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09/08/99

TIP PROJECT: W-5601FY

CONTRACT: DF00141

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

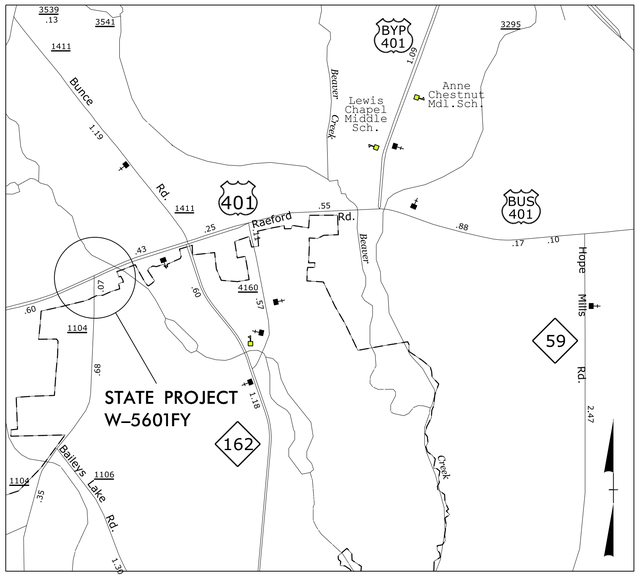
CUMBERLAND COUNTY

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

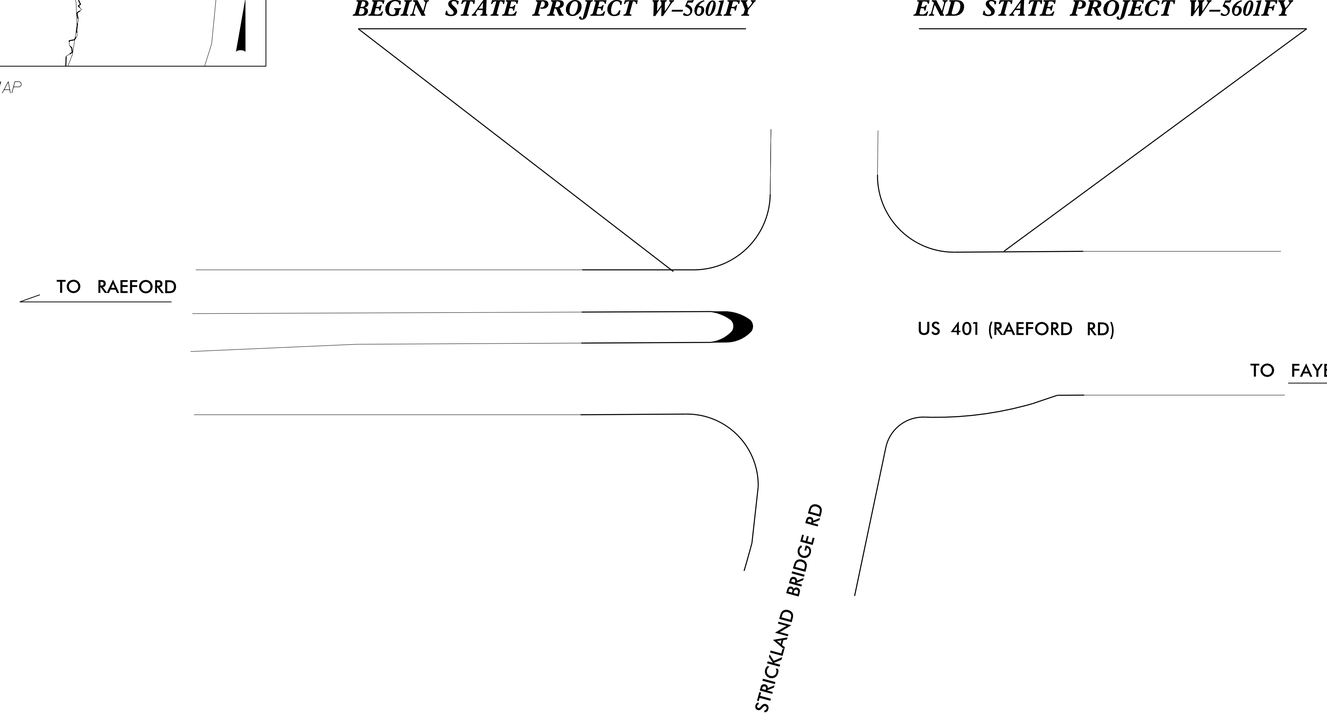
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50138.1.182	HSIP-0401(277)	P.E.
50138.3.182	HSIP-0401(277)	CONSTRUCTION

