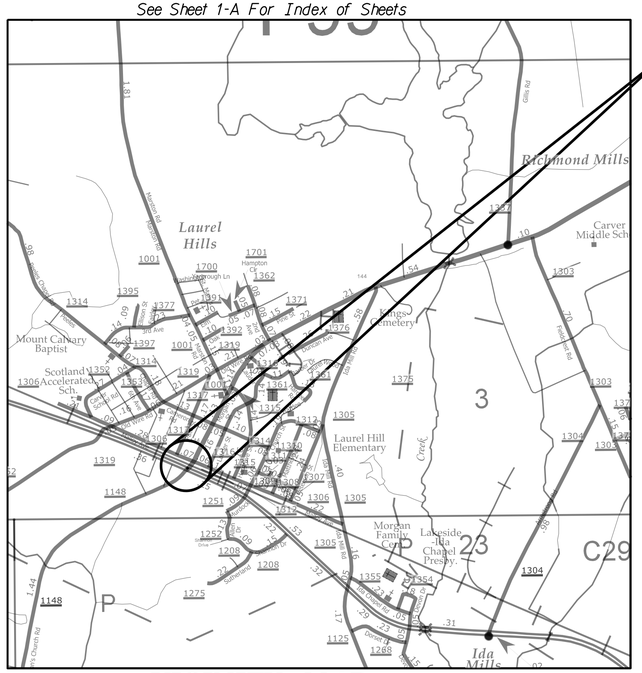
TIP PROJECT: HS-2008E PROJECT: US 74 AT NC 144/ST. JOHNS CHURCH RD

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

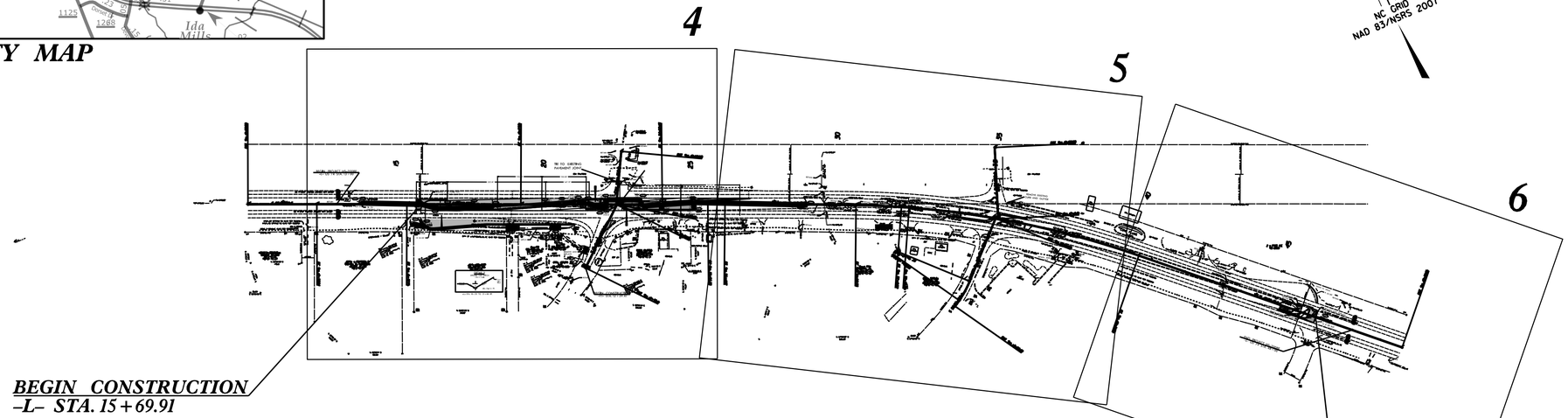
SCOTLAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2008E	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49318.1.6	0074253	PE
49318.2.6	0074253	RW
49318.3.6	0074253	CONST

LOCATION: US 74 AT NC 144/ST JOHNS CHURCH RD

TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, AND THERMOPLASTIC MARKINGS & MARKERS



NC GRID
NAD 83/NSRS 2007

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS 0 50 100

PROFILE (HORIZONTAL) 0 50 100

PROFILE (VERTICAL) 0 50 100

DESIGN DATA

ADT 2022 = 23000
ADT 2042 = 34500
V = 50 MPH

Prepared In the Office of:
DIVISION OF HIGHWAYS
DIVISION 8 DESIGN & CONSTRUCT UNIT
121 DOT DRIVE
CARTHAGE NC 28327
PLANS PREPARED BY: DDC

PROJECT LENGTH

ROADWAY: 0.58 MILES
STRUCTURE: MILES
TOTAL: 0.58 MILES

DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 31, 2025

LETTING DATE: MARCH 10, 2026

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER TRENTON J. CORNER

Signed by: Trenton J. Corner 76D7396E5482...

SIGNATURE: 01/20/2026 P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. ROBERTS

DocuSigned by: Michael Roberts 3B420DAD6B...

01/13/2026 P.E.

SIGNATURE:

DIVISION PROJECT ENGINEER

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

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	1–A

DocuSigned by: Michael Richett 3B420DAD60B44E...
01/20/2026

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL R. RICHETT

DIVISION PROJECT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1–A	INDEX OF SHEETS
1–B	CONVENTIONAL SYMBOLS
2A–1 THRU 2A–8	TYPICAL SECTIONS
2B–1 THRU 2B–3	CONCRETE ISLAND DETAILS
2B–4 THRU 2B–6	RESURFACING LIMITS
3A–1 THRU 3A–2	SUMMARY OF QUANTITIES
3B	EARTHWORK SUMMARY
3D–1	DRAINAGE SUMMARY
4 THRU 6	PLAN SHEETS
7 THRU 9	PROFILE SHEETS
RW01 THRU RW06	RIGHT OF WAY PLAN SHEETS
TMP–1 THRU TMP–8	TRAFFIC MANAGEMENT PLANS
PMP–1 THRU PMP–4	PAVEMENT MARKING PLANS
EC–1 THRU EC–9	EROSION CONTROL PLANS
SIGN–1 THRU SIGN–6	SIGNING PLANS
SIG–1.0 THRU SIG–5.3	SIGNAL PLAN SHEETS
SIG–M1A THRU SIGN–M9	SIGNAL DETAILS
SCP–1	SIGNAL COMMUNICATION PLAN SHEET
X–1 THRU X–28	CROSS–SECTIONS –L–

GENERAL NOTES

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 THE PROPER TIE–IN.

CLEARING

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

SHOULDER CONSTRUCTION:

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

UTILITIES

ANY RELOCATION OF EXISTING UTILITIES,
WILL BE ACCOMPLISHED BY OTHERS PRIOR TO THE DATE OF AVAILABILITY.

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

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed 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
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

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 & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

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
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (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
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?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 LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	2A–1
R/W SHEET NO.	

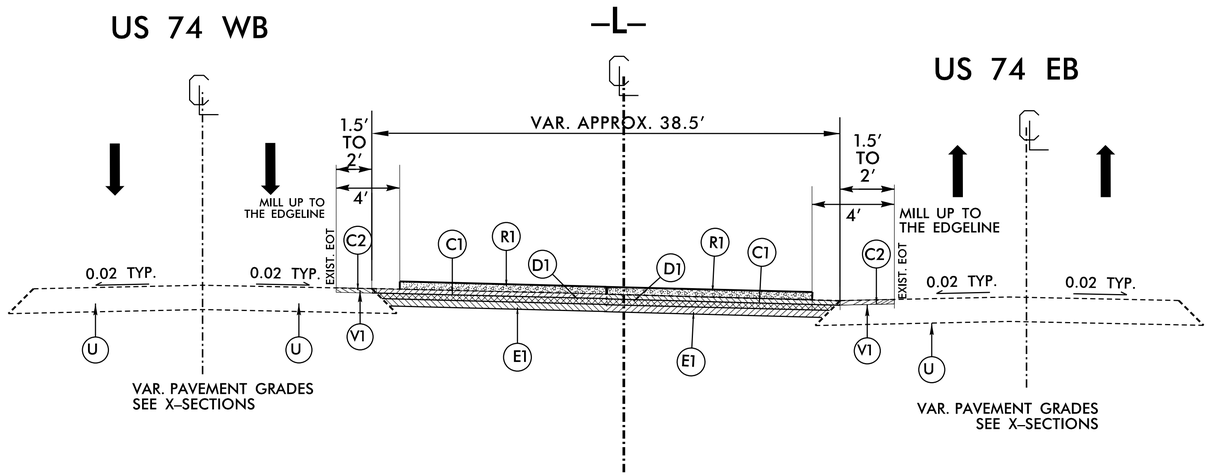
DocuSigned by: Michael Richetti
38420DAD60B44EB...
01/20/2026

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICHETTI

DIVISION DESIGN / CONSTRUCT ENGINEER

TYPICAL SECTION NO. 1

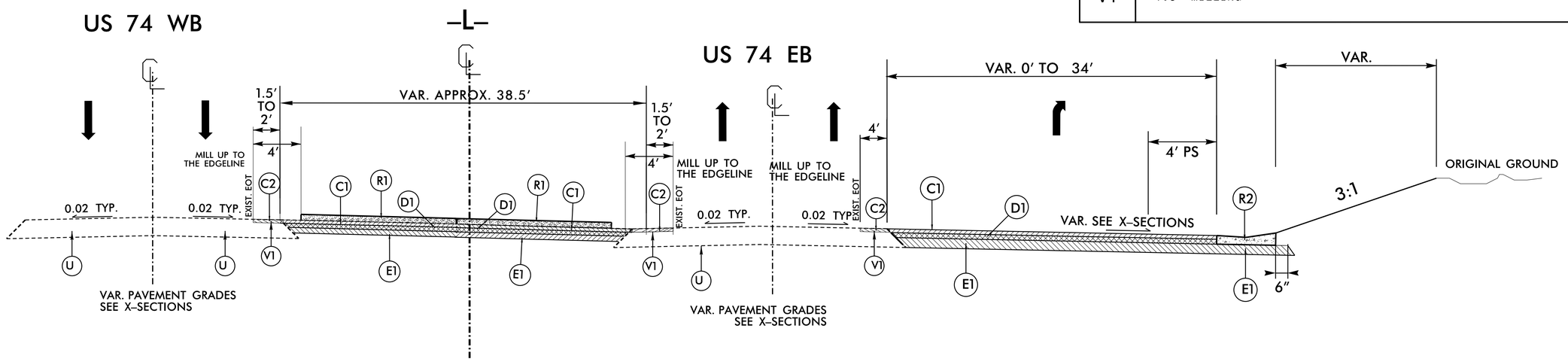
–L– STA. 15+69.80 TO 15+82.11
–L– STA. 46+40.09 TO 46+68.50



PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. PER 1½″ DEPTH. TO BE PLACED IN TWO LAYERS.
C2	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 5.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
R1	5″ MONOLITHIC CONCRETE ISLAND. (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2′6″ CURB AND GUTTER
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5″ MILLING

TYPICAL SECTION NO. 2

–L– STA. 15+82.11 TO 16+36.95



PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	2A–2
R/W SHEET NO.	

DocuSigned by: Michael Richetty 3B420DAD608446... 01/20/2021

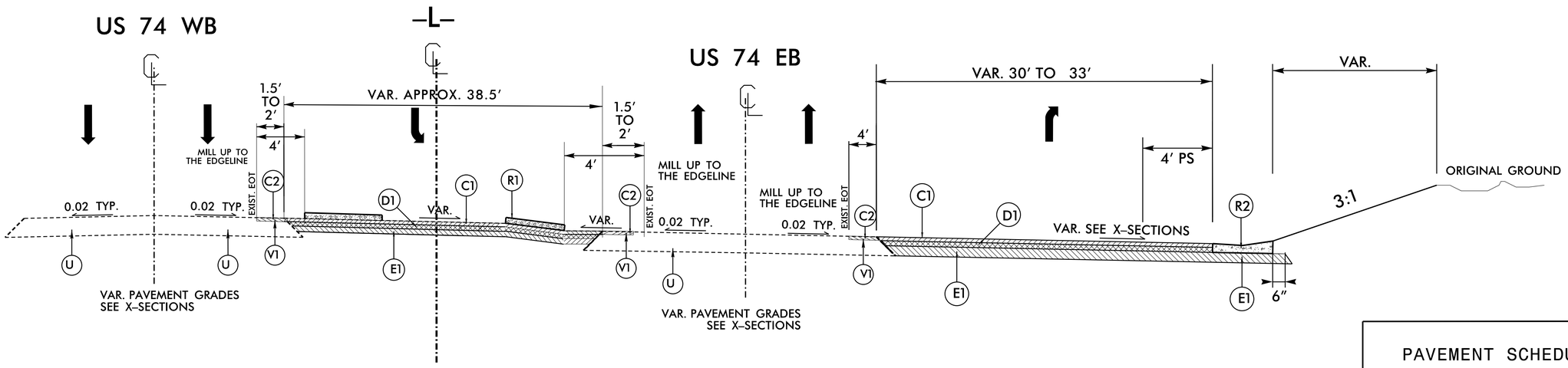
SEAL 052140 NORTH CAROLINA PROFESSIONAL ENGINEER MICHAEL E RICHETTY

DIVISION DESIGN / CONSTRUCT ENGINEER

REVISIONS

8/17/99

TYPICAL SECTION NO. 3
–L– STA. 16+36.95 TO 16+74.81



PAVEMENT SCHEDULE

C1	3.0″ S9.5C
C2	1.5″ S9.5C
D1	4″ I19.0C
E1	5.5″ B25.0C
R1	5″ ISLAND (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2′6″ C&G
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5″ MILLING

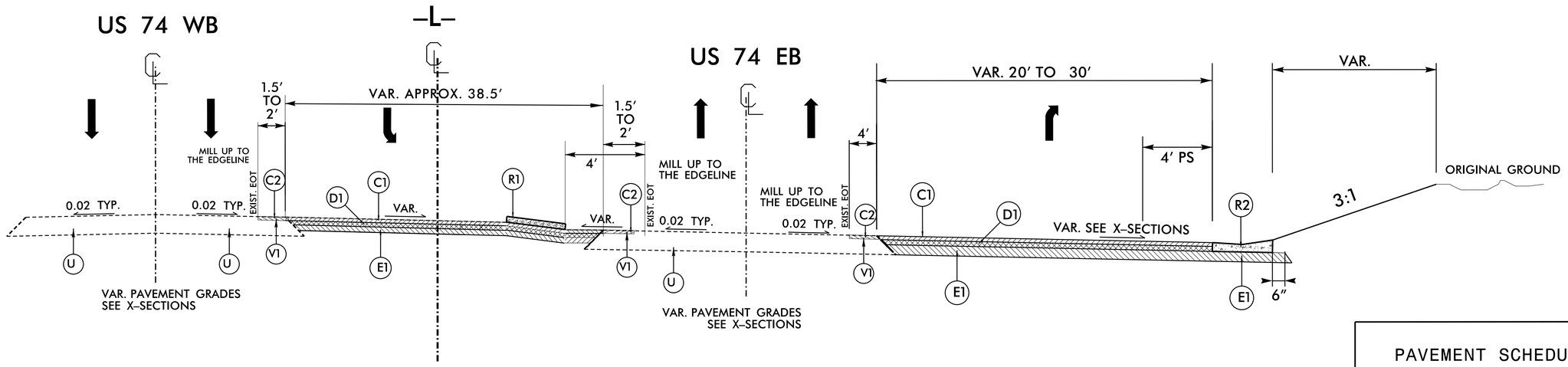
PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	2A–3
R/W SHEET NO.	

DocuSigned by: Michael Ricketts 3B420DAD60B44E8...
01/20/2026
NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E RICKETTS

DIVISION DESIGN / CONSTRUCT ENGINEER

REVISIONS 8/17/99

TYPICAL SECTION NO. 4
–L– STA. 16 + 74.81 TO 18 + 05.19



PAVEMENT SCHEDULE	
C1	3.0″ S9.5C
C2	1.5″ S9.5C
D1	4″ I19.0C
E1	5.5″ B25.0C
R1	5″ ISLAND (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2′6″ C&G
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5″ MILLING

PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	2A–4
R/W SHEET NO.	

DocuSigned by: Michael Ricketts 3B420DAD60B448...
01/20/2021

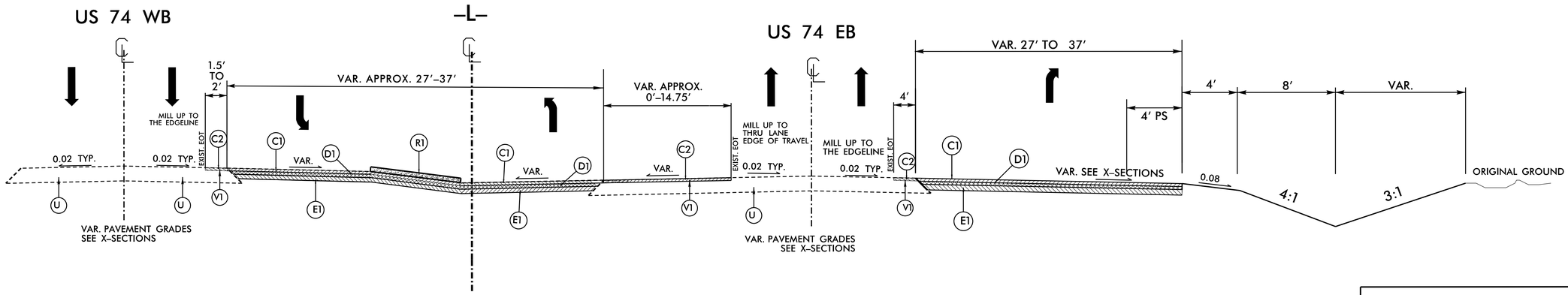
STATE OF CALIFORNIA PROFESSIONAL ENGINEER SEAL 052140 MICHAEL E. RICKETTS

DIVISION DESIGN / CONSTRUCT ENGINEER

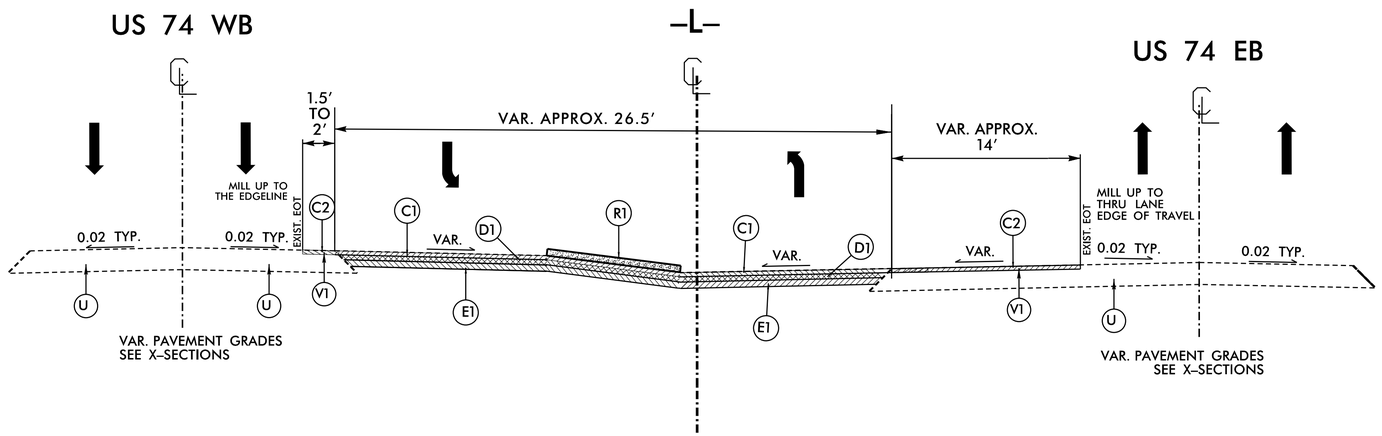
8/17/99

REVISIONS

TYPICAL SECTION NO. 5
–L– STA. 18+05.19 TO 21+09.05



TYPICAL SECTION NO. 6
–L– STA. 21+09.05 TO 21+42.38



PAVEMENT SCHEDULE

C1	3.0″ S9.5C
C2	1.5″ S9.5C
D1	4″ I19.0C
E1	5.5″ B25.0C
R1	5″ ISLAND (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2′6″ C&G
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5″ MILLING

PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	2A–5
R/W SHEET NO.	

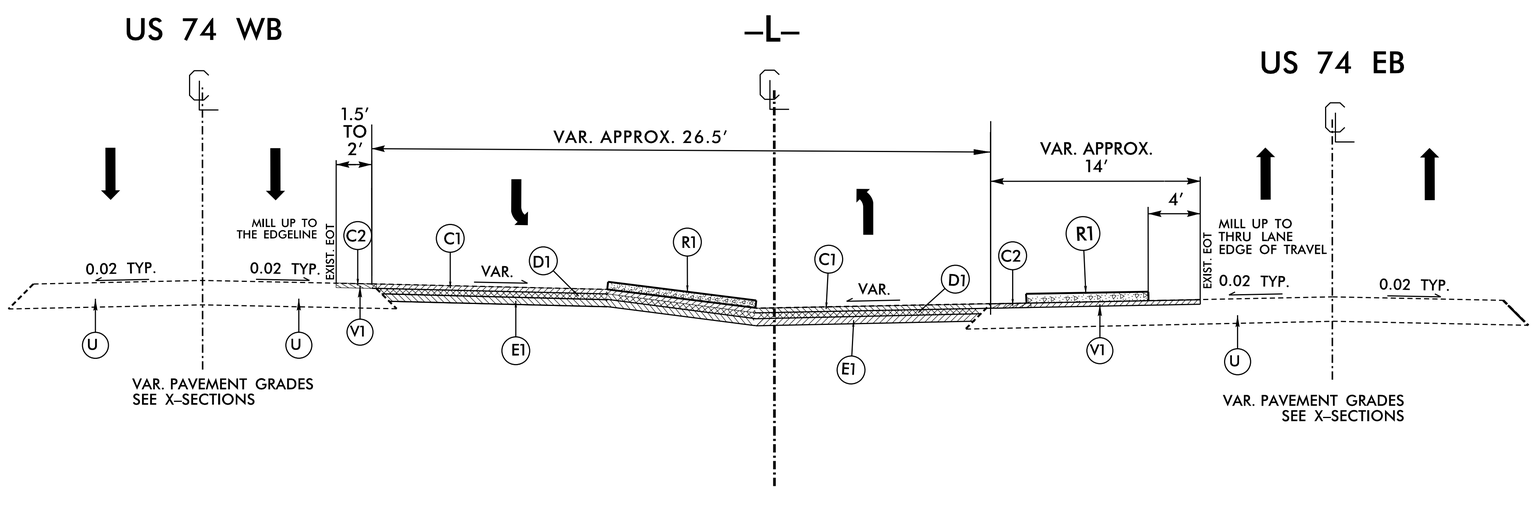
DocuSigned by: Michael Richards 01/20/2021

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 052140 MICHAEL E. RICHARDS

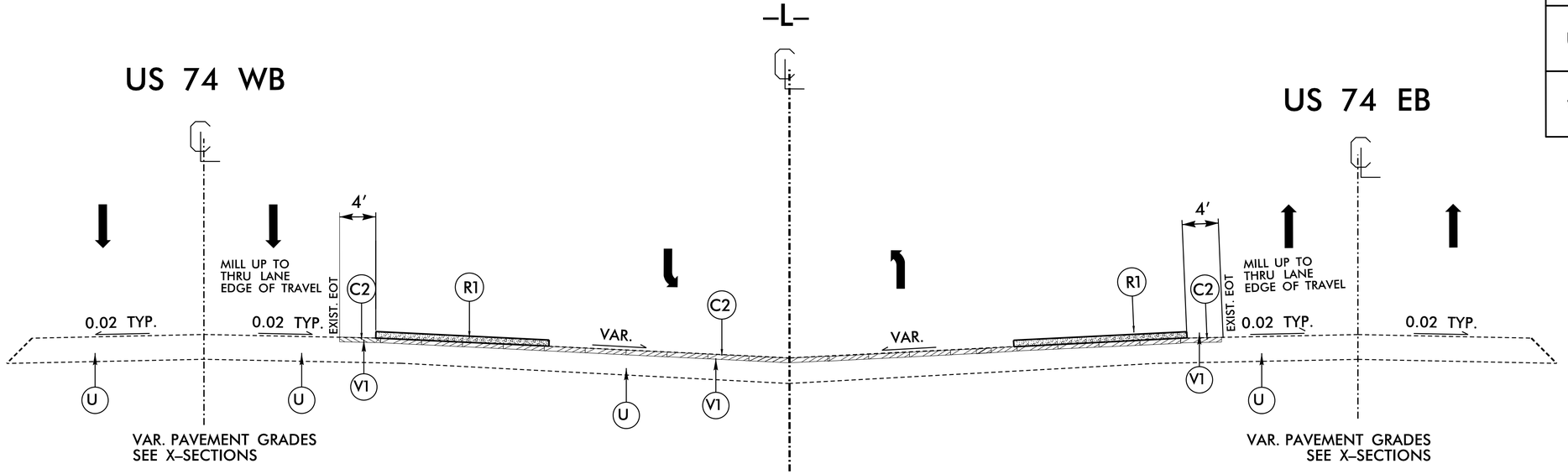
DIVISION DESIGN / CONSTRUCT ENGINEER

REVISIONS 8/17/99

TYPICAL SECTION NO. 7
–L– STA. 21+42.38 TO 21+96.78



TYPICAL SECTION NO. 8
–L– STA. 21+96.78 TO 22+68.93



PAVEMENT SCHEDULE	
C1	3.0″ S9.5C
C2	1.5″ S9.5C
D1	4″ I19.0C
E1	5.5″ B25.0C
R1	5″ ISLAND (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2′6″ C&G
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5″ MILLING

8/17/99

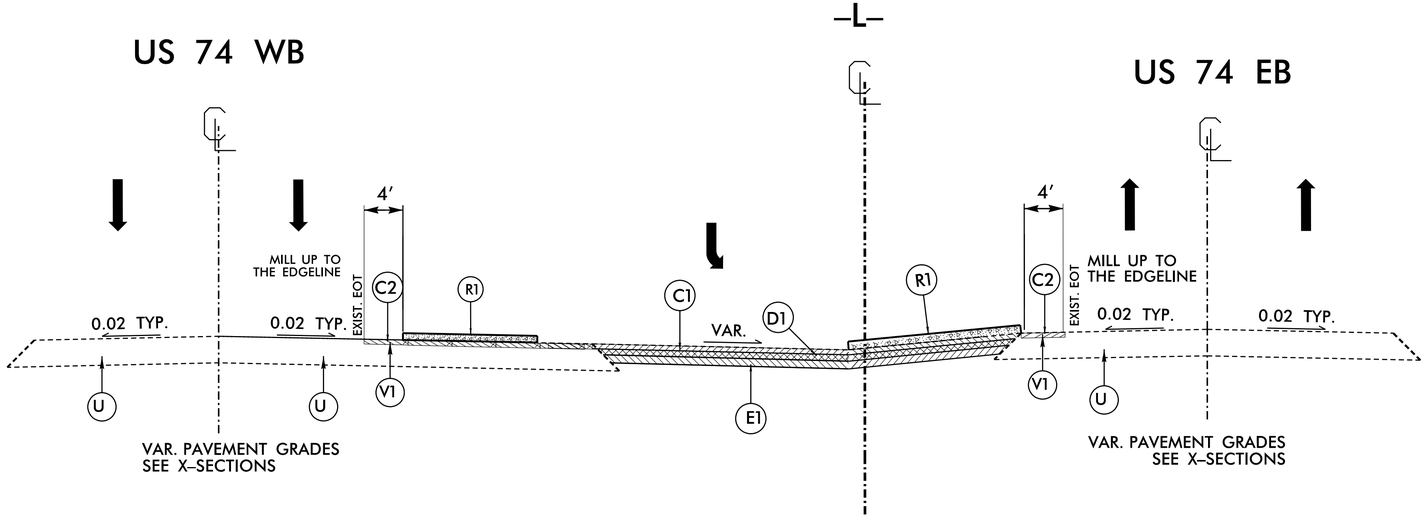
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	2A–6
R/W SHEET NO.	

DocuSigned by: Michael Ricketts 3B420DAD60B44E...
01/20/2021
SEAL 052140 REGISTERED PROFESSIONAL ENGINEER MICHAEL E. RICKETTS
DIVISION DESIGN / CONSTRUCT ENGINEER

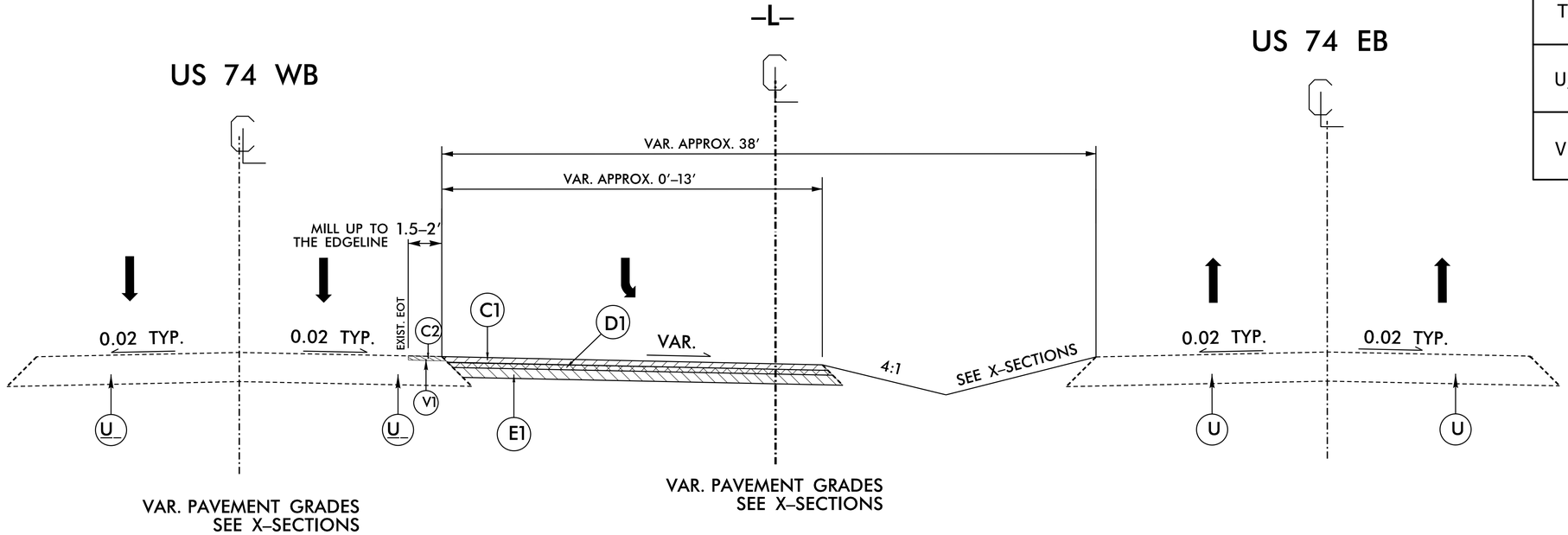
TYPICAL SECTION NO. 9

–L– STA. 22+68.93 TO 25+12.87



TYPICAL SECTION NO. 10

–L– STA. 25+12.87 TO 27+00.42 (END WIDENING)



PAVEMENT SCHEDULE	
C1	3.0″ S9.5C
C2	1.5″ S9.5C
D1	4″ I19.0C
E1	5.5″ B25.0C
R1	5″ ISLAND (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2′6″ C&G
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5″ MILLING

8/17/99

REVISIONS

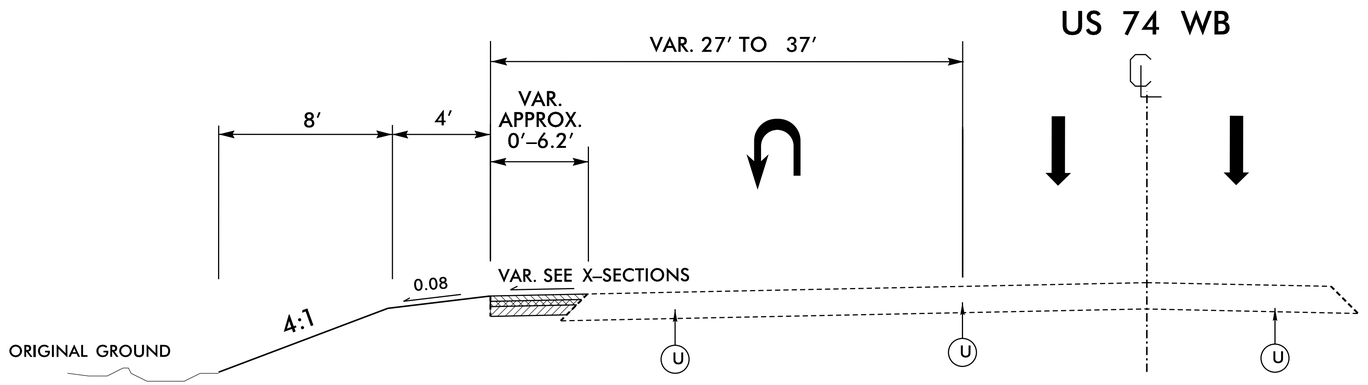
PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	2A–7
R/W SHEET NO.	

DocuSigned by: Michael Ricketts 3B420DAD60B44E8... 01/20/2026

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E RICKETTS

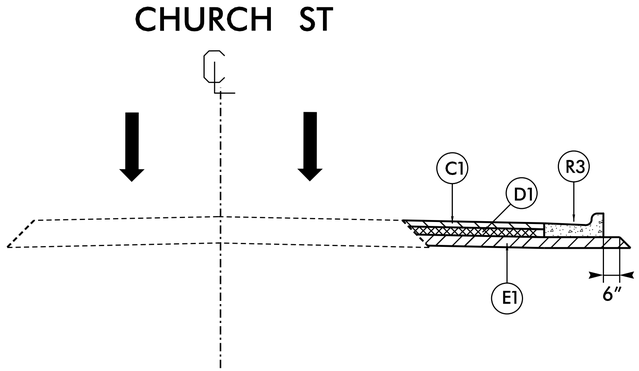
DIVISION DESIGN / CONSTRUCT ENGINEER

TYPICAL SECTION NO. 11
–L– STA. 45+37.75 TO 46+40.09



PAVEMENT SCHEDULE	
C1	3.0″ S9.5C
C2	1.5″ S9.5C
D1	4″ I19.0C
E1	5.5″ B25.0C
R1	5″ ISLAND (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2′6″ C&G
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5″ MILLING

TYPICAL SECTION NO. 12
USE FOR WIDENING
SHEET 6 CHURCH ST RADIUS AT US 74



8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	2A-8
R/W SHEET NO.	

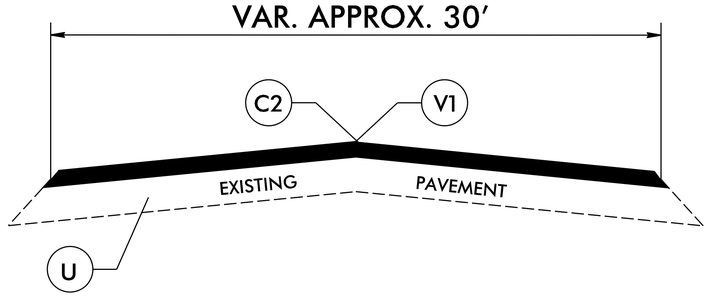
DocuSigned by: Michael Roberts 3B4200DAD60B448...
01/20/2021

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 052140 MICHAEL E. ROBERTS

DIVISION DESIGN / CONSTRUCT ENGINEER

TYPICAL SECTION NO. 13

USE FOR RESURFACING US 74 EB AND WB (PAID UNDER RESURFACING WBS)



PAVEMENT SCHEDULE	
C1	3.0" S9.5C
C2	1.5" S9.5C
D1	4" I19.0C
E1	5.5" B25.0C
R1	5" ISLAND (KEYED IN)
R2	EXPRESSWAY GUTTER
R3	2'6" C&G
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
V1	1.5" MILLING

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Docusigned by: Michael Ricketts 3B9[illegible]DAC0B44EB...

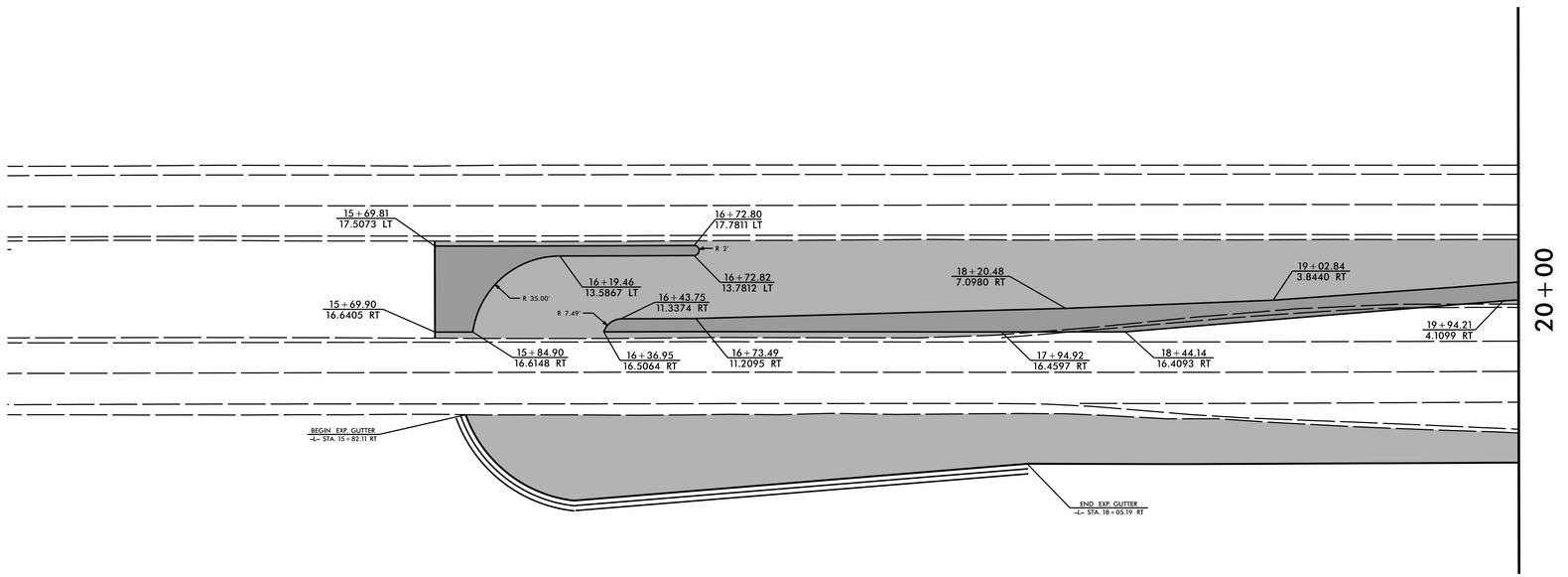
1/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83/NSRS 2007

8/17/99

REVISIONS



NOTE: CONTRACTOR SHALL COORDINATE THE INSTALLATION OF SIGN POST HOLES IN CONCRETE ISLANDS WITH DIVISION 8 TRAFFIC SERVICES UNIT. REFER TO ROADWAYS STANDARDS NOS. 901 THRU 904. SIGN POST HOLES SHALL EXTEND THROUGH PAVEMENT TO NATURAL GROUND.

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Document signed by: Michael Ricketts 38B...

1/20/2026

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NC GRID
NAD 83/NSRS 2007

8/17/99

REVISIONS

TIE TO EXISTING PAVEMENT JOINT

4' CUT IN ISLAND

20+00

26+01

15" RCP

21+83.15 17.47 LT
22+19.55 17.35 LT R 20.34'
22+62.30 12.82 LT
22+73.97 17.10 LT
23+30.77 16.76 LT
23+30.73 12.76 LT R 2.00'
25+12.87 6.09 LT
22+46.98 2.36 LT
22+40.76 1.08 RT R 93.48'
21+80.40 4.52 LT R 100.32'
21+44.47 4.72 LT
22+55.17 1.59 LT R 100.37'
23+00.88 12.97 LT
23+31.69 4.22 RT
25+12.61 18.79 RT
R 74.87'
22+48.93 1.84 RT
21+44.40 12.28 RT R 2.00'
R 20.48'
21+44.38 16.28 RT
22+22.31 16.66 RT
22+33.81 12.14 RT
22+69.09 16.91 RT
23+00.80 4.03 RT
22+20.54 54.79 RT R 5.00'
22+43.54 55.00 RT R 1.00'
22+16.36 56.98 RT
22+44.12 56.80 RT
21+91.33 99.43 RT R 3.95'
21+97.74 104.02 RT
MCNC, 2" CONE

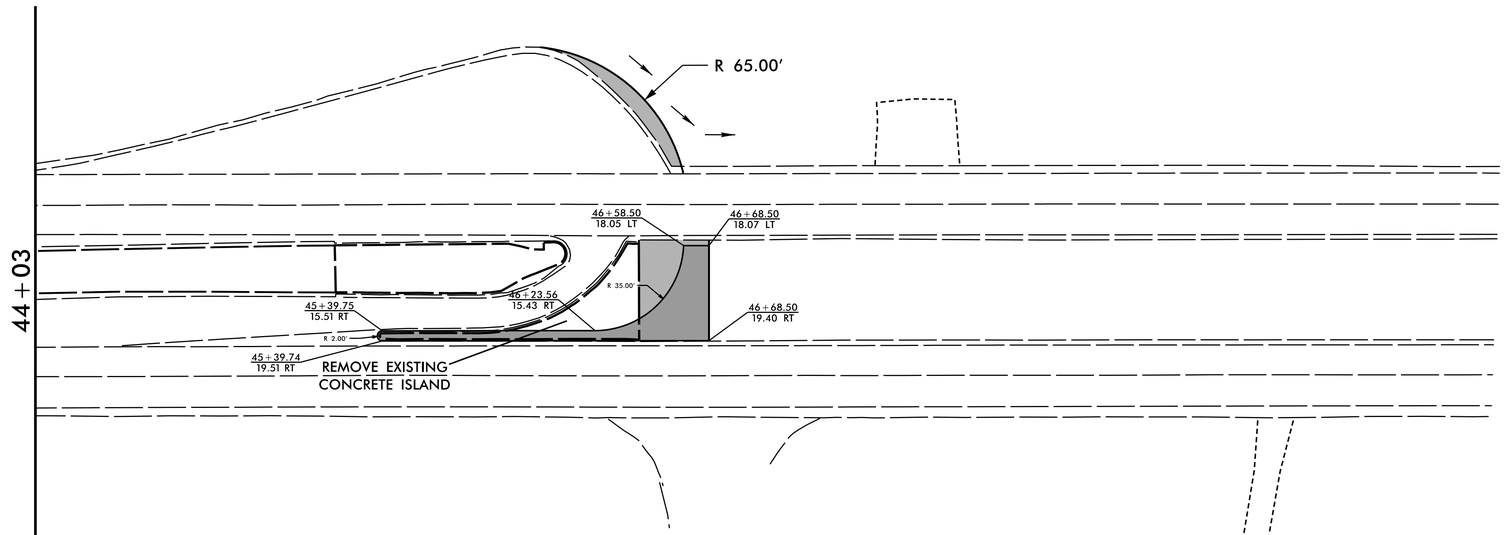
NOTE: CONTRACTOR SHALL COORDINATE THE INSTALLATION OF SIGN POST HOLES IN CONCRETE ISLANDS WITH DIVISION 8 TRAFFIC SERVICES UNIT. REFER TO ROADWAYS STANDARDS NOS. 901 THRU 904. SIGN POST HOLES SHALL EXTEND THROUGH PAVEMENT TO NATURAL GROUND.

BEGIN CONSTRUCTION
-Y1- STA. 12+39.41

$$SYSTIME$$
$$FILENAME$$

8/17/99

REVISIONS



NC GRID
NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	2B-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Digitally signed by: Michael Ricketts
DocuSigned by: 1/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE: CONTRACTOR SHALL COORDINATE THE INSTALLATION OF SIGN POST HOLES IN CONCRETE ISLANDS WITH DIVISION 8 TRAFFIC SERVICES UNIT. REFER TO ROADWAYS STANDARDS NOS. 901 THRU 904. SIGN POST HOLES SHALL EXTEND THROUGH PAVEMENT TO NATURAL GROUND.

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	2B-4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. MCGEE

DocuSigned by: Michael McGee 1/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

8/17/99

NC GRID
NAD 83/NSRS 2007

MATCHLINE -L- STA 25+88 (SEE SHEET 5)

BEGIN PROJECT HS-2008E
-L- US 74 STA. 13+00

PC Sta. 19+23.71

PT Sta. 24+02.43

POT Sta. 10+00.00

POT Sta. 11+80.65

POT Sta. 10+90.60

POT Sta. 12+39.41

PC Sta. 12+33.04

PT Sta. 15+37.75

PC Sta. 25+56.38

EXISTING RAILROAD R/W

100.00' CL OF TRACKS TO R/W

ANDREW JACKSON HWY) 30' BST

DAMAGED END

18" RCP

DI
CONC

GRASS MEDIAN

NCDOT TRAFFIC SIGNAL

AT&T, 84 STRAND FO (S/M PER RECORD)

AT&T, 48 STRAND FO (S/M PER RECORD)

MCNC, 2" CONDUIT (S/M PER RECORD)

CITY OF LAURINBURG, 6", AC (S/M PER RECORD)

15" RCP

SOIL & GRAVEL DRIVE

EXISTING R/W

GREENHOUSE / SELLER

R/W MON

WALNUT ST

PINE ST

CSX RAILROAD

10.20'

12.24'

CONC HW

DI

CB

30" RCP

24" RCP

NC 144 (MORGAN ST) 30' BST

8" AC TOW PER RECORD

NCDOT TRAFFIC SIGNAL

SIGNAL POLE

BILLBOARD

6" CURB

24' PAVED

28' PAVED

CONC CURB

MTL CANOPY

CANOPY

MONITORING WELLS

ISBKBUS

OHBS

BST DR

GRAVEL DR

CONC WALK

CONC

EIP

CON MON

EXISTING R/W

JERRY V. PEARSON &
MICHAEL W. THOMASON
DB 824 PG 159
PB 2 PG 61

JOHN LOCKLEAR
DB 1702 PG 205
BM 8 PG 16

WILLIAM MCLAUCHLIN, JR
DB 733 PG 281

ISBLKBUS
WILLIAM MCLAUCHLIN, JR
DB 733 PG 281

APRIL DANIRA FITE
DB 1578 PG 005

9440 ANDREW JACKSON, LLC
DB 1755 PG 217
PB 12 PG 31

N 66°22'20" W
313.92'

N 27°55'32" W
136.33'

N 66°53'41" W
182.05'

S 67°39'26" E
99.17'

S 67°09'08" W
67.36'

N 23°37'40" E
66.80'

112.80'
S 67°39'26" E

N 23°37'40" E
44.28'

N 45°19'10" W
60.84'

0.89'
(EIP-R/W)

S 22°04'26" W
126.99'

N 27°46'08" E
112.64'

GRAVEL DR S 70°12'36" E
182.13'

S 67°11'15" E
43.99'

N 22°36'44" E
2.60'

S 23°02'43" W
146.87'

S 32°25'43" E
54.82'

S 63°06'54" E
305.90'

-L-

PI Sta 13+85.39	PI Sta 21+63.07	PI Sta 25+85.53
Δ = 0° 18' 57.2" (RT)	Δ = 0° 45' 23.0" (LT)	Δ = 1° 10' 46.1" (RT)
D = 0° 06' 13.2"	D = 0° 09' 28.8"	D = 2° 01' 24.3"
L = 304.71'	L = 478.72'	L = 58.29'
T = 152.36'	T = 239.36'	T = 29.15'
R = 55,266.84'	R = 36,262.29'	R = 2,831.65'

MILL AND RESURFACE

$$$$SYSTIME$$$$
$$$$SDON$$$$
$$$$FILENAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	2B-5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 052140 MICHAEL E. MCKITTRICK

Docusigned by: Michael Ricketts 384A4AD6B44EB...

