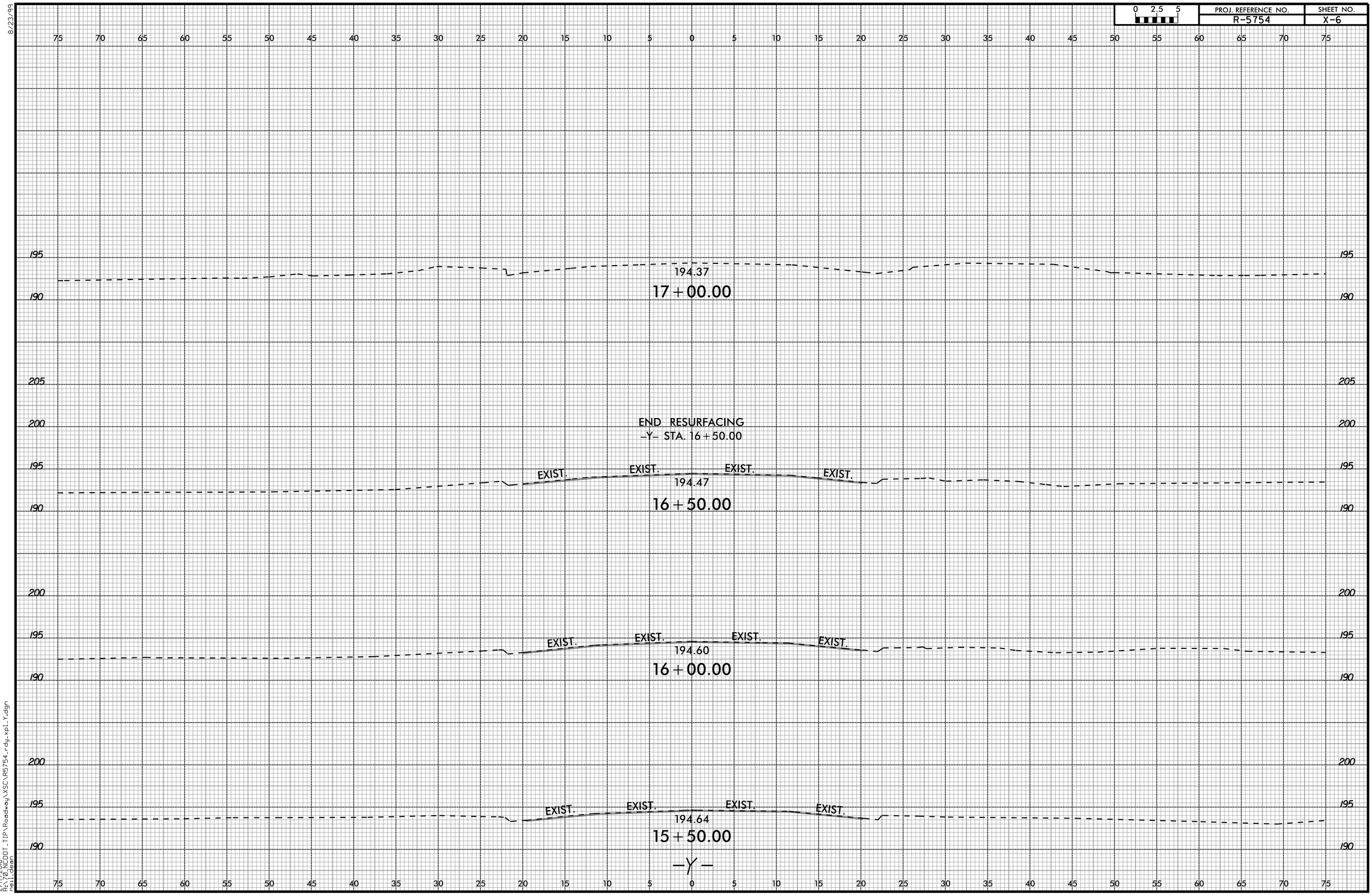

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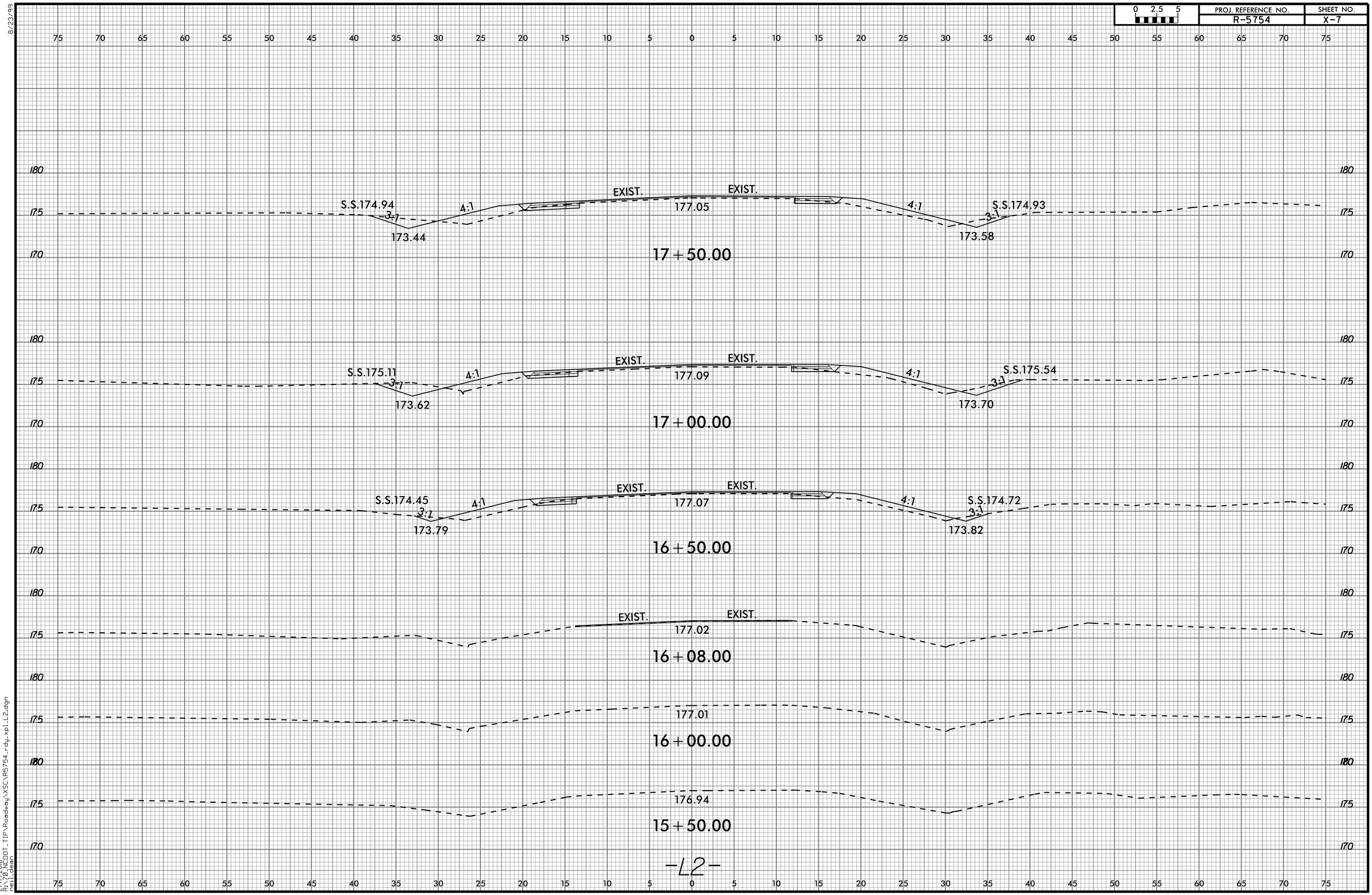

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