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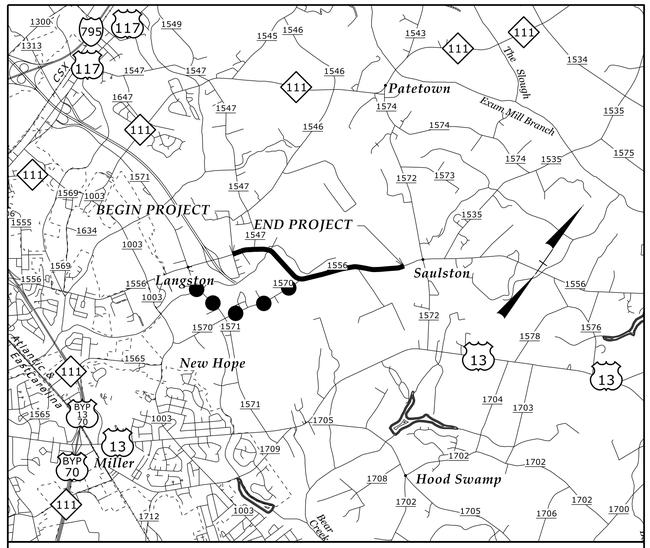
TIP PROJECT: W-5500

CONTRACT: DD00242

See Sheet 1-A For Index of Sheets



VICINITY MAP

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

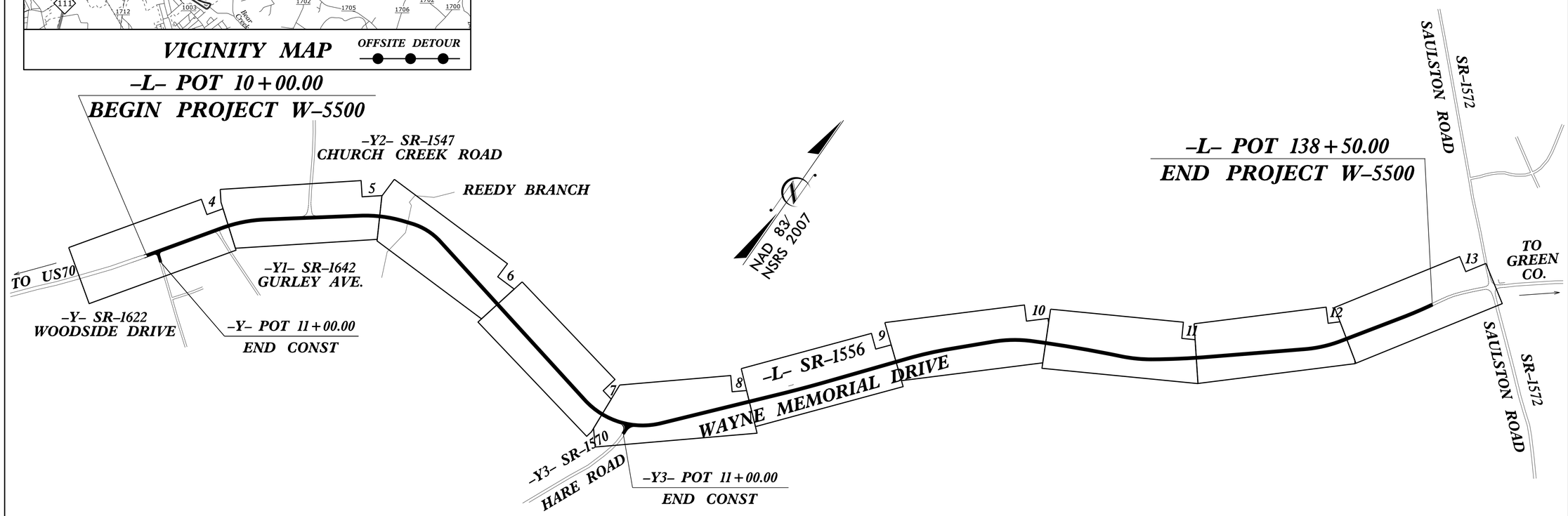
WAYNE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5500	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
45472.1.1	HSIP-1556(6)	PE
45472.2.FD1	HSIP-1556(6)	R/W & UTIL
45472.3.3	HSIP-1556(6)	CONST

LOCATION: SR-1556 (WAYNE MEMORIAL DRIVE) FROM SR-1622 (WOODSIDE DRIVE) TO 0.1 MILES SOUTHWEST OF SR-1572 SAULSTON ROAD.

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT.



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5500 = 2.434 MILES
TOTAL LENGTH TIP PROJECT W-5500 = 2.434 MILES

Prepared in the Office of:

DIVISION OF HIGHWAYS
Division 4 DDC
509 Ward Blvd., Wilson NC, 27895

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 1, 2016

LETTING DATE: FEBRUARY 27, 2018

RONNIE KEETER, PE
PROJECT ENGINEER

D.R. ETHRIDGE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
1/22/2018
DocuSigned by: CDD29BE9C7EE4F3...
P.E.
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE

ROADWAY DESIGN ENGINEER
1/22/2018
DocuSigned by: Norwood A. Gainey III
E0D89850AA5044B...
P.E.
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

22-JAN-2018 08:45
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PROJECT NO.	SHEET NO.
W-5500	1A

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey III
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1/22/2018

INDEX OF SHEETS

SHEET NUMBER			SHEET
1			TITLE SHEET
1A			INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARDS
1B			CONVENTIONAL SYMBOLS
1C-1			SURVEY CONTROL SHEETS
2A-1			PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	THRU	2C-7	GUARDRAIL DETAILS
3B-1			ROADWAY SUMMARIES (EARTHWORK, GUARDRAIL AND MILLING)
3D-1	THRU	3D-2	DRAINAGE SUMMARIES
4	THRU	13	PLAN AND PROFILE SHEETS
TMP-1	THRU	TMP-2	TRANSPORTATION MANAGEMENT PLANS
PMP-1	THRU	PMP-5	PAVEMENT MARKING PLANS
EC-1	THRU	EC-24	EROSION CONTROL PLANS
RF-1			REFORESTATION PLANS
SIGN-1	THRU	SIGN-10	SIGNING PLANS
X-1A	THRU	X-12	CROSS-SECTION SUMMARY SHEET
X-1	THRU	X-42	CROSS-SECTIONS
C-1	THRU	C-4	CULVERT PLANS

EFF. 01-17-2012

REV. 02-29-2016

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	
200.03	Method of Clearing - Method III
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	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
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
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01-17-2012

REVISED: 01-24-2017

GRADE LINE:

GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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 III.

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.

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.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

PROJECT REFERENCE NO.	SHEET NO.
W-5500	1B

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

DDC4 12/05/11

PROJECT REFERENCE NO.	SHEET NO.
W-5500	1C-1
Location and Surveys	

SURVEY CONTROL SHEET W-5500

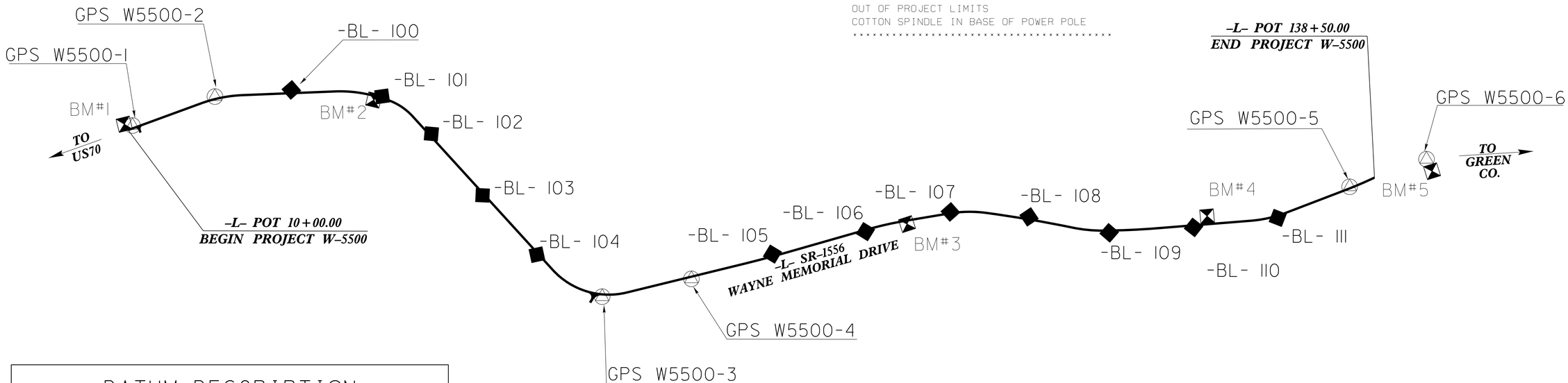
BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	W5500-GPS1	610127.2370	2318156.3840	130.85	10+53.57	25.77 LT
2	W5500-GPS2	610800.4410	2318641.4990	130.54	18+81.00	23.44 LT
100	BL-100	611267.2095	2319200.9015	125.87	26+05.81	31.50 LT
101	BL-101	611709.4887	2319943.9865	115.55	34+69.32	17.45 LT
102	BL-102	611683.8448	2320531.6627	122.85	40+59.11	19.90 LT
103	BL-103	611480.8182	2321263.9799	126.01	48+18.23	15.27 RT
104	BL-104	611312.0429	2322010.2187	123.36	55+83.32	13.96 RT
3	W5500-GPS3	611338.3750	2322747.1850	126.81	63+29.82	21.66 RT
4	W5500-GPS4	611961.4470	2323346.2870	124.31	71+90.58	19.88 RT
105	BL-105	612593.8645	2323843.2003	128.01	79+94.17	21.75 LT
106	BL-106	613274.0533	2324446.7485	130.45	89+03.02	15.09 RT
107	BL-107	613888.3917	2325001.5885	130.01	97+31.61	13.01 LT
108	BL-108	614276.2985	2325641.9065	129.90	104+78.58	24.30 LT
109	BL-109	614586.1043	2326352.9836	129.81	112+52.29	21.19 RT
110	BL-110	615086.1199	2326982.0076	130.08	120+54.68	19.45 RT
111	BL-111	615616.7009	2327585.8889	128.96	128+55.78	20.06 RT
5	W5500-GPS5	616249.6450	2327978.5450	128.09	135+98.75	14.26 LT
6	W5500-GPS6	616881.5510	2328427.9100	125.11	OUTSIDE PROJECT LIMITS	

BENCHMARK DATA

****
BM1 ELEVATION = 131.67
N 610093 E 2318085
L STATION 9+85 65 LEFT
RR SPIKE IN BASE OF 24" PINE
****
****
BM2 ELEVATION = 112.93
N 611635 E 2319899
L STATION 34+03 39 RIGHT
RR SPIKE IN BASE OF 12" OAK
****
****
BM3 ELEVATION = 131.74
N 613558 E 2324730
L STATION 93+07 33 RIGHT
RR SPIKE IN BASE OF 15" OAK
****
****
BM4 ELEVATION = 131.75
N 615230 E 2327045
L STATION 121+95 52 LEFT
RR SPIKE IN BASE OF 15" PINE
****
****
BM5 ELEVATION = 127.31
N 616818 E 2328536
OUT OF PROJECT LIMITS
COTTON SPINDLE IN BASE OF POWER POLE
****



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCGS FOR MONUMENT "GPS W-5500-3"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 611338.375(ft) EASTING: 2322747.185(ft)
ELEVATION: 126.81(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999876055
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GPS W-5500-3" TO -L- STATION 9+00.00 IS
S 73°49'05.50" W 4850.07(ft)
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:
   W5500_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.

DDC4
6/2/99
22-JAN-2018 08:46
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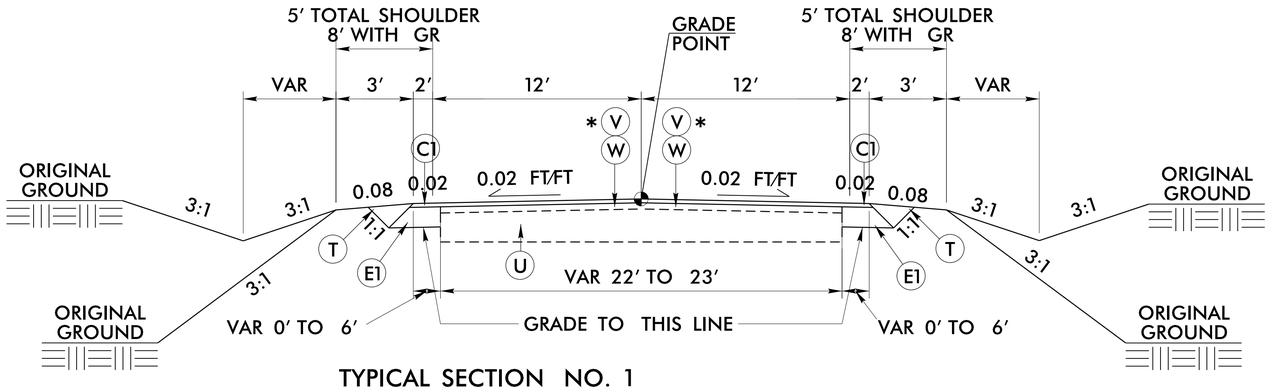
PROJECT REFERENCE NO.	SHEET NO.
W-5500	2A-1

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY, III
DocuSigned by: Norwood A. Gainey, III
E0D8985DA45044B

