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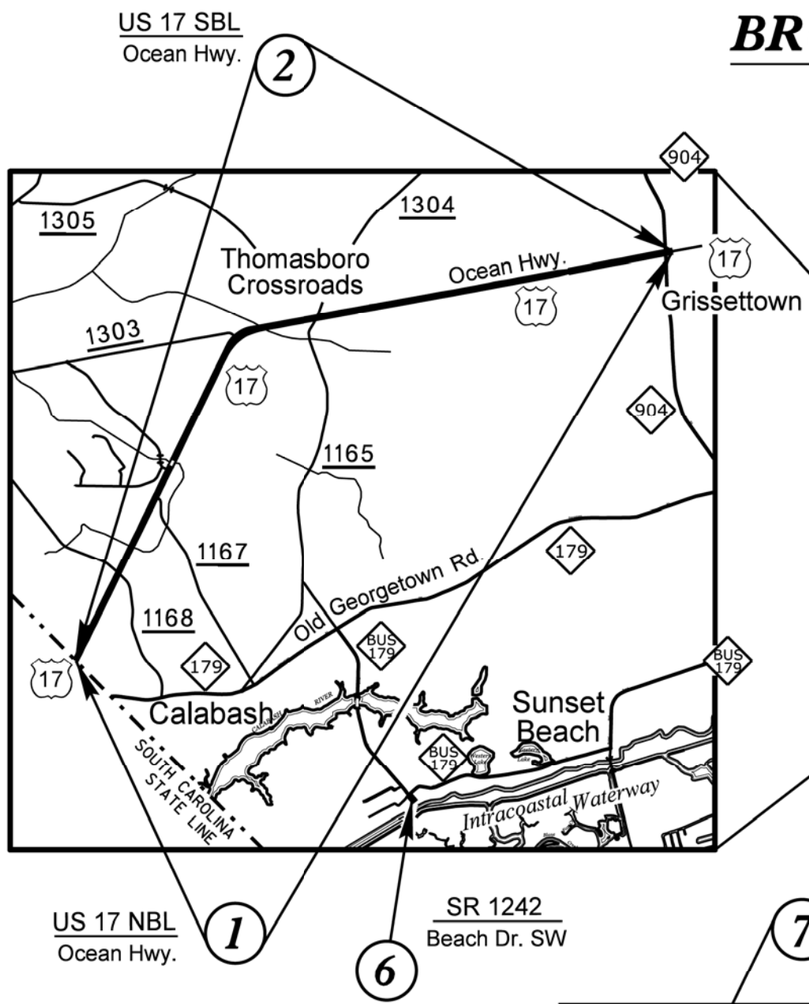
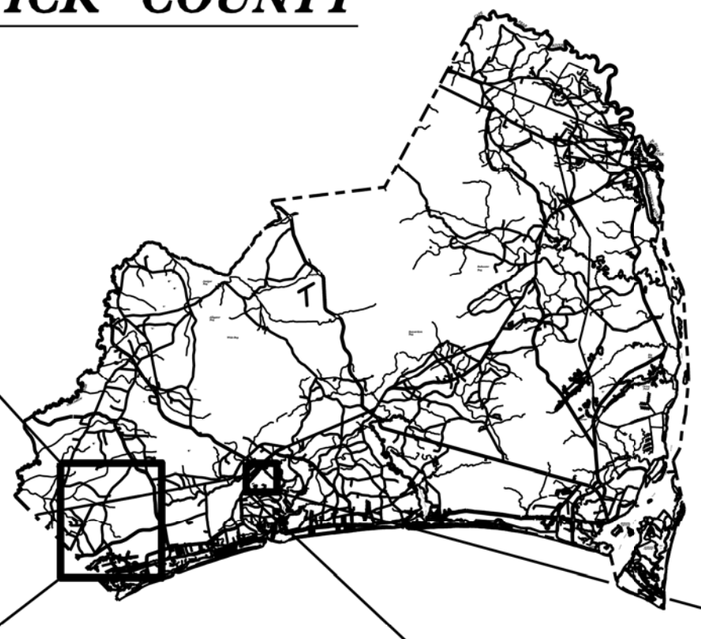
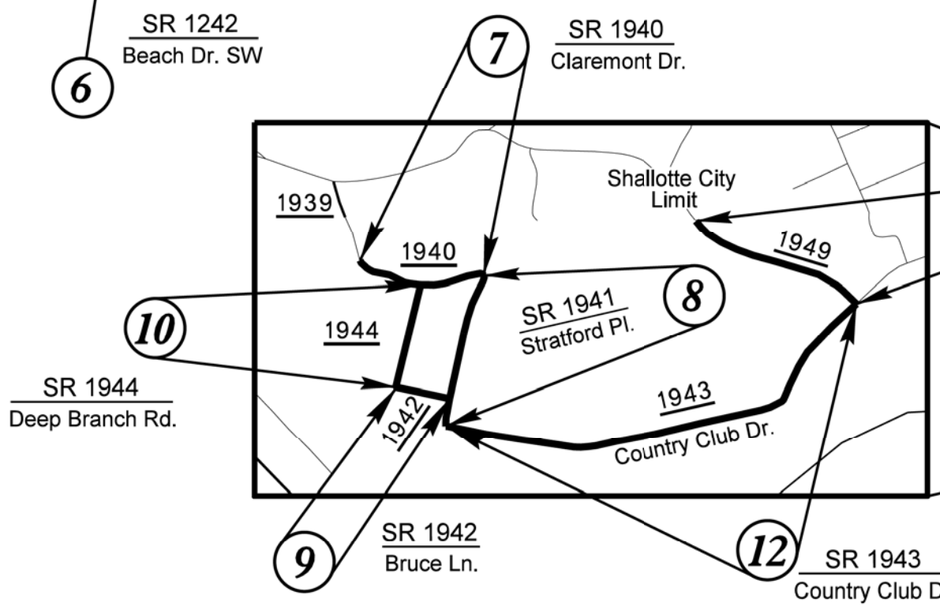
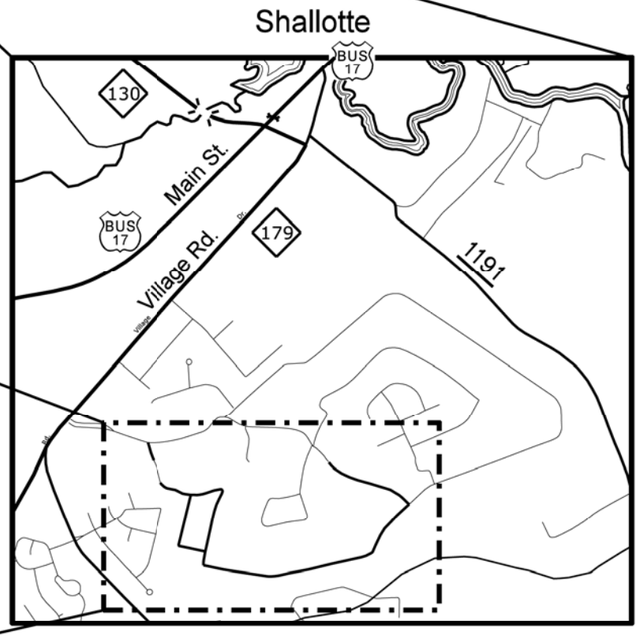
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101,Etc.	1

BRUNSWICK COUNTY









MAPS N.T.S.

REVISIONS

8/17/99

18-AUG-2015 15:07
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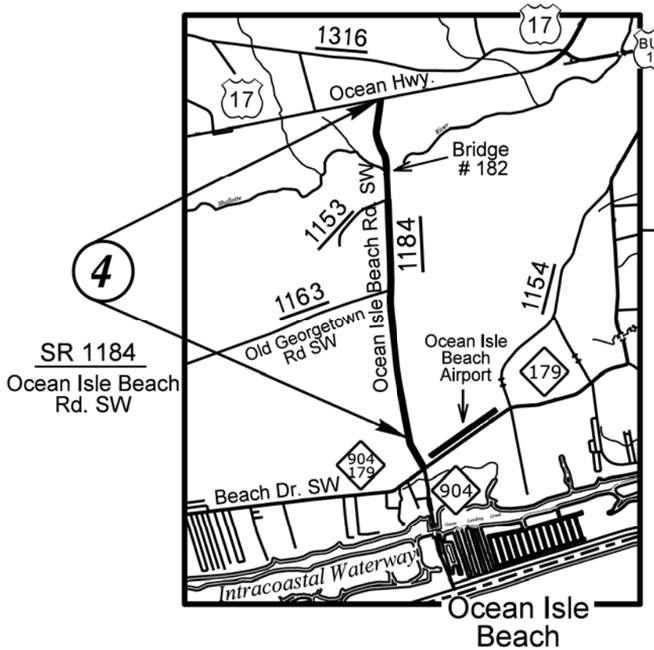
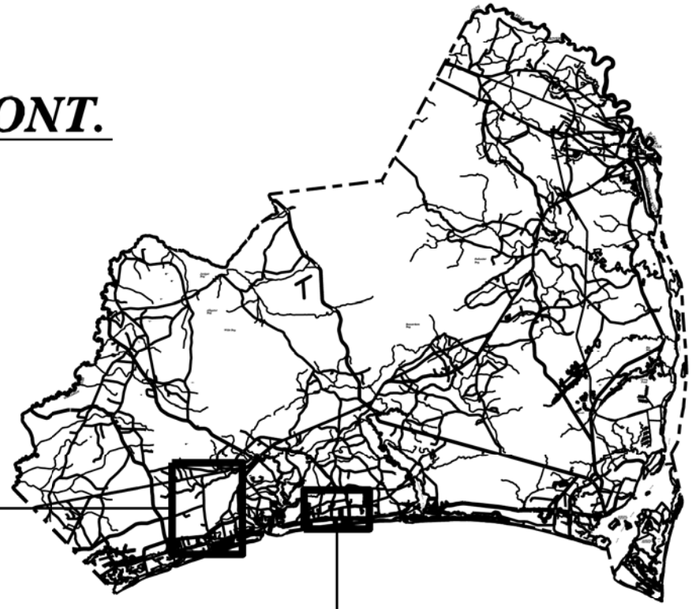
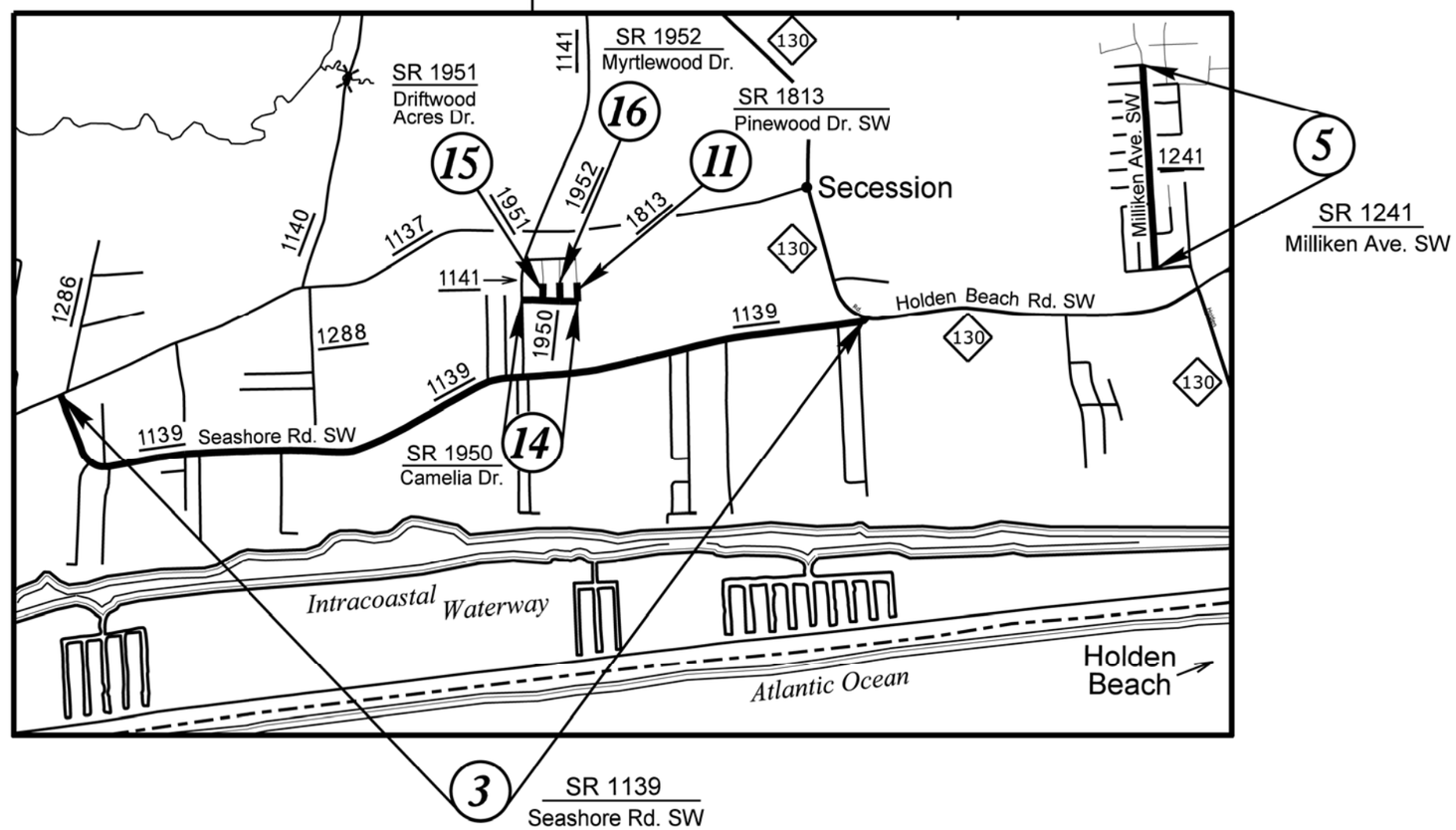
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101,Etc.	2

BRUNSWICK COUNTY – CONT.







MAPS N.T.S.

REVISIONS

8/17/99

18-AUG-2015 11:29
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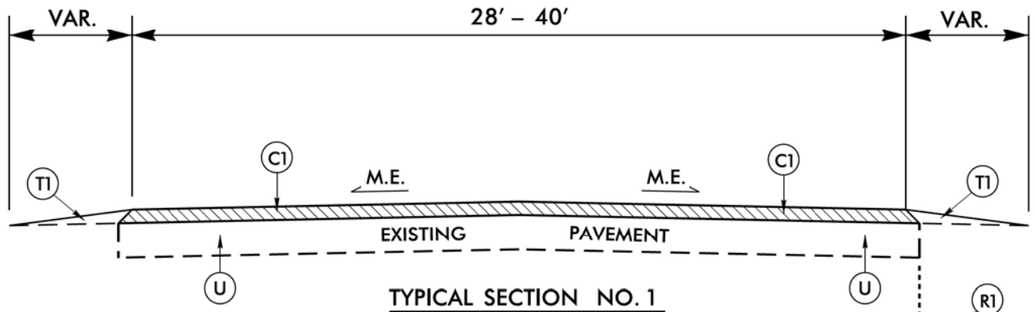
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	3



TYPICAL SECTION NO. 1

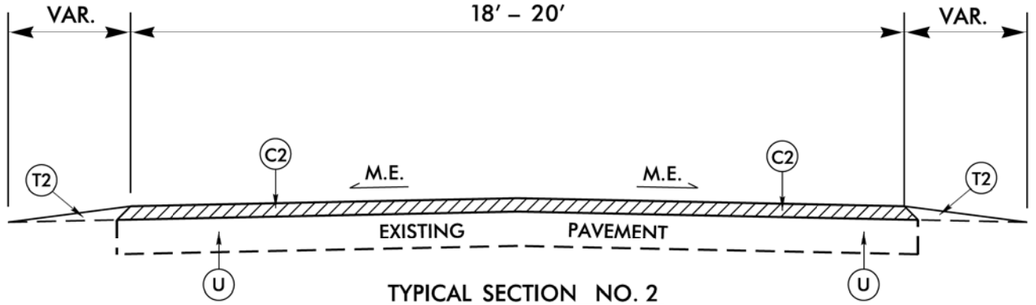
MAP NO. 1
US 17 NBL (OCEAN HWY.)
MP 0.00 – MP 7.10

MAP NO. 2 **
US 17 SBL (OCEAN HWY.)
MP 40.15 – MP 47.25

(V1) MAP NO. 1 & 2
1.5″ MILLING AT CONCRETE MEDIAN ISLANDS (SEE US 17 PROJECT LIMITS & MILLING DETAILS SHEET)

R1

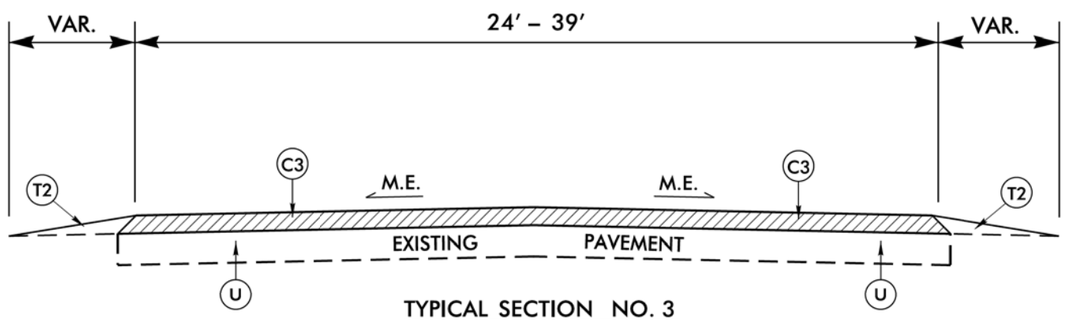
MAP NO. 2 **
US 17 SBL (OCEAN HWY.)
(SEE US 17 PROJECT LIMITS & MILLING DETAILS SHEET)



TYPICAL SECTION NO. 2

MAP NO. 3
SR 1139 (SEASHORE RD. SW)
MP 0.00 – MP 2.88

MAP NO. 5
SR 1241 (MILLIKEN AVE. SW)
MP 0.00 – MP 0.68



TYPICAL SECTION NO. 3

MAP NO. 4
SR 1184 (OCEAN ISLE BEACH RD. SW)
MP 0.00 – MP 3.46
(NO WORK: MP 1.60 – MP 1.98)

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. 2″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ.YD.
C4	PROP. APPROX. 1½″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD.
C5	PROP. APPROX. ¾″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S4.75A, AT AN AVERAGE RATE OF 85 LBS. PER SQ.YD.
C6	PROP. APPROX. 1¼″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ.YD.
F1	ASPHALT SERVICE TREATMENT - MAT COAT #67 STONE (GRANITE)
R1	6″x 9″ EXISTING CONCRETE CURB
T1	AGGREGATE SHOULDER BORROW (ASB)
T2	EARTH MATERIAL (SHOULDER RECONSTRUCTION)
U	EXISTING PAVEMENT
V1	MILLING BITUMINOUS PAVEMENT 1½″ DEPTH.

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

SEE STD. DRAWING 1205.01, SHEET 2 OF 2, TABLE 1 FOR EDGE LINE OFFSETS.

EFF.01-17-2012
REV.10-30-2012

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 8 - INCIDENTALS
862.01 Guardrail Placement
862.02 Guardrail Installation

REVISIONS

8/17/99

24-AUG-2015 16:31
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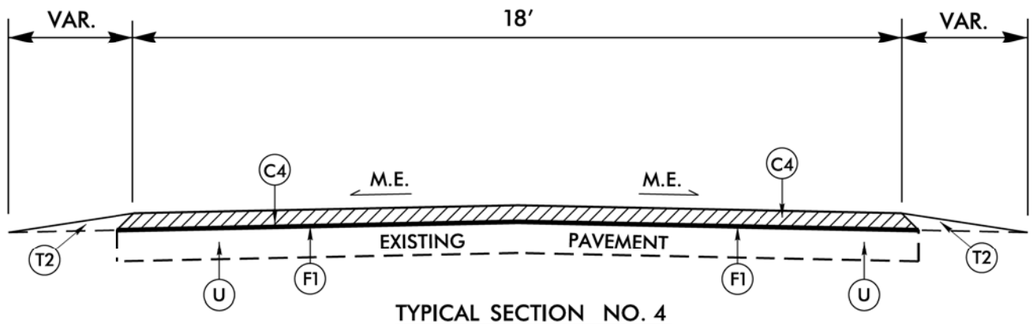
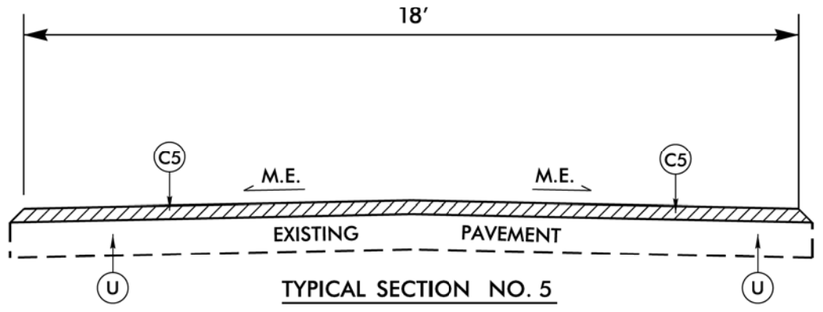
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	4



TYPICAL SECTION NO. 4

MAP NO. 6
SR 1242 (BEACH DR. SW)
MP 0.00 – MP 0.09



TYPICAL SECTION NO. 5

MAP NO. 7
SR 1940 (CLAREMONT DR.)
MP 0.00 – MP 0.20

MAP NO. 8
SR 1941 (STRATFORD PL.)
MP 0.00 – MP 0.24

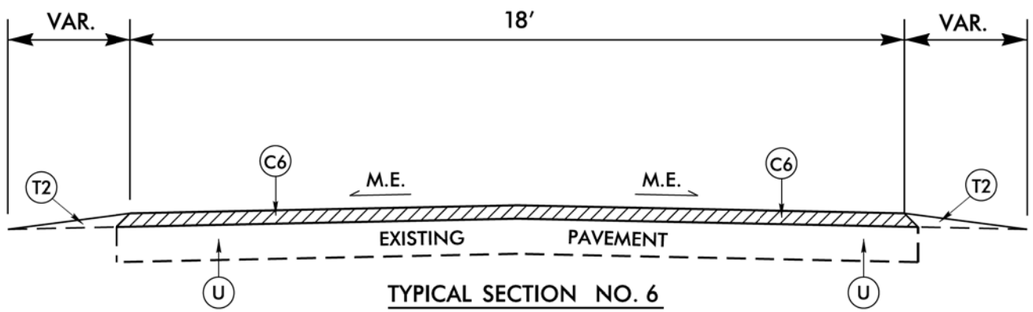
MAP NO. 9
SR 1942 (BRUCE LN.)
MP 0.00 – MP 0.08

MAP NO. 10
SR 1944 (DEEP BRANCH RD.)
MP 0.00 – MP 0.16

MAP NO. 12
SR 1943 (COUNTRY CLUB DR.)
MP 0.00 – MP 0.72

MAP NO. 13
SR 1949 (BRIERWOOD RD.)
MP 0.00 – MP 0.28

PAVEMENT SCHEDULE	
C4	1½" SF9.5A
C5	¾" S4.75A
C6	1¼" SF9.5A
F1	AST MAT COAT #67 STONE (GRANITE)
T2	SH. RECONSTR.
U	EXISTING PAVEMENT



TYPICAL SECTION NO. 6

MAP NO. 11
SR 1813 (PINEWOOD DR. SW)
MP 0.08 – MP 0.14

MAP NO. 14
SR 1950 (CAMELIA DR.)
MP 0.00 – MP 0.18

MAP NO. 15
SR 1951 (DRIFTWOOD ACRES DR.)
MP 0.00 – MP 0.06

MAP NO. 16
SR 1952 (MYRTLEWOOD DR.)
MP 0.00 – MP 0.06

REVISIONS

8/17/99

19-AUG-2015 11:05
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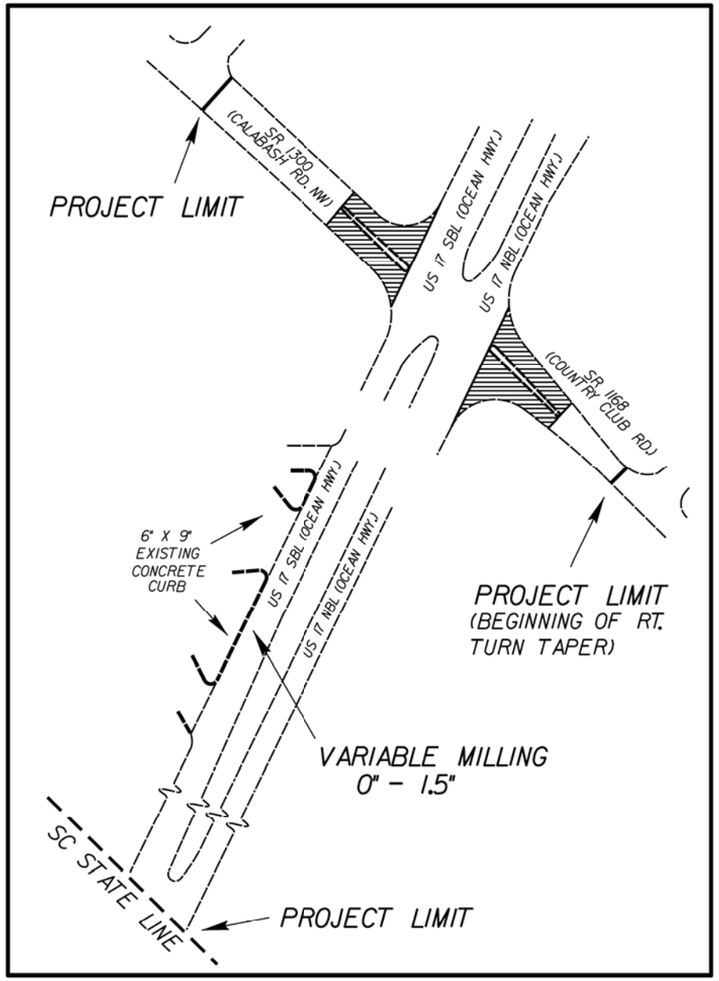
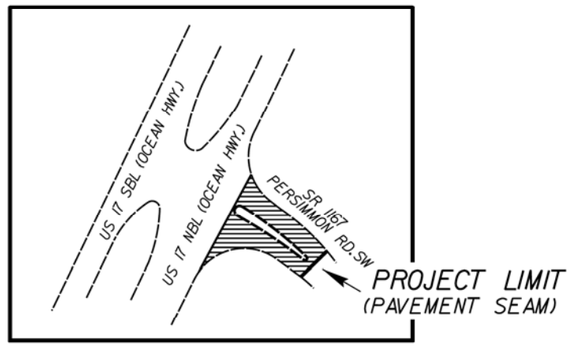
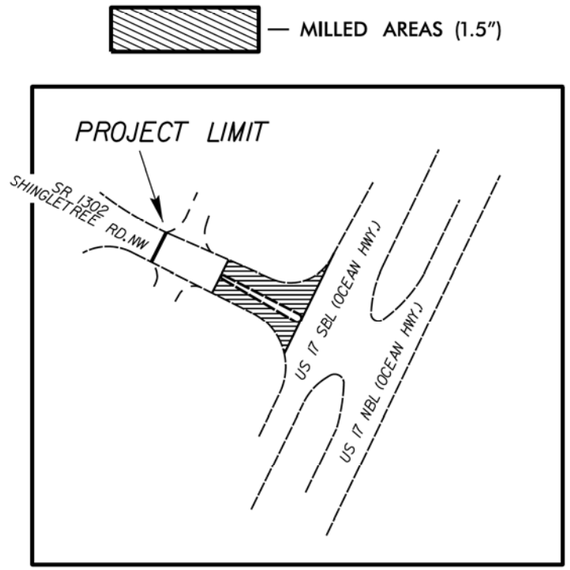
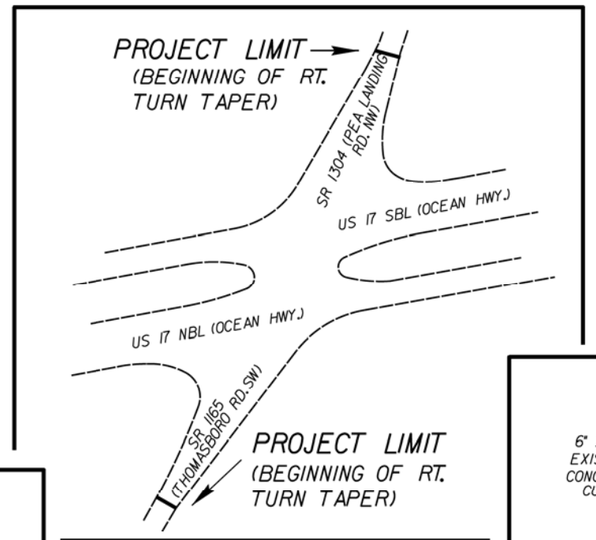
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	5

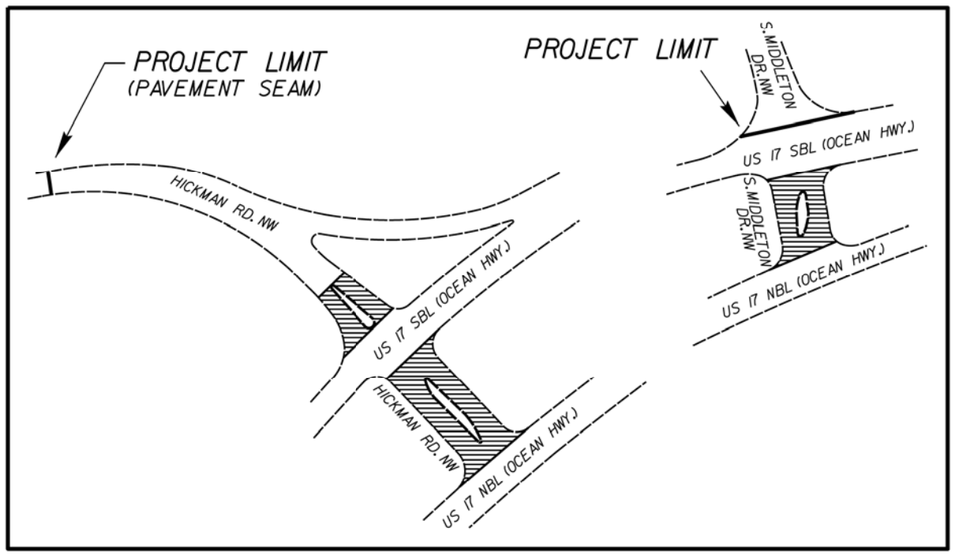
US 17 PROJECT LIMITS & MILLING DETAILS

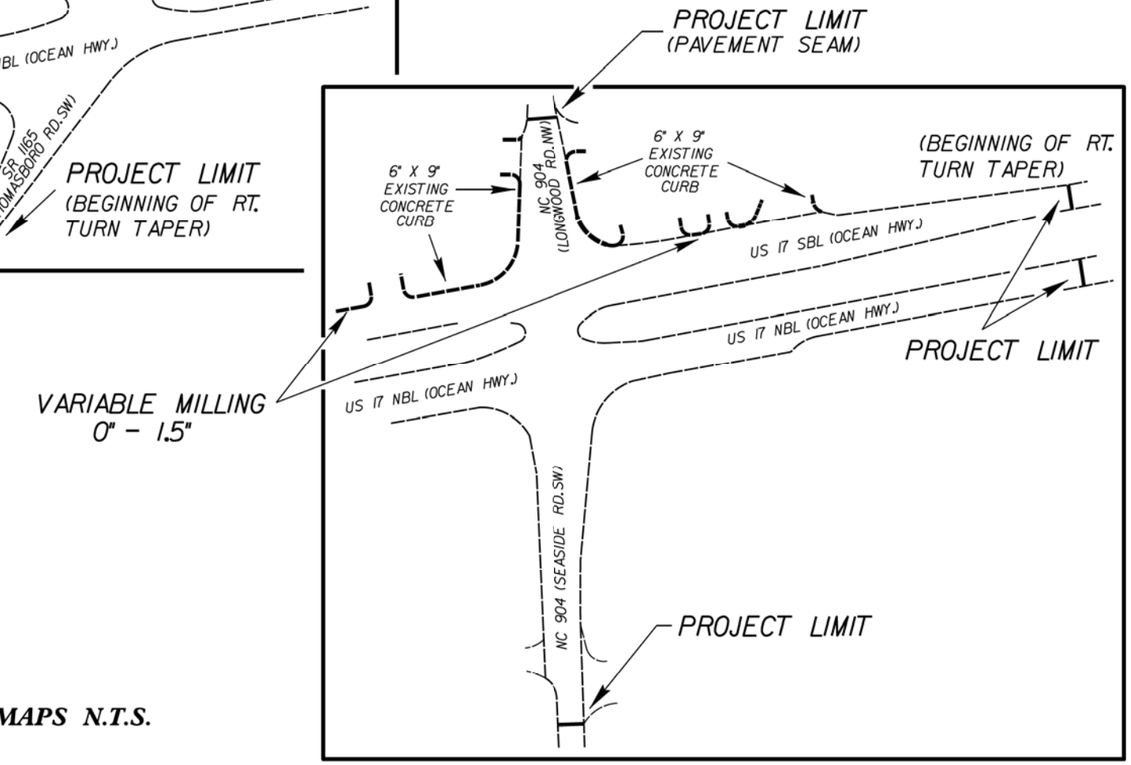












MAPS N.T.S.

