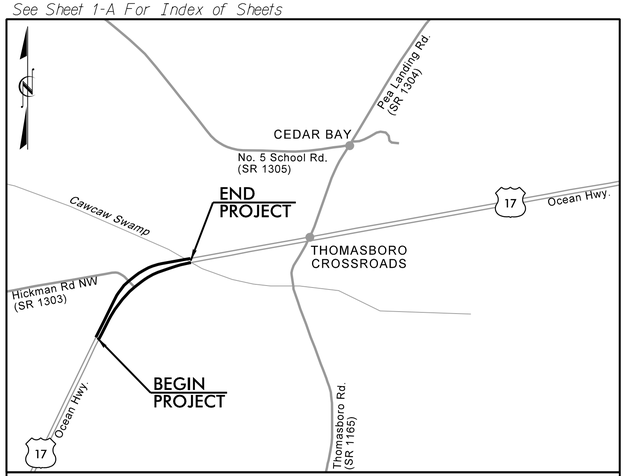
TIP PROJECT: W-5703H

CONTRACT: DC00326

See Sheet 1-A For Index of Sheets



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

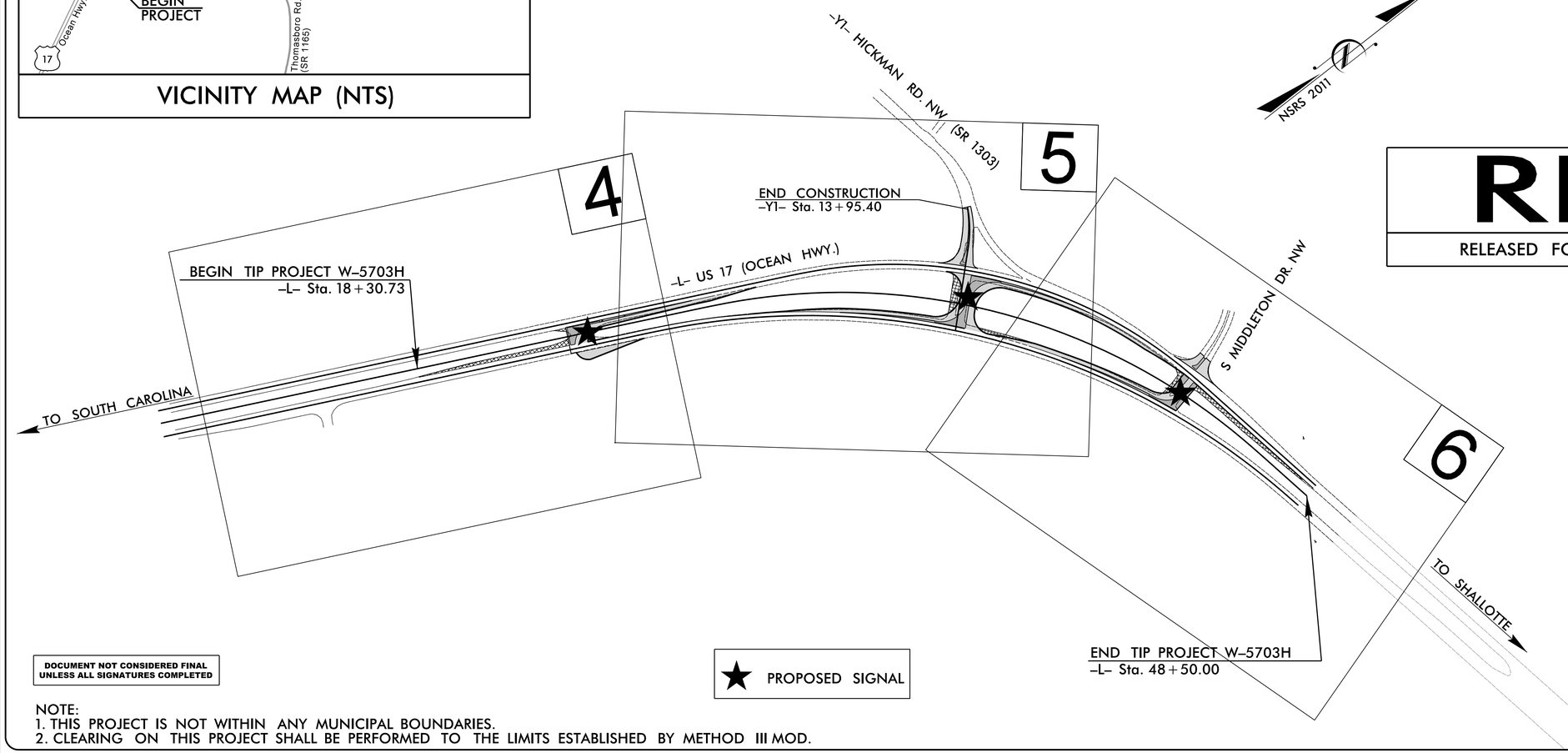
LOCATION: US-17 AT SR 1303 (HICKMAN ROAD NW)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5703H	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
44849.1.8	HSIP-0017 (169)	PE
44849.2.8	HSIP-0017 (169)	R/W
44849.3.8	HSIP-0017 (169)	CONST.





RFC
RELEASED FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

★ PROPOSED SIGNAL

NOTE:
1. THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III MOD.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2021 = 24,800
ADT 2040 = 43,500
V = 60 MPH
FUNC CLASS = ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5703H..... 0.572 miles
LENGTH STRUCTURE TIP PROJECT W-5703H..... 0 miles
TOTAL LENGTH OF PROJECT W-5703H..... 0.572 miles

PLANS PREPARED BY:
RK&K
P: (919) 878-9560
8601 SIX FORKS ROAD, FORUM 1, SUITE 700
RALEIGH, NORTH CAROLINA 27615
NC LICENSE NO. F-0112
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: August 13, 2021
LETTING DATE: December 16, 2021

Michael Merritt, P.E.
PROJECT ENGINEER

Scott Blevins, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: Michael Bass
PROJECT MANAGER - DIVISION 3

HYDRAULICS ENGINEER
DocuSigned by: Robert B. Huskey
SIGNATURE:
P.E. 11/17/2021
NORTH CAROLINA PROFESSIONAL SEAL 40807 ENGINEER ROBERT B. HUSKEY

ROADWAY DESIGN ENGINEER
DocuSigned by: Scott D. Blevins
SIGNATURE:
P.E. 11/17/2021
NORTH CAROLINA PROFESSIONAL SEAL 16725 ENGINEER SCOTT D. BLEVINS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

09/08/99
11/16/2021
R:\Roadway\Proj\W-5703H_Rdy_tsh.dgn
ahefler

8/17/99

INDEX of SHEETS, GENERAL NOTES, and LIST of STANDARDS

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SCOTT D. BLEVINS SEAL

DocuSigned by: Scott D. Blevins 3EC9C4C3BEFA41...

11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE, TYPICAL SECTIONS, WEDGING DETAILS,
2B-1	MEDIAN U-TURN BULB DETAIL
2B-2 AND 2B-3	INTERSECTION DETAILS
2C-1	NCDOT SPECIAL DETAILS
3B-1	SUMMARY OF EARTHWORK, PAVEMENT REMOVAL SUMMARY,
3D-1	DRAINAGE SUMMARIES
3G-1	SUMMARY OF SUBSURFACE DRAINAGE
4 THRU 6	PLAN SHEETS
7 THRU 10	PROFILE SHEETS
RW01 THRU RW06	RIGHT OF WAY PLAN SHEETS
TMP-1 THRU TMP-11	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-4	PAVEMENT MARKING PLANS
EC-1 THRU EC-9	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-7	SIGNING PLANS
SIG-1 THRU SIG-5	SIGNAL PLANS
UO-0 THRU UO-4	UTILITY BY OTHERS PLANS
X-0 THRU X-9	CROSS SECTIONS

LIST OF STANDARD DRAWINGS

EFF. 01-16-2018
REV.

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	
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.37	Steel Grate and Frame
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
848.04	Street Turnout
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
876.02	Guide for Rip Rap at Pipe Outlets

LIST OF GENERAL NOTES

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE ATLANTIC TELEPHONE MEMEBERSHIP CORP..

ATT/T (TRANSMISSION) - FIBER OPTIC, BRUNSWICK COUNTY PUBLIC UTILITY,

BRUNSWICK ELECTRICAL MEMBERSHIP CORP., DUKENET COMMUNICATIONS, LLC

EARTHLINK BUSINESS, TIME WARNER CABLE, AND NCDOT

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

11/17/2021
K:\Roadway\Proj\W-5703H_Rdy_psh01A.dgn
abeller

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW 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

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:

** SUE – Subsurface Utility Engineering*
LOS – Level of Service – A,B,C or D (Accuracy)

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 — HH
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — P

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE – LOS A)*
- U/G Water Line (SUE – LOS B)* — W
- U/G Water Line (SUE – LOS C)* — W
- U/G Water Line (SUE – LOS D)* — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Test Hole (SUE – LOS A)*
- U/G TV Cable (SUE – LOS B)* — TV
- U/G TV Cable (SUE – LOS C)* — TV
- U/G TV Cable (SUE – LOS D)* — TV
- U/G Fiber Optic Cable (SUE – LOS B)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS C)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS D)* — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE – LOS A)*
- U/G Gas Line (SUE – LOS B)* — G
- U/G Gas Line (SUE – LOS C)* — G
- U/G Gas Line (SUE – LOS D)* — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)* — FSS
- SS Force Main Line (SUE – LOS C)* — FSS
- SS Force Main Line (SUE – LOS D)* — FSS

MISCELLANEOUS:

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

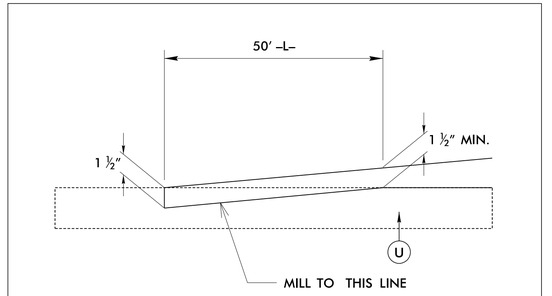
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
11/17/2021	11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

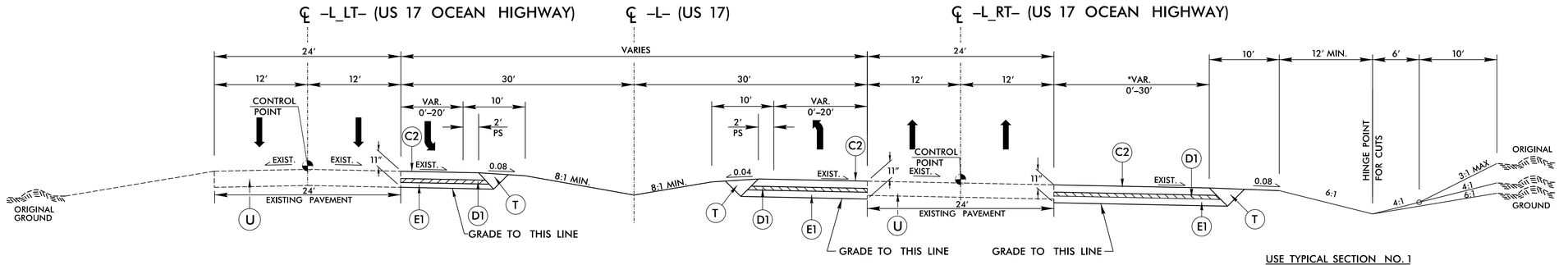
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
R1	5" MONOLITHIC CONCRETE ISLAND (KEYED-IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
SEE PLANS FOR LOCATION OF CONCRETE ISLANDS AND SIDEWALK.

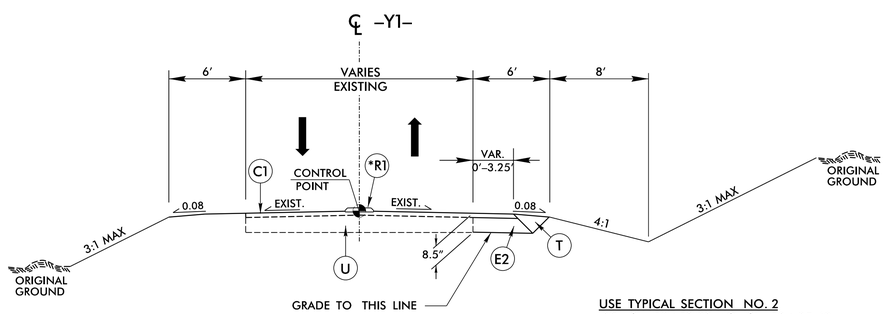


DETAIL SHOWING MILLED PAVEMENT TIE-IN



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- Sta. 23+25.00 TO Sta. 43+60.00
* -L_RT- Sta. 23+49.73 TO Sta. 25+67.57 (RT)



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-Y1- Sta. 10+12.02 TO Sta. 13+95.40
*-Y1- Sta. 12+10.00 TO Sta. 12+82.00

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

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

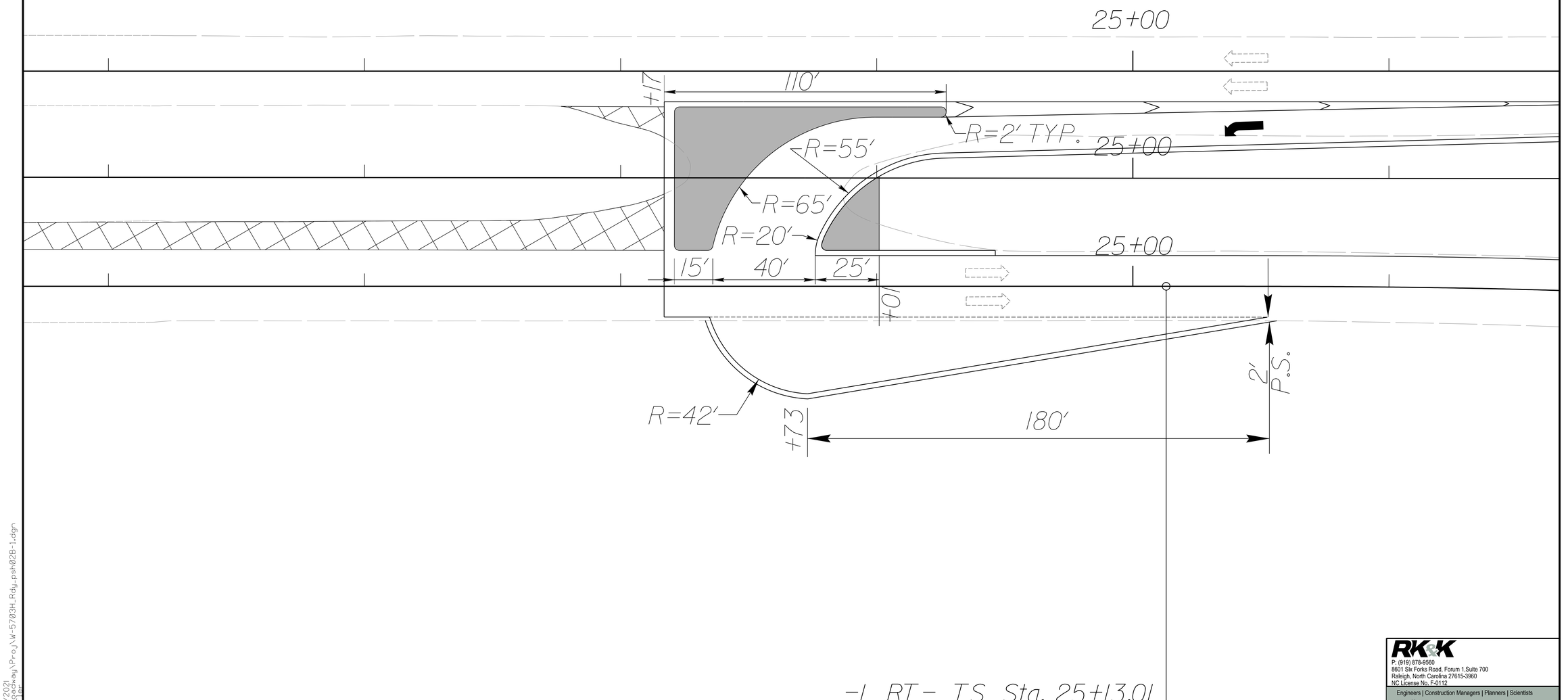
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS

Documented by: [signature]

11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL OF TYPICAL MEDIAN U-TURN BULB



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

11/16/2021
R:\Roadway\Proj\W-5703H_Rdy_psh02B-1.dgn
ahefler

–L– AND –Y1– INTERSECTION DETAIL

SCALE 1" = 30'

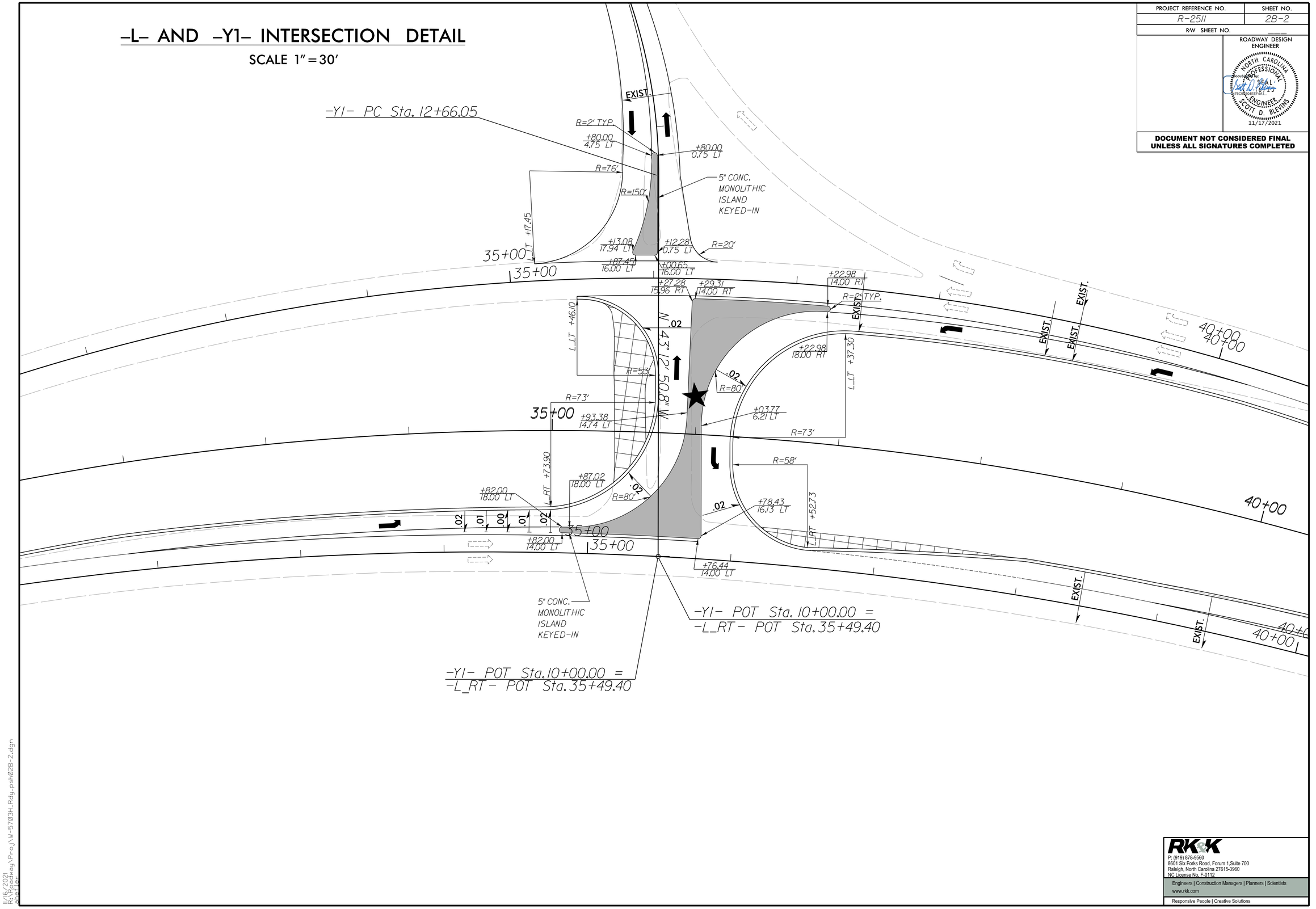
PROJECT REFERENCE NO.	SHEET NO.
R-2511	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047125 ENGINEER SCOTT D. BLEVINS

11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

11/15/2021
K:\Raleigh\Roadway\Proj\W-5703H_Rdy_psh02B-2.dgn
sheffler

PROJECT REFERENCE NO.	SHEET NO.
R-2511	2B-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

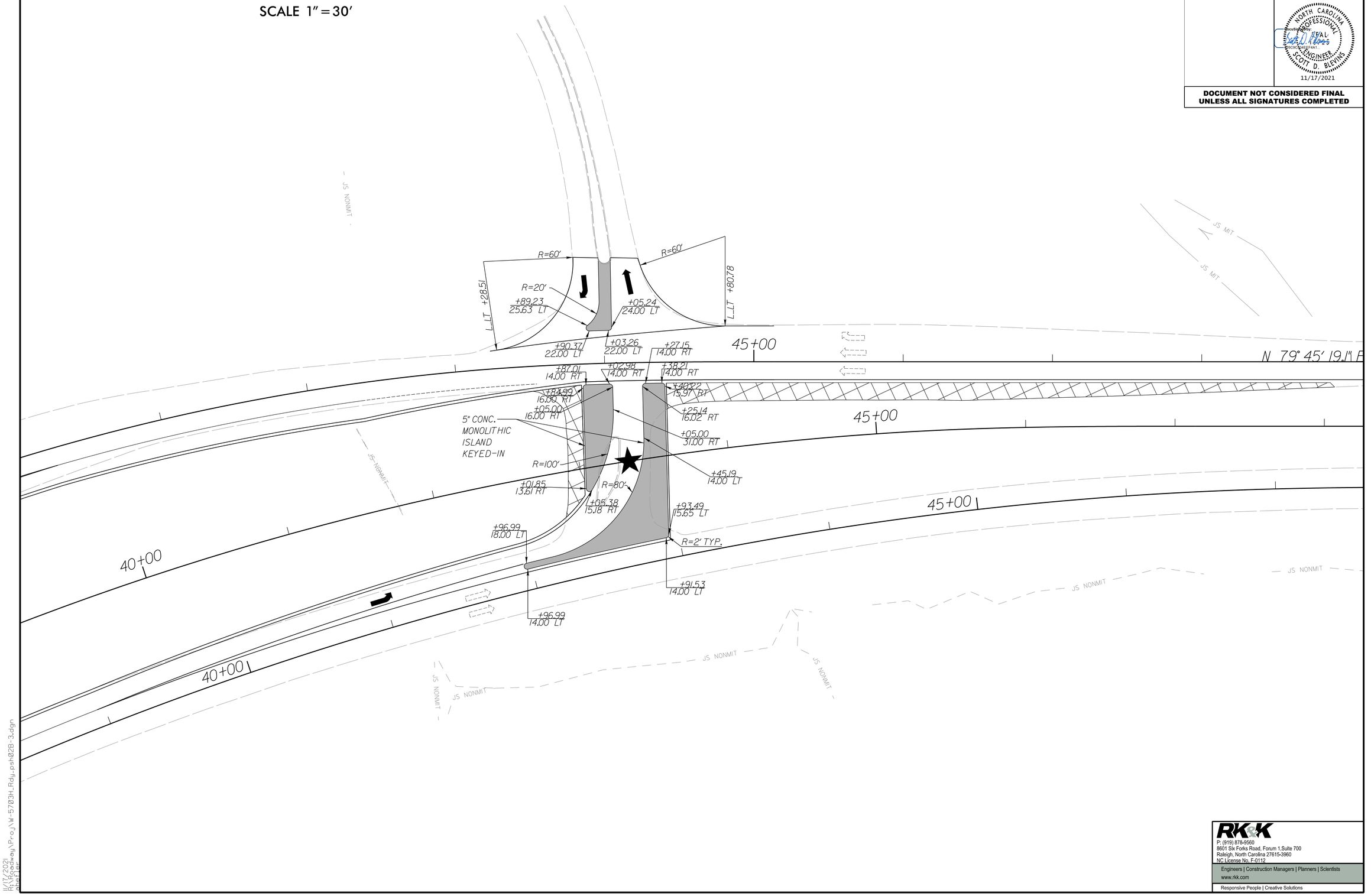
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS

11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEFT OVER DETAIL

SCALE 1" = 30'



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

11/17/2021
R:\Roadway\Proj\W-5703H_Rdy_psh02B-3.dgn

5/14/99

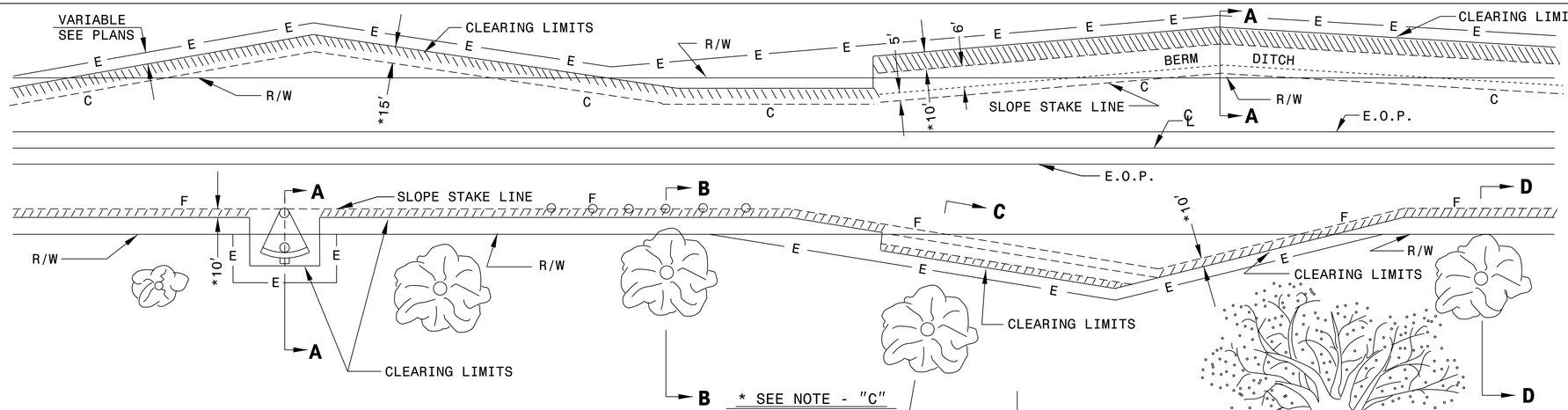
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	2C-1

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

ENGLISH DETAIL DRAWING FOR

METHOD OF CLEARING

MODIFIED METHOD - III



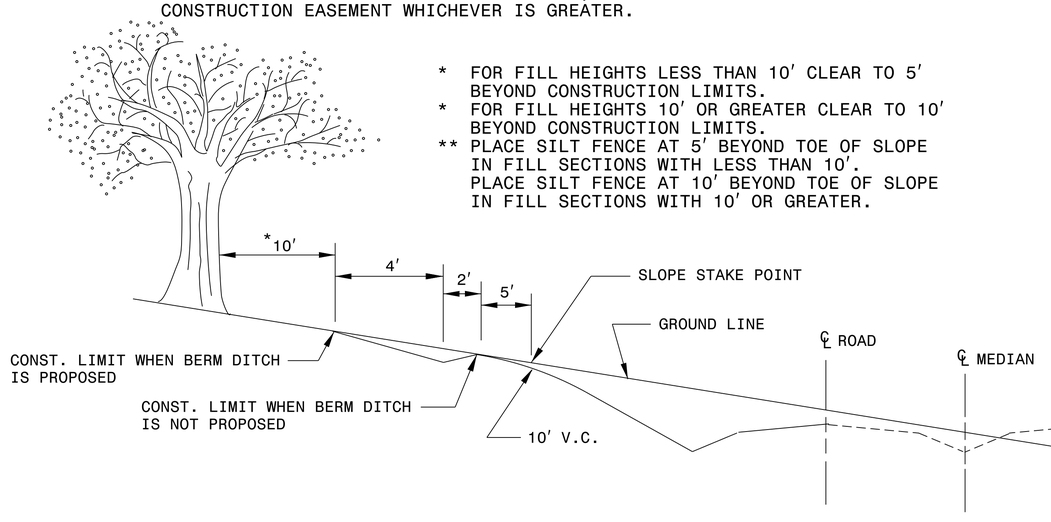
GENERAL NOTES:

1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.

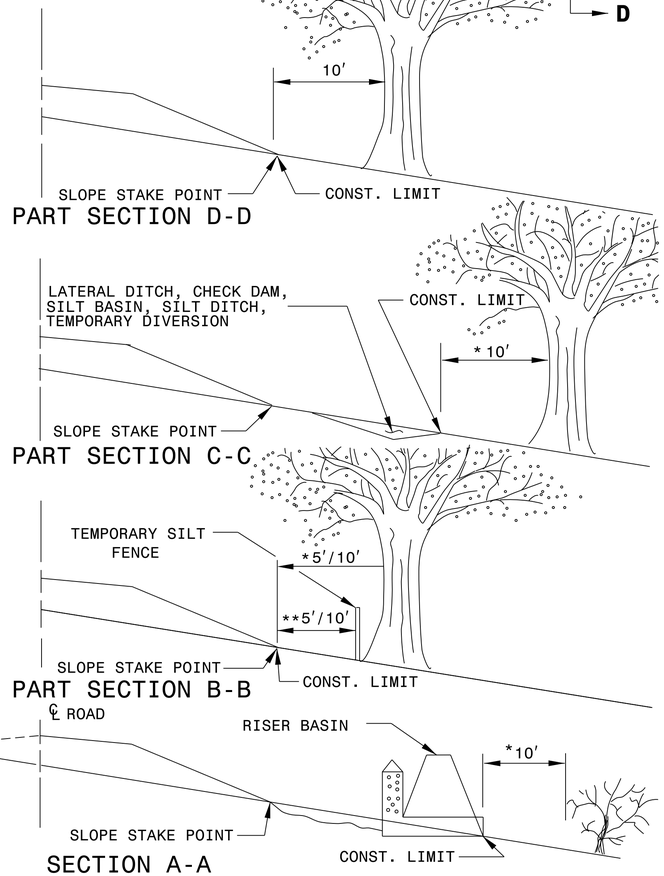
METHOD III CLEARING LIMITS

(A) CUTS -- CLEAR TO CONSTRUCTION LIMITS.
(B) FILLS - CLEAR TO 5′/10′ * BEYOND CONSTRUCTION LIMITS, UNLESS SPECIFIED OTHERWISE BY WETLAND PERMIT.
(C) CUTS AND FILLS - WHEN THE CLEARING LIMITS (A AND B) EXCEED THE PROPOSED R/W OR PROPOSED CONSTRUCTION EASEMENTS, THEN CLEAR ONLY TO THE R/W OR CONSTRUCTION EASEMENT WHICHEVER IS GREATER.

* FOR FILL HEIGHTS LESS THAN 10′ CLEAR TO 5′ BEYOND CONSTRUCTION LIMITS.
* FOR FILL HEIGHTS 10′ OR GREATER CLEAR TO 10′ BEYOND CONSTRUCTION LIMITS.
** PLACE SILT FENCE AT 5′ BEYOND TOE OF SLOPE IN FILL SECTIONS WITH LESS THAN 10′. PLACE SILT FENCE AT 10′ BEYOND TOE OF SLOPE IN FILL SECTIONS WITH 10′ OR GREATER.



SECTION A-A



SHEET 1 OF 1

200D03

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

ENGLISH DETAIL DRAWING FOR

METHOD OF CLEARING

MODIFIED METHOD - III

SHEET 1 OF 1

200D03

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel T. Howerton

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

SEE TITLE BLOCK

ORIGINAL BY:	T.S.S.	DATE:	FEB.2000
MODIFIED BY:	K.A.K.	DATE:	AUG.2016
CHECKED BY:		DATE:	
FILE SPEC.:	kkempf/english/0200d301.dgn		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

05-DEC-2017 09:31
S:\Contracts\Special Details\kkempf\english\0200D301_modified method III CandG.dgn
jhowerton
AT CSD-292695

COMPUTED BY: ASH DATE: 4 /30 /2021
CHECKED BY: DATE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	3B-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUMMARY OF EARTHWORK

IN CUBIC YARDS

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.
SUMMARY 1							
-L-	23+50.00	43+50.00	1,369		1,674	305	
SUBTOTAL			**1,369**		**1,674**	**305**	
SUMMARY 2							
-Y1-	10+35.00	13+00.00	85		677	592	
SUBTOTAL			**85**		**677**	**592**	
SHEET TOTALS			**1,454**		**2,352**	**898**	
PROJECT TOTAL			**1,454**		**2,352**	**898**	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT						**45**	
GRAND TOTAL			**1,454**			**943**	
SAY			**1,460**			**950**	

ASPHALT PAVEMENT REMOVAL

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
L	16+97	23+17	CL	6349.49		705.50
L	22+61	23+17	LT	322.05		35.78
Y1	10+52	11+77	LT	2321.37		257.93
L	36+51	38+33	RT	1022.67		113.63
L	42+92	43+03	CL	1030.21		114.47
L	43+63	48+50	LT	5377.61		597.51
					TOTAL	1,824.82
					SAY	**1,830**

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

5/9/06
10/20/2021
R:\Roadway\Proj\W-5703H_Rdy_psh03B-1.dgn
ghefler

COMPUTED BY:	RBH	DATE:	10/12/2021
CHECKED BY:	CAH	DATE:	10/15/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	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" & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | % MINIMUM REQUIRED SLOPE | 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, PP, OR PVC | R.C. PIPE CLASS IV 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | PIPE AS NOTED | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | 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 | "TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B')" | 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 AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.19 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29 | J.B. STD. 840.31 OR 840.32 | TBJB STD. 840.34 | M.H. FRAME AND COVER STD. 840.54 | ADJUST MH | CONV DI TO JBMH | CONV CB TO JB | FLOWABLE FILL (CY) | DRAINAGE PIPE ELBOWS NO. & SIZE | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---

8/17/99

COMPUTED BY: Tyler C. Bottoms DATE: 7/26/21
CHECKED BY: Thein Tun Zan DATE: 7/28/21

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	3G-1

(5-15-18)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-L-	22+00	28+75	LT & RT	SD	1400
-L-	34+75	43+65	LT & RT	SD	1800
CONTINGENCY				SD	500
				TOTAL LF:	3700

***UD = Underdrain**
***BD = Blind Drain**
***SD = Subsurface Drain**

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

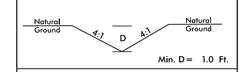
10/20/2021
R:\Roadway\Proj\W-5703H_Rdy_psh3G-1.dgn
sheetflag

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS 11/17/2021	NORTH CAROLINA PROFESSIONAL SEAL 40807 ENGINEER ROBERT B. HUSKEY 11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

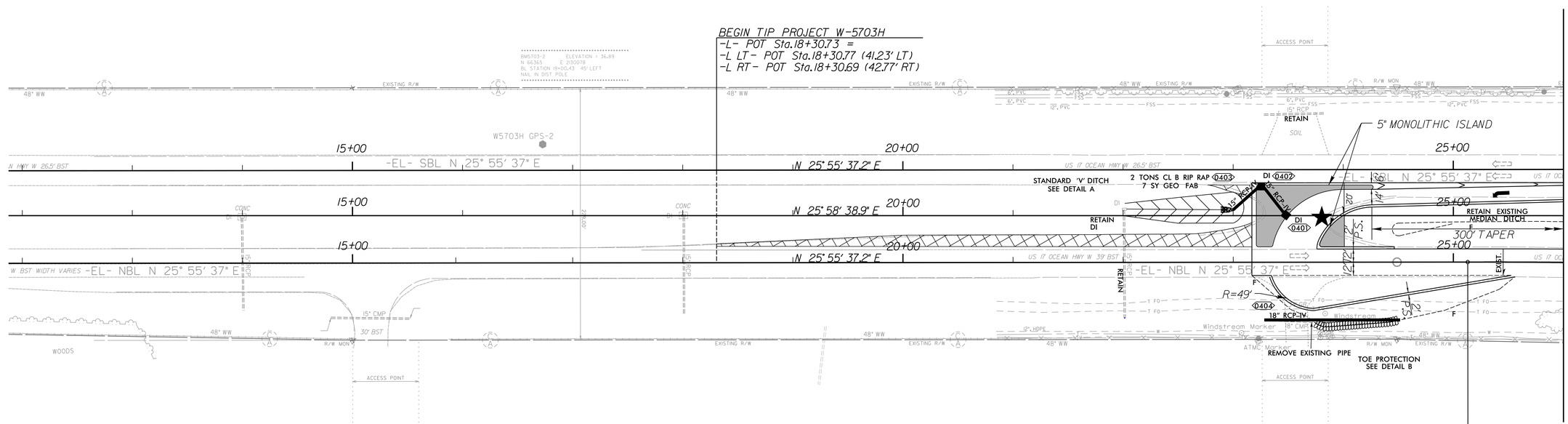
NSRS 2011

DETAIL A
STANDARD 'V' DITCH
(Not to Scale)



Min. D= 1.0 Ft.

-L- STA. 22+00 TO STA. 23+00 CL,
BEG EL=32.70', END EL=32.79', S=0.09%

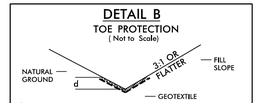


MATCH LINE -L- STA 26+00.00 SEE SHEET 5

-L_RT- TS Sta. 25+13.01

-L_RT-
PIs Sta 26+19.69
Θs = 1° 59' 18.9"
Ls = 160.00'
LT = 106.67'
ST = 53.34'

DETAIL B
TOE PROTECTION
(Not to Scale)



d= 1.0 Ft.

Type of Liner= Class B Rip-Rap

-L_RT- STA. 23+75 TO STA. 24+50 RT

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

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

FOR -L_LT- & -L_RT- PROFILES SEE SHT. 7

8/17/99

11/16/2021
R:\Roadway\Proj\W-5703H_Rdy_psh04.dgn

8/17/99

-L_LT-	
PIs Sta 30+93.70	PI Sta 37+87.65
θs = 3° 09' 01.0"	Δ = 47° 31' 39.9" (RT)
Ls = 160.00'	D = 3° 56' 16.3"
LT = 106.68'	L = 1,206.95'
ST = 53.35'	T = 640.64'
	R = 1,455.00'

-Y1-	
PI Sta 14+69.78	
Δ = 57° 01' 48.0" (LT)	
D = 15° 16' 43.9"	
L = 373.26'	
T = 203.74'	
R = 375.00'	

-L-	
PIs Sta 28+09.52	PI Sta 37+64.26
θs = 2° 19' 36.2"	Δ = 49° 10' 29.4" (RT)
Ls = 160.00'	D = 2° 54' 30.3"
LT = 106.68'	L = 1,690.78'
ST = 53.34'	T = 901.41'
	R = 1,970.00'

-L_RT-	
PIs Sta 26+19.69	PI Sta 37+44.21
θs = 1° 59' 18.9"	Δ = 49° 51' 04.2" (RT)
Ls = 160.00'	D = 2° 29' 08.6"
LT = 106.67'	L = 2,005.50'
ST = 53.34'	T = 1,071.20'
	R = 2,305.00'

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040123 ENGINEER SCOTT D. BLEVINS
Docusigned by: Scott D. Blevins
11/17/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040077 ENGINEER ROBERT B. HUSKEY
Docusigned by: Robert B. Huskey
11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NSRS 2011

END CONSTRUCTION
-Y1- POT Sta.13+95.40

-L_LT- SC Sta. 31+47.02

-Y1- PC Sta. 12+66.05

REMOVE EXISTING MONOLITHIC ISLAND

5" MONOLITHIC ISLAND

-L_LT- TS Sta. 29+87.02

REMOVE EXISTING MONOLITHIC ISLAND

RETAIN EXISTING MEDIAN DITCHES

RETAIN EXISTING MEDIAN DITCH

-L- SC Sta. 28+62.85

-L- TS Sta. 27+02.85

-L_RT- SC Sta. 26+73.01

-Y1- POT Sta.10+00.00 = -L RT- POT Sta.35+49.40

5 TONS CL B RIP RAP
14 SY GEO FAB

BM2 ELEVATION = 33.98
N 68092 E 213106
BL STATION 41+23.94 129' RIGHT
NAIL IN SKIN LIVE OAK

MATCH LINE -L- STA 26+00.00 SEE SHEET 4

MATCH LINE -L- STA 39+00.00 SEE SHEET 6

2017 ADT
2040 ADT

-Y1-
HICKMAN RD. NW
(SR 1303)
10,600
16,800

4,700 / 7,400
5,800 / 9,100

17 25,400 / 40,000
26,400 / 41,400 17

100 / 300

PROJECTED TRAFFIC VOLUMES

THE AADT DATA WAS DEVELOPED BASED ON PEAK HOUR VOLUMES SINCE A TRAFFIC FORECAST WAS NOT DEVELOPED AS PART OF THIS PROJECT.

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

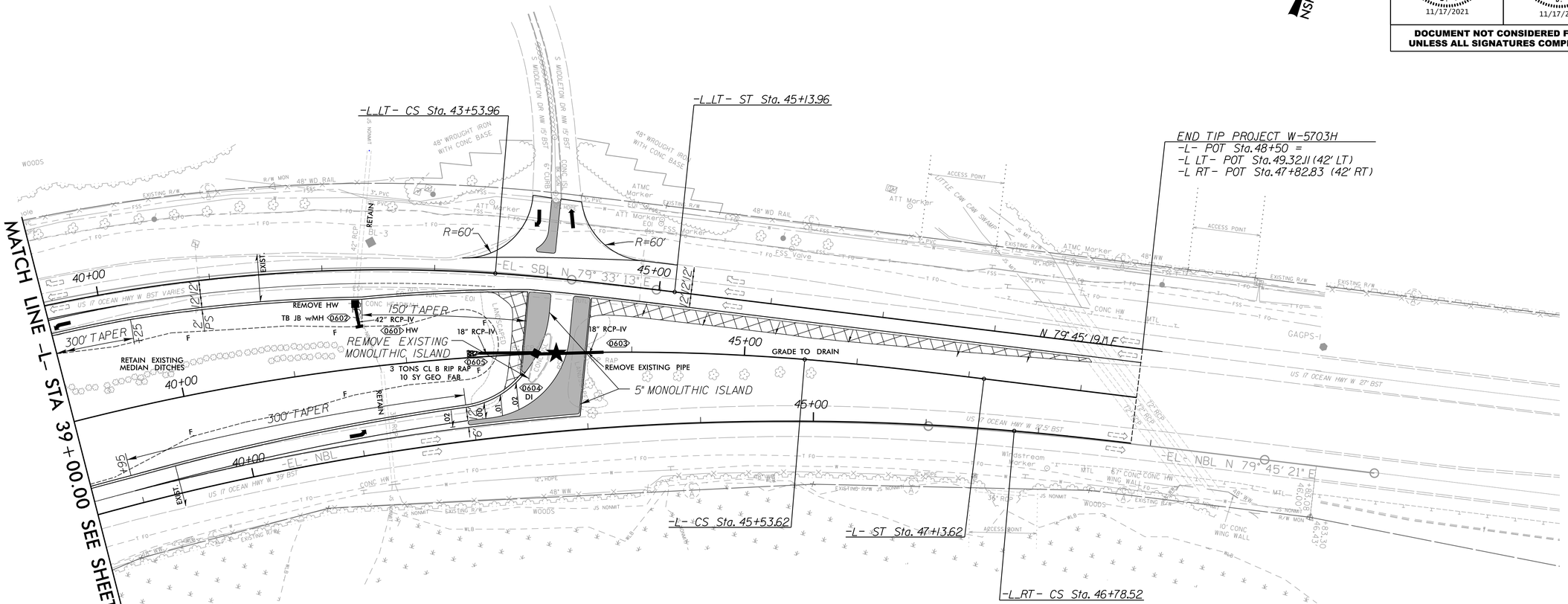
FOR -L_LT- & -L_RT- PROFILES SEE SHT. 8
FOR -Y1- & -Y1SPUR- PROFILES SEE SHT. 10

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

11/16/2021
R:\Projects\Proj\W-5703H_Rdy_psh05.dgn
shefler

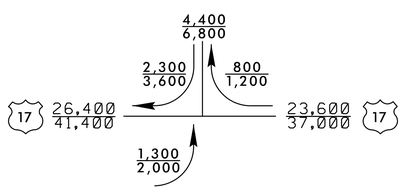
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS 11/17/2021	NORTH CAROLINA PROFESSIONAL SEAL 40807 ENGINEER ROBERT B. HUSKEY 11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



2017 ADT
2040 ADT

S MIDDLETON RD. SW



PROJECTED TRAFFIC VOLUMES

THE AADT DATA WAS DEVELOPED BASED ON PEAK HOUR VOLUMES SINCE A TRAFFIC FORECAST WAS NOT DEVELOPED AS PART OF THIS PROJECT.

