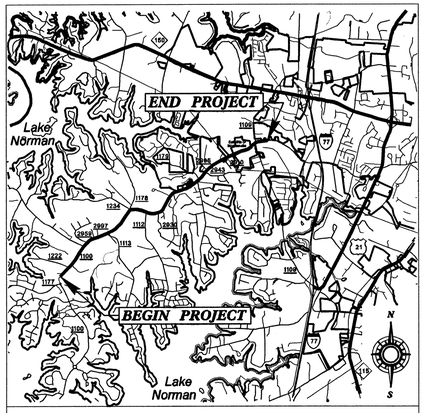
09/08/99

TIP PROJECT: R-3833A

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	SIG-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

IREDELL COUNTY

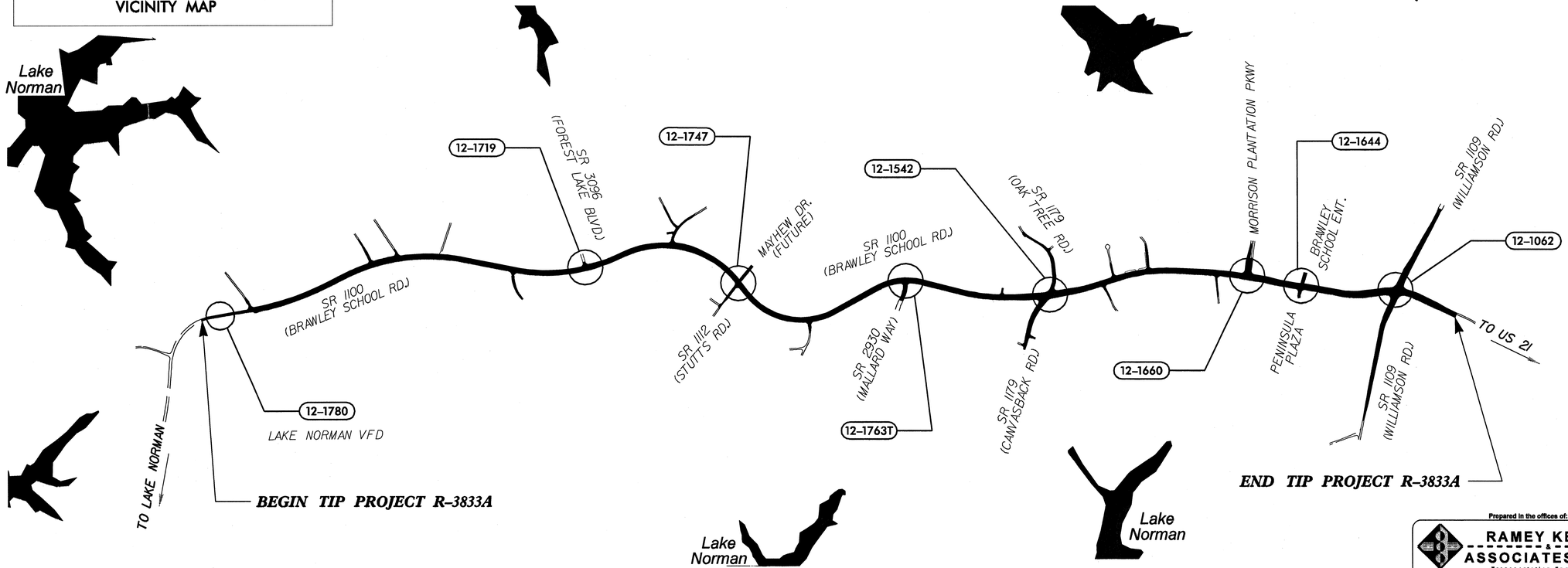


VICINITY MAP

LOCATION: ***SR 1100 (BRAWLEY SCHOOL ROAD) FROM SOUTH OF SR 1122 (SOUTHFORK ROAD) TO EAST OF SR 1109 (WILLIAMSON ROAD)***

TYPE OF WORK: ***TRAFFIC SIGNALS & FIBER OPTICS COMMUNICATIONS PLANS***

NAD 83/95



Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-870-5416 Fax.
www.rameykemp.com

PLANS PREPARED BY:

DONALD J. DARITY, P.E. – PROJECT MANAGER

HEMANG M. SURTI, P.E. – PROJECT ENGINEER

OWEN SYNAN, P.E. – DESIGN ENGINEER

HILLARY UPTON – PROJECT TECHNICIAN

INDEX OF PLANS

SHEET NUMBER	SIN	LOCATION/ DESCRIPTION
SIG 1	–	TITLE SHEET
SIG 2–3	12–1780	SR 1100 (BRAWLEY SCHOOL ROAD) AT LAKE NORMAN VOL. FIRE DEPT.
SIG 4–11	12–1719	SR 1100 (BRAWLEY SCHOOL ROAD) AT SR 3096 (FOREST LAKE BOULEVARD)
SIG 12–19	12–1747	SR 1100 (BRAWLEY SCHOOL ROAD) AT SR 1112 (STUTTS RD.)/MAYHEW DR.
SIG 20–21	12–1763T	SR 1100 (BRAWLEY SCHOOL ROAD) AT SR 2930 (MALLARD WAY)
SIG 22–27	12–1542	SR 1100 (BRAWLEY SCHOOL ROAD) AT SR 1179 (OAK TREE RD./CANVASBACK RD.)
SIG 28–33	12–1660	SR 1100 (BRAWLEY SCHOOL ROAD) AT MORRISON PLANTATION PARKWAY
SIG 34–41	12–1644	SR 1100 (BRAWLEY SCHOOL ROAD) AT BRAWLEY SCHOOL ENT./ PENINSULA PLAZA
SIG 42–52	12–1062	SR 1100 (BRAWLEY SCHOOL ROAD) AT SR 1109 (WILLIAMSON ROAD)
SIG 53–58	N/A	METAL POLE LOADING DIAGRAMS
SIG 59–71	–	COMMUNICATIONS CABLE AND CONDUIT ROUTING

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

7-8-2008

LEGEND

(##-####) ***SIGNAL INVENTORY NUMBER***

PLANS PREPARED FOR:

TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

PAM ALEXANDER, P.E. – SIGNALS AND GEOMETRICS ENGINEER
TIM WILLIAMS, P.E. – SIGNALS AND GEOMETRICS CONTRACTS ENGINEER
GEORGE BROWN, P.E. – SIGNAL EQUIPMENT DESIGN ENGINEER
NEIL AVERY – SIGNAL COMMUNICATIONS PROJECT ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-2

Emergency Vehicle Flasher

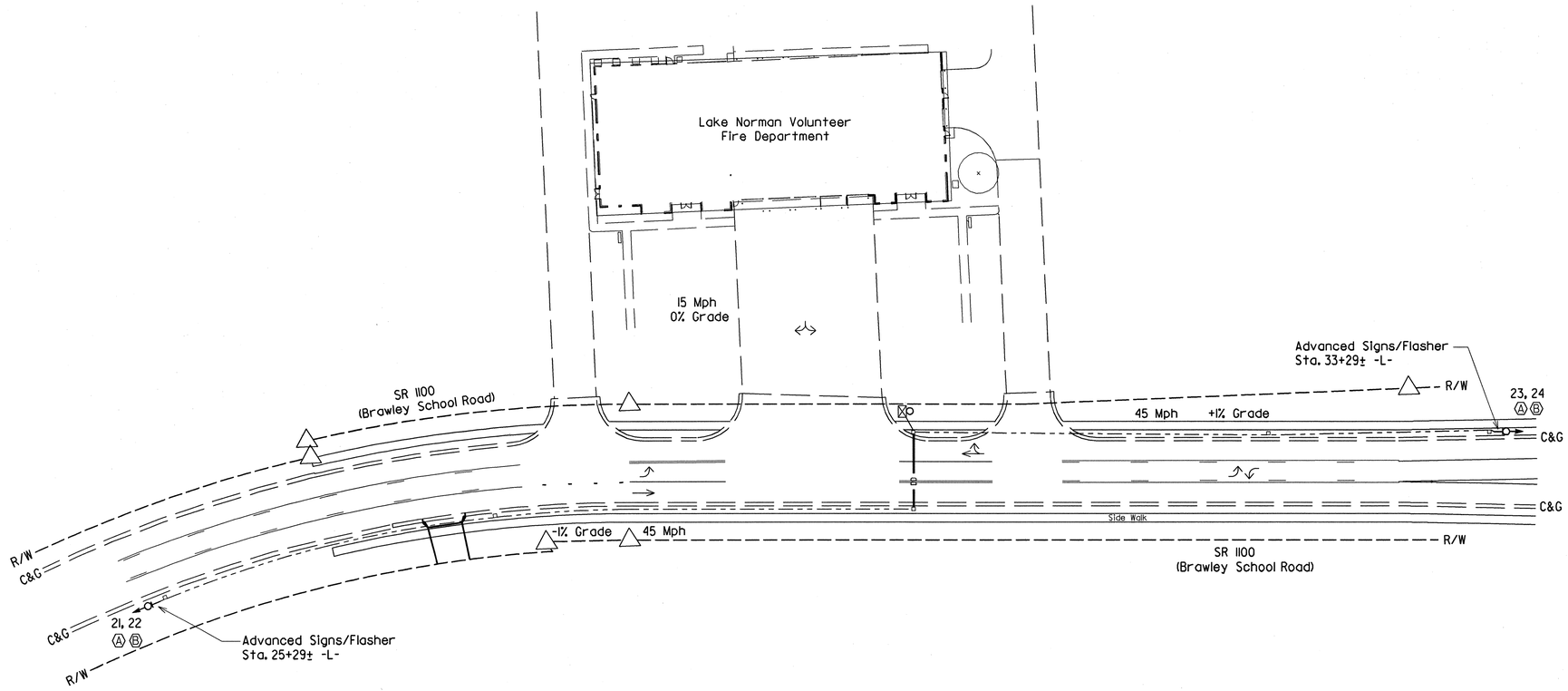
TABLE OF OPERATION		
SIGNAL FACE	INTERVAL 1	INTERVAL 2
21, 23	ON	OFF
22, 24	OFF	ON

SIGNAL FACE I.D.

Denotes L.E.D.

12"

21, 22
23, 24

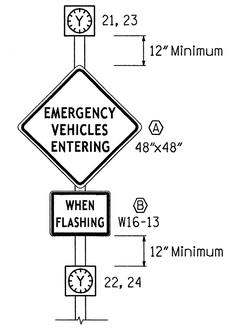


NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Locate emergency vehicle preeemption switch in fire station.
3. All signal heads to remain DARK until actuated.

Figure 1

See Note 3



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	
	Pole Mounted Flasher & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
DD DD	Directional Drill	N/A
A	"EMERGENCY VEHICLES ENTERING" Sign	A
B	"WHEN FLASHING" Sign W16-13 (See Figure 1)	B

New Installation

Prepared in the offices of:

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www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 Greenfield Pkwy, Garner, NC 27529

SCALE
0 40
1"=40'

SR 1100 (Brawley School Road)
at
Lake Norman Volunteer Fire Department

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.E. Upton	RKA PROJ. NO.:	08034 (040)

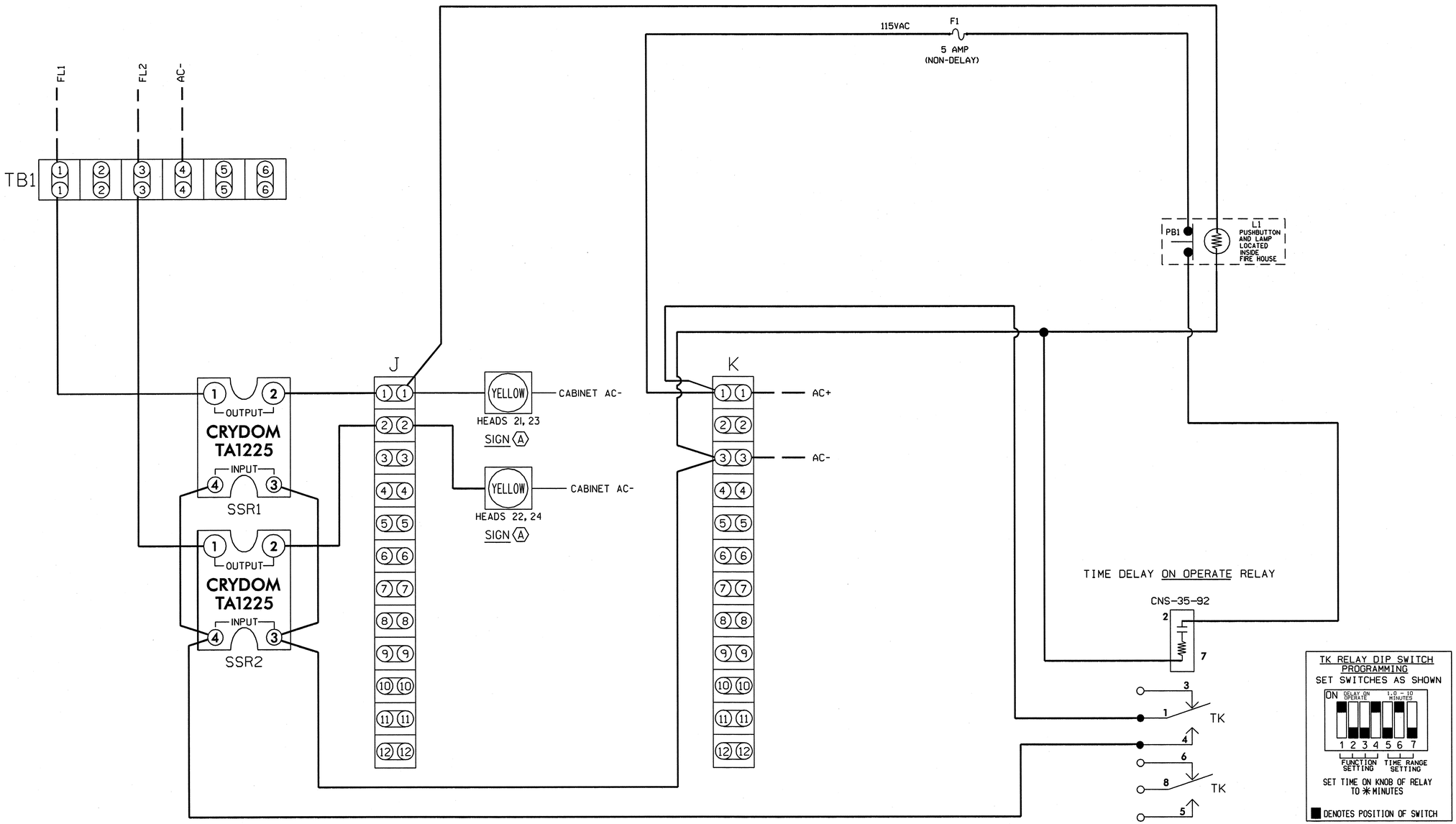
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 DONALD J. DARITY
4-28-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1780

$$$$USERNAME$$$$
$$$$DATE$$$$
$$$$TIME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-3



✳ = TIME DETERMINED BY FIELD TRIALS

NOTES

1. RELAYS 'SSR1' & 'SSR2' ARE SPST SOLID STATE RELAYS WITH AC INPUT, AC OUTPUT. (CRYDOM #TA1225), OR EQUIVALENT.
2. TERMINAL BLOCK DESIGNATIONS SHOWN ARE FOR A DUAL CIRCUIT NEMA FLASHER CABINET.
3. L1 IS A FULL VOLTAGE TYPE PILOT LAMP WITH LAMP AND RED LENS. (SQUARE D 9001AL2 SHOWN), OR EQUIVALENT.
4. PUSH BUTTON AND PILOT LAMP MAY BE MOUNTED IN A HOFFMAN TYPE WALL BOX PART NO. E1PB, OR EQUIVALENT.
5. PB1 IS A MOMENTARY NORMALLY CLOSED PUSH BUTTON. SQUARE "D" PART NO. 9001KR1U, OR EQUIVALENT. NORMALLY CLOSED CONTACT BLOCK FOR PUSH BUTTON IS A SQUARE "D" PART NO. 9001KA3, OR EQUIVALENT.
6. RELAY TK IS MULTIFUNCTION TIME DELAY RELAY, DPDT, 120VAC COIL, POTTER AND BRUMFIELD NUMBER CNS-35-92.
7. FUSE F1 IS A 5 AMP NON-DELAY TYPE.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1780
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

New Installation

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
6808 Farlingdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 Greenfield Pkwy, Garner, NC 27529

SR 1100 (Brawley School Rd)
at
Lake Norman Volunteer Fire Department

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	D.J. Darity	RKA PROJECT NO.:	08034 (040)

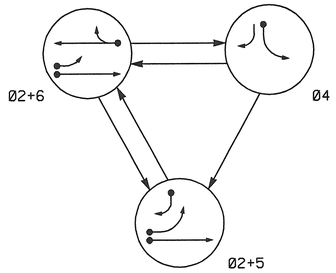
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1780

$$$$SYSTIME$$$$
$$$$SYSDATE$$$$
$$$$SYSNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-4

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

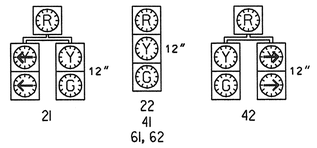
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	PHASE FLASH
21	G	G	R	Y
22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
61, 62	R	G	R	Y

SIGNAL FACE I.D.

Denotes L.E.D.



2070L LOOP & DETECTOR INSTALLATION

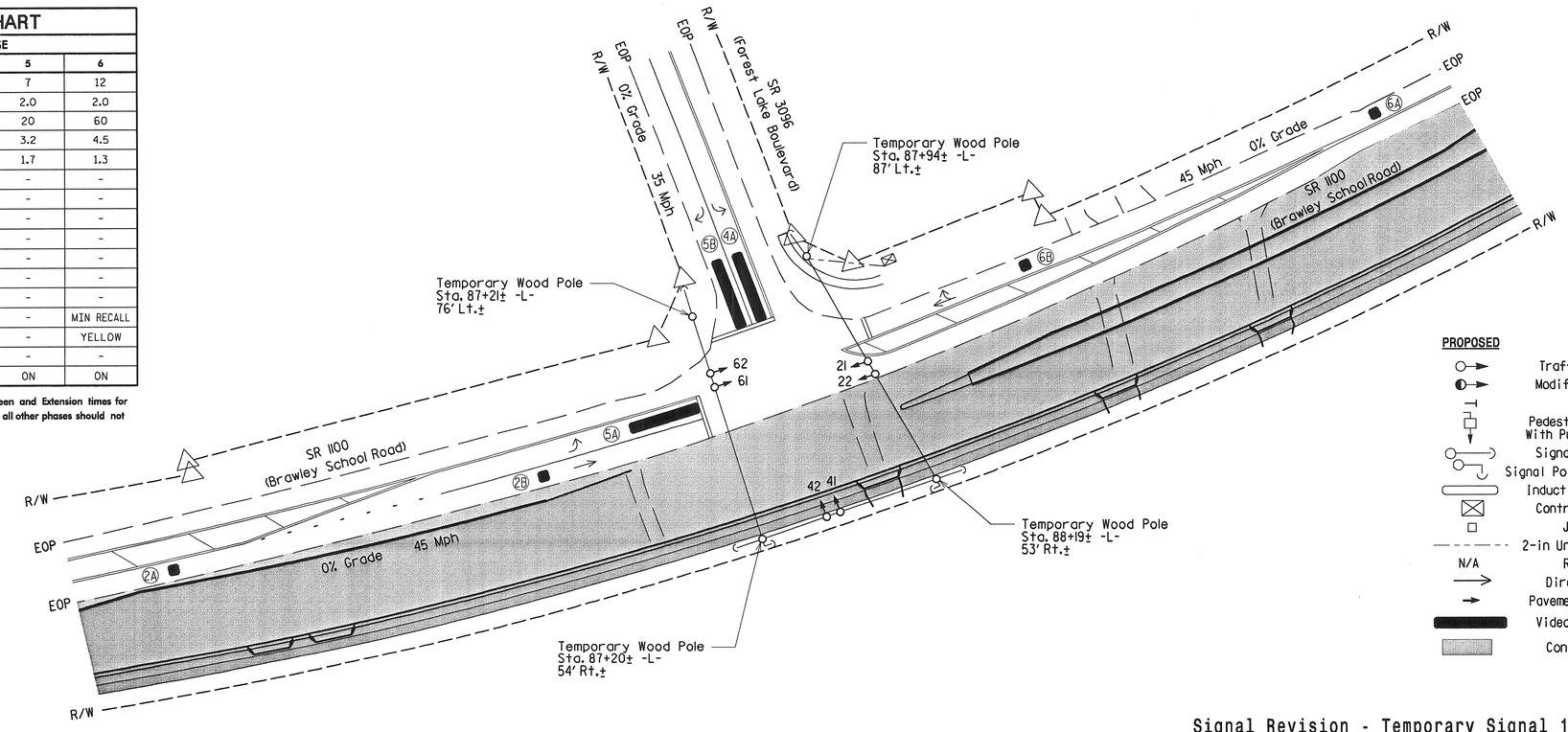
DETECTION ZONES					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
4A	6X40	0	*	Y	4	Y	Y	–	—	3	–	*
5A	6X40	0	*	Y	5	Y	Y	–	—	15	–	*
					2	Y	Y	–	—	—	–	*
5B	6X40	0	*	Y	5	Y	Y	–	—	15	–	*
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6B	6X6	90	*	Y	6	Y	Y	–	—	—	–	*

* Video Detection Zone

2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.5	3.2	3.2	4.5
Red Clearance	1.4	1.7	1.7	1.3
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	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	
	Pavement Marking Arrow	
	Video Detection Zone	
	Construction Zone	

3 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector zones to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:
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Prepared for:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 Greenfield Parkway, Garner, NC 27529

SCALE 0 40 1"=40'

SR 1100 (Brawley School Road)
at
SR 3096 (Forest Lake Boulevard)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 DONALD J. DARITY
4-28-2008
SIGNATURE DATE

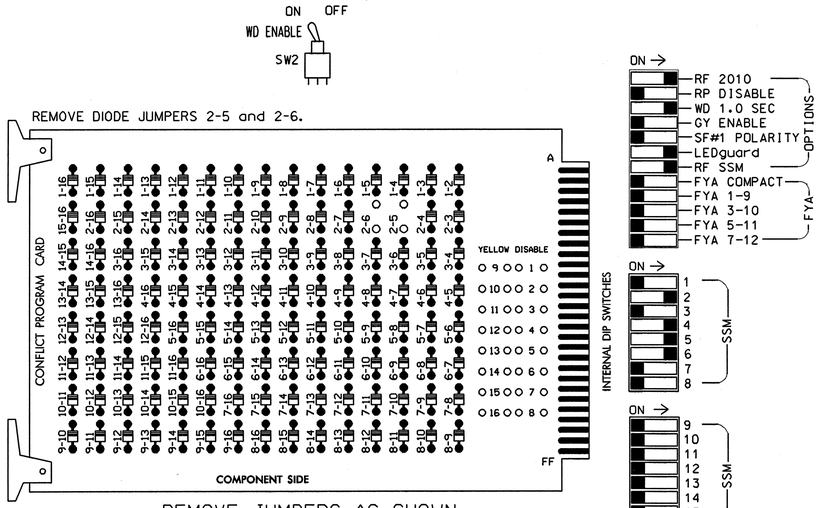
SIG. INVENTORY NO. 12-1719T1

$$$$USERNAME$$$$
$$$$DESIGN$$$$
$$$$TIME$$$$
$$$$DATE$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-5

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 1,3,7,8,9, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	21,42	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101		*	134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW							132											
GREEN ARROW							133											
✋																		
🚶																		

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S4,S5,S6
PHASES USED.....2,4,5,6
OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

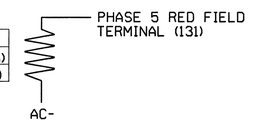
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

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



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

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1719T1
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch
NCDEPARTMENT OF TRANSPORTATION
Signal Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 3096 (Forest Lake Boulevard)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL

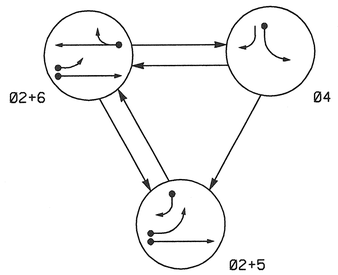
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1719T1

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-6

PHASING DIAGRAM



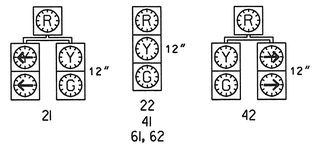
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21	G/→	G	R	Y
22	G	G	R	Y
41	R	R	G	R
42	R/→	R	G	R
61, 62	R	G	R	Y

SIGNAL FACE I.D.

Denotes L.E.D.



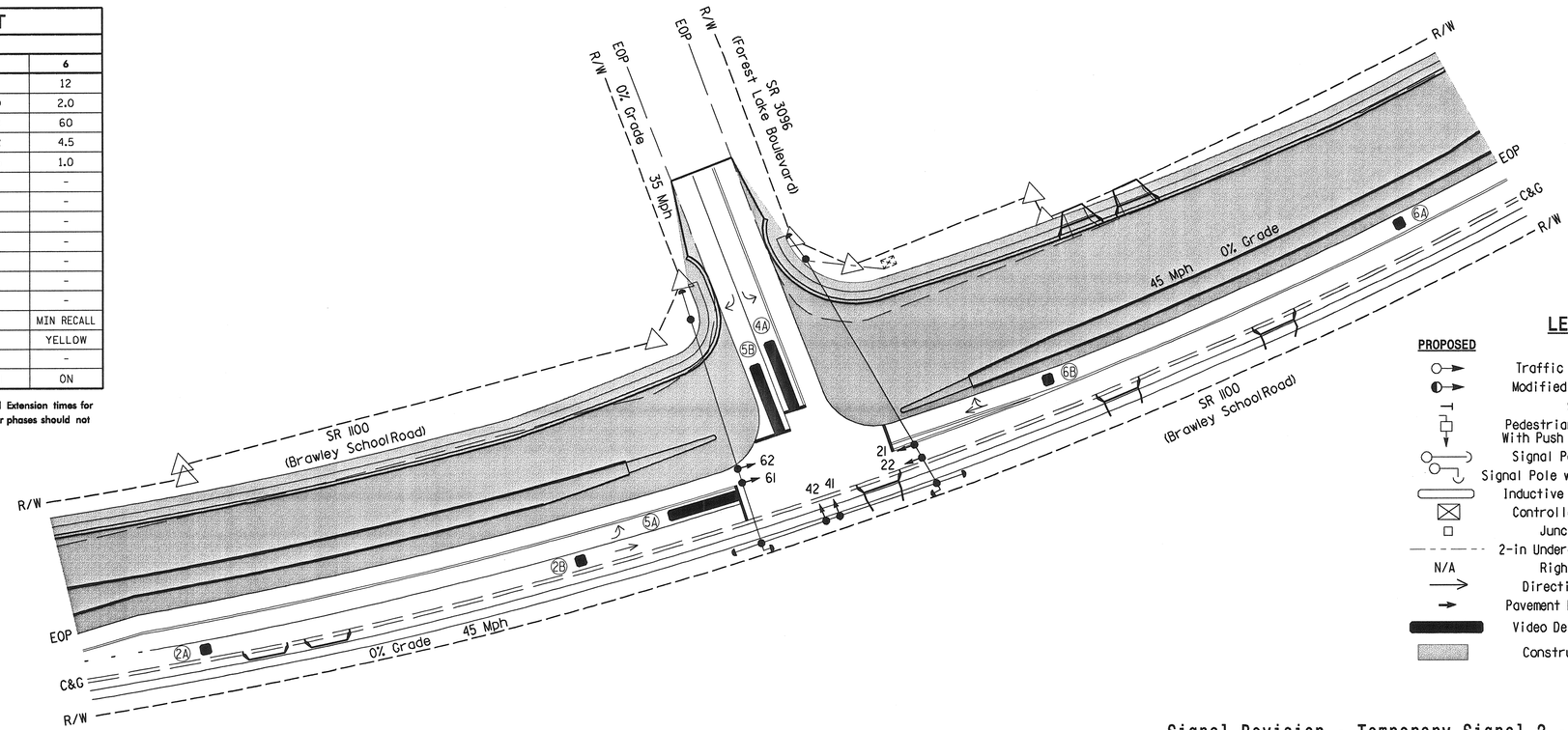
2070L LOOP & DETECTOR INSTALLATION												
DETECTION ZONES						DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	*	Y	2	Y	Y	I	1.6	—	—	*
2B	6X6	90	*	Y	2	Y	Y	—	—	—	—	*
4A	6X40	0	*	Y	4	Y	Y	—	—	3	—	*
5A	6X40	0	*	Y	5	Y	Y	—	—	15	—	*
					2	Y	Y	—	—	—	—	*
5B	6X40	0	*	Y	5	Y	Y	—	—	15	—	*
6A	6X6	300	*	Y	6	Y	Y	—	1.6	—	—	*
6B	6X6	90	*	Y	6	Y	Y	—	—	—	—	*

* Video Detection Zone

2070L TIMING CHART

FEATURE	PHASE 2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.5	3.2	3.2	4.5
Red Clearance	1.0	1.4	1.5	1.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▭	Construction Zone	▭

3 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector zones to presence mode.
5. Reposition existing signal heads numbered 21, 22, 61, and 62.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.

Signal Revision - Temporary Signal 2 - TCP Phase II

Prepared in the offices of:
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Transportation Engineers
5808 Faringdon Place, Suite 100
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Prepared for:
Traffic Engineering and Safety Systems Branch
Network and Geometrics Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
SR 3096 (Forest Lake Boulevard)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

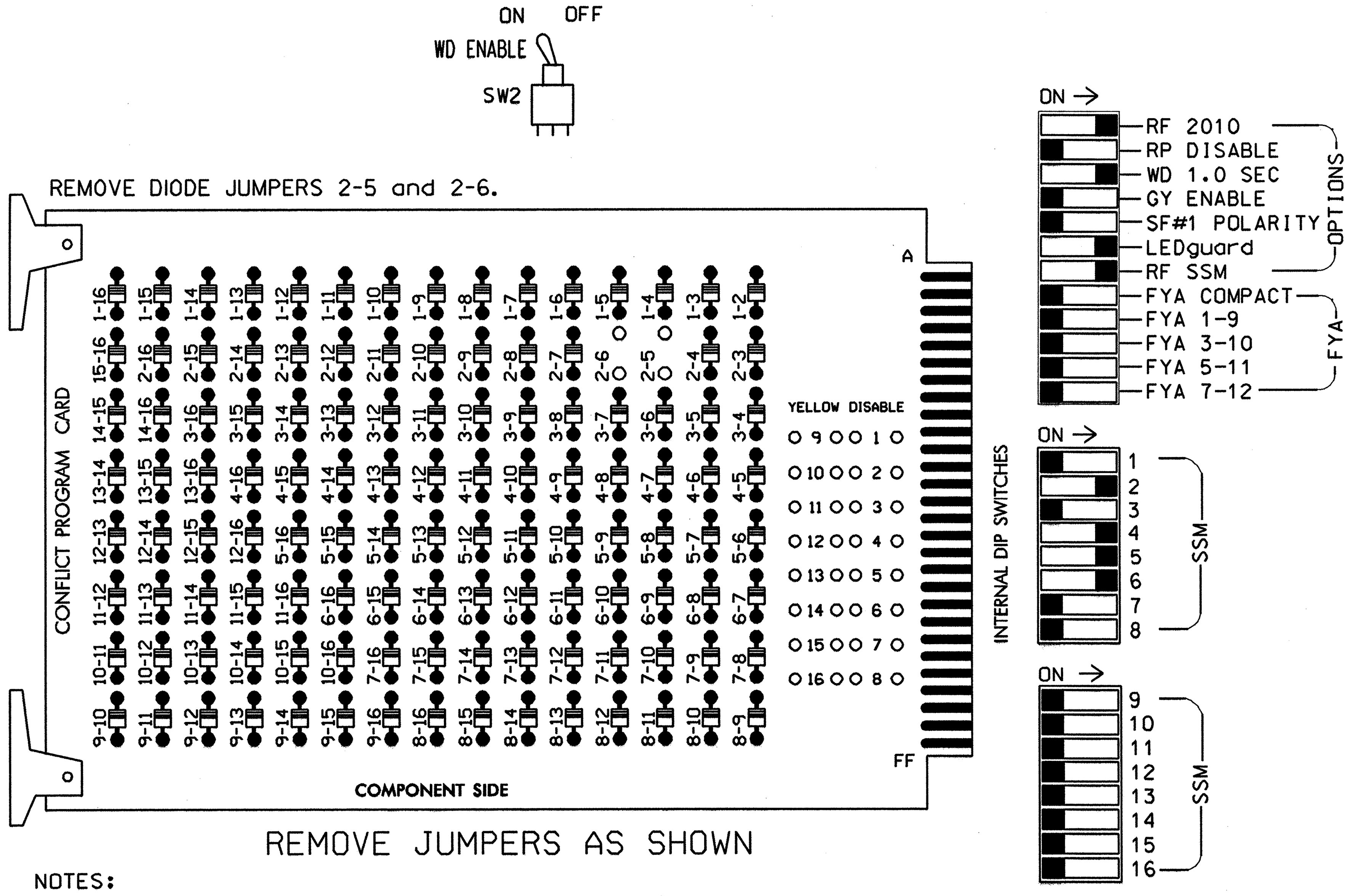
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 DONALD J. DARITY
4-28-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1719T2

$$$$$$$SYSTIMESTAMP$$$$$$$
$$$$$$$DGN$$$$$$$
$$$$$$$USERNAME$$$$$$$

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	21,42	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101		*	134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW							132											
GREEN ARROW							133											

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED......S2,S4,S5,S6
PHASES USED.............2,4,5,6
OVERLAPS................NONE

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

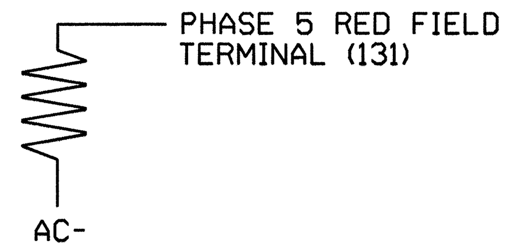
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1719T2
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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Signal Revision - Temporary Signal 2 - TCP Phase II

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road)
at
SR 3096 (Forest Lake Boulevard)

Division 12 Iredell County Mooresville

PLAN DATE: Apr 2008	REVIEWED BY: D.J. Darity
PREPARED BY: H.M Surti	RKA PROJ. NO.: 08034 (040)

REVISIONS	INIT.	DATE

Traffic Engineering and Safety Systems Branch
State of North Carolina Department of Transportation
Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1719T2

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

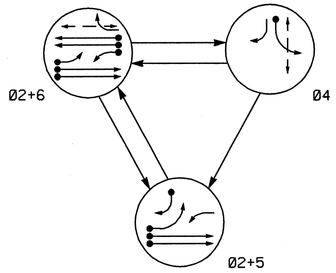
PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-8

3 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

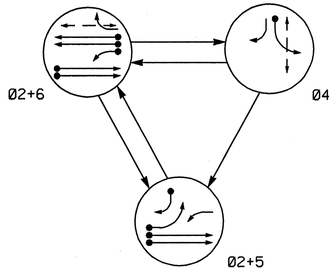
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed Loop System Data: Controller Asset #1719.

NORMAL PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



NORMAL PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R↘	R	G	R
51	←	~~FY~~	~~R~~	~~R~~
61	~~FY~~	~~FY~~	~~R~~	~~R~~
62, 63	R	G	R	Y
P41, P42	DW	DW	W	DRK
P61, P62	DW	W	DW	DRK

~~FY~~ - FLASHING YELLOW ARROW

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R↘	R	G	R
51	←	~~R~~	~~R~~	~~R~~
61	~~FY~~	~~FY~~	~~R~~	~~R~~
62, 63	R	G	R	Y
P41, P42	DW	DW	W	DRK
P61, P62	DW	W	DW	DRK

~~FY~~ - FLASHING YELLOW ARROW

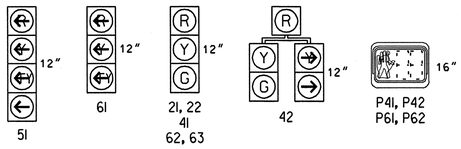
2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S1	6X6	300	5	Y	2	Y	Y	–	—	—	Y	Y
2B/S2	6X6	300	5	Y	2	Y	Y	–	—	—	Y	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	–	—	3	–	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	–	—	*15	–	Y
					2**	Y	Y	Y	—	3	–	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	–	—	15	–	Y
6A/S3	6X6	300	5	Y	6	Y	Y	–	—	—	Y	Y
6B/S4	6X6	300	5	Y	6	Y	Y	–	—	—	Y	Y
6C	6X40	0	2-4-2	Y	6	Y	Y	Y	—	3	–	Y

* Disable Delay During Alternate Phasing Operation.
** Disable Phase 2 Call For Loop 5A During Alternate Phasing Operation.

SIGNAL FACE I.D.

(All signal heads are L.E.D.)