10/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS 8/17/99

NC GRID NAD 83/NSRS 2007

MATCHLINE -L- STA 25+88 (SEE SHEET 4)

MATCHLINE -L- STA 39+83 (SEE SHEET 6)

POT Sta. 10+00.00

POT Sta. 12+41.81 BST

POT Sta. 10+00.00

POT Sta. 13+28.49

PT Sta. 26+14.67

PC Sta. 30+58.33

PT Sta. 32+12.22

PC Sta. 12+40.45

PC Sta. 32+38.36

S 65° 35' 39.7" E

S 21° 04' 08.0" W

S 56° 50' 48.0" W

N 67°03'02" W 506.36'

N 40°37'39" E 189.42'

S 18°22'58" W 247.62'

28.99' RP

N 67°03'02" W

CSX RAILROAD

CITY OF LAURINBURG, 8' AC (S/M PER RECORD)

BILLY RAY NORRIS, JR. DB 1584 PG 006 PB 12 PG 132

CECIL SAMUEL BOSTICK, JR. DB 1584 PG 253 PB 12 PG 132

2" PVC (S/M PER RECORD)

43' PAVED

55' CONC DR

30' PAVED

29' PAVED

24' GR

15" CMP

28" H X 24" W ELLIPTICAL RCP

100.00' CL OF TRACKS TO R/W

MTL CANOPY

CONC

ISBKBUS

ISFBUS

BST PARKING

GRAVEL DR

TREES & SHRUBS

EXISTING R/W

GRASS MEDIAN

CONC MEDIAN

CONC CURB

6" C&G

18" C&G

6" CURB

BST DR

CONC CURB

TOP=246.80'

TOP=247.01'

MILL AND RESURFACE

-L-

PI Sta 31+35.30	PI Sta 12+67.39	PI Sta 36+38.82
Δ = 3° 43' 18.0" (RT)	Δ = 12° 36' 13.9" (RT)	Δ = 14° 53' 56.1" (RT)
D = 2° 25' 06.5"	D = 17° 04' 29.8"	D = 1° 52' 14.8"
L = 153.88'	L = 73.81'	L = 796.40'
T = 76.97'	T = 37.06'	T = 400.46'
R = 2,369.08'	R = 335.55'	R = 3,062.65'

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	2B-6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. MCKITTRICK

DocuSigned by: Michael Rickett 3D10AD20844EB...

1/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

$$$$$SYSTIME$$$$
$$$$$DGN$$$$$

PROJECT NO.	SHEET NO.	TOTAL NO.
49318.3.6, 2026CPT.08.16.10771	3A-1	

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	0000400000-N CONSTRUCTION SURVEYING	0043000000-N GRADING	0057000000-E UNDERCUT EXCAVATION	0195000000-E SELECT GRANULAR MATERIAL	0196000000-E GEOTEXTILE FOR SOIL STABILIZATION	0318000000-E FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	0321000000-E FOUNDATION CONDITIONING GEOTEXTILE	0335200000-E 15" DRAINAGE PIPE	0335300000-E 18" DRAINAGE PIPE	0448200000-E 15" RC PIPE CULVERT, CLASS IV	0453000000-E 15" PIPE END SECTION	0995000000-E PIPE REMOVAL	0996000000-N PIPE CLEAN OUT	1220000000-E INCIDENTAL STONE BASE	1297000000-E 1.5" MILLING	1330000000-E INCIDENTAL MILLING	1491000000-E BASE COURSE, B25.0C	1503000000-E INTERMEDIATE COURSE, I19.0C	1523000000-E SURFACE COURSE, S9.5C	1575000000-E ASPHALT BINDER FOR PLANT MIX	1693000000-E AC PLANT MIX (REPAIR)	2000000000-N RIGHT OF WAY MARKERS	2286000000-N MASONRY DRAINAGE STRUCTURE	2364200000-N FRAME WITH TWO GRATES, STD 840.20
								MI	FT			LS	LS	CY	CY	SY	TON	SY	LF	LF	LF	EA	LF	EA	TONS	SY	SY	TONS	TONS	TONS	TONS	TONS	EA	EA	EA
49318.3.6	Scotland	1	US-74 E	US 74 WITHIN HS-2008E		2		0.500	75	0.000	0.500	1	1.000	100	100	200	190	580	48	140	1,548	1	58	1	50	2,920	500	1,159	1,081	825	153	105	3	21	21
TOTAL FOR MAP NO. 1								**0.500**				**1**	**1.000**	**100**	**100**	**200**	**190**	**580**	**48**	**140**	**1,548**	**1**	**58**	**1**	**50**	**2,920**	**500**	**1,159**	**1,081**	**825**	**153**	**105**	**3**	**21**	**21**
TOTAL FOR PROJ NO. 49318.3.6								**0.500**				**1**	**1.000**	**100**	**100**	**200**	**190**	**580**	**48**	**140**	**1,548**	**1**	**58**	**1**	**50**	**2,920**	**500**	**1,159**	**1,081**	**825**	**153**	**105**	**3**	**21**	**21**
2026CPT.08.16.10771	Scotland	2	US-74 E	RESURFACING FROM STATION -L-13+00 TO -L- 48+00	13	2	MD	0.663	48	0.000	0.663															22,340	3,200			2,145	127				
TOTAL FOR MAP NO. 2								**0.663**																		**22,340**	**3,200**			**2,145**	**127**				
TOTAL FOR PROJ NO. 2026CPT.08.16.10771								**0.663**																		**22,340**	**3,200**			**2,145**	**127**				
GRAND TOTAL								**1.163**				**1**	**1.000**	**100**	**100**	**200**	**190**	**580**	**48**	**140**	**1,548**	**1**	**58**	**1**	**50**	**25,260**	**3,700**	**1,159**	**1,081**	**2,970**	**280**	**105**	**3**	**21**	**21**

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	2365000000-N FRAME WITH TWO GRATES, STD 840.22	2451000000-N CONCRETE TRANSITIONAL SECTION FOR DROP INLET	2549000000-E 2'-6" CURB & GUTTER	2577000000-E CONCRETE EXPRESSWAY GUTTER	2655000000-E 5" MONOLITHIC CONCRETE ISLANDS(KEYED-IN)	2815000000-N ADJUST DROP INLET	3656000000-E GEOTEXTILE FOR DRAINAGE	4025000000-E CONTRACTOR FURNISHED, TYPE 'E' SIGN	4025000000-E CONTRACTOR FURNISHED, TYPE "D" SIGN	4025000000-E CONTRACTOR FURNISHED, TYPE 'F' SIGN	4072000000-E SUPPORTS, 3-LB STEEL U-CHANNEL STEEL	4096000000-N SIGN ERECTION, TYPE D	4102000000-N SIGN ERECTION, TYPE E	4108000000-N SIGN ERECTION, TYPE F	4155000000-N DISPOSAL OF SIGN SYSTEM, U CHANNEL	4238000000-N DISPOSAL OF SIGN, D ,E OR F	4650000000-N TEMPORARY RAISED PAVEMENT C&R MARKERS	6000000000-E TEMPORARY SILT FENCE	6006000000-E EROSION CONTROL STONE, CLASS A	6009000000-E EROSION CONTROL STONE, CLASS B	6012000000-E SEDIMENT CONTROL STONE	6015000000-E TEMPORARY MULCHING	6018000000-E SEED FOR TEMPORARY SEEDING
								MI	FT			EA	EA	LF	LF	SY	EA	SY	SF	SF	SF	LF	EA	EA	EA	EA	EA	EA	LF	TON	TON	TON	ACR	LB
49318.3.6	Scotland	1	US-74 E	US 74 WITHIN HS-2008E		2		0.500	75	0.000	0.500	2	21	16	241.00	1,440	2	190	115	27	81	562	3	17	11	24	1	34	500	65	25	135	2.00	200
TOTAL FOR MAP NO. 1								**0.500**				**2**	**21**	**16**	**241.00**	**1,440**	**2**	**190**	**115**	**27**	**81**	**562**	**3**	**17**	**11**	**24**	**1**	**34**	**500**	**65**	**25**	**135**	**2.00**	**200**
TOTAL FOR PROJ NO. 49318.3.6								**0.500**				**2**	**21**	**16**	**241.00**	**1,440**	**2**	**190**	**115**	**27**	**81**	**562**	**3**	**17**	**11**	**24**	**1**	**34**	**500**	**65**	**25**	**135**	**2.00**	**200**
																				223														
2026CPT.08.16.10771	Scotland	2	US-74 E	RESURFACING FROM STATION -L-13+00 TO -L- 48+00	13	2	MD	0.663	48	0.000	0.663																									
TOTAL FOR MAP NO. 2								**0.663**																										
TOTAL FOR PROJ NO. 2026CPT.08.16.10771								**0.663**																										
GRAND TOTAL								**1.163**				**2**	**21**	**16**	**241.00**	**1,440**	**2**	**190**	**115**	**27**	**81**	**562**	**3**	**17**	**11**	**24**	**1**	**34**	**500**	**65**	**25**	**135**	**2.00**	**200**
																				223														

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	6021000000-E FERTILIZER FOR TEMPORARY SEEDING	6024000000-E TEMPORARY SLOPE DRAINS	6029000000-E SAFETY FENCE	6030000000-E SILT EXCAVATION	6036000000-E MATTING (EROSION CONTROL)	6042000000-E 1/4" HARDWARE CLOTH	6071002000-E FLOCCULANT	6071012000-E COIR FIBER WATTLE	6084000000-E SEED & MULCHING	6087000000-E MOWING	6090000000-E SEED FOR REPAIR SEEDING	6093000000-E FERTILIZER FOR REPAIR SEEDING	6096000000-E SEED FOR SUPPLEMENTAL SEEDING	6108000000-E FERTILIZER TOPDRESSING	6114500000-N SPECIALIZED HAND MOWING	6114800000-N MANUAL LITTER REMOVAL	6114900000-E LITTER DISPOSAL	6117000000-N RESPONSE FOR EROSION CONTROL	6117500000-N CONCRETE WASHOUT STRUCTURE	6132000000-N GENERIC EROSION CONTROL ITEM - FABRIC INSERT INLE PROTECTION (TYP1)	6132000000-N GENERIC EROSION CONTROL ITEM - FABRIC INSERT INLET PROTECTION CLEANOUT
								MI	FT			TON	LF	LF	CY	SY	LF	LB	LF	AC	ACR	LB	TON	LB	TON	MHR	MHR	TON	EA	EA	EA	EA
49318.3.6	Scotland	1	US-74 E	US 74 WITHIN HS-2008E		2		0.500	75	0.000	0.500	1.00	200	120	30	6,250	275	50	420	3.00	3	50	0.25	50	1.25	10	2	1	13	2	32	96
TOTAL FOR MAP NO. 1								**0.500**				**1.00**	**200**	**120**	**30**	**6,250**	**275**	**50**	**420**	**3.00**	**3**	**50**	**0.25**	**50**	**1.25**	**10**	**2**	**1**	**13**	**2**	**32**	**96**
TOTAL FOR PROJ NO. 49318.3.6								**0.500**				**1.00**	**200**	**120**	**30**	**6,250**	**275**	**50**	**420**	**3.00**	**3**	**50**	**0.25**	**50**	**1.25**	**10**	**2**	**1**	**13**	**2**	**32**	**96**
2026CPT.08.16.10771	Scotland	2	US-74 E	RESURFACING FROM STATION -L-13+00 TO -L- 48+00	13	2	MD	0.663	48	0.000	0.663																					
TOTAL FOR MAP NO. 2								**0.663**																								
TOTAL FOR PROJ NO. 2026CPT.08.16.10771								**0.663**																								
GRAND TOTAL								**1.163**				**1.00**	**200**	**120**	**30**	**6,250**	**275**	**50**	**420**	**3.00**	**3**	**50**	**0.25**	**50**	**1.25**	**10**	**2**	**1**	**13**	**2**	**32**	**96**

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	7060000000-E SIGNAL CABLE	7120000000-E VEHICLE SIGNAL HEAD (12", 3 SECTION)	7180000000-N BACKPLATE	7288000000-E PAVED TRENCHING (1 CONDUIT, 2 INCH)	7300000000-E UNPAVED TRENCHING (1 CONDUIT, 2")	7300000000-E UNPAVED TENCHING (2 CONDUIT, 2 INCH)	7324000000-N JUNCTION BOX (STANDARD SIZE)	7444000000-E INDUCTIVE LOOP SAWCUT	7456100000-E LEAD-IN CABLE (14-2)	7575142010-N 900 MHZ SERIAL/ETHERNET SPREAD SPECTRUM RADIO	7588000000-N METAL POLE WITH SINGLE MAST ARM	7613000000-N SOIL TEST	7614100000-E DRILLED PIER FOUNDATION	7631000000-N MAST ARM WITH METAL POLE DESIGN	7636000000-N SIGN FOR SIGNALS	7642200000-N TYPE II PEDESTAL WITH FOUNDATION	7684000000-N SIGNAL CABINET FOUNDATION	7696000000-N CONTROLLER WITH CABINET (TYPE 2070LX, BASE MOUNTED)	7744000000-N DETECTOR CARD (TYPE 170)	7901000000-N CABINET BASE EXTENDER	7960000000-N METAL POLE FOUNDATION REMOVAL	7972000000-N METAL POLE REMOVAL	7980000000-N GENERIC SIGNAL ITEM-ETHERNET EDGE SWITCH
								MI	FT			LF	EA	EA	LF	LF	LF	EA	LF	LF	EA	EA	EA	CY	EA	EA	EA	EA	EA	EA	EA	EA	EA
49318.3.6	Scotland	1	US-74 E	US 74 WITHIN HS-2008E		2		0.500	75	0.000	0.500	1,875	17	11	25	950	75	13	650	2,525	3	3	3	18	3	11	6	3	3	9	3	4	4	3
TOTAL FOR MAP NO. 1								**0.500**				**1,875**	**17**	**11**	**25**	**950**	**75**	**13**	**650**	**2,525**	**3**	**3**	**3**	**18**	**3**	**11**	**6**	**3**	**3**	**9**	**3**	**4**	**4**	**3**
TOTAL FOR PROJ NO. 49318.3.6								**0.500**				**1,875**	**17**	**11**	**25**	**950**	**75**	**13**	**650**	**2,525**	**3**	**3**	**3**	**18**	**3**	**11**	**6**	**3**	**3**	**9**	**3**	**4**	**4**	**3**
																1,025																		
2026CPT.08.16.10771	Scotland	2	US-74 E	RESURFACING FROM STATION -L-13+00 TO -L- 48+00	13	2	MD	0.663	48	0.000	0.663																									
TOTAL FOR MAP NO. 2								**0.663**																										
TOTAL FOR PROJ NO. 2026CPT.08.16.10771								**0.663**																										
GRAND TOTAL								**1.163**				**1,875**	**17**	**11**	**25**	**950**	**75**	**13**	**650**	**2,525**	**3**	**3**	**3**	**18**	**3**	**11**	**6**	**3**	**3**	**9**	**3**	**4**	**4**	**3**
																1,025																		

PROJECT NO.	SHEET NO.	TOTAL NO.
49318.3.6, 2026CPT.08.16.10771	3A-2	

THERMOPLASTIC AND PAINT QUANTITIES

												4400000000-E	4405000000-E	4415000000-N	4420000000-N	4430000000-N	4435000000-N	4445000000-E	4455000000-N	4480000000-N	4510000000-N	4688000000-E		4700000000-E	4709000000-E	4725000000-E				
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	WORK ZONE SIGNS (STATIONARY)	WORK ZONE SIGNS (PORTABLE)	FLASHING ARROW BOARD	PORTABLE CHANGEABLE MESSAGE SIGN	DRUMS	CONES	TYPE III BARRICADE	FLAGGER	TMA	LAW ENFORCEMENT	6" X 90 M WHITE THERMO	6" X 90 M YELLOW THERMO	12" X 90 M WHITE THERMO	24" X 90 M WHITE THERMO	THERMO LT ARROW 90 M	THERMO RT ARROW 90 M	THERMO STR ARROW 90 M	THERMO U-TURN ARROW 90 M	THERMO STR & RT ARROW 90 M
								MI	FT			SF	SF	EA	EA	EA	EA	LF	HR	EA	HR	LF	LF	LF	LF	EA	EA	EA	EA	EA
49318.3.6	Scotland	1	US-74 E	US 74 WITHIN HS-2008E		2		0.5	75	0	0.5	174	288	2	3	123	35	72	60	2	320	1,863	2,451	1,979	120	4	5	1	3	
TOTAL FOR MAP NO. 1								**0.5**				**174**	**288**	**2**	**3**	**123**	**35**	**72**	**60**	**2**	**320**	**1,863**	**2,451**	**1,979**	**120**	**4**	**5**	**1**	**3**	
TOTAL FOR PROJ NO. 49318.3.6								**0.5**				**174**	**288**	**2**	**3**	**123**	**35**	**72**	**60**	**2**	**320**	**1,863**	**2,451**	**1,979**	**120**	**4**	**5**	**1**	**3**	
																						4,314						**13**		
2026CPT.08.16.10771	Scotland	2	US-74 E	RESURFACING FROM STATION -L-13+00 TO -L- 48+00	13	2	MD	0.663	48	0	0.663											7,974	2,576	566	67		2	10		2
TOTAL FOR MAP NO. 2								**0.663**														**7,974**	**2,576**	**566**	**67**		**2**	**10**		**2**
TOTAL FOR PROJ NO. 2026CPT.08.16.10771								**0.663**														**7,974**	**2,576**	**566**	**67**		**2**	**10**		**2**
																						10,550						**14**		
GRAND TOTAL								**1.163**				**174**	**288**	**2**	**3**	**123**	**35**	**72**	**60**	**2**	**320**	**9,837**	**5,027**	**2,545**	**187**	**4**	**7**	**11**	**3**	**2**
																						14,864						**27**		

												4815000000-E		4825000000-E	4835000000-E	4845000000-N					4855000000-E	4890000000-E		4895000000-N
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	6" WHITE PAINT	6" YELLOW PAINT	12" WHITE PAINT	24" WHITE PAINT	PAINT LT ARROW	PAINT RT ARROW	PAINT STR ARROW	PAINT U-TURN ARROW	PAINT STR & RT ARROW	6" LINE REMOVAL	GENERIC PAVEMENT MARKING ITEM - YELD LINE PAINT PAVEMENT MARKING, 24"	GENERIC PAVEMENT MARKING ITEM - YIELD LINE THERMOPLASTIC PAVEMENT MARKING,	GENERIC PAVEMENT MARKING ITEM POLYCARBONATE H-SHAPED MARKERS C&R
								MI	FT			LF	LF	LF	LF	EA	EA	EA	EA	EA	LF	LF	LF	EA
49318.3.6	Scotland	1	US-74 E	US 74 WITHIN HS-2008E		2		0.5	75	0	0.5	2,823	3,390	2,783	186	4	7	1	6		1,200	25	25	91
TOTAL FOR MAP NO. 1								**0.5**				**2,823**	**3,390**	**2,783**	**186**	**4**	**7**	**1**	**6**		**1,200**	**25**	**25**	**91**
TOTAL FOR PROJ NO. 49318.3.6								**0.5**				**2,823**	**3,390**	**2,783**	**186**	**4**	**7**	**1**	**6**		**1,200**	**25**	**25**	**91**
												6,213				**18**						**50**		
2026CPT.08.16.10771	Scotland	2	US-74 E	RESURFACING FROM STATION -L-13+00 TO -L- 48+00	13	2	MD	0.663	48	0	0.663	7,974	2,576	566	67		2	10		2				85
TOTAL FOR MAP NO. 2								**0.663**				**7,974**	**2,576**	**566**	**67**		**2**	**10**		**2**				**85**
TOTAL FOR PROJ NO. 2026CPT.08.16.10771								**0.663**				**7,974**	**2,576**	**566**	**67**		**2**	**10**		**2**				**85**
												10,550				**14**								
GRAND TOTAL								**1.163**				**10,797**	**5,966**	**3,349**	**253**	**4**	**9**	**11**	**6**	**2**	**1,200**	**25**	**25**	**176**
												16,763				**32**						**50**		

COMPUTED BY: ____DDC_____ DATE: ___11-19-25__
CHECKED BY: ____MER_____ DATE: _11-19-25__

PROJECT NO.	SHEET NO.
HS-2008E	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- Median 13+00	-L- Median 48+00	161	457	296	
-L- Bulb Rt 15+78	-L- Bulb Rt 21+08	596	88	0	
SUBTOTAL		757	545	296	
WASTE TO REPLACE BORROW					
GRAND TOTALS:		757	545	296	
SAY:		**760**	**550**	**300**	

Contingency Undercut = 100 CY

COMPUTED BY: CL DATE: 2025-02-21

CHECKED BY: AH DATE: 2025-02-21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
HS-2008E	3D-1

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

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

| STATION | LOCATION (LT, RT, OR CL)* OFFSET | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | R.C. PIPE CLASS IV SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 30" R.C. PIPE CLASS V | 36" R.C. PIPE CLASS V | 42" R.C. PIPE CLASS V | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | QUANTITIES FOR DRAINAGE STRUCTURES "TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. "B") LIN. FT. A: 5.0' THRU 10.0' | LIN. FT. B: 10.0' AND ABOVE | PER EACH (0' THRU 5.0') | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN | SPECIAL DETAIL MINIMUM DEPTH C.B. STD. 840.02 | SPECIAL DETAIL DOUBLE C.B. STD. 840.02/B1 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | SPECIAL DETAIL MINIMUM DEPTH G.D.I. TYPE "A" STD. 840.17 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.19 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 3 GRATES STD. 840.29 | J.B. STD. 840.31 OR STD. 340.32 | DRAINAGE PIPE ELBOWS NO. & SIZE | T.B.D.I. STD. 840.35 | M.H. STD. 840.51, STD. 840.52,, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | ADJUST G.D.I. | 15" C.S. PIPE ELBOWS | 18" C.S. PIPE ELBOWS | 15" R.C. FLARED END SECTION | 18" R.C. FLARED END SECTION | 24" R.C. FLARED END SECTION | 30" R.C. FLARED END SECTION | C.Y. 4" CONCRETE PAVED DITCH | C.Y. FLOWABLE FILL | C.Y. CONCRETE COLLARS CL. "B" STD. 840.72 | C.Y. CONCRETE AND BRICK PIPE PLUGS STD. 840.71 | LIN. FT. PIPE REMOVAL | REMARKS |
|---|---|---

NOTES: 1. NC811 "ONE CALL" SERVICES DO NOT LOCATE BURIED RAILROAD SIGNAL AND COMMUNICATIONS LINES.
2. PER THE CSXT SOIL AND WATER MANAGEMENT POLICY, IF THE SOIL CANNOT BE REUSED ON CSX PROPERTY, IT MUST BE PROPERLY DISPOSED AT A CSXT APPROVED DISPOSAL FACILITY. CSXT PROHIBITS ANY CONTRACTOR FROM TAKING SOILS FOR OFF PROPERTY REUSE.
CSXT ENVIRONMENTAL DEPARTMENT WILL HANDLE WASTE CHARACTERIZATION AND PROFILING INTO AN APPROVED DISPOSAL FACILITY.
3. PRIOR TO PLACEMENT OF FILL ON CSXT ROW, NCDOT SHALL PROVIDE A CERTIFICATION LETTER FROM THE BORROW PIT TO MOFFATT & NICHOL SHOWING LABORATORY ANALYSIS OF FILL MATERIAL REFLECTING FILL MATERIAL IS FREE OF ENVIRONMENTAL CONTAMINATION AND IS SUITABLE AS STRUCTURAL FILL.

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL RICHARD EVANS — 01/13/2026
HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER ROBERT LAMAR CORMIER — 01/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83/NSRS 2007

REVISIONS 8/17/99

BEGIN PROJECT HS-2008E
-L- US 74 STA. 13+00

-L- STA 12+00

PC Sta. 19+23.71

PT Sta. 24+02.43

POT Sta. 10+00.00

POT Sta. 11+80.65

POT Sta. 12+39.41

TIE TO EXISTING PAVEMENT JOINT

INSTALL 2 FT CURB CUT IN MONOLITHIC ISLAND

BEGIN CONSTRUCTION
-Y1- STA. 12+39.41

-L- STA 25+88 (SEE SHEET 5)

PC Sta. 12+33.04

PT Sta. 15+37.75

PC Sta. 25+56.38

JERRY V. PEARSON & MICHAEL W. THOMASON
DB 824 PG 159
PB 2 PG 61

JOHN LOCKLEAR
DB 1702 PG 205
BM 8 PG 16

WILLIAM MCLAUCHLIN, JR
DB 733 PG 281

APRIL DANIRA FITE
DB 1578 PG 861

9440 ANDREW JACKSON, LLC
DB 1755 PG 217
PB 12 PG 31

DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D=1.5 FT.
-L- STA. 18+20 TO 21+00 RT.

-L-

PI Sta 13+85.39	PI Sta 21+63.07	PI Sta 25+85.53
Δ = 0° 18' 57.2" (RT)	Δ = 0° 45' 23.0" (LT)	Δ = 1° 10' 46.1" (RT)
D = 0° 06' 13.2"	D = 0° 09' 28.8"	D = 2° 01' 24.3"
L = 304.71'	L = 478.72'	L = 58.29'
T = 152.36'	T = 239.36'	T = 29.15'
R = 55,266.84'	R = 36,262.29'	R = 2,831.65'

$$SYSTIME$$
$$USERNAME$$

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PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	4A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER — Docusigned by: Michael Evans PE — 01/13/2026

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER — Docusigned by: Thomas J Cormier — 01/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS 8/17/99

NC GRID NAD 83/NSRS 2007

-L- STA 12+00

MATCHLINE -L- STA 25+88 (SEE SHEET 5)

NC 144 (MORGAN ST) 30' BST

ANDREW JACKSON HWY) 30' BST

DRIVE

CSX RAILROAD

100.00' CL OF TRACKS TO R/W

18" RCP

15" RCP

15" RCP-IV

DAMAGED END

CONC ADJ 2GI

CONC HW

DI

CB

TB 2GI

2 TONS CL B RIP RAP
7 SY GEOTEXTILE

REMOVE

SPECIAL CUT DITCH SEE DETAIL 1

-L- 15+61.22 108.34 RT

-L- 16+22.98 108.68 RT

-L- 18+75.21 117.57 RT

-L- 22+95.65 89.81 RT

-L- 22+99.97 98.83 RT

-L- 22+68.76 102.95 RT

-L- 22+73.08 111.96 RT

GREENHOUSE / SELLER

JERRY V. PEARSON & MICHAEL W. THOMASON DB 824 PG 159 PB 2 PG 61

JOHN LOCKLEAR DB 1702 PG 205 BM 8 PG 16

WILLIAM MCLAUCHLIN, JR DB 733 PG 281

BM 8 PG 16 V. PATE N 67°09'08" W 67.52'

ISBLKBUS

APRIL DANIRA FITE DB 1578 PG 005

9440 ANDREW JACKSON, LLC DB 1755 PG 217 PB 12 PG 51

ISBKBUS

MTL CANOPY

GAS VENT

MONITORING WELLS

CANOPY

24' PAVED

28' PAVED

43' PAVED

6" CURB

CONC CURB

BST DR

GRAVEL DR

CONC WALK

CONC MON

R/W MON

EIP

EIP 43.99'

0.89' (EIP-R/W)

N 66°22'20" W 313.92'

N 27°55'32" W 158.33'

N 66°53'41" W 182.05'

S 67°39'26" E 99.17'

S 67°39'26" E 112.80'

N 23°37'40" E 44.81'

N 45°19'10" W 80.84'

S 22°04'26" W 126.99'

S 70°12'36" E 182.13'

S 67°11'15" E

N 22°36'44" E 2.60'

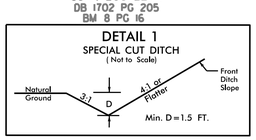
S 23°02'43" W 146.87'

S 37°25'43" E 54.82'

S 63°06'54" E 305.90'

N 27°46'08" E 82.64'

DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)



-L- STA. 18+20 TO 21+00 RT.

-L-

PI Sta 13+85.39	PI Sta 21+63.07	PI Sta 25+85.53
Δ = 0° 18' 57.2" (RT)	Δ = 0° 45' 23.0" (LT)	Δ = 1° 10' 46.1" (RT)
D = 0° 06' 13.2"	D = 0° 09' 28.8"	D = 2° 01' 24.3"
L = 304.71'	L = 478.72'	L = 58.29'
T = 152.36'	T = 239.36'	T = 29.15'
R = 55,266.84'	R = 36,262.29'	R = 2,831.65'

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

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PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER — Digitally signed by MICHAEL E. MORRIS — 01/13/2026

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER — Digitally signed by TIMOTHY I. CORMIER — 01/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83/NSRS 2007

REVISIONS 8/17/99

MATCHLINE –L– STA 25+88 (SEE SHEET 4)

MATCHLINE –L– STA 39+83 (SEE SHEET 6)

POT Sta. 10+00.00

POT Sta. 12+41.81

POT Sta. 13+28.49

PT Sta. 26+14.67

PC Sta. 30+58.33

PT Sta. 32+12.22

PC Sta. 32+36.56

PC Sta. 12+40.45

PT Sta. 13+04.15

CSX RAILROAD

SR 1302 (GRAY'S CREEK BST)

100.00' CL OF TRACKS TO R/W

28" H X 24" W ELLIPTICAL RCP

RETAIN

ADJ 2GI

TIE TO EX. 2GI

REMOVE AND REPLACE WITH 18" RCP

REMOVE EXISTING CURB AND GUTTER

RETAIN AND CLEANOUT

CITY OF LAURINBURG, 8" AC (S/M PER RECORD)

BILLY RAY NORRIS, JR. DB 1584 PG 006 PB 12 PG 132

CECIL SAMUEL BOSTICK, JR. DB 1584 PG 253 PB 12 PG 132

ISBKBUS

ISFBUS

MTL CANOPY

CONC

BST PARKING

GRAVEL DR

TREES & SHRUBS

EXISTING R/W

S 18°22'58" W 247.62'

N 40°37'39" E 189.42'

N 67°03'02" W 506.36'

28.99'

N 67°03'02" W

–L–

PI Sta 31+35.30	PI Sta 12+67.39	PI Sta 36+38.82
Δ = 3° 43' 18.0" (RT)	Δ = 12° 36' 13.9" (RT)	Δ = 14° 53' 56.1" (RT)
D = 2° 25' 06.5"	D = 17° 04' 29.8"	D = 1° 52' 14.8"
L = 153.88'	L = 73.81'	L = 796.40'
T = 76.97'	T = 37.06'	T = 400.46'
R = 2,369.08'	R = 335.55'	R = 3,062.65'

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. ROBERTS

Docusigned by: MICHAEL E. ROBERTS
01/13/2026

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER BRENTON J. CORMIER

Docusigned by: Brenton J. Cormier
01/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

$$$$$$$$SYSTIME$$$$$$$$

$$$$$$$$USERNAME$$$$$$$$

$$$$$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	7

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Docusigned by: Michael Ricketts 1DDADB9044EB...

11/20/2026

290

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

290
280
270
260
250
240
230
220
210
200

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

$$$$SYSTIME$$$$
$$$$ILENAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	8

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

DocuSigned by: Michael Ricketts 1/20/2026

290

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

290
280
270
260
250
240
230
220
210
200

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00

$$$$SYSTEM$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$
$$$$CELL$$$$
$$$$LEVELS$$$$
$$$$GRAPHICS$$$$
$$$$MESSAGE$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	9

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Docusigned by: Michael Ricketts 200AD0B44EB...

01/20/2026

290

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

290
280
270
260
250
240
230
220
210
200

38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00

280
270
260
250
240
230
220
210
200

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$
$$$$CELLNAME$$$$
$$$$LEVELNAME$$$$
$$$$ORIGIN$$$$
$$$$XSCALE$$$$
$$$$YSCALE$$$$
$$$$ACTIVEANGLE$$$$
$$$$REFFILES$$$$
$$$$REFNAMES$$$$
$$$$REFDGNS$$$$
$$$$REFLEVELS$$$$
$$$$REFSCALES$$$$
$$$$REFORIGINS$$$$
$$$$REFACTIVEANGLES$$$$
$$$$REFCELLNAMES$$$$
$$$$REFLEVELNAMES$$$$

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2008E	RW01	07

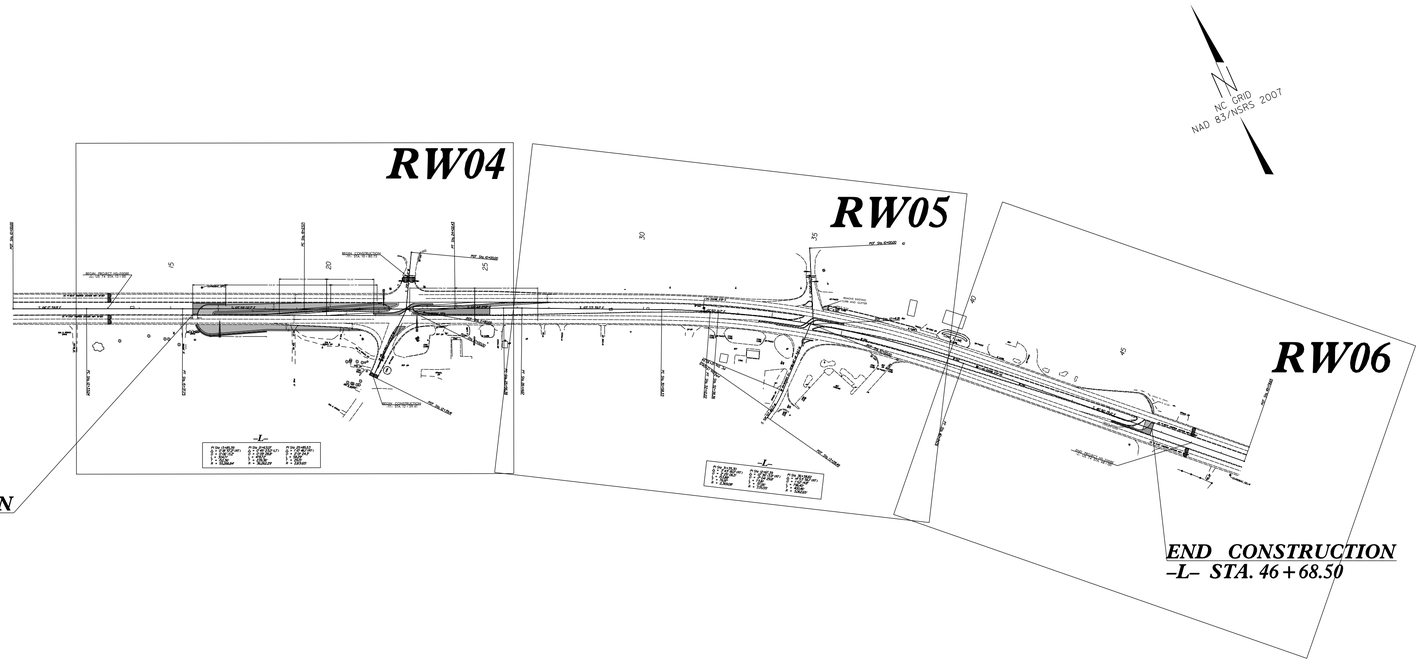
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

SCOTLAND COUNTY

TIP PROJECT: HS-2008E

09/08/99



GRAPHIC SCALE

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SS4908AC-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 385,702.607(ft) EASTING: 1,835,492.356(ft) ELEVATION: 251.694(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998953234 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SS4908AC-1" TO -L- STATION 13+00.00 IS N 65^-30'10.5" W 1,004.39(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:
Division 8 Location & Surveys Office
300 DOT Dr
Asheboro, NC 27205

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	***LETTING DATE:***
12/13/2024	*04/08/2025*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4206 LAND SURVEYOR M. TODD WOODRUFF

Signed by: M. Todd Woodruff 12/17/2024
76BC083D2EDF43E

SIGNATURE: ***Date:***

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

17-DEC-2024 14:59
S:\Units\Div08\ASHEBORO_PROJECTS\HS Projects\HS-2008E\rw staking\original_24126\rw_sheets\HS2008E_LS_RW01.dgn
mtwoodruff AT LS-34003IL

DocuSign Envelope ID: 12E44554-322C-4154-BCB9-DA0E0385B6A7

6/2/2

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
HS2008E	RW02C-1

Location and Surveys

ESP ASSOCIATES, INC
2200 GATEWAY CENTRE BLVD.
SUITE 216
MORRISVILLE, NC 27560
LICENSE NO. F-1407

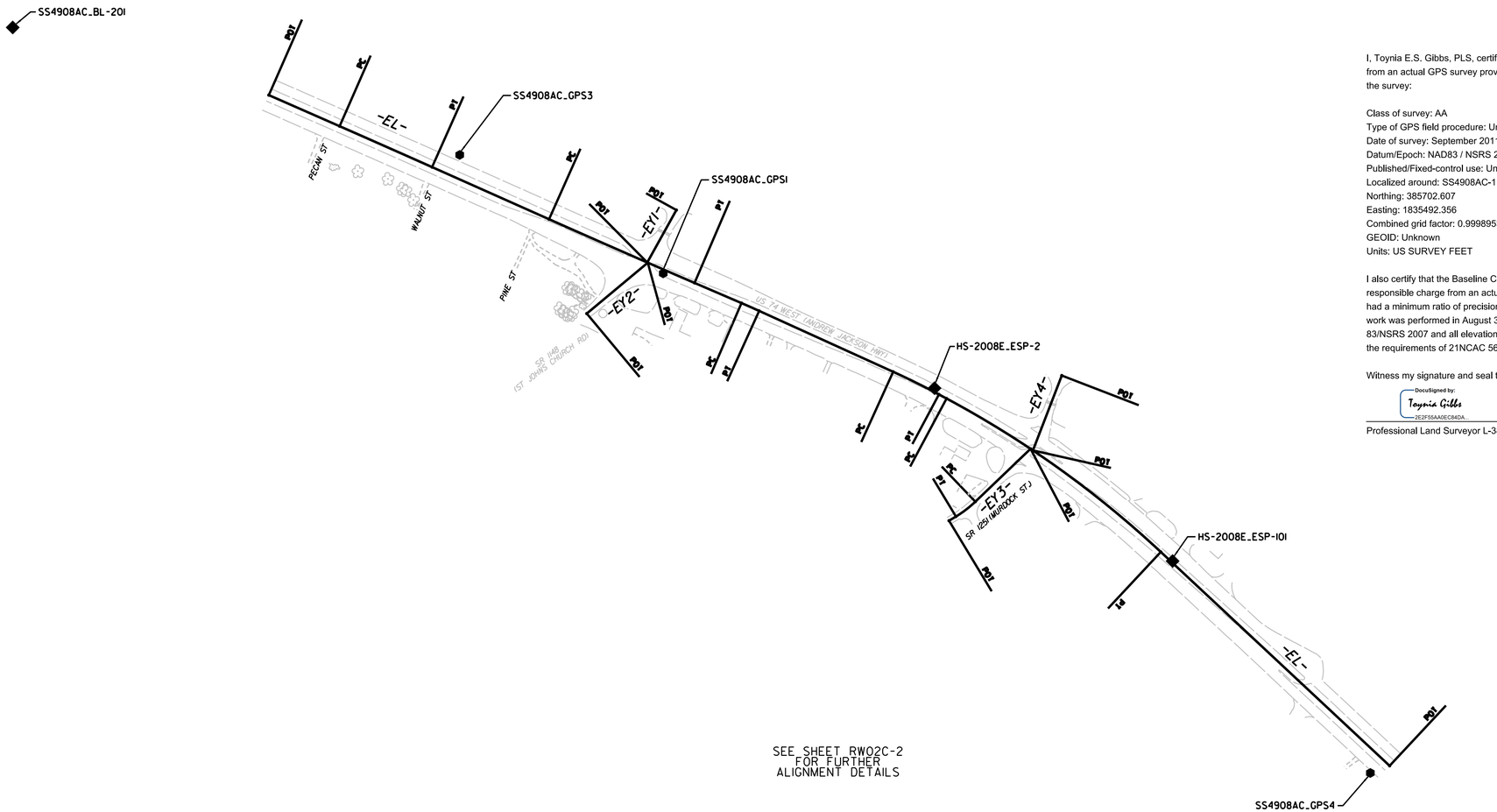
DS

PROJECT SURVEYOR:
TOYNIA E.S. GIBBS

NORTH CAROLINA PROFESSIONAL SEAL L-3866 LAND SURVEYOR TOYNIA E.S. GIBBS

NORTH CAROLINA LICENSE NO. F-1407 ESP ASSOCIATES, INC.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET RW02C-2 FOR FURTHER ALIGNMENT DETAILS

NC GRID
NAD 83/NSRS 2007

I, Toynia E.S. Gibbs, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey provided by others and the following information was used to perform the survey:

Class of survey: AA
Type of GPS field procedure: Unknown
Date of survey: September 2011
Datum/Epoch: NAD83 / NSRS 2007
Published/Fixed-control use: Unknown
Localized around: SS4908AC-1
Northing: 385702.607
Easting: 1835492.356
Combined grid factor: 0.9998953234
GEOID: Unknown
Units: US SURVEY FEET

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed in August 3, 2023 - August 9, 2023 , and all coordinates are based on NAD 83/NSRS 2007 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

DS

Witness my signature and seal this date 11/6/2023.

DocuSigned by:
Toynia Gibbs
2E2F55AA0EC84DA...

Professional Land Surveyor L-3866

NORTH CAROLINA PROFESSIONAL SEAL L-3866 LAND SURVEYOR TOYNIA E.S. GIBBS

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
3. NOT TO SCALE
4. COORDINATES FOR CONTROL POINTS SS4908AC_BL-201 AND SS4908AC_GPS3 WERE PROVIDED AND HELD.
5. COORDINATES FOR CONTROL POINTS SS4908AC_GPS1 AND SS4908AC_GPS4 WERE ESTABLISHED ON EXISTING POINTS.
6. CONTROL POINTS ESP2 AND ESP101 ARE NEW POINTS SET.

$$$

DocuSign Envelope ID: 12E44554-322C-4154-BCB9-DA0E0385B6A7

6/2/

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
HS2008E	RW02C-2

Location and Surveys

ESP ASSOCIATES, INC
2200 GATEWAY CENTRE BLVD.
SUITE 216
MORRISVILLE, NC 27560
LICENSE NO. F-1407

DS

PROJECT SURVEYOR:
TOYNIA E.S. GIBBS

NORTH CAROLINA PROFESSIONAL SEAL L-3866 LAND SURVEYOR TOYNIA E.S. GIBBS

NORTH CAROLINA LICENSE NO. F-1407 ESP ASSOCIATES, INC.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BL

POINT	DESC.	NORTH	EAST	ELEVATION
201	SS4908AC_BL-201	386443.5490	1833531.6880	243.94
3	SS4908AC_GPS3	386059.7250	1834879.0030	250.10
ESP1	SS4908AC_GPS1	385702.5802	1835492.4351	251.72
ESP2	HS-2008E_ESP-2	385356.4447	1836309.9881	247.14
ESP101	HS-2008E_ESP-101	384835.4263	1837027.6167	252.10
GEL14	SS4908AC_GPS4	384196.8176	1837623.6590	246.83

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	386239.698	1834303.692							
LINE			S 66°17'59.9" E	233.04					
PC	386146.029	1834517.076							
CURVE			S 66°08'31.3" E	304.71	00°18'57.2"(RT)	00°06'13.2"	304.71	152.36	55266.84
PT	386022.783	1834795.748							
LINE			S 65°59'02.7" E	385.96					
PC	385865.701	1835148.296							
CURVE			S 66°21'44.2" E	478.72	00°45'23.0"(LT)	00°09'28.8"	478.72	239.36	36262.29
PT	385673.758	1835586.849							
LINE			S 66°44'25.7" E	153.95					
PC	385612.964	1835728.287							
CURVE			S 66°09'02.7" E	58.29	01°10'46.1"(RT)	02°01'24.3"	58.29	29.15	2831.65
PT	385589.395	1835781.600							
LINE			S 65°33'39.7" E	443.67					
PC	385405.840	1836185.514							
CURVE			S 63°42'00.7" E	153.86	03°43'18.0"(RT)	02°25'06.5"	153.88	76.97	2369.08
PT	385337.671	1836323.445							
LINE			S 61°50'21.7" E	26.14					
PC	385325.334	1836346.492							
CURVE			S 54°23'23.6" E	794.16	14°53'56.1"(RT)	01°52'14.8"	796.40	400.46	3062.65
PT	384862.924	1836992.139							
LINE			S 46°56'25.6" E	943.89					
POT	384218.474	1837681.788							

EY1

POINT	N	E	BEARING	DIST
POT	385893.333	1835531.999		
LINE			S 29°01'36.6" W	180.65
POT	385735.373	1835444.343		

EY2

POINT	N	E	BEARING	DIST
POT	385734.689	1835445.917		
LINE			S 50°11'23.3" W	239.41
POT	385581.410	1835262.013		

EY3

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	385173.772	1836599.526							
LINE			S 46°14'34.1" W	230.34					
PC	385014.469	1836433.158							
CURVE			S 52°32'41.1" W	73.67	12°36'13.9"(RT)	17°04'29.8"	73.81	37.06	335.55
PT	384969.670	1836374.680							
LINE			S 58°50'48.0" W	24.34					
POT	384957.080	1836353.853							

EY4

POINT	N	E	BEARING	DIST
POT	385394.588	1836693.680		
LINE			S 21°04'09.0" W	241.81
POT	385168.942	1836606.751		

I, Toynia E.S. Gibbs, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey provided by others and the following information was used to perform the survey:

Class of survey: AA
Type of GPS field procedure: Unknown
Date of survey: September 2011
Datum/Epoch: NAD83 / NSRS 2007
Published/Fixed-control use: Unknown
Localized around: SS4908AC-1
Northing: 385702.607
Easting: 1835492.356
Combined grid factor: 0.9998953234
GEOID: Unknown
Units: US SURVEY FEET

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed in August 3, 2023 - August 9, 2023 , and all coordinates are based on NAD 83/NSRS 2007 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

DS

Witness my signature and seal this date 11/6/2023.

DocuSigned by:
Toynia Gibbs
2E2F55AA0EC84DA...