LOCATION: US 401 (RAEFORD ROAD) AT SR 1104 (STRICKLAND BRIDGE ROAD)

TYPE OF WORK: PEDESTRIAN SIGNALS AND PAVEMENT MARKINGS



VICINITY MAP



DESIGN DATA	PROJECT LENGTH
ADT 2016 = 26,500 ADT 2036 = 48,000	TOTAL LENGTH OF PROJECT W-5601FY = 0.06mi

Prepared in the Office of:
DIVISION OF HIGHWAYS
431 Transportation Dr., Fayetteville NC 28301

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: OCTOBER 19, 2016

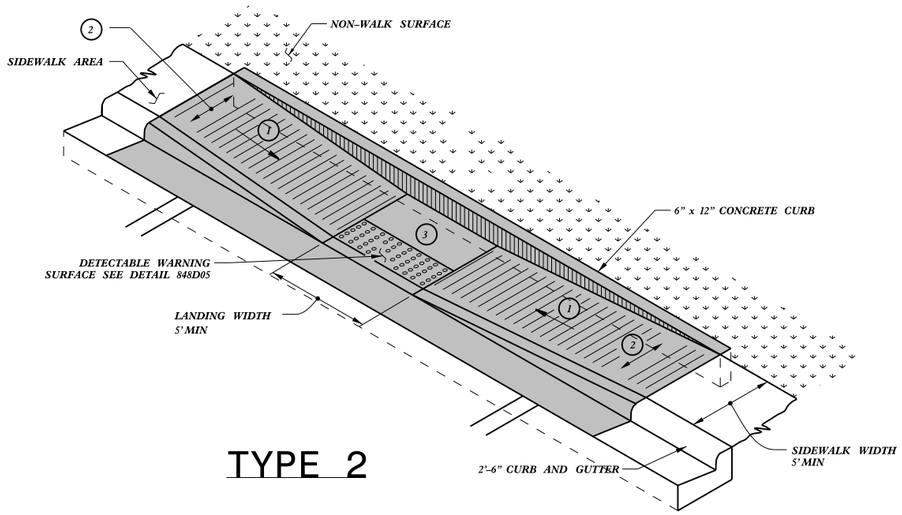
SEAN MATUSZEWSKI
PROJECT ENGINEER

NEIL BUTLER
PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

22-SEP-2016 10:50
H:\DDC\Projects\W5601FY Raeford Road at Strickland Bridge Road_Cumberland Co\Roadway\proj\W-560IFY_Rdy_tsh.dgn
$$$$USERNAME$$$$

