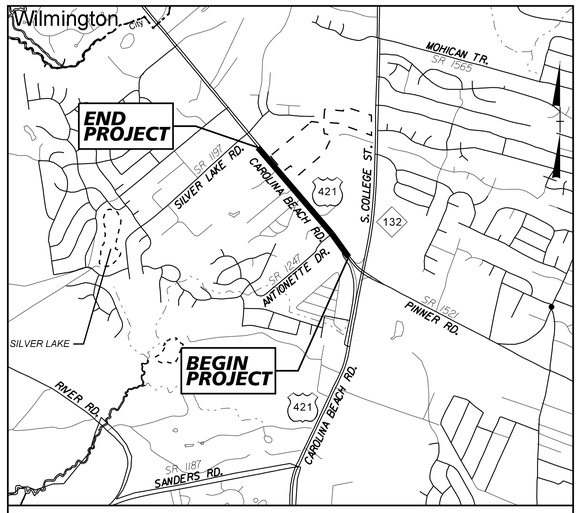
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09/26/99

TIP PROJECT: W-5703C

CONTRACT: DC00505

SEE SHEET 1A FOR INDEX OF SHEETS
SEE SHEET 1B FOR CONVENTIONAL PLAN SHEET SYMBOLS



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

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

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
44849.1.3	HSIP-0421(091)	PE
44849.2.9	HSIP-0421(091)	UTIL
44849.2.3	HSIP-0421(091)	R/W
44849.3.3	HSIP-0421(091)	CONSTR

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

100% PLANS

LOCATION: *US 421 (CAROLINA BEACH ROAD) FROM S. COLLEGE ROAD TO APPROXIMATELY 200' NORTH OF WILLOUGHBY PARK ROAD*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, FENCE, AND SIGNALS*

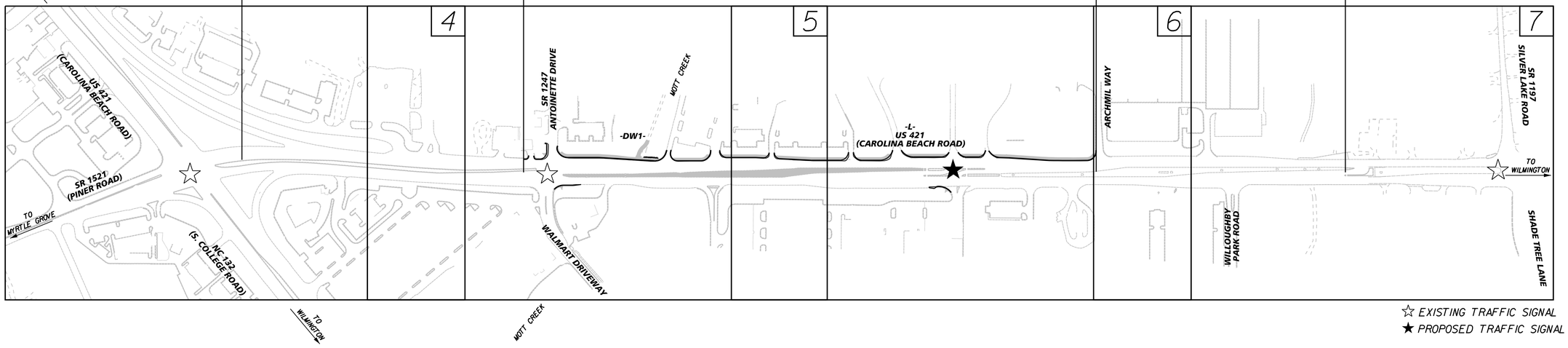
NAD 83 NC GRID NA 2011

BEGIN CONSTRUCTION
-L- STA 11+80.00

BEGIN TIP PROJECT
W-5703C
-L- STA 21+95.00

END TIP PROJECT
W-5703C
-L- STA 42+54.00

END CONSTRUCTION
-L- STA 51+50.00



☆ EXISTING TRAFFIC SIGNAL
★ PROPOSED TRAFFIC SIGNAL

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF WILMINGTON

NCDOT CONTACT: BRIAN HARDING, PE
DIVISION 3, DIVISION PROJECT MANAGER
(910) 341-2000

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 2024 = 35,400
ADT 2040 = 45,000
K = 8%
D = 55%
T = 3%*
V = 50 MPH

CLASSIFICATION:
PRINCIPAL ARTERIAL

* 1% TTST 2% DUAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5703C = 0.390 MILES

TOTAL LENGTH TIP PROJECT W-5703C = 0.390 MILES

PLANS PREPARED FOR THE NCDOT BY:

Kimley»Horn © 2025
NC LICENSE #F-0102
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 2025

LETTING DATE:
APRIL 16, 2026

SEAN KANE, P.E.
PROJECT ENGINEER

BEN CRAWFORD, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 050361 KRISTEN L FALKENSTROM REGISTERED
DocuSigned by: Kristen Falkenstrom
3/6/2026 *P.E.*
SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 050361 SEAN P. KANE REGISTERED
DocuSigned by: Sean Kane
3/6/2026 *P.E.*
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

3/6/2026

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	IA

ROADWAY DESIGN ENGINEER



REVISIONS

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, LIST OF ROADWAY STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS SHEET
2A-1 THRU 2A-2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND MISCELLANEOUS DETAILS
2B-1 THRU 2B-2	INTERSECTION DETAIL SHEETS
2C-1 THRU 2C-3	ROADWAY STANDARD DRAWINGS DETAILS
2D-1	DRAINAGE DETAILS
3B-1	SUMMARY OF EARTHWORK AND GUARDRAIL
3D-1 THRU 3D-2	DRAINAGE SUMMARY SHEETS
3P-1	PARCEL INDEX SHEETS
4 THRU 7	PLAN SHEETS
8 THRU 10	PROFILE SHEETS
RW01 THRU RW07	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS, AND PROPERTY TIES
TMP-1 THRU TMP-9	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING AND SIGNING PLANS
EC-1 THRU EC-11	EROSION CONTROL PLANS
SIG 1.0 THRU SCP-03	SIGNAL PLANS
UC-1 THRU UC-8	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-5	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION INDEX
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-12	CROSS-SECTIONS

GENERAL NOTES

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
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 MODIFIED METHOD III.

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.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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.

GUARDRAIL:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE
A) DUKE ENERGY (DISTRIBUTION)
B) CAPE FEAR PUBLIC UTILITIES AUTHORITY
C) PIEDMONT NATURAL GAS (DUKE ENERGY)
D) AT&T (DISTRIBUTION)
E) LUMEN
F) SPECTRUM
G) CITY OF WILMINGTON FIBER

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.06.

LIST OF 2024 ROADWAY STANDARD DRAWINGS

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Modified Method III
225.02	Guide for Grading Subgrade - Secondary and Local
275.01	Rock Plating
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.32	Brick Junction Box - 12" thru 66" Pipe
840.54	Manhole Frame and Cover
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.06	Curb Ramp
852.01	Concrete Islands
852.10	Median Construction with Curb and Gutter
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 12 of 15)
862.02	Guardrail Installation
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets

2/11/2026

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REVISIONS

2/10/2024

1/29/2026

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)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel/Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream
- Buffer Zone 1
- Buffer Zone 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch
- 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
- Existing Control of Access Line
- Proposed Control of Access Line
- Proposed ROW and CA Line
- Existing Easement Line
- Proposed Temporary Construction Easement
- 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
- 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.

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REVISIONS

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601 NC LICENSE #F-0102

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

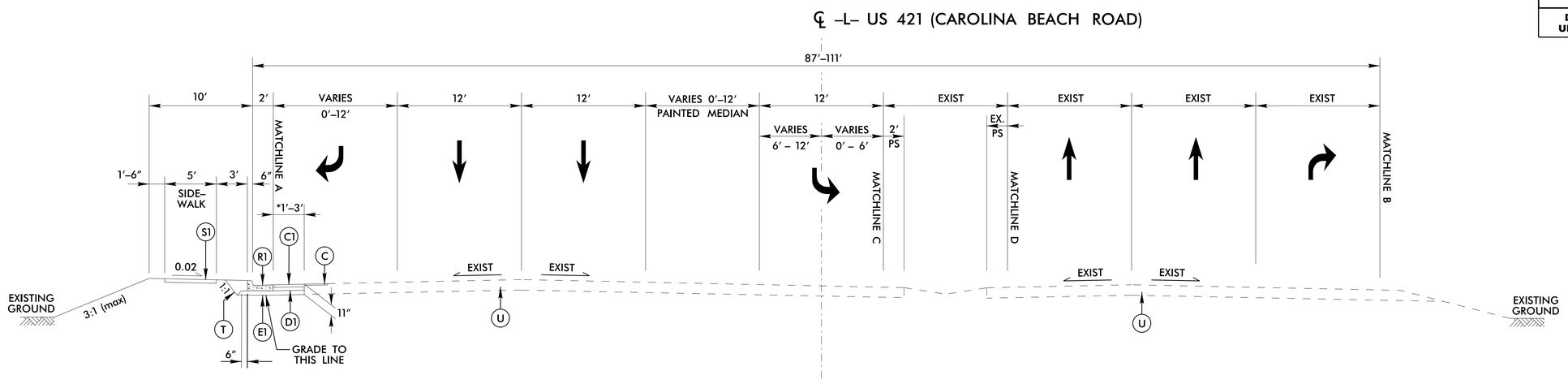
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052030 ENGINEER SEAN P. KANE
1/29/2026

PAVEMENT DESIGN ENGINEER

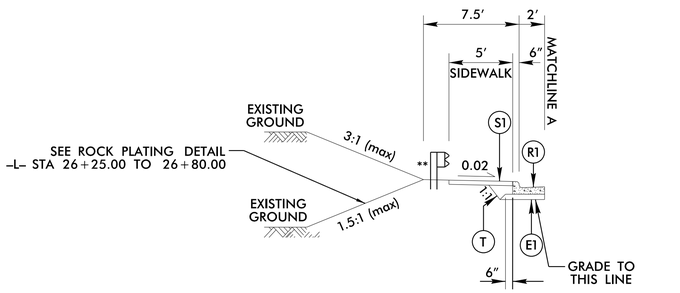
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1/29/2026

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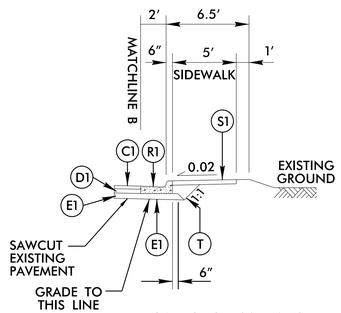


*SAW CUT TO ALLOW A MINIMUM 1′ OF WIDENING

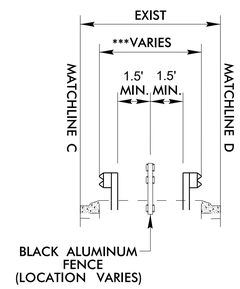
TYPICAL SECTION NO. 1
-L- 21+95.00 TO 31+35.00



TYPICAL SECTION NO. 1A
-L- 26+19.00 TO 26+90.00
*** EXTRA DEPTH POST (8′ STEEL)*



TYPICAL SECTION NO. 1B
-L- 22+99.77 TO 23+75.00

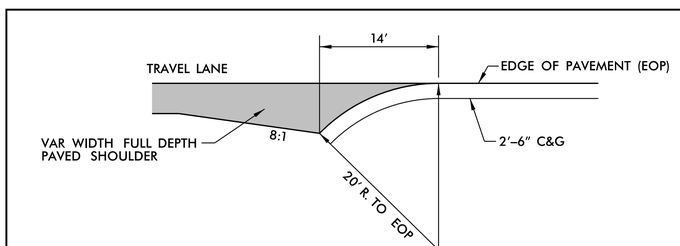


TYPICAL SECTION NO. 1C
-L- 23+75.00 TO 27+00.00
*** WHEN WIDTH FROM FACE OF GUARDRAIL TO FACE OF GUARDRAIL IS LESS THAN 7′ ADDITIONAL GUARDRAIL POSTS SHOULD BE INSTALLED.*

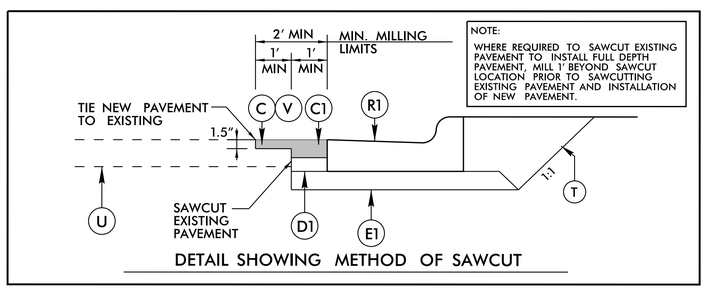
PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

A	6" PORTLAND CEMENT CONCRETE PAVEMENT
C	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD.
CI	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.
DI	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.
EI	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.
J	PROPOSED 6" AGGREGATE BASE COURSE
RI	PROPOSED 2'-6" CONCRETE CURB & GUTTER
SI	PROPOSED 4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE INDICATED



CURB & GUTTER FLARE DETAIL



DETAIL SHOWING METHOD OF SAWCUT

1/29/2026

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RALEIGH, N.C. 27601

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	2A-2

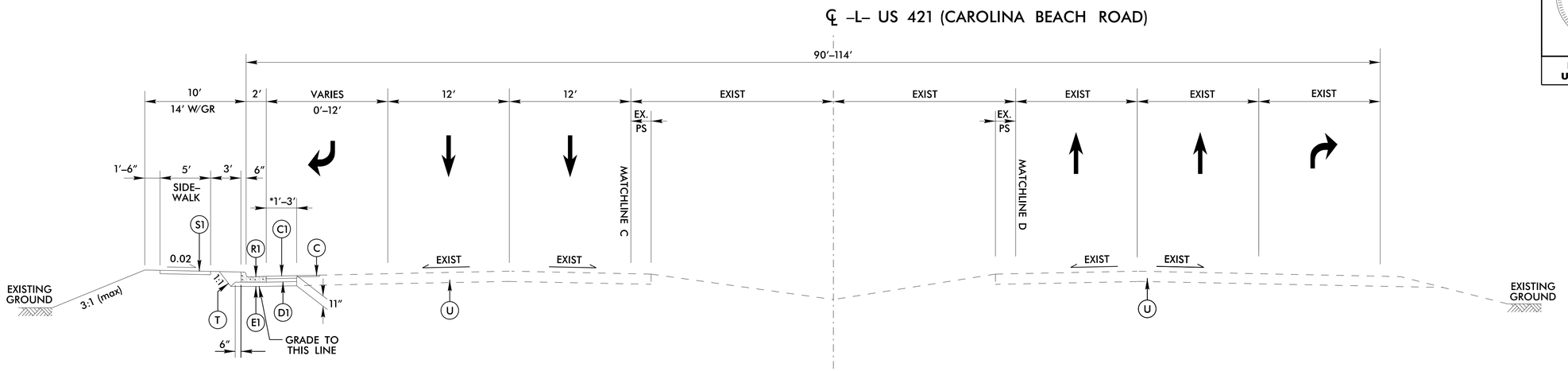
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052038 ENGINEER SEAN P. KANE
1/29/2026

PAVEMENT DESIGN ENGINEER

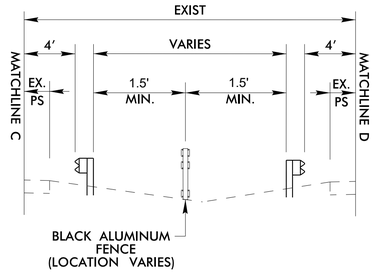
NORTH CAROLINA PROFESSIONAL SEAL 058176 ENGINEER SHIHAI ZHANG
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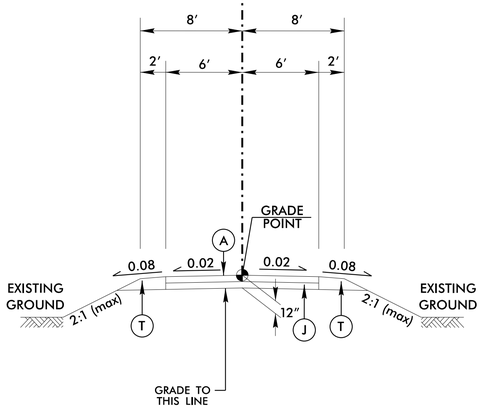


*SAW CUT TO ALLOW A MINIMUM 1' OF WIDENING

TYPICAL SECTION NO. 2
-L- 31+35.00 TO 42+54.00



TYPICAL SECTION NO. 1D & 2A
-L- 28+00.00 TO 35+20.00



TYPICAL SECTION NO. 11
-DW1- 10+09.00 TO 10+80.00

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

A	6" PORTLAND CEMENT CONCRETE PAVEMENT
C	1.5" OVERLAY TYPE S9.5C
CI	3" TYPE S9.5C
DI	4" TYPE 119.0C
EI	4" TYPE B25.0C
J	6" AGGREGATE BASE COURSE
RI	2'-6" CONCRETE CURB AND GUTTER
SI	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE INDICATED

1/29/2026

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5/14/99

REVISIONS

2/11/2026

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RALEIGH, N.C. 27601

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

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE

2/11/2026

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NAD 83/NSRS 2007

EXISTING R/W VARIES

CAROLINA BEACH RD 26' BST

25' BST

10' UTILITY EASEMENT

US 421 CAROLINA BEACH RD 41' BST

US 421 CAROLINA BEACH RD 39' BST

42' BST

24' BST

PINER ROAD EBL 23' BST

PINER ROAD WBL VARIABLE BST

INDIRECT EASEMENT

10+00

15+00

N 35° 03' 02.7" W

-L- PC Sta. 10+00.00

-L- PT Sta. 13+37.84

-L- PC Sta. 18+52.51

MATCHLINE -L- STA 19+00.00
SEE BELOW

SEE SHEET NO. 4 FOR PLAN

-L- PT Sta. 20+33.94

BEGIN CONSTRUCTION -EY7- STA 11+65.00 TIE TO EXISTING PAVEMENT MARKING

END 2'-6" C&G STA 22+71.82 103.77' LT.

4' x 4' LANDING PAD

BEGIN 2'-6" C&G STA 22+32.17 59.55' LT.

END 2'-6" C&G STA 22+11.94 60.26' LT.

BEGIN 2'-6" C&G STA 21+95.00 48.32' LT.

20

N 50° 26' 15" W

MATCHLINE -L- STA 19+00.00
SEE ABOVE

N 39° 34' 13.7" W

BEGIN TIP PROJECT W-5703C
-L- POT Sta. 21+95.00

-Y1- POT Sta.13+00.00 =
-L- POT Sta. 22+98.21

BEGIN 2'-6" C&G STA 23+17.90 95' LT.

-DW1- PRC Sta. 10+51.02

-DW1- PC Sta. 10+09.87

BEGIN GRADE

-DW1- PT Sta.10+09.00

S 53° 51' 47.4" W

-DW1- POT Sta. 10+00.00 =
-L- Sta. 26+06.96 (45.54' LT.)

-DW1- PT Sta. 10+77.73

END GRADE

-DW1- PT Sta.10+80.00

S 70° 24' 33.8" W

-DW1- POT Sta. 10+90.94

INSTALL ROCK PLATING -L- STA. 26+25.00 TO 26+80.00

END 2'-6" C&G STA 27+09.20 80' LT.

END 2'-6" C&G STA 28+67.25 79.77' LT.

BEGIN 2'-6" C&G STA 29+00.00 79.03' LT.

BEGIN 2'-6" C&G STA 27+26.02 80' LT.

END 2'-6" C&G STA 30+75.17 70.75' LT.

BEGIN 2'-6" C&G STA 30+97.11 70.55' LT.

140' STORAGE

200' TAPER

345' TAPER

240' STORAGE

50' TAPER SIDEWALK

200' LANE SHIFT AND TAPER

230' BAY TAPER MEDIAN

EXISTING R/W VARIES

5' SIDEWALK

2'-6" C&G

18' DR

20' DR

33' DR

12' DR

40'R

25'R

35'R

20'R

45'R

CAT -1

BEGIN BLACK ALUMINUM FENCE -L- STA 24+25.00 11.50' RT.

-L- STA 25+85.00 11.50' RT.

-L- STA 27+70.00 10.00' RT.

-L- STA 30+30.00 8.00' RT.

END 2'-6" C&G STA 23+75.00

BEGIN GUARDRAIL -L- STA 23+65.00

INSTALL 4' CONCRETE COVER -L- STA 23+37.80 TO 23+85.00

4' x 4' LANDING PAD

BEGIN 2'-6" C&G STA 23+05.55 61.42' RT.

75' GUARDRAIL TRANSITION LT & RT

US 421 CAROLINA BEACH RD VARIABLE BST

US 421 CAROLINA BEACH RD 28' BST

EXISTING R/W VARIES

MATCHLINE -L- STA 32+00.00
SEE DETAIL SHEET 2B-2

SEE SHEET NO. 5 FOR PLAN

50 0 50 100

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REVISIONS

Kimley»Horn
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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601

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

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE
DIGITALLY SIGNED
2/11/2026

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NAD 83/NSRS 2007

MATCHLINE -L- STA 32+00.00
SEE DETAIL SHEET 2B-1

BEGIN 2'-6" C&G STA 35+53.80 79.86' LT.
END 2'-6" C&G STA 35+21.58 79.86' LT.
END 2'-6" C&G STA 33+62.81 72.09' LT.
BEGIN 2'-6" C&G STA 33+81.78 70.04' LT.
BEGIN 2'-6" C&G STA 37+58.06 72.25' LT.
END 2'-6" C&G STA 37+24.10 79.86' LT.
END 2'-6" C&G STA 38+54.86 78.82' LT.
BEGIN 2'-6" C&G STA 38+68.36 77.54' LT.
END 2'-6" C&G STA 42+52.86 79.95' RT.

35
40
50

+10 +30 +50 +60 +35 +65 +00 +04

475' STORAGE
90' STORAGE
250' TAPER
130' TAPER

EXISTING R/W VARIES
EIP
R/W MON

19' DR
32' DR
34' DR
13' DR
50'R
30'R 30'R
45'R
35'R
25'R
30'R
5' SIDEWALK
2'-6" C&G
-L- STA 32+45.00 6.00' LT.
END GUARDRAIL -L- STA 35+65.00
ATTL-3
15'
N 39° 34' 13.7" W
END BLACK ALUMINUM FENCE -L- STA 34+80.00 9.50' LT.
SEE INSET A
EXIST
20'R
56'R
8'
CONTRACTOR TO CONFIRM LOCATION OF EXISTING 18" PIPE PRIOR TO INSTALLATION OF GUARDRAIL POSTS TO AVOID CONFLICT -L- STA.32+10 TO 33+85.GUARDRAIL OFFSET MAY VARY TO AVOID PIPE.4' MINIMUM TO EDGE OF TRAVEL
INSTALL FULL DEPTH PAVED SHOULDER -L- STA 35+40.00 TO 35+70.00
BEGIN 2'-6" C&B STA -L- 36+72.50 57.75' RT.
4' x 4' LANDING PAD
BEGIN 2'-6" C&B STA -L- 37+31.91 72.40' RT.

-L- US 421
(CAROLINA BEACH RD)

MATCHLINE -L- STA 45+00.00
SEE BELOW

2' PS

END TIP PROJECT W-5703C
-L- POT Sta. 42+54.00

SEE SHEET NO. 6 FOR PLAN

NAD 83/NSRS 2007

MATCHLINE -L- STA 45+00.00
SEE ABOVE

EXIST
N 39° 34' 13.7" W
-L- POT Sta. 53+40.00

INSET A

+58.72 13.30' LT.
1' R
+77.65 14.35' LT.
12'
4'
5'
+77.65 10.35' LT.
+65.65 10.35' LT.
-L-
+20.27 9.82' RT.
+08.27 9.82' RT.
12'
5'
4'
REMOVE EXISTING KEYED-IN MONO./ISLAND INSTALL 2" OF ASPHALT FLUSH TO ADJACENT ROADWAY
1' R
+27.46 12.62' RT.
+08.27 13.82' RT.

SEE SHEET NO. 7 FOR PLAN

50 0 50 100

2/11/2026

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

NORMAL EARTH FOUNDATION

ROCK FOUNDATION

PIPE IN TRENCH

UNSUITABLE MATERIAL FOUNDATION

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

ROADWAY STANDARD DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

1-24	STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 2 OF 2

300.01

NORMAL EARTH FOUNDATION

ROCK FOUNDATION

PIPE IN TRENCH

UNSUITABLE MATERIAL FOUNDATION

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

ROADWAY STANDARD DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

1-24	STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 1 OF 2

300.01

REVISIONS

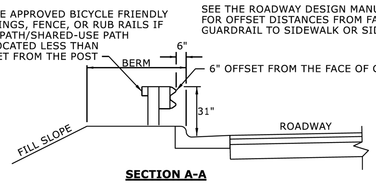
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2020/62/1

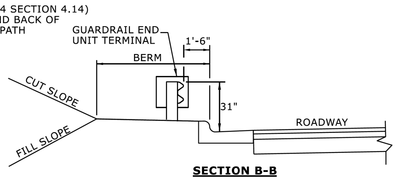
PROJECT REFERENCE NO.	SHEET NO.
W-5703C	2C-2

PLACE APPROVED BICYCLE FRIENDLY RAILINGS, FENCE, OR RUB RAILS IF SIDEPATH/SHARED-USE PATH IS LOCATED LESS THAN 4 FEET FROM THE POST

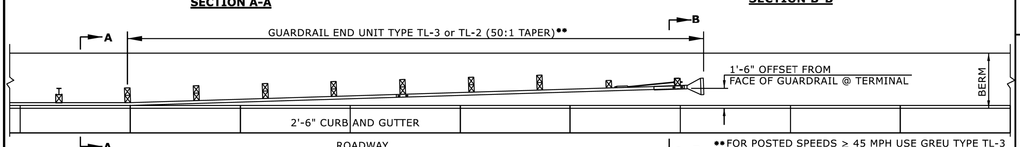
SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH



SECTION A-A



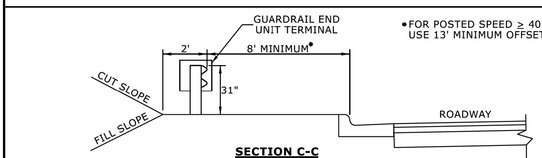
SECTION B-B



GUARDRAIL 6" FROM THE FACE OF CURB

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

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS



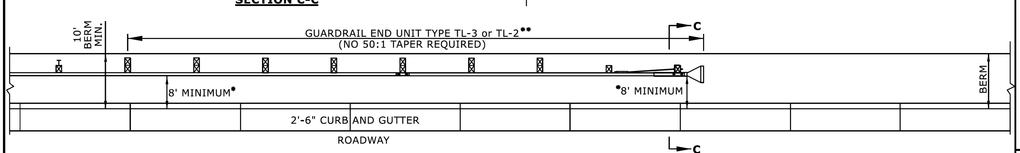
SECTION C-C

•FOR POSTED SPEED ≥ 40 MPH USE 13' MINIMUM OFFSET

SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH

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

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS



GUARDRAIL 8' OR GREATER OFFSET FROM FACE OF CURB

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

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

SHEET 12 OF 15
862D01

PROJECT REFERENCE NO.	SHEET NO.



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

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CHECKED BY:		DATE:	
FILE SPEC.:			

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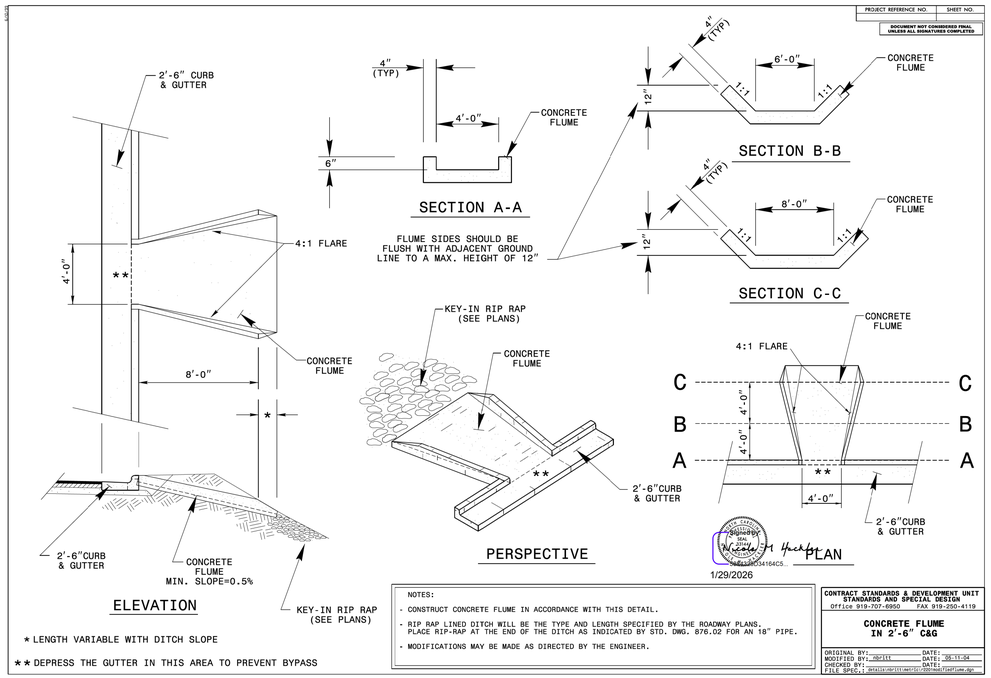
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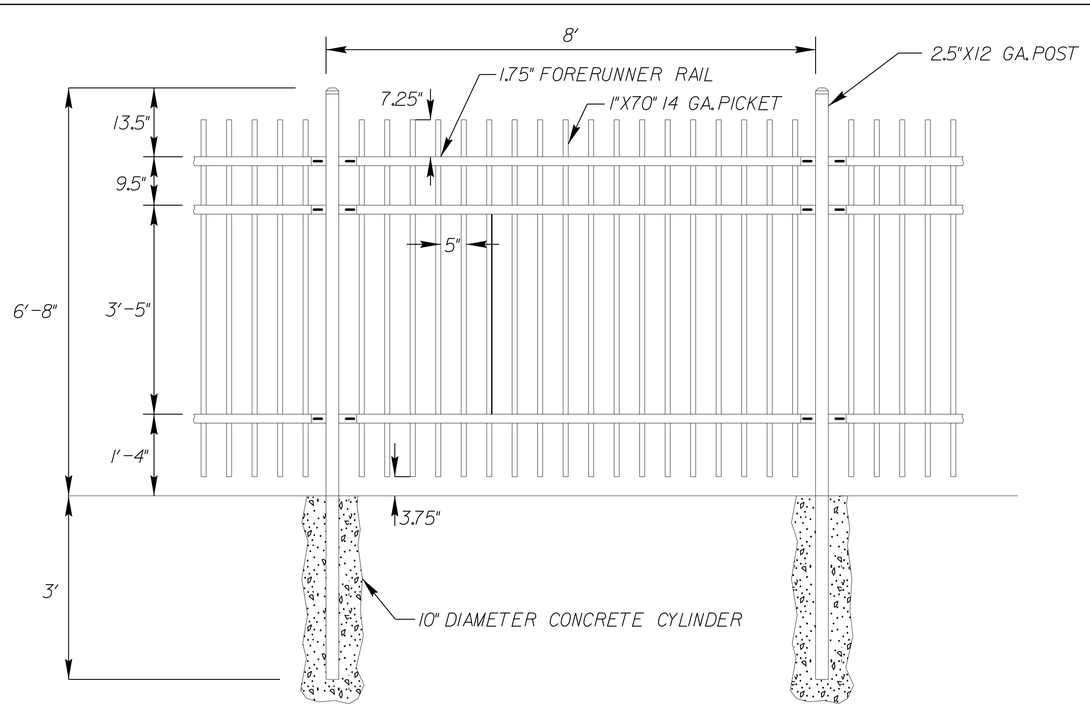
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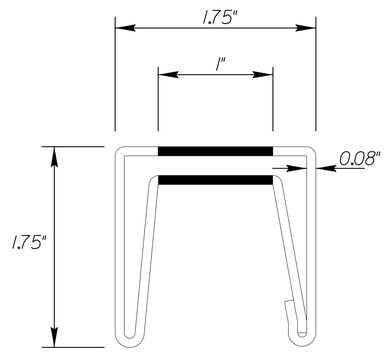
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BLACK ALUMINUM FENCE DETAIL

(NOT TO SCALE)



1 3/4" FORERUNNER RAIL DETAIL

(NOT TO SCALE)

1/12/2026

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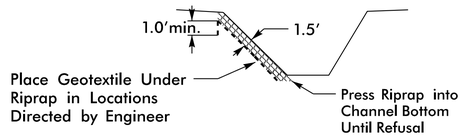
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REVISIONS

DETAIL 1

BANK STABILIZATION

(Not to Scale)



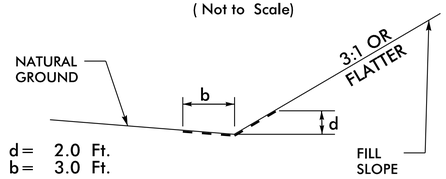
Type of Liner = 55 TONS,CL I Rip–Rap, Keyed–In

STA. 26 + 55 –L– (LT)

DETAIL 2

TOE PROTECTION

(Not to Scale)



d = 2.0 Ft.
b = 3.0 Ft.

Type of Liner = PSRM

FROM STA. 23 + 50 TO STA. 25 + 50 –L– (LT)
FROM STA. 27 + 50 TO 28 + 50 –L– (LT)

Kimley»Horn
© 2025
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601 NC LICENSE #F–0102

PROJECT REFERENCE NO.	SHEET NO.
W–5703C	2D–1
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE
Signature: Sean P. Kane
1/29/2026

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 056109 ENGINEER KAITLYN L. FAUGERON
Signature: Kaitlyn L. Faugeron
1/29/2026

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W-5703C	3B-1

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	EXCAVATION		EMBANKMENT		WASTE
		TOTAL UNCLASSIFIED	UNDERCUT	EMBANKMENT +25%	BORROW	TOTAL
(RIGHT)						
–L– 22+97.71	–L– 24+01.66	17		10		7
–L– 36+52.93	–L– 37+31.91	10		10		
–Y1– 11+65.00	–Y1– 12+30.00	0		33	33	
	SUBTOTAL	27		53	33	7
(LEFT)						
–L– 21+95.00	–L– 42+54.19	404		1,706	1,302	
–Y1– 12+00.00	–Y1– 12+30.00	5		3	0	3
–DW1– 10+09.00	–DW1– 10+80.00	9		36	27	
	SUBTOTAL	418		1745	1,329	3
EARTH WASTE TO REPLACE BORROW					1,362	–10
LOSS DUE TO CLEARING & GRUBBING						
PROJECT TOTAL		442			1,352	
EST. 5% TO REPLACE TOPSOIL ON BORROW PIT					68	
ADDITIONAL UNDERCUT FROM GEOTECH RECS						
GRAND TOTAL		442			1,419	
SAY		500			1,500	

ESTIMATED DDE =

ESTIMATED SHALLOW UNDERCUT =

FROM GEOTECH:

ESTIMATED SELECT GRANULAR MATERIAL =

ESTIMATED GEOTEXTILE FOR SUBRADE STABILIZATION = 300 SY

ESTIMATED CLASS IV SUBGRADE STABILIZATION = 200 TON

ESTIMATED SHALLOW UNDERCUT = 100 CY

Note. Earthwork quantities are calculated by Kimley-Horn. These earthwork quantities are based in part on subsurface data provided by

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE TL–3
NG = NON–GATING IMPACT ATTENUATOR TYPE TL–3

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS					IMPACT ATTENUATOR TYPE TL–3			TERMINAL SECTIONS	REMOVE EXISTING GUARDRAIL	REMOVE AND RESET EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	CAT–1	AT–1	TYPE III	GREU TL–2	GREU TL–3	EA	G	NG				
–L–	26+19.50	26+19.50	LT	58.25′	51.25′		26+60.00	26+40.00	7.50′	9.50′					1	1										EXTRA DEPTH POSTS (8′ STEEL) W/
–L–	23+65.00	27+00.00	MEDIAN LT	337.50′																1						3′–1.5″ POST SPACING ALONG
–L–	23+65.00	27+00.00	MEDIAN RT	337.50′																						LIMITS OF ROCK PLATING
–L–	27+00.00	35+65.00	MEDIAN LT	875.00′					4.00′	EX.										1						
–L–	27+00.00	35+65.00	MEDIAN RT	875.00′					4.00′	EX.																
			SUBTOTAL	2483.25′	51.25′																					
	LESS ANCHOR DEDUCTIONS																									
	CAT–1	1 @ 6.25′	=	–6.25′																						
	AT–1	1 @ 6.25′	=		–6.25′																					
	IA, TL–3	2 @ 21′	=	–42.00′																						
			PROJ. TOTAL	2435.00′	45.00′																					
			SAY	2435.00′	45.00′																					

ADDITIONAL GUARDRAIL POSTS SAY 5 EA

2/11/2026

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LL97386

COMPUTED BY: KLF DATE: 06-19-2025

CHECKED BY: DATE:

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W5703C	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

| LINE & STATION | OFFSET | | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | % MINIMUM REQUIRED SLOPE | Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) SIZE 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE PP PIPE | C. S. PIPE SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS III SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS IV SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | OPEN THROAT C.B. STD. 840.04 OR STD. 840.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | D.I. STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | M.H. FRAME AND COVER STD. 840.54 | ADJUST C.B. | ADJUST D.I. | 15" C.S. ELBOW | 18" C.S. ELBOW | 24" C.S. ELBOW | 30" C.S. ELBOW | 36" C.S. ELBOW | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---

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LL97386

COMPUTED BY: KLF DATE: 06-19-2025

CHECKED BY: DATE:

PROJECT NO.	SHEET NO.
W5703C	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

| LINE & STATION | OFFSET | | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | % MINIMUM REQUIRED SLOPE | Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) SIZE | | | | | | | | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE PP PIPE | C. S. PIPE SIZE | | | | | | | | R. C. PIPE CLASS III SIZE | | | | | | | | R. C. PIPE CLASS IV SIZE | | | | | | | | R. C. PIPE CLASS V SIZE | | | | | | | | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A 0' THRU 5' EACH | B 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | OPEN THROAT C.B. STD. 840.04 OR STD. 840.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | D.I. FRAME AND GRATES STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | M.H. FRAME AND COVER STD. 840.54 | ADJUST C.B. | ADJUST D.I. | 15" C.S. ELBOW | 18" C.S. ELBOW | 24" C.S. ELBOW | 30" C.S. ELBOW | 36" C.S. ELBOW | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	3P-1

5/14/99

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME	DEED BOOK
1	5	RI CS5 LLC	DB 1 PG 9, DB 11 PG 43, DB 5305 PG 1058
2	5	OREILLY AUTOMOTIVE STORES INC	DB 60 PG 332, DB 5606 PG 1079, DB 5948 PG 1485
3	5	POWELL DANNY M MARICA L	DB 60 PG 332, DB 5908 PG 2886
4	5	GORILLA LLC	DB 8 PG 13, DB 5590 PG 614

Docusign Envelope ID: 5AADD9BF-9F67-4417-917B-821F41A39C5E

-L-
PI Sta 11+71.28
Δ = 23°14' 15.7" (RT)
D = 6° 52' 41.7"
L = 337.84'
T = 171.28'
R = 833.00'

5/14/99

REVISIONS

2/11/2026

HOPE INVESTMENTS LTD PTNRP
DB 3978 PG 5

HOPE INVESTMENTS LTD PTNRP
DB 3978 PG 5

TRUDGEN LEE RUBY
DB 4379 PG 167
DB 5874 PG 143

LYNRICH ASSOCIATES LLC
DB 5032 PG 2679

BRITTON LLC
DB 5535 PG 2917
DB 5930 PG 2199

RUSHER E ALAN
DB 1490 PG 592
DB 2700 PG 294

WACHOVIA BANK & TRUST CO
DB 1505 PG 946

BVC MYRTLE GROVE LLC
DB 52 PG 21
DB 6005 PG 0944

PAYNE UMSTEAD PROPERTIES LLC
DB 48 PG 190
DB 6033 PG 1797

MATAVA GARY J ETAL
DB 52 PG 262
DB 5531 PG 2200

ZA SNEEDEN LLC
DB 3149 PG 58

ZA SNEEDEN LLC
DB 42 PG 9
DB 5409 PG 573

ZIMMERMAN RALPH S NANCY P
DB 32 PG 38
DB 3049 PG 656

ZIMMERMAN RALPH S NANCY P
DB 279 PG 587
DB 5292 PG 2194

SEABOARD COMMERCIAL PROP LLC
DB 28 PG 103
DB 2655 PG 470

SEABOARD COMMERCIAL PROP LLC
DB 28 PG 103
DB 2655 PG 470

US 421 (CAROLINA BEACH RD)

CAROLINA BEACH RD

S COLLEGE RD

PINER ROAD

-L- PC Sta. 10+00.00

-L- PT Sta. 13+37.84

-L- PC Sta. 18+52.51

10+00

15+00

N 35°03' 02.7" W

N 50°12'17" E 247.83'

NAD 83/NSRS 2007

RETAIN SYSTEM

RETAIN

EXISTING R/W VARIES

10' UTILITY EASEMENT

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET 5

☆ EXISTING TRAFFIC SIGNAL

SEE SHEET NO. 2B-1 FOR INTERSECTION DETAILS

SEE SHEET NO. 8 FOR -L- PROFILE

Kimley»Horn
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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601 NC LICENSE #F-0102

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036208 ENGINEER SEAN P. KANE
SEAN P. KANE
2/11/2026

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038287 ENGINEER KAITLYN L. FAUGERSON
KAITLYN L. FAUGERSON
2/11/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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5/14/99

REVISIONS

-L- CURVE DATA
PI Sta 19+43.27
△ = 4° 31' 11.0" (LT)
D = 2° 29' 28.0"
L = 181.43'
T = 90.76'
R = 2,300.00'

-DW1- CURVE DATA
PI Sta 10+64.70
△ = 30° 36' 23.2" (LT)
D = 114° 35' 29.6"
L = 26.71'
T = 13.68'
R = 50.00'

PI Sta 10+31.69
△ = 47° 09' 09.6" (RT)
D = 114° 35' 29.6"
L = 41.15'
T = 21.82'
R = 50.00'

DESIGN NOTE:
PRIOR TO EXCAVATING FOR THE PROPOSED JUNCTION BOXES AND RCP'S ON THE WEST SIDE OF THE ROADWAY, THE CONTRACTOR SHALL FIELD LOCATE THE EXTENTS OF THE EXISTING DOUBLE 6'X8' CULVERT, WING WALLS, AND FOOTINGS AND VERIFY THAT THE STRUCTURAL INTEGRITY OF THE EXISTING STRUCTURE WILL NOT BE IMPACTED. THE ENGINEER IS TO BE CONTACTED IF ANY CONFLICTS ARE DISCOVERED IN THE FIELD.

