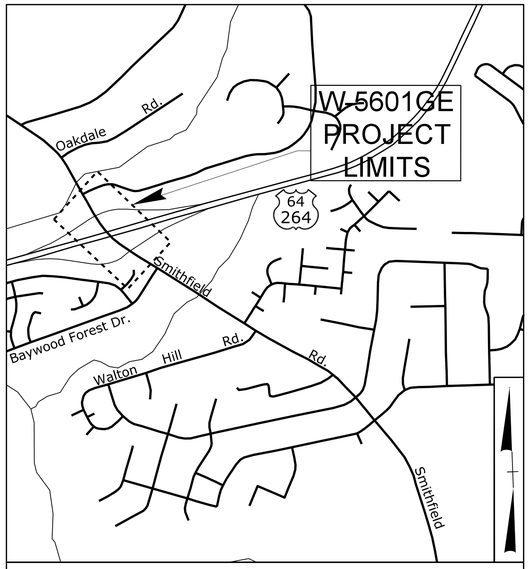
09/08/99

TIP NUMBER: W-5601GE

CONTRACT: DE00169

See Sheet 1A For Index of Sheets
See Sheet 1B For Symbology Sheet
See Sheet 1C-1 For Survey Control Sheet



VICINITY MAP

NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

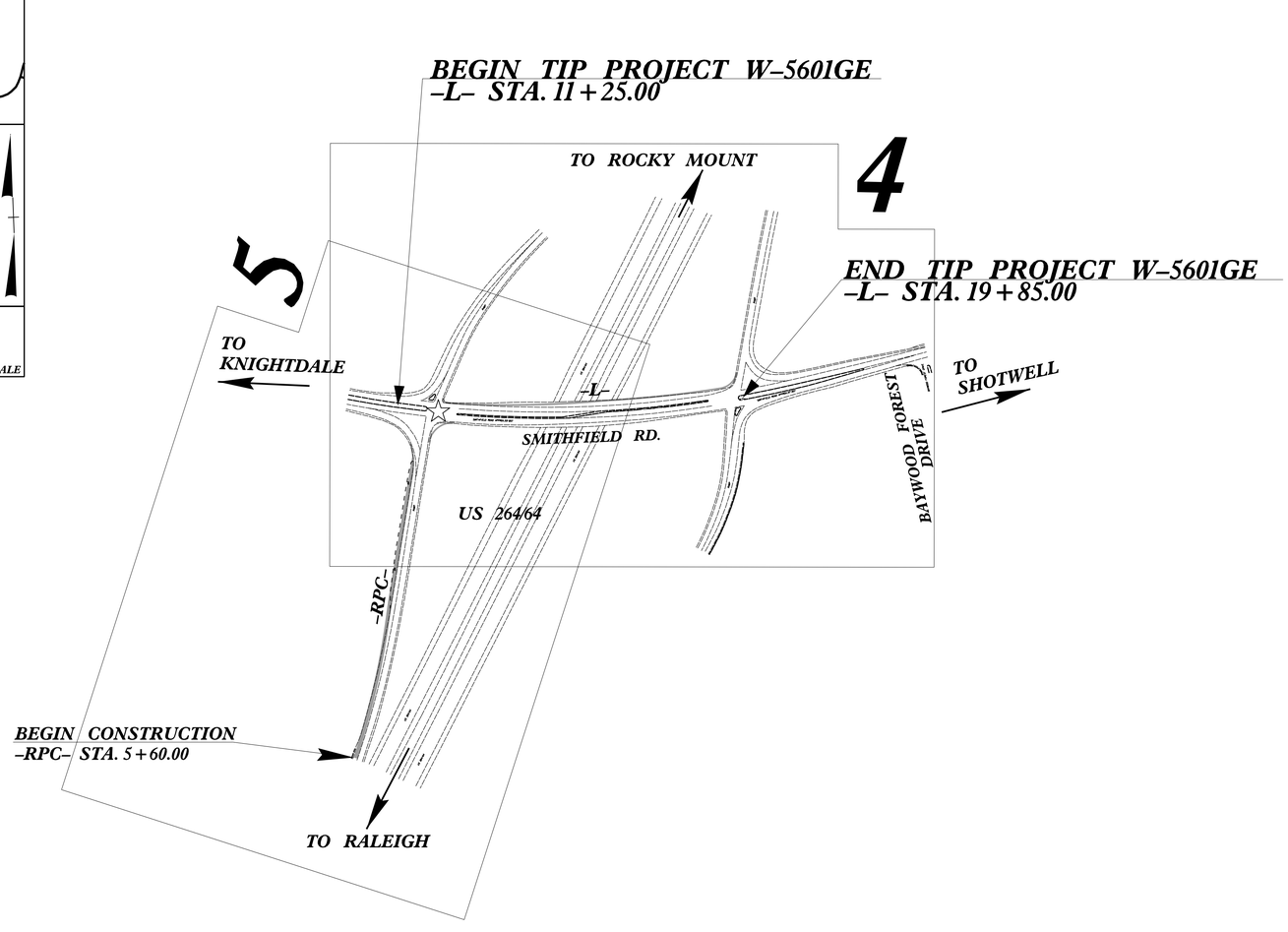
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5601GE	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50138.1.188	HSIP-2233(004)	PE
50138.3.188	HSIP-2233(004)	CONSTR.

LOCATION: SR 2233 (SMITHFIELD RD) AT US 64/264

TYPE OF WORK: PAVING, GRADING, SIGNALS, & PAVEMENT MARKINGS



☆ UPGRADE EXISTING TRAFFIC SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2013 = 19,000

V = 50 MPH

FUNC. CLASS = MINOR ARTERIAL

PROJECT LENGTH

TOTAL LENGTH WBS PROJECT W-5601GE = 0.163 MILES

Stantec

Plans Prepared By:
STANTEC CONSULTING
801 Jones Franklin Road |Suite 300| Raleigh, NC 27606
Tel. (919) 851-6866 | Fax. (919) 851-7024 | www.stantec.com
License No. F-0672

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
N/A

MIKE LINDGREN, PE
PROJECT ENGINEER

MIKE LITTLEFIELD, PE
PROJECT DESIGN ENGINEER

BEN UPSHAW, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D LINDGREN

DocuSigned by: Mike Lindgren 4/10/2017 *P.E.*
SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035663 ENGINEER MICHAEL B LITTLEFIELD

DocuSigned by: Michael B. Littlefield 4/10/2017 *P.E.*
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

4/10/2017
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mlittlefield

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035663 ENGINEER MICHAEL B. LITTLEFIELD

4/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

EFF. 01-17-2012
REV. 02-29-2016

2012 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, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
846.01	Concrete Curb, Gutter and Curb & Gutter
852.01	Concrete Islands
852.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 10-31-2014

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

GUARDRAIL:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE City of Raleigh, AT&T

Duke Energy, Time Warner Cable , NC Department of Transportation

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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04/06/15

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	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
- 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
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — 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:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

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*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- 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:

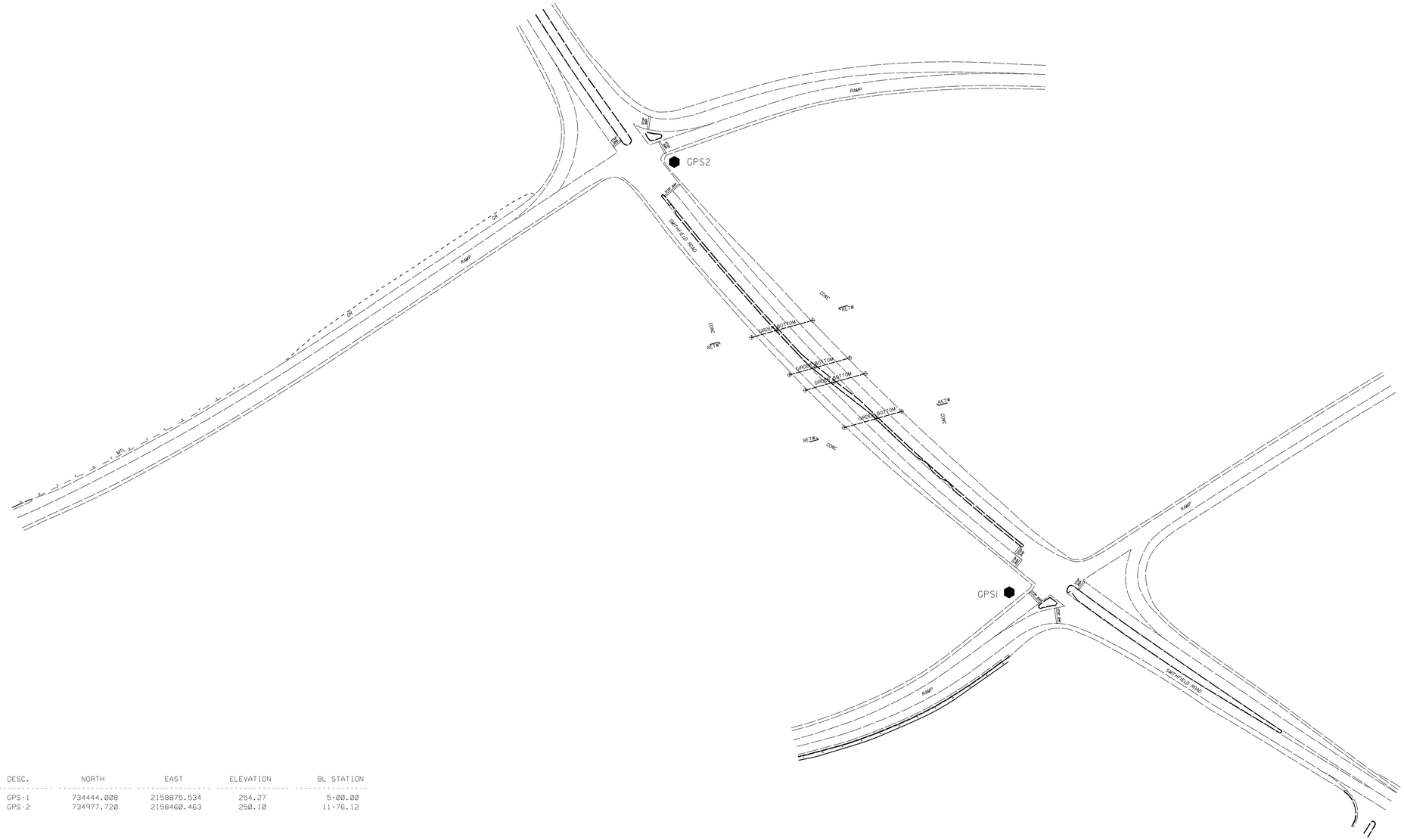
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

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.

SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	IC-1
Location and Surveys	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



BL

POINT	DESC.	NORTH	EAST	ELEVATION	BL STATION
1	GPS-1	734444.008	2158875.534	254.27	5+00.00
2	GPS-2	734977.720	2158460.463	250.10	11+76.12

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY STANTEC FOR MONUMENT "GPS-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 734444.008(ft) EASTING: 2158875.534(ft)
ELEVATION: 254.27(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999906025
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-1" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

EXISTING CONDITIONS SURVEY

SITE COORDINATE CONTROL AND EXISTING CONDITIONS FOR PROJECT ARE FROM A TOPOGRAPHIC SURVEY PERFORMED IN APRIL 2016 BY:
STANTEC CONSULTING
801 JONES FRANKLIN ROAD
RALEIGH, NC 27606

NOTE: DRAWING NOT TO SCALE

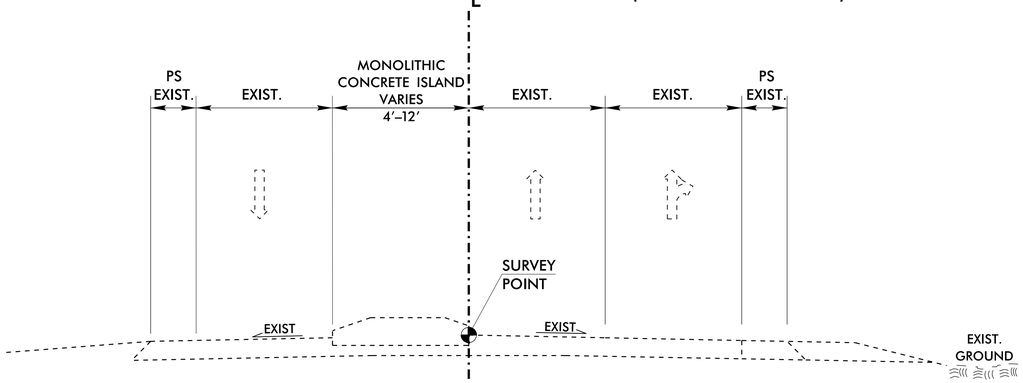
N
NC GRID
NAD 83 NA 2011

6/2/98

PAVEMENT SCHEDULE

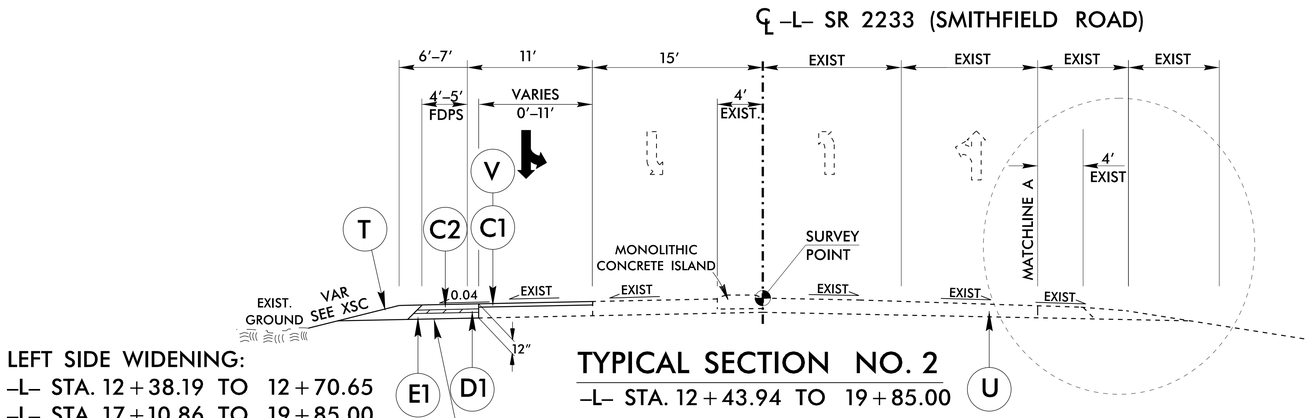
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	1.5″ MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

–L– STA. 11+25.00 TO 12+43.94



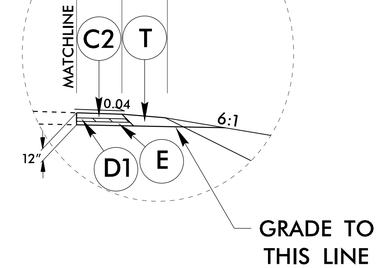
LEFT SIDE WIDENING:
–L– STA. 12+38.19 TO 12+70.65
–L– STA. 17+10.86 TO 19+85.00

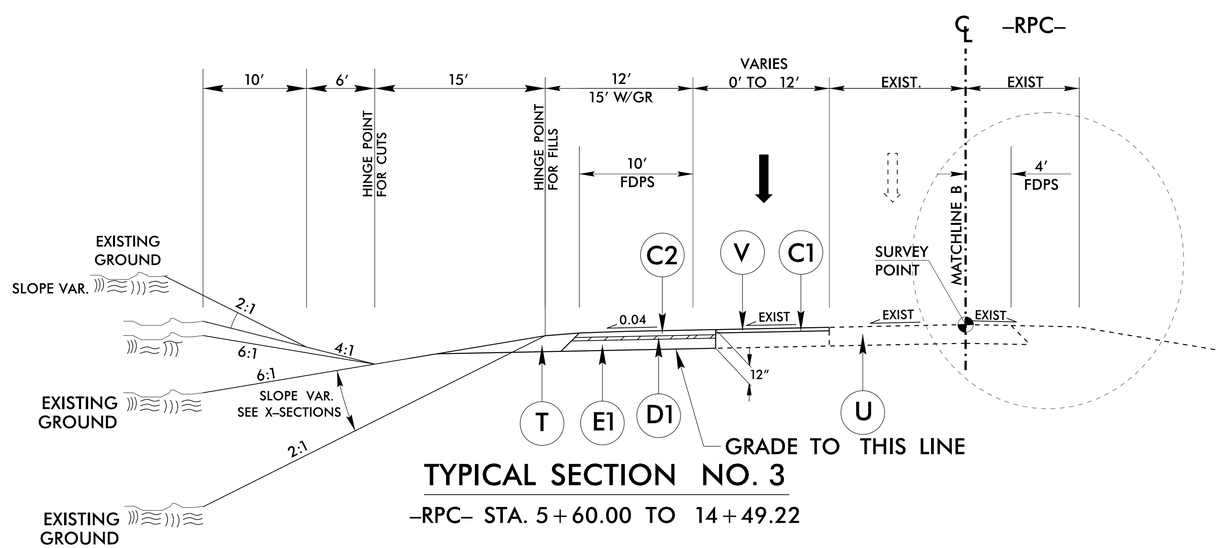
TYPICAL SECTION NO. 2

–L– STA. 12+43.94 TO 19+85.00

INSET 2–A

–L– STA. 12+13.40 TO 12+68.21 RT



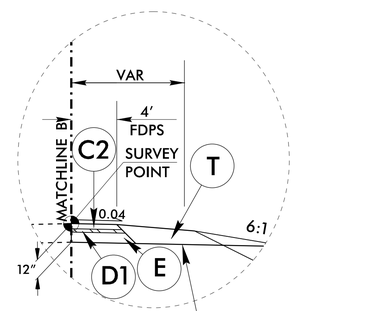


TYPICAL SECTION NO. 3

–RPC– STA. 5+60.00 TO 14+49.22

INSET 3–A

–RPC– STA. 13+67.27 TO 14+22.61 RT



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www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035663 MICHAEL B. LITTLEFIELD

3/8/2017

PAVEMENT DESIGN ENGINEER

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3/7/2017
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mgerdes

12/06/07

COMPUTED BY: LRS DATE: 10/5/16
CHECKED BY: MBL DATE: 3/6/17

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. + %	BORROW	WASTE
–L– 12+50	–L– 19+50	140	4		136
–RPC– 6+50	–RPC– 14+00	170	54		116
SUBTOTALS:		310	58		252
PROJECT TOTALS:		310	58		252
GRAND TOTALS:		310	58		252
SAY:		310			260

Note: Approximate quantities only. Clearing and Grubbing, Unclassified Excavation, and Fine Grading will be paid for at the contract lump sum price for "Grading"

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU 350	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
RPC	5+87.40	9+00.00	LT	312.60			8+00.00		12	15	50		1				1											315		
			SUBTOTAL:	312.60																										
			LESS DEDUCTIONS FOR ANCHORS																											
			GREU-350, TL-3 1 @ 50'	-50.00																										
			PROJECT SUBTOTALS:	262.60																										
			SAY:	275.00																										

6/3/2017
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mlittlefield

8/17/99

REVISIONS

-L-
PI Sta 16+08.19
△ = 25° 09' 27.7" (LT)
D = 2° 07' 47.8"
L = 1,181.14'
T = 600.24'
R = 2,690.00'
SE = EXIST.
RO = EXIST.

NAD 83

Stantec

Stantec Consulting Services Inc.
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Suite 300
Raleigh, NC 27606
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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035663 ENGINEER MICHAEL B LITTLEFIELD	NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D LINGREN
3/8/2017	3/8/2017

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+/- EXISTING R/W LINE (FROM WAKE COUNTY GIS)