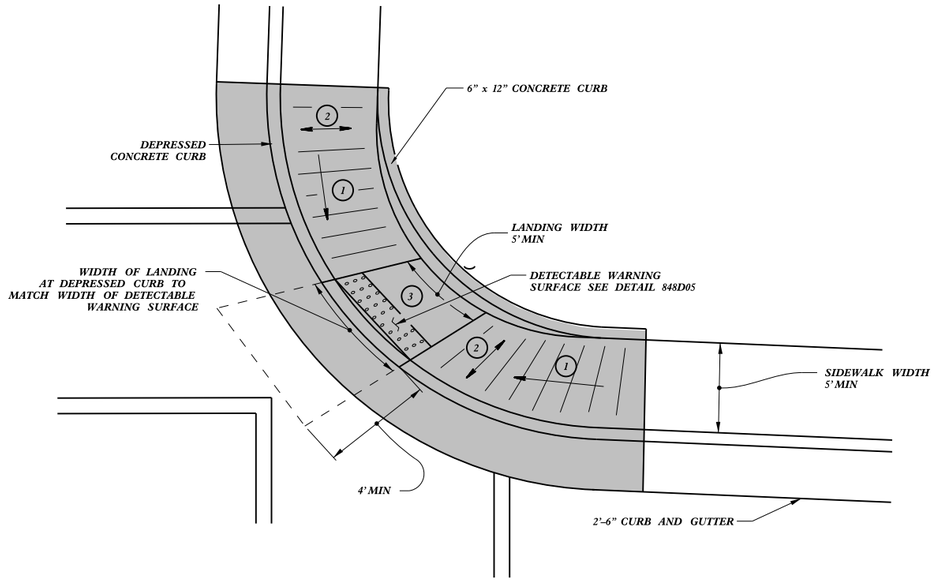
PROJECT REFERENCE NO.	SHEET NO.
W-5601FY	2B



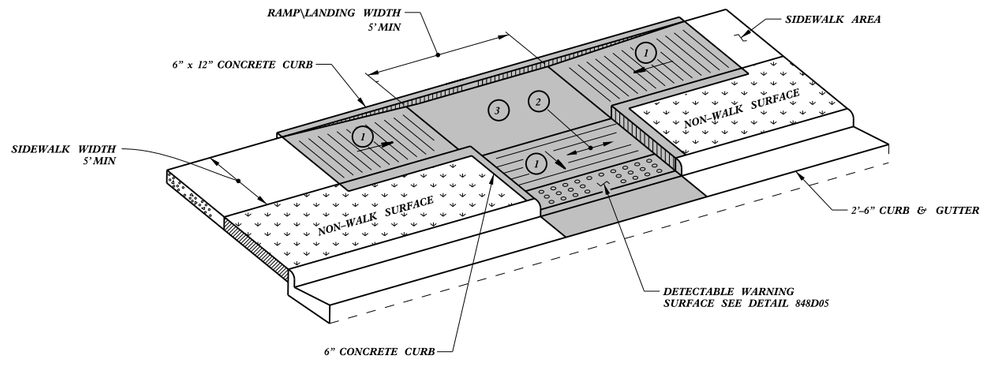
TYPE 2

PAY LIMITS FOR CURB RAMP

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



TYPE 2A



TYPE 3

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

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

CURB RAMPS

Parallel Ramps

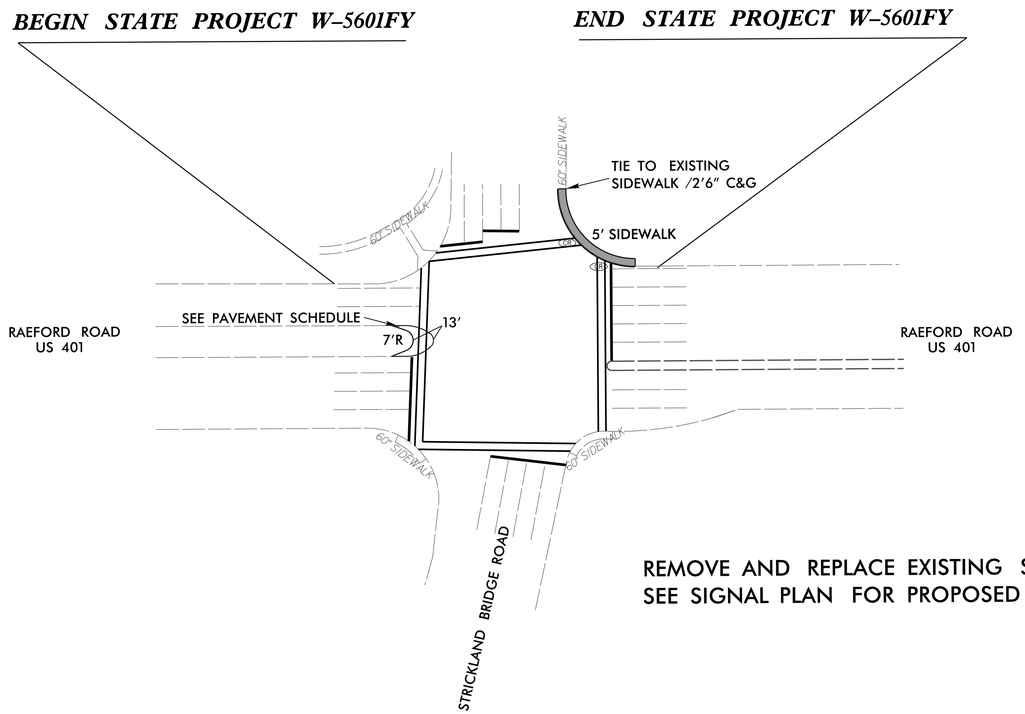
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

