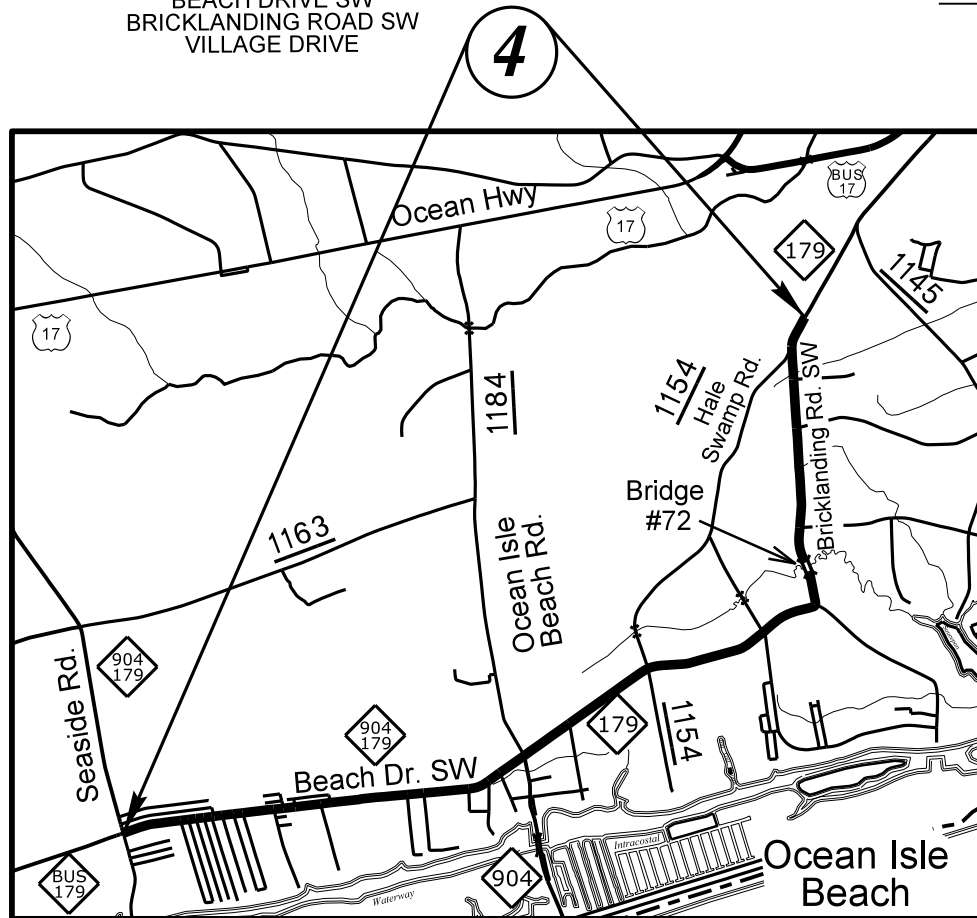
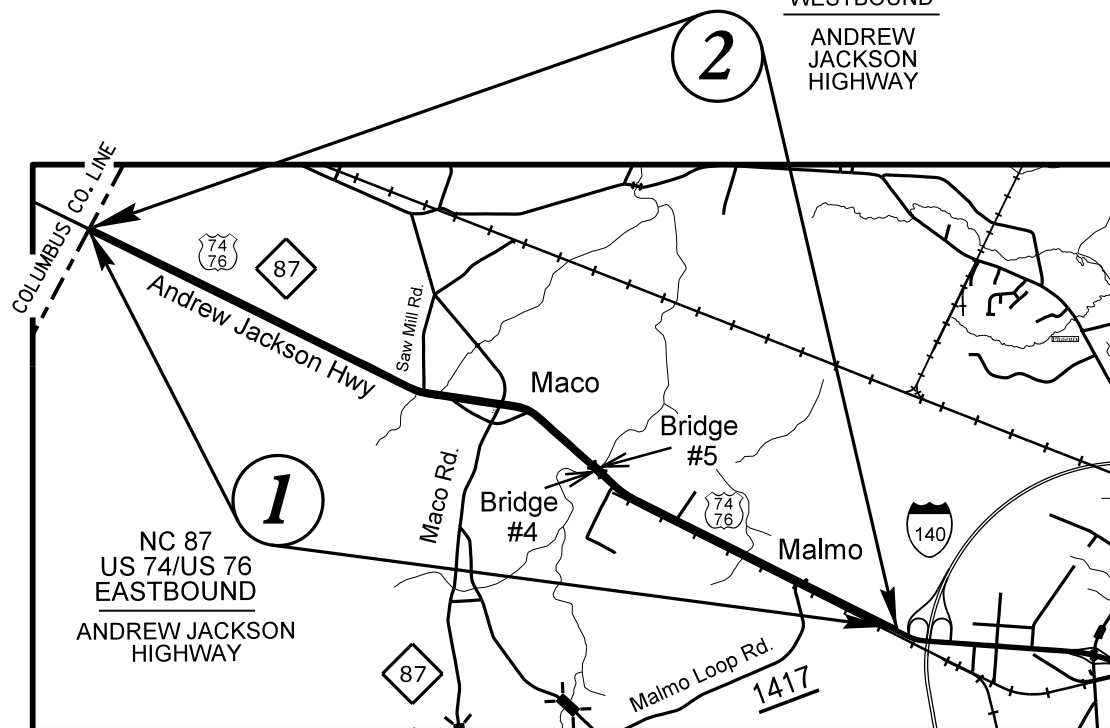


BRUNSWICK COUNTY

NC 904/ NC179
BEACH DRIVE SW
BRICKLANDING ROAD SW
VILLAGE DRIVE

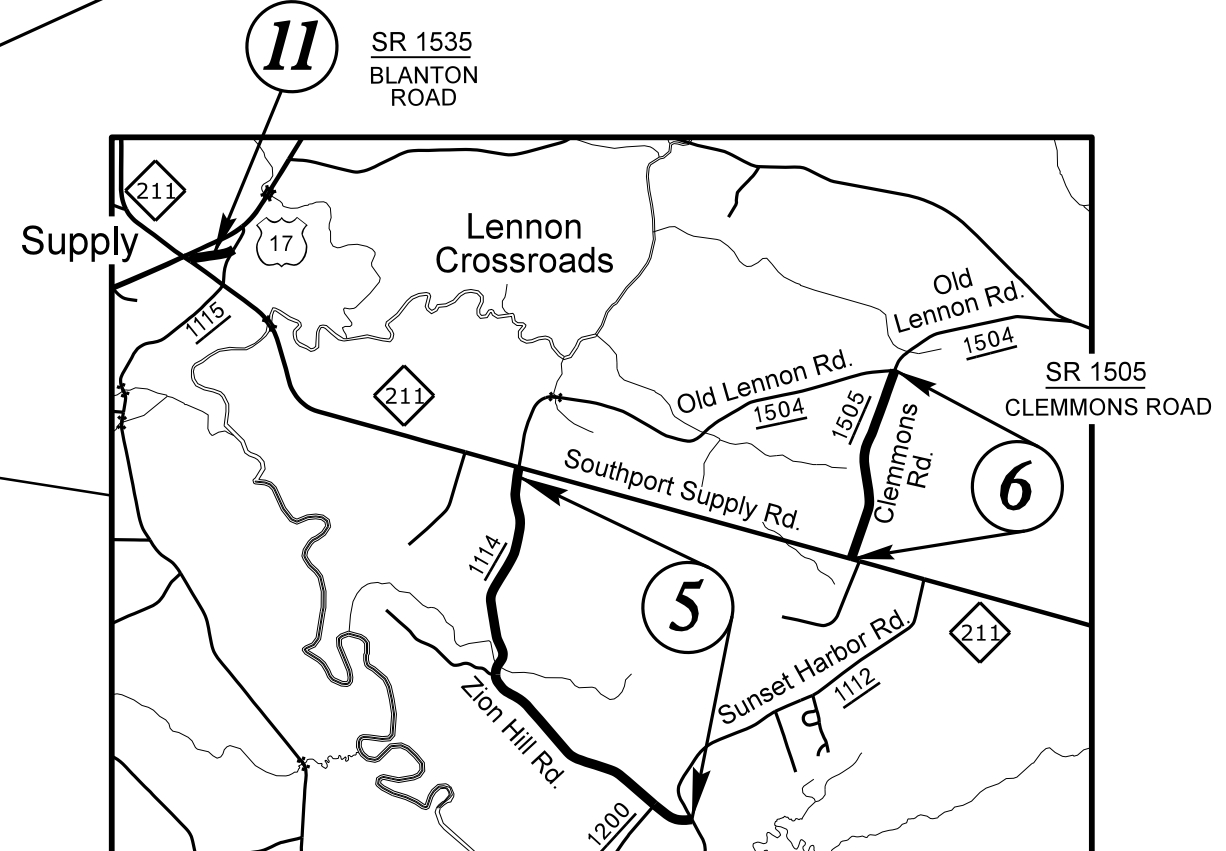
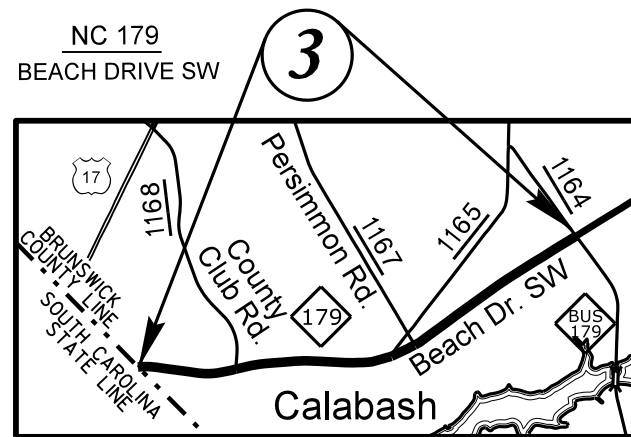


NC 87
US 74/US 76
WESTBOUND
ANDREW JACKSON
HIGHWAY



NC 87
US 74/US 76
EASTBOUND
ANDREW JACKSON
HIGHWAY

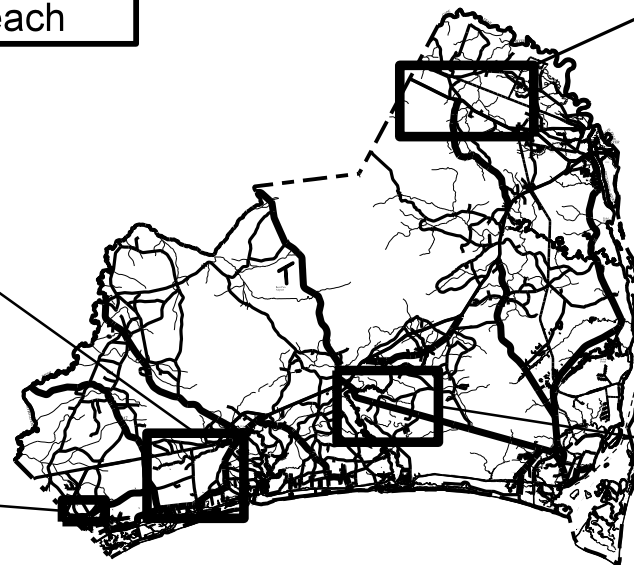
NC 179
BEACH DRIVE SW



SR 1535
BLANTON
ROAD

SR 1505
CLEMMONS ROAD

SR 1114
ZION HILL
ROAD



BRUNSWICK
COUNTY

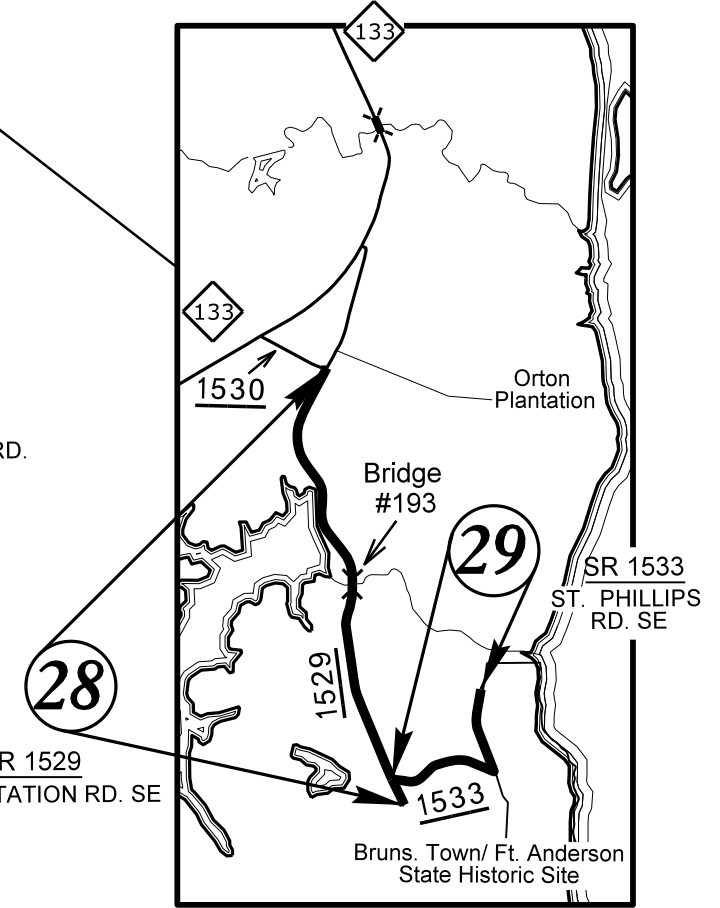
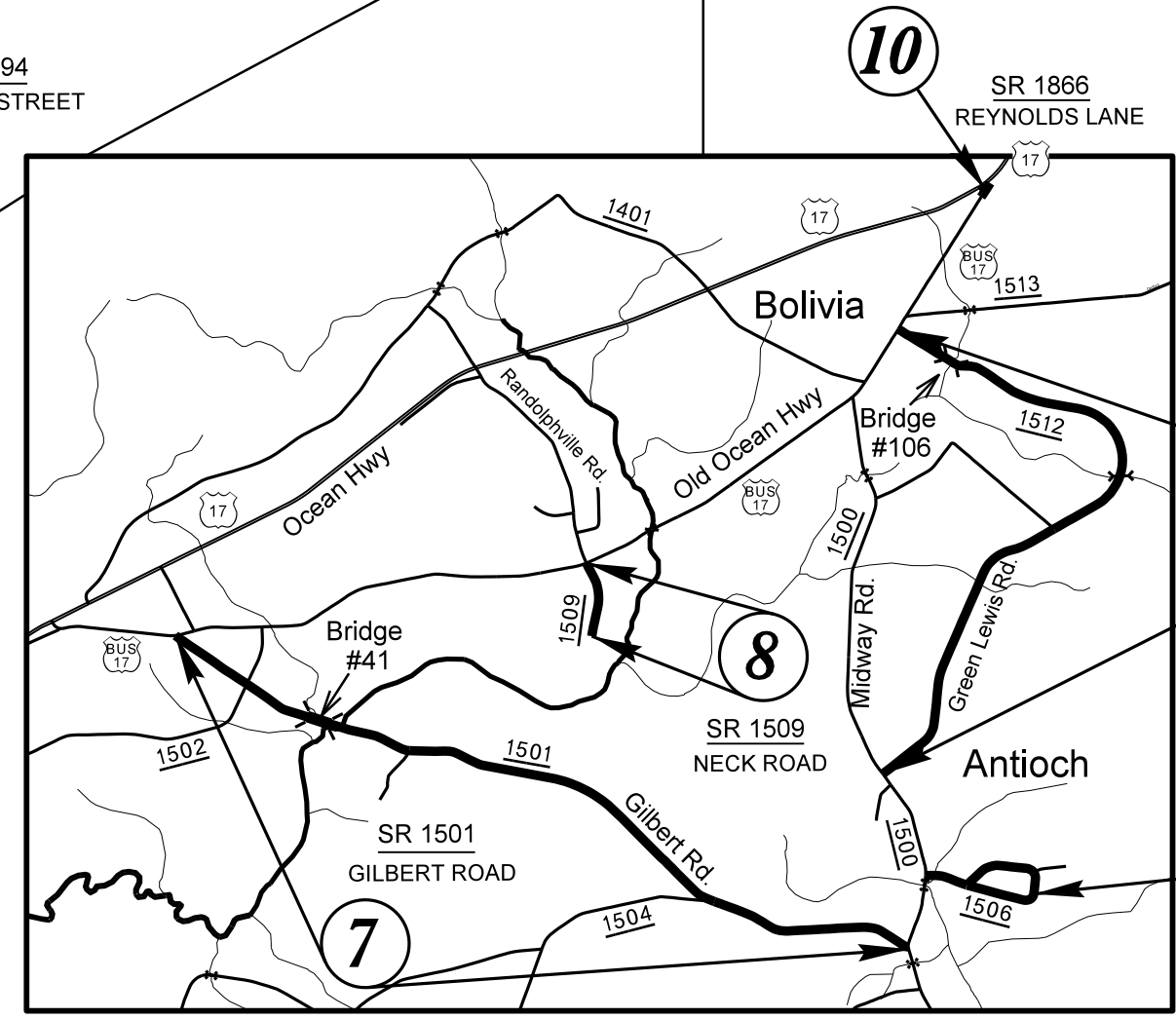
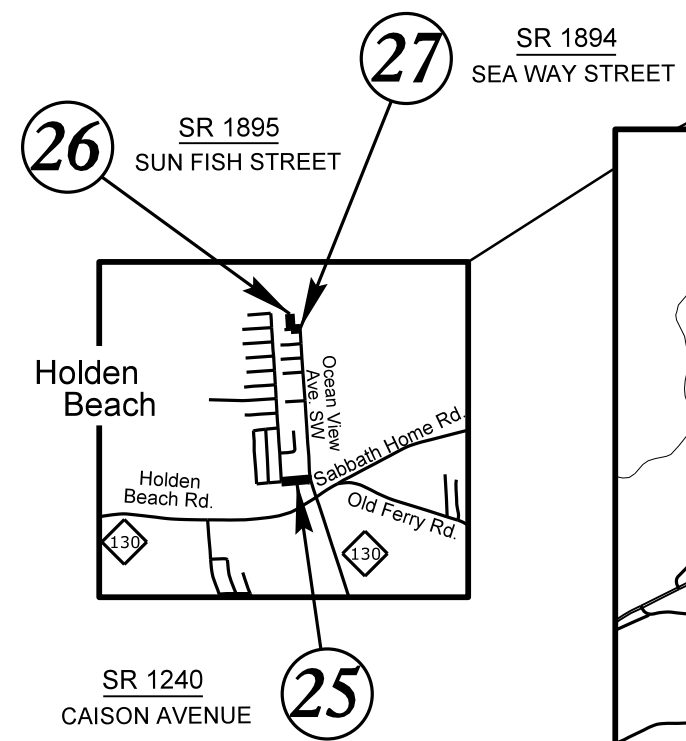
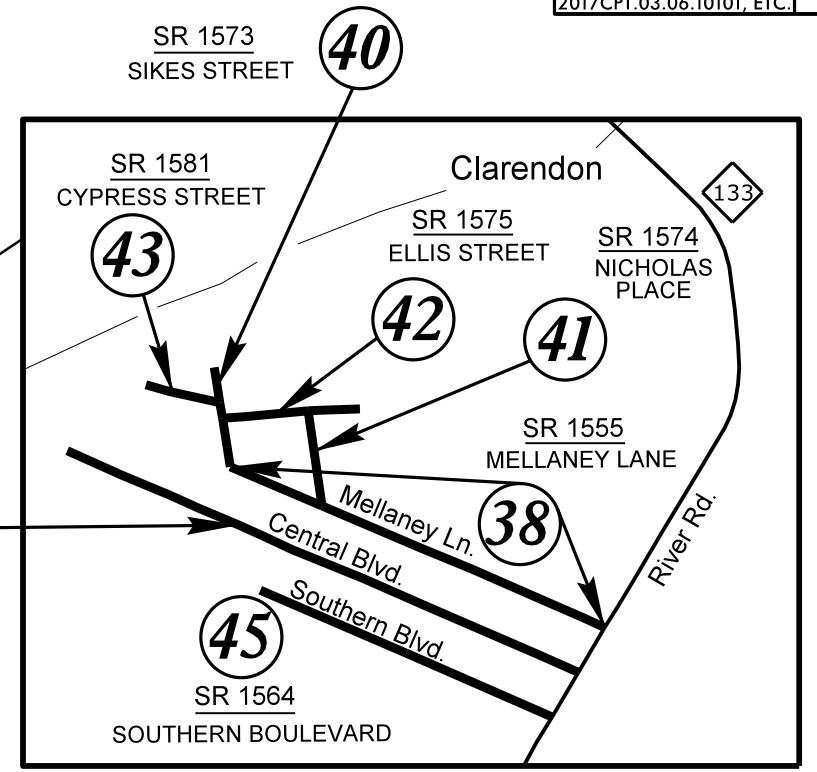
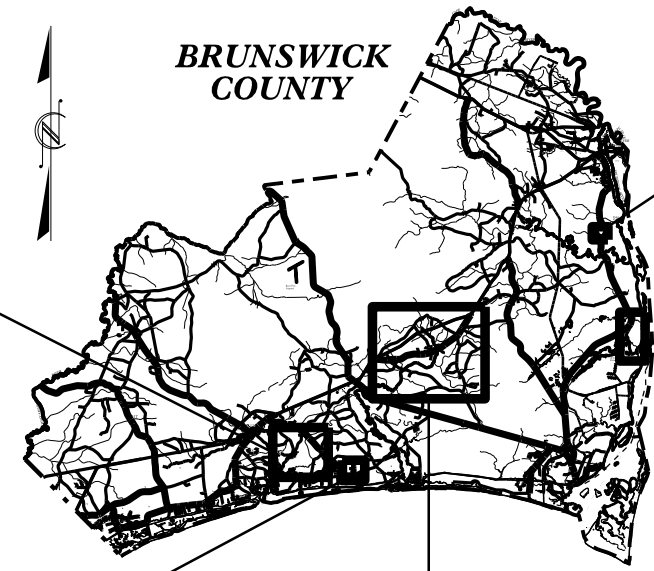
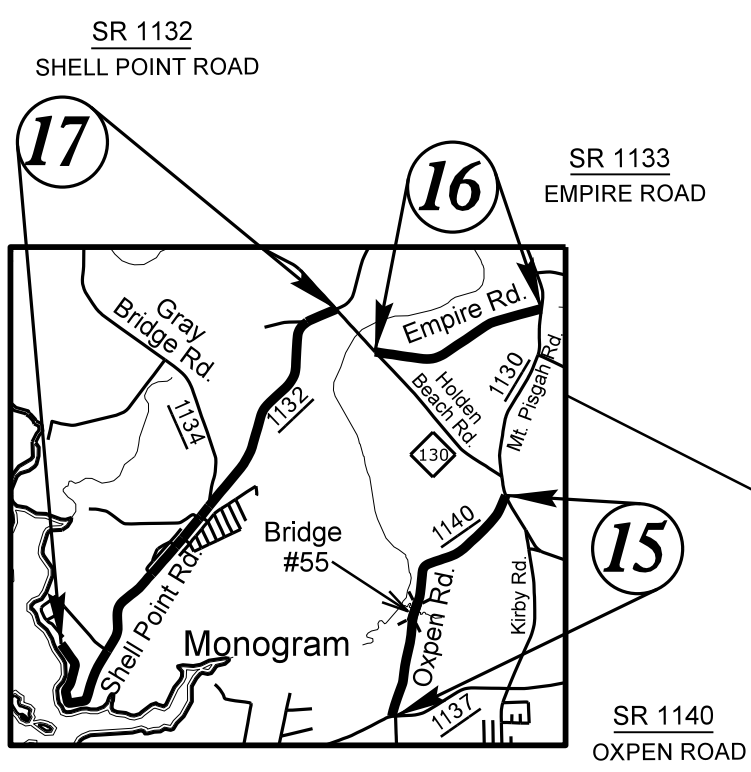
MAPS N.T.S.

REVISIONS

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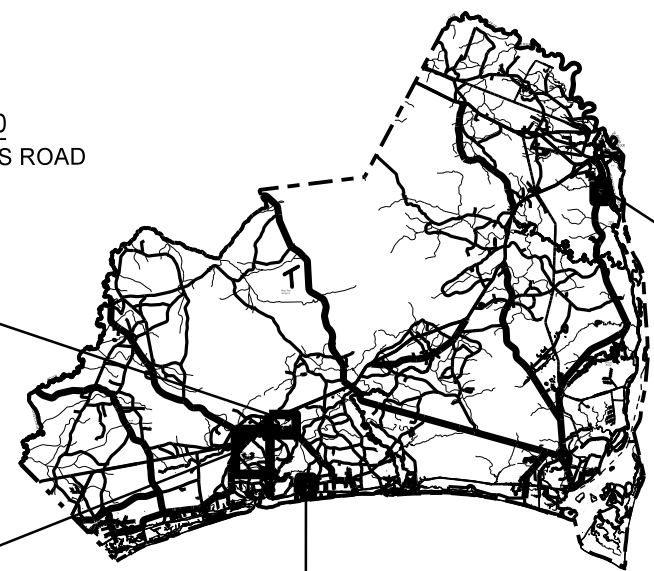
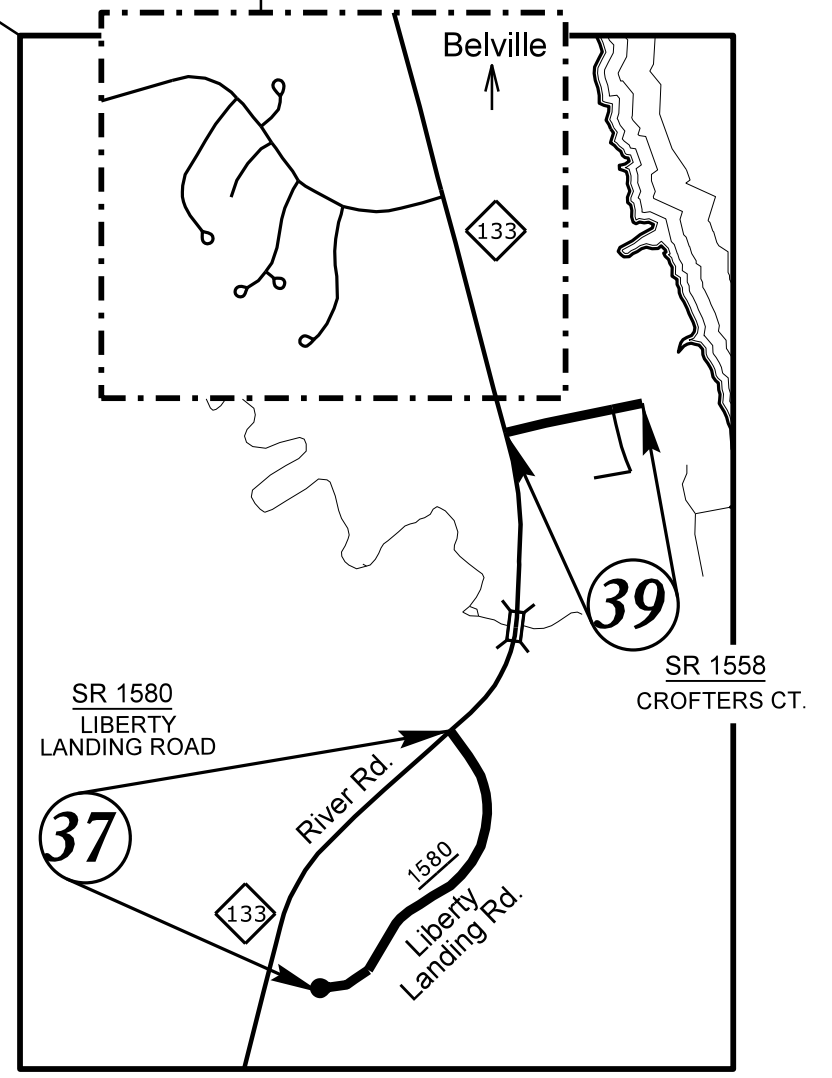
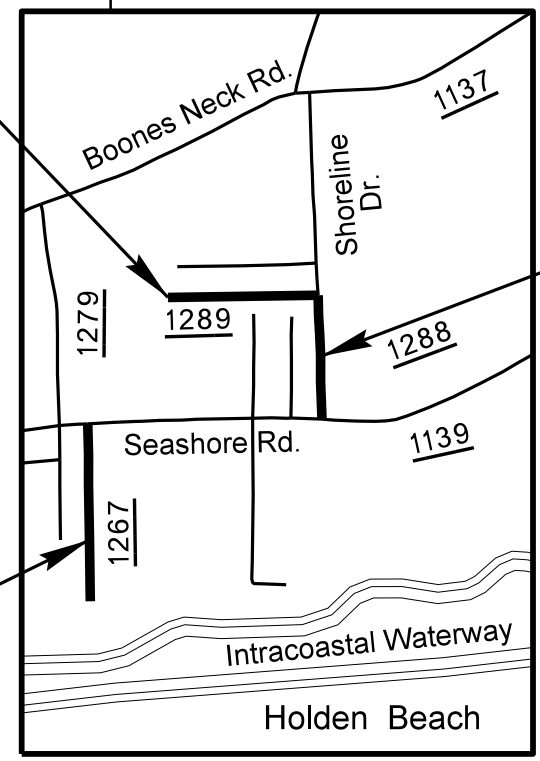
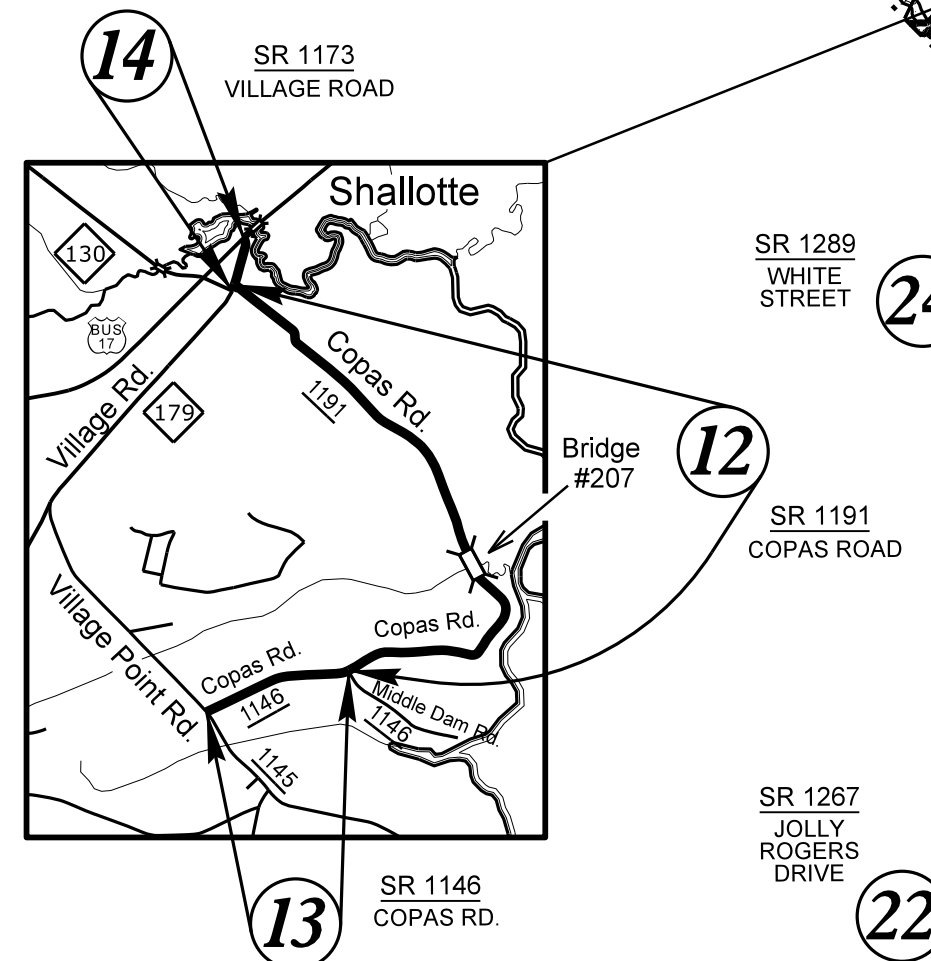
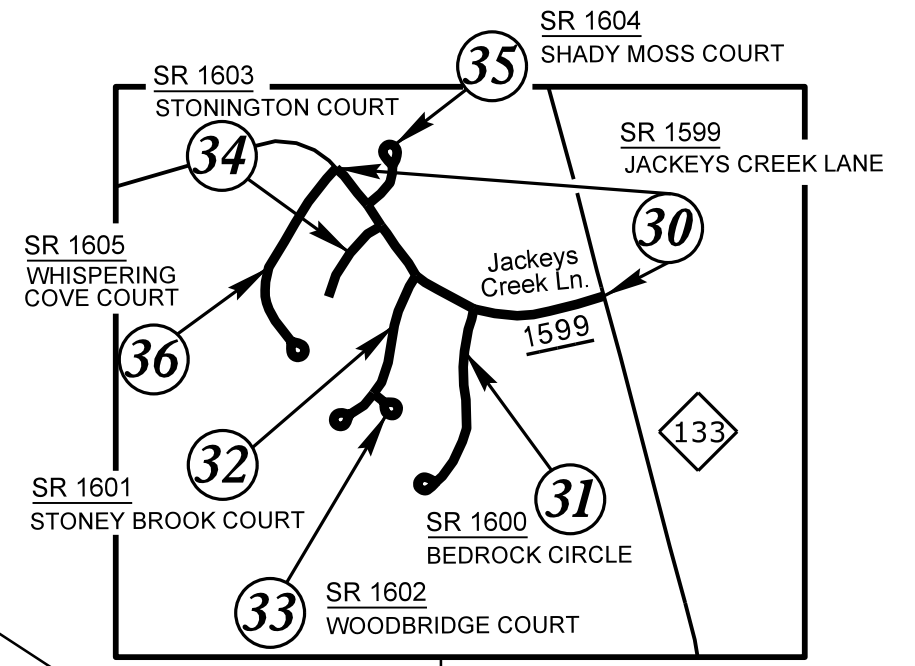
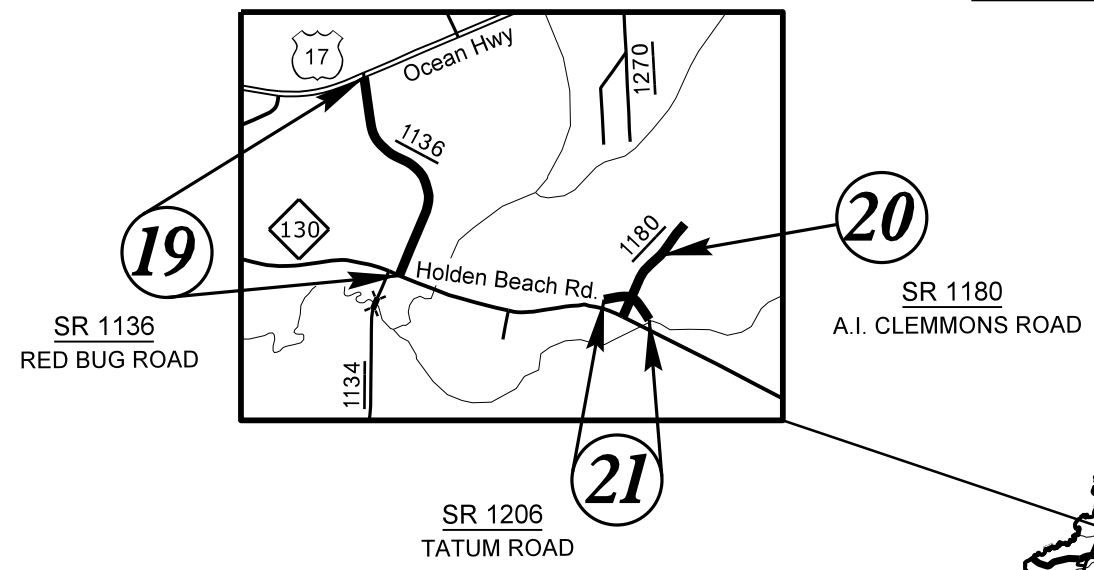
BRUNSWICK COUNTY



MAPS N.T.S.

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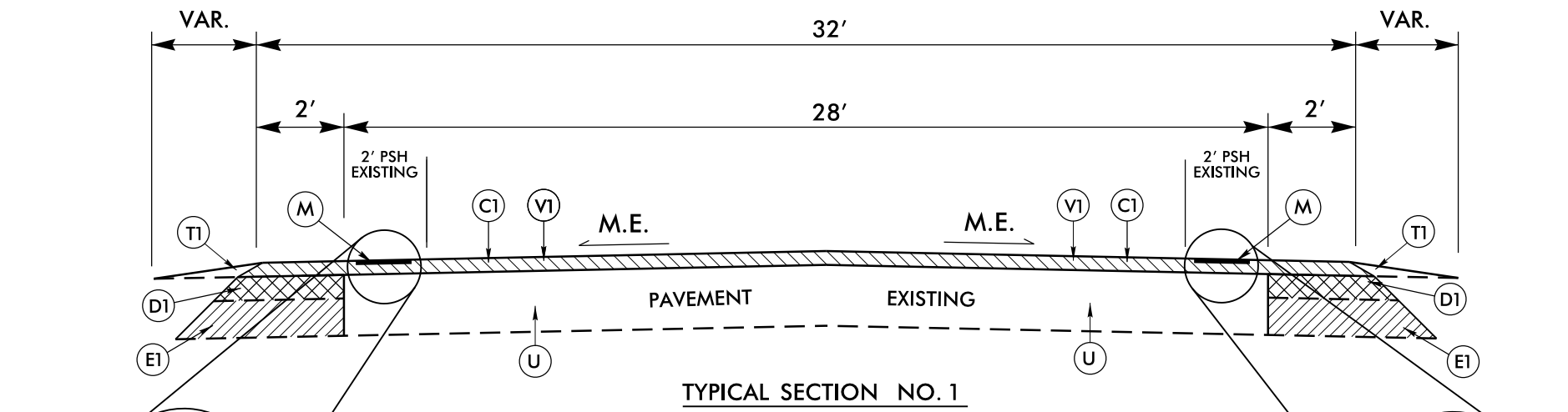
BRUNSWICK COUNTY



MAPS N.T.S.

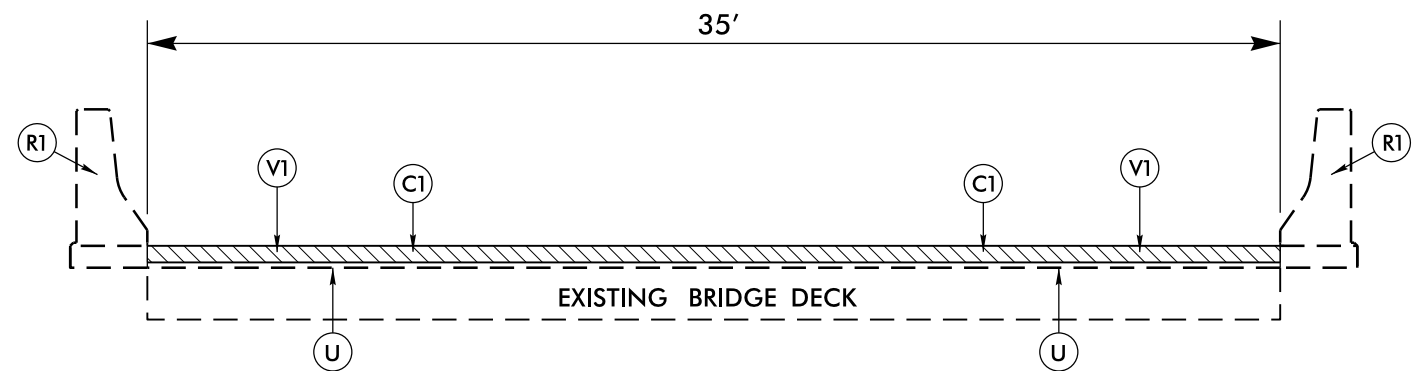
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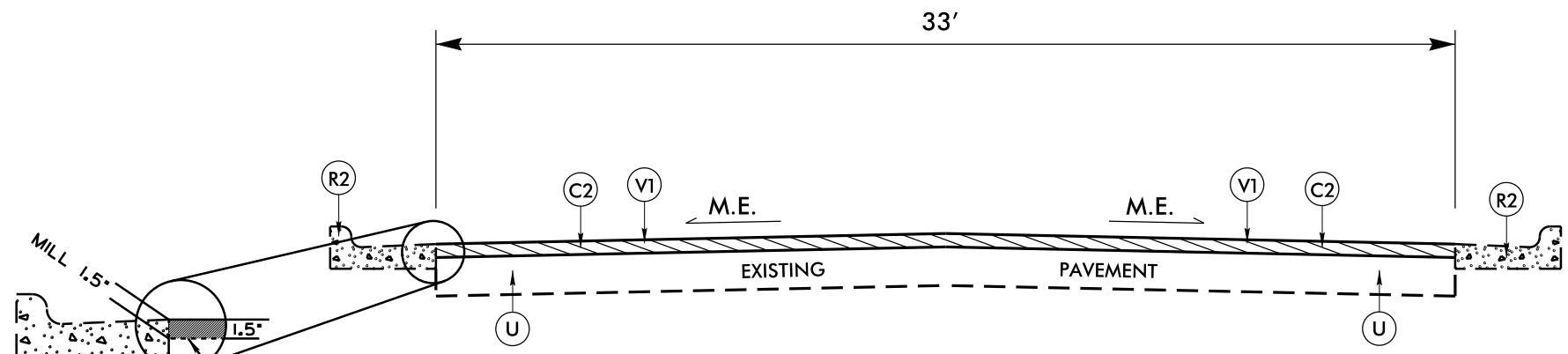


MAP NO. 1
 US 74 /US 76 EB (ANDREW JACKSON HWY.)
 MP 0.000 – MP 7.064
 (NO ASPHALT WORK BRIDGE NO. 4
 MP 4.485 – MP 4.505)

MAP NO. 2
 US 74 /US 76 WB (ANDREW JACKSON HWY.)
 MP 8.334 – MP 10.994
 MP 11.008 – MP 15.398



TYPICAL SECTION NO. 2
 MAP NO. 2 – US 74 /76 WB
 BRIDGE NO. 5
 MP 10.994 – MP 11.008



TYPICAL SECTION NO. 3
 MAP NO. 3
 NC 179 (BEACH DR. SW)
 (MP 0.000 – MP 2.158)

(TYPICAL FOR BOTH SIDES)

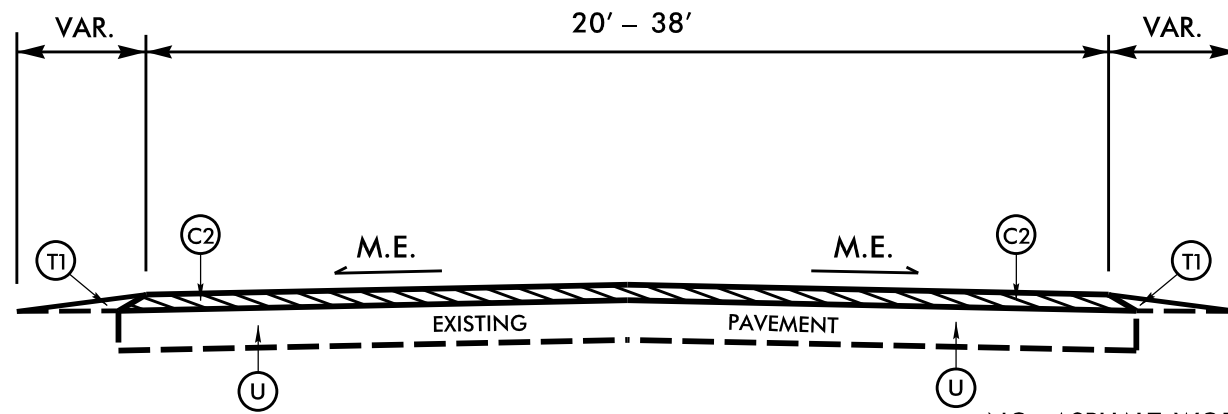
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD.
C2	PROP. APPROX. 1½" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD.
C3	PROP. APPROX. 1¼" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ.YD.
C4	PROP. APPROX. 2" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ.YD.
C5	PROP. APPROX. 1½" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD.
C6	PROP. APPROX. ¾" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S4.75A, AT AN AVERAGE RATE OF 85 LBS. PER SQ.YD.
D1	PROP. APPROX. 4" DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.
E1	PROP. APPROX. 5½" DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ.YD.
E3	PROP. APPROX. 5½" DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ.YD.
M	MILLED RUMBLE STRIP (16")
R1	EXISTING CONCRETE BRIDGE RAIL
R2	EXISTING CONCRETE 2'-6" CURB & GUTTER
R3	EXISTING CONCRETE VALLEY CURB
R4	EXISTING ROLLED ASPHALT CURB
T1	AGGREGATE SHOULDER BORROW (ASB)
T2	EARTH MATERIAL (SHOULDER RECONSTRUCTION)
U	EXISTING PAVEMENT
V1	MILLING ASPHALT PAVEMENT, 1½" DEPTH
V2	MILLING ASPHALT PAVEMENT, 1¼" DEPTH
V3	MILLING ASPHALT PAVEMENT, 0" - 1¼" DEPTH
V4	MILLING ASPHALT PAVEMENT, 2" DEPTH
V5	MILLING ASPHALT PAVEMENT, ¾" DEPTH
V6	MILLING ASPHALT PAVEMENT, 0" - ¾" DEPTH

PAVEMENT EDGE SLOPES ARE 1:1, EXCEPT FINAL SURFACE COURSE. SEE SHOULDER WEDGE DETAIL.