BEGIN TIP PROJECT W-5601GE
POT -L- Sta. 11+25.00

END TIP PROJECT W-5601GE
-L- POT STA.19+85.00

POT -RPA- Sta. 5+00.00

PC -L- Sta. 10+07.95

PT -L- Sta. 21+89.09

POT -L- Sta. 24+54.61

S 32° 20' 57.5" E

S 57° 11' 37.4" W

-RPA-

-L-

S 57° 30' 25.2" E

SMITHFIELD ROAD APPROX.55' BST

DO NOT DISTURB EXIST. CONCRETE

RETAIN

POC -L- Sta.12+15.01=
POT -RPC- Sta. 14+49.23

POC -L- Sta. 19+64.17=
POT -RPA- Sta. 8+66.44

-RPC-

N 56° 43' 58.9" E

MATCHLINE -RPC- STA 11+00.00
SEE SHEET 5

☆ UPGRADE EXISTING TRAFFIC SIGNAL
▨ PAVEMENT REMOVAL
SEE SHEET 6 FOR -L- & -RPC- PROFILES

3/7/2017
USR:Colleen.Lewis
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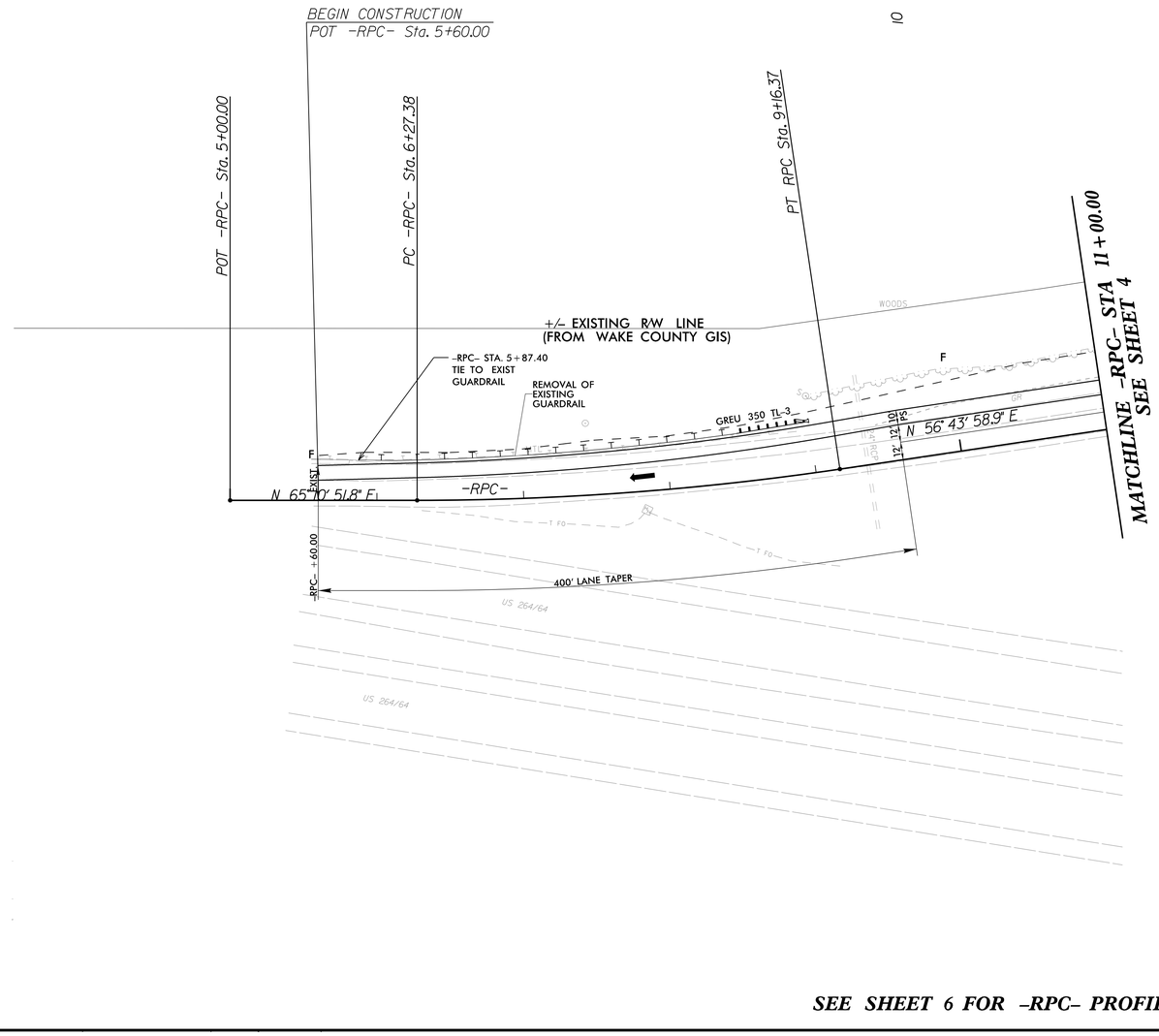
8/17/99

REVISIONS



SEE SHEET 6 FOR -RPC- PROFILE

NAD 83

Stantec
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PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035663 ENGINEER MICHAEL B. LITTLEFIELD
6/13/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
6/13/2017

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6/3/2017
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5/28/99

Stantec

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PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035663 ENGINEER MICHAEL B. LITTLEFIELD

3/8/2017

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025513 ENGINEER MICHAEL D. LINDGREN

3/8/2017

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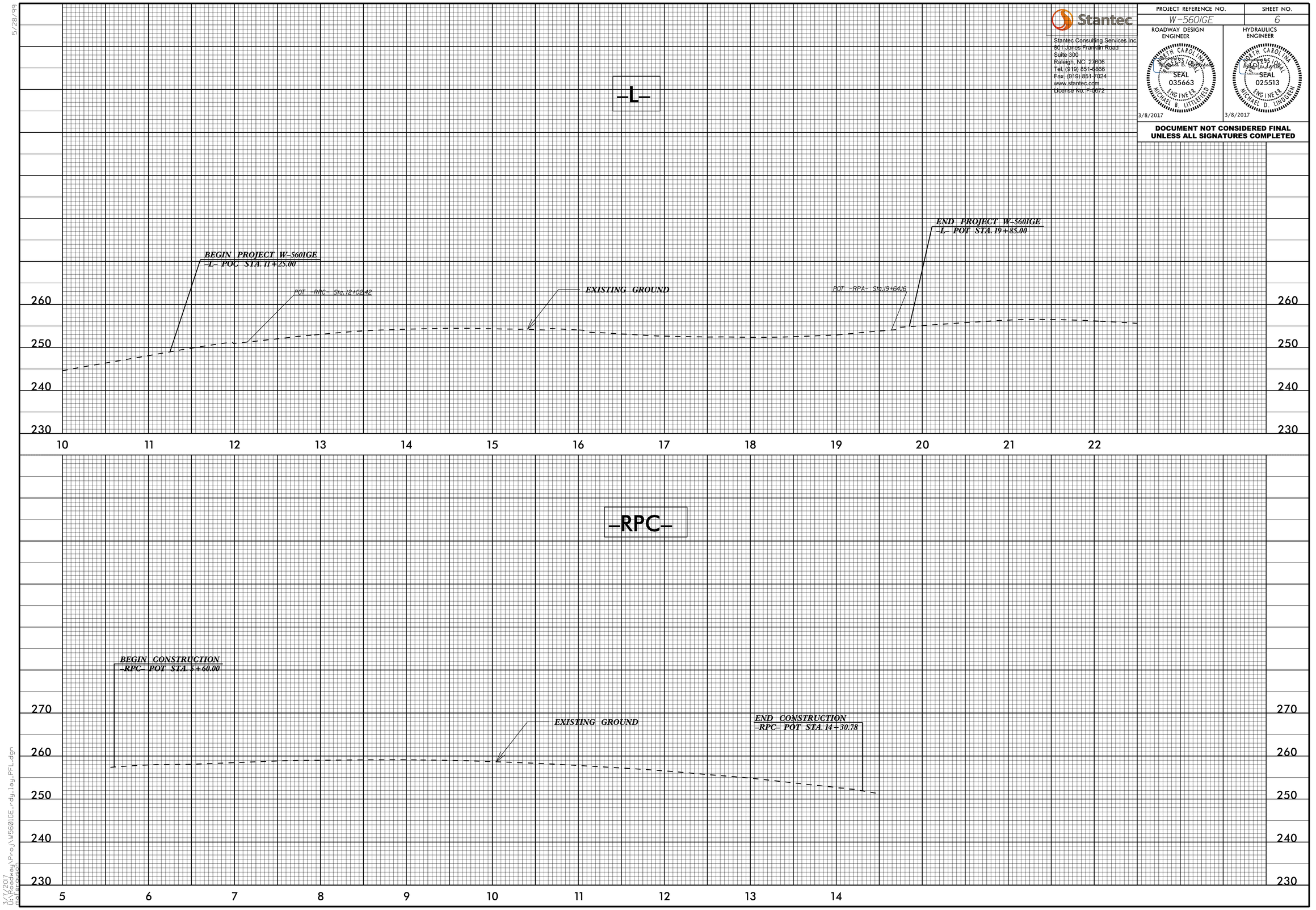

3/7/2017
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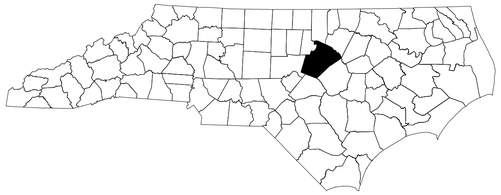
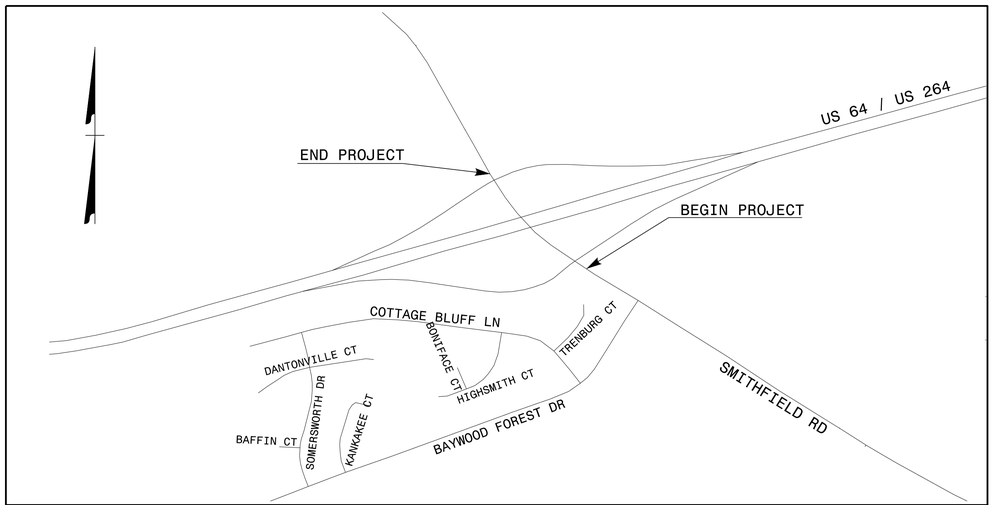
mpearson

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY





VICINITY MAP

INDEX OF SHEETS

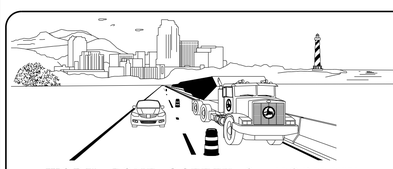
ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1180.01	SKINNY-DRUM
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

SHEET NO.
TMP-1

TIP PROJECT: W-5601GE



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

N.C.D.O.T. CONTACT: DIVISION 5 PROJECT MANAGEMENT

BEN UPSHAW, P.E. *PROJECT ENGINEER*

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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JAY WOOLARD, PE
SENIOR TRANSPORTATION ENGINEER

APPROVED: DocuSigned by: J. W. Woolard, Jr. 88CC2F49E95C4EC...

DATE: 3/8/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD JR.

PROJ. REFERENCE NO.	SHEET NO.
W-5601GE	TMP-2

MANAGEMENT STRATEGIES

THIS PROJECT WILL BE CONSTRUCTED USING THE FOLLOWING STRATEGIES:

- LANE / RAMP CLOSURES
- WORK HOUR RESTRICTIONS FOR PEAK TRAVEL

GENERAL NOTES / LOCAL NOTES

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

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

TIME RESTRICTIONS

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

ROAD NAME	DAY AND TIME RESTRICTIONS
SMITHFIELD RD. (-L-)	MONDAY THRU FRIDAY: 6 AM TO 9 AM MONDAY THRU FRIDAY: 4 PM TO 7 PM
US 64 / 264 RAMP	MONDAY THRU FRIDAY: 6 AM TO 9 AM MONDAY THRU FRIDAY: 4 PM TO 7 PM

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

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

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

F) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

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

TRAFFIC PATTERN ALTERATIONS

I) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

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

PAVEMENT MARKINGS AND MARKERS

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

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

MISCELLANEOUS

O) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) AND RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

PHASING

STEP 1: USING ROADWAY STANDARD DRAWING (RSD) 1101.01, PLACE ADVANCE WARNING SIGNS.