5/14/99

22-MAR-2012 15:07
S:\Contracts\Special Details\jhowerton\Standard Drawings\2012 Standard Drawings\2012 Curb Ramp Special Details\Curb Ramp Details.dgn
jhowerton
AT CSD0237501

PROJECT REFERENCE NO.	SHEET NO.
W-5601FY	4

PAVEMENT SCHEDULE
PROP. APPROX. 3" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
PROP. APPROX 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.



REMOVE AND REPLACE EXISTING STOP BARS AND CROSSWALKS
SEE SIGNAL PLAN FOR PROPOSED STOP BAR AND CROSSWALK PLACEMENT

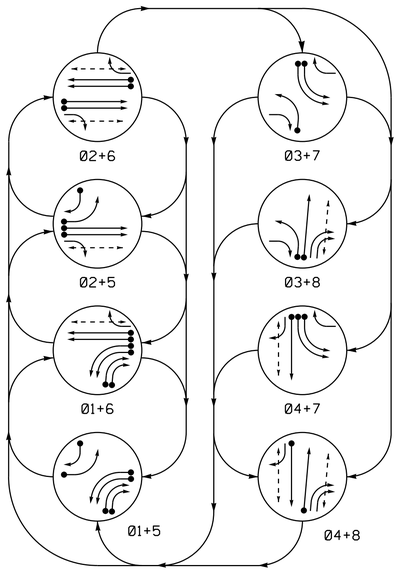
* NO SURVEY WAS PERFORMED.
EXISTING ROADWAY ESTABLISHED FROM AERIAL PHOTOGRAPHY.

REVISIONS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

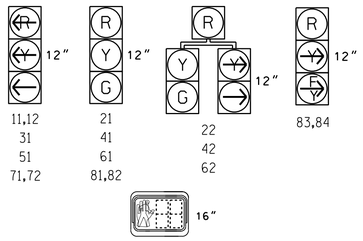
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11,12	←-	←-	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R/→	R/→	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	~~←~~	~~←~~	~~R~~	~~R~~	~~R~~
41	R	R	R	R	R	R	G	G	R
42	R/→	R	R/→	R	R	R	G	G	R
51	~~←~~	~~R~~	~~—~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R/→	R	R/→	R	Y
71,72	~~R~~	~~R~~	~~R~~	~~R~~	~~←~~	~~R~~	~~←~~	~~R~~	~~R~~
81,82	R	R	R	R	R	G	R	G	R
83,84	F.Y	F.Y	R	R	R	F.Y	R	F.Y	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