Kimley»Horn
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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601 NC LICENSE #F-0102

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	5
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 052038 ENGINEER SEAN P. KANE
SEAN P. KANE
2/11/2026

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL KAITLYN L. FAUGERON ENGINEER
Kaitlyn L. Faugeron
2/11/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

POWELL D MICHAEL MARICA LEE
DB 5912 PG 772

POWELL DANNY M MARICA L
DB 60 PG 332
DB 5908 PG 2886

BENNETT COMMERCIAL PROP LLC
DB 1PG 9
DB 2793 PG 719

RICSS LLC
DB 1PG 9
DB 1PG 43
DB 5305 PG 1058

OREILLY AUTOMOTIVE STORES INC
DB 60 PG 332
DB 5606 PG 1079
DB 5948 PG 1485

GORILLA LLC
DB 8 PG 15
DB 5590 PG 644

STOKED BUSINESS PARK LLC
DB 40 PG 210
DB 2864 PG 494

HUGHES JOYCE S
DB 40 PG 210
DB 2864 PG 494

ANTOINETTE DR
N 50° 26' 19.5" E

S 53° 51' 47.4" W

S 70° 24' 33.8" W

N 39° 34' 13.7" W

S 39°50'12" E
190.00'

N 50°08'48" E
300.00'

N 39°46'53" W
186.80'

S 67°18'02" E
347.40'

N 67°18'02" W
226.03'

N 39°17'09" E
423.83'

S 39°46'53" E
260.00'

N 39°46'53" W
260.00'

S 39°46'53" E
423.83'

S 50°13'07" W
91.80'

N 39°46'53" W
91.80'

S 39°11'52" E
267.78'

S 50°47'54" W
161.02'

N 50°47'54" E
161.02'

N 39°12'06" W
61.51'

S 50°47'54" W
89.50'

N 43°04'58" E
89.50'

S 50°47'54" W
89.50'

N 50°47'54" E
89.50'

S 50°47'54" W
89.50'

N 39°12'06" W
61.51'

S 50°47'54" W
161.02'

N 50°47'54" E
161.02

Docusign Envelope ID: 5AADD9BF-9F67-4417-917B-821F41A39C5E

5/14/99

REVISIONS

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RALEIGH, N.C. 27601 NC LICENSE #F-0102

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052038 ENGINEER SEAN P. KANE
SEAN P. KANE
2/11/2026

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 053626 ENGINEER KAITLYN L. FAUGERON
Kaitlyn L. Faugeron
2/11/2026

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NAD 83/NSRS 2007

MATCHLINE -L- STA 32+00.00
SEE PLAN SHEET 5

MATCHLINE -L- STA 45+00.00
SEE PLAN SHEET 7

ROYAL PALMS MHP LLC
DB 2267 PG 141

LLOYD C BOWDEN JR
DB 5202 PG 108

MONKEY JUNCTION MINI STORAGE INC
DB 5893 PG 2604

AUSTIN COMMONS COA INC
DB 8 PG 13
DB 2441PG 747

AMJB PROPERTIES LLC
DB 5733 PG 2016

ARCHMIL WAY

-L- US 421
(CAROLINA BEACH RD)

US 421 (CAROLINA BEACH RD) VARIABLE WIDTH PAVED ROAD

N 39°34'13.7" W

N 39°36'18" W
223.81'

N 0°38'18" W

S 50°26'00" W
251.68'

S 50°26'00" W
83.83'

S 50°26'45" W
432.42'

S 50°27'45" W
237.45'

N 50°23'10" E
249.64'

S 37°06'14" E
297.52'

CONTRACTOR TO CONFIRM LOCATION OF EXISTING 18" PIPE PRIOR TO INSTALLATION OF GUARDRAIL POSTS TO AVOID CONFLICT -L- STA 32+10 TO 33+85, GUARDRAIL OFFSET MAY VARY TO AVOID PIPE, 4' MINIMUM TO EDGE OF TRAVEL

MODIFIED CONCRETE FLUME SEE DETAIL SHEET 2C-4

WALMART PROPERTY TAX DEPT
DB 2656 PG 916
DB 51 PG 383

AJ MCGIRT LAND MANAGEMENT LLC
DB 6108 PG 194

DUKE ENERGY PROGRESS INC
DB 5719 PG 1796

UNDER CONSTRUCTION

END TIP PROJECT W-5703C
-L- POT Sta. 42+54.00

★ PROPOSED TRAFFIC SIGNAL

SEE SHEET NO. 2B-2 FOR INTERSECTION DETAILS
SEE SHEET NO. 9 FOR -L- PROFILE

2/11/2026

Docusign Envelope ID: 5AADD9BF-9F67-4417-917B-821F41A39C5E

REVISIONS 5/14/99

MATCHLINE -L- STA 45+00.00
SEE PLAN SHEET 6

PROPERTY LINES PLOTTED PER GIS NO METES/BOUNDS DESCRIPTION FOUND

GLADYS JOHNSON MILLIGAN LIFE ESTATE DB 5396 PG 2634

ELIZABETH S PETTETT DB 9904 PG 104

WILBUR C & GAIL R CHEERS DB 1244 PG 183

ALYSON D ABERNATHY DB 5730 PG 8

MONKEY JUNCTION MINI STORAGE INC DB 5893 PG 2597

MONKEY JUNCTION CAR WASH, LLC DB 5241 PG 2766

JAMES W SANDY & SANDRA H ABERNATHY DB 3868 PG 217

WILLOUGHBY PARK CONDO ASSOCIATION INC DB 5061 PG 1209

WILLOUGHBY PARK RD

JOHN C ROBERTS DB 9906 PG 1696

MICHAEL F & ALETA J MOSER DB 1317 PG 1981

WOODBRIDGE POINTE, LP DB 6055 PG 1666

-L- US 421 (CAROLINA BEACH RD)

N 39° 34' 13.7" W

-L- POT Sta. 53+40.00

RETAIN

RETAIN SYSTEM

TBJB

NAD 83 NSRS 2007

SEE SHEET NO. 2B-2 FOR INTERSECTION DETAILS
SEE SHEET NO. 9 FOR -L- PROFILE

2/11/2026

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601 NC LICENSE #F-0102

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 052038 ENGINEER SEAN P. KANE
2/11/2026

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 053267 ENGINEER KAITLYN L. FAUGERSTROM
2/11/2026

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RALEIGH, N.C. 27601 NC LICENSE #F-0102

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

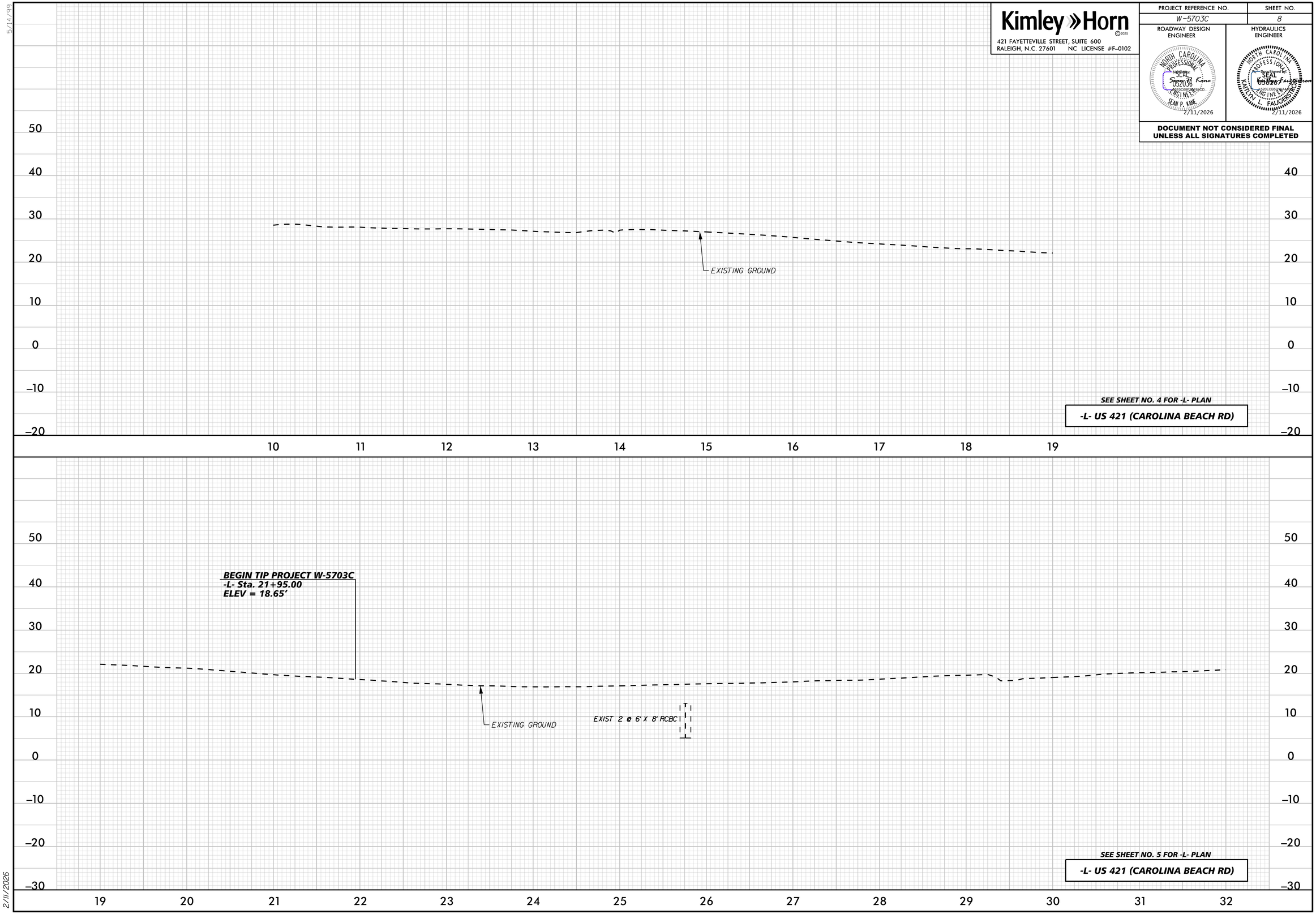
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE
Signature: Sean P. Kane
DocuSigned by: 2/11/2026

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 053626 ENGINEER KAITLYN L. FAUGERSTROM
Signature: Kaitlyn Faugerstrom
DocuSigned by: 2/11/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



2/11/2026

Docusign Envelope ID: 5AADD9BF-9F67-4417-917B-821F41A39C5E

5/14/99

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P.O. BOX 33068 • RALEIGH, N.C. 27636–3068

RIGHT–OF–WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
W–5703C	9

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE

Signed by: Sean P. Kane

Date: 2/11/2026

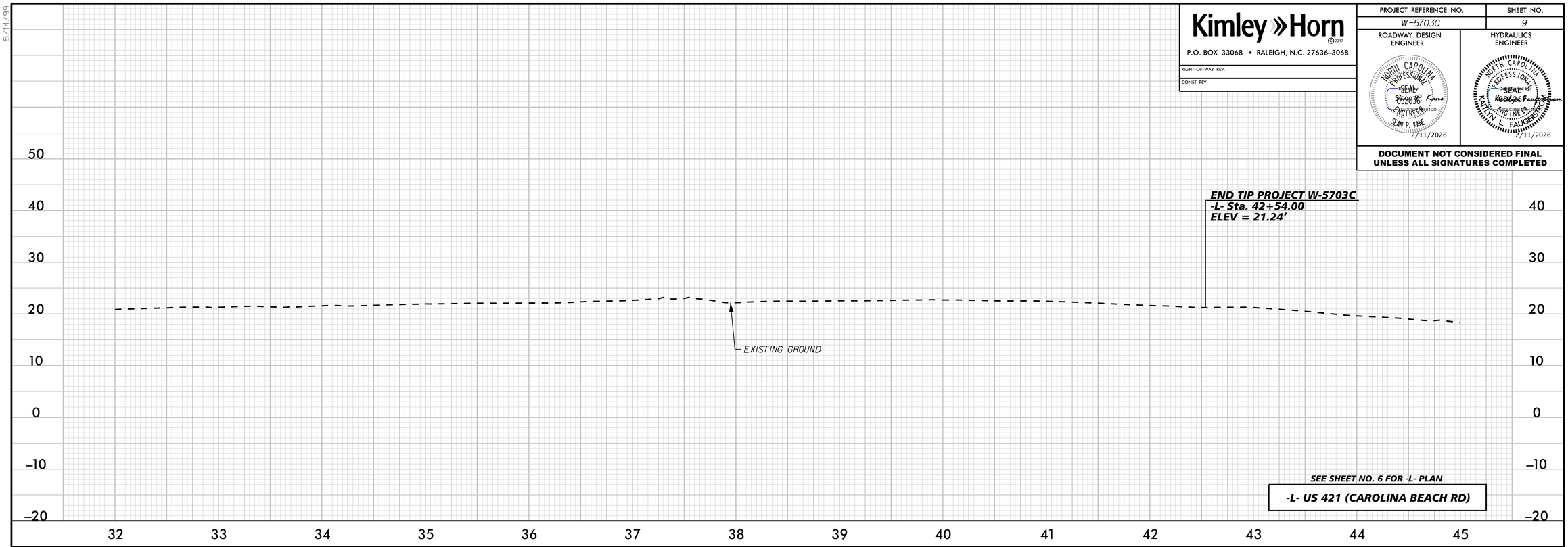
HYDRAULICS ENGINEER

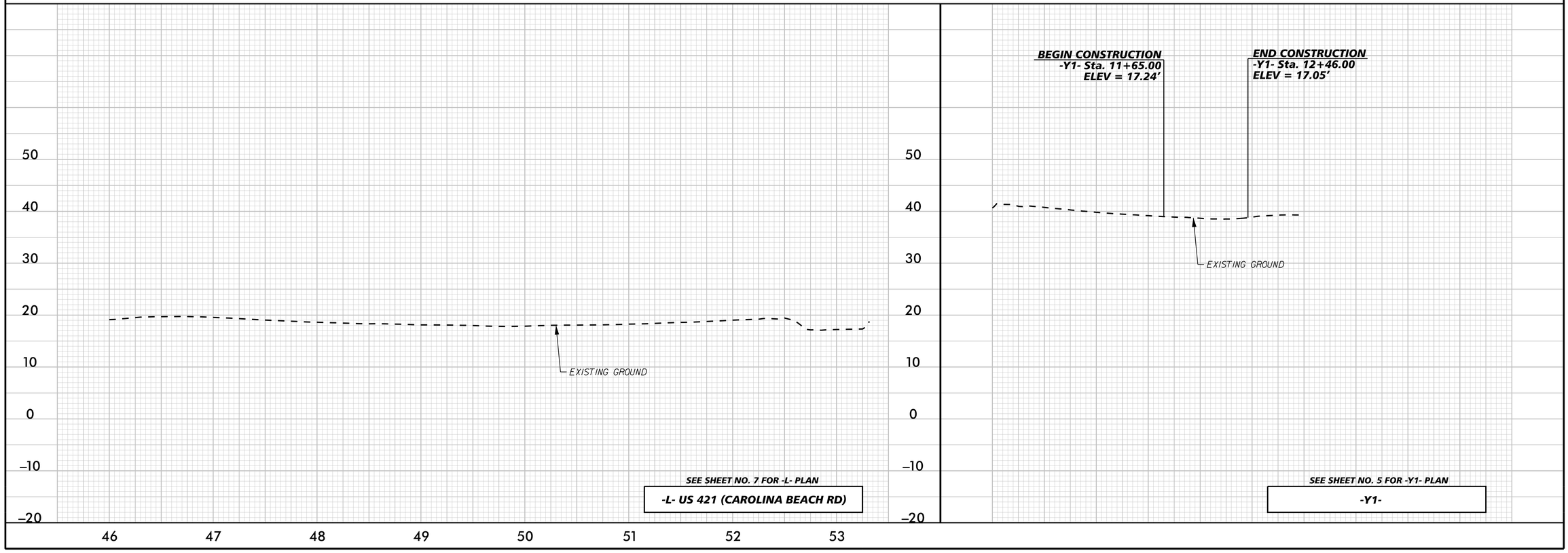
NORTH CAROLINA PROFESSIONAL SEAL 049261 ENGINEER KAITLYN L. FAUCHER

Signed by: Kaitlyn L. Faucher

Date: 2/11/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

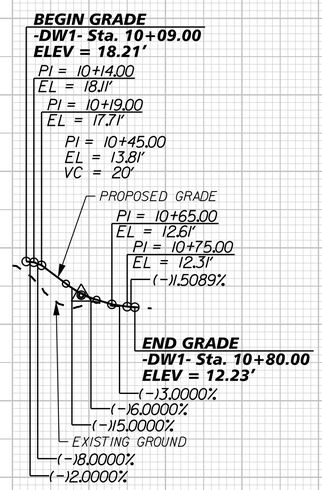




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Docusign Envelope ID: D6D51FDF-B6D2-4574-A513-935BB864DB8B

5/14/99



40 30 20 10 0 –10 –20 –30

10 11

30 20 10 0 –10 –20 –30

SEE SHEET NO. 5 FOR -DW1- PLAN

-DW1-

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601 NC LICENSE #F-0102

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

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052030 ENGINEER SEAN P. KANE

1/29/2026

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 054067 ENGINEER KAITLYN L. FAUGHNAN

1/29/2026

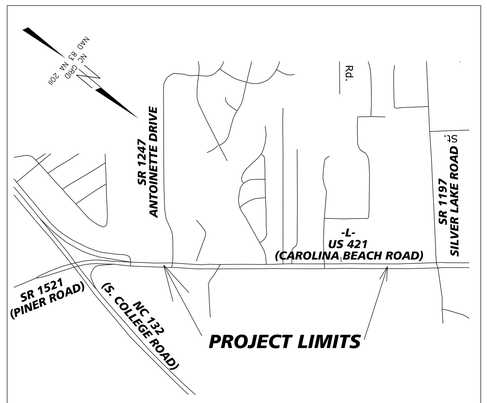
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

1/29/2026

09/08/99

TIP PROJECT: W-5703C

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5703C	RW01	8



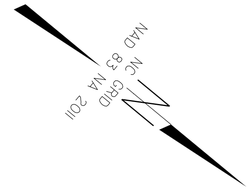
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

NEW HANOVER COUNTY

LOCATION: US 421 (CAROLINA BEACH ROAD) FROM ANTOINETTE DRIVE
TO APPROXIMATELY 200' NORTH OF WILLOUGHBY PARK ROAD

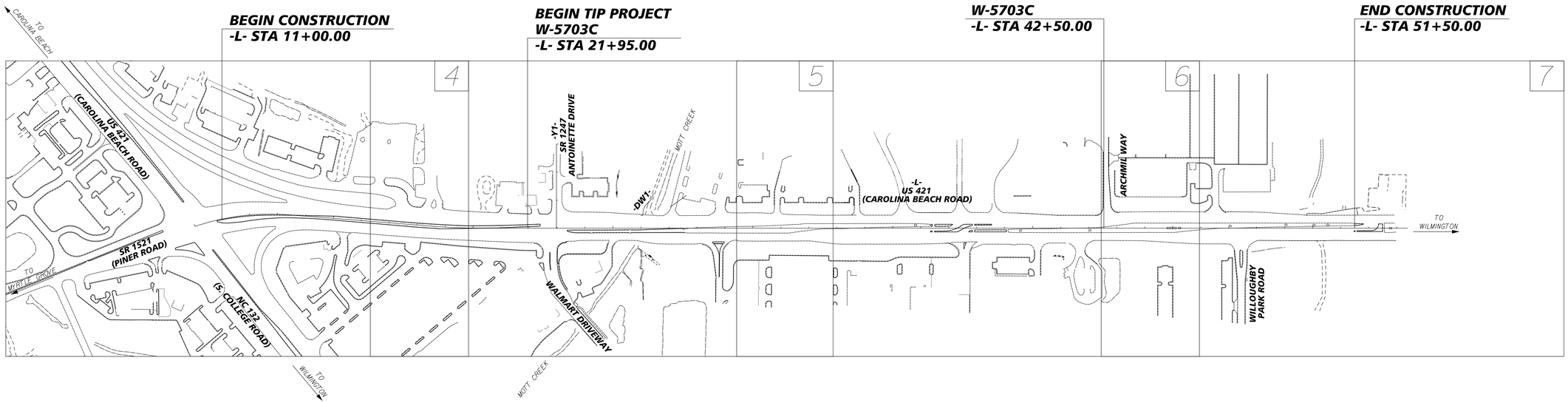


BEGIN CONSTRUCTION
-L- STA 11+00.00

BEGIN TIP PROJECT
W-5703C
-L- STA 21+95.00

END TIP PROJECT
W-5703C
-L- STA 42+50.00

END CONSTRUCTION
-L- STA 51+50.00



GRAPHIC SCALE
FOR SHEET RW04–RW07

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCGS FOR MONUMENT "MCDONALDS"
WITH NAD 83/NAD 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 162378.787(ft) EASTING: 232247.834(ft)
ELEVATION: 43.32(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 1.000046352
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"MCDONALDS" TO -L- STATION 10+00.00 IS
S 34-08'21.6" E 22,410.10(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

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:*
MARCH 13, 2023	*APRIL 16, 2026*

PROFESSIONAL LAND SURVEYOR

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

DocuSigned by:
03/19/2026
SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

16-MAR-2026 08:56
M:\Misc\New_Hanover\W5703 C\Working\RW SHEETS\revised controlsheets 25I208\W5703C_ls_rw01_25I208.dgn
mjduval AT LS-32872SL

6/2/99

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

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

Location and Surveys

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

PROJECT SURVEYOR

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83 NA 2011

EY5

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	143830.499	2334824.550							
CURVE			N 46°40'10.6" W	335.53	23°14'15.7"(RT)	06°52'41.7"	337.84	171.28	833.00
PT	144060.743	2334580.481							
LINE			N 35°03'02.7" W	514.67					
PC	144482.072	2334284.906							
CURVE			N 37°18'38.2" W	181.39	04°31'11.0"(LT)	02°29'28.0"	181.43	90.76	2300.00
PT	144626.339	2334174.962							
LINE			N 39°34'13.7" W	242.23					
POT	144813.062	2334020.653							
LINE			N 39°34'13.7" W	22.03					
POT	144830.046	2334006.618							
LINE			N 39°34'13.7" W	1101.79					
POT	145679.352	2333304.747							

EY6

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	144813.062	2334020.653							
LINE			N 52°21'29.1" E	106.24					
PC	144877.949	2334104.782							
CURVE			N 30°57'51.8" E	164.15	42°47'14.6"(LT)	25°27'53.2"	168.03	88.15	225.00
PT	145018.704	2334189.238							
LINE			N 09°34'14.4" E	175.73					
POT	145191.987	2334218.455							

EY7

POINT	N	E	BEARING	DIST
POT	144638.975	2333775.335		
LINE			N 50°26'19.5" E	300.00
POT	144830.046	2334006.618		

BLREV

POINT	DESC.	NORTH	EAST	ELEVATION
BL10	TRV CAP & REBAR	143934.2410	2334783.6697	27.55
BL11	TRV CAP & REBAR	144383.0113	2334413.1706	22.02
BL12	TRV CAP & REBAR	144888.9771	2334030.7668	17.67
BL13	TRV CAP & REBAR	145552.2948	2333472.2099	21.08
RBL14	TRV CAP & REBAR	146082.5960	2332984.2080	21.85
BL15	TRV CAP & REBAR	146597.0019	2332624.2558	19.63
BL16	TRV CAP & REBAR	147183.0461	2332133.2233	18.25

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

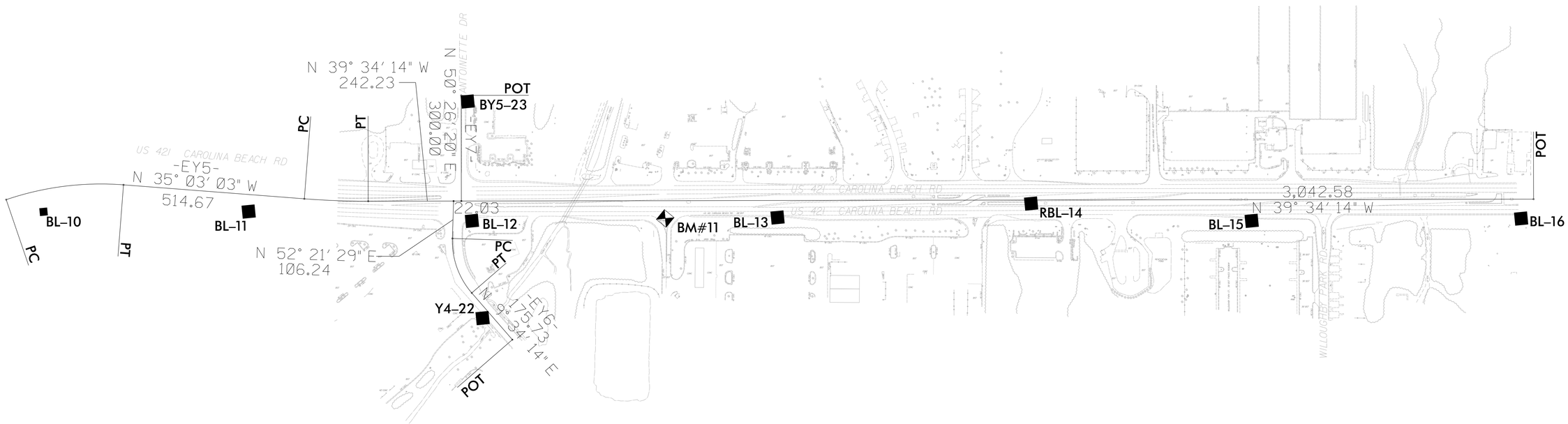
Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: February-March 2018 / May 2022
Datum/Epoch: NAD 83/ NA 2011
Published/Fixed-control use: N/A for RTN
Localized around: MCDONALDS
Northing: 162378.787
Easting: 2322247.834
Combined grid factor: 1.000046352
Geoid model: G12NC
Units: 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 February-March 2018 and May 2022, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 8TH day of DECEMBER, 2025.

DocuSigned by:
Christopher J. Sawyer
97000B0E1D214A7...

Professional Land Surveyor L-4526




```
**********************************************
BM11      ELEVATION = 20.10
N 145308      E 2333677
PK NAIL SET IN CONC
**********************************************
```

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.

29-DEC-2025 10:16
M:\Misc\New Hanover\W5703 C\Working\RW SHEETS\revised control sheets 251208\w5703c_ls_rw02c_1_251208.dgn
mjduval AT LS-328726L

PROPOSED ALIGNMENT CONTROL SHEET

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

Location and Surveys

LOCATION AND SURVEYS UNIT
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 8TH day of DECEMBER, 2025.

DocuSigned by:
Christopher J. Sawyer
9700CB2E41021467...

Professional Land Surveyor L-4526

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	143830.4990	2334824.5500
PT	13+37.84	144060.7429	2334580.4806
PC	18+52.51	144482.0719	2334284.9063
PT	20+33.94	144626.3392	2334174.9619
POT	53+40.00	147174.7853	2332068.9152

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	144638.9748	2333775.3347
POT	13+00.00	144830.0456	2334006.6180

DW1

TYPE	STATION	NORTH	EAST
POT	10+00.00	145068.4304	2333809.6158
PC	10+52.40	145035.0475	2333769.2204
PRC	10+96.55	145024.5109	2333727.8151
PT	11+23.26	145022.5378	2333701.4962
POT	11+36.47	145018.1086	2333689.0513

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

08-DEC-2025 16:00
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lgleiner
AT LS-328724

RIGHT OF WAY CONTROL SHEET

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

Location and Surveys

LOCATION AND SURVEYS UNIT
DIVISION 3
5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28405

PROJECT SURVEYOR

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Christopher J. Sawyer , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed May 18, 2023, and all coordinates are based on NAD83/2011: That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 08TH day of DECEMBER, 2025.

Signature: Christopher J Sawyer

Professional Land Surveyor L-4526

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST	
L	26+38.70	-87.37	145036.8531	2333722.3706	
L	26+47.67	-116.00	145025.5274	2333694.5862	
L	26+88.00	-116.00	145056.6181	2333668.8926	NOT SET - UNDER WATER
L	26+93.00	-85.47	145079.9227	2333689.2437	

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 MAY 15, 2023 .

REVISIONS 6/2/99

09-DEC-2025 14:38
N:\Wbs\New Hanover\W5703 C\Working\RW SHEETS\revised control sheets 251208\W5703C.ls.rw03e-1.251208.dgn
lgleiner
At (S-328724)

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

Location and Surveys

LOCATION AND SURVEYS UNIT
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

NOTE: NO ADDITIONAL R/W OR PERMANENT EASEMENTS ON THIS SHEET

NAD 83/NAD 2011

LYNRICH ASSOCIATES LLC
DB 5032 PG 2679

BRITTON LLC
DB 5535 PG 2917
DB 5930 PG 2199

PAYNE UMSTEAD PROPERTIES LLC
DB 48 PG 190
DB 6033 PG 1797

MATAVA GARY J ETAL
DB 52 PG 262
DB 5531PG 2200

ZA SNEEDEN LLC
DB 3149 PG 58

ZA SNEEDEN LLC
DB 42 PG 9
DB 5409 PG 573

ZIMMERMAN RALPH S NANCY P
DB 279 PG 587
DB 5292 PG 2194

SEABOARD COMMERCIAL PROP LLC
DB 28 PG 103
DB 2655 PG 470

-L- PC Sta. 10+00.00

-L- PT Sta. 13+37.84

-L- PC Sta. 18+52.51

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET RW05

US 421 CAROLINA BEACH RD

CAROLINA BEACH RD

EXISTING R/W VARIES

10' UTILITY EASEMENT

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. NO PROPOSED RIGHT OF WAY MONUMENTATION ESTABLISHED ON SHEET RW04.

REVISIONS 6/2/99

30-DEC-2025 10:08
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mduvol AT [S-3287251]

6/2/99

REVISIONS

I , Christopher J. Sawyer , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed May 18, 2023 AND September 30, 2025, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 08TH day of DECEMBER, 2025.

DocuSigned by:
Christopher J. Sawyer
83D6B0B9E4B74A7...

Professional Land Surveyor L-4526

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

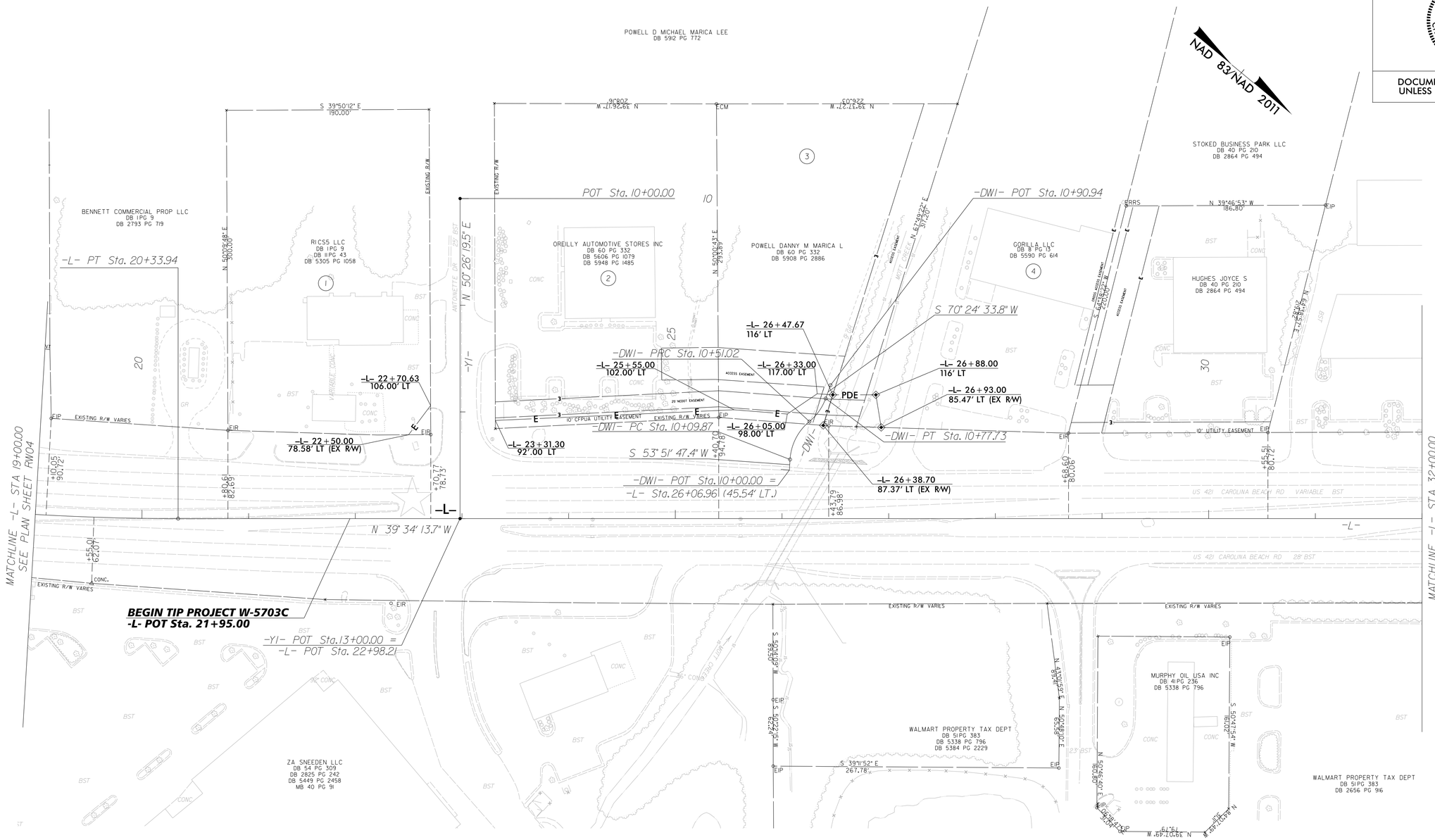
Location and Surveys

LOCATION AND SURVEYS UNIT
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



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 MAY 18, 2023 AND SEPTEMBER 30, 2025.

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mjduval AT LS-3287251

6/2/99

REVISIONS

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

Location and Surveys

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

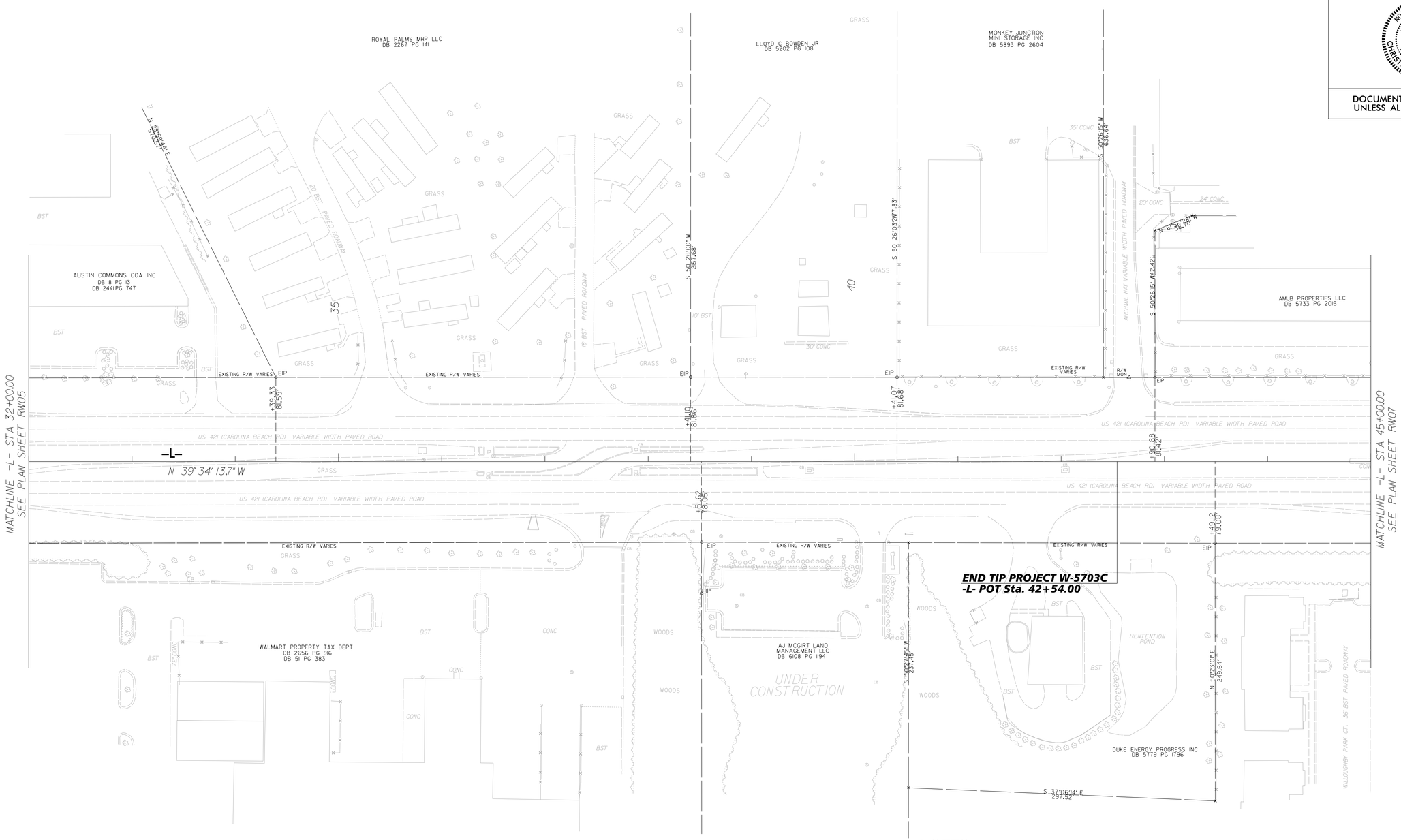
PROJECT SURVEYOR

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE: NO ADDITIONAL R/W OR PERMANENT EASEMENTS ON THIS SHEET

NAD 83/NAD 2011



END TIP PROJECT W-5703C
-L- POT Sta. 42+54.00

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. NO PROPOSED RIGHT OF WAY MONUMENTATION ESTABLISHED ON RW06.

28-DEC-2025 14:16
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mdavis AT 3287251

6/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	RW07

Location and Surveys

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

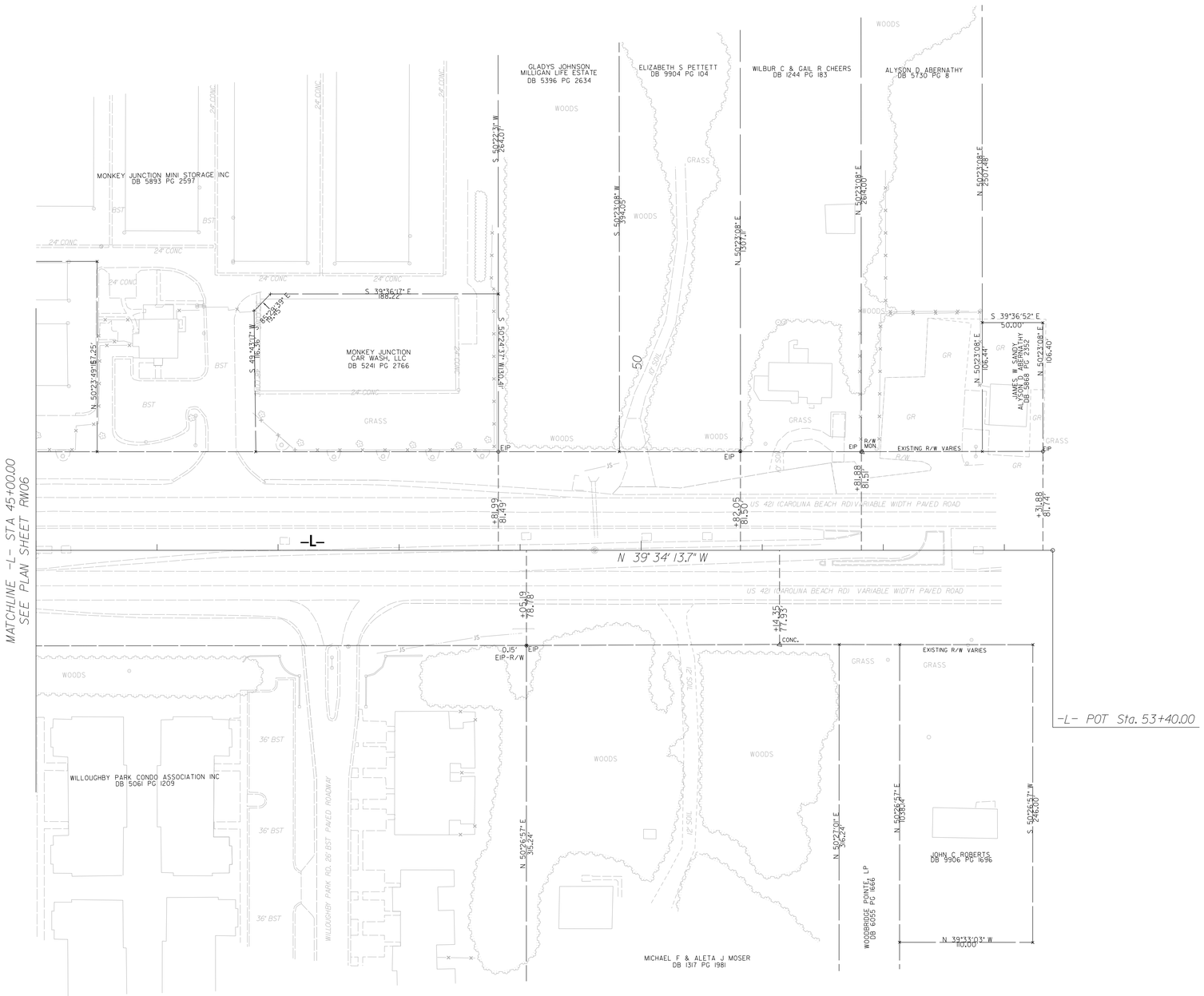
PROJECT SURVEYOR

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE: NO ADDITIONAL R/W OR PERMANENT EASEMENTS ON THIS SHEET

NAD 83/NAD 2011



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. NO PROPOSED RIGHT OF WAY MONUMENTATION ESTABLISHED ON RW07.

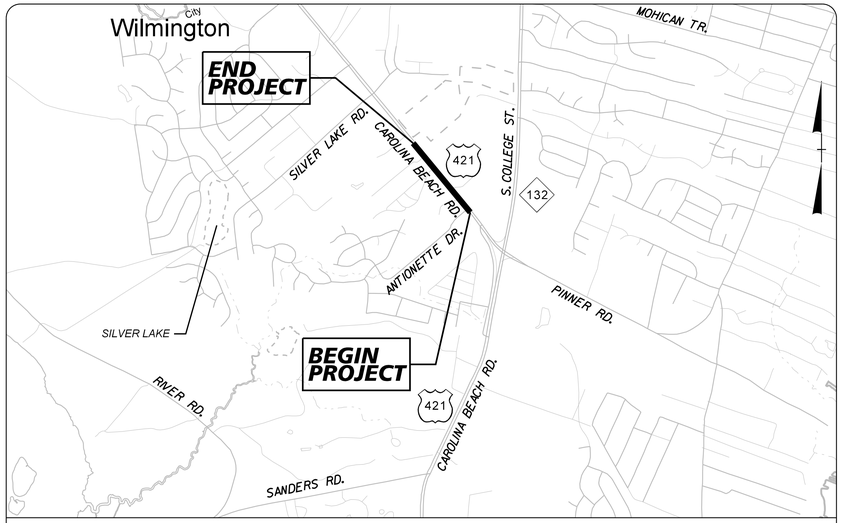
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mduval AT LS-3287261

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

NEW HANOVER COUNTY





VICINITY MAP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	ROADWAY STANDARD DRAWINGS & LEGEND
TMP-1B	GENERAL NOTES AND MANAGEMENT STRATEGIES
TMP-3	PHASING NOTES
TMP-4 TO TMP-5	PHASE I DETAILS
TMP-6 TO TMP-9	PHASE II DETAILS

SHEET NO.
TMP-1

W-5703C

TIP PROJECT:

01/08/26 DATE SUBMITTED
SUBMITTAL:
- [ ] STAGING CONCEPT
- [ ] MIDPOINT
- [ ] PRE-FINAL
- [X] FINAL

Kimley»Horn

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

PLANS PREPARED BY:

SEAN KANE, P.E.

BEN CRAWFORD, P.E.

NCDOT CONTACTS:

BRIAN HARDING, P.E.
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032050 ENGINEER SEAN P. KANE
1/12/2026

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

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

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1145.01	BARRICADES - TYPE III
1150.01	FLAGGERS
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS & 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
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXISTING PAVEMENT
- NORTH ARROW
- PROPOSED PAVEMENT
- WORK AREA
- WEDGING
- PAVEMENT/SIDEWALK REMOVAL

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- 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

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

Kimley»Horn

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: _____ DATE: _____

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE

1/12/2026

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

ROADWAY STANDARD DRAWINGS & LEGEND

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1/12/2026

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PROJ. REFERENCE NO.	SHEET NO.
W-5703C	TMP-1B

GENERAL NOTES / LOCAL NOTES

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

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

TIME RESTRICTIONS;

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:
(RESTRICTIONS DO NOT APPLY TO AUXILIARY AND TURN LANES)

ROAD NAME	DAY AND TIME RESTRICTIONS
US 421 (CAROLINA BEACH ROAD)	MEMORIAL DAY THRU LABOR DAY 6:00 AM TO 7:00 PM MONDAY THRU FRIDAY
US 421 (CAROLINA BEACH ROAD)	LABOR DAY THRU MEMORIAL DAY 7:00 AM TO 8:30 AM AND 3:00 PM TO 6:00 PM MONDAY THRU FRIDAY
US 421 (CAROLINA BEACH ROAD)	6:00 AM TO 7:00 PM SATURDAY THRU SUNDAY

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

ROAD NAME

US 421 (CAROLINA BEACH ROAD)

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 A.M. DECEMBER 31st TO 7:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 7:00 P.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 7:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 7:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 7:00 P.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 7:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 7:00 P.M. 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 WITHIN 10 FT OF AN OPEN TRAVEL LANE OR DIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

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

G) DO NOT WORK SIMULTANEOUSLY ON BOTH SIDES OF AN OPEN TRAVELWAY WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS:

H) 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.

I) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 100 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS:

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

SIGNING:

K) 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.

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

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

TRAFFIC CONTROL DEVICES:

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

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

PAVEMENT MARKINGS AND MARKERS:

P) INSTALL TEMPORARY PAINT PAVEMENT MARKINGS ON INTERIM LAYERS OF PAVEMENT. DO NOT INSTALL TEMPORARY PAVEMENT MARKERS.

Q) 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.

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

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

T) TRACE THE EXISTING AND PROPOSED MONOLITHIC ISLAND LOCATIONS WITH PROPER COLOR PAVEMENT MARKINGS PRIOR TO INSTALLATION. PLACE DRUMS TO DELIATE ANY EXISTING OR PROPOSED MONOLITHIC ISLANDS AFTER REMOVAL AND BEFORE INSTALLATION.

MISCELLANEOUS:

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

V) ALL CURB RAMP LOCATIONS SHALL BE DERIVED FROM STATIONING SHOWN ON PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER IN COORDINATION WITH THE SIGNING AND DELINEATION UNIT.

Kimley»Horn

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED:_____ DATE:_____

NORTH CAROLINA PROFESSIONAL SEAL 052030 ENGINEER SEAN P. KANE
Signed by: Sean P. Kane
3/6/2026

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

GENERAL NOTES AND MANAGEMENT STRATEGIES

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3/6/2026

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

PHASING

PHASE I

WHILE MAINTAINING TRAFFIC USING RSD 1101.02, AND 1101.04 FOR LANE AND SHOULDER CLOSURES AS NECESSARY, PERFORM THE FOLLOWING:

STEP 1:
-BEGIN WIDENING ON THE WESTERN SIDE OF -L- US 421 (CAROLINA BEACH ROAD), INCLUDING BUT NOT LIMITED TO:
PAVING , CURB AND GUTTER, SIDEWALK, DRIVEWAYS, BERM AND ASSOCIATED DRAINAGE IMPROVEMENTS AS SHOWN ON SHEETS TMP-4 THRU TMP-5.

STEP 2:
-BEGIN WIDENING ON THE EASTERN SIDE OF -L- US 421 (CAROLINA BEACH ROAD), INCLUDING BUT NOT LIMITED TO:
PAVING , CURB AND GUTTER, SIDEWALK, DRIVEWAYS, BERM AND ASSOCIATED DRAINAGE IMPROVEMENTS AS SHOWN ON SHEETS TMP-4 THRU TMP-5.

NOTE: MAINTAIN ACCESS TO Y LINES, DRIVEWAYS, AND BUS STOPS AT ALL TIMES DURING CONSTRUCTION.

PHASE II

WHILE MAINTAINING TRAFFIC USING RSD 1101.02, AND 1101.04 FOR LANE AND SHOULDER CLOSURES AS NECESSARY, PERFORM THE FOLLOWING:

STEP 1:
-INSTALL TEMPORARY PAINT PAVEMENT MARKINGS, TEMPORARY SIGNALS AND TRAFFIC CONTROL DEVICES AS SHOWN ON SHEETS TMP-6 THRU TMP-9.
-REMOVE CONFLICTING MARKINGS AND SHIFT TRAFFIC ONTO TEMPORARY PATTERN.

STEP 2:
-BEGIN WIDENING OF -L- US 421 (CAROLINA BEACH ROAD), INCLUDING BUT NOT LIMITED TO: PAVING UP TO BUT NOT INCLUDING THE FINAL SURFACE COURSE, CURB AND GUTTER, MONOLITHIC ISLANDS, GUARDRAIL, FENCE AND ASSOCIATED DRAINAGE IMPROVEMENTS AS SHOWN ON SHEETS TMP-6 THRU TMP-9.

STEP 3:
-INSTALL FINAL ASPHALT SURFACE COURSE AND FINAL PAVEMENT MARKINGS, REMOVE CONFLICTING MARKINGS, REMOVE ALL TRAFFIC CONTROL DEVICES AND OPEN ALL LANES TO TRAFFIC.

NOTE: MAINTAIN BUS STOP ACCESS AT ALL TIMES DURING CONSTRUCTION. DIRECTIONAL CROSSOVER AT -L- STA. 37+45 WILL BE CLOSED DURING THIS CONSTRUCTION PHASE. SB DRIVERS WILL NEED TO U-TURN AT THE ANTOINETTE DRIVE INTERSECTION . NB TRAFFIC WILL NEED TO UTILIZE THE U-TURN LANE JUST SOUTH OF THE SHADE TREE LANE INTERSECTION.