REVISIONS

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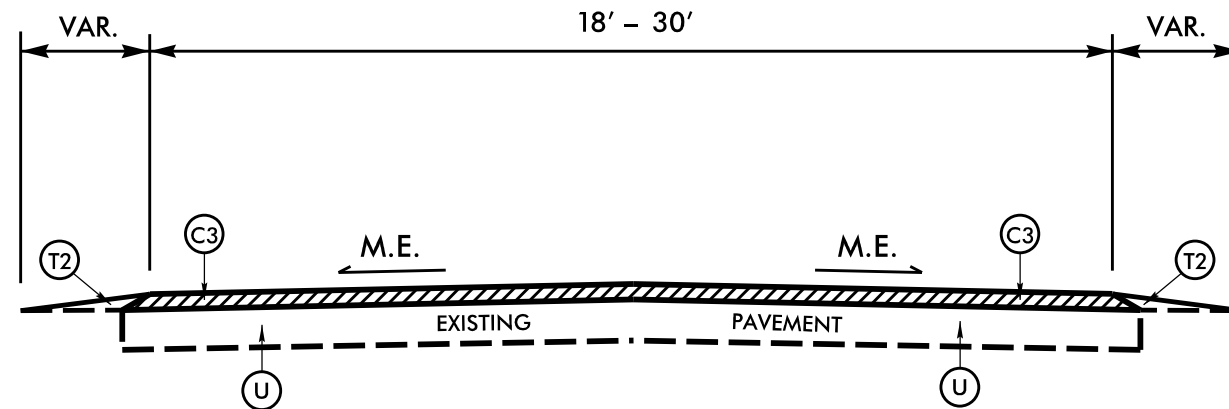
MAP NO. 4
NC 179 (BEACH DR. SW,
BRICKLANDING RD.)
MP 7.303 – MP 14.441

NO ASPHALT WORK:
BRUNSWICK BRIDGE NO. 72
MP 12.598 – MP 12.656

NO ASPHALT WORK:

OCEAN ISLE (FUTURE) ROUNDABOUT AT NC 179/NC 904/SR 1184:
MP 9.931 – MP 10.130
HALE SWAMP ROUNDABOUT AT NC 179 /SR 1154:
MP 11.103 – MP 13.491

PAVEMENT SCHEDULE	
C2	1½" S9.5B
C3	1¼" SF9.5A
T1	AGGREGATE SH. BORROW (ASB)
T2	EARTH MATERIAL (SH. RECONSTR.)
U	EXISTING PAVEMENT



TYPICAL SECTION NO. 5

MAP NO. 5
SR 1114 (ZION HILL RD.)
MP 0.000 – MP 1.400
MP 1.450 – MP 1.580
MP 1.640 – MP 1.650
MP 1.720 – MP 2.130
MP 2.190 – MP 2.210
MP 2.270 – MP 2.992

MAP NO. 6
SR 1505 (CLEMMONS RD.)
MP 0.000 – MP 1.301

MAP NO. 7
SR 1501 (GILBERT RD.)
MP 0.000 – MP 5.560
NO ASPHALT WORK
BRIDGE NO. 41

MAP NO. 8
SR 1509 (NECK RD.)
MP 0.000 – MP 0.514

MAP NO. 9
SR 1512 (GREEN LEWIS RD.)
MP 0.000 – MP 4.697
NO ASPHALT WORK
BRIDGE NO. 106

MAP NO. 10
SR 1866 (REYNOLDS LANE)
MP 0.000 – MP 0.110

MAP NO. 11
SR 1535 (BLANTON RD.)
MP 0.000 – MP 0.300

MAP NO. 12
SR 1191 (COPAS RD.)
MP 0.000 – MP 2.734

NO ASPHALT WORK
BRIDGE NO. 207

MAP NO. 13
SR 1146 (COPAS RD.)
MP 0.000 – MP 0.659

MAP NO. 15
SR 1140 (OXPEN RD.)
MP 0.000 – MP 1.740

MAP NO. 16
SR 1133 (EMPIRE RD.)
MP 0.000 – MP 1.176

MAP NO. 17
SR 1132 (SHELL POINT RD.)
MP 5.547 – MP 6.067

MAP NO. 18
SR 1506 (LEWIS LOOP RD.)
MP 0.000 – MP 1.426

MAP NO. 19
SR 1136 (RED BUG RD.)
MP 0.000 – MP 0.770

MAP NO. 20
SR 1180 (A.I. CLEMMONS RD.)
MP 0.000 – MP 0.370

MAP NO. 21
SR 1206 (TATUM RD.)
MP 0.000 – MP 0.180

MAP NO. 22
SR 1267 (JOLLY ROGERS DR.)
MP 0.000 – MP 0.290

MAP NO. 23
SR 1288 (SHORELINE DR.)
MP 0.000 – MP 0.204

MAP NO. 24
SR 1289 (WHITE ST.)
MP 0.000 – MP 0.250

MAP NO. 25
SR 1240 (CAISON AVE.)
MP 0.000 – MP 0.120

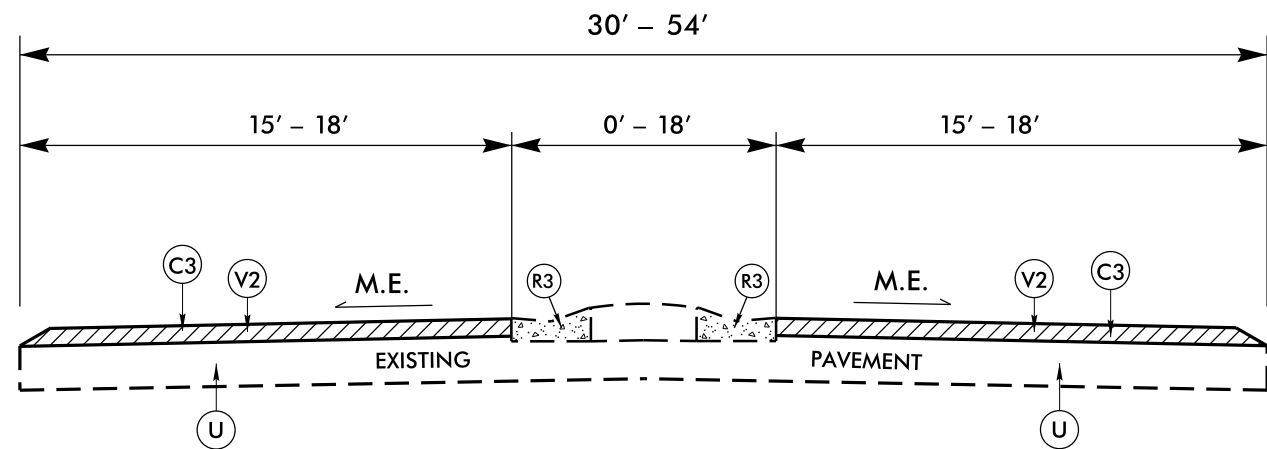
MAP NO. 26
SR 1895 (SUN FISH ST.)
MP 0.000 – MP 0.050

MAP NO. 27
SR 1894 (SEA WAY ST.)
MP 0.000 – MP 0.040

REVISIONS

8/17/99

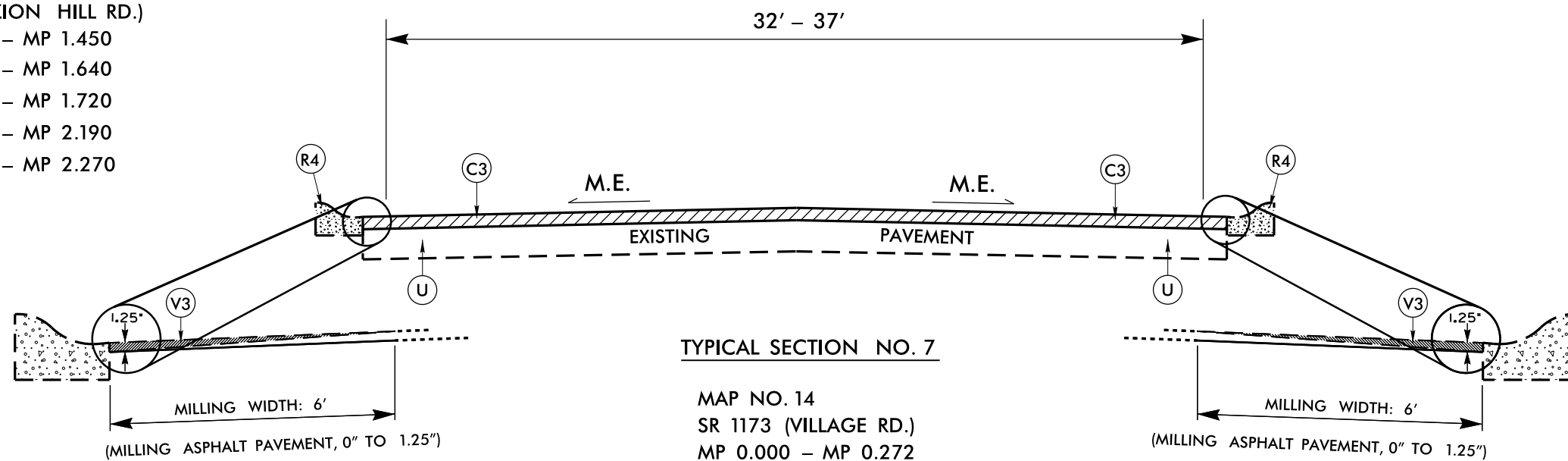
SYNOPSIS OF REVISIONS



TYPICAL SECTION NO. 6

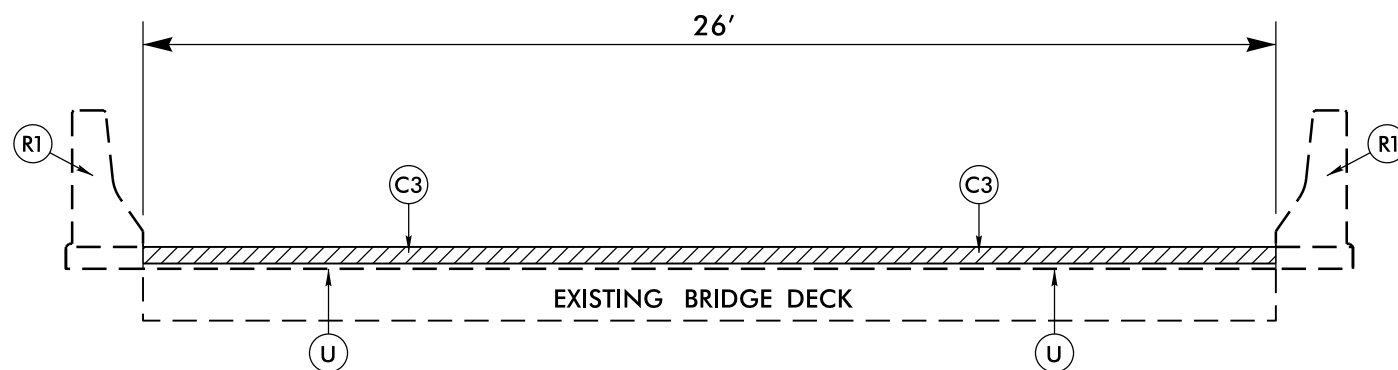
MAP NO. 5
 SR 1114 (ZION HILL RD.)
 MP 1.400 – MP 1.450
 MP 1.580 – MP 1.640
 MP 1.650 – MP 1.720
 MP 2.130 – MP 2.190
 MP 2.210 – MP 2.270

PAVEMENT SCHEDULE			
C3	1 1/4" SF9.5A	R4	EXISTING ROLLED ASPHALT CURB
E3	5 1/2" B25.0B	T2	EARTH MATERIAL (SH. RECONSTR.)
R1	EXIST. CONC. BRIDGE RAIL	U	EXISTING PAVEMENT
R3	EXISTING CONC. VALLEY CURB	V2	MILLING 1 1/4" DEPTH
		V3	MILLING 0" - 1 1/4" DEPTH



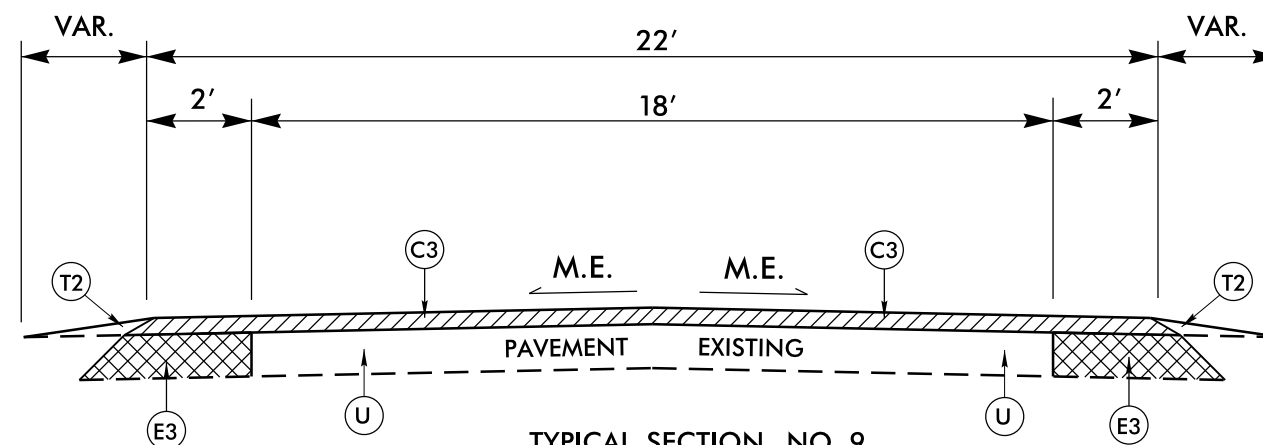
TYPICAL SECTION NO. 7

MAP NO. 14
 SR 1173 (VILLAGE RD.)
 MP 0.000 – MP 0.272



TYPICAL SECTION NO. 8

MAP NO. 15 – SR 1140 (OXPEN RD.)
 BRIDGE NO. 55
 MP 0.689 – MP 0.704

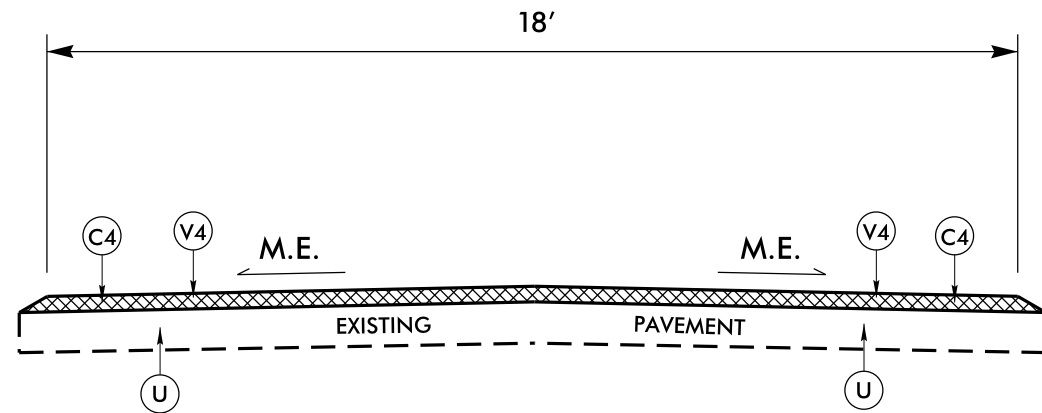


TYPICAL SECTION NO. 9

MAP 17
 SR 1132 (SHELL POINT RD.)
 MP 2.337 – MP 5.547

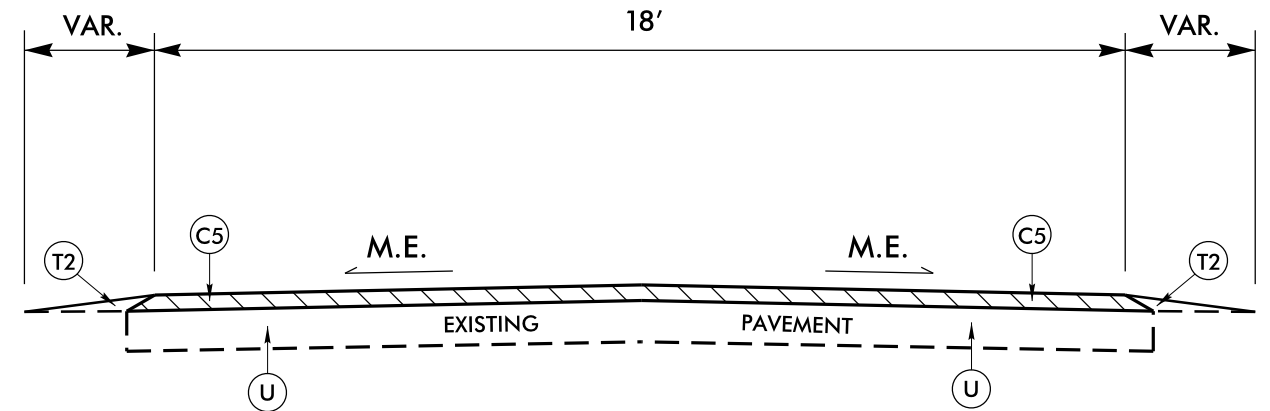
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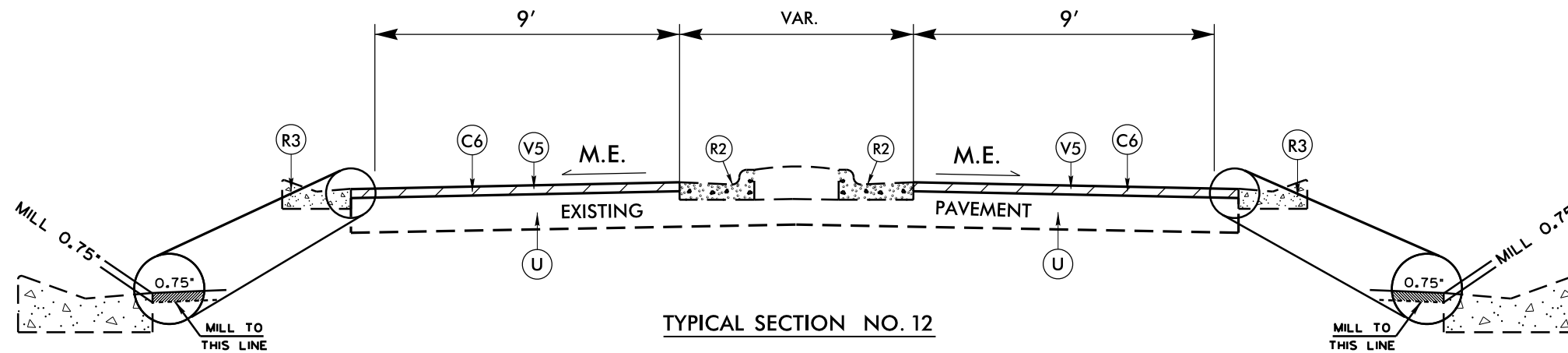
TYPICAL SECTION NO. 10

MAP NO. 28
 SR 1529 (PLANTATION RD.)
 MP 0.480 – MP 2.206
 NO ASPHALT WORK
 BRIDGE NO. 193
 MP 0.880 – MP 0.893



TYPICAL SECTION NO. 11

MAP NO. 29
 SR 1533 (ST. PHILLIPS RD.)
 MP 0.000 – MP 0.712



TYPICAL SECTION NO. 12

MAP NO. 31
 SR 1600 (BEDROCK CIRCLE)
 MP 0.000 – MP 0.200

MAP NO. 33
 SR 1602 (WOODRIDGE CT.)
 MP 0.000 – MP 0.032

MAP NO. 35
 SR 1604 (SHADY MOSS CT.)
 MP 0.000 – MP 0.072

MAP NO. 32
 SR 1601 (STONE BROOK CT.)
 MP 0.000 – MP 0.177

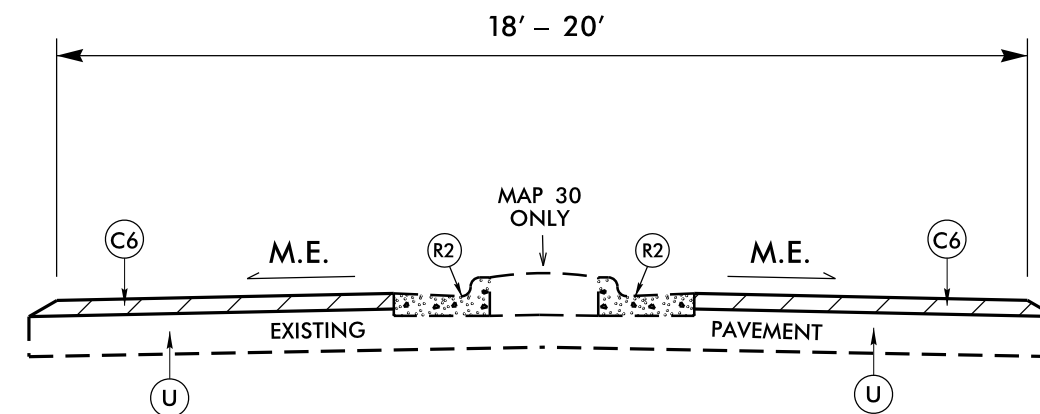
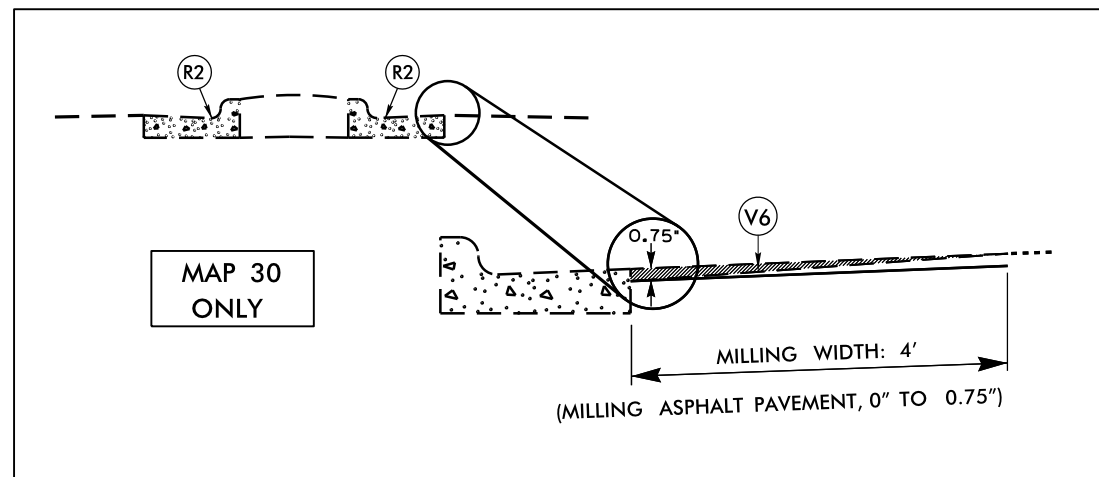
MAP NO. 34
 SR 1603 (STONINGTON CT.)
 MP 0.000 – MP 0.092

MAP NO. 36
 SR 1605 (WHISPERING COVE CT.)
 MP 0.000 – MP 0.219

PAVEMENT SCHEDULE	
C4	2" S9.5B
C5	1½" SF9.5A
C6	¾" S4.75A
R2	EXISTING CONC. 2'-6" C & G
R3	EXISTING CONC. VALLEY CURB
T2	EARTH MATERIAL (SH. RECONSTR.)
U	EXISTING PAVEMENT
V4	MILLING 2" DEPTH
V5	MILLING ¾" DEPTH

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TYPICAL SECTION NO. 13

PAVEMENT SCHEDULE	
C6	¾" S4.75A
R2	EXISTING 2'-6" CURB & GUTTER
U	EXISTING PAVEMENT
V6	MILLING 0" - ¾" DEPTH

MAP NO. 30
SR 1599 (JACKEYS CREEK LN)
MP 0.000 – MP 0.324

MAP NO. 37
SR 1580 (LIBERTY LANDING RD.)
MP 0.000 – MP 0.450

MAP NO. 38
SR 1555 (MELLANEY LN.)
MP 0.000 – MP 0.542

MAP NO. 39
SR 1558 (CROFTERS CT.)
MP 0.000 – MP 0.177

MAP NO. 40
SR 1573 (SIKES ST.)
MP 0.000 – MP 0.130

MAP NO. 41
SR 1574 (NICHOLAS PLACE)
MP 0.000 – MP 0.127

MAP NO. 42
SR 1575 (ELLIS ST.)
MP 0.000 – MP 0.185

MAP NO. 43
SR 1581 (CYPRESS ST.)
MP 0.000 – MP 0.098

MAP NO. 44
SR 1563 (CENTRAL BLVD.)
MP 0.000 – MP 0.740

MAP NO. 45
SR 1564 (SOUTHERN BLVD.)
MP 0.000 – MP 0.629

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:

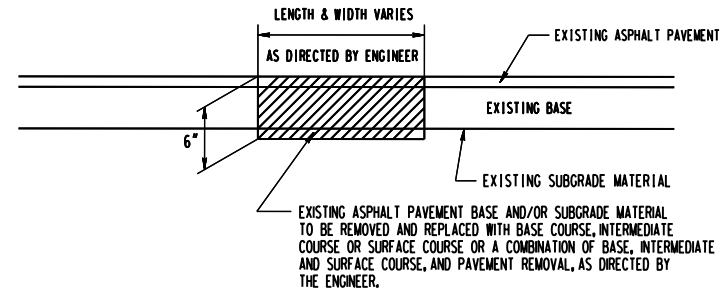
STD.NO.	TITLE
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
852.01	Concrete Islands

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

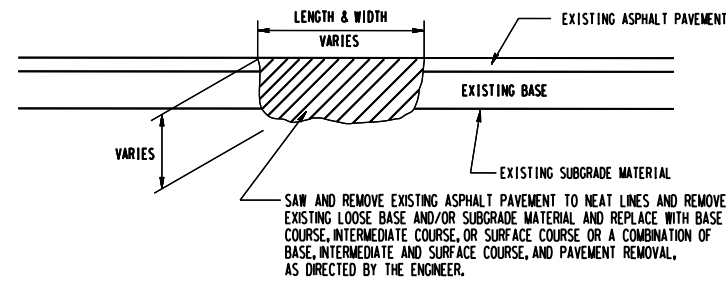
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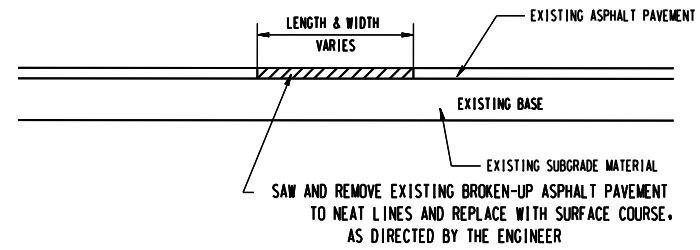
DETAILS OF REPAIRING EXISTING PAVEMENT PRIOR TO RESURFACING FOR FULL DEPTH AND MILLING



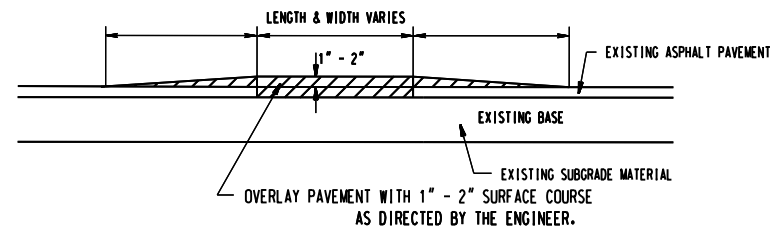
DETAIL NO. 1



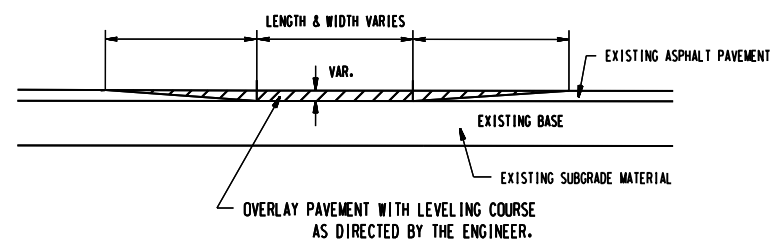
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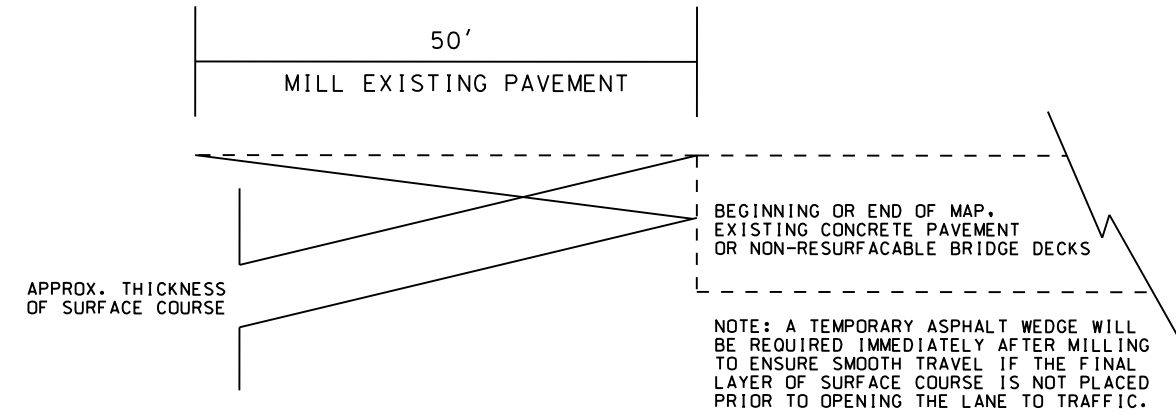
DETAIL NO. 3



DETAIL NO. 4



DETAIL NO. 5

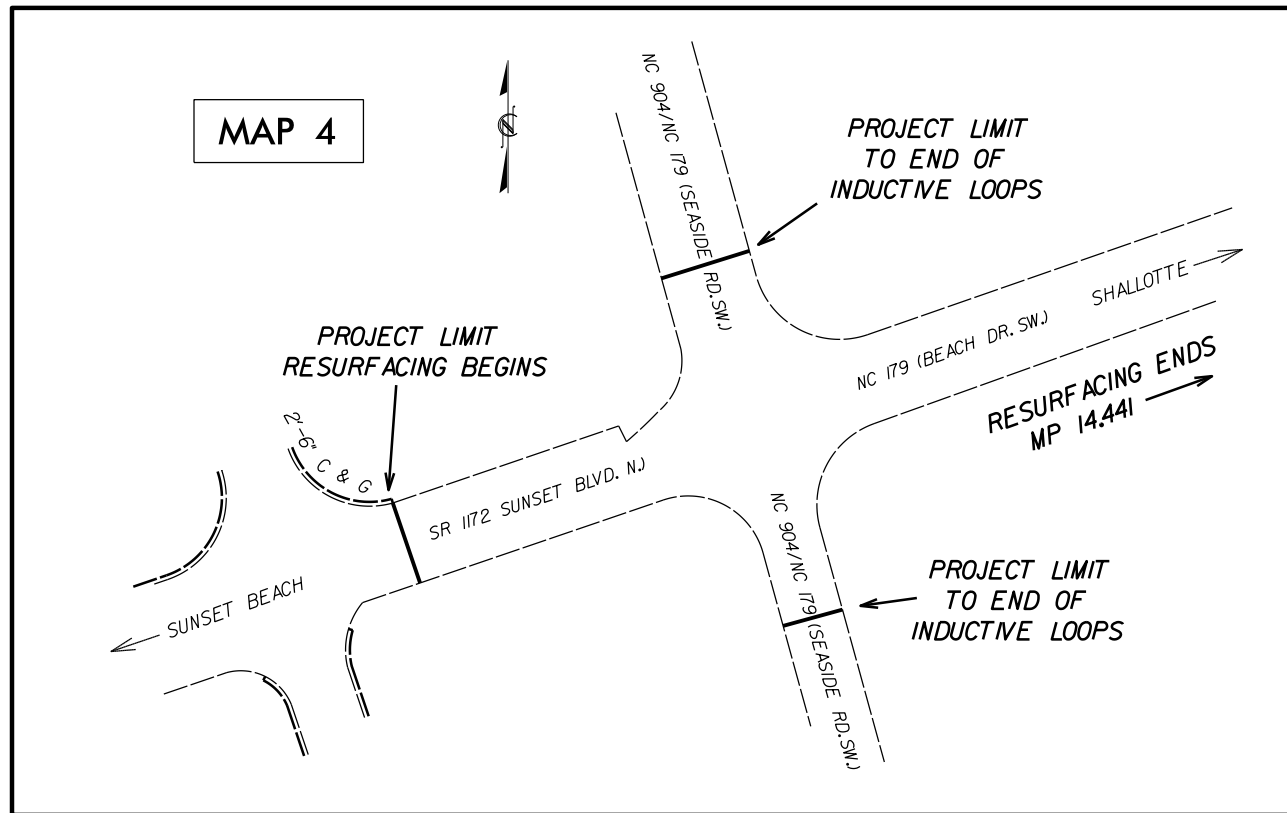


DETAIL FOR INCIDENTAL MILLING:
BEGINNING AND/OR END OF MAP & BRIDGES

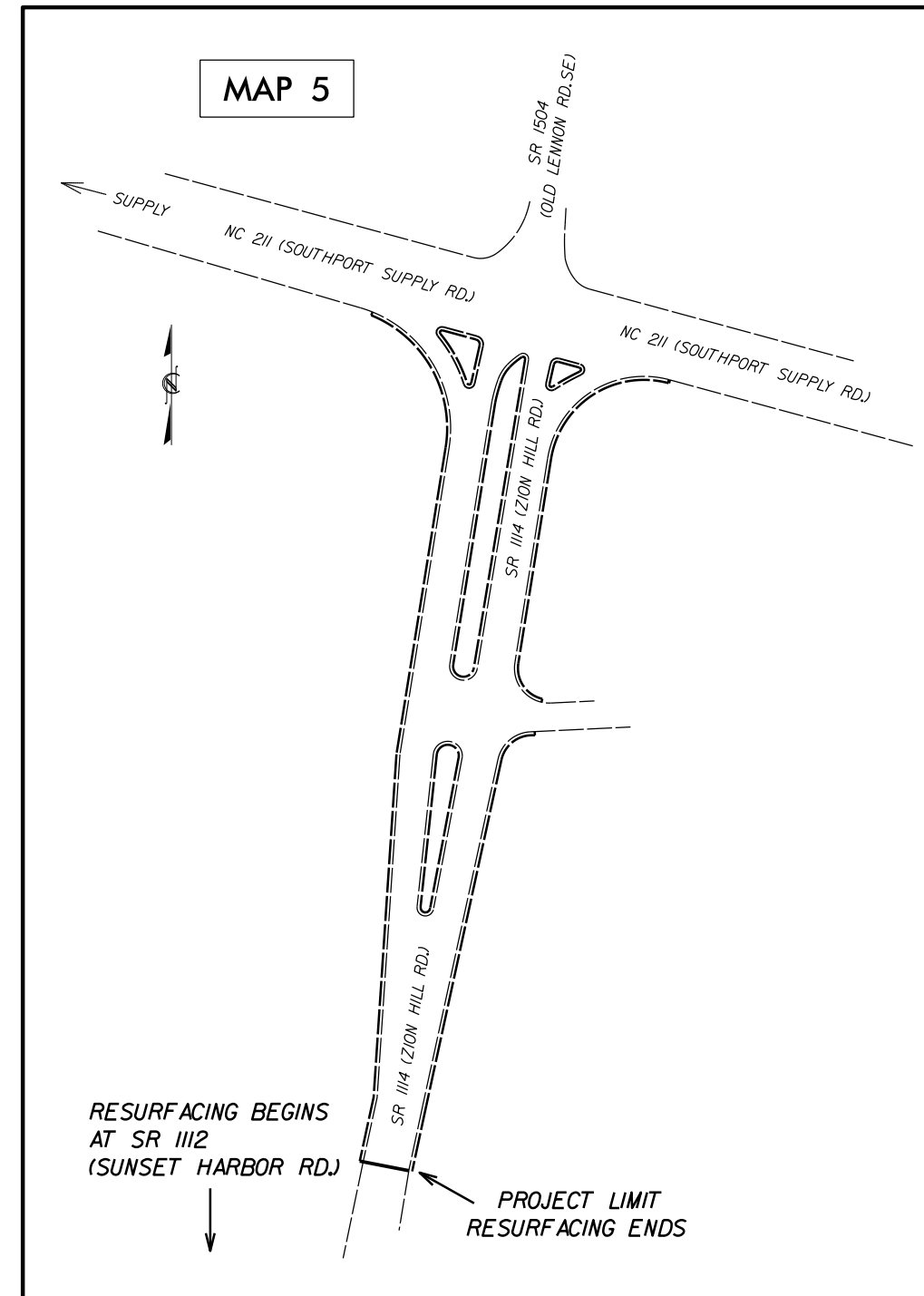
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RESURFACING LIMITS AND PAVEMENT MARKER DETAILS



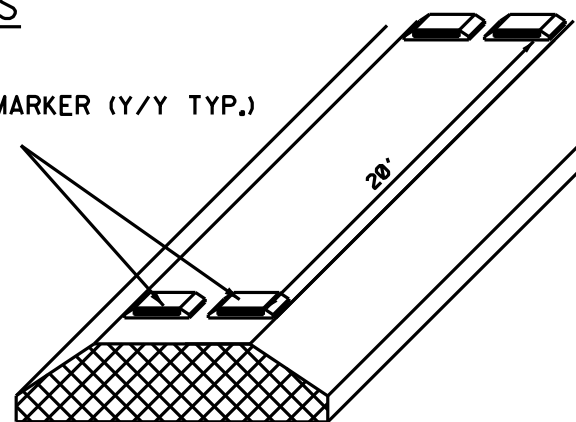
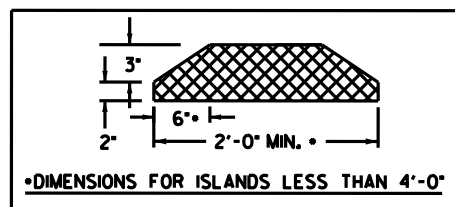
MAP 4: NC 179 (BEACH DR SW.) INTERSECTION NC 904 /NC 179 & SR 1172
RESURFACING LIMITS – SEE SIGNAL PLANS FOR LOCATION OF
INDUCTIVE LOOPS AND STOP BARS



MAP 5: SR 1114 (ZION HILL RD.)
RESURFACING LIMITS END AT PAVEMENT
SEAM BEFORE VALLEY CURB BEGINS

PAVEMENT MARKER DETAIL FOR CONCRETE ISLANDS

RAISED PAVEMENT MARKER (Y/Y TYP.)
(STD. DWG 1251.01)



MONOLITHIC CONCRETE ISLAND
(SEE STANDARD DRAWINGS 852.01, 852.02, & 852.06 FOR DETAILS.)