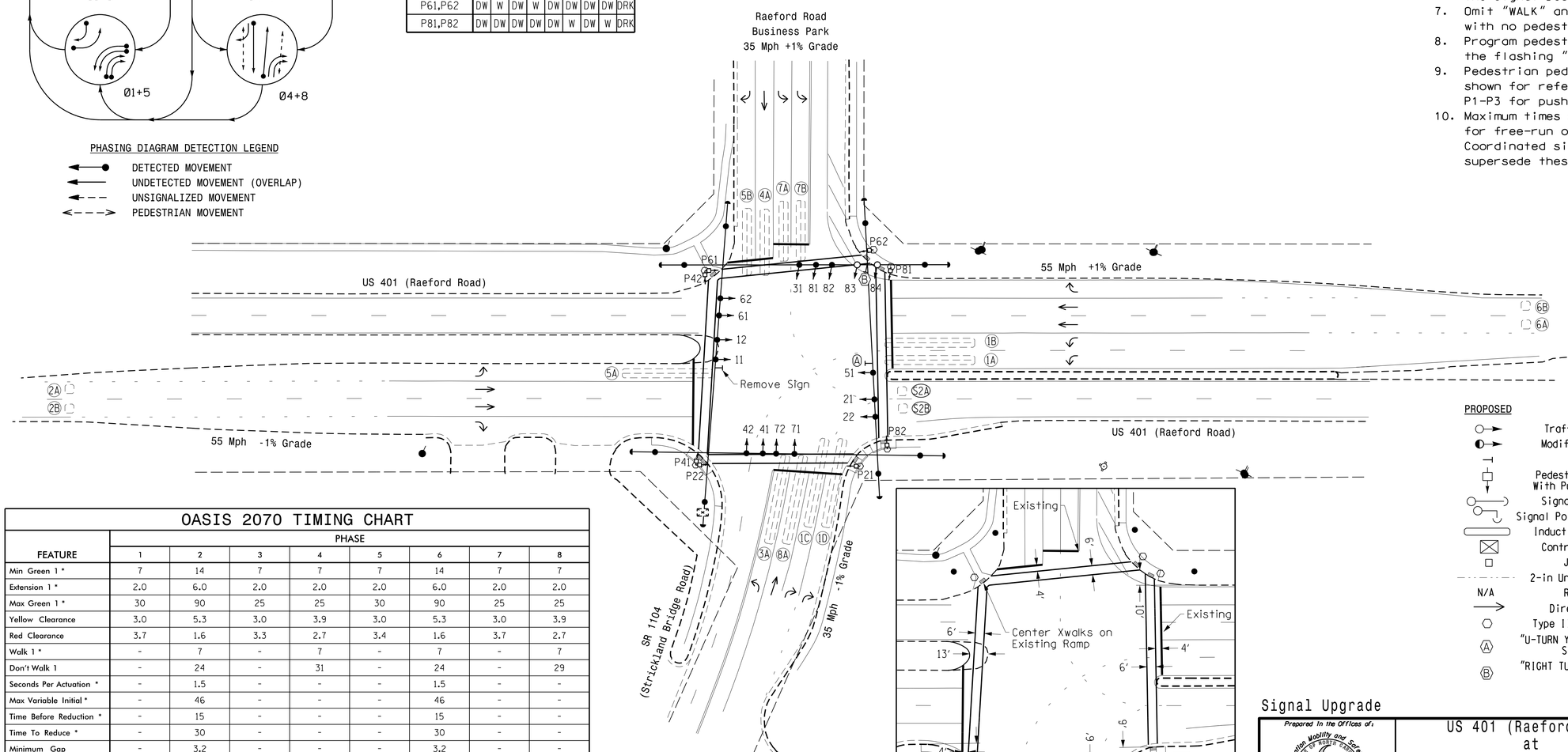
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