REVISIONS

8/17/99

20-AUG-2015 18:55
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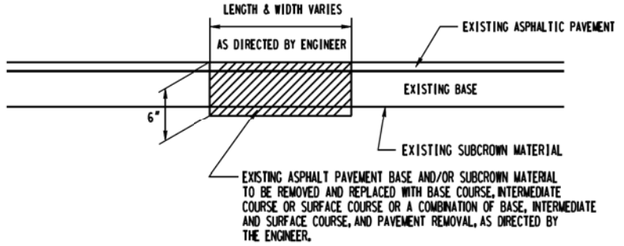
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101,Etc.	6

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



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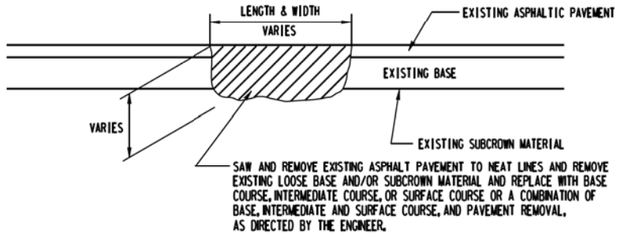

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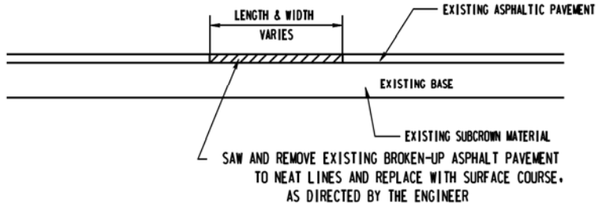

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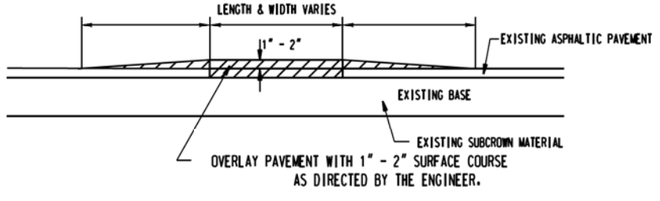

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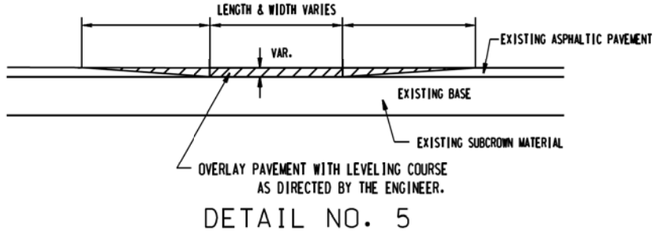

DETAIL NO. 5

REVISIONS

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

ENGLISH DETAIL DRAWING FOR

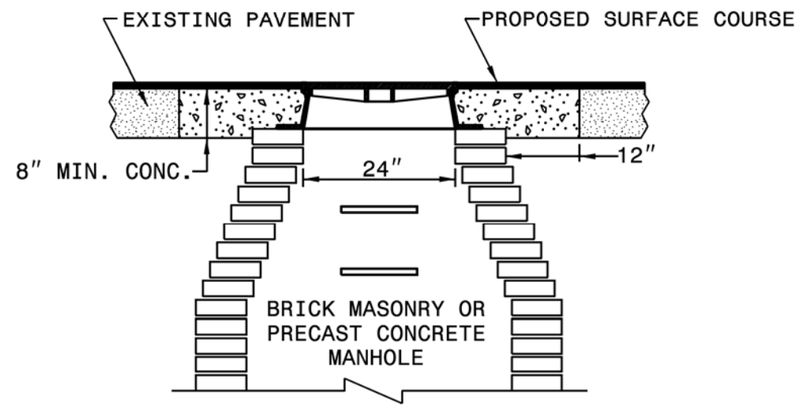
MANHOLE AND VALVE BOX ADJUSTMENTS

SHEET 1 OF 1

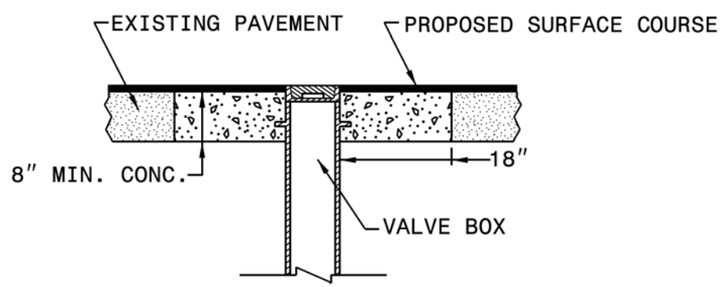
840D55

GENERAL NOTES:

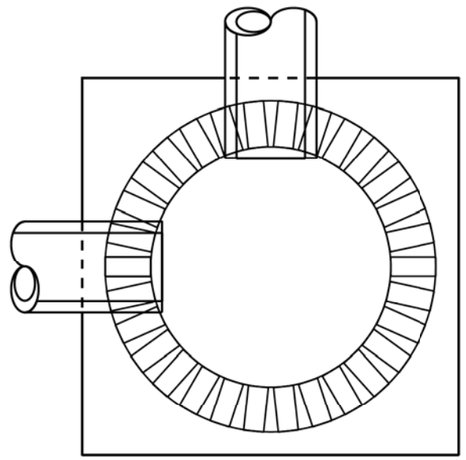
1. USE RAPID SET GROUT, MORTAR, OR CONCRETE THAT WILL TAKE FULL SET AND BECOME LOAD BEARING WITHIN SIXTY MINUTES OF PLACEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI.
2. REMOVE ALL FAULTY EXISTING BRICKWORK AND REPLACE WITH NEW BRICK MASONRY.
3. SHEER CUT EXCAVATION FOR THE ADJUSTMENT ON ALL SIDES.
4. FILL AREA BELOW 8″ DEPTH WITH 78M OR NO. 57 CLEAN STONE.
5. MIX MORTAR TO NCDOT SPECIFICATIONS.
6. MORTAR JOINTS ½″ +/- ⅛″



MANHOLE CONCRETE ENCASEMENT



VALVE BOX CONCRETE ENCASEMENT



ELEVATION VIEW

PLACE BRICK ACCORDING TO ELEVATION VIEW

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

REVISIONS

8/17/99

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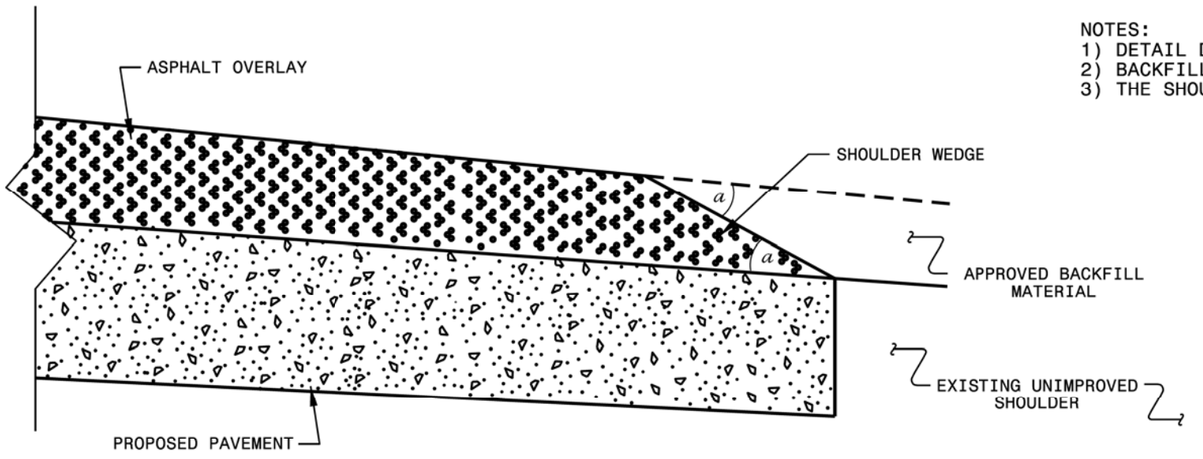
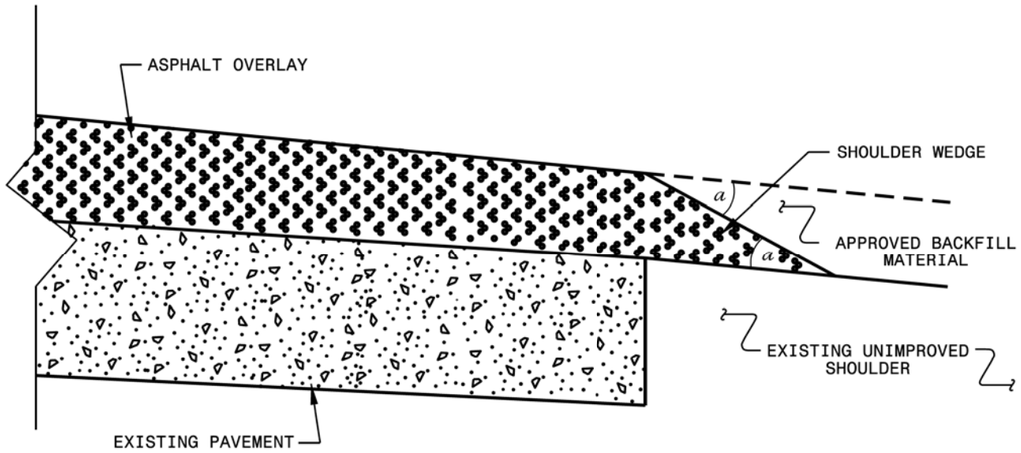
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	8

NOTES:
1) DETAIL DOES NOT APPLY TO OGAFC AND ULTRA-THIN BONDED WEARING COURSE.
2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



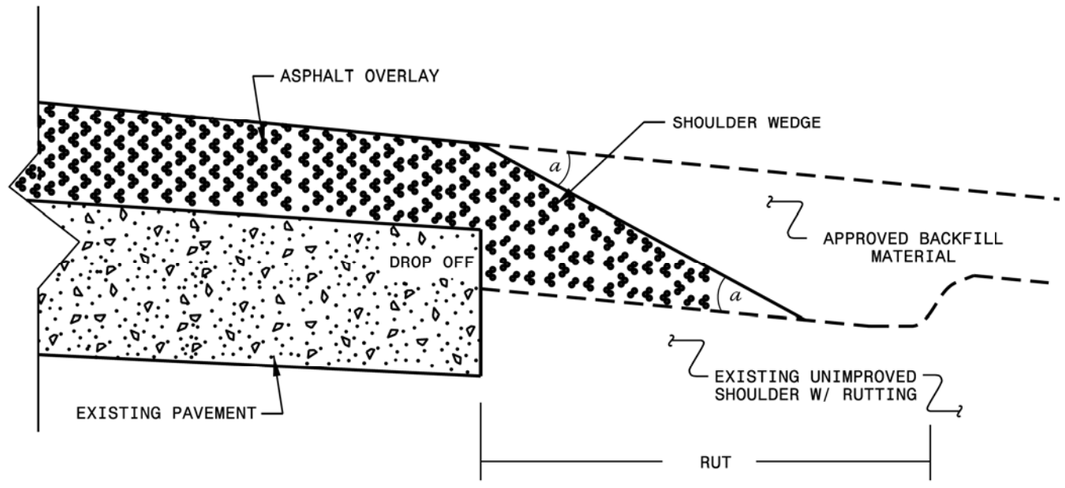
SHOULDER WEDGE DETAIL

(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:	10/16/12
CHECKED BY:		DATE:	
FILE SPEC.:	s:usr/details/stand/shoulderwedgedetail.dgn		

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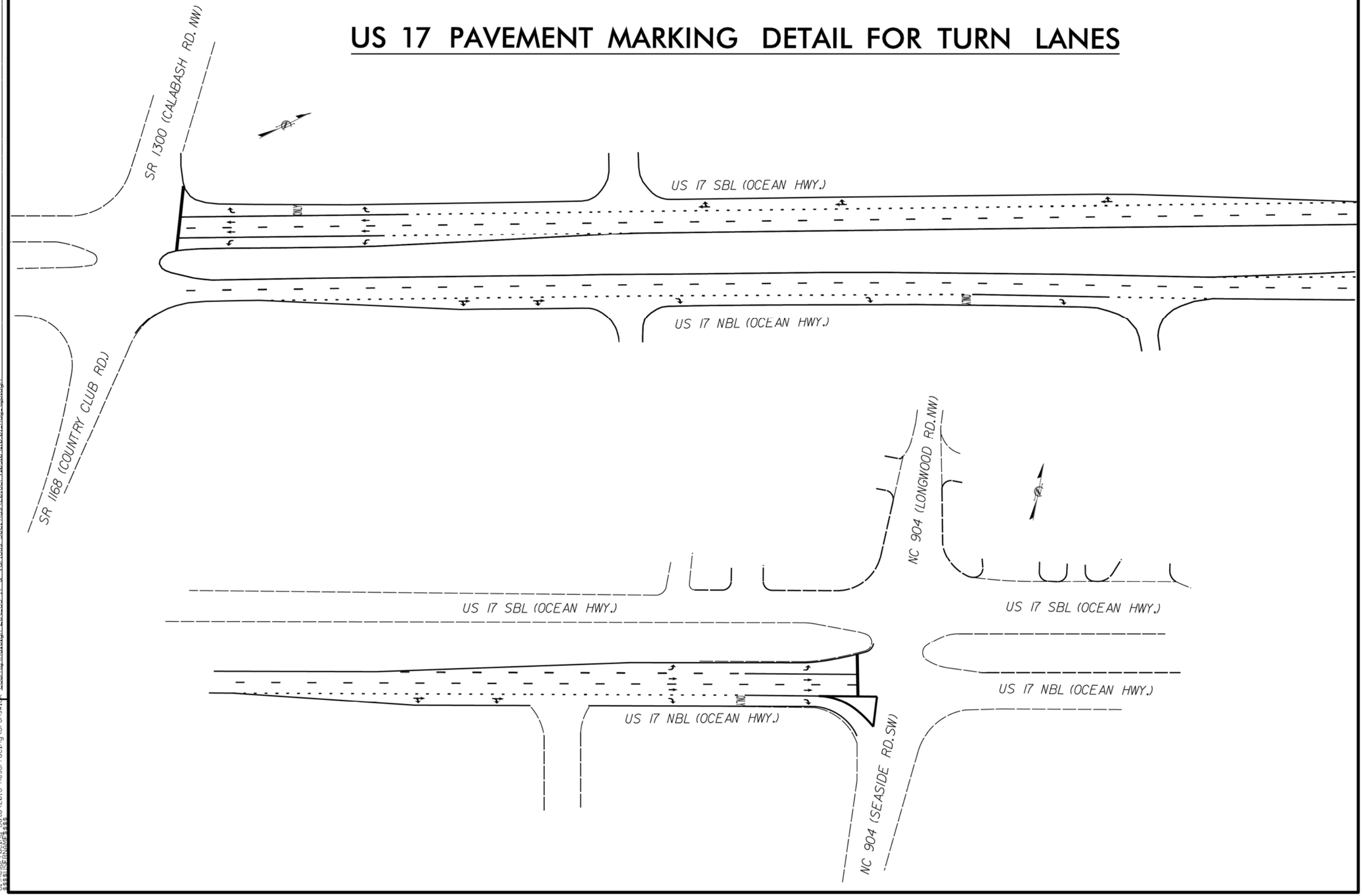
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	9

US 17 PAVEMENT MARKING DETAIL FOR TURN LANES



REVISIONS

8/17/99

20-AUG-2015 18:53
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TIP NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	10

APPROVED: RWK
DATE: 3/8/12

SEAL

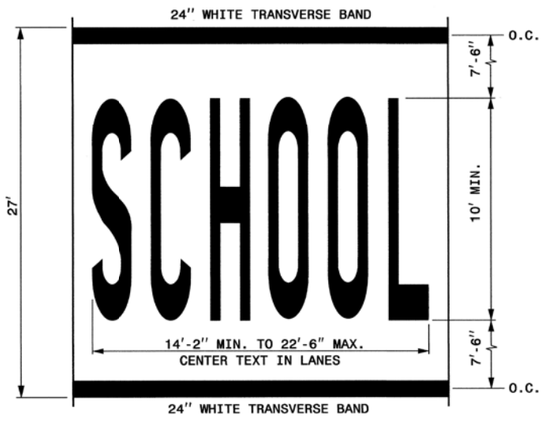
NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

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

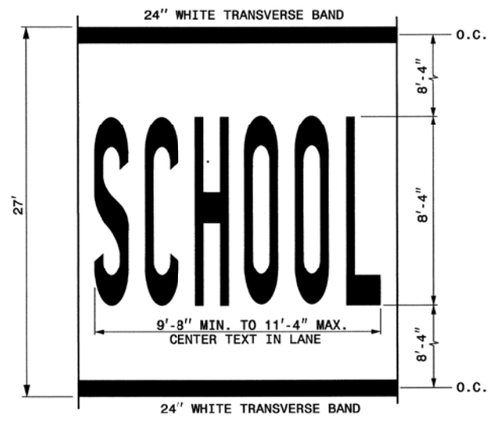
MULTI-LANE WIDTH "SCHOOL"



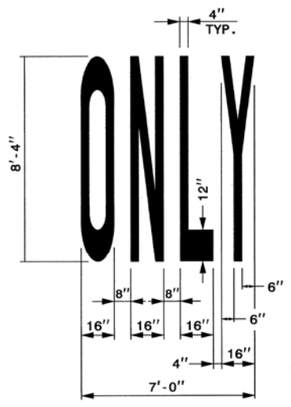
LETTER HEIGHT = 10' MIN.
LETTER WIDTH = 20"
SPACING = 10" MIN./30" MAX. (USE EQUAL SPACING BETWEEN LETTERS)

NOTE: THE TWO-LANE PAVEMENT MARKING DIMENSIONS OF "SCHOOL" SHOWN IN PART 7 OF THE MUTCD MAY ALSO BE USED.

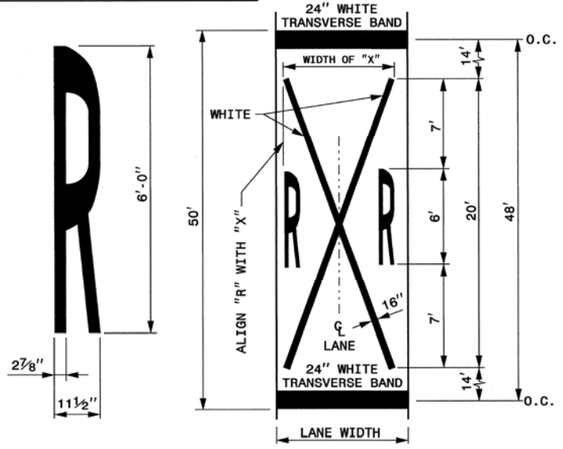
SINGLE LANE WIDTH "SCHOOL"



LETTER HEIGHT = 8'-4"
LETTER WIDTH = 16"
SPACING = 4" MIN./8" MAX. (USE EQUAL SPACING BETWEEN LETTERS)



RAILROAD RXR SYMBOL



LANE WIDTH (FEET)	WIDTH OF "X" (FEET)
8'≤W≤9'	7'
9'<W≤12'	8'
W>12'	10'

GENERAL NOTES:

1- 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.

2- PAVEMENT MARKING IN 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.

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

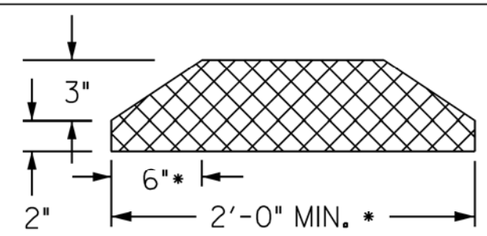
REVISED PAVEMENT MARKING ROADWAY STANDARD DRAWING

08-MAR-2012 12:18
S:\SDU\Standards Group\PMP\2012 Standard Drawings\Standard Dwgs 8-17-11\Revised\2050803_Revised 9-14-11_Sealed.dgn
dstrokes AT TE24745

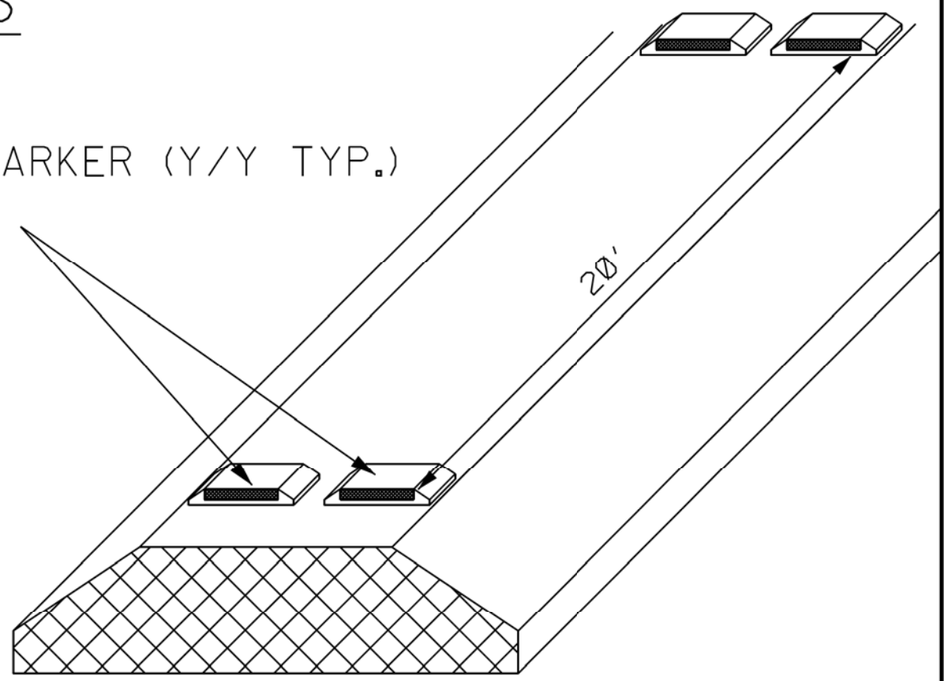
PAVEMENT MARKING DETAIL

PAVEMENT MARKER DETAIL FOR CONCRETE ISLANDS

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



*DIMENSIONS FOR ISLANDS LESS THAN 4'-0"



MONOLITHIC CONCRETE ISLAND

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

REVISIONS

8/17/99

11-FEB-2015 11:45
O:\Resurfacing Data\2015 Resurfacing\Pender County\Plan Sheets\3CR.20711.173_PM Detail.dgn
mkimmel AT 03CA0274450

PROJECT NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	12

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	INC. STONE BASE TONS	BORROW EXCAV. CY	SHOULDER RECONST. SMI	1 1/2" MILLING SY	0" - 1.5" MILLING SY	INC. MILLING SY	SURFACE COURSE, S9.5B TONS	LEVELING COURSE, S9.5B TONS	SURFACE COURSE, S9.5C TONS	SURFACE COURSE, SF9.5A TONS	SURFACE COURSE, S4.75A TON	ASPHALT BINDER FOR PLANT MIX TON	ASPHALT SURFACE TREATMENT, MATCOAT, #67 STONE SY	EMULSION FOR ASPHALT SURFACE TREATMENT GAL	PATCHING EXISTING PAVEMENT (FULL DEPTH) TON	PATCHING EXISTING PAVEMENT (MILL) TON	LEVELING COURSE, S4.75A TON	REMOVE & REPLACE 6" X 9" CONCRETE CURB LF
2016CPT.03.09.10101	Brunswick	1	US 17 NBL (OCEAN HWY.)	SC STATE LINE TO NC 904 (LONGWOOD RD. NW/ SEASIDE RD. SW (MP 0.00 - MP 7.1)	1	2 - 3	MD	NO	NO	7.10	28 - 40	32	976	14.20	743	50	1,000			16,922			998			100	1,650		
TOTAL FOR MAP NO. 1										**7.10**		**32**	**976**	**14.20**	**743**	**50**	**1,000**			**16,922**			**998**			**100**	**1,650**		
2016CPT.03.09.10101	Brunswick	2	US 17 SBL (OCEAN HWY.)	FROM NC 904 (LONGWOOD RD.NW/SEASIDE RD.SW) TO SC STATE LINE (MP 40.15 - 47.25)	1	2 - 3	MD	NO	NO	7.10	28 - 40	55	976	14.20	393	450	1,000			16,051			947			100	2,050		100
TOTAL FOR MAP NO. 2										**7.10**		**55**	**976**	**14.20**	**393**	**450**	**1,000**			**16,051**			**947**			**100**	**2,050**		**100**
TOTAL FOR PROJ NO. 2016CPT.03.09.10101										**14.20**		**87**	**1,952**	**28.40**	**1,136**	**500**	**2,000**			**32,973**			**1,945**			**200**	**3,700**		**100**
2016CPT.03.09.20101	Brunswick	3	SR 1139 (SEASHORE RD SW)	FROM SR 1137 (BOONES NECK RD.SW) TO NC 130	2	2	2WU	NO	NO	2.88	18	90	264	5.75			20	2,572	50				158			5	700		
TOTAL FOR MAP NO. 3										**2.88**		**90**	**264**	**5.75**			**20**	**2,572**	**50**				**158**			**5**	**700**		
2016CPT.03.09.20101	Brunswick	4	SR 1184 (OCEAN ISLE BEACH RD S.W.)	FROM US 17 TO 0.08 MI. NORTH OF NC 179 (NO WORK MP 1.6-1.98) MP 0.00 - MP 3.46	3	2	2WU	NO	NO	3.46	24 - 39	17	264	5.76			300	6,879	1,000				478			10	275		
TOTAL FOR MAP NO. 4										**3.46**		**17**	**264**	**5.76**			**300**	**6,879**	**1,000**				**478**			**10**	**275**		
2016CPT.03.09.20101	Brunswick	5	SR 1241 (MILLIKEN AVE S.W.)	FROM SR 1240 (CAISON AVE. SW) TO END OF MAINTENANCE	2	2	2WU	NO	NO	0.68	20	23	63	1.37			50	729					49				100		
TOTAL FOR MAP NO. 5										**0.68**		**23**	**63**	**1.37**			**50**	**729**					**49**				**100**		
2016CPT.03.09.20101	Brunswick	6	SR 1242 (BEACH DR.SW)	FROM NC 179 TO END OF MAINTENANCE	4	2	2WU	NO	NO	0.09	18	5	8	0.18			50				109		7	1,349	540		75		
TOTAL FOR MAP NO. 6										**0.09**		**5**	**8**	**0.18**			**50**				**109**		**7**	**1,349**	**540**		**75**		
2016CPT.03.09.20101	Brunswick	7	SR 1940 (CLAREMONT DR.)	FROM BEGIN MAINTENANCE TO SR 1941 (STRATFORD PLACE)	5	2	2WU	NO	NO	0.20	18	1										92	6				45		
TOTAL FOR MAP NO. 7										**0.20**		**1**										**92**	**6**				**45**		
2016CPT.03.09.20101	Brunswick	8	SR 1941 (STRATFORD PL.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1943 (COUNTRY CLUB DR,)	5	2	2WU	NO	NO	0.24	18	1										110	7				50		
TOTAL FOR MAP NO. 8										**0.24**		**1**										**110**	**7**				**50**		
2016CPT.03.09.20101	Brunswick	9	SR 1942 (BRUCE LN)	FROM SR 1944 (DEEP BRANCH RD.) TO SR 1941 (STRATFORD PL.)	5	2	2WU	NO	NO	0.08	18											37	2				30		
TOTAL FOR MAP NO. 9										**0.08**												**37**	**2**				**30**		
2016CPT.03.09.20101	Brunswick	10	SR 1944 (DEEP BRANCH RD.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1942 (BRUCE LN.)	5	2	2WU	NO	NO	0.16	18	1										73	5				10		
TOTAL FOR MAP NO. 10										**0.16**		**1**										**73**	**5**				**10**		
2016CPT.03.09.20101	Brunswick	11	SR 1813 (PINEWOOD DR S.W.)	FROM 0.08 MI. SOUTH OF SR 1812 (AZALEA DR.) TO SR 1950 (CAMELIA DR.) (MP 0.08 - MP 0.14)	6	2	2WU	NO	NO	0.06	18	2	6	0.12							48		3				5		
TOTAL FOR MAP NO. 11										**0.06**		**2**	**6**	**0.12**							**48**		**3**				**5**		
2016CPT.03.09.20101	Brunswick	12	SR 1943 (COUNTRY CLUB DR.)	FROM SR 1941 (STRATFORD PL.) TO SR 1949 (BRIERWOOD RD.)	5	2	2WU	NO	NO	0.72	18	3										330	22			5	225	5	
TOTAL FOR MAP NO. 12										**0.72**		**3**										**330**	**22**			**5**	**225**	**5**	
2016CPT.03.09.20101	Brunswick	13	SR 1949 (BRIERWOOD RD.)	FROM SR 1943 (COUNTRY CLUB DR.) TO SHALLOTTE CITY LIMITS	5	2	2WU	NO	NO	0.28	18											129	9				5	5	
TOTAL FOR MAP NO. 13										**0.28**												**129**	**9**				**5**	**5**	
2016CPT.03.09.20101	Brunswick	14	SR 1950 (CAMELIA DRIVE)	FROM SR 1813 (PINEWOOD DR. SW) TO SR 1141 (KIRBY RD. SW)	6	2	2WU	NO	NO	0.18	18		17	0.36			10				145		10				5		
TOTAL FOR MAP NO. 14										**0.18**			**17**	**0.36**			**10**				**145**		**10**				**5**		
2016CPT.03.09.20101	Brunswick	15	SR 1951 (DRIFTWOOD ACRES DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	NO	NO	0.06	18		6	0.12							48		3				5		
TOTAL FOR MAP NO. 15										**0.06**			**6**	**0.12**							**48**		**3**				**5**		
2016CPT.03.09.20101	Brunswick	16	SR 1952 (MYRTLEWOOD DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	NO	NO	0.06	18		11	0.12							48		3				5		
TOTAL FOR MAP NO. 16										**0.06**			**11**	**0.12**							**48**		**3**				**5**		
TOTAL FOR PROJ NO. 2016CPT.03.09.20101										**9.15**		**143**	**639**	**13.78**			**430**	**10,180**	**1,050**		**398**	**771**	**762**	**1,349**	**540**	**20**	**1,535**	**10**	
GRAND TOTAL										**23.35**		**230**	**2,591**	**42.18**	**1,136**	**500**	**2,430**	**10,180**	**1,050**	**32,973**	**398**	**771**	**2,707**	**1,349**	**540**	**220**	**5,235**	**10**	**100**

