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09/08/99

TIP PROJECT: W-5506

CONTRACT: DN00431

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

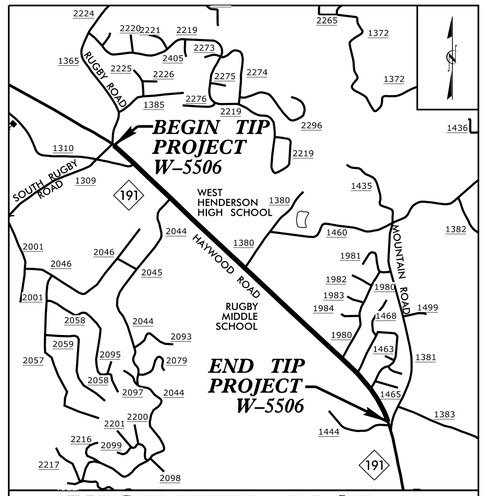
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5506	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
45505.1.1	HSIP-0191(12)	PE
45505.2.FR1	HSIP-0191(12)	ROW/UTIL.
45505.3.3	HSIP-0191(12)	CONST.

HENDERSON COUNTY

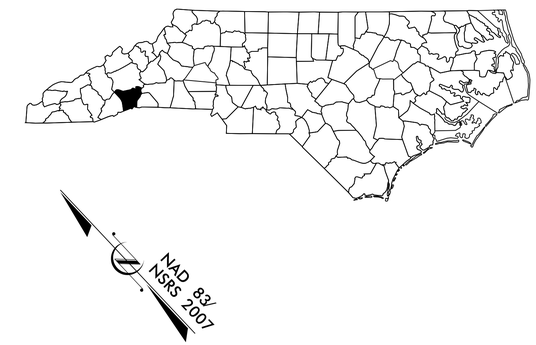
LOCATION: NC 191 (HAYWOOD ROAD), FROM SR 1365 (SOUTH OF RUGBY ROAD) TO SR 1381 (NORTH OF MOUNTAIN ROAD)

TYPE OF WORK: GRADING, PAVING, AND DRAINAGE

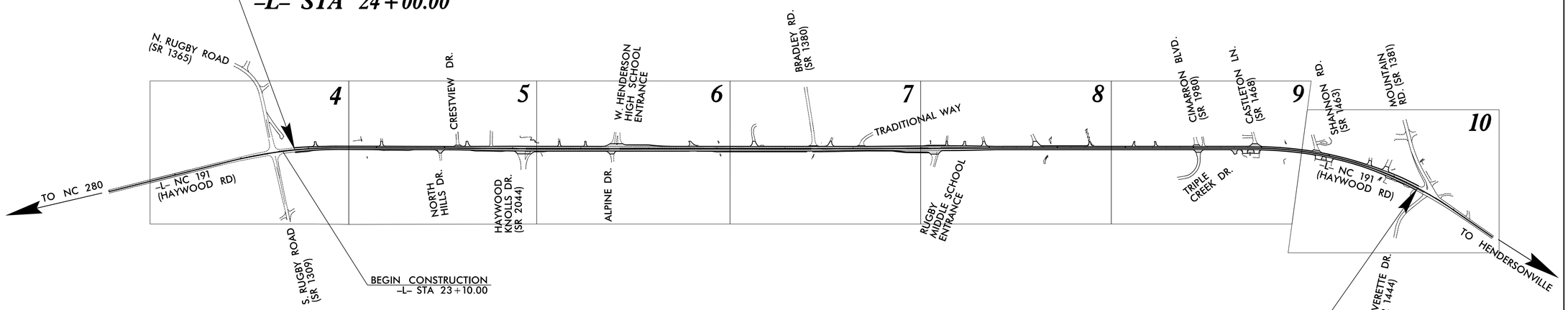


VICINITY MAP N.T.S

100% PLANS



BEGIN TIP PROJECT W-5506
-L- STA 24+00.00



END TIP PROJECT W-5506
-L- STA 106+95.00

RS&H

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

GRAPHIC SCALES

50 0 50 100
PLANS

50 0 50 100
PROFILE (HORIZONTAL)

10 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2017 = 15,000
ADT 2035 = 23,800
DHV = 10 %
D = 55 %
T = 7 % *
V = 50 MPH
*TTST 2%+DUAL 5%
FUNC CLASS = ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5506 = 1.571 MILES
LENGTH STRUCTURE TIP PROJECT W-5506 = 0.000 MILES
TOTAL LENGTH TIP PROJECT W-5506 = 1.571 MILES

NCDOT CONTACT:
WANDA H. AUSTIN, PE
DIVISION 14 PROJECT MANAGER

PREPARED IN THE OFFICE OF:
RS&H
ARCHITECTS-ENGINEERS-PLANNERS, INC.
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:
DECEMBER 12, 2017

JASON TALLEY, PE
PROJECT ENGINEER

ALLISON DRAKE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
DocuSigned by: Will Weatherstone
P.E. 11/10/2017
SIGNATURE:

ROADWAY DESIGN ENGINEER
DocuSigned by: Jason M. Talley
P.E. 11/10/2017
SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-5506	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER

DocuSigned by: DFSF8B8B0B0B434...

11/10/2017

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2C-1 THRU 2C-10	GUARDRAIL DETAILS
2D-1	DRAINAGE DETAIL
3B-1	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, AND EARTHWORK SUMMARY
4 THRU 10	PLAN SHEETS
11 THRU 14	PROFILE SHEETS
TMP-1 THRU TMP-17	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-9	PAVEMENT MARKING PLANS
EC-1 THRU EC-17	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-17	SIGNING PLANS
X-1A THRU X-1B	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-42	CROSS-SECTIONS

GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-12

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

UNDERDRAINS:

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

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, AT&T, CITY OF HENDERSONVILLE, PSNC, MORRIS BROADBAND

STANDARD DRAWINGS

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.72	Pipe Collar
852.01	Concrete Islands
876.02	Guide for Rip Rap at Pipe Outlets

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
W-5506	1B

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
- 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:

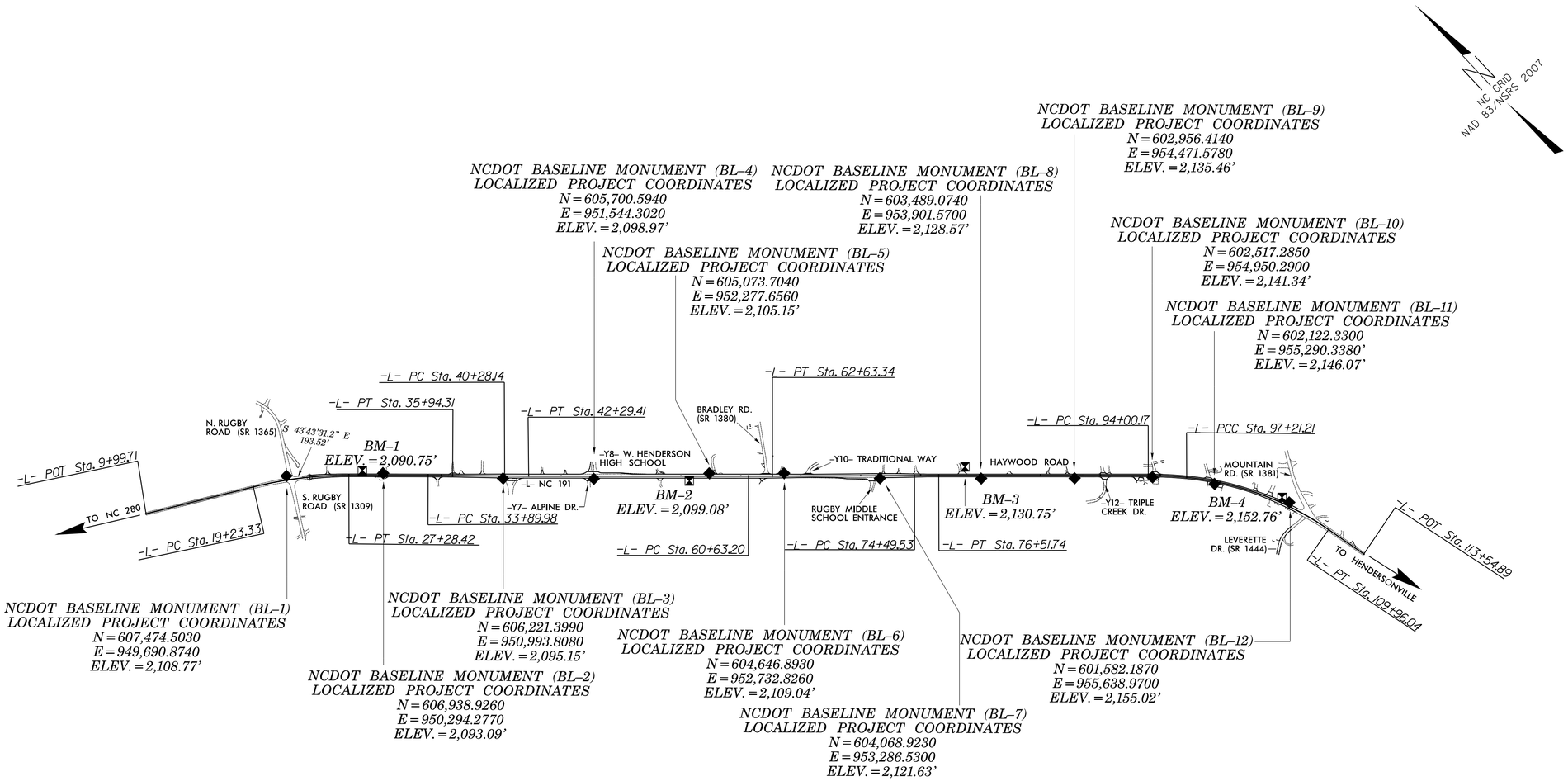
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

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.

PROJECT REFERENCE NO.	SHEET NO.
W-5506	1C-1
Location and Surveys	

SURVEY CONTROL SHEET W-5506
-FINAL-



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "W5506 BL-1"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 607474.5030(ft) EASTING: 949690.8740(ft)
ELEVATION: 2108.77(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: N/A
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM BL-1 TO -L- STATION 24+00 IS
S 43° 43' 31.2" E 193.52'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/

THE FILES TO BE FOUND ARE AS FOLLOWS:
W-5506_LS_CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	1C-2
Location and Surveys	

SURVEY CONTROL SHEET W-5506
-FINAL-

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	BL-1	607474.5030	949690.8740	2108.77
2	BL-2	606938.9260	950294.2770	2093.09
3	BL-3	606221.3990	950993.8080	2095.15
4	BL-4	605700.5940	951544.3020	2098.97
5	BL-5	605073.7040	952277.6560	2105.15
6	BL-6	604646.8930	952732.8260	2109.04
7	BL-7	604068.9230	953286.5300	2121.63
8	BL-8	603489.0740	953901.5700	2128.57
9	BL-9	602956.4140	954471.5780	2135.46
10	BL-10	602517.2850	954950.2900	2141.34
11	BL-11	602122.3300	955290.3380	2146.07
12	BL-12	601582.1870	955638.9700	2155.02

BY

POINT	DESC.	NORTH	EAST	ELEVATION
13	BY-13	607657.9922	949862.2150	2120.47
14	BY-14	607992.6209	949978.1982	2129.96

-L- FINAL

TYPE	STATION	NORTH	EAST
POT	09+99.71	608046.5909	948620.3048
PC	19+23.33	607596.5511	949426.8721
PT	27+28.42	607121.6386	950074.4108
PC	33+89.98	606667.4740	950555.4606
PT	35+94.31	606526.7982	950703.6421
PC	40+28.14	606227.2384	951017.4452
PT	42+29.41	606088.8252	951163.5678
PC	60+63.20	604832.8979	952499.7695
PT	62+63.34	604696.1586	952645.9133
PC	74+49.53	603887.6982	953513.9257
PT	76+51.74	603749.5625	953661.5984
PC	94+00.17	602552.4106	954935.8968
PCC	97+21.21	602321.4386	955158.6848
PT	109+96.04	601193.7057	955723.2934
POT	113+54.89	600842.7626	955798.1760

BM1 ELEVATION = 2090.75
N 607073 E 950184

BM2 ELEVATION = 2099.08
N 605141 E 952112

BM3 ELEVATION = 2130.75
N 603652 E 953870

BM4 ELEVATION = 2152.76
N 601655 E 955624

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "W5506 BL-1"
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S 43° 43′31.2″ E 193.52′
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   W-5506_LS_CONTROL.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
W-5506	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025473 ENGINEER JASON W. TALLEY
DocuSigned by: Jason Talley
11/8/2017

PAVEMENT DESIGN ENGINEER

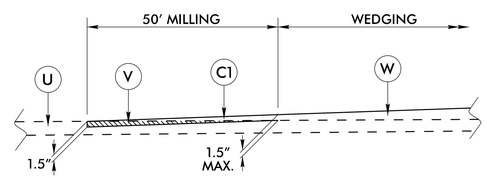
NORTH CAROLINA PROFESSIONAL SEAL 025936 ENGINEER WANDA H. AUSTIN
DocuSigned by: Wanda Austin
11/8/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

P A V E M E N T S C H E D U L E

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E1	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 4″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.		
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2″ IN DEPTH.	T	EARTH MATERIAL.		
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.		
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.	V	VARIABLE MILLING BITUMINOUS PAVEMENT 0″-1.5″ DEPTH		

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

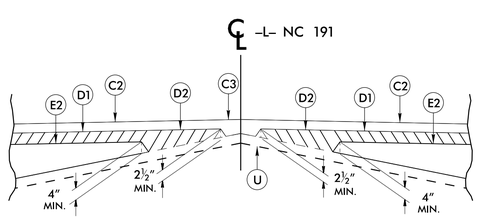


DETAIL OF MILLING AT PAVEMENT TIE–INS

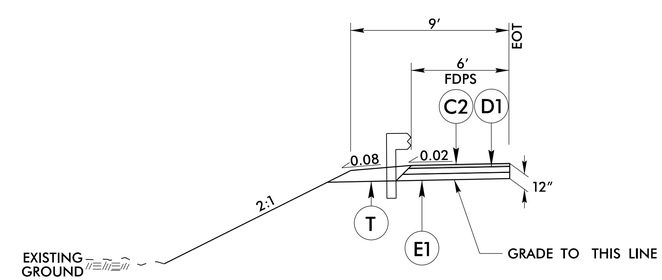
*USE DETAIL

–L– STA. 24+00.00 TO –L– STA. 24+50.00
–L– STA 106+45.00 TO –L– STA 106+95.00

NOTE: 3″ MILLING FOR PAVEMENT PATCH REPAIR AT THE DISCRETION OF THE ENGINEER THROUGHOUT PROJECT



STANDARD WEDGING DETAIL



DETAIL SHOWING PAVED SHOULDER RELATION TO GUARDRAIL

SEE PLANS FOR LOCATION
USE WITH –L– TYPICAL SECTION

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	2A-2

ROADWAY DESIGN ENGINEER — 11/8/2017

PAVEMENT DESIGN ENGINEER — 11/8/2017

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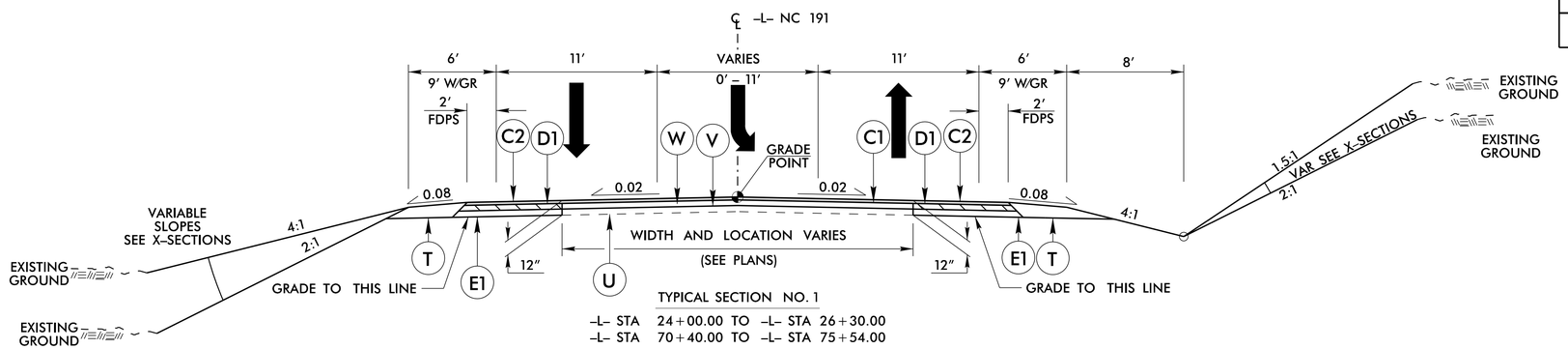
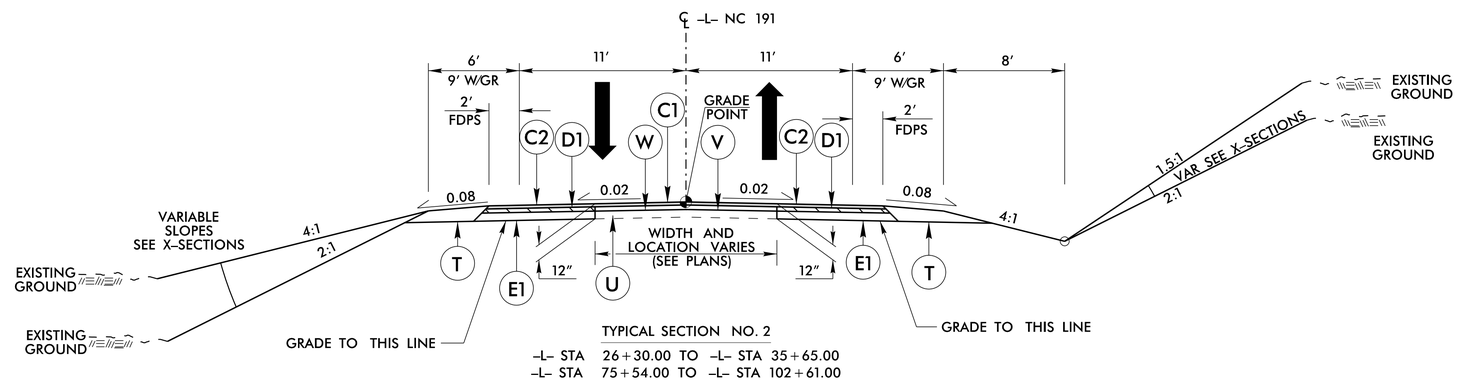
PAVEMENT SCHEDULE	
C1	1.5″ S9.5B
C2	3″ S9.5B
C3	VAR. DEPTH S9.5B
D1	4″ I19.0B
D2	VAR. DEPTH I19.0B
E1	5″ B25.0B
E2	VAR. DEPTH B25.0B
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	MILLING
W	WEDGING



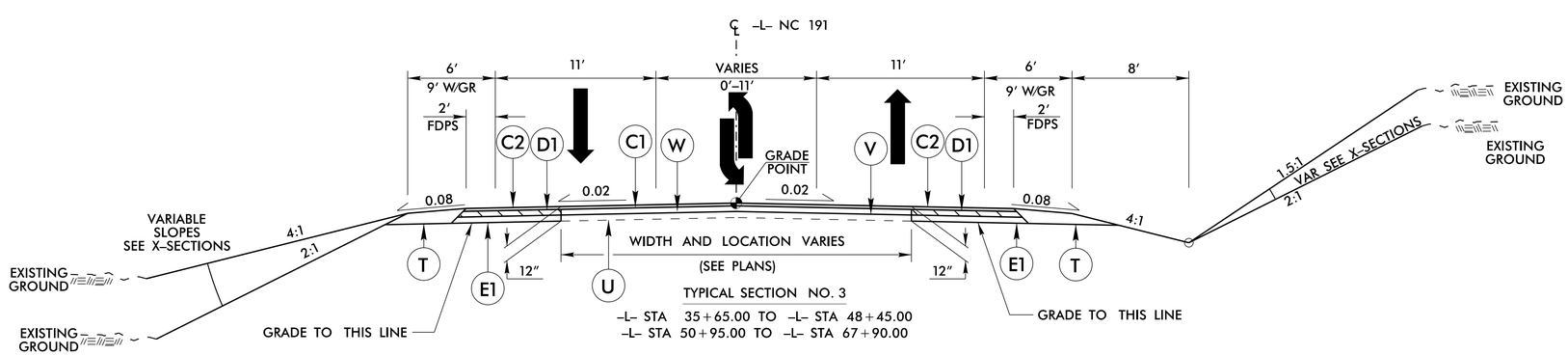
TYPICAL SECTION NO. 1

-L- STA 24+00.00 TO -L- STA 26+30.00
-L- STA 70+40.00 TO -L- STA 75+54.00



TYPICAL SECTION NO. 2

-L- STA 26+30.00 TO -L- STA 35+65.00
-L- STA 75+54.00 TO -L- STA 102+61.00



TYPICAL SECTION NO. 3

-L- STA 35+65.00 TO -L- STA 48+45.00
-L- STA 50+95.00 TO -L- STA 67+90.00

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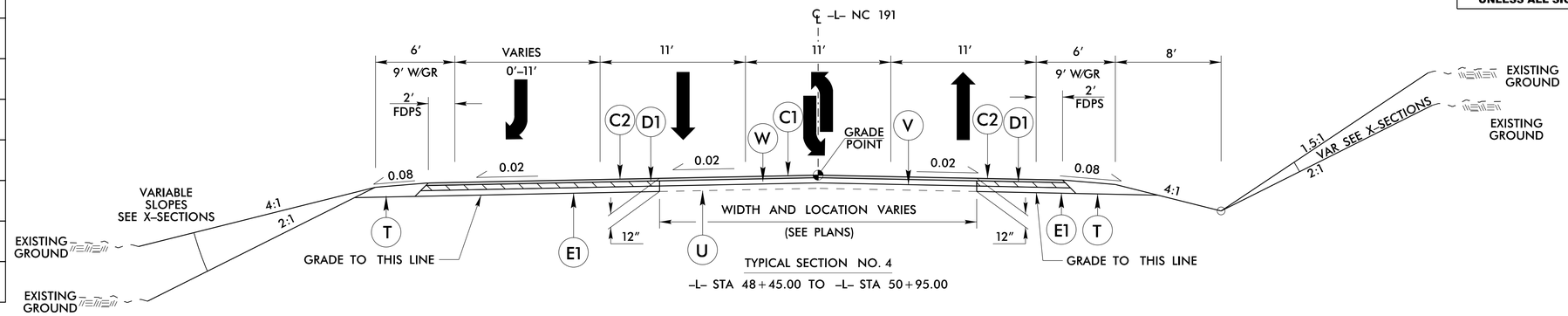
PROJECT REFERENCE NO.	SHEET NO.
W-5506	2A-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
11/8/2017	11/8/2017

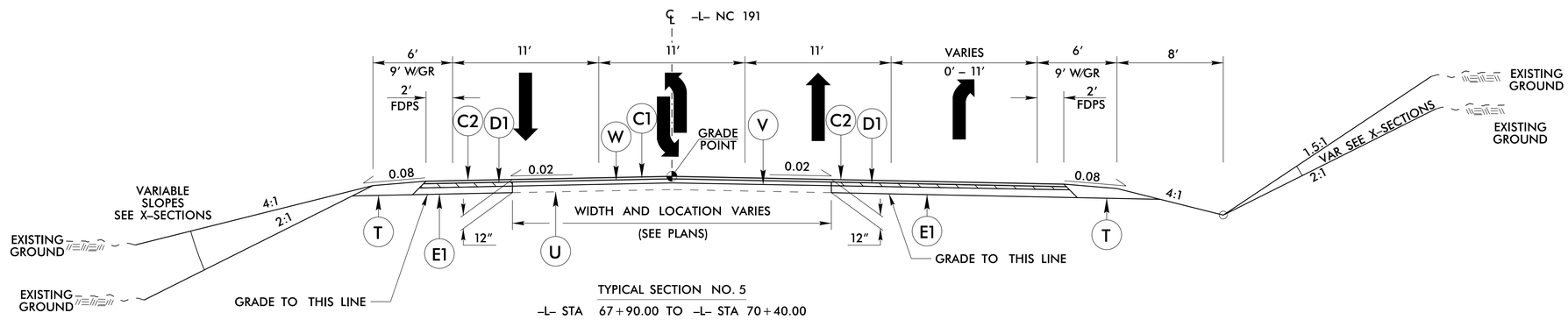
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE	
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	4" I19.0B
D2	VAR. DEPTH I19.0B
E1	5" B25.0B
E2	VAR. DEPTH B25.0B
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	MILLING
W	WEDGING



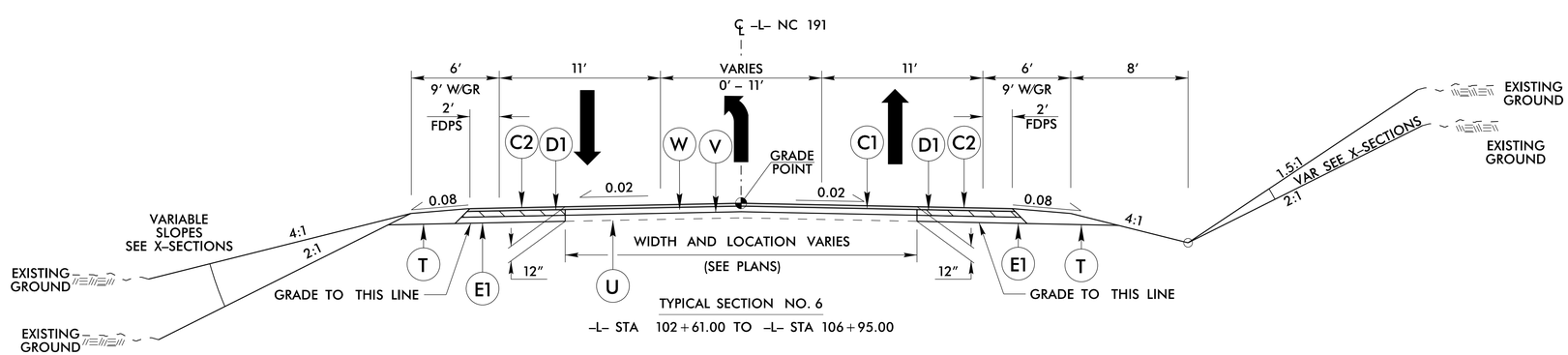
TYPICAL SECTION NO. 4

-L- STA 48+45.00 TO -L- STA 50+95.00



TYPICAL SECTION NO. 5

-L- STA 67+90.00 TO -L- STA 70+40.00



TYPICAL SECTION NO. 6

-L- STA 102+61.00 TO -L- STA 106+95.00

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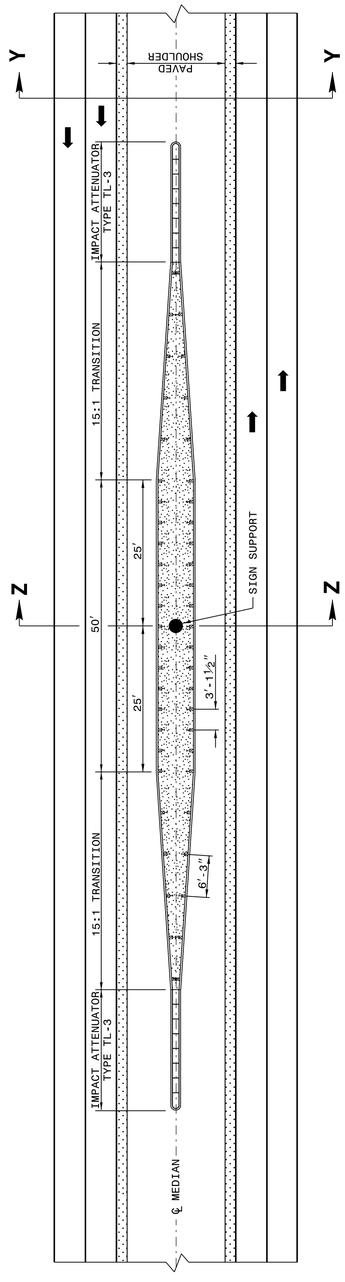
PROJECT REFERENCE NO.	SHEET NO.
W-5506	2C-1

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

ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT

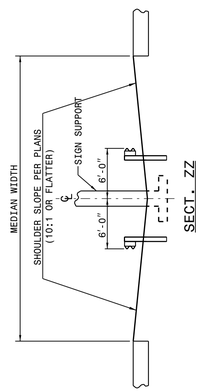
SHEET 2 OF 11 **862D01**

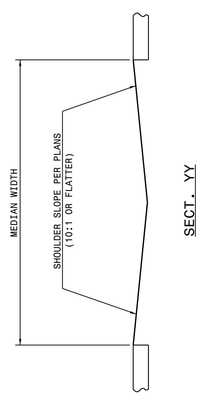


NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3'-11½" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.

GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862D01 SHEET 1 OF 12).





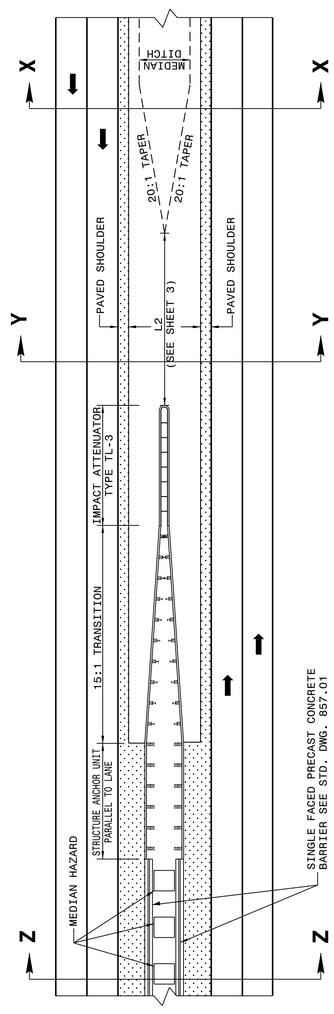
DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

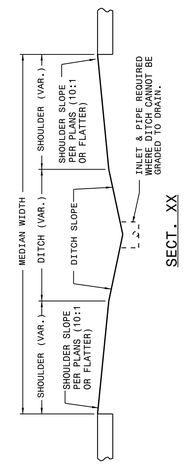
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

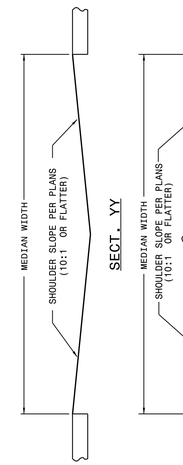
ROADWAY DETAIL DRAWING FOR

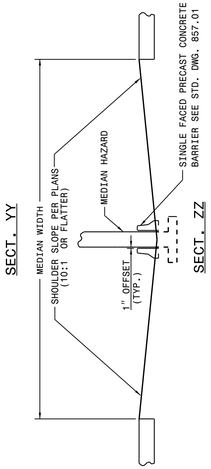
GUARDRAIL PLACEMENT

SHEET 1 OF 11 **862D01**

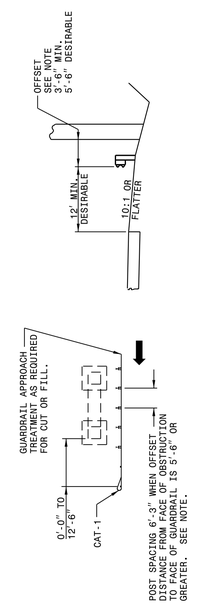








DETAIL OF MEDIAN TREATMENT AT UNDERPASS



NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-11½" POST SPACING AT 12' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

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

ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT

SHEET 1 OF 11 **862D01**

11/9/2017

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CHECKED BY: DATE:
FILE SPEC.:

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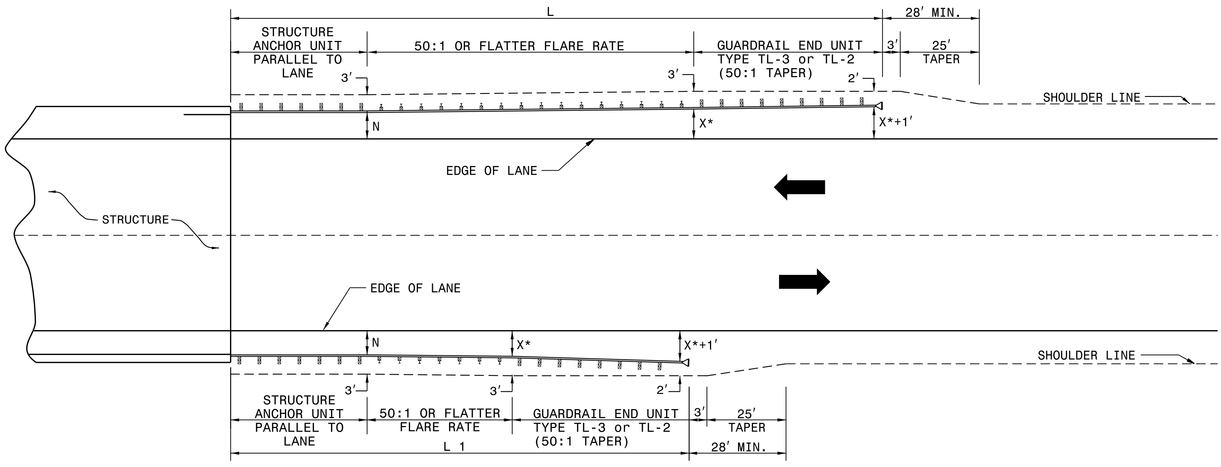
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



* USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

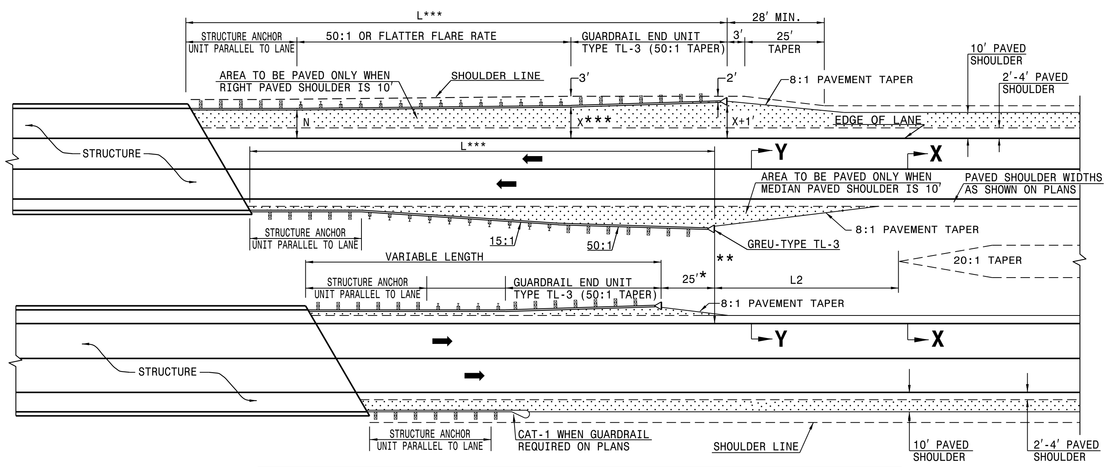
GUARDRAIL INSTALLATION AT BRIDGE APPROACHES FOR TWO-LANE, TWO-WAY TRAFFIC								
DESIGN SPEED (MPH)	"L" APPROACH LENGTH (FT.)				"L1" TRAILING LENGTH (FT.)			
	DESIGN YEAR ADT		CURRENT YEAR ADT		DESIGN YEAR ADT		CURRENT YEAR ADT	
	OVER 2000	1001-2000	400-1000	UNDER 400	OVER 2000	1001-2000	400-1000	UNDER 400
70	362.5'	362.5'	350.0'	287.5'	187.5'	187.5'	175.0'	75.0'
60	300.0'	287.5	275.0'	225.0'	137.5'	137.5'	100.0'	75.0'
50	212.5'	212.5'	200.0'	162.5'	87.5'	75.0'	75.0'	75.0'
40	175.0'	150.0'	137.5'	112.5'	75.0'	75.0'	75.0'	75.0'
X *	8'	6'	4'	4'	8'	6'	4'	4'

SHEET 4 OF 11
862D01

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DIMENSIONS FOR LENGTH OF GUARDRAIL APPROACHING DUAL LANE BRIDGES							
MEDIAN WIDTH	-L-***						-L2- DIM.
	70 MPH	60 MPH	50 MPH				
30'	300.0'	250.0'	150.0'				80.0'
36'	300.0'	250.0'	150.0'				60.0'
40' & ABOVE	300.0'	250.0'	150.0'				40.0'

NOTES: * MINOR VARIATION TO THE 25'-0" DIMENSION IS PERMISSIBLE TO ACCOMODATE THE 12'-6" IN GUARDRAIL LENGTHS.