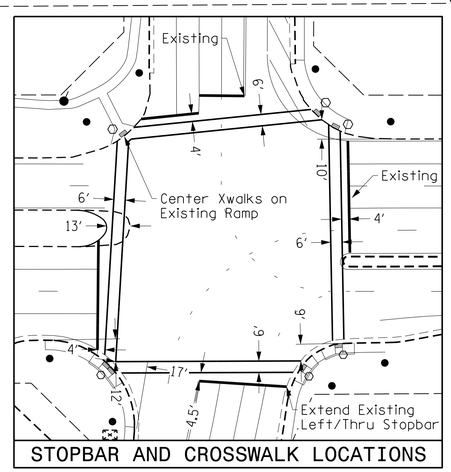
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A,1B	6X60	+5	2-4-2	-	1	Y	Y	-	-	-	-	-
1C,1D	6X60	+23	2-4-2	-	1	Y	Y	-	-	10	-	-
2A	6X6	414	4	-	2	Y	Y	-	-	-	-	-
2B	6X6	414	4	-	2	Y	Y	-	-	-	-	-
3A	6X60	+10	2-4-2	-	3	Y	Y	-	-	-	-	-
4A	6X45	+10	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X60	+12	2-4-2	-	5	Y	Y	-	-	-	-	-
5B	6X45	+10	2-4-2	-	5	Y	Y	-	-	10	-	-
6A	6X6	420	4	-	6	Y	Y	-	-	-	-	-
6B	6X6	420	4	-	6	Y	Y	-	-	-	-	-
7A,7B	6X40	+10	2-4-2	-	7	Y	Y	-	-	-	-	-
8A	6X60	+10	2-4-2	-	8	Y	Y	-	-	-	-	-
S2A	6X6	+137	4	-	-	-	-	-	-	-	Y	-
S2B	6X6	+137	4	-	-	-	-	-	-	-	Y	-

8 Phase
Fully Actuated
Fayetteville Signal System

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. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.





STOPBAR AND CROSSWALK LOCATIONS

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○→	Signal Pole with Sidewalk Guy	●→
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	-----
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ
Ⓑ	"RIGHT TURN YIELD TO U-TURN" Sign	Ⓑ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	14	7	7	7	14	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	30	90	25	25	30	90	25	25
Yellow Clearance	3.0	5.3	3.0	3.9	3.0	5.3	3.0	3.9
Red Clearance	3.7	1.6	3.3	2.7	3.4	1.6	3.7	2.7
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	24	-	31	-	24	-	29
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	46	-	-	-	46	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.2	-	-	-	3.2	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	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.

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 401 (Raeford Road)
at
SR 1104 (Strickland Bridge Road)

Division 6 Cumberland County Fayetteville

PLAN DATE:	February 2016	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 029904
ENGINEER
JASON P. GALLOWAY

DocuSigned by: Jason P. Galloway F700EA704B184D...
3/7/2016
DATE

SIG. INVENTORY NO. 06-0596

07-MAR-2016 13:39
S:\#TSGSW\Traffic Signals\Signal Design Section\Eastern Region\Div-06\06-0596\060596_sig_dsn_201602dd.dgn
jgalloway