-L_LT-

PI Sta 37+87.65	PIs Sta 44+07.31
△ = 47° 31' 39.9" (RT)	Θs = 3° 09' 01.0"
D = 3° 56' 16.3"	Ls = 160.00'
L = 1,206.95'	LT = 106.68'
T = 640.64'	ST = 53.35'
R = 1,455.00'	

-L-

PI Sta 37+64.26	PIs Sta 46+06.97
△ = 49° 10' 29.4" (RT)	Θs = 2° 19' 36.2"
D = 2° 54' 30.3"	Ls = 160.00'
L = 1,690.78'	LT = 106.68'
T = 901.41'	ST = 53.34'
R = 1,970.00'	

-L_RT-

PI Sta 37+44.21	PIs Sta 47+31.86
△ = 49° 51' 04.2" (RT)	Θs = 1° 59' 18.9"
D = 2° 29' 08.6"	Ls = 160.00'
L = 2,005.50'	LT = 106.67'
T = 1,071.20'	ST = 53.34'
R = 2,305.00'	

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

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

FOR -L LT- & -L RT- PROFILES SEE SHT. 9

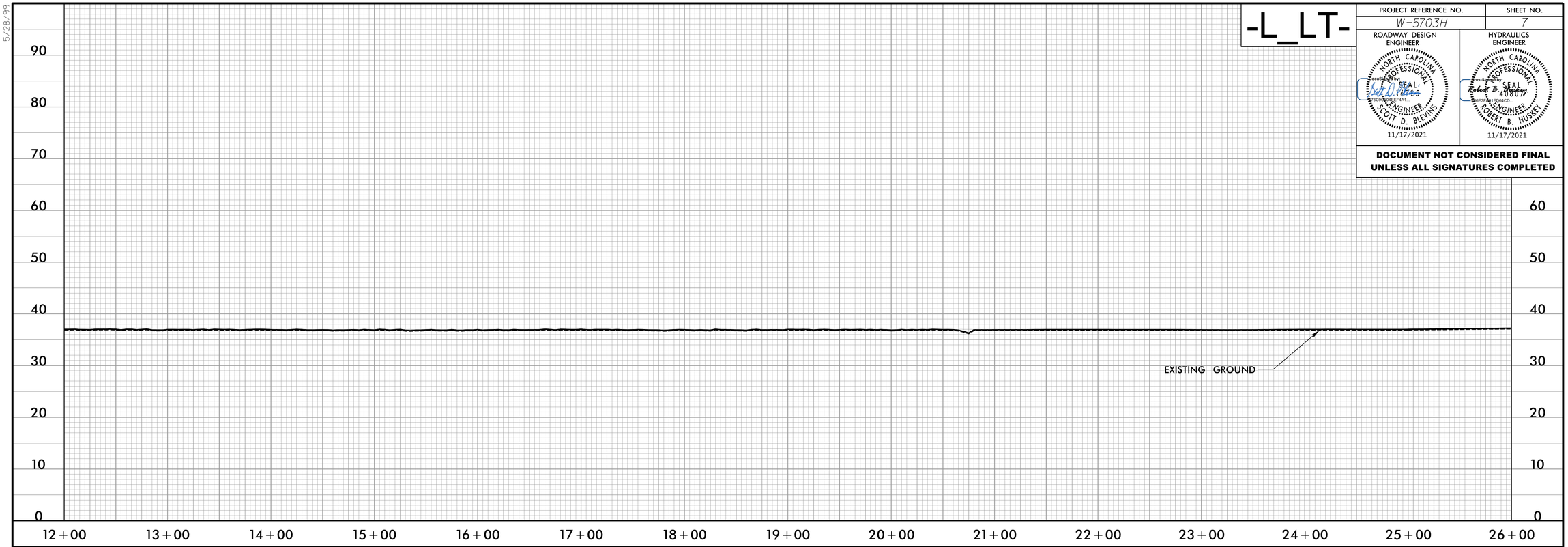
8/17/99
11/16/2021
R:\Roadway\Proj\W-5703H_Rdy_psh06.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	7

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS
11/17/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 408077 ENGINEER ROBERT B. HUSKEY
11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





FOR -L_LT- & -L_RT- PLAN SEE SHT. 4

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

5/28/99

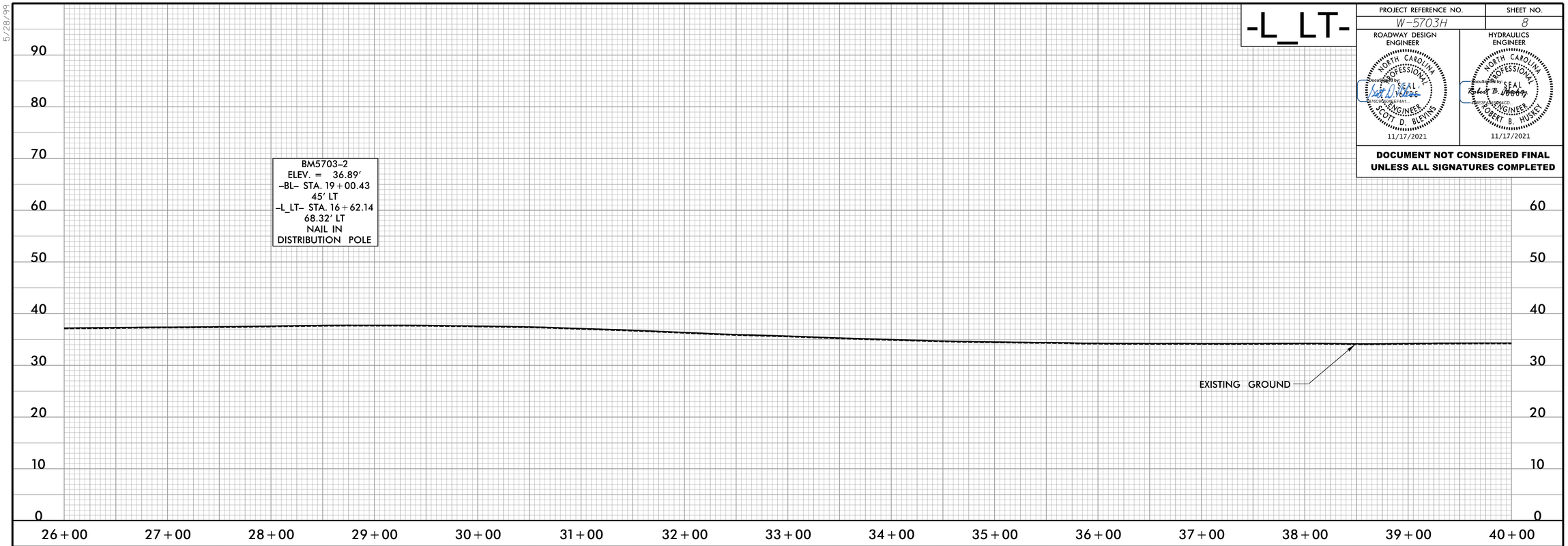
11/16/2021
R:\Roadway\Proj\W-5703H_Rdy_pfl_07.dgn

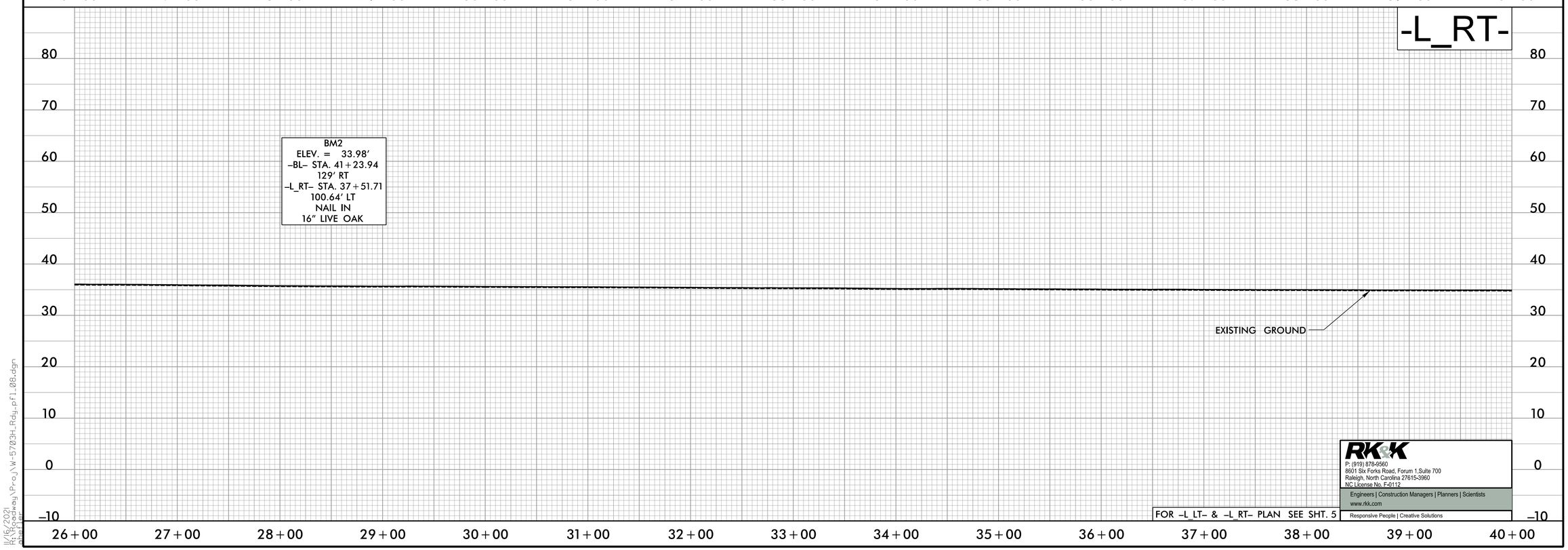
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	8

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS
11/17/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER ROBERT B. HUSKEY
11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





FOR -L_LT- & -L_RT- PLAN SEE SHT. 5

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

5/28/99

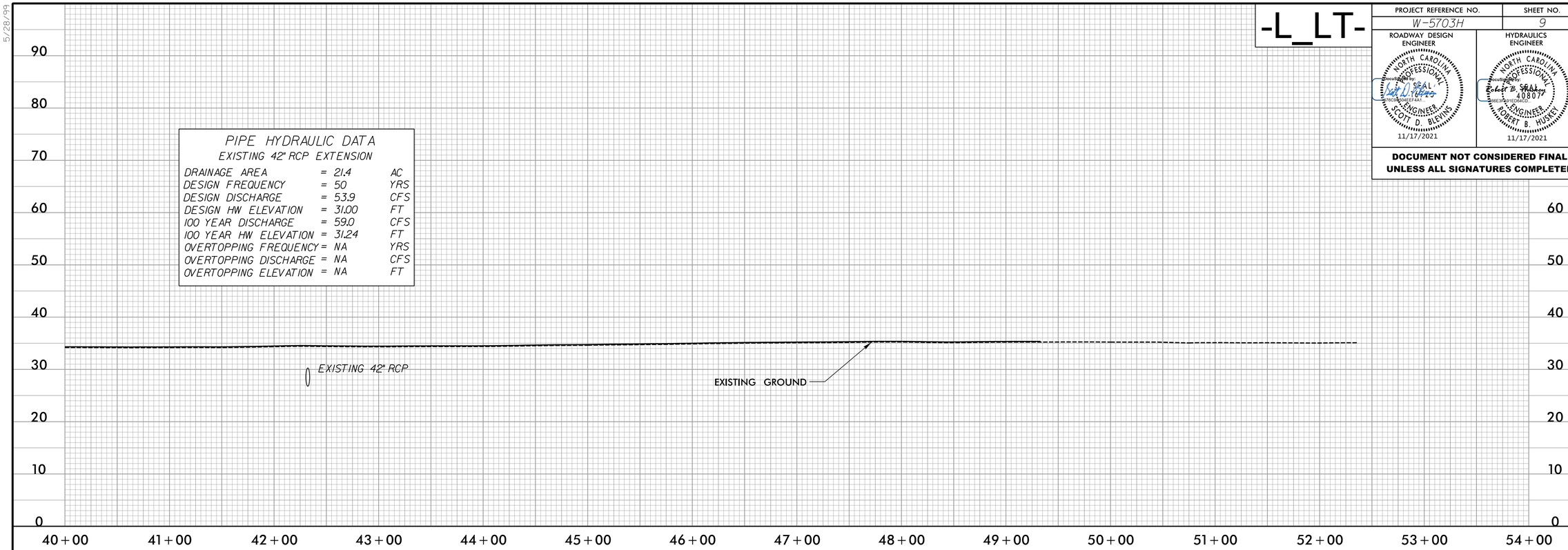
11/16/2021
R:\Roadway\Proj\W-5703H_Rdy_pfl_08.dgn

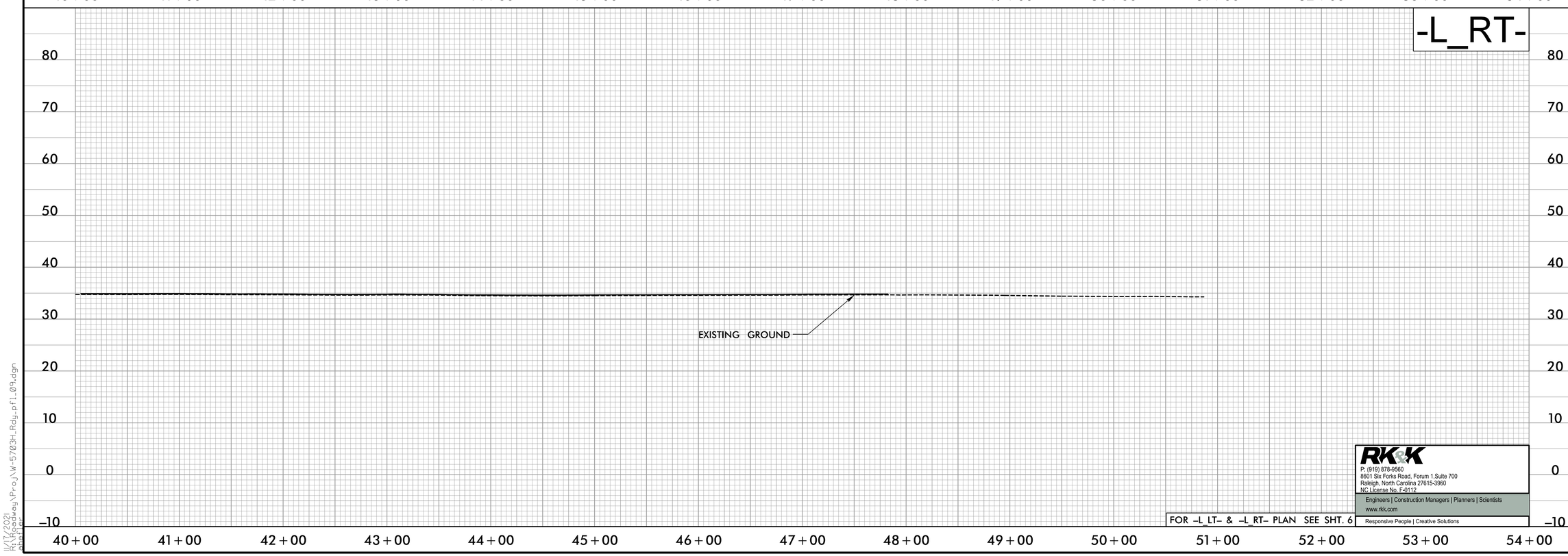
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	9

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS
11/17/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 40807 ENGINEER ROBERT B. HUSKEY
11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





FOR -L_LT- & -L_RT- PLAN SEE SHT. 6

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

5/28/99

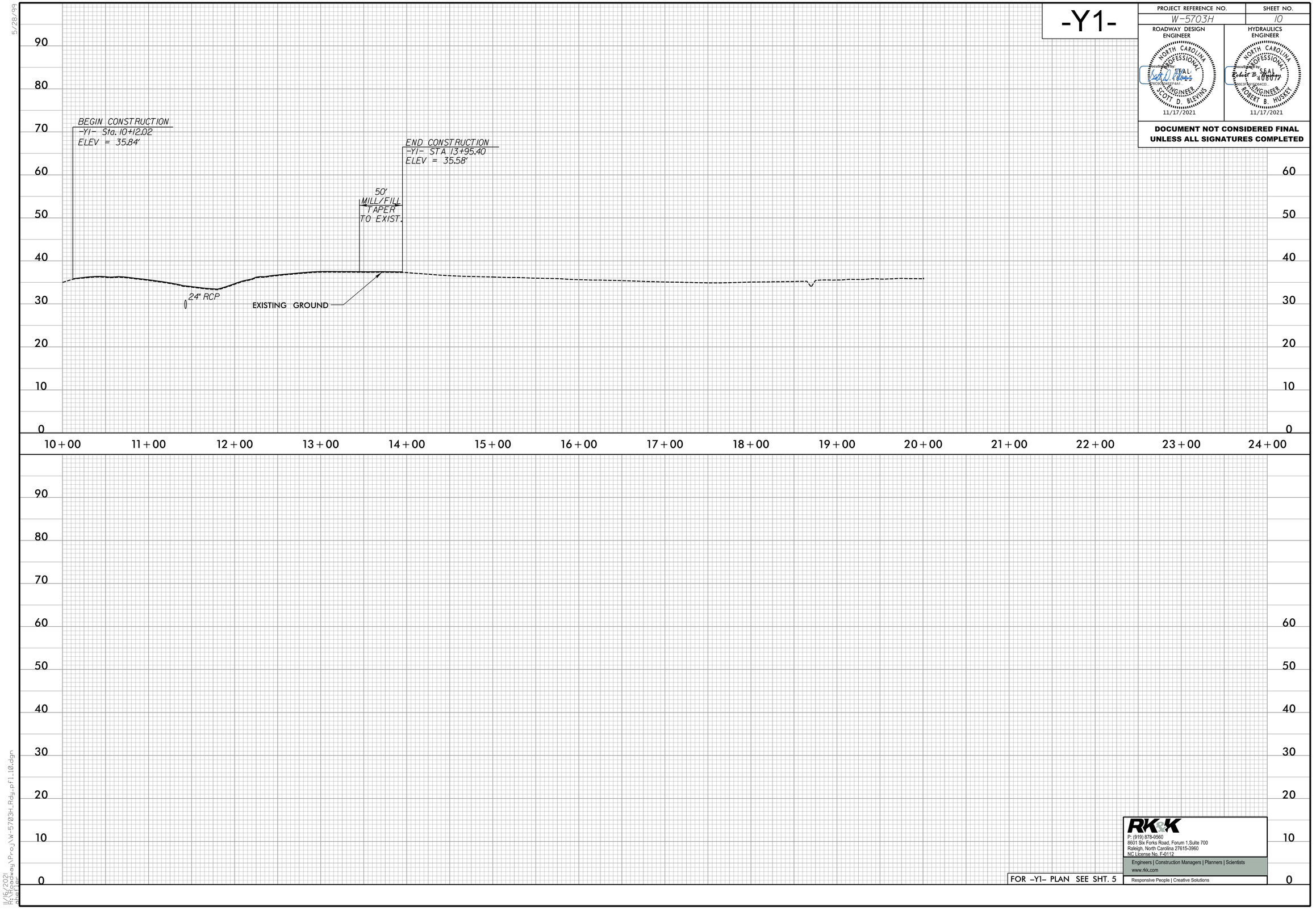
11/17/2021
R:\Roadway\Proj\W-5703H_Rdy_pfl_09.dgn

-Y1-

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	10

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER SCOTT D. BLEVINS	NORTH CAROLINA PROFESSIONAL SEAL 408077 ENGINEER ROBERT B. HUSKEY
DocuSigned by: Scott D. Blevins 76C9C9D4EEF4A1...	DocuSigned by: Robert B. Huskey 98E3F391E0B4CD...
11/17/2021	11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FOR -Y1- PLAN SEE SHT. 5

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

5/28/99

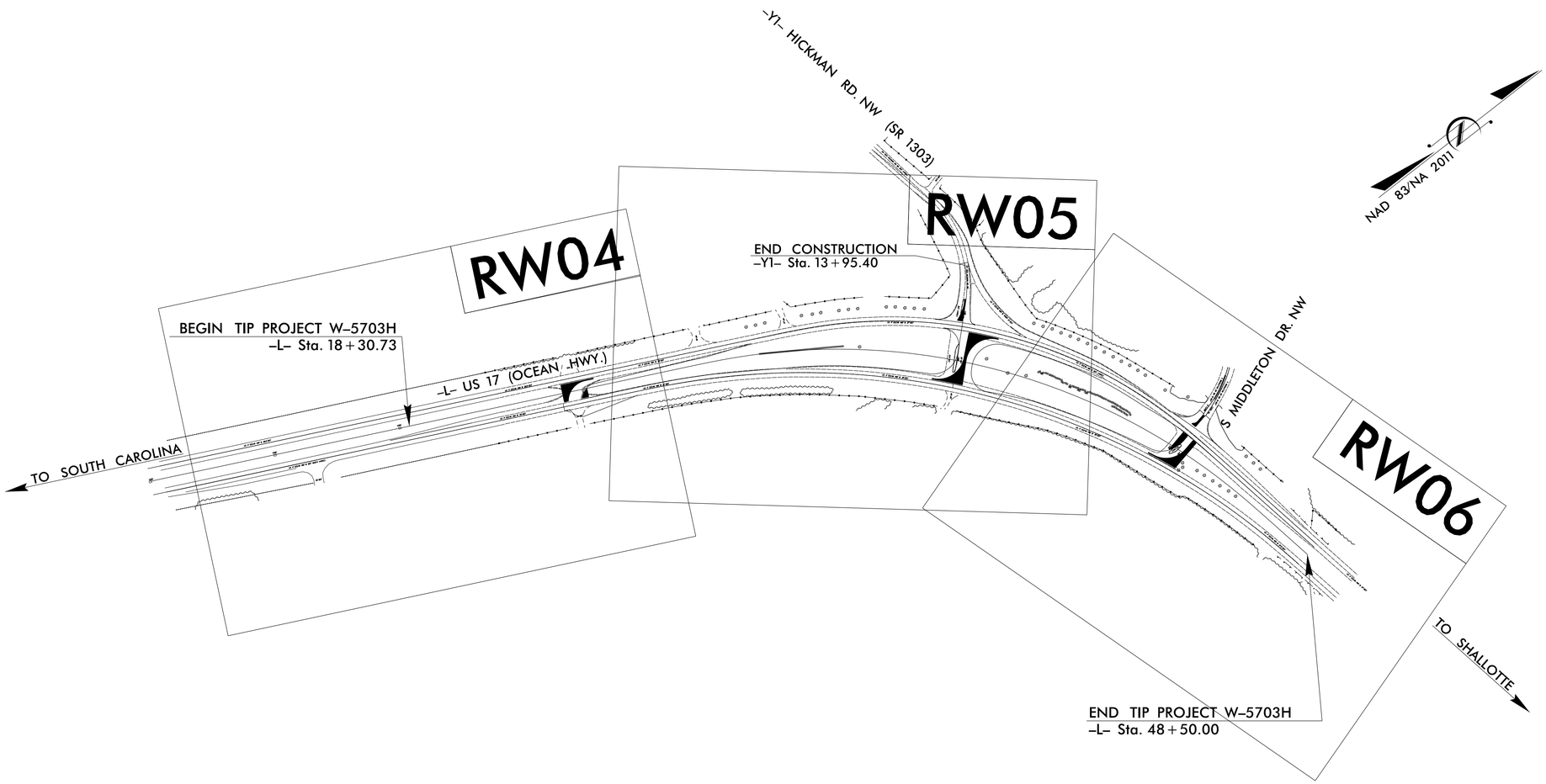
11/16/2021
R:\Roadway\Proj\W-5703H_Rdy_pfl_10.dgn

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5703H	RW01	7

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

BRUNSWICK COUNTY



TIP PROJECT: W-5703H

GRAPHIC SCALE

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR GPS MONUMENT "W5601GA-GPS2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 68746.903(ft) EASTING: 2133628.984(ft) ELEVATION: 33.471(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0001368100
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS2" TO -L- STATION 10+00.00 IS S 51-03'26.4" W 4,812.08(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
LOCATION AND SURVEYS UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
August 13, 2021	*December 16, 2021*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DocuSigned by: [signature] 11/5/2021

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

09/08/99

05-NOV-2021 12:19
S:\Units\Div03\Projects\MISC-INTERSTATE\Misc\Brunswick\W5703 H-Hickman road\Working\150 series sheets\w5703h_ls_rw01.dgn
mjduval AT LS-299896

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	RW02C-1

Location and Surveys

LOCATION AND SURVEYS
DIVISION 3
5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EL_NBL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R	DELTA S	Ls	LT	ST
POT	65613.351	2129881.666											
LINE			N 25°55'37.2" E	1548.79									
TS	67006.259	2130558.837											
SPIRAL			N 27°10'37.0" E	299.94						03°45'00.0"(RT)	300.00	200.04	100.04
SC	67273.088	2130695.833											
CURVE			N 52°50'29.0" E	1803.08	46°19'43.6"(RT)	02°30'00.0"	1853.15	980.59	2291.83				
CS	68362.190	2132132.826											
SPIRAL			N 78°30'21.0" E	299.94						03°45'00.0"(RT)	300.00	200.04	100.04
ST	68421.959	2132426.753											
LINE			N 79°45'20.8" E	98.06									
POT	68439.398	2132523.248											

EL_SBL

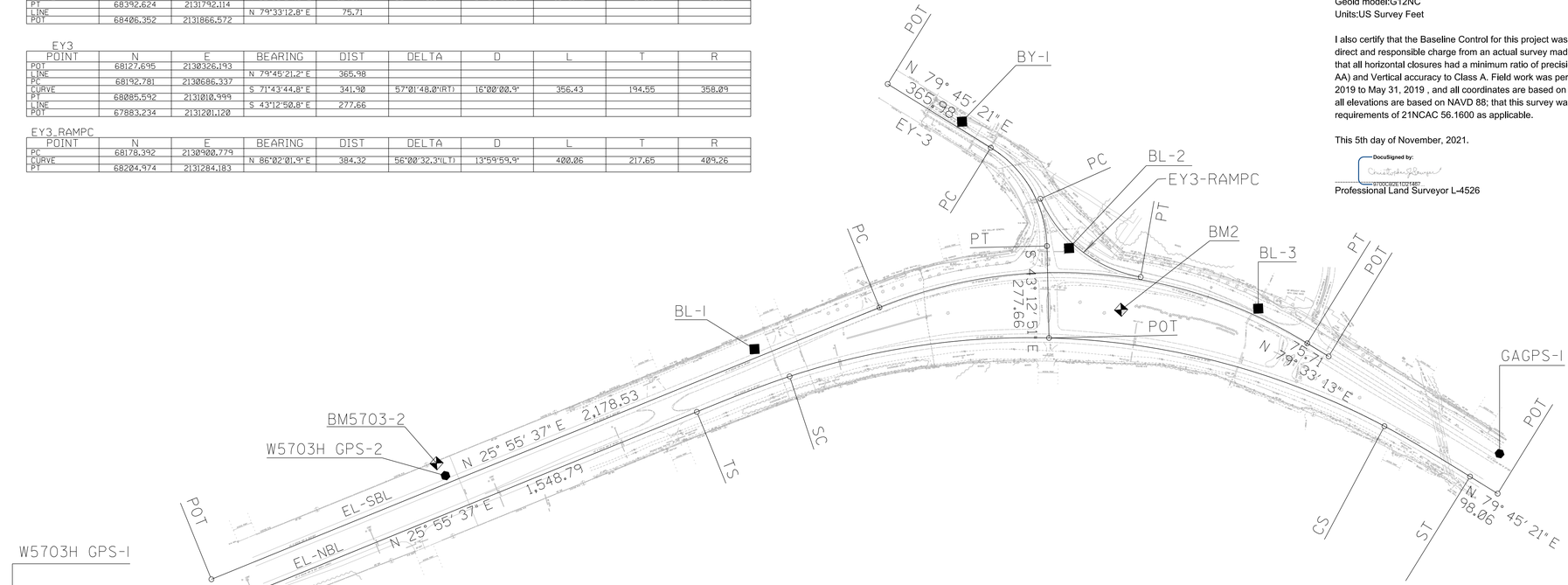
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	65650.078	2129806.120							
LINE			N 25°55'37.2" E	2178.53					
PC	67604.343	2130758.630							
CURVE			N 52°50'29.0" E	1296.77	53°49'43.6"(RT)	04°00'00.0"	1345.72	727.15	1432.39
PT	68392.624	2131792.114							
LINE			N 79°33'12.8" E	75.71					
POT	68406.352	2131866.572							

EY3

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	68127.695	2130326.193							
LINE			N 79°45'21.2" E	365.98					
PC	68192.781	2130686.337							
CURVE			S 71°43'44.8" E	341.90	57°01'48.0"(RT)	16°00'00.9"	356.43	194.55	358.09
PT	68085.592	2131010.999							
LINE			S 43°12'50.8" E	277.66					
POT	67883.234	2131201.120							

EY3_RAMPC

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	68178.392	2130900.779							
CURVE			N 86°02'01.9" E	384.32	56°00'32.3"(LT)	13°59'59.9"	400.06	217.65	409.26
PT	68204.474	2131284.183							



I, CHRISTOPHER J. SAWYER, PLS, certify that the Project Control was verified under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: NC-VRS-RTN
Dates of survey: 01/09/2019
Datum/Epoch: NAD 83/NA 2011
Published/Fixed-control use: NA for RTN
Localized around: GPS2
Northing: 68746.903
Easting: 2133628.984
Combined grid factor: 1.0001368100
Geoid model:G12NC
Units:US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from April 23, 2019 to May 31, 2019 , and all coordinates are based on NAD 83/NA 2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 5th day of November, 2021.

DocuSigned by:
Christopher Sawyer
37D0C80E1107487...

Professional Land Surveyor L-4526

NC GRID NAD 83 NA 2011

BL

POINT	DESC.	NORTH	EAST	ELEVATION
W5703H-1	GPS CAP AND REBAR	65087.4224	2129503.4400	35.16
W5703H-2	GPS CAP AND REBAR	66355.3809	2130122.8330	35.38
BL-1	TRV CAP AND REBAR	67263.4296	2130561.7180	35.77
BL-2	TRV CAP AND REBAR	68125.1545	2131064.9190	36.07
BL-3	TRV CAP AND REBAR	68371.5589	2131611.8110	34.27
W5601GA-1	GPS CAP AND REBAR	68533.0320	2132446.9180	34.24

BY

POINT	DESC.	NORTH	EAST	ELEVATION
BY-1	TRV CAP AND REBAR	68193.3063	2130569.1260	33.74

```
**************************************
BM57032       ELEVATION = 36.89
N 66365       E 2130078
EL_SBL STATION 246+62.00 68 LEFT
NAIL IN DISTRIBUTION POLE
**************************************
```

```
**************************************
BM2       ELEVATION = 33.98
N 68092       E 2131306
EL_NBL STATION 267+52.00 101 LEFT
NAIL IN 16IN LIVE OAK
**************************************
```

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

6/2/99

REVISIONS

05-NOV-2021 12:32
S:\Units\LS\Projects\MISC-INTERSTATE\Misc\Brunswick\W5703 H-Hickman road\Working\150 series sheets\w5703h_ls_rw02c-1.dgn
mjdural At LS-29486

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	RW02D-1

Location and Surveys

LOCATION AND SURVEY
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

This 5TH day of NOVEMBER, 2021.

DocuSigned by:
Christopher J. Sawyer
0100C3F3F1D7440...

Professional Land Surveyor L-4526

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	65722.3059	2129886.2667
TS	27+02.85	67253.1077	2130632.1438
SC	28+62.85	67396.0335	2130704.0360
CS	45+53.62	68386.2507	2132010.5467
ST	47+13.62	68416.8334	2132167.5848
POT	51+54.46	68495.2378	2132601.3964

L_LT

TYPE	STATION	NORTH	EAST
POT	10+00.00	65740.0135	2129849.8430
TS	29+87.02	67527.0417	2130718.6183
SC	31+47.02	67669.6126	2130791.1900
CS	43+53.96	68377.9171	2131725.7399
ST	45+13.96	68409.2500	2131882.6200
POT	52+36.57	68537.7679	2132593.7098

L_RT

TYPE	STATION	NORTH	EAST
POT	10+00.00	65703.2865	2129925.3885
TS	25+13.01	67064.0193	2130586.9175
SC	26+73.01	67207.0890	2130658.5298
CS	46+78.52	68380.6174	2132206.9047
ST	48+38.52	68410.8917	2132364.0057
POT	50+87.13	68455.1071	2132608.6494

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	67885.9094	2131204.4682
PC	12+66.05	68079.8036	2131022.2995
PT	16+39.31	68192.0533	2130682.3086
POT	20+01.19	68127.6948	2130326.1926

NOTES:

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

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

REVISIONS

6/2/99

04-NOV-2021 14:37
C:\Users\dwal\OneDrive - NCDOT\Projects\MISC-INTERSTATE\Misc\Brunswick\W5703 H-Hickman road\Working\150 series sheets\w5703h_ls_rw02d-1.dgn
mdwal AT LS-299896

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	RW03E-1

Location and Surveys

LOCATION AND SURVEY
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

11/5/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NO PERMANENT RIGHT OF WAY OR EASEMENTS WERE PURCHASED ON THIS PROJECT

REVISIONS

6/2/99

05-NOV-2021 12:40
S:\Units\Div03\Projects\MISC-INTERSTATE\Misc\Brunswick\W5703 H-Hickman road\Working\150 series sheets\W5703H_LS_rw03e-1.dgn
mjduval AT LS-299896

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	RW04

Location and Surveys

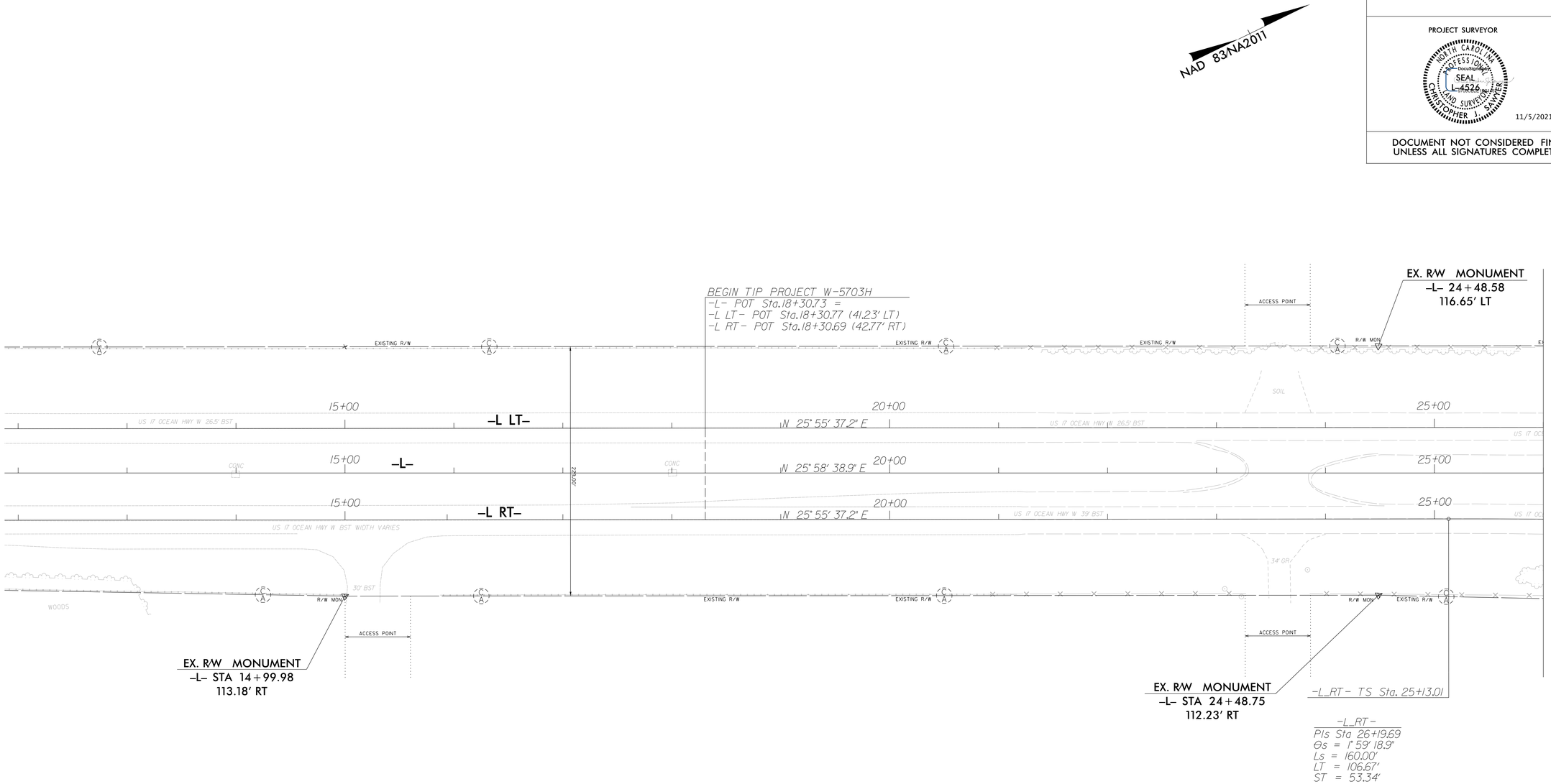
LOCATION AND SURVEYS
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

11/5/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTES:

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

6/2/99
04-NOV-2021 14:47
S:\Units\Div03\Projects\MISC-INTERSTATE\Misc\Brunswick\W5703 H-Hickman road\Working\150 series sheets\w5703h_ls_rw04.dgn
mjduval AT LS-299896

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	RW05

Location and Surveys

LOCATION AND SURVEYS
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

11/5/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L_LT-

PIs Sta 30+93.70	PI Sta 37+87.65
Θs = 3° 09' 01.0"	△ = 47° 31' 39.9" (RT)
Ls = 160.00'	D = 3° 56' 16.3"
LT = 106.68'	L = 1,206.95'
ST = 53.35'	T = 640.64'
	R = 1,455.00'

-Y1-

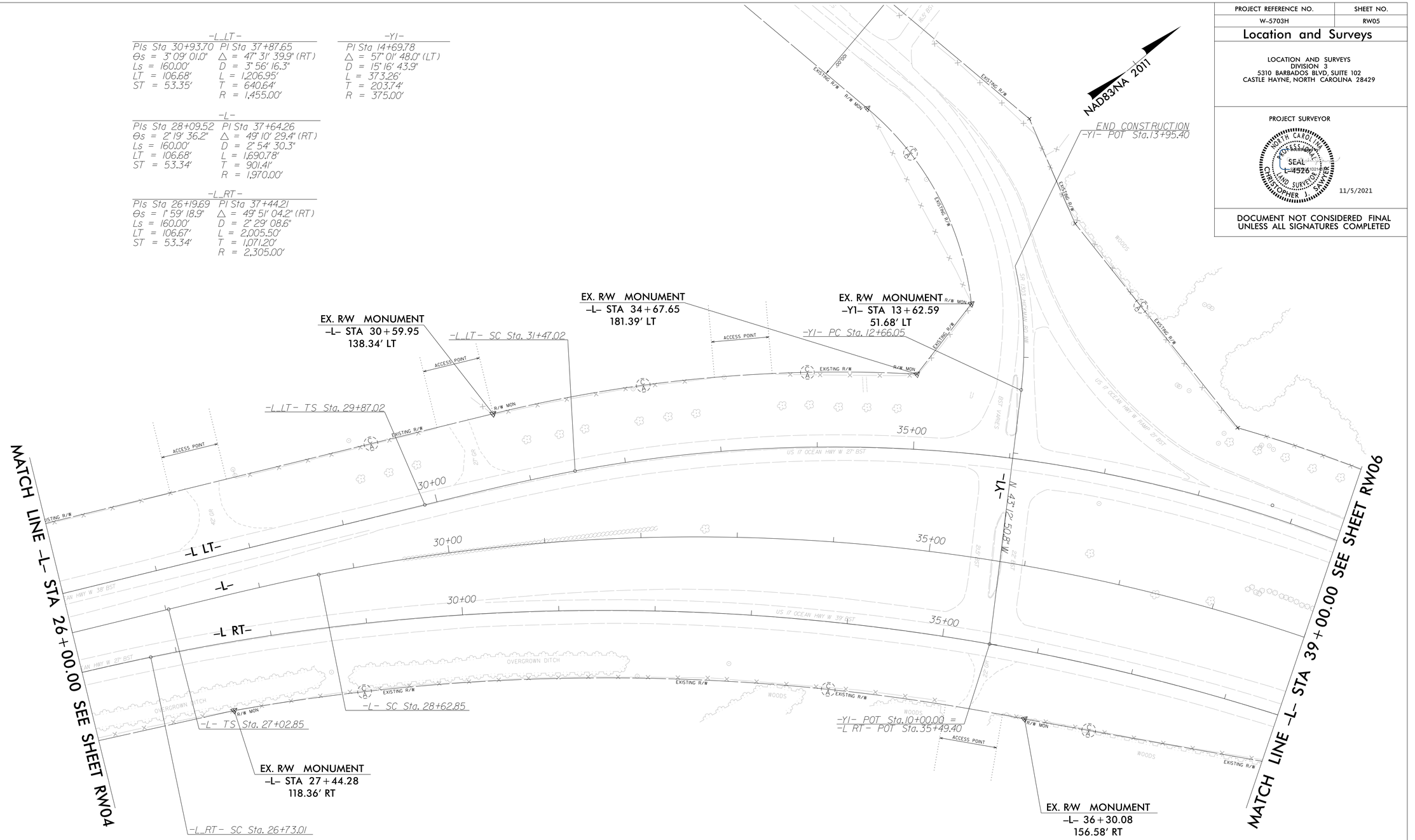
PI Sta 14+69.78
△ = 57° 01' 48.0" (LT)
D = 15° 16' 43.9"
L = 373.26'
T = 203.74'
R = 375.00'