** NO GUARDRAIL IS REQUIRED ON THE TRAILING END WHEN THIS DISTANCE EXCEEDS CLEAR ROADSIDE RECOVERY AREA FOR THE APPROPRIATE DESIGN SPEED.

*** BASED ON "X" OF 12'
USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1A).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

THE DESIGN LAYOUT FOR LENGTHS SHOWN ON THIS STANDARD ARE MINIMUM DESIGN LENGTHS.

SEE SHEET 1 OF 12 FOR SECTIONS XX, YY

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

SHEET 3 OF 11
862D01

DETAIL OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

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ORIGINAL BY: J. HOWERTON DATE: 06-22-12
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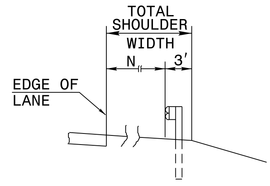
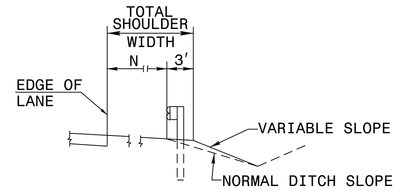
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

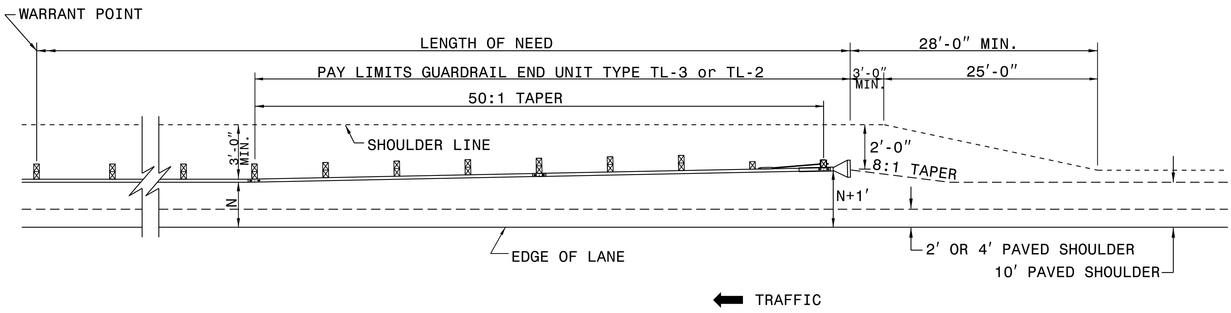


FILL SECTION



CUT SECTION

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

SHEET 6 OF 11
862D01

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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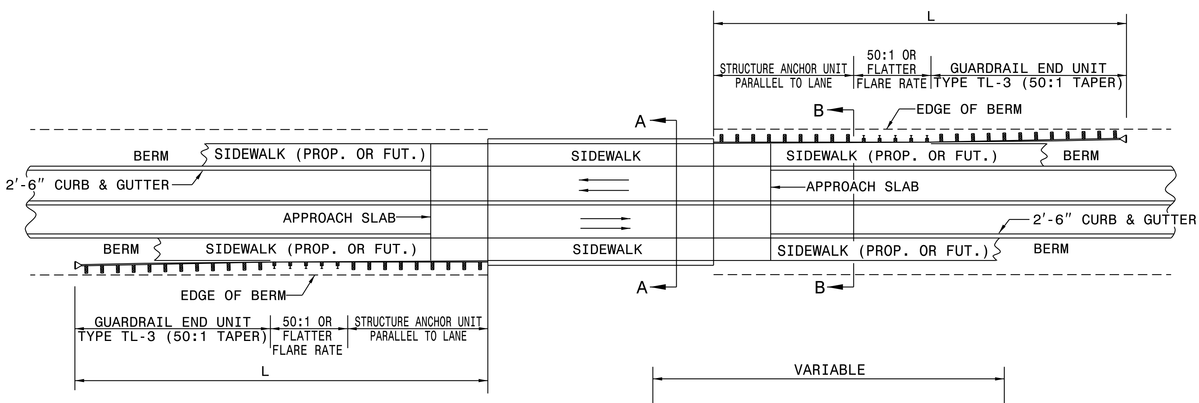
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 11
862D01

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

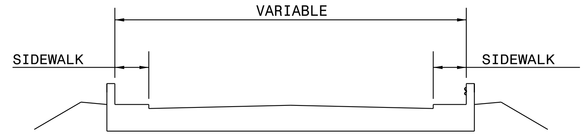
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



MINIMUM GUARDRAIL LENGTHS "L" REQUIRED AT BRIDGE APPROACHES ON 2'-6" CONCRETE CURB AND GUTTER ROADWAYS	
DESIGN SPEED (MPH)	"L"
40	150'
50	225'

NOTE: "L" VALUES ARE BASED ON NO HAZARDS OTHER THAN END OF BRIDGE BEING PRESENT WITHIN THE CLEAR ZONE.

SEE STD. 862D03 FOR STRUCTURE ANCHOR UNITS.



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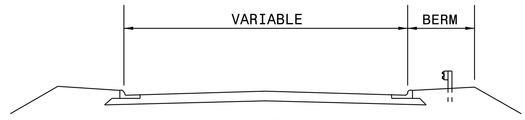

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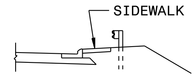

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

STANDARD GUARDRAIL PLACEMENT AT BRIDGES WITH 2'-6" CONCRETE CURB AND GUTTER

SHEET 5 OF 11
862D01

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 5 OF 11
862D01

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11/9/2017

NORTH CAROLINA PROFESSIONAL SEAL 029844 ENGINEER John Thomas Howerton

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W-5506

SHEET NO.
2C-3

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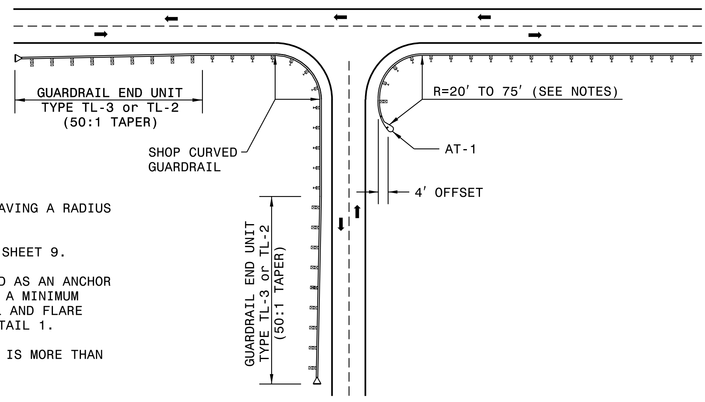
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



NOTES:

SHOP CURVED GUARDRAIL IS DEFINED AS HAVING A RADIUS OF 150' OR LESS.

WHEN RADIUS IS LESS THAN 20' REFER TO SHEET 9.

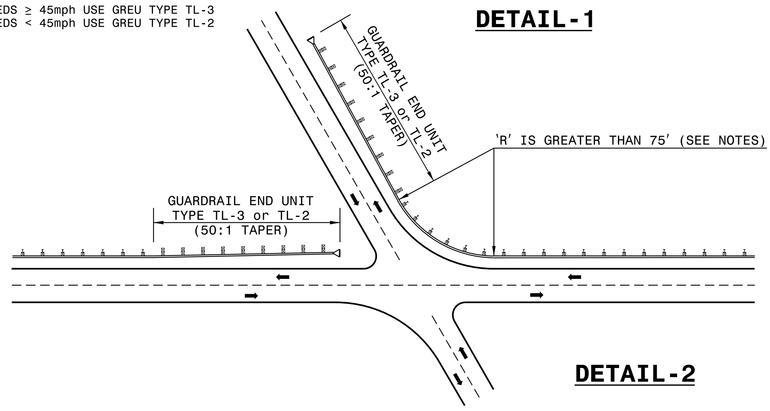
WHENEVER SHOP CURVED GUARDRAIL IS USED AS AN ANCHOR AND THE RADIUS IS FROM 20' TO 75', USE A MINIMUM LENGTH OF 50' OF SHOP CURVED GUARDRAIL AND FLARE WITH AN AT-1 ANCHOR UNIT. REFER TO DETAIL 1.

WHENEVER SHOP CURVED GUARDRAIL RADIUS IS MORE THAN 75', REFER TO DETAIL 2.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL-1



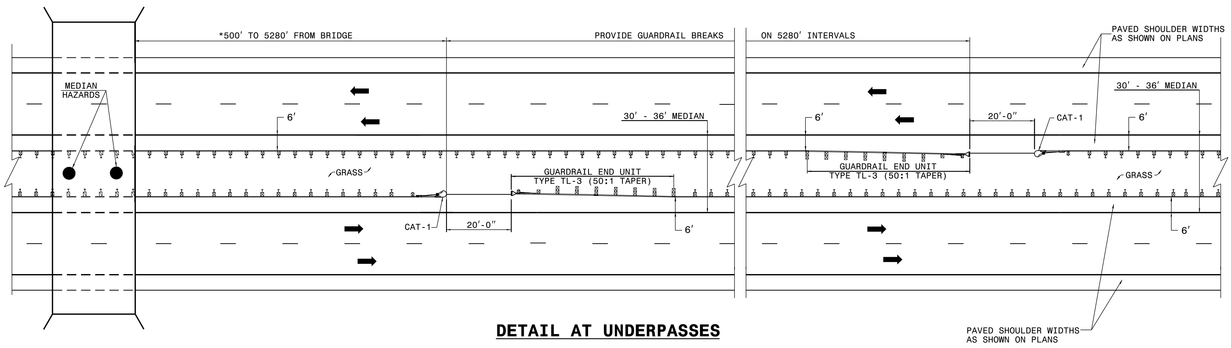
DETAIL-2

GUARDRAIL TREATMENT AT INTERSECTIONS

SHEET 8 OF 11
862D01

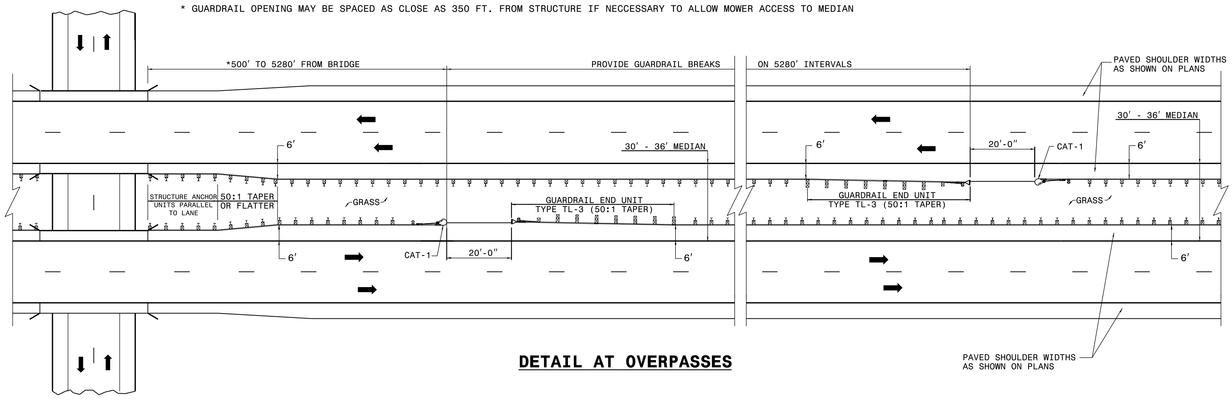
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



DETAIL AT UNDERPASSES

* GUARDRAIL OPENING MAY BE SPACED AS CLOSE AS 350 FT. FROM STRUCTURE IF NECCESSARY TO ALLOW MOWER ACCESS TO MEDIAN



DETAIL AT OVERPASSES

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

GUARDRAIL BREAK INTERVALS WITH 30' - 36' MEDIANS

SHEET 7 OF 11
862D01

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SEE TITLE BLOCK

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MODIFIED BY: DATE:
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FILE SPEC.:

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SHEET NO. 2C-4

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jhowerton AT CSD-292595

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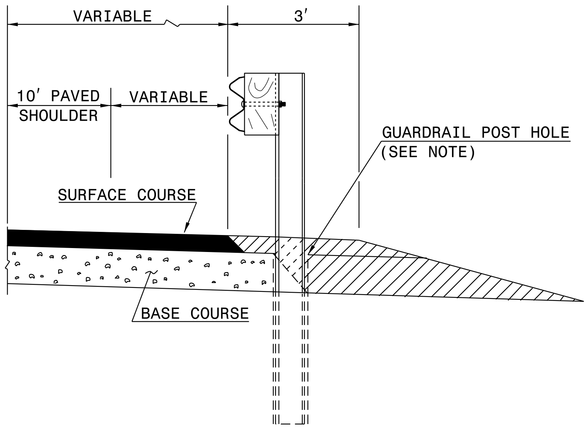
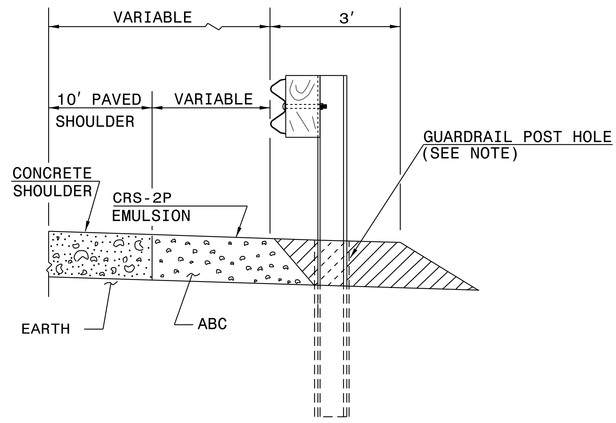
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



FLEXIBLE PAVED SHOULDER



CONCRETE PAVED SHOULDER

EARTH MATERIAL

NOTE:
WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE.THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL.

SHEET 10 OF 11
862D01

STATE OF NORTH CAROLINA
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ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 10 OF 11
862D01

STATE OF NORTH CAROLINA
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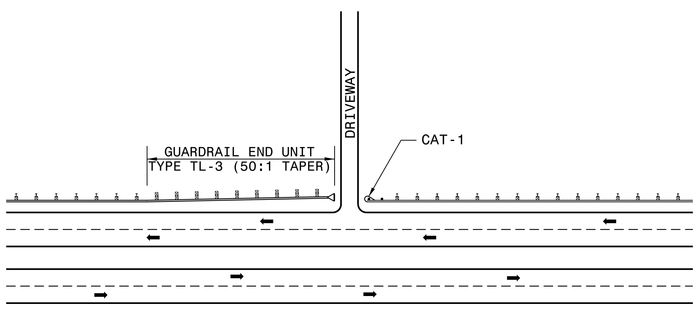
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

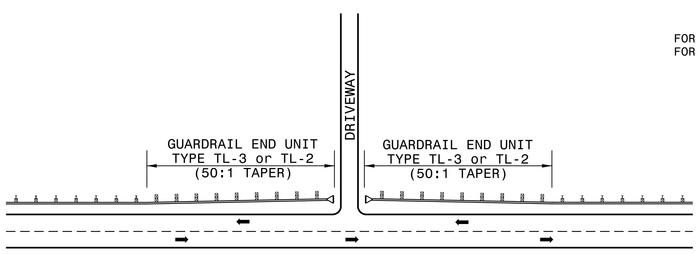


DETAIL-3
DIVIDED HIGHWAY

NOTE: USE DETAIL 3 & 4 WHENEVER 20' OR LARGER RADIUS CANNOT BE UTILIZED.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2



DETAIL-4
UNDIVIDED HIGHWAY

GUARDRAIL TREATMENT AT DRIVEWAYS

SHEET 9 OF 11
862D01

STATE OF NORTH CAROLINA
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 9 OF 11
862D01

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ORIGINAL BY: J. HOWERTON DATE: 06-22-12
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CHECKED BY: DATE:
FILE SPEC.:

NORTH CAROLINA PROFESSIONAL SEAL 025980 ENGINEER
JOHN S. HOWERTON
11/9/2017

PROJECT REFERENCE NO. W-5506
SHEET NO. 2C-5

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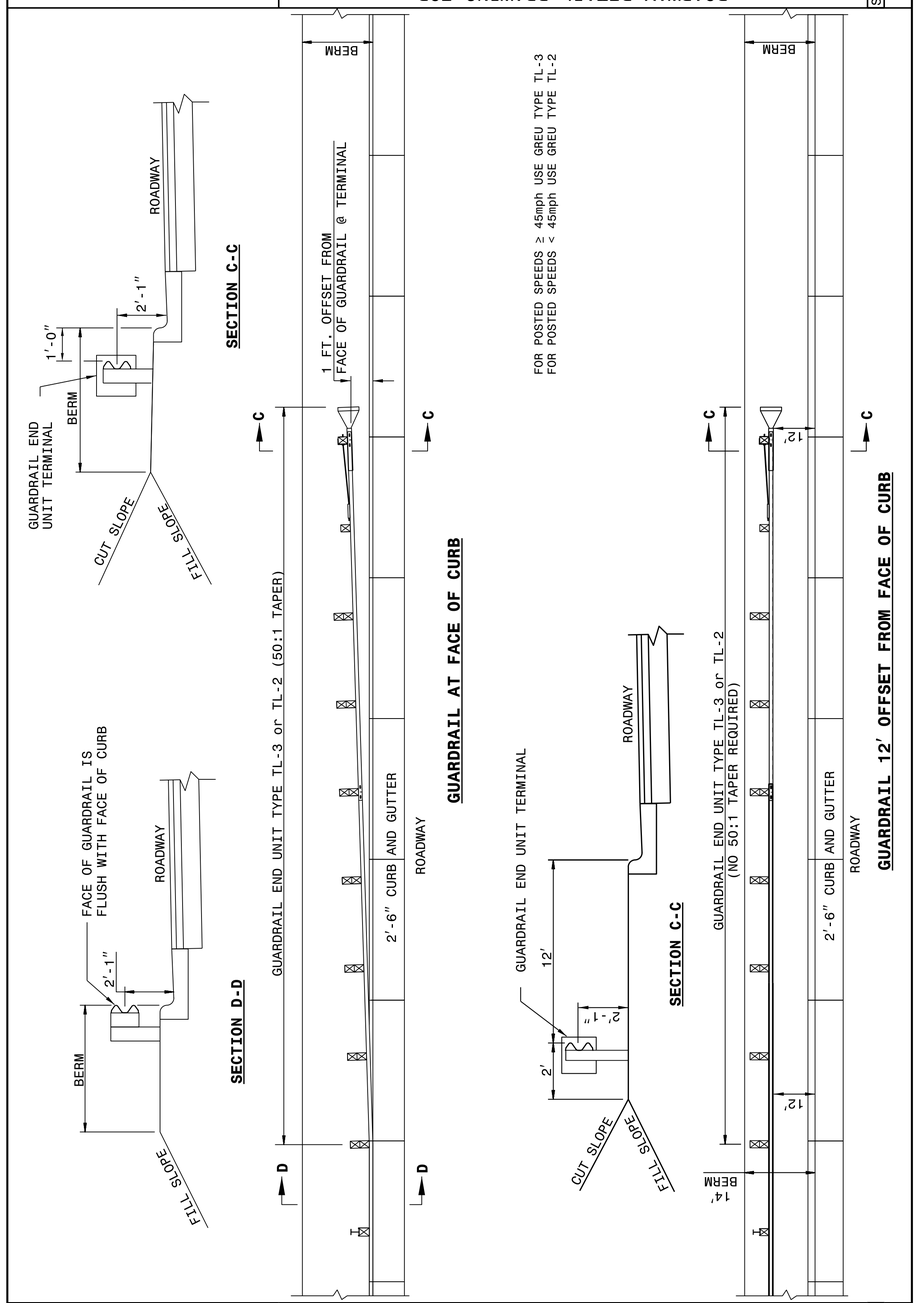
W-5506	2C-6



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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT
GUARDRAIL TREATMENT AT CURB AND GUTTER

SHEET 11 OF 11
862D01

STATE OF
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT
GUARDRAIL TREATMENT AT CURB AND GUTTER

SHEET 11 OF 11
862D01

NORTH CAROLINA PROFESSIONAL SEAL 022986 ENGINEER Joel S. Howerton
Digitally signed by Joel S. Howerton
DN: cn=Joel S. Howerton, c=US, o=NC DOT, ou=Contractor, email=jshowerton@ncdot.gov
Date: 2017.11.09 15:46:16 -05'00'

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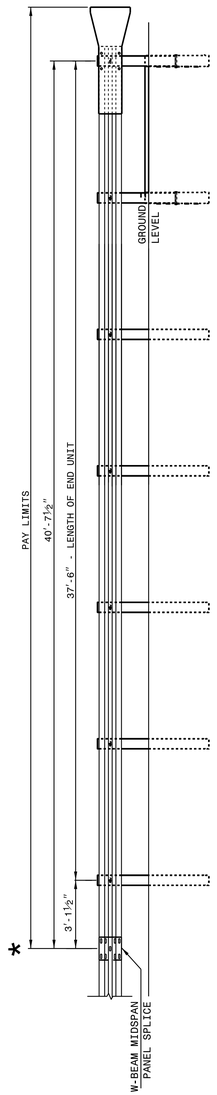
PROJECT REFERENCE NO.	SHEET NO.
W-5506	2C-7

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

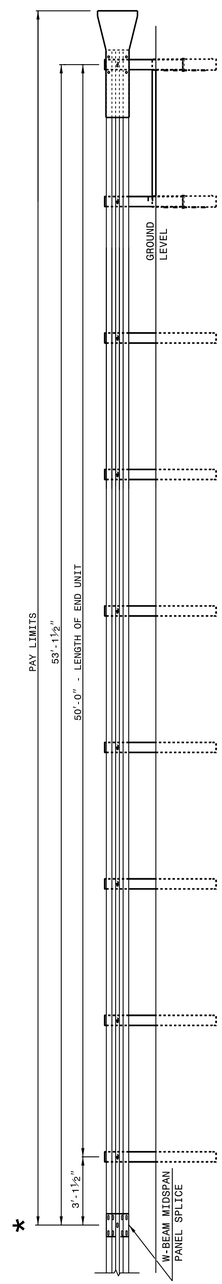
ROADWAY DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**

SHEET 2 OF 8 **862D02**



FLARED AND TANGENT ELEVATION VIEW

* **WHEN INSTALLING GUARDRAIL END UNITS THAT ARE 2'-1" MOUNTING HEIGHT TO EXISTING GUARDRAIL, REMOVE THE EXISTING GUARDRAIL TO TRANSITION FROM THE EXISTING HEIGHT TO THE PROPOSED 2'-1" HEIGHT. SEE 862.02, SHEET 4 OF 8 FOR TRANSITION DETAILS.**



FLARED AND TANGENT ELEVATION VIEW

APPROACH END UNITS

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

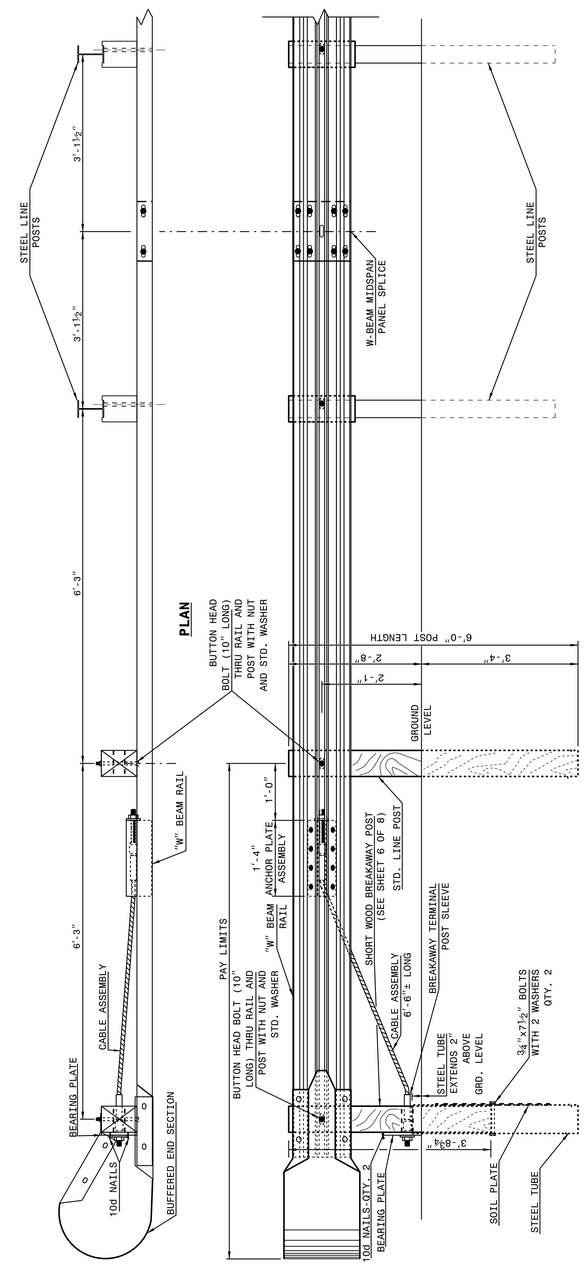
ROADWAY DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**

SHEET 2 OF 8 **862D02**

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

ROADWAY DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**

SHEET 1 OF 8 **862D02**



TRAILING END UNIT ASSEMBLY

C.A.T.-1 SYSTEM

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

ROADWAY DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**

SHEET 1 OF 8 **862D02**

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	2C-8

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 1'-11", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL, FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 2'-1" GUARDRAIL.

ELEVATION VIEW

TRANSITION FROM OR 1'-11" TO 2'-1" W-BEAM GUARDRAIL MOUNTING HEIGHT

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02

15'-7½" W-BEAM GUARDRAIL PANEL

NOTE: USE 5 SPACE 15'-7½" W-BEAM GUARDRAIL PANEL AT THE DOWNSTREAM END OF AN END UNIT OR EXISTING GUARDRAIL THAT DOES NOT OFFSET THE W-BEAM PANEL SPLICE TO MIDSPAN

11/9/2017

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

STATE OF
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02

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DEPT. OF TRANSPORTATION
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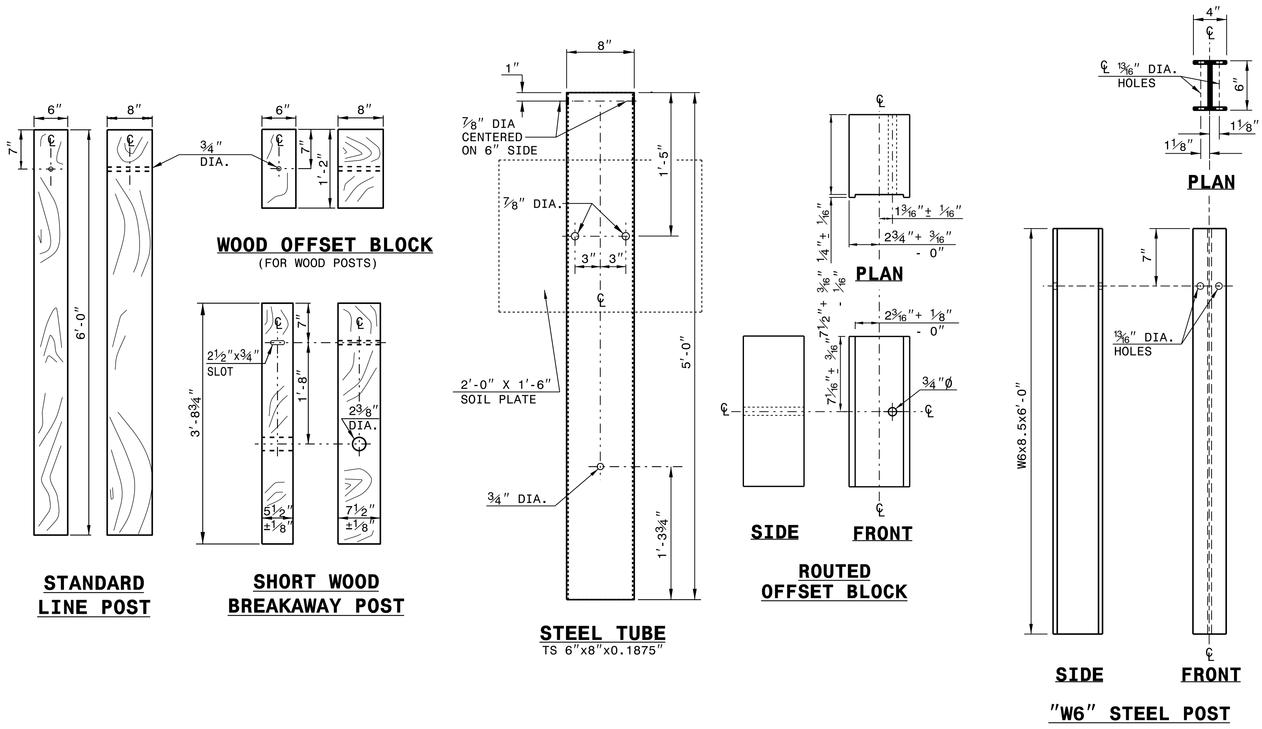
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



SYSTEM PARTS

SHEET 6 OF 8
862D02

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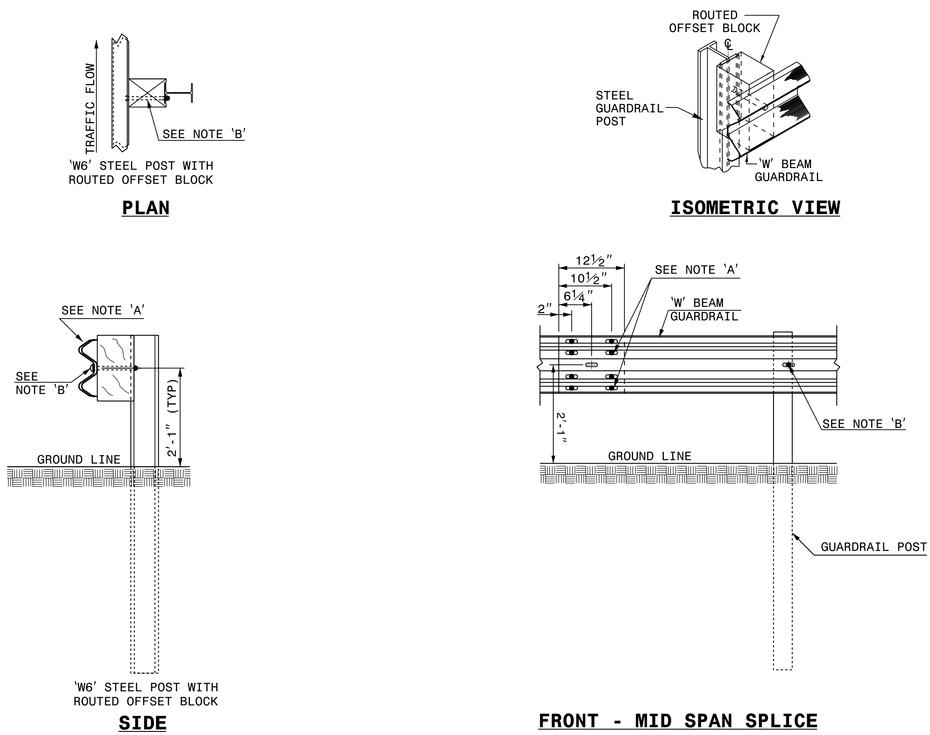
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



NOTES:
A - ⅝" DIA. BUTTON HEAD SPLICE BOLT 1¼" LONG (8 REQ. PER SPLICE JOINT).
B - ⅝" DIA. BUTTON HEAD BOLT 7½"/9" LONG WITH NUT FOR BOLTING 6"/8" ROUTED OFFSET BLOCK TO STEEL POSTS.
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