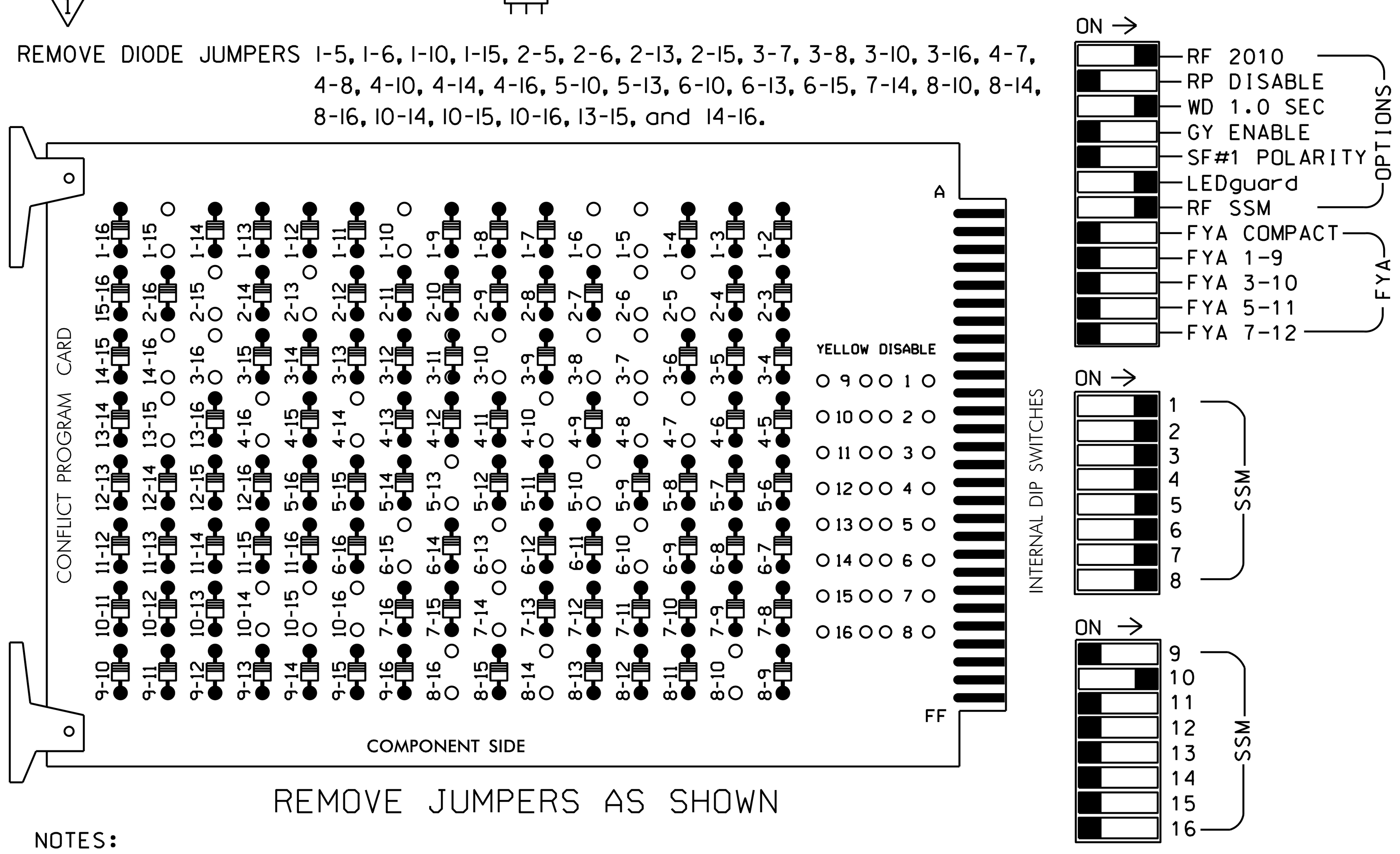
PROJECT REFERENCE NO.	SHEET NO.
	Sig. 1.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2

1 REMOVE DIODE JUMPERS 1-5, 1-6, 1-10, 1-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-10, 3-16, 4-7, 4-8, 4-10, 4-14, 4-16, 5-10, 5-13, 6-10, 6-13, 6-15, 7-14, 8-10, 8-14, 8-16, 10-14, 10-15, 10-16, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = 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 9,11,12 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. (1) Program phases 2, 4, 6, and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 2 as Wag Overlaps.
8. This cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.............2070L
CABINET................SAFETRAN
SOFTWARE...............ECONOLITE OASIS
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS..18 (12-STD, 6-AUX)
(1) LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6,S6P, S7,S8,S8P,S10
(1) PHASES USED...........1,2,2PED,3,4,4PED,5,6,6PED, 7,8,8PED
OVERLAP "A"............NONE
OVERLAP "B"............1+8
OVERLAP "C"............NONE
OVERLAP "D"............NONE

(1) 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.	11,12	21,22	P21, P22	31	22	41,42	P41, P42	51	42	61,62	P61, P62	71,72	62	81,82	P81, P82	NU	83,84 ★	NU	NU	NU	NU
RED		128				101				134				107			A124				
YELLOW		129				102				135				108							
GREEN		130				103				136				109							
RED ARROW	125			116				131				122									
YELLOW ARROW	126			117	117			132	132			123	123				A125				
FLASHING YELLOW ARROW																	A126				
GREEN ARROW	127			118	118			133	133			124	124								
(hand)			113				104				119				110						
(walking person)			115				106				121				112						