PROJECT NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	13

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	ADJ. OF METER OR VALVE BOX EA	GR ANCHOR UNITS,TYPE CAT-1 EA	GR ANCHOR UNITS, TYPE 350 EA	REMOVE & REPLACE EXISTING GR LF	TEMP. SILT FENCE LF	STONE FOR EC CLASS B TON	SEDIMENT CONTROL STONE TON	TEMP. MULCHING ACR	SEED FOR TEMP. SEEDING LBS	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	UNPAVED TRENCHING (1CONDUIT, 2 INCH) LF	JUNCTION BOX (STANDARD SIZE) EA	INDUCTIVE LOOP SAWCUT LF	LEAD-IN CABLE (14-2) LF
2016CPT.03.09.10101	Brunswick	1	US 17 NBL (OCEAN HWY.)	SC STATE LINE TO NC 904 (LONGWOOD RD. NW/ SEASIDE RD. SW (MP 0.00 - MP 7.1)	1	2 - 3	MD	NO	NO	7.10	28 - 40		2	2	1,125.00	710	178	178	7.10		50	355	110		355	1.78	170	2	2,630	1,700
TOTAL FOR MAP NO. 1										**7.10**			**2**	**2**	**1,125.00**	**710**	**178**	**178**	**7.10**		**50**	**355**	**110**		**355**	**1.78**	**170**	**2**	**2,630**	**1,700**
2016CPT.03.09.10101	Brunswick	2	US 17 SBL (OCEAN HWY.)	FROM NC 904 (LONGWOOD RD.NW/SEASIDE RD.SW) TO SC STATE LINE (MP 40.15 - 47.25)	1	2 - 3	MD	NO	NO	7.10	28 - 40		3	3	700.00	710	178	178	7.10		50	355	110		355	1.78	150	2	3,210	1,630
TOTAL FOR MAP NO. 2										**7.10**			**3**	**3**	**700.00**	**710**	**178**	**178**	**7.10**		**50**	**355**	**110**		**355**	**1.78**	**150**	**2**	**3,210**	**1,630**
TOTAL FOR PROJ NO. 2016CPT.03.09.10101										**14.20**			**5**	**5**	**1,825.00**	**1,420**	**356**	**356**	**14.20**		**100**	**710**	**220**		**710**	**3.56**	**320**	**4**	**5,840**	**3,330**
2016CPT.03.09.20101	Brunswick	3	SR 1139 (SEASHORE RD SW)	FROM SR 1137 (BOONES NECK RD.SW) TO NC 130	2	2	2WU	NO	NO	2.88	18					288	72	72	2.88	55	20	144	50	2.09	144	0.72				
TOTAL FOR MAP NO. 3										**2.88**						**288**	**72**	**72**	**2.88**	**55**	**20**	**144**	**50**	**2.09**	**144**	**0.72**				
2016CPT.03.09.20101	Brunswick	4	SR 1184 (OCEAN ISLE BEACH RD S.W.)	FROM US 17 TO 0.08 MI. NORTH OF NC 179 (NO WORK MP 1.6-1.98) MP 0.00 - MP 3.46	3	2	2WU	NO	NO	3.46	24 - 39	2		4	100.00	288	72	72	2.88	55	20	144	50	2.09	144	0.72				
TOTAL FOR MAP NO. 4										**3.46**		**2**		**4**	**100.00**	**288**	**72**	**72**	**2.88**	**55**	**20**	**144**	**50**	**2.09**	**144**	**0.72**				
2016CPT.03.09.20101	Brunswick	5	SR 1241 (MILLIKEN AVE S.W.)	FROM SR 1240 (CAISON AVE. SW) TO END OF MAINTENANCE	2	2	2WU	NO	NO	0.68	20					68	17	17	0.68	20	10	34	20	0.50	34	0.17				
TOTAL FOR MAP NO. 5										**0.68**						**68**	**17**	**17**	**0.68**	**20**	**10**	**34**	**20**	**0.50**	**34**	**0.17**				
2016CPT.03.09.20101	Brunswick	6	SR 1242 (BEACH DR.SW)	FROM NC 179 TO END OF MAINTENANCE	4	2	2WU	NO	NO	0.09	18					9	2	2	0.09	10	10	5	10		5	0.02				
TOTAL FOR MAP NO. 6										**0.09**						**9**	**2**	**2**	**0.09**	**10**	**10**	**5**	**10**		**5**	**0.02**				
2016CPT.03.09.20101	Brunswick	7	SR 1940 (CLAREMONT DR.)	FROM BEGIN MAINTENANCE TO SR 1941 (STRATFORD PLACE)	5	2	2WU	NO	NO	0.20	18																			
TOTAL FOR MAP NO. 7										**0.20**																				
2016CPT.03.09.20101	Brunswick	8	SR 1941 (STRATFORD PL.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1943 (COUNTRY CLUB DR,)	5	2	2WU	NO	NO	0.24	18																			
TOTAL FOR MAP NO. 8										**0.24**																				
2016CPT.03.09.20101	Brunswick	9	SR 1942 (BRUCE LN)	FROM SR 1944 (DEEP BRANCH RD.) TO SR 1941 (STRATFORD PL.)	5	2	2WU	NO	NO	0.08	18																			
TOTAL FOR MAP NO. 9										**0.08**																				
2016CPT.03.09.20101	Brunswick	10	SR 1944 (DEEP BRANCH RD.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1942 (BRUCE LN.)	5	2	2WU	NO	NO	0.16	18																			
TOTAL FOR MAP NO. 10										**0.16**																				
2016CPT.03.09.20101	Brunswick	11	SR 1813 (PINEWOOD DR S.W.)	FROM 0.08 MI. SOUTH OF SR 1812 (AZALEA DR.) TO SR 1950 (CAMELIA DR.) (MP 0.08 - MP 0.14)	6	2	2WU	NO	NO	0.06	18					6	2	2	0.06	10	10	3	10	0.04	3	0.02				
TOTAL FOR MAP NO. 11										**0.06**						**6**	**2**	**2**	**0.06**	**10**	**10**	**3**	**10**	**0.04**	**3**	**0.02**				
2016CPT.03.09.20101	Brunswick	12	SR 1943 (COUNTRY CLUB DR.)	FROM SR 1941 (STRATFORD PL.) TO SR 1949 (BRIERWOOD RD.)	5	2	2WU	NO	NO	0.72	18	1																		
TOTAL FOR MAP NO. 12										**0.72**		**1**																		
2016CPT.03.09.20101	Brunswick	13	SR 1949 (BRIERWOOD RD.)	FROM SR 1943 (COUNTRY CLUB DR.) TO SHALLOTTE CITY LIMITS	5	2	2WU	NO	NO	0.28	18																			
TOTAL FOR MAP NO. 13										**0.28**																				
2016CPT.03.09.20101	Brunswick	14	SR 1950 (CAMELIA DRIVE)	FROM SR 1813 (PINEWOOD DR. SW) TO SR 1141 (KIRBY RD. SW)	6	2	2WU	NO	NO	0.18	18					18	5	5	0.18	25	10	9	10	0.13	9	0.05				
TOTAL FOR MAP NO. 14										**0.18**						**18**	**5**	**5**	**0.18**	**25**	**10**	**9**	**10**	**0.13**	**9**	**0.05**				
2016CPT.03.09.20101	Brunswick	15	SR 1951 (DRIFTWOOD ACRES DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	NO	NO	0.06	18					6	2	2	0.06	10	10	3	10	0.04	3	0.02				
TOTAL FOR MAP NO. 15										**0.06**						**6**	**2**	**2**	**0.06**	**10**	**10**	**3**	**10**	**0.04**	**3**	**0.02**				
2016CPT.03.09.20101	Brunswick	16	SR 1952 (MYRTLEWOOD DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	NO	NO	0.06	18					6	2	2	0.06	15	10	3	10	0.04	3	0.02				
TOTAL FOR MAP NO. 16										**0.06**						**6**	**2**	**2**	**0.06**	**15**	**10**	**3**	**10**	**0.04**	**3**	**0.02**				
TOTAL FOR PROJ NO. 2016CPT.03.09.20101										**9.15**		**3**		**4**	**100.00**	**689**	**174**	**174**	**6.89**	**200**	**100**	**345**	**170**	**4.94**	**345**	**1.72**				
GRAND TOTAL										**23.35**		**3**	**5**	**9**	**1,925.00**	**2,109**	**530**	**530**	**21.09**	**200**	**200**	**1,055**	**390**	**4.93**	**1,055**	**5.30**	**320**	**4**	**5,840**	**3,330**

PROJECT NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	14

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	4413000000-E WORK ZONE ADVANCE/GENERAL WARNING SIGNING SF	4457000000-N TEMPORARY TRAFFIC CONTROL LS	4510000000-N LAW ENFORCEMENT HR	4685000000-E 4" X 90 M WHITE THERMO LF	4686000000-E 4" X 120 M YELLOW THERMO LF	4688000000-E 6" X 90 M WHITE THERMO LF	4688000000-E 6" X 90 M YELLOW THERMO LF	4690000000-E 6" X 120 M WHITE THERMO LF	4690000000-E 6" X 120 M YELLOW THERMO LF	4700000000-E 12" X 90 M WHITE THERMO LF	4700000000-E 12" X 90 M YELLOW THERMO LF	4710000000-E 24" X 120 M WHITE THERMO LF	4721000000-E THERMO MSG ONLY 120 M EA	4725000000-E THERMO LT ARROW 90 M EA	4725000000-E THERMO RT ARROW 90 M EA	4725000000-E THERMO STR ARROW 90 M EA	4725000000-E THERMO STR & LT ARROW 90 M EA	4725000000-E THERMO STR & RT ARROW 90 M EA
2016CPT.03.09.10101	Brunswick	1	US 17 NBL (OCEAN HWY.)	SC STATE LINE TO NC 904 (LONGWOOD RD. NW/ SEASIDE RD. SW (MP 0.00 - MP 7.1)	1	2 - 3	MD	7.10	28 - 40	256	0.29	120.00			37,135	36,735	12,050	9	130	178	168	8	48	16	94	3	4
TOTAL FOR MAP NO. 1								**7.10**		**256**	**0.29**	**120.00**			**37,135**	**36,735**	**12,050**	**9**	**130**	**178**	**168**	**8**	**48**	**16**	**94**	**3**	**4**
2016CPT.03.09.10101	Brunswick	2	US 17 SBL (OCEAN HWY.)	FROM NC 904 (LONGWOOD RD.NW/SEASIDE RD.SW) TO SC STATE LINE (MP 40.15 - 47.25)	1	2 - 3	MD	7.10	28 - 40	256	0.29	120.00			37,148	36,510	12,250		130		188	4	49	19	98	3	4
TOTAL FOR MAP NO. 2								**7.10**		**256**	**0.29**	**120**			**37,148**	**36,510**	**12,250**		**130**		**188**	**4**	**49**	**19**	**98**	**3**	**4**
TOTAL FOR PROJ NO. 2016CPT.03.09.10101								**14.20**		**512**	**0.58**	**240**			**74,283**	**73,245**	**24,300**	**9**	**260**	**178**	**356**	**12**	**97**	**35**	**192**	**6**	**8**
															147,528		**24,309**		**438**				**338**				
2016CPT.03.09.20101	Brunswick	3	SR 1139 (SEASHORE RD SW)	FROM SR 1137 (BOONES NECK RD.SW) TO NC 130	2	2	2WU	2.88	18	336	0.12		30,946	18,982													
TOTAL FOR MAP NO. 3								**2.88**		**336**	**0.12**		**30,946**	**18,982**													
2016CPT.03.09.20101	Brunswick	4	SR 1184 (OCEAN ISLE BEACH RD S.W.)	FROM US 17 TO 0.08 MI. NORTH OF NC 179 (NO WORK MP 1.6-1.98) MP 0.00 - MP 3.46	3	2	2WU	3.46	24 - 39	368	0.15		38,058	23,344						320			7	7			
TOTAL FOR MAP NO. 4								**3.46**		**368**	**0.15**		**38,058**	**23,344**						**320**			**7**	**7**			
2016CPT.03.09.20101	Brunswick	5	SR 1241 (MILLIKEN AVE S.W.)	FROM SR 1240 (CAISON AVE. SW) TO END OF MAINTENANCE	2	2	2WU	0.68	20	208	0.02																
TOTAL FOR MAP NO. 5								**0.68**		**208**	**0.02**																
2016CPT.03.09.20101	Brunswick	6	SR 1242 (BEACH DR.SW)	FROM NC 179 TO END OF MAINTENANCE	4	2	2WU	0.09	18	32	0.01		968	594													
TOTAL FOR MAP NO. 6								**0.09**		**32**	**0.01**		**968**	**594**													
2016CPT.03.09.20101	Brunswick	7	SR 1940 (CLAREMONT DR.)	FROM BEGIN MAINTENANCE TO SR 1941 (STRATFORD PLACE)	5	2	2WU	0.20	18	32	0.01																
TOTAL FOR MAP NO. 7								**0.20**		**32**	**0.01**																
2016CPT.03.09.20101	Brunswick	8	SR 1941 (STRATFORD PL.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1943 (COUNTRY CLUB DR,)	5	2	2WU	0.24	18	32	0.01																
TOTAL FOR MAP NO. 8								**0.24**		**32**	**0.01**																
2016CPT.03.09.20101	Brunswick	9	SR 1942 (BRUCE LN)	FROM SR 1944 (DEEP BRANCH RD.) TO SR 1941 (STRATFORD PL.)	5	2	2WU	0.08	18	32	0.01																
TOTAL FOR MAP NO. 9								**0.08**		**32**	**0.01**																
2016CPT.03.09.20101	Brunswick	10	SR 1944 (DEEP BRANCH RD.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1942 (BRUCE LN.)	5	2	2WU	0.16	18	32	0.01																
TOTAL FOR MAP NO. 10								**0.16**		**32**	**0.01**																
2016CPT.03.09.20101	Brunswick	11	SR 1813 (PINEWOOD DR S.W.)	FROM 0.08 MI. SOUTH OF SR 1812 (AZALEA DR.) TO SR 1950 (CAMELIA DR.) (MP 0.08 - MP 0.14)	6	2	2WU	0.06	18	32	0.01																
TOTAL FOR MAP NO. 11								**0.06**		**32**	**0.01**																
2016CPT.03.09.20101	Brunswick	12	SR 1943 (COUNTRY CLUB DR.)	FROM SR 1941 (STRATFORD PL.) TO SR 1949 (BRIERWOOD RD.)	5	2	2WU	0.72	18	80	0.03																
TOTAL FOR MAP NO. 12								**0.72**		**80**	**0.03**																
2016CPT.03.09.20101	Brunswick	13	SR 1949 (BRIERWOOD RD.)	FROM SR 1943 (COUNTRY CLUB DR.) TO SHALLOTTE CITY LIMITS	5	2	2WU	0.28	18	160	0.01																
TOTAL FOR MAP NO. 13								**0.28**		**160**	**0.01**																
2016CPT.03.09.20101	Brunswick	14	SR 1950 (CAMELIA DRIVE)	FROM SR 1813 (PINEWOOD DR. SW) TO SR 1141 (KIRBY RD. SW)	6	2	2WU	0.18	18	32	0.01																
TOTAL FOR MAP NO. 14								**0.18**		**32**	**0.01**																
2016CPT.03.09.20101	Brunswick	15	SR 1951 (DRIFTWOOD ACRES DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	0.06	18	32	0.01																
TOTAL FOR MAP NO. 15								**0.06**		**32**	**0.01**																
2016CPT.03.09.20101	Brunswick	16	SR 1952 (MYRTLEWOOD DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	0.06	18	144	0.01																
TOTAL FOR MAP NO. 16								**0.06**		**144**	**0.01**																
TOTAL FOR PROJ NO. 2016CPT.03.09.20101								**9.15**		**1,552**	**0.42**		**69,972**	**42,920**						**320**			**7**	**7**			
																			320				**14**				
GRAND TOTAL								**23.35**		**2,064**	**1**	**240**	**69,972**	**42,920**	**74,283**	**73,245**	**24,300**	**9**	**260**	**498**	**356**	**12**	**104**	**42**	**192**	**6**	**8**
															147,528		**24,309**		**758**				**352**				

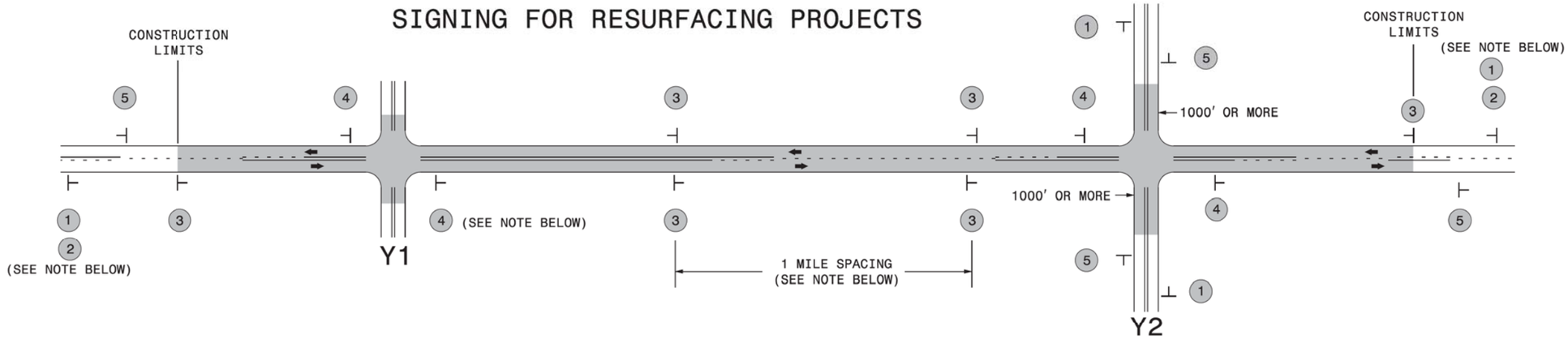
PROJECT NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	15

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	4815000000-E 6" WHITE PAINT LF	4835000000-E 24" WHITE PAINT LF	4840000000-N PAINT MSG ONLY EA	4845000000-N PAINT STR ARROW EA	4845000000-N PAINT LT ARROW EA	4845000000-N PAINT RT ARROW EA	4845000000-N PAINT STR & LT ARROW EA	4845000000-N PAINT STR & RT ARROW EA	4850000000-E REMOVAL OF PAVEMENT MARKING LINES (4") LF	4870000000-E REMOVAL OF PAVEMENT MARKING LINES (24") LF	4900000000-N YELLOW & YELLOW MARKERS EA	4900000000-N CRYSTAL & RED MARKERS EA	4905000000-N SNOW PLOWABLE MARKERS (C/R) EA	4905000000-N SNOW PLOWABLE MARKERS (Y/Y) EA
2016CPT.03.09.10101	Brunswick	1	US 17 NBL (OCEAN HWY.)	SC STATE LINE TO NC 904 (LONGWOOD RD. NW/ SEASIDE RD. SW (MP 0.00 - MP 7.1)	1	2 - 3	MD	7.10	28 - 40	2,812	168	8	12	7	11	3	4	200	200	47	2	762	5
TOTAL FOR MAP NO. 1								**7.10**		**2,812**	**168**	**8**	**12**	**7**	**11**	**3**	**4**	**200**	**200**	**47**	**2**	**762**	**5**
2016CPT.03.09.10101	Brunswick	2	US 17 SBL (OCEAN HWY.)	FROM NC 904 (LONGWOOD RD.NW/SEASIDE RD.SW) TO SC STATE LINE (MP 40.15 - 47.25)	1	2 - 3	MD	7.10	28 - 40	2,812	188	4	14	7	11	3	4	200	200	62	4	763	8
TOTAL FOR MAP NO. 2								**7.10**		**2,812**	**188**	**4**	**14**	**7**	**11**	**3**	**4**	**200**	**200**	**62**	**4**	**763**	**8**
TOTAL FOR PROJ NO. 2016CPT.03.09.10101								**14.20**		**5,624**	**356**	**12**	**26**	**14**	**22**	**6**	**8**	**400**	**400**	**109**	**6**	**1,525**	**13**
													76							**115**		**1,538**	
2016CPT.03.09.20101	Brunswick	3	SR 1139 (SEASHORE RD SW)	FROM SR 1137 (BOONES NECK RD.SW) TO NC 130	2	2	2WU	2.88	18											193			
TOTAL FOR MAP NO. 3								**2.88**												**193**			
2016CPT.03.09.20101	Brunswick	4	SR 1184 (OCEAN ISLE BEACH RD S.W.)	FROM US 17 TO 0.08 MI. NORTH OF NC 179 (NO WORK MP 1.6-1.98) MP 0.00 - MP 3.46	3	2	2WU	3.46	24 - 39											252			
TOTAL FOR MAP NO. 4								**3.46**												**252**			
2016CPT.03.09.20101	Brunswick	5	SR 1241 (MILLIKEN AVE S.W.)	FROM SR 1240 (CAISON AVE. SW) TO END OF MAINTENANCE	2	2	2WU	0.68	20														
TOTAL FOR MAP NO. 5								**0.68**															
2016CPT.03.09.20101	Brunswick	6	SR 1242 (BEACH DR.SW)	FROM NC 179 TO END OF MAINTENANCE	4	2	2WU	0.09	18											12			
TOTAL FOR MAP NO. 6								**0.09**												**12**			
2016CPT.03.09.20101	Brunswick	7	SR 1940 (CLAREMONT DR.)	FROM BEGIN MAINTENANCE TO SR 1941 (STRATFORD PLACE)	5	2	2WU	0.20	18														
TOTAL FOR MAP NO. 7								**0.20**															
2016CPT.03.09.20101	Brunswick	8	SR 1941 (STRATFORD PL.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1943 (COUNTRY CLUB DR,)	5	2	2WU	0.24	18														
TOTAL FOR MAP NO. 8								**0.24**															
2016CPT.03.09.20101	Brunswick	9	SR 1942 (BRUCE LN)	FROM SR 1944 (DEEP BRANCH RD.) TO SR 1941 (STRATFORD PL.)	5	2	2WU	0.08	18														
TOTAL FOR MAP NO. 9								**0.08**															
2016CPT.03.09.20101	Brunswick	10	SR 1944 (DEEP BRANCH RD.)	FROM SR 1940 (CLAREMONT DR.) TO SR 1942 (BRUCE LN.)	5	2	2WU	0.16	18														
TOTAL FOR MAP NO. 10								**0.16**															
2016CPT.03.09.20101	Brunswick	11	SR 1813 (PINEWOOD DR S.W.)	FROM 0.08 MI. SOUTH OF SR 1812 (AZALEA DR.) TO SR 1950 (CAMELIA DR.) (MP 0.08 - MP 0.14)	6	2	2WU	0.06	18														
TOTAL FOR MAP NO. 11								**0.06**															
2016CPT.03.09.20101	Brunswick	12	SR 1943 (COUNTRY CLUB DR.)	FROM SR 1941 (STRATFORD PL.) TO SR 1949 (BRIERWOOD RD.)	5	2	2WU	0.72	18														
TOTAL FOR MAP NO. 12								**0.72**															
2016CPT.03.09.20101	Brunswick	13	SR 1949 (BRIERWOOD RD.)	FROM SR 1943 (COUNTRY CLUB DR.) TO SHALLOTTE CITY LIMITS	5	2	2WU	0.28	18														
TOTAL FOR MAP NO. 13								**0.28**															
2016CPT.03.09.20101	Brunswick	14	SR 1950 (CAMELIA DRIVE)	FROM SR 1813 (PINEWOOD DR. SW) TO SR 1141 (KIRBY RD. SW)	6	2	2WU	0.18	18														
TOTAL FOR MAP NO. 14								**0.18**															
2016CPT.03.09.20101	Brunswick	15	SR 1951 (DRIFTWOOD ACRES DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	0.06	18														
TOTAL FOR MAP NO. 15								**0.06**															
2016CPT.03.09.20101	Brunswick	16	SR 1952 (MYRTLEWOOD DRIVE)	FROM SR 1950 (CAMELIA DR.) TO END OF MAINTENANCE	6	2	2WU	0.06	18														
TOTAL FOR MAP NO. 16								**0.06**															
TOTAL FOR PROJ NO. 2016CPT.03.09.20101								**9.15**												**457**			
																					457		
GRAND TOTAL								**23.35**		**5,624**	**356**	**12**	**26**	**14**	**22**	**6**	**8**	**400**	**400**	**566**	**6**	**1,525**	**13**
													76							**572**		**1,538**	

PROJ. REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	TMP-1

SIGNING FOR RESURFACING PROJECTS



LEGEND
- ⊢ STATIONARY SIGN
- ⬅ DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION

1 — ROAD WORK AHEAD W20-1 48″ X 48″

PLACE 1000′ PRIOR TO BEGINNING OF CONSTRUCTION LIMITS.
ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000′ ALONG -Y- LINE.

2 — NEXT XX MILES W7-3aP 24″ X 18″

#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)

3 — LOW/SOFT SHOULDER SP 13107 48″ X 48″

PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET ½ MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.

4 — ROAD UNDER CONST SP 13106 48″ X 48″

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.

5 — END ROAD WORK G20-2 A 48″ X 24″

PLACE 500′ FOLLOWING THE END OF CONSTRUCTION LIMITS.

-Y- LINE SIGNING

NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:

1) LESS THAN 1000′ OF RESURFACING ALONG -Y- LINE
2) SUBDIVISION ROADS
3) DEAD END ROADS

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.

ROAD WORK AHEAD W20-1 48″ X 48″ — PLACED 500′ IN ADVANCE OF FLAGGER.

W20-7 A 48″ X 48″ — PLACED 250′ IN ADVANCE OF FLAGGER.

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

RESURFACING ADVANCE WARNING SIGNS FOR RURAL AND SUBURBAN 2 LANE ROADWAYS

3/9/2015
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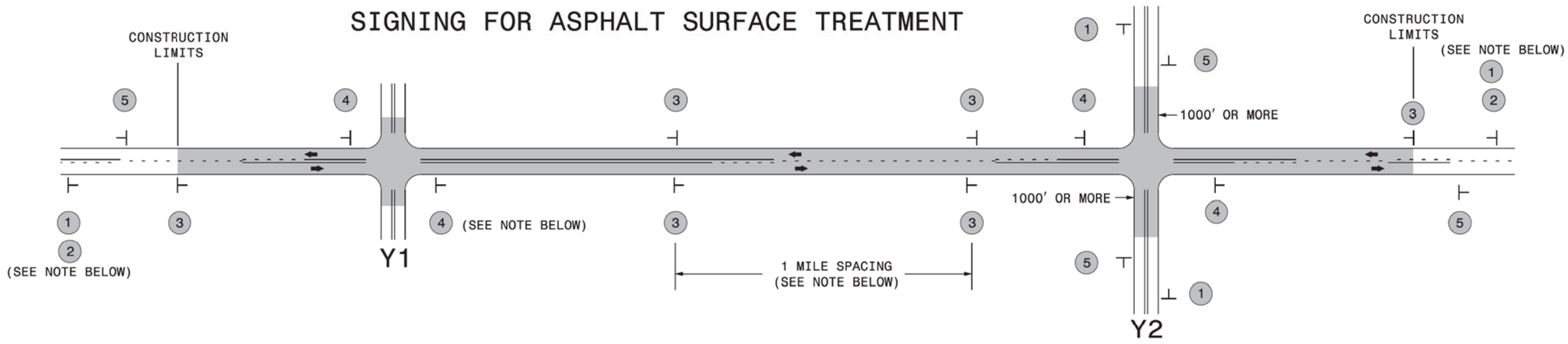
User:rmgarrett

PROJ. REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	TMP-2

SIGNING FOR ASPHALT SURFACE TREATMENT



LEGEND
- ⊢ STATIONARY SIGN
- ⬅ DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION

1 — ROAD WORK AHEAD, W20-1, 48″ X 48″

PLACE 1000′ PRIOR TO BEGINNING OF CONSTRUCTION LIMITS.
ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000′ ALONG -Y- LINE.

2 — NEXT XX MILES, W7-3aP, 24″ X 18″

#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)

3 — LOOSE GRAVEL, W8-7, 48″ X 48″; UNMARKED PAVEMENT, SP, 48″ X 48″

ALTERNATE THE FOLLOWING TWO SIGNS:

STARTING WITH "LOOSE GRAVEL" (W8-7) FOLLOWED BY "UNMARKED PAVEMENT".

PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET ½ MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.

4 — ROAD UNDER CONST, SP 13106, 48″ X 48″

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.

5 — END ROAD WORK, G20-2 A, 48″ X 24″

PLACE 500′ FOLLOWING THE END OF CONSTRUCTION LIMITS.

-Y- LINE SIGNING

NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:

1) LESS THAN 1000′ OF RESURFACING ALONG -Y- LINE
2) SUBDIVISION ROADS
3) DEAD END ROADS

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.

ROAD WORK AHEAD, W20-1, 48″ X 48″ — PLACED 500′ IN ADVANCE OF FLAGGER.

W20-7 A, 48″ X 48″ — PLACED 250′ IN ADVANCE OF FLAGGER.

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

ADVANCE WARNING SIGNS
FOR
ASPHALT SURFACE TREATMENTS
2 LANE ROADWAYS

12/22/2014
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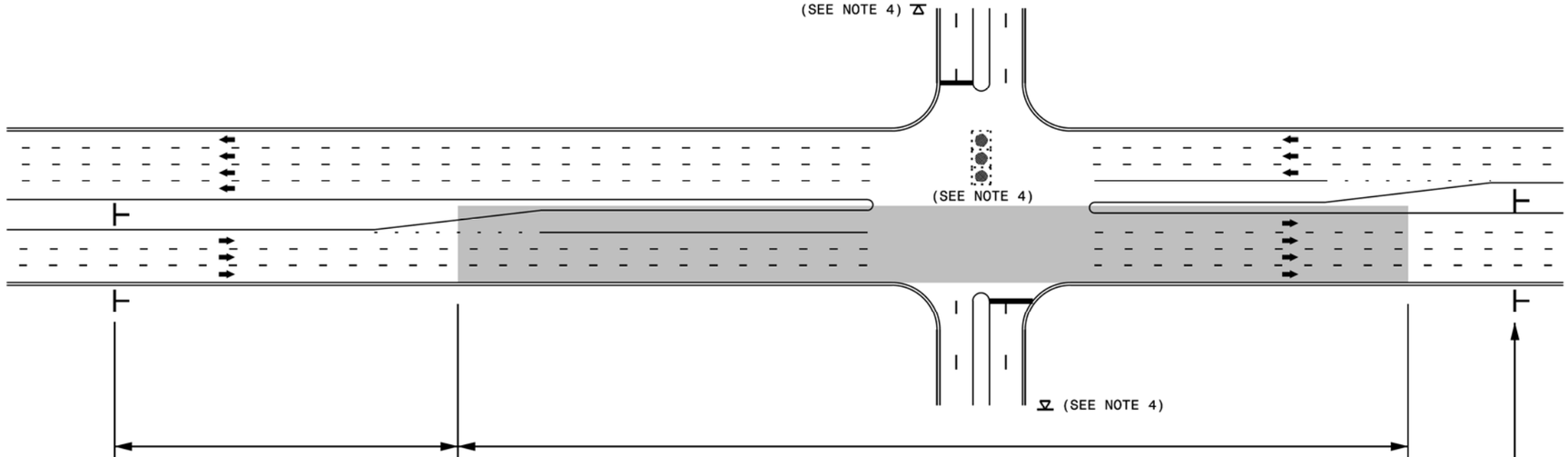
User:rmgarrett

PROJ. REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	TMP-3

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

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

RESURFACING ADVANCE WARNING SIGNS FOR URBAN / SUBURBAN FACILITIES

2/24/2014
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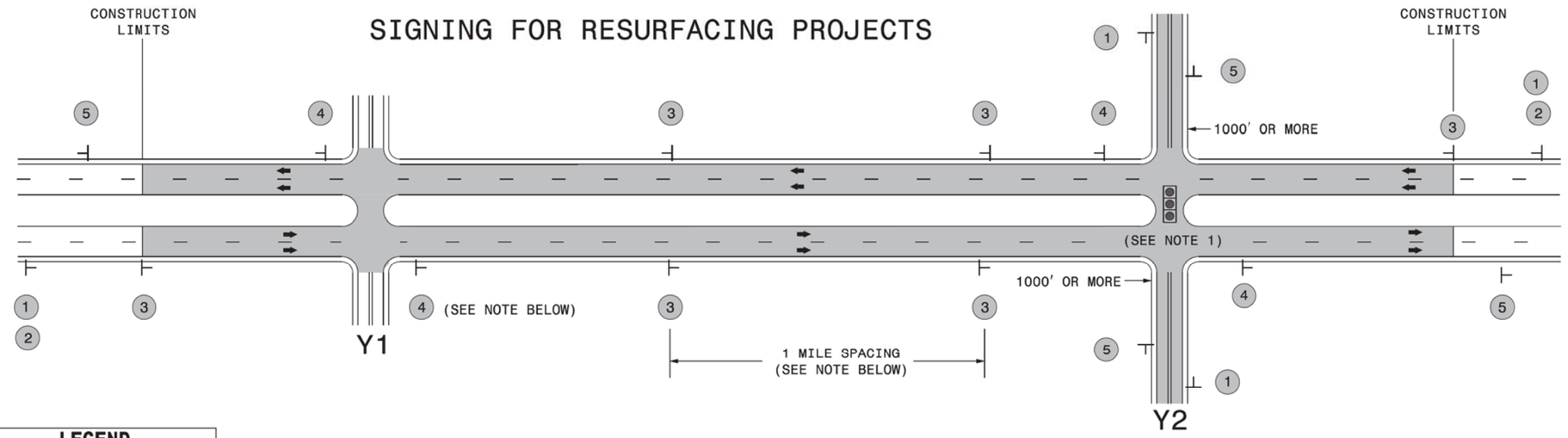
PROJ. REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	TMP-4

SIGNING FOR RESURFACING PROJECTS



LEGEND
- ⊢ STATIONARY SIGN
- ⬅ DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION

1 — PLACE 1000′ PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000′ ALONG -Y- LINE.