STEP 2: USING RSD 1101.04, CONSTRUCT WIDENING UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE:

- -L- STA. 12+43.94 +/- TO STA. 19+85 +/-
- -RPC- STA. 5+60 +/- TO STA. 14+49.22 +/-

USING RSD 1104.01 AND MOVING TRAFFIC INTO THE LEFT TURN LANE (ON -L-) AS NECESSARY, COMPLETE THE FOLLOWING FROM STA. 12+43.94 +/- -L- TO STA. 19+85 +/- -L- AND FROM STA. 5+60 +/- -RPC- TO STA 14+49.22 +/- -RPC-:

STEP 3: MILL THE EXISTING PAVEMENT AS SHOWN IN THE CONSTRUCTION PLANS.

STEP 4: PLACE THE FINAL LAYER OF SURFACE COURSE.

STEP 5: REMOVE ALL CONFLICTING PAVEMENT MARKINGS AND PLACE FINAL PAVEMENT MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS.

STEP 6: OPEN TRAFFIC TO THE FINAL TRAFFIC PATTERN AND REMOVE ALL TRAFFIC CONTROL DEVICES.

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APPROVED: DocuSigned by: J. W. Woolard, Jr. 8B0C0F4B85BC4D5...

DATE: 3/8/2017

NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD, JR.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

MANAGEMENT STRATEGIES
GENERAL NOTES
PHASING

T.I.P.: W-5601GE

CONTRACT:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
WAKE COUNTY

LOCATION: SR 2233 (SMITHFIELD RD) AT US 64/264

TIP NO.	SHEET NO.
W-5601GE	PMP-1

APPROVED: Docusigned by: Betsy L. Watson 3507B83E4F874EF...

DATE: 3/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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ROADWAY STANDARD DRAWINGS

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STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.08	PAVEMENT MARKINGS - SYMBOLS & WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
SMITHFIELD RD	THERMOPLASTIC	RAISED
RAMP C	THERMOPLASTIC	SNOWPLOWABLE

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

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

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

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

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

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	PAY ITEM	
T2	WHITE STOPBAR	(24", 120 MIL)	THERMOPLASTIC
T8	2 FT - 6 FT/SP WHITE MINISKIP	(4", 120 MIL)	THERMOPLASTIC
T13	3 FT - 9 FT/SP WHITE MINISKIP	(8", 120 MIL)	THERMOPLASTIC
TA	WHITE EDGELINE	(4", 90 MIL)	THERMOPLASTIC
TB	YELLOW EDGELINE	(4", 90 MIL)	THERMOPLASTIC
TD	3 FT - 9 FT/SP WHITE MINISKIP	(4", 120 MIL)	THERMOPLASTIC
TE	WHITE SOLID LANE LINE	(4", 120 MIL)	THERMOPLASTIC
TI	YELLOW DOUBLE CENTER	(4", 120 MIL)	THERMOPLASTIC
TN	WHITE GORELINE	(8", 90 MIL)	THERMOPLASTIC
TR	WHITE SOLID LANE LINE	(8", 120 MIL)	THERMOPLASTIC
TU	WHITE DIAGONAL	(12", 90 MIL)	THERMOPLASTIC
TV	YELLOW DIAGONAL	(12", 90 MIL)	THERMOPLASTIC
UA	LEFT TURN ARROW	(90 MIL)	THERMOPLASTIC
UC	STRAIGHT ARROW	(90 MIL)	THERMOPLASTIC
UD	COMBO LEFT/STRAIGHT	(90 MIL)	THERMOPLASTIC
UE	COMBO STRAIGHT/RIGHT	(90 MIL)	THERMOPLASTIC
UI	ALPHANUMERIC CHARACTERS	(120 MIL)	THERMOPLASTIC
UN	24" YIELD LINE TRIANGLE	(90 MIL)	THERMOPLASTIC
UP	MERGE ARROW	(90 MIL)	THERMOPLASTIC
UQ	RAMP ARROW SYMBOL	(90 MIL)	THERMOPLASTIC
ZZ	ROUTE SHIELD	(90 MIL)	THERMOPLASTIC

PLAN PREPARED BY:

BETSY L. WATSON, P.E. SENIOR TRANSPORTATION ENGINEER

ROSI R. HENNEIN TRANSPORTATION DESIGNER

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INDEX

TIP NO.	SHEET NO.
W-5601GE	PMP-2

APPROVED: Betsy L. Watson

DATE: 3/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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US 64/264

SR 2233 SMITHFIELD RD

-L- STA 11+79+/-

-L- STA 10+54+/-

TIE TO EXISTING

SR 2233 SMITHFIELD RD

-L- STA 12+34+/-

TIE TO EXISTING

-L- STA 12+44+/-

-L- STA 12+85+/-

-L- STA 12+76+/-

-L- STA 12+68+/-

-RPC- STA 13+67+/-

TIE TO EXISTING

-RPC- STA 11+99+/-

-L- STA 11+75+/-

-RPC- STA 13+59+/-

-RPC- STA 13+57+/-

TIE TO EXISTING

-RPC- STA 12+76+/-

-L- STA 11+90+/-

-L- STA 11+63+/-

-RPA- STA 8+01+/-

TIE TO EXISTING

-L- STA 19+35+/-

-L- STA 16+99+/-

-L- STA 16+27+/-

-L- STA 18+98+/-

-L- STA 15+51+/-

-L- STA 19+38+/-

TIE TO EXISTING

-L- STA 15+27+/-

PLACE PROPOSED MARKING ON TOP OF EXISTING

-RPA- STA 7+72+/-

-RPA- STA 7+76+/-

-RPA- STA 7+64+/-

-L- STA 21+41+/-

-L- STA 24+55+/-

-L- STA 21+61+/-

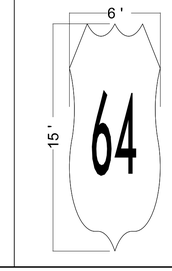
-L- STA 20+52+/-

PLACE PROPOSED MARKING ON TOP OF EXISTING & EXTEND

R 74'

MATCHLINE -RPC- STA 11+00 SEE SHEET PMP-3

ROUTE SHIELD DETAIL



★ SIGNALIZED

THERMOPLASTIC PAVEMENT MARKING LEGEND

UA LEFT TURN ARROW	T2 WHITE STOPBAR (24")
UC STRAIGHT ARROW	T8 2 FT - 6 FT/SP WHITE MINISKIP (4")
UD LEFT/STRAIGHT ARROW	T13 3 FT - 9 FT/SP WHITE MINISKIP (8")
UE STRAIGHT/RIGHT ARROW	TA WHITE EDGELINE (4")
UI ONLY ALPHANUMERIC CHARACTERS	TB YELLOW EDGELINE (4")
UI WEST ALPHANUMERIC CHARACTERS	TD 3 FT - 9 FT/SP WHITE MINISKIP (4")
UN 24" YIELD LINE TRIANGLE	TE WHITE SOLID LANE LINE (4")
UP MERGE ARROW	TI YELLOW DOUBLE CENTER (4")
UQ RAMP ARROW	TN WHITE GORELINE (8")
ZZ 64 ROUTE SHIELD ON DARK PAVEMENT	TR WHITE SOLID LANE LINE (8")
	TU WHITE DIAGONAL (12")
	TV YELLOW DIAGONAL (12")

PAVEMENT MARKING DETAIL

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

TIP NO.	SHEET NO.
W-5601GE	PMP-3

APPROVED: Betsy L. Watson (DocuSigned by: 3666788A5AF8428...)

DATE: 3/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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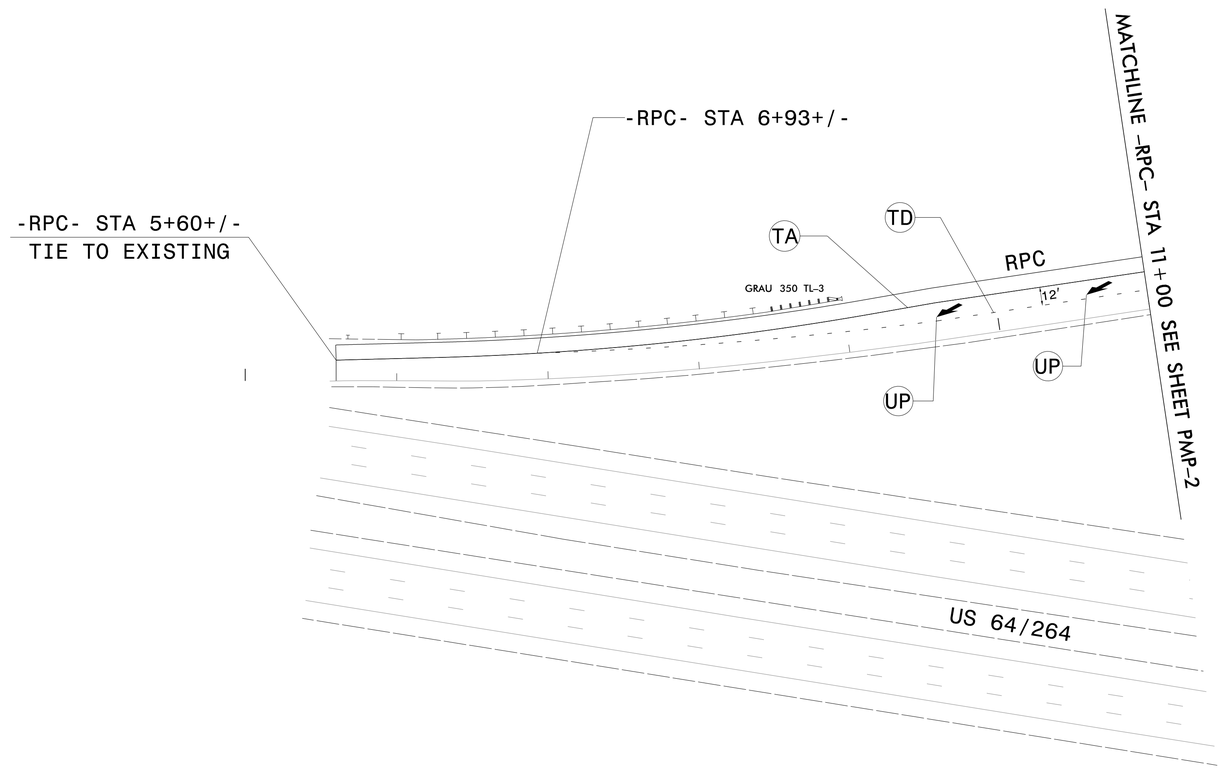

THERMOPLASTIC PAVEMENT MARKING LEGEND	
(UP) MERGE ARROW	(TA) WHITE EDGELINE (4")
	(TD) 3 FT - 9 FT/SP WHITE MINISKIP (4")

PAVEMENT MARKING DETAIL

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

EROSION CONTROL PLAN

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	
1630.05	Temporary Diversion	
1630.06	Special Stilling Basin	
1632.03	Rock Inlet Sediment Trap Type C	
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	
	Wattle with Polyacrylamide (PAM)	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	EC-1/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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REVISIONS 8/17/99

