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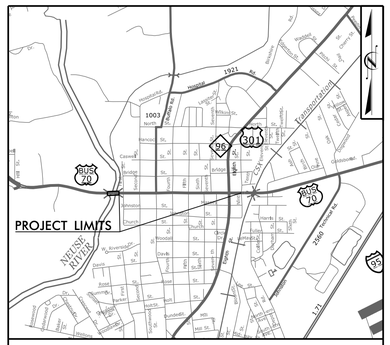
TIP PROJECT: HS-2404V

CONTRACT: DD00548

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



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

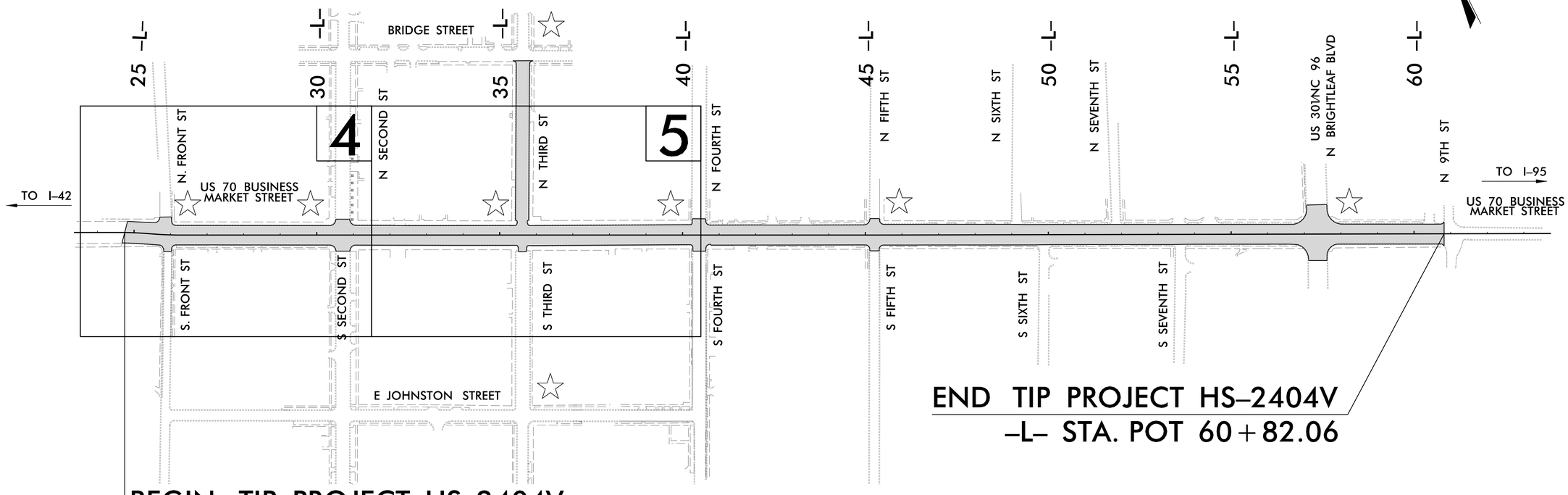
JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2404V	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50976.1.23		PE
50976.3.23		CONSTRUCTION

LOCATION: *US 70 BUSINESS (MARKET STREET), FRONT STREET TO US 301 (BRIGHTLEAF BOULEVARD). INSTALL RAISED CONCRETE MEDIAN, CROSSWALKS, ADA CURB RAMPS, PEDESTRIAN SIGNAL HEADS, REVISE STREET PARKING, AND WIDEN LANES.*

TYPE OF WORK: *PAVING AND SIGNALS*



BEGIN TIP PROJECT HS-2404V
-L- STA. POC 24+74.63

END TIP PROJECT HS-2404V
-L- STA. POT 60+82.06

THIS PROJECT IS IN THE MUNICIPAL LIMITS OF THE TOWN OF SMITHFIELD.

☆ EXISTING SIGNAL

GRAPHIC SCALES

30 15 0 30 60
PLANS

DESIGN DATA

NO DESIGN DATA AVAILABLE FOR THIS PROJECT

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT HS-2404V = 0.683 MILES

TOTAL LENGTH OF TIP PROJECT HS-2404V = 0.683 MILES

PROJECT LENGTH BASED ON
PAVEMENT MARKING DESIGN LIMITS ALONG -L-

PREPARED IN THE OFFICE OF:
HNTB
HNTB NORTH CAROLINA, P.C.
4000 CENTER AT NORTH HILLS ST.
SUITE 500
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO: C-1554
FOR NCDOT DIVISION 4

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
DECEMBER 09, 2026

ROY H. TELLIER, PE
PROJECT ENGINEER

ADDISON GAINEY, PE
NCDOT CONTACT - DIVISION 4

ROADWAY DESIGN ENGINEER

DocuSigned by:
Roy Tellier
BF7D8D80AE8C430...

NORTH CAROLINA PROFESSIONAL SEAL 044575 ENGINEER ROY H. TELLIER, III

P.E.

SIGNATURE:

10/22/2026

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044575 ENGINEER JAMES TELLER II

BF7D8D80AE8C4B0... 10/22/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE & TYPICAL SECTIONS
2C-1 THRU 2C-3	SPECIAL DETAILS
4 THRU 5	PLAN SHEETS
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-12	PAVEMENT MARKING PLANS
SIGN-1 THRU SIGN-12	SIGNING PLANS
SIG 1.0 THRU SIG 8.2	SIGNAL PLANS
UC-1 THRU UC-3	UTILITIES CONSTRUCTION PLANS

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 METHOD II.

SUPERELEVATION:

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

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.

STREET TURNOUT:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE TOWN OF SMITHFIELD

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

CURB RAMPS

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

EFF. 08-11-2025
REV. 11-26-2025

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk (Use Detail in Lieu of Standard for Sheet 1 of 1)
848.04	Street Turnout
848.06	Curb Ramp (Use Details in Lieu of Standards for Sheets 9 and 10 of 13)
852.01	Concrete Islands

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9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage/Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge

- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

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FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. PLACED IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R1	2′-6″ CONCRETE CURB AND GUTTER.
R2	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN)
S1	4″ CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	1.5″ MILLING

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044575 ENGINEER TELLIS WILLIAM TELLER
BF7D8DB0A2E9484...
10/22/2026

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER NORWOOD ROBERT KELLEY III
E0D8B65DAF4A4A8...
10/22/2026

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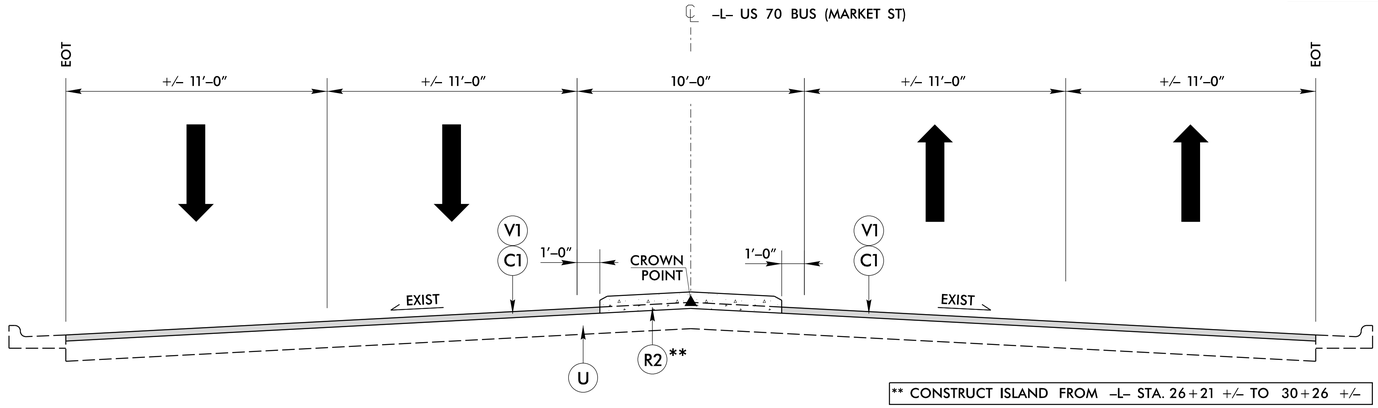
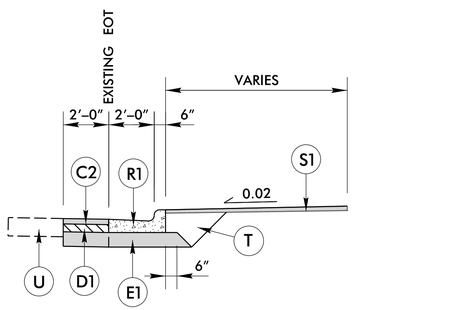


** CONSTRUCT ISLAND FROM –L– STA. 26+21 +/– TO 30+26 +/–

TYPICAL SECTION NO. 1

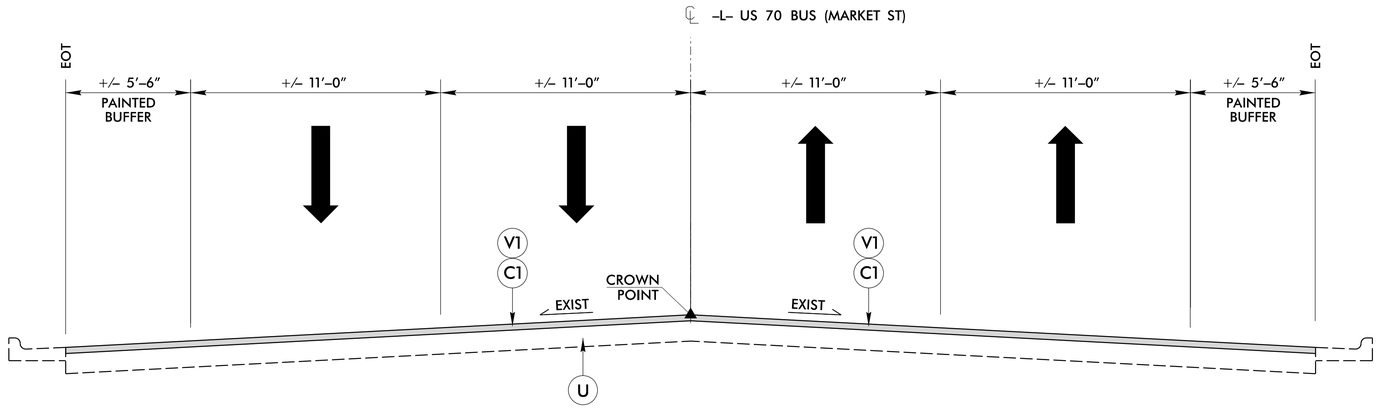
US 70 BUS (MARKET ST)
BETWEEN N. FRONT ST. AND N. 2ND ST.
–L– STA 24+74.63 TO 30+60 +/–



NOTE: REPLACE SIDEWALK AS DIRECTED BY ENGINEER.

CURB & GUTTER DETAIL

SEE PLANS FOR LOCATIONS
OR AS DIRECTED BY ENGINEER



TYPICAL SECTION NO. 2

US 70 BUS (MARKET ST)
BETWEEN N. 2ND ST. AND N. 9TH ST.

NOTES

1. SEE PAVEMENT MARKING PLANS FOR TURN LANE CONFIGURATIONS.
2. DIMENSIONS AND STATION RANGES ARE APPROXIMATE.

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FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
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4000 Center at North Hills St
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ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044575 ENGINEER TIMOTHY TELLER
BF7D8DB0A2E8488...
10/22/2026

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER Nathaniel Kelley III
E0D8985DAA8E4A6...
10/22/2026

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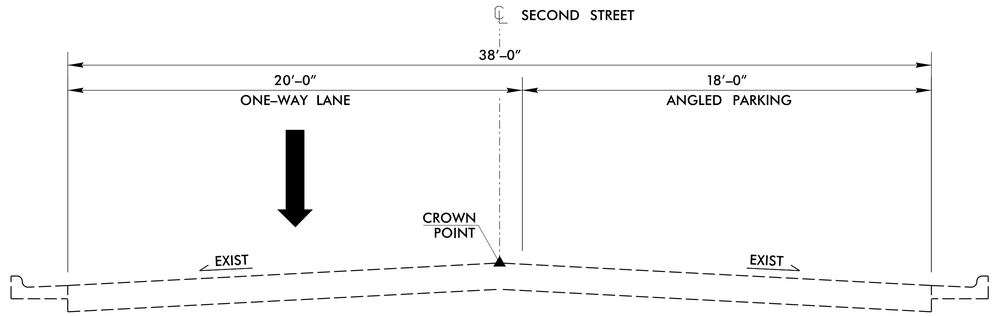
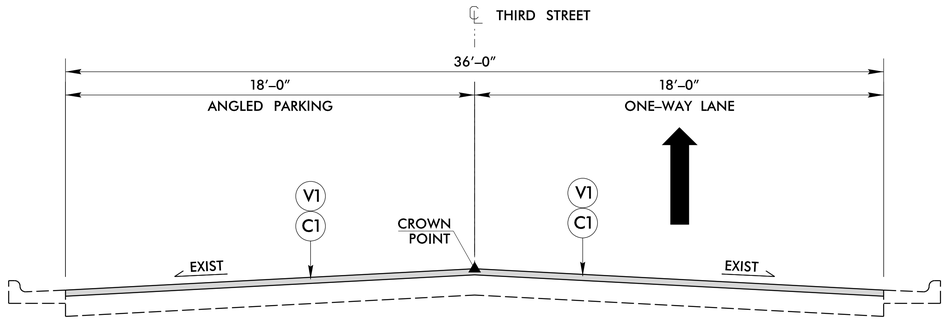
–L– STA 30+60 +/– TO 60+82.06



TYPICAL SECTION NO. 3

SECOND STREET
FROM BRIDGE ST. TO JOHNSTON ST.

NOTE: TYPICAL SECTION SHOWN FOR INFORMATION ONLY.



TYPICAL SECTION NO. 4

THIRD STREET
FROM BRIDGE ST. TO US BUS 70 (MARKET ST.)

NOTES

1. SEE PAVEMENT MARKING PLANS FOR LANE CONFIGURATIONS.
2. DIMENSIONS AND STATION RANGES ARE APPROXIMATE.

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FINAL PAVEMENT SCHEDULE

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	2A-3

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044575 ENGINEER CHRISTOPHER TELLER
BF7D8DB0A2E8424...
10/22/2026

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040774 ENGINEER MICHAEL KEARLEY III
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10/22/2026

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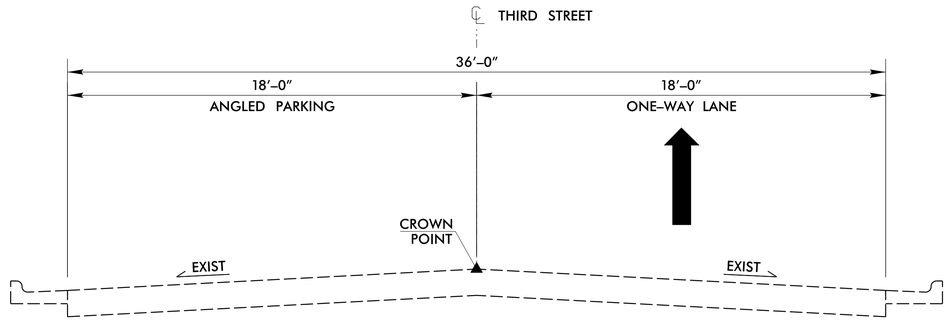
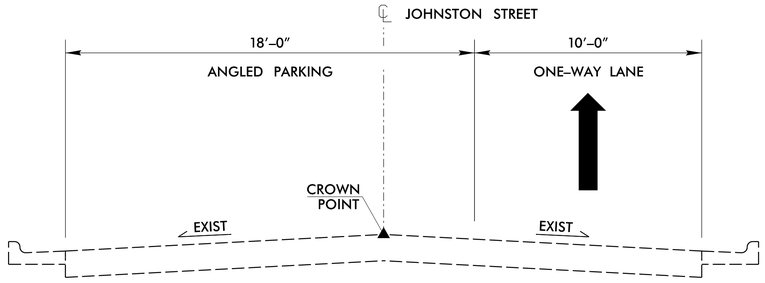


TYPICAL SECTION NO. 5

THIRD STREET
FROM US BUS 70 (MARKET ST.) TO JOHNSTON ST.

NOTE: TYPICAL SECTION SHOWN FOR INFORMATION ONLY.



TYPICAL SECTION NO. 6

JOHNSTON STREET
BETWEEN S. SECOND ST AND S. THIRD ST

NOTE: TYPICAL SECTION SHOWN FOR INFORMATION ONLY.

NOTES

1. SEE PAVEMENT MARKING PLANS FOR LANE CONFIGURATIONS.
2. DIMENSIONS AND STATION RANGES ARE APPROXIMATE.

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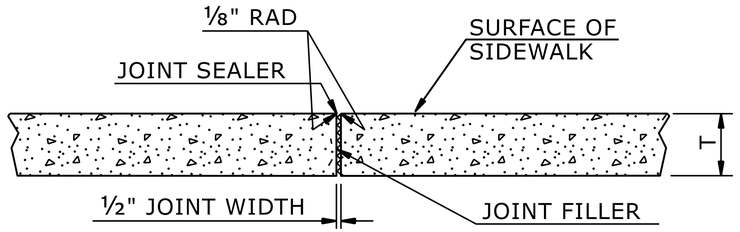
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	2C-1

NOTES:

CONSTRUCT STANDARD SIDEWALK 5' WIDE AND 4" THICK UNLESS OTHERWISE DENOTED ON PLANS.

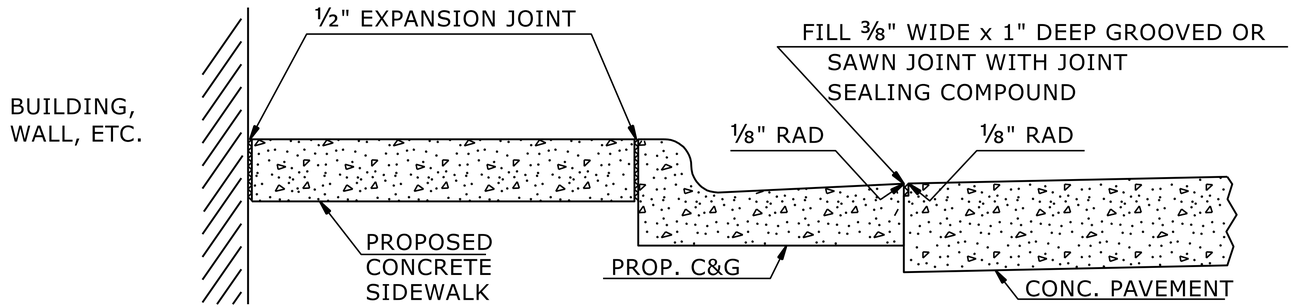
PLACE A GROOVE JOINT 1" DEEP WITH ⅛" RADII IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE ½" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS. A ½" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

SEE STD. DWG. 848.06 FOR CURB RAMP LOCATION REQUIREMENTS AND CONSTRUCTION GUIDELINES.



T = SIDEWALK THICKNESS

TRANSVERSE EXPANSION JOINT IN SIDEWALK



DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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

ROADWAY DETAIL DRAWING FOR

CONCRETE SIDEWALK

SHEET 1 OF 1

848D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER 10/22/2026

Signed by: Nicole M. Hackler 5884323D34164C8...

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

SEE TITLE BLOCK

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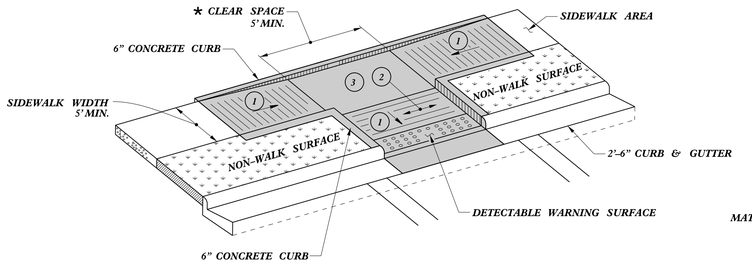
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

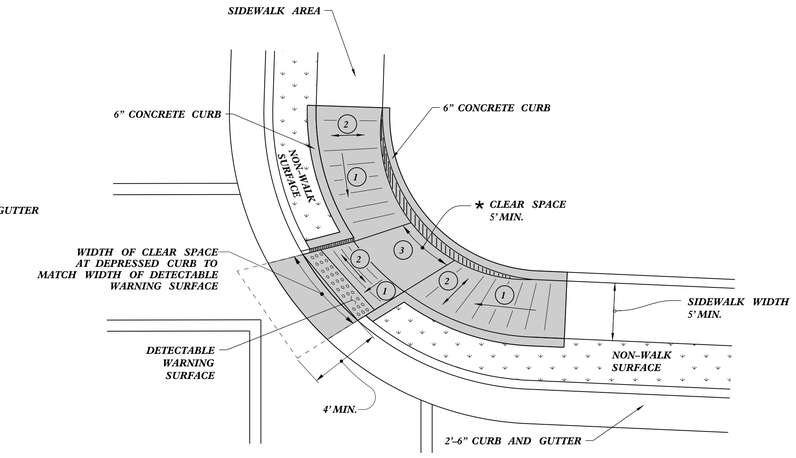
Docusign Envelope ID: B79417F0-2444-8C3E-8063-DDFA017E927B

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	2C-2

* – *WHERE CLEAR SPACE IS CONSTRAINED ON TWO OR MORE SIDES, THE CLEAR SPACE SHALL BE 4'MINIMUM X 5'MINIMUM, WITH 5' PROVIDED IN THE DIRECTION OF THE PEDESTRIAN STREET CROSSING.*



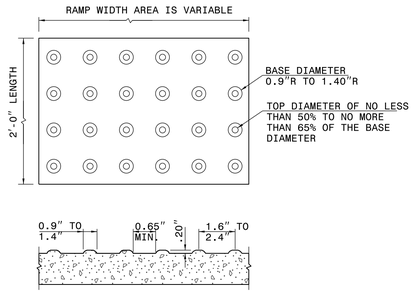
TYPE 3



TYPE 3 MODIFIED
INSTALLATION IN A RADIUS

NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.

DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DETECTABLE WARNING SURFACE

(1) *8.33% (12:1) MAX RAMP SLOPE*

(2) *CROSS SLOPE: 2.00%*

(3) *MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00%.*

PAY LIMITS FOR 1 CURB RAMP

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

ROADWAY DETAIL DRAWING FOR

CURB RAMP

PARALLEL RAMP

SHEET 9 OF13

848D06

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER
10/22/2026
Signature: Nicole M. Hackler
588432303041640C5...

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Office 919-707-6950 FAX 919-250-4119

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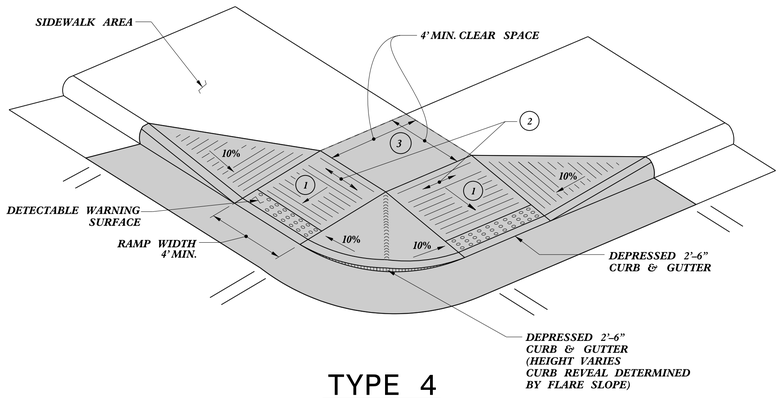
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	2C-3



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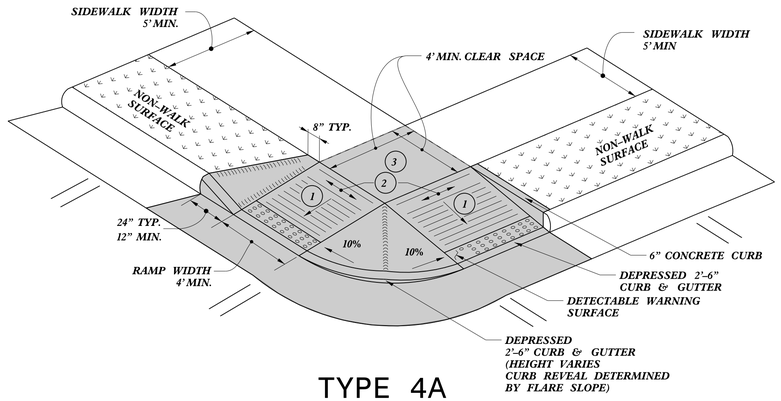
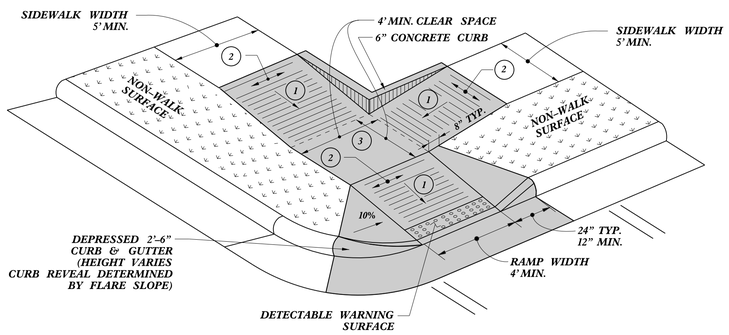
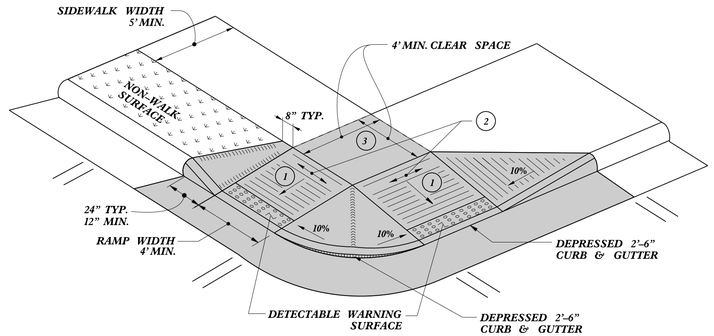


TYPE 4A



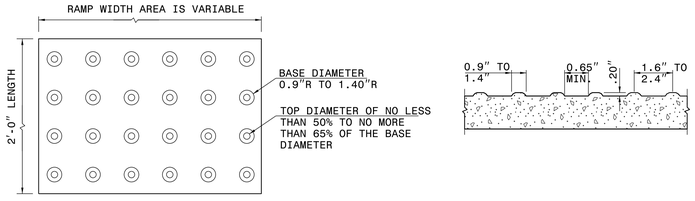
TYPE 4B



TYPE 4C

NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.

DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DETECTABLE WARNING SURFACE

1. 8.33% (12:1) MAX RAMP SLOPE
2. CROSS SLOPE: 2.00%
3. MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00%.

PAY LIMITS FOR 1 OR 2 CURB RAMPS (CALCULATE BASED ON NUMBER OF SETS OF DETECTABLE WARNING SURFACES

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

ROADWAY DETAIL DRAWING FOR

CURB RAMP

SHARED LANDING

SHEET 10 OF 13

848D06

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M. Hackler
58843233D34164C5...
10/22/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: special details\nmhackler\848D0610.dgn

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HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044575 ENGINEER
Docusigned by: Joanne Sellier
BF7D5E8E8E3E4E2...
10/22/2026

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8/17/99

REVISIONS

BEGIN TIP PROJECT HS-2404V
-L- STA. 24+74.63

25 -L-

N. FRONT ST

30 -L-

N SECOND ST

-L- PC Sta. 24+60.73

S 63° 16' 23.7" E

-L-

-L- PT Sta. 26+28.11

8'

+/- 22'

10'

+/- 22'

5" MONOLITHIC CONCRETE ISLAND (KEYED-IN)

S 63° 16' 23.7" E

US 70 BUSINESS (MARKET ST)

+21.49 -L-
0.21' RT

+25.89 -L-
0.58' RT

PROPOSED RESURFACING LIMITS (SEE NOTE)

-L- PRC Sta. 25+44.42

S. FRONT ST

S SECOND ST

MATCHLINE -L- STA. 31+50.00
SEE SHEET 5

-L- CURVE DATA

PI Sta 25+02.60	PI Sta 25+86.29
Δ = 4° 47' 42.4" (RT)	Δ = 4° 47' 42.4" (LT)
D = 5° 43' 46.5"	D = 5° 43' 46.5"
L = 83.69'	L = 83.69'
T = 41.87'	T = 41.87'
R = 1,000.00'	R = 1,000.00'
SE = EXIST	SE = EXIST
RO = EXIST	RO = EXIST

EXISTING SIGNAL

NOTES

FOR CURB RAMP LOCATIONS, SEE PAVEMENT MARKING PLANS.

LIMITS OF PROPOSED IMPROVEMENTS ARE APPROXIMATE AND TO BE CONSTRUCTED AS DIRECTED BY ENGINEER.

NO SURVEY INFORMATION IS AVAILABLE.
TOPOGRAPHIC & PARCEL INFORMATION SHOWN IS APPROXIMATE.

PAVEMENT RESURFACING LIMITS ALONG SIDE ROADS TO BE DETERMINED BY ENGINEER.

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8/17/99

REVISIONS

MATCHLINE –L– STA. 31+50.00 – SEE SHEET 4



EXISTING SIGNAL

NOTES

FOR CURB RAMP LOCATIONS, SEE PAVEMENT MARKING PLANS.

LIMITS OF PROPOSED IMPROVEMENTS ARE APPROXIMATE AND TO BE CONSTRUCTED AS DIRECTED BY ENGINEER.

NO SURVEY INFORMATION IS AVAILABLE.
TOPOGRAPHIC & PARCEL INFORMATION SHOWN IS APPROXIMATE.

PAVEMENT RESURFACING LIMITS ALONG SIDE ROADS TO BE DETERMINED BY ENGINEER.

