09/08/09

See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

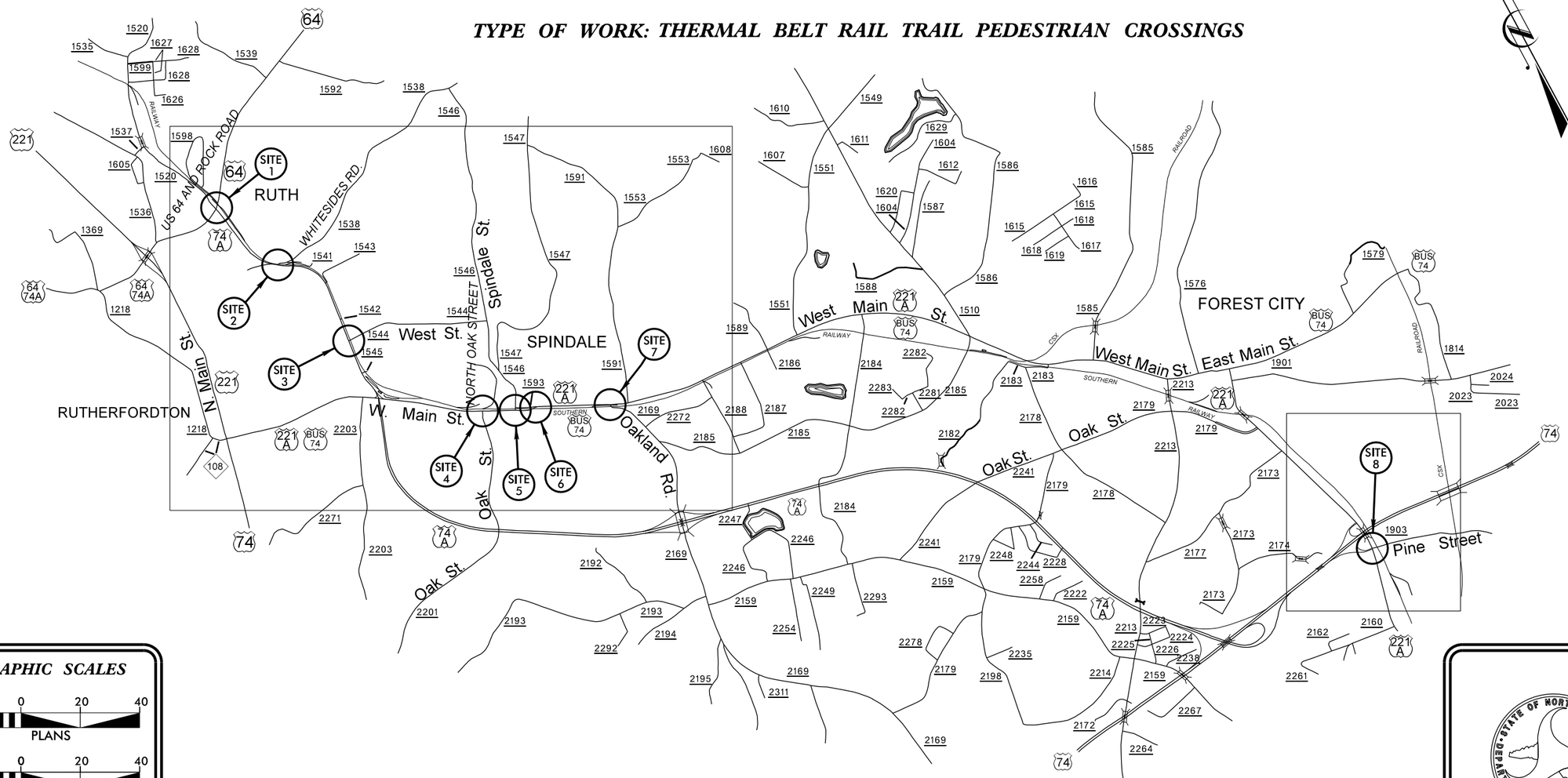
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	EB–5915	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47581.1.1		PE
47581.3.1	0064209	CONST.

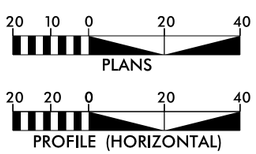
RUTHERFORD COUNTY

LOCATIONS: *SITE 1 – INTERSECTION OF US 64 AND ROCK ROAD AND ALT 74*
SITE 2 – INTERSECTION OF US 221A/74 BUS AND SR 1538 (WHITESIDES ROAD)
SITE 3 – INTERSECTION OF US 221A/74 BUS AND SR 1544 (WEST STREET)
SITE 4 – INTERSECTION OF US 221A/74 BUS AND (NORTH OAK STREET)
SITE 5 – INTERSECTION OF US 221A/74 BUS AND SR 1546 (SPINDALE STREET)
SITE 6 – INTERSECTION OF MARYLAND AND US 221A
SITE 7 – INTERSECTION OF US 221A/74 BUS AND SR 2169 (OAKLAND ROAD)
SITE 8 – INTERSECTION OF US 221A AND SR 1903 (PINE STREET)

TYPE OF WORK: THERMAL BELT RAIL TRAIL PEDESTRIAN CROSSINGS



GRAPHIC SCALES



CONTRACT: DM00298

TIP PROJECT: EB–5915

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	1A

ROADWAY DESIGN ENGINEER

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2A THRU 2C-4	ROADWAY DETAILS
4 THRU 11	PLAN SHEETS
PED-1 THRU PED-9	PEDESTRIAN TRAFFIC CONTORL SHEETS
EC-1 THRU EC-4	EROSION CONTROL PLANS
SIG-1 THRU SIG-7.2	SIGNAL PLANS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

DRIVEWAYS:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 8 - INCIDENTALS	
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.05	Curb Ramp - Proposed Curb & Gutter
852.01	Concrete Islands
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

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

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easement Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New 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:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — 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 Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*)
- U/G Water Line LOS C (S.U.E*)
- U/G Water Line LOS D (S.U.E*)
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

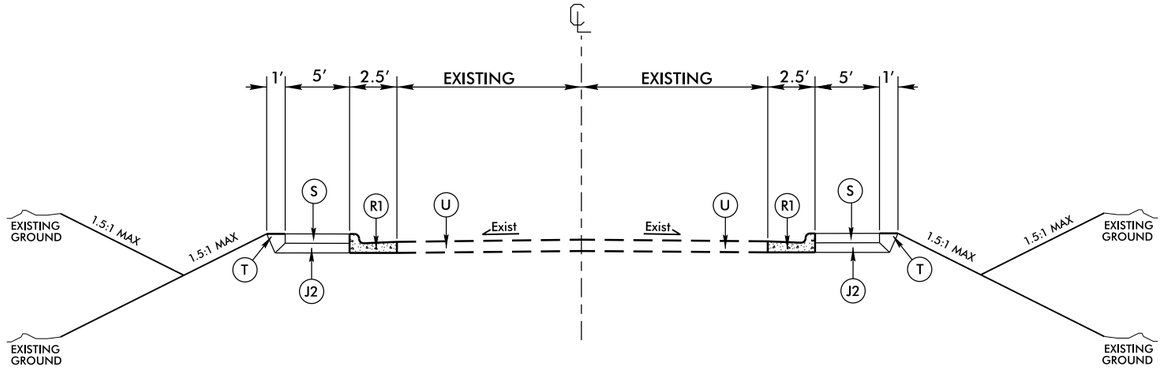
MISCELLANEOUS:

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

8/17/99

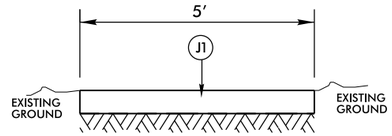
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT ENGINEER



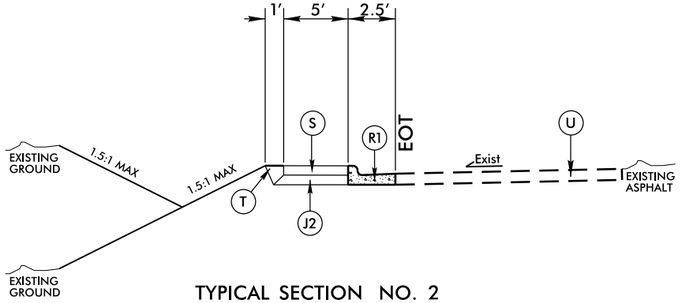
TYPICAL SECTION NO. 1

SITE #8 PINE STREET



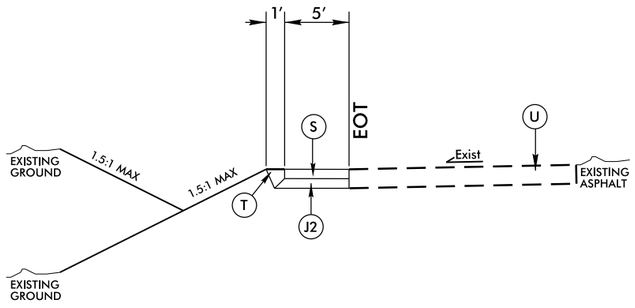
TYPICAL SECTION NO. 4

SITE #4 NORTH OAK STREETS
SITE #5 SPINDALE ST



TYPICAL SECTION NO. 2

SITE #4 NORTH OAK STREET



TYPICAL SECTION NO. 3

SITE #5 SPINDALE STREET

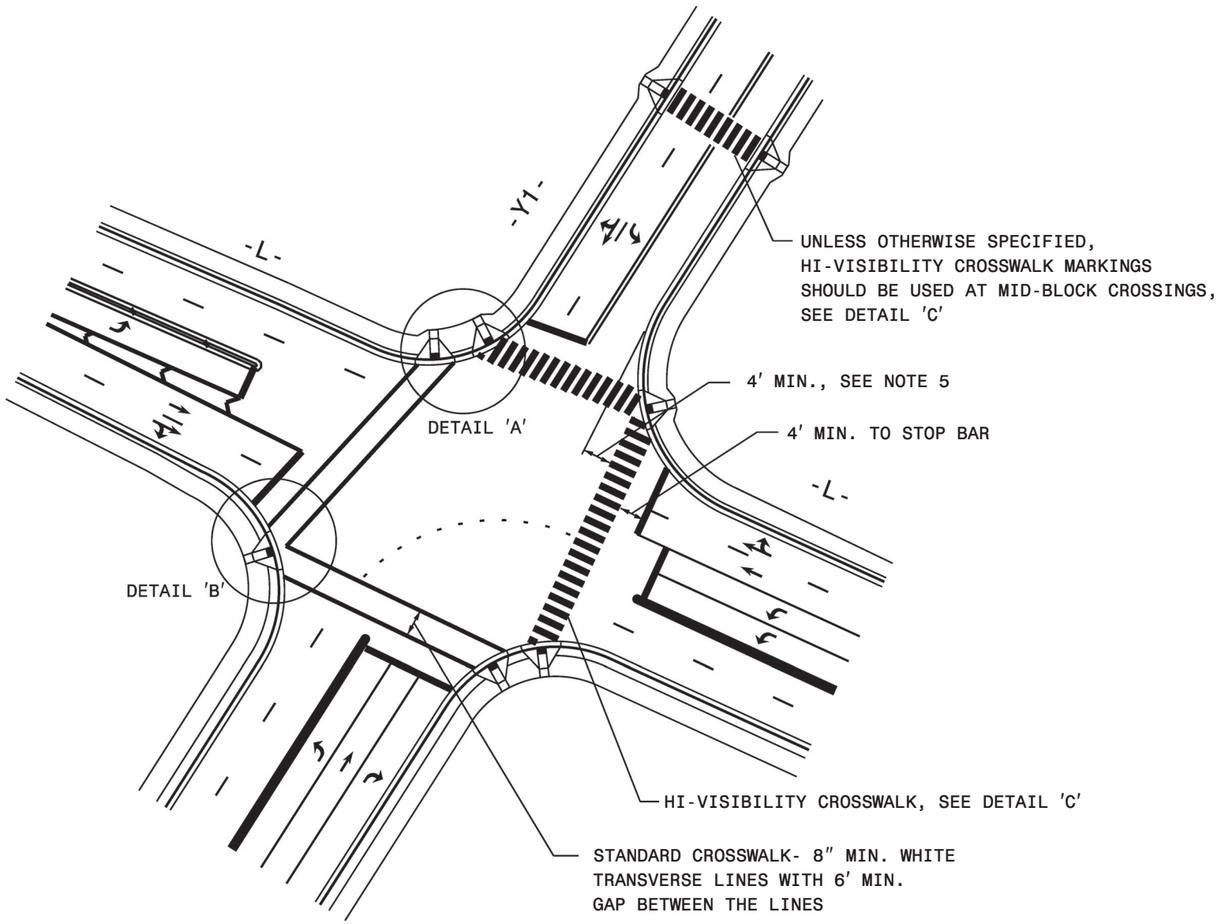
J1	4″ AGGREGATE BASE COURSE
J2	INCIDENTAL STONE BASE
R1	2′6″ CURB AND GUTTER
S	4″ SIDEWALK
T	SHOULDER RECONSTRUCTION
U	EXSISTING ASPHALT

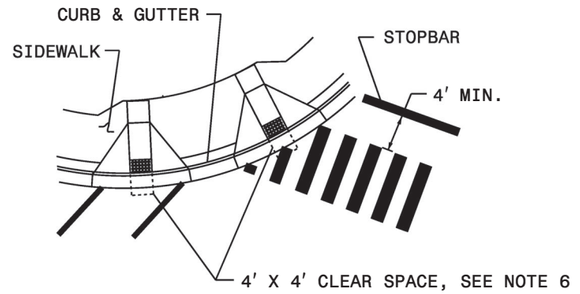
TYPICAL SECTION NOTES

* MILL AND RESURFACE AS NEEDED OR AS DIRECTED BY THE ENGINEER
* THE 5′ SIDEWALK @ SITE #4 WILL NEED TO TRANSITION LEVEL WITH EXISTING ASPHALT THROUGH OUT THE CROSSWALK AND CONNECT TO THE ADA RAMP NEAR US221A AND NORTH OAK STREET INTERSECTION.
* THE 5′ CONC. SIDEWALK @ SITE #5 WILL NEED TO BE INSTALLED LEVEL WITH THE EXISTING ASPHALT FROM THE EXISTING ADA RAMP THROUGH OUT THE CROSSWALK TO MEET THE END OF THE TRAIL NEAR THE 221A AND SPINDALE STREET INTERSECTION.

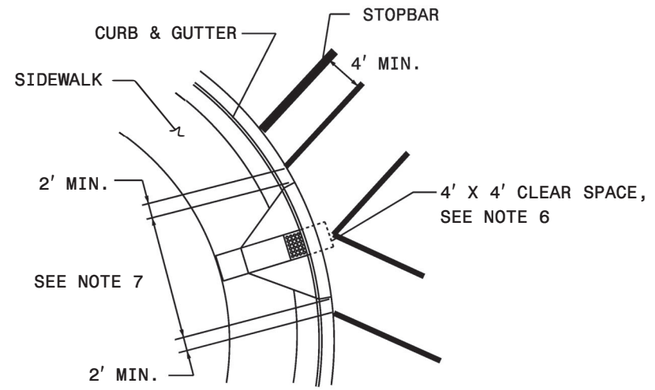
CROSSWALK PLACEMENT GUIDANCE

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	2-A

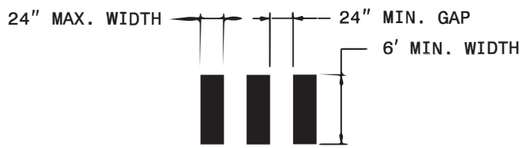




DETAIL 'A'- DUAL CURB RAMPS



DETAIL 'B'- SINGLE DIAGONAL CURB RAMP



DETAIL 'C'- HI-VISIBILITY CROSSWALK

GENERAL NOTES:

1- USE THE DETAILS ABOVE AND THE FOLLOWING NOTES FOR GUIDANCE IN PLACING CROSSWALK MARKINGS. REFER TO NCDOT ROADWAY STANDARD DRAWINGS, MUTCD AND ADA STANDARDS FOR ADDITIONAL GUIDANCE.

2- THE LOCATION AND TYPE OF CROSSWALK MARKINGS SHOWN ON THE ABOVE DETAILS ARE FOR REFERENCE ONLY. LOCATE CROSSWALK MARKINGS AS SHOWN ON THE PROJECT DETAIL SHEETS OR AS DIRECTED BY THE ENGINEER. THE CROSSWALK MARKING TYPE, STANDARD OR HI-VISIBILITY, SHALL BE INSTALLED AS SPECIFIED ON THE PROJECT DETAIL SHEETS OR AS DIRECTED BY THE ENGINEER.

3- THE STANDARD CROSSWALK IS TWO WHITE 8″ MIN. TRANSVERSE LINES WITH A 6′ MIN. GAP BETWEEN THE LINES. THE HI-VISIBILITY CROSSWALK IS WHITE 24″ MAX. WIDE LONGITUDINAL LINES WITH 24″ MIN. GAPS BETWEEN LINES, SEE DETAIL 'C'. HI-VISIBILITY CROSSWALKS SHOULD BE A MINIMUM OF 6′ WIDE. CURB RAMPS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARES.

4- STOP BARS SHOULD BE PLACED A 4′ MIN. IN ADVANCE OF NEAREST CROSSWALK LINE.

5- SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL IS 4′ MIN.

6- BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE OF 4′ X 4′ MIN. SHALL BE PROVIDED WITHIN THE MARKINGS.

7- SINGLE DIAGONAL CURB RAMPS WITH FLARED SIDES SHALL HAVE A SEGMENT OF CURB 2′ MIN. LONG LOCATED ON EACH SIDE OF THE CURB RAMP AND WITHIN THE MARKED CROSSING, SEE DETAIL 'B'.

8- CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE TO THE LATEST NCDOT ROADWAY STANDARD DRAWINGS. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR DETAILS OR A SPECIAL DESIGN.

1-18

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

ROADWAY STANDARD DRAWING FOR

PAVEMENT MARKINGS

PEDESTRIAN CROSSWALKS

SHEET 1 OF 1

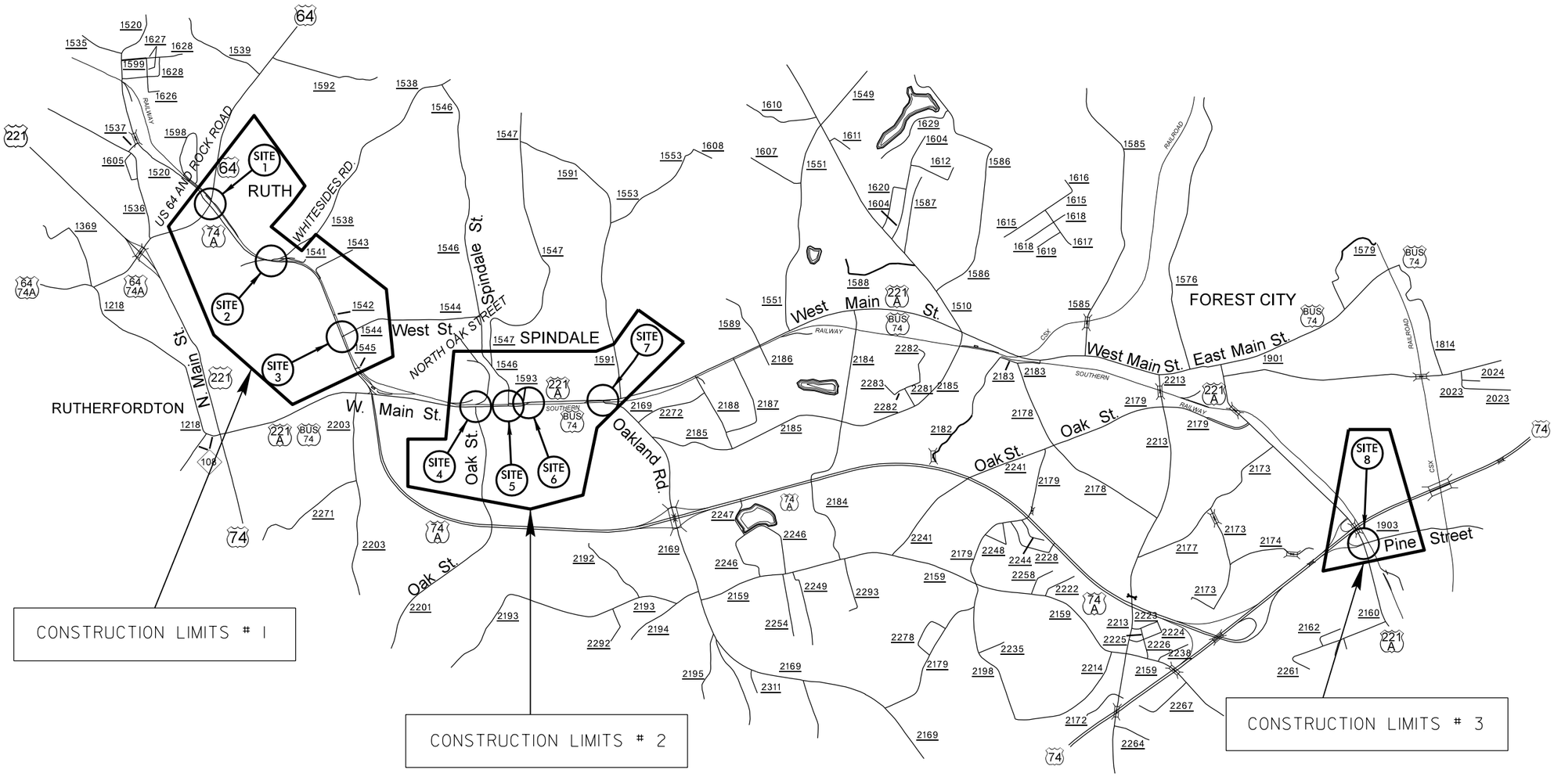
1205.07

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

WORK ZONE ADVANCE/GENERAL WARNING SIGN
PLAN LOCATION SHEET

REVISIONS

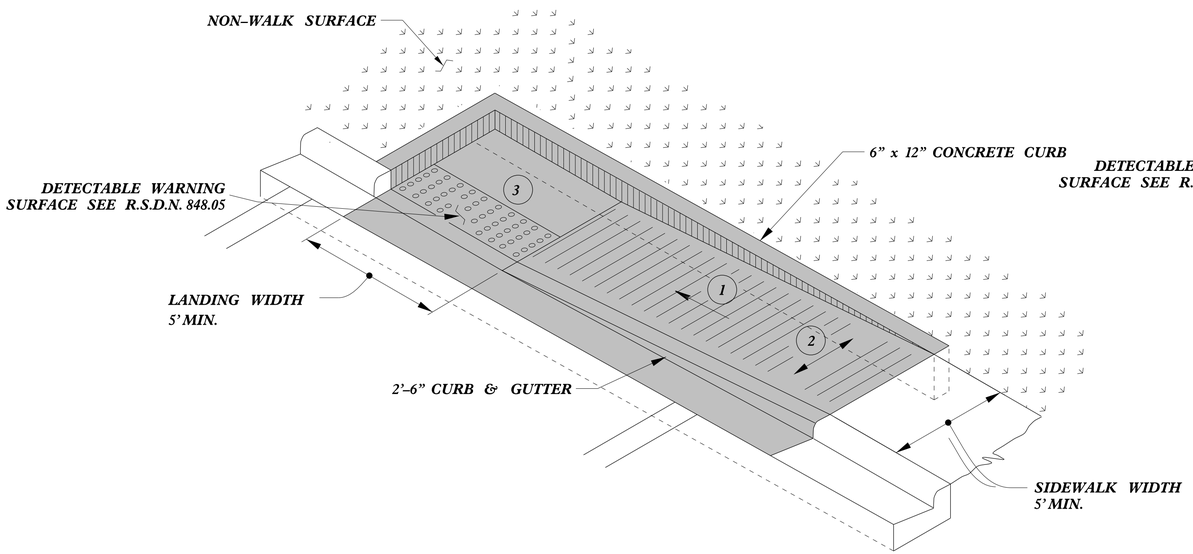
8/17/99



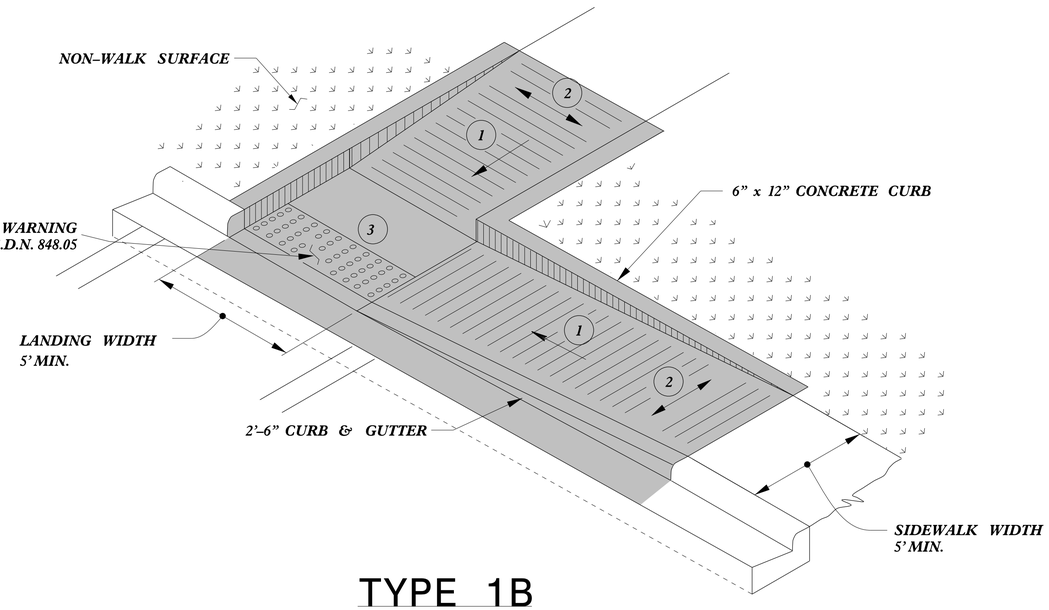
29-SEP-2020 14:06

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	2C-1



TYPE 1A



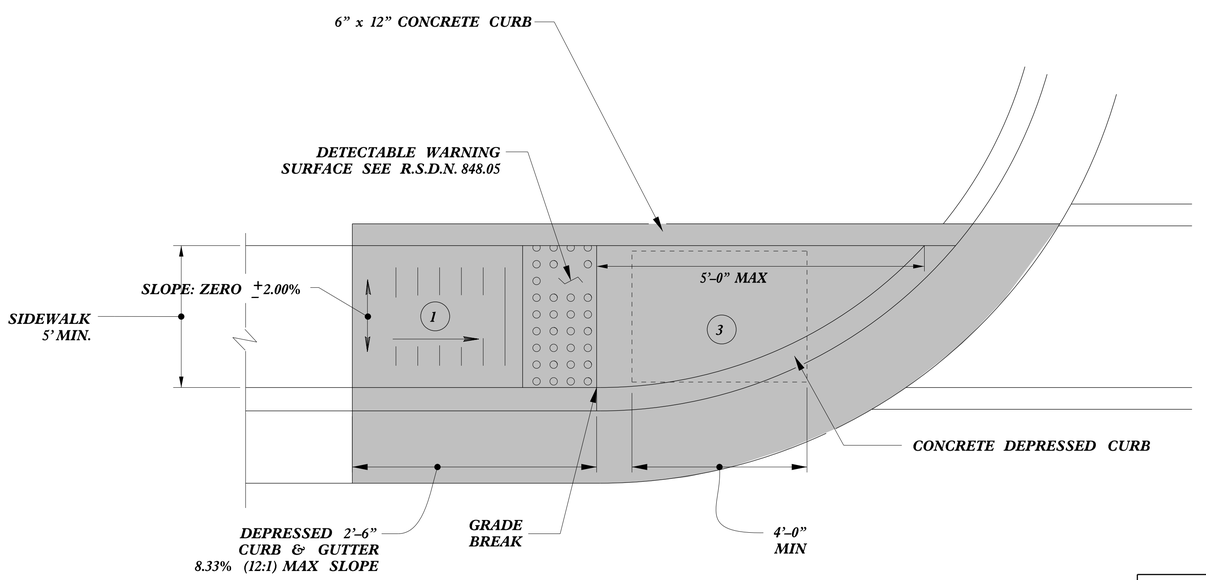
TYPE 1B

PAY LIMITS FOR 1 CURB RAMP

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

(2) *CROSS SLOPE: 2.00%*

(3) *CURB RAMPS REQUIRE A (4'–0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*



TYPE 1

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

CURB RAMPS

Directional Ramps

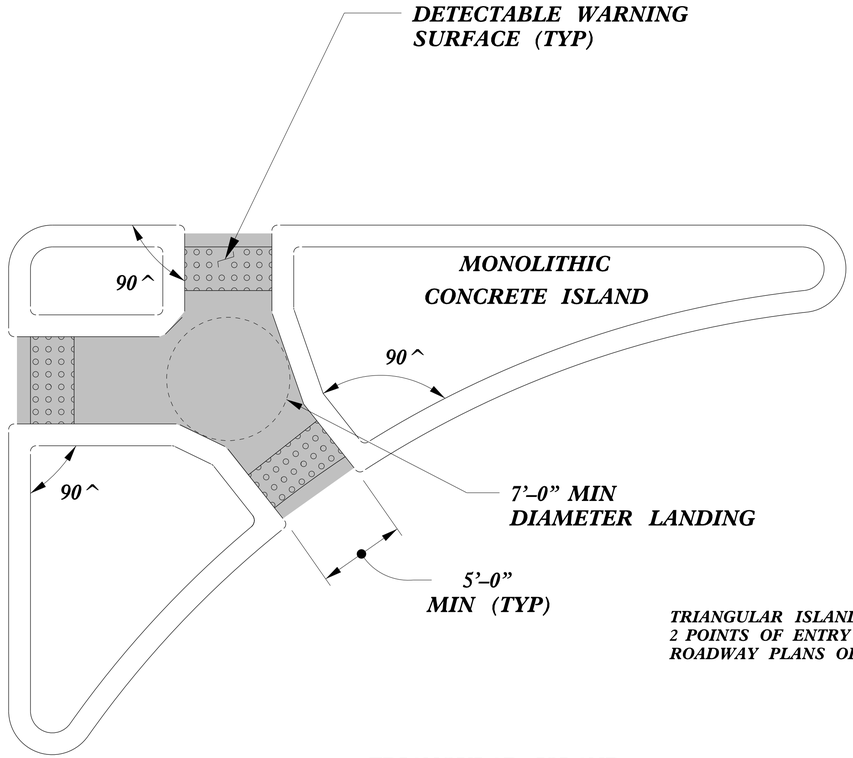
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