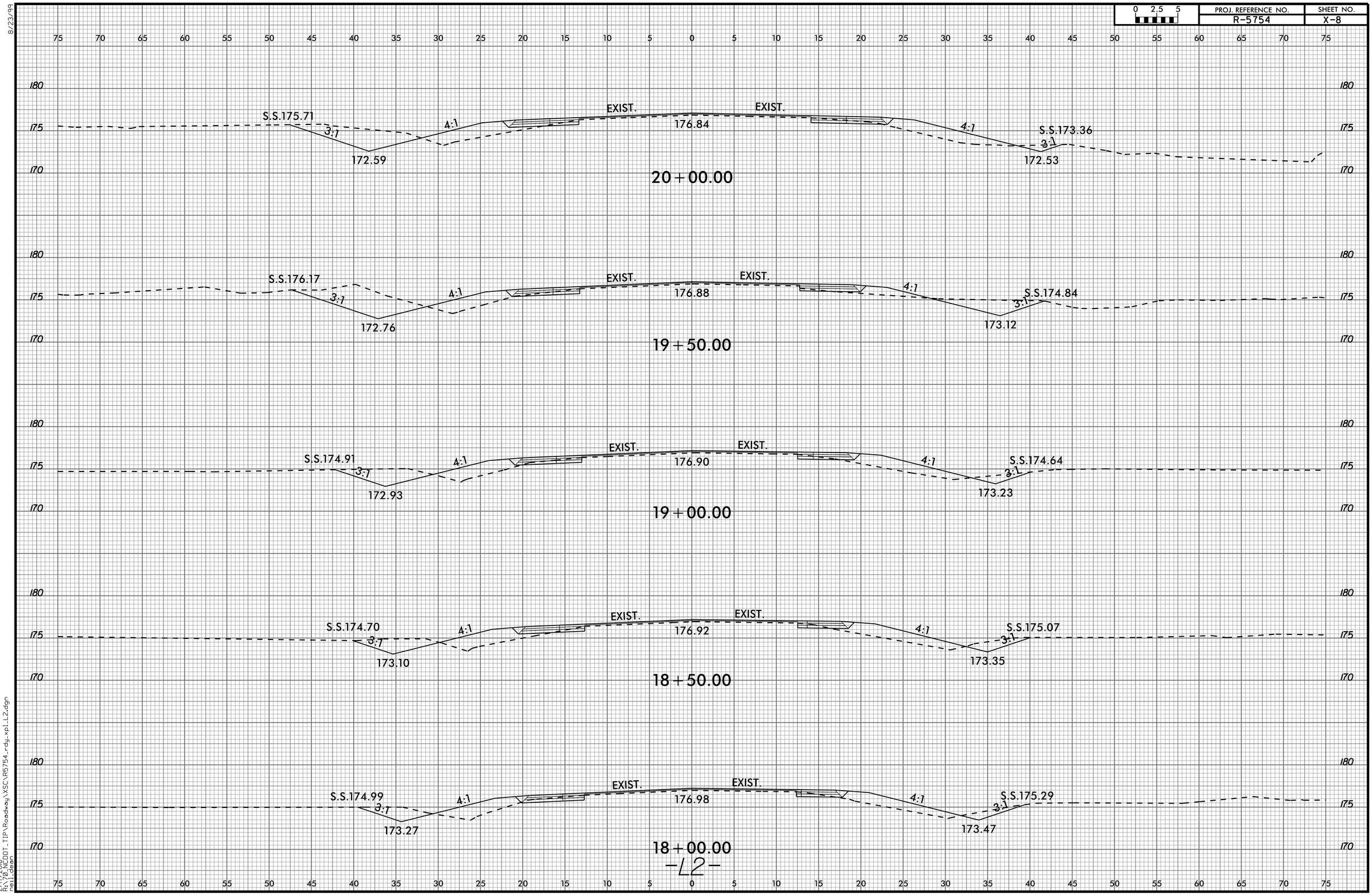

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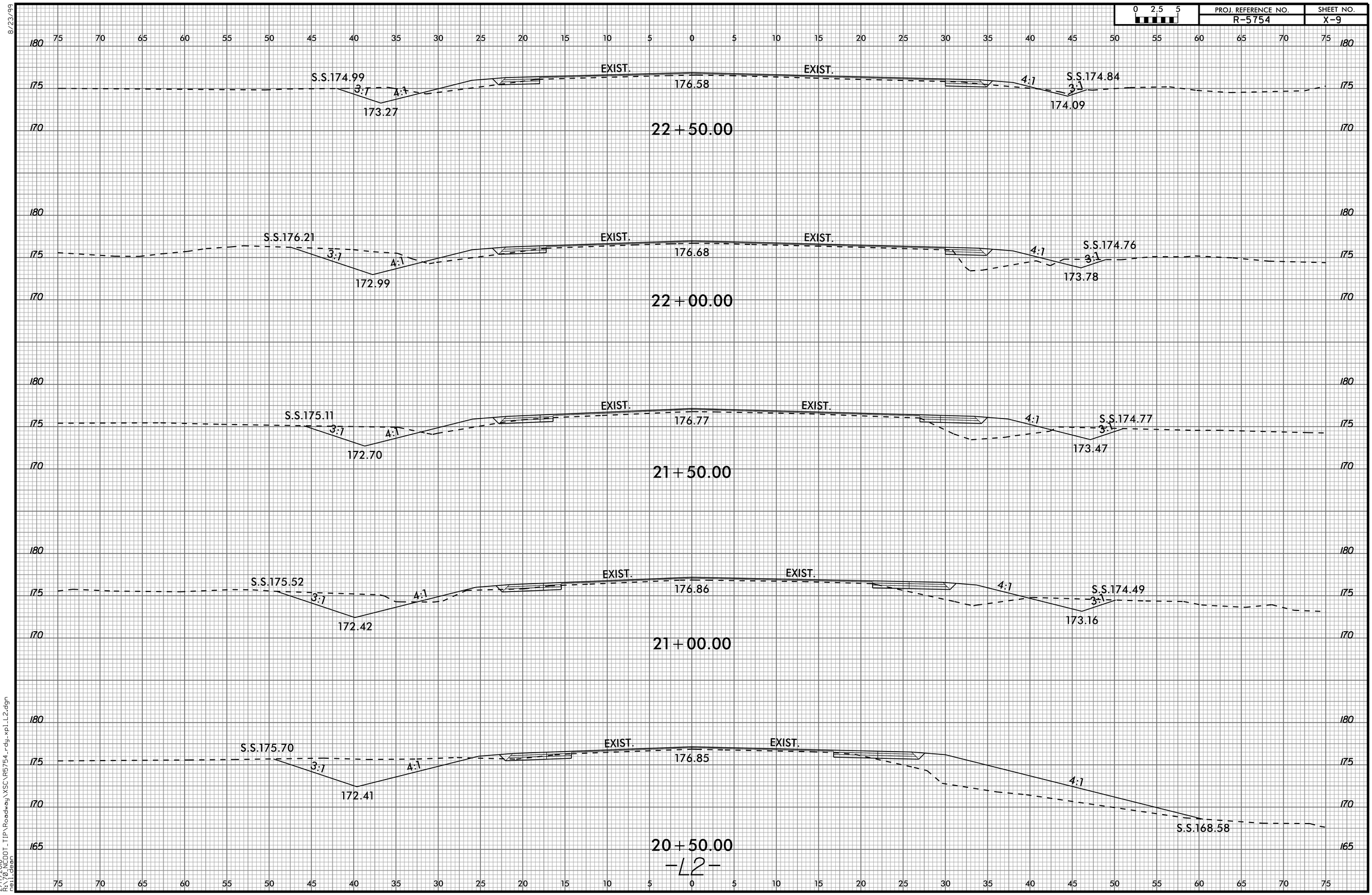

