



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

June 25, 2019

Addendum No. 5

RE: Contract # C204177

WBS # 34360.3.4

F. A. # NHF-0070 (049)

Carteret-Craven Counties (R-1015)

US-70 (Havelock Bypass) From North of Pine Grove to North
Of Carteret County Line

July 16, 2019 Letting

To Whom It May Concern:

Reference is made to the plans and proposal form furnished to you on this project.

The following revisions have been made to the Roadway plans:

Sheet No.	Revision
1 (Title sheet)	Revised the letting date to July 16, 2019. Revised Station limits for -Y4-
1A	Revised the Index of Sheets to reflect the addition of Signal plan sheets and Wall Detail sheets.
2A-6	Revised Typical Section #17
3B-1	Revised Earthwork for -Y4-
3B-2	Revised Earthwork totals
3D-20	Revised quantity of 72" RC Pipe Class IV in Drainage Summary
45	Revised Begin Construction Station
83	Revised Begin Construction Note on Profile
TMP-2C	Added additional shoring notes
TMP-3A	Revised phasing due to construction of 72" pipe
TMP-24	Revised to show 72" pipe
New TMP-24A	New sheet to show traffic control in area of proposed 72" pipe
New TMP-24B	New sheet to show traffic control in area of proposed 72" pipe
TMP-25	Revised to show new -Y4- limits and proposed 72" pipe
TMP-26	Revised to show new -Y4- limits.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
CONTRACT STANDARDS AND DEVELOPMENT
1591 MAIL SERVICE CENTER
RALEIGH, NC 27699-1591

Telephone: (919) 707-6900
Fax: (919) 250-4127
Customer Service: 1-877-368-4968

Location:
1020 BIRCH RIDGE DR.
RALEIGH, NC 27610

Website: www.ncdot.gov

Sheet No.	Revision
New EC-45A	New sheet for proposed pipe culvert sequencing
SIG 1.0	Revised to show -Y4- work, proposed temporary signals
New SIG 24.0	New sheet to show proposed temporary signal work
New SIG 24.1	New sheet for proposed temporary signal
New SIG 25.0	New sheet to show proposed temporary signal work
New SIG 25.1	New sheet for proposed temporary signal
X-1H	Revised to reflect extension of -Y4- limits
X-375	Revised cross section to reflect -Y4- changes

Please void the above listed existing Sheets in your plans and staple the revised Sheets thereto. Staple the New Sheets in the appropriate place in your plans.

The following revisions have been made to the Structure plans:

Sheet No.	Revision
New W-12	New Wall detail sheet to provide additional information
New W-13	New Wall detail sheet to provide additional information

Staple new Sheets W-12 and W-13 after existing Sheet W-11 in your proposal.

The following revisions have been made to the proposal:

Page No.	Revisions
Proposal Cover	Note added that reads "Includes Addendum No. 5 Dated 06-25-2019". Revised letting date to July 16, 2019.
Table of Contents	Deleted INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES . Added INTERMEDIATE CONTRACT TIME NUMBER 1, BONUS CLAUSE AND LIQUIDATED DAMAGES . Added SPECIAL REQUIREMENTS FOR ARCHAEOLOGICAL SITE 31CV302 . Added NONROAD CONSTRUCTION EQUIPMENT .
G-1 thru G-3	Revised date of availability and completion date in the project special provision entitled CONTRACT TIME AND LIQUIDATED DAMAGES . Deleted the project special provision entitled INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES . Added the project special provision entitled INTERMEDIATE CONTRACT TIME NUMBER 1, BONUS CLAUSE AND LIQUIDATED DAMAGES
G-12	Revised the project special provision entitled SCHEDULE OF ESTIMATED COMPLETION PROGRESS
G-13	Revised the project special provision entitled SPECIAL REQUIREMENTS FOR HAULING WITHIN DUKE ENERGY TRANSMISSION LINE EASEMENTS (last sentence of second paragraph on page)

Page No.	Revisions
G-15	Revised the project special provision entitled SPECIAL REQUIREMENTS FOR HAULING WITHIN DUKE ENERGY TRANSMISSION LINE EASEMENTS (first paragraph on page)
G-44 and New Page G-45	Added the project special provision entitled SPECIAL REQUIREMENTS FOR ARCHAEOLOGICAL SITE 31CV302. Added the project special provision entitled NONROAD CONSTRUCTION EQUIPMENT.
SSP-6	Revised the standard special provision entitled PLANT AND PEST QUARANTINES
P-1 and New Pages P-2 thru P-255	Permits received and included in the proposal.

Please void your entire previous proposal form. You will receive a new proposal form containing all the revisions in this Addendum #5.

On the item sheets the following pay items have been revised:

<u>Item</u>	<u>Description</u>	<u>Old Quantity</u>	<u>New Quantity</u>
29-0199000000-E-SP	Temporary Shoring	1,341.2 SF	1,612 SF
33-0320000000-E-300	Foundation Conditioning Geotextile	16,520 SY	16,530 SY
59-0448000000-E-310	72" RC Pipe Culverts, Class IV	932 LF	944 LF
84-1491000000-E-610	Asphalt Concrete Base Course, Type B25.0C	20,880 TON	21,090 TON
86-1519000000-E-610	Asphalt Concrete Surface Course, Type S9.5B	13,100 TON	13,140 TON
88-1575000000-E-620	Asphalt Binder for Plant Mix	14,470 TON	14,485 TON
171-4400000000-E-1110	Work Zone Signs (Stationary)	752 SF	929 SF
172-4405000000-E-1110	Work Zone Signs (Portable)	832 SF	822 SF
173-4410000000-E-1110	Work Zone Signs (Barricade Mounted)	384 SF	373 SF

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Carteret-Craven Counties

179-4465000000-N-1160	Temporary Crash Cushions	3 EA	5 EA
180-4470000000-N-1160	Remove & Reset Temporary Crash Cushion	1 EA	3 EA
182-4485000000-E-1170	Portable Concrete Barrier	5,220 LF	5,280 LF
183-4500000000-E-1170	Remove & Reset Portable Concrete Barrier	610 LF	670 LF
186-4650000000-N-1250	Temporary Raised Pavement Markers	400 EA	394 EA
187-4685000000-E-1205	Thermoplastic Pavement Marking Lines (4", 90 mils)	20,359 LF	45,345 LF
189-4688000000-E-1205	Thermoplastic Pavement Marking Lines (6", 90 mils)	258,306 LF	294,113 LF
191-4695000000-E-1205	Thermoplastic Pavement Marking Lines (8", 90 mils)	249 LF	714 LF
193-4700000000-E-1205	Thermoplastic Pavement Marking Lines (12", 90 mils)	9,926 LF	13,433 LF
227-6070000000-N-1639	Special Stilling Basins	38 EA	40EA
239-6111000000-E-SP	Impervious Dike	2,100 LF	2,200 LF
246-7060000000-E-1705	Signal Cable	5,950 LF	6,520 LF
247-7120000000-E-1705	Vehicle Signal Head (12", 4 Section)	33 EA	39 EA
251-7264000000-E-1710	Messenger Cable (3/8")	1,360 LF	1,820 LF
257-7300100000-E-1715	Unpaved Trenching for Temporary Lead-In	10 LF	170 LF

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Carteret-Craven Counties

264-7372000000-N-1721	Guy Assembly	35 EA	42 EA
266-7420000000-E-1722	2" Riser with Weatherhead	14 EA	18 EA
269-7444000000-E-1725	Inductive Loop Sawcut	1,850 LF	2,270 LF
270-7456000000-E-1726	Lead-In Cable (14-2)	6,620 LF	7,370 LF
281-7636000000-N-1745	Sign for Signals	15 EA	18 EA
291-7980000000-N-SP	Detector Card (Type 2070E)	136 EA	139 EA
387-2619000000-E-850	4" Concrete Paved Ditch	NEW ITEM	330SY
388-4490000000-E-1170	Portable Concrete Barrier (Anchored)	NEW ITEM	50 LF
389-4505000000-E-1170	Remove & Reset Portable Concrete Barrier (Anchored)	NEW ITEM	50 LF
390-4891000000-E-1205	Thermoplastic Pavement Marking Lines (24", 90 mils)	NEW ITEM	609 LF
391-4892000000-N-1205	Thermoplastic Pavement Marking Character (90 mils)	NEW ITEM	32 EA
392-6045000000-E-SP	72" Temporary Pipe	NEW ITEM	85 LF
393-6165000000-E-SP	Compost Blanket	NEW ITEM	5 ACR
394-6134000000-N-SP	Herbicide Application for Non-Native Invasive Species	NEW ITEM	25 HR

R-1015 (C204177)

Carteret-Craven Counties

395-7696000000-N-1751	Controllers with Cabinet (Type 2070E Pole Mounted)	NEW ITEM	1 EA
396-7360000000-N-1720	Wood Pole	NEW ITEM	6 EA
397-7408000000-E-1722	1" Riser with Weatherhead	NEW ITEM	1 EA
188-4686000000-E-1205	Thermoplastic Pavement Marking Lines (4", 120 mils)	24,986 LF	DELETED
190-4690000000-E-1205	Thermoplastic Pavement Marking Lines (6", 120 mils)	35,807 LF	DELETED
192-4697000000-E-1205	Thermoplastic Pavement Marking Lines (8", 120 mils)	465 LF	DELETED
194-4702000000-E-1205	Thermoplastic Pavement Marking Lines (12", 120 mils)	3,507 LF	DELETED
195-4710000000-E-1205	Thermoplastic Pavement Marking Lines (24", 120 mils)	609 LF	DELETED
196-4721000000-E-1205	Thermoplastic Pavement Marking Character (120 mils)	32 EA	DELETED

The Contractor's bid must include these pay item revisions.

The electronic bidding file has been updated to reflect this revision. Please download the Addendum File and follow the instructions for applying the addendum. Bid Express will not accept your bid unless the addendum has been applied.

The contract will be prepared accordingly.

Sincerely,

DocuSigned by:

Ronald E. Davenport, Jr.

F81B6038A47A442...

Ronald E. Davenport, Jr., PE
State Contract Officer

RED/jjr
Attachments

cc: Mr. Lamar Sylvester, PE
Mr. Preston Hunter, PE
Mr. Ron Hancock, PE
Mr. Chris Peoples, PE
Mr. Jon Weathersbee, PE
Mr. Ken Kennedy, PE
Project File (2)

Mr. Ray Arnold, PE
Ms. Jaci Kincaid
Ms. Lori Strickland
Mr. Mike Gwyn
Ms. Penny Higgins
Mr. Mitchell Dixon

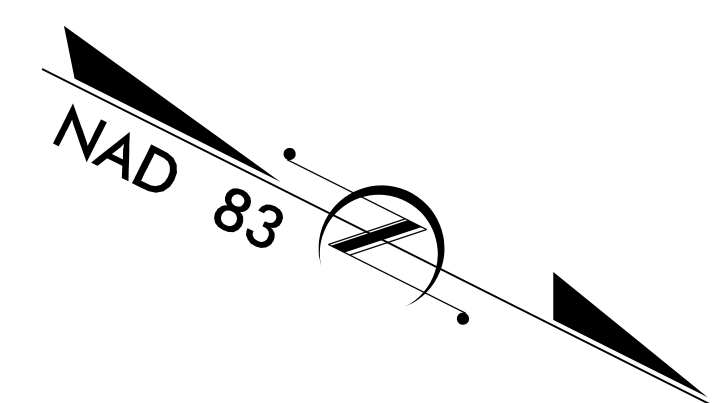
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34360.1.2	NHF-70(49)	PE	
34360.2.4	NHF-70(49)	RW	
34360.2.5	NHF-70(49)	UTIL	
34360.3.4	NHF-70(49)	CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN / CARTERET COUNTY

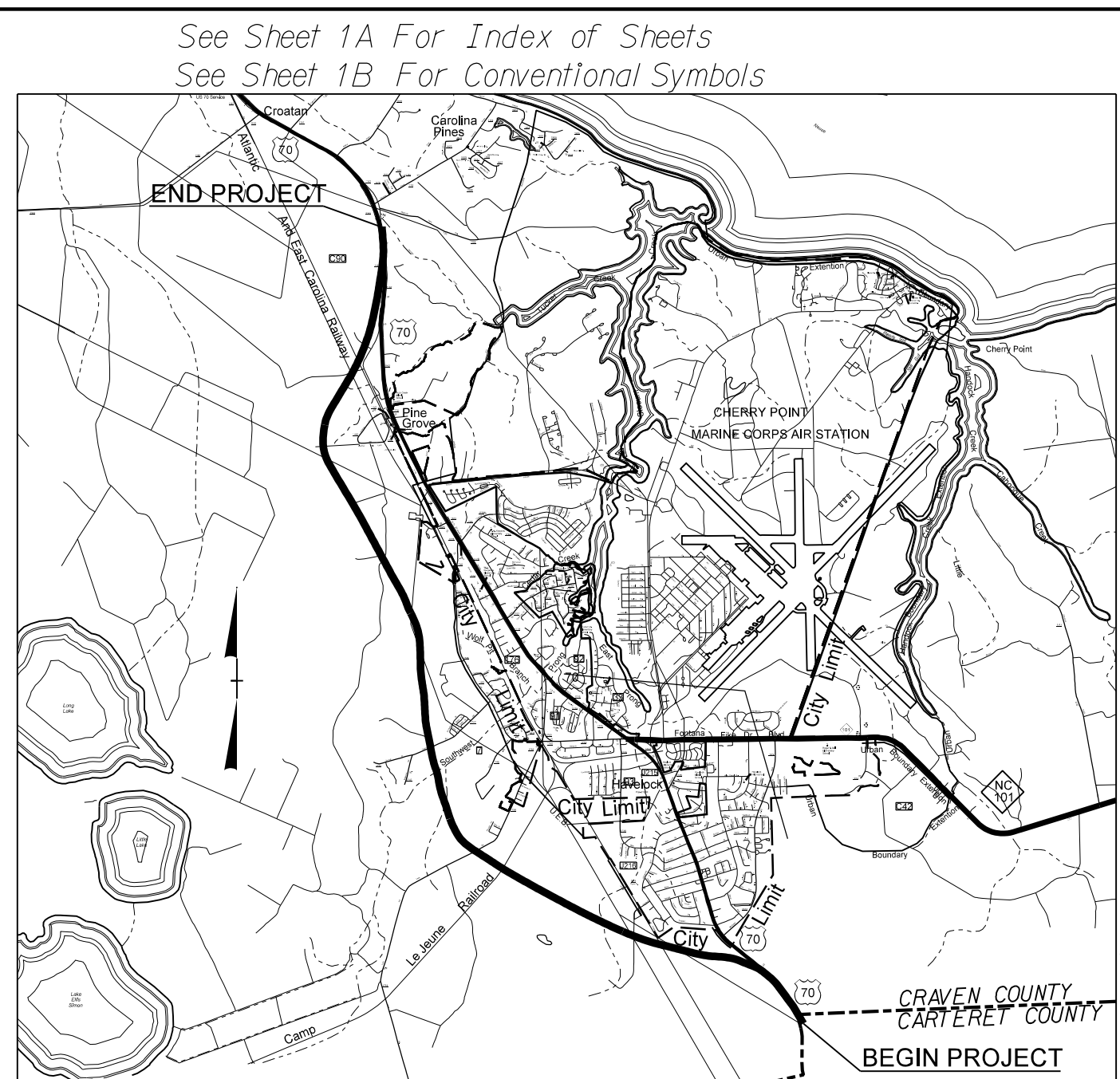
LOCATION: US 70 (HAVELOCK BYPASS) FROM SOUTH OF CARTERET /CRAVEN COUNTY LINE TO SOUTH OF SR 1176, (CAROLINA PINES BLVD.)

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, CULVERTS
SIGNING, SIGNALS AND STRUCTURES**

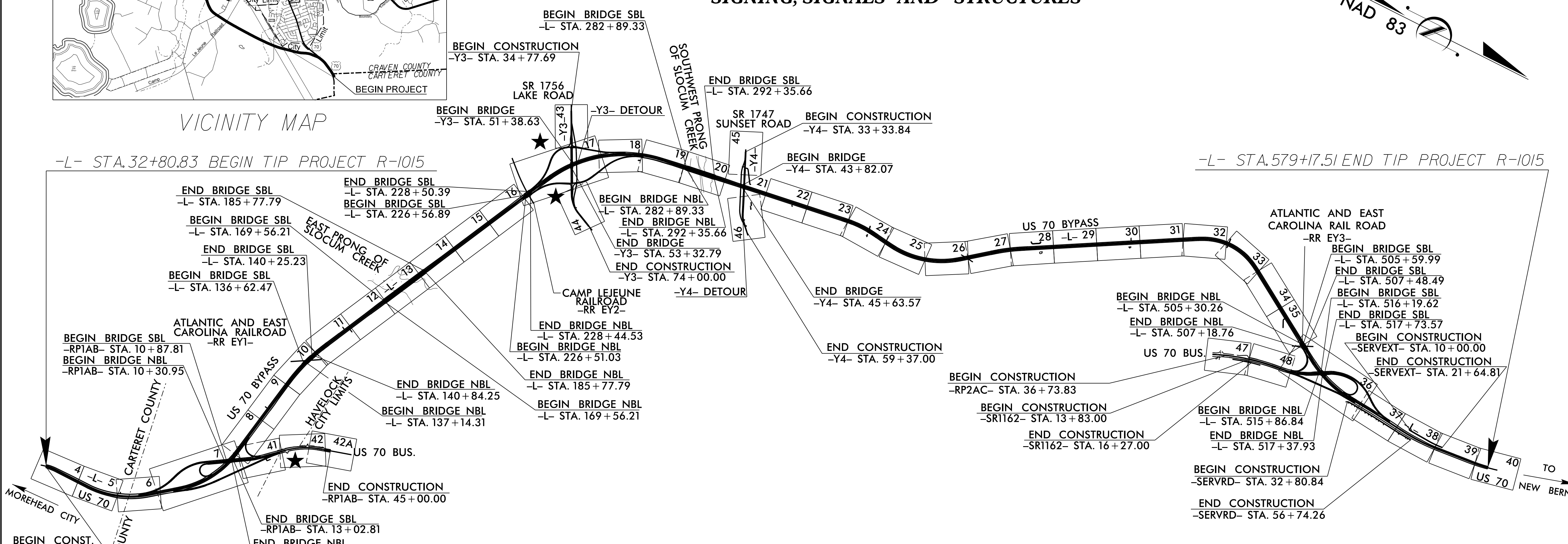


TIP PROJECT: R-1015

CONTRACT: C204177



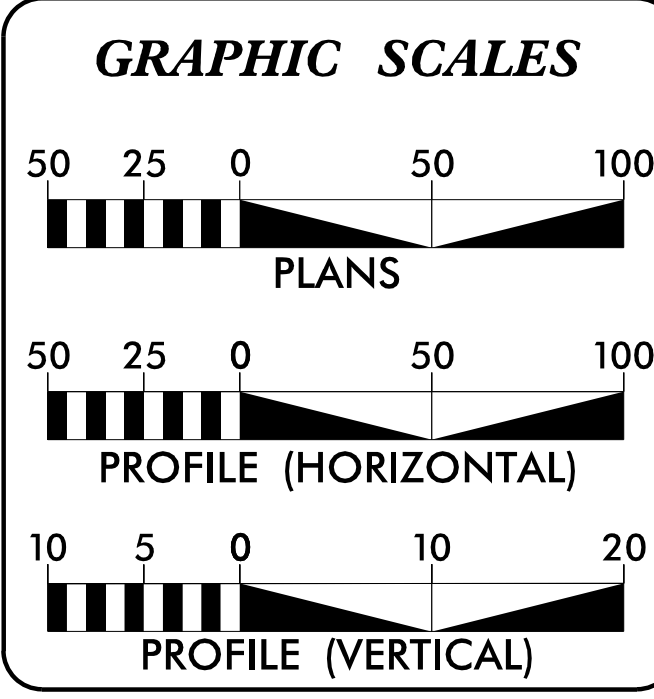
VICINITY MAP



THIS IS A CONTROLLED-ACCESS PROJECT WITH PUBLIC ACCESS BEING LIMITED TO INTERCHANGES, GATED ENCROACHMENTS HAVE BEEN ADDED TO PROVIDE RESTRICTED ACCESS FOR US DEPT. OF AGRICULTURE (CROATAN NATIONAL FOREST) AND FOR UTILITY OWNERS.

★ SIGNAL LOCATION
NCDOT CONTACT: ROADWAY DESIGN PROJECT ENGINEER
GARY LOVERING, P.E.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2015 =	N/A
ADT 2035 =	22,900
K =	9 %
D =	60 %
T =	6 % *
V =	70 MPH
* TTST 3% DUAL 3%	
FUNC. CLASS =	FREEWAY (FUTURE INTERSTATE)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-1015	=	9.691 MILES
LENGTH OF STRUCTURE TIP PROJECT R-1015	=	0.657 MILES
TOTAL LENGTH OF TIP PROJECT R-1015	=	10.348 MILES
USED NBL FOR PROJECT LENGTHS		

Prepared For NCDOT In the Office of:

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX (F-0105)

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 16, 2016

LETTING DATE:
JULY 16, 2019

TIM REID, PE
PROJECT ENGINEER

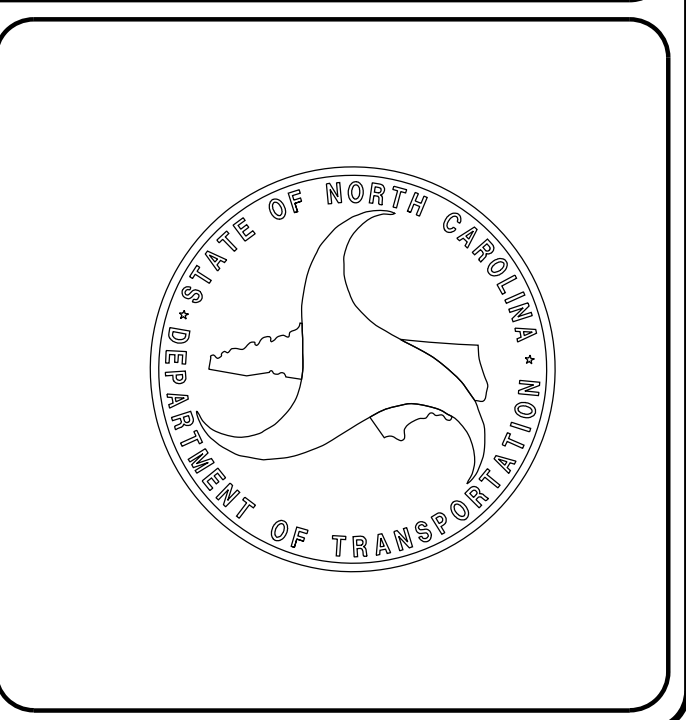
TRENT HUFFMAN, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

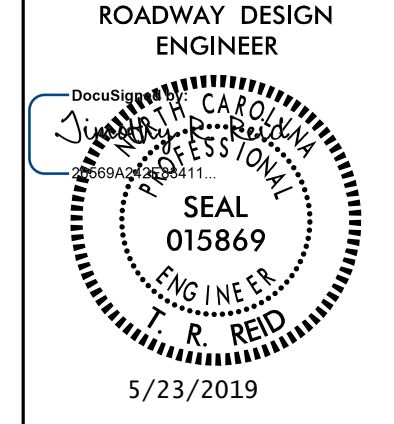
DocuSigned by:
Brook Anderson
SIGNATURE

ROADWAY DESIGN ENGINEER

DocuSigned by:
Timothy R. Reid
SIGNATURE



8/17/99



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 thru 1C-8	SURVEY CONTROL SHEETS
2A-1 thru 2A-10	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1 thru 2B-6	DETOUR DETAIL SHEETS
2B-7 thru 2B-9	BRIDGE SKETCHES
2C-1	SPECIAL JUNCTION BOX DETAIL
2C-2	CONCRETE ENDWALL FOR 84" DIAMETER PIPE
2C-3	MINIMUM DEPTH DROP INLET
2C-4	GUARDRAIL INSTALLATION
2C-5	STRUCTURE ANCHOR UNITS
2C-6	TYPE III REINFORCED BRIDGE APPROACH FILLS
2C-7	MEDIAN HAZZARD PROTECTION
2C-8	USFS - WELDED PIPE GATE DETAIL
2C-9	CDAL COMBUSTION PRODUCT PLACEMENT DETAIL
2C-10	DETAIL FOR MEDIAN CROSSOVER
2D-1 thru 2D-2	DRAINAGE DITCH DETAILS
2G-1	GEOTEXTILE FOR EMBANKMENT STABILIZATION DETAILS
2G-2 THRU 2G-4	STANDARD TEMPORARY WALL
2H-1	STOCKPILE CONTAINMENT DETAIL
3B-1 thru 3B-2	EARTHWORK SUMMARY
3B-3 thru 3B-4	GUARDRAIL SUMMARY
3B-5	ROADWAY SUMMARIES
3D-1 thru 3D-20	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX
4 thru 48	PLAN SHEETS
49 thru 93	PROFILE SHEETS
TMP-1 thru TMP-42	TRAFFIC MANAGEMENT PLANS
FMP-1 thru FMP-29	PAVEMENT MARKING PLANS
EC-1 thru EC-99	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
S-1 thru S-34	SIGNING PLAN
SIG-1.0 thru SIG-25.1	SIGNAL PLANS
SIG M1 THRU M-8	SIGNAL PLANS - METAL POLES
SCP 1 THRU SCP 97	SIGNAL COMMUNICATION PLANS
U0-1 thru U0-29	UTILITY BY OTHERS PLAN
X-1A THRU X-1J	CROSS-SECTION SUMMARY SHEETS
X-1 THRU X-439	CROSS-SECTIONS
S01-1 THRU S01-41	STRUCTURE PLAN - S1
S02-S1 THRU S02-S41	STRUCTURE PLAN - S2
S03-S1 THRU S03-S46	STRUCTURE PLAN - S3
S04-S1 THRU S04-S46	STRUCTURE PLAN - S4
S05-S1 THRU S05-S46	STRUCTURE PLAN - S5
S06-S1 THRU S06-S46	STRUCTURE PLAN - S6
S07-S1 THRU S07-S35	STRUCTURE PLAN - S7
S08-S1 THRU S08-S36	STRUCTURE PLAN - S8
S09-S1 THRU S09-S32	STRUCTURE PLAN - S9
S10-S1 THRU S10-S44	STRUCTURE PLAN - S10
S11-S1 THRU S11-S44	STRUCTURE PLAN - S11
S12-1 THRU S12-41	STRUCTURE PLAN - S12
S13-S1 THRU S13-S39	STRUCTURE PLAN - S13
S14-S1 THRU S14-S40	STRUCTURE PLAN - S14
S15-S1 THRU S15-S44	STRUCTURE PLAN - S15
S16-S1 THRU S16-S44	STRUCTURE PLAN - S16
C01-C1 THRU C01-C10	CULVERT PLANS - C1
C02-C1 THRU C02-C8	CULVERT PLANS - C2
W1 THRU W6	WALL PLANS - W1 AND W2
W7 THRU W11	WALL PLANS - W3 AND W4
W12 THRU W13	WALL DETAILS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

**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. 225.05 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. 560.02

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.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

POWER - DUKE ENERGY (TRANS)
POWER - CITY OF NEW BERN
POWER - CARTERET-CRAVEN

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.