-L-

PIs Sta 28+09.52	PI Sta 37+64.26
Θs = 2° 19' 36.2"	△ = 49° 10' 29.4" (RT)
Ls = 160.00'	D = 2° 54' 30.3"
LT = 106.68'	L = 1,690.78'
ST = 53.34'	T = 901.41'
	R = 1,970.00'

-L_RT-

PIs Sta 26+19.69	PI Sta 37+44.21
Θs = 1° 59' 18.9"	△ = 49° 51' 04.2" (RT)
Ls = 160.00'	D = 2° 29' 08.6"
LT = 106.67'	L = 2,005.50'
ST = 53.34'	T = 1,071.20'
	R = 2,305.00'



NOTES:

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

6/2/99

04-NOV-2021 15:07
S:\Units\Div03\Projects\MISC-INTERSTATE\Misc\Brunswick\W5703 H-Hickman road\Working\150 series sheets\w5703h_ls_rw05.dgn
mjduval AT LS-299896

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	RW06

Location and Surveys

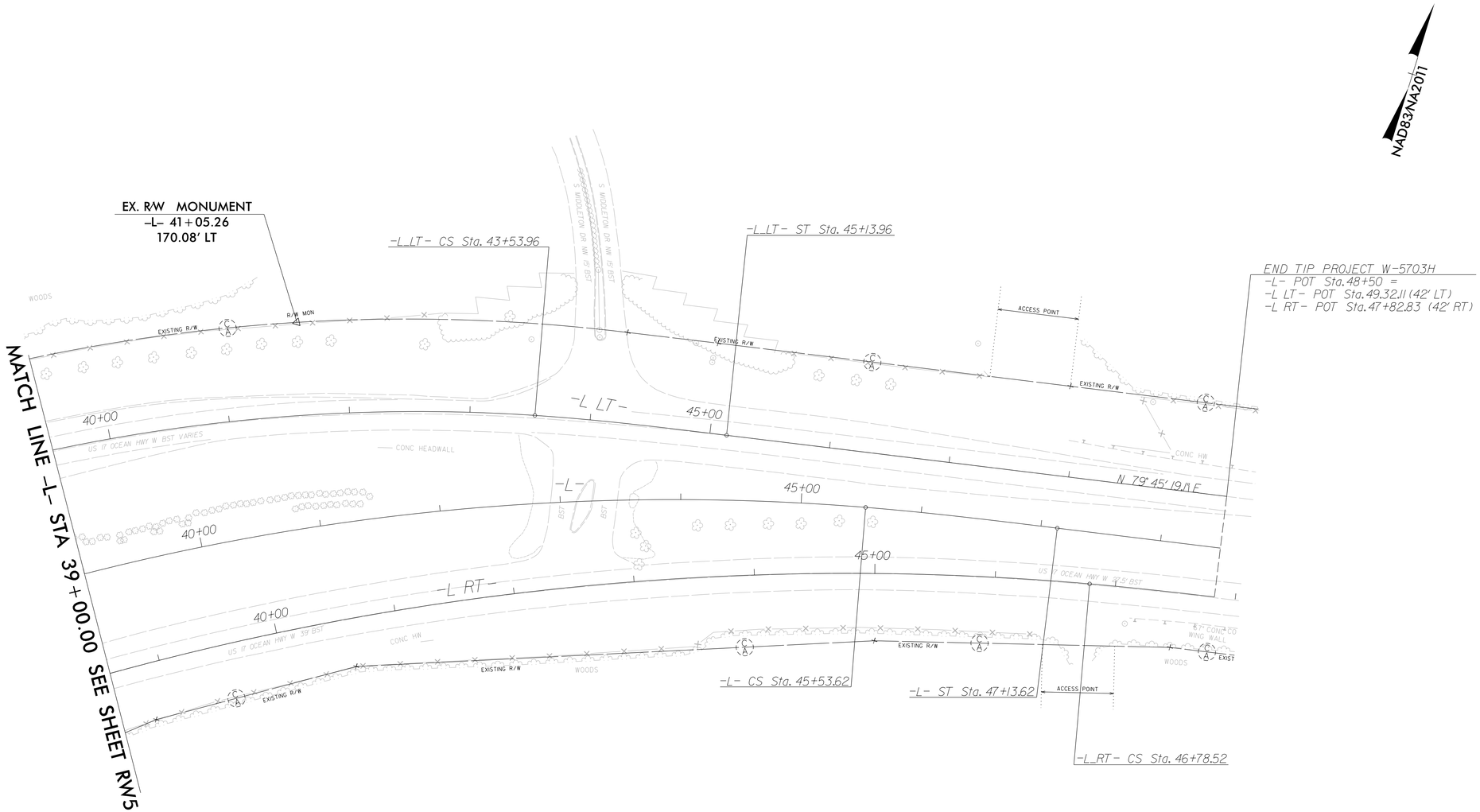
LOCATION AND SURVEYS
DIVISION 3
5310 BARBADOS BLVD. SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

11/5/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-L_LT-

PI Sta 37+87.65	PIs Sta 44+07.31
△ = 47° 31' 39.9" (RT)	Θs = 3° 09' 01.0"
D = 3° 56' 16.3"	Ls = 160.00'
L = 1,206.95'	LT = 106.68'
T = 640.64'	ST = 53.35'
R = 1,455.00'	

-L-

PI Sta 37+64.26	PIs Sta 46+06.97
△ = 49° 10' 29.4" (RT)	Θs = 2° 19' 36.2"
D = 2° 54' 30.3"	Ls = 160.00'
L = 1,690.78'	LT = 106.68'
T = 901.41'	ST = 53.34'
R = 1,970.00'	

-L_RT-

PI Sta 37+44.21	PIs Sta 47+31.86
△ = 49° 51' 04.2" (RT)	Θs = 1° 59' 18.9"
D = 2° 29' 08.6"	Ls = 160.00'
L = 2,005.50'	LT = 106.67'
T = 1,071.20'	ST = 53.34'
R = 2,305.00'	

NOTES:

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

REVISIONS

6/2/99

04-NOV-2021 15:09
S:\Units\Div03\Projects\MISC-INTERSTATE\Misc\Brunswick\W5703 H-Hickman road\Working\150 series sheets\w5703h_ls_rw06.dgn
mjduval AT LS-299896

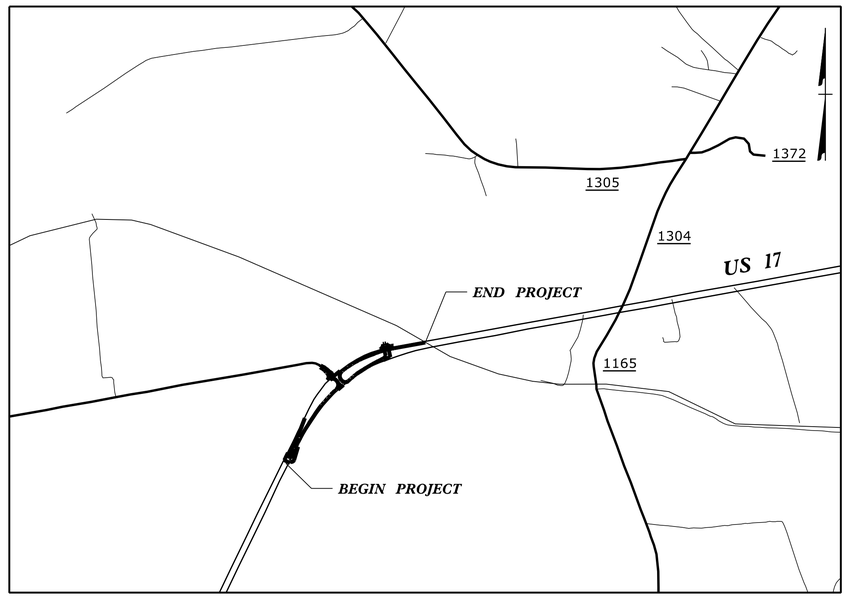
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BRUNSWICK COUNTY



VICINITY MAP



INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, PAVEMENT MARKING SCHEDULE
TMP-2 AND 2A	TRANSPORTATION OPERATIONS PLAN: (GENERAL NOTES)
TMP-3	TEMPORARY TRAFFIC CONTROL PHASING
TMP-4 THRU 6	PHASE I DETAILS
TMP-7 THRU 9	PHASE II DETAILS
TMP-10 AND 11	PHASE III DETAILS

SHEET NO.
TMP-1

TIP PROJECT: W5703H CONTRACT: DC00326

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

PLANS PREPARED BY:

BYRON HOLDEN, PE
PROJECT MANAGER

KEVIN BISBY, PE
SENIOR PROJECT ENGINEER

NCDOT CONTACTS:

MICHAEL BASS
PROJECT MANAGER – DIVISION 1

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

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

APPROVED: DocuSigned by: Kevin Bisby BDD8D2028912474...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

11/16/2021
W5703H_TMP_PSH01.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-1A

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

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.15	PAVEMENT MARKINGS - SUPERSTREETS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

LEGEND

GENERAL

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

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

EXISTING PROPOSED TEMPORARY (TEMP)

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TEMPORARY PAVEMENT MARKING SCHEDULE

PAINT	
Symbol	Description
P1	WHITE EDGELINE (4")
P10	YELLOW EDGELINE (4")
P13	YELLOW DOUBLE CENTER (4")
P20	WHITE EDGELINE (6")
P23	3 FT. - 9 FT./SP WHITE MINISKIP (6")
P24	2 FT. - 6 FT./SP WHITE MINISKIP (6")
P30	YELLOW EDGELINE (6")
P40	WHITE GORELINE (8")
P50	WHITE GORELINE (12")
P61	WHITE STOP BAR (24")
P70	LEFT TURN ARROW
P77	U-TURN ARROW
TEMPORARY RAISED PAVEMENT MARKERS	
Symbol	Description
MH	YELLOW/YELLOW
MI	CRYSTAL/RED

APPROVED: DocuSigned by: Kevin Bisby BDD8D262B912474...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY STANDARD DRAWINGS & LEGEND

11/16/2021
W5703H_TMP_PSH01A.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-2

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

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

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

TIME RESTRICTIONS

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

ROAD NAME	DAY AND TIME RESTRICTIONS
US 17	MONDAY THROUGH FRIDAY 6:00 AM TO 9:00 AM 4:00 PM TO 6:00 PM

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

ROAD NAME
US 17

HOLIDAY

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

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

3) FOR EASTER, BETWEEN THE HOURS OF 6:00 AM THURSDAY AND 6:00 PM MONDAY.

4) FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY TO 6:00 PM TUESDAY.

5) FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 AM THE DAY BEFORE INDEPENDENCE DAY AND 6:00 PM THE DAY AFTER INDEPENDENCE DAY.

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

6) FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY AND 6:00 PM TUESDAY.

7) FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 AM TUESDAY TO 6:00 PM MONDAY.

8) FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 AM THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 6:00 PM THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

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

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

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

APPROVED: Docusigned by: Kevin Bisby BDC6D2026912472...
DATE: 11/19/2021
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

GENERAL NOTES

11/9/2021
W5703H_TMP_PSH02.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-2A

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

TRAFFIC PATTERN ALTERATIONS

H) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

TRAFFIC CONTROL DEVICES

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

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

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

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
US 17	PAINT	TEMPORARY RAISED
SR 1303	PAINT	TEMPORARY RAISED
S MIDDLETON DR NW	PAINT	NONE

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

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

Q) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

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

APPROVED: DocuSigned by: Kevin Bisby BDD8D2626891247...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

GENERAL NOTES

11/16/2021
W5703H_TMP_PSH02A.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-3

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

TRAFFIC CONTROL PHASING

PHASE I

STEP 1:
USING RDWY STD DWG 1101.01, ERECT WORK ZONE ADVANCE WARNING SIGNS ON -L- (US 17), -Y1- (SR 1303 HICKMAN RD NW) AND S MIDDLETON DR NW.

STEP 2:
USING RDWY STD DWG 1101.02, CONSTRUCT THE PROPOSED WIDENING AND PAVEMENT REMOVAL ON -L- (US 17) TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT WHILE MAINTAINING CURRENT TRAFFIC PATTERNS. (REFER TO TMP-4 THROUGH TMP-6)

STEP 3:
USING RDWY STD DWG 1101.02, CLOSE EXISTING MEDIAN OPENINGS AT -L- STA 23+50± AND STA 43+50±. CONSTRUCT THE PROPOSED MEDIAN ISLANDS, PAVEMENT REMOVAL AND PROPOSED SIGNALS. APPLY PAVEMENT MARKINGS AS SHOWN ON S MIDDLETON DR NW. (SEE TMP-4 THROUGH 6)

PHASE II

STEP 1:
USING RDWY STD DWG 1101.02 APPLY PAVEMENT MARKINGS, OPEN U-TURN LANES TO TRAFFIC AND ACTIVATE SIGNALS. SIMULTANEOUSLY CLOSE THE EXISTING US 17/-Y1- (SR 1303 HICKMAN RD NW) INTERSECTION TO THROUGH TRAFFIC. (REFER TO TMP-7 THROUGH TMP-9)

STEP 2:
USING RDWY STD 1101.02, CONSTRUCT MEDIAN ISLANDS, PAVEMENT REMOVAL AND PROPOSED SIGNAL ON US 17 AT THE INTERSECTION WITH -Y1- (SR 1303 HICKMAN RD NW). (SEE TMP-8)

USING RDWY STD 1101.02, CONSTRUCT -Y1- (SR 1303 HICKMAN RD NW) FROM -Y1- STA 12+06± TO STA 13+95± AND APPLY PAVEMENT MARKINGS. (SEE TMP-8)

PHASE III

STEP 1:
USING RDWY STD 1101.02, APPLY PAVEMENT MARKINGS, ACTIVATE SIGNALS AND OPEN THE US 17/-Y1- (SR 1303 HICKMAN RD NW) INTERSECTION TO TRAFFIC. (REFER TO TMP-10 AND TMP-11)

STEP 2:
USING RDWY STD DWG 1101.02, APPLY THE FINAL PAVEMENT MARKINGS. (REFER TO THE FINAL PAVEMENT MARKING PLANS).

APPROVED: DocuSigned by: Kevin Bisby BDD8D2626912474...
DATE: 11/16/2021
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

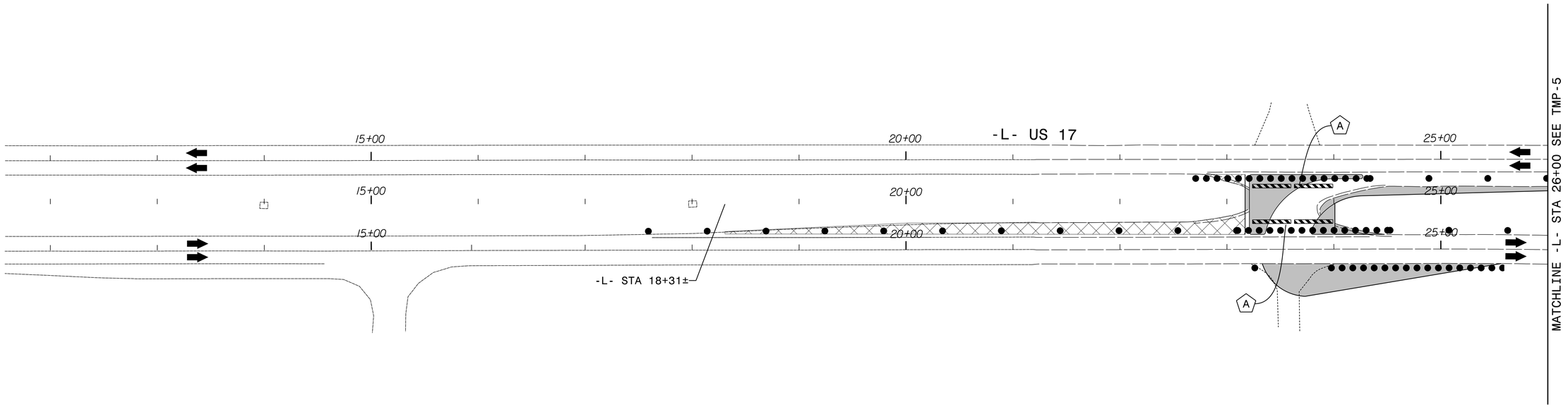
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

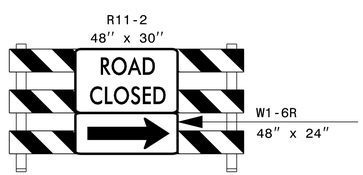
TEMPORARY
TRAFFIC CONTROL PHASING

11/16/2021
W5703H_TMP_PSH03.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-4

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





TYPE III BARRICADE

A

APPROVED: DocuSigned by: Kevin Bisley BDD8D2628912472...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISLEY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

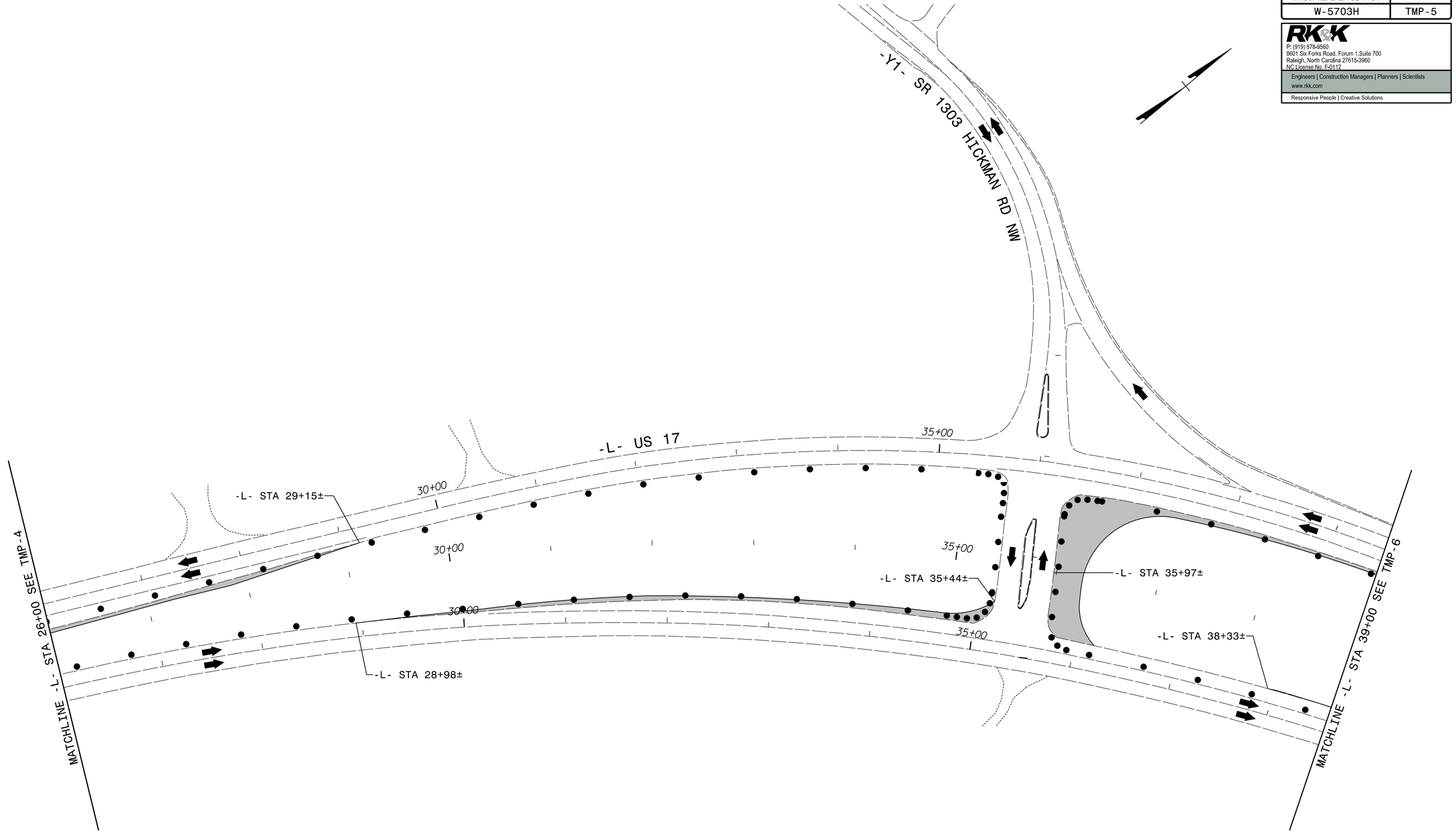
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE I DETAIL

11/16/2021
W-5703H_TMP_PSH04.dgn
kbisley

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-5

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



APPROVED: DocuSigned by: Kevin Bisby BD0B02628912474...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

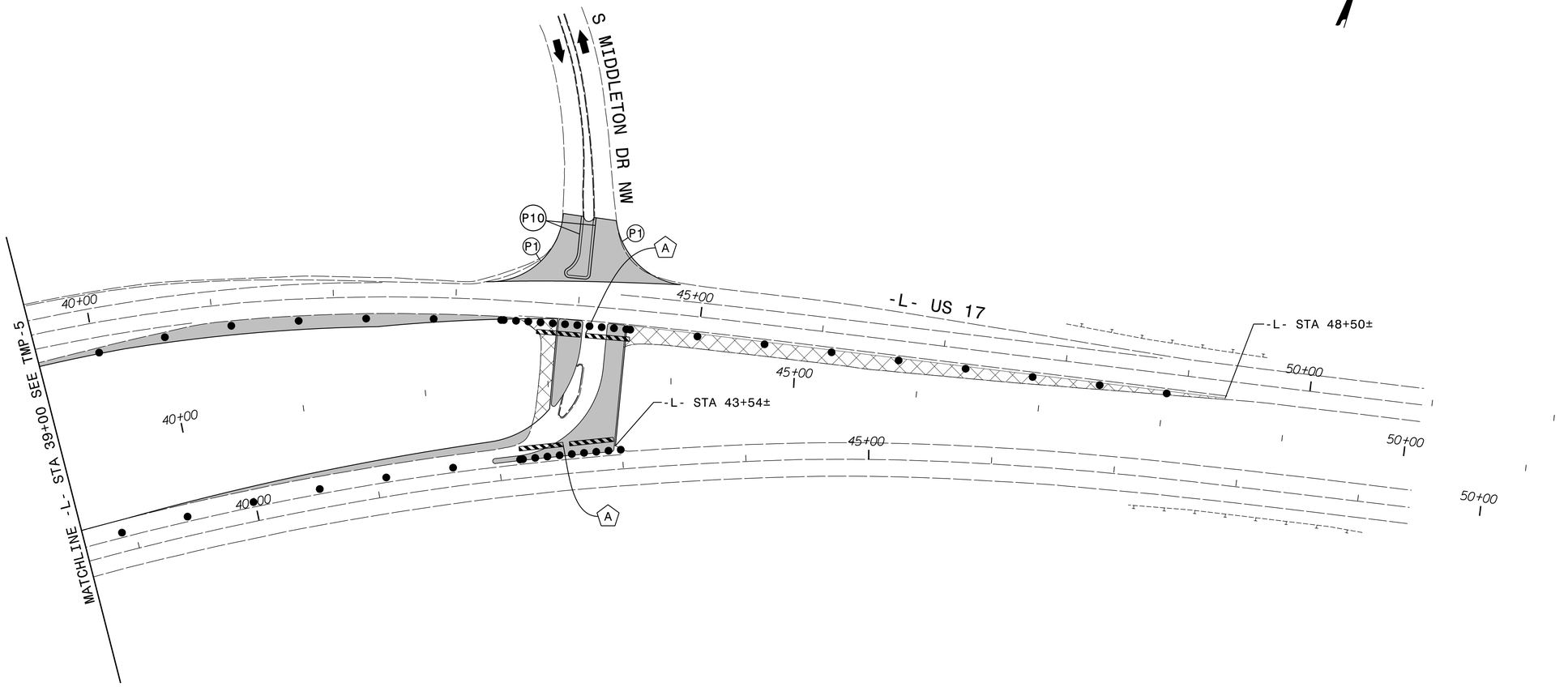
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

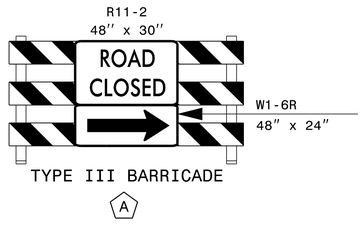
PHASE I DETAIL

11/16/2021
W-5703H_TMP_PSH05.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-6

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





APPROVED: DocuSigned by: Kevin Bisby BDD8D2828912474...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

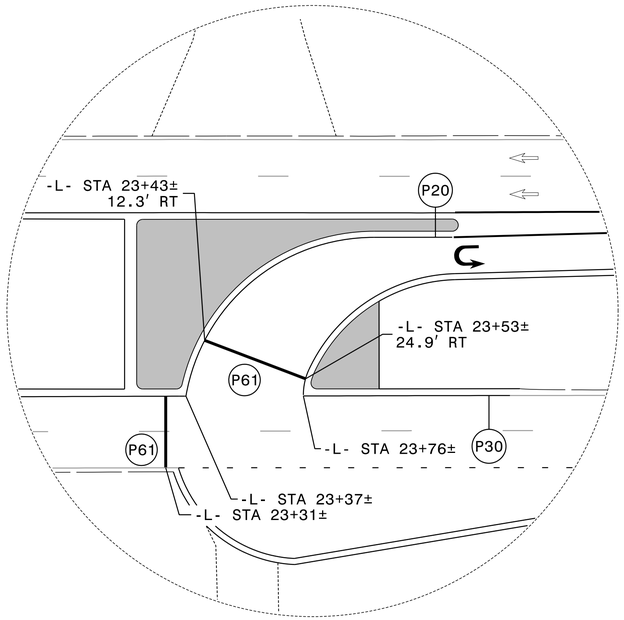
DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

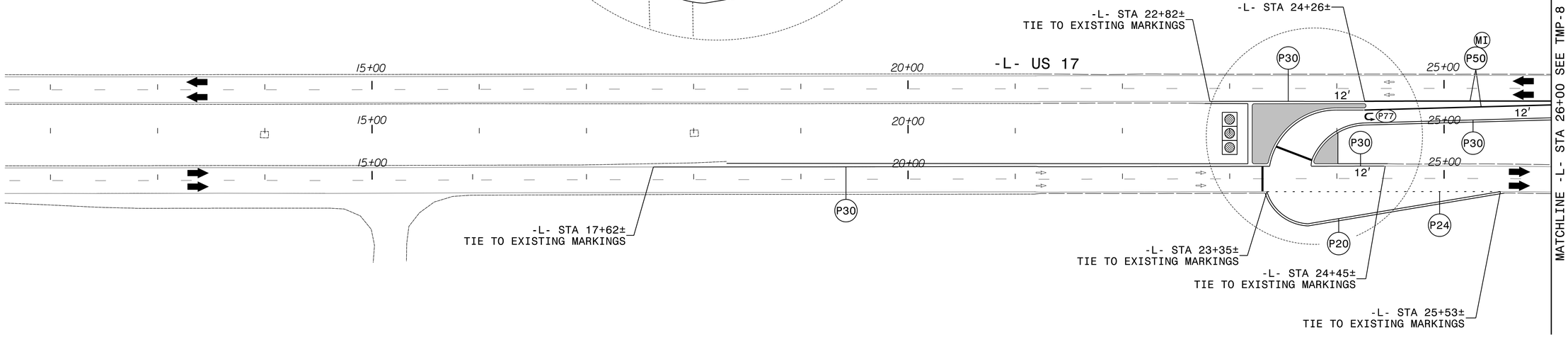
PHASE I DETAIL

11/16/2021
W-5703H_TMP_PSH06.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-7

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1,Suite 700
Raleigh, North Carolina 27615-5960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions





ERECT PROPOSED SIGNING AS APPLICABLE

APPROVED: DocuSigned by: Kevin Bisby BDD8D2826912474...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

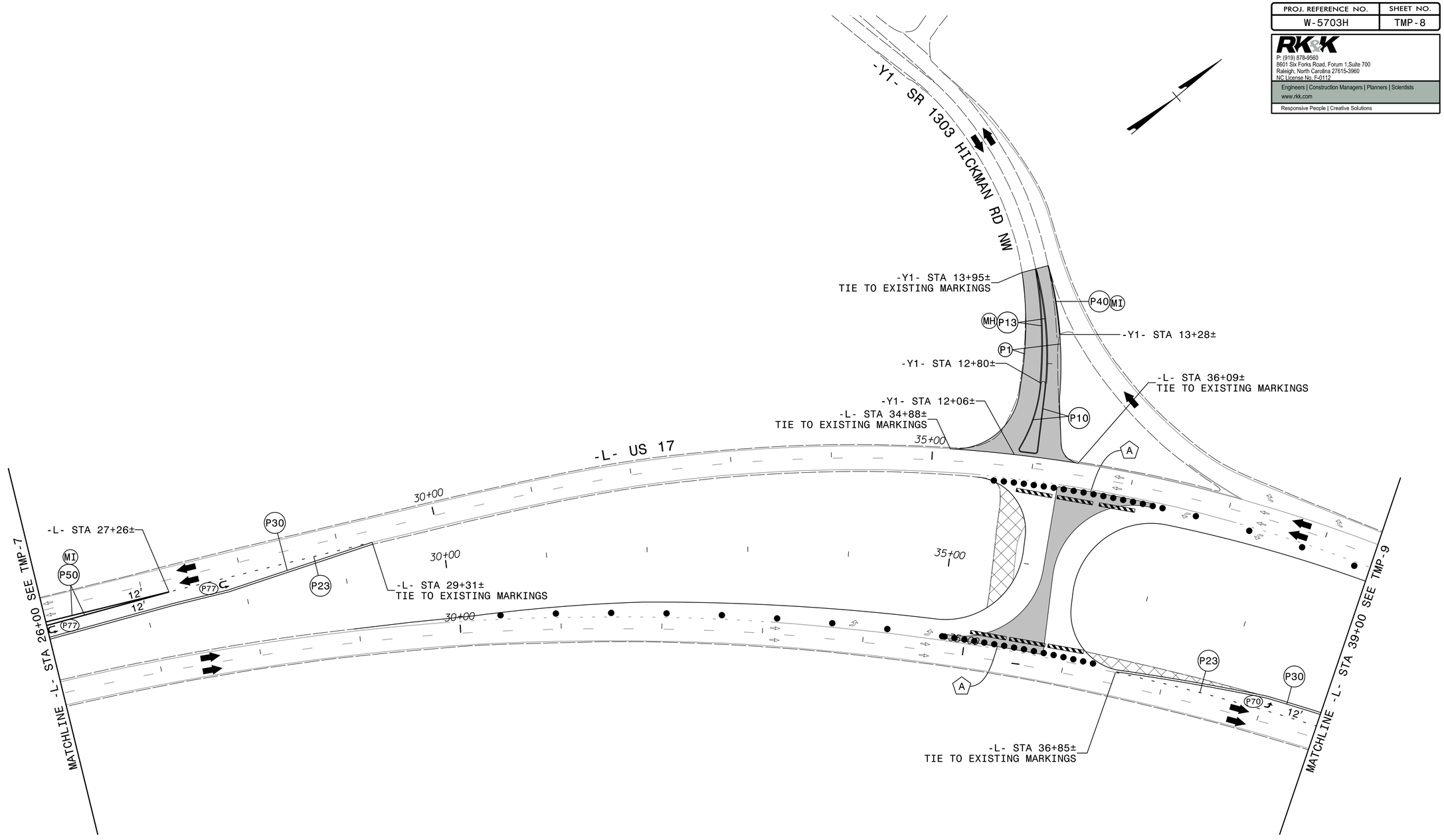
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE II DETAIL

11/16/2021
W-5703H_TMP_PSH07.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-8

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



R11-2
48" x 30"



W1-6R
48" x 24"

TYPE III BARRICADE

A

APPROVED: DocuSigned by: Kevin Bisby BDD8D2626891247...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

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

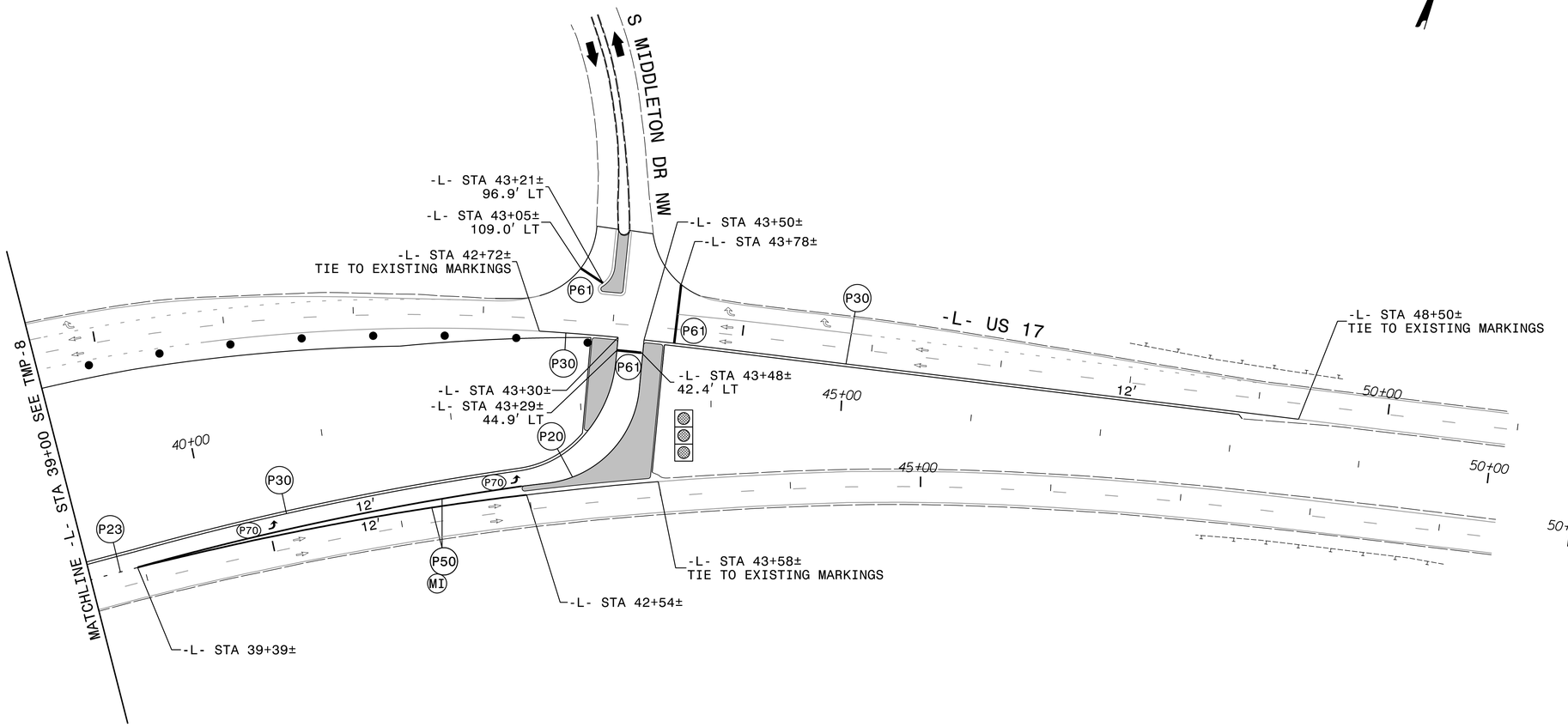
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PHASE II DETAIL

11/16/2021
W-5703H_TMP_PSH08.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-9

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



ERECT PROPOSED SIGNING AS APPLICABLE

APPROVED: DocuSigned by: Kevin Bisby BDD8D2628912474...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

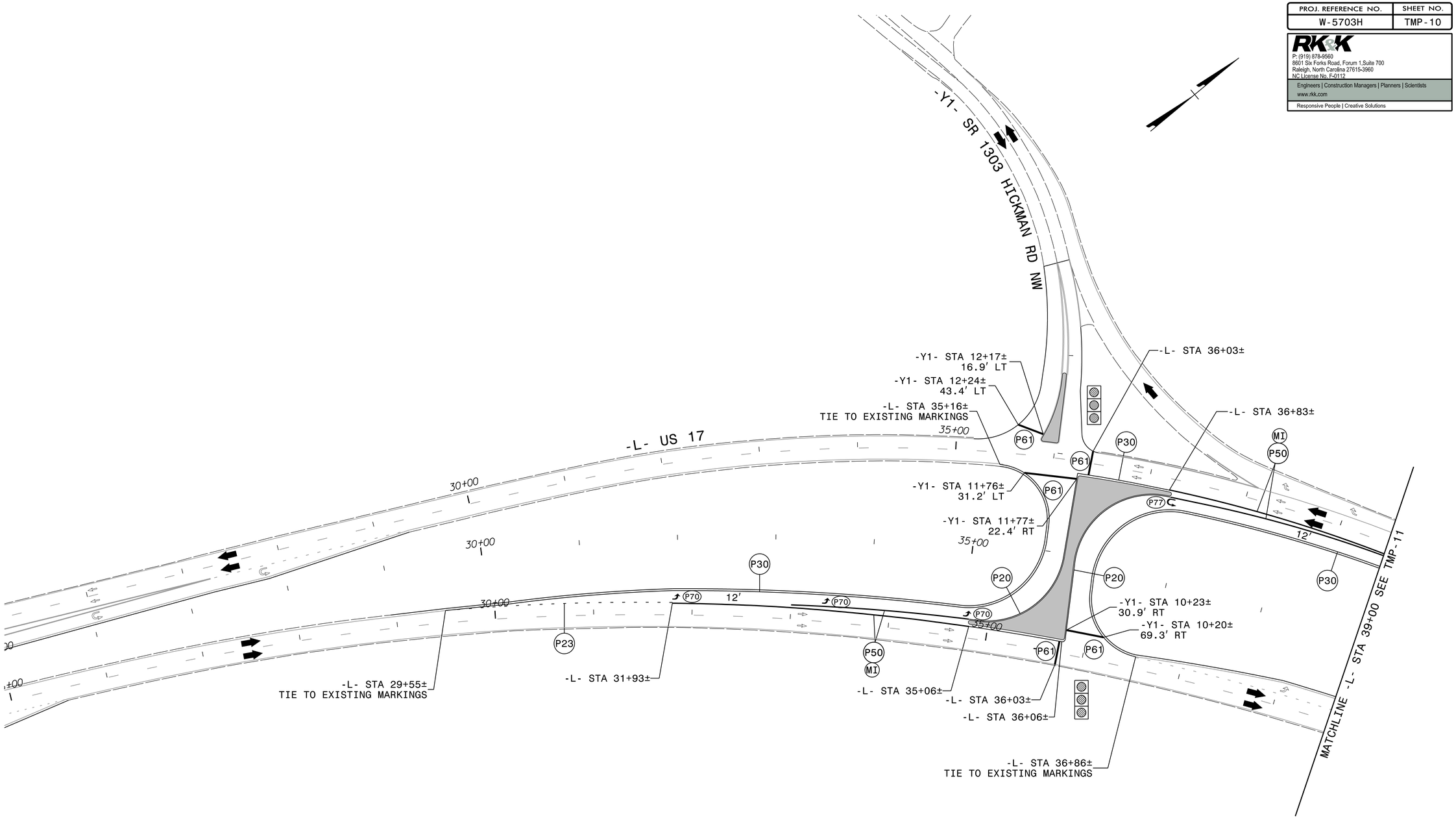
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE II DETAIL

11/16/2021
W-5703H_TMP_PSH09.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-10

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



ERECT PROPOSED SIGNING AS APPLICABLE

APPROVED: DocuSigned by: Kevin Bisby BDD8D262891247...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISBY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

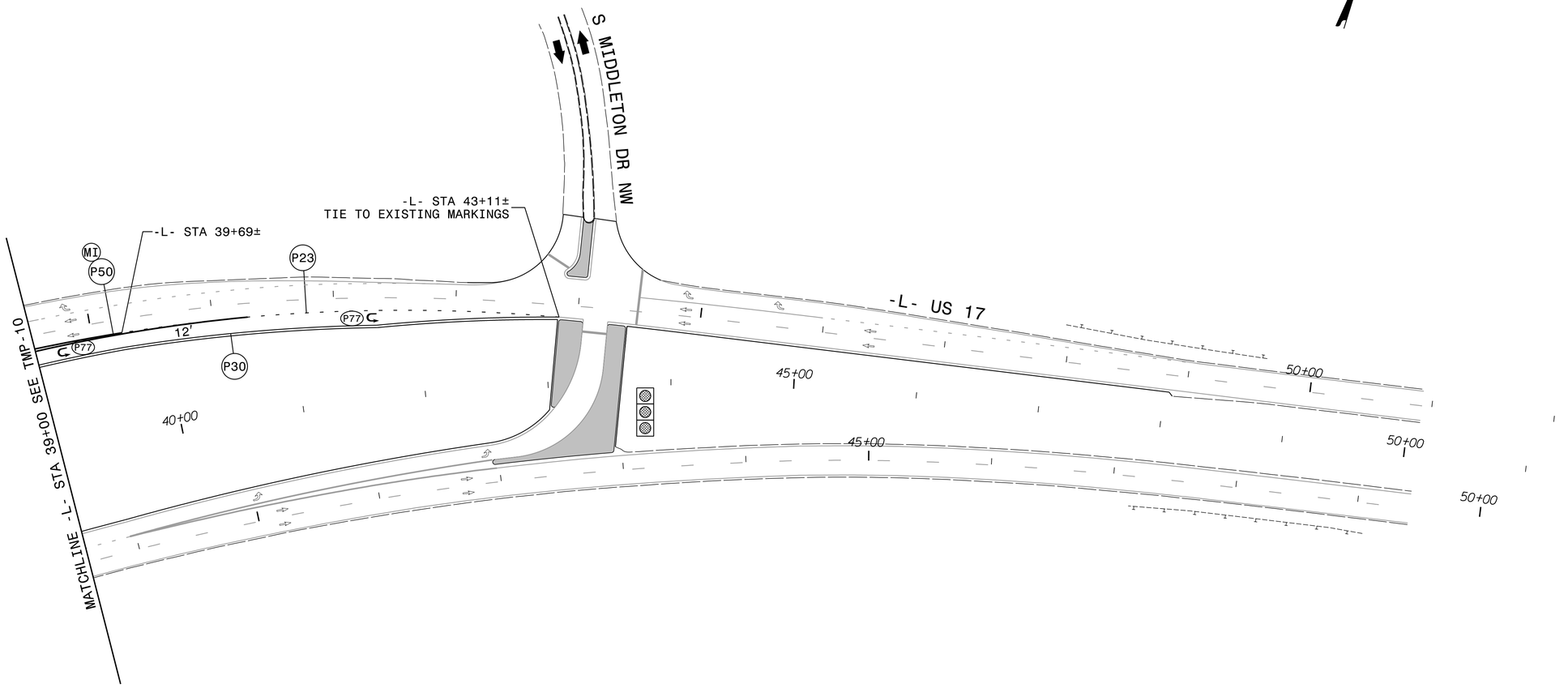
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE III DETAIL

11/16/2021
W-5703H_TMP_PSH10.dgn
kbisby

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	TMP-11

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



APPROVED: DocuSigned by: Kevin Bisley BDD8D2828912474...