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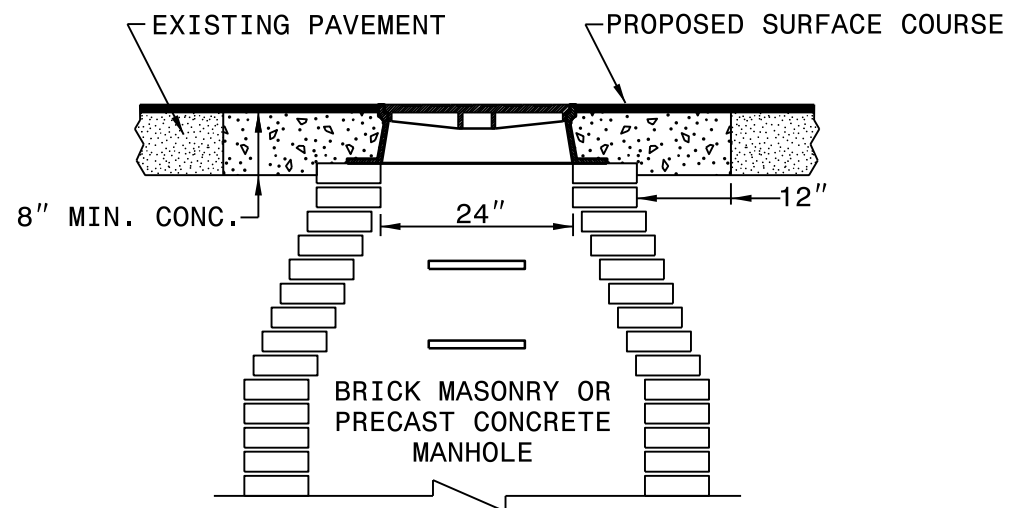
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MANHOLE AND VALVE BOX ADJUSTMENTS

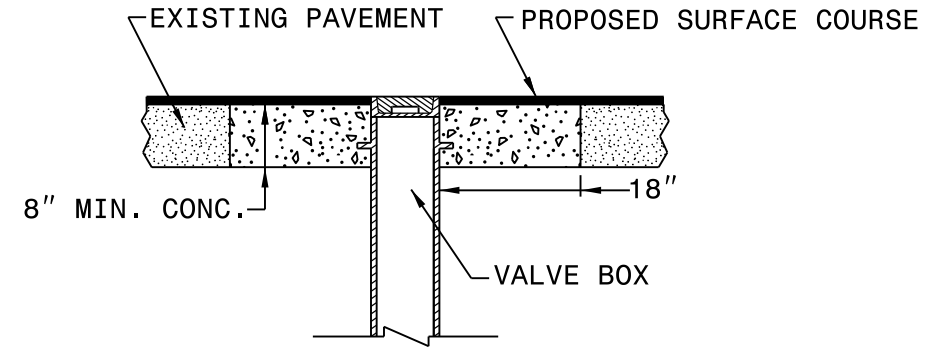
SHEET 1 OF 1
840D55

GENERAL NOTES:

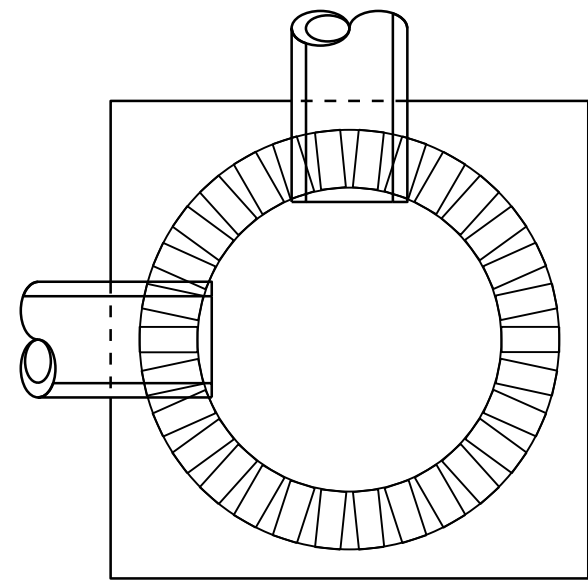
1. USE RAPID SET GROUT, MORTAR, OR CONCRETE THAT WILL TAKE FULL SET AND BECOME LOAD BEARING WITHIN SIXTY MINUTES OF PLACEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI.
2. REMOVE ALL FAULTY EXISTING BRICKWORK AND REPLACE WITH NEW BRICK MASONRY.
3. SHEER CUT EXCAVATION FOR THE ADJUSTMENT ON ALL SIDES.
4. FILL AREA BELOW 8" DEPTH WITH 78M OR NO. 57 CLEAN STONE.
5. MIX MORTAR TO NCDOT SPECIFICATIONS.
6. MORTAR JOINTS $\frac{1}{2}$ " +/- $\frac{1}{8}$ "
7. CONSTRUCT AN ASPHALT RAMP IN ACCORDANCE WITH SECTION 858-3 OF THE 2012 STANDARD SPECIFICATIONS.



MANHOLE CONCRETE ENCASEMENT



VALVE BOX CONCRETE ENCASEMENT



ELEVATION VIEW

PLACE BRICK ACCORDING TO ELEVATION VIEW

ENGLISH DETAIL DRAWING FOR
MANHOLE AND VALVE BOX ADJUSTMENTS

SHEET 1 OF 1
840D55

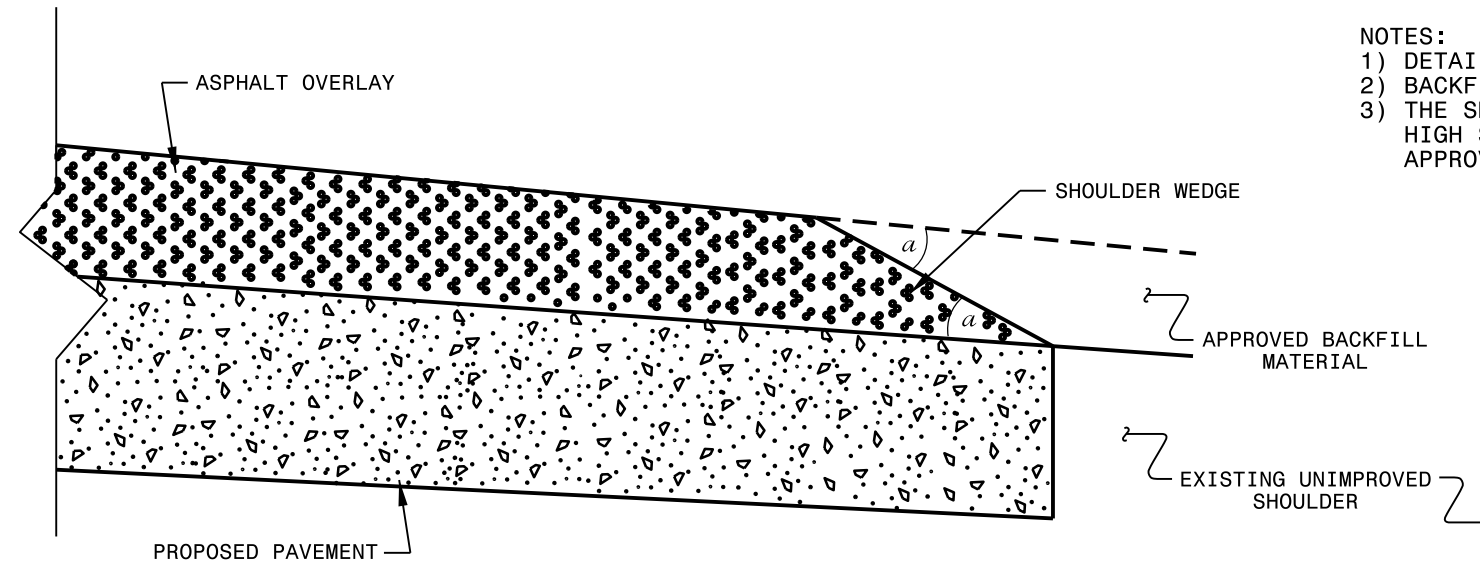
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

REVISIONS

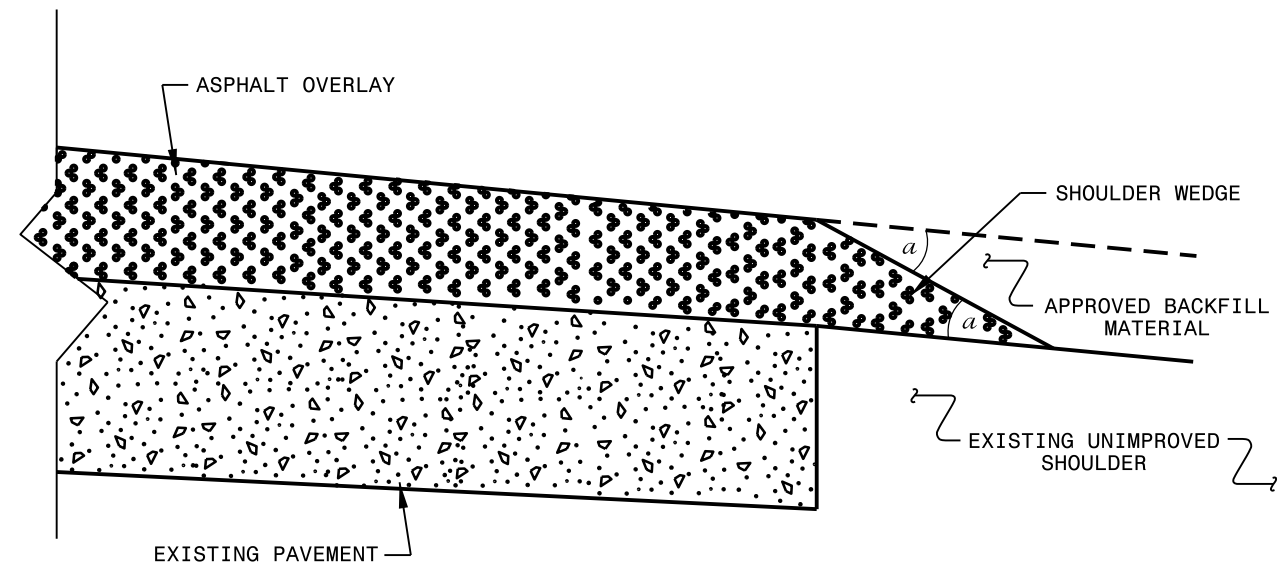
24-JAN-2016 13:31 C:\Users\jokjmmel\Desktop\DETAIL_PSHS\Microstation Files\MH_Valve_Adjust_2015.dgn \$\$\$\$USERNAME\$\$\$\$ 8/17/99

NOTES:

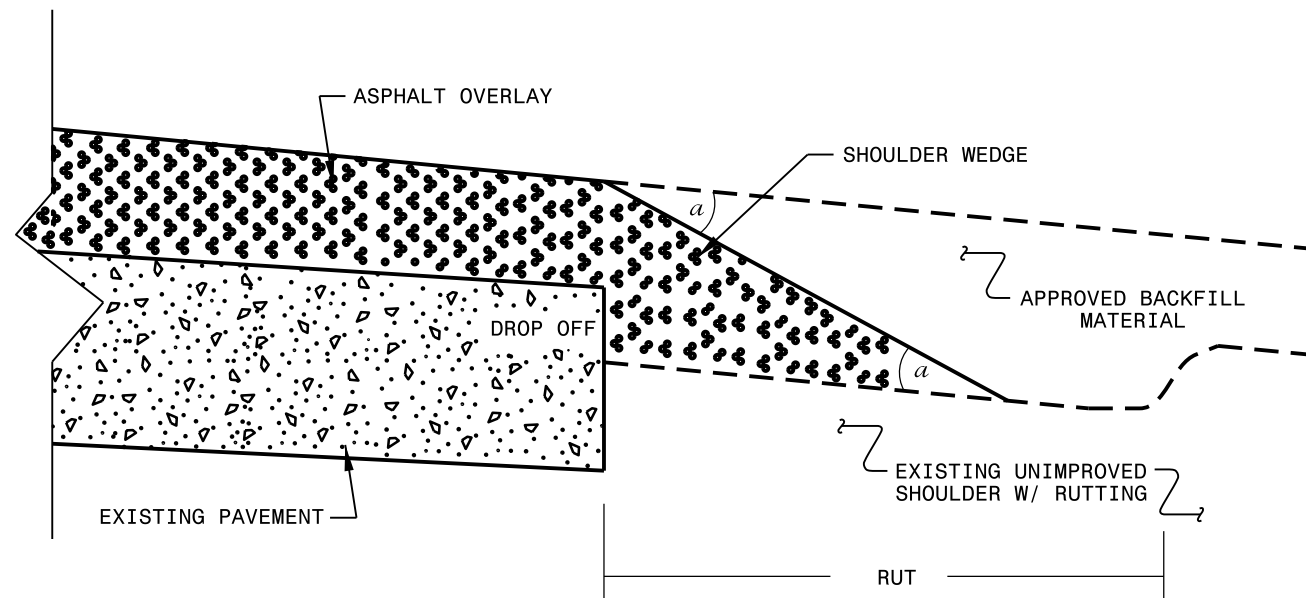
- 1) DETAIL DOES NOT APPLY TO OGAFB AND ULTRA-THIN BONDED WEARING COURSE.
- 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
- 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS, SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS APPROVED BY THE ENGINEER.



SHOULDER WEDGE DETAIL
 (Resurfacing Projects w/ Widening or
 with Existing Paved Shoulder having no dropoffs)



SHOULDER WEDGE DETAIL
 (Resurfacing Projects w/ NO Widening)



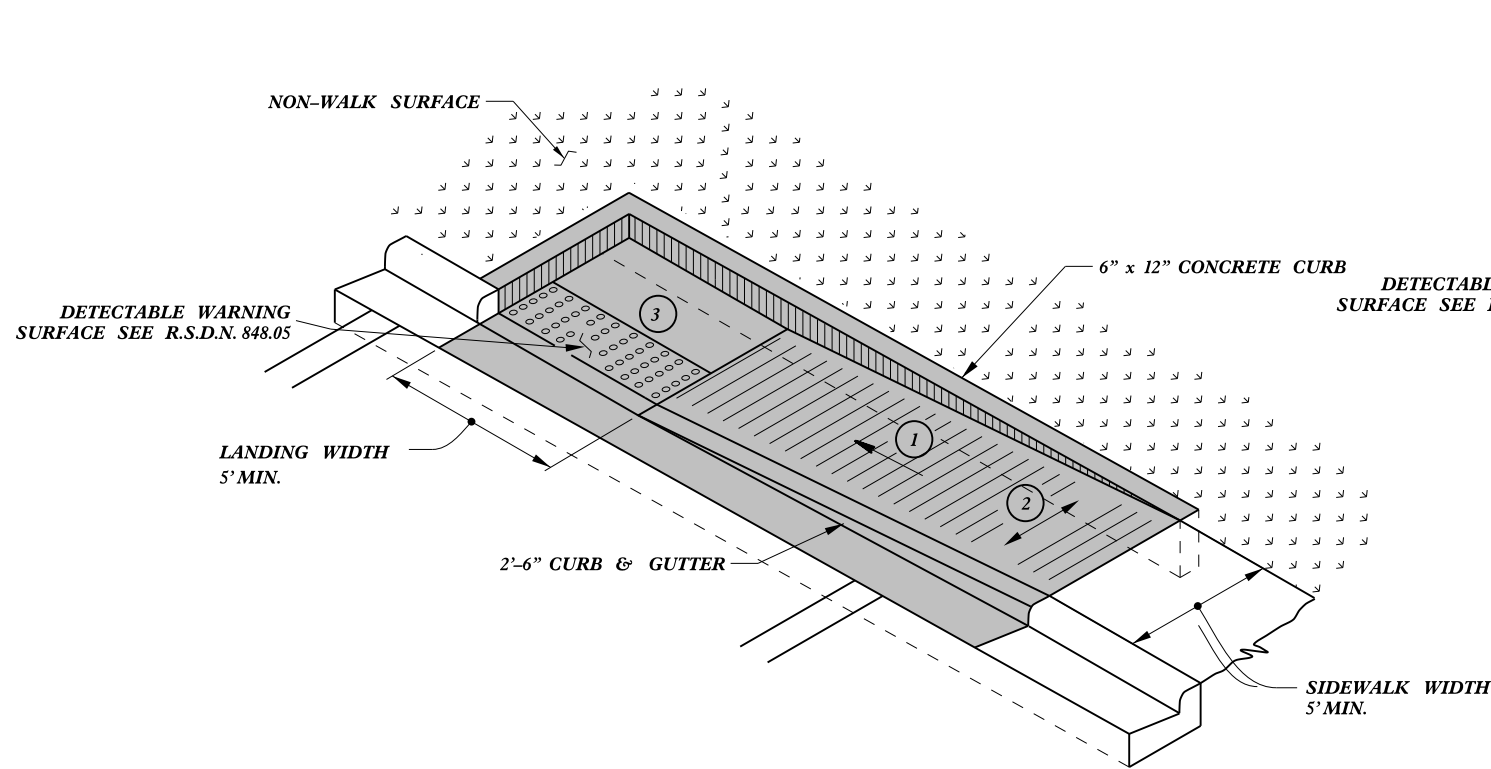
SHOULDER WEDGE DETAIL
 (Resurfacing Adjacent to
 Rutted Shoulder)

- SHOULDER WEDGE ANGLE = 30°

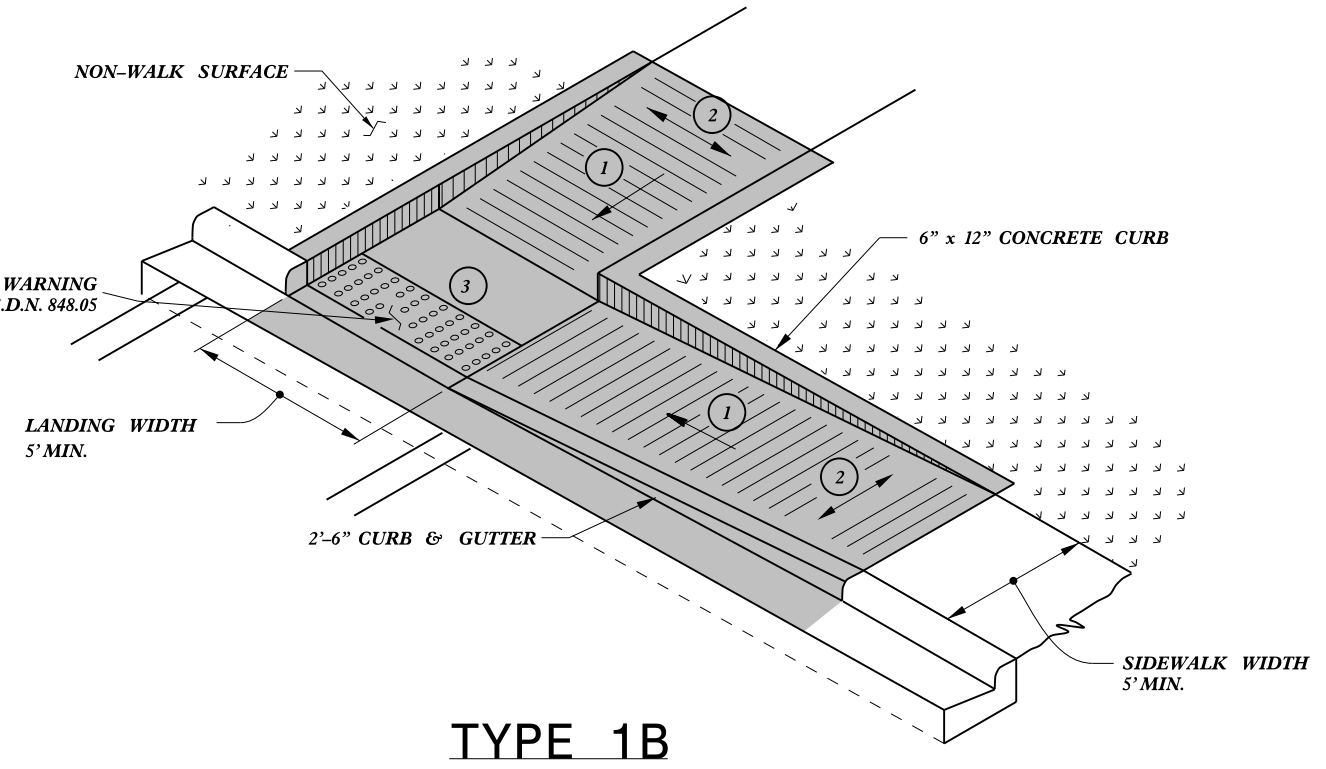
CONTRACT STANDARDS AND DEVELOPMENT UNIT			
Office 919-707-6950		FAX 919-250-4119	
SHOULDER WEDGE DETAILS			
ORIGINAL BY: T.SPELL	DATE: 7-19-11		
MODIFIED BY:	DATE: 2/2/16		
CHECKED BY:	DATE:		
FILE SPEC.: s:\usr\details\stand\shoulderwedgedetail.dgn			

23-AUG-2016 14:08
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 P:\p\ter - AT\USD-212512

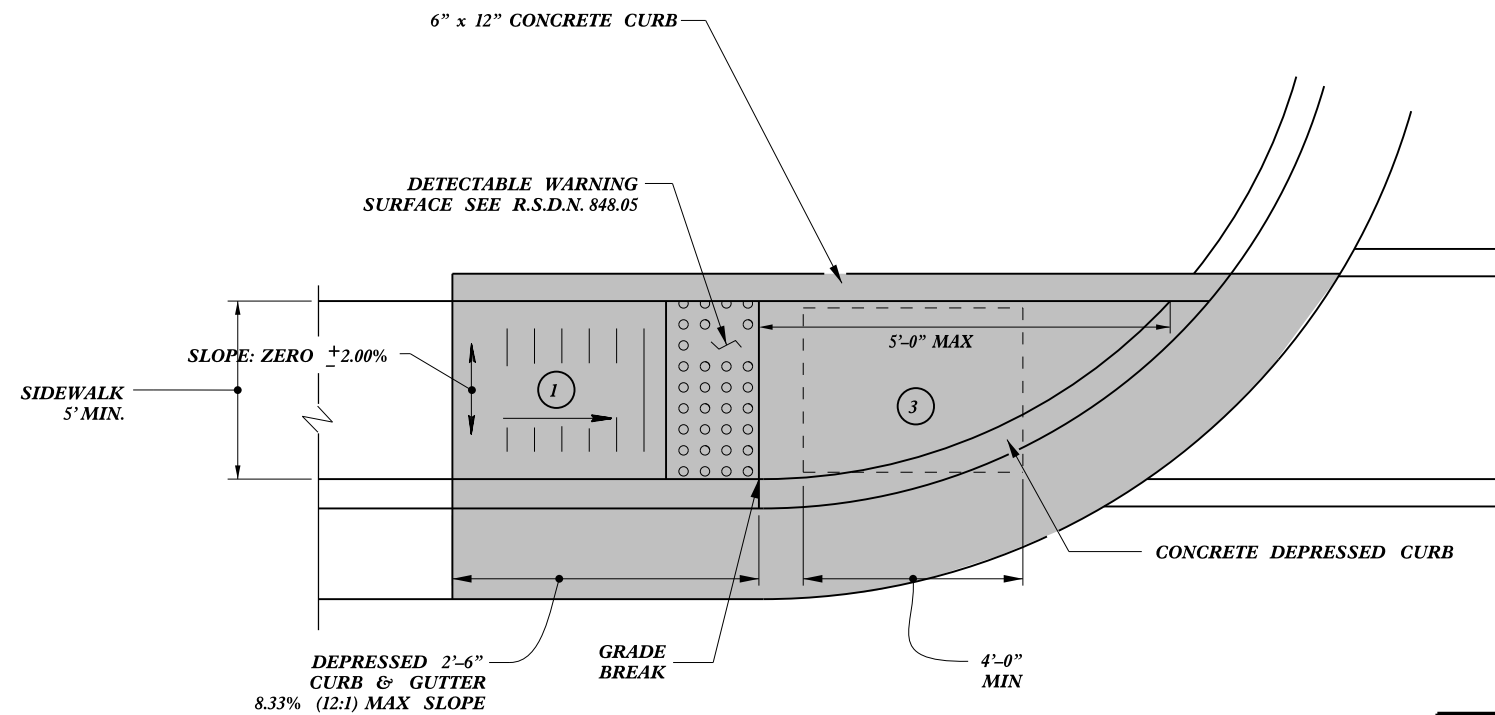
etc



TYPE 1A



TYPE 1B



TYPE 1

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.

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



DocuSign
Joel S. Howerton

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11/18/2015

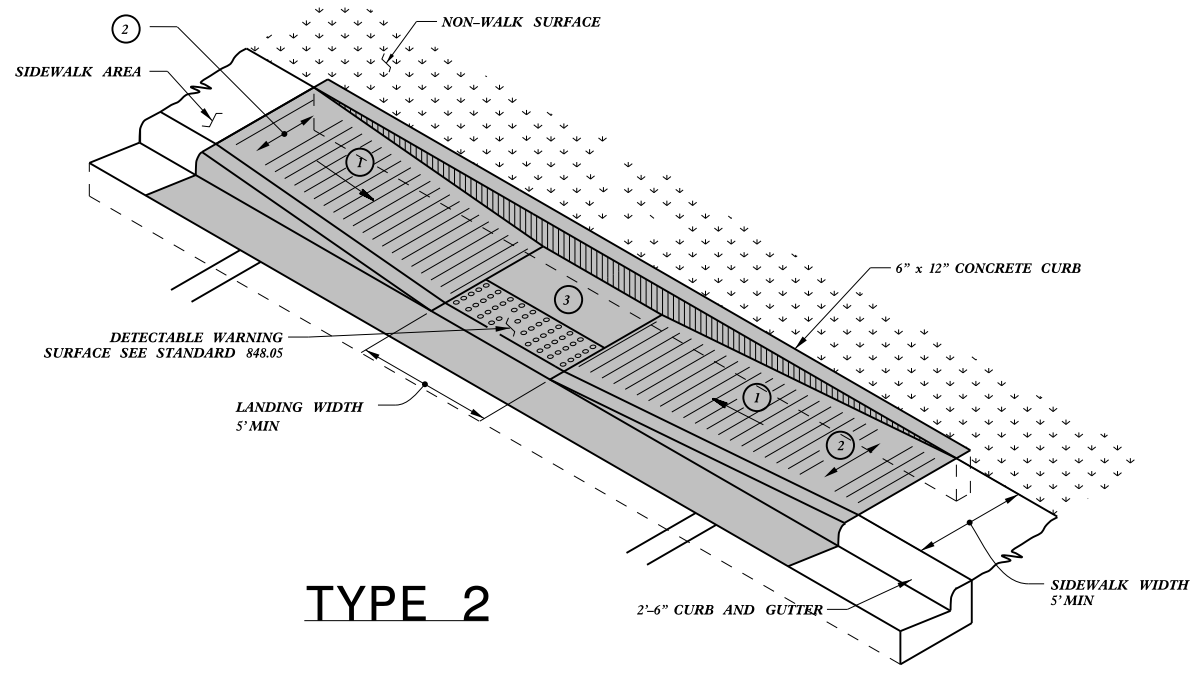
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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.dwg

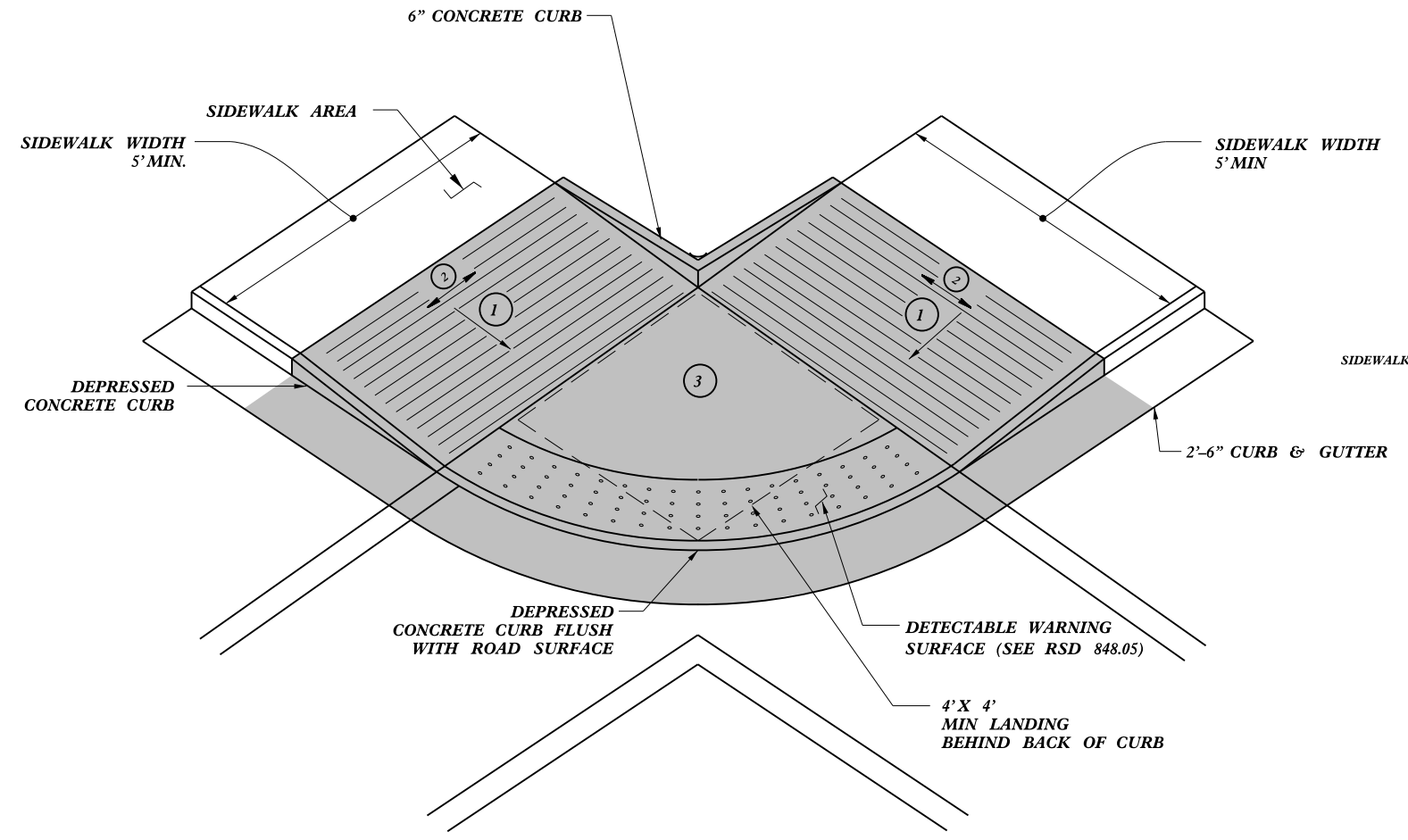
etc



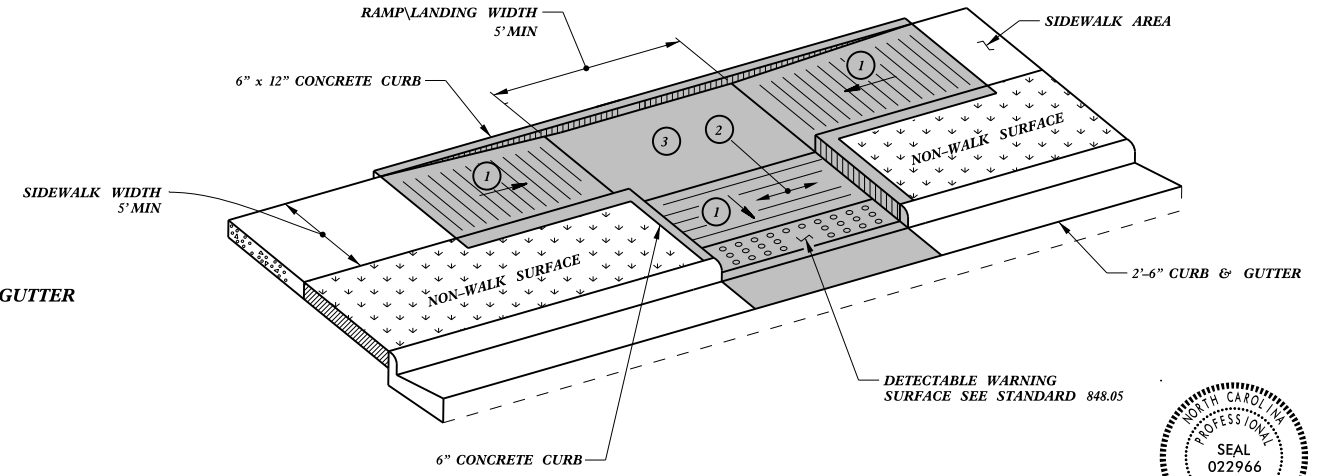
TYPE 2

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



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 Joel S. Howerton
 449E8E25522144E

11/18/2015

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

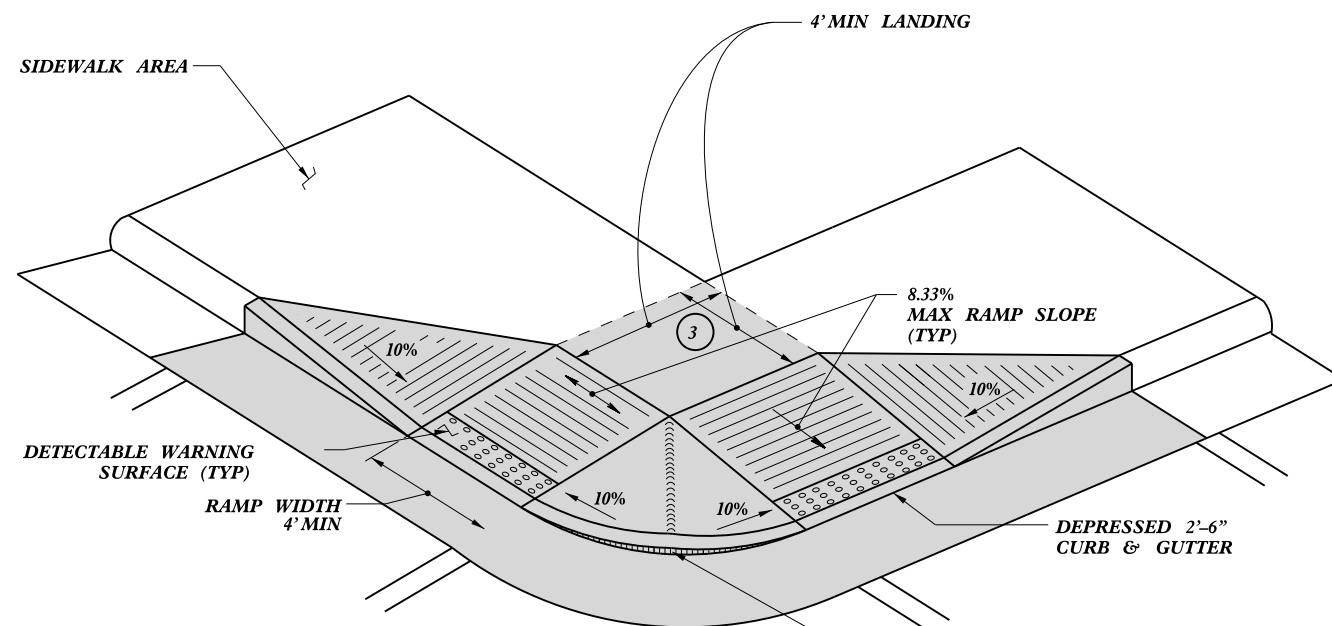
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
 MODIFIED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
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REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

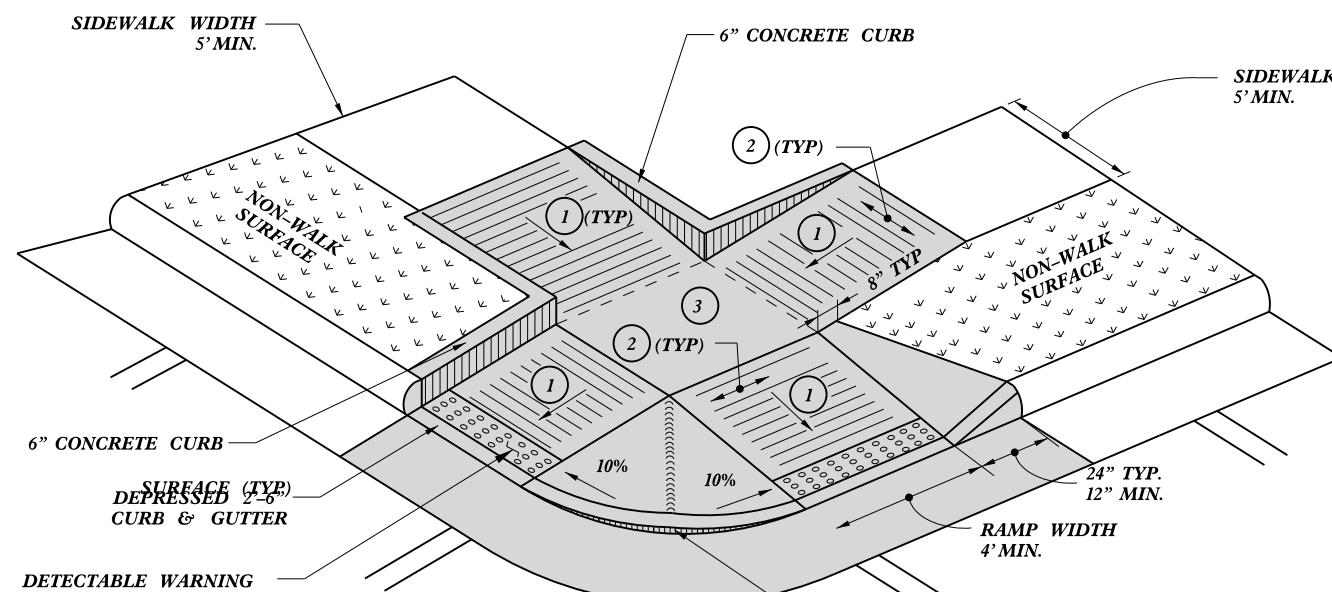
5/14/99

etc

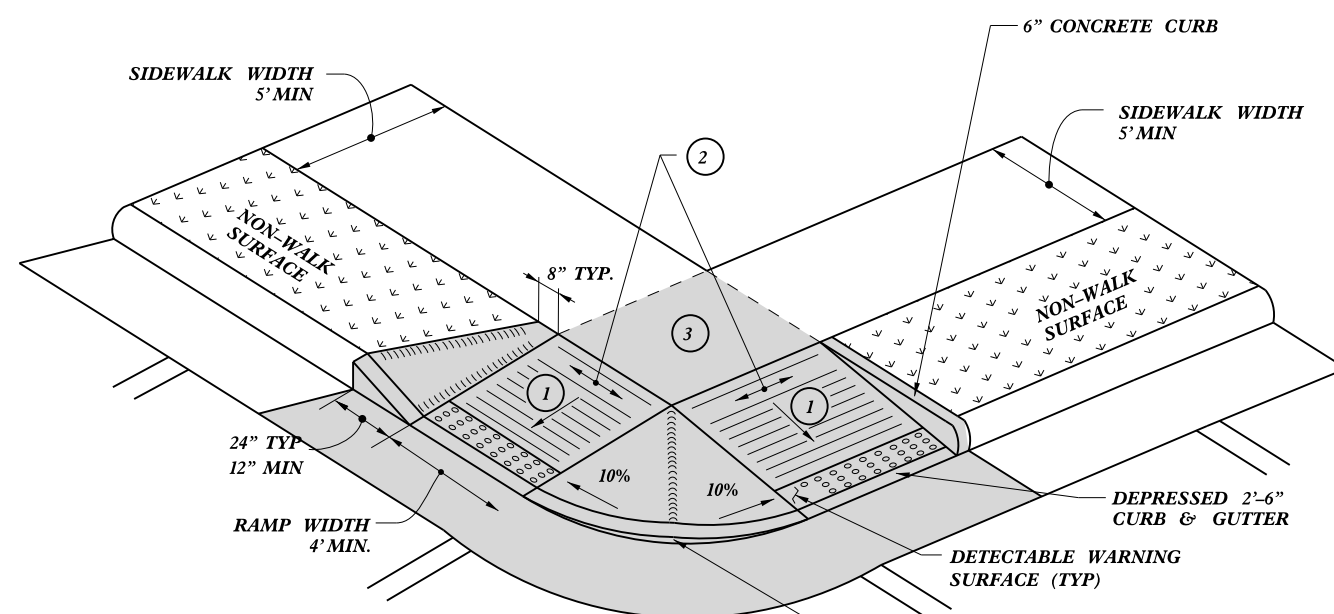
PAY LIMITS FOR 2 CURB RAMPS



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.

DocuSigned by:
Joel S Howerton
449E8E25522144F...