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

5/14/99

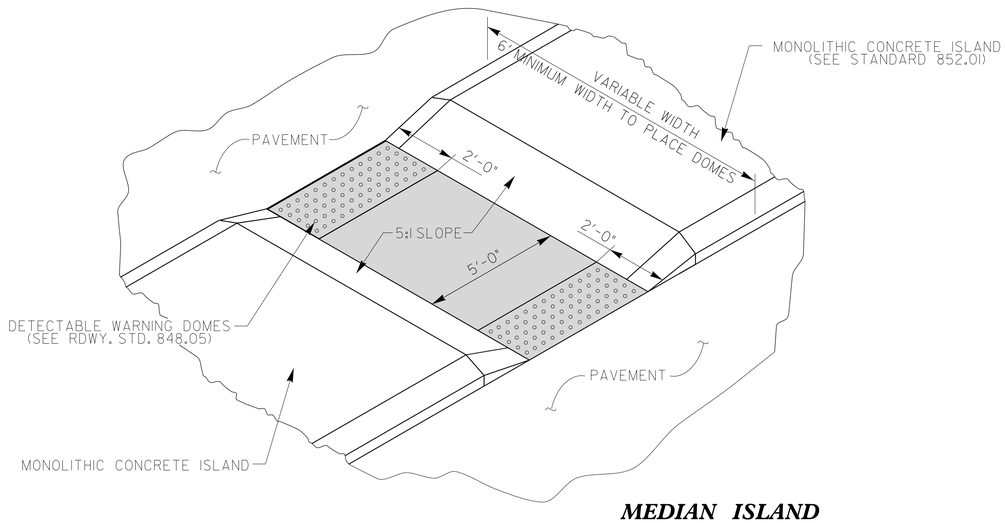
PROJECT REFERENCE NO.	SHEET NO.
EB-5915	2C-2

PAY LIMITS FOR 2 OR 3 CURB RAMPS
(CALCULATE BASED ON NUMBER OF SETS OF TRUNCATED DOMES)

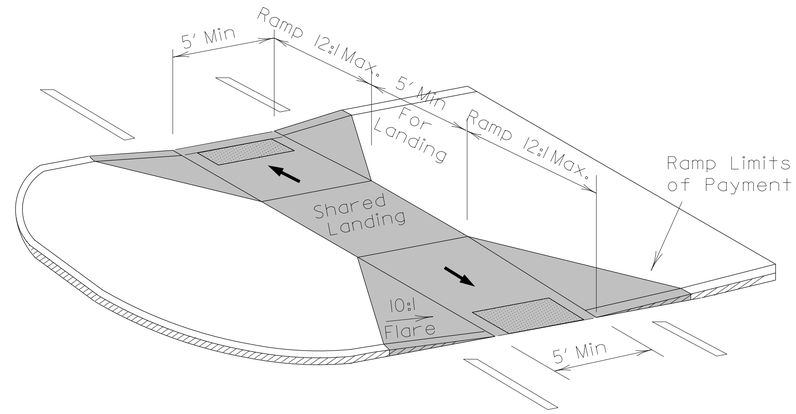


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

TRIANGULAR ISLAND WITH CUT THROUGH



MEDIAN ISLAND WITH CUT THROUGH



MEDIAN ISLAND CURB RAMPS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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

CURB RAMPS

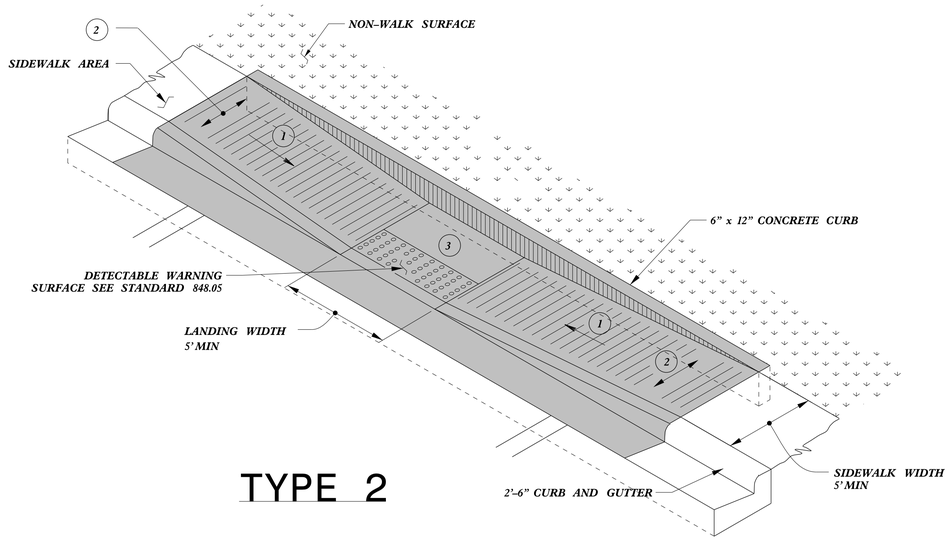
Median or Turn Lane Islands

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC. :stds/2012CurbRamp/CurbRampDetails.dgn

$$$$SYSTIME$$$$
$$$$SIGNS$$$$
$$$$USERNAME$$$$

5/14/99

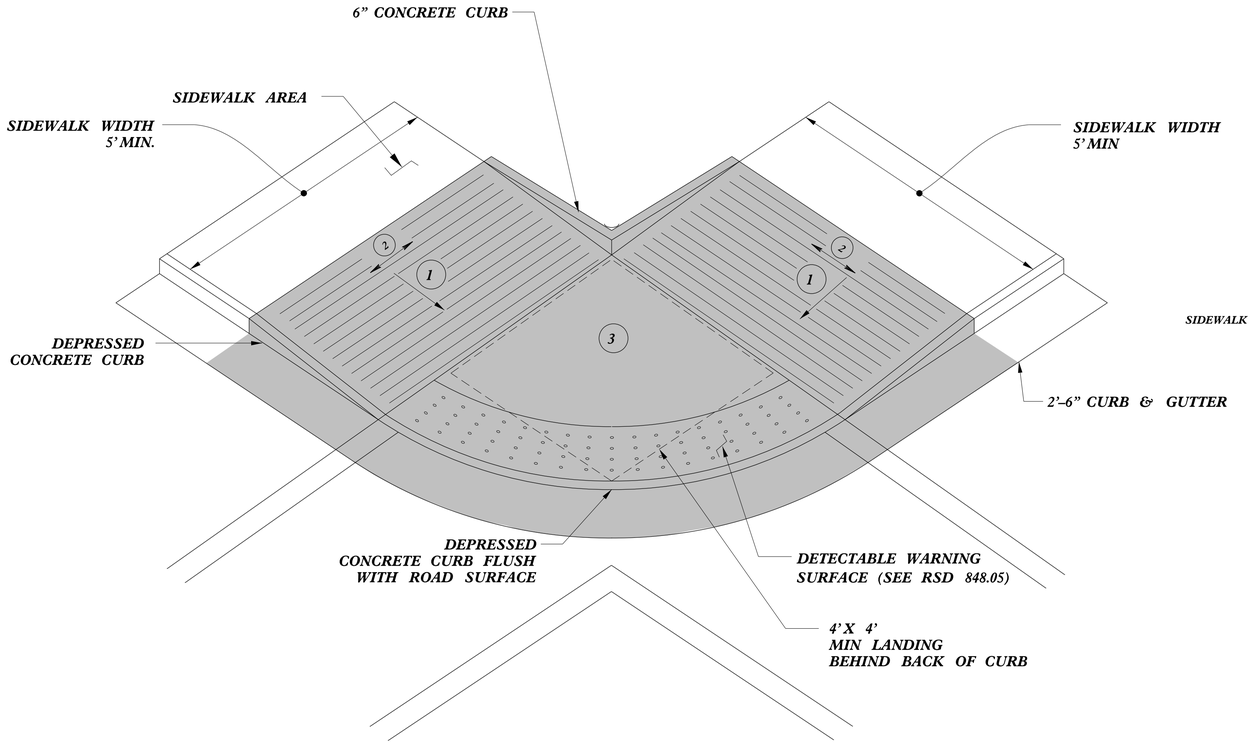
PROJECT REFERENCE NO.	SHEET NO.
EB-5915	2C-3



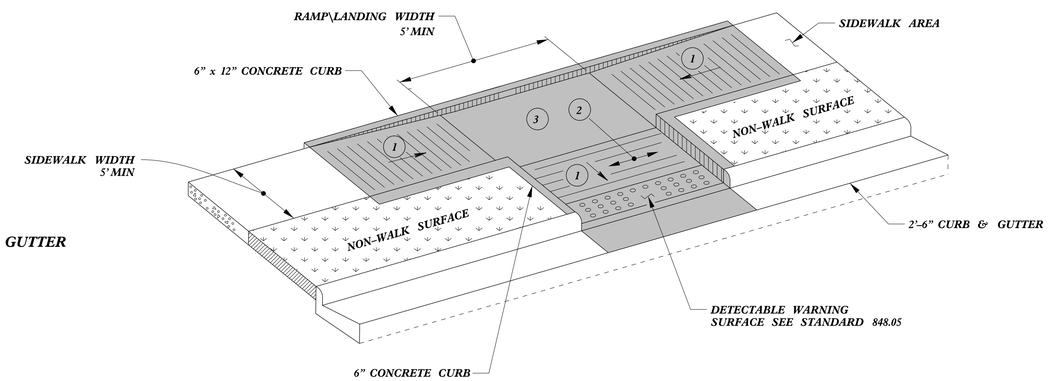
TYPE 2

PAY LIMITS FOR 1 CURB RAMP

1. *8.33% (12:1) MAX RAMP SLOPE*
2. *CROSS SLOPE: 2.00%*
3. *CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*



TYPE 2A



TYPE 3

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

CURB RAMPS

Parallel Ramps

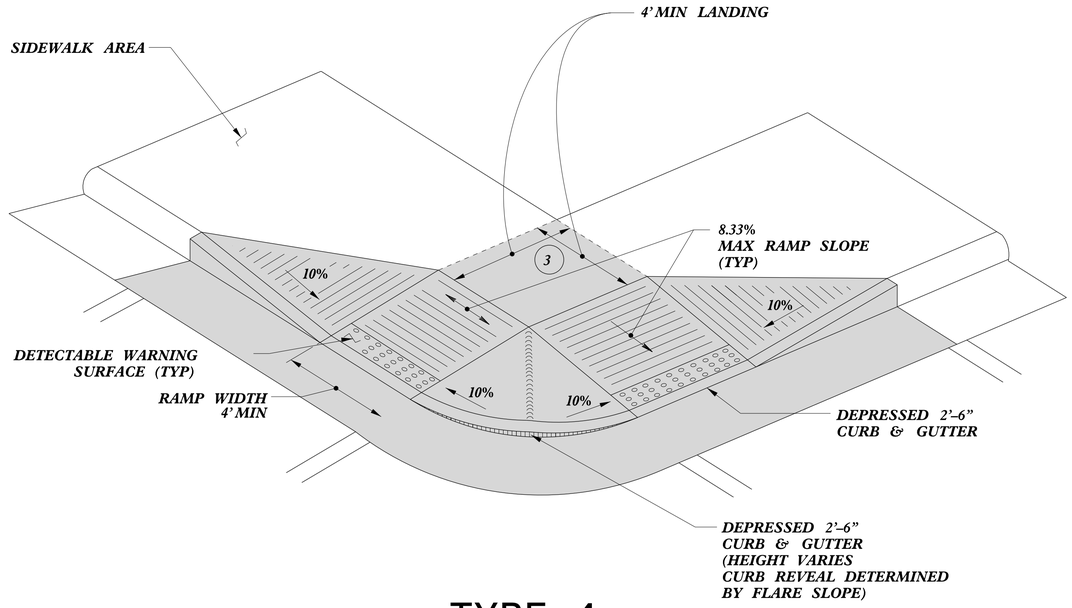
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

$$$$SYTIME$$$$
$$$$SIZE$$$$
$$$$USERNAME$$$$
$$$$USERNAME$$$$

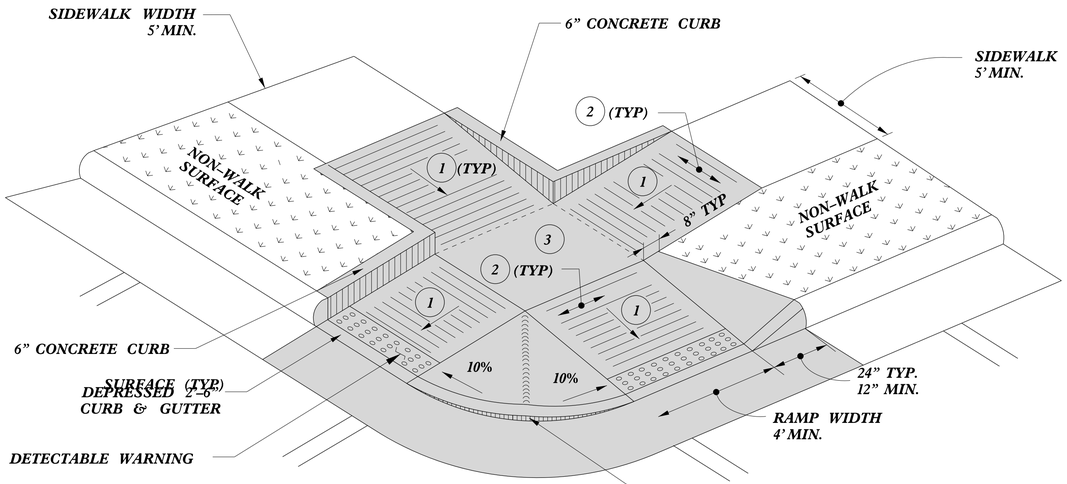
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	2C-4

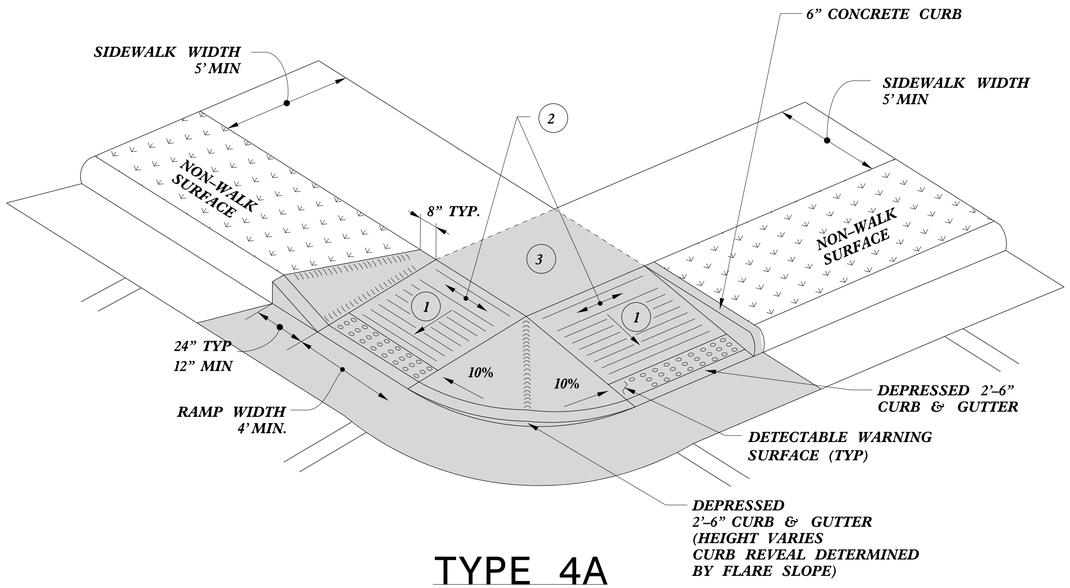
PAY LIMITS FOR 2 CURB RAMPS



TYPE 4



TYPE 5



TYPE 4A

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

(2) *CROSS SLOPE: 2.00%*

(3) *CURB RAMPS REQUIRE A (4'–0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

CURB RAMPS

Shared Landing

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

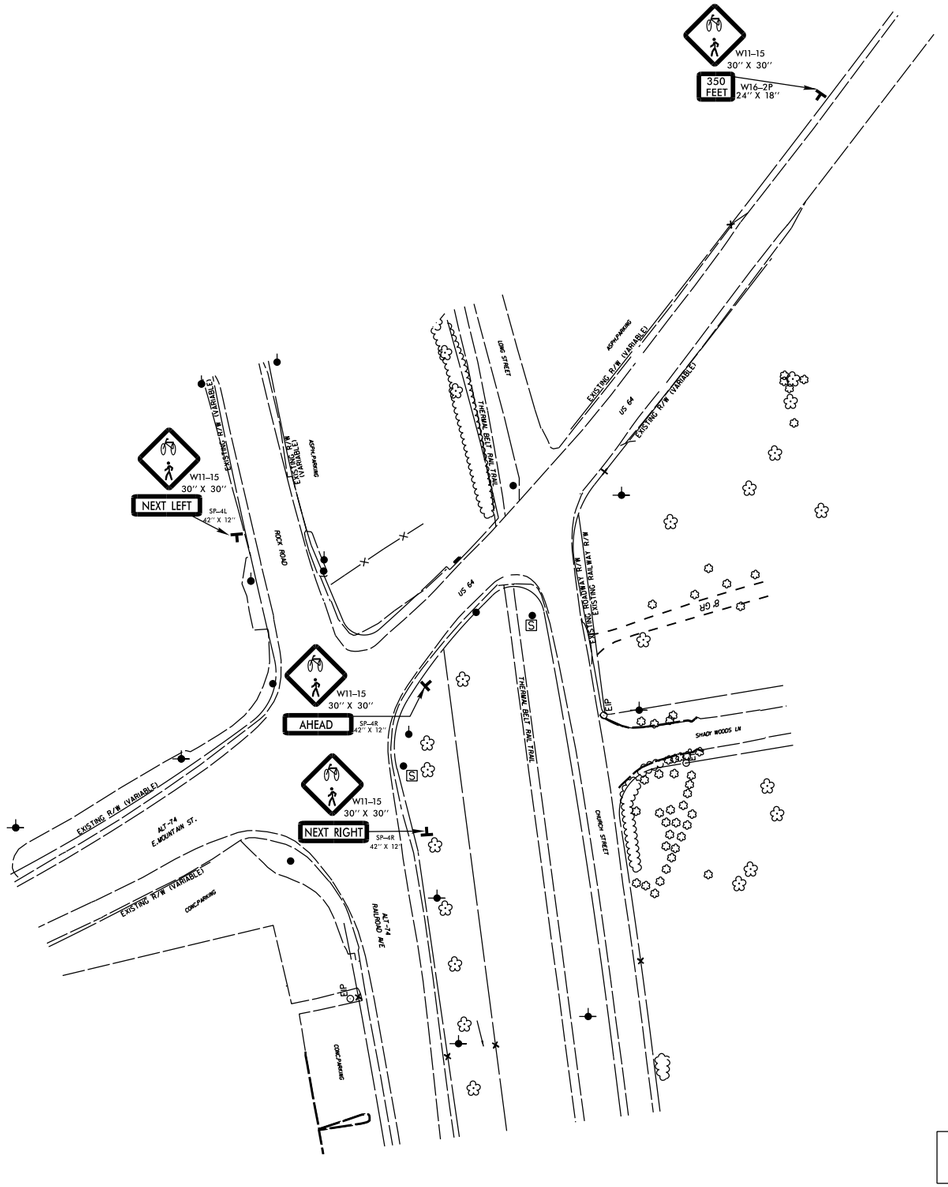
$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$DGNS$$$$

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 1



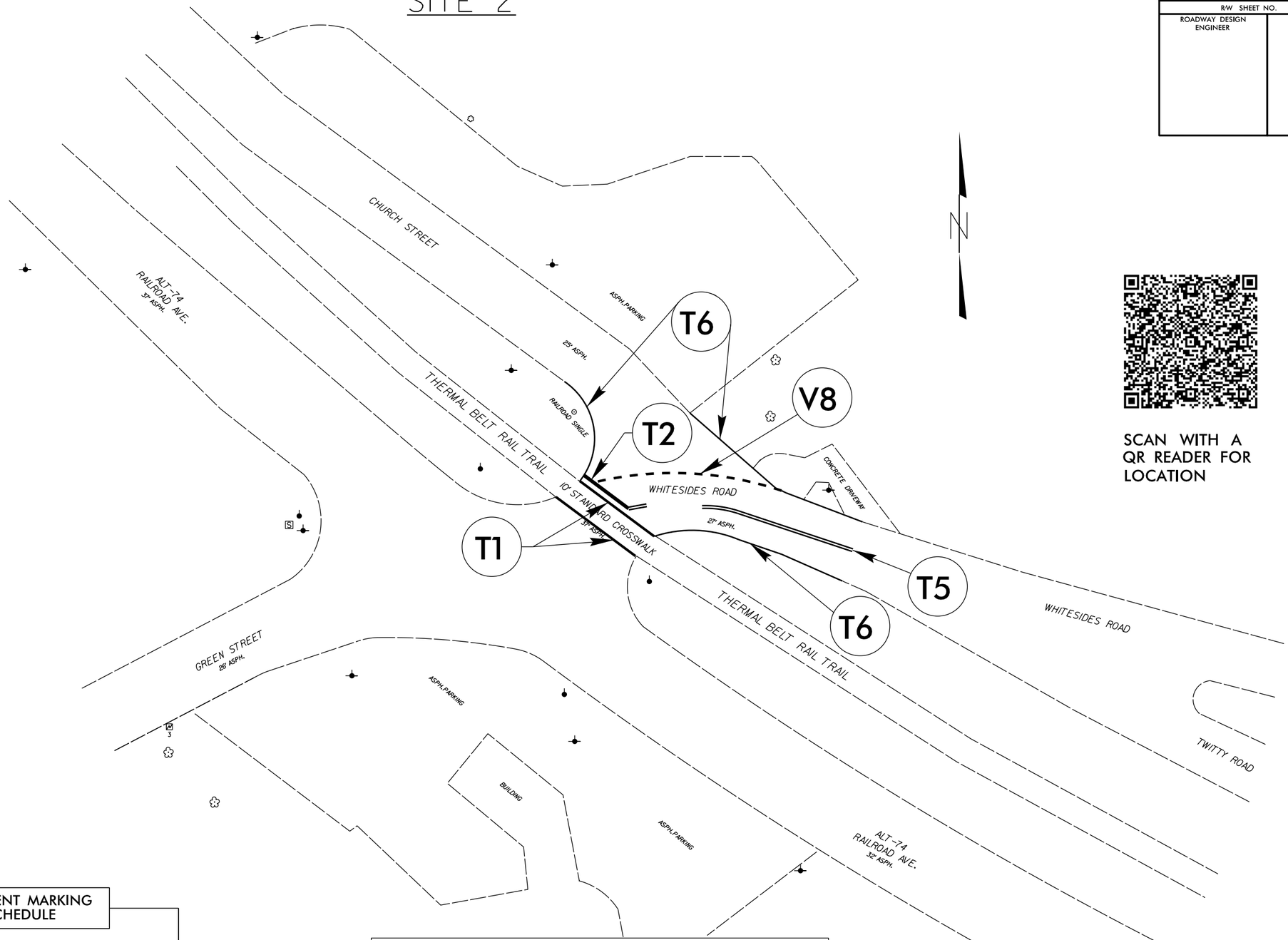
SCAN WITH A QR READER FOR LOCATION

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 2



SCAN WITH A QR READER FOR LOCATION

PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
T3	HI-VISIBILITY CROSSWALK
T4	LT/RT SYMBOL (90 MILS)
T5	DOUBLE YELLOW PAINT MARKINGS (4")
T6	WHITE PAINT MARKINGS (4")
V8	2FT-3'/SP WHITE MINISKIP (4" PAINT)
UA	WHITE PAINTED LT ARROW
UB	WHITE PAINTED RT ARROW
UC	WHITE PAINTED RT/STRAIGHT ARROW

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

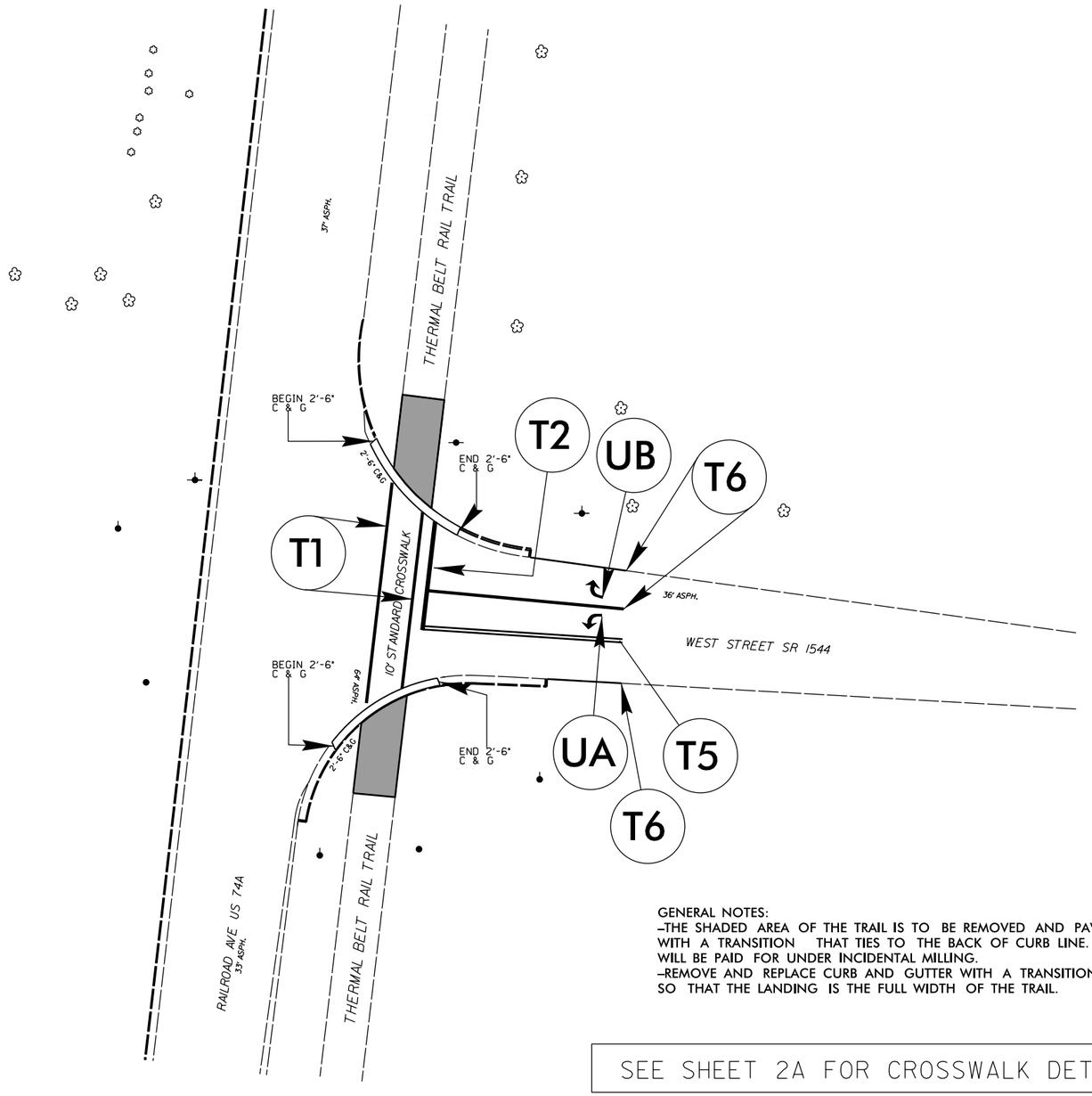
REVISIONS 8/17/99

DJ 8/28/21

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 3



SCAN WITH A QR READER FOR LOCATION

GENERAL NOTES:
–THE SHADED AREA OF THE TRAIL IS TO BE REMOVED AND PAVED WITH A TRANSITION THAT TIES TO THE BACK OF CURB LINE. THIS WILL BE PAID FOR UNDER INCIDENTAL MILLING.
–REMOVE AND REPLACE CURB AND GUTTER WITH A TRANSITION SO THAT THE LANDING IS THE FULL WIDTH OF THE TRAIL.

PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
T3	HI-VISIBILITY CROSSWALK
T4	LT/RT SYMBOL (90 MILS)
T5	DOUBLE YELLOW PAINT MARKINGS (4")
T6	WHITE PAINT MARKINGS (4")
V8	2FT-3'/SP WHITE MINISKIP (4" PAINT)
UA	WHITE PAINTED LT ARROW
UB	WHITE PAINTED RT ARROW
UC	WHITE PAINTED RT/STRAIGHT ARROW

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

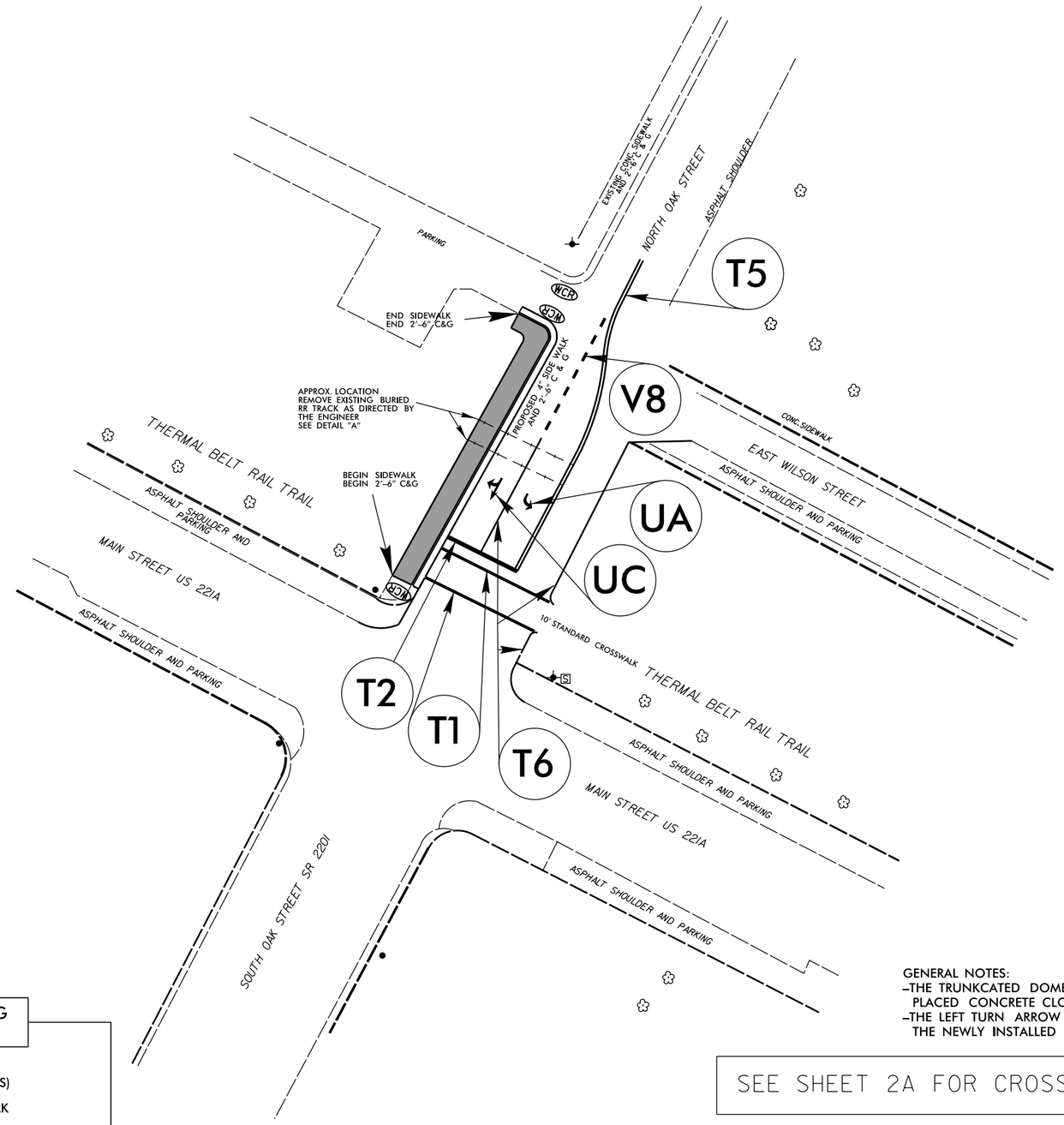
D1 8/3/2021

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

8/17/99

REVISIONS

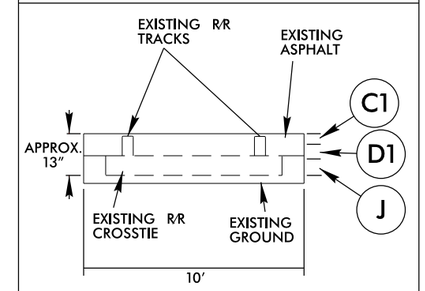
SITE 4



N

SCAN WITH A QR READER FOR LOCATION

DETAIL "A"



C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4" ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
J	INCIDENTAL STONE (6")

PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
T3	HI-VISIBILITY CROSSWALK
T4	LT/RT SYMBOL (90 MILS)
T5	DOUBLE YELLOW PAINT MARKINGS (4")
T6	WHITE PAINT MARKINGS (4")
V8	2FT-3/SP WHITE MINISKIP (4" PAINT)
UA	WHITE PAINTED LT ARROW
UB	WHITE PAINTED RT ARROW
UC	WHITE PAINTED RT/STRAIGHT ARROW

GENERAL NOTES:
-THE TRUNKCATED DOMES WILL NEED TO BE RELOCATED AND PLACED IN THE NEWLY PLACED CONCRETE CLOSE TO THE EDGE OF TRAVEL.
-THE LEFT TURN ARROW WILL NEED TO BE REMOVED DUE TO THE PLACEMENT OF THE NEWLY INSTALLED CROSSWALK AND STOP BAR.

SEE SHEET 2A FOR CROSSWALKS DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

DJ 8/2/21

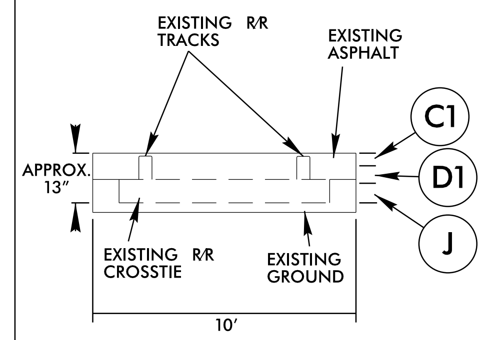
PROJECT REFERENCE NO.	SHEET NO.
EB-5915	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

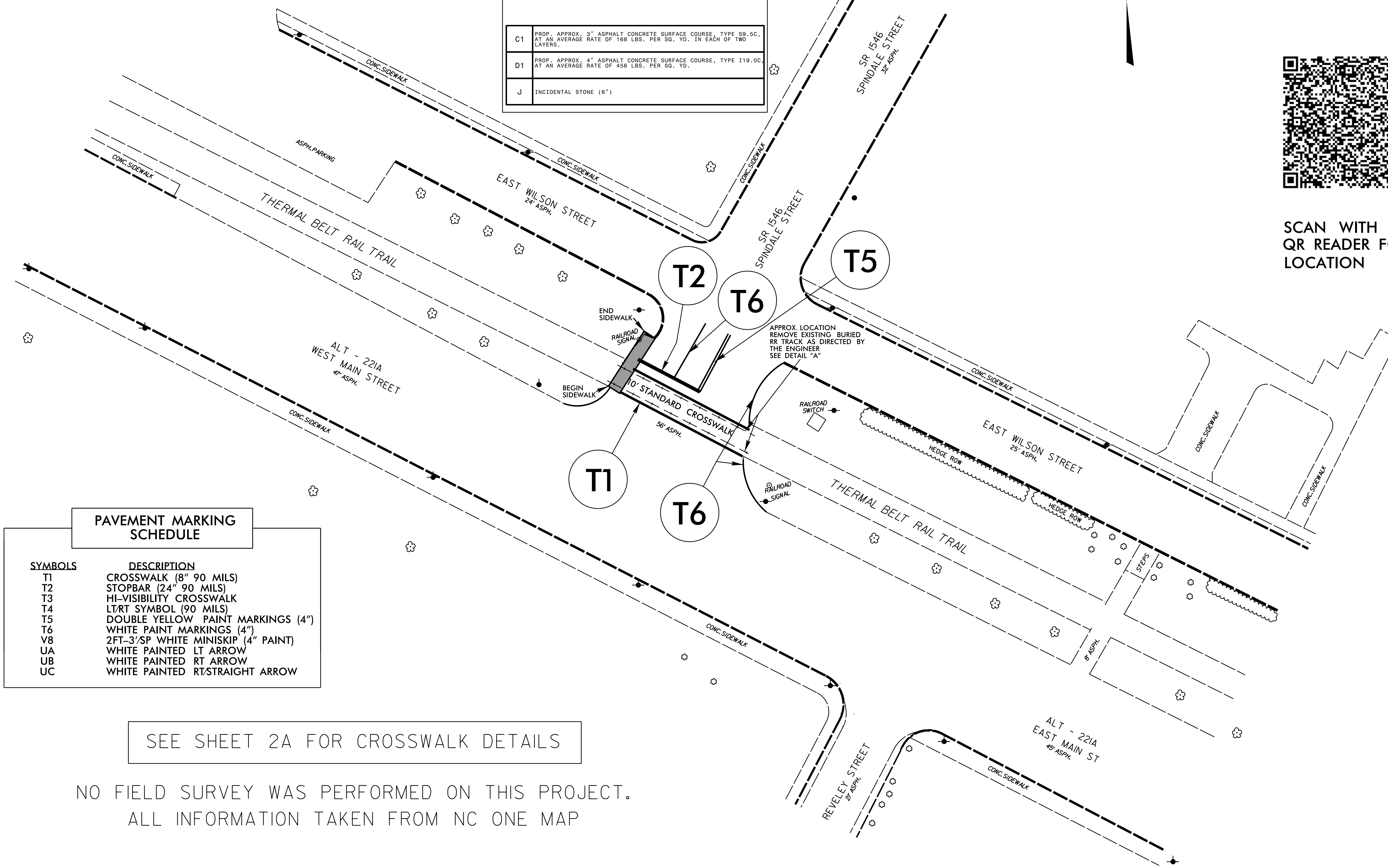
8/17/99

SITE 5

DETAIL "A"



C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4" ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
J	INCIDENTAL STONE (6")



SCAN WITH A QR READER FOR LOCATION

PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
T3	HI-VISIBILITY CROSSWALK
T4	LT/RT SYMBOL (90 MILS)
T5	DOUBLE YELLOW PAINT MARKINGS (4")
T6	WHITE PAINT MARKINGS (4")
V8	2FT-3'/SP WHITE MINISKIP (4" PAINT)
UA	WHITE PAINTED LT ARROW
UB	WHITE PAINTED RT ARROW
UC	WHITE PAINTED RT/STRAIGHT ARROW

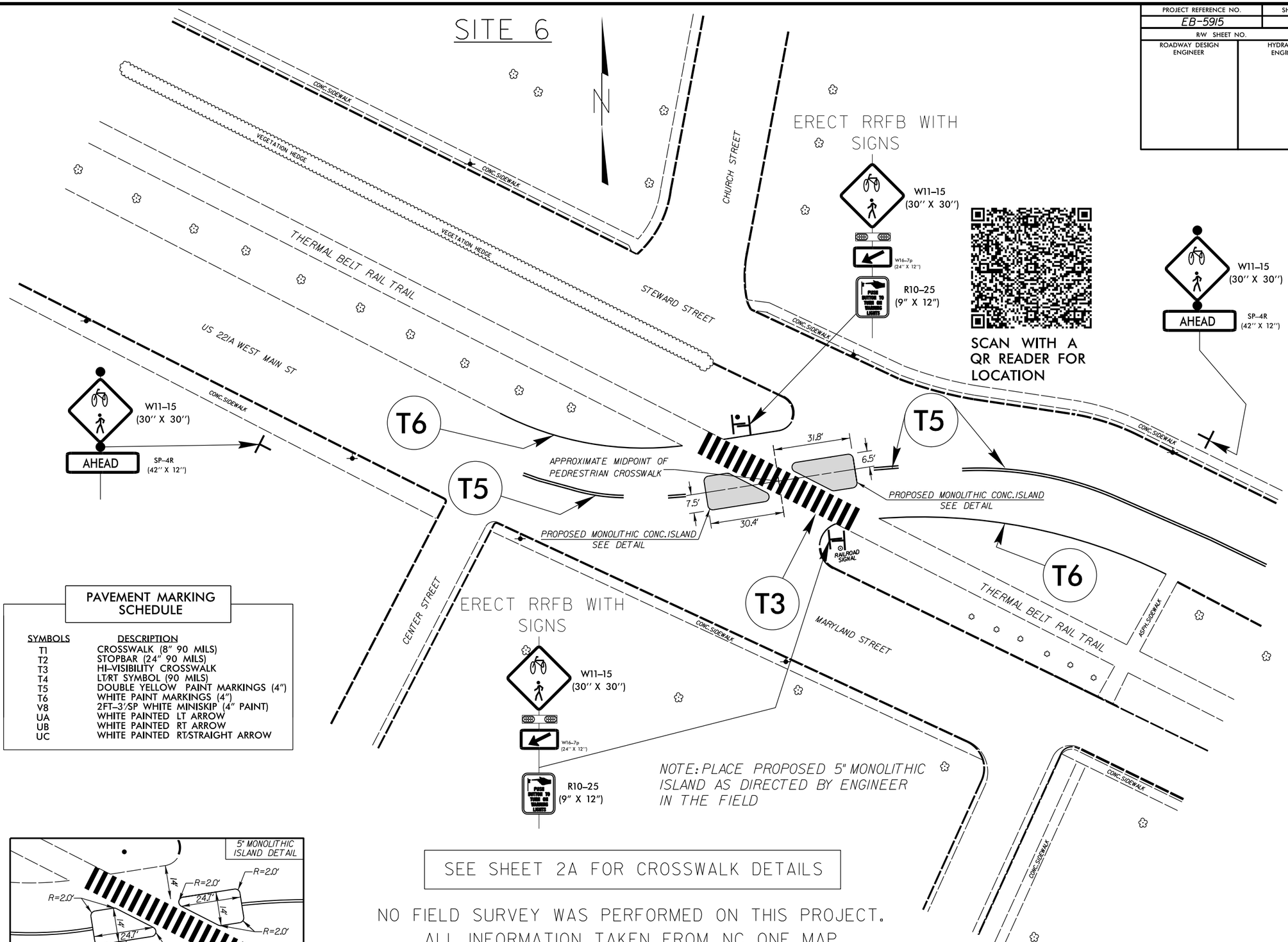
SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS 8/17/99

SITE 6



PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
T3	HI-VISIBILITY CROSSWALK
T4	LT/RT SYMBOL (90 MILS)
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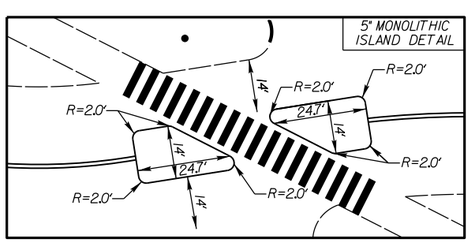
UA	WHITE PAINTED LT ARROW
UB	WHITE PAINTED RT ARROW
UC	WHITE PAINTED RT/STRAIGHT ARROW



SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

D.E. 8/29/25

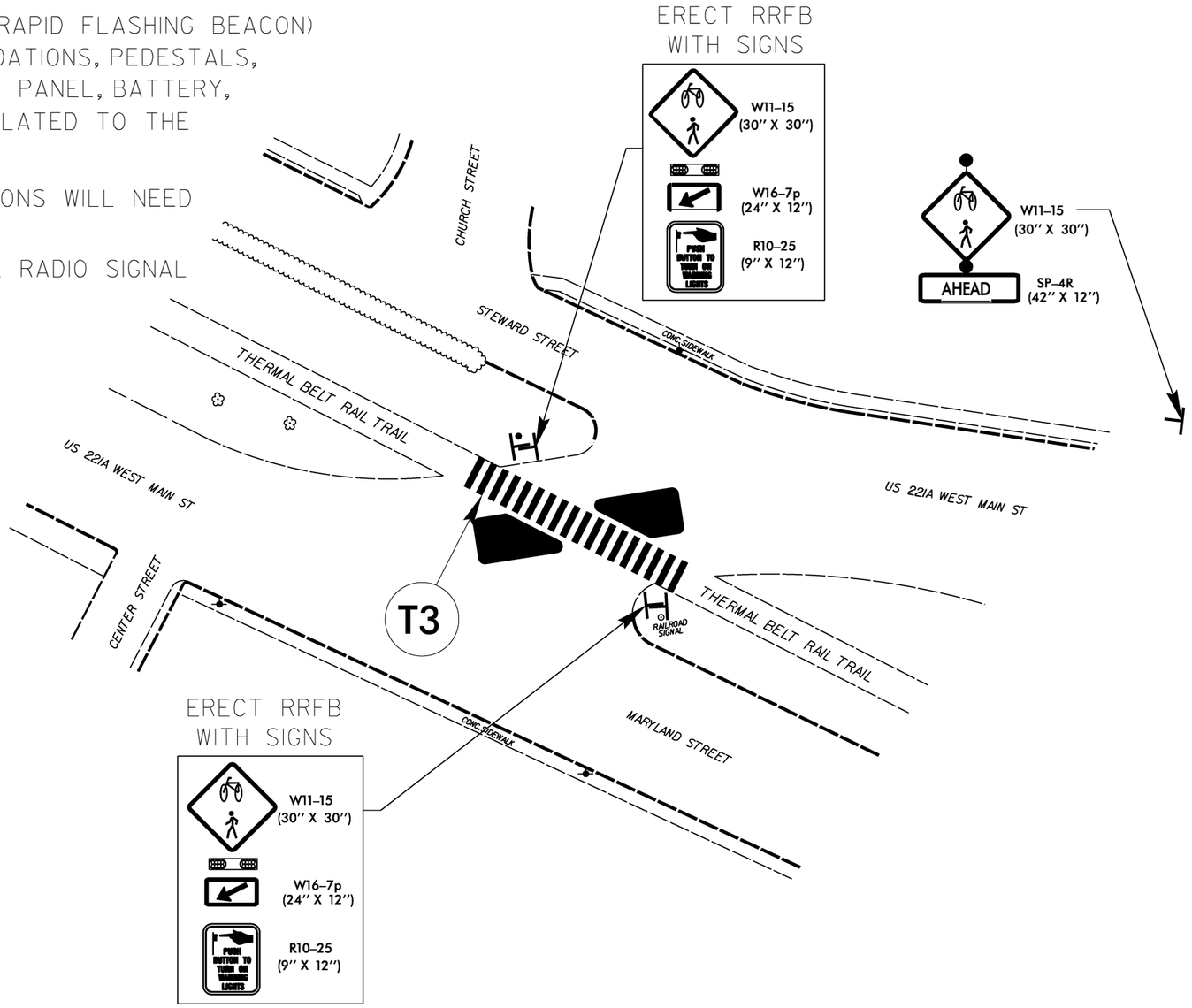
PROJECT REFERENCE NO.	SHEET NO.
EB-5915	9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

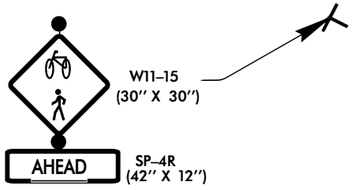
8/17/99

REVISIONS

RECTANGULAR RAPID FLASHING BEACON (RRFB) INSTALLATION NOTES:

1. ALIGN THE FRONT FACE OF THE PEDESTRIAN PUSH BUTTON ASSEMBLY PARALLEL WITH THE CROSSWALK.
2. SIGN FACE AND RRFB BAR WILL BE ALIGNED PERPENDICULAR TO ONCOMING TRAFFIC.
3. THE DISTANCE OF THE PUSH BUTTON FROM THE EDGE OF THE THERMAL BELT RAIL TRAIL SHOULD BE NO GREATER THAN 1'-6".
4. THE NORMAL DUTY (TYPE II) PEDESTAL (1743.02) SHALL BE LOCATED 8' O.C. FROM THE ROADWAY EDGE OF PAVEMENT.
5. THE LUMP SUM ITEM FOR RRFB (RECTANGULAR RAPID FLASHING BEACON) SHALL INCLUDE BUT NOT LIMITED TO THE FOUNDATIONS, PEDESTALS, SIGNS, PUSH BUTTONS, FLASHING BEACONS, SOLAR PANEL, BATTERY, CONTROLER ASSEMBLY AND ALL INCIDENTALS RELATED TO THE INSTALLATION OF THE RRFB.
6. THE RRFB AND ADVANCE WARNING FLASHING BECONS WILL NEED TO BE SYNCHRONIZED WITH EACH OTHER.
7. THE SYSTEM IS OPERATED BY REMOTE CONTROL RADIO SIGNAL AND SOLAR POWER





PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
T3	HI-VISIBILITY CROSSWALK
T4	LT/RT SYMBOL

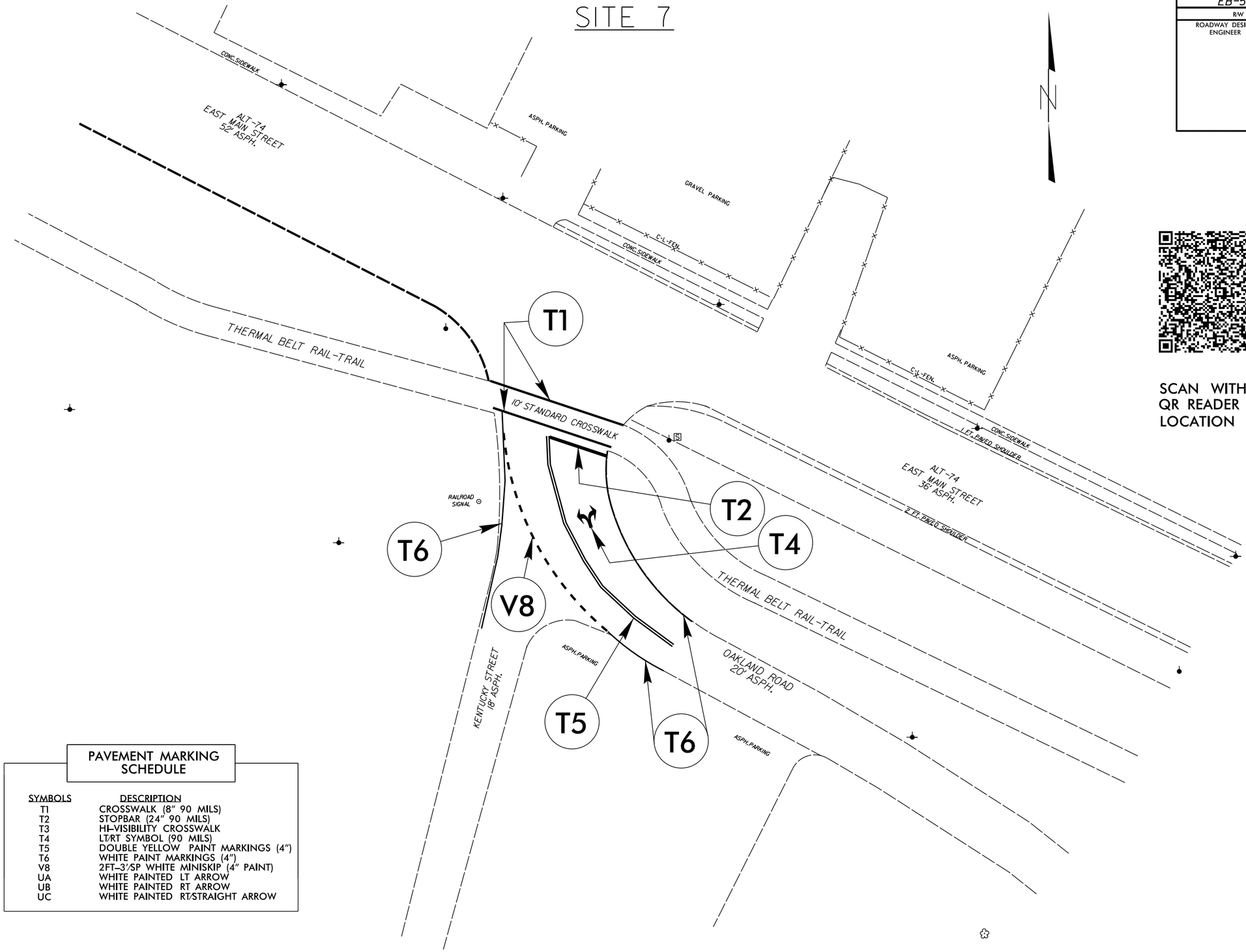
29-SEP-2020 11:33

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

8/17/99

SITE 7



SCAN WITH A QR READER FOR LOCATION

PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
T3	HI-VISIBILITY CROSSWALK
T4	LT/RT SYMBOL (90 MILS)
T5	DOUBLE YELLOW PAINT MARKINGS (4")
T6	WHITE PAINT MARKINGS (4")
V8	2FT-3'/SP WHITE MINISKIP (4" PAINT)
UA	WHITE PAINTED LT ARROW
UB	WHITE PAINTED RT ARROW
UC	WHITE PAINTED RT/STRAIGHT ARROW

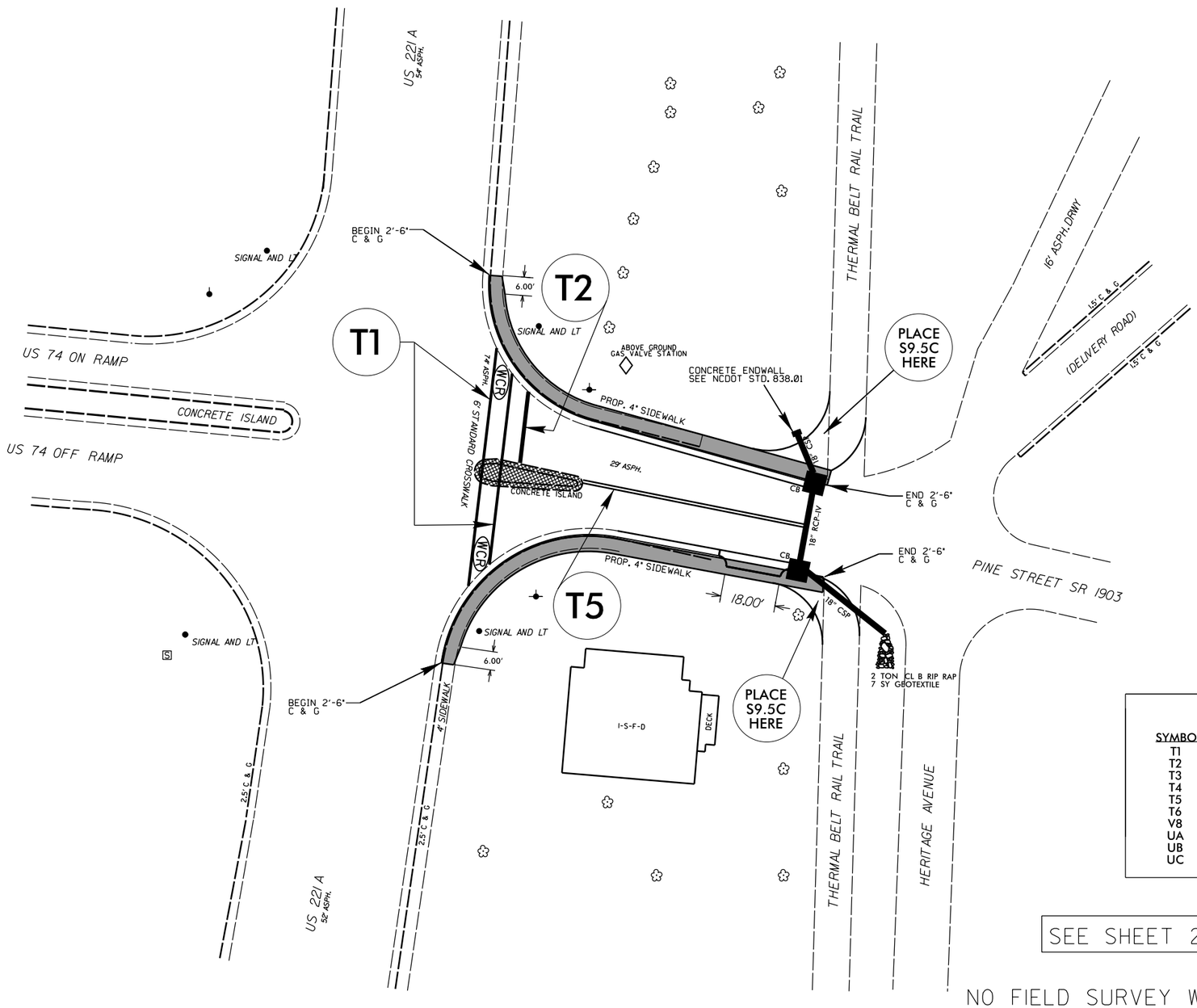
SEE SHEET 2A FOR CROSSWALK FOR DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

8/17/2021

SITE 8

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



SCAN WITH A QR READER FOR LOCATION

PAVEMENT MARKING SCHEDULE

SYMBOLS	DESCRIPTION
T1	CROSSWALK (8" 90 MILS)
T2	STOPBAR (24" 90 MILS)
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UA	WHITE PAINTED LT ARROW
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UC	WHITE PAINTED RT/STRAIGHT ARROW

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

DRAINAGE PIPES & STRUCTURES INVERTS TO BE DETERMINED IN THE FIELD OR AS DIRECTED BY THE ENGINEER

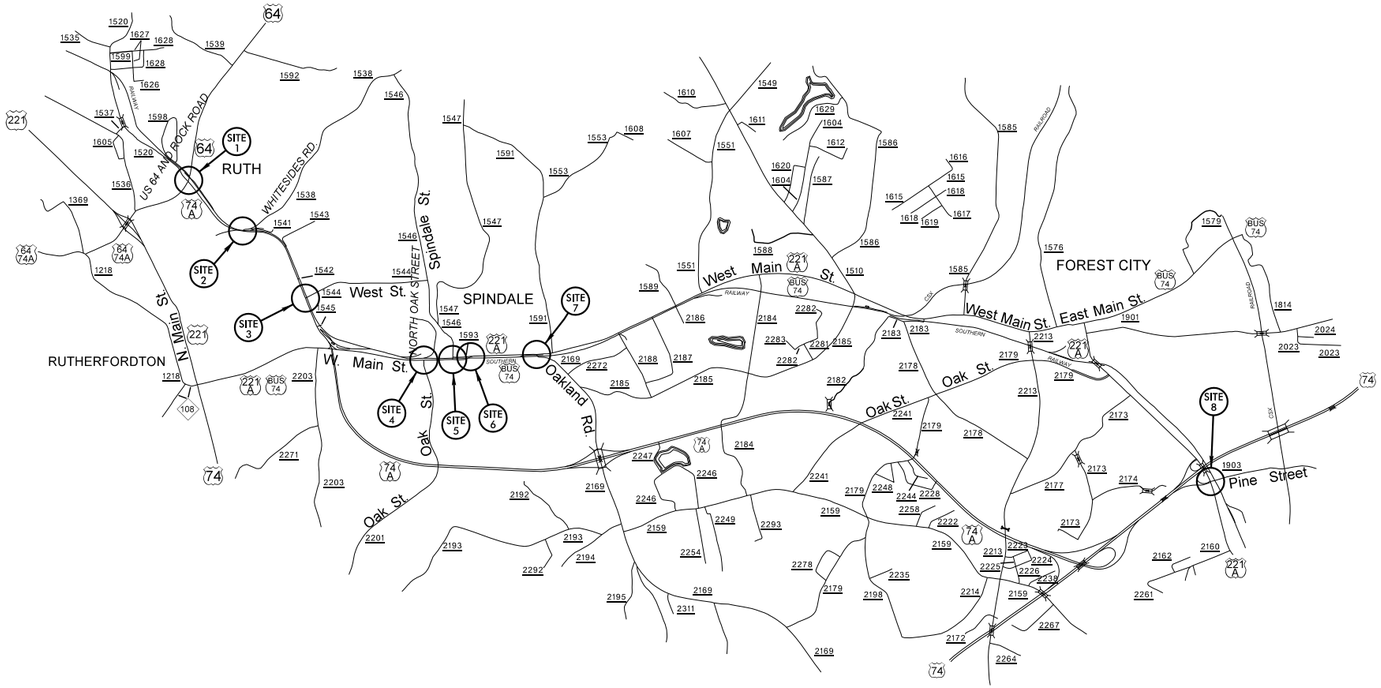
REVISIONS 8/17/99

DJ 8/17/21

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PEDESTRIAN TRANSPORTATION MANAGEMENT PLAN

RUTHERFORD COUNTY



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

PLANS PREPARED BY:

_____

_____

NCDOT CONTACTS:

_____
PROJECT ENGINEER

_____
PROJECT DESIGN ENGINEER

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

INDEX OF SHEETS

APPROVED:_____

DATE:_____

SEAL

SHEET NO.
PED-1

EB-5915

TIP PROJECT:

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-1A

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1180.01	SKINNY - DRUMS

LOCAL NOTES

1) NOTIFY RUTHERFORD COUNTY EMERGENCY AND PUBLIC SCHOOLS AT LEAST ONE MONTH PRIOR TO ANY ROAD CONSTRUCTION.

2) ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED BY THE ENGINEER.

3) MAINTAIN ACCESS TO EXISTING DRIVEWAYS AT ALL TIME.