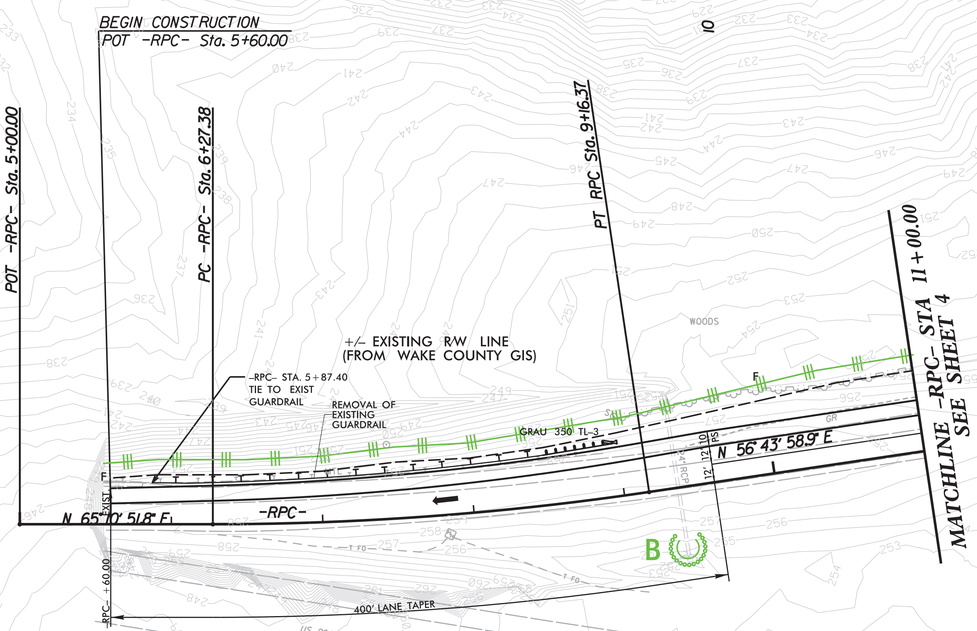
SYSTEM\$\$\$

8/17/99

REVISIONS

EROSION CONTROL PLAN

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1632.03	Rock Inlet Sediment Trap Type C	
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	
	Wattle with Polyacrylamide (PAM)	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	



PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	EC-2/CONST.5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

2012 STANDARD DRAWINGS

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		

-RPC-
PI Sta 7+72.14
Δ = 8° 26' 52.9" (LT)
D = 2° 55' 23.7"
L = 288.99'
T = 144.76'
R = 1,960.00'
SE = EXIST.
RO = EXIST.

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2012 STANDARD SPECIFICATIONS

CRYSTAL MOORE
LEVEL III NAME

3124
LEVEL III CERTIFICATION NO.

SCTIME SIGNATURE

T.I.P.: W-5601GE

CONTRACT:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
WAKE COUNTY

LOCATION: SR 2233 (SMITHFIELD RD) AT US 64/264

TIP NO.	SHEET NO.
W-5601GE	SIGN-1

APPROVED: Digitally signed by Betsy L. Watson

DATE: 3/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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ROADWAY STANDARD DRAWINGS

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STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

GENERAL NOTES

. SIGNS FURNISHED BY STATE.

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

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

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

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

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

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4072000000	903	SUPPORTS, 3-LB STEEL U-CHANNEL	100	L.F.
4102000000	904	SIGN ERECTION, TYPE E	4	EA.
4108000000	904	SIGN ERECTION, TYPE F	1	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	2	EA.

INDEX

PLAN PREPARED BY:

BETSY L. WATSON, P.E. SENIOR TRANSPORTATION ENGINEER

ROSI R. HENNEIN TRANSPORTATION DESIGNER

Stantec

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Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

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

401 QUANTITY REQ'D 1

36 X 36 X 36
R1-2

ONE "U" POST PER SIGN

402 QUANTITY REQ'D 1

36 X 36
W9-1R

ONE "U" POST PER SIGN

403 QUANTITY REQ'D 1

36 X 36
W4-2R

ONE "U" POST PER SIGN

404 QUANTITY REQ'D 1

36 X 36
R3-7L

ONE "U" POST PER SIGN

501

2 - 24 X 12
2 - 24 X 24
2 - 30 X 24
1 - 24 X 18
1 - 21 X 15

TWO "U" POSTS PER SIGN

TIP NO.	SHEET NO.
W-5601GE	SIGN-2

APPROVED: Developed by Betsy L. Watson (DocuSigned by: 3A6E7B5D4F6E4A9...)

DATE: 3/9/2017

SEAL

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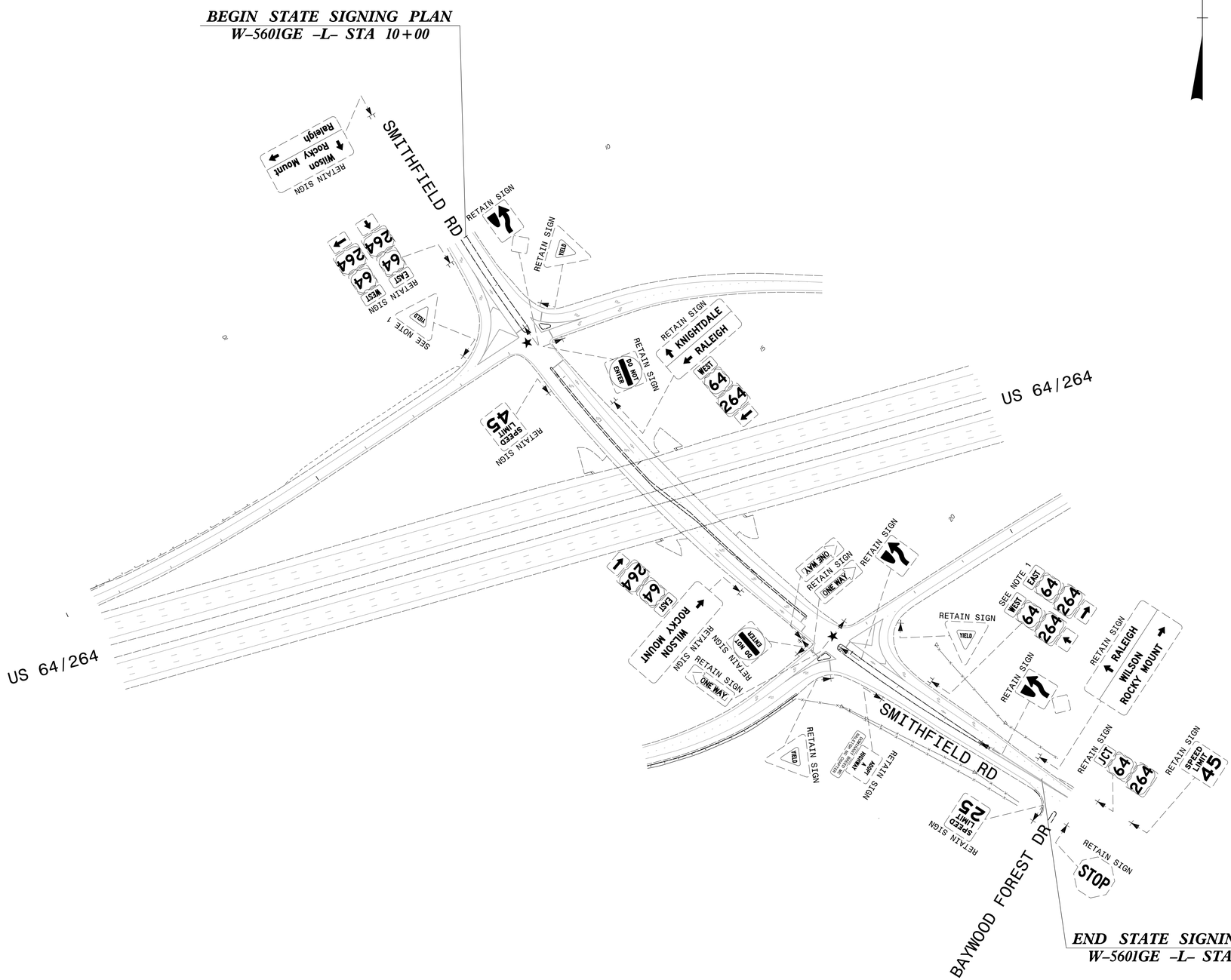
Stantec

TYPE 'E' SIGNS
&
TYPE 'F' SIGNS

$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$JCN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT NOTES

1 DISPOSAL OF SIGN SYSTEM, U-CHANNEL



TIP NO.	SHEET NO.
W-5601GE	SIGN-3

APPROVED: Docusigned by: Betsy L. Watson 3568788E34F87A3F...

DATE: 3/9/2017

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NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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EXISTING SIGNING
SMITHFIELD RD
-L- STA 10+00 TO 24+00

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

TIP NO.	SHEET NO.
W-5601GE	SIGN-4

APPROVED: Betsy L. Watson (DocuSigned by: 3966788D49874CF...)

DATE: 3/9/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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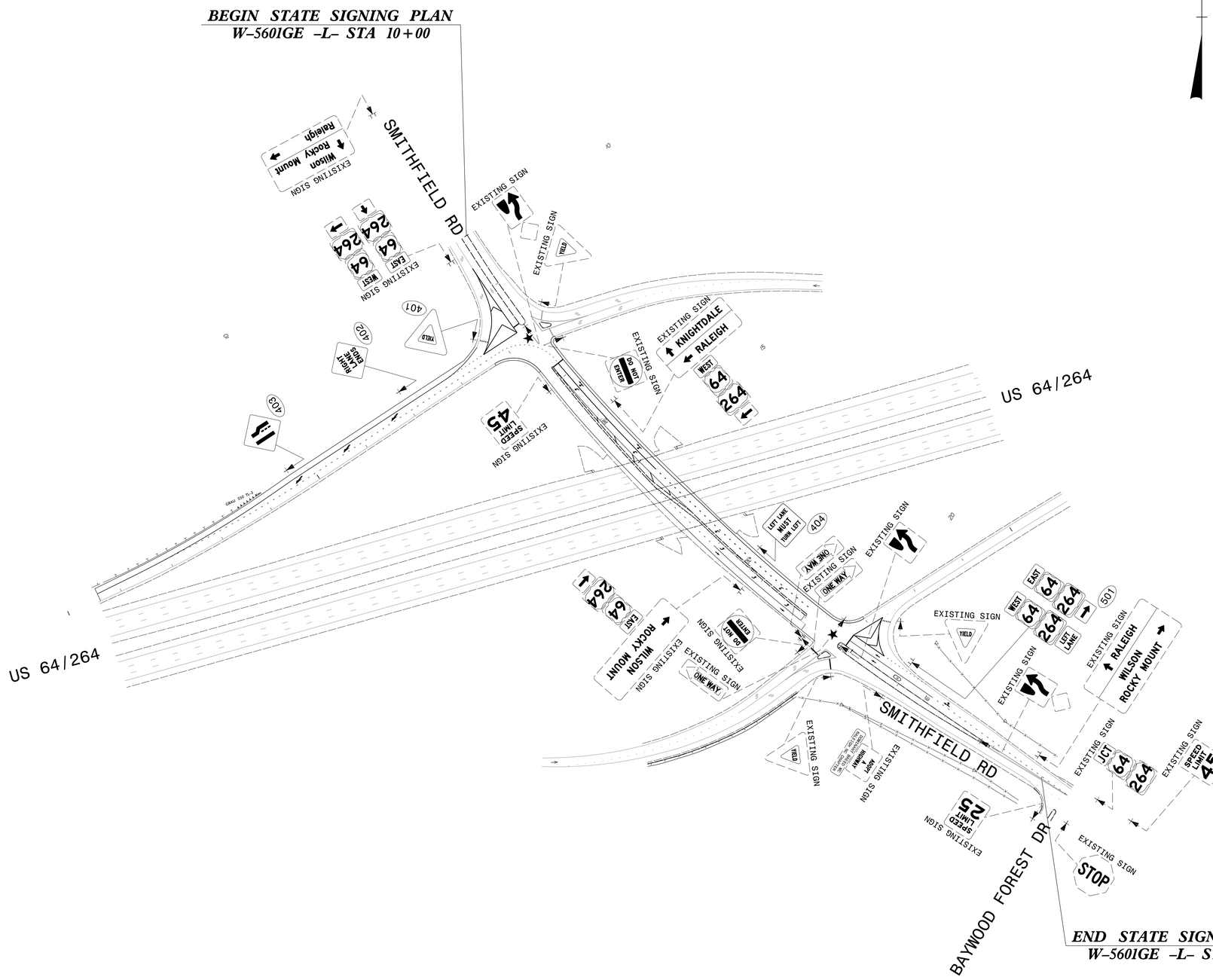
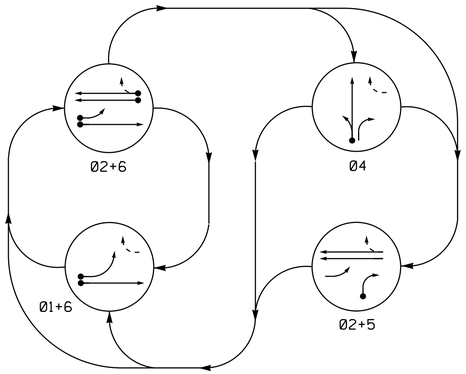