11/18/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

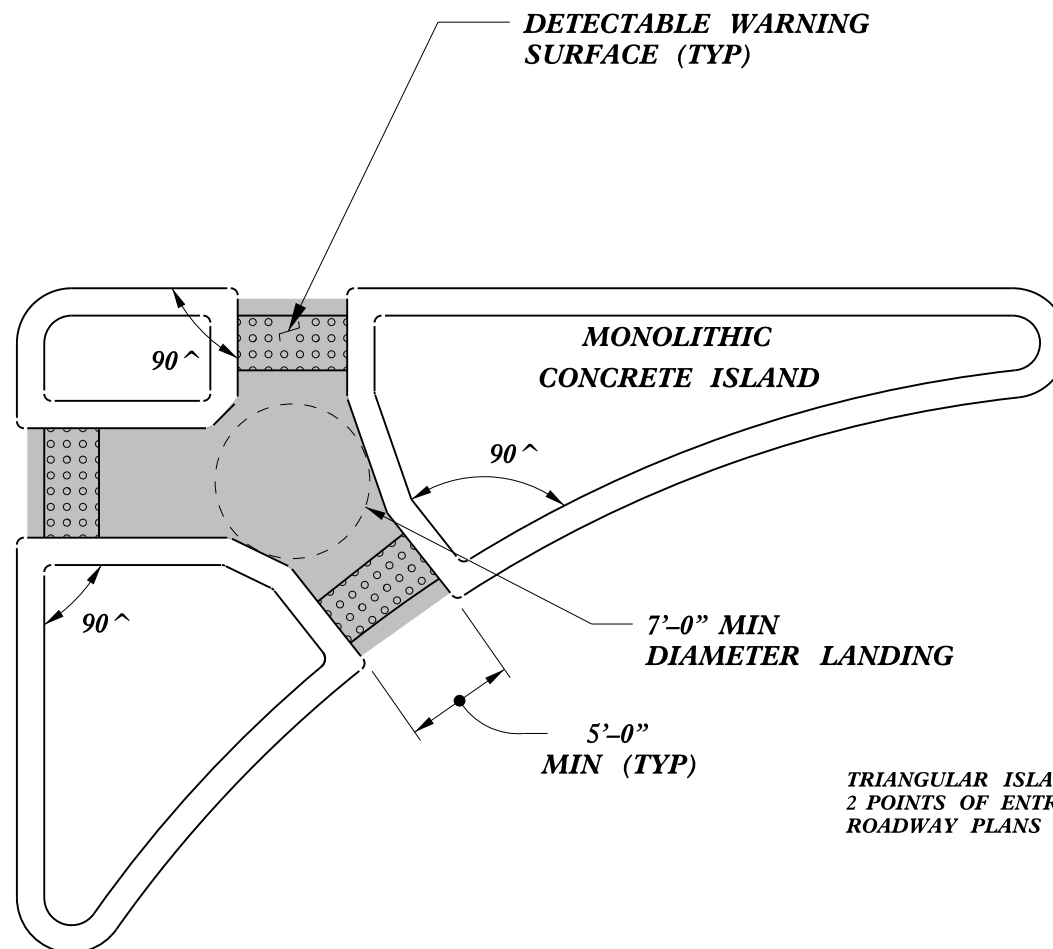
CURB RAMPS
Shared Landing

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

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

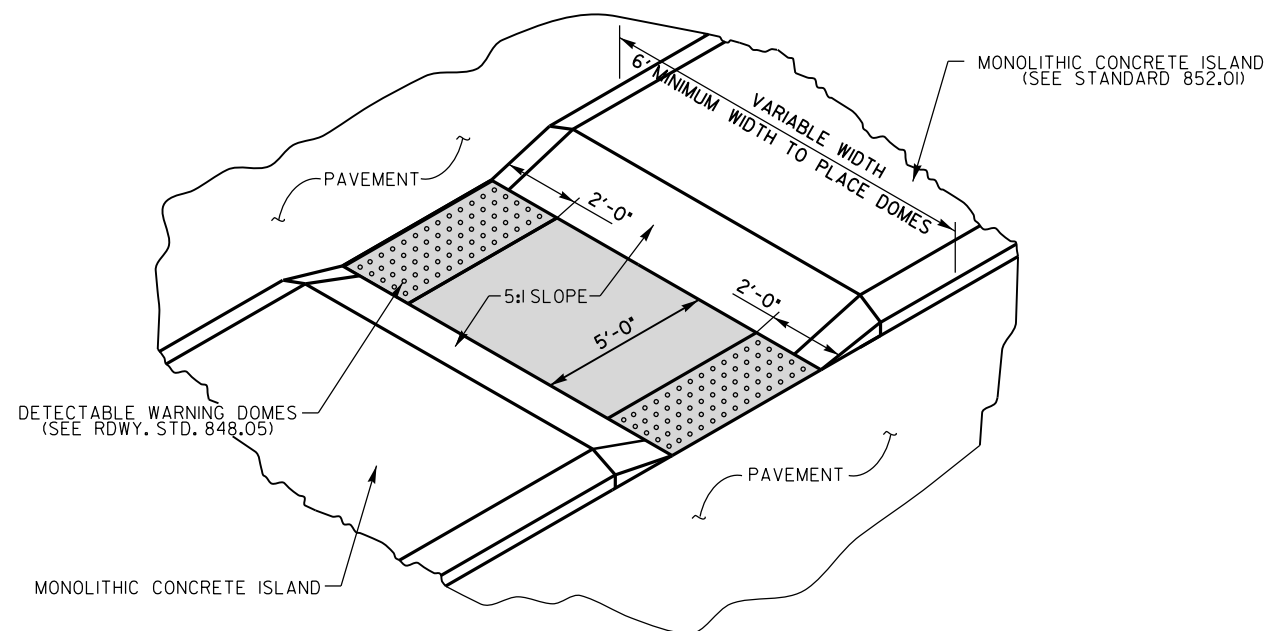
5/14/1999

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

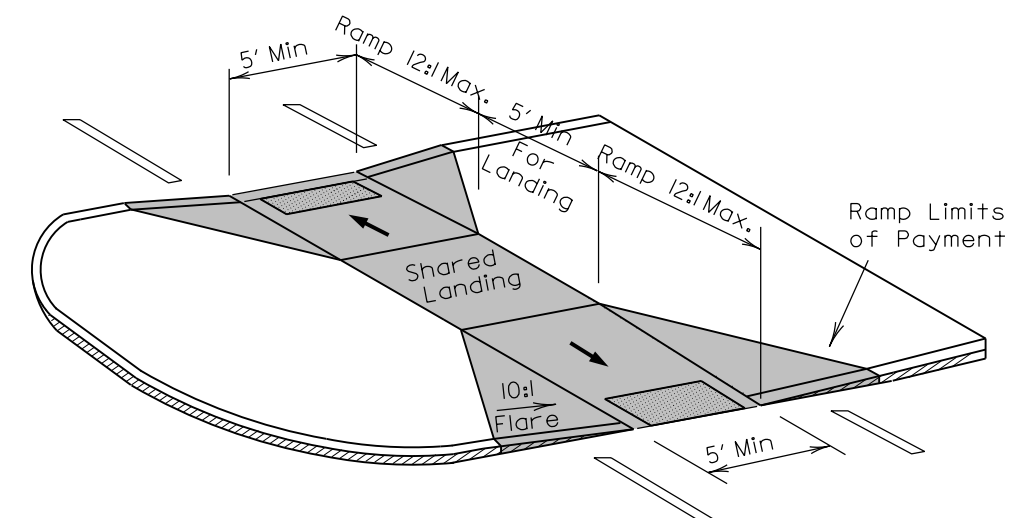


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY
 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE
 ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

**TRIANGULAR ISLAND
 WITH CUT THROUGH**



**MEDIAN ISLAND
 WITH CUT THROUGH**



**MEDIAN ISLAND
 CURB RAMPS**

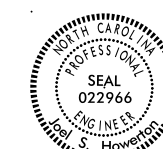
DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

**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.dwg



DocuSign
 Joel S. Howerton

11/18/2015

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5/14/99
 \$\$\$\$SYTIME\$\$\$\$
 \$\$\$\$CONGN\$\$\$\$
 \$\$\$\$USERNAME\$\$\$\$

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH MI	WIDTH FT	BORROW EXC. CY	AGGR. SHDR. BORROW TON	INC. STONE BASE TONS	SHDR. RECON. ST. SMI	1-1/2" MILLING SY	1-1/4" MILLING SY	2" MILLING SY	0.75" MILLING SY	MILLING ASPHALT PAV. 0" - 1.25" SY	MILLING ASPHALT PAV. 0" - 0.75" SY	INC. MILLING SY	BASE COURSE, B25.0B TONS	BASE COURSE, B25.0C TONS	INT. COURSE, I19.0C TONS	SURFACE COURSE, S9.5B TONS	LEVELING COURSE, S9.5B TONS	SURFACE COURSE, S9.5C TONS	LEVELING COURSE, S9.5C TONS	SURFACE COURSE, SF9.5A TONS	LEVELING COURSE, SF9.5A TONS	SURFACE COURSE, S4.75A TONS	ASPHALT BINDER FOR PLANT MIX TON	MILLED RUMBLE STRIPS (16") LF	PATCHING EXI. PAV. (MILL) TON	PATCHING EXI. PAV. (FULL DEPTH) TON	4" CONC. SIDE-WALK SY	
																																						NO
2017CPT.03.06.10101	Brunswick	1	NC 74 /US 76 EB (ANDREW JACKSON HWY)	FROM COLUMBUS COUNTY LINE TO I-140 (MP 0.000 - 7.064) NO PAVING MP 4.485 - 4.505 BRIDGE NO. 4	1	2	MD	NO	NO	7.064	32		534	25	14.13	128,528						2,000		6340*	3,968				12,799	10				1,232	74,596	130	30	
		2	NC 74 /US 76 WB (ANDREW JACKSON HWY)	FROM I-140 TO COLUMBUS CO. LINE (MP 8.334 - 15.398)	1, 2	2	MD	NO	NO	7.064	32		534	42	14.13	123,029							2,262		6362*	3,966				12,288				1,202	74,554	77	55	
		3	NC 179 (BEACH DRIVE SW)	FROM SOUTH CAROLINA STATE LINE TO NC BUS.179 & SR 1164 IN CALABASH (MP 0.000 - 2.158)	3	3	MU	NO	NO	2.158	33						43,350						200				3,740	50						228		130	50	10
		4	NC 179 (BEACH DR./BRICKLANDING RD.) INCLUDES 3 LANE SECT.	FROM NC 904 TOWARD SHALLOTTE BEGIN 2'6" C & G (MP 7.303 - 14.441) NO PAVING MP 9.931 - 10.130/ MP 12.598 - 12.656 / MP 11.103 - 13.491	4	3	MU	NO	NO	7.138	20 - 38				552	200	14.60							2,155				9,255	20					557		1,200	200	
TOTAL FOR PROJ NO. 2017CPT.03.06.10101										23.424			1,620	267	42.86	294,907					6,617		12,702	7,934	12,995	70	25,087	10				3,219	149,150	1,537	335	10		

*side roads and crossovers are excluded

2017CPT.03.06.20101	Brunswick	5	SR 1114 (ZION HILL RD.)	FROM SR 1112 TO PAVEMENT SEAM BEFORE NC 211 (MP 0.00 - 2.992)	5, 6	2	2WU	NO	NO	2.992	20	60		1	5.38														2,667	6		179		14	42								
		6	SR 1505 (CLEMMONS RD.)	FROM SR 1504 TO NC 211 (MP 0.00 - 1.301)	5	2	2WU	NO	NO	1.301	20	26			1	2.60															1,055			71									
		7	SR 1501 (GILBERT RD.)	FROM SR 1500 TO US 17 BUS (MP 0.00 - 5.56) NO PAVING BRIDGE NO. 41	5	2	2WU	NO	NO	5.56	20	20			1	11.12																4,508			302		10						
		8	SR 1509 (NECK RD.)	FROM US 17 BUS TO DEAD END (MP 0.00 - 0.514)	5	2	2WU	NO	NO	0.514	20	10			1	1.03																417			28		20						
		9	SR 1512 (GREEN LEWIS RD.)	FROM SR 1500 TO US 17 BUS (MP 0.00 - 4.697) NO PAVING BRIDGE NO.106	5	2	2WU	NO	NO	4.697	18	94			1	9.39																3,430	5		230								
		10	SR 1866 (REYNOLDS LANE)	FROM US 17 BUS TO DEAD END (MP 0.00 - 0.110)	5	2	2WU	NO	NO	0.11	20	2			1	0.22																89			6								
		11	SR 1535 (BLANTON RD.)	FROM NC 211 TO SR 1115 (MP 0.00 - 0.300)	5	2	2WU	NO	NO	0.3	18	6			1	0.60																219			15								
		12	SR 1191 (COPAS RD.)	FROM SR 1173 TO SR 1146 (MP 0.00 - 2.734) NO PAVING BRIDGE NO.207	5	2	2WU	NO	NO	2.734	20	55			1	5.47																2,217			149		15						
		13	SR 1146 (COPAS RD.)	FROM SR 1145 TO SR 1191 (MP 0.00 - 0.659)	5	2	2WU	NO	NO	0.659	20	13			1	1.32																534			36		20						
		14	SR 1173 (VILLAGE RD.)	FROM NC 179 TO US 17 BUS (MP 0.00 - 0.272)	7	2	2WU	NO	NO	0.272	32																					2,390			352		10	5					
		15	SR 1140 (OXPEN RD.)	FROM SR 1137 TO NC 130 (MP 0.00 - 1.740)	5, 8	2	2WU	NO	NO	1.74	20	35			1	3.48																222			1,411			95		40	20		
		16	SR 1133 (EMPIRE RD.)	FROM SR 1130 TO NC 130 (MP 0.00 - 1.176)	5	2	2WU	NO	NO	1.176	18	24			1	2.35																200			859			58					
		17	SR 1132 (SHELL POINT RD.)	FROM NC 130 TO DEAD END (MP 2.337 - 6.067)	5, 9	2	2WU	NO	NO	3.73	22	30			1	7.46																200	2,608			3,215			330		25		
		18	SR 1506 (LEWIS LOOP RD.)	FROM SR 1500 TO SR 1506 (MP 0.00 - 1.426)	5	2	2WU	NO	NO	1.426	20	29			1	2.85																	222			1,156			77				
		19	SR 1136 (RED BUG RD.)	FROM NC 130 TO US 17 (MP 0.00 - 0.770)	5	2	2WU	NO	NO	0.77	20	15			1	1.54																	222			624			42				
		20	SR 1180 (A.I. CLEMMONS RD.)	FROM NC 130 TO DEAD END (MP 0.00 - 0.370)	5	2	2WU	NO	NO	0.37	18	7			1	0.74																	200			270			18				
		21	SR 1206 (TATUM RD.)	FROM NC 130 TO END MAINT. (MP 0.00 - 0.180)	5	2	2WU	NO	NO	0.18	18	4			1	0.36																	200			131			9				
		22	SR 1267 (JOLLY ROGERS DR.)	FROM SR 1139 TO END MAINT (MP 0.00 - 0.290)	5	2	2WU	NO	NO	0.29	20	6			1	0.58																	222			235			16				
		23	SR 1288 (SHORELINE DR.)	FROM SR 1139 TO SR 1289 (MP 0.00 - 0.204)	5	2	2WU	NO	NO	0.204	20	4			1	0.41																	222			165			11				
		24	SR 1289 (WHITE ST.)	FROM SR 1288 TO END MAINT. (MP 0.00 - 0.250)	5	2	2WU	NO	NO	0.25	18	5			1	0.50																	200			183			12				
		25	SR 1240 (CAISON AVE.)	FROM SR 1239 TO SR 1241 (MP 0.00 - 0.120)	5	2	2WU	NO	NO	0.12	20	2			1	0.24																	222			97			7				
		26	SR 1895 (SUN FISH ST.)	FROM SR 1894 TO END MAINT. (MP 0.00 - 0.050)	5	2	2WU	NO	NO	0.05	18	1			1	0.10																	200			37			2				
		27	SR 1894 (SEA WAY ST.)	FROM SR 1239 TO SR 1895 (MP 0.000 - 0.040)	5	2	2WU	NO	NO	0.04	18	1			1	0.08																	200			29			2				
		28	SR 1529 ((PLANTATION RD.)	FROM SR 1530 TO END OF MAINT. AT GATE (MP 0.480 - MP 2.206) NO PAVING ON BRIDGE NO. 193 [MP 0.880 - 0.893]	10	2	2WU	NO	NO	1.726	18					14	3.41																				2,082			125		550	
		29	SR 1533 (ST. PHILLIPS RD.)	FROM SR 1529 (PLANTATION RD.) TO END OF SYSTEM (MP 0.000 - 0.712)	11	2	2WU	NO	NO	0.712	18	29					1.43																					627			42		25
		TOTAL FOR PROJ NO. 2017CPT.03.06.20101										31.923			478	36	62.66			5,280	18,590		2,390		5,186	2,608				2,082				24,527	11		1,886		154	642			

SUMMARY OF QUANTITIES

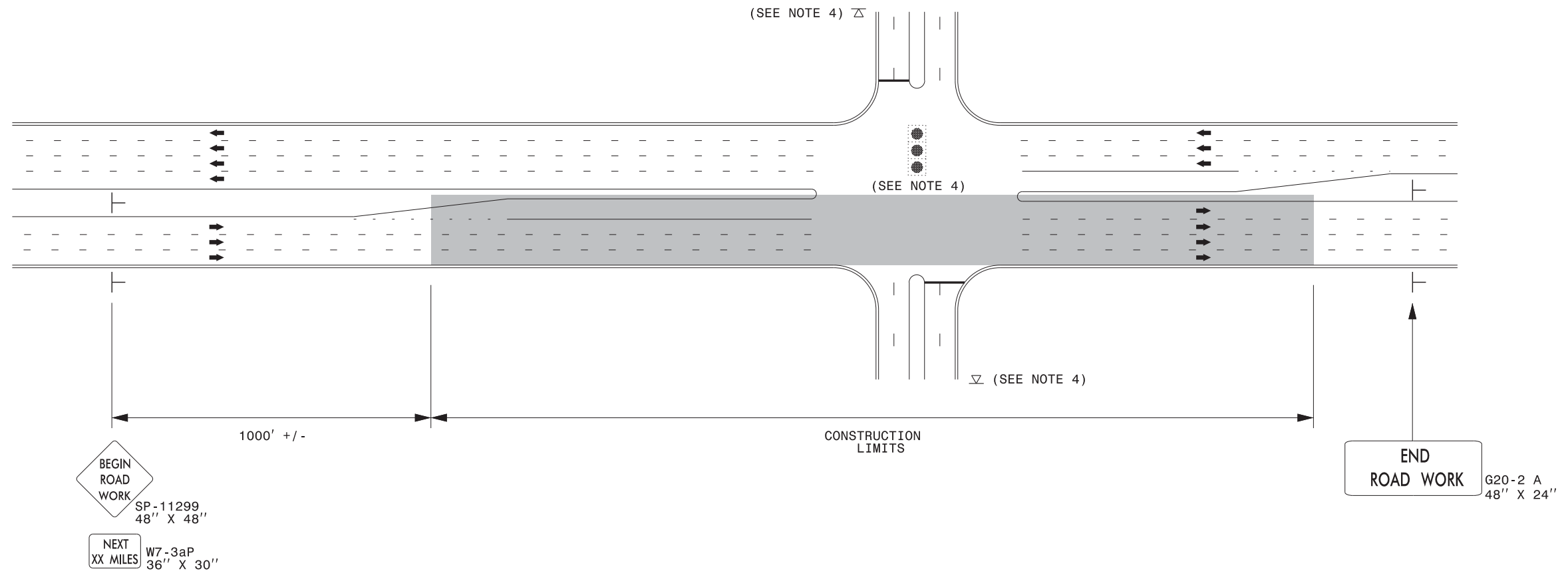
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP	LANES	LANE TYPE	FINAL SURFACE REQUIRE D	CONC. CURB RAMP	6" DRIVE-WAYS	REMOVE & REPLACE MONOL. CONC. ISLAND	REMOVE & REPLACE 4" CONC. SIDEWALK	2'6" CURB & GUTTER, REMOVE & REPLACE	REMOVE & REPLACE CONC. CURB RAMP	REMOVE CONC. CURB RAMPS	ADJ. OF DROP INLETS	ADJ. OF MAN HOLES	ADJ. OF METER OR VALVE BOXES	TEMP. SILT FENCE	STONE FOR EC CLASS B	SEDIMENT CONTROL STONE	TEMP. MULCH ING	SEED FOR TEMP. SEEDIN G	FERTILIZER FOR TEMP. SEEDING	MATTING FOR EROSION CONTROL	1/4" HARD-WARE CLOTH	WATTLE	SEED & MULCH ING	SEED FOR REPAIR SEEDING	FERTILIZE R FOR REPAIR SEEDING	RESPONSE FOR EROSION CONTROL	UNPAVED TRENCHIN G (1, 2")	DIRECTIONA L DRILL (1, 2")	JUNCTION BOX (STANDARD SIZE)	INDUCTIVE LOOP SAWCUT	LEAD- IN CABLE (14-2)																					
																																					EA	SY	SY	SY	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
2017CPT.03.06.10101	Brunswick	1	NC 74 /US 76 EB (ANDREW JACKSON HWY)	FROM COLUMBUS COUNTY LINE TO I-140 (MP 0.000 - 7.064) NO PAVING MP 4.485-4.505 BRIDGE NO. 4	1	2	MD	NO			35								500					50		100	5.17			5						600																					
		2	NC 74 /US 76 WB (ANDREW JACKSON HWY)	FROM I-140 TO COLUMBUS CO. LINE (MP 8.334 - 15.398)	1, 2	2	MD	NO		10										500					50		100	5.17			5					560																					
		3	NC 179 (BEACH DRIVE SW)	FROM SOUTH CAROLINA STATE LINE TO NC BUS.179 & SR 1164 IN CALABASH (MP 0.000 - 2.158)	3	3	MU	NO	1			10	40		9	2	1	3	1														250			3		2,710	370																		
		4	NC 179 (BEACH DR./BRICKLANDING RD.) INCLUDES 3 LANE SECT.	FROM NC 904 TOWARD SHALLOTTE BEGIN 2'6" C & G (MP 7.303 - 14.441) NO PAVING MP 9.931- 10.130/ MP 12.598 - 12.656 / MP 11.103 - 13.491	4	3	MU	NO					15								500					50		100	5.28			5	320	25	4		2,260	380																			
TOTAL FOR PROJ NO. 2017CPT.03.06.10101																													1	10	35	10	55	9	2	2	5	5	1,500					150		300	15.62			15	570	25	7		6,130	750	
2017CPT.03.06.20101	Brunswick	5	SR 1114 (ZION HILL RD.)	FROM SR 1112 TO PAVEMENT SEAM BEFORE NC 211 (MP 0.00 - 2.992)	5, 6	2	2WU	NO											269	67	67	1.96	135	0.67	20	135	50	1.96	135	0.67	1																										
		6	SR 1505 (CLEMMONS RD.)	FROM SR 1504 TO NC 211 (MP 0.00-1.301)	5	2	2WU	NO												258	64	64	1.87	129	0.65	20	129	40	1.87	129	0.65	1																									
		7	SR 1501 (GILBERT RD.)	FROM SR 1500 TO US 17 BUS (MP 0.00 - 5.56) NO PAVING BRIDGE NO. 41	5	2	2WU	NO													556	139	139	4.00	278	1.39	40	278	90	4.00	278	1.39	1																								
		8	SR 1509 (NECK RD.)	FROM US 17 BUS TO DEAD END (MP 0.00-0.514)	5	2	2WU	NO													51	13	13	0.37	26	0.13	10	26	10	0.37	26	0.13	1																								
		9	SR 1512 (GREEN LEWIS RD.)	FROM SR 1500 TO US 17 BUS (MP 0.00 - 4.697) NO PAVING BRIDGE NO.106	5	2	2WU	NO													47	12	12	0.34	23	0.11	10	23	10	0.34	23	0.11	1																								
		10	SR 1866 (REYNOLDS LANE)	FROM US 17 BUS TO DEAD END (MP 0.00-0.110)	5	2	2WU	NO													11	3	3	0.08	6	0.03	10	6	10	0.08	6	0.03	1																								
		11	SR 1535 (BLANTON RD.)	FROM NC 211 TO SR 1115 (MP 0.00-0.300)	5	2	2WU	NO													30	8	8	0.22	15	0.08	10	15	10	0.22	15	0.08	1																								
		12	SR 1191 (COPAS RD.)	FROM SR 1173 TO SR 1146 (MP 0.00 - 2.734) NO PAVING BRIDGE NO.207	5	2	2WU	NO													273	68	68	1.99	137	0.68	20	137	50	1.99	137	0.68	1																								
		13	SR 1146 (COPAS RD.)	FROM SR 1145 TO SR 1191 (MP 0.00 - 0.659)	5	2	2WU	NO													66	16	16	0.48	33	0.16	10	33	10	0.48	33	0.16	1																								
		14	SR 1173 (VILLAGE RD.)	FROM NC 179 TO US 17 BUS (MP 0.00 - 0.272)	7	2	2WU	NO					15																																												
		15	SR 1140 (OXPEN RD.)	FROM SR 1137 TO NC 130 (MP 0.00 - 1.740)	5, 8	2	2WU	NO													174	43	43	1.26	87	0.44	20	87	30	1.26	87	0.44	1																								
		16	SR 1133 (EMPIRE RD.)	FROM SR 1130 TO NC 130 (MP 0.00 - 1.176)	5	2	2WU	NO													118	29	29	0.86	59	0.29	10	59	20	0.86	59	0.29	1																								
		17	SR 1132 (SHELL POINT RD.)	FROM NC 130 TO DEAD END (MP 2.337 - 6.067)	5, 9	2	2WU	NO													373	93	93	2.70	187	0.93	30	187	60	2.71	187	0.93	1																								
		18	SR 1506 (LEWIS LOOP RD.)	FROM SR 1500 TO SR 1506 (MP 0.00 - 1.426)	5	2	2WU	NO													143	36	36	1.00	71	0.36	20	71	30	1.00	71	0.36	1																								
		19	SR 1136 (RED BUG RD.)	FROM NC 130 TO US 17 (MP 0.00 - 0.770)	5	2	2WU	NO													77	19	19	0.56	39	0.19	10	39	20	0.56	39	0.19	1																								
		20	SR 1180 (A.I. CLEMMONS RD.)	FROM NC 130 TO DEAD END (MP 0.00 - 0.370)	5	2	2WU	NO													37	9	9	0.27	18	0.09	10	18	10	0.27	18	0.09	1																								
		21	SR 1206 (TATUM RD.)	FROM NC 130 TO END MAINT. (MP 0.00 - 0.180)	5	2	2WU	NO													18	4	4	0.13	9	0.05	10	9	10	0.13	9	0.05	1																								
		22	SR 1267 (JOLLY ROGERS DR.)	FROM SR 1139 TO END MAINT (MP 0.00 - 0.290)	5	2	2WU	NO													29	7	7	0.21	15	0.07	10	14	10	0.21	15	0.07	1																								
		23	SR 1288 (SHORELINE DR.)	FROM SR 1139 TO SR 1289 (MP 0.00 - 0.204)	5	2	2WU	NO													20	5	5	0.15	10	0.05	10	10	10	0.15	10	0.05	1																								
		24	SR 1289 (WHITE ST.)	FROM SR 1288 TO END MAINT. (MP 0.00 - 0.250)	5	2	2WU	NO													25	6	6	0.18	13	0.06	10	12	10	0.18	13	0.06	1																								
		25	SR 1240 (CAISON AVE.)	FROM SR 1239 TO SR 1241 (MP 0.00 - 0.120)	5	2	2WU	NO													12	3	3	0.09	6	0.03	10	6	10	0.09	6	0.03	1																								
		26	SR 1895 (SUN FISH ST.)	FROM SR 1894 TO END MAINT. (MP 0.00 - 0.050)	5	2	2WU	NO													5	1	1	0.04	3	0.01	10	3	10	0.04	3	0.01	1																								
		27	SR 1894 (SEA WAY ST.)	FROM SR 1239 TO SR 1895 (MP 0.000 - 0.040)	5	2	2WU	NO													4	1	1	0.03	2	0.01	10	2	10	0.03	2	0.01	1																								
		28	SR 1529 ((PLANTATION RD.)	FROM SR 1530 TO END OF MAINT. AT GATE (MP 0.480 - MP 2.206) NO PAVING ON BRIDGE NO. 193 [MP 0.880 - 0.893]	10	2	2WU	NO													2,000	43	43	2.60	80	0.50	20	87	30	5.00	80	0.50																									
		29	SR 1533 (ST. PHILLIPS RD.)	FROM SR 1529 (PLANTATION RD.) TO END OF SYSTEM (MP 0.000 - 0.712)	11	2	2WU	NO													40	18	18	1.00	36	0.50	10	36	20	5.00	36	0.50																									
		TOTAL FOR PROJ NO. 2017CPT.03.06.20101																																	15						4,636	707	707	22.37	1,417	7.47	350	1,422	570	28.78	1,417	7.46	22				

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH MI	WIDTH FT	BORROW EXC. CY	AGGR. SHOULDER BORROW TON	INC. STONE BASE TONS	SHOULDER RECON. SMI	1-1/2" MILLING SY	1-1/4" MILLING SY	2" MILLING SY	0.75" MILLING SY	MILLING ASPHALT PAV. 0" - 1.25" SY	MILLING ASPHALT PAV. 0" - 0.75" SY	INC. MILLING SY	BASE COURSE, B25.0B TONS	BASE COURSE, B25.0C TONS	INT. COURSE, I19.0C TONS	SURFACE COURSE, S9.5B TONS	LEVELING COURSE, S9.5B TONS	SURFACE COURSE, S9.5C TONS	LEVELING COURSE, S9.5C TONS	SURFACE COURSE, SF9.5A TONS	LEVELING COURSE, SF9.5A TONS	SURFACE COURSE, S4.75A TONS	ASPHALT BINDER FOR PLANT MIX TON	MILLED RUMBLE STRIPS (16") LF	PATCHING EXI. PAV. (MILL) TON	PATCHING EXI. PAV. (FULL DEPTH) TON	4" CONC. SIDEWALK SY	CONC. CURB RAMP EA		
																																							GRAND TOTAL	
2017CPT.03.06.20102	Brunswick	30	SR 1599 (JACKEYS CREEK LN)	FROM NC 133 TO SR 1605 (MP 0.00 - 0.324)	13	2	2WU	NO	NO	0.324	18										1,126										135	9		5						
		31	SR 1600 (BEDROCK CIRCLE)	FROM SR 1599 TO CUL-DE-SAC (MP 0.000 - 0.200)	12	2	2WU	NO	NO	0.2	18									872												83	6		5					
		32	SR 1601 (STONE BROOK COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.177)	12	2	2WU	NO	NO	0.177	18																					74	5		10					
		33	SR 1602 (WOODRIDGE COURT)	FROM SR 1601 TO CUL-DA-SAC (MP 0.00 - 0.032)	12	2	2WU	NO	NO	0.032	18																					13	1		5					
		34	SR 1603 (STONINGTON COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.092)	12	2	2WU	NO	NO	0.092	18																					38	3		5					
		35	SR 1604 (SHADY MOSS COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.072)	12	2	2WU	NO	NO	0.072	18																					30	2		5					
		36	SR 1605 (WHISPERING COVE COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.219)	12	2	2WU	NO	NO	0.219	18																					91	6		10					
		37	SR 1580 (LIBERTY LANDING RD.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.450)	13	2	2WU	NO	NO	0.45	20																					5	209	14	5					
		38	SR 1555 (MELLANEY LN.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.452)	13	2	2WU	NO	NO	0.542	20																					251	17		5					
		39	SR 1558 (CROFTERS COURT)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.177)	13	2	2WU	NO	NO	0.177	20																					5	82	6	5					
		40	SR 1573 (SIKES ST.)	FROM SR 1555 TO END MAINT. (MP 0.00 - 0.130)	13	2	2WU	NO	NO	0.13	18																					54	4							
		41	SR 1574 (NICHOLAS PLACE)	FROM SR 1555 TO SR 1575 (MP 0.00 - 0.127)	13	2	2WU	NO	NO	0.127	18																					53	4							
		42	SR 1575 (ELLIS ST.)	FROM SR 1573 TO END MAINT. (MP 0.00 - 0.185)	13	2	2WU	NO	NO	0.185	18																					77	5							
		43	SR 1581 (CYPRESS ST.)	FROM SR 1573 TO END MAINT. (MP 0.00 - 0.098)	13	2	2WU	NO	NO	0.098	18																					41	3							
		44	SR 1563 (CENTRAL BLVD.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.740)	13	2	2WU	NO	NO	0.74	18																					309	21		5					
45	SR 1564 (SOUTHERN BLVD.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.629)	13	2	2WU	NO	NO	0.629	18																					262	18		5							
TOTAL FOR PROJ NO. 2017CPT.03.06.20102										4.194									3515	1126										10	1802	124		70						
GRAND TOTAL										59.541				478	1,620	303	105.52	294,907	5,280	18,590	3,515	2,390	1,126	11,803	2,608	12,702	7,934	15,077	70	25,087	10	24,527	21	1,802	5,229	149,150	1,761	977	10	1

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH MI	WIDTH FT	6" DRIVEWAYS SY	REMOVE & REPLACE MONOL. CONC. ISLAND. SY	REMOVE & REPLACE 4" CONC. SIDEWALK SY	REMOVE & REPLACE 2'6" CURB & GUTTER LF	REMOVE & REPLACE CONC. CURB RAMP EA	REMOVE CONC. CURB RAMP EA	ADJ. OF DROP INLETS EA	ADJ. OF MAN-HOLES EA	ADJ. OF METER OR VALVE BOXES EA	TEMP. SILT FENCE LF	STONE FOR EC CLASS B TON	SEDIMENT CONTROL STONE TON	TEMP. MULCHING ACR	SEED FOR TEMP. SEEDING LBS	FERTILIZER FOR TEMP. SEEDING TON	MATTING FOR EROSION CONTROL SY	1/4" HARDWARE CLOTH LF	WATTLE LF	SEED & MULCHING AC	SEED FOR REPAIR SEEDING LB	FERTILIZER FOR REPAIR SEEDING TON	RESPONSE FOR EROSION CONTROL EA	UNPAVED TRENCHING (1, 2") LF	DIRECT ONAL DRILL (1, 2") LF	JUNCTION BOX (STD SIZE) EA	INDUCTIVE LOOP SAW-CUT LF	LEAD-IN CABLE (14-2) LF					
																																							GRAND TOTAL				
2017CPT.03.06.20102	Brunswick	30	SR 1599 (JACKEYS CREEK LN)	FROM NC 133 TO SR 1605 (MP 0.00 - 0.324)	13	2	2WU	NO	NO	0.324	18								3	2																							
		31	SR 1600 (BEDROCK CIRCLE)	FROM SR 1599 TO CUL-DE-SAC (MP 0.000 - 0.200)	12	2	2WU	NO	NO	0.2	18																																
		32	SR 1601 (STONE BROOK COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.177)	12	2	2WU	NO	NO	0.177	18																																
		33	SR 1602 (WOODRIDGE COURT)	FROM SR 1601 TO CUL-DA-SAC (MP 0.00 - 0.032)	12	2	2WU	NO	NO	0.032	18																																
		34	SR 1603 (STONINGTON COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.092)	12	2	2WU	NO	NO	0.092	18																																
		35	SR 1604 (SHADY MOSS COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.072)	12	2	2WU	NO	NO	0.072	18																																
		36	SR 1605 (WHISPERING COVE COURT)	FROM SR 1599 TO CUL-DA-SAC (MP 0.00 - 0.219)	12	2	2WU	NO	NO	0.219	18																																
		37	SR 1580 (LIBERTY LANDING RD.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.450)	13	2	2WU	NO	NO	0.45	20																																
		38	SR 1555 (MELLANEY LN.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.452)	13	2	2WU	NO	NO	0.542	20																																
		39	SR 1558 (CROFTERS COURT)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.177)	13	2	2WU	NO	NO	0.177	20																																
		40	SR 1573 (SIKES ST.)	FROM SR 1555 TO END MAINT. (MP 0.00 - 0.130)	13	2	2WU	NO	NO	0.13	18																																
		41	SR 1574 (NICHOLAS PLACE)	FROM SR 1555 TO SR 1575 (MP 0.00 - 0.127)	13	2	2WU	NO	NO	0.127	18																																
		42	SR 1575 (ELLIS ST.)	FROM SR 1573 TO END MAINT. (MP 0.00 - 0.185)	13	2	2WU	NO	NO	0.185	18																																
		43	SR 1581 (CYPRESS ST.)	FROM SR 1573 TO END MAINT. (MP 0.00 - 0.098)	13	2	2WU	NO	NO	0.098	18																																
		44	SR 1563 (CENTRAL BLVD.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.740)	13	2	2WU	NO	NO	0.74	18																																
45	SR 1564 (SOUTHERN BLVD.)	FROM NC 133 TO END MAINT. (MP 0.00 - 0.629)	13	2	2WU	NO	NO	0.629	18																																		
TOTAL FOR PROJ NO. 2017CPT.03.06.20102										4.582												27	2																				
GRAND TOTAL										4.762		10	35	10	70	9	2	2	32	7	6,136	707	707	22.37	1,417	7.47	500	1,422	870	44.40	1,417	7.46	37	570	25	7	6,130	750					

URBAN / SUBURBAN WORKZONES

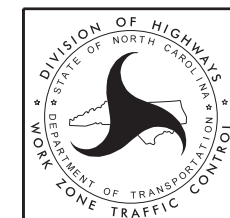


NOTES:

- 1) 48" x 48" SIZED SIGNS (SP- 11299) MAY BE REDUCED TO 36" X 36" ON ROADWAYS WITH SPEED LIMITS OF 40 MPH OR LESS.
- 2) MOUNT SIGNS THAT ARE LARGER THAN 10 SQUARE FEET IN AREA ON TWO OR MORE WOOD OR U-CHANNEL SUPPORTS. PERFORATED SQUARE TUBING SUPPORT SYSTEMS MAY SUPPORT LARGER AREAS ON A SINGLE SUPPORT. FOLLOW MANUFACTURER'S RECOMMENDATIONS. THESE SYSTEMS SHALL BE NCHRP 350 COMPLIANT AND NCDOT APPROVED.
- 3) ADVANCE WARNING SIGNS NOT REQUIRED ON NON-SIGNALIZED SIDE STREETS.
- 4) MAY USE LAW ENFORCEMENT TO CONTROL TRAFFIC AT SIGNALIZED INTERSECTIONS AS DIRECTED BY THE ENGINEER. PROVIDE PORTABLE "ROAD WORK AHEAD" (W20-1) SIGNS 500' IN ADVANCE ALONG BOTH APPROACHES FROM THE SIDE STREETS WHEN PAVING PROCEEDS THROUGH THE INTERSECTION.
- 5) LATERAL CLEARANCE AT ALL SIGN LOCATIONS SHALL BE 2' AS MEASURED FROM THE EDGE OF PAVEMENT OR THE FACE OF THE CURB. WHEN UNABLE TO OBTAIN THE LATERAL CLEARANCE WITHIN THE MEDIAN AREA USE SHOULDER MOUNTS ONLY.
- 6) SIGN MOUNT LOCATIONS SHALL NOT BLOCK SIDEWALKS OR DRIVEWAYS.
- 7) IF STATIONARY GENERAL WARNING SIGNS ARE USED, THEY WILL BE PAID FOR PER SECTION 104 OF THE NCDOT STANDARD SPECIFICATIONS AS EXTRA WORK.
- 8) IF MILLED AREAS ARE NOT PAVED BACK BY THE END OF THE WORK DAY, PORTABLE SIGNS SHALL BE USED TO WARN DRIVERS OF THE PRESENT CONDITIONS. THESE ARE TO INCLUDE, BUT NOT LIMITED TO "ROUGH ROAD" W8-8, "UNEVEN LANES" W8-11, "GROOVED PAVEMENT" W8-15 w/MOTORCYCLE PLAQUE MOUNTED BELOW. THESE ARE TO BE DOUBLE INDICATED ON MULTI-LANE ROADWAYS WITH SPEED LIMITS 45 MPH AND GREATER WHERE LATERAL CLEARANCE CAN BE OBTAINED WITHIN THE MEDIAN AREAS. THESE PORTABLE SIGNS ARE INCIDENTAL TO THE OTHER ITEMS OF WORK INCLUDED IN THE TEMPORARY TRAFFIC CONTROL (LUMP SUM) PAY ITEM.