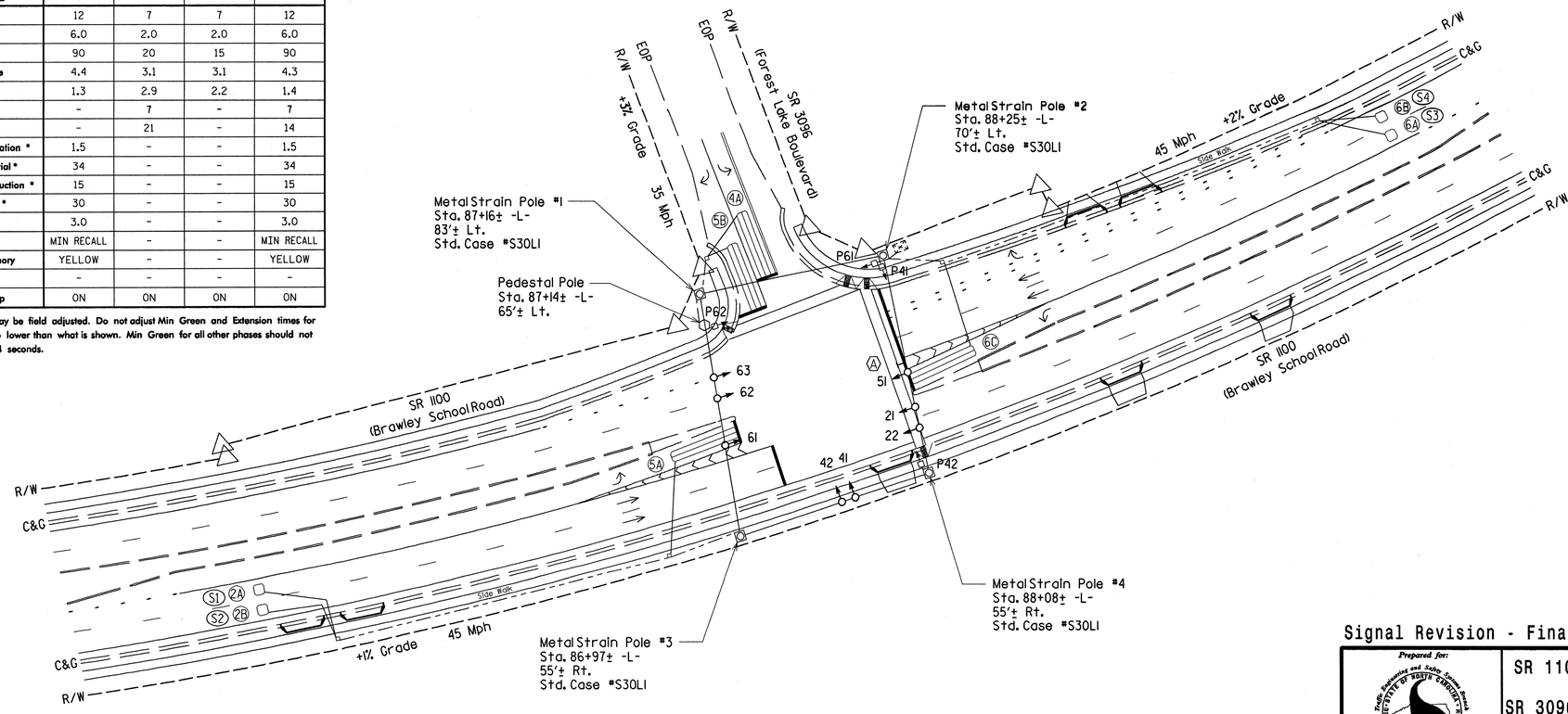
2070L TIMING CHART

FEATURE	PHASE 2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	2.0	2.0	6.0
Max Green 1 *	90	20	15	90
Yellow Clearance	4.4	3.1	3.1	4.3
Red Clearance	1.3	2.9	2.2	1.4
Walk 1 *	-	7	-	7
Don't Walk 1	-	21	-	14
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

PHASING DIAGRAM DETECTION LEGEND

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



STANDARD SIGNAL FACE CLEARANCES FOR 4 SECTION LEFT TURN SIGNAL

FROM	TO ← 1	← 2	~~FY~~ 1	~~FY~~ 2	~~R~~ 1	~~R~~ 2
←	←	←	~~Y~~	~~R~~	~~Y~~	~~R~~
~~FY~~ 1	~~FY~~	~~FY~~	~~FY~~	~~FY~~	~~Y~~	~~R~~
~~FY~~ 2	~~FY~~	~~FY~~	~~FY~~	~~FY~~	~~Y~~	~~R~~
~~R~~ 1	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
~~R~~ 2	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~

~~FY~~ - FLASHING YELLOW ARROW

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	→
→	Pavement Marking Arrow	→
N/A	Wheelchair Ramp	◢
◎	Metal Strain Pole	■
⬡	Pedestrian Signal Pedestal	⬢
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:
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Prepared for:
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation
750 Greenfield Pkwy, Garner, NC 27529

SCALE 0 40 1"=40'

SR 1100 (Brawley School Road)
at
SR 3096 (Forest Lake Boulevard)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (240)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

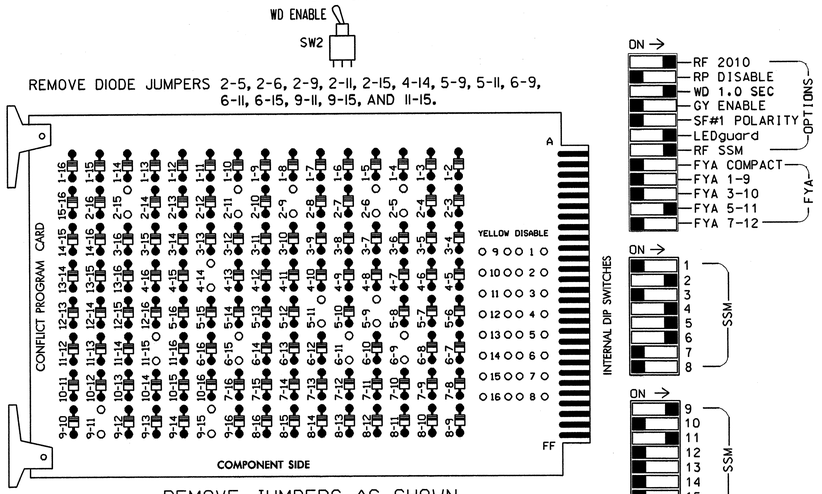
SIG. INVENTORY NO. 12-1719

$$$$USERNAME$$$$ $$$$DATE$$$$ $$$$TIME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-9

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7,8, 10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
6. Program phases 4 and 6 for 'STARTUP PED CALL'.
7. The cabinet and controller are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5		S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5 ⊗		6	6 PED	7	8	8 PED	OLA ⊗	OLB	SPARE	OLC ⊗	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	P41, P42	51	42	62,63	P61, P62	NU	NU	NU	61	NU	NU	51	NU	NU
RED		128			101		✱		134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW														A121			A114		
YELLOW ARROW								132						A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW							133	133											
✋						104				119									
🚶						106				121									

NU = Not Used

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

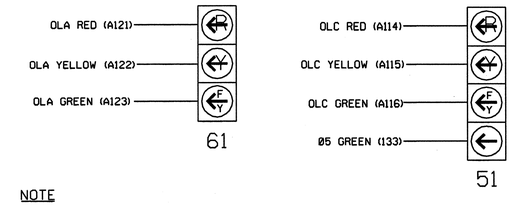
⊗ Denotes see pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S4,S4P,S5,S6,S6P, S9,S12
PHASES USED.....2,4,4PED,5,6,6PED
OVERLAP "A".....5+6
OVERLAP "B".....NONE
OVERLAP "C".....5+6
OVERLAP "D".....NONE

3 AND 4 SECTION FYA-PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The display sequence for this signal requires special logic programming. See sheet 2 of 3 for programming instructions.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2/SYS 2A/S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø2/SYS 2B/S2				NOT USED						Ø4PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	Ø5 5B	Ø5 5A	Ø6/SYS 6A/S3	Ø6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø2 5A	Ø6/SYS 6B/S4	NOT USED										

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S1	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S2	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A[1]	TB3-5,6	J2U	40	2	6	5	Y	Y			15*
	TB3-7,8	J2L	44	6	16	2**	Y	Y	Y		3
5B	TB3-1,2	J1U	55	17	5	5	Y	Y			15
6A/S3	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
6B/S4	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y			
6C	TB5-1,2	J4U	48	10	26	6	Y	Y	Y		3
PED PUSH BUTTON											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

Note: Install DC Isolators in input file slots I12 and I13.

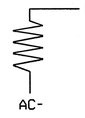
[1] Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.

* Disable Delay During Alternate Phasing Operation.
** Disable Phase 2 Call For Loop 5A During Alternate Phasing Operation.

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 this resistor is to load the channel red monitor input in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1719
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Electrical Detail Sheet 1 of 3

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

North Carolina Department of Transportation, Traffic Engineering and Safety Systems Branch, Signal Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 3096 (Forest Lake Boulevard)

Division 12 | Iredell County | Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (240)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008

SIGNATURE | DATE

SIG. INVENTORY NO. 12-1719

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-10

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

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

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

          SCROLL DOWN

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

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

PRESS '+'

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

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

TOD EVENT SCHEDULING PROGRAMMING DETAIL
TO CALL ALTERNATE PHASING OPERATION

(program controller as shown below)

*DENOTES TO BE DETERMINED BY THE CITY.

ALL EVENTS SHOWN BELOW SHALL BE PROGRAMMED TO START AND STOP ON THE SAME TIMES AND DATES.

FROM MAIN MENU PRESS 'B' (SCHEDULING),

NOTE THAT THE TOP LINE WILL CHANGE FROM "NOT ASSIGNED" TO SPECIFIED FUNCTION WHEN EVENT IS ASSIGNED AS SHOWN.

```
SCHEDULED EVENT #1  OUTPUT PAGE CHANGE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW     ISUN MON TUE WED THR FRI SAT
ENABLED I *   *   *   *   *   *   *
EVENT GROUPS   |12345678910111213141516
ASSIGNED       |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).....................
PLAN (65=FLSH,66=FREE)...  OFFSET#...
PLAN PRIORTY:  LOW...  MED...  HIGH...
CAHNGE 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)..............2
SET OUTPUT ON  (1-64)..................
SET OUTPUT OFF (1-64)..................
SET INPUT ON   (1-64)..................
SET INPUT OFF  (1-64)..................
ENABLE FAILURES LOG?...................
ENABLE EVENTS LOG?.....................
ENABLE DATA ENTRIES LOG?...............
ENABLE COORDINATION PLANS LOG?.........
ENABLE SPECIAL FUNCTIONS LOG?..........
ENABLE SLIT MONITOR LOG?...............
ENABLE DETECTOR DATA LOG?..............
ENABLE DETECTOR (1-64).................
ENABLE DETECTOR DIAGNOSTICS (1-64).....
DISABLE DET STRETCH / DELAY (1-64).....
DISABLE DET STOP BAR MODE (1-64).......
SET LOGIC FLAG ON (1-16)...............
SET LOGIC FLAG OFF (1-64)..............
OVERIDE PHASE CONTROL FUNCTIONS?.......
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #2  INPUT OVERRIDE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW     ISUN MON TUE WED THR FRI SAT
ENABLED I *   *   *   *   *   *   *
EVENT GROUPS   |12345678910111213141516
ASSIGNED       |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).....................
PLAN (65=FLSH,66=FREE)...  OFFSET#...
PLAN PRIORTY:  LOW...  MED...  HIGH...
CAHNGE 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)...............
SET OUTPUT ON  (1-64)..................
SET OUTPUT OFF (1-64)..................
SET INPUT ON   (1-64)..................
SET INPUT OFF  (1-64)..................6
ENABLE FAILURES LOG?...................
ENABLE EVENTS LOG?.....................
ENABLE DATA ENTRIES LOG?...............
ENABLE COORDINATION PLANS LOG?.........
ENABLE SPECIAL FUNCTIONS LOG?..........
ENABLE SLIT MONITOR LOG?...............
ENABLE DETECTOR DATA LOG?..............
ENABLE DETECTOR (1-64).................
ENABLE DETECTOR DIAGNOSTICS (1-64).....
DISABLE DET STRETCH / DELAY (1-64).....
DISABLE DET STOP BAR MODE (1-64).......
SET LOGIC FLAG ON (1-16)...............
SET LOGIC FLAG OFF (1-64)..............
OVERIDE PHASE CONTROL FUNCTIONS?.......
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #3  DETECTOR CONTROL
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW     ISUN MON TUE WED THR FRI SAT
ENABLED I *   *   *   *   *   *   *
EVENT GROUPS   |12345678910111213141516
ASSIGNED       |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).....................
PLAN (65=FLSH,66=FREE)...  OFFSET#...
PLAN PRIORTY:  LOW...  MED...  HIGH...
CAHNGE 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)...............
SET OUTPUT ON  (1-64)..................
SET OUTPUT OFF (1-64)..................
SET INPUT ON   (1-64)..................
SET INPUT OFF  (1-64)..................
ENABLE FAILURES LOG?...................
ENABLE EVENTS LOG?.....................
ENABLE DATA ENTRIES LOG?...............
ENABLE COORDINATION PLANS LOG?.........
ENABLE SPECIAL FUNCTIONS LOG?..........
ENABLE SLIT MONITOR LOG?...............
ENABLE DETECTOR DATA LOG?..............
ENABLE DETECTOR (1-64).................
ENABLE DETECTOR DIAGNOSTICS (1-64).....
DISABLE DET STRETCH / DELAY (1-64)...6
DISABLE DET STOP BAR MODE (1-64).......
SET LOGIC FLAG ON (1-16)...............
SET LOGIC FLAG OFF (1-64)..............
OVERIDE PHASE CONTROL FUNCTIONS?.......
```

TOD PROGRAMMING COMPLETE

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?...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

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?...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

OVERLAP PROGRAMMING COMPLETE

ALTERNATE PHASING NOTES

THIS EVENT SCHEDULING DETAIL SHOWS THE TOD PROGRAMMING STEPS NECESSARY FOR THE CONTROLLER TO OPERATE THE "ALTERNATE PHASING" AS SHOWN ON THE SIGNAL PLANS.

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE TOD EVENTS ACTIVATE TO CALL THE "ALTERNATE PHASING":

EVENT NO.

1. OUTPUT PAGE 2 IS CALLED: Modifies control circuits for signal head 51.
2. INPUT 6 IS SWITCHED OFF: Disables phase 2 call on loop 5A.
3. DELAY IS DISABLED FOR DETECTOR 6 (Phase 5, Loop 5A).

OUTPUT REFERENCE SCHEDULE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1719
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Electrical Detail Sheet 2 of 3

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:
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Transportation Engineers
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Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5419 Fax.
www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road)
at
SR 3096 (Forest Lake Boulevard)

Division 12 | Iredell County | Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (240)

REVISIONS	INIT.	DATE

750 Greenfield Parkway, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008

SIGNATURE | DATE

SIG. INVENTORY NO. 12-1719

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGNNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-11

PPLT SIGNAL OUTPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

NOTE: THIS PROGRAMMING APPLIES FOR OUTPUT PAGE 2 ONLY.
OUTPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS.
THIS PROGRAMMING IS NECESSARY FOR ALTERNATE PHASING OPERATION.

OUTPUT ASSIGNMENTS FOR SIGNAL HEAD 51

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS). PRESS 'NEXT' FOR PAGE 2.
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "42"

```
PAGE:2  C1 PIN:88  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................42
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.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:88  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).....5
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:88  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................42
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................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 43

STEP 2

```
PAGE:2  C1 PIN:89  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................43
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.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:89  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).....5
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:89  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................43
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................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 44

STEP 3

```
PAGE:2  C1 PIN:90  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................44
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.....................Y
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" FOR NOT ENABLED (THIS WILL DISABLE THE OUTPUT)

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'NOT ENABLED' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:90  NOT ENABLED
OUTPUT ASSIGNMENT #.................44
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..........................
```

NOTE: THE OUTPUT ASSIGNMENT CHANGES, SHOWN ABOVE, ARE NECESSARY FOR THE TIME OF DAY OPERATION OF SIGNAL HEAD 51.
IN ALTERNATE PHASING (PROTECTED ONLY) OPERATION, THE RED ARROW CONTROL IS SWITCHED TO THE LEFT TURN PHASE RED.
THE SOLID YELLOW ARROW CONTROL IS SWITCHED TO THE LEFT TURN PHASE YELLOW.
IN ADDITION, THE FLASHING YELLOW ARROW IS SWITCHED OFF BY DISABLING THE OVERLAP GREEN OUTPUT.

ALL OF THESE OUTPUT CHANGES ARE ACCOMPLISHED ON OUTPUT PAGE 2. THEREFORE IN ALTERNATE PHASING (PROTECTED ONLY) MODE, THE PAGE IS SWITCHED TO "2" BY THE CONTROLLER TOD EVENT SCHEDULING.

IN NORMAL PHASING (PPLT) MODE THE STANDARD, DEFAULT, OUPUT ASSIGNMENTS ARE USED WHICH ARE DESIGNATED ON OUTPUT PAGE 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1719
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Electrical Detail Sheet 3 of 3

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
SR 3096 (Forest Lake Boulevard)

Division 12 | Iredell County | Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (240)

REVISIONS	INIT.	DATE

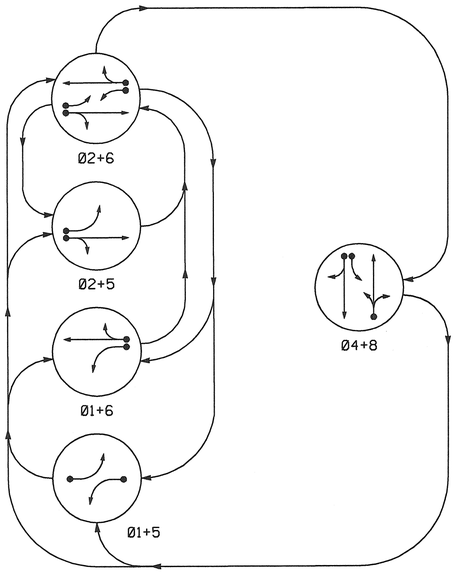
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1719

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-12

5 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
21	R←	R	G←	G	R	Y
22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
61	R←	G←	R	G	R	Y
62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

SIGNAL FACE I.D.

Denotes L.E.D.

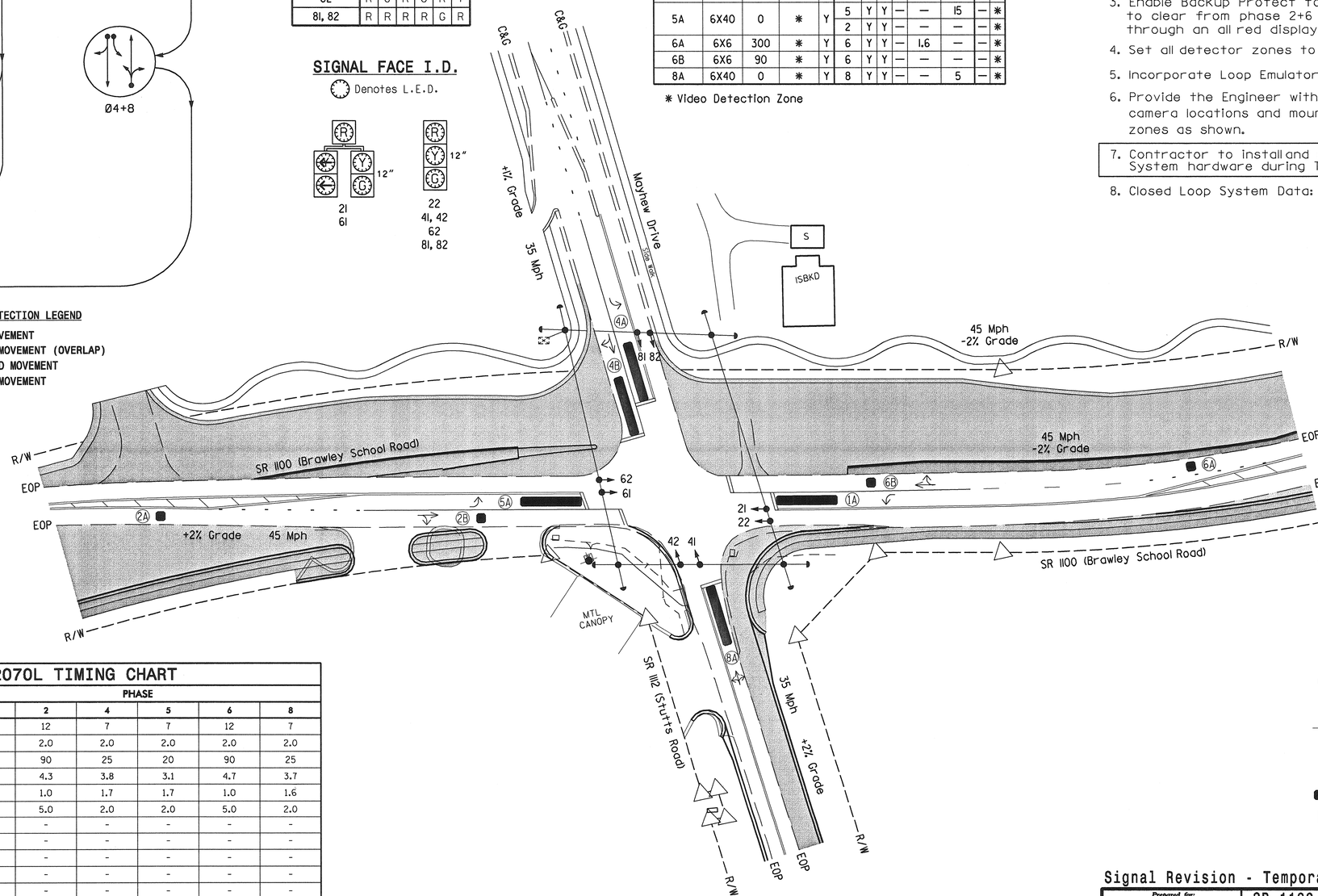
2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP / NEW CARD
1A	6X40	0	*	Y	1	Y	Y	—	—	15	— *
					6	Y	Y	—	—	—	— *
2A	6X6	300	*	Y	2	Y	Y	—	1.6	—	— *
2B	6X6	90	*	Y	2	Y	Y	—	—	—	— *
4A	6X40	0	*	Y	4	Y	Y	—	—	3	— *
4B	6X40	0	*	Y	4	Y	Y	—	—	10	— *
5A	6X40	0	*	Y	5	Y	Y	—	—	15	— *
					2	Y	Y	—	—	—	— *
6A	6X6	300	*	Y	6	Y	Y	—	1.6	—	— *
6B	6X6	90	*	Y	6	Y	Y	—	—	—	— *
8A	6X40	0	*	Y	8	Y	Y	—	—	5	— *

* Video Detection Zone

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Set all detector zones to presence mode.
5. Incorporate Loop Emulator Detection System for Vehicle Detection.
6. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
7. Contractor to install and maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
8. Closed Loop System Data: Controller Asset # 1747.



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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▭	Construction Zone	▭

2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	25	20	90	25
Yellow Clearance	3.3	4.3	3.8	3.1	4.7	3.7
Red Clearance	1.8	1.0	1.7	1.7	1.0	1.6
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	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 Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:
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5808 Farrington Place, Suite 100
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www.rameykemp.com

Prepared for: Traffic Engineering and Safety Systems Branch, North and Geometrics Section, NCDOT
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1112 (Stutts Road)/ Mayhew Drive

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RK&A PROJ. NO.:	08034 (241)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE

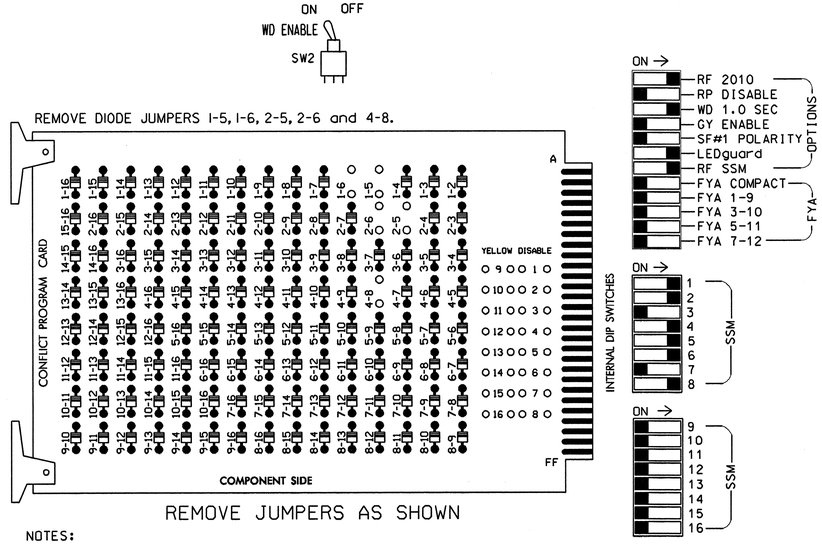
SIG. INVENTORY NO. 12-1747T1

$$$$USERNAME$$$$
$$$$DATE$$$$
$$$$TIME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-13

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7,9, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. This controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

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.	61	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126						132											
GREEN ARROW	127						133											
✋																		
🚶																		

NU = NOT USED

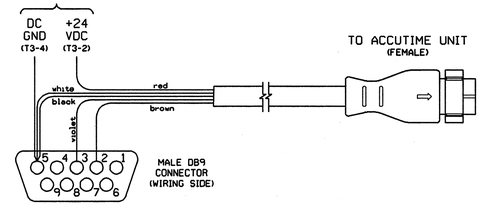
* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER.....EXISTING 2070L
CABINET.....EXISTING 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S8
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

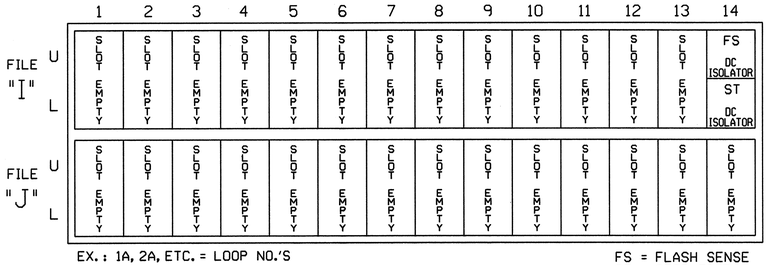
Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

INPUT FILE POSITION LAYOUT

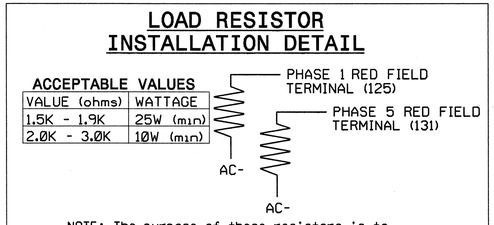
(front view)



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

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL



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

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

BACKUP PROTECTION NOTE

(program controller as shown below)

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

Signal Revision - Temporary Signal 1 - TCP Phase I

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1747T1
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-6416 Fax.
www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1112 (Stutts Road)/ Mayhew Drive

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008

SIGNATURE DATE

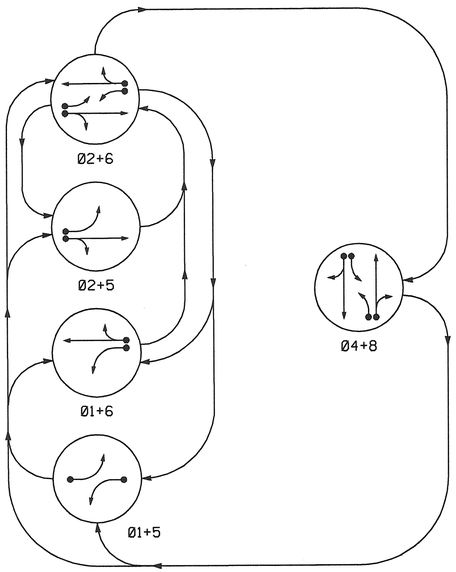
SIG. INVENTORY NO. 12-1747T1

$$$$USERNAME$$$$
$$$$SYSTIME$$$$
$$$$SYSDATE$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-14

5 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

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

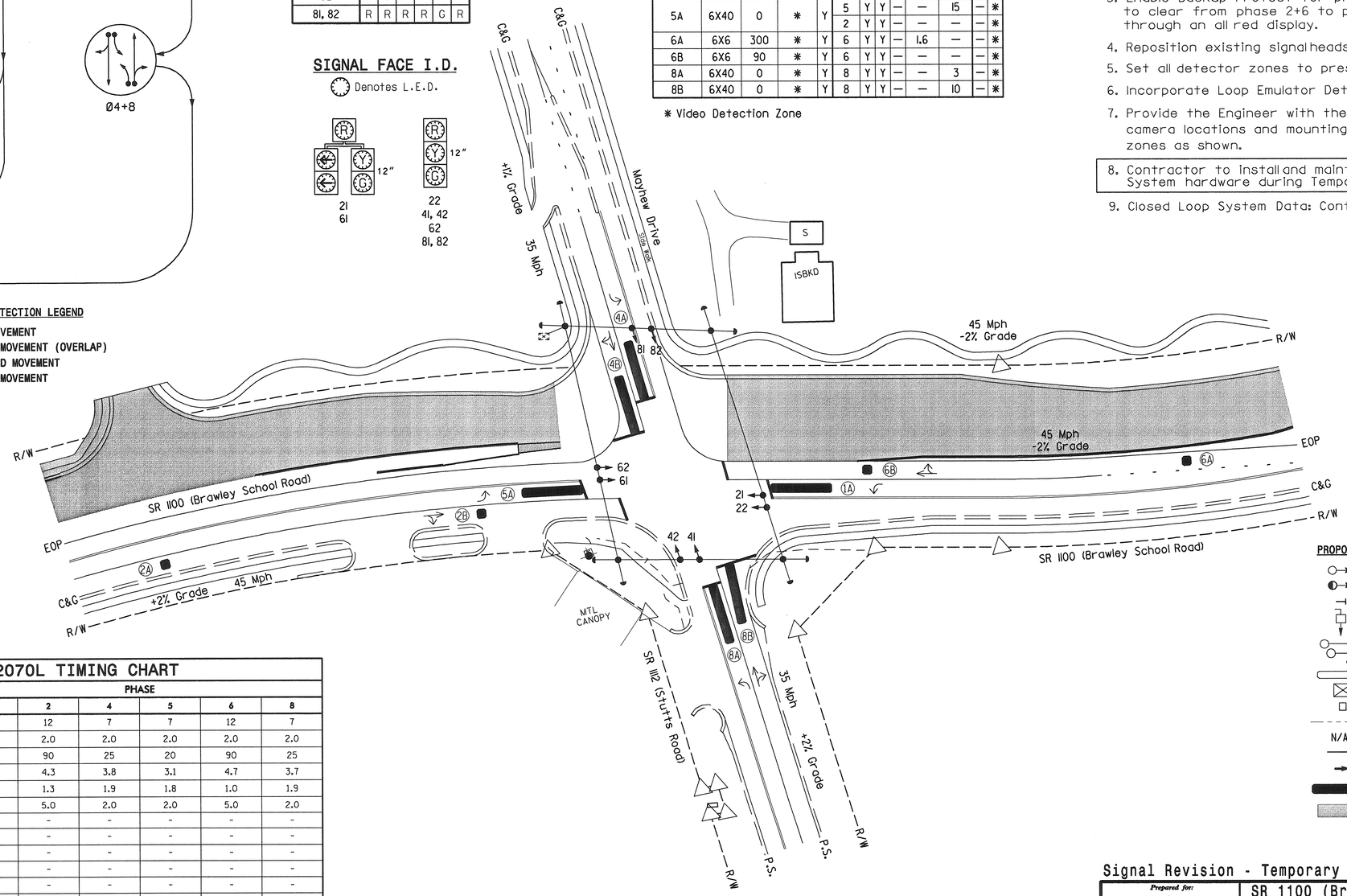
SIGNAL FACE I.D.

Denotes L.E.D.

2070L LOOP & DETECTOR INSTALLATION

LOOP	DETECTION ZONES SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	DETECTOR PROGRAMMING PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	Y	1	Y	Y	—	—	15	—	*
					6	Y	Y	—	—	—	—	*
2A	6X6	300	*	Y	2	Y	Y	—	1.6	—	—	*
2B	6X6	90	*	Y	2	Y	Y	—	—	—	—	*
4A	6X40	0	*	Y	4	Y	Y	—	—	3	—	*
4B	6X40	0	*	Y	4	Y	Y	—	—	10	—	*
5A	6X40	0	*	Y	5	Y	Y	—	—	15	—	*
					2	Y	Y	—	—	—	—	*
6A	6X6	300	*	Y	6	Y	Y	—	1.6	—	—	*
6B	6X6	90	*	Y	6	Y	Y	—	—	—	—	*
8A	6X40	0	*	Y	8	Y	Y	—	—	3	—	*
8B	6X40	0	*	Y	8	Y	Y	—	—	10	—	*

* Video Detection Zone



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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▭	Construction Zone	▭

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Reposition existing signal heads numbered 21, 22, 61, 62, 81, and 82.
5. Set all detector zones to presence mode.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
8. Contractor to install and maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
9. Closed Loop System Data: Controller Asset # 1747.

2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	25	20	90	25
Yellow Clearance	3.3	4.3	3.8	3.1	4.7	3.7
Red Clearance	1.8	1.3	1.9	1.8	1.0	1.9
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	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 Revision - Temporary Signal 2 - TCP Phase II

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-6416 Fax.
www.rameykemp.com

Prepared for: North Carolina Department of Transportation, Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1112 (Stutts Road)/ Mayhew Drive

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (241)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE

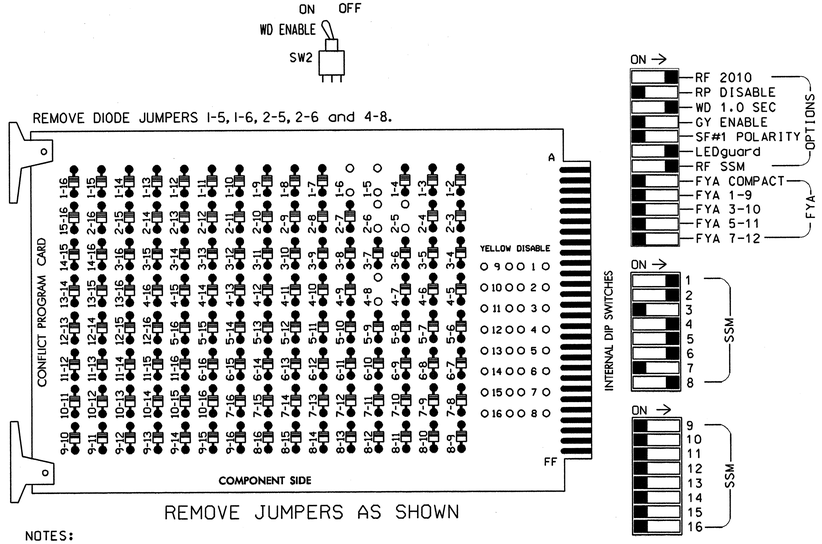
SIG. INVENTORY NO. 12-1747T2

$$$$USERNAME$$$$
$$$$SYSTIME$$$$
$$$$SYSDATE$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-15

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

BACKUP PROTECTION NOTE

(program controller as shown below)

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

NOTES

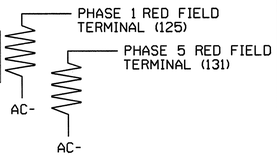
1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7,9, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. This controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....EXISTING 2070L
CABINET.....EXISTING 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S8
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

LOAD RESISTOR INSTALLATION DETAIL

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



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

SIGNAL HEAD HOOK-UP CHART

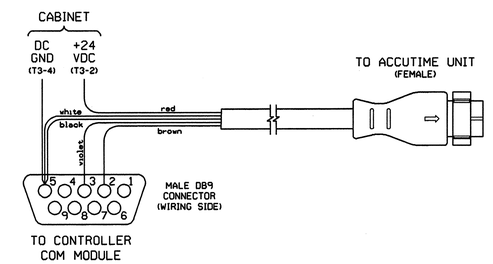
LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126						132											
GREEN ARROW	127						133											
✋																		
🚶																		

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

Signal Revision - Temporary Signal 2 - TCP Phase II

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1747T2
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

North Carolina Department of Transportation, Traffic Engineering Branch, Signal Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1112 (Stutts Road)/ Mayhew Drive

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1747T2

$$$$SYSTIME$$$$
$$$$VERSION$$$$
$$$$USERNAME$$$$

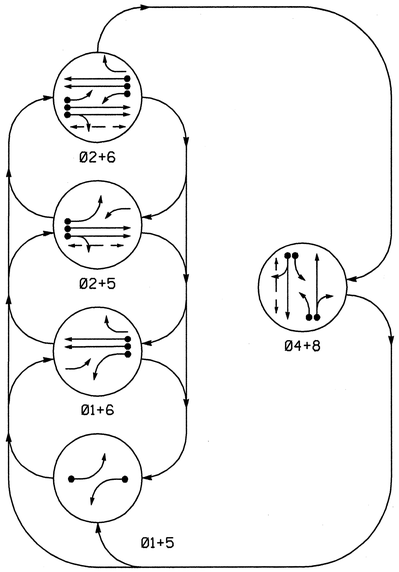
PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-16

5 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

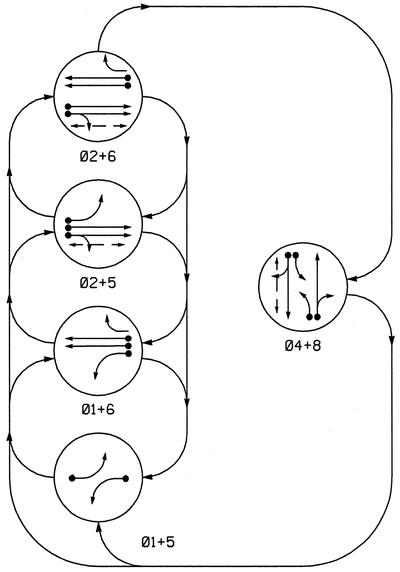
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
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. Omit 'WALK' and flashing 'DON'T WALK' with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed Loop System Data: Controller Asset # 1747.

NORMAL PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

NORMAL PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	↚	↚	↛	↛
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	↚	←	↚	↛	↛
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK

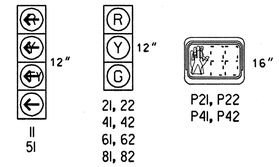
↚ - FLASHING YELLOW ARROW

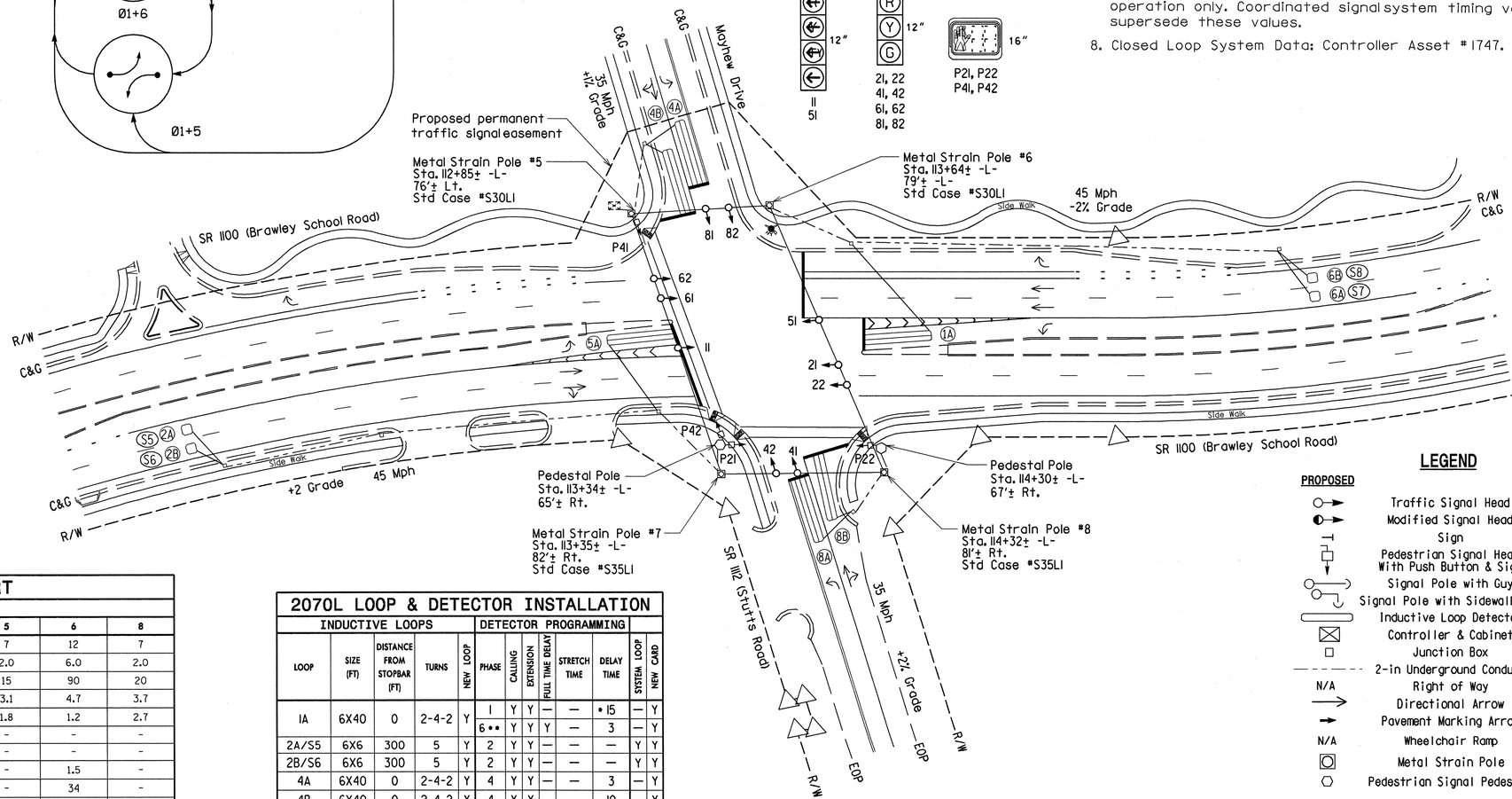
ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	↛	↛	↛	↛
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	↛	←	↛	↛	↛
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

(All signal heads are L.E.D.)