DATE: 11/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISLEY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PHASE III DETAIL

11/6/2021
W-5703H_TMP_PSHII.dgn
kbisley

T.I.P.: W-5703H

CONTRACT: DC00326

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

TIP NO.	SHEET NO.
W-5703H	PMP-1

APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT MARKING PLAN

BRUNSWICK COUNTY

LOCATION: US 17 AT SR 1303 (HICKMAN RD NW)

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-1A	REVISED PAVEMENT MARKING ROADWAY STANDARD DRAWINGS
PMP-2-4	PAVEMENT MARKING DETAIL

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.15	PAVEMENT MARKINGS - SUPERSTREETS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE

PAVEMENT MARKING SCHEDULE

THERMOPLASTIC LINES (90 MILS)

T1 WHITE EDGE LINE (4")
T13 YELLOW DOUBLE CENTER (4")
T20 WHITE EDGELINE (6")
T23 3FT.-9FT. /SP WHITE MINISKIP (6")
T24 2FT.-6FT./SP WHITE MINISKIP (6")
T30 YELLOW EDGELINE (6")
T50 WHITE GORELINE (12")
T51 WHITE DIAGONAL (12")
T61 WHITE STOPBAR (24")

THERMOPLASTIC SYMBOLS (90 MILS)

T70 LEFT TURN ARROW
T71 RIGHT TURN ARROW
T77 U-TURN ARROW

PAVEMENT MARKERS

ME SNOWPLOWABLE (YELLOW & YELLOW)
MF SNOWPLOWABLE (CRYSTAL & RED)

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
-L- US 17 OCEAN HWY	THERMOPLASTIC	SNOWPLOWABLE, REFLECTIVE
-Y- HICKMAN RD. NW (SR 1303)	THERMOPLASTIC	SNOWPLOWABLE, REFLECTIVE
S MIDDLETON DR NW	THERMOPLASTIC	MATCH EXISTING

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

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

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

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

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

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

R. B. Roach, PE, CPM — STATE SIGNING & DELINEATION ENGINEER

Ayman I. Alqudwah, PE, CPM — SIGNING & DELINEATION PROJECT REGIONAL ENGINEER

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY RK&K

David Sears, PE, PTOE — PROJECT ENGINEER

Allen Tutt — SR. DESIGNER

RK&K
P: (919) 878-9560
8601 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

11/17/2021
W-5703H_PMP_TSH.dgn
dsears

TIP NO.	SHEET NO.
W-5703H	PMP-1A

APPROVED: Matthew V. Springer
DATE: 8/13/2019
DocuSigned by: BC60F6E8B584403...

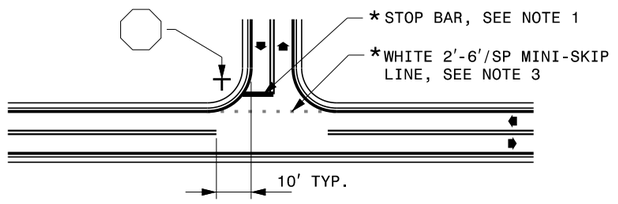
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

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

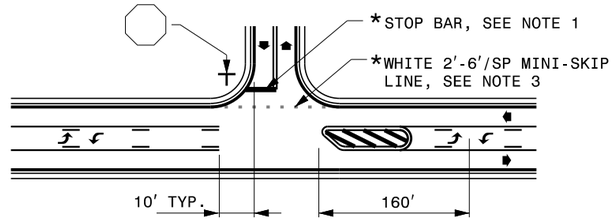
8-19

ENGLISH DETAIL DRAWING FOR
PAVEMENT MARKINGS
INTERSECTIONS

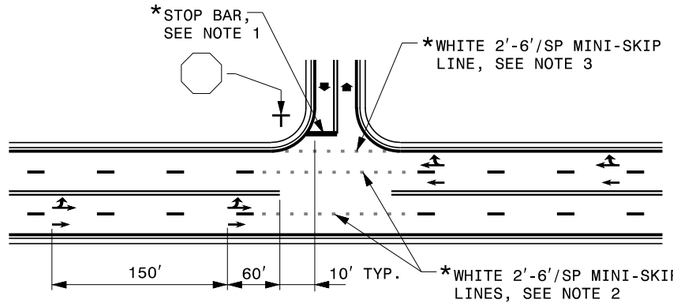
TWO-LANE, TWO-WAY ROADWAY



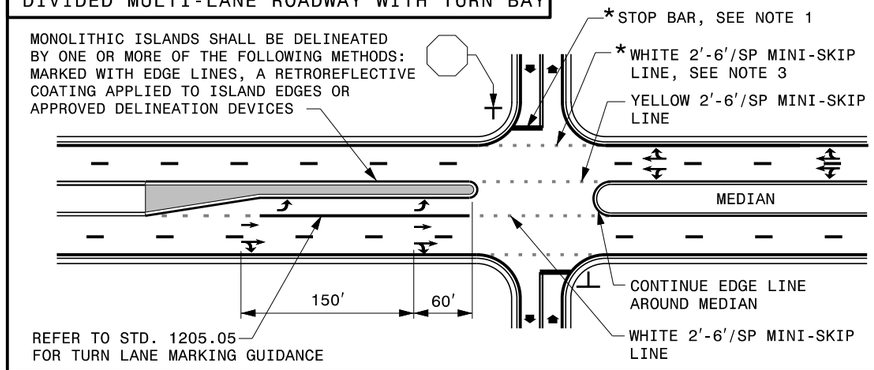
TWO-LANE, TWO-WAY ROADWAY WITH TWO-WAY LEFT TURN LANE



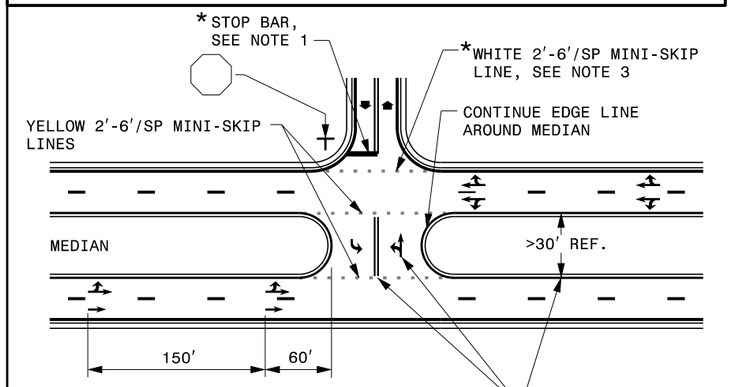
UNDIVIDED MULTI-LANE ROADWAY



DIVIDED MULTI-LANE ROADWAY WITH TURN BAY



DIVIDED MULTI-LANE ROADWAY WITH WIDE MEDIAN CROSSOVER



USE DOUBLE YELLOW CENTER LINE AND ARROW SYMBOLS IN MEDIAN CROSSOVER WHEN WIDTH OF MEDIAN EXCEEDS 30 FT, OTHERWISE THEY ARE NOT REQUIRED.

GENERAL NOTES:

1- PLACEMENT OF STOP BARS AT NON-SIGNALIZED INTERSECTIONS IS OPTIONAL AND USED WHERE IT IS IMPORTANT TO INDICATE THE POINT WHICH VEHICLES ARE REQUIRED TO STOP. PLACE STOP BARS NO LESS THAN 4 FEET AND NO MORE THAN 30 FEET FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY. USE 10 FEET AS THE TYPICAL SETBACK DISTANCE OR AS DIRECTED BY THE ENGINEER.

2- MINI-SKIP LANE LINE EXTENSIONS SHOULD BE USED AT INTERSECTIONS THAT HAVE REDUCED VISIBILITY CONDITIONS SUCH AS OFFSET, SKEWED, OR CURVED ROADWAYS.

3- MINI-SKIP EDGE LINE EXTENSIONS MAY BE PLACED THROUGH INTERSECTIONS AND MAJOR DRIVEWAYS.

4- REFER TO ROADWAY STANDARD DRAWINGS 1205.01, 1205.02, 1205.05, 1205.08 AND 1205.09 FOR ADDITIONAL PAVEMENT MARKING GUIDANCE.

LEGEND

STOP SIGN	STATIONARY SIGN
DIRECTION OF TRAFFIC FLOW	PAVEMENT MARKING SYMBOLS
* OPTIONAL	

SHEET 2 OF 2
1205D04

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

8-19

ENGLISH DETAIL DRAWING FOR
PAVEMENT MARKINGS
INTERSECTIONS

SHEET 2 OF 2
1205D04

REVISED PAVEMENT MARKING ROADWAY STANDARD DRAWING

08/13/19
S:\S&DU\Standards Group\Standards and Drawings\Drawings\2018 Standard Dwgs\Division 12 Final\12050402_08-13-19.dgn
User:dstokes

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	PMP-2

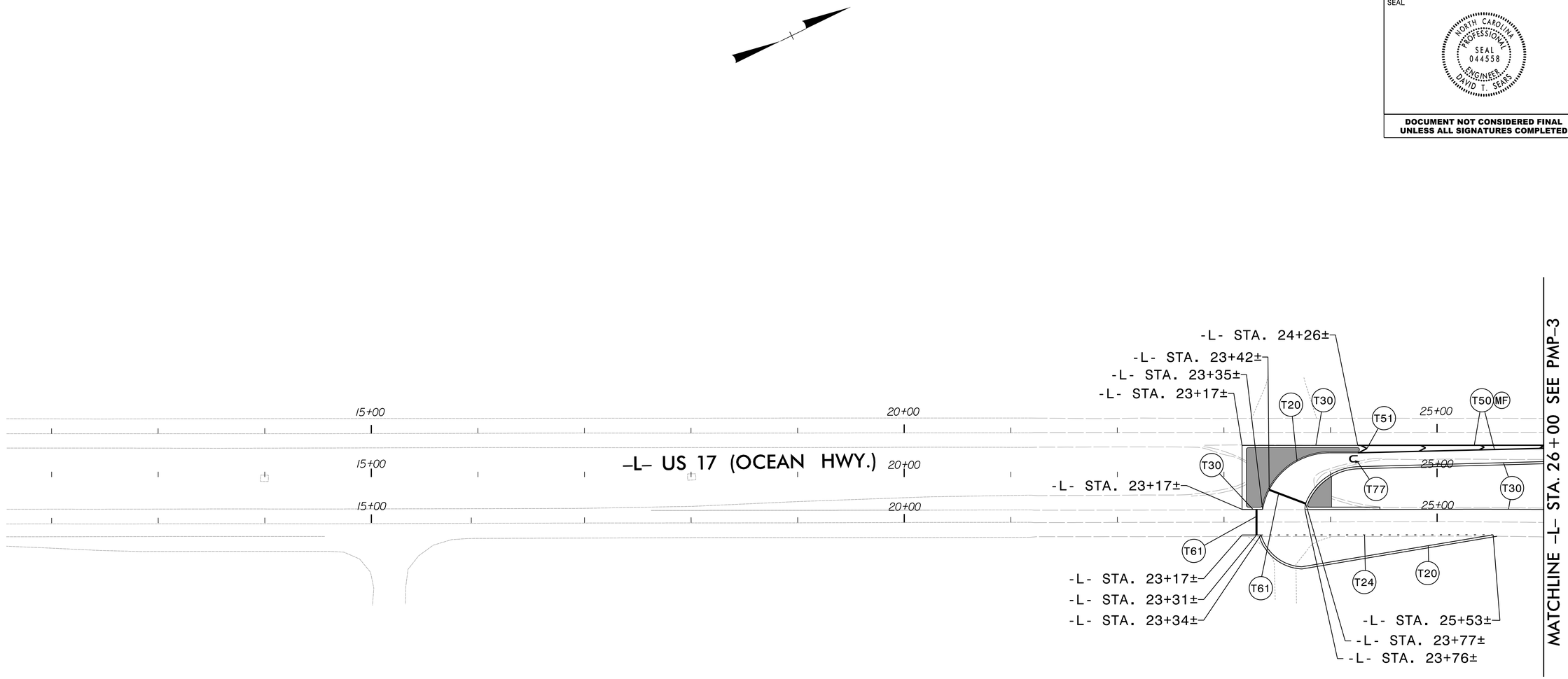
APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVEMENT MARKING SCHEDULE

THERMOPLASTIC LINES (90 MILS)
T1 WHITE EDGE LINE (4")
T13 YELLOW DOUBLE CENTER (4")
T20 WHITE EDGELINE (6")
T23 3FT.-9FT. /SP WHITE MINISKIP (6")
T24 2FT.-6FT./SP WHITE MINISKIP (6")
T30 YELLOW EDGELINE (6")
T50 WHITE GORELINE (12")
T51 WHITE DIAGONAL (12")
T61 WHITE STOPBAR (24")

THERMOPLASTIC SYMBOLS (90 MILS)
T70 LEFT TURN ARROW
T71 RIGHT TURN ARROW
T77 U-TURN ARROW

PAVEMENT MARKERS
ME SNOWPLOWABLE (YELLOW & YELLOW)
MF SNOWPLOWABLE (CRYSTAL & RED)

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

11/17/2021
W-5703H_PMP_psh02.dgn
dsears

PAVEMENT MARKING DETAIL

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	PMP-3

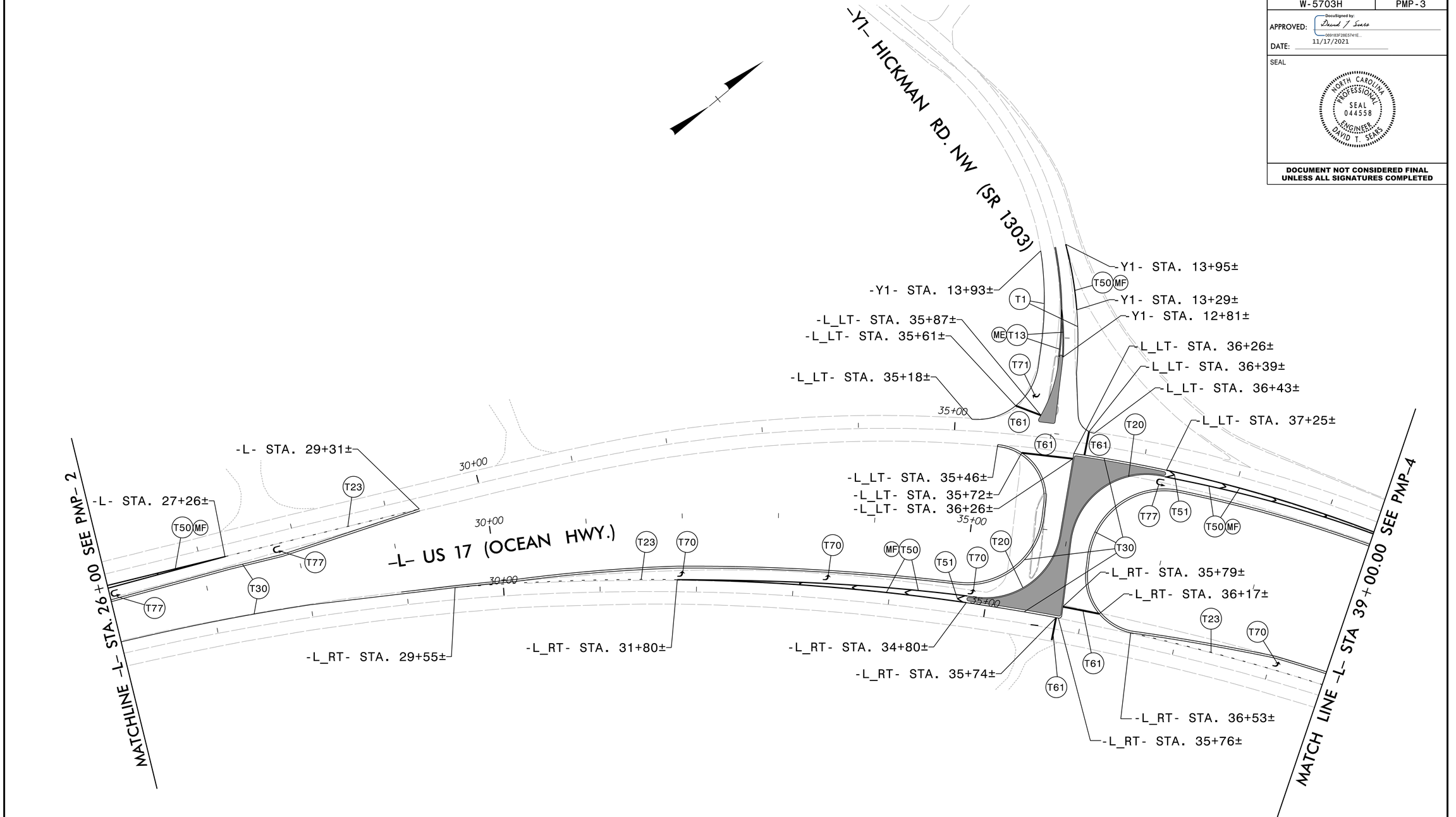
APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVEMENT MARKING SCHEDULE

THERMOPLASTIC LINES (90 MILS)
T1 WHITE EDGE LINE (4")
T13 YELLOW DOUBLE CENTER (4")
T20 WHITE EDGELINE (6")
T23 3FT.-9FT. /SP WHITE MINISKIP (6")
T24 2FT.-6FT./SP WHITE MINISKIP (6")
T30 YELLOW EDGELINE (6")
T50 WHITE GORELINE (12")
T51 WHITE DIAGONAL (12")
T61 WHITE STOPBAR (24")

THERMOPLASTIC SYMBOLS (90 MILS)
T70 LEFT TURN ARROW
T71 RIGHT TURN ARROW
T77 U-TURN ARROW

PAVEMENT MARKERS
ME SNOWPLOWABLE (YELLOW & YELLOW)
MF SNOWPLOWABLE (CRYSTAL & RED)

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

PAVEMENT MARKING DETAIL

11/17/2021
W-5703H_PMP_psh03.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	PMP-4

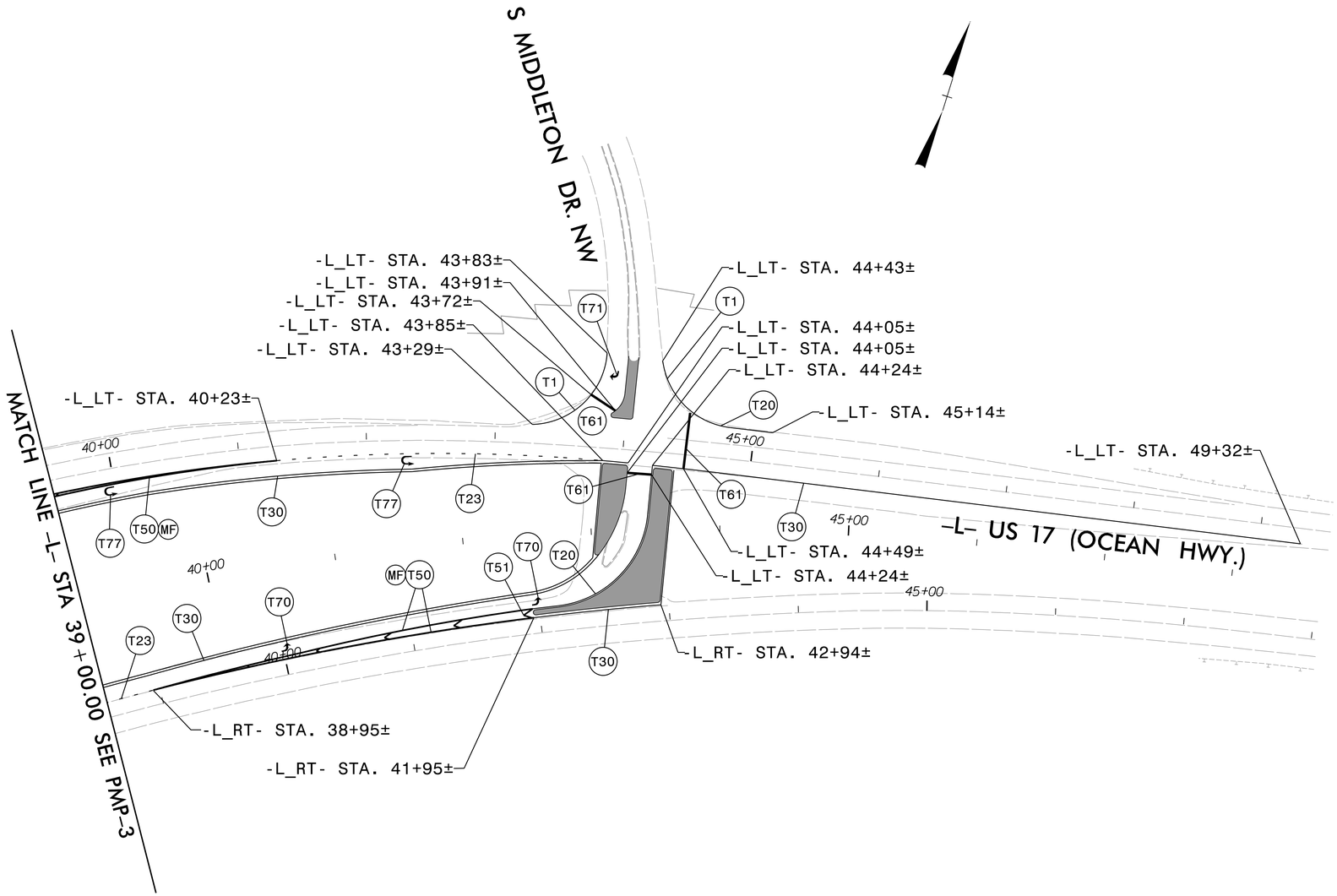
APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVEMENT MARKING SCHEDULE

THERMOPLASTIC LINES (90 MILS)
T1 WHITE EDGE LINE (4")
T13 YELLOW DOUBLE CENTER (4")
T20 WHITE EDGELINE (6")
T23 3FT.-9FT. /SP WHITE MINISKIP (6")
T24 2FT.-6FT./SP WHITE MINISKIP (6")
T30 YELLOW EDGELINE (6")
T50 WHITE GORELINE (12")
T51 WHITE DIAGONAL (12")
T61 WHITE STOPBAR (24")

THERMOPLASTIC SYMBOLS (90 MILS)
T70 LEFT TURN ARROW
T71 RIGHT TURN ARROW
T77 U-TURN ARROW

PAVEMENT MARKERS
ME SNOWPLOWABLE (YELLOW & YELLOW)
MF SNOWPLOWABLE (CRYSTAL & RED)

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

PAVEMENT MARKING DETAIL

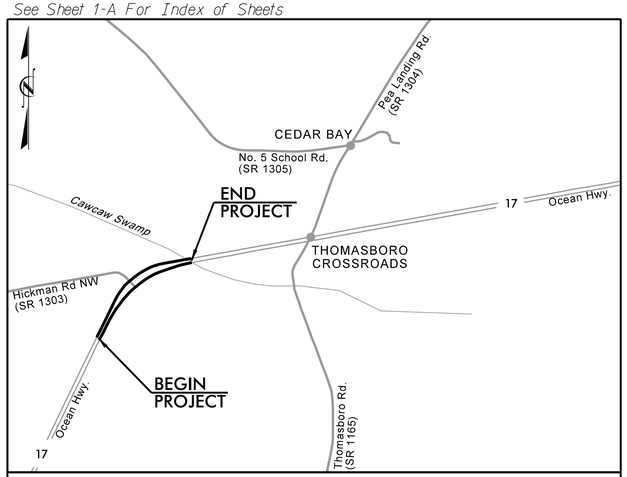
11/17/2021
W-5703H_PMP_psh04.dgn

09/08/99

TIP PROJECT: W-5703H

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP (NTS)

Clearing and Grubbing Phase

Final Phase

Both Phases

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

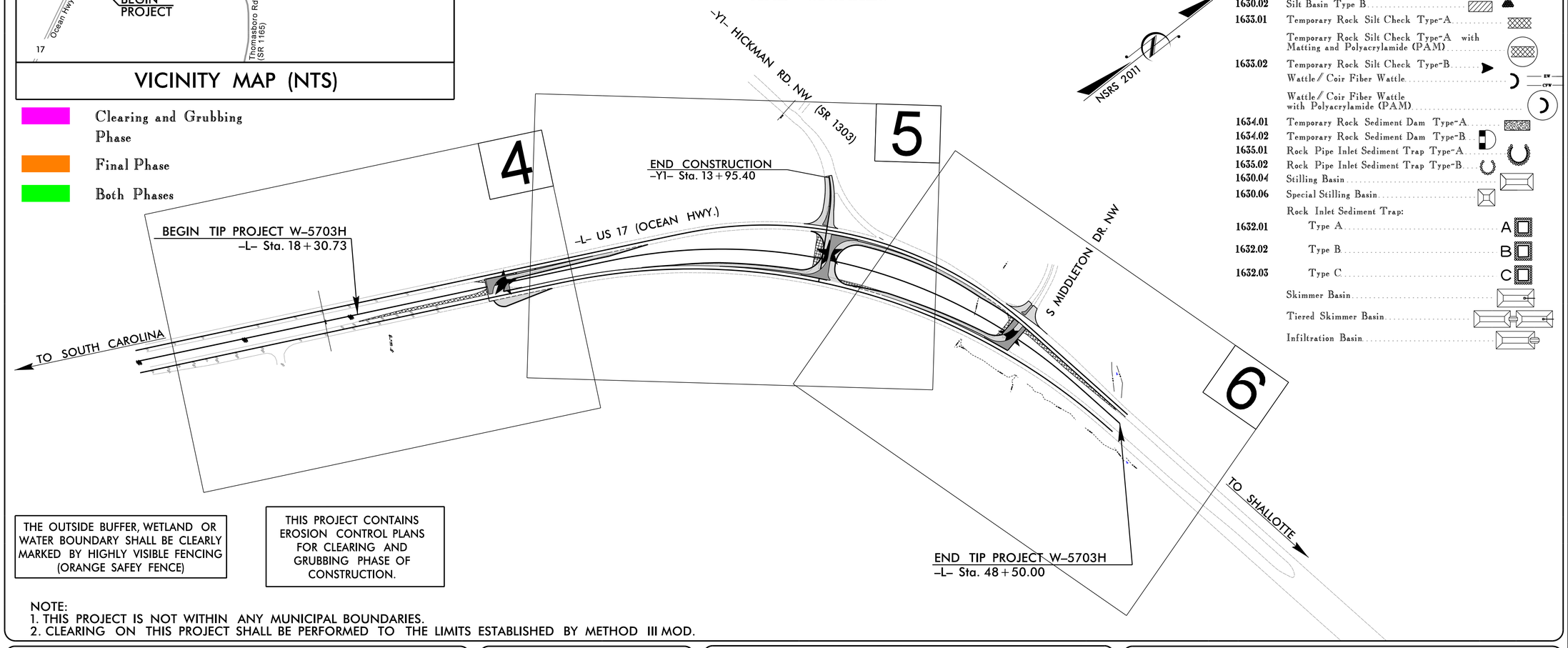
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
BRUNSWICK COUNTY

LOCATION: US-17 AT SR 1303 (HICKMAN ROAD NW)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5703H	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
44849.1.8	HSIP-0017 (169)	PE
44849.2.8		R/W
44849.3.8		CONST.



THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFEY FENCE)

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

NOTE:
1. THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III MOD.

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

GRAPHIC SCALE

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

RK&K

Prepared in the Office of:

RUMMEL, KLEPPER & KAHL, LLP

8601 SIX FORKS ROAD, SUITE 700
RALEIGH, NORTH CAROLINA 27615
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

Designed by:

Robert B. Huskey, P.E. ***3493***
NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

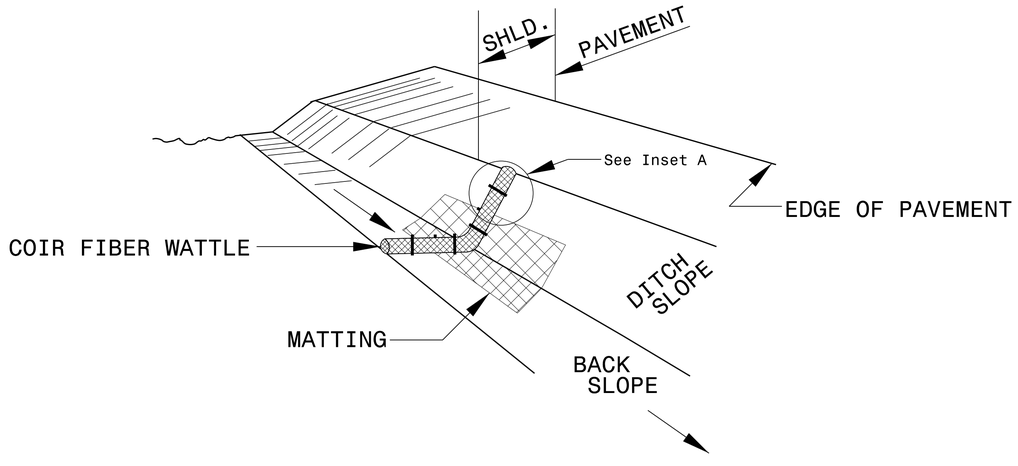
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

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

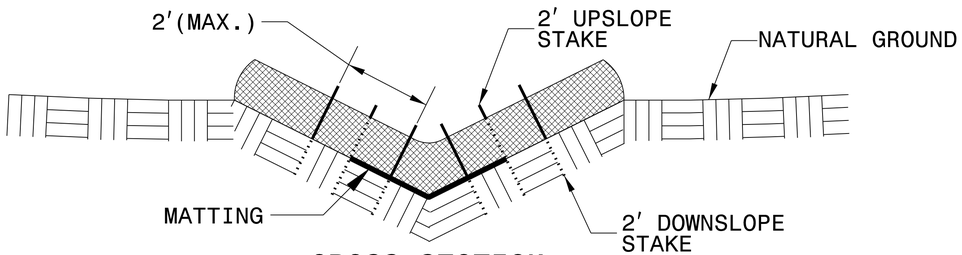
9/15/2021
R:\Hydraulics\CADD\PSH\Erosion Control\W-5703H_EC_tsh.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

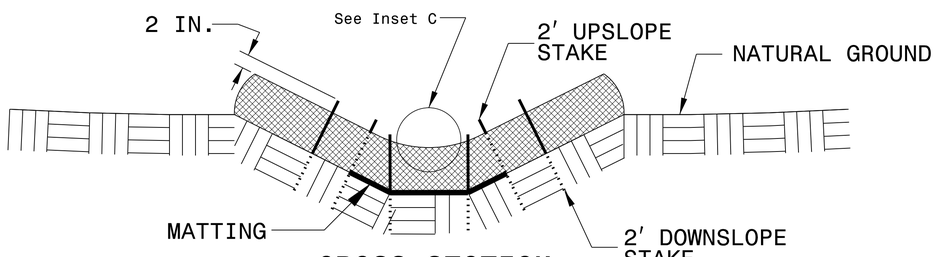
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

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

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

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

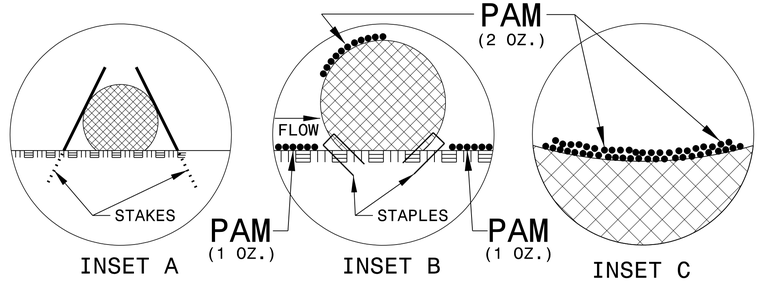
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

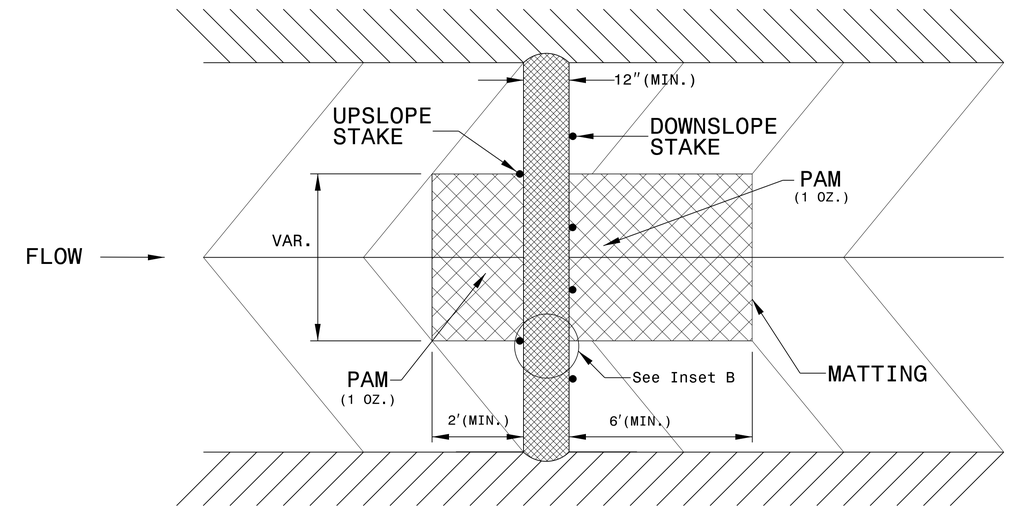
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

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





TOP VIEW

9/15/2021
R:\Hydraulics\CADD\PSH\Erosion Control\W-5703H_EC_psh02.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

8/5/2021
R:\Hydraulics\CADD\PSHE rosion Control\W-5703H_EC_psh03.dgn
default

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-4/CONST. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

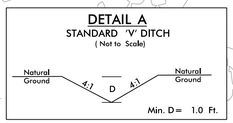
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION IN LIEU OF TYPE C INLET PROTECTION WHERE WATER MIGHT POND ON ROADWAY USED BY PUBLIC TRAFFIC.

NSRS 2011

DETAIL A
STANDARD 'V' DITCH
(Not to Scale)



–L– STA. 22+00 TO STA. 23+00 CL,
BEG EL=32.70', END EL=32.79', S=0.09%

BEGIN TIP PROJECT W-5703H
–L– POT Sta.18+30.73 =
–L LT– POT Sta.18+30.77 (41.23' LT)
–L RT– POT Sta.18+30.69 (42.77' RT)

BM5703-2
ELEVATION = 36.89
N 66365 E 210078
BL STATION 15+00.33 (45.36' LT)
NAIL IN DOT POST

15+00 20+00 25+00

N 25° 55' 37.2" E

N 25° 58' 39.9" E

EXISTING R/W
48" WW
8" PVC
12" PVC
6" PVC
15" RCP
FSS
SOIL
R/W MON
ACCESS POINT
US 17 OCEAN HWY W 26.5' BST
US 17 OCEAN HWY W 39' BST
30' BST WIDTH VARIES
WOODS
15" CMP
18" RCP-IV
18" HDPE
INV=31.78'
INV=31.60'
INV=31.51'
INV=30.93'
INV=33.75'
INV=34.02'
INV=32.08'
INV=33.07'
INV=31.23'
RETAIN
RETAIN DI
RETAIN EXISTING MEDIAN DITCH
5" MONOLITHIC ISLAND
STANDARD 'V' DITCH SEE DETAIL A
2 TONS CL B RIP RAP Ø403
7 SY GEO FAB
DI Ø402
DI Ø401
Ø404
R=49'
300' TAPER
REMOVE EXISTING PIPE
TOE PROTECTION SEE DETAIL B
ATMC Marker
Wood Power Pole
Wood Power Pole with Guy Wire
Underground Telephone Marker
Underground Telephone Pedestal
Underground Telephone Manhole
Underground Telephone Box
Underground Electric Box
Underground Electric Manhole
Underground Electric Pedestal
Underground Electric Marker
Underground Gas Marker
Underground Water Marker
Underground Water Valve
Underground Water Manhole
Underground Water Meter
Underground Water Blow Off
Underground Water Hydrant
Underground Water Box
Underground Water Pedestal

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-5/CONST. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L_LT-

PIs Sta 30+93.70 PI Sta 37+87.65
Θs = 3° 09' 01.0" △ = 47° 31' 39.9" (RT)
Ls = 160.00' D = 3° 56' 16.3"
LT = 106.68' L = 1,206.95'
ST = 53.35' T = 640.64'
R = 1,455.00'

-L-

PIs Sta 28+09.52 PI Sta 37+64.26
Θs = 2° 19' 36.2" △ = 49° 10' 29.4" (RT)
Ls = 160.00' D = 2° 54' 30.3"
LT = 106.68' L = 1,690.78'
ST = 53.34' T = 901.41'
R = 1,970.00'

-L_RT-

PIs Sta 26+19.69 PI Sta 37+44.21
Θs = 1° 59' 18.9" △ = 49° 51' 04.2" (RT)
Ls = 160.00' D = 2° 29' 08.6"
LT = 106.67' L = 2,005.50'
ST = 53.34' T = 1,071.20'
R = 2,305.00'

-Y1-

PI Sta 14+69.78
△ = 57° 01' 48.0" (LT)
D = 15° 16' 43.9"
L = 373.26'
T = 203.74'
R = 375.00'

-Y1SPUR-

PI Sta 12+13.19
△ = 56° 06' 48.7" (RT)
D = 14° 19' 26.2"
L = 391.75'
T = 213.19'
R = 400.00'

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

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 5

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION IN LIEU OF TYPE C INLET PROTECTION WHERE WATER MIGHT POND ON ROADWAY USED BY PUBLIC TRAFFIC.

NSRS 2011

END CONSTRUCTION
-Y1- POT Sta.13+95.40

-L_LT- SC Sta. 31+47.02

-Y1- PC Sta. 12+66.05

REMOVE EXISTING MONOLITHIC ISLAND

5' MONOLITHIC ISLAND

-L_LT- TS Sta. 29+87.02

R=65'

REMOVE EXISTING MONOLITHIC ISLAND

RETAIN EXISTING MEDIAN DITCHES

300' TAPER

150' TAPER

5 TONS CL B RIP RAP
14 SY GEO FAB

RETAIN EXISTING MEDIAN DITCHES

F RETAIN EXISTING MEDIAN DITCH

-L- SC Sta. 28+62.85

-L- TS Sta. 27+02.85

-L_RT- SC Sta. 26+73.01

-Y1- POT Sta.10+00.00 =
-L RT- POT Sta.35+49.40

MATCH LINE -L- STA 26+00.00 SEE SHEET 4

MATCH LINE -L- STA 39+00.00 SEE SHEET 6

2017 ADT
2040 ADT

-Y1-
HICKMAN RD. NW
(SR 1303)
10,600
16,800

4,700
7,400

5,800
9,100

25,400
40,000

26,400
41,400

100
300

PROJECTED TRAFFIC VOLUMES

THE AADT DATA WAS DEVELOPED BASED ON PEAK HOUR VOLUMES SINCE A TRAFFIC FORECAST WAS NOT DEVELOPED AS PART OF THIS PROJECT.

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

FOR -L_LT- & -L_RT- PROFILES SEE SHT. 8
FOR -Y1- & -Y1SPUR- PROFILES SEE SHT. 10

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

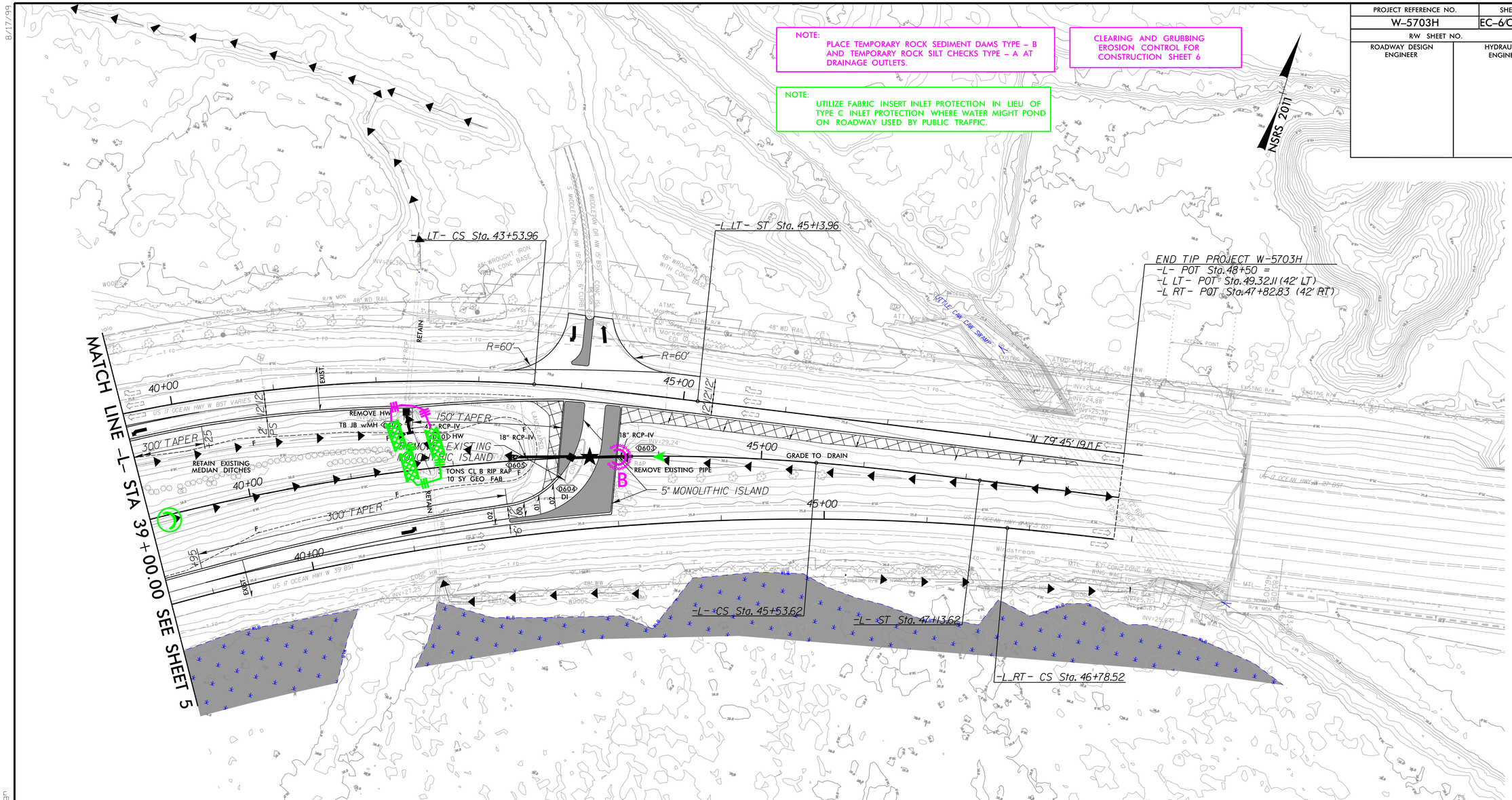
8/05/2021
R:\Projects\CADD\PSHE\Erosion Control\W-5703H_EC_psh05.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-6/CONST. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

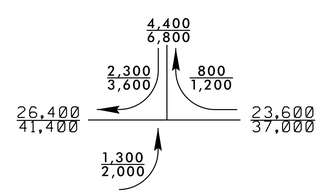
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 6

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION IN LIEU OF TYPE C INLET PROTECTION WHERE WATER MIGHT POND ON ROADWAY USED BY PUBLIC TRAFFIC.