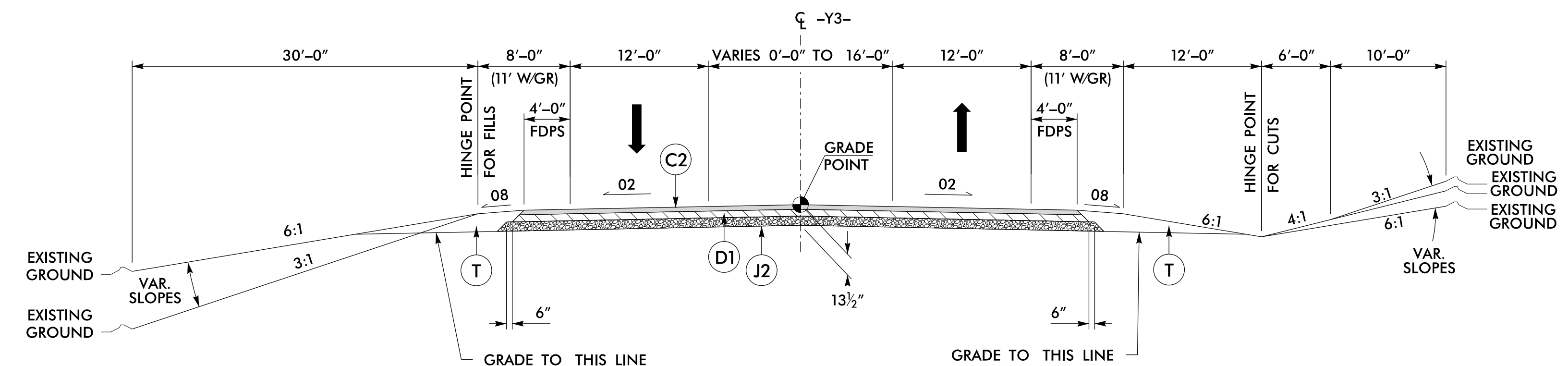
2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 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
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
225.05	Method of Obtaining Super-elevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
235.01	Embankment Monitoring
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Super-elevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
610.04	Guide for Paving Shoulders Under Bridges - Method IV
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Gravel Right-of-Way Marker
806.03	Concrete Cantol of Access Marker
815.02	Subsurface 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
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
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
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 12" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.10	Median Construction - with Curb and Gutter
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
865.01	Cable Guiderail
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

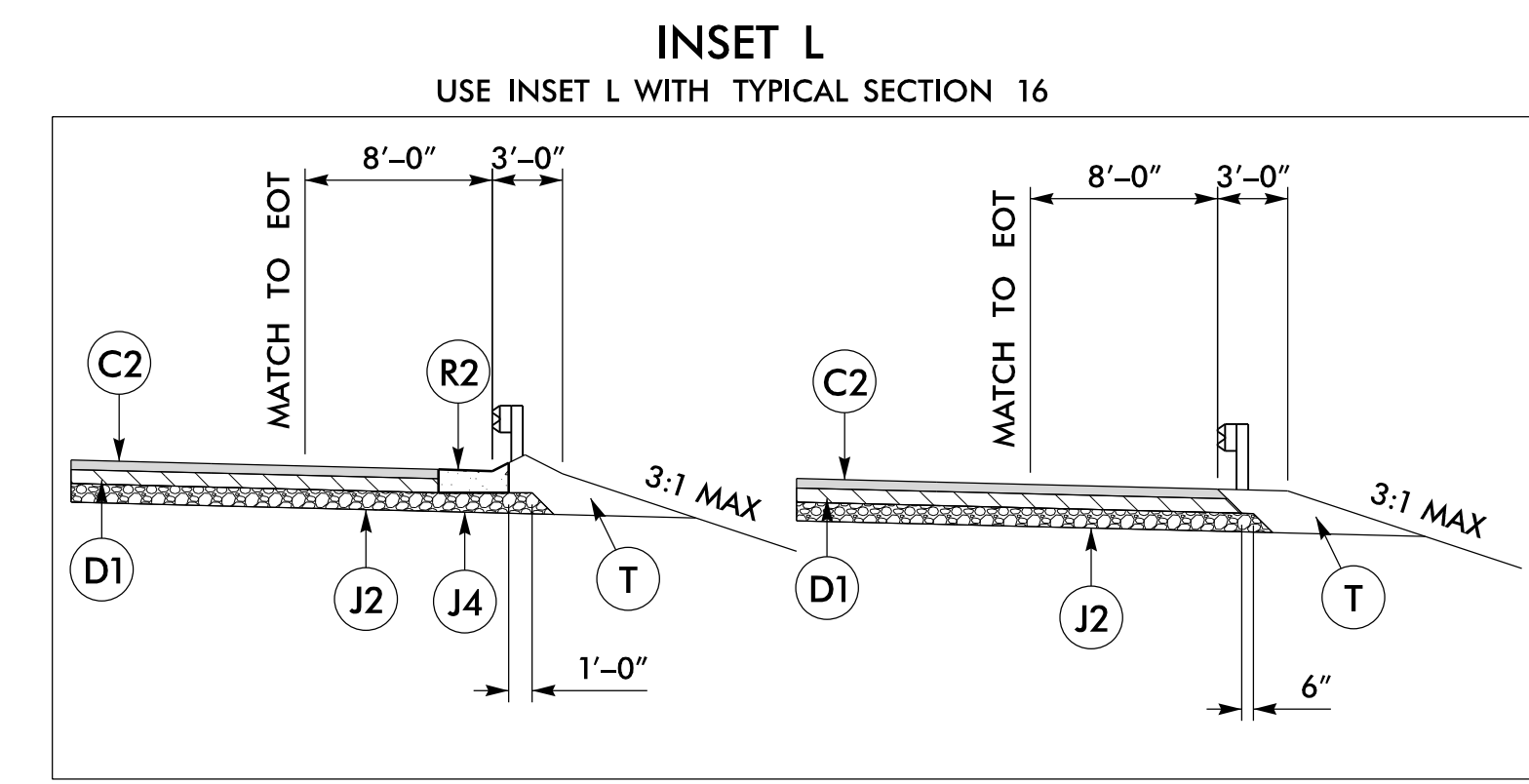
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PROJECT REFERENCE NO.		SHEET NO.	
R-1015		2A-6	
ROADWAY DESIGN ENGINEER R. REID 015869 5/3/2019		PAVEMENT DESIGN ENGINEER CLARK S. MORRISON 022896 5/6/2019	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
C1	1 1/2" S9.5B		
C2	3" S9.5B		
D1	2 1/2" I19.0C		
E2	5" B25.0C		
E3	VAR B25.0C		
J2	8" ABC		
J4	VAR ABC		
P	PRIME COAT		
R2	SBG		
T	EARTH MATERIAL		
U	EXISTING PAVEMENT		
W	WEDGING		

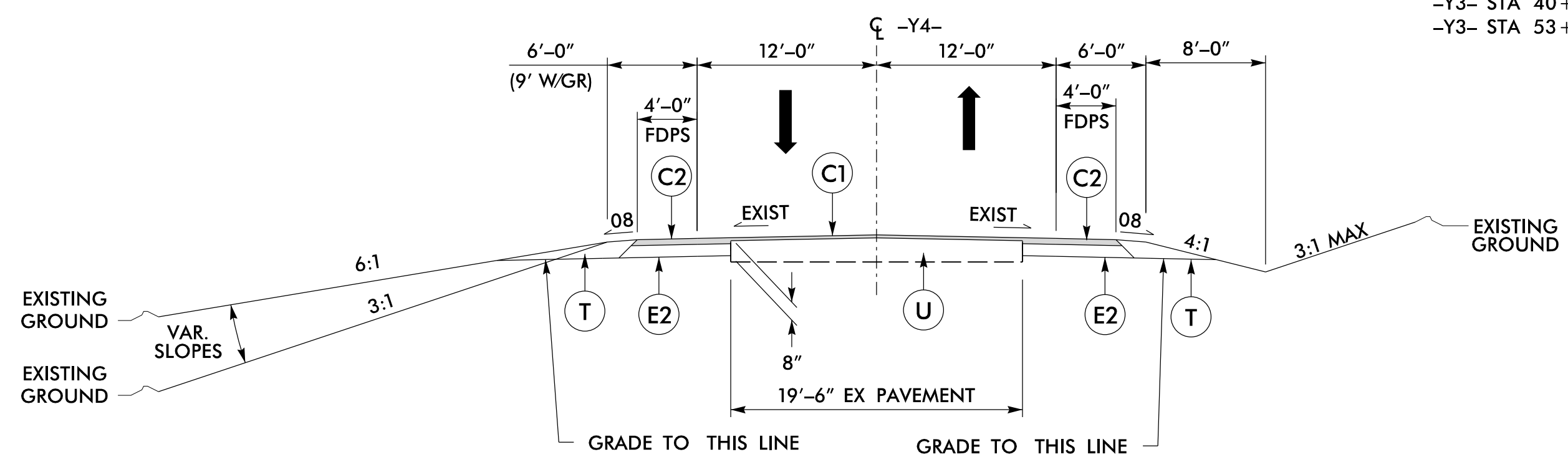


TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16:
 -Y3- STA 40+50.00 TO STA 51+38.63 (BEGIN BRIDGE)
 -Y3- STA 53+32.79 (END BRIDGE) TO STA 65+00.00

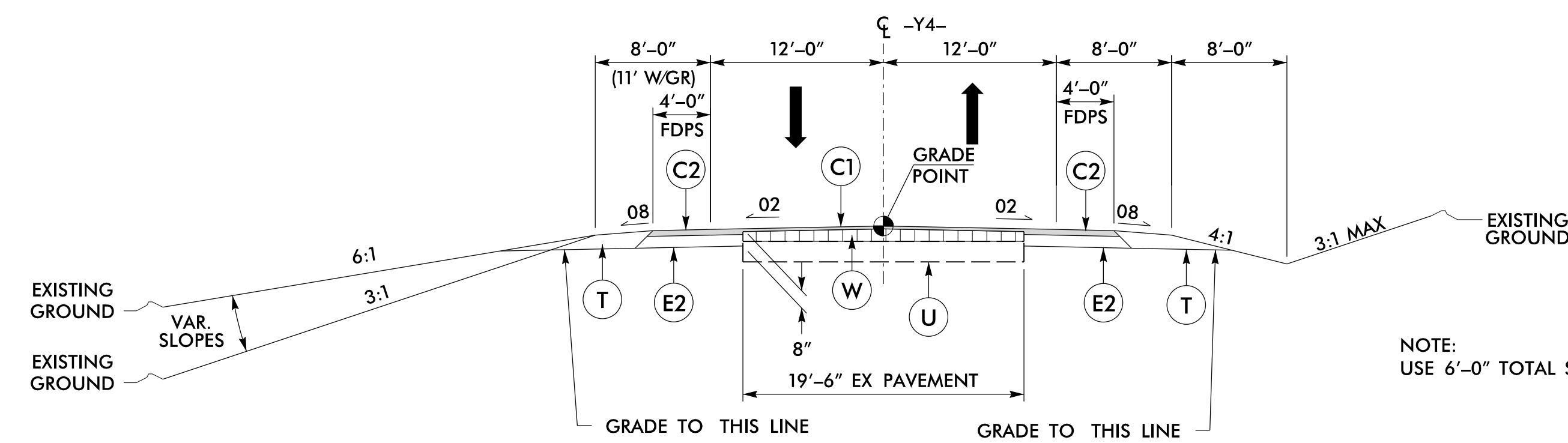


INSET L
 USE INSET L WITH TYPICAL SECTION 16
 -Y3- SHOULDER BERM GUTTER DETAIL
 -Y3- PAVE TO FACE OF GUARDRAIL DETAIL
 USE AT LOCATIONS SHOWN ON PLANS



TYPICAL SECTION NO. 17

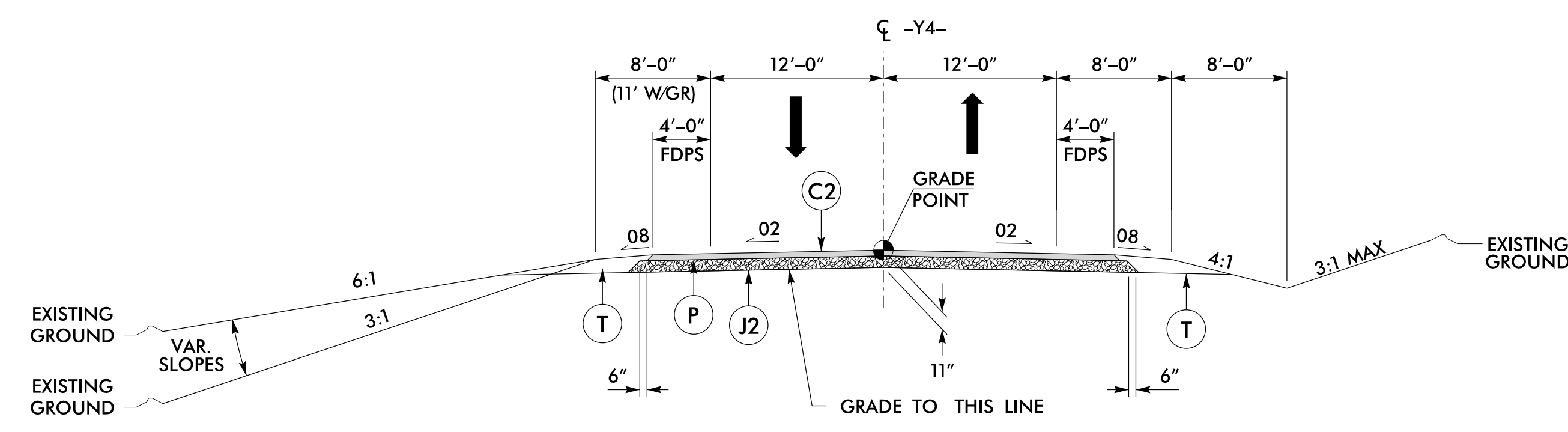
USE TYPICAL SECTION NO. 17:
 -Y4- STA. 33+33.84 TO STA. 34+40.00



TYPICAL SECTION NO. 18

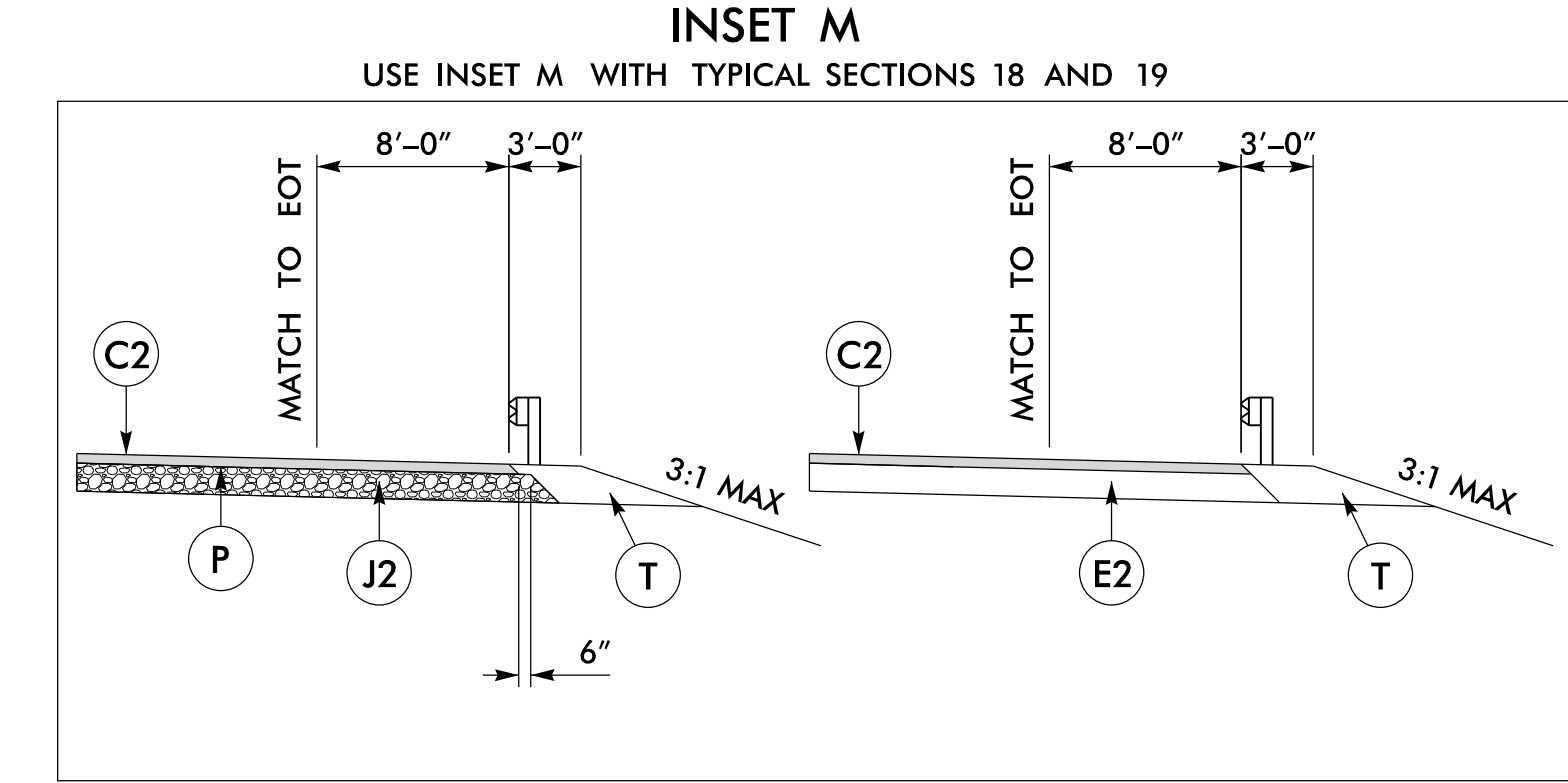
NOTE:
 USE 6'-0" TOTAL SHOULDER WIDTH STA 34+40.00 TO STA 35+00.00

USE TYPICAL SECTION NO. 18:
 -Y4- STA. 34+40.00 TO STA. 36+50.00
 -Y4- STA 56+00.00 TO STA 59+12.29

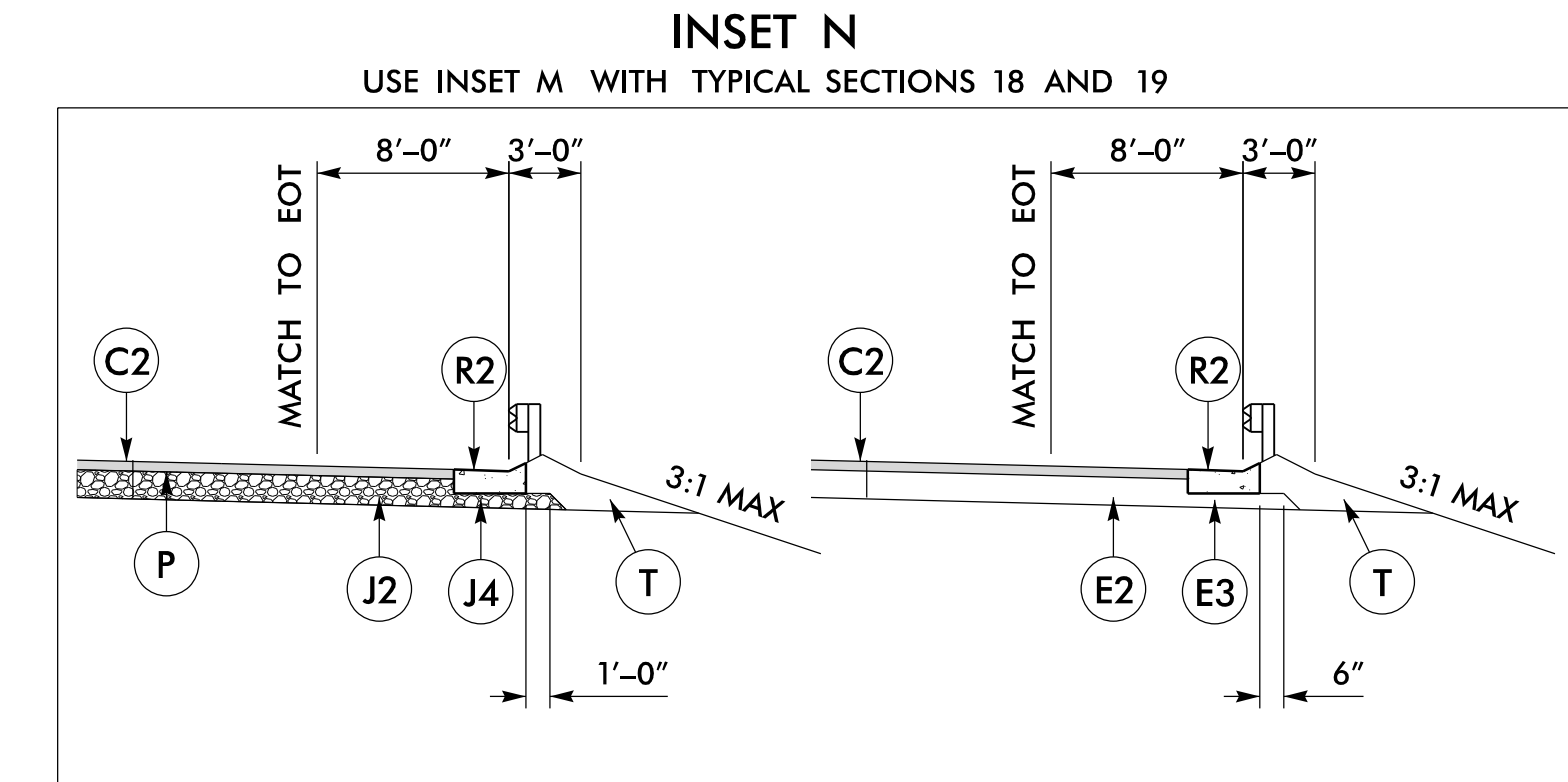


TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19:
 -Y4- STA 36+50.00 TO STA 43+82.07 (BEGIN BRIDGE)
 -Y4- STA 45+63.57 (END BRIDGE) TO STA 56+00.00



INSET M
 USE INSET M WITH TYPICAL SECTIONS 18 AND 19
 -Y4- PAVE TO FACE OF GUARDRAIL DETAIL
 USE AT LOCATIONS SHOWN ON PLANS