HNTB
HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044575 ENGINEER
Digitally signed by [illegible]
BFTOLLIVER
10/22/2026

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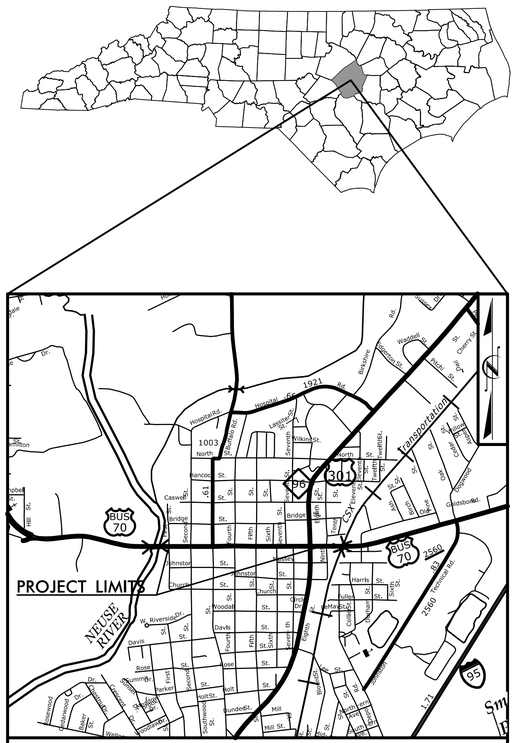
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

JOHNSTON COUNTY



VICINITY MAP (NTS)

LOCATION: *US 70 BUSINESS (MARKET STREET), FRONT STREET TO US 301 (BRIGHTLEAF BOULEVARD). INSTALL RAISED CONCRETE MEDIAN, CROSSWALKS, ADA CURB RAMPS, PEDESTRIAN SIGNAL HEADS, REVISE STREET PARKING, AND WIDEN LANES.*

TYPE OF WORK: *PAVING AND TRAFFIC SIGNALS*



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

PLANS PREPARED BY:

DYLAN J O'NEAL, PE
PROJECT ENGINEER

NCDOT CONTACTS:

ADDISON GAINEY, PE
DIVISION 4 CONTACT

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

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, INDEX OF SHEETS AND STANDARD DRAWINGS
TMP-1A	MANAGEMENT STRATEGIES AND GENERAL NOTES
TMP-2	CROSSWALK CLOSURE AND PEDESTRIAN DETOUR TYPICAL
TMP-3	PHASING

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
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1180.01	SKINNY - DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

LEGEND

GENERAL

NORTH ARROW

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HNTB
HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554

APPROVED: Signed by: Dylan O'Neal 063597E73B4D431...

DATE: 10/20/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 062995 ENGINEER DYLAN O'NEAL

SHEET NO.
TMP-1

HS-2404V

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PROJ. REFERENCE NO.	SHEET NO.
HS-2404V	TMP-1A

MANAGEMENT STRATEGIES

TRAFFIC MANAGEMENT STRATEGIES

- LANE SHIFTS OR CLOSURES
- ONE-LANE, TWO WAY OPERATION (FLAGGING)
- NIGHT WORK
- WEEKEND WORK
- WORK HOUR RESTRICTIONS FOR PEAK TRAVEL

TRAFFIC / INCIDENT MANAGEMENT & SPEED ENFORCEMENT STRATEGIES:

- COORDINATION WITH MEDIA

GENERAL NOTES

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

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

TIME RESTRICTIONS

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

ROAD NAME	DAY AND TIME RESTRICTIONS
US 70 BUS (MARKET STREET), SECOND ST (SOUTH OF MARKET ST), THIRD ST (SOUTH OF MARKET ST), AND JOHNSTON ST	MONDAY THRU SUNDAY 6:00 A.M. - 9:00 P.M.

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

ROAD NAME
ANY ROAD

HOLIDAYS

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 9:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 9:00 P.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 9:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 9:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 9:00 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 9:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 9:00 P.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 9:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 5 FT OF AN OPEN TRAVEL LANE ON AN UNDIVIDED 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 TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

G) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON US 70 BUS (MARKET ST)

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 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 LANE OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200 FT IN ADVANCE AND A MINIMUM OF EVERY ONE 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) 200' 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 PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
ANY ROAD	PAINT	NONE

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 PROPOSED MONOLITHIC ISLAND LOCATIONS WITH PROPER COLOR PAVEMENT MARKINGS PRIOR TO INSTALLATION. PLACE DRUMS TO DELINEATE ANY PROPOSED MONOLITHIC ISLANDS.

MISCELLANEOUS

U) LAW ENFORCEMENT SHALL 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.

W) CONTRACTOR SHALL MAINTAIN SIDEWALK ACCESS AT ALL TIMES AS STATED IN THE PHASING. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE TEMPORARY SIDEWALKS (CONCRETE, ASPHALT, OR OTHER SUITABLE MATERIAL AS APPROVED BY THE ENGINEER) AT ALL LOCATIONS WHERE THE OPEN PEDESTRIAN TRAVELWAY HAS BEEN REMOVED FOR CONSTRUCTION OPERATIONS (UTILITIES, DRAINAGE, ETC.).

HNTB
HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St.
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554

APPROVED: Signed by: Dylan O'Neal D63597E73B4D431...
DATE: 10/20/2026
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 062995 ENGINEER DYLAN O'NEAL

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

TRANSPORTATION MANAGEMENT PLAN

MANAGEMENT STRATEGIES & GENERAL NOTES

28-SEP-2026 11:40
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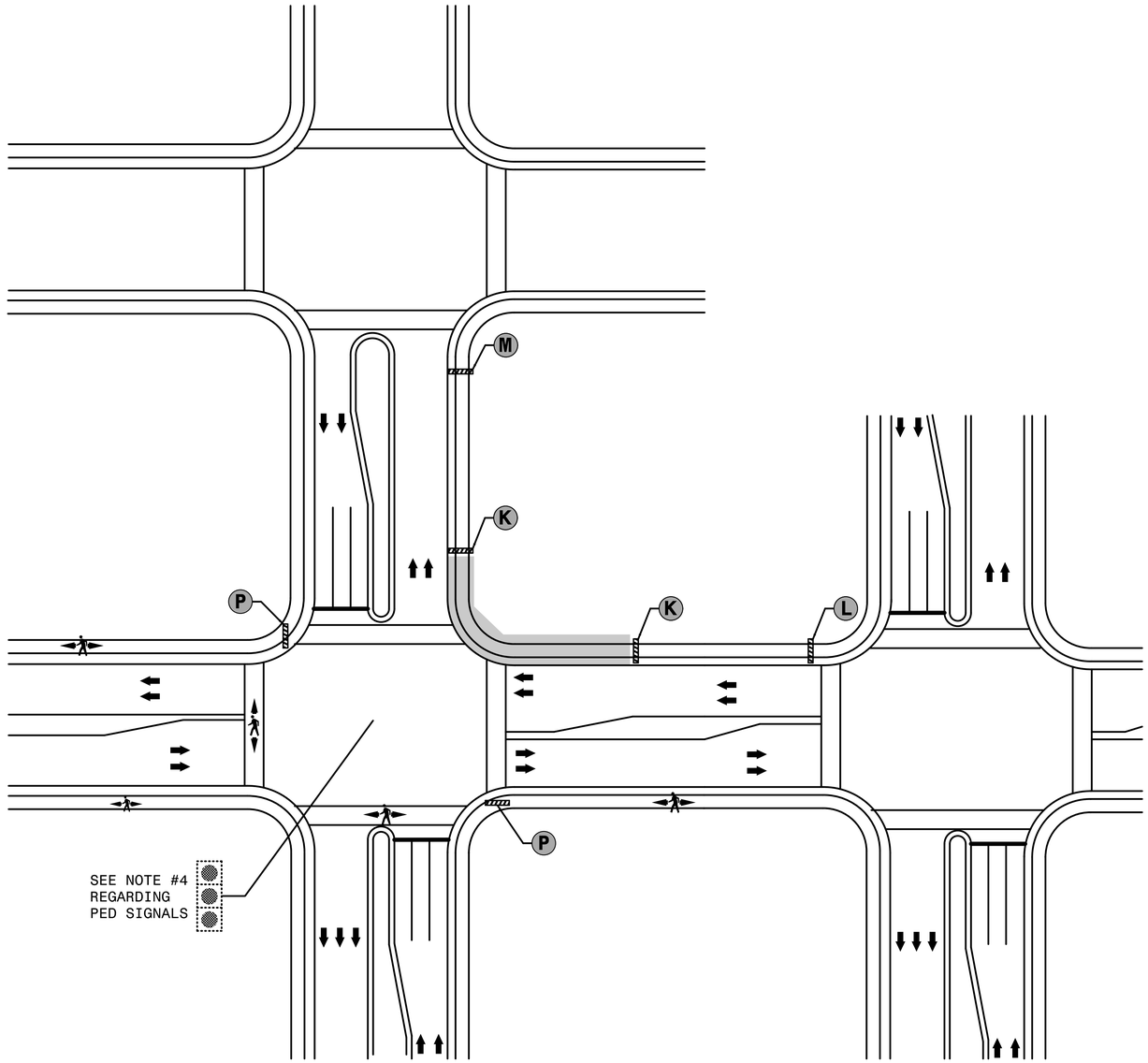
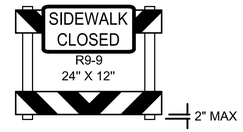
HS-2404V	TMP-2



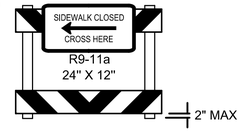
CROSSWALK CLOSURE AND PEDESTRIAN DETOUR

K



PEDESTRIAN BARRICADE
MUST BE ADA-COMPLIANT

L



PEDESTRIAN BARRICADE
MUST BE ADA-COMPLIANT

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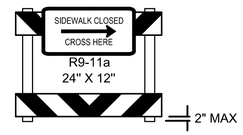
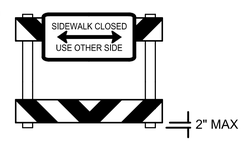


PEDESTRIAN BARRICADE
MUST BE ADA-COMPLIANT

P



PEDESTRIAN BARRICADE
MUST BE ADA-COMPLIANT

1. SEE MUTCD PART 6H FOR APPLICATION DETAILS.
2. CURB PARKING SHALL BE PROHIBITED FOR AT LEAST 50 FEET IN ADVANCE OF THE MIDBLOCK CROSSWALK.
3. AUDIBLE WARNING DEVICES SHALL BE USED WHERE MIDBLOCK CLOSINGS AND CHANGED CROSSWALK AREAS CAUSE INADEQUATE COMMUNICATION TO BE PROVIDED TO PEDESTRIANS WHO HAVE VISUAL DISABILITIES.
4. PEDESTRIAN TRAFFIC SIGNAL DISPLAYS CONTROLLING CLOSED CROSSWALKS SHOULD BE COVERED OR DEACTIVATED.

HNTB NORTH CAROLINA, P.C.
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Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554

APPROVED: Signed by: Dylan O'Neal D53597E73B4D43... DATE: 10/20/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 062995 ENGINEER DYLAN O'NEAL

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

TRANSPORTATION MANAGEMENT PLAN

CROSSWALK CLOSURE AND PEDESTRIAN DETOUR TYPICAL

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9/26/2026

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PROJ. REFERENCE NO.	SHEET NO.
HS-2404V	TMP-3

PHASING

NOTES:

REPLACE MARKINGS AND RETURN TRAFFIC TO THE CURRENT TRAFFIC PATTERN AT THE END OF EACH WORK PERIOD UNLESS OTHERWISE NOTED IN THE PHASING OR DIRECTED BY THE ENGINEER.

MAINTAIN VEHICULAR ACCESS TO ALL RESIDENCES AND BUSINESSES DURING THE LIFE OF THE CONTRACT UNLESS OTHERWISE NOTED IN THE PHASING OR DIRECTED BY THE ENGINEER.

CONSTRUCT UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE, IN ALL PHASES UNTIL STATED TO INSTALL FINAL LAYER IN THE PHASING.

THE TERM RSD DENOTES "ROADWAY STANDARD DRAWINGS".

STEP 1: USING RSD 1101.01 (SHEET 3 OF 3), INSTALL WORK ZONE ADVANCE WARNING SIGNS ON US 70 BUSINESS (E MARKET STREET), SECOND STREET, THIRD STREET, BRIDGE STREET, AND E JOHNSTON STREET.

STEP 2: USING RSD 1101.02 (SHEET 3 OF 19) COMPLETE THE FOLLOWING:

- INSTALL PROPOSED SIGNALS AND COVER
- INSTALL PROPOSED SIGNAGE AND COVER

STEP 3: USING RSD 1101.02 (SHEET 1 AND 3 OF 19) AND LAW ENFORCEMENT, COMPLETE THE FOLLOWING:

- CONSTRUCT CURB AND GUTTER AT THE INTERSECTION OF THIRD STREET AND US 70 BUS AS SHOWN IN ROADWAY PLANS (SHEET-5)
  - USE TMP-2 AS NEEDED TO DETOUR PEDESTRIAN TRAFFIC DURING CURB CONSTRUCTION

STEP 4: USING RSD 1101.02 (SHEET 1, 3, AND 7 OF 19) AND LAW ENFORCEMENT, COMPLETE THE FOLLOWING IN A CONTINUOUS MANNER:

NOTE: STEPS 4.1, 4.2, AND 4.3 SHALL BE DONE IN ORDER.

STEP 4.1:
- USE DRUMS TO CLOSE EXISTING LEFT TURN LANE FOR TRAFFIC TAKING A LEFT FROM US 70 BUS EB ONTO SECOND STREET NB.
- INSTALL TEMPORARY PAVEMENT MARKINGS IN LOCATION OF THE PROPOSED MONOLITHIC ISLAND. (SEE ROADWAY SHEET 4, PMP-3, AND GENERAL NOTE T)
- INSTALL TEMPORARY PAVEMENT MARKINGS AT US 70 BUS BETWEEN SECOND STREET AND FOURTH STREET AS SHOWN ON PAVEMENT MARKING PLANS (PMP-3 AND PMP-4)

NOTE: STEPS 4.2.1, 4.2.2, AND 4.2.3 CAN BE DONE IN ANY ORDER, BUT SHALL NOT BE WORKED ON SIMULTAENOUSLY. COORDINATE WITH CITY OF SMITHFIELD TO RESTRICT ON-STREET PARKING PRIOR TO REMOVING EXISTING PAVEMENT MARKINGS.

COMPLETE THE REQUIREMENTS OF STEP 4.2.1 BETWEEN 9:00 PM [ON ANY DAY], TO 6:00 AM THE FOLLOWING DAY. (SEE INTERMEDIATE CONTRACT TIME AND LIQUIDATED DAMAGES.)

STEP 4.2.1: USING RSD 1101.02 (SHEET 1 OF 19), COMPLETE THE FOLLOWING:

- REMOVE EXISTING PAVEMENT MARKINGS AT SECOND STREET
- INSTALL TEMPORARY MARKINGS PER PMP, INCLUDING ON-STREET PARKING
- INSTALL DRUMS AT 10′ SPACING ON THE FIRST TWO ON STREET PARKING SPACES TO PREVENT WRONG WAY VEHICLES AND OPEN BACK ON STREET PARKING

COMPLETE THE REQUIREMENTS OF STEP 4.2.2 BETWEEN 9:00 PM [ON ANY DAY], TO 6:00 AM THE FOLLOWING DAY. (SEE INTERMEDIATE CONTRACT TIME AND LIQUIDATED DAMAGES.)

STEP 4.2.2: USING RSD 1101.02 (SHEET 1 OF 19), COMPLETE THE FOLLOWING:

- REMOVE EXISTING PAVEMENT MARKINGS AT THIRD STREET
- INSTALL TEMPORARY MARKINGS PER PMP, INCLUDING ON-STREET PARKING
- INSTALL DRUMS AT 10′ SPACING ON THE FIRST TWO ON STREET PARKING SPACES TO PREVENT WRONG WAY VEHICLES AND OPEN BACK ON STREET PARKING

COMPLETE THE REQUIREMENTS OF STEP 4.2.3 BETWEEN 9:00 PM [ON ANY DAY], TO 6:00 AM THE FOLLOWING DAY. (SEE INTERMEDIATE CONTRACT TIME AND LIQUIDATED DAMAGES.)

STEP 4.2.3: USING RSD 1101.02 (SHEET 1 OF 19), COMPLETE THE FOLLOWING:

- REMOVE EXISTING PAVEMENT MARKINGS AT THE SEGEMENT OF E JOHNSTON STREET BETWEEN SECOND STREET AND THIRD STREET
- INSTALL TEMPORARY MARKINGS PER PMP, INCLUDING ON-STREET PARKING
- INSTALL DRUMS AT 10′ SPACING ON THE FIRST TWO ON STREET PARKING SPACES TO PREVENT WRONG WAY VEHICLES AND OPEN BACK ON STREET PARKING.

STEP 4.3:
- UNCOVER SIGNS AND SIGNALS AND ACTIVATE PROPOSED SIGNALS. TRAFFIC SHOULD BE IN PROPOSED PATTERN. (SEE NOTE AT THE BOTTOM OF THIS PAGE)

STEP 5: USING RSD 1101.02 (SHEET 1, 3, AND 7 OF 19) AND LAW ENFORCEMENT, COMPLETE THE FOLLOWING:

- INSTALL PROPOSED MONOLITHIC ISLAND
- CONSTRUCT RESURFACING IN ACCORDANCE WITH ROADWAY PLANS
- INSTALL PROPOSED PAVEMENT MARKINGS IN ACCORDANCE WITH PMP.

AFTER ALL WORK HAS BEEN COMPLETED, REMOVE ANY REMAINING TRAFFIC CONTROL DEVICES.

NOTE: AT THE INTERSECTIONS OF BRIDGE ST AND N SECOND ST & E JOHNSTON AND S THIRD STREET, THE EXISTING SIGNALS ARE TO BE SWITCHED TO ALL RED FLASHING. THIS WILL BE DONE WHEN ACTIVATING PROPOSED SIGNALS AS STATED IN STEP 4.3.

APPROVED: Signed by: Dylan O'Neal 053697E73840431...

DATE: 11/10/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 062995 ENGINEER DYLAN O'NEAL

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

TRANSPORTATION MANAGEMENT PLAN

PHASING

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4000 Center at North Hills St.
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NC License No: C-1554

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T.I.P.: HS-2404V

CONTRACT: DD00548

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-1

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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PAVEMENT MARKING PLAN
JOHNSTON COUNTY

LOCATION: US 70 BUSINESS (MARKET STREET), FRONT STREET TO US 301 (BRIGHTLEAF BOULEVARD). INSTALL RAISED CONCRETE MEDIAN, CROSSWALKS, ADA CURB RAMPS, PEDESTRIAN SIGNAL HEADS, REVISE STREET PARKING, AND WIDEN LANES.

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - CONTRACT STANDARDS AND DEVELOPMENT 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
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS (SEE SHEET PMP-1A FOR SHEET 1 OF 2)
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE 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 AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
ALL ROADS	THERMOPLASTIC	NONE

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

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

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

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

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

G) UNLESS OTHERWISE SPECIFIED, CURB RAMP PAY LIMITS MAY BE INCLUSIVE OF UP TO 15' OF SIDEWALK REPLACEMENT FOR SUITABLE TIE-IN.

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE
PMP-1A	REVISED ROADWAY STANDARD DRAWING
PMP-2	PAVEMENT MARKING SCHEDULE
PMP-3-7	PAVEMENT MARKING DETAIL
PMP-8-12	PAVEMENT MARKING DIMENSIONS

PLAN PREPARED FOR: N.C.D.O.T. DIVISION 4

Paul Marak, PE DIVISION 4 TRAFFIC ENGINEER

Jason M. Grantham, EI DIVISION 4 ASSISTANT DIVISION TRAFFIC ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: HNTB NORTH CAROLINA, P.C.

A.D. Klinksiek, PE, PTOE PROJECT ENGINEER

J.A. Wagner, PE DESIGN ENGINEER

HNTB

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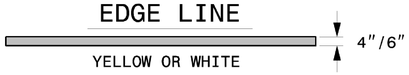
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-1A

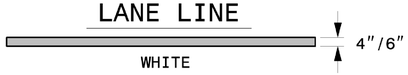
CONTINUOUS LINES

EDGE LINE



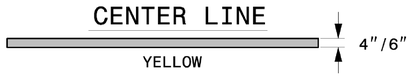
YELLOW OR WHITE

LANE LINE



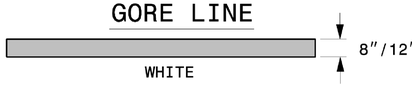
WHITE

CENTER LINE



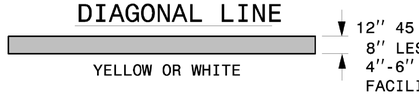
YELLOW

GORE LINE



WHITE

DIAGONAL LINE



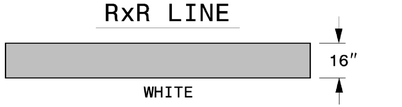
YELLOW OR WHITE

CROSSWALK LINE



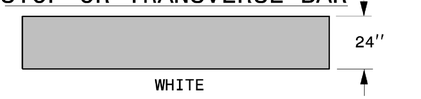
WHITE

RxR LINE



WHITE

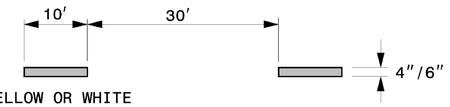
STOP OR TRANSVERSE BAR



WHITE

10′-30′/SP SKIP LINE

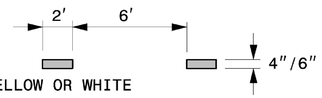
UNLESS OTHERWISED SHOWN, USE 10′-30′/SP SKIPS FOR SKIP LANE LINES AND SKIP CENTER LINES.



YELLOW OR WHITE

2′-6′/SP MINI-SKIP LINE

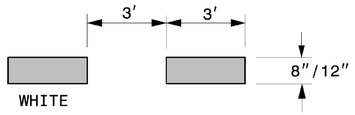
UNLESS OTHERWISED SHOWN, USE 2′-6′/SP MINI-SKIPS FOR LANE LINE EXTENSIONS THROUGH INTERSECTIONS, EDGE LINE EXTENSIONS THROUGH INTERSECTIONS AND BICYCLE LANE EXTENSIONS.



YELLOW OR WHITE

3′-3′/SP MINI-SKIP LINE

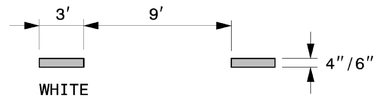
UNLESS OTHERWISED SHOWN, USE 3′-3′/SP MINI-SKIPS FOR THE WHITE EDGE LINE ENTENSIONS AT ROUNDABOUTS.



WHITE

3′-9′/SP MINI-SKIP LINE

UNLESS OTHERWISED SHOWN, USE 3′-9′/SP MINI-SKIPS FOR MINI-SKIP LANE LINES, LINE EXTENSIONS THROUGH TAPERS, AND MINI-SKIPS USED FOR BICYCLE LANE LINES.



WHITE

GENERAL NOTES:

1- USE 6″ LANE, EDGE, AND CENTER LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER ROUTES AS DIRECTED BY THE ENGINEER.

2- LANE LINES INDICATED AS "WIDE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE.

3- GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.

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

ROADWAY DETAIL DRAWING FOR

PAVEMENT MARKINGS

LINE TYPES AND OFFSETS

SHEET 1 OF 2

1205D01

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

Signed by: Matthew V. Springer BC60F6E8B584403... 10/22/2026

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-8950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: M.V. SPRINGER DATE: 2-15-24
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

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FINAL PAVEMENT MARKING SCHEDULE

MATERIAL	SYMBOL	DESCRIPTION
THERMOPLASTIC (4″, 90 MILS)		
	T1	WHITE EDGELINE
	T2	WHITE SOLID LANE LINE
	T3	10 FT. WHITE SKIP
	T4	3 FT.-9 FT./SP WHITE MINISKIP
	T10	YELLOW EDGELINE
	T13	YELLOW DOUBLE CENTER
	T14	2 FT.-6 FT./SP YELLOW MINISKIP
THERMOPLASTIC (6″, 90 MILS)		
	T20	WHITE EDGELINE
	T21	WHITE SOLID LANE LINE
	T22	10 FT. WHITE SKIP
	T23	3 FT.-9 FT./SP WHITE MINISKIP
	T24	2 FT.-6 FT./SP WHITE MINISKIP
	T30	YELLOW EDGELINE
	T33	YELLOW DOUBLE CENTER
THERMOPLASTIC (8″, 90 MILS)		
	T41	WHITE DIAGONAL
	T42	YELLOW DIAGONAL
THERMOPLASTIC (12″, 90 MILS)		
	T53	WHITE SOLID LANE LINE
	T54	3 FT.-9 FT./SP WHITE MINISKIP
THERMOPLASTIC (24″, 90 MILS)		
	T61	WHITE STOPBAR
	T62	WHITE CROSSWALK LINE
THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)		
	T70	LEFT TURN ARROW
	T71	RIGHT TURN ARROW
	T72	STRAIGHT ARROW
	T73	COMBO. LEFT/STRAIGHT ARROW
	T74	COMBO. RIGHT/STRAIGHT ARROW
	T75	COMBO. LEFT/RIGHT ARROW
	T76	COMBO. LEFT/RIGHT/STRAIGHT ARROW
	T101	HANDICAP PARKING
	T104	ROUTE SHIELD 6 FT x 15 FT
THERMOPLASTIC PAVEMENT MARKING CHARACTERS (90 MILS)		
	T100	ALPHANUMERIC CHAR.

LEGEND

GENERAL

NORTH ARROW

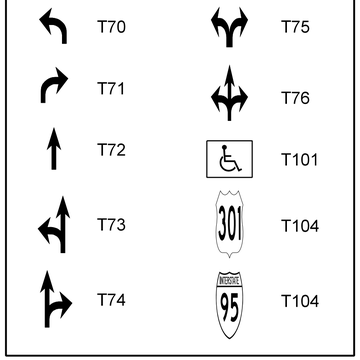
PROPOSED PVMT. ---------- EXIST. PVMT.

PAVEMENT MARKINGS

PAVEMENT MARKING SYMBOLS

ONLY PAVEMENT MARKING CHARACTERS

PAVEMENT MARKING SYMBOLS



PROJECT REFERENCE NO.	SHEET NO.
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APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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PAVEMENT MARKING SCHEDULE

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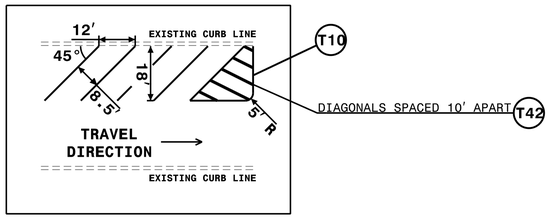
ANGLE PARKING DETAIL



ALL ANGLE PARKING (T2)

CURB RAMP DETAILS

SEE GENERAL NOTE G

- (3-1) TYPE 4
- (3-2) TYPE 4
- (3-3) TYPE 3 MODIFIED
- (3-4) TYPE 4A
- (3-5) TYPE 4A
- (3-6) TYPE 4
- (3-7) TYPE 4
- (3-8) BY OTHERS
- (3-9) BY OTHERS
- (3-10) TYPE 4
- (3-11) TYPE 4
- (3-12) TYPE 4
- (3-13) TYPE 4
- (3-14) TYPE 4
- (3-15) TYPE 4
- (3-16) TYPE 5A
- (3-17) TYPE 5A
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- (3-20) TYPE 5A
- (3-21) TYPE 5A
- (3-22) TYPE 5A
- (3-23) TYPE 5A
- (3-24) TYPE 1
- (3-25) TYPE 1
- (3-26) TYPE 1 MODIFIED
- (3-27) TYPE 1 MODIFIED
- (3-28) TYPE 1 MODIFIED
- (3-29) TYPE 1 MODIFIED
- (3-30) TYPE 1 MODIFIED
- (3-31) TYPE 1 MODIFIED

CURB RAMP LEGEND

- NEW
- EXISTING

HNTB NORTH CAROLINA, P.C.
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PAVEMENT MARKING DETAIL

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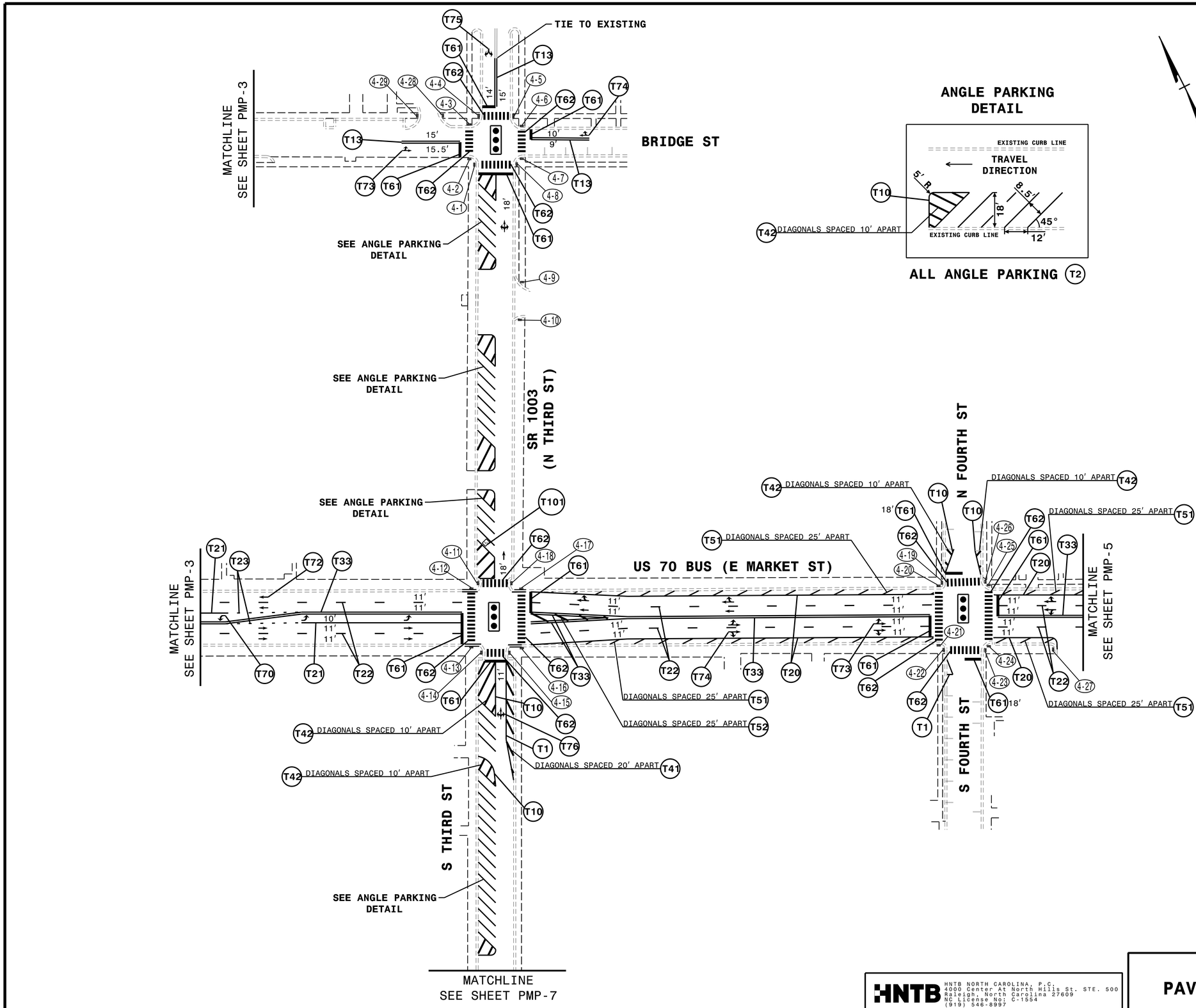
DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ANGLE PARKING DETAIL