2017 ADT
2040 ADT

S MIDDLETON RD. SW



PROJECTED TRAFFIC VOLUMES

THE AADT DATA WAS DEVELOPED BASED ON PEAK HOUR VOLUMES SINCE A TRAFFIC FORECAST WAS NOT DEVELOPED AS PART OF THIS PROJECT.

-L_LT-

PI Sta 37+87.65	PIs Sta 44+07.31
Δ = 47° 31' 39.9" (RT)	Θs = 3° 09' 01.0"
D = 3° 56' 16.3"	Ls = 160.00'
L = 1,206.95'	LT = 106.68'
T = 640.64'	ST = 53.35'
R = 1,455.00'	

-L-

PI Sta 37+64.26	PIs Sta 46+06.97
Δ = 49° 10' 29.4" (RT)	Θs = 2° 19' 36.2"
D = 2° 54' 30.3"	Ls = 160.00'
L = 1,690.78'	LT = 106.68'
T = 901.41'	ST = 53.34'
R = 1,970.00'	

-L_RT-

PI Sta 37+44.21	PIs Sta 47+31.86
Δ = 49° 51' 04.2" (RT)	Θs = 1° 59' 18.9"
D = 2° 29' 08.6"	Ls = 160.00'
L = 2,005.50'	LT = 106.67'
T = 1,071.20'	ST = 53.34'
R = 2,305.00'	

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

FOR -L LT- & -L RT- PROFILES SEE SHT. 9

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

8/17/99

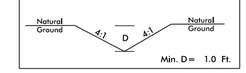
9/15/2021
R:\Hydraulics\CADD\PSH\Erosion Control\W-5703H_EC_psh06.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-7/CONST. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

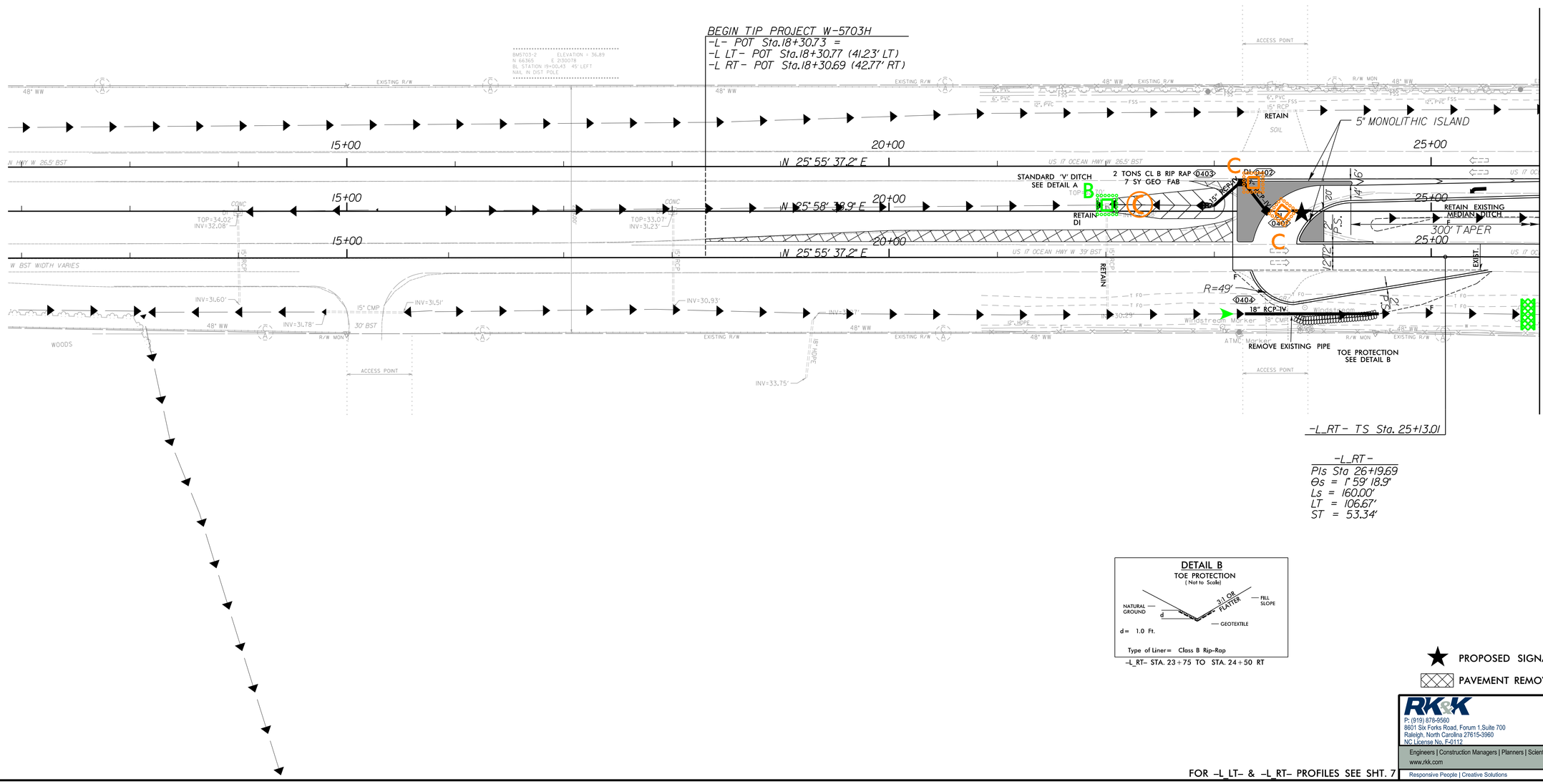
NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION IN LIEU OF TYPE C INLET PROTECTION WHERE WATER MIGHT POND ON ROADWAY USED BY PUBLIC TRAFFIC.

NSRS 2011

DETAIL A
STANDARD 'V' DITCH
(Not to Scale)



-L- STA. 22+00 TO STA. 23+00 CL,
BEG EL=32.70', END EL=32.79', S=0.09%



DETAIL B
TOE PROTECTION
(Not to Scale)

d= 1.0 Ft.

Type of Liner= Class B Rip-Rap

-L_RT- STA. 23+75 TO STA. 24+50 RT

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

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

FOR -L_LT- & -L_RT- PROFILES SEE SHT. 7

8/17/99

9/15/2021
R:\Hydraulics\CADD\PSH\Erosion Control\W-5703H_EC_psh07.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-8/CONST. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L_LT-

PIs Sta 30+93.70 PI Sta 37+87.65
Θs = 3° 09' 01.0" △ = 47° 31' 39.9" (RT)
Ls = 160.00' D = 3° 56' 16.3"
LT = 106.68' L = 1,206.95'
ST = 53.35' T = 640.64'
R = 1,455.00'

-Y1-

PI Sta 14+69.78
△ = 57° 01' 48.0" (LT)
D = 15° 16' 43.9"
L = 373.26'
T = 203.74'
R = 375.00'

-L-

PIs Sta 28+09.52 PI Sta 37+64.26
Θs = 2° 19' 36.2" △ = 49° 10' 29.4" (RT)
Ls = 160.00' D = 2° 54' 30.3"
LT = 106.68' L = 1,690.78'
ST = 53.34' T = 901.41'
R = 1,970.00'

-Y1SPUR-

PI Sta 12+13.19
△ = 56° 06' 48.7" (RT)
D = 14° 19' 26.2"
L = 391.75'
T = 213.19'
R = 400.00'

-L_RT-

PIs Sta 26+19.69 PI Sta 37+44.21
Θs = 1° 59' 18.9" △ = 49° 51' 04.2" (RT)
Ls = 160.00' D = 2° 29' 08.6"
LT = 106.67' L = 2,005.50'
ST = 53.34' T = 1,071.20'
R = 2,305.00'

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION IN LIEU OF TYPE C INLET PROTECTION WHERE WATER MIGHT POND ON ROADWAY USED BY PUBLIC TRAFFIC.

NSRS 2011

END CONSTRUCTION
-Y1- POT Sta.13+95.40

-L_LT- SC Sta. 31+47.02

-Y1- PC Sta. 12+66.05

REMOVE EXISTING MONOLITHIC ISLAND

5' MONOLITHIC ISLAND

-L_LT- TS Sta. 29+87.02

R=65'

35+00

30+00

REMOVE EXISTING MONOLITHIC ISLAND

RETAIN EXISTING MEDIAN DITCHES

150' TAPER

300' TAPER

RETAIN EXISTING MEDIAN DITCH

5 TONS CL B RIP RAP
14 SY GEO FAB

-L- SC Sta. 28+62.85

-L- TS Sta. 27+02.85

-L_RT- SC Sta. 26+73.01

-Y1- POT Sta.10+00.00 =
-L RT- POT Sta.35+49.40

MATCH LINE -L- STA 26+00.00 SEE SHEET 4

MATCH LINE -L- STA 39+00.00 SEE SHEET 6

2017 ADT
2040 ADT

-Y1-
HICKMAN RD. NW
(SR 1303)
10,600
16,800

4,700 / 7,400
5,800 / 9,100
25,400 / 40,000
26,400 / 41,400
100 / 300

PROJECTED TRAFFIC VOLUMES

THE AADT DATA WAS DEVELOPED BASED ON PEAK HOUR VOLUMES SINCE A TRAFFIC FORECAST WAS NOT DEVELOPED AS PART OF THIS PROJECT.

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

FOR -L_LT- & -L_RT- PROFILES SEE SHT. 8
FOR -Y1- & -Y1SPUR- PROFILES SEE SHT. 10

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

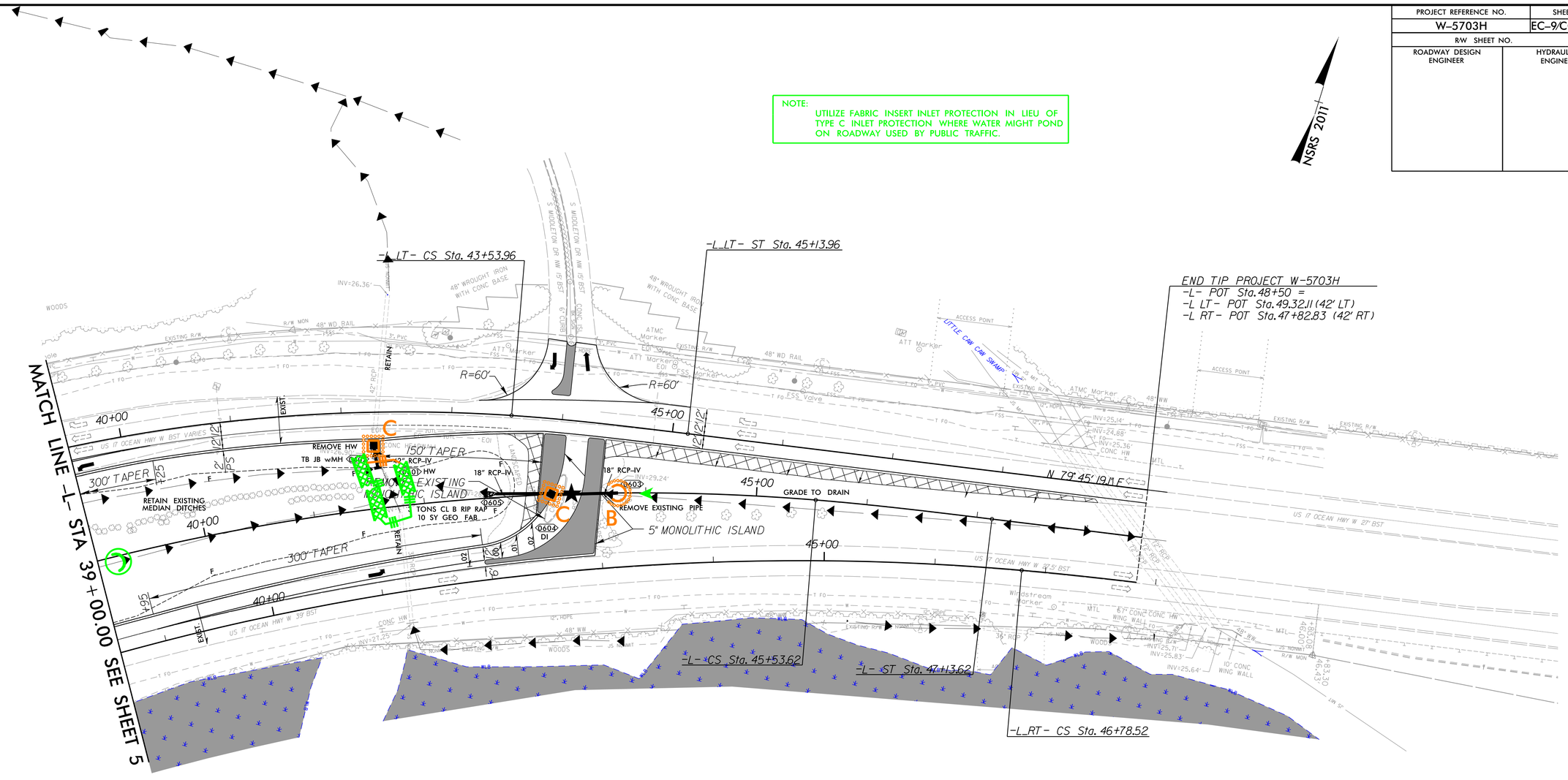
8/15/2021
R:\Highways\CADD\PSHE-rosion Control\W-5703H_EC_psh08.dgn
default

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	EC-9/CONST. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

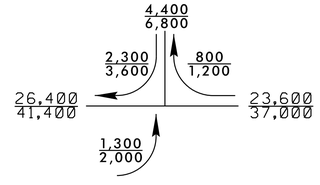
NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION IN LIEU OF TYPE C INLET PROTECTION WHERE WATER MIGHT POND ON ROADWAY USED BY PUBLIC TRAFFIC.

NSRS 2011



2017 ADT
2040 ADT

S MIDDLETON RD. SW



PROJECTED TRAFFIC VOLUMES

THE AADT DATA WAS DEVELOPED BASED ON PEAK HOUR VOLUMES SINCE A TRAFFIC FORECAST WAS NOT DEVELOPED AS PART OF THIS PROJECT.

-L_LT-

PI Sta 37+87.65	PIs Sta 44+07.31
Δ = 47° 31' 39.9" (RT)	Θs = 3° 09' 01.0"
D = 3° 56' 16.3"	Ls = 160.00'
L = 1,206.95'	LT = 106.68'
T = 640.64'	ST = 53.35'
R = 1,455.00'	

-L-

PI Sta 37+64.26	PIs Sta 46+06.97
Δ = 49° 10' 29.4" (RT)	Θs = 2° 19' 36.2"
D = 2° 54' 30.3"	Ls = 160.00'
L = 1,690.78'	LT = 106.68'
T = 901.41'	ST = 53.34'
R = 1,970.00'	

-L_RT-

PI Sta 37+44.21	PIs Sta 47+31.86
Δ = 49° 51' 04.2" (RT)	Θs = 1° 59' 18.9"
D = 2° 29' 08.6"	Ls = 160.00'
L = 2,005.50'	LT = 106.67'
T = 1,071.20'	ST = 53.34'
R = 2,305.00'	

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

FOR -L LT- & -L RT- PROFILES SEE SHT. 9

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

8/15/2021
11:16:06
default
C:\Projects\CADD\PSH\Erosion Control\W-5703H_EC_psh09.dgn

T.I.P.: W-5703H

CONTRACT: DC00326

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

TIP NO.	SHEET NO.
W-5703H	SIGN-1

APPROVED: DocuSigned by: David T Sears 06918F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNING PLAN
BRUNSWICK COUNTY
LOCATION: US 17 AT SR 1303 (HICKMAN RD NW)

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
901.50	ARROWS AND SHIELDS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
910.30	SIGNING SIGNALIZED AND UNSIGNALIZED SUPERSTREET
1264.01	OBJECT MARKERS - TYPES

GENERAL NOTES

. SIGNS FURNISHED BY STATE

. CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.

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

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

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

. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

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

. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	258	L.F.
4102000000	904	SIGN ERECTION, TYPE E	10	EA.
4108000000	904	SIGN ERECTION, TYPE F	5	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	36	EA.
4360000000	SP	END OF MEDIAN MARKER	5	EA.

PROJECT NOTES

1. SIGN ERECTION, TYPE D, E, AND F

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-3-3A	E AND F SHEET, SIGN DETAIL
SIGN-5-7	SIGNING PLAN SHEETS

PLAN PREPARED FOR: NCDOT DIVISION 3

Jessi Leonard, PE — DIVISION 3 TRAFFIC ENGINEER

Ayman I. Alqudwah, PE — SIGNING & DELINEATION PROJECT REGIONAL ENGINEER

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY:

David Sears, PE, PTOE PROJECT ENGINEER

Allen Tutt SR. DESIGNER

RK&K

P: (919) 878-9560
8601 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

11/17/21
W-5703H_SGN_TSH.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SIGN-3

APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

(401) QUANTITY REQ'D 4



54" X 18"
R6-1(L)

TWO "U" POSTS PER SIGN

(402) QUANTITY REQ'D 4

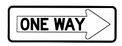


12"x36"
OM3-C

END OF MEDIAN MARKER
WITH TYPE IV REFLECTIVE SHEETING
OM3-C DECAL
(OR APPROVED EQUIVALENT)

PAID FOR AS "END OF MEDIAN MARKER"
SEE SPECIAL PROVISIONS

(403) QUANTITY REQ'D 1



54" X 18"
R6-1(R)

TWO "U" POSTS

(404) QUANTITY REQ'D 1



12" X 36"
OM3-L

END OF MEDIAN MARKER
WITH TYPE IV REFLECTIVE SHEETING
OM3-L DECAL
(OR APPROVED EQUIVALENT)

PAID FOR AS "END OF MEDIAN MARKER"
SEE SPECIAL PROVISIONS

(501)



M3-3
24" X 12"

M1-4
24" X 24"

ONE "U" POST

(502) (505)



M3-1
24" X 12"

M1-4
24" X 24"

21" X 21"

SEE SHEET SIGN-3A
FOR ARROW DETAIL

ONE "U" POST PER SIGN

(503)



M3-3
24" X 12"

M1-4
24" X 24"

21" X 21"

SEE SHEET SIGN-3A
FOR ARROW DETAIL

ONE "U" POST

(504)



M3-1
24" X 12"

M1-4
24" X 24"

ONE "U" POST

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

11/17/2021
W-5703H_SGN_E_F.dgn
dsears

TYPE "E" & "F" SIGNS

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SIGN-3A

APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGN NUMR: 502,503,505
TYPE: F Ground
QUANTITY: 3

BACKG. COLOR: White
COPY COLOR: Black

DESIGN BY:
PROJECT ID:

CHK BY:
DIV:

STD #:
DATE:

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

SIGN WIDTH: 1′-9″
HEIGHT: 1′-9″
TOTAL AREA: 3.1 Sq.Ft.

MAT'L: 0.063 ″ ALUMINUM

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

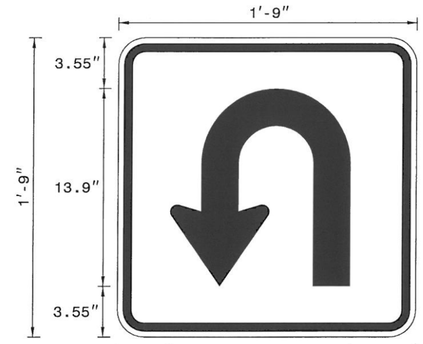
NO. Z BARS:
LENGTH:

SYMBOL	X	Y	WID	HT
u arrow	3.7	3.5	12.7	13.9

NOTES:

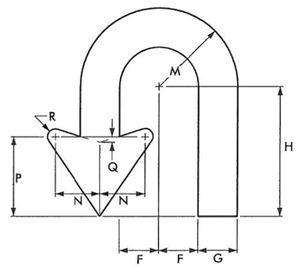
1. Legend and border shall be direct applied Non-reflective sheeting.

2. Background shall be Grade C reflective sheeting.



BORDER
R=1.5″
TH=0.63″
IN=0.38″

Arrow Details



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

Spacing Factor is 1 unless specified otherwise

FILENAME: GSENG

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1,Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

11/17/2021
W-5703H_SGN_E_F.dgn
dsears

SIGN DETAIL

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SIGN-5

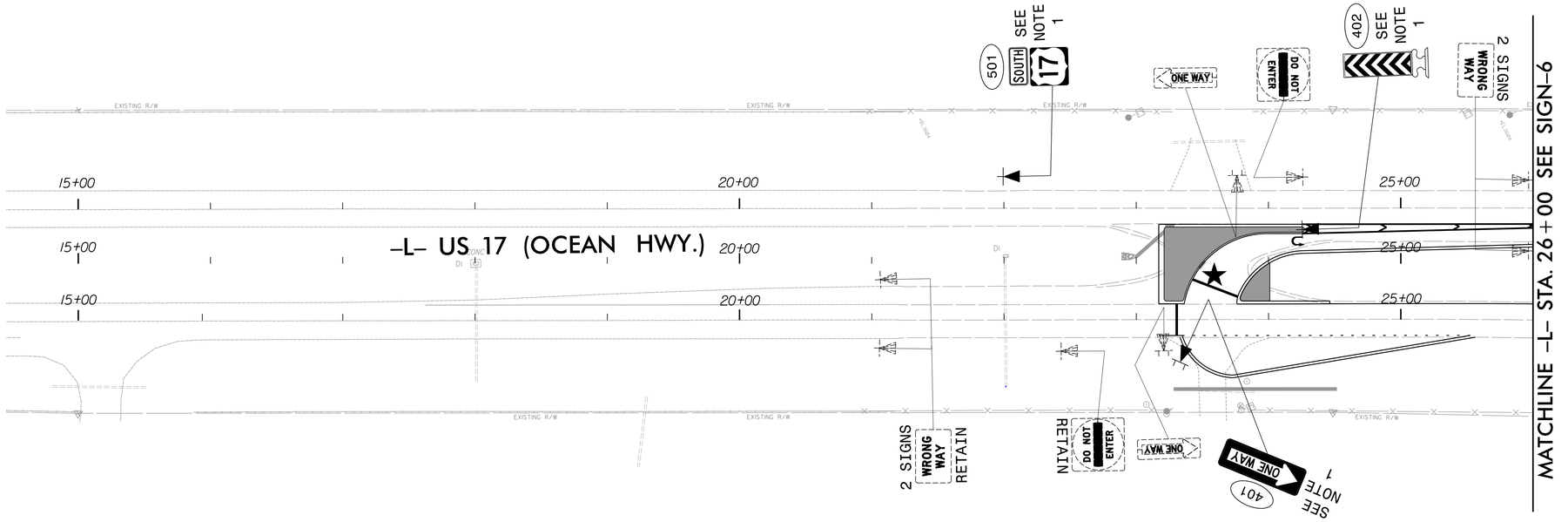
APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



★ SIGNALIZED INTERSECTION

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

PROJECT NOTES

1. SIGN ERECTION, TYPE D, E, AND F

SIGNING PLAN

11/17/2021
W-5703H_SGN_psh05.dgn
dsears

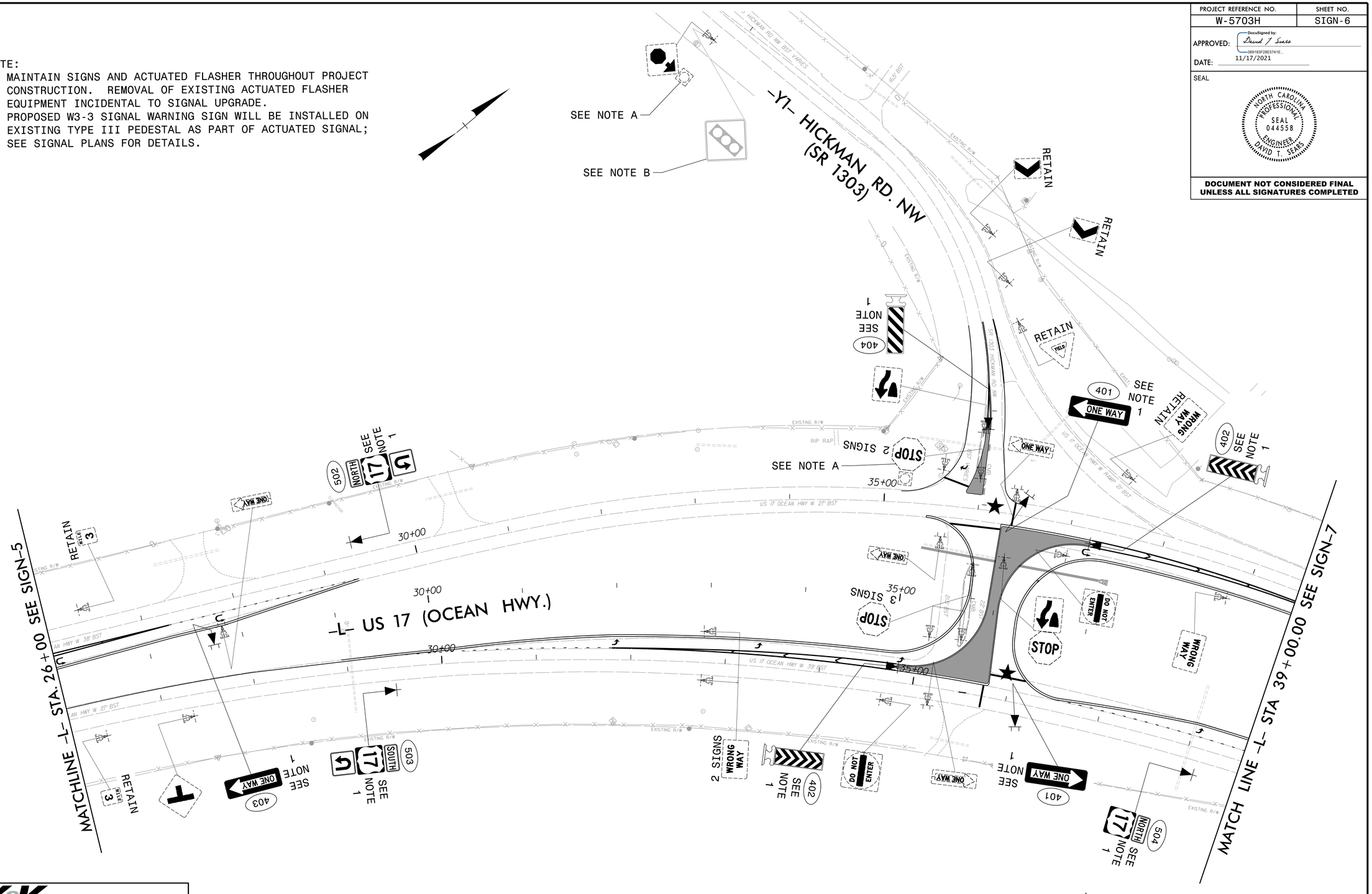
NOTE:
A. MAINTAIN SIGNS AND ACTUATED FLASHER THROUGHOUT PROJECT CONSTRUCTION. REMOVAL OF EXISTING ACTUATED FLASHER EQUIPMENT INCIDENTAL TO SIGNAL UPGRADE.
B. PROPOSED W3-3 SIGNAL WARNING SIGN WILL BE INSTALLED ON EXISTING TYPE III PEDESTAL AS PART OF ACTUATED SIGNAL; SEE SIGNAL PLANS FOR DETAILS.

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SIGN-6

APPROVED: DocuSigned by: David T Sears 069183F28E5741E...
DATE: 11/17/2021

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



★ SIGNALIZED INTERSECTION

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

PROJECT NOTES

1. SIGN ERECTION, TYPE D, E, AND F

SIGNING PLAN

11/17/21
W-5703H_SGN_psh06.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SIGN-7

APPROVED: DocuSigned by: David T Sears 069183F28E5741E...

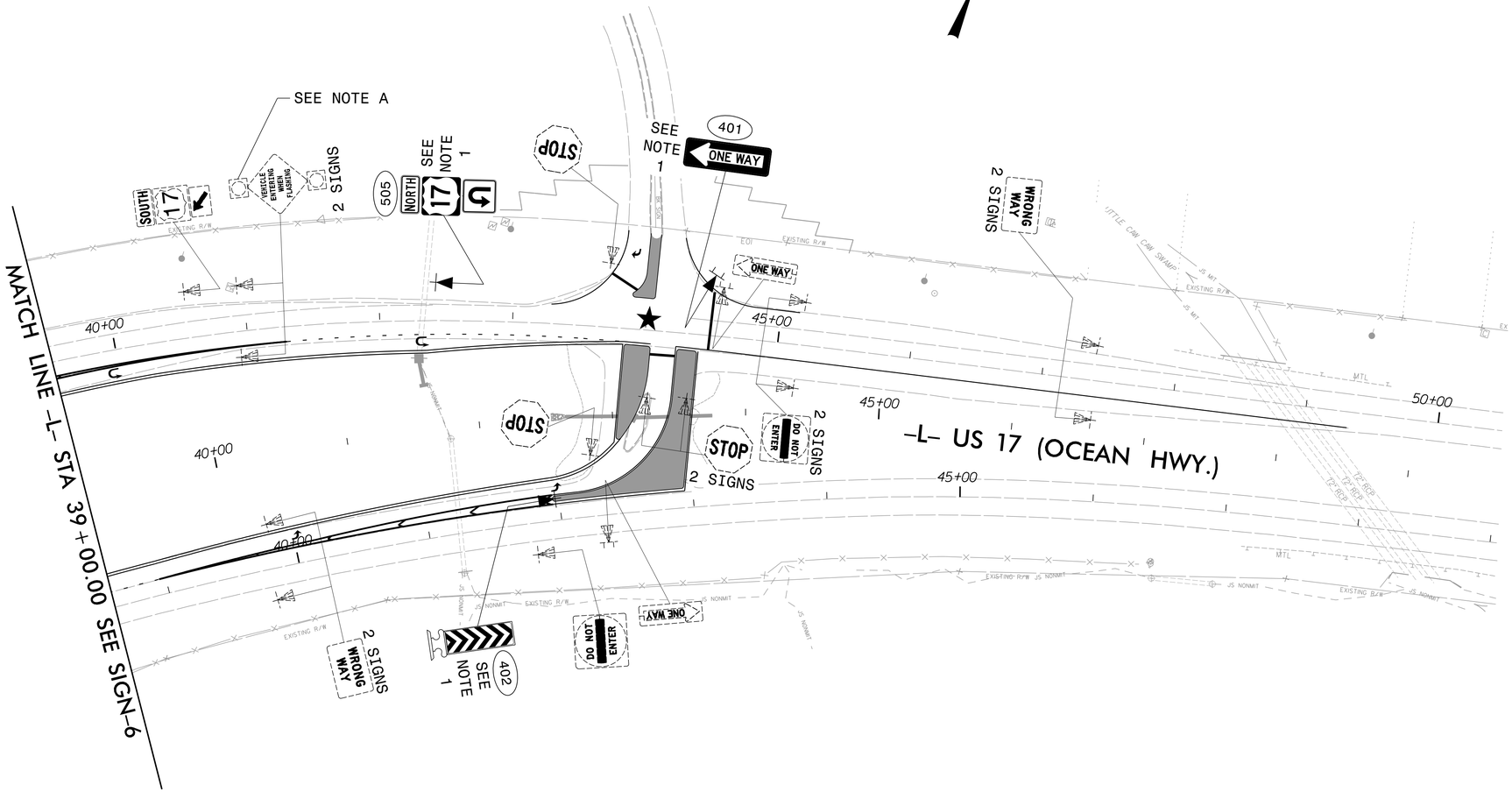
DATE: 11/17/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE:
A. MAINTAIN SIGNS AND ACTUATED FLASHER THROUGHOUT PROJECT CONSTRUCTION. REMOVAL OF EXISTING ACTUATED FLASHER EQUIPMENT INCIDENTAL TO SIGNAL UPGRADE.



★ SIGNALIZED INTERSECTION

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

PROJECT NOTES

1. SIGN ERECTION, TYPE D, E, AND F

SIGNING PLAN

11/17/2021
W-5703H_SGN_psh07.dgn
dsears

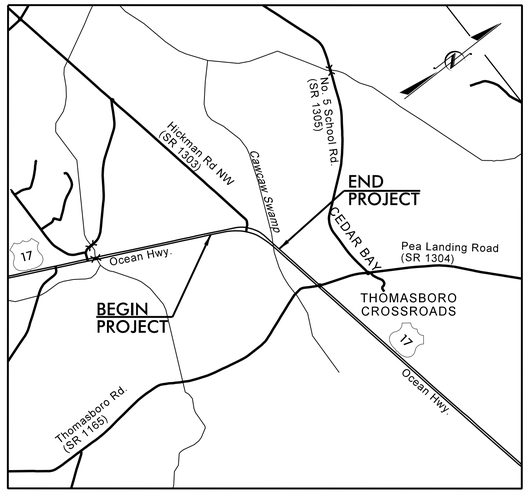
Project No.	Sheet No.
W-5703H	Sig. 1.0

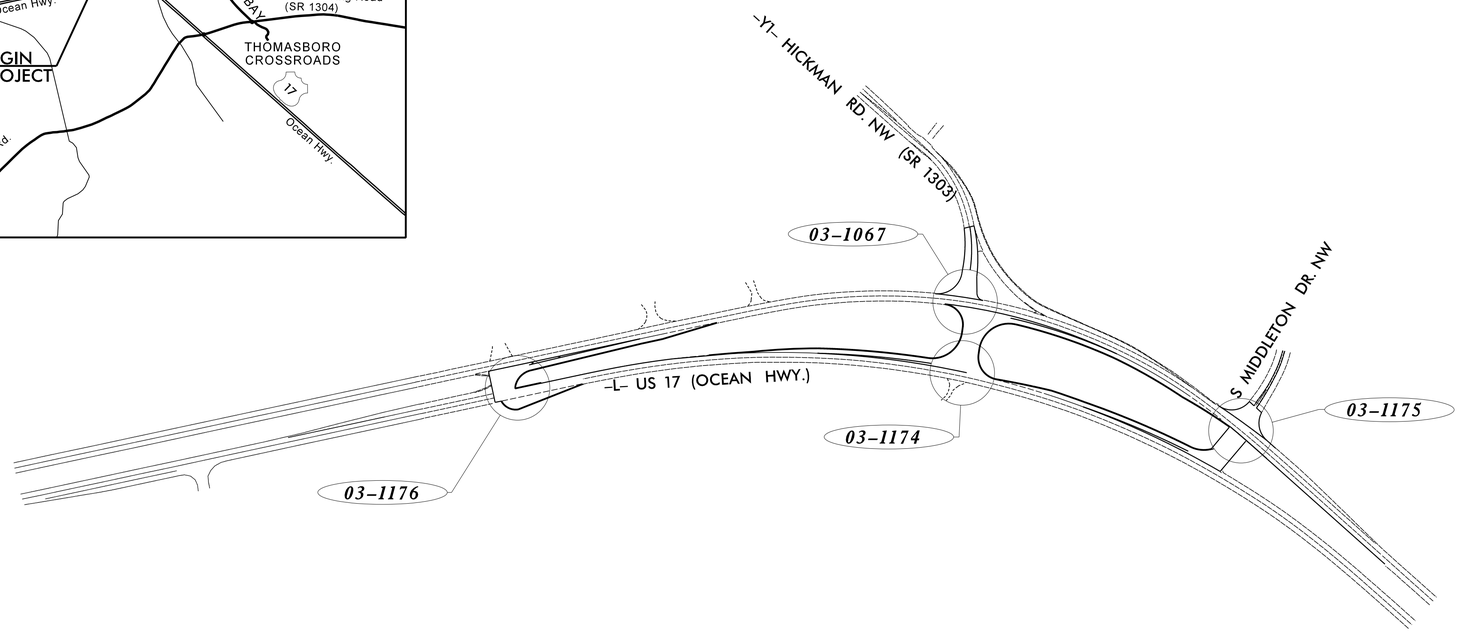
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: US-17 AT SR 1303 (HICKMAN ROAD NW)
TYPE OF WORK: SIGNALS

Vicinity





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

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	-------	Title Sheet
Sig. 1.1-1.2	-------	Standard Plate Sheets
Sig. 2.0-2.8	03-1176	US 17 Northbound at U-turn South of SR 1303 (Hickman Road)
Sig. 3.0-3.2	03-1067	US 17 Southbound at SR 1303 (Hickman Road)
Sig. 4.0-4.4	03-1174	US 17 Northbound at SR 1303 (Hickman Road)
Sig. 5.0-5.4	03-1175	US 17 Southbound at South Middleton Drive
SCP. 1-4	-------	Signal Communication Plans

NCDOT SIGNAL & ITS
CONTACT INFORMATION:

Zachary Little, PE - Eastern Region Signals Engineer
D. Todd Joyce, PE - Signal Equipment Design Review Engineer
Gregg A. Green - Signal Communication Project Engineer

DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS and Signals Unit
750 N. Greenfield Parkway, Garner, NC 27529

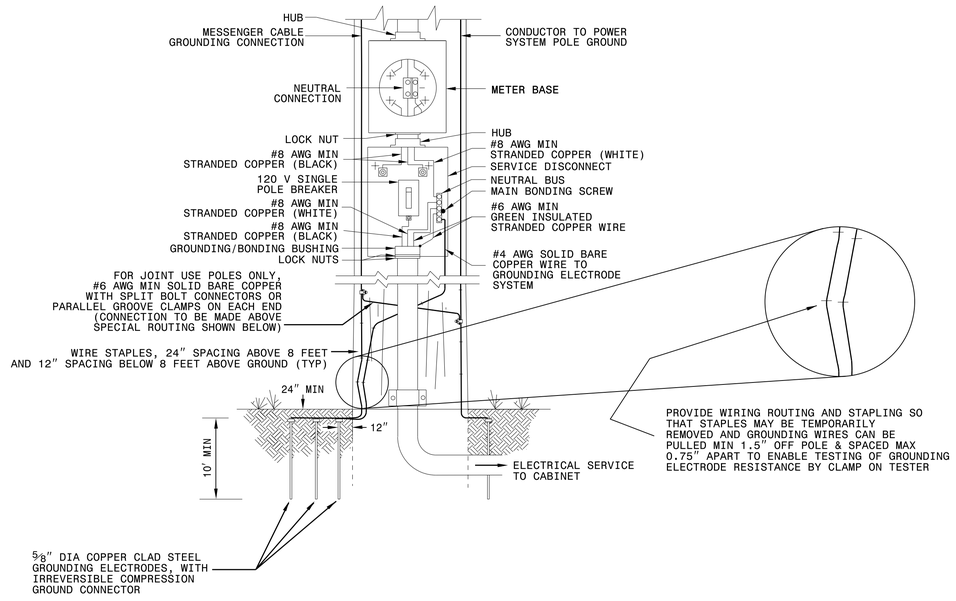
Project: W-5703H

CONTRACT: DC00326

11/24/2021
R:\Traffic\Signals\Design\Signals\W-5703H_SIG_TSH.dgn
dseors

DocuSign Envelope ID: 3AB00590-16A7-4DBF-945B-115C94D4A1AB

PROJECT NO.	SHEET NO.
W-5703H	Sig.1.1



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

1-18

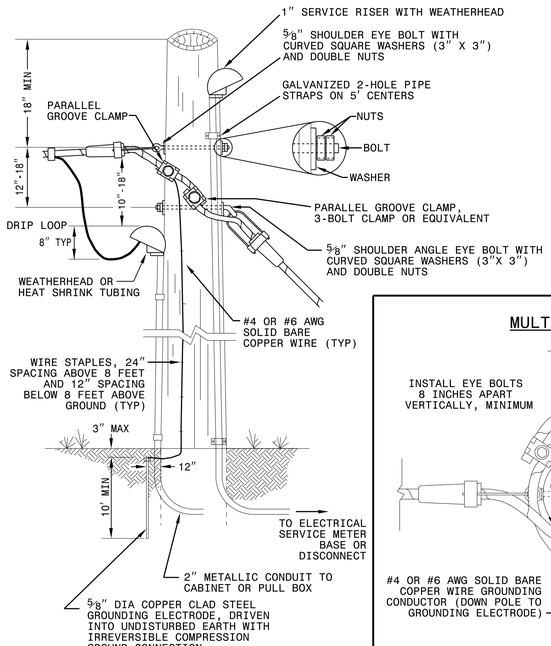
ENGLISH STANDARD DRAWING FOR

ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

SHEET 1 OF 1

1700D01



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

1-18

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

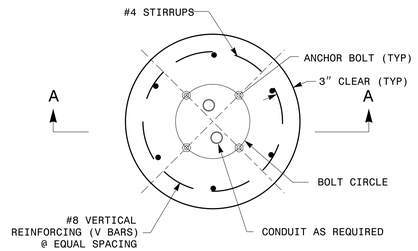
NORTH CAROLINA PROFESSIONAL SEAL 032108 ENGINEER MOHD A. ASLAMI

DocuSigned by: Mohd Aslami
5D90B0BA6DBB6495...

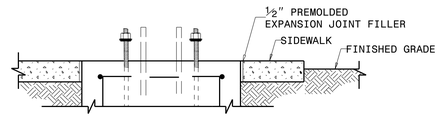
10/11/2017
DATE

11-OCT-2017 08:56
U:\NCDOT\Std Drawings\Plate Sheets\2018_Plate Sheet .dgn
rwhough

PROJECT NO.	SHEET NO.
W-5703H	Sig. 1.2



PEDESTAL FOUNDATION - PLAN VIEW

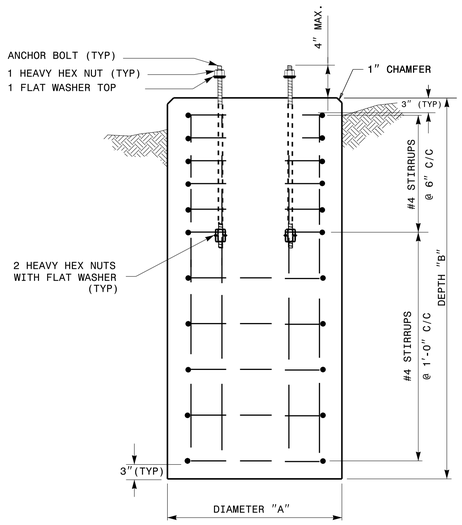


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK

NOTES:

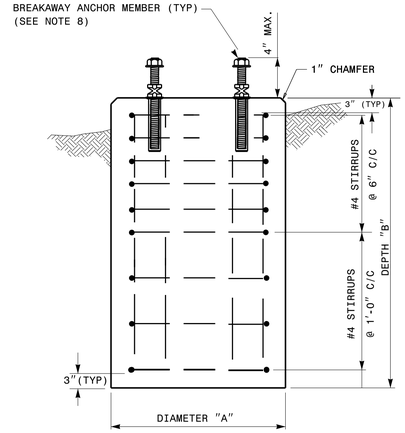
1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF F'c= 3000 PSI (MIN.).
4. USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
5. GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
   A. SANDY TYPE SOIL
   B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
   C. WIND SPEED NOT TO EXCEED 140 MPH

   IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
6. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
7. ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
8. USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4½" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6⅝". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



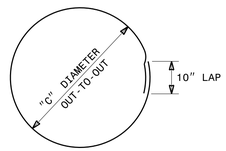
TYPES I, II & III

SECTION A-A

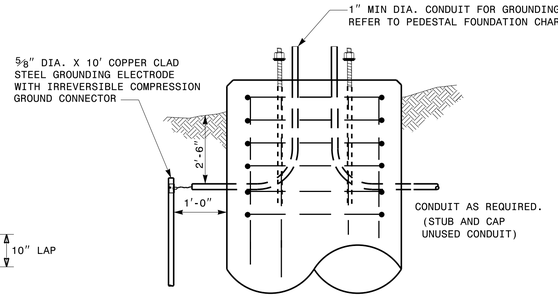


TYPES I & II ONLY

SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	½	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	¾	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

REINFORCING STEEL SCHEDULE

TYPE	V-BAR				STIRRUP								TOTAL STEEL WEIGHT LBS
	SIZE #	QTY	LENGTH	WEIGHT LBS	SIZE #	QUANTITY VERTICAL SPACING ON 6" CENTERS	QUANTITY VERTICAL SPACING ON 12" CENTERS	QUANTITY TOTAL	LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

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

1-18

ENGLISH STANDARD DRAWING FOR

PEDESTALS

FOUNDATIONS

SHEET 1 OF 1

1743D01

See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
ITS & Signals Unit
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBESH C. SARKAR

DocuSigned by:
Debesh C. Sarkar
44E8E32E147E4C4...
10/11/2017
DATE

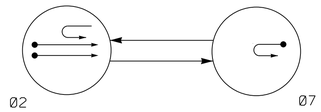
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

11-OCT-2017 03:03
U:\NCDOT Std Drawings\Plate Sheets\2018_Plate Sheet .dgn
rwhough

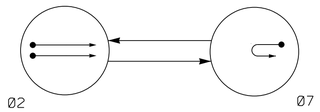
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 2.0

2 Phase
Fully Actuated
D03-06_CALABASH SIGNAL SYSTEM

PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

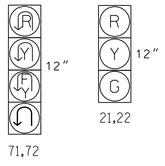
SIGNAL FACE	PHASE Ø2	PHASE Ø7	PHASE PREEMPT 7R1	PHASE DWELL	PHASE FLASH
21,22	G	R	R	Y	Y
23,24,25,26	OFF	ON	ON	OFF	OFF
71,72	(flashing)			(R)	(R)

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2	PHASE Ø7	PHASE PREEMPT 7R1	PHASE DWELL	PHASE FLASH
21,22	G	R	R	Y	Y
23,24,25,26	OFF	ON	ON	OFF	OFF
71,72	(R)			(R)	(R)

SIGNAL FACE I.D.