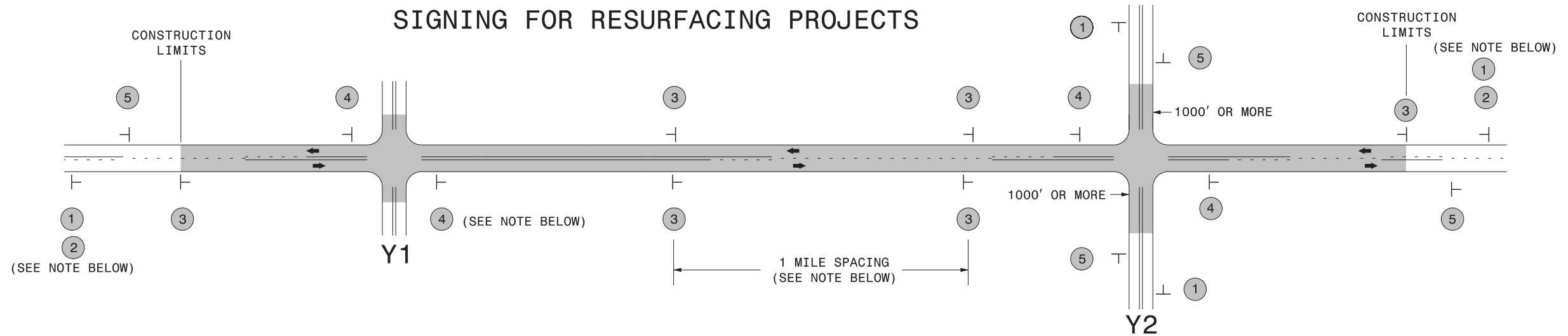
LEGEND

- ┆ STATIONARY SIGN
- ➔ DIRECTION OF TRAFFIC FLOW



**RESURFACING ADVANCE
WARNING SIGNS FOR
URBAN / SUBURBAN
FACILITIES**

SIGNING FOR RESURFACING PROJECTS



LEGEND

┆ STATIONARY SIGN

← DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

-Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	 	<p>PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.</p> <p>#2 SIGN ONLY USED WHEN RESURFACING LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER. (NO FRACTIONAL OR DECIMAL NUMBERS)</p>	<p>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</p> <ol style="list-style-type: none"> 1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE 2) SUBDIVISION ROADS 3) DEAD END ROADS <p>WHEN PAVING/CONSTRUCTION ACTIVITIES PROCEED ACROSS AN UNSIGNED -Y- LINE, ADVANCE WARNING PORTABLE SIGNS SHALL BE USED ALONG THE -Y- LINE AS SHOWN BELOW. REMOVE UPON COMPLETION OF WORK.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <small>W20-1 48" X 48"</small> </div> <div style="text-align: center;"> <small>W20-7 A 48" X 48"</small> </div> </div> <p>PLACED 500' IN ADVANCE OF FLAGGER. PLACED 250' IN ADVANCE OF FLAGGER.</p>
		<p>PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET 1/2 MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.</p>	
		<p>THESE ARE FOR -Y- LINES THAT ARE "THROUGH" ROADWAYS. DEAD END AND SUBDIVISION ROADS ARE NOT "THROUGH" ROADWAYS. INSTALL 500' +/- FROM EACH -Y- LINE APPROACH AS SHOWN ABOVE. FOR MULTIPLE -Y- LINES THAT ARE SEPARATED BY 0.25 MILES OR LESS, TREAT AS A SINGLE UNIT AND INSTALL WITHIN 500' OF EACH APPROACH. A MAXIMUM OF 2 SIGN SETS PER MILE. DO NOT INSTALL WHEN -Y- LINES ARE WITHIN 0.5 MILES FROM "END ROAD WORK" SIGN.</p>	
		<p>PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.</p>	

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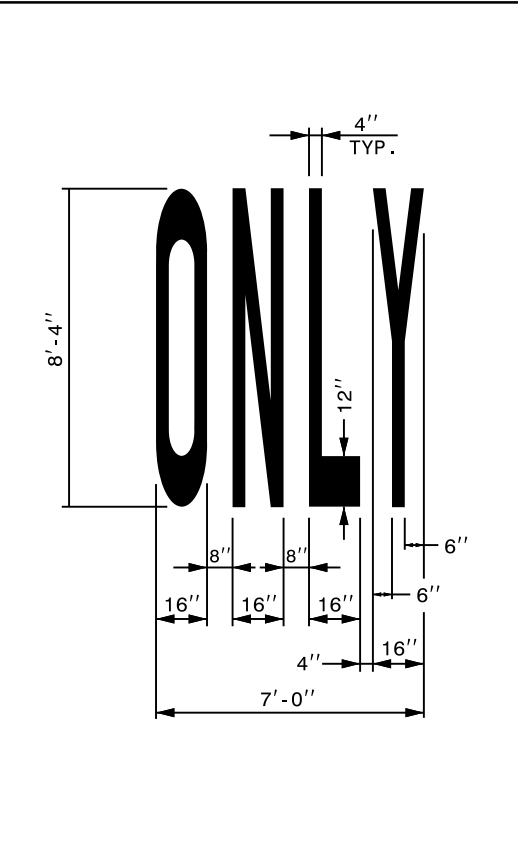
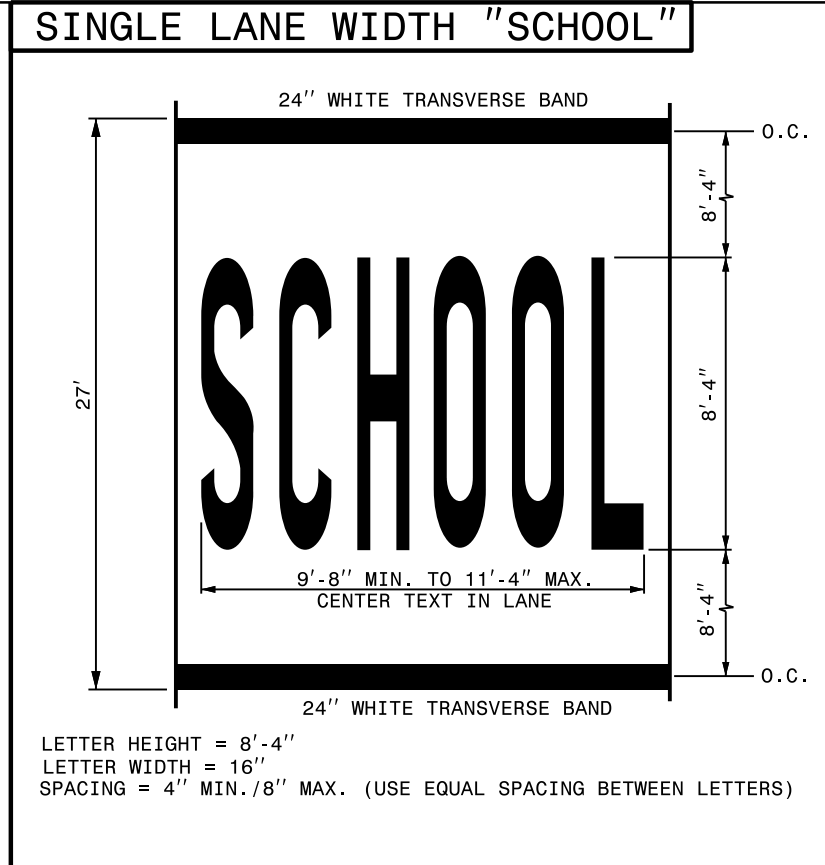
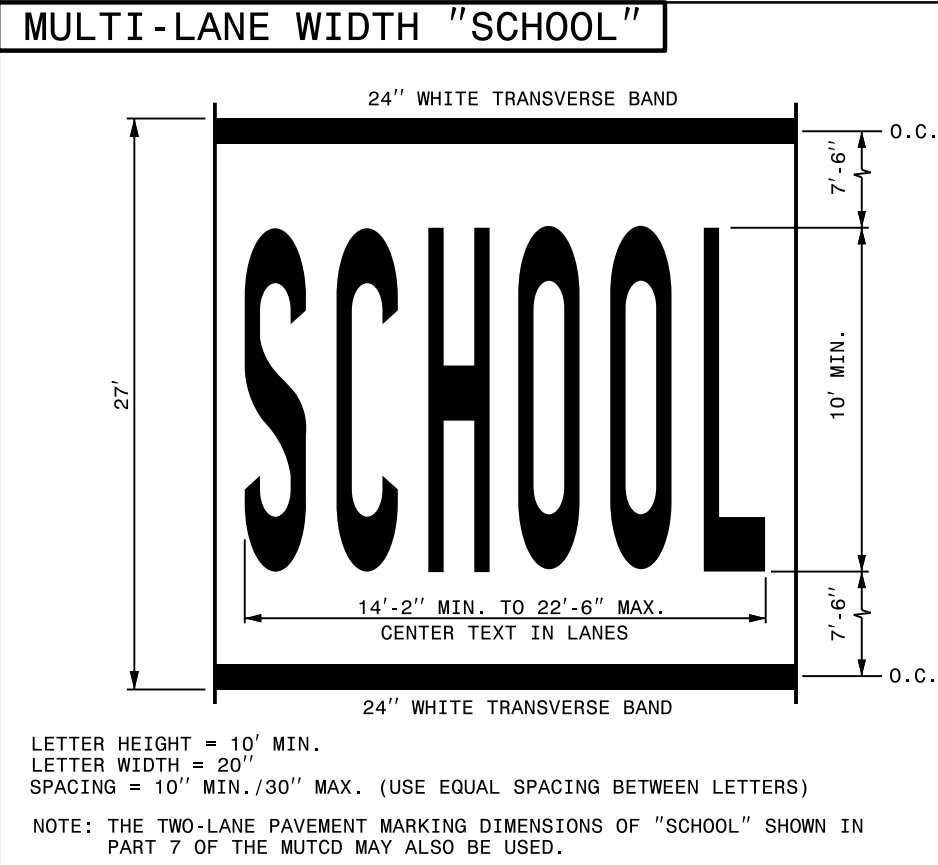
**RESURFACING
ADVANCE WARNING SIGNS
FOR
RURAL AND SUBURBAN
2 LANE ROADWAYS**

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

1-12

ENGLISH DETAIL DRAWING FOR
PAVEMENT MARKINGS
SYMBOLS AND WORD MESSAGES

REVISED 9/14/11
SHEET 3 OF 8
1205D08

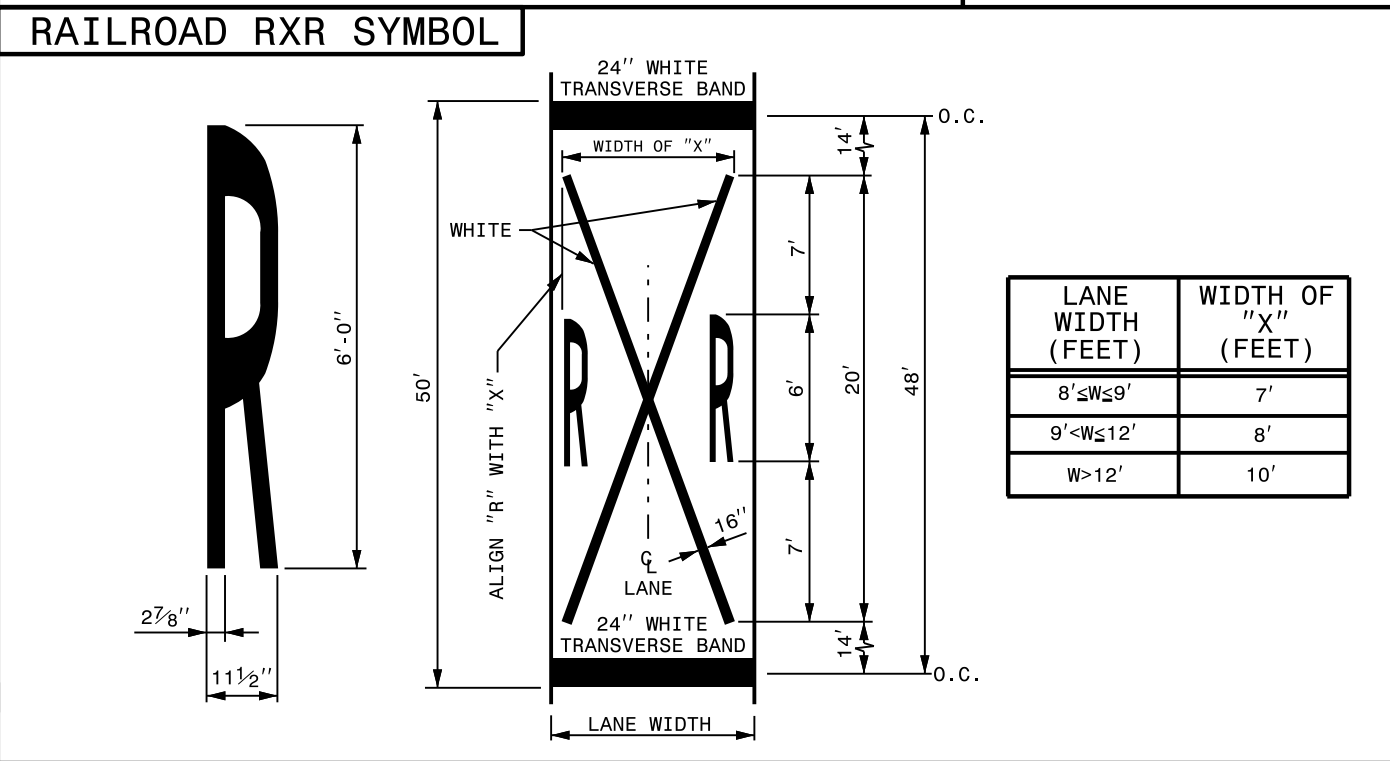


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH DETAIL DRAWING FOR
PAVEMENT MARKINGS
SYMBOLS AND WORD MESSAGES

REVISED 9/14/11
SHEET 3 OF 8
1205D08



GENERAL NOTES:

- THE SCHOOL PAVEMENT MARKING CONSISTS OF SIX (6) CHARACTERS. THE TWO (2) 24" TRANSVERSE BANDS WILL BE PAID FOR UNDER A SEPARATE PAY ITEM. REFER TO ROADWAY STANDARD DRAWING 1205.10 FOR ADDITIONAL PAVEMENT MARKING GUIDANCE.
- PAVEMENT MARKING ADVANCE OF A HIGHWAY-RAIL CROSSING SHALL CONSIST OF TWO (2) CHARACTERS AND TWO (2) 16" LINES (FORMING AN X) WHICH ARE PAID FOR UNDER TWO SEPARATE PAY ITEMS. THE TWO (2) 24" TRANSVERSE BANDS WILL BE PAID FOR UNDER A SEPARATE PAY ITEM. REFER TO ROADWAY STANDARD DRAWING 1205.11 FOR ADDITIONAL PAVEMENT MARKING GUIDANCE.

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

SEE TITLE BLOCK

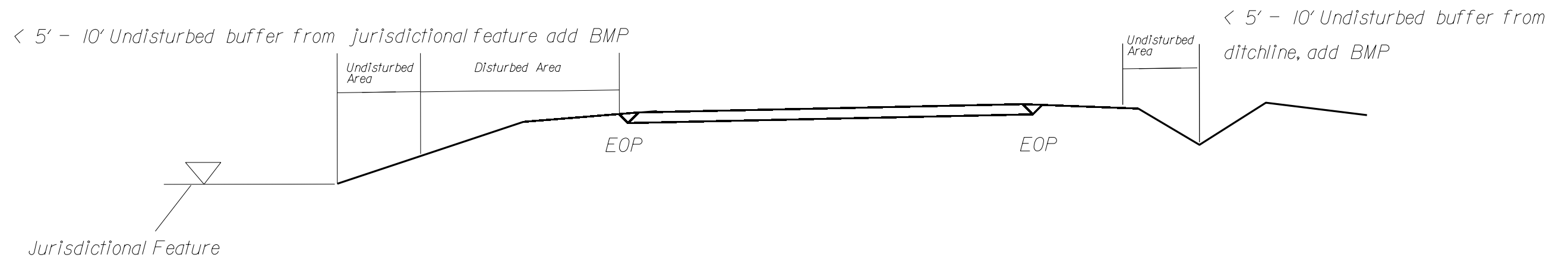
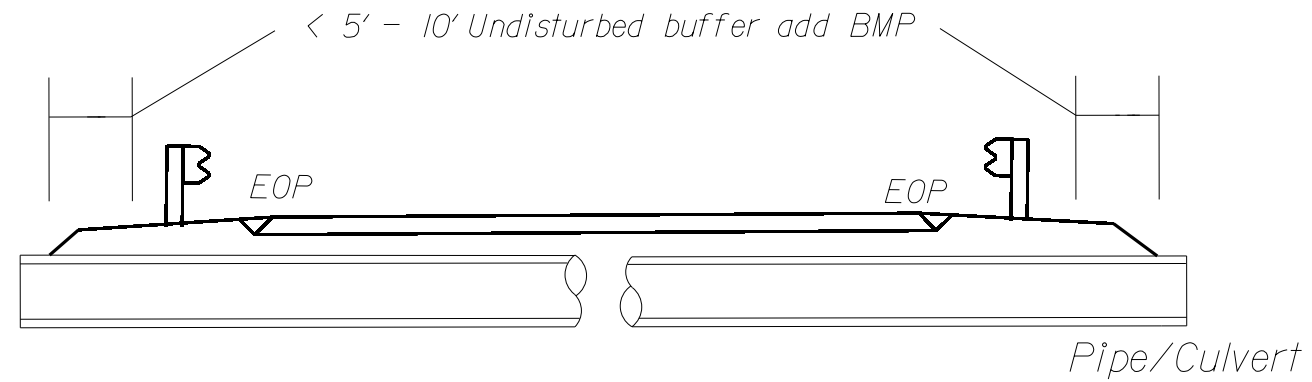
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CHECKED BY: DATE:
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26-OCT-2011 4:41 PM C:\Users\jhowerton\Documents\Standard Drawings\Details in Lieu of Standards\Division 12\1205D0803 Revised 9-14-11.dgn

NOTES: Less than 5' - 10' undisturbed buffer from ROW, ditchline, water feature, or drainage inlet, add BMP.

BMP Options: Wattle or Silt Fence

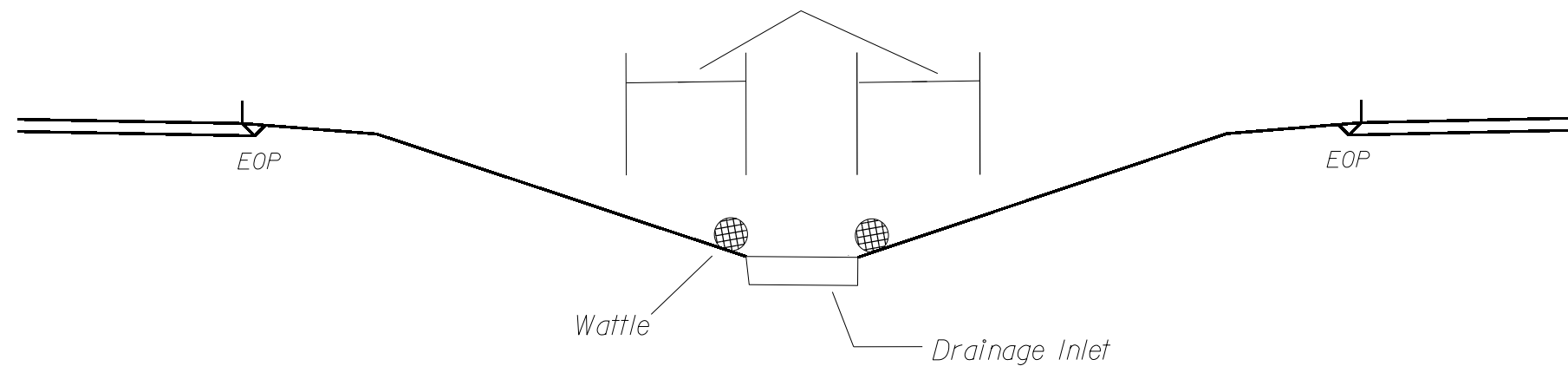
EROSION CONTROL DETAIL



Use BMP's if shoulders and/or frontslopes and/or ditchline and/or backslopes are disturbed



< 5' - 10' Undisturbed buffer from inlet, add wattle



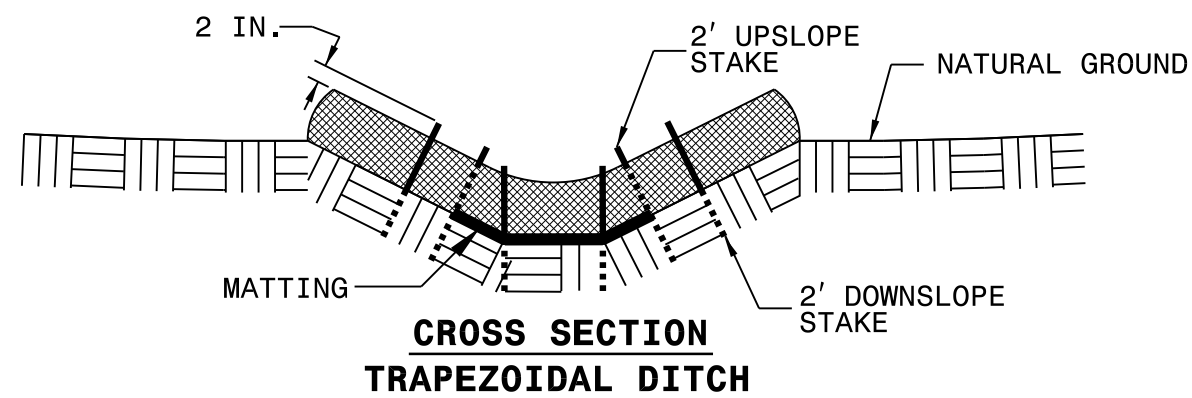
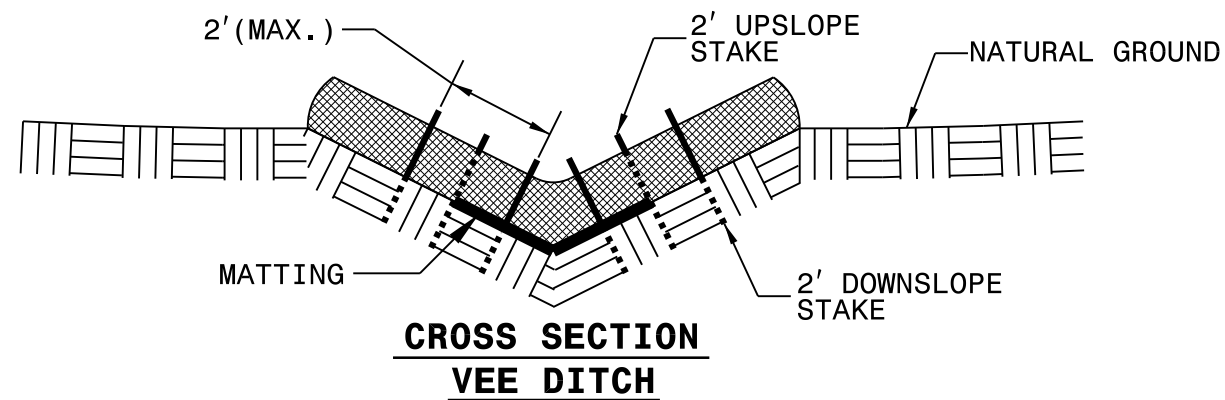
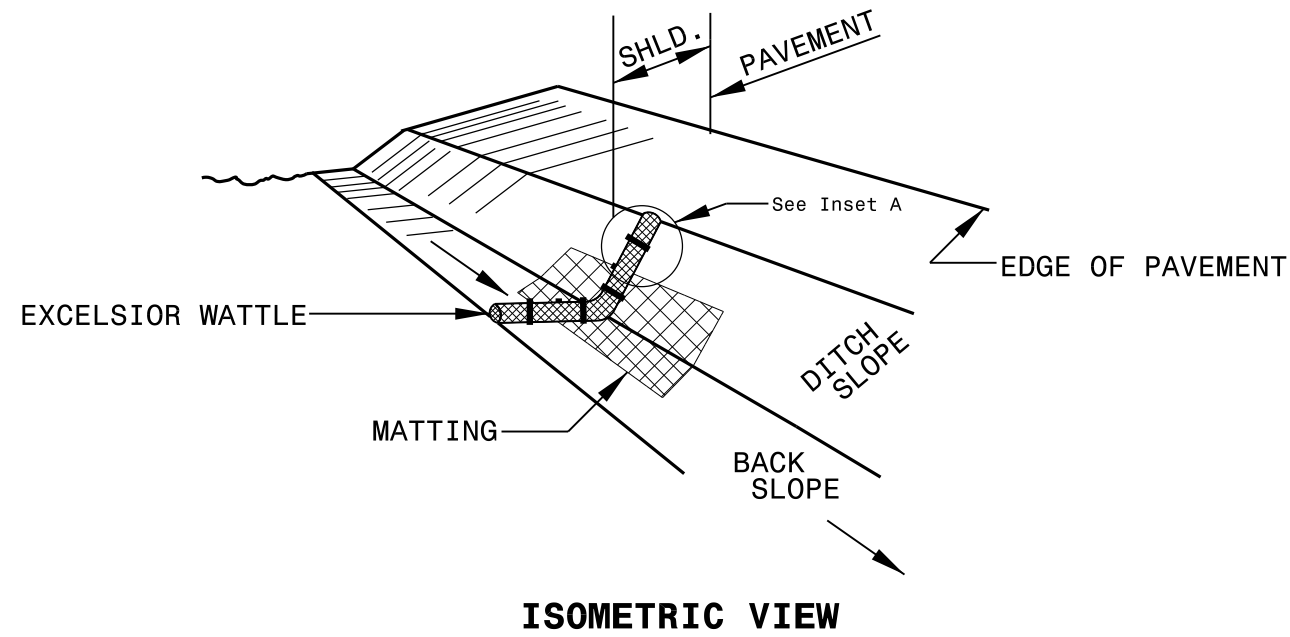
NOT TO SCALE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
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.

WATTLE DETAIL



NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

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

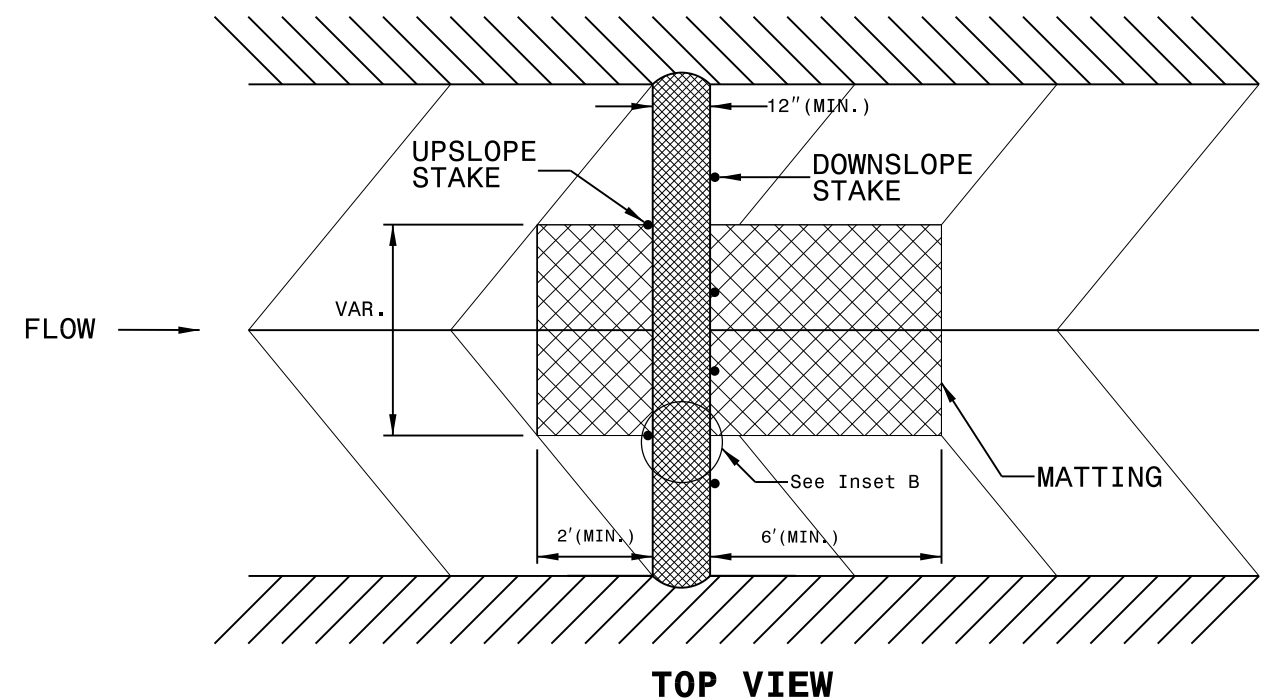
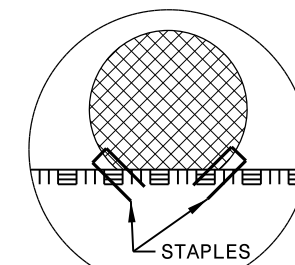
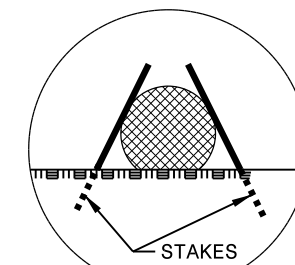
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

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

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

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

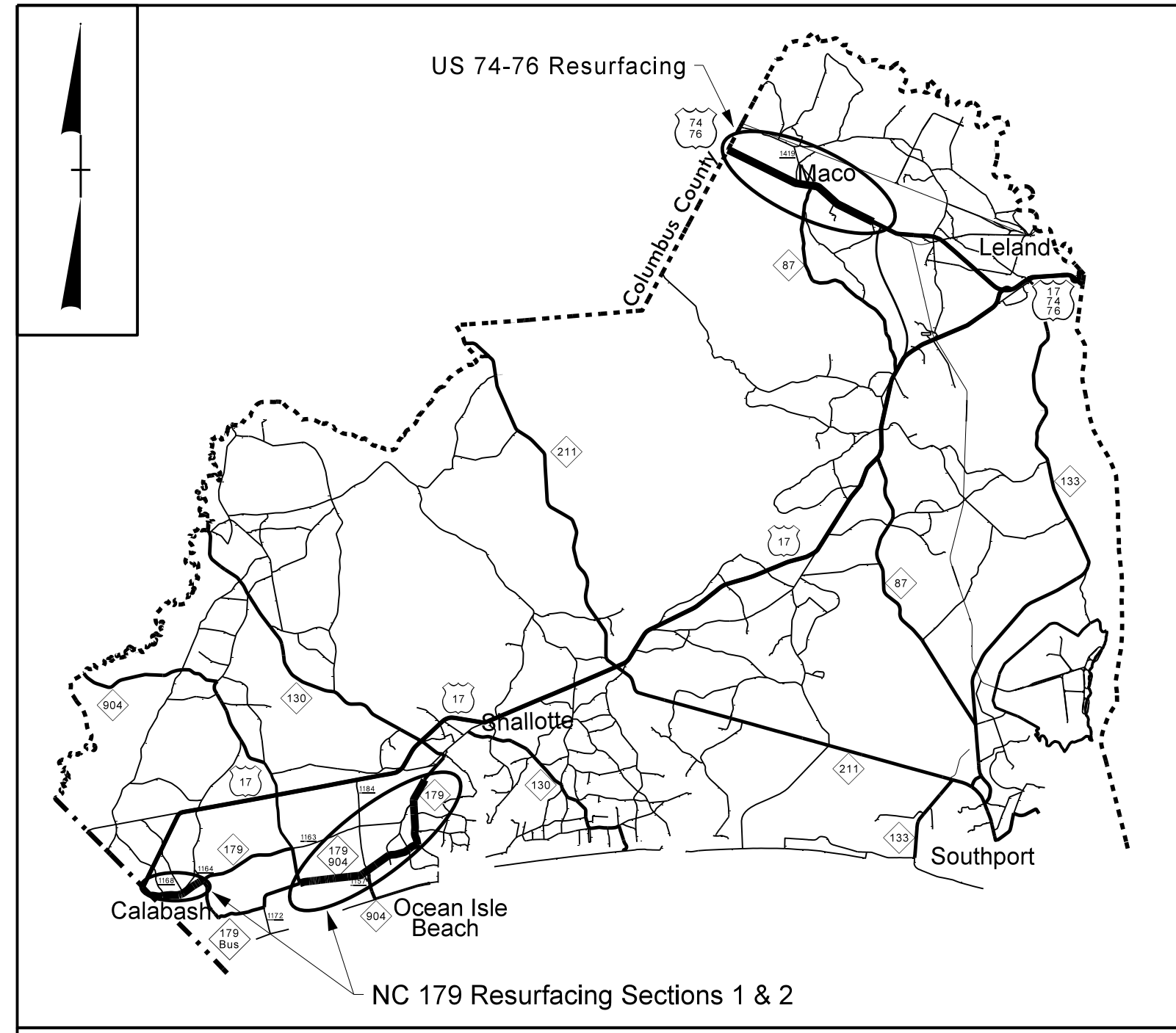


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

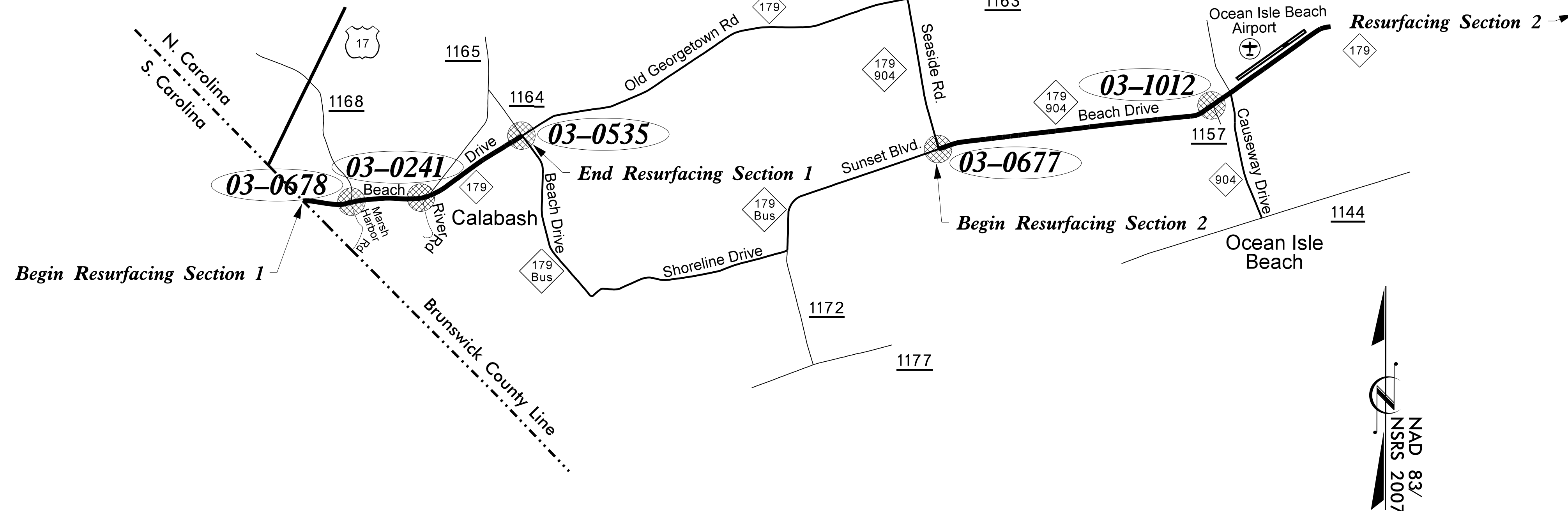
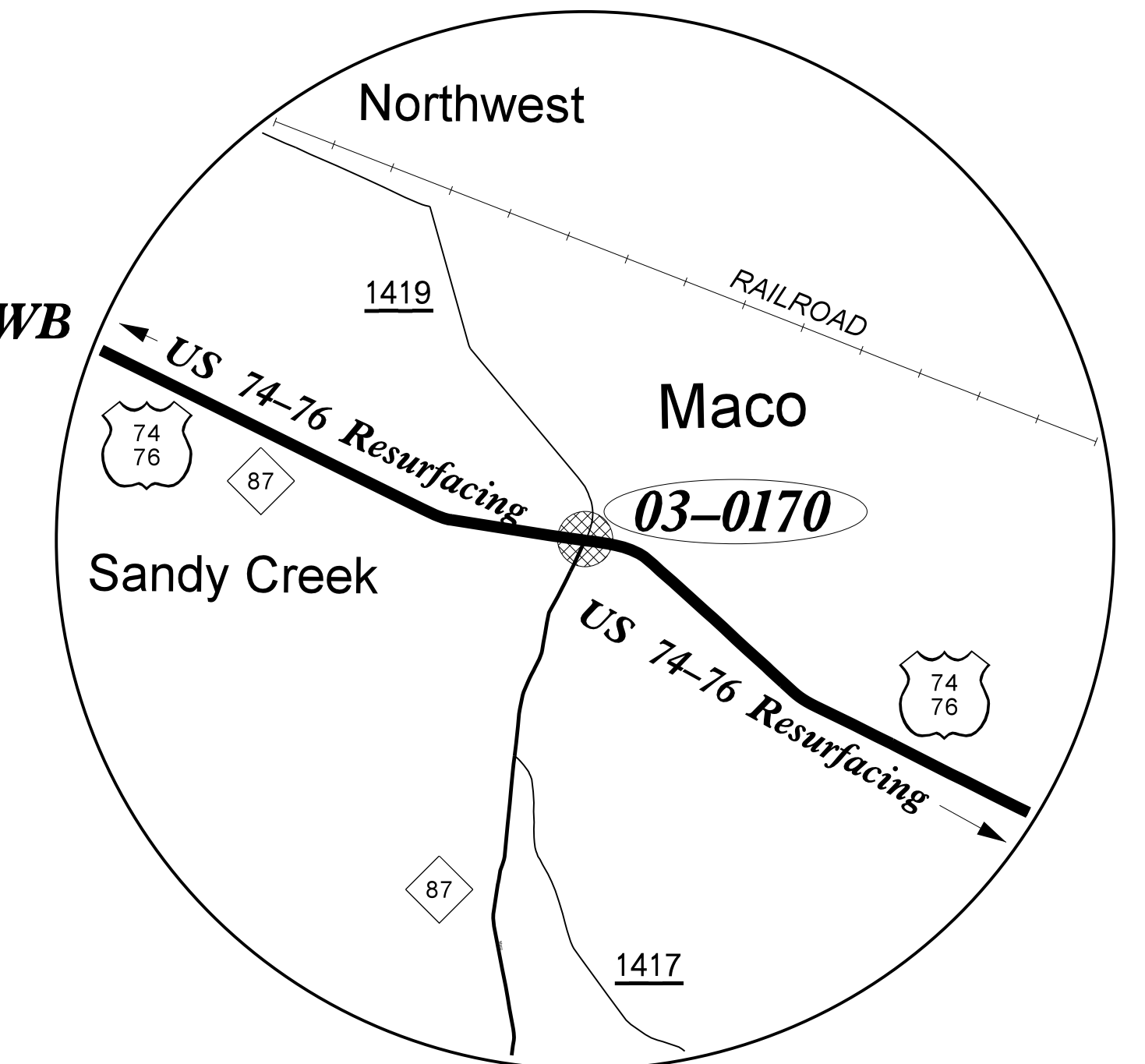
LOCATION: DIVISION 3 - BRUNSWICK COUNTY: US 74 /76 EB & WB (4' SYMETRICAL WIDENING & RESURFACING) AND NC 179 (SECTION 1 - MILLING & RESURFACING, SECTION 2 - RESURFACING)

TYPE OF WORK: TRAFFIC SIGNALS



VICINITY MAP

NOT TO SCALE



NAD 83/
NSRS 2007

Contract Number: Brunswick County Resurfacing

Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.

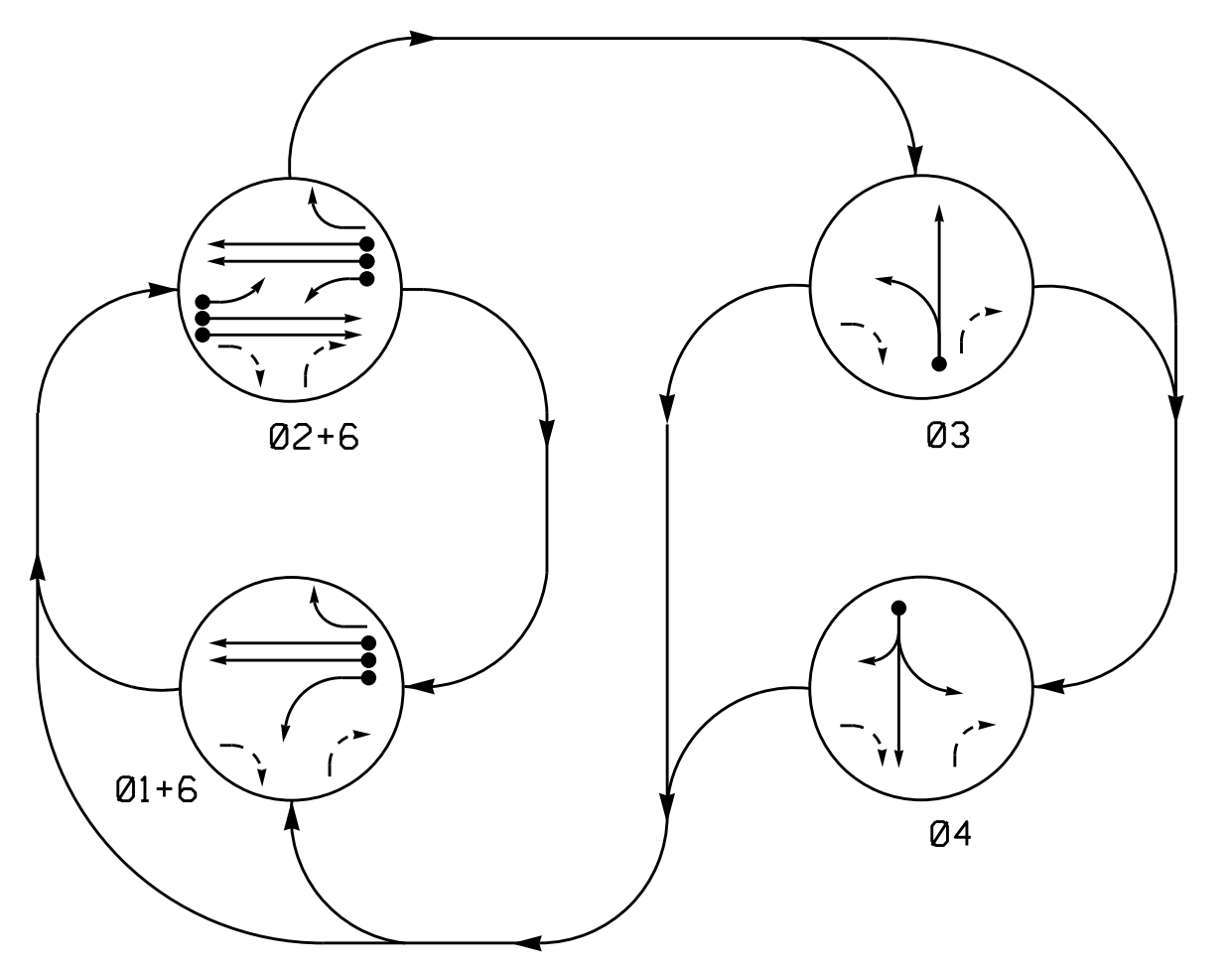
Sheet #	Reference #	Index of Plans Location/Description
Sig. 1.0	-----	Title Sheet
Sig. 2.0 - 2.4	03-0170	US 74-76 (Andrew Jackson Hwy) at NC 87 (Maco Rd)/SR 1419 (Northwest Rd)
Sig. 3.0 - 3.1	03-0678	NC 179 (Beach Dr) at SR 1168 (Country Club Rd)/Marsh Harbor Rd
Sig. 4.0 - 4.1	03-0241	NC 179 (Beach Dr) at River Rd/Business Entrance
Sig. 5.0 - 5.1	03-0535	NC 179 (Beach Dr/Old Georgetown Rd) at NC 179 Bus (Beach Dr)/SR 1164 (Clariday Rd)
Sig. 6.0 - 6.1	03-0677	NC 179-904 (Beach Dr)/NC 179 Bus (Sunset Blvd) at NC 179-904/SR 1162 (Seaside Dr)
Sig. 7.0 - 7.1	03-1012	NC 179-904 (Beach Dr) at SR 1157 (Hale Beach Rd)/Ocean Isle Beach Landing Entrance

Transportation Mobility and Safety Division
Contacts:
Pamela L. Alexander, PE - Eastern Region Signals Engineer
Keith M. Mims, PE - Signal Equipment Design Engineer

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

D:\4452206\1704_Signals\SignalDesign_Region\Div-03\Brunswick_Resurfacing Title Sheet\3CR+PE_tsh_brunswick.dgn

PHASING DIAGRAM



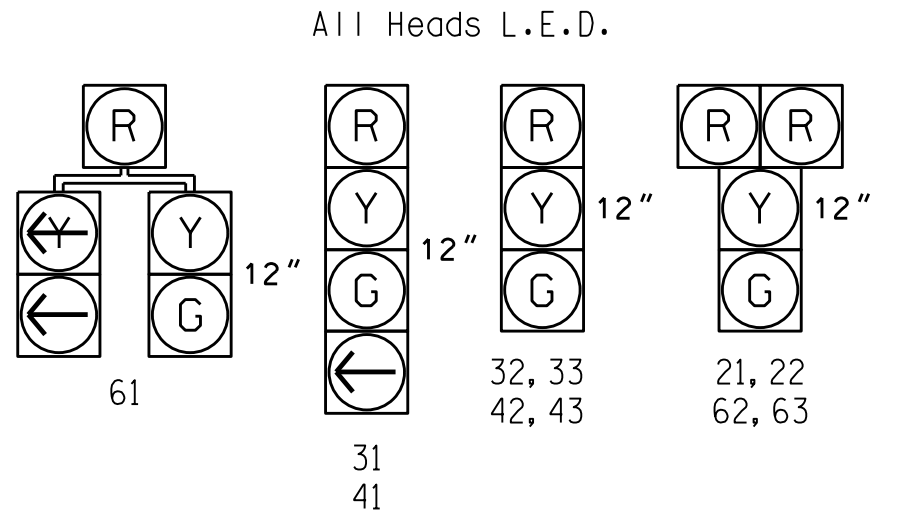
PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← - - UNSIGNALIZED MOVEMENT
- ← - - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE				
	01+6	02+6	03	04	PEDEST
21, 22	R	G	R	R	Y
31	R	R	G	R	R
32, 33	R	R	G	R	R
41	R	R	R	G	R
42, 43	R	R	R	G	R
61	G	G	R	R	Y
62, 63	G	G	R	R	Y

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

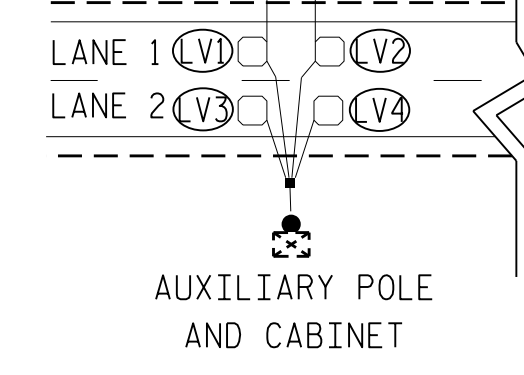
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY		
1A	6X40	0	2-4-2	Y	1	Y	Y	-	15	-
					6	Y	Y	Y	3	-
2A	6X6	420	5	Y	2	Y	Y	-	-	-
2B	6X6	420	5	Y	2	Y	Y	-	-	-
2C	6X40	0	2-4-2	Y	2	Y	Y	Y	3	-
3A	6X6	420	5	-	3	-	Y	-	3.2	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-	5	-
4A	6X6	420	5	-	4	-	Y	-	3.8	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	10	-
6A	6X6	420	5	Y	6	Y	Y	-	-	-
6B	6X6	420	5	Y	6	Y	Y	-	-	-

4 Phase Fully Actuated Isolated

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 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.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- 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.