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- 4" ABC

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- SPOTTER

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

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, SUPPLEMENT, 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 PLANS OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE TRAIL AS FOLLOWS:

SITE #	DAY AND TIME RESTRICTIONS
1, 2, 6, & 7	MONDAY THRU FRIDAY 7AM – 8PM
3	CONTRACTOR MAY CLOSE SITE FOR A MAXIMUM DURATION OF 5 DAYS. CONTRACTOR IS REQUIRED TO PROVIDE 7 DAY NOTICE TO ENGINEER PRIOR TO CLOSING.
4	CONTRACTOR SHALL PERFORM ALL WORK ACTIVITIES BETWEEN JUNE 7TH THRU AUGUST 6TH, 2021.
4 & 5	CONTRACTOR WILL MAINTAIN MINIMUM TRAIL WIDTH AS NOTED ON THE PLANS FOR PEDESTRIAN DETOUR.
8	CONTRACTOR SHALL PERFORM WORK ACTIVITIES BETWEEN THE HOURS OF 7AM AND 7PM. MAXIMUM DURATION OF CLOSURE IS 5 DAYS. CONTRACTOR IS REQUIRED TO PROVIDE 7 DAY NOTICE TO THE ENGINEER PRIOR TO CLOSING.

ADTIONAL ICT: NO WORK SHALL BE PERFORMED BETWEEN THE HOURS OF 12AM SATURDAYS THRU 11:59PM SUNDAYS FOR THE DURATION OF THE PROJECT. ALL TRAIL FACILITIES SHALL BE OPEN DURING THE WEEKENDS. ADA DETOURS ARE CONSIDERED OPEN.

TRAILER CLOSURE REQUIREMENTS

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

TRAFFIC PATTERN ALTERATIONS

C) NOTIFY THE ENGINEER SEVEN (7) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATIONS

SIGNING

D) ALL SIGNS SHALL BE PLACED BETWEEN MONDAY THRU FRIDAY BETWEEN THE HOURS 8PM TILL 7AM.

E) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND PEDESTRIAN TRAFFIC CONTROL PLANS

F) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAIL PATTERN

PEDESTRIAN TRAFFIC CONTROL DEVICES

G) PLACE ADA COMPLIANT BARRICADES, WITH "SIDEWALK CLOSED" SIGN R9-9 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE TRAIL

H) CONTRACTOR TO SUPPLY SPOTTER TO ASSIST PEDESTRIANS IN CROSSING TRAIL DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR FURNISHING A SPOTTER. PAYMENT AT THE CONTRACT UNIT PRICES FOR VARIOUS PAY ITEMS WILL BE FULL COMPENSATION TO COMPLETE THE WORK

PAVEMENT MARKINGS AND MARKERS

I) PLACE TEMPORARY AND PERMANENT PAVEMENT MARKINGS BETWEEN MONDAY THRU FRIDAY BETWEEN 8PM TILL 7AM.

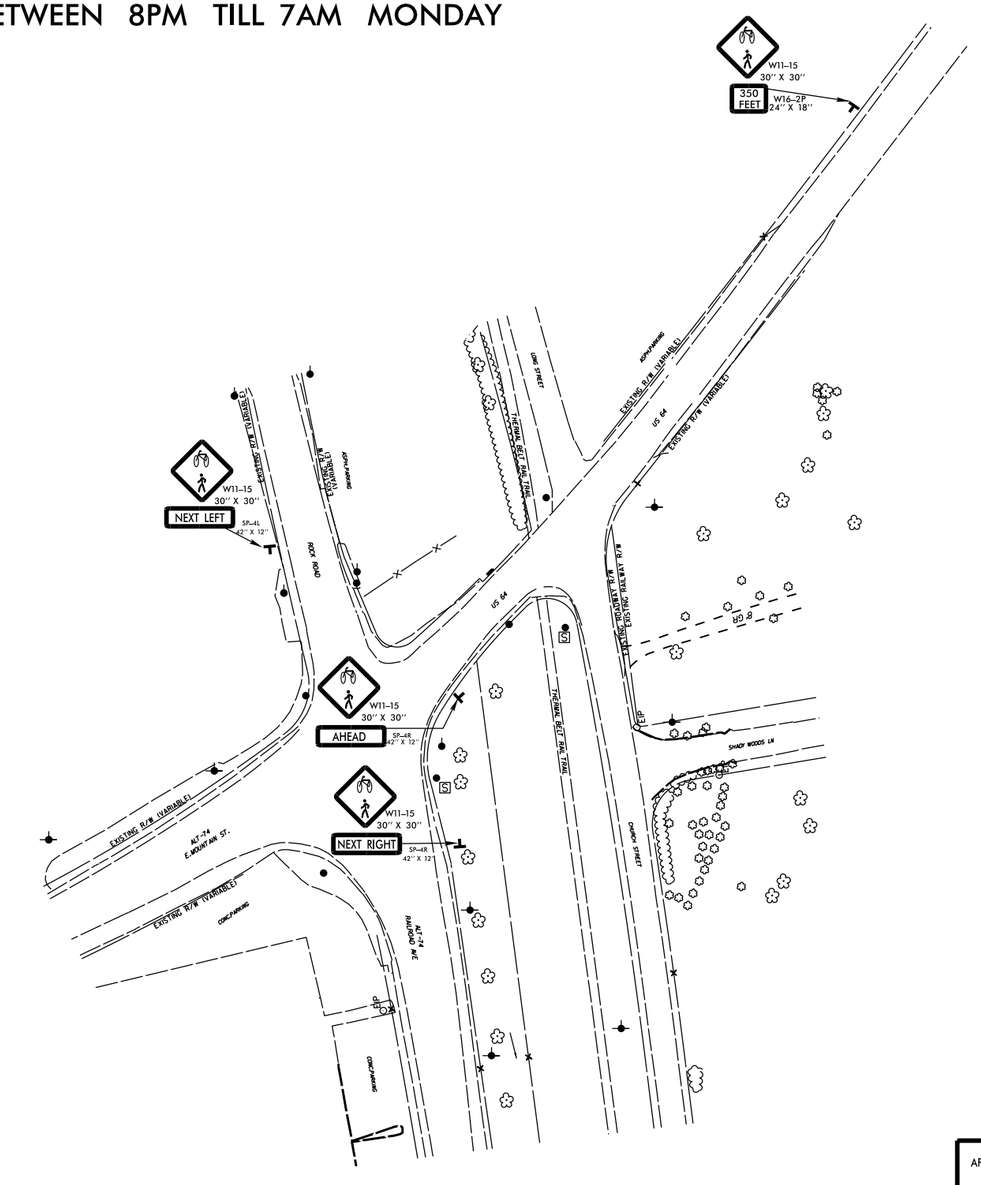
J) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES

APPROVED: _____

DATE: _____

SEAL

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



PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-2

SITE 1

PEDESTRIAN TRAFFIC CONTROL NOTES:
– ALL PAVEMENT MARKINGS AND SIGN INSTALLATION TO BE PERFORMED BETWEEN 8PM TILL 7AM MONDAY THRU FRIDAY

SCAN WITH A QR READER FOR LOCATION

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

APPROVED: ____________

DATE: ____________

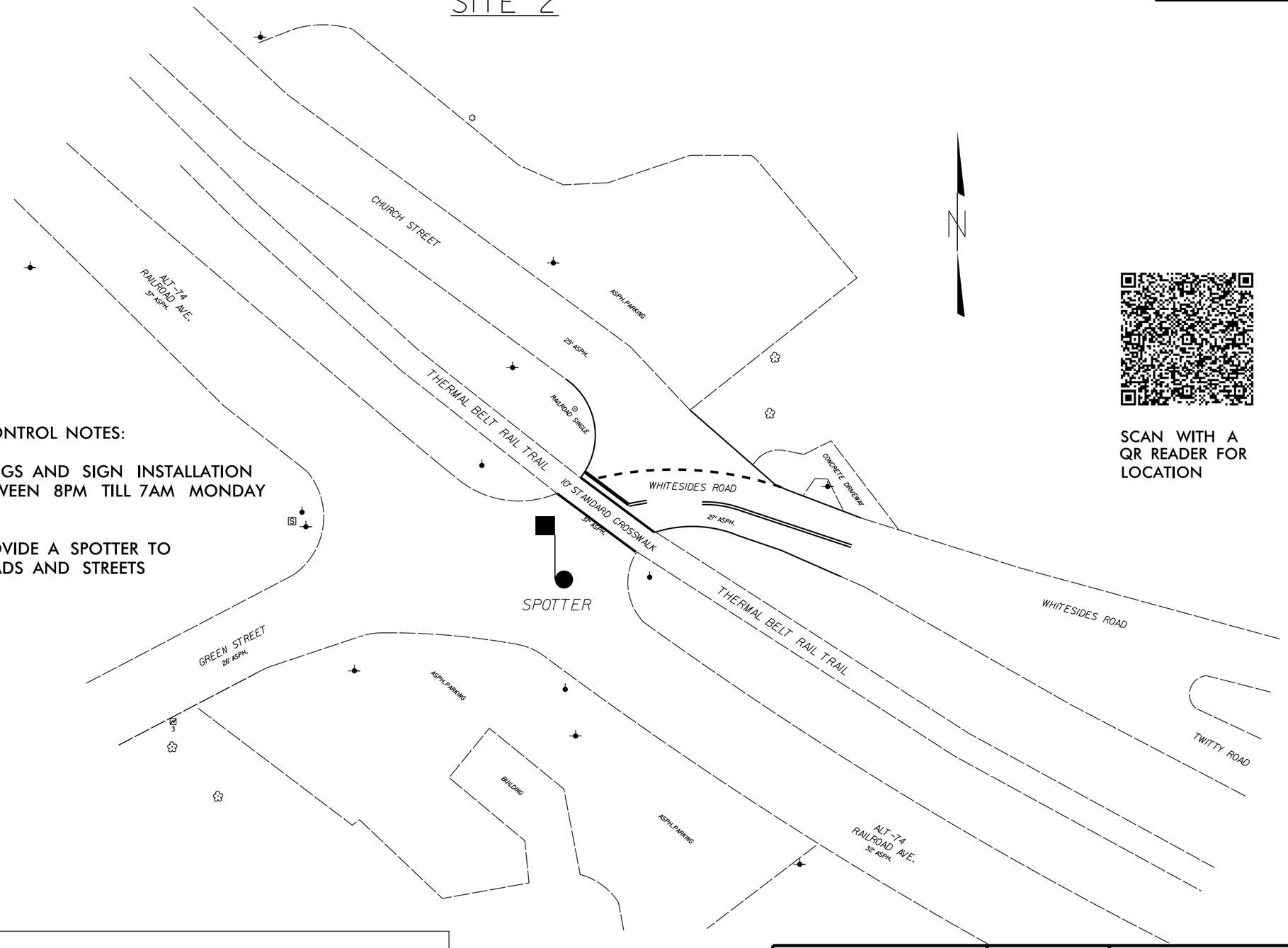
SEAL

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

DJ 03/29/21

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-3

SITE 2



PEDESTRIAN TRAFFIC CONTROL NOTES:

– ALL PAVEMENT MARKINGS AND SIGN INSTALLATION TO BE PERFORMED BETWEEN 8PM TILL 7AM MONDAY THRU FRIDAY

– CONTRACTOR TO PROVIDE A SPOTTER TO ASSIST PEDESTRIANS ROADS AND STREETS

SCAN WITH A QR READER FOR LOCATION

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

APPROVED: _____

DATE: _____

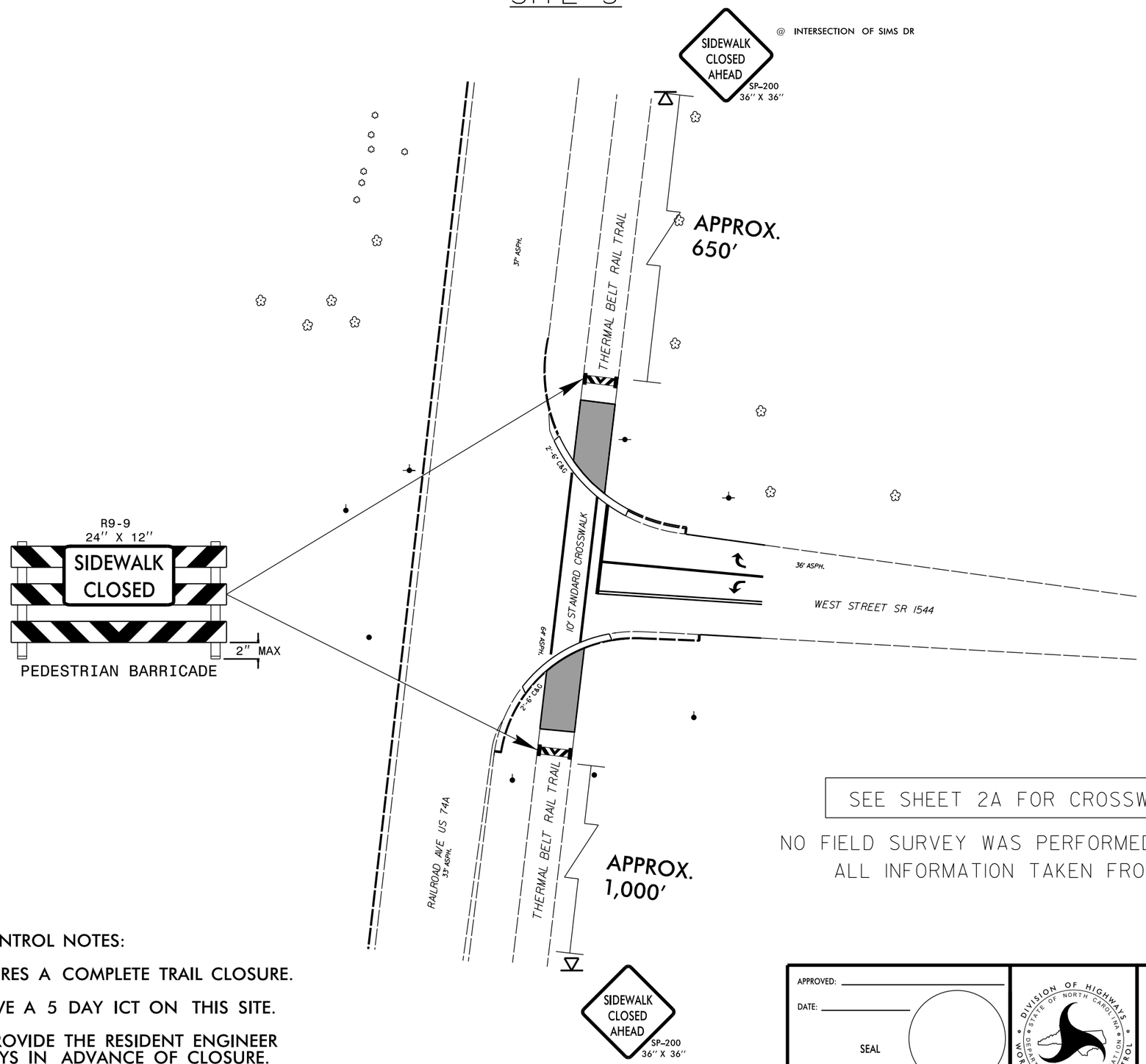
SEAL

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

DJI 20241121

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-4

SITE 3



SCAN WITH A QR READER FOR LOCATION

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

PEDESTRIAN TRAFFIC CONTROL NOTES:

- CONSTRUCTION REQUIRES A COMPLETE TRAIL CLOSURE.
- CONTRACTOR WILL HAVE A 5 DAY ICT ON THIS SITE.
- CONTRACTOR SHALL PROVIDE THE RESIDENT ENGINEER A NOTIFICATION 7 DAYS IN ADVANCE OF CLOSURE.

APPROVED: _____

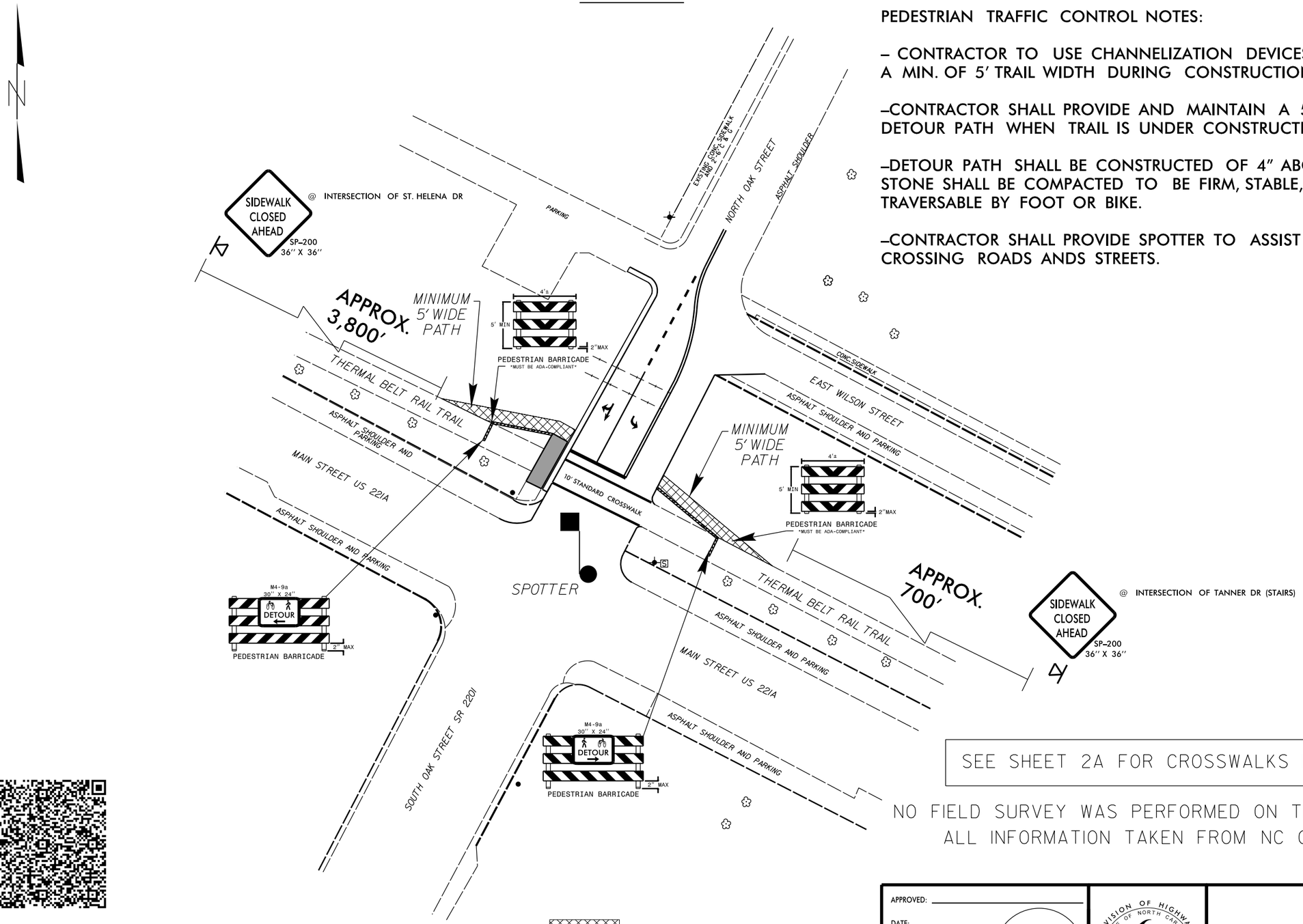
DATE: _____

SEAL

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

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-5

SITE 4



PEDESTRIAN TRAFFIC CONTROL NOTES:

– CONTRACTOR TO USE CHANNELIZATION DEVICES TO MAINTAIN A MIN. OF 5' TRAIL WIDTH DURING CONSTRUCTION.

–CONTRACTOR SHALL PROVIDE AND MAINTAIN A 5' WIDE DETOUR PATH WHEN TRAIL IS UNDER CONSTRUCTION.

–DETOUR PATH SHALL BE CONSTRUCTED OF 4" ABC STONE. STONE SHALL BE COMPACTED TO BE FIRM, STABLE, AND TRAVERSABLE BY FOOT OR BIKE.

–CONTRACTOR SHALL PROVIDE SPOTTER TO ASSIST IN PEDESTRIANS CROSSING ROADS ANDS STREETS.

SEE SHEET 2A FOR CROSSWALKS DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

SCAN WITH A QR READER FOR LOCATION

APPROVED: _____

DATE: _____

SEAL

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

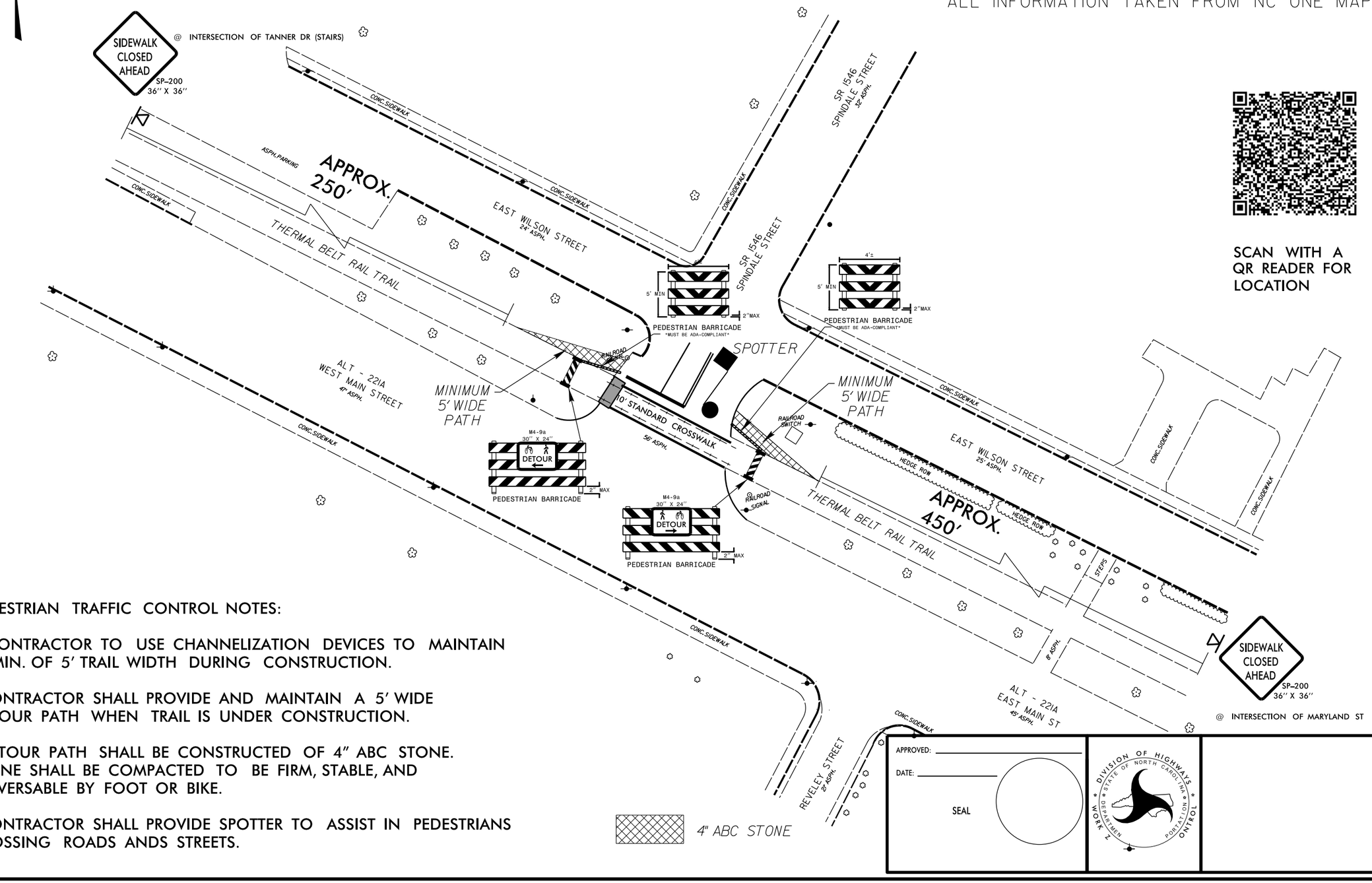
PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-6

SITE 5

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

SCAN WITH A QR READER FOR LOCATION



PEDESTRIAN TRAFFIC CONTROL NOTES:

– CONTRACTOR TO USE CHANNELIZATION DEVICES TO MAINTAIN A MIN. OF 5' TRAIL WIDTH DURING CONSTRUCTION.

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–DETOUR PATH SHALL BE CONSTRUCTED OF 4" ABC STONE. STONE SHALL BE COMPACTED TO BE FIRM, STABLE, AND TRAVERSABLE BY FOOT OR BIKE.

–CONTRACTOR SHALL PROVIDE SPOTTER TO ASSIST IN PEDESTRIANS CROSSING ROADS ANDS STREETS.

APPROVED: _____

DATE: _____

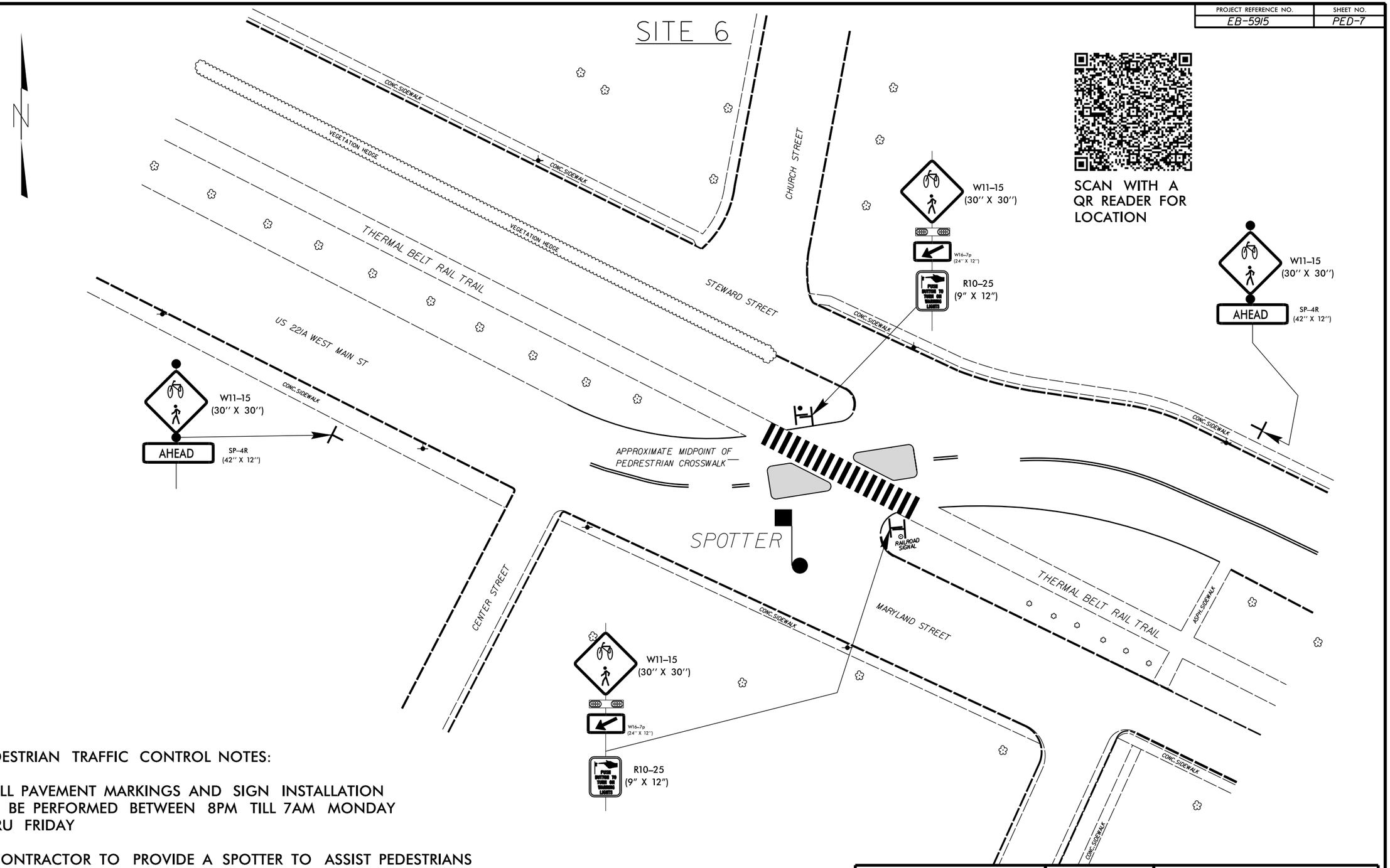
SEAL

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

D.I. 8/1/2021

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-7

SITE 6



SCAN WITH A QR READER FOR LOCATION

PEDESTRIAN TRAFFIC CONTROL NOTES:

– ALL PAVEMENT MARKINGS AND SIGN INSTALLATION TO BE PERFORMED BETWEEN 8PM TILL 7AM MONDAY THRU FRIDAY

– CONTRACTOR TO PROVIDE A SPOTTER TO ASSIST PEDESTRIANS ROADS AND STREETS

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

APPROVED: _____

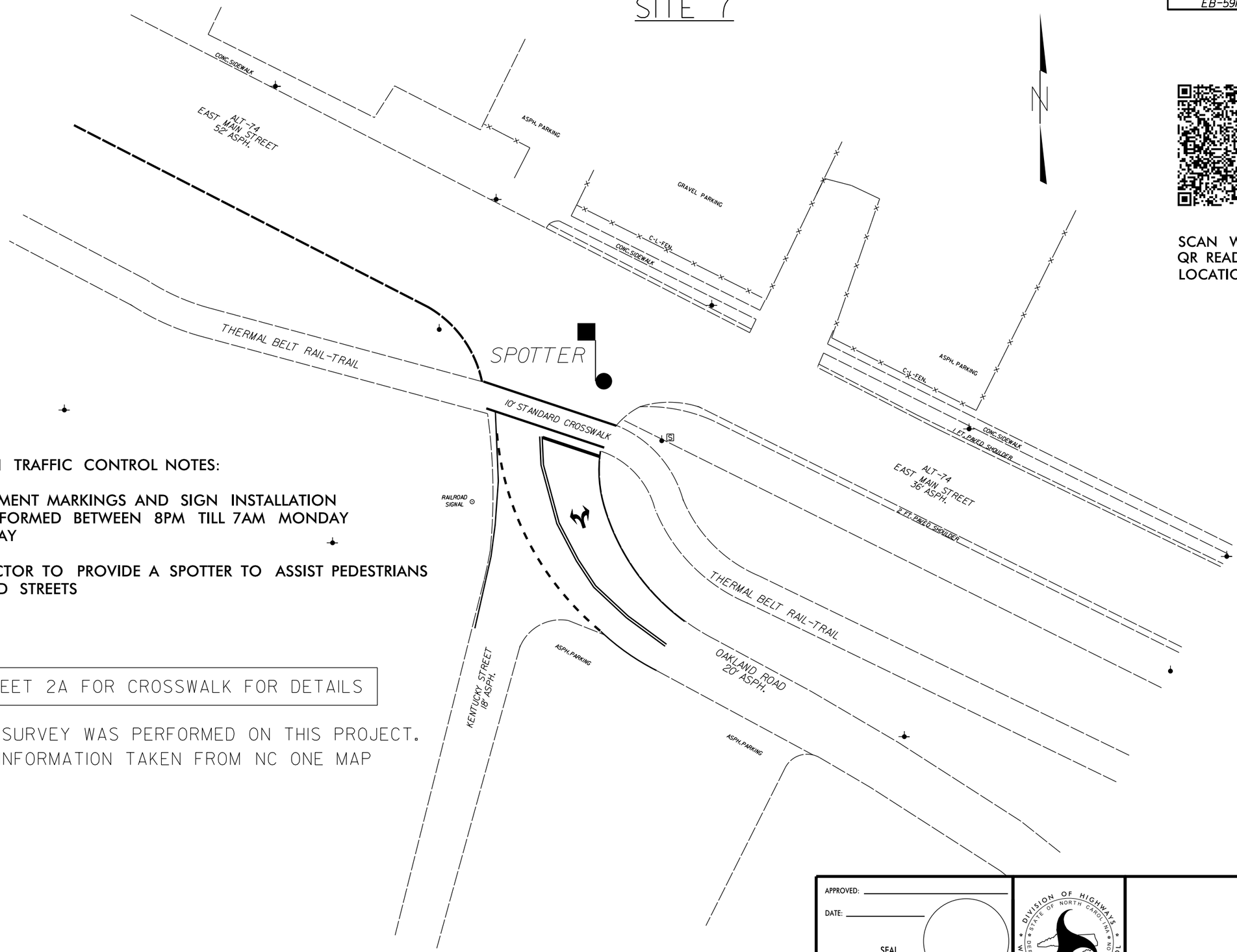
DATE: _____

SEAL

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

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-8

SITE 7



SCAN WITH A QR READER FOR LOCATION

PEDESTRIAN TRAFFIC CONTROL NOTES:

– ALL PAVEMENT MARKINGS AND SIGN INSTALLATION TO BE PERFORMED BETWEEN 8PM TILL 7AM MONDAY THRU FRIDAY

– CONTRACTOR TO PROVIDE A SPOTTER TO ASSIST PEDESTRIANS ROADS AND STREETS

SEE SHEET 2A FOR CROSSWALK FOR DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

APPROVED: _____

DATE: _____

SEAL

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

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	PED-9

SITE 8

SCAN WITH A QR READER FOR LOCATION

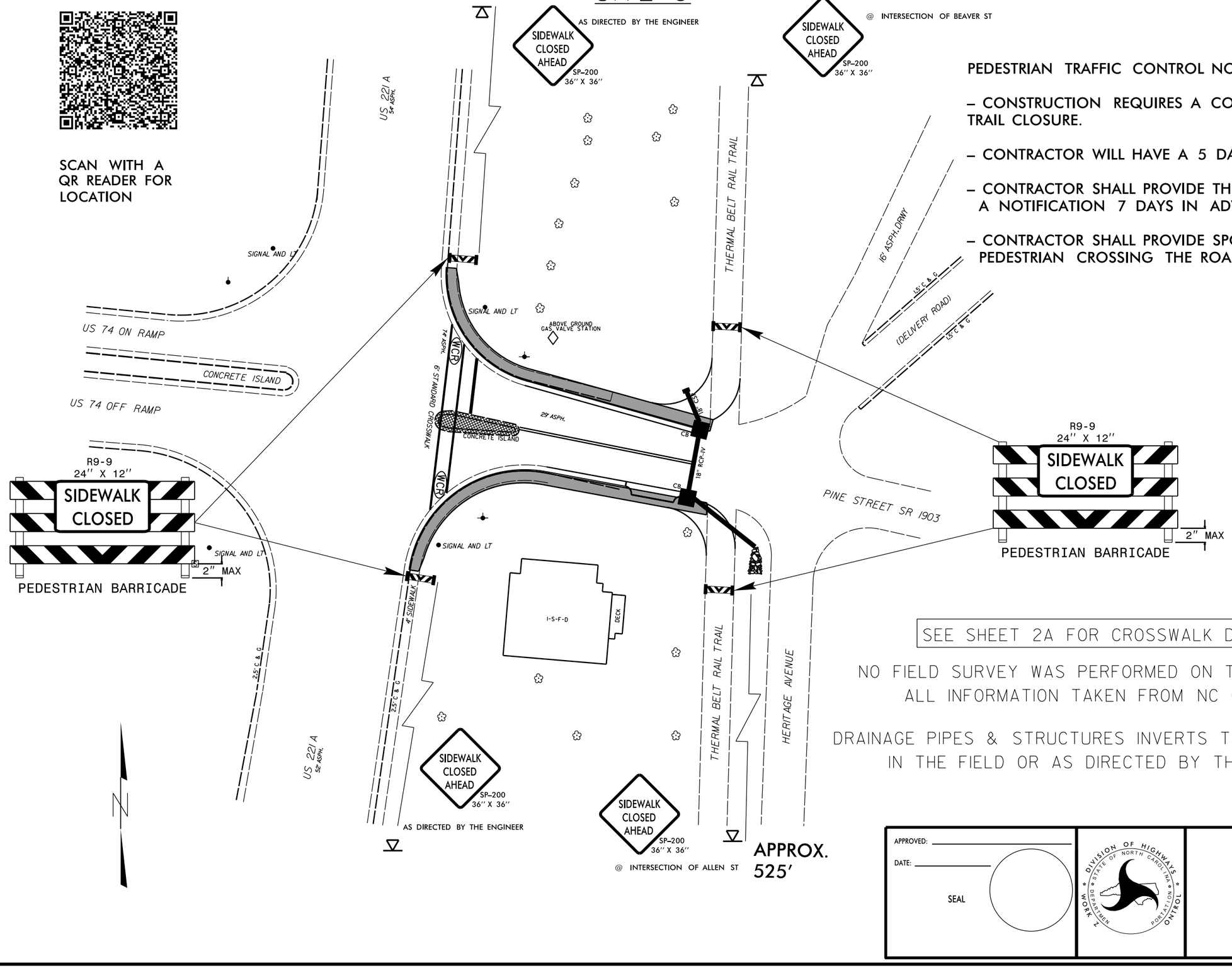
PEDESTRIAN TRAFFIC CONTROL NOTES:

– CONSTRUCTION REQUIRES A COMPLETE SIDEWALK AND TRAIL CLOSURE.

– CONTRACTOR WILL HAVE A 5 DAY ICT ON THIS SITE.

– CONTRACTOR SHALL PROVIDE THE RESIDENT ENGINEER A NOTIFICATION 7 DAYS IN ADVANCE OF CLOSURE.

– CONTRACTOR SHALL PROVIDE SPOTTER TO ASSIST IN PEDESTRIAN CROSSING THE ROAD AND TRAIL.



SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

DRAINAGE PIPES & STRUCTURES INVERTS TO BE DETERMINED IN THE FIELD OR AS DIRECTED BY THE ENGINEER

APPROVED: _____

DATE: _____

SEAL

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

09/30/68

CONTRACT: TIP PROJECT: EB-5915

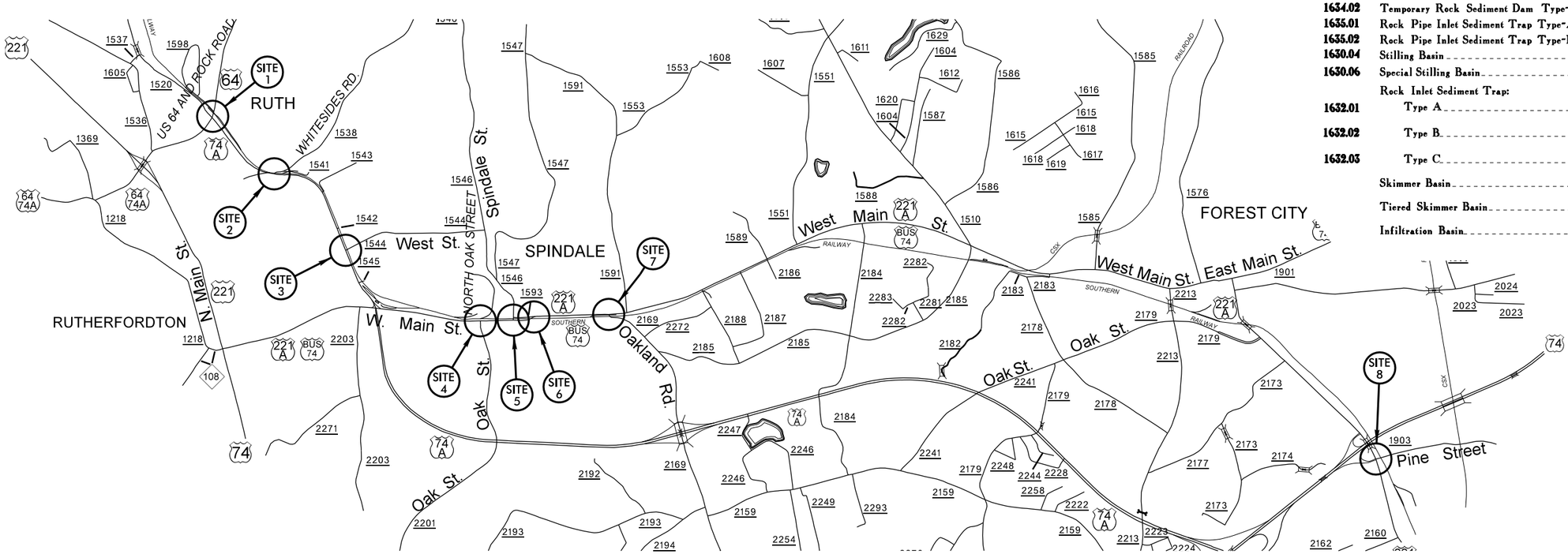
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

RUTHERFORD COUNTY

LOCATIONS: SITE 1 – INTERSECTION OF US 64 AND ROCK ROAD AND ALT 74
SITE 2 – INTERSECTION OF US 221A/74 BUS AND SR 1538 (WHITESIDES ROAD)
SITE 3 – INTERSECTION OF US 221A/74 BUS AND SR 1544 (WEST STREET)
SITE 4 – INTERSECTION OF US 221A/74 BUS AND (NORTH OAK STREET)
SITE 5 – INTERSECTION OF US 221A/74 BUS AND SR 1546 (SPINDALE STREET)
SITE 6 – INTERSECTION OF MARYLAND AND US 221A
SITE 7 – INTERSECTION OF US 221A/74 BUS AND SR 2169 (OAKLAND ROAD)
SITE 8 – INTERSECTION OF US 221A AND SR 1903 (PINE STREET)

TYPE OF WORK: THERMAL BELT RAIL TRAIL PEDESTRIAN CROSSINGS



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	EB-5915	EC-1	4

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

EROSION AND SEDIMENT CONTROL MEASURES

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

GRAPHIC SCALE

20 0 40

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared In the Office of:

DIVISION DESIGN & CONSTRUCT

55 Orange St.
Asheville, NC 28801

2018 STANDARD SPECIFICATIONS

Designed by:

CHASE CARVER — *NAME*

3373 — *LEVEL III CERTIFICATION NO.*

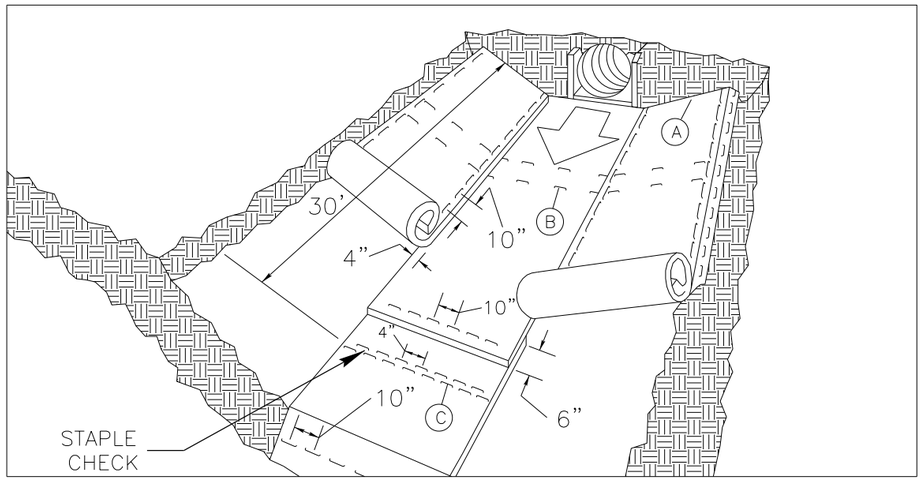
The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

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

29-SEP-2020 15:10

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MATTING INSTALLATION DETAIL



MATTING IN DITCHES

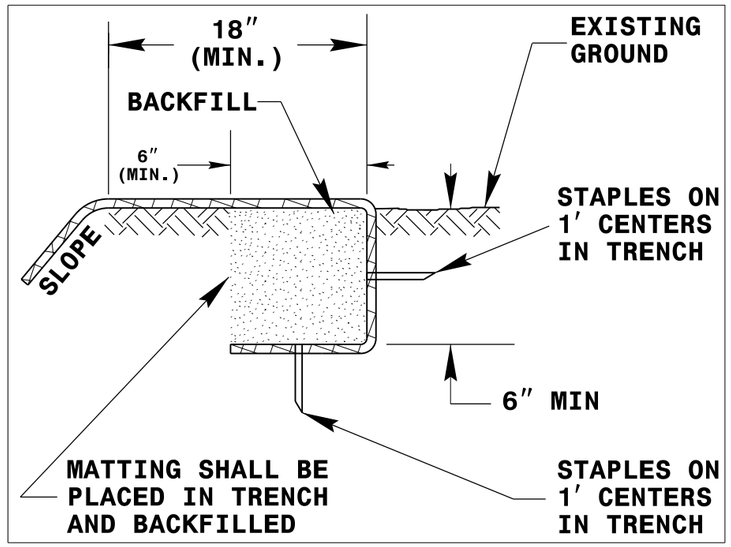
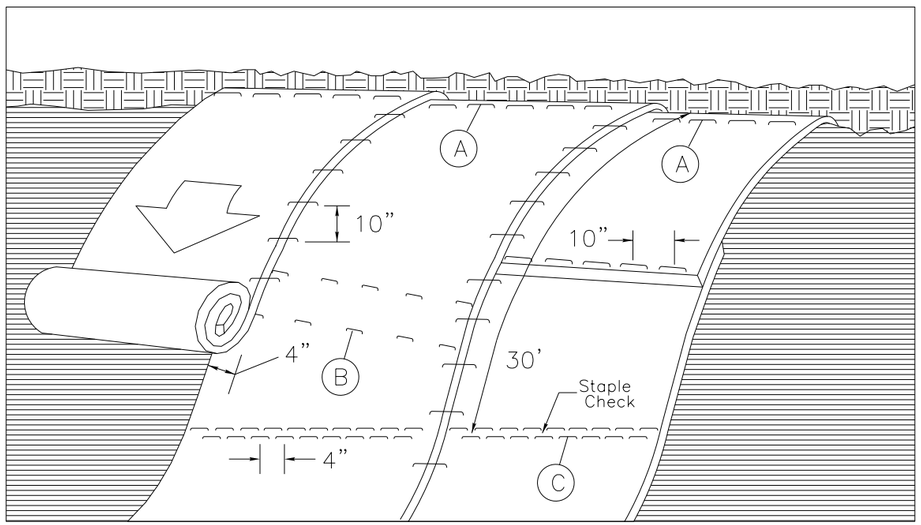


DIAGRAM (A)



MATTING ON SLOPES

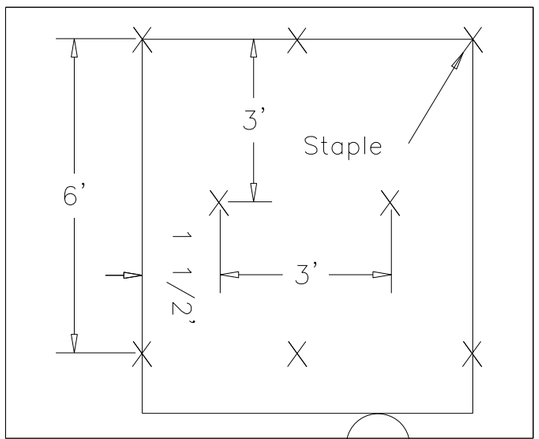


DIAGRAM (B)

Staple Check Pattern

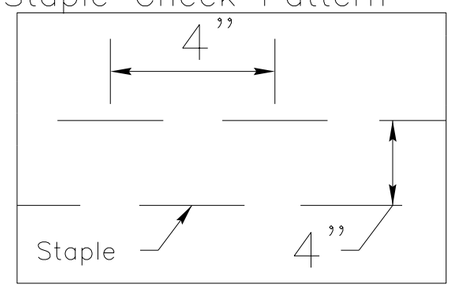


DIAGRAM (C)

NOTES:

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION.

STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	EC-3

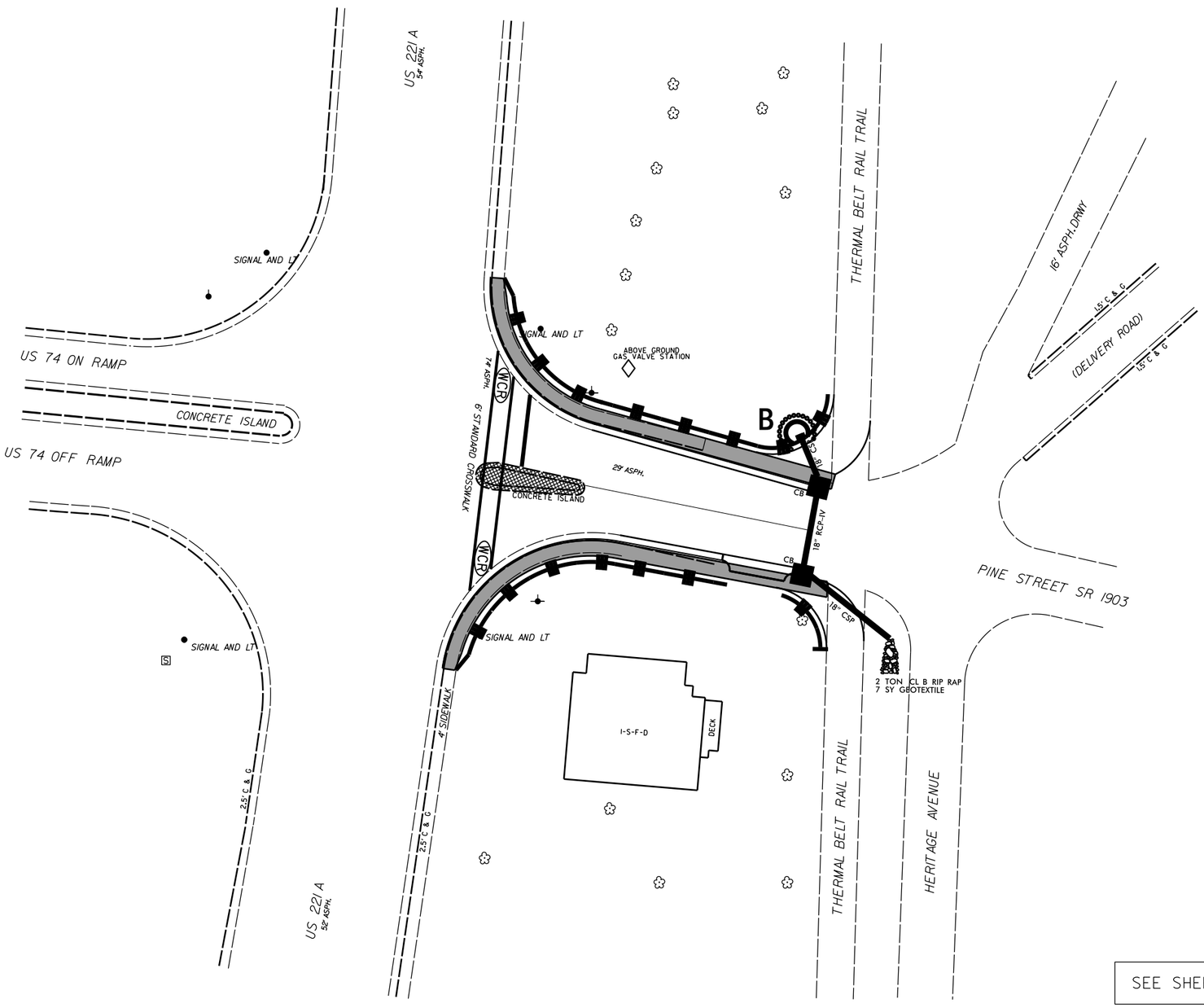
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	EC-4/CON II
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 8



SCAN WITH A QR READER FOR LOCATION

SEE SHEET 2A FOR CROSSWALK DETAILS

NO FIELD SURVEY WAS PERFORMED ON THIS PROJECT.
ALL INFORMATION TAKEN FROM NC ONE MAP

DRAINAGE PIPES & STRUCTURES INVERTS TO BE DETERMINED IN THE FIELD OR AS DIRECTED BY THE ENGINEER

REVISIONS 8/17/99

29-SEP-2020 16:00

Project No.	Sheet No.
EB-5915	Sig. 1.0

Project: EB-5915

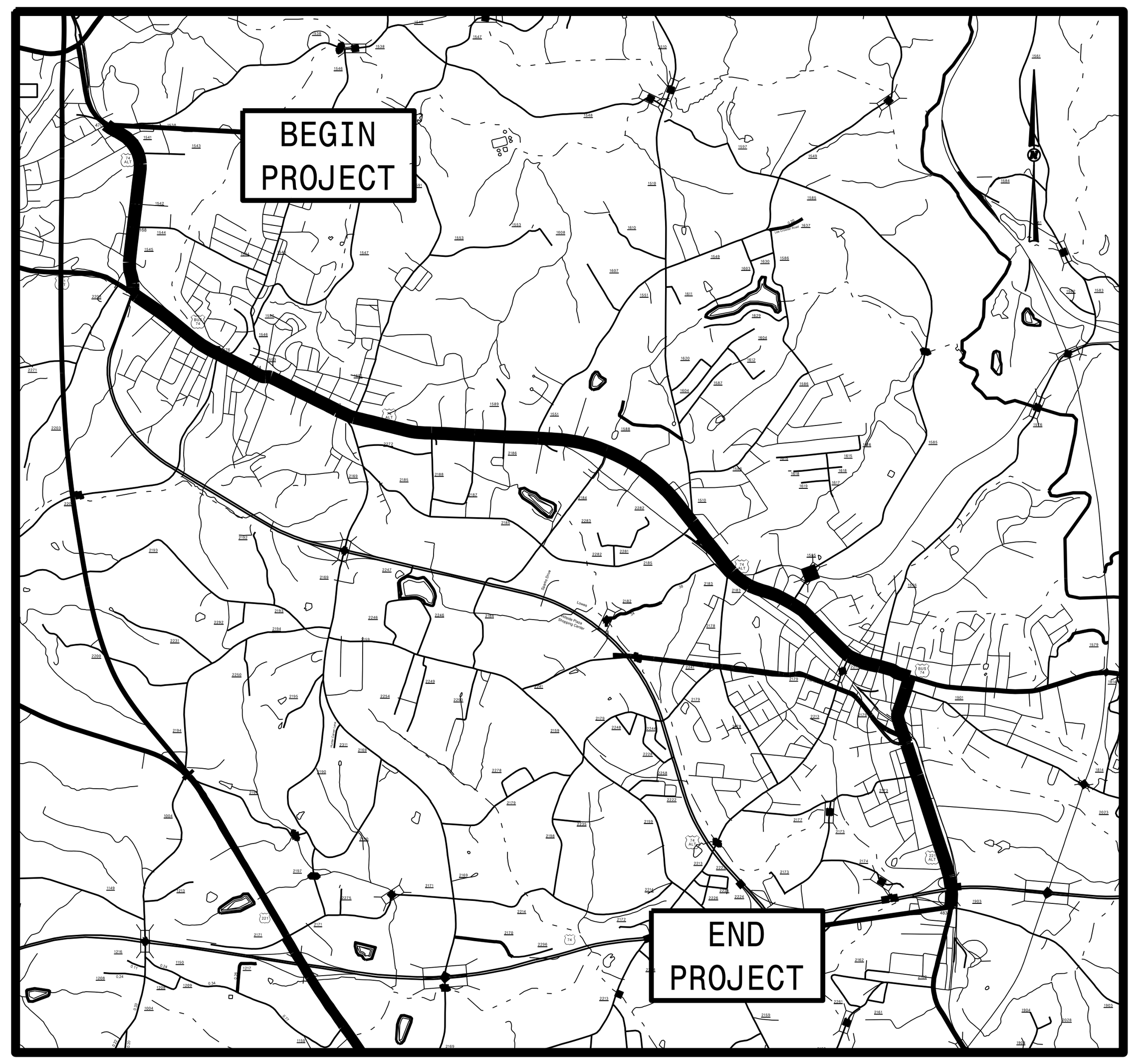
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

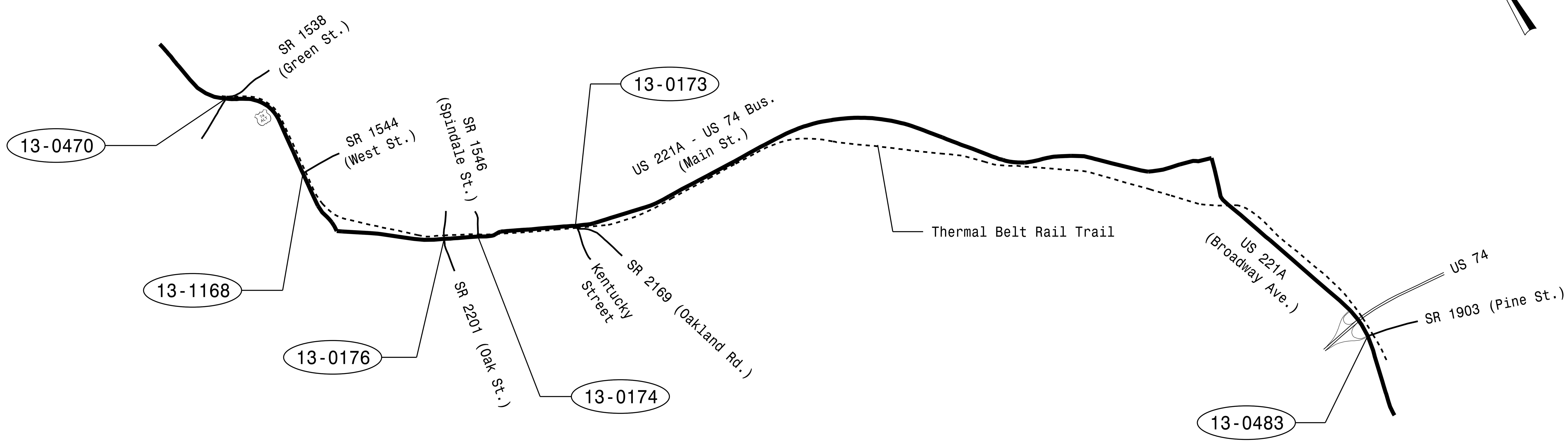
RUTHERFORD COUNTY

LOCATION: US 221A – US 74 BUS. (MAIN ST.) FROM SR 1538 (GREEN ST.) TO SR 1903 (PINE ST.)

TYPE OF WORK: TRAFFIC SIGNALS

Vicinity





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

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	---------	Title Sheet
Sig. 2.0–2.1	13–0470	US 74A (Railroad Ave.) at SR 1538 (Green St.)
Sig. 3.0–3.2	13–1168	US 74A (Railroad Ave.) at SR 1544 (West St.)
Sig. 4.0–4.1	13–0176	US 221A–US 74 Bus. (Main St.) at SR 2201 (Oak St.)
Sig. 5.0–5.2	13–0174	US 221A–US 74 Bus. (Main St.) at SR 1546 (Spindale St.)
Sig. 6.0–6.1	13–0173	US 221A–US 74 Bus. (Main St.) at SR 2169 (Oakland Rd.)/Kentucky Street
Sig. 7.0–7.2	13–0483	US 221A (Broadway Ave.) at US 74 Eastbound Ramp/SR 1903 (Pine St.)
Sig. 8.0–8.1	---------	Revised Standard Drawings

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

Contacts:

Timothy J. Williams, PE – Western Region Signals Engineer
Keith Mims, PE – Signal Equipment Design Engineer

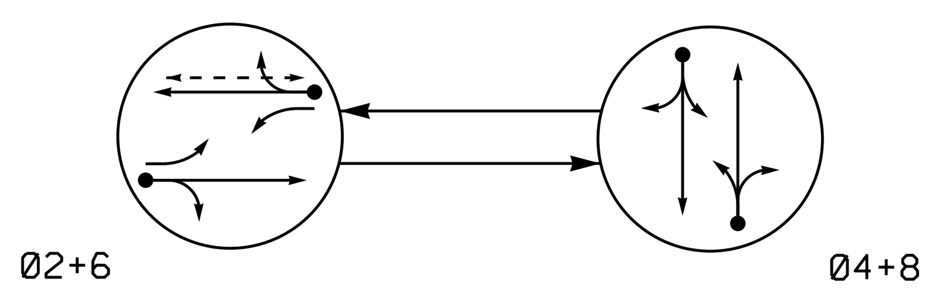
Prepared In the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION

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

750 N. Greenfield Parkway, Garner, NC 27529

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

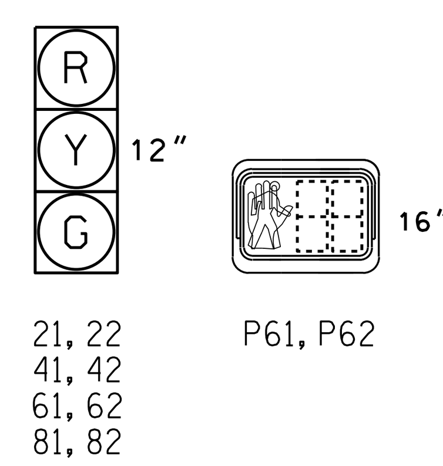
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P61, P62	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



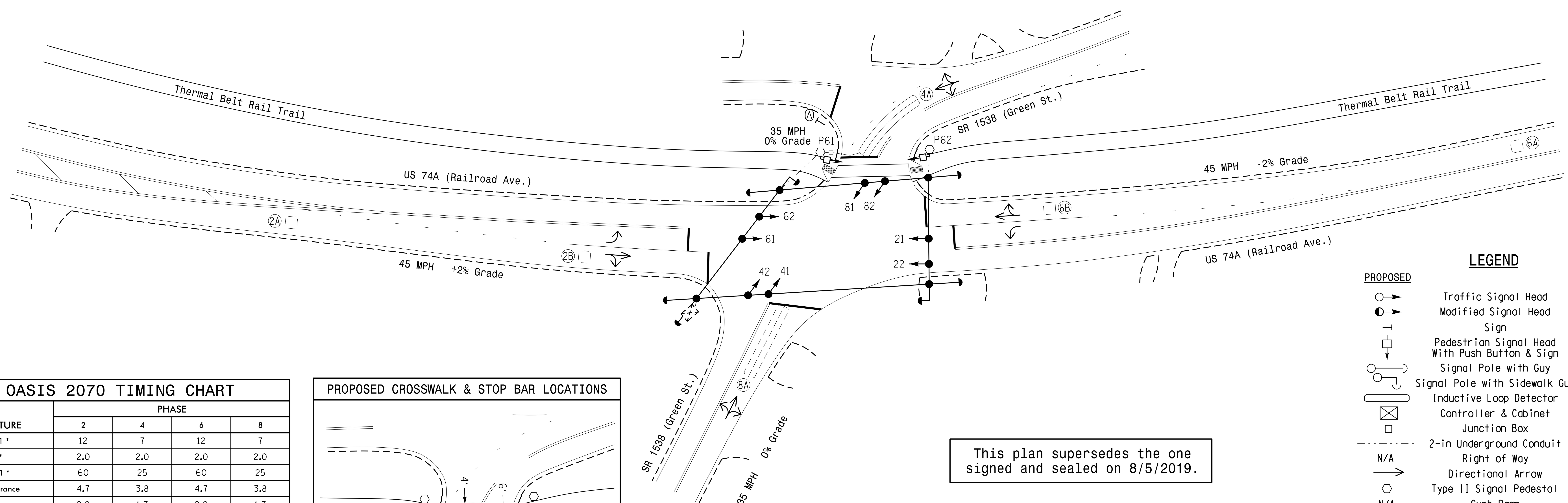
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	210	EXIST	-	2	Y	Y	-	2.0	-	-	-
2B	6X6	60	EXIST	-	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	-
6A	6X6	300	EXIST	-	6	Y	Y	-	2.0	-	-	-
6B	6X6	60	EXIST	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	-

2 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. 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.