PROPOSED SIGNING
SMITHFIELD RD
-L- STA 10+00 TO 24+00

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

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	Sig 1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

QUEUE PREEMPTION

(Medium Priority)

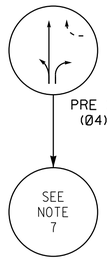
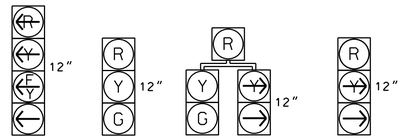


TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 04	PHASE 02+5	OVERLAP RECTANGULAR	FLASHER
11	←F Y	←R	←F Y	←R	←R	←Y
21, 22	R	G	R	G	R	Y
41	R	R	G	R	G	R
42	R	R	G→	R→	G→	R
51	R	R	→	→	→	R
61, 62	G	G	R	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



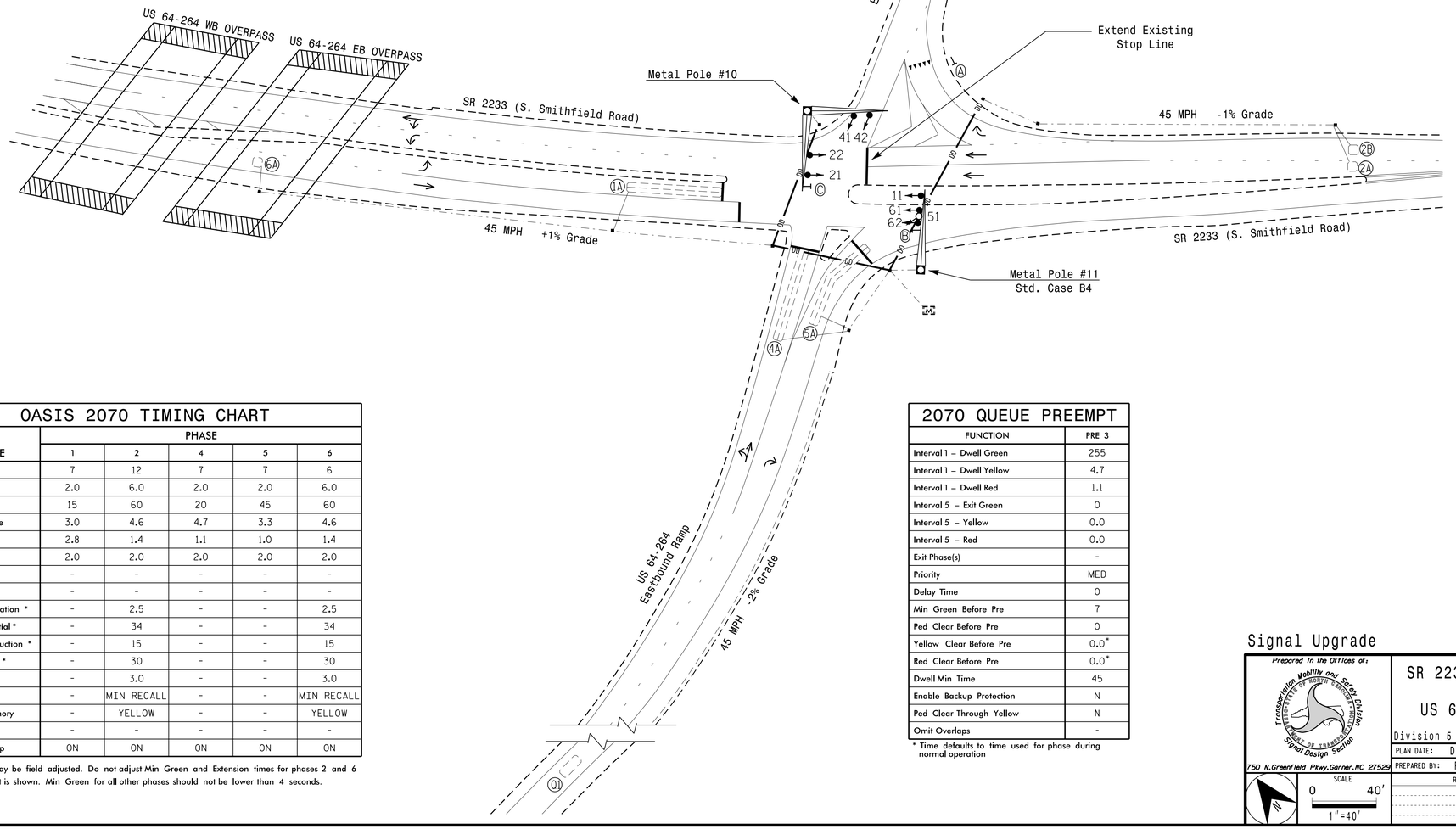
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING									
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	QUEUE MAX OCC. TIME	QUEUE GAP RESET TIME	PREEMPT INDEX FOR QUEUE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Y	Y	-	-	15	-	-	-	-	-
					6	Y	Y	Y	-	3	-	-	-	-	-
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-	-	-	-
2B	6X6	300	4	Y	2	Y	Y	-	-	-	-	-	-	-	Y
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-	-	-	-
5A	6X60	+7	2-4-2	-	5	Y	Y	-	-	15	-	-	-	-	-
6A	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	-	-	-	-
Q1	6X15	1200	6	-	PRE	Y	Y	-	-	-	7	0.1	3	-	-

4 Phase
Fully Actuated
w/Queue Preemption
(Smithfield Road CLS)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Set all detector units to presence mode.
3. Reposition existing signal head 22.
4. Phase 1 may be lagged.
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. Loop Q1 serves as a queue backup detector. After 7 seconds of constant actuation, the detector unit places a call to the controller to preempt normal operation to clear out the storage lanes.
7. Upon completion of Queue Preemption, controller returns to normal operation based on vehicle demand.
8. Pavement markings are existing unless otherwise shown.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Closed loop system data:
    Master Asset #: 10513.
    Controller Asset #: 2105.
11. Do not add backplates to Metal Pole 11 without prior approval from Signal Design Section Senior Structural Engineer.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
	Sign	⊣
	Pedestrian Signal Head	■
○	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 Pole with Mastarm	
M	Master Controller & Cabinet	M
N/A	Directional Drill	DD
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	No Right Turn Sign (R3-1)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2)	Ⓒ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	7	12	7	7	6
Extension 1 *	2.0	6.0	2.0	2.0	6.0
Max Green 1 *	15	60	20	45	60
Yellow Clearance	3.0	4.6	4.7	3.3	4.6
Red Clearance	2.8	1.4	1.1	1.0	1.4
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
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	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.

2070 QUEUE PREEMPT

FUNCTION	PRE 3
Interval 1 – Dwell Green	255
Interval 1 – Dwell Yellow	4.7
Interval 1 – Dwell Red	1.1
Interval 5 – Exit Green	0
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Exit Phase(s)	-
Priority	MED
Delay Time	0
Min Green Before Pre	7
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	45
Enable Backup Protection	N
Ped Clear Through Yellow	N
Omit Overlaps	-

* Time defaults to time used for phase during normal operation

Signal Upgrade

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

SR 2233 (S. Smithfield Road) at US 64-264 Eastbound Ramps

Division 5 Wake County Knightdale

PLAN DATE: December 2016 REVIEWED BY:

PREPARED BY: PL Alexander REVIEWED BY:

SCALE 0 40' 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: 2/13/2017
SIGNATURE DATE

SIG. INVENTORY NO. 05-2105

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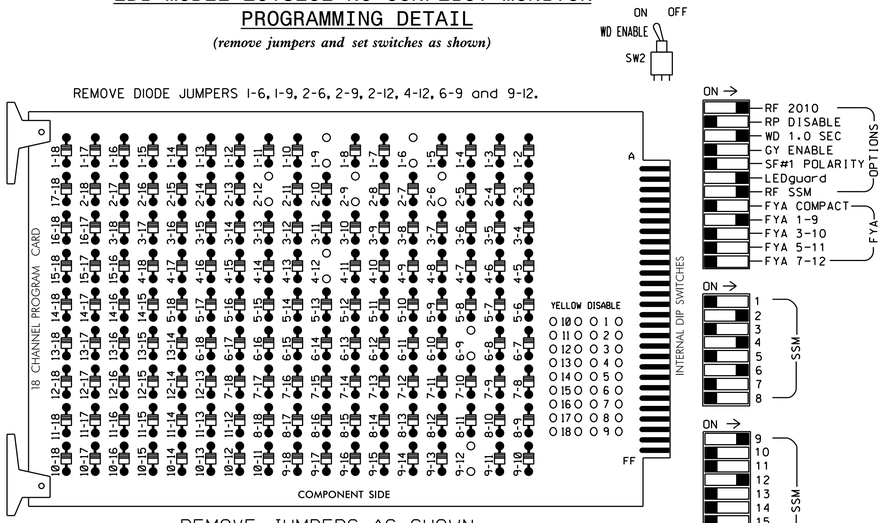
EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
6. The cabinet and controller are part of the Smithfield Road CLS.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1,AUX S5
PHASES USED.....1,2,4,5*,6
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....4+5

*Phase used for timing purposes only.