22' LONG VEHICLE OVERSPEED DETECTION SYSTEM ①



AUXILIARY POLE AND CABINET

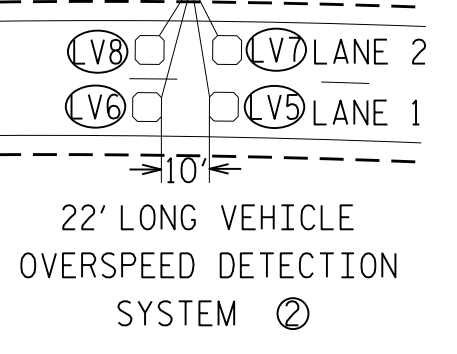
US 74-76 (Andrew Jackson Highway)

55 mph -1% Grade

55 mph 0% Grade

US 74-76 (Andrew Jackson Highway)

AUXILIARY POLE AND CABINET



22' LONG VEHICLE OVERSPEED DETECTION SYSTEM ②

FEATURE	PHASE				
	1	2	3	4	6
Min Green 1 *	7	20	7	7	20
Extension 1 *	2.0	6.0	2.0	2.0	6.0
Max Green 1 *	25	110	30	25	110
Yellow Clearance	3.0	5.3	5.3	5.3	5.3
Red Clearance	3.7	2.5	2.5	2.5	2.5
Red Revert	2.0	2.0	2.0	2.0	5.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	2.0	-	-	2.0
Max Variable Initial *	-	46	-	-	46
Time Before Reduction *	-	20	-	-	20
Time To Reduce *	-	60	-	-	60
Minimum Gap	-	4.0	-	-	4.0
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.

LONG VEHICLE OVERSPEED DETECTION SYSTEM LOOP & DETECTION INSTALLATION CHART

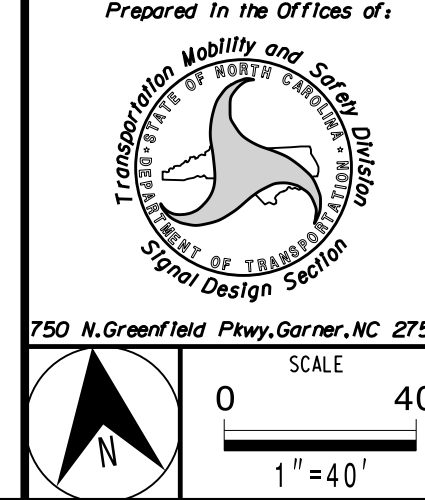
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW EXISTING	INDUCTIVE LOOP CHANNEL	NEMA PHASE	TIMING		PLACE CALL DURING PHASE	INHIBIT DELAY DURING GREEN?	
							FEATURE	TIME			
LV1	6'X6'	4	1015'	X	1	1	2*	NONE - SEC.	ALL	NO	
LV2	6'X6'	4	999'	X	1	1	2	NONE - SEC.	ALL	NO	
LV3	6'X6'	4	1015'	X	2	2	2*	NONE - SEC.	ALL	NO	
LV4	6'X6'	4	999'	X	2	2	2	NONE - SEC.	ALL	NO	
LV5	6'X6'	4	1015'	X	1	1	1	6*	NONE - SEC.	ALL	NO
LV6	6'X6'	4	999'	X	1	1	2	6*	NONE - SEC.	ALL	NO
LV7	6'X6'	4	1015'	X	2	2	1	6*	NONE - SEC.	ALL	NO
LV8	6'X6'	4	999'	X	2	2	2	6*	NONE - SEC.	ALL	NO
LVODS THRESHOLD SPEED (MPH)						55	2	6			
LVODS EXTEND TIME						12 SEC.	2	6			

*Phase hold output to controller

LEGEND

- | PROPOSED | EXISTING |
|--|--|
| ○ → Traffic Signal Head | ● → N/A |
| ● → Modified Signal Head | ○ → N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head With Push Button & Sign |
| ⊥ Signal Pole with Guy | ⊥ Signal Pole with Guy |
| ⊥ Signal Pole with Sidewalk Guy | ⊥ Signal Pole with Sidewalk Guy |
| ⊠ Inductive Loop Detector | ⊠ Inductive Loop Detector |
| ⊠ Controller & Cabinet | ⊠ Controller & Cabinet |
| ⊠ Junction Box | ⊠ Junction Box |
| - - - 2-in Underground Conduit | - - - 2-in Underground Conduit |
| - - - Right of Way | - - - Right of Way |
| → Directional Arrow | → Directional Arrow |
| ⊠ "YIELD" Sign (R1-2) | ⊠ "YIELD" Sign (R1-2) |

Signal Upgrade



US 74-76 (Andrew Jackson Hwy) at NC 87 (Maco Road) / SR 1419 (Northwest Road)

Division 3 Brunswick County Maco

PLAN DATE: January 2016 REVIEWED BY: JG

PREPARED BY: PLA REVIEWED BY:

REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

PROFESSIONAL ENGINEER

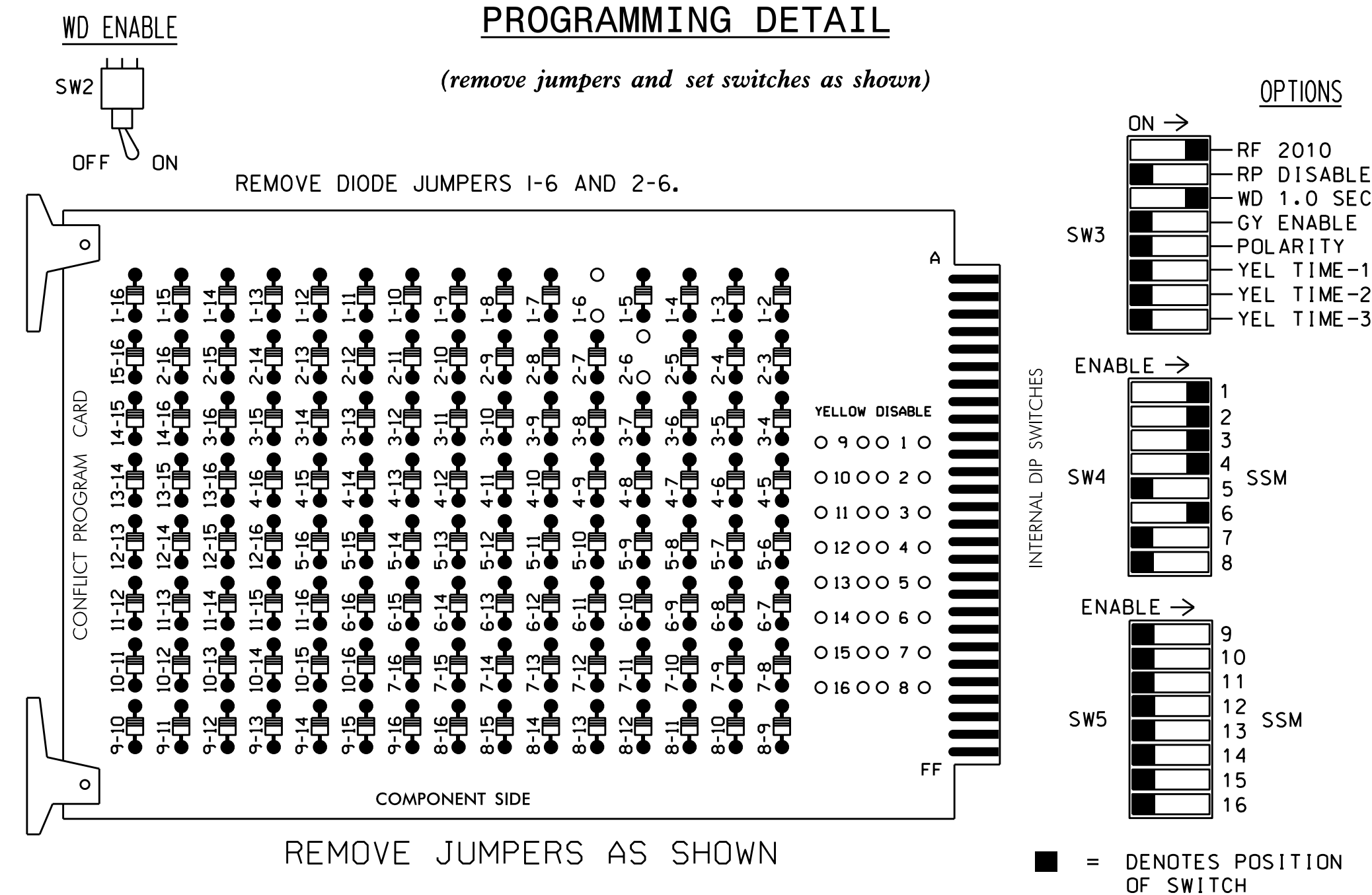
PAULETTE L. ALEXANDER

2/9/16

SIG. INVENTORY NO. 03-0170

EDI MODEL 2010ECL CONFLICT MONITOR

PROGRAMMING DETAIL



NOTES

- 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.
- To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
- Program phases 2 and 6, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

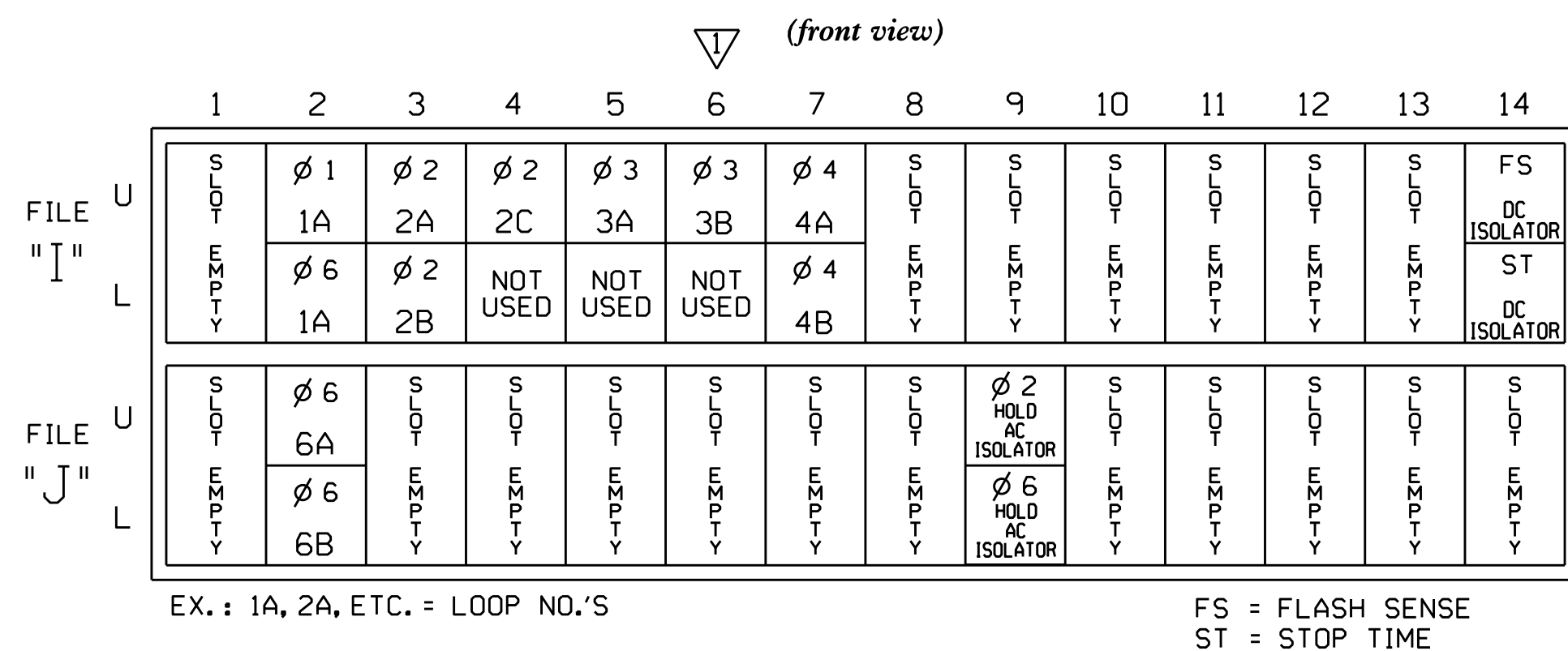
CONTROLLER.....EAGLE TYPE 2070L
 CABINET.....McCAIN/CONTROL TECHNOLOGIES (DWG.NO.9500-332-NCDOT)
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S3,S4,S6
 PHASES USED.....1,2,3,4,6
 OVERLAPS.....NONE

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	NU	31	32,33	41	42,43	NU	61	62,63	NU	NU
RED	*	128		116	116	101	101		134			
YELLOW		129		117	117	102	102		135			
GREEN		130		118	118	103	103		136			
RED ARROW												
YELLOW ARROW	126											
GREEN ARROW	127			118	103							

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

INPUT FILE POSITION LAYOUT

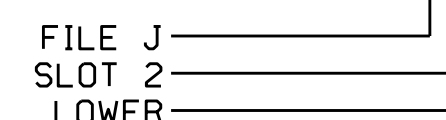


INPUT FILE CONNECTION & PROGRAMMING CHART

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	TB2-5,6	I2U	39	1	2	1	Y	Y			15
	TB2-7,8	I2L	43	5	12	6	Y	Y	Y		3
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
2C	TB4-1,2	I4U	47	9	22	2	Y	Y	Y		3
3A	TB4-5,6	I5U	58	20	3	3		Y		3.2	
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			5
3C	TB4-11,12	I6L	45	7	14	3	Y	Y			15
4A	TB6-1,2	I7U	65	27	34	4		Y		3.8	
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

¹Add jumpers from TB2-5 to TB2-7, and from TB2-6 to TB2-8.

INPUT FILE POSITION LEGEND: J2L



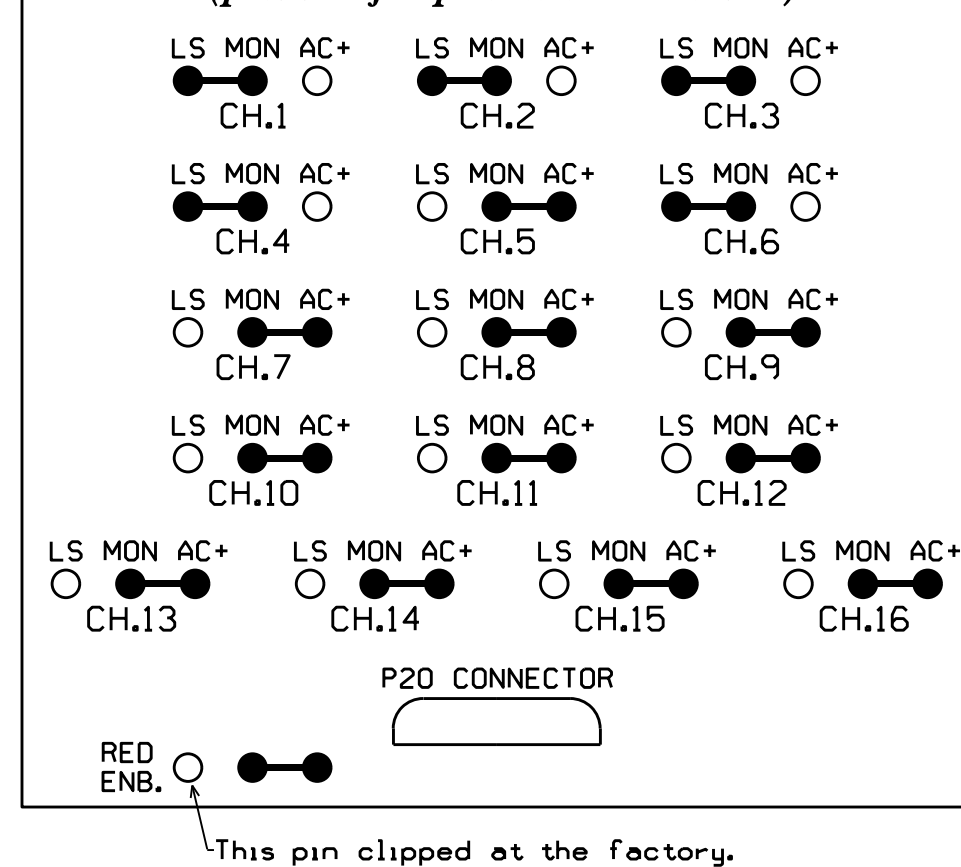
BACKUP PROTECTION NOTE

(program controller as shown below)

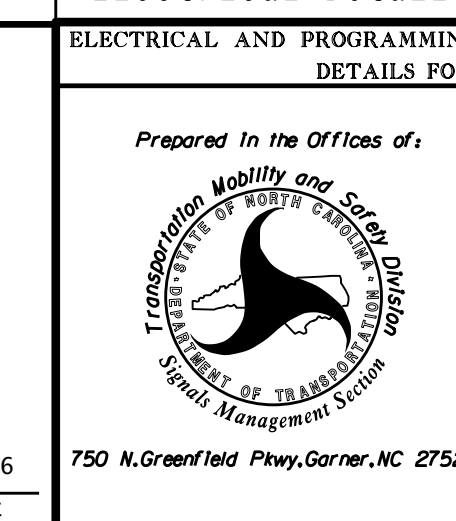
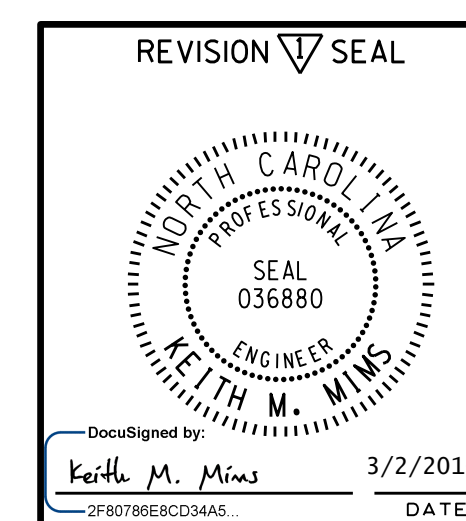
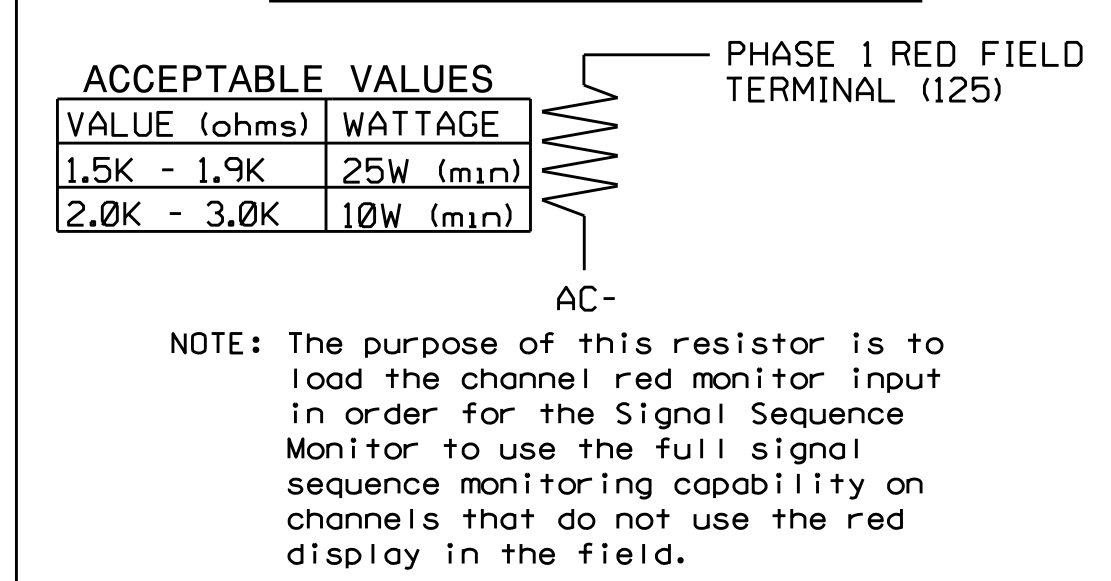
From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0170
 DESIGNED: January 2016
 SEALED: 2/9/2016
 REVISED: N/A

RED MONITOR BOARD PROGRAMMING



LOAD RESISTOR INSTALLATION DETAIL



REVISIONS		DATE
Changed head 32 from 5-section to 3-section, deleted loop 3C, revised stretch times and monitor jumpers, added a note. (WSA) (DTJ)	KMM	3/2/2016

US 74-76 (Andrew Jackson Hwy.) at NC 87 (Maco Road) / SR 1419 (Northwest Road)

PLAN DATE: April 2007 REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland REVIEWED BY:

SIGNATURE DATE

SIG. INVENTORY NO. 03-0170

03-0170-2016-06-15
 C:\MITSAS\15\SIGNAL\work\hous\sig\mon\mstronp030170_sml.e.xxx.dgn
 somstronp

INPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 59 (INPUT 21) IS REACHED.

```

PAGE: 1 C1 PIN:59 HOLD PHASES
INPUT ASSIGNMENT #.....21
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....2
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

PRESS '+' TWICE

```

PAGE: 1 C1 PIN:61 HOLD PHASES
INPUT ASSIGNMENT #.....23
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....6
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

PRESS '+'

```

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

PROGRAMMING COMPLETE

← Note: Program for Plan 65 and Offset 0

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).
2. The programming shown below will place the controller in flash if the output of the Long Vehicle Detection Unit is active for longer than 4 minutes

```

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF INPUT ASSIGNMENT #21 IS ON
OR INPUT ASSIGNMENT #23 IS ON
↓
SCROLL DOWN
THEN:
DELAY FOR 240.0 SECONDS
SET INPUT ASSIGNMENT #64 ON
    