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	→
→	Pavement Marking Arrow	→
N/A	Wheelchair Ramp	♿
◎	Metal Strain Pole	■
⬡	Pedestrian Signal Pedestal	●

STANDARD SIGNAL FACE CLEARANCES FOR 4 SECTION LEFT TURN SIGNAL

FROM \ TO	←	↚	→
	1 2	1 2	1 2
←	← ←	↚ ↚	→ →
↚	↚ ↚	↚ ↚	→ →
→	→ →	→ →	→ →

↚ - FLASHING YELLOW ARROW

2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	15	90	20	15	90	20
Yellow Clearance	3.3	4.3	3.8	3.1	4.7	3.7
Red Clearance	2.4	1.3	2.7	1.8	1.2	2.7
Walk 1 *	-	7	7	-	-	-
Don't Walk 1	-	14	25	-	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	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.

2070L LOOP & DETECTOR INSTALLATION

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	—	Y
					6 ••	Y	Y	Y	—	3	—	Y
2A/S5	6X6	300	5	Y	2	Y	Y	—	—	—	Y	Y
2B/S6	6X6	300	5	Y	2	Y	Y	—	—	—	Y	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	—	—	3	—	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	—	—	10	—	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	—	—	• 15	—	Y
					2 ••	Y	Y	Y	—	3	—	Y
6A/S7	6X6	300	5	Y	6	Y	Y	—	—	—	Y	Y
6B/S8	6X6	300	5	Y	6	Y	Y	—	—	—	Y	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	—	—	3	—	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	—	—	10	—	Y

• Disable Delay During Alternate Phasing Operation.
•• Disable Phase 2/6 Call For Loops 1A and 5A During Alternate Phasing Operation.

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:

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Prepared for:
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation
Division of Highways
Traffic Engineering and Safety Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE 0 40 1"=40'

SR 1100 (Brawley School Road) at SR 1112 (Stutts Road)/ Mayhew Drive

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	O.W.Synan	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

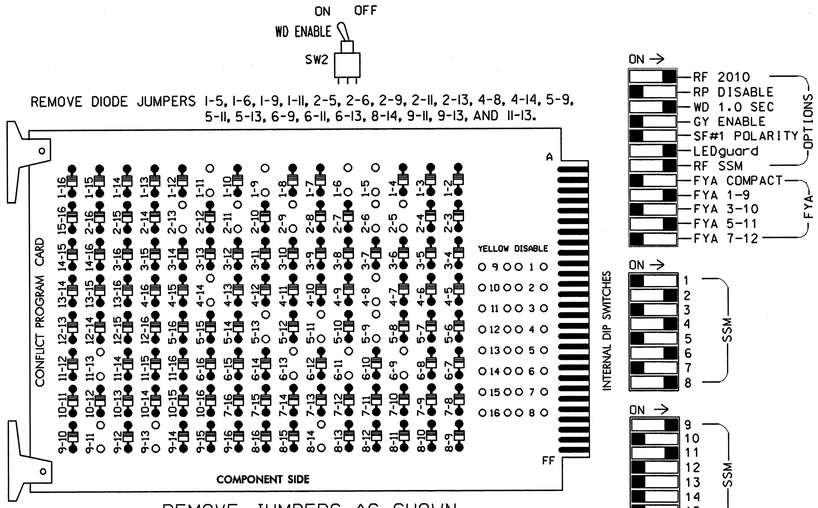
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1747

$$$$$$SYSTEM$$$$$$
$$$$$$USER$$$$$$
$$$$$$FILENAME$$$$$$

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

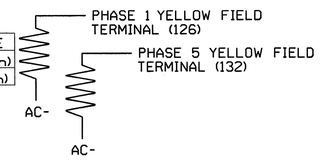
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 1	Ø2/SYS	SLOT EMPTY	SLOT EMPTY	Ø 4	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 2PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
			1A	2A/S5			4A								
	L		Ø 6	Ø2/SYS			Ø 4						Ø 4PED DC ISOLATOR		ST DC ISOLATOR
			1A	2B/S6			4B								
FILE "J"	U	SLOT EMPTY	Ø 5	Ø6/SYS	SLOT EMPTY	SLOT EMPTY	Ø 8	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
			5A	6A/S7			8A								
	L		Ø 2	Ø 6/SYS			Ø 8								
			5A	6B/S8			8B								

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

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

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



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5,7, 10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 4 and 8, on the controller unit, for Dual Entry.
6. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
7. Program phases 2 and 4 for 'STARTUP PED CALL'.
8. This controller and cabinet are part of the SR 1100 (Brawley School Road) Closed Loop Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....EXISTING 2070L
CABINET.....EXISTING 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,S8, S9,S12
PHASES USED.....1,2,2PED,4,4PED,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....NONE
OVERLAP "C".....5+6
OVERLAP "D".....NONE

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-5,6	I2U	39	1	2	1	Y	Y			15*
	TB2-7,8	I2L	43	5	12	6**	Y	Y	Y		3
2A/S5	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y			
2B/S6	TB2-11,12	I3L	76	38	42	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A[2]	TB3-5,6	J2U	40	2	6	5	Y	Y			15*
	TB3-7,8	J2L	44	6	16	2**	Y	Y	Y		3
6A/S7	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
6B/S8	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10
PED PUSH BUTTON											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					

Note: Install DC Isolator in input file slot I12.

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

[2] Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.

* Disable Delay During Alternate Phasing Operation.

** Disable Phase 2/6 Call For Loops 1A and 5A During Alternate Phasing Operation.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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	21,22	P21, P22	NU	41,42	P41, P42	51	61,62	NU	NU	81,82	NU	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													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133											
✋			113		104													
🚶			115		106													

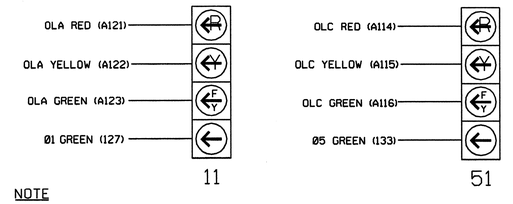
NU = NOT USED

✱ Denotes install load resistor. See Load Resistor Installation Detail this page.

⊘ Denotes see pictorial of head wiring in detail below.

4 SECTION PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The display sequence for this signal requires special logic programming. See sheet 2 of 3 for programming instructions.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1747
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 1 of 3

Signal Revision - Final Signal - TCP Final Phase

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road) at SR 1112 (Stutts Road)/ Mayhew Drive

Division 12 | Iredell County | Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

Prepared in the offices of:

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SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY

7-8-2008

SIGNATURE | DATE

SIG. INVENTORY NO. 12-1747

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

(program controller as shown below)

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

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

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

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

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

PRESS '+'

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

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

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

PRESS '+'

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

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

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

PRESS '+'

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

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

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

PRESS '+'

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

               SCROLL DOWN
 THEN:
 SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

               SCROLL DOWN
 THEN:
 SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

TOD EVENT SCHEDULING PROGRAMMING DETAIL
TO CALL ALTERNATE PHASING OPERATION

(program controller as shown below)

*DENOTES TO BE DETERMINED BY THE CITY.

ALL EVENTS SHOWN BELOW SHALL BE PROGRAMMED TO START AND STOP ON THE SAME TIMES AND DATES.

FROM MAIN MENU PRESS 'B' (SCHEDULING).

NOTE THAT THE TOP LINE WILL CHANGE FROM "NOT ASSIGNED" TO SPECIFIED FUNCTION WHEN EVENT IS ASSIGNED AS SHOWN.

```
SCHEDULED EVENT #1  OUTPUT PAGE CHANGE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE).._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............2
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)..............._
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......._
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64).._
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #2  INPUT OVERRIDE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE).._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)...............5
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64).._
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #3  INPUT OVERRIDE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE).._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)...............6
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64).._
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #4  DETECTOR CONTROL
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE).._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)..............._
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64)..2
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #5  DETECTOR CONTROL
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE).._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)..............._
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64)..6
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

TOD PROGRAMMING COMPLETE

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?...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

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?...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

OVERLAP PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

ALTERNATE PHASING NOTES

THIS EVENT SCHEDULING DETAIL SHOWS THE TOD PROGRAMMING STEPS NECESSARY FOR THE CONTROLLER TO OPERATE THE "ALTERNATE PHASING" AS SHOWN ON THE SIGNAL PLANS.

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE TOD EVENTS ACTIVATE TO CALL THE "ALTERNATE PHASING":

EVENT NO.

1. OUTPUT PAGE 2 IS CALLED: Modifies control circuits for signal heads 11 and 51.
2. INPUT 5 IS SWITCHED OFF: Disables phase 6 call on loop 1A.
3. INPUT 6 IS SWITCHED OFF: Disables phase 2 call on loop 5A.
4. DELAY IS DISABLED FOR DETECTOR 2 (Phase 1, Loop 1A).
5. DELAY IS DISABLED FOR DETECTOR 6 (Phase 5, Loop 5A).

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1747
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 2 of 3

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch
State of North Carolina Department of Transportation
Signals Management Section
750 Greenfield Pkwy, Garner, NC 27529

SR 1100 (Brawley School Road)
at
SR 1112 (Stutts Road)/
Mayhew Drive

Division 12 Iredell County Mooresville

PLAN DATE: June 2008	REVIEWED BY: D.J. Darity
PREPARED BY: H.M. Surti	RKA PROJ. NO.: 08034 (241)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

7-8-2008

SIGNATURE DATE

SIG. INVENTORY NO. 12-1747

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-19

PPLT SIGNAL OUTPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

NOTE: THIS PROGRAMMING APPLIES FOR OUTPUT PAGE 2 ONLY.
OUTPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS.
THIS PROGRAMMING IS NECESSARY FOR ALTERNATE PHASING OPERATION.

OUTPUT ASSIGNMENTS FOR SIGNAL HEAD 51

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS). PRESS 'NEXT' FOR PAGE 2.
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "42"

```
PAGE:2  C1 PIN:88  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................42
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................._
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:88  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........5
SELECT COLOR(O=RED,1=YEL,2=GRN).....0
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:88  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................42
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 43

STEP 2

```
PAGE:2  C1 PIN:89  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................43
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:89  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........5
SELECT COLOR(O=RED,1=YEL,2=GRN).....1
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:89  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................43
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 44

STEP 3

```
PAGE:2  C1 PIN:90  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................44
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR NOT ENABLED (THIS WILL DISABLE THE OUTPUT)

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'NOT ENABLED' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:90  NOT ENABLED
OUTPUT ASSIGNMENT #.................44
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=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.........................._
```

OUTPUT ASSIGNMENTS FOR SIGNAL HEAD 11

STEP 4

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS). PRESS 'NEXT' FOR PAGE 2.
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "50"

```
PAGE:2  C1 PIN:97  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................50
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................._
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:97  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........1
SELECT COLOR(O=RED,1=YEL,2=GRN).....0
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:97  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................50
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 51

STEP 5

```
PAGE:2  C1 PIN:98  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................51
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:98  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........1
SELECT COLOR(O=RED,1=YEL,2=GRN).....1
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'NOT ENABLED' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:98  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................51
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 52

STEP 6

```
PAGE:2  C1 PIN:99  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................52
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR NOT ENABLED (THIS WILL DISABLE THE OUTPUT)

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'NOT ENABLED' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:99  NOT ENABLED
OUTPUT ASSIGNMENT #.................52
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=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.........................._
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1747
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Signal Revision - Final Signal - TCP Final Phase

NOTE: THE OUTPUT ASSIGNMENT CHANGES, SHOWN ABOVE, ARE NECESSARY FOR THE TIME OF DAY OPERATION OF SIGNAL HEADS 11 AND 51. IN ALTERNATE PHASING (PROTECTED ONLY) OPERATION, THE RED ARROW CONTROL IS SWITCHED TO THE LEFT TURN PHASE RED. THE SOLID YELLOW ARROW CONTROL IS SWITCHED TO THE LEFT TURN PHASE YELLOW. IN ADDITION, THE FLASHING YELLOW ARROW IS SWITCHED OFF BY DISABLING THE OVERLAP GREEN OUTPUT.

ALL OF THESE OUTPUT CHANGES ARE ACCOMPLISHED ON OUTPUT PAGE 2. THEREFORE IN ALTERNATE PHASING (PROTECTED ONLY) MODE, THE PAGE IS SWITCHED TO "2" BY THE CONTROLLER TOD EVENT SCHEDULING.

IN NORMAL PHASING (PPLT) MODE THE STANDARD, DEFAULT, OUPUT ASSIGNMENTS ARE USED WHICH ARE DESIGNATED ON OUTPUT PAGE 1.

Electrical Detail Sheet 3 of 3

Prepared in the offices of:
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch, State of North Carolina Department of Transportation, Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
SR 1112 (Stutts Road)/
Mayhew Drive

Division 12 Iredell County Mooresville

PLAN DATE: June 2008	REVIEWED BY: D.J. Darity
PREPARED BY: H.M. Surti	RKA PROJ. NO.: 08034 (241)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008

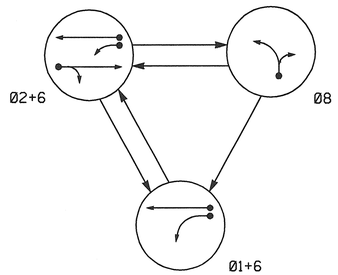
SIGNATURE DATE

SIG. INVENTORY NO. 12-1747

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-20

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

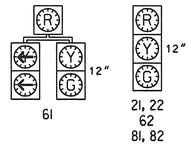
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
21, 22	R	G	R	Y
61	G	G	R	Y
62	G	G	R	Y
81, 82	R	R	G	R

SIGNAL FACE I.D.

Denotes L.E.D.



2070L LOOP & DETECTOR INSTALLATION

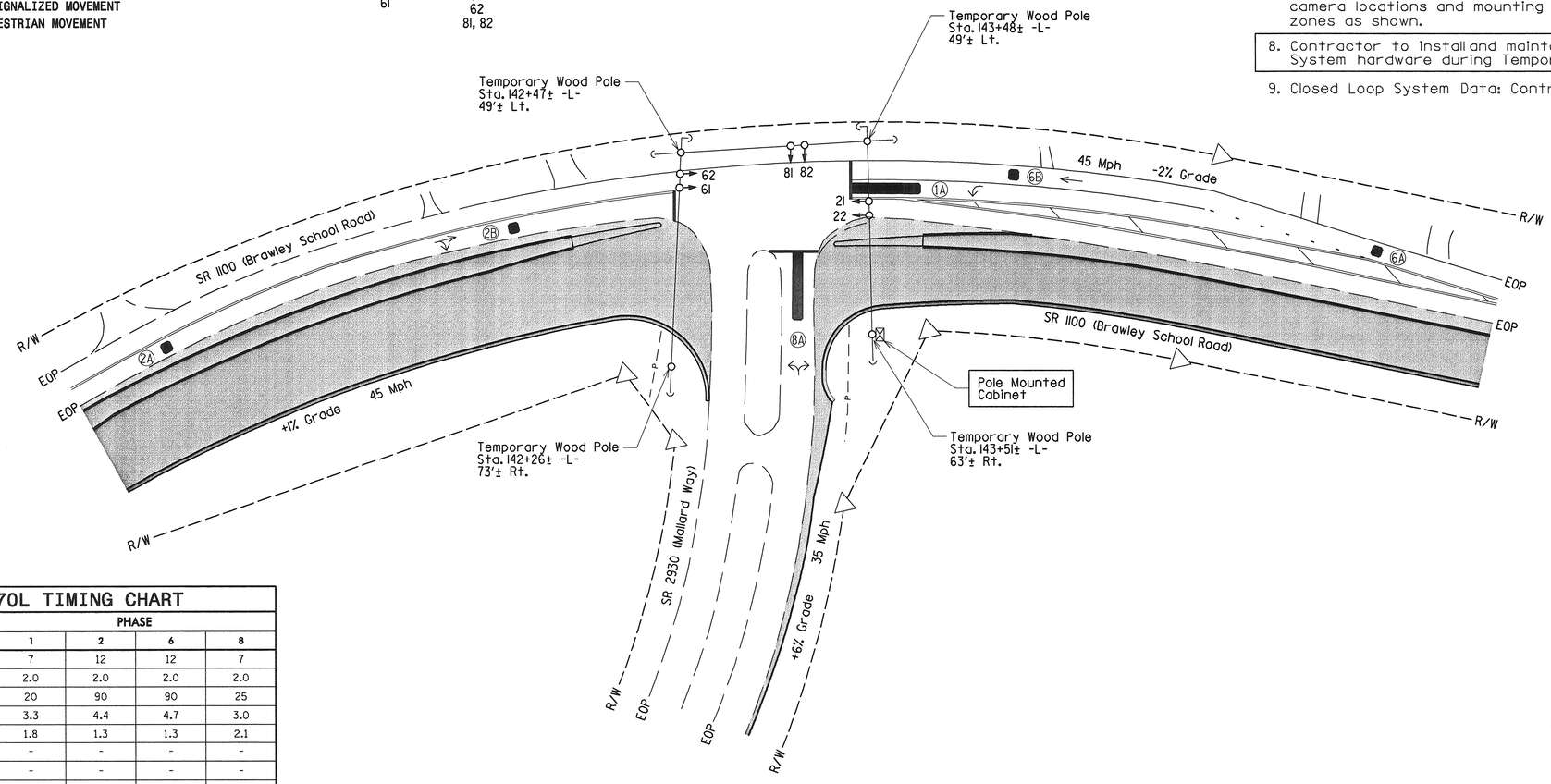
DETECTION ZONES					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	Y	1	Y	Y	–	—	15	–	*
					6	Y	Y	–	—	—	–	*
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6B	6X6	90	*	Y	6	Y	Y	–	—	—	–	*
8A	6X40	0	*	Y	8	Y	Y	–	—	10	–	*

* Video Detection Zone

3 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

NOTES

1. Refer to 'Roadway Standard Drawings NCDOT' dated July 2006, 'Standard Specifications for Roads and Structures' dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector zones to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
8. Contractor to install and maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
9. Closed Loop System Data: Controller Asset # 1763.



2070L TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	90	25
Yellow Clearance	3.3	4.4	4.7	3.0
Red Clearance	1.8	1.3	1.3	2.1
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	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	
	Pavement Marking Arrow	
	Video Detection Zone	
	Construction Zone	

New Installation - Temporary Construction Signal - TCP Phase I

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Farlington Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-8416 Fax.
www.rameykemp.com

Prepared for:
North Carolina Department of Transportation
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 Greenfield Parkway, Garner, NC 27529

SCALE 0 40 1"=40'

SR 1100 (Brawley School Road) at SR 2930 (Mallard Way)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

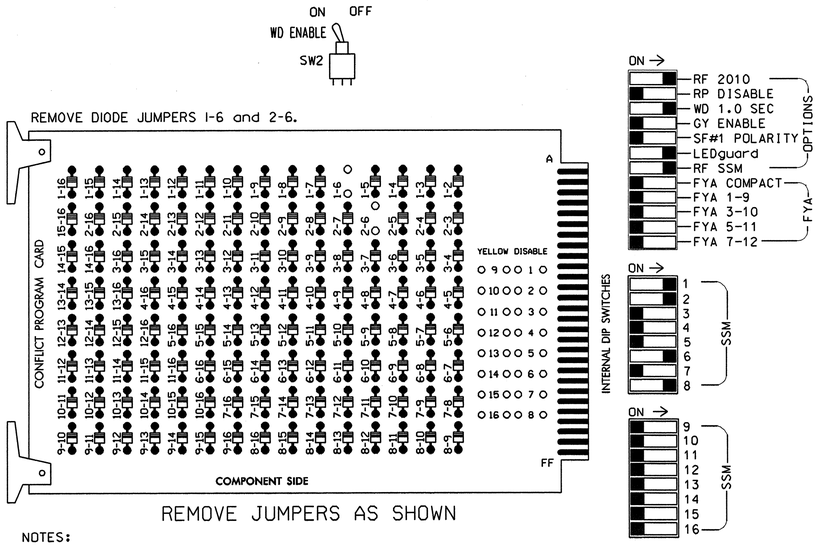
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19113 DONALD J. DARITY
7-8-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1763T

$$$$USERNAME$$$$
$$$$DESIGNATION$$$$
$$$$SIGNATURE$$$$
$$$$DATE$$$$
$$$$TIME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-21

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,4,5,7, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. The cabinet and controller are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

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

NU = NOT USED

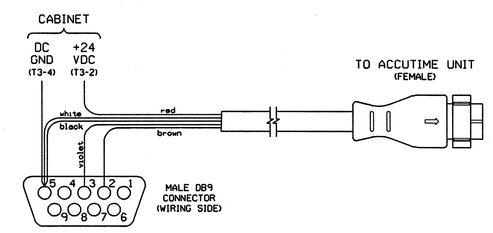
* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

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

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

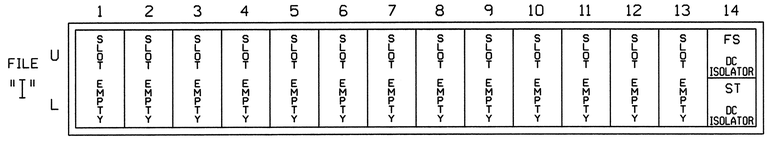
Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

INPUT FILE POSITION LAYOUT

(front view)

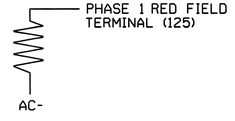


EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

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



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

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1763T
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-8416 Fax.
www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in Cooperation with and Under Supervision of the STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signals Management Section

750 Greenfield Parkway, Garner, NC 27529

New Installation - Temporary Construction Signal - TCP Phase I

SR 1100 (Brawley School Road) at SR 2930 (Mallard Way)

Division 12 | Iredell County | Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

7-8-2008

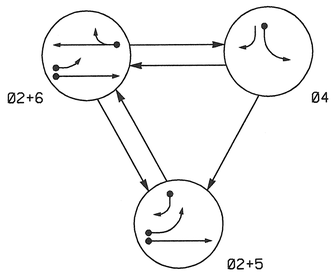
SIGNATURE | DATE

SIG. INVENTORY NO. 12-1763T

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-22

3 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

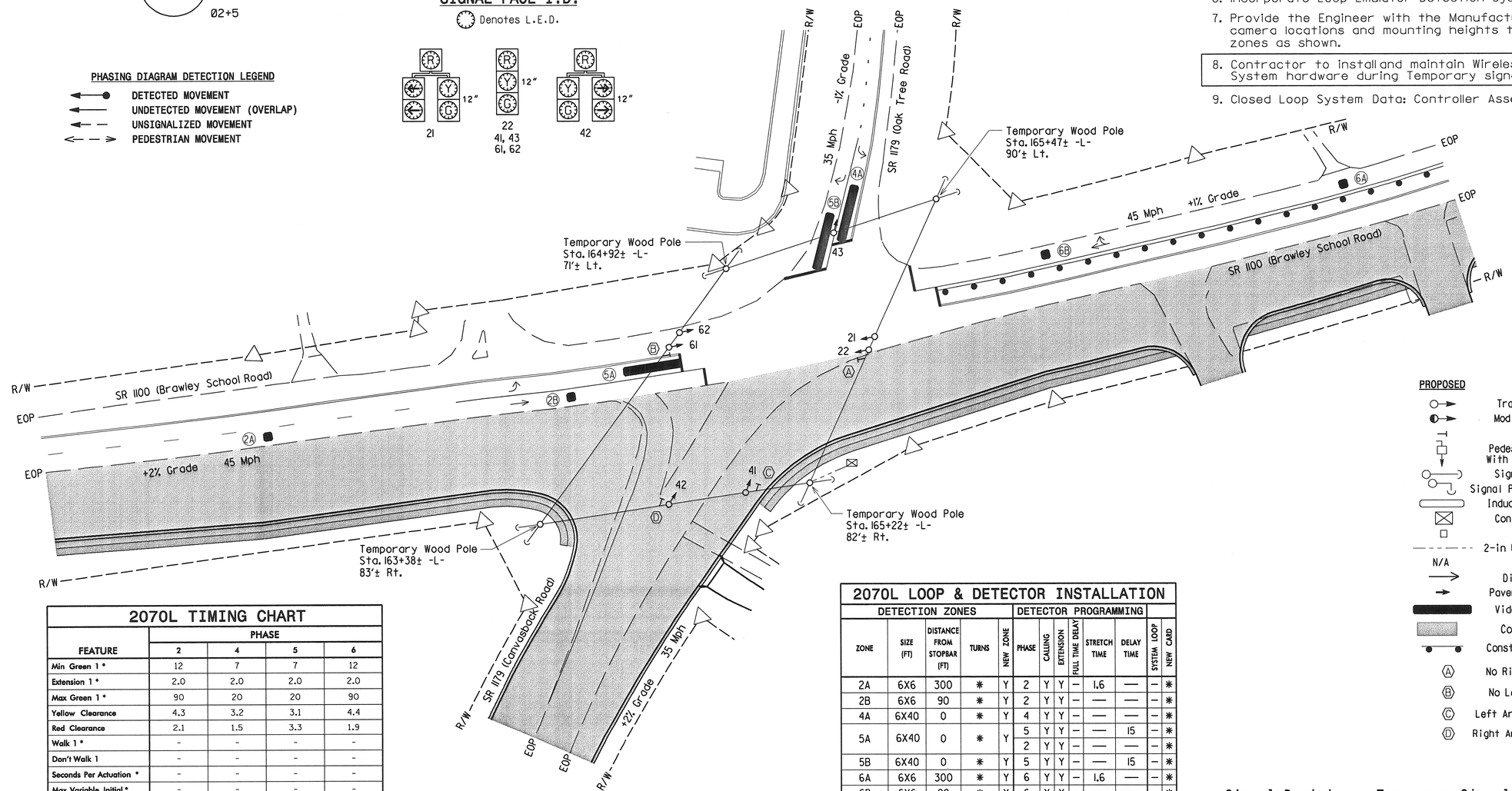
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21	G	G	R	Y
22	G	G	R	Y
41, 43	R	R	G	R
42	R	R	G	R
61, 62	R	G	R	Y

SIGNAL FACE I.D.

Denotes L.E.D.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector zones to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
8. Contractor to install and maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
9. Closed Loop System Data: Controller Asset # 1542.



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	
	Pavement Marking Arrow	
	Video Detection Zone	
	Construction Zone	
	Construction Zone Drums	
Ⓐ	No Right Turn Sign (R3-1)	Ⓐ
Ⓑ	No Left Turn Sign (R3-2)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	Right Arrow "ONLY" Sign (R3-5R)	Ⓓ

2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	90	20	20	90
Yellow Clearance	4.3	3.2	3.1	4.4
Red Clearance	2.1	1.5	3.3	1.9
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	*	Y	2	Y	Y	-	1.6	—	-	*
2B	6X6	90	*	Y	2	Y	Y	-	—	—	-	*
4A	6X40	0	*	Y	4	Y	Y	-	—	—	-	*
5A	6X40	0	*	Y	5	Y	Y	-	—	15	-	*
					2	Y	Y	-	—	—	-	*
5B	6X40	0	*	Y	5	Y	Y	-	—	15	-	*
6A	6X6	300	*	Y	6	Y	Y	-	1.6	—	-	*
6B	6X6	90	*	Y	6	Y	Y	-	—	—	-	*

* Video Detection Zone

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:

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Transportation Engineers
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Prepared for:
The State of North Carolina
Department of Transportation
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1179 (Canvasback Road/ Oak Tree Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W Surti	RKA PROJ. NO.:	08034 (241)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1542T1

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

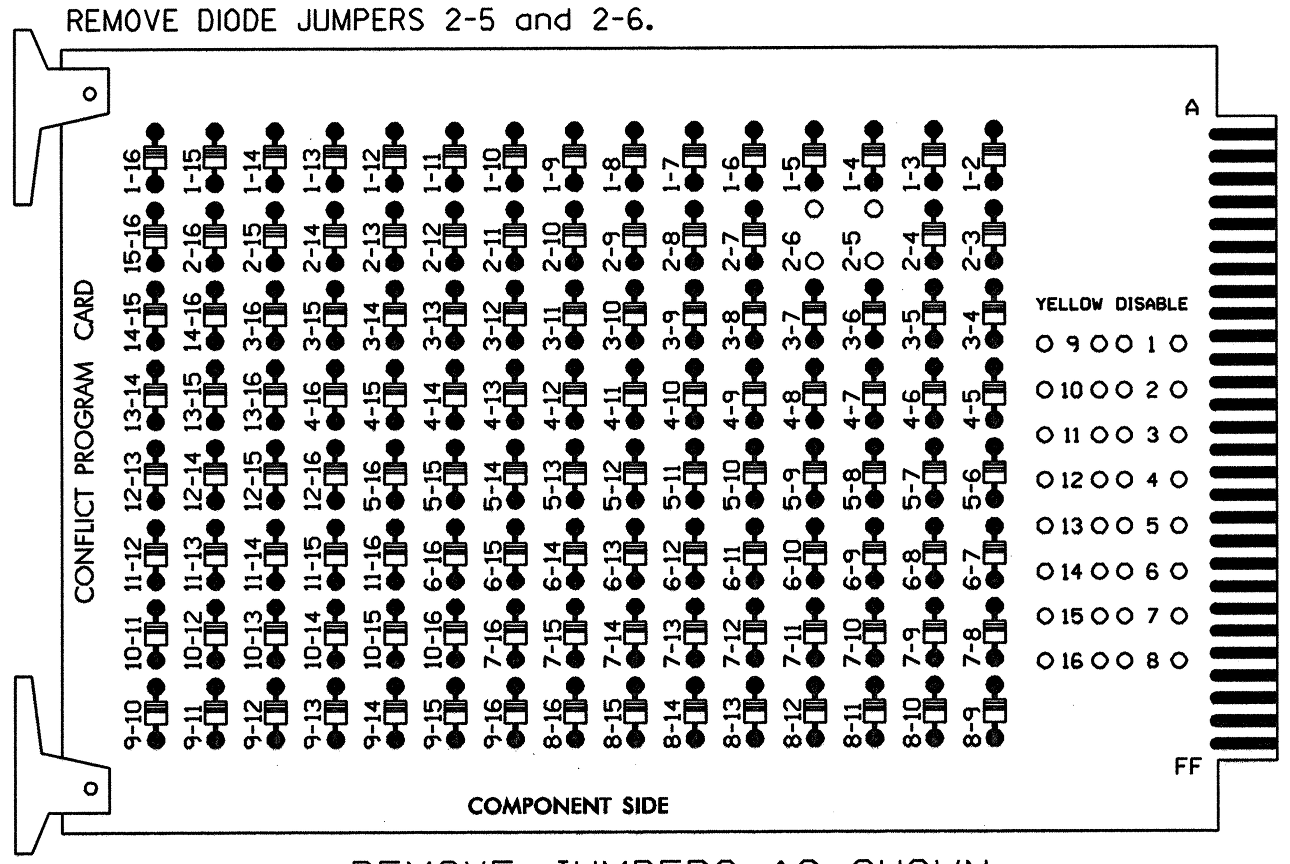
PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-23

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

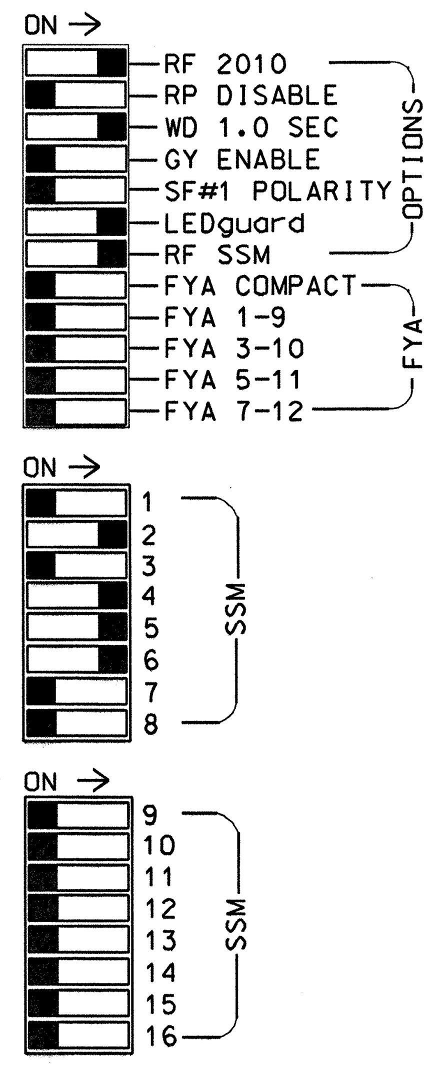
(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2

REMOVE DIODE JUMPERS 2-5 and 2-6.



REMOVE JUMPERS AS SHOWN



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7,8, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. The cabinet and controller are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42 43	NU	21,42	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101		*	134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW																		
YELLOW ARROW							132											
GREEN ARROW							133											
(hand)																		
(walk)																		

NU = NOT USED

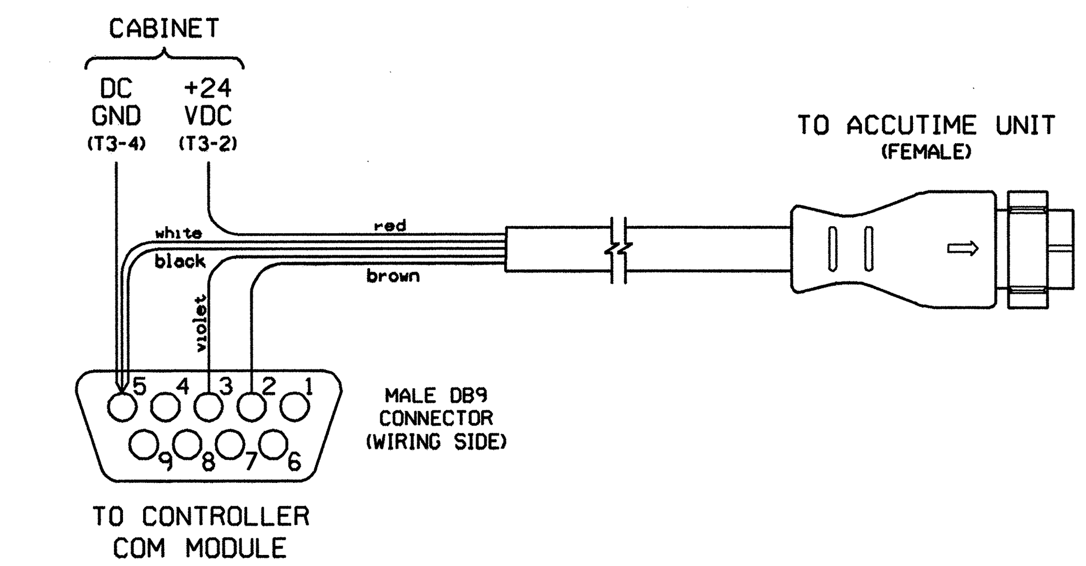
* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED......S2,S4,S5,S6
PHASES USED.............2,4,5,6
OVERLAPS................NONE

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

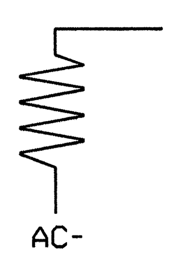
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1542T1
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
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919-872-5115 Tel. 919-878-5416 Fax.
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Signal Revision - Temporary Signal 1 - TCP Phase I

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch — State of North Carolina Department of Transportation — Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

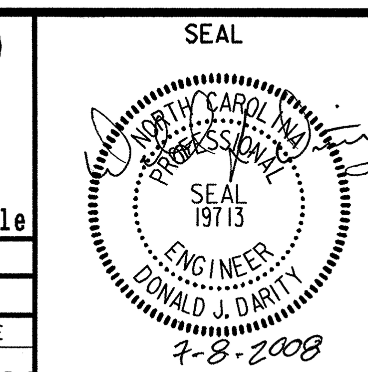
SR 1100 (Brawley School Road)
at
SR 1179 (Canvasback Road/ Oak Tree Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL



SIGNATURE DATE

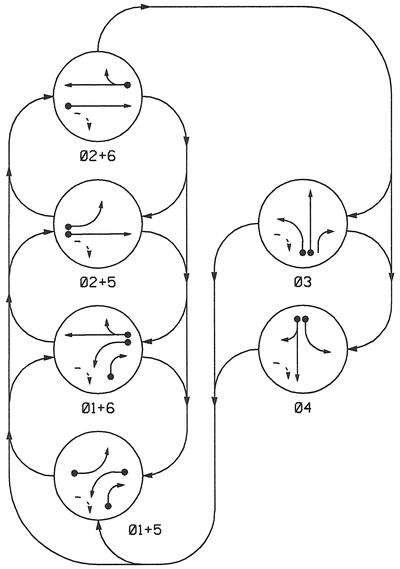
SIG. INVENTORY NO. 12-1542T1

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-24

6 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

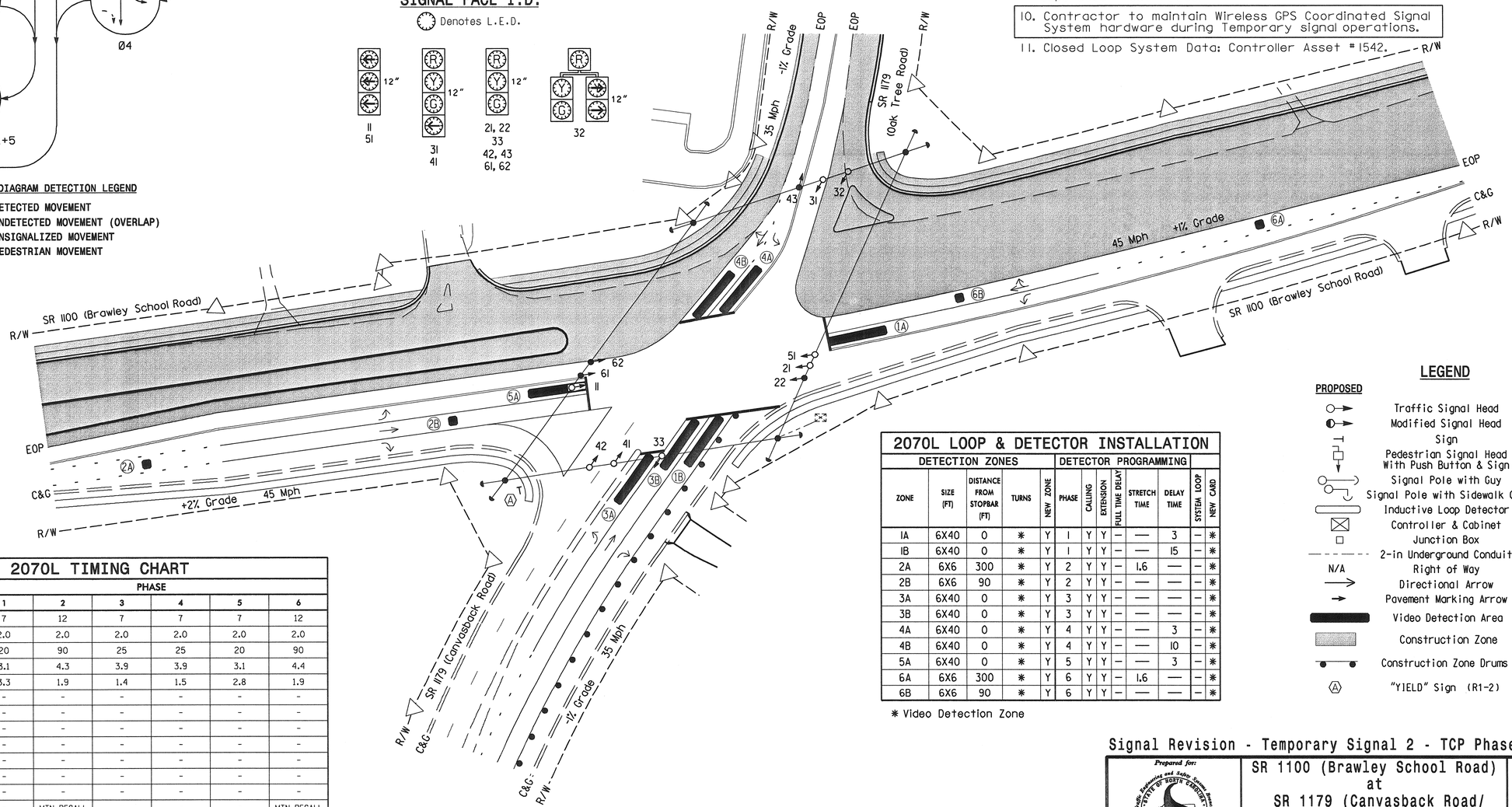
SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	Ø3	Ø4	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R →	R →	R	R	G	R	R
33	R	R	R	R	G	R	R
41	R	R	R	R	R	G ←	R
42, 43	R	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

Denotes L.E.D.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
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. Reposition existing heads numbered 22, 61, and 62.
6. Set all detector zones to presence mode.
7. Incorporate Loop Emulator Detection System for Vehicle Detection.
8. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Contractor to maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
11. Closed Loop System Data: Controller Asset # 1542.