INSET N
 USE INSET M WITH TYPICAL SECTIONS 18 AND 19
 -Y4- SHOULDER BERM GUTTER DETAIL
 USE AT LOCATIONS SHOWN ON PLANS

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 32 + 80.83 -L- 64 + 50.00	12,241		71,075	58,834	
SUBTOTAL	12,241		71,075	58,834	
-L- 64 + 50.00 -L- 94 + 50.00	5,312		111,407	106,095	
-LPIB- 2 + 23.34 -LPIB- 6 + 50.00		4,015	11,722	11,722	4,015
-RPIB- 5 + 20.31 -RPIB- 25 + 50.60	3,022	18,930	72,894	69,872	18,930
-RPICD- 2 + 95.59 -RPICD- 32 + 53.25	13,793		33,073	19,280	
SUBTOTAL	22,127	22,945	229,096	206,969	22,945
-L- 94 + 50.00 -L- 107 + 00.00			55,392	55,392	
-RPIAB- 4 + 89.37 -RPIAB- 10 + 00.00		20,438	146,297	146,297	20,438
-RPIAB- 14 + 00.00 -RPIAB- 45 + 00.00	4,363		138,265	133,902	
-RPIA- 2 + 99.97 -RPIA- 7 + 54.62			8,153	8,153	
SUBTOTAL	4,363	20,438	348,107	343,744	20,438
-L- 107 + 00.00 -L- 136 + 50.00			544,442	544,442	
SUBTOTAL			544,442	544,442	
-L- 141 + 50.00 -L- 169 + 50.00			302,831	302,831	
SUBTOTAL			302,831	302,831	
-L- 186 + 00.00 -L- 216 + 00.00			488,075	488,075	
SUBTOTAL			488,075	488,075	
-L- 216 + 00.00 -L- 226 + 00.00			360,484	360,484	
SUBTOTAL			360,484	360,484	
-L- 228 + 70.94 -L- 258 + 50.00	137		358,709	358,572	
-Y3- 35 + 00.00 -Y3- 51 + 00.00	515	594	80,741	80,226	594
-Y3RPB- 6 + 41.92 -Y3RPB- 20 + 06.96			134,722	134,722	
-Y3RPC- 10 + 27.15 -Y3RPC- 17 + 04.29			74,233	74,233	
SUBTOTAL	652	594	648,405	647,753	594
-L- 258 + 50.00 -L- 282 + 50.00		4,561	201,174	201,174	4,561
-Y3- 53 + 50.00 -Y3- 73 + 50.00	1,375	1,322	113,981	122,701	1,417
-Y3RPA- 7 + 50.00 -Y3RPA- 17 + 30.74			40,682	40,682	
-Y3RPD- 6 + 50.00 -Y3RPD- 25 + 23.59			104,886	104,886	
-Y3DET- 36 + 50.00 -Y3DET- 69 + 00.00	2,256	2,123	16,836	14,580	2,123
SUBTOTAL	3,631	8,006	477,559	474,023	8,101
-L- 292 + 50.00 -L- 322 + 50.00	948	1,457	95,071	94,123	1,457
SUBTOTAL	948	1,457	95,071	94,123	1,457
-L- 322 + 50.00 -L- 352 + 50.00	2,231	319	135,246	133,015	319
-Y4- 33 + 33.84 -Y4- 43 + 50.00	1,000		45,210	45,210	
-Y4- 46 + 00.00 -Y4- 59 + 12.29	647	1,064	79,723	79,076	1,064
-Y4DET- 34 + 60.97 -Y4DET- 58 + 70.00	435	3,511	15,392	14,957	3,511
-Y4DR- 10 + 50.00 -Y4DR- 16 + 00.00	488	589	1,697	1,209	589
SUBTOTAL	4,801	5,483	277,268	272,467	5,483
-L- 352 + 50.00 -L- 382 + 50.00	921	1,880	153,001	152,080	1,880
SUBTOTAL	921	1,880	153,001	152,080	1,880
-L- 382 + 50.00 -L- 412 + 50.00			127,967	127,967	
-DRI- 10 + 00.00 -DRI- 13 + 78.96	440		331		109
SUBTOTAL	440		128,298	127,967	109
-L- 412 + 50.00 -L- 442 + 50.00			109,613	109,613	
SUBTOTAL			109,613	109,613	
-L- 442 + 50.00 -L- 472 + 50.00	20	2,285	99,125	99,105	2,285
SUBTOTAL	20	2,285	99,125	99,105	2,285

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA
SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 472 + 50.00 -L- 505 + 00.00		76	180,835	180,835	76
-G12- 11 + 00.00 -G12- 13 + 47.00			605	605	
SUBTOTAL		76	181,440	181,440	76
-L- 507 + 50.00 -L- 515 + 50.00		6,811	366,176	366,176	6,811
-RP2C- 5 + 87.11 -RP2C- 10 + 71.91		102	74,383	74,383	102
SUBTOTAL		6,913	440,559	440,559	6,913
-L- 518 + 07.32 -L- 548 + 00.00	2,101	1,083	211,540	209,439	1,083
-LP2A- 81 + 29.61 -LP2A- 86 + 00.00	28	313	5,344	5,316	313
-RP2A- 79 + 22.74 -RP2A- 92 + 00.00	7	17	29,731	29,724	17
-RP2AC- 38 + 30.60 -RP2AC- 67 + 00.00	1,439	18	43,424	42,020	53
-RP2AC- 67 + 00.00 -RP2AC- 79 + 22.74			50,236	50,236	
-RP2CD- 5 + 39.89 -RP2CD- 15 + 00.00	1,678		30,272	28,594	
SUBTOTAL	5,253	1,431	370,547	365,329	1,466
-L- 548 + 00.00 -L- 579 + 00.00	2,420	475	20,724	18,304	475
-SERVEXT- 10 + 00.00 -SERVEXT- 21 + 64.81	310	378	4,969	4,659	378
SUBTOTAL	2,730	853	25,963	22,963	853
DETOUR REMOVAL					
-Y3DET- 36 + 50.00 -Y3DET- 69 + 00.00	14,030				14,030
-Y4DET- 34 + 60.97 -Y4DET- 58 + 70.00	12,827				12,827
SUBTOTAL	26,857				26,857
PROJECT TOTAL	84,984	72,361	5,350,689	5,292,801	99,457
MATERIAL FOR SHOULDER CONSTRUCTION					
ADDITIONAL UNDERCUT		18,000	64,776	64,776	18,000
GRADE POINT UNDERCUT		2,900	21,600	21,600	2,900
WASTE IN LIEU OF BORROW				-26,966	-26,966
EST.5% TO REPLACE TOP SOIL ON BORROW PIT				267,781	
GRAND TOTAL	84,984	93,261	5,440,545	5,623,476	93,391
SAY	88,000	96,000		5,793,000	

EST DDE = 1,560 CY
 TOTAL EST SHALLOW UNDERCUT = 1,000 CY
 SELECT GRANULAR MATERIAL = 144,000 CY
 GEOTEXTILE FOR SOIL STABILIZATION = 62,500 SY

PAVEMENT STRUCTURE VOLUME			
L	189,344 CY	Y3RPC	1,769 CY
RP1A	937 CY	Y3RPD	3,102 CY
RP1B	4,313 CY	Y4	2,390 CY
RP1AB	10,057 CY	Y4DR	272 CY
LP1B	1,059 CY	RP2A	3,037 CY
RP1CD	2,222 CY	LP2A	978 CY
Y3	6,166 CY	RP2C	1,391 CY
Y3RPA	1,206 CY	RP2AC	9,741 CY
Y3RPB	2,501 CY	RP2CD	4,179 CY
PAVEMENT STRUCTURE VOLUME			
PROJECT TOTAL = 253,195 CY			

SERVEXT	1,354 CY
SERVRD	1,930 CY
SR1162	56 CY
DRI	278 CY
G12	114 CY
Y3DET	3,030 CY
Y4DET	1,769 CY

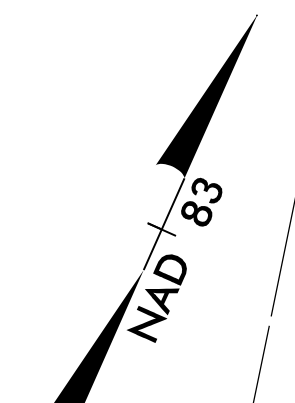
NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

PROJECT REFERENCE NO. R-1015	SHEET NO. 45
RW SHEET NO.	
ROADWAY DESIGN ENGINEER MOFFATT & NICHOL SEAL 015869 T. R. REID 5/7/2019	HYDRAULICS ENGINEER MOFFATT & NICHOL SEAL 032581 Brook E. Anderson 5/7/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
moffatt & nichol	

MICHAEL O. WOODRUFF, et ux
DB 1494 - PG 68

DEPARTMENT OF AGRICULTURE
CROATAN NATIONAL FOREST

2



-Y4DR-
 PI Sta 10+97.71
 $\Delta = 80' 24' 31.6''$ (RT)
 $D = 95' 29' 34.7''$
 $L = 84.20'$
 $T = 50.71'$
 $R = 60.00'$
 SE = NC

-Y4DR- PT Sta. 11+31.20

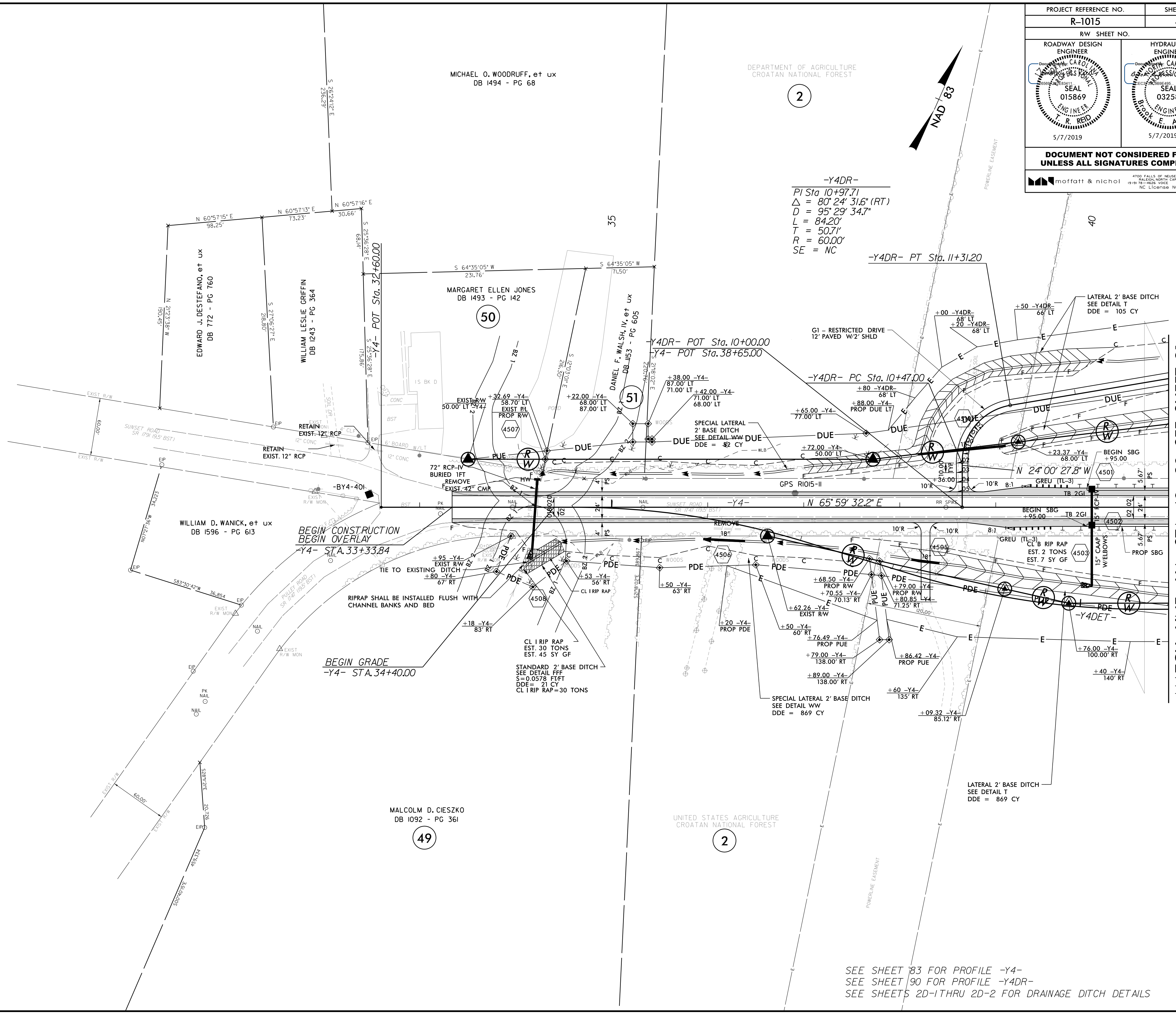
Y4DR- POT Sta. 10+00.00
 Y4- POT Sta. 38+65.00

-Y4DR- PC Sta. 10+47.00

-Y4- N 65°59'32.2"E

N 24°00'27.8"W

MATCH LINE -Y4- STA. 40 + 80 SEE SHEET 21



EDWARD J. DESTEFANO, et ux
DB 772 - PG 760

WILLIAM LESLIE GRIFFIN
DB 1243 - PG 364

MARGARET ELLEN JONES
DB 1493 - PG 142

DANIEL F. WALSH, IV, et ux
DB 153 - PG 605

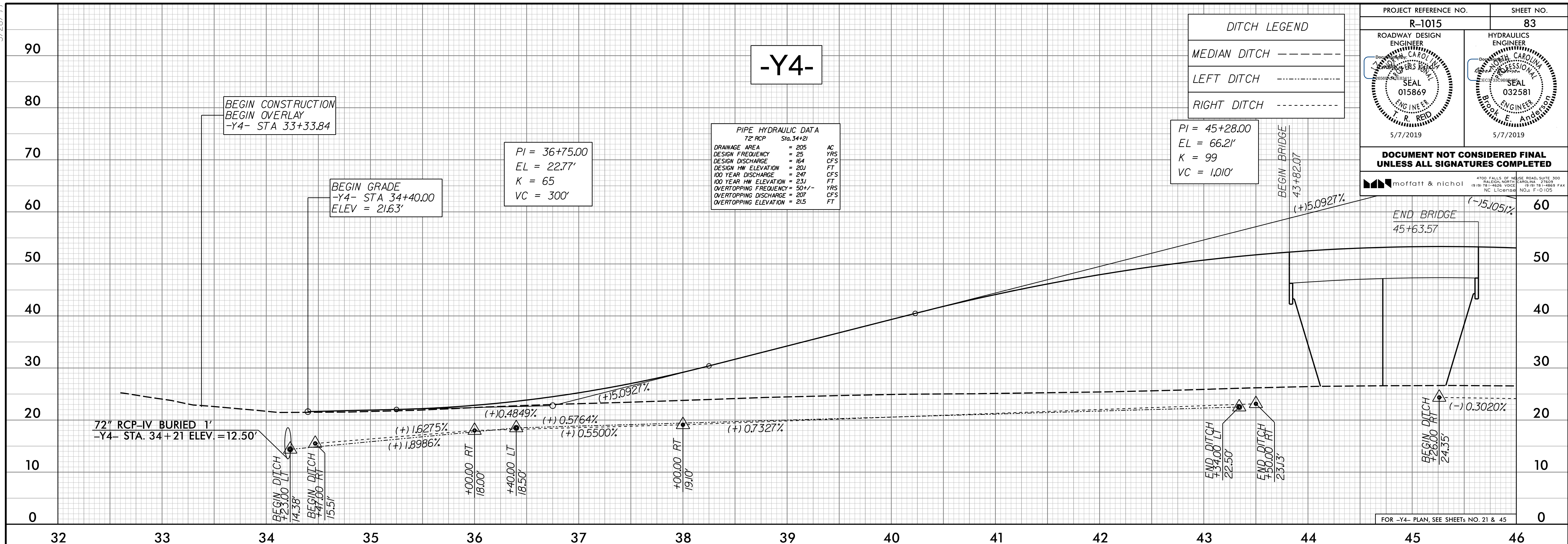
WILLIAM D. WANICK, et ux
DB 1596 - PG 613

MALCOLM D. CIESZKO
DB 1092 - PG 361

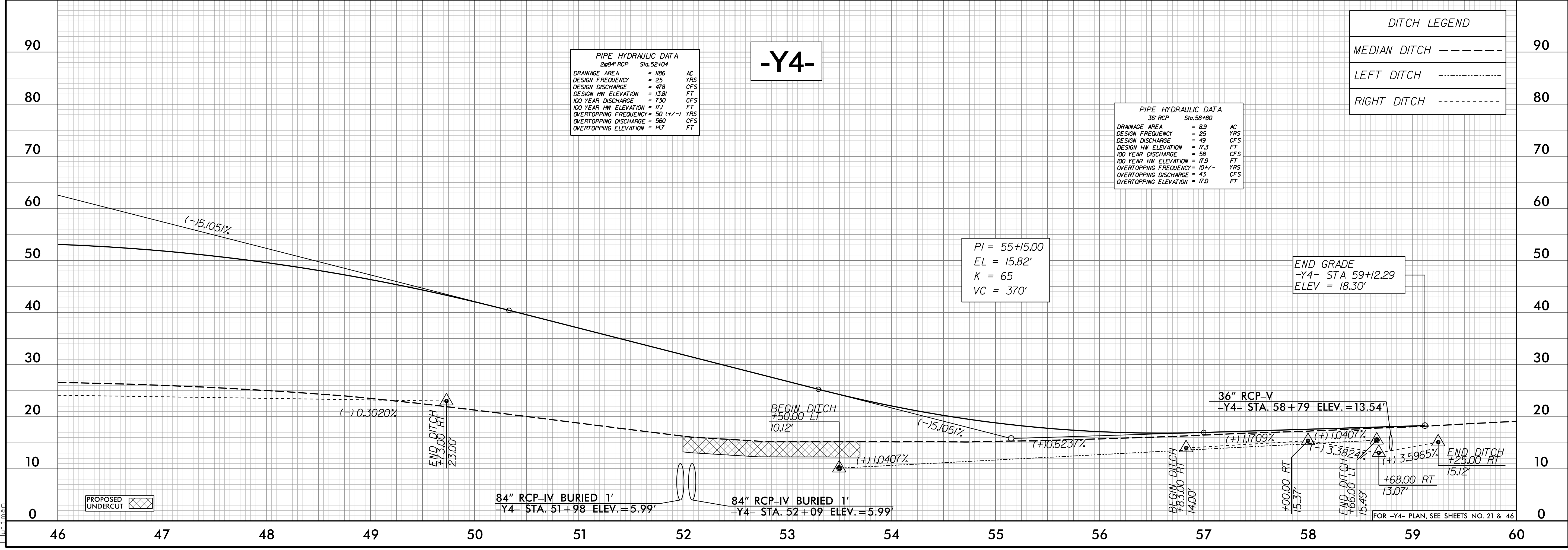
UNITED STATES AGRICULTURE
CROATAN NATIONAL FOREST

SEE SHEET 83 FOR PROFILE -Y4-
 SEE SHEET 90 FOR PROFILE -Y4DR-
 SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

5/28/2019



5/16/2019 04:16:39 29-022\CA000\RI015\Roadway\Proc\Y4-1015_rdy_of183.dgn



Shoring Location No. 1

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION 52+18± -Y4DET-, 20 FT, LEFT, TO STATION 52+80± -Y4DET-, 20 FT, LEFT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ) = 120 PCF
 FRICTION ANGLE (ϕ) = 30 DEGREES
 COHESION (c) = 0 PSF
 GROUNDWATER ELEVATION = 8 FT

DO NOT USE CANTILEVER, BRACED OR ANCHORED SHORING FOR TEMPORARY SHORING FROM STATION 52+18± -Y4DET-, 20 FT, LEFT, TO STATION 52+80± -Y4DET-, 20 FT, LEFT.

AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION 52+18± -Y4DET-, 20 FT, LEFT, TO STATION 52+80± -Y4DET-, 20 FT, LEFT. SEE GEOTECHNICAL STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

Shoring Location No. 2

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION 51+87± -Y4-, 68 FT, RIGHT, TO STATION 52+74± -Y4-, 68 FT, RIGHT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ) = 120 PCF
 FRICTION ANGLE (ϕ) = 30 DEGREES
 COHESION (c) = 0 PSF
 GROUNDWATER ELEVATION = 8 FT

DO NOT USE CANTILEVER, BRACED OR ANCHORED SHORING FOR TEMPORARY SHORING FROM STATION 51+87± -Y4-, 68 FT, RIGHT, TO STATION 52+74± -Y4-, 68 FT, RIGHT.

AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION 51+87± -Y4-, 68 FT, RIGHT, TO STATION 52+74± -Y4-, 68 FT, RIGHT. SEE GEOTECHNICAL STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

Shoring Location No. 3

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

TEMPORARY SHORING IS REQUIRED FOR THE PIPE INSTALLATION FROM STATION -Y4- 33+96±, 2.0± FT RIGHT, TO STATION -Y4- 34+44±, 2.15± FT RIGHT.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -Y4- 33+96±, 2.0± FT RIGHT, TO STATION -Y4- 34+44±, 2.15± FT RIGHT FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

UNIT WEIGHT (γ) = 120 LB/CF
 FRICTION ANGLE (ϕ) = 30 DEGREES
 COHESION (c) = 0 LB/PSF
 GROUNDWATER ELEVATION = 15 FT ±

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -Y4- 33+96±, 2.0± FT RIGHT, TO STATION -Y4- 34+44±, 2.15± FT RIGHT.

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION -Y4- 33+96±, 2.0± FT RIGHT, TO STATION -Y4- 34+44±, 2.15± FT RIGHT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

Shoring Location No. 4

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

TEMPORARY SHORING IS REQUIRED FOR THE PIPE INSTALLATION FROM STATION -Y4- 33+96±, 1.21± FT LEFT, TO STATION -Y4- 34+44±, 1.10± FT LEFT.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -Y4- 33+96±, 1.21± FT, LEFT, TO STATION -Y4- 34+44±, 1.10± FT LEFT FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

UNIT WEIGHT (γ) = 120 LB/CF
 FRICTION ANGLE (ϕ) = 30 DEGREES
 COHESION (c) = 0 LB/PSF
 GROUNDWATER ELEVATION = 15 FT ±

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION -Y4- 33+96±, 1.21± FT LEFT, TO STATION -Y4- 34+44±, 1.10± FT LEFT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

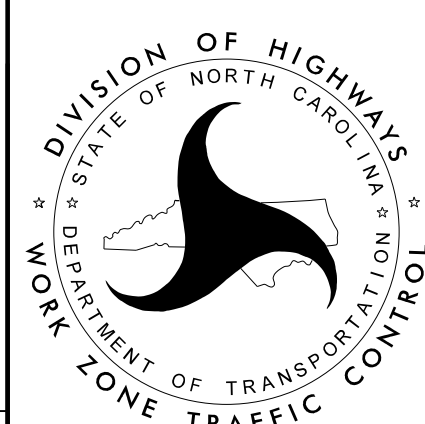
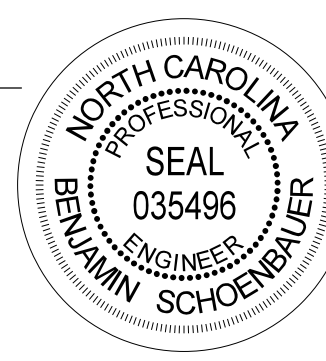
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REVISIONS

- 1/ 12/17/2018: ADDED NEW SHEET, TEMPORARY SHORING NOTES
- 2/ 5/22/2019: ADDED TEMPORARY SHORING NOTES 3 AND 4

APPROVED: *Ben Schoenbener*
 DATE: 5/22/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TEMPORARY SHORING NOTES

PROJ. REFERENCE NO.	SHEET NO.
R - 1015	TMP - 3A

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PHASING CONTINUED

AREA 4

-Y4-, -Y4DET-, AND -Y4DR-

PHASE 1

STEP 1:
AWAY FROM TRAFFIC BEGIN CONSTRUCTION OF -Y4DET-, -Y4DR-, AND TEMPORARY SHORING (SEE SHEET TMP-24). USING RSD 1101.02 SHEET 1 OF 14 CONSTRUCT THE PROPOSED RIGHT SHOULDER FROM -Y4- STA. 33+34 TO 37+00 (TEMPORARY PAVEMENT REQUIRED) AND TEMPORARY SIGNAL.

STEP 2A:
UPON COMPLETION OF SHOULDER AND TEMPORARY SIGNAL, PLACE TEMPORARY PAVEMENT MARKINGS, REMOVE ANY CONFLICTING PAVEMENT MARKINGS, SHIFT TRAFFIC TO STEP 2 PATTERN, AND ACTIVATE TEMPORARY SIGNAL, THEN PLACE PCB, ANCHORED PCB (SEE SHEET TMP-24A, SIGNALIZATION PLANS, AND RSD 1101.02 SHEET 14 OF 14).

STEP 2B:
USING RSD 1101.02 SHEET 1 OF 14, AS NECESSARY, INSTALL TEMPORARY SHORING #3, THEN PARTIALLY REMOVE EXISTING PIPE, PARTIALLY CONSTRUCT PROPOSED PIPE, AND INSTALL TEMPORARY SHORING #4 AND CONSTRUCT PROPOSED PAVEMENT UP TO, BUT NOT INCLUDING, FINAL SURFACE LAYER (SEE SHEET TMP-24A).