Professional Land Surveyor L-3866

NORTH CAROLINA PROFESSIONAL SEAL L-3866 LAND SURVEYOR TOYNIA E.S. GIBBS

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
3. NOT TO SCALE
4. COORDINATES FOR CONTROL POINTS SS4908AC_BL-201 AND SS4908AC_GPS3 WERE PROVIDED AND HELD.
5. COORDINATES FOR CONTROL POINTS SS4908AC_GPS1 AND SS4908AC_GPS4 WERE ESTABLISHED ON EXISTING POINTS.
6. CONTROL POINTS HS-2008E_ESP-2 AND HS-2008E_ESP-101 ARE NEW POINTS SET.

$$$

PROPOSED ALIGNMENT CONTROL SHEET

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	386239.6980	1834303.6920
PC	12+33.04	386146.0288	1834517.0761
PT	15+37.75	386022.7828	1834795.7482
PC	19+23.71	385865.7010	1835148.2962
PT	24+02.43	385673.7582	1835586.8485
PC	25+56.38	385612.9636	1835728.2871
PT	26+14.67	385589.3952	1835781.5997
PC	30+58.33	385405.8402	1836185.5137
PT	32+12.22	385337.6709	1836323.4449
PC	32+38.36	385325.3337	1836346.4917
PT	40+34.76	384862.9236	1836992.1387
POT	49+78.65	384218.4736	1837681.7880

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	385893.3333	1835531.9985
POT	11+80.65	385735.3732	1835444.3431

Y2

TYPE	STATION	NORTH	EAST
POT	10+00.00	385734.6886	1835445.9174
POT	12+39.41	385581.4099	1835262.0133

Y3

TYPE	STATION	NORTH	EAST
POT	10+00.00	385173.7715	1836599.5262
PC	12+30.34	385014.4691	1836433.1585
PT	13+04.15	384969.6696	1836374.6801
POT	13+28.49	384957.0796	1836353.8534

Y4

TYPE	STATION	NORTH	EAST
POT	10+00.00	385394.5877	1836693.6805
POT	12+41.81	385168.9422	1836606.7506

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	RW02D-1

Location and Surveys

DIVISION 8
LOCATION & SURVEYS
OFFICE
300 DOT DR
ASHEBORO, NC 27205

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4206 M. TODD WOODRUFF

Signed by: M. Todd Woodruff
76BC08302EDF43E...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, M. Todd Woodruff, PLS, certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 17th day of December, 2024.

Signed by: M. Todd Woodruff
76BC08302EDF43E...

Professional Land Surveyor L-4206

REVISIONS

6/2/99

17-DEC-2024 15:06
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mtwoodruff AT LS-340031

I , M. Todd Woodruff , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from December 2024, and all coordinates are based on NAD83/NSRS 2007; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 17th day of December, 2024.

Signed by:
M. Todd Woodruff
76BC08302EDF43E...
Professional Land Surveyor L-4206

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	RW04

Location and Surveys

DIVISION 8
LOCATION & SURVEYS
OFFICE
300 DOT DR
ASHEBORO, NC 27205

PROJECT SURVEYOR

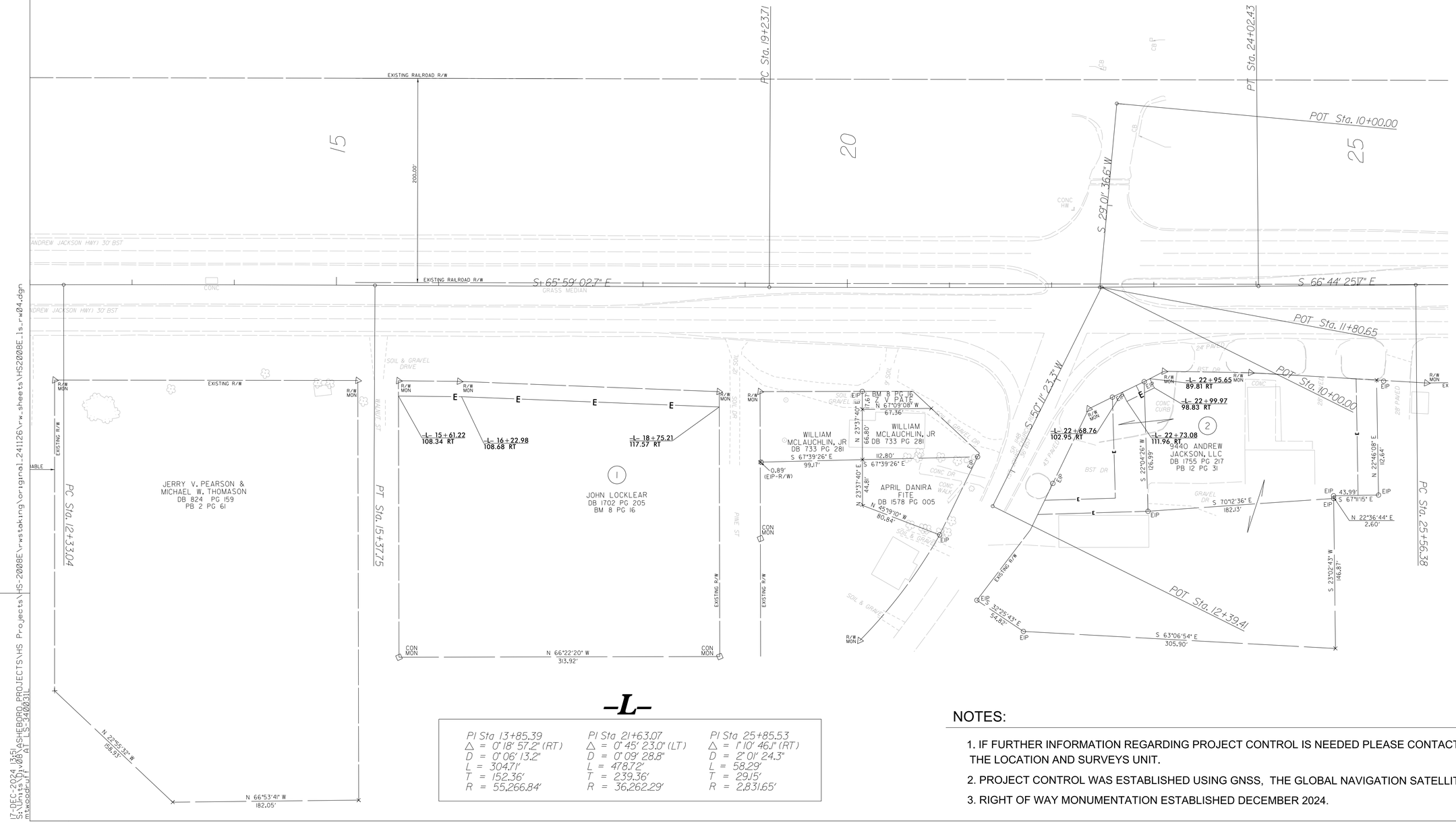
NORTH CAROLINA PROFESSIONAL SEAL L-4206 LAND SURVEYOR M. TODD WOODRUFF

Signed by:
M. Todd Woodruff
76BC08302EDF43E...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

6/2/99



-L-

PI Sta 13+85.39	PI Sta 21+63.07	PI Sta 25+85.53
△ = 0° 18' 57.2" (RT)	△ = 0° 45' 23.0" (LT)	△ = 1° 10' 46.1" (RT)
D = 0° 06' 13.2"	D = 0° 09' 28.8"	D = 2° 01' 24.3"
L = 304.71'	L = 478.72'	L = 58.29'
T = 152.36'	T = 239.36'	T = 29.15'
R = 55,266.84'	R = 36,262.29'	R = 2,831.65'

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED DECEMBER 2024.

17 DEC 2024 15:51
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mtwoodruff
AT LS-340031

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	RW05

Location and Surveys

DIVISION 8
LOCATION & SUVEYS
OFFICE
ASHEBORO, NC 27205

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4206 LAND SURVEYOR TODD WOODRUFF

Signed by: M. Todd Woodruff
76BC08302EDF43E...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , M. Todd Woodruff , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from December 2024, and all coordinates are based on NAD83/NSRS 2007; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 17th day of December, 2024.

Signed by: M. Todd Woodruff

Professional Land Surveyor L-4206

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED DECEMBER 2024.

-L-

PI Sta 31+35.30	PI Sta 12+67.39	PI Sta 36+38.82
△ = 3° 43' 18.0" (RT)	△ = 12° 36' 13.9" (RT)	△ = 14° 53' 56.1" (RT)
D = 2° 25' 06.5"	D = 17° 04' 29.8"	D = 1° 52' 14.8"
L = 153.88'	L = 73.81'	L = 796.40'
T = 76.97'	T = 37.06'	T = 400.46'
R = 2,369.08'	R = 335.55'	R = 3,062.65'

REVISIONS

6/2/99

J-DEC-2024 14:08
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mtwoodruff At LS-340031L

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	RW06

Location and Surveys

DIVISION 8
LOCATION & SURVEYS
OFFICE
300 DOT DR
ASHEBORO, NC 27205

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4206 LAND SURVEYOR M. TODD WOODRUFF

Signed by:
M. Todd Woodruff
76BC08302EDF43E...

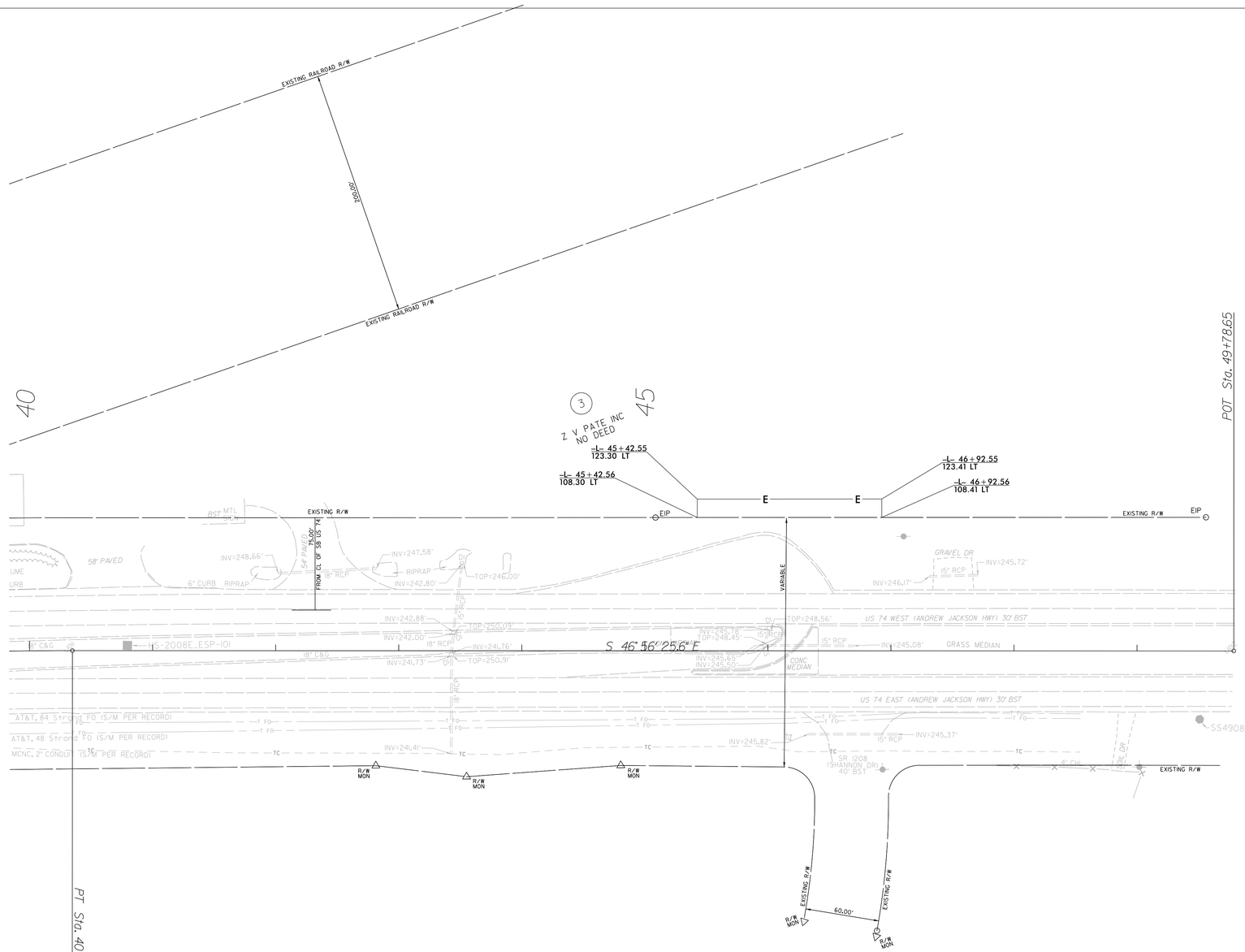
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , M. Todd Woodruff , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from December 2024, and all coordinates are based on NAD83/NSRS 2007; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 17th day of December, 2024.

Signed by:
M. Todd Woodruff

Professional Land Surveyor L-4206



NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED DECEMBER 2024.

REVISIONS 6/2/99

17-DEC-2024 08:41
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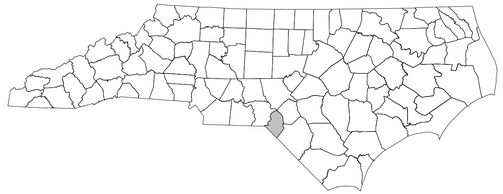
mtwoodruff
AT LS-34003II

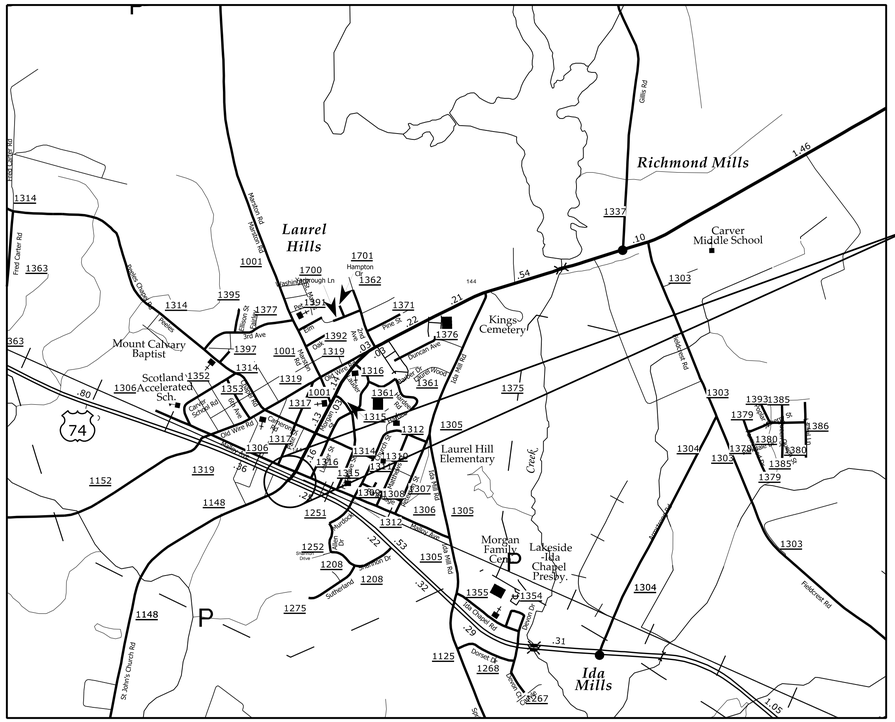
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

SCOTLAND COUNTY



LOCATION: US 74 AT NC 144/ST JOHNS CHURCH RD
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, AND THERMOPLASTIC MARKINGS & MARKERS



PROJECT LOCATION

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

PLANS PREPARED BY:

CHRISTOPHER R. SILVER, P.E, PTOE
PROJECT ENGINEER

KEVIN BISBY, P.E.
TECHNICAL MANAGER

NCDOT CONTACTS:

GREG S. DAVIS, P.E.
DIVISION DESIGN/CONSTRUCTION ENGINEER

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

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 TO TMP-1C	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND TRAFFIC CONTROL PHASING)
TMP-2	OFFSITE DETOUR: U-TURN CLOSURE
TMP-2A	OFFSITE DETOUR: SIGN DESIGN
TMP-3 TO TMP-5	TEMPORARY TRAFFIC CONTROL PHASE I DETAILS
TMP-6 TO TMP-8	TEMPORARY TRAFFIC CONTROL PHASE II DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1,Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

APPROVED: Signed by: Christopher R Silver 15A2201BF4F746B...

DATE: 1/7/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 048473 ENGINEER CHRISTOPHER R. SILVER

SHEET NO.
TMP-1

PROJECT: HS-2008E

CONTRACT:

1/6/2026
HS-2008E_TMP_PSH01 - TSH.dgn
csilver

PROJ. REFERENCE NO.	SHEET NO.
HS-2008E	TMP-1A

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1,Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 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
1101.02	TEMPORARY LANE CLOSURES
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
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1165.01	TRUCK MOUNTED ATTENUATOR
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.15	PAVEMENT MARKINGS - REDUCED CONFLICT INTERSECTIONS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- NORTH ARROW
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL

SIGNALS

EXISTING PROPOSED TEMPORARY (TEMP)

PAVEMENT MARKINGS

——— EXISTING 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
- DRUM (SECTION VIEW)
- CONE (SECTION VIEW)

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

TEMPORARY PAVEMENT MARKING SCHEDULE

P20	WHITE EDGELINE (6")
P23	3 FT.-9 FT./SP WHITE MINISKIP (6")
P24	2 FT.-6 FT./SP WHITE MINISKIP (6")
P30	YELLOW EDGELINE (6")
P34	2 FT.-6 FT./SP YELLOW MINISKIP (6")
P50	WHITE GORELINE (12")
P51	WHITE DIAGONAL (12")
P61	WHITE STOPBAR (24")
P71	RIGHT TURN ARROW
P77	U-TURN ARROW

APPROVED: Signed by: Christopher R Silver 15A2201BF4F746B...

DATE: 1/7/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 048473 ENGINEER CHRISTOPHER R. SILVER

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

ROADWAY STANDARD DRAWINGS & LEGEND

1/7/2026
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TRANSPORTATION MANAGEMENT STRATEGIES

THE FOLLOWING LISTED WORK ZONE STRATEGIES ARE RECOMMENDED FOR INCLUSION WITHIN THIS TRANSPORTATION MANAGEMENT PLAN (TMP).

RECOMMENDED STRATEGIES:

TRAFFIC MANAGEMENT STRATEGIES:
- LANE SHIFTS OR CLOSURES
- SHOULDER CLOSURES
- ONE-LANE, TWO WAY OPERATION (FLAGGING)

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
ALL ROADS	6:30AM-9:00AM MONDAY THRU FRIDAY
	BEACH SEASON (MEMORIAL DAY TO LABOR DAY) 6:30AM-9:00AM AND 4:00PM-6:00PM MONDAY THRU SUNDAY

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

ROAD NAME

ALL ROADS

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 6:30 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 6:30 A.M. THURSDAY AND 6:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:30 A.M. FRIDAY TO 6:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:30 A.M. THE MONDAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:30 A.M. FRIDAY AND 6:00 P.M. THURSDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:30 A.M. TUESDAY TO 6:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:30 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 6:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 5 FT OF AN OPEN TRAVEL LANE ON AN UNDIVIDED FACILITY, 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 WITHIN 10 FT OF AN OPEN TRAVEL LANE ON A DIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

F) 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.

G) 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.

H) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON US 74 (ANDREW JACKSON HWY).

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) 400 ft IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

K) NOTIFY THE ENGINEER THIRTY (30) 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) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

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TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES & PHASING)

1/7/2026
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GENERAL NOTES (CONT.)

TRAFFIC CONTROL DEVICES

N) 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.

O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

P) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES DRUMS 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
US 74	PAINT	TEMPORARY RAISED
ALL OTHER ROADS	PAINT	NONE

MISCELLANEOUS

R) RAILROAD FLAGGING MAY BE REQUIRED FOR WORK WITHIN CSXT RIGHT OF WAY. A MINIMUM 30-DAY NOTICE IS REQUIRED TO SCHEDULE A FLAGGER. ARRANGEMENTS FOR RAILROAD FLAGGING SERVICE MAY TAKE UPTO 90 DAYS TO SCHEDULE A QUALIFIED EMPLOYEE. SIX (6) DAYS ADVANCE NOTIFICATION IS REQUIRED TO TERMINATE FLAGGING PROTECTION. GENERALLY, ONCE A FLAGGER IS ASSIGNED, THAT COVERAGE WILL NOT BE REASSIGNED ELSEWHERE UNTIL FLAGGING IS NO LONGER NEEDED TO SUPPORT THE PROJECT. THE CONTRACTOR SHALL COORDINATE WITH MOFFATT & NICHOL COORDINATOR TO ARRANGE FLAGGING SERVICES.

TRAFFIC CONTROL PHASING

PHASE I

STEP 1:
USING RDWY STD 1101.01, ERECT WORK ZONE ADVANCE WARNING SIGNS ON -L- (US 74), -Y1- (ST JOHN CHURCH RD/ MORGAN ST).

INSTALL AND COVER OFFSITE DETOUR SIGNAGE. (REFER TO TMP-2)

COMPLETE THE WORK OF PHASE 1, STEP 2 FROM FRIDAY 9:00 AM TO THE FOLLOWING MONDAY 6:30 AM DURING A WEEKEND OUTSIDE OF BEACH SEASON. SEE INTERMEDIATE CONTRACT TIMES AND LIQUIDATED DAMAGES.

STEP 2:
UNCOVER DETOUR SIGNS AND CLOSE THE EXISTING U-TURN BULB ON -L- (US-74) NEAR STATION 45+00.

AWAY FROM TRAFFIC REMOVE THE EXISTING CONCRETE ISLAND AND CONSTRUCT THE PROPOSED DRAINAGE AND MEDIAN WIDENING AND MONOLITHIC ISLANDS. (REFER TO TMP-5)

USING RDWY STD 1101.02 TO MAINTAIN TRAFFIC, CONSTRUCT THE PROPOSED OUTSIDE WIDENING ON -L- (US 74) UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT.

APPLY TEMPORARY PAVEMENT MARKINGS IN THE FINAL PATTERN AND OPEN THE U-TURN BULB TO TRAFFIC. REMOVE DETOUR SIGNS.

STEP 3:
USING RDWY STD 1101.02 TO MAINTAIN TRAFFIC, CONSTRUCT THE PROPOSED DRAINAGE AND WIDENING ON -L- (US 74) UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT WHILE MAINTAINING CURRENT TRAFFIC PATTERNS. (REFER TO TMP-3 & 4)

STEP 4:
USING RDWY STD 1101.02 TO MAINTAIN TRAFFIC, CONSTRUCT MONOLITHIC ISLANDS IN THE MEDIAN AT THE U-TURN BULB. (REFER TO TMP-3)

INSTALL TEMPORARY SIGNAL FOR U-TURN BULB

PHASE II

STEP 1:
USING RDWY STD 1101.02 TO MAINTAIN TRAFFIC; (REFER TO TMP-6 THRU TMP-8)
- APPLY PAVEMENT MARKINGS, ACTIVATE SIGNAL AND OPEN U-TURN LANES TO TRAFFIC.
- CLOSE THE EXISTING -Y1- (ST JOHN CHURCH RD/ MORGAN ST) INTERSECTION MEDIAN OPENING ONCE THE MEDIAN U-TURN INTERSECTIONS ARE OPEN TO TRAFFIC AND ACTIVATE TEMPORARY SIGNALS.

STEP 2:
USING RDWY STD 1101.02 TO MAINATAIN TRAFFIC, CONSTRUCT LEFT-OVER MEDIAN ISLANDS ON -L- (US 74). (REFER TO TMP-6)

PHASE III (NOT SHOWN)

USING RDWY STD 1101.02 TO MAINTAIN TRAFFIC, MILL AND PAVE THE FINAL SURFACE COURSE, APPLY THE FINAL PAVEMENT MARKINGS, INSTALL PROPOSED SIGNALS AT -Y1- INTERSECTION AND OPEN TO TRAFFIC IN THE FINAL PATTERN. (REFER TO THE FINAL PAVEMENT MARKING PLANS)
REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES.

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NORTH CAROLINA PROFESSIONAL SEAL 048473 ENGINEER CHRISTOPHER R. SILVER

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TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES & PHASING)

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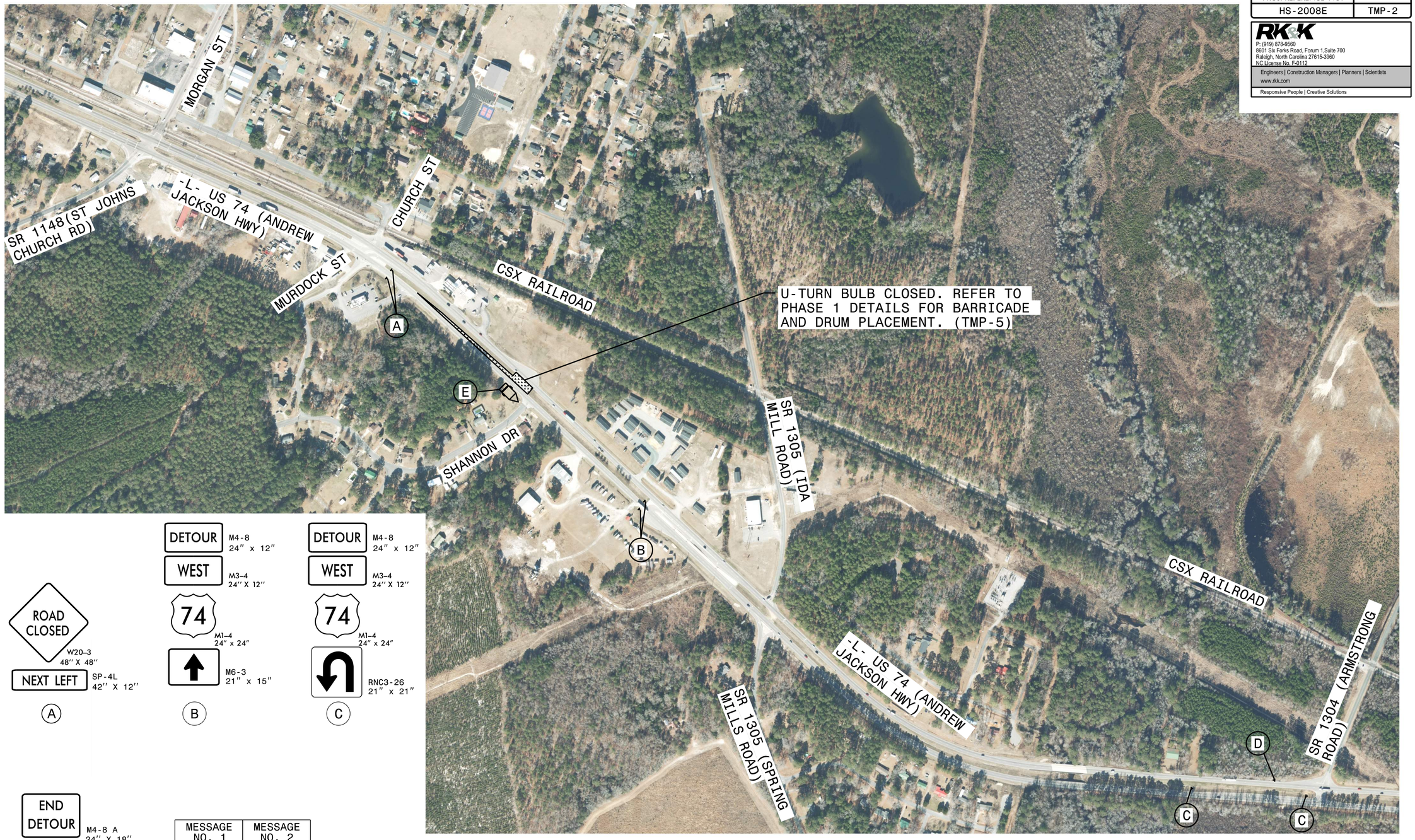

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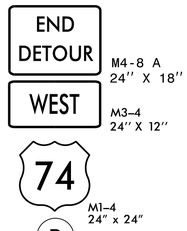
B

C



D

MESSAGE NO. 1	MESSAGE NO. 2
US 74 WEST	U TURN 1 MILE

CHANGEABLE MESSAGE SIGN

E

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

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OFFSITE DETOUR U-TURN CLOSURE

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SIGN NUMR:
TYPE: F Ground
QUANTITY: 1

BACKG. COLOR: White
COPY COLOR: Black

DESIGN BY:
PROJECT ID:

CHK BY:
DIV:

STD #:
DATE:

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY
SIGNING & DELINEATION UNIT

SIGN WIDTH: 1'-9"
HEIGHT: 1'-9"
TOTAL AREA: 3.1 Sq.Ft.

MAT'L: 0.063 " ALUMINUM

BORDER TYPE: RECESSED
RECESS: 0.38"
WIDTH: 0.63"
RADII: 1.5"

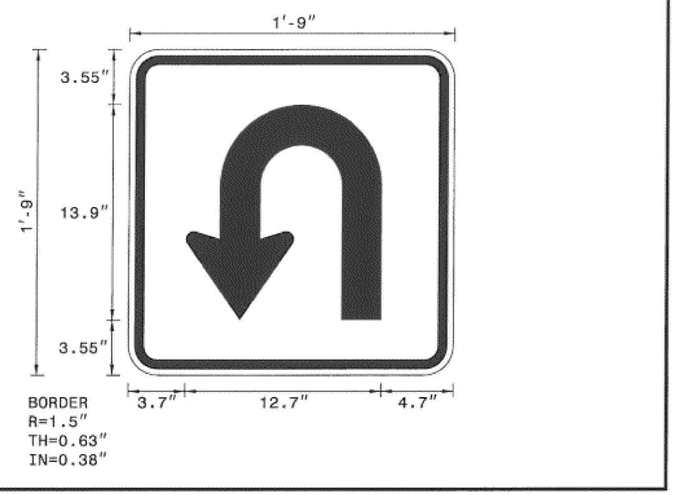
NO. Z BARS:
LENGTH:

SYMBOL	X	Y	WID	HT
u arrow	3.7	3.5	12.7	13.9

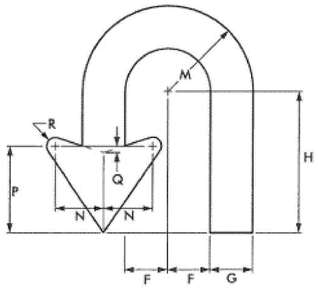
NOTES:

1. Legend and border shall be direct applied Non-reflective sheeting.

2. Background shall be Grade C reflective sheeting.



Arrow Details



ARROW DIMENSIONS (INCHES)	F	G	H	M	N	P	Q	R
	2.625	2.625	8.659	5.25	3	5.25	0.375	0.5

Spacing Factor is 1 unless specified otherwise

FILENAME: GSENG

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OFFSITE DETOUR SIGN DESIGN

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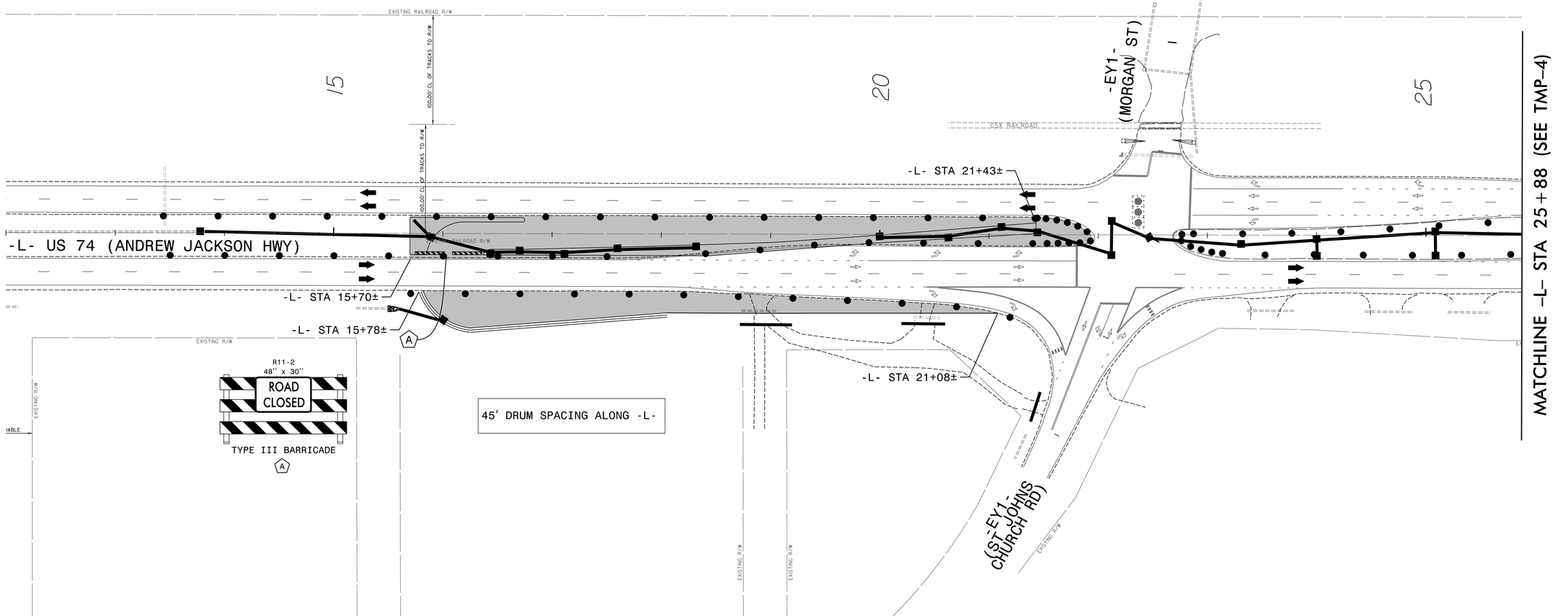

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TRAFFIC CONTROL PHASE 1 DETAILS

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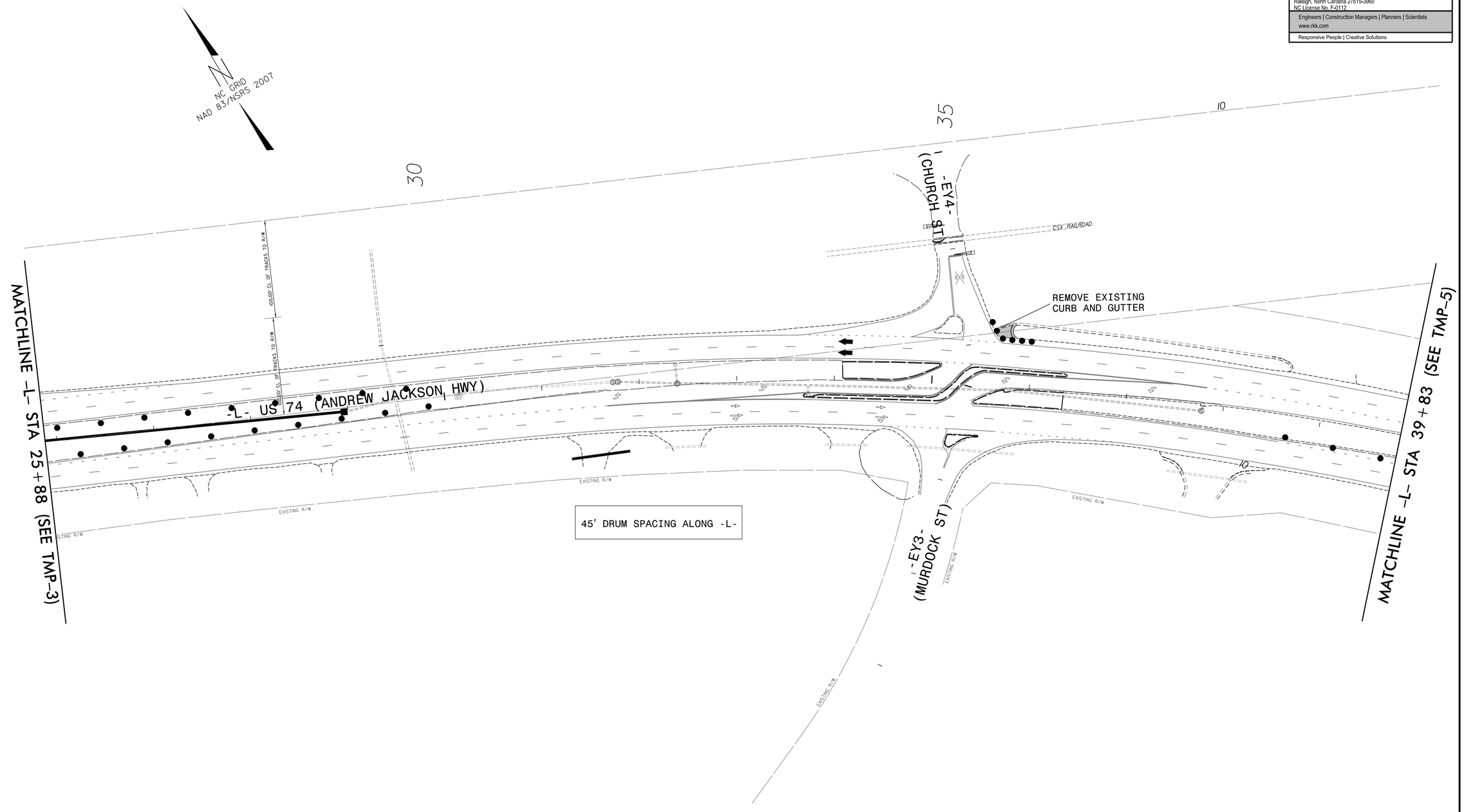

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TRAFFIC CONTROL PHASE 1 DETAILS

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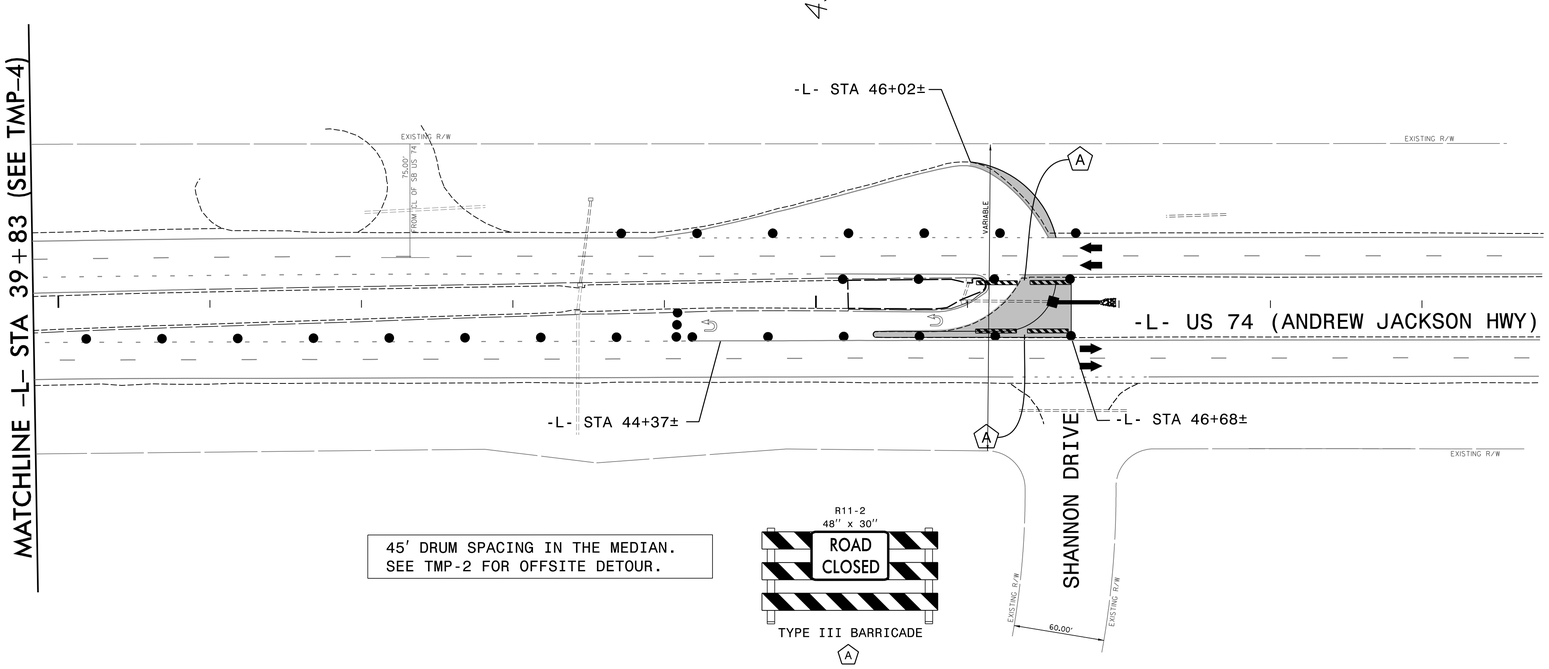

45' DRUM SPACING IN THE MEDIAN.
SEE TMP-2 FOR OFFSITE DETOUR.

TYPE III BARRICADE

A

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TRAFFIC CONTROL PHASE 1 DETAILS

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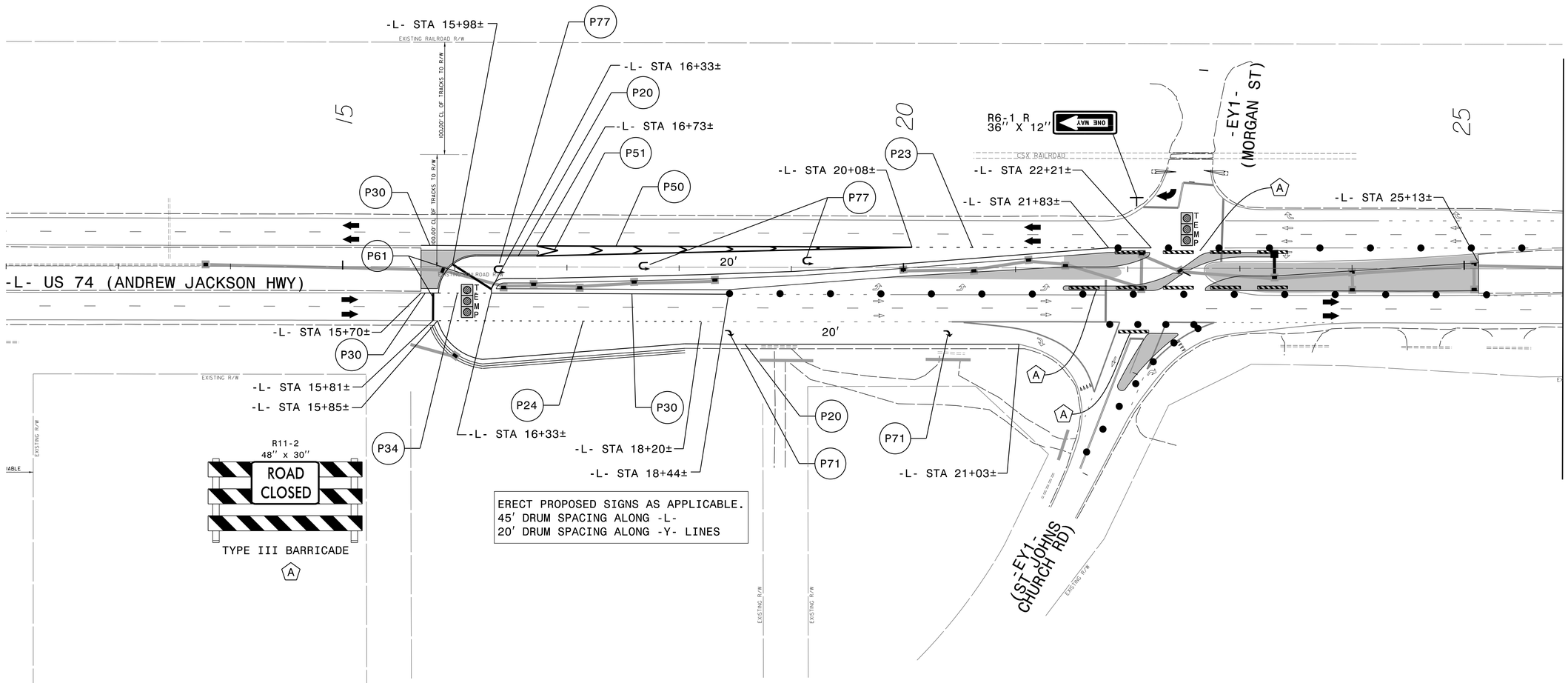

ERECT PROPOSED SIGNS AS APPLICABLE.
45' DRUM SPACING ALONG -L-
20' DRUM SPACING ALONG -Y- LINES

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TRAFFIC CONTROL PHASE 2 DETAILS

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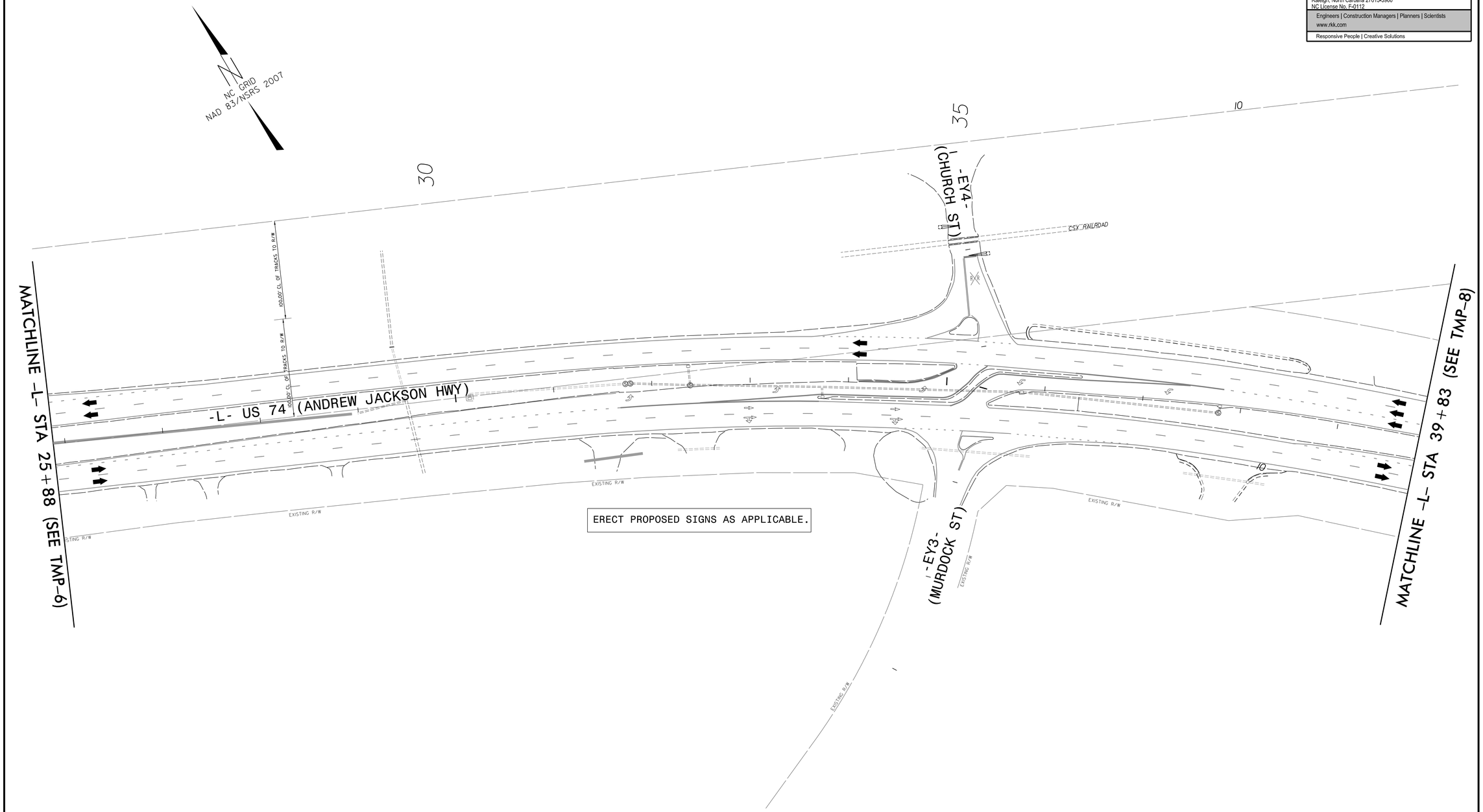

ERECT PROPOSED SIGNS AS APPLICABLE.