```

3. From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Logic Flag 1.

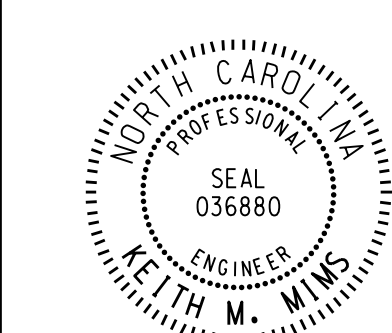
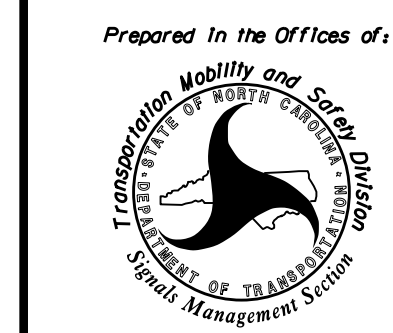
LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0170
DESIGNED: January 2016
SEALED: 2/9/2016
REVISED: N/A

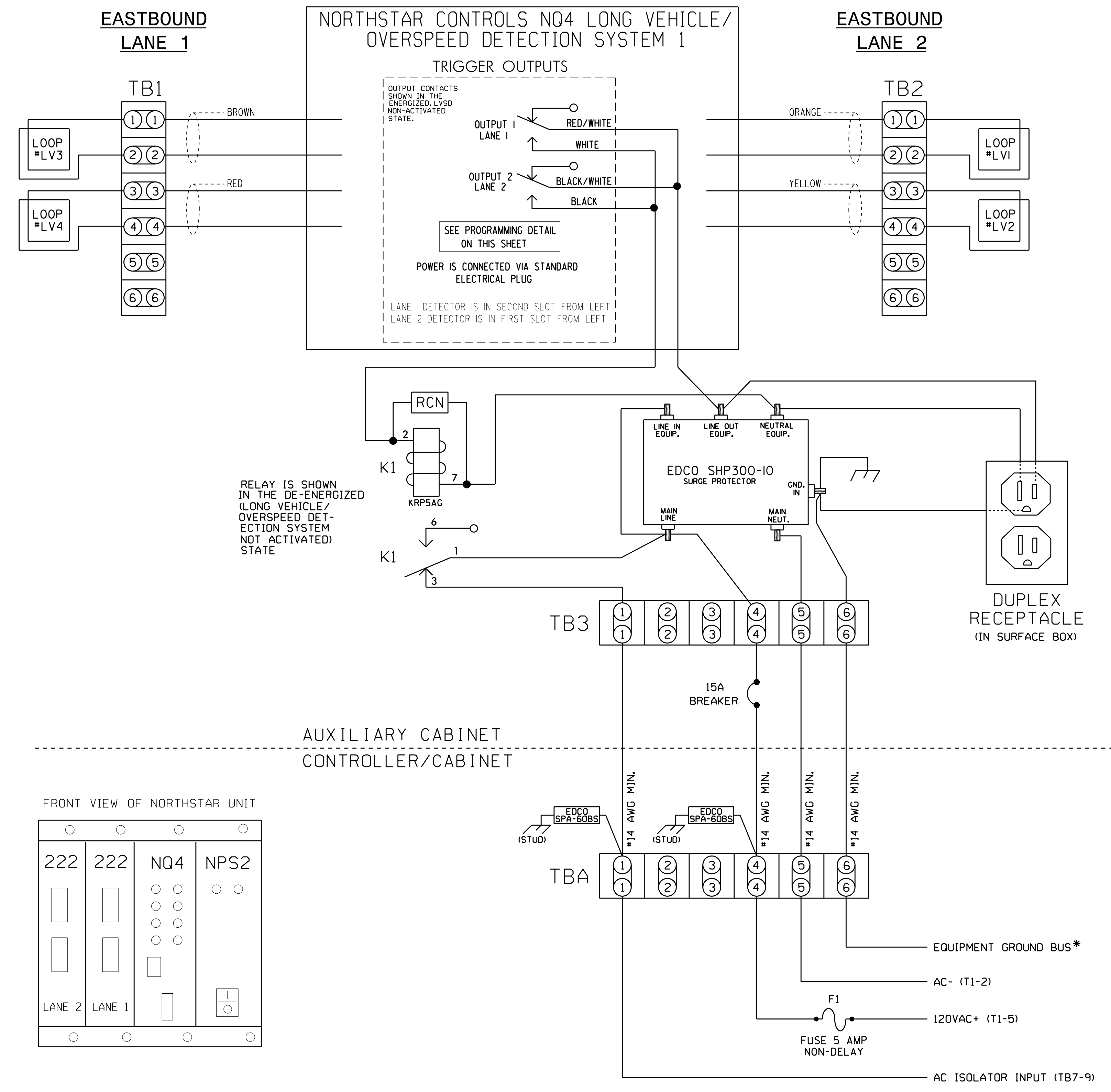
C:\MSD-016_0516
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 somstrcong

Electrical Detail - Sheet 2 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISION SEAL 	ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 74-76 (Andrew Jackson Hwy.) at NC 87 (Maco Road)/ SR 1419 (Northwest Road)	SEAL Not a certified document as to the Original Document but only as to the Revisions - This document originally issued and sealed by George C. Brown, #022013, on 4/19/07. This document is only certified as to the revisions.
Division 3 Brunswick County Maco		PREPARED BY: C. Strickland REVIEWED BY: T. Joyce	
REVISIONS		ANIT. DATE	
Changed head 32 from 5-section to 3-section, deleted loop 3c, revised stretch times and monitor jumpers, added a note. (WSA) (DTJ)		KMM 3/2/2016	
DocuSigned by: Keith M. Mims 3/2/2016 DATE		SIGNATURE DATE	
		SIG. INVENTORY NO. 03-0170	

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 1
(wire unit as shown below)



- NOTES**
- All loop lead-ins shall be twisted.
 - Loop spacing is critical to the proper operation of this Overspeed Detection System. Make sure loop spacing is correctly programmed in NQ4 Unit.
 - Insure that connectors on rear of NQ4 are seated securely.
 - NQ4 Unit shall be located in an auxiliary cabinet adjacent to Speed Warning System loops.
 - Unit power is connected by standard electrical plug.
 - Terminal strips TB1, TB2, TB3, & TBA to be added by installer.
 - Relay 'K1' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG, Dot Material no. 625028600.
 - RC network across the coil of K1 is Dot no. 106018075.
 - EDCO SPA-60BS is a surge protector for 120VAC interconnect circuits. Dot Material no. 625022076.
 - EDCO SHP300-10 is an AC service surge protector. Dot Material no. 625022075.
- IMPORTANT!** A jumper must be installed between input file terminals J9-E and J9-K if not already present.
 - IMPORTANT!** For proper operation of the Long Vehicle Detection Unit, remove surge protection from terminals TB7-9, TB7-10, TB7-11 and TB7-12. Tie TB7-12 to AC neutral.
 - IMPORTANT!** Make sure both channels of AC isolator card inserted at input file position J9 are set for inverted operation.
 - Do not install ground rods at auxiliary cabinet.
 - Install disconnect if there is no disconnect present at auxiliary cabinet.
 - *16.** Install equipment ground from controller cabinet to auxiliary cabinet if not already present.

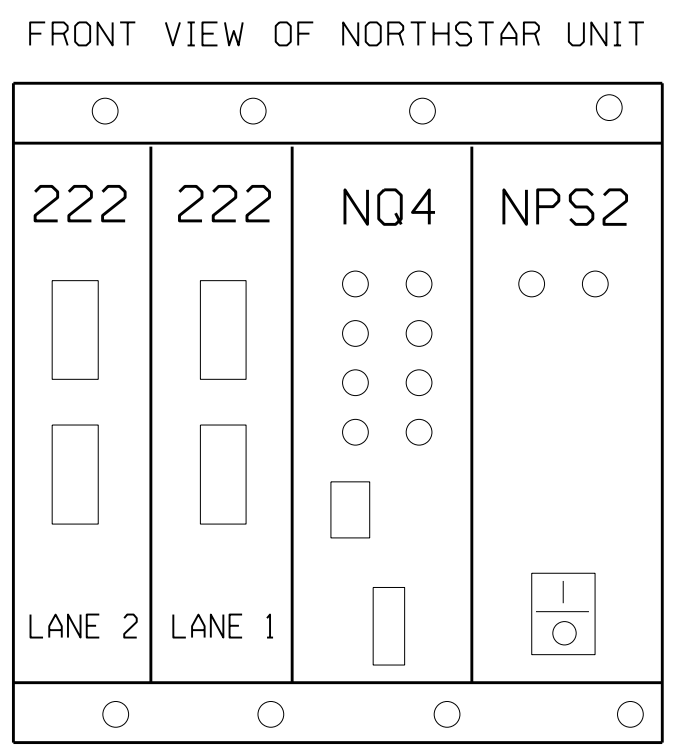
NORTHSTAR CONTROLS MODEL NQ4
PROGRAMMING DETAIL
 (program unit as shown)

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

PROGRAM NQ4 BY TYPING THE FOLLOWING COMMANDS

- SET SPEED=55
- SET LENGTH=22'
- SET ALARMTIME=12
- SET SEPARATION=16' (LEADING EDGE TO LEADING EDGE)
(THIS VALUE MAY VARY, PROGRAM ACTUAL MEASURED SEPARATION)
- SET LOOP LENGTH=6' (THIS VALUE MAY VARY, PROGRAM ACTUAL MEASURED LOOP LENGTH)
- SAVE

NOTE
 PROGRAMMING APPLIES TO BOTH LANE 1 AND LANE 2



Electrical Detail - Sheet 3 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISION SEAL

DocuSigned by:
 Keith M. Mims
 3/2/2016

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:

 Keith M. Mims
 2507 Greenfield Pkwy, Garner, NC 27529

US 74-76 (Andrew Jackson Hwy.)
 at
 NC 87 (Maco Road)/
 SR 1419 (Northwest Road)

Division 3 Brunswick County Maco

PLAN DATE: April 2007 REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS

NO.	DATE	DESCRIPTION
1	3/2/2016	Changed head 32 from 5-section to 3-section, deleted loop 3C, revised stretch times and monitor jumpers, added a note. (NSA) (D14)

DATE: 3/2/2016

SIGNATURE: KMM DATE: 3/2/2016

SEAL

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SIGNATURE: DATE:

SIG. INVENTORY NO. 03-0170

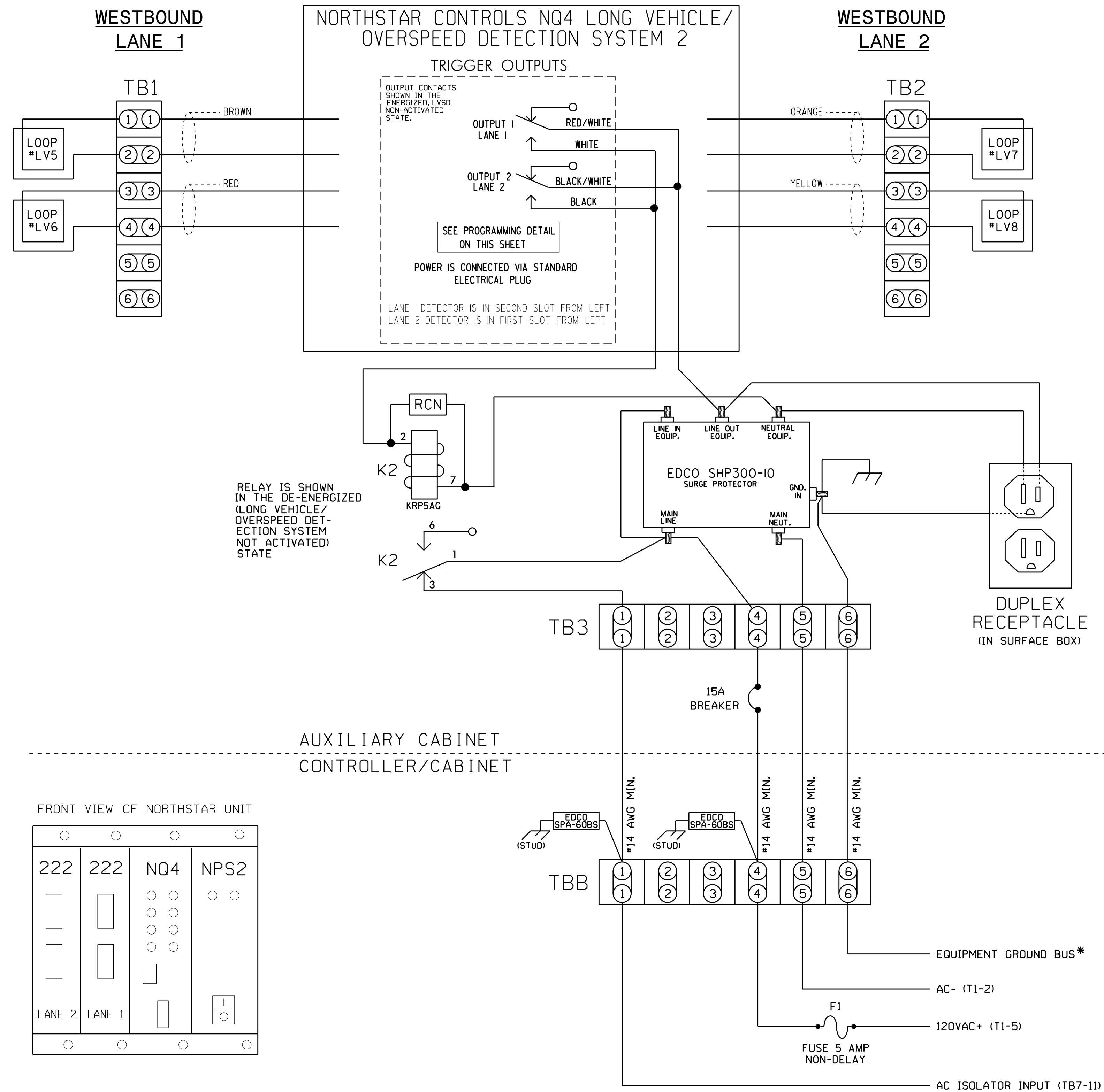
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0170
 DESIGNED: January 2016
 SEALED: 2/9/2016
 REVISED: N/A

03-0170-016.dgn
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 3/2/2016 10:15:15 AM
 Keith M. Mims
 2507 Greenfield Pkwy, Garner, NC 27529

NOTES

1. All loop lead-ins shall be twisted.
 2. Loop spacing is critical to the proper operation of this Overspeed Detection System. Make sure loop spacing is correctly programmed in NQ4 Unit.
 3. Insure that connectors on rear of NQ4 are seated securely.
 4. NQ4 Unit shall be located in an auxiliary cabinet adjacent to Speed Warning System loops.
 5. Unit power is connected by standard electrical plug.
 6. Terminal strips TB1, TB2, TB3, & TBB to be added by installer.
 7. Relay 'K1' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG, Dot Material no. 625028600.
 8. RC network across the coil of K2 is Dot no. 106018075.
 9. EDCO SPA-60BS is a surge protector for 120VAC interconnect circuits. Dot Material no. 625022076.
 10. EDCO SHP300-10 is an AC service surge protector. Dot Material no. 625022075.
11. Do not install ground rods at auxiliary cabinet.
 12. Install disconnect if there is no disconnect present at auxiliary cabinet.
 - *13. Install equipment ground from controller cabinet to auxiliary cabinet if not already present.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 2
(wire unit as shown below)



NORTHSTAR CONTROLS MODEL NQ4
PROGRAMMING DETAIL
(program unit as shown)

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

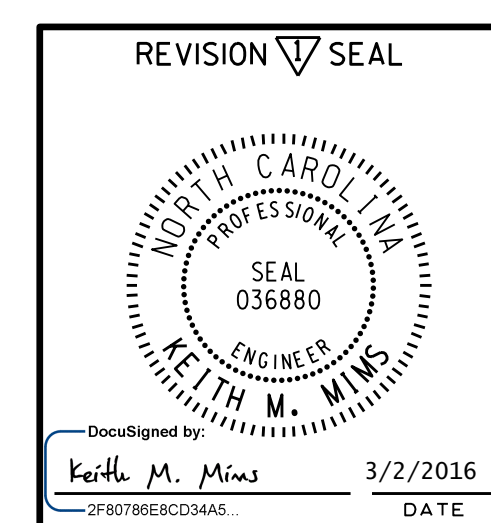
PROGRAM NQ4 BY TYPING THE FOLLOWING COMMANDS

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

NOTE
PROGRAMMING APPLIES TO BOTH LANE 1 AND LANE 2

Electrical Detail - Sheet 4 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Prepared in the Offices of:
Transposition Mobility and Safety Solutions
750 N. Greenfield Pkwy, Garner, NC 27529

US 74-76 (Andrew Jackson Hwy.)
at
NC 87 (Maco Road) /
SR 1419 (Northwest Road)

Division 3	Brunswick County	Maco
PLAN DATE: April 2007	REVIEWED BY: T. Joyce	
PREPARED BY: C. Strickland	REVIEWED BY:	
REVISIONS		
1	Changed head 32 from 3-section to 3-section, deleted loop 36, revised stretch times and monitor jumpers, added a note. (WSA) (DTJ)	3/2/2016

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by George C. Brown, #022013, on 4/19/07.

This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 03-0170

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0170
DESIGNED: January 2016
SEALED: 2/9/2016
REVISED: N/A

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PHASING DIAGRAM

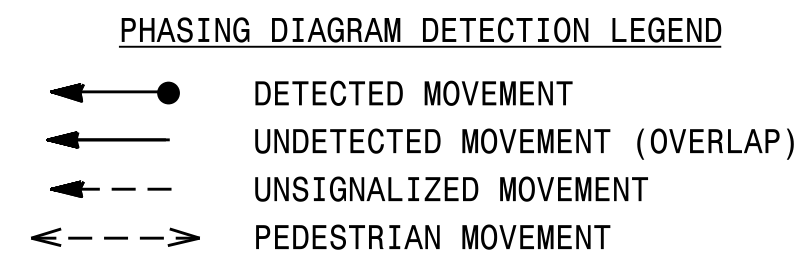
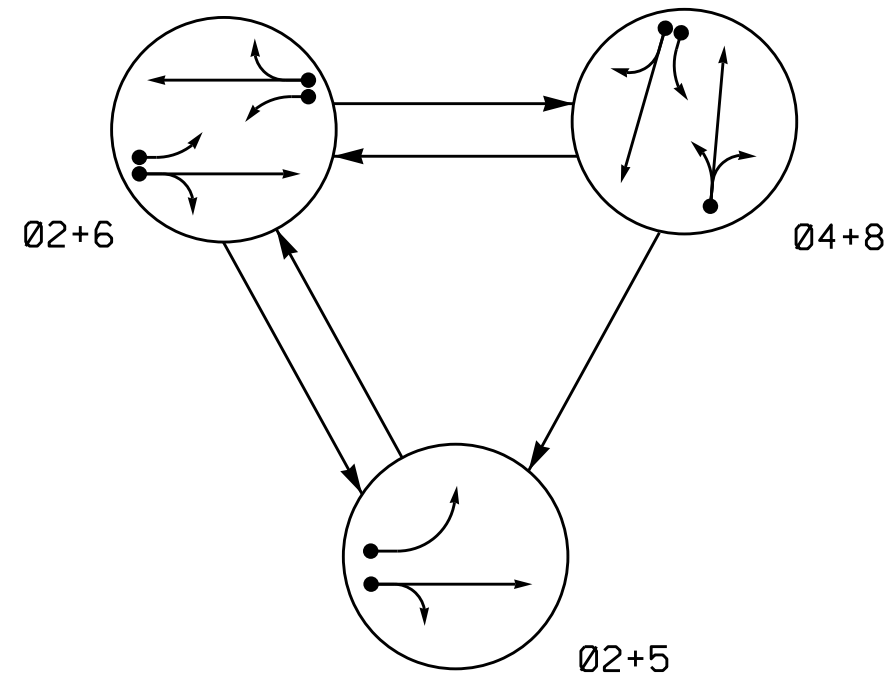
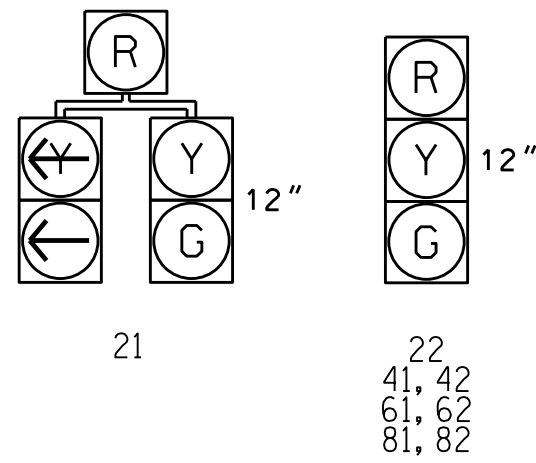


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04+8	F L R
21	G	R	Y	
22	G	R	Y	
41, 42	R	G	R	
61, 62	R	G	Y	
81, 82	R	R	G	

SIGNAL FACE I.D.

All Heads L.E.D.



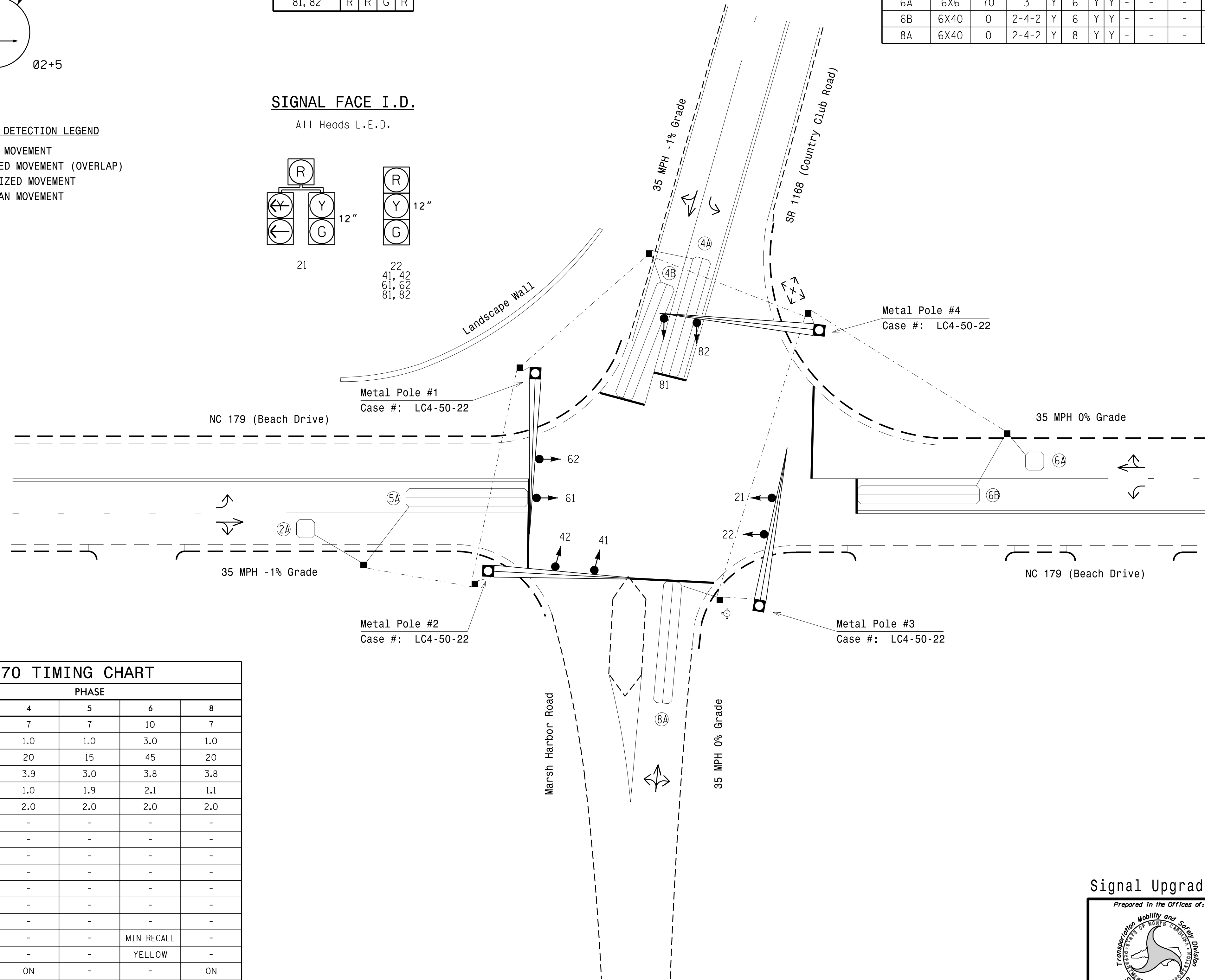
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY		
2A	6X6	70	3	Y	2	Y	Y	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	10
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15
6A	6X6	70	3	Y	6	Y	Y	-	-	-
6B	6X40	0	2-4-2	Y	6	Y	Y	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-

3 Phase Fully Actuated Isolated

NOTES

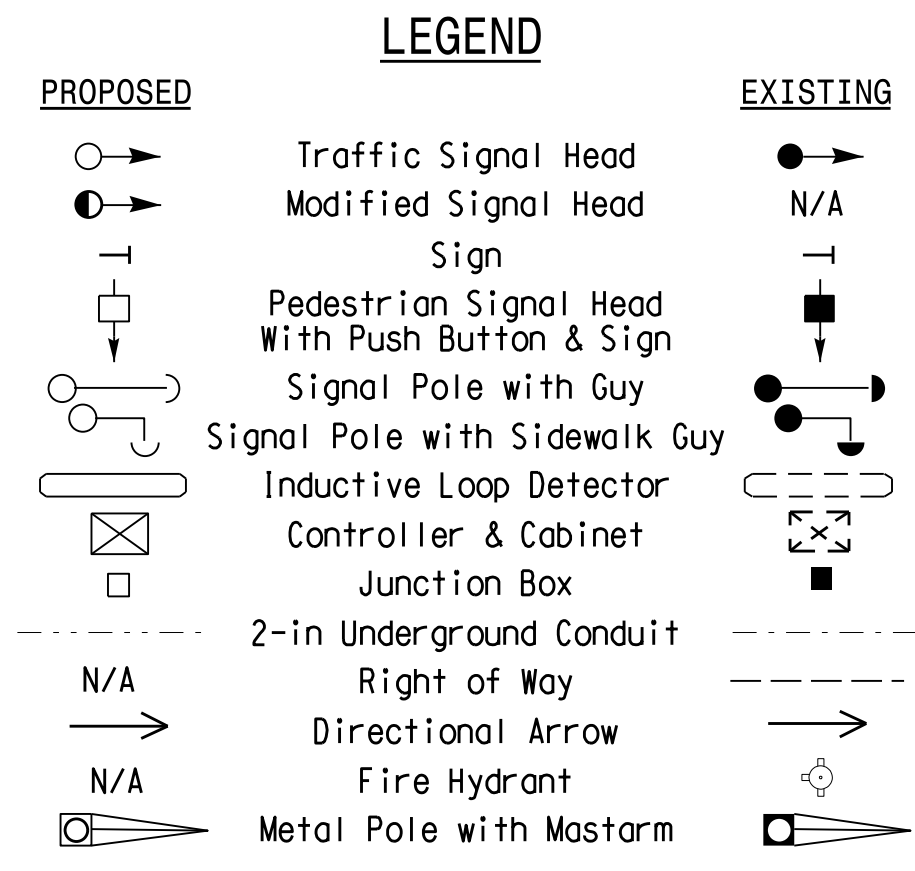
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
- Set all detector units to presence mode.



OASIS 2070 TIMING CHART

FEATURE	PHASE				
	2	4	5	6	8
Min Green 1 *	10	7	7	10	7
Extension 1 *	3.0	1.0	1.0	3.0	1.0
Max Green 1 *	45	20	15	45	20
Yellow Clearance	3.9	3.9	3.0	3.8	3.8
Red Clearance	1.3	1.0	1.9	2.1	1.1
Red Revert	5.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
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

* 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.



Signal Upgrade

Prepared In the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

NC 179 (Beach Drive) at SR 1168 (Country Club Road) / Marsh Harbor Road

Division 3 Brunswick County Calabash

PLAN DATE: February 2016 REVIEWED BY: JPG/PLA

PREPARED BY: Devin Smith REVIEWED BY:

REVISIONS: _____ INIT. DATE

SCALE: 1"=20'

750 N. Greenfield Pkwy, Garner, NC 27529

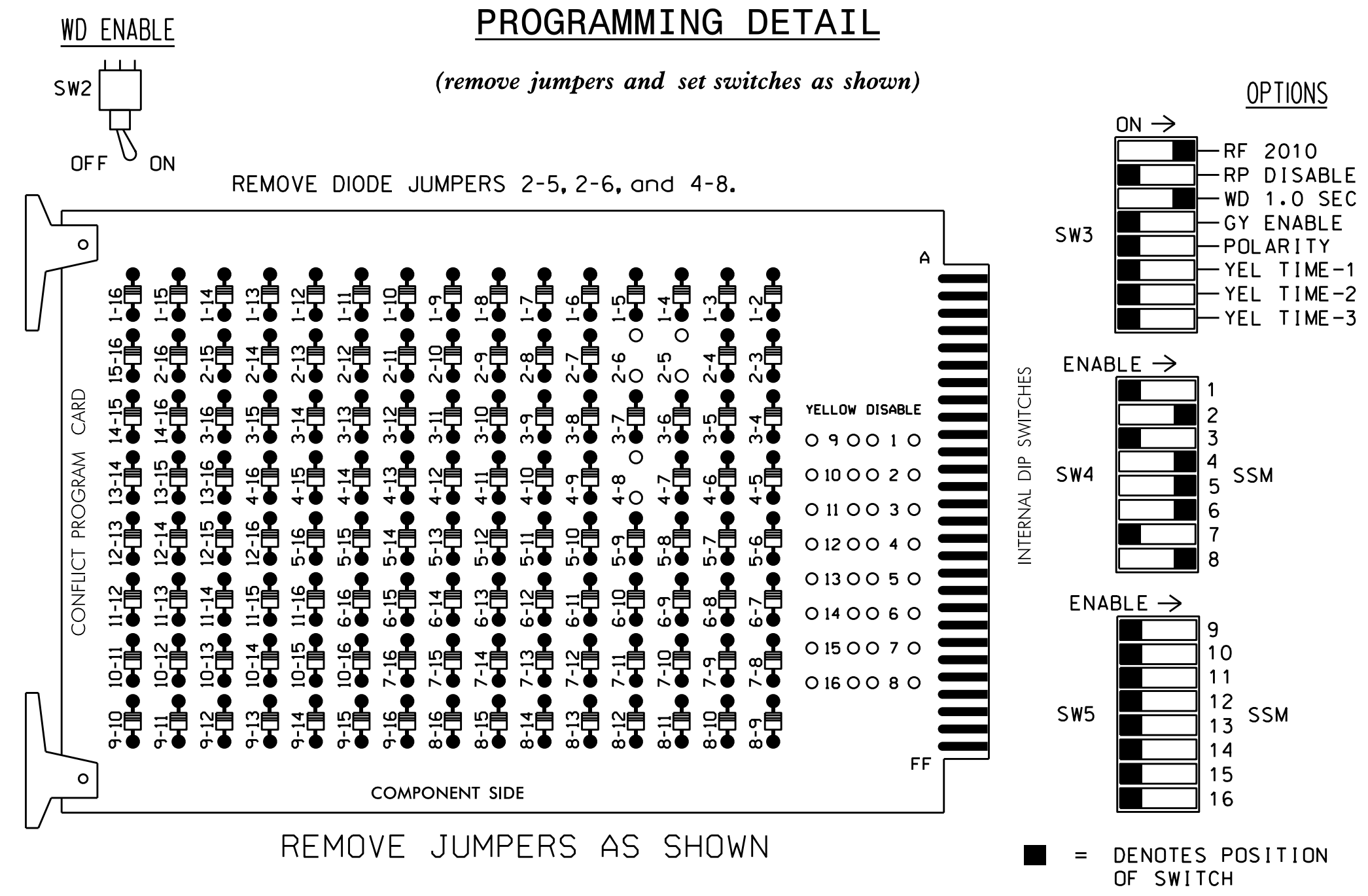
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
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 3/14/16
 DATE
 SIG. INVENTORY NO. 03-0678

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EDI MODEL 2010ECL CONFLICT MONITOR

PROGRAMMING DETAIL



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

NOTES

- 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.
- 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, 7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

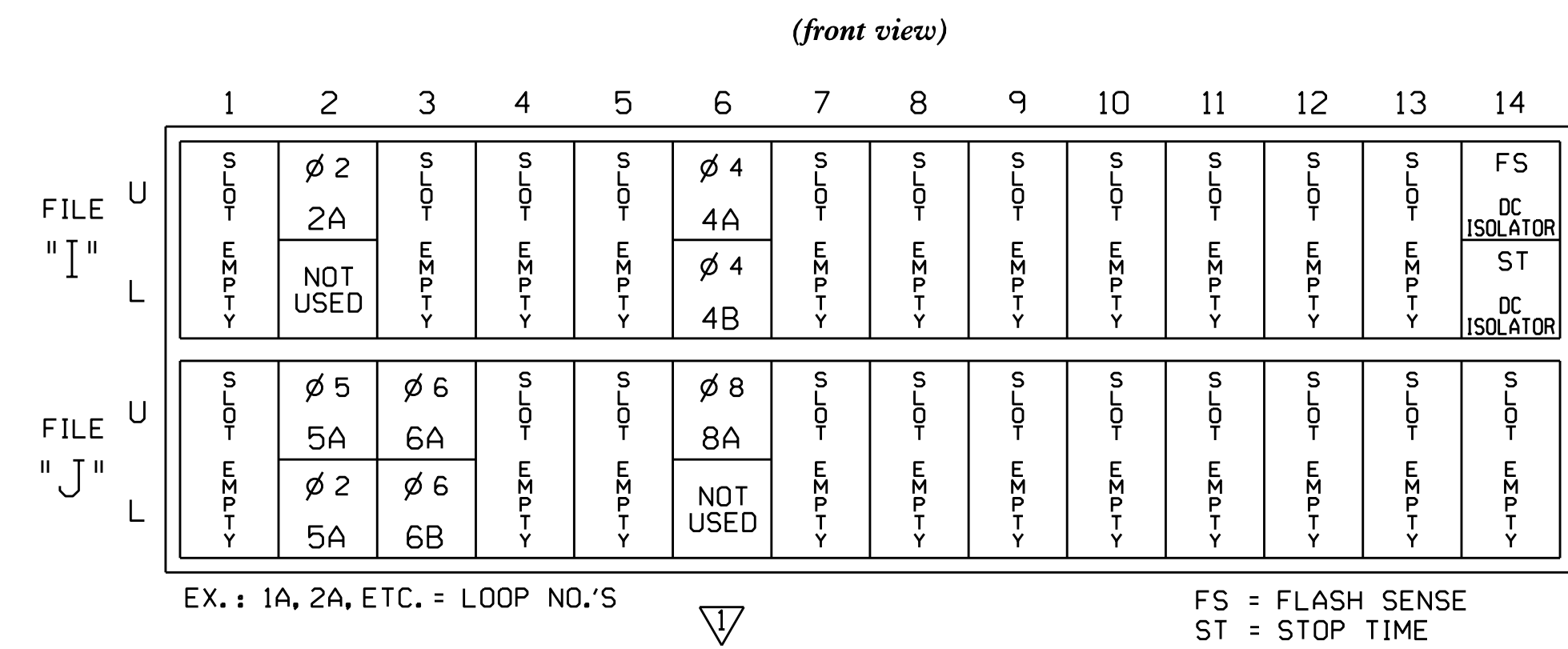
CONTROLLER.....2070
 CABINET.....McCain/CONTROL TECHNOLOGIES (DWG.NO.9500-332-NCDOT)
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S4,S5,S6,S8
 PHASES USED.....2,4,5,6,8
 OVERLAPS.....NONE

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.	NU	21,22	NU	NU	41,42	NU	21	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							132					
GREEN ARROW							133					

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

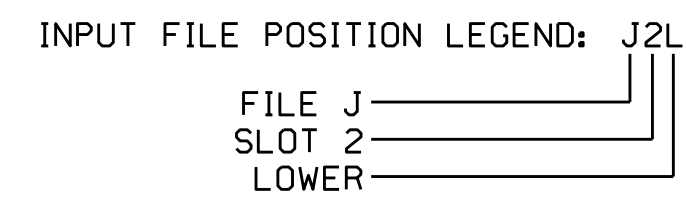
INPUT FILE POSITION LAYOUT



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
5A'	TB3-5,6	J2U	40	2	6	5	Y	Y			15
	TB3-7,8	J2L	44	6	16	2	Y	Y			
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

1 Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.



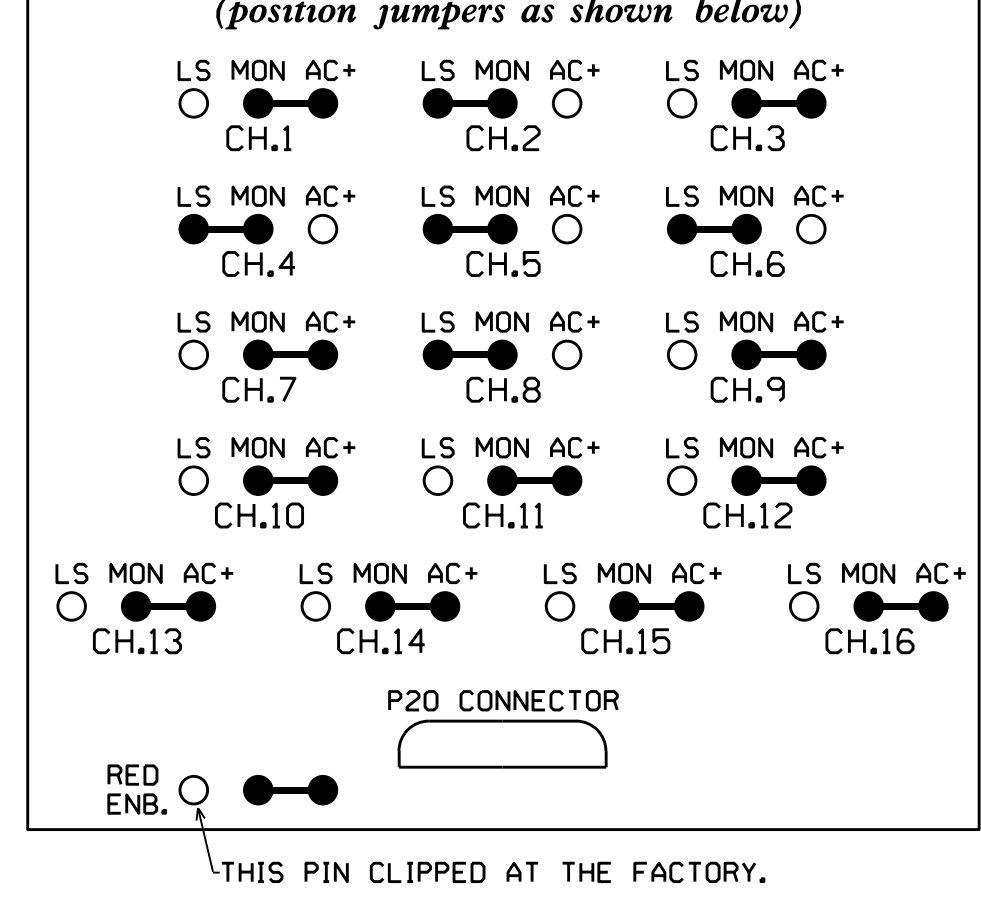
BACKUP PROTECTION NOTE

(program controller as shown below)

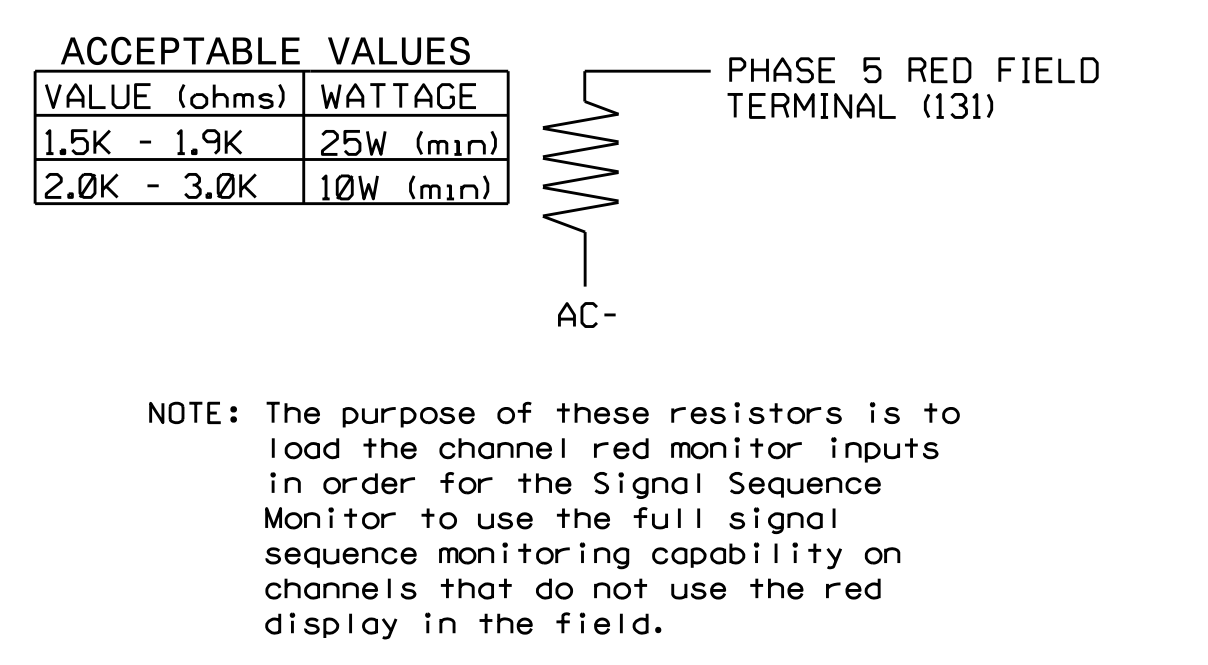
From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0678
 DESIGNED: February 2016
 SEALED: 3/14/2016
 REVISED: N/A

RED MONITOR BOARD PROGRAMMING



LOAD RESISTOR INSTALLATION DETAIL



Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISION SEAL

DocuSigned by: Keith M. Mims 3/15/2016

Electrical and Programming DETAILS FOR:

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY CONSULTANTS
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 179 (Beach Drive) at SR 1168 (Country Club Road) / Marsh Harbor Road

Division 3 Brunswick County Calabash

PLAN DATE: January 2007 REVIEWED BY: JTP
 PREPARED BY: C. Strickland REVIEWED BY:

DATE: 3/15/2016

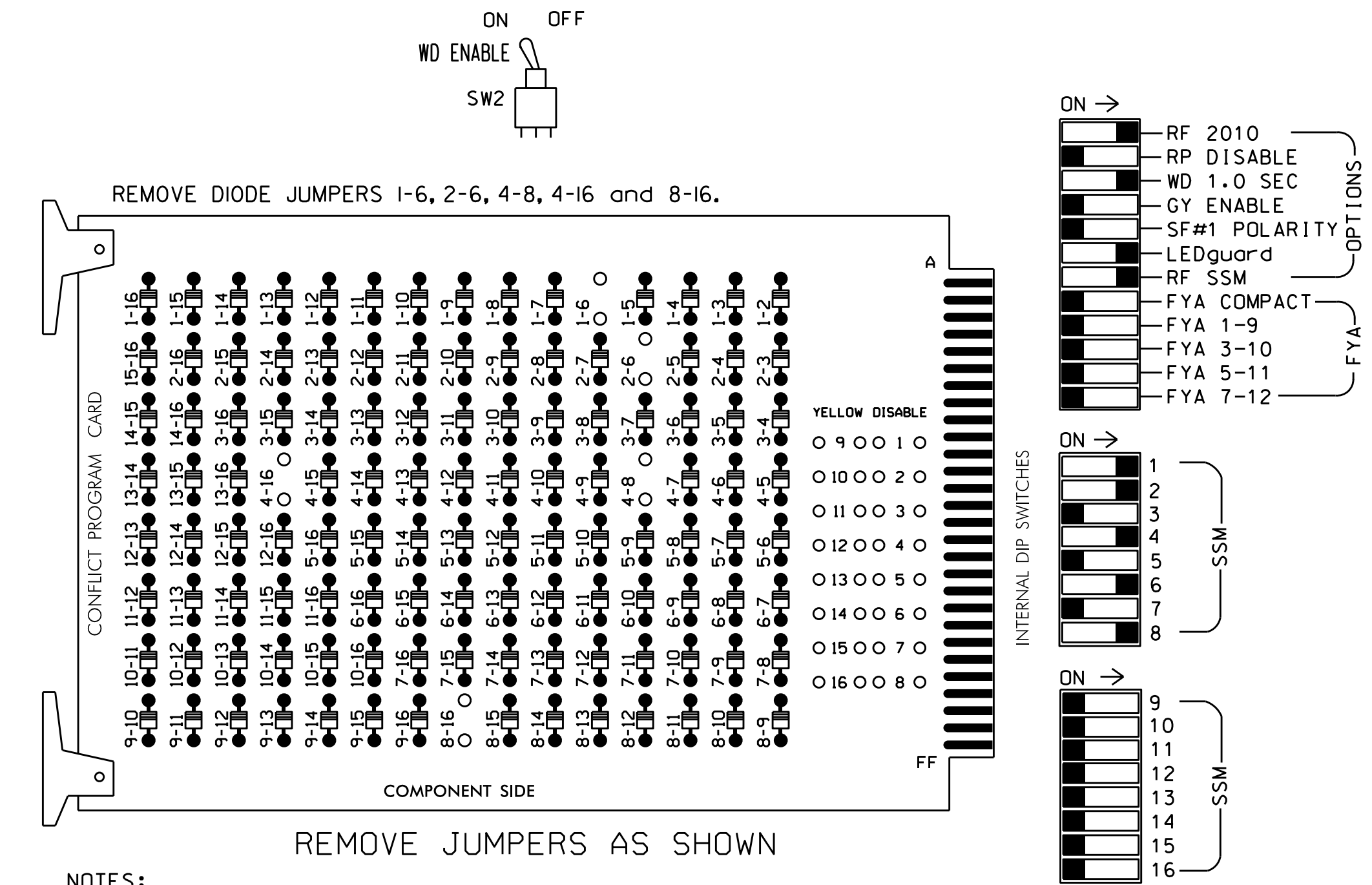
Removed loop 8B, removed delay from loop 8A, revised monitor SEL jumpers, added a note. (MSA)

SIG. INVENTORY NO. 03-0678

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EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

NOTES

- 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.
- 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 3,5,7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phase 8 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....336
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....POLE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S6,S8,S8P
 PHASES USED.....1,2,4,6,8,8PED
 OVERLAPS.....NONE

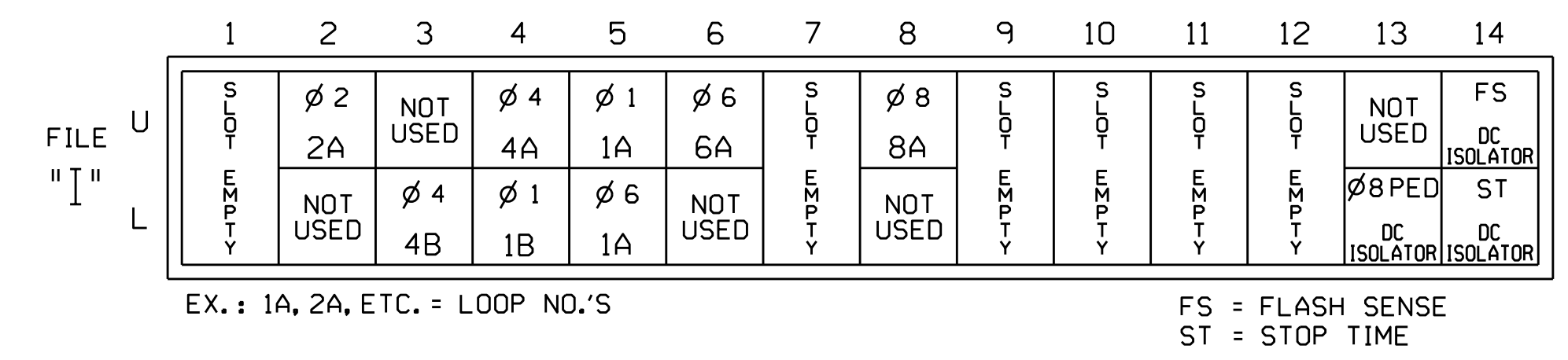
SIGNAL HEAD HOOK-UP CHART

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.	61,82	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	P81, P82
RED	*	128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126											
GREEN ARROW	127											
Hand icon												110
Walking person icon												112

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

INPUT FILE POSITION LAYOUT

(front view)



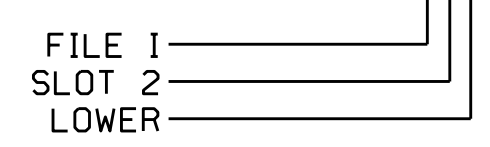
INPUT FILE CONNECTION & PROGRAMMING CHART

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	TB21-9,10	15U	55	17	5	1	Y	Y			15
1B	TB23-9,10	15L	48	10	26	6	Y	Y			15
2A	TB21-3,4	12U	39	1	2	2	Y	Y			
4A	TB21-7,8	14U	41	3	4	4	Y	Y			3
4B	TB23-5,6	13L	49	11	24	4	Y	Y			15
6A	TB21-11,12	16U	40	2	6	6	Y	Y			
8A	TB22-1,2	18U	42	4	8	8	Y	Y			3
PED PUSH BUTTONS											
P81,P82	TB24-11,12	113L	70	32	PED 8	8 PED					

NOTE:
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 113.

¹Add jumpers from TB21-9 to TB23-9, and from TB21-10 to TB23-10.

INPUT FILE POSITION LEGEND: I2L



BACKUP PROTECTION NOTE

(program controller as shown below)

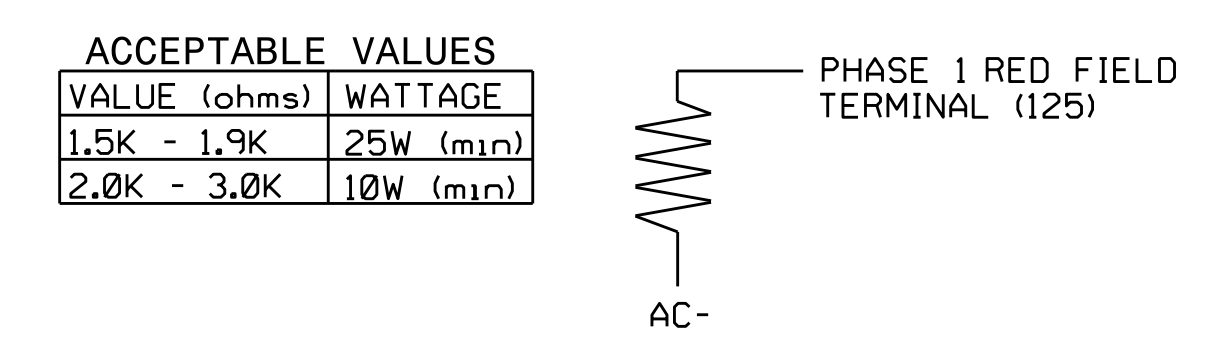
From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

NOTE: Ensure that no Dynamic/BackUp functions are enabled (Phase Control menu, '1') and that no Dynamic/Backup Control functions have been programmed (Phase Control Menu, '2').

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0241
 DESIGNED: February 2016
 SEALED: 3/14/2016
 REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



15-MAR-2016 08:16 S:\MITS\15-Signal\work\hgr\oups\51g_MonMtr\stronp030241_sm.ele.xxx.dgn sarstronp

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY ADMINISTRATION
 FEDERAL BUREAU OF INVESTIGATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 179 (Beach Drive) at River Road/Business Entrance

Division 3 Brunswick County Calabash

PLAN DATE: February 2016 REVIEWED BY: T. Joyce
 PREPARED BY: S. Armstrong REVIEWED BY:

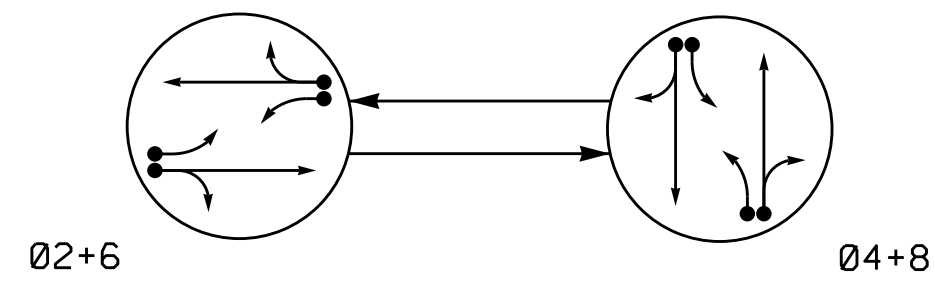
REVISIONS INIT. DATE

Seal: KEITH M. MINAS ENGINEER 036880

DocuSigned by: Keith M. Minas 3/15/2016

SIG. INVENTORY NO. 03-0241

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

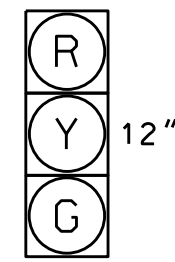
- ←●→ DETECTED MOVEMENT
- ←→ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ←- - - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2+6	Ø 4+8	F L S H
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



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

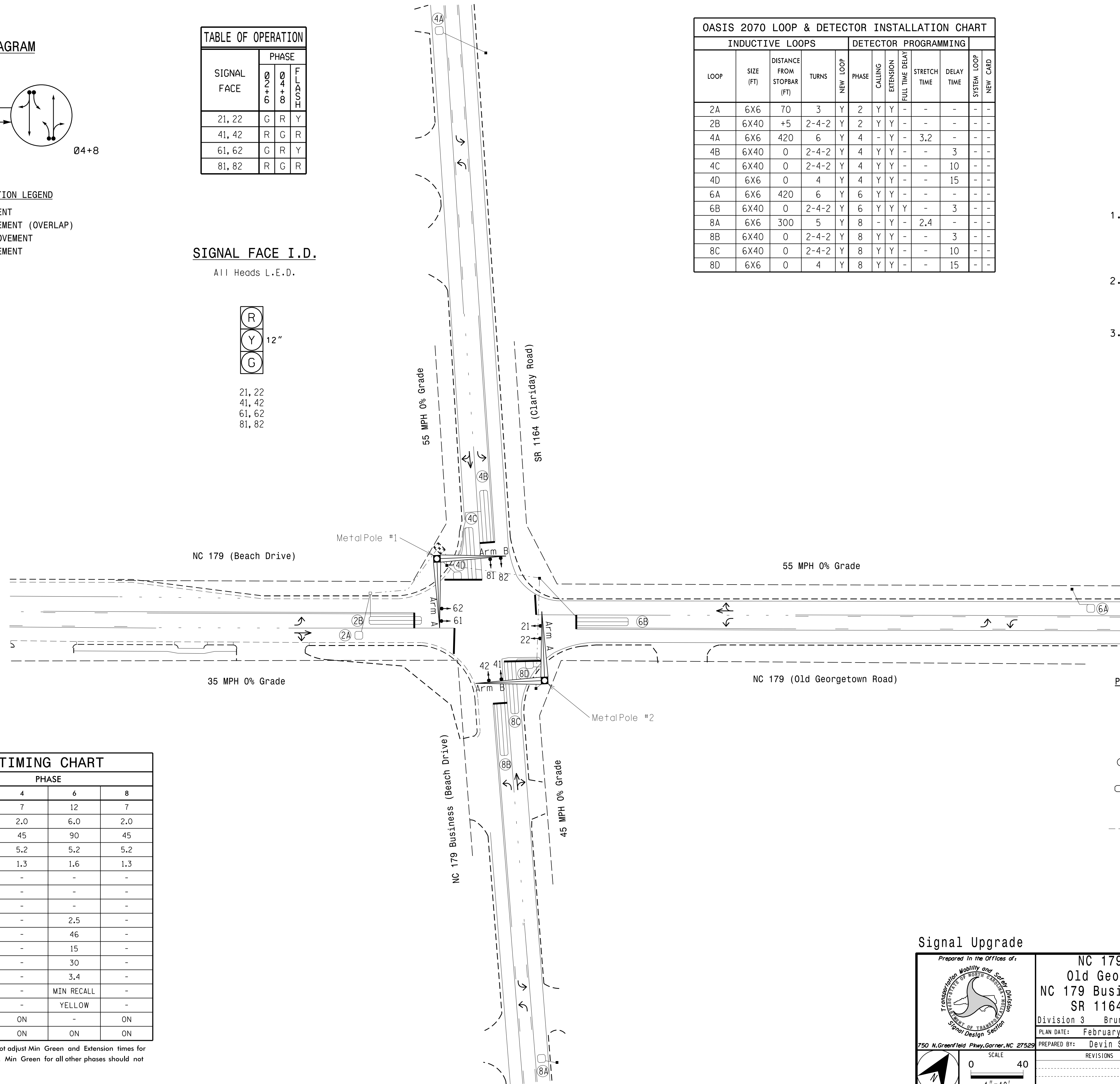
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	INDUCTIVE LOOPS			DETECTOR PROGRAMMING							
	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	3	Y	2	Y	Y	-	-	-	-
2B	6X40	+5	2-4-2	Y	2	Y	Y	-	-	-	-
4A	6X6	420	6	Y	4	-	Y	-	3.2	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-
4D	6X6	0	4	Y	4	Y	Y	-	-	15	-
6A	6X6	420	6	Y	6	Y	Y	-	-	-	-
6B	6X40	0	2-4-2	Y	6	Y	Y	Y	-	3	-
8A	6X6	300	5	Y	8	-	Y	-	2.4	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	3	-
8C	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-
8D	6X6	0	4	Y	8	Y	Y	-	-	15	-

2 Phase Fully Actuated Isolated

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	12	7	12	7
Extension 1 *	3.0	2.0	6.0	2.0
Max Green 1 *	90	45	90	45
Yellow Clearance	5.2	5.2	5.2	5.2
Red Clearance	1.6	1.3	1.6	1.3
Red Revert	-	-	-	-
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	2.5	-
Max Variable Initial *	-	-	46	-
Time Before Reduction *	-	-	15	-
Time To Reduce *	-	-	30	-
Minimum Gap	-	-	3.4	-
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.

LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Signal Upgrade

Prepared In the Offices of:

 TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS, INC.
 ENGINEERS OF TRANSPORTATION SIGNAL DESIGN SECTION
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 179 (Beach Drive/ Old Georgetown Road) at NC 179 Business (Beach Drive)/ SR 1164 (Clariday Road)

Division 3 Brunswick County Calabash

PLAN DATE: February 2016 REVIEWED BY: JPG/PLA

PREPARED BY: Devin Smith REVIEWED BY:

REVISIONS: _____ INIT. DATE

SCALE: 0 40
1" = 40'

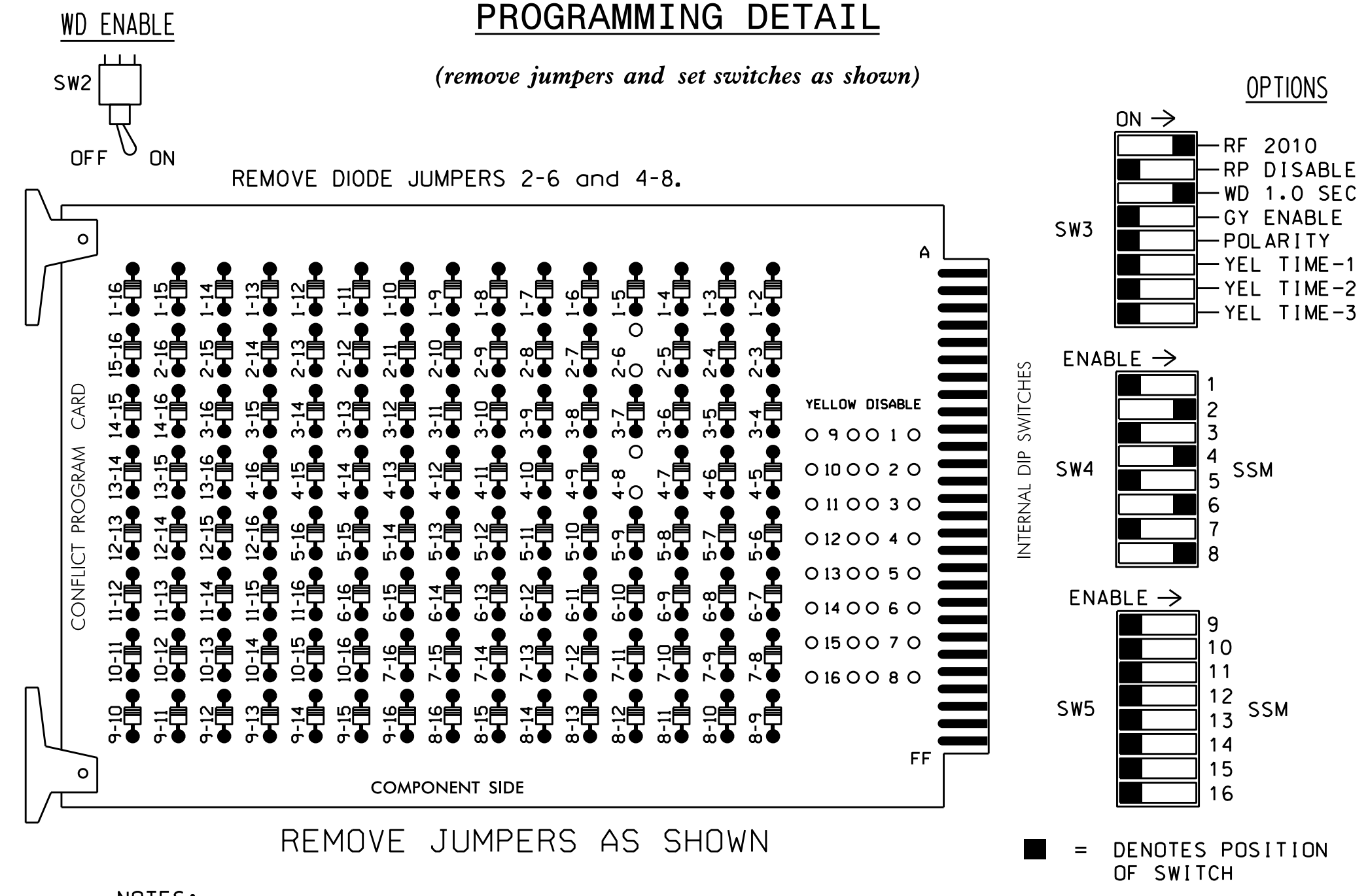
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 023489
 ALEXANDER
 3/14/16
 DATE
 SIG. INVENTORY NO. 03-0535

EDI MODEL 2010ECL 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.

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 phase 6 for Variable Initial and Gap Reduction.
6. Program phases 2 and 6 for Start Up In Green.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX FILE
 LOAD SWITCHES USED.....S2,S4,S6,S8
 PHASES USED.....2,4,6,8
 OVERLAPS.....NONE

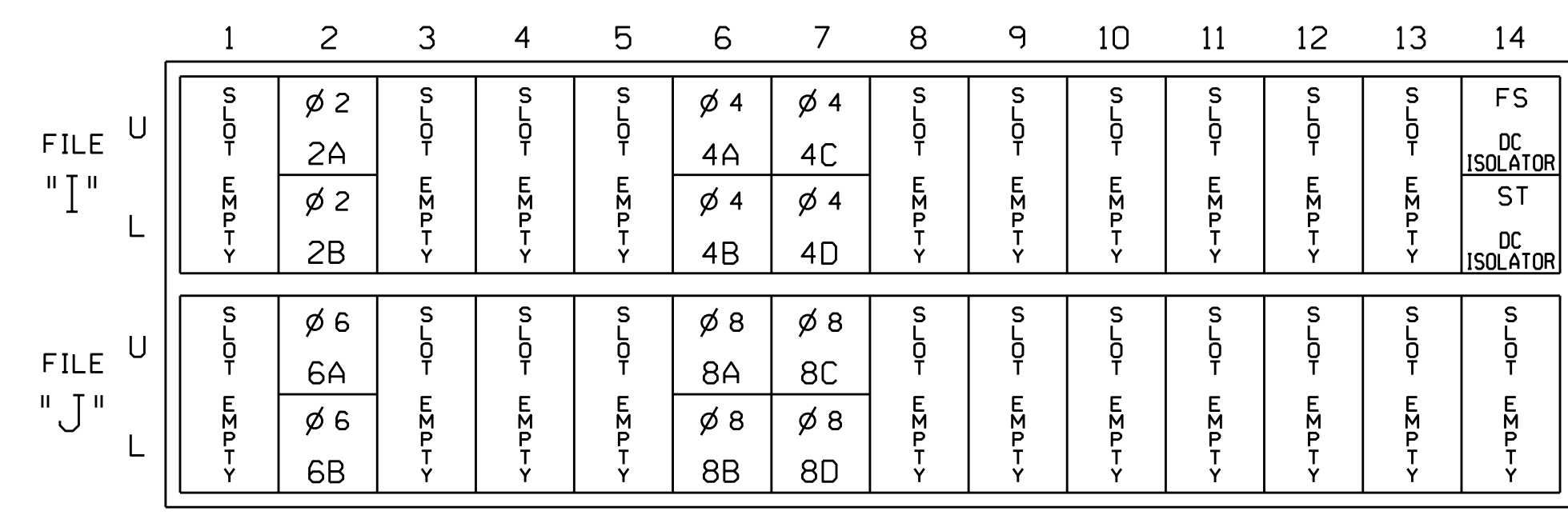
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		
Hand icon																		
Person icon																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



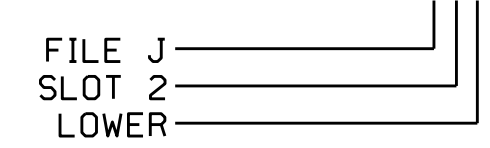
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y		3,2	
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			10
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y		2,4	
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			3
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			10
8D	TB7-3,4	J7L	79	41	48	8	Y	Y			15

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0535
 DESIGNED: February 2016
 SEALED: 3/14/2016
 REVISED: N/A

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical AND PROGRAMMING DETAILS FOR: NC 179 (Beach Drive/ Old Georgetown Road) at NC 179 Business (Beach Drive)/ SR 1164 (Claridy Road)

Division 3 Brunswick County Calabash

PLAN DATE: February 2016 REVIEWED BY: T. Joyce

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS: _____ INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

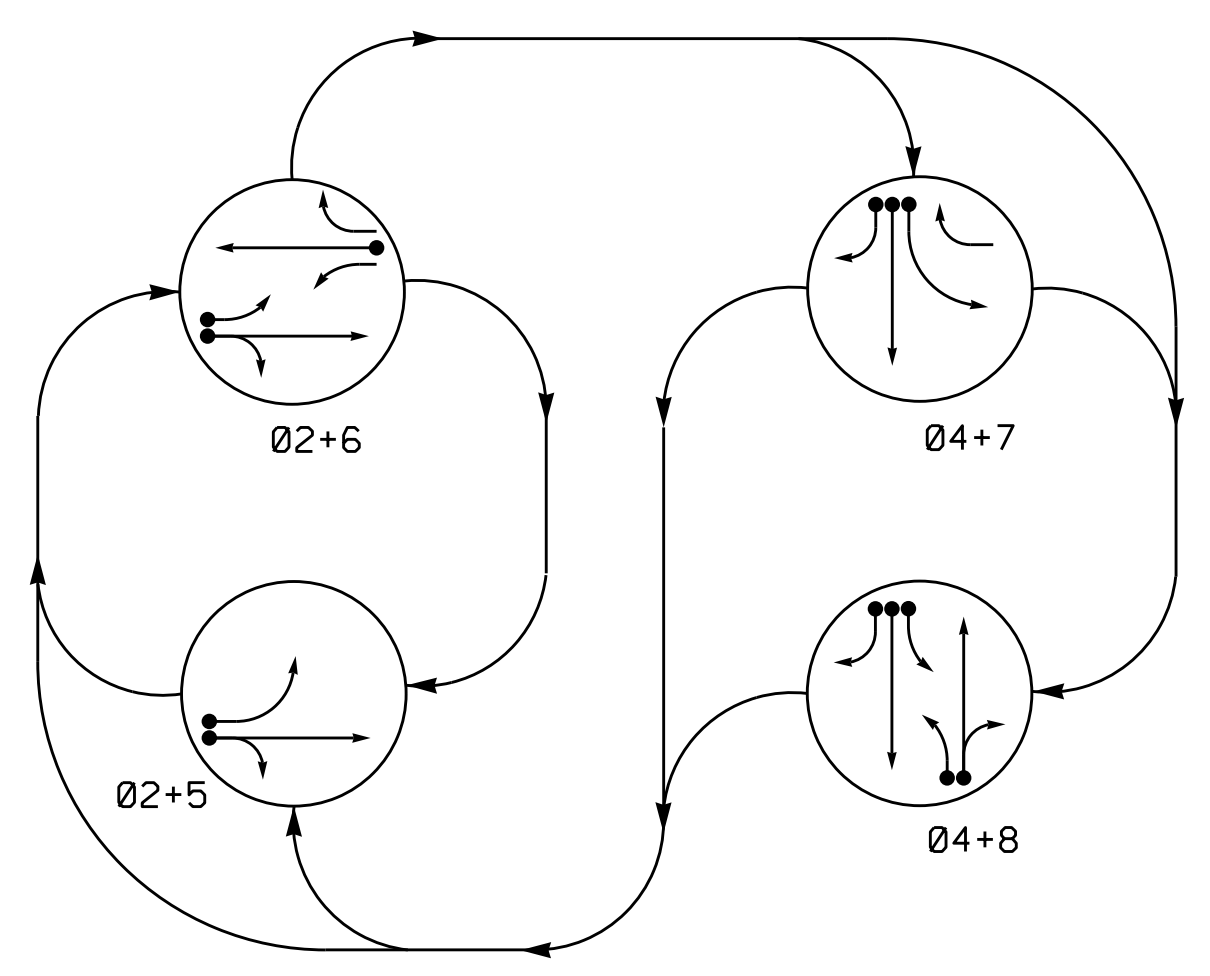
Seal of Keith M. Mins, Professional Engineer, State of North Carolina, License No. 036880

DocuSigned by: Keith M. Mins 3/15/2016

SIG. INVENTORY NO. 03-0535

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 armstrong

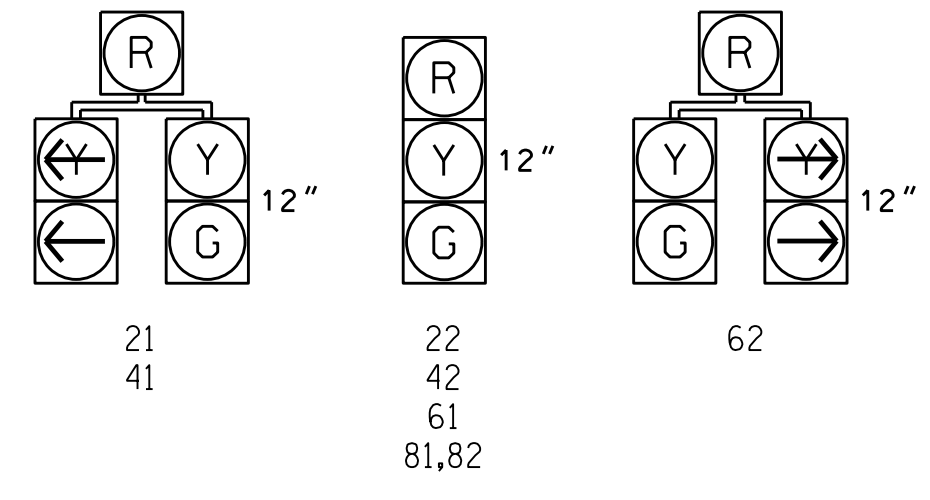
PHASING DIAGRAM



SIGNAL FACE	PHASE				
	02+5	02+6	04+7	04+8	F
21	G	R	R	Y	
22	G	G	R	Y	
41	R	R	G	R	
42	R	R	G	R	
61	R	G	R	Y	
62	R	G	R	Y	
81,82	R	R	R	G	

SIGNAL FACE I.D.

All Heads L.E.D.



PHASING DIAGRAM DETECTION LEGEND

- ←● DETECTED MOVEMENT
- ←○ UNDETECTED MOVEMENT (OVERLAP)
- ←- - UNSIGNALIZED MOVEMENT
- ←- - - PEDESTRIAN MOVEMENT

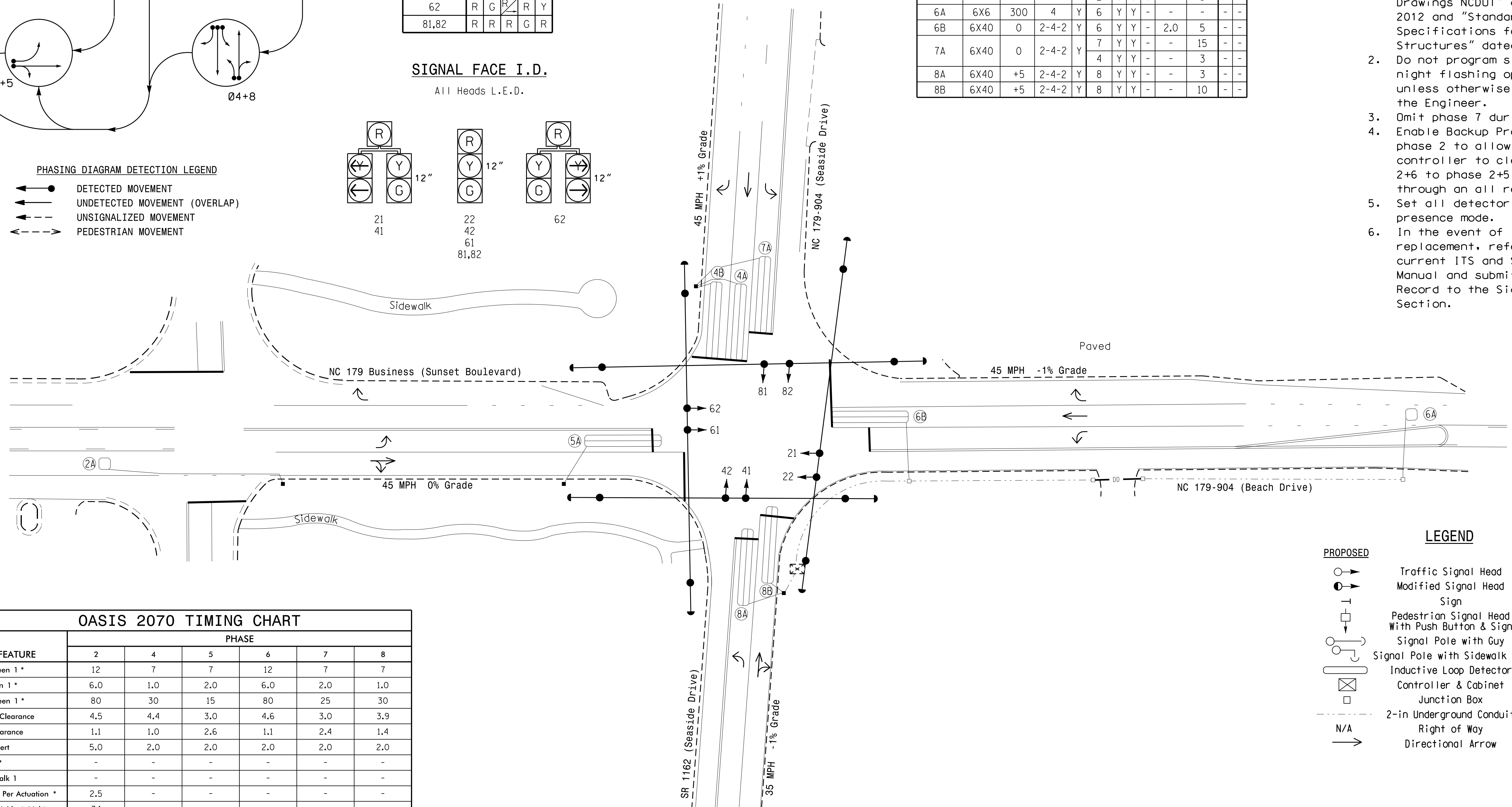
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	-
5A	6X40	+5	2-4-2	Y	5	Y	Y	-	-	15	-	-
6A	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6B	6X40	0	2-4-2	Y	6	Y	Y	-	2.0	5	-	-
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	15	-	-
8A	6X40	+5	2-4-2	Y	8	Y	Y	-	-	3	-	-
8B	6X40	+5	2-4-2	Y	8	Y	Y	-	-	10	-	-

4 Phase Fully Actuated Isolated

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. Omit phase 7 during phase 8 on.
4. Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
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.



FEATURE	PHASE					
	2	4	5	6	7	8
Min Green 1 *	12	7	7	12	7	7
Extension 1 *	6.0	1.0	2.0	6.0	2.0	1.0
Max Green 1 *	80	30	15	80	25	30
Yellow Clearance	4.5	4.4	3.0	4.6	3.0	3.9
Red Clearance	1.1	1.0	2.6	1.1	2.4	1.4
Red Revert	5.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	2.5	-	-	-	-	-
Max Variable Initial *	34	-	-	-	-	-
Time Before Reduction *	10	-	-	10	-	-
Time To Reduce *	50	-	-	50	-	-
Minimum Gap	3.0	-	-	3.0	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL	-	-
Vehicle Call Memory	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	EXISTING
○ → Traffic Signal Head	● → N/A
● → Modified Signal Head	-
⊥ 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	- - -
- - - Right of Way	- - -
→ Directional Arrow	→

Signal Upgrade

NC 179-904 (Beach Drive) / NC 179 Business (Sunset Boulevard) at NC 179-904 / SR 1162 (Seaside Dr.)

Division 3 Brunswick County Seaside

PLAN DATE: February 2016 PREPARED BY: KGP, Jr. REVIEWED BY: JGP/PLA

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 1" = 30'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

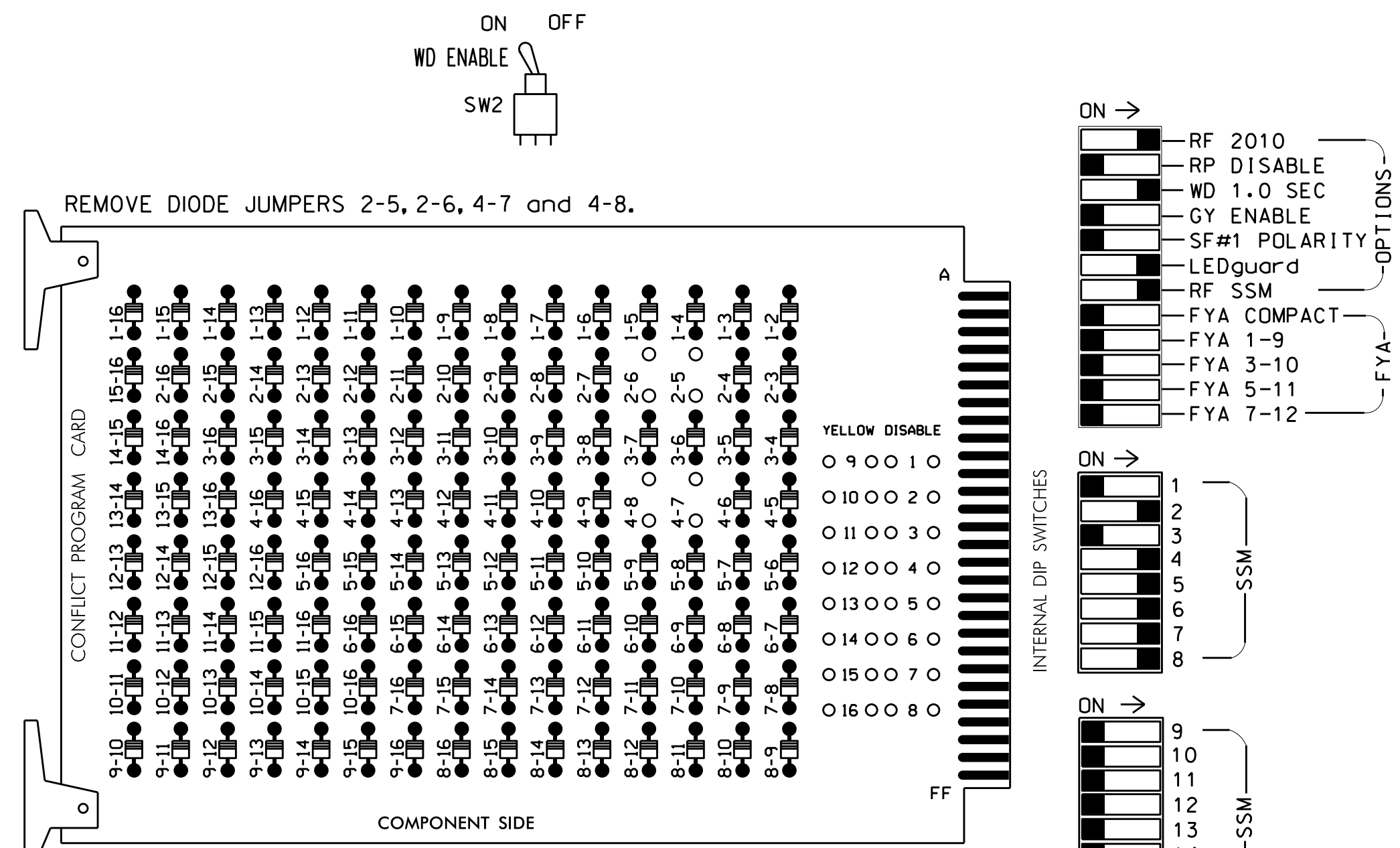
3/11/16

SIG. INVENTORY NO. 03-0677

09-10-2016 10:49
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EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- 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.
- To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for Variable Initial and phases 2 and 6 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....McCAIN/CONTROL TECHNOLOGIES (DWG.NO.9500-332-NC DOT)
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S4,S5,S6,S7,S8
 PHASES USED.....2,4,5,6,7,8
 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	21	61,62	NU	41,62	81,82	NU
RED		128			101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW							132			123		
GREEN ARROW							133			124		

NU = Not Used

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

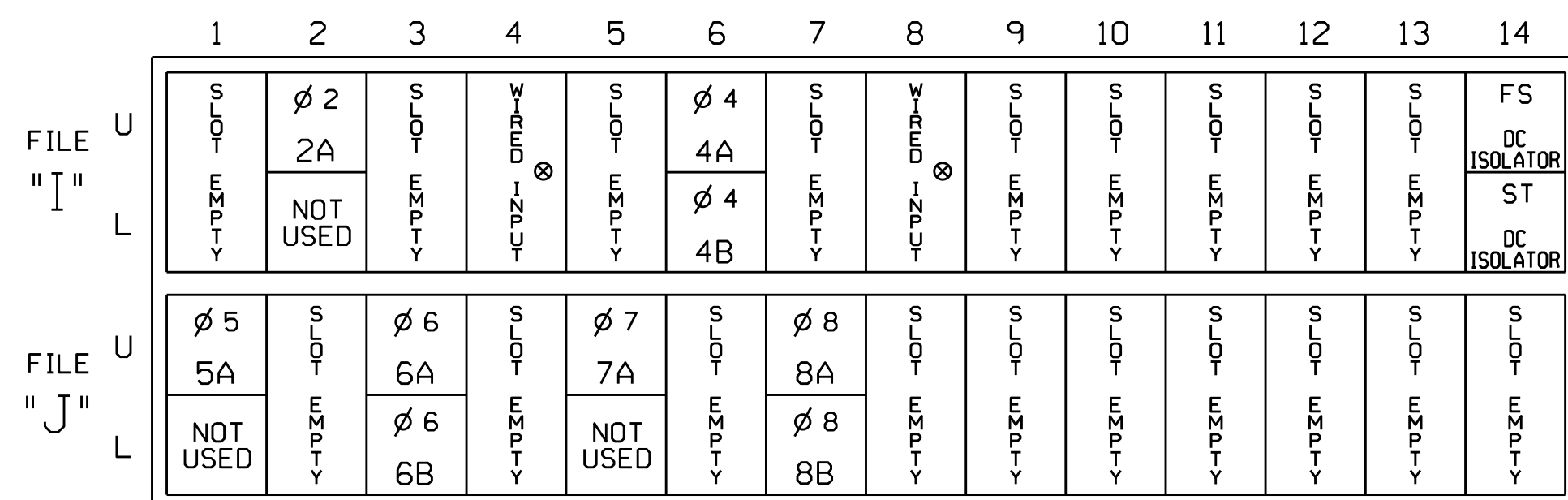
BACKUP PROTECTION NOTE

(program controller as shown below)

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

INPUT FILE POSITION LAYOUT

(front view)



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
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
5A ¹	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y		2.0	5
7A ²	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			3
8A	TB7-1,2	J7U	66	28	38	8	Y	Y			3
8B	TB7-3,4	J7L	79	41	48	8	Y	Y			10

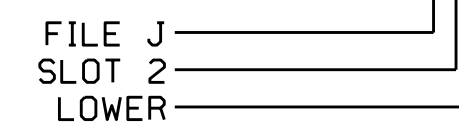
¹Add jumper from J1-W to I4-W, on rear of input file.

²Add jumper from J5-W to I8-W, on rear of input file.

! If present, remove jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.

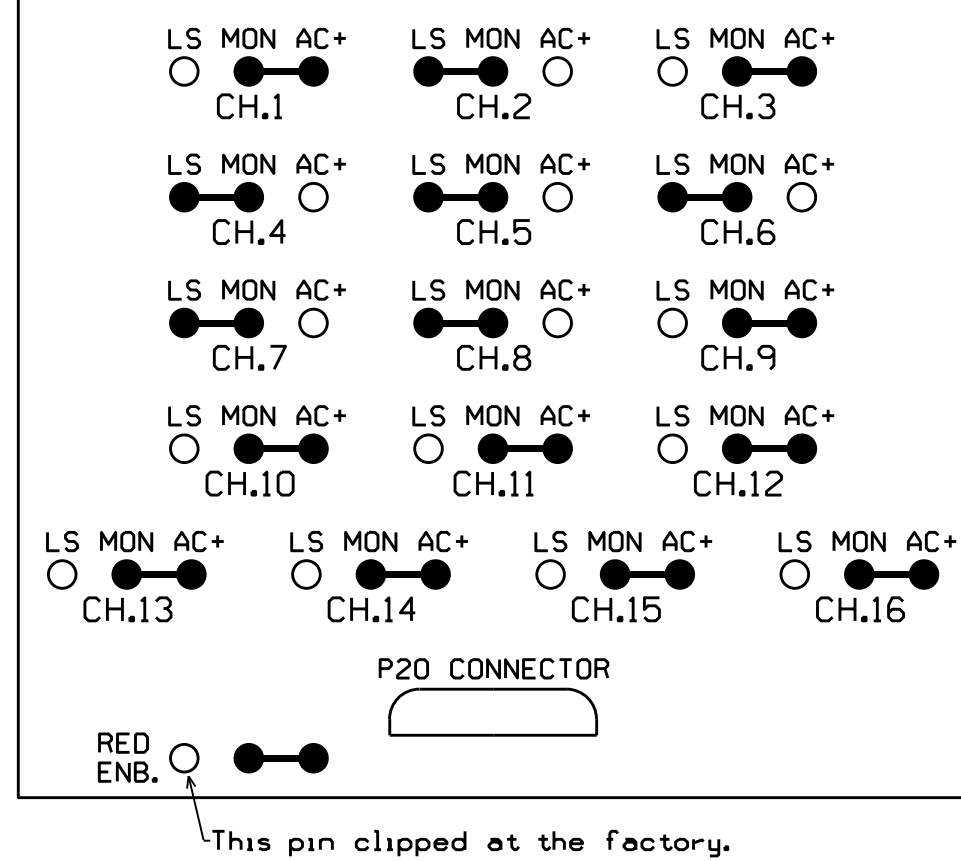
! If present, remove jumpers from TB5-9 to TB5-11, and from TB5-10 to TB5-12.

INPUT FILE POSITION LEGEND: J2L



RED MONITOR BOARD PROGRAMMING

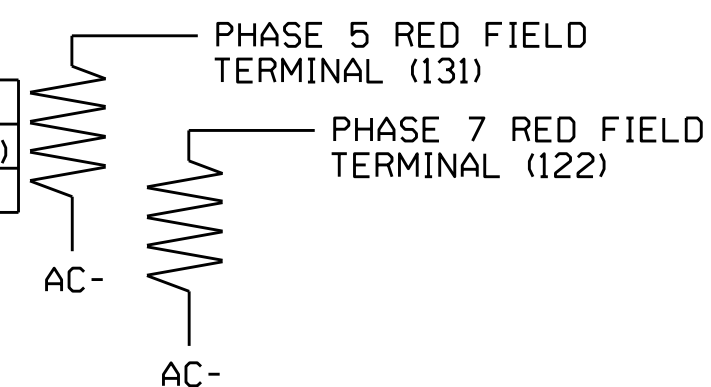
(position jumpers as shown below)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

- From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
- From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```

DYNAMIC/BACKUP CONTROL FUNCTION #01
OVERLAPS:;ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ;
OR PHASES:;12345678910111213141516
IF PHASES ARE ON; X
OMIT PHASES ; X
CALL PHASES ;
    
```