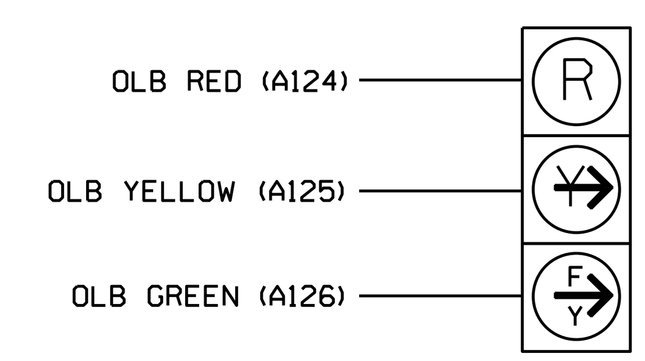
NU = Not Used

★ See pictorial of head wiring in detail below.

(1) NOTE: For signal heads 83 and 84 to flash concurrently with 31, 81, and 82, locate the wire that connects terminal 01-5 on the rear of the output file to terminal 03-1 on the rear of the auxiliary output file. Remove this wire from terminal 01-5 and terminate it on terminal 01-7.

(1) FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



83,84

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	U	SLOT EMPTY	ø2 2A	ø2 S2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø3 3A	SLOT EMPTY	ø1 1A,1B	SLOT EMPTY	SLOT EMPTY	ø2PED DC ISOLATOR	ø6PED DC ISOLATOR	FS DC ISOLATOR
	L		ø2 2B	ø2 S2B				ø4 4A		ø1 1C,1D			ø4PED DC ISOLATOR	ø8PED DC ISOLATOR	ST DC ISOLATOR
"J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø7 7A,7B	SLOT EMPTY	ø5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B					ø8 8A		ø5 5B					

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			
* S2A	TB2-9,10	I3U	63	25	32	SYS					
* S2B	TB2-11,12	I3L	76	38	42	SYS					
3A	TB6-1,2	I7U	65	27	34	3	Y	Y			
4A	TB6-3,4	I7L	78	40	44	4	Y	Y			
1A,1B	TB6-9,10	I9U	60	22	11	1	Y	Y			
1C,1D	TB6-11,12	I9L	62	24	13	1	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
7A,7B	TB7-1,2	J7U	66	28	38	7	Y	Y			
8A	TB7-3,4	J7L	79	41	48	8	Y	Y			
5A	TB7-9,10	J9U	59	21	15	5	Y	Y			
5B	TB7-11,12	J9L	61	23	17	5	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

(1) COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press '8' (Overlaps), then '1' (Vehicle Overlap Settings). PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          ¦12345678910111213141516
VEH OVL PARENTS:¦X       X
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?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH (1)

OVERLAP PROGRAMMING COMPLETE

(1)
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0596
PREPARED: February 2016
SEALED: 3/7/2016
REVISED: N/A

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISION (1) SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036880 ENGINEER KEITH M. MIMS

DocuSigned by: Keith M. Mims 2F80786E8CD34A5... 3/9/2016 DATE

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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 401 (Raeford Road) at SR 1104 (Strickland Bridge Rd)

Division 6 Cumberland County Fayetteville

PLAN DATE: Feb 2013	REVIEWED BY: L.W. Overcash
PREPARED BY: D.J. Darity	VHB PROJECT NO.: 38211

REVISIONS	INIT.	DATE
(1) Added Peds, changed 83 & 84 to FYA, revised monitor, split phase 2 & 6 loops, moved flasher wires, added a note. (WSA)	KMM	3/9/2016

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by Donald J. Darity, #019713, on 4/29/13. This document is only certified as to the revisions.

DATE

SIG. INVENTORY NO. 06-0596