2 — #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)

ROAD WORK AHEAD — W20-1 48″ X 48″
NEXT XX MILES — W7-3aP 24″ X 18″

3 — PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET ½ MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.

LOW/SOFT SHOULDER — SP 13107 48″ X 48″

4 — 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.

ROAD UNDER CONST — SP 13106 48″ X 48″

5 — PLACE 500′ FOLLOWING THE END OF CONSTRUCTION LIMITS.

END ROAD WORK — G20-2 A 48″ X 24″

-Y- LINE SIGNING

NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:

1) LESS THAN 1000′ OF RESURFACING ALONG -Y- LINE
2) SUBDIVISION ROADS
3) DEAD END ROADS

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.

ROAD WORK AHEAD — W20-1 48″ X 48″ — PLACED 500′ IN ADVANCE OF FLAGGER.

W20-7 A 48″ X 48″ — PLACED 250′ IN ADVANCE OF FLAGGER.

NOTES:

1) 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.

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

RESURFACING ADVANCE WARNING SIGNS FOR RURAL AND SUBURBAN MULTI-LANE ROADWAYS W/ SHOULDER SECTIONS

3/23/2015
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User:rmgarrett

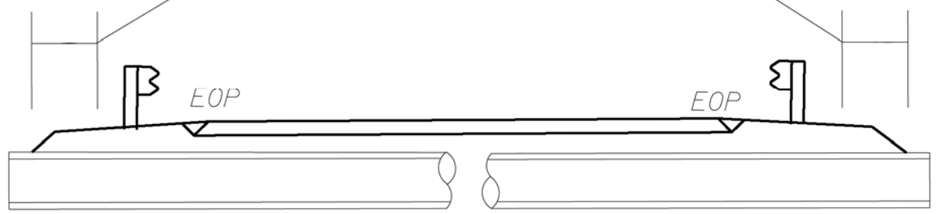
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101,Etc.	EC-1

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

< 5' – 10' Undisturbed buffer add BMP



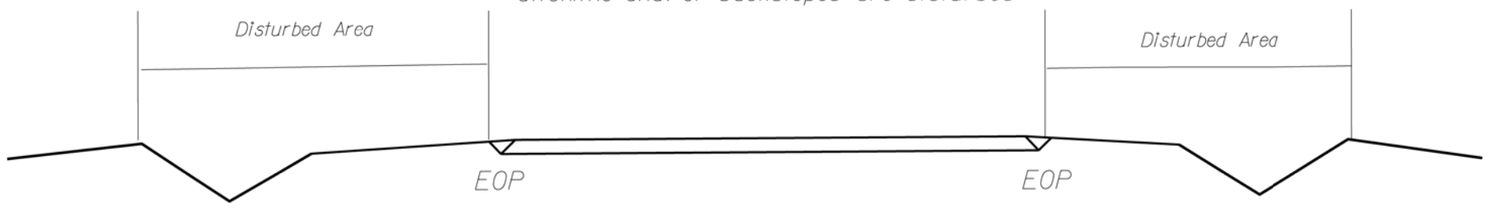
Pipe/Culvert

< 5' – 10' Undisturbed buffer from jurisdictional feature add BMP

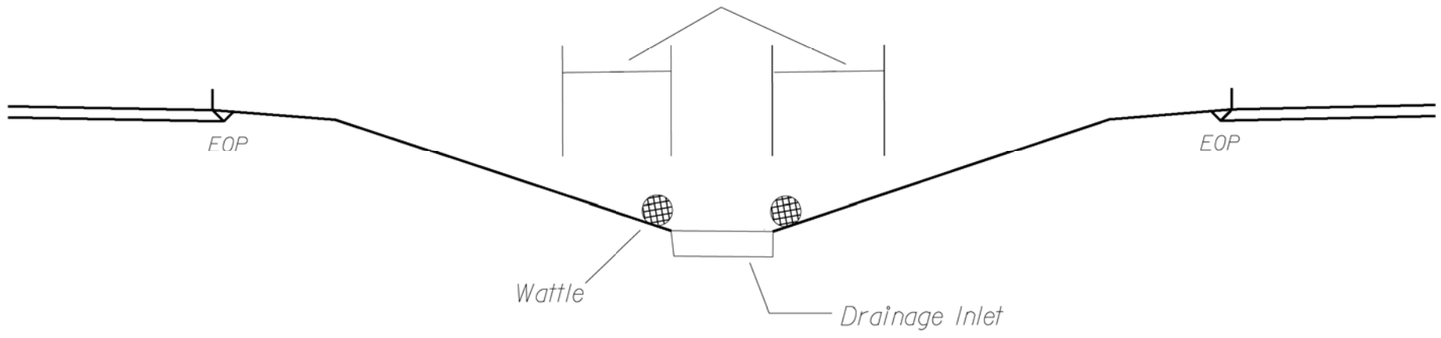
< 5' – 10' Undisturbed buffer from ditchline, add BMP

Jurisdictional Feature

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



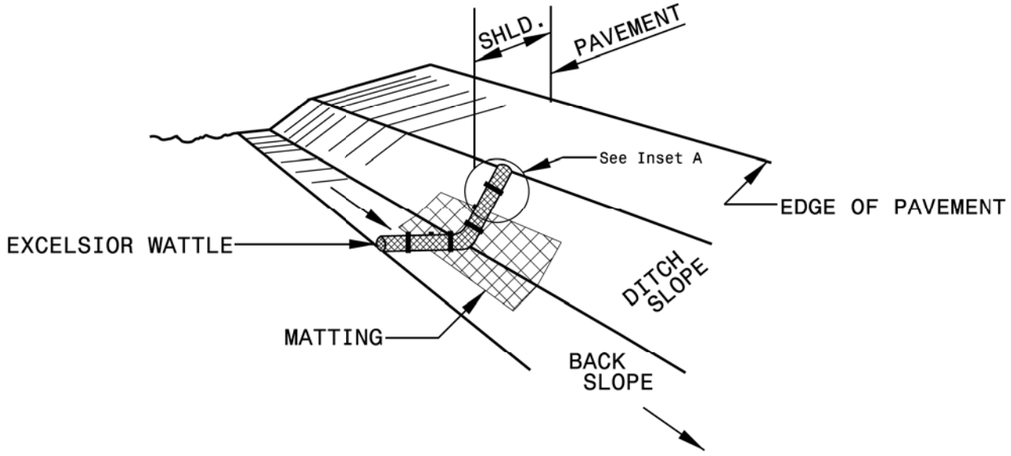
< 5' – 10' Undisturbed buffer from inlet, add wattle



NOT TO SCALE

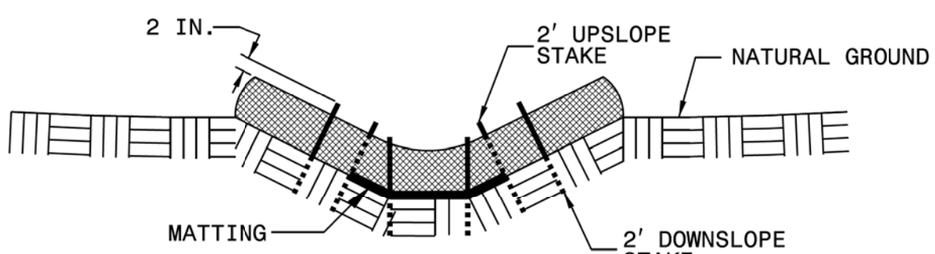
PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101,Etc.	EC-2

WATTLE DETAIL



ISOMETRIC VIEW

CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

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.

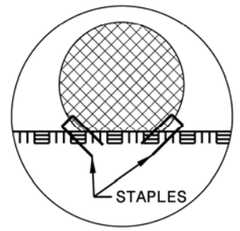
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

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

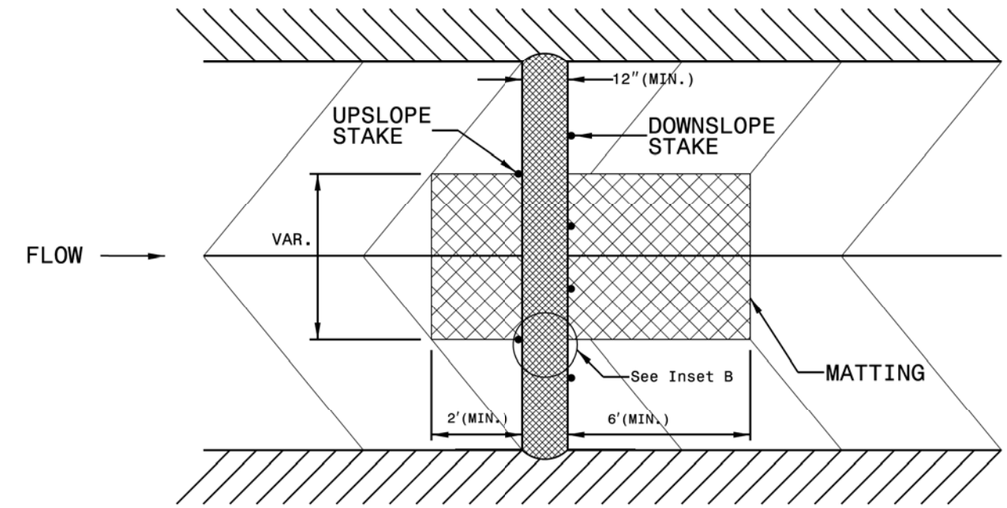
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

INSET A



INSET B



TOP VIEW

11-FEB-2015 11:41
D:\Resurfacing Data\2015 Resurfacing\Pender County\Plan Sheets\3CR.20711.173_ EC RESURF_2015.dgn

PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101,Etc.	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

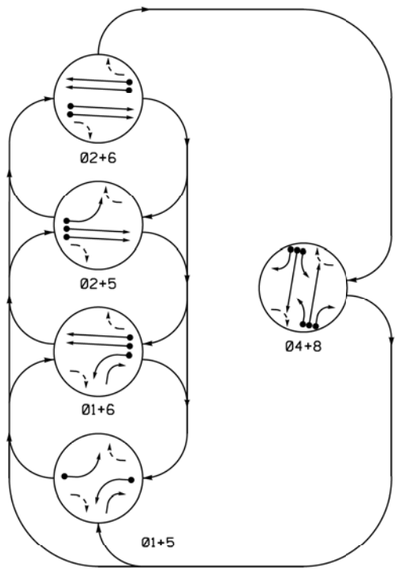
SITE DESCRIPTION	*STABILIZATION TIME*	*TIMEFRAME EXCEPTIONS*
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14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

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig. 1

2016CPT.03.09.10101, ETC.

5 Phase
Fully Actuated
Isolated

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

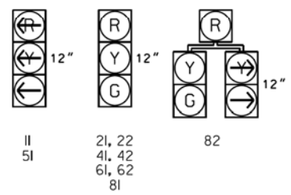
SIGNAL FACE	PHASE 0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 4 + 8	FLASH
11	~~←~~	~~←~~	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	Y
23,24, 25,26	ON	ON	OFF	OFF	ON	OFF
41, 42	R	R	R	R	G	R
51	~~←~~	~~R~~	~~←~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	Y
63,64,65,66	ON	OFF	ON	OFF	ON	OFF
81	R	R	R	R	G	R
82	R/~~R~~	R/~~R~~	R	R	G	R

TABLE OF OPERATION

SIGNAL FACE	INTERVAL 1	INTERVAL 2
23, 25	ON	OFF
24, 26	OFF	ON
63,65	ON	OFF
64,66	OFF	ON

SIGNAL FACE I.D.

All Heads L.E.D.



LONG VEHICLE OVERSPEED DETECTION SYSTEM
LOOP & DETECTION INSTALLATION CHART

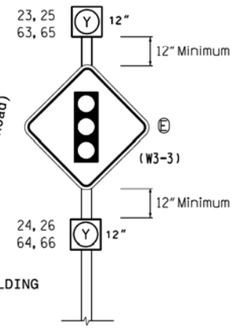
INDUCTIVE LOOPS: LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	DETECTOR UNITS: MODULE/SLOT/CONNECTOR	LANE NO.	HOME-RUN/CABLE/PAIR	CHANNEL	NEMA PHASE	TIMING: FEATURE	TIMING: TIME	PLACE CALL DURING PHASE	INHIBIT DELAY DURING GREEN†
LV1	6'X6'	4	1015'	X	-	① ZONE 1 DECODE	1	1	1	2*	NONE	- SEC.	ALL	NO
LV2	6'X6'	4	999'	X	-	① ZONE 1 DECODE	1	1	2	2*	NONE	- SEC.	ALL	NO
LV3	6'X6'	4	1015'	X	-	① ZONE 2 DECODE	2	2	1	2*	NONE	- SEC.	ALL	NO
LV4	6'X6'	4	999'	X	-	① ZONE 2 DECODE	2	2	2	2*	NONE	- SEC.	ALL	NO
LV5	6'X6'	4	1015'	X	-	② ZONE 1 DECODE	1	1	1	6*	NONE	- SEC.	ALL	NO
LV6	6'X6'	4	999'	X	-	② ZONE 1 DECODE	1	1	2	6*	NONE	- SEC.	ALL	NO
LV7	6'X6'	4	1015'	X	-	② ZONE 2 DECODE	2	2	1	6*	NONE	- SEC.	ALL	NO
LV8	6'X6'	4	999'	X	-	② ZONE 2 DECODE	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

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS: 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
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	-
2A	6X6	420	6	Y	2	Y	Y	-	-	-	-	-
2B	6X6	420	6	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	-	-	-	-	-
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
6A	6X6	420	6	Y	6	Y	Y	-	-	-	-	-
6B	6X6	420	6	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	3	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8C	6X40	0	2-4-2	Y	8	Y	Y	-	-	15	-	-

Figure 1

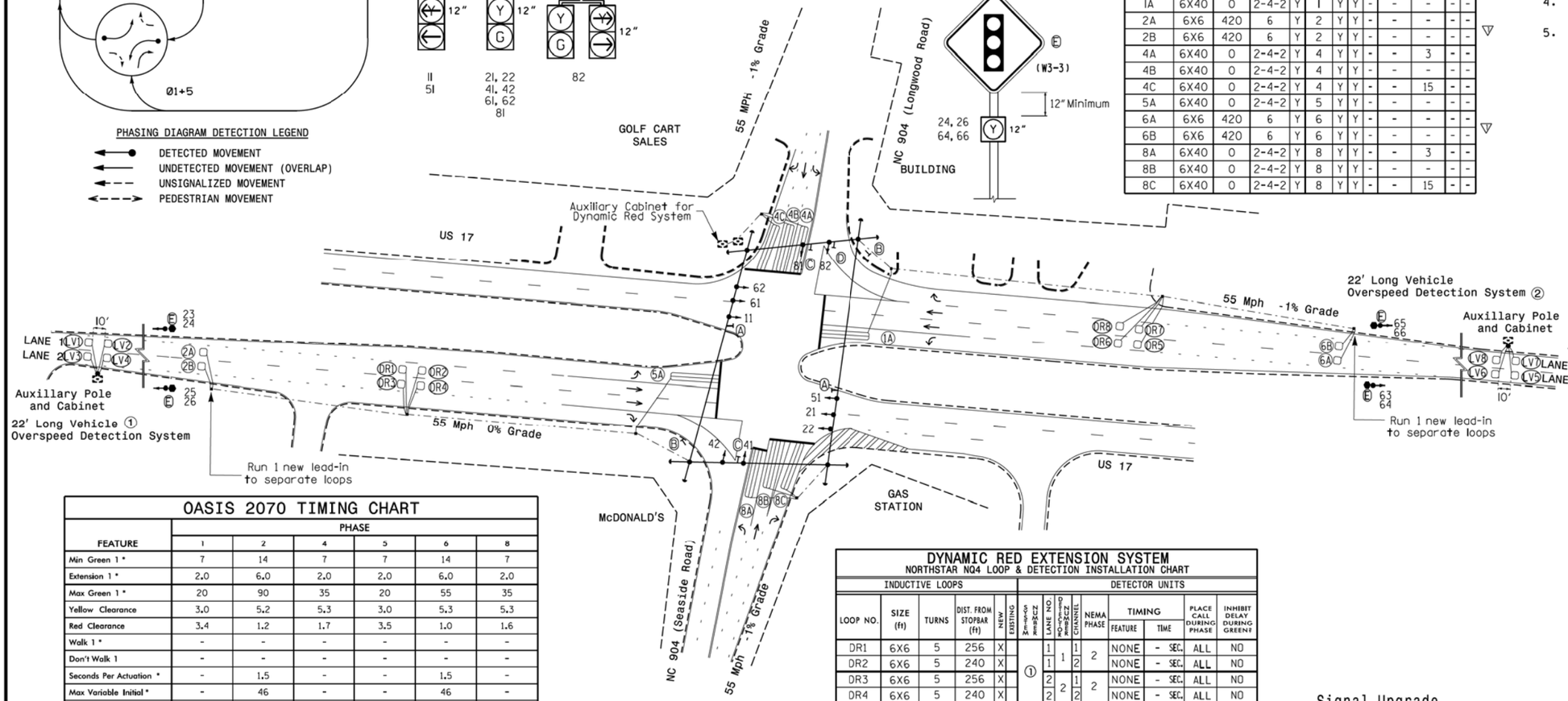


NOTES

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. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Activate flashers at the end of green for phase 2 and/or phase 6.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	N/A
	Directional Arrow	
	Signal Pedestal	
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)
(B)	"YIELD" Sign (R1-2)	(B)
(C)	Through Arrow "ONLY" Sign (R3-5A)	(C)
(D)	Right Arrow "ONLY" Sign (R3-5R)	(D)
(E)	Signal Ahead Sign (W3-3) (See Figure 1)	(E)



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	14	7	7	14	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	90	35	20	55	35
Yellow Clearance	3.0	5.2	5.3	3.0	5.3	5.3
Red Clearance	3.4	1.2	1.7	3.5	1.0	1.6
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	46	-	-	46	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.4	-	-	3.4	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

DYNAMIC RED EXTENSION SYSTEM
NORTHSTAR NQ4 LOOP & DETECTION INSTALLATION CHART

INDUCTIVE LOOPS: LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	DETECTOR UNITS: MODULE/SLOT/CONNECTOR	LANE NO.	HOME-RUN/CABLE/PAIR	CHANNEL	NEMA PHASE	TIMING: FEATURE	TIMING: TIME	PLACE CALL DURING PHASE	INHIBIT DELAY DURING GREEN†
DR1	6X6	5	256	X		①	1	1	1	2	NONE	- SEC.	ALL	NO
DR2	6X6	5	240	X		①	1	1	2	2	NONE	- SEC.	ALL	NO
DR3	6X6	5	256	X		①	2	2	1	2	NONE	- SEC.	ALL	NO
DR4	6X6	5	240	X		①	2	2	2	2	NONE	- SEC.	ALL	NO
DR5	6X6	4	256	X		②	1	1	1	6	NONE	- SEC.	ALL	NO
DR6	6X6	4	240	X		②	1	1	2	6	NONE	- SEC.	ALL	NO
DR7	6X6	4	256	X		②	2	2	1	6	NONE	- SEC.	ALL	NO
DR8	6X6	4	240	X		②	2	2	2	6	NONE	- SEC.	ALL	NO
SET SPEED (MPH)	50									2/6				
SET LENGTH (FT)	1									2/6				
ALARM TIME (SEC)	5*									2/6				

•If output is present during associated phase's red clear, place stop time on red clearance interval.

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023489 ENGINEER PAMELA L. ALEXANDER

DocuSigned by: P L Alexander 7/16/2015

DATE

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally Issued and sealed by Jason P.Galloway,PE-029904 on 12-06-2012 This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 03-0342

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 50 1"=50'

US 17
at
NC 904 (Longwood Road/ Seaside Road)

Division 3 Brunswick County Grissettown

PLAN DATE: December 2012 REVIEWED BY: JPG

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE
▽ Volume-density detection scheme and replace loops (kgp)	jka	7/16/2015

15-JUL-2015 09:53
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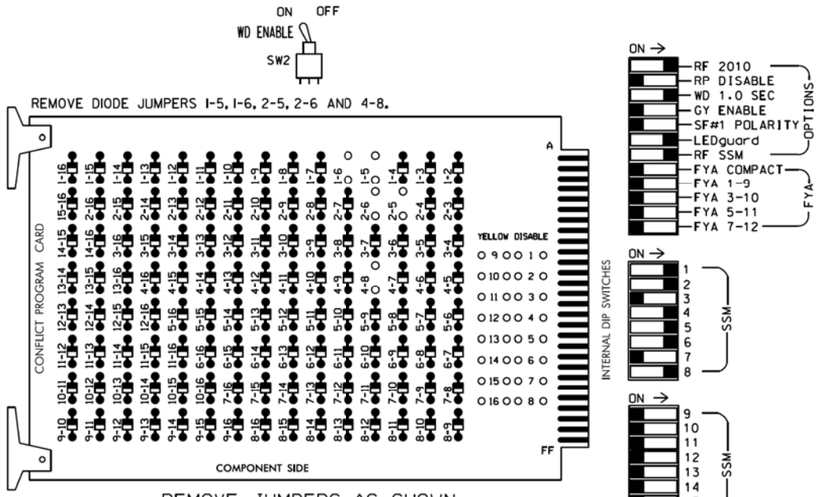
palexander

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 2

2016CPT.03.09.10101, Etc.

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. ▽ Program phases 2 and 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.....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,*S2P,S4,*S4P,S5,S6,*S6P,S8,*S8P
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

* USED FOR ADVANCE BEACON ONLY

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	82	21,22	**	NU	41,42	**	51	61,62	**	NU	81,82	**
RED			128			101			134			107	
YELLOW			129			102			135			108	
GREEN			130			103			136			109	
RED ARROW	125							131					
YELLOW ARROW	126	126						132					
GREEN ARROW	127	127						133					

NU = Not Used

** Special advance beacons will be wired to S2P-Y, S4P-Y, S6P-Y, and S8P-Y. See wiring and programming details on sheets 9 and 10 of this electrical detail.

▽ INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

!! CAUTION! BE SURE TO REMOVE SURGE ARRESTORS EXISTING ON INPUT PANEL TERMINALS TB7-9&10 AND TB7-11&12. THIS WILL EQUIP SLOT J9 FOR USE WITH THE AC ISOLATOR CARD AS SHOWN ABOVE.

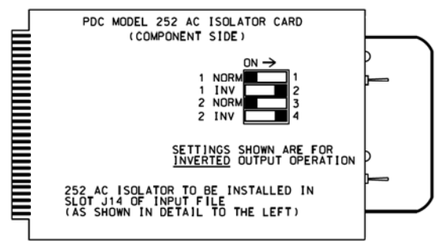
▽ INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
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
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			15

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

PHASE 2+6 HOLD (SLOT J14)AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL FOR LONG VEHICLE DETECTION

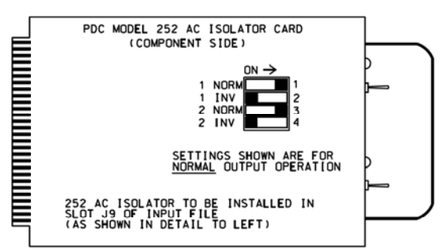
(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

PHASE 2+6 STOP TIME (SLOT J9)AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL FOR DYNAMIC RED EXTEND

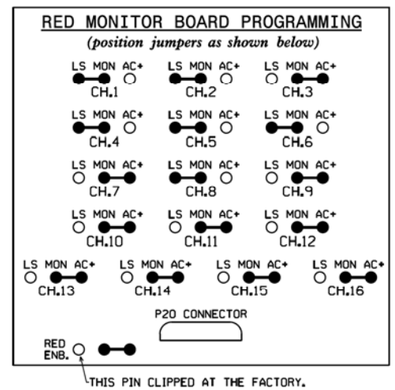
(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

RED MONITOR BOARD PROGRAMMING

(position jumpers as shown below)



▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

Signal Upgrade - Sheet 1 of 10

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17
at
NC 904 (Longwood Road/ Seaside Road)

Division 3 | Brunswick County | Grissettown

PLAN DATE: December 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE
▽ Revised from stretch to Volume Density. (WSA)	JTR	7/20/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 12/10/2012
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DATE
SIG. INVENTORY NO. 03-0342

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PROJECT REFERENCE NO.	SHEET NO.
	Sig. 3

2016CPT.03.09.10101, Etc.

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL FOR DYNAMIC RED EXTENSION SYSTEM

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL). THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, AND 9.

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

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #21 IS ON
AND RED CLEAR ON PHASE #2  IS ON
AND YELLOW ON PHASE    #6  IS OFF
          SCROLL DOWN
THEN:
SET LOGIC FLAG         #1  ON
SET INPUT   ASSIGNMENT #61 ON
    DELAY FOR   30.0 SECONDS
SET LOGIC FLAG         #3 ON
```

NOTE1: STOP TIME AND SPECIAL FUNCTION ALARM LOGIC FOR PHASE 2 APPROACH. (FOR DYNAMIC RED EXTENSION SYSTEM)

NOTE2: LOGIC FLAG #3 TO PLACE THE CONTROLLER IN FLASH IF THE STOP TIME INPUT FROM N04 SYSTEM IS ACTIVE FOR LONGER THAN 30 SECONDS.

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #21 IS OFF
OR  RED CLEAR ON PHASE #2  IS OFF
          SCROLL DOWN
THEN:
SET LOGIC FLAG         #1  OFF
SET INPUT   ASSIGNMENT #61 OFF
```

NOTE: STOP TIME AND SPECIAL FUNCTION ALARM LOGIC FOR PHASE 2 APPROACH. (FOR DYNAMIC RED EXTENSION SYSTEM)

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #23 IS ON
AND RED CLEAR ON PHASE #6  IS ON
AND YELLOW ON PHASE    #2  IS OFF
          SCROLL DOWN
THEN:
SET LOGIC FLAG         #2  ON
SET INPUT   ASSIGNMENT #62 ON
    DELAY FOR   30.0 SECONDS
SET LOGIC FLAG         #4 ON
```

NOTE1: STOP TIME AND SPECIAL FUNCTION ALARM LOGIC FOR PHASE 6 APPROACH. (FOR DYNAMIC RED EXTENSION SYSTEM)

NOTE2: LOGIC FLAG #4 TO PLACE THE CONTROLLER IN FLASH IF THE STOP TIME INPUT FROM N04 SYSTEM IS ACTIVE FOR LONGER THAN 30 SECONDS.

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #23 IS OFF
OR  RED CLEAR ON PHASE #6  IS OFF
          SCROLL DOWN
THEN:
SET LOGIC FLAG         #2  OFF
SET INPUT   ASSIGNMENT #62 OFF
```

NOTE: STOP TIME AND SPECIAL FUNCTION ALARM LOGIC FOR PHASE 6 APPROACH. (FOR DYNAMIC RED EXTENSION SYSTEM)

PRESS '+'

```
LOGICAL I/O COMMAND #5  (+/-COMMAND#)
IF  LOGIC FLAG         #1  IS ON
OR  LOGIC FLAG         #2  IS ON
OR  INPUT   ASSIGNMENT #44 IS ON
          SCROLL DOWN
THEN:
SET INPUT   ASSIGNMENT #60 ON
```

NOTE: LOGIC TO SWITCH STOP TIME "ON" IF DYNAMIC RED SYSTEM "OR" OTHER CABIENT STOP TIME INPUT IS ACTIVE.