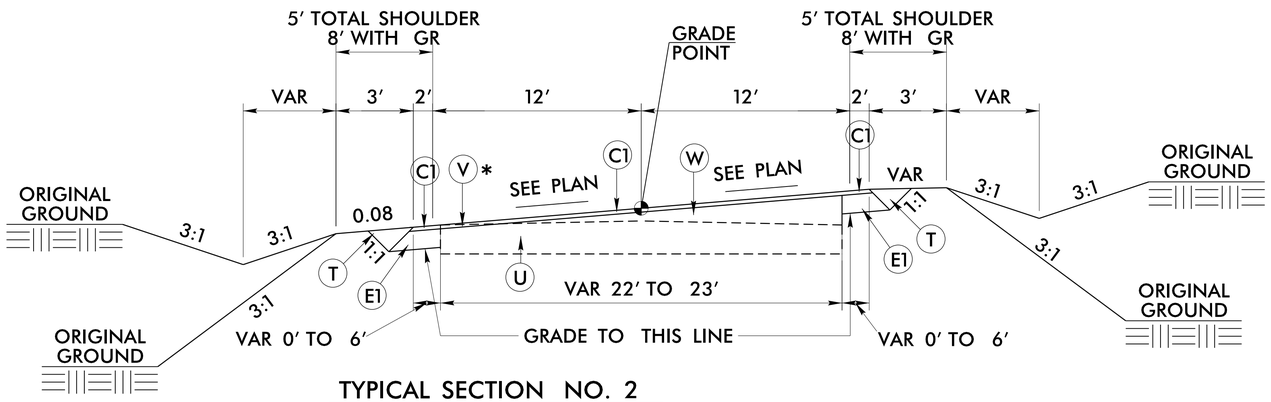
PAVEMENT DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY, III
DocuSigned by: Norwood A. Gainey, III
E0D8985DA45044B



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

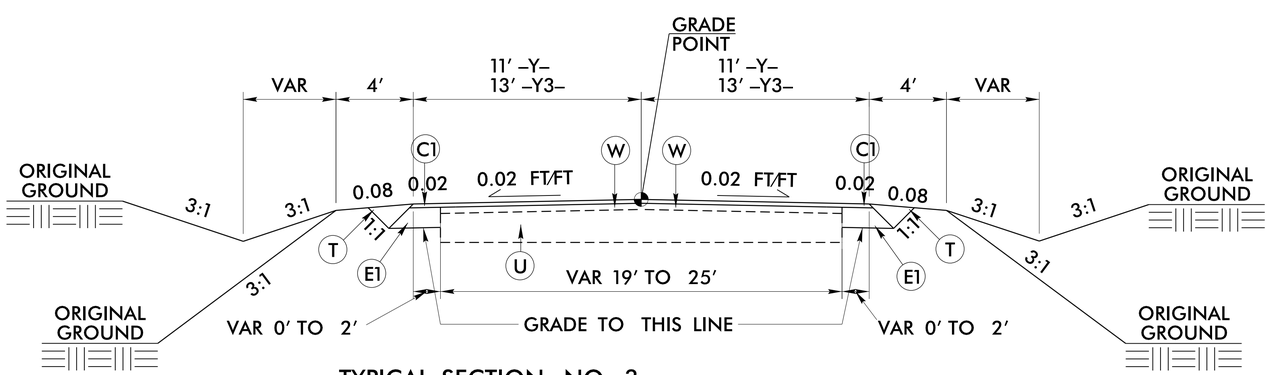
–L– 10+00.00 TO 16+47.00
–L– 22+32.00 TO 29+30.00
–L– 39+06.00 TO 57+02.00
–L– 66+54.00 TO 88+87.00
–L– 93+33.00 TO 96+22.00
–L– 101+66.00 TO 108+11.00
–L– 116+96.00 TO 125+37.00
–L– 130+10.00 TO 135+45.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 12

–L– 16+47.00 TO 22+32.00
–L– 29+30.00 TO 39+06.00
–L– 57+02.00 TO 66+54.00
–L– 88+87.00 TO 93+33.00
–L– 96+22.00 TO 101+66.00
–L– 108+11.00 TO 116+96.00
–L– 125+37.00 TO 130+10.00
–L– 135+45.00 TO 138+50.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

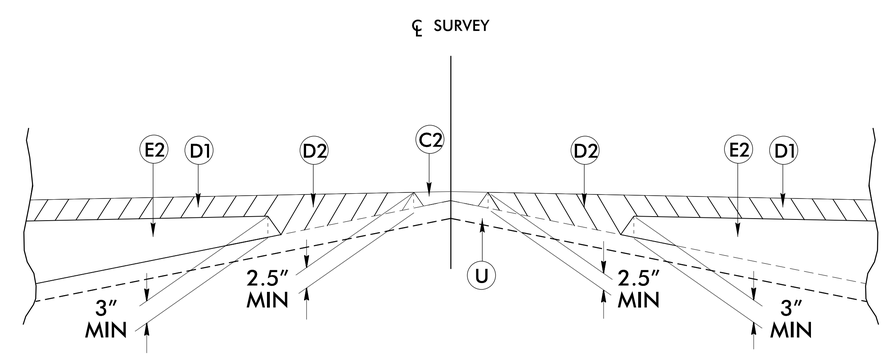
–Y– 10+13.00 TO 10+63.02
–Y3– 10+13.00 TO 11+00.00

* MILLING STATIONS

–L–	10+00.00	TO	16+50.00	LT
–L–	10+00.00	TO	19+25.00	RT
–L–	20+25.00	TO	21+25.00	RT
–L–	22+25.00	TO	25+10.00	LT
–L–	22+25.00	TO	24+50.00	RT
–L–	26+75.00	TO	29+25.00	RT
–L–	38+50.00	TO	52+25.00	LT
–L–	38+50.00	TO	46+00.00	RT
–L–	47+00.00	TO	52+25.00	RT
–L–	58+25.00	TO	74+50.00	LT
–L–	59+50.00	TO	64+25.00	RT
–L–	65+80.00	TO	90+00.00	RT
–L–	78+50.00	TO	87+50.00	LT
–L–	92+25.00	TO	94+75.00	LT
–L–	92+25.00	TO	94+75.00	RT
–L–	100+25.00	TO	104+00.00	RT
–L–	101+50.00	TO	106+75.00	LT
–L–	105+00.00	TO	106+75.00	RT
–L–	111+00.00	TO	125+55.00	LT
–L–	112+50.00	TO	125+55.00	RT
–L–	126+25.00	TO	127+25.00	LT
–L–	128+10.00	TO	130+75.00	LT
–L–	130+00.00	TO	138+50.00	RT
–L–	134+50.00	TO	138+50.00	LT

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YARD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YARD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
U	EXISTING PAVEMENT
T	EARTH MATERIAL
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING ON THIS SHEET)
V	MILLING (1.5")

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



Detail Showing Method of Wedging

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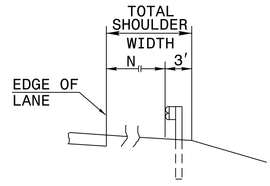
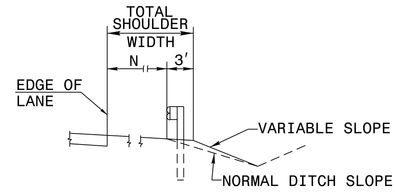
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

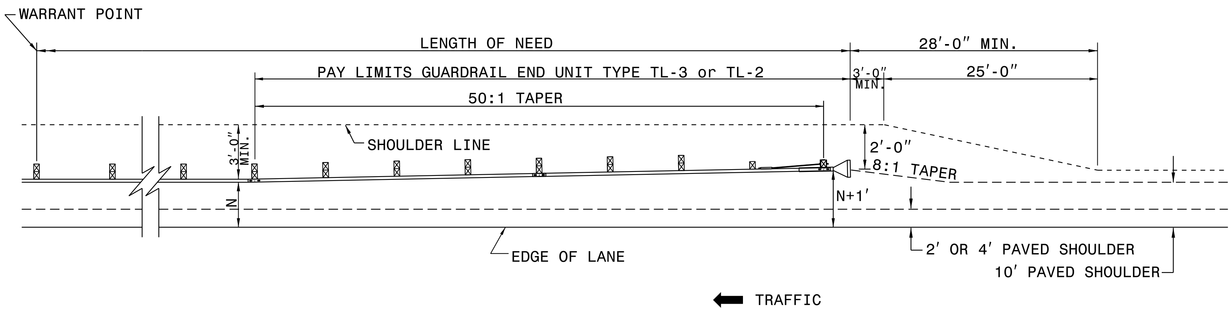


FILL SECTION



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
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ROADWAY DETAIL DRAWING FOR
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SHEET 6 OF 11
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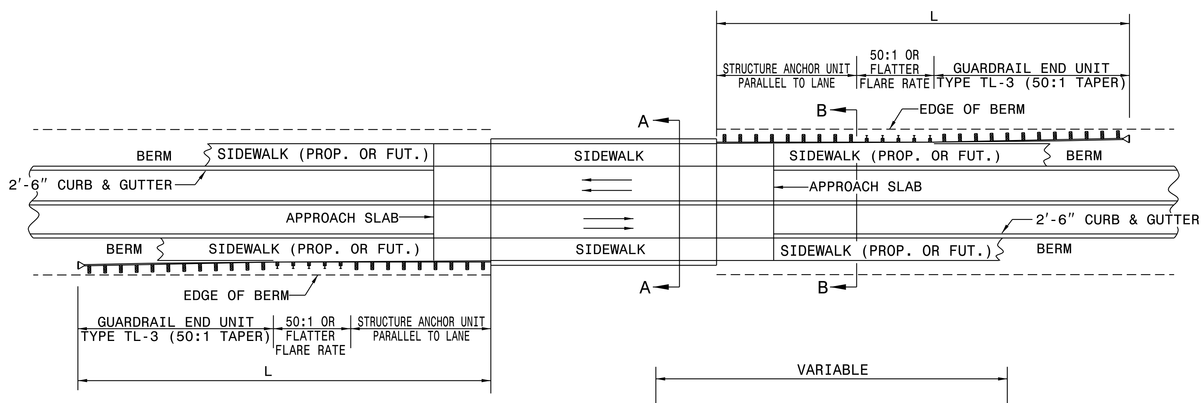
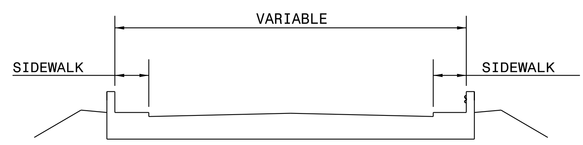
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



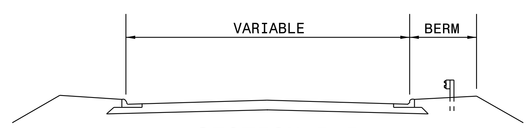
MINIMUM GUARDRAIL LENGTHS "L" REQUIRED AT BRIDGE APPROACHES ON 2'-6" CONCRETE CURB AND GUTTER ROADWAYS	
DESIGN SPEED (MPH)	"L"
40	150'
50	225'

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.



SECTION A-A



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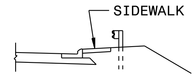

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

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

SHEET 5 OF 11
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 5 OF 11
862D01

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Jul S. Howerton
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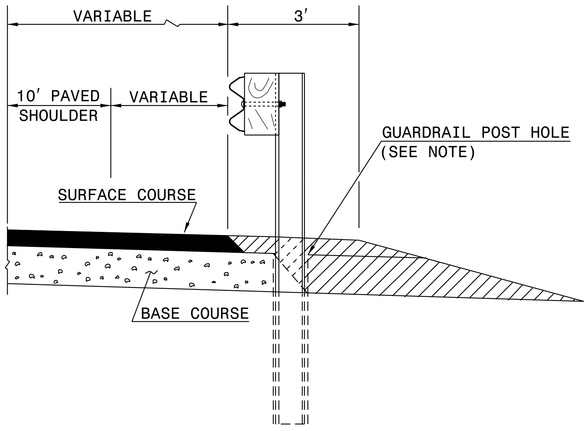
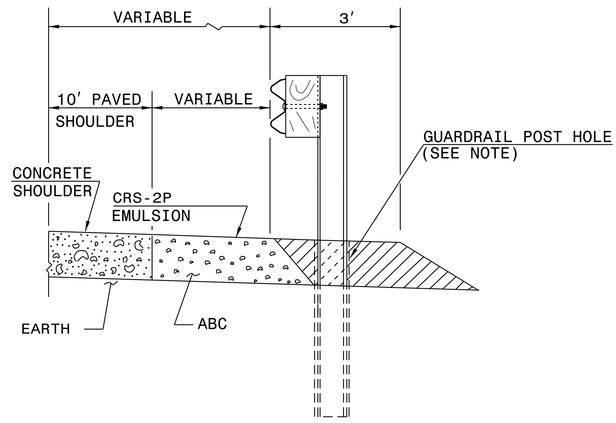
ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



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
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ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

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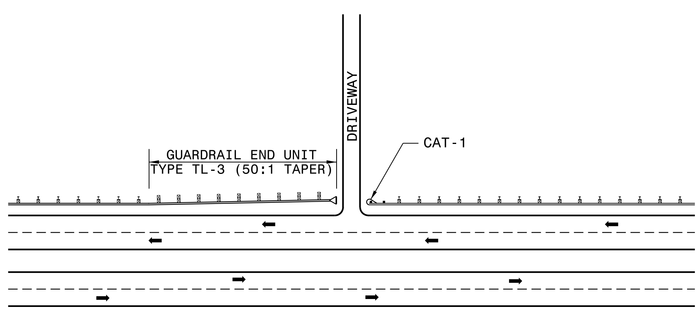
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

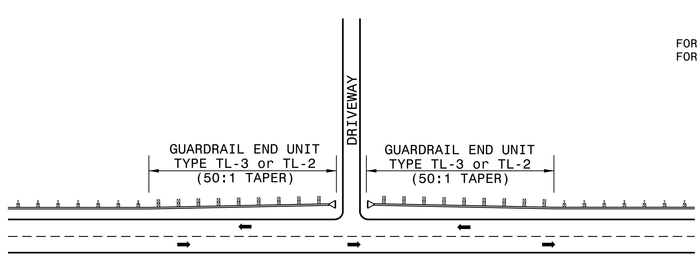


DETAIL-3
DIVIDED HIGHWAY

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
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 9 OF 11
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1/4/2018