ALL ANGLE PARKING (T2)

CURB RAMP DETAILS

SEE GENERAL NOTE G

- (4-1) TYPE 4
- (4-2) TYPE 4
- (4-3) TYPE 1 MODIFIED
- (4-4) TYPE 1 MODIFIED
- (4-5) TYPE 1 MODIFIED
- (4-6) TYPE 1 MODIFIED
- (4-7) TYPE 5A
- (4-8) TYPE 5A
- (4-9) TYPE 1 MODIFIED
- (4-10) TYPE 1 MODIFIED
- (4-11) TYPE 4
- (4-12) TYPE 4
- (4-13) TYPE 4
- (4-14) TYPE 4
- (4-15) TYPE 4
- (4-16) TYPE 4
- (4-17) TYPE 4
- (4-18) TYPE 4
- (4-19) TYPE 4
- (4-20) TYPE 4
- (4-21) TYPE 4C
- (4-22) TYPE 4C
- (4-23) TYPE 4
- (4-24) TYPE 4
- (4-25) TYPE 4A
- (4-26) TYPE 4A
- (4-27) TYPE 4A
- (4-28) TYPE 1 MODIFIED
- (4-29) TYPE 1 MODIFIED

CURB RAMP LEGEND

- NEW
- EXISTING

HNTB NORTH CAROLINA, P.C.
4000 Center At North Hills St. STE. 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-5

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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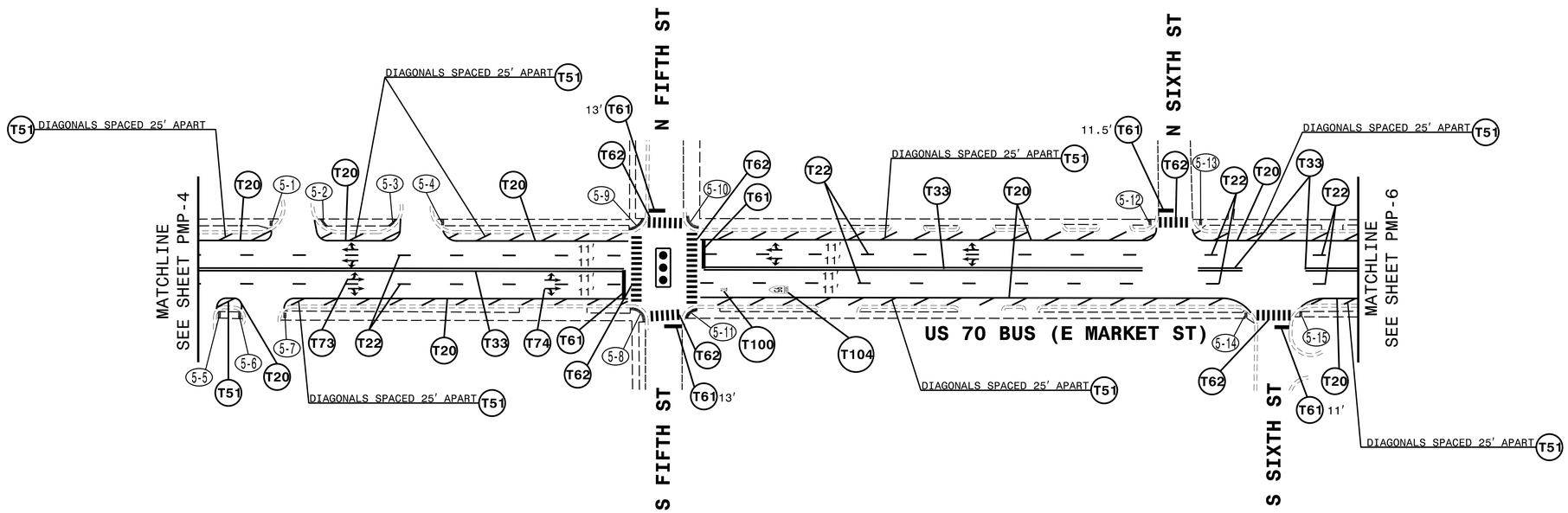

CURB RAMP DETAILS

SEE GENERAL NOTE G

- (5-1) TYPE 1 MODIFIED
- (5-2) TYPE 1C
- (5-3) TYPE 1C
- (5-4) TYPE 1 MODIFIED
- (5-5) TYPE 1 MODIFIED
- (5-6) TYPE 1 MODIFIED
- (5-7) TYPE 1 MODIFIED
- (5-8) TYPE 2A
- (5-9) TYPE 2A
- (5-10) TYPE 2A
- (5-11) TYPE 2A MODIFIED
- (5-12) TYPE 1 MODIFIED
- (5-13) TYPE 1 MODIFIED
- (5-14) TYPE 1
- (5-15) TYPE 1 MODIFIED

CURB RAMP LEGEND

- NEW
- EXISTING

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Raleigh, North Carolina 27609
NC License No: C-1554
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PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-6

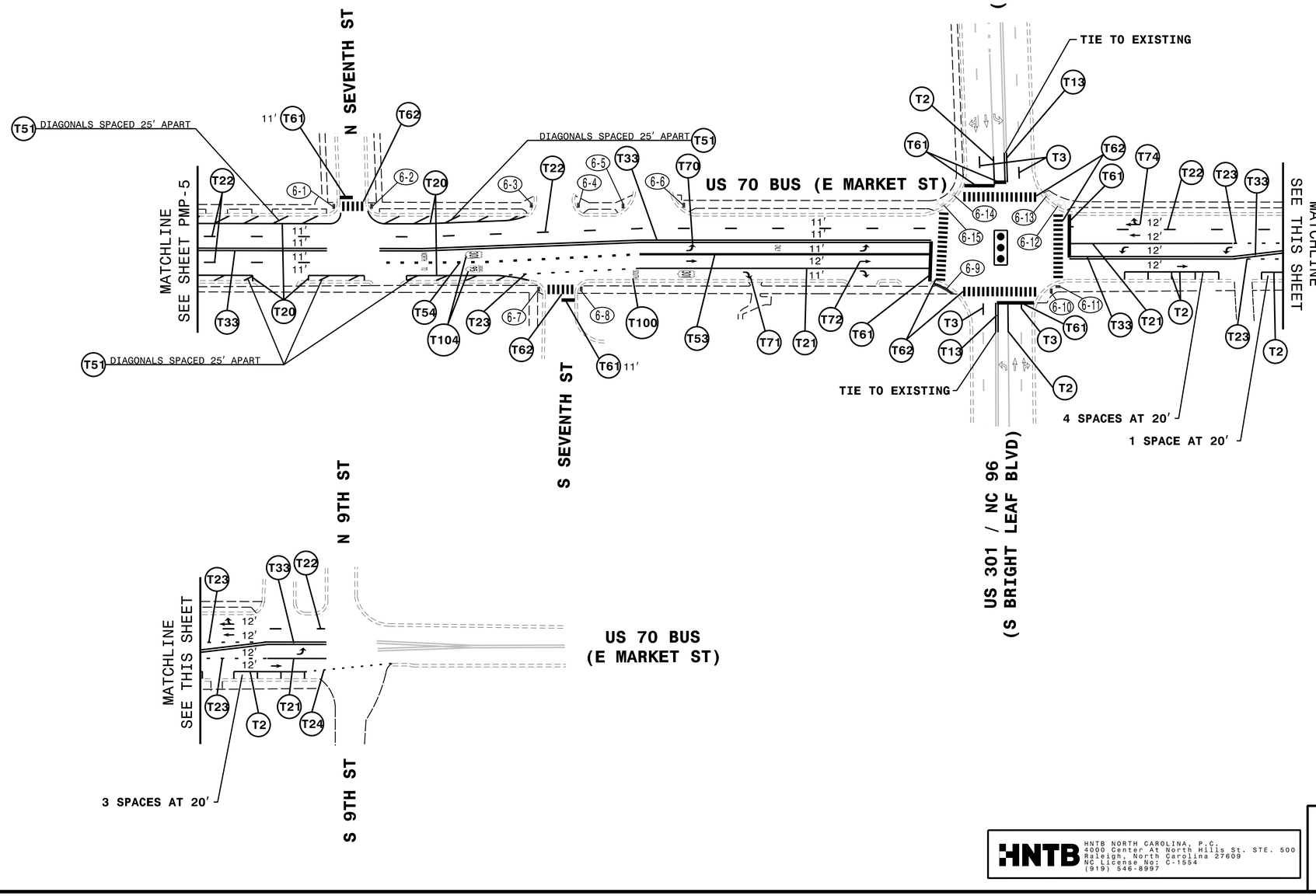
APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



CURB RAMP DETAILS

SEE GENERAL NOTE G

- 6-1 TYPE 1 MODIFIED
- 6-2 TYPE 1 MODIFIED
- 6-3 TYPE 1
- 6-4 TYPE 1
- 6-5 TYPE 1
- 6-6 TYPE 1 MODIFIED
- 6-7 TYPE 1 MODIFIED
- 6-8 TYPE 1 MODIFIED
- 6-9 TYPE 2A MODIFIED
- 6-10 TYPE 4
- 6-11 TYPE 4
- 6-12 EXISTING
- 6-13 EXISTING
- 6-14 EXISTING
- 6-15 EXISTING

CURB RAMP LEGEND

- NEW
- EXISTING

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Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-7

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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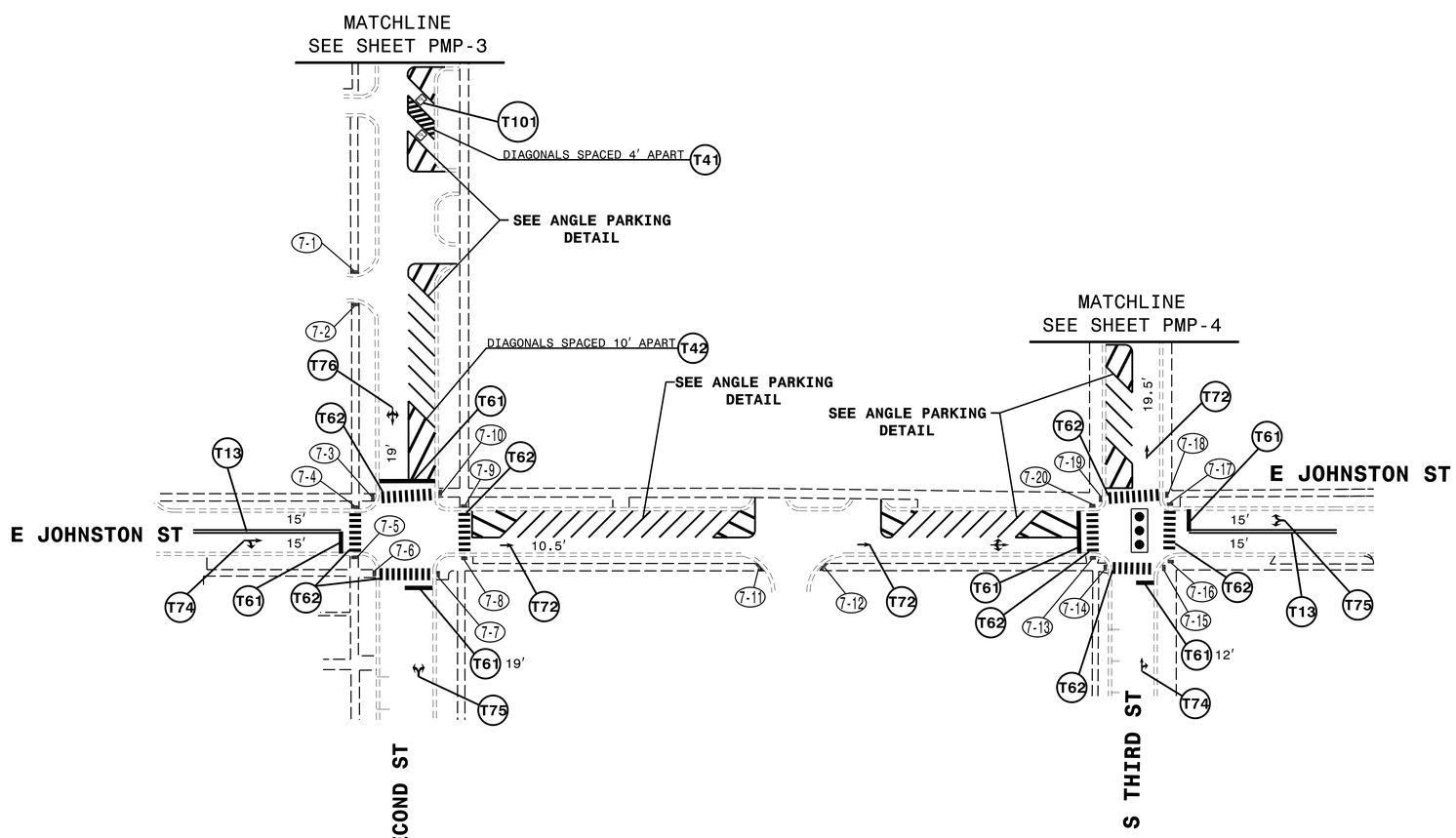


CURB RAMP DETAILS

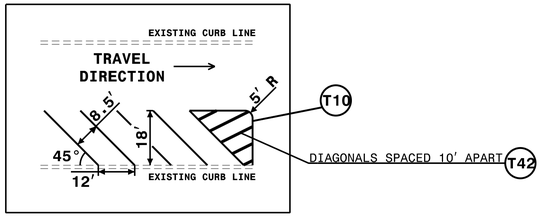
SEE GENERAL NOTE G

- 7-1 TYPE 1 MODIFIED
- 7-2 TYPE 1 MODIFIED
- 7-3 TYPE 5A
- 7-4 TYPE 5A
- 7-5 TYPE 5A
- 7-6 TYPE 5A
- 7-7 TYPE 5
- 7-8 TYPE 5
- 7-9 TYPE 5A
- 7-10 TYPE 5A
- 7-11 TYPE 2A MODIFIED
- 7-12 TYPE 2A MODIFIED
- 7-13 TYPE 5A
- 7-14 TYPE 5A
- 7-15 TYPE 4
- 7-16 TYPE 4
- 7-17 TYPE 4
- 7-18 TYPE 4
- 7-19 TYPE 4
- 7-20 TYPE 4

CURB RAMP LEGEND

- NEW
- EXISTING

ANGLE PARKING DETAIL



ALL ANGLE PARKING T2

HNTB NORTH CAROLINA, P.C.
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PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-8

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

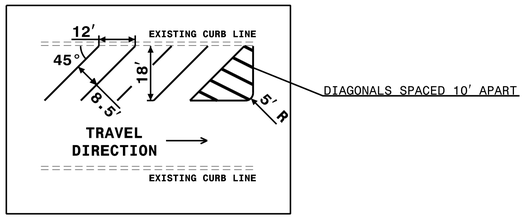
DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ANGLE PARKING DETAIL



ALL ANGLE PARKING (T2)

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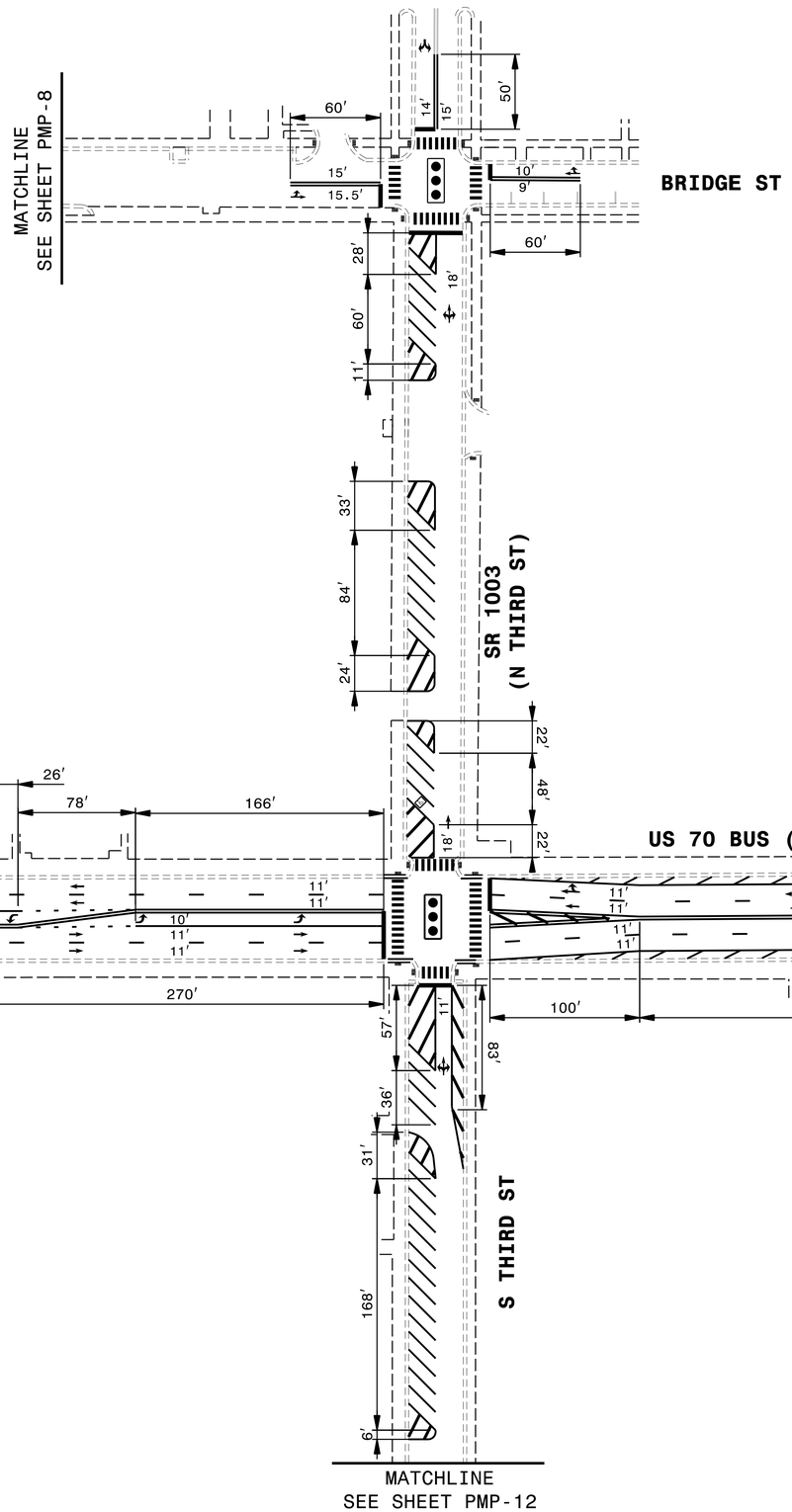
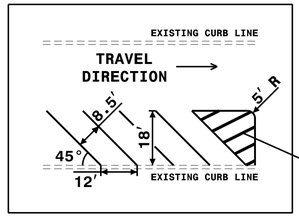
PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207



ANGLE PARKING DETAIL



ALL ANGLE PARKING (T2)

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-9

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-10

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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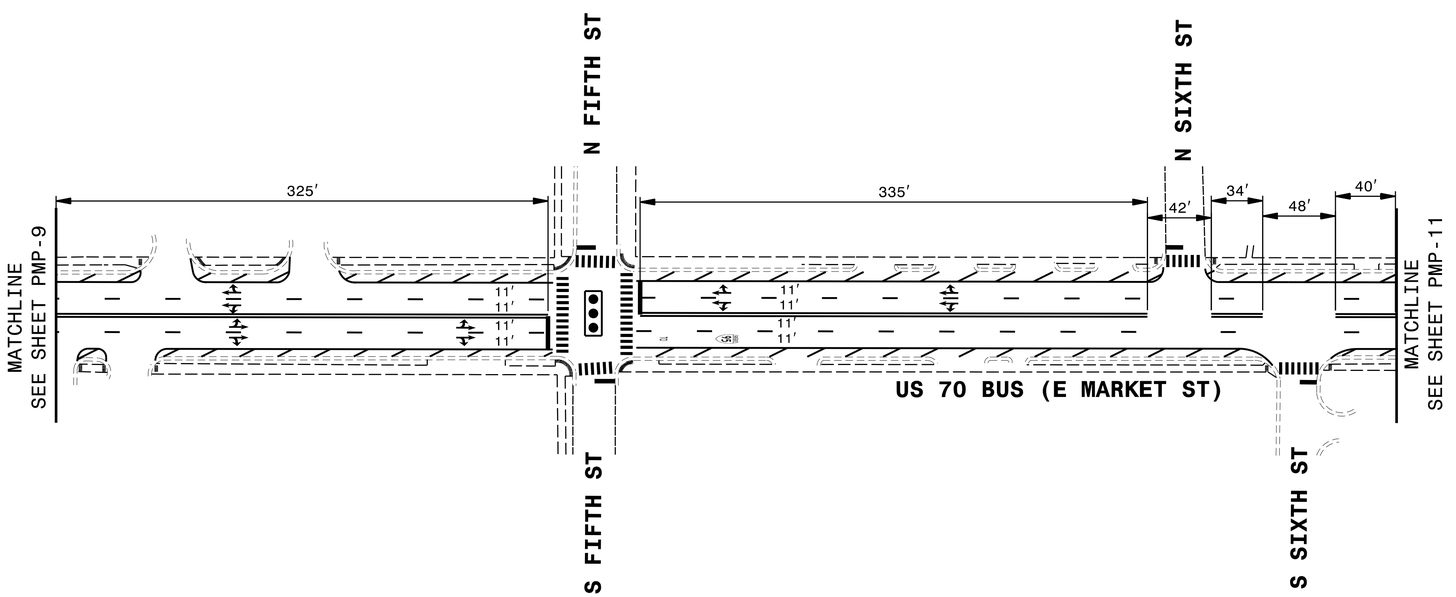

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PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-11

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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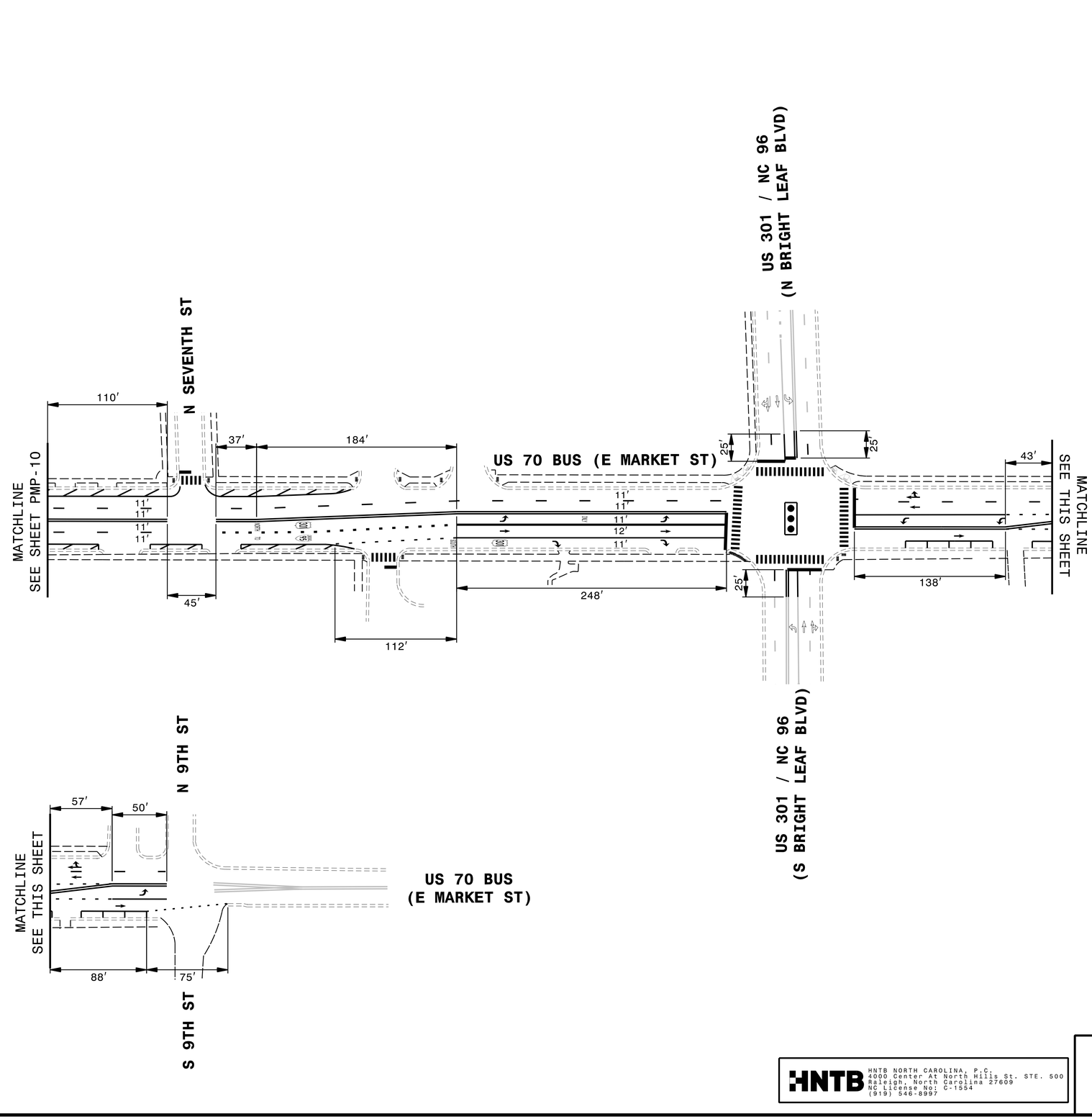

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PAVEMENT MARKING DETAIL

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	PMP-12

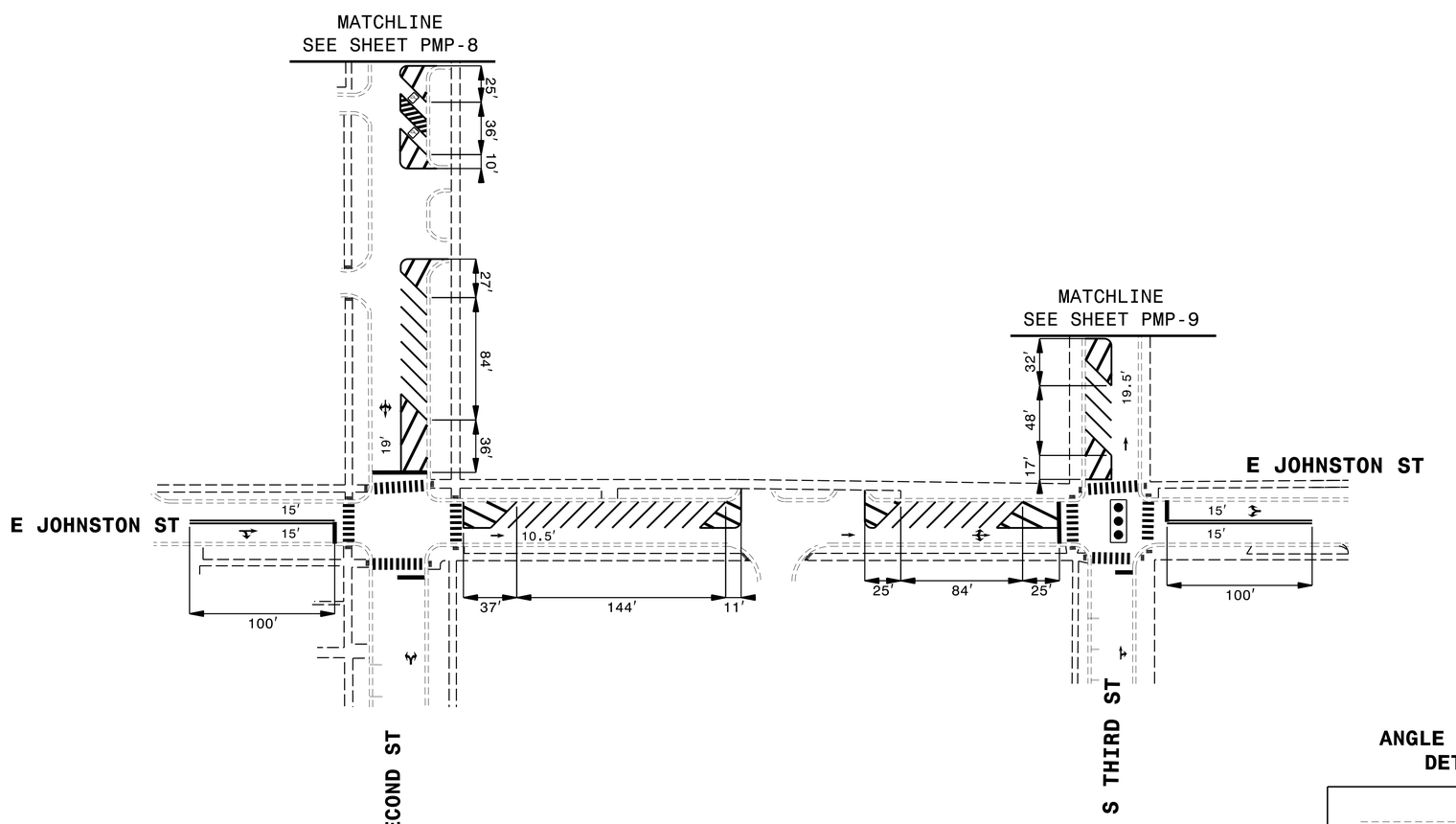
APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 10/22/2026

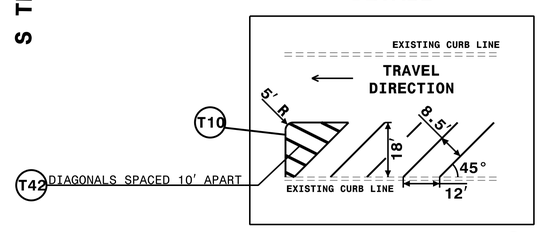
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ANGLE PARKING DETAIL



ALL ANGLE PARKING (T2)

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Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

PAVEMENT MARKING DETAIL

Docusign Envelope ID: 618F3B3F-2029-8209-81FE-C1352E1A63CB

CONTRACT: DD00548 T.I.P.: HS-2404V

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-1

APPROVED: DocuSigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 11/5/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNING PLAN
JOHNSTON COUNTY

LOCATION: US 70 BUSINESS (MARKET STREET), FRONT STREET TO US 301 (BRIGHTLEAF BOULEVARD). INSTALL RAISED CONCRETE MEDIAN, CROSSWALKS, ADA CURB RAMPS, PEDESTRIAN SIGNAL HEADS, REVISE STREET PARKING, AND WIDEN LANES.