STEP 3A:
USING RSD 1101.02 SHEET 1 OF 14, AS NECESSARY, RELOCATE PCB, SHIFT TRAFFIC TO STEP 3 PATTERN, PLACE TEMPORARY PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.

STEP 3B:
USING RSD 1101.02 SHEET 1 OF 14, AS NECESSARY, COMPLETE REMOVAL OF EXISTING PIPE, CONSTRUCTION OF PROPOSED PIPE, AND CONSTRUCT PROPOSED PAVEMENT UP TO, BUT NOT INCLUDING, FINAL SURFACE LAYER (SEE SHEET TMP-24B).

STEP 4:
UPON COMPLETION OF -Y4- DETOUR AND -Y4DR-, USE RSD 1101.02 SHEET 1 OF 14, AS NECESSARY, CONSTRUCT THE TIE-INS TO -Y4DET-.

PHASE 2

STEP 1:
USING RSD 1101.02 SHEET 1 OF 14, AS NECESSARY, SHIFT TRAFFIC FROM EXISTING TO -Y4DET-.

STEP 2:
CONSTRUCT -Y4-, PROPOSED STRUCTURE AND TEMPORARY SHORING (SEE SHEET TMP-25).

PHASE 3

STEP 1:
USING RSD 1101.02 SHEET 1 OF 14 SHIFT TRAFFIC FROM -Y4DET- ONTO -Y4- (SEE SHEET TMP-26). AWAY FROM TRAFFIC REMOVE -Y4DET- AND COMPLETE ALL REMAINING CONSTRUCTION.

STEP 2:
USING RSD 1101.02 SHEET 1 OF 14, CONSTRUCT THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS.

AREA 5

-L- FROM STA. 529+00± TO STA. 579+18±, -RP2AC-, -RP2A-, -RP2CD-, -SR1162-, -SRVRD-, AND -SERVEXT-

PHASE 1

STEP 1:
AWAY FROM TRAFFIC BEGIN CONSTRUCTION OF -L-, -RP2AC-, -RP2A-, AND -SERVEXT-. USING RSD 1101.02 SHEETS 3 AND 5 OF 15 AND RSD 1101.04 SHEET 1 OF 1, AS NECESSARY, PLACE TEMPORARY PAVEMENT FROM -RP2CD- STA. 6+79± TO -RP2CD- STA. 12+25±, -RP2CD- STA. 12+92± TO -RP2CD- STA. 20+34±, -RP2AC- STA. 45+00± TO -RP2AC- STA. 57+73±, -L- STA. 546+50± TO -L- STA. 554+53±, -L- STA. 558+43± TO -L- STA. 559+46±, -L- STA. 559+97± TO -L- STA. 561+00±, -L- STA. 581+24± TO -L- STA. 582+29±, AND -L- 582+69± TO -L- STA. 583+33± (SEE SHEETS TMP-27 THRU TMP-30).

STEP 2:
USING RSD 1101.03 SHEET 6 OF 9, AS NECESSARY, INSTALL ALL PIPE CROSSINGS WITHIN CROSS-OVER AREA.

STEP 3:
USING RSD 1101.03 SHEETS 1 AND 2 OF 9 CLOSE AND DETOUR -SR1162-. CONSTRUCT -SR1162- AND STRUCTURE, AND -SRVRD-. USING RSD 1101.02 SHEETS 3 AND 5 OF 15 AND LAW ENFORCEMENT, AS NECESSARY, SHIFT SOUTHBOUND US 70 TRAFFIC ONTO TEMPORARY PAVEMENT (SEE SHEET TMP-27). CONTINUE CONSTRUCTION OF -L-, -RP2AC-, AND -RP2A-.

PHASE 2

STEP 1:
REOPEN -SR1162-. USING RSD 1101.02 SHEETS 3 AND 5 OF 14 AND LAW ENFORCEMENT, AS NECESSARY, PLACE TEMPORARY PAVEMENT MARKINGS AND SHIFT SOUTHBOUND US 70 TRAFFIC ONTO -RP2A- AND -RP2AC-.

STEP 2:
WITH SOUTHBOUND US 70 TRAFFIC SHIFTED ONTO NEW ALIGNMENT SHIFT NORTHBOUND US 70 TRAFFIC ONTO EXISTING US 70 SOUTHBOUND USING RSD 1101.02 SHEETS 3 AND 5 OF 14 (SEE SHEETS TMP-31 THRU TMP-34). WITH NB US 70 TRAFFIC SHIFTED BEGIN CONSTRUCTION OF -L- AND -RP2CD- (SEE SHEETS TMP-32 THRU TMP-33).

PHASE 3

STEP 1:
USING LANE CLOSURES AND LAW ENFORCEMENT, AS NECESSARY, SHIFT NORTHBOUND US 70 TRAFFIC ONTO THE PARTIALLY CONSTRUCTED -RP2CD-/-L-.

STEP 2:
USING RSD 1101.02 SHEETS 3 AND 5 OF 14 AND RSD 1101.04 SHEET 1 OF 1, AS NECESSARY BEGIN CONSTRUCTION OF REMAINING -RP2CD- AND -L- AND REMOVE TEMPORARY PAVEMENT (SEE SHEETS TMP-35-38).

PHASE 4

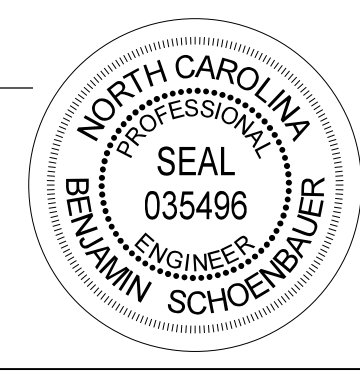

STEP 1:
USING RSD 1101.02 SHEETS 3 AND 5 OF 14 AND LAW ENFORCEMENT, AS NECESSARY, SHIFT NB TRAFFIC TO -RP2CD AND -L- (SEE SHEETS TMP-39-42).

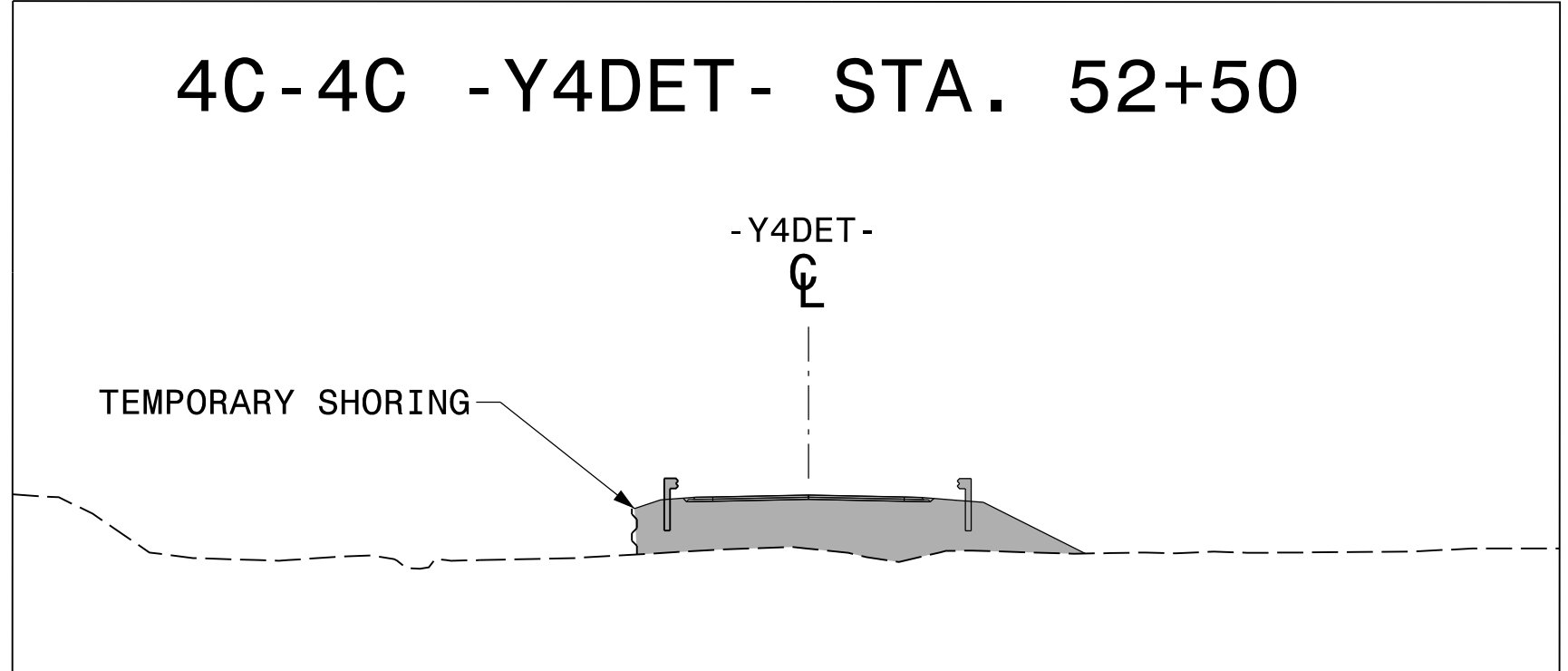
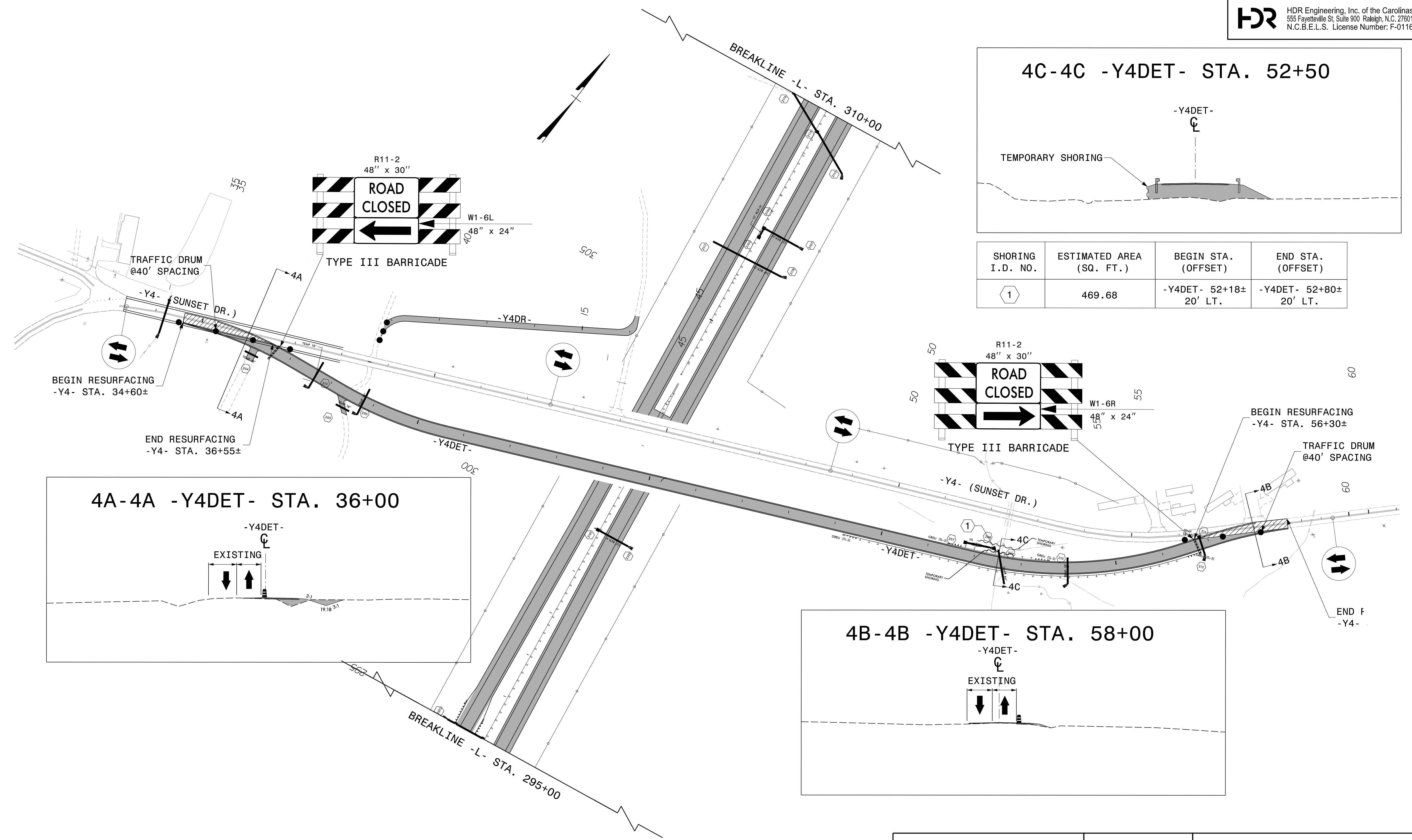
STEP 2:
USING RSD 1102.02 SHEETS 3 AND 5 OF 14, AS NECESSARY, COMPLETE ALL REMAINING CONSTRUCTION, PLACE THE FINAL LAYER OF SURFACE COURSE, AND FINAL PAVEMENT MARKINGS.

REVISIONS

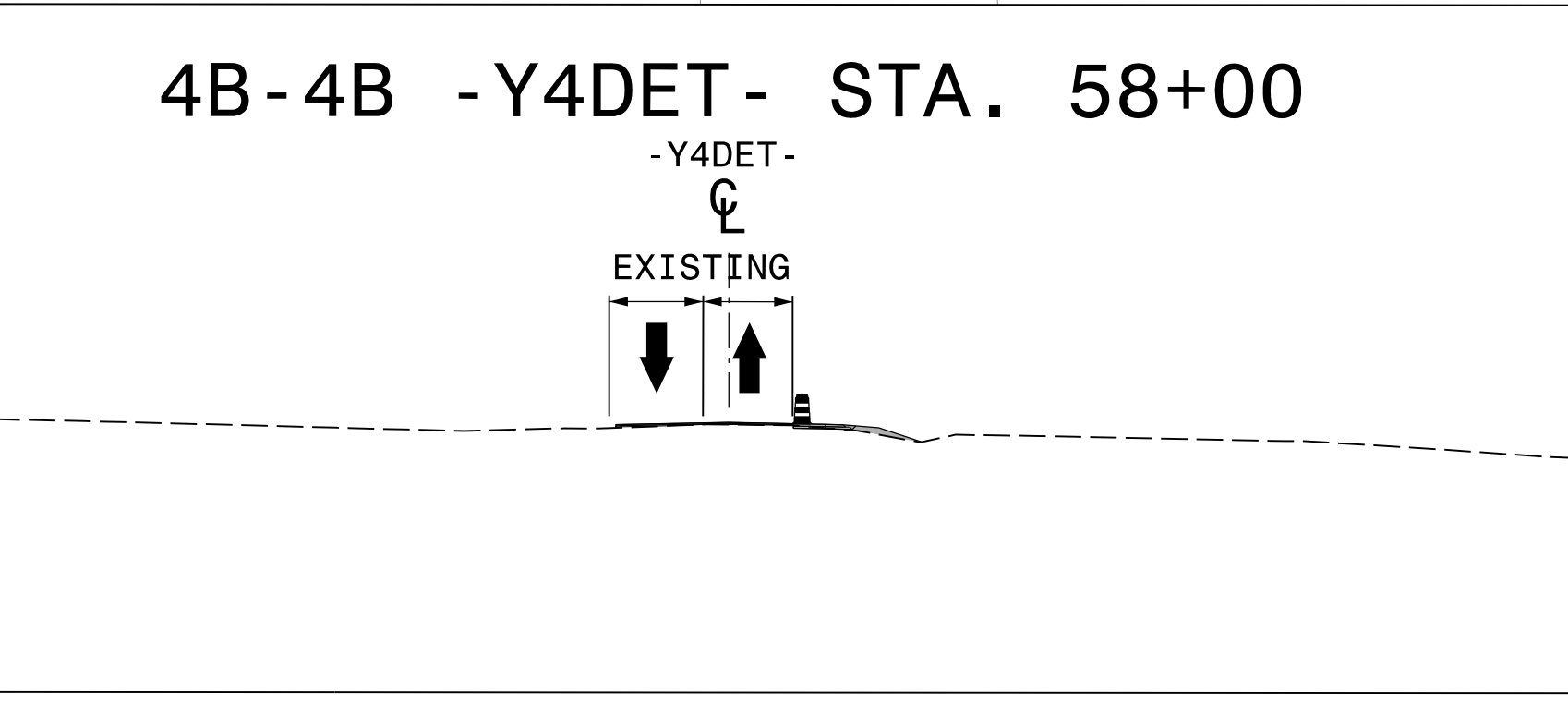
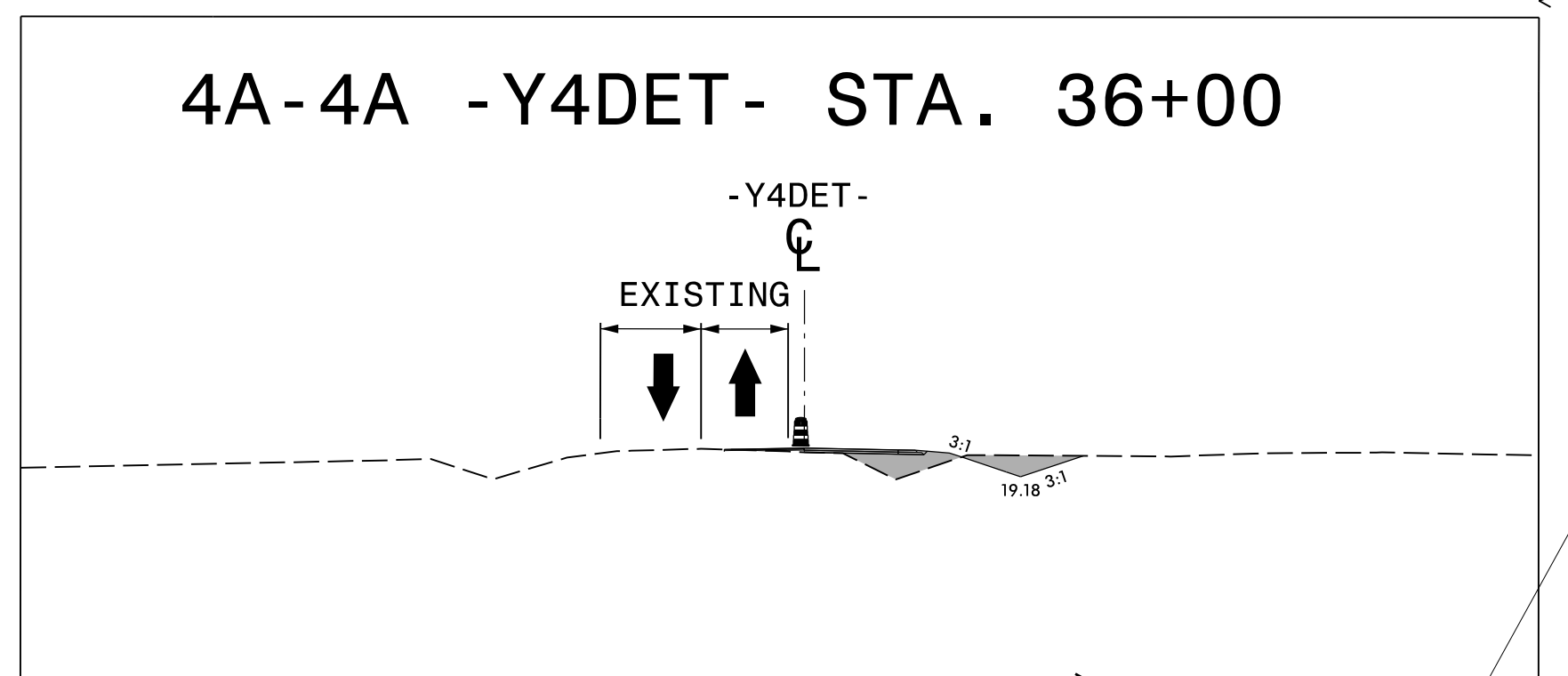
05/09/2019: REVISED AREA 4 PHASING FOR CONSTRUCTION OF 72 INCH PIPE
05/21/2019: REVISED AREA 4 PHASE 1, STEP 2A AND 2B

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DATE: 5/21/2019
TIME: 3:09:29 PM
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APPROVED: <i>Ben Schoenberger</i> DATE: 5/21/2019 <div style="text-align: center;">SEAL</div>			TEMPORARY TRAFFIC CONTROL PHASING
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



SHORING I.D. NO.	ESTIMATED AREA (SQ. FT.)	BEGIN STA. (OFFSET)	END STA. (OFFSET)
1	469.68	-Y4DET- 52+18± 20' LT.	-Y4DET- 52+80± 20' LT.

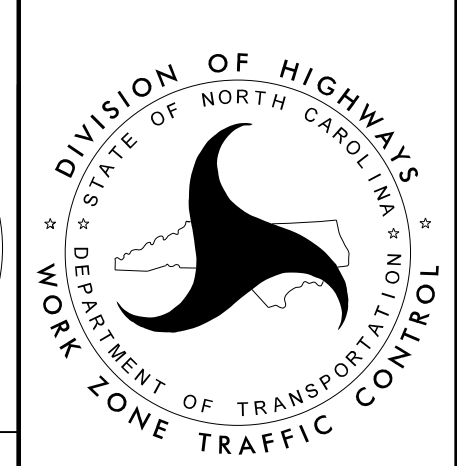


REVISIONS

- 12/17/2018: ADDED TEMPORARY GUARDRAIL -Y4DET-, 4C-4C -Y4DET- 52+50
- 12/17/2018: PROPOSED SHOULDER ADDED AT BEGINNING OF -Y4- DUE TO ROADWAY REVISIONS

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APPROVED: *Ben Schoenberger*
 DATE: 5/13/2019
 SEAL

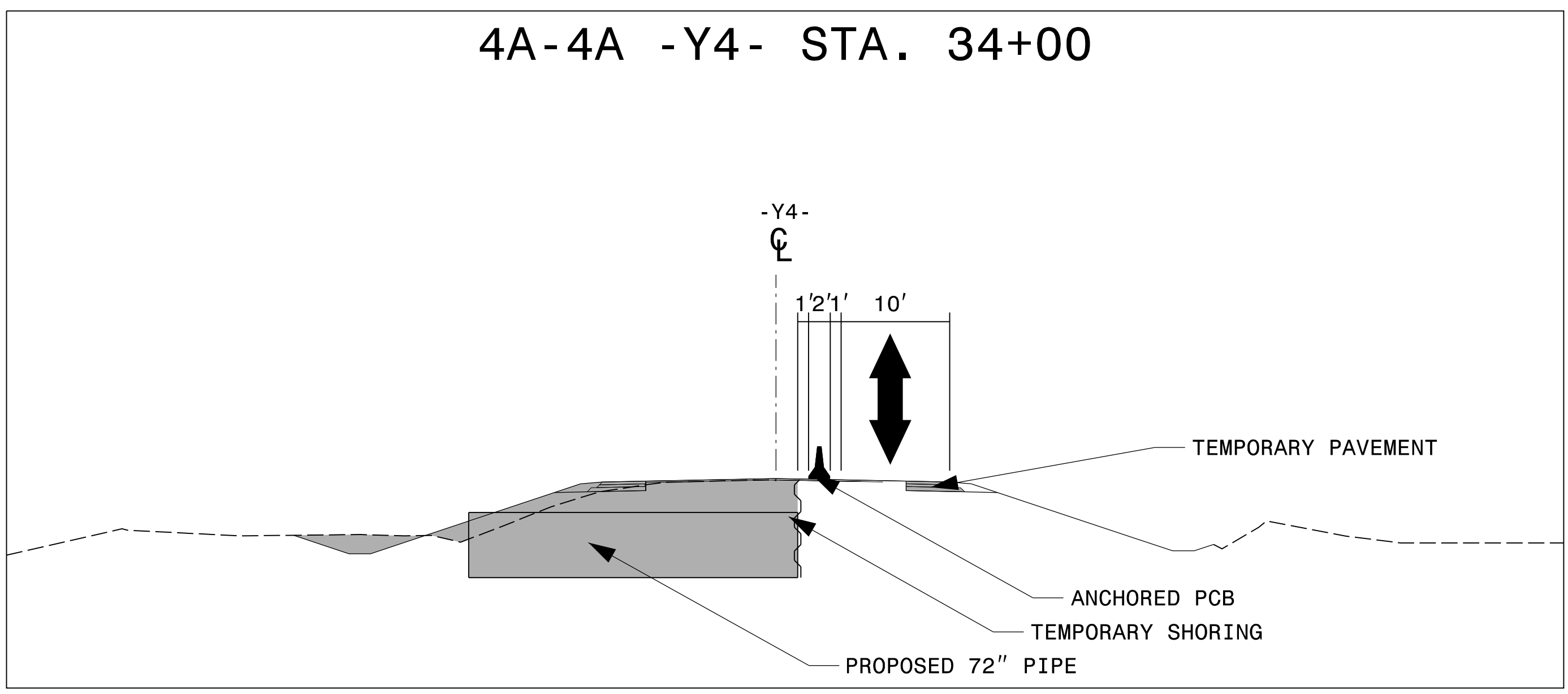
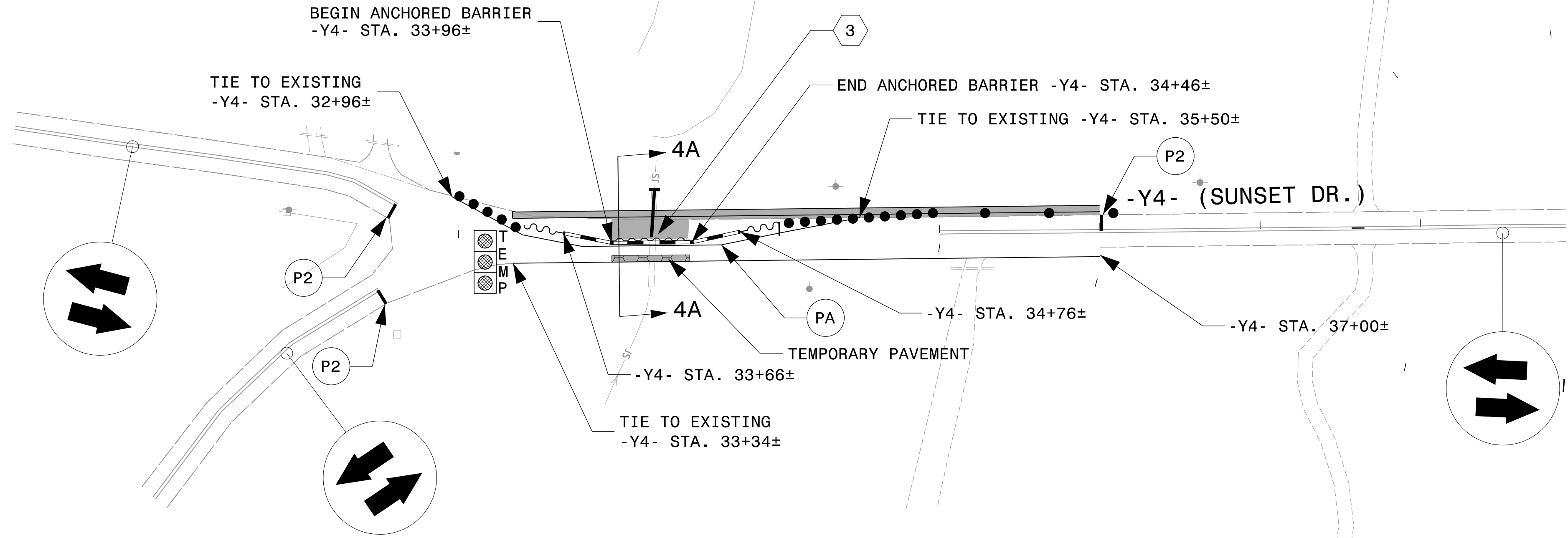


AREA 4
 PHASE 1

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

SHORING I.D. NO.	ESTIMATED AREA (SQ. FT.)	BEGIN STA. (OFFSET)	END STA. (OFFSET)
3	270.80	-Y4- 33+96± 2.00' RT.	-Y4- 33+44± 2.15' RT.