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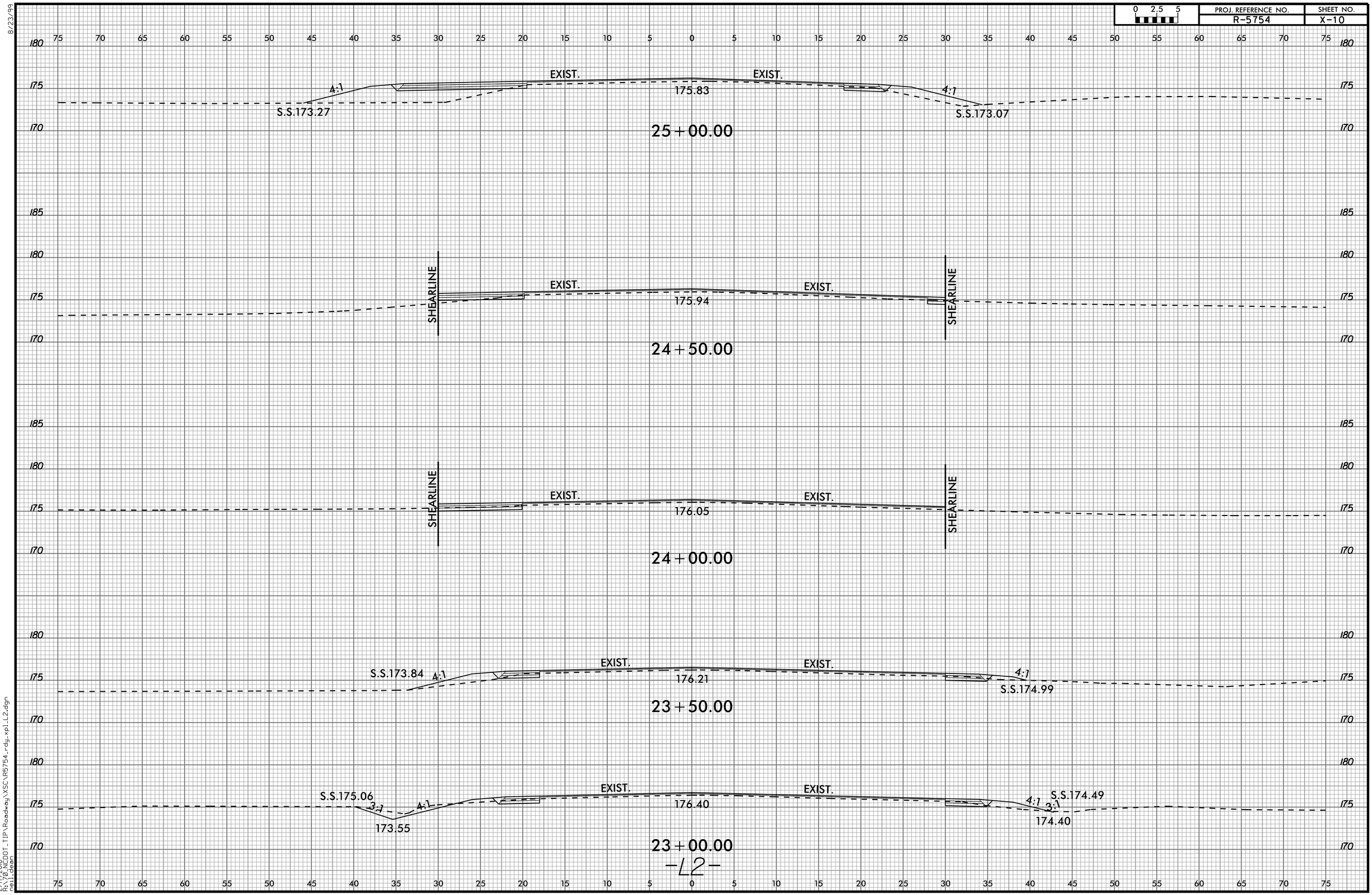

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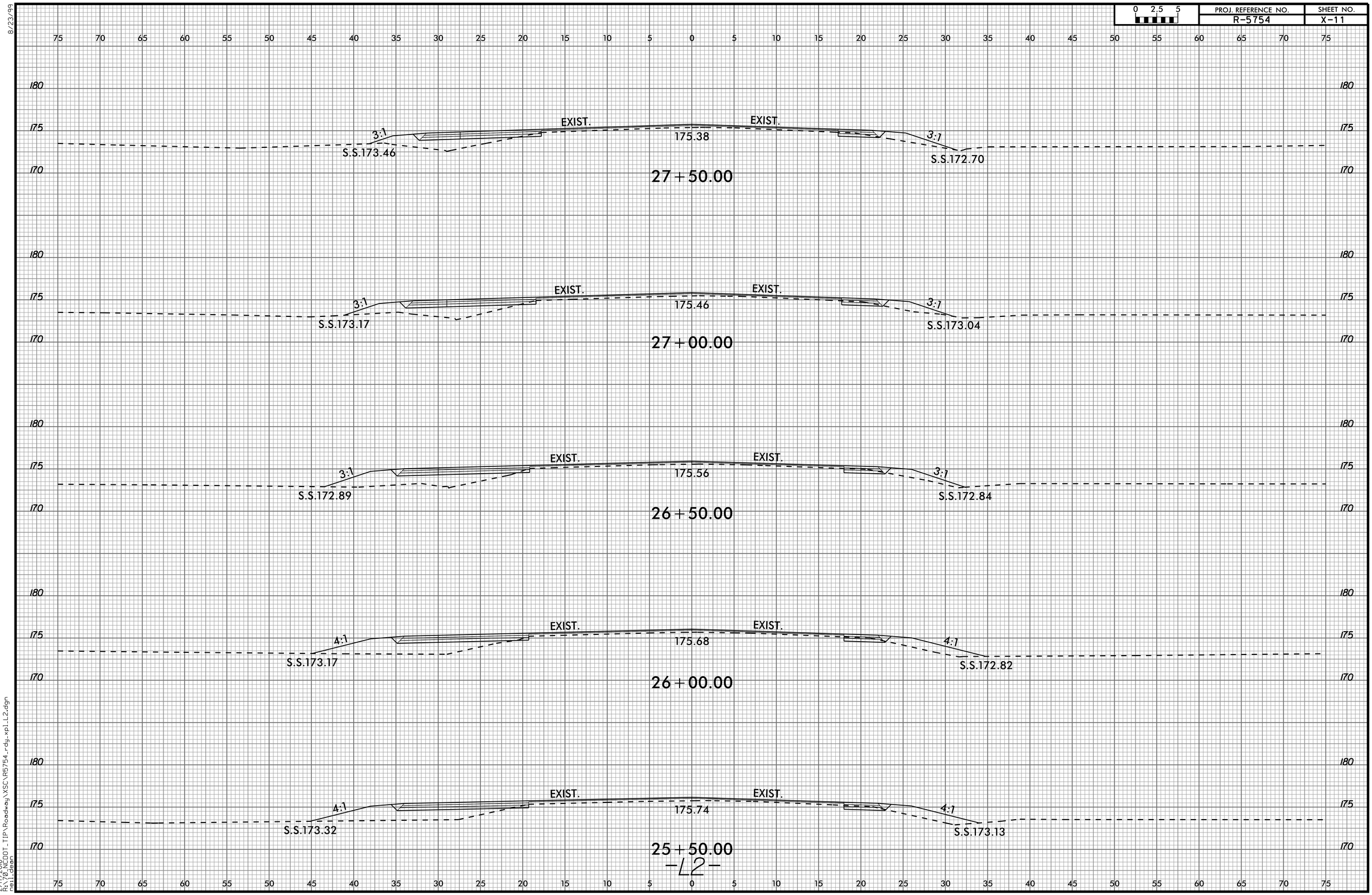