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TRAFFIC CONTROL PHASE 2 DETAILS

1/6/2026
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csilver

PROJ. REFERENCE NO.	SHEET NO.
HS-2008E	TMP-8

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1,Suite 700
Raleigh, North Carolina 27615-3960
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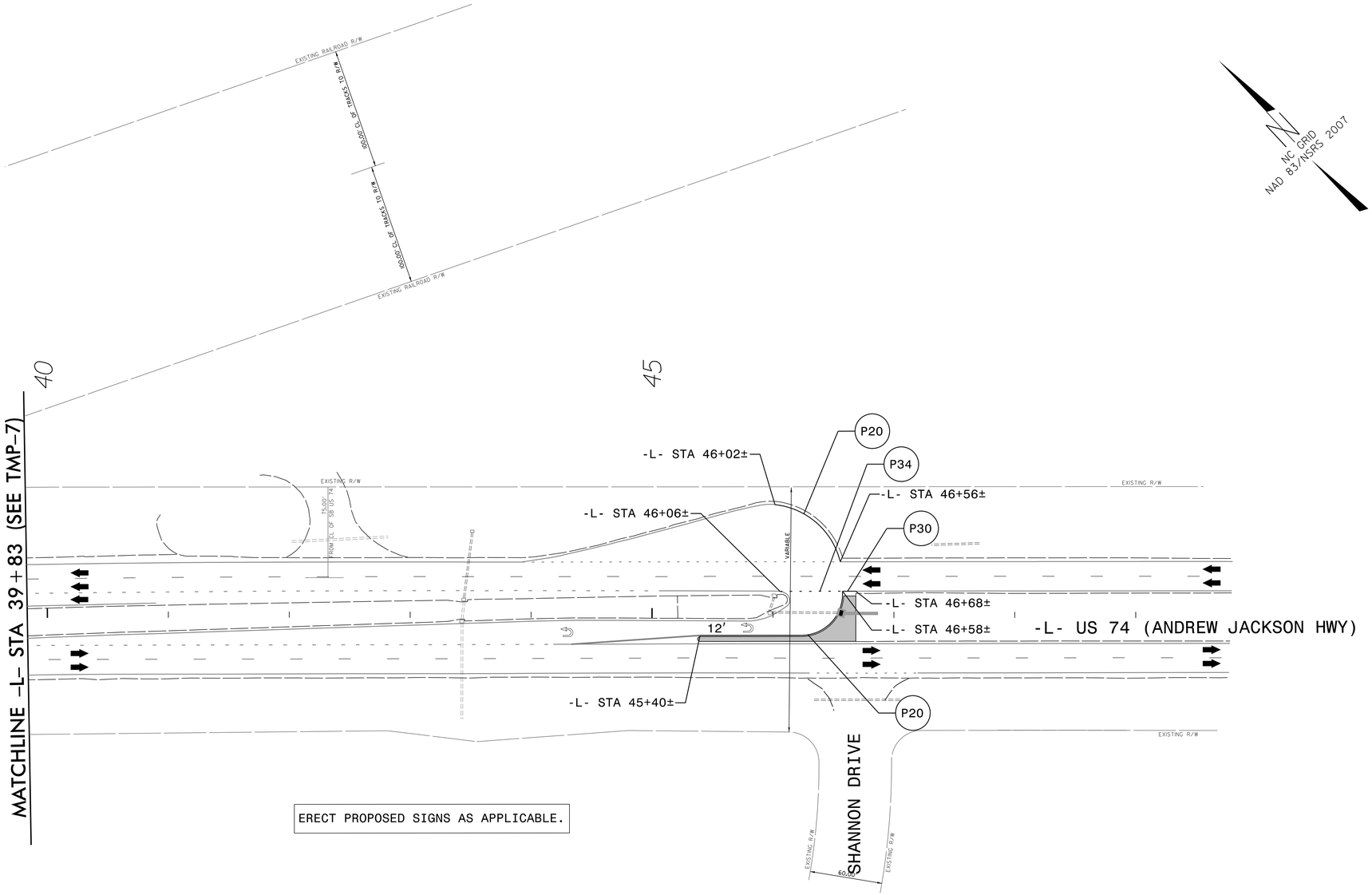
www.rkk.com
Responsive People | Creative Solutions



APPROVED: Signed by: Christopher R Silver 15A2201BF4F746B...

DATE: 1/7/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 048473 ENGINEER CHRISTOPHER R. SILVER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRAFFIC CONTROL PHASE 2 DETAILS

1/6/2026
HS-2008E_TMP_PSH08.dgn
csilver

PROJECT: HS-2008E

CONTRACT:

$$$$$$SYSTIME$$$$$

$$$$$$

STATE PROJECT REFERENCE NO.	SHEET NO.
HS–2008E	PMP–1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Docusigned by: Michael Ricketts 38[illegible]4EB.. 1/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

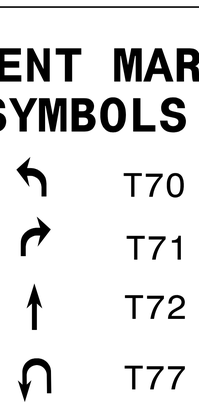
PROJECT: HS–2008E

CONTRACT:

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	MATERIAL	DESCRIPTION
PAVEMENT MARKING		
THERMOPLASTIC (6″, 90 MILS)		
	T20	WHITE EDGELINE
	T21	WHITE SOLID LANE LINE
	T22	10 FT. WHITE SKIP
	T23	3 FT.- 9 FT./SP WHITE MINISKIP
	T24	2 FT. - 6 FT./SP WHITE MINISKIP
	T30	YELLOW EDGELINE
	T33	YELLOW DOUBLE CENTER
	T34	2 FT. - 6 FT./SP YELLOW MINISKIP
THERMOPLASTIC (12″, 90 MILS)		
	T50	WHITE GORELINE
	T51	WHITE DIAGONAL
THERMOPLASTIC (24″, 90 MILS)		
	T61	WHITE STOPBAR
	T103	24″ YIELD LINE TRIANGLE
THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)		
	T70	LEFT TURN ARROW
	T71	RIGHT TURN ARROW
	T72	STRAIGHT ARROW
	T77	U-TURN ARROW

PAVEMENT MARKING SYMBOLS



PAVEMENT MARKING SCHEDULE

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$CELLNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	PMP-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Digitally signed by: Michael Ricketts
01/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83/NSRS 2007

REVISIONS 8/17/99

–L– STA. 12+00

REPLACE EXISTING MARKINGS AND MARKERS FOR RESURFACING WITHIN PROJECT LIMITS

VERIFY STOP BAR LOCATIONS WITH SIGNAL PLANS

NC 144 (MORGAN ST)

US 74

–L– STA. 15+69.71
TIE TO EXISTING

–L– STA. 15+98.00
5.0' LT

–L– STA. 16+72.79

–L– STA. 15+85.00
45.0' RT

–L– STA. 16+33.00
17.0' RT

–L– STA. 18+04.98

–L– STA. 18+44.47

–L– STA. 20+07.24

–L– STA. 19+94.43

–L– STA. 21+83.01

–L– STA. 21+44.40

–L– STA. 20+48.14

–L– STA. 22+19

–L– STA. 23+30.84

–L– STA. 24+65.07

–L– STA. 22+71

–L– STA. 25+71.46

–L– STA. 25+12.76

–Y2– STA. 11+29.84

–Y2– STA. 11+19.23

–Y2– STA. 12+39.41

EXISTING STOP BAR LOCATIONS

EXISTING LOCATION

ST JOHNS CHURCH RD

MATCHLINE –L– STA. 25+88 (SEE SHEET 5)

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	PMP-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

DocuSigned by: Michael Ricketts 01/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

NC GRID
NAD 83/NSRS 2007

CHURCH ST

CSX RAILROAD

REPLACE EXISTING MARKINGS AND MARKERS FOR RESURFACING WITHIN PROJECT LIMITS

T20 T23 T22 T30

-L- STA. 27+05.84

MATCHLINE -L- STA 25+88 (SEE SHEET 4)

MATCHLINE -L- STA 39+83 (SEE SHEET 6)

MURDOCK ST

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

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	PMP-4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052140 ENGINEER MICHAEL E. RICKETTS

Digitally signed by: Michael Ricketts
DocuSigned by: 60DA360844EB...
01/20/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83/NSRS 2007

MATCHLINE -L- STA 39+83 (SEE SHEET 5)

REPLACE EXISTING MARKINGS AND MARKERS FOR RESURFACING WITHIN PROJECT LIMITS

T20

T20

TIE TO EXISTING TURN LANE MARKINGS

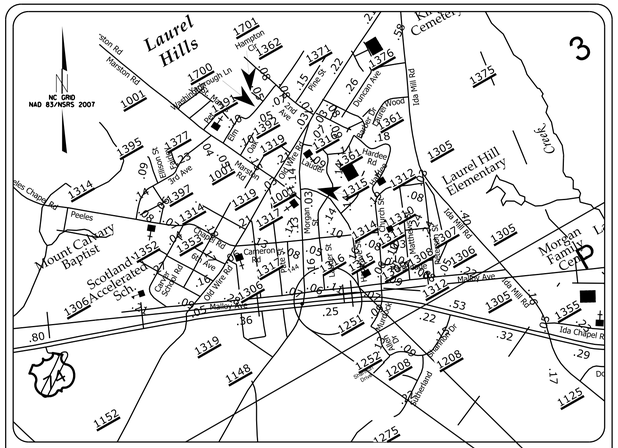
SHANNON DR

$$$$$$$SYSTIME$$$$$
$$$$$$$

TIP PROJECT: HS-2008E

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2008E	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49318.1.6		
49318.2.6		
49318.3.6		



VICINITY MAP
NOT TO SCALE

PROJECT LOCATION

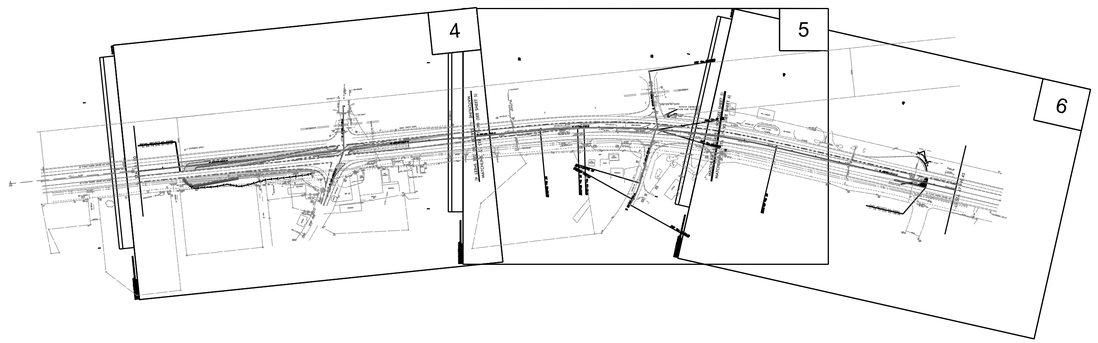
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

SCOTLAND COUNTY

LOCATION: US 74 AT NC 144/ST JOHNS CHURCH RD

TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, AND THERMOPLASTIC MARKINGS & MARKERS



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

GRAPHIC SCALE

50 25 0 50 100
PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG 010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

tomo ENGINEERING

Prepared in the Office of:

Tomo Engineering, PLLC
2319 Cardinal Drive
Durham, NC 27707
N.C.B.E.L.S. License Number: P-2066

Designed by:

Trenton J. Cormier, PE CPESC *3377*
NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

$$$$$$SYSTIME$$$$$$
$$$$$$DATE$$$$$$
$$$$$$USERNAME$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-02

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

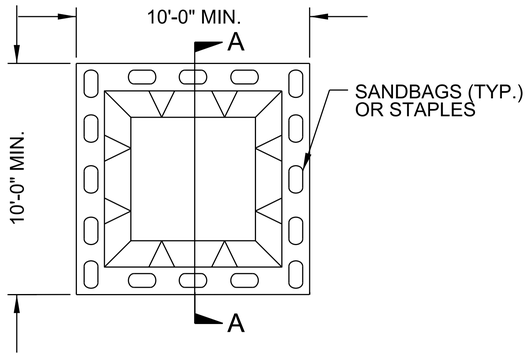
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

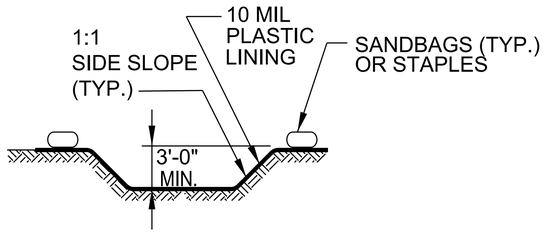
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	—EW—EW—EW—
1636.03	Coir Fiber Wattle Barrier	—CFW—CFW—CFW—

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-2A

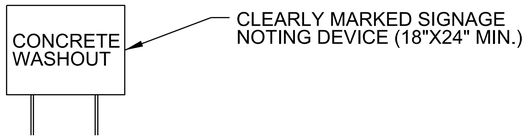
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



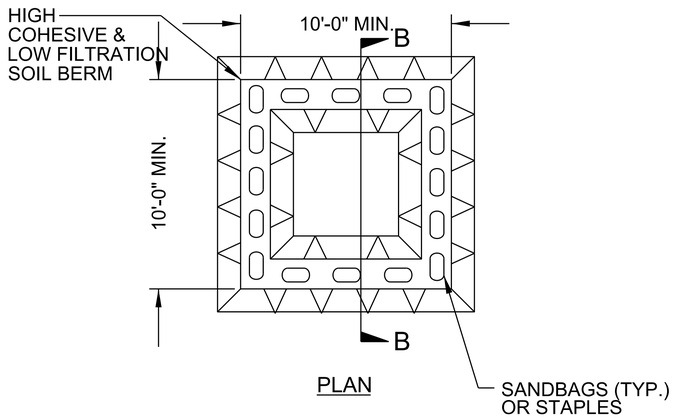
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

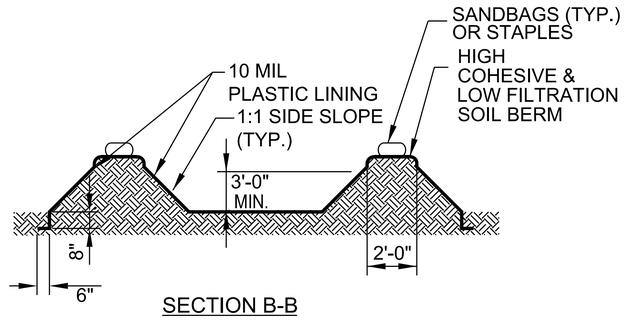
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-3

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 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-4/CON-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

tomo ENGINEERING
Tomo Engineering, PLLC
2319 Cardinal Drive, Durham, N.C. 27707
N.C.B.E.L.S. License Number: P-2066

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
USE FABRIC INSERT PROTECTION IN LEIU OF TYPE C INLET PROTECTION AS DIRECTED.

8/17/99

REVISIONS

NC GRID
NAD 83/NSRS 2007

BEGIN PROJECT HS-2008E
-L- US 74 STA. 15+69.91

-L- STA 15+00

-L- STA 27+90 (SEE SHEET 5)

MATCHLINE -L- STA 27+90 (SEE SHEET 5)

PC Sta. 19+23.71

PT Sta. 24+02.43

POT Sta. 10+00.00

POT Sta. 12+39.41

PC Sta. 25+56.38

PT Sta. 26+14.67

PT Sta. 15+37.75

EXISTING RAILROAD R/W

CSX RAILROAD

NC 144 (MORGAN ST)

105.00' | 332.81' | 150.00' | 150.00' | 147.19' | 206.36' | 200.00'

INSTALL 2 FT CURB CUT IN MONOLITHIC ISLAND

ADJUST GRADE TO EXISTING 2GI

15" RCP

24" RCP

18" RCP

TB 2GI

RETAIN

REMOVE

SPECIAL CUT DITCH SEE DETAIL 1

2 TONS CL B RIP RAP
7" SY GEOTEXTILE

GREENHOUSE / SELLER

CITY OF LAURINBURG, 6" AC (S/M PER RECORD)

NCDOT TRAFFIC SIGNAL

AT&T, 84 STRAND FO (S/M PER RECORD)

AT&T, 48 STRAND FO (S/M PER RECORD)

MCNC, 2" CONDUIT (S/M PER RECORD)

CITY OF LAURINBURG 8" AC (S/M PER RECORD)

GRASS MEDIAN

REMOVE AND REPLACE

9440 ANDREW JACKSON, LLC
DB 1755 PG 217
PB 12 PG 31

ISBKBUS

MTL CANOPY

43' PAVED

28' PAVED

24' PAVED

BST DR

GRAVEL DR

MONITORING WELLS

V. PEARSON & EL W. THOMASON
824 PG 159
PB 2 PG 61

JOHN LOCKLEAR
DB 1702 PG 205
BM 8 PG 16

WILLIAM MCLAUCHLIN, JR
DB 733 PG 281

APRIL DANIRA FITE
DB 1578 PG 281

PI Sta 13+85.39
Δ = 0° 18' 57.2" (RT)
D = 0° 06' 13.2"
L = 304.71'
T = 152.36'
R = 55,266.84'

PI Sta 21+63.07
Δ = 0° 45' 23.0" (LT)
D = 0° 09' 28.8"
L = 478.72'
T = 239.36'
R = 36,262.29'

PI Sta 25+85.53
Δ = 1° 10' 46.1" (RT)
D = 2° 01' 24.3"
L = 58.29'
T = 29.15'
R = 2,831.65'

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-5/CON-5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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2319 Cardinal Drive, Durham, N.C. 27707
N.C.B.E.L.S. License Number: P-2066

REVISIONS 8/17/99

NC GRID NAD 83/NSRS 2007

MATCHLINE -L- STA 27+90 (SEE SHEET 4)

MATCHLINE -L- STA 37+93 (SEE SHEET 6)

POT Sta. 10+00.00

POT Sta. 12+41.81

POT Sta. 10+00.00

POT Sta. 13+28.49

PC Sta. 30+58.33

PC Sta. 12+30.34

PT Sta. 32+12.22

PT Sta. 32+38.36

PT Sta. 40+34.76

S 21°04'09" W

S 46°14'34" W

S 58°50'48" W

S 65°33'39" E

S 78°22'58" W 247.62

N 10°57'31" E 189.42'

N 67°03'02" W 28.99'

CSX RAILROAD

43' PAVED

55' CONC DR

58' PAVED

GRASS MEDIAN

CONC FLUME

MTL CANOPY

ISBKBUS

ISFBUS

BST PARKING

GRAVEL DR

CITY OF LAURINBURG, 8" AC (S/M PER RECORD)

AT&T, 84 STR GRD F.O. (S/M PER RECORD)

AT&T, 48 STR GRD F.O. (S/M PER RECORD)

MCNC, 2" CONDUIT (S/M PER RECORD)

2" PVC (S/M PER RECORD)

BILLY RAY NORRIS, JR. DB 1584 PG 006 PB 12 PG 132

CECIL SAMUEL BOSTICK, JR. DB 1584 PG 253 PB 12 PG 132

REMOVE EXISTING CURB AND GUTTER

REMOVE AND REPLACE WITH 18" RCP

RETAIN AND CLEANOUT

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 05

NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE: PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE: USE FABRIC INSERT PROTECTION IN LEIU OF TYPE C INLET PROTECTION AS DIRECTED.

PI Sta 12+67.39
Δ = 12° 36' 13.9" (RT)
D = 17° 04' 29.8"
L = 73.81'
T = 37.06'
R = 335.55'

PI Sta 36+38.82
Δ = 14° 53' 56.1" (RT)
D = 1° 52' 14.8"
L = 796.40'
T = 400.46'
R = 3,062.65'

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-6/CON-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Tomo Engineering, PLLC
2319 Cardinal Drive, Durham, N.C. 27707
N.C.B.E.L.S. License Number: P-2066

REVISIONS

8/17/99

MATCHLINE –L– STA 37+90 (SEE SHEET 5)

–L– STA 47+90.45

END PROJECT HS-2008E
–L– US 74 STA. 46+68.50

PT Sta. 40+34.76

S 46°56'25.6"E

HS-2008E_ESP-101

GRADE TO DRAIN

R 65.00'

REMOVE AND REPLACE

REMOVE EXISTING CONCRETE ISLAND

2 TONS CL B RIP RAP
7 SY GEOTEXTILE

CLEARING AND GRUBBING
EROSION CONTROL FOR CONSTRUCTION SHEET 06

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
USE FABRIC INSERT PROTECTION IN LEIU OF TYPE C INLET PROTECTION AS DIRECTED.

NC GRID
NAD 83/NSRS 2007

SYSTIME $$SYSTIME$$
DESIGN $$DESIGN$$
FILENAME $$FILENAME$$

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-7/CON-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Tomo Engineering, PLLC
2319 Cardinal Drive, Durham, N.C. 27707
N.C.B.E.L.S. License Number: P-2066

8/17/99

REVISIONS

NOTE:
USE FABRIC INSERT PROTECTION IN LEIU OF TYPE C INLET PROTECTION AS DIRECTED.

NC GRID
NAD 83/NSRS 2007

15 20 25

PC Sta. 19+23.71

PT Sta. 24+02.43

POT Sta. 10+00.00

BEGIN PROJECT HS-2008E
-L- US 74 STA. 15+69.91

-L- STA 15+00

-L- STA 27+90 (SEE SHEET 5)

MATCHLINE -L- STA 27+90 (SEE SHEET 5)

105.00' 332.81' 150.00' 150.00' 147.19' 206.36' 200.00'

S 65°59'02" E

S 29°01'36" W

INSTALL 2 FT CURB CUT IN MONOLITHIC ISLAND

TIE TO EXISTING 2GI

15" RCP

TB 2GI

R 48.00'
R 52.00'
2 TONS
CL B RIP RAP
7" BY GEOTEXTILE

180.00'

REMOVE

SPECIAL CUT DITCH SEE DETAIL 1

REMOVE AND REPLACE

RETAIN

EXISTING RAILROAD R/W

CSX RAILROAD

NC 144 (MORGAN ST) 30' BSL

NCDOT TRAFFIC SIGNAL

AT&T, 84 STRAND FO (S/M PER RECORD)

CITY OF LAURINBURG, 6", AC (S/M PER RECORD)

CITY OF LAURINBURG 8", AC (S/M PER RECORD)

GREENHOUSE / SELLER

WAHAW ST

PINE ST

BST DR

GRASS MEDIAN

MONITORING WELL

CANOPY

MTL CANOPY

ISBKBUS

OHBKS

WILLIAM MCLAUCHLIN, JR
DB 733 PG 281

JOHN LOCKLEAR
DB 1702 PG 205
BM 8 PG 16

APRIL DANIRA FITE
DB 1578 PG

9440 ANDREW JACKSON, LLC
DB 1755 PG 217
PB 12 PG 31

V. PEARSON &
EL W. THOMASON
B 824 PG 159
PB 2 PG 61

PI Sta 13+85.39
Δ = 0° 18' 57.2" (RT)
D = 0° 06' 13.2"
L = 304.71'
T = 152.36'
R = 55,266.84'

PI Sta 21+63.07
Δ = 0° 45' 23.0" (LT)
D = 0° 09' 28.8"
L = 478.72'
T = 239.36'
R = 36,262.29'

PI Sta 25+85.53
Δ = 1° 10' 46.1" (RT)
D = 2° 01' 24.3"
L = 58.29'
T = 29.15'
R = 2,831.65'

$$$$USERNAME$$$$ $$$$DGN$$$$ $$$$STYLE$$$$

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-8/CON-5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

tomo ENGINEERING
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2319 Cardinal Drive, Durham, N.C. 27707
N.C.B.E.L.S. License Number: P-2066

REVISIONS 8/17/99

SYSTEM FILENAME

NC GRID NAD 83/NSRS 2007

MATCHLINE -L- STA 27+90 (SEE SHEET 4)

MATCHLINE -L- STA 37+93 (SEE SHEET 6)

POT Sta. 10+00.00

POT Sta. 12+41.81

POT Sta. 10+00.00

POT Sta. 13+28.49

PT Sta. 40+34.76

PC Sta. 30+58.33

PT Sta. 32+12.22

PC Sta. 12+30.34

PT Sta. 13+04.15

PC Sta. 32+38.36

S 21°04'09"W

S 65°33'39"E

S 58°50'48"W

S 56°46'14"W

REMOVE EXISTING CURB AND GUTTER

REMOVE AND REPLACE WITH 18" RCP

RETAIN AND CLEANOUT

CSX RAILROAD

CITY OF LAURINBURG, 8" AC (S/M PER RECORD)

BILLY RAY NORRIS, JR. DB 1584 PG 006 PB 12 PG 132

CECIL SAMUEL BOSTICK, JR. DB 1584 PG 253 PB 12 PG 132

+35.30	PI Sta 12+67.39	PI Sta 36+38.82
3' 18.0" (RT)	Δ = 12° 36' 13.9" (RT)	Δ = 14° 53' 56.1" (RT)
5' 06.5"	D = 17° 04' 29.8"	D = 1° 52' 14.8"
38'	L = 73.81'	L = 796.40'
7"	T = 37.06'	T = 400.46'
59.08'	R = 335.55'	R = 3,062.65'

NOTE:
USE FABRIC INSERT PROTECTION IN LEIU OF TYPE C INLET PROTECTION AS DIRECTED.

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	EC-9/CON-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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8/17/99

REVISIONS

MATCHLINE –L– STA 37+90 (SEE SHEET 5)

–L– STA 47+90.45

EXISTING RAILROAD R/W

200.00'

40

45

MTL CANOPY

MTL CANOPY

BST

MTL SIGN

EXISTING R/W

EIP

GRADE TO DRAIN

R 65.00'

RETAIN

GRAVEL DR

15" RCP

PAVED

55' CONC DR

6" CURB

CONC FLUME

58' PAVED

6" CURB

6" CURB RIPRAP

INV=248.66'

RETAIN

54" PAVED DITCH FROM C/L OF SR 1174

18" RCP

INV=247.58'

RIPRAP

DI

TOP=246.00'

RETAIN

RETAIN

15" RCP

RETAIN

RETAIN

VARIABLE

REMOVE AND REPLACE

US 74 WEST (ANDREW JACKSON HWY)

INV=248.56'

TOP=250.09'

INV=242.00'

18" RCP

INV=241.76'

TOP=248.45'

S 46° 56' 25.6" E

8" C&G

HS-2008E_ESP-101

18" C&G

GRASS MEDIAN

INV=241.73'

DI

TOP=250.91'

GI

RCP-IV

CONC

RETAIN

RETAIN

REMOVE EXISTING CONCRETE ISLAND

RETAIN

GRASS ME

10.00

10

AT&T, 84 Strand FO (S/M PER RECORD)

AT&T, 48 Strand FO (S/M PER RECORD)

MCNC, 2" CONDUIT (S/M PER RECORD)

INV=244.80'

INV=245.20'

TOP=247.00'

INV=241.41'

US 74 EAST (ANDREW JACKSON HWY)

CITY OF LAURINBURG, B', AC

15" RCP

SR 1208 (SHANNON DR) 40' BST

END PROJECT HS-2008E
–L– US 74 STA. 46+68.50

PT Sta. 40+34.76

EXISTING R/W

60.00'

EXISTING R/W

R/W MON

NC GRID
NAD 83/NSRS 2007

NOTE:
USE FABRIC INSERT PROTECTION IN LEIU OF TYPE C INLET PROTECTION AS DIRECTED.

$SYSTIME$
$SYSTIME$
$USERNAME$
$DGNFILE$

T.I.P.: HS-2008E

CONTRACT:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	SIGN-1

APPROVED: DocuSigned by: David T Sears 069183F2BE5741E...

DATE: 10/27/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNING PLAN
SCOTLAND COUNTY

LOCATION: US 74 AT NC 144/ST JOHNS CHURCH RD

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
910.30	SIGNING REDUCED CONFLICT INTERSECTION

GENERAL NOTES

. SIGNS FURNISHED BY THE CONTRACTOR.

. ALL TYPE 'D' SIGNS SHALL BE MOUNTED ON TWO U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS.

. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER

. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000	901	CONTRACTOR FURNISHED, TYPE D SIGN	27	S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	115	S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE F SIGN	81	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	562	L.F.
4096000000	904	SIGN ERECTION, TYPE D	3	EA.
4102000000	904	SIGN ERECTION, TYPE E	17	EA.
4108000000	904	SIGN ERECTION, TYPE F	11	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	24	EA.
4238000000	907	DISPOSAL OF SIGN, D, E OR F	1	EA.

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	E & F SHEET
SIGN-3	SIGN DESIGN
SIGN-4-6	SIGNING PLAN SHEETS

PLAN PREPARED FOR N.C.D.O.T. SIGNING AND DELINEATION UNIT

Mitch Eaton, PE — Signing and Delineation Regional Engineer

Stacey Johns — Design Engineer III

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · DIVISION

PLAN PREPARED BY: RK&K

David Sears, PE, PTOE — Project Manager

Allen Tutt — Project Designer

RK&K

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Raleigh, North Carolina 27615-3960
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10/27/25
HS-2008E_SGN_TSH.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	SIGN-2

APPROVED: DocuSigned by: David T Seaks 069183F2BE5741E...

DATE: 10/27/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEAKS

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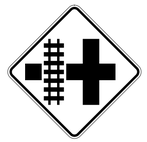
(401) QUANTITY REQ'D 1



36" X 36"
W10-2

ONE "U" POST

(402) QUANTITY REQ'D 2

48" X 18"
R6-1(L)

TWO "U" POSTS PER SIGN

(403) QUANTITY REQ'D 5

30" X 30
W12-1

ONE "U" POST PER SIGN

(404) QUANTITY REQ'D 2

30" X 36"
R2-1

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 2

36" X 36" x 36"
R1-2

ONE "U" POST PER SIGN

(406) QUANTITY REQ'D 1

36" X 12"
R6-1(R)

MOUNT ABOVE SIGN-405
IN ONE INSTALLATION

(407) QUANTITY REQ'D 1

24" X 30"
R4-7B

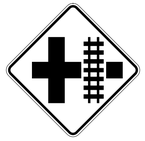
ONE "U" POST

(408) QUANTITY REQ'D 1

30" X 30"
W3-2

ONE "U" POST

(409) QUANTITY REQ'D 1



36" X 36"
W10-2

ONE "U" POST

(410) QUANTITY REQ'D 1

30" X 30
W2-1

ONE "U" POST

(501) (509)

M2-1P
21" X 15"

M1-5
24" X 24"

ONE "U" POST PER ASSEMBLY

(502)

M3-2P
24" X 12"

M1-5
24" X 24"

M5-1P(L)
21" X 15"

ONE "U" POST

(503)

M3-4P
24" X 12"

M1-4
24" X 24"

ONE "U" POST

(504)

M3-2P
24" X 12"

M1-5
24" X 24"

M6-1P
21" X 15"

ONE "U" POST

(505)

M3-2P
24" X 12"

M1-4
24" X 24"

U-TURN
21" X 21"

ONE "U" POST

(506)

M3-2P
24" X 12"

M1-5
24" X 24"

M6-1P
21" X 15"

ONE "U" POST

(507) (511)

M3-2P
24" X 12"

M1-4
24" X 24"

ONE "U" POST PER ASSEMBLY

(508)

M3-2P
24" X 12"

M1-5
24" X 24"

M5-1P(R)
21" X 15"

ONE "U" POST

(510)

M3-4P
24" X 12"

M1-4
24" X 24"

U-TURN
21" X 21"

ONE "U" POST

SEE SHEET SIGN-3
FOR U-TURN SIGN DESIGN

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TYPE "E" & "F" SIGNS

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	SIGN-3

APPROVED: DocuSigned by: David T Sears 069183F2BE57414...

DATE: 10/27/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

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SIGN NUMBER: 301
TYPE: D
QUANTITY: 1
SIGN WIDTH: 6'-0"
HEIGHT: 2'-6"
TOTAL AREA: 15.0 Sq.Ft.
BORDER TYPE: FLUSH
RECESS: 0"
WIDTH: 0.75"
RADII: 2.25"
NO. Z BARS:
LENGTH:

BACKG COLOR: Green
COPY COLOR: White

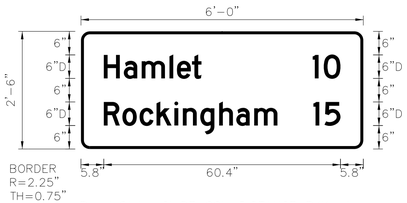
SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM

DESIGN BY: A. TUTT
PROJECT ID: HS-2008E
CHECKED BY: D. SEARS
LOCATION: -L- STA. 13+00
Aug 26, 2025
DIV: 8

USE NOTES: 1,2

1. Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.
3. Shields; A, B, and C type arrows shall be on 0.032" (0.8mm) aluminum and demountable.



Panel Style: GUIDE_CON_DISTANCE_RKK.ssi
M.U.T.C.D.:: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																														Series/Size Text Length
		H	a	m	l	e	t																							D 2000
	5.8	5.1	4.6	7.1	1.9	3.8	2.4	41.3																						24.9
		1	0																											D 2000
	59.1	2.8	4.3	5.8																										7.1
		R	o	c	k	i	n	g	h	a	m																			D 2000
	5.8	4.7	4.4	4.3	4.6	2.2	4.4	4.8	4.4	4.6	5.9	21.9																		44.3
		1	5																											D 2000
	59.3	2.8	4.1	5.8																										6.9

FILENAME: HS-2008E_SGN_Design

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER: 302, 303
TYPE: D
QUANTITY: 2
SIGN WIDTH: 4'-0"
HEIGHT: 1'-6"
TOTAL AREA: 6.0 Sq.Ft.
BORDER TYPE: FLUSH
RECESS: 0"
WIDTH: 0.75"
RADII: 2.25"
NO. Z BARS:
LENGTH:

BACKG COLOR: Green
COPY COLOR: White

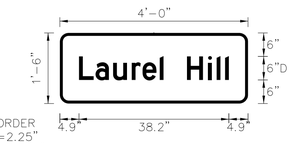
SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM

DESIGN BY: A. TUTT
PROJECT ID: HS-2008E
CHECKED BY: D. SEARS
LOCATION: -L- STA. 23+75
Aug 26, 2025
DIV: 8

USE NOTES: 1,2

1. Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.
3. Shields; A, B, and C type arrows shall be on 0.032" (0.8mm) aluminum and demountable.



Panel Style: GUIDE_CON_DISTANCE_RKK.ssi
M.U.T.C.D.:: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																															Series/Size Text Length
		L	a	u	r	e	l		H	i	l	l																			D 2000
	4.9	4.2	4.5	4.7	2.8	4.4	1	6	5.4	2.2	2.2	1	4.9																		38.2

FILENAME: HS-2008E_SGN_Design

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMR: 505,510
TYPE: F Ground
QUANTITY: 2
SIGN WIDTH: 1'-9"
HEIGHT: 1'-9"
TOTAL AREA: 3.1 Sq.Ft.
MAT'L: 0.063" ALUMINUM
BORDER TYPE: RECESSED
RECESS: 0.38"
WIDTH: 0.63"
RADII: 1.5"
NO. Z BARS:
LENGTH:

BACKG. COLOR: White
COPY COLOR: Black

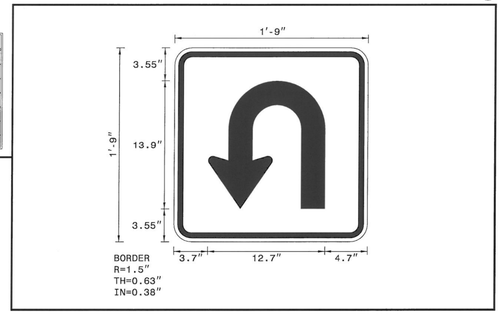
DESIGN BY:
PROJECT ID: HS-2008E
CHK BY:
DIV: 8
STD #:
DATE:

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY
SIGNING & DELINEATION UNIT

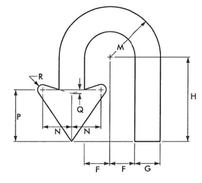
SYMBOL	X	Y	WID	HT
u arrow	3.7	3.5	12.7	13.9

NOTES:

1. Legend and border shall be direct applied Non-reflective sheeting.
2. Background shall be Grade C reflective sheeting.



Arrow Details



ARROW DIMENSIONS (INCHES)	F	G	H	M	N	P	Q	R
	2.625	2.625	8.659	5.25	3	5.25	0.375	0.5

Spacing Factor is 1 unless specified otherwise

FILENAME: GSENG

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SIGN DESIGN

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	SIGN-4

APPROVED: DocuSigned by: David T Seaks 069183F2BE5741E...

DATE: 10/27/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEAKS

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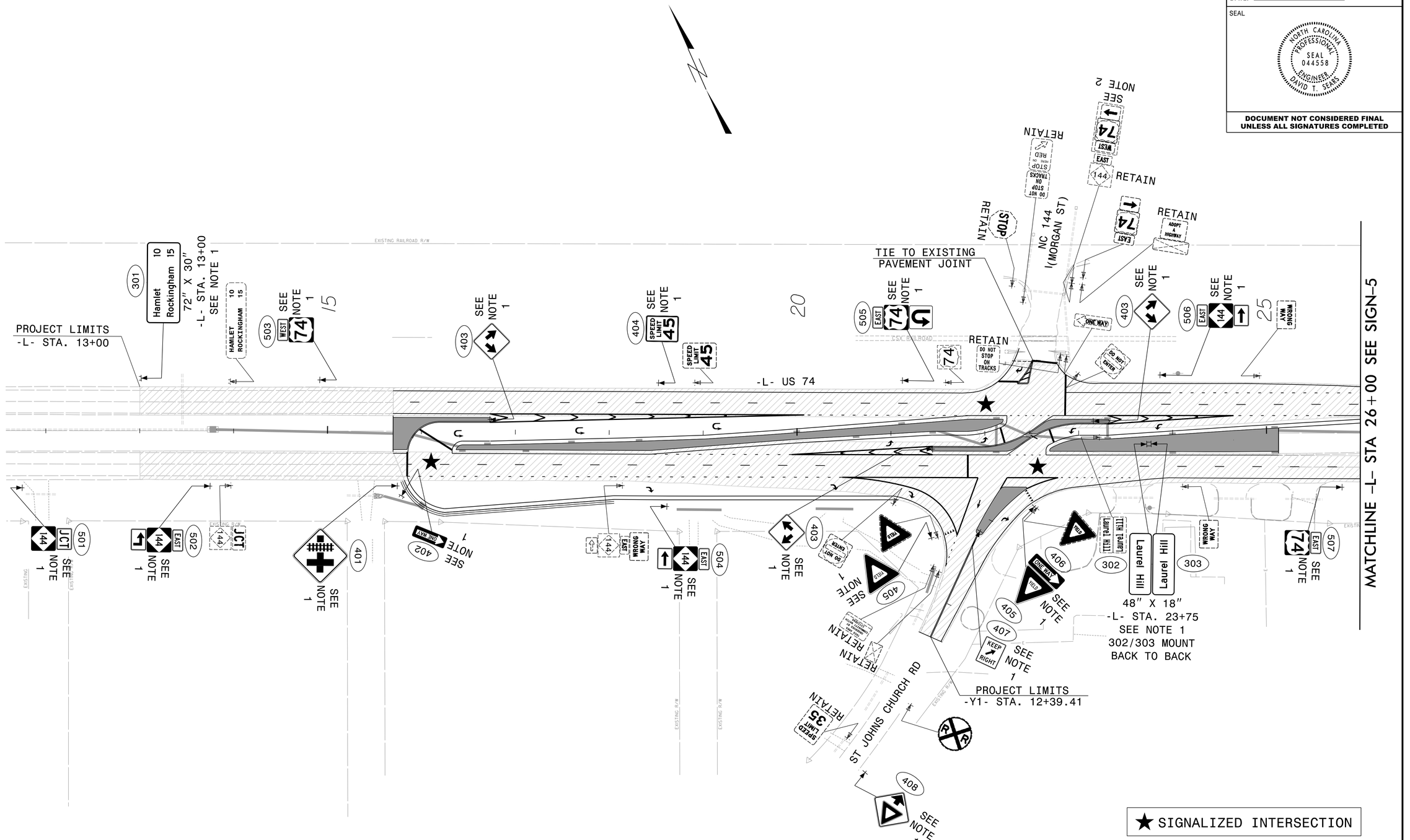

★ SIGNALIZED INTERSECTION

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PROJECT NOTES

1. SIGN ERECTION, TYPE D, E AND F
2. DISPOSAL OF SIGN, TYPE D, E AND F

INDICATES MILL & FILL

SIGNING PLAN

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	SIGN-5

APPROVED: DocuSigned by: David T Seaks 069183F2BE5741E...

DATE: 10/27/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEAKS

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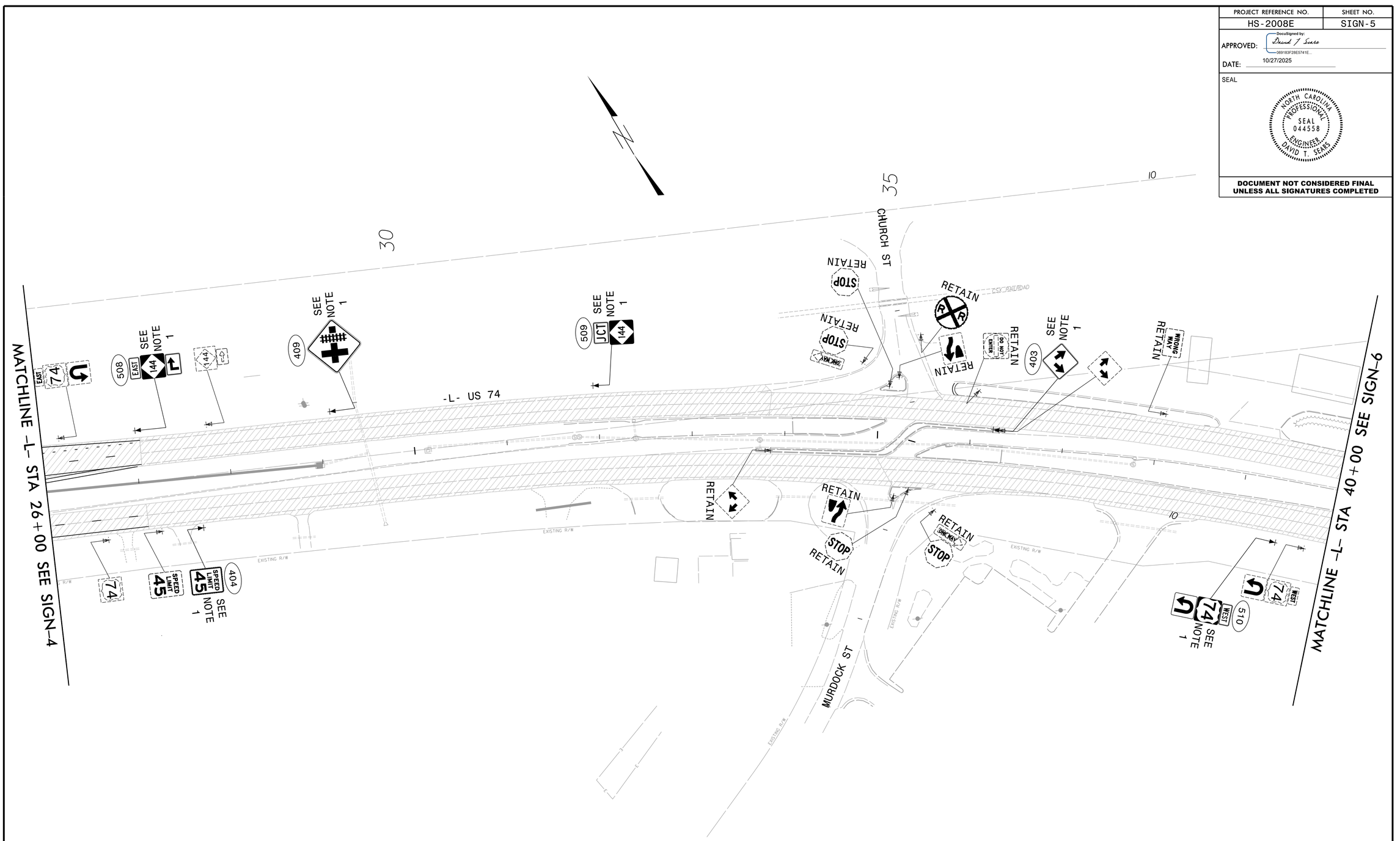

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PROJECT NOTES

1. SIGN ERECTION, TYPE D, E AND F
2. DISPOSAL OF SIGN, TYPE D, E AND F

INDICATES MILL & FILL

SIGNING PLAN

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	SIGN-6

APPROVED: DocuSigned by: David T Seaks 069183F2BE5741E...