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SHEET NO. 2C-2

PROJECT REFERENCE NO.	SHEET NO.
W-5500	2C-3

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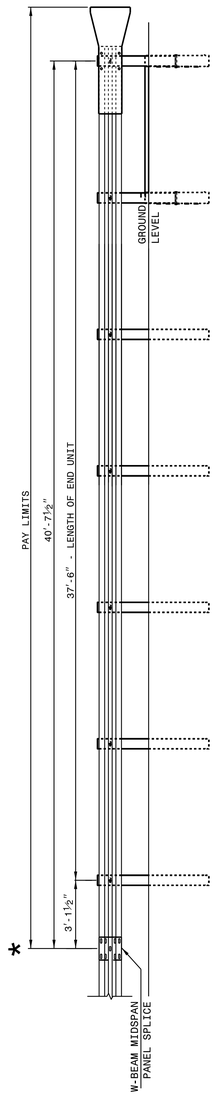
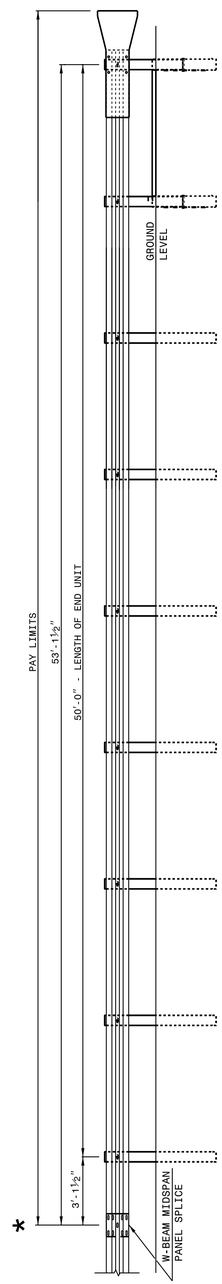
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

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

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 2 OF 8
862D02

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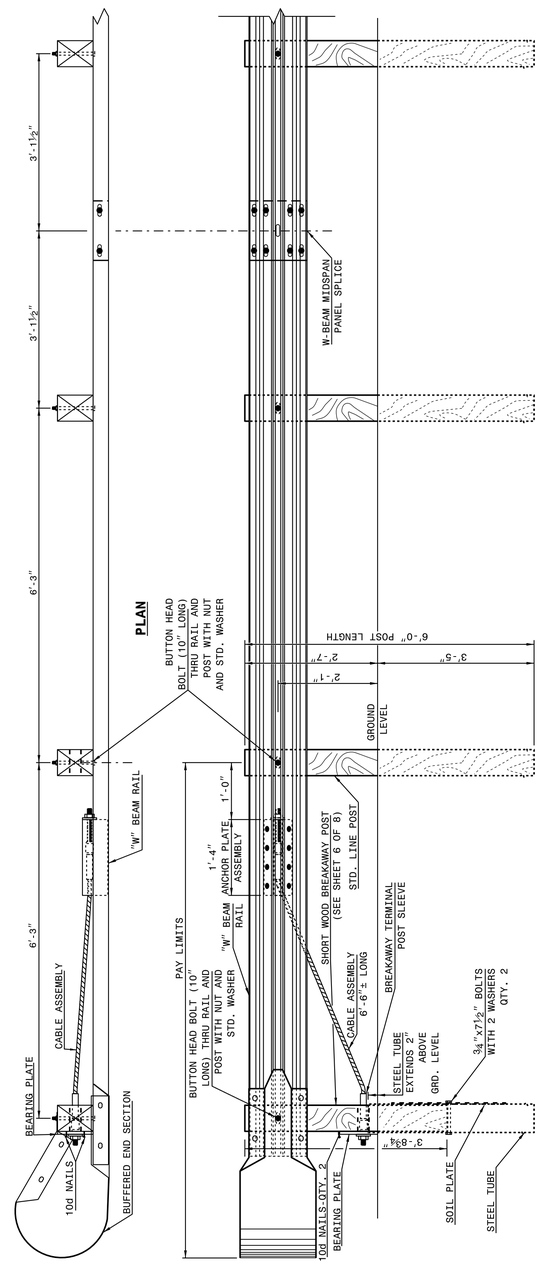
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 8
862D02



TRAILING END UNIT ASSEMBLY

C.A.T.-1 SYSTEM

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 8
862D02

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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PROJECT REFERENCE NO.	SHEET NO.
W-5500	2C-4

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

ELEVATION VIEW

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.

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

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02

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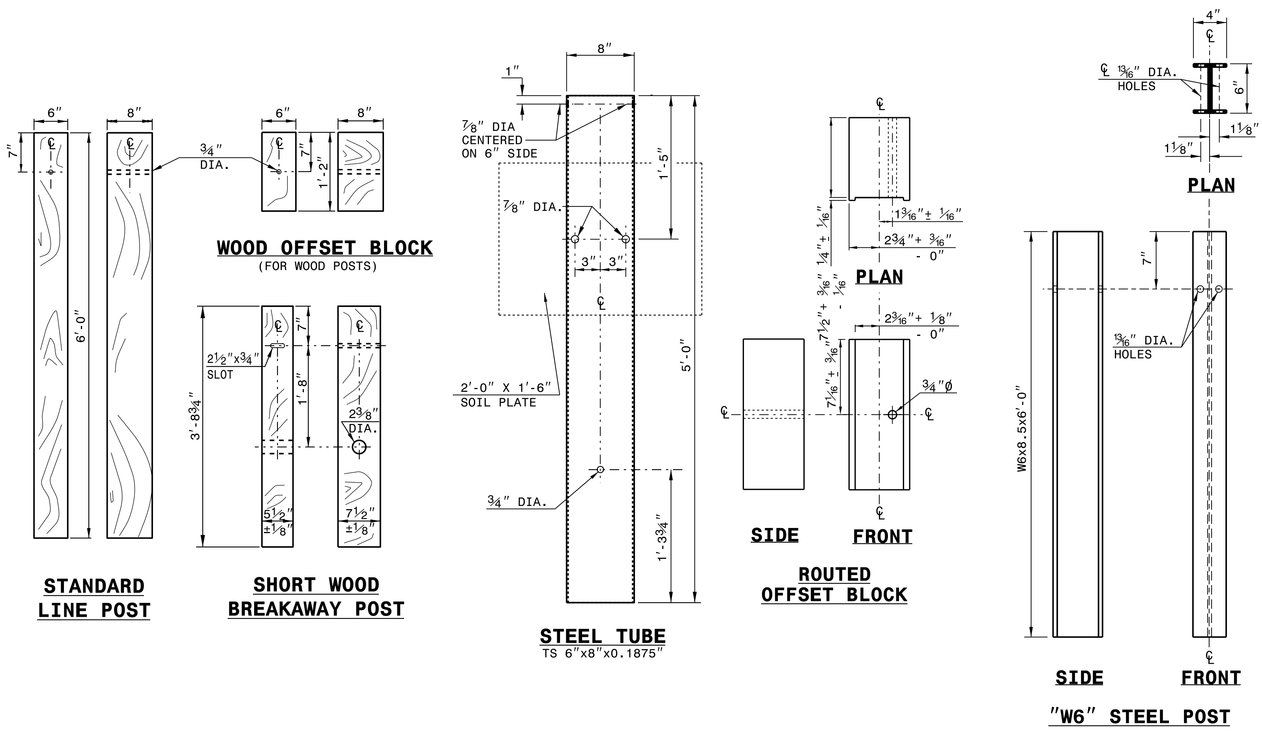
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



SYSTEM PARTS

SHEET 6 OF 8
862D02

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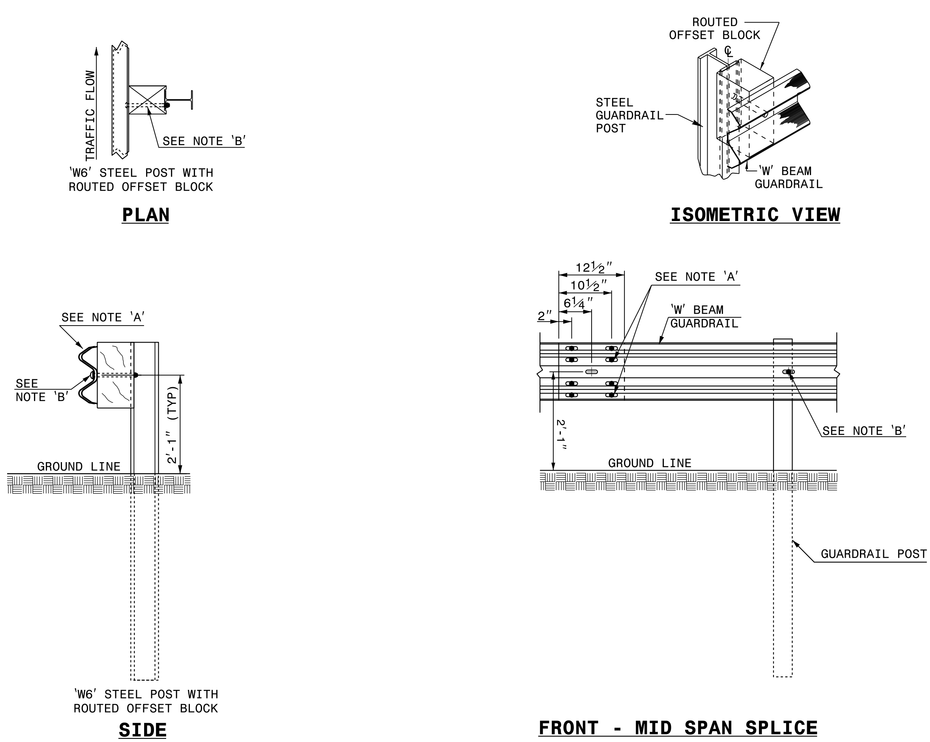
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



NOTES:
A - 5/8" DIA. BUTTON HEAD SPLICE BOLT 1 1/4" LONG (8 REQ. PER SPLICE JOINT).
B - 5/8" DIA. BUTTON HEAD BOLT 7 1/2"/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

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 8
862D02

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PROJECT REFERENCE NO. W-5500
SHEET NO. 2C-5

PROJECT REFERENCE NO.	SHEET NO.
W-5500	2C-6

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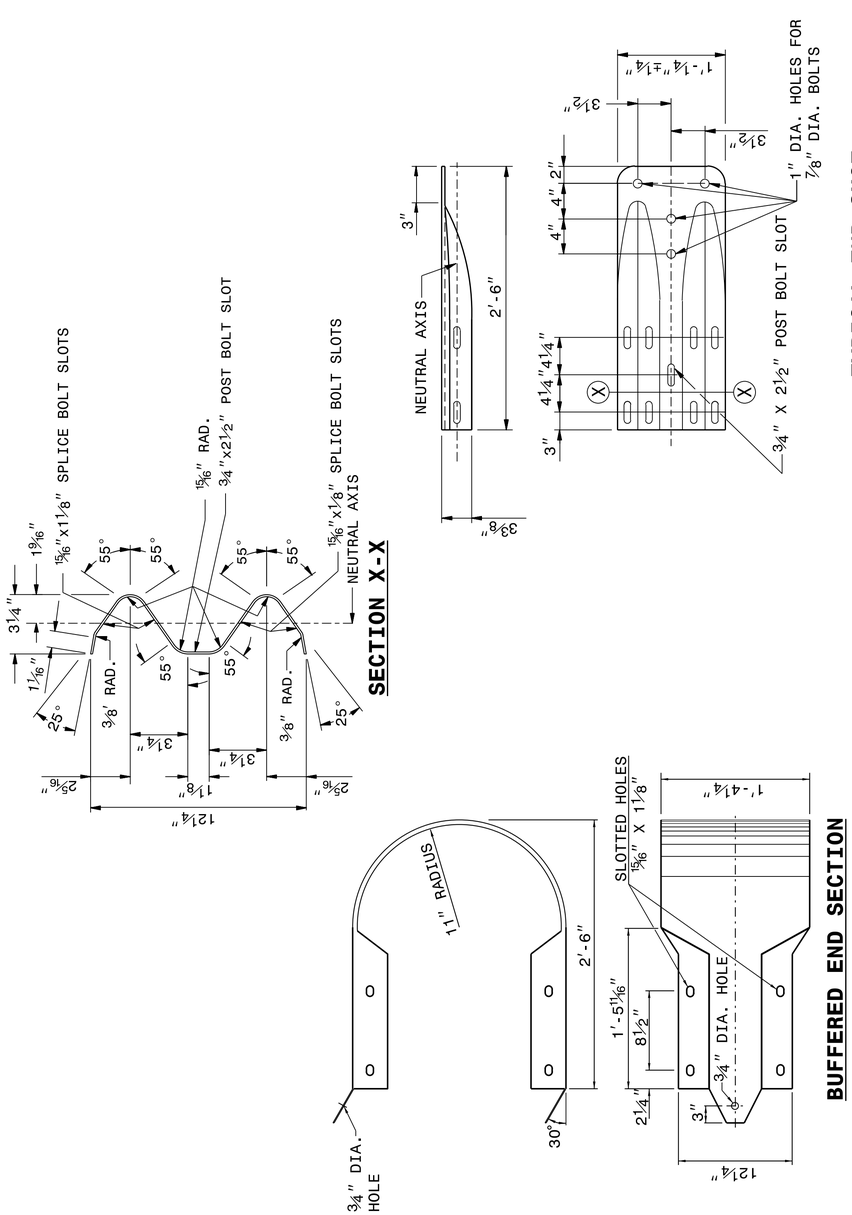
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 8 OF 8
862D02