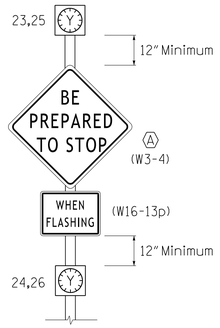
All Heads L.E.D.



BEACON TABLE OF OPERATION

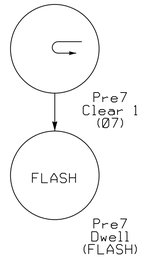
SIGNAL FACE	INTERVAL 1	INTERVAL 2
23,25	ON	OFF
24,26	OFF	ON

Figure 1



FAILURE PREEMPT

(High Priority)



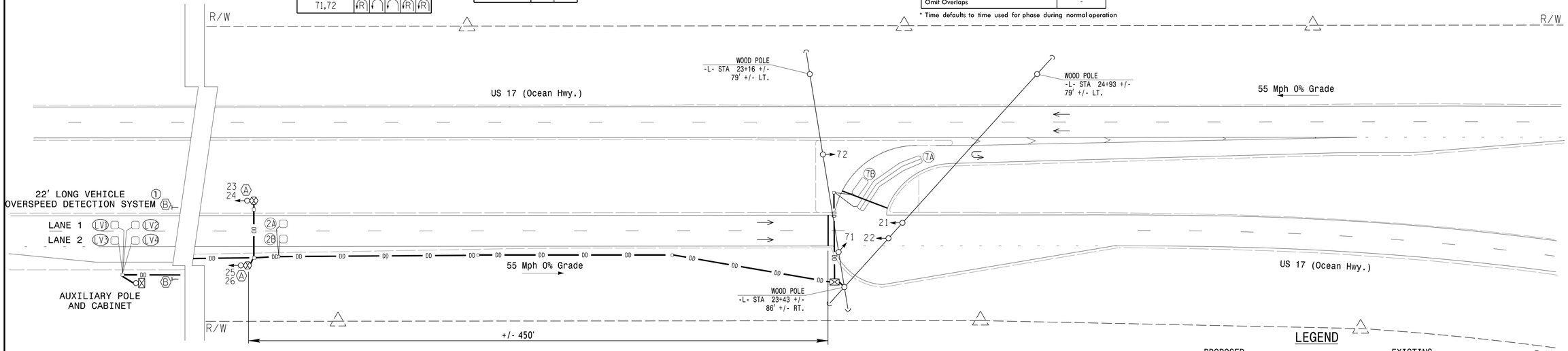
FAILURE PREEMPT

FUNCTION	PRE 7
Interval 1 – Green Clear	15
Interval 1 – Yellow Clear	0.0*
Interval 1 – Red Clear	0.0*
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Exit Phase(s)	2
Priority	High
Delay Time	0.0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	14
Flash Dwell Interval?	Y
Enable Backup Protection	N
Ped Clear Through Yellow	N
Omit Overlaps	-

* Time defaults to time used for phase during normal operation

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specification for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Activate flashers 3 seconds prior to the end of phase 2 green.
5. Refer to pavement marking plans for stop bar locations.
6. Install pull boxes at intervals of no greater than 150 ft along all runs of lead-in wire.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
DD	Directional Drill	N/A
	Type II Signal Pedestal	
	Type III Signal Pedestal	
(A)	"BE PREPARED TO STOP" Sign (W3-4) w/ "WHEN FLASHING" Plaque (W16-3p) (See Figure 1)	(A)
(B)	Signal Ahead Sign (W3-3)	(B)

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 7
Min Green 1 *	14	7
Extension 1 *	6.0	2.0
Max Green 1 *	90	30
Yellow Clearance	5.2	3.0
Red Clearance	1.0	2.3
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	1.5	-
Max Variable Initial *	46	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.4	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

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

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING: PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	420	6	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	420	6	Y	2	Y	Y	-	-	-	-	Y
7A	6X60	+10	2-4-2	Y	7	Y	Y	-	-	✳15	-	Y
7B	6X15	0	3	Y	7	Y	Y	-	-	✳15	-	Y

✳Disable Delay During Alternate Phasing Operation.

LONG VEHICLE OVERSPEED DETECTION SYSTEM
LOOP & DETECTION INSTALLATION CHART

INDUCTIVE LOOPS: LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	DETECTOR UNITS: CABINET TYPE	LANE NO	LOOP AMP NO	CHANNEL	NEMA PHASE	TIMING: FEATURE	TIME	PLACE CALL DURING PHASE	INHIBIT DELAY DURING GREEN?
LV1	6'X6'	4	1015'	X		① 170E/2070N/2070L	1	1	1	2*	NONE	- SEC.	ALL	NO
LV2	6'X6'	4	999'	X			1		2		NONE	- SEC.	ALL	NO
LV3	6'X6'	4	1015'	X			2	2	1	2*	NONE	- SEC.	ALL	NO
LV4	6'X6'	4	999'	X			2		2		NONE	- SEC.	ALL	NO
LVODS THRESHOLD SPEED (MPH)	55													
LVODS EXTEND TIME	12 SEC.													

*Phase hold output to controller

NEW INSTALLATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

SCALE 0 40 1"=40'

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 Brunswick County Calabash

PLAN DATE: November 2021 REVIEWED BY: D. Sears
PREPARED BY: A Pokhrel REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

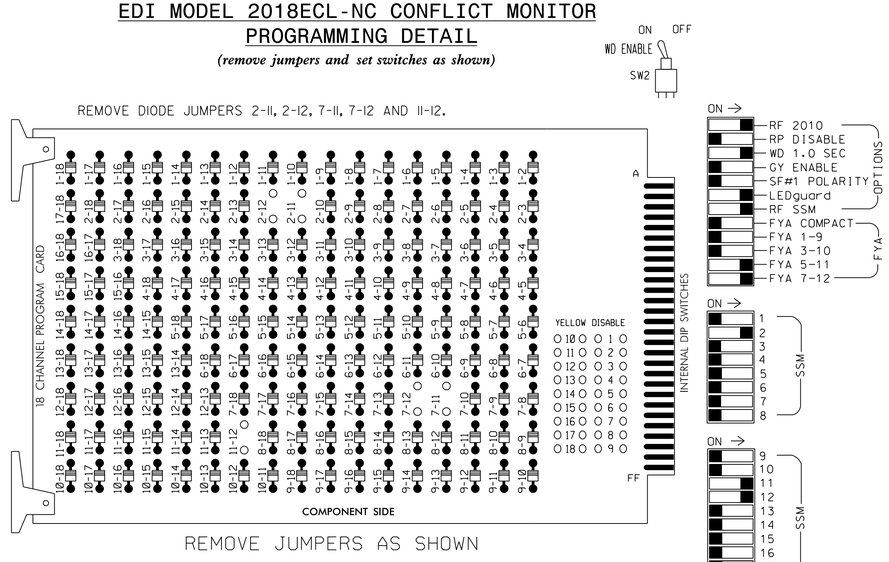
DocuSigned by: David T Sears 11/19/2021
DESIGNER SIGNATURE DATE

SIG. INVENTORY NO. 03-1176

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 2.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phase 2 for Variable Initial and Gap Reduction.
4. Program phase 2 for Startup In Green.
5. Program phase 2 for Yellow Flash.
6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
7. The cabinet and controller are part of the D03-06 Calabash Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 w/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S3*,S7,S9*,S10,AUX S4,AUX S5
PHASES USED.....2,7
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....2+7
OVERLAP "D".....2+7

* USED FOR ADVANCE BEACON CONTROL ONLY

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	7 ★	6	6 PED	7 ★	8	8 PED	OLA	OLB	SPARE	OLC ★	OLD ★	SPARE
SIGNAL HEAD NO.	NU	21,22	ADVANCE BEACON	NU	NU	NU	71	NU	ADVANCE BEACON	72	NU	NU	NU	NU	NU	71	72	NU
RED		128																
YELLOW		129					*			*								
GREEN		130																
RED ARROW																A114	A101	
YELLOW ARROW																A115	A102	
FLASHING YELLOW ARROW																A116	A103	
GREEN ARROW							133			124								
✋																		
PED YELLOW			**						**									
🚶			*						*									

NU = Not Used

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

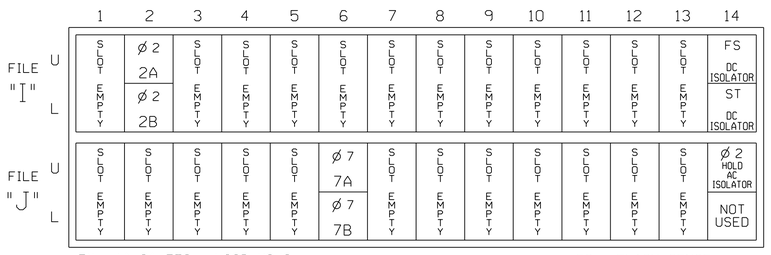
** Special advance beacons will be wired to S3-Y (2 PED YELLOW) and S9-Y (6 PED YELLOW). See wiring and programming details on sheet 5 of this electrical detail.

★ See pictorial of head wiring in detail below.

See Output Reassignment Programming Detail of S7 on sheet 8.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

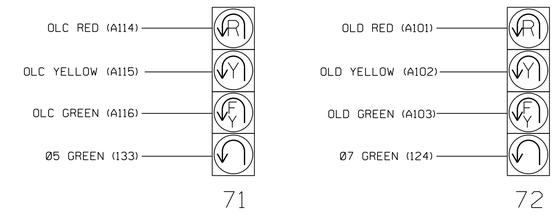
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
7A	TB5-9,10	J6U	42	4	8	7	Y	Y			15
	-	J6U	42	4 ★	57	7	Y	Y			
7B	TB5-11,12	J6L	46	8	18	7	Y	Y			15
	-	J6L	46	8 ★	58	7	Y	Y			

★ See Input Assignment Programming Details for Alternate Phasing on sheets 6 and 7.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

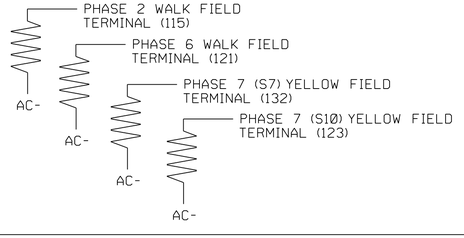


NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021 | REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch | REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 40FFBAC430BD4DE... SIGNATURE 11/19/2021 DATE

SIG. INVENTORY NO. 03-1176

ELECTRICAL DETAIL - SHEET 1 OF 8

11/19/2021
R:\Projects\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1176a.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 2.2

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

(program controller as shown below)

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

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

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON
AND RED CLEAR ON PHASE #7  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #39 ON
SET OUTPUT  ASSIGNMENT #40 OFF
```

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 2 (HEAD 72).

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #41 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 72).

PRESS '+'

```
  LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #7  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #40 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 72).

```
  LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON
AND RED CLEAR ON PHASE #7  IS ON

          SCROLL DOWN

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

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 2 (HEAD 71).

PRESS '+'

```
  LOGICAL I/O COMMAND #5  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 71).

PRESS '+'

```
  LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #7  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 71).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314151 6
VEH OVL PARENTS:| X     X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+' ONCE

```
 PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          |1234567891011121314151 6
VEH OVL PARENTS:| X     X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

PRESS '+' TWICE

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314151 6
VEH OVL PARENTS:|       X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+' ONCE

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314151 6
VEH OVL PARENTS:|       X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 2 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021	REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 40FFBAC4089040F... SIGNATURE 11/19/2021 DATE

SIG. INVENTORY NO. 03-1176

11/19/2021
R:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1176e.dgn
dseary

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 2.3

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR LONG VEHICLE OVERSPEED DETECTION SYSTEM PHASE HOLD INPUTS

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS). THEN '+' UNTIL PIN 51 (INPUT 13) IS REACHED.

```
PAGE: 1 C1 PIN:51  HOLD PHASES
INPUT ASSIGNMENT #.................13
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16).................2
PLAN (65=FLSH,66=FREE)...  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PRESS THE 'ENT KEY. THEN PRESS '+' UNTIL PIN '0' (INPUT 64) IS REACHED

```
PAGE: 1 C1 PIN:0  PLAN
INPUT ASSIGNMENT #.................64
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................7
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)...  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PROGRAMMING COMPLETE

FLASH PREEMPTION PROGRAMMING DETAIL FOR PREEMPT 7

(program controller as shown below)

THIS PREEMPT PLACES THE CONTROLLER IN FLASH IF THE LVOD HOLD TIME EXCEEDS 240 SECONDS.

FROM MAIN MENU PRESS 'A' (PREEMPTION). THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #7 IS REACHED.

```
   PREEMPTION  #7  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |123456789101112131415 16
1  15  0.0  0.0  |      X
2 255  0.0  0.0  | X
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   1  0.0  0.0  | X
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........14
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............Y
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PUT CABINET IN FLASH UPON LVODS FAIL

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and Enable Act Logic Command 7.

2. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).

3. The programming shown below will place the controller in flash if the output of the Long Vehicle Detection Unit is active for longer than 4 minutes.

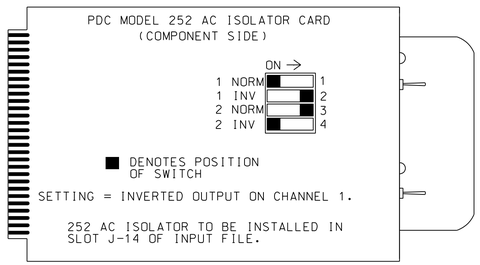
```
  LOGICAL I/O COMMAND #7   (+/-COMMAND#)
IF  INPUT    ASSIGNMENT #13 IS ON

                  SCROLL DOWN

THEN:
    DELAY FOR  240.0 SECONDS
SET INPUT    ASSIGNMENT #64 ON
```

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

INPUT 13 = LVODS Input (Ø2 Hold)
INPUT 64 = Preempt 7

AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL SHEET 3 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE:	November 2021	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
40FFBAC43080406... SIGNATURE DATE

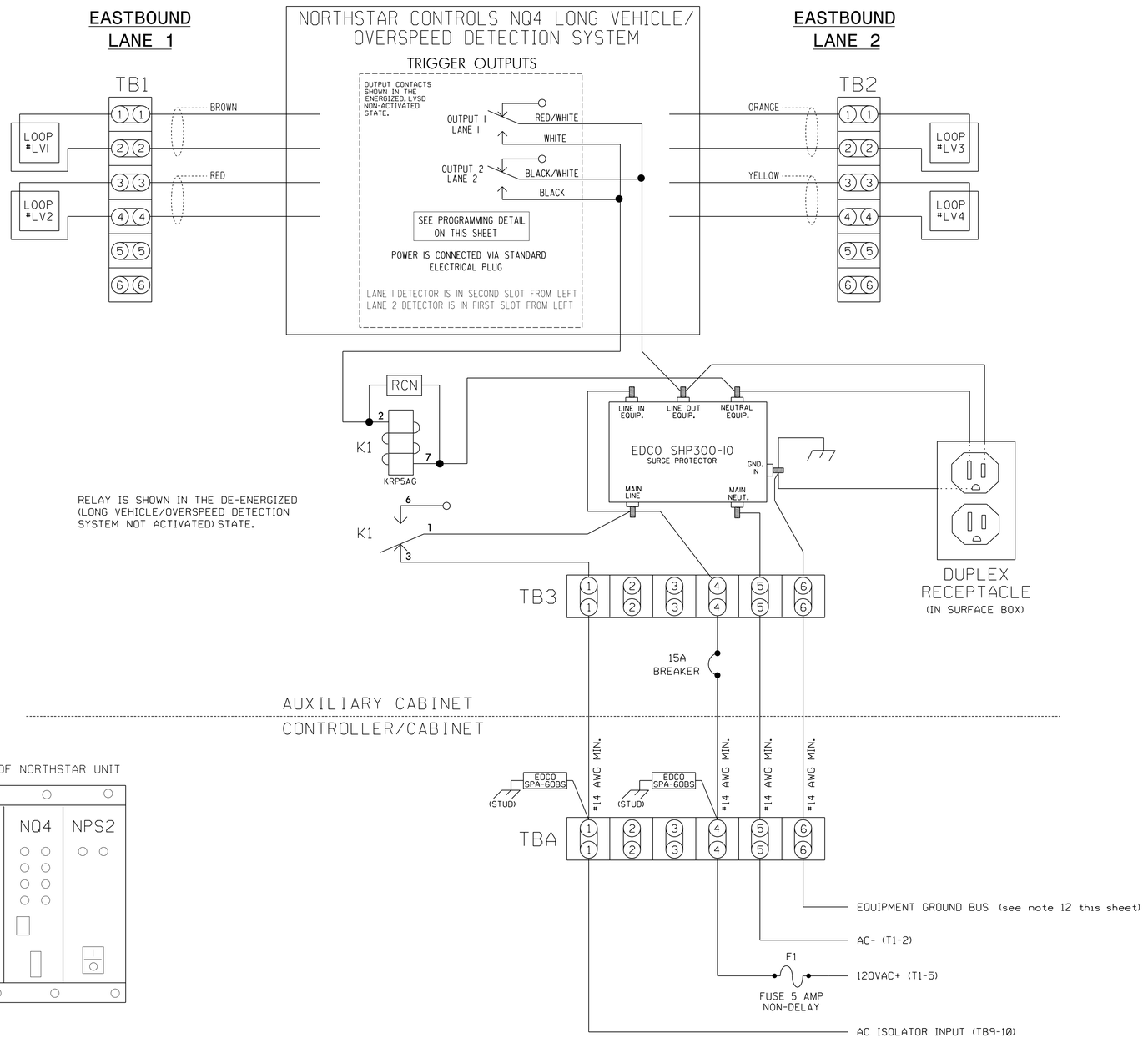
SIG. INVENTORY NO. 03-1176

11/19/2021
R:\Traffic\Signals\Designs\Signals\Electrical Details\W-5703H_SIG_03-1176e.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
_____W-5703H_____	Sig. 2.4

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT

NOTES

1. All loop lead-ins shall be twisted.
2. Loop spacing is critical to the proper operation of this Overspeed Detection System. Make sure loop spacing is correctly programmed in NQ4 Unit.
3. Ensure that connectors on rear of NQ4 are seated securely.
4. NQ4 Unit shall be located in an auxiliary cabinet adjacent to Speed Warning System loops.
5. Unit power is connected by standard electrical plug.
6. Terminal strips TB1, TB2, TB3, & TBA to be added by installer.
7. Relay 'K1' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG, Dot Material no. 625028600.
8. The RC Network across the coil of 'K1' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. P&B no. 104M060C100
9. EDCO SPA-60BS is a surge protector for 120VAC interconnect circuits. Dot Material no. 625022076.
10. EDCO SHP300-10 is an AC service surge protector. Dot Material no. 625022075.
11. Do not install ground rods at auxiliary cabinet.
12. Install equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.
14. IMPORTANT! A jumper must be installed between input file terminals J14-E and J14-K if not already present.
15. IMPORTANT! For proper operation of the Long Vehicle Detection Unit, tie TB9-12 to AC neutral.
16. IMPORTANT! Make sure channel 1 of AC Isolator card inserted at input file position J14 is set for inverted operation. See the detail on sheet 3.

NORTHSTAR CONTROLS MODEL NQ4 PROGRAMMING DETAIL

(program unit as shown)

NOTE: UNIT MUST BE PROGRAMMED USING PC AND TERMINAL EMULATION PROGRAM. FOR CONNECTION TO TERMINAL EMULATOR REFER TO NQ4 OPERATION MANUAL.

PROGRAM NQ4 BY TYPING THE FOLLOWING COMMANDS

1. SET SPEED=55
2. SET LENGTH=22'
3. SET ALARMTIME=12
4. SET SEPARATION=16' (LEADING EDGE TO LEADING EDGE) (THIS VALUE MAY VARY, PROGRAM ACTUAL MEASURED SEPARATION)
5. SET LOOP LENGTH=6' (THIS VALUE MAY VARY, PROGRAM ACTUAL MEASURED LOOP LENGTH)
6. SAVE

NOTE

PROGRAMMING APPLIES TO BOTH LANE 1 AND LANE 2

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021	REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:

REVISIONS	INIT.	DATE

ELECTRICAL DETAIL - SHEET 4 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
40FFBAC430B04DF... SIGNATURE DATE

SIG. INVENTORY NO. 03-1176

11/19/2021
R:\RK&K Projects\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1176e.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
____W-5703H_____	Sig. 2.5

ADVANCE BEACON
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH).............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON.....................Y
OUT OF PHASE FLASHER..............._
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................_
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................_
PHASE ON............................_
PHASE NEXT.........................._
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE AT WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:35  NOT ENABLED
SELECT BEACON INDEX (1-4)..........1
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:35  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH).............1
SELECT ASSIGNMENT:
NOT ENABLED.........................._
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON.....................Y
OUT OF PHASE FLASHER..............._
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................_
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................_
PHASE ON............................_
PHASE NEXT.........................._
```

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #34 (PIN 36) IS REACHED.

```
PAGE:1  C1 PIN:36  NOT ENABLED
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER..............Y
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................_
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................_
PHASE ON............................_
PHASE NEXT.........................._
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:36  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).....33
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:36  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................._
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER..............Y
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................_
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................_
PHASE ON............................_
PHASE NEXT.........................._
```

OUTPUT REFERENCE SCHEDULE

OUTPUT 33 = Ø2 Ped Yellow
OUTPUT 34 = Ø6 Ped Yellow

ADVANCE BEACON PROGRAMMING DETAIL

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '2' (OUTPUT BEACON SETTINGS).

```
        OUTPUT BEACON SETTINGS
TRIGGER PHASES:  12345678910111213141516
BEACON #1 OFF    X
BEACON #2 OFF
BEACON #3 OFF
BEACON #4 OFF
                 BEACON    1   2   3   4
OFF DELAY TIME (0-255)     0   0   0   0
ON DELAY TIME  (0-255)     0   0   0   0
STOP-TIME HOLD (0-255)     3   0   0   0
```

SCROLL DOWN TO VIEW ALL DATA

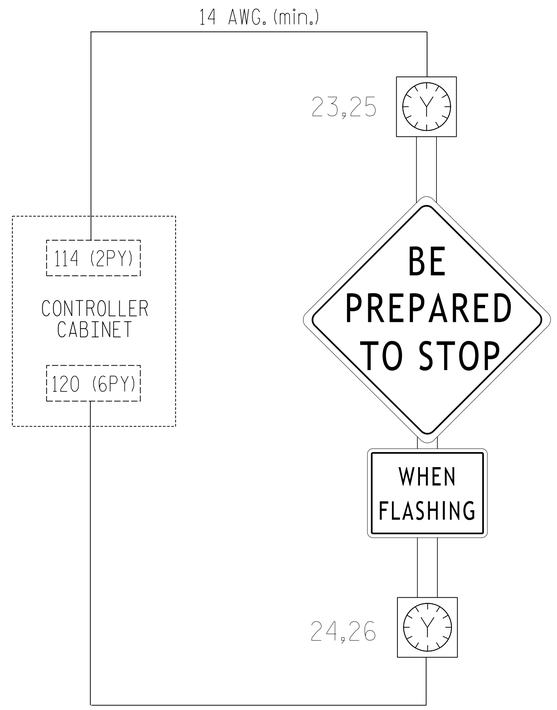
NOTICE STOP TIME HOLD SETTINGS

ADVANCE BEACON PROGRAMMING COMPLETE

NOTE: AN OUTPUT HAS TO BE ASSIGNED AS AN ADVANCE BEACON IN ORDER FOR PROPER OPERATION TO OCCUR. SEE OUTPUT ASSIGNMENT DETAIL ON THIS SHEET.

ADVANCE BEACON WIRING DETAIL

(wire flashers as shown below)



IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 114 (2PY) AND TERMINAL 120 (6PY).
2. INSERT LOADSWITCH FOR S3 AND S9.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN IN LOAD RESISTOR INSTALLATION DETAIL ON SHEET 1.
4. TO ACTIVATE SIGN OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUT 33 AND 34 AS SHOWN ON THIS SHEET.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 5 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021	REVIEWED BY:	J O Deaton	
PREPARED BY: M W Yalch	REVIEWED BY:		

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by:
JAMES O. Deaton 11/19/2021
ACFFAC43D9DA4DE...
SIGNATURE DATE

SIG. INVENTORY NO. 03-1176

11/19/2021
R:\Projects\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1176a.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
_____W-5703H_____	Sig. 2.6

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 7A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE PROGRAMMING BELOW REASSIGNS DETECTOR 57 TO INPUT #4 SO THAT THE DELAY ON LOOP 7A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 4 IS REACHED.

```
PAGE: 2 C1 PIN:42  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................4
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............8
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)...  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

ENTER '57' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 7A - PHASE 7)

```
PAGE: 2 C1 PIN:42  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................4
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............57
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)...  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PROGRAMMING COMPLETE

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #57.

```
VEHICLE DETECTOR #57  SETTINGS (+-.1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................N
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

ENTER 'Y' FOR ENABLE DETECTOR

ENTER '7' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```
VEHICLE DETECTOR #57  SETTINGS (+-.1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦      X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 6 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021	REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: JAMES O. Deaton 11/19/2021
40FFBAC430BD40F...
SIGNATURE DATE

SIG. INVENTORY NO. 03-1176

11/19/2021
R:\rkk\ncdot\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1176e.dgn
dbegro

PROJECT REFERENCE NO.	SHEET NO.
_____W-5703H_____	Sig. 2.7

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 7B

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE PROGRAMMING BELOW REASSIGNS DETECTOR 58 TO INPUT #8 SO THAT THE DELAY ON LOOP 7B CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 8 IS REACHED.

```
PAGE: 2 C1 PIN:46  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................8
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64).............18
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N).....................N
FLASH SENSE (Y/N)...................N
DOOR OPEN (Y/N).....................N
MANUAL CONTROL ENABLE (Y/N).........N
MANUAL CONTROL ADVANCE (Y/N)........N
SPECIAL FUNCTION ALARM (1-8)........0
TOD HOUR SYCHRONIZATION (0-23)......0
FORCE OFF RING (1-4)................0
HOLD PHASES (1-16)..................0
PLAN (65=FLSH,66=FREE)..._  OFFSET#..0
CHANGE PHASE SEQUENCE PAGE (1-12)...1
CHANGE PHASE TIMING PAGE (1-4)......1
CHANGE PHASE CONTROL PAGE (1-4).....1
CHANGE OVERLAP CONTROL PAGE (1-4)...1
CHANGE INPUT PAGE (1-4).............2
CHANGE OUTPUT PAGE (1-4)............1
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

ENTER '58' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 7B - PHASE 7)

```
PAGE: 2 C1 PIN:46  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................8
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64).............58
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N).....................N
FLASH SENSE (Y/N)...................N
DOOR OPEN (Y/N).....................N
MANUAL CONTROL ENABLE (Y/N).........N
MANUAL CONTROL ADVANCE (Y/N)........N
SPECIAL FUNCTION ALARM (1-8)........0
TOD HOUR SYCHRONIZATION (0-23)......0
FORCE OFF RING (1-4)................0
HOLD PHASES (1-16)..................0
PLAN (65=FLSH,66=FREE)..._  OFFSET#..0
CHANGE PHASE SEQUENCE PAGE (1-12)...1
CHANGE PHASE TIMING PAGE (1-4)......1
CHANGE PHASE CONTROL PAGE (1-4).....1
CHANGE OVERLAP CONTROL PAGE (1-4)...1
CHANGE INPUT PAGE (1-4).............2
CHANGE OUTPUT PAGE (1-4)............1
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PROGRAMMING COMPLETE

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #58.

```
VEHICLE DETECTOR #58  SETTINGS (+-.1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................N
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

ENTER 'Y' FOR ENABLE DETECTOR

ENTER '7' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```
VEHICLE DETECTOR #58  SETTINGS (+-.1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦      X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 7 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021 | REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
40FFAC430BD40F...
SIGNATURE DATE

SIG. INVENTORY NO. 03-1176

11/19/2021
R:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1176e.dgn
dbergs

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 2.8

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN NORMAL PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OUTPUT/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 71 and 72 to run protected turns only.

INPUTS PAGE 2: Reduces delay time for phase 7 call on loops 7A and 7B to 0 seconds.

OUTPUT ASSIGNMENT PROGRAMMING DETAIL TO REMAP LOADSWITCH S7 TO PHASE 7

(program controller as shown below)

CHANGING OUTPUT ASSIGNMENTS

1. FROM MAIN MENU SELECT '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS)
2. ENTER 30 (PHASE 5 RED) FOR OUTPUT ASSIGNMENT #.
3. SCROLL DOWN TO 'VEHICLE PHASE' AND ENTER 'Y' REGARDLESS OF DEFAULT PROGRAMMING!
4. ENTER '7' FOR 'SELECT VEHICLE PHASE'. NO CHANGE NEEDED FOR 'SELECT COLOR'
5. BACKUP TO 'OUTPUT ASSIGNMENTS AND SETTINGS MENU:' BY PRESSING THE 'ESC' BUTTON ON KEYBOARD.
6. SELECT '1' (OUTPUT ASSIGNMENTS)
7. ENTER 31 (PHASE 5 YELLOW) FOR OUTPUT ASSIGNMENT #.
8. REPEAT STEPS # 3 AND # 4.
9. ENTER 32 (PHASE 5 GREEN) FOR OUTPUT ASSIGNMENT #.
10. REPEAT STEPS # 3 AND # 4.

PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1176
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 8 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
U-TURN SOUTH OF
SR 1303 (HICKMAN ROAD)

Division 3 Brunswick County Calabash

PLAN DATE:	November 2021	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by:
JamES O. Deaton 11/19/2021
40FF6AC430BD40F
SIGNATURE DATE

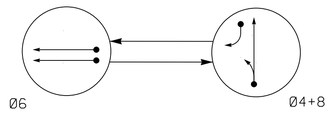
SIG. INVENTORY NO. 03-1176

11/19/2021
R:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1176e.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 3.0

2 Phase
Fully Actuated
D03-06_Calabash Signal System

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

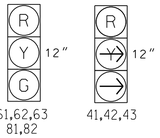
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø4+8	PHASE Ø6	FLASH
41,42,43	→	R	R
61,62,63	R	G	Y
81,82	G	R	R

TABLE OF OPERATION		
SIGNAL FACE	INTERVAL 1	INTERVAL 2
44	ON	OFF

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
4B	6X6	830	6	-	#	Y	Y	-	-	-	-	Y
6A	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X20	0	4	Y	8	Y	Y	-	-	-	-	Y

Activates Advance Warning Beacon (See Note 5)

Figure 1

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specification for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Activate beacon 44 for 4 seconds when loop 4B is activated.
6. See Pavement Marking Plans for Stop Bar locations.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	————
→	Directional Arrow	→
—DD—	Directional Drill	N/A
Ⓐ	RIGHT TURN ONLY SIGN (R3-5R)	Ⓐ
Ⓑ	NO RIGHT TURN SIGN (R3-1)	Ⓑ
Ⓒ	SIGNAL AHEAD SIGN (W3-3) SEE FIGURE 1	Ⓒ
Ⓧ	Type III Signal Pedestal	◆

OASIS 2070 TIMING CHART

FEATURE	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	7	14	7
Extension 1 *	2.0	6.0	2.0
Max Green 1 *	30	90	30
Yellow Clearance	5.2	5.2	3.0
Red Clearance	1.0	1.0	1.1
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	1.5	-
Max Variable Initial *	-	46	-
Time Before Reduction *	-	15	-
Time To Reduce *	-	30	-
Minimum Gap	-	3.4	-
Recall Mode	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-
Dual Entry	ON	-	ON
Simultaneous Gap	ON	ON	ON

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

SIGNAL UPGRADE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

SCALE 0 40 1"=40'

US 17 SOUTHBOUND
AT
SR 1303 (HICKMAN ROAD)

Division 3 Brunswick County Calabash

PLAN DATE: November 2021 REVIEWED BY: D. Sears
PREPARED BY: A Pokhrel REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 044558
ENGINEER
DAVID T. SEARS

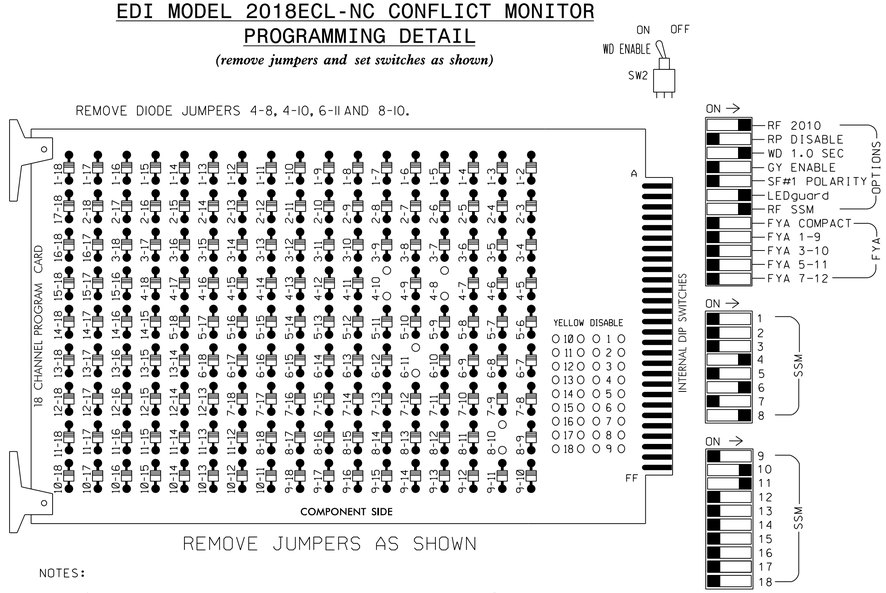
DocuSigned by: David T Sears 11/19/2021
DESIGNER'S SIGNATURE DATE

SIG. INVENTORY NO. 03-1067

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 3.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L						*** 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				Ø8 8B								

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

FS = FLASH SENSE
ST = STOP TIME

*** Activates Advance Beacon head 44

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			15
* 4B	TB4-11,12	I6L	45	7	14	-	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			

* Remove phase associated with this detector. Activates Advance Beacon head 44. See Sheet 2 for Logical I/O Processor Programming details.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phases 4 and 8 for Dual Entry.
4. Program phase 6 for Variable Initial and Gap Reduction.
5. Program phase 6 for Startup In Green.
6. Program phase 6 for Yellow Flash.
7. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
8. The cabinet and controller are part of the D03-06 Calabash Signal System.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |1234567891011121314 1516
VEH OVL PARENTS:|    X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314 1516
VEH OVL PARENTS:|     X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	ADVANCE BEACON	NU	61,62	NU	NU	81,82	NU	NU	43	NU	63	NU	NU
RED					101			134			107			A124		A114		
YELLOW								135			108					A115		
GREEN								136			109					A116		
RED ARROW																		
YELLOW ARROW					102									A125				
GREEN ARROW					103									A126				
✋																		
PED YELLOW						**												
🚶						*												

NU = Not Used

* Denotes install load resistor. See load resistor installation detail sheet 2.

** Special advance beacon will be wired to S6-Y (4 PED YELLOW). See wiring and programming details on sheet 2 of this electrical detail.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 w/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S5,S6*,S8,S11,AUX S2,AUX S4
PHASES USED.....4,6,8
OVERLAP "A".....NOT USED
OVERLAP "B".....4
OVERLAP "C".....6
OVERLAP "D".....NOT USED

*USED FOR ADVANCE BEACON CONTROL ONLY

ELECTRICAL DETAIL - SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1067
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
North Carolina Department of Transportation, Traffic Engineering Branch, Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 17 SOUTHBOUND
AT
SR 1303 (HICKMAN ROAD)

Division 3	Brunswick County	Calabash
PLAN DATE: November 2021	REVIEWED BY:	J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
40FFBAC4309040F... SIGNATURE DATE

SIG. INVENTORY NO. 03-1067

11/19/2021
P:\Traffic\Signals\Designs\Signals\Electrical Details\W-5703H_SIG_03-1067e.dgn
dseurs

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 3.2

ADVANCE BEACON
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #35 (PIN 37) IS REACHED.

```
PAGE:1  C1 PIN:37  NOT ENABLED
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON.....................Y
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT........................._
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE AT WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:37  NOT ENABLED
SELECT BEACON INDEX (1-4)...........1
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:37  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON.....................Y
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT........................._
```

OUTPUT REFERENCE SCHEDULE

OUTPUT 35 = Ø 4 Ped Yellow

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL FOR ADVANCE BEACON

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Act Logic Commands 1 and 2.
2. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).
3. The programming shown below will activate the Advance Beacon for 4 seconds when Loop 4B is occupied.

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #7   IS ON

                 SCROLL DOWN
THEN:
SET LOGIC FLAG          #1   ON
```

PRESS '+'

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

                 SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #35  ON
    DELAY   4.0 SECONDS
SET LOGIC FLAG          #1   OFF
```

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

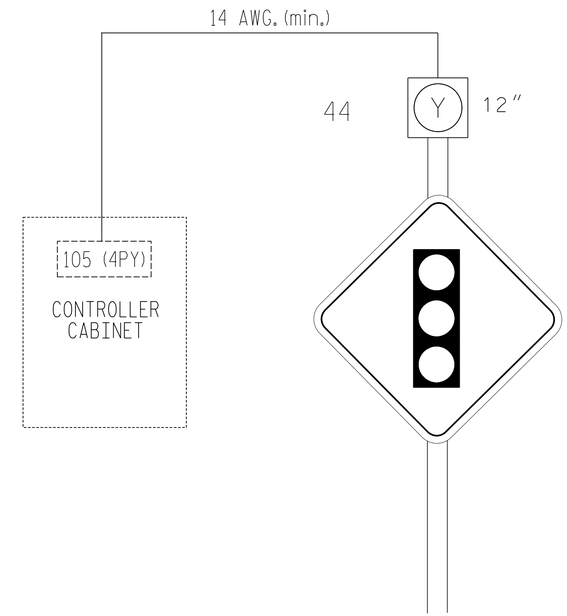
4. Remove the vehicle phase assigned to Detector 14.

LOGIC PROGRAMMING REFERENCE SCHEDULE

INPUT 7 = DETECTOR 14 (LOOP 4B)

ADVANCE BEACON WIRING DETAIL

(wire flashers as shown below)

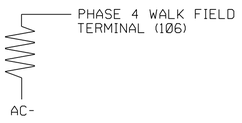


IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 105 (4PY).
2. INSERT LOADSWITCH FOR S6.
3. MAKE SURE LOAD RESISTOR IS IN PLACE AS SHOWN IN LOAD RESISTOR INSTALLATION DETAIL THIS SHEET.
4. TO ACTIVATE SIGN OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSION OUTPUT 35 AS SHOWN ON THIS SHEET.

LOAD RESISTOR INSTALLATION DETAIL

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1067
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL DETAIL - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 17 SOUTHBOUND AT SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021	REVIEWED BY: J O Deaton		
PREPARED BY: M W Yalch	REVIEWED BY:		

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
40FFBAC4308040F... SIGNATURE DATE

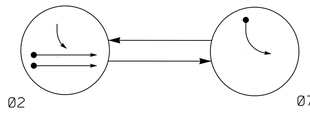
SIG. INVENTORY NO. 03-1067

11/19/2021
11:47:07 AM
Z:\Traffic\Signals\Designs\Signals\Electrical Details\W-5703H_Sig_03-1067e.dgn
dseors

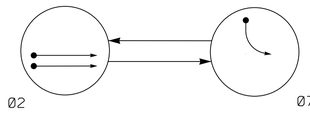
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 4.0

2 Phase
Fully Actuated
D03-06_Calabash Signal System

PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

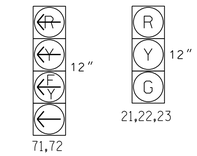
SIGNAL FACE	PHASE Ø2	PHASE Ø7	FLASH
21,22,23	G	R	Y
71,72	~~F Y~~	←	~~R~~

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2	PHASE Ø7	FLASH
21,22,23	G	R	Y
71,72	~~R~~	←	~~R~~

SIGNAL FACE I.D.

All Heads L.E.D.