SHEET 5 OF 8
862D02

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 8
862D02

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SHEET NO. 2C-9

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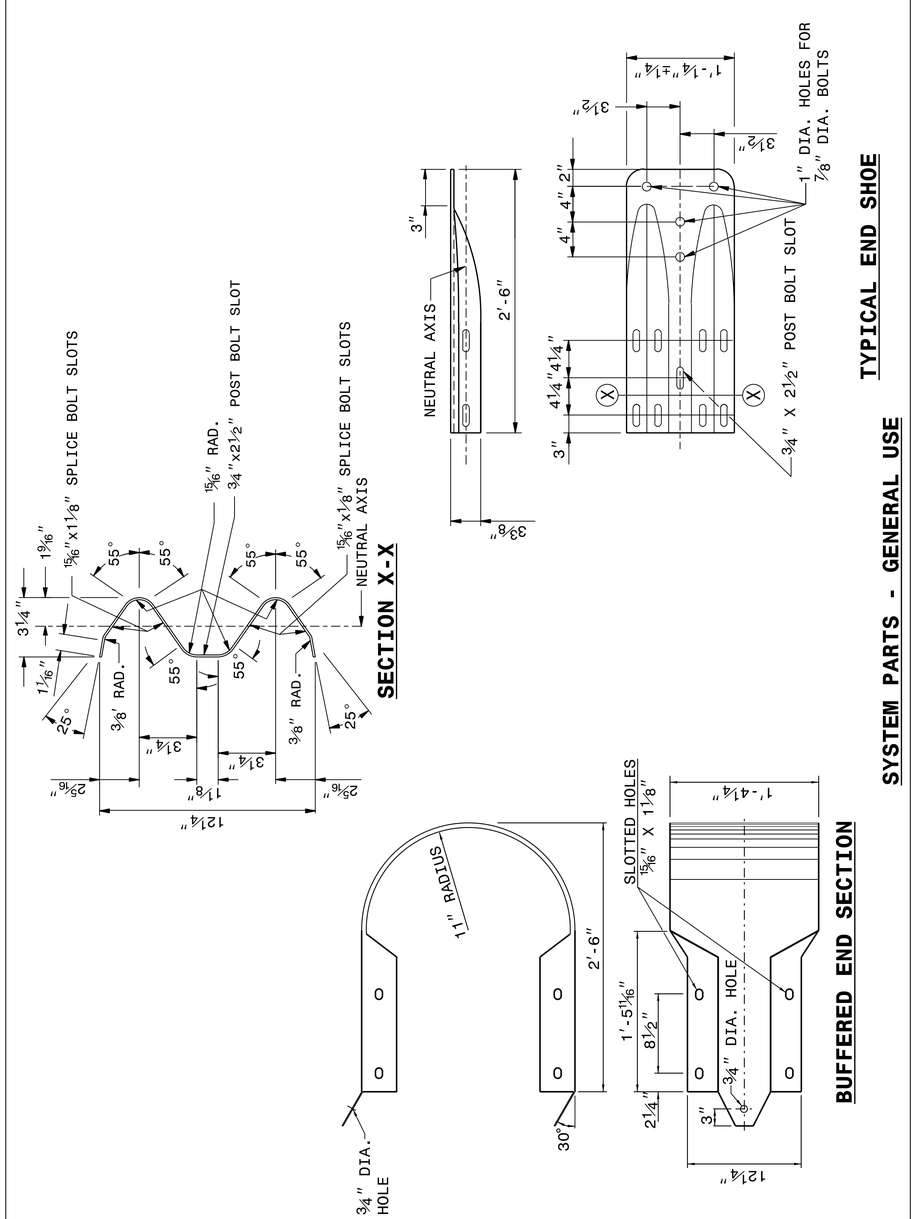
PROJECT REFERENCE NO.	SHEET NO.
W-5506	2C-10



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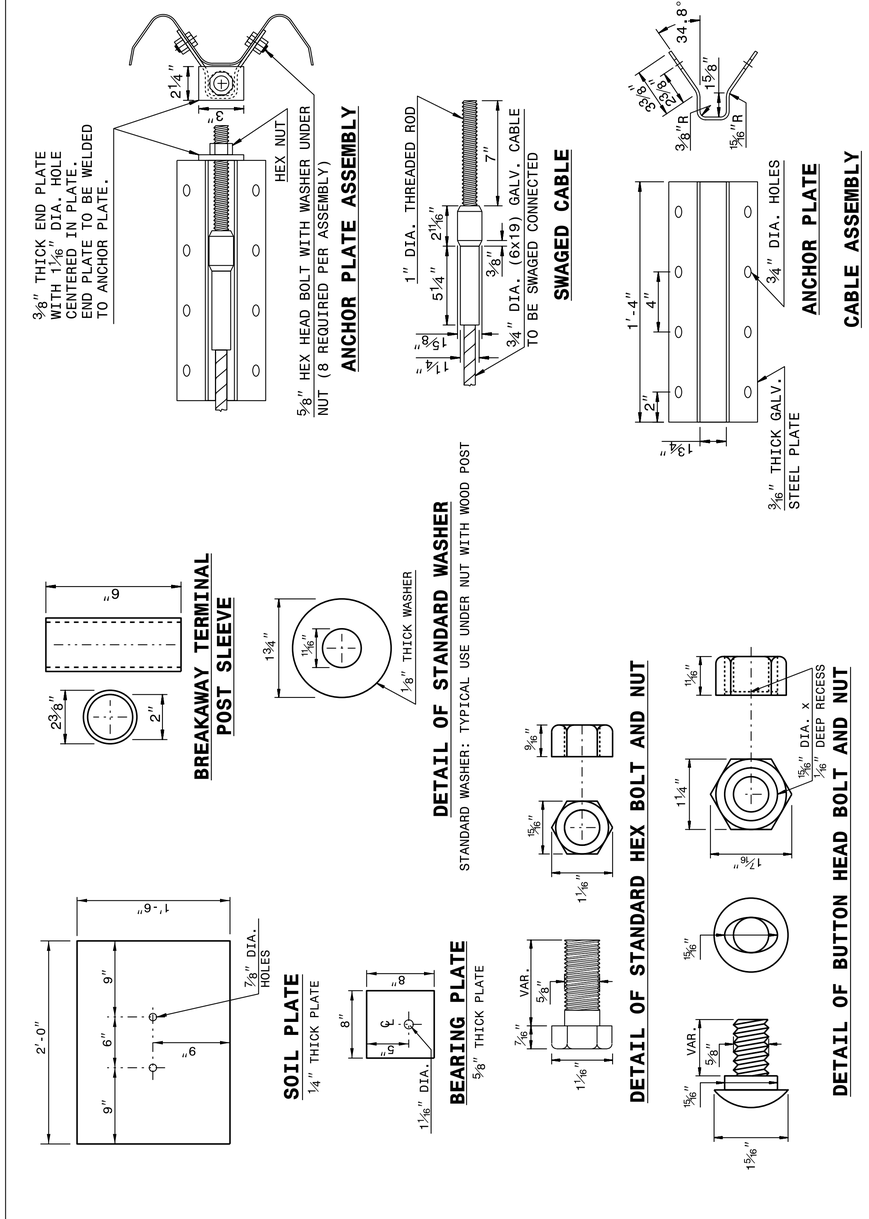
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 8 OF 8
862D02



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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 8
862D02

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 8 OF 8
862D02

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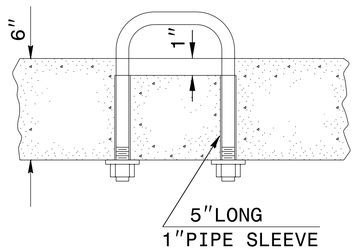
PROJECT REFERENCE NO.	SHEET NO.
W-5506	2D-1



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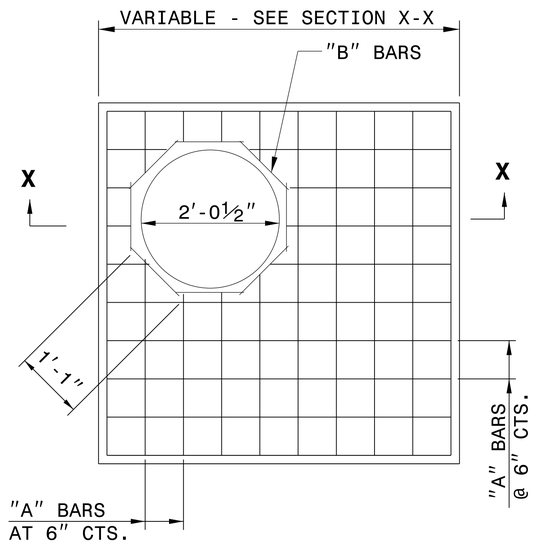
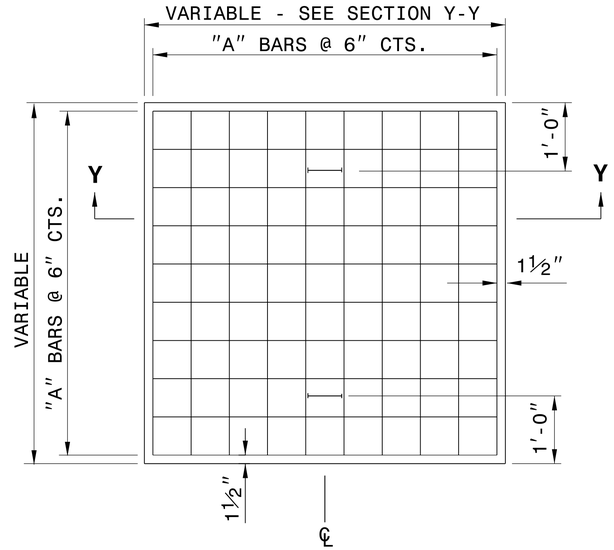


PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

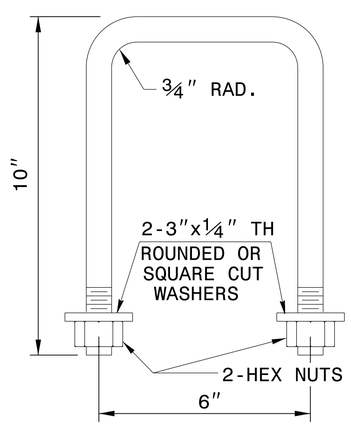
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

BILL OF MATERIALS

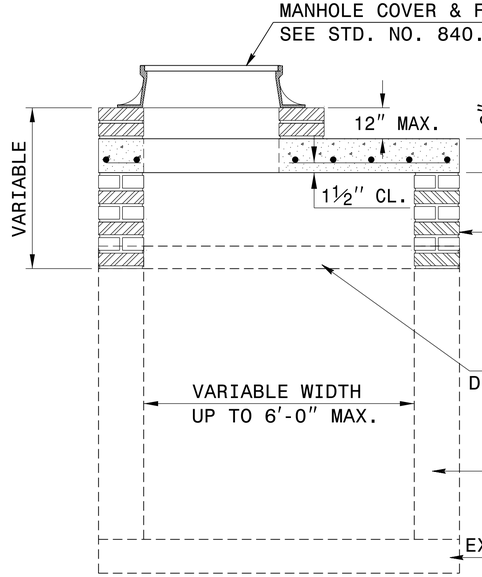
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

MASONRY	CU YDS
TOP SLAB CONCRETE CLASS "B"	.4326 *
BRICK MASONRY PER FT HT (MIN)	.4111

* NOTE:
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



DETAIL OF HANDLE



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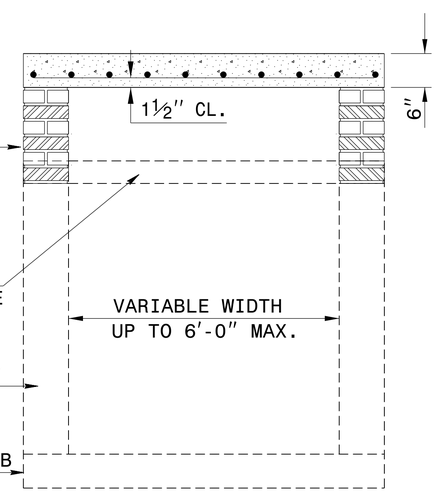

SECTION Y-Y

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DETAIL TO CONVERT EXISTING DI, CB, OTCB or GI TO JUNCTION BOX (MANHOLE OPTIONAL)

ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: T.S.S. DATE: FEB.2000
CHECKED BY: DATE:
FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn

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

12/06/07

COMPUTED BY: CJY	DATE: 8-31-2017
CHECKED BY: ACD	DATE: 10-3-2017

SUMMARY OF EARTHWORK

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
W-5506	3B-1

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 24+00 LT	-L- 54+00 LT	2,446	183		2,263
-L- 54+00 LT	-L- 84+00 LT	1,084	252		832
-L- 84+00 LT	-L- 106+95 LT	345	184		161
PVMT STRC			-134		134
	SUBTOTAL	3,875	484		3,390
-L- 24+00 RT	-L- 54+00 RT	378	1,452	1,704	
-L- 54+00 RT	-L- 84+00 RT	332	2,063	1,731	
-L- 84+00 RT	-L- 106+95 RT	460	87		373
PVMT STRC			-675	-675	
	SUBTOTAL	1,170	2,927	2,130	373
PROJECT TOTALS:		5,045	3,411	2,130	3,762
MATERIAL FOR SHOULDER CONSTRUCTION			1,784	1,784	
WASTE IN LIEU OF BORROW				-3,762	-1,196
EST. 5% TO REPLACE TOP SOIL				8	
GRAND TOTALS:		5,045	5,195	160	
SAY:		5,298		167	

EST. UNDERCUT = 1,300 CY (CONTINGENCY)
EST. SELECT GRANULAR MATERIAL = 500 CY (CONTINGENCY)
EST. FABRIC FOR SOIL STABILIZATION = 5,850 SY (CONTINGENCY)

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING ASPHALT PAVEMENT WILL BE PAIDFOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
L 25+08	LT	0401	0402		2101.00	2100.35	
L 33+02	LT	501					
		501	502		2089.20	2087.90	
L 35+03	LT	503					
		503	504		2087.97	2087.70	
L 47+57	RT	601		2097.80			
L 48+15	RT	602		2099.70			
L 48+68	LT	604		2099.50			
L 47+18	RT	604	603		2096.80	2096.60	
L 53+30	RT						
L 66+00	LT	701			2110.30	2108.00	
L 72+00	LT	802			2120.98	2120.74	
L 73+32	LT	803			2122.31	2122.08	
L 74+82	LT	804			2123.69	2123.55	
L 85+74	LT	901			2131.86	2131.50	
TOTALS							

STATION	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	C.S. PIPE (UNLESS NOTED OTHRWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
L 25+08																
L 33+02																
L 35+03																
L 47+57																
L 48+15																
L 48+68																
L 47+18																
L 53+30																
L 66+00																
L 72+00																
L 73+32																
L 74+82																
L 85+74																
TOTALS																

STATION	CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15"	18"	24"	30"	36"	CLASS IV R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15"	18"	24"	30"	36"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	LIN. *FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02
L 25+08		32																			
L 33+02																1.3					
									142												
L 35+03																					
			12																		
L 47+57																					
L 48+15																					
L 48+68																		1			
L 47+18										12											
L 53+30																					
L 66+00			60																		
L 72+00														28							
L 73+32			32																		
L 74+82								36													
L 85+74													24								
TOTALS		32	104					36	142	12			24	28		1.3		1			

STATION	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.D.I. STD. 840.35	T.B.D.I. FRAME WITH GRATE STD. 840.36	T.B.D.I. FRAME WITH TWO GRATES STD. 840.36	SPRING BOX STD. 840.41	M.H. STD. 840.51 OR 840.53	M.H. FRAME & COVER STD. 840.54	ADJUST D.I.	CONVERT EXISTING D.I. TO J.B.	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
L 25+08																						0.399			
L 33+02																									
L 35+03																						0.447			
L 47+57																				1					
L 48+15																			1		1				
L 48+68								1		1															
L 47+18																						0.533			
L 53+30																								40	REMOVE 15" HDPE
L 66+00																									
L 72+00																								27	REMOVE 12" CMP
L 73+32																								29	REMOVE 12" HDPE
L 74+82																								37	REMOVE 15" RCP
L 85+74																									
TOTALS								1		1									1	1	1	1.379		133	

ABBREVIATIONS

C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
G.D.I. GRATED DROP INLET
G.D.I. (N.S.) GRATED DROP INLET (NARROW SLOT)
J.B. JUNCTION BOX
M.H. MANHOLE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W APPROACH END	TRAILING END
-L-	23+10.00	24+97.50	RT.	187.5'			24+89.54	N/A	6.0	9.0	50'	50'	1.0	1.0
-L-	30+50.00	32+37.50	RT.	187.5'			32+28.47	N/A	6.0	9.0	50'	50'	1.0	1.0
-L-	37+25.00	39+12.50	RT.	187.5'			38+52.52	N/A	6.0	9.0	50'	50'	1.0	1.0
-L-	41+51.65	42+31.25	RT.	56.25'	31.25'		42+00.00	N/A	6.0	9.0				
-L-	55+00.00	61+57.32	RT.	637.5'	31.25'		56+00.00	61+00.00	6.0	9.0	50'		1.0	
-L-	62+37.50	70+56.25	RT.	818.75'			62+87.50	70+50.00	6.0	9.0	50'		1.0	
-L-	70+41.25	71+65.66	LT.	118.75'	56.25'		70+57.28	71+53.09	6.0	9.0				
-L-	78+71.28	82+28.58	LT.	275'	112.5'		81+48.09	79+50.00	6.0	9.0				
			SUBTOTALS	2468.75	231.25									
			ANCHOR DEDUCTION	418.75	31.25									
			TOTAL	2050	200									
			SAY	2100	225									

BEG. STA.	ANCHORS GREU 350 TL-3	TYPE III SC	CAT-1	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
23+10.00	2										POLE
30+50.00	2										POLE
37+25.00	2										POLE
41+51.65			1	1							HEADWALL
55+00.00	1			1							FILL SLOPE
62+37.50	1		1						850'		REPLACE EXISTING GUARDRAIL
70+41.25			1	1							SIGNAL POLES
78+71.28				2							POLE AND FILL SLOPE

ANCHOR DEDUCTION

GREU 350: 8 @ 50' = 400'
AT-1: 5 @ 6.25' = 31.25'
CAT-1: 3 @ 6.25' = 18.75'
GRAND TOTAL = 450'
ADDITIONAL GUARDRAIL POSTS = 5

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JOHN M. TEDESCO 11/10/2017	NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER DAVID WEATHERLY 11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

-L-

PI Sta 23+27.95
△ = 14° 11' 35.4" (RT)
D = 1° 45' 46.6"
L = 805.08'
T = 404.61'
R = 3,250.00'
e = 0.035
RO = 224'

NAD 83/NSRS 2007

-BY-13 12+51.05

BARGELOH, THOMAS S & SUSAN R
1547/312
9650070428

ALEXANDER, MARGARETA E
1236/006
9650074101

-L- PT Sta. 27+28.42

N. RUGBY RD.

Woven Wire Fence

DO NOT DISTURB BRICK COLUMNS

BRICK COLUMNS

INGLES MARKETS INC.
1209/629
9640975985

-L- PC Sta. 19+23.33

BEGIN TIP PROJECT W-5506
POC -L- STA.24+00.00

-BL-1 10+00.00

BEGIN CONSTRUCTION
-L- STA.23+10.00

(0402) COLLAR AND EXTEND

(0401) 15" RCP-III

RETAIN

R=30'

R=25'

28' INC

GREU TL-3

SPECIAL CUT DITCH SEE DETAIL B

SPECIAL CUT DITCH SEE DETAIL A

CLEVELAND, JESSE
94A/146
9640976246

KATHLEEN W. HAYNES
1363/435
9640971985

NC 191 HAYWOOD RD.
22' BST

S 60°50'23.4" E

S. RUGBY RD.

RHODES, KELLY
1518/680
9640974341

RHODES, KELLY
994/366
9640973345

RHODES, KELLY YVONNE
DB 994 PG 366
9640976105

MILL POND CEMETARY
13/246
9640978098

MILLS RIVER, LLC
1420/144
9640872793

RHODES, HOWARD L
1518/682
9640974118

15" CMP

RETAIN

S 66°42'05" E
255.48

N 57°58'05" W
180.01'

S 80°36'32" E
50.49

S 44°25'08" E
98.06'

S 33°20'32" E
86.25'

N 00°17'33" W
81.34'

N 10°21'01" W
188.27'

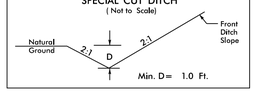
S 45°20'00" W
124.30'

S 2°50'49" W
84.85'

MATCH LINE -L- STA 28+00 SEE SHEET 5

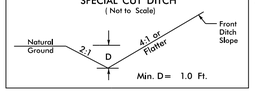
FOR -L- PROFILE SEE SHEET 11

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 24+00 TO STA. 24+50 RT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 24+50 TO STA. 29+10 RT

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER — 11/10/2017

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER — 11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

NAD 83/NSRS 2007

-L-
PI Sta 34+92.15
△ = 0° 18' 59.0" (RT)
D = 0° 09' 17.5"
L = 204.32'
T = 102.16'
R = 37,000.00'
e = NC
RO = N/A

-L-
PI Sta 41+28.77
△ = 0° 26' 36.7" (LT)
D = 0° 13' 13.3"
L = 201.27'
T = 100.64'
R = 26,000.00'
e = NC
RO = N/A

MATCH LINE -L- STA 28+00 SEE SHEET 4

MATCH LINE -L- STA 42+00 SEE SHEET 6

-BL-2 18+06.81

-L- STA. 28+41.16 39.79' LT

BM#1 28" INC 1497.5

-L- PC Sta. 40+28.14

460' SHIFT TAPER LT. AND RT.

REMOVE 15" RCP

SPECIAL CUT DITCH SEE DETAIL C

S 46° 38' 48.0" E

-L- NC 191

S 46° 19' 48.9" E

RETAIN

8:1 TAPER

GREU-350 TL-3

CLASS 'B' RIP RAP EST 3 TONS EST 10 SY GEO AT DITCH OUTLET

SPECIAL CUT DITCH SEE DETAIL B

(2) CLASS 'B' RIP RAP EST 3 TONS EST 10 SY GEO

COLLAR AND EXTEND

CLASS 'B' RIP RAP EST 3 TONS EST 10 SY GEO

SPECIAL CUT DITCH SEE DETAIL A

-BL-3 28+08.90

RETAIN NEIGHBORHOOD ENTRANCE SIGNS

SR 2044

-L- PC Sta. 33+89.98

-L- PT Sta. 35+94.31

N. HILLS DR.

CRESTVIEW DR.

HAYWOOD PARK DR.

SINCLAIR, FROSTY A
1431/204
9650068876

JOHN SPAETH

CASTLE GARDEN VILLAS
DB 1595 PG 078
9650069662

CASTLE GARDEN VILLAS
DB 1294 PG 092
9650161443

CASTLE GARDEN VILLAS
DB 1294 PG 092
9650163229

ALEXANDER, MARGARETA E
1236/006
9650074101

HATZFELD, STANLEY G
667/731
9650065719

ALLISON, WILLIE T & PATRICIA M
619/461
9650066656

MILL POND CEMETARY
13/246
9640978098

HINKLE, JAMES LARRY & ELIZABETH P
571/083
9650062643

CAROLINA MOUNTAIN LAND CONSERVANCY
1602/307
9650059838

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

FROM -L- STA. 37+00 TO STA. 39+15 RT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)

FROM -L- STA. 24+50 TO STA. 29+10 RT
FROM -L- STA. 32+50 TO STA. 32+95 RT
FROM -L- STA. 33+05 TO STA. 34+36 RT
FROM -L- STA. 35+15 TO STA. 37+00 RT

FOR -L- PROFILE SEE SHEET 11

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JOHN W. LEONARD Digitally signed by 11/9/2017	NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER MATTHEW T. WEATHERS Digitally signed by 11/10/2017

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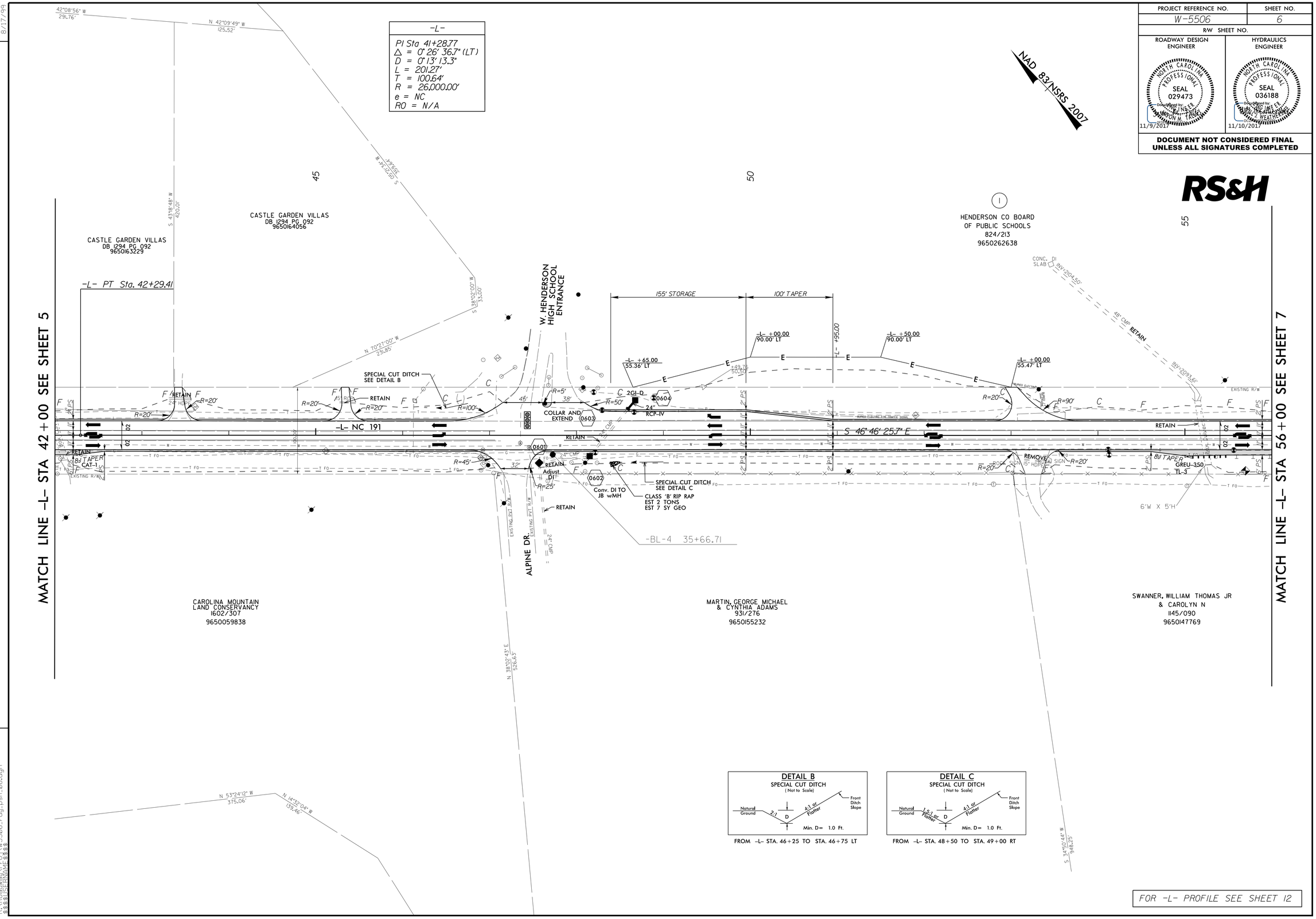
RS&H



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PROJECT REFERENCE NO.	SHEET NO.
W-5506	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON W. LAND 11/9/2017	NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER 11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

NAD 83/NSRS 2007

-L-
PI Sta 61+63.27
Δ = 0° 15' 38.2" (LT)
D = 0° 07' 48.8"
L = 200.14'
T = 100.07'
R = 44,000.00'
e = NC
RO = N/A

MATCH LINE -L- STA 56+00 SEE SHEET 6

MATCH LINE -L- STA 70+00 SEE SHEET 8

MASON, TONY & PAMELA SUE
942/488
9650256075

CRANE, WILLIAM B & TAMRA H
710/378
9650343953

HENDERSON CO BOARD OF PUBLIC SCHOOLS
824/213
9650262638

JOHNS BOBBY & CONSTANCE
1042/407
9650245856

MUELLER
1231/490

JG MARCUS HOMES INC
1589/316
9650341329

JG MARCUS HOMES INC
1589/316
9650341329

SWANNER, WILLIAM THOMAS JR & CAROLYN N
1145/090
9650147769

SWANNER, WILLIAM THOMAS JR & CAROLYN N
1145/093
9650241605

COUNTY OF HENDERSON
1096/052
9650236422

-L- PC Sta. 60+63.20

-L- PT Sta. 62+63.34

-BL-5 45+31.49

-BL-6 51+55.47

-L- NC 191

SR 1380

TRADITIONAL WAY

S 46° 46' 25.7" E

S 47° 02' 03.9" E

330' SHIFT TAPER LT. AND RT.

475' SHIFT TAPER LT. AND RT.

100' TAPER

150' STORAGE

+90.00

+00.00

+70.00

RETAIN

REMOVE

RETAIN SIGN

SPECIAL CUT DITCH SEE DETAIL B

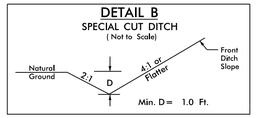
18" RCP-III

GREU-350

TI-3

AT-1

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 66+00 TO STA. 66+50 LT

FOR -L- PROFILE SEE SHEET 12

REVISIONS

8/17/99

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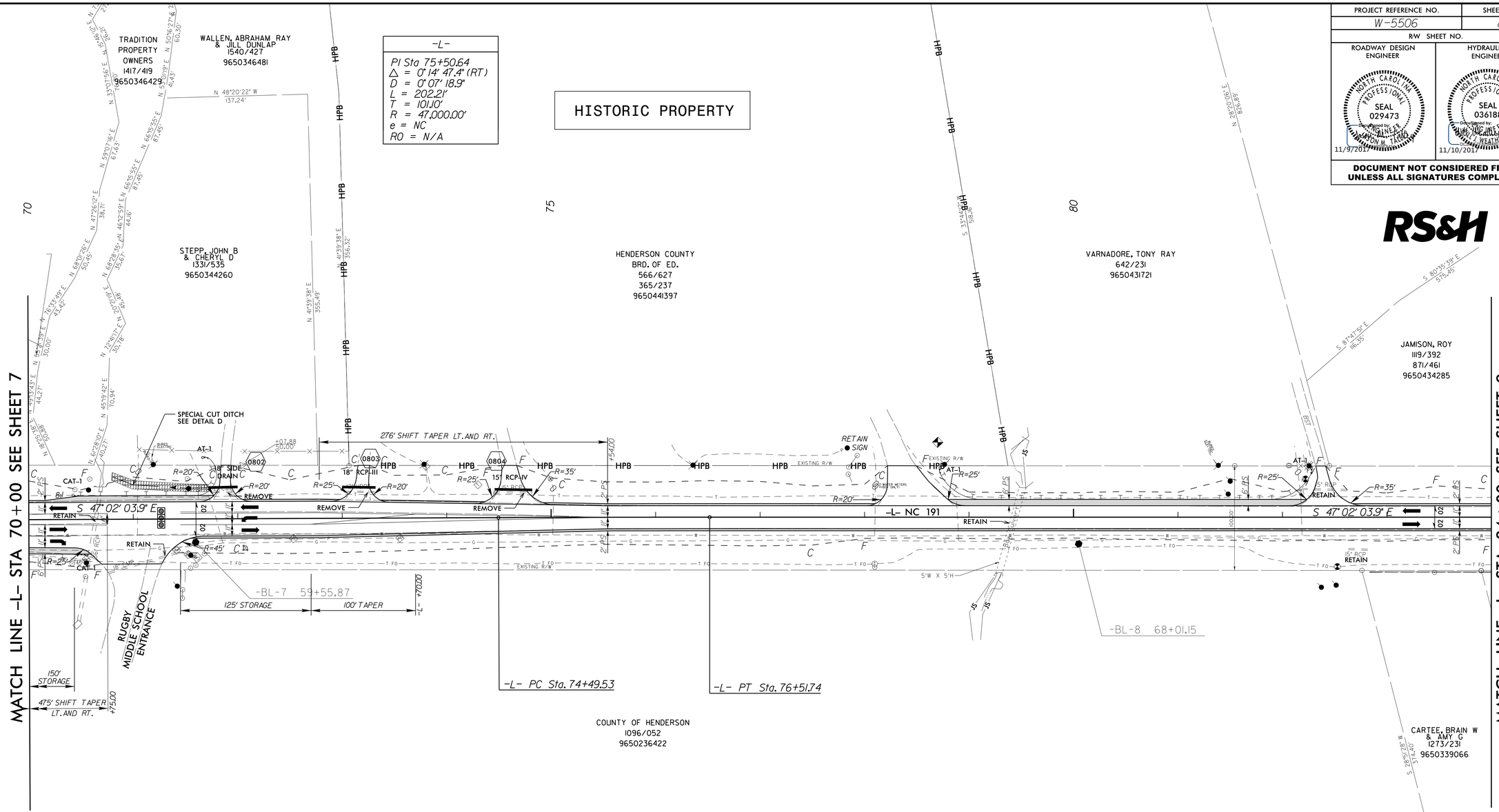
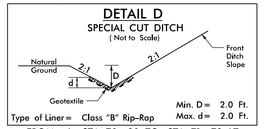
PROJECT REFERENCE NO.	SHEET NO.
W-5506	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 Docusigned by: JAMES E. ALNES, JR. JAMES E. ALNES, JR. 11/9/2017	NORTH CAROLINA PROFESSIONAL SEAL 036188 Docusigned by: MATTHEW CARROLL WEATHERS MATTHEW CARROLL WEATHERS 11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H



DETAIL D
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner = Class "B" Rip-Rap
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
FROM -L- STA. 70+80 TO STA. 71+72 LT

FOR -L- PROFILE SEE SHEET 13

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER KATHRYN M. TUNDO — 11/9/2017

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER MATTHEW D. WEATHERLY — 11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

NAD 83/NSRS 2007

-L-
PI Sta 95+60.82
△ = 5° 38' 32.6" (RT)
D = 1° 45' 27.1"
L = 321.04'
T = 160.65'
R = 3,260.00'
e = 0.035
R0 = 77'

MATCH LINE -L- STA 84+00 SEE SHEET 8

MATCH LINE -L- STA 98+00 SEE SHEET 10

-L- NC 191 — S 146° 47' 16.5" E

SR 1980 — MAINTENANCE R/W — EXISTING R/W

SR 1468

-L- PC Sta. 94+00.17

-L- PCC Sta. 97+21.21

JAMISON, ROY
1119/392
871/461
9650434285

SHIPLEY, GREGORY L & LESLEY R
858/215
9650438073

MADSEN, MARK A & JANE E
1534/628
9650428673

HOLDEN, MICHAEL & DIANNE
1572/714
9650520454

THOMPSON, DONALD O SR
451/435
9650521288

STYLES, BRYAN PHILLIP & TAMARA STEWART
1394/138
9650431001

BONADUCE, FRANCO
1319/382
9650423813

CARTEE
1273/231
9650339066

S&N PROPERTIES INC
939/494

TRIPLE CREEK DR

TRIPLE CK HOMEOWNERS
1250/572
9650422626

HUNTLY, BARBARA
SHIPMAN, TOMMY WAYNE
CORN, JANET
SHIPMAN, RODNEY SHANE
1470/699
9650427212

SHIPMAN, S E
552/341
9650429176

HUNTLY, BARBARA
1470/699
9650427212

-BL-9 75+81.30

-BL-10 82+30.91

RETAIN SIGN

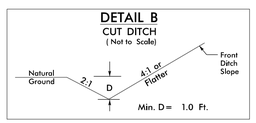
15" SIDE DRAIN — REMOVE

SPECIAL CUT DITCH SEE DETAIL B

CLASS 'B' RIP RAP
EST. 2 TONS
EST. 7 SY GEO

11/2 SFB

DETAIL B
CUT DITCH
(Not to Scale)



FROM -L- STA. 94+94 TO STA. 95+50 RT

FOR -L- PROFILE SEE SHEET 13

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER DAVID W. TARGONSKI 11/9/2017	NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER DONALD W. LINE JR. 11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

-L-
PI Sta 103+72.69
△ = 29° 06' 02.3" (RT)
D = 2° 16' 57.7"
L = 1,274.83'
T = 651.48'
R = 2,510.00'
e = 0.045
RO = 99'

NAD 83/NSRS 2007

MATCH LINE -L- STA 98+00 SEE SHEET 9

-L- NC 191

SR 1463

LINK, MICHAEL JEFFERY
1336/380
9650523124

DUNN, STEVE MARK & KIMBERLEY M
1079/144
9650524130

WESTSIDE VILLAGE PROPERTIES LLC
1437/173
9650517950

HOOPERS CREEK PROPERTY MANAGEMENT LLC
1582/364
9650515989

SHIPLEY, GREGORY & LESLEY
1328/386
9650518601

SHIPLEY, GREGORY LYNN & LESLEY RENEE
1451/728
9650518326

SHIPMAN, S E
552/341
9650429176

SHIPMAN, LULA F
447/288
9650521013

CAUSBY, MARIE
377/019
9650512809

CAUSBY, MARIE
377/189
9650511765

GUDINO, GERALDINE GIBBY
1525/421
9650513613

GUDINO, GERALDINE GIBBY
1525/427
9650514428

GUDINO, GERALDINE GIBBY
1525/421
9650512441

COLEMAN, CHRISTOPHER W & MICHAEL ANNE
788/547
9650517178

COLEMAN, CHRISTOPHER & MICHAEL ANNE
687/693
9650600960

MCMINN, RANDY
622/258
9650513296

STEPP, CLYDE ROSCOE
718/815
9650514082

MOUNTAIN RD.