2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	Y	1	Y	Y	–	—	3	–	*
1B	6X40	0	*	Y	1	Y	Y	–	—	15	–	*
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
3A	6X40	0	*	Y	3	Y	Y	–	—	—	–	*
3B	6X40	0	*	Y	3	Y	Y	–	—	—	–	*
4A	6X40	0	*	Y	4	Y	Y	–	—	3	–	*
4B	6X40	0	*	Y	4	Y	Y	–	—	10	–	*
5A	6X40	0	*	Y	5	Y	Y	–	—	3	–	*
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6B	6X6	90	*	Y	6	Y	Y	–	—	—	–	*

* Video Detection Zone

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	→
→	Pavement Marking Arrow	→
▬	Video Detection Area	▬
▭	Construction Zone	▭
●–●	Construction Zone Drums	●–●
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ

2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	25	25	20	90
Yellow Clearance	3.1	4.3	3.9	3.9	3.1	4.4
Red Clearance	3.3	1.9	1.4	1.5	2.8	1.9
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
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.

Signal Revision - Temporary Signal 2 - TCP Phase II

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section
750 Greenfield Pkwy, Graner, NC 27529

SR 1100 (Brawley School Road) at SR 1179 (Canvasback Road/ Oak Tree Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (241)

SCALE 0 40 1"=40'

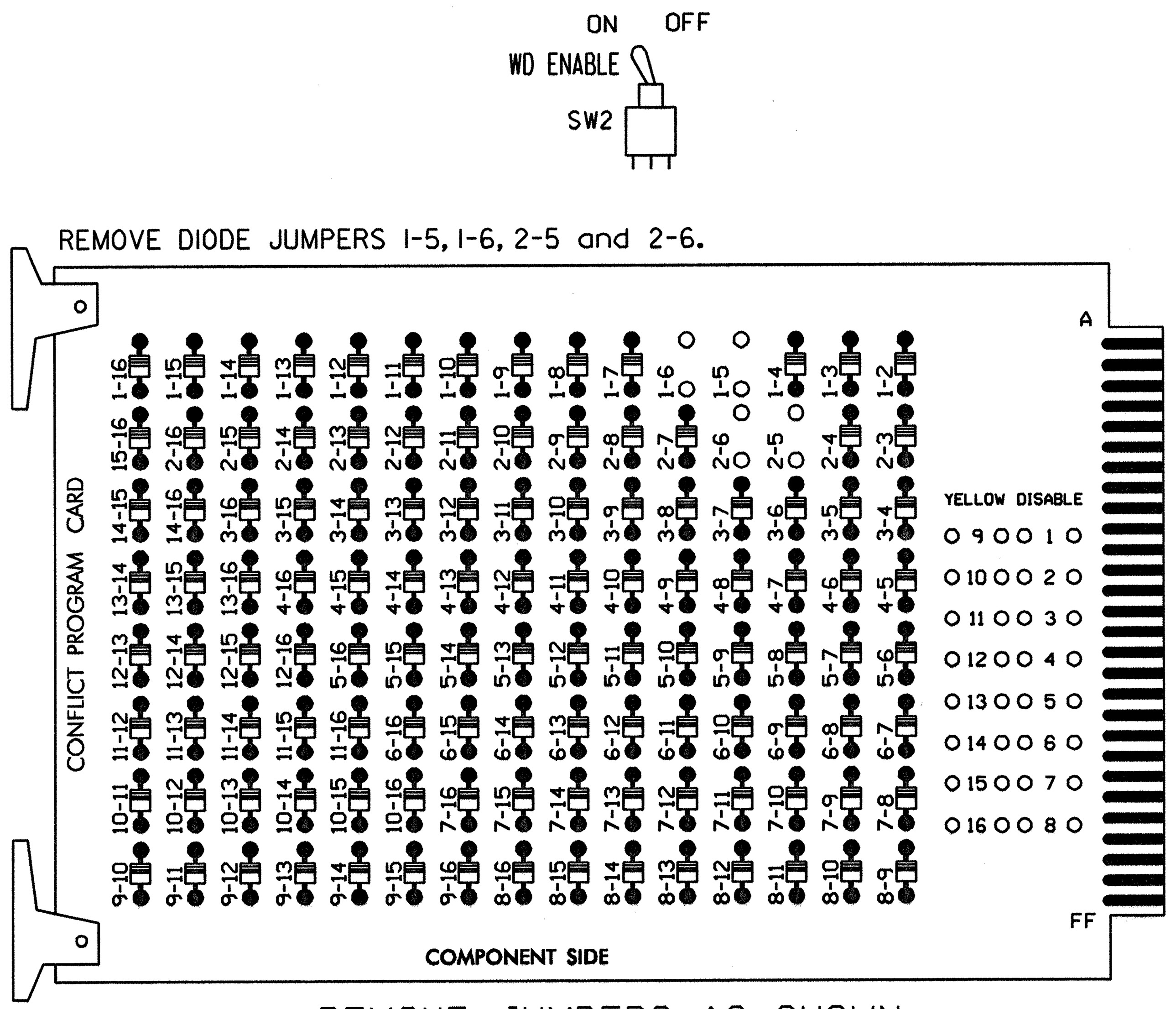
REVISIONS	INIT.	DATE

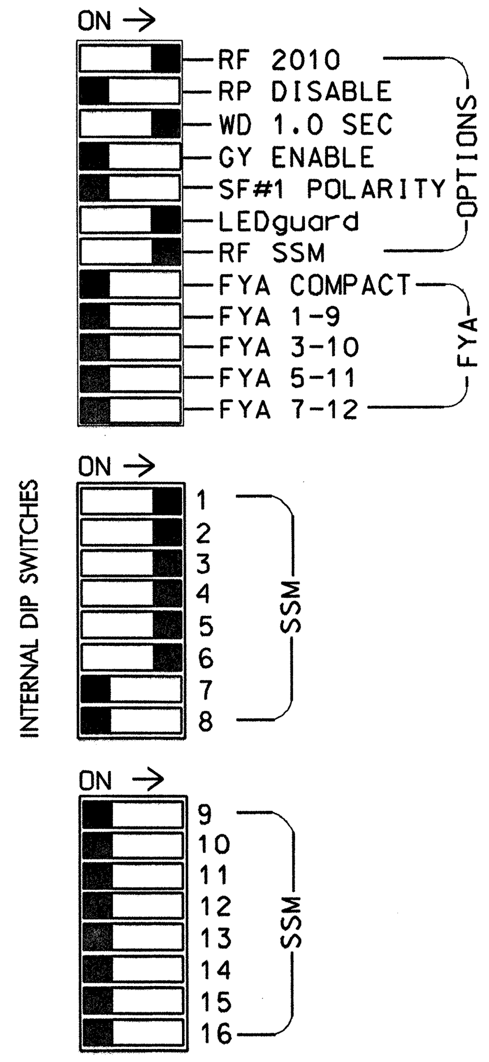
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1542T2

$$$$$$$$$$STIME$$$$$
$$$$$$$$$$$$$$$$$$$$DON$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$DON$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$DON$$$$$$$$$$$$$$$$$$$$
$$$$$$USERNAME$$$$

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 7,8,9, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. This controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

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	32	21,22	NU	31	32,33	41	42,43	NU	51	61,62	NU	NU	NU	NU	NU	NU	NU	NU	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											
GREEN ARROW	127	127			118		103			133											
(DON'T WALK)																					
(WALK)																					

NU = NOT USED

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED......S1,S2,S3,S4,S5,S6
PHASES USED.............1,2,3,4,5,6
OVERLAPS................NONE

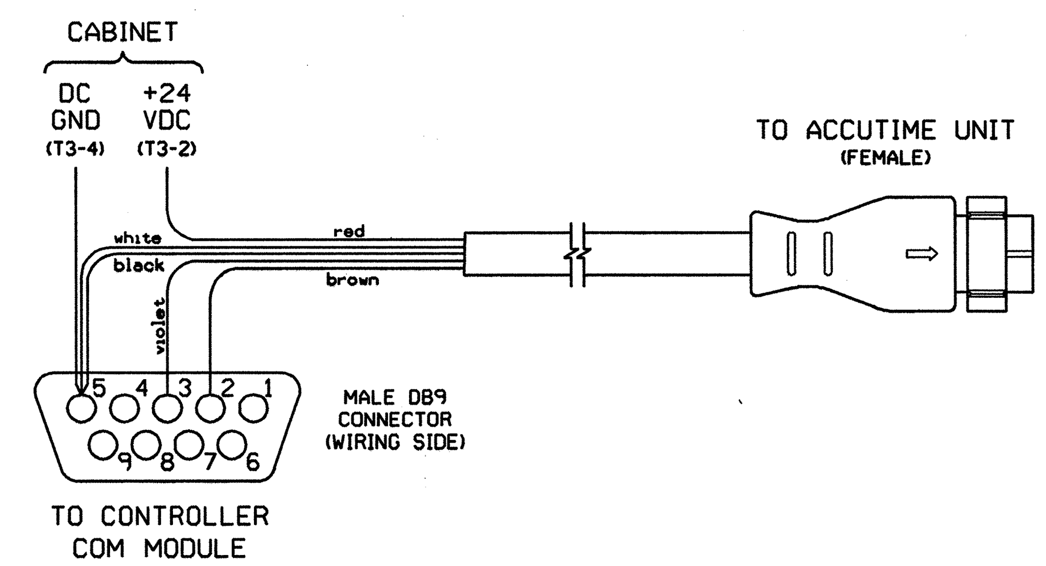
SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1542T2
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

Signal Revision - Temporary Signal 2 - TCP Phase II

Prepared in the offices of:

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Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch - State of North Carolina - Department of Transportation - Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

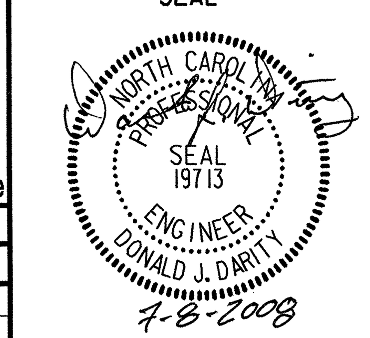
SR 1100 (Brawley School Road)
at
SR 1179 (Canvasback Road/ Oak Tree Road)

Division 12 Iredell County Mooresville

PLAN DATE: June 2008	REVIEWED BY: D.J. Darity
PREPARED BY: H.M. Surti	RKA PROJ. NO.: 08034 (241)

REVISIONS	INIT.	DATE

SEAL



SIGNATURE DATE

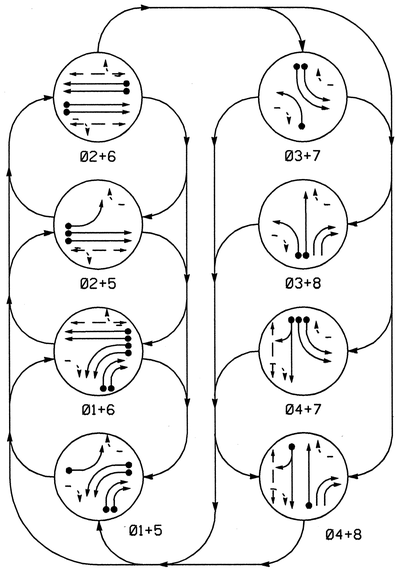
SIG. INVENTORY NO. 12-1542T2

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-26

8 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

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, 22	R	R	G	G	R	R	R	R	Y
31, 32	~~R~~	~~R~~	~~R~~	~~R~~	←	←	~~R~~	~~R~~	~~R~~
41, 42	R	R	R	R	R	R	G	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61, 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	→	→	~~R~~	~~R~~	~~R~~	→	~~R~~	→	~~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

SIGNAL FACE I.D.

Denotes L.E.D.

11, 12
31, 32
51
71, 72

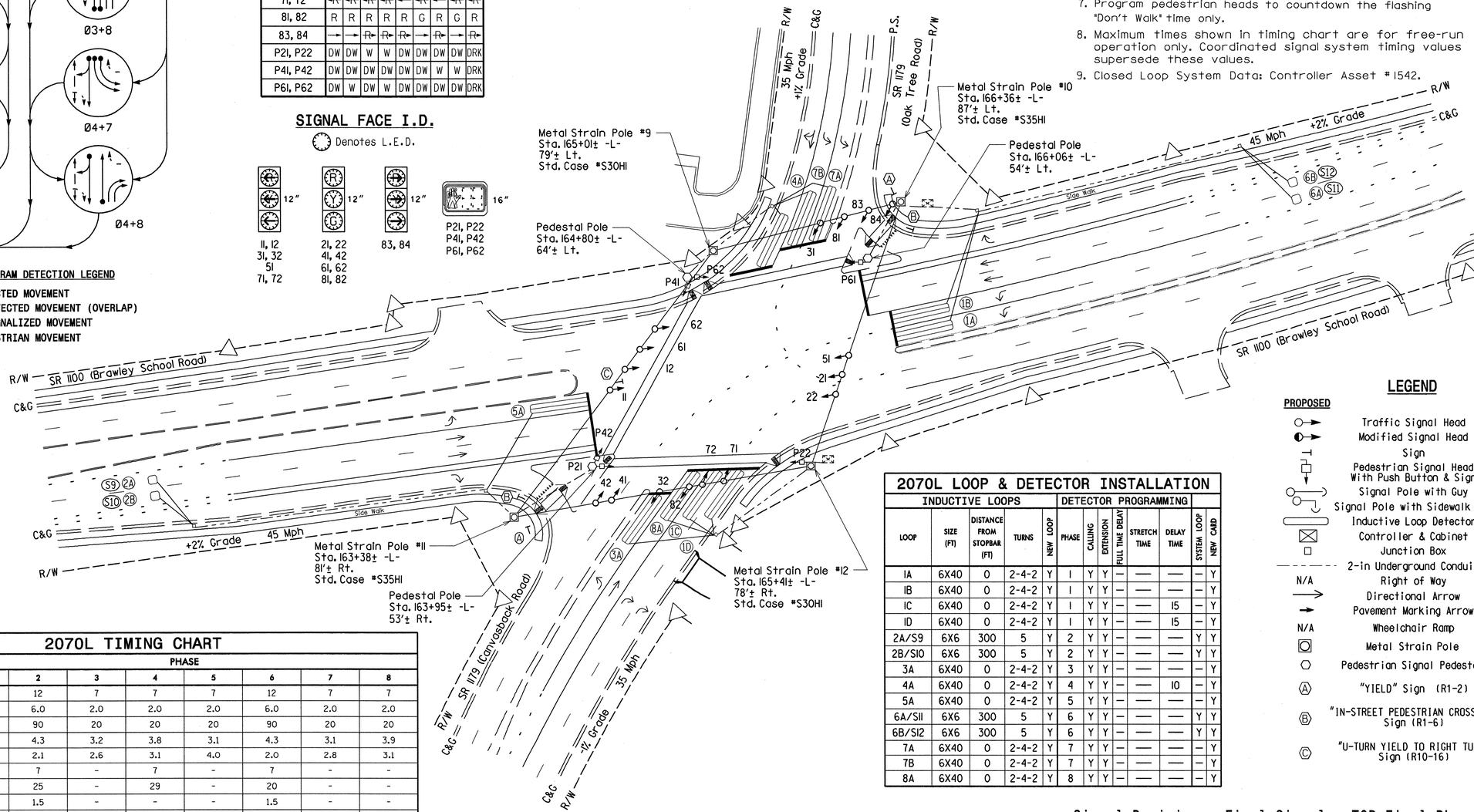
21, 22
41, 42
61, 62
81, 82

83, 84

P21, P22
P41, P42
P61, P62

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Closed Loop System Data: Controller Asset #1542.



2070L LOOP & DETECTOR INSTALLATION

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	–	—	—	–	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	–	—	—	–	Y
1C	6X40	0	2-4-2	Y	1	Y	Y	–	—	15	–	Y
1D	6X40	0	2-4-2	Y	1	Y	Y	–	—	15	–	Y
2A/S9	6X6	300	5	Y	2	Y	Y	–	—	—	Y	Y
2B/S10	6X6	300	5	Y	2	Y	Y	–	—	—	Y	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	–	—	—	–	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	–	—	10	–	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	–	—	—	–	Y
6A/S11	6X6	300	5	Y	6	Y	Y	–	—	—	Y	Y
6B/S12	6X6	300	5	Y	6	Y	Y	–	—	—	Y	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	–	—	—	–	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	–	—	—	–	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	–	—	—	–	Y

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	→
→	Pavement Marking Arrow	→
N/A	Wheelchair Ramp	♿
◎	Metal Strain Pole	◘
⬡	Pedestrian Signal Pedestal	⬢
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	"IN-STREET PEDESTRIAN CROSSING" Sign (R1-6)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ

2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	20	90	20	20	20	90	20	20
Yellow Clearance	3.1	4.3	3.2	3.8	3.1	4.3	3.1	3.9
Red Clearance	4.2	2.1	2.6	3.1	4.0	2.0	2.8	3.1
Walk 1 *	-	7	-	7	-	7	-	-
Don't Walk 1	-	25	-	29	-	20	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	20	-	-	-	20	-	-
Time To Reduce *	-	40	-	-	-	40	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	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 Revision - Final Signal - TCP Final Phase

Prepared in the offices of:

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Prepared for:
750 Greenfield Pkwy, Garner, NC 27529

SCALE 0 40 1"=40'

SR 1100 (Brawley School Road) at SR 1179 (Canvasback Road/ Oak Tree Road)

Division 12 | Iredell County | Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-29-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1542

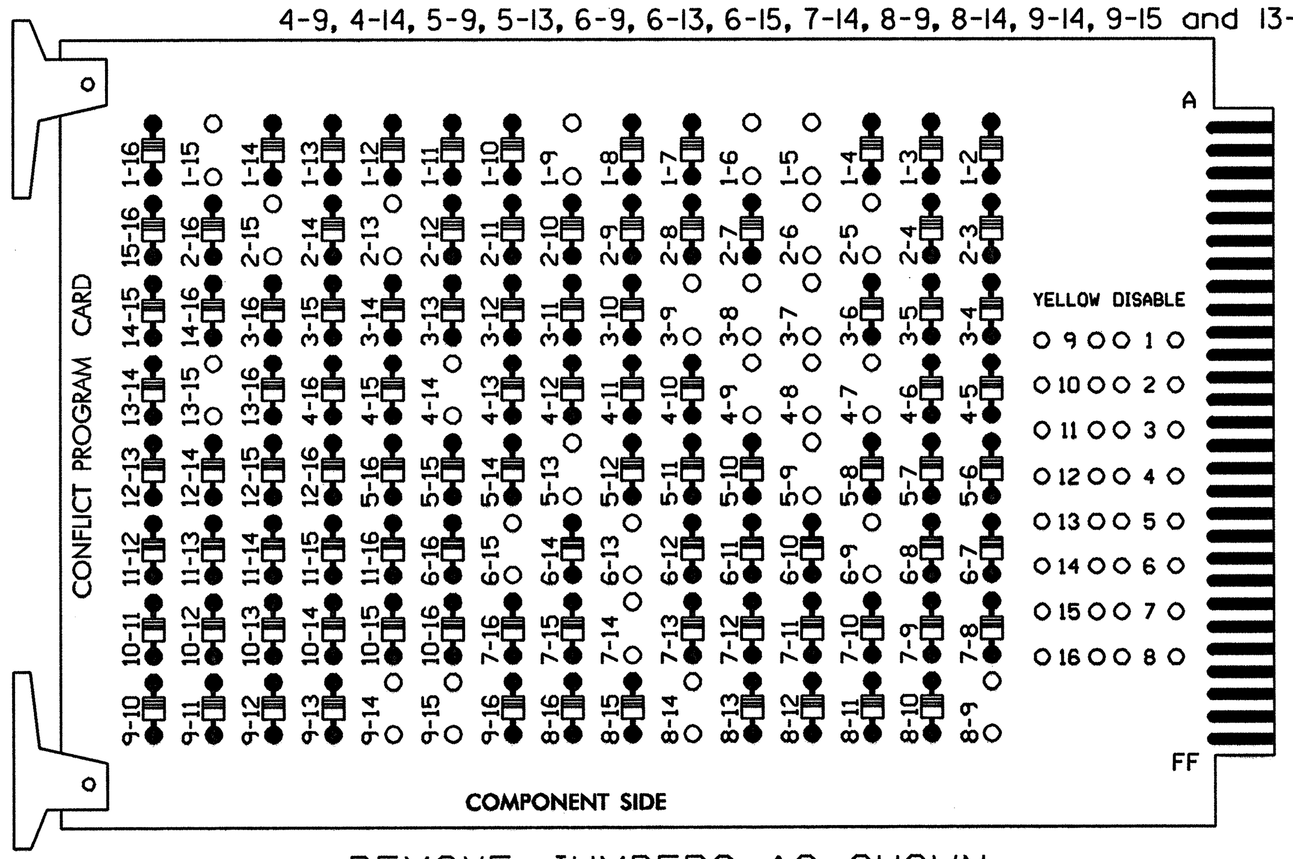
$$$$$SYSTIME$$$$$
$$$$$USERNAME$$$$$

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

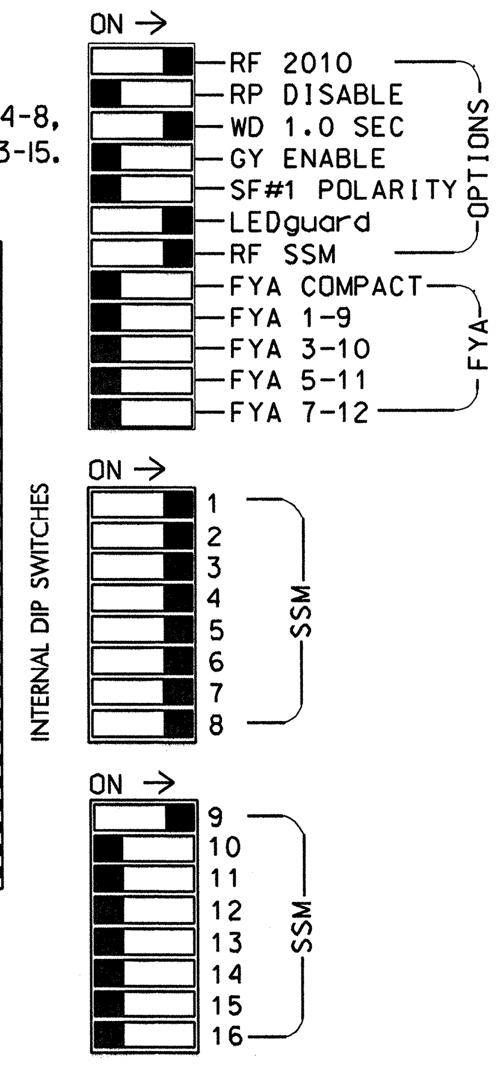
(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-9, 4-7, 4-8, 4-9, 4-14, 5-9, 5-13, 6-9, 6-13, 6-15, 7-14, 8-9, 8-14, 9-14, 9-15 and 13-15.



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 10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
6. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
7. Program phases 2, 4 and 6 for 'STARTUP PED CALL'.
8. This controller and cabinet are part of the SR 1100 (Brawley School Road) Closed Loop Signal System.

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	31,32	41,42	P41 P42	51	61,62	P61 P62	71,72	81,82	NU	83,84	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122			A121					
YELLOW ARROW	126			117			132			123			A122					
GREEN ARROW	127			118			133			124			A123					
(Don't Walk hand)			113			104			119									
(Walk person)			115			106			121									

NU = Not Used

** Rewire OLA to flash on flash unit #2 circuit #1

EQUIPMENT INFORMATION

CONTROLLER.............CONTRACTOR SUPPLIED 2070L
CABINET ....CONTRACTOR SUPPLIED 332
SOFTWARE ....ECONOLITE OASIS
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS..18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6, S6P,S7,S8,S9
PHASES USED............1,2,2PED,3,4,4PED,5,6,6PED,7,8
OVERLAP A..............1+8

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 1 1C	Ø2/SYS 2A/S9	SLOT EMPTY	Ø 3 3A	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2PED DC ISOLATOR	Ø6PED DC ISOLATOR	FS DC ISOLATOR
	L	Ø 1 1B	Ø 1 1D	Ø2/SYS 2B/S10		NOT USED	NOT USED						Ø4PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø6/SYS 6A/S11	SLOT EMPTY	SLOT EMPTY	Ø 7 7A	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 6/SYS 6B/S12			Ø 7 7B	NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-3,4	I1L	56	18	1	1	Y	Y			
1C	TB2-5,6	I2U	39	1	2	1	Y	Y			15
1D	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A/S9	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y			
2B/S10	TB2-11,12	I3L	76	38	42	2/SYS	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A/S11	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B/S12	TB3-7,8	J2L	44	6	16	6/SYS	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8					
PED PUSH BUTTON											
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					

Note: Install DC Isolator in input file slot I12 and I13.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1542
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Signal Revision - Final Signal - TCP Final Phase

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road) at SR 1179 (Canvasback Road/ Oak Tree Road)

Division 12 Iredell County Mooresville

750 Greenfield Pkwy, Garner, NC 27529

PLAN DATE: Apr 2008	REVIEWED BY: D.J. Darity
PREPARED BY: H.M. Surti	RKA PROJ. NO.: 08034 (040)

REVISIONS	INIT.	DATE

SEAL

SIGNATURE 4-28-2008 DATE

SIG. INVENTORY NO. 12-1542

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-28

3 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM

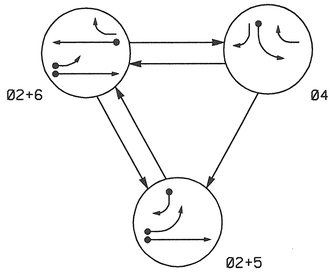


TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21	G	G	R	Y
22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
61	R	G	R	Y
62	R	G	R	Y

SIGNAL FACE I.D.

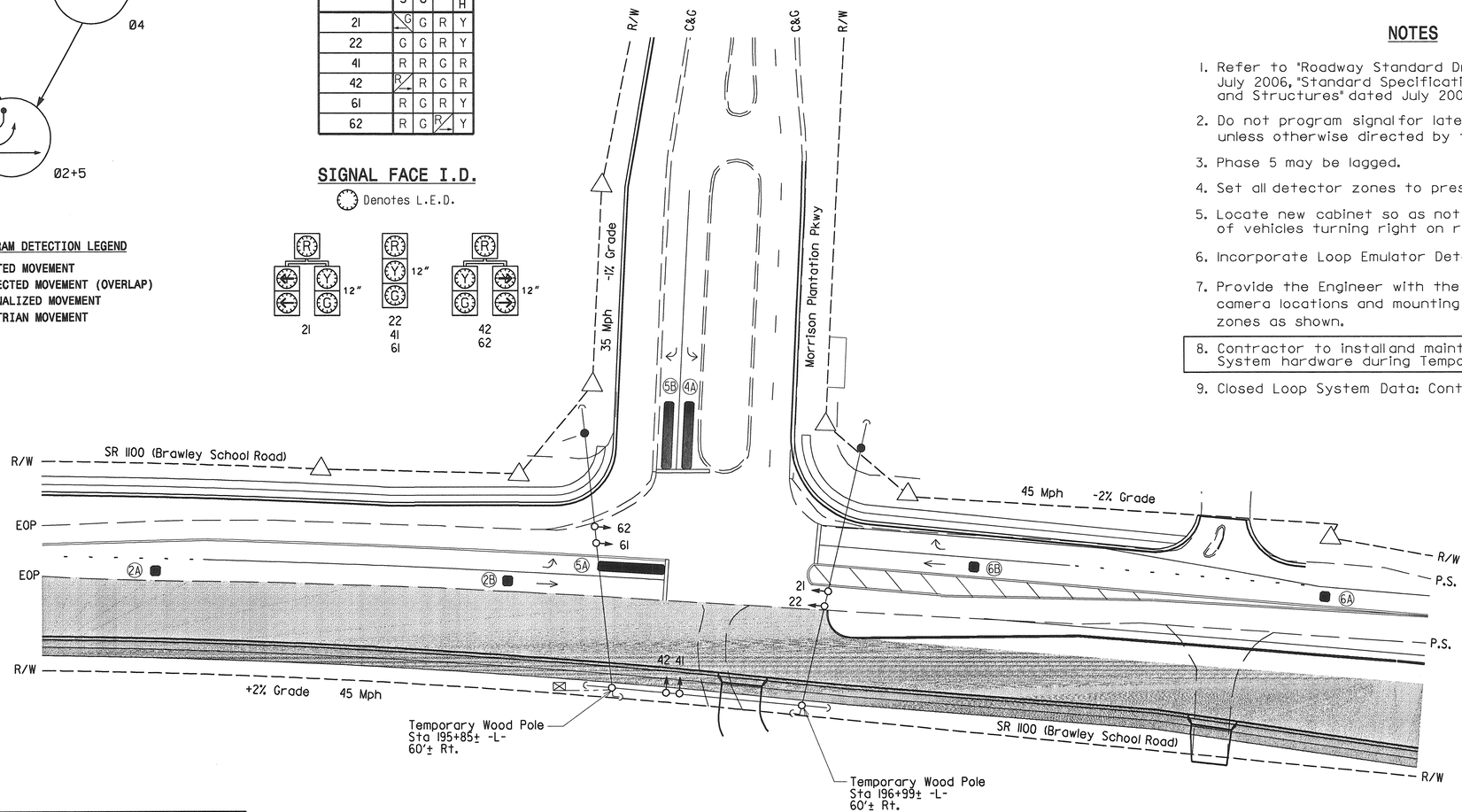
Denotes L.E.D.

PHASING DIAGRAM DETECTION LEGEND

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

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector zones to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
8. Contractor to install and maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
9. Closed Loop System Data: Controller Asset #1660.



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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▨	Construction Zone	▨

2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.3	3.2	3.1	4.7
Red Clearance	1.1	2.6	1.7	1.5
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP / NEW CARD
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	– *
2B	6X6	90	*	Y	2	Y	Y	–	—	—	– *
4A	6X40	0	*	Y	4	Y	Y	–	—	—	– *
5A	6X40	0	*	Y	5	Y	Y	–	—	15	– *
					2	Y	Y	–	—	—	– *
5B	6X40	0	*	Y	5	Y	Y	–	—	15	– *
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	– *
6B	6X6	90	*	Y	6	Y	Y	–	—	—	– *

* Video Detection Zone

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
Morrison Plantation Pkwy

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

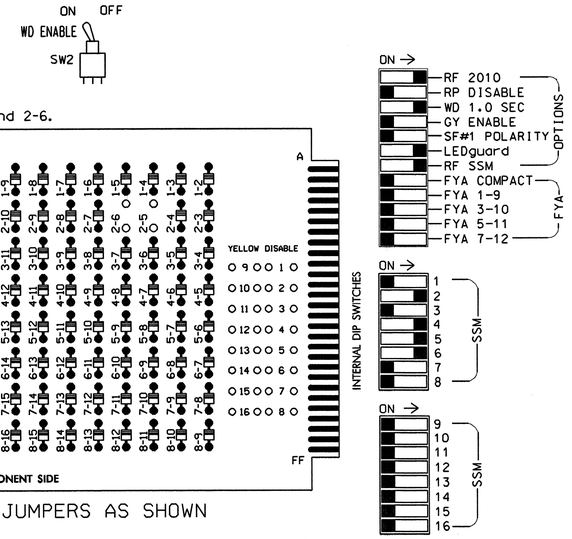
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1660T1

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-29

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7,8, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. The cabinet and controller are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4		S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	21,42	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101			*	134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW																			
YELLOW ARROW						102		132											
GREEN ARROW						103		133											
✋																			
🚶																			

NU = NOT USED

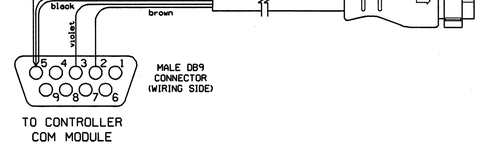
* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S4,S5,S6
PHASES USED.....2,4,5,6
OVERLAPS.....NONE

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

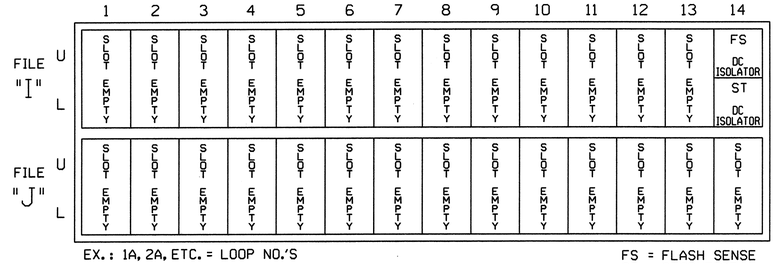
Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

INPUT FILE POSITION LAYOUT

(front view)

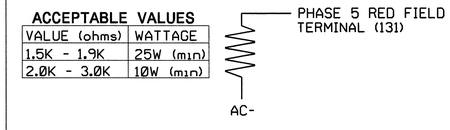


EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

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



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

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1660T1
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
6808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-6416 Fax.
www.rameykemp.com

Signal Revision - Temporary Signal 1 - TCP Phase I

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at Morrison Plantation Pkwy

Division 12 | Iredell County | Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

4-28-2008

SIGNATURE | DATE

SIG. INVENTORY NO. 12-1660T1

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-30

3 Phase
Fully Actuated
(SR 1100 (Brawley Sch Rd) Closed Loop Signal System)

PHASING DIAGRAM

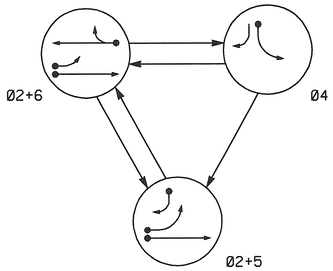


TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21	G	G	R	Y
22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
61, 62	R	G	R	Y

SIGNAL FACE I.D.

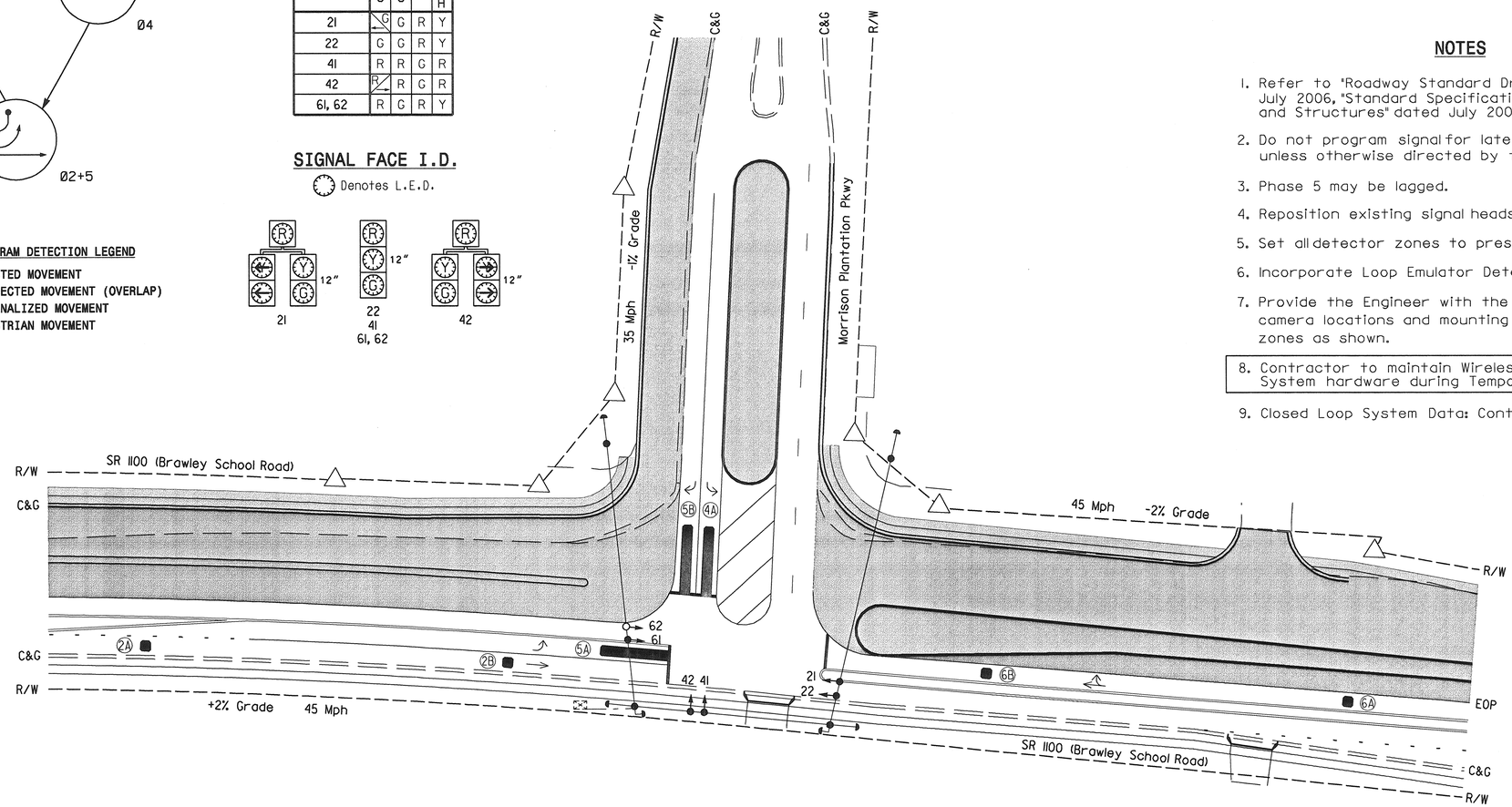
Denotes L.E.D.

PHASING DIAGRAM DETECTION LEGEND

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

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads 21, 22, and 61.
5. Set all detector zones to presence mode.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
8. Contractor to maintain Wireless GPS Coordinated Signal System System hardware during Temporary signal operations.
9. Closed Loop System Data: Controller Asset # 1660.