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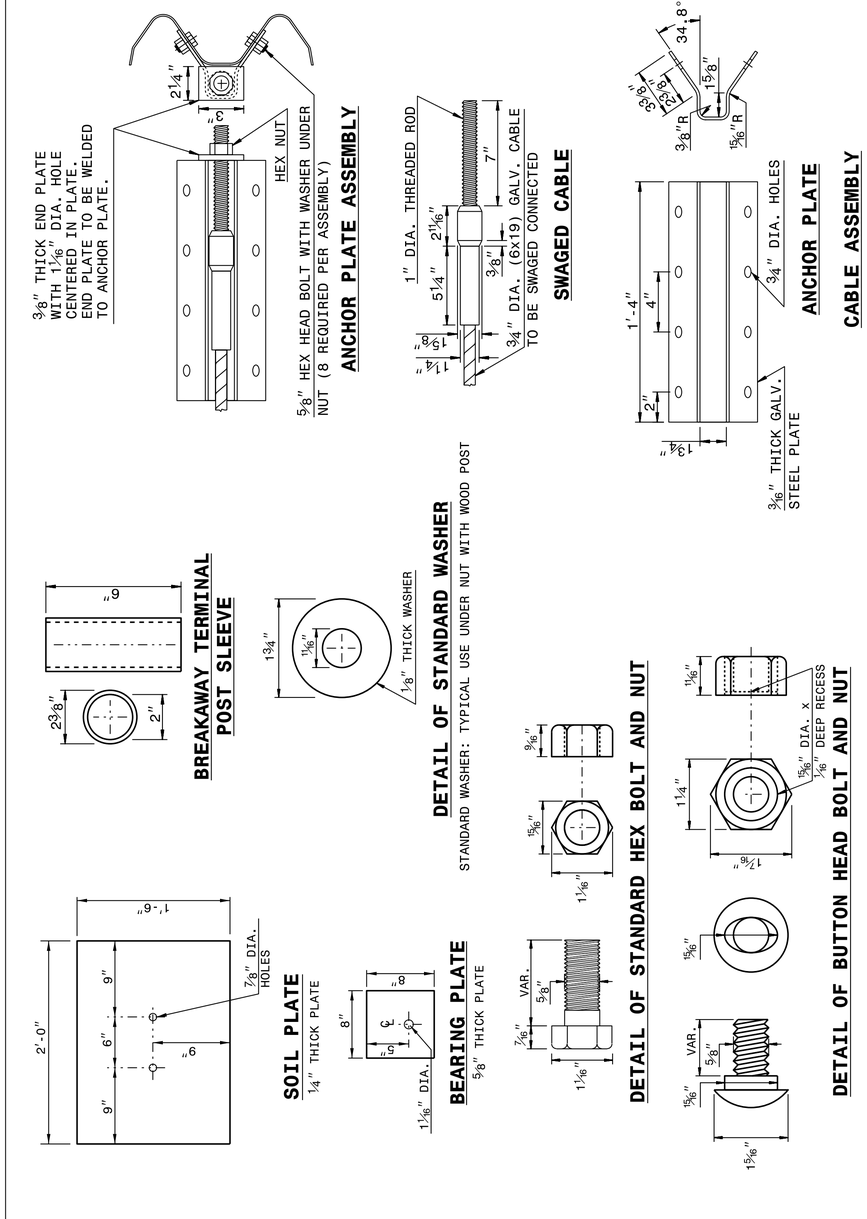
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 8
862D02



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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 8 OF 8
862D02

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ROADWAY DETAIL DRAWING FOR
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SHEET 7 OF 8
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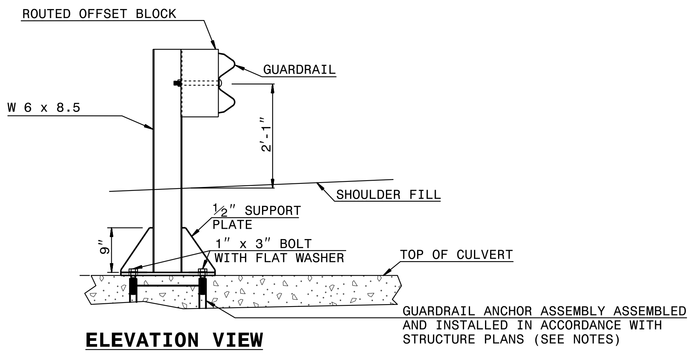
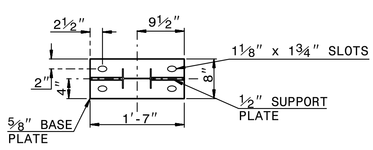
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

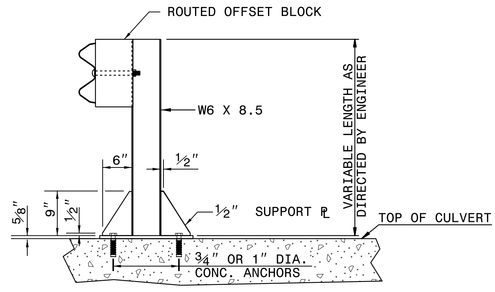
SHEET 7 OF 7
862D03



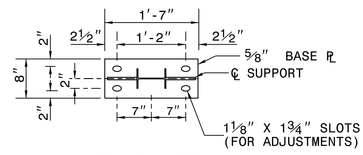
ELEVATION VIEW



PLAN VIEW



ELEVATION VIEW



PLAN VIEW

NOTES FOR:
GUARDRAIL POST ANCHORED TO STRUCTURE:
- USE FULL LENGTH ¼" BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST.
- USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.

NEW STRUCTURES:
- ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.

EXISTING STRUCTURES:
- USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A ¾" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON ¼ THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

- USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7
862D03

PROJECT REFERENCE NO. W-5500 | SHEET NO. 2C-7

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Documents
Joel S. Howerton
1/4/2018
1E8F4D170C0C4B...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOEL S. HOWERTON

COMPUTED BY:	DRE	DATE:	1/22/2018
CHECKED BY:	DRE	DATE:	1/22/2018

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
W-5500	3B-1

"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

GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	B-77	GREU, TL-3	GREU, TL-2	CAT-1	AT-1	Type III SC	B-77 SC		G	NG				
-L-	33+18.00	35+68.00	RT.	250.0					5	8	50	50	1	1			2												
-L-	33+27.50	36+15.00	LT.	287.5					5	8	50	50	1	1			2												
-L-	52+27.50	57+15.00	RT.	487.5					5	8	50	50	1	1			2												
-L-	53+47.50	57+85.00	LT.	437.5					5	8	50	50	1	1			2												
-L-	67+03.00	69+28.00	RT.	225.0					5	8	50	50	1	1			2												
-L-	69+58.00	71+70.50	RT.	212.5					5	8	50	50	1	1			2												
-L-	68+22.50	73+10.00	LT.	487.5					5	8	50	50	1	1			2												
-L-	71+95.50	73+45.50	RT.	150.0					5	8	50	50	1	1			2												
-L-	94+68.00	99+43.00	RT.	475.0					5	8	50	50	1	1			2												
			SUBTOTAL	3012.50													18												
	GREU, TL-3	18@50'	900.00																										
	TOTAL DEDUCTIONS			-900.00																									
			TOTAL	2112.50													18												
ADDITIONAL GUARDRAIL POSTS			10	EA.																									

PARCEL INDEX

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAMES
1	4,5	JOAN CRUMPLER JOYNER
2	4	PATRICIA R PERSON
3	4	JAMES D. ETHERIDGE & WIFE
4	4	JOHN L. AND MARY H. CHAPMAN
5	4	JEFFERY B. JACKSON
6	4	LISA JO GURLEY ANDERSON
7	4,5	LISA JO GURLEY ANDERSON
8	5	JOSEPH T. OLEJNICZAK
9	5	REUBEN HAMILTON HEIRS
10	5	QUEEN ESTHER SIMMONS
11	5	JOANNE J. ROBERTS
12	5,6	MAXWELL FOODS, LLC
13	5	HUGH E. ROBERTS
14	5,6	JOANNE J. ROBERTS
15	6	SHIRLEY DAVIS GARDNER
16	6-12	SLEEPY CREEK FARMS
17	6,7,8	MARSHALL EDWIN COX SR. ETAL
18	8,9,10	MARSHALL EDWIN COX SR.
19	10,11,12	MAXWELL FOODS, LLC
20	12	ANTIONETTE V. BROWN
21	12	EDDIE RAY TEACHEY
22	12	CHARLES B. STRICKLAND & WIFE
23	12	KENNETH R. MCCULLEN
24	12	LANEY CARL HILL
25	12	SULA BEST TEACHEY
26	12	SALLIE H. STRICKLAND
27	12	JOHN L. GURLEY
28	12	MAXWELL FOODS, LLC
29	12,13	KENNETH R. & SHEILA W. MCCULLEN
30	13	DUANE A. JONES & JAMI R. HARRIS
31	13	ROBERT LEE GURLEY
32	13	LEONARD RAY & KATHY TURNAGE EDMUNDSON
33	13	JOSEPH G. PITTMAN & WIFE
34	13	TRUSTEES OF SAULSTON UNITED METHODIST CHURCH

SUMMARY OF EARTHWORK

Volumes in Cubic Yards

STATION TO STATION				Uncl. Excav.	Undercut	Embank +25%	Borrow	Waste
L	10+00.00	TO	34+50.00	1970		1702	796	1064
Y	10+20.00	TO	11+00.00	81				81
			SUBTOTAL	2051		1702	796	1145
L	34+50.00	TO	62+50.00	4480		2210	150	2420
Y3	10+20.00	TO	11+00.00	26		2		24
			SUBTOTAL	4506		2212	150	2444
L	62+50.00	TO	90+00.00	3822		1374		2448
			SUBTOTAL	3822		1374		2448
L	90+00.00	TO	115+00.00	3491		2324	719	1886
			SUBTOTAL	3491		2324	719	1886
L	115+00.00	TO	138+50.00	6128		2043		4085
			SUBTOTAL	6128		2043		4085
TOTAL				19998		9655	1665	12008
WASTE IN LIEU OF BORROW							-1205	-1205
PROJECT TOTAL				19998		9655	460	10803
ESTIMATE TO REPLACE TOPSOIL ON BORROW PIT							23	
GRAND TOTAL				19998		9655	483	10803
SAY				20000			500	

MILLING ASPHALT PAVEMENT, 1.5"DEPTH

STATION TO STATION				SIDE	SY
-L-	10+00.00	TO	16+50.00	LT	810.00
-L-	10+00.00	TO	19+25.00	RT	1200.00
-L-	20+25.00	TO	21+25.00	RT	160.00
-L-	22+25.00	TO	25+10.00	LT	390.00
-L-	22+25.00	TO	24+50.00	RT	280.00
-L-	26+75.00	TO	29+25.00	RT	350.00
-L-	38+50.00	TO	52+25.00	LT	1550.00
-L-	38+50.00	TO	46+00.00	RT	1030.00
-L-	47+00.00	TO	52+25.00	RT	760.00
-L-	58+25.00	TO	74+50.00	LT	2070.00
-L-	59+50.00	TO	64+25.00	RT	660.00
-L-	65+80.00	TO	90+00.00	RT	3240.00
-L-	78+50.00	TO	87+50.00	LT	1130.00
-L-	92+25.00	TO	94+75.00	LT	330.00
-L-	92+25.00	TO	94+75.00	RT	320.00
-L-	100+25.00	TO	104+00.00	RT	470.00
-L-	101+50.00	TO	106+75.00	LT	730.00
-L-	105+00.00	TO	106+75.00	RT	210.00
-L-	111+00.00	TO	125+55.00	LT	1890.00
-L-	112+50.00	TO	125+55.00	RT	1600.00
-L-	126+25.00	TO	127+25.00	LT	120.00
-L-	128+10.00	TO	130+75.00	LT	360.00
-L-	130+00.00	TO	138+50.00	RT	1100.00
-L-	134+50.00	TO	138+50.00	LT	520.00
				TOTAL	21280.00
				SAY	21300.00

SUMMARY OF RIP RAP

			RIP RAP (TON)		FILTER FABRIC	
LINE	STATION	LOCATION	CLASS I	CLASS B	(SY)	
L	10+69.51	RT		3		10
L	34+63.00		35			
L	55+20.00	LT		8		21
L	63+35.82	LT		5		14
L	86+44.80	RT		3		10
L	97+61.47	LT		3		10
L	97+61.47	LT		3		10
L	122+38.50	LT		3		10
L	122+38.50	LT		3		10
L	129+44.99	LT		3		10
L	135+10.00	LT		3		10
		TOTAL	35	37		115
		SAY	40	40		115

COMPUTED BY: D.R.ETHRIDGE DATE: 1/22/2018
CHECKED BY: DATE:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5500	3D-1

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12" 15" 18" 24" 30" 36" 42" 48" (DO NOT USE RCP / DO NOT USE CSP / DO NOT USE CAAP / DO NOT USE HDPE)	C.S. PIPE 12" .064, 15" .064, 18" .064, 24" .064, 30" .079, 36" .079, 42" .109, 48" .109	R.C. PIPE CLASS III 12"	R.C. PIPE CLASS III 15"	R.C. PIPE CLASS III 18"	R.C. PIPE CLASS III 24"	R.C. PIPE CLASS III 30"	R.C. PIPE CLASS III 36"	R.C. PIPE CLASS III 42"	R.C. PIPE CLASS III 48"	R.C. PIPE CLASS IV 12"	R.C. PIPE CLASS IV 15"	R.C. PIPE CLASS IV 18"	R.C. PIPE CLASS IV 24"	R.C. PIPE CLASS IV 30"	R.C. PIPE CLASS IV 36"	R.C. PIPE CLASS IV 42"	R.C. PIPE CLASS IV 48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	30" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS 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	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CONCRETE TRANSITIONAL SECTION CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
-L- 10+69.51	RT	401			126.70'																																									
		401	402		126.70'	126.80'														68'																										
-L- 11+37.51	RT	402			126.80'																																									
-Y- 10+24.38	CL	406																								32'																			21'	
-L- 13+96.37	RT	403																								28'																			29'	
-L- 14+29.26	RT	404																								28'																			21'	
-L- 16+17.69	RT	405																								40'																			33'	
-L- 18+32.05	RT	501																								28'																			22'	
-L- 19+04.31	RT	502																								36'																			21'	
-L- 20+04.60	RT	503																								40'																			33'	
-L- 24+12.78	RT	504																									28'																		17'	
-L- 24+61.74	RT	505																									28'																		21'	
-L- 25+22.99	RT	506																									28'																		21'	
-L- 26+71.72	RT	507																									28'																		22'	
-L- 26+77.48	LT	508																								40'																				
-L- 32+86.64	RT	601																										48'																	46'	
-L- 34+78.14	RT	602			108.90'																																									
		602	603		108.90'	109.50'														72'																										
-L- 35+51.70	RT	603		112.30'	109.50'																											1									1	1			126'	
		603	604		109.50'	110.30'														92'																										
-L- 36+47.84	RT	604		112.80'	110.30'																											1									1	1			125'	
		604	605		110.30'	114.30'														160'																										
-L- 38+15.39	RT	605			114.30'																																								55'	
-L- 46+83.96	LT	701																								32'																			25'	
-L- 55+20.00	RT	702			119.10'																									2.3																
		702	703		119.10'	118.90'																64'																								
-L- 55+20.00	LT	703			118.90'																																								39'	
-L- 63+35.01	RT	807			121.80'																																								54'	
		807	808		121.80'	121.10'															64'																									
-L- 63+35.82	LT	808			121.10'																																									
-L- 63+84.44	LT	801																								24'																			22'	
-L- 65+27.55	LT	802																								28'																				
-L- 69+43.79	RT	803																								24'																			17'	
-L- 70+18.83	RT	805			119.20'																									4.5															42'	
		805	806		119.20'	119.00'																	136'																							2 @ 36" RCP-IV WITH EW
-L- 70+01.43	LT	806			119.00'																																									
-L- 71+85.71	RT	804																								24'																				
-L- 76+24.78	LT	901																								40'																			36'	
-L- 80+12.80	LT	902																								36'																			29'	
-L- 80+00.04	RT	903																								36'																			30'	
SHEET 3D-1 TOTAL																				392'	64'	64'	136'			516'	112'	48'		6.8		2									2	2			907'	