NOTE:
 SEE SIGNALIZATION PLANS FOR SIGNAL DETAILS
 AND STOP BAR LOCATIONS



REVISIONS

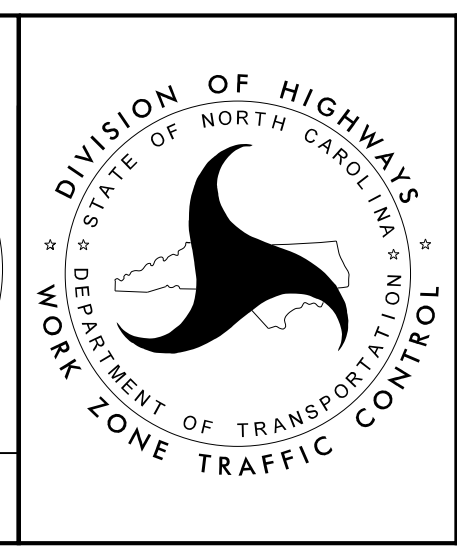
- 1 05/09/2019: ADDED NEW SHEET SHOWING STAGE CONSTRUCTION OF PROPOSED 72 INCH PIPE
- 2 05/21/2019: REVISED LIMITS OF PIPE CONSTRUCTION

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 DATE: 5/21/2019
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APPROVED: *Ben Schoenberger*
 DATE: 5/21/2019

SEAL

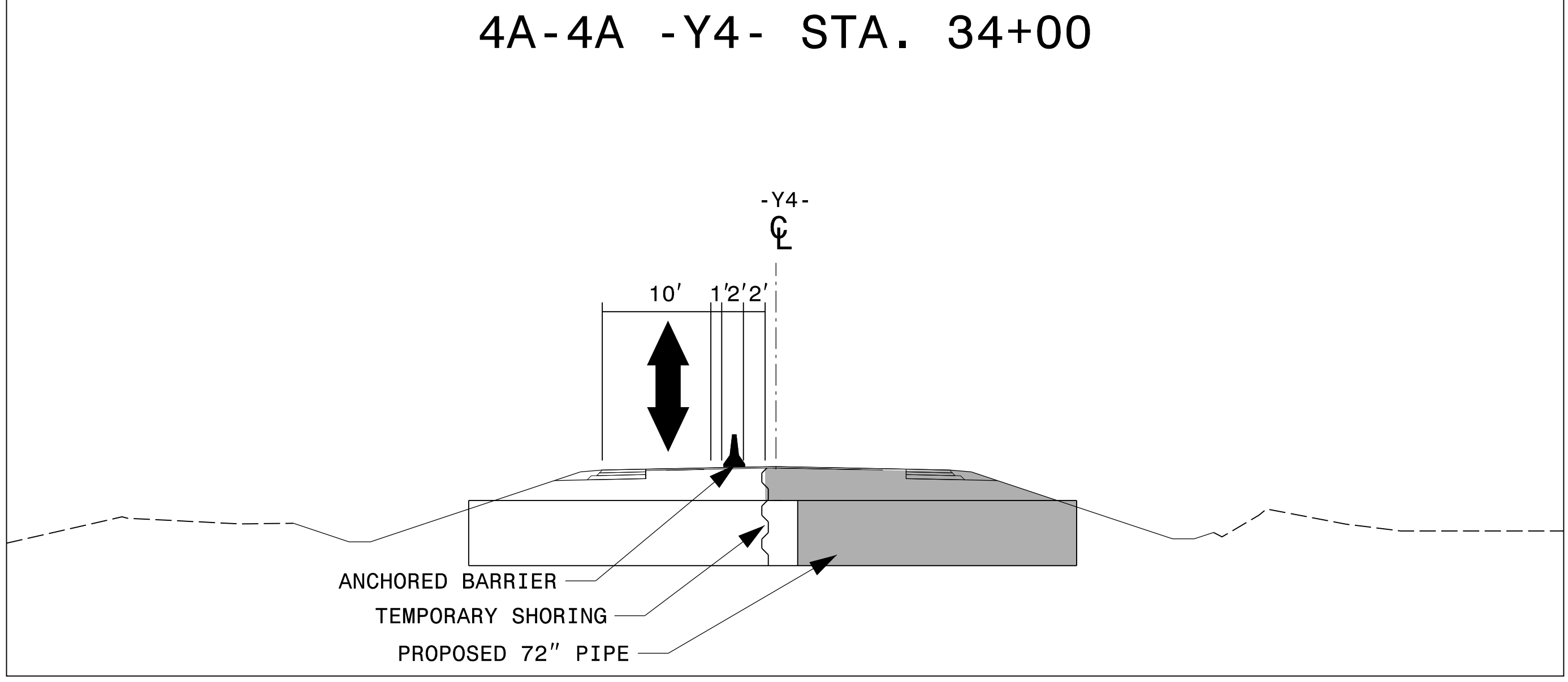
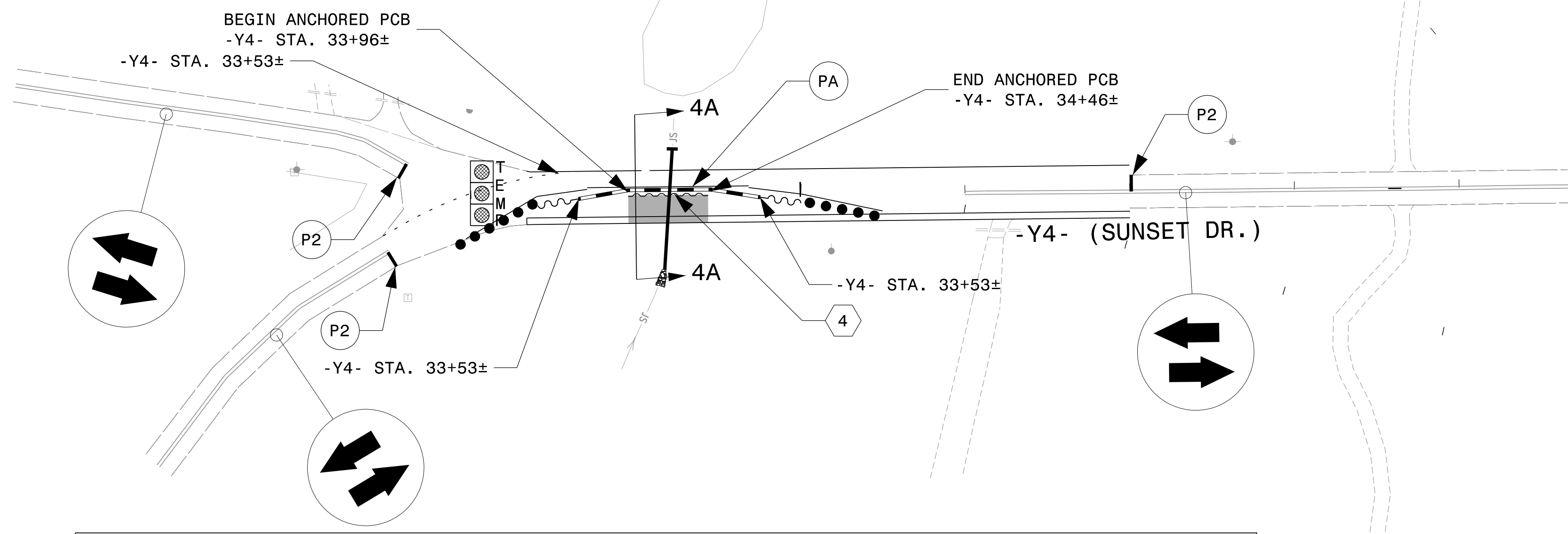
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**



AREA 4
 PHASE 1
 STEP 2

SHORING I.D. NO.	ESTIMATED AREA (SQ. FT.)	BEGIN STA. (OFFSET)	END STA. (OFFSET)
4	270.80	-Y4- 33+96± 1.21' LT.	-Y4- 33+44± 1.10' LT.

NOTE:
 SEE SIGNALIZATION PLANS FOR SIGNAL DETAILS
 AND STOP BAR LOCATIONS



REVISIONS

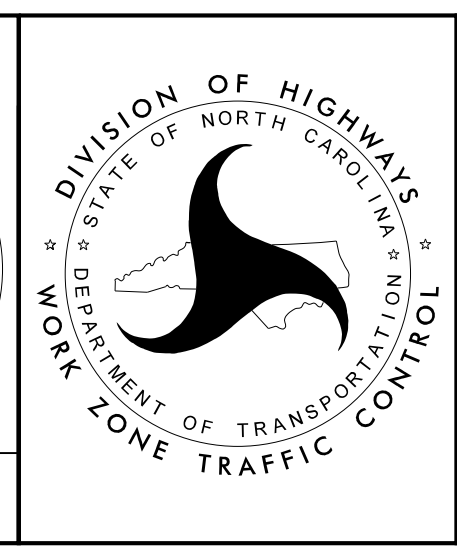
- 1 05/09/2019: ADDED NEW SHEET SHOWING STAGE CONSTRUCTION OF PROPOSED 72 INCH PIPE
- 2 05/21/2019: REVISED LIMITS OF PIPE CONSTRUCTION AND ADDED TEMPORARY SHORING NO. 4

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_tcp.tbl
 USER: JWILES DATE: 5/21/2019 TIME: 3:03:34 PM
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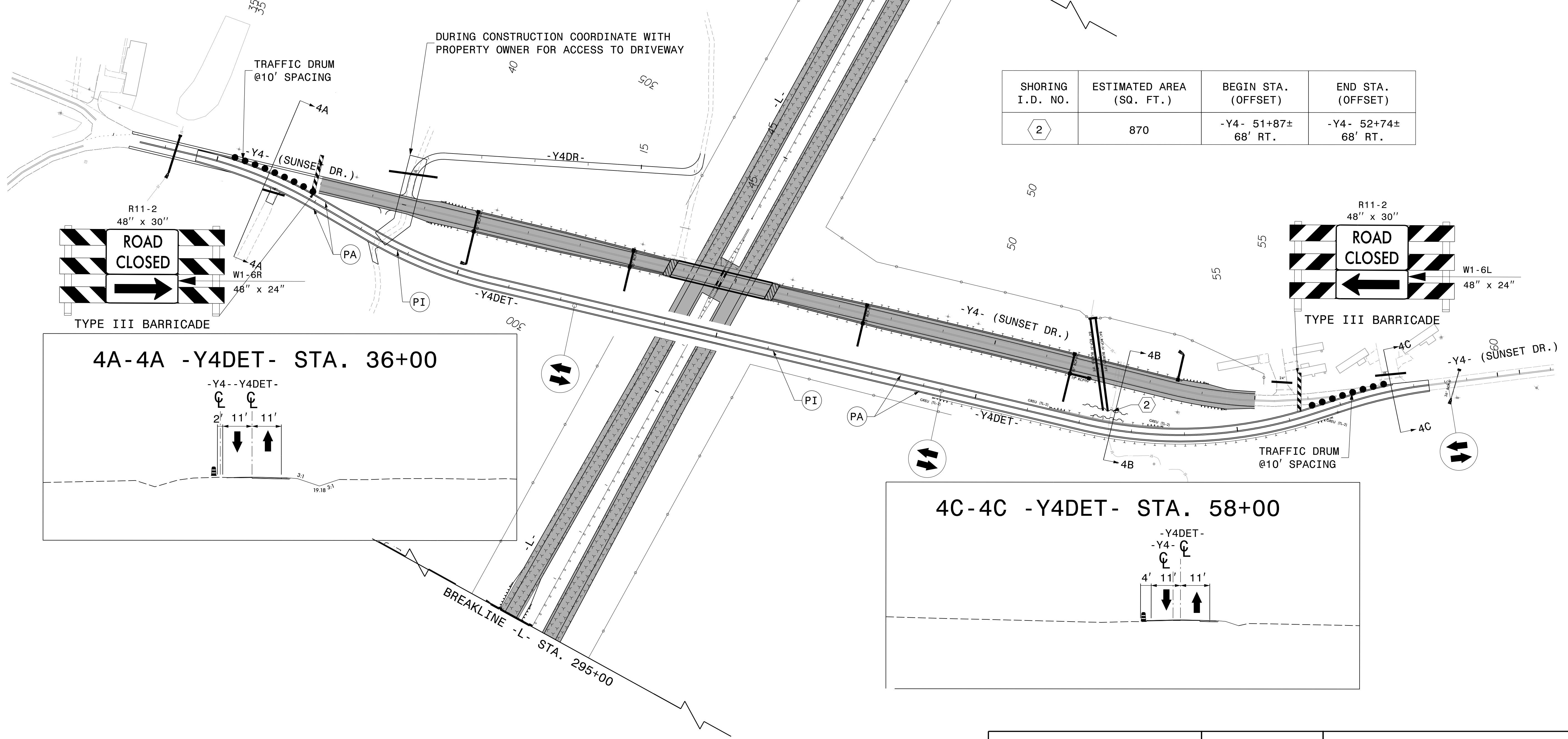
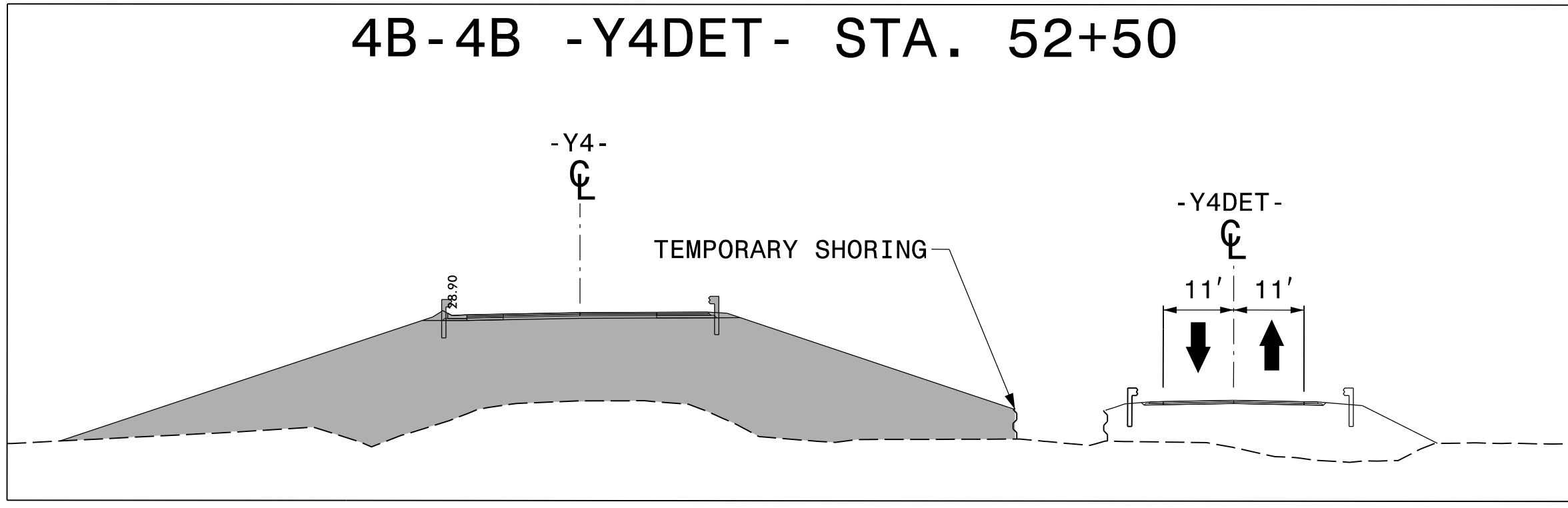
APPROVED: *Ben Schoenauer*
 DATE: 5/21/2019

SEAL

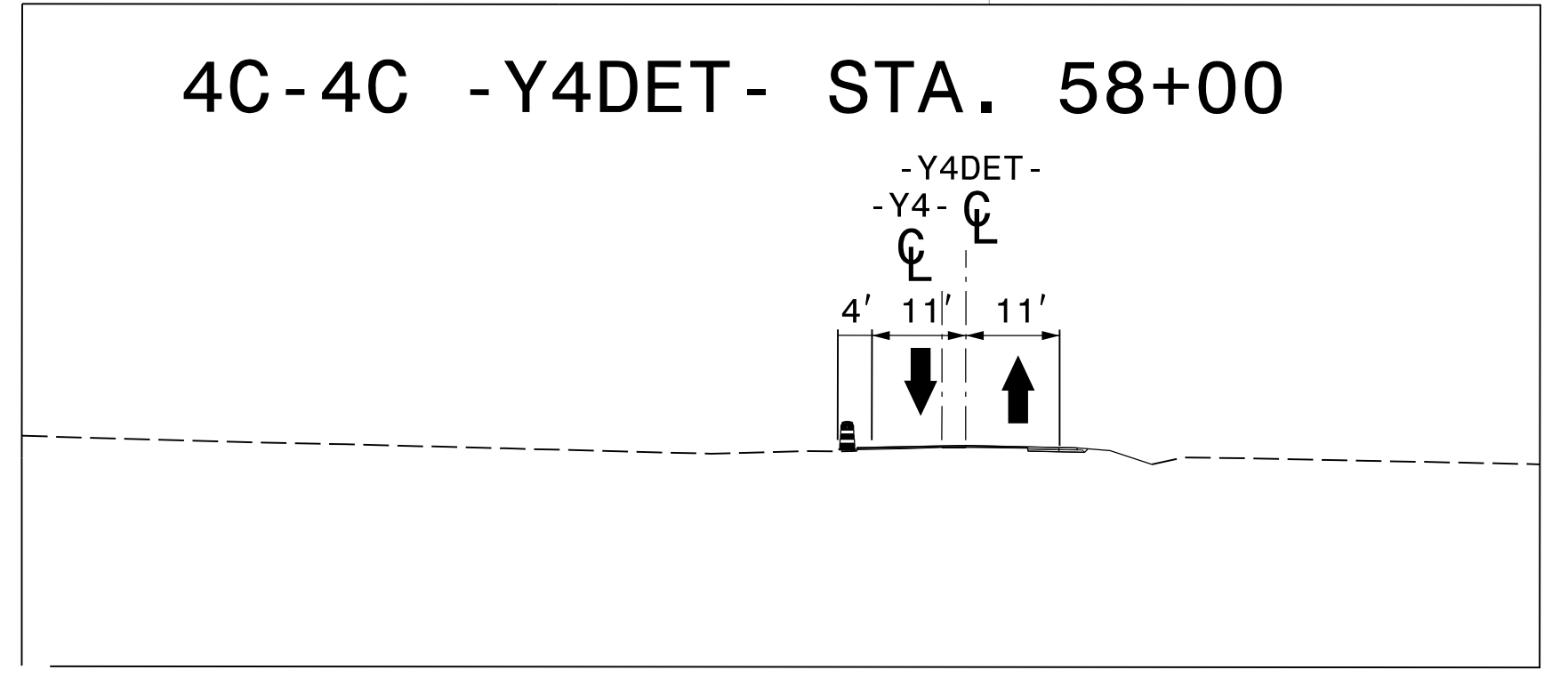
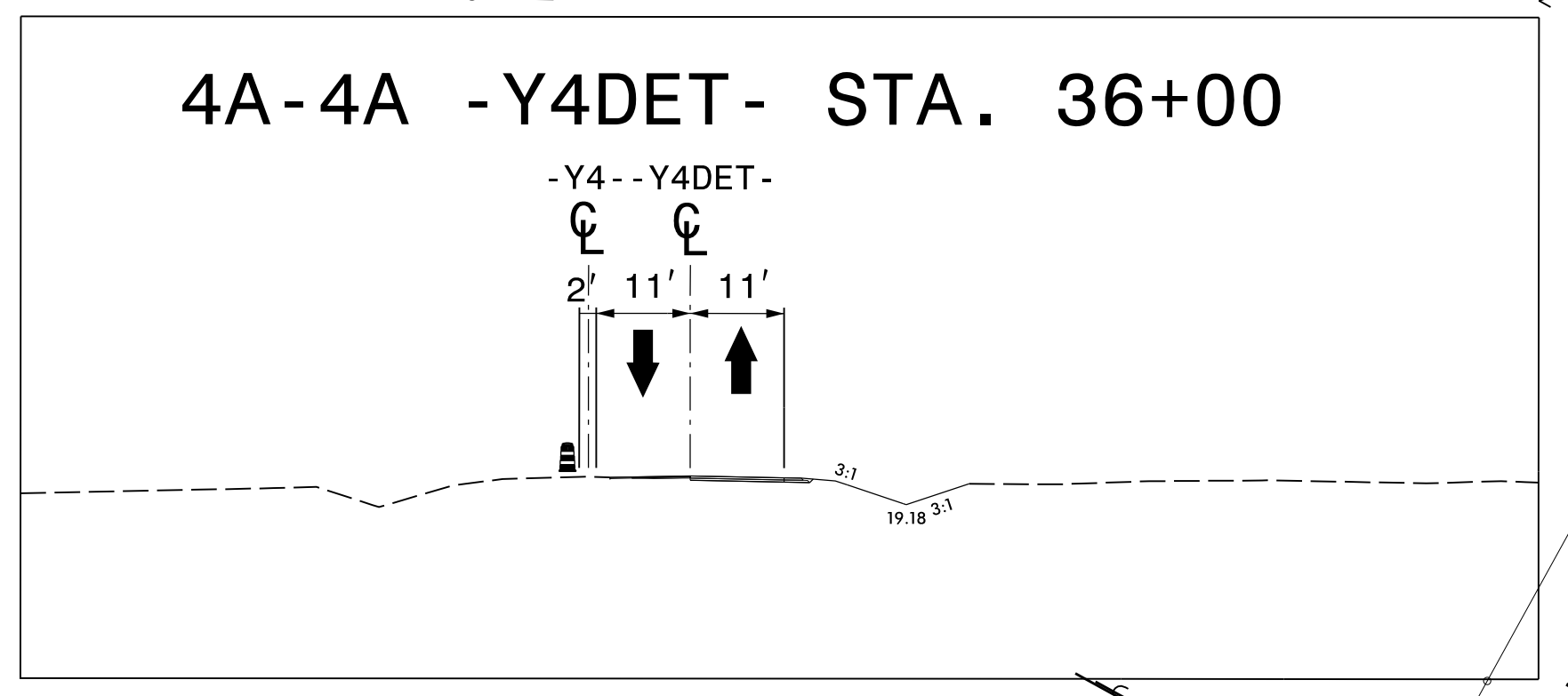
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**



AREA 4
 PHASE 1
 STEP 3



SHORING I.D. NO.	ESTIMATED AREA (SQ. FT.)	BEGIN STA. (OFFSET)	END STA. (OFFSET)
2	870	-Y4- 51+87± 68' RT.	-Y4- 52+74± 68' RT.