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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▨	Construction Zone	▨

2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.3	3.2	3.1	4.7
Red Clearance	1.3	2.4	1.7	1.5
Red Revert	5.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
4A	6X40	0	*	Y	4	Y	Y	–	—	—	–	*
5A	6X40	0	*	Y	5	Y	Y	–	—	15	–	*
					2	Y	Y	–	—	—	–	*
5B	6X40	0	*	Y	5	Y	Y	–	—	15	–	*
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6B	6X6	90	*	Y	6	Y	Y	–	—	—	–	*

* Video Detection Zone

Signal Revision - Temporary Signal 2 - TCP Phase II

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Farringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Prepared for: Traffic Engineering and Safety Systems Branch, North Carolina Department of Transportation, Signals and Geometrics Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at Morrison Plantation Pkwy

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

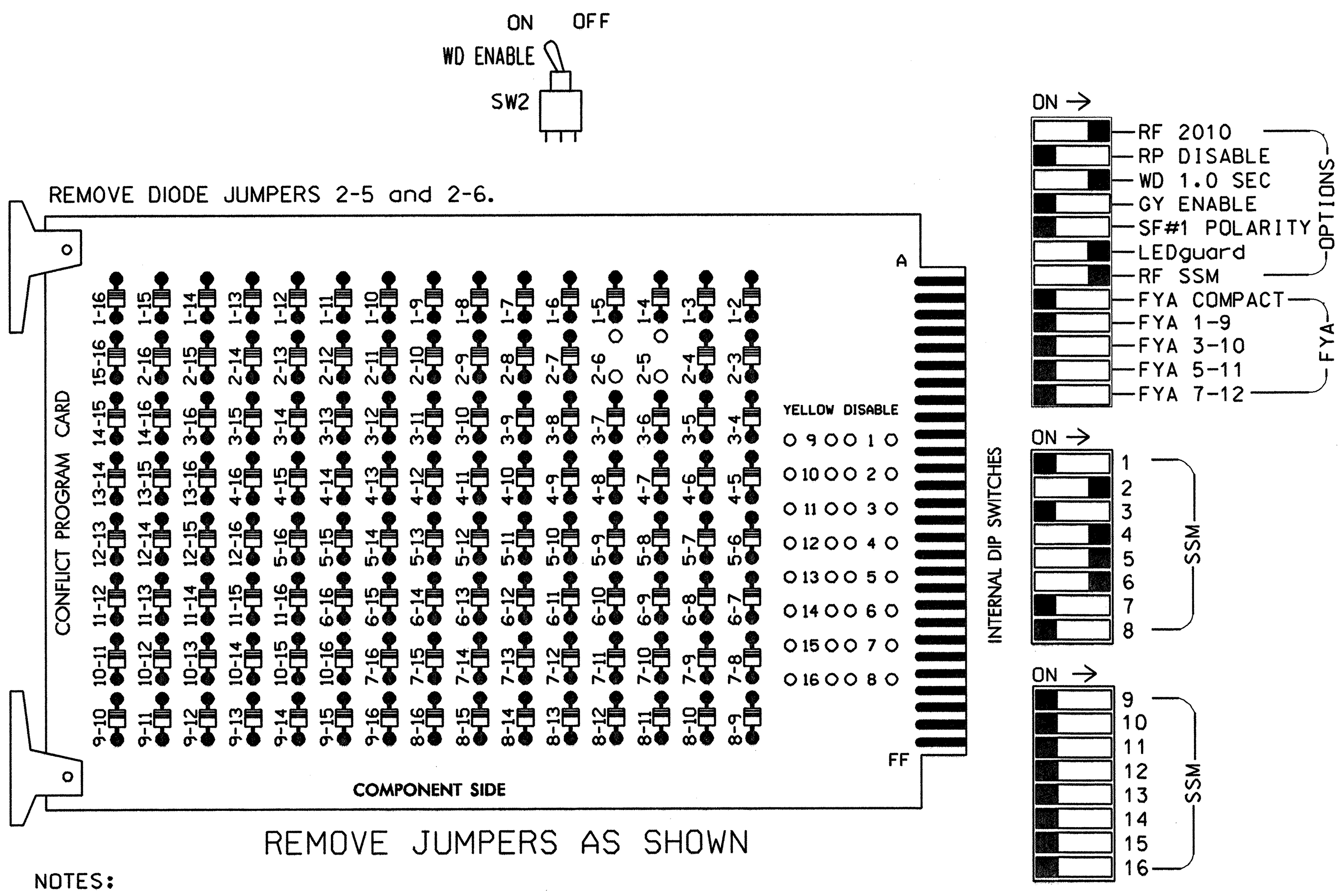
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 DONALD J. DARITY
4-28-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1660T2

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-31

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 1,3,7,8, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. The cabinet and controller are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4		S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	21,42	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101			*	134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW																			
YELLOW ARROW						102		132											
GREEN ARROW						103		133											

NU = NOT USED

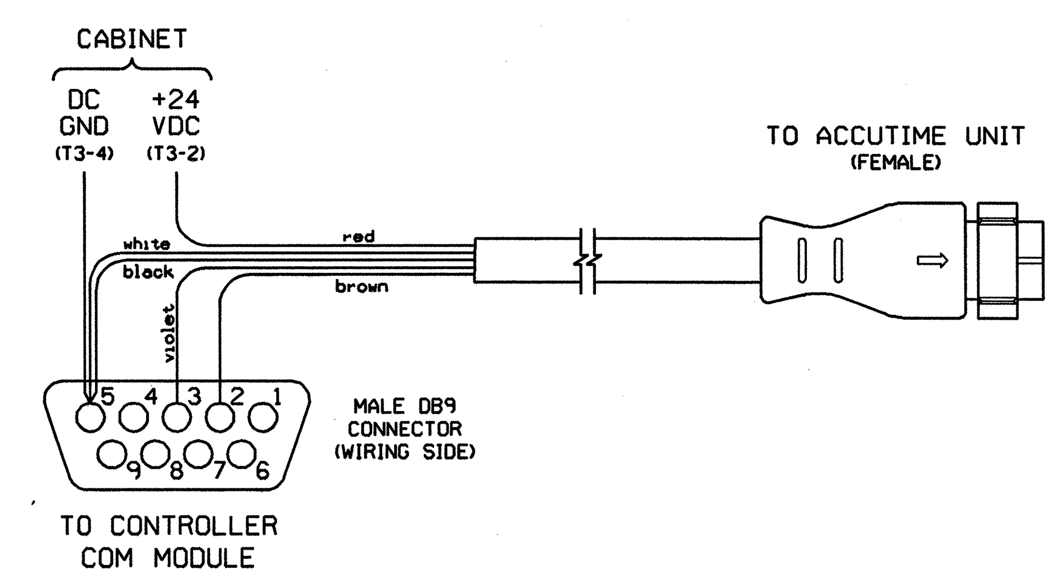
* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER.............CONTRACTOR SUPPLIED 2070L
CABINET................CONTRACTOR SUPPLIED 332
SOFTWARE...............ECONOLITE OASIS
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S4,S5,S6
PHASES USED............2,4,5,6
OVERLAPS...............NONE

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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

PHASE 5 RED FIELD TERMINAL (131)

AC-

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

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1660T2
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Signal Revision - Temporary Signal 2 - TCP Phase II

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch - State of North Carolina Department of Transportation - Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
Morrison Plantation Pkwy

Division 12	Iredell County	Mooresville	
PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1660T2

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-32

3 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM

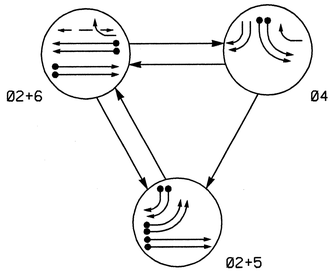


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21, 22	G	G	R	Y
41, 42	~~R~~	~~R~~	←	~~R~~
43, 44	→	~~R~~	→	~~R~~
51, 52	←	~~R~~	~~R~~	~~R~~
61	R	G	R	Y
62	R	G	R→	Y
P61, P62	DW	W	DW	DRK

SIGNAL FACE I.D.

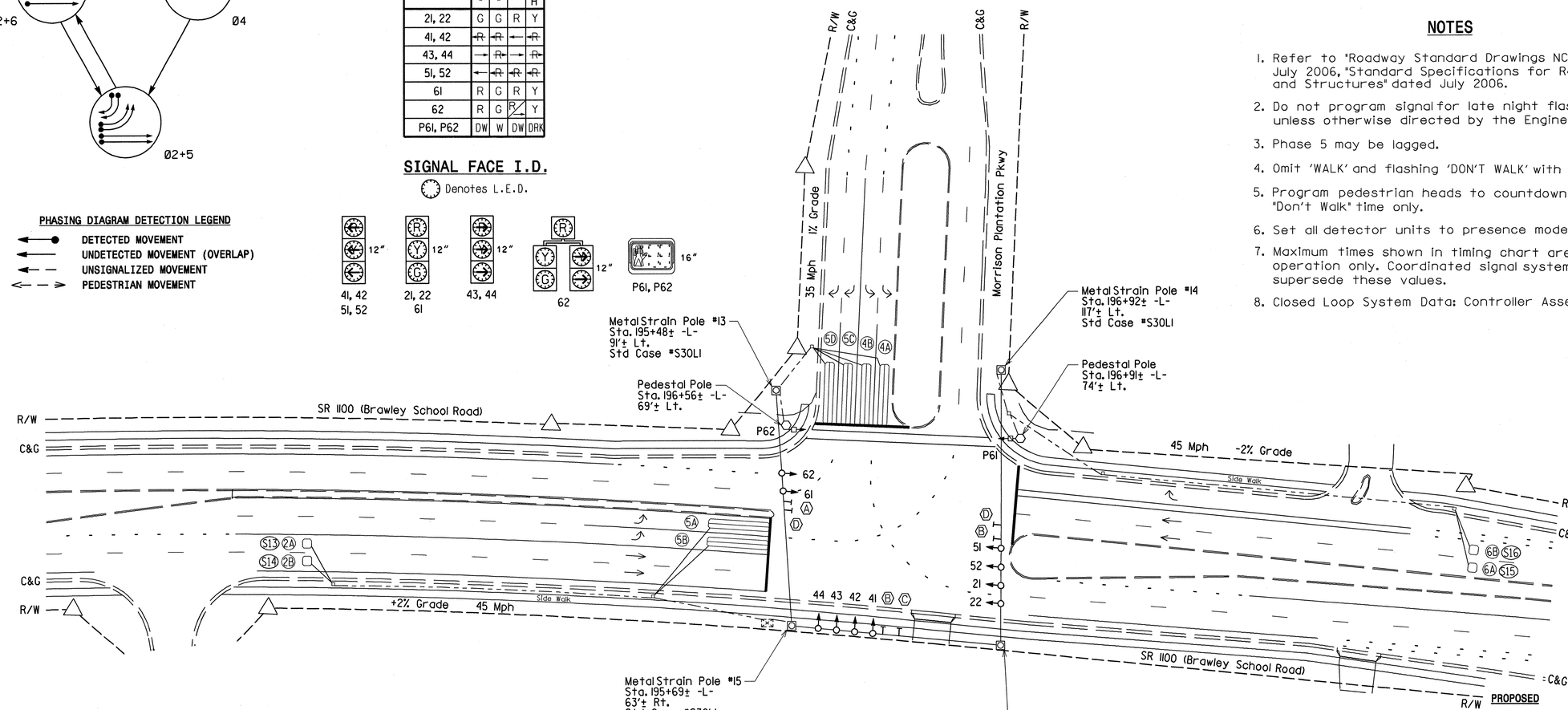
Denotes L.E.D.

PHASING DIAGRAM DETECTION LEGEND

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

NOTES

1. Refer to 'Roadway Standard Drawings NCDOT' dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Omit 'WALK' and flashing 'DON'T WALK' with no pedestrian calls.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Set all detector units to presence mode.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed Loop System Data: Controller Asset # 1660.



2070L TIMING CHART

FEATURE	PHASE 2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	2.0	2.0	6.0
Max Green 1 *	90	20	20	90
Yellow Clearance	4.3	3.1	3.1	4.7
Red Clearance	2.1	3.4	3.5	2.0
Walk 1 *	-	-	-	7
Don't Walk 1	-	-	-	26
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

2070L LOOP & DETECTOR INSTALLATION

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
2A/SI3	6X6	300	5	Y	2	Y	Y	-	—	—	Y	Y
2B/SI4	6X6	300	5	Y	2	Y	Y	-	—	—	Y	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	—	—	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	—	—	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	—	—	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	—	—	-	Y
5C	6X40	0	2-4-2	Y	5	Y	Y	-	—	15	-	Y
5D	6X40	0	2-4-2	Y	5	Y	Y	-	—	15	-	Y
6A/SI5	6X6	300	5	Y	6	Y	Y	-	—	—	Y	Y
6B/SI6	6X6	300	5	Y	6	Y	Y	-	—	—	Y	Y

SIGN ID

PROPOSED		EXISTING
Ⓐ	No U-Turn Sign (R3-4)	Ⓐ
Ⓑ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓑ
Ⓒ	Brawley School Road	Ⓒ
Ⓓ	Morrison Plantation Pkwy	Ⓓ

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	
	Pavement Marking Arrow	
N/A	Wheelchair Ramp	
	Metal Strain Pole	

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Farrington Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-6416 Fax.
www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch
Traffic Engineering Unit
North and Geometrics Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at Morrison Plantation Pkwy

Division 12 | Iredell County | Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W Surti	RKA PROJ. NO.:	08034 (040)

SCALE: 0 40, 1"=40'

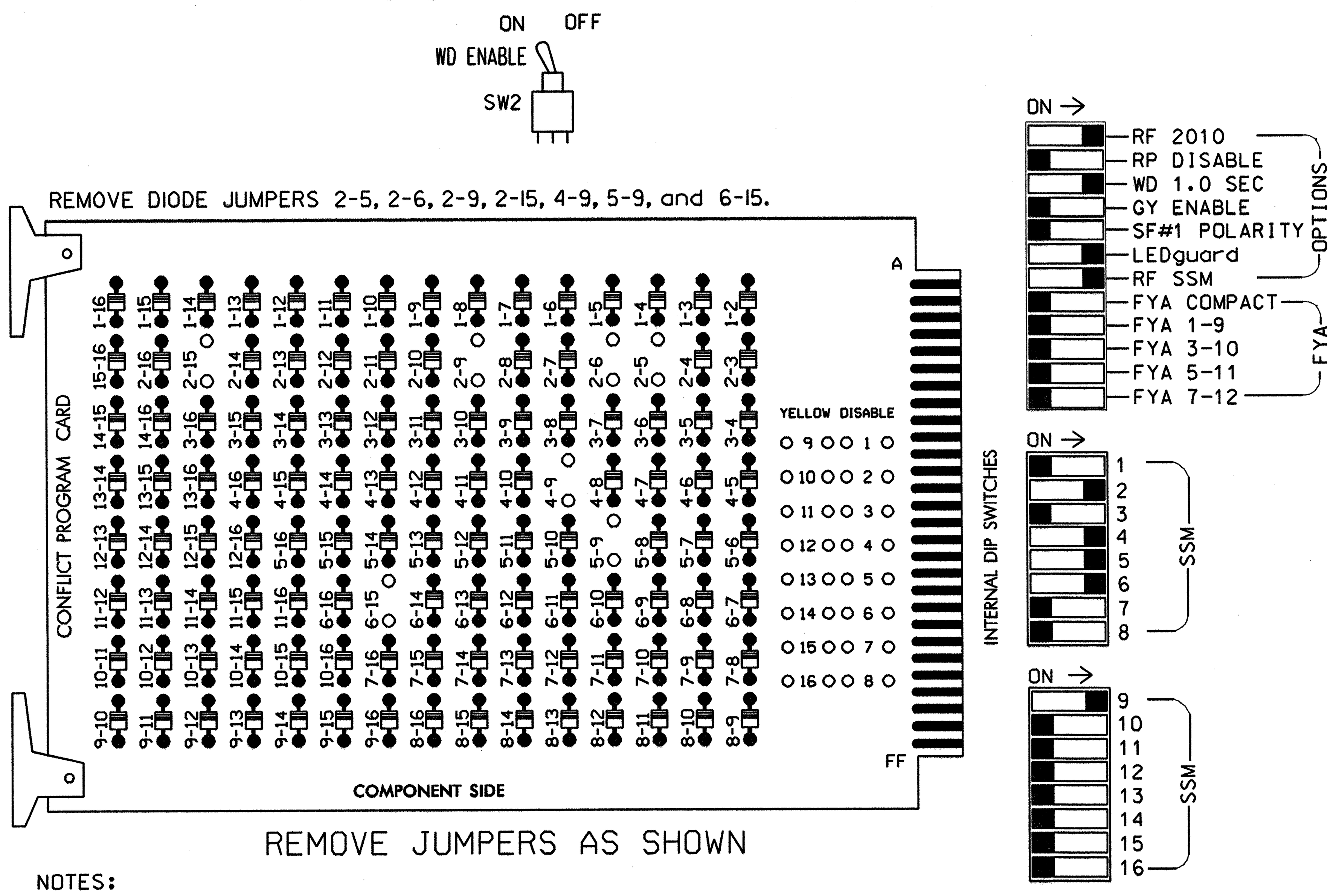
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1660

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

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7,8, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
6. Program phase 6 for 'STARTUP PED CALL'.
7. The cabinet and controller are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4		S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED	** OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	51,52	61,62	P61 P62	NU	NU	NU	43,44	NU	NU	NU	NU	NU
RED		128							134										
YELLOW		129							135										
GREEN		130							136										
RED ARROW					101			131						A121					
YELLOW ARROW					102	102		132						A122					
GREEN ARROW					103	103		133						A123					
✋										119									
🚶										121									

NU = Not Used

** Rewire OLA to flash on flash unit #2 circuit #2

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED......S2,S4,S5,S6,S6P,S9
PHASES USED.............2,4,5,6,6PED
OVERLAP A...............4+5

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2/SYS 2A/S13	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I"	L		Ø2/SYS 2B/S14				Ø 4 4B							NOT USED	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5C	Ø6/SYS 6A/S15	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J"	L	Ø 5 5B	Ø 5 5D	Ø6/SYS 6B/S16											

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/S13	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S14	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	J6U	41	3	4	4	Y	Y			
4B	TB4-11,12	J6L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y			15
5D	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A/S15	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
6B/S16	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y			
PED PUSH BUTTONS											
P61,P62	TB8-7,8	I13U	68	30	PED 6	6 PED					

Note: Install DC Isolator in input file slot I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1660
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
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919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Signal Revision - Final Signal - TCP Final Phase

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road) at Morrison Plantation Pkwy

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

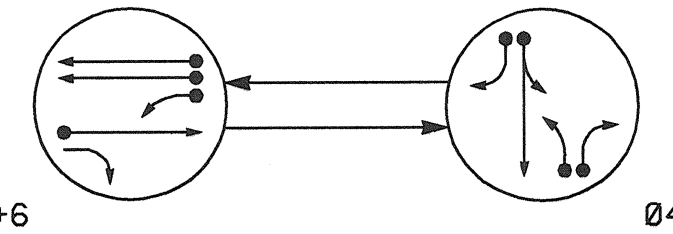
750 Greenfield Parkway, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1660

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

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

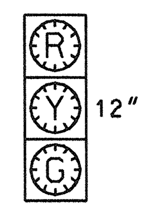
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

Denotes L.E.D.



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

2070L LOOP & DETECTOR INSTALLATION

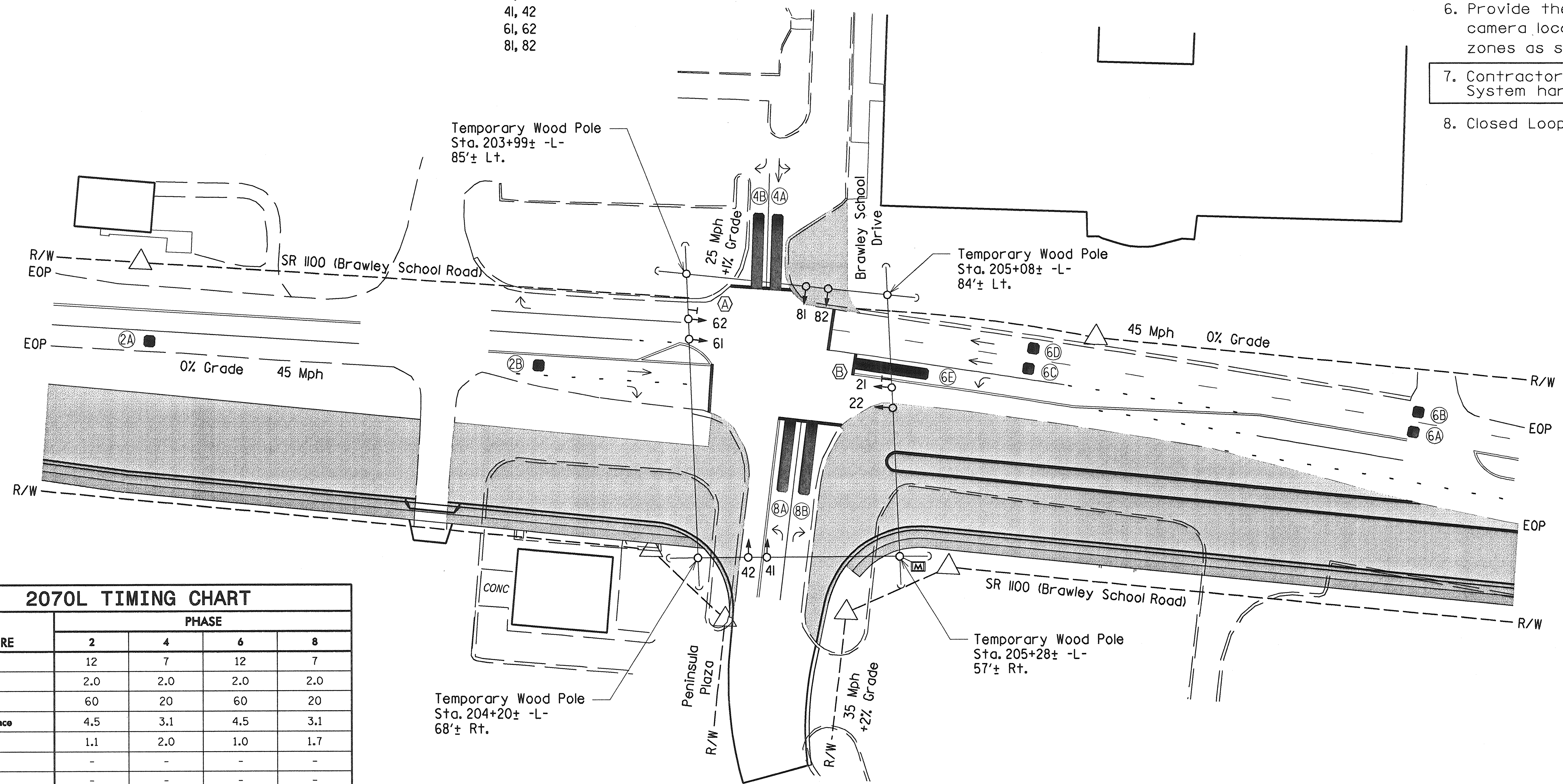
DETECTION ZONES					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
4A	6X40	0	*	Y	4	Y	Y	–	—	—	–	*
4B	6X40	0	*	Y	4	Y	Y	–	—	15	–	*
6A, 6B	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6C, 6D	6X6	90	*	Y	6	Y	Y	–	—	—	–	*
6E	6X40	0	*	Y	6	Y	Y	–	—	—	–	*
8A	6X40	0	*	Y	8	Y	Y	–	—	3	–	*
8B	6X40	0	*	Y	8	Y	Y	–	—	15	–	*

* Video Detection Zone

2 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector zones to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Incorporate Loop Emulator Detection System for Vehicle Detection.
6. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
7. Contractor to install and maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
8. Closed Loop System Data: Controller Asset #1644.



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	
	Master Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Pavement Marking Arrow	
	Video Detection Zone	
	Construction Zone	
A	No Right Turn Sign (R3-1)	A
B	No Left Turn Sign (R3-2)	B

2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	12	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	60	20	60	20
Yellow Clearance	4.5	3.1	4.5	3.1
Red Clearance	1.1	2.0	1.0	1.7
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* 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.

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

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919-872-5116 Tel. 919-878-5416 Fax.
www.rameykemp.com

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared for:
Traffic Engineering and Safety Systems Branch
State of North Carolina • Department of Transportation
Signals and Geometrics Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at Brawley School Drive/ Peninsula Plaza

Division 12 | Iredell County | Mooresville

PLAN DATE: Apr 2008	REVIEWED BY: D.J. Darity
PREPARED BY: H.M Surti	RKA PROJ. NO.: 08034 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

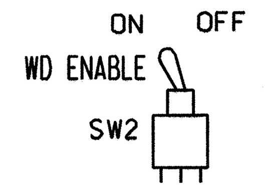
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008

SIGNATURE | DATE

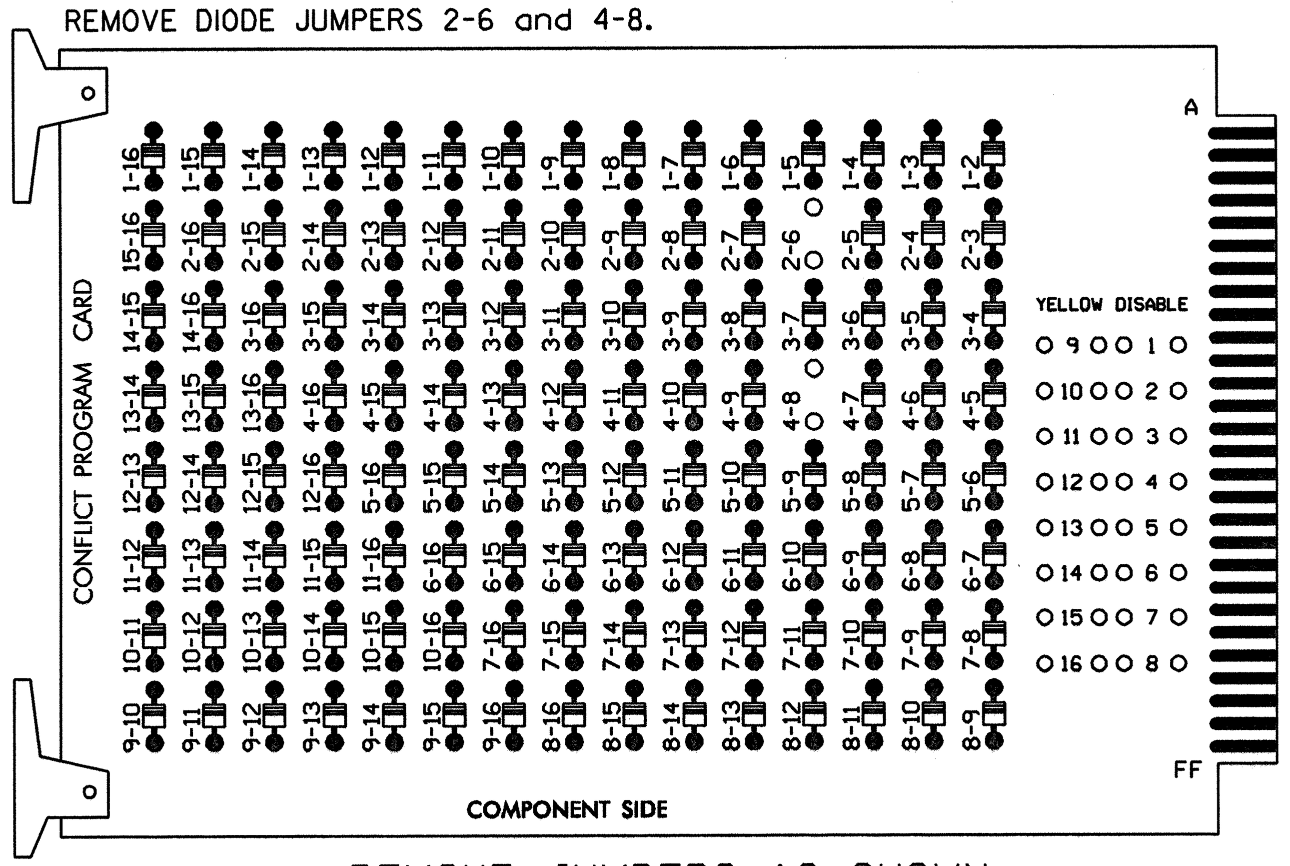
SIG. INVENTORY NO. 12-1644T1

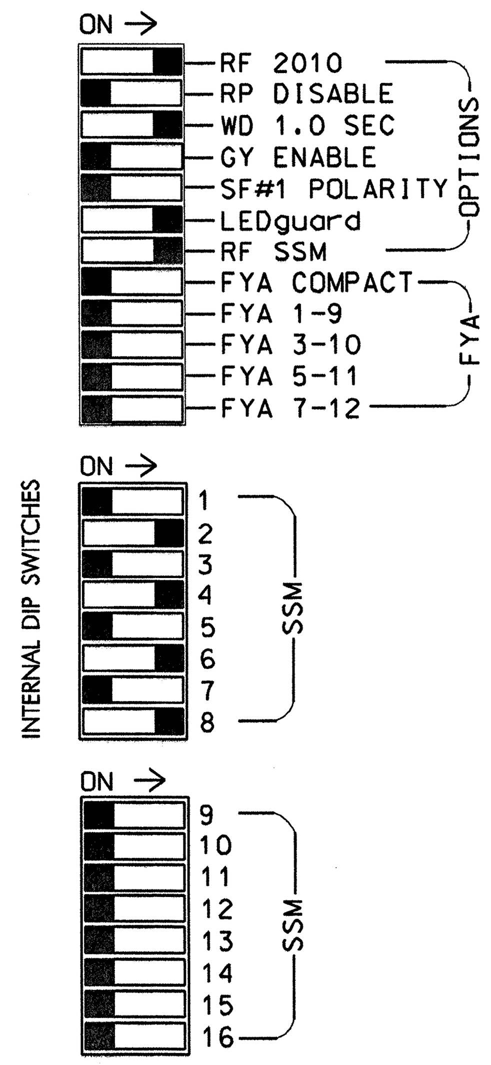
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6 and 4-8.





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 1,3,5,7, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. This controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		
(Don't Walk hand)																		
(Walk person)																		

NU = NOT USED

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

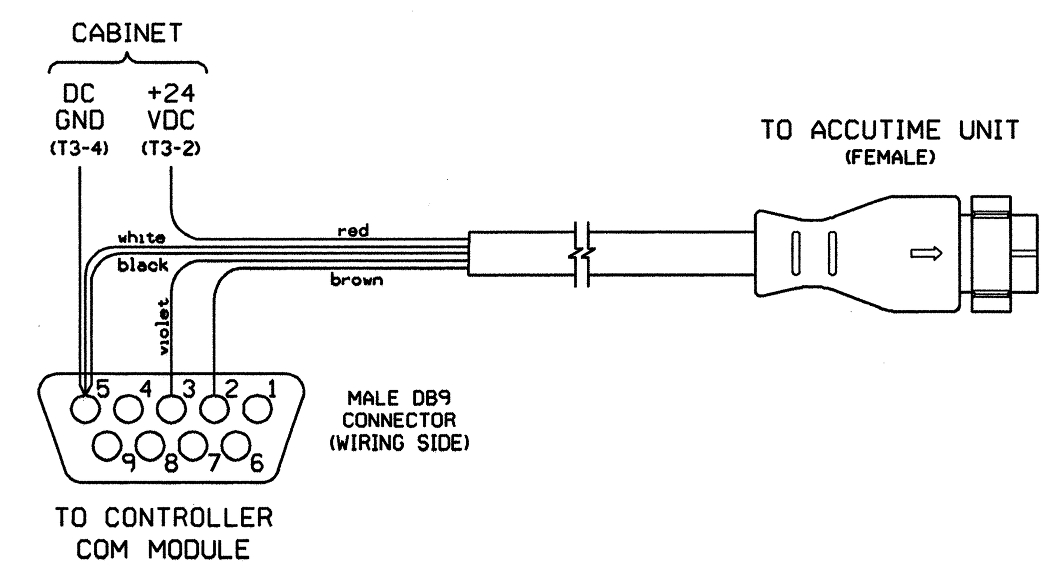
EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED......S2,S4,S6,S8
PHASES USED.............2,4,6,8
OVERLAPS................NONE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1644T1
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
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5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch · State of North Carolina · Department of Transportation · Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at Brawley School Drive/ Peninsula Plaza

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

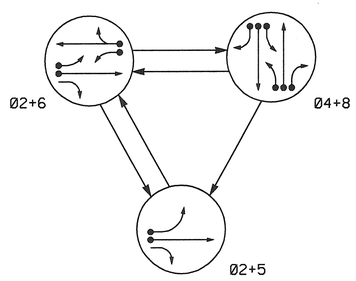
SIG. INVENTORY NO. 12-1644T1

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-36

3 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

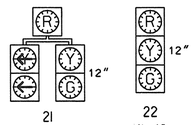
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

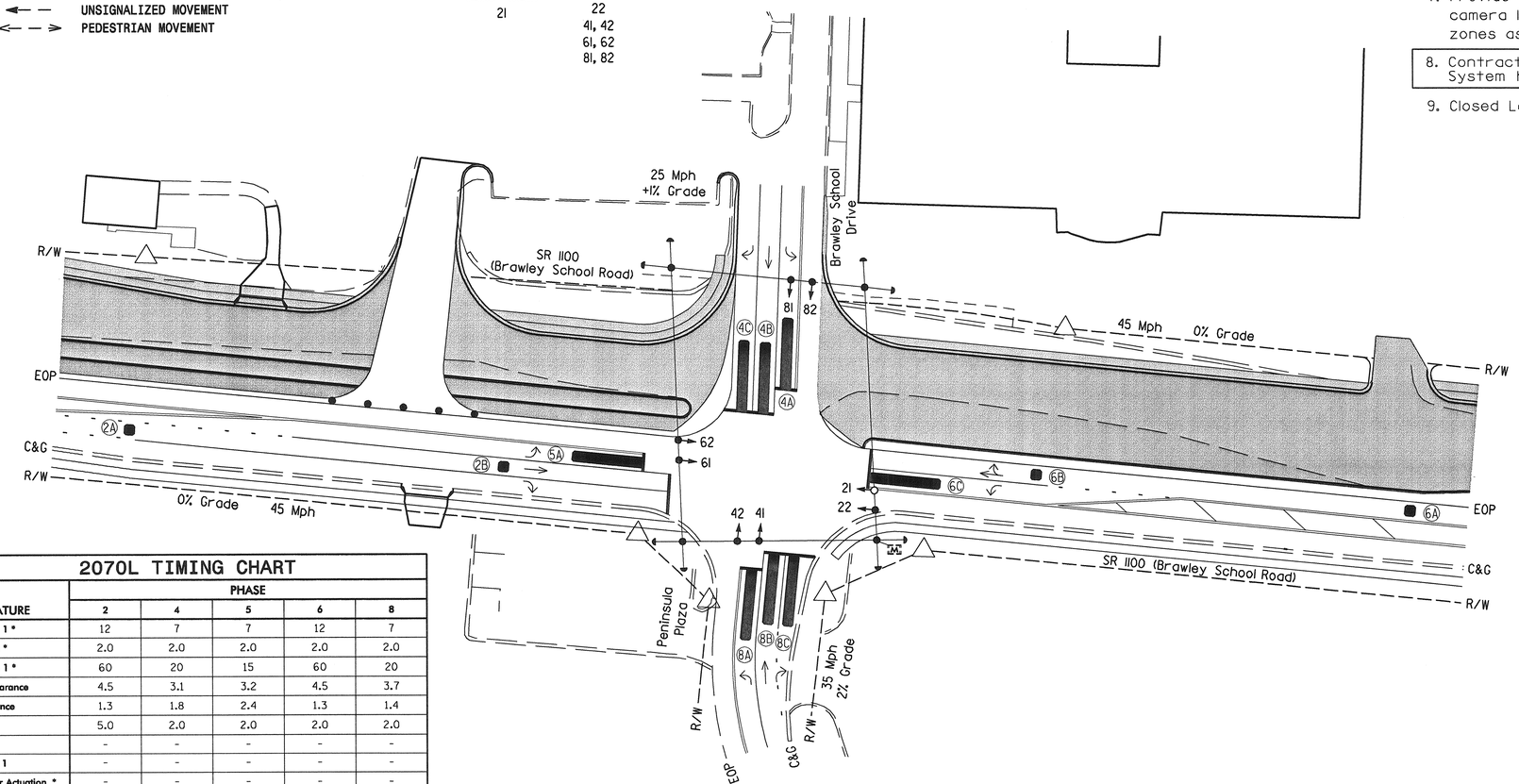
Denotes L.E.D.



2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
4A	6X40	0	*	Y	4	Y	Y	–	—	3	–	*
4B	6X40	0	*	Y	4	Y	Y	–	—	—	–	*
4C	6X40	0	*	Y	4	Y	Y	–	—	15	–	*
5A	6X40	0	*	Y	5	Y	Y	–	—	15	–	*
					2	Y	Y	–	—	—	–	*
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6B	6X6	90	*	Y	6	Y	Y	–	—	—	–	*
6C	6X40	0	*	Y	6	Y	Y	–	—	—	–	*
8A	6X40	0	*	Y	8	Y	Y	–	—	3	–	*
8B	6X40	0	*	Y	8	Y	Y	–	—	—	–	*
8C	6X40	0	*	Y	8	Y	Y	–	—	15	–	*

* Video Detection Zone



2070L TIMING CHART

FEATURE	PHASE 2	4	5	6	8
Min Green 1 *	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	60	20	15	60	20
Yellow Clearance	4.5	3.1	3.2	4.5	3.7
Red Clearance	1.3	1.8	2.4	1.3	1.4
Red Revert	5.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
4. Reposition existing signal heads 22, 41, 42, 61, 62, 81, and 82.
5. Set all detector zones to presence mode.
6. Incorporate Loop Emulator Detection System for Vehicle Detection.
7. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
8. Contractor to maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
9. Closed Loop System Data: Controller Asset # 1644.

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	
	Master Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Pavement Marking Arrow	
	Video Detection Zone	
	Construction Zone	
	Construction Zone Drums	

Signal Revision - Temporary Signal 2 - TCP Phase II

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
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Prepared for:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
Brawley School Drive/
Peninsula Plaza

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

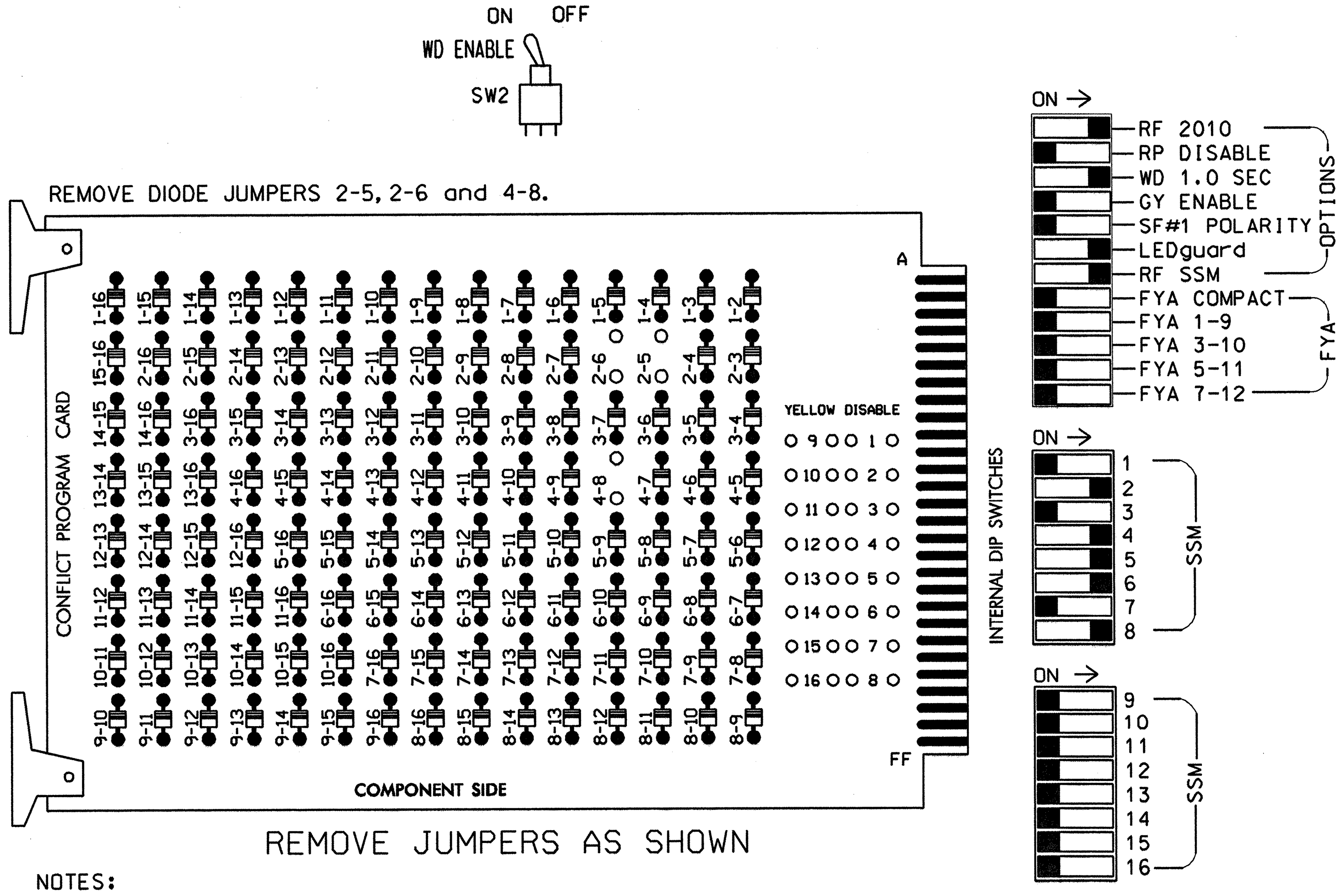
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1644T2

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-37

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.