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - CONTRACT STANDARDS AND DEVELOPMENT 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
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.20	SECONDARY SIGN MOUNTING
904.30	SUPPLEMENTAL SIGN MOUNTING
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL SUPPORTS
910.50	SIGNING FOR SPEED REDUCTION ZONE
1264.01	OBJECT MARKER TYPES
1264.02	OBJECT MARKERS INSTALLATION

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4080200000	903	SUPPORTS, STEEL SQUARE TUBE	602	L.F.
4102000000	904	SIGN ERECTION, TYPE E	61	EA.
4116100000	904	SIGN ERECTION, RELOCATE TYPE E	1	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	33	EA.
4238000000	907	DISPOSAL OF SIGN, D, E OR F	14	EA.
4360000000	SP	DISPOSAL OF SIGN SYSTEM, SQUARE TUBE	11	EA.

GENERAL NOTES

. SIGNS FURNISHED BY STATE.

. ALL PROPOSED SIGNS SEE PAY ITEM NOTE 1 UNLESS OTHERWISE NOTED.

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

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

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

. ALL EXISTING SIGNS ON U-CHANNEL AND SQUARE TUBE SUPPORT(S) WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS OTHERWISE NOTED ON PLANS.

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

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

. SIGN BASES WILL BE PROVIDED BY THE DEPARTMENT FOR ALL LOCATIONS WHERE PROPOSED SIGNS WILL BE INSTALLED ON HARD SURFACE (SUCH AS CONCRETE). SIGN BASES ARE TO BE DRILLED AND ANCHORED INTO THE HARD SURFACE PER MANUFACTURER SPECIFICATIONS.

PAY ITEM NOTES

1 SIGN ERECTION, TYPE D, E OR F
2 DISPOSAL OF SIGN SYSTEM, U-CHANNEL
3 DISPOSAL OF SIGN, D, E OR F
4 DISPOSAL OF SIGN SYSTEM, SQUARE TUBE
5 SIGN ERECTION, RELOCATE TYPE E

PLAN PREPARED FOR: N.C.D.O.T. DIVISION 4

Paul Marak, PE DIVISION 4 TRAFFIC ENGINEER

Jason M. Grantham, EI DIVISION 4 ASSISTANT DIVISION TRAFFIC ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLANS PREPARED BY: HNTB NORTH CAROLINA, P.C.

A.D. KLINKSIEK, PE, PTOE SIGNING PROJECT MANAGER

J.A. WAGNER, PE PROJECT ENGINEER

HNTB

HNTB NORTH CAROLINA, P.C.
4000 CENTER AT NORTH HILLS ST
SUITE 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919)546-8997

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	SIGN DESIGNS
SIGN-2A	TYPE E SIGNS
SIGN-3-12	SIGNING PLAN SHEETS

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-2

APPROVED: Andrew D. Klinksiek (Docusigned by: E3D78FB4596E44B...)

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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SIGN NUMBER: 408
TYPE: E
QUANTITY: 3
SIGN WIDTH: 1'-0"
HEIGHT: 1'-6"
TOTAL AREA: 1.5 Sq.Ft.
BORDER TYPE: RECESSED
RECESS: 0.38"
WIDTH: 0.38"
RADII: 1.5"
NO. Z BARS: N/A
LENGTH: N/A

BACKG COLOR: White/Blue
COPY COLOR: Green/White

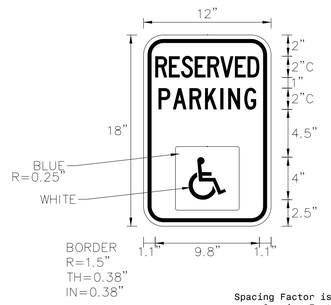
SYMBOL	X	Y	WID	HT
Handicap Sym	4.2	2.5	3.5	4
Blue Hdcp Bkgd	3	1.5	6	6

MAT'L: 0.063" ALUMINUM

NOTES:

1. Legend and border shall be silk-screened or reverse silk-screened.
2. Background shall be Grade C reflective sheeting.
3. See MUTCD SHS 8-45 for symbol design.

DESIGN BY: JAW **CHECKED BY:** ADK
PROJECT ID: HS-2404V **DIV:** 04 **DATE:** August 2026



Spacing Factor is 1 unless specified otherwise
Spacing Factor for "RESERVED" is 0.5

LETTER POSITIONS

Letter spacings are to start of next letter

																														Series/Size Text Length
		R	E	S	E	R	V	E	D																					C 2000
	1.1	1.3	1.1	1.3	1.2	1.2	1.4	1.2	1.1	1.1																				9.8
		P	A	R	K	I	N	G																						C 2000
	1.4	1.4	1.6	1.5	1.5	0.7	1.5	1.1	1.4																					9.2

SIGN NUMBER: 409
TYPE: E
QUANTITY: 3
SIGN WIDTH: 1'-0"
HEIGHT: 0'-9"
TOTAL AREA: 0.8 Sq.Ft.
BORDER TYPE: RECESSED
RECESS: 0.38"
WIDTH: 0.38"
RADII: 1.5"
NO. Z BARS: N/A
LENGTH: N/A

BACKG COLOR: White
COPY COLOR: Green

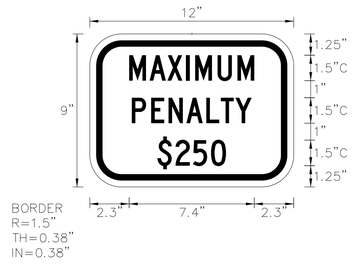
SYMBOL	X	Y	WID	HT

MAT'L: 0.063" ALUMINUM

NOTES:

1. Legend and border shall be silk-screened or reverse silk-screened.
2. Background shall be Grade C reflective sheeting.

DESIGN BY: JAW **CHECKED BY:** ADK
PROJECT ID: HS-2404V **DIV:** 04 **DATE:** August 2026



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																														Series/Size Text Length
		M	A	X	I	M	U	M																						C 2000
	2.3	1.2	1.1	1.1	0.5	1.3	1.2	1	2.3																					7.4
		P	E	N	A	L	T	Y																						C 2000
	2.5	1.1	1	1.1	1.2	0.9	0.9	1	2.5																					7.1
		$	2	5	0																									C 2000
	4	1.1	1	1.1	0.9	4																								4

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SIGN DESIGNS

Docusign Envelope ID: 1D3841B3-47FF-83FC-812F-E68BA8551207

(401) QUANTITY REQ'D 8



36" X 12"
R6-1(L)

ONE SQUARE TUBE POST
PER INSTALLATION

(402) QUANTITY REQ'D 10



36" X 12"
R6-1(R)

ONE SQUARE TUBE POST
PER INSTALLATION

(403) QUANTITY REQ'D 11



36" X 36"
R5-1

ONE SQUARE TUBE POST
PER INSTALLATION

(404) QUANTITY REQ'D 1



36" X 36"
W3-5

ONE SQUARE TUBE POST
PER INSTALLATION

(405) QUANTITY REQ'D 9



36" X 36"
R1-1

ONE SQUARE TUBE POST
PER INSTALLATION

(406) QUANTITY REQ'D 10



18" X 6"
R1-3P

MOUNTED BELOW SIGN 405
IN 9 INSTALLATIONS
MOUNTED BELOW EXISTING STOP SIGN
IN 1 INSTALLATION

(407) QUANTITY REQ'D 1



36" X 36"
R3-7

ONE SQUARE TUBE POST
PER INSTALLATION

(408) QUANTITY REQ'D 3



12" X 18"
R7-8a
SEE SHEET
SIGN-2 FOR
PANEL DESIGN

ONE SQUARE TUBE POST
PER INSTALLATION

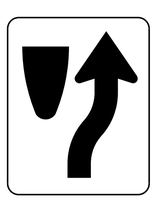
(409) QUANTITY REQ'D 3



12" X 9"
R7-8d
SEE SHEET
SIGN-2 FOR
PANEL DESIGN

MOUNTED BELOW SIGN 408
IN 3 INSTALLATIONS

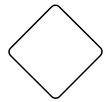
(410) QUANTITY REQ'D 2



24" X 30"
R4-7

ONE SQUARE TUBE POST
PER INSTALLATION

(411) QUANTITY REQ'D 2



18" X 18"
OM1-3

MOUNTED BELOW SIGN 410
IN 2 INSTALLATIONS

(412) QUANTITY REQ'D 1



36" X 36"
W3-5

ONE SQUARE TUBE POST
PER INSTALLATION

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-2A

APPROVED: Andrew D. Klinksiek (Docusigned by: E3D78FB4596E44B...)

DATE: 10/22/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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NC License No: C-1554
(919) 546-8997

TYPE E SIGNS

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-3

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SEAL

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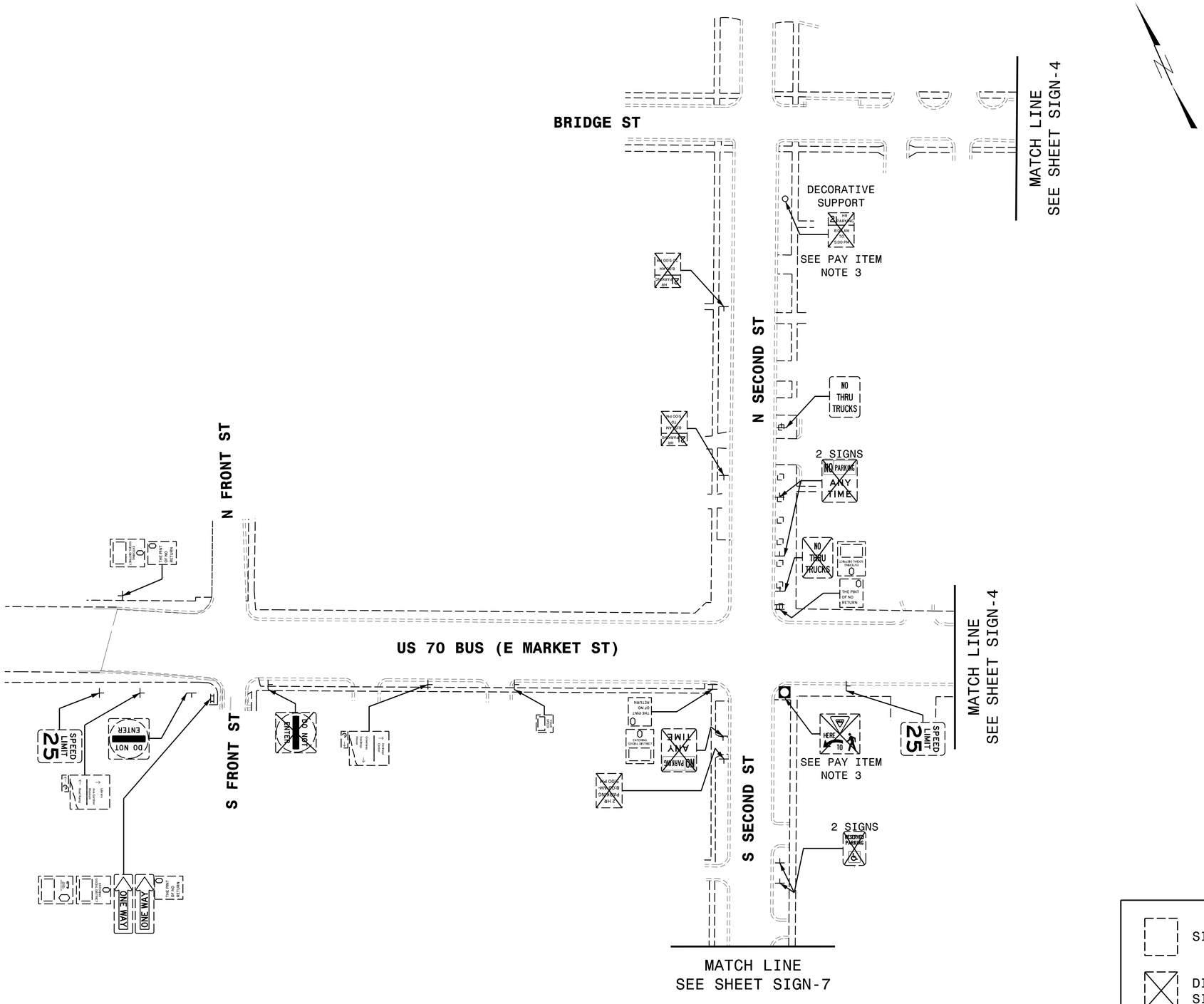

LEGEND

- SIGN TO REMAIN
- DISPOSAL OF SIGN OR SIGN ASSEMBLY

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-4

APPROVED: Andrew D. Klinksiek (E3D78FB4596E448...)

DATE: 10/22/2026

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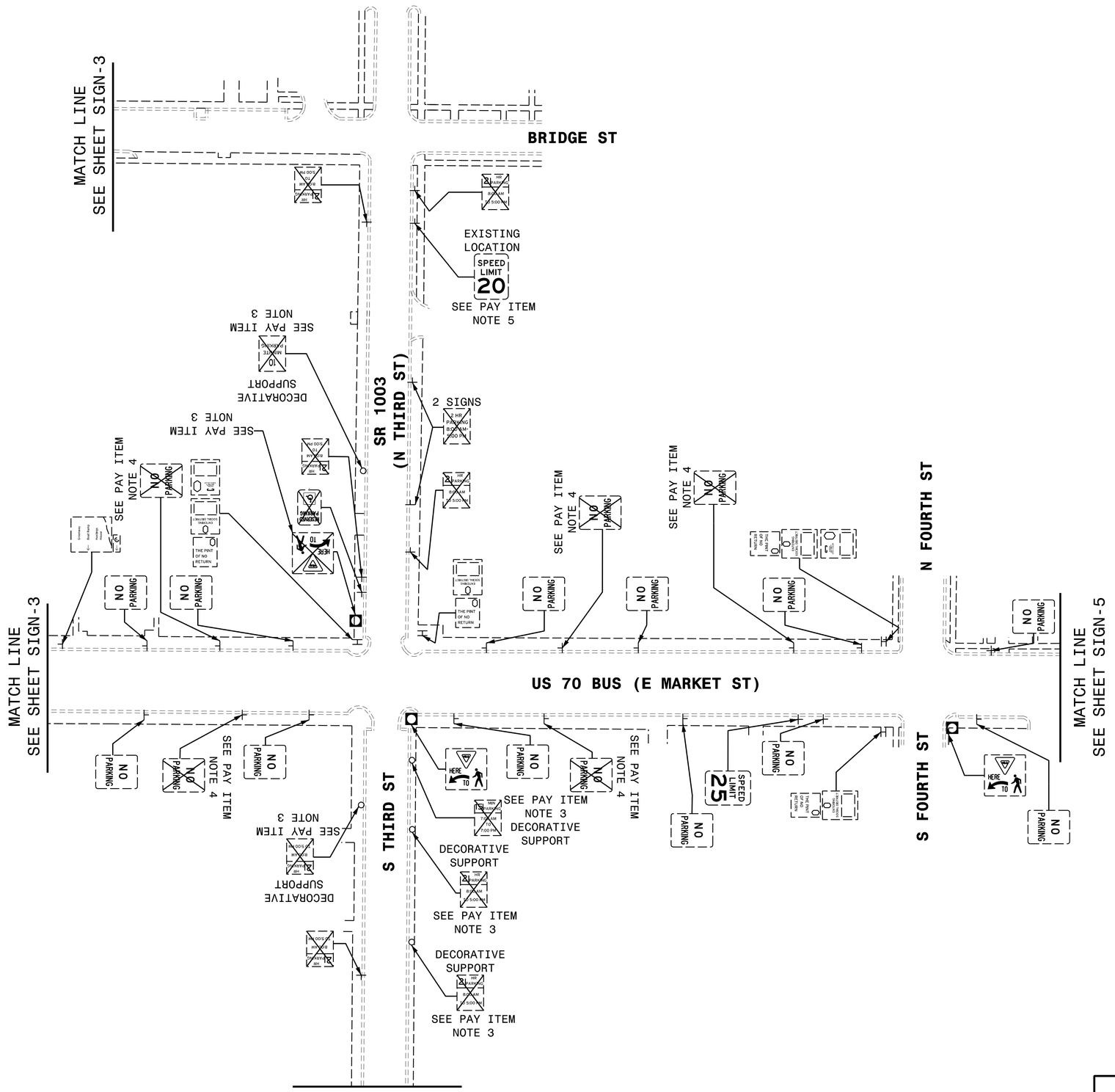

LEGEND

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-5

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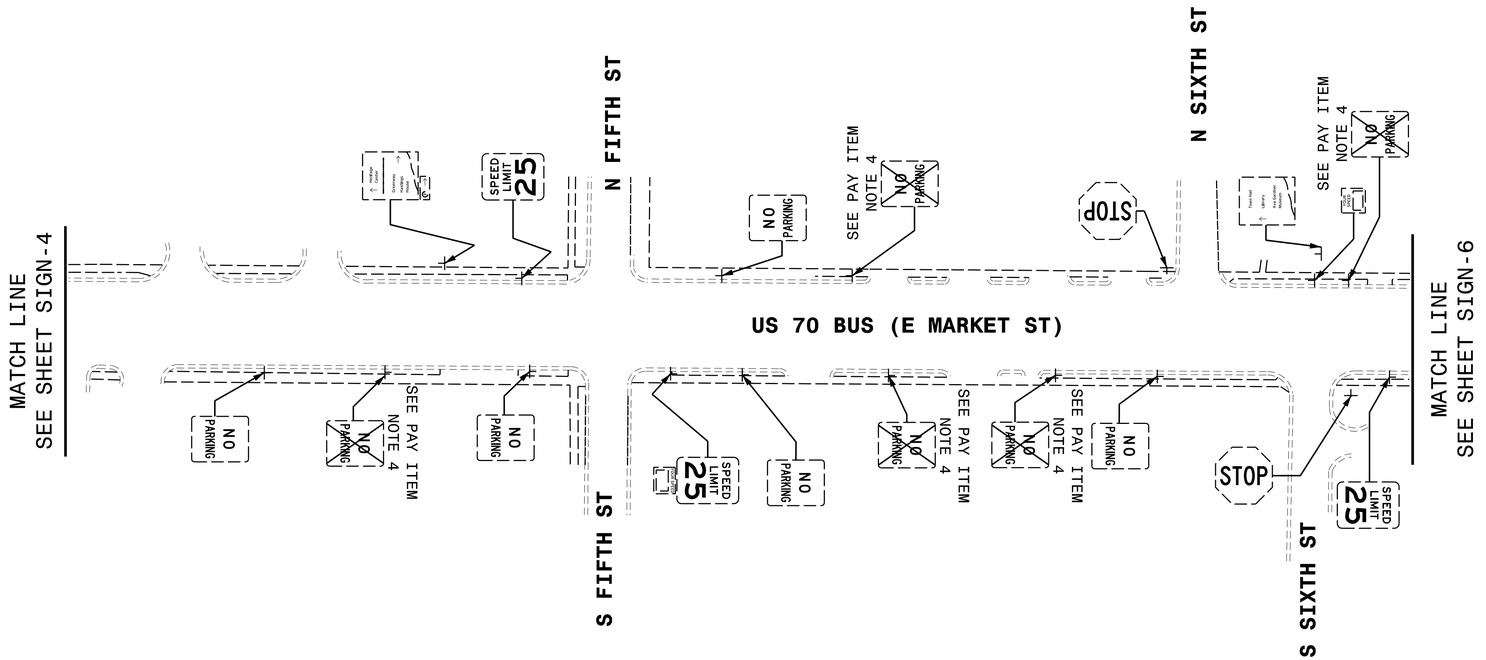

LEGEND

- SIGN TO REMAIN
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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-6

APPROVED: Andrew D. Klinksiek (Docusigned by: E3D78FB4596E448...)

DATE: 10/22/2026

SEAL

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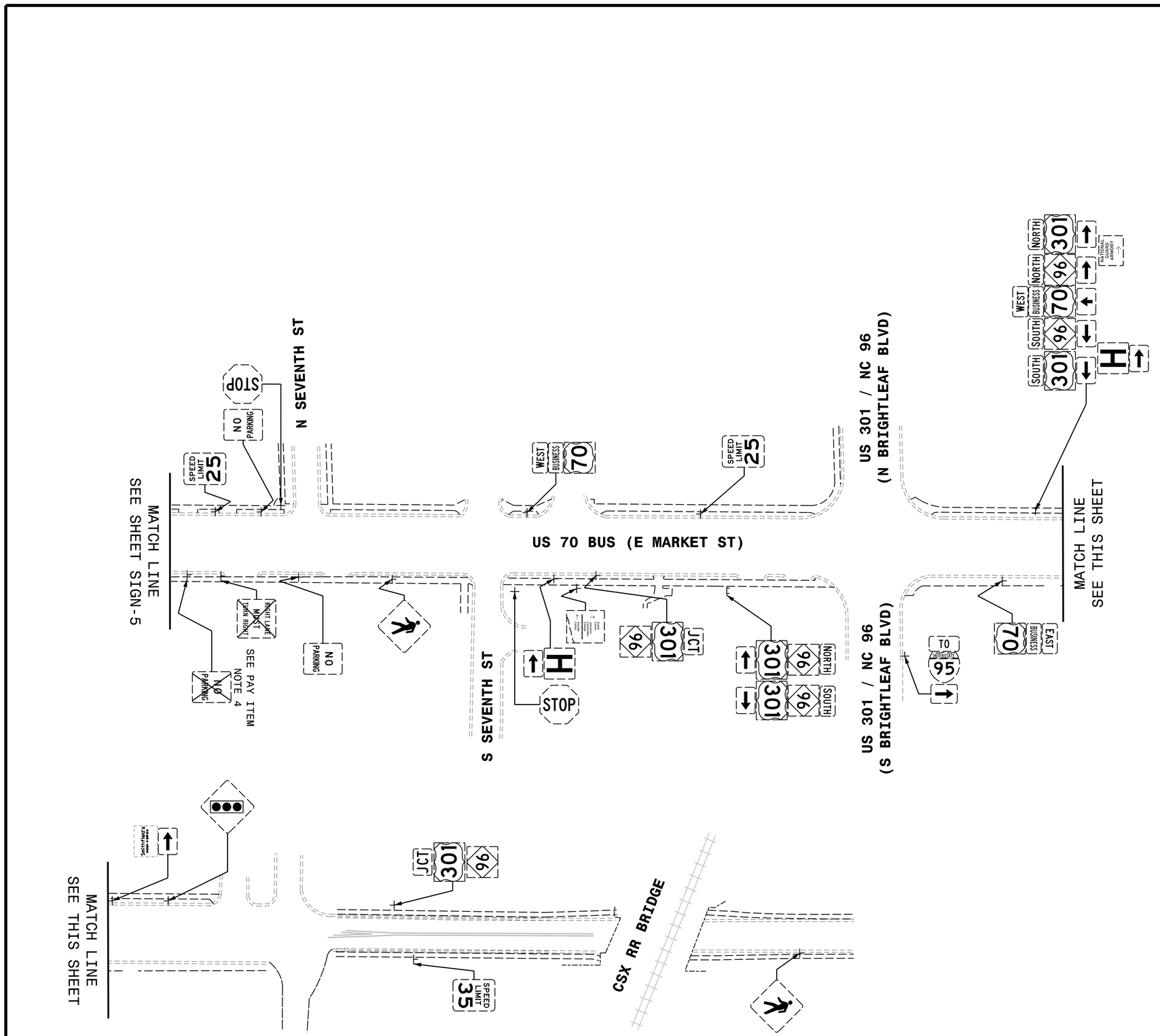

LEGEND

- SIGN TO REMAIN
- DISPOSAL OF SIGN OR SIGN ASSEMBLY

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-7

APPROVED: Andrew D. Klinksiek (DocuSigned by: E3D78FB4596E44B...)

DATE: 10/22/2026

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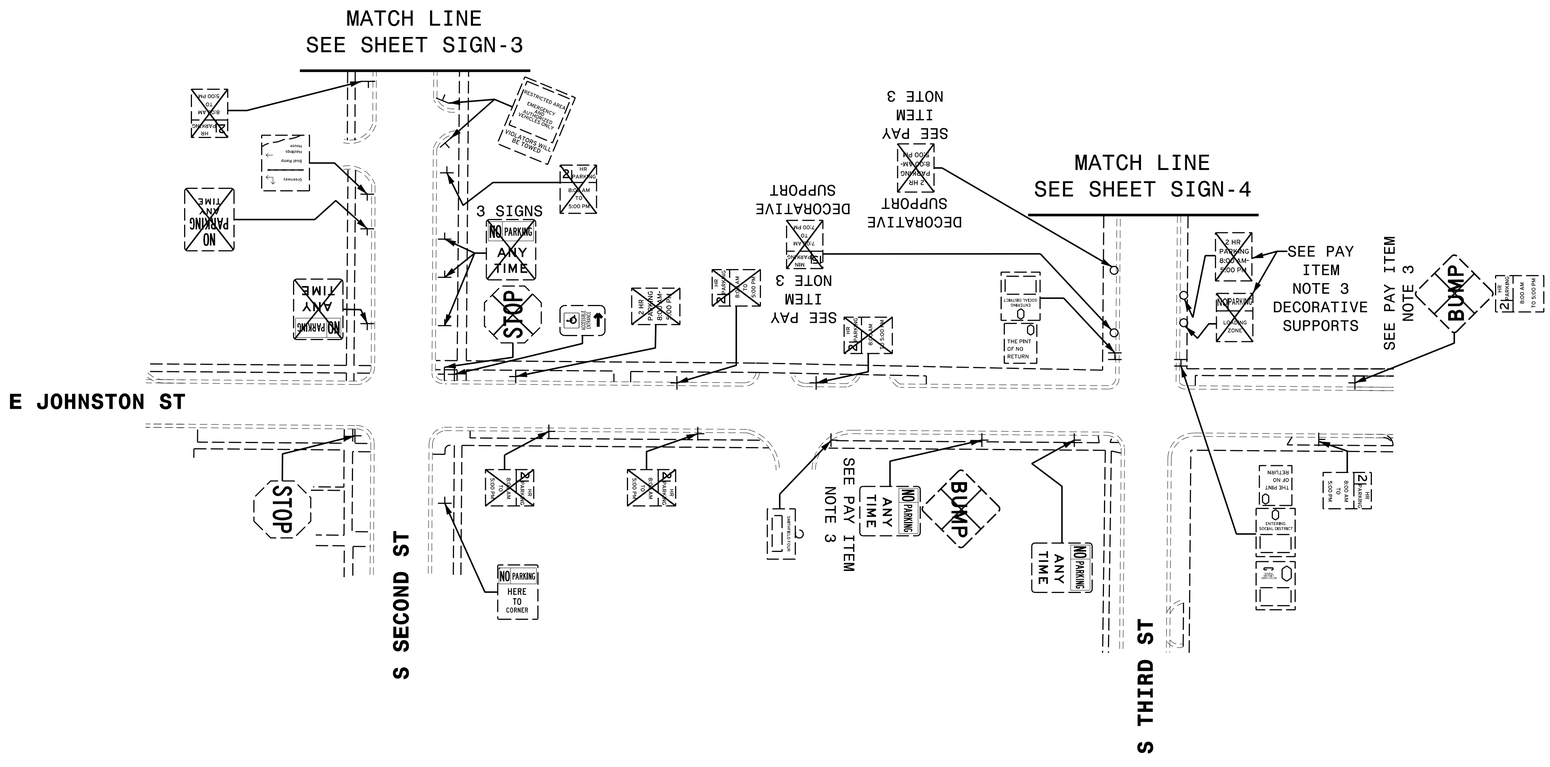

LEGEND

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- DISPOSAL OF SIGN OR SIGN ASSEMBLY

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-8

APPROVED: Andrew D. Klinksiek (Docusigned by: E3D78FB4596E448...)

DATE: 11/5/2026

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NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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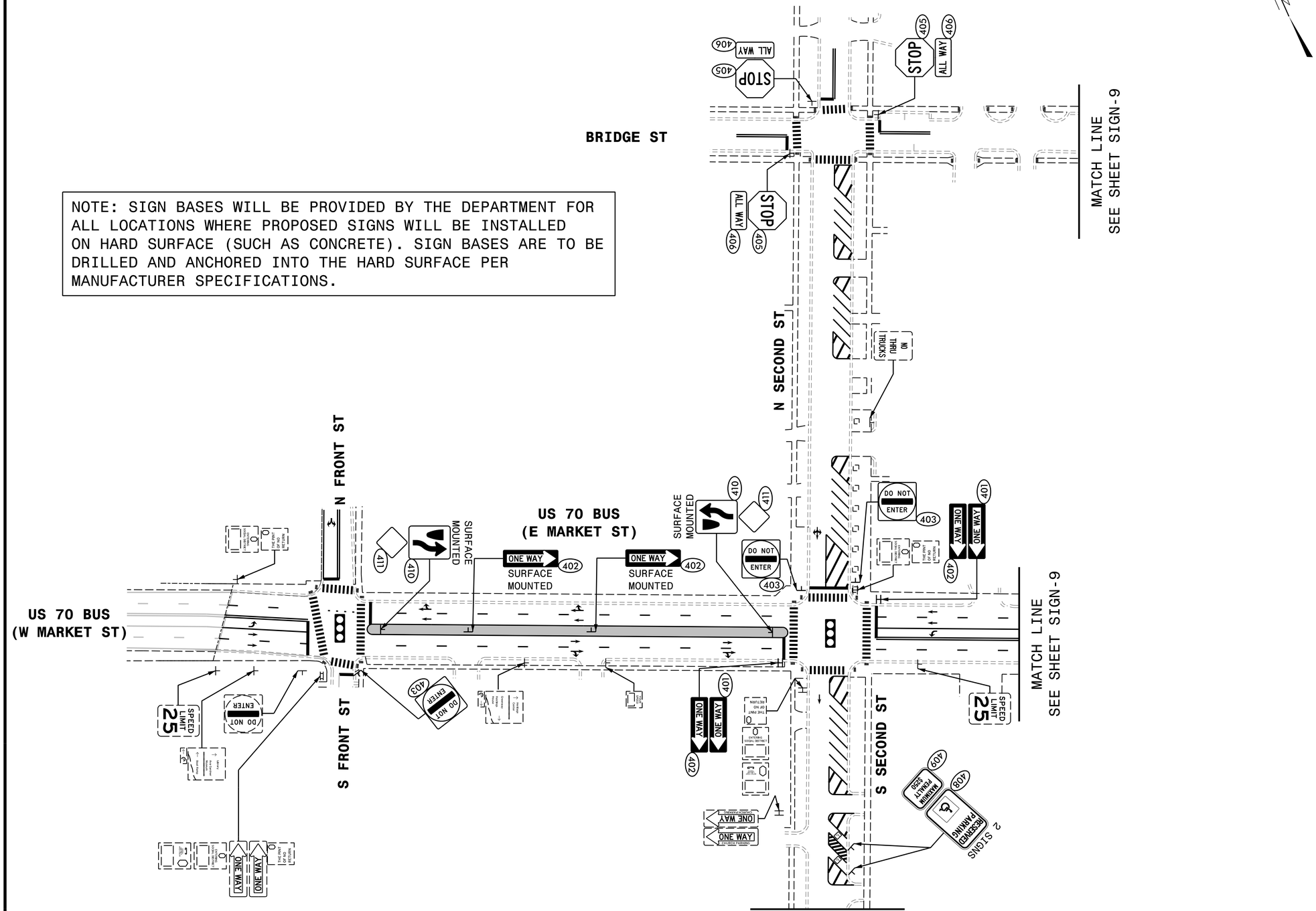
NOTE: SIGN BASES WILL BE PROVIDED BY THE DEPARTMENT FOR ALL LOCATIONS WHERE PROPOSED SIGNS WILL BE INSTALLED ON HARD SURFACE (SUCH AS CONCRETE). SIGN BASES ARE TO BE DRILLED AND ANCHORED INTO THE HARD SURFACE PER MANUFACTURER SPECIFICATIONS.