2/11/2026 K:\RAL_Roadway\Oll036431 - W-5703C\Traffic\Traffic Control\TCP\Sheets\W-5703C_tcp_tsh.dgn

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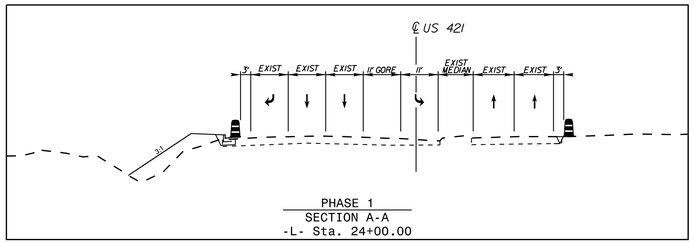
NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE
2/11/2026

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

Kimley»Horn

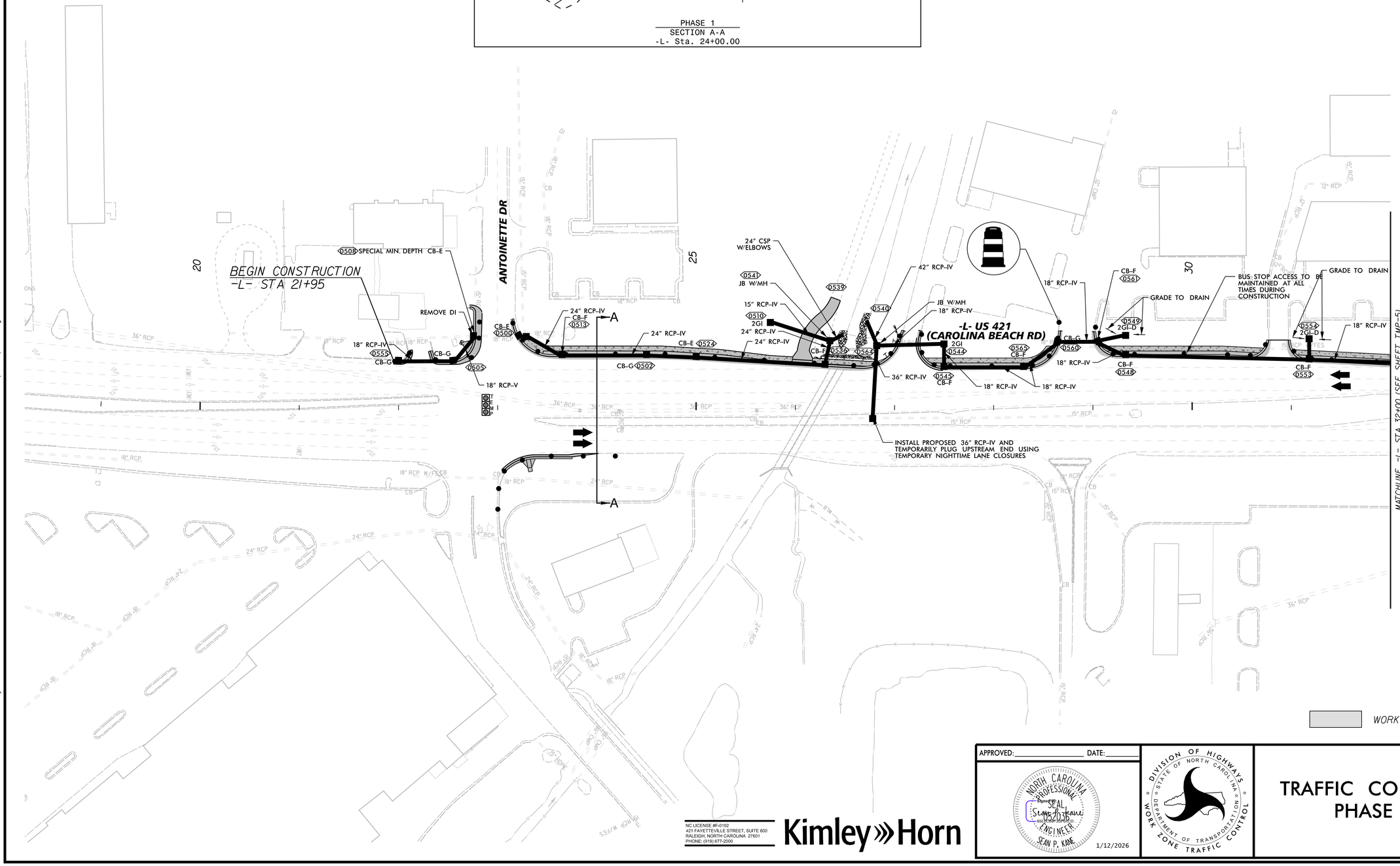
PHASING NOTES

PROJ. REFERENCE NO.	SHEET NO.
W-5703C	TMP-04



PHASE 1
SECTION A-A
-L- Sta. 24+00.00

NAD 83/NSRS 2007



WORK AREA

NC LICENSE #F-0102
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919)677-2000

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NORTH CAROLINA PROFESSIONAL SEAL 042018 ENGINEER SEAN P. KANE

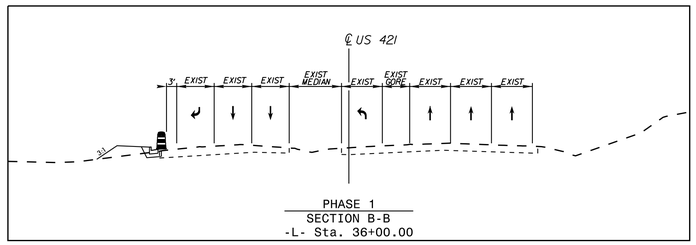
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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRAFFIC CONTROL PHASE 1

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1/12/2026

PROJ. REFERENCE NO.	SHEET NO.
W-5703C	TMP-05



PHASE 1
SECTION B-B
-L- Sta. 36+00.00

NAD 83/NSRS 2007

ARCHMIL WAY

-L- US 421
(CAROLINA BEACH RD)

END CONSTRUCTION
-L- STA 42+54

MATCHLINE -L- STA 32+00 (SEE SHEET TMP-4)

0601 CB-G
0603 2GI-D
0604 TBJB W/MH
0606 CB-F
0611 CB-F
0613
0614
0616
0617
0618 CB-G
0621 CB-F
0622
0624
0626 CB-G
0627 2GI-D
0628 REMOVE EXIST DI COLLAR AND EXTEND EXIST 18" RCP
0629 2GI-D
0630 2GI-D
0631 2GI-D
0632 2GI-D
0633 2GI-D
0635 2GI-D
0636 2GI-D
0640 2GI

15" RCP-IV
18" RCP-IV
GRADE TO DRAIN
REMOVE
JB W/MH
TIE EXIST 18" TO PROP JB W/MH
PIPE DIRECTION RCP END NOT FOUND
18" RCP
15" RCP
36" RCP
30" HDPE

WORK AREA

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1/12/2026

NC LICENSE #F-0102
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

Kimley»Horn

APPROVED: _____ DATE: _____

NORTH CAROLINA PROFESSIONAL SEAL 036436 ENGINEER SEAN P. KANE
Signed
Date: 2026.01.12 08:57:00 -05'00'

1/12/2026

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

TRAFFIC CONTROL PHASE 1

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W-5703C	TMP-06

NAD 83/NSRS 2007

US 421
(CAROLINA BEACH RD)

CAROLINA BEACH RD

S COLLEGE RD

10+00

MATCHLINE -L- STA 19+00 (SEE SHEET TMP-8)

BUS STOP ACCESS
TO REMAIN

WORK AREA

K:\RAL_Roadway\Oll03643\ - W-5703C\Traffic\Traffic Control\TCP\Sheets\Phase 2\W-5703C_tcp_07_phase2.dgn

2/11/2026

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

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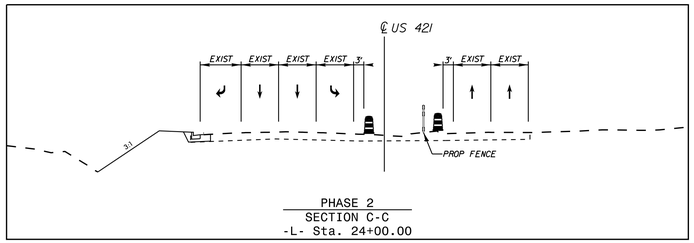
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DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

TRAFFIC CONTROL PHASE II

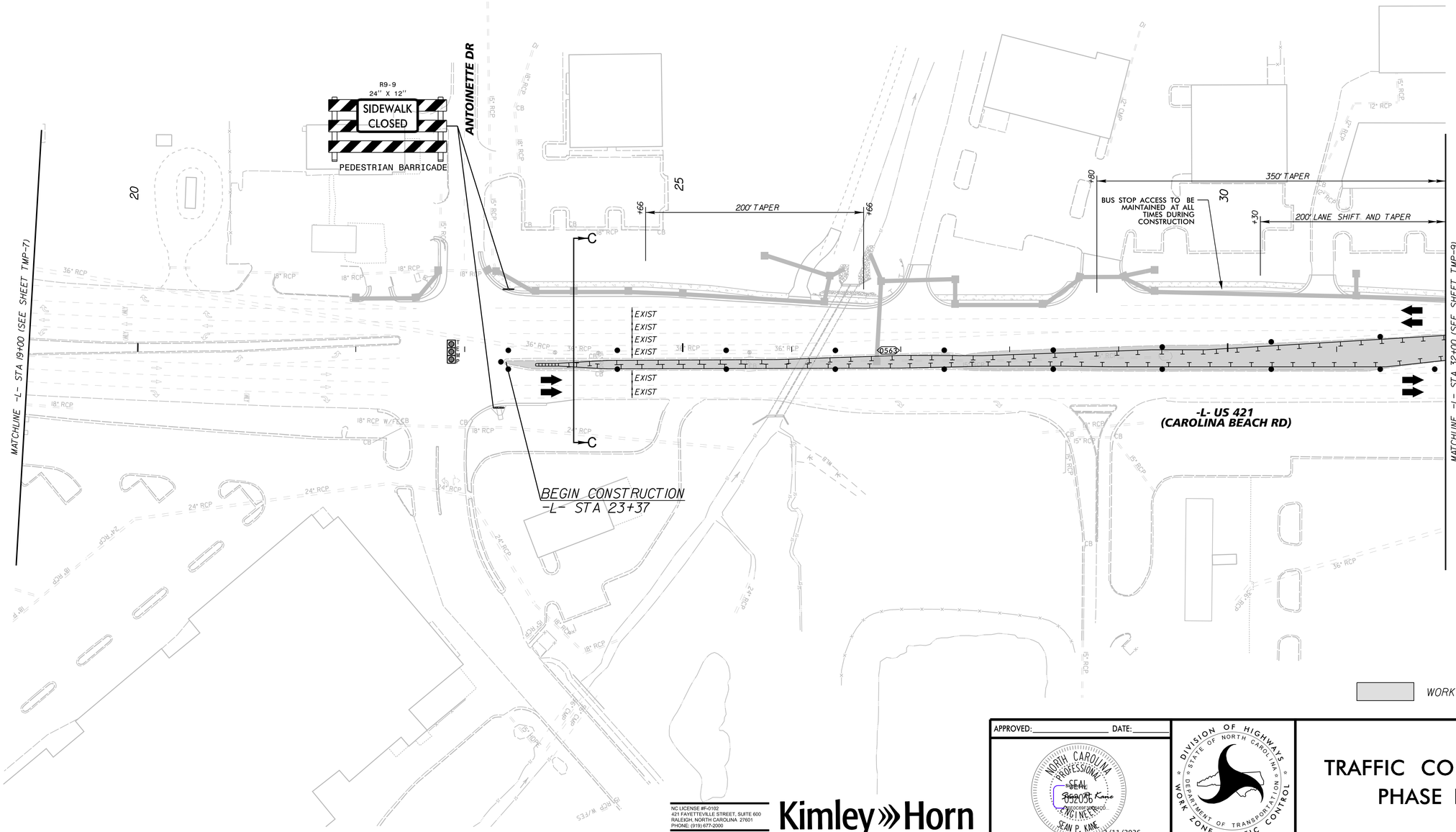
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PROJ. REFERENCE NO.	SHEET NO.
W-5703C	TMP-07



PHASE 2
SECTION C-C
-L- Sta. 24+00.00

NAD 83/NSRS 2007



WORK AREA

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NORTH CAROLINA PROFESSIONAL SEAL 032036 ENGINEER SEAN P. KANE
Sean P. Kane
2/11/2026

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

TRAFFIC CONTROL PHASE II

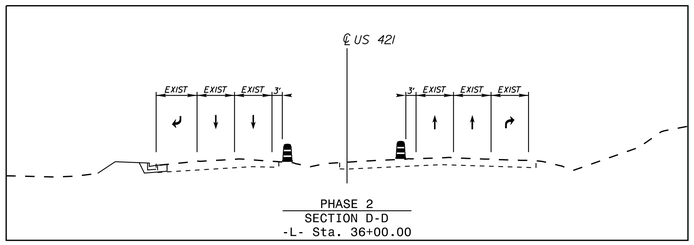
NC LICENSE #F-0102
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RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

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PROJ. REFERENCE NO.	SHEET NO.
W-5703C	TMP-08



PHASE 2
SECTION D-D
-L- Sta. 36+00.00

NAD 83/NSRS 2007

ARCHMIL WAY

12" CMP
15" RCP
35
40
D
R9-9
24" X 12"
SIDEWALK CLOSED
PEDESTRIAN BARRICADE
350' TAPER
+30
200' LANE SHIFT AND TAPER
END CONSTRUCTION
-L- STA 37+78
EXIST
EXIST
18" RCP
15" RCP
PIPE DIRECTION END NOT FOUND
MATCHLINE -L- STA 32+00 (SEE SHEET TMP-8)
MATCHLINE -L- STA 45+00 (SEE SHEET TMP-10)
-L- US 421
(CAROLINA BEACH RD)
CB
30" HDPE
36" RCP
R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE
R9-9
24" X 12"
SIDEWALK CLOSED
PEDESTRIAN BARRICADE
R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE

WORK AREA

NC LICENSE #F-0102
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

Kimley»Horn

APPROVED: _____ DATE: _____

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE

Sean P. Kane
ACCOUNT DISABLED
2/11/2026

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

TRAFFIC CONTROL PHASE II

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2/11/2026

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PROJ. REFERENCE NO.	SHEET NO.
W-5703C	TMP-09

NAD 83/NSRS 2007

SILVER LAKE RD

-L- US 421
(CAROLINA BEACH RD)

MATCHLINE -L- STA 38+75 (SEE SHEET TMP-9)

WILLOUGHBY PARK RD

SHADE TREE LN

EXIST
EXIST
EXIST
EXIST
EXIST

18" RCP
15" RCP
24" RCP
48" RCP
36" HDPE

WORK AREA

NC LICENSE #F-0102
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

Kimley»Horn

APPROVED: _____ DATE: _____

NORTH CAROLINA PROFESSIONAL SEAL 052036 ENGINEER SEAN P. KANE

SEAN P. KANE 2/11/2026

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

TRAFFIC CONTROL PHASE II

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T.I.P.: W-5703C

CONTRACT: DC00505

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3/6/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054756 SEAN P. KANE
Signed by: Sean P. Kane
DocuSigned by: 3/6/2026

3/6/2026

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PAVEMENT MARKING AND SIGNING PLAN

NEW HANOVER COUNTY

LOCATION: US 421 (CAROLINA BEACH ROAD) FROM S. COLLEGE ROAD TO APPROXIMATELY 200' NORTH OF WILLOUGHBY PARK ROAD

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2 THRU PMP-3	PAVEMENT MARKING DETAIL

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	FINAL PAVEMENT MARKINGS
	THERMOPLASTIC (24", 90 MILS)
T61	WHITE STOPBAR
T62	WHITE CROSSWALK
	THERMOPLASTIC (4", 90 MILS)
T2	WHITE SOLID LANE LINE
T4	WHITE 3' - 9'/SP MINI-SKIP
T13	YELLOW DOUBLE CENTER
	THERMOPLASTIC (8", 90 MILS)
T40	WHITE GORELINE
T41	WHITE DIAGONAL
	THERMOPLASTIC (90 MILS)
T70	LEFT TURN ARROW
T74	COMBO. RIGHT/STRAIGHT ARROW

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 ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
-L-	THERMOPLASTIC	N/A

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

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

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

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

ROADWAY STANDARD DRAWING

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

STD. NO.	TITLE
901.50	ARROWS AND SHIELDS
903.10	GROUND MOUNTED SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.30	SUPPLEMENTAL SIGN MOUNTING
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
910.30	SIGNING SIGNALIZED REDUCED CONFLICT INTERSECTION
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	6.25	SF
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	76	LF
4102000000	904	SIGN ERECTION, TYPE E	1	EA
4116100000	904	SIGN ERECTION, RELOCATE TYPE 'D', 'E' AND 'F'	7	EA
7648000000	1746	RELOCATE EXISTING SIGN	1	EA

SIGNING NOTES

- SIGNS FURNISHED BY CONTRACTOR
- 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.
- 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.
- SIGNING PLANS DO NOT INCLUDE TEMPORARY CONSTRUCTION SIGNING OR PAVEMENT MARKINGS. SEE TRAFFIC MANAGEMENT PLANS.

PLAN REVIEWED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

MITCH EATON, P.E. — SIGNING & DELINEATION REGIONAL ENGINEER

STACEY JOHNS, P.E. — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

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

PLAN PREPARED BY: Kimley-Horn and Associates

SEAN KANE, P.E. — PROJECT DESIGN ENGINEER

SPENCER STRINGFELLOW, E.I. — DESIGNER

Kimley»Horn

Kimley»Horn
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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601

TIP NO.	SHEET NO.
W-5703C	PMP-2

APPROVED: _____

DATE: _____

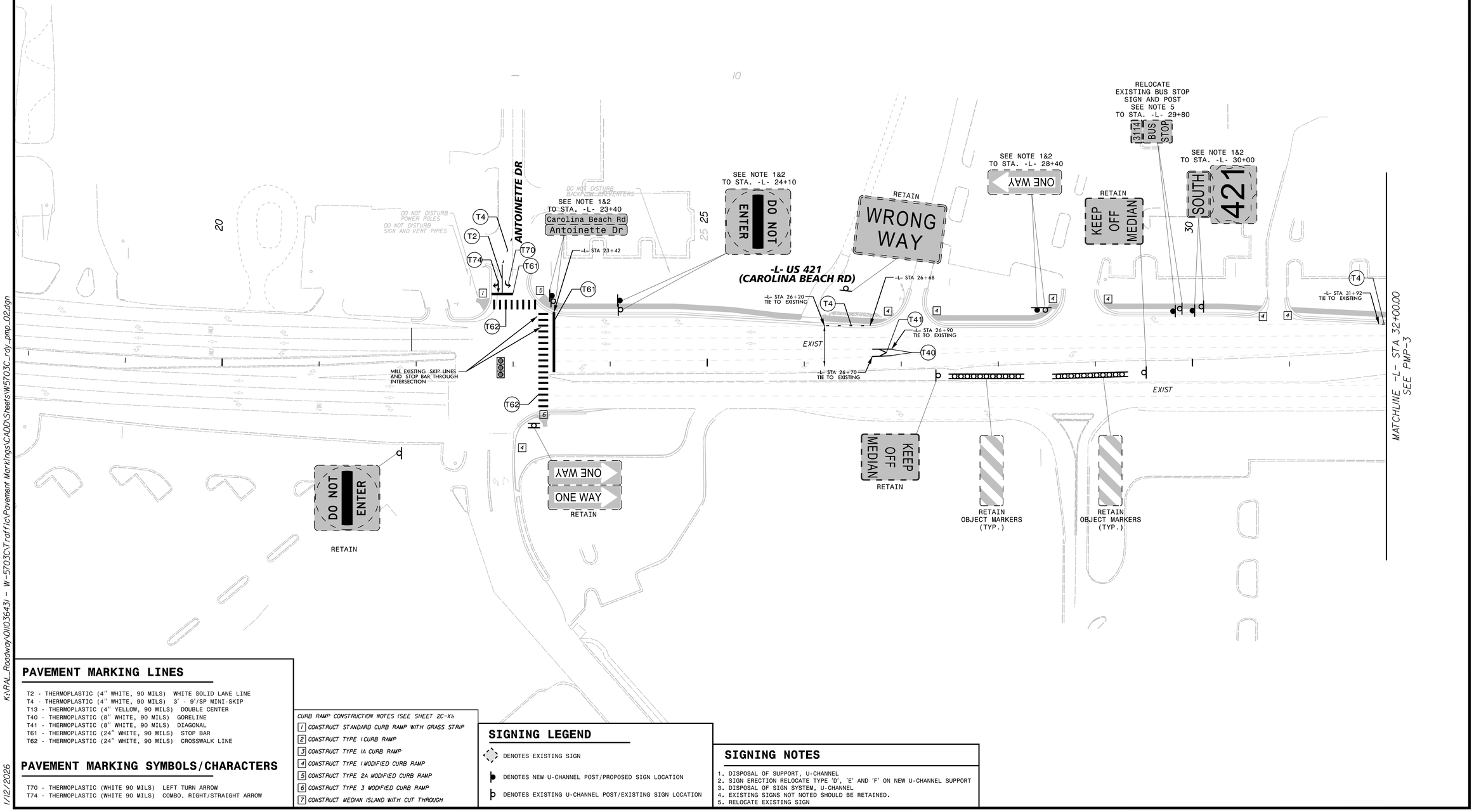
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 050136 ENGINEER SEAN P. KANE

1/12/2026

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NAD 83/NSRS 2007



PAVEMENT MARKING LINES

T2 - THERMOPLASTIC (4" WHITE, 90 MILS) WHITE SOLID LANE LINE
T4 - THERMOPLASTIC (4" WHITE, 90 MILS) 3' - 9'/SP MINI-SKIP
T13 - THERMOPLASTIC (4" YELLOW, 90 MILS) DOUBLE CENTER
T40 - THERMOPLASTIC (8" WHITE, 90 MILS) GORELINE
T41 - THERMOPLASTIC (8" WHITE, 90 MILS) DIAGONAL
T61 - THERMOPLASTIC (24" WHITE, 90 MILS) STOP BAR
T62 - THERMOPLASTIC (24" WHITE, 90 MILS) CROSSWALK LINE

PAVEMENT MARKING SYMBOLS/CHARACTERS

T70 - THERMOPLASTIC (WHITE 90 MILS) LEFT TURN ARROW
T74 - THERMOPLASTIC (WHITE 90 MILS) COMBO. RIGHT/STRAIGHT ARROW

CURB RAMP CONSTRUCTION NOTES (SEE SHEET 2C-X)

1. CONSTRUCT STANDARD CURB RAMP WITH GRASS STRIP
2. CONSTRUCT TYPE I CURB RAMP
3. CONSTRUCT TYPE IA CURB RAMP
4. CONSTRUCT TYPE I MODIFIED CURB RAMP
5. CONSTRUCT TYPE 2A MODIFIED CURB RAMP
6. CONSTRUCT TYPE 3 MODIFIED CURB RAMP
7. CONSTRUCT MEDIAN ISLAND WITH CUT THROUGH

SIGNING LEGEND

- DENOTES EXISTING SIGN
- DENOTES NEW U-CHANNEL POST/PROPOSED SIGN LOCATION
- DENOTES EXISTING U-CHANNEL POST/EXISTING SIGN LOCATION

SIGNING NOTES

1. DISPOSAL OF SUPPORT, U-CHANNEL
2. SIGN ERECTION RELOCATE TYPE 'D', 'E' AND 'F' ON NEW U-CHANNEL SUPPORT
3. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4. EXISTING SIGNS NOT NOTED SHOULD BE RETAINED.
5. RELOCATE EXISTING SIGN

K:\RAL_Roadway\0110364\3 - W-5703C\Traffic\Pavement Markings\CADD\Sheets\W5703C_rdy_pmp_02.dgn
1/12/2026

401 QUANTITY REQ'D _1_

W12-1
30"x30"

TYPE "E" SIGN

Kimley»Horn
©2019
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601

TIP NO.	SHEET NO.
W-5703C	PMP-3

APPROVED: _____

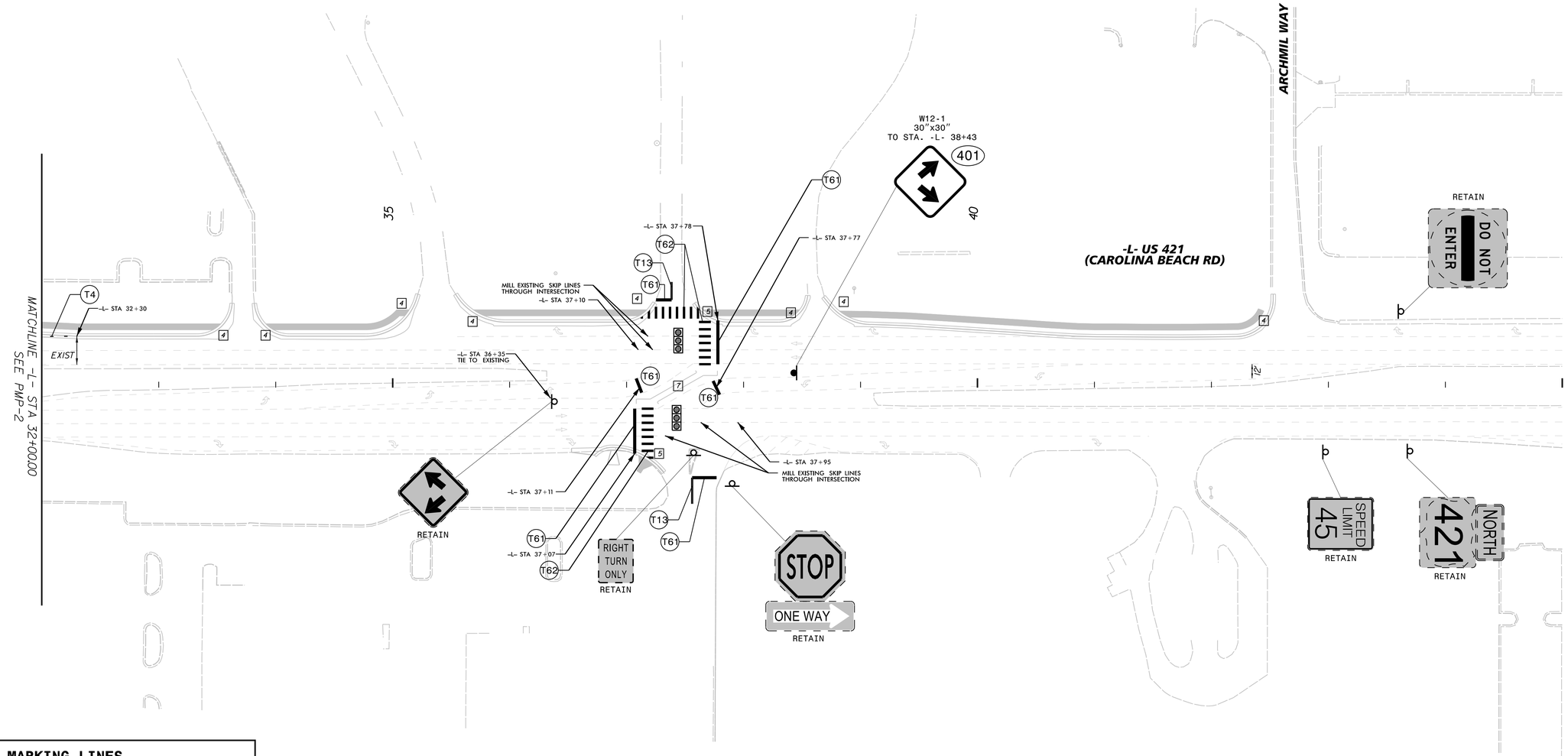
DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 050108 ENGINEER SEAN P. KANE
Sean Kane
1/12/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007



PAVEMENT MARKING LINES

T2 - THERMOPLASTIC (4" WHITE, 90 MILS) WHITE SOLID LANE LINE
T4 - THERMOPLASTIC (4" WHITE, 90 MILS) 3' - 9'/SP MINI-SKIP
T13 - THERMOPLASTIC (4" YELLOW, 90 MILS) DOUBLE CENTER
T40 - THERMOPLASTIC (8" WHITE, 90 MILS) GORELINE
T41 - THERMOPLASTIC (8" WHITE, 90 MILS) DIAGONAL
T61 - THERMOPLASTIC (24" WHITE, 90 MILS) STOP BAR
T62 - THERMOPLASTIC (24" WHITE, 90 MILS) CROSSWALK LINE

PAVEMENT MARKING SYMBOLS/CHARACTERS

T70 - THERMOPLASTIC (WHITE 90 MILS) LEFT TURN ARROW
T74 - THERMOPLASTIC (WHITE 90 MILS) COMBO. RIGHT/STRAIGHT ARROW

CURB RAMP CONSTRUCTION NOTES (SEE SHEET 2C-X):

1. *CONSTRUCT STANDARD CURB RAMP WITH GRASS STRIP*
2. *CONSTRUCT TYPE I CURB RAMP*
3. *CONSTRUCT TYPE IA CURB RAMP*
4. *CONSTRUCT TYPE I MODIFIED CURB RAMP*
5. *CONSTRUCT TYPE 2A MODIFIED CURB RAMP*
6. *CONSTRUCT TYPE 3 MODIFIED CURB RAMP*
7. *CONSTRUCT MEDIAN ISLAND WITH CUT THROUGH*

SIGNING LEGEND

DENOTES EXISTING SIGN

DENOTES NEW U-CHANNEL POST/PROPOSED SIGN LOCATION

DENOTES EXISTING U-CHANNEL POST/EXISTING SIGN LOCATION

SIGNING NOTES

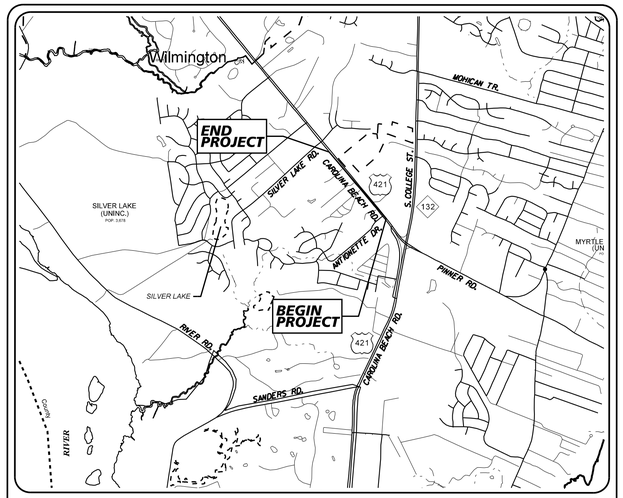
1. DISPOSAL OF SUPPORT, U-CHANNEL
2. SIGN ERECTION RELOCATE TYPE 'D', 'E' AND 'F' ON NEW U-CHANNEL SUPPORT
3. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4. EXISTING SIGNS NOT NOTED SHOULD BE RETAINED.
5. RELOCATE EXISTING SIGN

K:\RAL_Roadway\0li03643 - W-5703C\Traffic\Pavement Markings\CADD\Sheets\W5703C_rdy_pmp_03.dgn
1/12/2026

TIP PROJECT: W-5703C

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5703C	EC-1	10

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

NEW HANOVER COUNTY

LOCATION: US 421 (CAROLINA BEACH ROAD) FROM ANTOINETTE DR TO APPROXIMATELY 200' NORTH OF WILLOUGHBY PARK ROAD

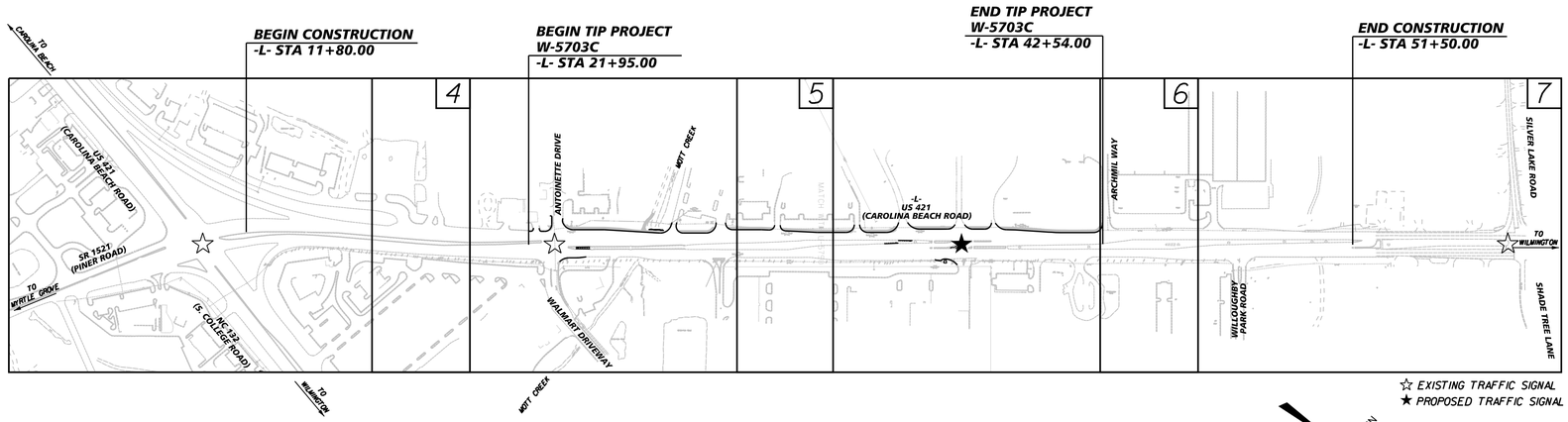
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND SIGNALS

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF WILMINGTON

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

NCDOT CONTACT: BRIAN HARDING, P.E.
DIVISION 3, DIVISION PROJECT MANAGER
(910) 341-2000

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 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES

Kimley»Horn ©2024

Prepared in the Office of:

Kimley-Horn

421 Fayetteville Street, Suite 600
Raleigh, NC 27601

Designed by:

DAVID HURSEY ***4359***

NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

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

$$$$$$$$SYSTINF$$$$$$$$
$$$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-2

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

EROSION & SEDIMENT CONTROL LEGEND

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

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

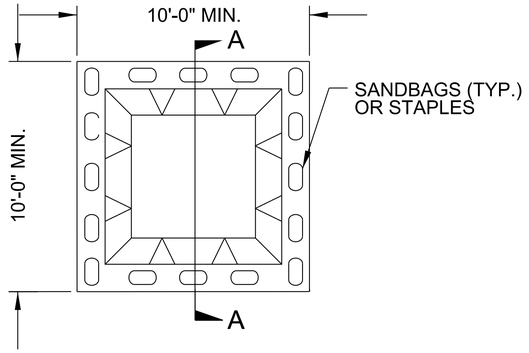
REVISIONS

5/14/99

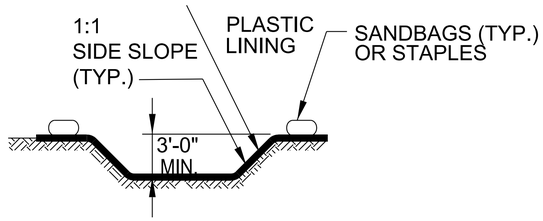
12/9/2025

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-2A

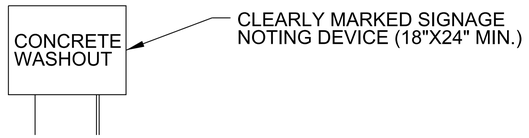
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



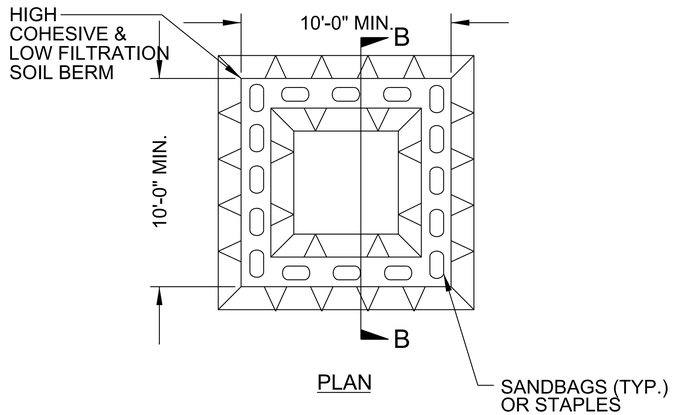
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

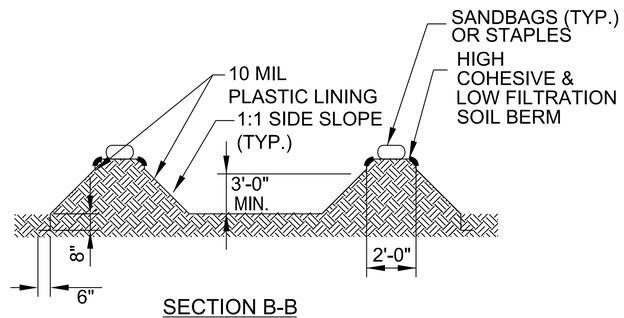
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

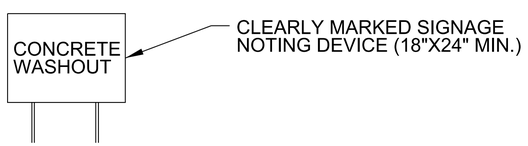
NOT TO SCALE



PLAN



SECTION B-B



NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

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

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

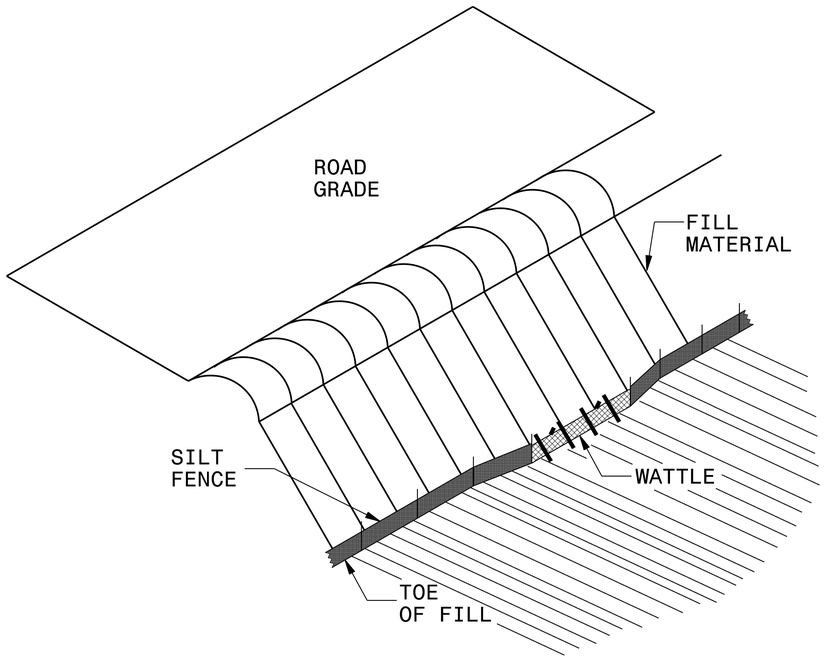
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12/9/2025

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-2B

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

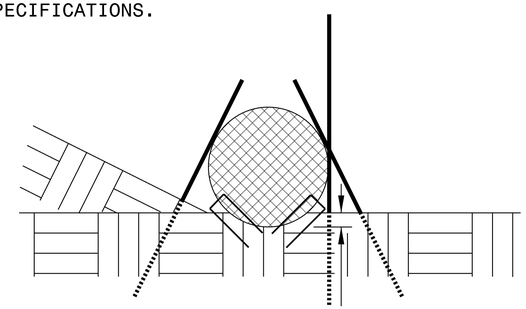
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

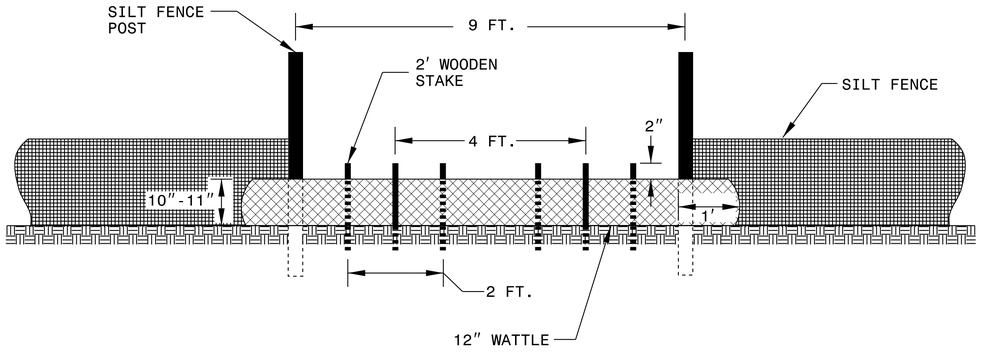
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

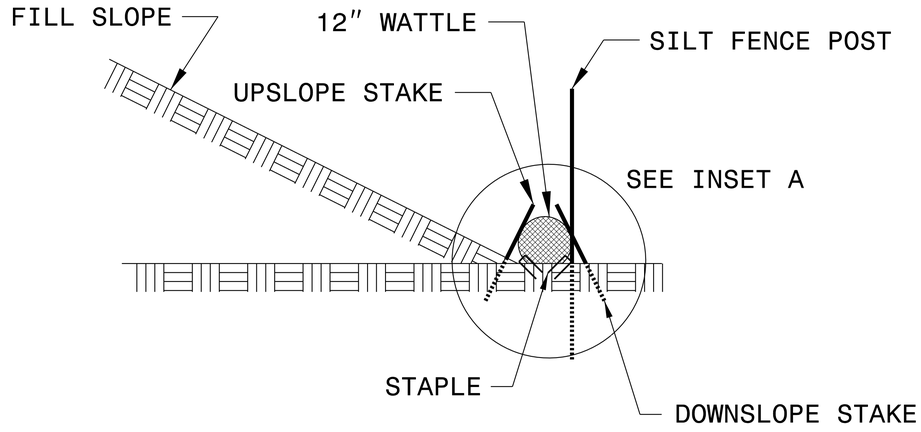
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE



SIDE VIEW

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12/9/2025

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

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12/9/2025

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-4/CONT.4

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RALEIGH, N.C. 27601

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12/9/2025

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HOPE INVESTMENTS LTD PTNRP
HOPE INVESTMENTS LTD PTNRP
TRUDGEN LEE RUBY
LYNRICH ASSOCIATES LLC
BRITTON LLC
RUSHER E ALAN
PAYNE UMSTEAD PROPERTIES LLC
MATAVA GARY J ETAL
WACHOVIA BANK & TRUST CO
BVC MYRTLE GROVE LLC
ZA SNEEDEN LLC
ZA SNEEDEN LLC
ZIMMERMAN RALPH S NANCY P
ZIMMERMAN RALPH S NANCY P
SEABOARD COMMERCIAL PROP LLC
SEABOARD COMMERCIAL PROP LLC

US 421 (CAROLINA BEACH RD)
CAROLINA BEACH RD
S COLLEGE RD

RETAIN SYSTEM
RETAIN
RETAIN
RETAIN

10+00
15+00
N 35° 03' 02.7" W
-L- PC Sta. 10+00.00
-L- PT Sta. 13+37.84
-L- PC Sta. 18+52.51

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET 5

SEE SHEET NO. 8 FOR -L- PROFILE

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-5/CONST.5

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RALEIGH, N.C. 27601

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12/9/2025

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POWELL D MICHAEL MARICA LEE

STOKED BUSINESS PARK LLC

POWELL DANNY M MARICA L

BENNETT COMMERCIAL PROP LLC

RICS5 LLC

OREILLY AUTOMOTIVE STORES INC

GORILLA LLC

HUGHES JOYCE S

ANTOINETTE DR
N 50° 26' 19.5" E

-L- PT Sta. 20+33.94

POT Sta. 10+00.00

-DW1- PRC Sta. 10+51.02

-DW1- PC Sta. 10+09.87

BEGIN GRADE

-DW1- PT Sta.10+09.00

S 53° 51' 47.4" W

-DW1- POT Sta. 10+00.00 =
-L- Sta.26+06.96 (45.54' LT.)

-DW1- PT Sta. 10+77.73

END GRADE

-DW1- PT Sta.10+80.00

S 70° 24' 33.8" W

-DW1- POT Sta. 10+90.94

SPECIAL MIN. DEPTH. CB-E

REMOVE DI

DO NOT DISTURB POWER POLES

DO NOT DISTURB SIGN AND VENT PIPES

DO NOT DISTURB BACKFLOW PREVENTERS

TOE PROTECTION EST. 180 SY PSRM SEE DETAIL 2 SHEET 2D-1

TOE PROTECTION EST. 90 SY PSRM SEE DETAIL 2 SHEET 2D-1

LIMITS OF JURISDICTIONAL DETERMINATION

24" CSP W/ELBOWS
24" RCP-IV

ADJUST EXIST MH

REMOVE 41 LF 24" RCP-IV

JB W/MH REMOVE

JB W/MH

REMOVE

GRADE TO DRAIN

15" RCP-IV

18" RCP-IV

18" RCP-V

24" RCP-IV

2GI

2GI-D

CB-E

CB-F

CB-G

EXIST. CB-G

RETAIN

FILL AND ABANDON

STABILIZE EX. BANK W/CLASS I RIP RAP KEYED-IN EST 55 TONS EST 110 SY GFD SEE DETAIL 1/SHEET 2D-1

N 39° 34' 13.7" W

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET 4

MATCHLINE -L- STA 32+00.00
SEE PLAN SHEET 6

BEGIN TIP PROJECT W-5703C
-L- POT Sta. 21+95.00

-Y1- POT Sta.13+00.00 =
-L- POT Sta. 22+98.21

-L- US 421
(CAROLINA BEACH RD)

ZA SNEEDEN LLC

WALMART DRIVEWAY

WALMART PROPERTY TAX DEPT

MURPHY OIL USA INC

RETENTION POND

SEE SHEET NO. 2D-1 FOR DRAINAGE DITCH DETAILS
SEE SHEET NO. 8 FOR -L- PROFILE

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 6

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-6/CONST.6

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RALEIGH, N.C. 27601

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ROYAL PALMS MHP LLC

LLOYD C BOWDEN JR

MONKEY JUNCTION MINI STORAGE INC

ARCHMIL WAY

AUSTIN COMMONS COA INC

AMJB PROPERTIES LLC

MATCHLINE -L- STA 32+00.00
SEE PLAN SHEET 5

MATCHLINE -L- STA 45+00.00
SEE PLAN SHEET 7

N 39° 34' 13.7" W

-L- US 421
(CAROLINA BEACH RD)

END TIP PROJECT W-5703C
-L- POT Sta. 42+54.00

MODIFIED CONCRETE FLUME SEE DETAIL SHEET 2C-4

WALMART PROPERTY TAX DEPT.

AJ MCGIRT LAND MANAGEMENT LLC

UNDER CONSTRUCTION

DUKE ENERGY PROGRESS INC

RETENTION POND

SEE SHEET NO. 9 FOR -L- PROFILE

REVISIONS

5/14/99

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 7

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-7/CONST.7

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RALEIGH, N.C. 27601

NAD 83 NSRS 2007

MATCHLINE -L- STA 45+00.00
SEE PLAN SHEET 6

MONKEY JUNCTION MINI STORAGE INC

GLADYS JOHNSON MILLIGAN LIFE ESTATE

ELIZABETH S PETTETT

WILBUR C & GAIL R CHEERS

ALYSON D ABERNATHY

MONKEY JUNCTION CAR WASH, LLC

JAMES W SANDY
ALYSON D ABERNATHY

RETAIN

RETAIN SYSTEM

TBJB

-L- US 421
(CAROLINA BEACH RD)

N 39° 34' 13.7" W

-L- POT Sta. 53+40.00

WILLOUGHBY PARK CONDO ASSOCIATION INC

WILLOUGHBY PARK RD

MICHAEL F & ALETA J MOSER

WOODBRIDGE POINTE, LP

JOHN C ROBERTS

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

SEE SHEET NO. 2D-1 FOR DRAINAGE DITCH DETAILS

SEE SHEET NO. 9 FOR -L- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-8/CONST.4

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 4

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

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REVISIONS

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HOPE INVESTMENTS LTD PTNRP

HOPE INVESTMENTS LTD PTNRP

TRUDGEN LEE RUBY

LYNRICH ASSOCIATES LLC

BRITTON LLC

RUSHER E ALAN

PAYNE UMSTEAD PROPERTIES LLC

MATAVA GARY J ETAL

US 421 (CAROLINA BEACH RD)

CAROLINA BEACH RD

RETAIN SYSTEM

RETAIN

RETAIN

RETAIN

WACHOVIA BANK & TRUST CO

BVC MYRTLE GROVE LLC

10+00

15+00

N 35° 03' 02.7" W

-L- PC Sta. 10+00.00

-L- PT Sta. 13+37.84

-L- PC Sta. 18+52.51

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET 5

ZA SNEEDEN LLC

ZA SNEEDEN LLC

ZIMMERMAN RALPH S NANCY P

ZIMMERMAN RALPH S NANCY P

S COLLEGE RD

SEABOARD COMMERCIAL PROP LLC

SEABOARD COMMERCIAL PROP LLC

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 5

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-9/CONST.5

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601

REVISIONS 5/14/99

12/9/2025

NAD 83/NSRS 2007

POWELL D MICHAEL MARICA LEE

STOKED BUSINESS PARK LLC

POWELL DANNY M MARICA L

BENNETT COMMERCIAL PROP LLC

RICS5 LLC

OREILLY AUTOMOTIVE STORES INC

GORILLA LLC

HUGHES JOYCE S

ANTOINETTE DR
N 50° 26' 19.5" E

-L- PT Sta. 20+33.94

POT Sta. 10+00.00

-DW1- PRC Sta. 10+51.02

-DW1- PC Sta. 10+09.87

BEGIN GRADE

-DW1- PT Sta.10+09.00

S 53° 51' 47.4" W

-DW1- POT Sta. 10+00.00 =
-L- Sta.26+06.96 (45.54' LT.)

-DW1- PT Sta. 10+77.73

END GRADE

-DW1- PT Sta.10+80.00

S 70° 24' 33.8" W

-DW1- POT Sta. 10+90.94

SPECIAL MIN. DEPTH CB-E

REMOVE DI

DO NOT DISTURB POWER POLES

DO NOT DISTURB SIGN AND VENT PIPES

DO NOT DISTURB BACKFLOW PREVENTERS

TOE PROTECTION EST. 180 SY PSRM SEE DETAIL 2 SHEET 2D-1

TOE PROTECTION EST. 90 SY PSRM SEE DETAIL 2 SHEET 2D-1

LIMITS OF JURISDICTIONAL DETERMINATION

ADJUST EXIST MH

REMOVE 41 LF 24" RCP-IV

JB W/MH REMOVE

24" CSP W/ELBOWS 24" RCP-IV

PDE

GRADE TO DRAIN

REMOVE

FILL AND ABANDON

STABILIZE EX. BANK W/CLASS I RIP RAP KEYED-IN EST 55 TONS EST 110 SY GFD SEE DETAIL 1SHEET 2D-1

-L- US 421 (CAROLINA BEACH RD)

BEGIN TIP PROJECT W-5703C
-L- POT Sta. 21+95.00

-Y1- POT Sta.13+00.00 =
-L- POT Sta. 22+98.21

N 39° 34' 13.7" W

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET 4

MATCHLINE -L- STA 32+00.00
SEE PLAN SHEET 6

ZA SNEEDEN LLC

WALMART DRIVEWAY

WALMART PROPERTY TAX DEPT

MURPHY OIL USA INC

RETENTION POND

SEE SHEET NO. 2D-1 FOR DRAINAGE DITCH DETAILS
SEE SHEET NO. 8 FOR -L- PROFILE

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 6

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-10/CONST.6

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RALEIGH, N.C. 27601

REVISIONS 5/14/99

NAD 83/NSRS 2007

ROYAL PALMS MHP LLC

LLOYD C BOWDEN JR

MONKEY JUNCTION MINI STORAGE INC

ARCHMIL WAY

AUSTIN COMMONS COA INC

AMJB PROPERTIES LLC

MATCHLINE -L- STA 32+00.00 SEE PLAN SHEET 5

MATCHLINE -L- STA 45+00.00 SEE PLAN SHEET 7

N 39° 34' 13.7" W

-L- US 421 (CAROLINA BEACH RD)

END TIP PROJECT W-5703C
-L- POT Sta. 42+54.00

MODIFIED CONCRETE FLUME SEE DETAIL SHEET 2C-4

WALMART PROPERTY TAX DEPT

AJ MCGIRT LAND MANAGEMENT LLC

DUKE ENERGY PROGRESS INC

UNDER CONSTRUCTION

SEE SHEET NO. 9 FOR -L- PROFILE

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 7

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	EC-11/CONST.7

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, N.C. 27601

NAD 83 NSRS 2007

REVISIONS 5/14/99

MONKEY JUNCTION MINI STORAGE INC

GLADYS JOHNSON MILLIGAN LIFE ESTATE

ELIZABETH S PETTETT

WILBUR C & GAIL R CHEERS

ALYSON D ABERNATHY

MONKEY JUNCTION CAR WASH, LLC

JAMES W SANDY
ALYSON D ABERNATHY

MATCHLINE -L- STA 45+00.00
SEE PLAN SHEET 6

RETAIN

RETAIN SYSTEM

TBJB

-L- US 421
(CAROLINA BEACH RD)

N 39° 34' 13.7" W

-L- POT Sta. 53+40.00

WILLOUGHBY PARK CONDO ASSOCIATION INC

WILLOUGHBY PARK RD

MICHAEL F & ALETA J MOSER

WOODBRIDGE POINTE, LP

JOHN C ROBERTS

UTILIZE FABRIC INSERT INLET PROTECTION DEVICE IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C WHERE WATER MAY POND ON THE ROADWAY IN AREAS WHERE LIVE TRAFFIC IS PRESENT, AS DIRECTED BY THE ENGINEER.