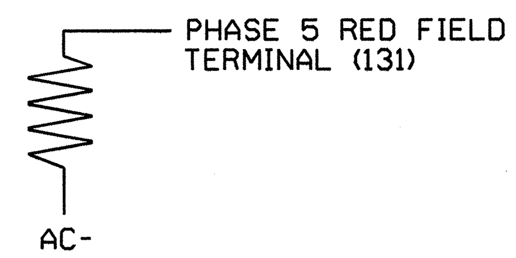
NOTES

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 1,3,7, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 4 and 8, on the controller unit, for Dual Entry.
6. This controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW							132											
GREEN ARROW							133											
(Don't Walk)																		
(Walk)																		

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED......S2,S4,S5,S6,S8
PHASES USED.............2,4,5,6,8
OVERLAPS................NONE

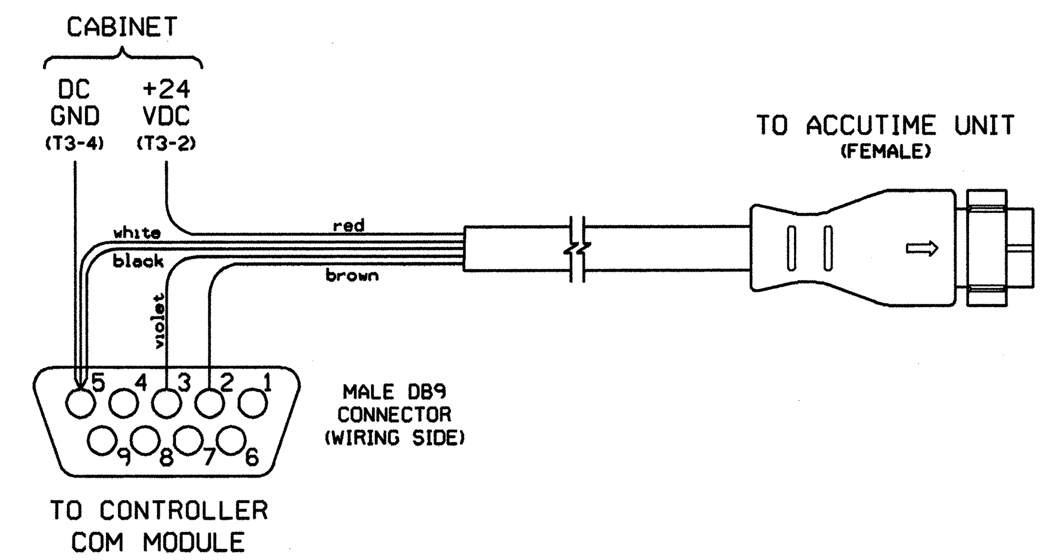
BACKUP PROTECTION NOTE

(program controller as shown below)

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

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CONNECTOR	DB9 TO CONTROLLER	CABINET CONNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1644T2
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Signal Revision - Temporary Signal 2 - TCP Phase II

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road) at Brawley School Drive/ Peninsula Plaza

Division 12 Iredell County Mooresville

750 Greenfield Parkway, Garner, NC 27529

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

4-28-2008

SIGNATURE DATE

SIG. INVENTORY NO. 12-1644T2

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

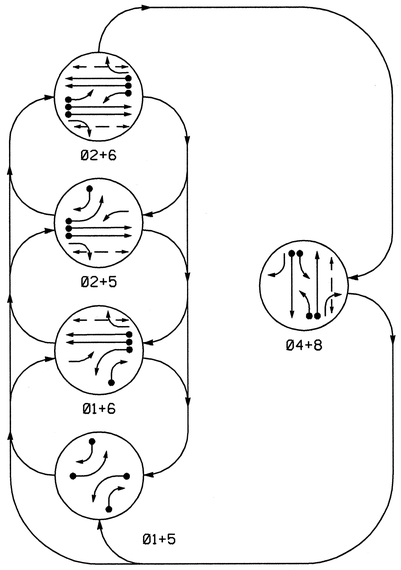
PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-38

5 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

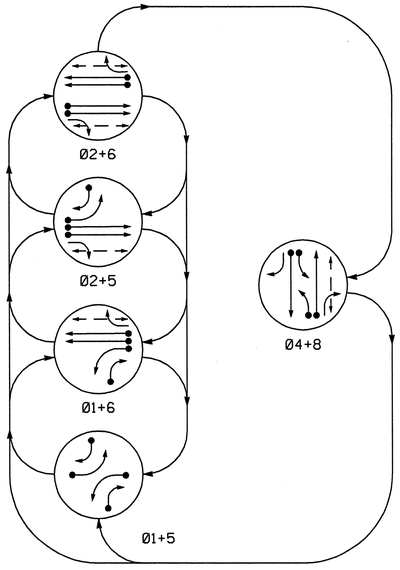
NOTES

1. Refer to 'Roadway Standard Drawings NCDOT' dated July 2006, 'Standard Specifications for Roads and Structures' dated July 2006.
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. Omit 'WALK' and flashing 'DON'T WALK' with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed Loop System Data: Controller Asset #1644. Master Asset #11211.

NORMAL PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

NORMAL PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	←FY	←FY	~~R~~	~~R~~
21, 22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R/→	R	R/→	R	G	R
51	←	←FY	←	←FY	~~R~~	~~R~~
61, 62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/→	R/→	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

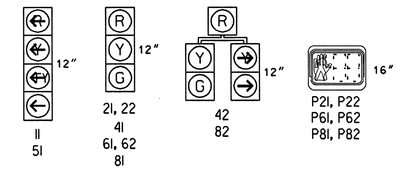
←FY - FLASHING YELLOW ARROW

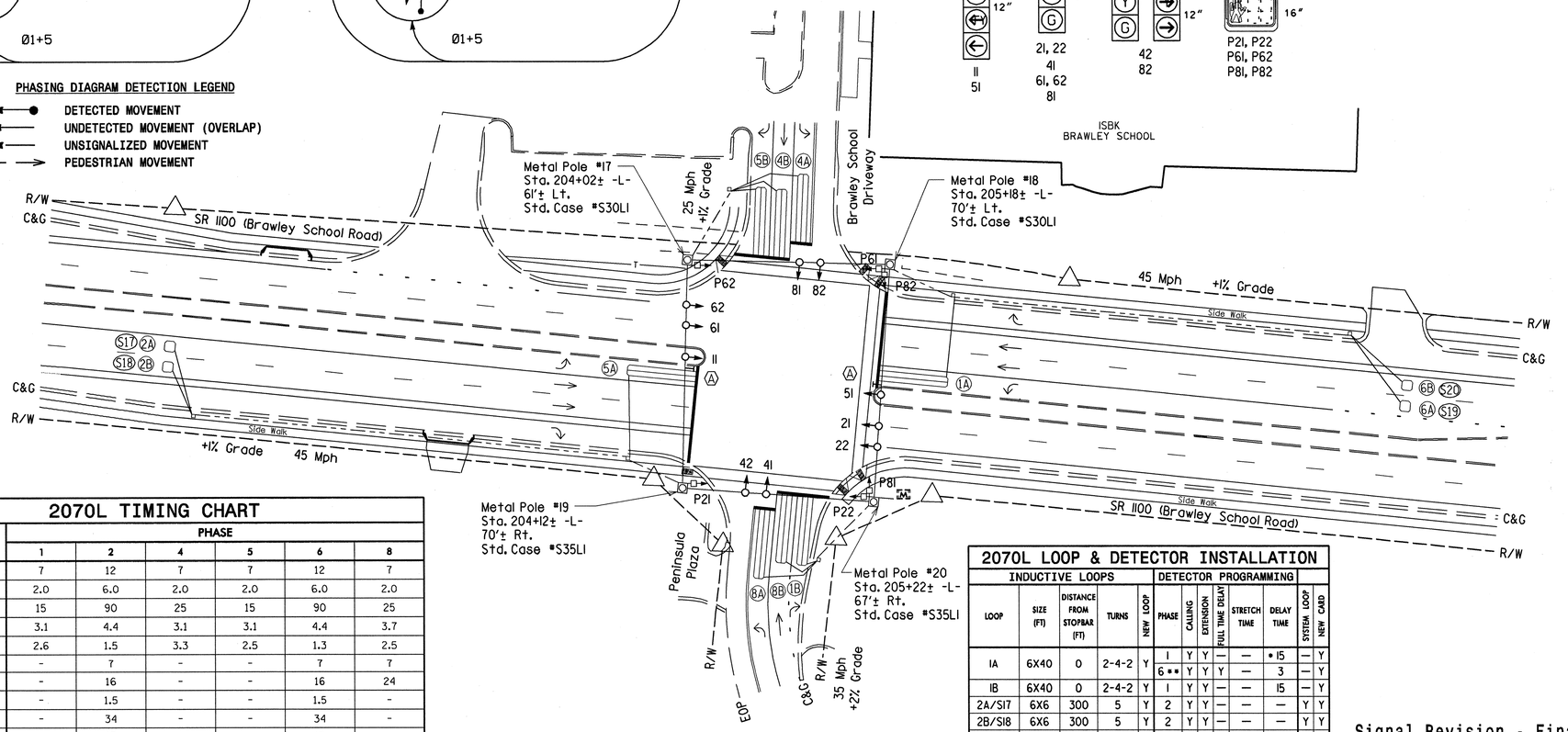
ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R/→	R	R/→	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/→	R/→	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

(All signal heads are L.E.D.)





2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	15	90	25	15	90	25
Yellow Clearance	3.1	4.4	3.1	3.1	4.4	3.7
Red Clearance	2.6	1.5	3.3	2.5	1.3	2.5
Walk 1 *	-	7	-	-	7	7
Don't Walk 1	-	16	-	-	16	24
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	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.

2070L LOOP & DETECTOR INSTALLATION

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	—	—	•15	—	Y
					6••	Y	Y	Y	—	3	—	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	—	—	15	—	Y
2A/S17	6X6	300	5	Y	2	Y	Y	—	—	—	Y	Y
2B/S18	6X6	300	5	Y	2	Y	Y	—	—	—	Y	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	—	—	3	—	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	—	—	—	—	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	—	—	•15	—	Y
					2••	Y	Y	Y	—	3	—	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	—	—	15	—	Y
6A/S19	6X6	300	5	Y	6	Y	Y	—	—	—	Y	Y
6B/S20	6X6	300	5	Y	6	Y	Y	—	—	—	Y	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	—	—	3	—	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	—	—	—	—	Y

• Disable Delay During Alternate Phasing Operation.
•• Disable Phase 2/6 Call For Loops 1A and 5A During Alternate Phasing Operation.

STANDARD SIGNAL FACE CLEARANCES FOR 4 SECTION LEFT TURN SIGNAL

FROM \ TO	←		←FY		~~R~~	
	1	2	1	2	1	2
←	←	←	~~R~~	~~R~~	~~R~~	~~R~~
←FY	←FY	←FY	←FY	←FY	~~R~~	~~R~~
~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~

←FY - FLASHING YELLOW ARROW

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	⊠
M	Master Controller & Cabinet	M
□	Junction Box	■
- - - - -	2-in Underground Conduit	- - - - -
N/A	Right of Way	—△—
→	Directional Arrow	→
→	Pavement Marking Arrow	→
N/A	Wheelchair Ramp	
◎	Metal Strain Pole	◘
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ

Prepared in the offices of:

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Signal Revision - Final Signal - TCP Final Phase

Prepared for: Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, 750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at Brawley School Drive/ Peninsula Plaza

Division 12 Iredell County Mooresville

PLAN DATE: Apr 2008 REVIEWED BY: D.J. Darity

PREPARED BY: H.W Surti RKA PROJ. NO.: 08034 (240)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 DONALD J. DARITY — 4-28-2008

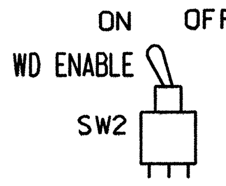
SIGNATURE DATE

SIG. INVENTORY NO. 12-1644

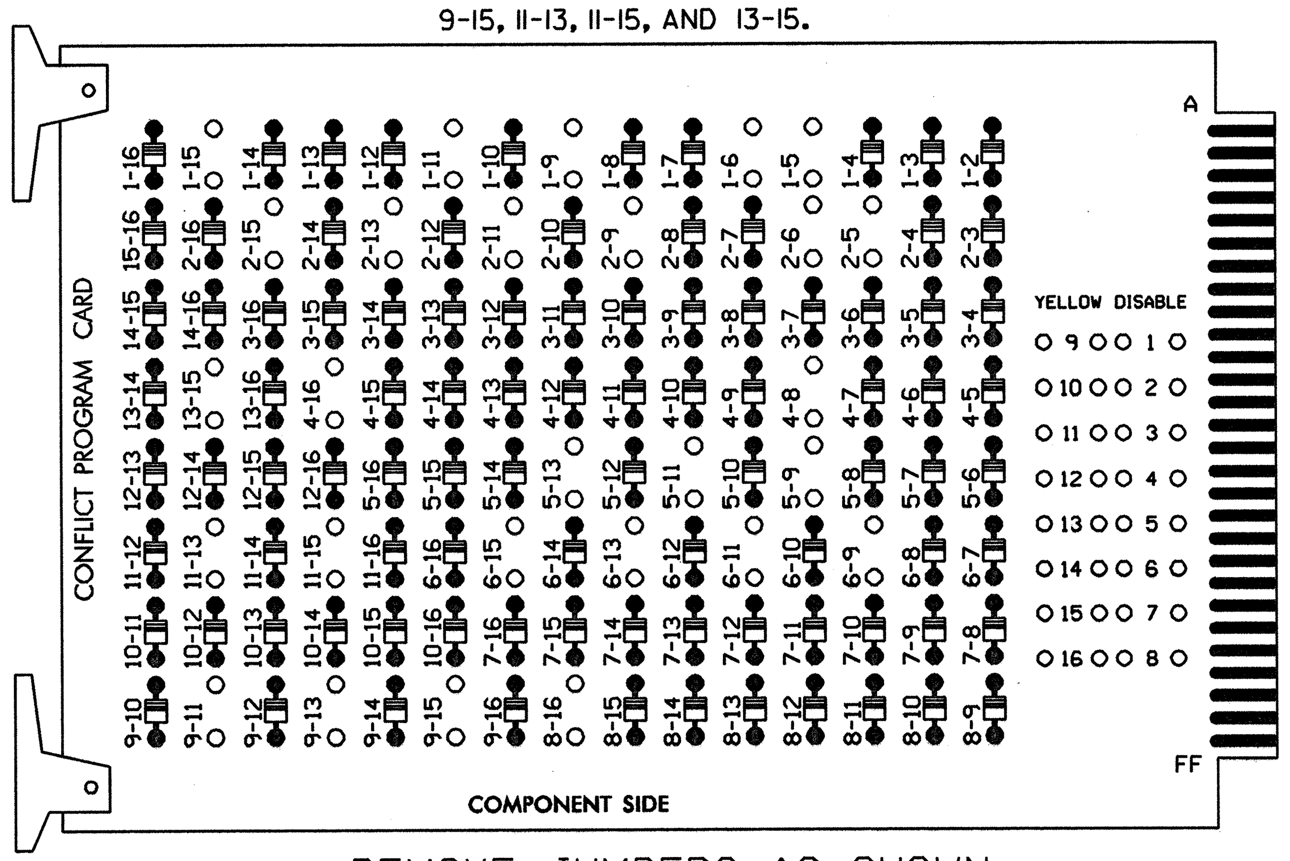
$$$$$$SYSTIME$$$$$
$$$$$$SESSION$$$$$$

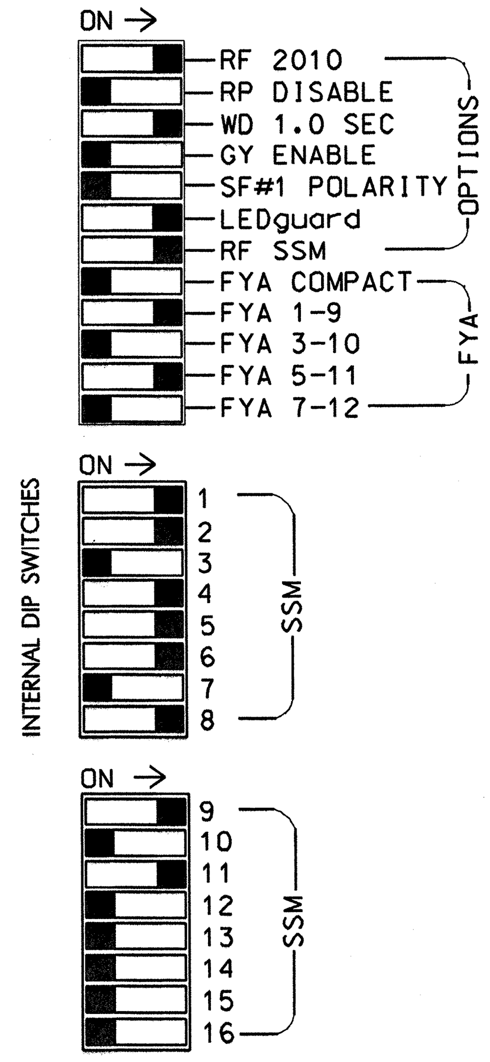
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, AND 13-15.





REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7, 10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 4 and 8, on the controller unit, for Dual Entry.
6. Program phases 2, 6 and 8 for 'STARTUP PED CALL'.
7. The cabinet and controller are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-39

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	P21, P22	NU	41,42	NU	51	42	61,62	P61, P62	NU	81,82	P81, P82	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											
(Don't Walk hand)				113							119			110						
(Walk person)				115							121			112						

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

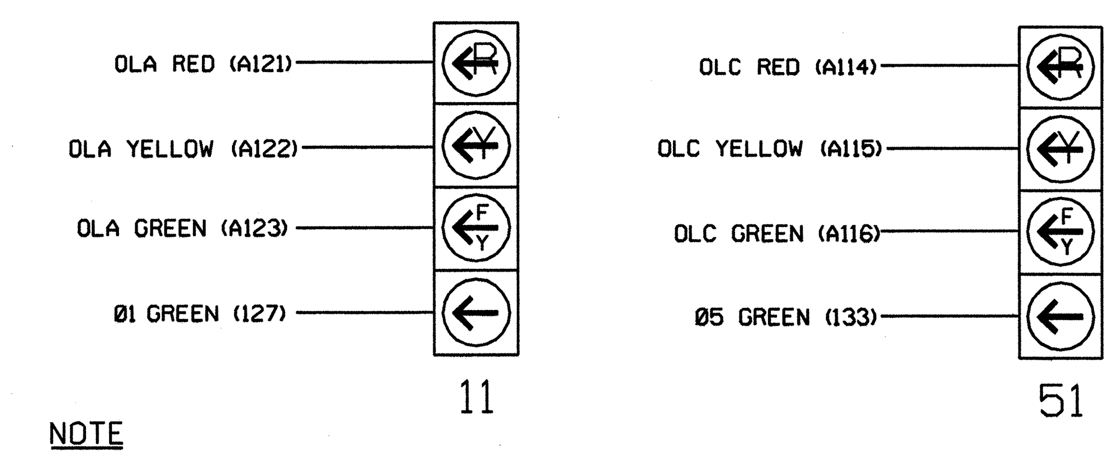
⊕ Denotes see pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED......S1,S2,S2P,S4,S5,S6,S6P, S8,S8P,S9,S12
PHASES USED.............1,2,2PED,4,5,6,6PED,8,8PED
OVERLAP "A".............1+2
OVERLAP "B".............NONE
OVERLAP "C".............5+6
OVERLAP "D".............NONE

4 SECTION PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The display sequence for this signal requires special logic programming. See sheet 2 of 3 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A [1]	TB2-5,6	I2U	39	1	2	1	Y	Y			15*
	TB2-7,8	I2L	43	5	12	6**	Y	Y	Y		3
1B	TB2-1,2	I1U	56	18	1	1	Y	Y			15
2A/S17	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y			
2B/S18	TB2-11,12	I3L	76	38	42	2/SYS	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			
5A [2]	TB3-5,6	J2U	40	2	6	5	Y	Y			15*
	TB3-7,8	J2L	44	6	16	2**	Y	Y	Y		3
5B	TB3-1,2	J1U	55	17	5	5	Y	Y			15
6A/S19	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
6B/S20	TB3-11,12	J3L	77	39	46	6/SYS	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			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P61,P62	TB8-7,8	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.

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

[2] Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.

* Disable Delay During Alternate Phasing Operation.

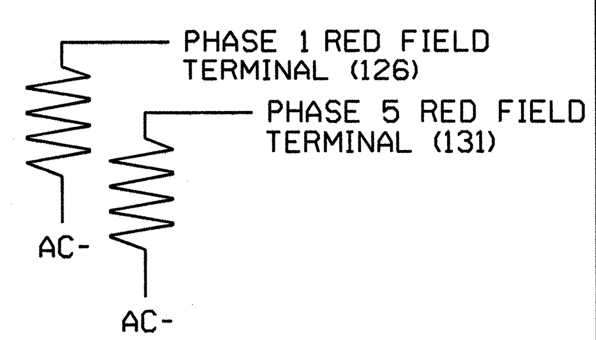
** Disable Phase 2/6 Call For Loops 1A and 5A During Alternate Phasing Operation.

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 red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1644
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Electrical Detail Sheet 1 of 3

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:
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www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch – State of North Carolina Department of Transportation – Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
Brawley School Drive/
Peninsula Plaza

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M Surti	RKA PROJ. NO.:	08034 (240)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

4-28-2008

SIGNATURE DATE

SIG. INVENTORY NO. 12-1644

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-40

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

(program controller as shown below)

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

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

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

SCROLL DOWN

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

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

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

PRESS '+'

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

SCROLL DOWN

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

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

TOD EVENT SCHEDULING PROGRAMMING DETAIL
TO CALL ALTERNATE PHASING OPERATION

(program controller as shown below)

*DENOTES TO BE DETERMINED BY THE CITY.

ALL EVENTS SHOWN BELOW SHALL BE PROGRAMMED TO START AND STOP ON THE SAME TIMES AND DATES.

FROM MAIN MENU PRESS 'B' (SCHEDULING).

NOTE THAT THE TOP LINE WILL CHANGE FROM "NOT ASSIGNED" TO SPECIFIED FUNCTION WHEN EVENT IS ASSIGNED AS SHOWN.

```
SCHEDULED EVENT #1  OUTPUT PAGE CHANGE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............2   <--
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)..............._
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64).._
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #2  INPUT OVERRIDE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)...............5   <--
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64).._
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #3  INPUT OVERRIDE
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)...............6   <--
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64).._
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #4  DETECTOR CONTROL
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)..............._
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64)..2   <--
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

PRESS "+" FOR NEXT EVENT

```
SCHEDULED EVENT #5  DETECTOR CONTROL
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**:**
STOP TIME (HH:MM)..............**:**
DOW      |SUN MON TUE WED THR FRI SAT
ENABLED | *   *   *   *   *   *   *
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORTY:  LOW.._ MED_..  HIGH.._
CAHNGE 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)............_
SET OUTPUT ON  (1-64)..............._
SET OUTPUT OFF (1-64)..............._
SET INPUT ON   (1-64)..............._
SET INPUT OFF  (1-64)..............._
ENABLE FAILURES LOG?................_
ENABLE EVENTS LOG?.................._
ENABLE DATA ENTRIES LOG?............_
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64).............._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64)..6   <--
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)............_
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?...._
```

TOD PROGRAMMING COMPLETE

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   <-- NOTICE GREEN FLASH
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
```

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

OVERLAP PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

ALTERNATE PHASING NOTES

THIS EVENT SCHEDULING DETAIL SHOWS THE TOD PROGRAMMING STEPS NECESSARY FOR THE CONTROLLER TO OPERATE THE "ALTERNATE PHASING" AS SHOWN ON THE SIGNAL PLANS.

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE TOD EVENTS ACTIVATE TO CALL THE "ALTERNATE PHASING":

EVENT NO.

1. OUTPUT PAGE 2 IS CALLED: Modifies control circuits for signal heads 11 and 51.
2. INPUT 5 IS SWITCHED OFF: Disables phase 6 call on loop 1A.
3. INPUT 6 IS SWITCHED OFF: Disables phase 2 call on loop 5A.
4. DELAY IS DISABLED FOR DETECTOR 2 (Phase 1, Loop 1A).
5. DELAY IS DISABLED FOR DETECTOR 6 (Phase 5, Loop 5A).

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1644
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Electrical Detail Sheet 2 of 3

Signal Revision - Final Signal - TCP Final Phase

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road)
at
Brawley School Drive/
Peninsula Plaza

Division 12   Iredell County   Mooresville

Traffic Engineering and Safety Systems Branch
State of North Carolina Department of Transportation
Signals Management Section
750 Greenfield Pkwy, Garner, NC 27529

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (240)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

4-28-2008

SIGNATURE   DATE

SIG. INVENTORY NO. 12-1644

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

PPLT SIGNAL OUTPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

NOTE: THIS PROGRAMMING APPLIES FOR OUTPUT PAGE 2 ONLY.
OUTPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS.
THIS PROGRAMMING IS NECESSARY FOR ALTERNATE PHASING OPERATION.

OUTPUT ASSIGNMENTS FOR SIGNAL HEAD 51

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS). PRESS 'NEXT' FOR PAGE 2.
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "42"

```
PAGE:2  C1 PIN:88  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................42
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:88  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........5
SELECT COLOR(O=RED,1=YEL,2=GRN).....0
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:88  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................42
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 43

STEP 2

```
PAGE:2  C1 PIN:89  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................43
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED........................
VEHICLE PHASE......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:89  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........5
SELECT COLOR(O=RED,1=YEL,2=GRN).....1
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:89  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................43
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 44

STEP 3

```
PAGE:2  C1 PIN:90  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................44
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR NOT ENABLED (THIS WILL DISABLE THE OUTPUT)

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'NOT ENABLED' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:90  NOT ENABLED
OUTPUT ASSIGNMENT #.................44
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=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.........................._
```

OUTPUT ASSIGNMENTS FOR SIGNAL HEAD 11

STEP 4

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS). PRESS 'NEXT' FOR PAGE 2.
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "50"

```
PAGE:2  C1 PIN:97  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................50
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:97  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........1
SELECT COLOR(O=RED,1=YEL,2=GRN).....0
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:97  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................50
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 51

STEP 5

```
PAGE:2  C1 PIN:98  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................51
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED........................
VEHICLE PHASE......................Y
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR VEHICLE PHASE.

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

```
PAGE:2  C1 PIN:98  VEHICLE OVERLAP
SELECT VEHICLE PHASE (1-16).........1
SELECT COLOR(O=RED,1=YEL,2=GRN).....1
```

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

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

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'NOT ENABLED' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:98  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................51
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=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................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 52

STEP 6

```
PAGE:2  C1 PIN:99  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................52
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP.....................Y
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" FOR NOT ENABLED (THIS WILL DISABLE THE OUTPUT)

THE OUPUT IS SET AS AN OVERLAP BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'NOT ENABLED' AS SHOWN BELOW.

```
PAGE:2  C1 PIN:99  NOT ENABLED
OUTPUT ASSIGNMENT #.................52
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (O - 100%)...0
MODE (O=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.........................._
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1644
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Signal Revision - Final Signal - TCP Final Phase

NOTE: THE OUTPUT ASSIGNMENT CHANGES, SHOWN ABOVE, ARE NECESSARY FOR THE TIME OF DAY OPERATION OF SIGNAL HEADS 11 AND 51. IN ALTERNATE PHASING (PROTECTED ONLY) OPERATION, THE RED ARROW CONTROL IS SWITCHED TO THE LEFT TURN PHASE RED. THE SOLID YELLOW ARROW CONTROL IS SWITCHED TO THE LEFT TURN PHASE YELLOW. IN ADDITION, THE FLASHING YELLOW ARROW IS SWITCHED OFF BY DISABLING THE OVERLAP GREEN OUTPUT.

ALL OF THESE OUTPUT CHANGES ARE ACCOMPLISHED ON OUTPUT PAGE 2. THEREFORE IN ALTERNATE PHASING (PROTECTED ONLY) MODE, THE PAGE IS SWITCHED TO "2" BY THE CONTROLLER TOD EVENT SCHEDULING.

IN NORMAL PHASING (PPLT) MODE THE STANDARD, DEFAULT, OUPUT ASSIGNMENTS ARE USED WHICH ARE DESIGNATED ON OUTPUT PAGE 1.

Electrical Detail Sheet 3 of 3

Prepared in the offices of:
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Transportation Engineers
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Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch - State of North Carolina - Department of Transportation - Signals Management Section
750 Greenfield Pkwy, Garner, NC 27529

SR 1100 (Brawley School Road)
at
Brawley School Drive/
Peninsula Plaza

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (240)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

4-28-2008

SIGNATURE DATE

SIG. INVENTORY NO. 12-1644

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-42

8 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM

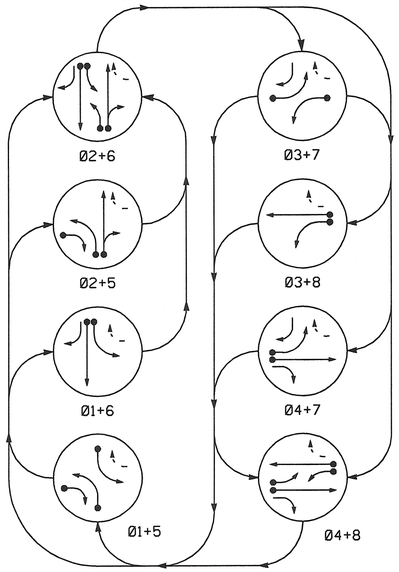


TABLE OF OPERATION

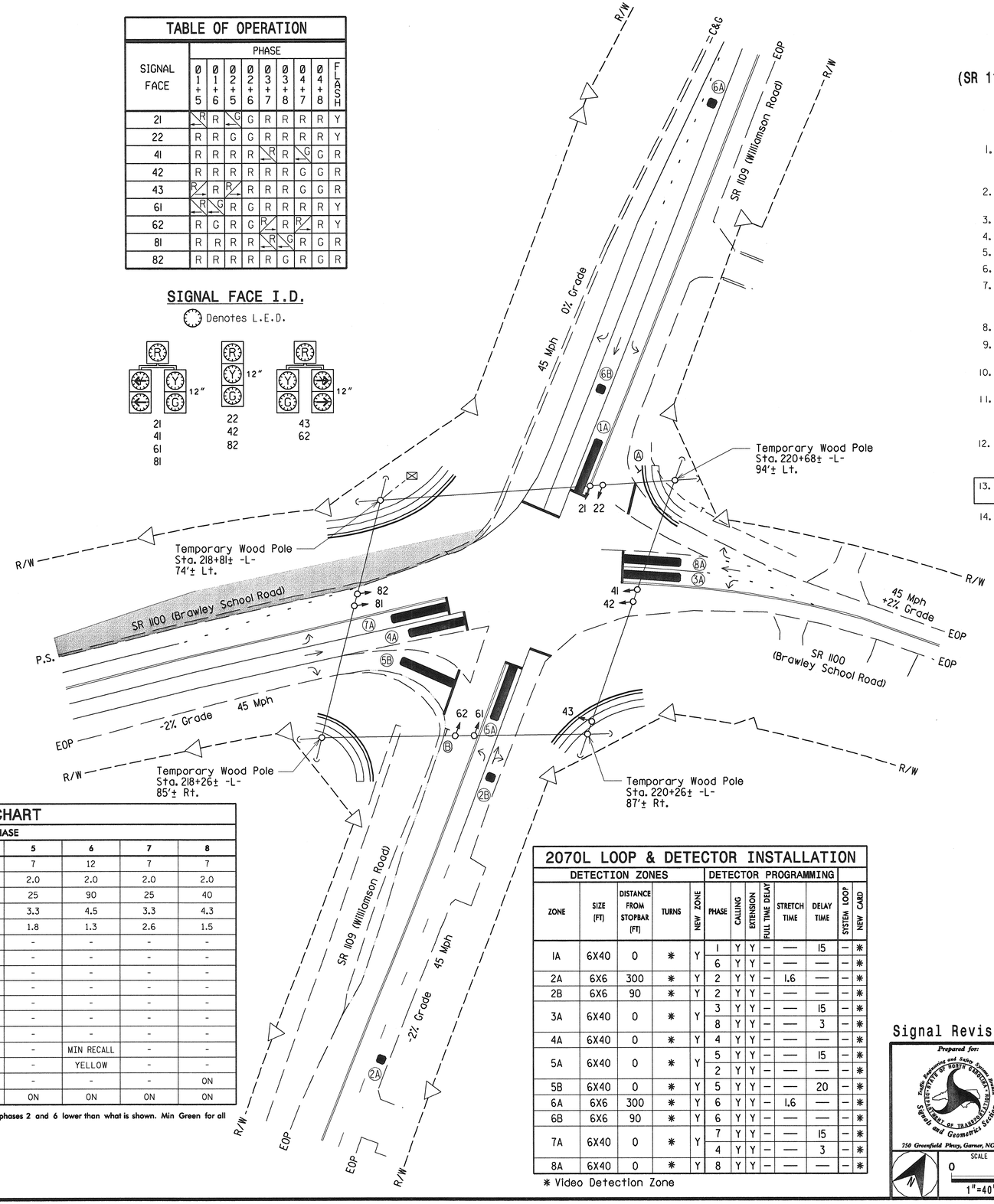
SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R	R	R	R	Y
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
43	R	R	R	R	R	R	G	G	R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

Denotes L.E.D.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 1 during phase 2 on.
4. Omit phase 3 during phase 4 on.
5. Omit phase 5 during phase 6 on.
6. Omit phase 7 during phase 8 on.
7. Program controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through phase 4+8. (see Electrical Details).
8. Set all detector zones to presence mode.
9. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
10. Incorporate Loop Emulator Detection System for Vehicle Detection.
11. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
13. Contractor to install and maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
14. Closed Loop System Data: Controller Asset # 1062.



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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▒	Construction Zone	▒
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11)	Ⓑ

2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	25	90	25	40	25	90	25	40
Yellow Clearance	3.2	4.7	3.1	4.7	3.3	4.5	3.3	4.3
Red Clearance	1.8	1.3	2.4	1.2	1.8	1.3	2.6	1.5
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	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.

2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	Y	1	Y	Y	–	—	15	–	*
					6	Y	Y	–	—	—	–	*
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
3A	6X40	0	*	Y	3	Y	Y	–	—	15	–	*
					8	Y	Y	–	—	3	–	*
4A	6X40	0	*	Y	4	Y	Y	–	—	—	–	*
5A	6X40	0	*	Y	5	Y	Y	–	—	15	–	*
					2	Y	Y	–	—	—	–	*
5B	6X40	0	*	Y	5	Y	Y	–	—	20	–	*
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6B	6X6	90	*	Y	6	Y	Y	–	—	—	–	*
7A	6X40	0	*	Y	7	Y	Y	–	—	15	–	*
					4	Y	Y	–	—	3	–	*
8A	6X40	0	*	Y	8	Y	Y	–	—	—	–	*

* Video Detection Zone

Prepared in the offices of:

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Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
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www.rameykemp.com

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared for: Traffic Engineering and Safety Systems Branch, Traffic Engineering Unit, Division of Highways, State of North Carolina Department of Transportation, Signals and Geometrics Section
750 Greenfield Pkwy, Garner, NC 27529

SCALE 0 40 1"=40'

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE

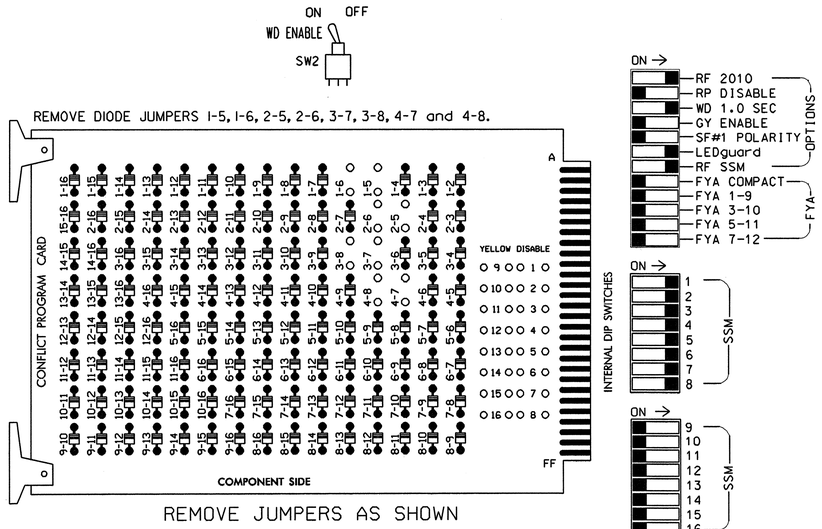
SIG. INVENTORY NO. 12-1062T1

$$$$$$USERNAME$$$$
$$$$$$$$DGN$$$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-43

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 9, 10, 11, 12, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 4 and 8, on the controller unit, for Dual Entry.
6. The controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	81	41,42 43	NU	21,43	61,62	NU	41,62	81,82	NU
RED	*	128		*	101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126			117			132			123		
GREEN ARROW	127			118			133			124		
✋												
🚶												

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

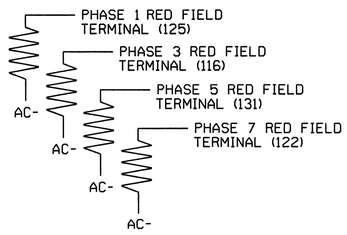
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

FS = FLASH SENSE
ST = STOP TIME

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 red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1062T1
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 1 of 2

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
8008 Farringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-6416 Fax.
www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 DONALD J. DARITY
7-8-2008
SIGNATURE DATE

SIG. INVENTORY NO. 12-1062T1

$$$$$SYSTIME$$$$$
$$$$$DOWN$$$$$
$$$$$USERNAME$$$$$

DYNAMIC BACK-UP CONTROL PROGRAMMING

(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 Dynamic/Backup Control Functions 1, 2, 3 and 4.