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PROPOSED SIGNING

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-9

APPROVED: Andrew D. Klinksiek (Docusigned by: E3D78FB4596E44B...)

DATE: 11/5/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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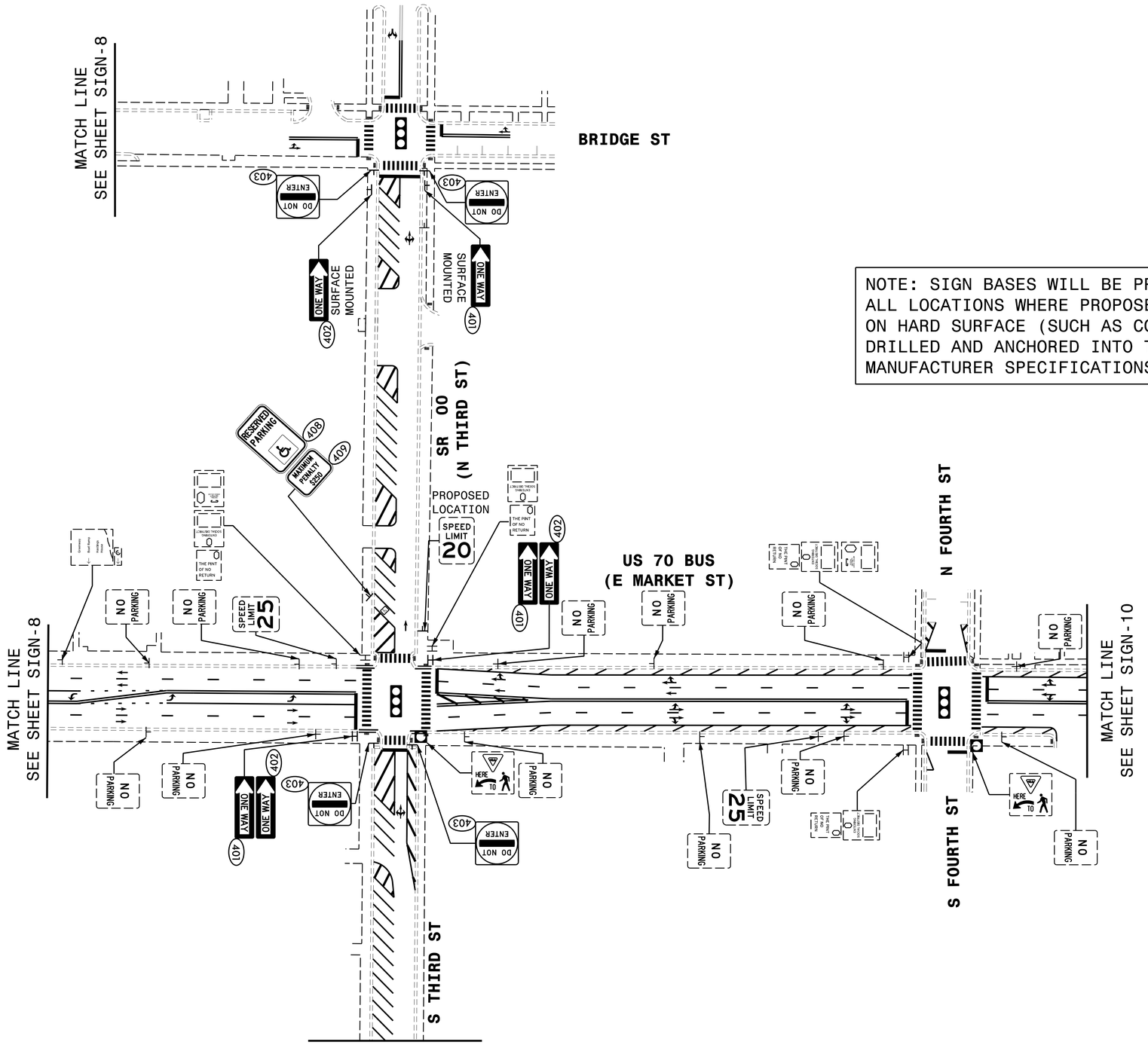

NOTE: SIGN BASES WILL BE PROVIDED BY THE DEPARTMENT FOR ALL LOCATIONS WHERE PROPOSED SIGNS WILL BE INSTALLED ON HARD SURFACE (SUCH AS CONCRETE). SIGN BASES ARE TO BE DRILLED AND ANCHORED INTO THE HARD SURFACE PER MANUFACTURER SPECIFICATIONS.

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PROPOSED SIGNING

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-10

APPROVED: Andrew D. Klinksiek (Docusigned by: E3D78FB4596E44B...)

DATE: 11/5/2026

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NORTH CAROLINA PROFESSIONAL SEAL 40311 ENGINEER ANDREW D. KLINKSIEK

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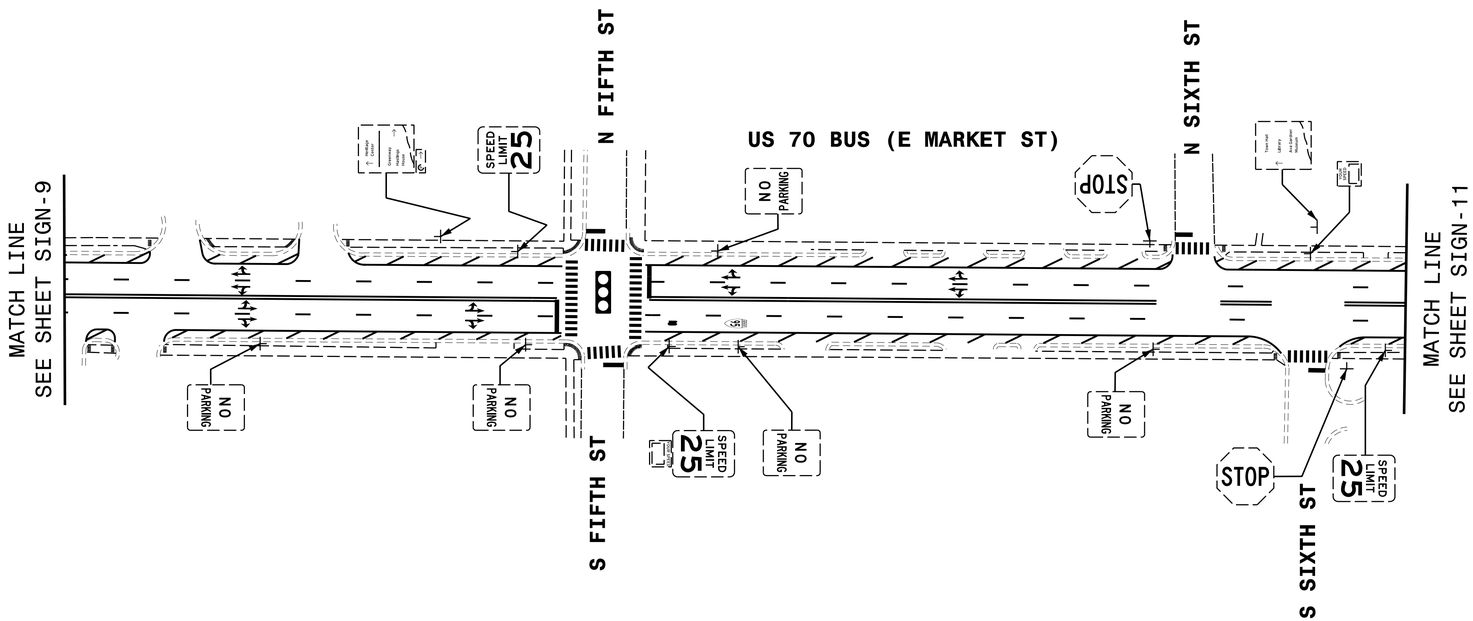

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-11

APPROVED: Andrew D. Klinksiek (Docusigned by: E3D78FB4596E44B...)

DATE: 11/5/2026

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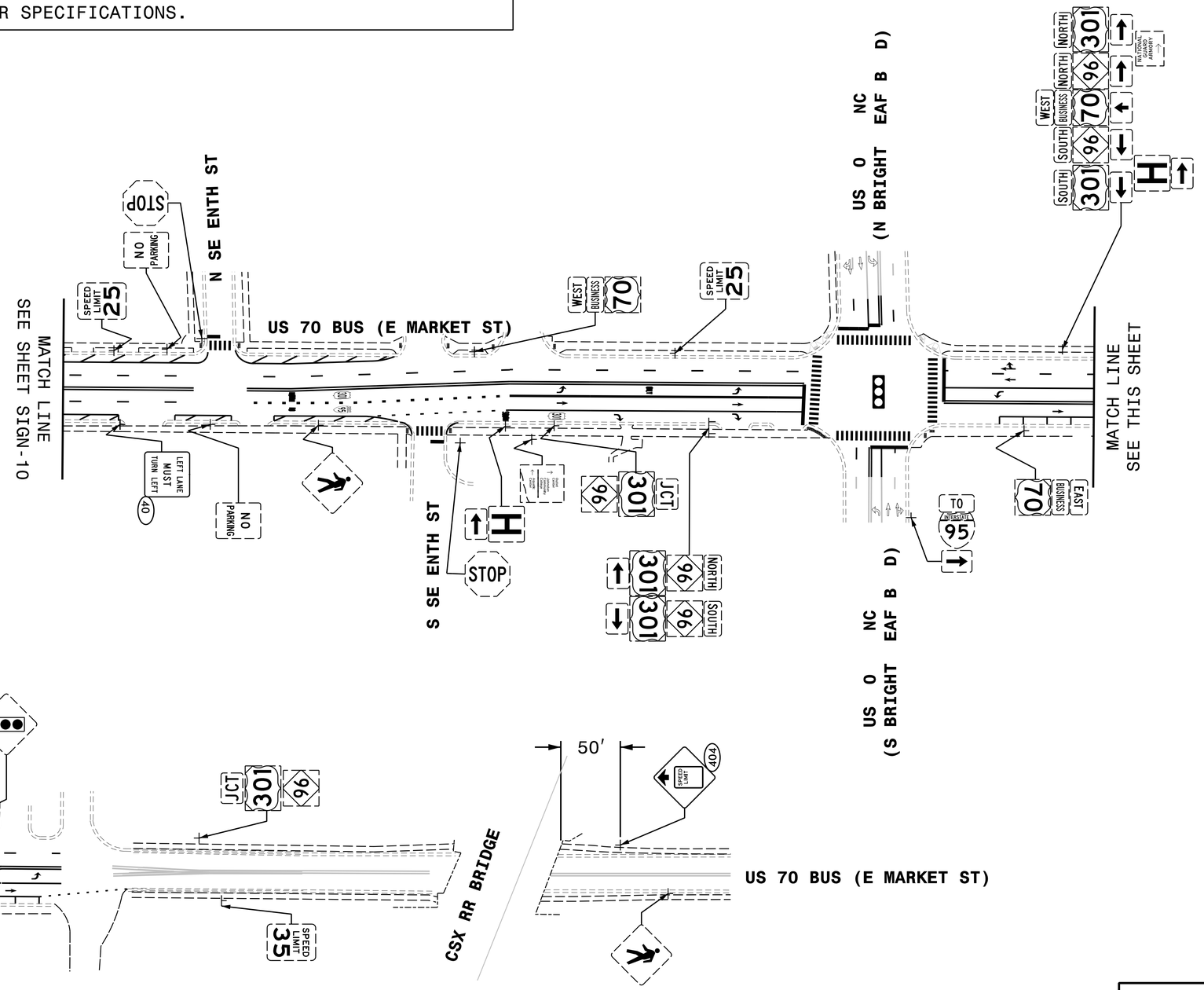

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PROPOSED SIGNING

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	SIGN-12

APPROVED: Docusigned by: Andrew D. Klinksiek E3D78FB4596E44B...

DATE: 11/5/2026

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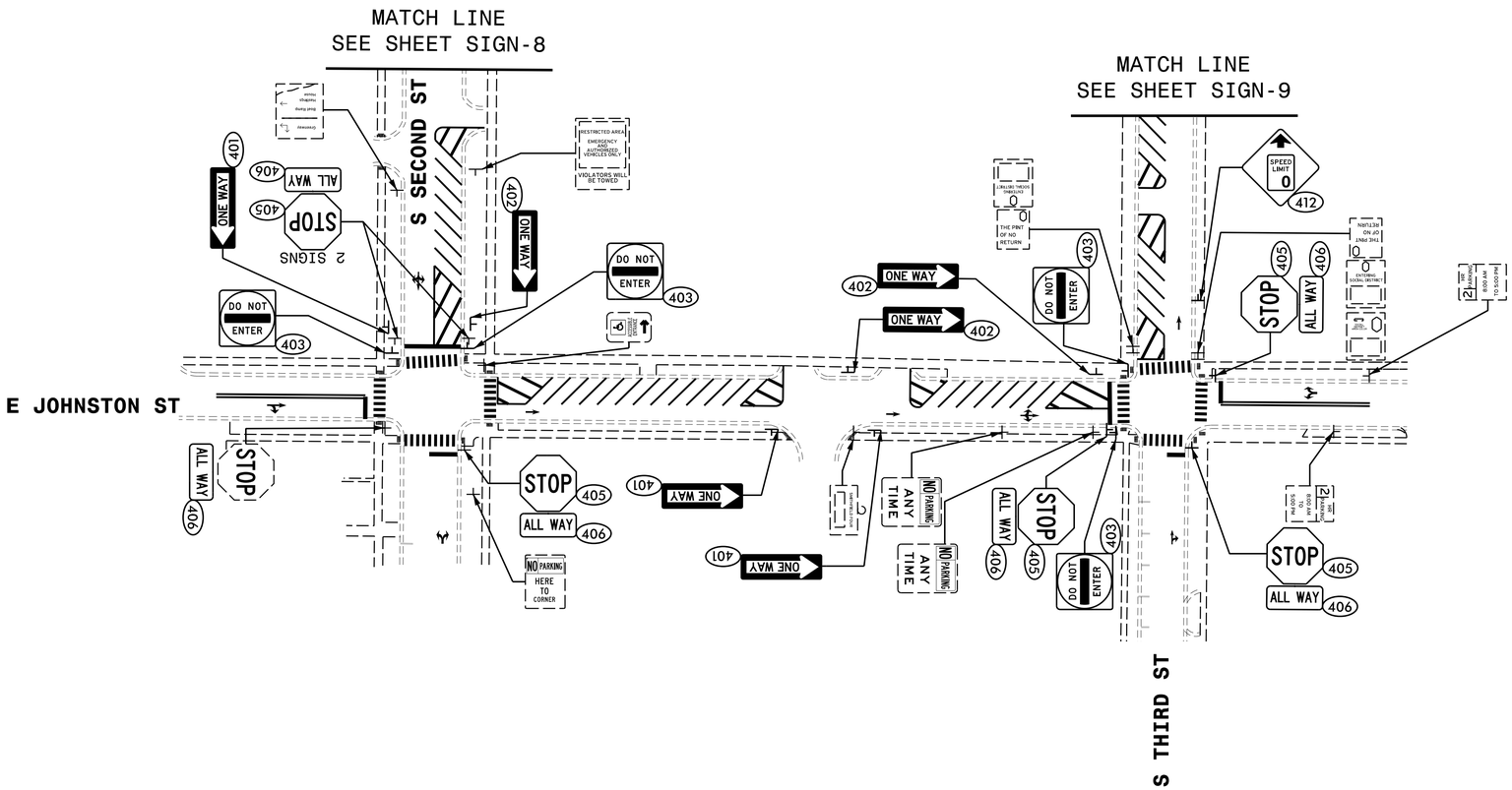
NOTE: SIGN BASES WILL BE PROVIDED BY THE DEPARTMENT FOR ALL LOCATIONS WHERE PROPOSED SIGNS WILL BE INSTALLED ON HARD SURFACE (SUCH AS CONCRETE). SIGN BASES ARE TO BE DRILLED AND ANCHORED INTO THE HARD SURFACE PER MANUFACTURER SPECIFICATIONS.

SIGN TO BE FIELD LOCATED BY ENGINEER.



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PROPOSED SIGNING

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

09/08/2024

PROJECT	SHEET NO.
HS–2404V	Sig. 1.0

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

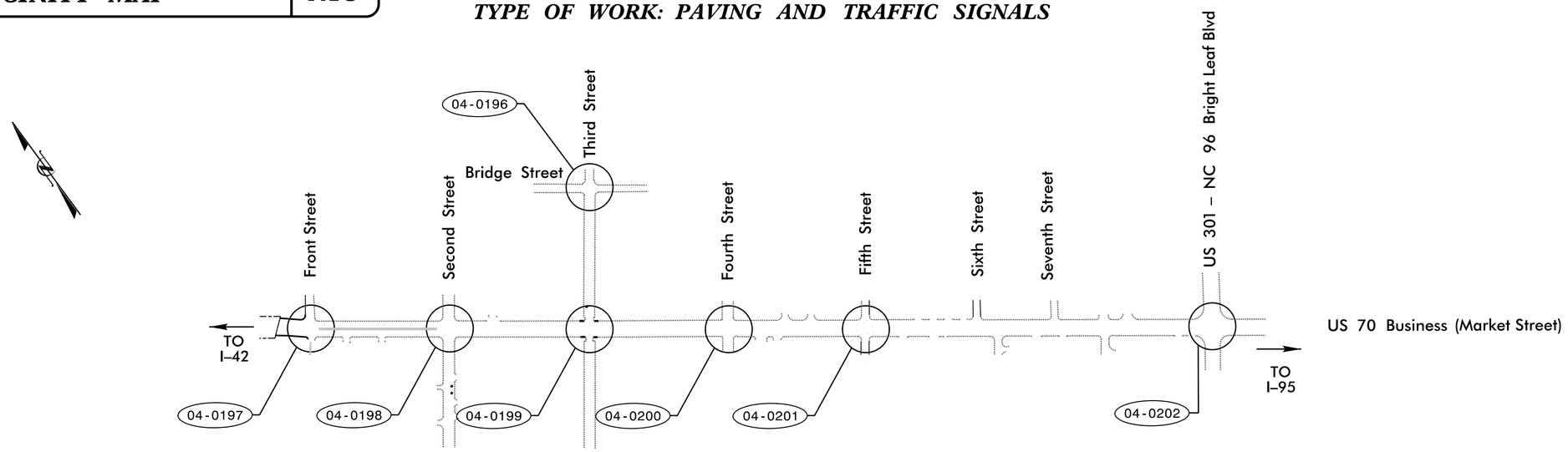
JOHNSTON COUNTY

LOCATION: *US 70 BUSINESS (MARKET STREET), FRONT STREET TO US 301 (BRIGHTLEAF BOULEVARD). INSTALL RAISED CONCRETE MEDIAN, CROSSWALKS, ADA CURB RAMPS, PEDESTRIAN SIGNAL HEADS, REVISE STREET PARKING, AND WIDEN LANES.*

TYPE OF WORK: *PAVING AND TRAFFIC SIGNALS*



VICINITY MAP | *NTS*



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Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Natasha R. Simmons, PE, PTOE – Project Task Lead
Nicole K. Vlanich, PE – Project Engineer
Emily E. Tiller, EI – Design Engineer

LEGEND

04-#### *SIGNAL INVENTORY NUMBER*

NCDOT SIGNAL DESIGN

Contacts:
Zachary Little, PE – Eastern Region Signals Engineer
Bryan M. Green – Project Manager

Sheet #	*Reference #*	*Location/Description*
Sig. 1.0	--------	*Title Sheet*
Sig. 2.0–2.2	*04–0197*	*US 70 Business (Market Street) at Front Street*
Sig. 3.0–3.2	*04–0198*	*US 70 Business (Market Street) at Second Street*
Sig. 4.0–4.2	*04–0199*	*US 70 Business (Market Street) at Third Street*
Sig. 5.0–5.3	*04–0200*	*US 70 Business (Market Street) at Fourth Street*
Sig. 6.0–6.2	*04–0201*	*US 70 Business (E. Market Street) at Fifth Street*
Sig. 7.0–7.2	*04–0202*	*US 70 Business (E. Market Street) at US 301 – NC 96 Bright Leaf Blvd*
Sig. 8.0–8.2	*04–0196*	*SR 1003 (Third Street) at Bridge Street*

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

Prepared for:

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

750 N. Greenfield Parkway,
Garner, NC 27529

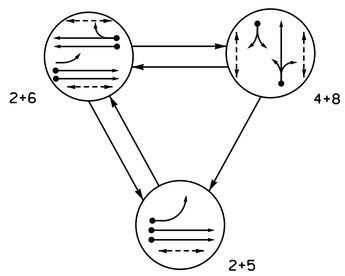
CONTRACT: DD00548 PROJECT: HS–2404V

$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

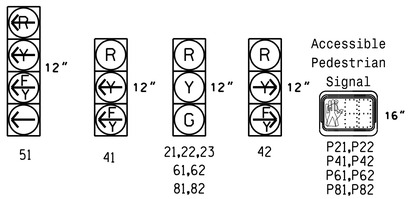
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 4+8	FLASH
21,22,23	G	G	R	R
41	R	R	F Y	R
42	R	R	F Y	R
51	←	F Y	R	R
61,62	R	G	R	R
81,82	R	R	G	R
P21, P22	W	W	DW	DRK
P41, P42	DW	DW	W	DRK
P61, P62	DW	W	DW	DRK
P81, P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



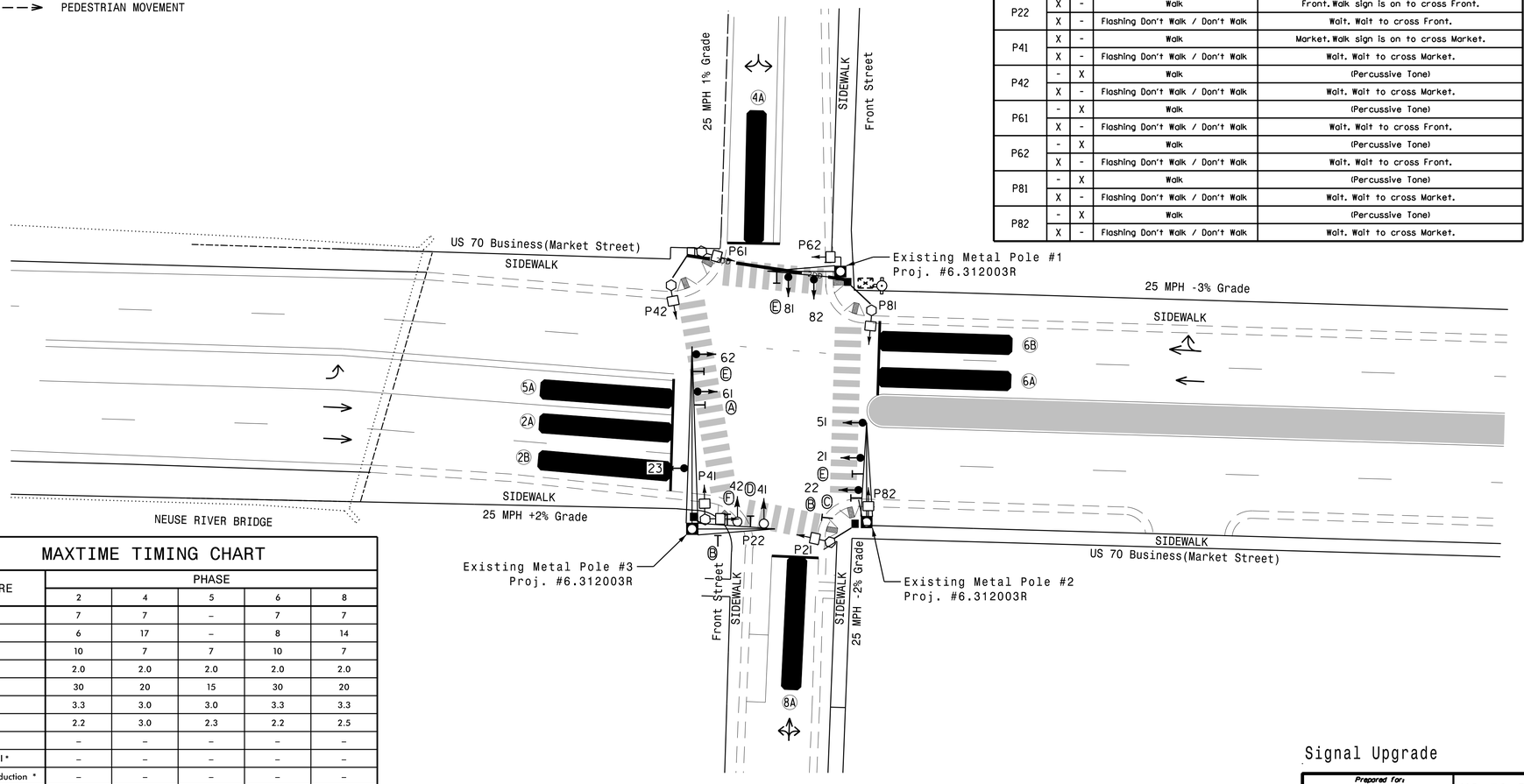
MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	*	0	*	X	2	-	-	X	-	X	-	*
2B	*	0	*	X	2	-	-	X	-	X	-	*
4A	*	0	*	X	4	5.0	-	X	-	X	-	*
5A	*	0	*	X	5	15.0	-	X	-	X	-	*
					2	3.0	-	X	-	X	-	*
6A	*	0	*	X	6	-	-	X	-	X	-	*
6B	*	0	*	X	6	-	-	X	-	X	-	*
8A	*	0	*	X	8	-	-	X	-	X	-	*

* Multizone Microwave Detection

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Front.
P22	X	-	Walk	Front. Walk sign is on to cross Front.
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Front.
P41	X	-	Walk	Market. Walk sign is on to cross Market.
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Market.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Market.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Front.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Front.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Market.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, Wait to cross Market.