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

COMPUTED BY: D.R.ETHRIDGE DATE: 1/22/2018
CHECKED BY: DATE:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5500	3D-2

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

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

Station	Location (LT, RT, or CL)	Structure No. From	Structure No. To	Top Elevation	Invert Elevation	Invert Elevation	Slope Critical	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. Pipe 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. Pipe Class III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. Pipe Class IV 12"	15"	18"	24"	30"	36"	42"	48"
-L- 86+44.78	LT	904			126.50'																																						
		904	905		126.50'	126.30'																																56'					
-L- 86+44.80	RT	905			126.30'																																						
-L- 92+23.73	LT	1002																																									
-L- 97+63.35	RT	1003			127.30'																																						
		1003	1004		127.30'	127.10'																																128'					
-L- 97+61.47	LT	1004			127.10'																																						
-L- 121+13.31	RT	1203																																									
-L- 121+55.85	RT	1204																																									
-L- 122+14.13	RT	1205																																									
-L- 122+38.50	RT	1201			126.10'																																						
		1201	1202		126.10'	125.90'																																104'					
-L- 122+38.50	LT	1202			125.90'																																						
-L- 122+96.64	RT	1206																																									
-L- 124+74.84	LT	1207																																									
-L- 127+64.53	LT	1211																																									
-L- 128+44.16	RT	1208																																									
-L- 129+45.01	RT	1209																																									
		1209	1210																																			56'					
-L- 129+44.99	LT	1210																																									
-L- 130+00.00	RT	1301																																									
-L- 131+81.74	RT	1302																																									
-L- 132+43.95	RT	1303																																									
-L- 132+95.26	RT	1304																																									
-L- 133+93.90	RT	1305																																									
-L- 135+10.00	RT	1306			125.20'																																						
		1306	1307		125.20'	123.85'																																60'					
-L- 135+10.00	LT	1307			123.85'																																						
-L- 135+47.20	RT	1308																																									
-L- 136+42.34	RT	1309																																									
-L- 137+93.15	RT	1310																																									
SHEET 3D-2 TOTAL																																						404'					
SHEET 3D-1 TOTAL																																						392'	64'	64'	136'		
SHEET 3D-2 TOTAL																																						404'					
PROJECT TOTAL																																						796'	64'	64'	136'		

Station	Structure No. From	Structure No. To	15" Side Drain Pipe	18" Side Drain Pipe	24" Side Drain Pipe	30" Side Drain Pipe	Endwalls STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	Endwalls C.S.P.	Quantities for Drainage Structures: 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	Frame, Grates, and Hood Standard 840.03, Type of Grate E	F	G	Concrete Transitional Section: Drop Inlet	Catch Basin	D.I. STD. 840.14 OR STD. 840.15	D.I. Frame & Grate STD. 840.16	Conc. & Brick Pipe Plug, C.Y. STD. 840.71	Conc. Collars CL. "B" C.Y. STD. 840.72	Pipe Removal Lin. Ft.	Remarks
-L- 86+44.78	904																					22'	
	904	905																					
-L- 86+44.80	905																					38'	
-L- 92+23.73	1002		28'																			21'	
-L- 97+63.35	1003						1.3															35'	
	1003	1004																					2 @ 18" RCP-IV WITH EW
-L- 97+61.47	1004																						
-L- 121+13.31	1203		24'																			22'	
-L- 121+55.85	1204		24'																			56'	
-L- 122+14.13	1205		24'																			58'	
-L- 122+38.50	1201						1.3																
	1201	1202																					2 @ 18" RCP-IV WITH EW
-L- 122+38.50	1202																						
-L- 122+96.64	1206			64'																		61'	
-L- 124+74.84	1207					20'																9'	
-L- 127+64.53	1211					44'																48'	
-L- 128+44.16	1208		24'																			16'	
-L- 129+45.01	1209																						
	1209	1210																					
-L- 129+44.99	1210																					35'	
-L- 130+00.00	1301			40'																		40'	
-L- 131+81.74	1302			28'																		20'	
-L- 132+43.95	1303			24'																		20'	
-L- 132+95.26	1304			24'																		22'	
-L- 133+93.90	1305			24'																		21'	
-L- 135+10.00	1306																					33'	
	1306	1307																					
-L- 135+10.00	1307																						
-L- 135+47.20	1308			24'																		20'	
-L- 136+42.34	1309			24'																		21'	
-L- 137+93.15	1310			68'																		58'	
SHEET 3D-2 TOTAL			124'	320'		64'	2.6															676'	
SHEET 3D-1 TOTAL			516'	112'	48'		6.8		2									2	2			907'	
SHEET 3D-2 TOTAL			124'	320'		64'	2.6															676'	
PROJECT TOTAL			640'	432'	48'	64'	9.4		2									2	2			1583'	
SAY							10													1	1		

ABBREVIATIONS

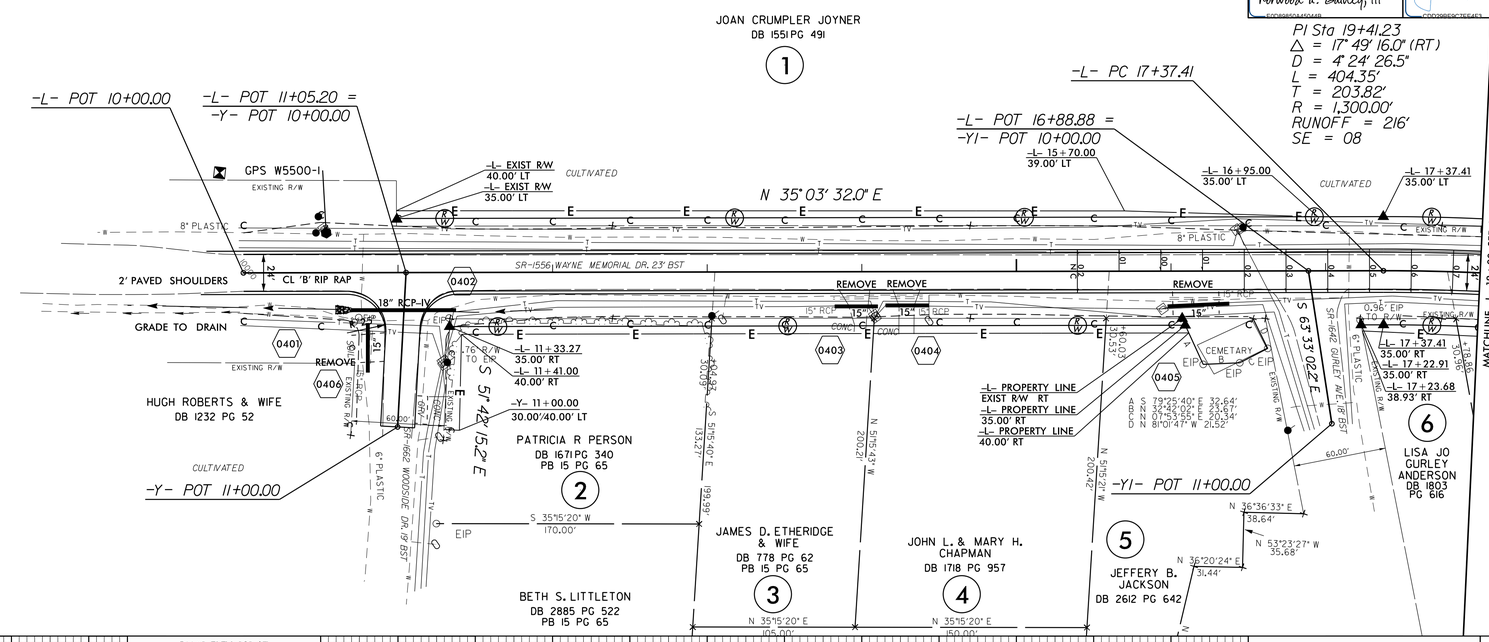
C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

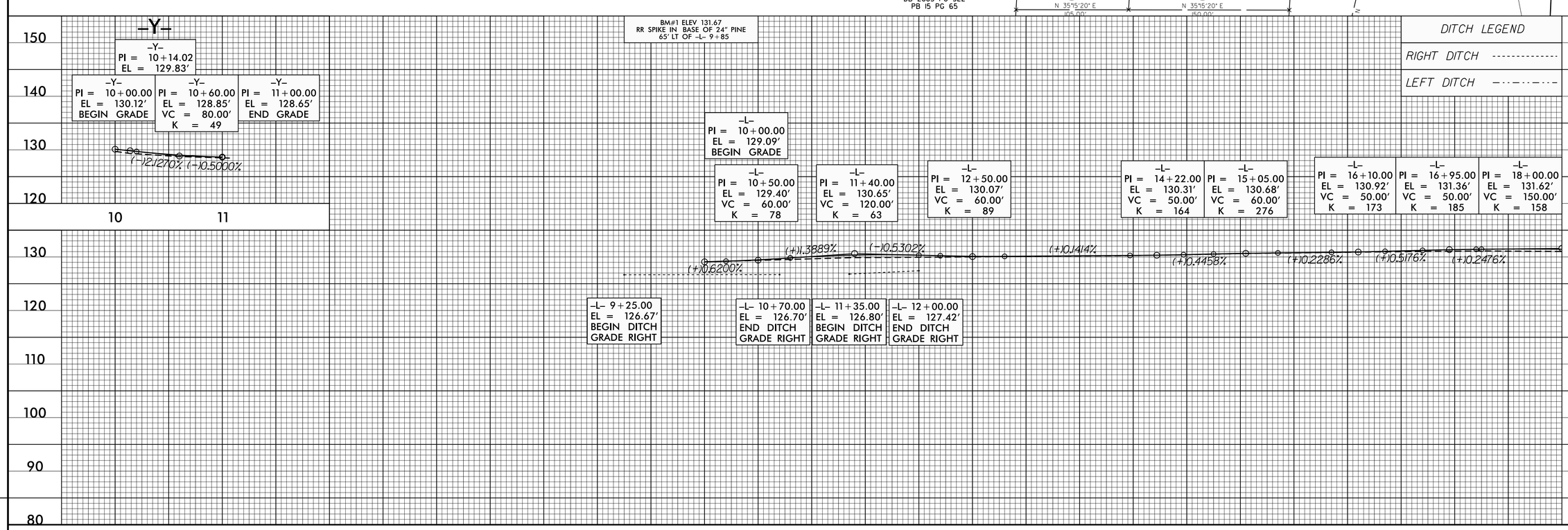
PROJECT REFERENCE NO.	SHEET NO.
W-5500	04
R/W SHEET NO.	04

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey III
E0C88E0A4D04EB...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CD0398E9C7E9AE3...

NAD 83/NSRS 2007





REVISIONS

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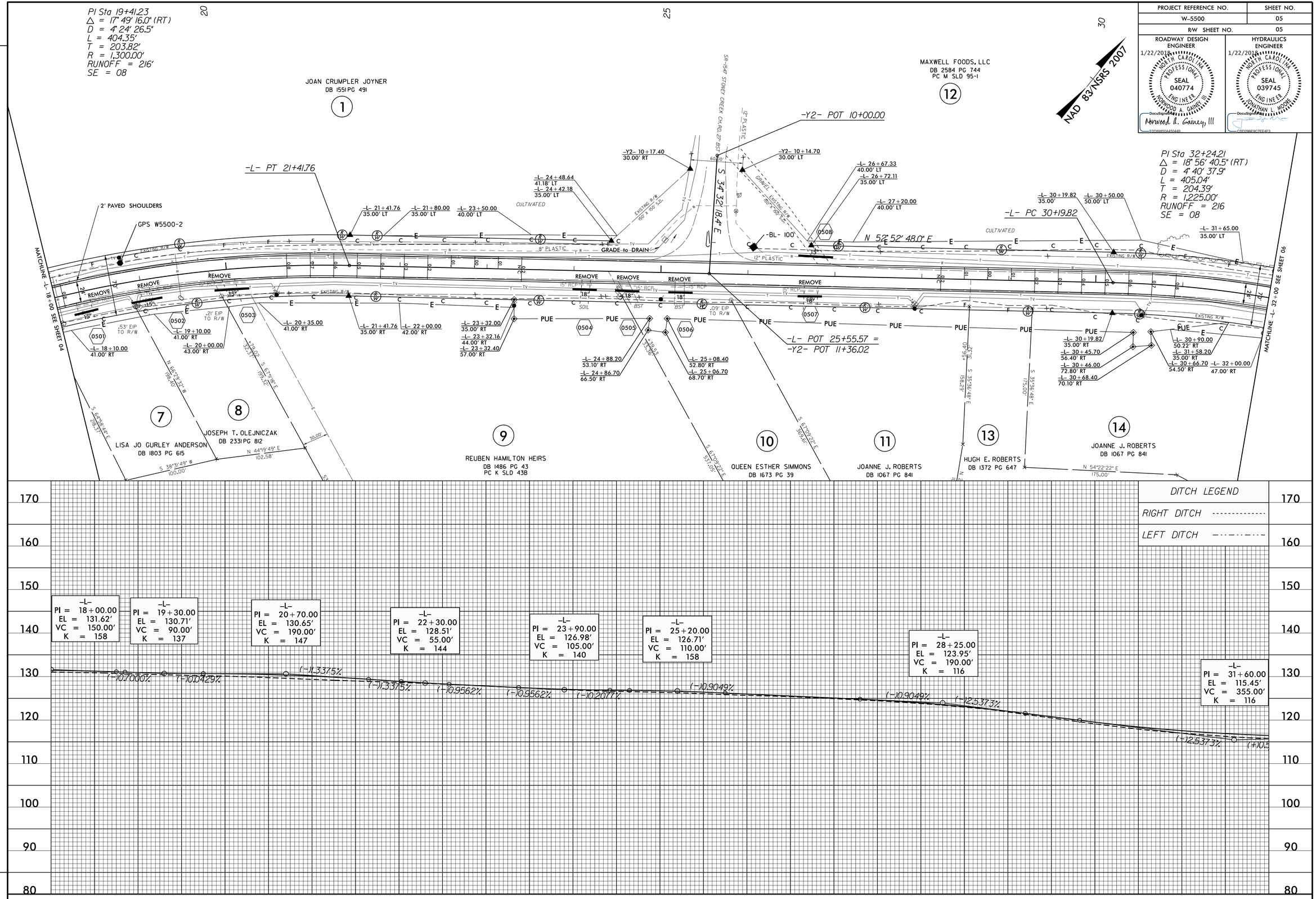
PROJECT REFERENCE NO.	SHEET NO.
W-5500	05
R/W SHEET NO.	05

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
F0D86850A45044B...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CBD298F6C7EE4F3...