SEE SHEET NO. 2D-1 FOR DRAINAGE DITCH DETAILS

SEE SHEET NO. 9 FOR -L- PROFILE

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

TIP PROJECT: W-5703C

CONTRACT:

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

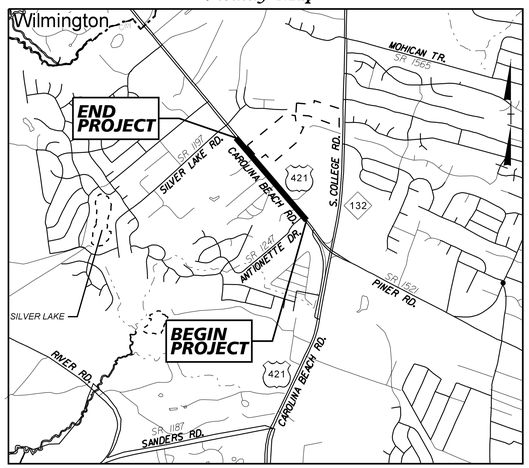
NEW HANOVER COUNTY

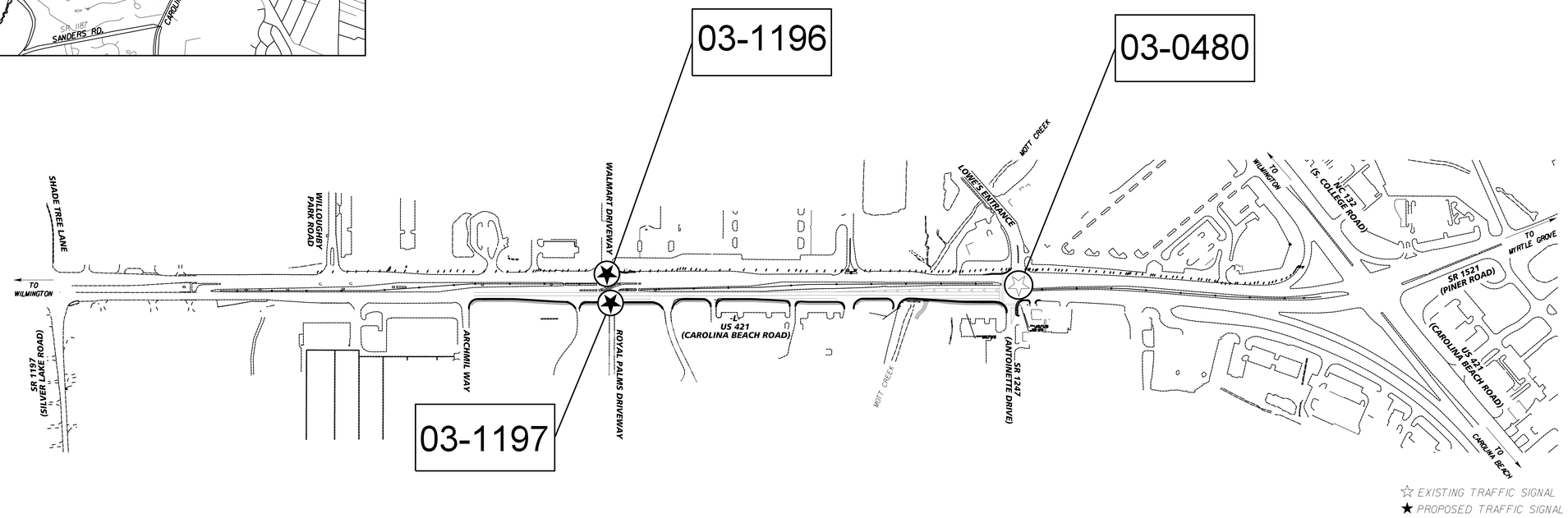
LOCATION: US 421 (CAROLINA BEACH ROAD) FROM SR 1247 (ANTOINETTE DRIVE) TO APPROXIMATELY 200' NORTH OF WILLOUGHBY PARK ROAD

TYPE OF WORK: TRAFFIC SIGNAL DESIGN AND CABLE ROUTING

NC GRID
NAD 83 NA 2011

Vicinity Map





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

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	--------	Title Sheet
Sig. 2.1–2.5	03–1197	US 421 (Carolina Beach Road) at Royal Palms Driveway
Sig. 3.0–3.5	03–1196	US 421 (Carolina Beach Road) at Walmart Driveway
Sig. 4.0–4.8	03–0480	US 421 (Carolina Beach Road) at SR 1247 (Antoinette Drive) /Lowe's Entrance
Sig. M1–M9	--------	Standard Metal Pole Sheets
SCP 1.0–3.0	--------	Signal Communication Plans

NCDOT SIGNAL CONTACT:

Zachary Little, P.E.
EASTERN REGION SIGNALS ENGINEER

Keith M. Mims, P.E.
SIGNAL EQUIPMENT DESIGN ENGINEER

Ryan W. Hough, P.E.
SIGNAL COMMUNICATIONS PROJECT ENGINEER

PLANS PREPARED BY:

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, North Carolina 27601
PE NO. F-0102
© 2026

Kevin P. Baumann, P.E.
TRAFFIC SIGNAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by:
[signature]
5DC709A868C8447...
1/7/2026
SIGNATURE: *P.E.*

Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
TSMO UNIT

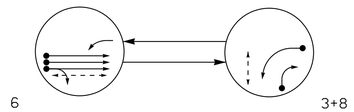
750 N. Greenfield Parkway, Garner, NC 27529

1/7/2026 8:20:47 AM susan.pennington K:\RAL_TPTO_SIGNALS\W5703C\Monkey Junction\MS4 - Signal Design\W-5703C tsh.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

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

DEFAULT PHASING DIAGRAM

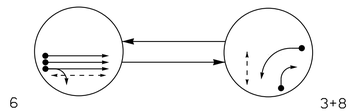


PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION			
SIGNAL FACE	PHASE 6	PHASE 3+8	FLASH
31,32	~~FY~~	←	~~R~~
61,62,63	G	R	R
81,82	R	→	R
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION			
SIGNAL FACE	PHASE 6	PHASE 3+8	FLASH
31,32	~~R~~	←	~~R~~
61,62,63	G	R	R
81,82	R	→	R
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
DETECTION ZONES					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP NEW CARD
3A*	6X40	0	*	Y	3	Y	Y	-	-	10#	- -
8A*	6X40	0	*	Y	8	Y	Y	-	-	15	- -

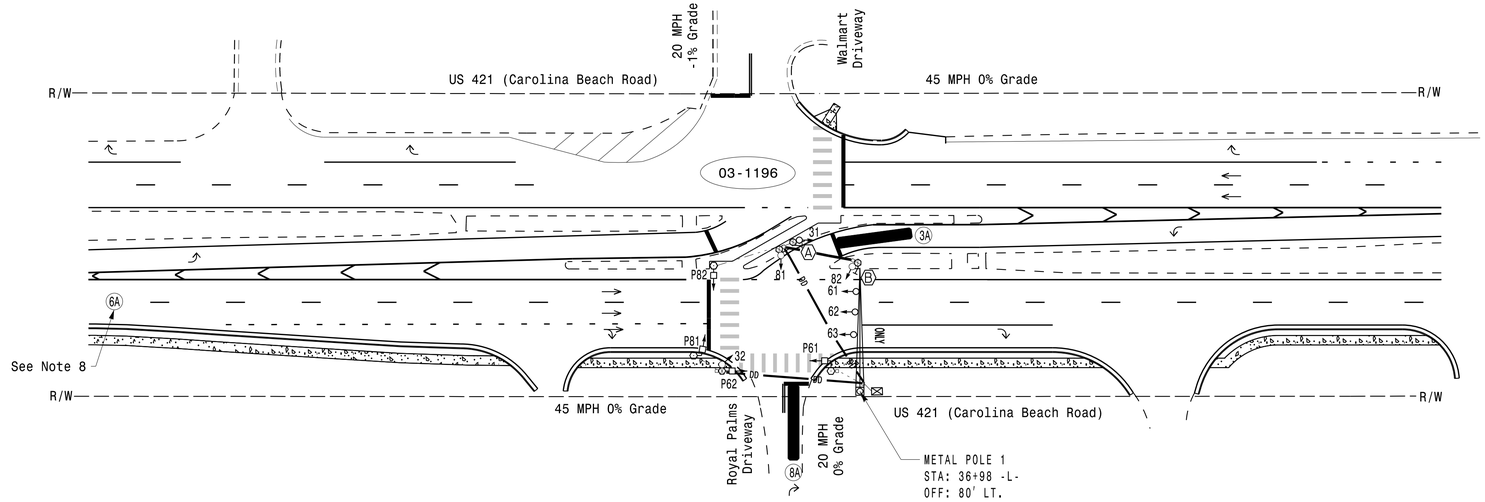
*Microwave Detection Zone
Disable delay during Alternate Phasing operation.

Advance Microwave Detection		
FUNCTION	Sensor 1 (6A)	
Channel	1	
Phase	6	
Direction of Travel	SB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100–600	100–150
Enable Speed	Y	Y
Speed Range (mph)	35–100	1–35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5–6.5	–

2 Phase
Fully Actuated
w/ Alternate Phasing
Wilmington Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. 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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
8. The intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
10. City system data:
    Controller Asset #1197
11. See Roadway Pavement Marking Plans for stopline and crosswalk locations.



LEGEND

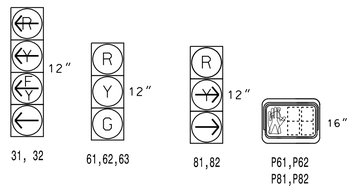
PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
⬡	Type II Signal Pedestal	⬢
ⓥ	Type III Signal Pedestal	ⓥ
○	Metal Pole with Mastarm	○
▬	Non-Intrusive Detection Zone	▬
⊠	Controller & Cabinet	⊡
□	Junction Box	■
—DD—	Directional Drill	N/A
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - - - -
→	Directional Arrow	→
N/A	Curb Ramp	◪
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ

OASIS 2070 TIMING CHART			
	PHASE		
FEATURE	3	6	8
Min Green 1 *	5	12	5
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	30	90	30
Yellow Clearance	3.0	4.5	3.0
Red Clearance	2.6	1.2	2.6
Walk 1 *	-	14	7
Don't Walk 1	-	11	12
Advanced Walk	-	7	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
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 FACE I.D.

All Heads L.E.D.



New Installation

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

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

US 421 (Carolina Beach Road) at Royal Palms Driveway

Division 3 New Hanover County Wilmington

PLAN DATE: May 2025 REVIEWED BY: KP Baumann
PREPARED BY: CF Davis REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by: Kevin Baumann
SIGNATURE
1/7/2026
DATE

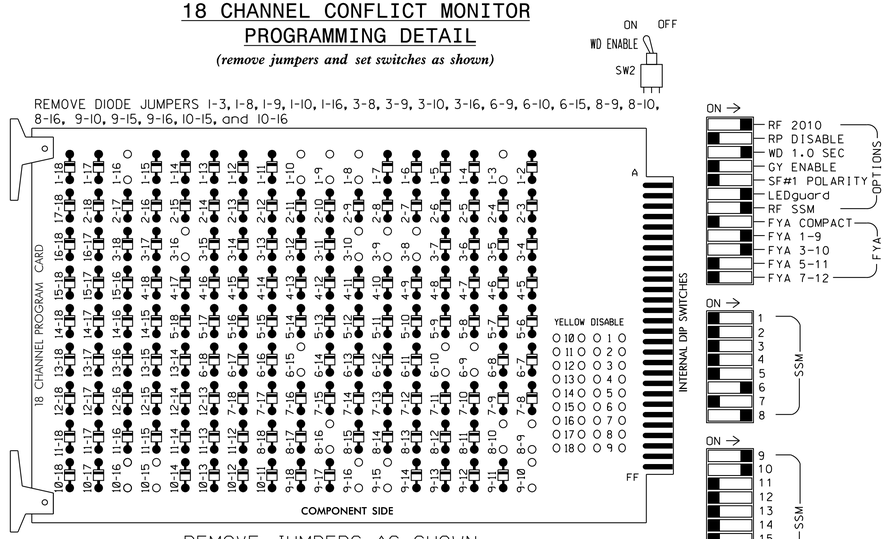
SIG. INVENTORY NO. 03-1197

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susan.pennington
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1/7/2026

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

18 CHANNEL 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. Program phases 3 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phase 6 for First Phases.
5. Disable all phases for Yellow Flash.
6. Program overlaps 1 and 2 as Wag Overlaps.
7. Disable all phases for startup in Green.
8. The cabinet and controller are part of the Wilmington 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.....S1,S4,S8,S9,S11,S12,AUX S1,AUX S2
PHASES USED.....3,6,6PED,8,8PED
OVERLAP "A".....3+6
OVERLAP "B".....3+6
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED
OVERLAP "G".....3

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

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	OLG	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	31★	NU	NU	32★	NU	NU	NU	61,62 63	P61, P62	NU	81,82	P81, P82	31★	32★	NU	NU	NU	NU
RED								134			107							
YELLOW	✳			✳				135										
GREEN								136										
RED ARROW													A121	A124				
YELLOW ARROW											108		A122	A125				
FLASHING YELLOW ARROW													A123	A126				
GREEN ARROW	127			118							109							
✋									119			110						
🚶									121			112						

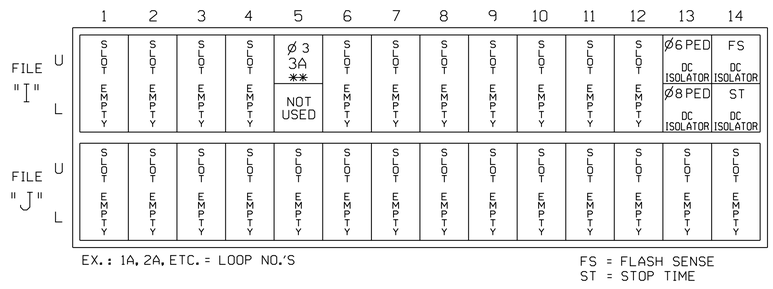
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

** SPECIAL DETECTOR NOTE

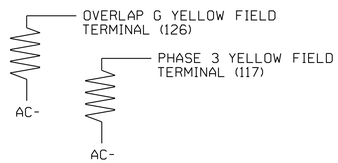
For all detectors, install multi-point microwave system for vehicle detection. Perform installation according to manufacture's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For zone 3A, inputs associated with the typical slot for an NCDOT installation are compatible with time of day instructions located on sheet 4 of this electrical detail.

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)



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
3A	**	I5U	58	20	3	3	Y	Y	_	___	10
		I5U	58	20★	53	3	Y	Y	_	___	__
PED PUSH BUTTONS											
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

★ See input page assignment programming details on Sheet 3.

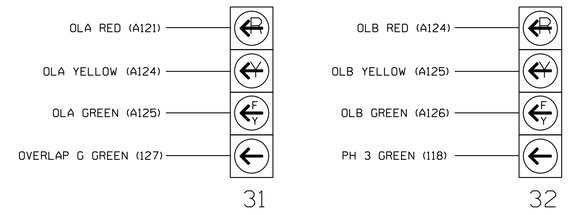
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

The sequence display for signal headS 31 and 32 requires special logic programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1197
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Transportation Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road) at Royal Palms Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
044434
NORTH CAROLINA PROFESSIONAL ENGINEER
KEVIN P. BAUMANN
DocuSigned by: 5DC709A868C8447...
1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-1197

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

1/7/2026 8:20:56 AM susan.pennington K:\RAL_TPTD_SIGNALS\#011036431 W-5703C (Monkey Junction)\Sd - Signal Design\031197-2025e.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	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 #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #50 ON
SET OUTPUT ASSIGNMENT #51 OFF

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 (HEAD 31).

PRESS '+'

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 31).

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #51 ON

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

PRESS '+'

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #47 ON
SET OUTPUT ASSIGNMENT #48 OFF

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 (HEAD 32).

PRESS '+'

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 32).

PRESS '+'

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #48 ON

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 32).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1197
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Electrical Detail - Sheet 2 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
NCDOT Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road)
at
Royal Palms Driveway

Division 3 New Hanover County Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by:
SIGNATURE 1/7/2026

SIG. INVENTORY NO. 03-1197

1/7/2026 8:20:57 AM susan.pennington K:\HAL_TPTD_SIGNALS\0011036431 W-5703C (Monkey Junction)\S4 - Signal Design\031197-2025e.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

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

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 3A

(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. THIS PROGRAMMING REASSIGNS DETECTOR 53 TO INPUT #20 SO THAT THE DELAY ON LOOP 3A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 20 IS REACHED.

```
PAGE: 2 C1 PIN:58  VEHICLE DETECTOR
INPUT ASSIGNMENT #.....................20
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).............3
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 '53' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 3A - PHASE 3)

```
PAGE: 2 C1 PIN:58  VEHICLE DETECTOR
INPUT ASSIGNMENT #.....................20
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).............53
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

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

```
PAGE 1: VEHICLE OVERLAP 'A' 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 '+'

```
PAGE 1: VEHICLE OVERLAP 'B' 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 '+' UNTIL OVERLAP G

```
PAGE 1: VEHICLE OVERLAP 'G' 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  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.

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'A' 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 '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'B' 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 '+' UNTIL OVERLAP G

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'G' 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

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 3A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #53.

```
VEHICLE DETECTOR #53  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#          ¦1234567891011121314151 6
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 '3' FOR PHASES ASSIGNED →

→ ENSURE DELAY IS '0' →

```
VEHICLE DETECTOR #53  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#          ¦1234567891011121314151 6
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: 03-1197
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 3 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road) at Royal Palms Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Traffic Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
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421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: 1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-1197

K:\RAL_TPTO_SIGNALS\W5703101036431 W-5703C (Monkey Junction)#54 - Signal Design\03197-2025e.dgn 1/7/2026 8:20:58 AM susan.pennington

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 2.4

OUTPUT ASSIGNMENT PROGRAMMING DETAIL
TO REMAP OVERLAP 'G' TO LOADSWITCH S1 (PHASE 1)

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "14"

```
PAGE:1  C1 PIN:16 VEHICLE PHASE
OUTPUT ASSIGNMENT #.................14
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.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S1 RED

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:32  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:16  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................14
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 15

```
PAGE:1  C1 PIN:17 VEHICLE PHASE
OUTPUT ASSIGNMENT #.................15
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.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S1 YELLOW

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:33 VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:17  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................15
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 16

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................16
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.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S1 GREEN

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:34  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:18  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................16
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1197
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Electrical Detail - Sheet 4 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 421 (Carolina Beach Road)
at
Royal Palms Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by:
SIGNATURE 1/7/2026

SIG. INVENTORY NO. 03-1197

1/7/2026 8:20:59 AM susan.pennington K:\RAL_TPTD_SIGNALS\0011036431 W-5703C (Monkey Junction)\S4 - Signal Design\031197-2025e.dgn

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 2.5

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 DEFAULT 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 OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 31 and 32 to run protected turns only.

INPUTS PAGE 2: Reduces delay time for phase 3 call on loop 3A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1197
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Electrical Detail - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Traffic Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road)
at
Royal Palms Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

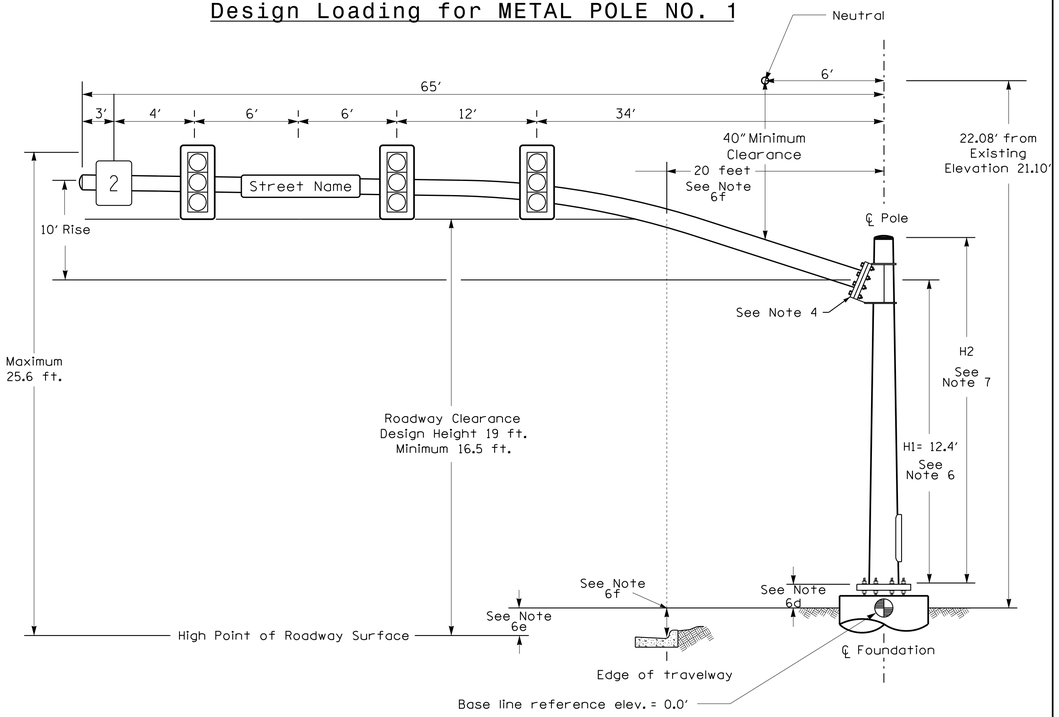
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SIG. INVENTORY NO. 03-1197

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Design Loading for METAL POLE NO. 1



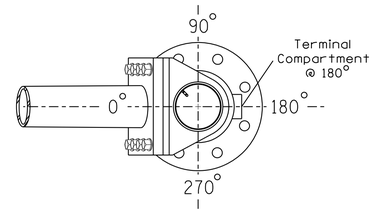
Elevation View

SPECIAL NOTE

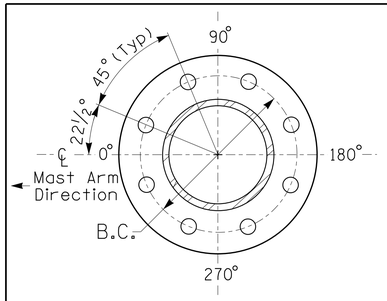
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+1.9 ft.	
Elevation difference at Edge of travelway or face of curb	+1.0 ft.	

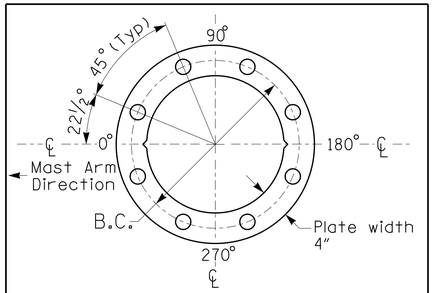


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

METAL POLE No. 1

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 2.6

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5"W X 52.5"L	60 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS
2	SIGN RIGID MOUNTED	9.0 S.F.	36.0"W X 36.0"L	20 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

NCDOT Wind Zone 1 (150 mph)

Prepared for: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road) at Royal Palms Driveway

Division 3 New Hanover County Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	SP Pennington	REVIEWED BY:	

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: 5DC709A868CB447...
1/7/2026
SIGNATURE

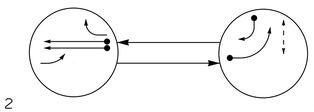
SIG. INVENTORY NO. 03-1197

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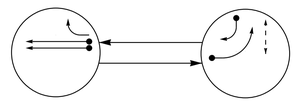
PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 3.0

DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION			
SIGNAL FACE	PHASE 2	PHASE 4+7	PHASE FLASH
21,22	G	R	R
23	F Y	R	R
41,42	R	→	R
71, 72	F Y	←	~~R~~
P41,P42	DW	W	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION			
SIGNAL FACE	PHASE 2	PHASE 4+7	PHASE FLASH
21,22	G	R	R
23	F Y	R	R
41,42	R	→	R
71, 72	~~R~~	←	~~R~~
P41,P42	DW	W	DRK

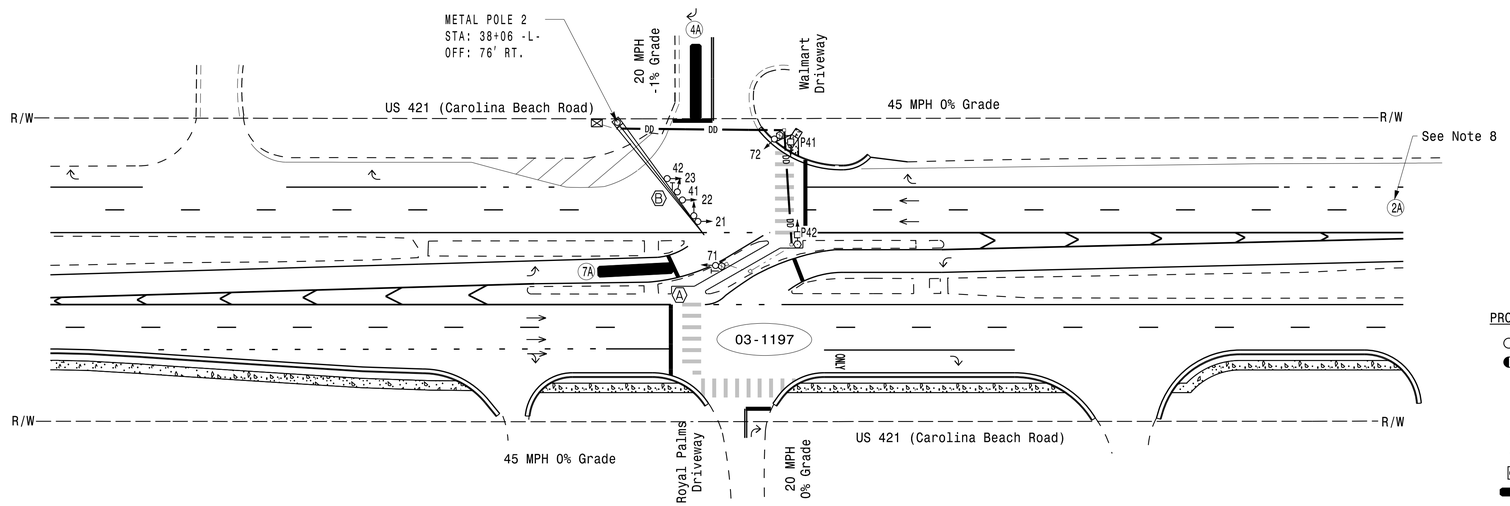
PHASING DIAGRAM DETECTION LEGEND

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

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
DETECTION ZONES					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A*	6X40	0	*	Y	4	Y	Y	-	-	15	-	-
7A*	6X40	0	*	Y	7	Y	Y	-	-	10#	-	-

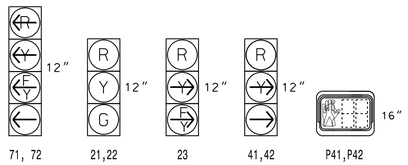
*Microwave Detection Zone
Disable delay during Alternate Phasing operation.

Advance Microwave Detection		
FUNCTION	Sensor 2 (2A)	
Channel	1	
Phase	2	
Direction of Travel	NB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100–600	100–150
Enable Speed	Y	Y
Speed Range (mph)	35–100	1–35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5–6.5	–



SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART			
FEATURE	PHASE 2	PHASE 4	PHASE 7
Min Green 1 *	12	5	5
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	90	30	30
Yellow Clearance	4.5	3.0	3.0
Red Clearance	1.7	2.9	2.9
Walk 1 *	-	7	-
Don't Walk 1	-	11	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
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 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase Fully Actuated w/ Alternate Phasing Wilmington Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. 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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
8. The intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
10. City system data:
    Controller Asset #1196
11. See Roadway Pavement Marking Plans for stopline and crosswalk locations.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
⬡	Type II Signal Pedestal	⬢
Ⓘ	Type III Signal Pedestal	ⓘ
▭	Metal Pole with Mastarm	▬
▬	Non-Intrusive Detection Zone	▬
⊠	Controller & Cabinet	⛶
□	Junction Box	■
— DD —	Directional Drill	N/A
- - - -	2-in Underground Conduit	- - - -
N/A	Right of Way	— — — —
→	Directional Arrow	→
N/A	Curb Ramp	◢
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: North Carolina Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signal Design Section

US 421 (Carolina Beach Road) at Walmart Driveway

Division 3 New Hanover County Wilmington

PLAN DATE: May 2025 REVIEWED BY: KP Baumann

PREPARED BY: CF Davis REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by: SIGNATURE 1/7/2026 DATE

SIG. INVENTORY NO. 03-1196

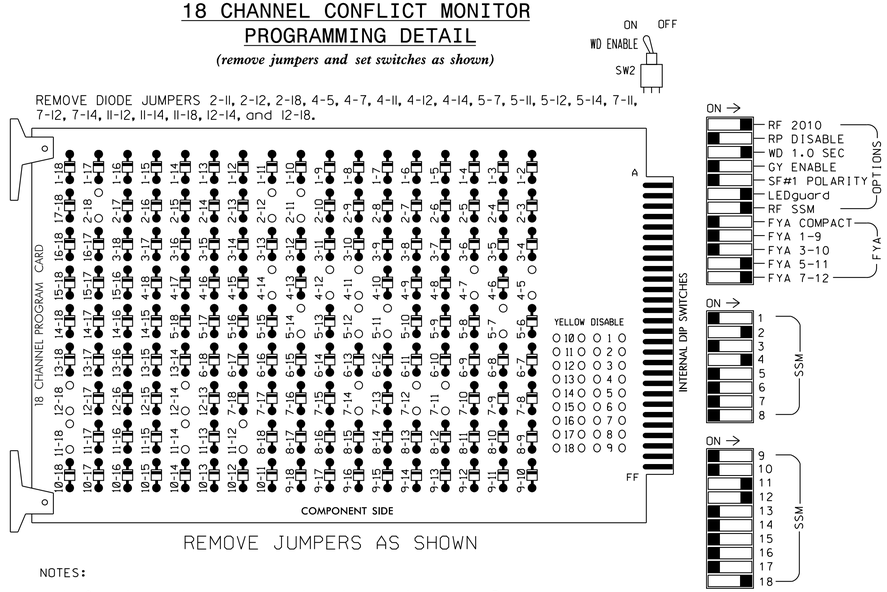
PLANS PREPARED IN THE OFFICE OF:
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18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(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.

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. Program phases 4 and 7 for Dual Entry.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phase 2 for First Phases.
5. Disable all phases for Yellow Flash.
6. Program overlaps 1 and 2 as Wag Overlaps.
7. Disable all phases for startup in Green.
8. The cabinet and controller are part of the Wilmington 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,S5,S6,S7,S10,AUX S4,AUX S5,AUX S6
PHASES USED.....2,4,4PED,7
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....2+7
OVERLAP "D".....2+7
OVERLAP "E".....NOT USED
OVERLAP "F".....2
OVERLAP "G".....7

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

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	OLG	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	OLF
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42 43	P41, P42	71 ★	NU	NU	72 ★	NU	NU	NU	NU	NU	71 ★	72 ★	23 ★
RED		128			101													A104
YELLOW		129					✳			✳								
GREEN		130																
RED ARROW																A114	A101	
YELLOW ARROW					102											A115	A102	A105
FLASHING YELLOW ARROW																A116	A103	A106
GREEN ARROW					103		133			124								
✋						104												
🚶						106												

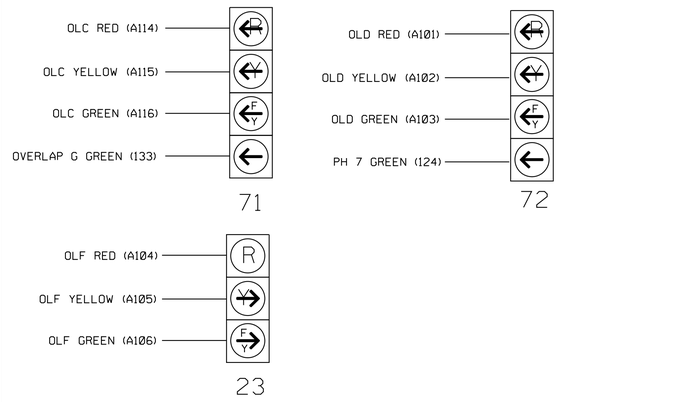
NU = Not Used

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

★ See pictorial of head wiring detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

The sequence display for signal heads 71 and 72 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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	SLOT EMPTY	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR		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
7A	**	J5U	57	19	7	7	Y	Y	_	___	10
		J5U	57	19★	57	7	Y	Y	_	___	__
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

★ See Input Page Assignment programming details on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

** SPECIAL DETECTOR NOTE

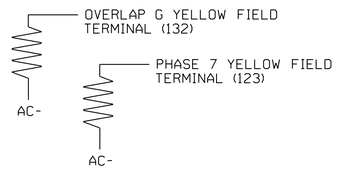
For all detectors, install multi-point microwave system for vehicle detection. Perform installation according to manufacture's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For zone 7A, inputs associated with the typical slot for an NCDOT installation are compatible with time of day instructions located on sheet 4 of this electrical detail.

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)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1196
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
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(919) 677-2000

Electrical Detail - Sheet 1 of 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Traffic Engineering & Safety Systems Branch, Traffic Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road) at Walmart Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
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1/7/2026
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SIG. INVENTORY NO. 03-1196

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

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

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

SCROLL DOWN

THEN:

SET OUTPUT ASSIGNMENT #42 ON
SET OUTPUT ASSIGNMENT #43 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:

SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:

SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

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

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

SCROLL DOWN

THEN:

SET OUTPUT ASSIGNMENT #39 ON
SET OUTPUT ASSIGNMENT #40 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:

SET OUTPUT ASSIGNMENT #41 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:

SET OUTPUT ASSIGNMENT #40 ON

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1196
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 2 of 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road)
at
Walmart Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Transportation Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
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Raleigh, NC 27601
(919) 677-2000

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: 5DC709A8B8C3447...
1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-1196

1/7/2026 8:21:13 AM susan.pennington K:\RAL_TPTD\e_SIGNALS\0110364\31 W-5703C (Monkey Junction)\64 - Signal Design\W031196-2025e.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

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. THIS PROGRAMMING REASSIGNS DETECTOR 57 TO INPUT #19 SO THAT THE DELAY ON LOOP 7A CAN BE REDUCED FROM 10 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).....................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)........_
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)...N
CHANGE PHASE TIMING PAGE (1-4)......N
CHANGE PHASE CONTROL PAGE (1-4).....N
CHANGE OVERLAP CONTROL PAGE (1-4)...N
CHANGE INPUT PAGE (1-4).............N
CHANGE OUTPUT PAGE (1-4)............N
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).....................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)........_
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)...N
CHANGE PHASE TIMING PAGE (1-4)......N
CHANGE PHASE CONTROL PAGE (1-4).....N
CHANGE OVERLAP CONTROL PAGE (1-4)...N
CHANGE INPUT PAGE (1-4).............N
CHANGE OUTPUT PAGE (1-4)............N
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 7A (ALT.)

(program controller as shown below)

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#          ¦123456789101112131415 16
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#          ¦123456789101112131415 16
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

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          ¦123456789101112131415 16
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 '+'

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:          ¦123456789101112131415 16
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 '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'F' 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  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 '+'

```
PAGE 1: VEHICLE OVERLAP 'G' 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

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.

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'C' 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 '+'

NOTICE PAGE 2 →

```
PAGE 2: 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
```

PRESS '+' TWICE

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'F' 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  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 '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'G' 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

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1196
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 3.3

Electrical Detail - Sheet 3 of 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road) at Walmart Driveway

Division 3 — New Hanover County — Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

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Raleigh, NC 27601
(919) 677-2000

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by: SDC709A868C38447...
1/7/2026
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SIG. INVENTORY NO. 03-1196

1/7/2026 8:21:14 AM susan.pennington K:\RAL_TPTO_SIGNALS\#01103643i W-5703C (Monkey Junction)\S4 - Signal Design\#03119b-2025e.dgn

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 3.4

OUTPUT ASSIGNMENT PROGRAMMING DETAIL
TO REMAP OVERLAP 'G' TO LOADSWITCH S5 (PHASE 5)

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "30"

```
PAGE:1  C1 PIN:32  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................30
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.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S5 RED

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:32  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:32  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................30
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 54

```
PAGE:1  C1 PIN:33 VEHICLE PHASE
OUTPUT ASSIGNMENT #.................31
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.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S5 YELLOW

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:33 VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:33 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................31
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 46

```
PAGE:1  C1 PIN:34  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................32
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.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S5 GREEN

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:34  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:34  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................32
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1196
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Electrical Detail - Sheet 4 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
NC Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
NC DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road)
at
Walmart Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by:
SIGNATURE 1/7/2026

SIG. INVENTORY NO. 03-1196

1/7/2026 8:21:15 AM susan.pennington K:\RAL_TPD_SIGNALS\W5103643\1 W-5703C (Monkey Junction)#34 - Signal Design\031196-2025e.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 3.5

OUTPUT ASSIGNMENT PROGRAMMING DETAIL
TO REMAP OVERLAP 'F' TO LOADSWITCH AUX S6

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "37"

```
PAGE:1  C1 PIN:83  NOT ENABLED
OUTPUT ASSIGNMENT #.................37
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 RED

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................37
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 53

```
PAGE:1  C1 PIN:100 CONTROLLER FLASH
OUTPUT ASSIGNMENT #.................53
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................Y
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 YELLOW

ENTER A "Y" FOR VEHICLE OVERLAP.

THE OUTPUT IS SET AS CONTROLLER FLASH BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:1  C1 PIN:100 VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:100 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................53
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 38

```
PAGE:1  C1 PIN:84  NOT ENABLED
OUTPUT ASSIGNMENT #.................38
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 GREEN

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................38
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1196
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PLANS PREPARED IN THE OFFICE OF:
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NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Electrical Detail - Sheet 5 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 421 (Carolina Beach Road)
at
Walmart Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by:
SDC709A868C8447...
SIGNATURE
1/7/2026

SIG. INVENTORY NO. 03-1196

1/7/2026 8:21:16 AM susan.pennington K:\RAL_TPTD_SIGNALS\D1103643\1 W-5703C (Monkey Junction)\54 - Signal Design\031196-2025e.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 3.6

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 DEFAULT 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 OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phase 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: 03-1196
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

PLANS PREPARED IN THE OFFICE OF:
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Raleigh, NC 27601
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Electrical Detail - Sheet 6 of 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
NCDOT Transportation Mobility and Safety Division
Traffic Engineering Branch
Traffic Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road)
at
Walmart Driveway

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

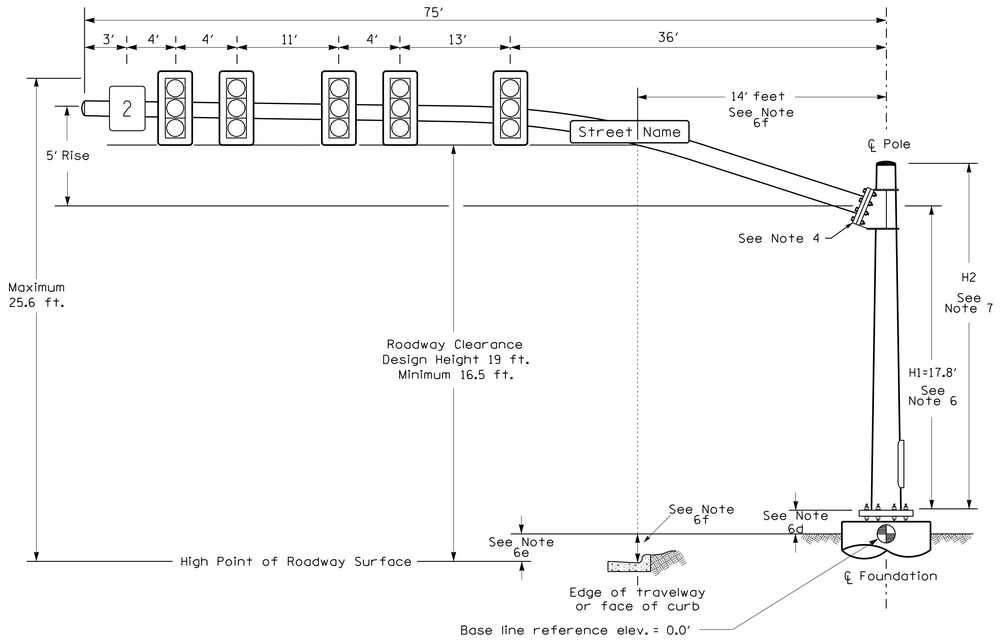
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1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-1196

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Design Loading for METAL POLE NO. 2



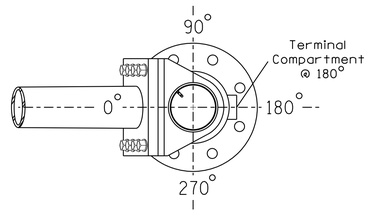
Elevation View

SPECIAL NOTE

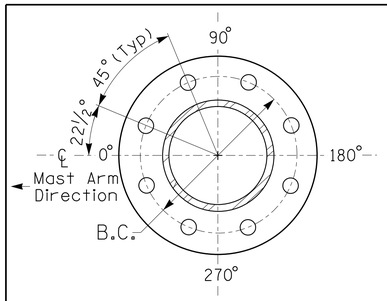
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 2	
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+2.3 ft.	
Elevation difference at Edge of travelway or face of curb	+2.1 ft.	

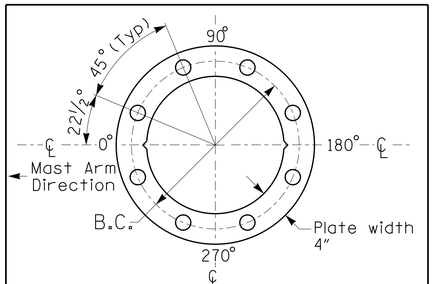


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



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

METAL POLE No. 2

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 3.7

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 8"-3 SECTION-WITH BACKPLATE	6.4 S.F.	22.0"W X 42.0"L	43 LBS
2	SIGN RIGID MOUNTED	9.0 S.F.	36.0"W X 36.0"L	20 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

NCDOT Wind Zone 1 (150 mph)

Prepared for: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road) at Walmart Driveway

Division 3 New Hanover County Wilmington

PLAN DATE: May 2025 REVIEWED BY: KP Baumann

PREPARED BY: SP Pennington REVIEWED BY:

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by: SDC709A868C8447 1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-1196

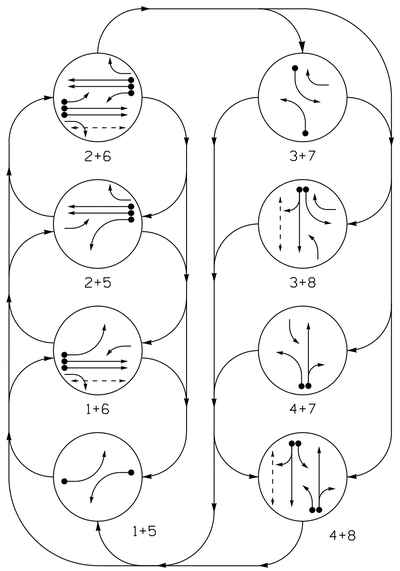
1/7/2026 8:21:20 AM susan.pennington K:\RAL_TPTD*.SIGNALS\031036431 W-5703C (Monkey Junction*54 - Signal Design\031196-2025_MP.dgn

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

8 Phase Fully Actuated w/ Alternate Phasing Wilmington Signal System

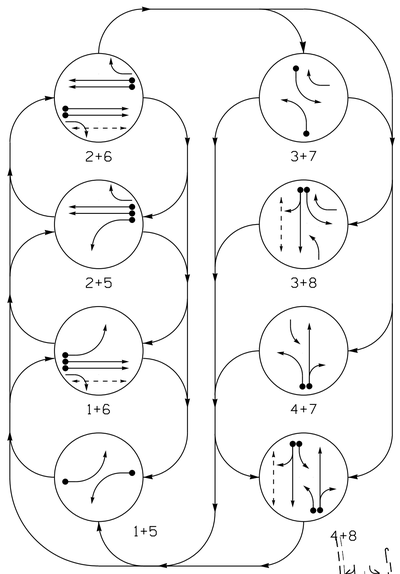
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←	←	F Y	F Y	R	R	R	R	R
21,22,24	R	R	G	G	R	R	R	R	R
23	R	R	F Y	F Y	F Y	R	R	R	R
31	R	R	R	R	←	←	F Y	F Y	R
41,42,43	R	R	R	R	R	R	G	G	R
51	←	F Y	←	F Y	R	R	R	R	R
61,62,64	R	G	R	G	R	R	R	R	R
63	R	F Y	R	F Y	R	R	R	R	R
71	R	R	R	R	←	F Y	←	F Y	R
81,82,83	R	R	R	R	R	G	R	G	R
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←	←	R	R	R	R	R	R	R
21,22,24	R	R	G	G	R	R	R	R	R
23	R	R	F Y	F Y	F Y	R	R	R	R
31	R	R	R	R	←	←	F Y	F Y	R
41,42,43	R	R	R	R	R	R	G	G	R
51	←	R	←	R	R	R	R	R	R
61,62,64	R	G	R	G	R	R	R	R	R
63	R	F Y	R	F Y	R	R	R	R	R
71	R	R	R	R	←	F Y	←	F Y	R
81,82,83	R	R	R	R	R	G	R	G	R
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

DETECTION ZONES: ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	DETECTOR PROGRAMMING: PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A *	6X40	0	*	Y	1	Y	Y	-	-	10#	-	-
					6**	Y	Y	-	-	-	-	-
3A *	6X40	0	*	Y	3	Y	Y	-	-	10	-	-
					8	Y	Y	-	-	3	-	-
4A *	6X40	0	*	Y	4	Y	Y	-	-	10	-	-
5A *	6X40	0	*	Y	5	Y	Y	-	-	10#	-	-
					2**	Y	Y	-	-	-	-	-
7A *	6X40	0	*	Y	7	Y	Y	-	-	10	-	-
					4	Y	Y	-	-	3	-	-
8A *	6X40	0	*	Y	8	Y	Y	-	-	10	-	-

*Microwave Detection Zone
** Disable phase call for loops during Alternate Phasing operation.
# Disable delay during Alternate Phasing operation.

Advance Microwave Detection

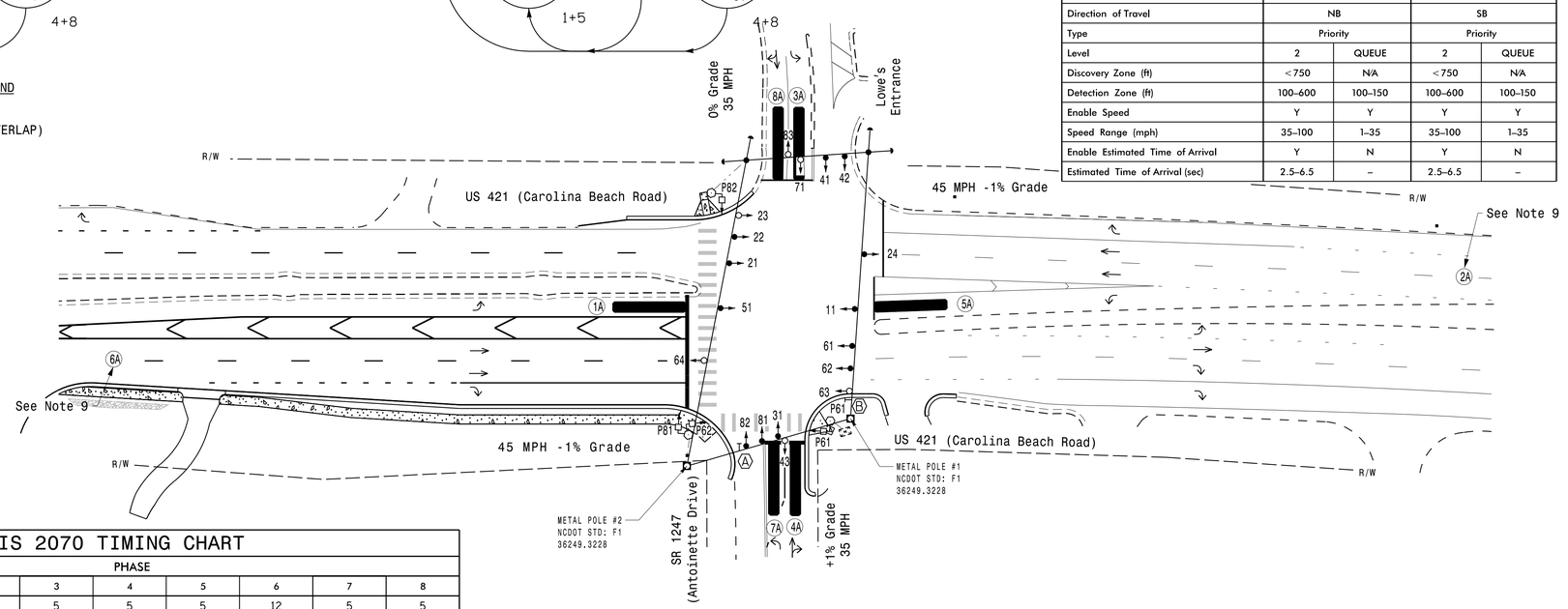
FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)	
Channel	1		1	
Phase	2		6	
Direction of Travel	NB		SB	
Type	Priority		Priority	
Level	2	QUEUE	2	QUEUE
Discovery Zone (ft)	<750	N/A	<750	N/A
Detection Zone (ft)	100-600	100-150	100-600	100-150
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35-100	1-35	35-100	1-35
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5-6.5	-	2.5-6.5	-

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 21, 22, 61, 62 81 & 82.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. The intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. The Division Traffic Engineer will determine the hours of use for each phasing plan.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
12. Signal system data: Controller Asset #0480
13. See Roadway Pavement Marking Plans for stopline and crosswalk locations.
14. Suppress the FYA in signal heads 51 and 63 during the first 7 seconds of Phase 6 Ped.
15. Install new conflict monitor in existing cabinet.

PHASING DIAGRAM DETECTION LEGEND

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



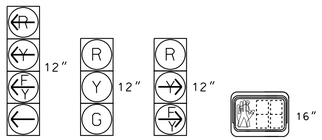
OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	5	12	5	5	5	12	5	5
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	20	30	20	90	20	30
Yellow Clearance	3.0	4.6	3.0	3.8	3.0	4.6	3.0	3.8
Red Clearance	3.1	1.5	3.1	2.6	3.1	1.5	3.3	2.6
Walk 1 *	-	-	-	-	-	14	-	13
Don't Walk 1	-	-	-	-	-	11	-	30
Advanced Walk	-	-	-	-	-	**	-	6
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
** See Note 14.

SIGNAL FACE I.D.

All Heads L.E.D.