LEGEND

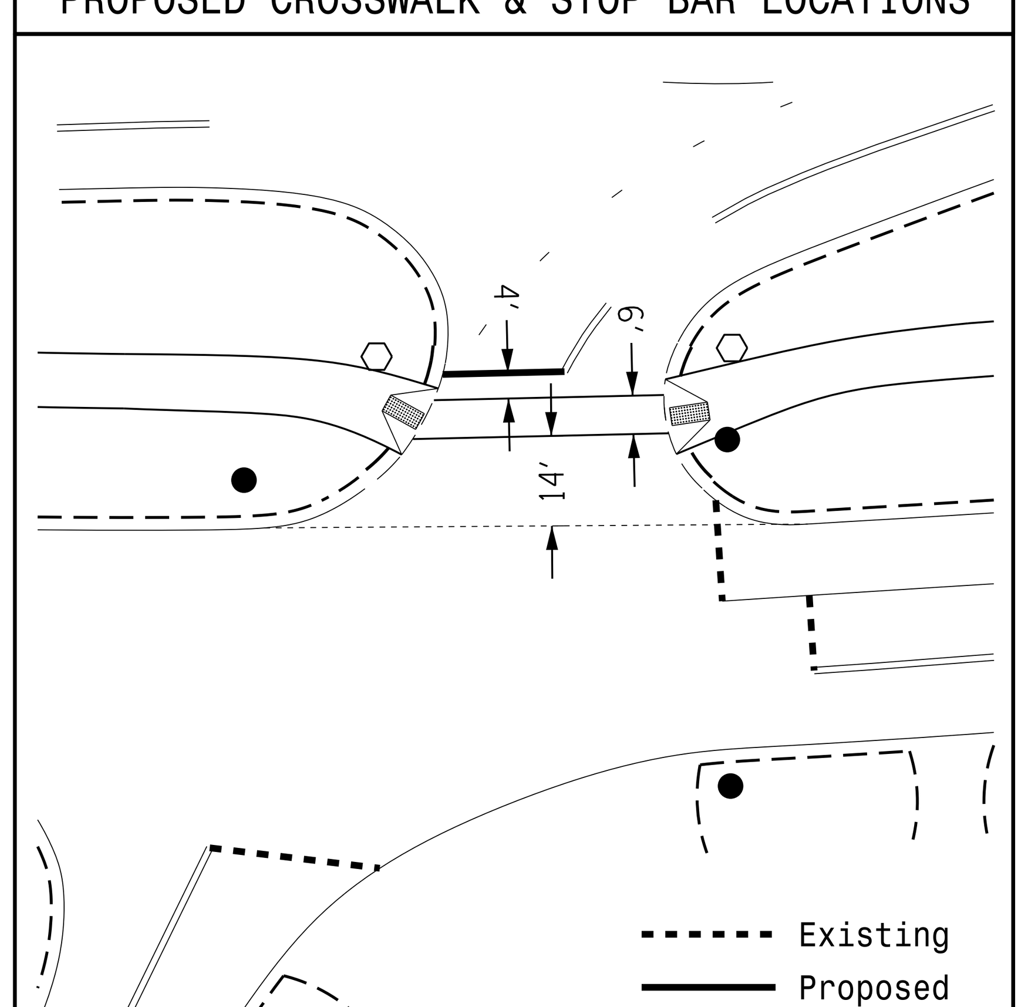
PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
N/A	Curb Ramp	
A	"STOP" Sign (R1-1)	A

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	12	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	60	25	60	25
Yellow Clearance	4.7	3.8	4.7	3.8
Red Clearance	2.0	1.7	2.0	1.7
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	7	-
Don't Walk 1	-	-	7	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

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

PROPOSED CROSSWALK & STOP BAR LOCATIONS



This plan supersedes the one signed and sealed on 8/5/2019.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 74A (Railroad Ave.)
at
SR 1538 (Green St.)

Division 13 Rutherford County Ruth

PLAN DATE: September 2019 REVIEWED BY: T.J. Williams
PREPARED BY: R.N. Zinser REVIEWED BY:

SCALE 0 30
1"=30'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043914 ENGINEER RICHARD N. ZINSER

DocuSigned by: R. N. Zinser 9/20/2019
DATE

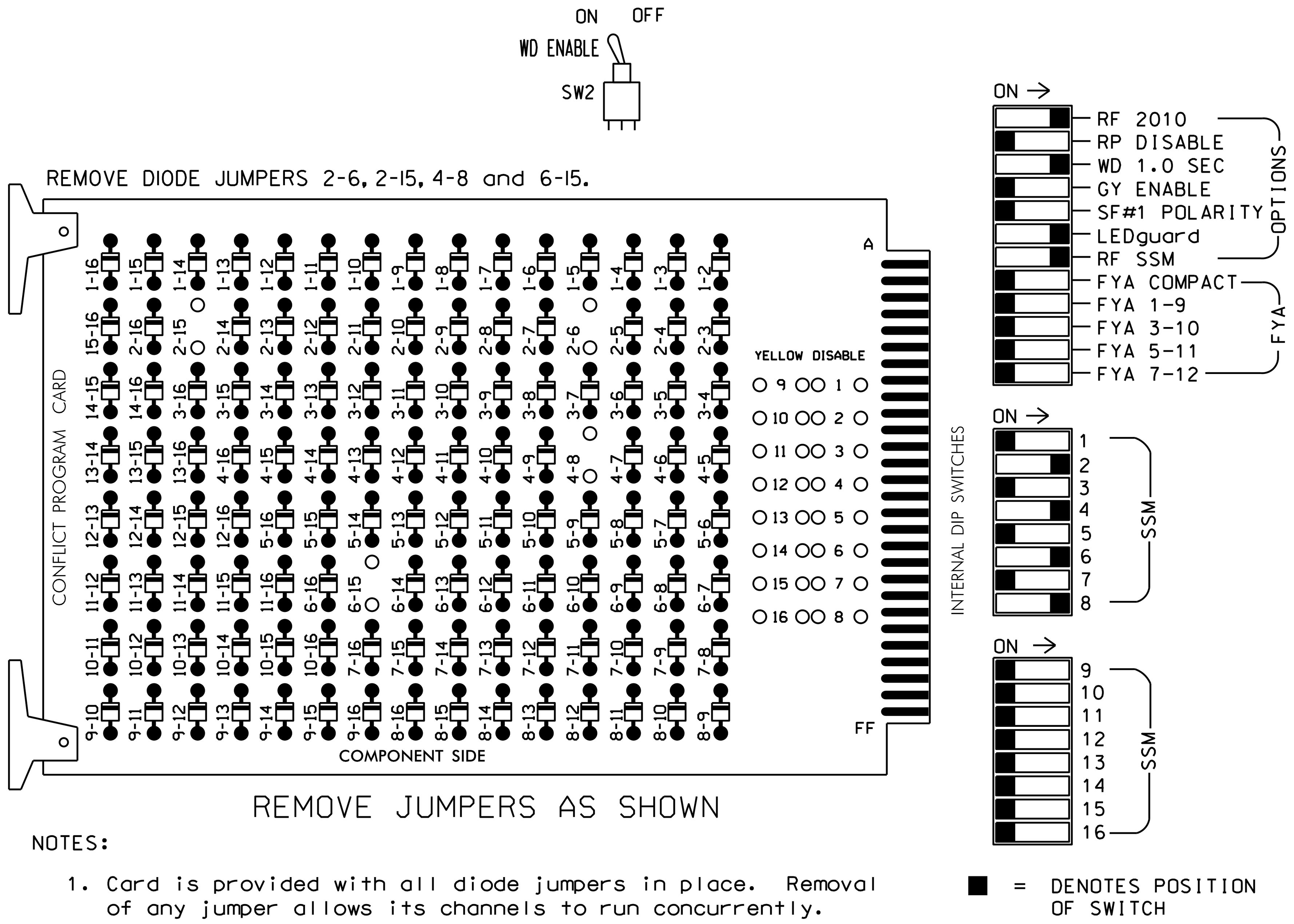
SIG. INVENTORY NO. 13-0470

20-SEP-2019 10:01
S:\ITS&SU\ITS Signals\Signal Design Section\Western Region\Div-13\EB-5915\13-0470\130470_sig_dsn_2019mmdd.dgn
rnzinser

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 2.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. 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 unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 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. Enable Simultaneous Gap-Out for all Phases.
5. Program phases 2 and 6 for Startup In Green.
6. Program phase 6 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash.
8. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.

EQUIPMENT INFORMATION

CONTROLLER..............2070
CABINET.................332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S2,S4,S6,S6P,S8
PHASES USED.............2,4,6,6 PED,8
OVERLAPS................NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	P61, P62	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
(hand)									119			
(pedestrian)									121			

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)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø2 2B				NOT USED							NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y		2.0	
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y		2.0	
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 13-0470
DESIGNED: September 2019
SEALED: 9-20-19
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 8-07-19.

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division — ITS & Signals Management Section — State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

US 74A (Railroad Ave.)
at
SR 1538 (Green St.)

Division 13 Rutherford County Ruth

PLAN DATE: September 2019	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

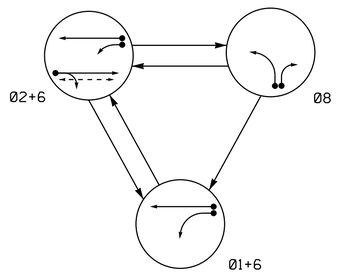
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

DocuSigned by: Ryan W. Hough
430320FAA2654C3...
10/1/2019
DATE

SIG. INVENTORY NO. 13-0470

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 3.0

PHASING DIAGRAM



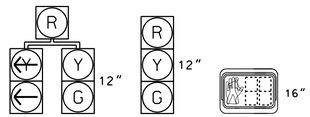
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION				
SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	FLASH
21, 22	R	G	R	Y
61	←G	G	R	Y
62	G	G	R	Y
81, 82	R	R	G	R
P21, P22	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



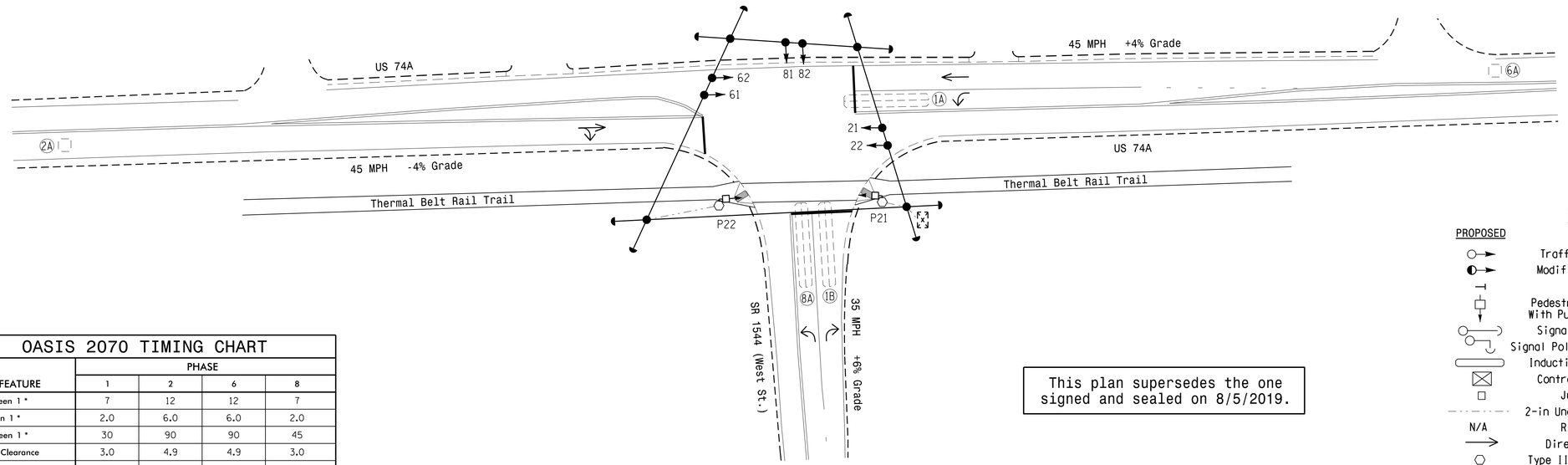
61 | 21, 22, 62, 81, 82 | P21, P22

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	5	-	2	Y	Y	-	-	-	-	-
6A	6X6	300	5	-	6	Y	Y	-	-	-	-	-
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	3	-	-

3 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Renumber all loops and signal heads as shown.
4. Phase 1 may be lagged.
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. Pavement markings are existing.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	6.0	6.0	2.0
Max Green 1 *	30	90	90	45
Yellow Clearance	3.0	4.9	4.9	3.0
Red Clearance	1.9	1.0	1.0	2.3
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	-
Don't Walk 1	-	11	-	-
Seconds Per Actuation *	-	2.5	2.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.0	3.0	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

This plan supersedes the one signed and sealed on 8/5/2019.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
N/A	Curb Ramp	

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 74A
at
SR 1544 (West St.)

Division 13 Rutherford County Ruth

PLAN DATE: September 2019 REVIEWED BY: T.J. Williams

PREPARED BY: R.N. Zinser REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043914 ENGINEER RICHARD N. ZINSER

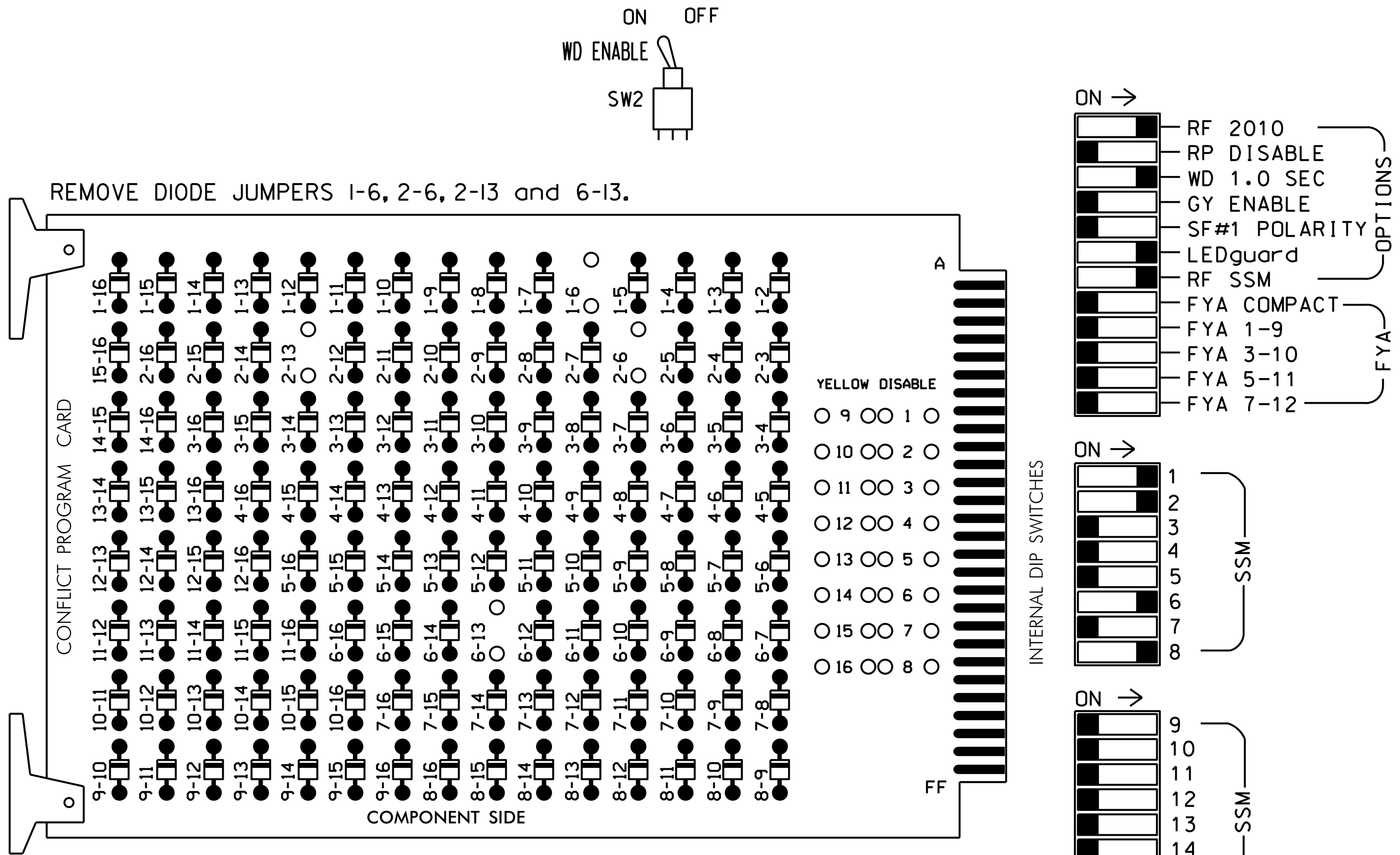
DocuSigned by: R. N. Zinser 9/20/2019
F13B9D73A7224AF DATE

SIG. INVENTORY NO. 13-1168

20-SEP-2019 10:05
X:\Traffic\Projects\415 Signals\Signal Design Section\Western Region\DJ\v-13\EB-5915*13-1168*311168_sig_dsn_2019mmdd.dgn
rtzinser

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. 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 unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,4,5, 7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Startup In Green.
6. Program phase 2 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash.
8. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.

EQUIPMENT INFORMATION

CONTROLLER..............2070
CABINET.................332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S1,S2,S2P,S6,S8
PHASES USED.............1,2,2 PED,6,8
OVERLAPS................NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	P21, P22	NU	NU	NU	NU	61,62	NU	NU	81,82	NU
RED	✳	128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW	126											
GREEN ARROW	127											
(hand)			113									
(walking person)			115									

NU = Not Used

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

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)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø1 1B	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED	NOT USED									NOT USED		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED				NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-5,6	I2U	39	1	2	2	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

[1] Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

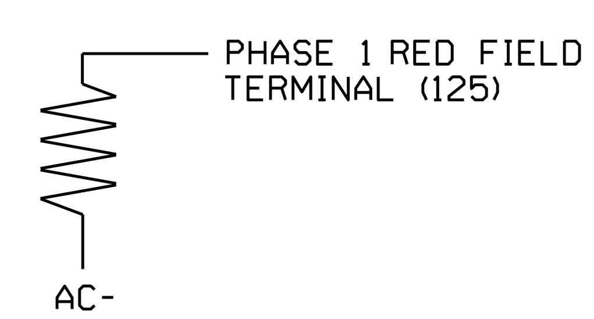
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 13-1168
DESIGNED: September 2019
SEALED: 9-20-19
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 8-07-19.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
750 N.Greenfield Pkwy,Garner,NC 27529

US 74A
at
SR 1544 (West St.)

Division 13 Rutherford County Ruth

PLAN DATE: September 2019 REVIEWED BY:
PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

DocuSigned by:
Ryan W. Hough
10/1/2019
DATE

SIG. INVENTORY NO. 13-1168

01-OCT-2019 08:40
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 3.2

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

(program controller as shown below)

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

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

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

            SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

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

PRESS '+'

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

            SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #1  IS ON

            SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 13-1168
DESIGNED: July 2019
SEALED: 8-05-19
REVISED: N/A

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
ITS & Signals Management Section – Transportation Mobility and Safety Division – State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

US 74A
at
SR 1544 (West St.)

Division 13 Rutherford County Ruth

PLAN DATE: July 2019	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

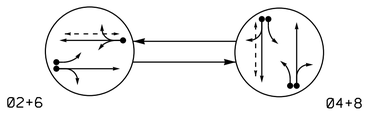
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

DocuSigned by: Ryan W. Hough 430320FAA2654C3... 8/7/2019 DATE

SIG. INVENTORY NO. 13-1168

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 4.0

PHASING DIAGRAM



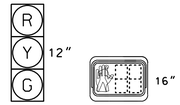
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



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

P41, P42
P61, P62

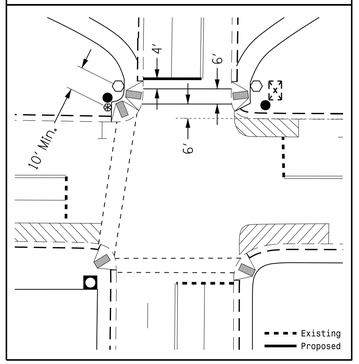
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	90	EXIST	-	2	Y	Y	-	-	-	-	-
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X40	+5	2-4-2	-	4	Y	Y	-	-	10	-	-
6A	6X6	90	EXIST	-	6	Y	Y	-	-	-	-	-
8A	6X60	0	2-4-2	-	8	Y	Y	-	-	3	-	-
8B	6X60	0	2-4-2	-	8	Y	Y	-	-	10	-	-

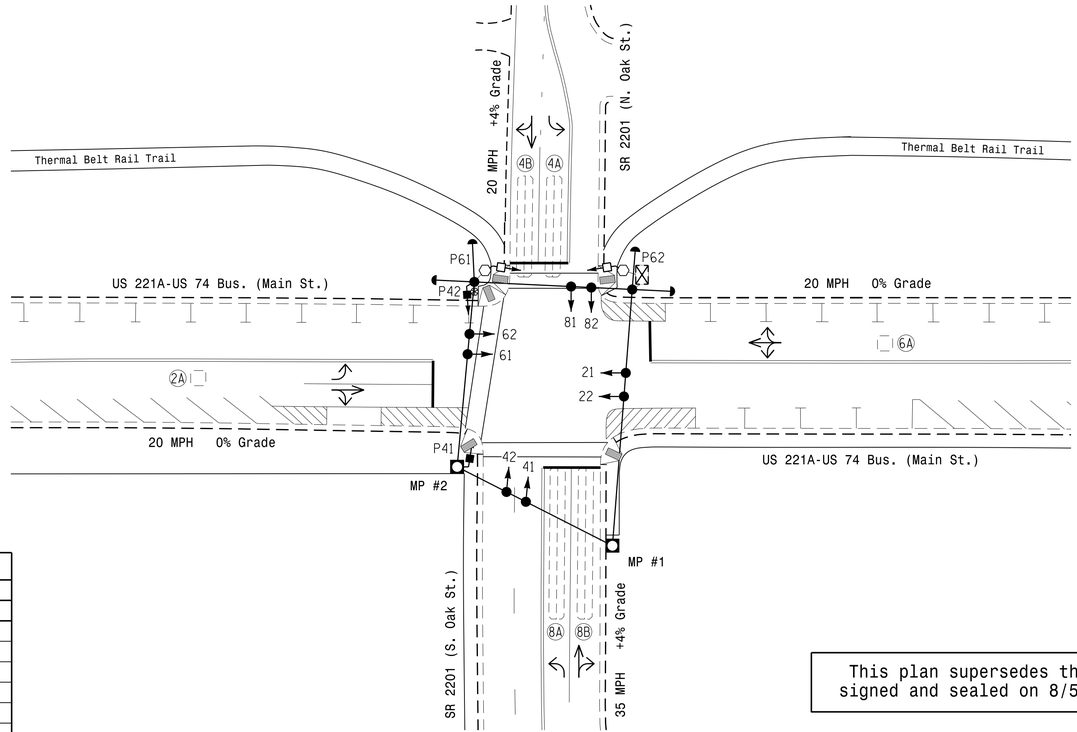
2 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
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.

PROPOSED CROSSWALK & STOP BAR LOCATIONS





OASIS 2070 TIMING CHART				
	PHASE			
FEATURE	2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	45	25	45	25
Yellow Clearance	3.0	3.6	3.0	3.6
Red Clearance	3.1	2.6	3.1	2.6
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-
Don't Walk 1	-	12	8	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

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

This plan supersedes the one signed and sealed on 8/5/2019.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
N/A	Curb Ramp	

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 221A-US 74 Bus. (Main St.)
at
SR 2201 (Oak St.)

Division 13 Rutherford County Spindale

PLAN DATE: February 2021 REVIEWED BY: T.J. Williams
PREPARED BY: R.N. Zinser REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043914 ENGINEER RICHARD N. ZINSER

DocuSigned by: R. N. Zinser 2/19/2021
DATE

SIG. INVENTORY NO. 13-0176

19-FEB-2021 08:10
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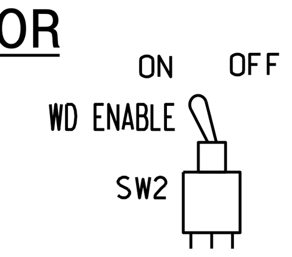
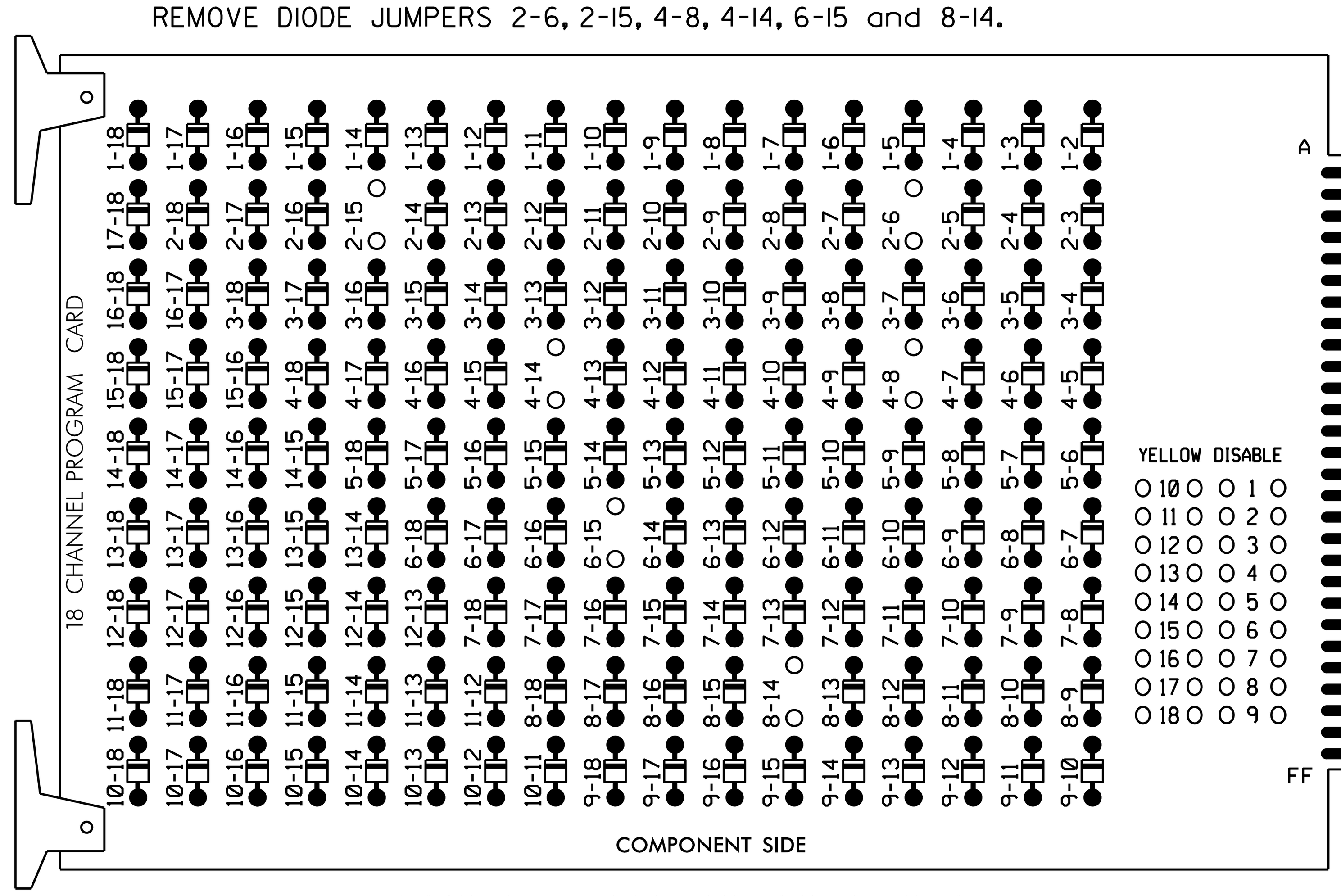
rnzinser

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

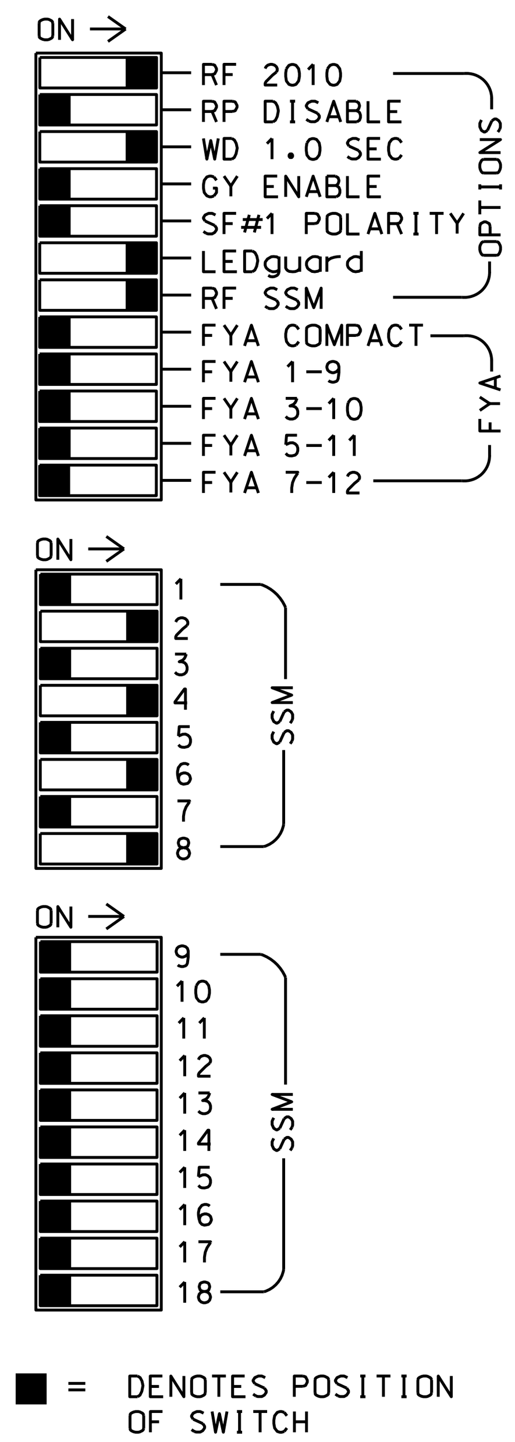
(remove jumpers and set switches as shown)



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



REMOVE JUMPERS AS SHOWN



NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER..............2070
CABINET.................332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S2,S5,S6,S8,S9,S11
PHASES USED.............2,4,4 PED,6,6 PED,8
OVERLAPS................NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋						104			119			
🚶						106			121			

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)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		NOT USED				Ø 4 4B						Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED				Ø 8 8B								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

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

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 13-0176
DESIGNED: February 2021
SEALED: 02-19-21
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 08-07-19.