LEVERETTE DR.

BL-12 93+94.97

BL-11 87+52.09

END TIP PROJECT W-5506
POC -L- STA.106+95.00

-L- PT Sta. 109+96.04

-L- POT Sta. 113+54.89

275' SHIFT TAPER LT. AND RT.

100' TAPER

S 12°02' 41.6" E

FOR -L- PROFILE SEE SHEET 14

REVISIONS

8/17/99

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5/28/99

RIGHT DITCH ----------

LEFT DITCH —·—·—·—

PROJECT REFERENCE NO.	SHEET NO.
W-5506	11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEERING

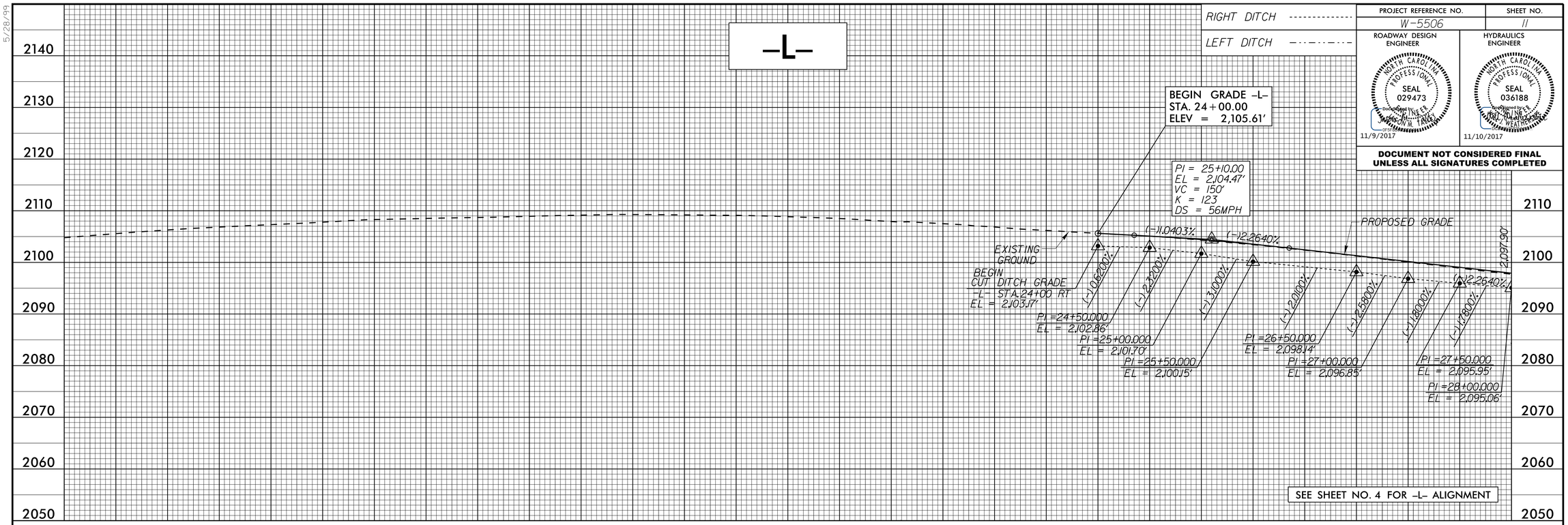
DocuSigned by: 11/9/2017

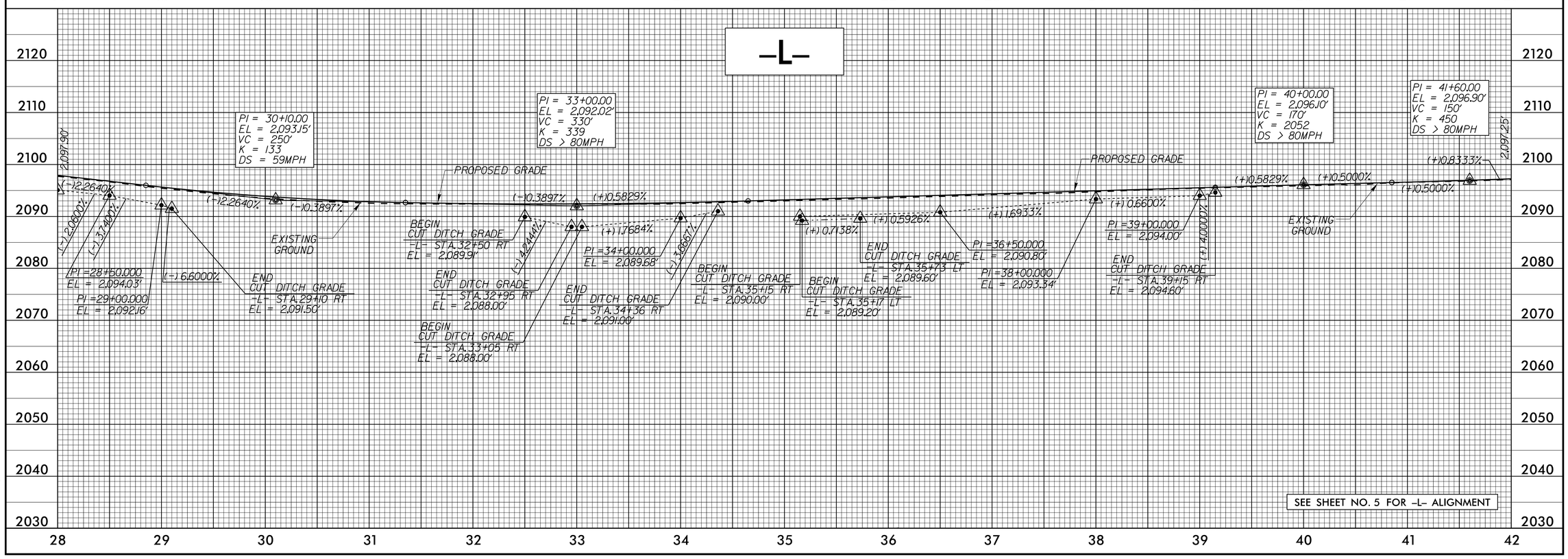
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEERING

DocuSigned by: 11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	12

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEERING

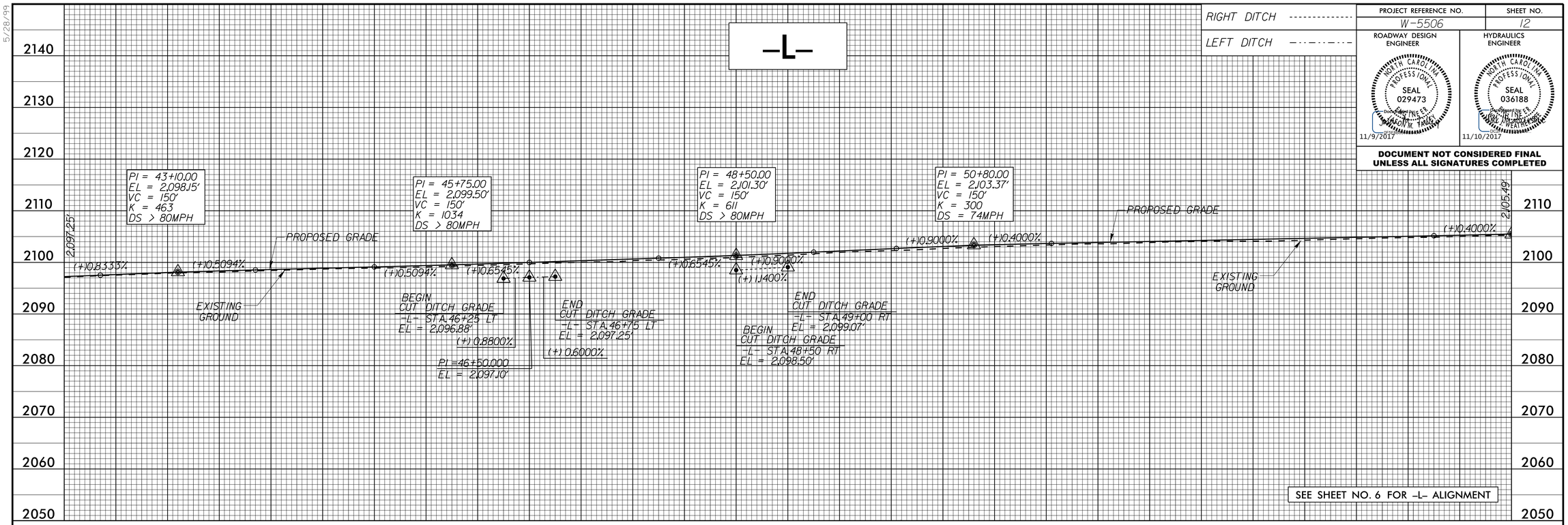
11/9/2017

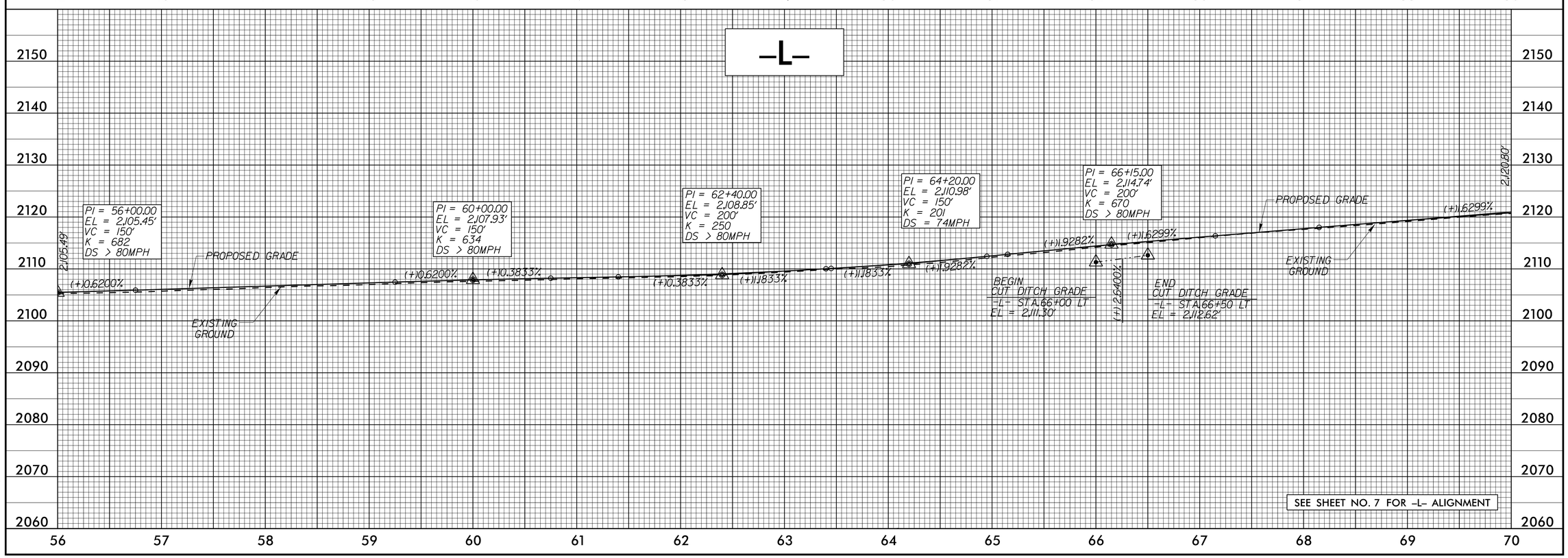
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEERING

11/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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PROJECT REFERENCE NO.	SHEET NO.
W-5506	13

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER
Docusigned by: DOUGLAS W. TAYLOR
11/9/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER
Docusigned by: MICHAEL A. WEAVER
11/10/2017

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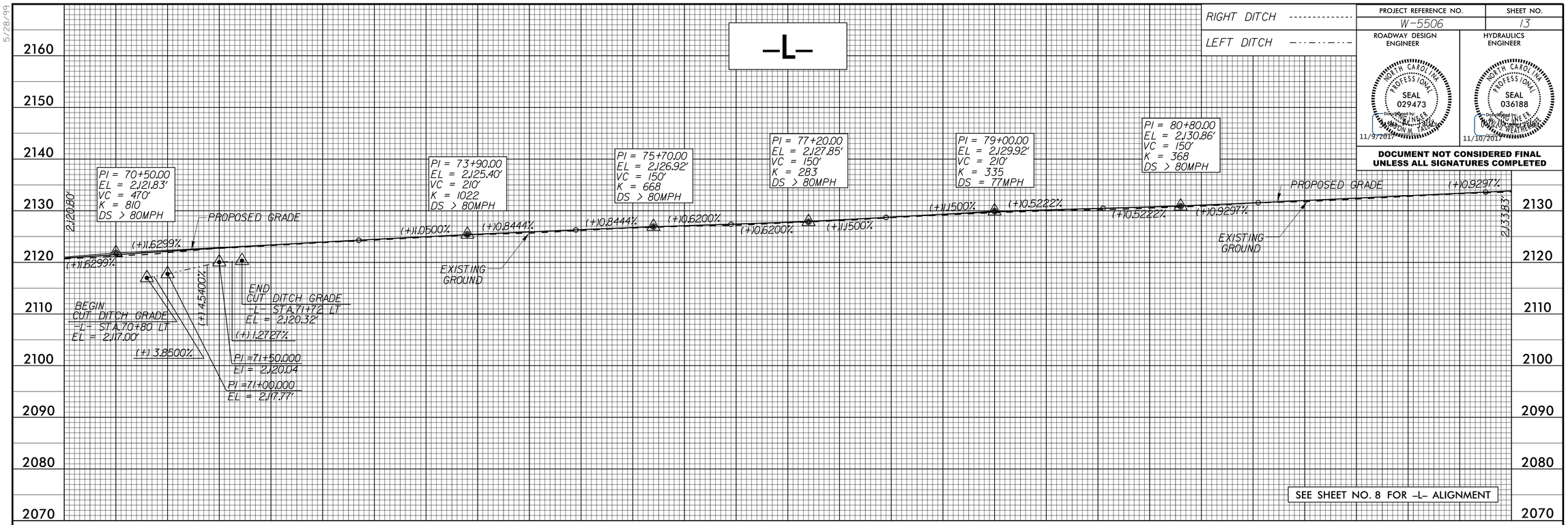

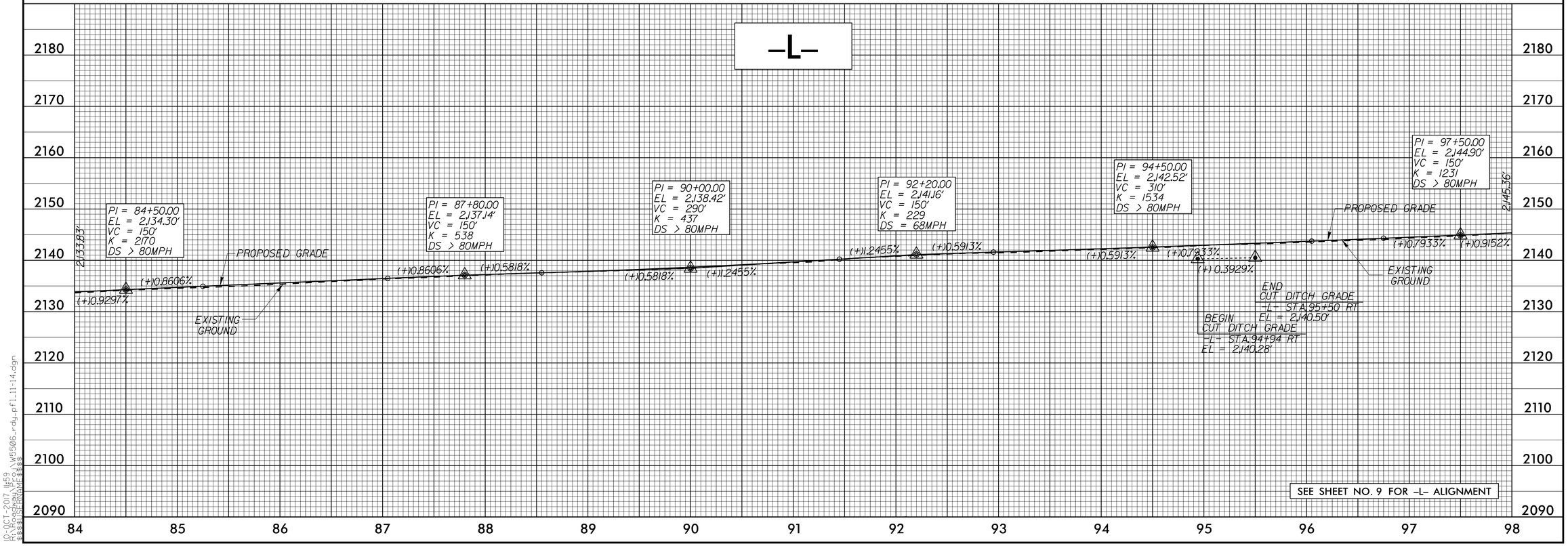

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PROJECT REFERENCE NO.	SHEET NO.
W-5506	14

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEERING SERVICES, P.C. C-2678 DAVID M. TAYLOR

11/9/2017

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEERING SERVICES, P.C. C-2678 KEVIN W. WEATHERSBEE

11/10/2017

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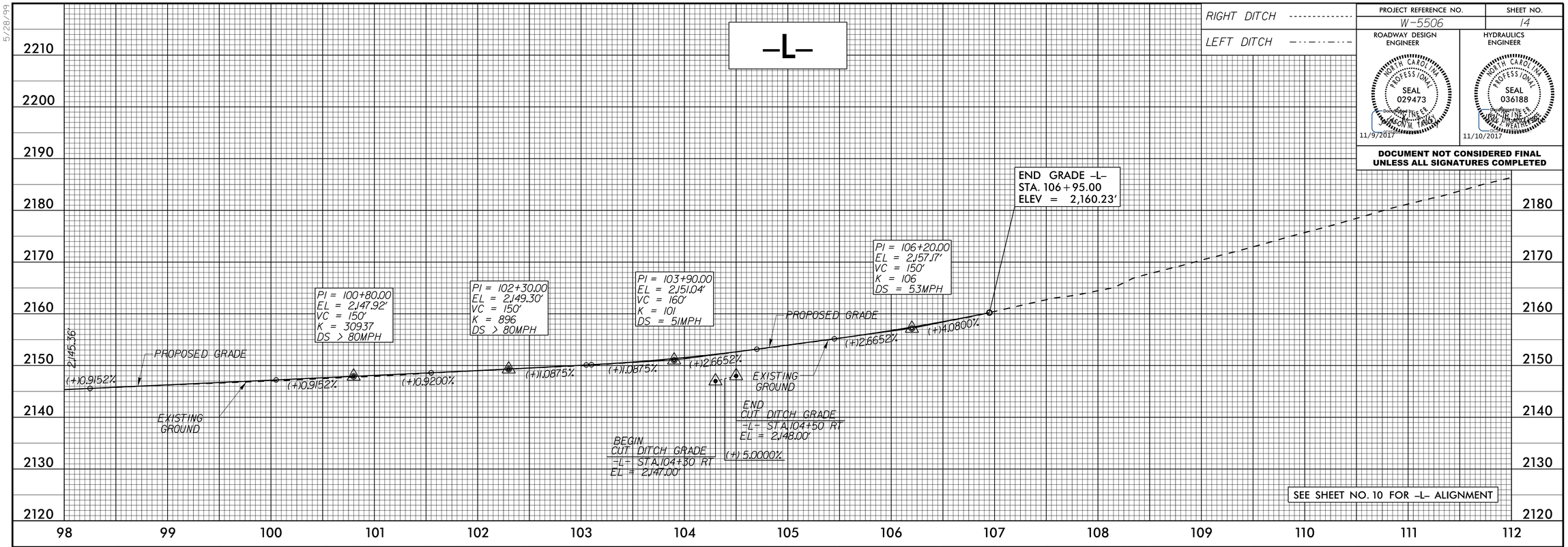

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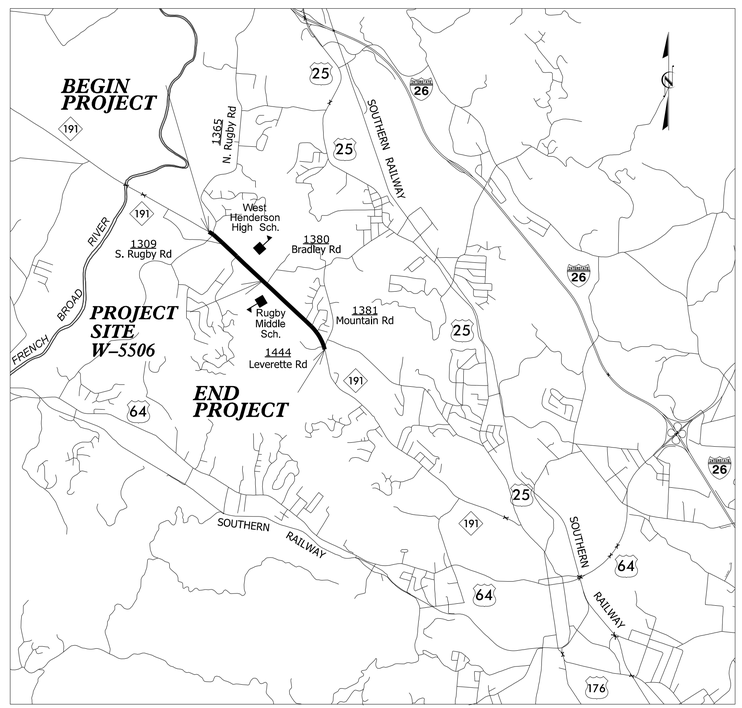
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

HENDERSON COUNTY



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-2	TRANSPORTATION OPERATIONS PLAN
TMP-3	PHASING
TMP-4 - 10	PHASE I DETAILS
TMP-11 - 17	PHASE II DETAILS

SHEET NO.
TMP-1

W-5506

TIP PROJECT:

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

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

_____ STATE TRAFFIC MANAGEMENT ENGINEER

_____ TRAFFIC CONTROL PROJECT ENGINEER

_____ TRAFFIC CONTROL PROJECT DESIGN ENGINEER

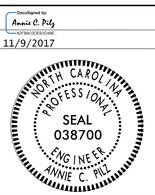
_____ TRAFFIC CONTROL DESIGN ENGINEER

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

RS&H

APPROVED: Annie C. Pilz (DocuSigned by: 5F9B1D2D8C4D4...)
DATE: 11/9/2017

SEAL



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PROJ. REFERENCE NO.	SHEET NO.
W-5506	TMP-1A

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1135.01	CONES
1150.01	FLAGGING DEVICES
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
1205.07	PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

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

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

	PAINT (24")		PAINT (8")
P2	WHITE STOPBAR	PP	YELLOW DIAGONAL
	PAINT (4")		**PAINT MARKING SYMBOLS**
PA	WHITE EDGELINE	QA	LEFT TURN ARROW
PD	3 FT. - 9 FT. WHITE MINI SKIP	QB	RIGHT TURN ARROW
PE	WHITE SOLID LANE LINE	QE	COMBE RIGHT/STRAIGHT ARROW
PI	YELLOW DOUBLE CENTER		

TEMPORARY RAISED MARKERS

MH	YELLOW & YELLOW
MI	YELLOW & RED

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RS&H

APPROVED DocuSigned by: Annie C. Pilz DATE: 11/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER ANNIE C. PILZ

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

ROADWAY STANDARD DRAWINGS & LEGEND

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GENERAL NOTES

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

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

TIME RESTRICTIONS

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

ROAD NAME	DAY AND TIME RESTRICTIONS	
NC HWY 191 (-L-)	MONDAY THRU FRIDAY	7:00 A.M. TO 9:00 A.M.
	MONDAY THRU FRIDAY	2:30 P.M. TO 6:00 P.M.

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

ROAD NAME

NC HWY 191 (-L-)

HOLIDAY

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

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

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

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

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

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

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

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

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

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

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

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

I) DO NOT INSTALL MORE THAN 2 SIMULTANEOUS LANE CLOSURES IN ANY ONE DIRECTION ON NC HWY 191.

PAVEMENT EDGE DROP OFF REQUIREMENTS

J) 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.

K) 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) 100 FT. IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

L) NOTIFY THE ENGINEER, COUNTY EMS, AND SCHOOL OFFICIALS THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

M) 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.

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

O) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 FT. IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

P) 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.

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
NC HWY 191	PAINT	TEMPORARY RAISED MARKER

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

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

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

MISCELLANEOUS

U) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100 FT. AND 100 FT. RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

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RS&H

APPROVED: DocuSigned by: Annie C. Pilz DATE: 11/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER ANNIE C. PILZ

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

TRANSPORTATION OPERATIONS PLAN

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PROJ. REFERENCE NO.	SHEET NO.
W-5506	TMP-3

TRAFFIC CONTROL PHASING

PHASE I

STEP 1:

USING RSD 1101.01 (SHEET 3 OF 3), INSTALL ALL WORK ZONE ADVANCE WARNING SIGNS ON –L– (NC 191 HAYWOOD RD.)

STEP 2:

ICT: COMPLETE THE WORK AT THE FOLLOWING LOCATION DURING WEEKENDS OR SCHOOL BREAKS:

WEST HENDERSON HIGH SCHOOL ENTRANCE RESURFACING (SEE SHEET TMP–06)

USING RSD 1101.02 (SHEETS 1 AND 2 OF 15) WITH TRAFFIC IN EXISTING PATTERN AND WHILE MAINTAINING –Y– LINE AND DRIVEWAY ACCESS, CONSTRUCT ROAD WIDENING UP TO THE EDGE OF EXISTING PAVEMENT EXCLUDING THE FINAL LAYER OF SURFACE COURSE AT THE FOLLOWING AND INSTALL GUARDRAIL AT THE FOLLOWING (SEE SHEETS TMP–4 THRU TMP–10):

–L– STA 24+00+/– LT TO –L– STA 106+95+/– LT

USING RSD 1101.02 (SHEETS 1 AND 2 OF 15) AND WHILE MAINTAINING –Y– LINE AND DRIVEWAY ACCESS, WEDGE EXISTING PAVEMENT EXCLUDING THE FINAL LAYER OF SURFACE COURSE AT THE FOLLOWING:

–L– STA 24+00+/– LT TO –L– STA 106+95+/– LT

CONSTRUCT WEDGING AS NEEDED TO PROVIDE A SMOOTH TRANSITION TO EXISTING PAVEMENT AND APPROPRIATE CROSS SLOPES TO ENSURE POSITIVE DRAINAGE.

REPLACE EXISTING PAVEMENT MARKINGS WITH TEMPORARY PAVEMENT MARKINGS AND RETURN TRAFFIC TO EXISTING TRAVEL PATTERN AT THE END OF EACH WORK PERIOD.

PHASE II

STEP 1:

ICT: COMPLETE THE WORK AT THE FOLLOWING LOCATION DURING WEEKENDS OR SCHOOL BREAKS:

RUGBY MIDDLE SCHOOL ENTRANCE RESURFACING (SEE SHEET TMP–15)

USING RSD 1101.02 (SHEETS 1 AND 2 OF 15) WITH TRAFFIC IN EXISTING PATTERN AND WHILE MAINTAINING –Y– LINE AND DRIVEWAY ACCESS, CONSTRUCT ROAD WIDENING UP TO THE EDGE OF EXISTING PAVEMENT EXCLUDING THE FINAL LAYER OF SURFACE COURSE AND INSTALL GUARDRAIL AT THE FOLLOWING (SEE SHEETS TMP–11 THRU TMP–17):

–L– STA 24+00+/– RT TO –L– STA 106+95+/– RT

USING RSD 1101.02 (SHEETS 1 AND 2 OF 15) AND WHILE MAINTAINING –Y– LINE AND DRIVEWAY ACCESS, WEDGE EXISTING PAVEMENT EXCLUDING THE FINAL LAYER OF SURFACE COURSE AT THE FOLLOWING:

–L– STA 24+00+/– RT TO –L– STA 106+95+/– RT

CONSTRUCT WEDGING AS NEEDED TO PROVIDE A SMOOTH TRANSITION TO EXISTING PAVEMENT AND APPROPRIATE CROSS SLOPES TO ENSURE POSITIVE DRAINAGE.

REPLACE EXISTING PAVEMENT MARKINGS WITH TEMPORARY PAVEMENT MARKINGS AND RETURN TRAFFIC TO EXISTING TRAVEL PATTERN AT THE END OF EACH WORK PERIOD.

STEP 2:

USING RSD 1101.02 (SHEET 1 OF 15), PLACE FINAL LAYER OF SURFACE COURSE, FINAL PAVEMENT MARKINGS AND MARKERS AND REMOVE ALL TRAFFIC CONTROL DEVICES ON –L– (NC 191 HAYWOOD RD.) (SEE PMP PLANS).

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APPROVED: DocuSigned by: Annie C. Pilz DATE: 11/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER ANNIE C. PILZ

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

PHASING

11/8/2017
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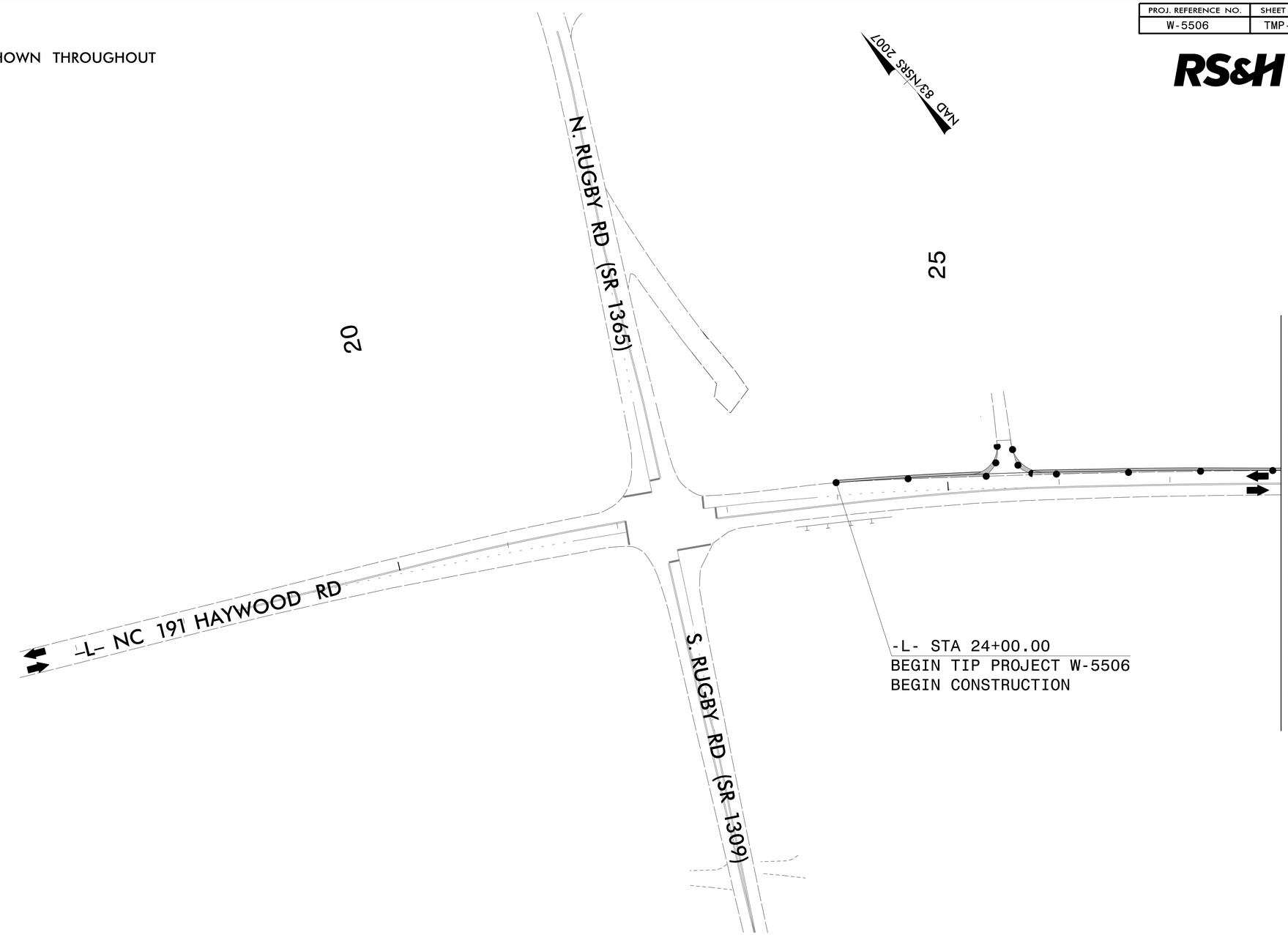
PROJ. REFERENCE NO.	SHEET NO.
W-5506	TMP-04

RS&H

NOTE:
EXISTING PAVEMENT MARKINGS ARE SHOWN THROUGHOUT PHASE I.