DATE: 10/27/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEAKS

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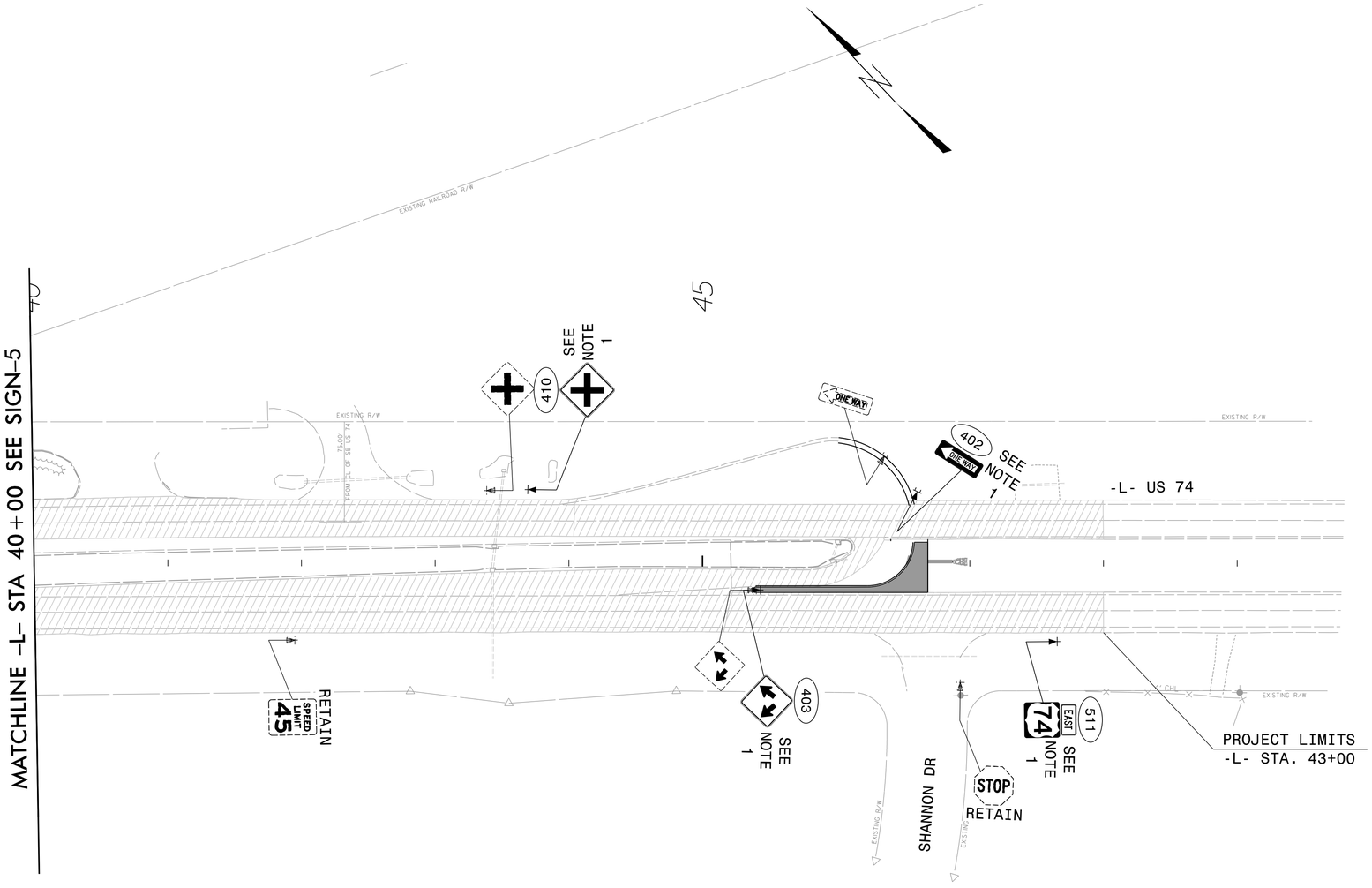

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PROJECT NOTES

1. SIGN ERECTION, TYPE D, E AND F
2. DISPOSAL OF SIGN, TYPE D, E AND F

INDICATES MILL & FILL

SIGNING PLAN

Project: HS-2008E

Project No.	Sheet No.
HS-2008E	Sig. 1.0

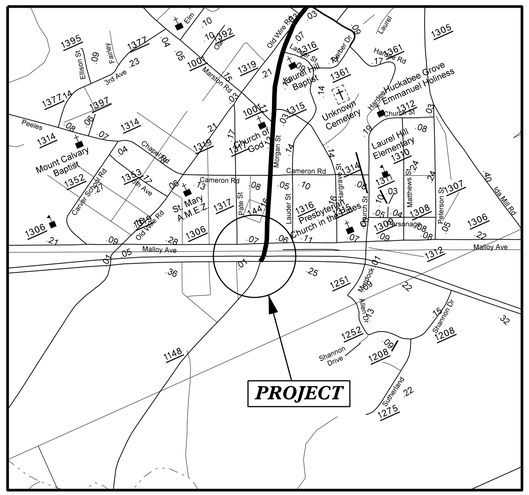
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

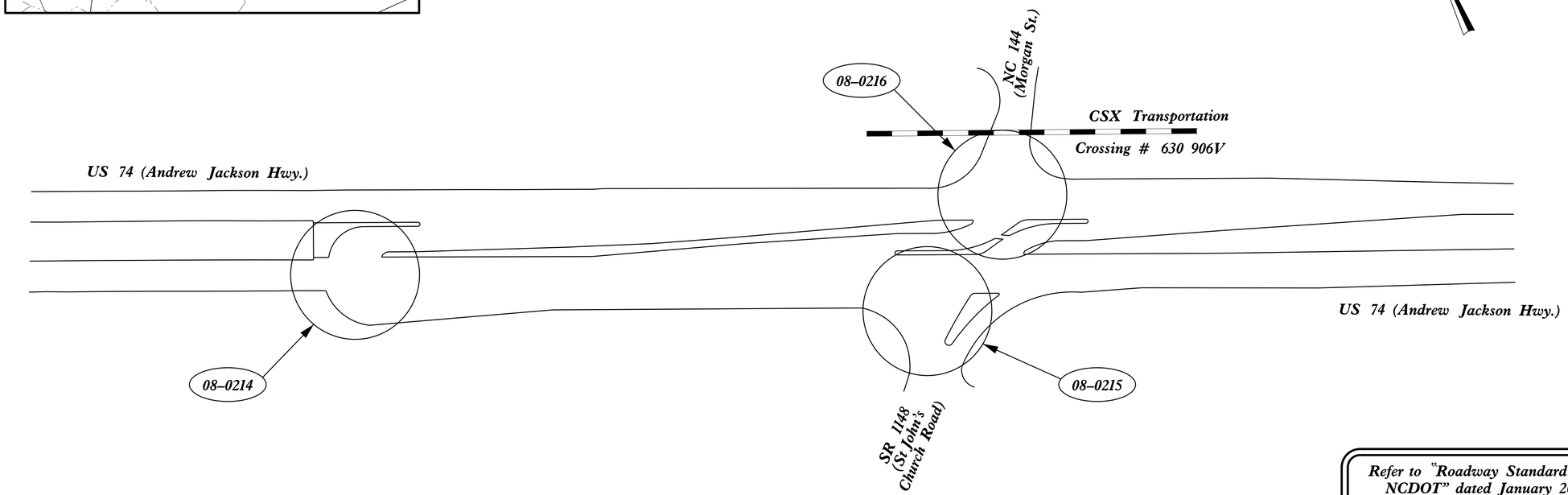
SCOTLAND COUNTY

LOCATION: US 74 (ANDREW JACKSON HIGHWAY) AT SR 1148 (ST. JOHN'S CHRUCH ROAD)

TYPE OF WORK: TRAFFIC SIGNALS AND SIGNAL COMMUNICATIONS

Vicinity





Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	--------	Title Sheet
Sig. 2.0–2.1	08–0214	US 74 EB (Andrew Jackson Highway) at U–Turn West of SR 1148 (St. John's Church Road)
Sig. 3.0–3.2	08–0215	US 74 EB (Andrew Jackson Highway) at SR 1148 (St. John's Church Road)
Sig. 4.0–5.3	08–0216	US 74 EB (Andrew Jackson Highway) at NC 144 (Morgan Street)
M1A–M9		Standard Metal Pole Sheets
SCP 1		Signal Communications Plans

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

Contacts:

Robert J. Ziemba, PE – Central Region Signals Engineer
Ryan W. Hough, PE – Signal Equipment Design Engineer
Gregg Green – Signal Communications Project Engineer

Prepared In the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION
TSMO UNIT
750 N. Greenfield Parkway, Garner, NC 27529

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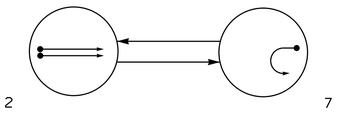
PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig. 2.0

2 Phase
Fully Actuated
(Laurel Hill CLS)
Signal System #:D08-31_Laurel Hill

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

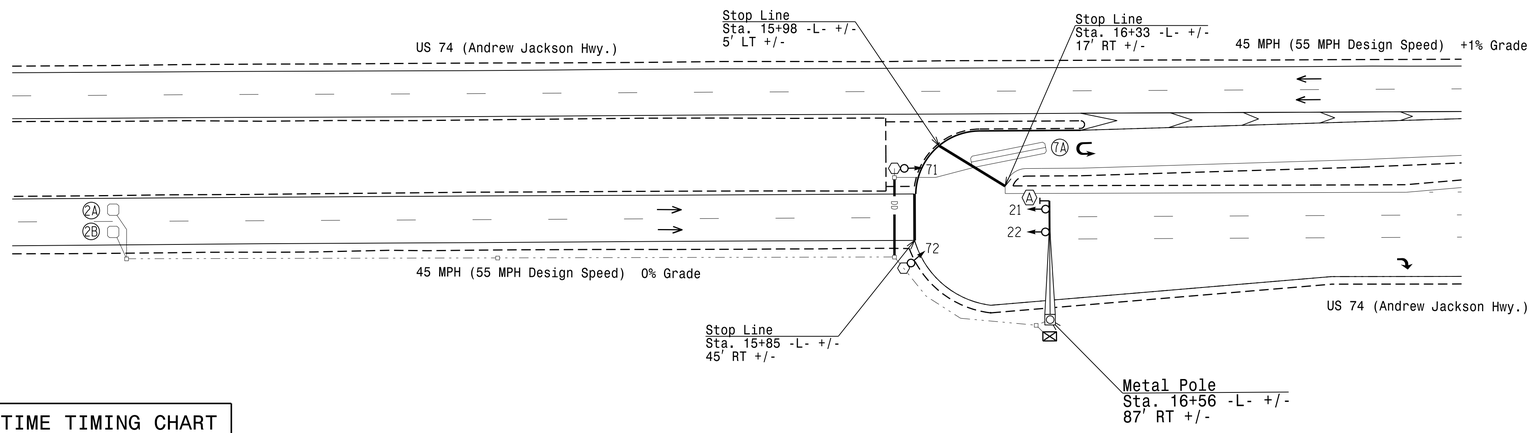
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 2	PHASE 7	FLASH
21	G	R	R
22	G	R	R
71	(R)	(R)	(R)
72	R	R	R

MAXTIME DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	420	5	X	2	-	-	X	X	X	-	X
2B	6X6	420	5	X	2	-	-	X	X	X	-	X
7A	6X40	0	2-4-2	X	7	-	-	X	-	X	-	X

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Install backplates for all signal heads.
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.



LEGEND

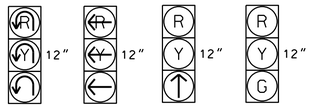
PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⛶
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	- - -
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
◯▭	Metal Pole with Mastarm	◯▭
DD	Directional Drill	N/A
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ

MAXTIME TIMING CHART		
FEATURE	PHASE 2	PHASE 7
Walk *	–	–
Ped Clear	–	–
Min Green *	14	7
Passage *	6.0	2.0
Max 1 *	90	20
Yellow Change	5.2	3.0
Red Clear	1.0	1.9
Added Initial *	1.5	–
Maximum Initial *	44	–
Time Before Reduction *	15	–
Time To Reduce *	30	–
Minimum Gap	3.0	–
Advance Walk	–	–
Non Lock Detector	–	X
Vehicle Recall	MIN RECALL	–
Dual Entry	–	–

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

SIGNAL FACE I.D.

All Heads L.E.D.



New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 74 EB (Andrew Jackson Highway)
at
U-Turn West of
SR 1148 (St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: December 2024 | REVIEWED BY:
PREPARED BY: I.O. Umozurike | REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIENBA

DocuSigned by: Robert J. Zienba 01/27/2025
DATE

SIG. INVENTORY NO. 08-0214

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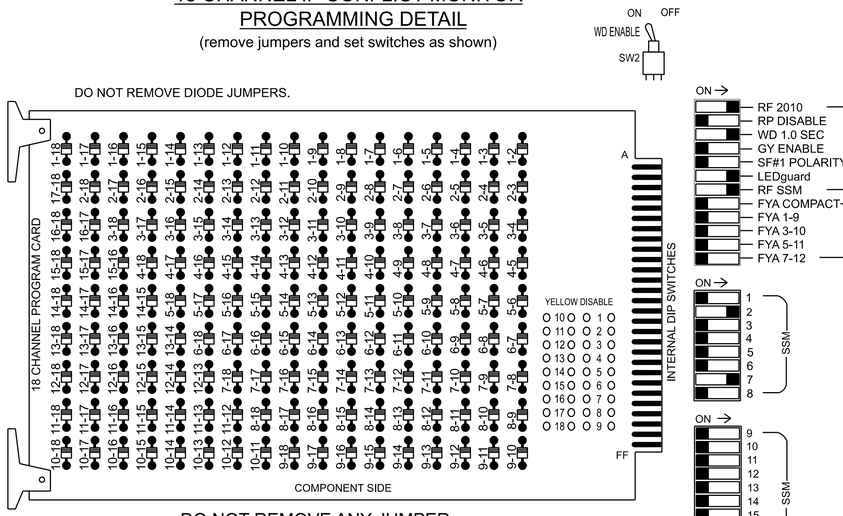
rzienba

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig. 2.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



DO NOT REMOVE ANY JUMPER

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 the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø 2 2B												ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 7 7A	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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
2B	TB2-7,8	I2L	43	5	3	2			X	X	X	
7A	TB5-5,6	J5U	57	19	21	7			X		X	

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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 plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Phase Not On.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Laurel Hill CLS. Signal System #: D08-31_Laurel Hill

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S10
Phases Used.....2, 7
Overlap "1".....Not Used
Overlap "2".....Not Used
Overlap "3".....Not Used
Overlap "4".....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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	NU	NU	NU	NU	NU	NU	NU	71,72	NU	NU	NU	NU	NU	NU	NU	NU
RED		128	128																
YELLOW		129	129																
GREEN			130																
RED ARROW											122								
YELLOW ARROW											123								
FLASHING YELLOW ARROW																			
GREEN ARROW		130									124								
✋																			
🚶																			

NU = Not Used

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	2,a,7,b
2	

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0214
DESIGNED: December 2024
SEALED: 01/27/2025
REVISED: N/A

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

US 74 EB (Andrew Jackson Highway)
at
U-Turn West of
SR 1148 (St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: January 2025 | REVIEWED BY:
PREPARED BY: Sarah Kirkpatrick | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals & Signal Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

Signed by: Ryan W. Hough 01/29/2025
DATE

SIG. INVENTORY NO. 08-0214

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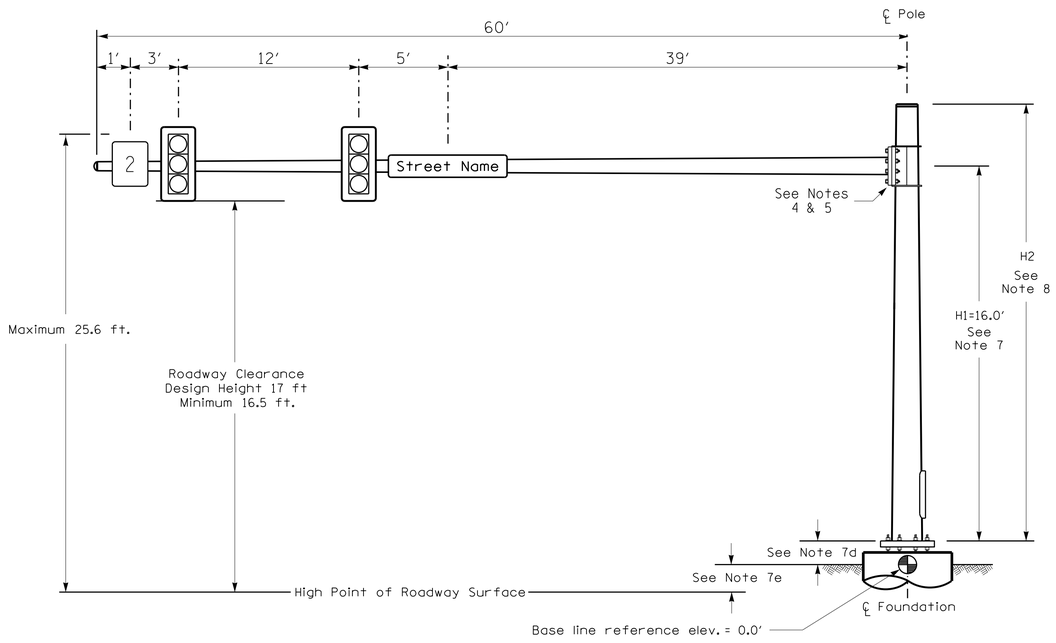
sgkirkpatrick

METAL POLE

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig 2.2

Design Loading for METAL POLE



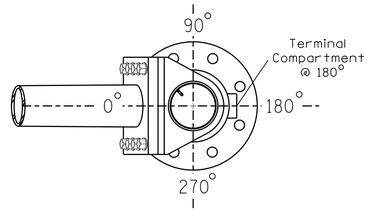
Elevation View

SPECIAL NOTE

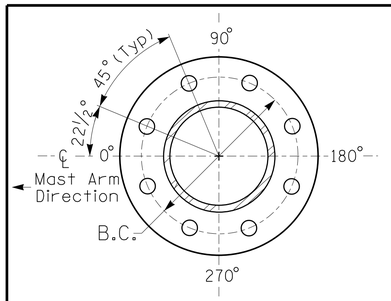
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole
Baseline reference point at ⊕ Foundation @ ground level	0.0 ft.
Elevation difference at High point of roadway surface	-2.80 ft.
Elevation difference at Edge of travelway or face of curb	-3.37 ft.

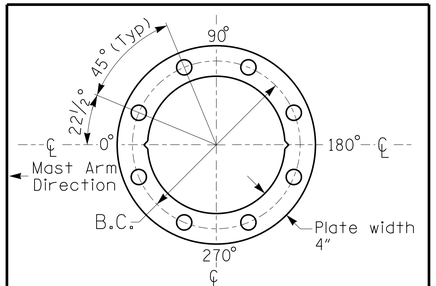


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2024 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using force ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2 (140 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 74 (Andrew Jackson Highway)
at
U-Turn West of SR 1148
(St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: December 2024 | REVIEWED BY:
PREPARED BY: I.O. Umozurike | REVIEWED BY:

SCALE: 0 N/A — N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
DocuSigned by: 01/29/2025
SIG. INVENTORY NO. 08-0214

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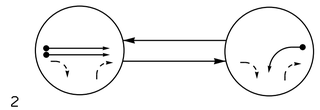
iumozurike

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig 3.0

2 Phase
Fully Actuated
(Laurel Hill CLS)
Signal System #: D08-31_Laurel Hill

PHASING DIAGRAM



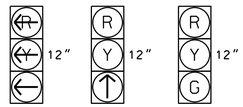
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE 2	PHASE 7	FLASH
21	↑	R	R
22	G	R	R
71	~~R~~	←	~~R~~

SIGNAL FACE I.D.

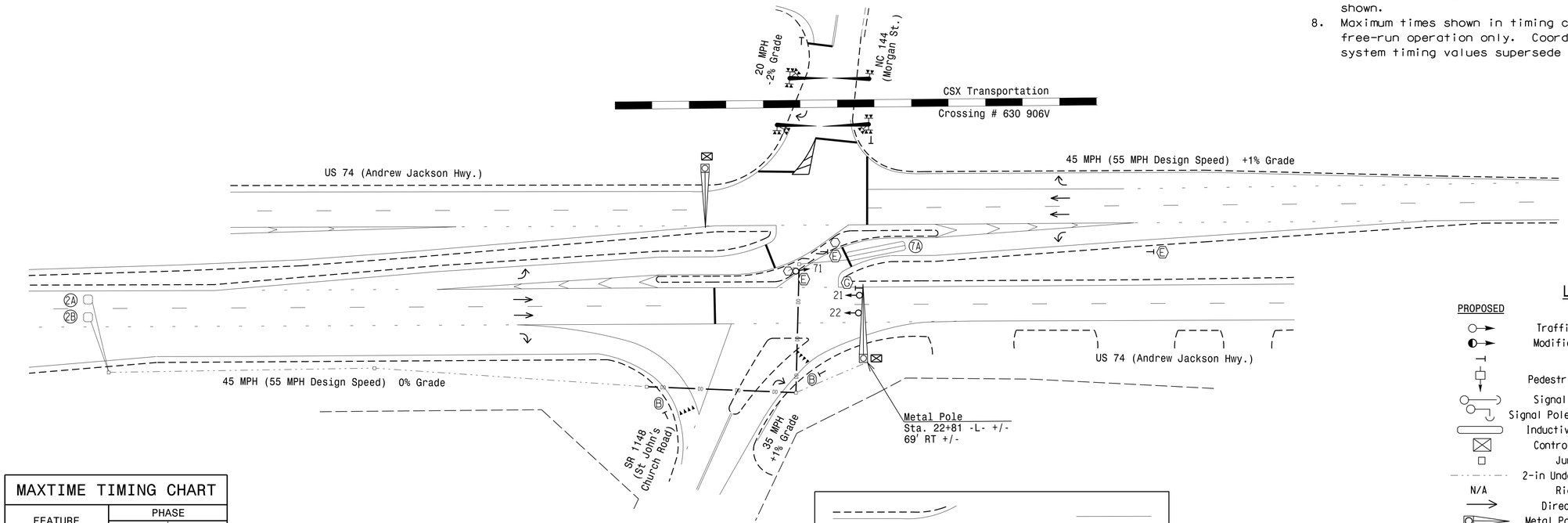
All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	420	EXIST	X	2	-	-	X	X	X	-	X
2B	6X6	420	EXIST	X	2	-	-	X	X	X	-	X
7A	6X40	0	2-4-2	X	7	-	-	X	-	X	-	X

NOTES

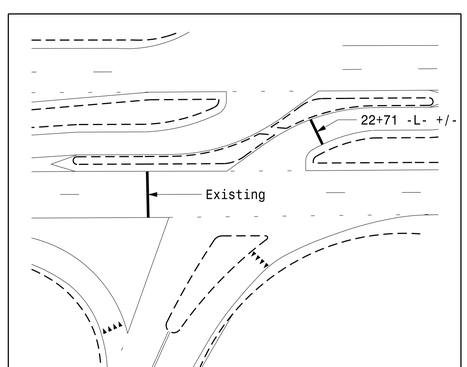
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Install backplates for all signal heads.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current TSMO Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 7
Walk *	–	–
Ped Clear	–	–
Min Green *	14	7
Passage *	6.0	2.0
Max 1 *	90	20
Yellow Change	5.2	3.0
Red Clear	1.1	2.6
Added Initial *	1.5	–
Maximum Initial *	44	–
Time Before Reduction *	15	–
Time To Reduce *	30	–
Minimum Gap	3.0	–
Advance Walk	–	–
Non Lock Detector	–	X
Vehicle Recall	MIN RECALL	–
Dual Entry	–	–

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



PROPOSED STOP LINE LOCATIONS

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head	■↓
○→ ○↓	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	N/A
→	Directional Arrow	→
⊲	Metal Pole with Mastarm	⊲
⬡	Type II Signal Pedestal	⬢
N/A	Railroad Tracks	N/A
N/A	Railroad Gate and Flasher	N/A
(B)	"YIELD" Sign (R1-2)	(B)
(E)	No U-Turn Sign (R3-4)	(E)
(G)	No Left Turn Sign (R3-2)	(C)

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 74 (Andrew Jackson Highway)
at
SR 1148 (St. John's Church Road)

Division 8 Scotland County Laurel Hill

PLAN DATE: December 2024 REVIEWED BY:
PREPARED BY: J.A. Lohr REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
DocuSigned by: 01/27/2025
DATE
SIG. INVENTORY NO. 08-0215

21-JAN-2025 07:03
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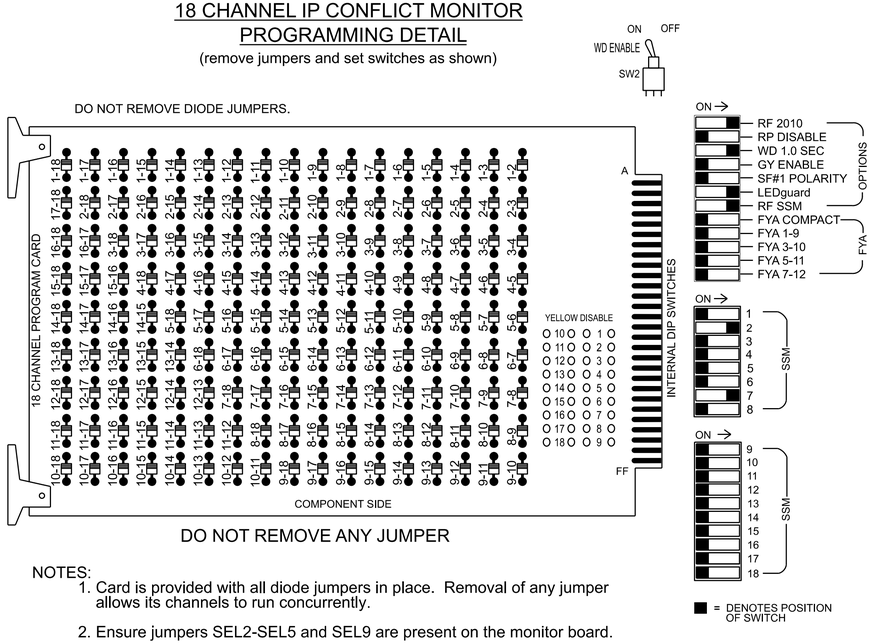
jolohr

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig. 3.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



DO NOT REMOVE ANY JUMPER

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 the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø 2 2B												ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 7 7A	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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
2B	TB2-7,8	I2L	43	5	3	2			X	X	X	
7A	TB5-5,6	J5U	57	19	21	7			X		X	

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

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 plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Phase Not On.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Laurel Hill CLS. Signal System #: D08-31_Laurel Hill

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S10
Phases Used.....2, 7
Overlap "1".....Not Used
Overlap "2".....Not Used
Overlap "3".....Not Used
Overlap "4".....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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	NU	NU	NU	NU	NU	NU	NU	71	NU	NU	NU	NU	NU	NU	NU	NU
RED		128	128																
YELLOW		129	129																
GREEN			130																
RED ARROW											122								
YELLOW ARROW											123								
FLASHING YELLOW ARROW																			
GREEN ARROW		130									124								

NU = Not Used

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	2,a,7,b
2	

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0215
DESIGNED: December 2024
SEALED: 01/27/2025
REVISED: N/A

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

US 74 (Andrew Jackson Highway) at SR 1148 (St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: January 2025 | REVIEWED BY:

PREPARED BY: Sarah Kirkpatrick | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:

Traffic Engineering Branch
Traffic Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

Signed by: Ryan W. Hough 01/29/2025
DATE

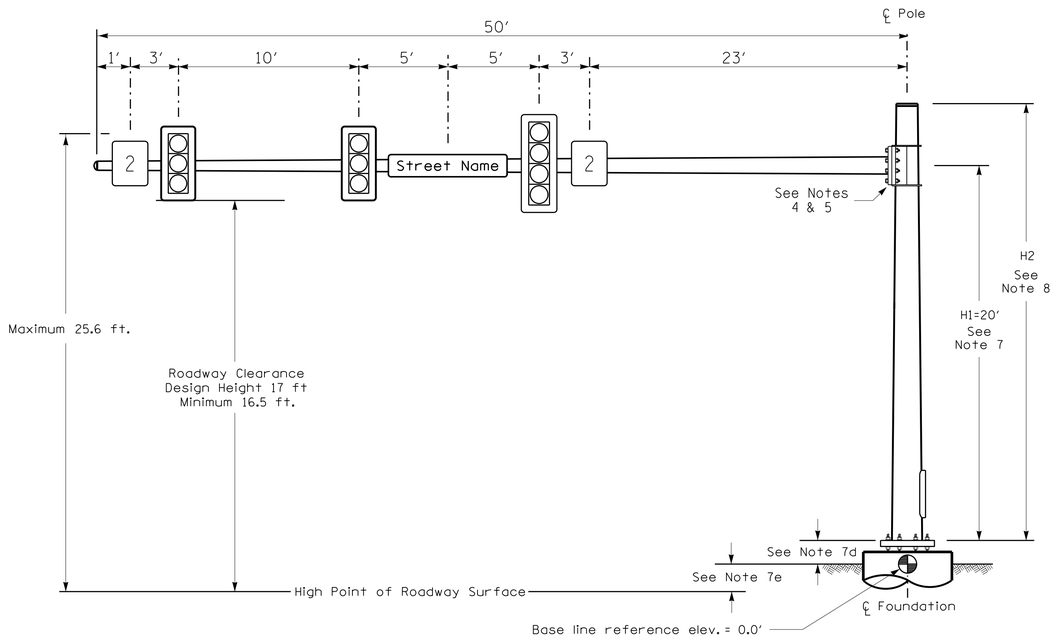
SIG. INVENTORY NO. 08-0215

29-JAN-2025 08:12
mwatson@dot.nc.gov
sgkirkpatrick

METAL POLE

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig 3.2

Design Loading for METAL POLE



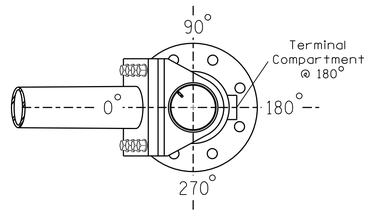
Elevation View

SPECIAL NOTE

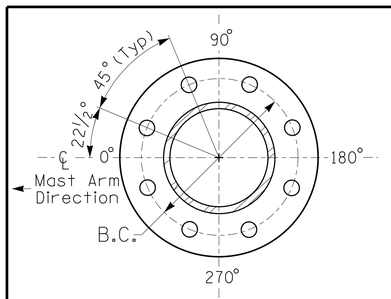
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole	
Baseline reference point at ⊕ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+1.2 ft.	
Elevation difference at Edge of travelway or face of curb	+0.4 ft.	

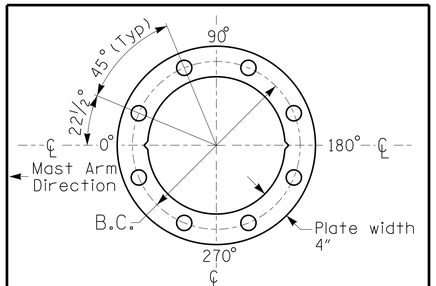


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″ W X 96.0″ L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2024 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using force ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2 (140 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 74 (Andrew Jackson Highway)
at
SR 1148 (St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: December 2024 | REVIEWED BY:
PREPARED BY: J.A. Lohr | REVIEWED BY:

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

Docusigned by: Robert J Ziemba 01/29/2025
1B0848B6B2744A94 DATE

SIG. INVENTORY NO. 08-0215

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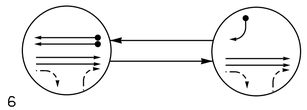
PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig.4.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION						
SIGNAL FACE	6	4	TRAFFIC CONTROL	RAIL PREEMPT	DWELL	FLASH
21, 22	FY	FY	FY	FY	Y	
41, 42, 43	R	→	→	R	R	
61	↑	R	R	↑	R	
62	G	R	R	G	R	
Sign A	OFF	OFF	ON	ON	✳	

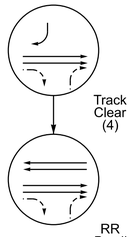
FY = Flashing Yellow
✳See Note 7

SIGNAL FACE I.D.

All Heads L.E.D.

RAIL PREEMPT PHASES

(High Priority)



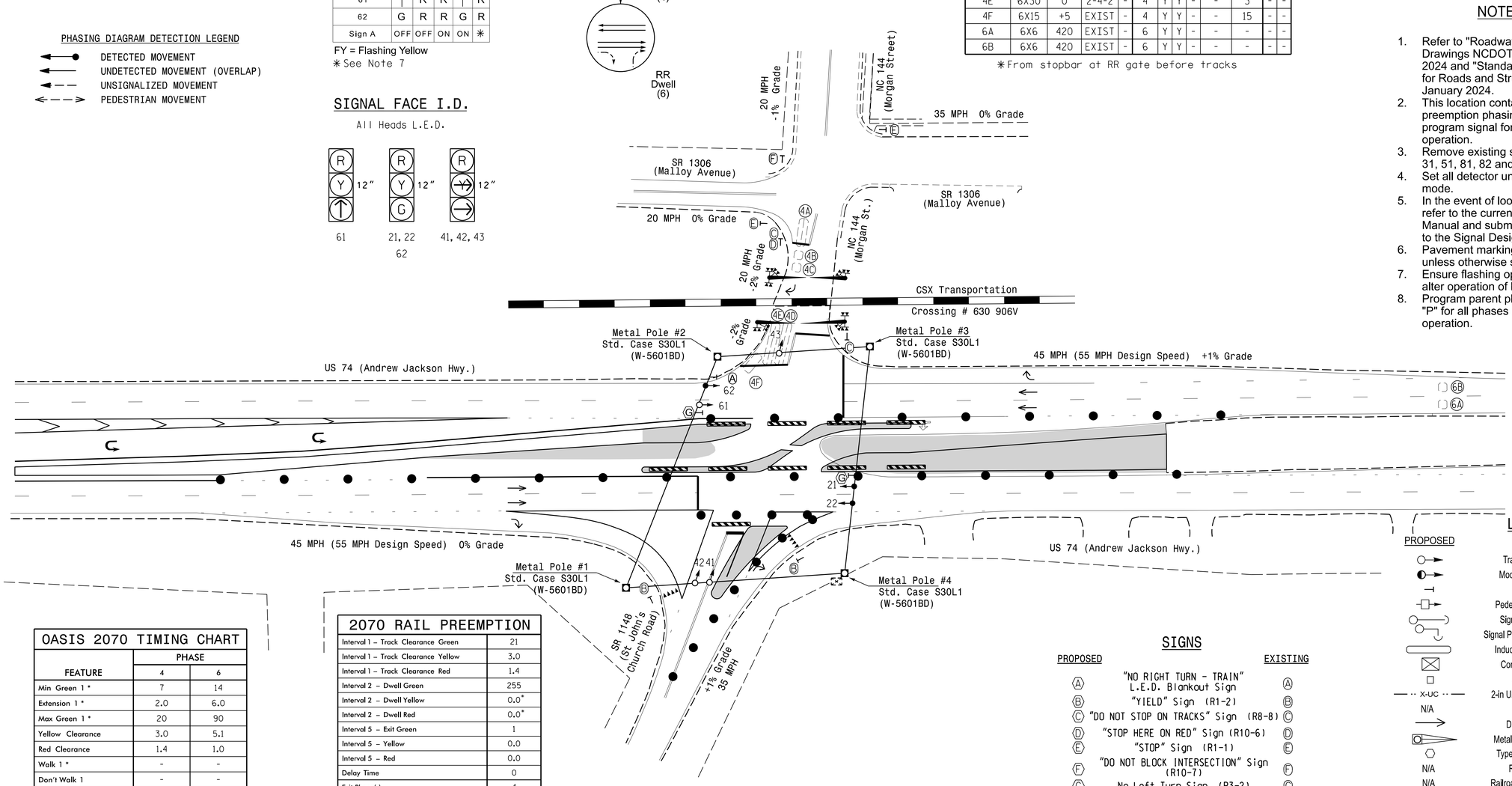
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X20	+2✳	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X6	+11✳	EXIST	-	4	Y	Y	-	-	3	-	-
4C	6X6	+20✳	EXIST	-	4	Y	Y	-	-	3	-	-
4D	6X30	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4E	6X30	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4F	6X15	+5	EXIST	-	4	Y	Y	-	-	15	-	-
6A	6X6	420	EXIST	-	6	Y	Y	-	-	-	-	-
6B	6X6	420	EXIST	-	6	Y	Y	-	-	-	-	-

✳From stopbar at RR gate before tracks

2 Phase
Fully Actuated
w/ Railroad Preemption
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Remove existing signal heads 11, 31, 51, 81, 82 and 83.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current TSMO Design Manual and submit a Plan of Record to the Signal Design Section.
6. Pavement markings are existing unless otherwise shown/noted.
7. Ensure flashing operation does not alter operation of blankout signs.
8. Program parent phases for Overlap "P" for all phases used in normal operation.



SIGNS

PROPOSED		EXISTING
Ⓐ	"NO RIGHT TURN - TRAIN" L.E.D. Blankout Sign	Ⓐ
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ
Ⓒ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓒ
Ⓓ	"STOP HERE ON RED" Sign (R10-6)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ
Ⓕ	"DO NOT BLOCK INTERSECTION" Sign (R10-7)	Ⓕ
Ⓖ	No Left Turn Sign (R3-2)	Ⓖ

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
X-UC	2-in Underground Conduit	UC
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
N/A	Railroad Tracks	
N/A	Railroad Gate and Flasher	
	Construction Zone Drums	
	Construction Zone	

OASIS 2070 TIMING CHART		
	PHASE	
FEATURE	4	6
Min Green 1 *	7	14
Extension 1 *	2.0	6.0
Max Green 1 *	20	90
Yellow Clearance	3.0	5.1
Red Clearance	1.4	1.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	1.5
Max Variable Initial *	-	34
Time Before Reduction *	-	20
Time To Reduce *	-	30
Minimum Gap	-	3.4
Recall Mode	-	MIN RECALL
Vehicle Call Memory	-	YELLOW
Dual Entry	-	-
Simultaneous Gap	ON	ON

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

2070 RAIL PREEMPTION	
Interval 1 – Track Clearance Green	21
Interval 1 – Track Clearance Yellow	3.0
Interval 1 – Track Clearance Red	1.4
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Delay Time	0
Exit Phase(s)	4
Priority	HIGH
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	5.1
Red Clear Before Pre	1.0
Dwell Min Time	14
Ped Clear Through Yellow	N
Omit Overlaps	P

This signal was designed for advanced preemption.

Signal Upgrade - Temporary Design (TMP Phase II)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
1750 N.Greenfield Pkwy.Garner,NC 27529

US 74 (Andrew Jackson Highway)
at
NC 144 (Morgan Street)/
SR 1148 (St. John's Church Road)

Division 8 Scotland County Laurel Hill

PLAN DATE: September 2025 REVIEWED BY: J.A. Lohr

PREPARED BY: I.O. Umozurike REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: 09/29/2025
DATE

SIG. INVENTORY NO. 08-0216T

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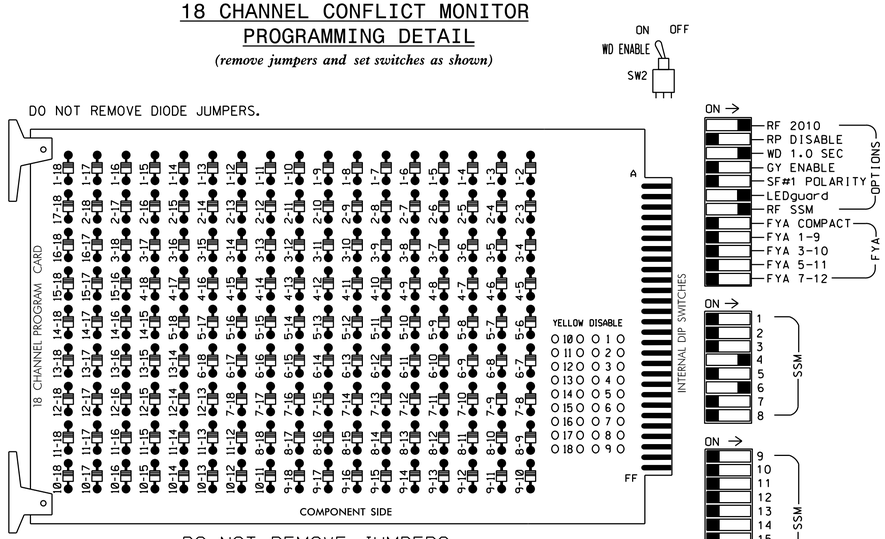
jlolar

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig.4.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



DO NOT REMOVE JUMPERS

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.

■ = DENOTES POSITION OF SWITCH

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 phase 6 for Variable Initial and Gap Reduction.
4. Disable all phases for Start Up In Green.
5. Disable all phases for Yellow Flash.
6. Program phase 6 for First Phases.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS 3.03.32E OR LATEST APPROVED SOFTWARE
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S5,S8
PHASES USED.....4,6
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED
OVERLAP "P".....4+6

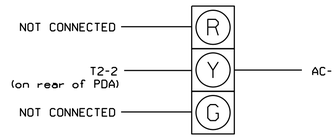
SIGNAL HEAD HOOK-UP CHART

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	NU	NU	NU	41, 42,43	NU	NU	61	62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED					101			134	134										
YELLOW								135	135										
GREEN									136										
RED ARROW																			
YELLOW ARROW					102														
FLASHING YELLOW ARROW																			
GREEN ARROW					103			136											

NU = Not Used

CONTINUOUS FLASHING YELLOW SECTION WIRING DETAIL

(wire to flasher circuit as shown)



21,22

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	Ø 4 4C	SLOT EMPTY	Ø 4 4E	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L						Ø 4 4B	Ø 4 4D		Ø 4 4F					ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	PRE1 AC ISOLATOR
FILE "J" L		Ø 6 6B												NOT USED

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

FS = FLASH SENSE
ST = STOP TIME
RR = RAILROAD PREEMPT

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
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			3
4E	TB6-9,10	I9U	60	22	11	4	Y	Y			3
4F	TB6-11,12	I9L	62	24	13	4	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

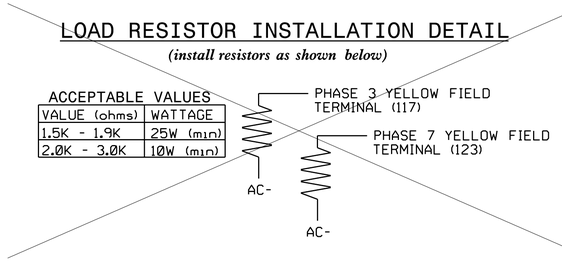
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0216T
DESIGNED: September 2025
SEALED: 09/29/2025
REVISED: N/A

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)



REMOVE

REMOVE

PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phases 3 and 7 for 'Omit Phase' and Phases 1,2,4,5,6, and 8 for 'Startup Calls'. This is to prevent Phases 3 and 7 from being served when not in Preempt.

Electrical Detail - Temporary Design - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 (Andrew Jackson Hwy.) at NC 144 (Morgan Street)/ SR 1148 (St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: September 2025 | REVIEWED BY:

PREPARED BY: S. Kirkpatrick | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Traffic Signals Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

Signed by: Ryan W. Hough 09/30/2025
430320FAA2654C3 DATE

SIG. INVENTORY NO. 08-0216T

29-SEP-2025 15:38
c:\users\sgkirkpatrick.contractor+pw01\Documents\NCDOT TSMD/Signal Design Section/Division_08/08-0216/Signals Management/080216T_sms.ele.20250929.dgn
sgkirkpatrick

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig.4.2

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 AND 3.

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

REMOVE

```
  LOGICAL I/O COMMAND #1  (+/-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 #2  (+/-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 #3  (+/-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 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS:|
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ 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
```

USING + OR - KEY POSITION ON OVERLAP 'P'

```
 PAGE 1: VEHICLE OVERLAP 'P' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS:|   X X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ 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
```

← THE UTILIZATION OF OVERLAP P ENSURES CONSISTENT CLEARANCE TIMING DURING TRANSITION TO PREEMPTION.