REVISIONS

12/17/2018: ADDED TEMPORARY GUARDRAIL -Y4DET-, 4B-4B -Y4DET- 52+50

05/09/2019: REVISED TEMPORARY PAVEMENT MARKINGS AT THE BEGINNING OF -Y4- DUE TO ROADWAY REVISION

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_tcp.tbl

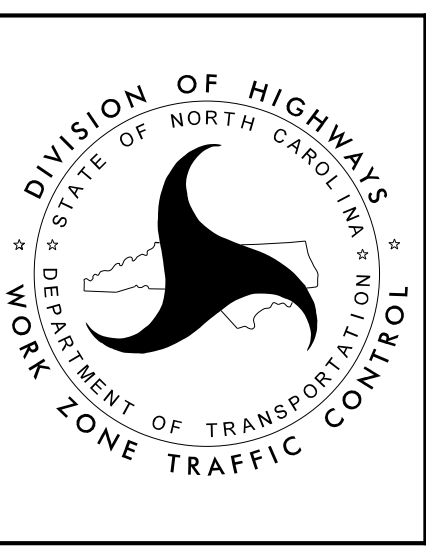
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APPROVED: *Ben Schoenberger*

DATE: 5/13/2019

SEAL



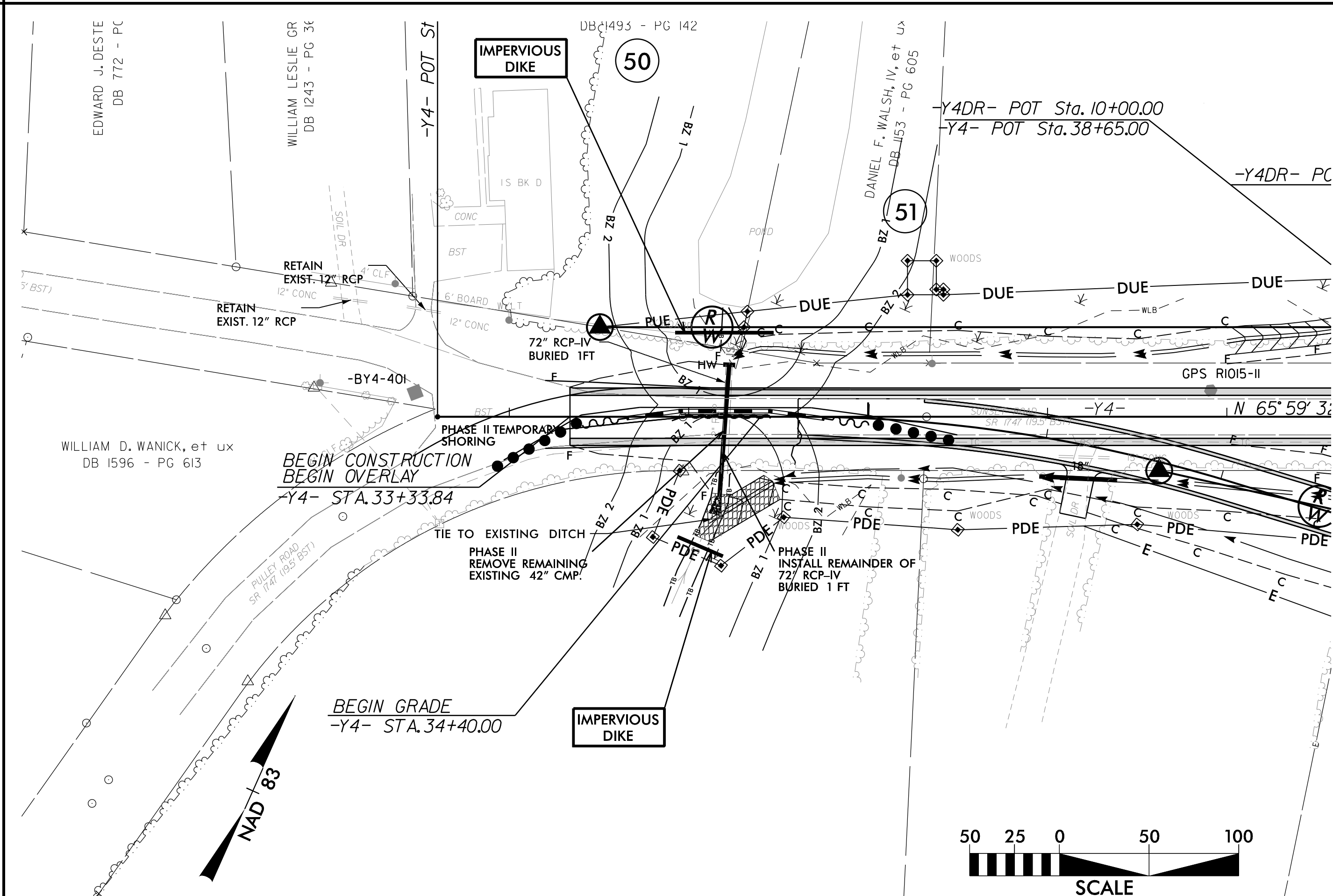
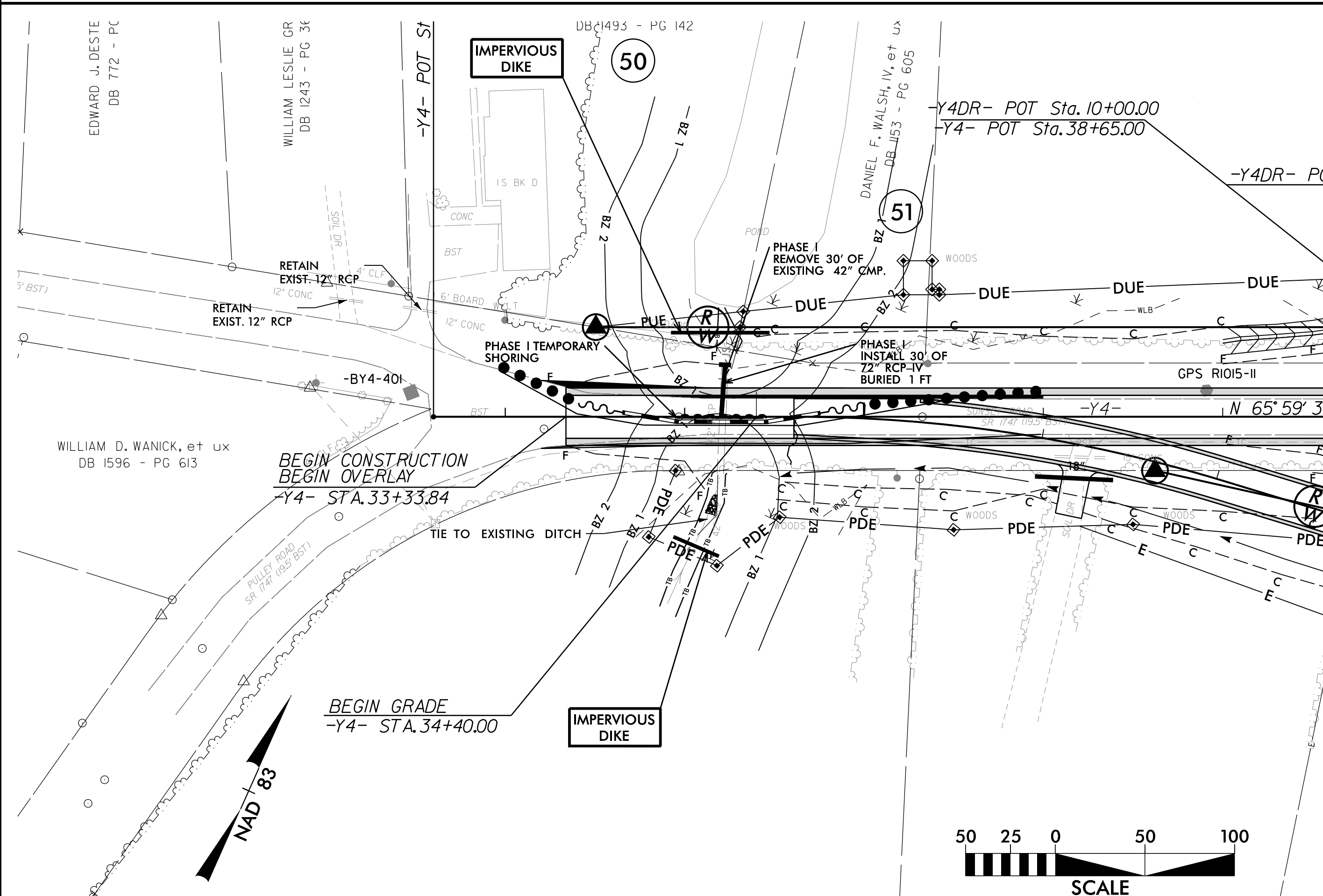
AREA 4
PHASE 2

CULVERT CONSTRUCTION SEQUENCE

STA. 34 + 21 -Y4-

PHASE I

PHASE II



CULVERT CONSTRUCTION SEQUENCE

1. UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT THE PIPE CULVERT CONSTRUCTION.
2. CONSTRUCT IMPERVIOUS DIKES AS SHOWN ON PLANS.
3. INSTALL A TRENCH UNDERNEATH ROADWAY AND COVER AS DIRECTED BY ENGINEER.
4. INSTALL PUMP TO CONVEY FLOW ACROSS THE TRENCH.
5. DRY OUT WORK AREA NEEDED TO CONSTRUCT THE CULVERT, PUMPING EFFLUENT INTO SPECIAL STILLING BASIN.
6. INSTALL TRAFFIC CONTROL MEASURES AND CLOSE WESTBOUND LANE.
7. INSTALL TEMPORARY SHORING.
8. REMOVE 30' OF THE EXISTING 42" CMP.
9. CONSTRUCT 30' OF 72" RCP-IV WHILE TRAFFIC IS MAINTAINED WITH ONE LANE ON THE OPPOSITE SIDE OF THE ROAD.
10. CONSTRUCT HEADWALL OF THE 72" RCP-IV AS SHOWN ON THE PLANS.
11. PLACE ROADWAY BACK IN PLACE OVER COMPLETED CONSTRUCTION.

CULVERT CONSTRUCTION SEQUENCE

12. SHIFT TRAFFIC CONTROL MEASURES AND CLOSE EASTBOUND LANE.
13. REMOVE THE REMAINDER OF THE EXISTING 42" CMP.
14. CONSTRUCT REMAINDER OF 72" RCP-IV THAT WAS PARTLY CONSTRUCTED IN PHASE I.
15. PLACE ROADWAY BACK IN PLACE OVER COMPLETED CONSTRUCTION.
16. INSTALL RIPRAP PROTECTION ON THE DOWNSTREAM SIDE. CONSTRUCT DITCHES IN DRY WORK AREA.
17. REMOVE TEMPORARY SHORING, IMPERVIOUS DIKES AND SPECIAL STILLING BASIN.
18. REMOVE PUMP, FILL TRENCH AND COMPLETE ROADWAY.

Project: R-1015

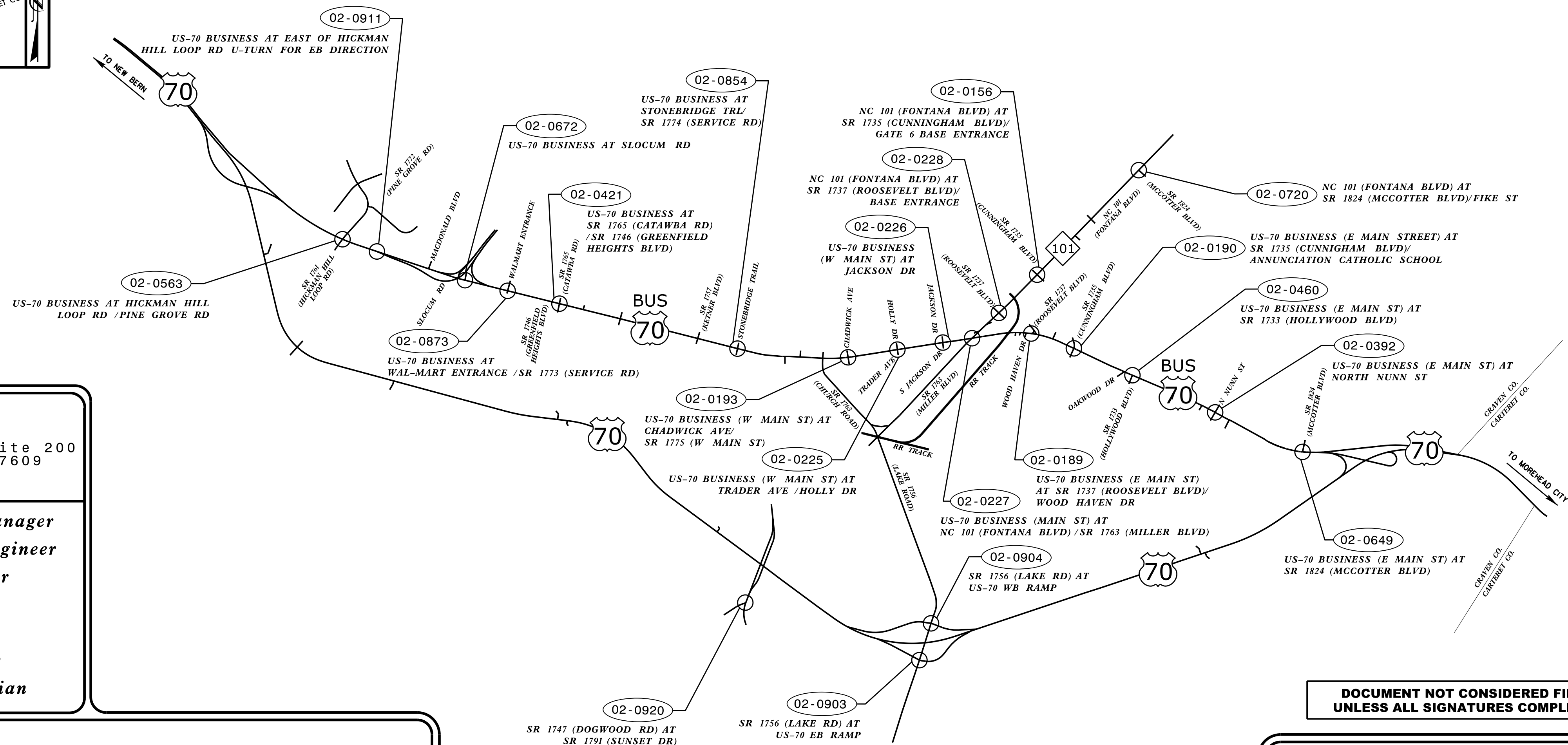
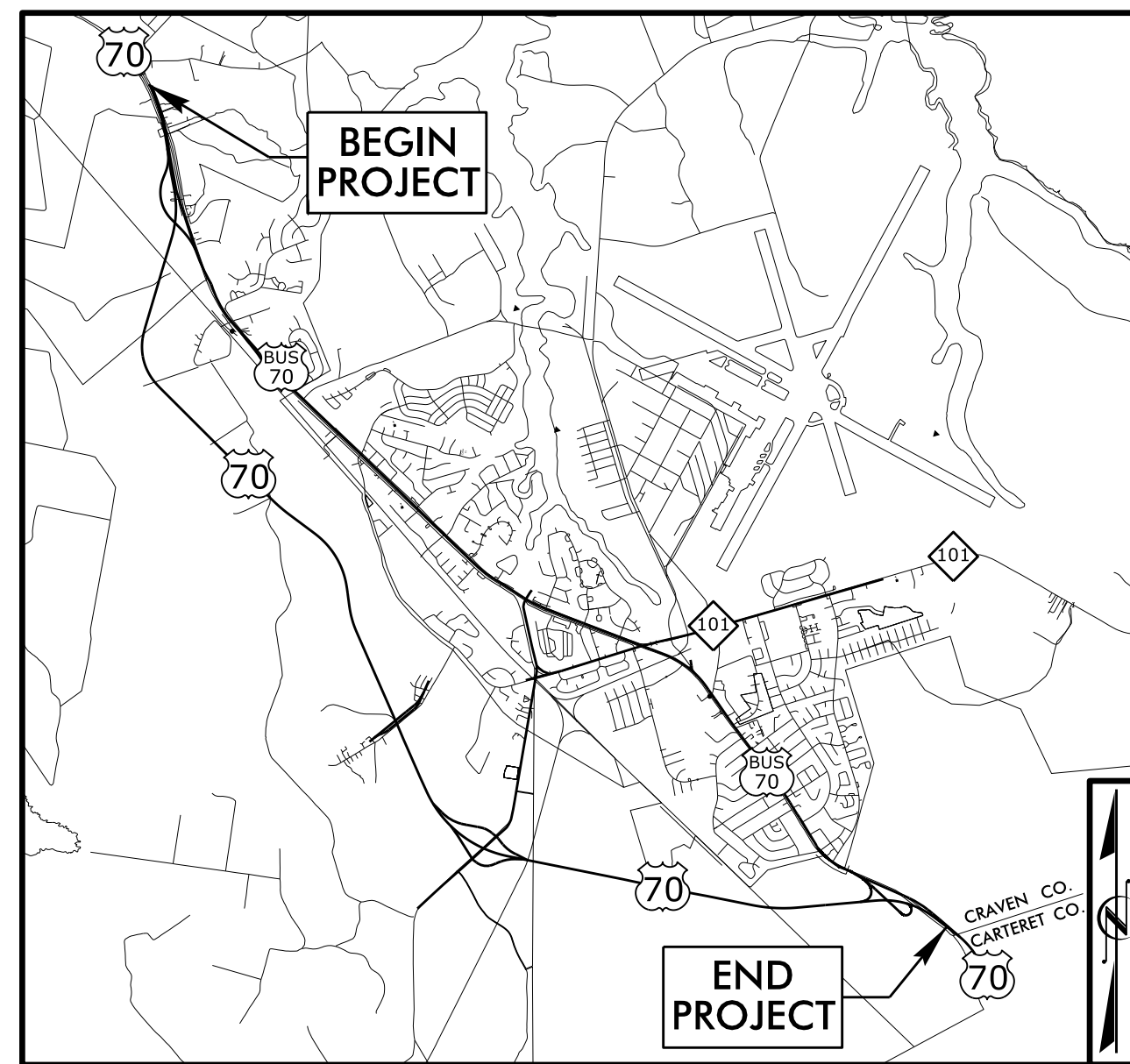
Contract: C204177

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN AND CARTERET COUNTIES

**LOCATION: US 70 HAVELOCK BYPASS, NORTH OF SR 1772
(PINE GROVE RD)/SR 1761 (HICKMAN HILL LOOP RD)
TO NORTH OF COUNTY LINE**

**TYPE OF WORK: SIGNALS, CABLE ROUTING, CCTV CAMERAS &
DYNAMIC MESSAGE SIGN INSTALLATIONS**



HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Natasha R. Simmons, PE, PTOE - Project Manager
Andrew D. Klinksiek, PE, PTOE - Project Engineer
Alex H. Thornburg, PE - Project Engineer
John A. Wagner, PE - Design Engineer
James T. Thibault, EI - Design Engineer
Nicole K. Vlanich, EI - Design Engineer
Tracey R. Terrell - Senior Design Technician

Sheet #	Reference #	Index of Plans Location/Description
Sig. 1.0	-----	Title Sheet
Sig. 2.0-2.1	02-0873	US-70 Business at Wal-Mart Entrance/SR 1773 (Service Road)
Sig. 3.0-3.1	02-0421	US-70 Business at SR 1765 (Catawba Road)/SR 1746 (Greenfield Heights Boulevard)
Sig. 4.0-4.2	02-0854	US-70 Business at Stonebridge Trail/SR 1774 (Service Road)
Sig. 5.0-5.1	02-0193	US-70 Business (W Main Street) at Chadwick Avenue/SR 1775 (W Main Street)
Sig. 6.0-6.1	02-0225	US-70 Business (W Main Street) at Trader Avenue/Holly Drive
Sig. 7.0-7.1	02-0226	US-70 Business (W Main Street) at Jackson Drive
Sig. 8.0-8.1	02-0227	US-70 Business (Main Street) at NC 101 (Fontana Boulevard)/SR 1763 (Miller Boulevard)
Sig. 9.0-9.1	02-0189	US-70 Business (E Main Street) at SR 1737 (Roosevelt Boulevard)/Wood Haven Drive
Sig. 10.0-10.3	02-0190	US-70 Business (E Main Street) at SR 1735 (Cunningham Boulevard)/Annunciation Catholic School
Sig. 11.0-11.1	02-0460	US-70 Business (E Main Street) at SR 1733 (Hollywood Boulevard)
Sig. 12.0-12.1	02-0392	US-70 Business (E Main Street) at North Nunn Street
Sig. 13.0-16.1	02-0649	US-70 Business (E Main Street) at SR 1824 (McCotter Boulevard)
Sig. 17.0-17.2	02-0903	SR 1756 (Lake Road) at US-70 EB Ramp
Sig. 18.0-18.2	02-0904	SR 1756 (Lake Road) at US-70 WB Ramp
Sig. 19.0-19.1	02-0228	NC 101 (Fontana Boulevard) at SR 1737 (Roosevelt Boulevard)/Base Entrance
Sig. 20.0-20.1	02-0156	NC 101 (Fontana Boulevard) at SR 1735 (Cunningham Boulevard)/Gate 6 Base Entrance
Sig. 21.0-21.2	02-0720	NC 101 (Fontana Boulevard) at SR 1824 (McCotter Boulevard)/Fike Street
Sig. 22.0	-----	Standard Drawing for Electrical Service Grounding and Wood Poles
Sig. 23.0	-----	Standard Drawing for Pedestals
Sig. 24.0-24.1	02-0920T1	SR 1747 (Dogwood Road) at SR 1791 (Sunset Drive) - Temporary 1
Sig. 25.0-25.1	02-0920T2	SR 1747 (Dogwood Road) at SR 1791 (Sunset Drive) - Temporary 2
Sig. M1-M8	-----	Standard Drawing for Metal Poles
SCP. 1-97	-----	Signal Communication Plans

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

Refer to "Roadway Standard Drawings
NCDOT" dated January 2018 and
"Standard Specifications for Roads
and Structures" dated January 2018.