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
ITS & Signals Management Section
Transportation Mobility and Safety Division
750 N.Greenfield Pkwy,Garner,NC 27529

US 221A-US 74 Bus. (Main St.) at SR 2201 (Oak St.)

Division 13 | Rutherford County | Spindle

PLAN DATE: February 2021	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

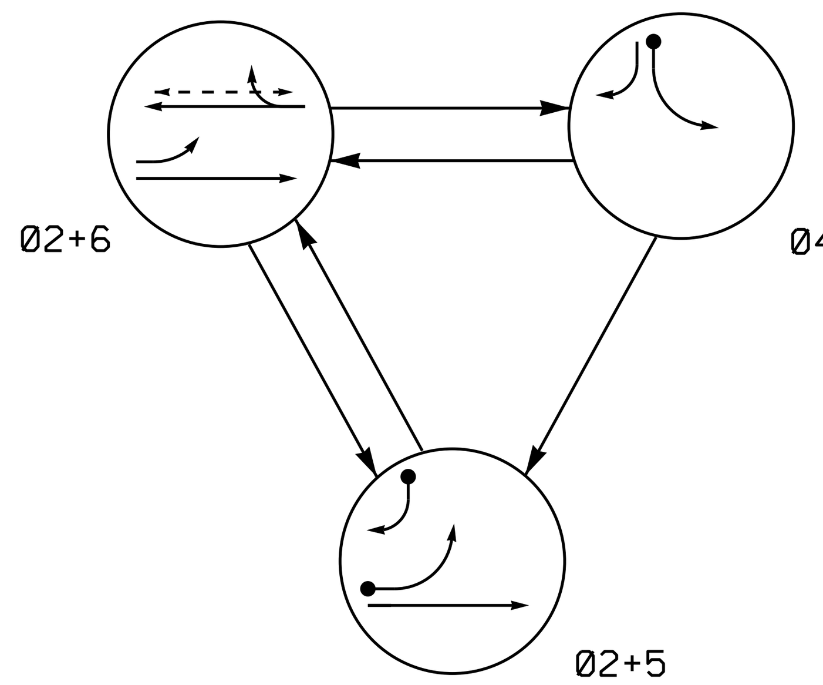
DocuSigned by:
Ryan W. Hough
430320FAA2654C3...
2/19/2021
DATE

SIG. INVENTORY NO. 13-0176

19-FEB-2021 08:49
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Peterson*130176_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 5.0

PHASING DIAGRAM



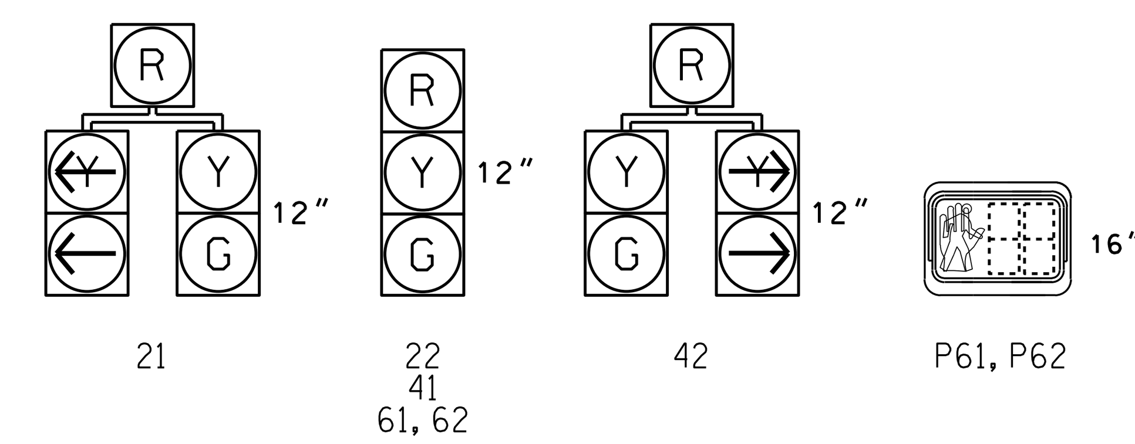
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION				
SIGNAL FACE	PHASE			
	Ø2+5	Ø2+6	Ø4	FLASH
21	G (↙)	G	R	Y
22	G	G	R	Y
41	R	R	G	R
42	R (↗)	R	G	R
61, 62	R	G	R	Y
P61, P62	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

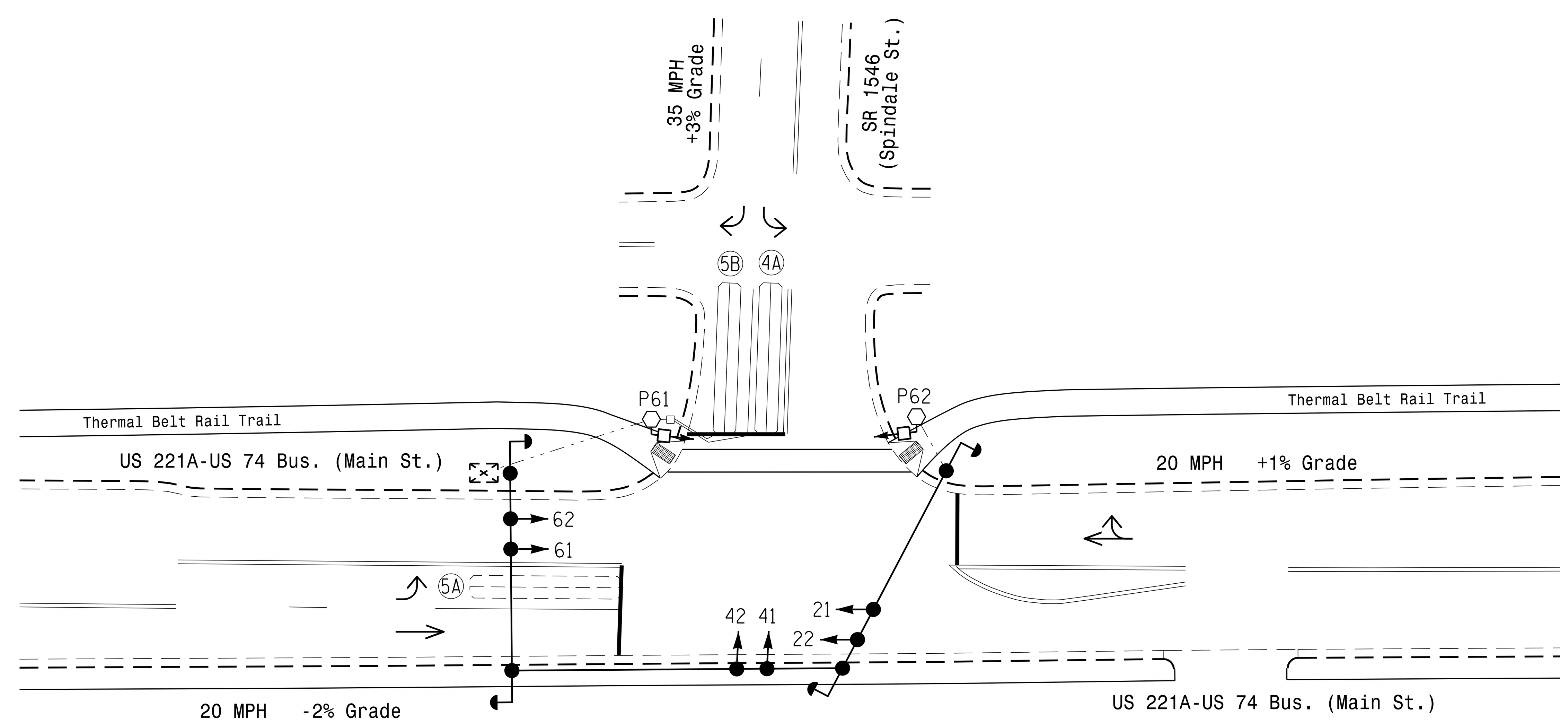


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-

3 Phase
Semi-Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.



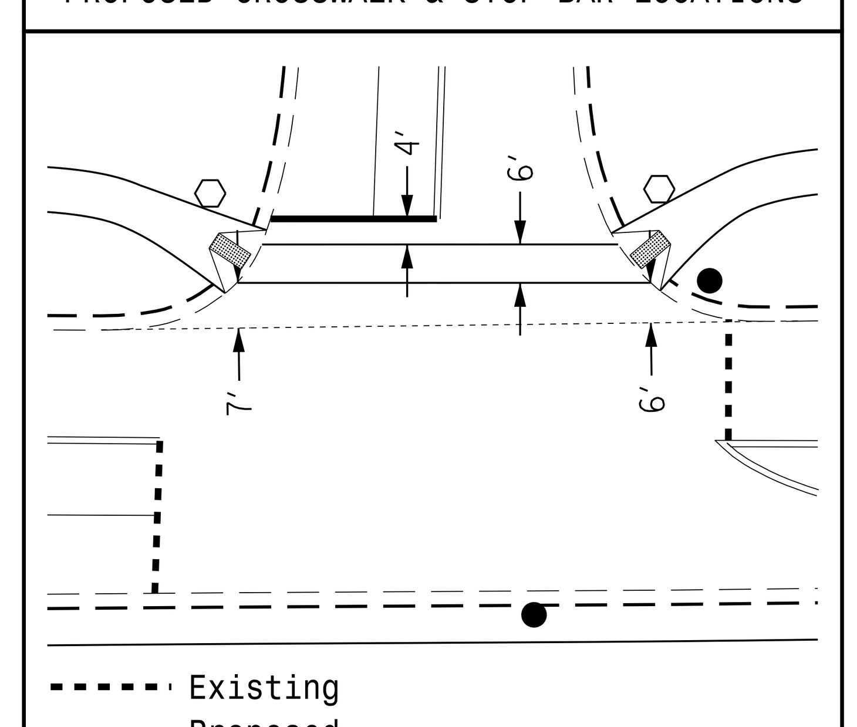
LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
N/A	Curb Ramp	

OASIS 2070 TIMING CHART				
	PHASE			
FEATURE	2	4	5	6
Min Green 1 *	10	7	7	10
Extension 1 *	0.0	2.0	2.0	0.0
Max Green 1 *	45	25	15	45
Yellow Clearance	3.0	3.0	3.0	3.0
Red Clearance	2.8	2.1	2.8	2.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	7
Don't Walk 1	-	-	-	15
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	-	-	MAX RECALL
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

PROPOSED CROSSWALK & STOP BAR LOCATIONS



This plan supersedes the one signed and sealed on 8/5/2019.

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 221A-US 74 Bus. (Main St.) at SR 1546 (Spindale St.)

Division 13 Rutherford County Spindale

PLAN DATE: September 2019	REVIEWED BY: T.J. Williams
PREPARED BY: R.N. Zinser	REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

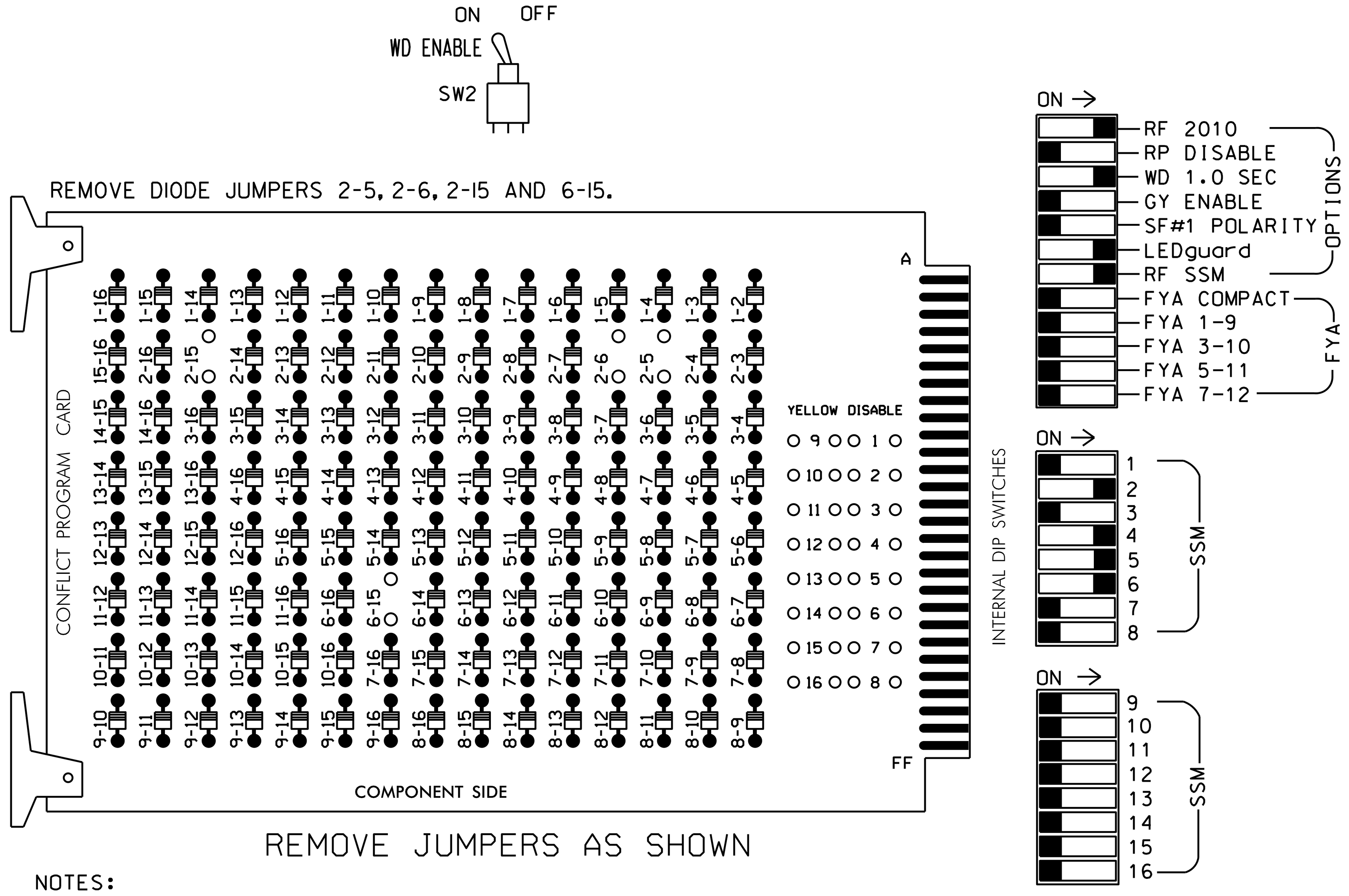
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043914 ENGINEER RICHARD N. ZINSER

DocuSigned by: R. N. Zinser 9/20/2019
F1388973472248F...
DATE

SIG. INVENTORY NO. 13-0174

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6PED DC ISOLATOR	FS DC ISOLATOR
"I"	L						NOT USED							NOT USED	ST DC ISOLATOR
"J"	U	Ø5 5A	Ø5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
"J"	L	NOT USED	NOT USED												

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			15
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I13.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

NOTES

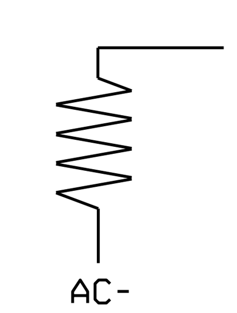
1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phase 6 for Startup Ped Call.
6. Program phases 2 and 6 for Yellow Flash.
7. If this signal will be managed by the ATMS software, enable controller and detector logging for all enabled detectors.

EQUIPMENT INFORMATION

CONTROLLER..............2070L
CABINET.................332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S2,S4,S5,S6,S6P
PHASES USED.............2,4,5,6,6 PED
OVERLAPS................NONE

LOAD RESISTOR INSTALLATION DETAIL

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



NOTE: The purpose of this resistor is to load the channel red monitor input in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on a channel that does not use the red display in the field.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	21,42	61,62	P61, P62	NU	NU	NU
RED		128			101		✳	134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW							132					
GREEN ARROW							133					
(hand)									113			
(walk)									115			

NU = Not Used

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

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: 13-0174
DESIGNED: September 2019
SEALED: 9-20-19
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 8-07-19.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 Bus.-221A (Main Street)
at
SR 1546 (Spindale Street)

Division 13 | Rutherford County | Spindale

PLAN DATE: September 2019 | REVIEWED BY:
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS | INIT. | DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division, ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036833 RYAN W. HOUGH

Ryan W. Hough 10/1/2019
SIGNATURE DATE

SIG. INVENTORY NO. 13-0174

01-OCT-2019 08:46
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jtpeterson

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

(program controller as shown below)

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

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

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE        #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

            SCROLL DOWN

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

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

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE        #5  IS ON

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS:|     XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED   _ YELLOW  _ GREEN
FLASH COLORS:  _ RED   _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:    (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 13-0174
DESIGNED: May 2019
SEALED: 8-05-19
REVISED: N/A

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 221A-US 74 Bus. (Main St.)
at
SR 1546 (Spindale St.)

Division 13 Rutherford County Spindale

PLAN DATE: July 2019	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
ITS & Signals Management Section
State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

DocuSigned by:
Ryan W. Hough
430320FAA2654C3...
8/7/2019
DATE

SIG. INVENTORY NO. 13-0174

07-AUG-2019 07:37
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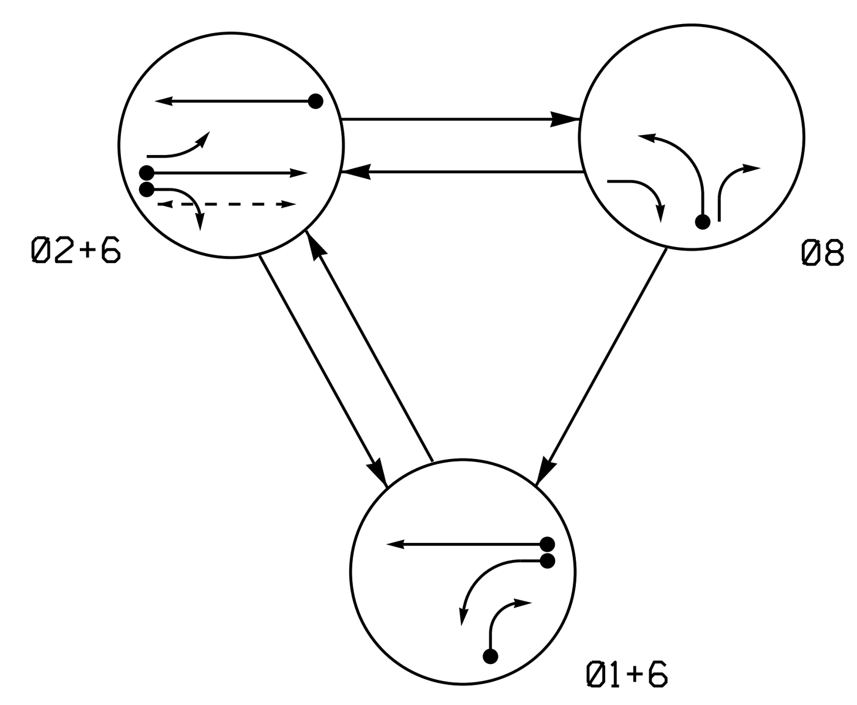
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 6.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

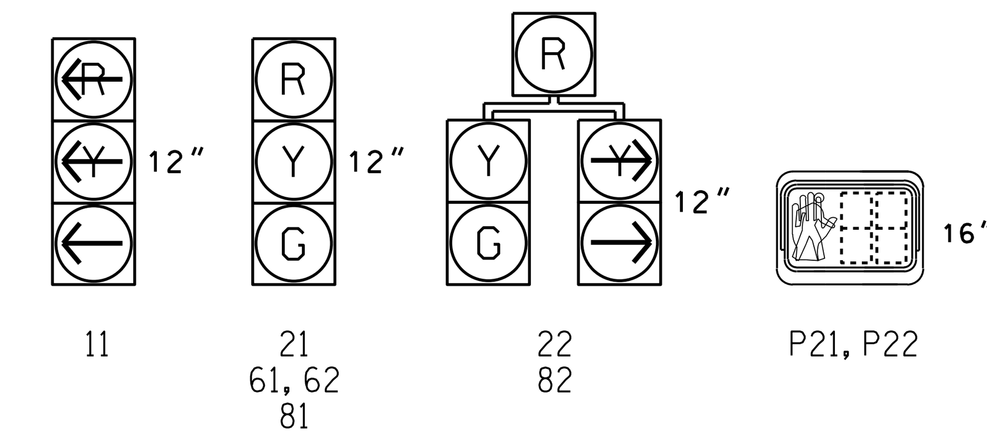
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø8	FLASH
11	←	←R	←R	←R
21	R	G	R	Y
22	R	G	R/→	Y
61, 62	G	G	R	Y
81	R	R	G	R
82	R/→	R	G	R
P21, P22	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



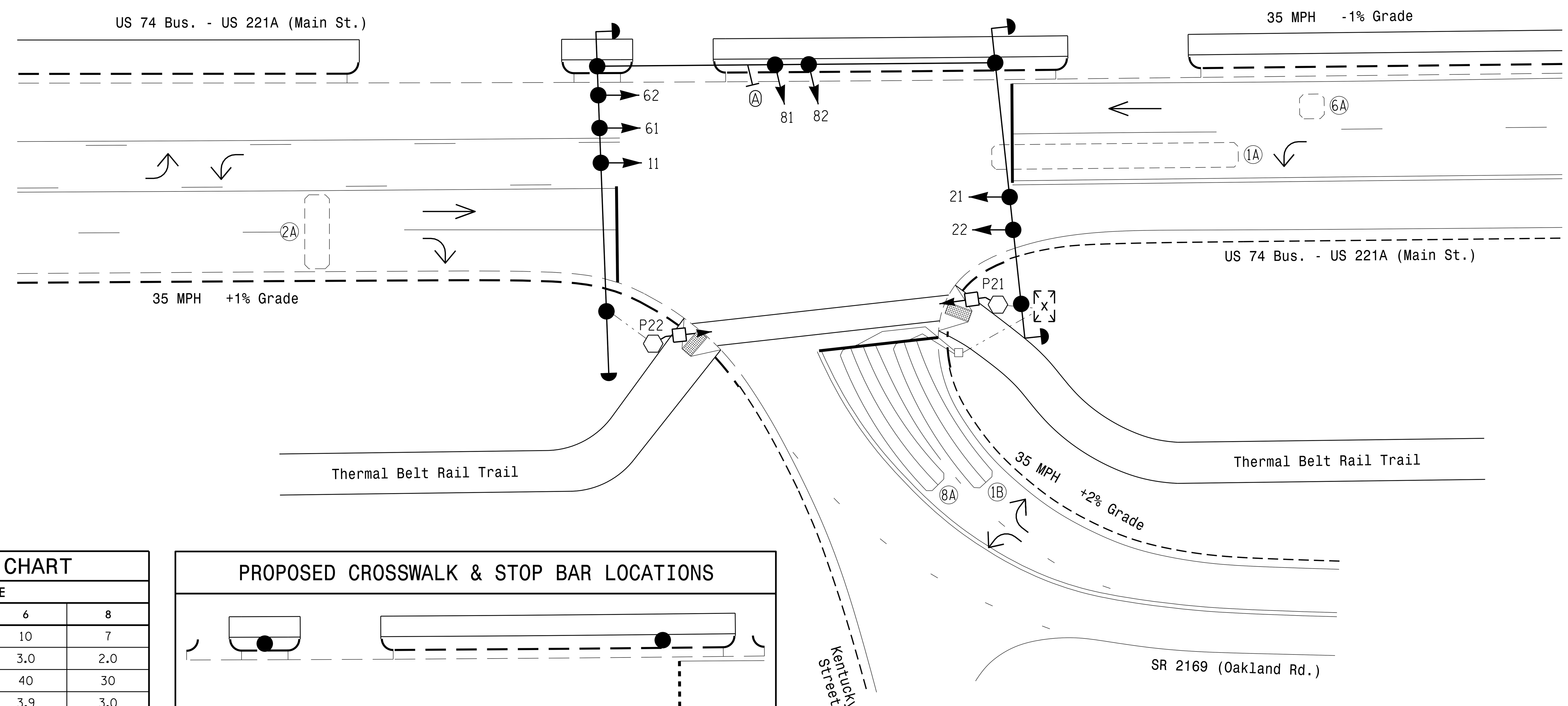
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	+5	EXIST	-	1	Y	Y	-	-	-	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X18	70	EXIST	-	2	Y	Y	-	-	-	-	-
6A	6X6	70	EXIST	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	3	-	-

3 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
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.