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0216T
DESIGNED: September 2025
SEALED: 09/29/2025
REVISED: N/A

Electrical Detail - Temporary Design - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 (Andrew Jackson Hwy.)
at
NC 144 (Morgan Street)/
SR 1148 (St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: September 2025 | REVIEWED BY:

PREPARED BY: S. Kirkpatrick | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Traffic Signals Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

Signed by: Ryan W. Hough 09/30/2025
6D320FAA2654C7...
DATE

SIG. INVENTORY NO. 08-0216T

29-SEP-2025 15:38
z:/projects/bentley.comncdot-pw-01/Documents/NCDOT TSMO/Signal Design Section/Division_08/08-0216/Signals Management/D802161_sm_ele.20250929.dgn
sgkirkpatrick

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig.4.3

RAILROAD PREEMPTION PROGRAMMING DETAIL

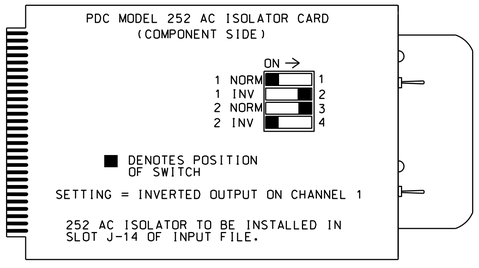
(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

```
    PREEMPTION  #1   SETTINGS (NEXT:1-10)
 INTERVAL/TIMING  |   CLEAR/DWELL PHASES
   GRN  YEL  RED  |123456789101111213141516
 1  21  3.0  1.4  |   X
 2 255  0.0  0.0  |      X
 3   0  0.0  0.0  |
 4   0  0.0  0.0  |
 5   1  0.0  0.0  |   X
EXIT CALLS        |
              OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).5.1
RED CLEAR BEFORE PRE (0= DEFAULT)....1.0
DWELL MIN TIMER (0-255 SEC) .........14
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:           | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW |
OMIT OVERLAPS:      |               X
```

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

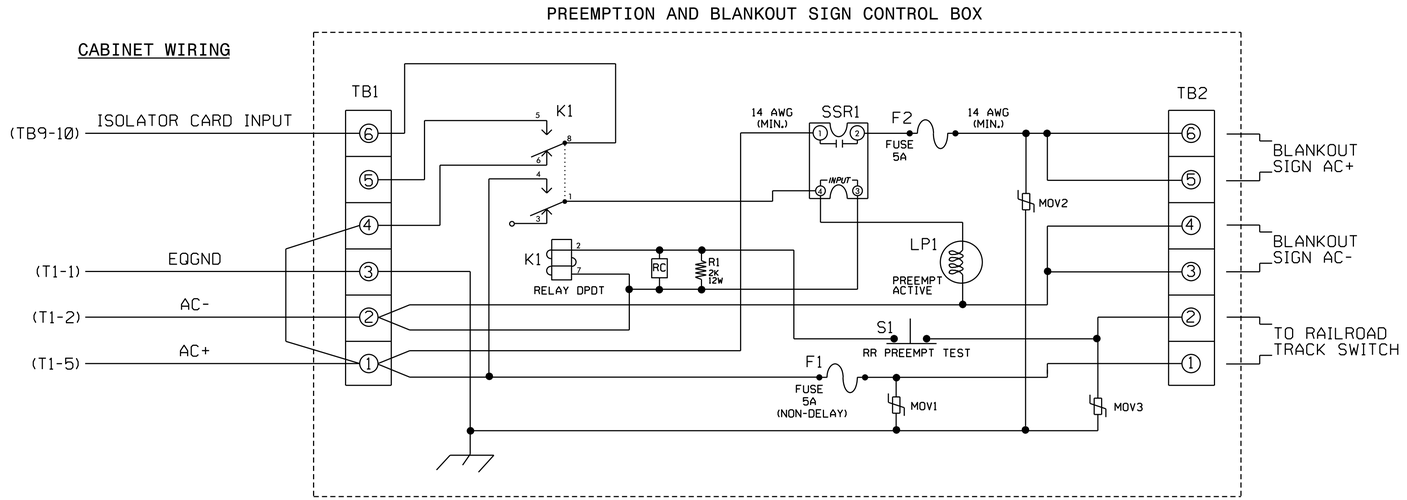
(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

RAILROAD PREEMPTION WIRING DETAIL

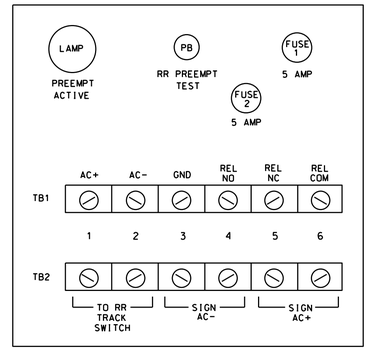
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0216T
DESIGNED: September 2025
SEALED: 09/29/2025
REVISED: N/A

Electrical Detail - Temporary Design - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 (Andrew Jackson Hwy.)
at
NC 144 (Morgan Street)/
SR 1148 (St. John's Church Road)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: September 2025 | REVIEWED BY:

PREPARED BY: S. Kirkpatrick | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036833 RYAN W. HOUGH

Signed by: Ryan W. Hough 09/30/2025
430320FAA2654C3... DATE

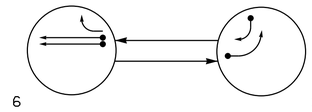
SIG. INVENTORY NO. 08-0216T

29-SEP-2025 15:40
Z:/projects/ncdot-pw-01/Documents/NCDOT TSMO/Signal Design Section/Division_08/08-0216/Signals Management/0802167_sm.ele.20250929.dgn
bentley.connectdot-pw-01
sgkirkpatrick

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig 5.0

2 Phase
Fully Actuated
w/ Railroad Preemption
(Laurel Hill CLS)
Signal System #: D08-31_Laurel Hill

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

RAIL PREEMPT PHASES
(High Priority)

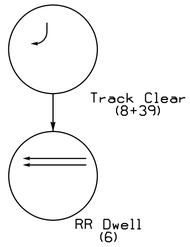


TABLE OF OPERATION

SIGNAL FACE	PHASE 6	3+8	TCRLFCARXR	DWELL	FLASH
31	R	←	R	R	R
61	↑	R	R	↑	R
62	G	R	R	G	R
63	Y	R	R	R	R
81, 82	R	→	→	R	R

MAXTIME DETECTOR INSTALLATION CHART

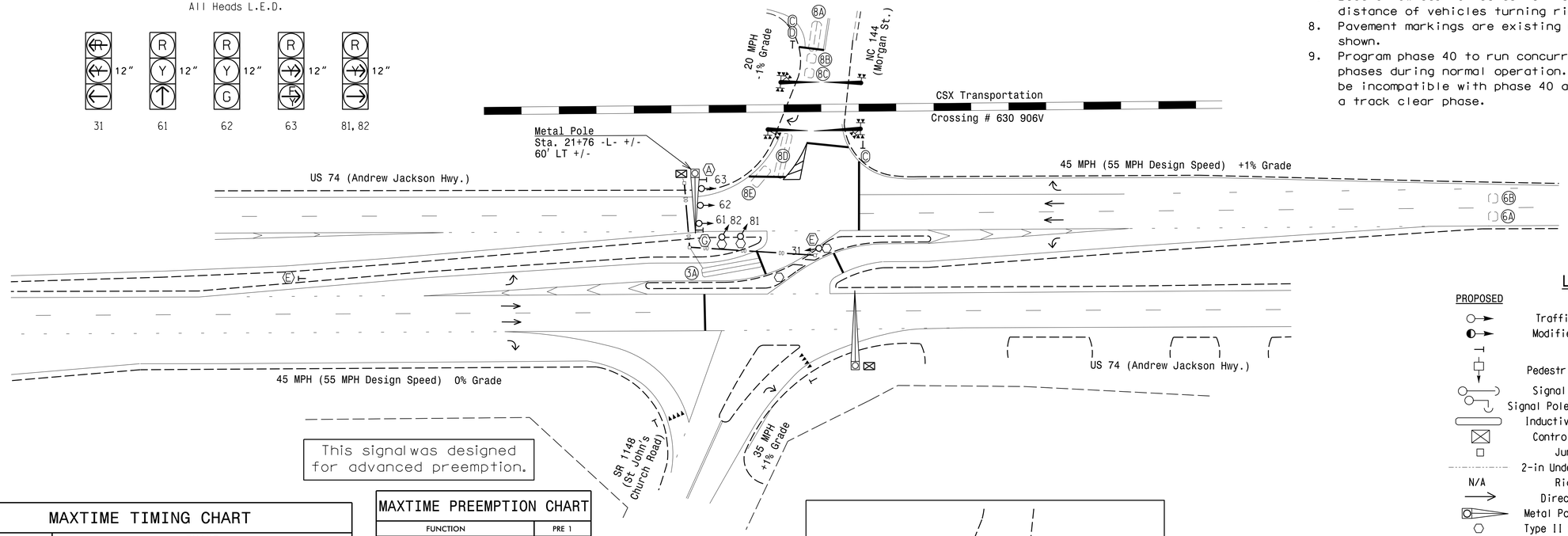
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
3A	6X40	0	2-4-2	X	3	-	-	X	-	X	-	X
6A	6X6	420	EXIST	-	6	-	-	X	X	X	-	X
6B	6X6	420	EXIST	-	6	-	-	X	X	X	-	X
8A	6X20	+2	2-4-2	-	8	3.0	-	X	-	X	-	X
8B	6X6	+8	EXIST	-	8	3.0	-	X	-	X	-	X
8C	6X6	+20	EXIST	-	8	3.0	-	X	-	X	-	X
8D	6X30	0	2-4-2	-	8	3.0	-	X	-	X	-	X
8E	6X15	+5	EXIST	-	8	15.0	-	X	-	X	-	X

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Install backplates for signal heads numbered 31, 61, 62 and 63.
4. Renumber existing phase 4 loops as shown.
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current TSMO Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Pavement markings are existing unless otherwise shown.
9. Program phase 40 to run concurrently wtih all phases during normal operation. Phase 39 must be incompatible with phase 40 and included as a track clear phase.

SIGNAL FACE I.D.

All Heads L.E.D.



This signal was designed for advanced preemption.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	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	→
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
N/A	Railroad Tracks	
N/A	Railroad Gate and Flasher	
—20—	Directional Drill	N/A
Ⓐ	"RIGHT TURN SIGNAL" Sign (R10-10)	Ⓐ
Ⓒ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓒ
Ⓓ	"STOP HERE ON RED" Sign (R10-6)	Ⓓ
Ⓔ	No U-Turn Sign (R3-4)	Ⓔ
Ⓖ	No Left Turn Sign (R3-2)	Ⓖ

MAXTIME TIMING CHART

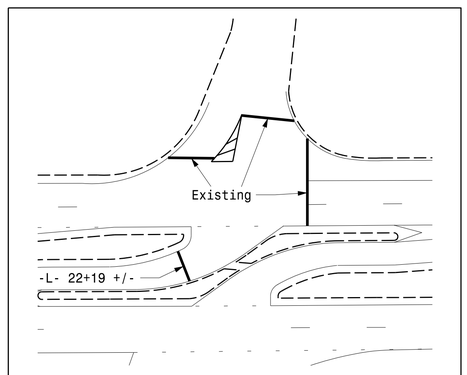
FEATURE	PHASE 3	6	8	39	40
Walk *	–	–	–		
Ped Clear	–	–	–		
Min Green *	7	14	7		
Passage *	2.0	6.0	2.0		
Max 1 *	20	90	20		
Yellow Change	3.0	5.1	3.0	3.0	5.1
Red Clear	2.1	1.0	2.1	2.1	2.1
Added Initial *	–	1.5	–		
Maximum Initial *	–	44	–		
Time Before Reduction *	–	15	–		
Time To Reduce *	–	30	–		
Minimum Gap	–	3.0	–		
Advance Walk	–	–	–		
Non Lock Detector	X	–	X		
Vehicle Recall	–	MIN RECALL	–		MIN RECALL
Dual Entry	–	–	–		

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

MAXTIME PREEMPTION CHART

FUNCTION	PRE 1
Type	RAIL ROAD
Exit Phases	3, 8
Delay	0
Call Extend Time	1.0
Max Presence	0
Enter Min Green	1
Enter Walk	0
Enter Ped Clear	0
Enter Yellow Change	5.1
Enter Red Clear	2.1
Track Green	21
Track Yellow Change	3.0
Track Red Clear	2.1
Dwell Green	0
Exit Min Green	255*
Exit Yellow Change	25.5*
Exit Red Clear	25.5*
Exit Type	EXIT PHASES
Ped Clear Through Yellow	–
Require All Red Entry	–

* Directs controller to use default phase timing.



PROPOSED STOP LINE LOCATIONS

Signal Upgrade- Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 74 WB (Andrew Jackson Highway)
at
NC 144 (Morgan Street)

Division 8 Scotland County Laurel Hill

PLAN DATE: September 2025 REVIEWED BY:
PREPARED BY: I.O Umozurike REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: Robert J Ziemba 09/29/2025
1B9B4B9027A4494 DATE

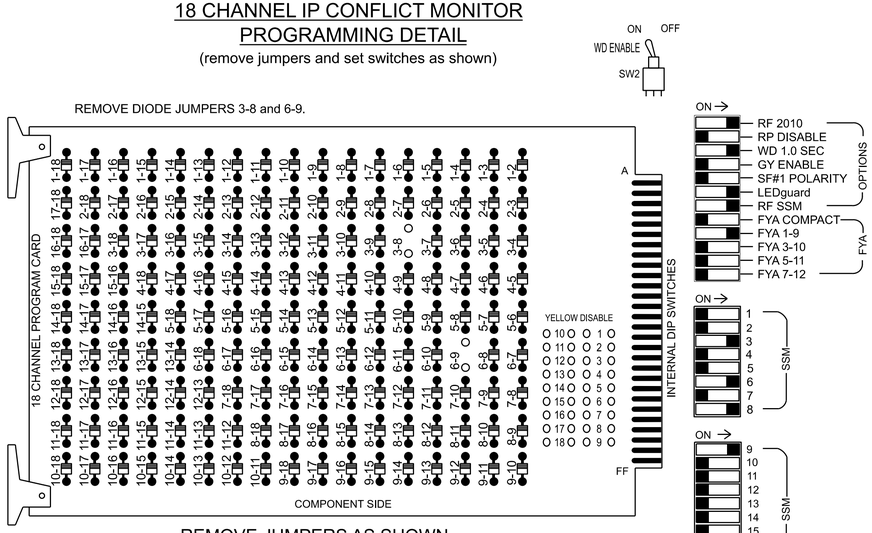
SIG. INVENTORY NO. 08-0216

29-SEP-2025 11:04
plotted by: tpwbentley.contractor
C:\Users\tpwbentley.contractor\Documents\NCDOT TSMO\Signal Design Section\Division_08\08-0216\Signal Design\2025-09\080216_sig_dsn_20250929.dgn

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig.5.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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 the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Phase Not On, 6 Green No Walk, 39 Phase Not On, and 40 Green No Walk.
3. Program phase 39 for No Startup Veh Call.
4. Program phases 6 and 40 for Min Recall.
5. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
6. The cabinet and controller are part of the Laurel Hill CLS. Signal System #: D08-31_Laurel Hill

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S4, S8, S11, AUX S1
Phases Used.....3, 6, 8, **39, **40
Overlap "1".....*
Overlap "2".....Not Used
Overlap "3".....Not Used
Overlap "4".....Not Used

*See overlap programming detail on sheet 2
**Phases used for timing purposes only.

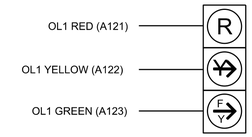
SIGNAL HEAD HOOK-UP CHART

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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	NU	NU	31	NU	NU	NU	61	62	NU	NU	81,82	NU	63★	NU	NU	NU	NU	NU
RED								134	134			107		A121					
YELLOW								135	135										
GREEN									136										
RED ARROW				116															
YELLOW ARROW				117								108		A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW				118				136				109							
✋																			
🚶																			

NU = Not Used
★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



63

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L					NOT USED									ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	Ø 8 8C	Ø 8 8E	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	PRE1 AC ISOLATOR
	L		Ø 6 6B				Ø 8 8B	Ø 8 8D	NOT USED						NOT USED

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

FS = FLASH SENSE
ST = STOP TIME
PRE = PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I5U	58	20	7	3			X		X	
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
6B	TB3-7,8	J2L	44	6	17	6			X	X	X	
8A	TB5-9,10	J6U	42	4	22	8	3.0		X		X	
8B	TB5-11,12	J6L	46	8	23	8	3.0		X		X	
8C	TB7-1,2	J7U	66	32	24	8	3.0		X		X	
8D	TB7-3,4	J7L	79	45	25	8	3.0		X		X	
8E	TB7-5,6	J8U	50	12	26	8	15.0		X		X	

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

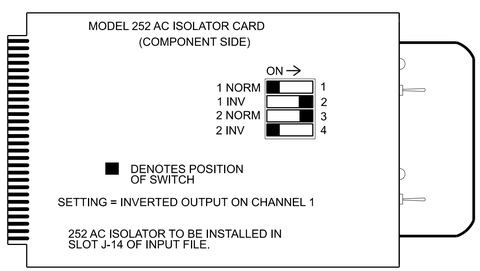
Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	a,3,b
2	6,a,8,b
3	39,c,40,d

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0216
DESIGNED: September 2025
SEALED: 09/29/2025
REVISED: N/A

Electrical Detail - Final Design - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

US 74 (Andrew Jackson Highway) at NC 144 (Morgan Street)

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

Division 8 | Scotland County | Laurel Hill

PLAN DATE: September 2025 | REVIEWED BY:
PREPARED BY: Sarah Kirkpatrick | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

Signed by: Ryan W. Hough 09/30/2025
DATE

SIG. INVENTORY NO. 08-0216

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sgkirkpatrick

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig.5.2

PREEMPTION PROGRAMMING

Front Panel
Main Menu >Controller >Preemption >Preempt Phasing/Preempt Parameters

Web Interface
Home >Controller >Preempt Configuration >Preempts

Preempt Configuration

Preempt	1
Enabled	Enabled
Type	Rail Road
Track Phases	8,39
Track Overlaps	-
Dwell Phases	6
Dwell Peds	-
Dwell Overlaps	-
Cycling Phases	-
Cycling Peds	-
Cycling Overlaps	-
Exit Phases	3,8
Exit Overlaps	-
Delay	0
Call Ext Time	1.0
Max Presence	0
Max Pres Act	Terminate
Enter Min Green	1
Enter Walk	0
Enter Ped Clear	0
Enter Yellow Change	5.1
Enter Red Clear	2.1
Track Green	21
Track Yellow Change	3.0
Track Red Clear	2.1
Dwell Green	0
Exit Min Green	255
Exit Yellow Change	25.5
Exit Red Clear	25.5
Exit Type	Exit Phases
Non Locking Memory	-
Not Ovrd Flash	X
Not Ovrd Nxt Pre	-
Require All Red Entry	-
Track Clear Ovrd	X
Ped Clear During Yellow	-
Entry Omit OLTG	X
Track Reserve	-

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

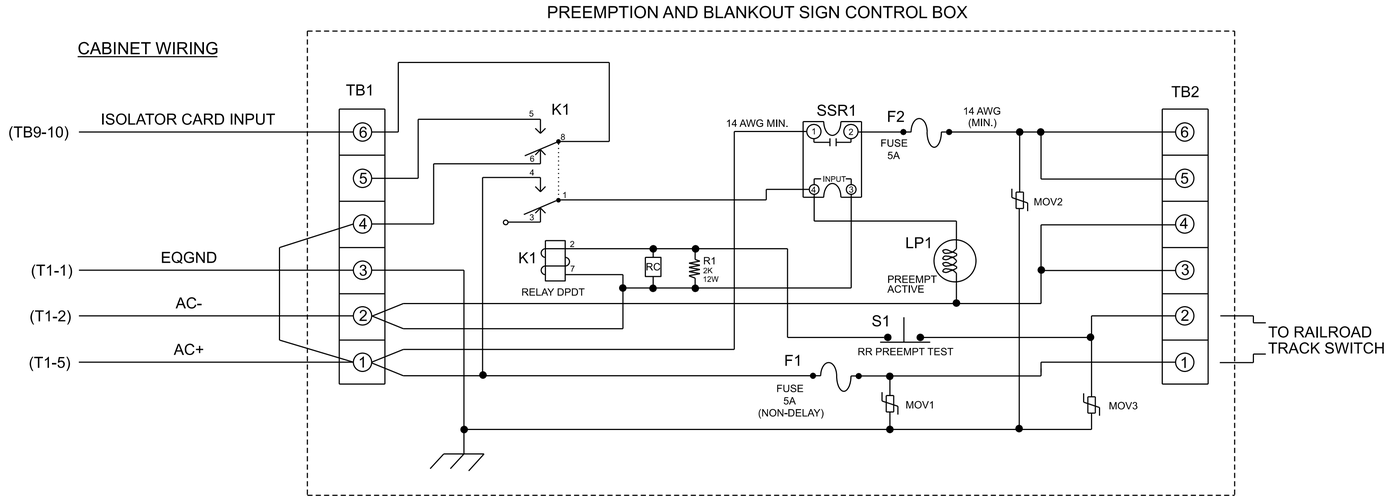
Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

RAILROAD PREEMPTION WIRING DETAIL

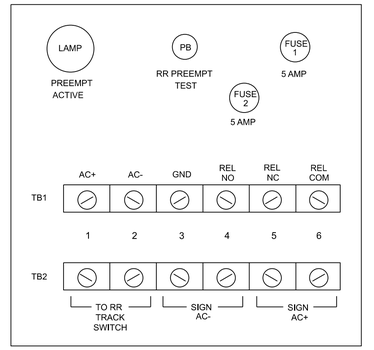
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1
Type	FYA - 4 Section
Included Phases	6
Modifier Phases	-
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0216
DESIGNED: September 2025
SEALED: 09/29/2025
REVISED: N/A

Electrical Detail - Final Design - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic & Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

US 74 (Andrew Jackson Highway)
at
NC 144 (Morgan Street)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: September 2025 | REVIEWED BY:
PREPARED BY: Sarah Kirkpatrick | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

Signed by: Ryan W. Hough 09/30/2025
430320FAA2654C3 DATE

SIG. INVENTORY NO. 08-0216

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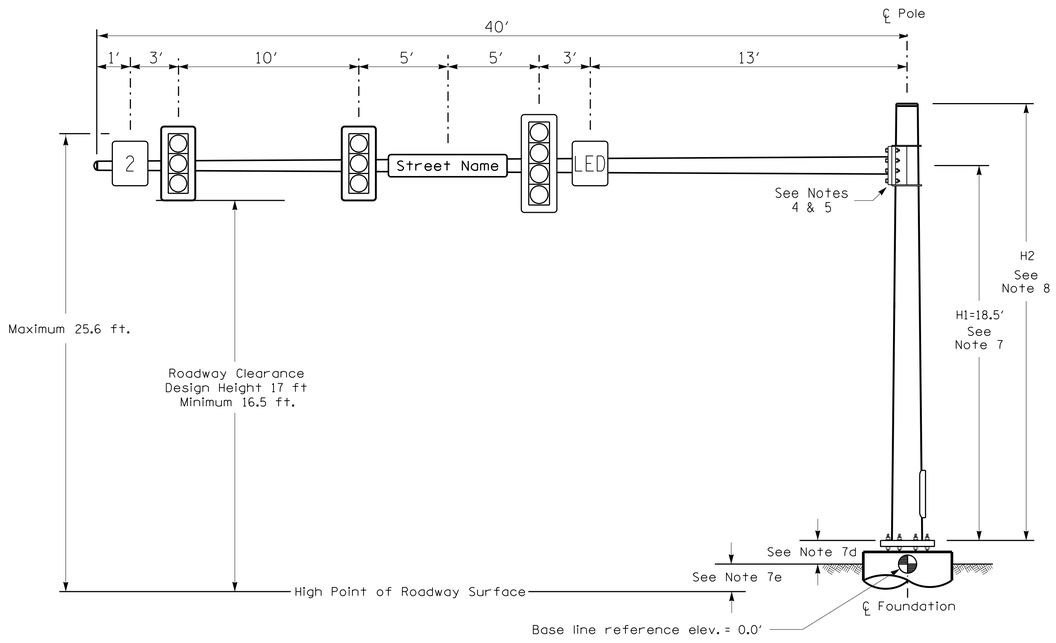
sgkirkpatrick

METAL POLE

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	Sig 5.3

Design Loading for METAL POLE



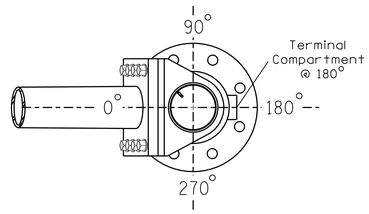
Elevation View

SPECIAL NOTE

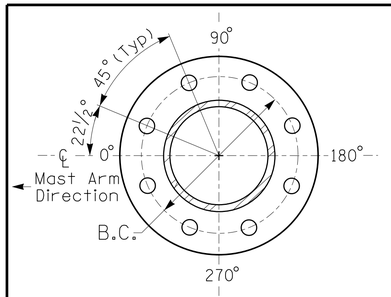
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole	
Baseline reference point at ⊕ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	-0.4 ft.	
Elevation difference at Edge of travelway or face of curb	-0.6 ft.	

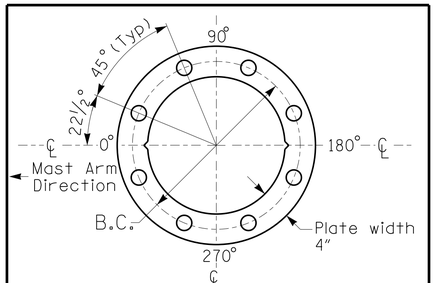


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5"W X 52.5"L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5"W X 66.0"L	74 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0"W X 36.0"L	14 LBS
LED	L.E.D. BLANKOUT SIGN RIGID MOUNTED	5.0 S.F.	24.0"W X 36.0"L	110 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2024 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using force ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2 (140 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 74 (Andrew Jackson Highway) at NC 144 (Morgan Street)

Division 8 | Scotland County | Laurel Hill

PLAN DATE: December 2024 | REVIEWED BY:

PREPARED BY: J.A. Lohr | REVIEWED BY:

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: Robert J Ziemba 10/07/2025 DATE

SIG. INVENTORY NO. 08-0216

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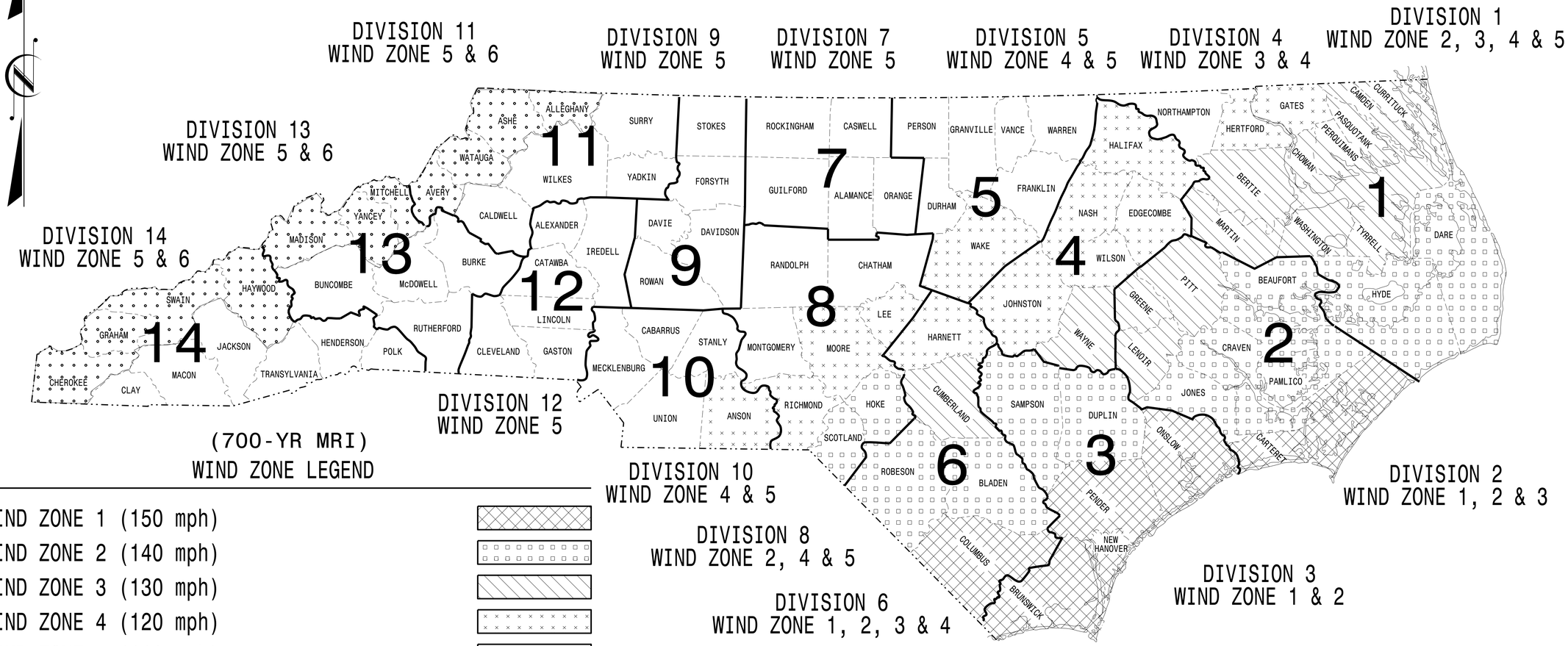
PROJECT I.D.NO.	SHEET NO.
HS-2008E	Sig.M1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)

NCDOT METAL POLE STANDARDS



(700-YR MRI)
WIND ZONE LEGEND

WIND ZONE 1 (150 mph)	
WIND ZONE 2 (140 mph)	
WIND ZONE 3 (130 mph)	
WIND ZONE 4 (120 mph)	
WIND ZONE 5 (110 mph)	
WIND ZONE 6 (135 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
750 N.Greenfield Pkwy.
Garner, NC 27529

Designed in conformance with the latest 2020 Interim to the 1st Edition 2015

AASHTO LRFD

Standard Specifications for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

DRAWING NUMBER	DESCRIPTION
Sig. M 1A	Statewide Wind Zone Map (700–yr MRI)
Sig. M 1B	Statewide Wind Zone Map (10–yr MRI)
Sig. M 2	Typical Fabrication Details–All Metal Poles
Sig. M 3	Typical Fabrication Details–Strain Poles
Sig. M 4	Typical Fabrication Details–Mast Arm Poles
Sig. M 5	Typical Fabrication Details–Mast Arm Connection
Sig. M 6	Typical Fabrication Details–Strain Pole Attachments
Sig. M 7	Construction Details–Foundations
Sig. M 8	Standard Strain Pole Foundation–All Soil Conditions
Sig. M 9	Typical Fabrication Details–CCTV Camera Poles

MOBILITY AND SAFETY DIVISION – TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS UNIT

D.Y. ISHAK – STATE SIGNALS ENGINEER

K. DURIGON, P.E. – ITS AND SIGNALS STRUCTURAL ENGINEER

B. WALKER, P.E. – ITS AND SIGNALS STRUCTURAL ENGINEER

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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DATE

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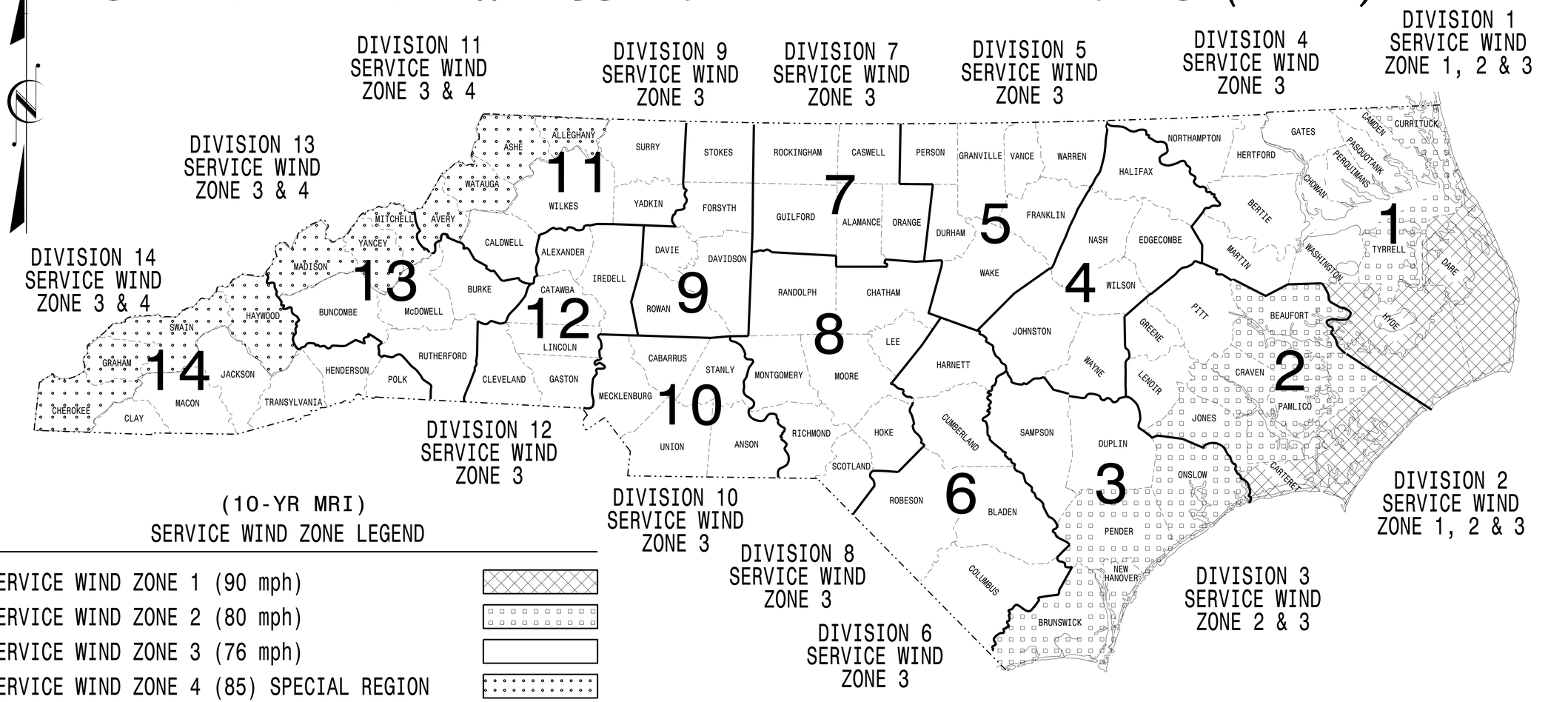
kdurigon

PROJECT I.D.NO.	SHEET NO.
HS-2008E	Sig.M1B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)

NCDOT METAL POLE STANDARDS



(10-YR MRI)
SERVICE WIND ZONE LEGEND

SERVICE WIND ZONE 1 (90 mph)	
SERVICE WIND ZONE 2 (80 mph)	
SERVICE WIND ZONE 3 (76 mph)	
SERVICE WIND ZONE 4 (85) SPECIAL REGION	

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

Prepared in the Offices of:

Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.
Garner, NC 27529

Designed in conformance with the latest 2020 Interim to the 1st Edition 2015

AASHTO LRFD

Standard Specifications for Highway Signs, Luminaires, and Traffic Signals

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Sig. M 8	Standard Strain Pole Foundation–All Soil Conditions
Sig. M 9	Typical Fabrication Details–CCTV Camera Poles

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS UNIT

D.Y. ISHAK – STATE SIGNALS ENGINEER

K. DURIGON, P.E. – ITS AND SIGNALS STRUCTURAL ENGINEER

B. WALKER, P.E. – ITS AND SIGNALS STRUCTURAL ENGINEER

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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09/21/2023
DATE

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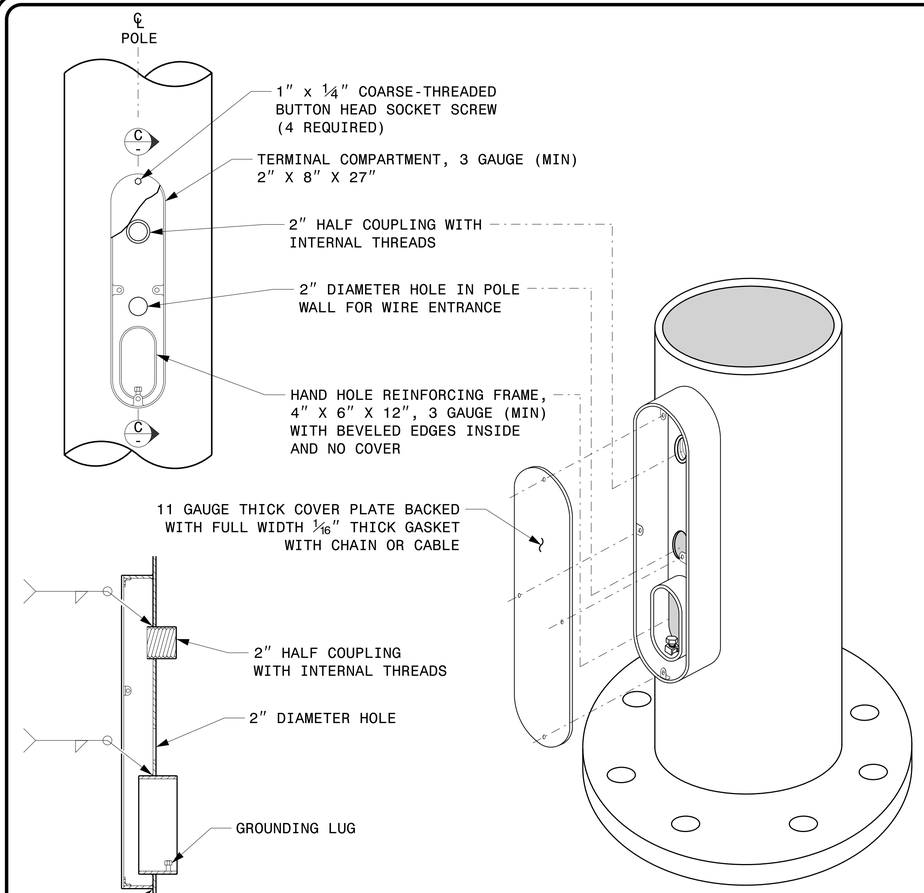
kcdurigon



SECTION C-C

NOTE: UNLESS OTHERWISE SPECIFIED, LOCATE TERMINAL COMPARTMENT 1 FOOT ABOVE THE POLE BASE AT 180 DEGREES ON THE POLE'S RADIAL INDEX.

TERMINAL COMPARTMENT 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 SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

SHAFT I.D. TAG
(PROVIDE ON SHAFT OF STRAIN POLES
AND MAST ARM POLE SHAFT)

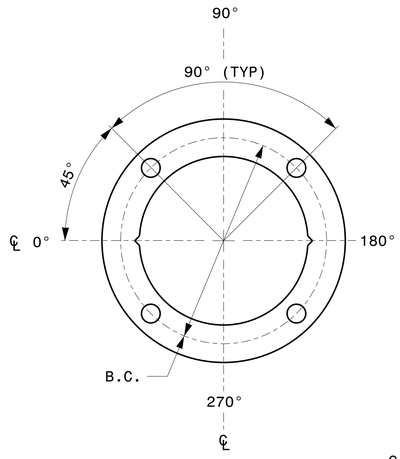
MFG _____ MFG. DATE: MM/YY
SECTION D/T/L/Y ----/----/----/----
NCDOT SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

ARM I.D. TAG
(PROVIDE ON EACH SECTION OF
A MULTI-SECTION MAST ARM)

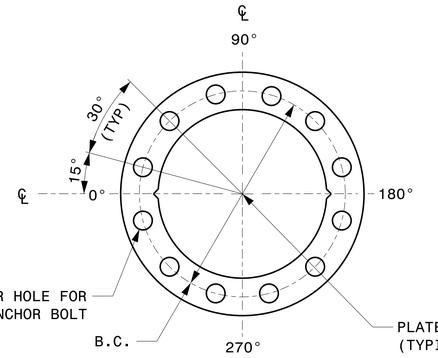
NOTES:

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 STANDARD DESIGN, INCLUDE CASE NUMBER IN ADDITION TO POLE NUMBER ON "NCDOT POLE NO." LINE.
5. SIGNAL INV. NUMBER AND POLE I.D. NUMBER. SEE DRAWING M3 AND M4 FOR MOUNTING POSITIONS OF I.D. TAGS.

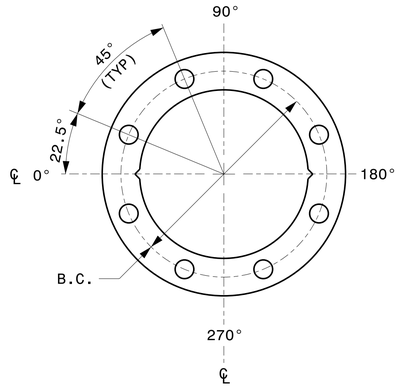
IDENTIFICATION TAG DETAILS



4 BOLT PATTERN



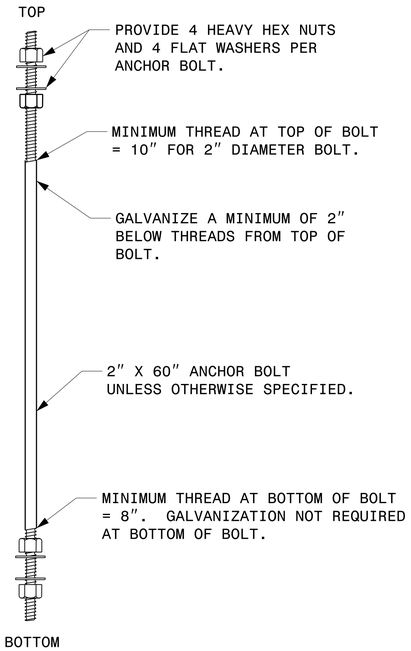
12 BOLT PATTERN



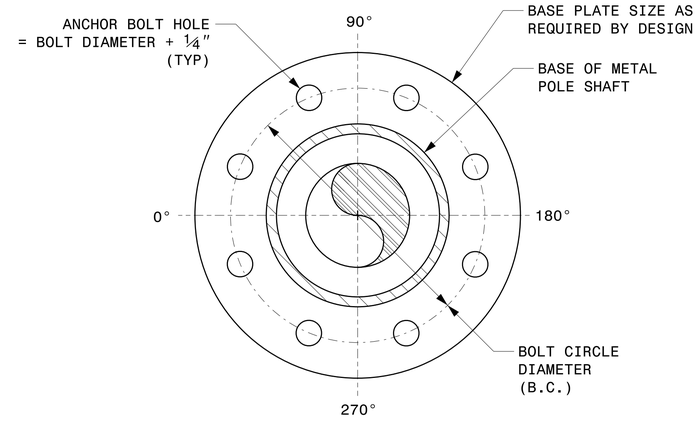
8 BOLT PATTERN

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: BASE PLATE MAY BE CIRCULAR, OCTAGONAL, SQUARE OR RECTANGULAR IN SHAPE.

TYPICAL BASE PLATE DETAIL

PROJECT I.D. NO.	SHEET NO.
HS-2008E	Sig.M2

Fabrication Details – All Metal Poles

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

SCALE 0 NA NONE

Typical Fabrication Details For All Metal Poles

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: C.F.ANDREWS
PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

DocuSigned by:
Kevin Durigon
SIGNATURE
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09/21/2023
DATE

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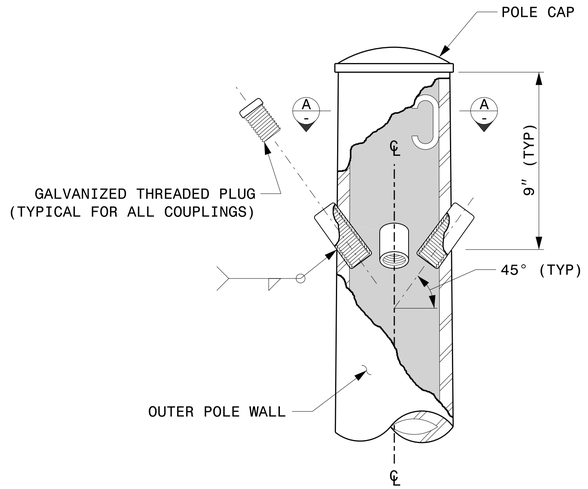
kcdurigon

PROJECT I.D. NO.	SHEET NO.
HS-2008E	Sig.M3

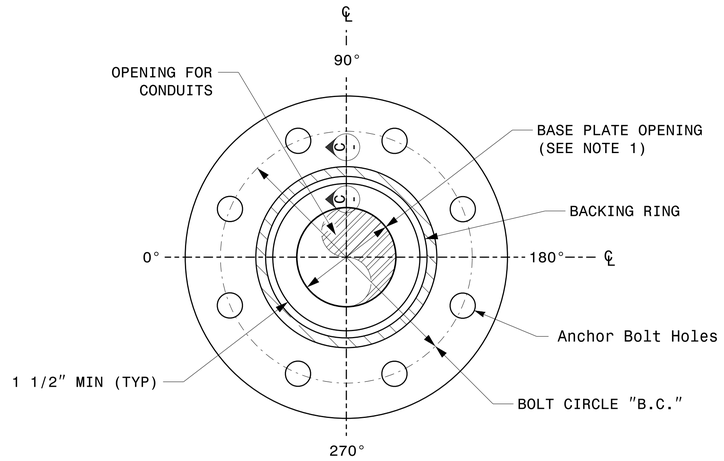
Fabrication Details — Strain Poles

NOTE:

1. OPENING IN POLE BASE PLATE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS 3½" BUT SHALL NOT BE LESS THAN 8½".

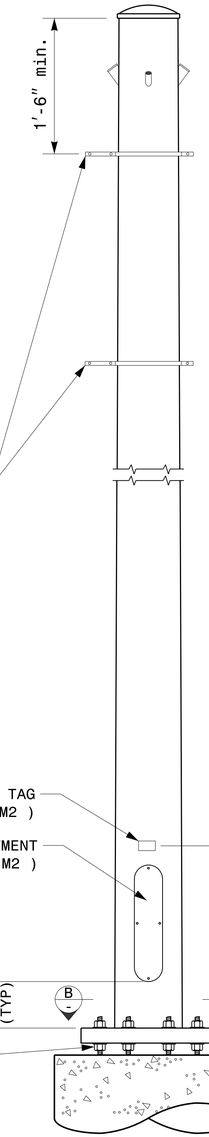


CABLE ENTRANCES AT TOP OF POLE

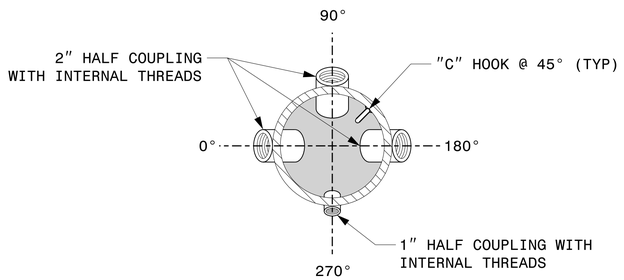


SECTION B-B

POLE BASE PLATE DETAILS
(8 AND 12 BOLT PATTERN)

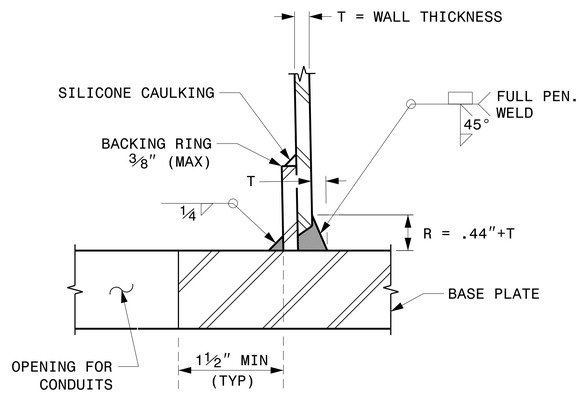


MONOTUBE STRAIN POLE



SECTION A-A

RADIAL ORIENTATION OF FACTORY INSTALLED ACCESSORIES AT TOP OF POLE



SECTION C-C

(POLE ATTACHMENT TO BASE PLATE)

FULL-PENETRATION GROOVE WELD DETAIL

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Poles

PLAN DATE:	SEPTEMBER 2023	DESIGNED BY:	K.C. DURIGON
PREPARED BY:	K.C. DURIGON	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
036626
ENGINEER
KEVIN C. DURIGON

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Kevin Durigon
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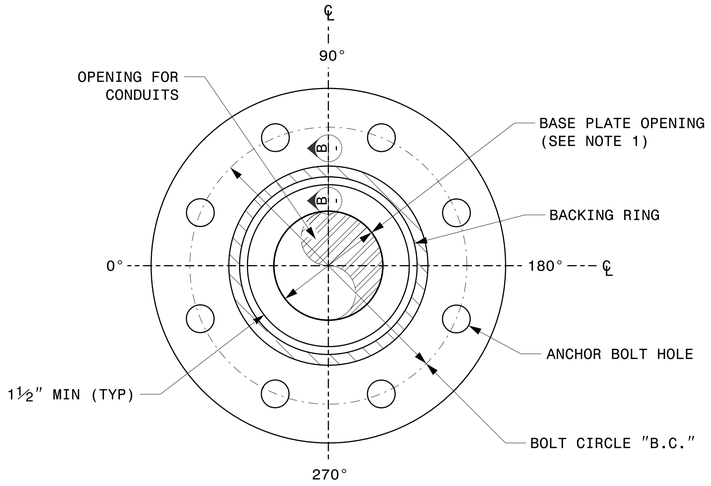
kcdurigon

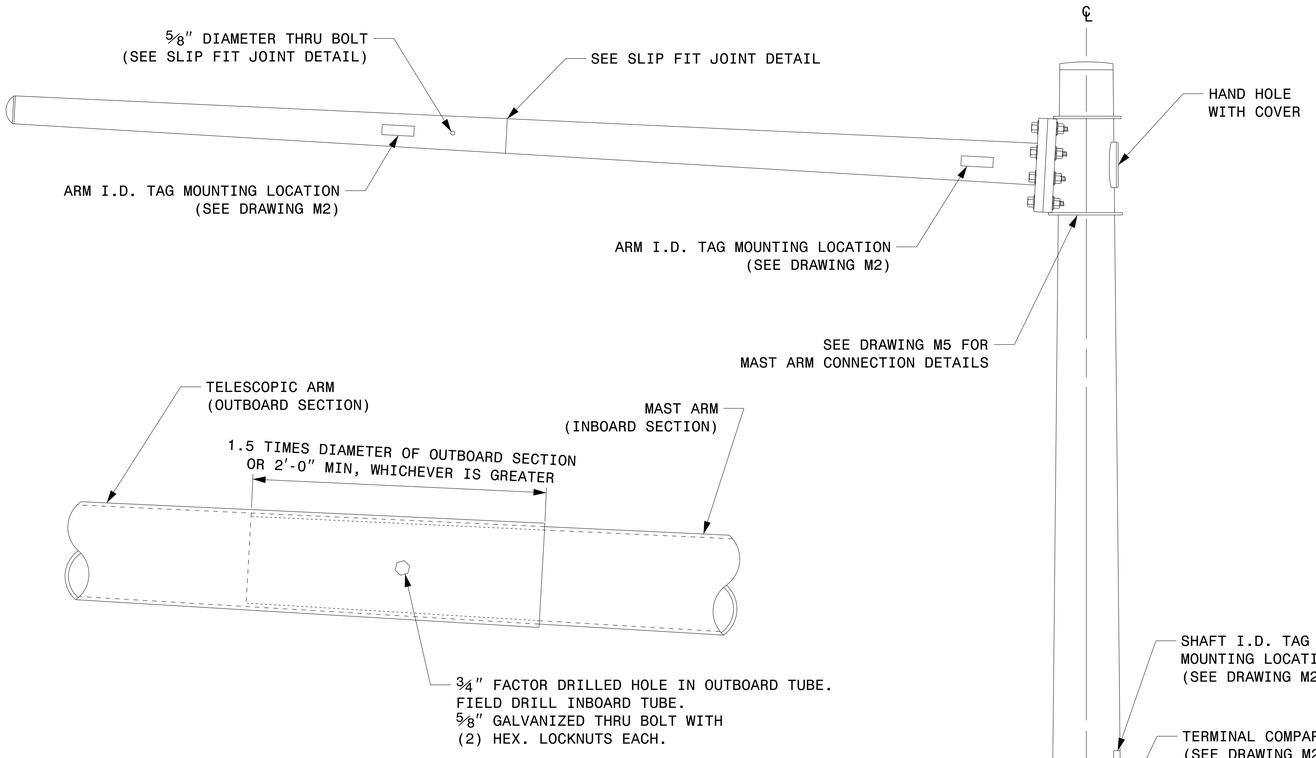
PROJECT I.D. NO.	SHEET NO.
HS-2008E	Sig.M4

NOTE:

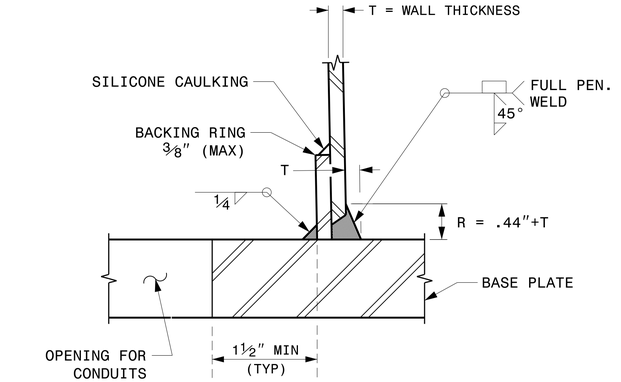
1. OPENING IN POLE BASE PLATE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS 3½" BUT SHALL NOT BE LESS THAN 8½".