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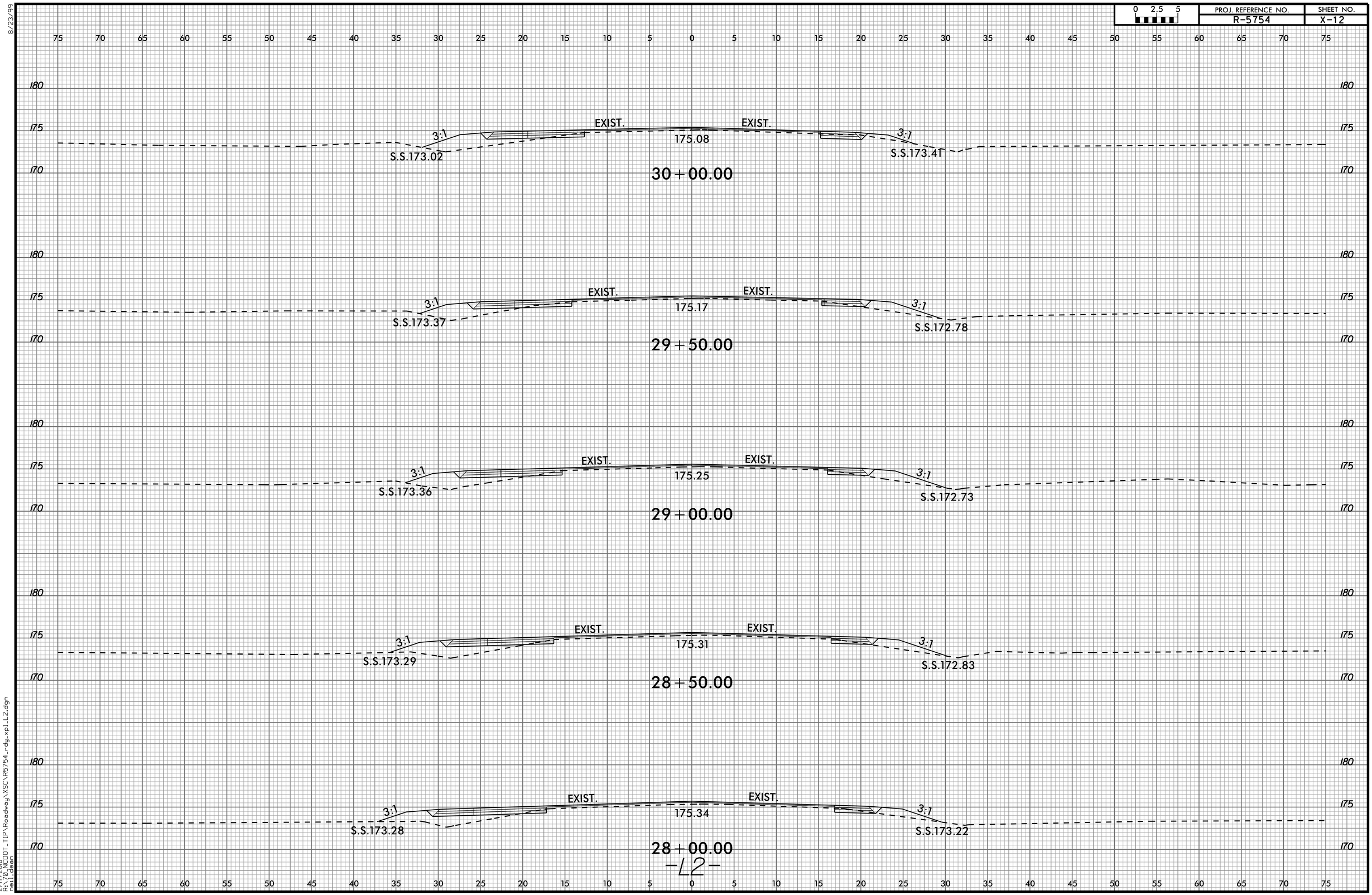

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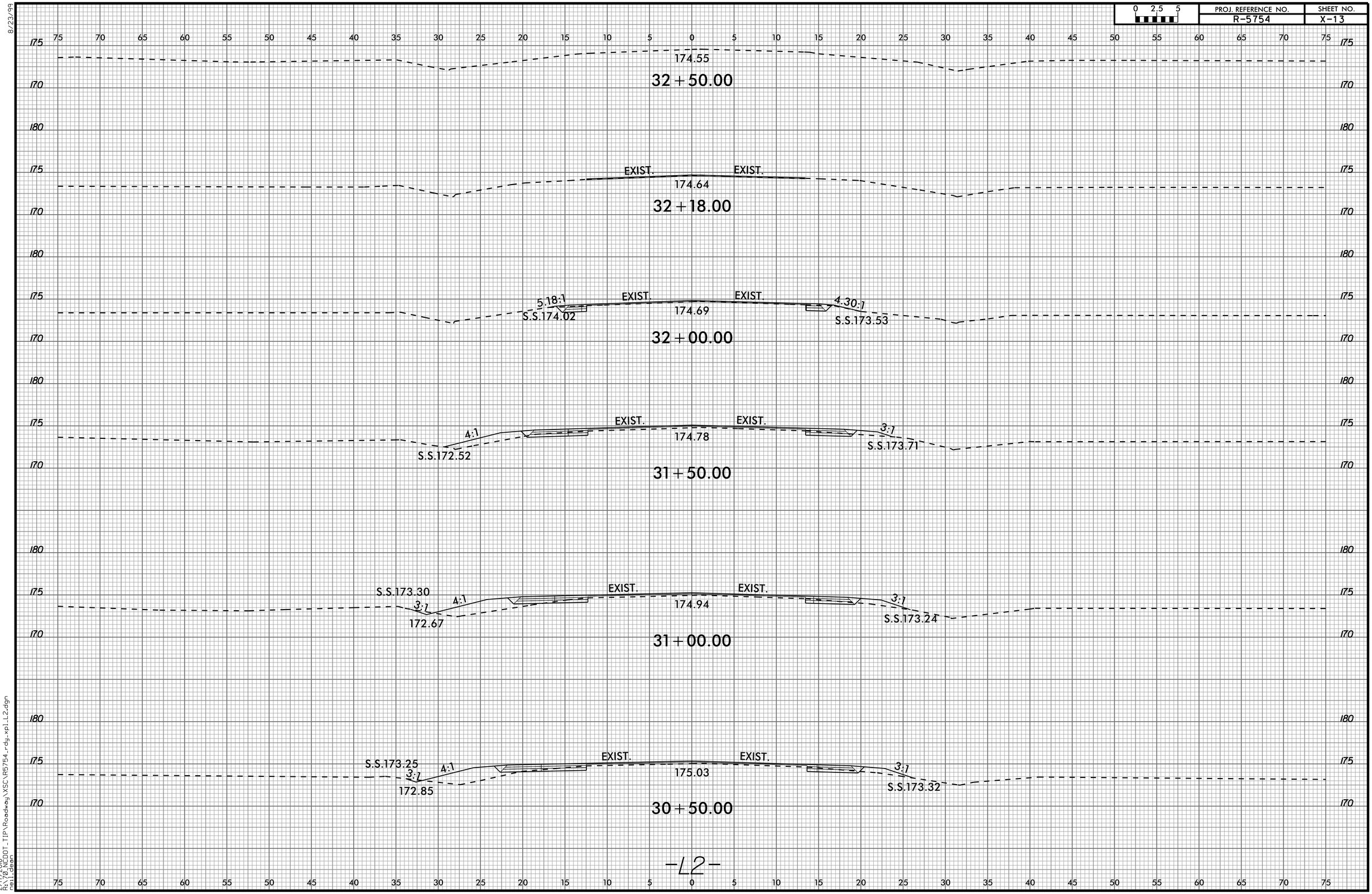