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

PHASE I DETAIL

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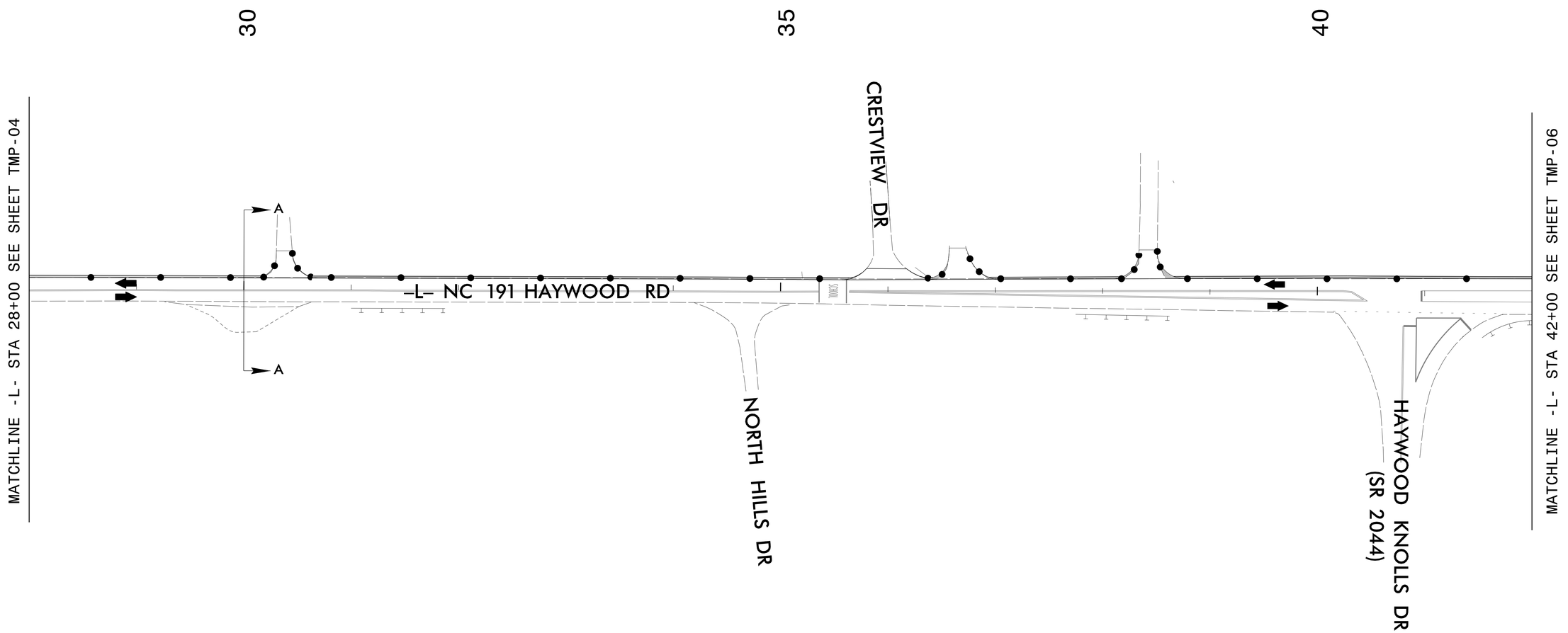

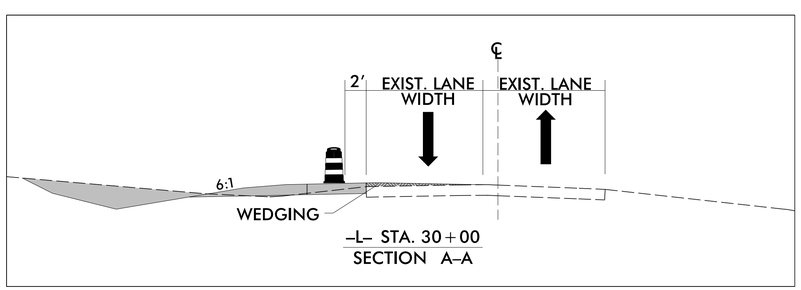

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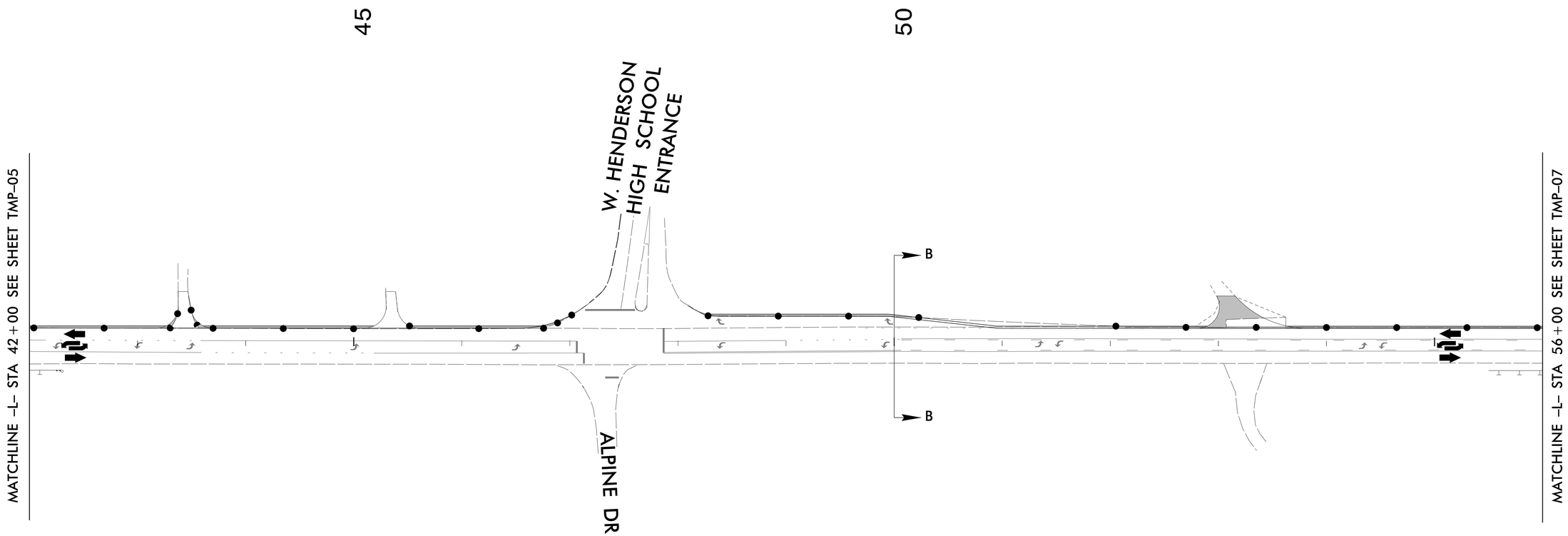

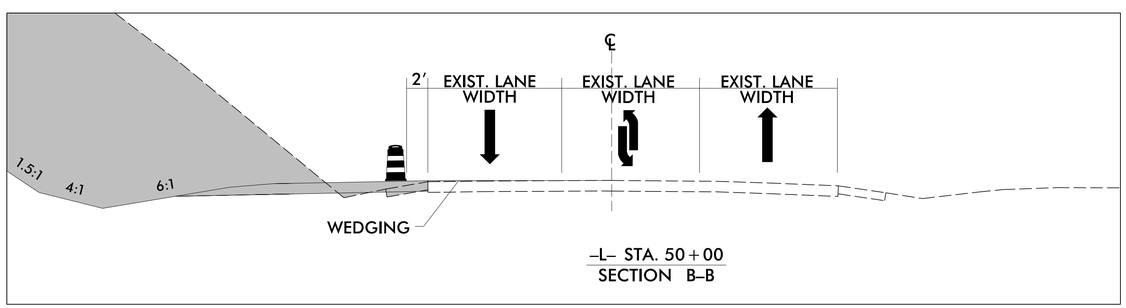

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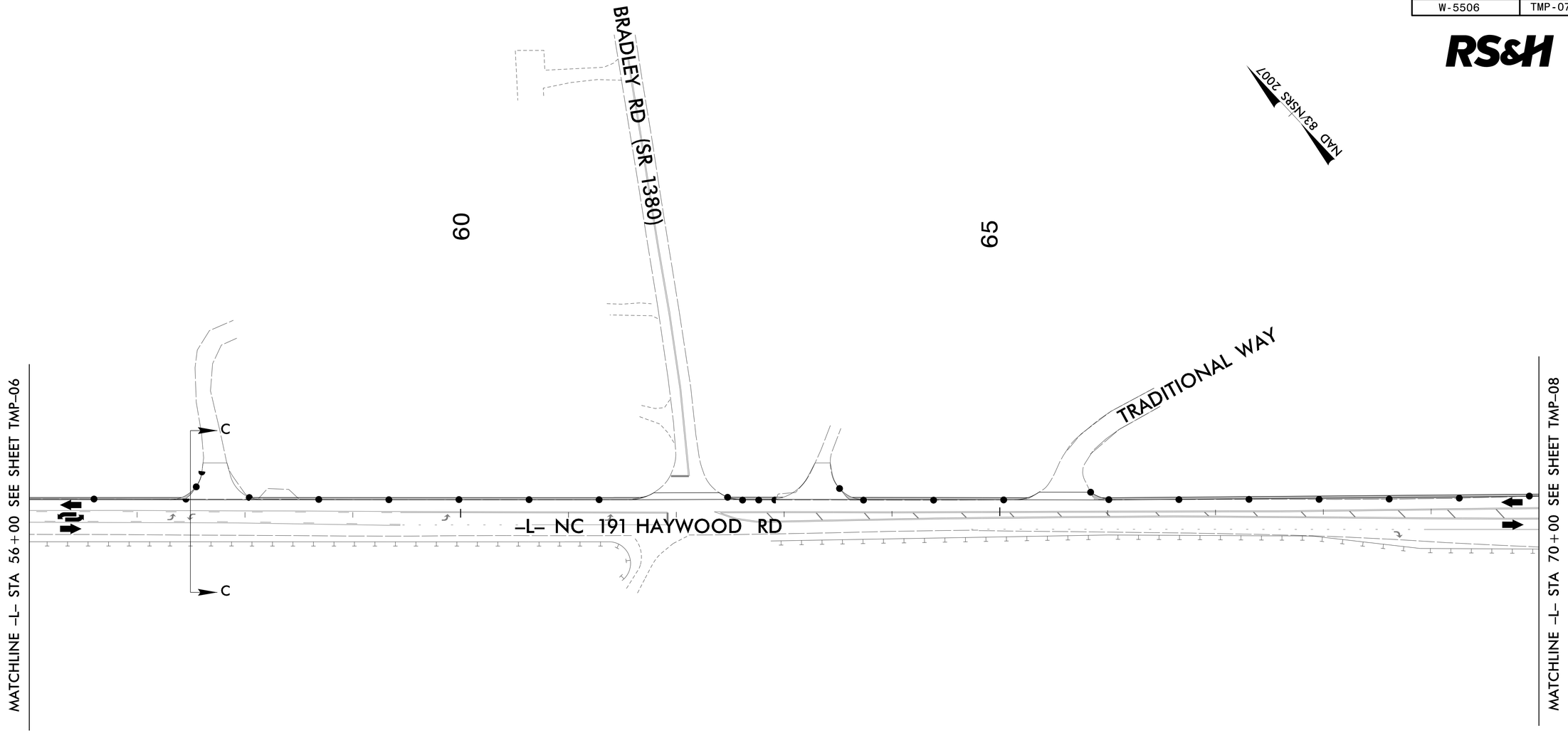

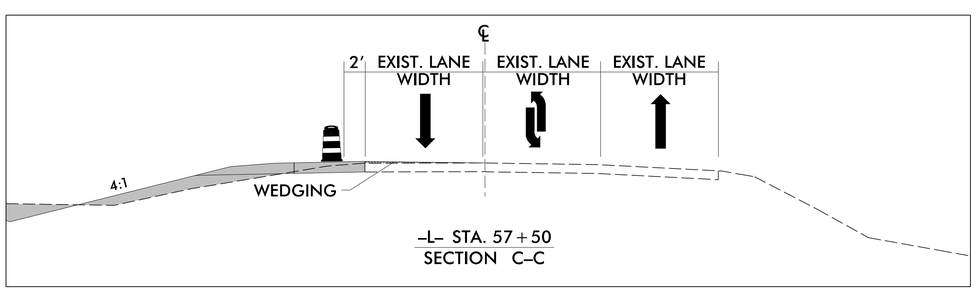

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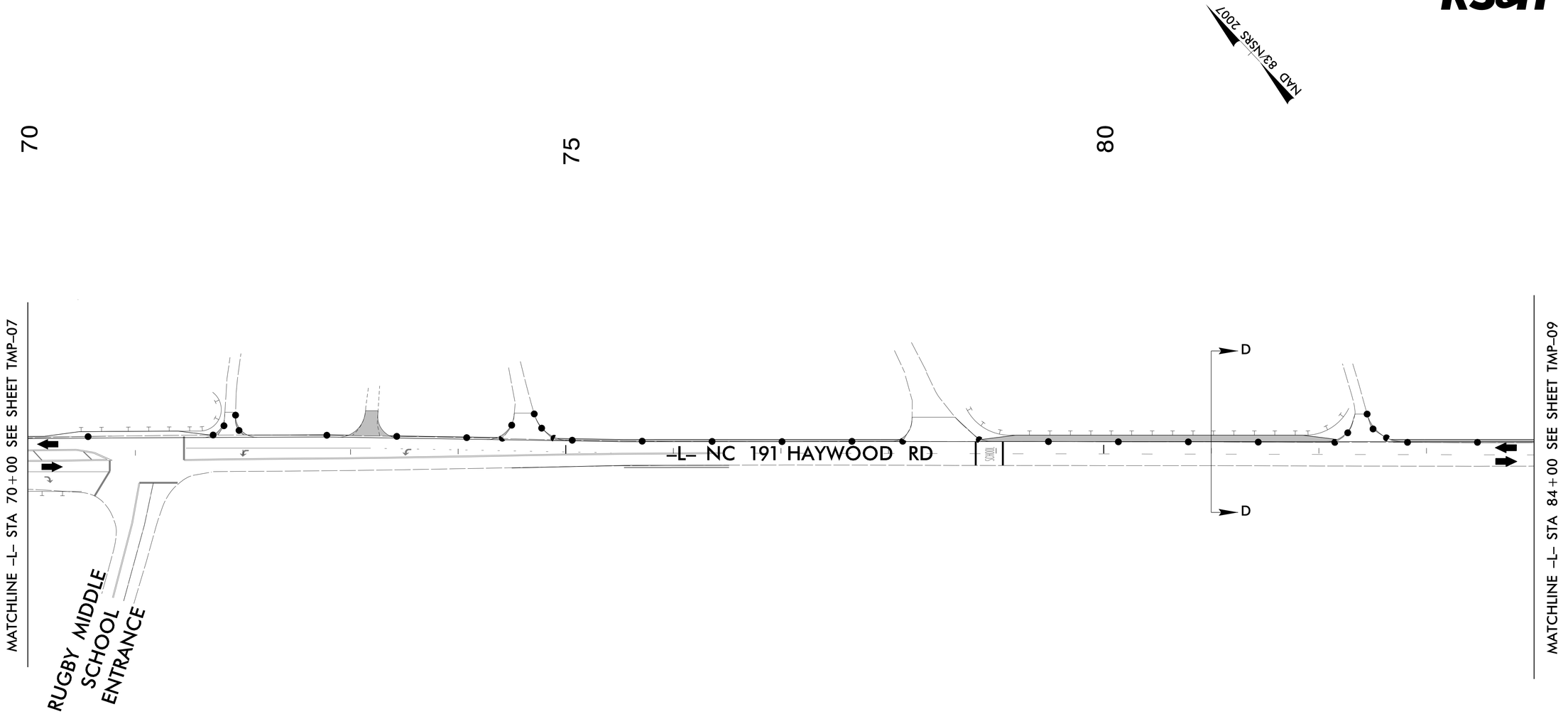

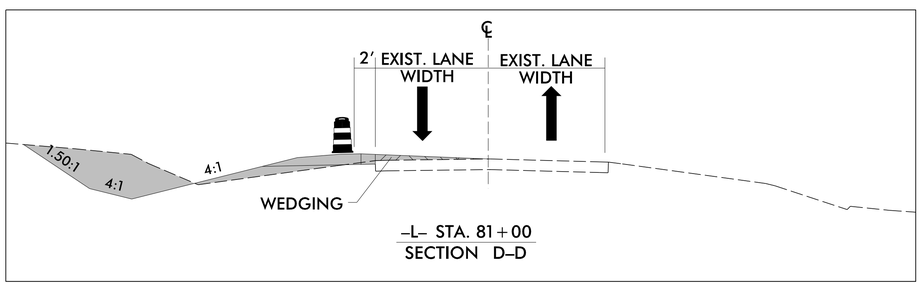

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SECTION D-D

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PHASE I
DETAIL

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W-5506	TMP-09

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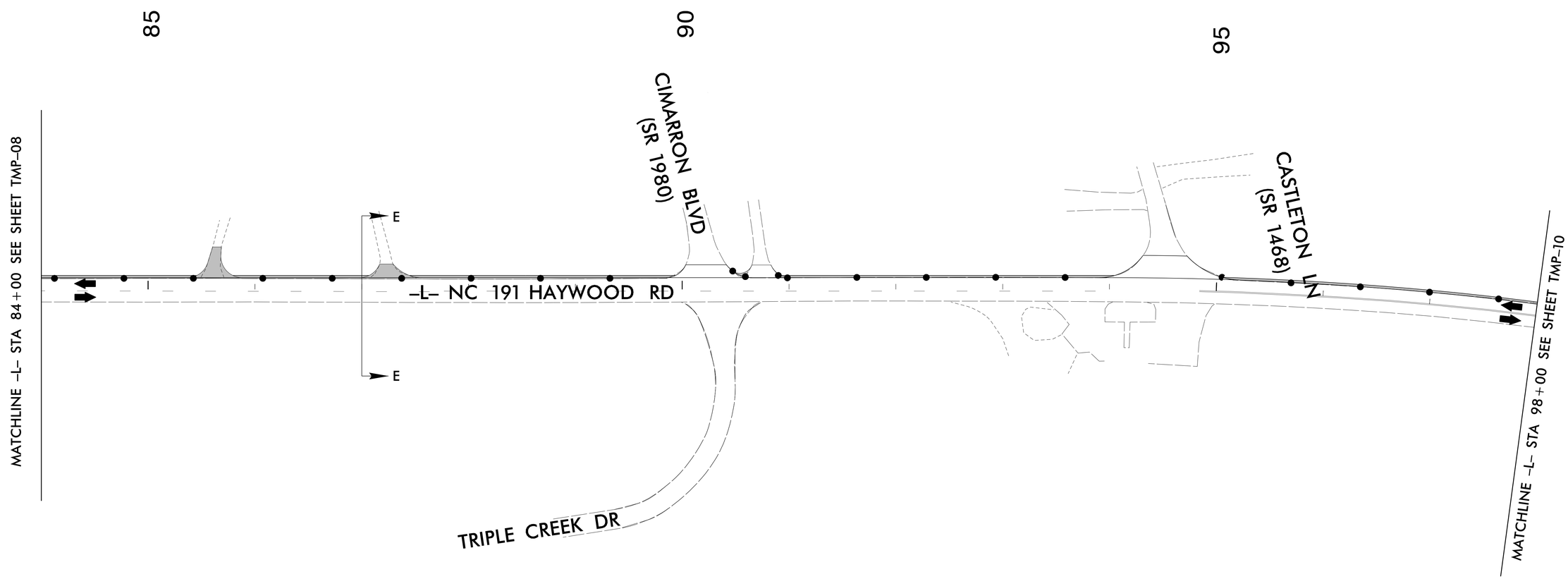

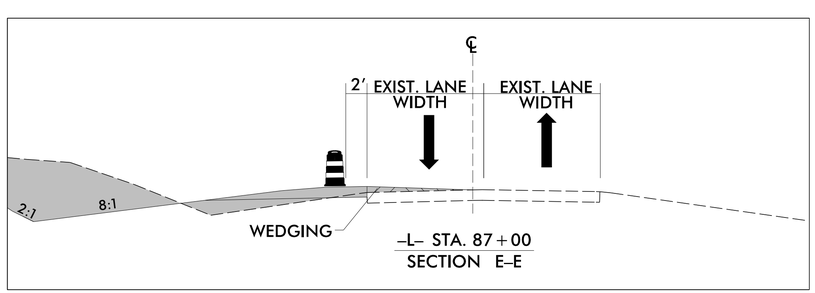

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STATE OF NORTH CAROLINA
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WORK ZONE TRAFFIC CONTROL

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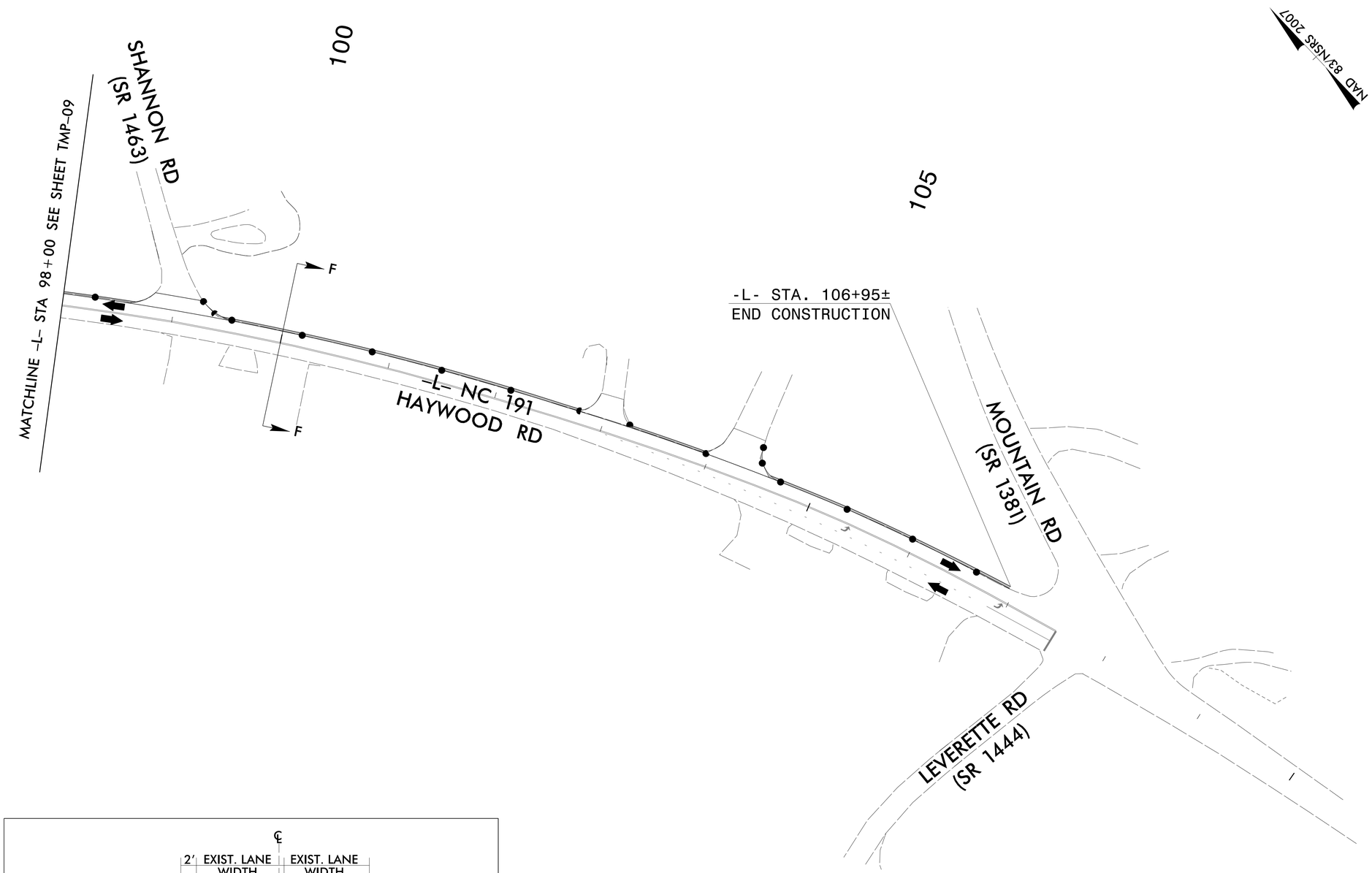

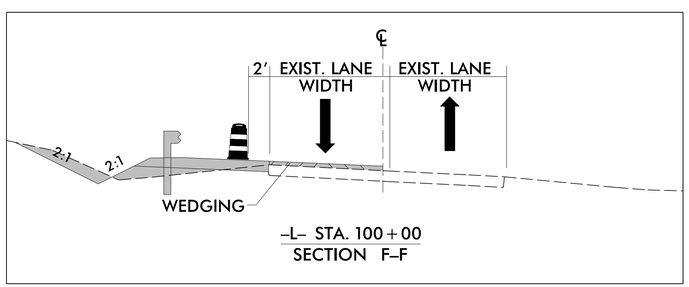

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PHASE I
DETAIL

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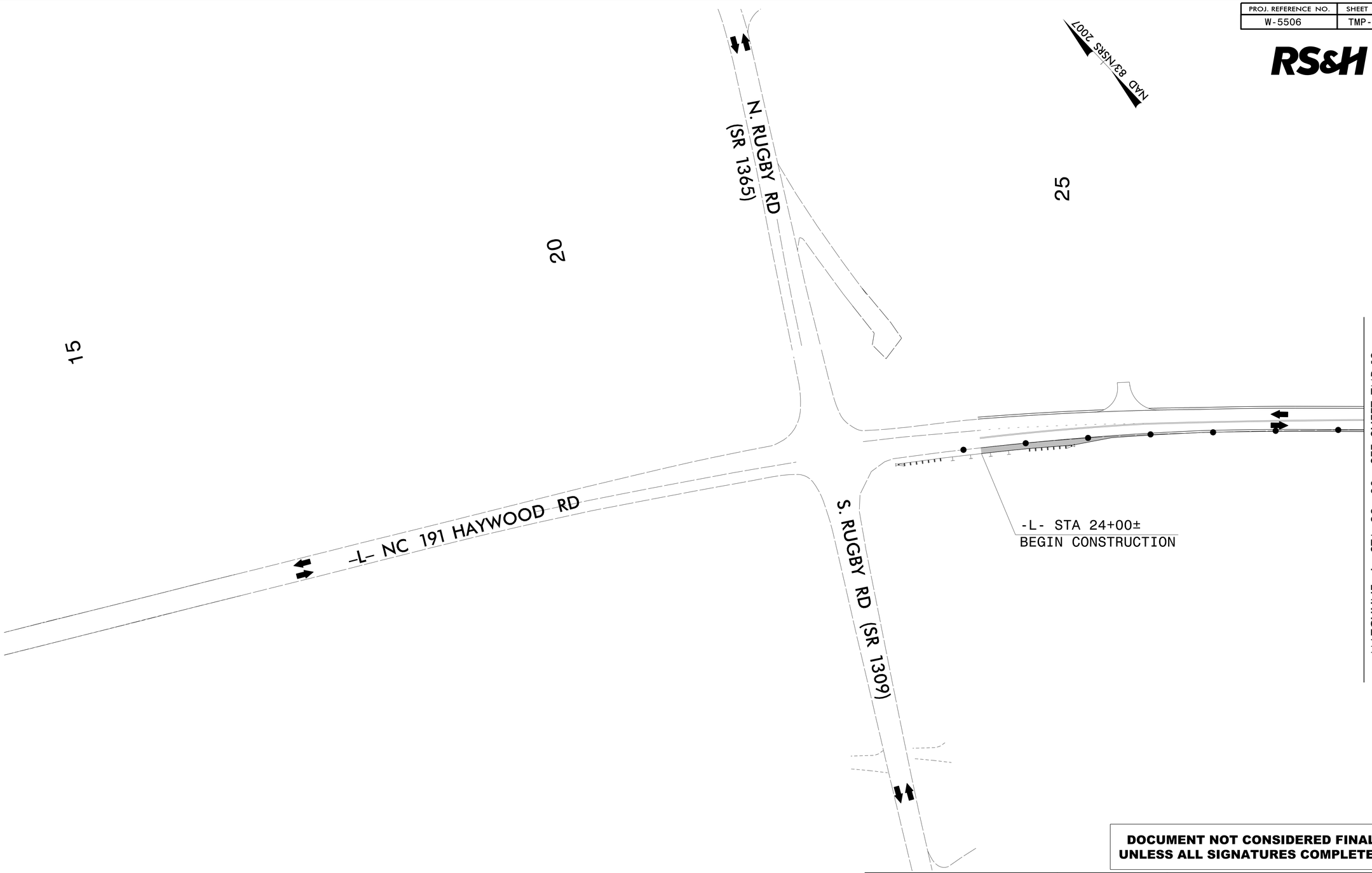

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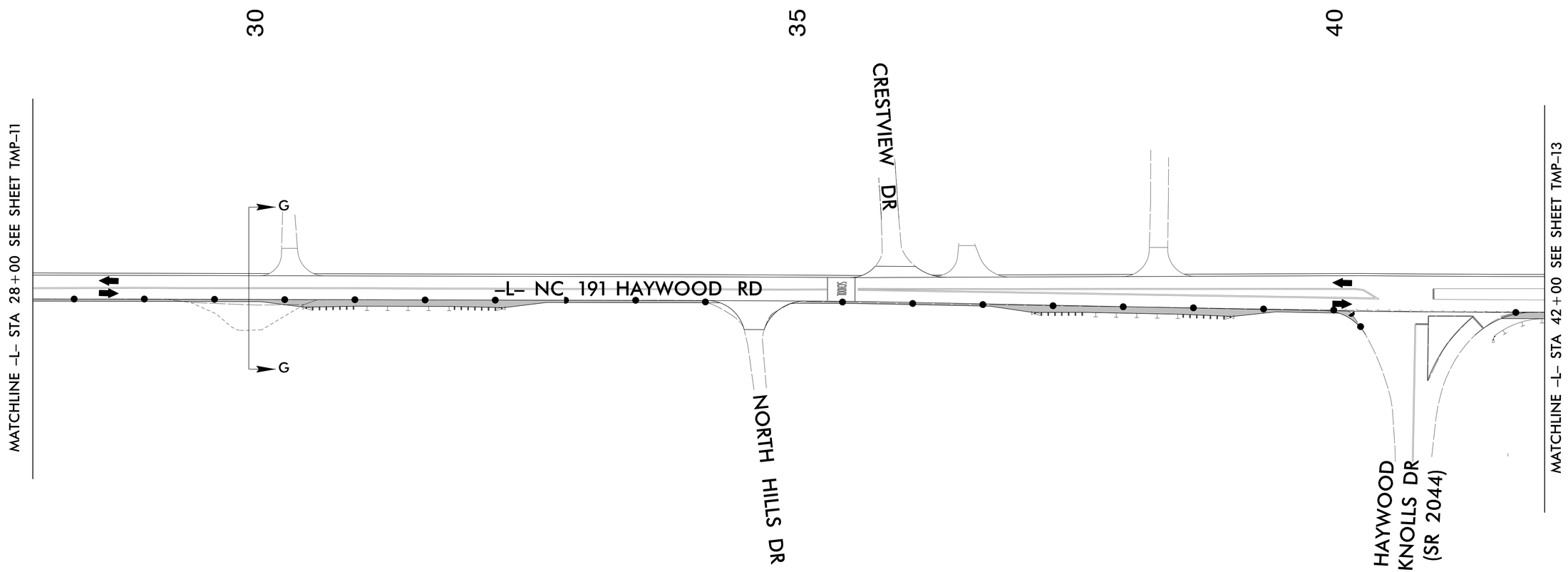

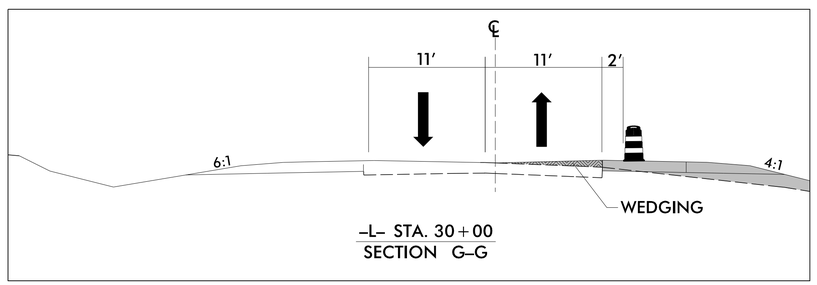

-L- STA. 30+00
SECTION G-G

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PHASE II DETAIL

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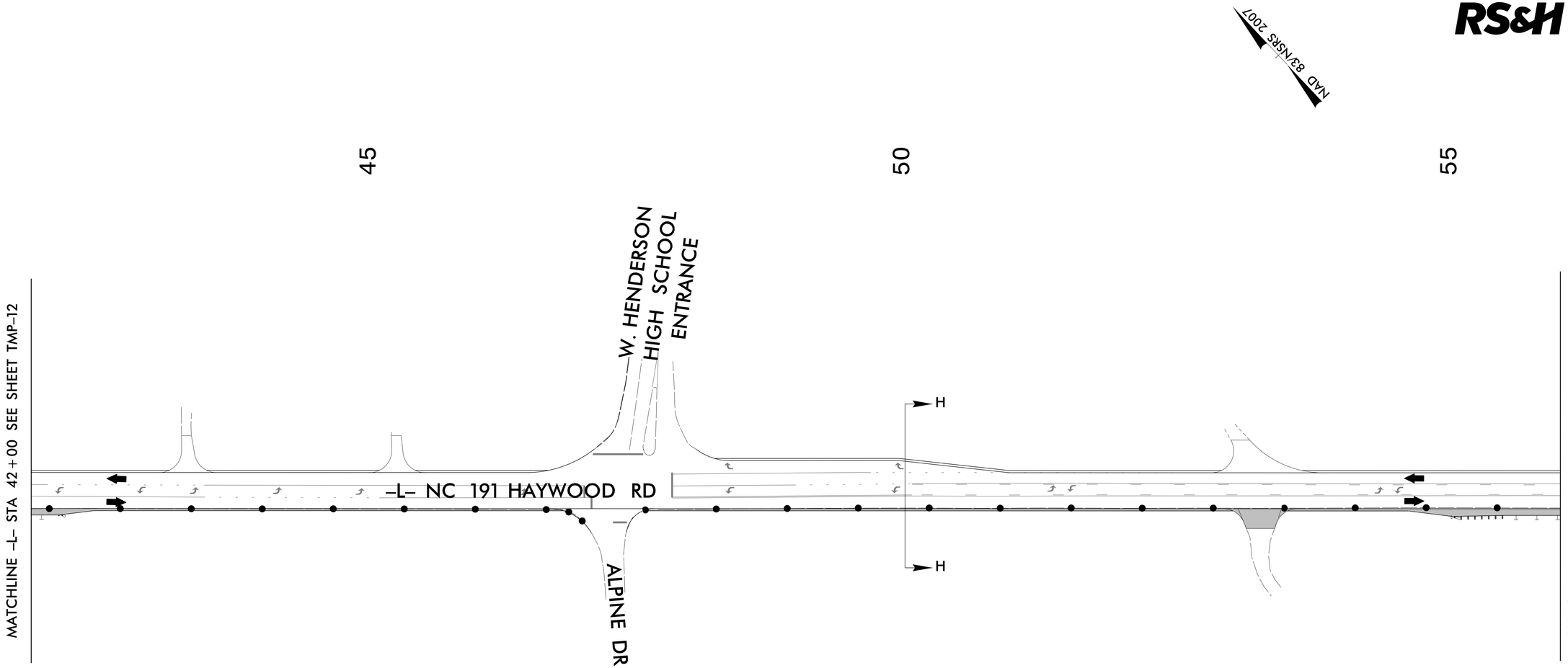