PI Sta 19+41.23
△ = 17° 49' 16.0" (RT)
D = 4° 24' 26.5"
L = 404.35'
T = 203.82'
R = 1,300.00'
RUNOFF = 216'
SE = 08

PI Sta 32+24.21
△ = 18° 56' 40.5" (RT)
D = 4° 40' 37.9"
L = 405.04'
T = 204.39'
R = 1,225.00'
RUNOFF = 216
SE = 08



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
W-5500	06
R/W SHEET NO.	06

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSign Envelope ID: 6C0B8F0A-E00A-4B
Norwood A. Gainey, III

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSign Envelope ID: CBD0B9BC-7E6E-4E7
Jonathan L. Moore

NAD 83/NSRS 2007

PI Sta 32+24.21
△ = 18° 56' 40.5" (RT)
D = 4° 40' 37.9"
L = 405.04'
T = 204.39'
R = 1,225.00'
RUNOFF = 216'
SE = 08

PI Sta 36+64.71
△ = 31° 01' 05.7" (RT)
D = 9° 57' 52.1"
L = 311.29'
T = 159.56'
R = 575.00'
RUNOFF = 216'
SE = 08

N 71° 49' 28.5" E

-L- PC 35+05.15

-L- PT 34+24.86

-L- PT 38+16.44

MAXWELL FOODS, LLC
DB 2584 PG 744
PC M SLD 95-I
12

SLEEPY CREEK FARMS, INC.
DB 2215 PG 103
16

SHIRLEY DAVIS GARDNER
DB 898 PG 15
15

MARSHALL EDWIN COX SR. ETAL
DB 824 PG 300
PB 19 PG 5
17

JOANNE J. ROBERTS
DB 1067 PG 841
14

MATCHLINE -L- 33+00 SEE SHEET 07

MATCHLINE -L- 46+00 SEE SHEET 07

GRAU 350 TL-3 REMOVE

18" RCP-IV REMOVE

15" RCP REMOVE

@10'x8' RCBC

CLASS 'I' RIP RAP

2' SPECIAL CUT BASE SWALE GRASS LINED SEE DETAIL 'D'

SPECIAL LATERAL GRASSED SWALE GRASS LINED SEE DETAIL 'B'

SPECIAL CUT GRASSED SWALE GRASS LINED SEE DETAIL 'C'

2' SPECIAL CUT BASE SWALE GRASS LINED SEE DETAIL 'D'

2' PAVED SHOULDERS

SPECIAL CUT DITCH GRASS LINED SEE DETAIL 'E'

12" PLASTIC

EXISTING R/W

CULTIVATED

WOODS

S 78°06'34" E 249.68'

S 13°47'00" E 110.35'

S 11°53'26" W 200.00'

N 79°18'33" E 112.31'

DETAIL 'D'
SPECIAL CUT BASE GRASSED SWALE
(Not to Scale)

Natural Ground, 3:1, D, B, 3:1 or Flatter, Front Ditch Slope

Min. D= 1 Ft.
B= 2 Ft.

FROM STA. 32+00 TO STA. 34+50 RT.
FROM STA. 38+15 TO STA. 39+50 RT.

DETAIL 'E'
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground, 3:1, D, 3:1 or Flatter, Front Ditch Slope

Min. D= 1 Ft.

FROM STA. 43+50 TO STA. 50+00 RT.
FROM STA. 44+50 TO STA. 50+00 RT.

DETAIL 'B'
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)

Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope

Min. D= 1 Ft.

FROM STA. 32+50 TO STA. 34+50 LT.

DETAIL 'C'
SPECIAL CUT GRASSED SWALE
(Not to Scale)

Natural Ground, 6:1, D, 3:1 or Flatter, Front Ditch Slope

Min. D= VARIABLE

FROM STA. 35+50 TO STA. 37+70 RT.

BM#2 ELEV 112.93
RR SPIKE IN BASE OF 12" OAK
39' RT OF -L- 34+03

CULVERT INFORMATION
10'X8' RC BOX Sta. -L- 34+63.25
CL INVERT = 105.1 FT
SKEW = 86 DEGREES
BURIED 1' WITH HEADWALLS AND SILLS

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 400	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 112.8	FT
BASE DISCHARGE	= 615	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 114.43	FT
OVERTOPPING DISCHARGE	= 930	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 117.5	FT

DITCH LEGEND
RIGHT DITCH
LEFT DITCH

-L-
PI = 34+62.00
EL = 117.00'
VC = 160.00'
K = 164

-L-
PI = 37+20.00
EL = 115.80'
VC = 270.00'
K = 117

-L-
PI = 39+65.00
EL = 120.33'
VC = 105.00'
K = 155

-L-
PI = 43+20.00
EL = 124.49'
VC = 75.00'
K = 323

-L-
PI = 46+01.00
EL = 127.13'
VC = 195.00'
K = 175

(+)0.5132% (-)0.4651% (-)0.4651% (-)0.8490% (+)0.8490% (+)1.1718% (+)1.1718% (+)0.9395% (+)0.9395%

-L- 32+50.00
EL = 113.79'
BEGIN DITCH
GRADE LEFT

-L- 32+00.00
EL = 113.11'
BEGIN DITCH
GRADE RIGHT

-L- 32+60.00
EL = 112.25'
DITCH GRADE RIGHT

-L- 34+50.00
EL = 113.19'
END DITCH
GRADE LEFT

-L- 34+50.00
EL = 111.70'
END DITCH
GRADE RIGHT

-L- 35+50.00
EL = 112.30'
BEGIN DITCH
GRADE RIGHT

-L- 36+50.00
EL = 112.80'
DITCH GRADE RIGHT

-L- 37+70.00
EL = 114.80'
END DITCH
GRADE RIGHT

-L- 38+10.00
EL = 114.30'
BEGIN DITCH
GRADE RIGHT

-L- 38+65.00
EL = 114.67'
DITCH GRADE RIGHT

-L- 39+50.00
EL = 117.43'
END DITCH
GRADE RIGHT

-L- 43+50.00
EL = 122.19'
BEGIN DITCH
GRADE RIGHT

-L- 44+50.00
EL = 123.13'
BEGIN DITCH
GRADE LEFT

REVISIONS

22-JAN-2018 08:46
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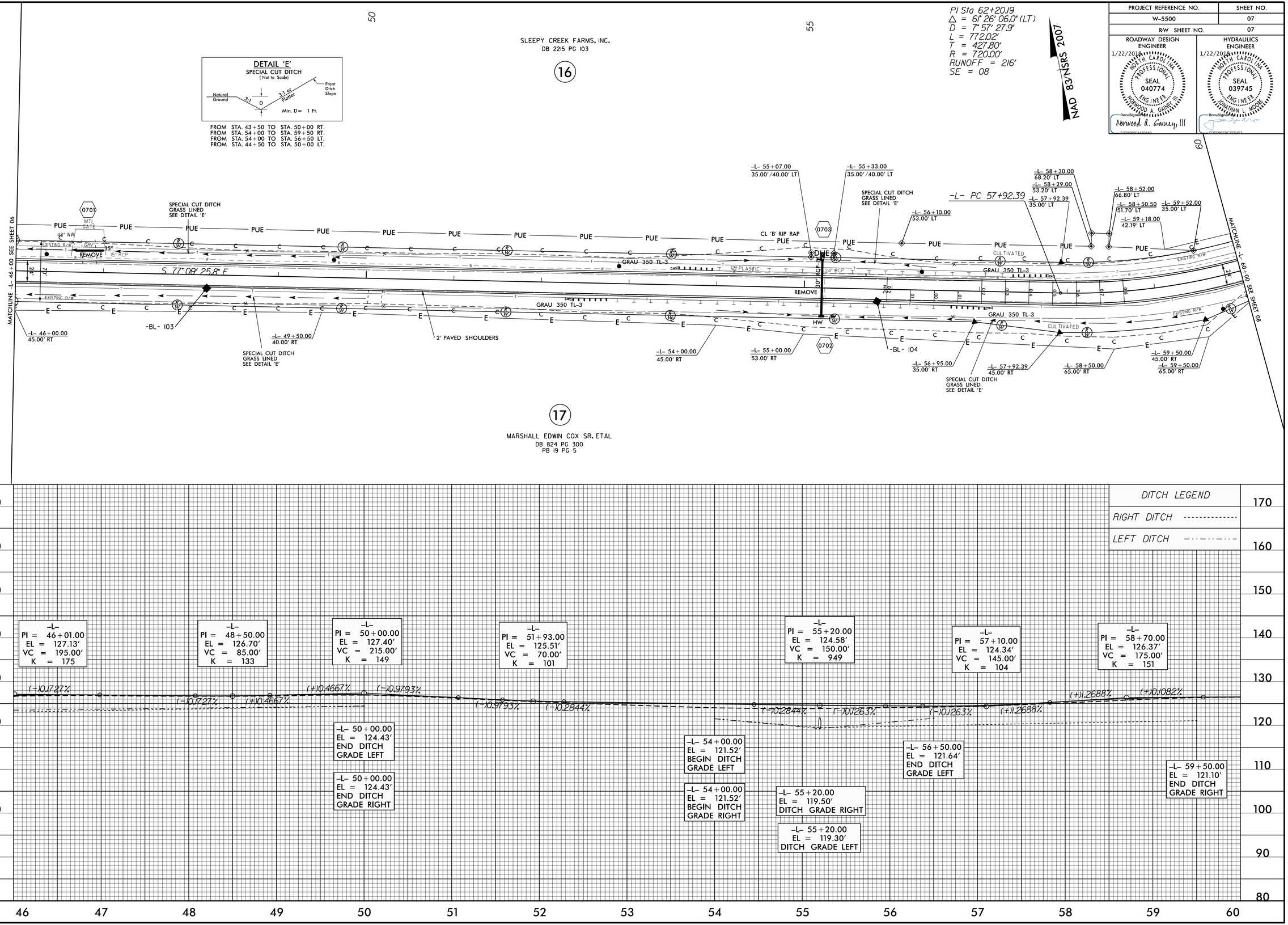
PROJECT REFERENCE NO.	SHEET NO.
W-5500	07
R/W SHEET NO.	07

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
E0C9B6C0A4C04AB...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CDD9B6C7EE4E3...

PI Sta 62+20.19
△ = 61° 26′ 06.0″ (LT)
D = 7° 57′ 27.9″
L = 772.02′
T = 427.80′
R = 720.00′
RUNOFF = 216′
SE = 08

NAD 83/NSRS 2007



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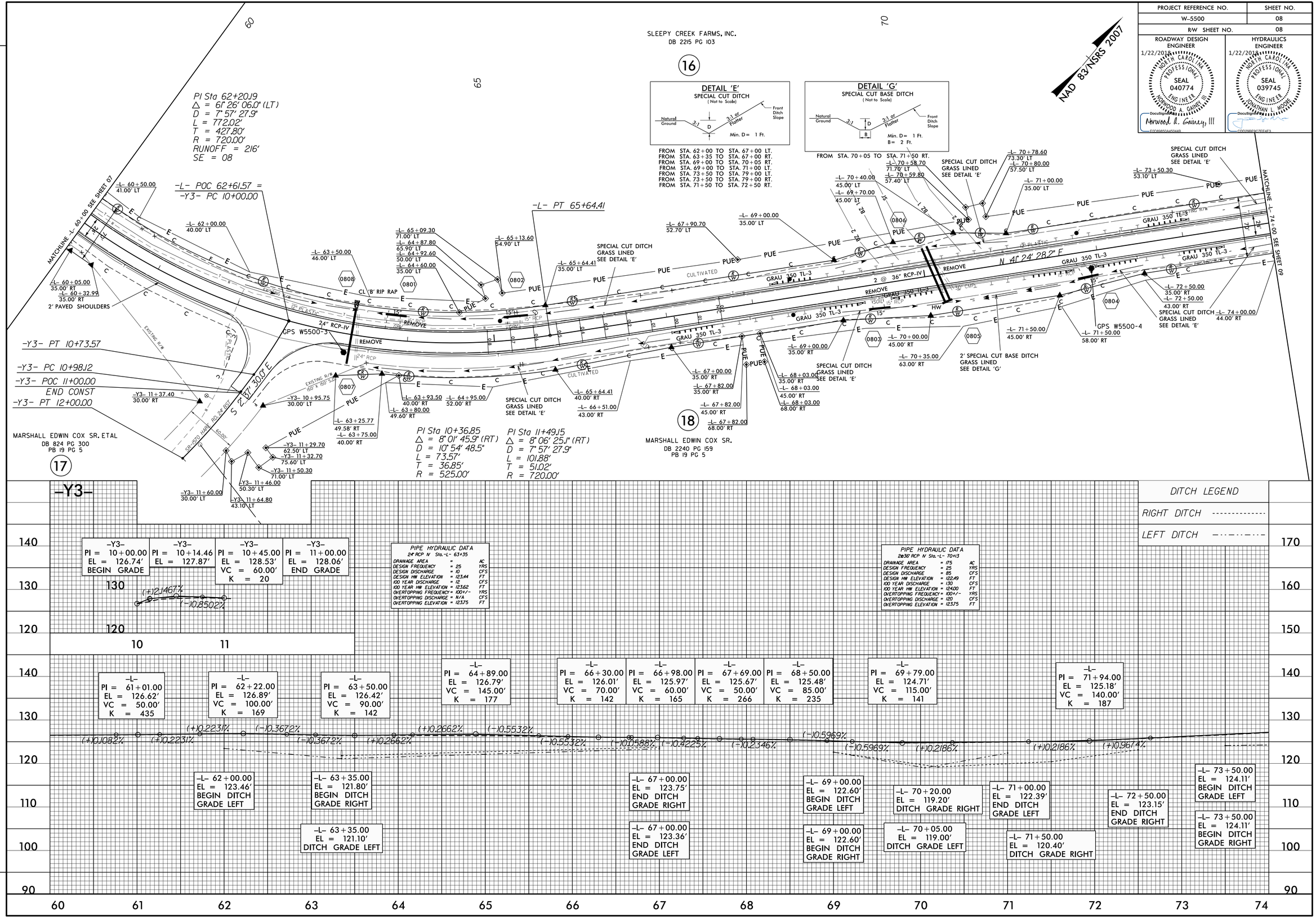
PROJECT REFERENCE NO.	SHEET NO.
W-5500	08
R/W SHEET NO.	08

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
F0D9B850A450448...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CBD29BF9C7EE4F3...