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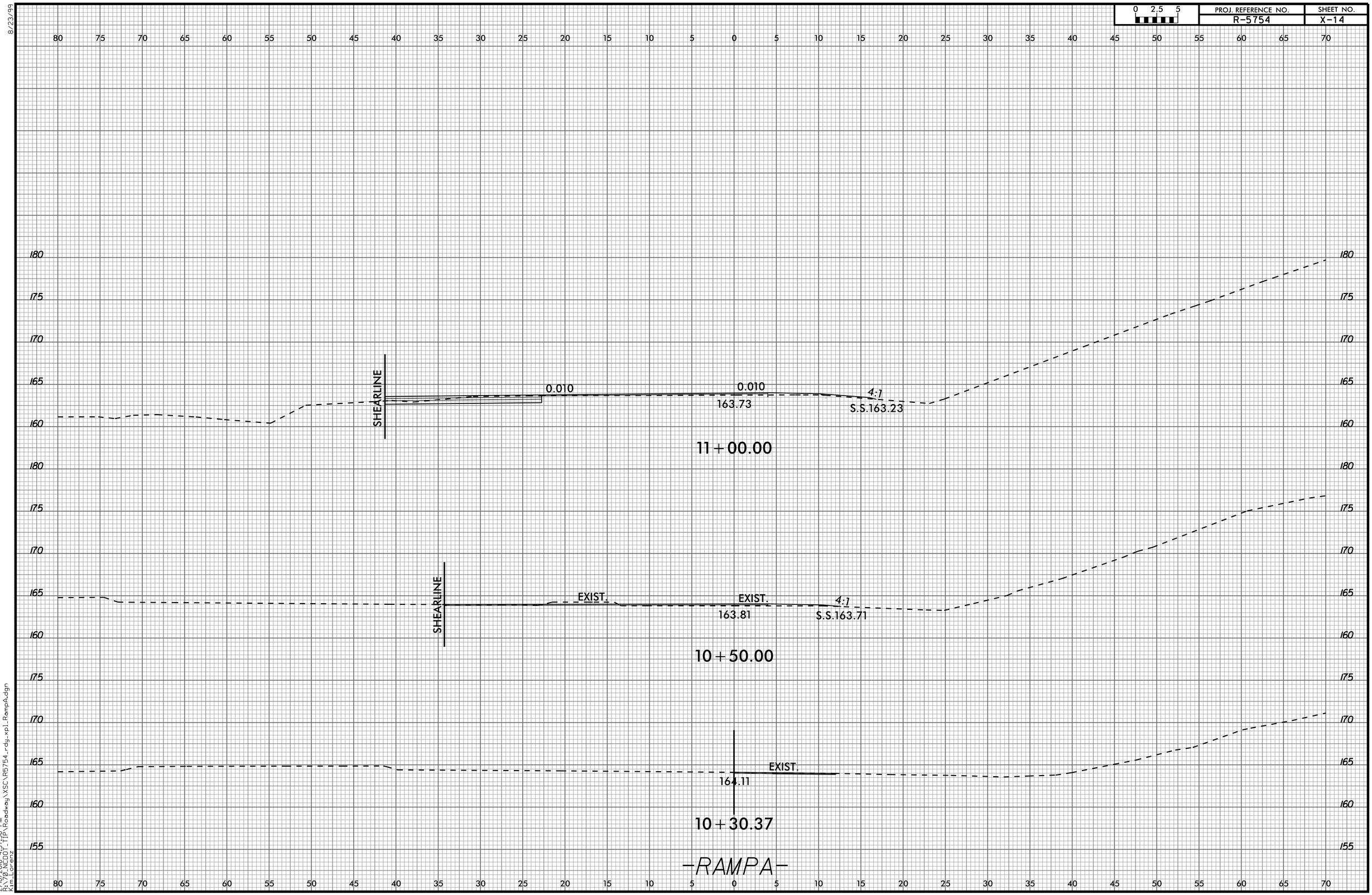

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