SECTION A-A
POLE BASE PLATE DETAILS

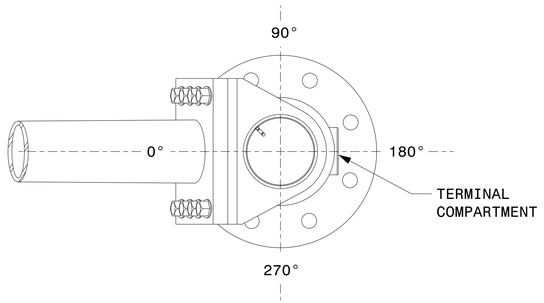


SLIP FIT JOINT DETAIL FOR MAST ARM

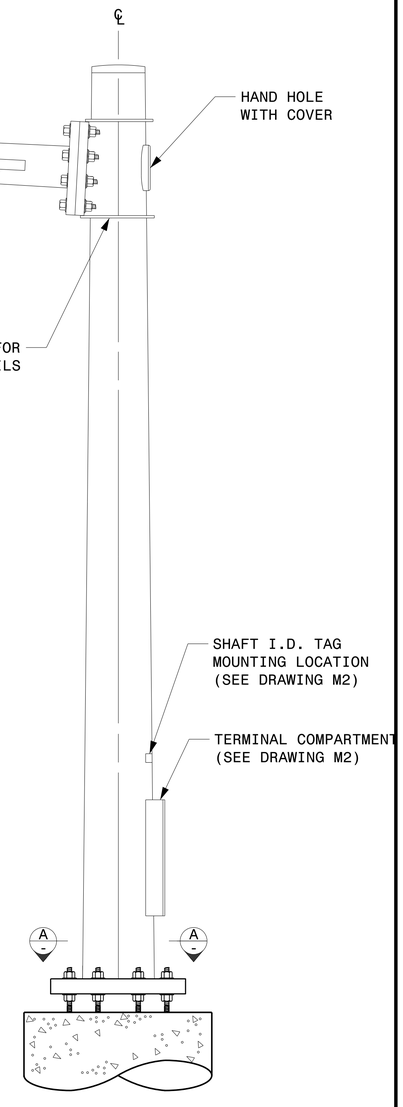


SECTION B-B
(POLE ATTACHMENT TO BASE PLATE)

FULL-PENETRATION GROOVE WELD DETAIL



MAST ARM RADIAL ORIENTATION



MAST ARM POLE

Fabrication Details – Mast Arm Poles

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

SCALE 0 NA NONE

Typical Fabrication Details For Mast Arm Poles

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON
PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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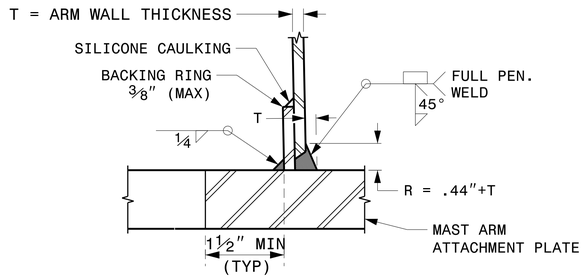
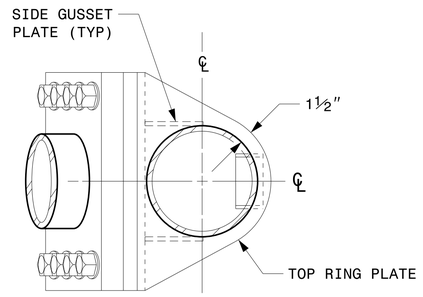
kcdurigon

WELDED RING STIFFENED MAST ARM CONNECTION

PROJECT I.D. NO.	SHEET NO.
HS-2008E	Sig.M5



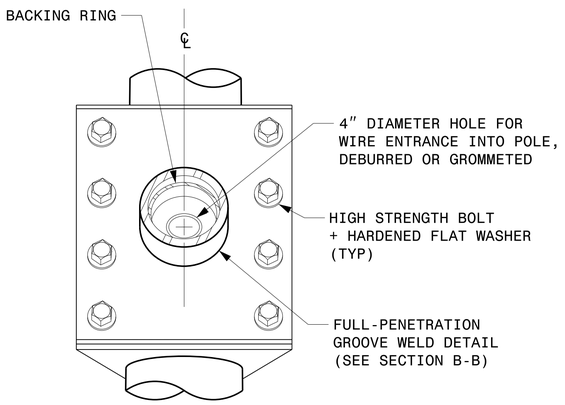
SECTION B-B
FULL-PENETRATION GROOVE WELD DETAIL



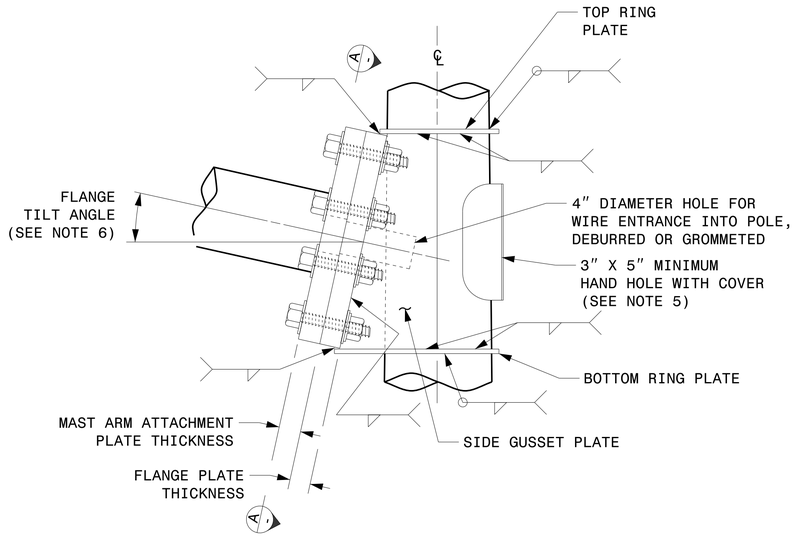
PLAN VIEW

NOTES:

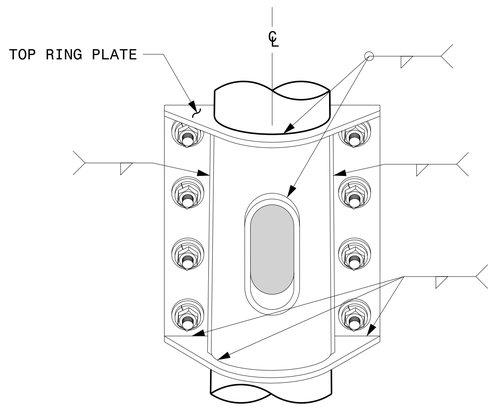
1. PROVIDE A PERMANENT MEANS OF IDENTIFICATION ABOVE THE MAST ARM TO INDICATE PROPER ATTACHMENT ORIENTATION OF THE MAST ARM.
2. DESIGNER WILL DETERMINE THE SIZE OF ALL STRUCTURAL COMPONENTS, PLATES, FASTENERS, AND WELDS SHOWN UNLESS THEY ARE ALREADY SPECIFIED.
3. FABRICATOR IS RESPONSIBLE FOR PROVIDING APPROPRIATE HOLES AT DRAINAGE POINTS TO DRAIN GALVANIZING MATERIALS.
4. FOR MINIMUM EDGE DISTANCE AND NOMINAL BOLT HOLE SIZE, FOLLOW THE LATEST AISC STEEL CONSTRUCTION MANUAL.
5. PROVIDE UPPER HANDHOLE AS NECESSARY WHEN SHAFT EXTENSIONS ARE REQUIRED FOR LUMINAIRE ARMS OR CAMERA. FOR POLES WITHOUT LUMINAIRES/CAMERA, WIRING CAN BE DONE THROUGH THE TOP OF POLE.
6. ALLOWABLE RANGE OF FLANGE TILT ANGLE WILL VARY FROM 0° TO AS REQUIRED.



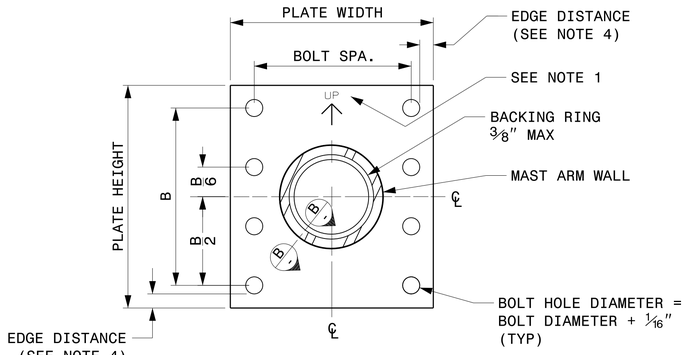
FRONT ELEVATION VIEW



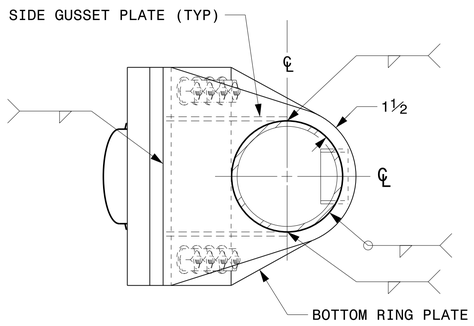
SIDE ELEVATION VIEW



BACK ELEVATION VIEW



SECTION A-A
MAST ARM ATTACHMENT PLATE



BOTTOM VIEW

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Mast Arm Connection To Pole

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: C.F. ANDREWS
PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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09/21/2023
DATE

Fabrication Details – Mast Arm Connection

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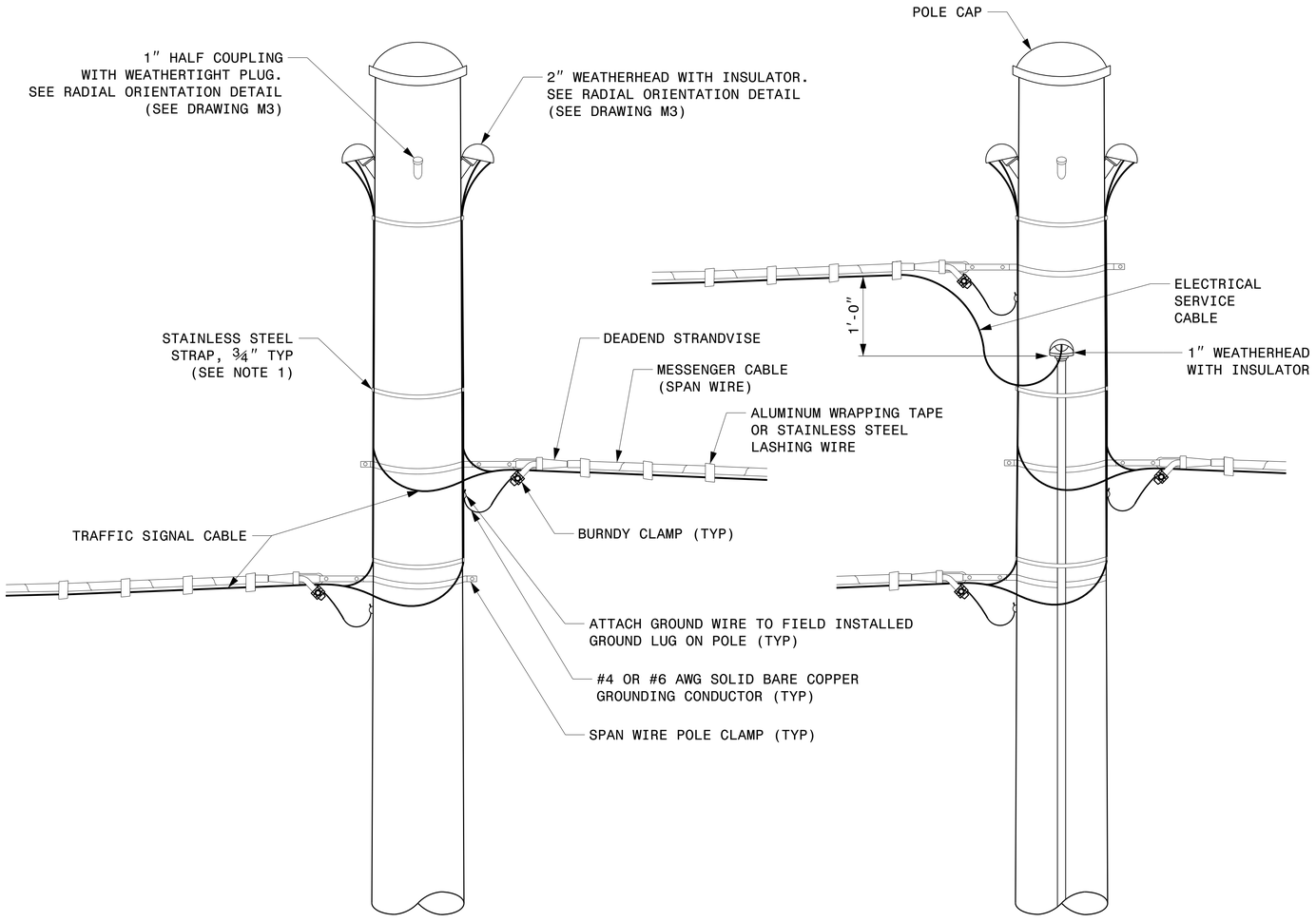
kcdurigon

PROJECT I.D. NO.	SHEET NO.
HS-2008E	Sig.M6

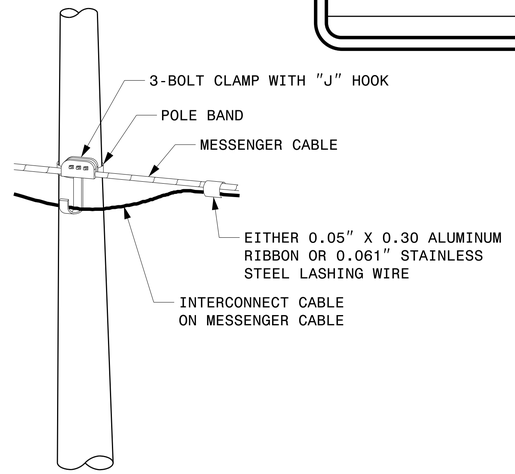
Fabrication Details – Strain Pole Attachments



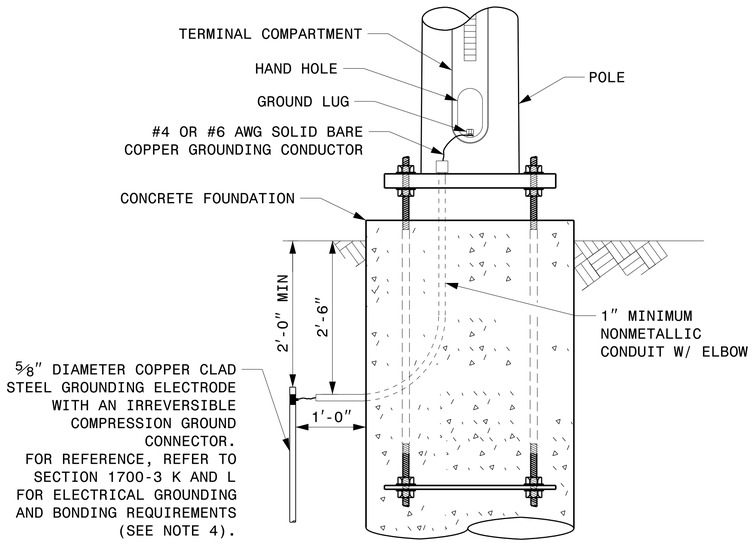
STRAIN POLE ATTACHMENTS

NOTES:

1. STRAP ALL SIGNAL CABLES TO THE SIDE OF THE POLE WITH ¾″ STAINLESS STEEL STRAPS WHEN THE DISTANCE BETWEEN SPAN WIRE ATTACHMENT CLAMP AND WEATHERHEADS EXCEEDS 3′-0″.
2. PROVIDE MINIMUM TWO SPAN WIRE POLE CLAMPS PER POLE.
3. IT IS PROHIBITED TO ATTACH TWO SPAN WIRES AT ONE POLE CLAMP.
4. FOR GENERAL REQUIREMENTS, REFER TO NCDOT STANDARD SPECIFICATIONS FOR ROADWAY AND STRUCTURES, JANUARY 2024.



ATTACHMENT OF CABLE TO INTERMEDIATE METAL POLE



METAL POLE GROUNDING DETAIL FOR STRAIN POLE AND MAST ARM

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Pole Attachments

PLAN DATE:	SEPTEMBER 2023	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	K.C. DURIGON	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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09/21/2023
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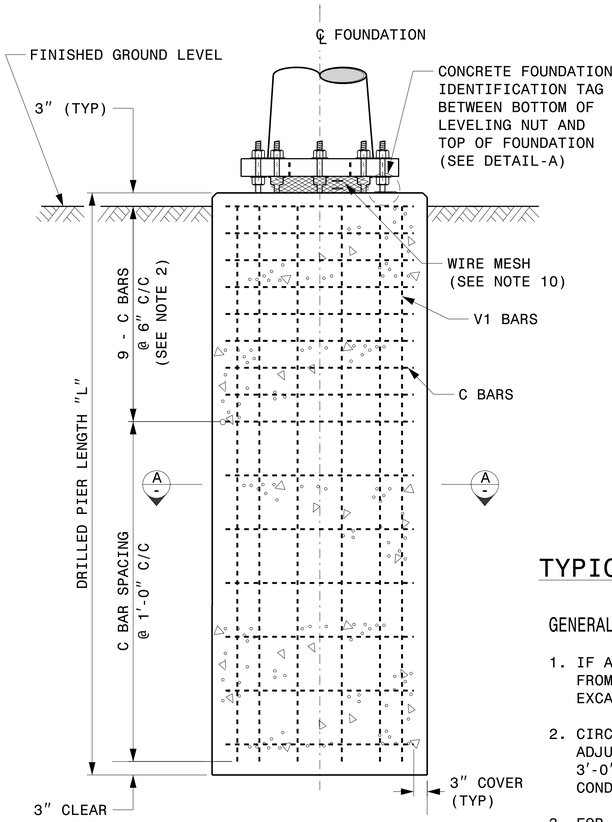
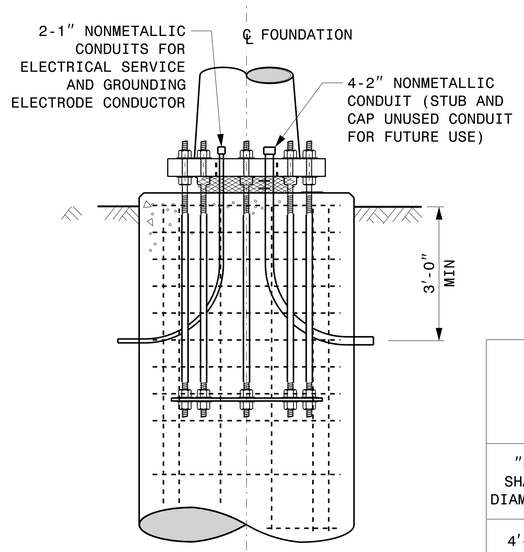
kcdurigon

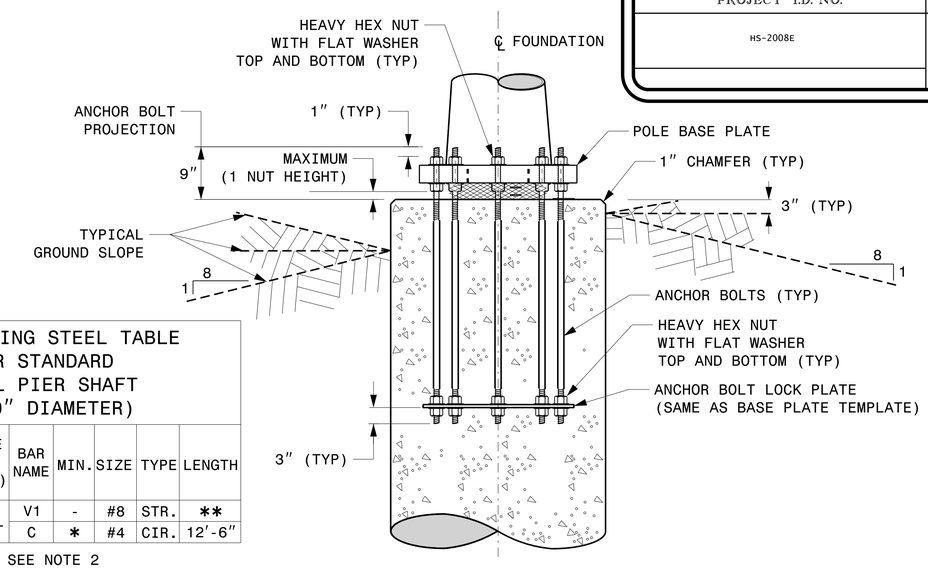
Construction Details – Foundations



CONCRETE SHAFT ELEVATION



TYPICAL FOUNDATION CONDUIT DETAILS



TYPICAL FOUNDATION ANCHOR BOLT DETAILS

(REINFORCING CAGE NOT SHOWN FOR CLARITY)

REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4′-0″ DIAMETER)

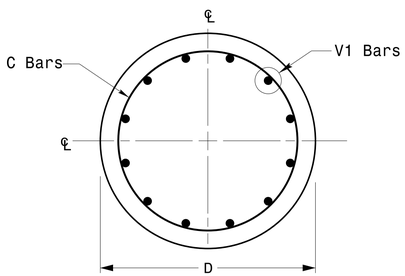
"D" SHAFT DIAMETER	CONCRETE VOLUME (CU. YDS)	BAR NAME	MIN.	SIZE	TYPE	LENGTH
4′-0″	.465 X L	V1	-	#8	STR.	**
		C	*	#4	CIR.	12′-6″

* SEE NOTE 2
** SEE NOTE 3

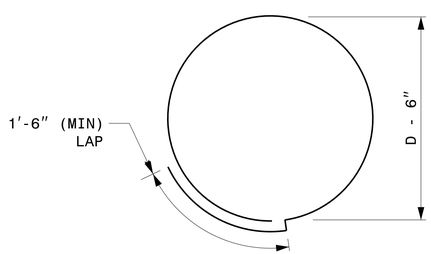
GENERAL NOTES:

1. IF ACTUAL SUBSURFACE CONDITIONS DIFFER SIGNIFICANTLY FROM BORING DATA, CONTACT THE ENGINEER BEFORE EXCAVATING OR PLACING CONCRETE.
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. FOR STANDARD FOUNDATIONS, SEE SHEET SIG. M8 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 2″ TO 5″ FOUNDATION PROJECTION ABOVE GROUND LEVEL, DEPENDING ON THE GROUND SLOPE.
5. UNLESS OTHERWISE SHOWN, FOUNDATION DESIGNS ARE BASED ON NON-SLOPING LEVEL GROUND SURFACES WITH SLOPE RATIOS OF 8:1 (H:V) OR FLATTER. IF ACTUAL GROUND LINE SLOPES ARE STEEPER, CONTACT THE ENGINEER BEFORE EXCAVATING OR PLACING CONCRETE.
6. CONSTRUCT FOUNDATIONS IN ACCORDANCE WITH NCDOT STANDARD PROVISIONS SP09 R005- FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES. ALL APPLICABLE 2024 NCDOT STANDARD SPECIFICATIONS ARE REFERENCED IN THIS PROVISION. REFER TO THE NCDOT RESOURCES/SPECIFICATIONS PAGE LOCATED ON THE CONNECT NCDOT WEBSITE.

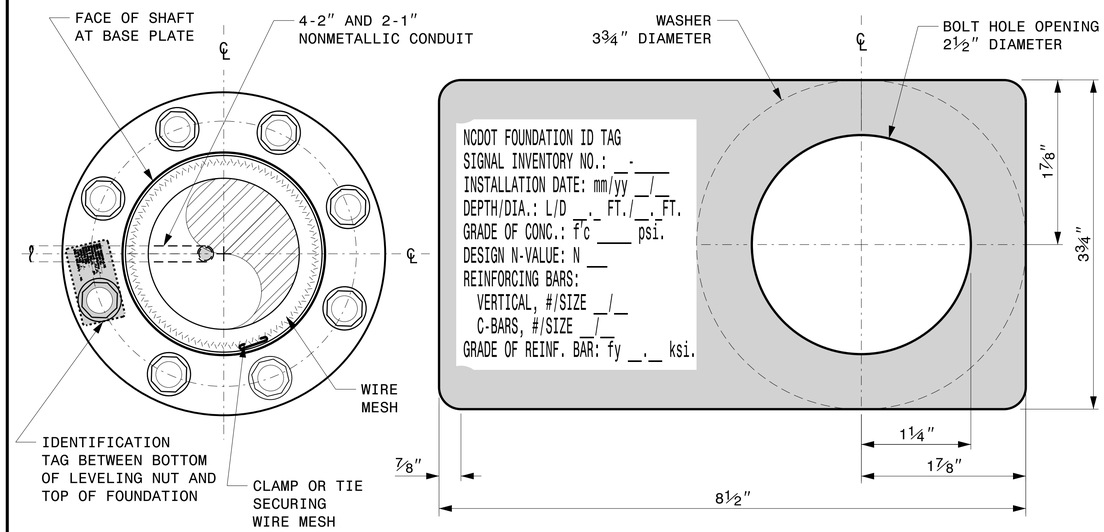
   https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx
7. USE AIR ENTRAINED AA CONCRETE MIX WITH A COMPRESSION STRENGTH OF f′c=4500 psi (MIN) AFTER 28 DAYS.
8. USE ASTM A615 GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL. MAINTAIN AT LEAST 3″ COVER ON ALL REINFORCEMENT.
9. LOCATE IDENTIFICATION TAG ON TOP OF THE FOUNDATION, DIRECTLY ABOVE THE CONDUIT'S ENTRY POINT.
10. PROVIDE TWO LAYERS OF 4 MESH GALVANIZED WELDED 23 GAUGE (0.025) 6″ WIDE AROUND PIPES UNDER THE BASE PLATE AND SECURE IT WITH TIES IF NECESSARY.
11. PREFERRED LOCATION FOR THE I.D. TAG IS AS SHOWN IN DETAIL-A: DIRECTLY ABOVE THE CONDUIT ENTERING THE FOUNDATION.



SECTION A-A



TYPICAL "C" BAR DETAIL



D = DIAMETER
L = LENGTH / DEPTH
mm = MONTH
yy = YEAR

DETAIL-A

CONCRETE FOUNDATION IDENTIFICATION TAG DETAILS

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

Construction Details For Foundations

PLAN DATE:	SEPTEMBER 2023	DESIGNED BY:	K.C. DURIGON
PREPARED BY:	K.C. DURIGON	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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DATE

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kcdurigon

SOIL CONDITION

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 (ea.)	Bar Size (#)	Spacing (in.)
S26L1	26	22	2	9	210	19.5	12.5	9	6.5	15.5	14.5	13	8	12	4	12
S26L2	26	23	2	10	240	19.5	12	9	6.5	15.5	14.5	13	8	12	4	12
S26L3	26	25	2	11	260	20.5	12	10	8	16	15	13	8	12	4	12
S30L1	30	22	2	9	230	19	11	9	7	15.5	14	12.5	8	12	4	12
S30L2	30	23	2	10	270	20	12	10	8	16	14.5	13	8	12	4	12
S30L3	30	25	2	11	290	21	12	10	8	17	15	13.5	8	12	4	12
S30H1	30	25	3	13	355	23	13	11	9	18	16.5	14.5	8	12	4	12
S30H2	30	29	3	15	405	25	14	11	9	19	17.5	15.5	8	14	4	12
S30H3	30	29	3	16	430	26	15	12	9	20	18	16	8	14	4	6
S35L1	35	22	3	8	260	19.5	12	10	8	15.5	14.5	13	8	12	4	12
S35L2	35	23	3	10	300	21	12	10	8	16.5	15	13.5	8	12	4	12
S35L3	35	25	3	10	320	21.5	13	10	8	17	15.5	14	8	12	4	12
S35H1	35	25	3	12	390	23.5	14	11	9	18	17	15	8	14	4	12
S35H2	35	29	4	14	460	26	15	12	9	20	18	16	8	14	4	6
S35H3	35	29	4	16	495	28.5	15	13.5	10	21.5	19	17	8	14	4	6

48″ DIAMETER FOUNDATION CONCRETE VOLUME (CUBIC YARDS) = (0.465) x DRILLED PIER LENGTH

GENERAL NOTES:

1. VALUES SHOWN IN THE "REACTIONS AT THE POLE BASE" COLUMN REPRESENT THE MINIMUM ACCEPTABLE CAPACITY ALLOWED FOR DESIGN USING A COMBINED FORCE RATIO (CFR) OF 1.00.
2. USE CHAIRS AND SPACERS TO MAINTAIN PROPER CLEARANCE.
3. FOR FOUNDATION, ALWAYS USE AIR-ENTRAINED CONCRETE MIX.

FOUNDATION SELECTION:

1. PERFORM A STANDARD PENETRATION TEST AT EACH PROPOSED FOUNDATION SITE TO DETERMINE "N" VALUE.
2. SELECT THE APPROPRIATE WIND ZONE FROM M1 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 UNDER "STANDARD FOUNDATIONS" BASED ON SOIL TYPE AND "N" VALUE. SELECT THE APPROPRIATE ROW BASED ON THE POLE LOAD CASE.
6. THE FOUNDATION DEPTH IS THE VALUE SHOWN IN THE "STANDARD FOUNDATIONS" CATEGORY WHERE THE COLUMN AND THE ROW INTERSECT.
7. USE CONSTRUCTION PROCEDURES AND DESIGN METHODS PRESCRIBED BY FHWA-NHI-10-016 MANUAL FOR DRILLED SHAFTS.

PROJECT I.D. NO.	SHEET NO.
HS-2008E	Sig.M8

Standard Strain Pole Foundation – All Soil Conditions

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

SCALE
0 NA
NONE

Standard Strain Pole Foundation for All Soil Conditions

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON
PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

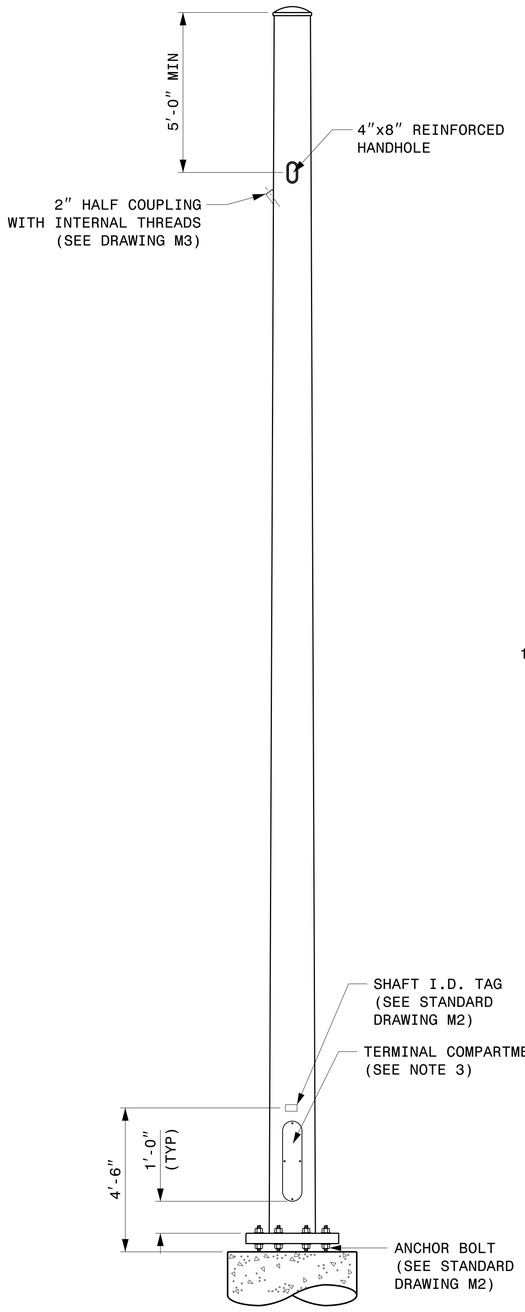
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

DocuSigned by:
Kevin Durigon
SIGNATURE
4B23DC79B3784DA...
09/21/2023
DATE

03-OCT-2023 12:48
S:\NTISSDW\ITS Signals\Signal Design Section\Structures\Drawings\2024 Metal Pole Std Drawings for LRFD\2024 Sig_M8 Std. Strain Pole Found.-Saturated Soil Condition.dgn
kcdurigon

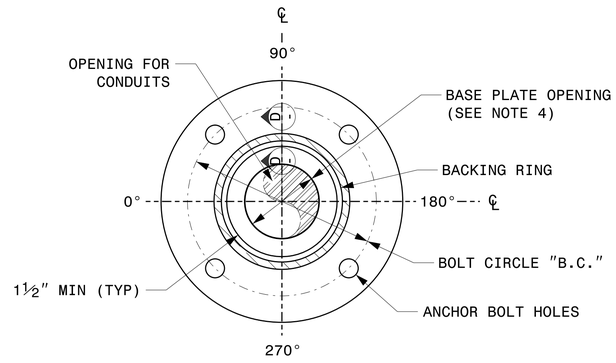
PROJECT I.D. NO.	SHEET NO.
HS-2008E	Sig.M9

Fabrication Details – CCTV Camera Poles

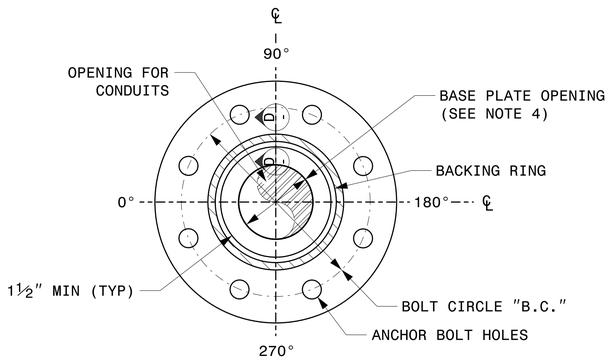


CCTV CAMERA POLE

(NOT TO SCALE)

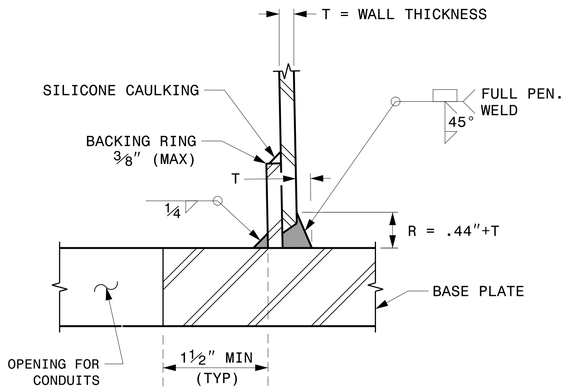


4 BOLT PATTERN
FOR POLES UP TO 40'



8 BOLT PATTERN
FOR POLES TALLER THAN 40'

BASE PLATE DETAILS



SECTION D-D

(POLE ATTACHMENT TO BASE PLATE)

FULL-PENETRATION GROOVE WELD DETAIL

NOTES:

1. THIS DRAWING PROVIDES BASIC DETAILS FOR CCTV POLES. PROJECT REQUIREMENTS MAY REQUIRE SPECIAL FACTORY PREPS THAT ARE NOT SHOWN ON THESE DETAILS.
2. DETAILS FOR INTERNAL CAMERA LOWERING SYSTEMS ARE NOT SHOWN.
3. POLE MOUNTED CABINETS MAY REQUIRE MODIFICATIONS TO THE LOWER HANDHOLE OPENING TO MOUNT CABINETS. 4" X 8" REINFORCED HANDHOLES ARE ACCEPTABLE OPTIONS, AND MAY BE PREFERRED.
4. OPENING IN POLE BASE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS 3½" BUT SHALL NOT BE LESS THAN 8½".
5. USE COMPACT SECTION CRITERIA D/T RATIO PER AASHTO LTS-LRFD 1ST EDITION SECTION 5.7.2.

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

SCALE
0 NA
NONE

Typical Fabrication Details For CCTV Poles

PLAN DATE:	SEPTEMBER 2023	DESIGNED BY:	K.C. DURIGON
PREPARED BY:	K.C. DURIGON	REVIEWED BY:	C.F. ANDREWS

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

DocuSigned by:
Kevin Durigon
SIGNATURE
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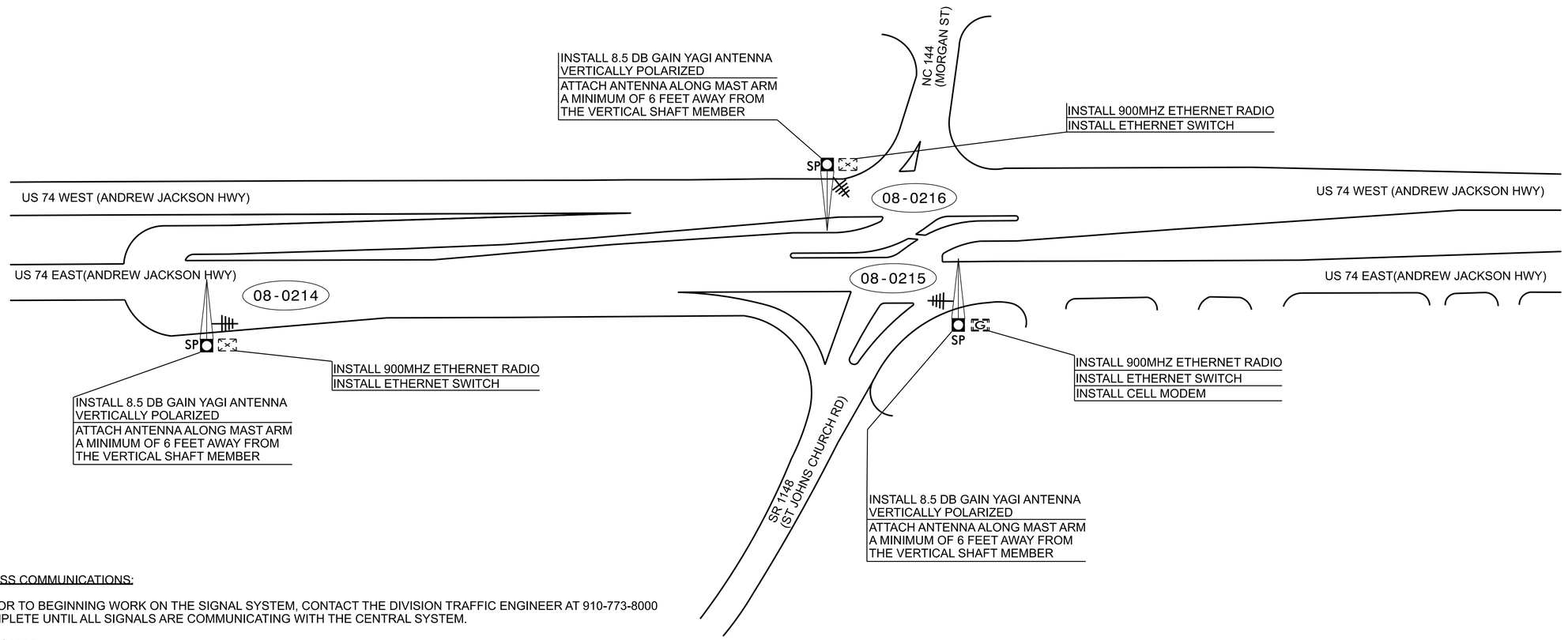
09/21/2023
DATE

03-OCT-2023 12:51
S:\HITSSUP\ITS\Signals\Design Sections\Structures\Drawings\2024 Metal Pole Std Drawings for LRFD\2024 Sig_M9 Fabrication Details - CCTV Poles.dgn
kcdurigon

PROJECT REFERENCE NO.	SHEET NO.
HS-2008E	SCP-1

LEGEND

- YAGI ANTENNA (SINGLE)
- EXISTING CONTROLLER AND CABINET
- GATEWAY RADIO LOCATION
- XX-XXXX — SIGNAL INVENTORY NUMBER
- SP — EXISTING METAL POLE W/MAST ARM SIGNAL POLE



NOTES FOR WIRELESS COMMUNICATIONS:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION TRAFFIC ENGINEER AT 910-773-8000 NOTIFY NOT COMPLETE UNTIL ALL SIGNALS ARE COMMUNICATING WITH THE CENTRAL SYSTEM.

2. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2" RISER WITH WEATHERHEAD
   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, METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING 3/4" STAINLESS STEEL STRAPS EVERY 12".

3. IF AN EXISTING 2" SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER WITH 2" WEATHERHEAD.

4. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
   (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)

5. INSTALL WIRELESS RADIO 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. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.

7. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS."

8. CELL MODEMS TO BE SUPPLIED BY THE DEPARTMENT. CONTACT THE DIVISION TRAFFIC ENGINEER AT 910-773-8000 TO REQUEST THE CELL MODEM. ALLOW 8 WEEKS LEAD TIME BEFORE ANTICIPATED DEPLOYMENT.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SCALE 0 N/A

Wireless Communication Plans
D08-33 Laurel Hill

DIVISION 8 | SCOTLAND CO. | LAUREL HILL

PLAN DATE: DECEMBER 2024
PREPARED BY: M. DIAZ
REVIEWED BY: DocuSigned by: Greg Green 899E7705AF4...