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  LOGIC FLAG         #1  IS OFF
AND LOGIC FLAG         #2  IS OFF
AND INPUT   ASSIGNMENT #44 IS OFF
          SCROLL DOWN
THEN:
SET INPUT   ASSIGNMENT #60 OFF
```

NOTE: LOGIC TO SWITCH STOP TIME "OFF" WHEN ALL INPUTS ARE OFF.

PRESS '+'

```
LOGICAL I/O COMMAND #7  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #13 IS ON
OR  INPUT   ASSIGNMENT #14 IS ON
          SCROLL DOWN
THEN:
    DELAY FOR  240.0 SECONDS
SET LOGIC FLAG         #5 ON
```

NOTE: LOGIC TO PLACE THE CONTROLLER IN FLASH IF THE HOLD INPUTS FROM THE LONG VEHICLE SPEED SYSTEM ARE ACTIVE FOR LONGER THAN 4 MINUTES.

PRESS '+'

```
LOGICAL I/O COMMAND #8  (+/-COMMAND#)
IF  LOGIC FLAG         #3 IS ON
OR  LOGIC FLAG         #4 IS ON
OR  LOGIC FLAG         #5 IS ON
          SCROLL DOWN
THEN:
SET INPUT   ASSIGNMENT #64 ON
SET OUTPUT  ASSIGNMENT #33 OFF
SET OUTPUT  ASSIGNMENT #35 OFF
```

NOTE: LATCHED LOGIC 3, 4, OR 5 ACTUATES PREEMPT 7 AND PLACES CONTROLLER IN FLASH. ALSO PREVENTS THE ADVANCE BEACONS FROM TURNING ON BEFORE GOING INTO FLASH.

PRESS '+'

```
LOGICAL I/O COMMAND #9  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #13 IS OFF
AND INPUT   ASSIGNMENT #14 IS OFF
AND INPUT   ASSIGNMENT #21 IS OFF
AND INPUT   ASSIGNMENT #23 IS OFF
          SCROLL DOWN
THEN:
SET LOGIC FLAG         #3  OFF
SET LOGIC FLAG         #4  OFF
SET LOGIC FLAG         #5  OFF
```

NOTE: RESETS LATCHED LOGIC FLAGS.

LOGIC PROGRAMMING COMPLETE

! NOTE: THIS LOGIC IS BASED UPON CHANGES MADE TO INPUT MAPS WHICH ARE SHOWN ON SHEETS 3 AND 4 OF THIS ELECTRICAL DETAIL. !

INPUT/OUPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

INPUT 13 = PHASE 2 HOLD
INPUT 14 = PHASE 6 HOLD
INPUT 21 = OUTPUT FROM DYNAMIC RED EXTENSION SYSTEM (PHASE 2)
INPUT 23 = OUTPUT FROM DYNAMIC RED EXTENSION SYSTEM (PHASE 6)
INPUT 44 = CABINET CIRCUITRY STOP TIME CONTROL INPUT
INPUT 60 = STOP TIME
INPUT 61 = SPECIAL FUNCTION ALARM 1
INPUT 62 = SPECIAL FUNCTION ALARM 2
INPUT 64 = PREEMPT 7
OUTPUT 33 = ADVANCE BEACON
OUTPUT 35 = ADVANCE BEACON

FLASH PREEMPTION PROGRAMMING DETAIL FOR PREEMPT 7

(program controller as shown below)

THIS PREEMPT PLACES THE CONTROLLER IN FLASH IF RED EXTENSION IS GREATER THAN 30 SECONDS. OR IF THE LVOD HOLD TIME EXCEEDS 240 SECONDS.

FROM MAIN MENU PRESS 'A' (PREEMPTION). THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #7 IS REACHED.

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

▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 17
at
NC 904 (Longwood Road/ Seaside Road)

Division 3 | Brunswick County | Grissettown

PLAN DATE: December 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE
▽ Revised from stretch to Volume Density. (WSA)	JTR	7/20/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
DocuSigned by: John T. Rowe, Jr. 12/10/2012
DATE
SIG. INVENTORY NO. 03-0342

15-JUL-2015 12:13
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PROJECT REFERENCE NO.	SHEET NO.
	Sig. 4

2016CPT.03.09.10101, Etc.

INPUT RE-ASSIGNMENT PROGRAMMING DETAIL FOR DYNAMIC RED EXTENSION SYSTEM & LONG VEHICLE/SPEED DETECTION SYSTEM OPERATION

(program controller as shown below)

START HERE

1. FROM MAIN MENU PRESS '5' (INPUTS).
2. WITH CURSOR IN "INPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE INPUT ASSIGNMENT NUMBER 13, AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

```
PAGE:1  C1 PIN:51  PREEMPT ..... DEFAULT PROGRAMMING
INPUT ASSIGNMENT #.....13
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.....
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....1 ---- DEFAULT PROGRAMMING
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)._
```

SCROLL DOWN TO VIEW ALL DATA

→ ENTER A "2" FOR HOLD PHASES FIELD

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:51  HOLD PHASES
INPUT ASSIGNMENT #.....13
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.....
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 "+" KEY ONCE TO ADVANCE TO INPUT 14

```
PAGE:1  C1 PIN:52  PREEMPT ..... DEFAULT PROGRAMMING
INPUT ASSIGNMENT #.....14
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.....
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....2 ---- DEFAULT PROGRAMMING
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)._
```

SCROLL DOWN TO VIEW ALL DATA

→ ENTER A "6" IN HOLD PHASES FIELD

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:52  HOLD PHASES
INPUT ASSIGNMENT #.....14
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.....
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 "+" KEY 7 TIMES TO ADVANCE TO INPUT 21

```
PAGE:1  C1 PIN:59  VEHICLE DETECTOR ..... DEFAULT PROGRAMMING
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
VEHICLE DETECTOR (1-64).....15 ---- DEFAULT PROGRAMMING
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)..  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)._
```

SCROLL DOWN TO VIEW ALL DATA

→ ENTER A "Y" FOR NOT ENABLED

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:59  NOT ENABLED
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
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)..  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 "+" KEY TWICE TO ADVANCE TO INPUT 23

```
PAGE:1  C1 PIN:61  VEHICLE DETECTOR ..... DEFAULT PROGRAMMING
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
VEHICLE DETECTOR (1-64).....17 ---- DEFAULT PROGRAMMING
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)..  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)._
```

SCROLL DOWN TO VIEW ALL DATA

→ ENTER A "Y" FOR NOT ENABLED

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:61  NOT ENABLED
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
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)..  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 "+" KEY 21 TIMES TO ADVANCE TO INPUT 44

PROGRAMMING CONTINUED ON NEXT PAGE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy,Garner,NC 27529

US 17
at
NC 904 (Longwood Road/
Seaside Road)

Division 3 | Brunswick County | Grissettown

PLAN DATE: December 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE
▽ Revised from stretch to Volume Density. (WSA)	JTR	7/20/2015

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 12/10/2012
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DATE

SIG. INVENTORY NO. 03-0342

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PROJECT REFERENCE NO.	SHEET NO.
	Sig. 5

2016CPT.03.09.10101, Etc.

INPUT RE-ASSIGNMENT PROGRAMMING DETAIL (continued from previous page)

(program controller as shown below)

CONTINUE INPUT PROGRAMMING HERE

CONTINUED FROM PREVIOUS PAGE

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:82  STOP TIME
INPUT ASSIGNMENT #.................44
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
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10).....................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................Y
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)..._ 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)._
```

DEFAULT PROGRAMMING

→ ENTER A "Y" FOR NOT ENABLED

DEFAULT PROGRAMMING

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:82  NOT ENABLED
INPUT ASSIGNMENT #.................44
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
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)..._ 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 "+" KEY 16 TIMES TO ADVANCE TO INPUT 60

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:0   NOT ENABLED
INPUT ASSIGNMENT #.................60
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
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10).....................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................Y
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)..._ 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)._
```

DEFAULT PROGRAMMING

→ ENTER A "Y" IN STOP TIME FIELD

DEFAULT PROGRAMMING

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:0    STOP TIME
INPUT ASSIGNMENT #.................60
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.........................
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10).....................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................Y
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)..._ 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 "+" KEY ONCE TO ADVANCE TO INPUT 61

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:0   NOT ENABLED
INPUT ASSIGNMENT #.................61
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
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)..._ 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)._
```

DEFAULT PROGRAMMING

→ ENTER A "1" FOR SPECIAL FUNCTION ALARM

DEFAULT PROGRAMMING

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:0   SPECIAL FUNCTION ALAR
INPUT ASSIGNMENT #.................61
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.........................
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).....1
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4)................
HOLD PHASES (1-16).................
PLAN (65=FLSH.66=FREE)..._ OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PRESS "+" KEY ONCE TO ADVANCE TO INPUT 62

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:0   NOT ENABLED
INPUT ASSIGNMENT #.................62
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
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).....2
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4)................
HOLD PHASES (1-16).................
PLAN (65=FLSH.66=FREE)..._ OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

DEFAULT PROGRAMMING

→ ENTER A "2" FOR SPECIAL FUNCTION ALARM

DEFAULT PROGRAMMING

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:0   SPECIAL FUNCTION ALAR
INPUT ASSIGNMENT #.................62
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.........................
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).....2
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4)................
HOLD PHASES (1-16).................
PLAN (65=FLSH.66=FREE)..._ OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PRESS "+" KEY TWICE TO ADVANCE TO INPUT 64

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:0   NOT ENABLED
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
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10).....................7
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)..._ 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)._
```

DEFAULT PROGRAMMING

→ ENTER PREEMPT 7

DEFAULT PROGRAMMING

SCREEN SHOULD NOW APPEAR AS SHOWN TO THE RIGHT

```
PAGE:1  C1 PIN:0    PREEMPT
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.........................
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10).....................7
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)..._ 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)._
```

INPUT PROGRAMMING COMPLETE

▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at NC 904 (Longwood Road/ Seaside Road)	SEAL
Prepared in the Offices of: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Traffic Engineering Branch Signals Management Section	Division 3 Brunswick County Grissettown	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy,Garner,NC 27529	PLAN DATE: December 2012 REVIEWED BY: JTR	
	PREPARED BY: S. Armstrong REVIEWED BY:	
	REVISIONS: ▽ Revised from stretch to Volume Density. (WSA) INIT. JTR DATE 7/20/2015	DocuSigned by: John T. Rowe, Jr. 12/10/2012 DATE
		SIG. INVENTORY NO. 03-0342

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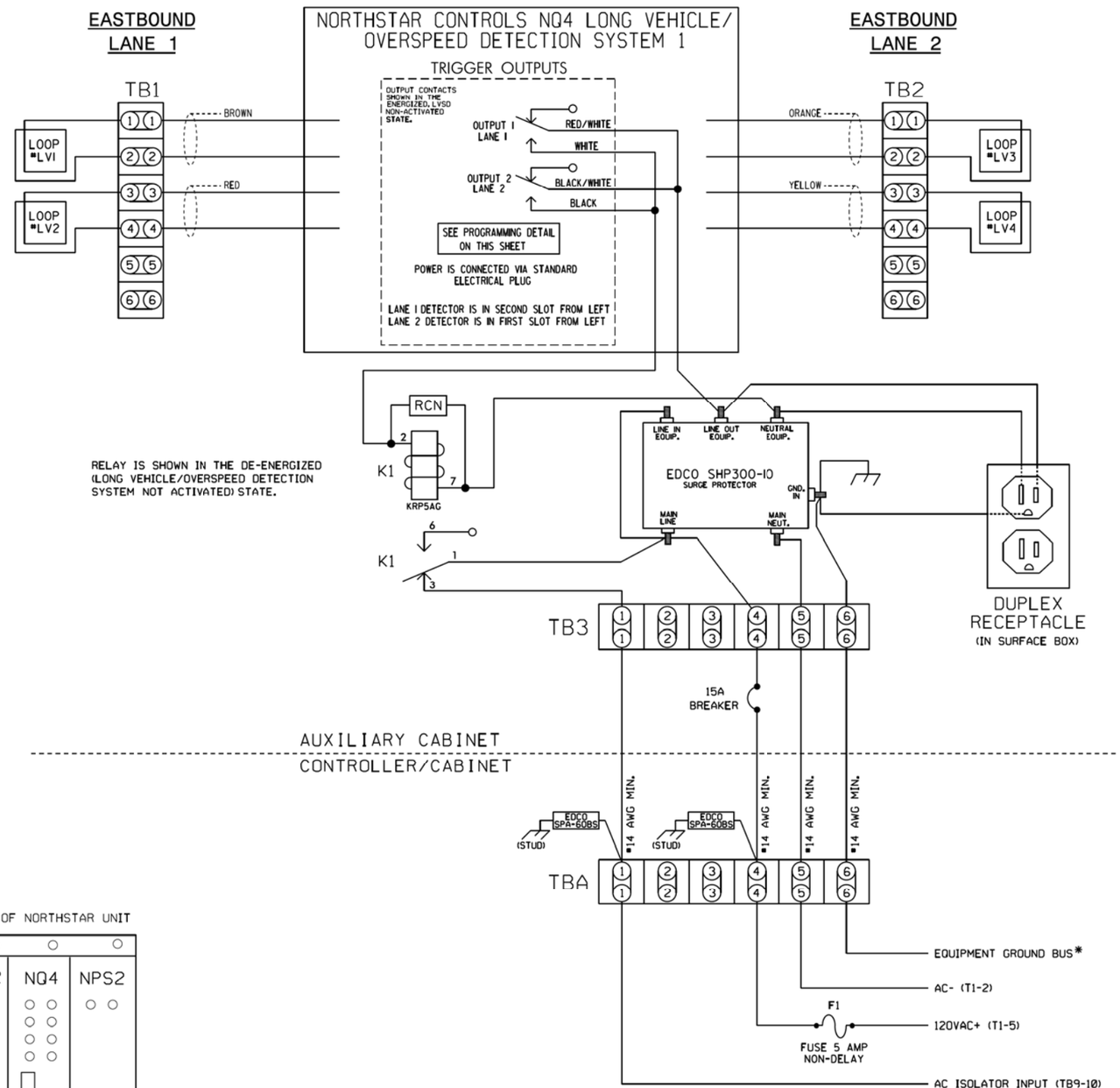
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 6

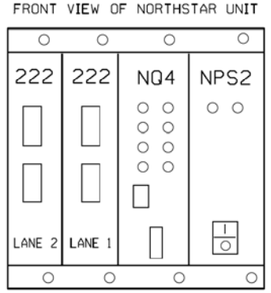
2016CPT.03.09.10101, Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 1

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

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, & TBA 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 K1 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. IMPORTANT! A jumper must be installed between input file terminals J14-E and J14-K if not already present.
12. IMPORTANT! For proper operation of the Long Vehicle Detection Unit, tie TB9-12 to AC neutral.
13. IMPORTANT! Make sure both channels of AC isolator card inserted at input file position J14 are set for inverted operation.
14. Do not install ground rods at auxiliary cabinet.
15. 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

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

Signal Upgrade - Sheet 5 of 10

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at NC 904 (Longwood Road/ Seaside Road)
Prepared in the Offices of: Traffic Engineering Branch, Signals Management Section, Division of Highways, Mobility and Safety, NC Department of Transportation	Division 3 — Brunswick County — Grissettown
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: December 2012 — REVIEWED BY: JTR
	PREPARED BY: S. Armstrong — REVIEWED BY:
	REVISIONS — UNIT. — DATE
	▽ Revised from sfratch to Volume Density. (WSA) — STE — 7/20/2015
	SEAL 008453 NORTH CAROLINA PROFESSIONAL ENGINEER JOHN T. ROWE, JR.
	DocuSigned by: John T. Rowe, Jr. 12/10/2012 DATE
	SIG. INVENTORY NO. 03-0342

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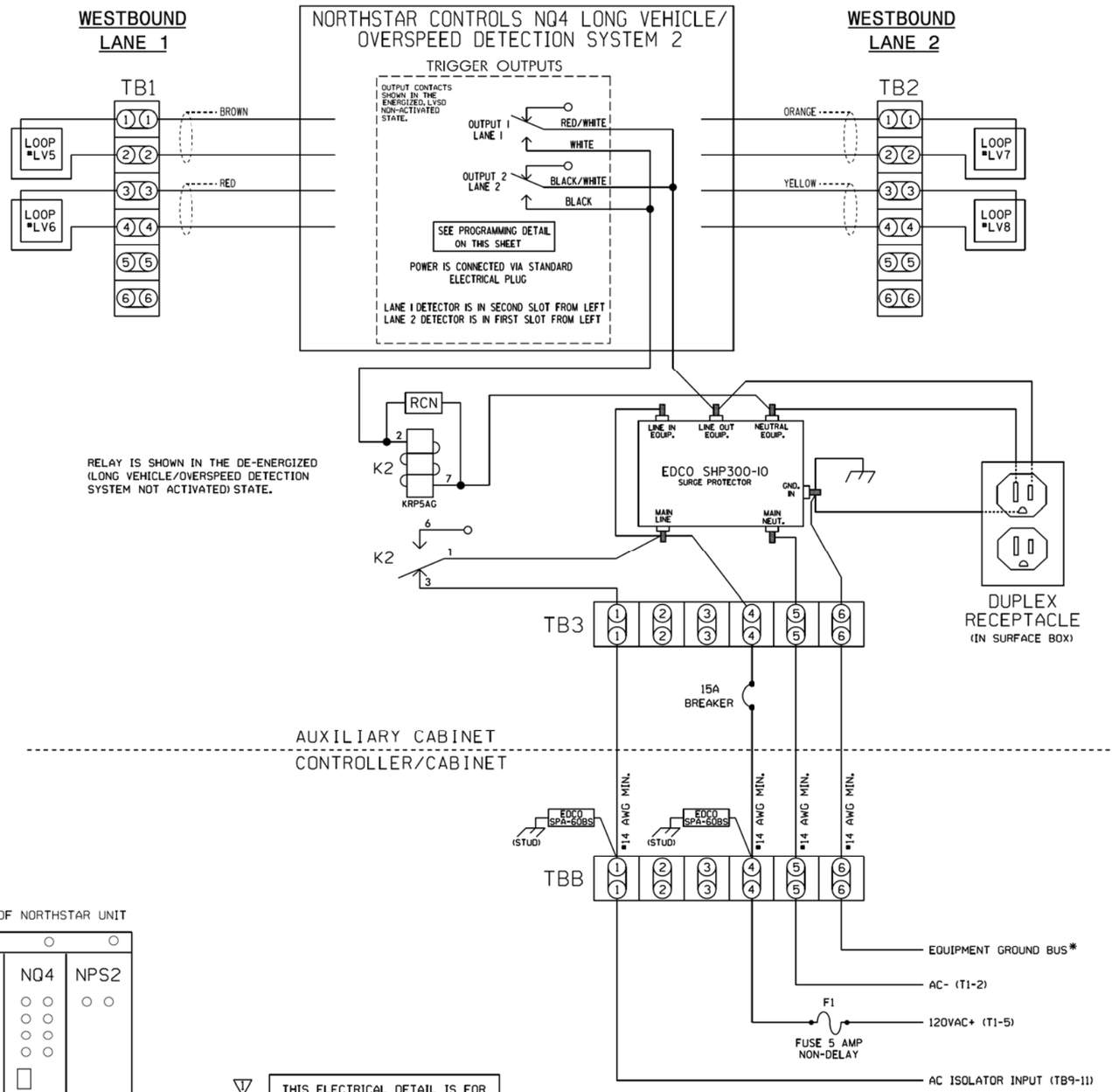
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 7

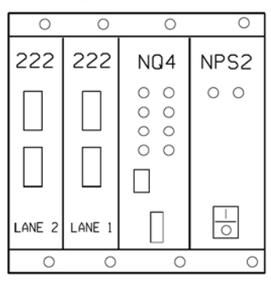
2016CPT.03.09.10101, Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 2

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

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 'K2' 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.

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

Signal Upgrade - Sheet 6 of 10

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17
at
NC 904 (Longwood Road/ Seaside Road)

Division 3 Brunswick County Grissettown

PLAN DATE: December 2012	REVIEWED BY: JTR		
PREPARED BY: S. Armstrong	REVIEWED BY:		
REVISIONS		INIT.	DATE
Revised from stretch to Volume Density. (WSA)		JTR	7/20/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 12/10/2012
DATE
SIG. INVENTORY NO. 03-0342

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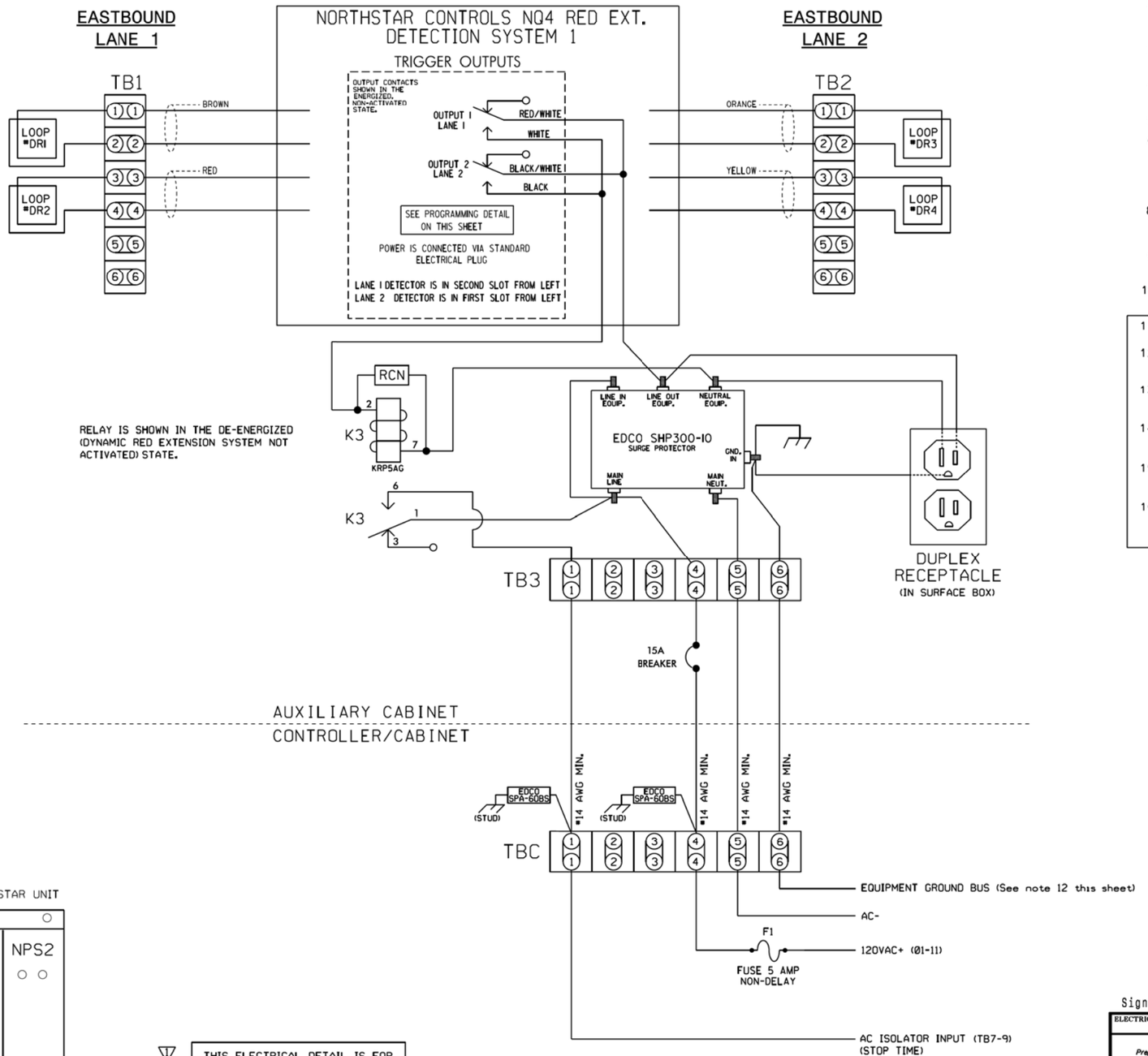
PROJECT REFERENCE NO.	SHEET NO.
	Sig. 8

2016CPT.03.09.10101, Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 USED FOR DYNAMIC RED EXTENSION - SYSTEM NO. 1

(wire unit as shown below)



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 Dynamic Red Extension System loops.
5. Unit power is connected by standard electrical plug.
6. Terminal strips TB1, TB2, TB3, & TBC to be added by installer.
7. Relay 'K3' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG. Dot Material no. 625028600.
8. The RC Network across the coil of 'K3' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. ITW no. 104M060C100
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 equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.
14. IMPORTANT! A jumper must be installed between input file terminals J9-E and J9-K.
15. IMPORTANT! For proper operation of the Dynamic Red Extension System, tie TB7-12 to AC neutral.
16. IMPORTANT! Make sure both channels of AC Isolator card inserted at input file position J9 are set for NORMAL OUTPUT operation. See sheet 1 of this Electrical Detail.

NORTHSTAR CONTROLS MODEL NQ4 PROGRAMMING DETAIL

(program unit as shown)

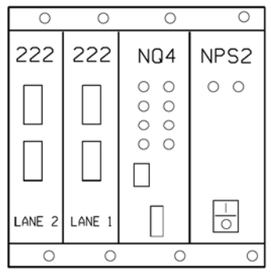
NOTE: UNIT MUST BE PROGRAMMED USING PC AND HYPERTERMINAL PROGRAM. FOR CONNECTION TO HYPERTERMINAL REFER TO NQ4 OPERATION MANUAL.

PROGRAM NQ4 BY TYPING THE FOLLOWING COMMANDS

1. SET SPEED=50
2. SET LENGTH=1'
3. SET ALARMTIME=5
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

ALARM LOG NOTE: WHEN DYNAMIC RED EXTENSION SYSTEM 1 DETECTS A VIOLATION, A SPECIAL FUNCTION 1 ALARM IS RECORDED WITHIN THE OASIS ALARM LOG (WITH TIME AND DATE STAMP).

FRONT VIEW OF NORTHSTAR UNIT



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

Signal Upgrade - Sheet 7 of 10

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at NC 904 (Longwood Road/ Seaside Road)	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, NC Department of Transportation, Signals Management Section	Division 3 · Brunswick County · Grissettown	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy, Garner, NC 27529	PLAN DATE: December 2012 · REVIEWED BY: JTR	DocuSigned by: John T. Rowe, Jr. 12/10/2012 DATE
	PREPARED BY: S. Armstrong · REVIEWED BY:	SIG. INVENTORY NO. 03-0342
	REVISIONS: ▽ Revised from scratch to Volume Density. (WSA) · INIT. JTR · DATE 7/20/2015	

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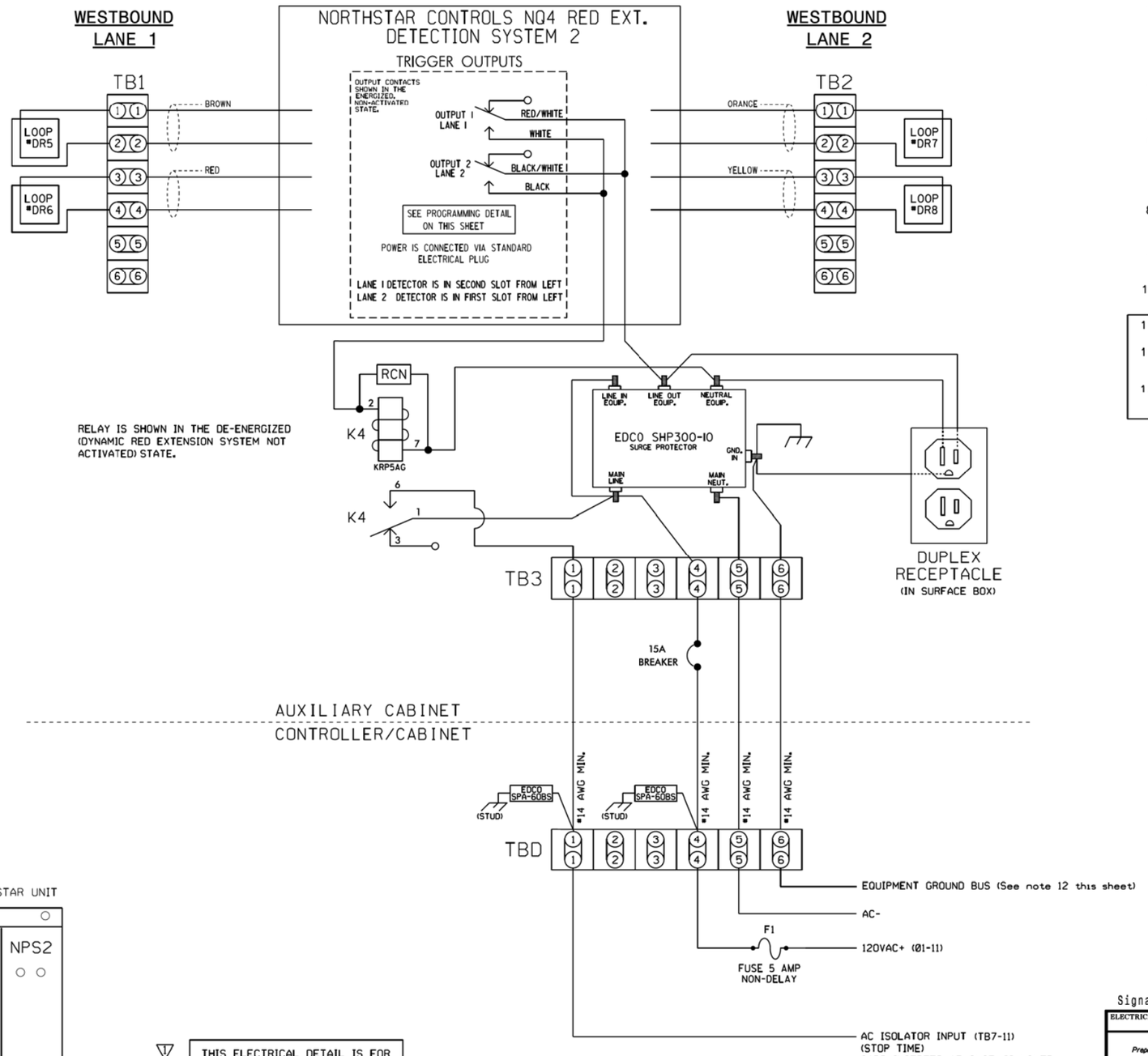
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 9

2016CPT.03.09.10101, Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 USED FOR DYNAMIC RED EXTENSION - SYSTEM NO. 2

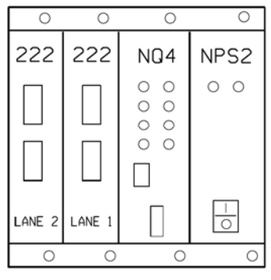
(wire unit as shown below)



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 Dynamic Red Extension System loops.
5. Unit power is connected by standard electrical plug.
6. Terminal strips TB1, TB2, TB3, & TBD to be added by installer.
7. Relay 'K4' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG. Dot Material no. 625028600.
8. The RC Network across the coil of 'K4' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. ITW no. 104M060C100
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 equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.

FRONT VIEW OF NORTHSTAR UNIT



▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

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=50
2. SET LENGTH=1'
3. SET ALARMTIME=5
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

ALARM LOG NOTE: WHEN DYNAMIC RED EXTENSION SYSTEM 2 DETECTS A VIOLATION, A SPECIAL FUNCTION 2 ALARM IS RECORDED WITHIN THE OASIS ALARM LOG (WITH TIME AND DATE STAMP).

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at NC 904 (Longwood Road/ Seaside Road)	SEAL
Prepared in the Offices of: NC Department of Transportation, Mobility and Safety Division, Signals Management Section	Division 3 · Brunswick County · Grissettown	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy.,Garner,NC 27529	PLAN DATE: December 2012 · REVIEWED BY: JTR	DocuSigned by: John T. Rowe, Jr. 12/10/2012 DATE
	PREPARED BY: S. Armstrong · REVIEWED BY:	SIG. INVENTORY NO. 03-0342
	▽ Revised from stratch to Volume Density. (WSA) · JTR · 7/20/2015	

15-SIG-2015 12:17
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sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 10

2016CPT.03.09.10101, Etc.

ADVANCE BEACON #1
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON.....................Y
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH. ALONG WITH THE RATE IN WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:35  NOT ENABLED
SELECT BEACON INDEX (1-4).....1
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:35  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................._
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON.....................Y
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #34 (PIN 36) IS REACHED.

```
PAGE:1  C1 PIN:36  NOT ENABLED
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER...............Y
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:36  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).....33
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:36  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................._
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER...............Y
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OUTPUT REFERENCE SCHEDULE

OUTPUT 33 = Ø2 Ped Yellow
OUTPUT 34 = Ø6 Ped Yellow

ADVANCE BEACON PROGRAMMING DETAIL

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '2' (OUTPUT BEACON SETTINGS).

```
        OUTPUT BEACON SETTINGS
TRIGGER PHASES: |123456789101111213141516
BEACON #1 OFF   | X
BEACON #2 OFF   |    X
BEACON #3 OFF   |
BEACON #4 OFF   |
                BEACON  |  1   2   3   4
OFF DELAY TIME (0-255)  |  0   0   0   0
ON DELAY TIME  (0-255)  |  0   0   0   0
STOP-TIME HOLD (0-255)  |  0   0   0   0
```

SCROLL DOWN TO VIEW ALL DATA

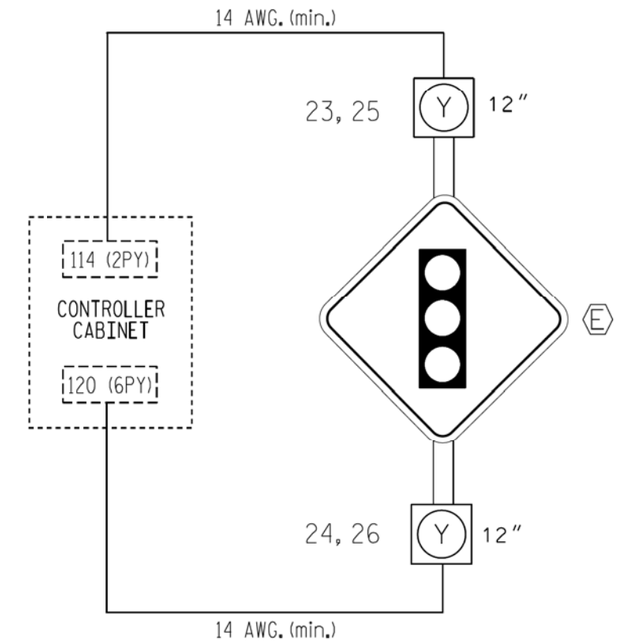
ADVANCE BEACON PROGRAMMING COMPLETE

NOTE: AN OUTPUT HAS TO BE ASSIGNED AS AN ADVANCE BEACON IN ORDER FOR PROPER OPERATION TO OCCUR. SEE OUTPUT ASSIGNMENT DETAIL ON THIS SHEET.

▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

ADVANCE BEACON #1 WIRING DETAIL

(wire flashers as shown below)

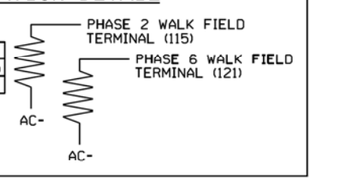


IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 114 (2PY) AND TERMINAL 120 (6PY).
2. INSERT LOADSWITCH FOR S2P AND S6P.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN IN LOAD RESISTOR INSTALLATION DETAIL ON THIS SHEET.
4. TO ACTIVATE SIGN OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUT 33 AND 34 AS SHOWN ON THIS SHEET.

LOAD RESISTOR INSTALLATION DETAIL

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



ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at NC 904 (Longwood Road/ Seaside Road)	SEAL
Prepared In the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Traffic Signals Management Section	Division 3 · Brunswick County · Grissettown	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
	PLAN DATE: December 2012 · REVIEWED BY: JTR	
	PREPARED BY: S. Armstrong · REVIEWED BY:	
	REVISIONS: ▽ Revised from stretch to Volume Density. (WSA) · INIT.: JTR · DATE: 7/20/2015	DocuSigned by: John T. Rowe, Jr. 12/10/2012 DATE
750 N.Greenfield Pkwy,Garner,NC 27529		SIG. INVENTORY NO. 03-0342

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armstrong

ADVANCE BEACON #2
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #35 (PIN 37) IS REACHED.

```
PAGE:1  C1 PIN:37  NOT ENABLED
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH. ALONG WITH THE RATE IN WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:37  NOT ENABLED
SELECT BEACON INDEX (1-4)..........2
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:37  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #36 (PIN 38) IS REACHED.

```
PAGE:1  C1 PIN:38  NOT ENABLED
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:38  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).....35
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:38  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT REFERENCE SCHEDULE

OUTPUT 35 = Ø 4 Ped Yellow
OUTPUT 36 = Ø 8 Ped Yellow

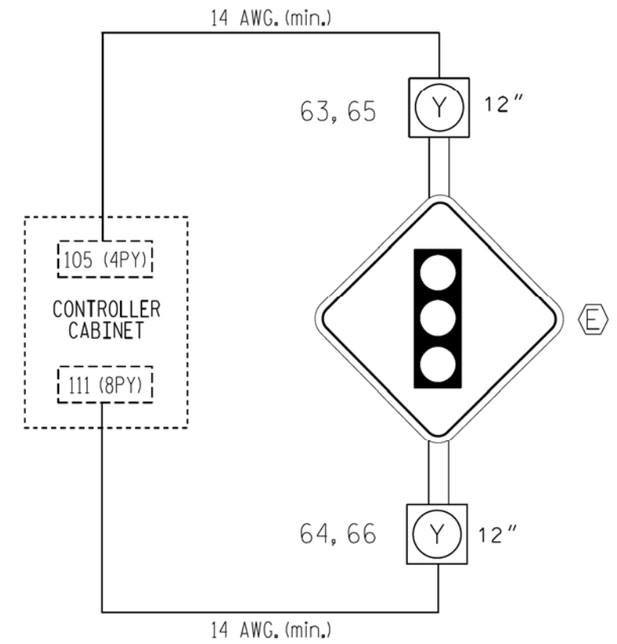
▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0342
DESIGNED: December 2012
SEALED: 12/6/12
REVISED: 7/16/2015

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 11

2016CPT.03.09.10101, ETC.

ADVANCE BEACON #2 WIRING DETAIL

(wire flashers as shown below)

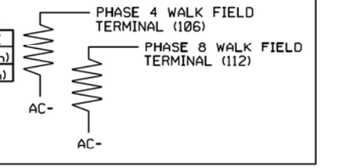


IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 105 (4PY) AND TERMINAL 111 (8PY).
2. INSERT LOADSWITCH FOR S4P AND S8P.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN IN LOAD RESISTOR INSTALLATION DETAIL ON THIS SHEET.
4. TO ACTIVATE SIGN OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUT 35 AND 36 AS SHOWN ON THIS SHEET.

LOAD RESISTOR INSTALLATION DETAIL

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



ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17
at
NC 904 (Longwood Road/ Seaside Road)

Division 3 | Brunswick County | Grissettown

PLAN DATE: December 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE
▽ Revised from stretch to Volume Density. (WSA)	JTR	7/20/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 12/10/2012 DATE
94D90C14684F5...

SIG. INVENTORY NO. 03-0342

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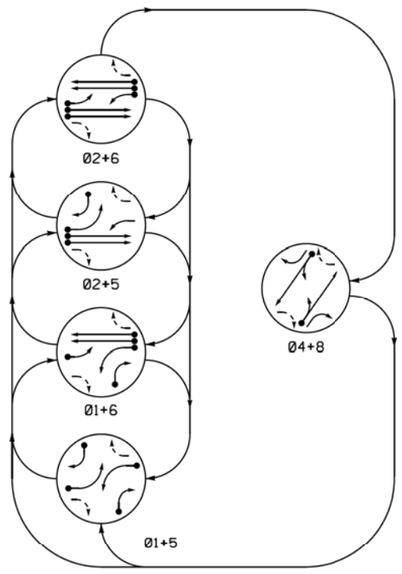
armstrong

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig. 1

2016CPT.03.09.10101, Etc.

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

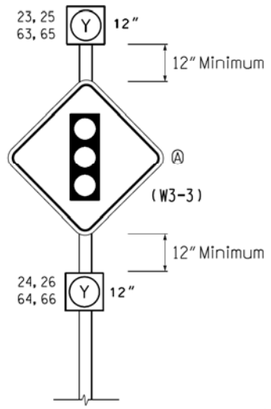
TABLE OF OPERATION							
SIGNAL FACE	PHASE						
	01+05	01+06	02+05	02+06	04+08	FLASH
11	←	←	F↑	F↑	↑	Y
21,22	R	R	G	G	R	Y
23,24,25,26	ON	ON	OFF	OFF	ON	OFF
41,43	R	R	R	R	G	R
42	R↗	R	R↗	R	G	R
51	←	F↑	←	F↑	↑	Y
61,62	R	G	R	G	R	Y
63,64,65,66	ON	OFF	ON	OFF	ON	OFF
81,83	R	R	R	R	G	R
82	R↗	R↗	R	R	G	R

TABLE OF OPERATION		
SIGNAL FACE	INTERVAL	
	1	2
23,25	ON	OFF
24,26	OFF	ON
63,65	ON	OFF
64,66	OFF	ON

SIGNAL FACE I.D.

All Heads L.E.D.

Figure 1

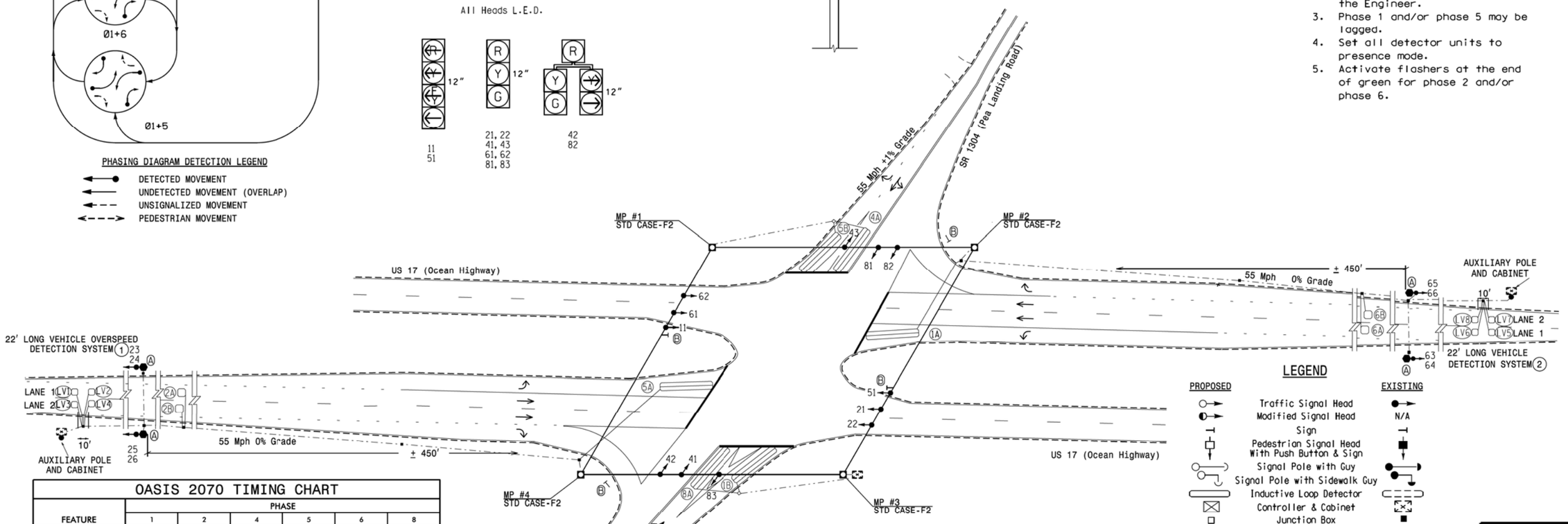


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP / NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	- / -
					6	Y	Y	Y	-	3	- / -
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	- / -
2A	6X6	420	5	Y	2	Y	Y	-	-	-	- / -
2B	6X6	420	5	Y	2	Y	Y	-	-	-	- / -
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	- / -
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	- / -
					2	Y	Y	Y	-	3	- / -
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	- / -
6A	6X6	420	5	Y	6	Y	Y	-	-	-	- / -
6B	6X6	420	5	Y	6	Y	Y	-	-	-	- / -
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	3	- / -

5 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. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Activate flashers at the end of green for phase 6.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○→	Signal Pole with Sidewalk Guy	●→
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·-·	2-in Underground Conduit	·-·-·-·
N/A	Right of Way	— — —
→	Directional Arrow	→
○	Signal Pedestal	●
▣	Metal Strain Pole	■
Ⓐ	Signal Ahead Sign (W3-3) (See Fig. 1)	Ⓐ
Ⓑ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓑ

OASIS 2070 TIMING CHART						
FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	14	10	7	14	10
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	60	20	35	20	20
Yellow Clearance	3.2	5.2	5.1 ▽	3.2	5.2	5.0 ▽
Red Clearance	3.3	2.0	2.3	3.2	2.0	2.4
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	46	-	-	46	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.4	-	-	3.4	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

LONG VEHICLE OVERSPEED DETECTION SYSTEM
LOOP & DETECTION INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR UNITS								
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	SPEED ZONE	ON INVT	DIST FROM STOPBAR	DZ CHANNEL	NEMA PHASE	TIMING FEATURE	TIMING TIME	PLACE CALL DURING PHASE	INHIBIT DELAY DURING GREEN
LV1	6X6	6	1015	X	NORTHBOUND ① APPROACH	1	1	1	1	*2	NONE	- SEC.	ALL	NO
LV2	6X6	6	999	X		1	1		2		NONE	- SEC.	ALL	NO
LV3	6X6	6	1015	X		2	2	2	1	*2	NONE	- SEC.	ALL	NO
LV4	6X6	6	999	X		2			2		NONE	- SEC.	ALL	NO
LV5	6X6	6	1015	X	SOUTHBOUND ② APPROACH	1	1	1	1	*6	NONE	- SEC.	ALL	NO
LV6	6X6	6	999	X		1	1		2		NONE	- SEC.	ALL	NO
LV7	6X6	6	1015	X		2	2	2	1	*6	NONE	- SEC.	ALL	NO
LV8	6X6	6	999	X		2			2		NONE	- SEC.	ALL	NO
LVODS THRESHOLD SPEED (MPH)			55							2/6				
LVODS EXTEND TIME			12 SEC.							2/6				

*PHASE HOLD OUTPUT TO CONTROLLER

Signal Upgrade

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

US 17 (Ocean Highway)
at
SR 1304 (Pea Landing Road)/
SR 1165 (Thomasboro Road)

Division 3 Brunswick County Near Sunset Beach

PLAN DATE: December 2009 REVIEWED BY:
PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE
\Install\loops\revise clearance times.tkgp	dlo	7/17/2015

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023489 ENGINEER PAMELA L. ALEXANDER

DocuSigned by: P L Alexander 7/17/2015
DATE

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally Issued and sealed by Jason P.Galloway,PE-029904 on 12/18/2009 This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 03-0416

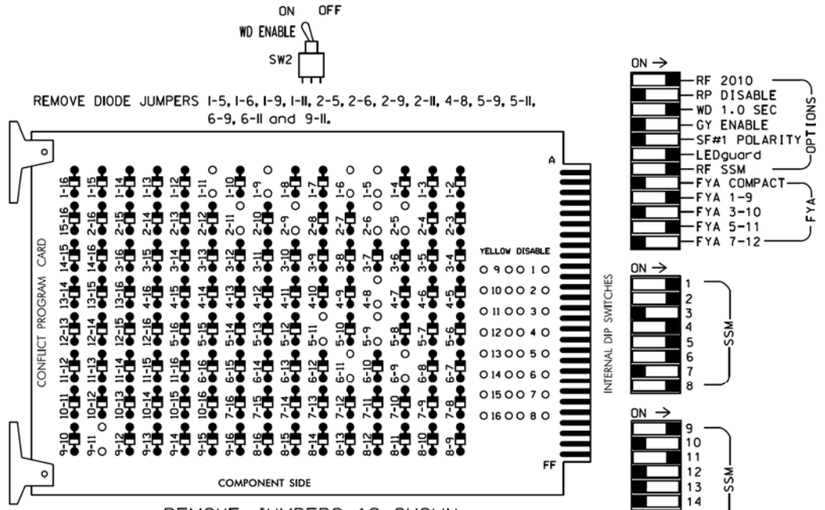
17-JUL-2015 10:47
S:\TELCOM\ITS Signals\Signal Design Section\Eastern Region\0is-03\03-0416\03041G_sig_dsn_2015mods.dgn
palexander

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 2

2016CPT.03.09.10101, Etc.

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7,10, 12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Variable Initial and Gap Reduction.
6. Program phases 2 and 6 for Start Up In Green.
7. Program phases 2 and 6, on the controller unit, for Yellow Flash, and overlap 1 as Wag Overlaps.

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.	11 ★	82	21,22	**	NU	41,42 43	**	51 ★	42	61,62	**	NU	81,82 83	**	11 ★	NU	NU	51 ★	NU	NU
RED		*	128			101			*	134			107							
YELLOW			129			102				135			108							
GREEN			130			103				136			109							
RED ARROW															A121			A114		
YELLOW ARROW		126						132							A122			A115		
FLASHING YELLOW ARROW															A123			A116		
GREEN ARROW	127	127						133	133											

NU = Not Used

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

★ See pictorial of head wiring in detail below.

** Special advance beacons will be wired to S2P-Y, S4P-Y, S6P-Y and S8P-Y. See wiring and programming details on sheets 6 of 7 and 7 of 7 of this electrical detail.

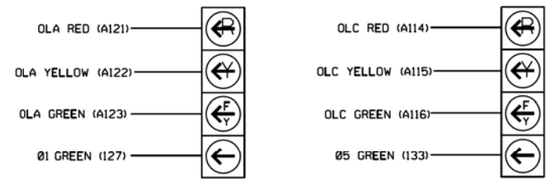
EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,*S2P,S4,*S4P,S5,S6,*S6P,S8,*S8P, S9,S12
PHASES USED.....1,2,4,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

*USED FOR ADVANCED BEACON CONTROL ONLY.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
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			3

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

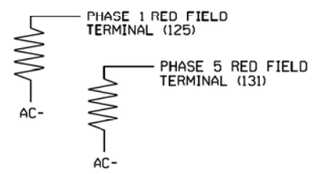
[2] Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0416
DESIGNED: December 2009
SEALED: 12-18-09
REVISED: 7/17/2015

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 7/21/2015 DATE

ELECTRICAL DETAIL SHEET 1 OF 7

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Ocean Highway) at SR 1304 (Pea Landing Road)/ SR 1165 (Thomasboro Road)

Division 03 Brunswick County Near Sunset Beach

PLAN DATE: 08-04-10 REVIEWED BY:

PREPARED BY: D.H. Spaulding REVIEWED BY:

REVISIONS	INIT.	DATE
▽ No changes to this electrical plan. (WSA)	JTR	7/21/2015

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, Department of Transportation, Signal Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL

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SIGNATURE DATE

SIG. INVENTORY NO. 03-0416

21-JUL-2015 06:02
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armstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 3

2016CPT.03.09.10101, Etc.

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

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6 AND 7.

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

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

SCROLL DOWN

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

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

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

PRESS '+'

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

SCROLL DOWN

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

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #7  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #13 IS ON
OR  INPUT   ASSIGNMENT #14 IS ON

SCROLL DOWN

THEN:
    DELAY FOR  240.0 SECONDS
SET INPUT   ASSIGNMENT #64 ON
```

NOTE: THIS PROGRAMMING WILL PLACE CONTROLLER IN FLASH IF OUTPUT OF L.V.D. UNIT IS ACTIVE LONGER THAN 4 MINUTES.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

INPUT 13 = Phase 2 Hold
INPUT 14 = Phase 6 Hold
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

← NOTICE GREEN FLASH

PRESS '+' TWICE

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

▽ THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0416
DESIGNED: December 2009
SEALED: 12-18-09
REVISED: 7/17/2015

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 7/21/2015 DATE

ELECTRICAL DETAIL SHEET 2 OF 7

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Ocean Highway) at SR 1304 (Pea Landing Road)/ SR 1165 (Thomasboro Road)

Division 03 Brunswick County Near Sunset Beach

PLAN DATE: 08-04-10 REVIEWED BY:

PREPARED BY: D.H. Spaulding REVIEWED BY:

REVISIONS	INIT.	DATE
▽ No changes to this electrical plan. (NSA)	JTR	7/21/2015

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, Traffic Engineering Section, Signal Management Section, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL

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This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 03-0416

31-JUL-2015 06:03
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armstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 4

2016CPT.03.09.10101, Etc.

INPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS). THEN '+' UNTIL PIN 51 (INPUT 13) IS REACHED.

```
PAGE: 1 C1 PIN:51  HOLD PHASES
INPUT ASSIGNMENT #.................13
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 SYCHRONIZATION (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 '+'

```
PAGE: 1 C1 PIN:52  HOLD PHASES
INPUT ASSIGNMENT #.................14
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 SYCHRONIZATION (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 '+' until input assignment #64 is reached

```
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 SYCHRONIZATION (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)._
```

← Note: Program for Plan 65 and Offset 0

PROGRAMMING COMPLETE

(1) THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0416
DESIGNED: December 2009
SEALED: 12-18-09
REVISED: 7/17/2015

REVISION (1) SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 7/21/2015 DATE

ELECTRICAL DETAIL SHEET 3 OF 7

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 (Ocean Highway) at SR 1304 (Pea Landing Road)/ SR 1165 (Thomasboro Road)	SEAL
Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, North Carolina Department of Transportation, Signals Management Section	Division 03 Brunswick County Near Sunset Beach	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 8/5/10. This document is only certified as to the revisions.
750 N. Greenfield Pwky, Garner, NC 27529	PLAN DATE: 08-04-10 REVIEWED BY:	
	PREPARED BY: D.H. Spaulding REVIEWED BY:	
	REVISIONS: (1) No changes to this electrical plan. (WSA) INIT. JTR DATE 7/21/2015	SIGNATURE DATE
		SIG. INVENTORY NO. 03-0416

21-JUL-2015 06:03
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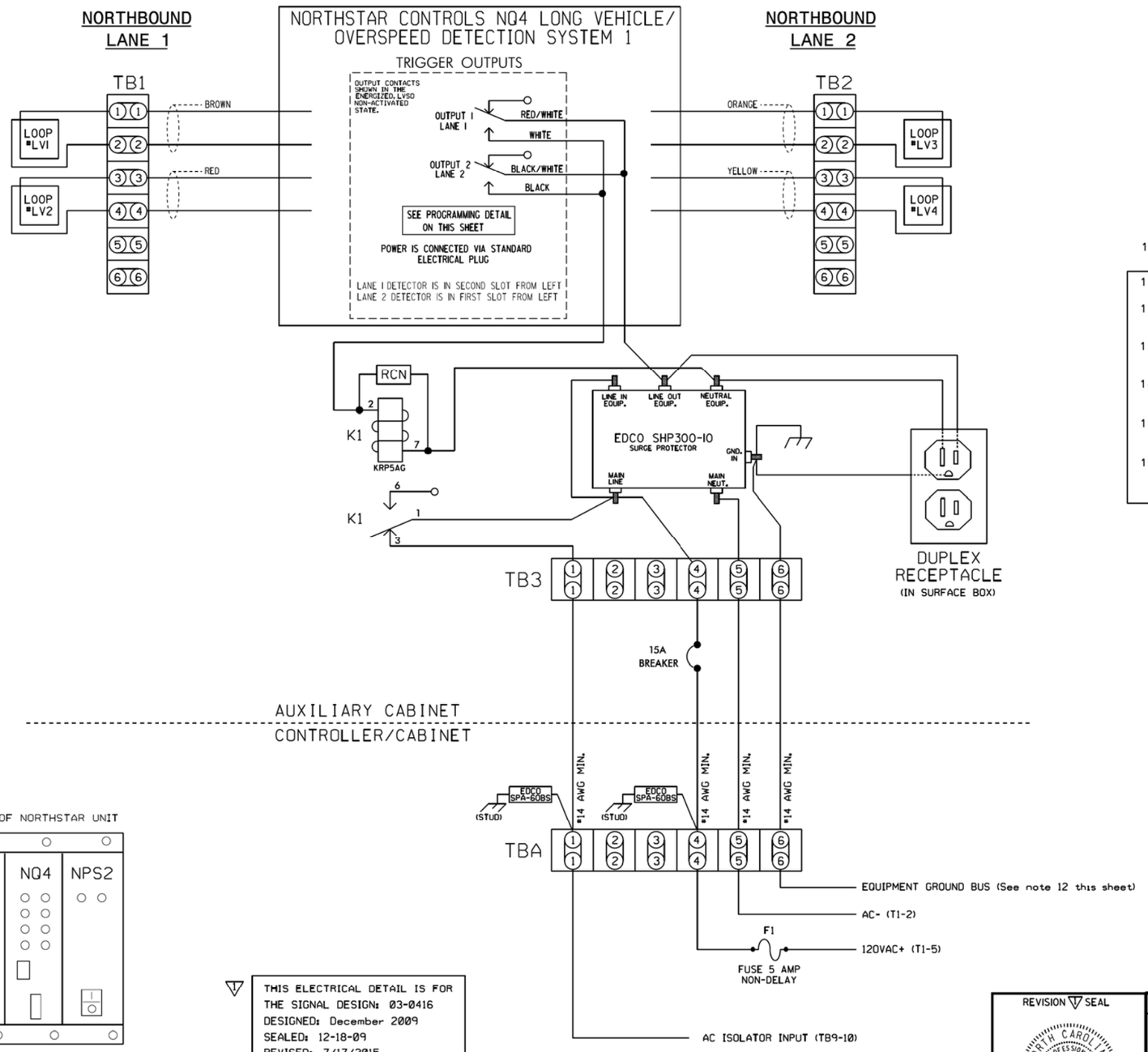
armstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 5

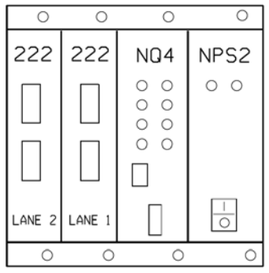
2016CPT.03.09.10101, Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 1

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0416
DESIGNED: December 2009
SEALED: 12-18-09
REVISED: 7/17/2015

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, & TBA to be added by installer.
7. Relay 'K1' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG. Dot Material no. 625028600.
8. The RC Network across the coil of 'K1' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. P&B no. 104M060C100
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 equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.
14. IMPORTANT! A jumper must be installed between input file terminals J14-E and J14-K if not already present.
15. IMPORTANT! For proper operation of the Long Vehicle Detection Unit, tie TB9-12 to AC neutral.
16. IMPORTANT! Make sure both channels of AC Isolator card inserted at input file position J14 are set for inverted operation.

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 7

REVISION ▽ SEAL	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.	Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, North Carolina Department of Transportation, Signal Management Section	US 17 (Ocean Highway) at SR 1304 (Pea Landing Road)/ SR 1165 (Thomasboro Road)	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 8/5/10. This document is only certified as to the revisions.
DocuSigned by: John T. Rowe, Jr. 7/21/2015 DATE	750 N. Greenfield Pkwy, Garner, NC 27529	Division 03 Brunswick County Near Sunset Beach	SIGNATURE DATE
		PLAN DATE: 08-04-10 REVIEWED BY:	SIG. INVENTORY NO. 03-0416
		PREPARED BY: D.H. Spaulding REVIEWED BY:	
		REVISIONS: ▽ No changes to this electrical plan. (WSA) INIT. JTR DATE 7/21/2015	

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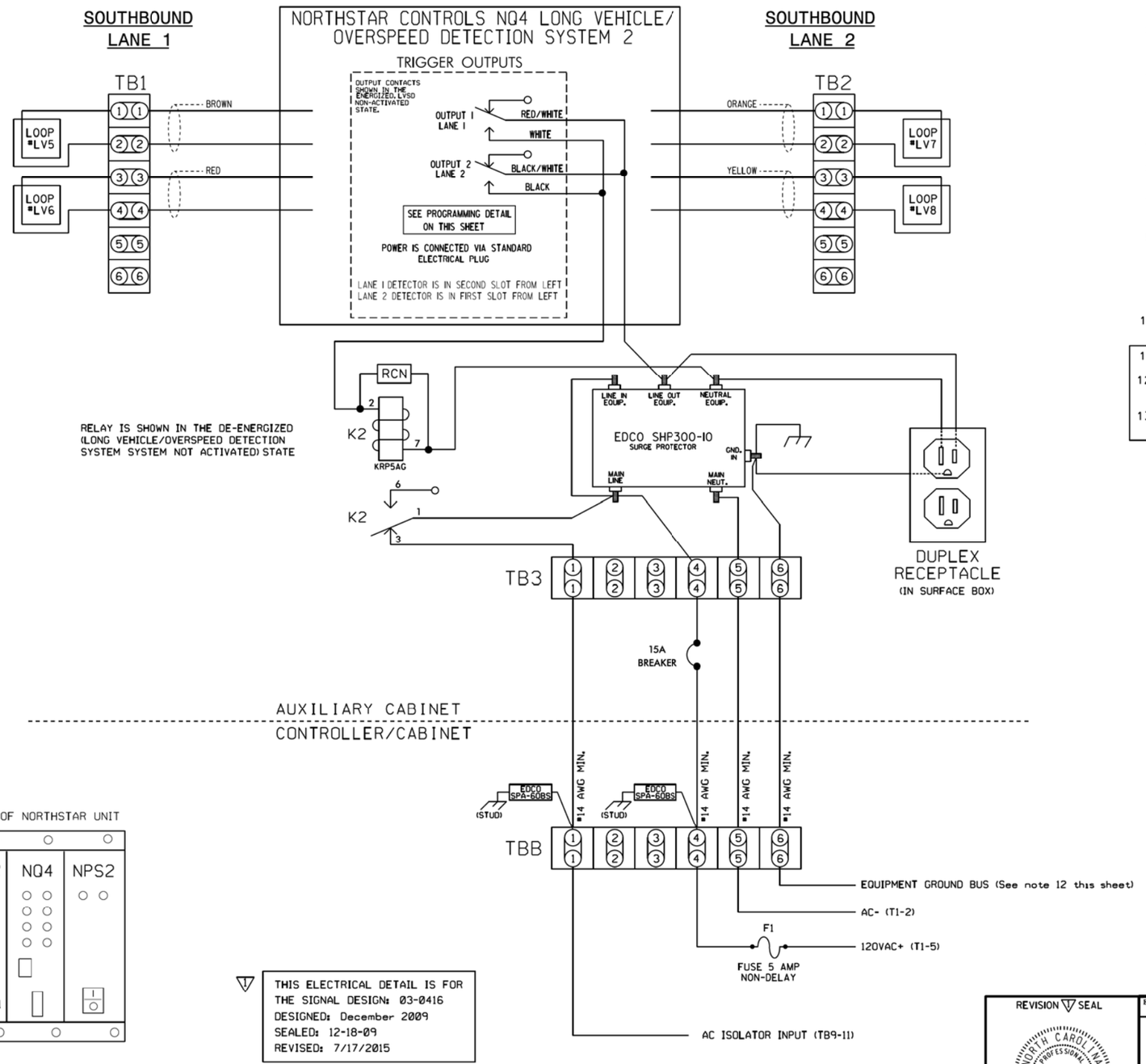
armstrong

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 6

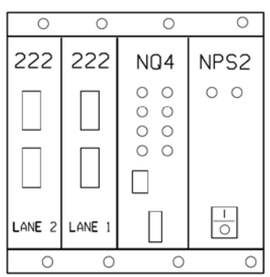
2016CPT.03.09.10101, Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 2

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0416
DESIGNED: December 2009
SEALED: 12-18-09
REVISED: 7/17/2015

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 'K2' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG, Dot Material no. 625028600.
8. The RC Network across the coil of 'K2' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. P&B no. 104M060C100
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 equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.

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 5 OF 7

REVISION ▽ SEAL	ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 (Ocean Highway) at SR 1304 (Pea Landing Road)/ SR 1165 (Thomasboro Road)	SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.	*Prepared in the Offices of:*	Division 03 Brunswick County Near Sunset Beach	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 8/5/10. This document is only certified as to the revisions.
DocuSigned by: John T. Rowe, Jr. 7/21/2015 DATE	750 N. Greenfield Pkwy, Garner, NC 27529	PLAN DATE: 08-04-10 REVIEWED BY:	SIGNATURE DATE
		PREPARED BY: D.H. Spaulding REVIEWED BY:	SIG. INVENTORY NO. 03-0416
		REVISIONS: ▽ No changes to this electrical plan. (WSA) — INIT. DTT — DATE 7/21/2015	

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armstrong

ADVANCE BEACON #1
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH. ALONG WITH THE RATE IN WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:35  NOT ENABLED
SELECT BEACON INDEX (1-4)..........1
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:35  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #34 (PIN 36) IS REACHED.

```
PAGE:1  C1 PIN:36  NOT ENABLED
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:36  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).....33
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:36  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT REFERENCE SCHEDULE

OUTPUT 33 = Ø2 Ped Yellow
OUTPUT 34 = Ø6 Ped Yellow

ADVANCE BEACON PROGRAMMING DETAIL

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '2' (OUTPUT BEACON SETTINGS).

```
OUTPUT BEACON SETTINGS
TRIGGER PHASES: 12345678910111213141516
BEACON #1 OFF   X
BEACON #2 OFF       X
BEACON #3 OFF
BEACON #4 OFF
                BEACON    1   2   3   4
OFF DELAY TIME (0-255)    0   0   0   0
ON DELAY TIME  (0-255)    0   0   0   0
STOP-TIME HOLD (0-255)    0   0   0   0
```

SCROLL DOWN TO VIEW ALL DATA

ADVANCE BEACON PROGRAMMING COMPLETE

NOTE: AN OUTPUT HAS TO BE ASSIGNED AS AN ADVANCE BEACON IN ORDER FOR PROPER OPERATION TO OCCUR. SEE OUTPUT ASSIGNMENT DETAIL ON THIS SHEET.