11	21,22,24	23	P61,P62
31	41,42,43	63	P81,P82
51	61,62,64		
71	81,82,83		

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	
	Metal Strain Pole	
	Type II Signal Pedestal	
	Non-Intrusive Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
(A)	"RIGHT ON RED MUST YIELD TO U-TURN" Sign (R10-30)	(A)
(B)	"RIGHT TURN SIGNAL" Sign (R10-10R)	(B)

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Design Section, 750 N.Greenfield Pkwy.Garner,NC 27529

US 421 (Carolina Beach Road) at SR 1247 (Antoinette Drive) / Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE: May 2025 | REVIEWED BY: KP Baumann

PREPARED BY: CF Davis | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by: SIGNATURE 1/7/2026 DATE

SIG. INVENTORY NO. 03-0480

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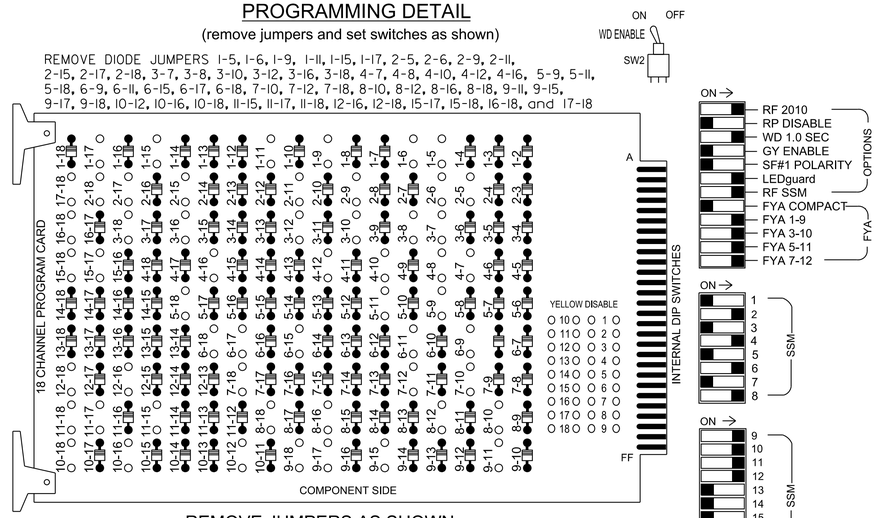
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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 4.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. 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	Ø1 1A **	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	Ø3 3A **	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	NOT USED				NOT USED								Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5 5A **	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	Ø7 7A **	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED				NOT USED									

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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

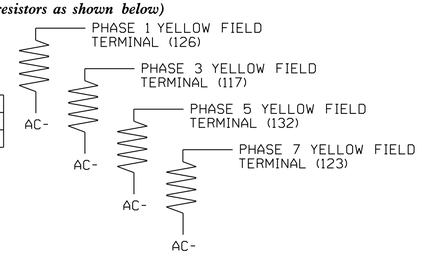
** SPECIAL DETECTOR NOTE

For all detectors, install multi-point microwave system for vehicle detection. Perform installation according to manufacture's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For zones 1A and 5A, inputs associated with the typical slot for an NCDOT installation are compatible with time of day instructions located on sheet 8 of this electrical detail.

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)

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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 13, 14,15, & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all Phases.
5. Program phases 2 and 6 for First Phases.
6. Disable all phases for Yellow Flash.
7. Disable all phases for startup in green.
8. Program overlaps 1, 2 and 5 as Wag Overlaps.
9. The cabinet and controller are part of the Wilmington Signal System.
10. Install new conflict monitor in existing cabinet.

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.....S1,S2,S3,S4,S5,S6,S6P,S7,S8,S8P, S9,S10,S11,S12,S13,S14
PHASES USED.....1,2,3,4,5,6,6PED,7,8,8PED
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....5+6
OVERLAP "D".....7+8
OVERLAP "E".....6
OVERLAP "F".....2+3

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	**	I1U	56	18	1	1	Y	Y			10
		J4U	48	10★	26	6	Y	Y			
		I1U	56	18★	51	1	Y	Y			
3A[2]	**	I5U	58	20	3	3	Y	Y			10
		J8U	50	12★	28	8	Y	Y	Y		3
5A[3]	**	J1U	55	17	5	5	Y	Y			10
		I4U	47	9★	22	2	Y	Y	Y		
		J1U	55	17★	55	5	Y	Y			
7A[4]	**	J5U	57	19	7	7	Y	Y			10
		I8U	49	11★	24	4	Y	Y	Y		3
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

★ See Input Page Assignment programming details on sheets 5 and 6.

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from I5-W to J8-W, on rear of input file.
[3] Add jumper from J1-W to I4-W, on rear of input file.
[4] Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

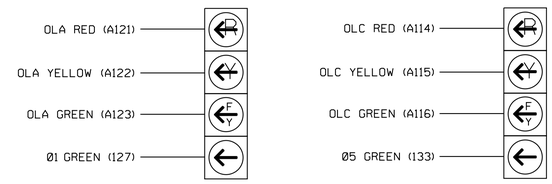
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11★	21,22 24	NU	31★	41,42 43	NU	51★	61,62 64	P61, P62	71★	81,82 83	P81, P82	11★	31★	63★	51★	71★	23★
RED		128			101			134			107				A111			A104
YELLOW	✳	129		✳	102		✳	135		✳	108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125	A112	A115	A102	A105
FLASHING YELLOW ARROW													A123	A126	A113	A116	A103	A106
GREEN ARROW	127			118			133			124								
✋									119			110						
🚶									121			112						

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 heads as shown)



NOTE

The sequence display for signal heads 11, 31, 51, and 71 requires special logic programming. See sheet 2 for programming instructions.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road) at SR 1247 (Antoinette Drive) / Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

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

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NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
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1/7/2026
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SIG. INVENTORY NO. 03-0480

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	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, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 AND 16.

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON
AND RED CLEAR ON PHASE #1 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #50 ON
SET OUTPUT ASSIGNMENT #51 OFF
PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #52 OFF
PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #1 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #51 ON
PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
AND RED CLEAR ON PHASE #5 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #42 ON
SET OUTPUT ASSIGNMENT #43 OFF
PRESS '+'

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #44 OFF
PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 5 (HEAD 51).

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #43 ON
PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGICAL I/O COMMAND #7 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #47 ON
SET OUTPUT ASSIGNMENT #48 OFF
PRESS '+'

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

LOGICAL I/O COMMAND #8 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #49 OFF
PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 3 (HEAD 31).

LOGICAL I/O COMMAND #9 (+/-COMMAND#)
IF YELLOW ON PHASE #3 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #48 ON
PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

LOGICAL I/O COMMAND #10 (+/-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
PRESS '+'

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 8 (HEAD 71).

LOGICAL I/O COMMAND #11 (+/-COMMAND#)
IF ACTIVE PHASE #7 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #41 OFF
PRESS '+'

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

LOGICAL I/O COMMAND #12 (+/-COMMAND#)
IF YELLOW ON PHASE #7 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #40 ON
PRESS '+'

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

LOGICAL I/O COMMAND #13 (+/-COMMAND#)
IF ACTIVE PHASE #6 IS OFF
AND PED CALL ON PHASE #6 IS ON
SCROLL DOWN
THEN:
SET LOGIC FLAG #6 ON
PRESS '+'

NOTE: LOGIC FOR FYA SUPPRESSION FOR HEADS 51 AND 63 DURING PED 6 LPI.

LOGICAL I/O COMMAND #14 (+/-COMMAND#)
IF ACTIVE PHASE #6 IS ON
AND LOGIC FLAG #6 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #45 ON
SET OUTPUT ASSIGNMENT #54 OFF
SET OUTPUT ASSIGNMENT #46 OFF
PRESS '+'

NOTE: LOGIC FOR FYA SUPPRESSION FOR HEAD 63 DURING PED 6 LPI.

LOGICAL I/O COMMAND #15 (+/-COMMAND#)
IF ACTIVE PHASE #6 IS ON
AND LOGIC FLAG #6 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #42 ON
SET OUTPUT ASSIGNMENT #43 OFF
SET OUTPUT ASSIGNMENT #44 OFF
PRESS '+'

NOTE: LOGIC FOR FYA SUPPRESSION FOR HEAD 51 DURING PED 6 LPI.

LOGICAL I/O COMMAND #16 (+/-COMMAND#)
IF ACTIVE PHASE #6 IS ON
AND LOGIC FLAG #6 IS ON
SCROLL DOWN
THEN:
DELAY FOR 7.0 SECONDS
SET LOGIC FLAG #6 OFF
LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

NOTE: LOGIC FOR FYA SUPPRESSION FOR HEADS 51 AND 63 DURING PED 6 LPI.

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

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
OUTPUT 45 = Overlap E Red
OUTPUT 54 = Overlap E Yellow
OUTPUT 46 = Overlap E Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 2 of 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 421 (Carolina Beach Road)
at
SR 1247 (Antoinette Drive) / Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: SOC709A861BC8447...
1/7/2026
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SIG. INVENTORY NO. 03-0480

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 4.3

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
  PHASE:          :1234567891011121314151 6
VEH OVL PARENTS:  :XX
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 '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
  PHASE:          :1234567891011121314151 6
VEH OVL PARENTS:  : XX
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 '+'

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
  PHASE:          :1234567891011121314151 6
VEH OVL PARENTS:  :   XX
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 '+'

```
 PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
  PHASE:          :1234567891011121314151 6
VEH OVL PARENTS:  :     XX
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 '+'

```
 PAGE 1: VEHICLE OVERLAP 'E' 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  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 '+'

```
 PAGE 1: VEHICLE OVERLAP 'F' SETTINGS
  PHASE:          :1234567891011121314151 6
VEH OVL PARENTS:  : XX
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.

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'A' 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 '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'B' 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 '+'

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 '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'D' 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 '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'E' 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  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
```

PRESS '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'F' SETTINGS
  PHASE:          :1234567891011121314151 6
VEH OVL PARENTS:  : XX
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
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 3 of 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 421 (Carolina Beach Road)
at
SR 1247 (Antoinette Drive) / Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: SDC709A6B2C5B4A7...
SIGNATURE 1/7/2026

SIG. INVENTORY NO. 03-0480

1/7/2026 8:21:31 AM susan.pennington K:\RAL_TPD*_SIGNALS\4011036431 W-5703C (Monkey Junction)\S4 - Signal Design\030480-2025e.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 4.4

OUTPUT ASSIGNMENT PROGRAMMING DETAIL
TO REMAP OVERLAP 'E' TO LOADSWITCH AUX S3

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "45"

```
PAGE:1  C1 PIN:91  NOT ENABLED
OUTPUT ASSIGNMENT #.................45
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 RED

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:91  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:91  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................45
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 54

```
PAGE:1  C1 PIN:101 CONTROLLER FLASH
OUTPUT ASSIGNMENT #.................54
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................Y
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 YELLOW

ENTER A "Y" FOR VEHICLE OVERLAP.

THE OUTPUT IS SET AS CONTROLLER FLASH BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:1  C1 PIN:101 VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:101 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................54
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 46

```
PAGE:1  C1 PIN:93  NOT ENABLED
OUTPUT ASSIGNMENT #.................46
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 GREEN

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:93  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:93  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................46
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.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 4 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road)
at
SR 1247 (Antoinette Drive) /
Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by: SOC709A861BC8447 — 1/7/2026

SIGNATURE

SIG. INVENTORY NO. 03-0480

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

PLANS PREPARED IN THE OFFICE OF:
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1/7/2026 8:21:32 AM susan.pennington K:\RAL_TPTO_SIGNALS\011036431 W-5703C (Monkey Junction)\S4 - Signal Design\030480-2025a.dgn

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 4.5

OUTPUT ASSIGNMENT PROGRAMMING DETAIL
TO REMAP OVERLAP 'F' TO LOADSWITCH AUX S6

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "37"

```
PAGE:1  C1 PIN:83  NOT ENABLED
OUTPUT ASSIGNMENT #.................37
FREQUENCY (O=DEFAULT) (O-25.5 HZ)...O.O
DUTY CYCLE (O=DEFAULT) (O - 100%)...O
MODE (O=SOLID,1=FLASH)..............O
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 RED

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(O=RED,1=YEL,2=GRN).....O
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................37
FREQUENCY (O=DEFAULT) (O-25.5 HZ)...O.O
DUTY CYCLE (O=DEFAULT) (O - 100%)...O
MODE (O=SOLID,1=FLASH)..............O
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 53

```
PAGE:1  C1 PIN:100 CONTROLLER FLASH
OUTPUT ASSIGNMENT #.................53
FREQUENCY (O=DEFAULT) (O-25.5 HZ)...O.O
DUTY CYCLE (O=DEFAULT) (O - 100%)...O
MODE (O=SOLID,1=FLASH)..............O
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................Y
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 YELLOW

ENTER A "Y" FOR VEHICLE OVERLAP.

THE OUTPUT IS SET AS CONTROLLER FLASH BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:1  C1 PIN:100 VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(O=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:100 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................53
FREQUENCY (O=DEFAULT) (O-25.5 HZ)...O.O
DUTY CYCLE (O=DEFAULT) (O - 100%)...O
MODE (O=SOLID,1=FLASH)..............O
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

NAVIGATE TO OUTPUT 38

```
PAGE:1  C1 PIN:84  NOT ENABLED
OUTPUT ASSIGNMENT #.................38
FREQUENCY (O=DEFAULT) (O-25.5 HZ)...O.O
DUTY CYCLE (O=DEFAULT) (O - 100%)...O
MODE (O=SOLID,1=FLASH)..............O
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 GREEN

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(O=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
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 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................38
FREQUENCY (O=DEFAULT) (O-25.5 HZ)...O.O
DUTY CYCLE (O=DEFAULT) (O - 100%)...O
MODE (O=SOLID,1=FLASH)..............O
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 5 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road)
at
SR 1247 (Antoinette Drive) /
Lowe's Entrance

Division 3 — New Hanover County — Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for:
NC DEPARTMENT OF TRANSPORTATION — Transportation Mobility and Safety Division — Traffic Engineering Branch — Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: 5DC709A868C8447...
1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-0480

PLANS PREPARED IN THE OFFICE OF:
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1/7/2026 8:21:34 AM susan.pennington K:\RAL_TP\TOM_SIGNALS\011036431 W-5703C (Monkey Junction\#S4 - Signal Design\030480-2025a.dgn

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 4.6

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(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 FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.

```
PAGE: 2 C1 PIN:48  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................10
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)..................Y
VEHICLE DETECTOR (1-64).............26
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 A 'Y' FOR NOT ENABLED

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 1A - PHASE 6)

```
PAGE: 2 C1 PIN:48  NOT ENABLED
INPUT ASSIGNMENT #.................10
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)..................Y
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)..................._
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 '+' TO ADVANCE TO INPUT 18

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................18
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).............1
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 '51' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 1A - PHASE 1)

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................18
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).............51
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

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

```
VEHICLE DETECTOR #51  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 '1' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```
VEHICLE DETECTOR #51  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: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 6 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road)
at
SR 1247 (Antoinette Drive) / Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Transportation Mobility and Safety Division, Traffic Engineering Branch, Signal & Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

PLANS PREPARED IN THE OFFICE OF:
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(919) 677-2000

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: 5DC709A868C8447...
1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-0480

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 4.7

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(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 FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................9
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)...................Y
VEHICLE DETECTOR (1-64).............22
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 A 'Y' FOR NOT ENABLED →

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #.................9
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)...................Y
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)..................
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 '+' TO ADVANCE TO INPUT 17

```
PAGE: 2 C1 PIN:55  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................17
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).............5
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 '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 5A - PHASE 5)

```
PAGE: 2 C1 PIN:55  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................17
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).............55
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

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

```
VEHICLE DETECTOR #55  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 '5' FOR PHASES ASSIGNED →