2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

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

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #02
               OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR         PHASES:¦12345678910111213141516
IF PHASES ARE ON¦   X
OMIT PHASES     ¦  X
CALL PHASES     ¦
```

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #03
               OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR         PHASES:¦12345678910111213141516
IF PHASES ARE ON¦     X
OMIT PHASES     ¦    X
CALL PHASES     ¦   X
```

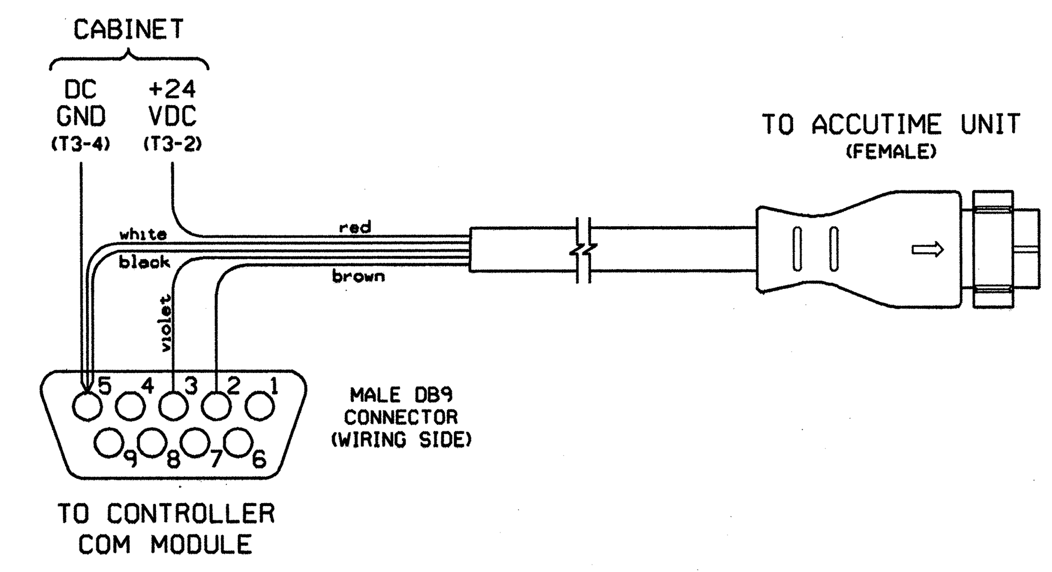
PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #04
               OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR         PHASES:¦12345678910111213141516
IF PHASES ARE ON¦       X
OMIT PHASES     ¦      X
CALL PHASES     ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CØNNECTOR	DB9 TO CØNTROLLER	CABINET CØNNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1062T1
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 2 of 2

Signal Revision - Temporary Signal 1 - TCP Phase I

Prepared in the offices of:

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch · State of North Carolina Department of Transportation · Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

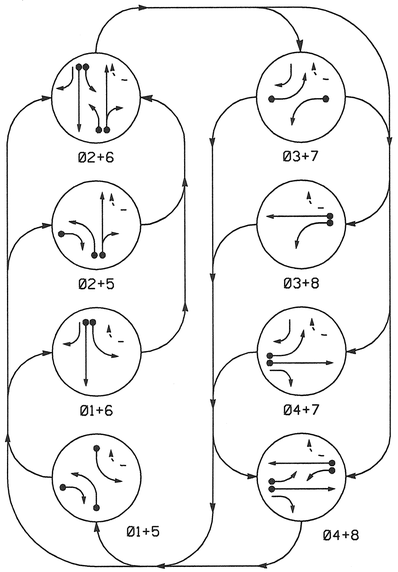
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1062T1

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-45

8 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

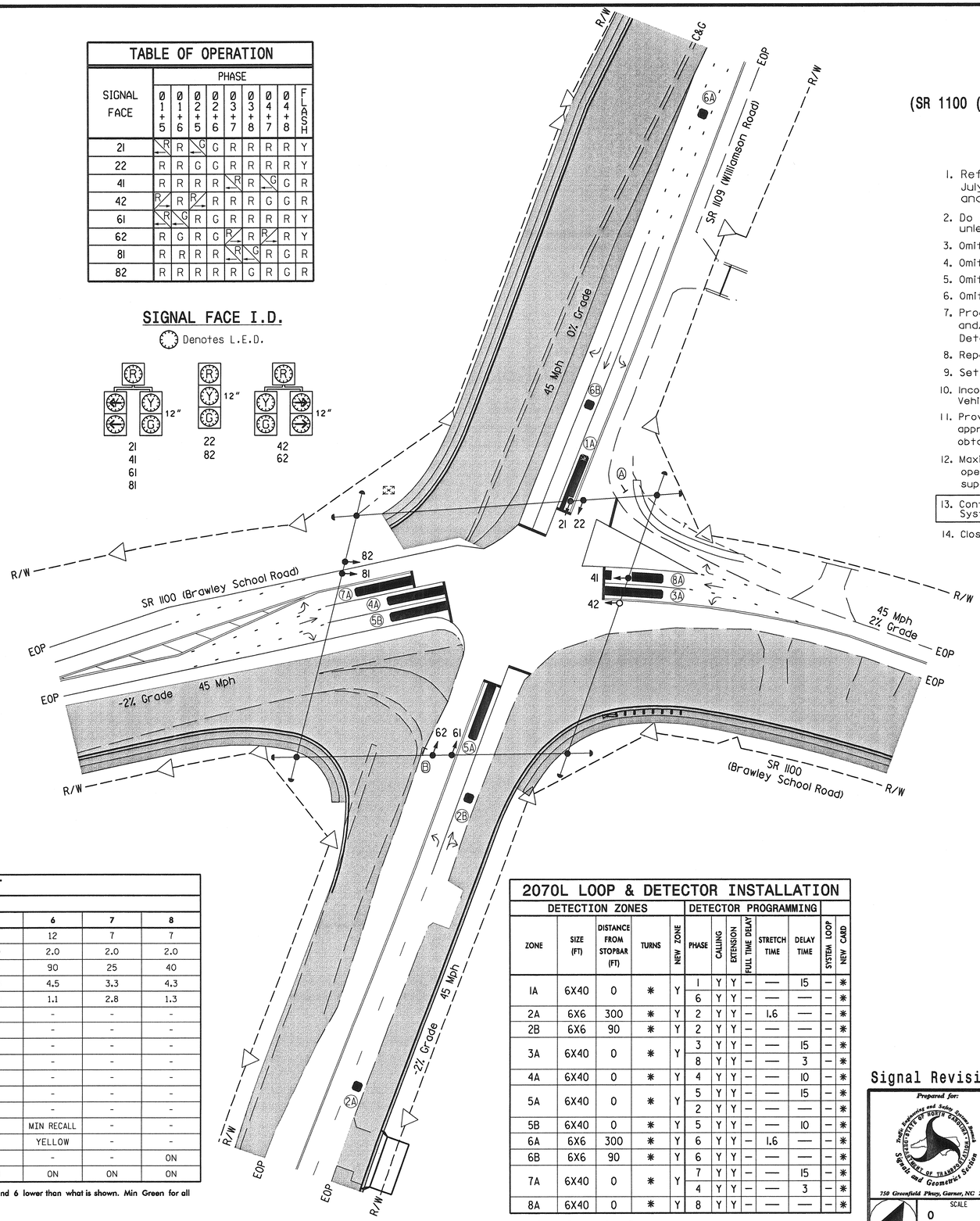
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 0 1+5	0 1+6	0 2+5	0 2+6	0 3+7	0 3+8	0 4+7	0 4+8	FLASH
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R	R	R	R	Y
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

Denotes L.E.D.



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 1 during phase 2 on.
4. Omit phase 3 during phase 4 on.
5. Omit phase 5 during phase 6 on.
6. Omit phase 7 during phase 8 on.
7. Program controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through phase 4+8 (see Electrical Details).
8. Reposition existing signal heads numbered 21, 22, 41, 61, 62, 81, and 82.
9. Set all detector zones to presence mode.
10. Incorporate Loop Emulator Detection System for Vehicle Detection.
11. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
13. Contractor to maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
14. Closed Loop System Data: Controller Asset #1062.

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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▒	Construction Zone	▒
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11)	Ⓑ

2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	25	90	25	40	25	90	25	40
Yellow Clearance	3.2	4.7	3.1	4.7	3.3	4.5	3.3	4.3
Red Clearance	1.8	1.3	2.1	1.4	2.4	1.1	2.8	1.3
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	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.

2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP / NEW CARD
1A	6X40	0	*	Y	1	Y	Y	-	—	15	- *
					6	Y	Y	-	—	—	- *
2A	6X6	300	*	Y	2	Y	Y	-	1.6	—	- *
2B	6X6	90	*	Y	2	Y	Y	-	—	—	- *
3A	6X40	0	*	Y	3	Y	Y	-	—	15	- *
					8	Y	Y	-	—	3	- *
4A	6X40	0	*	Y	4	Y	Y	-	—	10	- *
5A	6X40	0	*	Y	5	Y	Y	-	—	15	- *
					2	Y	Y	-	—	—	- *
5B	6X40	0	*	Y	5	Y	Y	-	—	10	- *
6A	6X6	300	*	Y	6	Y	Y	-	1.6	—	- *
6B	6X6	90	*	Y	6	Y	Y	-	—	—	- *
7A	6X40	0	*	Y	7	Y	Y	-	—	15	- *
					4	Y	Y	-	—	3	- *
8A	6X40	0	*	Y	8	Y	Y	-	—	—	- *

* Video Detection Zone

Prepared in the offices of:

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Transportation Engineers
8608 Farrington Place, Suite 100
Raleigh, North Carolina 27615
919-872-5115 Tel. 919-878-5418 Fax.
www.rameykemp.com

Signal Revision - Temporary Signal 2 - TCP Phase I

Prepared for: Traffic Engineering and Safety Systems Branch, NCDEPARTMENT OF TRANSPORTATION, Signals and Geometrics Section, 750 Greenfield Pkwy, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 | Iredell County | Mooresville

PLAN DATE: June 2008 | REVIEWED BY: D.J. Darity

PREPARED BY: H.W. Surti | RKA PROJ. NO.: 08034 (241)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY — 7-8-2008

SIGNATURE | DATE

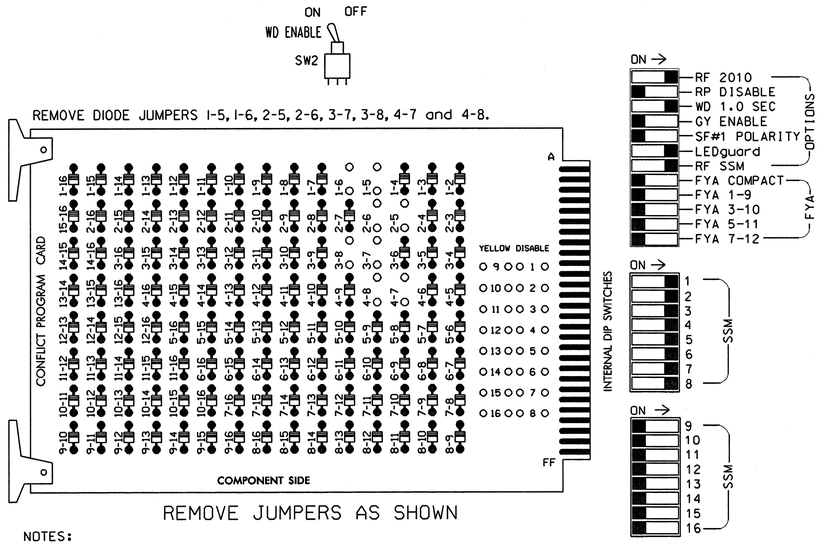
SIG. INVENTORY NO. 12-1062T2

$$$$USERNAME$$$$
$$$$DESIGNATION$$$$
$$$$SETTINGS$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-46

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 9, 10, 11, 12, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 4 and 8, on the controller unit, for Dual Entry.
6. The controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	81	41,42	NU	21,42	61,62	NU	41,62	81,82	NU
RED	*	128		*	101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126			117			132			123		
GREEN ARROW	127			118			133			124		
✋												
🚶												

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1, S2, S3, S4, S5, S6, S7, S8
PHASES USED.....1, 2, 3, 4, 5, 6, 7, 8
OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

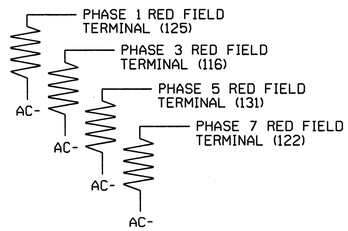
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

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 red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1062T2
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 1 of 2

Signal Revision - Temporary Signal 2 - TCP Phase I

Prepared in the offices of:

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY 7-8-2008

SIGNATURE DATE

SIG. INVENTORY NO. 12-1062T2

$$$$$$SYSTIME$$$$$$
$$$$$$SYSDATE$$$$$$
$$$$$$USERNAME$$$$$$

DYNAMIC BACK-UP CONTROL PROGRAMMING

(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 Dynamic/Backup Control Functions 1, 2, 3 and 4.

2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

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

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #02
             OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR          PHASES:¦12345678910111213141516
IF PHASES ARE ON¦   X
OMIT PHASES     ¦  X
CALL PHASES     ¦
```

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #03
             OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR          PHASES:¦12345678910111213141516
IF PHASES ARE ON¦      X
OMIT PHASES     ¦     X
CALL PHASES     ¦    X
```

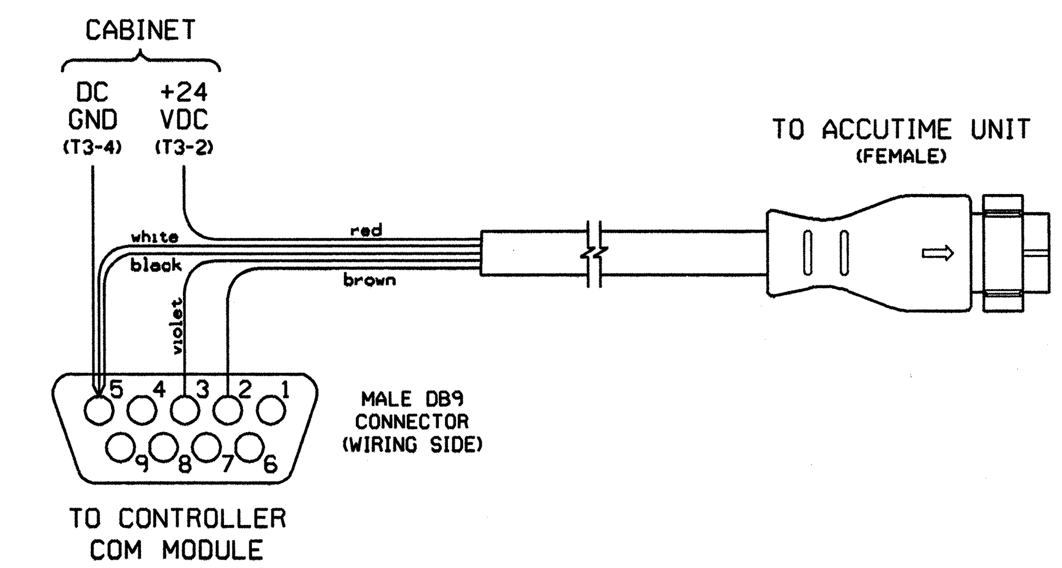
PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #04
             OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR          PHASES:¦12345678910111213141516
IF PHASES ARE ON¦       X
OMIT PHASES     ¦      X
CALL PHASES     ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CØNNECTOR	DB9 TO CØNTROLLER	CABINET CØNNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1062T2
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 2 of 2

Signal Revision - Temporary Signal 2 - TCP Phase I

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
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5808 Faringdon Place, Suite 100
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919-872-5115 Tel. 919-878-5416 Fax.
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch — State of North Carolina Department of Transportation — Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.M. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008
SIGNATURE DATE

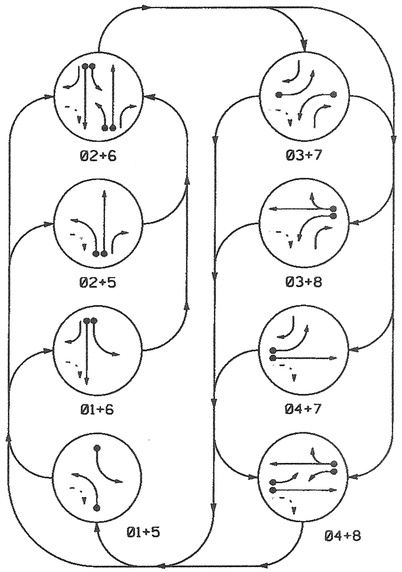
SIG. INVENTORY NO. 12-1062T2

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-48

8 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

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
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R	R	R	R	Y
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R

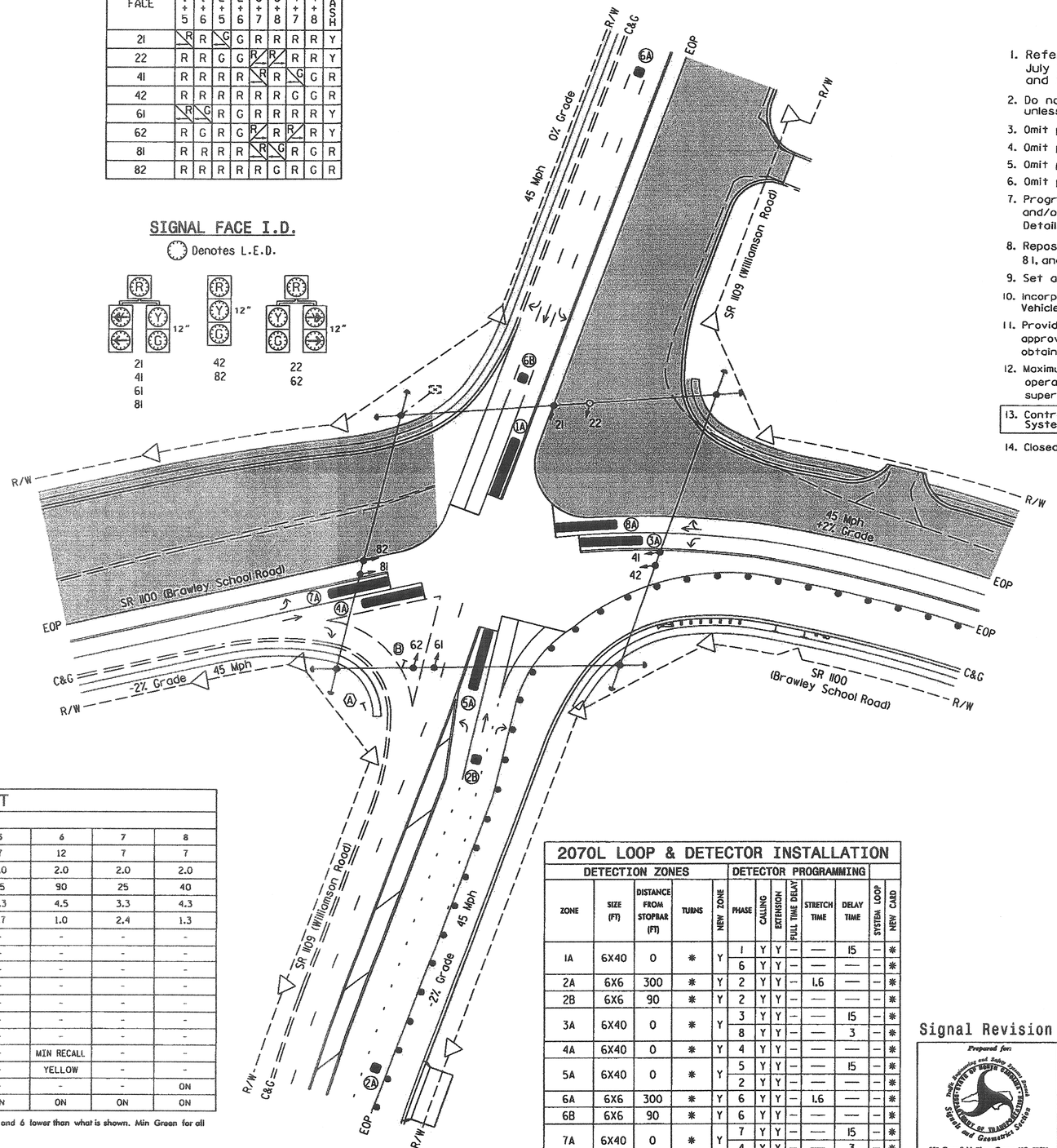
SIGNAL FACE I.D.

Denotes L.E.D.

21, 41, 61, 81 — 42, 82 — 22, 62

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 1 during phase 2 on.
4. Omit phase 3 during phase 4 on.
5. Omit phase 5 during phase 6 on.
6. Omit phase 7 during phase 8 on.
7. Program controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through phase 4+8 (see Electrical Details).
8. Reposition existing signal heads numbered 21, 41, 42, 61, 62, 81, and 82.
9. Set all detector zones to presence mode.
10. Incorporate Loop Emulator Detection System for Vehicle Detection.
11. Provide the Engineer with the Manufacturer's approved camera locations and mounting heights to obtain detection zones as shown.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
13. Contractor to maintain Wireless GPS Coordinated Signal System hardware during Temporary signal operations.
14. Closed Loop System Data: Controller Asset # 1062.



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	→
→	Pavement Marking Arrow	→
▬	Video Detection Zone	▬
▭	Construction Zone	▭
●—	Construction Zone Drums	●—
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11)	Ⓑ

2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	25	90	25	40	25	90	25	40
Yellow Clearance	3.2	4.7	3.1	4.7	3.3	4.5	3.3	4.3
Red Clearance	1.8	1.1	2.1	1.5	1.7	1.0	2.4	1.3
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	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.

2070L LOOP & DETECTOR INSTALLATION

DETECTION ZONES					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTENSION	PULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	Y	1	Y	Y	–	—	15	–	*
					6	Y	Y	–	—	—	–	*
2A	6X6	300	*	Y	2	Y	Y	–	1.6	—	–	*
2B	6X6	90	*	Y	2	Y	Y	–	—	—	–	*
3A	6X40	0	*	Y	3	Y	Y	–	—	15	–	*
					8	Y	Y	–	—	3	–	*
4A	6X40	0	*	Y	4	Y	Y	–	—	—	–	*
5A	6X40	0	*	Y	5	Y	Y	–	—	15	–	*
					2	Y	Y	–	—	—	–	*
6A	6X6	300	*	Y	6	Y	Y	–	1.6	—	–	*
6B	6X6	90	*	Y	6	Y	Y	–	—	—	–	*
7A	6X40	0	*	Y	7	Y	Y	–	—	15	–	*
					4	Y	Y	–	—	3	–	*
8A	6X40	0	*	Y	8	Y	Y	–	—	10	–	*

* Video Detection Zone

Prepared in the offices of:

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Signal Revision - Temporary Signal 3 - TCP Phase II

Prepared for:
North Carolina Department of Transportation
Traffic Engineering and Safety Systems Branch
750 Greenfield Pkwy, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RK& PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
HOWARD GARDNER SURTI
PROFESSIONAL SEAL 19713 ENGINEER
DONALD J. DARITY
1-8-2008
SIGNATURE DATE

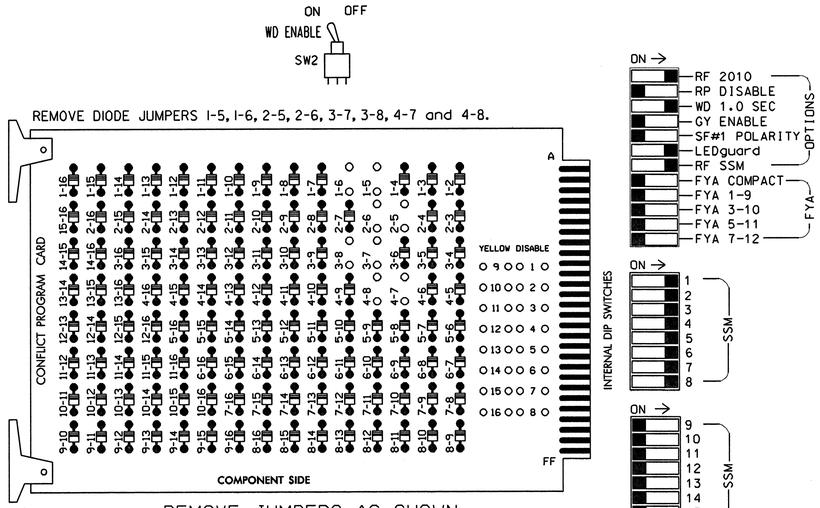
SIG. INVENTORY NO. 12-1062T3

$$$$USERNAME$$$$
$$$$DATE$$$$
$$$$TIME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-49

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTES

1. Install a loop emulator detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Traffic Engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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, 10, 11, 12, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 4 and 8, on the controller unit, for Dual Entry.
6. The controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

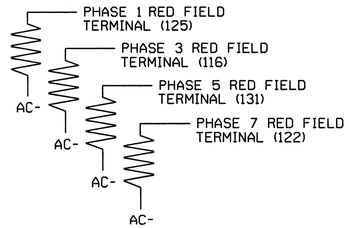
EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1, S2, S3, S4, S5, S6, S7, S8
PHASES USED.....1, 2, 3, 4, 5, 6, 7, 8
OVERLAPS.....NONE

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	81,22	41,42	NU	21	61,62	NU	41,62	81,82	NU
RED	*	128		*	101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126			117			132			123		
GREEN ARROW	127			118			133			124		
✋												
🚶												

NU = NOT USED

* Denotes install load resistor. See Load Resistor Installation Detail this page.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1062T2
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 1 of 2

Signal Revision - Temporary Signal 3 - TCP Phase II

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008

SIGNATURE DATE

SIG. INVENTORY NO. 12-1062T3

Prepared in the offices of:

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Transportation Engineers
6808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-6416 Fax.
www.rameykemp.com

750 Greenfield Parkway, Garner, NC 27529

$$$$$$$$SSTIME$$$$$$$$
$$$$$$$$USERNAME$$$$$$$$
$$$$$$$$DGN$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-50

DYNAMIC BACK-UP CONTROL PROGRAMMING

(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 Dynamic/Backup Control Functions 1, 2, 3 and 4.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
 DYNAMIC/BACKUP CONTROL FUNCTION #01
                 OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR        PHASES:¦123456789101112131415 16
IF PHASES ARE ON¦ X
OMIT PHASES     ¦X
CALL PHASES     ¦   X
```

PRESS 'NEXT'

```
 DYNAMIC/BACKUP CONTROL FUNCTION #02
                 OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR        PHASES:¦123456789101112131415 16
IF PHASES ARE ON¦   X
OMIT PHASES     ¦  X
CALL PHASES     ¦
```

PRESS 'NEXT'

```
 DYNAMIC/BACKUP CONTROL FUNCTION #03
                 OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR        PHASES:¦123456789101112131415 16
IF PHASES ARE ON¦      X
OMIT PHASES     ¦     X
CALL PHASES     ¦   X
```

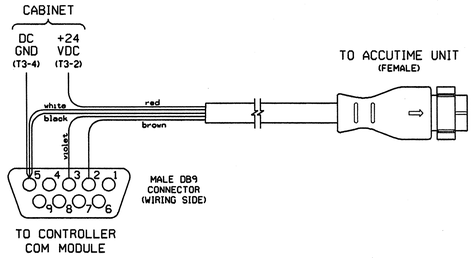
PRESS 'NEXT'

```
 DYNAMIC/BACKUP CONTROL FUNCTION #04
                 OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR        PHASES:¦123456789101112131415 16
IF PHASES ARE ON¦        X
OMIT PHASES     ¦       X
CALL PHASES     ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

CONNECTOR WIRING DETAIL FOR ACCUTIME GPS ANTENNA WITH SERIAL INTERFACE

(make connections as shown)



SIGNAL DESCRIPTION	12 CONDUCTOR CABLE COLOR	ACCUTIME CØNNECTOR	DB9 TO CØNTROLLER	CABINET CØNNECTION
DC POWER	RED	PIN 1		T3-2
PORT B: RECEIVE	VIOLET	PIN 2	PIN 3	
PORT B: TRANSMIT	BROWN	PIN 4	PIN 2	
PORT A: RECEIVE	WHITE	PIN 6	PIN 5	
DC GROUND	BLACK	PIN 9	PIN 5	T3-4

Note: All other wires in the Accutime cable are unused and should be tied off.

Configure the Com Port used by the Accutime unit in the Oasis software using the settings below:

* 9600 Baud
* 8 Data Bits
* 1 Stop Bit
* Odd Parity
* Trimble TSIP GPS Protocol

Be sure to enable the "GET TIME FROM GPS" option under D-1 (Set Clock) menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1062T3
DESIGNED: June 2008
SEALED: 7-8-2008
REVISED:

Electrical Detail Sheet 2 of 2

Signal Revision - Temporary Signal 3 - TCP Phase II

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 Greenfield Parkway, Garner, NC 27529

SR 1100 (Brawley School Road)
at
SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	June 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (241)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
7-8-2008

SIGNATURE DATE

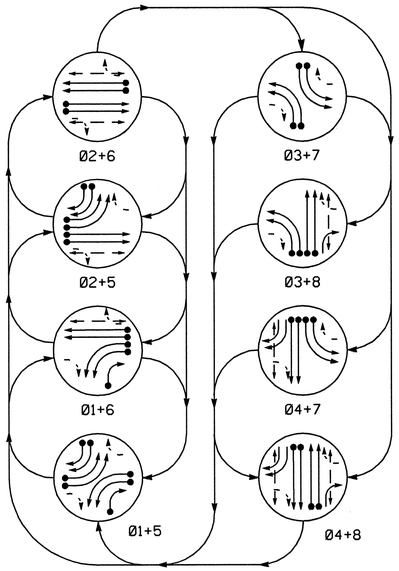
SIG. INVENTORY NO. 12-1062T3

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-51

8 Phase
Fully Actuated
(SR 1100 (Brawley School Rd) Closed Loop Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

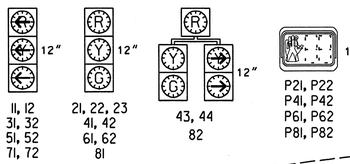
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

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	←	←	↛	↛	↛	↛	↛	↛	↛
21, 22, 23	R	R	G	G	R	R	R	Y	
31, 32	↛	↛	↛	↛	←	↛	↛	↛	
41, 42	R	R	R	R	R	R	G	G	R
43, 44	R/→	R	R/←	R	R	R	G	G	R
51, 52	←	↛	←	↛	↛	↛	↛	↛	↛
61, 62	R	G	R	G	R	R	R	Y	
71, 72	↛	↛	↛	↛	←	↛	↛	↛	
81	R	R	R	R	R	G	R	G	R
82	R/→	R/←	R	R	R	G	R	G	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.

Denotes L.E.D.

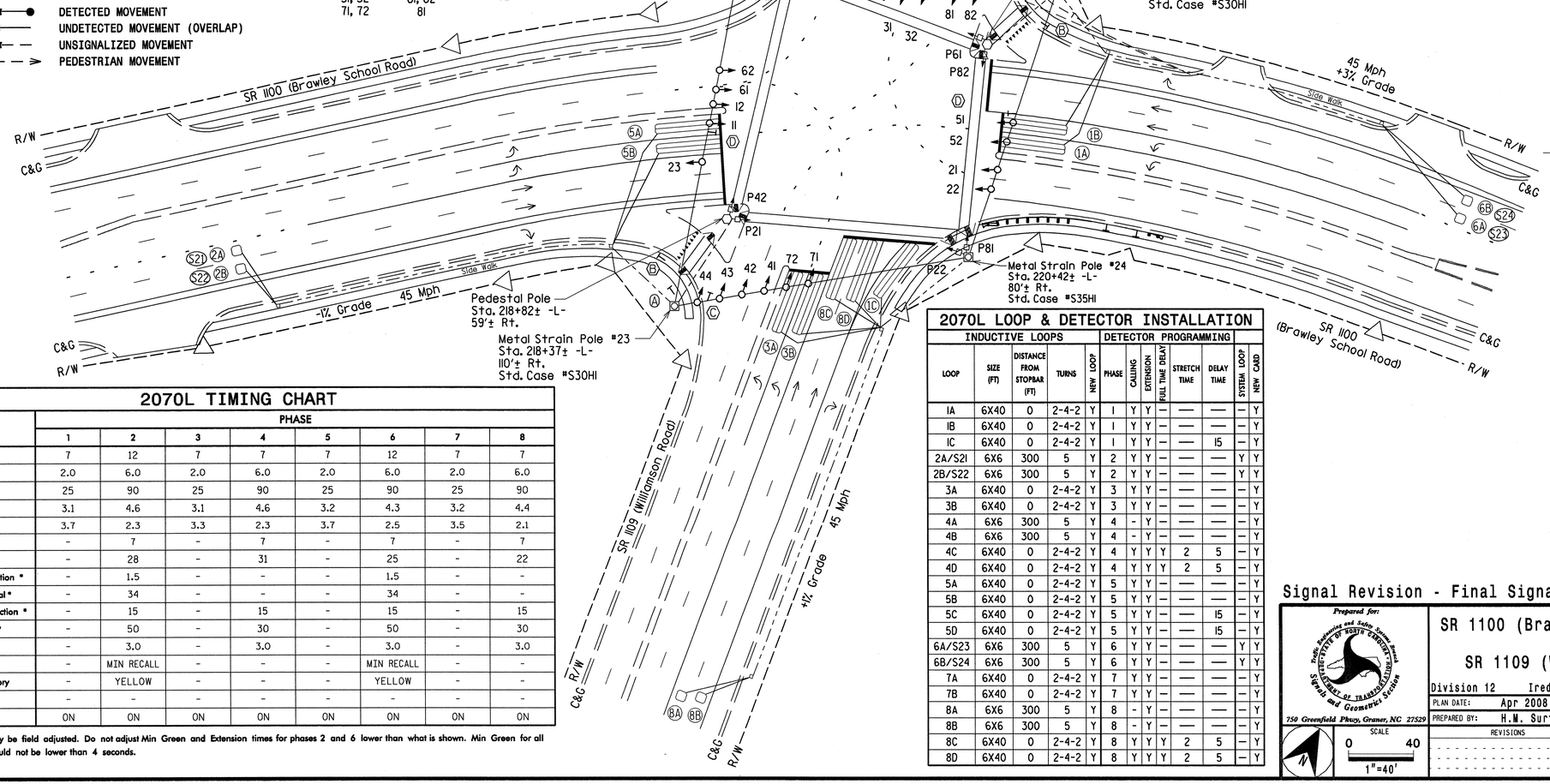


11, 12
31, 32
51, 52
71, 72

21, 22, 23
41, 42
61, 62
81

43, 44
82

P21, P22
P41, P42
P61, P62
P81, P82



2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	6.0	2.0	6.0	2.0	6.0
Max Green 1 *	25	90	25	90	25	90	25	90
Yellow Clearance	3.1	4.6	3.1	4.6	3.2	4.3	3.2	4.4
Red Clearance	3.7	2.3	3.3	2.3	3.7	2.5	3.5	2.1
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	28	-	31	-	25	-	22
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	15	-	15	-	15
Time To Reduce *	-	50	-	30	-	50	-	30
Minimum Gap	-	3.0	-	3.0	-	3.0	-	3.0
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.

2070L LOOP & DETECTOR INSTALLATION

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	–	—	—	–	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	–	—	—	–	Y
1C	6X40	0	2-4-2	Y	1	Y	Y	–	—	15	–	Y
2A/S21	6X6	300	5	Y	2	Y	Y	–	—	—	Y	Y
2B/S22	6X6	300	5	Y	2	Y	Y	–	—	—	Y	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	–	—	—	–	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	–	—	—	–	Y
4A	6X6	300	5	Y	4	-	Y	–	—	—	–	Y
4B	6X6	300	5	Y	4	-	Y	–	—	—	–	Y
4C	6X40	0	2-4-2	Y	4	Y	Y	Y	2	5	–	Y
4D	6X40	0	2-4-2	Y	4	Y	Y	Y	2	5	–	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	–	—	—	–	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	–	—	—	–	Y
5C	6X40	0	2-4-2	Y	5	Y	Y	–	—	15	–	Y
5D	6X40	0	2-4-2	Y	5	Y	Y	–	—	15	–	Y
6A/S23	6X6	300	5	Y	6	Y	Y	–	—	—	Y	Y
6B/S24	6X6	300	5	Y	6	Y	Y	–	—	—	Y	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	–	—	—	–	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	–	—	—	–	Y
8A	6X6	300	5	Y	8	-	Y	–	—	—	–	Y
8B	6X6	300	5	Y	8	-	Y	–	—	—	–	Y
8C	6X40	0	2-4-2	Y	8	Y	Y	Y	2	5	–	Y
8D	6X40	0	2-4-2	Y	8	Y	Y	Y	2	5	–	Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006, "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Phase 1 and/or phase 5 may be lagged.
5. Phase 3 and/or phase 7 may be lagged.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Closed Loop System Data: Controller Asset #1062.