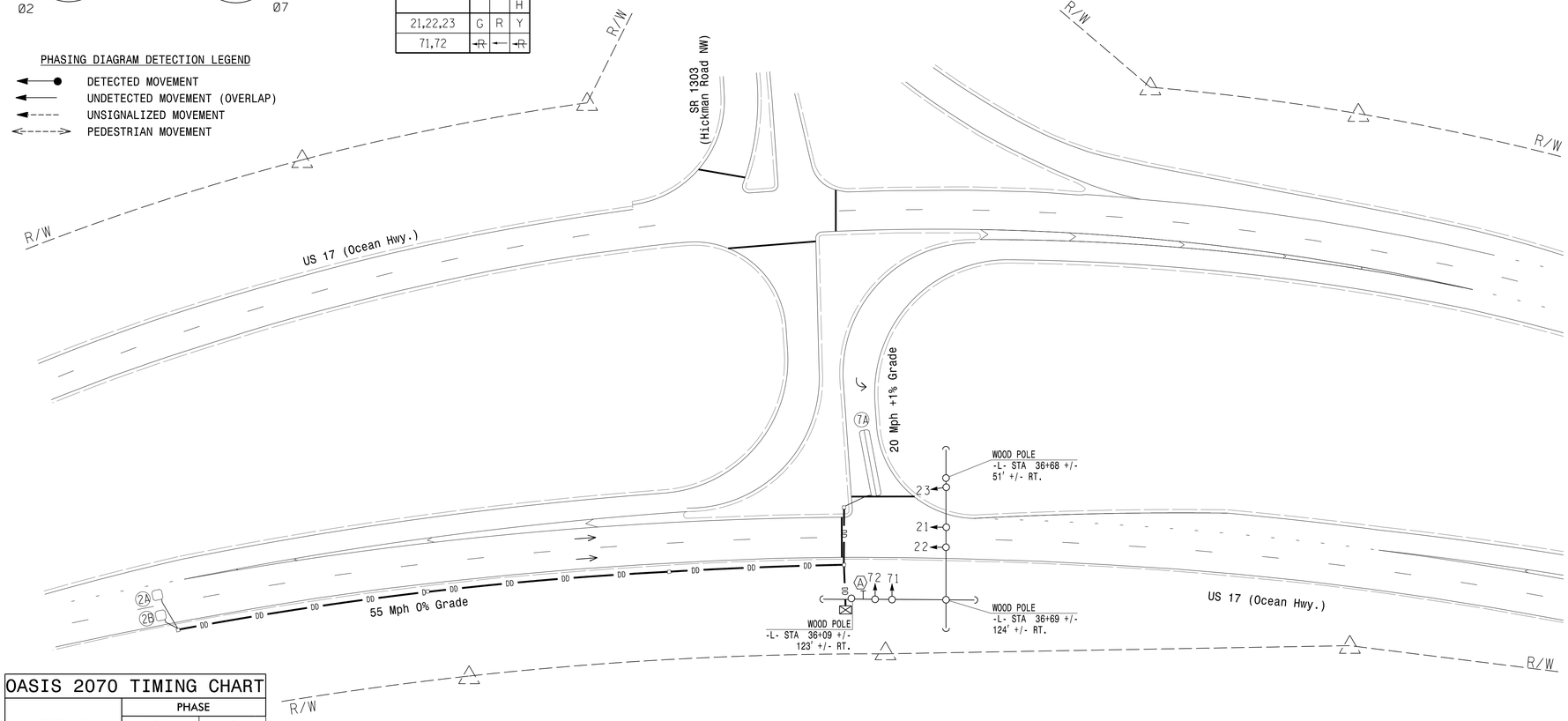
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	420	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	420	5	Y	2	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	✳15	-	Y

✳Disable Delay During Alternate Phasing Operation.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specification for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. See Pavement Marking Plans for Stop Bar location details.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 7
Min Green 1 *	14	7
Extension 1 *	6.0	2.0
Max Green 1 *	90	30
Yellow Clearance	5.2	3.0
Red Clearance	1.0	1.2
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	1.5	-
Max Variable Initial *	46	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.4	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
DD	Directional Drill	N/A
(A)	LEFT TURN ONLY SIGN (R3-5L)	(A)

NEW INSTALLATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

SCALE 0 40 1"=40'

US 17 NORTHBOUND AT SR 1303(HICKMAN ROAD)

Division 3 Brunswick County Calabash

PLAN DATE: November 2021 REVIEWED BY: D. Sears

PREPARED BY: A Pokhrel REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
044558
ENGINEER
DAVID T. SEARS

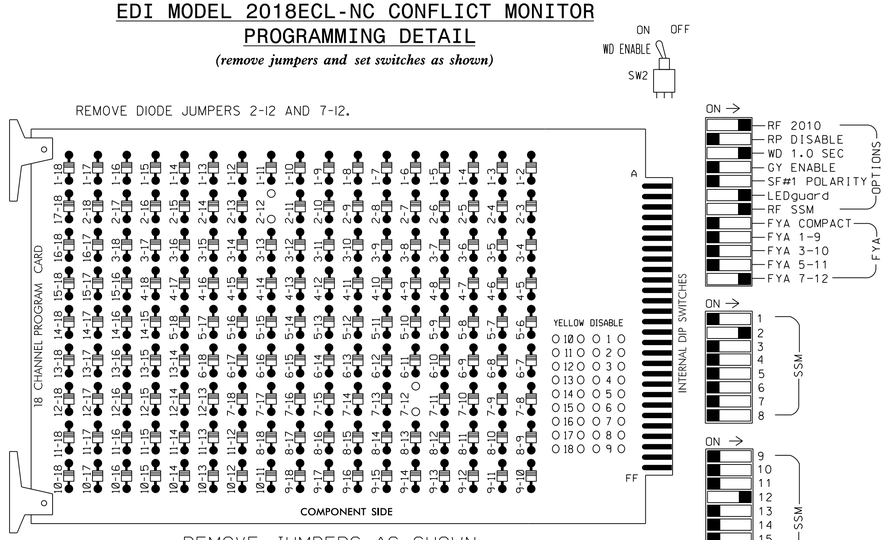
DocuSigned by: David T Sears 11/19/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1174

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 4.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phase 2 for Variable Initial and Gap Reduction.
4. Program phase 2 for Startup In Green.
5. Program phase 2 for Yellow Flash.
6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
7. The cabinet and controller are part of the D03-06 Calabash Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 w/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S10,AUX S5
PHASES USED.....2,7
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....2+7

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22, 23	NU	NU	NU	NU	NU	NU	NU	71,72 ★	NU	NU	NU	NU	NU	NU	71,72 ★	NU
RED		128																
YELLOW		129								✳								
GREEN		130																
RED ARROW																	A101	
YELLOW ARROW																	A102	
FLASHING YELLOW ARROW																	A103	
GREEN ARROW										124								

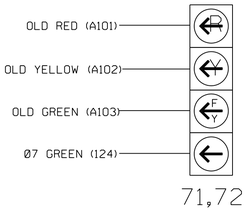
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	J5U	57	19 ★	57	7	Y	Y			

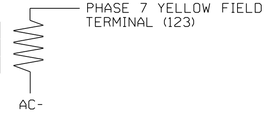
★ See Input Assignment Programming Detail for Alternate Phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1174
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 1 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 NORTHBOUND
AT
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021 | REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1174

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

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

11/19/2021
R:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H.SIG.03-1174a.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 4.2

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

(program controller as shown below)

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

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

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON
AND RED CLEAR ON PHASE #7  IS ON

            SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #39 ON
 SET OUTPUT  ASSIGNMENT #40 OFF
```

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 2 (HEADS 71,72).

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON

            SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #41 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEADS 71,72).

PRESS '+'

```
  LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #7  IS ON

            SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #40 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEADS 71,72).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' 3x

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

PRESS '+' 3x

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS: |      X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

←

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1174
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 2 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RK&K
P: (919) 876-9560
8601 Six Forks Road, Forum 1,Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

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

750 N.Greenfield Pkwy,Garner,NC 27529

US 17 NORTHBOUND
AT
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE:	November 2021	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1174

11/19/2021
R:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H.SIG.03-1174a.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 4.3

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 7A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE PROGRAMMING BELOW REASSIGNS DETECTOR 57 TO INPUT #19 SO THAT THE DELAY ON LOOP 7A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 19 IS REACHED.

```
PAGE: 2 C1 PIN:57  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................19
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64).............7
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..._  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

→ ENTER '57' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 7A - PHASE 7)

```
PAGE: 2 C1 PIN:57  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................19
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64).............57
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..._  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PROGRAMMING COMPLETE

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #57.

```
VEHICLE DETECTOR #57  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................N
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)...............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)..............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

→ ENTER 'Y' FOR ENABLE DETECTOR

→ ENTER '7' FOR PHASES ASSIGNED

→ ENSURE DELAY IS '0'

```
VEHICLE DETECTOR #57  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦      X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)...............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)..............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: Ø3-1174
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 3 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
SR 1303 (HICKMAN ROAD)

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021	REVIEWED BY:	J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by:
James O. Deaton 11/19/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1174

11/19/2021
R:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1174e.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 4.4

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN NORMAL PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OUTPUT/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 71 and 72 to run protected turns only.

INPUTS PAGE 2: Reduces delay time for phase 7 call on loop 7A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1174
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

ELECTRICAL DETAIL - SHEET 4 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 NORTHBOUND
AT
SR 1303 (HICKMAN ROAD)

Division 3 Brunswick County Calabash

PLAN DATE:	November 2021	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by:
JAMES O. Deaton 11/19/2021
40FF8AC430BD40F
SIGNATURE DATE

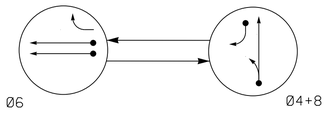
SIG. INVENTORY NO. 03-1174

11/19/2021
R:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1174e.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 5.0

2 Phase
Fully Actuated
D03-06_Calabash Signal System

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

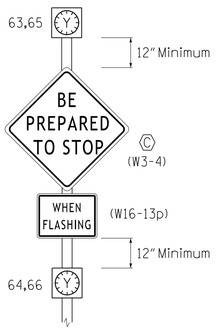
TABLE OF OPERATION

SIGNAL FACE	PHASE Ø4+8	PHASE Ø6	PHASE CLEAR 1	PHASE DWELL 7	PHASE FLASH
41,42,43	→	R	→	R	R
61,62	R	G	R	Y	Y
63,64,65,66	ON	OFF	ON	OFF	OFF
81,82,83	G	R	G	R	R

BEACON TABLE OF OPERATION

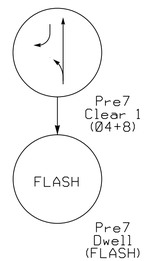
SIGNAL FACE	INTERVAL 1	INTERVAL 2
63,65	ON	OFF
64,66	OFF	ON

Figure 1



FAILURE PREEMPT

(High Priority)

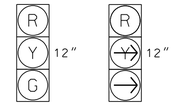


FAILURE PREEMPT	
FUNCTION	PRE 7
Interval 1 – Green Clear	15
Interval 1 – Yellow Clear	0.0*
Interval 1 – Red Clear	0.0*
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Exit Phase(s)	6
Priority	High
Delay Time	0.0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	14
Flash Dwell Interval?	Y
Enable Backup Protection	N
Ped Clear Through Yellow	N
Omit Overlaps	-

* Time defaults to time used for phase during normal operation

SIGNAL FACE I.D.

All Heads L.E.D.



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specification for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Activate flashers 3 seconds prior to the end of phase 6 green.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Refer to Pavement Marking Plans for Stop Bar location details.
7. Install pull boxes at intervals of no greater than 150 ft along all runs of lead-in wire.

LONG VEHICLE OVERSPEED DETECTION SYSTEM
LOOP & DETECTION INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR UNITS							
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	SOUTHBOUND DISCRIMINATION ZONE	LANE NO.	DETECTOR UNIT NO.	CHANNEL	NEMA PHASE	TIMING FEATURE	TIMING TIME	PLACE CALL DURING PHASE	INHIBIT DELAY DURING GREEN?
LV1	6'X6'	4	1015'	X		①	1	1	1	6*	NONE	- SEC.	ALL	NO
LV2	6'X6'	4	999'	X			1		2		NONE	- SEC.	ALL	NO
LV3	6'X6'	4	1015'	X			2	2	1	6*	NONE	- SEC.	ALL	NO
LV4	6'X6'	4	999'	X			2		2		NONE	- SEC.	ALL	NO
LVODS THRESHOLD SPEED (MPH)	55													
LVODS EXTEND TIME	12 SEC.													

*Phase hold output to controller

OASIS 2070 TIMING CHART

FEATURE	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	7	14	7
Extension 1 *	2.0	6.0	2.0
Max Green 1 *	30	90	30
Yellow Clearance	3.7	5.2	3.0
Red Clearance	1.0	1.0	1.8
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	1.5	-
Max Variable Initial *	-	46	-
Time Before Reduction *	-	15	-
Time To Reduce *	-	30	-
Minimum Gap	-	3.4	-
Recall Mode	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-
Dual Entry	ON	-	ON
Simultaneous Gap	ON	ON	ON

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

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	———
→	Directional Arrow	→
— DD —	Directional Drill	N/A
⬡	Type II Signal Pedestal	⬢
⊗	Type III Signal Pedestal	⬢
Ⓐ	No Right Turn Sign (R3-1)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	"BE PREPARED TO STOP" Sign (W3-4) w/ "WHEN FLASHING" Plaque (W16-3p) (See Figure 1)	Ⓒ
Ⓓ	Signal Ahead Sign (W3-3)	Ⓓ

NEW INSTALLATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

N

SCALE 0 40 1" = 40'

US 17 SOUTHBOUND
AT
SOUTH MIDDLETON DRIVE

Division 3 Brunswick County Calabash

PLAN DATE: November 2021 REVIEWED BY: D. Sears
PREPARED BY: A Pokhrel REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 044558
ENGINEER
DAVID T. SEARS

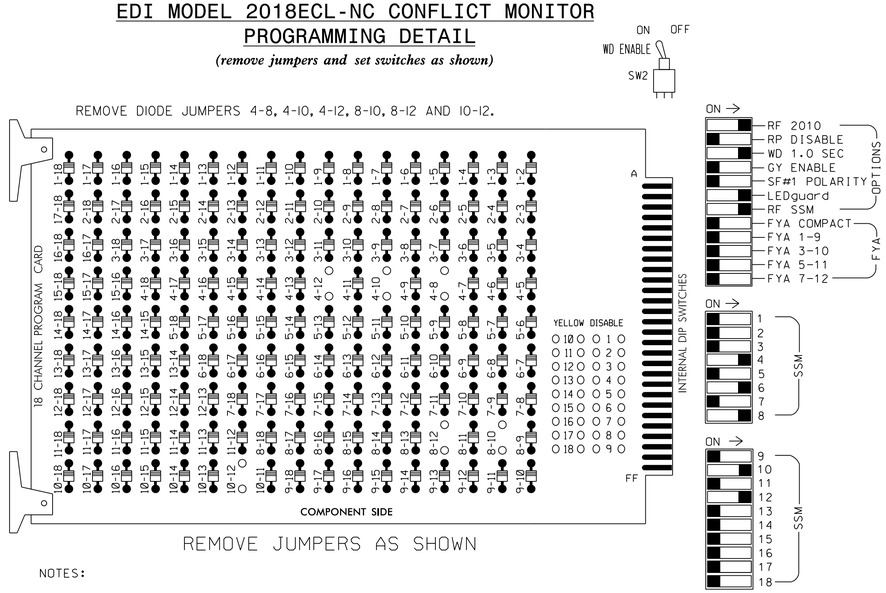
DocuSigned by: David T Sears 11/19/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1175

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 5.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

INPUT FILE POSITION LAYOUT

(front view)

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

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
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phases 4 and 8 for Dual Entry.
4. Program phase 6 for Variable Initial and Gap Reduction.
5. Program phase 6 for Startup In Green.
6. Program phase 6 for Yellow Flash.
7. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
8. The cabinet and controller are part of the D03-06 Calabash Signal System.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+'

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

PRESS '+' TWICE

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

OVERLAP PROGRAMMING COMPLETE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	ADVANCE BEACON	NU	61,62	NU	NU	81,82	ADVANCE BEACON	NU	43	NU	NU	83	NU
RED					101			134			107			A124			A101	
YELLOW								135			108						A102	
GREEN								136			109						A103	
RED ARROW																		
YELLOW ARROW					102									A125				
GREEN ARROW					103									A126				
✋																		
PED YELLOW						**						**						
🚶						*						*						

NU = Not Used

* Denotes install load resistor. See load resistor installation detail on sheet 4.

** Special advance beacons will be wired to S6-Y (4 PED YELLOW) and S12-Y (8 PED YELLOW). See wiring and programming details on sheet 4 of this electrical detail.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 w/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S5,S6*,S8,S11,S12*,AUX S2,AUX S5
PHASES USED.....4,6,8
OVERLAP "A".....NOT USED
OVERLAP "B".....4
OVERLAP "C".....NOT USED
OVERLAP "D".....8

*USED FOR ADVANCE BEACON CONTROL ONLY

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1175
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL DETAIL - SHEET 1 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 SOUTHBOUND AT SOUTH MIDDLETON DRIVE

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021 | REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: JAMES O. Deaton 11/19/2021
40FFBAC4308040F... SIGNATURE DATE

SIG. INVENTORY NO. 03-1175

11/19/2021
M:\Traffic\Signals\Design\Signals\Electrical Details\W-5703H_SIG_03-1175e.dgn
dsears

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 5.2

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR LONG VEHICLE OVERSPEED DETECTION SYSTEM PHASE HOLD INPUTS

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 52 (INPUT 14) IS REACHED.

```
PAGE: 1 C1 PIN:52  HOLD PHASES
INPUT ASSIGNMENT #.................14
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC)........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................
VEHICLE DETECTOR (1-64)............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16)......
PREEMPT (1-10).....................
INVERTED PREEMPT (1-10)............
STOP TIME (Y/N)....................
FLASH SENSE (Y/N)..................
DOOR OPEN (Y/N)....................
MANUAL CONTROL ENABLE (Y/N)........
MANUAL CONTROL ADVANCE (Y/N)......
SPECIAL FUNCTION ALARM (1-8).......
TOD HOUR SYCHRONIZATION (0-23).....
FORCE OFF RING (1-4)...............
HOLD PHASES (1-16).................6
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4)............
CHANGE OUTPUT PAGE (1-4)...........
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PRESS THE 'ENT KEY, THEN PRESS '+' UNTIL PIN '0' (INPUT 64) IS REACHED

```
PAGE: 1 C1 PIN:0  PLAN
INPUT ASSIGNMENT #.................64
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC)........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................
VEHICLE DETECTOR (1-64)............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16)......
PREEMPT (1-10).....................7
INVERTED PREEMPT (1-10)............
STOP TIME (Y/N)....................
FLASH SENSE (Y/N)..................
DOOR OPEN (Y/N)....................
MANUAL CONTROL ENABLE (Y/N)........
MANUAL CONTROL ADVANCE (Y/N)......
SPECIAL FUNCTION ALARM (1-8).......
TOD HOUR SYCHRONIZATION (0-23).....
FORCE OFF RING (1-4)...............
HOLD PHASES (1-16).................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4)............
CHANGE OUTPUT PAGE (1-4)...........
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PROGRAMMING COMPLETE

FLASH PREEMPTION PROGRAMMING DETAIL FOR PREEMPT 7

(program controller as shown below)

THIS PREEMPT PLACES THE CONTROLLER IN FLASH IF THE LVOD HOLD TIME EXCEEDS 240 SECONDS.

FROM MAIN MENU PRESS 'A' (PREEMPTION). THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #7 IS REACHED.

```
   PREEMPTION  #7  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |1234567891011121314 1516
1  15  0.0  0.0  |   X   X
2 255  0.0  0.0  |       X
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   1  0.0  0.0  |       X
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........14
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............Y
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PUT CABINET IN FLASH UPON LVODS FAIL

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and Enable Act Logic Command 4.
2. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).
3. The programming shown below will place the controller in flash if the output of the Long Vehicle Detection Unit is active for longer than 4 minutes.

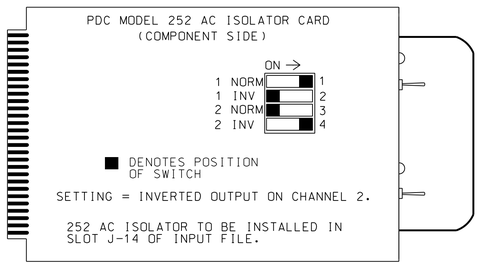
```
  LOGICAL I/O COMMAND #4   (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #14 IS ON

                  SCROLL DOWN
THEN:
    DELAY FOR  240.0 SECONDS
SET INPUT   ASSIGNMENT #64 ON
```

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

INPUT 14 = LVODS Input (Ø6 Hold)
INPUT 64 = Preempt 7

LONG VEHICLE DETECTION AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: Ø3-1175
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL DETAIL - SHEET 2 OF 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

Traffic Engineering Branch, Mobility and Safety Division, NC Department of Transportation, Traffic Engineering & Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 17 SOUTHBOUND AT SOUTH MIDDLETON DRIVE

Division 3 | Brunswick County | Calabash

PLAN DATE:	November 2021	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 40FFBAC4908D40F... SIGNATURE 11/19/2021 DATE

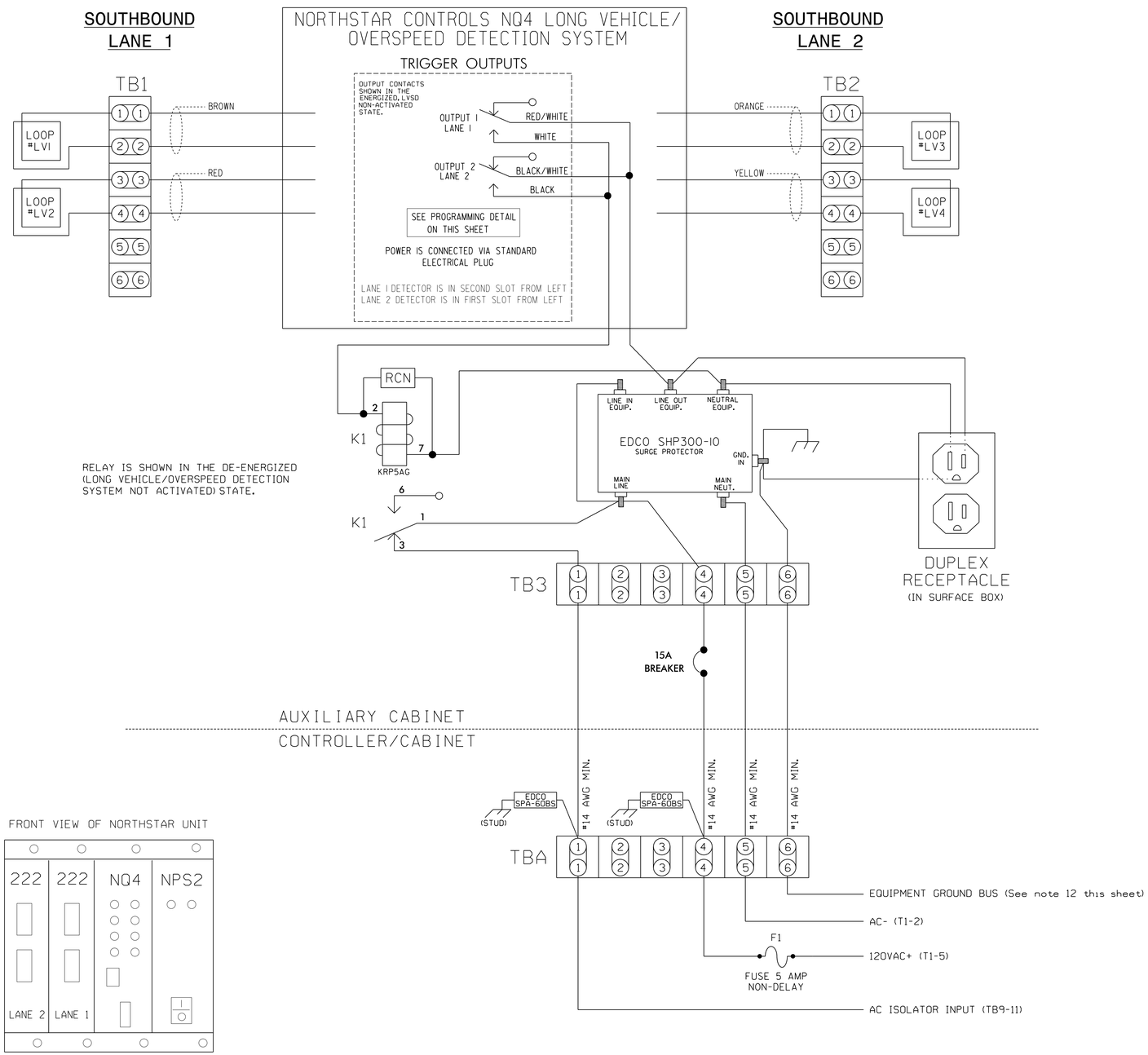
SIG. INVENTORY NO. 03-1175

11/19/2021
R:\Traffic\Signals\Designs\Signals\Electrical Details\W-5703H_SIG_03-1175e.dgn
dseers

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 5.3

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT

NOTES

1. All loop lead-ins shall be twisted.
2. Loop spacing is critical to the proper operation of this Overspeed Detection System. Make sure loop spacing is correctly programmed in NQ4 Unit.
3. Ensure that connectors on rear of NQ4 are seated securely.
4. NQ4 Unit shall be located in an auxiliary cabinet adjacent to Speed Warning System loops.
5. Unit power is connected by standard electrical plug.
6. Terminal strips TB1, TB2, TB3, & TBA to be added by installer.
7. Relay 'K1' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG, Dot Material no. 625028600.
8. The RC Network across the coil of 'K1' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. P&B no. 104M06QC100
9. EDCO SPA-60BS is a surge protector for 120VAC interconnect circuits. Dot Material no. 625022076.
10. EDCO SHP300-10 is an AC service surge protector. Dot Material no. 625022075.
11. Do not install ground rods at auxiliary cabinet.
12. Install equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.
14. IMPORTANT! A jumper must be installed between input file terminals J14-E and J14-K if not already present.
15. IMPORTANT! For proper operation of the Long Vehicle Detection Unit, tie TB9-12 to AC neutral.
16. IMPORTANT! Make sure Channel 2 of AC Isolator card inserted at input file position J14 is set for inverted operation. See the detail on sheet 2.

NORTHSTAR CONTROLS MODEL NQ4 PROGRAMMING DETAIL

(program unit as shown)

NOTE: UNIT MUST BE PROGRAMMED USING PC AND TERMINAL EMULATION PROGRAM. FOR CONNECTION TO TERMINAL EMULATOR REFER TO NQ4 OPERATION MANUAL.

PROGRAM NQ4 BY TYPING THE FOLLOWING COMMANDS

1. SET SPEED=55
2. SET LENGTH=22'
3. SET ALARMTIME=12
4. SET SEPARATION=16' (LEADING EDGE TO LEADING EDGE) (THIS VALUE MAY VARY, PROGRAM ACTUAL MEASURED SEPARATION)
5. SET LOOP LENGTH=6' (THIS VALUE MAY VARY, PROGRAM ACTUAL MEASURED LOOP LENGTH)
6. SAVE

NOTE

PROGRAMMING APPLIES TO BOTH LANE 1 AND LANE 2

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1175
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL DETAIL - SHEET 3 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 17 SOUTHBOUND AT SOUTH MIDDLETON DRIVE

Division 3	Brunswick County	Calabash
PLAN DATE: November 2021	REVIEWED BY: J O Deaton	
PREPARED BY: M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
40FFBAC4209D40F... SIGNATURE DATE

SIG. INVENTORY NO. 03-1175

11/19/2021
D:\Traffic\Signals\Designs\Signals\Electrical Details\W-5703H_SIG_03-1175e.dgn
dseurs

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	Sig. 5.4

ADVANCE BEACON
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #35 (PIN 37) IS REACHED.

```
PAGE:1  C1 PIN:37  NOT ENABLED
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE AT WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:37  NOT ENABLED
SELECT BEACON INDEX (1-4)..........2
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:37  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #36 (PIN 38) IS REACHED.

```
PAGE:1  C1 PIN:38  NOT ENABLED
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:38  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).......35
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:38  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT REFERENCE SCHEDULE

OUTPUT 35 = Ø 4 Ped Yellow
OUTPUT 36 = Ø 8 Ped Yellow

ADVANCE BEACON PROGRAMMING DETAIL

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '2' (OUTPUT BEACON SETTINGS).