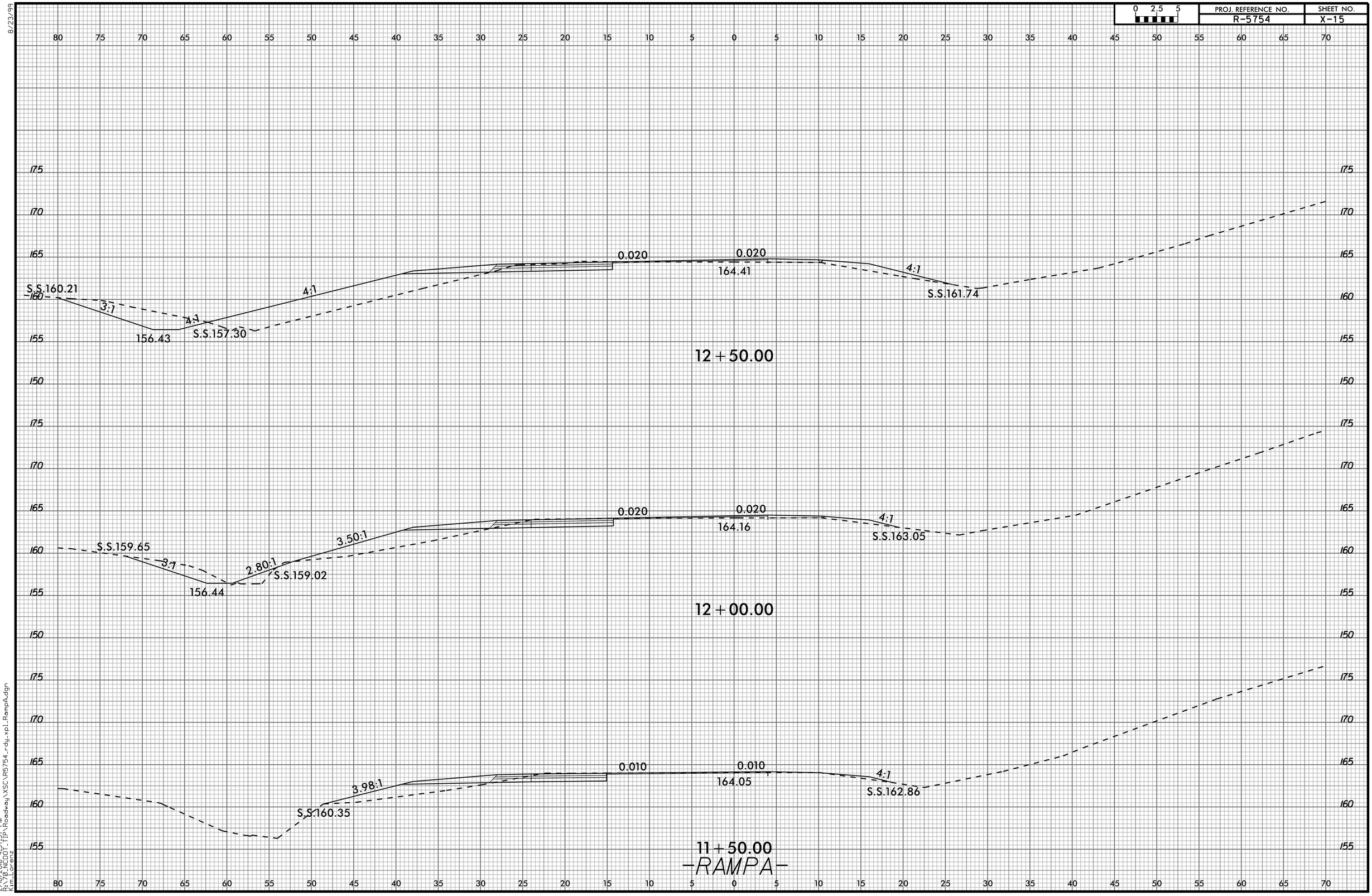

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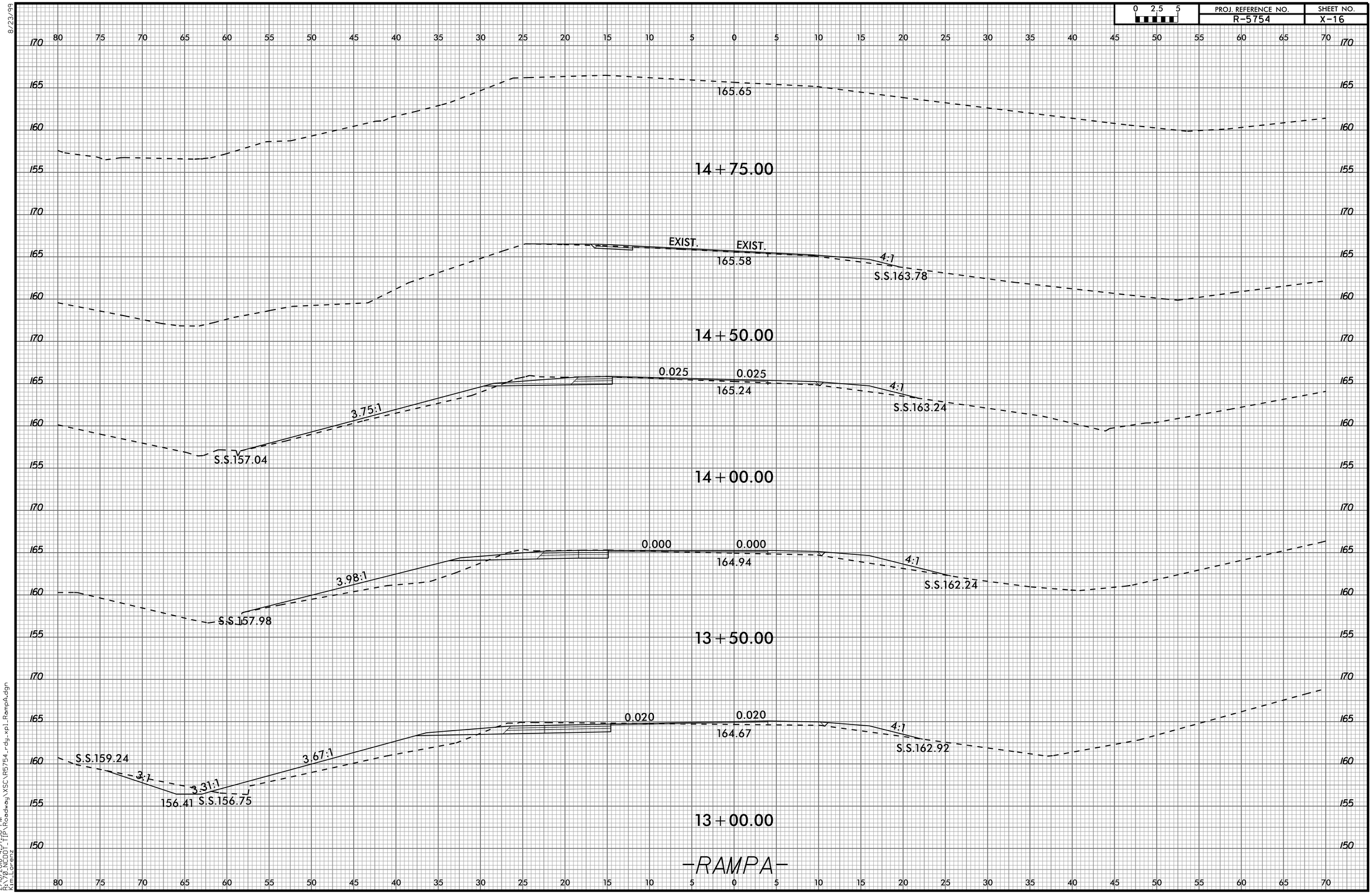

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