MAXTIME TIMING CHART

FEATURE	PHASE 2	4	5	6	8
Walk *	7	7	–	7	7
Ped Clear	6	17	–	8	14
Min Green *	10	7	7	10	7
Passage *	2.0	2.0	2.0	2.0	2.0
Max 1 *	30	20	15	30	20
Yellow Change	3.3	3.0	3.0	3.3	3.3
Red Clear	2.2	3.0	2.3	2.2	2.5
Added Initial *	–	–	–	–	–
Maximum Initial *	–	–	–	–	–
Time Before Reduction *	–	–	–	–	–
Time To Reduce *	–	–	–	–	–
Minimum Gap	–	–	–	–	–
Advance Walk	–	7	–	6	4
Non Lock Detector	–	X	X	–	X
Vehicle Recall	MIN RECALL	–	–	MIN RECALL	–
Dual Entry	–	X	–	–	X
Simultaneous Start	–	X	–	–	X

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

3 Phase
Fully Actuated
Signal System: D04-07_Smithfield

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 5 may be lagged.
4. Set all detector units to presence mode.
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. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
8. This intersection features accessible pedestrian signals utilizing percussive tone walk indicators and/or speech messages.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□→	Pedestrian Signal Head	■→
○→	Signal Pole with Guy	●→
◐	Signal Pole with Sidewalk Guy	●
▬	Non-Intrusive Detection Zone	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
⊛	Type I Pushbutton Post	⊛
⬡	Type II Signal Pedestal	⬢
— X-DD —	Directional Drill	— DD —
— ·· X-UC ·· —	2-in Underground Conduit	— ·· UC ·· —
⊂▭	Metal Pole with Mastarm	⊂▭
N/A	Fire Hydrant	⊹
N/A	Right of Way	- - - - -
→	Directional Arrow	→
N/A	Curb Ramp	◢
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	"DO NOT ENTER" Sign (R5-1)	Ⓑ
Ⓒ	No Right Turn Sign (R3-1)	Ⓒ
Ⓓ	Combination Left and Right Lane Control Sign (R3-18)	Ⓓ
Ⓔ	Street Name Sign	Ⓔ
Ⓕ	"NO TURN ON RED" ● Sign (R10-11)	Ⓕ

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 70 Business (Market Street)
at
Front Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons F6DA86DF3AD445A...
11/3/2026
SIGNATURE DATE

SIG. INVENTORY NO. 04-0197

0 20
1"=20'

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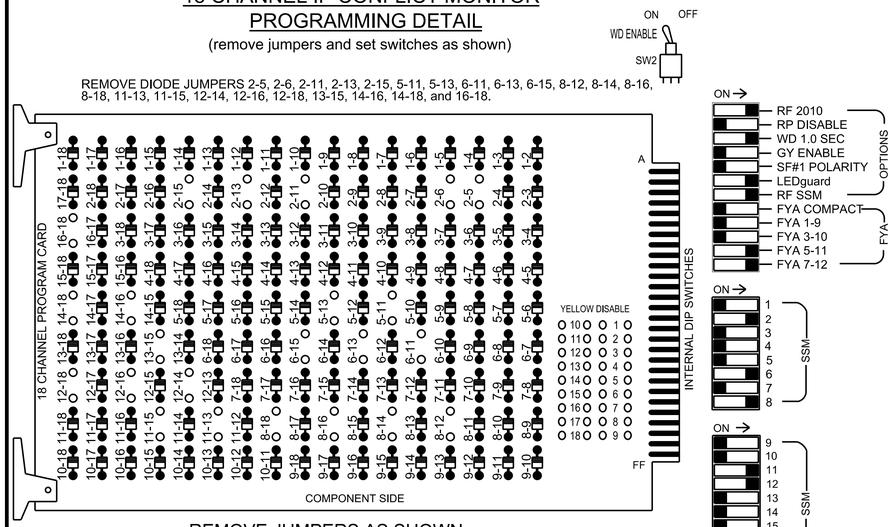
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 2.1

18 CHANNEL IP 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 the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program phases 4 and 8 for Simultaneous Start.
4. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
5. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
6. The cabinet and controller are part of the D04-07_Smithfield System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S3, S6, S7, S8, S9, S11, S12, AUX S4, AUX S5, AUX S6
Phases Used.....2, 2PED, 4**, 4PED, 5, 6, 6PED, 8, 8PED
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "5".....NOT USED
Overlap "6".....*

*See overlap programming detail on sheet 2.
**Phase used for timing purposed only

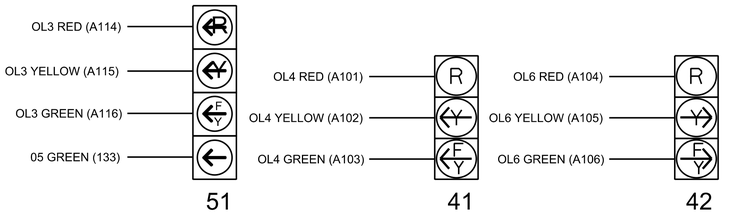
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	OL6
SIGNAL HEAD NO.	NU	21,22, 23	P21, P22	NU	NC	P41, P42	51★	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	51★	41★	42★
RED		128						134			107						A101	A104
YELLOW		129					*	135			108							
GREEN		130						136			109							
RED ARROW																A114		
YELLOW ARROW																A115	A102	A105
FLASHING YELLOW ARROW																A116	A103	A106
GREEN ARROW							133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used
NC = Not Connected
* 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)



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	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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 POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4	5.0		X		X	
5A	-	-	-	*	35	5	15.0		X		X	
				-	127	2	3.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
8A	-	-	-	*	60	8			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

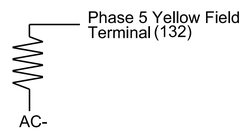
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



$$$$CSVSTIME$$$$
$$$$SIGNALS$$$$
$$$$SIGNALS$$$$
$$$$SIGNALS$$$$
$$$$SIGNALS$$$$
$$$$USERNAME$$$$

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0197
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70 Business (Market Street)
at
Front Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
SIGNATURE 11/3/2026 DATE

SIG. INVENTORY NO. 04-0197

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 2.2

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	5A	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Cell	127	Is Module A Input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 35 to vehicle detector 127.

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	3	4	6
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	6	4	4
Modifier Phases	5	-	-
Modifier Overlaps	-	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0197
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 70 Business (Market Street)
at
Front Street

Division 4 | Johnston County | Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
F6DA85DE3AD445A...
SIGNATURE 11/3/2026 DATE

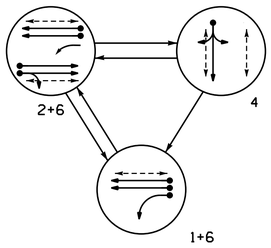
SIG. INVENTORY NO. 04-0197

$$$$$$CSKTIME$$$$
$$$$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 3.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

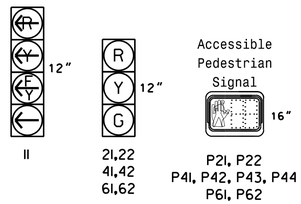
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 1+6	PHASE 2+6	PHASE 4	FLASH
11	~~Y~~	~~FY~~	~~R~~	~~R~~
21,22	R	G	R	R
41,42	R	R	G	R
61,62	G	G	R	R
P21,P22	DW	W	DW	DRK
P41,P42,P43,P44	DW	DW	W	DRK
P61, P62	W	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	*	0	*	X	1	15.0	-	X	-	X	-	*
					6	3.0	-	X	-	X	-	*
2A	*	0	*	X	2	-	-	X	-	X	-	*
2B	*	0	*	X	2	-	-	X	-	X	-	*
4A	*	0	*	X	4	5.0	-	X	-	X	-	*
6A	*	0	*	X	6	-	-	X	-	X	-	*
6B	*	0	*	X	6	-	-	X	-	X	-	*

* Multizone Microwave Detection

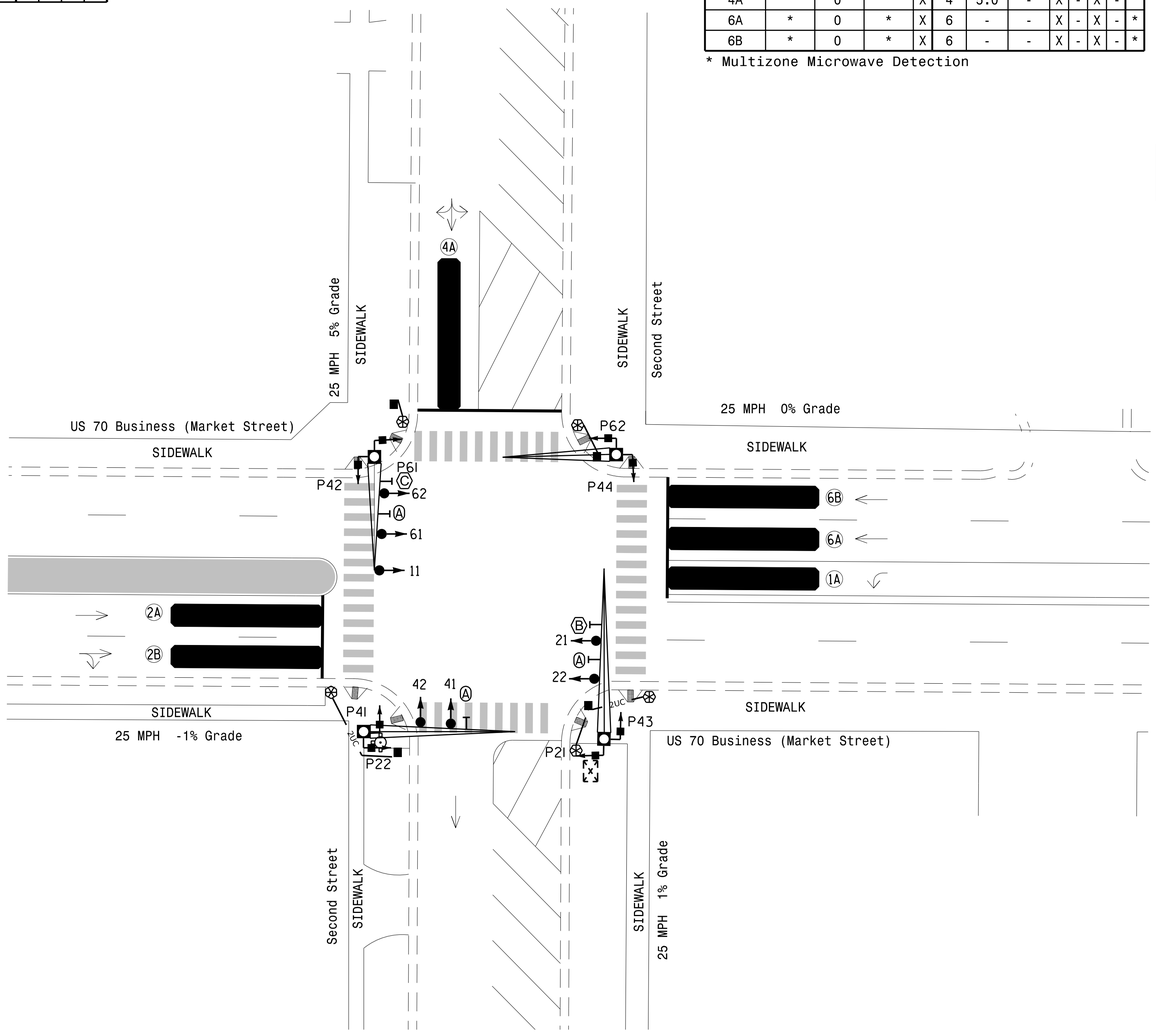
ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Second.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Second.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P43	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P44	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Second.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Second.

MAXTIME TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Walk *	–	7	7	7
Ped Clear	–	10	14	11
Min Green *	7	10	7	10
Passage *	2.0	2.0	2.0	2.0
Max 1 *	25	60	40	60
Yellow Change	3.0	3.2	3.0	3.2
Red Clear	3.0	2.8	3.1	2.8
Added Initial *	–	–	–	–
Maximum Initial *	–	–	–	–
Time Before Reduction *	–	–	–	–
Time To Reduce *	–	–	–	–
Minimum Gap	–	–	–	–
Advance Walk	–	7	4	–
Non Lock Detector	X	–	X	–
Vehicle Recall	–	MIN RECALL	–	MIN RECALL
Dual Entry	–	–	–	–

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



3 Phase
Fully Actuated
Signal System: D04-07_Smithfield

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 may be lagged.
4. Renumber existing pedestrian heads for phases 2, 4, 6, and 8.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
9. Replace existing pushbuttons with APS Pushbuttons.
10. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
11. Remove existing "Yield Here to Pedestrians" sign.
12. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Non-Intrusive Detection Zone	
	Controller & Cabinet	
	Junction Box	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
N/A	Fire Hydrant	
X-DD	Directional Drill	DD
X-UC	2-in Underground Conduit	UC
	Metal Pole with Mastarm	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
A	Street Name Sign	A
B	No Left Turn Sign (R3-2)	B
C	No Right Turn Sign (R3-1)	C

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

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

US 70 Business (Market Street) at Second Street

Division 4 Johnston County Smithfield

PLAN DATE: May 2026 REVIEWED BY: N.K. Vlanich

PREPARED BY: E.E. Tiller REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE

0 20
1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
F6DA80DF3AD445A...
SIGNATURE 11/3/2026 DATE

SIG. INVENTORY NO. 04-0198

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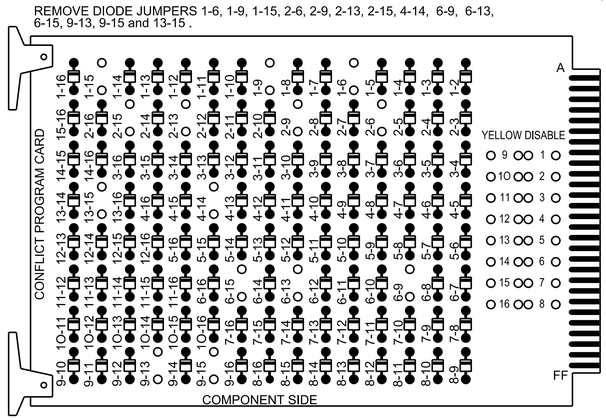
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 3.1

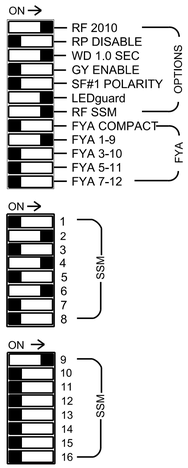
16 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-6, 1-9, 1-15, 2-6, 2-9, 2-13, 2-15, 4-14, 6-9, 6-13, 6-15, 9-13, 9-15 and 13-15 .





■ = 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. Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused monitor inputs 1, 3, 5, 7, 8, 10, 11, 12, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
5. The cabinet and controller are part of the D04-07_Smithfield System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ AUX
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S2P, S4, S4P, S6, S6P, S9
Phases Used.....1, 2, 2PED, 4, 4PED, 6, 6PED
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....NOT USED
Overlap "4".....NOT USED

*See overlap programming detail on sheet 2.

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
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41,P42 P43,P44	NU	61,62	P61, P62	NU	NU	NU	11★	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN		130			103			136										
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	
✋			113			104			119									
🚶			115			106			121									

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)

		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	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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 POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	-	-	-	*	33	1	15.0		X		X	
				-	125	6	3.0		X		X	
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4	5.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P41,P42 P43,P44	TB8-5,6	I12L	69	35	4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

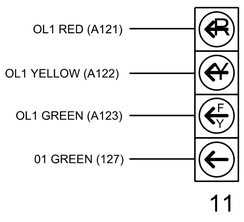
NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



SPECIAL DETECTOR NOTE

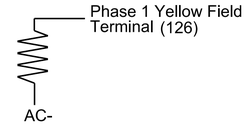
Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0198
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 1 of 2

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, Traffic Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 70 Business (Market Street) at Second Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
F6DA89DF5AD0455A...
SIGNATURE 11/3/2026 DATE

SIG. INVENTORY NO. 04-0198

$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 3.2

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Cell	125	Is Module A Input B ON	Number	2	Number	1	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 33 to vehicle detector 125.

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	1A	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	NU
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1
Type	FYA 4 - Section
Included Phases	2
Modifier Phases	1
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0198
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70 Business (Market Street)
at
Second Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R Simmons
F6DA8B0E9AD445A... 11/3/2026
SIGNATURE DATE

SIG. INVENTORY NO. 04-0198

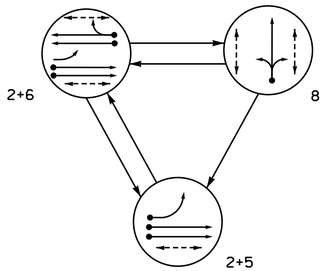
$$$$$$SYSTEMS$$$$$$
$$$$$$SIGNALS$$$$$$
$$$$$$SIGNALS$$$$$$PROJECTS$$$$$$$$$$$$$$$$$$
$$$$$$SIGNALS$$$$$$
$$$$$$SIGNALS$$$$$$
$$$$$$LICENSE$$$$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 4.0

3 Phase
Fully Actuated
Signal System: D04-07_Smithfield

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

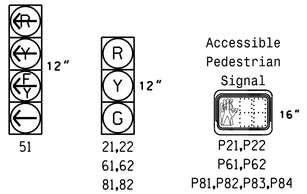
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 8	FLASH
21,22	G	G	R	R
51	~~←~~	~~↓~~	~~R~~	~~R~~
61,62	R	G	R	R
81,82	R	R	G	R
P21,P22	W	W	DW	DRK
P61,P62	DW	W	DW	DRK
P81,P82,P83,P84	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	*	0	*	X	2	-	-	X	-	X	-	*
2B	*	0	*	X	2	-	-	X	-	X	-	*
5A	*	0	*	X	5	15.0	-	X	-	X	-	*
					2	3.0	-	X	-	X	-	*
6A	*	0	*	X	6	-	-	X	-	X	-	*
6B	*	0	*	X	6	-	-	X	-	X	-	*
8A	*	0	*	X	8	5.0	-	X	-	X	-	*

* Multizone Microwave Detection

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 5 may be lagged.
4. Renumber existing pedestrian heads for phases 2, 4, 6, and 8.
5. Reposition existing heads 21 and 22.
6. Install new cabinet on existing foundation.
7. Do not install backplates on Existing Metal Pole #6 due to loadings.
8. Set all detector units to presence mode.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
12. Replace existing pushbuttons with APS Pushbuttons.
13. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
14. Remove existing "Yield Here to Pedestrians" signs, No Left Turn Signs (R3-2) for EB and NB movements, and No Right Turn Trucks Sign for EB movement.
15. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
16. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

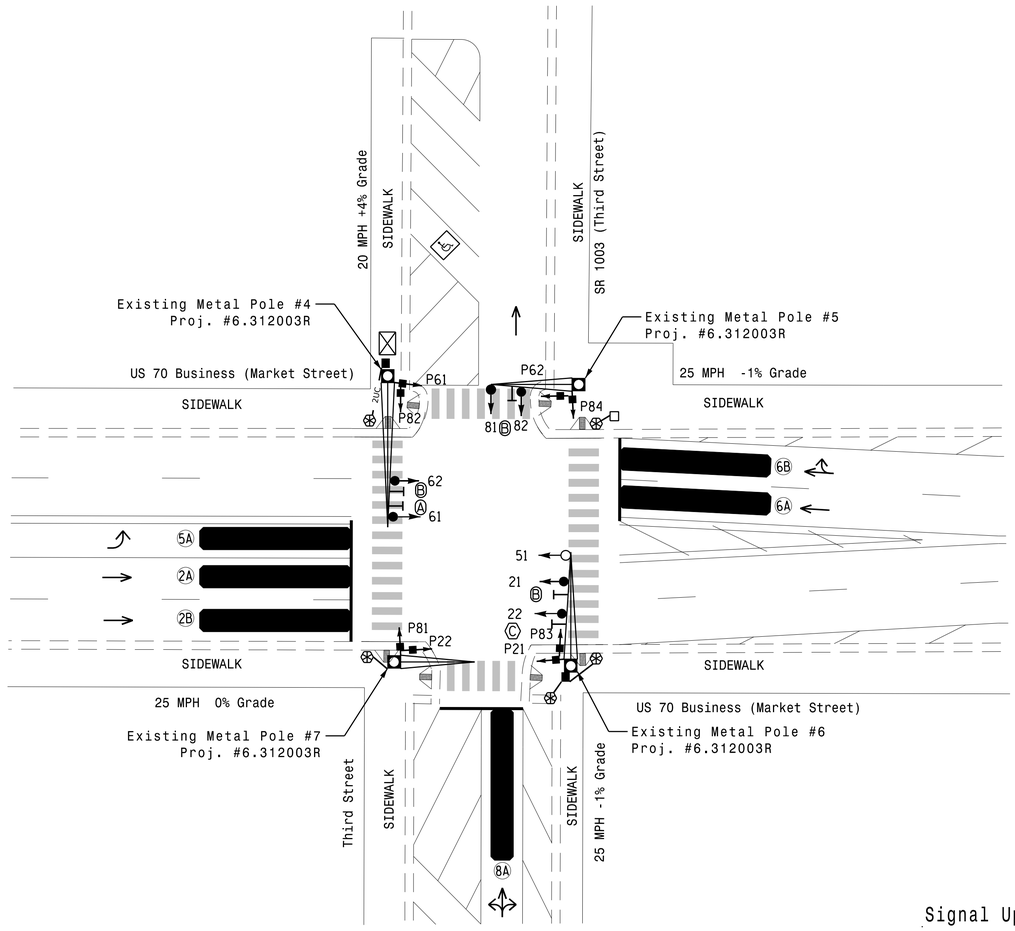
ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	"Percussive Tone"
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Third."
P22	X	-	Walk	"Third. Walk sign is on to cross Third."
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Third."
P61	-	X	Walk	"Percussive Tone"
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Third."
P62	-	X	Walk	"Percussive Tone"
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Third."
P81	X	-	Walk	"Market. Walk sign is on to cross Market."
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Market."
P82	-	X	Walk	"Percussive Tone"
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Market."
P83	-	X	Walk	"Percussive Tone"
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Market."
P84	-	X	Walk	"Percussive Tone"
	X	-	Flashing Don't Walk / Don't Walk	"Wait. Wait to cross Market."

MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 5	PHASE 6	PHASE 8
Walk *	7	–	7	7
Ped Clear	5	–	6	14
Min Green *	10	7	10	7
Passage *	2.0	2.0	2.0	2.0
Max 1 *	45	20	45	20
Yellow Change	3.2	3.0	3.2	3.2
Red Clear	2.1	2.3	2.1	2.3
Added Initial *	–	–	–	–
Maximum Initial *	–	–	–	
Time Before Reduction *	–	–	–	–
Time To Reduce *	–	–	–	–
Minimum Gap	–	–	–	–
Advance Walk	–	–	5	4
Non Lock Detector	–	X	–	X
Vehicle Recall	MIN RECALL	–	MIN RECALL	–
Dual Entry	–	–	–	–

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



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Non-Intrusive Detection Zone	
	Controller & Cabinet	
	Junction Box	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
X-DD	Directional Drill	DD
X-UC	2-in Underground Conduit	UC
	Metal Pole with Mastarm	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
A	No Left Turn Sign (R3-2)	A
B	Street Name Sign	B
C	No Right Turn Sign (R3-1)	C

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 70 Business (Market Street) at Third Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

0 20
1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R Simmons
F6DA895E3AD445A...
SIGNATURE
11/3/2026
DATE

SIG. INVENTORY NO. 04-0199

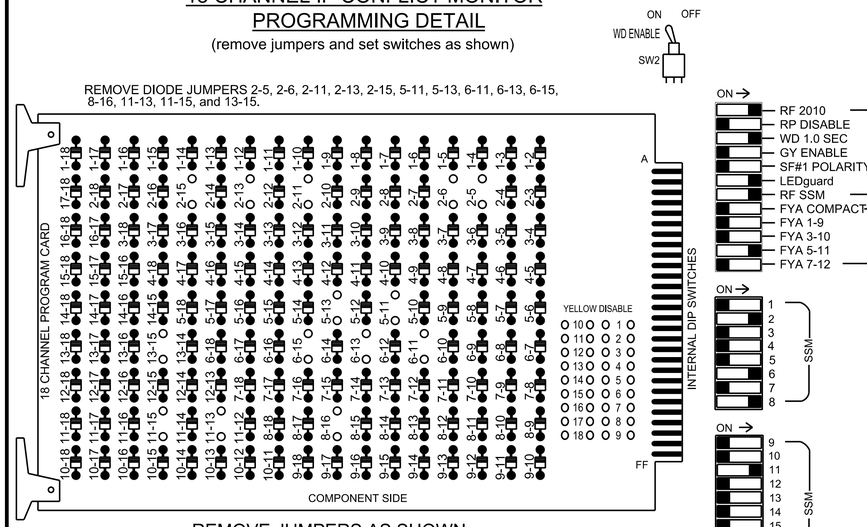
HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 4.1

18 CHANNEL IP 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. Make sure jumpers SEL2-SEL5 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D04-07_Smithfield System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ AUX
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S3, S7, S8, S9, S11, S12, AUX S4
Phases Used.....2, 2PED, 5, 6, 6PED, 8, 8PED
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....NOT USED

*See overlap programming detail on sheet 2.

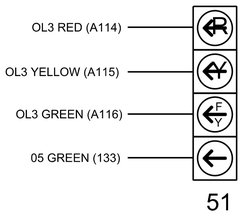
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	NU	NU	51★	61,62	P61, P62	NU	81,82	P81,P82, P83,P84	NU	NU	NU	51★	NU	NU
RED		128						134			107							
YELLOW		129					*	135			108							
GREEN		130						136			109							
RED ARROW																A114		
YELLOW ARROW																A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW							133											
✋			113					119			110							
🚶			115					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.

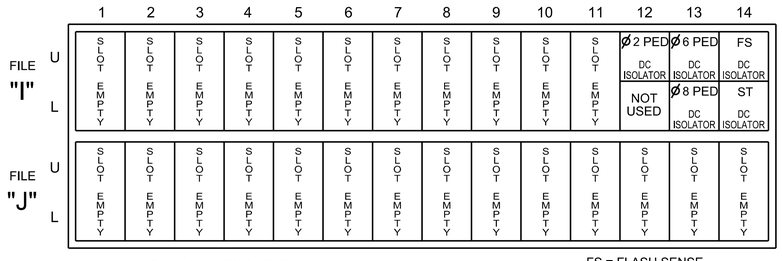
FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
5A	-	-	-	*	35	5	15.0		X		X	
				-	127	2	3.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
8A	-	-	-	*	60	8	5.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	PED 2	PED 2						
P61,P62	TB8-7,9	I13U	68	34	PED 6	PED 6						
P81,P82, P83,P84	TB8-8,9	I13L	70	36	PED 8	PED 8						

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

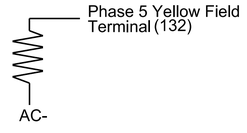
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



$$$$SYSTIME$$$$
$$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Cell	127	Is Module A Input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 35 to vehicle detector 127.

SDLC NON-INTRUSIVE DETECTION CHART

Input Point	Detector Rack #3		Detector Rack #4	
	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	5A	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	NU	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	3
Type	FYA 4 - Section
Included Phases	6
Modifier Phases	5
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0199
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70 Business (Market Street)
at
Third Street

Division 4 | Johnston County | Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS
DocuSigned by: Natasha R Simmons
F4DA89DF3AD445A...
SIGNATURE
11/3/2026
DATE
SIG. INVENTORY NO. 04-0199

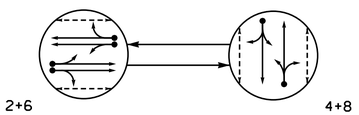
$$$$$$SYSTIME$$$$
$$$$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 5.0

2 Phase W/EV Preempt
Fully Actuated
Signal System: D04-07_Smithfield

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

EV PREEMPT PHASES

(Medium Priority)

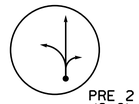
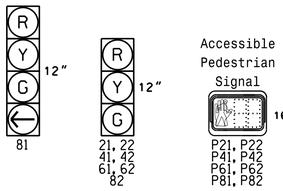


TABLE OF OPERATION

SIGNAL FACE	PHASE 2+6	PHASE 4+8	PHASE PRE 2	PHASE FLASH
21, 22	G	R	R	R
41, 42	R	G	R	R
61, 62	G	R	R	R
81	R	G	G	R
82	R	G	G	R
P21, P22	W	DW	DW	DRK
P41, P42	DW	W	DW	DRK
P61, P62	W	DW	DW	DRK
P81, P82	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

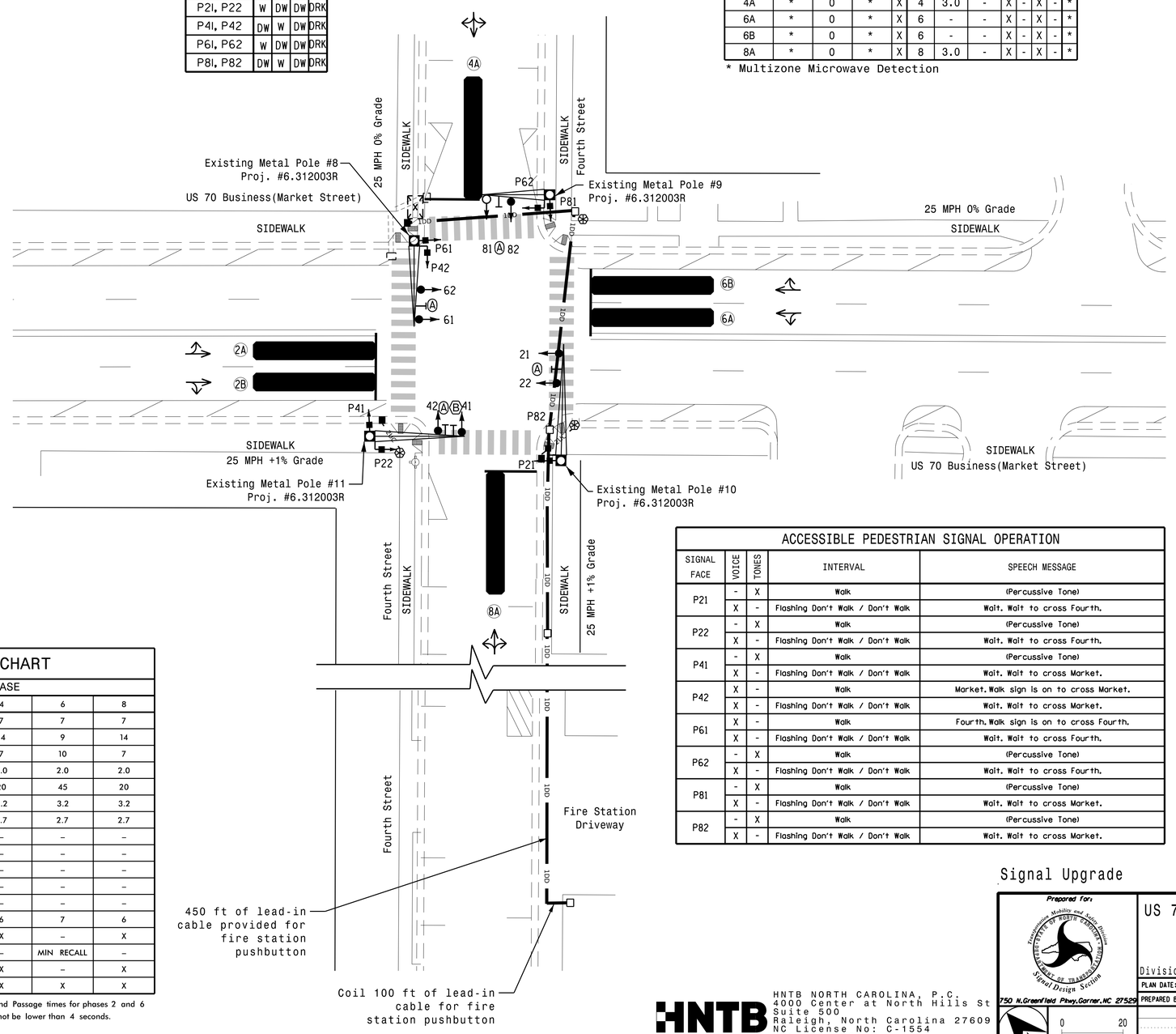
DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	*	0	*	X	2	-	-	X	-	X	-	*
2B	*	0	*	X	2	-	-	X	-	X	-	*
4A	*	0	*	X	4	3.0	-	X	-	X	-	*
6A	*	0	*	X	6	-	-	X	-	X	-	*
6B	*	0	*	X	6	-	-	X	-	X	-	*
8A	*	0	*	X	8	3.0	-	X	-	X	-	*

* Multizone Microwave Detection

MAXTIME PREEMPTION CHART

FUNCTION	PRE 2
Type	EMERG VEH
Exit Phases	2,6
Delay	**
Call Extend Time	0
Enter Min Green	1
Enter Walk	1
Enter Ped Clear	255*
Enter Yellow Change	25.5*
Enter Red Clear	25.5*
Track Green	0
Track Yellow Change	25.5*
Track Red Clear	25.5*
Dwell Green	**
Exit Min Green	255*
Exit Yellow Change	25.5*
Exit Red Clear	25.5*
Exit Type	EXIT PHASES
Ped Clear Through Yellow	Y
Require All Red Entry	–

* Directs controller to use default phase timing.
** See Note 10.



ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fourth.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fourth.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P42	X	-	Walk	Market. Walk sign is on to cross Market.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P61	X	-	Walk	Fourth. Walk sign is on to cross Fourth.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fourth.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fourth.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.

MAXTIME TIMING CHART

FEATURE	PHASE 2	3	4	6	8
Walk *	7	–	7	7	7
Ped Clear	9	–	14	9	14
Min Green *	10	7	7	10	7
Passage *	2.0	0.0	2.0	2.0	2.0
Max 1 *	45	0	20	45	20
Yellow Change	3.2	3.2	3.2	3.2	3.2
Red Clear	2.7	2.7	2.7	2.7	2.7
Added Initial *	–	–	–	–	–
Maximum Initial *	–	–	–	–	–
Time Before Reduction *	–	–	–	–	–
Time To Reduce *	–	–	–	–	–
Minimum Gap	–	–	–	–	–
Advance Walk	6	–	6	7	6
Non Lock Detector	–	X	X	–	X
Vehicle Recall	MIN RECALL	–	–	MIN RECALL	–
Dual Entry	–	–	X	–	X
Simultaneous Start	X	–	X	X	X

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

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. Renumber existing pedestrian heads for phases 2, 4, 6, and 8.
4. Do not install backplates on Existing Metal Pole #9 due to loading.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
9. Locate emergency vehicle preemption switch in fire station.
10. The Division Traffic Engineer will determine the Delay Time and Preempt Dwell Min Time for the emergency vehicle preemption timing.
11. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
12. Remove existing "Yield Here to Pedestrians" sign.
13. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
14. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Non-Intrusive Detection Zone	
	Controller & Cabinet	
	Junction Box	
N/A	Fire Hydrant	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
X-DD	Directional Drill	DD
X-UC	2-in Underground Conduit	UC
	Metal Pole with Mastarm	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
A	Street Name Sign	A
B	"ONCOMING TRAFFIC MAY HAVE EXTENDED GREEN" Sign (W25-2)	B

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Department of Transportation, State of North Carolina, Signal Design Section

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0 20
1"=20'

US 70 Business (Market Street)
at
Fourth Street

Division 4 Johnston County Smithfield

PLAN DATE: May 2026 REVIEWED BY: N.K. Vlanich
PREPARED BY: E.E. Tiller REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
F6DA80FD3AD445A...
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SIGNATURE DATE

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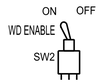
Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

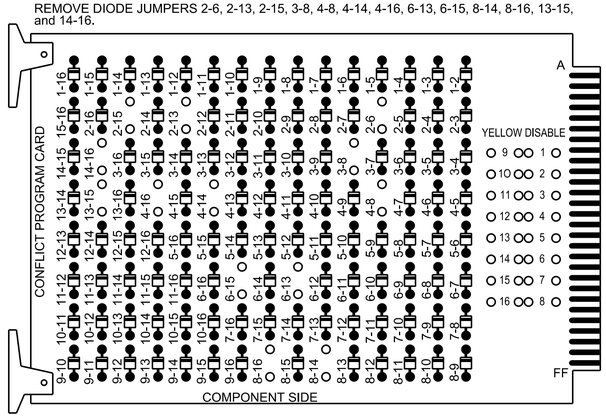
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 5.1

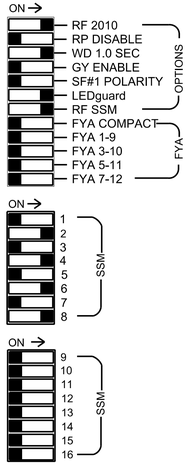
16 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6, 2-13, 2-15, 3-8, 4-8, 4-14, 4-16, 6-13, 6-15, 8-14, 8-16, 13-15, and 14-16.





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. Make sure jumpers SEL1-SEL5 are present on the monitor board.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused monitor inputs 1, 5, 7, 9, 10, 11, 12, 13, 14, 15, & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Program phases 2, 4, 6, and 8 for Simultaneous Start.
5. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
6. Program Phase 3 for No Startup Veh Call.
7. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
8. The cabinet and controller are part of the D04-07_Smithfield System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....12
Load Switches Used.....S2, S2P, S3, S4, S4P, S6, S6P, S8, S8P
Phases Used.....2, 2PED, *3, 4, 4PED, 6, 6PED, 8, 8PED
Overlaps.....None

* Phase used for preemption purposes only.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P		S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
CMU CHANNEL NO.	1	2	13		3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED		3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	FIRE PILOT LAMP	81	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128				101			134			107	
YELLOW		129			*	102			135			108	
GREEN		130				103			136			109	
RED ARROW													
YELLOW ARROW													
GREEN ARROW					118								
✋			113				104			119			110
PED YELLOW				* 114									
🚶			115				106			121			112

NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.

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	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED
	L														PRE2 AC ISOLATOR

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

FS = FLASH SENSE
ST = STOP TIME
PRE = PREEMPT

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4	3.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
8A	-	-	-	*	60	8	3.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	PED 2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	PED 4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	PED 6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	PED 8	PED 8						

*For Input Point Numbers, see SDLC Non-Intrusive Detection Chart sheet 2.

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

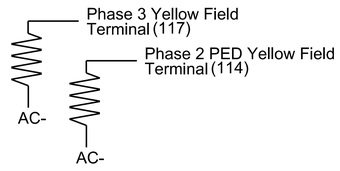
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



$$$$$$SYSTIME$$$$
$$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 5.2

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

PREEMPTION PROGRAMMING

Front Panel
Main Menu >Controller >Preemption >Preempt Phasing/Preempt Parameters

Web Interface
Home >Controller >Preempt Configuration >Preempts

Preempt Configuration

Preempt	2
Enabled	Enabled
Type	Emergency Veh
Track Phases	-
Track Overlaps	-
Dwell Phases	3,8
Dwell Overlaps	-
Cycling Phases	-
Cycling Overlaps	-
Exit Phases	2,6
Exit Overlaps	-
Delay	*
Max Presence	0
Call Ext Time	0
Max Pres Act	Terminate
Enter Min Green	1
Enter Walk	1
Enter Ped Clear	255
Enter Yellow Change	25.5
Enter Red Clear	25.5
Track Green	0
Track Yellow Change	25.5
Track Red Clear	25.5
Dwell Green	*
Exit Min Green	255
Exit Yellow Change	25.5
Exit Red Clear	25.5
Dwell Ext Time	0
Exit Type	Exit Phases
Non Locking Memory	-
Not Ovrd Flash	X
Not Ovrd Nxt Pre	-
Require All Red Entry	-
Track Clear Ovrd	X
Ped Clear During Yellow	X
Entry Omit OLTG	-
Track CLear Reserve	-

* Times to be determined by Division Traffic Engineer

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Phase Phase Omit	3	Result=!A	Preempt Input	2	-	-	0.0	0.0
2	Global Variable	33	Result=(A OR B)	Preempt Input	2	Preempt Status	2	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Omits phase 3 while not in preemption 2.

Statement 2 Description: Turns Pilot Light for Preempt 2 on when button is pushed.

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$PROJECTNUMBER$$$$
$$$$SIGNATURE$$$$

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0200
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70 Business (Market Street)
at
Fourth Street

Division 4 | Johnston County | Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

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

750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R Simmons 11/3/2026
SIGNATURE DATE

SIG. INVENTORY NO. 04-0200

Docusign Envelope ID: 7C019187-CA47-851F-814A-397A128D6DD5

OUPUT POINTS PROGRAMMING

Front Panel
Main Menu >Controller >More>Advanced IO >Output Points

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >Output Points

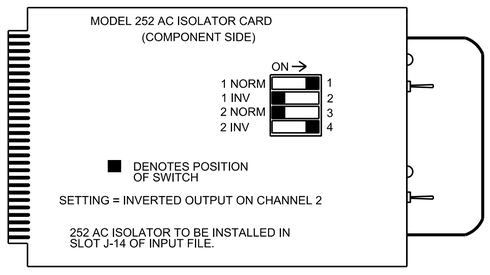
IO Module 1

NOTICE OUTPUT POINT ASSIGNED TO GLOBAL VARIABLE 33 →

Detector	Descripton	Output Control Type	Index
33	C1-35	Global Variable	33
34	C1-36	Not Active	15
35	C1-37	Not Active	14
36	C1-38	Not Active	16

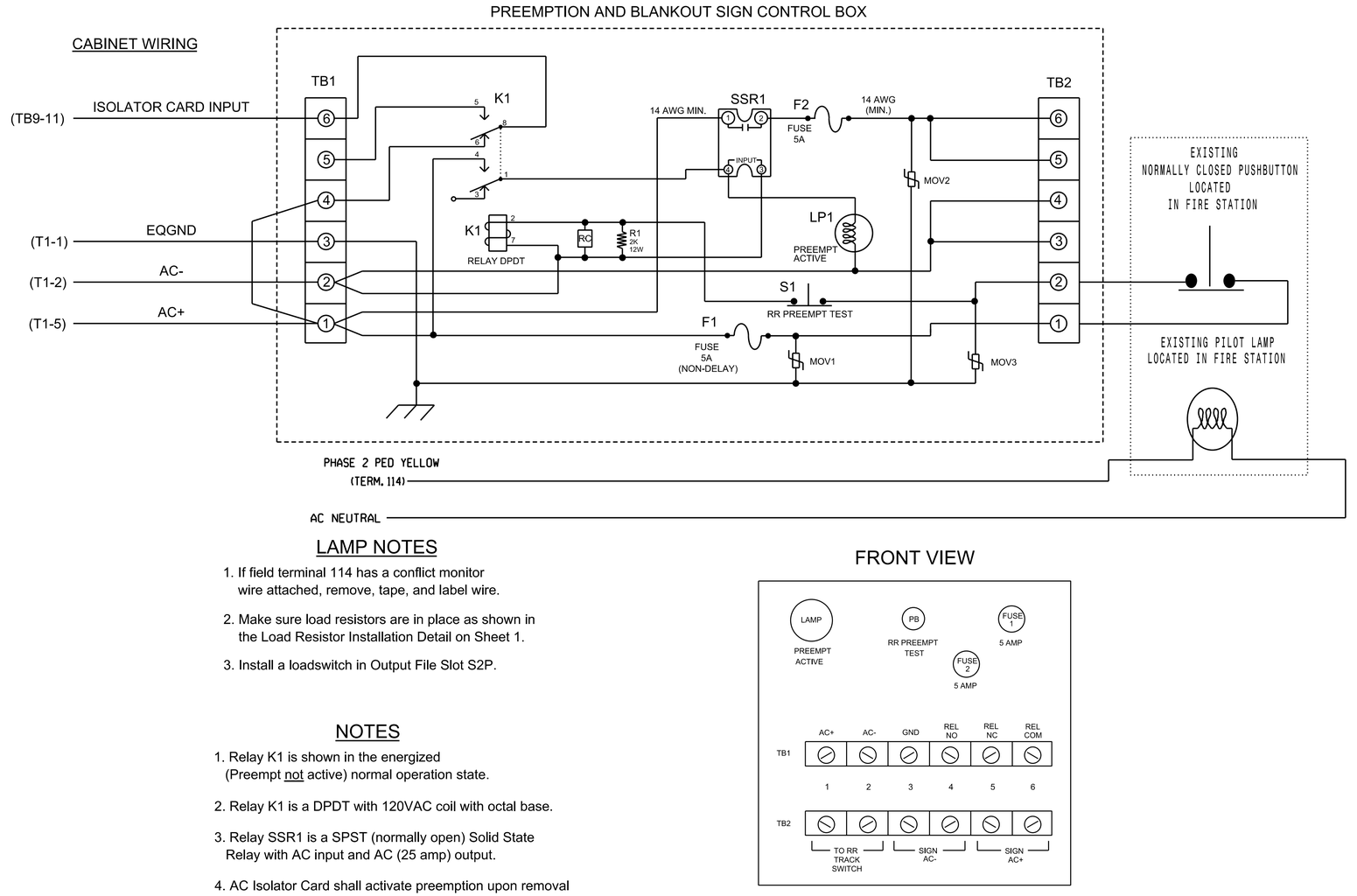
PREEMPT 2 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



EV Preemption Control Box Wiring Detail

(wire as shown below)



LAMP NOTES

1. If field terminal 114 has a conflict monitor wire attached, remove, tape, and label wire.
2. Make sure load resistors are in place as shown in the Load Resistor Installation Detail on Sheet 1.
3. Install a loadswitch in Output File Slot S2P.

NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. IMPORTANT!! Terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0200
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
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(919) 546-8997

Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70 Business (Market Street)
at
Fourth Street

Division 4 | Johnston County | Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

Prepared for:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signals Management Section
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NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R Simmons F6DA88DF3AD44AA... 11/3/2026
SIGNATURE DATE

SIG. INVENTORY NO. 04-0200

$$$$$USERTIME$$$$
$$$$$

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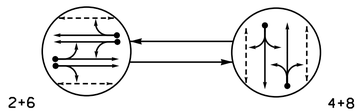
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 6.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

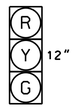
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 2+6	PHASE 4+8	PHASE FLASH
21, 22	G	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42
61, 62
81, 82

Accessible Pedestrian Signal

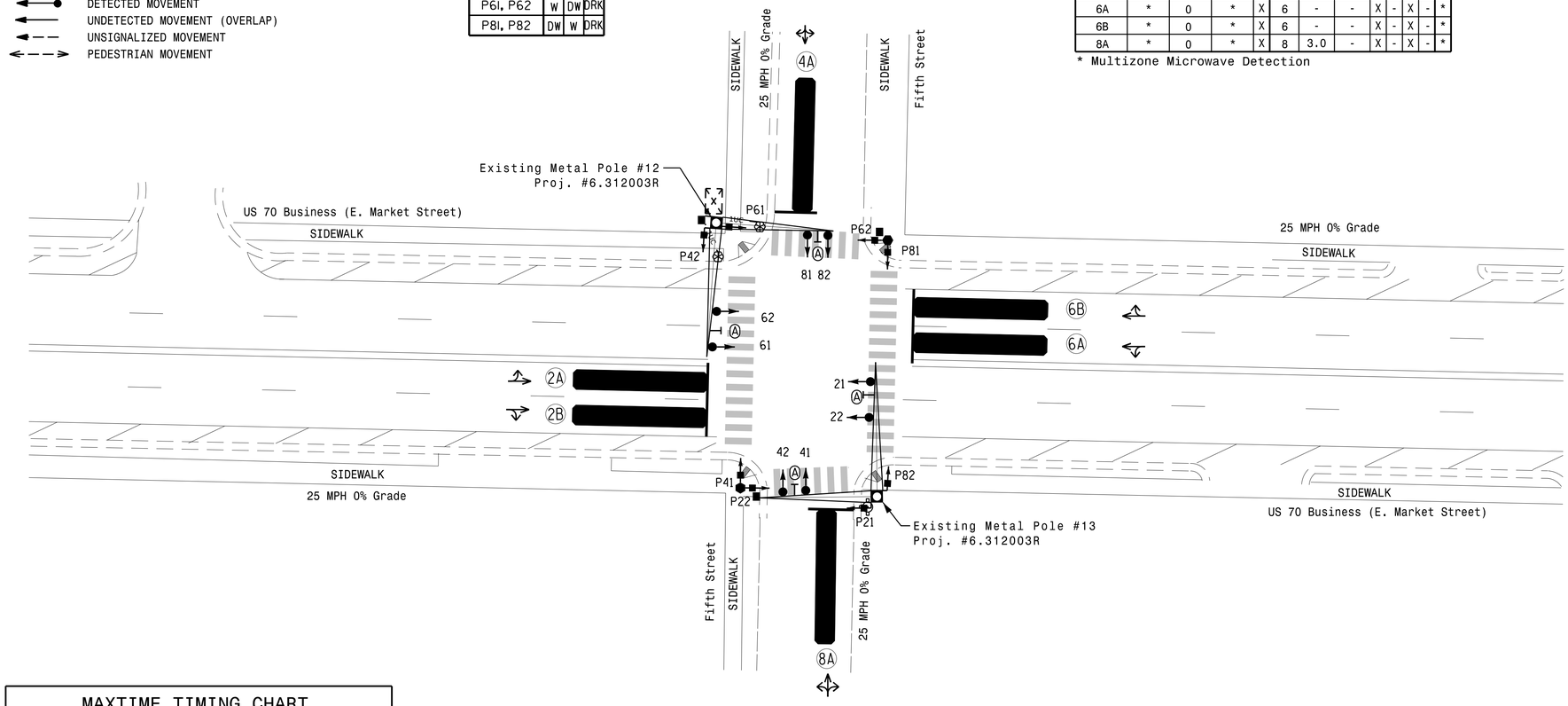


P21, P22
P41, P42
P61, P62
P81, P82

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	*	0	*	X	2	-	-	X	-	X	-	*
2B	*	0	*	X	2	-	-	X	-	X	-	*
4A	*	0	*	X	4	3.0	-	X	-	X	-	*
6A	*	0	*	X	6	-	-	X	-	X	-	*
6B	*	0	*	X	6	-	-	X	-	X	-	*
8A	*	0	*	X	8	3.0	-	X	-	X	-	*

* Multizone Microwave Detection



MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Walk *	7	7	7	7
Ped Clear	6	15	8	15
Min Green *	10	7	10	7
Passage *	2.0	2.0	2.0	2.0
Max 1 *	30	20	30	20
Yellow Change	3.2	3.2	3.2	3.2
Red Clear	2.3	2.3	2.3	2.3
Added Initial *	–	–	–	–
Maximum Initial *	–	–	–	–
Time Before Reduction *	–	–	–	–
Time To Reduce *	–	–	–	–
Minimum Gap	–	–	–	–
Advance Walk	5	6	6	6
Non Lock Detector	–	X	–	X
Vehicle Recall	MIN RECALL	–	MIN RECALL	–
Dual Entry	–	X	–	X
Simultaneous Start	X	X	X	X

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

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	X	-	Walk	Fifth. Walk sign is on to cross Fifth.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fifth.
P22	X	-	Walk	Fifth. Walk sign is on to cross Fifth.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fifth.
P41	X	-	Walk	Market. Walk sign is on to cross Market.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fifth.
P62	X	-	Walk	Fifth. Walk sign is on to cross Fifth.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Fifth.
P81	X	-	Walk	Market. Walk sign is on to cross Market.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P82	X	-	Walk	Market. Walk sign is on to cross Market.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.

2 Phase
Fully Actuated
Signal System: D04-07_Smithfield

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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
7. Replace existing pushbuttons with APS Pushbuttons.
8. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
9. Remove existing "Yield Here to Pedestrians" signs.
10. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desire detection.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Non-Intrusive Detection Zone	
	Controller & Cabinet	
	Junction Box	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
N/A	Fire Hydrant	
X-DD	Directional Drill	DD
X-UC	2-in Underground Conduit	UC
	Metal Pole with Mastarm	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
A	Street Name Sign	A

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

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US 70 Business (E. Market Street) at Fifth Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

0 20
1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
F6DA86DF3AD445A...
11/3/2026
SIGNATURE DATE

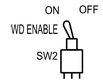
SIG. INVENTORY NO. 04-0201

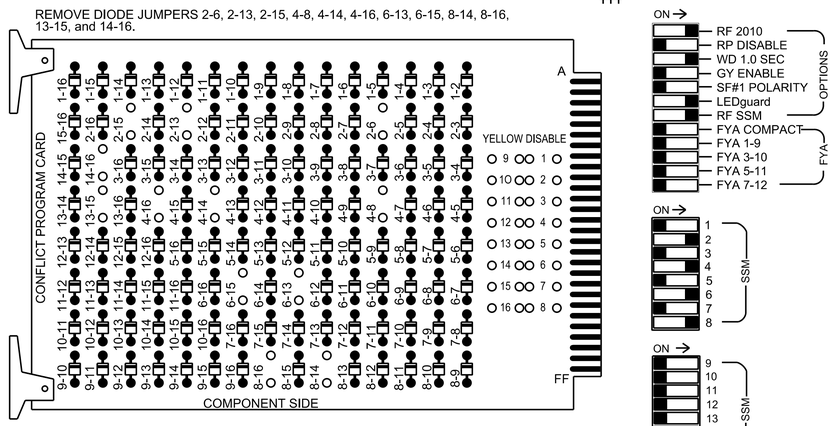
Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 6.1

16 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. Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused monitor inputs 1, 3, 5, 7, 9, 10, 11, 12, 13, 14, 15, & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Program phases 2, 4, 6 and 8 for Simultaneous Start.
5. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
7. The cabinet and controller are part of the D04-07_Smithfield System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....12
Load Switches Used.....S2, S2P, S4, S4P, S6, S6P, S8, S8P
Phases Used.....2, 2PED, 4, 4PED, 6, 6PED, 8, 8PED
Overlaps.....None

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113			104			119			110
🚶			115			106			121			112

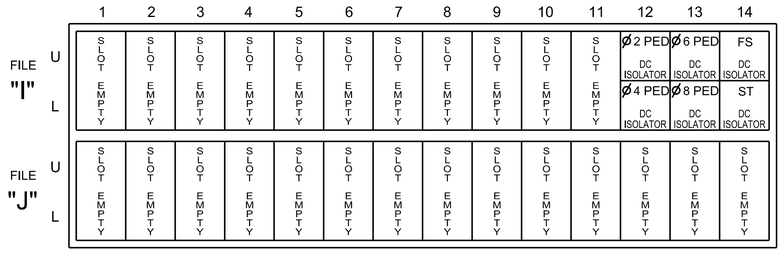
NU = Not Used

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.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4	3.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
8A	-	-	-	*	60	8	3.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	PED 2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	PED 4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	PED 6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	PED 8	PED 8						

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart sheet 2.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0201
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 70 Business
(E. Market Street)
at
Fifth Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
SIGNATURE 11/3/2026 DATE

SIG. INVENTORY NO. 04-0201

$$$$$$CVISITIME$$$$
$$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 6.2

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

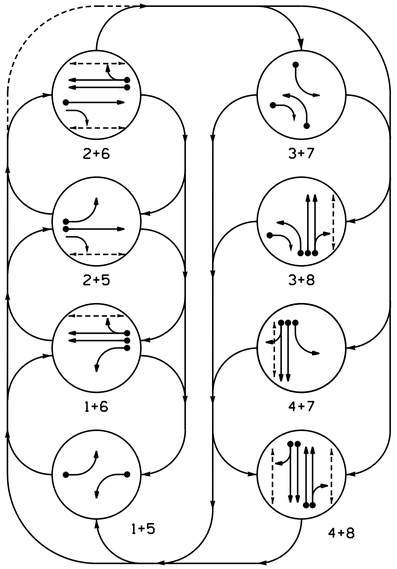
1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

$$$$USERNAME$$$$
$$$$SIGNATURE$$$$
$$$$SIGNATURE$$$$
$$$$SIGNATURE

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 7.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

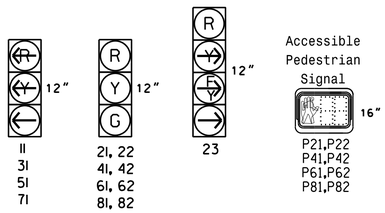
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

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~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	R	R	R	R
23	R	R	FY	FY	~~R~~	~~R~~	R	R	R
31	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
41, 42	R	R	R	R	R	R	G	G	R
51	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	R	R	R	R
71	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
81, 82	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

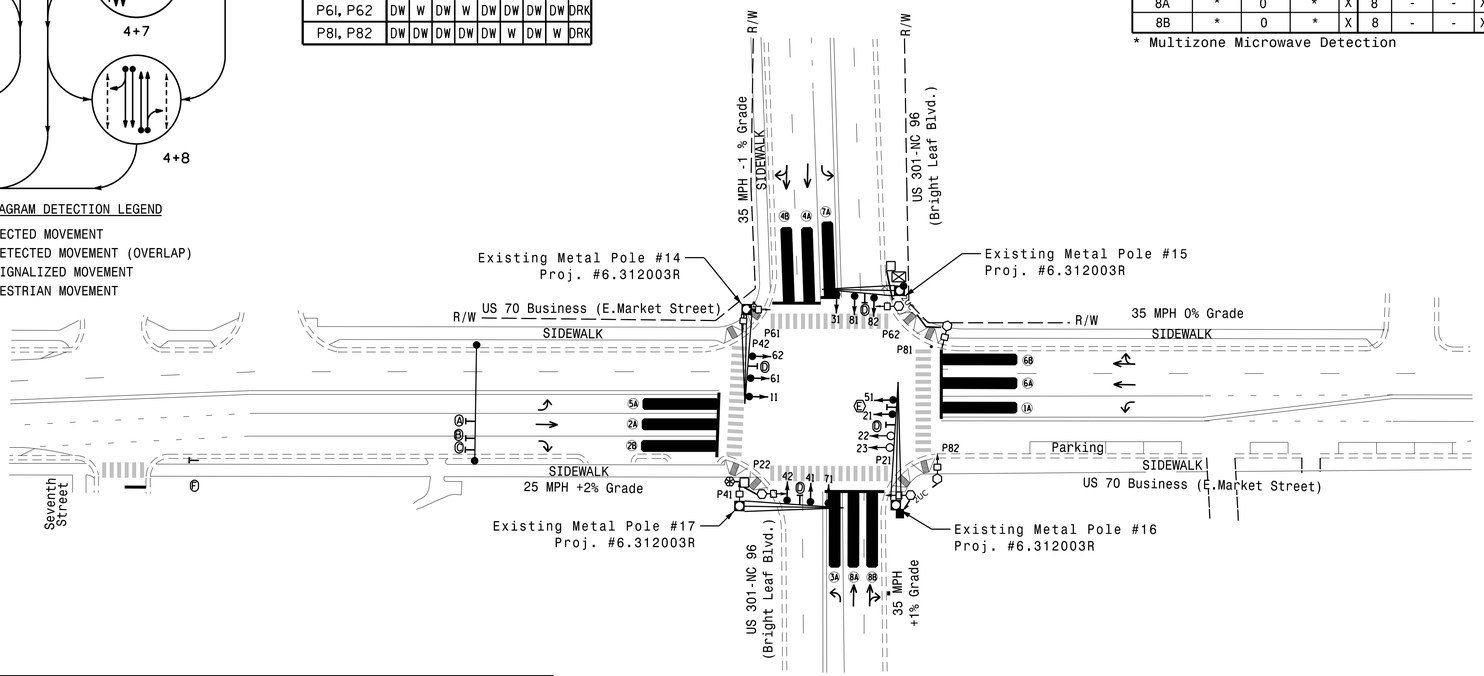
All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	*	0	*	X	1	3.0	-	X	-	X	-	*
2A	*	0	*	X	2	-	-	X	-	X	-	*
2B	*	0	*	X	2	-	-	X	-	X	-	*
3A	*	0	*	X	3	3.0	-	X	-	X	-	*
4A	*	0	*	X	4	-	-	X	-	X	-	*
4B	*	0	*	X	4	-	-	X	-	X	-	*
5A	*	0	*	X	5	3.0	-	X	-	X	-	*
6A	*	0	*	X	6	-	-	X	-	X	-	*
6B	*	0	*	X	6	-	-	X	-	X	-	*
7A	*	0	*	X	7	3.0	-	X	-	X	-	*
8A	*	0	*	X	8	-	-	X	-	X	-	*
8B	*	0	*	X	8	-	-	X	-	X	-	*

* Multizone Microwave Detection



MAXTIME TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Walk *	–	7	–	7	–	7	–	7
Ped Clear	–	20	–	16	–	18	–	16
Min Green *	7	12	7	10	7	12	7	10
Passage *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	25	60	20	40	25	60	20	40
Yellow Change	3.0	3.8	3.0	3.9	3.0	3.8	3.0	3.9
Red Clear	3.3	2.9	3.3	1.8	3.4	2.9	3.5	1.8
Added Initial *	–	–	–	–	–	–	–	–
Maximum Initial *	–	–	–	–	–	–	–	–
Time Before Reduction *	–	–	–	–	–	–	–	–
Time To Reduce *	–	–	–	–	–	–	–	–
Minimum Gap	–	–	–	–	–	–	–	–
Advance Walk	–	**	–	6	–	7	–	7
Non Lock Detector	X	–	X	X	X	–	X	X
Vehicle Recall	–	MIN RECALL	–	–	–	MIN RECALL	–	–
Dual Entry	–	–	–	–	–	–	–	–

* These values may be field adjusted. Do not adjust Min Green and Passage 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 12.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bright Leaf.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bright Leaf.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P42	X	-	Walk	Market.Walk sign is on to cross Market.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P61	X	-	Walk	Bright Leaf.Walk sign is on to cross Bright Leaf.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bright Leaf.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bright Leaf.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Market.

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8 Phase Fully Actuated Signal System: D04-07_Smithfield 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 signs Ⓐ, Ⓑ and Ⓒ.
6. Disconnect and abandon existing loops 3A, 4A, 4B, 6A, 6B, 7A, 8A, and 8B.
7. Do not install backplates on Existing Metal Pole #16 due to loading.
8. Set all detector units to presence mode.
9. Install new cabinet on existing foundation.
10. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
11. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
12. To provide a leading pedestrian interval on phase 2, program FYA head numbered 11 and 23 for 7 seconds after the start of the phase 2 walk interval. See Electrical Details for programming.
13. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
14. This intersection features accessible pedestrian signals utilizing percussive tone walk indicators and/or speech messages.
15. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
16. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□→	Pedestrian Signal Head	■→
○—	Signal Pole with Guy	●—
○↓	Signal Pole with Sidewalk Guy	●↓
▬	Non-Intrusive Detection Zone	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
⊛	Type I Pushbutton Post	◉
⬡	Type II Signal Pedestal	⬢
N/A	Fire Hydrant	⍥
— X-DD —	Directional Drill	— DD —
— ·· X-UC ·· —	2-in Underground Conduit	— ·· UC ·· —
◎▱	Metal Pole with Mastarm	◎▱
N/A	Right of Way	- - - - -
→	Directional Arrow	→
N/A	Curb Ramp	◢
Ⓐ	"EAST" US 70 with Through Arrow	Ⓐ
Ⓑ	"SOUTH" US 301 with Right Arrow	Ⓑ
Ⓒ	"RIGHT LANE MUST TURN RIGHT" Sign (Custom)	Ⓒ
Ⓓ	Street Sign	Ⓓ
Ⓔ	Left Arrow "Only" Sign (R3-5L)	Ⓔ

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 70 Business (E.Market Street) at US 301-NC 96 (Bright Leaf Blvd)

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

0 40
1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
F6DA80DF3AD445A...
SIGNATURE 11/3/2026 DATE

SIG. INVENTORY NO. 04-0202

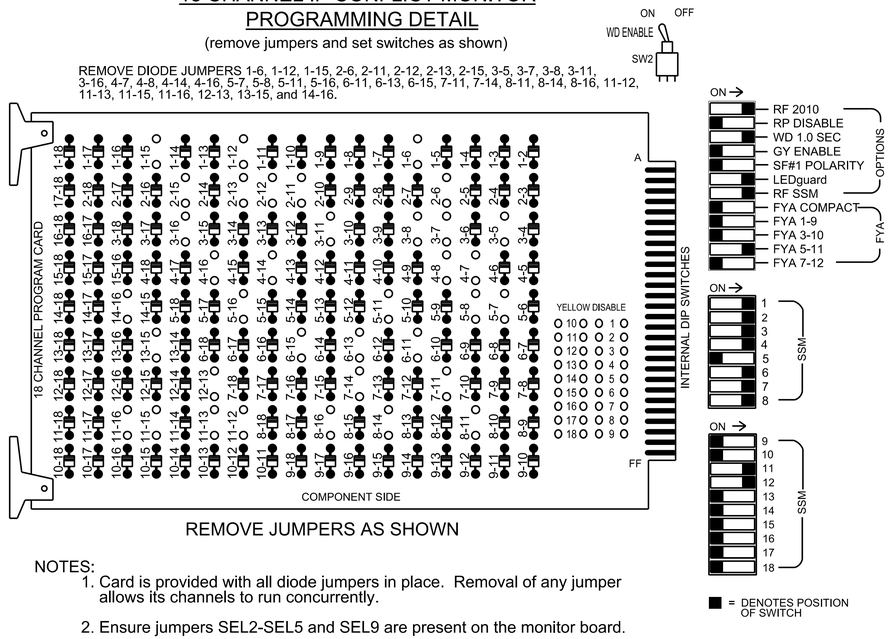
Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 7.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-12, 1-15, 2-6, 2-11, 2-12, 2-13, 2-15, 3-5, 3-7, 3-8, 3-11, 3-16, 4-7, 4-8, 4-14, 4-16, 5-7, 5-8, 5-11, 5-16, 6-11, 6-13, 6-15, 7-11, 7-14, 8-11, 8-14, 8-16, 11-12, 11-13, 11-15, 11-16, 12-13, 13-15, and 14-16.