REVISIONS

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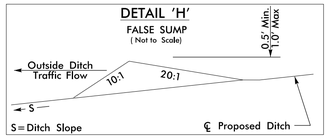
PROJECT REFERENCE NO.	SHEET NO.
W-5500	09
R/W SHEET NO.	09

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
E0D88E0A4E0A4B...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CDD39E9C7E6E4F...

NAD 83/NSRS 2007

DETAIL 'H'
FALSE SUMP
(Not to Scale)

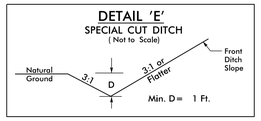


PI Sta 79+16.33
△ = 2° 12' 27.6" (LT)
D = 0° 28' 38.9"
L = 462.37'
T = 231.21'
R = 12,000.00'

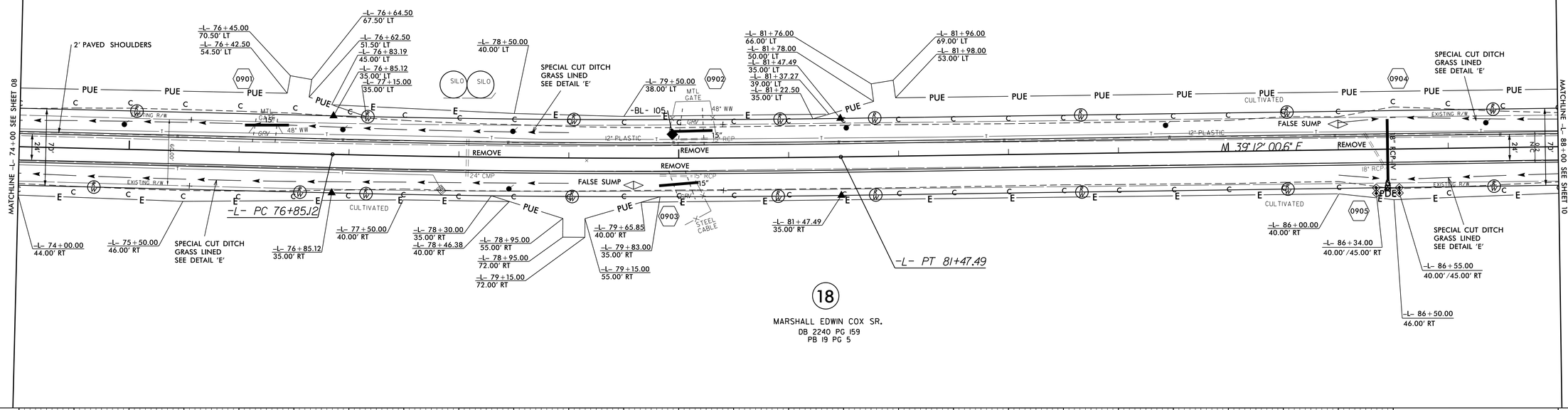
SLEEPY CREEK FARMS, INC.
DB 2215 PG 103

16

DETAIL 'E'
SPECIAL CUT DITCH
(Not to Scale)

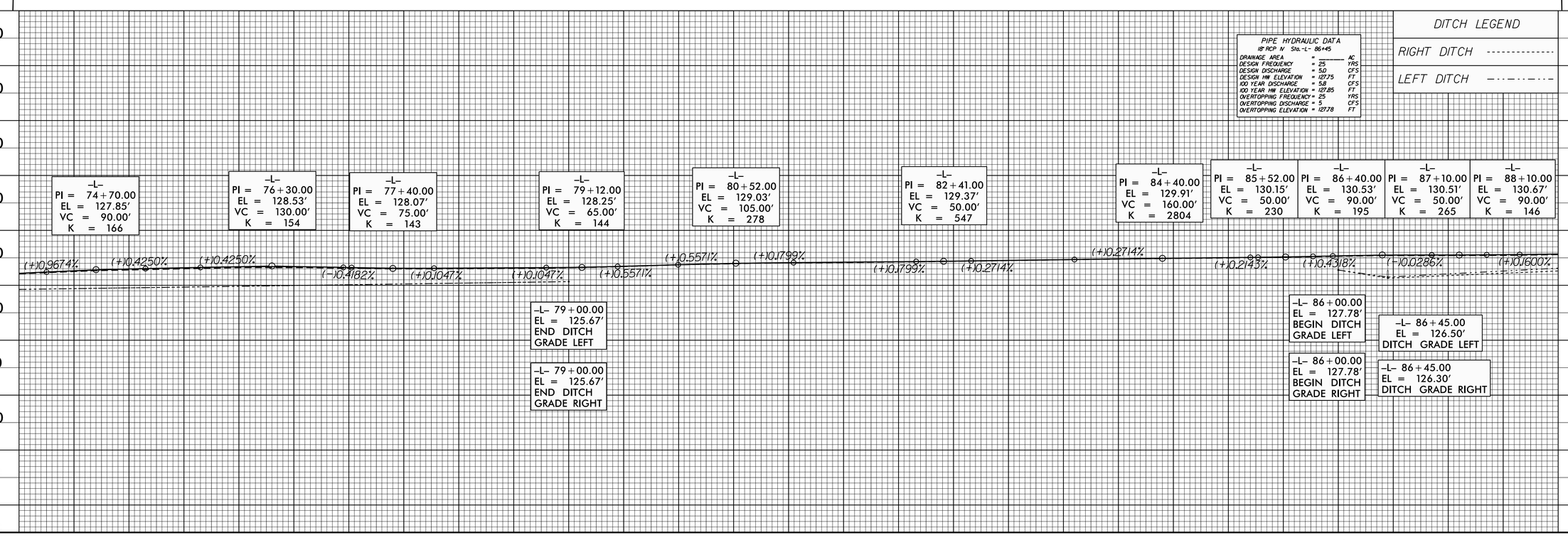


FROM STA. 73+50 TO STA. 79+00 LT.
FROM STA. 73+50 TO STA. 79+00 RT.
FROM STA. 86+00 TO STA. 90+00 LT.
FROM STA. 86+00 TO STA. 90+00 RT.



18

MARSHALL EDWIN COX SR.
DB 2240 PG 159
PB 19 PG 5



PIPE HYDRAULIC DATA
18" RCP N Sta.-L- 86+45

DRAINAGE AREA	=	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 5.0	CFS
DESIGN HW ELEVATION	= 127.75	FT
100 YEAR DISCHARGE	= 5.8	CFS
100 YEAR HW ELEVATION	= 127.85	FT
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING DISCHARGE	= 5	CFS
OVERTOPPING ELEVATION	= 127.78	FT

DITCH LEGEND
RIGHT DITCH
LEFT DITCH

REVISIONS

22-JAN-2018 08:46
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
W-5500	10
R/W SHEET NO.	10

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
E0C9B5F0A450418...

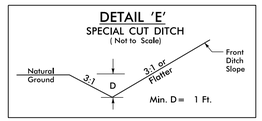
HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CD0398FC7EE4E7...

PI Sta 91+10.08
Δ = 6° 25' 03.0" (RT)
D = 1° 38' 13.3"
L = 392.02'
T = 196.22'
R = 3,500.00'
RUNOFF = 121.5'
SE = 045

PI Sta 98+95.08
Δ = 17° 17' 43.0" (RT)
D = 4° 45' 17.4"
L = 363.74'
T = 183.26'
R = 1,205.00'
RUNOFF = 216'
SE = 08

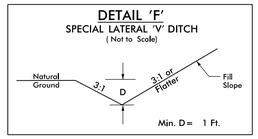
NAD 83/NSRS 2007

DETAIL 'E'
SPECIAL CUT DITCH
(Not to Scale)

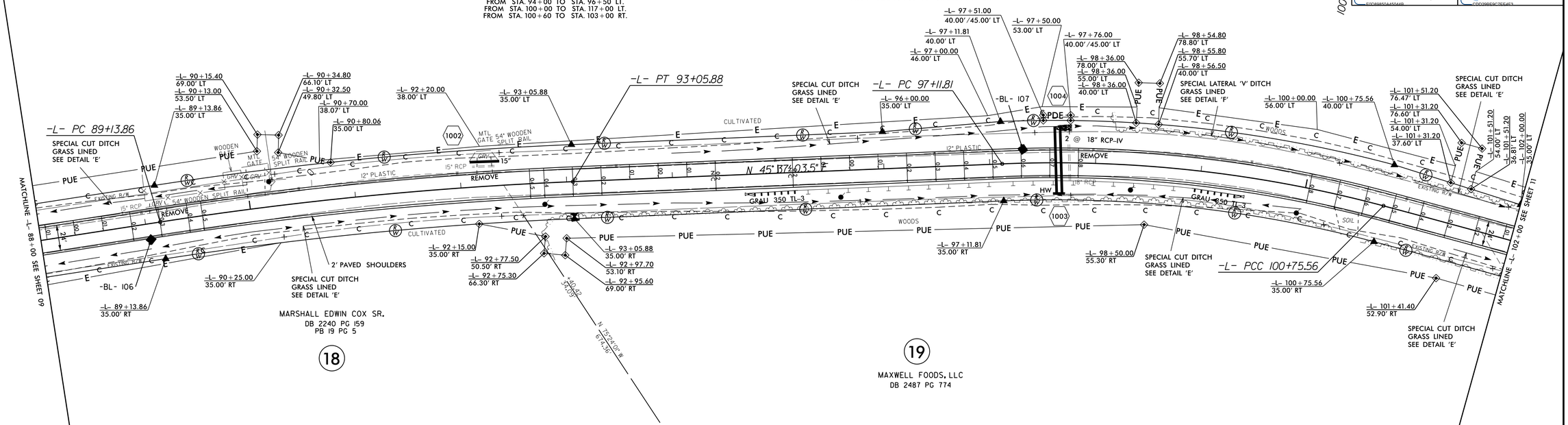


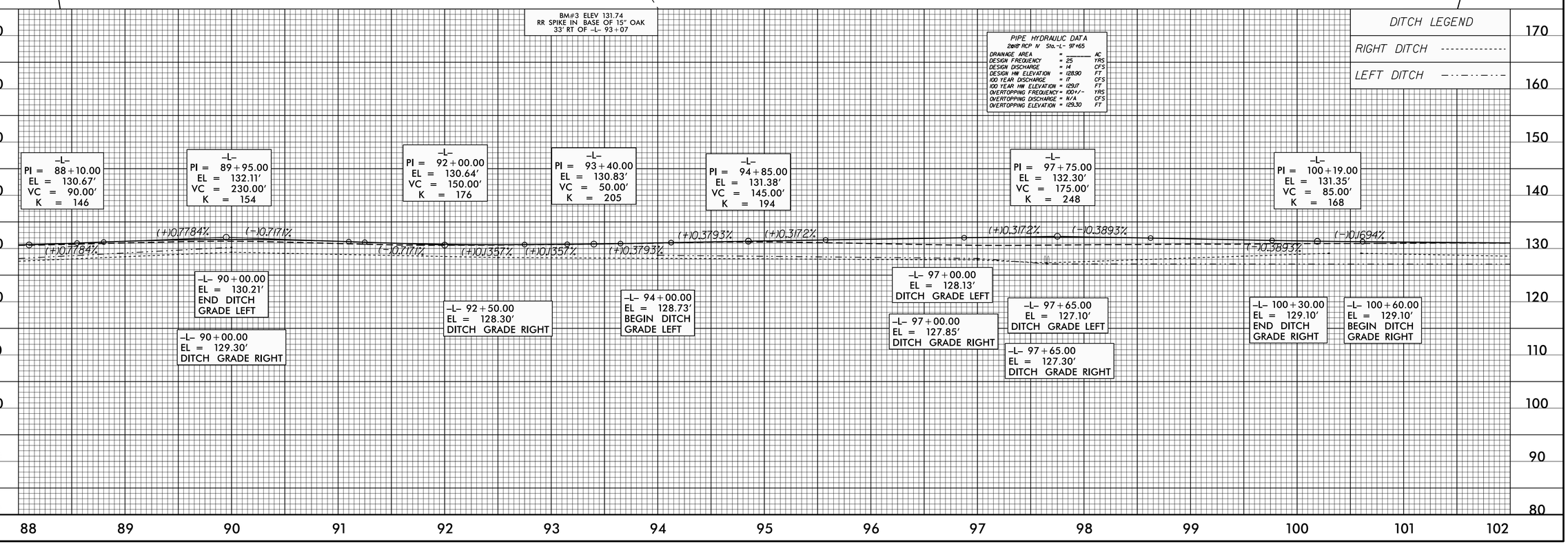
FROM STA. 86+00 TO STA. 90+00 LT.
FROM STA. 86+00 TO STA. 100+30 RT.
FROM STA. 94+00 TO STA. 96+50 LT.
FROM STA. 100+00 TO STA. 117+00 LT.
FROM STA. 100+60 TO STA. 103+00 RT.

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



FROM STA. 96+50 TO STA. 100+00 LT.