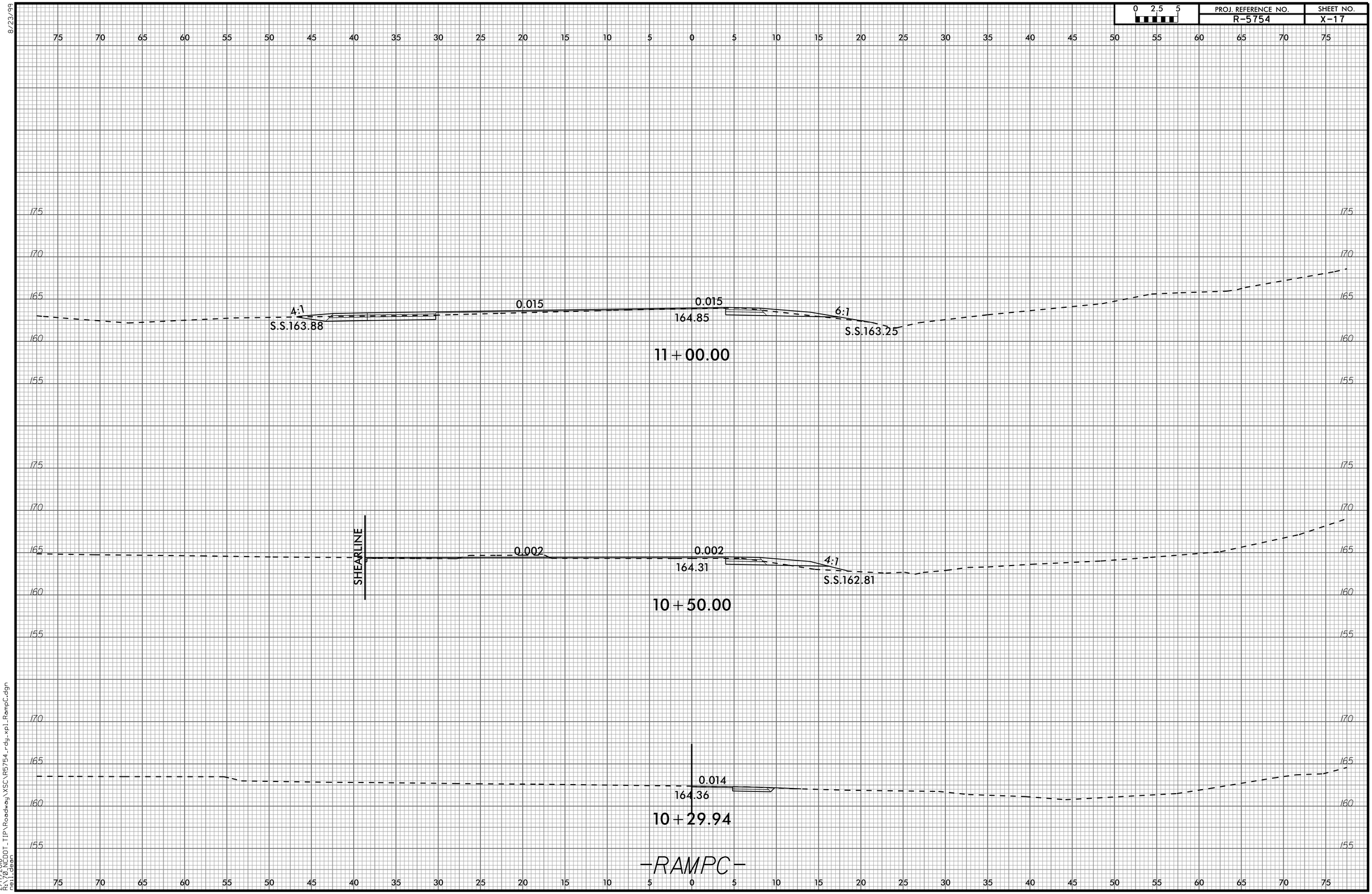

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
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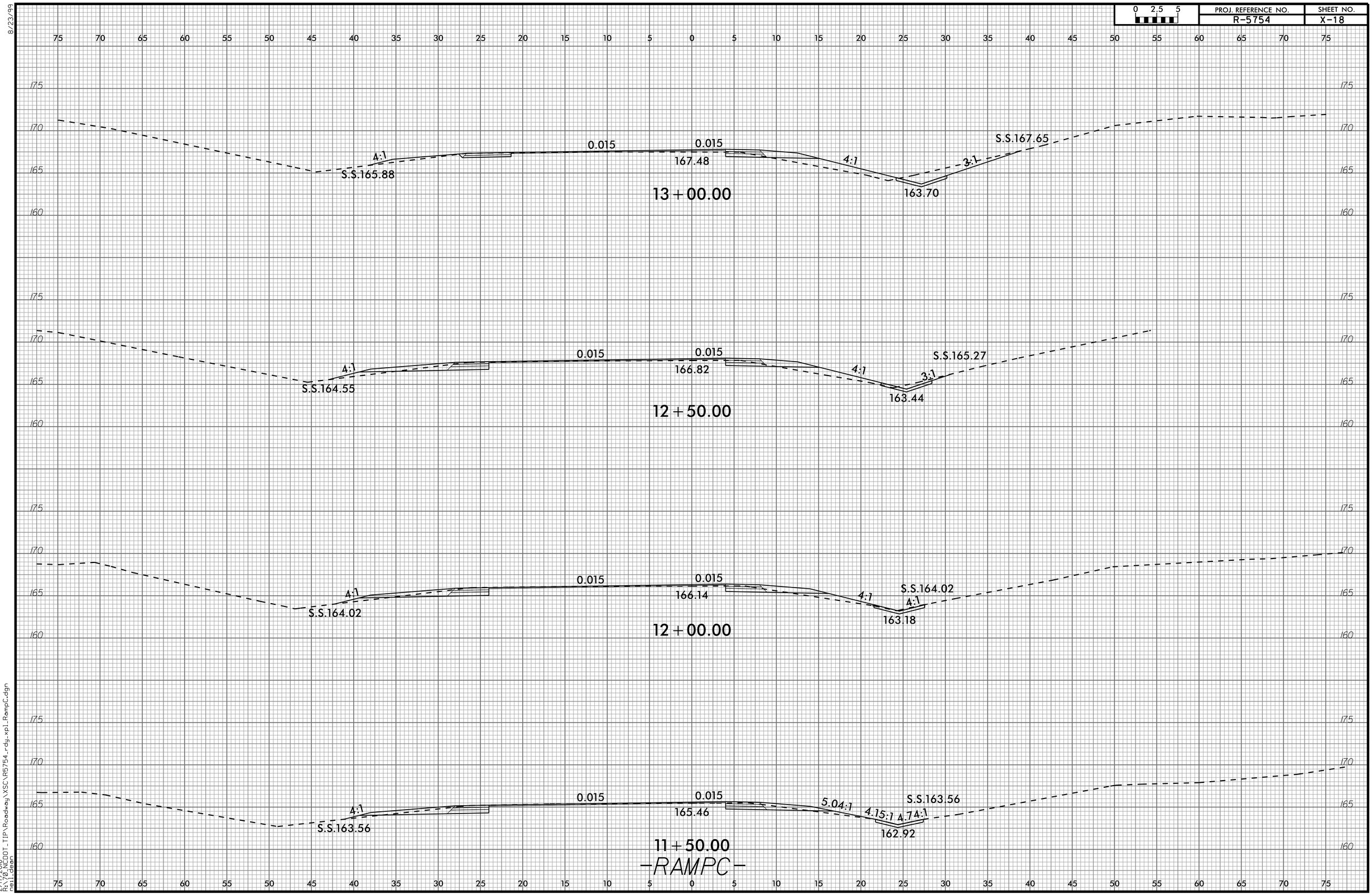