LEGEND
##-####
SIGNAL INVENTORY NUMBER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Meghan LeBlanc, PE - Eastern Region Signals Engineer
Todd Joyce, PE - Signal Equipment Design Engineer
Andrew Skuce - Signal Communications Project Engineer
Gregory Green - ITS Design Engineer

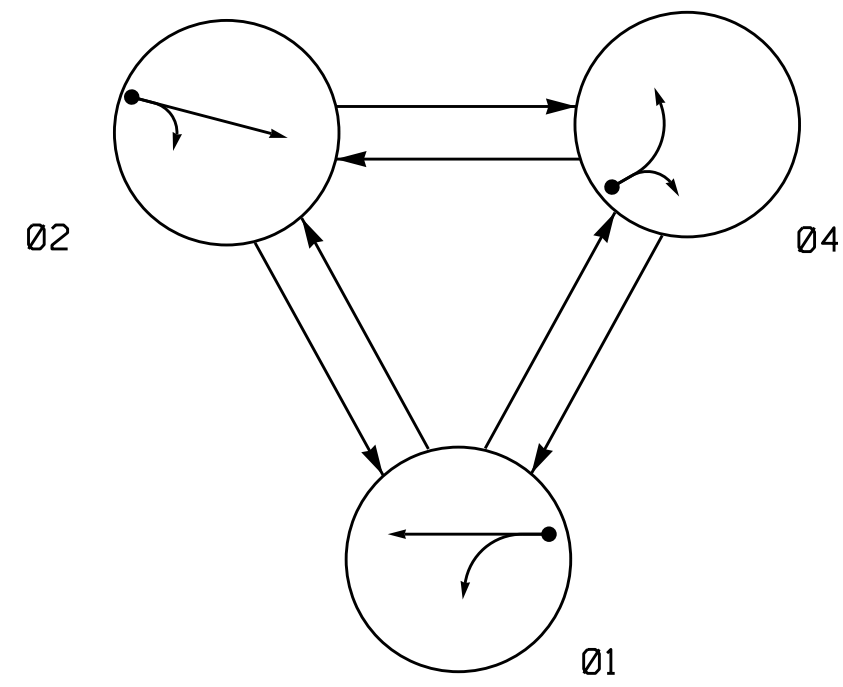
Prepared for the Office of:
**DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION**

ITS and Signals Unit

750 N. Greenfield Parkway, Garner, NC 27529

PHASING DIAGRAM

Program AllPhases for "Red Rest"



PHASING DIAGRAM DETECTION LEGEND

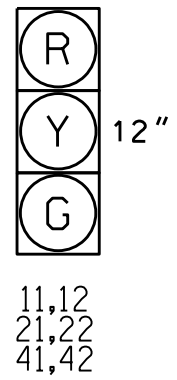
- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←- - -→ UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01	02	04	F L S O H
11,12	G	R	R	R
21,22	R	G	R	R
41,42	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



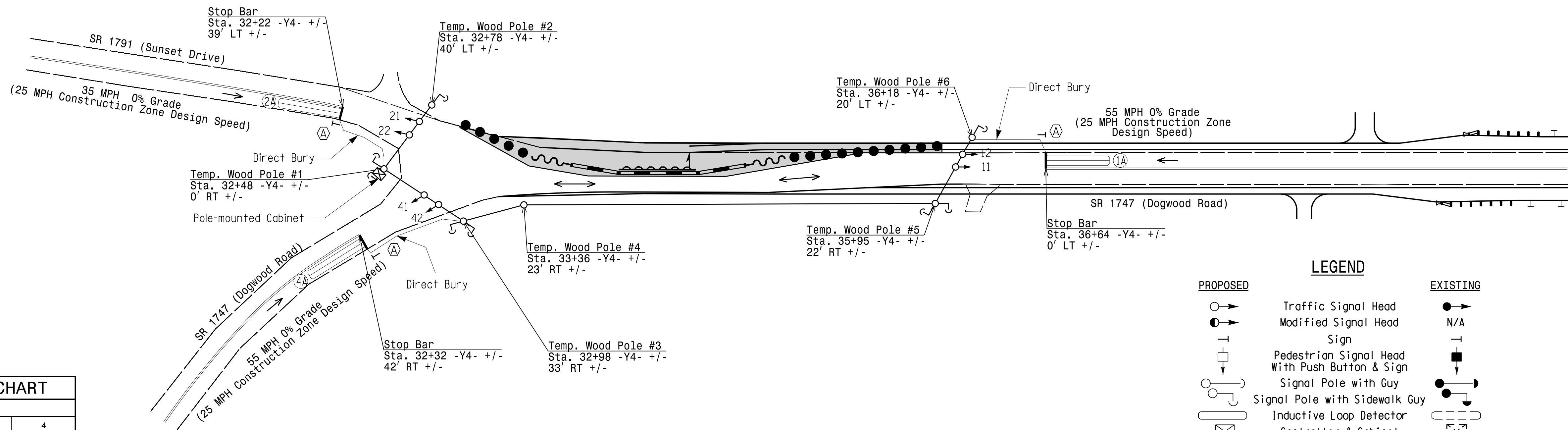
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

3 Phase Fully Actuated Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Program controller to start up in phase 4 red clearance.
4. Program controller to rest in red in the absence of vehicle calls.
5. Set all detector units to presence mode.



OASIS 2070 TIMING CHART

FEATURE	PHASE		
	1	2	4
Min Green 1 *	10	10	10
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	45	45	20
Yellow Clearance	5.2	3.8	5.2
Red Clearance	15.0	15.0	15.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	-	-	-
Vehicle Call Memory	-	-	-
Dual Entry	-	-	-
Red Rest	ON	ON	ON
Simultaneous Gap	ON	ON	ON

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

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ Traffic Signal Head
○→ Modified Signal Head	N/A
○→ Pedestrian Signal Head	N/A
○→ Signal Pole with Guy	○→ Signal Pole with Guy
○→ Signal Pole with Sidewalk Guy	○→ Signal Pole with Sidewalk Guy
□→ Inductive Loop Detector	□→ Inductive Loop Detector
□→ Controller & Cabinet	□→ Controller & Cabinet
□→ Junction Box	□→ Junction Box
- - - 2-in Underground Conduit	- - - 2-in Underground Conduit
N/A Right of Way	- - - Right of Way
→ Directional Arrow	→ Directional Arrow
⊙ "STOP HERE ON RED" Sign (R10-6)	⊙ "STOP HERE ON RED" Sign (R10-6)
N/A Guardrail	- - - Guardrail
● Construction Zone Drums	● Construction Zone Drums
■ Construction Zone	■ Construction Zone

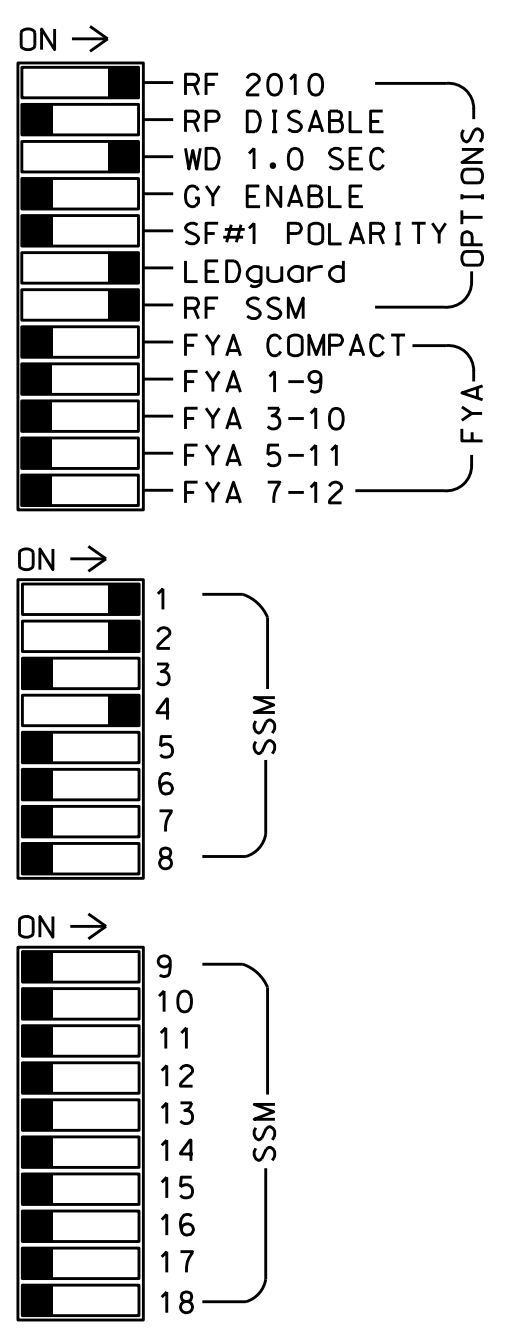
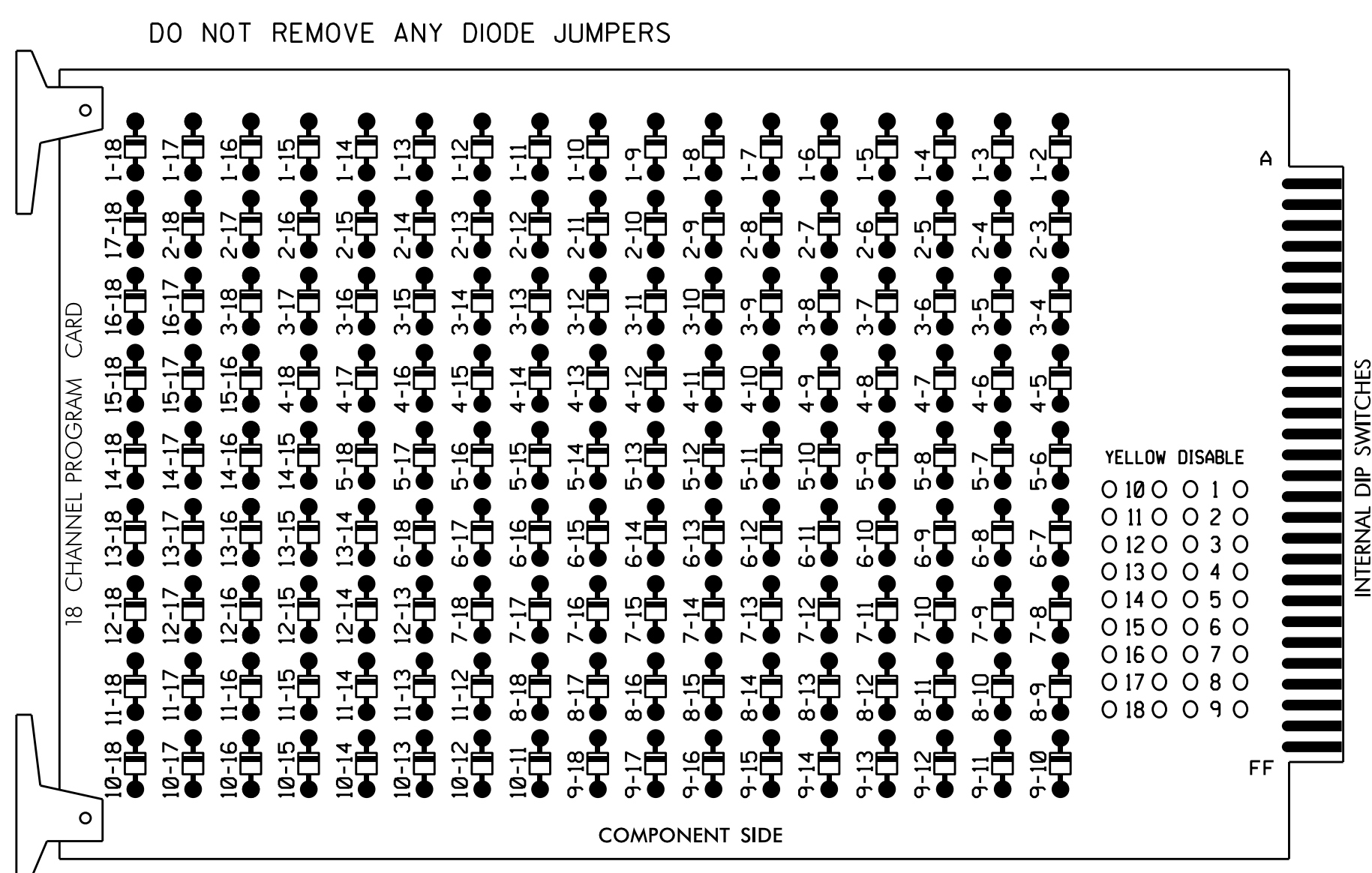
New Installation - Temporary Signal (Step 1)

	SR 1747 (Dogwood Road) at SR 1791 (Sunset Drive)		
	Division 2 Craven County West of Havelock		
PLAN DATE: May 2019 PREPARED BY: KGP, Jr.	REVIEWED BY: ZML REVIEWED BY:	DATE: 5/8/2019	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

08-MAY-2019 16:57:00 S:\IT\GIS\KMT\S\SIGNAL\KAS\SIGNAL\Design\Signal Design Section\East\Term Reg\on40\1015\02-0920\020920.dwg, dgn, 2019mmad-11.dgn, kgspeardrn

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phases 1, 2, and 4 for Red Rest.
4. Program phase 4 for Startup In Red Clear.
5. Program phase 1 as First Phases.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....336
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....POLE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S5
 PHASES USED.....1,2,4
 OVERLAPS.....NONE

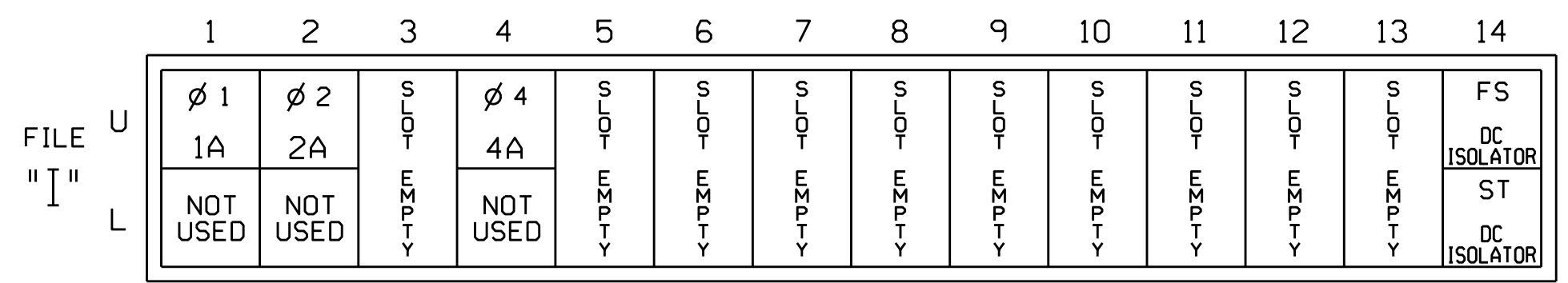
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	21,22	NU	NU	41,42	NU	NU	NU	NU	NU	NU	NU
RED	125	128			101							
YELLOW	126	129			102							
GREEN	127	130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



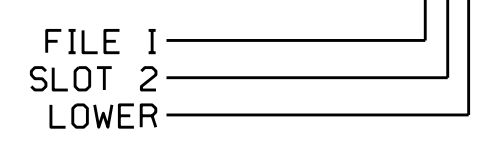
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB21-1,2	I1U	56	18	1	1	Y	Y			
2A	TB21-3,4	I2U	39	1	2	2	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			

INPUT FILE POSITION LEGEND: I2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 02-0920T1
 DESIGNED: May 2019
 SEALED: 5/8/2019
 REVISED: N/A

09-MAY-2019 08:13 S:\MIS\SSM\15\SIGNAL\work\hough\020920_sm.elec.xxx.dgn somstron

Electrical Detail - Temporary Signal (Step 1)

Electrical and Programming Details For: SR 1747 (Dogwood Road) at SR 1791 (Sunset Drive)

Prepared In the Offices of:

Division 2 Craven County West of Havelock

PLAN DATE: May 2019 REVIEWED BY:

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS: _____ INIT. DATE

DocuSigned by: Ryan W. Hough 5/13/2019 4:30:20 PM

430320FAA2854C3 DATE

SIG. INVENTORY NO. 02-0920T1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036833 RYAN W. HOUGH

PHASING DIAGRAM

Program AllPhases for "Red Rest"

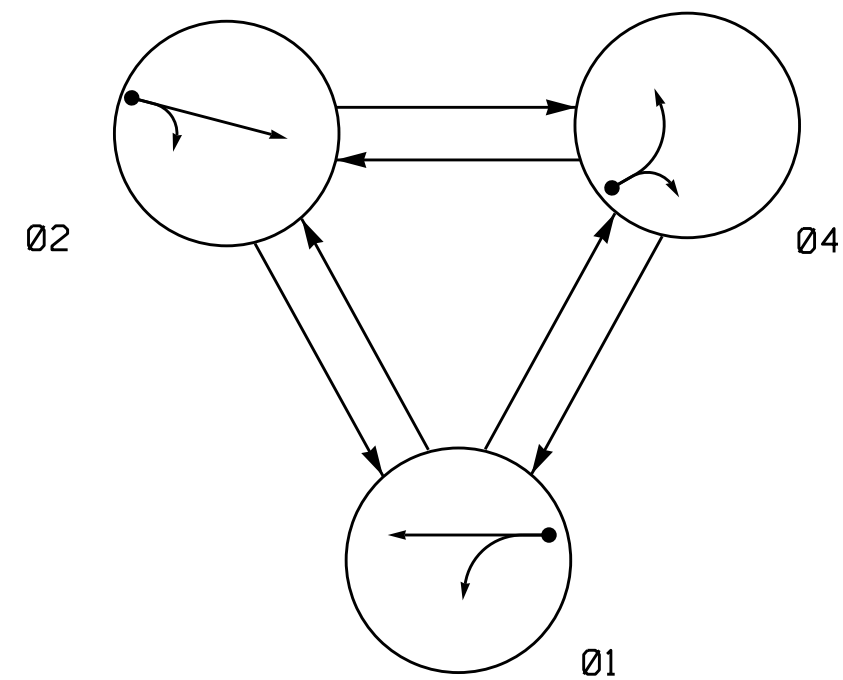
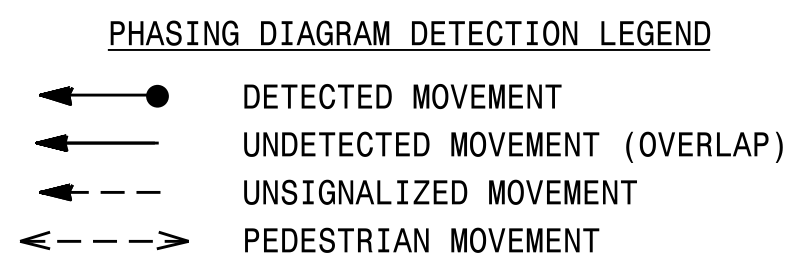
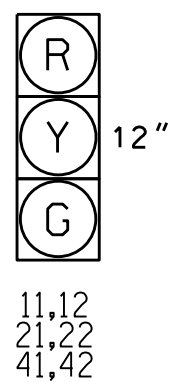


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 1	Ø 2	Ø 4	F L S A H
11,12	G	R	R	R
21,22	R	G	R	R
41,42	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



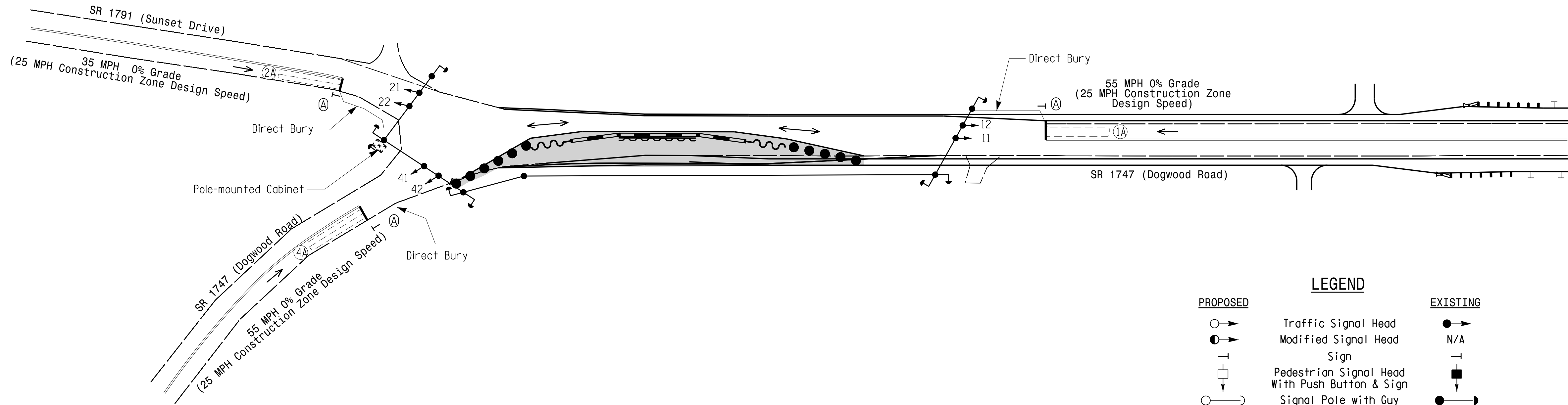
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

3 Phase Fully Actuated Isolated

NOTES

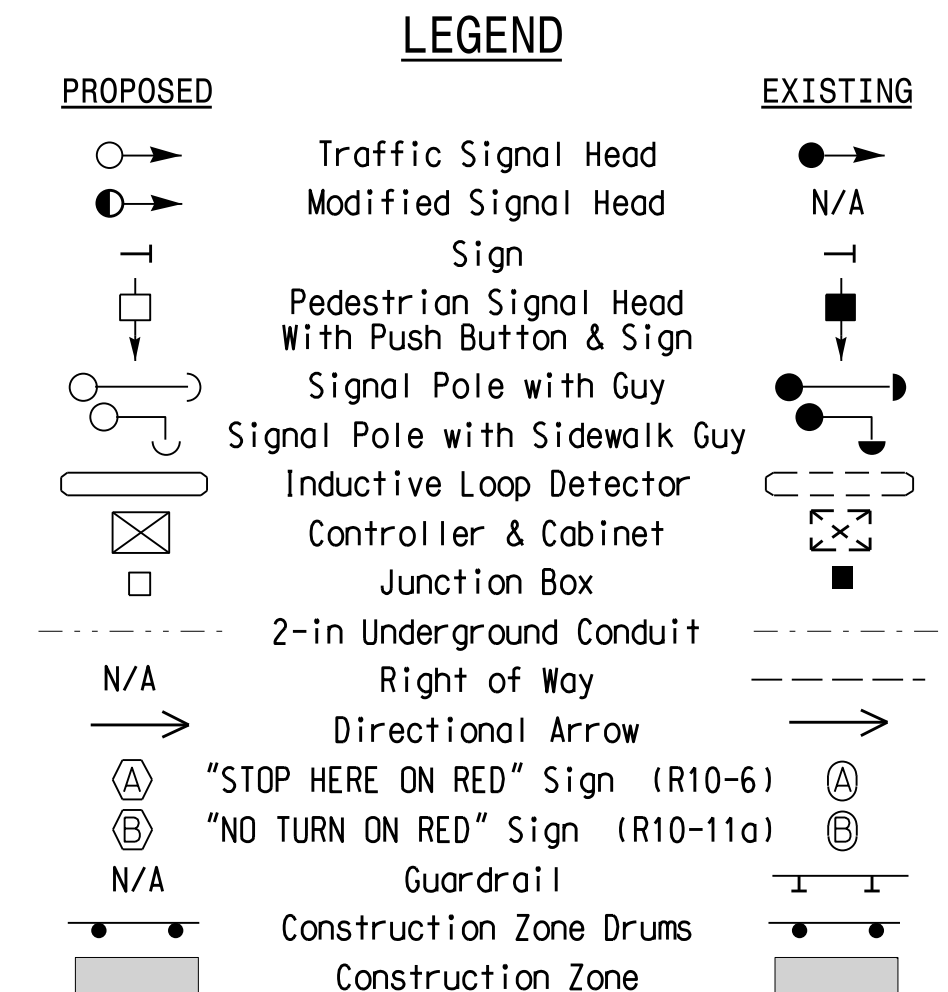
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Program controller to start up in phase 4 red clearance.
- Program controller to rest in red in the absence of vehicle calls.
- Set all detector units to presence mode.