LEGEND

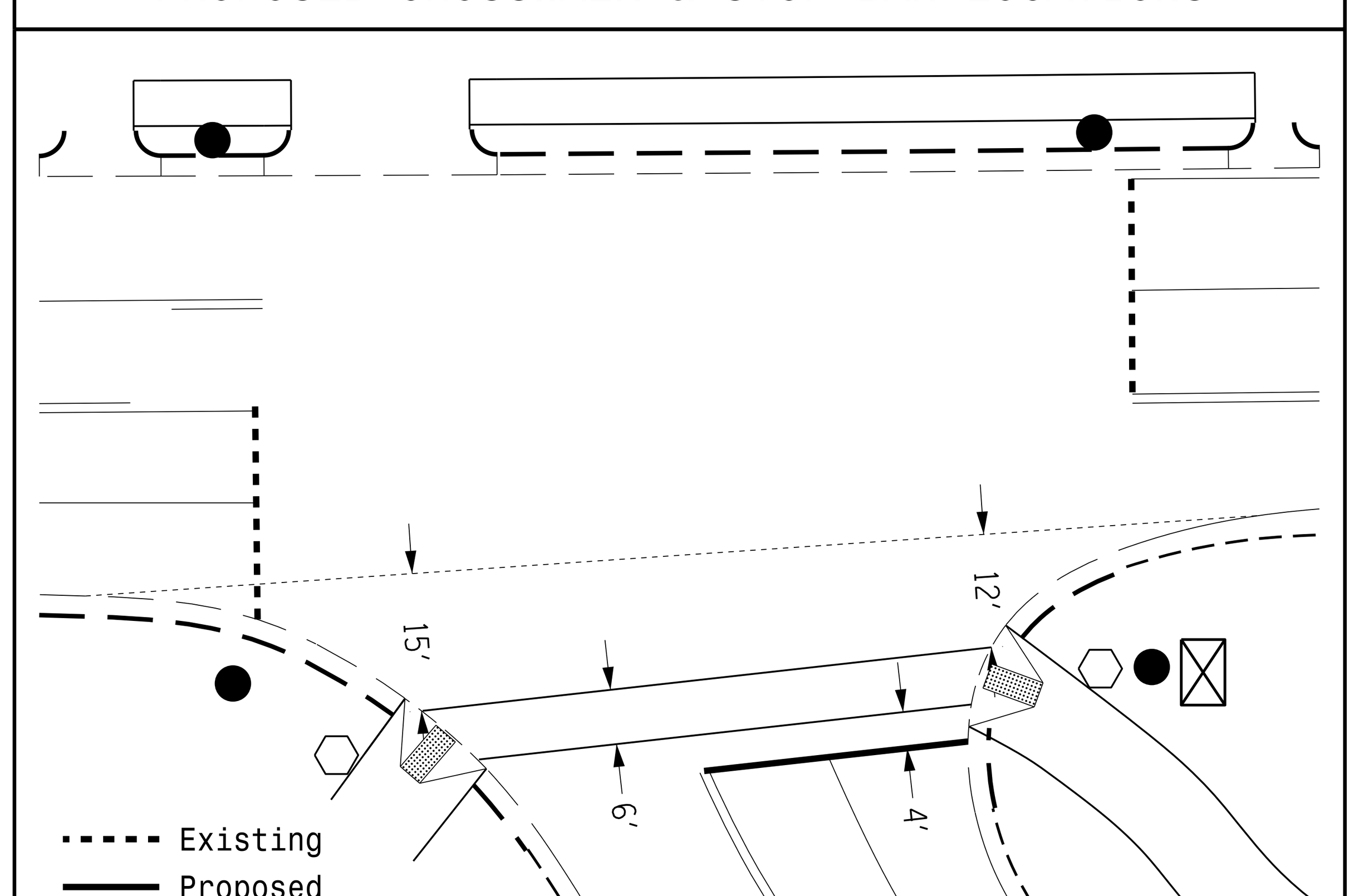
PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
N/A	Curb Ramp	
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	6	8
Min Green 1 *	7	10	10	7
Extension 1 *	2.0	3.0	3.0	2.0
Max Green 1 *	20	40	40	30
Yellow Clearance	3.0	3.9	3.9	3.0
Red Clearance	2.4	1.8	1.8	2.6
Red Revert	2.0	2.0	5.0	2.0
Walk 1 *	-	7	-	-
Don't Walk 1	-	14	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

PROPOSED CROSSWALK & STOP BAR LOCATIONS



Signal Upgrade

US 74 Bus.-US 221A (Main St.)
at
SR 2169 (Oakland Rd.)/
Kentucky Street

Division 13 Rutherford County Spindale

Prepared in the Offices of: Transportation Mobility and Safety Division, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

PLAN DATE: June 2019	REVIEWED BY: T.J. Williams
PREPARED BY: R.N. Zinser	REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043914 ENGINEER RICHARD N. ZINSER

DocuSigned by: R. N. Zinser 8/5/2019
DATE

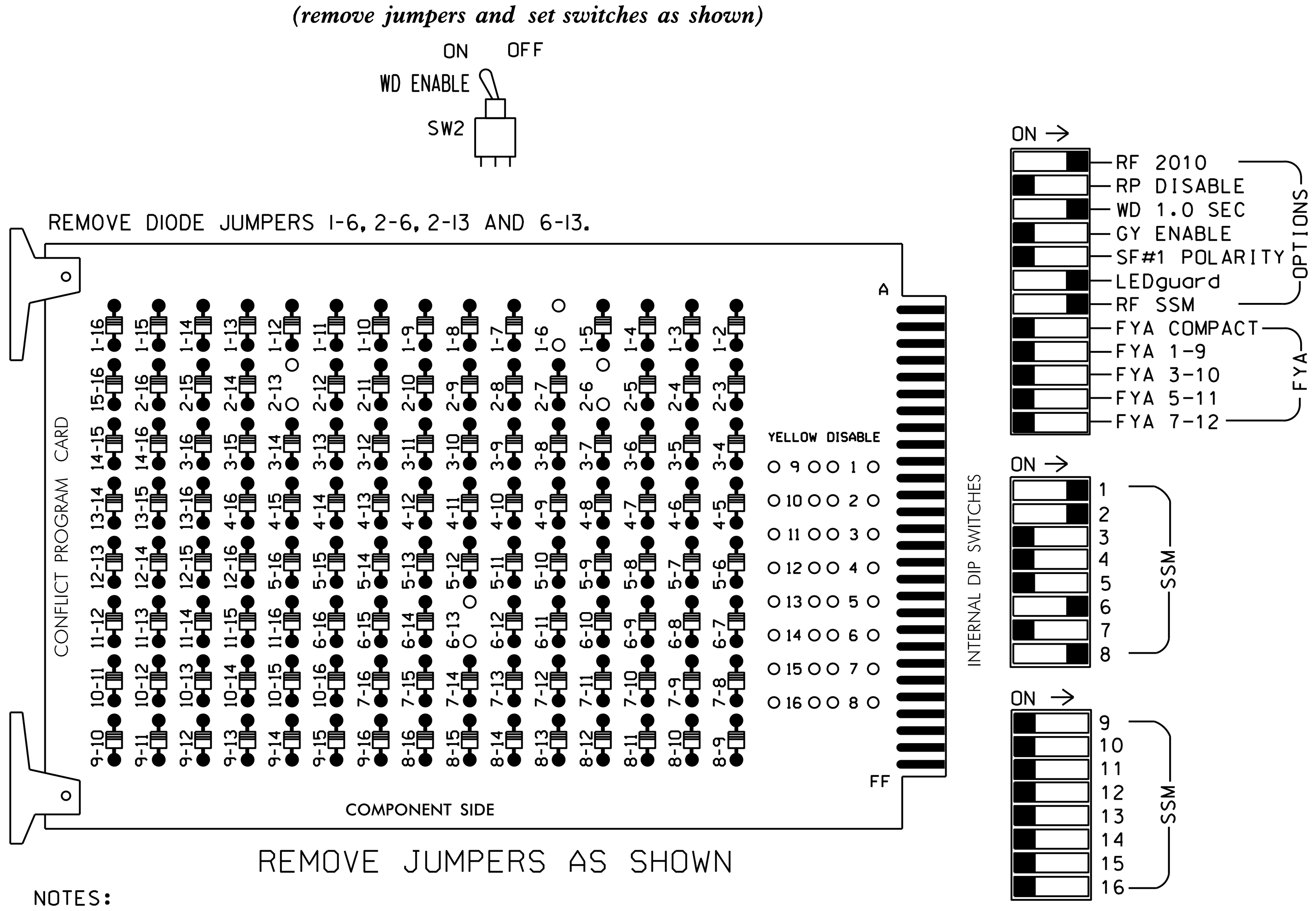
SIG. INVENTORY NO. 13-0173

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 6.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 2-6, 2-13 AND 6-13.



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.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,4,5,7, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phase 6 for Startup Ped Call.
6. Program phases 2 and 6 for Yellow Flash.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8		S8P
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	11	82	21,22	P21, P22	NU	NU	NU	NU	61,62	NU	NU	81,82	22	NU
RED			128						134			107		
YELLOW			129						135			108		
GREEN			130						136			109		
RED ARROW	125													
YELLOW ARROW	126	126											108	
GREEN ARROW	127	127											109	
(hand)				113										
(pedestrian)				115										

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER..............2070
CABINET.................332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S1,S2,S2P,S6,S8
PHASES USED.............1,2,2 PED,6,8
OVERLAPS................NONE

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)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L		Ø1 1B	NOT USED									NOT USED		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED				NOT USED								

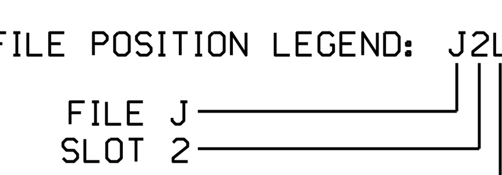
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-5,6	I2U	39	1	2	1	Y	Y			
1B	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.



BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 13-0173
DESIGNED: June 2019
SEALED: 8-05-19
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 Bus.- US 221A (Main St.)
at
SR 2169 (Oakland Rd.) /
Kentucky Street

Division 13 Rutherford County Spindale

PLAN DATE: July 2019 REVIEWED BY:

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

Prepared In the Offices of:
Transportation Mobility and Safety Division
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

Ryan W. Hough 8/7/2019
SIGNATURE DATE

SIG. INVENTORY NO. 13-0173

07-AUG-2019 09:50
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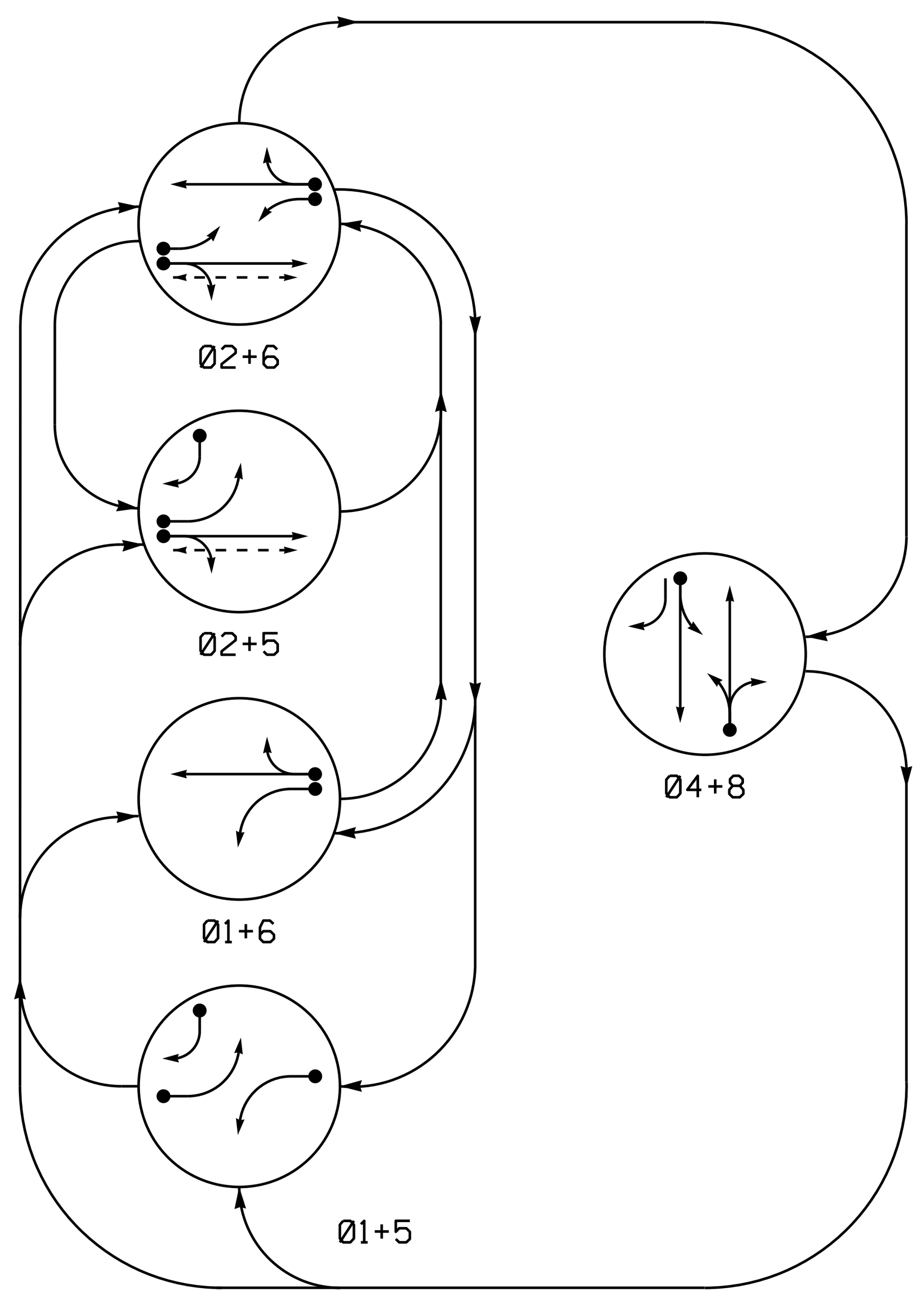
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
EB-5915	Sig. 7.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

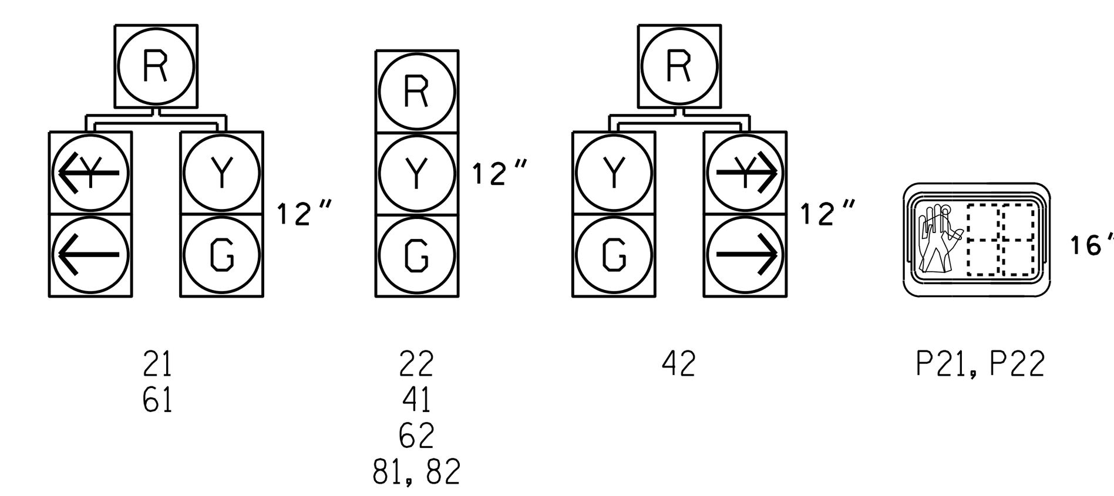
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
21	←/R	R	←/G	G	R	Y
22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R/→	R	R/→	R	G	R
61	←/R	←/G	R	G	R	Y
62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



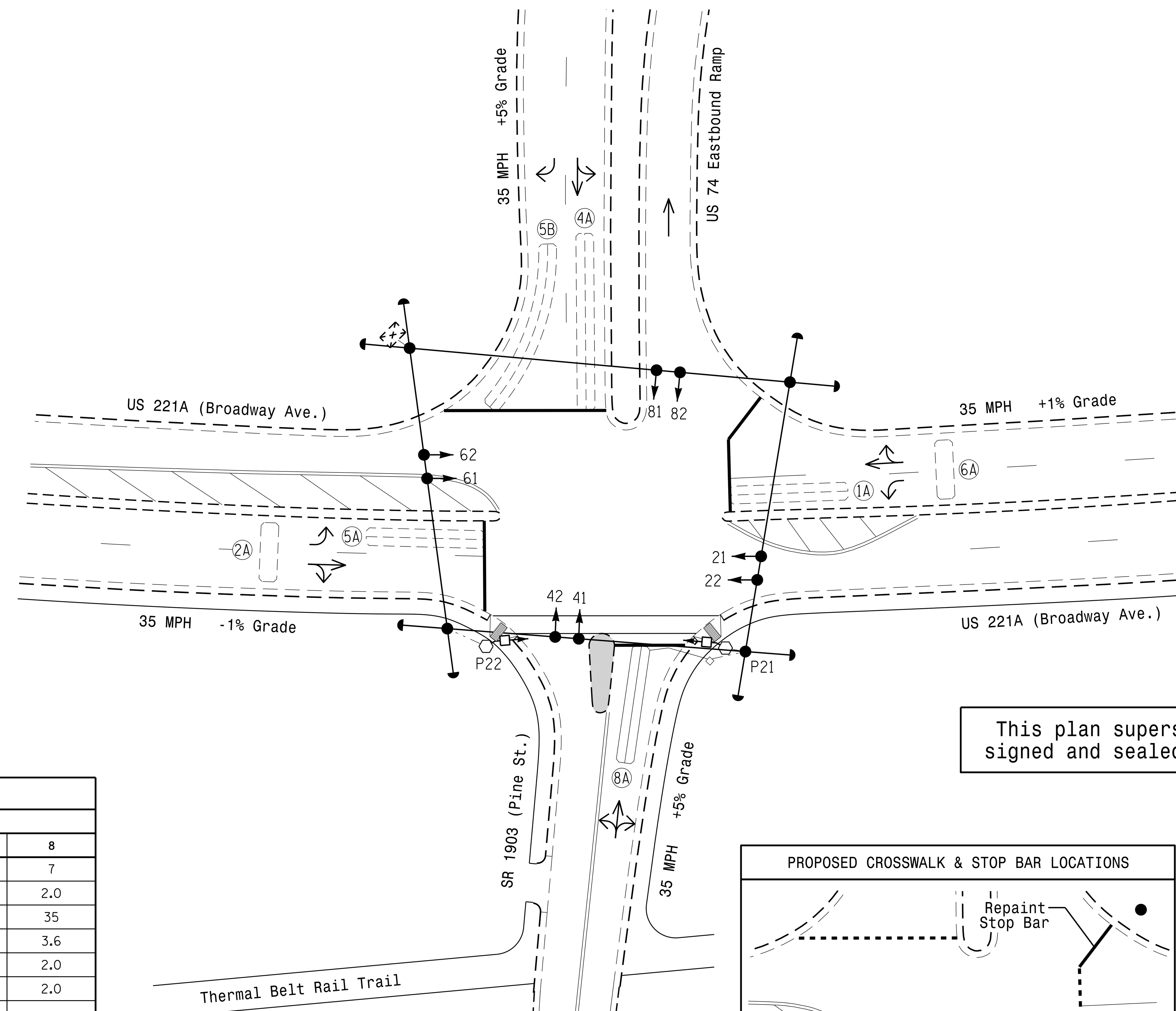
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
					6	Y	Y	-	-	-	-	-
2A	6X20	70	EXIST	-	2	Y	Y	-	-	-	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
					2	Y	Y	-	-	-	-	-
5B	6X60	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X20	70	EXIST	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	-

5 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phases 2 and 6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Trim Westbound raised median to allow clearance for crosswalk, as shown on plan inset.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.



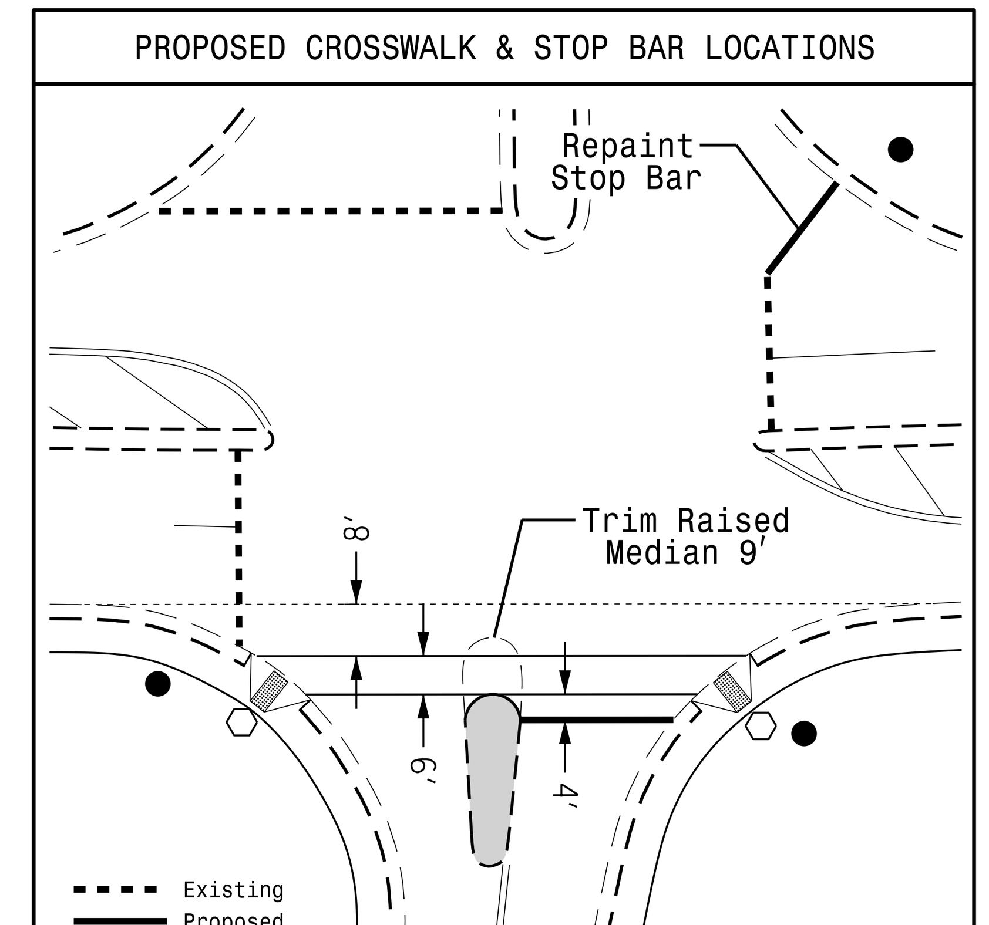
This plan supersedes the one signed and sealed on 8/5/2019.

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	3.0	1.0	2.0	3.0	2.0
Max Green 1 *	20	45	35	20	45	35
Yellow Clearance	3.0	3.9	3.6	3.0	3.9	3.6
Red Clearance	2.4	1.6	2.0	2.4	1.6	2.0
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	7	-	-	-	-
Don't Walk 1	-	16	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

PROPOSED CROSSWALK & STOP BAR LOCATIONS



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
N/A	Curb Ramp	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signal Upgrade

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

US 221A (Broadway Ave.) at US 74 Eastbound Ramp/ SR 1903 (Pine St.)

Division 13 Rutherford County Alexander Mills

PLAN DATE: September 2019	REVIEWED BY: T.J. Williams
PREPARED BY: R.N. Zinser	REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043914 ENGINEER RICHARD N. ZINSER

DocuSigned by: R. N. Zinser
F1388973472248F...
9/20/2019
DATE

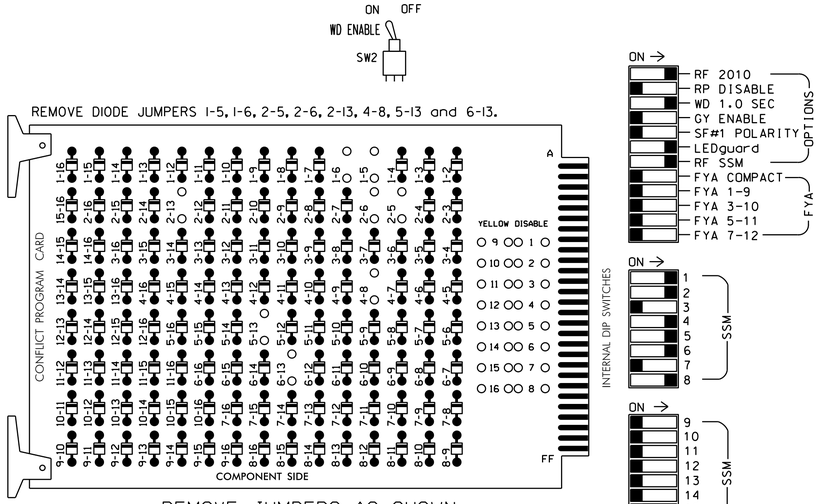
SIG. INVENTORY NO. 13-0483

20-SEP-2019 10:03
S:\ITS&SU\ITS Signals\Signal Design Section\Western Region\Div-13\EB-5915\13-0483\130483_sig_dsn_2019mmdd.dgn
rnzinser

PROJECT REFERENCE NO.	SHEET NO.
EE-5913	Sig. 7.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7,9, 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. Enable Simultaneous Gap-Out for all Phases.
5. Program phases 2 and 6 for Startup In Green.
6. Program phase 2 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash.
8. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S2P,S4,S5,S6,S8
PHASES USED.....1,2,2 PED,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	P21, P22	NU	41,42	NU	21,42	61,62	NU	NU	81,82	NU
RED	✳	128			101		✳	134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126						132					
GREEN ARROW	127						133					
✋			113									
🚶			115									

NU = Not Used

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

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)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	NOT USED				NOT USED							NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø5 5A	Ø6 6A	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø5 5B	NOT USED			NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A[2]	TB3-5,6	J2U	40	2	6	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					

[1] Add jumper from I1-W to J4-W, on rear of input file.

[2] Add jumper from J2-F to I4-W, on rear of input file.

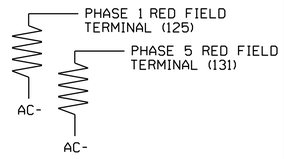
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

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: 13-0483
DESIGNED: September 2019
SEALED: 9-20-19
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 8-07-19.

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 221A (Broadway Avenue)
at
US 74 Eastbound Ramp/
SR 1903 (Pine St.)

Division 13 | Rutherford County | Alexander Mills

PLAN DATE: September 2019 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

DocuSigned by: Ryan W. Hough 10/2/2019
436320EAA2654C3... DATE

SIG. INVENTORY NO. 13-0483

01-OCT-2019 13:21
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jrpeterson

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

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

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

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

SCROLL DOWN

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

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE     #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  ACTIVE PHASE        #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

SCROLL DOWN

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

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE     #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:           |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

PRESS '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:           |12345678910111213141516
VEH OVL PARENTS: |    XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 13-0483
DESIGNED: July 2019
SEALED: 8/5/2019
REVISED:

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division — ITS & Signals Management Section — State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

US 221A (Broadway Avenue) at US 74 Eastbound Ramp/ SR 1903 (Pine St.)

Division 13 — Rutherford County — Alexander Mills

PLAN DATE: July 2019	REVIEWED BY: RWH
PREPARED BY: JPG	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

DocuSigned by: Ryan W. Hough 8/7/2019
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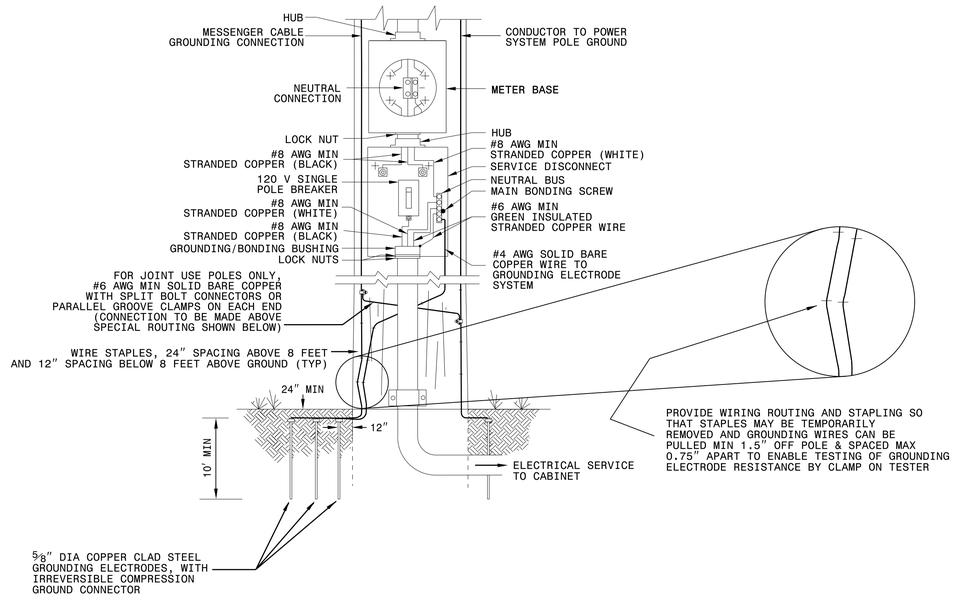
DATE

SIG. INVENTORY NO. 13-0483

PROJECT NO.	SHEET NO.
	Sig.



1-18

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

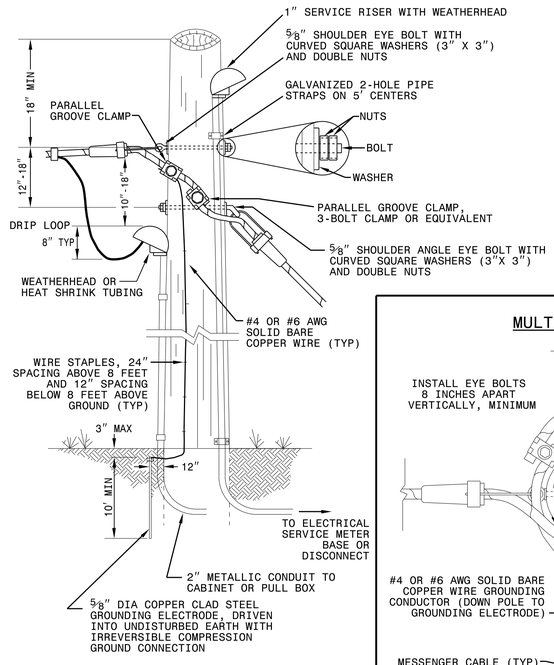
ENGLISH STANDARD DRAWING FOR

ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

SHEET 1 OF 1

1700D01



NOTE

FOR CONNECTING MESSENGER TO MESSENGER, USE PARALLEL GROOVE CLAMP, 3-BOLT CLAMP OR EQUIVALENT. FOR CONNECTING COPPER WIRE TO MESSENGER, USE PARALLEL GROOVE CLAMP.

1-18

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

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

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See Plate for Title

Prepared in the Offices of:

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

750 N. Greenfield Parkway
Garner, NC 27529

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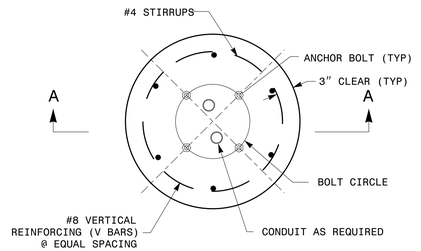
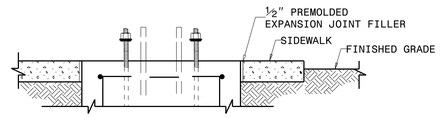
PROJECT NO.	SHEET NO.
	Sig.



PEDESTAL FOUNDATION - PLAN VIEW

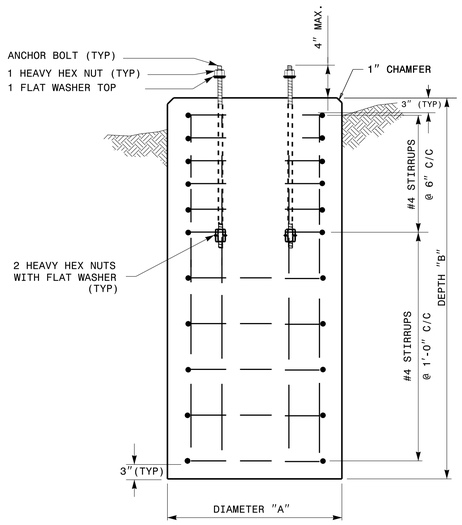


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK

NOTES:

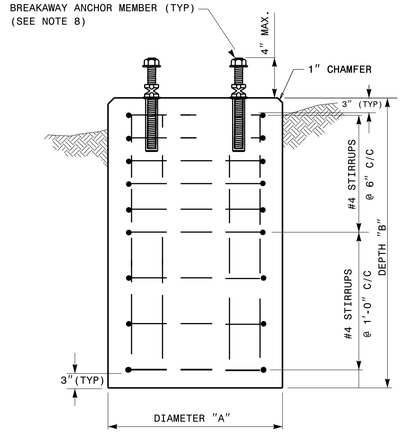
1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION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

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



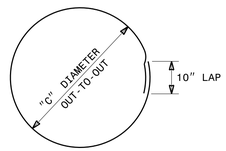
TYPES I, II & III

SECTION A-A

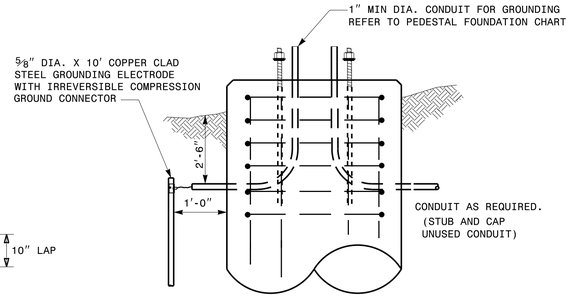


TYPES I & II ONLY

SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

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

REINFORCING STEEL SCHEDULE

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

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

1-18

ENGLISH STANDARD DRAWING FOR

PEDESTALS

FOUNDATIONS

SHEET 1 OF 1

1743D01

See Plate for Title

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

750 N. Greenfield Parkway
Garner, NC 27529

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DEBESH C. SARKAR

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