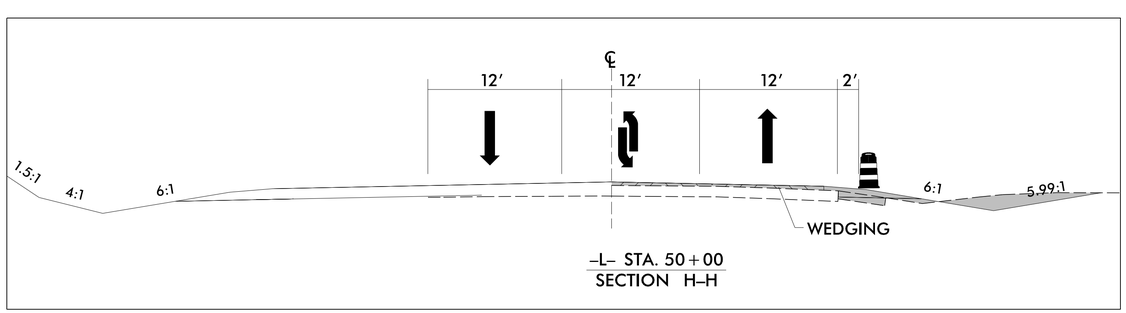

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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE II DETAIL

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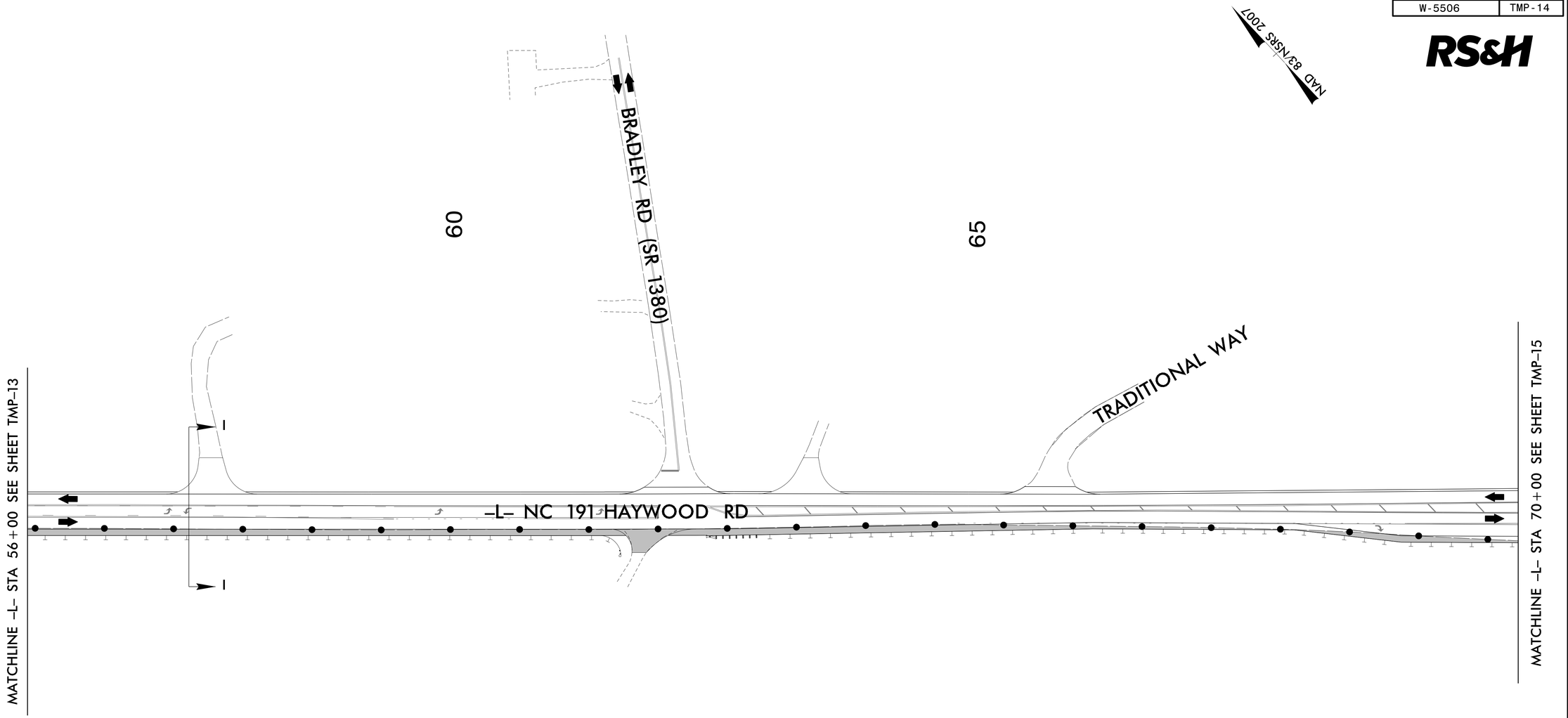

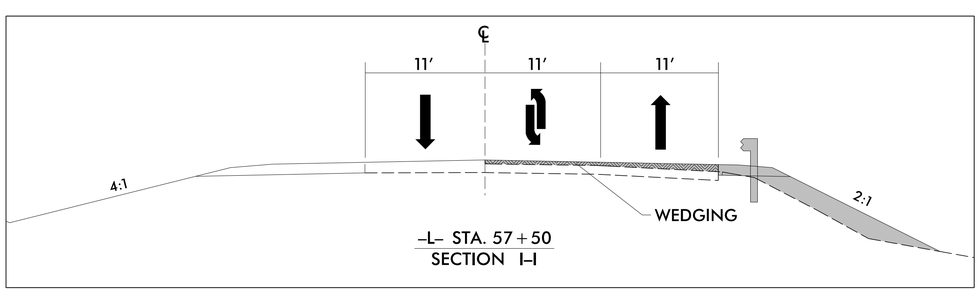

–L– STA. 57+50
SECTION I–I

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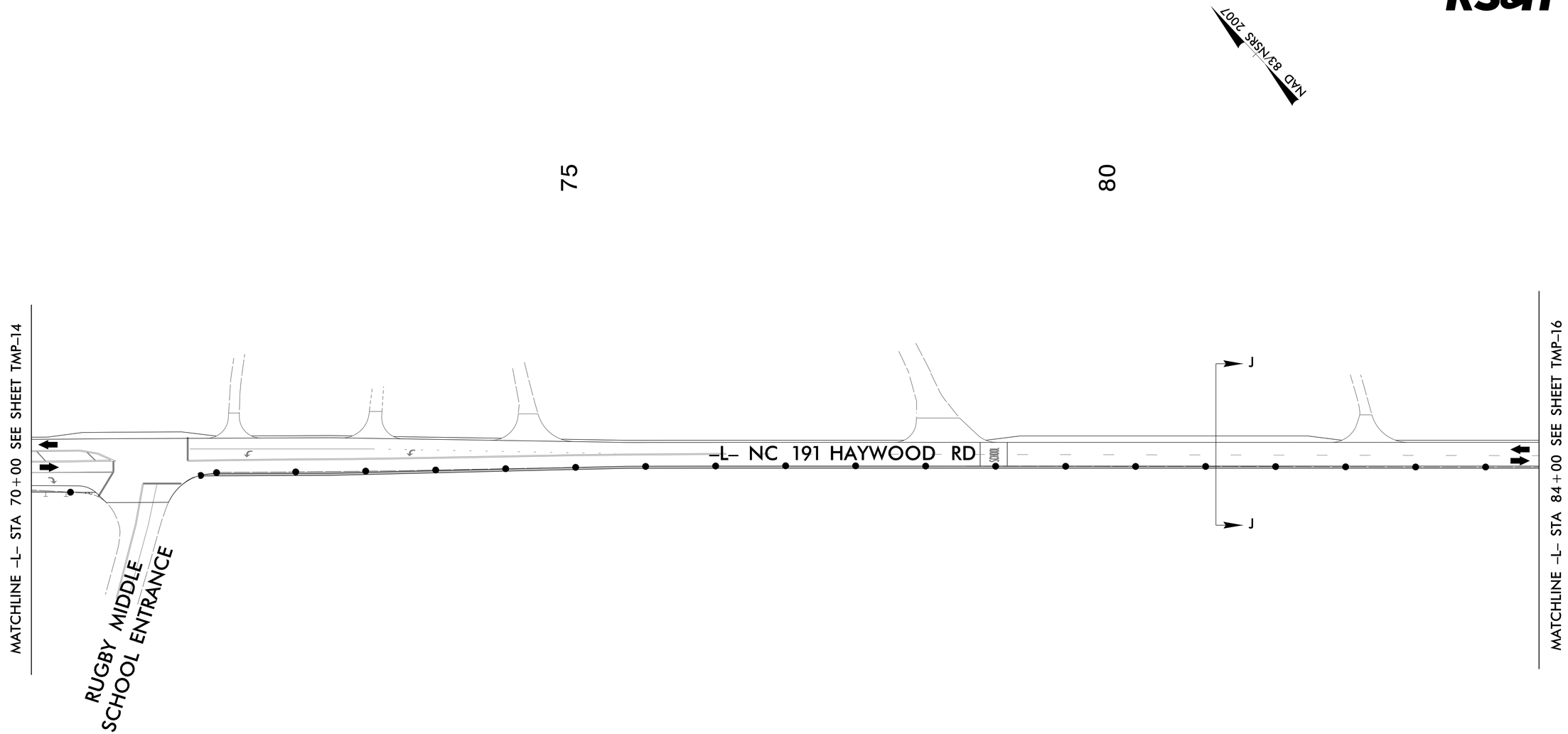

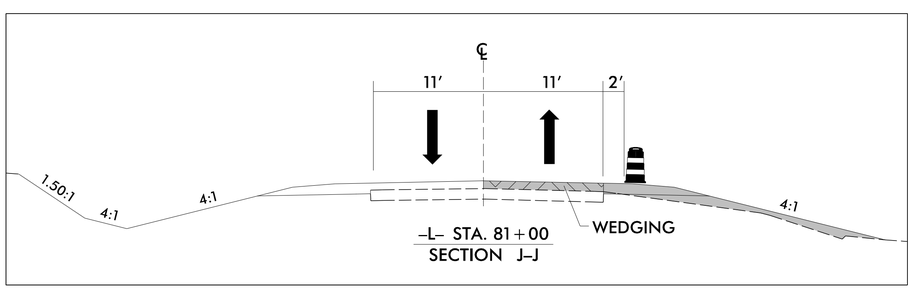

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W-5506	TMP-16

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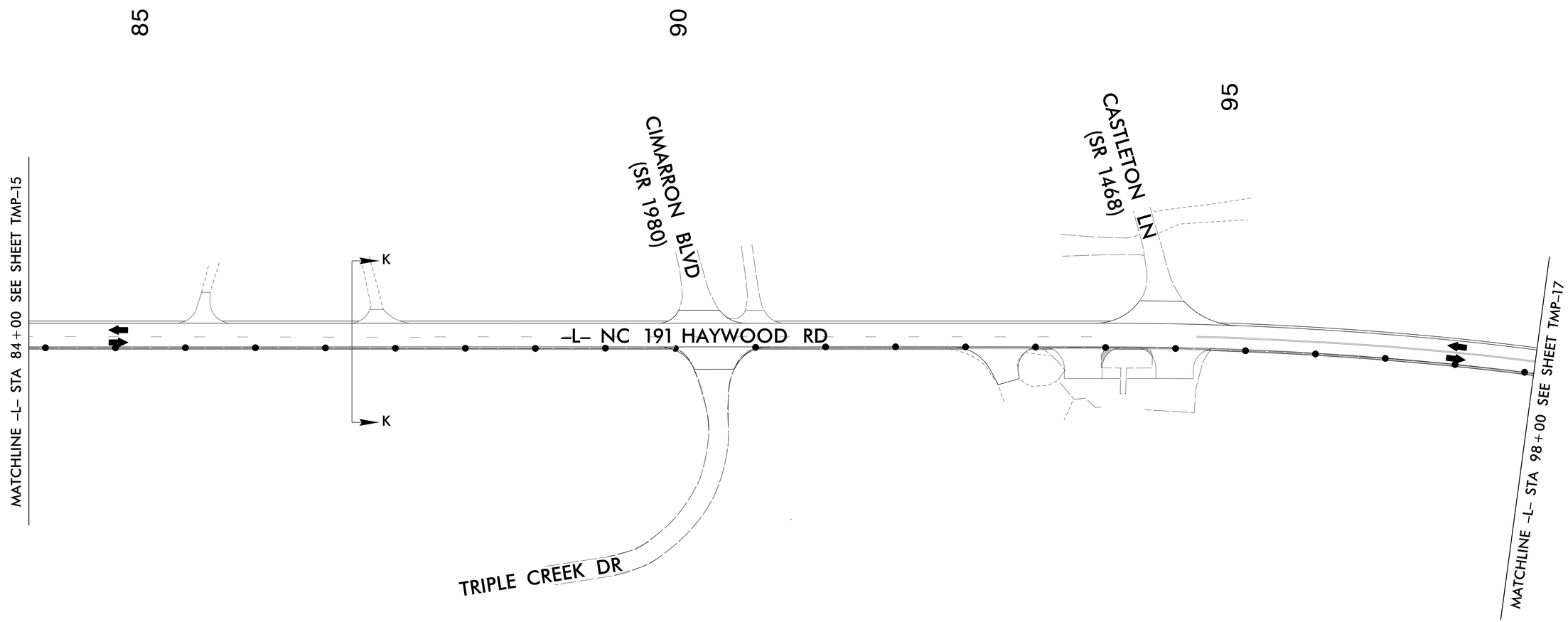
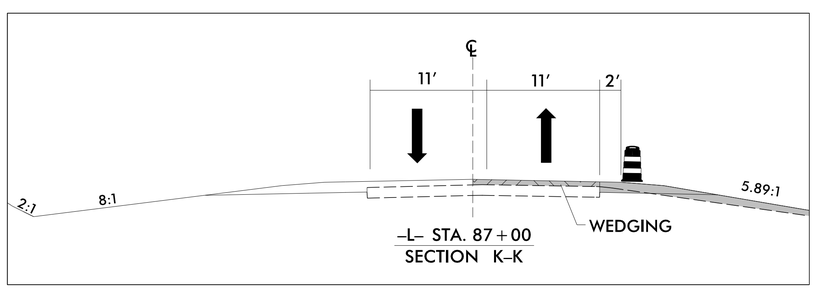
NAD 83/NSRS 2007





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DATE: 11/9/2017

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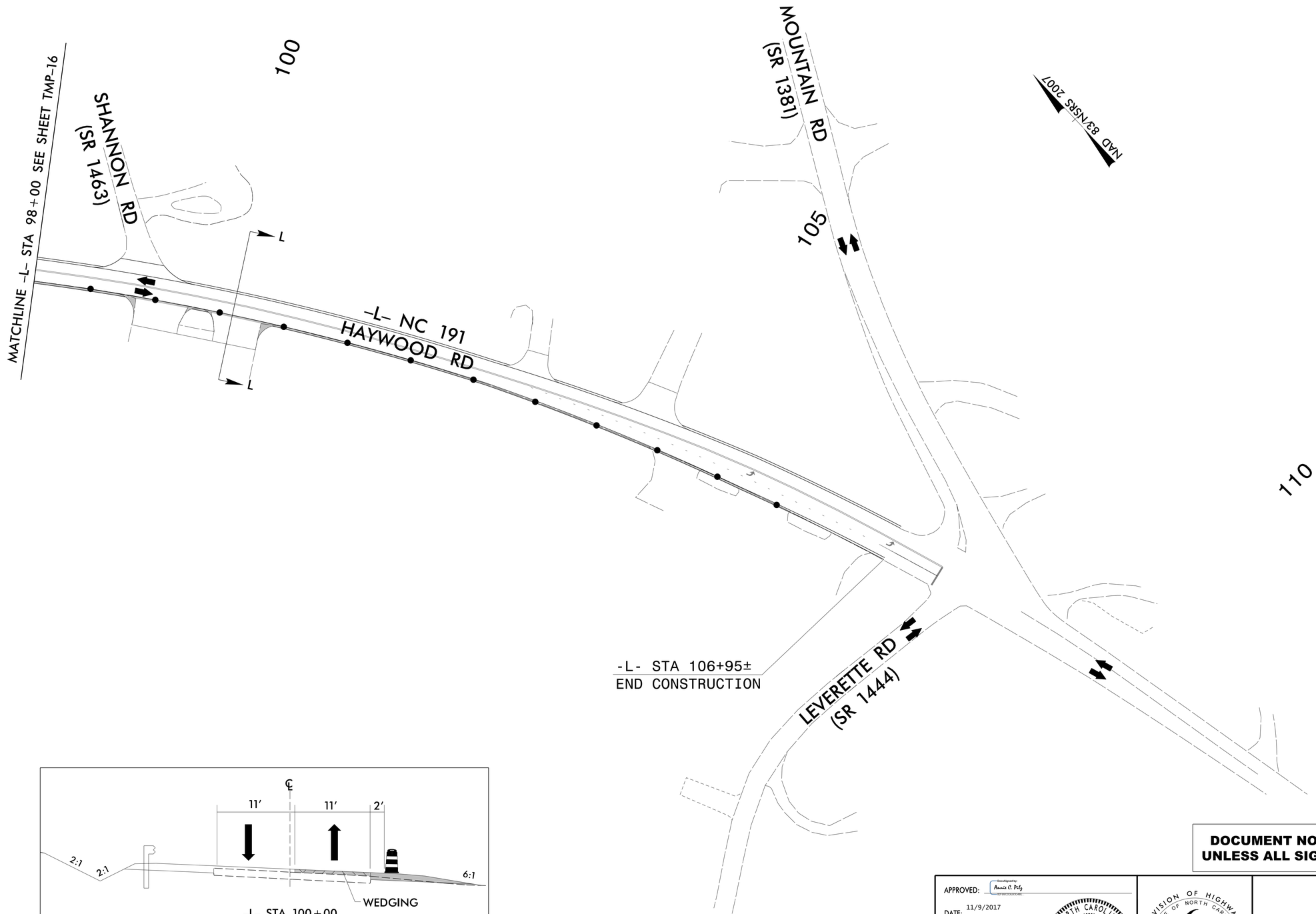

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T.I.P.: W-5506

CONTRACT: DN00431

TIP NO.	SHEET NO.
W-5506	PMP-1

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
HENDERSON COUNTY

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE SHEET
PMP-2	PAVEMENT MARKING SCHEDULE SHEET
PMP-3 THRU 9	PAVEMENT MARKING DETAILS

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 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
NC 191 (HAYWOOD RD)	THERMOPLASTIC	SNOWPLOWABLE

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

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

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

E) STOP BAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

F) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS. IF HEATED-IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE EXTRUDED THERMOPLASTIC PAY ITEM.

PLAN SUBMITTED TO: NCDOT DIVISION 14

WANDA AUSTIN, PE PROJECT TEAM LEAD

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY:
RS&H
ARCHITECTS–ENGINEERS–PLANNERS, INC.

ANNIE C. PILZ, PE PROJECT ENGINEER

SEAN KANE, EI DESIGN ENGINEER

RS&H

11/9/2017
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User:pilzo

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TIP NO.	SHEET NO.
W-5506	PMP-2

APPROVED: Annie C. Pilz (DOCUSIGNED BY)

DATE: 11/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER ANNIE C. PILZ

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W-5506 PAVMENT MARKING SCHEDULE

FINAL
PAVEMENT MARKINGS

SYMBOL	DESCRIPTION
THERMOPLASTIC (4″, 90 MILS)	
TA	WHITE EDGELINE
THERMOPLASTIC (4″, 120 MILS)	
TD	3FT.-9FT./SP WHITE MINISKIP
TE	WHITE SOLID LANE LINE
TF	10 FT. YELLOW SKIP
TH	YELLOW SINGLE CENTER
TI	YELLOW DOUBLE CENTER
T8	2 FT.- 6 FT./SP WHITE MINISKIP
THERMOPLASTIC (24″, 120 MILS)	
T2	WHITE STOPBAR
THERMOPLASTIC (8″, 90 MILS)	
TN	WHITE GORELINE
TP	YELLOW DIAGONAL
THERMOPLASTIC (12″, 90 MILS)	
UA	LEFT TURN ARROW
UB	RIGHT TURN ARROW
UI	ALPHANUMERIC CHARACTERS

RS&H

10/18/2017
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User:KawahakM

PAVEMENT MARKING SCHEDULE

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TIP NO.	SHEET NO.
W-5506	PMP-3

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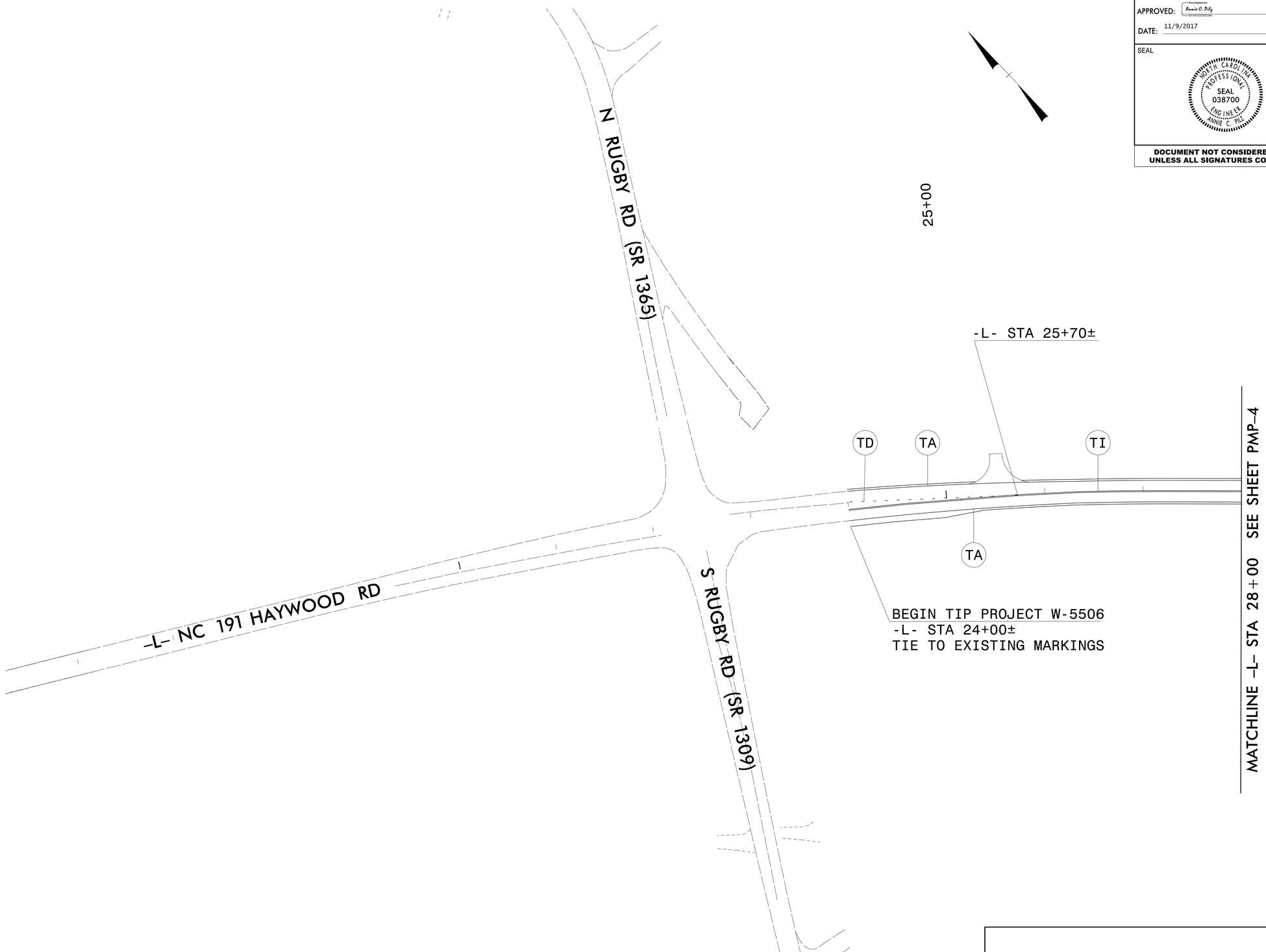

RS&H

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User:KawahakM

PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
W-5506	PMP-4

APPROVED: Annie C. Pilz
DATE: 11/9/2017

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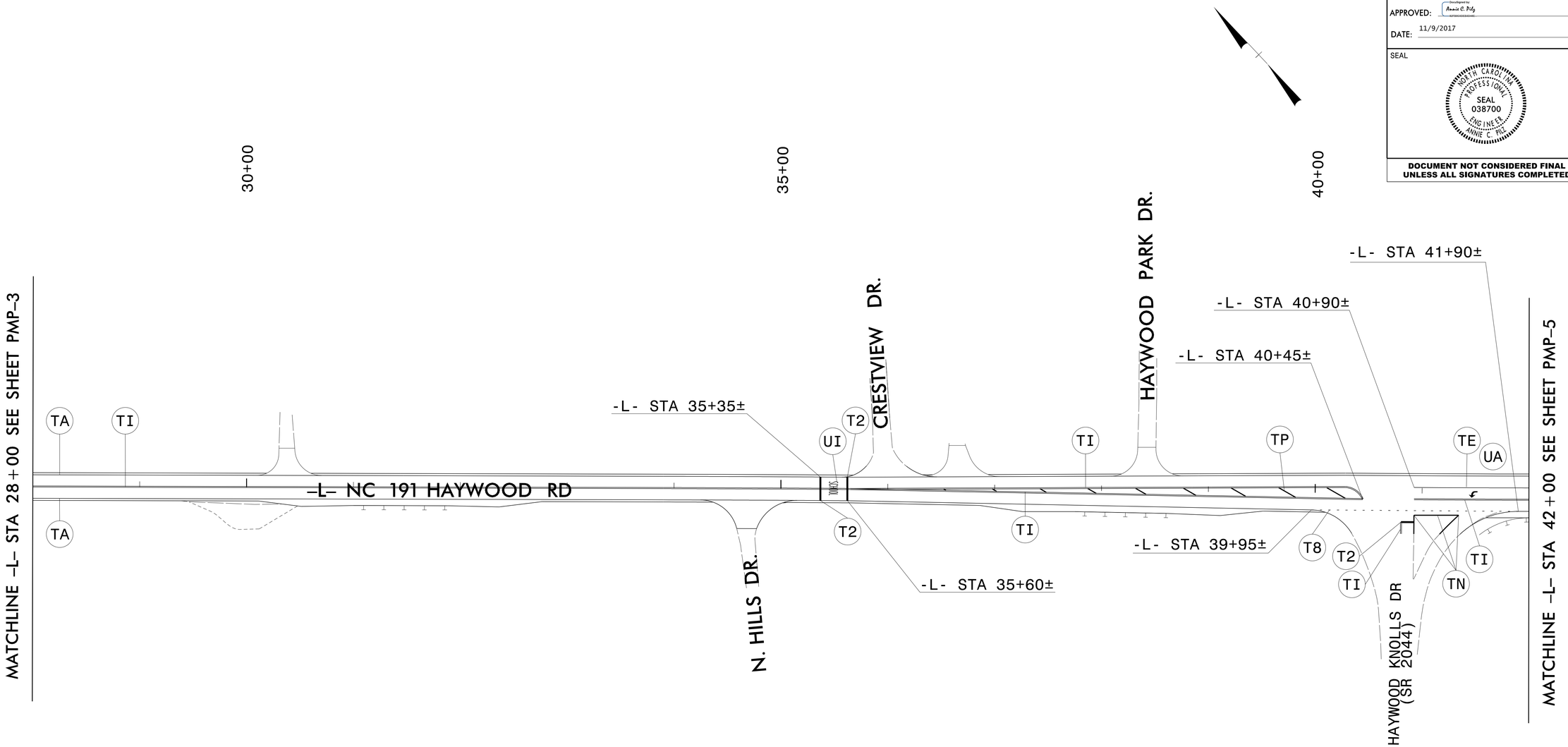

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PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
W-5506	PMP-5

APPROVED: Annie C. Pilz (DocuSigned by: 1C3F8C0DE0E04AE...)

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SEAL

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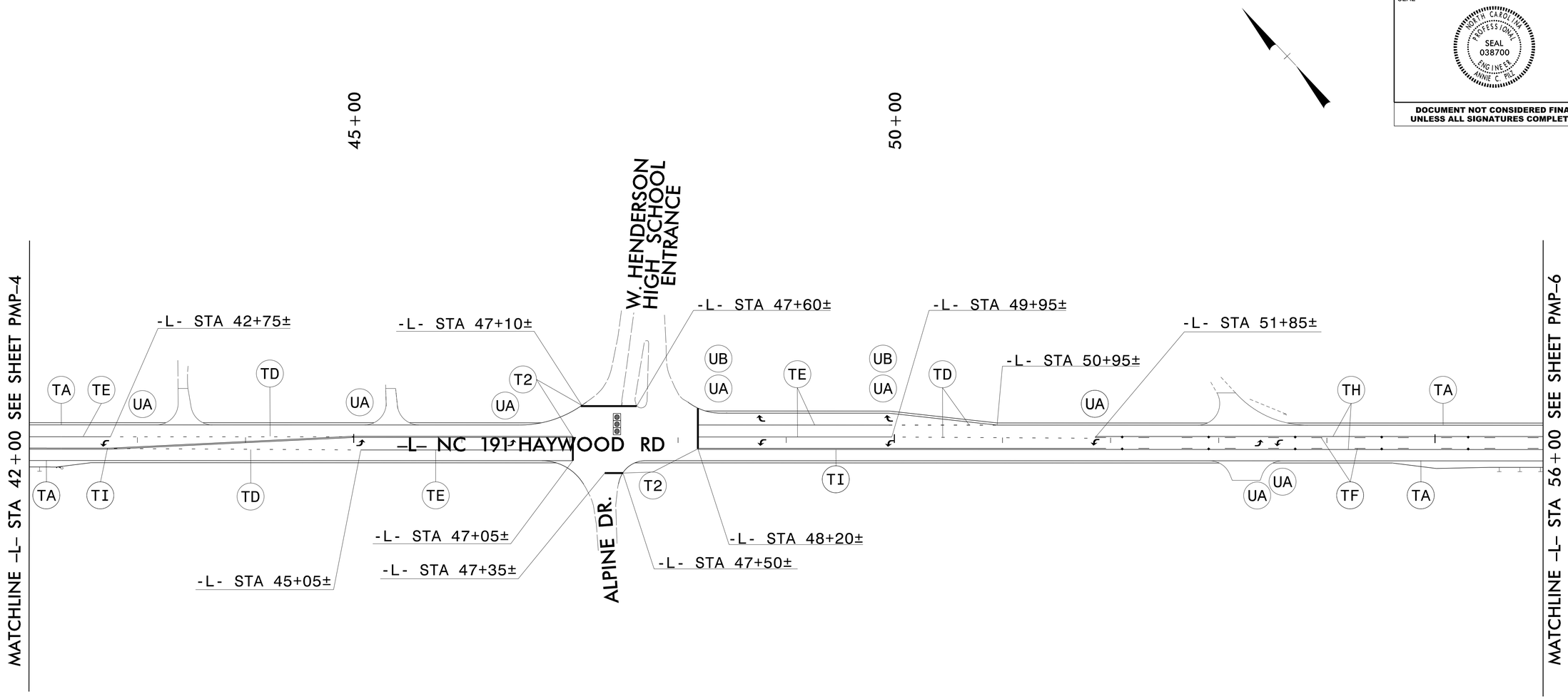

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PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
W-5506	PMP-6

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SEAL

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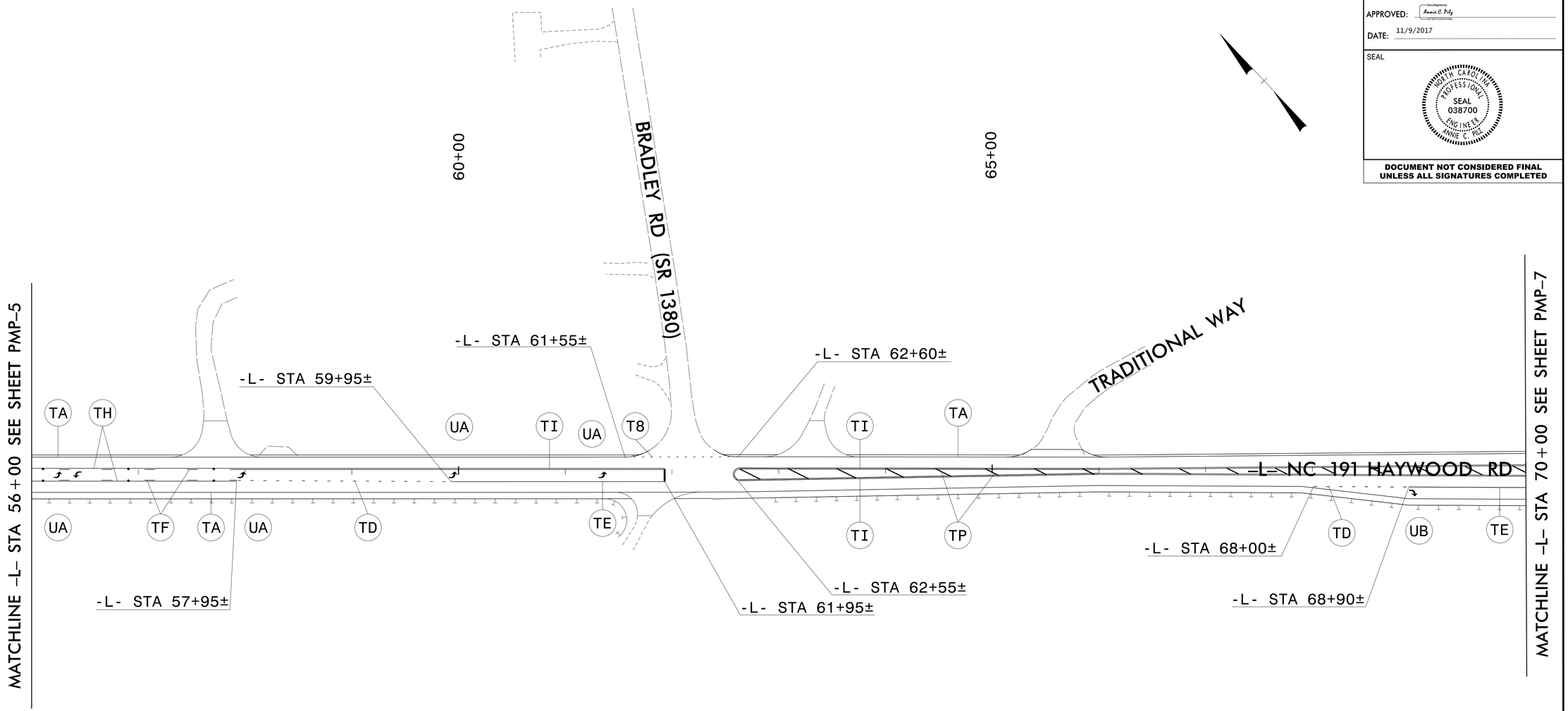