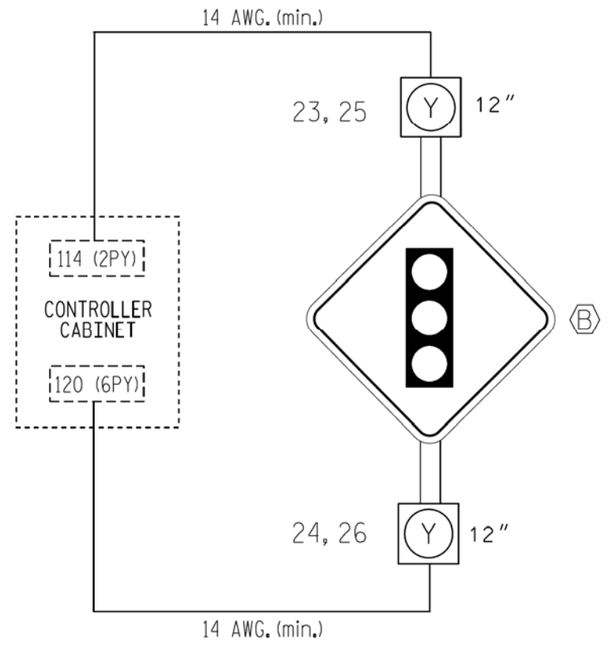
▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0416
DESIGNED: December 2009
SEALED: 12-18-09
REVISED: 7/17/2015

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 7

2016CPT.03.09.10101, Etc.

ADVANCE BEACON #1 WIRING DETAIL

(wire flashers as shown below)

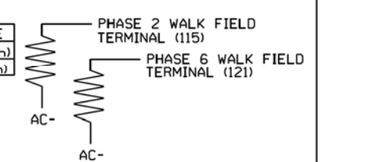


IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 114 (2PY) AND TERMINAL 120 (6PY).
2. INSERT LOADSWITCH FOR S2P AND S6P.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN IN LOAD RESISTOR INSTALLATION DETAIL ON THIS SHEET.
4. TO ACTIVATE SIGN OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUT 33 AND 34 AS SHOWN ON THIS SHEET.

LOAD RESISTOR INSTALLATION DETAIL

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



Signal Upgrade Sheet 6 of 7

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR

DocuSigned by: John T. Rowe, Jr. 7/21/2015 DATE

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Traffic Engineering and Safety Systems Branch, Department of Transportation, Statewide Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

US 17 (Ocean Highway)
at
SR 1304 (Pea Landing Road)/
SR 1165 (Thomasboro Road)

Division 03 | Brunswick County | Near Sunset Beach

PLAN DATE: 08-04-10 | REVIEWED BY:

PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE
▽ No changes to this electrical plan. (WSA)	JTR	7/21/2015

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 8/5/10. This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 03-0416

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mstrong

ADVANCE BEACON #2
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #35 (PIN 37) IS REACHED.

```
PAGE:1  C1 PIN:37  NOT ENABLED
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH. ALONG WITH THE RATE IN WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:37  NOT ENABLED
SELECT BEACON INDEX (1-4)...........2
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:37  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #36 (PIN 38) IS REACHED.

```
PAGE:1  C1 PIN:38  NOT ENABLED
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTOUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:38  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).......35
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:38  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT REFERENCE SCHEDULE

OUTPUT 35 = Ø 4 Ped Yellow
OUTPUT 36 = Ø 8 Ped Yellow

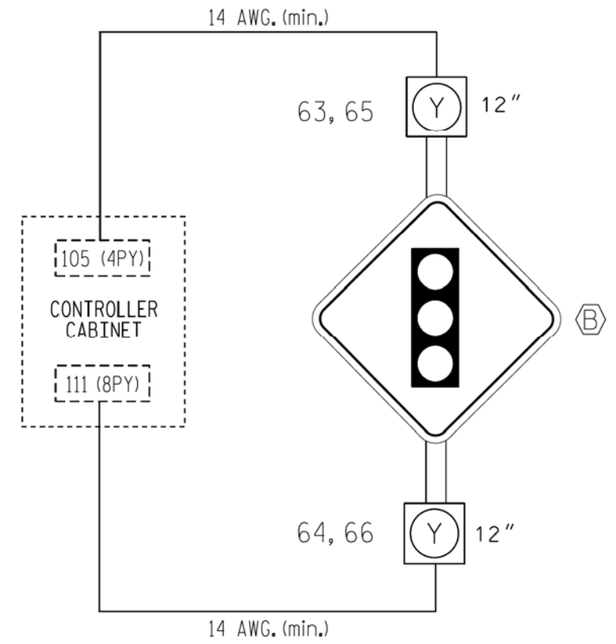
▽ THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0416
DESIGNED: December 2009
SEALED: 12-18-09
REVISED: 7/17/2015

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 8

2016CPT.03.09.10101, Etc.

ADVANCE BEACON #2 WIRING DETAIL

(wire flashers as shown below)



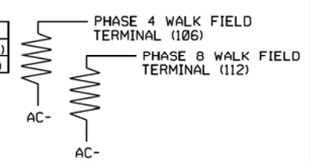
IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 105 (4PY) AND TERMINAL 111 (8PY).
2. INSERT LOADSWITCH FOR S4P AND S8P.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN IN LOAD RESISTOR INSTALLATION DETAIL ON THIS SHEET.
4. TO ACTIVATE SIGN OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUT 35 AND 36 AS SHOWN ON THIS SHEET.

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



Signal Upgrade Sheet 7 of 7

REVISION ▽ SEAL	ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 (Ocean Highway) at SR 1304 (Pea Landing Road)/ SR 1165 (Thomasboro Road)	SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR	*Prepared in the Offices of:* Traffic Engineering and Safety Systems Branch, NCDOT Division of Highways, Traffic Management Section	Division 03 Brunswick County Near Sunset Beach	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 8/5/10. This document is only certified as to the revisions.
DocuSigned by: John T. Rowe, Jr. 7/21/2015 DATE	750 N. Greenfield Pkwy, Garner, NC 27529	PLAN DATE: 08-04-10 REVIEWED BY:	SIGNATURE DATE
641D60C145BE4F5...		PREPARED BY: D.H. Spaulding REVIEWED BY:	SIG. INVENTORY NO. 03-0416
		REVISIONS: ▽ No changes to this electrical plan. (MSA) INIT. JTR DATE 7/21/2015	

21-JUL-2015 06:05
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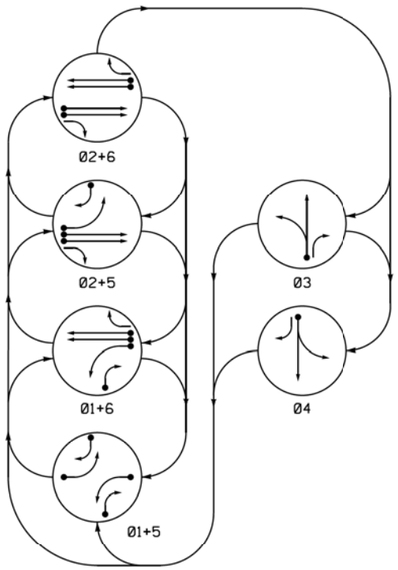
armstrong

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig. 1

2016PT_03_09_10101, Etc.

PHASING DIAGRAM



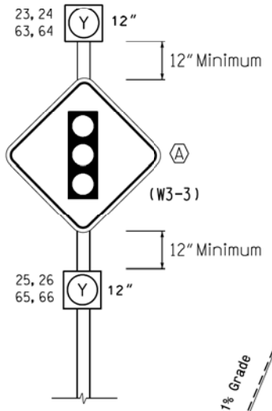
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

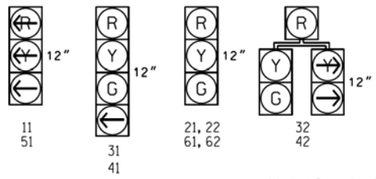
SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	R	Y
23,24, 25,26	ON	ON	OFF	OFF	ON	ON	OFF
31	R	R	R	R	G	R	R
32	R/~~R~~	R/~~R~~	R	R	G	R	R
41	R	R	R	R	G	R	R
42	R/~~R~~	R	R/~~R~~	R	R	G	R
51	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	R	Y
63,64,65,66	ON	OFF	ON	OFF	ON	ON	OFF

Figure 1



SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

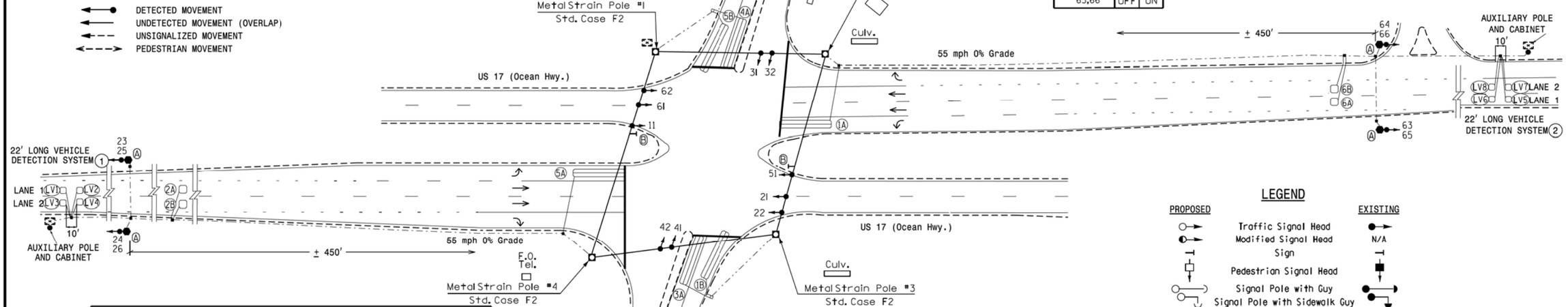
6 Phase
Fully Actuated
Isolated

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. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Activate flashers at the end of green for phase 2 and/or phase 6.

TABLE OF OPERATION

SIGNAL FACE	INTERVAL 1	2
23,24	ON	OFF
25,26	OFF	ON
63,64	ON	OFF
65,66	OFF	ON



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green 1 *	7	14	7	7	7	14
Extension 1 *	2.0	6.0	3.0	3.0	2.0	6.0
Max Green 1 *	15	120	20	20	15	120
Yellow Clearance	3.0	5.2	3.8	5.1	3.0	5.2
Red Clearance	3.8	1.3	2.7	1.7	3.9	1.2
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5
Max Variable Initial *	-	46	-	-	-	46
Time Before Reduction *	-	20	-	-	-	20
Time To Reduction *	-	50	-	-	-	50
Minimum Gap	-	3.4	-	-	-	3.4
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
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.

LONG VEHICLE OVERSPEED DETECTION SYSTEM
LOOP & DETECTION INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR UNITS								
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	CABINET SLOT NO.	LANE NO	DETECTOR CHANNEL	CHANNEL	NEMA PHASE	TIMING FEATURE	TIMING TIME	PLACE CALL DURING PHASE	INHIBIT DELAY DURING GREEN?
LV1	6'X6'	4	1015'	X		①	1	1	1	2*	NONE	- SEC.	ALL	NO
LV2	6'X6'	4	999'	X			1		2		NONE	- SEC.	ALL	NO
LV3	6'X6'	4	1015'	X			2	2	1	2*	NONE	- SEC.	ALL	NO
LV4	6'X6'	4	999'	X			2		2		NONE	- SEC.	ALL	NO
LV5	6'X6'	4	1015'	X		②	1	1	1	6*	NONE	- SEC.	ALL	NO
LV6	6'X6'	4	999'	X			1		2		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		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	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Signal Pedestal	
Ⓐ	Signal Ahead Sign (W3-3)	Ⓐ
Ⓑ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓑ

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023489 ENGINEER PAMELA L. ALEXANDER

DocuSigned by: P L Alexander 7/20/2015 DATE

Signal Upgrade

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

US 17 (Ocean Hwy.) at SR 1300 (Calabash Rd)/ SR 1168 (Country Club Rd.)

Division 03 Brunswick County Calabash

PLAN DATE: November 2009 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE
▽InstallLoops (kgp)	PA	7/20/2015

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally Issued and sealed by Jason P.Galloway,PE-029904 on 12/18/2009 This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 03-0553

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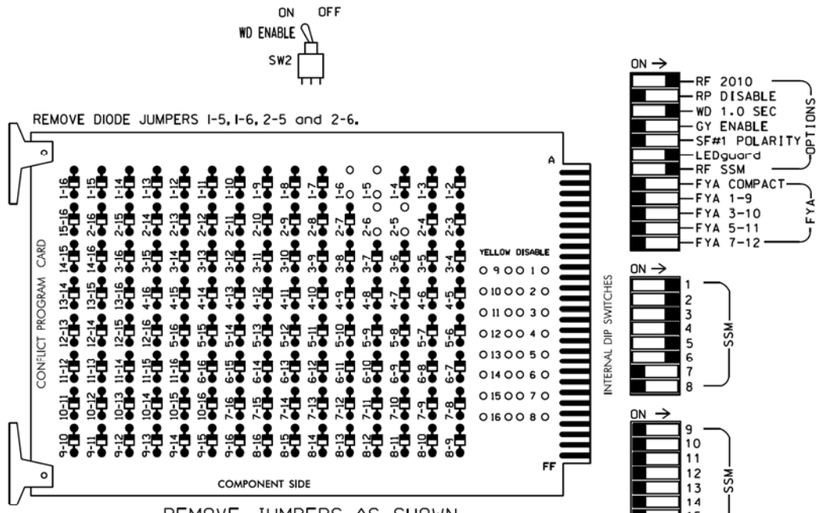
palexander

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 2

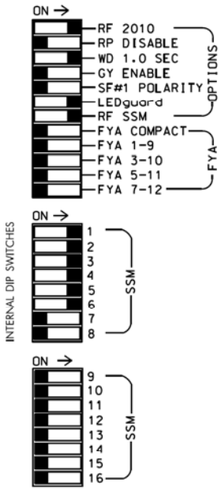
2016CPT.03.09.10101. Etc.

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6
PHASES USED.....1,2,3,4,5 6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

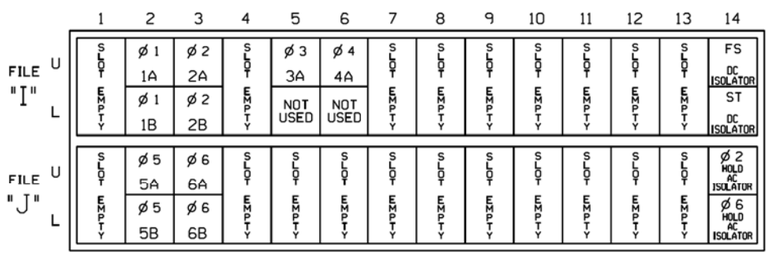
LOAD SWITCH NO.	S1		S2	S2P	S3		S4		S4P	S5		S6	S6P	S7	S8	S8P
PHASE	1		2	2 PED	3		4		4 PED	5		6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	32	21,22	**	31	32	41	42	**	42	51	61,62	**	NU	NU	**
RED			128		116	116	101	101				134				
YELLOW			129		117	117	102	102				135				
GREEN			130		118	118	103	103				136				
RED ARROW	125										131					
YELLOW ARROW	126	126								132	132					
GREEN ARROW	127	127			118		103			133	133					

NU = Not Used

** A Special Advanced Beacon will be wired to 2SP-Y,S4P-Y, S6P-Y and S8P-Y. See wiring and programming detail on Sheet 5 of this electrical detail.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

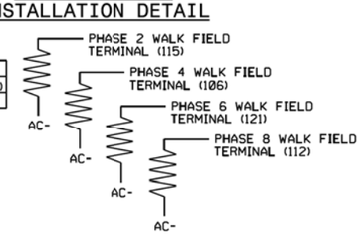
INPUT FILE CONNECTION & PROGRAMMING CHART

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
1A	TB2-5,6	I2U	39	1	2	1	Y	Y			
1B	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A	TB3-5,6	J2U	40	2	6	5	Y	Y			
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

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



NOTE: The purpose of these resistors is to load the channel green monitor inputs in order to prevent the Signal Sequence Monitor from detecting any possible 'phantom' (or false) conflict, as this channel has no green field display.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0553
DESIGNED: November 2009
SEALED: 12-18-09
REVISED: 7-20-15

Signal Upgrade - Sheet 1 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Ocean Hwy.) at SR 1300 (Calabash Rd.)/ SR 1168 (Country Club Rd.)

Division 03 | Brunswick County | Calabash

PLAN DATE: January 2010 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE
1 Installed new loops, no change to electrical detail (JP).	JTR	7/21/2015

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 1-08-10
SIGNATURE DATE

SIG. INVENTORY NO. 03-0553

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jpeterson

INPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS). THEN '+' UNTIL PIN 51 (INPUT 13) IS REACHED.

```
PAGE: 1 C1 PIN:51  HOLD PHASES
INPUT ASSIGNMENT #.................13
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 SYCHRONIZATION (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 '+'

```
PAGE: 1 C1 PIN:52  HOLD PHASES
INPUT ASSIGNMENT #.................14
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 SYCHRONIZATION (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 '+' until input assignment #64 is reached

```
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 SYCHRONIZATION (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)._
```

← Note: Program for Plan 65 and Offset 0

PROGRAMMING COMPLETE

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 #13 IS ON
OR  INPUT    ASSIGNMENT #14 IS ON

                  ↓
              SCROLL DOWN

THEN:
    DELAY FOR  240.0 SECONDS
SET INPUT    ASSIGNMENT #64 ON
```

Input #13 = LVDD System 1 (TB9-10)
Input #14 = LVDD System 2 (TB9-11)

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0553
DESIGNED: November 2009
SEALED: 12-18-09
REVISED: 7-20-15

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

US 17 (Ocean Hwy.)
at
SR 1300 (Calabash Rd.)/
SR 1168 (Country Club Rd.)

Division 03 | Brunswick County | Calabash

PLAN DATE: January 2010 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE
Updated per Joey, no change to electrical detail (JP)	JTR	7/21/2015

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 1-08-10
SIGNATURE DATE

SIG. INVENTORY NO. 03-0553

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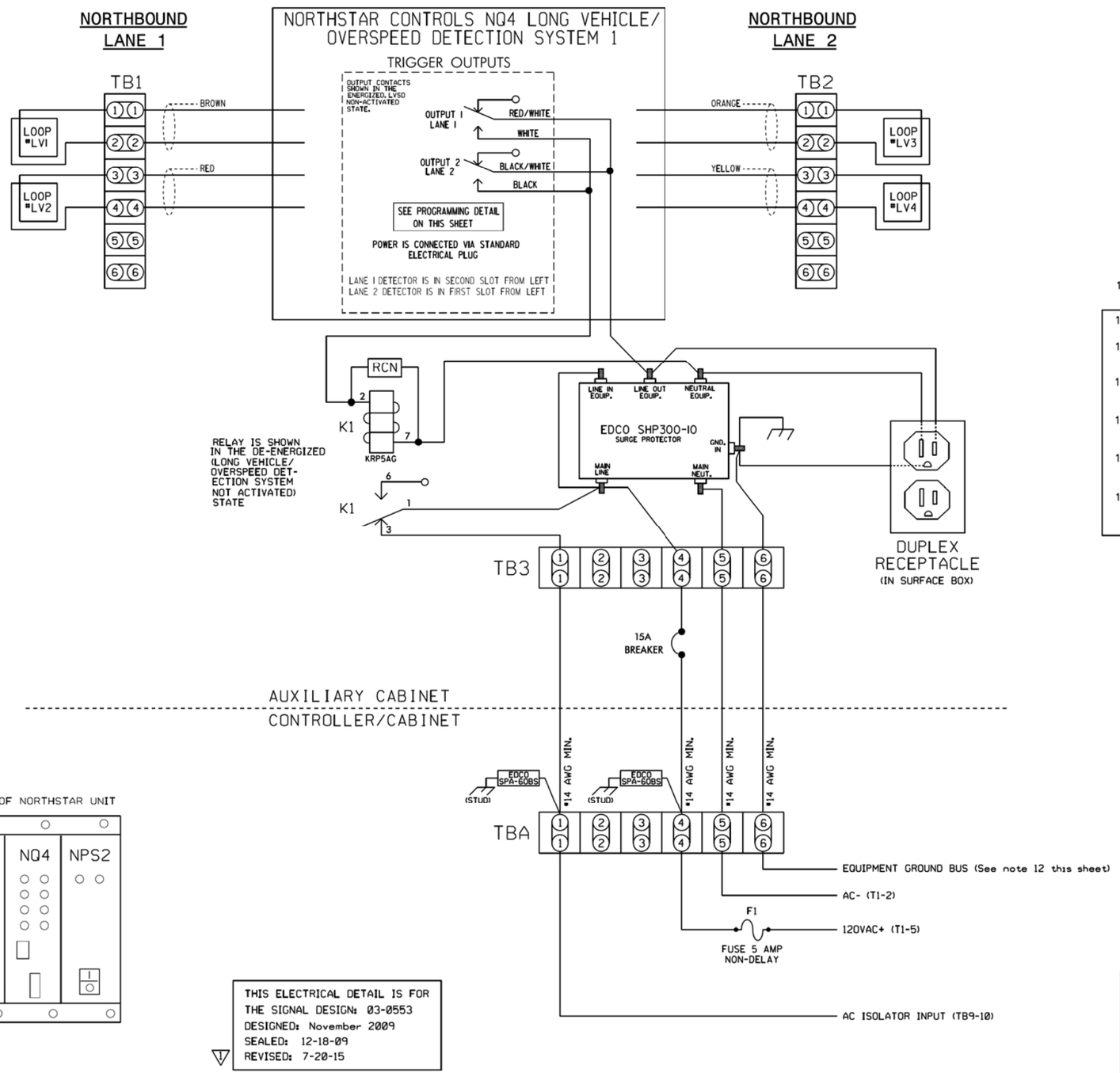
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 4

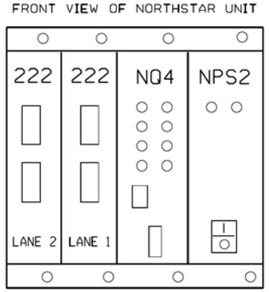
2016CPT.03.09.10101. Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 1

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0553
DESIGNED: November 2009
SEALED: 12-18-09
REVISED: 7-20-15 (1)

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, & TBA to be added by installer.
7. Relay 'K1' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG. Dot Material no. 625028600.
8. The RC Network across the coil of 'K1' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. P&B no. 104M060C100
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 equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.
14. IMPORTANT! A jumper must be installed between input file terminals J14-E and J14-K if not already present.
15. IMPORTANT! For proper operation of the Long Vehicle Detection Unit, tie TB9-12 to AC neutral.
16. IMPORTANT! Make sure both channels of AC Isolator card inserted at input file position J14 are set for inverted operation.

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

Signal Upgrade - Sheet 3 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 (Ocean Hwy.) at SR 1300 (Calabash Rd.)/ SR 1168 (Country Club Rd.)	SEAL
Prepared In the Offices of: Traffic Engineering Branch, Traffic Signal Management Section, NC DEPARTMENT OF TRANSPORTATION	Division 3 Brunswick County Calabash	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: January 2010 REVIEWED BY: JTR	DocuSigned by: John T. Rowe, Jr. 1-08-10 SIGNATURE DATE
	PREPARED BY: James Peterson REVIEWED BY:	SIG. INVENTORY NO. 03-0553
	REVISIONS: (1) Installed new loops, no change to electrical detail (JJP). INIT. JTR DATE 7/21/201	

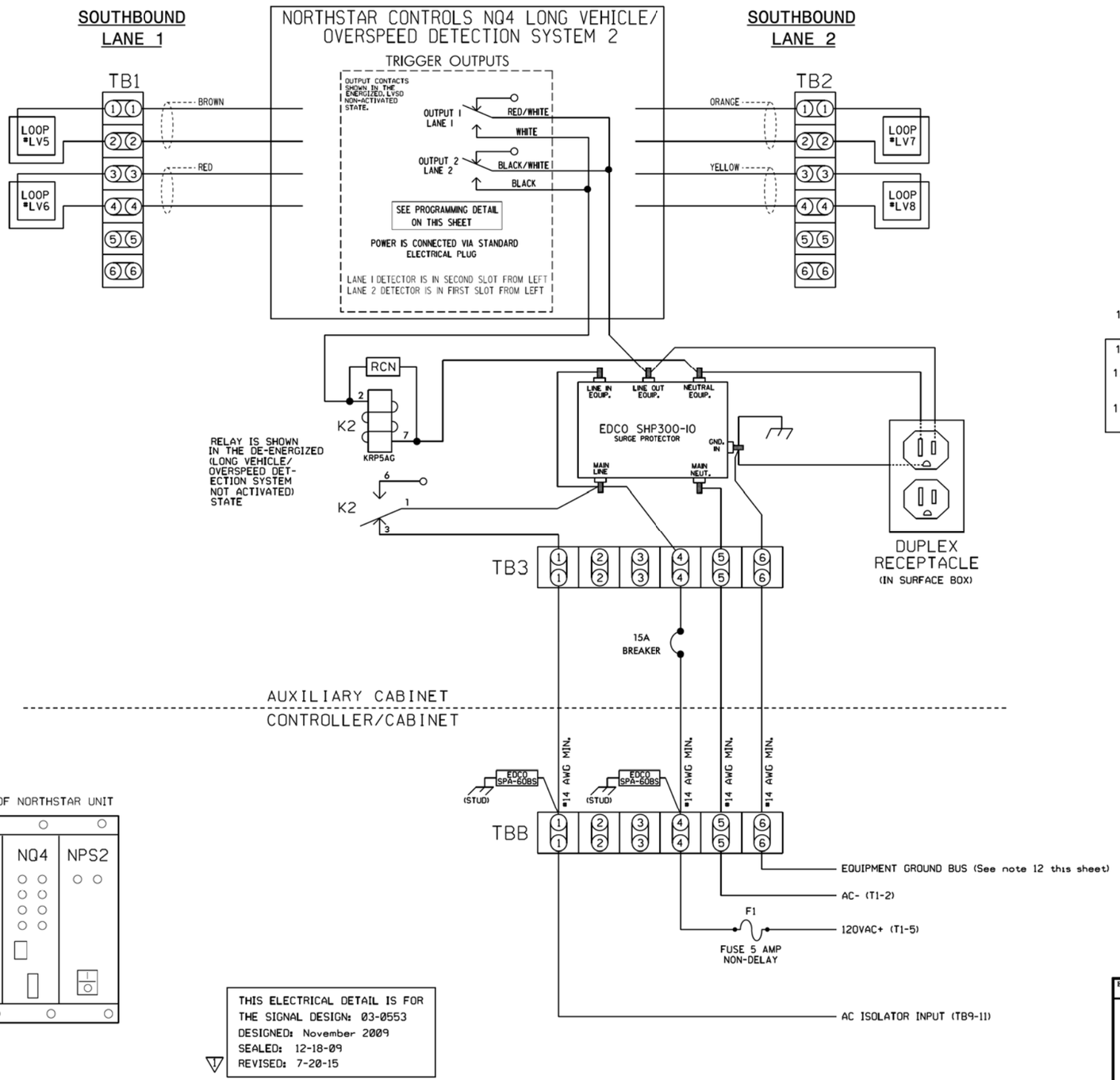
7/16/2015 11:00
S:\TSCM\TS Signals\Workgroups\Sig Mon\Peterson\030553_sheet_20100108.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 5

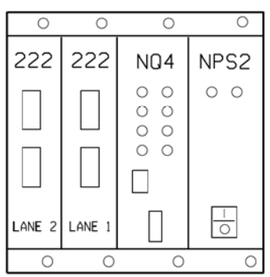
2016CPT.03.09.10101. Etc.

WIRING DETAIL FOR NORTHSTAR CONTROLS NQ4 LONG VEHICLE / OVERSPEED DETECTION SYSTEM NO. 2

(wire unit as shown below)



FRONT VIEW OF NORTHSTAR UNIT



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0553
DESIGNED: November 2009
SEALED: 12-18-09
REVISED: 7-20-15

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 'K2' is a SPDT with an 120VAC coil. Potter & Brumfield no. KRP5AGAG, Dot Material no. 625028600.
8. The RC Network across the coil of 'K2' is a .1 micro farad, 100 ohm. Dot Material no. 106018075. P&B no. 104M060C100
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 equipment ground from controller cabinet to auxiliary cabinet if not already present.
13. Install disconnect if there is no disconnect present at auxiliary cabinet.

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 AND PROGRAMMING DETAILS FOR:	US 17 (Ocean Hwy.) at SR 1300 (Calabash Rd.)/ SR 1168 (Country Club Rd.)	SEAL
Prepared In the Offices of: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section	Division 3 Brunswick County Calabash	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy,Garner,NC 27529	PLAN DATE: January 2010 REVIEWED BY: JTR	DocuSigned by: John T. Rowe, Jr. 1-08-10
	PREPARED BY: James Peterson REVIEWED BY:	SIGNATURE DATE
	REVISIONS: 7/20/15 Installed new loops, no change to electrical detail JTR. INIT. JTR DATE 7/21/2015	SIG. INVENTORY NO. 03-0553

21-JUL-2015 11:01
S:\Traffic\Signals\Workgroups\Sig Mgr\Peterson\030553_sm_ele_20100108.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
N/A	SIG. 6

2016CPT.03.09.10101. Etc.

ADVANCE BEACON
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH. ALONG WITH THE RATE IN WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:35  NOT ENABLED
SELECT BEACON INDEX (1-4)..........1
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:35  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #34 (PIN 36) IS REACHED.

```
PAGE:1  C1 PIN:36  NOT ENABLED
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:36  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).....33
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:36  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #35 (PIN 37) IS REACHED.

```
PAGE:1  C1 PIN:37  NOT ENABLED
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE FIRST THREE PROGRAMMING ROWS DEFINE THE OUTPUT TO FLASH. ALONG WITH THE RATE IN WHICH IT WILL FLASH.

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:37  NOT ENABLED
SELECT BEACON INDEX (1-4)..........2
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'ADVANCE BEACON' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:37  ADVANCE BEACON
OUTPUT ASSIGNMENT #.................35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................Y
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

Output #33 = Ø2 Ped Yellow
Output #34 = Ø6 Ped Yellow
Output #35 = Ø4 Ped Yellow
Output #36 = Ø8 Ped Yellow

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #36 (PIN 38) IS REACHED.

```
PAGE:1  C1 PIN:38  NOT ENABLED
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE NOT ENABLED 'Y' WILL REMAIN UNTIL THE FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER AN 'N'.

```
PAGE:1  C1 PIN:38  NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).....35
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

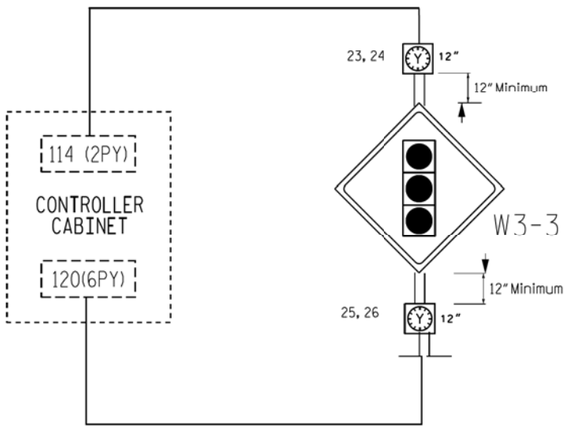
PRESS THE 'ENT' KEY AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'OUT OF PHASE FLASHER' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:38  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................36
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

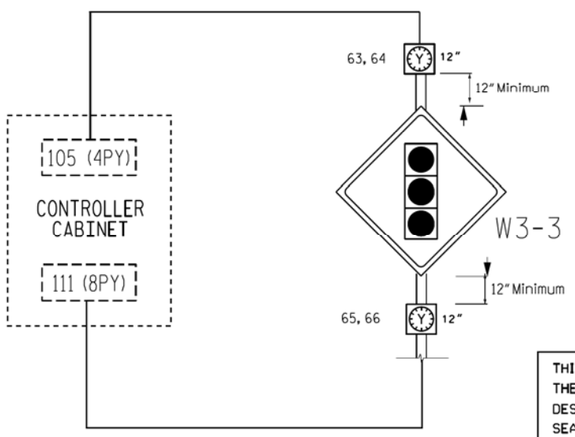
ADVANCE BEACON WIRING DETAIL

(wire flashers as shown below)



IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 114 (2PY) AND TERMINAL 120 (6PY).
2. INSERT LOADSWITCH FOR S2P AND S6P.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN ON LOAD RESISTOR INSTALLATION DETAIL ON SHEET 1.
4. TO PRODUCE FLASHING OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUTS 33 AND 34 AS SHOWN ON THIS SHEET.



IMPORTANT

1. REMOVE, TAPE AND LABEL CONFLICT MONITOR WIRE ATTACHED TO THE REAR OF TERMINAL 105 (4PY) AND TERMINAL 111 (8PY).
2. INSERT LOADSWITCH FOR S4P AND S8P.
3. MAKE SURE LOAD RESISTORS ARE IN PLACE AS SHOWN ON LOAD RESISTOR INSTALLATION DETAIL ON SHEET 1.
4. TO PRODUCE FLASHING OPERATION AS INDICATED ON THE SIGNAL PLANS, RE-ASSIGN OUTPUTS 35 AND 36 AS SHOWN ON THIS SHEET.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0553
DESIGNED: November 2009
SEALED: 12-18-09
REVISED: 7-20-15

ADVANCE BEACON PROGRAMMING DETAIL

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '2' (OUTPUT BEACON SETTINGS).