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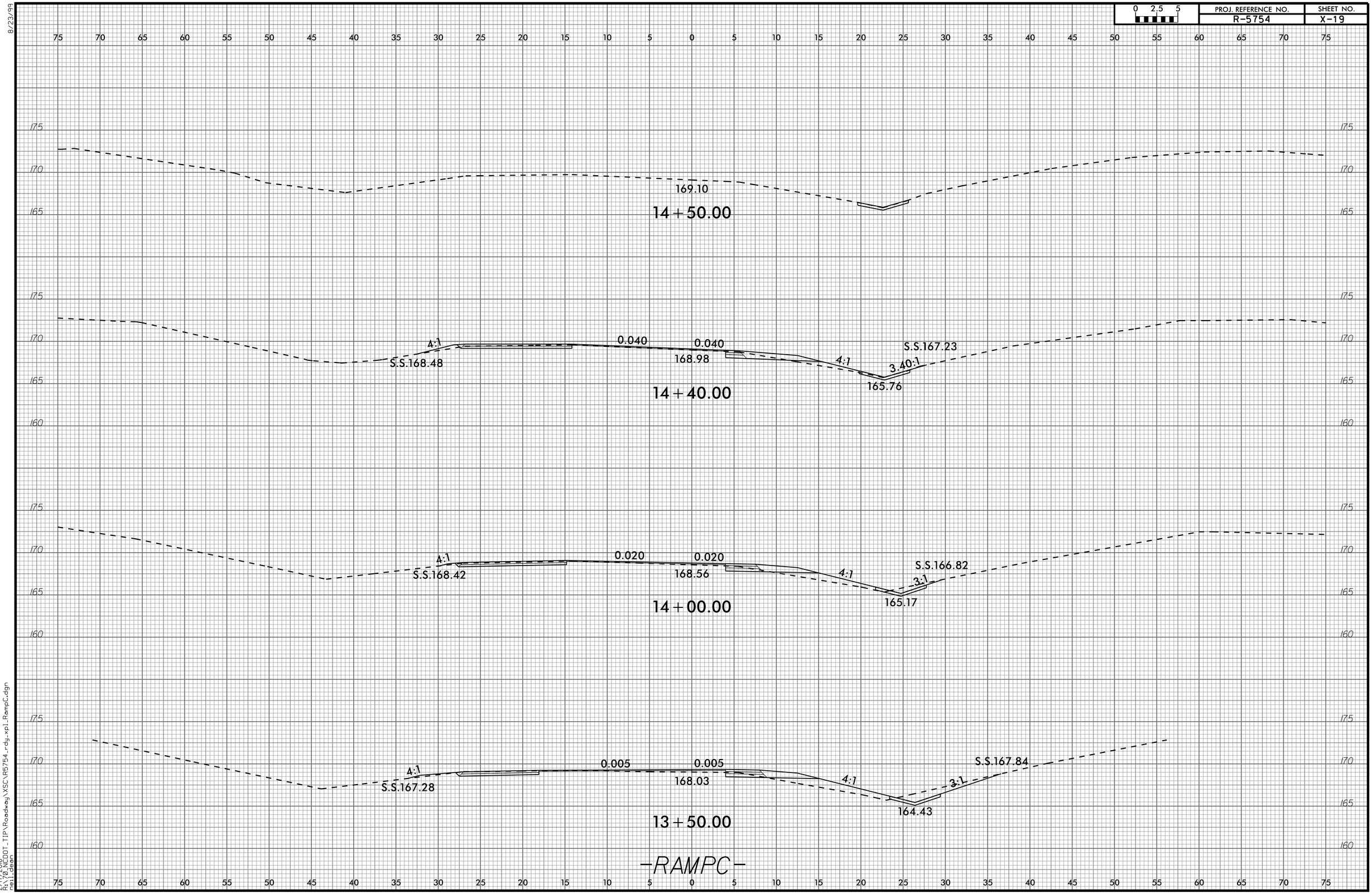

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