RS&H

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User:KawahakM

PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
W-5506	PMP-7

APPROVED: Annie C. Pilz

DATE: 11/9/2017

SEAL

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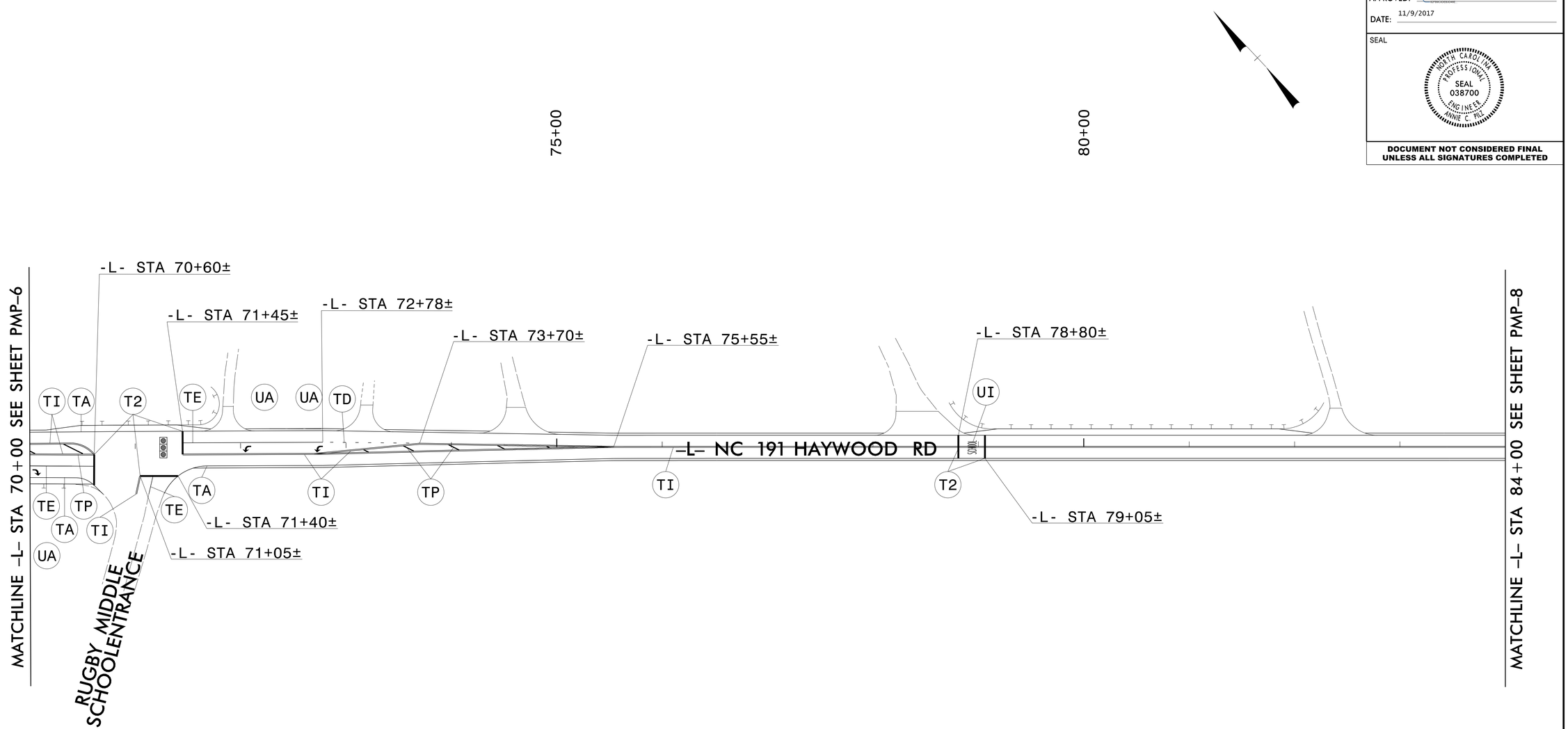

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PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
W-5506	PMP-8

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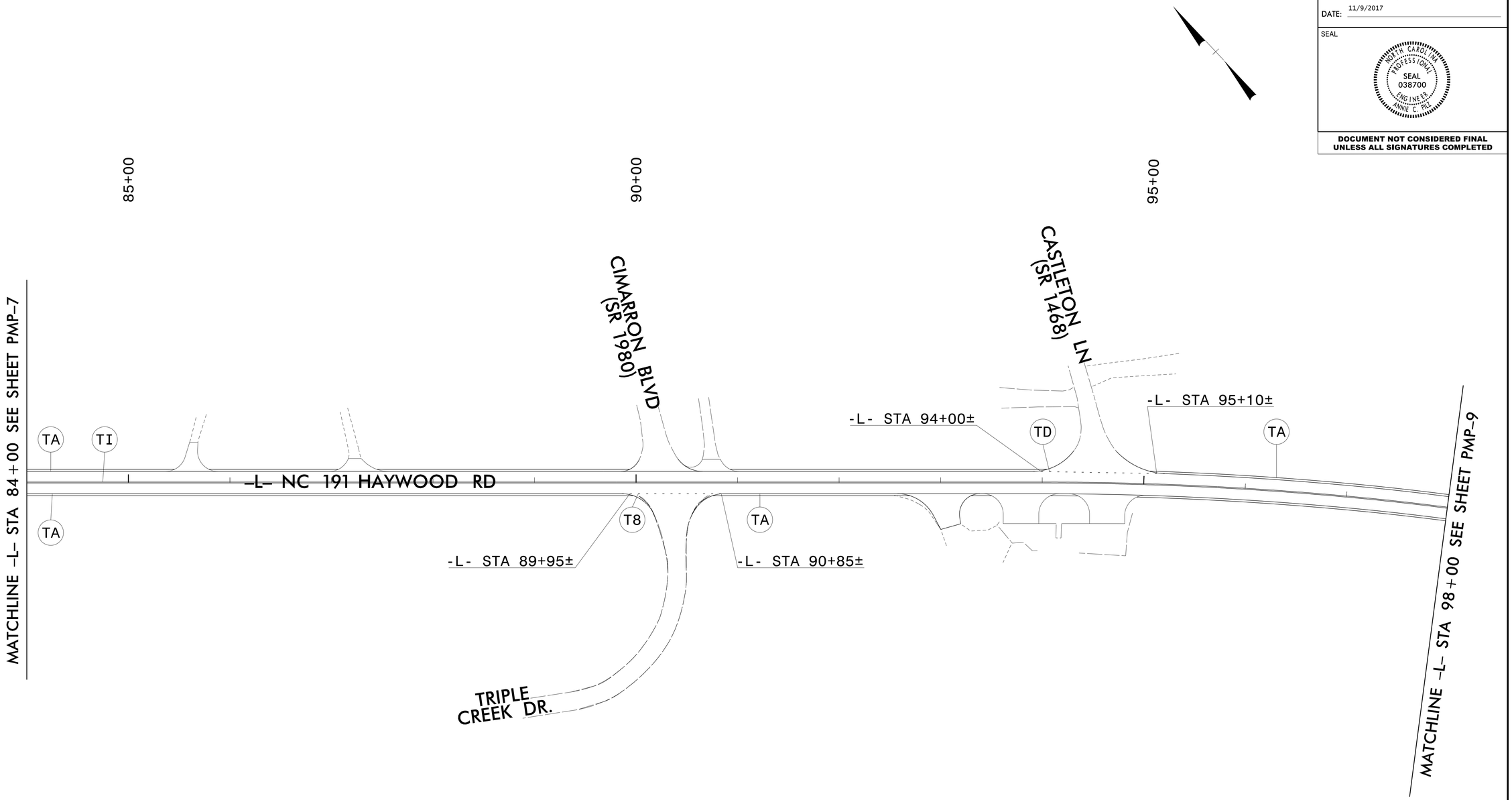

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User:KawahdkM

PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
W-5506	PMP-9

APPROVED: Annie C. Pitz
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SEAL

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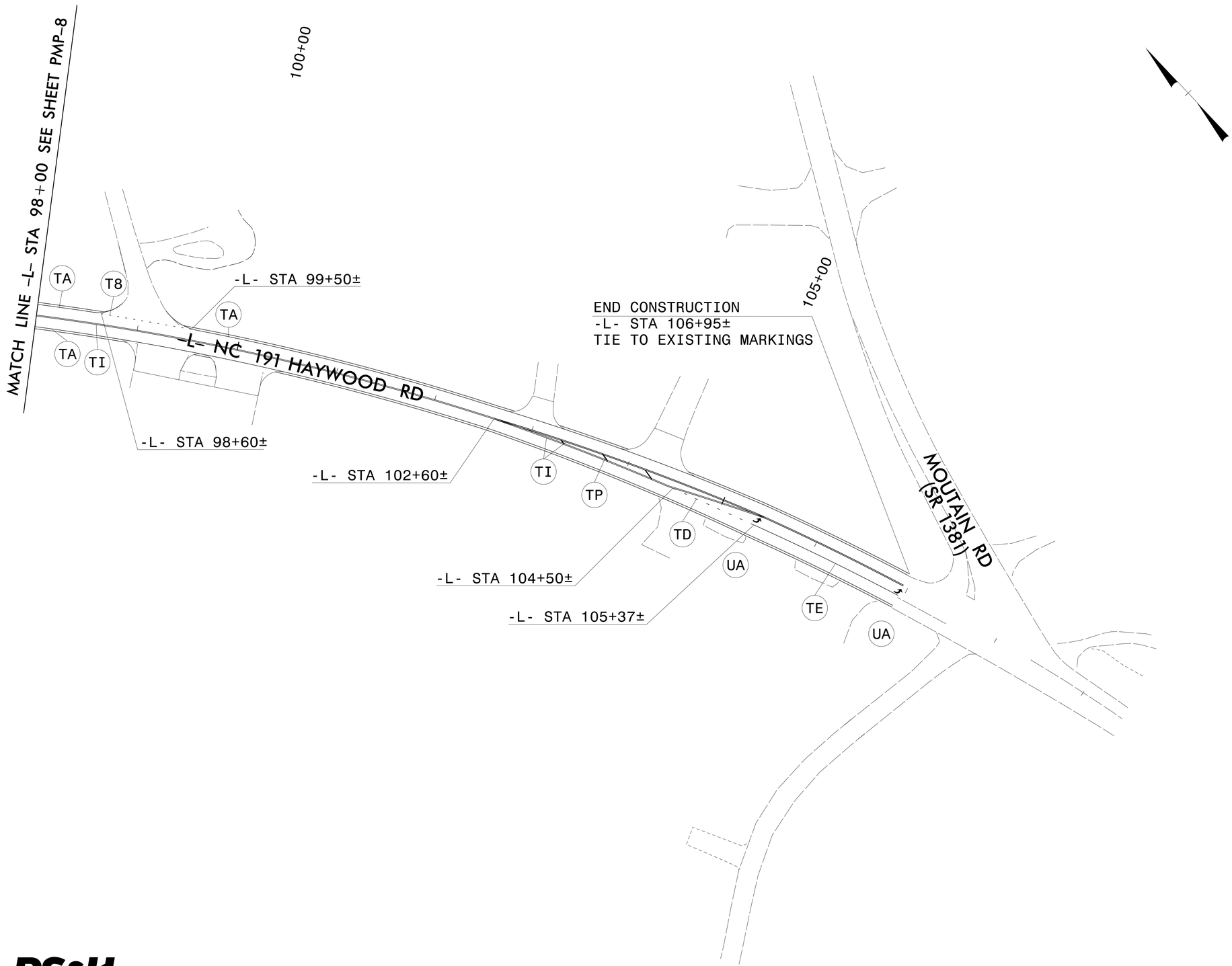

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PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
W-5506	SIGN-1

APPROVED: DocuSigned by: Annie C. Pilz

DATE: 11/9/2017

SEAL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
HENDERSON COUNTY

LOCATION: NC 191, SR 1365 (NORTH RUGBY ROAD) TO SR 1381 (MOUNTAIN ROAD)

T.I.P.: W-5506

CONTRACT: DN00431

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 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
901.50	ARROWS AND SHIELDS
901.70	SIGN STRINGERS AND SUPPORT SPACING
903.10	GROUND MOUNTED SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

GENERAL NOTES

- 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.
- GREEN STREET NAME SIGNS ARE TO BE REMOVED, STOCKPILED AND REINSTALLED BY CONTRACTOR.

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4078000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	240	LF.
4096000000	904	SIGN ERECTION, TYPE D	1	EA.
4102000000	904	SIGN ERECTION, TYPE E	21	EA.
4116100000	904	SIGN ERECTION, RELOCATE SIGN TYPE D	2	EA.
4154000000	907	STOCKPILE SIGN SYSTEM, U-CHANNEL	2	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	21	EA.

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	SIGN DESIGN
SIGN-3	E SHEET
SIGN-4 THRU 10	PROPOSED SIGN DETAIL SHEETS
SIGN-11 THRU 17	EXISTING SIGN DETAIL SHEETS

PLAN SUBMITTED TO: NCDOT DIVISION 14

WANDA AUSTIN, PE PROJECT TEAM LEAD

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: RS&H

ANNIE C. PILZ, PE ROADWAY PROJECT ENGINEER

SEAN P. KANE, EI ROADWAY DESIGN ENGINEER

RS&H

11/8/2017
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TIP NO.	SHEET NO.
W-5506	SIGN-2

APPROVED: Annie C. Pilz (DocuSigned by: APPROVED BY/DATE)

DATE: 11/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER ANNIE C. PILZ

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SIGN NUMBER: 301
TYPE: D
QUANTITY: 1

SIGN WIDTH: 7′-0″
HEIGHT: 2′-6″
TOTAL AREA: 17.5 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0″
WIDTH: 0.75″
RADII: 2.25″

NO. Z BARS:
LENGTH:

BACKG COLOR: Brown
COPY COLOR: White

SYMBOL	X	Y	WID	HT
AR_Type A	5.6	19.2	6	9.5
AR_Type A	6.4	4.8	6	9.5

MAT′L: 0.125″ (3.2 mm) ALUMINUM

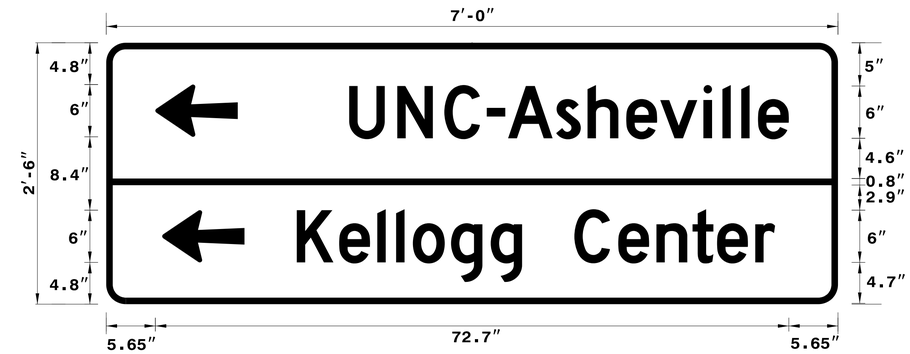
DESIGN BY: ACP
PROJECT ID: W-5506

CHECKED BY:
LOCATION: HENDERSON CO.

Sep 07, 2017
DIV: 14

USE NOTES:

1. Legend and border(except those that are colored black) shall be direct applied Grade B 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.



BORDER
R=2.25″
TH=0.75″

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																											Series/Size Text Length
		U	N	C	–	A	s	h	e	v	i	l	l	e													D 2000
	27.9	5.5	5.4	4.9	2.5	5.5	3.6	4.4	3.9	5	2.2	2.2	1.9	3.5	5.6												50.5
		K	e	l	l	o	g	g		C	e	n	t	e	r												D 2000
	21.9	4.9	4.4	2.2	1.9	4.4	4.6	3.6	6	5	4.4	4.1	2.8	4.4	2.3	7.2											54.9

FILENAME: w5506_sign_design_301

NORTH CAROLINA D.O.T. SIGN DETAIL

10/18/2017
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User:kwohak

SIGN DESIGN

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TIP NO.	SHEET NO.
W-5506	SIGN-3

APPROVED: Annie C. Pitz (DocuSigned by: 62F9BC0DB3D4BE...)

DATE: 11/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER ANNIE C. PITZ

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(401) QUANTITY REQ'D 4

SPEED LIMIT 45

24" X 30"
R2-1

ONE "U" POSTS PER SIGN

(402) QUANTITY REQ'D 2

SCHOOL SPEED LIMIT 35

36" X 36"
S4-5

YELLOW/GREEN REFLECTIVE SHEETING

ONE "U" POSTS PER SIGN

(403) QUANTITY REQ'D 5

SCHOOL

24" X 8"
S4-3P

YELLOW/GREEN REFLECTIVE SHEETING

MOUNT ABOVE SIGN 406
IN 5 INSTALLATIONS

(404) QUANTITY REQ'D 2

36" X 36"
S1-1

YELLOW/GREEN REFLECTIVE SHEETING

ONE "U" POSTS PER SIGN

(405) QUANTITY REQ'D 5

7:20 - 8:30 AM
2:20 - 3:30 PM
SCHOOL DAYS

24" X 10"
S4-1P

MOUNT BELOW SIGN 406
IN 5 INSTALLATIONS

(406) QUANTITY REQ'D 5

SPEED LIMIT 35

24" X 30"
R2-1

ONE "U" POSTS PER SIGN

(407) QUANTITY REQ'D 2

30" X 30"
W11-3

ONE "U" POSTS PER SIGN

(408) QUANTITY REQ'D 2

END SCHOOL ZONE

24" X 30"
S5-2

ONE "U" POSTS PER SIGN

(409) QUANTITY REQ'D 2

DO NOT PASS

24" X 30"
R4-1

ONE "U" POSTS PER SIGN

(410) QUANTITY REQ'D 2

NO PASSING ZONE

48" X 48" X 36"
W14-3

TWO "U" POSTS PER SIGN

(411) QUANTITY REQ'D 1

DO NOT BLOCK INTERSECTION

24" X 30"
R10-7

ONE "U" POSTS PER SIGN

(413) QUANTITY REQ'D 2

SCHOOL

36" X 12"
S4-3P

YELLOW/GREEN REFLECTIVE SHEETING

MOUNT BELOW SIGN 404
IN 2 INSTALLATIONS

TYPE "E" SIGNS

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User:KawaSAM

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TIP NO.	SHEET NO.
W-5506	SIGN-4

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DATE: 11/9/2017

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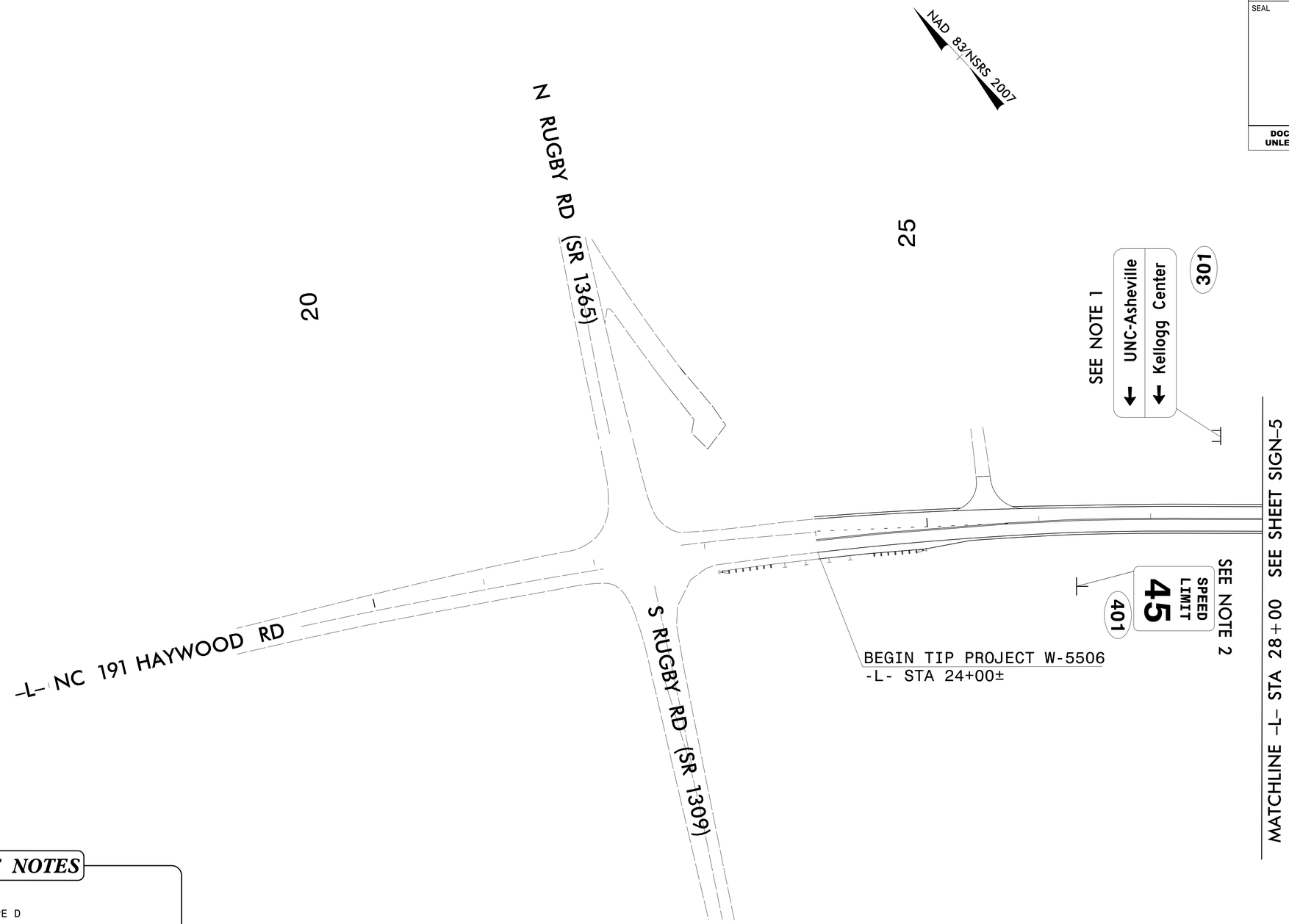

PROJECT NOTES

1 SIGN ERECTION, SIGN TYPE D
2 SIGN ERECTION, SIGN TYPE E
3 DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4 STOCKPILE SIGN SYSTEM, U-CHANNEL
5 SIGN ERECTION, RELOCATE SIGN TYPE D
6 SIGN EXISTING, TO REMAIN

PROPOSED SIGNS

10/18/2017
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TIP NO.	SHEET NO.
W-5506	SIGN-5

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DATE: 11/9/2017

SEAL

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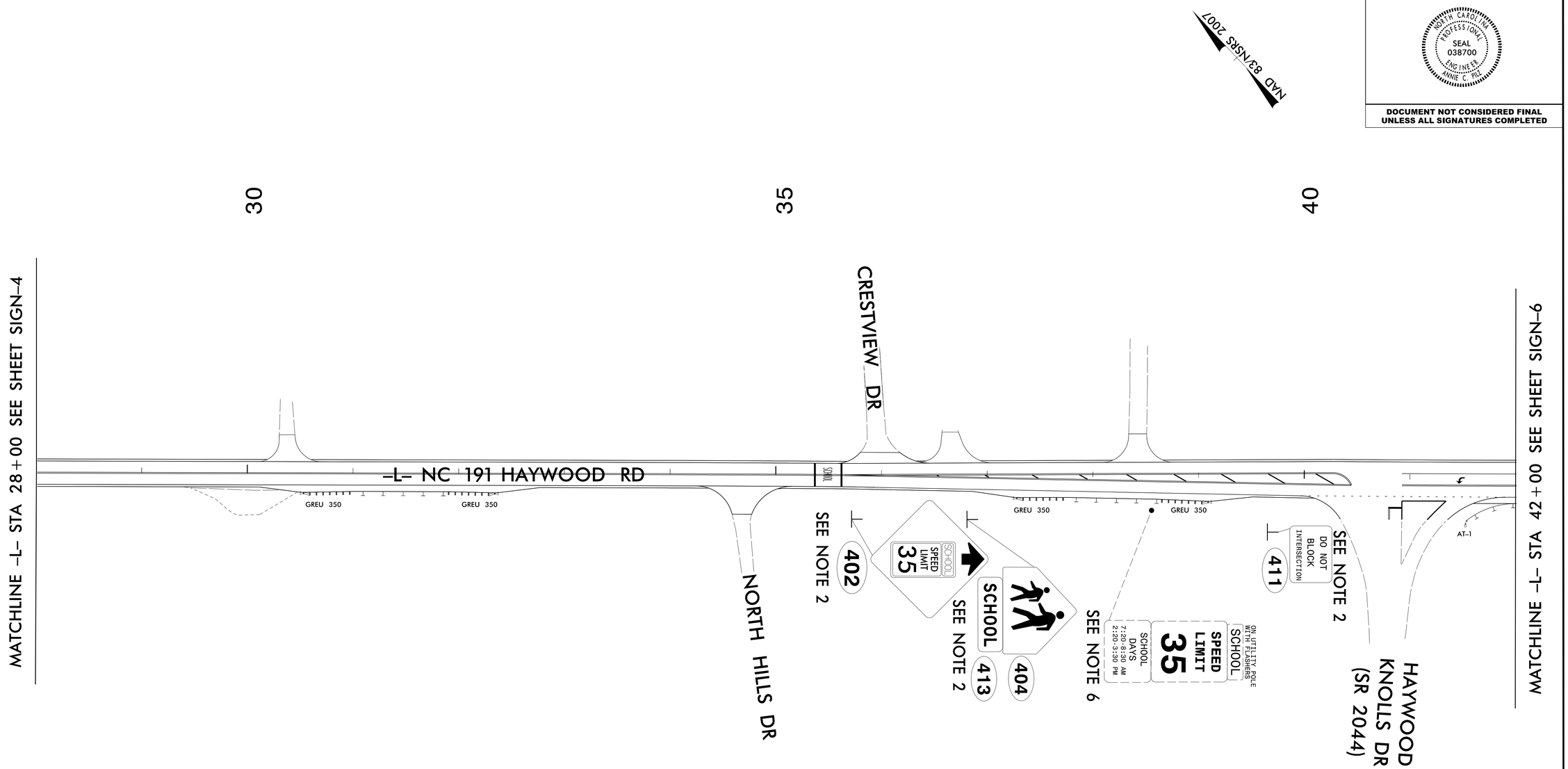

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1. SIGN ERECTION, SIGN TYPE D
2. SIGN ERECTION, SIGN TYPE E
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4. STOCKPILE SIGN SYSTEM, U-CHANNEL
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10/18/2017
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TIP NO.	SHEET NO.
W-5506	SIGN-6

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DATE: 11/9/2017

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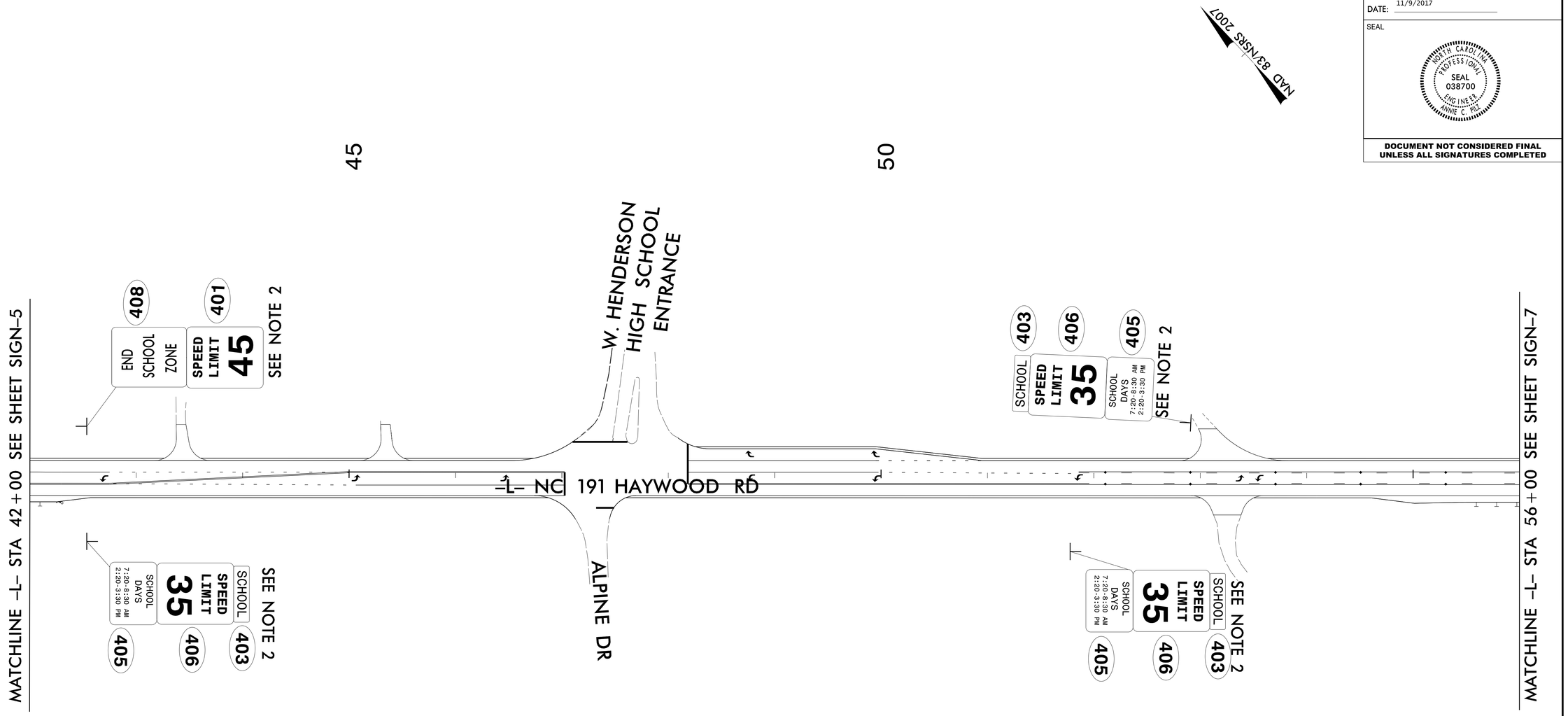

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PROPOSED SIGNS

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TIP NO.	SHEET NO.
W-5506	SIGN-7

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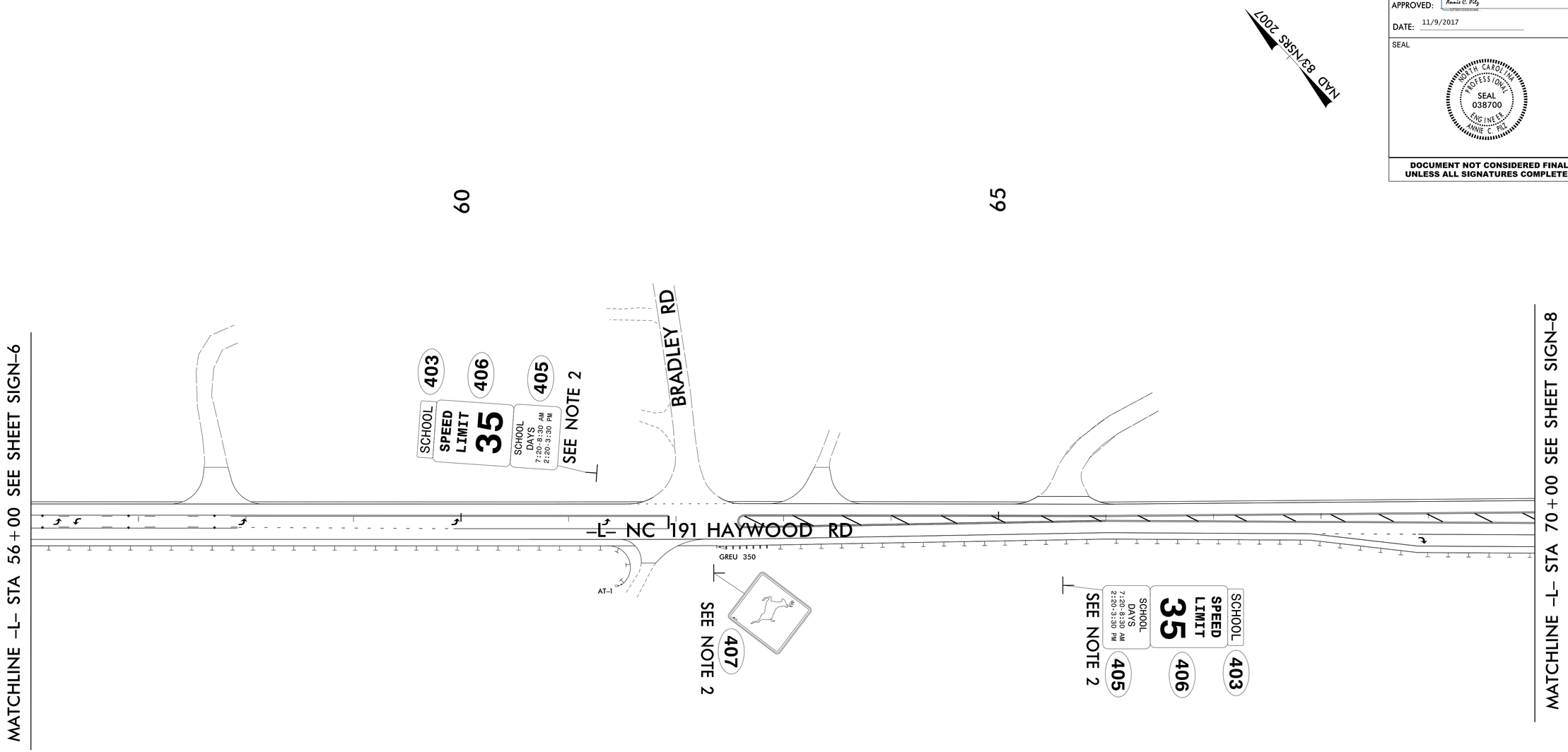

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TIP NO.	SHEET NO.
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SEAL