→ ENSURE DELAY IS '0' →

```
VEHICLE DETECTOR #55  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: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

Electrical Detail - Sheet 7 of 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 421 (Carolina Beach Road)
at
SR 1247 (Antoinette Drive) / Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Traffic Engineering Branch, Traffic Signal Systems Section

750 N.Greenfield Pkwy.Garner,NC 27529

PLANS PREPARED IN THE OFFICE OF:
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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: 5DC709A868C8447...
1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-0480

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Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	Sig. 4.8

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 DEFAULT 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 OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO ENSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0480
DESIGNED: MAY 2025
SEALED: 01/07/2026
REVISED: N/A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Transportation Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 421 (Carolina Beach Road)
at
SR 1247 (Antoinette Drive) / Lowe's Entrance

Division 3 | New Hanover County | Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN
DocuSigned by: 5DC709A868C8447...
1/7/2026
SIGNATURE

SIG. INVENTORY NO. 03-0480

1/7/2026 8:21:37 AM susan.pennington K:\RAL_TPTD_SIGNALS\011036431 W-5703C (Monkey Junction)\S4 - Signal Design\030480-2025e.dgn

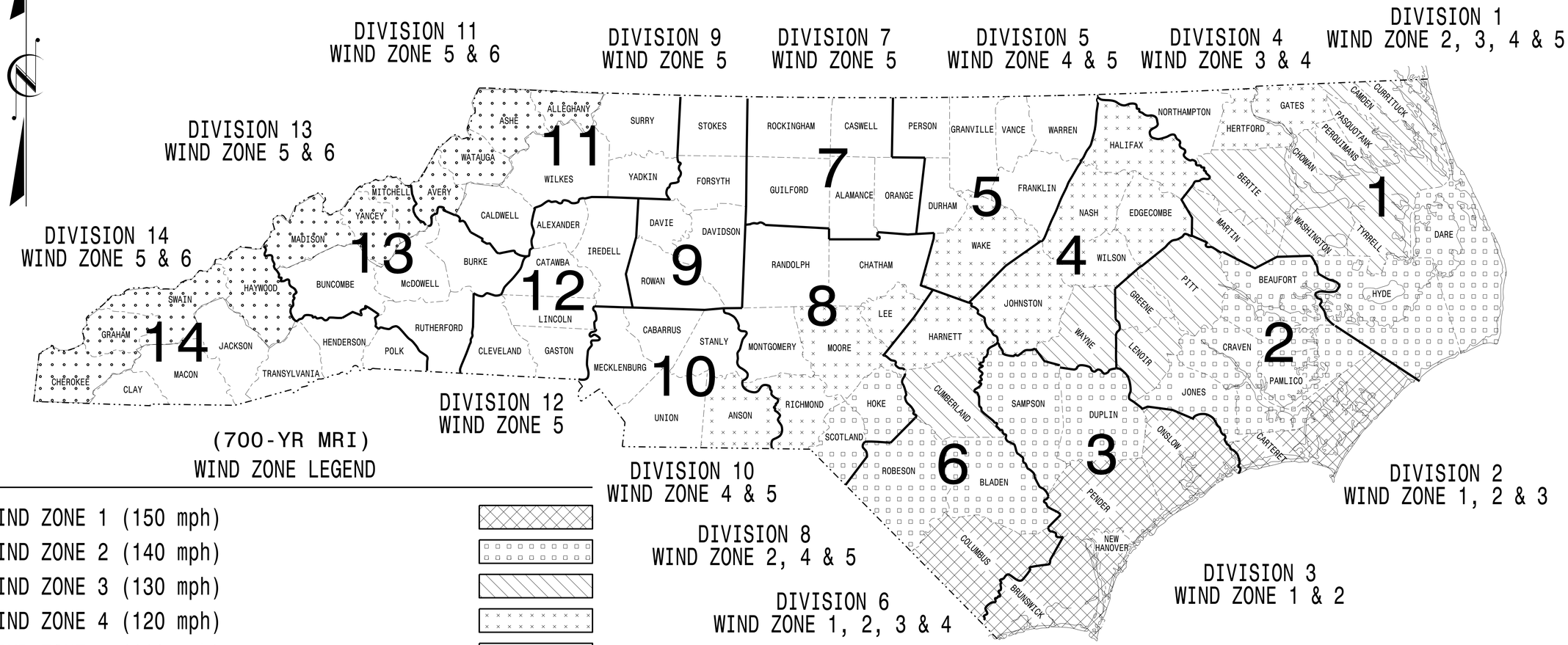
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PROJECT I.D.NO.	SHEET NO.
W-5703C	Sig.M1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)

NCDOT METAL POLE STANDARDS



(700-YR MRI)
WIND ZONE LEGEND

WIND ZONE 1 (150 mph)	
WIND ZONE 2 (140 mph)	
WIND ZONE 3 (130 mph)	
WIND ZONE 4 (120 mph)	
WIND ZONE 5 (110 mph)	
WIND ZONE 6 (135 mph) Special Wind Zone	

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

Prepared in the Offices of:

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

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

AASHTO LRFD

Standard Specifications for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

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

MOBILITY AND SAFETY DIVISION – TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS UNIT

D.Y. ISHAK – STATE SIGNALS ENGINEER

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

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

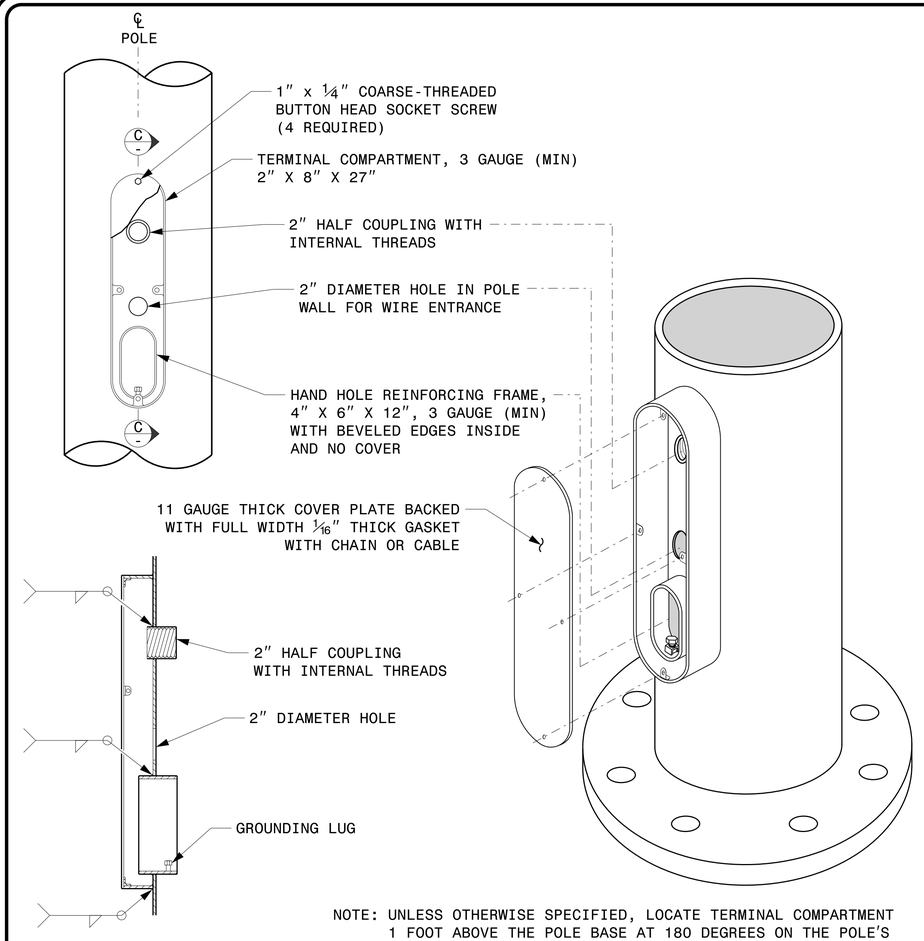
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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

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kdurigon

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SECTION C-C

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

TERMINAL COMPARTMENT DETAIL

MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y ----/----/----/----
ARM-A D/T/L/Y ----/----/----/----
----/----/----/----
ARM-B D/T/L/Y ----/----/----/----
----/----/----/----
A.B. DIA./B.C./L/Y ----/----/----/----
NCDOT SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

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

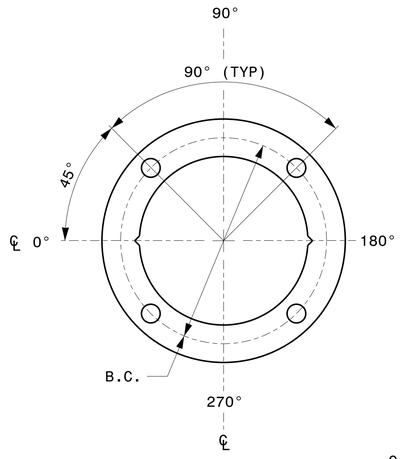
MFG _____ MFG. DATE: MM/YY
SECTION D/T/L/Y ----/----/----/----
NCDOT SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

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

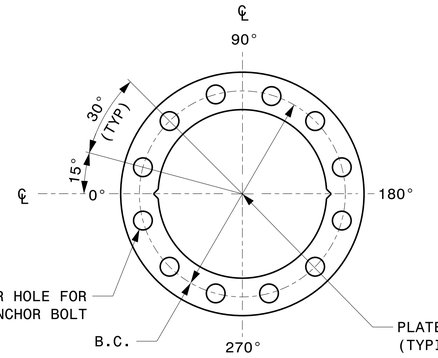
NOTES:

1. D = DIAMETER, T = THICKNESS, L = LENGTH, Y = YIELD STRENGTH
2. A.B. = ANCHOR BOLT
3. B.C. = BOLT CIRCLE OF ANCHOR BOLTS
4. IF STANDARD DESIGN, INCLUDE CASE NUMBER IN ADDITION TO POLE NUMBER ON "NCDOT POLE NO." LINE.
5. SIGNAL INV. NUMBER AND POLE I.D. NUMBER. SEE DRAWING M3 AND M4 FOR MOUNTING POSITIONS OF I.D. TAGS.

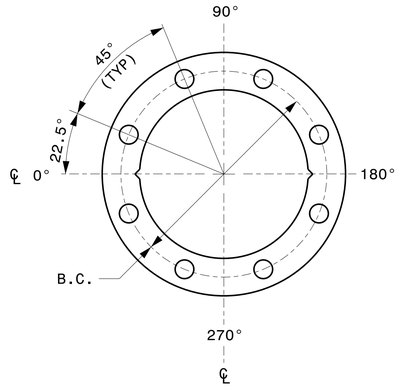
IDENTIFICATION TAG DETAILS



4 BOLT PATTERN



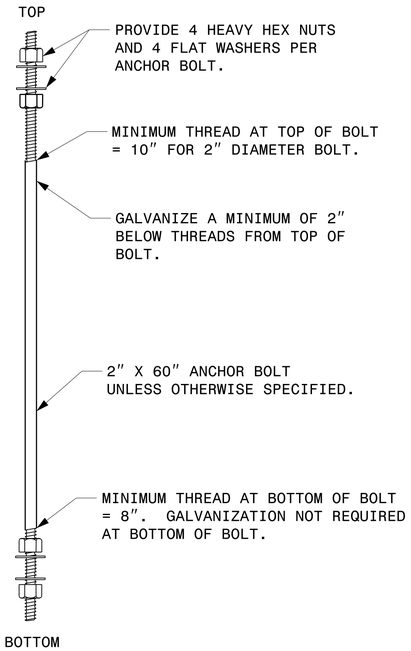
12 BOLT PATTERN



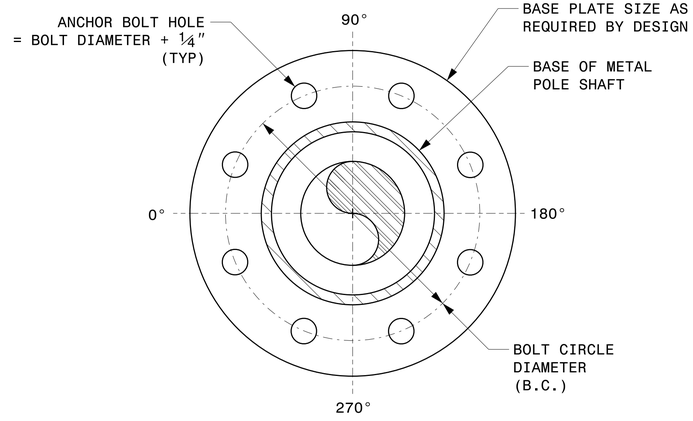
8 BOLT PATTERN

CONSTRUCT TEMPLATES AND PLATES FROM ¼″ (MIN) THICK STEEL. GALVANIZING IS NOT REQUIRED.

BASE PLATE TEMPLATE AND ANCHOR BOLT LOCK PLATE DETAILS



ANCHOR BOLT DETAIL



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

TYPICAL BASE PLATE DETAIL

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

SCALE
0 NA
NONE

Typical Fabrication Details For All Metal Poles

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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

PROJECT I.D. NO.	SHEET NO.
W-5703C	Sig.M2

Fabrication Details – All Metal Poles

03-SEP-2023 12:24
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kcdurigon

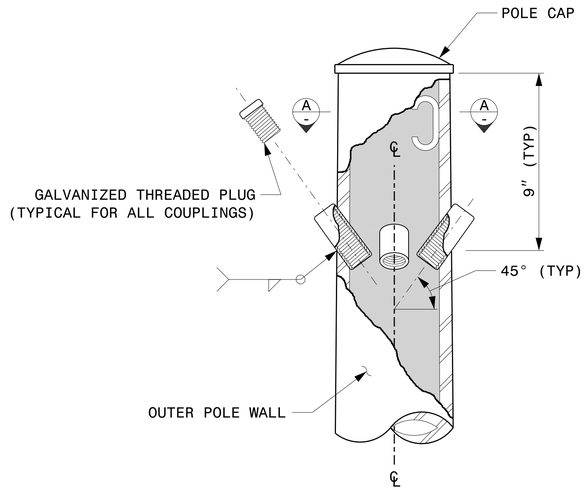
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W-5703C	Sig.M3

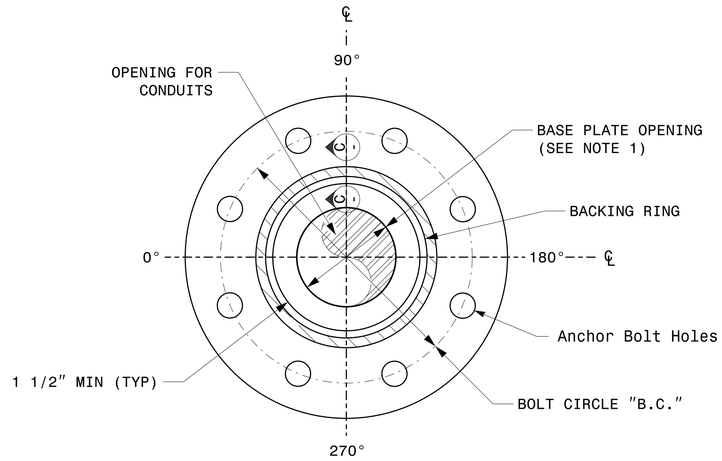
Fabrication Details – Strain Poles

NOTE:

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

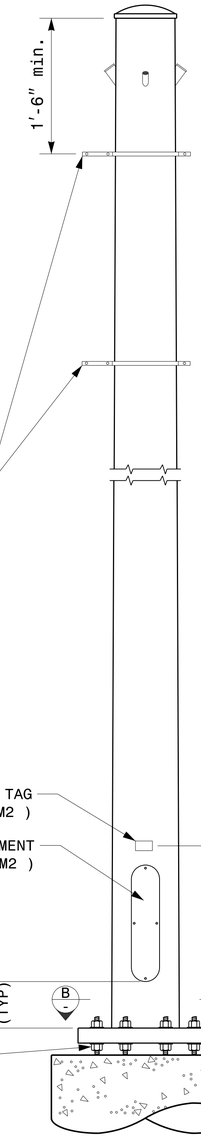


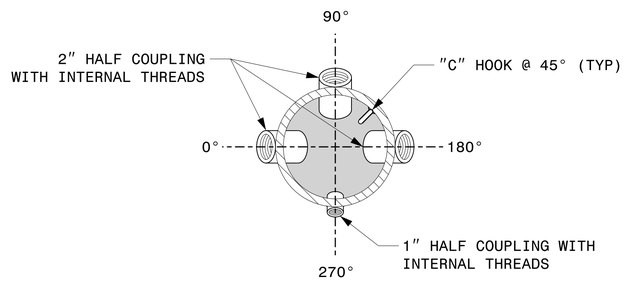
CABLE ENTRANCES AT TOP OF POLE



SECTION B-B

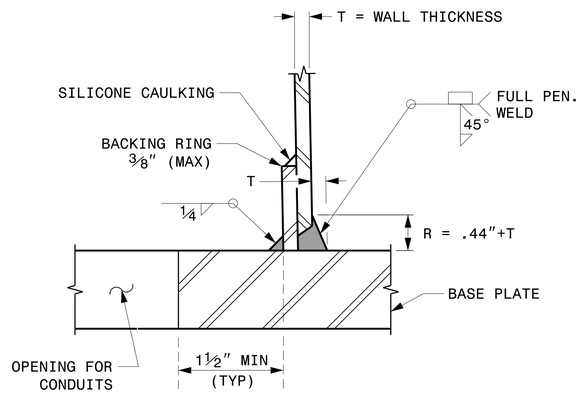
POLE BASE PLATE DETAILS
(8 AND 12 BOLT PATTERN)





SECTION A-A

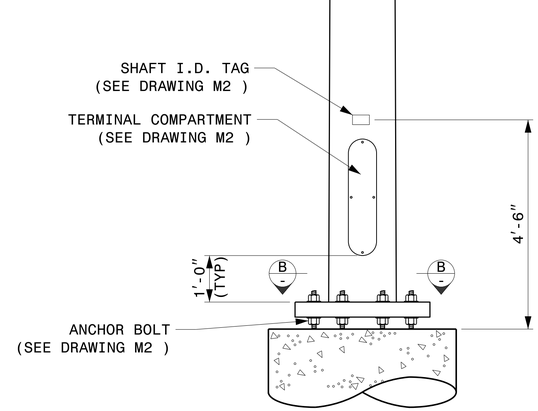
RADIAL ORIENTATION OF FACTORY INSTALLED ACCESSORIES AT TOP OF POLE



SECTION C-C

(POLE ATTACHMENT TO BASE PLATE)

FULL-PENETRATION GROOVE WELD DETAIL



MONOTUBE STRAIN POLE

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

Typical Fabrication Details
For
Strain Poles

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

REVISIONS	INIT.	DATE

SCALE
0 NA
NONE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
036626
ENGINEER
KEVIN C. DURIGON

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

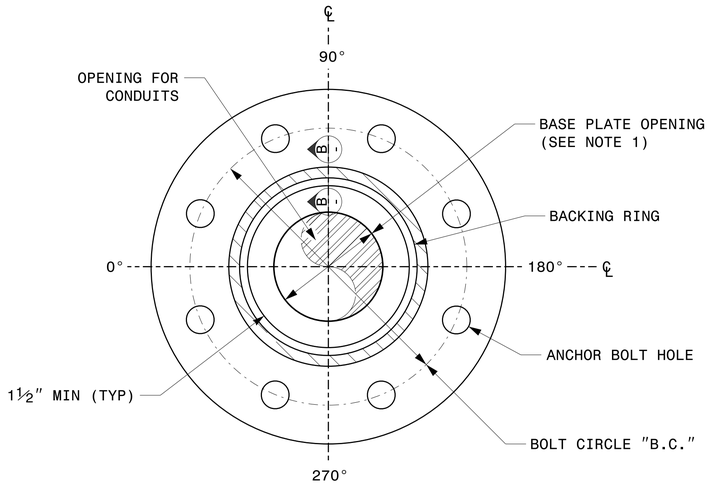
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kcdurigon

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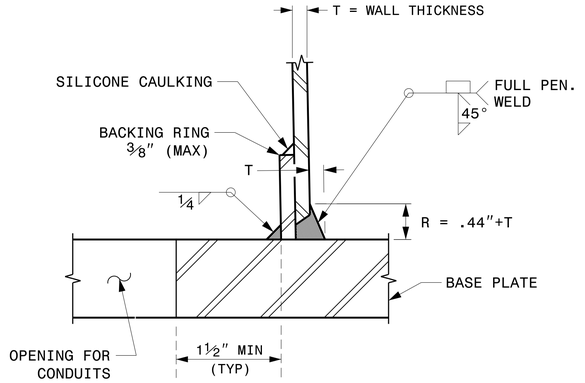
PROJECT I.D. NO.	SHEET NO.
W-5703C	Sig.M4

NOTE:

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

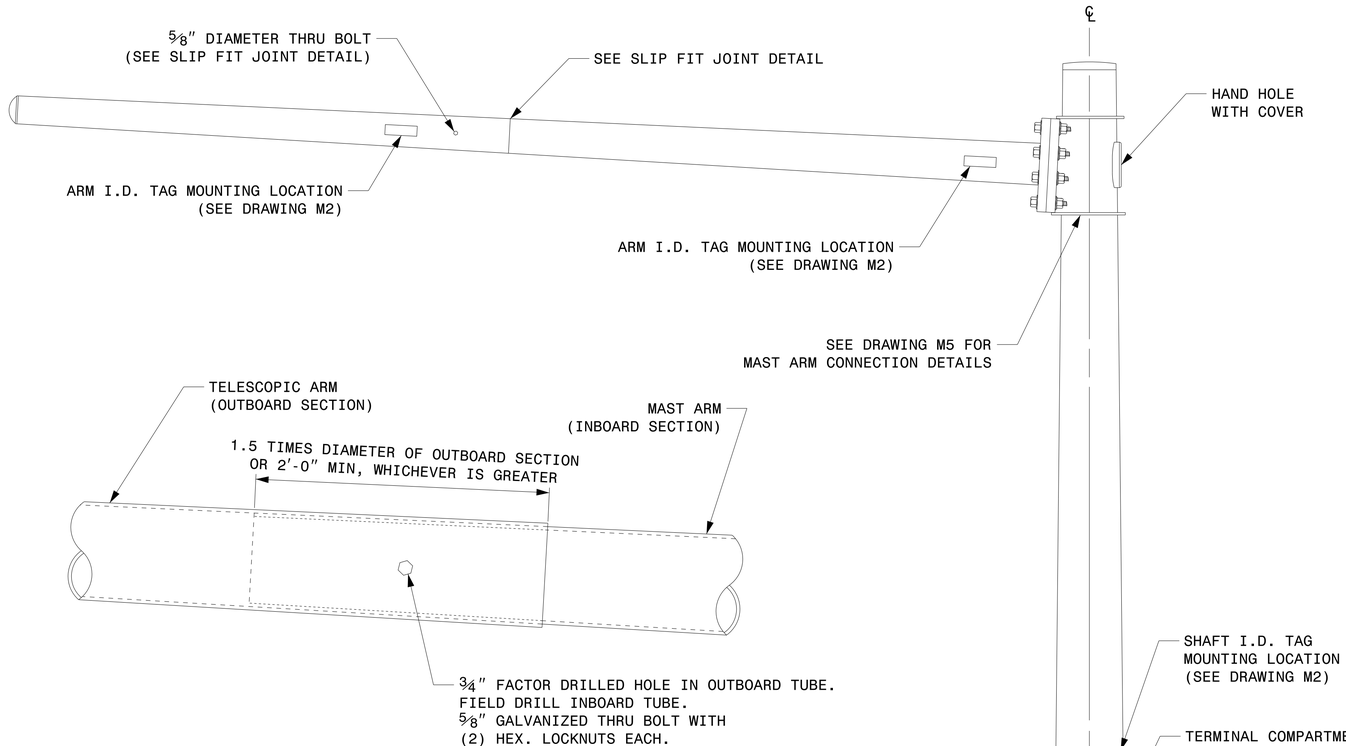


SECTION A-A
POLE BASE PLATE DETAILS

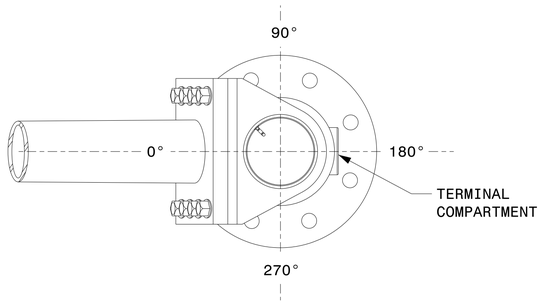


SECTION B-B
(POLE ATTACHMENT TO BASE PLATE)

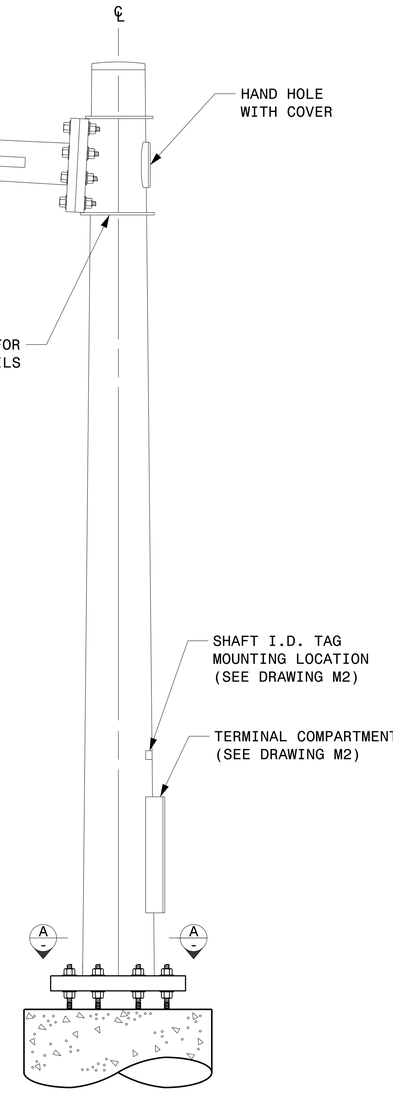
FULL-PENETRATION GROOVE WELD DETAIL



SLIP FIT JOINT DETAIL FOR MAST ARM



MAST ARM RADIAL ORIENTATION



MAST ARM POLE

Fabrication Details – Mast Arm Poles

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

SCALE
0 NA
NONE

Typical Fabrication Details For Mast Arm Poles

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

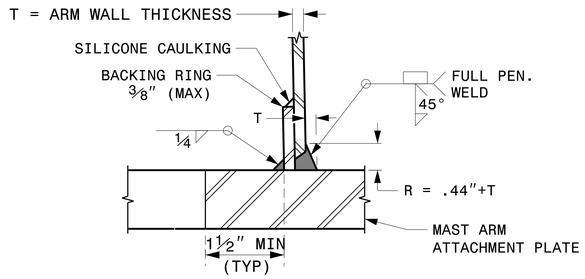
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09/21/2023
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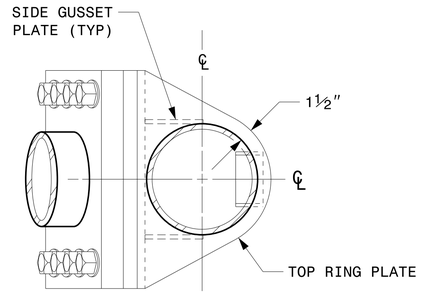
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WELDED RING STIFFENED MAST ARM CONNECTION

PROJECT I.D. NO.	SHEET NO.
W-5703C	Sig.M5



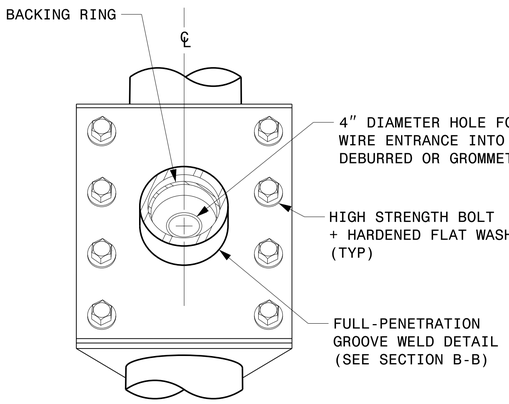
SECTION B-B
FULL-PENETRATION GROOVE WELD DETAIL



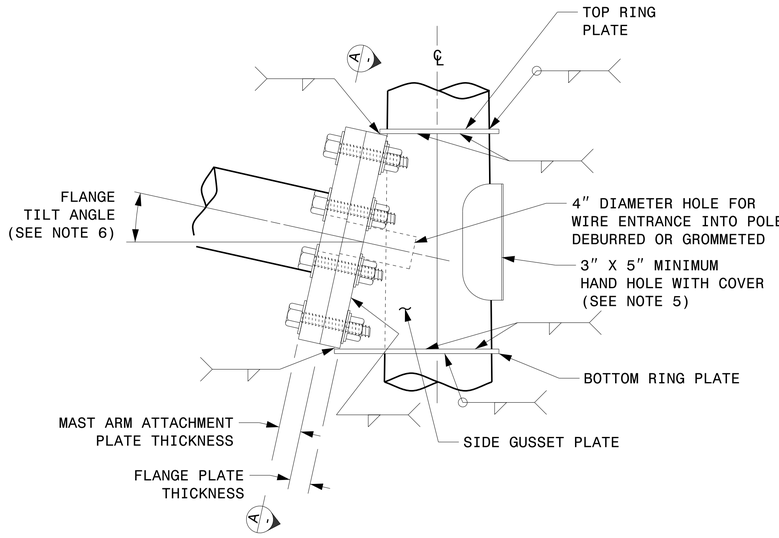
PLAN VIEW

NOTES:

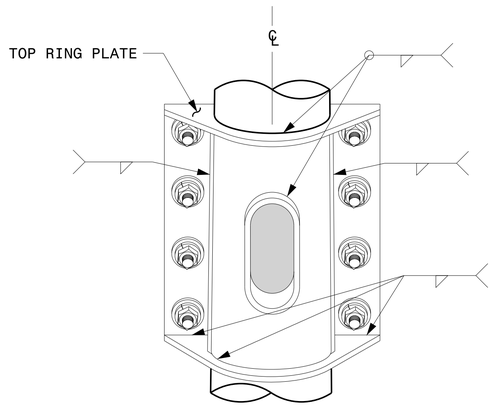
1. PROVIDE A PERMANENT MEANS OF IDENTIFICATION ABOVE THE MAST ARM TO INDICATE PROPER ATTACHMENT ORIENTATION OF THE MAST ARM.
2. DESIGNER WILL DETERMINE THE SIZE OF ALL STRUCTURAL COMPONENTS, PLATES, FASTENERS, AND WELDS SHOWN UNLESS THEY ARE ALREADY SPECIFIED.
3. FABRICATOR IS RESPONSIBLE FOR PROVIDING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



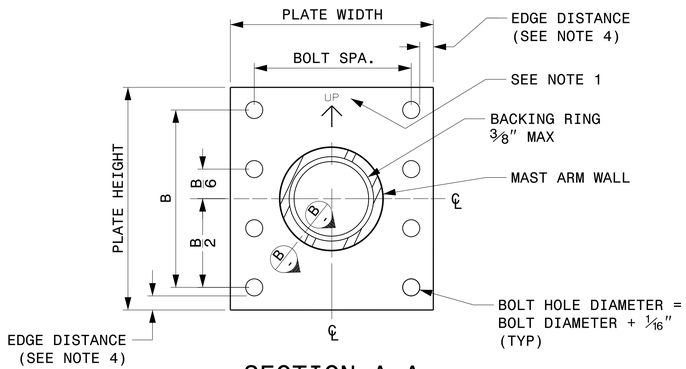
FRONT ELEVATION VIEW



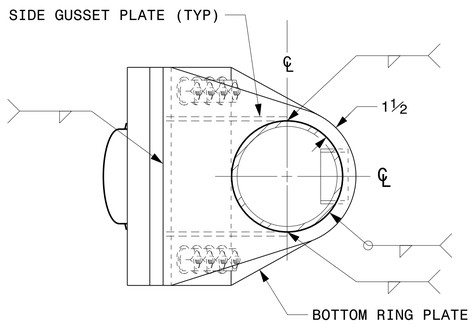
SIDE ELEVATION VIEW



BACK ELEVATION VIEW



SECTION A-A
MAST ARM ATTACHMENT PLATE



BOTTOM VIEW

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Mast Arm Connection To Pole

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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

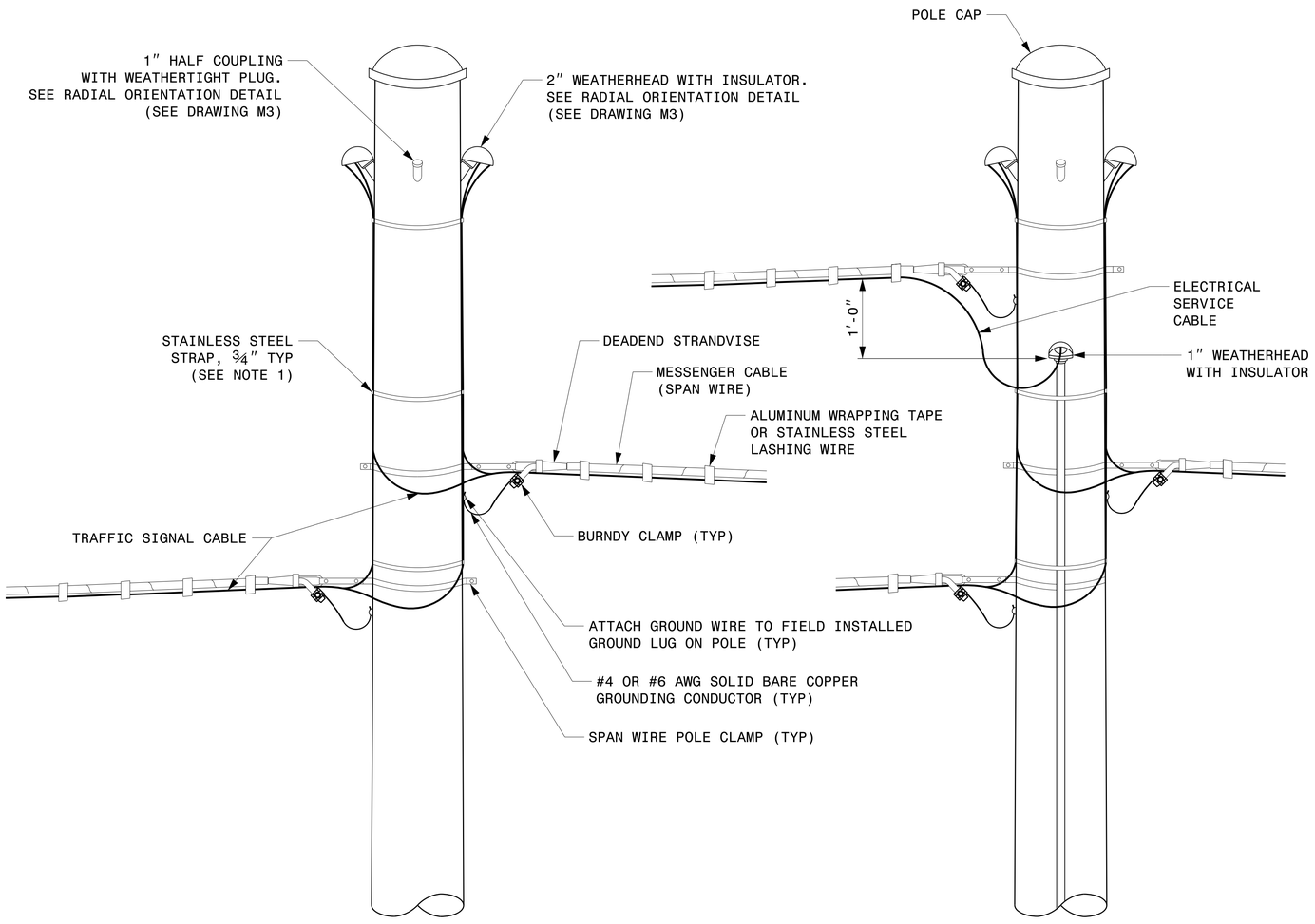
Fabrication Details – Mast Arm Connection

03-OCT-2023 12:18
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kcdurigon

Docusign Envelope ID: D1CFFDCA-D155-4338-A6BD-FB6F4448A8C9

PROJECT I.D. NO.	SHEET NO.
W-5703C	Sig.M6

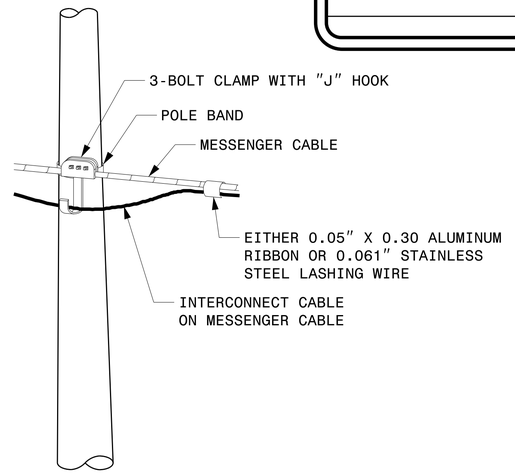
Fabrication Details – Strain Pole Attachments



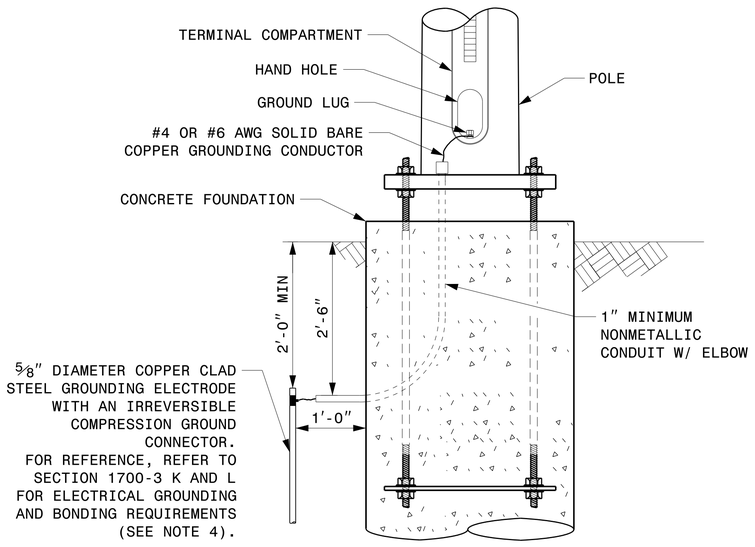
STRAIN POLE ATTACHMENTS

NOTES:

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



ATTACHMENT OF CABLE TO INTERMEDIATE METAL POLE



METAL POLE GROUNDING DETAIL FOR STRAIN POLE AND MAST ARM

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Pole Attachments

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

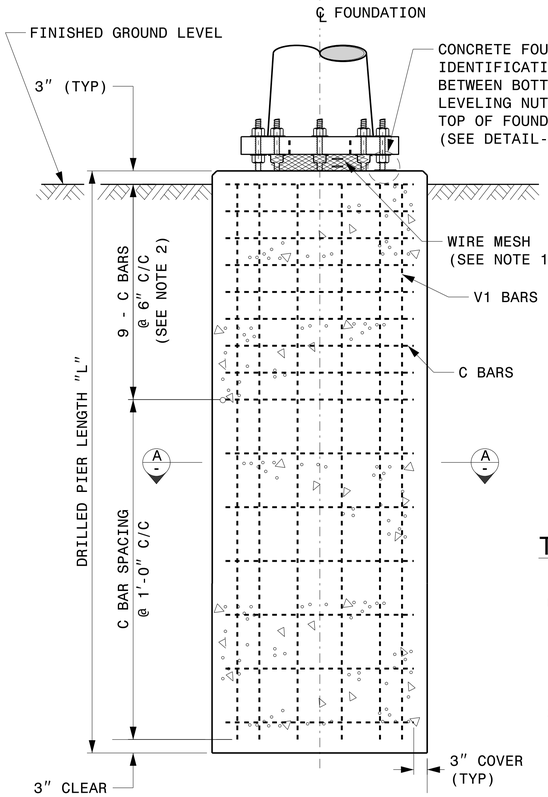
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Kevin Durigon
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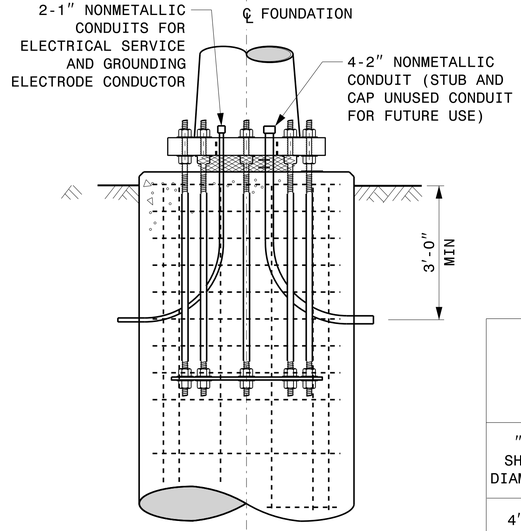
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PROJECT I.D. NO.	SHEET NO.
W-5703C	Sig.M7

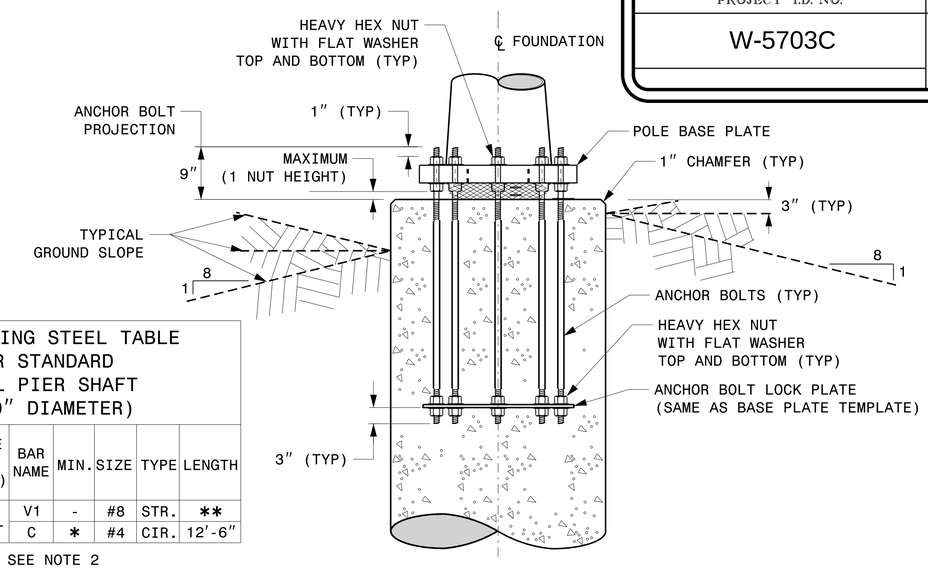
Construction Details – Foundations



CONCRETE SHAFT ELEVATION



TYPICAL FOUNDATION CONDUIT DETAILS



TYPICAL FOUNDATION ANCHOR BOLT DETAILS

(REINFORCING CAGE NOT SHOWN FOR CLARITY)

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

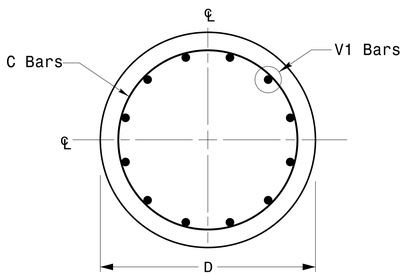
"D" SHAFT DIAMETER	CONCRETE VOLUME (CU. YDS)	BAR NAME	MIN.	SIZE	TYPE	LENGTH
4′-0″	.465 X L	V1	-	#8	STR.	**
		C	*	#4	CIR.	12′-6″

* SEE NOTE 2
** SEE NOTE 3

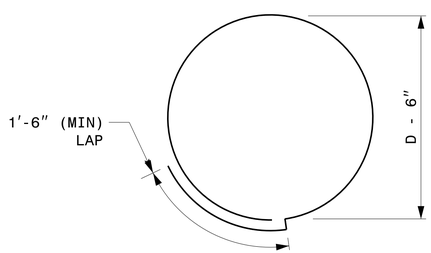
GENERAL NOTES:

1. IF ACTUAL SUBSURFACE CONDITIONS DIFFER SIGNIFICANTLY FROM BORING DATA, CONTACT THE ENGINEER BEFORE EXCAVATING OR PLACING CONCRETE.
2. CIRCULAR TIE REINFORCING RINGS MAY BE VERTICALLY ADJUSTED BY +/-3″ AT A DEPTH BETWEEN 2′-0″ AND 3′-0″ TO FACILITATE THE INSTALLATION OF ELECTRICAL CONDUIT ENTERING IN THE CAGE.
3. FOR STANDARD FOUNDATIONS, SEE SHEET SIG. M8 FOR DETAILS. VERTICAL REINFORCING BARS (V1) MAY BE HORIZONTALLY ADJUSTED BY +/-3″ TO FACILITATE THE INSTALLATION OF ELECTRICAL CONDUIT ENTERING INTO THE CAGE.
4. PROVIDE 2″ TO 5″ FOUNDATION PROJECTION ABOVE GROUND LEVEL, DEPENDING ON THE GROUND SLOPE.
5. UNLESS OTHERWISE SHOWN, FOUNDATION DESIGNS ARE BASED ON NON-SLOPING LEVEL GROUND SURFACES WITH SLOPE RATIOS OF 8:1 (H:V) OR FLATTER. IF ACTUAL GROUND LINE SLOPES ARE STEEPER, CONTACT THE ENGINEER BEFORE EXCAVATING OR PLACING CONCRETE.
6. CONSTRUCT FOUNDATIONS IN ACCORDANCE WITH NCDOT STANDARD PROVISIONS SP09 R005- FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES. ALL APPLICABLE 2024 NCDOT STANDARD SPECIFICATIONS ARE REFERENCED IN THIS PROVISION. REFER TO THE NCDOT RESOURCES/SPECIFICATIONS PAGE LOCATED ON THE CONNECT NCDOT WEBSITE.

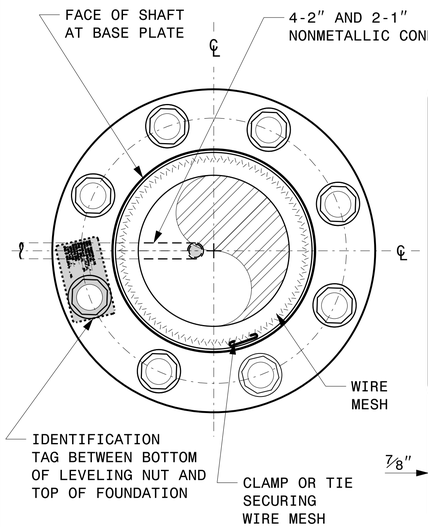
   https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx
7. USE AIR ENTRAINED AA CONCRETE MIX WITH A COMPRESSION STRENGTH OF f′c=4500 psi (MIN) AFTER 28 DAYS.
8. USE ASTM A615 GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL. MAINTAIN AT LEAST 3″ COVER ON ALL REINFORCEMENT.
9. LOCATE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



SECTION A-A

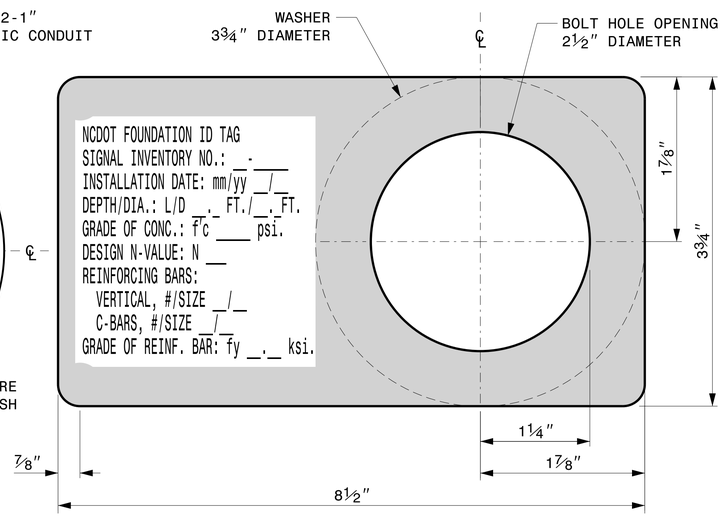


TYPICAL "C" BAR DETAIL



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

DETAIL-A



CONCRETE FOUNDATION IDENTIFICATION TAG DETAILS

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

SCALE: 0 NA — NONE

Construction Details For Foundations

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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kcdurigon

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SOIL CONDITION

Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Reactions at the Pole Base: Axial (kip)	Shear (kip)	Moment (ft–kip)	Clay: Medium N–Value 4–8	Clay: Stiff N–Value 9–15	Clay: Very Stiff N–Value 16–30	Clay: Hard N–Value >30	Sand: Loose N–Value 4–10	Sand: Medium N–Value 11–30	Sand: Dense N–Value >30	Longitudinal: Bar Size (#)	Longitudinal: Quantity (ea.)	Stirrups: Bar Size (#)	Stirrups: Spacing (in.)
			STANDARD STRAIN POLES			STANDARD FOUNDATIONS 48″ Diameter Drilled Pier Length (L) – Feet							Reinforcement			
S26L1	26	22	2	9	210	19.5	12.5	9	6.5	15.5	14.5	13	8	12	4	12
S26L2	26	23	2	10	240	19.5	12	9	6.5	15.5	14.5	13	8	12	4	12
S26L3	26	25	2	11	260	20.5	12	10	8	16	15	13	8	12	4	12
S30L1	30	22	2	9	230	19	11	9	7	15.5	14	12.5	8	12	4	12
S30L2	30	23	2	10	270	20	12	10	8	16	14.5	13	8	12	4	12
S30L3	30	25	2	11	290	21	12	10	8	17	15	13.5	8	12	4	12
S30H1	30	25	3	13	355	23	13	11	9	18	16.5	14.5	8	12	4	12
S30H2	30	29	3	15	405	25	14	11	9	19	17.5	15.5	8	14	4	12
S30H3	30	29	3	16	430	26	15	12	9	20	18	16	8	14	4	6
S35L1	35	22	3	8	260	19.5	12	10	8	15.5	14.5	13	8	12	4	12
S35L2	35	23	3	10	300	21	12	10	8	16.5	15	13.5	8	12	4	12
S35L3	35	25	3	10	320	21.5	13	10	8	17	15.5	14	8	12	4	12
S35H1	35	25	3	12	390	23.5	14	11	9	18	17	15	8	14	4	12
S35H2	35	29	4	14	460	26	15	12	9	20	18	16	8	14	4	6
S35H3	35	29	4	16	495	28.5	15	13.5	10	21.5	19	17	8	14	4	6

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

GENERAL NOTES:

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

FOUNDATION SELECTION:

1. PERFORM A STANDARD PENETRATION TEST AT EACH PROPOSED FOUNDATION SITE TO DETERMINE "N" VALUE.
2. SELECT THE APPROPRIATE WIND ZONE FROM M1 DRAWING.
3. SELECT THE SOIL TYPE (CLAY OR SAND) THAT BEST DESCRIBES THE SOIL CHARACTERISTICS.
4. GET THE APPROPRIATE STANDARD POLE CASE NUMBER FROM THE PLANS OR FROM THE ENGINEER.
5. SELECT THE APPROPRIATE COLUMN UNDER "STANDARD FOUNDATIONS" BASED ON SOIL TYPE AND "N" VALUE. SELECT THE APPROPRIATE ROW BASED ON THE POLE LOAD CASE.
6. THE FOUNDATION DEPTH IS THE VALUE SHOWN IN THE "STANDARD FOUNDATIONS" CATEGORY WHERE THE COLUMN AND THE ROW INTERSECT.
7. USE CONSTRUCTION PROCEDURES AND DESIGN METHODS PRESCRIBED BY FHWA-NHI-10-016 MANUAL FOR DRILLED SHAFTS.

PROJECT I.D. NO.	SHEET NO.
W-5703C	Sig.M8

Standard Strain Pole Foundation – All Soil Conditions

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

SCALE 0 NA NONE

Standard Strain Pole Foundation for All Soil Conditions

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

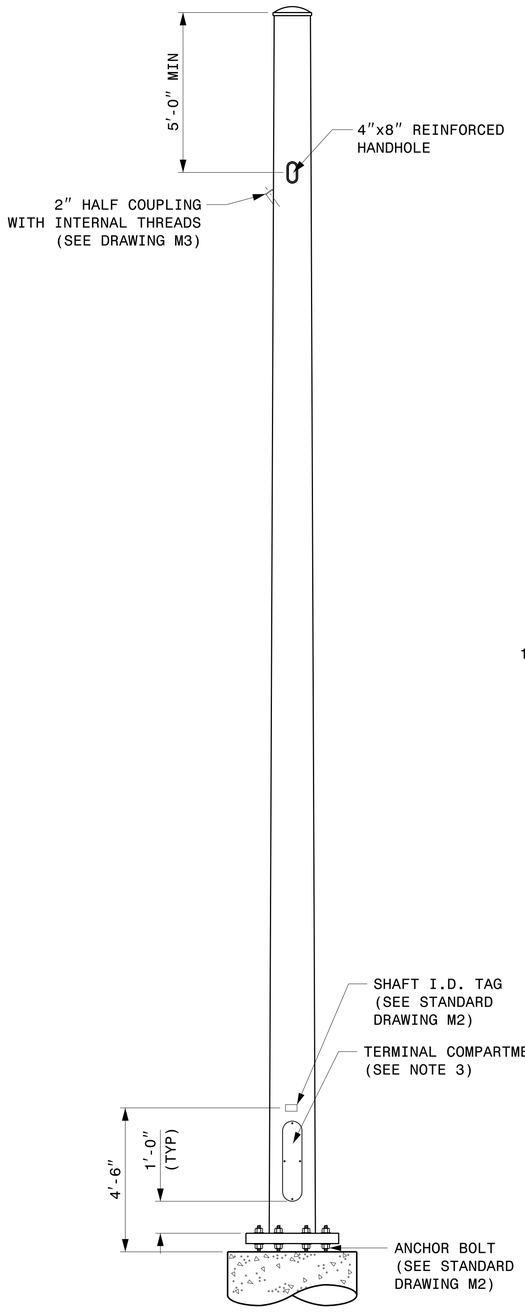
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kcdurigon

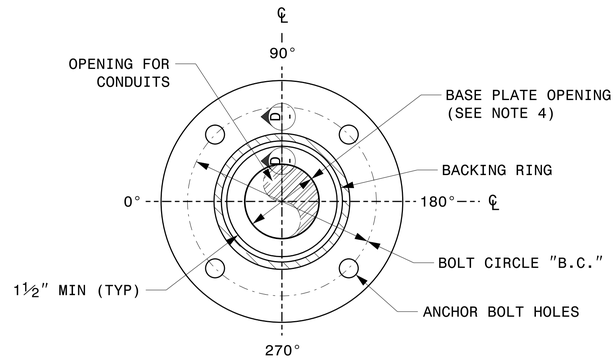
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PROJECT I.D. NO.	SHEET NO.
W-5703C	Sig.M9

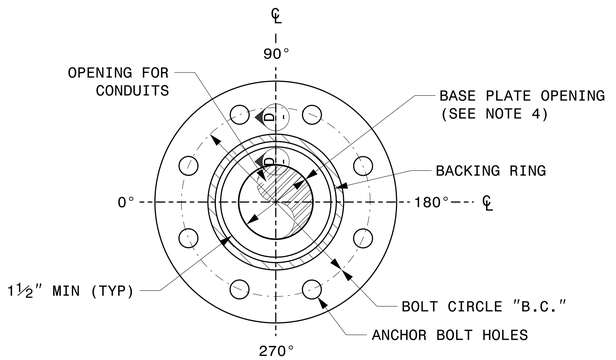
Fabrication Details – CCTV Camera Poles



CCTV CAMERA POLE
(NOT TO SCALE)

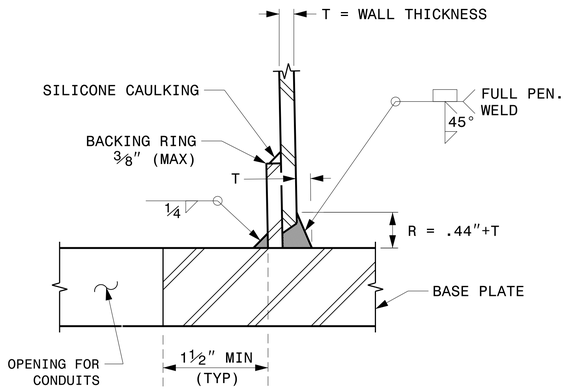


4 BOLT PATTERN
FOR POLES UP TO 40'



8 BOLT PATTERN
FOR POLES TALLER THAN 40'

BASE PLATE DETAILS



SECTION D-D
(POLE ATTACHMENT TO BASE PLATE)

FULL-PENETRATION
GROOVE WELD DETAIL

NOTES:

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

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
CCTV Poles

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

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Kevin Durigon
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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	SCP-01

1 INSTALL COAX CABLE

2 INSTALL ETHERNET CABLE

3 EXISTING ETHERNET (OR COAX) CABLE

4 INSTALL SMFO CABLE

5 EXISTING SMFO CABLE

6 INSTALL FIBER OPTIC DROP CABLE ASSEMBLY

7 INSTALL TRACER WIRE

8 TRENCH

9 INSTALL PVC CONDUIT

10 INSTALL RIGID, GALVANIZED STEEL CONDUIT

11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD

12 INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL

13 INSTALL OUTER–DUCT POLYETHYLENE CONDUIT

14 INSTALL POLYETHYLENE CONDUIT

15 DIRECTIONAL DRILL CONDUIT

16 BORE AND JACK CONDUIT

17 INSTALL CABLE(S) IN EXISTING CONDUIT

18 INSTALL CABLE(S) IN NEW CONDUIT

19 INSTALL CABLE(S) IN EXISTING RISER

20 INSTALL CABLE(S) IN NEW RISER

21 INSTALL CABLE(S) IN EXISTING CONDUIT STUB–OUTS

22 INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB–OUTS WHEN AVAILABLE)

23 INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB–OUTS WHEN AVAILABLE)

24 INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET

25 INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET

26 INSTALL NEW ETHERNET EDGE SWITCH

27 INSTALL NEW FIBER OPTIC TRANSCEIVER

28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPLICE CABLE IN CABINET

29 INSTALL UNDERGROUND SPLICE ENCLOSURE

30 INSTALL AERIAL SPLICE ENCLOSURE

31 MODIFY EXISTING INTERCONNECT CENTER /SPLICE ENCLOSURE

32 INSTALL POLE MOUNTED SPLICE CABINET

33 INSTALL BASE MOUNTED SPLICE CABINET

34 INSTALL CABINET FOUNDATION

35 INSTALL CCTV CAMERA POLE MOUNTED CABINET

36 INSTALL CCTV CAMERA ASSEMBLY

37 INSTALL CCTV CAMERA WOOD POLE

38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION

39 INSTALL JUNCTION BOX

40A INSTALL OVERSIZED JUNCTION BOX

40B INSTALL SPECIAL OVERSIZED JUNCTION BOX (36″ x 24″ x 24″)

41 REMOVE EXISTING JUNCTION BOX

42 INSTALL WOOD POLE

43 REMOVE EXISTING WOOD POLE

44 INSTALL AERIAL GUY ASSEMBLY

45 INSTALL STANDARD GUY ASSEMBLY

46 INSTALL SIDEWALK GUY ASSEMBLY

47 INSTALL MESSENGER CABLE

48A REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE

48B REMOVE EXISTING COMMUNICATIONS CABLE

49 BACK PULL EXISTING COMMUNICATIONS CABLE

50 INSTALL CELL MODEM AND ANTENNA

51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE

52A INSTALL DELINEATOR MARKER

52B INSTALL JUNCTION BOX MARKER

53A STORE 20 FEET OF COMMUNICATIONS CABLE

53B STORE 50 FEET OF EACH COMMUNICATIONS CABLE

54 LASH CABLE(S) TO EXISTING COMMUNICATIONS CABLE

55 LASH CABLE(S) TO EXISTING MESSENGER CABLE

56 LASH CABLE(S) TO NEW MESSENGER CABLE

57 MODIFY EXISTING ELECTRICAL SERVICE

58 INSTALL NEW ELECTRICAL SERVICE

59 INSTALL NEW EQUIPMENT CABINET DISCONNECT

60 BOND TRACER WIRE TO EQUIPMENT GROUND BUS

61 DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS

62 BOND RISER AND MESSENGER CABLE TO POLE GROUND

63 BOND RISER TO POLE GROUND

64 BOND MESSENGER CABLE TO POLE GROUND

65 INSTALL HEAT SHRINK TUBING RETROFIT KIT

66 INSTALL MOLDABLE DUCT SEAL

67 SLACK SPAN

LEGEND

FO	NEW FIBER OPTIC COMMUNICATIONS CABLE
EXI	EXISTING COMMUNICATIONS CABLE
REM	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
DD	NEW DIRECTIONAL DRILLED CONDUIT

NEW		EXISTING
	OVERSIZED JUNCTION BOX	
	WOOD POLE	
S	AERIAL SPLICE ENCLOSURE	S
S	UNDERGROUND SPLICE ENCLOSURE	S
	METAL POLE	
	CCTV ASSEMBLY	
	STANDARD GUY ASSEMBLY	
	SIDEWALK GUY ASSEMBLY	
	CABLE STORAGE RACKS (SNOW SHOES)	
	SIGNAL/EQUIPMENT CABINET	
S	SPLICE CABINET	S
	FLAT PANEL ANTENNA (SINGLE)	
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION	
	YAGI ANTENNA (SINGLE)	
	OMNI ANTENNA	
SP	SIGNAL POLE	SP
XX–XXXX	SIGNAL INVENTORY NUMBER	XX–XXXX

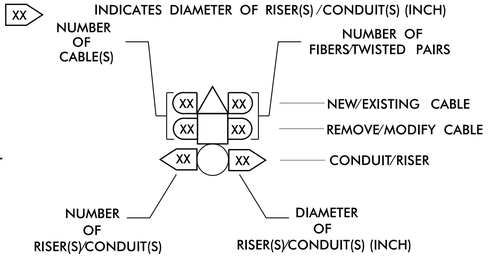
CONSTRUCTION NOTE SYMBOLOGY KEY

XX INDICATES NUMBER OF CABLES, LOOPS, ETC.

XX INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.

XX INDICATES NUMBER OF RISER(S)/CONDUIT(S)

XX INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



ATTACHMENT POINT:

XX″/SS / YYY DISTANCE ABOVE (IN)/ATTACHMENT POINT REFERENCE POINT

YYY / XX″/SS REFERENCE POINT DISTANCE BELOW (IN)/ATTACHMENT POINT

"SS"	REFERENCE LOCATION
FS =	FRONT SIDE OF POLE
BS =	BACK SIDE OF POLE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

Signal System - City of Wilmington

Construction Notes

Division 3 New Hanover County Wilmington

PLAN DATE: May 2025 REVIEWED BY: MC Burke

PREPARED BY: REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 N.T.S.

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 058683 ENGINEER MOLLY C. BURKE

DocuSigned by: Molly Burke 954EEB6C04C843E... 1/7/2026

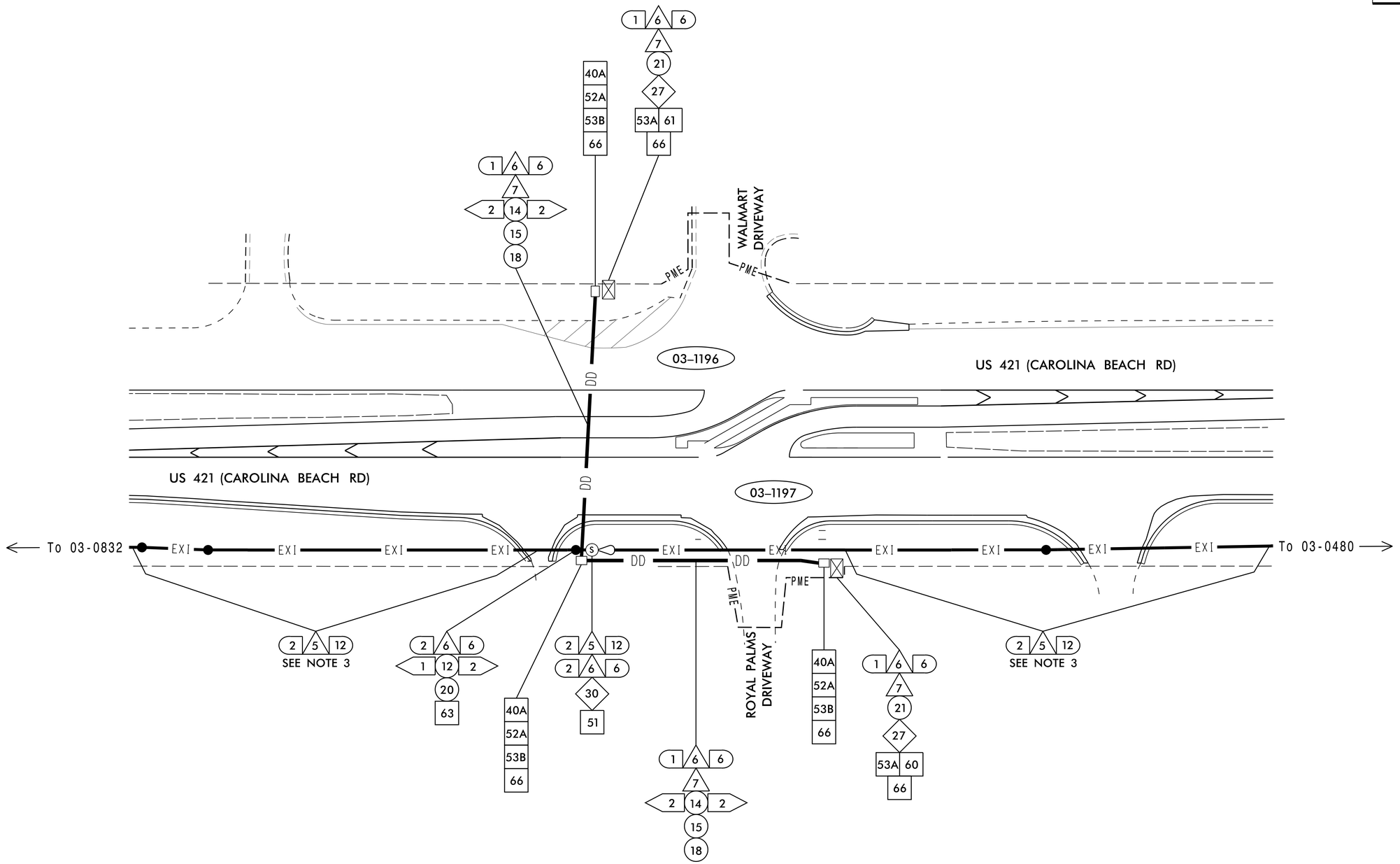
SIGNATURE DATE

SIG. INVENTORY NO.

1/7/2026 8:23:56 AM susan.pennington ##kimley-horn.com#CL_RAL1#RAL_TPTD#_SIGNALS#011036431 W-5703C (Monkey Junction#SS - Cable Routing#_CADD#SCP-01.dgn

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	SCP-02



NOTES:

1) NOTIFY THE SIGNAL SYSTEMS MANAGEMENT ENGINEER AT 910-341-4696, FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL ALL SIGNALS ARE COMMUNICATING WITH THE CENTRAL SYSTEM.

2) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETIALS. IF DISCREPENCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3) THERE ARE TWO EXISTING 12-FIBER CABLES FOR THE CITY OF WILMINGTON SIGNAL SYSTEM LASHED TOGETHER ON THE EXISTING POLE LINE. DO NOT CUT OR DISTURB THE EXISTING 12-FIBER CABLE THAT ORIGINATES AT THE EXISTING SPLICE CABINET AT CAROLINA BEACH RD & COLLEGE RD AND RUNS TO THE EXISTING SIGNAL CABINETS AT 03-0480 (CAROLINA BEACH RD & ANTOINETTE DR) AND 03-0653 (CAROLINA BEACH RD & SILVA TERRA DR) BUT BYPASSES THE EXISTING SIGNAL CABINET AT 03-0832 (CAROLINA BEACH RD & SILVER LAKE RD). CUT AND SPLICE INTO THE EXISTING 12-FIBER CABLE THAT ORIGINATES IN THE EXISTING SIGNAL CABIENT AT 03-0480 AND ENDS IN THE EXISTING SIGNAL CABINET AT 03-0832.

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

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

Signal System - City of Wilmington
Communications Cable and Conduit Routing Plans

Division 3 New Hanover County Wilmington

PLAN DATE:	May 2025	REVIEWED BY:	MC Burke
PREPARED BY:		REVIEWED BY:	

SCALE 0 N.T.S.

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 058683 ENGINEER MOLLY C. BURKE
DocuSigned by: Molly Burke 954EF80C4C847E...
1/7/2026
SIGNATURE DATE
SIG. INVENTORY NO.

1/7/2026 8:23:59 AM susan.pennington
\\kimley-horn.com\CL_RAL1\RAL_TPTO_SIGNALS\011036431 W-5703C (Monkey Junction)\SS - Cable Routing\1.CADD\SCP-02.dgn

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	SCP-03

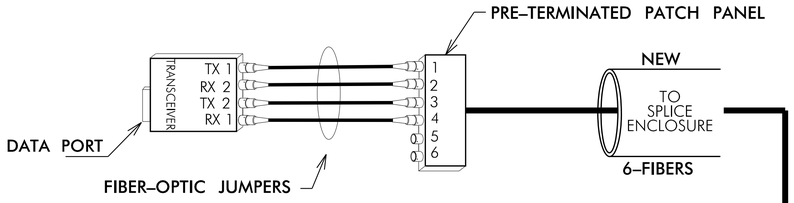
COLOR CODE
TIA/EIA 598-C

(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

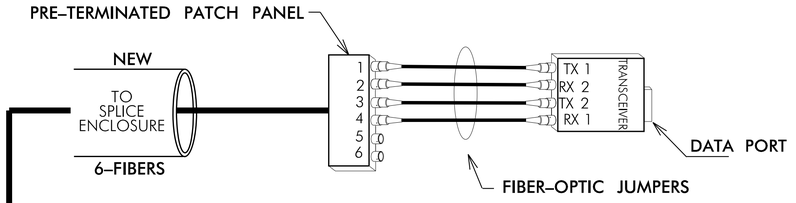
LEGEND
- X – FUSION SPLICE INDIVIDUAL FIBER
- O – EXISTING SPLICE
- □ – EXPRESS INDIVIDUAL FIBER

EXPRESS	EXPRESS ENTIRE BUFFER TUBE
SPLICE	SPLICE ENTIRE BUFFER TUBE OR MAINTAIN IF EXISTING EXPRESSED

NEW CONTROLLER CABINET
US 421 (CAROLINA BEACH RD.) AT WALMART DRIVEWAY
SIG. INV. # 03–1196

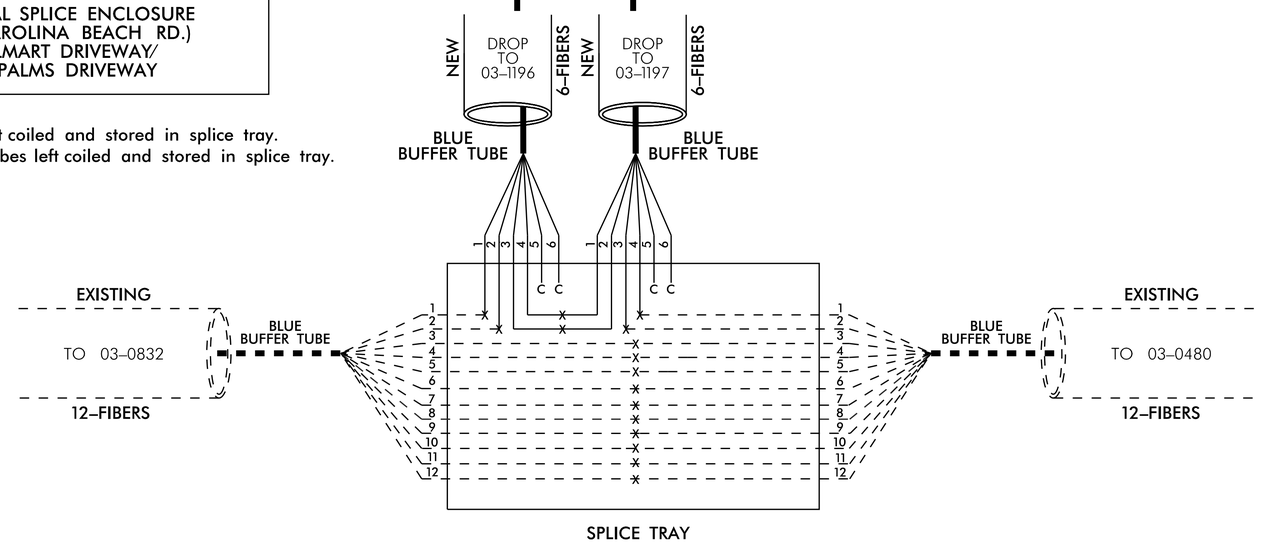


NEW CONTROLLER CABINET
US 421 (CAROLINA BEACH RD.) AT ROYAL PALMS DRIVEWAY
SIG. INV. # 03–1197



NEW AERIAL SPLICE ENCLOSURE
US 421 (CAROLINA BEACH RD.)
AT WALMART DRIVEWAY/
ROYAL PALMS DRIVEWAY

Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



NOTES:

1) NOTIFY THE SIGNAL SYSTEMS MANAGEMENT ENGINEER AT 910-341-4696, FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL ALL SIGNALS ARE COMMUNICATING WITH THE CENTRAL SYSTEM.

2) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETIALS. IF DISCREPENCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3) TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING PROPER TERMINATIONS.

4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

1/7/2026 8:24:02 AM susan.pennington \\kimley-horn.com\CL_RAL1\RAL_TPTO_SIGNALS\W011036431 W-5703C (Monkey Junction)\SS - Cable Routing\1_CADD\SCP-03.dgn

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Prepared for the Offices of:
NCDOT Transportation Mobility and Safety Division
750 N. Greenfield Pkwy., Garner, NC 27529

Signal System - City of Wilmington
Splice Detail

Division 3 New Hanover County Wilmington

PLAN DATE: May 2025	REVIEWED BY: MC Burke
PREPARED BY:	REVIEWED BY:

SCALE 0 N.T.S.

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 058683 ENGINEER MOLLY C. BURKE

DocuSigned by: Molly Burke 954EEB6C04C843E... SIGNATURE 1/7/2026 DATE

SIG. INVENTORY NO.

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TIP PROJECT: W-5703C

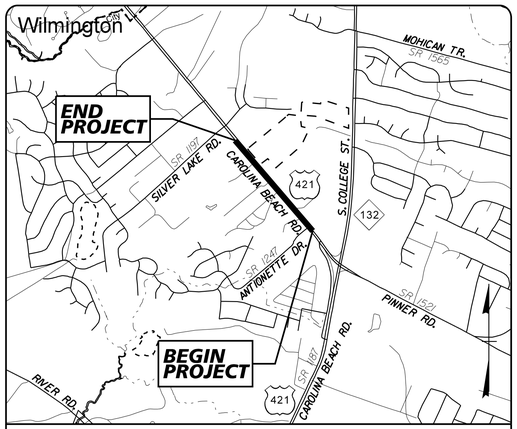
T.I.P. NO.	SHEET NO.
W-5703C	UC-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
NEW HANOVER COUNTY

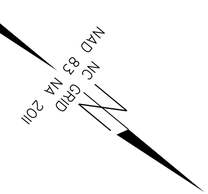
LOCATION: US 421 (CAROLINA BEACH ROAD) FROM ANTOINETTE DR TO APPROXIMATELY 200' NORTH OF WILLOUGHBY PARK ROAD

TYPE OF WORK: RELOCATION OF WATER AND SEWER INFRASTRUCTURE



VICINITY MAP N.T.S.

UC PLANS

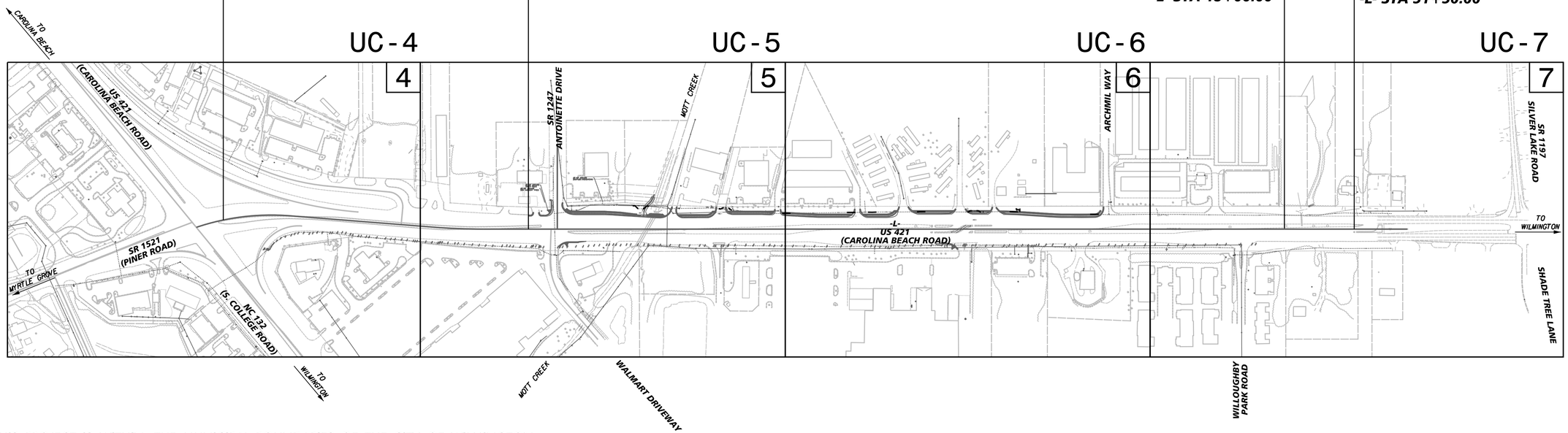


BEGIN CONSTRUCTION
-L- STA 11+80.00

BEGIN TIP PROJECT
W-5703C
-L- STA 21+95.00

END TIP PROJECT
W-5703C
-L- STA 48+00.00

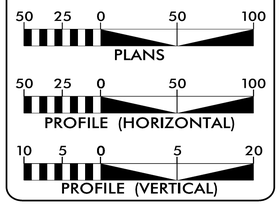
END CONSTRUCTION
-L- STA 51+50.00



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF WILMINGTON

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	UTILITY NOTES
UC-3A THRU UC-3C	UTILITY DETAILS
UC-4 THRU UC-7	UTILITY CONSTRUCTION SHEETS
UC-8	UTILITY PROFILE SHEET

WATER AND SEWER OWNERS ON PROJECT

WATER & SEWER – CFPUA

PREPARED IN THE OFFICE OF

Kimley»Horn © 2025

NC LICENSE #F-0102
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

Nate Harvey, P.E. — CONSULTANT CONTACT #1
Leonardo Karimi, E.I. — CONSULTANT CONTACT #2

SEAL



DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

Timothy Godwin — DIVISION UTILITY ENGINEER
Thomas Scruggs — ASSISTANT UTILITY ENGINEER
Chris Sutton — DIVISION UTILITY COORDINATOR
Donald Langley — DIVISION UTILITY COORDINATOR

K:\DOT_Utilities_Roadway Utilities Projects\0036431 - W-5703C\CPro\NW5703C_uf_tsh_uc01_pshdgn

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PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-2

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — REH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal — T
- CATV Pedestal — C
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line — P
- *Underground Telephone Cable — T
- *Underground Telephone Conduit — TC
- *Underground Fiber Optics Telephone Cable — T FO
- *Underground TV Cable — TV
- *Underground Fiber Optics TV Cable — TV FO
- *Underground Gas Pipeline — G
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line — W
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line — FSS
- Underground Unknown Utility Line — ?UTL
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown) — W
- Designated Utility Line (Type as Shown) — W

$$$$ SYSTEM $$$$ DESIGN $$$$ FILE $$$$ DESIGNATION $$$$

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NCDOT GENERAL UTILITY NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO CAPE FEAR PUBLIC UTILITY AUTHORITY.

3. ALL WATER LINE TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT AND THE UTILITY OWNER THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND A MINIMUM OF ONE WEEK PRIOR TO SERVICE INTERRUPTIONS AND TESTING. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER*S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

$$$$SYSTIME$$$$
$$$$FILENAME$$$$
$$$$DGN$$$$$$$$$$$$$$$$$$$$

PROJECT SPECIFIC UTILITY NOTES:

1. ALL NECESSARY LICENSES AND PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT ITS EXPENSE, UNLESS PREVIOUSLY OBTAINED BY THE OWNER AND PROVIDED AT THE PRECONSTRUCTION CONFERENCE.

2. DEVIATION FROM THESE PLANS AND NOTES WITHOUT THE PRIOR WRITTEN CONSENT OF THE UTILITY OWNER OR THEIR REPRESENTATIVE OR THE ENGINEER MAY BE CAUSE FOR THE WORK TO BE UNACCEPTABLE.

3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SHOULD ANY FIELD CONDITIONS BE ENCOUNTERED THAT VARY FROM THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE UTILITY OWNER PRIOR TO CONSTRUCTION.

4. CONTRACTOR SHALL COORDINATE ALL WORK WITH UTILITY OWNER AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION, OR AS OTHERWISE SPECIFIED HEREIN.

5. UNLESS OTHERWISE INDICATED, ALL PROFILE ELEVATIONS ARE ALONG THE PIPE CENTERLINE.

6. CONTRACTOR SHALL NOTIFY PROPERTY OWNERS AND TENNANTS AT LEAST 7 DAYS PRIOR TO CONSTRUCTION THAT CONSTRUCTION ACTIVITY WILL TAKE PLACE IN THEIR AREA.

7. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS FOR ALL UTILITY CONSTRUCTION PRIOR TO PLACING THE PIPELINE(S) IN SERVICE

8. PIPE ALIGNMENT SHOWN IS BASED ON STANDARD DUCTILE IRON MECHANICAL JOINT FITTINGS. JOINT DEFLECTIONS SHALL NOT EXCEED 75 PERCENT OF MANUFACTURER'S RECOMMENDED DEFLECTION. CONTRACTOR SHALL ADJUST PIPELINE ALIGNMENT AND DEFLECT JOINTS AS NECESSARY TO ACCOMMODATE THE STANDARD BENDS SHOWN.

9. MINIMUM PIPE COVER FOR DISTRIBUTION WATER MAINS SHALL BE 3 FEET.

10. ALL PRESSURIZED FITTINGS SHALL BE DUCTILE IRON RESTRAINED MECHANICAL JOINT WITH PRESSURE RATING EQUAL TO OR HIGHER THAN HOST PIPE, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

11. ALL MECHANICAL JOINTS SHALL BE FITTED WITH WEDGE-TYPE MECHANICAL RESTRAINT ACCESSORY KITS DESIGNED FOR THE INTENDED USE AND MATERIAL, AS APPROVED BY UTILITY OWNER.

PREPARED BY:
Kimley»Horn ©2024
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

PROJECT REFERENCE NO.	SHEET NO.
	UC-3
DESIGNED BY: NLH	
DRAWN BY: JHC	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

Docusigned by: NATHANIEL L. HARVEY
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249
5/14/2026

UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

UTILITY CONSTRUCTION

CONSTRUCTION SEQUENCE:

1. FOR EACH WATER LINE RELOCATION, THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A DETAILED INSTALLATION, CONNECTION, AND SERVICE INTERRUPTION PLAN FOR APPROVAL AT LEAST SEVEN (7) DAYS PRIOR TO THE RELOCATION. AT A MINIMUM, EACH PLAN SHALL ADDRESS THE FOLLOWING:

   A. SEQUENCE OF CONSTRUCTION OPERATIONS.

   B. PROCEDURE FOR FLUSHING, TESTING, AND DISINFECTION OF ALL AFFECTED PIPING AND VALVES, AS REQUIRED BY THE OWNER.

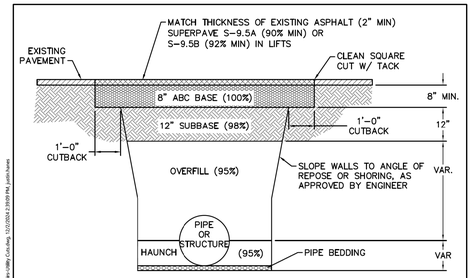
   C. PHASING AND SCHEDULE FOR ALL CONNECTIONS, INCLUDING PLANNED SERVICE OUTAGES, DURATION, AND CONTINGENCY PLAN.

2. NO INTERRUPTION OF SERVICE WILL BE PERMITTED UNTIL THE FOREGOING PLAN HAS BEEN APPROVED BY THE OWNER. THE OWNER'S PERSONNEL SHALL OPERATE THE OWNER'S EXISTING FACILITIES INVOLVED IN THE INTERRUPTIONS OF SERVICE.

3. WRITTEN WATER SERVICE INTERRUPTION NOTICES SHALL BE PROVIDED TO ALL AFFECTED CUSTOMERS AT LEAST 72 HOURS PRIOR TO EACH PLANNED INTERRUPTION.

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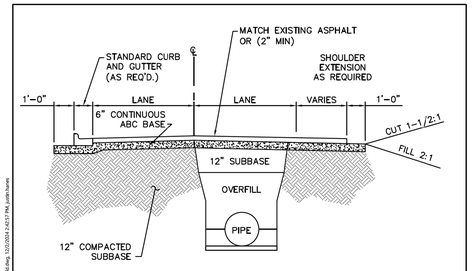


NOTES:

1. CONTRACTOR SHALL ENSURE BOTTOM OF TRENCH IS SUITABLE FOR INSTALLATION AND DOES NOT REQUIRE FOUNDATION CONDITIONING STONE.
2. FILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBOS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.
3. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57 STONE, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC).
4. SOIL SHALL BE INSTALLED IN 6"–8" LIFTS AND COMPACTED BY A MECHANIZED TAMPER (I.E. JUMPING JACK). HOWEVER, VIBRATORY ROLLERS > 18" WIDTH MAY BE USED FOR LARGER EXCAVATIONS. THE PLATE TAMP METHOD SHALL NOT BE USED.
5. ALL APPROVED CASTINGS SHALL BE SET FLUSH TO GRADE AND SUPPORTED IF APPLICABLE.
6. COMPACT MATERIALS TO MINIMUM % DENSITY SHOWN IN DIAGRAM AS DETERMINED BY THE STANDARD PROCTOR METHOD ASTM D–698–A FOR SOILS, AND ASTM D–698–C FOR ABC STONE, AND BY NUCLEAR GAGE OR CORE SAMPLE FOR ASPHALT.
7. CUTBACKS OF ASPHALT SHALL BE PREPARED ON EDGE OF EXCAVATION OVER TOP OF UNDISTURBED SOIL.

(FOR PRIVATE ROADS AND PAVED AREAS; CONTRACTOR TO MEET MINIMUM REQUIREMENTS AS DEFINED BY RIGHT-OF-WAY OWNER FOR PUBLIC ROAD REPAIRS)

DETAIL:		DETAIL NO:
CITY OF WILMINGTON PAVEMENT REPAIRS-UTILITY CUTS	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	WS-1
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -

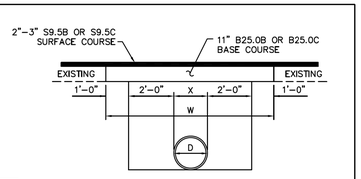


NOTES:

1. PAVEMENT RESTORATION DESIGN IS DEPENDEND ON CITY OF WILMINGTON STREET CUT POLICY AND PERMITTED CONDITIONS.
2. PIPE TRENCH AND COMPACTION REQUIREMENTS PER SPECIFICATIONS. SEE WS–1.

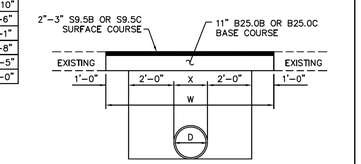
(FOR PRIVATE ROADS AND PAVED AREAS; CONTRACTOR TO MEET MINIMUM REQUIREMENTS AS DEFINED BY RIGHT-OF-WAY OWNER FOR PUBLIC ROAD REPAIRS)

DETAIL:		DETAIL NO:
CITY OF WILMINGTON TYPICAL ROAD REBUILD	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	WS-2
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



D	X	W
12"	1'–4"	7'–4"
15"	1'–7"	7'–7"
18"	1'–10"	7'–10"
24"	2'–6"	8'–6"
30"	3'–1"	9'–1"
36"	3'–8"	9'–8"
42"	4'–5"	10'–5"
48"	5'–0"	11'–0"

PAVEMENT REPAIRS ON ROADS TO BE RESURFACED (PIPE IS PLACED UNDER EXISTING PAVEMENT)

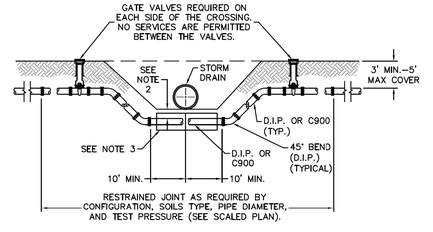


PAVEMENT REPAIRS ON ROADS NOT TO BE RESURFACED (PIPE IS PLACED UNDER EXISTING PAVEMENT)

NOTE:

1. FOR REFERENCE, SEE NCDOT STANDARD 654.01

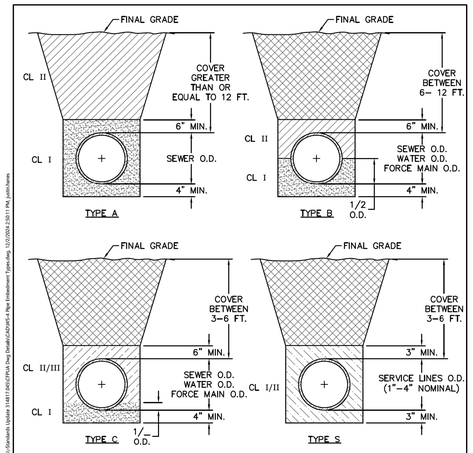
DETAIL:		DETAIL NO:
NCDOT-PAVEMENT REPAIRS	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	WS-3
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:

1. ALL BURIED PIPES, VALVES AND FITTINGS SHALL BE RESTRAINED.
2. MINIMUM DEPTH OF COVER SHALL BE 30".
   a. IN DOT R/W, MINIMUM OF 36" DEPTH REQUIRED.
   b. IF 30" DEPTH OF COVER CANNOT BE ACHIEVED, THEN PRESSURE CLASS 350 DIP SHALL BE USED. PRIOR APPROVAL FROM CFPUA AND PWS REQUIRED.
   c. MINIMUM DEPTH OF COVER OF 24" WHEN INSTALLING DIP.
   d. REFER TO 15A NCAC 18C AND 15A NCAC 2T FOR REQUIREMENTS GOVERNING STORM DRAIN AND PRESSURE MAIN SEPARATIONS.
   e. REFER TO CFPUA DETAIL WS–12 FOR STRUCTURAL BRIDGING REQUIREMENTS WHEN CROSSING UNDERNEATH A STORM DRAIN.
3. FOR OPEN DITCH CROSSINGS, INSTALL CASING PIPE (PER WS–8) AT THE CROSSING. THE CASING WILL NEED TO EXTEND A MINIMUM OF 2' PAST THE OUTSIDE WALL OF THE STORM DRAIN.

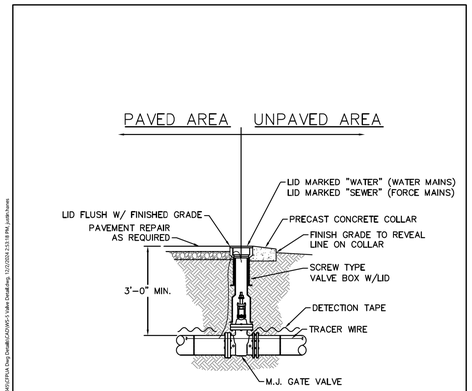
DETAIL:		DETAIL NO:
PRESSURE MAIN DITCH AND STORM DRAIN DITCH CROSSING-DIP	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	WS-10
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



COMPACTION NOTES:

1. ALL ZONES: 95% STD EFFORT PER ASTM D698, EXCEPT AS STATED IN COMPACTION NOTE 2.
2. 12" SUBGRADE UNDER PAVEMENT: 98% STD EFFORT PER ASTM D698.
3. BEDDING REQUIREMENTS FOR SEWER FORCE MAINS AND WATER MAINS WITHIN TYPE A THROUGH TYPE S CONDITIONS, SHALL BE FOLLOWED IF IT HAS BEEN DETERMINED THAT UNSUITABLE SOILS EXIST WITHIN THE EXCAVATED TRENCH. OTHERWISE BEDDING FOR SEWER FORCE MAINS AND WATER MAINS MAY BE CLASS I OR CLASS II.

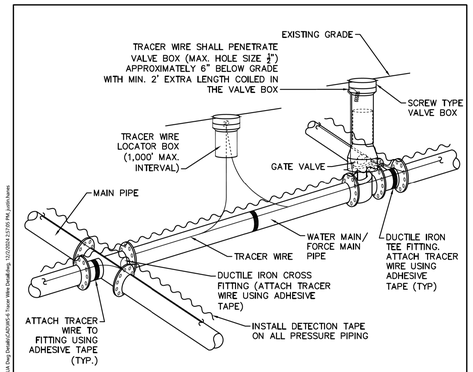
DETAIL:		DETAIL NO:
PIPE EMBEDMENT TYPES	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	WS-4
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:

1. TRACER WIRE SHALL PENETRATE VALVE BOX THROUGH DRILLED HOLE APPROX. 6" BELOW GRADE WITH MINIMUM 2–FEET EXTRA LENGTH COILED IN THE VALVE BOX. SEE WS–6.

DETAIL:		DETAIL NO:
VALVE DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	WS-5
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:

1. TRACER WIRE SHALL BE INSTALLED PER THE CFPUA MSM.
2. WIRE SHALL BE STRAPPED TO ALL PVC PIPING WITH ADHESIVE TAPE AT 12 FOOT INTERVALS.
3. SECURE WIRE TO ALL TEE AND CROSS FITTINGS WITH ADHESIVE TAPE.
4. ALL SPLICES IN THE WIRE SHALL BE MADE WITH 3M DBR DIRECT BURY SPLICE KITS.

DETAIL:		DETAIL NO:
TRACER WIRE DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	WS-6
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -

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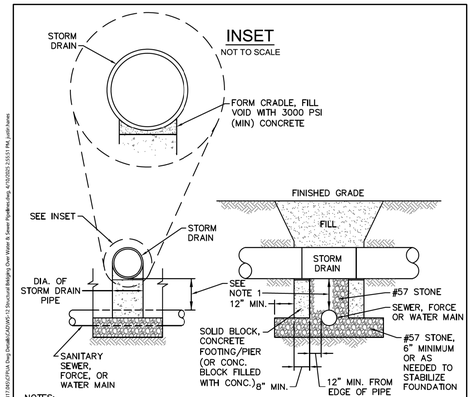
5/14/99

PREPARED BY:
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RALEIGH, NC 27601

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-3B
DESIGNED BY: NLH	
DRAWN BY: KLK	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

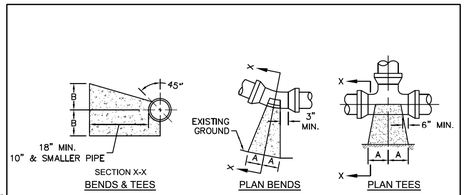
Digitally signed by NATHANIEL L. HARVEY
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249 ENGINEER NATHANIEL L. HARVEY
DATE: 9/19/2026

UTILITY CONSTRUCTION



NOTES:
1. STRUCTURAL BRIDGING IS REQUIRED WHEN STATE STANDARD MINIMUM SEPARATIONS CANNOT BE ACHIEVED. IN ADDITION TO STRUCTURAL BRIDGING, A VARIANCE APPROVAL FROM THE REVIEWING STATE AGENCY AND CFPUA SHALL BE OBTAINED.
   1.1. WATER MAIN CROSSING STORM DRAIN SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL SEPARATION OF 12 INCHES.
   1.2. SEWER MAIN AND SEWER FORCE MAIN CROSSING STORM DRAIN SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL SEPARATION OF 18 INCHES.
2. THIS DETAIL IS NOT APPLICABLE TO NCDOT ROADWAYS. ANY STRUCTURAL BRIDGING WITHIN NCDOT RIGHT-OF-WAY MUST ADHERE TO NCDOT REGULATIONS.
3. THIS DETAIL IS APPLICABLE SOLELY TO STORM DRAIN PIPES WITH A DIAMETER OF 24 INCHES OR SMALLER. FOR PIPES EXCEEDING 24 INCHES IN DIAMETER, THE ENGINEER MUST CREATE A CUSTOM STRUCTURAL BRIDGING DETAIL TO SUPPORT THE LARGER PIPES, WHICH WILL BE SUBMITTED TO CFPUA FOR REVIEW AND APPROVAL.

DETAIL: STORM DRAIN STRUCTURAL BRIDGING CROSSING WATER AND SEWER PIPELINES (24" DIAMETER & LESS)		CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-12
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/2025 REV. 1 - 04/10/2025		SHEET NO: -



SIZE	90 BENDS A	90 BENDS B	45 BENDS A	45 BENDS B	22-1/2 BENDS A	22-1/2 BENDS B	TEES/PLUGS A	TEES/PLUGS B	45 VERT. BENDS
3"	8"	6"	5"	6"	3"	7"	6"	8"	27"
4"	8"	9"	5"	8"	3"	11"	6"	9"	28"
6"	14"	11"	9"	9"	8"	8"	12"	9"	36"
8"	16"	16"	12"	12"	10"	13"	14"	13"	42"
10"	18"	22"	15"	14"	14"	16"	18"	15"	50"
12"	20"	28"	18"	17"	16"	16"	22"	18"	62"
14"	26"	29"	21"	19"	18"	18"	26"	20"	72"
16"	33"	29"	25"	21"	20"	21"	32"	21"	83"
18"	40"	30"	28"	24"	22"	23"	36"	24"	88"

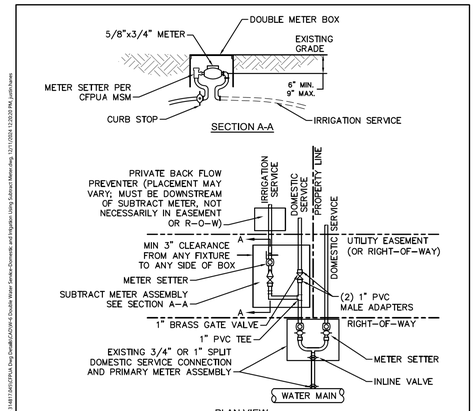
NOTES:
1. THRUST BLOCKING IS NOT PERMITTED EXCEPT IN SPECIAL INSTALLATIONS WHERE DESIGNED BY ENGINEER AND APPROVED BY CFPUA.
2. ALLOW 7-DAY MINIMUM CONCRETE CURE TIME BEFORE PLACING LOAD ON THRUST BLOCK
3. BASED ON 150 PSI TEST PRESSURE AND 2,000 PSF SOIL BEARING CAPACITY.
4. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.
5. PIPE & FITTINGS TO BE WRAPPED IN 10 MIL PLASTIC PRIOR TO THRUST BLOCK BEING POURED.

DETAIL: THRUST BLOCK		CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-13
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -

CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD NOTES:

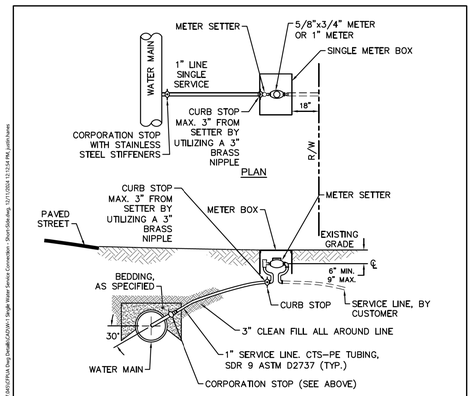
1. ALL INDIVIDUALS ENGAGED IN CFPUA PROJECTS MUST ADHERE TO THE CFPUA TECHNICAL STANDARDS, WHICH ENCOMPASS SPECIFICATIONS, STANDARD DETAILS, THE DESIGN GUIDE MANUAL, AND THE MATERIAL SPECIFICATION MANUAL. THESE DOCUMENTS PROVIDE ESSENTIAL REQUIREMENTS FOR MATERIALS, CONSTRUCTION METHODS, AND DESIGN PRINCIPLES. AN UNDERSTANDING OF THE ABOVE-MENTIONED RESOURCES IS REQUIRED TO AVOID NON-COMPLIANCE ISSUES.
2. ATTENTION: COMPLY WITH NOTES ON APPLICABLE DETAILS.

DETAIL: STANDARD NOTES (REQUIRED ON ALL PLAN AND PROFILE SHEETS)		CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: WS-14
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:
1. BEYOND THE PRIMARY DOMESTIC METER ASSEMBLY, CFPUA IS ONLY RESPONSIBLE FOR METER AND WASHERS OF SUBTRACT METER ASSEMBLY.
2. ALL PIPE AND FITTINGS UP TO FINAL SERVICE LINE TO BE 1" EXCLUDING METERS.
3. METER SETTER REQUIRED ON SUBTRACT METER ASSEMBLY.
4. SUBTRACTION METER ASSEMBLY TO BE LOCATED OUTSIDE OF R/W OR UTILITY EASEMENT AND WITHIN 2 FEET OF PUBLIC METER BOX.
5. PLASTIC PIPE STIFFENERS SHALL BE USED.

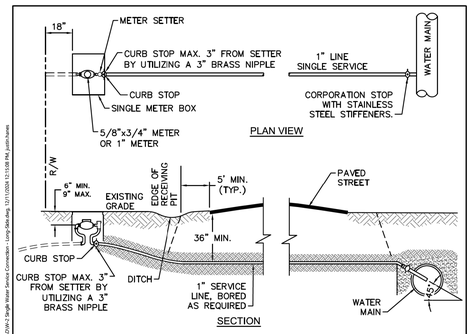
DETAIL: DOUBLE DOMESTIC SERVICE CONNECTION USING SUBTRACT METER		CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-6
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



SECTION

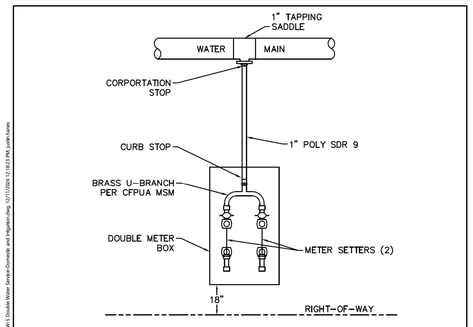
NOTES:
1. NO JOINT SHALL BE INSTALLED BETWEEN THE MAIN SERVICE TAP AND THE METER STOP. ALL SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN.
2. SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
3. METER BOXES SUBJECT TO TRAFFIC LOADS SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
4. WATER SERVICE LINE SHALL TERMINATE 18" WITHIN RIGHT-OF-WAY LINE.
5. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.
6. SERVICE PIPING AND METER SETTER TO BE CENTERED IN THE METER BOX.
7. TRACING WIRE SHALL BE INSTALLED WITH ADHESIVE TAPE AT 12' INTERVALS AND EXTEND A MINIMUM OF 2' OUTSIDE OF METER BOX PER CFPUA DETAIL WS-6.
8. PLASTIC PIPE STIFFENERS SHALL BE USED.

DETAIL: SINGLE WATER SERVICE CONNECTION - TYPICAL SHORT-SIDE CONNECTION		CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-1
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:
1. NO JOINT SHALL BE INSTALLED BETWEEN THE MAIN SERVICE TAP AND THE METER STOP. ALL SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN.
2. SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
3. METER BOXES SUBJECT TO TRAFFIC LOADS SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS
4. WATER SERVICE LINE SHALL BE PERPENDICULAR TO MAIN AND TERMINATE 18" WITHIN RIGHT-OF-WAY LINE.
5. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.
6. SERVICE PIPING AND METER SETTER TO BE CENTERED IN THE METER BOX.
7. TRACING WIRE SHALL BE INSTALLED WITH ADHESIVE TAPE AT 12' INTERVALS AND EXTEND A MINIMUM OF 2' OUTSIDE OF METER BOX PER CFPUA DETAIL WS-6.