OASIS 2070 TIMING CHART

FEATURE	PHASE		
	1	2	4
Min Green 1 *	10	10	10
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	45	45	20
Yellow Clearance	5.2	3.8	5.2
Red Clearance	15.0	15.0	15.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	-	-	-
Vehicle Call Memory	-	-	-
Dual Entry	-	-	-
Red Rest	ON	ON	ON
Simultaneous Gap	ON	ON	ON

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



New Installation - Temporary Signal (Step 2)

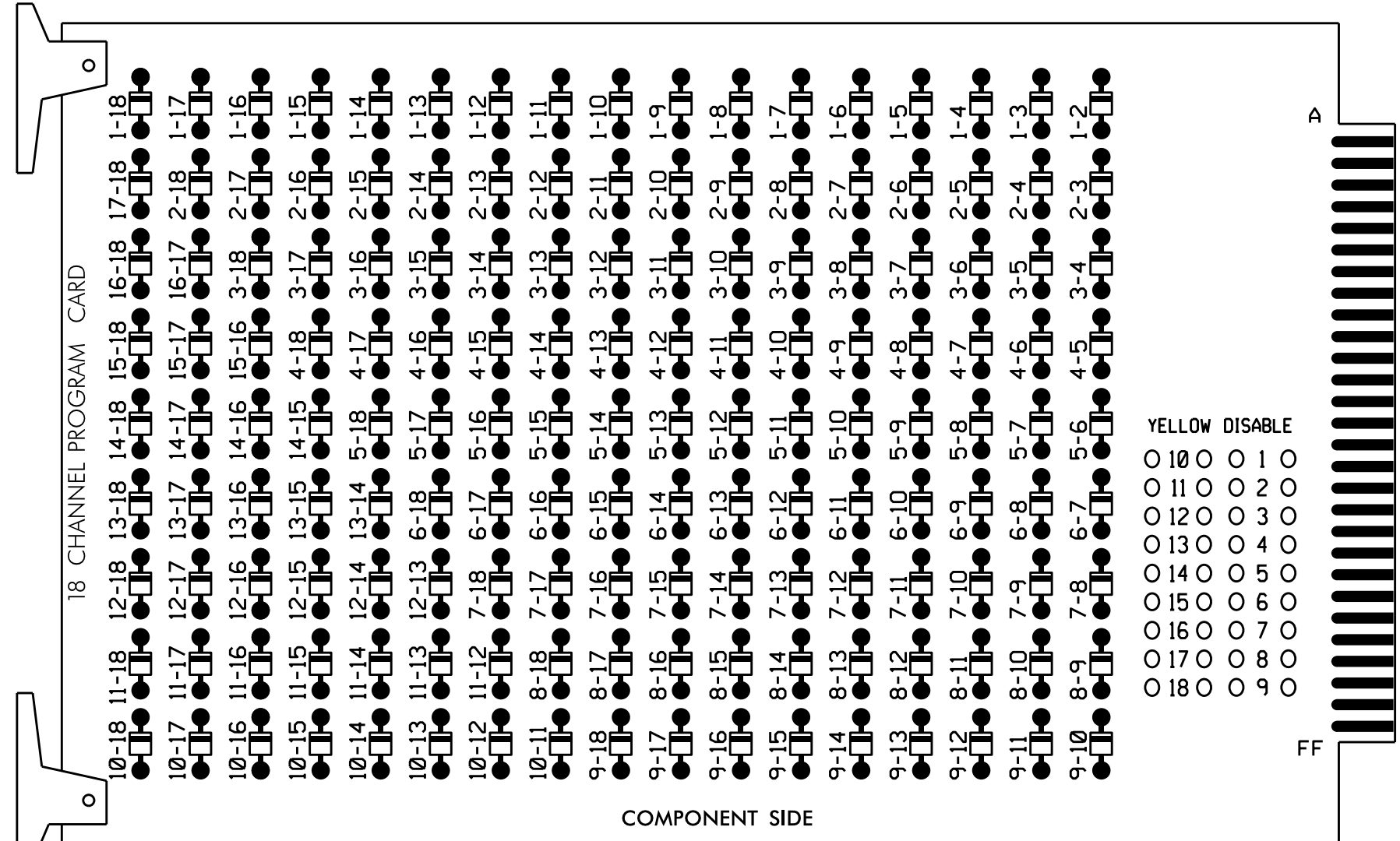
	SR 1747 (Dogwood Road) at SR 1791 (Sunset Drive)		SEAL
	Division 2 Craven County West of Havelock		
750 N. Greenfield Pkwy, Garner, NC 27529	PLAN DATE: May 2019	REVIEWED BY: ZML	DATE: 5/8/2019
PREPARED BY: KGP, Jr.	REVIEWED BY:	REVISIONS:	DATE:
SCALE: 1" = 40'		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

08-MAY-2019 16:21
 S:\IT\GIS\KMT\S\S\Signal\Signal Design Section\Signal Design Section\Reg\Con\401v-02\AR-1015\02-0920\020920-01.dgn
 kgspeedr

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)

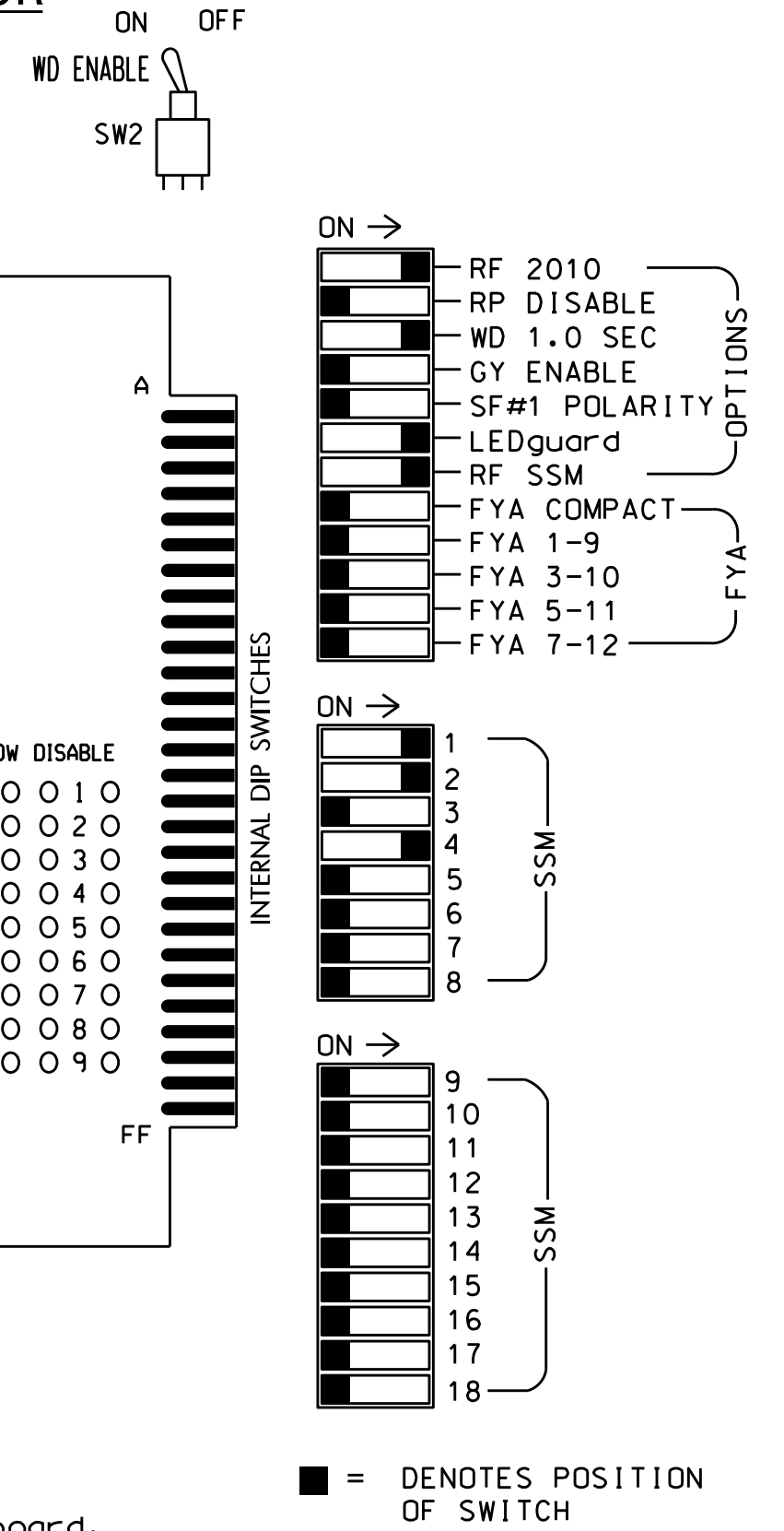
DO NOT REMOVE ANY DIODE JUMPERS



DO NOT REMOVE ANY DIODE JUMPERS

NOTES:

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



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phases 1, 2, and 4 for Red Rest.
4. Program phase 4 for Startup In Red Clear.
5. Program phase 1 as First Phases.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....336
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....POLE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S5
 PHASES USED.....1,2,4
 OVERLAPS.....NONE

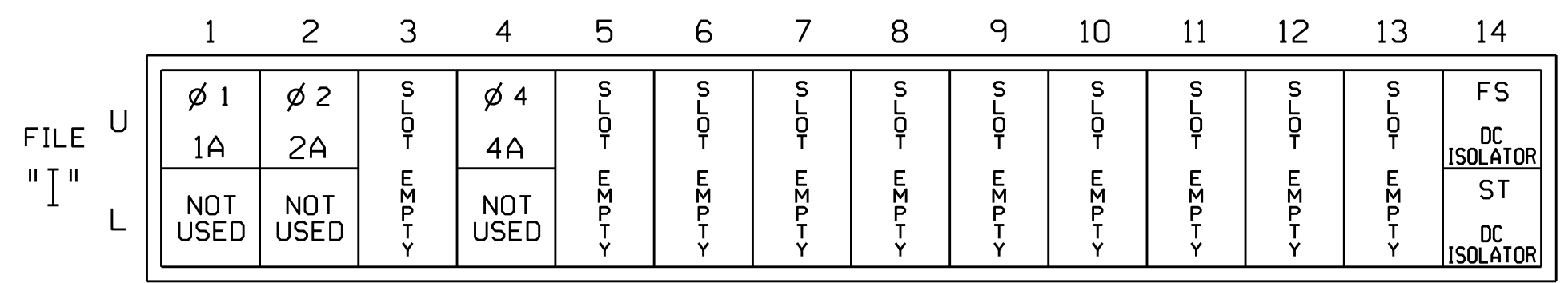
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	21,22	NU	NU	41,42	NU	NU	NU	NU	NU	NU	NU
RED	125	128			101							
YELLOW	126	129			102							
GREEN	127	130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

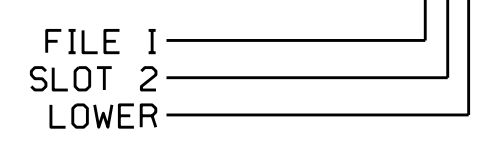
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB21-1,2	I1U	56	18	1	1	Y	Y			
2A	TB21-3,4	I2U	39	1	2	2	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			

INPUT FILE POSITION LEGEND: I2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 02-0920T2
 DESIGNED: May 2019
 SEALED: 5/8/2019
 REVISED: N/A

Electrical Detail - Temporary Signal (Step 2)

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:
 SR 1747 (Dogwood Road) at SR 1791 (Sunset Drive)

Division 2 Craven County West of Havelock
 PLAN DATE: May 2019 REVIEWED BY:
 PREPARED BY: S. Armstrong REVIEWED BY:

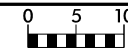
REVISIONS INIT. DATE

DocuSigned by: Ryan W. Hough 5/13/2019
 SEAL 036833
 SEAL 036833
 ENGINEER RYAN W. HOUGH
 SIG. INVENTORY NO. 02-0920T2

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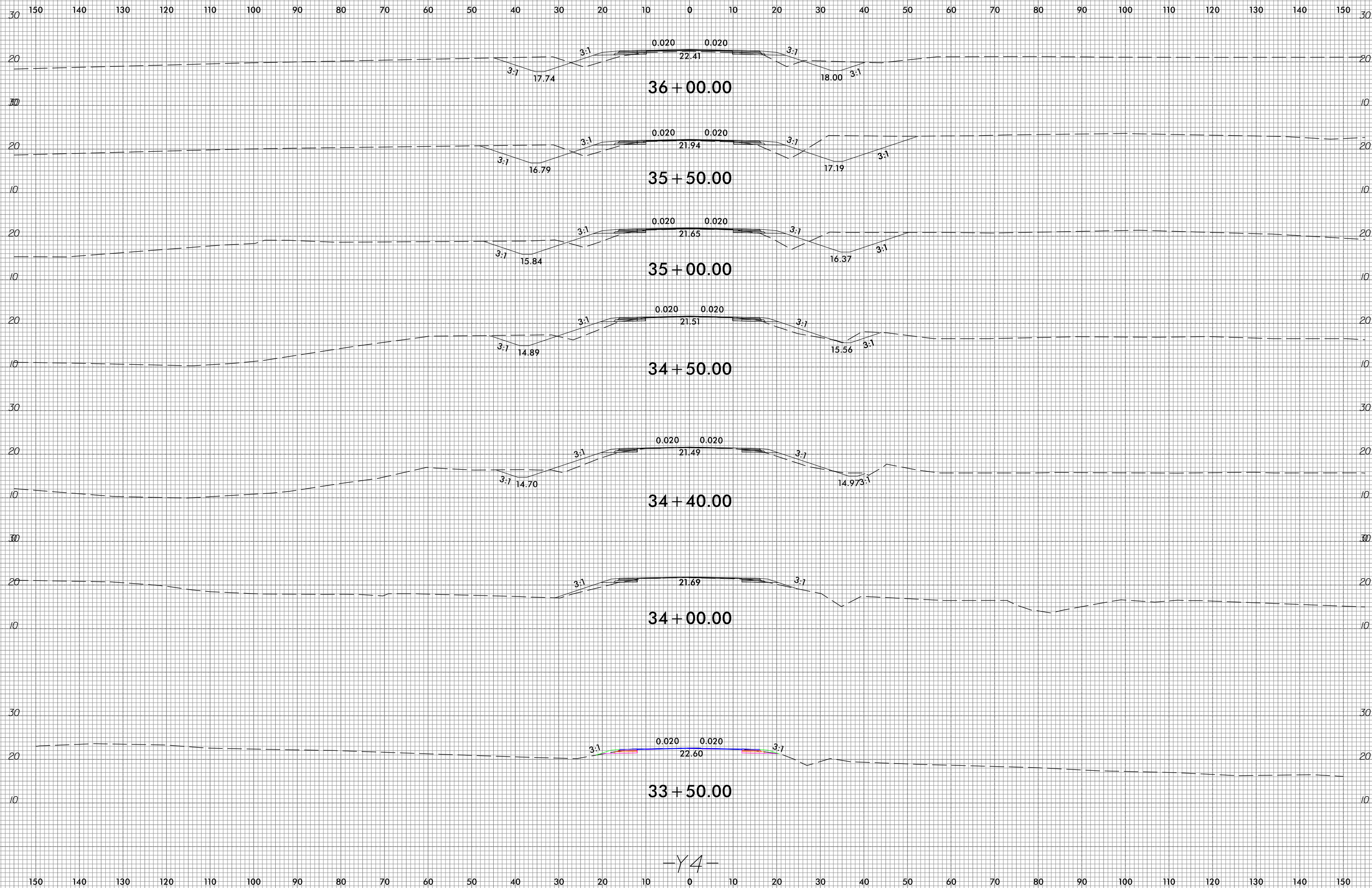
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6/23/16



PROJ. REFERENCE NO.
R-1015

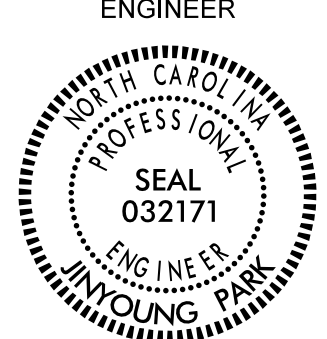
SHEET NO.
X-375



-Y4-

4/23/2016 9:29:02 AM C:\Users\Roadway\XSC\1015_xp1_Y4.dgn gncdlin

GEOTECHNICAL ENGINEER



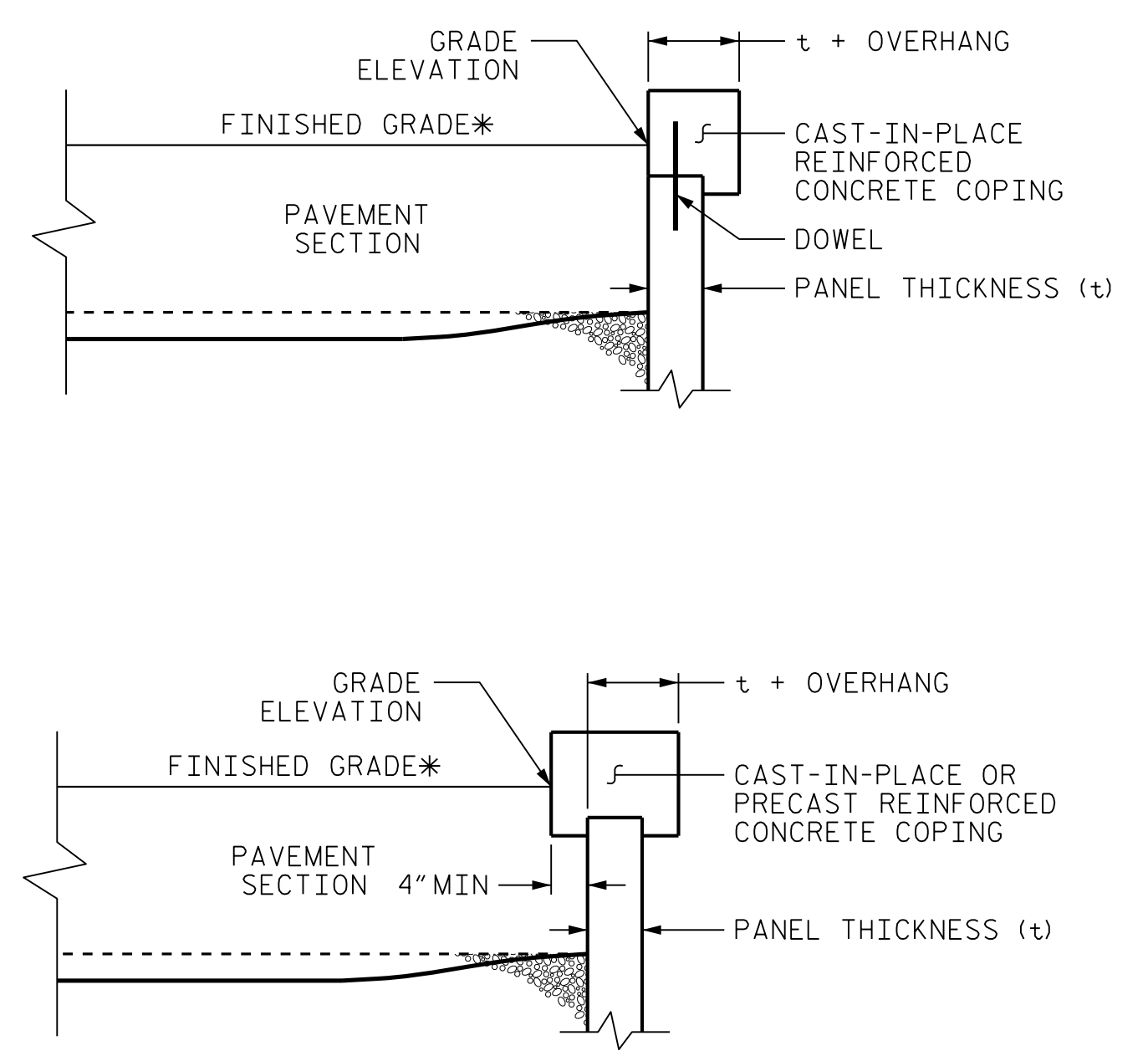
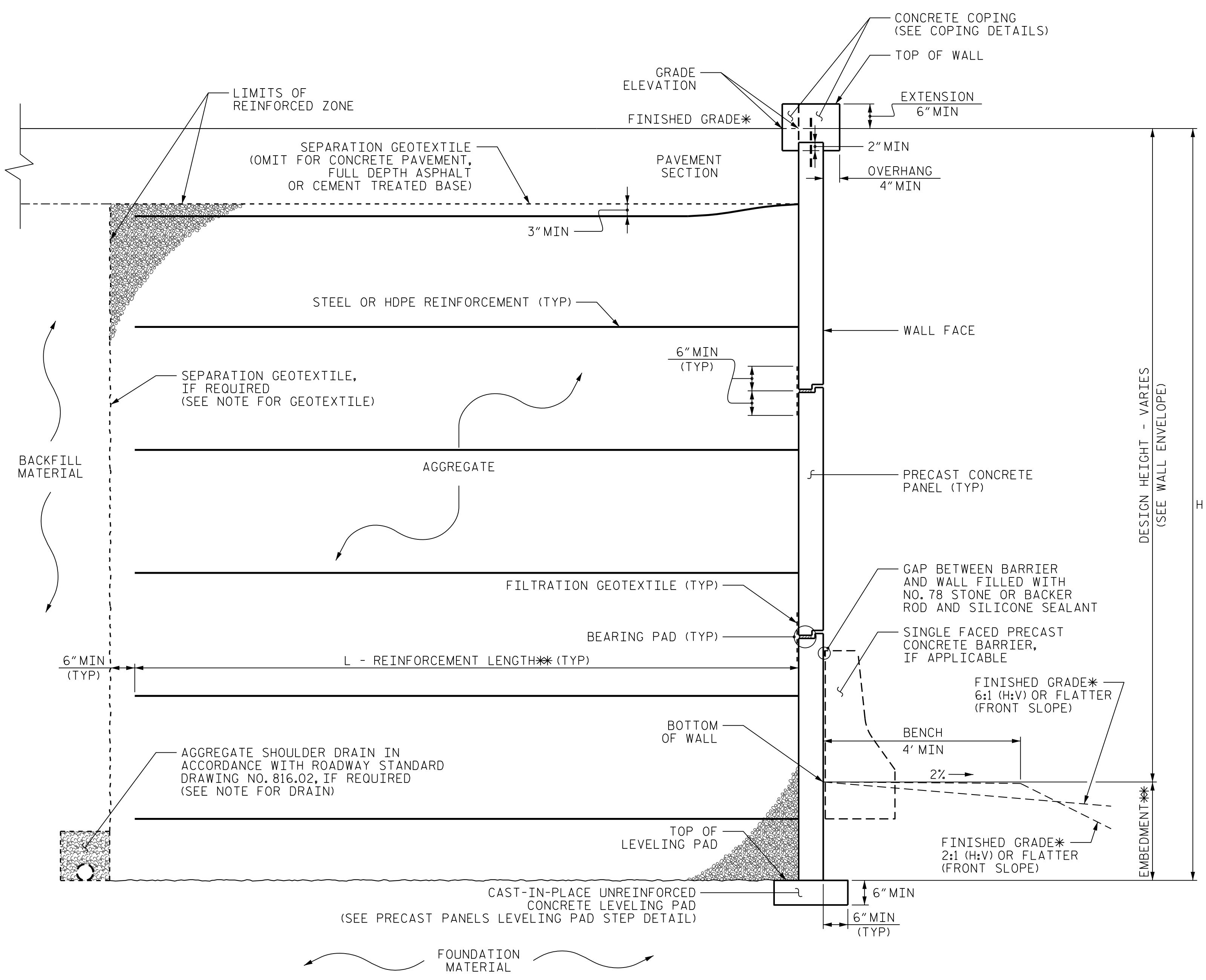
DocuSigned by:
J. Park
5/21/2019

ENGINEER

DATE: 5/21/2019

SIGNATURE: _____ DATE: _____

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UNLESS ALL SIGNATURES COMPLETED**



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.
*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

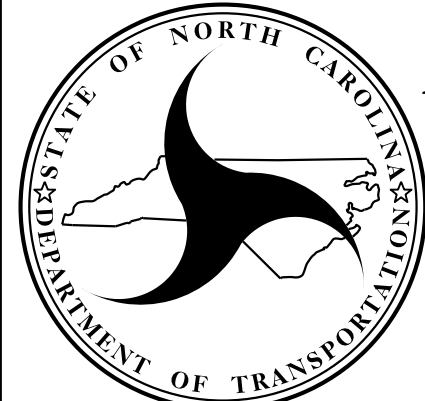
MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

FROM -WALL-1- STA. 13+70.32 TO -WALL-1- STA. 14+54.32, FROM -WALL-2- STA. 12+70.37 TO -WALL-2- STA. 13+35.38,
FROM -WALL-3- STA. 13+16.68 TO -WALL-3- STA. 13+83.68 AND FROM -WALL-4- STA. 12+73.79 TO -WALL-4- STA. 13+55.79

PROJECT NO.: R-1015
 CRAVEN COUNTY
 STATION: 96+97.07 -L / 516+87.37 -L-
 SHEET OF _____

PREPARED BY: J. PARK DATE: 5/21/2019
 REVIEWED BY: J. BATTS DATE: 5/21/2019



**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

REVISIONS						SHEET NO. W-12
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

GEOTECHNICAL ENGINEER

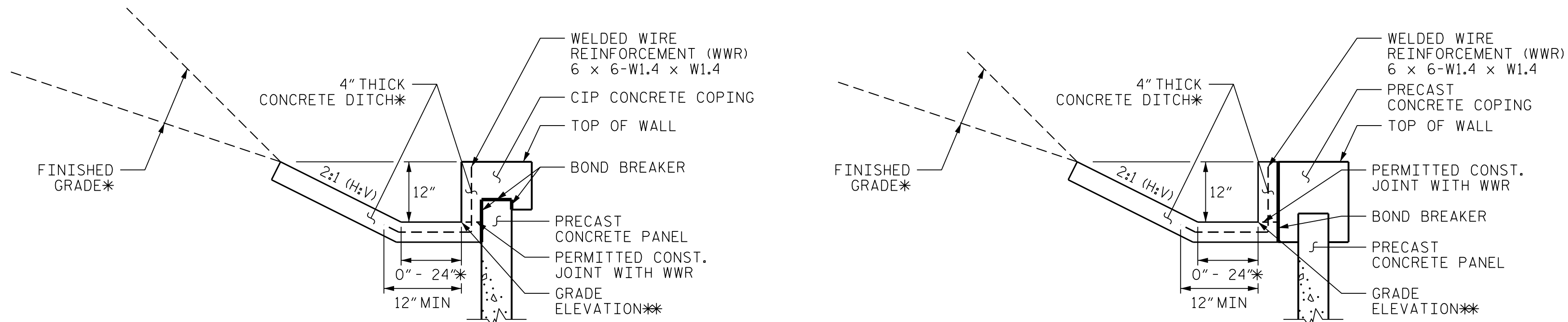
DocSigned by: *J. Young Park* 5/21/2019

DATE

ENGINEER

SIGNATURE DATE

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**CONCRETE DITCH BEHIND
WALL WITH CONCRETE COPING**

*SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
**SEE WALL ENVELOPE FOR GRADE ELEVATIONS.

NOTES

FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.

INSTALL CONCRETE DITCHES FROM -WALL_1- STA. 10+00.00 TO -WALL_1- STA. 11+98.56, FROM -WALL_2- STA. 10+00.00 TO -WALL_2- STA. 11+09.87, FROM -WALL_3- STA. 10+00.00 TO -WALL_3- STA. 11+50.33 AND FROM -WALL_4- STA. 10+00.00 TO -WALL_4- STA. 11+03.00.

PROJECT NO.: R-1015
 CRAVEN COUNTY
 STATION: 96+97.07 -L- / 516+87.37 -L-
 SHEET OF

**NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS**

**GEOTECHNICAL
 ENGINEERING UNIT**

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PREPARED BY: J. PARK	DATE: 5/21/2019
REVIEWED BY: J. BATTS	DATE: 5/21/2019

SHEET NO.
W-13