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 046152 ENGINEER ALEX D STEWART

SIGNATURE: Alex D. Stewart
DATE: 12/04/2024

6/23/16

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	HS-2008E	X-1

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260 255 250 245

252.43
33.56

0.009

252.32
21.59

0.003

252.50
20.55

0.012

252.63
32.57

16+20.00

260 255 250 245

252.14
33.54

0.009

252.03
21.55

0.005

252.36
20.59

0.011

252.50
32.61

16+00.00

260 255 250 245

251.84
33.51

0.008

251.75
21.52

0.008

252.23
20.62

0.011

252.36
32.66

15+80.00

255 250 245

15+60.00

℄

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6/23/16

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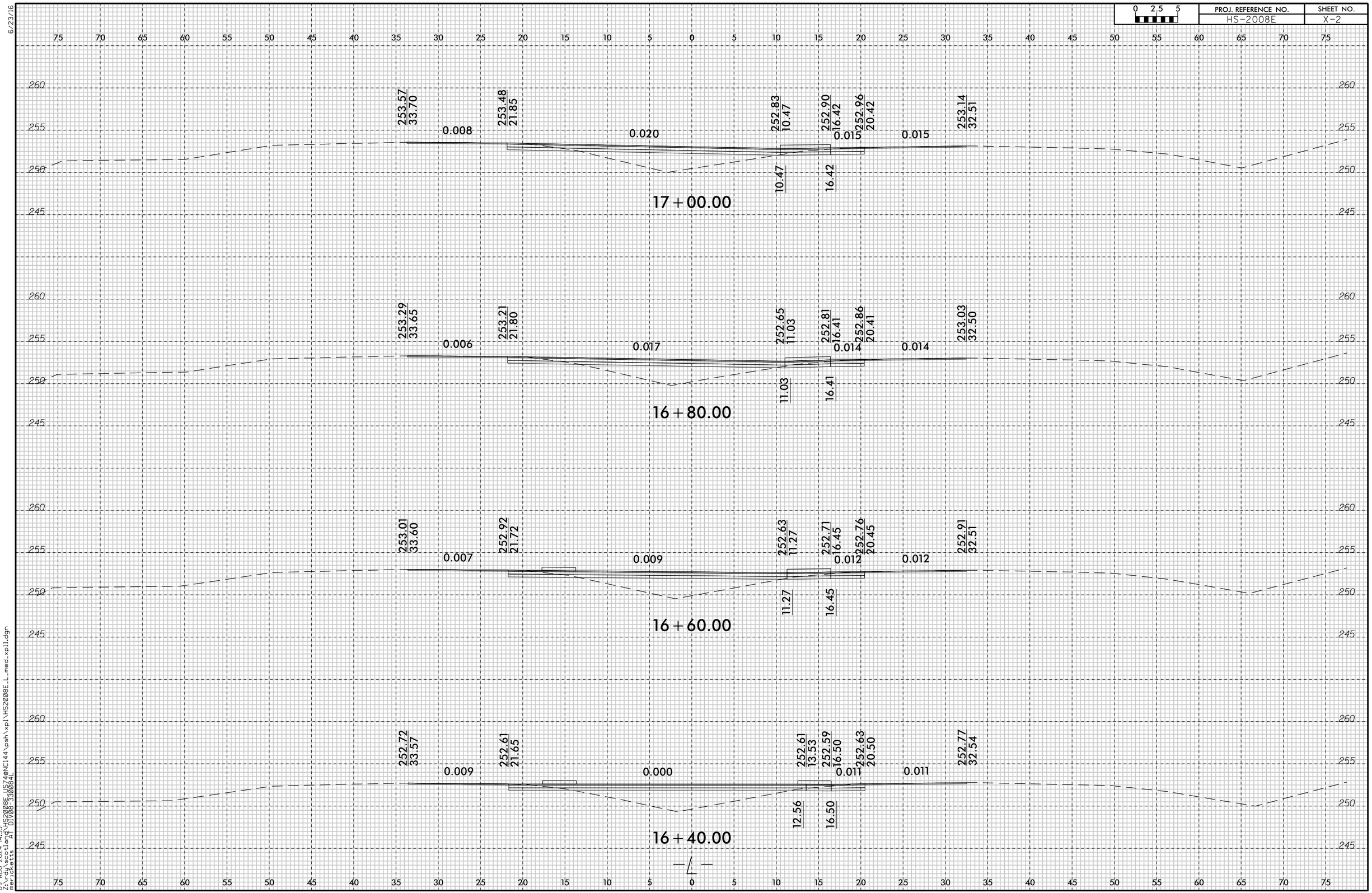

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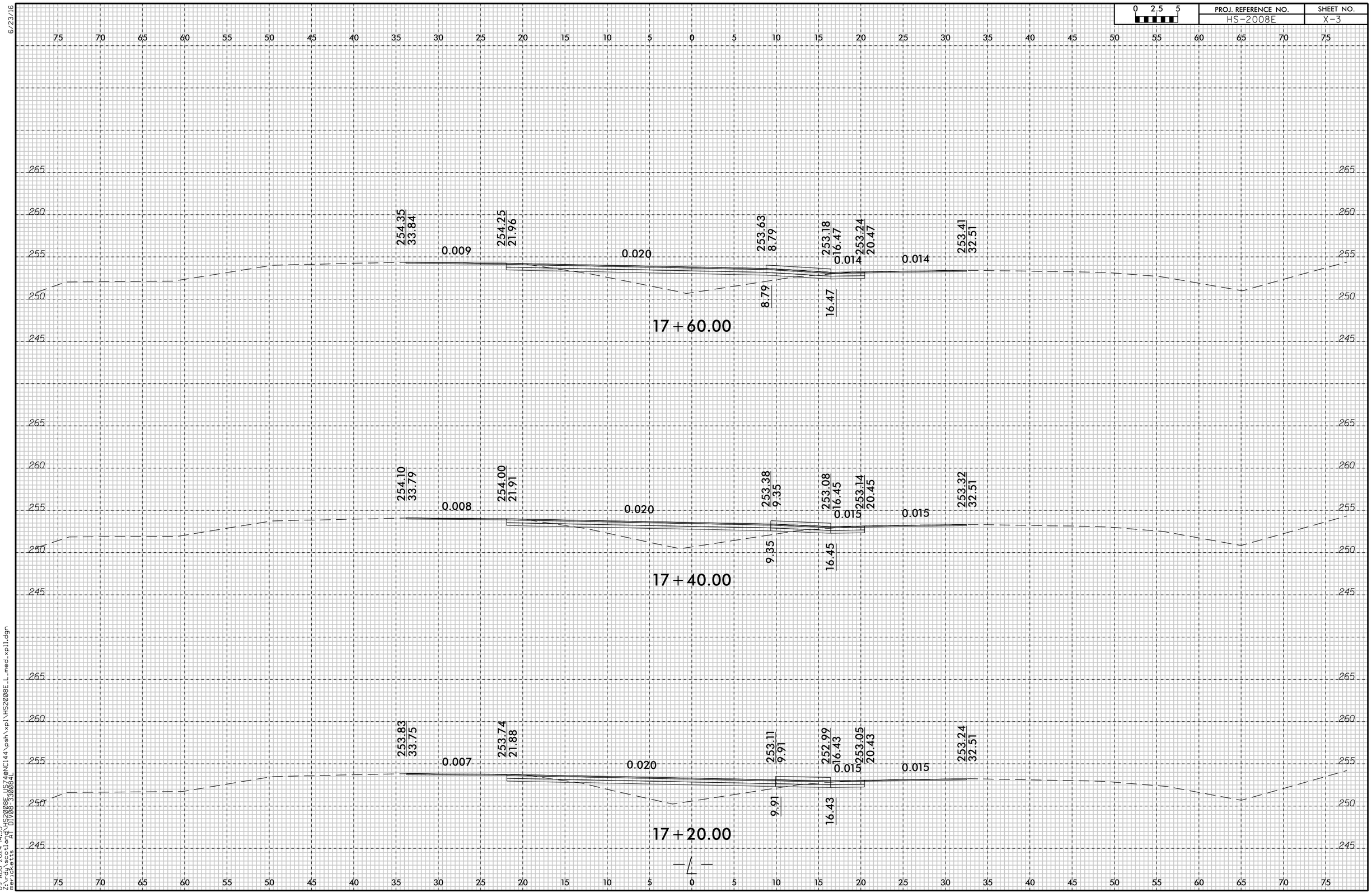

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6/23/16

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265 260 255 250 245

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34.00
0.009
254.85
22.06
0.020
254.26
7.10
253.37
16.43
0.029
253.49
20.40
7.11
16.43

18+20.00

254.78
33.95
0.009
254.67
22.02
0.020
254.08
7.67
253.36
16.45
0.013
253.41
20.43
0.013
253.57
32.50
7.67
16.45

18+00.00

254.58
33.89
0.008
254.48
21.99
0.020
253.87
8.23
253.27
16.47
0.014
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20.47
0.014
253.49
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16.47

17+80.00

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merickets
All Units Standard

6/23/16

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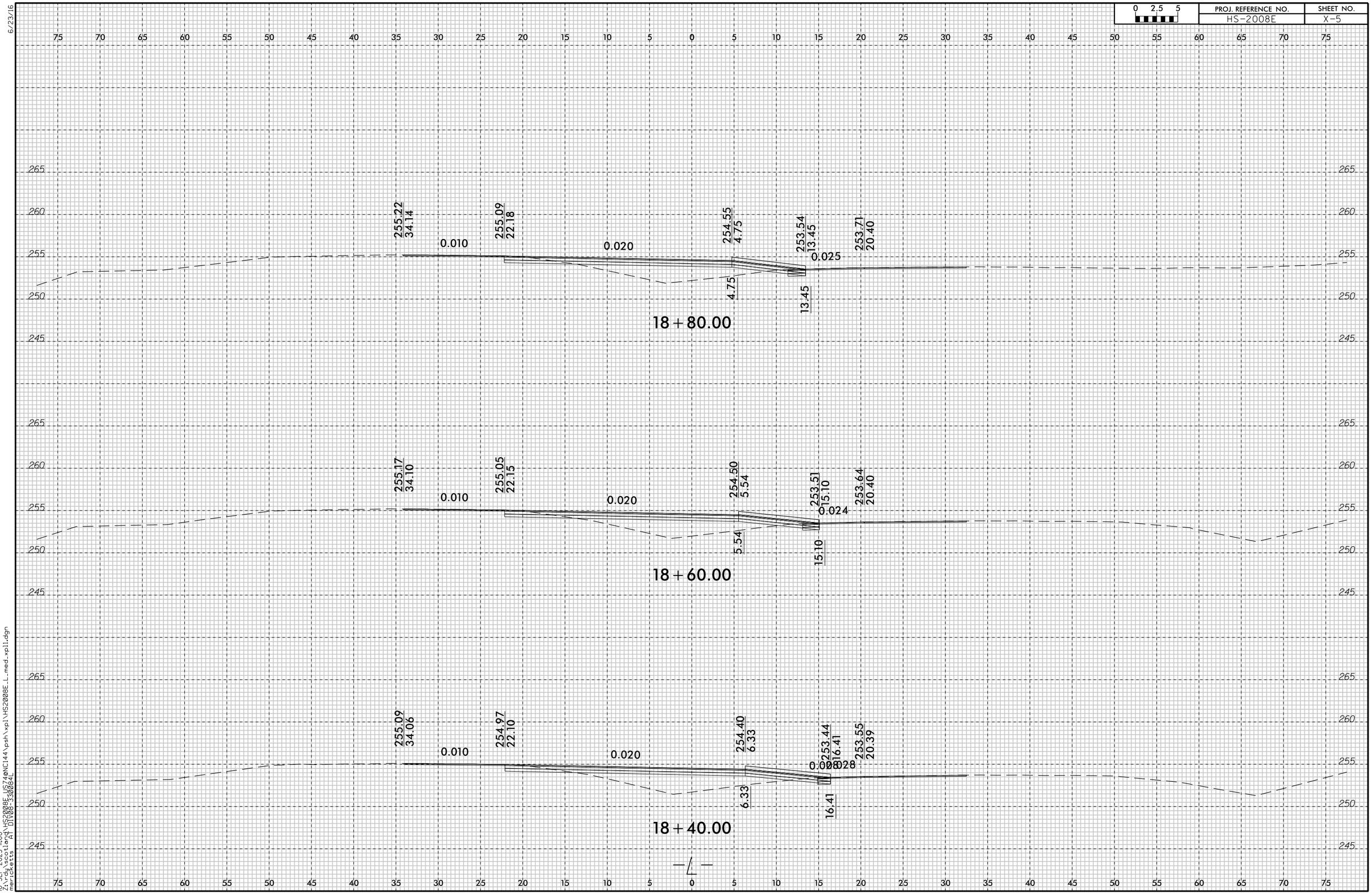

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DIV08 32084L

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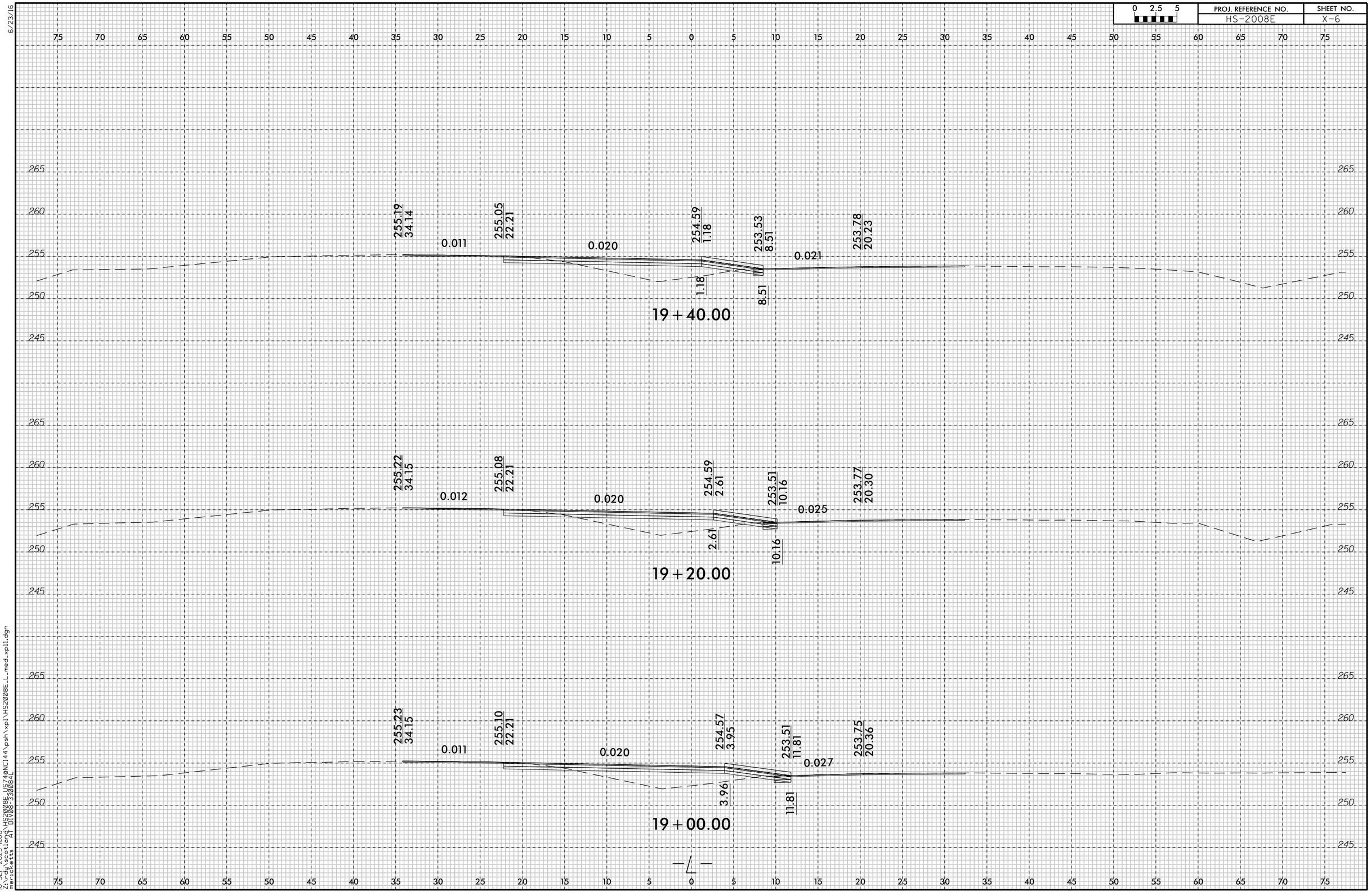

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DIV08 32084L

6/23/16

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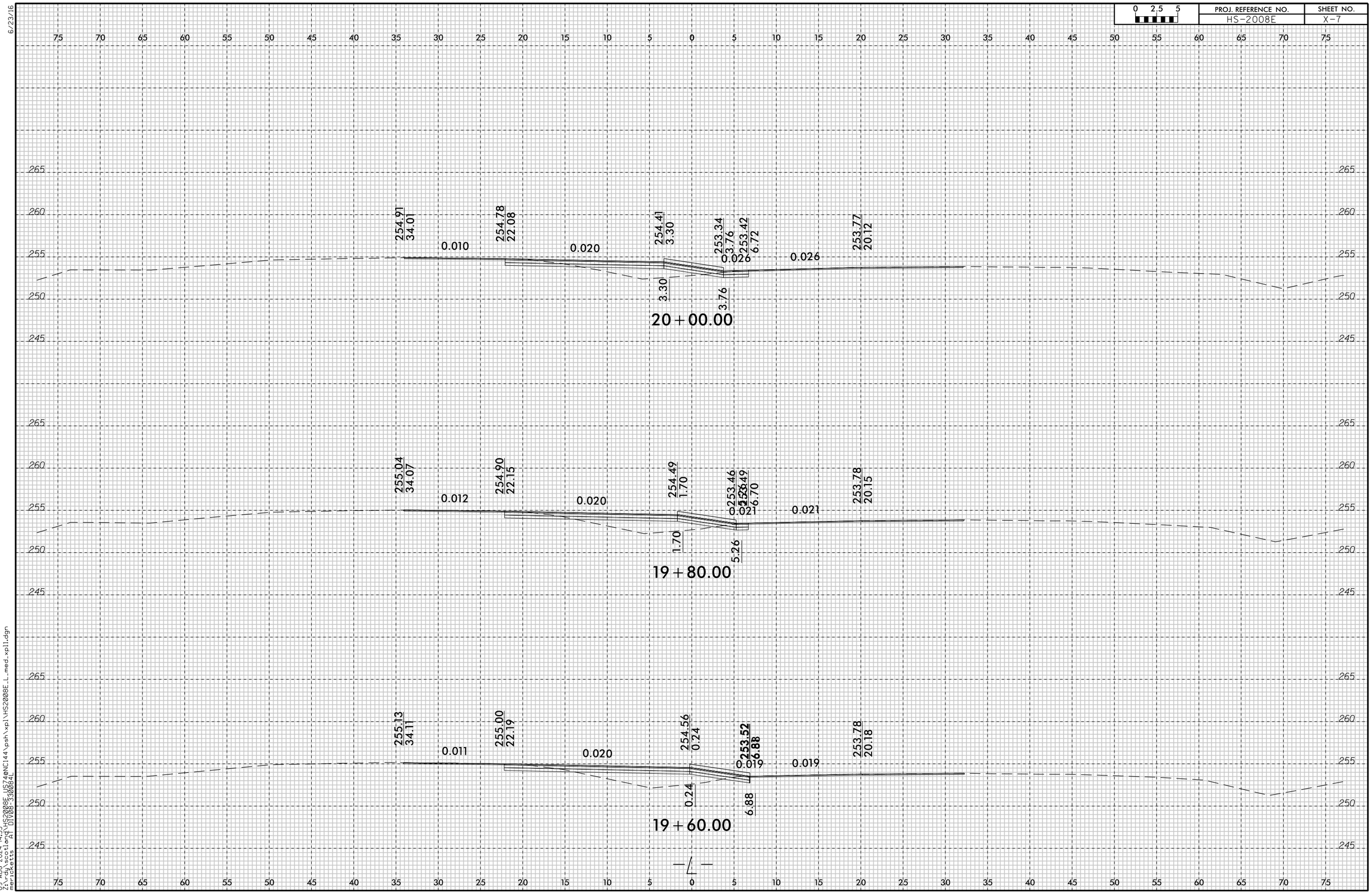

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6/23/16

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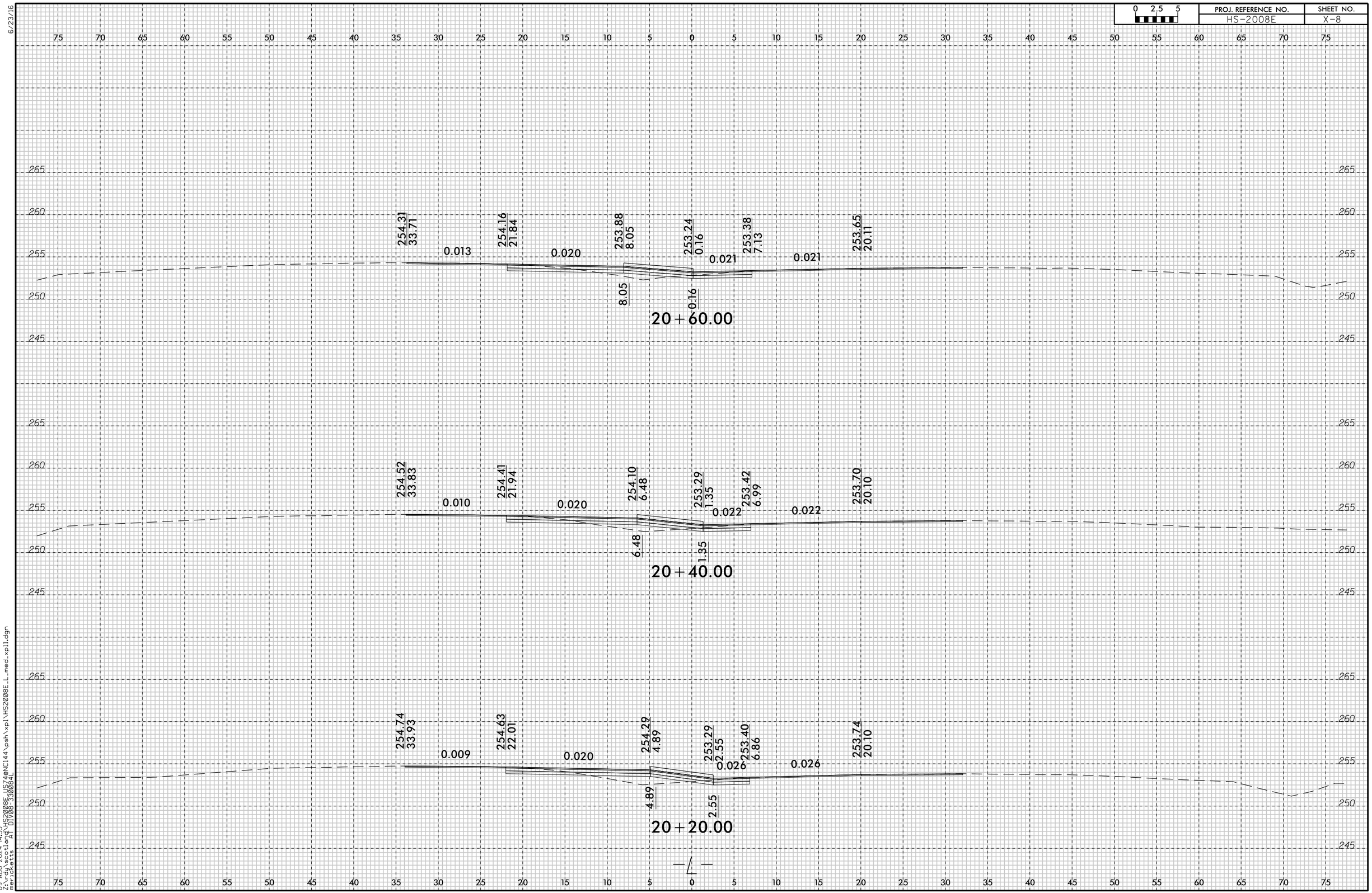

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6/23/16

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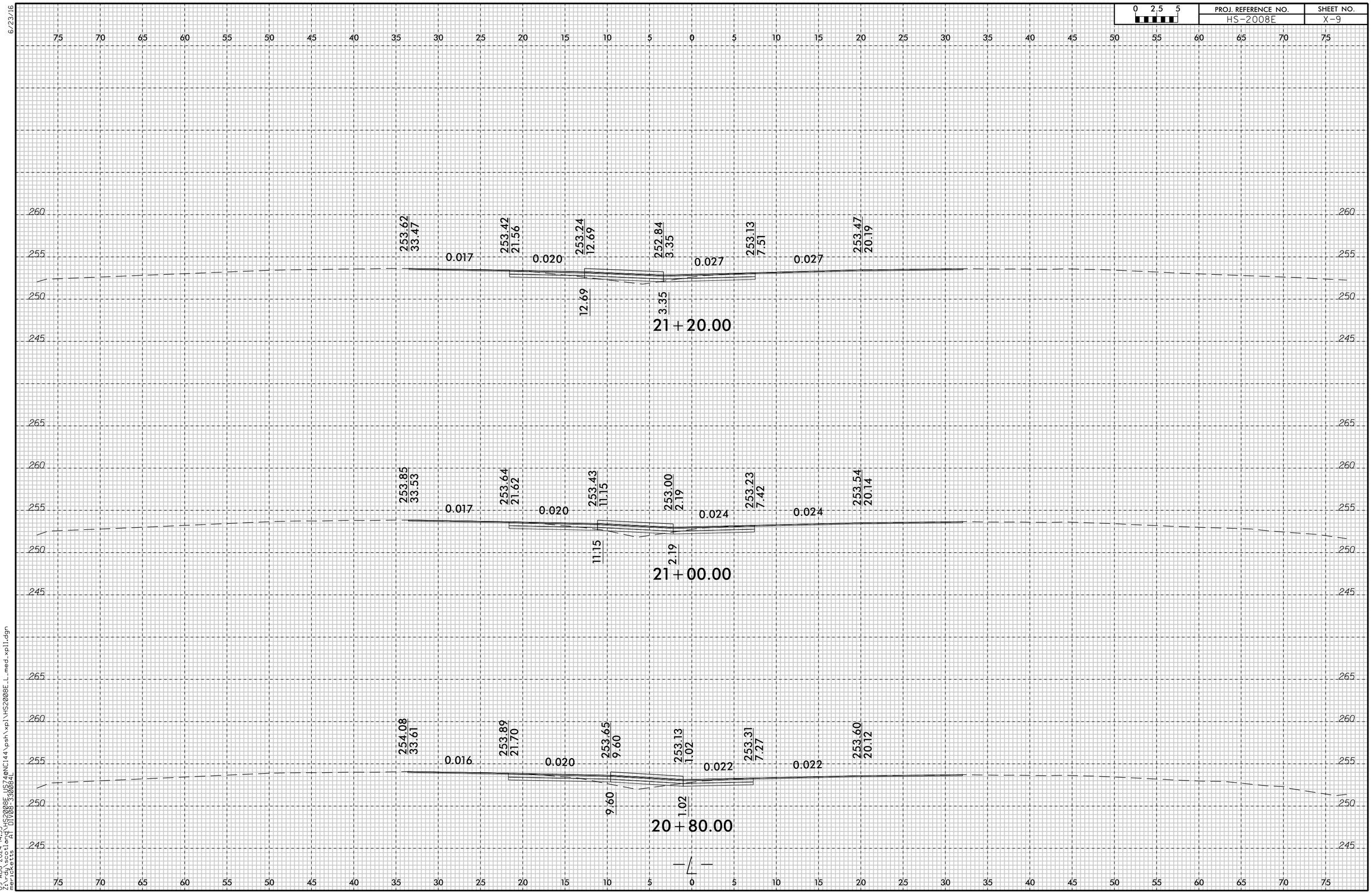

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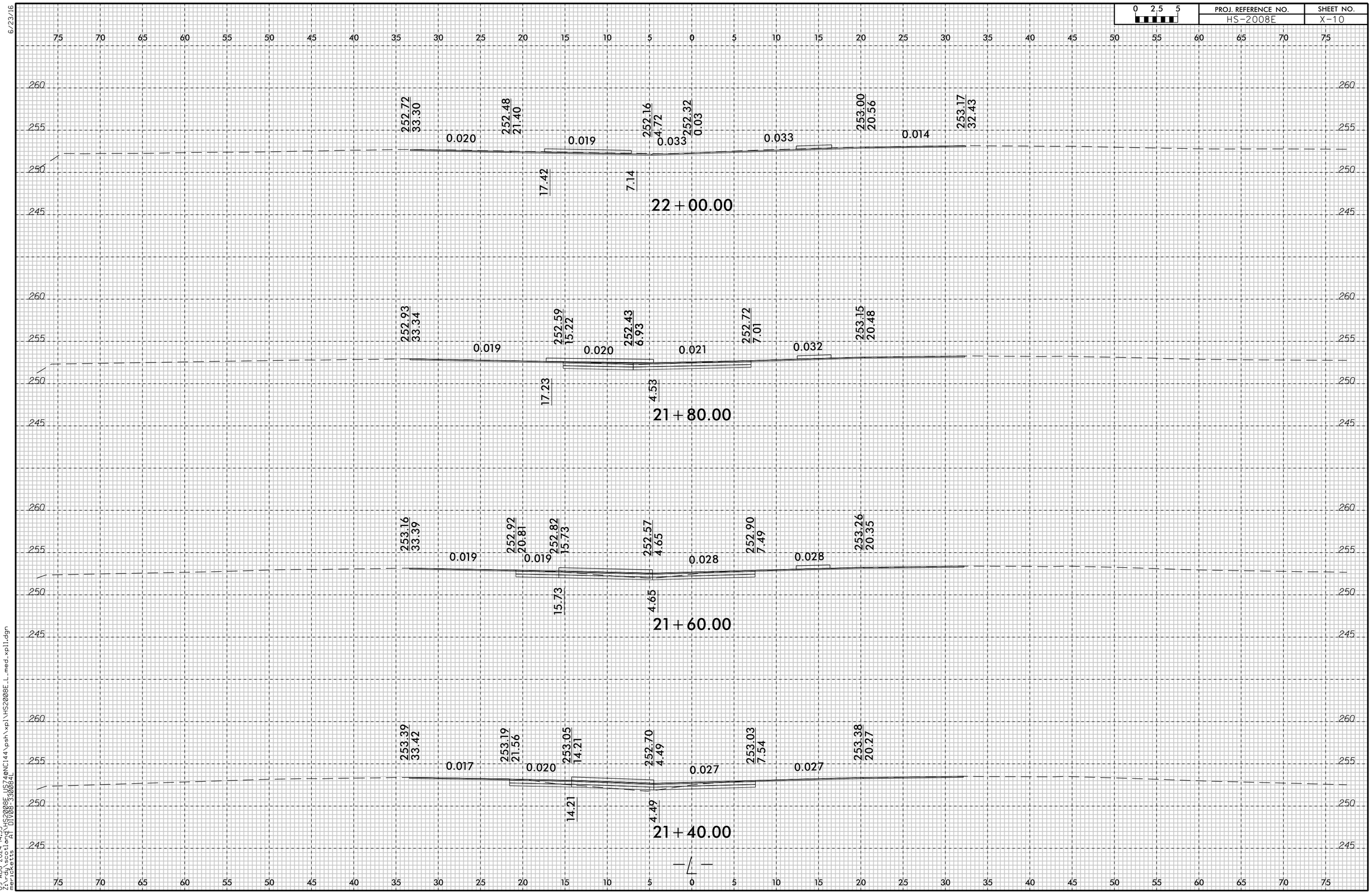

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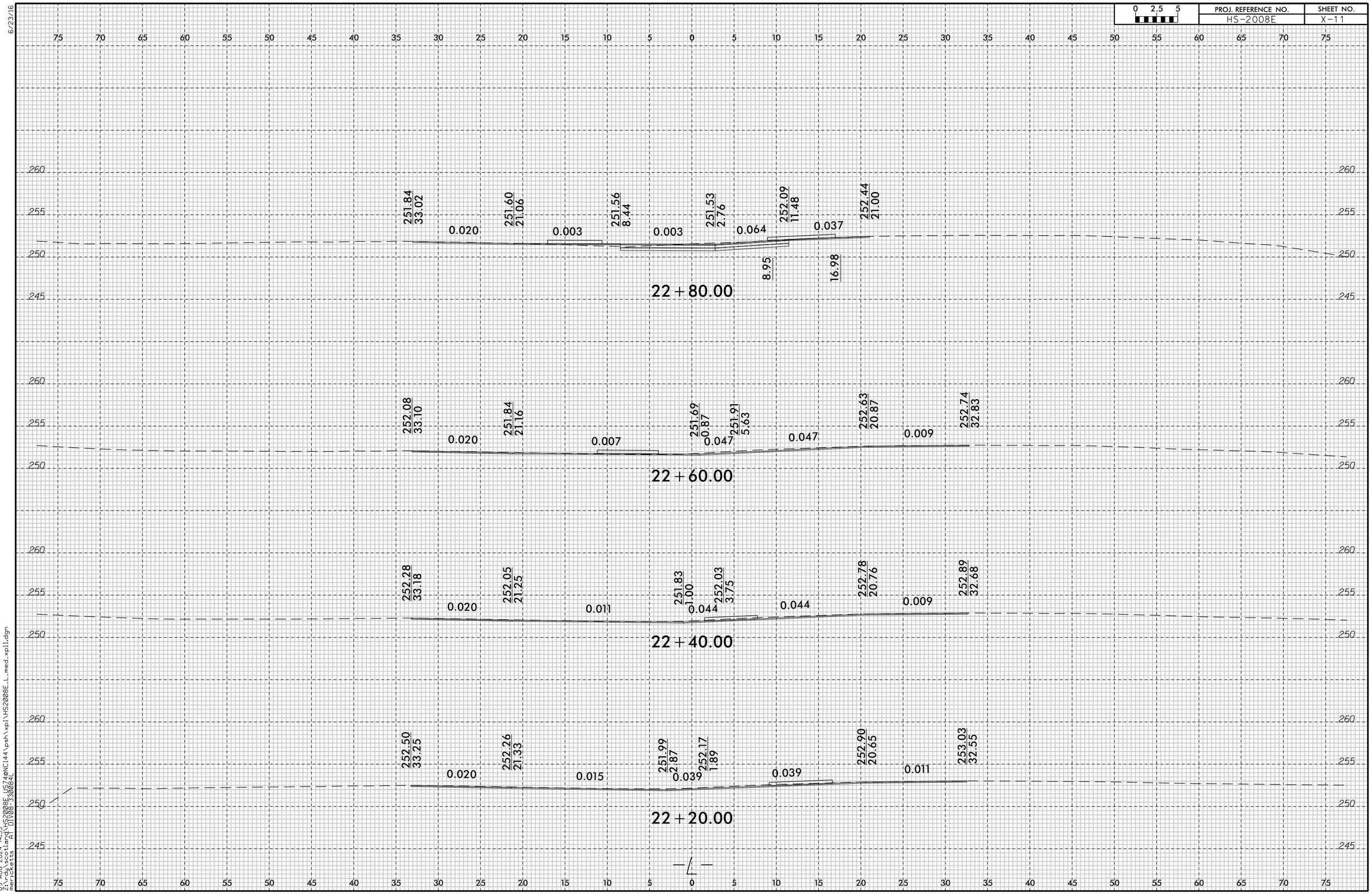

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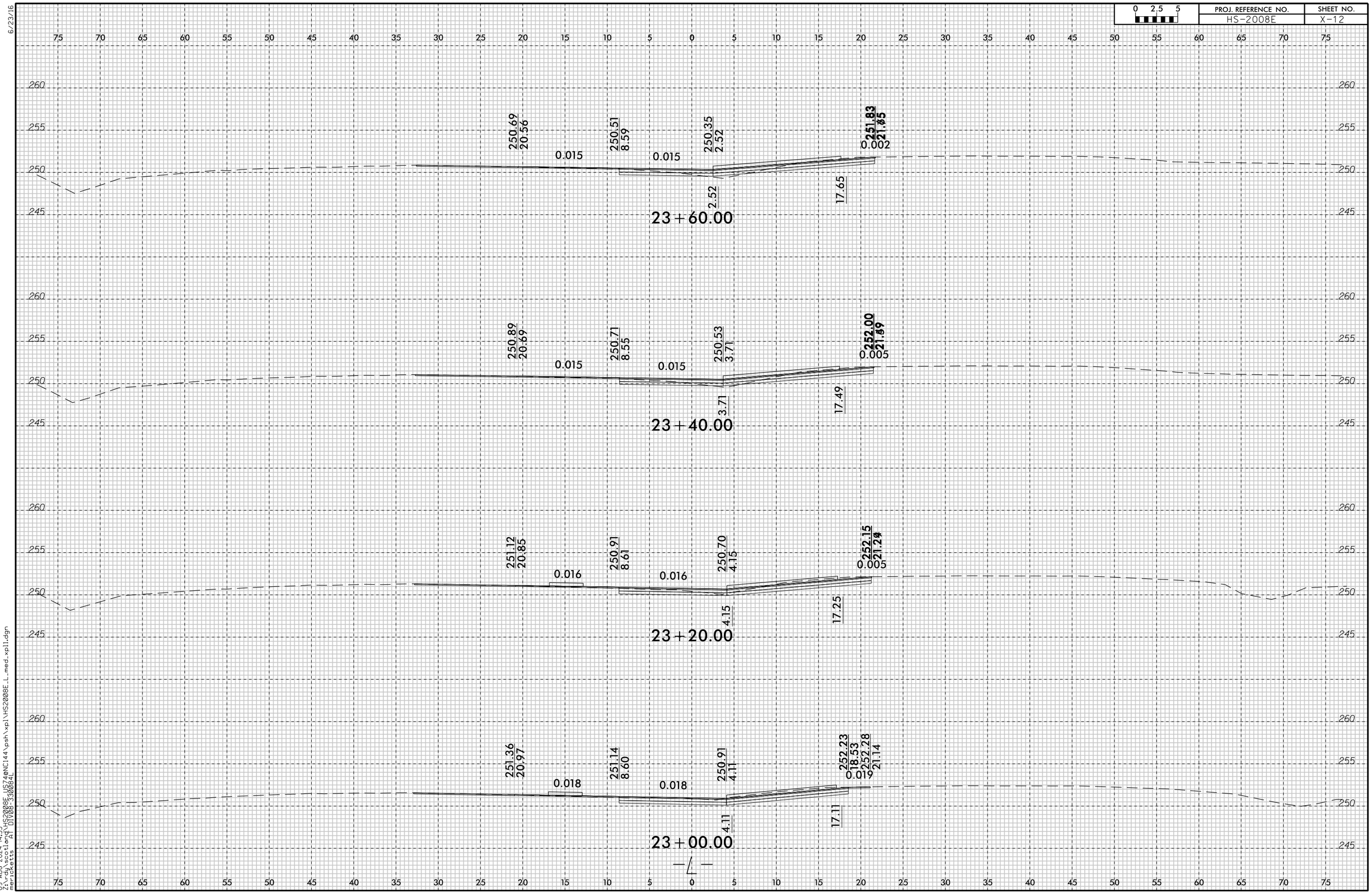

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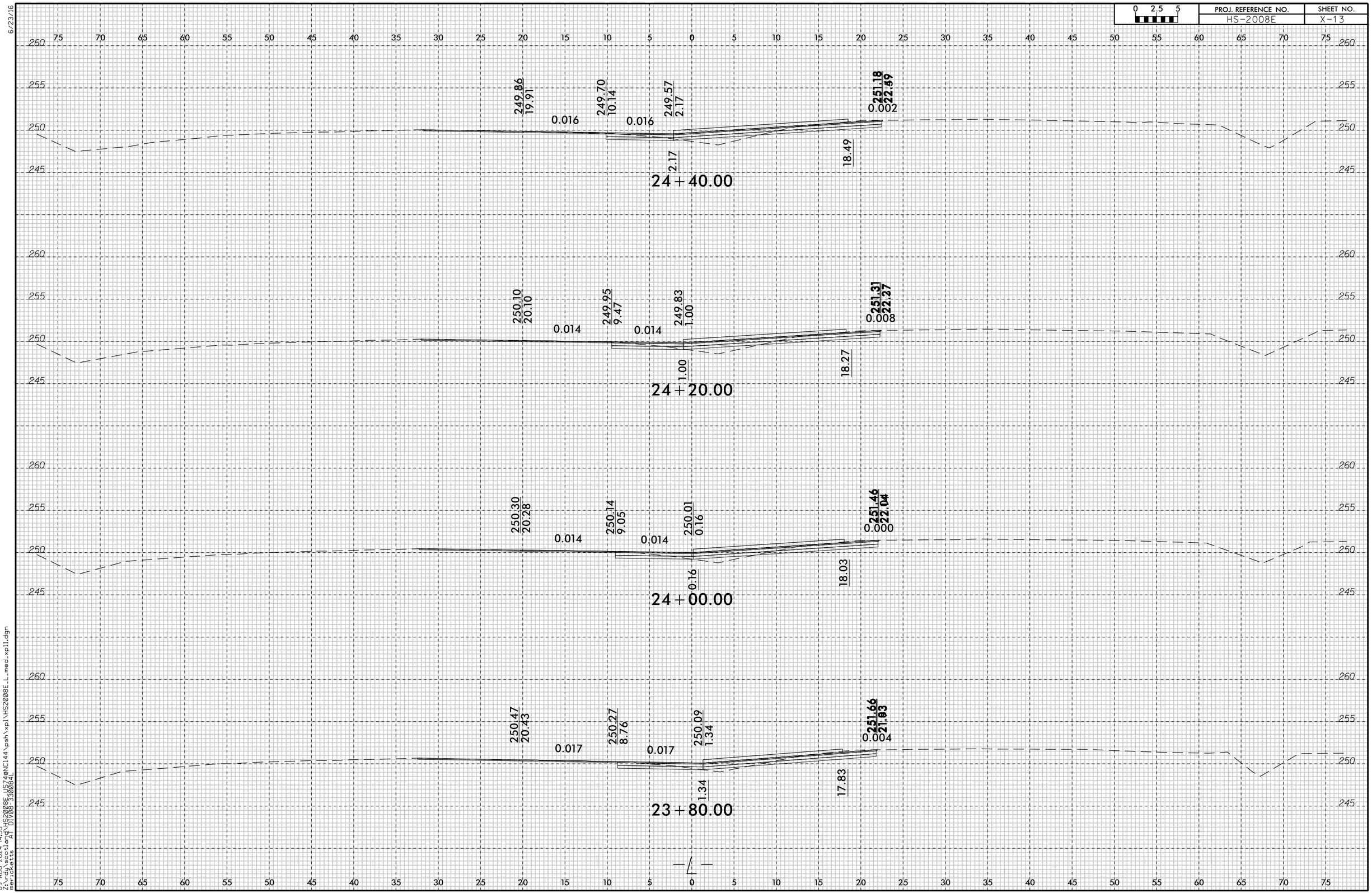

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260 255 250 245 240

249.28
19.35
0.015
249.18
13.33
0.015
249.06
5.43
250.65
222.88
0.001
5.43
18.78
25+00.00

249.48
19.50
0.016
249.36
12.12
0.016
249.24
4.40
250.83
222.86
0.000
4.40
18.76
24+80.00

249.66
19.72
0.015
249.53
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0.015
249.41
3.34
251.01
222.86
0.001
3.34
18.66
24+60.00

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6/23/16

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30.69
0.010
248.73
18.81
0.010
248.71
16.68
248.24
11.91
250

25+80.00

260 255 250 245

248.80
19.78
0.010
248.78
17.44
0.011
248.76
15.31

25+60.00

260 255 250 245

248.91
18.90
0.022
248.85
16.17
0.022
248.80
14.05

25+40.00

260 255 250 245

249.09
19.17
0.026
248.97
14.73
0.026
248.92
12.60

25+20.00

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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merickeitts
AT DIV08-3300084L

6/23/16

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255 250 245

248.15
31.68
0.013
247.99
19.74
247.96
17.62
0.25
246.98
10.87
26+80.00

248.28
31.48
0.014
248.11
19.51
248.08
17.38
0.25
247.13
10.73
26+60.00

248.41
31.25
0.012
248.26
19.27
248.23
17.14
0.25
247.33
10.68
26+40.00

248.55
30.96
0.010
248.43
19.01
248.41
16.88
0.25
247.50
10.40
26+20.00

248.70
30.73
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248.59
18.79
248.57
16.66
0.25
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10.73
26+00.00

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mericketts
AT DIV08-330084L

6/23/16

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250

245

27+00.00

250

245

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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mericketts AT DIV08-330084L

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250 245 260 255 250 245 240

46 + 80.00

248.30
0.016
20.25
18.06

0.023

249.27
0.004
21.40
19.41

46 + 60.00

46 + 40.00

46 + 20.00

250 245 250 245 250 245

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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6/23/16

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260
255
250

252.63
32.57
0.021
252.38
45.10
0.021
251.60
82.65
3:1
253.84
92.12
252.02
86.65

16+20.00

255
250

252.50
32.61
0.022
252.22
45.12
0.022
251.61
73.46
251.55
76.02
3:1
252.03
77.46

16+00.00

250

15+80.00

250

15+60.00

-L- Bulb Rt

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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merickette
AT DW08-330084L

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-20

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

260 255 250

253.03
32.50

0.018

252.81
44.98

0.018

252.20
79.02

3:1

256.41
94.40

252.62
83.02

16+80.00

260 255 250

252.91
32.51

0.016

252.71
45.02

0.016

252.14
80.65

3:1

255.51
93.53

252.56
84.65

16+60.00

260 255 250

252.77
32.54

0.019

252.54
45.07

0.019

251.85
82.28

3:1

254.66
93.46

252.27
86.28

16+40.00

-L- Bulb Rt

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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merricketts AT DIV08-330084L

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-21

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

260
255
250

253.32
32.51

0.014

253.15
44.91

0.014

252.76
74.13

3:1

257.62
91.46

253.18
78.13

17+40.00

260
255
250

253.24
32.51

0.017

253.03
44.93

0.017

252.52
75.76

3:1

257.63
93.81

252.94
79.76

17+20.00

260
255
250

253.14
32.51

0.019

252.90
44.95

0.019

252.29
77.39

3:1

257.10
94.56

252.71
81.39

17+00.00

-L- Bulb Rt

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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mericketts
AT DIV08-330084L

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-22

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

255
250

253.57
32.50

0.010

253.45
44.95

0.010

251.55
66.99

253.21
69.23

3:1

253.64
73.23

18+00.00

260
255
250

253.49
32.51

0.014

253.32
44.88

0.014

252.97
70.86

254.80
79.09

3:1

253.39
74.86

17+80.00

260
255
250

253.41
32.51

0.013

253.25
44.89

0.013

252.89
72.50

257.33
88.54

3:1

253.31
76.50

17+60.00

-L- Bulb Rt

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-23

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

260 255 250

253.76 32.48 — 0.005 — 253.68 48.39 — 0.005 — 253.57 68.89 — 0.080 — 253.25 72.89 — 4:1 — 3:1 — 256.44 92.95

251.75 78.89

18+60.00

260 255 250

253.71 32.49 — 0.003 — 253.66 46.74 — 0.003 — 253.59 68.86 — 0.080 — 253.27 72.86 — 4:1 — 3:1 — 257.62 96.42

251.77 78.86

18+40.00

260 255 250

253.64 32.50 — 0.007 — 253.55 45.48 — 0.007 — 253.38 68.83 — 0.080 — 253.06 72.83 — 4:1 — 3:1 — 258.20 98.73

251.56 78.83

18+20.00

-L- Bulb Rt

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-24

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

260
255
250

253.86
32.38

0.010

253.67
51.64

0.010

253.50
68.66

0.080

253.18
72.66

4:1

3:1

253.46
83.99

251.68
78.66

19+20.00

260
255
250

253.84
32.42

0.009

253.68
50.87

0.009

253.52
68.76

0.080

253.20
72.76

4:1

3:1

254.58
87.41

251.70
78.76

19+00.00

260
255
250

253.81
32.46

0.009

253.66
49.85

0.009

253.49
68.83

0.080

253.17
72.83

4:1

3:1

255.38
89.96

251.67
78.83

18+80.00

-L- Bulb Rt

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-25

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

260
255
250

253.88
32.18

0.024

253.36
54.16

0.024

253.02
68.40

0.080

252.70
72.40

4:1

3:1

252.90
83.51

251.20
78.40

19+80.00

253.89
32.26

0.020

253.47
53.27

0.020

253.17
68.47

0.080

252.85
72.47

4:1

3:1

253.05
83.56

251.35
78.47

19+60.00

253.88
32.32

0.013

253.62
52.42

0.013

253.40
68.56

0.080

253.08
72.56

4:1

3:1

253.17
83.32

251.58
78.56

19+40.00

℄ Bulb Rt

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-26

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

260 255 250 245

253.80 32.05 | 0.025 | 253.18 57.11 | 0.025 | 252.90 68.27 | 0.080 | 252.58 72.27 | 4:1 | 3:1 | 252.57 82.73

251.08 78.27

20+40.00

253.84 32.07 | 0.026 | 253.21 56.04 | 0.026 | 252.89 68.30 | 0.080 | 252.57 72.30 | 4:1 | 3:1 | 252.64 83.01

251.07 78.30

20+20.00

253.86 32.11 | 0.026 | 253.27 55.07 | 0.026 | 252.92 68.35 | 0.080 | 252.60 72.35 | 4:1 | 3:1 | 252.77 83.35

251.10 78.35

20+00.00

—L— Bulb Rt

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-27

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

255 250 245

253.67
32.06

0.025

252.89
63.59

0.025

252.77
68.20

0.080

252.45
72.20

4:1

3:1

251.32
79.31

250.95
78.20

21+00.00

253.72
32.04

0.027

252.95
60.31

0.027

252.74
68.22

0.080

252.42
72.22

4:1

3:1

251.87
81.08

250.92
78.22

20+80.00

260 255 250 245

253.76
32.04

0.025

253.12
58.41

0.025

252.87
68.25

0.080

252.55
72.25

4:1

3:1

252.15
81.54

251.05
78.25

20+60.00

-L- Bulb Rt

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	HS-2008E	X-28

21+20.00

-L- Bulb Rt

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