8. PLASTIC PIPE STIFFENERS SHALL BE USED.

DETAIL: SINGLE WATER SERVICE CONNECTION - LONG-SIDE		CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-2
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:
1. ALL WATER SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN AND TERMINATE 18" INSIDE THE RIGHT OF WAY.
2. WATER SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
3. METER BOXES SUBJECT TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
4. 3" CLEAN FILL REQUIRED ALL AROUND 1" POLY SERVICE LINE.
5. JOINT RESTRAINT SYSTEMS SHALL BE WEDGE ACTION STYLE FOR DI OR C-900 PVC PIPE.
6. METER BOXES SHALL BE LOCATED MINIMUM 5-FEET FROM THE PROPERTY CORNER.
7. ASSEMBLY TO BE CENTERED IN THE METER BOX.
8. PLASTIC PIPE STIFFENERS SHALL BE USED.

DETAIL: DOUBLE WATER SERVICE - DOMESTIC AND IRRIGATION SPLIT		CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-5
SCALE: NOT TO SCALE	CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -

ACCEPTED AS NOTED
NO EXCEPTIONS TAKEN
MAKE CORRECTIONS NOTED
REVISE AND RESUBMIT
REJECTED

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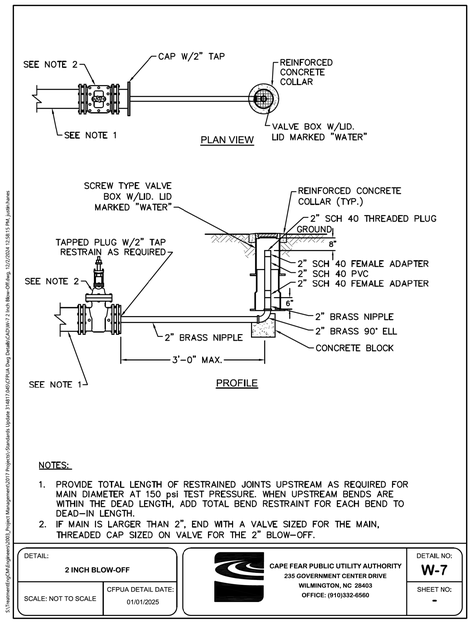
5/14/99

PREPARED BY:
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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-3C
DESIGNED BY: NLH	
DRAWN BY: KLK	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

Docusigned by: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249 ENGINEER NATHANIEL L. HARVEY 9/18/2026

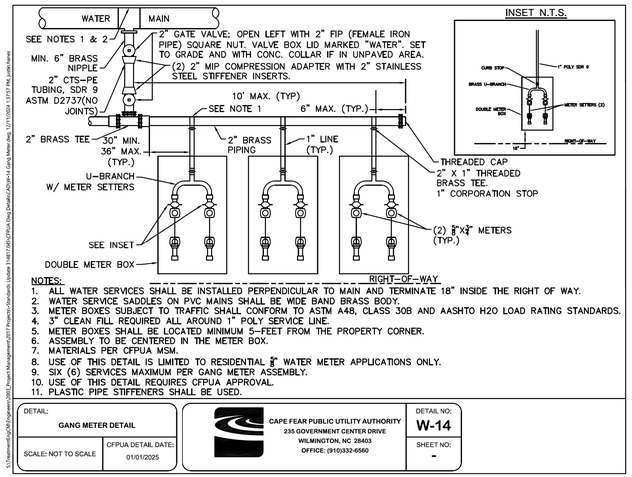
UTILITY CONSTRUCTION



NOTES:

1. PROVIDE TOTAL LENGTH OF RESTRAINED JOINTS UPSTREAM AS REQUIRED FOR MAIN DIAMETER AT 150 psi TEST PRESSURE. WHEN UPSTREAM BENDS ARE WITHIN THE DEAD LENGTH, ADD TOTAL BEND RESTRAINT FOR EACH BEND TO DEAD-IN LENGTH.
2. IF MAIN IS LARGER THAN 2", END WITH A VALVE SIZED FOR THE MAIN, THREADED CAP SIZED ON VALVE FOR THE 2" BLOW-OFF.

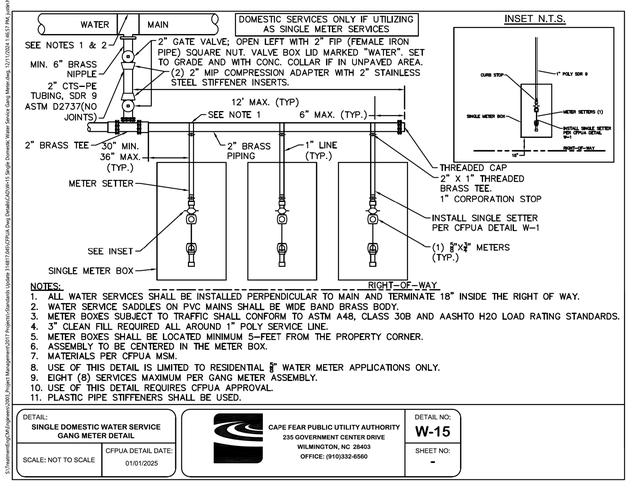
DETAIL: 2 INCH BLOW-OFF	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-7
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:

1. ALL WATER SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN AND TERMINATE 18" INSIDE THE RIGHT OF WAY.
2. WATER SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
3. METER BOXES SUBJECT TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
4. 3" CLEAN FILL REQUIRED ALL AROUND 1" POLY SERVICE LINE.
5. METER BOXES SHALL BE LOCATED MINIMUM 5-FEET FROM THE PROPERTY CORNER.
6. ASSEMBLY TO BE CENTERED IN THE METER BOX.
7. MATERIALS PER CFPUA MSM.
8. USE OF THIS DETAIL IS LIMITED TO RESIDENTIAL 5/8" WATER METER APPLICATIONS ONLY.
9. SIX (6) SERVICES MAXIMUM PER GANG METER ASSEMBLY.
10. USE OF THIS DETAIL REQUIRES CFPUA APPROVAL.
11. PLASTIC PIPE STIFFENERS SHALL BE USED.

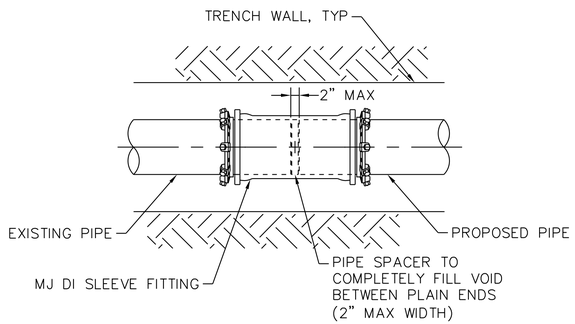
DETAIL: GANG METER DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-14
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:

1. ALL WATER SERVICES SHALL BE INSTALLED PERPENDICULAR TO MAIN AND TERMINATE 18" INSIDE THE RIGHT OF WAY.
2. WATER SERVICE SADDLES ON PVC MAINS SHALL BE WIDE BAND BRASS BODY.
3. METER BOXES SUBJECT TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND AASHTO H20 LOAD RATING STANDARDS.
4. 3" CLEAN FILL REQUIRED ALL AROUND 1" POLY SERVICE LINE.
5. METER BOXES SHALL BE LOCATED MINIMUM 5-FEET FROM THE PROPERTY CORNER.
6. ASSEMBLY TO BE CENTERED IN THE METER BOX.
7. MATERIALS PER CFPUA MSM.
8. USE OF THIS DETAIL IS LIMITED TO RESIDENTIAL 5/8" WATER METER APPLICATIONS ONLY.
9. EIGHT (8) SERVICES MAXIMUM PER GANG METER ASSEMBLY.
10. USE OF THIS DETAIL REQUIRES CFPUA APPROVAL.
11. PLASTIC PIPE STIFFENERS SHALL BE USED.

DETAIL: SINGLE DOMESTIC WATER SERVICE GANG METER DETAIL	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-15
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2025		SHEET NO: -



NOTES:

1. SLEEVES SHALL BE DUCTILE IRON MECHANICAL JOINT (DI MJ) OF THE SAME OR HIGHER PRESSURE RATING AS THE HOST PIPE.
2. RESTRAINT GLANDS SHALL BE DESIGNED FOR THE INTENDED USE AND SHALL CONSIST OF MULTIPLE GRIPPING WEDGES INCORPORATED INTO A FOLLOWER GLAND AND BOLT-ACTUATED BY TORQUE-LIMITING TWIST OFF NUTS.

1	RESTRAINED MJ SOLID SLEEVE
UC-3C	SCALE: N.T.S.

$$$$SYSTIME$$$$
$$$$ICONDATE$$$$
$$$$ICONFNAME$$$$

Docusign Envelope ID: AA6CE56D-8BF6-46DD-A5BB-8C91854924C4

NO UTILITY CONSTRUCTION ON THIS SHEET

PREPARED BY:
Kimley»Horn ©2025
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-4
DESIGNED BY: NLH	
DRAWN BY: KLK	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

Docusigned by: NATHANIEL L. HARVEY
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249
9/18/2026

UTILITY CONSTRUCTION

THIS SHEET CORRESPONDS TO RDY-4

NAD 83/NSRS 2007

CAROLINA BEACH RD (US-421)

SOUTH COLLEGE RD (NC-132)

MATCHLINE
SEE PLAN SHEET UC-5

RETAIN SYSTEM

RETAIN

RETAIN

RETAIN

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 0 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

$SYSTIME$ $SYSDATE$
$FILENAME$

Docusign Envelope ID: AA6CE56D-8BF6-46DD-A5BB-8C91854924C4

5/14/99

NOTES:
1. CONTRACTOR SHALL VERIFY ELEVATIONS OF EXISTING WATER LINES PRIOR TO CONSTRUCTING PROPOSED DRAINAGE SYSTEM AND SHALL PROVIDE FINDINGS TO OWNER AND ENGINEER.

   A. WHERE THERE IS AT LEAST 18" OF VERTICAL SEPARATION BETWEEN THE PROPOSED DRAINAGE AND EXISTING WATER LINE, NO RELOCATION OR STRUCTURAL BRIDGING IS REQUIRED.
   B. WHERE THERE IS LESS THAN 18" BUT MORE THAN 12" OF VERTICAL SEPARATION, INSTALL STRUCTURAL BRIDGING PER CFPUA STANDARD DETAIL WS-12.
   C. WHERE THERE IS LESS THAN 12" OF VERTICAL SEPARATION, RELOCATE WATER LINE PER CFPUA STANDARD DETAIL WS-10. VALVES PER DETAIL WS-10 NOT REQUIRED UNLESS SHOWN ON PLANS.

2. ALL PROPOSED VALVES SHALL BE RESILIENT WEDGE GATE VALVES UNLESS OTHERWISE NOTED.

PREPARED BY:
Kimley»Horn ©2025
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-5
DESIGNED BY: NLH	
DRAWN BY: KLK	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249 NATHANIEL L. HARVEY
9/18/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

THIS SHEET CORRESPONDS TO RDY-5

NAD 83/NSRS 2007

CULVERT #1
TWO BARRELS

	NORTH	EAST	ELEV.
CUL1	145059.36	2333736.87	5.75
CUL2	145064.24	2333732.92	5.80
CUL3	145065.31	2333732.11	5.81
CUL4	145069.79	2333728.34	5.88
CE1	145063.63	2333733.38	6.81
HW1	145065.01	2333732.31	14.20
CUL5	145084.74	2333873.18	6.57
CUL6	145088.31	2333870.27	6.59
CUL7	145089.33	2333869.79	6.56
CUL8	145093.24	2333866.00	6.57
CE2	145087.67	2333870.70	9.57
HW2	145092.05	2333867.10	14.78

MATCHLINE SEE PLAN SHEET UC-4

MATCHLINE SEE PLAN SHEET UC-6

CAROLINA BEACH RD (US-421)

ANTOINETTE DR

POWELL D MICHAEL MARICA LEE
DB 592 PG 772

POWELL DANNY M MARICA L
DB 60 PG 332
DB 5908 PG 2886

BENNETT COMMERCIAL PROP LLC
DB 1PG 9
DB 2793 PG 719

RICS5 LLC
DB 1PG 9
DB 8PG 43
DB 5305 PG 1058

ORIELLY AUTOMOTIVE STORES INC
DB 60 PG 332
DB 5606 PG 1079
DB 5948 PG 1485

CORILLA LLC
DB 8 PG 13
DB 5590 PG 614
1521BUS

STOKED BUSINESS PARK LLC
DB 40 PG 210
DB 2864 PG 494

HUGHES JOYCE S
DB 40 PG 210
DB 2864 PG 494

ZA SNEEDEN LLC
DB 54 PG 309
DB 2825 PG 242
DB 5449 PG 2458
MB 40 PG 91

WALMART PROPERTY TAX DEPT
DB 5IPG 383
DB 5338 PG 796
DB 5384 PG 2229

MURPHY OIL USA INC
DBI 4IPG 236
DB 5338 PG 796

WALMART PROPERTY TAX DEPT
DB 5IPG 383
DB 2656 PG 916

68 LF 8" WATER LINE
8" VALVE
THRUST COLLAR
CONNECT TO EXISITNG 8" PVC WATER LINE WITH MJ LONG BODY SOLID SLEEVE -W1- STA 10+67.39

53 LF 8" WATER LINE
8" DI RJ 45° BEND (2)
THRUST COLLAR
CONNECT TO EXISITNG 8" PVC WATER LINE WITH MJ LONG BODY SOLID SLEEVE -W2- STA 10+00.00
SEE DETAIL 2 SHEET UC-1

ABANDON 41 LF 8" UTILITY PIPE
8" VALVE
THRUST COLLAR
CONNECT TO EXISITNG 8" PVC WATER LINE WITH MJ LONG BODY SOLID SLEEVE -W1- STA 10+00.00
SEE DETAIL 2 SHEET UC-1

30 LF 8" WATER LINE
VERTICAL OFFSET PER DETAIL WS-10
CONNECT TO EXISTING 15" RCP PER DETAIL 1/UC-3C

ABANDON 33 LF 8" UTILITY PIPE

8" VALVE
ROD TO THRUST COLLAR
THRUST COLLAR

8" DI RJ 45° BEND (2)
CONNECT TO EXISITNG 8" PVC WATER LINE WITH MJ LONG BODY SOLID SLEEVE STA -W2- 10+52.23
THRUST COLLAR

0508 SPECIAL MIN. DEPTH CB-E
REMOVE DI
0541 JB W/MH REMOVE
REMOVE 41 LF 24" RCP-IV
ADJUST EXIST MH
0513 CB-F
0555 CB-G
0502 CB-E
0522 CB-E
0544 CB-F
0545 CB-F
0565 CB-F
0561 CB-F
0548 CB-F
0553 CB-F
0554 CB-D
0563 CB-F

RETAIN
DO NOT DISTURB POWER POLES
DO NOT DISTURB SIGN AND VENT PIPES
DO NOT DISTURB BACKFLOW PREVENTERS
TOE PROTECTION EST. 180 SY PSRM SEE DETAIL 2 SHEET
15" RCP-IV M.T.L. CAN
MONITORING WELLS
EXIST OEP
24" RCP-IV
18" RCP-V
18" RCP-IV
36" RCP
STABILIZE EX. BANK W/CLASS I RIP RAP KEYED IN, EST 55 TONS EST 110 SY GEO SEE DETAIL 1/SHEET 2D
LIMITS OF JURISDICTIONAL DETERMINATION
RETENTION POND
BARREL SIZES ADJUSTED TO MATCH EFFECTIVE FEMA MODEL VERIFIED IN FIELD
24" CSP (W=1.08' RCP-IV (COMMON)
PDE
FILL AND ABANDON
GRADE TO DRAIN
REMOVE
MTL CANOPY
GAS VENTS
EXISTING R/W VARIES

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2,000 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

Docusign Envelope ID: AA6CE56D-8BF6-46DD-A5BB-8C91854924C4

5/14/99

NOTES:
1. CONTRACTOR SHALL VERIFY ELEVATIONS OF EXISTING WATER LINES PRIOR TO CONSTRUCTING PROPOSED DRAINAGE SYSTEM AND SHALL PROVIDE FINDINGS TO OWNER AND ENGINEER.

   A. WHERE THERE IS AT LEAST 18" OF VERTICAL SEPARATION BETWEEN THE PROPOSED DRAINAGE AND EXISTING WATER LINE, NO RELOCATION OR STRUCTURAL BRIDGING IS REQUIRED.
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2. ALL PROPOSED VALVES SHALL BE RESILIENT WEDGE GATE VALVES UNLESS OTHERWISE NOTED.

PREPARED BY:
Kimley»Horn ©2025
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

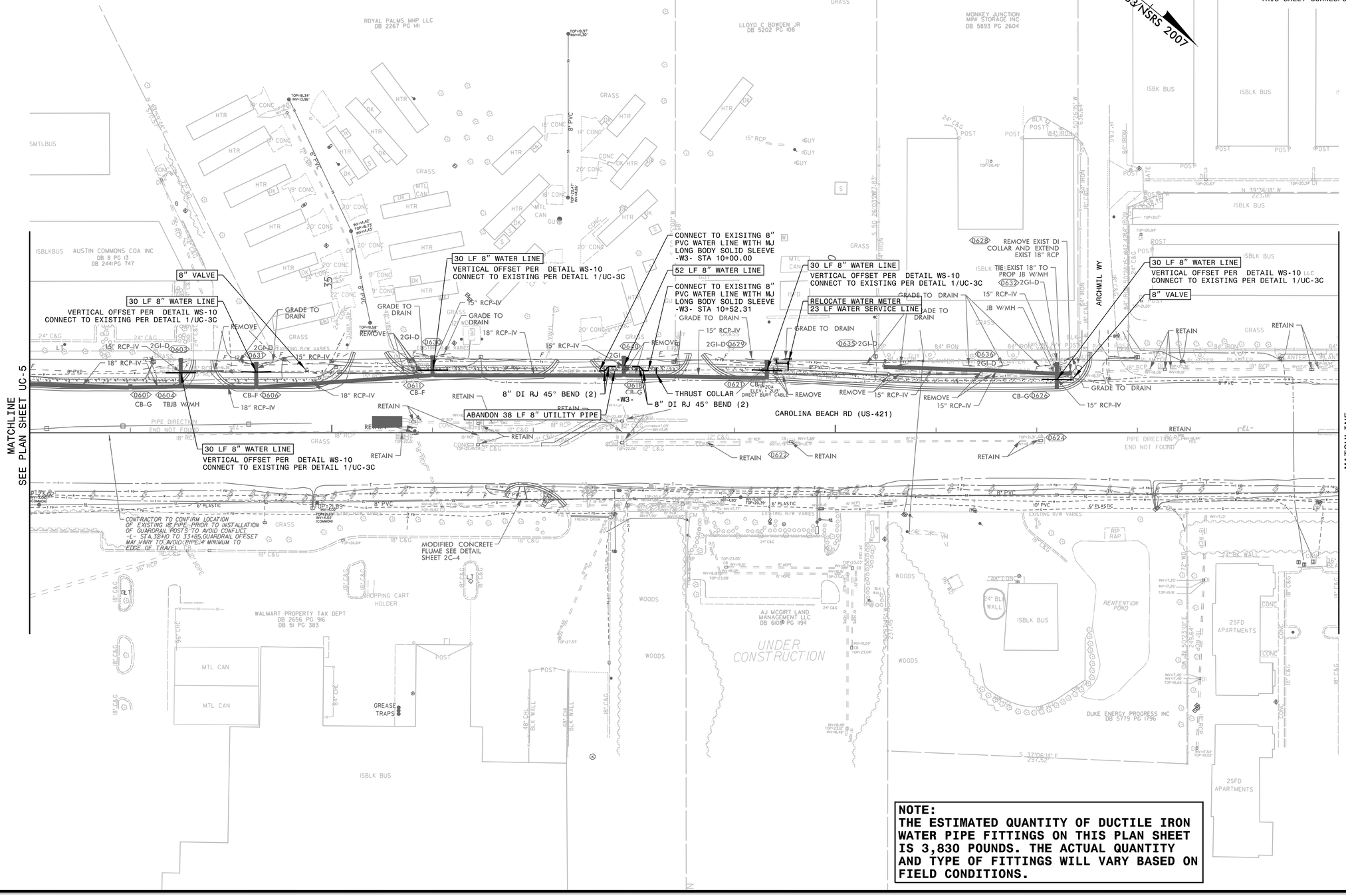
PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-6
DESIGNED BY: NLH	
DRAWN BY: KLK	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

Docusigned by: NATHANIEL L. HARVEY
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249
5/18/2026

UTILITY CONSTRUCTION

THIS SHEET CORRESPONDS TO RDY-6

NAD 83/NSRS 2007



NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3,830 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

Docusign Envelope ID: AA6CE56D-8BF6-46DD-A5BB-8C91854924C4

5/14/99

NO UTILITY CONSTRUCTION ON THIS SHEET

PROPERTY LINES PLOTTED PER GIS NO METES/BOUNDS DESCRIPTION FOUND

MATCHLINE SEE PLAN SHEET UC-6

MATCHLINE SEE PLAN SHEET UC-7

CAROLINA BEACH RD (US-421)

WILLOUGHBY PARK RD

MONKEY JUNCTION MINI STORAGE INC DB 5893 PG 2597

MONKEY JUNCTION CAR WASH, LLC DB 5241 PG 2766

GLADYS JOHNSON MILLIGAN LIFE ESTATE DB 5396 PG 2634

ELIZABETH S PETTETT DB 9904 PG 104

WILBUR C & GAIL R CHEERS DB 1244 PG 183

ALTSON D ABERNATHY DB 5730 PG 8

WILLOUGHBY PARK CONDO ASSOCIATION INC DB 5061 PG 1209

WOODBRIDGE POINTE, LP DB 6055 PG 1666

MICHAEL F & ALETA J MOSER DB 1317 PG 1981

JOHN C ROBERTS DB 9906 PG 1696

	NORTH	EAST	ELEV.
CUL 1	146846.40	2332864.98	10.00
CUL 2	146843.89	2332867.01	10.02
CE1	146845.37	2332855.73	14.00
CE2	146845.35	2332300.35	11.35
CUL 3	146876.33	2332300.35	11.35
CUL 4	146876.39	2332301.86	11.33
	146877.16	2332301.11	15.36

CULVERT #1 ONE BARREL

RETAIN

RETAIN SYSTEM

4' X 4' BOX CULVERT

BOX CULVERT STOPS HERE (NO HW/CONCRETED IN)

TBJB

0701 0707 0712 0713

NAD 83/NSRS 2007

PREPARED BY:
Kimley»Horn ©2025
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-7
DESIGNED BY: NLH	
DRAWN BY: KLK	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249 NATHANIEL L. HARVEY
9/18/2026

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

THIS SHEET CORRESPONDS TO RDY-7

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 0 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

$$$$SYSTEM$$$$
$$$$DESIGN$$$$
$$$$USER$$$$
$$$$FILENAME$$$$

Docusign Envelope ID: AA6CE56D-8BF6-46DD-A5BB-8C91854924C4

PREPARED BY:
Kimley»Horn
© 2025
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UC-8
DESIGNED BY: NLH	
DRAWN BY: KLK	
CHECKED BY: NLH	
APPROVED BY: NLH	
REVISED:	

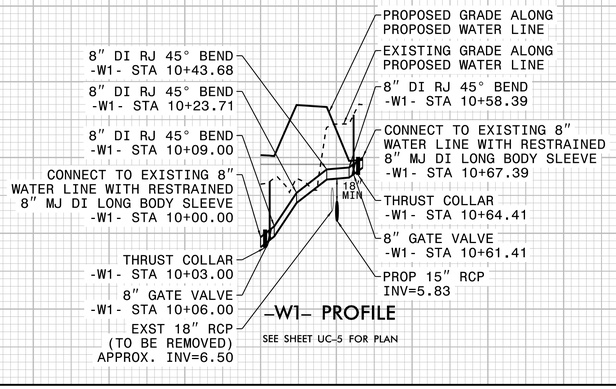
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045249 NATHANIEL L. HARVEY
5/18/2026

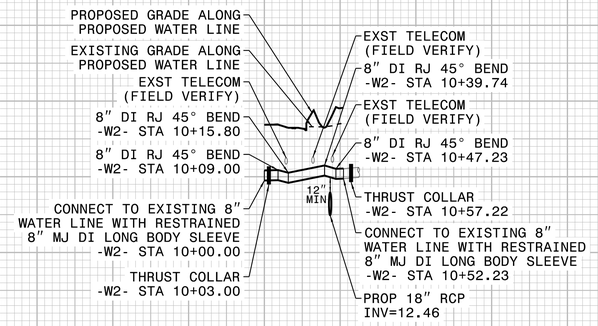
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



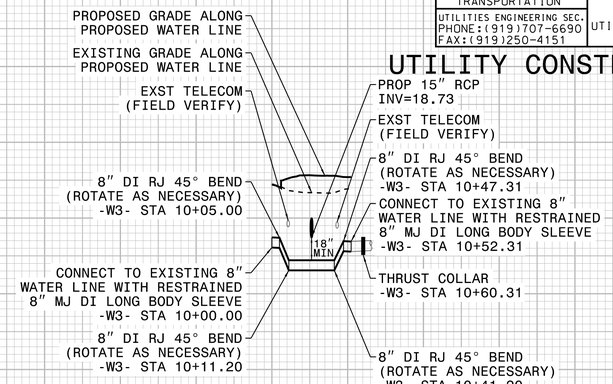
-W1- PROFILE

SEE SHEET UC-5 FOR PLAN



-W2- PROFILE

SEE SHEET UC-5 FOR PLAN



-W3- PROFILE

SEE SHEET UC-6 FOR PLAN

5/14/99

1/12/2026

09/08/99

TIP PROJECT: W-5703C

CONTRACT: DC0505

3/6/2026

STATE OF NORTH CAROLINA
DIVISIONS OF HIGHWAYS

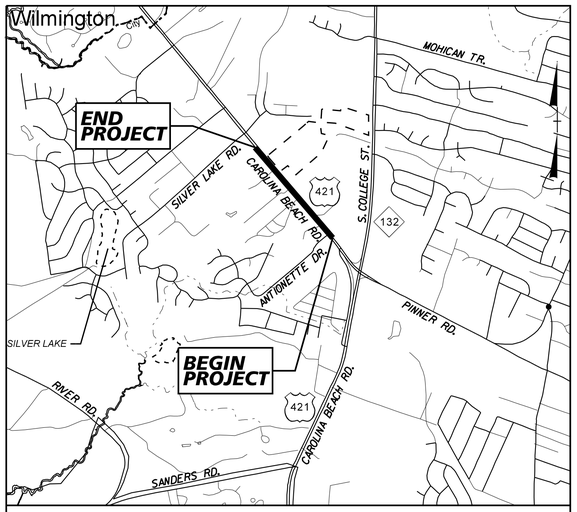
UTILITIES BY OTHERS PLANS
NEW HANOVER COUNTY

T.I.P. NO.	SHEET NO.
W–5703C	UO–1

Kimley»Horn

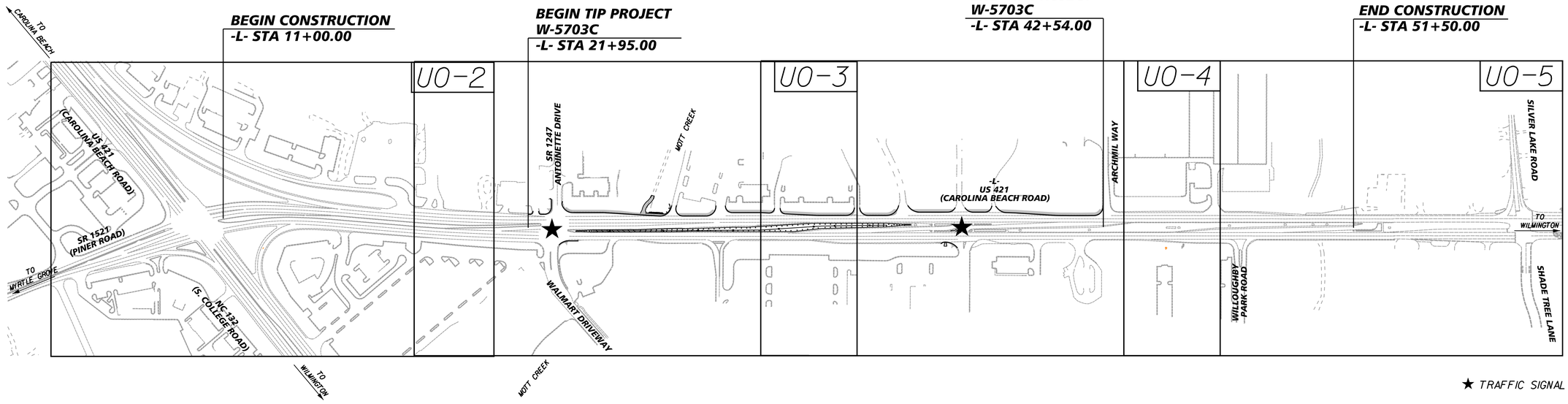
LOCATION: *US 421 (CAROLINA BEACH ROAD) FROM S. COLLEGE ROAD TO APPROXIMATELY 200' NORTH OF WILLOUGHBY PARK ROAD*

TYPE OF WORK: *UTILITY RELOCATIONS BY OTHERS*



VICINITY MAP

NAD 83/NSRS 2007



★ TRAFFIC SIGNAL

NCDOT CONTACT: BRIAN HARDING, P.E.
DIVISION 3, DIVISION PROJECT MANAGER
(910) 341–2000

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE

50 25 0 50 100
PLANS

INDEX OF SHEETS

SHEET NO.	*DESCRIPTION*
UO–1	*TITLE SHEET*
UO–2 THRU UO–4	*UTILITY BY OTHERS PLAN SHEETS*

UTILITY OWNERS ON PROJECT

(A) POWER – DUKE ENERGY PROGRESS (DISTRIBUTION): ALEX CRAIG 910–620–5273
(B) TELECOMMUNICATIONS – AT&T: ROC IV 704–560–5580
(C) CATV – CHARTER–SPECTRUM: STEVE BARNETTE 910–772–5755
(D) GAS – PIEDMONT NATURAL GAS (DISTRIBUTION): DJ MEDEIROS 910–620–3233
(E) TELECOMMUNICATIONS – LUMEN (CENTURYLINK):

PREPARED FOR OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

BO HEMPHILL, P.E.	*EASTERN UTILITIES ENGINEER*
TIMOTHY GODWIN	*DIVISION UTILITY ENGINEER*
ROY (CHRIS) SUTTON	*UTILITIES COORDINATOR*

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	U0-2

UTILITIES BY OTHERS

NOTE:
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.

NAD 83/NSRS 2007

US 421 (CAROLINA BEACH RD)

CAROLINA BEACH RD

S COLLEGE RD

10+00

15+00

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET U0-3

K:\RAL_Roadway\Oll036431 - W-5703C\Utilities\Engineering\UB0\Proj\W5703C_ub0_u002.dgn

12/9/2025

Kimley»Horn

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	U0-3

UTILITIES BY OTHERS

NOTE:
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NAD 83/NSRS 2007

ANTOINETTE DR

-L- US 421
(CAROLINA BEACH RD)

WALMART DRIVEWAY

MATCHLINE -L- STA 19+00.00
SEE PLAN SHEET U0-2

MATCHLINE -L- STA 32+00.00
SEE PLAN SHEET U0-4

AT&T TO RETAIN UG LINE AND HH

AT&T TO REPLACE GUY WIRES AND PLACE AERIAL FIBER

ADJ. SIGNALS HH

AT&T TO RETAIN HH AND PLACE AERIAL F/O LINES

REPLACE SEWER LINE SEGEMENT

AT&T TO REMOVE PEDESTAL ABANDON UNDERGROUND

SIGNAL UNIT TO RAISE FIBER ATTACHMENT

SPECTRUM TO COMBINE & RAISE ATTACHMENTS

AT&T TO RAISE ATTACHMENT

AT&T TO REMOVE PEDESTAL ABANDON UNDERGROUND INSTALL AERIAL F/O LINES

AT&T TO REMOVE PEDESTAL AND ABANDON UNDERGROUND

AT&T ABANDON UG COPPER LINES
RETAIN UG FIBER LINES

LUMEN HH TO BE RETAINED

POLE RETAINED BY CROWN CASTLE

PNG TO RETAIN GAS LINE

AT&T TO ABANDON UG COPPER LINES

LUMEN UG LINE TO BE RETAINED

AT&T FIBER CABLE NOT SHOWN TO BE RETAINED

SPECTRUM TO RETAIN PEDESTAL

PNG TO RETAIN GAS LINE

LUMEN HH TO BE RETAINED

AT&T ABANDON UG COPPER LINES
RETAIN UG FIBER LINES

AT&T FIBER CABLE NOT SHOWN TO BE RETAINED

RETENTION POND

K:\RAL_Roadway\0II036431 - W-5703C\Utilities\Engineering\UBO\Pro\W5703C_ubo_u003.dgn

12/9/2025

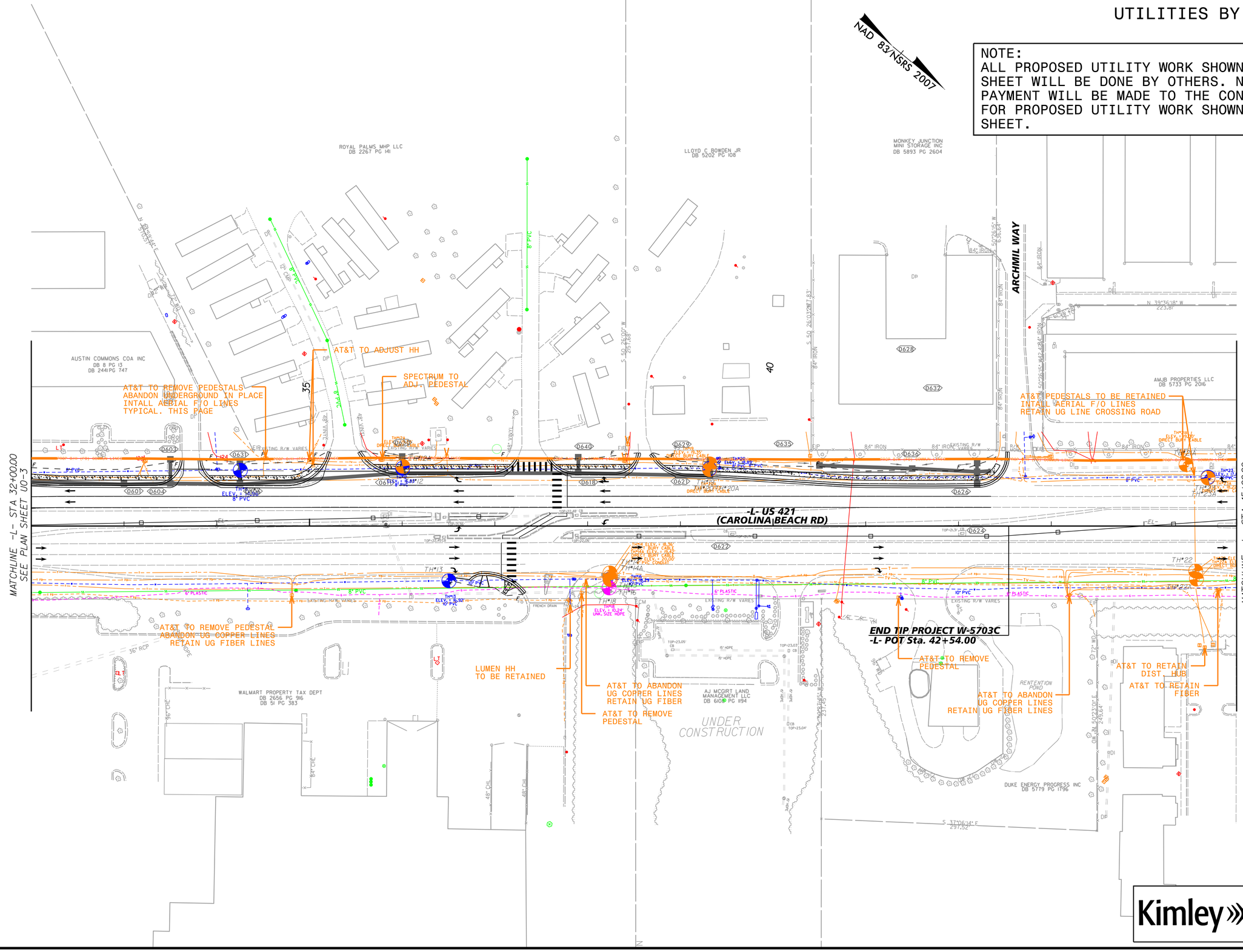
Kimley»Horn

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	U0-4

UTILITIES BY OTHERS

NOTE:
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NAD 83/NSRS 2007



Kimley»Horn

PROJECT REFERENCE NO.	SHEET NO.
W-5703C	UO-5

UTILITIES BY OTHERS

NOTE:
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.

NAD 83/NSRS 2007

PROPERTY LINES PLOTTED PER GIS NO METES/BOUNDS DESCRIPTION FOUND

AT&T INTALL AERIAL F/O LINES RETAIN PEDESTAL AND UG LINES TO NORTH

AT&T TO ABANDON UG LINES IN PLACE

AT&T TO ABANDON UG COPPER LINES RETAIN UG FIBER LINES

SPECTRUM TO RETAIN UNDERGROUND LINES

-L- US 421 (CAROLINA BEACH RD)

WILLOUGHBY PARK RD

MATCHLINE -L- STA 45+00.00 SEE PLAN SHEET UO-4

Kimley»Horn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
W-5703C	X-1

W-5703C
NEW HANOVER COUNTY
CROSS SECTION INDEX

CROSS-SECTION SUMMARY SHEET	X-1A
-L- US 421 (CAROLINA BEACH ROAD)	X-2 THRU X-10
-Y1-	X-11
-DW1-	X-12

1/29/2026

PROJ. REFERENCE NO.	SHEET NO.
W-5703C	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

Station L (LT)	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
21+95.00	0	0
22+00.00	1	1
22+23.00	6	4
22+50.00	7	3
23+00.00	8	1
23+50.00	6	9
24+00.00	12	51
24+50.00	12	99
24+90.00	9	97
25+00.00	2	26
25+50.00	11	143
25+75.00	6	83
26+00.00	4	49
26+30.00	5	9
26+45.00	4	4
26+50.00	1	1
26+55.00	1	1
26+60.00	1	1
26+65.00	1	2
26+70.00	1	1
26+75.00	1	1
27+00.00	6	12
27+17.00	2	6
27+50.00	4	9
28+00.00	11	29
28+50.00	11	37
28+80.00	4	14
29+00.00	0	0
29+50.00	5	22
30+00.00	10	41
30+50.00	10	43
30+87.00	4	18
31+00.00	0	0
31+50.00	12	25
32+00.00	10	27
32+50.00	11	21
33+00.00	12	21
33+50.00	11	53
33+73.00	3	19
34+00.00	3	11
34+50.00	11	53
35+00.00	14	65
35+50.00	8	32
36+00.00	7	11
36+50.00	12	20
37+00.00	12	19
37+50.00	6	10
38+00.00	7	9
38+50.00	14	15
38+62.00	2	2
39+00.00	5	5
39+50.00	11	15
40+00.00	10	19

Station L (LT)	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
40+50.00	10	25
41+00.00	11	25
41+50.00	11	21
41+70.00	4	9
42+00.00	7	12
42+50.00	13	14
42+54.19	1	1

Station L (RT)	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
22+97.71	0	0
23+50.00	7	4
24+00.00	9	4
24+01.66	1	0

Station L (RT)	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
36+52.93	0	0
37+00.00	6	5
37+31.91	4	3

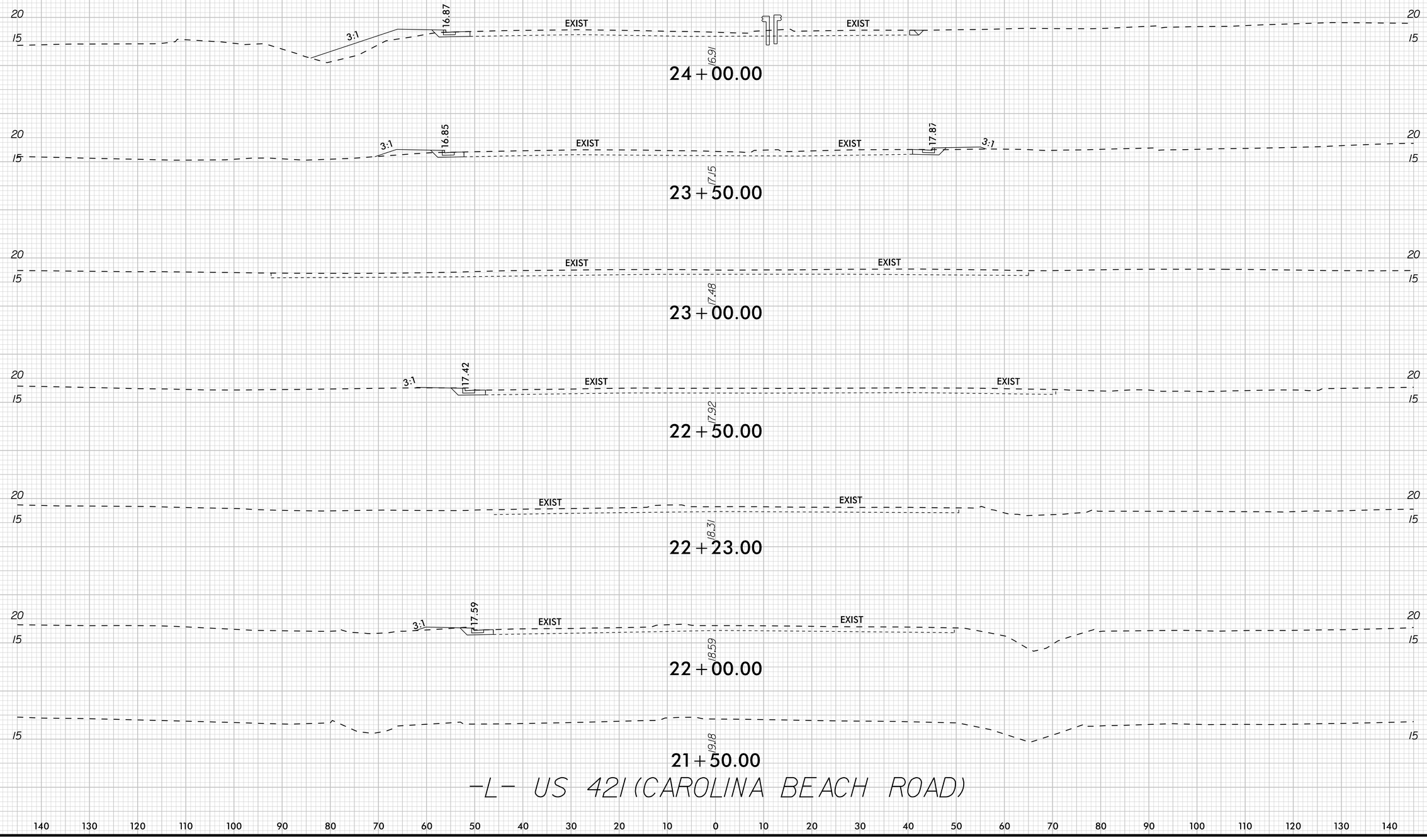
Station Y1 (LT)	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+05.00	0	0
12+30.00	2	1
12+46.00	3	1

Station Y1 (RT)	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+96.24	0	0
12+00.00	2	0
12+30.00	16	0
12+47.00	8	0

Station DW1 (LT/RT)	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+09.00	0	0
10+50.00	2	23
10+80.00	7	6

8/23/99

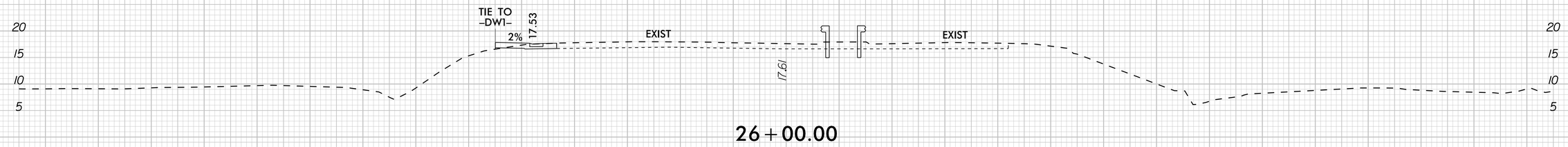
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	W-5703C	X-2



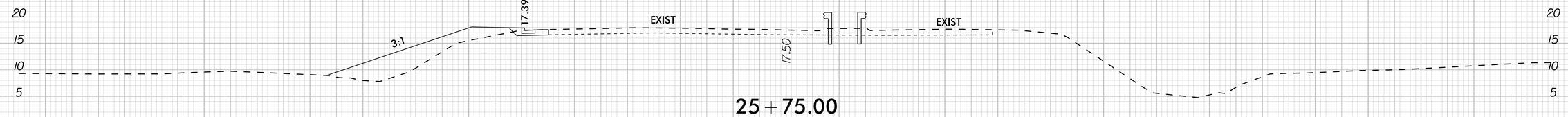
2/11/2025

8/23/99

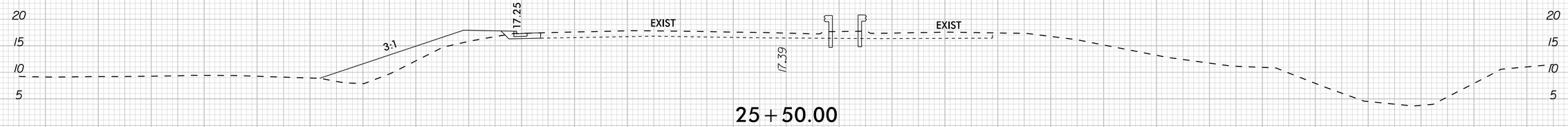
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703C	X-3



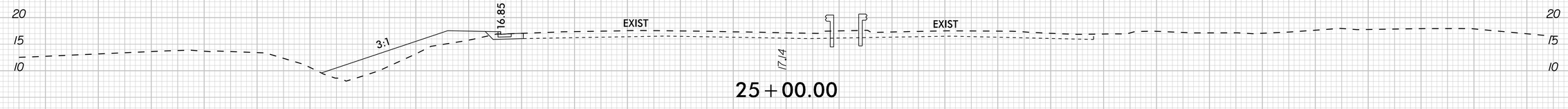
26+00.00



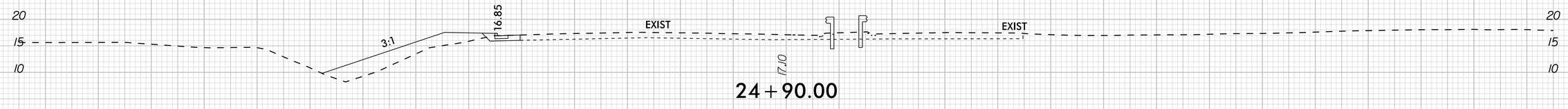
25+75.00



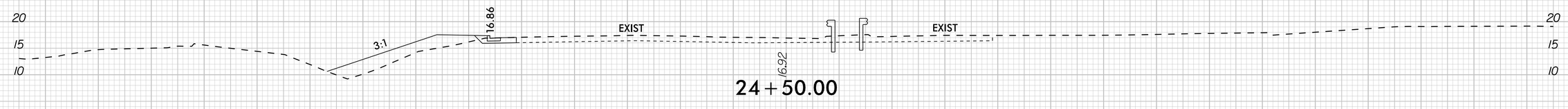
25+50.00



25+00.00



24+90.00



24+50.00

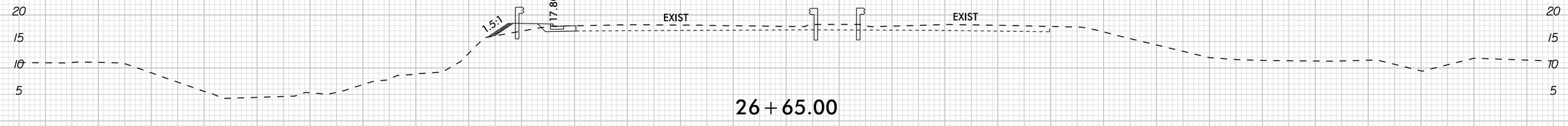
-L- US 421 (CAROLINA BEACH ROAD)

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

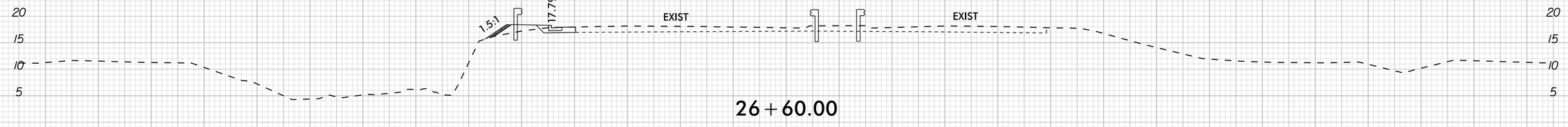
11/29/2006

8/23/99

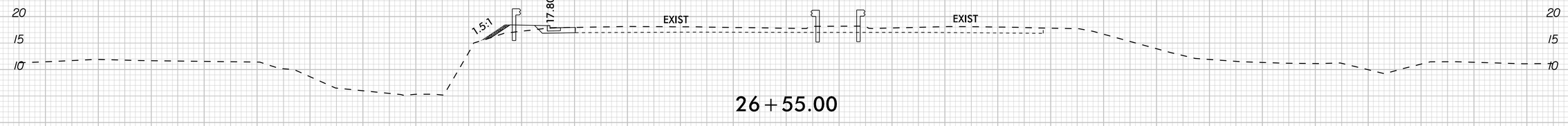
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703C	X-4



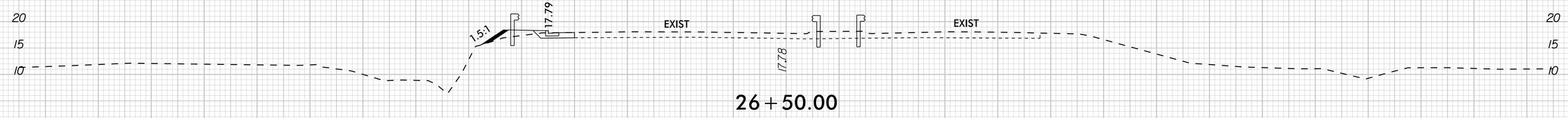
26+65.00



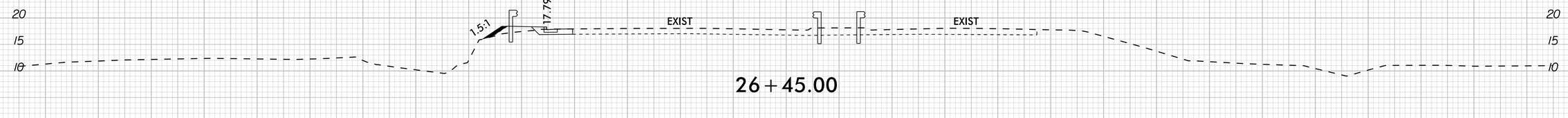
26+60.00



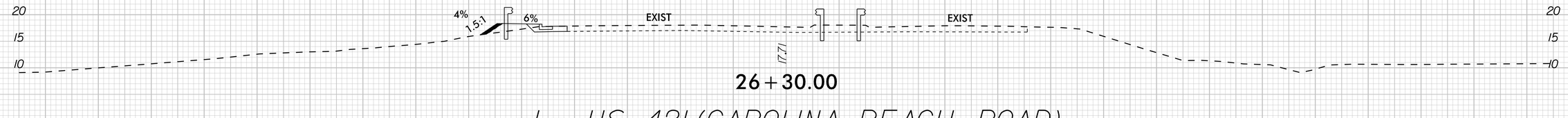
26+55.00



26+50.00



26+45.00



26+30.00

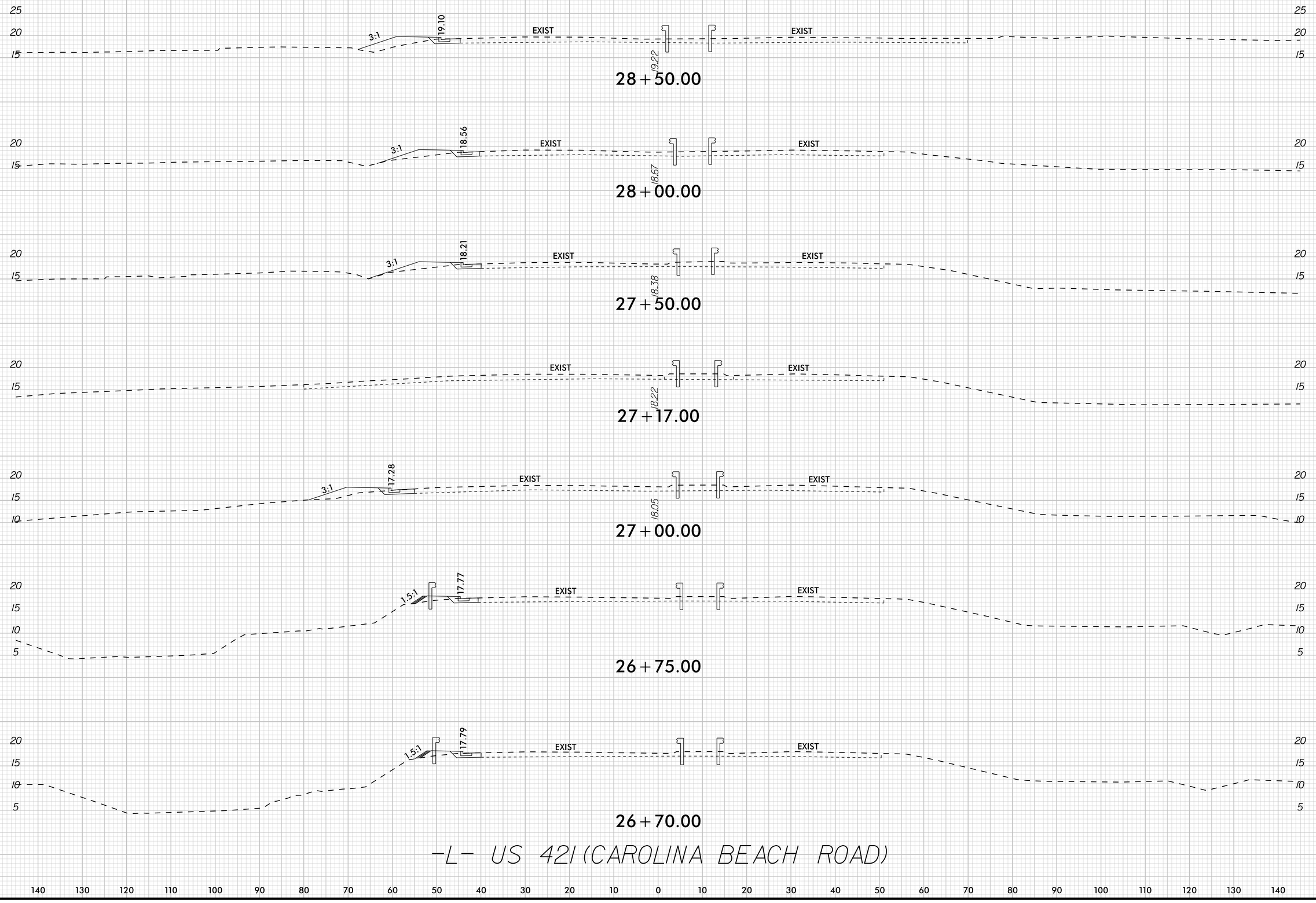
-L- US 421 (CAROLINA BEACH ROAD)

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

7/29/2020

8/23/99

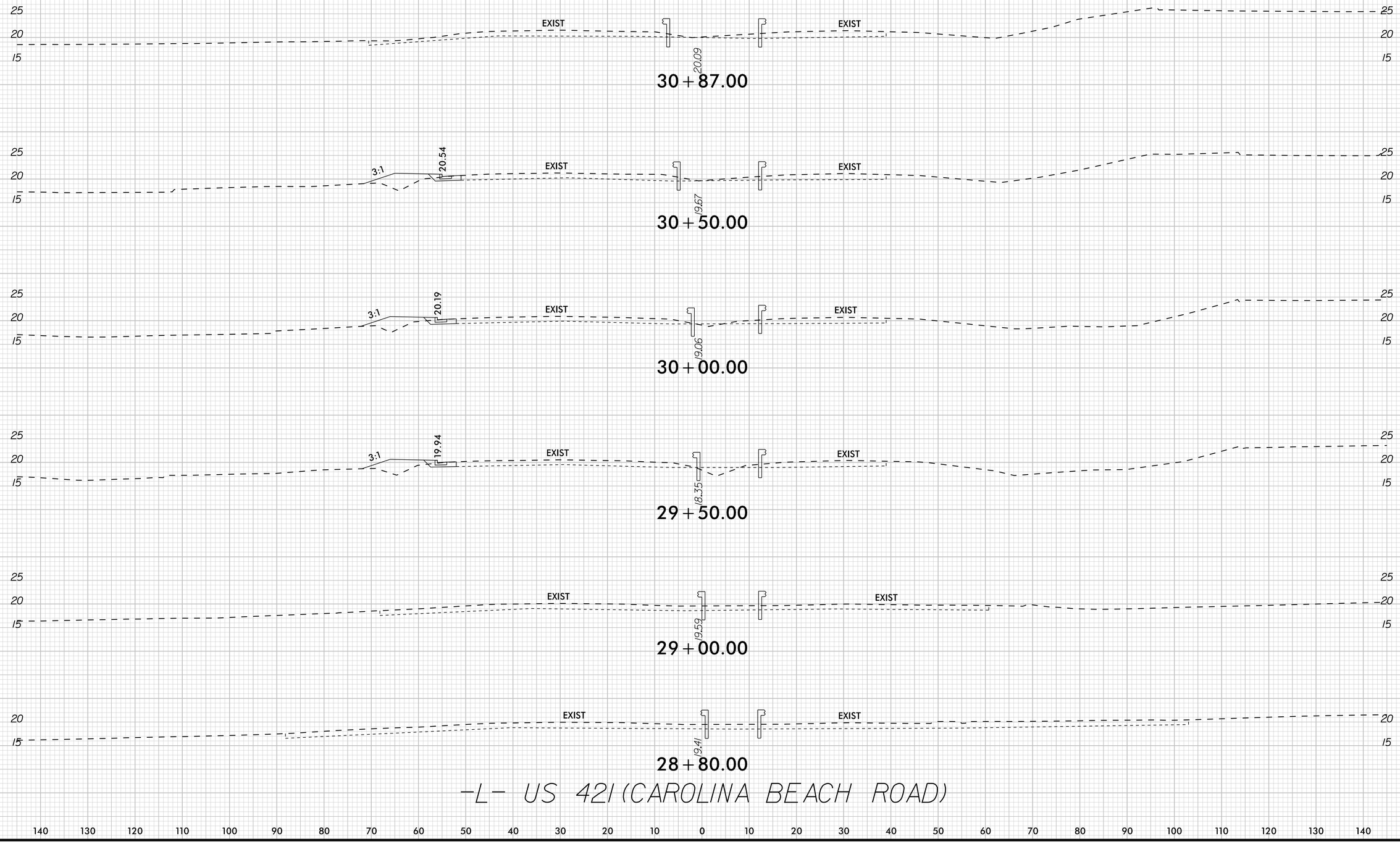
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703C	X-5



1/29/2026

8/23/99

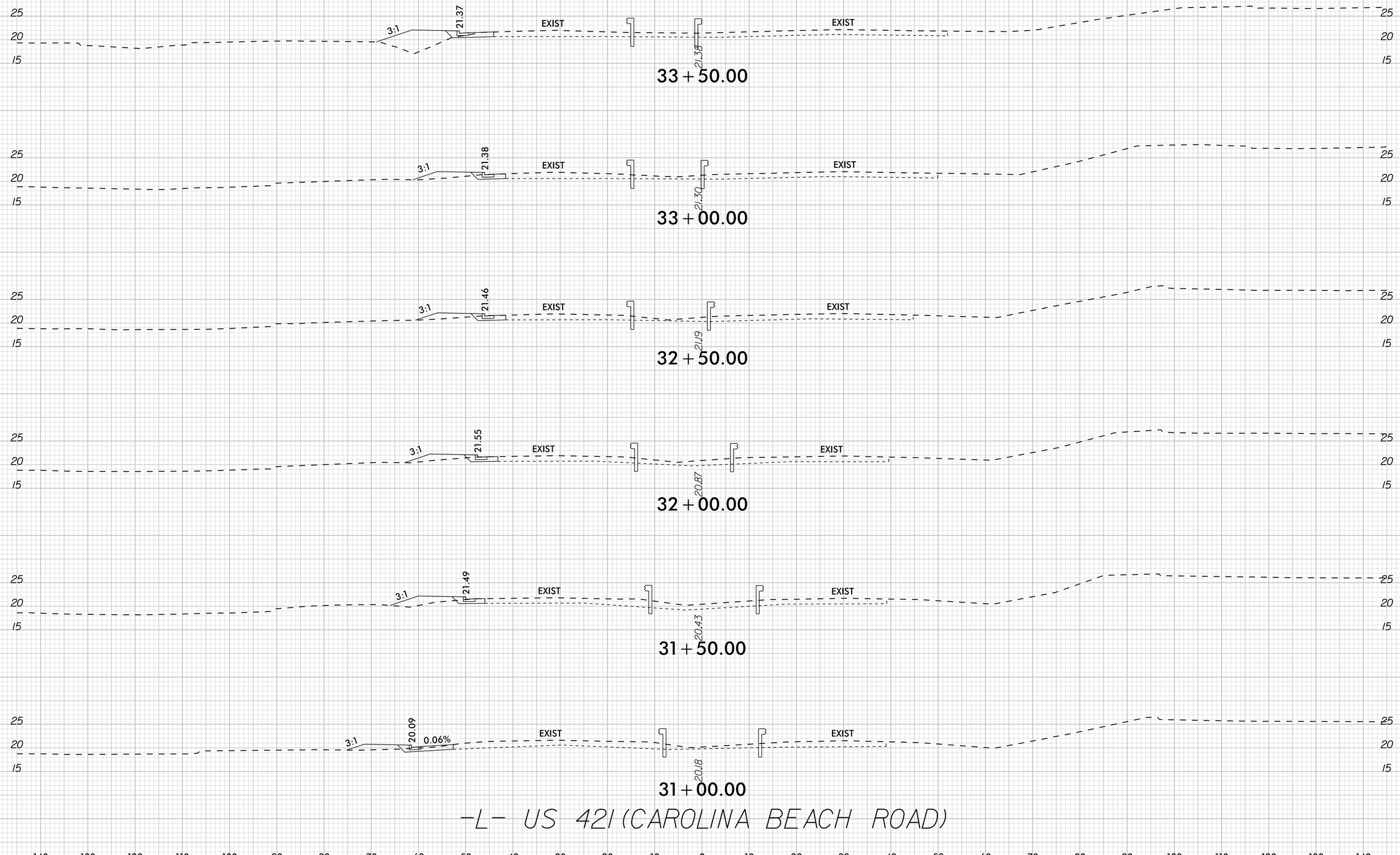
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	W-5703C	X-6



1/29/2025

8/23/99

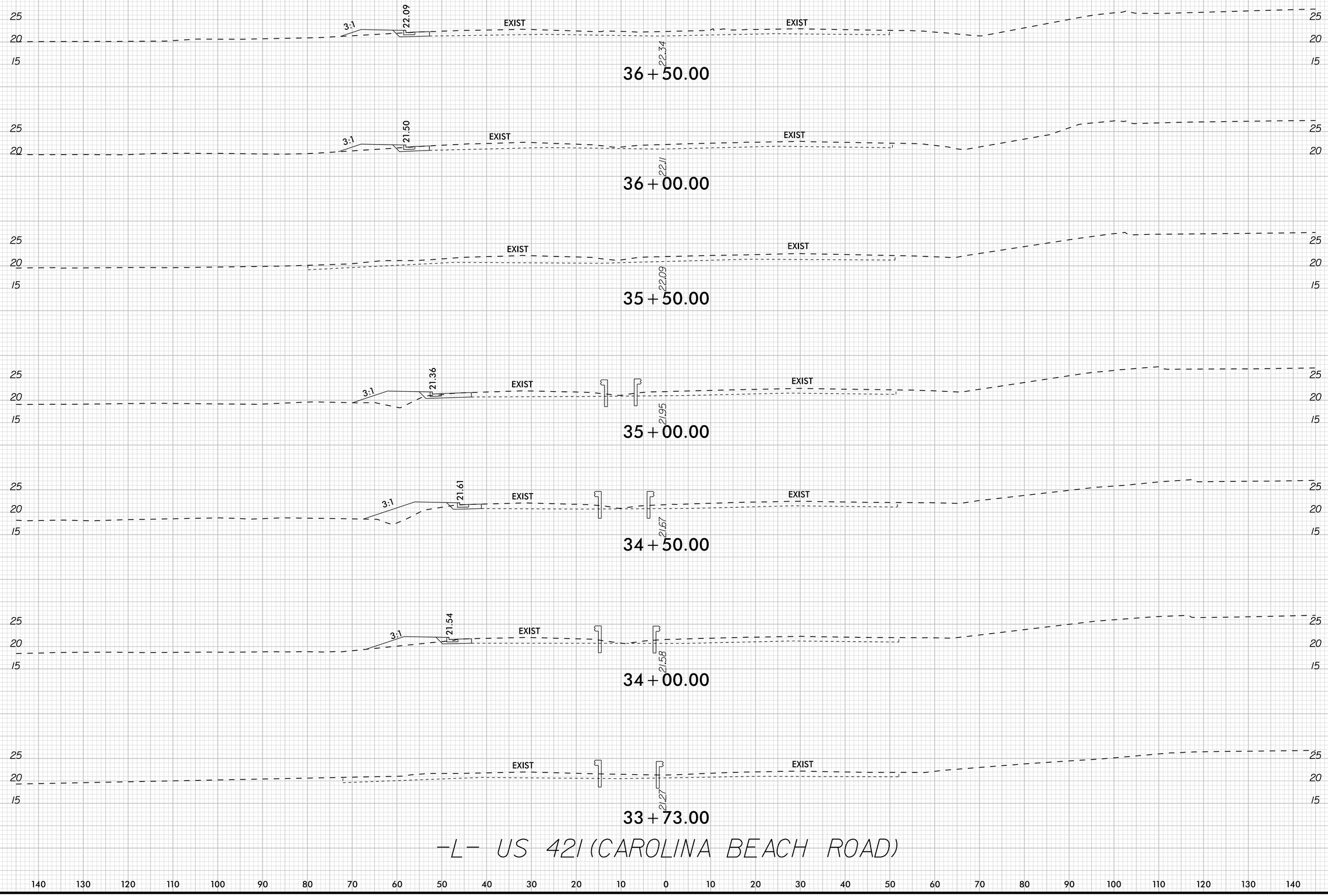
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	W-5703C	X-7



1/29/2026

8/23/99

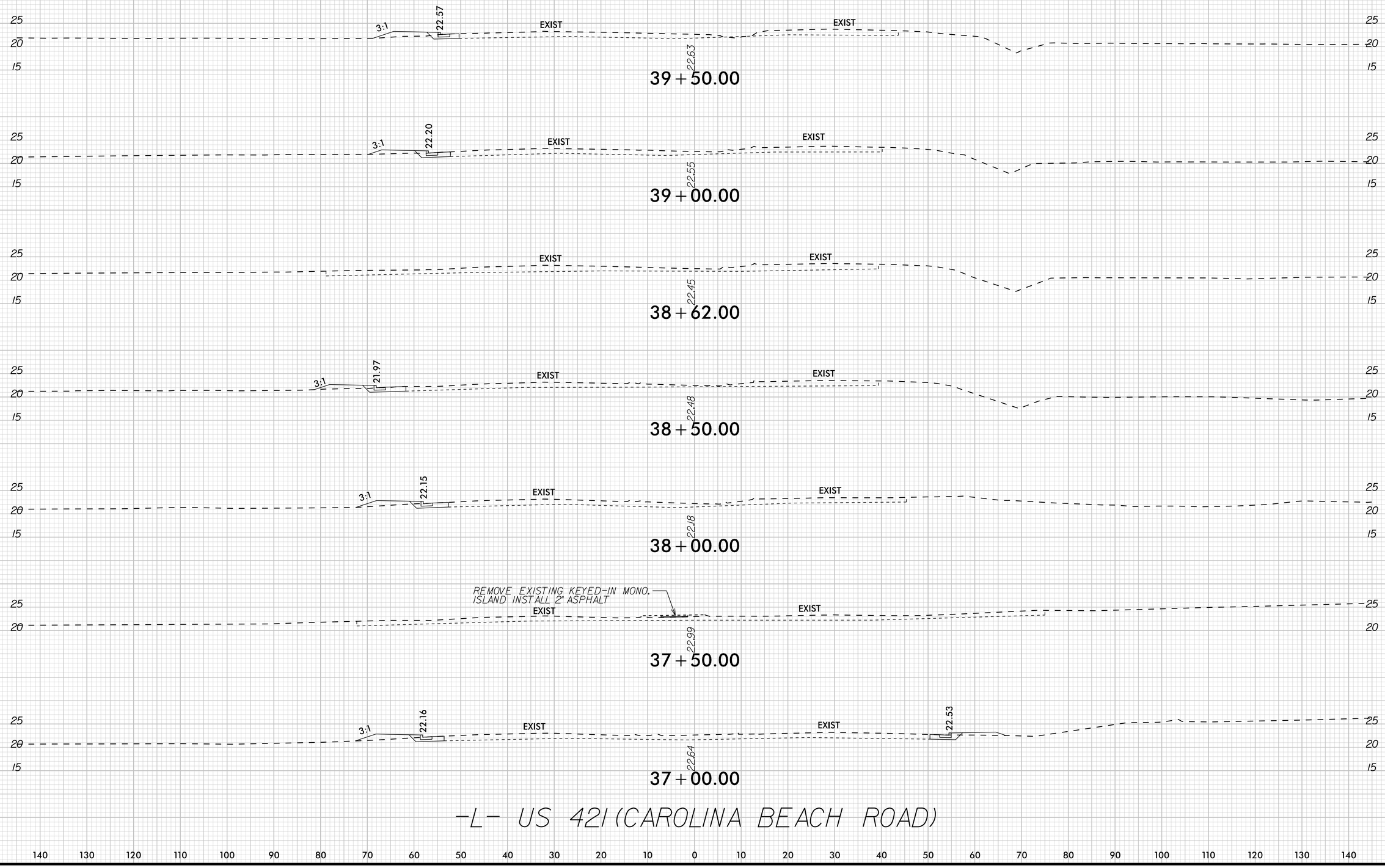
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	W-5703C	X-8



2/11/2026

8/23/99

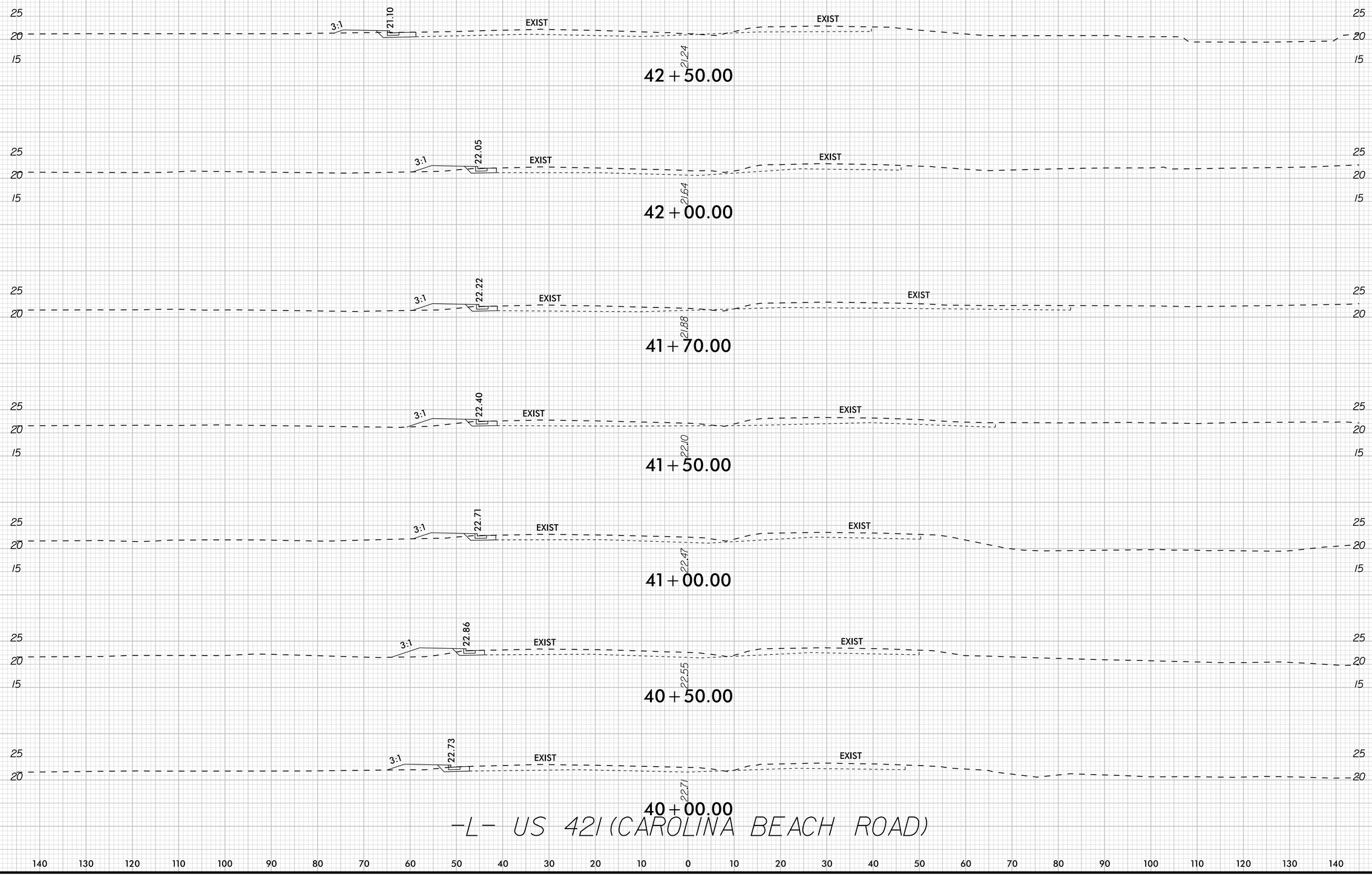
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	W-5703C	X-9



1/29/2026

8/23/99

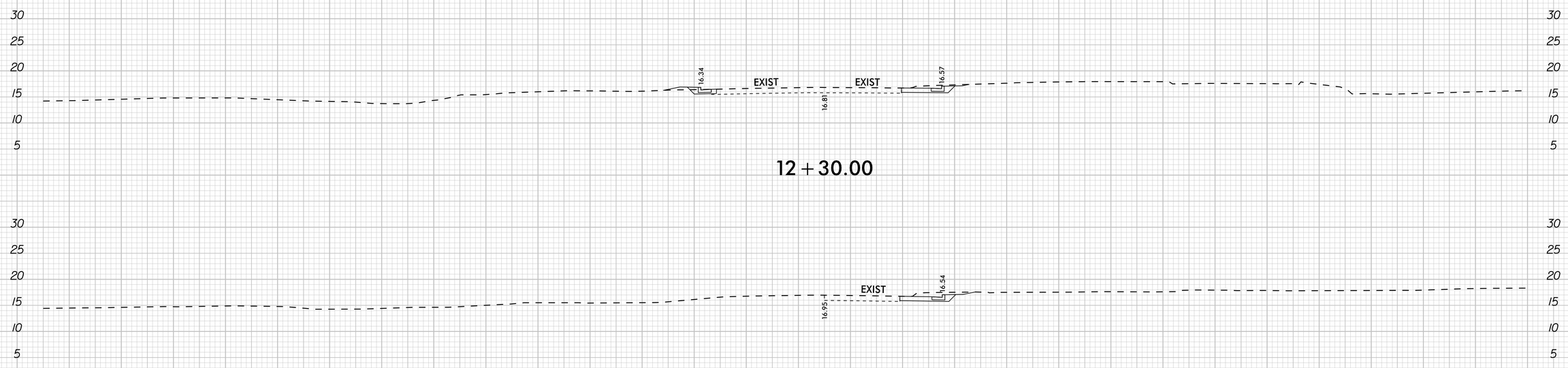
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11/29/2006

8/23/99

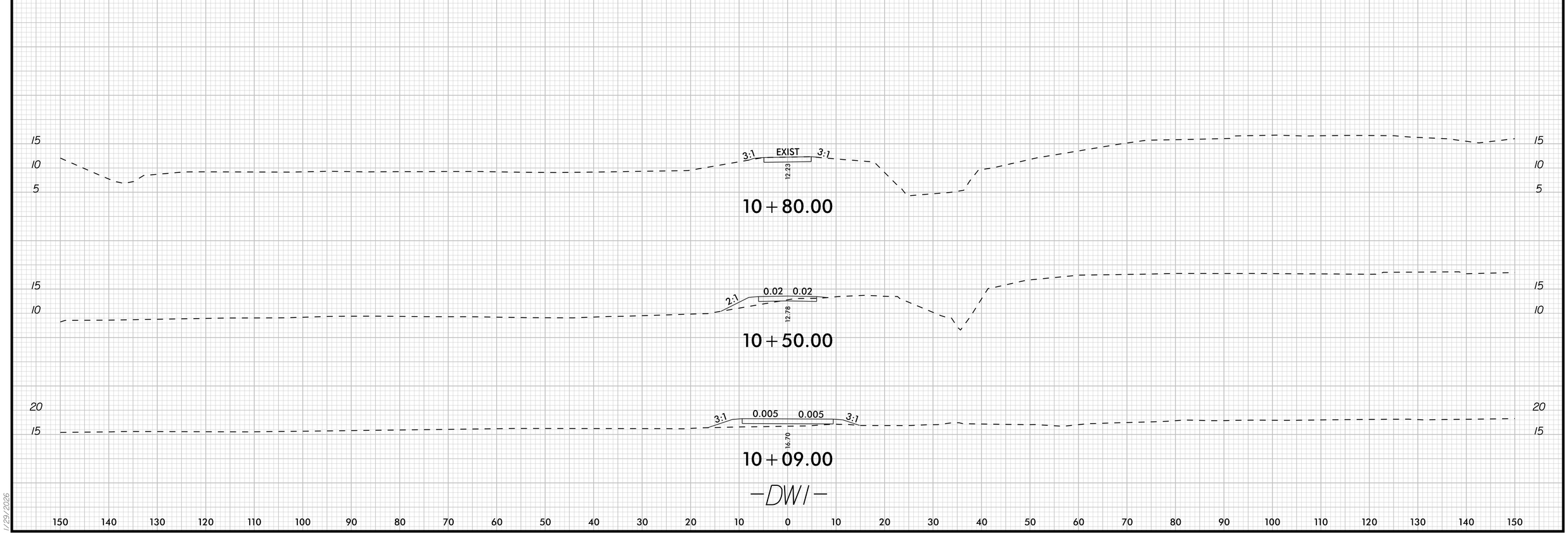
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	W-5703C	X-11



1/29/2026

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5703C	X-12



1/29/2026