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	Sig. 1.1

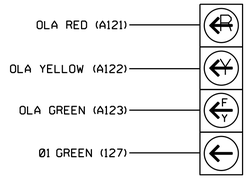
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5		AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12		18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD		SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	NC	61,62	NU	NU	NU	NU	11★	NU	NU	NU	42	51	NU
RED		128			101			134										A101	
YELLOW	✳	129			102			135											
GREEN		130			103			136											
RED ARROW													A121						
YELLOW ARROW													A122				A102	A102	
FLASHING YELLOW ARROW													A123						
GREEN ARROW	127																A103	A103	

NU = Not Used
NC = Not Connected, used for timing purposes only.
✳ Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L	NOT USED	Ø2 2B				NOT USED								ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED ⊗ INPUT	SLOT EMPTY	SLOT EMPTY	PRE 3 Q1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	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
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
Ø1	TB7-1,2	J7U	66	28	38 ★	PRE 3					

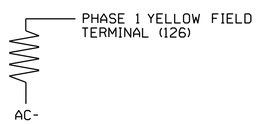
[1] Add jumper from I1-W to J4-W, on rear of input file.
★ See vehicle detector programming detail on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)



PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)

RNG	LEAD	BARRIER 1		X-LAG	LEAD	BARRIER 2		X-LAG	LEAD	BARRIER 3		X-LAG
1	1	2	0	0	0	4	0	0	0	2	0	0
2	0	6	0	0	0	0	0	0	0	5	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-2105
DESIGNED: December 2016
SEALED: 2/13/2017
REVISED:

Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 2233 (S. Smithfield Road)
at
US 64-264 Eastbound Ramps

Division 5 | Wake County | Knightdale

PLAN DATE: January 2017 | REVIEWED BY: T. Joyce
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030530 ENGINEER ZACHARY M. LITTLE

DocuSigned by: Zachary M. Little 2/23/2017
DC21EFD94F5341F... DATE

SIG. INVENTORY NO. 05-2105

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cestrickland

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

PRESS '+' THREE TIMES

```
 PAGE 1: VEHICLE OVERLAP 'D' 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  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-2105
DESIGNED: December 2016
SEALED: 2/13/2017
REVISED:

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SR 2233 (S. Smithfield Road)
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Division 5 | Wake County | Knightdale

PLAN DATE: January 2017 | REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030530 ENGINEER ZACHARY W. LITTLE

DocuSigned by: Zachary W. Little 2/23/2017
DC21EFD04F5341F... DATE

SIG. INVENTORY NO. 05-2105

14-FEB-2017 07:28
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cestrickland

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	Sig. 1.3

QUEUE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 'A' (PREEMPTION), THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #3 IS REACHED.

```
   PREEMPTION  #3  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1 255  4.7  1.1  |   X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |
            OPTIONS
PRIORITY (Y/N TO SELECT) ............MED
DELAY TIMER (0-255 SEC) .............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....7
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........45
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

VEHICLE DETECTOR #38 SETTINGS FOR QUEUE PREEMPT

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN '1' (VEHICLE DETECTOR ASSIGNMENTS). PRESS '+' UNTIL DETECTOR #38 IS REACHED.

```
VEHICLE DETECTOR #38  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................N
EXTENSION DETECTOR..................N
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          |12345678910111213141516
PHASES ASSIGNED |
SWITCH/DUPLICATE|
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)...............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)..............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....7
QUEUE GAP RESET TIME (0-25.5).......0.1
PREEMPTION INDEX FOR QUEUE (0-10)...3
```

← CLEAR DEFAULT PHASE

← ENTER DATA

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-2105
DESIGNED: December 2016
SEALED: 2/13/2017
REVISED:

Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2233 (S. Smithfield Road)
at
US 64-264 Eastbound Ramps

Division 5 | Wake County | Knightdale

PLAN DATE: January 2017 | REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030530 ENGINEER ZACHARY M. LITTLE

DocuSigned by: Zachary M. Little 2/23/2017
DC21EFD0AF5341F... DATE

SIG. INVENTORY NO. 05-2105

14-FEB-2017 07:31
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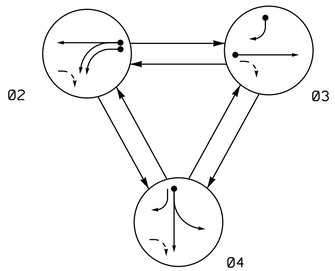
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	Sig. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

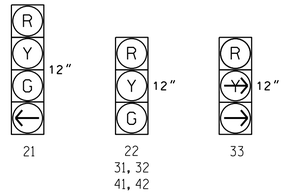
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02	PHASE 03	PHASE 04	FLASH
21	G	R	R	R
22	G	R	R	R
31, 32	R	G	R	R
33	R	→	→	R
41, 42	R	R	G	R

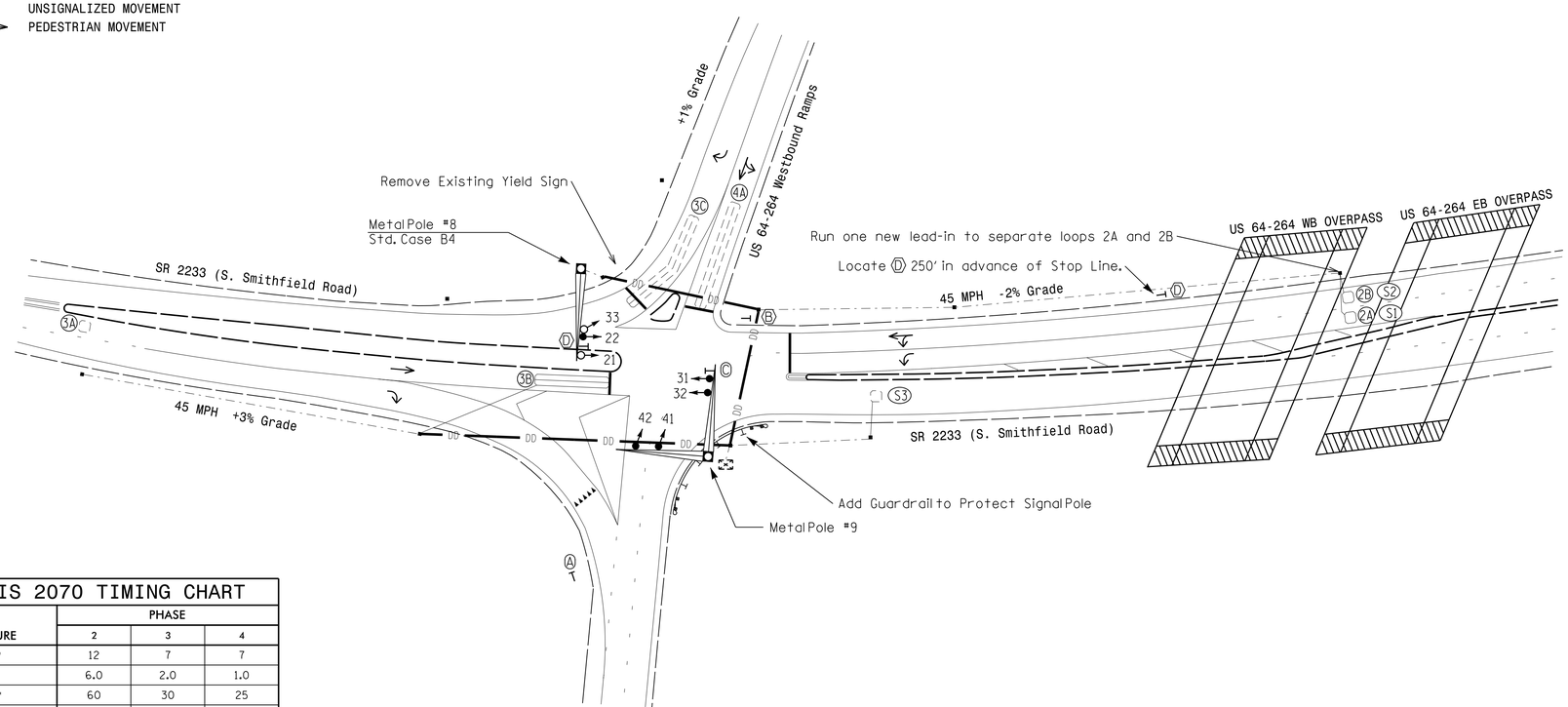
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S1	6X6	300	5	Y	2	Y	Y	-	-	-	Y	-
2B/S2	6X6	300	5	Y	2	Y	Y	-	-	-	Y	-
3A	6X6	290	4	-	3	-	Y	-	3.5	-	-	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	-
3C	6X60	+5	2-4-2	-	3	Y	Y	-	-	15	-	Y
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
S3	6X6	+140	4	-	-	-	-	-	-	-	Y	-



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 3	PHASE 4
Min Green 1 *	12	7	7
Extension 1 *	6.0	2.0	1.0
Max Green 1 *	60	30	25
Yellow Clearance	4.7	4.3	4.4
Red Clearance	1.6	1.3	1.0
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	1.8	-	-
Max Variable Initial *	34	-	-
Time Before Reduction *	15	-	-
Time To Reduce *	30	-	-
Minimum Gap	3.0	-	-
Recall Mode	SOFT RECALL	-	-
Vehicle Call Memory	YELLOW	-	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

3 Phase
Fully Actuated
(Smithfield Road CLS)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Renumber existing phase 6 loops and signal heads for phase 3 and existing loop 4B as 3C.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. 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.
7. Program controller to start up in Phase 4 Red.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Closed loop system data:
   Controller Asset #: 2106.
10. Do not add backplates to Metal Pole 8 without prior approval from Signal Design Section Senior Structural Engineer.

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 Pole with Mastarm	◯▱
I I	Guardrail	N/A
N/A	Directional Drill	DD
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	No Right Turn Sign (R3-1)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2)	Ⓒ
Ⓓ	Left Arrow "ONLY" and Combined Through and Left Arrow Sign (R3-8L)	Ⓓ

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

SR 2233 (S. Smithfield Road)
at
US 64-264 Westbound Ramps

Division 5 Wake County Knightdale

PLAN DATE: December 2016 REVIEWED BY:
PREPARED BY: PL Alexander REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: 2/13/2017 DATE

SIG. INVENTORY NO. 05-2106

24-FEB-2017 11:09
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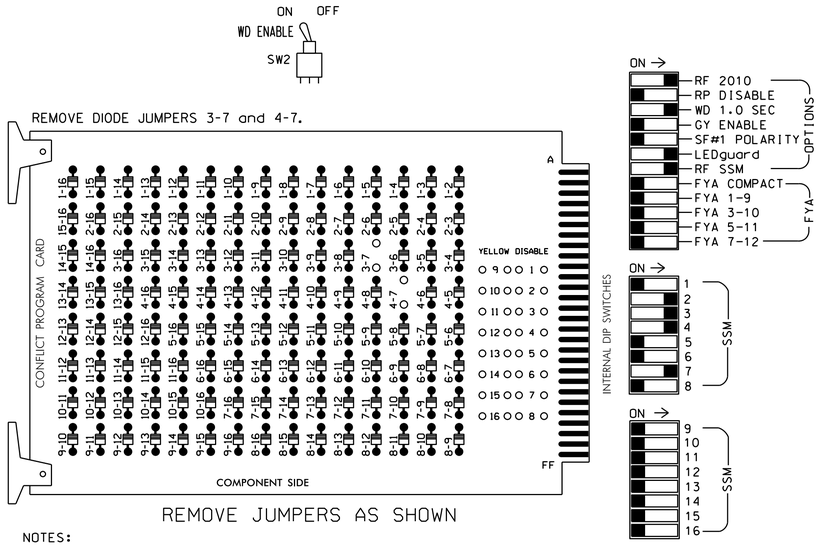
rziemba

PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	Sig. 2.1

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 1,5,6, 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 phase 2 for Variable Initial and Gap Reduction.
5. Program phase 4 for Startup Red Clear.
6. Remove phases 2 and 6 from Startup In Green.
7. The cabinet and controller are part of the Smithfield Road Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S4,S7
PHASES USED.....2,3,4
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....3+4
OVERLAP "D".....NOT USED

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	OLC	8	8 PED
SIGNAL HEAD NO.	NU	21	22	NU	31,32	41,42	NU	NU	NU	NU	33	NU	NU
RED		128	128		116	101					122		
YELLOW		129	129		117	102							
GREEN		130	130		118	103							
RED ARROW													
YELLOW ARROW											123		
GREEN ARROW		130									124		

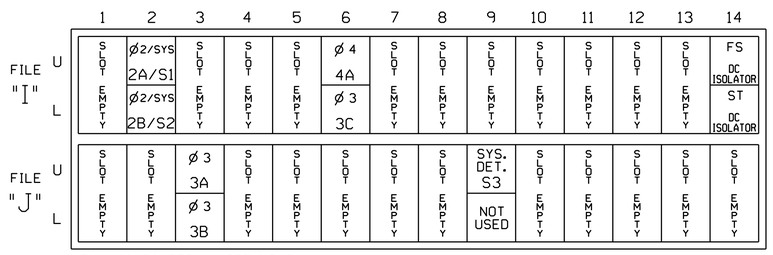
NU = Not Used

RED CLEARANCE START-UP PROGRAMMING

From main menu press '2' (Phase Control). Then '1' (Phase Control Functions). Scroll down on this screen to 'Startup Red Clr' and toggle phase 4 'On'. (An 'X' will appear under this phase column to indicate activation).

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S1	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S2	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
3A	TB3-9,10	J3U	64	26	36	3		Y		3.5	
3B	TB3-11,12	J3L	77	39	46	3	Y	Y			
3C	TB4-11,12	I6L	45	7	14	3	Y	Y			15
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
* S3	TB7-9,10	J9U	59	21	15	SYS					

* System Detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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:          ¦123456789101112131415 16
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  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....7
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2106
DESIGNED: December 2016
SEALED: 2/13/2017
REVISED:

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2233 (S. Smithfield Road)
at
US 64-264 Westbound Ramps

Division 5 | Wake County | Knightdale

PLAN DATE: January 2017 | REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030530 ENGINEER ZACHARY M. LITTLE

DocuSigned by: Zachary M. Little 2/24/2017
DC21EFD9AF5341F... DATE

SIG. INVENTORY NO. 05-2106

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PROJECT REFERENCE NO.	SHEET NO.
W-5601GE	X-A

CROSS SECTION INDEX

ROADWAY	STATION	TO	STATION	SHEET NO.
CROSS SECTION INDEX				X–A
CROSS SECTION SUMMARY				X–1A
–L– SR 2233 (Smithfield Rd)	10 + 00.00		22 + 00.00	X–1 THRU X–6
–RPC–	6 + 00.00		14 + 00.00	X–7 THRU X–9

PROJ. REFERENCE NO.	SHEET NO.
W-5601GE	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the lump sum price for "Grading".

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+30.00	0	0
12+50.00	4	0
13+00.00	14	0
13+50.00	7	0
14+00.00	7	0
14+50.00	7	1
15+00.00	8	0
15+50.00	8	0
16+00.00	8	0
16+50.00	8	0
17+00.00	9	0
17+50.00	11	0
18+00.00	14	0
18+50.00	12	1
19+00.00	9	1
19+50.00	10	0
19+85.00	4	0

Station Rpc	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
5+60.00	0	0
6+50.00	8	0
7+00.00	8	0
7+50.00	7	0
8+00.00	7	1
8+50.00	9	0
9+00.00	11	0
9+50.00	13	0
10+00.00	14	1
10+50.00	15	4
11+00.00	14	5
11+50.00	14	5
12+00.00	11	7
12+50.00	8	9
13+00.00	8	9
13+50.00	8	4
14+00.00	15	0

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5601GE	X-1

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270 260 250 240

9.5:1

EXIST. 0.038

252.02

12+50.00

EXIST. 0.007

0.038

250.95

12+00.00

249.85

11+50.00

248.09

11+00.00

246.38

10+50.00

244.60

10+00.00

3/7/2017
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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5601GE	X-2

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270 260 250 280 270 260 250 270 260 250 240 260 250 240

EXIST. 0.044
254.35
15+00.00

13:1 EXIST. 0.035
254.45
14+50.00

10:1 EXIST. 0.042
254.24
14+00.00

11:1 EXIST. 0.041
253.86
13+50.00

8.9:1 EXIST. 0.05
253.05
13+00.00

3/7/2017
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0 5 10

PROJ. REFERENCE NO.	SHEET NO.
W-5601GE	X-3

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270 260 250 240

EXIST. 0.036

252.42

17+50.00

270 260 250 240

EXIST. 0.048

252.64

17+00.00

260 250 240

EXIST. 0.04

253.14

16+50.00

280 270 260 250

EXIST. 0.037

254.07

16+00.00

280 270 260 250

EXIST. 0.033

254.14

15+50.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
W-5601GE	X-4

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270 260 250 240

255.77
20+50.00

255.08
20+00.00

EXIST. 0.031
5.4:1
253.82
19+50.00

EXIST. 0.039
5.7:1
252.91
19+00.00

EXIST. 0.04
252.51
18+50.00

EXIST. 0.036
4:1
252.37
18+00.00

3/7/2017
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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5601GE	X-5

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270 260 250 240

253.68
23+50.00

260 250 270 260 250

254.40
23+00.00

270 260 250

255.61
22+50.00

270 260 250

256.18
22+00.00

270 260 250 270 260 250

256.50
21+50.00

270 260 250

256.36
21+00.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3/7/2017
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mferguson

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
W-5601GE	X-6

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270
260
250
270
260
250
240

252.70
24+50.00

253.15
24+00.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3/7/2017
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mferguson

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
W-5601GE	X-7

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

260 250 240

2:1 EXIST. 0.032 259.02

8+00.00

260 250 240

3.1:1 EXIST. 0.040 258.85

7+50.00

260 250 240

2.7:1 EXIST. 0.046 258.47

7+00.00

260 250 240

8:1 EXIST. 0.049 258.08

6+50.00

260 250 240 230

EXIST. 0.073 257.94

6+00.00

—RPC—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3/7/2017
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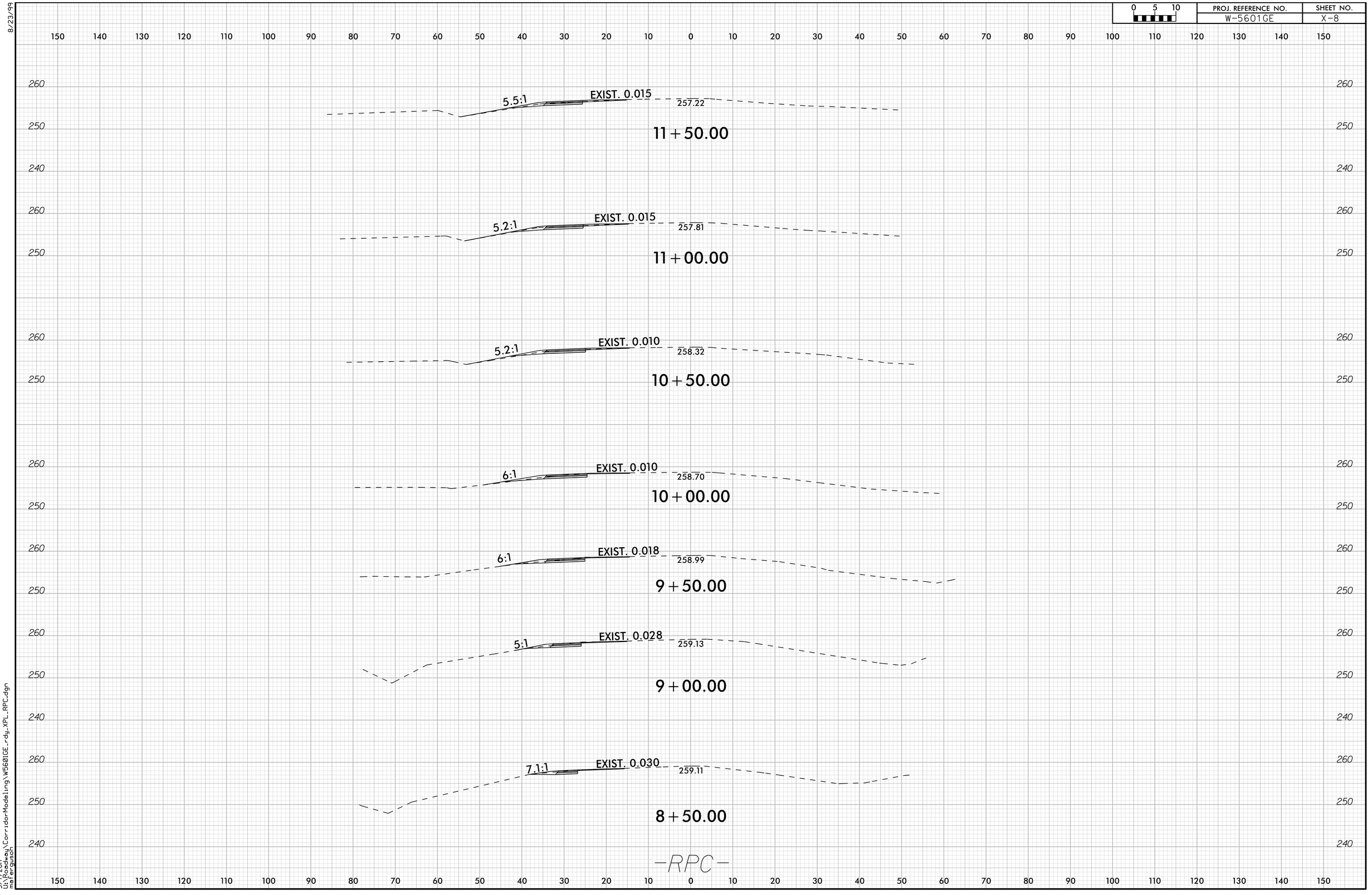
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5601GE	X-8



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mferguson

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	W-5601GE	X-9

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

250
240

EXIST. 0.018
8.6:1
252.68

14+00.00

250
240

6:1
EXIST. .024
253.78

13+50.00

250
240

5.4:1
EXIST. 0.019
254.87

13+00.00

250
240

6:1
EXIST. 0.013
255.70

12+50.00

250
240

6:1
EXIST. 0.017
256.55

12+00.00

250
240

—RPC—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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