BACKUP PROTECTION PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0677
 DESIGNED: February 2016
 SEALED: 3/11/2016
 REVISED:

Electrical Detail

Electrical and Programming Details For: NC 179-904 (Beach Drive) / NC 179 Business (Sunset Boulevard) at NC 179-904/SR 1162 (Seaside Dr.)

Prepared In the Offices of: **Transporation Mobility and Safety Solutions** (Seaside Dr. Brunswick County, NC 27509)

750 N. Greenfield Pkwy, Garner, NC 27529

PLAN DATE: March 2016 REVIEWED BY: BAS
 PREPARED BY: C. Strickland REVIEWED BY:

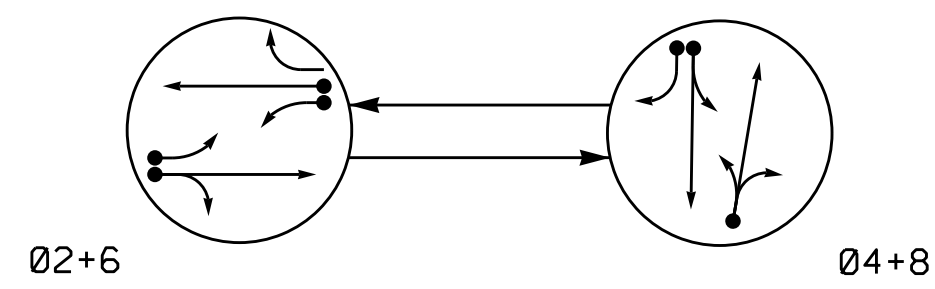
REVISIONS: INIT. DATE

Seal: **Keith M. Mims**, Professional Engineer, No. 036880, State of North Carolina. Seal Date: 3/17/2016.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 03-0677

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

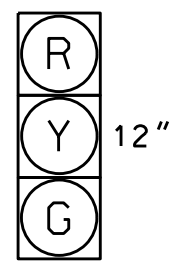
- ● DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLIGHT
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



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

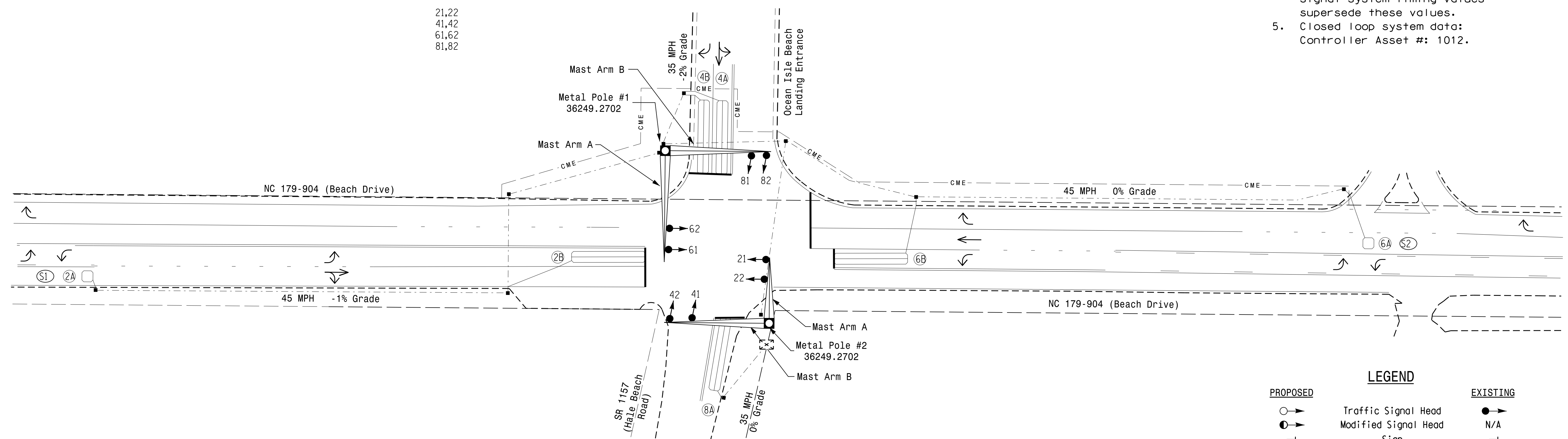
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME			DELAY TIME
2A/S1	6X6	300	4	Y	2	Y	Y	-	-	-	Y	-
2B	6X40	0	2-4-2	Y	2	Y	Y	Y	-	3	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	-
6A/S2	6X6	300	4	Y	6	Y	Y	-	-	-	Y	-
6B	6X40	0	2-4-2	Y	6	Y	Y	Y	-	3	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	5	-	-

2 Phase Fully Actuated NC 179/904 Closed Loop System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 1012.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	12	7	12	7
Extension 1 *	6.0	1.0	6.0	1.0
Max Green 1 *	90	30	90	30
Yellow Clearance	4.6	4.0	4.6	4.0
Red Clearance	1.2	1.3	1.2	1.3
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 *	45	-	45	-
Minimum Gap	3.0	-	3.0	-
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.

LEGEND

- | PROPOSED | EXISTING |
|--|---|
| ○ → Traffic Signal Head | ● → N/A |
| ○ → Modified Signal Head | ○ → N/A |
| □ → Sign | □ → N/A |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → N/A |
| ○ → Signal Pole with Guy | ○ → N/A |
| ○ → Signal Pole with Sidewalk Guy | ○ → N/A |
| □ → Inductive Loop Detector | □ → N/A |
| □ → Controller & Cabinet | □ → N/A |
| □ → Junction Box | □ → N/A |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A → Right of Way | N/A → Right of Way |
| → → Directional Arrow | → → Directional Arrow |
| N/A → Construction Maintenance Easement | N/A → Construction Maintenance Easement |

Signal Upgrade

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 179-904 (Beach Drive) at SR 1157 (Hale Beach Road) / Ocean Isle Beach Landing Entrance

Division 3 Brunswick County Ocean Isle Beach

PLAN DATE: February 2016 PREPARED BY: KGP, Jr. REVIEWED BY: JPG/PLA

REVISIONS: _____ INIT. DATE

SCALE: 1"=30'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

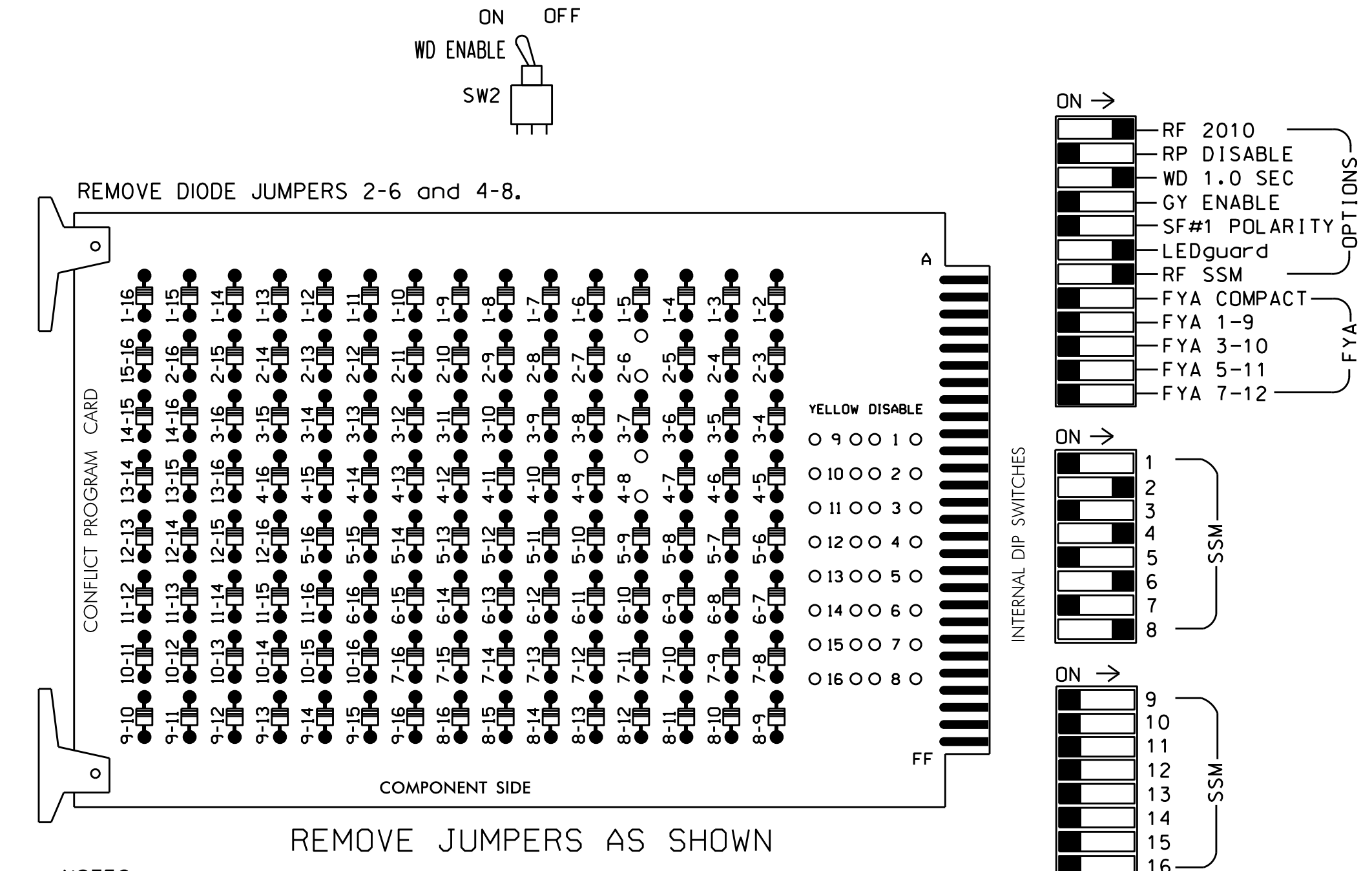
SEAL: PAMELA L. ALEXANDER, ENGINEER, 023489

3/11/16

SIG. INVENTORY NO. 03-1012

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- 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.
- 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.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the NC 179/904 Closed Loop System.

EQUIPMENT INFORMATION

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

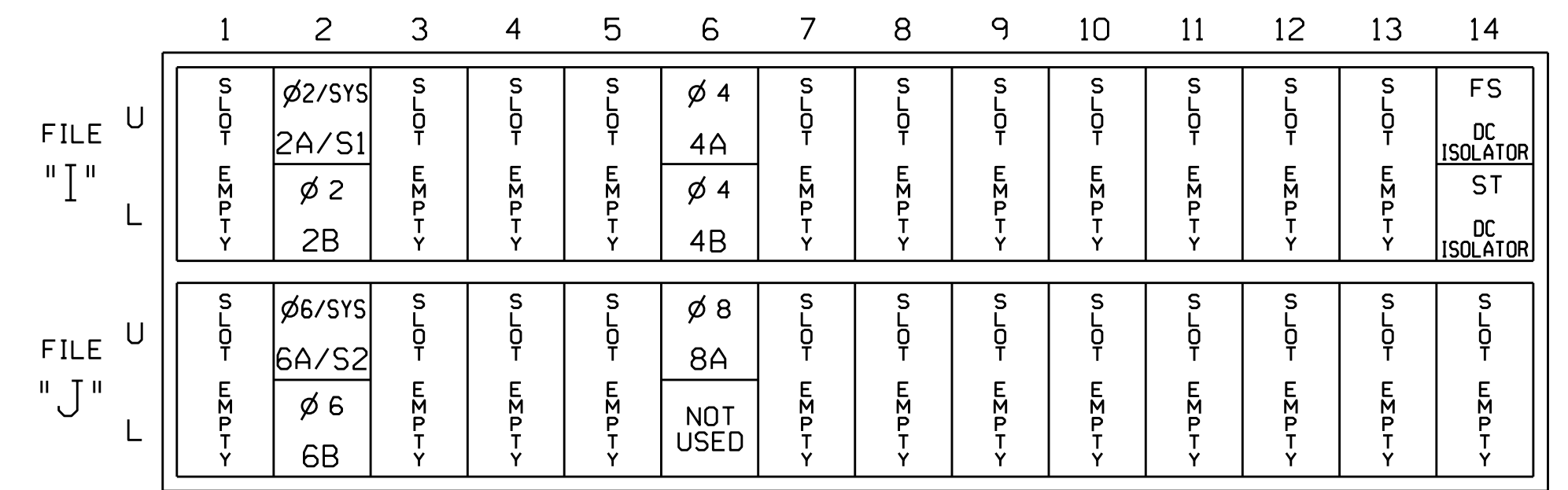
SIGNAL HEAD HOOK-UP CHART

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.	NU	21,22	NU	NU	41,42	NU	NU	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												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



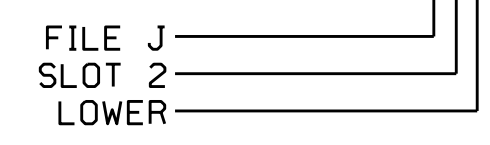
EX.: 1A, 2A, ETC. = LOOP NO.'S

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	TB2-7,8	I2L	43	5	12	2	Y	Y	Y		3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
6A/S2	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1012
 DESIGNED: February 2016
 SEALED: 3-11-16
 REVISED: N/A

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Electrical Detail

REVISION SEAL

Electrical and Programming Details For: NC 179-904 (Beach Drive) at SR 1157 (Hale Beach Road) / Ocean Isle Beach Landing Entrance

Division 3 Brunswick County Ocean Isle Beach

PLAN DATE: February 2008 REVIEWED BY: J. Cross

PREPARED BY: J. Cross REVIEWED BY: S. Privette

REVISIONS: Resurfacing, no change to electrical details. (JP) KMM 3/17/2016

750 N. Greenfield Pkwy, Garner, NC 27529

Seal of Keith M. Mims, Professional Engineer, No. 036880

Not a certified document as to the Original Document but only as to the Revisions - This document originally issued and sealed by Stephanie E. Privette, PE #24432, on 5-20-08. This document is only certified as to the revisions.

SIG. INVENTORY NO. 03-1012