```
OUTPUT BEACON SETTINGS
TRIGGER PHASES:  123456789101112131415 16
BEACON #1 OFF      X
BEACON #2 OFF         X
BEACON #3 OFF
BEACON #4 OFF
          BEACON     1   2   3   4
OFF DELAY TIME (0-255)  0   0   0   0
ON DELAY TIME  (0-255)  0   0   0   0
STOP-TIME HOLD (0-255)  0   0   0   0
```

SCROLL DOWN TO VIEW ALL DATA

ADVANCE BEACON PROGRAMMING COMPLETE

NOTE: AN OUTPUT HAS TO BE ASSIGNED AS AN ADVANCE BEACON IN ORDER FOR PROPER OPERATION TO OCCUR. SEE OUTPUT ASSIGNMENT DETAIL ON THIS SHEET.

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Ocean Hwy.)
at
SR 1300 (Calabash Rd.)
SR 1300 (Country Club Rd.)

Division 3 | Brunswick County | Calabash

PLAN DATE: January 2010 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE
Updated per comments	JTR	7/21/2015

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
NC DEPARTMENT OF TRANSPORTATION
Signals Management Section
122 N. McDowell St., Raleigh, NC 27603

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
DocuSigned by: John T. Rowe, Jr. 1-08-10
SIGNATURE DATE

SIG. INVENTORY NO. 03-0553

21JUL2015 11:02
I:\TRAFFIC\ITS Signals\Workgroups\Sig Mgmt\Peterson\030553_sm.dgn 20100108.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig.1

2016CPT.03.09.10101, Etc.

Actuated Flasher

TABLE OF OPERATION		
SIGNAL FACE	INTERVAL 1	INTERVAL 2
21, 22	ON	OFF
41	ON	OFF
61, 62	OFF	ON
81, 82	ON	OFF

SIGNAL FACE I.D.

All Heads L.E.D.

R 12" — 81, 82

Y 12" — 41, 21, 22, 61, 62

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	+5	2-4-2	Y	2	Y	Y	-	-	-	-	-
2B	6X40	+5	2-4-2	Y	2	Y	Y	-	-	-	-	-
4A	6X6	✱240	6	-	4	Y	Y	-	4	-	-	-
8A	6X6	240	3	-	8	Y	Y	-	4	-	-	-
8B	6X40	+5	2-4-2	Y	8	Y	Y	-	-	-	-	-
8C	6X6	0	3	Y	8	Y	Y	-	-	-	-	-

✱ See Plans

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Set all detector units to presence mode.
3. Flash beacons 21, 22, 61, 62, 81, and 82 when actuated by loops 8A, 8B, and/or 8C.
4. Flash beacons 21, 22, 61, and 62 when actuated by loops 2A and/or 2B.

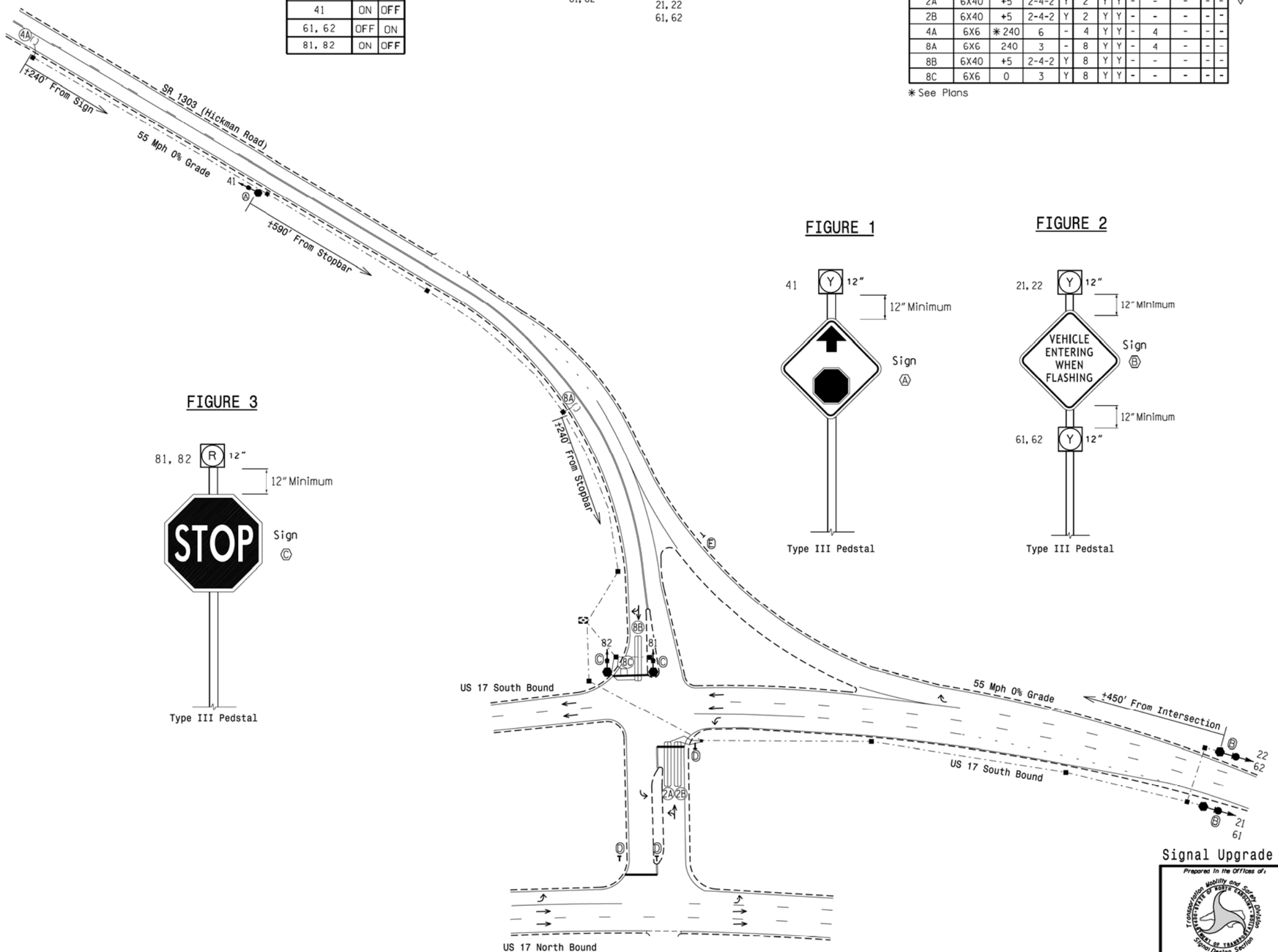


FIGURE 1

FIGURE 2

FIGURE 3

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Type III Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
N/A	Right of Way	
	Directional Arrow	
A	Stop Ahead Sign (W3-1) See Figure 1	A
B	"Vehicle Entering When Flashing" Sign See Figure 2	B
C	"STOP" Sign (R1-1) See Figure 3	C
D	"STOP" Sign (R1-1)	D
E	"YIELD" Sign (R1-2)	E

Signal Upgrade

Prepared in the Offices of:

Transportation Mobility and Safety Division — State of North Carolina — Department of Transportation — Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 50 1"=50'

US 17 at SR 1303 (Hickman Road)

Division 3 Brunswick County Carolina Shores

PLAN DATE:	July 2012	REVIEWED BY:
PREPARED BY:	IOU/PLA	REVIEWED BY:

REVISIONS	INIT.	DATE
▽ Install loops	pla	7/16/2015

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA L. ALEXANDER

DocuSigned by: P L Alexander 7/16/2015

DATE

SIG. INVENTORY NO. 03-1067

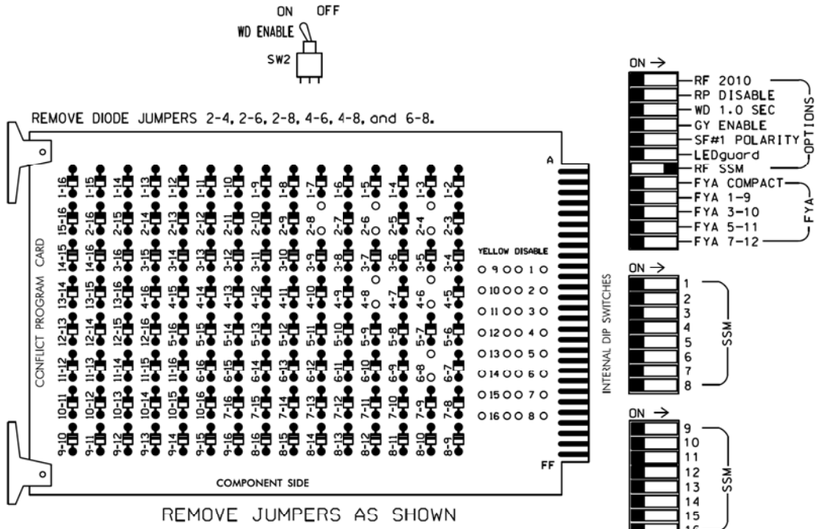
16-JUL-2015 11:09
s:\ITS&SUNITS Signals\Signal Design Section\Eastern Region\Div-03\03-1067\03106T_sig_dsn_2015mmdd.dgn
palexander

PROJECT REFERENCE NO.	SHEET NO.
XXXXXXXXXX	Sig. 2

2016CPT.03.09.10101, Etc.

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

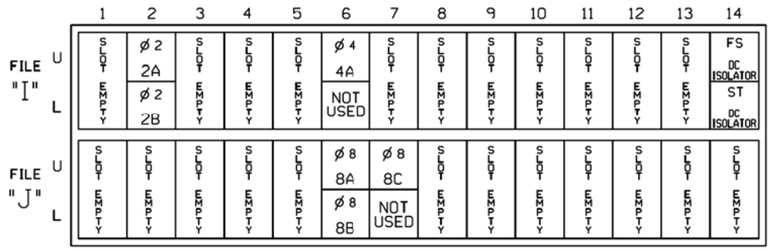
1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.
3. The RED FAIL fault indicator will flash once every two seconds to indicate that red fail monitoring is disabled. This is permissible for the above monitor configuration.

!! !!

■ = DENOTES POSITION OF SWITCH

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		4.0	
8A	TB5-9,10	J6U	42	4	8	8	Y	Y		4.0	
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			

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.

   Make sure yellow flash program plugs are inserted for phases 2, 4 and 6; and red plug for phase 8.

2. To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
3. Program phases 2, 6, 4, and 8 for Start Up In Green.
4. Sequence programming is critical to proper operation. See "Phase Sequence Programming Detail" below.
5. Program phases 2, 4, and 6 for "YELLOW FLASH."

EQUIPMENT INFORMATION

CONTROLLER.....2070L
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

PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

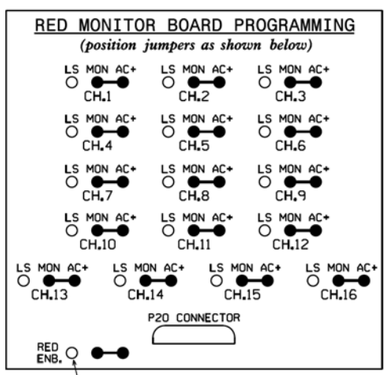
PHASE SEQUENCE: PAGE 1 NEXT: PAGES) ↘

RNG	LEAD	BARRIER 1		X-LAG	LEAD	BARRIER 2		X-LAG
1	0	2	0	0	0	0	0	0
2	0	6	0	0	0	0	0	0
3	0	4	0	0	0	0	0	0
4	0	8	0	0	0	0	0	0

NOTICE PHASES 2, 4, 6, AND 8 IN RESPECTIVE RINGS. AND ALL IN BARRIER 1. NO BARRIER 2 PHASES.

RED MONITOR BOARD PROGRAMMING

(position jumpers as shown below)

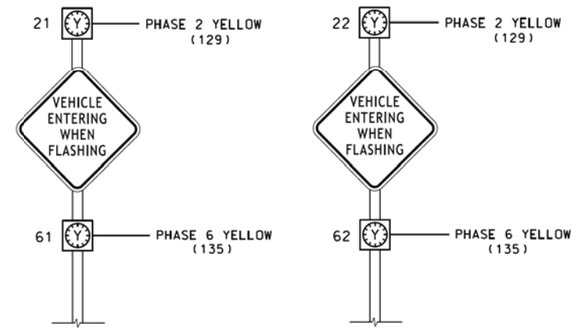


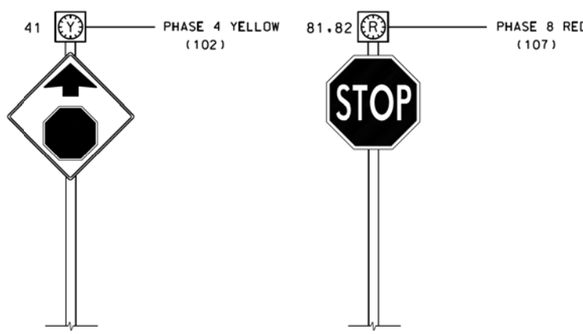
SIGNAL HEAD HOOK-UP CHART

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	NU	NU	61,62	NU	NU	81,82	NU
RED											107	
YELLOW		129			102			135				

NU = Not Used

NOTE: SEE PICTORIAL DIAGRAM OF SIGNAL HEAD WIRING BELOW:





THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1067
DESIGNED: July 2012
SEALED: 7/16/15
REVISED: 7/16/15

Electrical Detail Sheet 1 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Traffic Engineering Branch, Mobility and Safety Division, North Carolina Department of Transportation, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 17
at
SR 1303 (Hickman Road)

Division 03 | Brunswick County | Carolina Shores

PLAN DATE: July 2012 | REVIEWED BY:
PREPARED BY: M.W. HARRISON | REVIEWED BY:

REVISIONS	INIT.	DATE
1)Install loops, no change to electrical detail. (JP)	WK	7/20/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

Docusigned by: John T. Rowe, Jr. 7/31/12
SIGNATURE DATE

SIG. INVENTORY NO. 03-1067

S:\ITS\SIGNALS\Workgroups\Sig Mgmt\Peterson\03106?_smele_20120731.dgn
7/31/2015 11:14
ITS\SIGNALS
tpeterson

PROJECT REFERENCE NO.	SHEET NO.
XXXXXXXXXX	Sig. 3

2016CPT.03.09.10101, Etc.

FLASHER CONTROL LOGIC PROGRAMMING DETAIL

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF VEH CALL ON PHASE #2 IS ON
↓
SCROLL DOWN
THEN:
SET LOGIC FLAG #2 ON

PRESS '+'

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF VEH CALL ON PHASE #4 IS ON
↓
SCROLL DOWN
THEN:
SET LOGIC FLAG #4 ON

PRESS '+'

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF VEH CALL ON PHASE #8 IS ON
↓
SCROLL DOWN
THEN:
SET LOGIC FLAG #8 ON

PRESS '+'

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF VEH CALL ON PHASE #2 IS OFF
↓
SCROLL DOWN
THEN:
SET LOGIC FLAG #2 OFF

PRESS '+'

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF VEH CALL ON PHASE #4 IS OFF
↓
SCROLL DOWN
THEN:
SET LOGIC FLAG #4 OFF

PRESS '+'

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF VEH CALL ON PHASE #8 IS OFF
↓
SCROLL DOWN
THEN:
SET LOGIC FLAG #8 OFF

PRESS '+'

LOGICAL I/O COMMAND #7 (+/-COMMAND#)
IF LOGIC FLAG #2 IS ON
OR LOGIC FLAG #8 IS ON
↓
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #12 ON

PRESS '+'

LOGICAL I/O COMMAND #8 (+/-COMMAND#)
IF LOGIC FLAG #2 IS OFF
AND LOGIC FLAG #8 IS OFF
↓
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #12 OFF

PRESS '+'

LOGICAL I/O COMMAND #9 (+/-COMMAND#)
IF LOGIC FLAG #8 IS ON
↓
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #19 ON

PRESS '+'

LOGICAL I/O COMMAND #10 (+/-COMMAND#)
IF LOGIC FLAG #8 IS OFF
↓
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #19 OFF

LOGICAL I/O COMMAND #11 (+/-COMMAND#)
IF LOGIC FLAG #4 IS ON
↓
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #4 ON

PRESS '+'

LOGICAL I/O COMMAND #12 (+/-COMMAND#)
IF LOGIC FLAG #4 IS OFF
↓
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #4 OFF

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1067
DESIGNED: July 2012
SEALED: 7/16/15
REVISED: 7/16/15

OUTPUT MAP REFERENCE TABLE

OUTPUT 4 = PHASE 4 YELLOW (SIGNAL HEAD 41)
OUTPUT 12 = PHASE 2 YELLOW (SIGNAL HEADS 21,22)
OUTPUT 19 = PHASE 8 RED (SIGNAL HEAD 81)

NOTE: WHEN PHASE 2 YELLOW STARTS FLASHING, PHASE 6 YELLOW WILL FLASH AS WELL, WITH THE EXCEPTION THAT IT WILL BE OUT OF PHASE.

Electrical Detail Sheet 2 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17
at
SR 1303 (Hickman Road)

Division 03 Brunswick County Carolina Shores

PLAN DATE: July 2012 REVIEWED BY:
PREPARED BY: M.W. HARRISON REVIEWED BY:

REVISIONS	INIT.	DATE
1 Install loops, no change to electrical detail. (JP)	JTR	7/20/2012

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 7/31/12
SIGNATURE DATE

SIG. INVENTORY NO. 03-1067

20-JUL-2015 11:31
S:\ITS\SIGNALS\Workgroups\Sig Mar\Peterson\03106 7_sm_ele_20120731.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
XXXXXXXXX	Sig. 4

Z016CPT.03.09.10101, Etc.

OUTPUT RE-ASSIGNMENT PROGRAMMING DETAIL
TO CONVERT LOAD SWITCH S2 (PHASE 2 VEH.) TO FLASHER OUTPUT
(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT (ASSIGNMENTS).
2. WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD. USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 11. AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................11
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:12  NOT ENABLED
OUTPUT ASSIGNMENT #.................11
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 2-RED = NOT ENABLED

PRESS + KEY ONCE
TO ADVANCE TO OUTPUT 12

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:13  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID. 1=FLASH..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PROGRAM OUTPUT TO FLASH AS SHOWN

ENTER A "Y" BESIDE NOT ENABLED

THE VEHICLE PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:13  NOT ENABLED
OUTPUT ASSIGNMENT #.................12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID. 1=FLASH..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 2-YEL - FLASHER OUT

PRESS + KEY ONCE
TO ADVANCE TO OUTPUT 13

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:15  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................13
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:15  NOT ENABLED
OUTPUT ASSIGNMENT #.................13
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 2-GRN = NOT ENABLED

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1067
DESIGNED: July 2012
SEALED: 7/16/15
REVISED: 7/16/15

Electrical Detail Sheet 3 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17
at
SR 1303 (Hickman Road)

Division 03 | Brunswick County | Carolina Shores

PLAN DATE: July 2012 | REVIEWED BY:
PREPARED BY: M.W. HARRISON | REVIEWED BY:

REVISIONS	INIT.	DATE
Winstall loops..no change to electrical detail. (JP)	JTR	7/20/201

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

Docusigned by: John T. Rowe, Jr. 7-31-12
SIGNATURE DATE

SIG. INVENTORY NO. 03-1067

20-JUL-2015 11:32
S:\Traffic\Shared\Signals\Workgroups\Sig Mgmt\Peterson\031067_sm.e1e.20120731.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
XXXXXXXXX	Sig. 5

2016CPT.03.09.10101, Etc.

OUTPUT RE-ASSIGNMENT PROGRAMMING DETAIL
TO CONVERT LOAD SWITCH S6 (PHASE 6 VEH.) TO OUT OF PHASE FLASHER

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT (ASSIGNMENTS).
2. WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD. USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 27. AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:29  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................27
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:29  NOT ENABLED
OUTPUT ASSIGNMENT #.................27
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 6-RED = NOT ENABLED

PRESS + KEY ONCE
TO ADVANCE TO OUTPUT 28

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:30  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................28
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE VEHICLE PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N".

ENTER A "Y" BESIDE "OUT OF PHASE FLASHER"

AFTER "OUT OF PHASE FLASHER" HAS BEEN SELECTED THE SCREEN BELOW WILL APPEAR. ENTER "12" TO CORRELATE FLASHER OUTPUT WITH OUTPUT 12.

```
PAGE:1  C1 PIN:30  VEHICLE PHASE
SELECT OUTPUT ASSIGNMENT (1-64).....12
```

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "OUT OF PHASE FLASHER" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:30  OUT OF PHASE FLASHER
OUTPUT ASSIGNMENT #.................28
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................Y
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 6-YEL = OUT OF PHASE FLASHER OUTPUT

PRESS + KEY ONCE
TO ADVANCE TO OUTPUT 29

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:31  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................29
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:31  NOT ENABLED
OUTPUT ASSIGNMENT #.................29
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID. 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 6-GRN = NOT ENABLED

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1067
DESIGNED: July 2012
SEALED: 7/16/15
REVISED: 7/16/15

Electrical Detail Sheet 4 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at SR 1303 (Hickman Road)	SEAL
Prepared In the Offices of: NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section	Division 03 Brunswick County Carolina Shores	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy,Garner,NC 27529	PLAN DATE: July 2012 REVIEWED BY:	Docusigned by: John T. Rowe, Jr. 7/31/12 SIGNATURE DATE
	PREPARED BY: M.W. HARRISON REVIEWED BY:	SIG. INVENTORY NO. 03-1067
	REVISIONS: Winstall loops, no change to electrical detail..(JR) INIT. JTR DATE 7/20/201	

20-JUL-2015 11:33
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jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
~~XXXXXXXX~~	Sig. 6

Z016CPT.03.09.10101, Etc.

OUTPUT RE-ASSIGNMENT PROGRAMMING DETAIL
TO CONVERT LOAD SWITCH S4 (PHASE 4 VEH.) TO FLASHER

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT (ASSIGNMENTS).
2. WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 3, AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:4   VEHICLE PHASE
OUTPUT ASSIGNMENT #.................3
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" BESIDE "NOT ENABLED"

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:4   NOT ENABLED
OUTPUT ASSIGNMENT #.................3
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 4-RED = NOT ENABLED

PRESS + KEY ONCE
TO ADVANCE TO OUTPUT 4

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:5   VEHICLE PHASE
OUTPUT ASSIGNMENT #.................4
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID, 1=FLASH..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PROGRAM OUTPUT TO FLASH AS SHOWN

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

LS 4-YEL = FLASHER OUTPUT

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:5   NOT ENABLED
OUTPUT ASSIGNMENT #.................4
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID, 1=FLASH..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS + TO ADVANCE
TO OUTPUT 5

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:6   VEHICLE PHASE
OUTPUT ASSIGNMENT #.................5
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:6   NOT ENABLED
OUTPUT ASSIGNMENT #.................5
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LS 4-GRN = NOT ENABLED

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1067
DESIGNED: July 2012
SEALED: 7/16/15
REVISED: 7/16/15

Electrical Detail Sheet 5 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at SR 1303 (Hickman Road)	SEAL
Prepared In the Offices of: NCDOT Traffic Engineering Branch, Signals Management Section 750 N.Greenfield Pkwy,Garner,NC 27529	Division 03 Brunswick County Carolina Shores PLAN DATE: July 2012 REVIEWED BY: PREPARED BY: M.W. HARRISON REVIEWED BY: REVISIONS: Install loops..no change to electrical detail. (JP) — INIT. TTR — DATE 7/20/2012	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR. Designed by: John T. Rowe, Jr. 7/31/12 SIGNATURE DATE SIG. INVENTORY NO. 03-1067

29-JUL-2015 11:34
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jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
XXXXXXXXX	Sig. 7

Z016CPT.03.09.10101, Etc.

OUTPUT RE-ASSIGNMENT PROGRAMMING DETAIL
TO CONVERT LOAD SWITCH S8 (PHASE 8 VEH.) TO FLASHER

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT (ASSIGNMENTS).
2. WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 19, AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:21  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................19
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID, 1=FLASH..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PROGRAM OUTPUT TO FLASH AS SHOWN

ENTER A "Y" BESIDE "NOT ENABLED"

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

LS 8-RED = FLASHER OUTPUT

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:21  NOT ENABLED
OUTPUT ASSIGNMENT #.................19
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID, 1=FLASH..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS + KEY ONCE TO ADVANCE TO OUTPUT 20

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:22  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................20
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

LS 8-YEL = NOT ENABLED

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:22  NOT ENABLED
OUTPUT ASSIGNMENT #.................20
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS + KEY ONCE TO ADVANCE TO OUTPUT 21

SCROLL DOWN TO VIEW ALL DATA

```
PAGE:1  C1 PIN:23  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................21
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

ENTER A "Y" TO DISABLE THIS OUTPUT

THE VEH. PHASE "Y" WILL REMAIN UNTIL FUNCTION OF THIS OUTPUT IS CHANGED. DO NOT ENTER A "N". ENTER A "YES" BESIDE "NOT ENABLED" AS SHOWN.

LS 8-GRN = NOT ENABLED

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "NOT ENABLED" AS SHOWN BELOW:

```
PAGE:1  C1 PIN:23  NOT ENABLED
OUTPUT ASSIGNMENT #.................21
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1067
DESIGNED: July 2012
SEALED: 7/16/15
REVISED: 7/16/15

Electrical Detail Sheet 6 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 at SR 1303 (Hickman Road)	SEAL
Prepared In the Offices of: NCDOT Traffic Engineering Branch, Signals Management Section	Division 03 · Brunswick County · Carolina Shores	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy,Garner,NC 27529	PLAN DATE: July 2012 · REVIEWED BY:	Designed by: John T. Rowe, Jr. 7/31/12 (SIGNATURE) (DATE)
	PREPARED BY: M.W. HARRISON · REVIEWED BY:	SIG. INVENTORY NO. 03-1067
	REVISIONS: 1 Install loops..no change to electrical detail..(JP) · INIT. TTR · DATE 7/20/2015	

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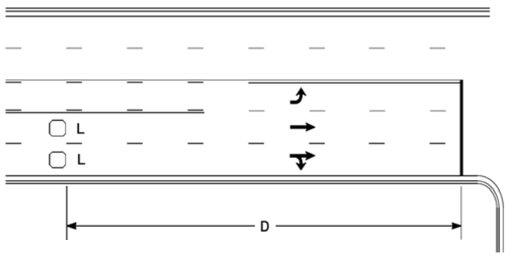
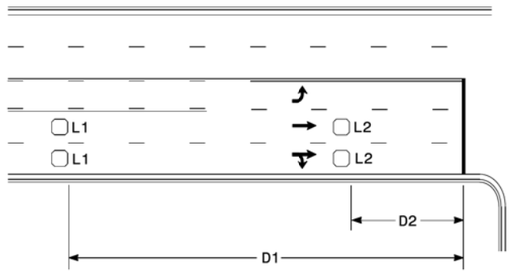
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
2016CPT.03.09.10101, Etc.	SIG-1.1

High Speed Detection
(≥40 mph)



OR



Speed Limit mph	D ft
40	250
45	300
50	355
55	420

L = 6ft X 6ft
Wired in series for TS1 Controllers
Wired separately for TS2, 170, and 2070L Controllers

Volume Density Operation

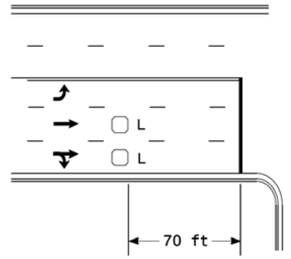
Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

L1 = 6ft X 6ft
Wired in series

L2 = 6ft X 6ft
Wired in series

"Stretch" Operation

Low Speed Detection
(≤35 mph)



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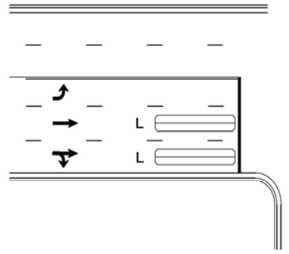
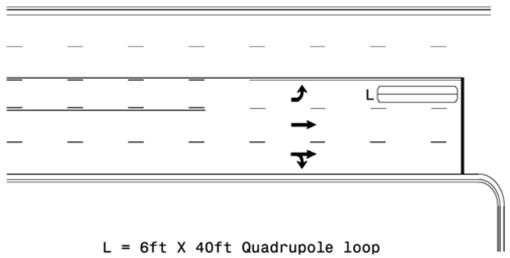


L = 6ft X 6ft
Wired in series

L = 6ft X 40ft
Quadrupole loop, wired separately

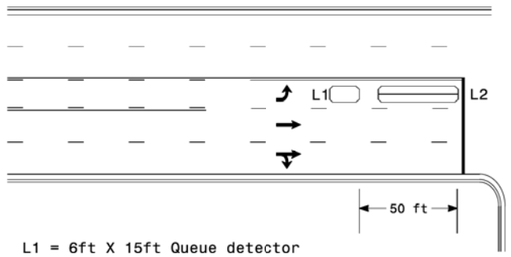
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

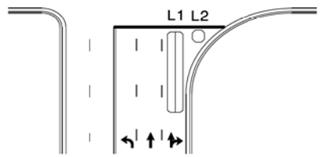
OR



L1 = 6ft X 15ft Queue detector
L2 = 6ft X 40ft Quadrupole loop

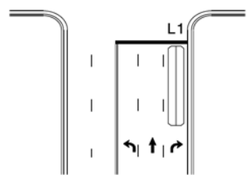
Queue Loop Detection

Right Turn Lane Detection

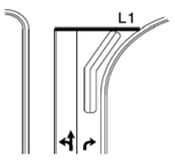


L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately

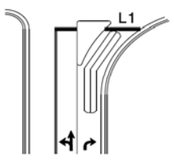
Shared Lane/
Wide Radius Turn



Standard Turn

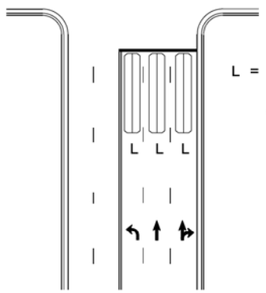


Wide Radius Turn



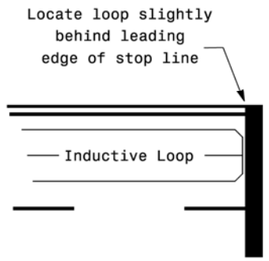
Channelized Turn

Side Street Detection



L = 6ft X 40ft
Quadrupole loop
Wired to separate detectors/channels

Presence Loop Placement at Stop Lines



Note:
Loop may be located in advance of stop line under any of the following conditions:
1) stop line is greater than 15' from edge of intersecting roadway
2) loop detects a permissive or protected/permissive left turn
3) for an exclusive right turn lane

Recommended Number of Turns

Single 6' X 6' loop
(when wired separately):

Length of Lead-in ft	Number of Turns
< 250	3
250-375	4
375-525	5
> 525	6

Quadrupole loops: Use 2-4-2 turns

6' X 15' Loops:
Lead-in < 150', use 2 turns
Lead-in > 150', use 3 turns

Prepared in the Offices of:
Traffic Engineering Branch
Traffic Operations Section
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

Typical Signal Loop Locations

PLAN DATE: January 2015 | REVIEWED BY: JPG
PREPARED BY: PLA | REVIEWED BY:

SCALE: N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA L ALEXANDER
DocuSigned by: P L Alexander B475E0DCE4E46D...
1/30/2015
DATE
SIG. INVENTORY NO.

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palexander