REVISIONS

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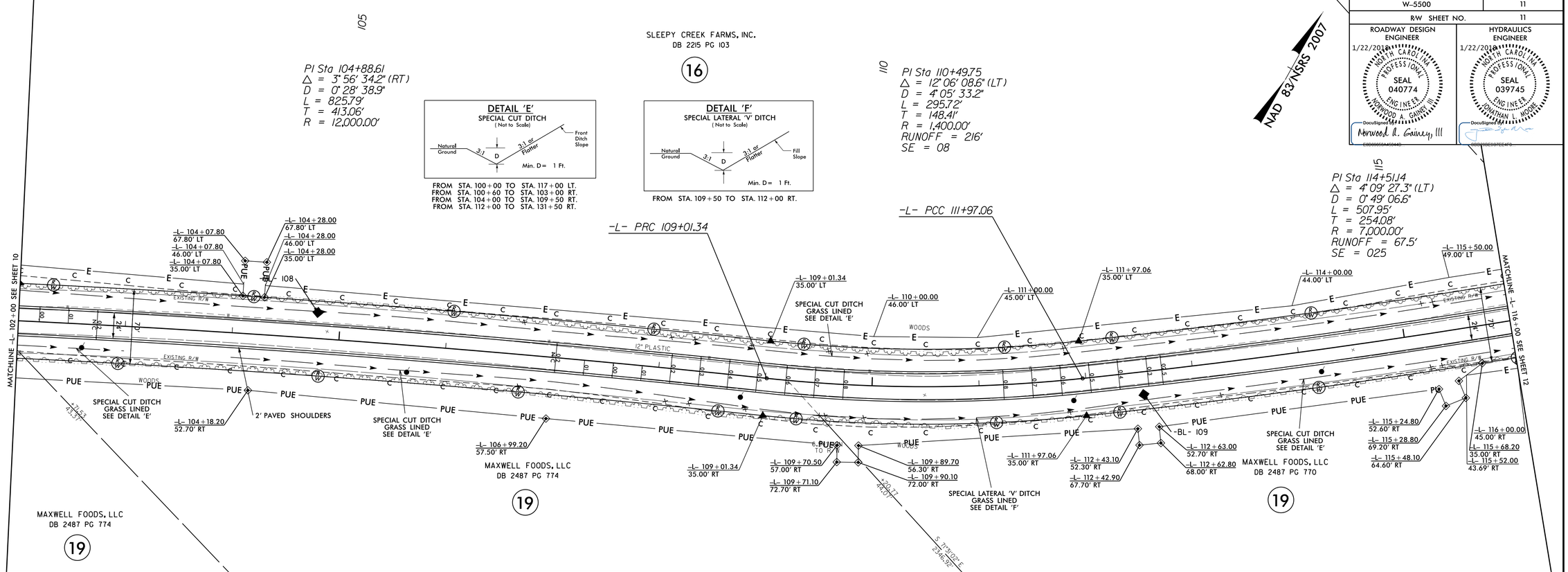
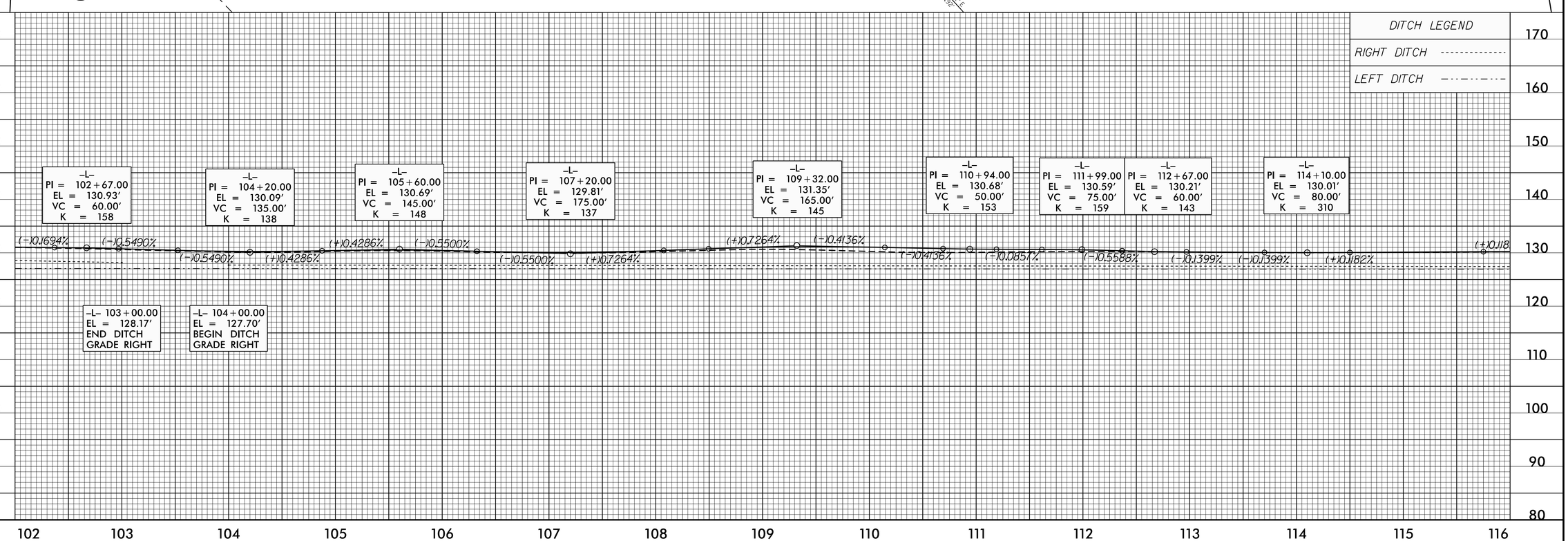
PROJECT REFERENCE NO.	SHEET NO.
W-5500	11
R/W SHEET NO.	11

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
E8D6665A4A624D...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
C8B9B6E8BTEE4F3...

NAD 83/NSRS 2007





REVISIONS

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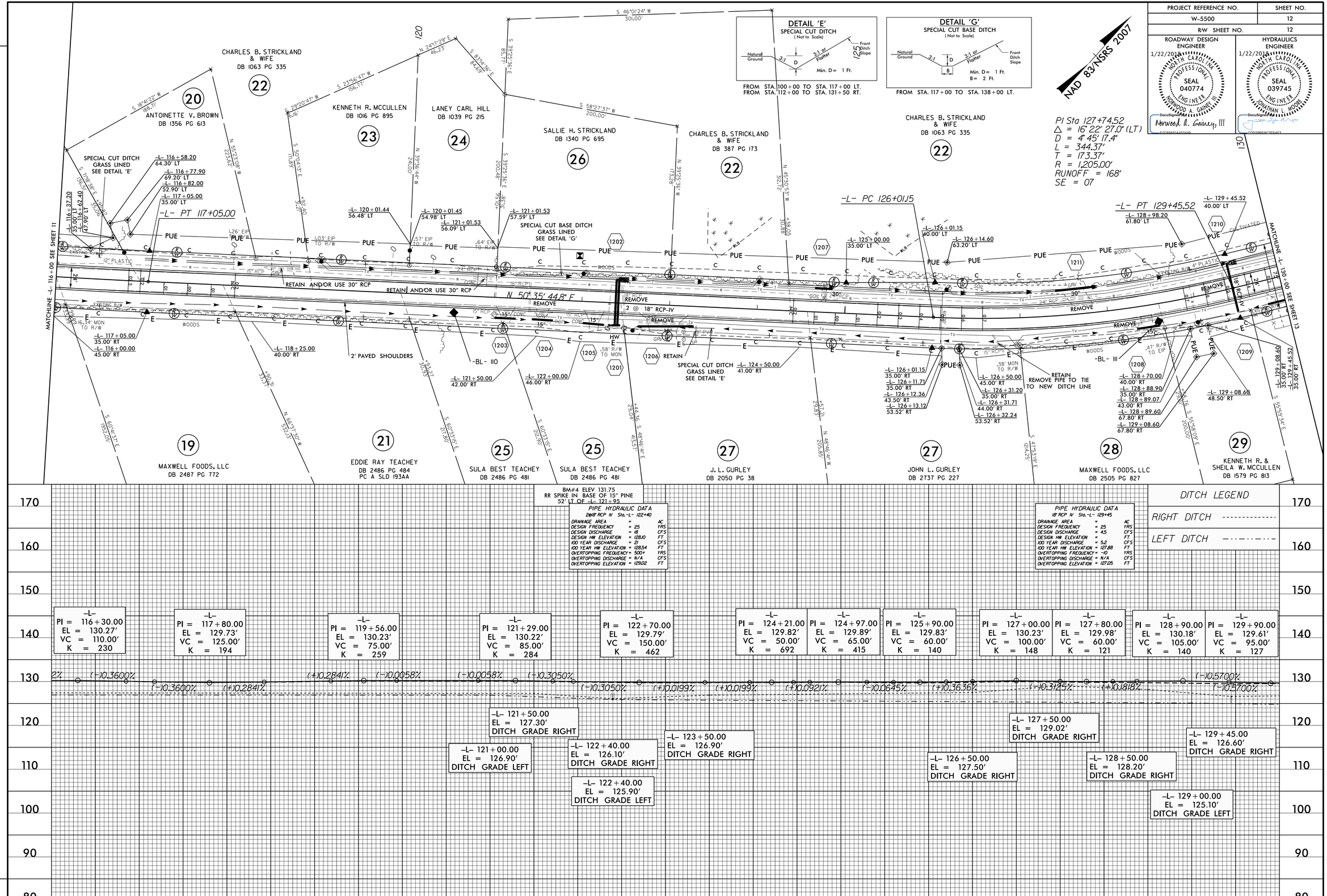
PROJECT REFERENCE NO.	SHEET NO.
W-5500	12
R/W SHEET NO.	12

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
E0C9B5F0A5004AB...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CD0988C7E5E43...

NAD 83/NSRS 2007

PI Sta 127+74.52
Δ = 16° 22' 27.0" (LT)
D = 4° 45' 17.4"
L = 344.37'
T = 173.37'
R = 1,205.00'
RUNOFF = 168'
SE = 07



REVISIONS

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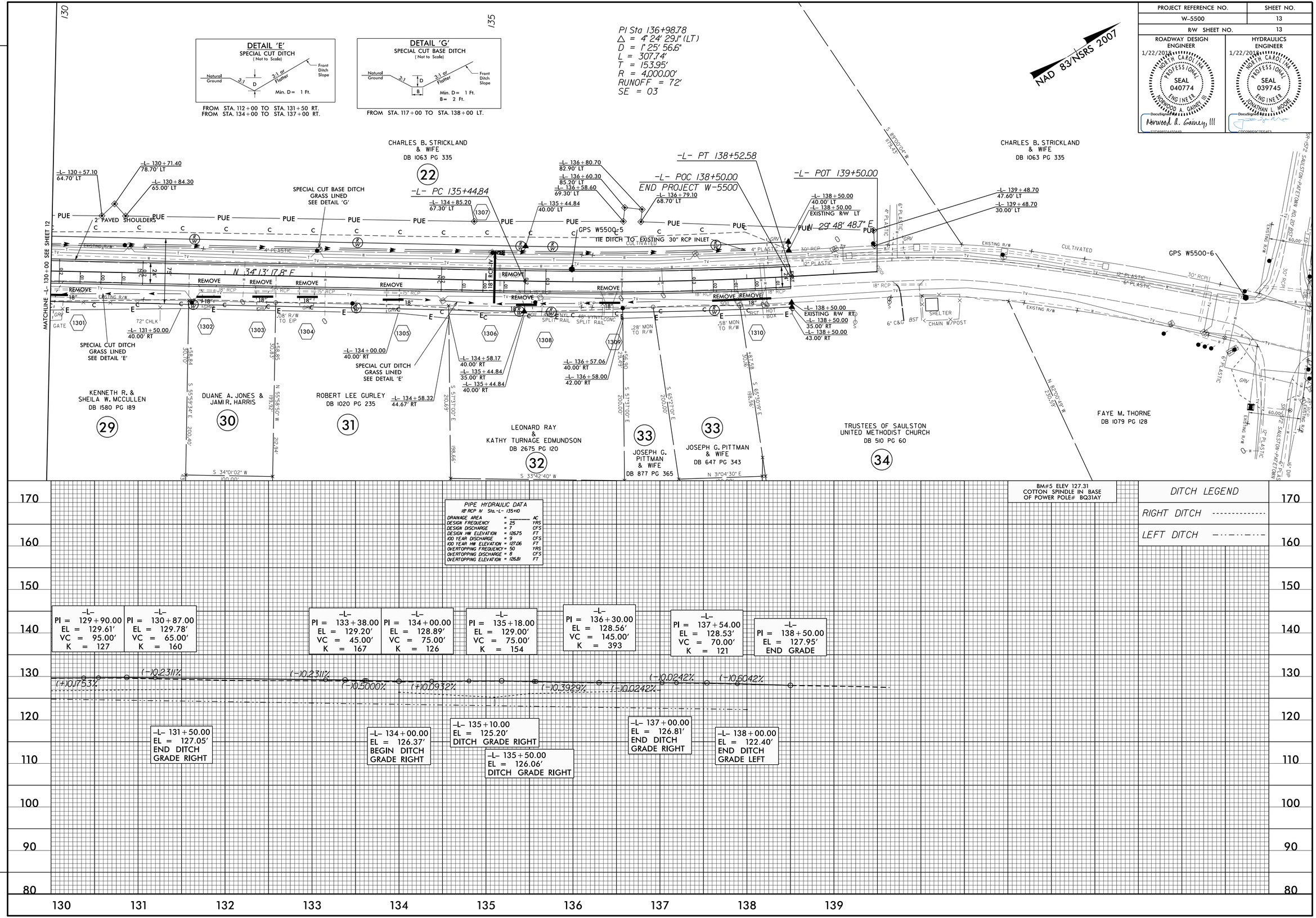
PROJECT REFERENCE NO.	SHEET NO.
W-5500	13
R/W SHEET NO.	13

ROADWAY DESIGN ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD A. GAINEY III
DocuSigned by: Norwood A. Gainey, III
E0D9B8D4A50A4B...

HYDRAULICS ENGINEER
1/22/2018
NORTH CAROLINA PROFESSIONAL SEAL 039745 ENGINEER JONATHAN L. MOORE
DocuSigned by:
CDD3B9EC7E6E4E...



REVISIONS

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