■ = 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. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D04-07_Smithfield System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ AUX
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, AUX S4, AUX S5
Phases Used.....1, 2, 2PED, 3, 4, 4PED, 5, 6, 6PED, 7, 8, 8PED
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2.

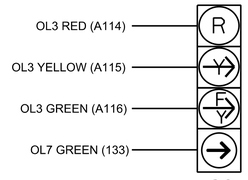
SIGNAL HEAD HOOK-UP CHART

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	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	31	41,42	P41, P42	23★	61,62	P61, P62	71	81,82	P81, P82	NU	NU	NU	23★	51	NU
RED		128			101			134			107					A114		
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW	125			116						122							A101	
YELLOW ARROW	126			117						123						A115	A102	
FLASHING YELLOW ARROW																A116		
GREEN ARROW	127			118			133			124							A103	
✋			113			104			119			110						
🚶			115			106			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.
NOTE: Load Switch S7 requires output remapping. See Sheet 2 for instructions.

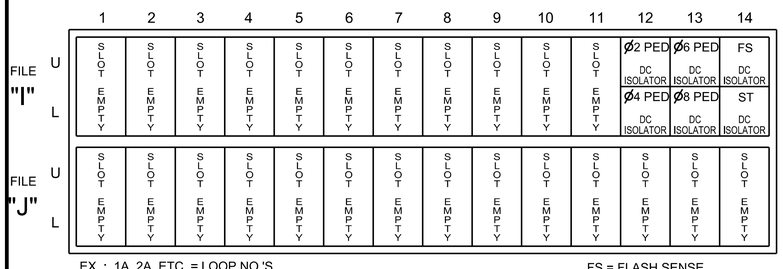
FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	-	-	-	*	33	1	3.0		X		X	
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
3A	-	-	-	*	34	3	3.0		X		X	
4A	-	-	-	*	44	4			X		X	
4B	-	-	-	*	45	4			X		X	
5A	-	-	-	*	35	5	3.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
7A	-	-	-	*	36	7	3.0		X		X	
8A	-	-	-	*	60	8			X		X	
8B	-	-	-	*	61	8			X		X	
PED PUSH BUTTONS												
P21;P22	TB8-4,6	I12U	67	33	PED 2	PED 2						
P41;P42	TB8-5,6	I12L	69	35	PED 4	PED 4						
P61;P62	TB8-7,9	I13U	68	34	PED 6	PED 6						
P81;P82	TB8-8,9	I13L	70	36	PED 8	PED 8						

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart sheet 2.

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

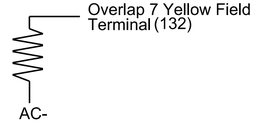
INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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: 04-0202
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70 Business (E.Market Street)
at
US 301-NC 96
(Bright Leaf Blvd)

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

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

750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R Simmons
F6DA89DF9A04454A...
SIGNATURE 11/3/2026 DATE

SIG. INVENTORY NO. 04-0202

$$$$$SYSTIME$$$$
$$$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 7.2

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	1A	49	NU
2	34	3A	50	NU
3	35	5A	51	NU
4	36	7A	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	4B	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	3	4	7
Type	FYA 4 - Section	Normal	Normal
Included Phases	2	5	3
Modifier Phases	3	-	-
Modifier Overlaps	-	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0
FYA Ped Delay	7.0	0.0	0.0

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channel Config/Channel Options

Web Interface
Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

NOTICE OL7 ASSIGNED TO CHANNEL 5 →

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Overlap	7		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

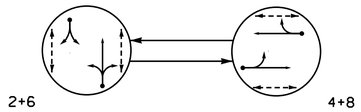
IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default

$$$$$$SYSTIME$$$$
$$$$$$

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 8.0

PHASING DIAGRAM



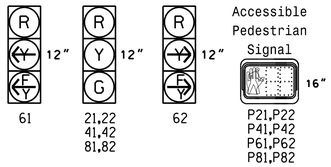
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 2+6	PHASE 4+8	FLASH
21,22	G	R	R
41,42	R	G	R
61	FY	R	R
62	FY	R	R
81,82	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

SIGNAL FACE I.D.



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	*	0	*	X	2	-	-	X	-	X	-	*
4A	*	0	*	X	4	3.0	-	X	-	X	-	*
6A	*	0	*	X	6	-	-	X	-	X	-	*
8A	*	0	*	X	8	3.0	-	X	-	X	-	*

* Multizone Microwave Detection

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

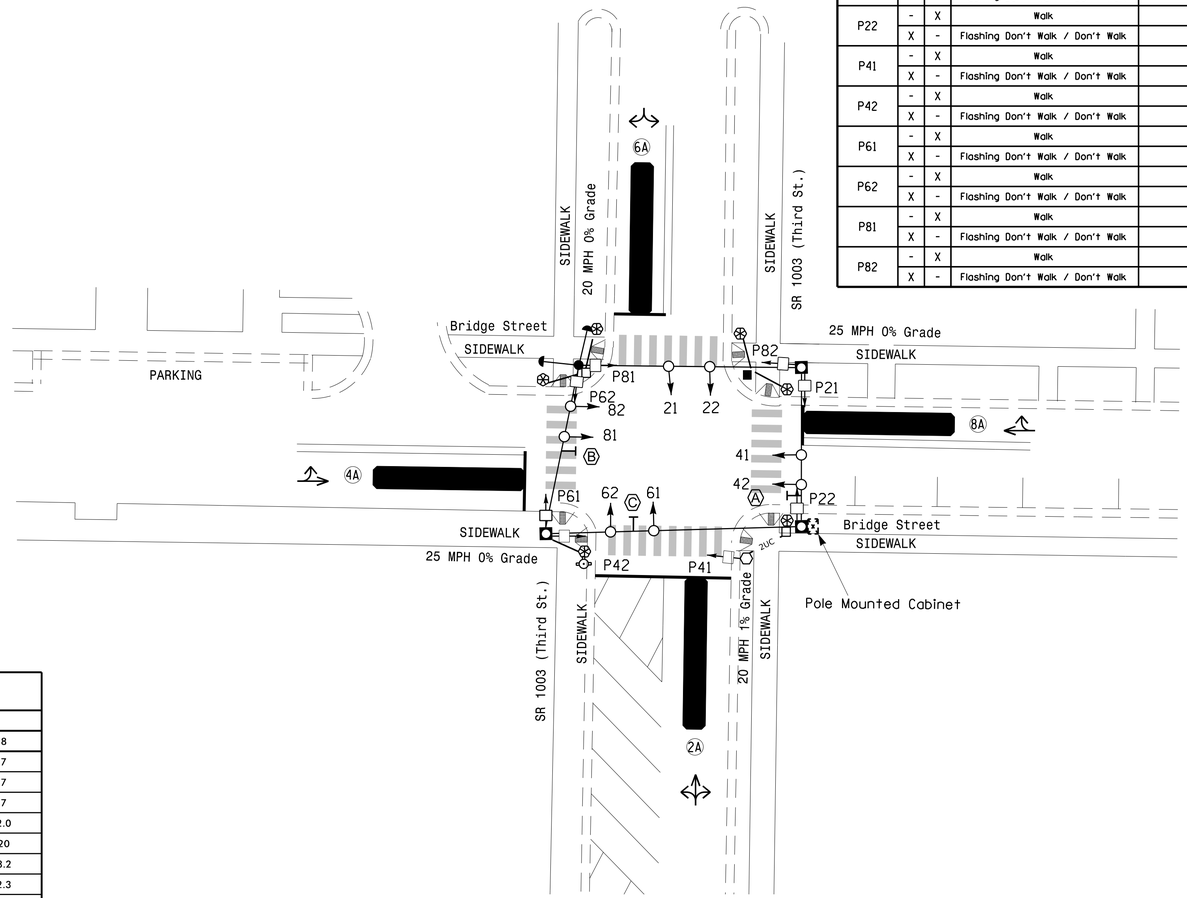
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bridge.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bridge.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Third.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Third.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bridge.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Bridge.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Third.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Third.

2 Phase
Fully Actuated
(Isolated)

NOTES

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. Disconnect and abandon existing loops.
4. Set all detector units to presence mode.
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. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
8. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Non-Intrusive Detection Zone	
	Controller & Cabinet	
	Junction Box	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
X-DD	Directional Drill	DD
X-UC	2-in Underground Conduit	UC
N/A	Fire Hydrant	
	Metal Pole with Mastarm	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
A	No Right Turn Sign (R3-1)	A
B	No Left Turn Sign (R3-2)	B
C	Dual Turn Arrows Sign	C

MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Walk *	7	7	7	7
Ped Clear	6	9	7	7
Min Green *	10	7	10	7
Passage *	2.0	2.0	2.0	2.0
Max 1 *	30	20	30	20
Yellow Change	3.0	3.2	3.0	3.2
Red Clear	2.3	2.3	2.3	2.3
Added Initial *	–	–	–	–
Maximum Initial *	–	–	–	–
Time Before Reduction *	–	–	–	–
Time To Reduce *	–	–	–	–
Minimum Gap	–	–	–	–
Advance Walk	5	7	5	5
Non Lock Detector	–	X	–	X
Vehicle Recall	MIN RECALL	–	MIN RECALL	–
Dual Entry	–	X	–	X
Simultaneous Start	X	X	X	X

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

$$$$$$SYSTIME$$$$$
$$$$$$SYSTIMEMDY$$$$$
$$$$$$USERNAME$$$$$

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SR 1003 (Third Street) at Bridge Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

0 20
1"=20'

HNTB
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4000 Center at North Hills St
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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R. Simmons
F6DA80DF3AD445A...
SIGNATURE 11/3/2026 DATE

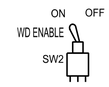
SIG. INVENTORY NO. 04-0196

Docusign Envelope ID: 060C5636-816C-8A5A-8388-69B82AF32022

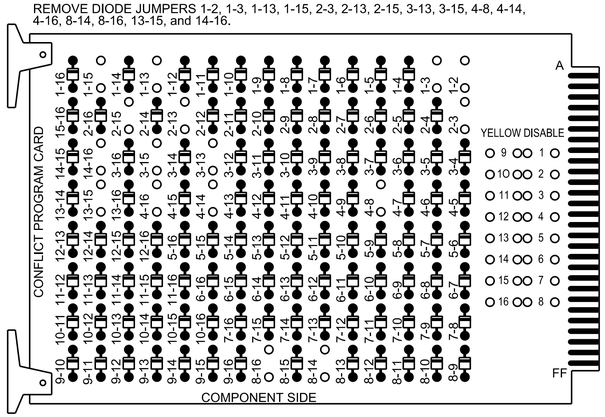
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 8.1

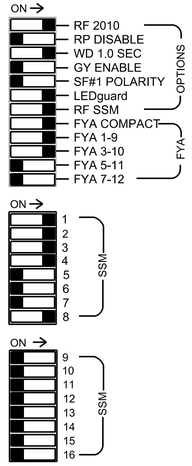
16 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-2, 1-3, 1-13, 1-15, 2-3, 2-13, 2-15, 3-13, 3-15, 4-8, 4-14, 4-16, 8-14, 8-16, 13-15, and 14-16.





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. Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
3. Program phases 4 and 8 for Dual Entry.
4. Program phases 2, 4, 6, and 8 for Simultaneous Start.
5. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....336
Software.....Q-Free MAXTIME
Cabinet Mount.....Pole
Output File Positions.....12
Load Switches Used.....S1, S2, S2P, S3, S4, S4P, S6P, S8, S8P
Phases Used.....2, 2PED, 4, 4PED, 6, 6PED, 8, 8PED
Overlap "1".....*
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....NOT USED

*See overlap programming detail on sheet 2.

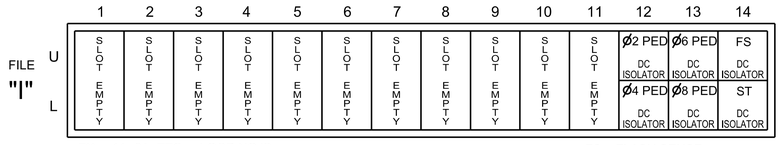
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	OL1	2	2 PED	OL2	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	P21, P22	62	41,42	P41, P42	NU	NC	P61, P62	NU	81,82	P81, P82
RED	125	128		116	101						107	
YELLOW		129			102						108	
GREEN		130			103						109	
RED ARROW												
YELLOW ARROW	126			117								
FLASHING YELLOW ARROW	127			118								
GREEN ARROW												
✋			113			104			119			110
🚶			115			105			121			112

NU = Not Used
NC = Not Connected
★See pictorial of head wiring in detail this sheet.
NOTE: Load Switches S1 and S3 require output remapping. See Sheet 2 for instructions.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
4A	-	-	-	*	44	4	3.0		X		X	
6A	-	-	-	*	54	6			X		X	
8A	-	-	-	*	60	8	3.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB22-9,10	I12U	67	33	2	PED 2						
P41,P42	TB24-9,10	I12L	69	35	4	PED 4						
P61,P62	TB22-11,12	I13U	68	34	6	PED 6						
P81,P82	TB24-11,12	I13L	70	36	8	PED 8						

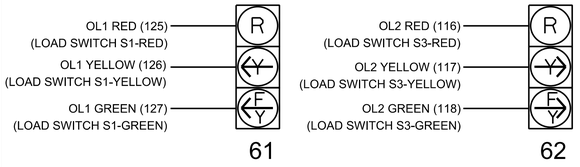
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

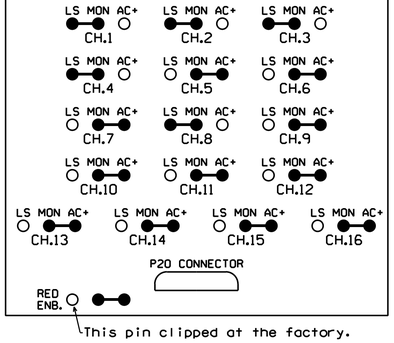
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



RED MONITOR BOARD PROGRAMMING

(position jumpers as shown below)



FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE 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.

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: 04-0196
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1003 (Third Street)
at
Bridge Street

Division 4 Johnston County Smithfield

PLAN DATE:	May 2026	REVIEWED BY:	N.K. Vlanich
PREPARED BY:	E.E. Tiller	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS

DocuSigned by: Natasha R Simmons
F6DA89DF9AD445A...
SIGNATURE 11/3/2026 DATE

SIG. INVENTORY NO. 04-0196

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

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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	Sig. 8.2

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2
Type	FYA 4 - Section	FYA 4 - Section
Included Phases	6	6
Modifier Phases	-	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channel>Channel Config/Channel Options

Web Interface
Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

NOTICE OL1 ASSIGNED TO CHANNEL 1 →
NOTICE OL2 ASSIGNED TO CHANNEL 3 →

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Overlap	1		X	X	1
2	Phase Vehicle	2		X		2
3	Overlap	2		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0196
DESIGNED: May 2026
SEALED: 11/3/2026
REVISED:

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1003 (Third Street)
at
Bridge Street

Division 4 | Johnston County | Smithfield

PLAN DATE: May 2026 | REVIEWED BY: N.K. Vlanich
PREPARED BY: E.E. Tiller | REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE

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

HNTB
HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031464 ENGINEER NATASHA R. SIMMONS
DocuSigned by: Natasha R Simmons
F6DA89DE3AD445A...
SIGNATURE
11/3/2026
DATE
SIG. INVENTORY NO. 04-0196

Docusign Envelope ID: 60E70260-46F6-86C2-81D4-8551BAE0FC9D

09/08/99

TIP PROJECT: HS–2404V

CONTRACT: DD00548

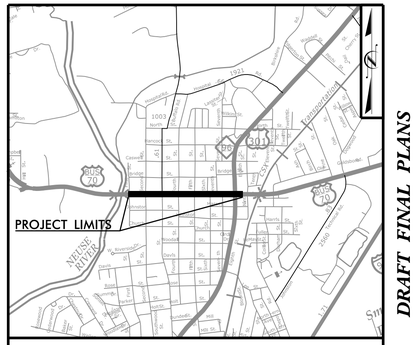
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
HS–2404V	UC–01

UTILITY CONSTRUCTION PLANS
JOHNSTON COUNTY

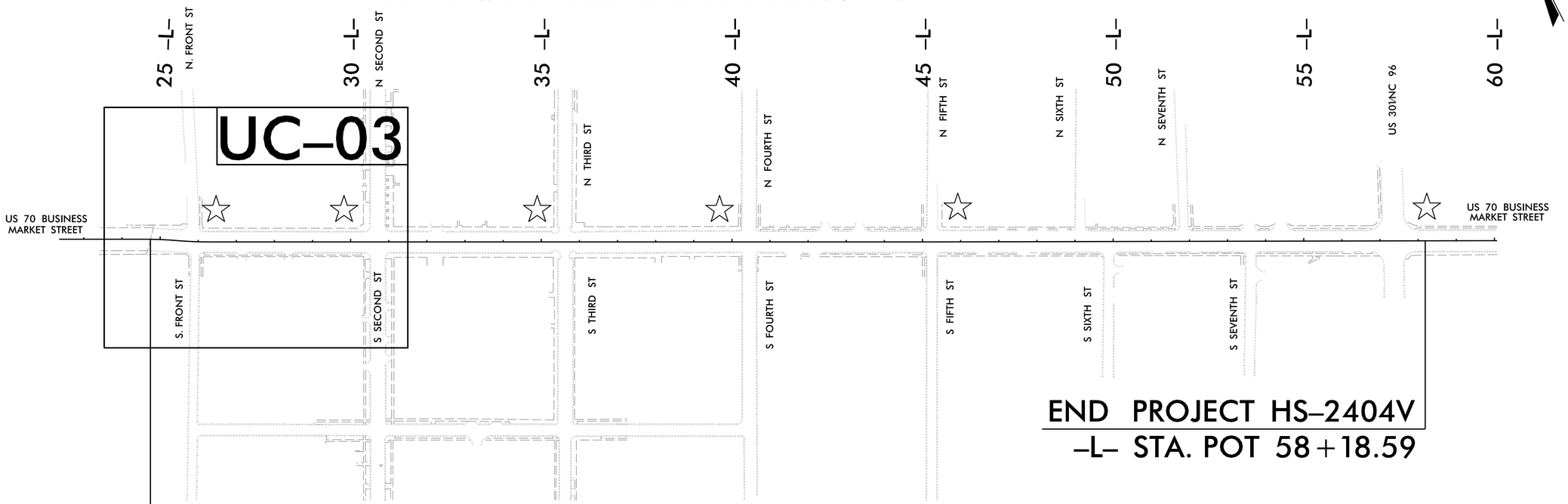
LOCATION: *US 70 BUSINESS (MARKET STREET), FRONT STREET TO US 301 (BRIGHTLEAF BOULEVARD). INSTALL RAISED CONCRETE MEDIAN, CROSSWALKS, ADA CURB RAMPS, PEDESTRIAN SIGNAL HEADS, REVISE STREET PARKING, AND WIDEN LANES.*

TYPE OF WORK: *FIRE HYDRANT RELOCATION*



VICINITY MAP (NTS)

DRAFT FINAL PLANS



DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES

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PLANS

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UC–01	*TITLE SHEET*
UC–02	*UTILITY SYMBOLOGY SHEET*
UC–03	*UTILITY CONSTRUCTION SHEETS*

WATER AND SEWER OWNERS ON PROJECT

(A) WATER LINE – TOWN OF SMITHFIELD

PREPARED IN THE OFFICE OF
Weston & Sampson
WSE of North Carolina, PC
598 East Chatham Street Suite 137
Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221
NC License: C-4947
FOR
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

KEVIN HUTCHENS P.E.	*PROJECT ENGINEER*
K. DOMINGUEZ	*PROJECT DESIGN ENGINEER*
JIM FORBES	*PROJECT UTILITY COORDINATOR*

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 39283 ENGINEER KEVIN S. HUTCHENS
10/19/2026

DIVISION OF HIGHWAYS
DIVISION 4
509 WARD BLVD.
WILSON, NC 27895
PHONE (252) 640-6400
FAX (252) 234-6174

MATT CLARKE	*DIVISION ENGINEER*
JAKE GREEN	*DIV. PROJECT ENGINEER*
DAVID BEAMAN	*DIVISION UTILITIES ENGINEER*
JIMMY SHARPE	*DIV. UTILITIES COORDINATOR*

10/19/2026
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PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	UC-02

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 — RFH
- 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 MISCELLANOUS 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
- *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

REV: 2/1/2012

5/14/99

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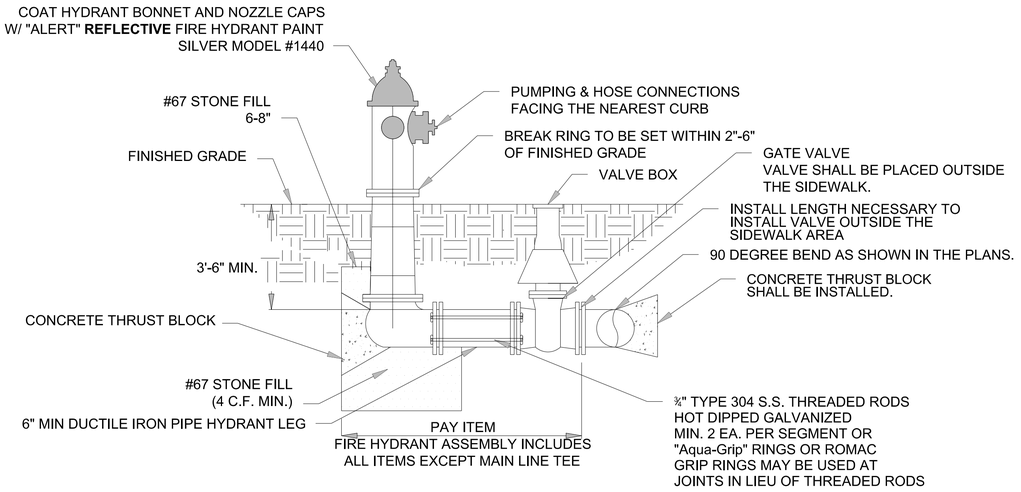


DETAIL NOTES:
1. MIN. OF 4 CU. FT. STONE (MORE IF REQ'D).
2. CONC. THRUST BLOCK TO HAVE MIN. OF 6 SQ. FT. BEARING ON SOLID BANK (MORE IF REQ'D.) AT 3000 PSI.
3. DRAIN HOLES AND FLANGES SHALL BE CLEAR OF CONC.
4. FIRE HYDRANT BARREL SHALL BE PLUMB.
5. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.
6. COMPACTED BACKFILL TO BE TAMPED IN 6" LIFTS.
7. HYDRANT SHALL HAVE 5 $\frac{1}{4}$" STORZ CONNECTION.
8. 6" PIPE SHALL MEET THE AWWA C150-96 REQUIREMENTS.
9. 6" VALVE SHALL BE AWWA C500-86 OPEN LEFT
10. HYDRANT SHALL HAVE 36" MINIMUM CLEARANCE TO ALL OBJECTS.

FIRE HYDRANT ASSEMBLY

NOT TO SCALE

GENERAL NOTES:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

1. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
2. UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND SHALL BE USED FOR REFERENCE ONLY.
3. CONTRACTOR SHALL COORDINATE THE CONNECTION OF THE PROPOSED FIRE HYDRANT WITH THE UTILITY OWNER AND ENGINEER TO MINIMIZE SERVICE INTERRUPTION.
4. CONTRACTOR SHALL AVOID INSTALLING VALVES WITHIN THE SIDEWALK.
5. EXISTING FIRE HYDRANT SHALL BE REMOVED AND RETURNED TO THE UTILITY OWNER. INSTALL A 90-DEGREE BEND ON THE EXISTING FLANGE AND INSTALL A NEW FIRE HYDRANT IN ACCORDANCE WITH THE DETAIL SHOWN ON THIS SHEET. INSTALL ALL FITINGS AS NECESSARY TO AVOID ANY CONFLICT WITH EXISTING UTILITIES.
6. ALL WATER LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ), DIVISION OF WATER RESOURCES. A MINIMUM VERTICAL SEPARATION OF 18 INCHES SHALL BE MAINTAINED AT ALL SEWER CROSSINGS. REFER TO 15A NCAC 02T.0305, DESIGN CRITERIA, FOR APPLICABLE SEPARATION REQUIREMENTS.
7. FIRE HYDRANT ASSEMBLY INSTALLATION SHALL INCLUDE ALL NECESSARY EQUIPMENT, LABOR, MATERIALS, TOOLS, TESTING, AND INCIDENTALS REQUIRED TO COMPLETE THE WORK.
8. CONTRACTOR SHALL NOT OPERATE ANY VALVES ON EXISTING UTILITY SYSTEMS WITHOUT THE PRESENCE OF UTILITY OWNER REPRESENTATIVE.
9. ALL WORK SHALL BE PERFORMED WITHIN NCDOT RIGHT-OF-WAY.

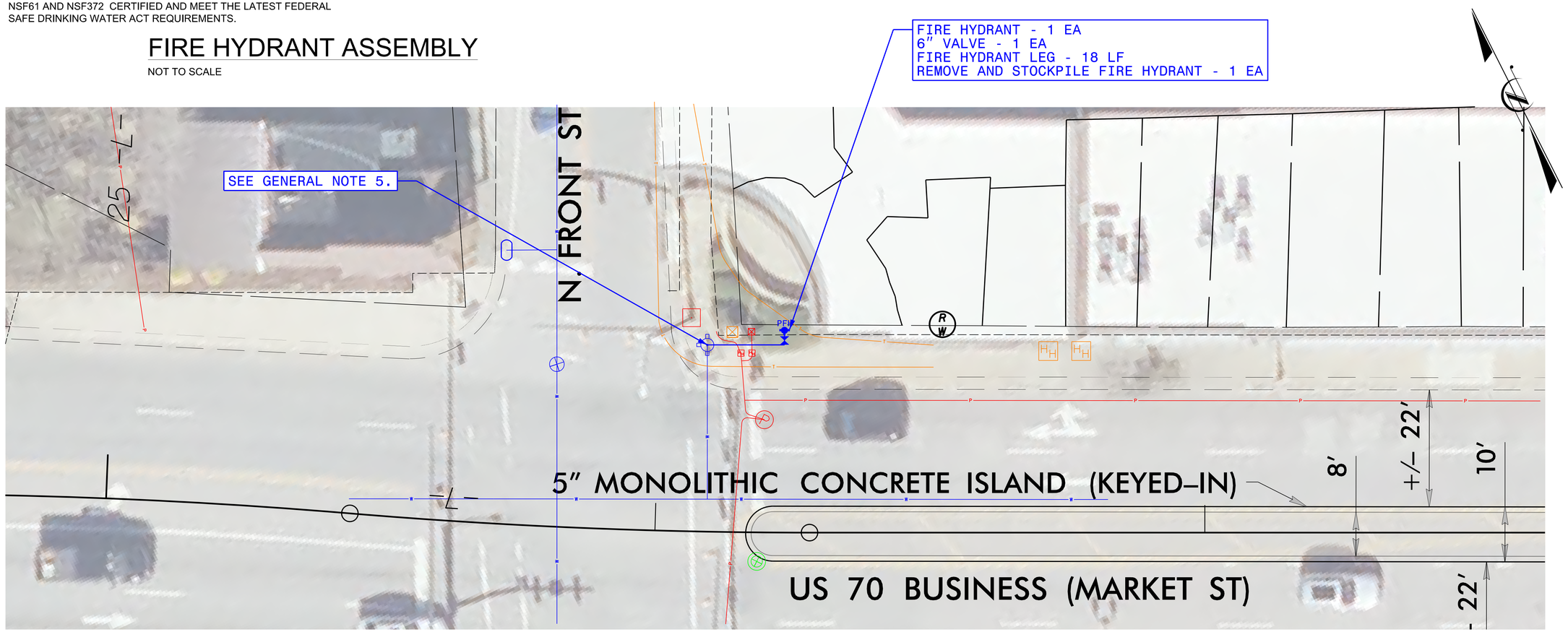
PROJECT REFERENCE NO.	SHEET NO.
HS-2404V	UC-03
DESIGNED BY: KD	
DRAWN BY: KD/DV	
CHECKED BY: JAF	
APPROVED BY: -	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 39283 ENGINEER KEVIN S. HUTCHENS
10/19/2026

UTILITY CONSTRUCTION

WATER UTILITY OWNERS ON THIS SHEET:
TOWN OF SMITHFIELD
CONTACT:
TED CREDLE - PUBLIC UTILITIES DIRECTOR
EMAIL: TED.CREDLE@SMITHFIELD-NC.COM
PHONE: (919) 934-2798

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 170 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



PLAN VIEW

1" = 10'

8/17/99
10/19/2026
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