```
            OUTPUT BEACON SETTINGS
TRIGGER PHASES:  |12345678910111213141516
BEACON #1 OFF    |
BEACON #2 OFF    |      X
BEACON #3 OFF    |
BEACON #4 OFF    |
                 BEACON  |  1   2   3   4
OFF DELAY TIME  (0-255)  |  0   0   0   0
ON DELAY TIME   (0-255)  |  0   0   0   0
STOP-TIME HOLD  (0-255)  |  0   3   0   0
```

SCROLL DOWN TO VIEW ALL DATA ↓

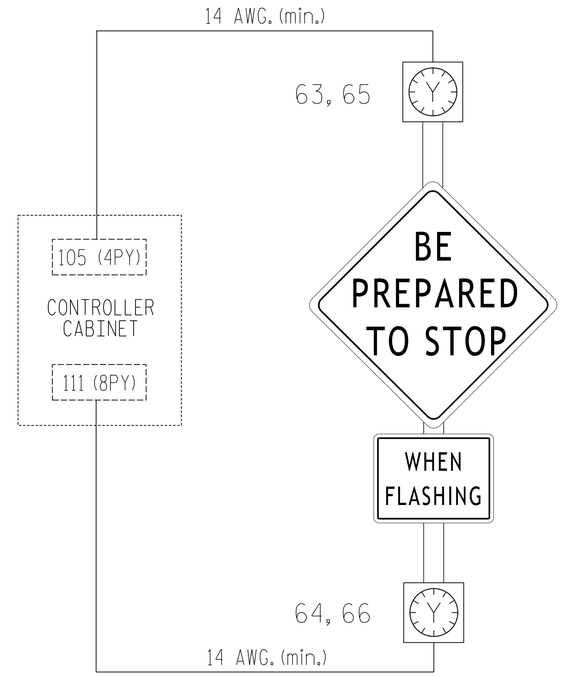
← NOTICE STOP TIME HOLD

ADVANCE BEACON PROGRAMMING COMPLETE

NOTE: AN OUTPUT HAS TO BE ASSIGNED AS AN ADVANCE BEACON IN ORDER FOR PROPER OPERATION TO OCCUR. SEE OUTPUT ASSIGNMENT DETAIL ON THIS SHEET.

ADVANCE BEACON WIRING DETAIL

(wire flashers as shown below)

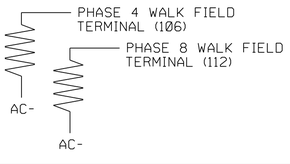


IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 105 (4PY) AND TERMINAL 111 (8PY).
2. INSERT LOADSWITCH FOR S6 AND S12.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN IN LOAD RESISTOR INSTALLATION DETAIL THIS SHEET.
4. TO ACTIVATE SIGN OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUT 35 AND 36 AS SHOWN ON THIS SHEET.

LOAD RESISTOR INSTALLATION DETAIL

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1175
DESIGNED: November 2021
SEALED: November 19, 2021
REVISED:

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

ELECTRICAL DETAIL - SHEET 4 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 SOUTHBOUND
AT
SOUTH MIDDLETON DRIVE

Division 3 | Brunswick County | Calabash

PLAN DATE: November 2021 | REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON

DocuSigned by: James O. Deaton 11/19/2021
SIGNATURE | DATE

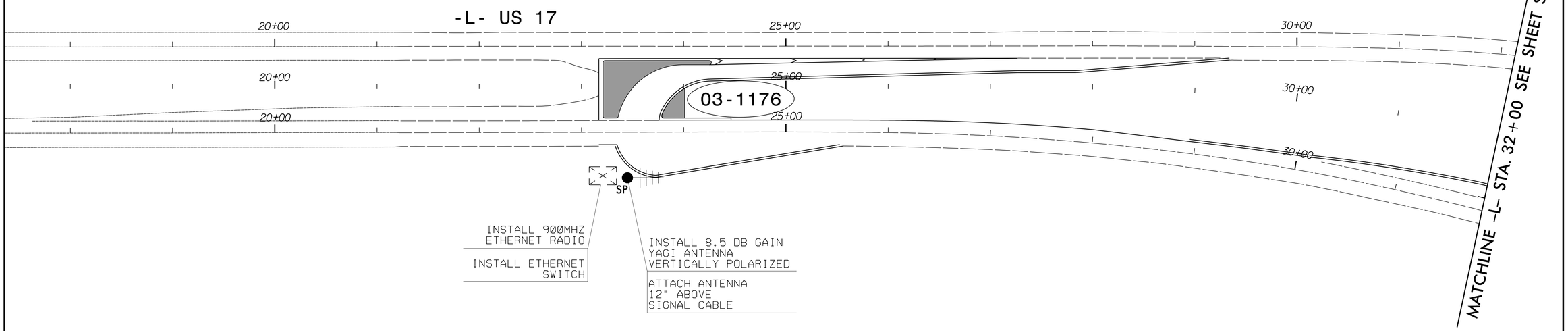
SIG. INVENTORY NO. 03-1175

11/19/2021
R:\Traffic\Signals\Designs\Signals\Electrical Details\W-5703H.SIG.03-1175a.dgn
dsers

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SCP-1

LEGEND

- YAGI ANTENNA (DOUBLE) FOR REPEATOR OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- EXISTING CONTROLLER AND CABINET
- EXISTING MASTER CONTROLLER AND CABINET
- SIGNAL INVENTORY NUMBER
- EXISTING METAL POLE W/MAST ARM
- EXISTING WOOD POLE
- EXISTING METAL POLE
- SP — SIGNAL POLE
- EXISTING OVERSIZED JUNCTION BOX
- NEW OVERSIZED JUNCTION BOX
- EXISTNG CONDUIT
- EXI — EXISTING COMMUNICATIONS CABLE



NOTES FOR WIRELESS COMMUNICATIONS:

1. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2" RISER WITH WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   B. ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A ½" HOLE UP THROUGH THE BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
   C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   D. BETWEEN THE POINT OF EXITING THE RISER, METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING ¾" STAINLESS STEEL STRAPS EVERY 12".
2. IF AN EXISTING 2" SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
   (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
5. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS" IN THE 2018 NCDOT ROADWAY STANDARD DRAWINGS.
6. SIX(6) WEEKS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 3 DEPUTY TRAFFIC ENGINEER, STONEWALL (STONEY) MATHIS, AT 910-341-220 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITHCES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK, AND VLAN ID INFORMATION. NOTIFY THE DEPUTY TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND FUNCTIONAL.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RK&K
P: (919) 878-9560
8601 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 50 1"=50'

SIGNAL COMMUNICATIONS PLANS

DIVISION 3 BRUNSWICK COUNTY CALABASH

PLAN DATE: November 2021 REVIEWED BY: DT SEARS

PREPARED BY: WP ERICKSON-JONES REVIEWED BY:

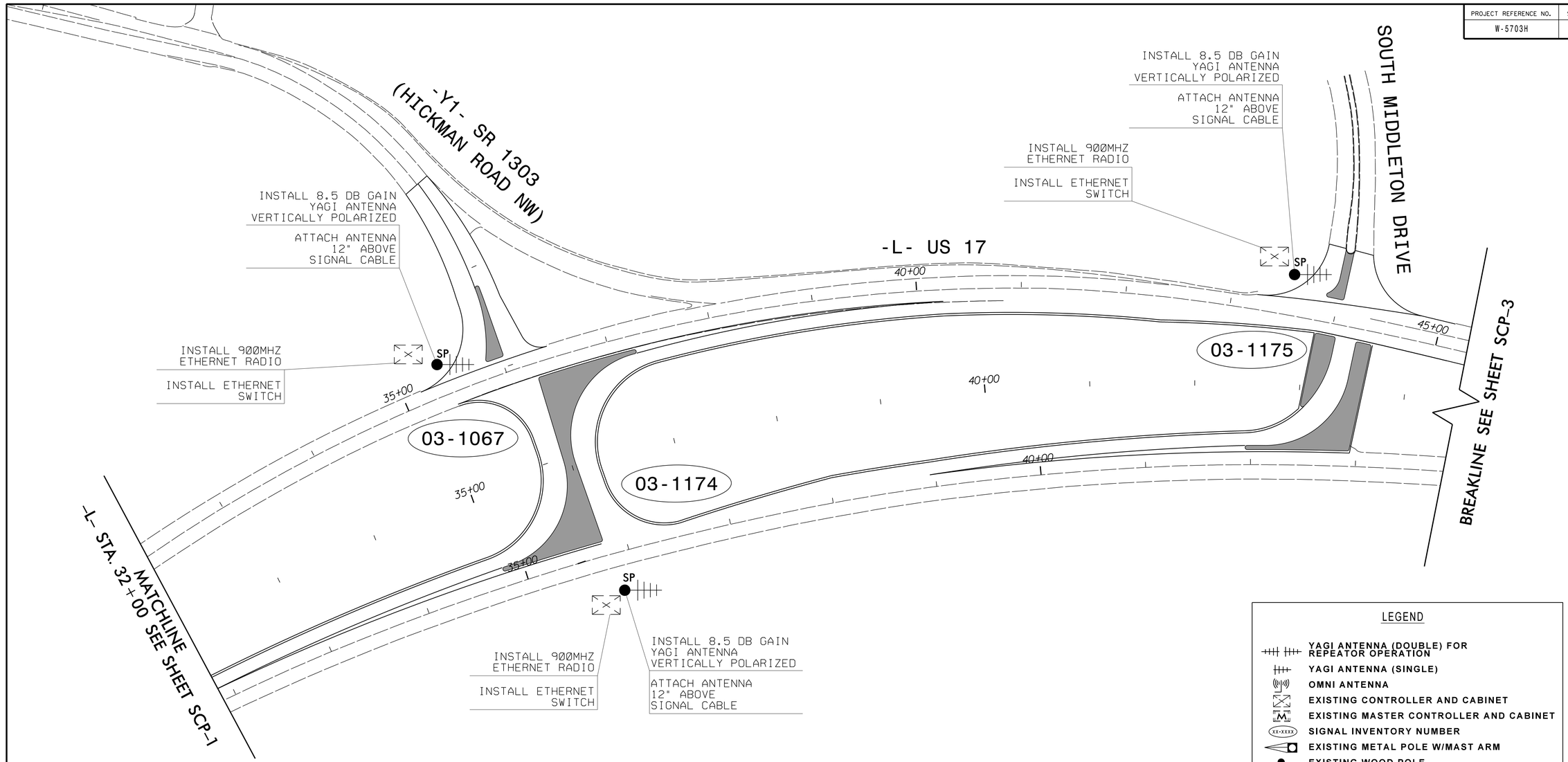
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 044558
ENGINEER DAVID T. SEARS

DocuSigned by: David T Sears 11/19/2021
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SCP-2



LEGEND

- YAGI ANTENNA (DOUBLE) FOR REPEATOR OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- EXISTING CONTROLLER AND CABINET
- EXISTING MASTER CONTROLLER AND CABINET
- XX-XXXX SIGNAL INVENTORY NUMBER
- EXISTING METAL POLE W/MAST ARM
- EXISTING WOOD POLE
- EXISTING METAL POLE
- SP SIGNAL POLE
- EXISTING OVERSIZED JUNCTION BOX
- NEW OVERSIZED JUNCTION BOX
- EXISTNG CONDUIT
- —EXI— EXISTING COMMUNICATIONS CABLE

NOTES FOR WIRELESS COMMUNICATIONS:

1. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2″ RISER WITH WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   B. ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A ½″ HOLE UP THROUGH THE BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
   C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   D. BETWEEN THE POINT OF EXITING THE RISER, METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING ¾″ STAINLESS STEEL STRAPS EVERY 12″.
2. IF AN EXISTING 2″ SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
   (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
5. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS" IN THE 2018 NCDOT ROADWAY STANDARD DRAWINGS.
6. SIX(6) WEEKS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 3 DEPUTY TRAFFIC ENGINEER, STONEWALL (STONEY) MATHIS, AT 910-341-220 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITHCES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK, AND VLAN ID INFORMATION. NOTIFY THE DEPUTY TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND FUNCTIONAL.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RK&K
P: (919) 878-9560
8601 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Integrated Mobility Division — Traffic Engineering Branch
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 50 1"=50'

SIGNAL COMMUNICATIONS PLANS

DIVISION 3 BRUNSWICK COUNTY CALABASH

PLAN DATE: November 2021 REVIEWED BY: DT SEARS

PREPARED BY: WP ERICKSON-JONES REVIEWED BY:

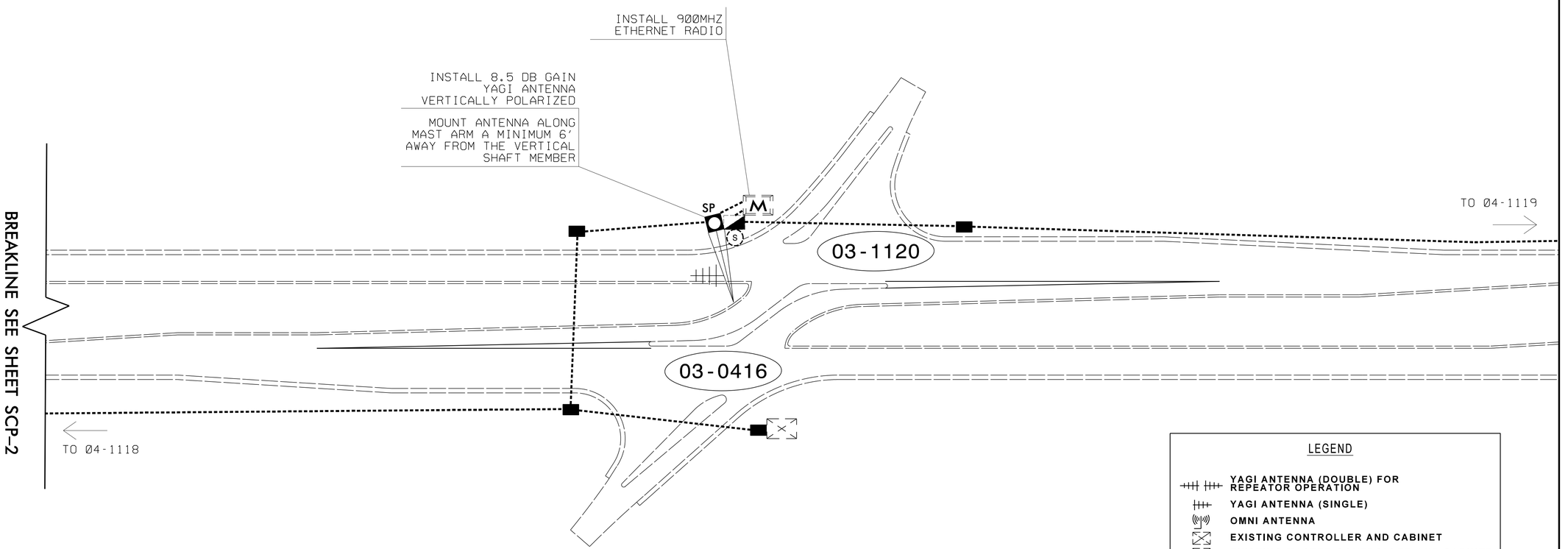
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

DocuSigned by: David T Sears 11/19/2021
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SCP-3



LEGEND

- YAGI ANTENNA (DOUBLE) FOR REPEATOR OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- EXISTING CONTROLLER AND CABINET
- EXISTING MASTER CONTROLLER AND CABINET
- XX-XXXX SIGNAL INVENTORY NUMBER
- EXISTING METAL POLE W/MAST ARM
- EXISTING WOOD POLE
- EXISTING METAL POLE
- SP SIGNAL POLE
- EXISTING OVERSIZED JUNCTION BOX
- NEW OVERSIZED JUNCTION BOX
- EXISTNG CONDUIT
- —EXI— EXISTING COMMUNICATIONS CABLE

NOTES FOR WIRELESS COMMUNICATIONS:

1. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2″ RISER WITH WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   B. ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A ½″ HOLE UP THROUGH THE BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
   C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   D. BETWEEN THE POINT OF EXITING THE RISER, METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING ¾″ STAINLESS STEEL STRAPS EVERY 12″.
2. IF AN EXISTING 2″ SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
   (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
5. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS" IN THE 2018 NCDOT ROADWAY STANDARD DRAWINGS.
6. SIX(6) WEEKS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 3 DEPUTY TRAFFIC ENGINEER, STONEWALL (STONEY) MATHIS, AT 910-341-220 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITHCES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK, AND VLAN ID INFORMATION. NOTIFY THE DEPUTY TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND FUNCTIONAL.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RK&K
P: (919) 878-9560
8601 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 50 1″=50′

SIGNAL COMMUNICATIONS PLANS

DIVISION 3 BRUNSWICK COUNTY CALABASH

PLAN DATE: November 2021 REVIEWED BY: DT SEARS

PREPARED BY: WP ERICKSON-JONES REVIEWED BY:

REVISIONS	INIT.	DATE

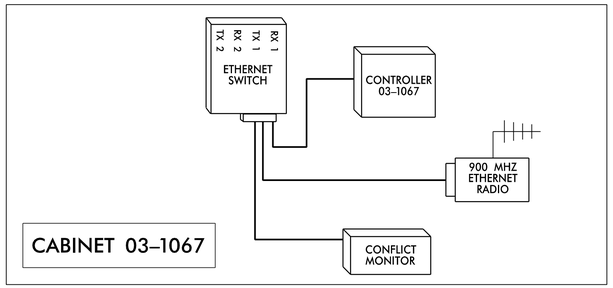
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS

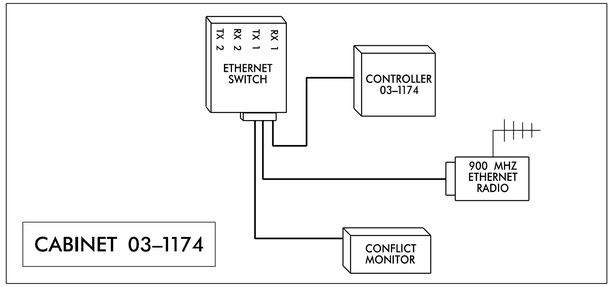
DocuSigned by: David T Sears 11/19/2021
SIGNATURE DATE

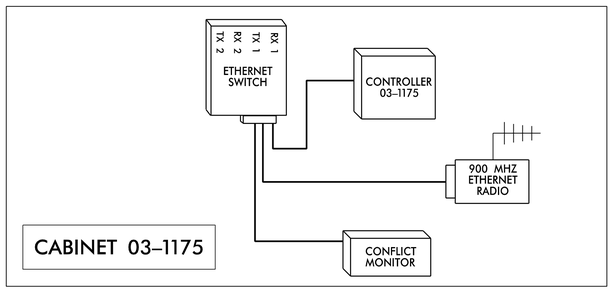
CADD Filename:

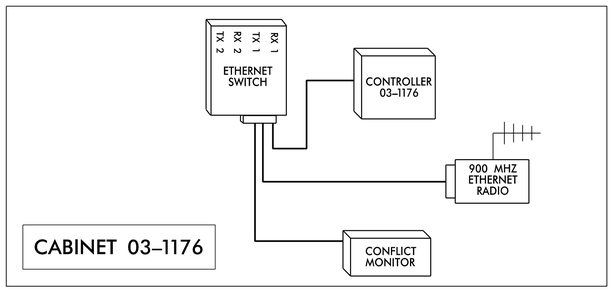
PROJECT REFERENCE NO.	SHEET NO.
W-5703H	SCP-4

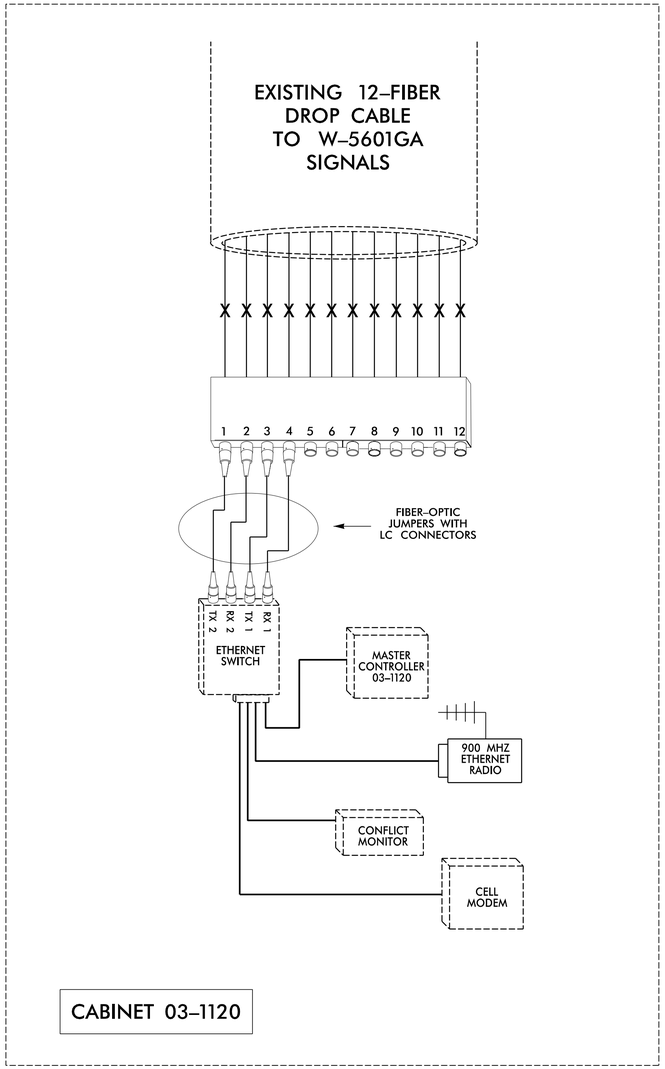
RADIO COMMUNICATIONS DETAIL











DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RK&K
P: (919) 878-9560
8601 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

Prepared for the Offices of:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Pkwy., Garner, NC 27529

SCALE

NTS

SIGNAL COMMUNICATIONS PLANS

DIVISION 3 BRUNSWICK COUNTY CALABASH

PLAN DATE: November 2021 REVIEWED BY: DT SEARS

PREPARED BY: WP ERICKSON-JONES REVIEWED BY:

REVISIONS	INIT.	DATE

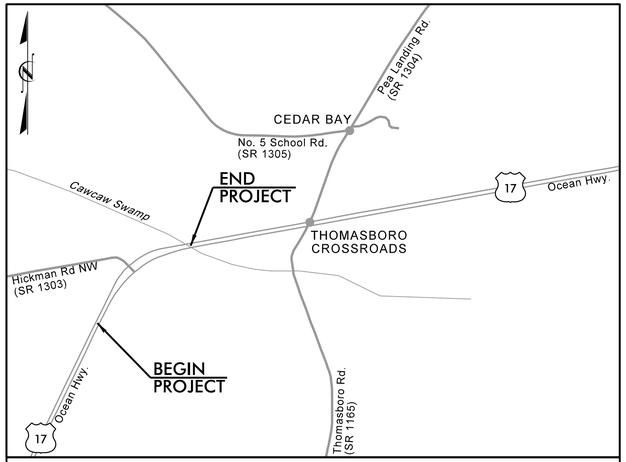
SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
044558
ENGINEER
DAVID T. SEARS

DocuSigned by:
David T Sears
11/19/2021
SIGNATURE DATE

CADD Filename:

09/08/99

TIP PROJECT: W–5703H



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
BRUNSWICK COUNTY

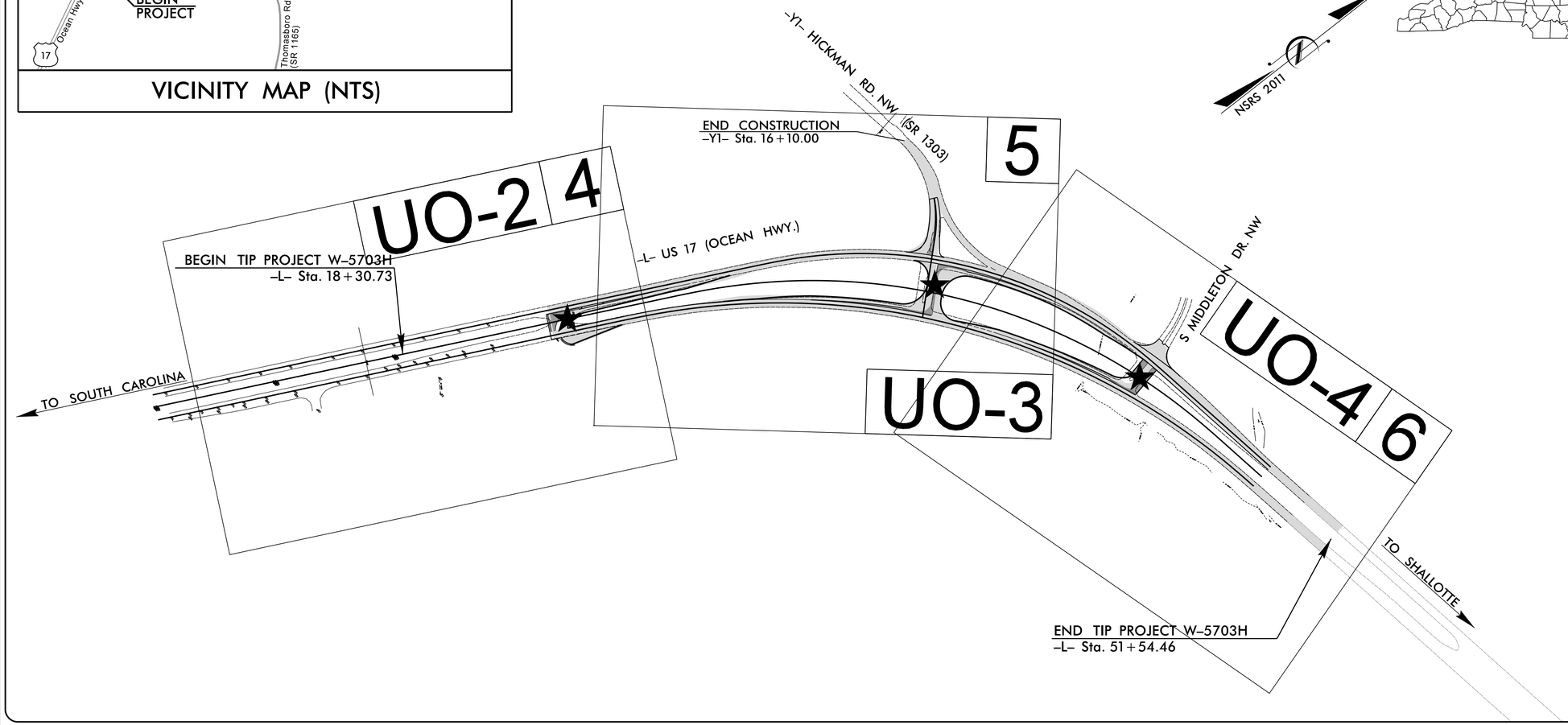
LOCATION: US–17 AT SR 1303 (HICKMAN ROAD NW)

TYPE OF WORK: UTILITY

T.I.P. NO.	SHEET NO.
W–5703H	UO–1

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





GRAPHIC SCALES

50 25 0 50 100
PLANS

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2 THRU UO–4	*UBO PLAN SHEETS*

UTILITY OWNERS

(A) BRUNSWICK EMC – POWER (T)
(B) BRUNSWICK EMC – POWER (D)
(C) AT&T TELECOMMUNICATIONS – FIBER OPTIC (T)
(D) AT&T TELECOMMUNICATIONS – FIBER OPTIC (D)
(E) WINDSTREAM COMMUNICATIONS – FIBER OPTIC
(F) SPECTRUM – CATV
(G) NCDOT – FIBER OPTIC
(H) BRUNSWICK COUNTY – WATER/SEWER

PREPARED IN THE OFFICE OF:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
8601 SIX FORKS RD., FORUM 1 SUITE 700
RALEIGH, NORTH CAROLINA 27615
NC LICENSE NO. F–0112
1–888–521–4455 OR 919–878–9560

HOWARD WOODALL	*UTILITY PROJECT MANAGER*
NATE HARRIS	*PROJECT UTILITY COORDINATOR*
NATE HARRIS	*PROJECT UTILITY CADD*

DIVISION OF HIGHWAYS
DIVISION 3

5501 Barbados Blvd.
Castle Hayne, NC 28429

CHAD KIMES, PE	*DIVISION CONTACT #1*
ANTHONY LAW	*DIVISION CONTACT #2*
LONNY A. SLEEPER	*DIVISION CONTACT #3*
J. STEVE DAVIS	*DIVISION CONTACT #4*

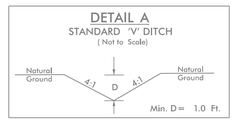
11/23/2021
R:\Utilities\Engineering\UBO\Proj\W-5703H_UT_tsh.dgn
dhefler

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	UO-2
THIS SHEET CORRESPONDS TO RDY-4	

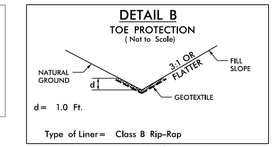
UTILITIES BY OTHERS

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

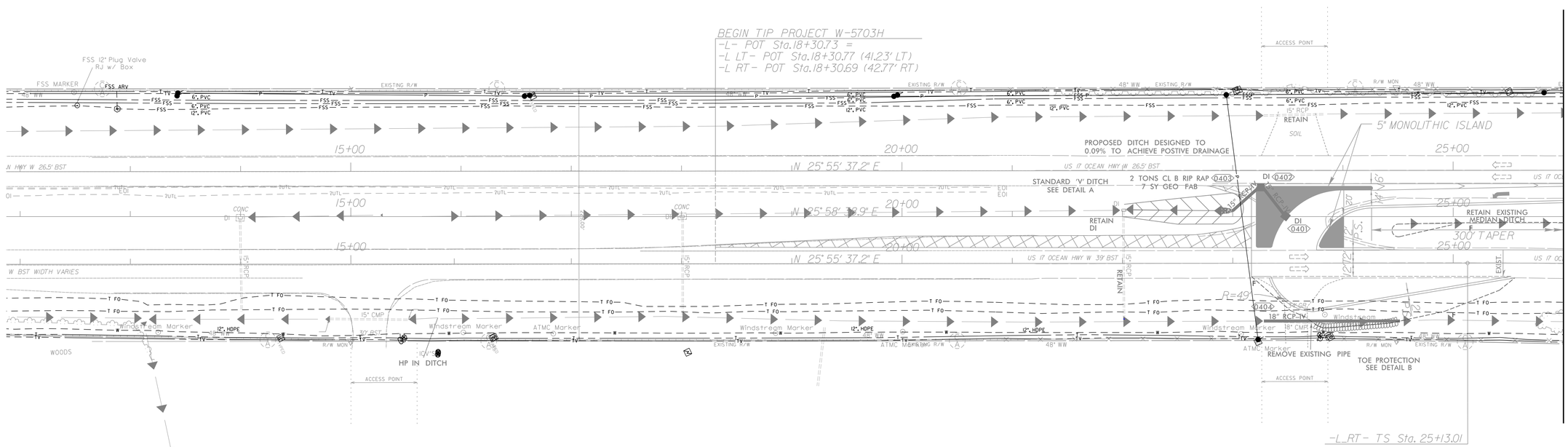




-L- STA. 22+00 TO STA. 23+00 CL,
BEG EL=32.70', END EL=32.79', S=0.09%



-L_RT- STA. 23+75 TO STA. 24+50 RT



MATCH LINE -L- STA 26+00.00 SEE SHEET UO-3

NOTE:

1. ALL EXISTING POWER ROUTING/CONNECTIVITY PROVIDED BY; BRUNSWICK EMC AND GOOGLE EARTH.

UTILITY OWNERS ON THIS SHEET

BRUNSWICK EMC – POWER (D)
AT&T TELECOMMUNICATIONS – FIBER OPTIC
WINDSTREAM COMMUNICATIONS – COPPER/FIBER OPTIC
SPECTRUM – CATV
NCDOT – FIBER OPTIC
BRUNSWICK COUNTY – WATER/SEWER

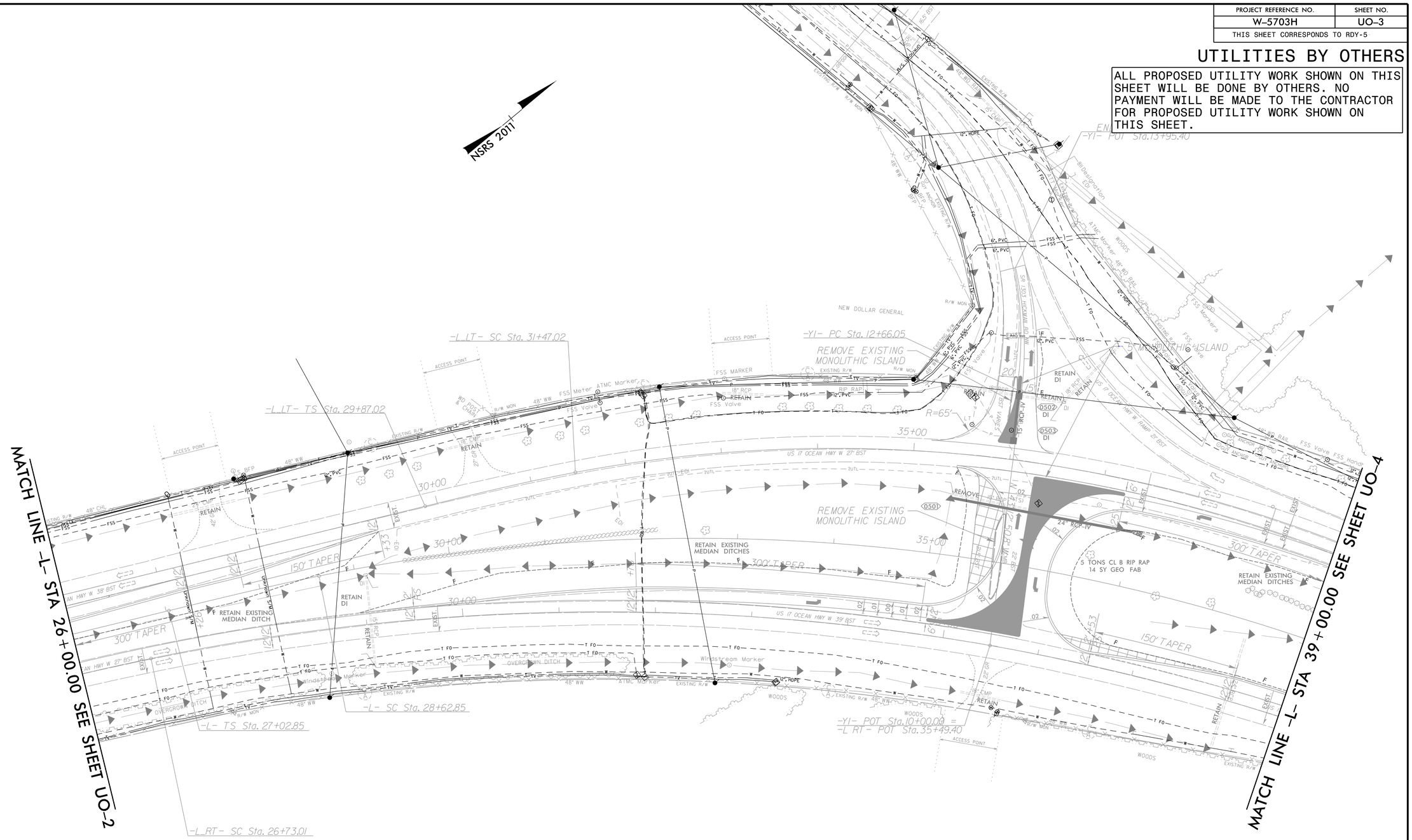
RK&K
P: (919) 878-9560
900 Ridgefield Drive Suite 350 | Raleigh, North Carolina 27609-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

5/14/99
11/16/2021
\\ad.rkk.com\fs\Cloud\Projects\2015\15213_NCEastLSA\001_W5703H_US17_SuperSt\Design\Utilities\Engineering\UBO\Proj\W-5703H_Ut_rdy04_UO02.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	UO-3
THIS SHEET CORRESPONDS TO RDY-5	

UTILITIES BY OTHERS

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



NOTE:

1. ALL EXISTING POWER ROUTING/CONNECTIVITY PROVIDED BY; BRUNSWICK EMC AND GOOGLE EARTH.

UTILITY OWNERS ON THIS SHEET

BRUNSWICK EMC – POWER (T)
BRUNSWICK EMC – POWER (D)
AT&T TELECOMMUNICATIONS – FIBER OPTIC
WINDSTREAM COMMUNICATIONS – COPPER/FIBER OPTIC
SPECTRUM – CATV
NCDOT – FIBER OPTIC
BRUNSWICK COUNTY – WATER/SEWER

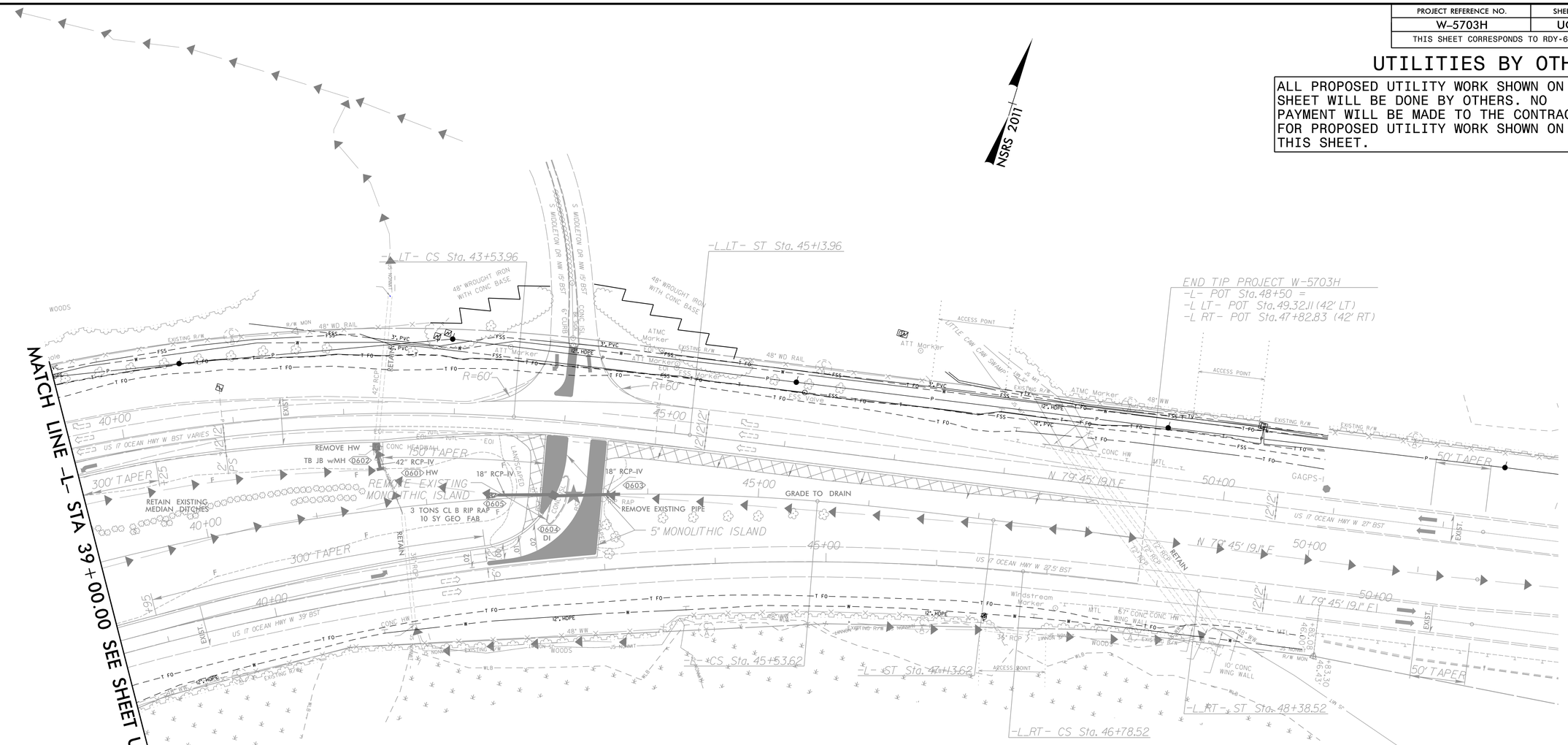
RK&K
P: (919) 878-9560
900 Ridgefield Drive Suite 350 | Raleigh, North Carolina 27609-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

5/14/99
11/16/2021
\\adrkk.com\fs\Cloud\Projects\2015\15213_NCEastLSA\001_W5703H_US17_SuperSt\Design\Utilities\Engineering\UBO\Proj\W-5703H_Ut_rdy05_UO03.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
W-5703H	UO-4
THIS SHEET CORRESPONDS TO RDY-6	

UTILITIES BY OTHERS

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



NOTE:

1. ALL EXISTING POWER ROUTING/CONNECTIVITY PROVIDED BY; BRUNSWICK EMC AND GOOGLE EARTH.

UTILITY OWNERS ON THIS SHEET

BRUNSWICK EMC – POWER (T)
BRUNSWICK EMC – POWER (D)
AT&T TELECOMMUNICATIONS – FIBER OPTIC (T)
AT&T TELECOMMUNICATIONS – FIBER OPTIC (D)
WINDSTREAM COMMUNICATIONS – COPPER/FIBER OPTIC
SPECTRUM – CATV
NCDOT – FIBER OPTIC
BRUNSWICK COUNTY – WATER/SEWER

RK&K
P: (919) 878-9560
900 Ridgefield Drive Suite 350 | Raleigh, North Carolina 27609-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

5/14/99
11/16/2021
\\rkk.com\fs\Cloud\Projects\2015\15213.NCEast.SA\001_W5703H_US17_SuperSt\Design\Utilities\Engineering\UBO\Proj\W-5703H_Uti_rdy06_UO04.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	X-0

US 17 WIDENING
BRUNSWICK COUNTY

T.I.P. PROJECT W-5703H

LINE	SHEET NO.
-L-	X-1 THRU X-7
-Y1-	X-8 THRU X-9

RFC

RELEASED FOR CONSTRUCTION

11/17/2021
R:\Roadway\XSC\W-5703H_Rdy_xpl_Index.dgn
ahefler

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703H	X-1

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

50
40
30
20

–L_LT– EXIST. EXIST. 36.99 3:1

25+50.00

–L_RT– EXIST. EXIST. 36.07 3:1

40
30
20

–L_LT– EXIST. EXIST. 36.88 3:1

25+00.00

–L_RT– EXIST. EXIST. 36.16 3:1

40
30
20

–L_LT– EXIST. EXIST. 36.87 3.6:1

24+50.00

–L_RT– EXIST. EXIST. 36.29 3:1

40
30
50

–L_LT– EXIST. EXIST. 36.87 8:1 6:1

24+00.00

–L_RT– EXIST. EXIST. 36.31 3:1

40
30
50

–L_LT– EXIST. EXIST. 36.79

23+50.00

–L_RT– EXIST. EXIST. 36.34

40
30

36.79 4:1 32.79 4:1 36.41

23+00.00

—℄—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10/20/2021
R:\Roadway\XSC\W-5703H_Rdy_xp1_L.dgn
dhefler

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703H	X-2

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

50 40 30 20

–L_LT– EXIST. EXIST. 37.60 5:1 –L_RT– EXIST. EXIST. 35.58

28+50.00

40 30 20

–L_LT– EXIST. EXIST. 37.47 5:1 –L_RT– EXIST. EXIST. 35.63

28+00.00

40 30 20

–L_LT– EXIST. EXIST. 37.35 4:1 –L_RT– EXIST. EXIST. 35.73

27+50.00

40 30 20

–L_LT– EXIST. EXIST. 37.27 3.7:1 –L_RT– EXIST. EXIST. 35.81

27+00.00

40 30 20

–L_LT– EXIST. EXIST. 37.18 3.3:1 –L_RT– EXIST. EXIST. 35.89

26+50.00

40 30 20

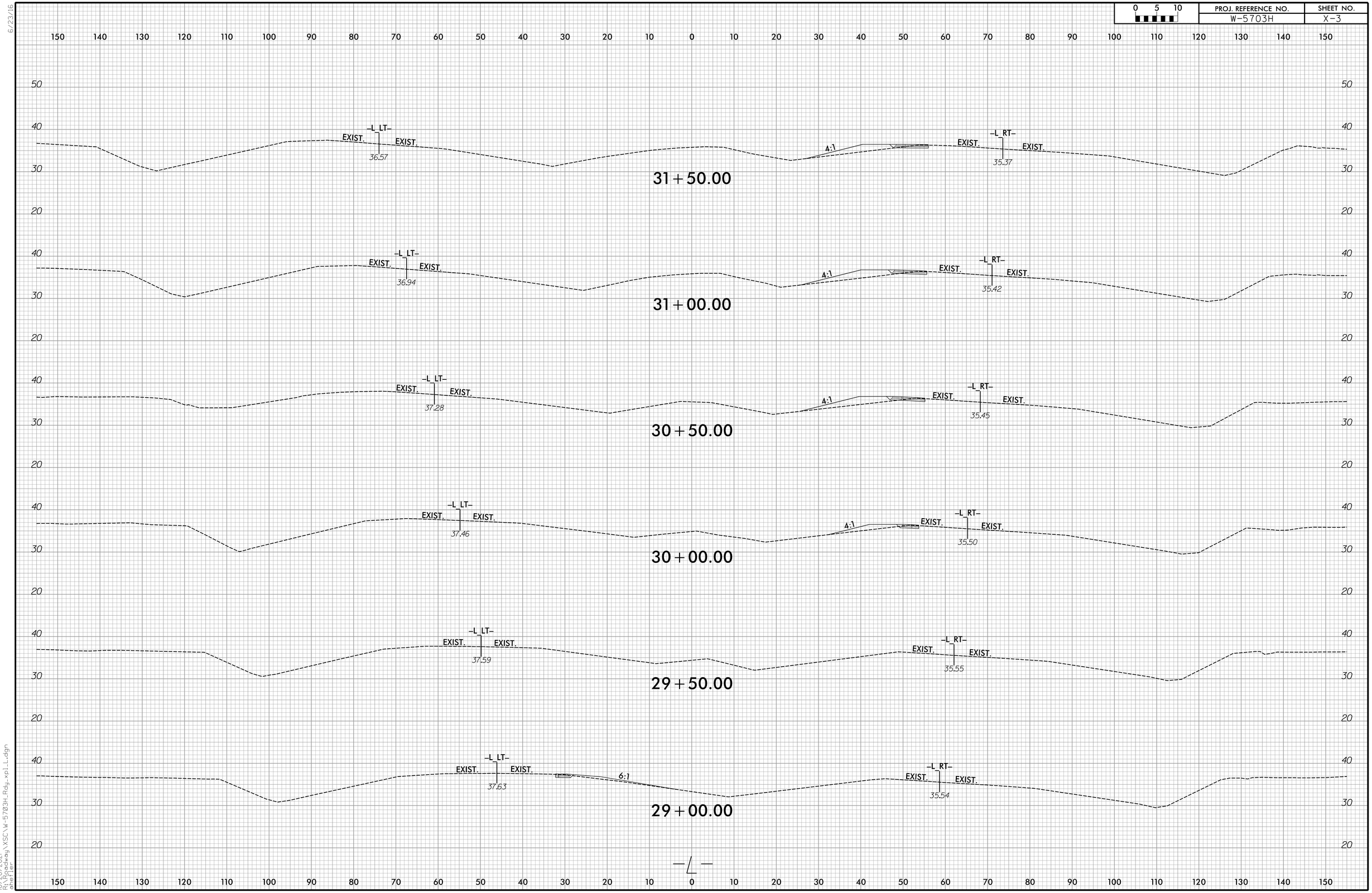
–L_LT– EXIST. EXIST. 37.09 3.11:1 –L_RT– EXIST. EXIST. 35.94

26+00.00

—℄—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10/20/2021
R:\Roadway\XSC\w-5703H_Rdy-xpl_L.dgn
chelsea



6/23/16

10/20/2021
R:\Roadway\XSC\W-5703H_Rdy_xpl_L.dgn
ahefler

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703H	X-4

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

50 40 30 20

34+50.00

–L_LT– EXIST. EXIST. 34.48

3.42:1

–L_RT– EXIST. EXIST. 35.08

40 30 20

34+00.00

–L_LT– EXIST. EXIST. 34.73

3.35:1

–L_RT– EXIST. EXIST. 35.11

40 30 20

33+50.00

–L_LT– EXIST. EXIST. 35.04

3.38:1

–L_RT– EXIST. EXIST. 35.21

40 30 20

33+00.00

–L_LT– EXIST. EXIST. 35.40

3.58:1

–L_RT– EXIST. EXIST. 35.24

40 30 20

32+50.00

–L_LT– EXIST. EXIST. 35.73

4:1

–L_RT– EXIST. EXIST. 35.26

40 30 20

32+00.00

–L_LT– EXIST. EXIST. 36.12

4:1

–L_RT– EXIST. EXIST. 35.33

40 30 20

—℄—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10/20/2021
R:\Projects\Highway\XSC\w-5703H_Rdy-xpl_L.dgn
chelsea

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703H	X-5

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

50 40 30 20

–L_LT–
EXIST. EXIST.
34.14
4:1

37+50.00

–L_RT–
EXIST. EXIST.
34.89

40 30 20

–L_LT–
EXIST. EXIST.
34.10
3.3:1

37+00.00

–L_RT–
EXIST. EXIST.
34.93

40 30 20

–L_LT–
EXIST. EXIST.
34.11

36+50.00

–L_RT–
EXIST. EXIST.
34.93

40 30 20

INTERSECTIO –Y1– @ SHEAR LINI

–L_LT–
EXIST. EXIST.
34.12

36+00.00

–L_RT–
EXIST. EXIST.
34.98

40 30 20

INTERSECTION –Y1– @ SHEAR LINE

–L_LT–
EXIST. EXIST.
34.17
8:1
8:1

35+50.00

–L_RT–
EXIST. EXIST.
35.02

40 30 20

–L_LT–
EXIST. EXIST.
34.33
3.54:1

35+00.00

–L_RT–
EXIST. EXIST.
35.09

40 30 20

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10/20/2021
R:\Projects\dwg\XSC\w-5703H_Rdy-xpl_L.dgn
sheetflow

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703H	X-6

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

50 40 30 20

–L_LT– EXIST. EXIST. 34.19 4:1 6.5:1 –L_RT– EXIST. EXIST. 34.76

40+50.00

40 30 20

–L_LT– EXIST. EXIST. 34.16 4:1 6.7:1 –L_RT– EXIST. EXIST. 34.79

40+00.00

40 30 20

–L_LT– EXIST. EXIST. 34.20 5:1 –L_RT– EXIST. EXIST. 34.81

39+50.00

40 30 20

–L_LT– EXIST. EXIST. 34.19 4:1 –L_RT– EXIST. EXIST. 34.82

39+00.00

40 30 20

–L_LT– EXIST. EXIST. 34.10 4:1 –L_RT– EXIST. EXIST. 34.86

38+50.00

40 30 20

–L_LT– EXIST. EXIST. 34.05 3.82:1 –L_RT– EXIST. EXIST. 34.87

38+00.00

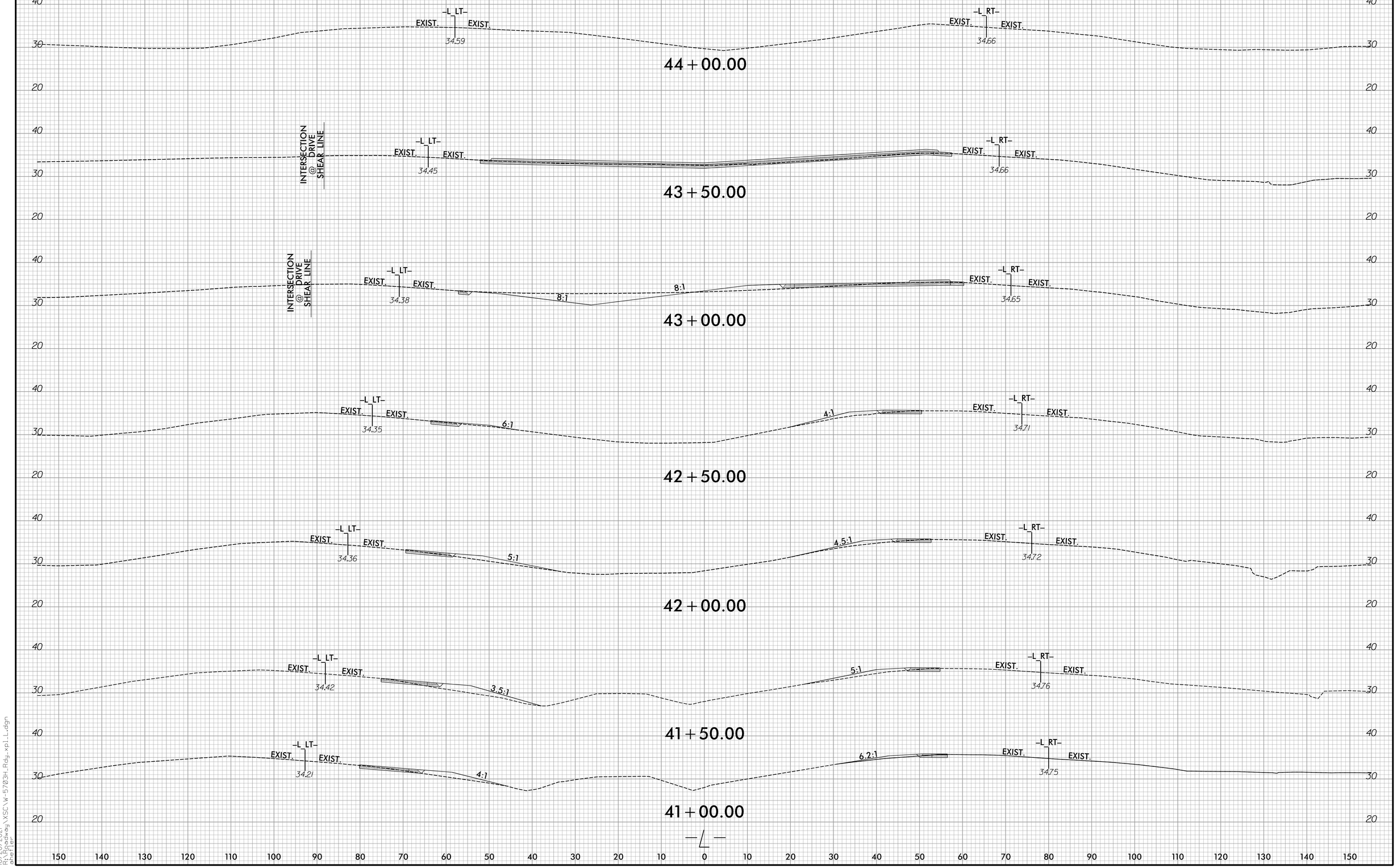
—℄—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

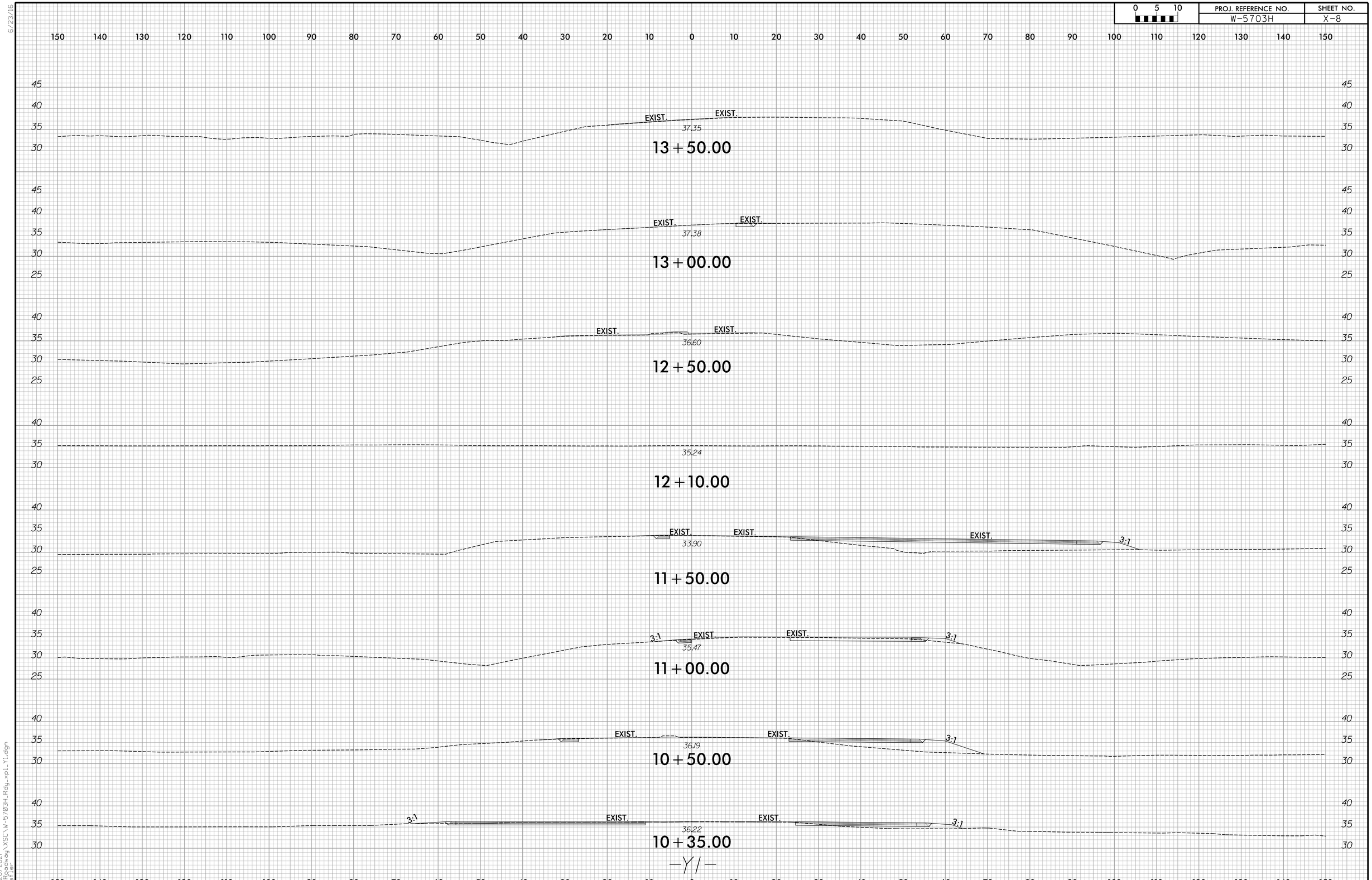
10/20/2021
R:\Roadway\XSC\w-5703H_Rdy-xpl_L.dgn
shefler

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703H	X-7



10/20/2021
R:\Roadway\XSC\W-5703H_Rdy_xp1_L.dgn
default



6/23/16

10/20/2021
R:\Roadway\XSC\W-5703H_Rdy_xpl_Y1.dgn
ahefler

6/23/16

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
W-5703H	X-9

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

40
35
30
25

37.28

14+00.00

—Y1—

40
35
30
25

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10/20/2021
R:\Projects\Highway\XSC\w-5703H_Rdy_xpl_Y1.dgn
chelsea