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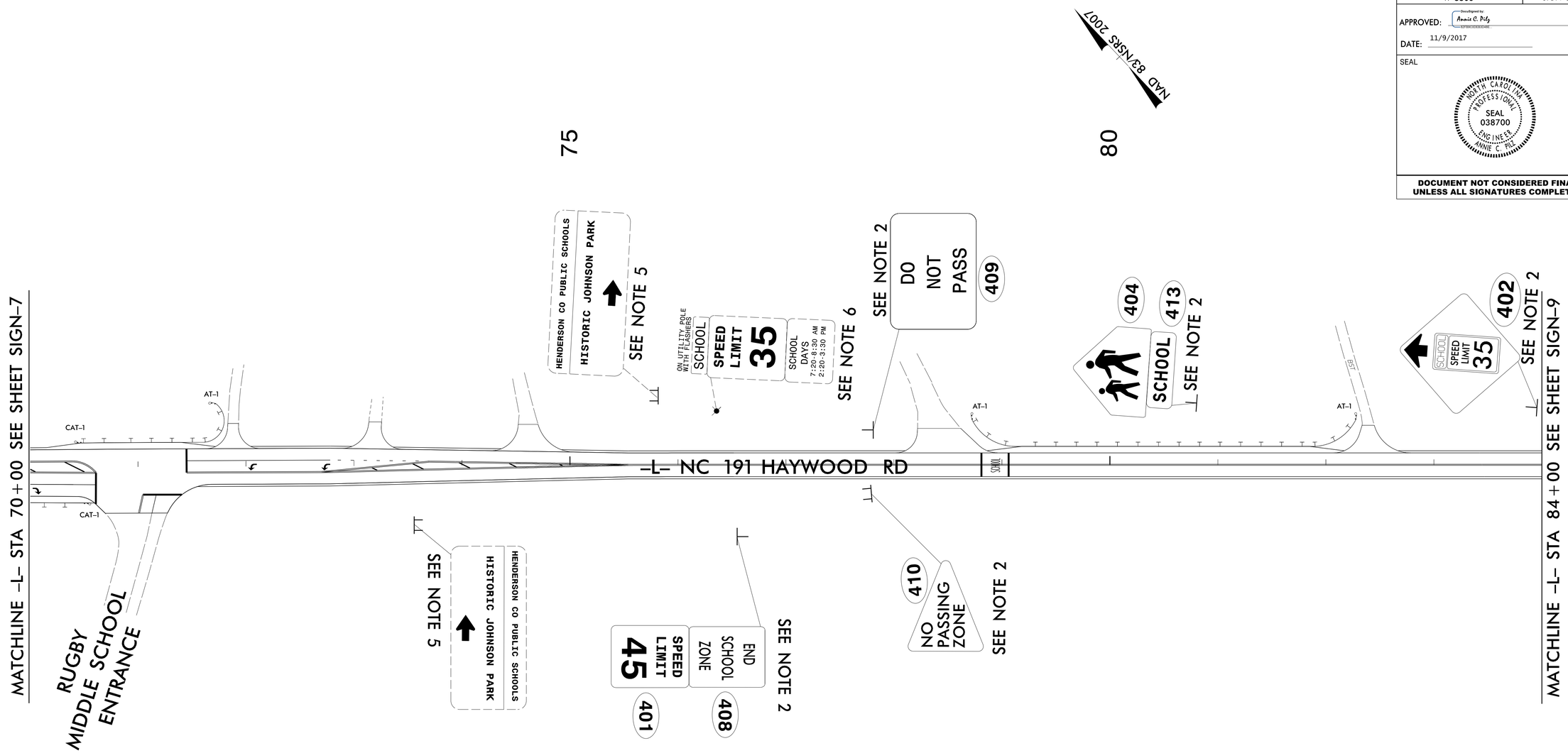

PROJECT NOTES

1. SIGN ERECTION, SIGN TYPE D
2. SIGN ERECTION, SIGN TYPE E
3. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4. STOCKPILE SIGN SYSTEM, U-CHANNEL
5. SIGN ERECTION, RELOCATE SIGN TYPE D
6. SIGN EXISTING, TO REMAIN

PROPOSED SIGNS

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User:KawaSKR

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TIP NO.	SHEET NO.
W-5506	SIGN-9

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DATE: 11/9/2017

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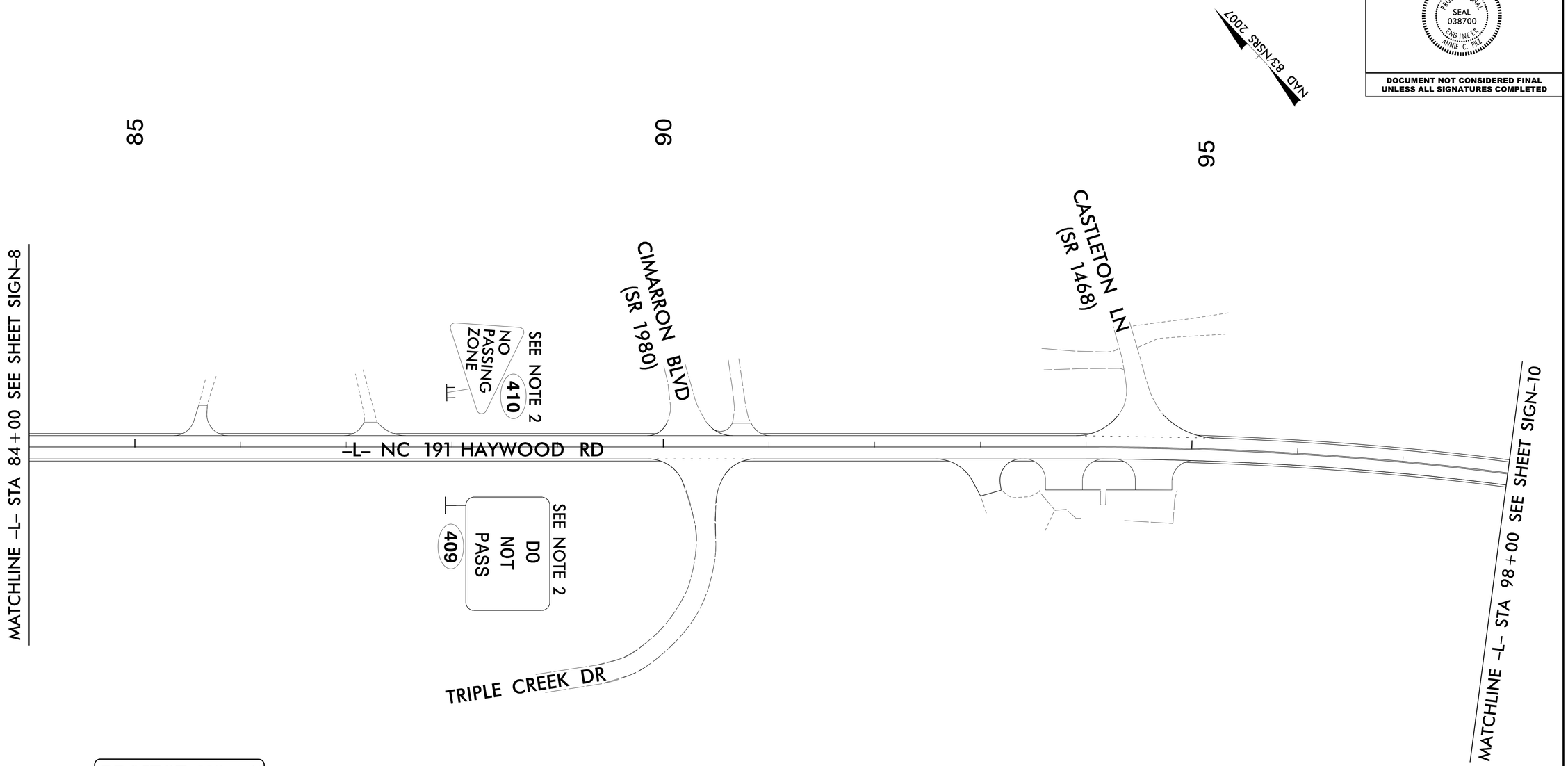

PROJECT NOTES

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3. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
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PROPOSED SIGNS

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User:Kawahak

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TIP NO.	SHEET NO.
W-5506	SIGN-10

APPROVED: Annie C. Pilz
DATE: 11/9/2017

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NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER ANNIE C. PILZ

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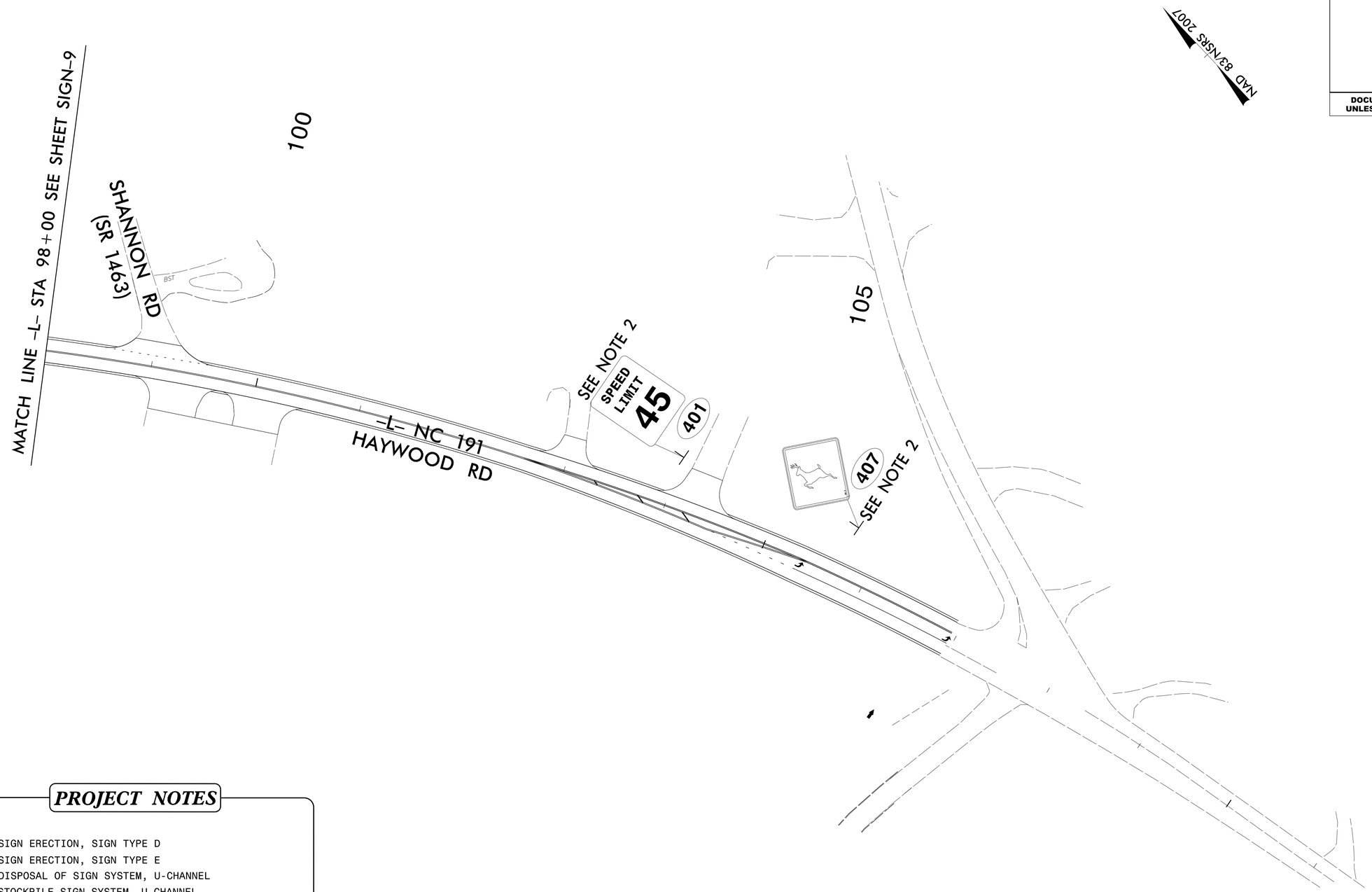

PROJECT NOTES

1 SIGN ERECTION, SIGN TYPE D
2 SIGN ERECTION, SIGN TYPE E
3 DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4 STOCKPILE SIGN SYSTEM, U-CHANNEL
5 SIGN ERECTION, RELOCATE SIGN TYPE D
6 SIGN EXISTING, TO REMAIN

PROPOSED SIGNS

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TIP NO.	SHEET NO.
W-5506	SIGN-11

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DATE: 11/9/2017

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PROJECT NOTES

1 SIGN ERECTION, SIGN TYPE D
2 SIGN ERECTION, SIGN TYPE E
3 DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4 STOCKPILE SIGN SYSTEM, U-CHANNEL
5 SIGN ERECTION, RELOCATE SIGN TYPE D
6 SIGN EXISTING, TO REMAIN

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TIP NO.	SHEET NO.
W-5506	SIGN-12

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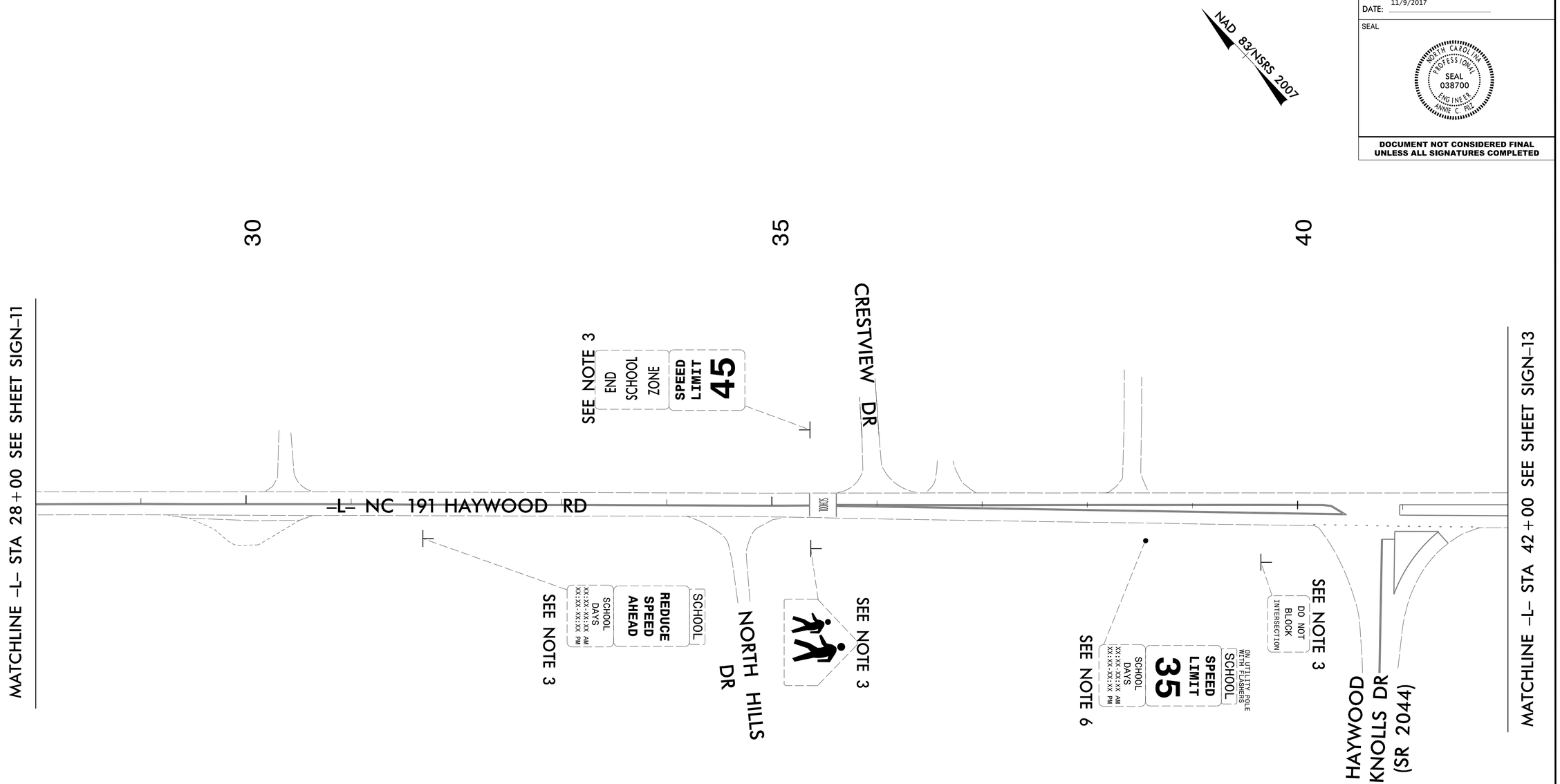

PROJECT NOTES

1. SIGN ERECTION, SIGN TYPE D
2. SIGN ERECTION, SIGN TYPE E
3. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4. STOCKPILE SIGN SYSTEM, U-CHANNEL
5. SIGN ERECTION, RELOCATE SIGN TYPE D
6. SIGN EXISTING, TO REMAIN

EXISTING SIGNS

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TIP NO.	SHEET NO.
W-5506	SIGN-13

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DATE: 11/9/2017

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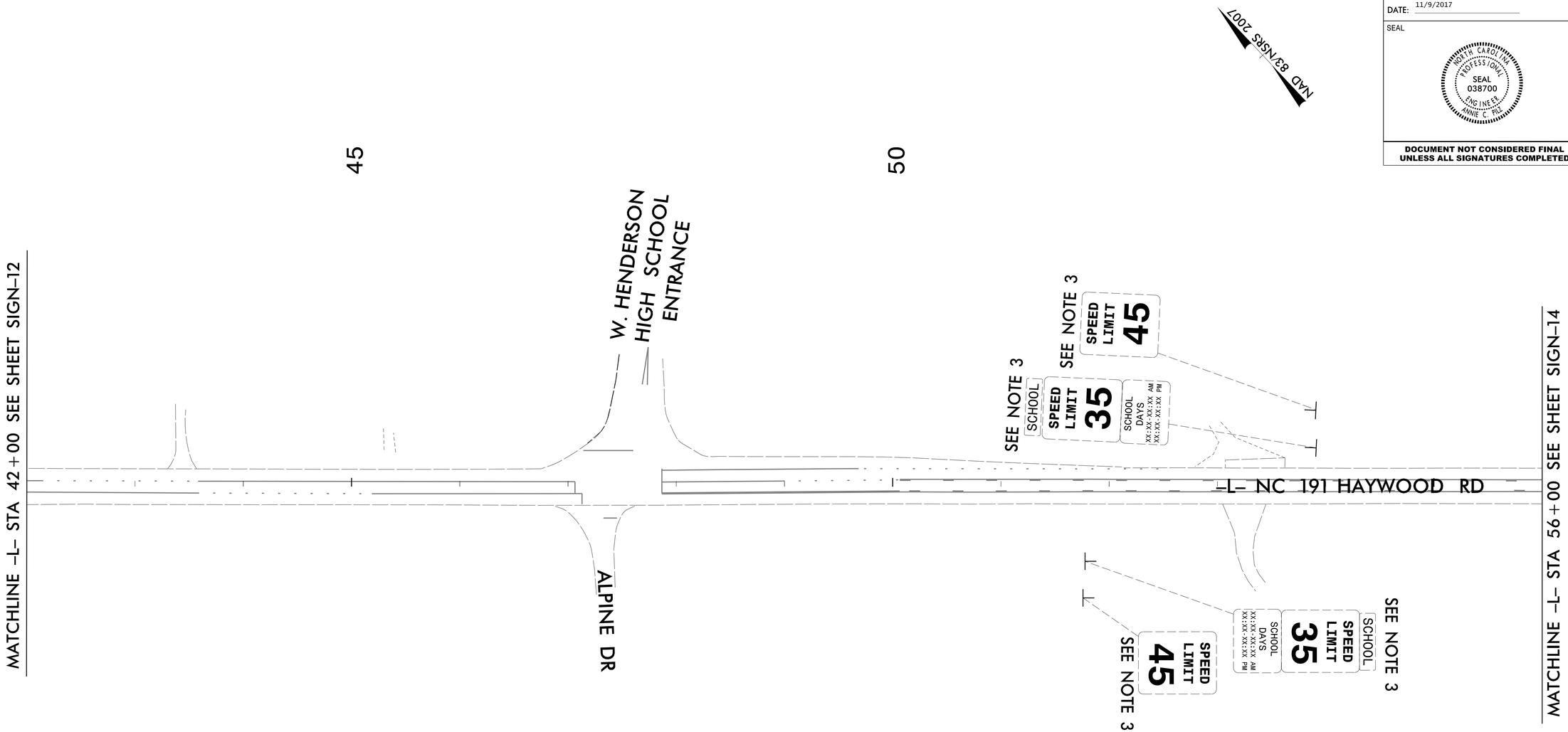

PROJECT NOTES

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3 DISPOSAL OF SIGN SYSTEM, U-CHANNEL
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5 SIGN ERECTION, RELOCATE SIGN TYPE D
6 SIGN EXISTING, TO REMAIN

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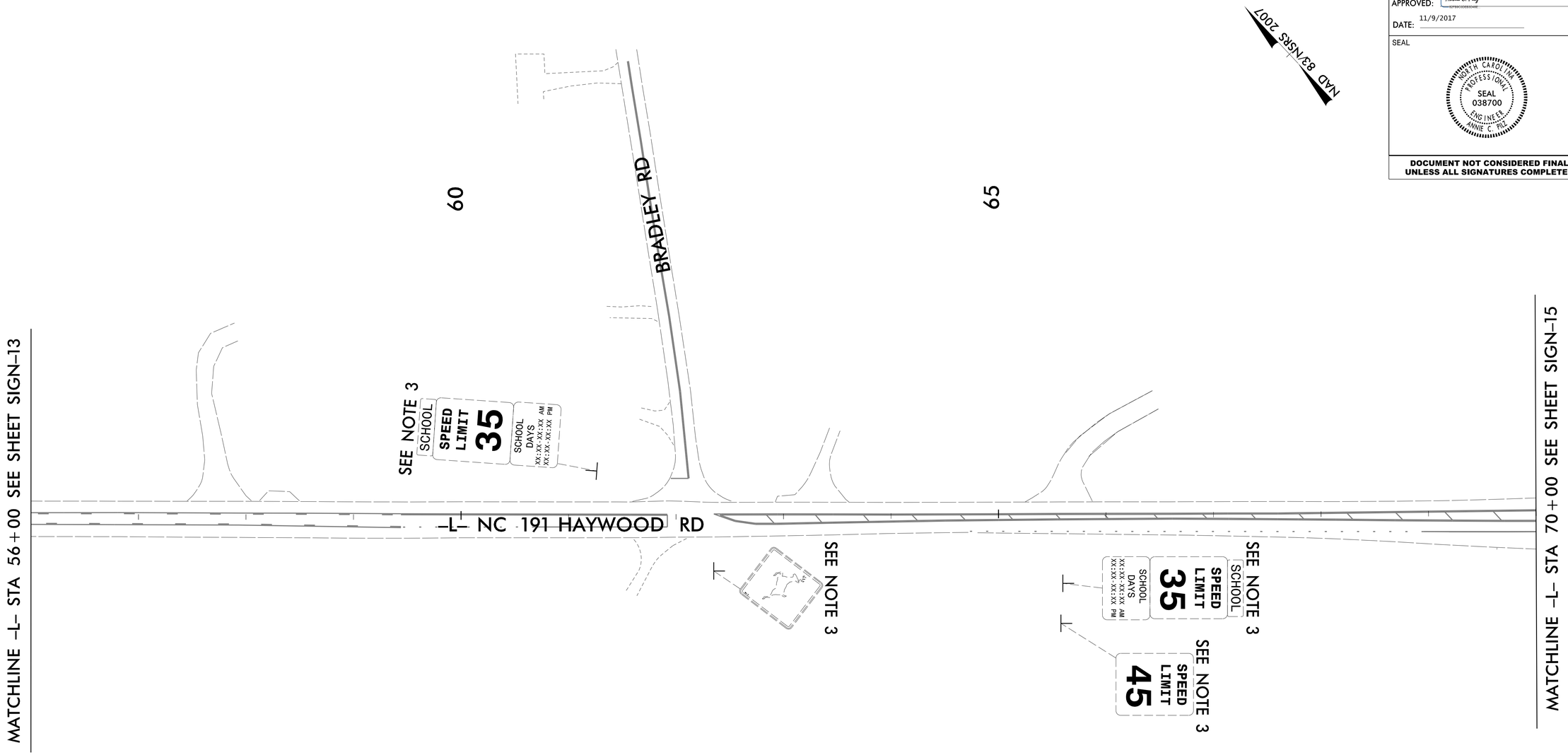

PROJECT NOTES

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5 SIGN ERECTION, RELOCATE SIGN TYPE D
6 SIGN EXISTING, TO REMAIN

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TIP NO.	SHEET NO.
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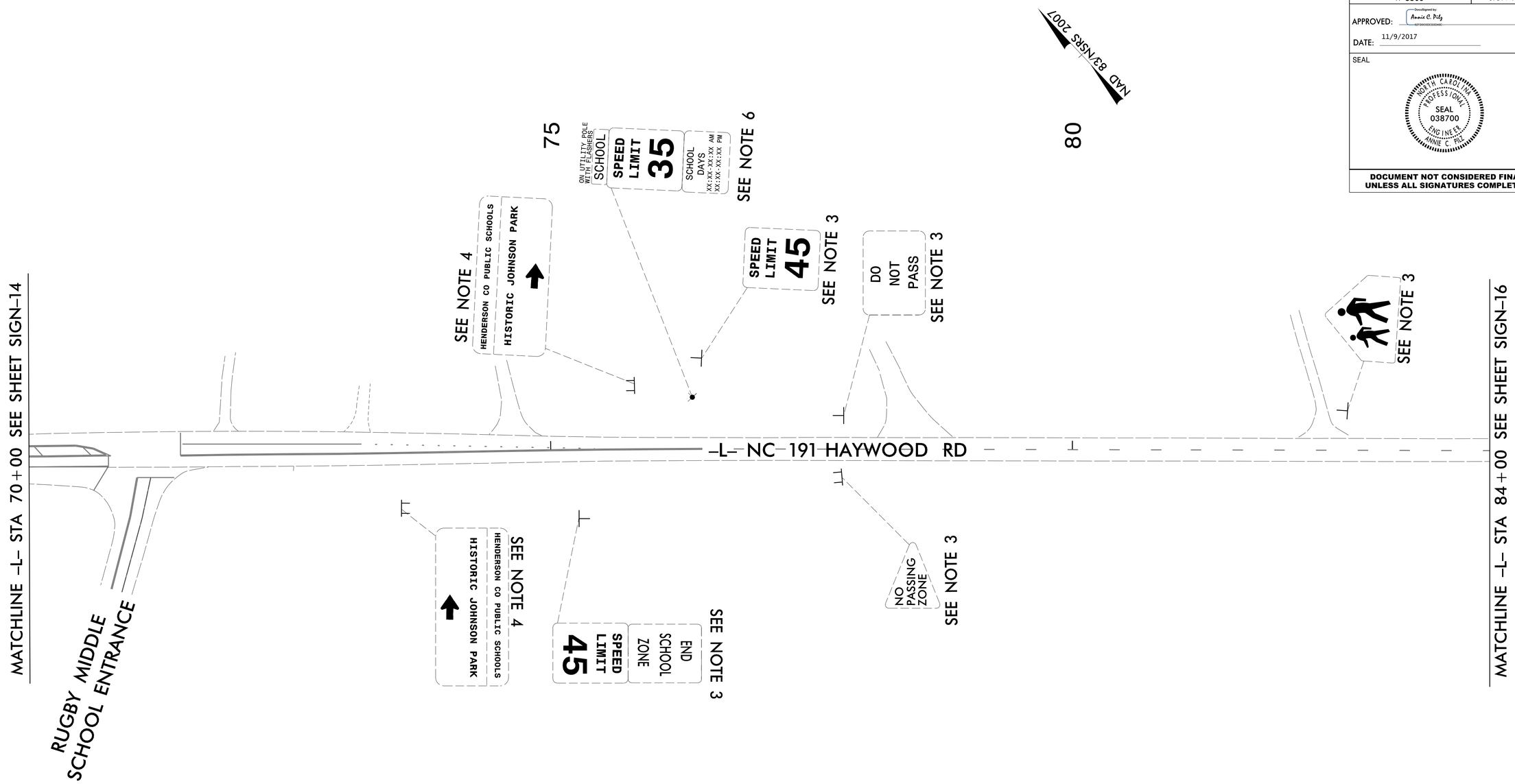

PROJECT NOTES

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6 SIGN EXISTING, TO REMAIN

EXISTING SIGNS

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TIP NO.	SHEET NO.
W-5506	SIGN-16

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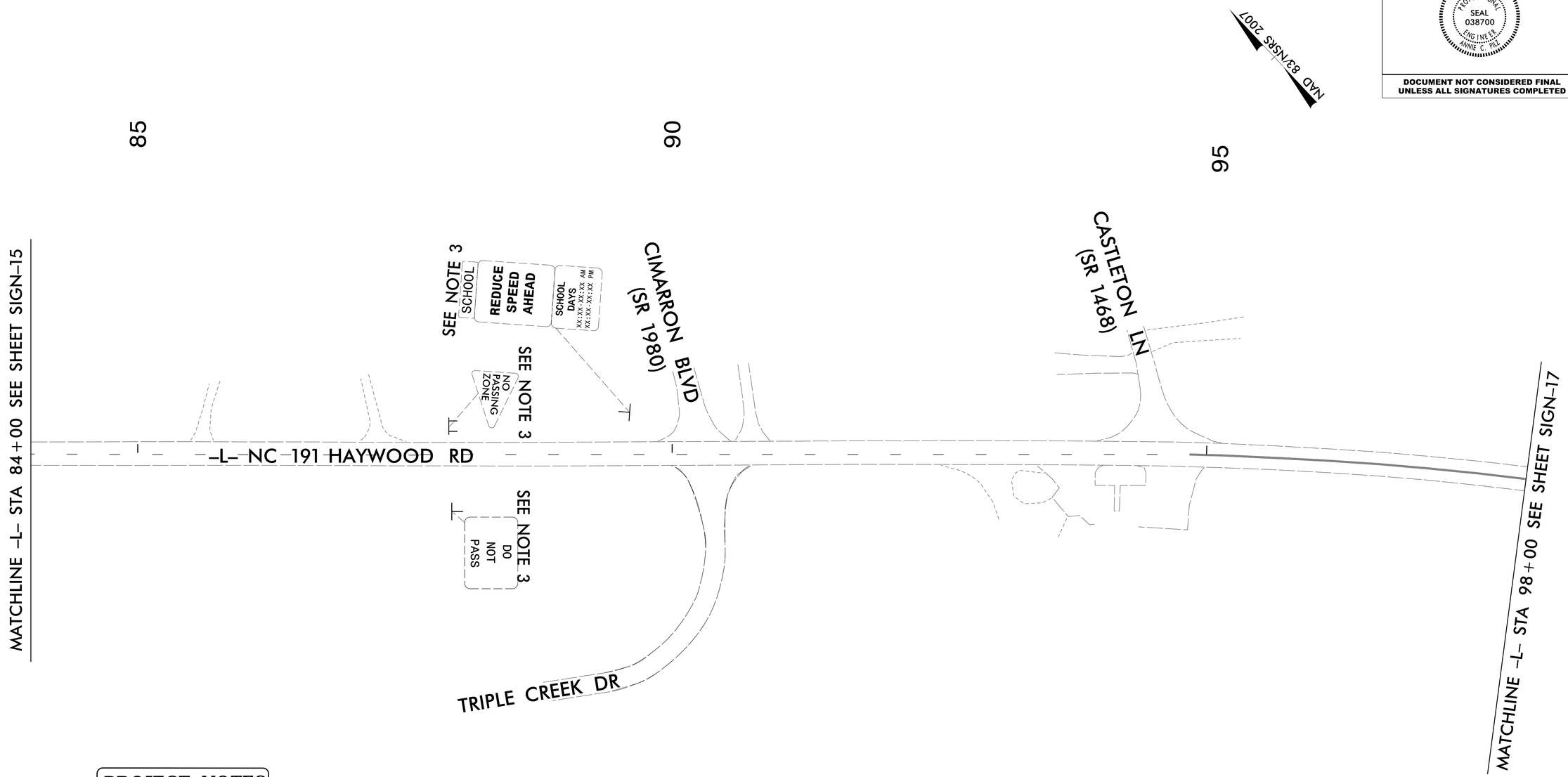

PROJECT NOTES

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6 SIGN EXISTING, TO REMAIN

EXISTING SIGNS

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TIP NO.	SHEET NO.
W-5506	SIGN-17

APPROVED: Annie C. Pilz (DocuSigned by: 5F8C0CE0E0C8E...)

DATE: 11/9/2017

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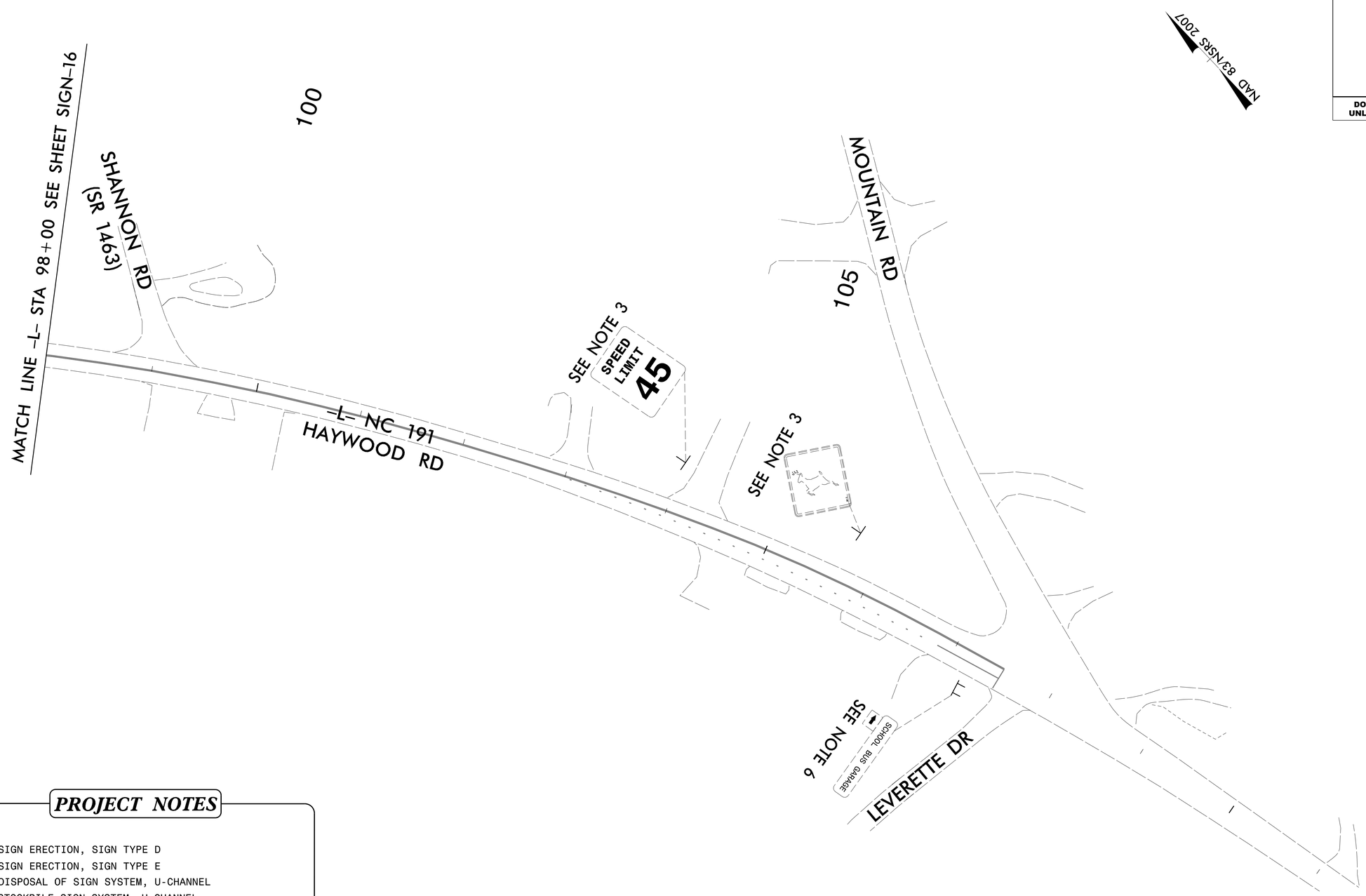

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10/18/2017
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