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	→
→	Pavement Marking Arrow	→
N/A	Wheelchair Ramp	♿
▣	Metal Strain Pole	■
⬡	Pedestrian Signal Pedestal	●
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	"IN-STREET PEDESTRIAN CROSSING" Sign (R1-6)	Ⓑ
Ⓒ	"TURNING TRAFFIC MUST YIELD TO PEDESTRIANS" Sign (R10-15)	Ⓒ
Ⓓ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓓ

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-8416 Fax.
www.rameykemp.com

Signal Revision - Final Signal - TCP Final Phase

Prepared for: North Carolina Department of Transportation, Traffic Engineering Branch, Signals and Geometrics Section
750 Greenfield Pkwy, Graner, NC 27529

SCALE 0 40 1"=40'

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RK&A PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

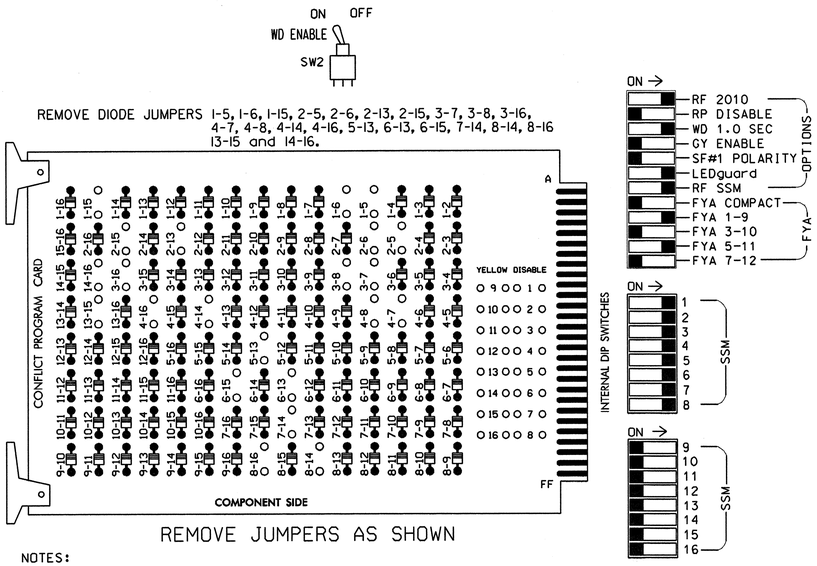
SIG. INVENTORY NO. 12-1062

$$$$USERNAME$$$$
$$$$DESIGNATION$$$$
$$$$SETTING$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-52

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 9, 10, 11, 12, 13, 14, 15, & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
6. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
7. The controller and cabinet are part of the SR 1100 (Brawley School Rd) Closed Loop Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1, S2, S2P, S3, S4, S4P, S5, S6, S6P, S7, S8, S8P
PHASES USED.....1, 2, 2PED, 3, 4, 4PED, 5, 6, 6PED, 7, 8, 8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3	S4	S4P	S5		S6	S6P	S7	S8	S8P
PHASE	1		2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	82	21,22 23	P21 P22	31,32	41,42 43,44	P41 P42	51,52	43,44	61,62	P61 P62	71,72	81,82	P81 P82
RED			128			101				134			107	
YELLOW			129			102				135			108	
GREEN			130			103				136			109	
RED ARROW	125				116			131				122		
YELLOW ARROW	126	126			117			132	132			123		
GREEN ARROW	127	127			118			133	133			124		
✋				113			104				119			110
🚶				115			106				121			112

NU = NOT USED

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1	ø1	ø2/SYS	SLOT EMPTY	ø3	ø4	ø4	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 2PED DC ISOLATOR	ø 6PED DC ISOLATOR	FS DC ISOLATOR
		1A	1C	2A/S21		3A	4A	4C							
	L	ø1	NOT USED	ø2/SYS		ø3	ø4	ø4					ø 4PED DC ISOLATOR	ø 8PED DC ISOLATOR	ST DC ISOLATOR
		1B		2B/S22		3B	4B	4D							
FILE "J"	U	ø5	ø5	ø6/SYS	SLOT EMPTY	ø7	ø8	ø8	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
		5A	5C	6A/S23		7A	8A	8C							
	L	ø5	ø2	ø6/SYS		ø7	ø8	ø8							
		5B	5D	6B/S24		7B	8B	8D							

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	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-3,4	I1L	56	18	1	1	Y	Y			
1C	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A/S21	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y			
2B/S22	TB2-11,12	I3L	76	38	42	2/SYS	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
3B	TB4-7,8	I5L	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4		Y			
4B	TB4-11,12	I6L	45	7	14	4		Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2	5
4D	TB6-3,4	I7L	78	40	44	4	Y	Y	Y	2	5
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y			15
5D	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A/S23	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
6B/S24	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8		Y			
8B	TB5-11,12	J6L	46	8	18	8		Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2	5
8D	TB7-3,4	J7L	79	41	48	8	Y	Y	Y	2	5
PED PUSH BUTTON											
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 Isolaters in Input file slots 112 and 113.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown ped signals are required to display timing only during ped clearance interval. Consult ped signal module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1062
DESIGNED: Apr 2008
SEALED: 4-28-2008
REVISED:

Signal Revision - Final Signal - TCP Final Phase

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-870-6416 Fax.
www.rameykemp.com

ELECTRICAL AND PROGRAMMING DETAILS FOR:

North Carolina Department of Transportation Traffic Engineering and Safety Systems Branch Signals Management Section
750 Greenfield Pkwy, Garner, NC 27529

SR 1100 (Brawley School Road) at SR 1109 (Williamson Road)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	H.W. Surti	RKA PROJ. NO.:	08034 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE
SIG. INVENTORY NO. 12-1062

$$$$$$SYSTIME$$$$$$
$$$$$$SYSDATE$$$$$$
$$$$$$USERNAME$$$$$$

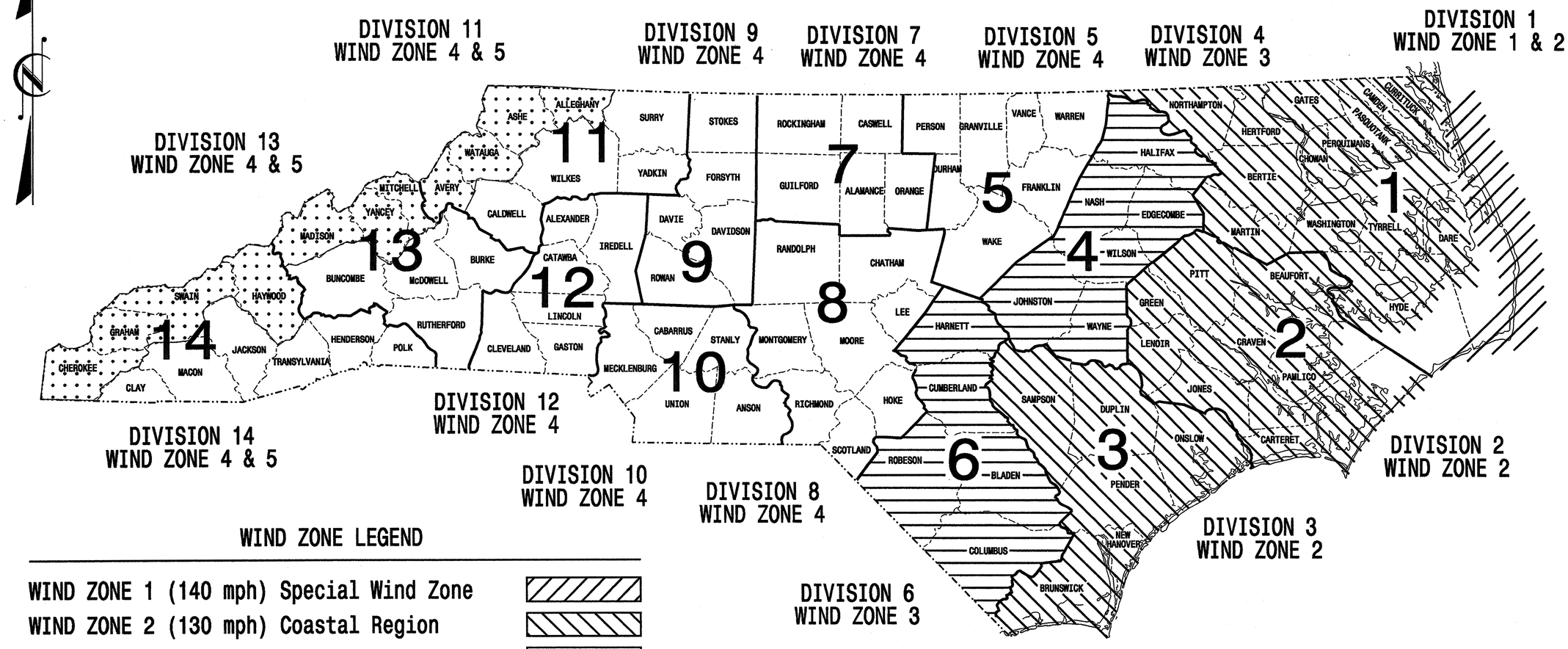
STATE	PROJECT NO.	SHEET NO.
N.C.	R-3833A	Sig. 53
F.A. PROJ. NO.		M 1
PROJECT ID. NO.		

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR METAL POLES

POLE STANDARDS

NCDOT METAL P



WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone	
WIND ZONE 2 (130 mph) Coastal Region	
WIND ZONE 3 (110 mph) Eastern Region	
WIND ZONE 4 (90 mph) Central & Mtn. Region	
WIND ZONE 5 (120 mph) Special Wind Zone	

http://www.ncdot.org/doh/preconstruct/traffic/tmssu/ws/default.htm

Prepared in the Offices of:

Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section

122 N. McDowell St., Raleigh, NC 27603

Designed in conformance with the 2002 Interim to the 4th Edition 2001

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminares, and Traffic Signals

INDEX OF PLANS

DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details – All Poles
M 3	Fabrication Details – Strain Poles
M 4,5	Fabrication Details – Mast Arm Poles
M 6	Construction Details – Strain Poles
M 7	Construction Details – Foundations
M 8	Standard Strain Poles

NCDOT CONTACTS:

TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

G. A. Fuller, P.E. – State ITS and Signals Engineer
R. E. Mullinax, P.E. – Signals and Geometrics Engineer
P. L. Alexander, P.E. – Signals and Geometrics Special Projects Engineer
D. C. Sarkar, P.E. – Signals and Geometrics Structural Engineer
A. M. Esposito, P.E. – Signals and Geometrics Project Engineer
C. F. Andrews, Jr. – Signals and Geometrics Project Engineer

SEAL

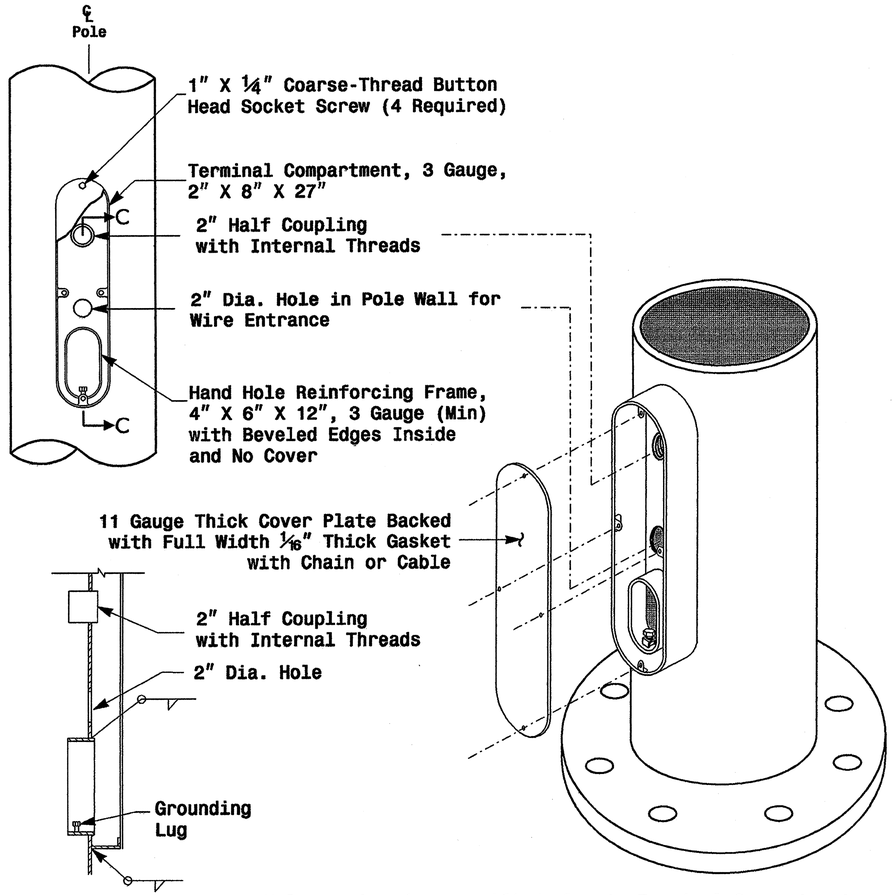
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar — SIGNATURE

9.2.2005 — DATE

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig.54 M 2

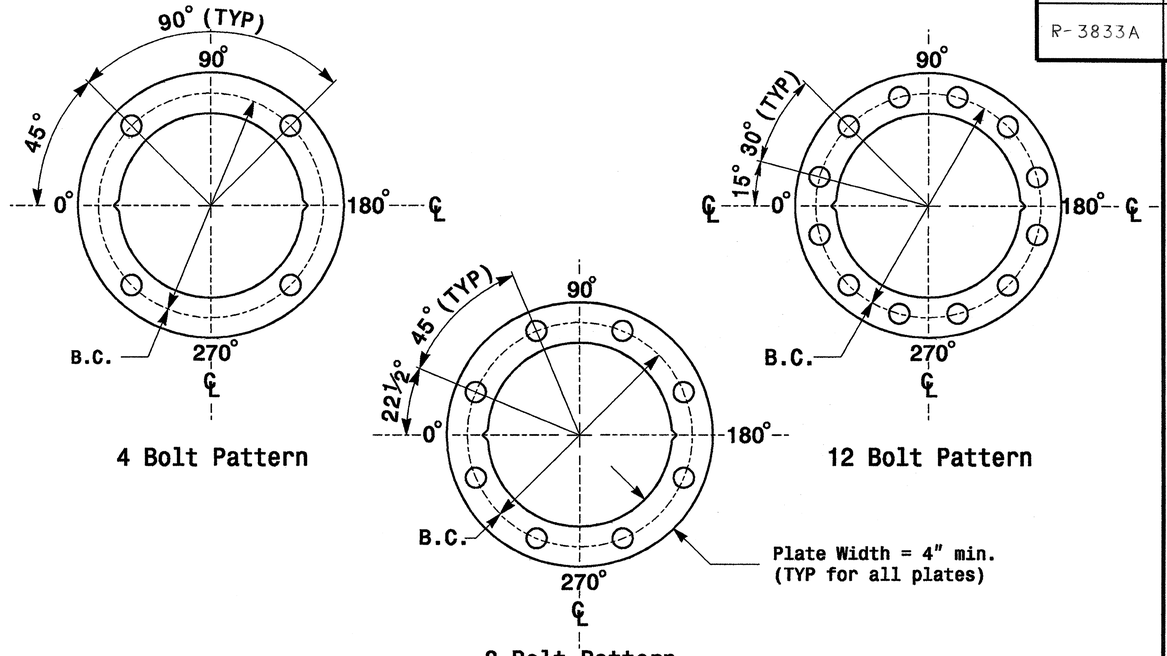
Fabrication Details – All Poles



Section C-C

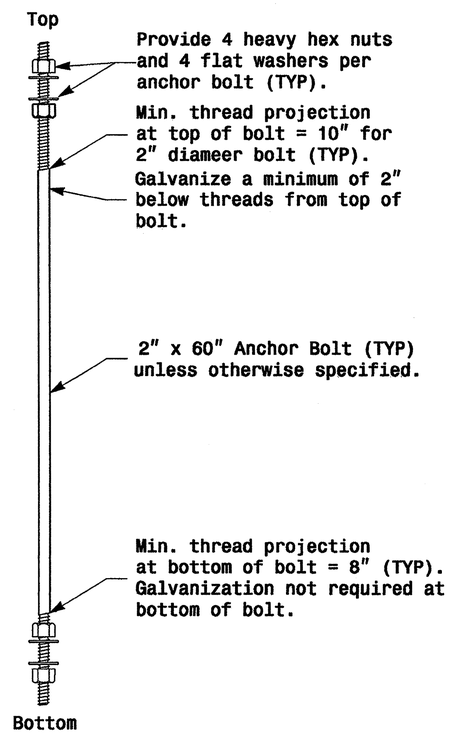
Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail



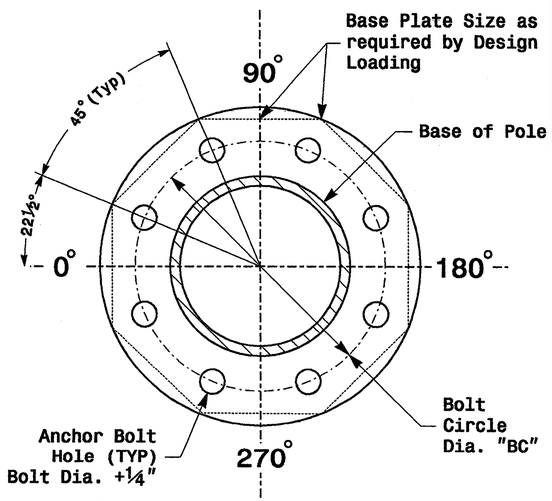
Construct Templates and Plates from ¼" min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details



Anchor Bolt Detail

Note: See Strain Pole drawing M3 and Mast arm drawing M4 for base plate weld details.



8 Bolt Base Plate Detail

MFG _____	MFG. DATE: MM/YY
SHAFT D/T/L/Y	----/----/----/----
ARM-A D/T/L/Y	----/----/----/----
	----/----/----/----
ARM-B D/T/L/Y	----/----/----/----
	----/----/----/----
A.B. DIA./B.C./L/Y	----/----/----/----
NCDOT STANDARD	----------

Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

MFG _____	MFG. DATE: MM/YY
SECTION D/T/L/Y	----/----/----/----
NCDOT STANDARD	----------

Arm I.D. Tag
(Provide on each section of a multi-section mast arm)

Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for plan pole I.D.
5) See drawing M4 for mounting positions of I.D. tags.

Identification Tag Details

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, State of North Carolina, Department of Transportation, Signals and Geometrics Section, 122 N. McDowell St., Raleigh, NC 27603

Typical Fabrication Details Common To All Metal Poles

PLAN DATE:	May 2005	REVIEWED BY:	C.F. Andrews
PREPARED BY:	P.L. Alexander	REVIEWED BY:	A.M. Esposito

REVISIONS	INIT.	DATE

SCALE 0 NA NONE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

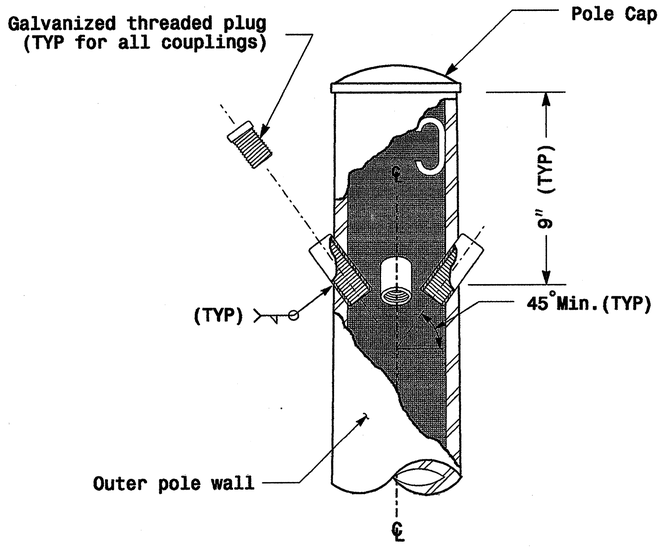
D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

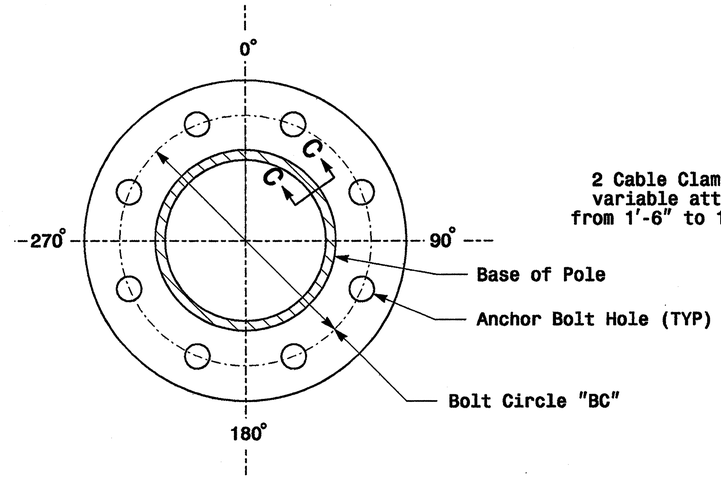
01-SEP-2005 18:22
D:\#2004 Metal Pole Standards\#2004 m2 thru m5.dgn
candrews

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig.55 M 3

Fabrication Details – Strain Poles



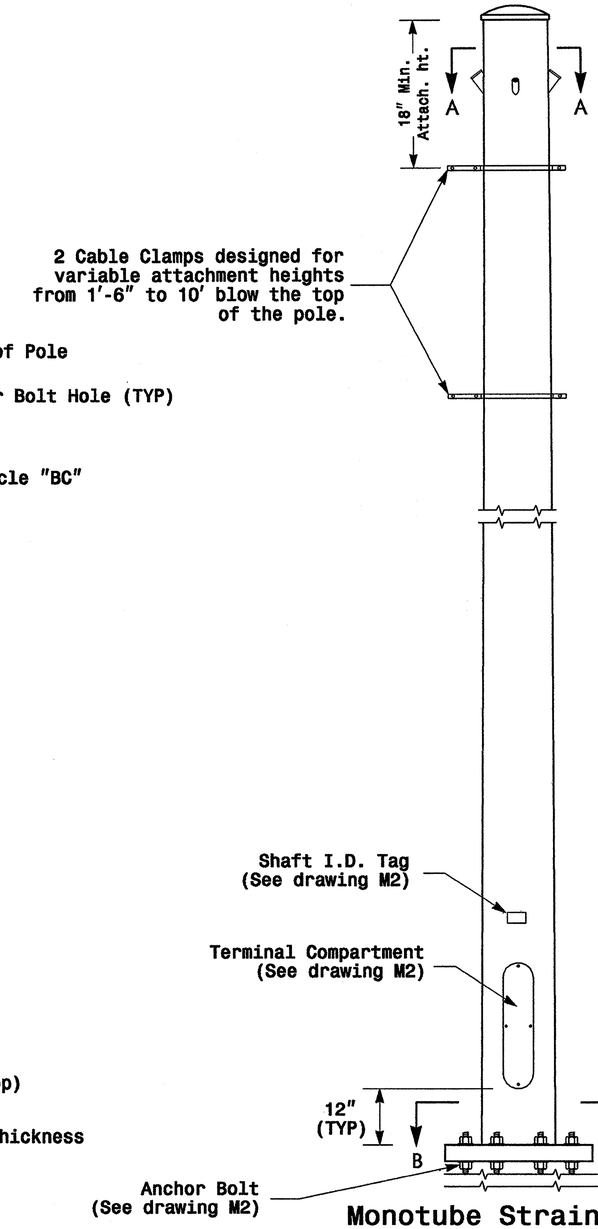
Cable Entrances at Top of Pole



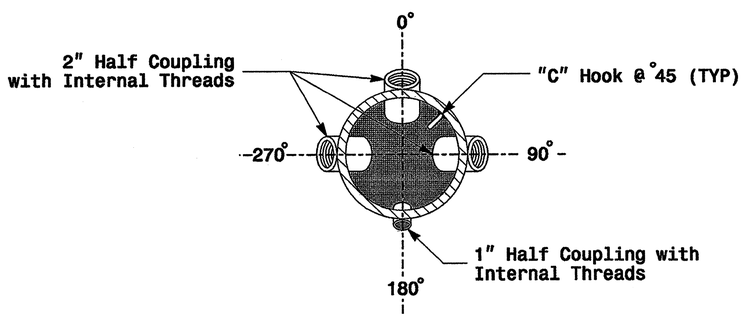
Section B-B

(See drawing M2)

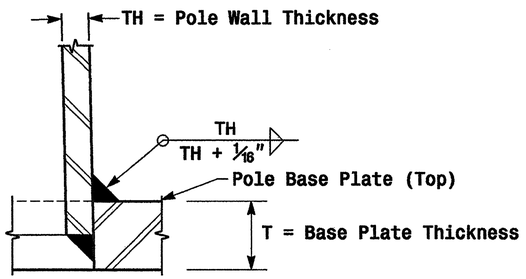
Pole Base Plate



Monotube Strain Pole
(.14"/Foot Taper)



Section A-A



Section C-C

Radial Orientation for Factory Installed Accessories at Top of Pole

Socket Connection Weld Detail

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, State of North Carolina, Department of Transportation, Signals and Geometrics Section, 122 N. McDowell St., Raleigh, NC 27603

Typical Fabrication Details For Strain Poles

PLAN DATE: May 2005	REVIEWED BY: C.F. Andrews		
PREPARED BY: P.L. Alexander	REVIEWED BY: A.M. Esposito		
REVISIONS		INIT.	DATE

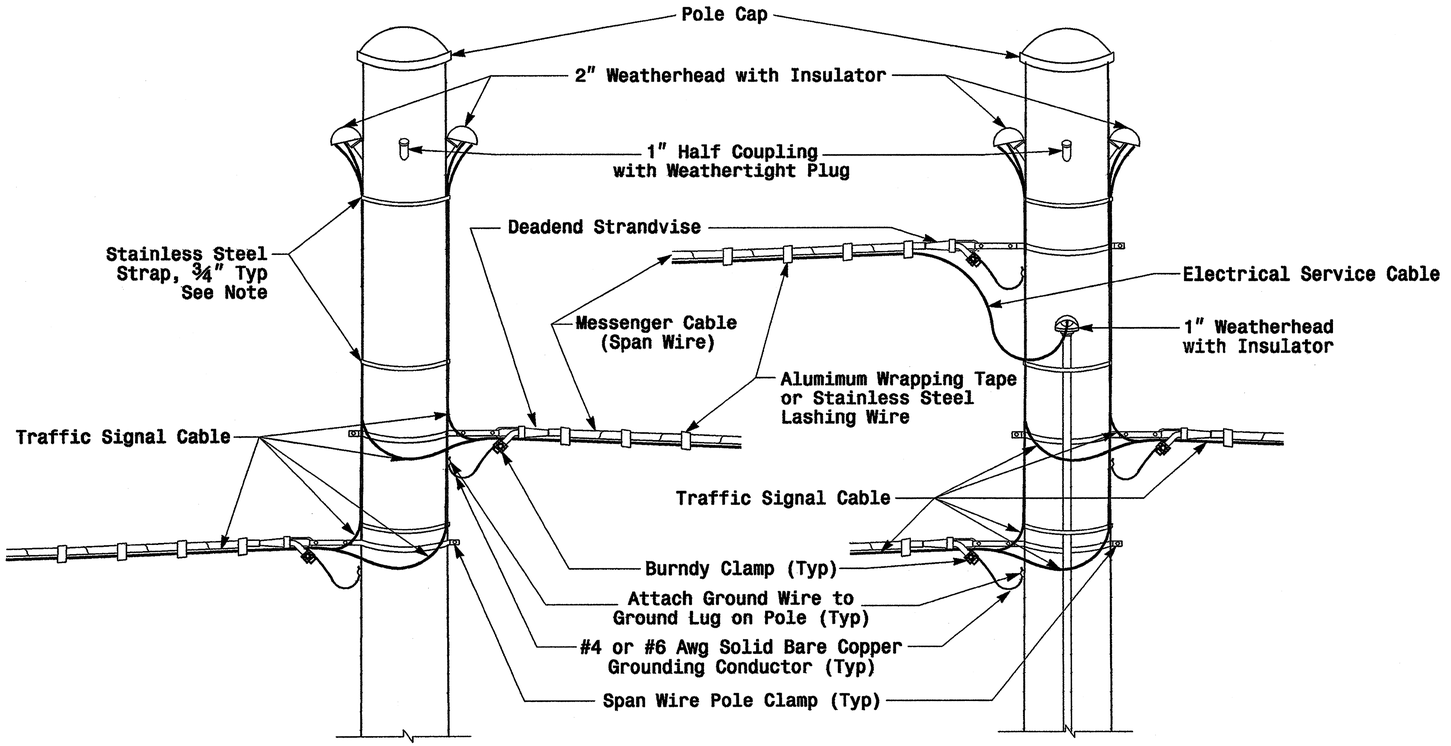
SCALE 0 NA NONE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

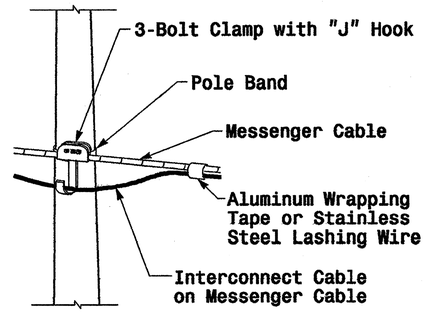
SIG. INVENTORY NO.

01-SEP-2005 14:07
w:\pecoles-unit\workgroups\2004 metal pole standards\2004 m3.dgn
palexander

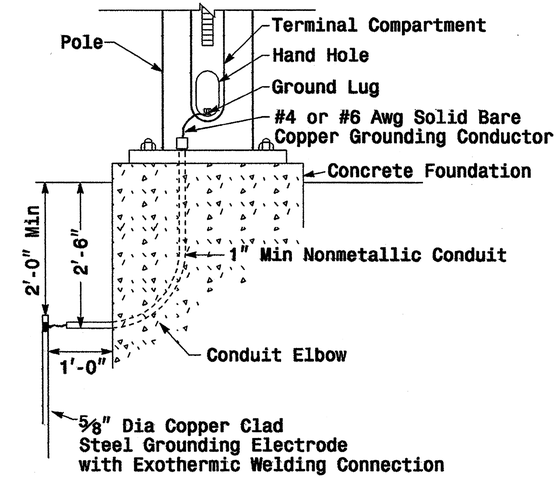


Note: Strap all signal cables to the side of the pole with ¾" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail

Construction Details - Strain Poles

Prepared in the Offices of
North Carolina Department of Transportation
Traffic Engineering and Safety Systems Branch
Signal and Geometrics Section
122 N. McDowell St., Raleigh, NC 27603

Construction Details
Strain Poles

PLAN DATE:	May 2005	REVIEWED BY:	P.L. ALEXANDER
PREPARED BY:	C.F. ANDREWS	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

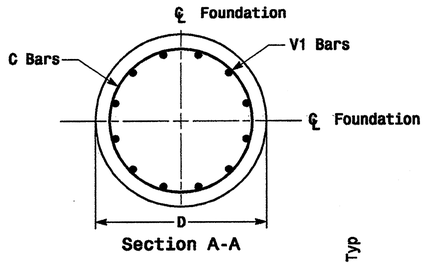
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 016286 ENGINEER MILTON I. OLEAN

Milton I. Olean 9-1-05
SIGNATURE DATE

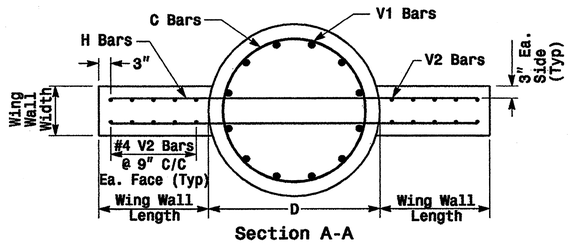
SIG. INVENTORY NO.

01-SEP-2005 16:33
w:\traffic\projects-unit\workgroups\2004 metal pole standards\2004 m6.dgn
pslexander

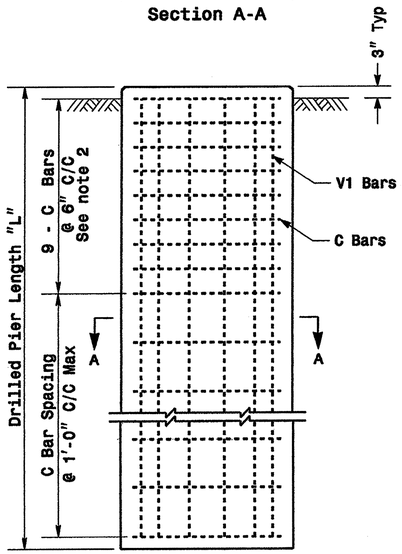
Reinforcing Steel Bars

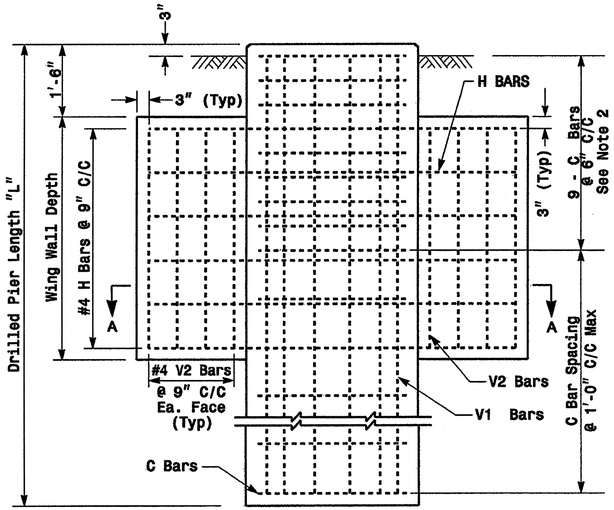


Section A-A



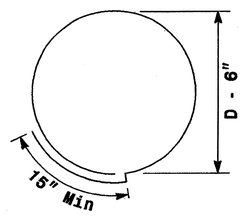
Section A-A





REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (42" & 48" DIAMETER)						
Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	No.	Size	Type	Length
42"	.356 x L	V1	9	#8	STR.	**
		C	*	#4	CIR.	10'-9"
48"	.465 x L	V1	12	#8	STR.	**
		C	*	#4	CIR.	12'-6"

* See Note No. 1
** See Note No. 3



Typical "C" Bars

REINFORCING STEEL TABLE FOR STANDARD 42" and 48" DRILL PIER SHAFT WITH TYPE 1 AND TYPE 2 WING WALLS						
Wing Wall Type	Drill Pier Shaft Dia. (in.)	Reinforcing Steel				
		Bar Name	No.	Size	Type	Length
TYPE 1	42"	V1	9	#8	STR.	**
		V2	12	#4	STR.	2'-6"
		H	8	#4	STR.	6'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	42"	V1	9	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	48"	V1	12	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-0"
		C	*	#4	CIR.	12'-6"

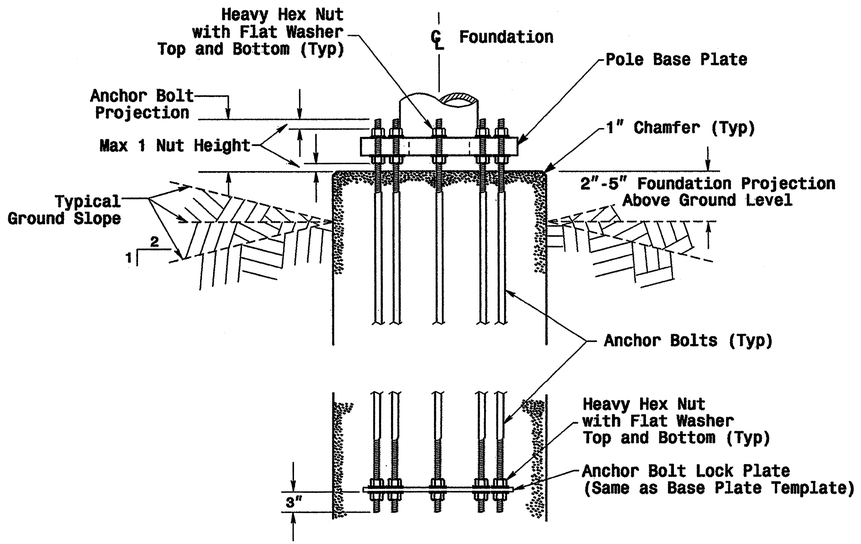
* See Note No. 1
** See Note No. 3

WING WALL DETAILS				
Wing Wall Type	Wing Wall Length (Ft.)	Wing Wall Width (Ft.)	Wing Wall Depth (Ft.)	Concrete Volume (Cu. Yds.)
TYPE 1	1'-6"	1'-0"	3'-0"	.4
TYPE 2	3'-0"	1'-0"	5'-0"	1.2

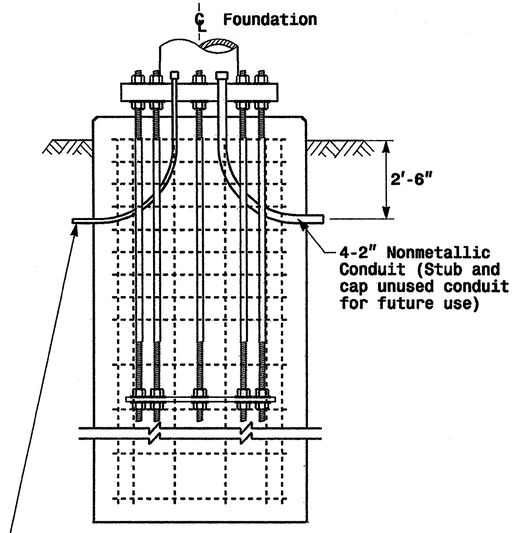
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



Notes

1. The number of C-bars is based on foundation depth. For standard foundations, see sheet M 8.
2. Circular tie reinforcing rings may be vertically adjusted by +/- 3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
3. The length of V1-bars is based on foundation depth. For standard foundations, see sheet M 8.
4. The quantities for steel and concrete shown in the Wing Wall Details Chart reflect the amount of material for 1 pair of wing walls (2 wing walls per drilled pier shaft.)

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig.57 M 7

Construction Details – Foundations

Prepared in the Office of:
North Carolina Department of Transportation
Division of Highways
Structure Design Unit
1722 N. McDowell St., Raleigh, NC 27603

Construction Details
Foundations

PLAN DATE:	May 2005	REVIEWED BY:	P.L. ALEXANDER
PREPARED BY:	C.F. ANDREWS	REVIEWED BY:	A.W. ESPOSITO

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

01-SEP-2005 11:48
w:\Projects-unit\workgroups\2004 metal pole standards\2004 m1.dgn
pollworster

		STANDARD STRAIN POLES				STANDARD FOUNDATIONS 42" Diameter Drilled Pier Length (L) – Feet						
						Clay				Sand		
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Moment at the Pole Base (ft-kp)	Medium N-Value 4-8	Stiff N-Value 9-15	Very Stiff N-Value 16-30	Hard N-Value >30	Loose N-Value 4-10	Medium N-Value 11-30	Dense N-Value >30
WIND ZONE 1	LIGHT	S26L3	26	25	280	20.5	14.0	11.5	9.5	18.0	16.0	14.0
		S30L3	30	25	310	21.0	14.5	11.5	9.5	18.5	16.5	14.5
		S35L3	35	25	350	22.5	15.0	12.0	10.0	19.5	17.5	15.5
	HEAVY	S30H3	30	29	450	25.5	16.5	13.0	11.0	21.0	18.5	16.5
		S35H3	35	29	540	26.0	17.0	13.5	11.5	22.0	19.5	17.0
WIND ZONE 2	LIGHT	S26L2	26	23	250	19.5	13.5	11.0	9.0	18.0	15.5	14.0
		S30L2	30	23	290	20.0	14.0	11.5	9.5	18.5	16.0	14.0
		S35L2	35	23	315	21.0	14.5	11.5	9.5	19.0	16.5	14.5
	HEAVY	S30H2	30	29	415	24.5	16.0	13.0	10.5	21.0	18.5	16.0
		S35H2	35	29	485	25.5	16.5	13.5	11.0	21.5	19.0	16.5
WIND ZONE 3	LIGHT	S26L2	26	23	250	18.5	13.0	10.5	9.0	17.5	15.0	13.5
		S30L2	30	23	290	19.5	13.5	11.0	9.0	18.0	15.5	14.0
		S35L2	35	23	315	20.0	14.0	11.5	9.5	18.5	16.0	14.5
	HEAVY	S30H2	30	29	415	23.0	15.5	12.5	10.0	20.5	17.5	16.0
		S35H2	35	29	485	24.0	16.0	13.0	10.5	21.0	18.0	16.5
WIND ZONE 4	LIGHT	S26L1	26	22	195	18.0	13.0	10.5	9.0	16.5	14.5	13.0
		S30L1	30	22	225	18.5	13.0	10.5	9.0	17.0	15.0	13.5
		S35L1	35	22	255	19.0	13.5	11.0	9.0	17.5	15.5	14.0
	HEAVY	S30H1	30	25	330	22.0	15.0	12.0	9.5	19.5	17.0	15.0
		S35H1	35	25	385	23.0	15.5	12.5	10.0	20.0	17.5	15.5
WIND ZONE 5	LIGHT	S26L2	26	23	250	19.0	13.5	10.5	9.0	17.5	15.5	13.5
		S30L2	30	23	290	20.0	14.0	11.0	9.5	18.0	16.0	14.0
		S35L2	35	23	315	21.0	14.5	11.5	10.0	19.0	16.5	14.5
	HEAVY	S30H2	30	29	415	23.5	15.5	12.5	10.5	21.0	18.0	16.0
		S35H2	35	29	485	25.0	16.5	13.0	11.0	21.5	18.5	16.5

Concrete Volume (cubic yards)=.356 X L

Fabrication Design Notes:

1. Values shown in "Moment at the Pole Base" column represents the minimum acceptable capacity allowable for design using a design CSR of 1.
2. Base plate thickness (T) is 2.0 inches.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from sheet M 1.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate pole case load number from the plans or from the Engineer.
5. Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case. The foundation depth is the value where the column and the row intersect.

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig.58 M 8

Standard Strain Poles

Prepared in the Offices of:
Roadway Design Unit, Structure Design Branch
North Carolina Department of Transportation
Bridge and Geomatics Section
1722 N. McDowell St., Raleigh, NC 27603

SCALE: 0 NA None

Standard Strain Poles and Standard Foundations

PLAN DATE:	May 2005	REVIEWED BY:	C.F. Andrews
PREPARED BY:	P.L. Alexander	REVIEWED BY:	A.N. Esposito

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

02-SEP-2005 12:42
w:\Roadsides-Unit\workgroups\2004 metal pole standards\2004 m8 std strain pole.dgn
pplexander

1 INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE

2 INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE

3 INSTALL REA, PE – 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE

4 INSTALL SMFO CABLE

5 INSTALL MMFO CABLE

6 INSTALL FIBER OPTIC DROP CABLE

7 INSTALL TRACER WIRE

8 TRENCH

9 INSTALL PVC CONDUIT

10 INSTALL RIGID, GALVANIZED STEEL CONDUIT

11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD

12 INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL

13 INSTALL OUTER-DUCT POLYETHYLENE CONDUIT

14 INSTALL POLYETHYLENE CONDUIT

15 DIRECTIONAL DRILL CONDUIT

16 BORE AND JACK CONDUIT

17 INSTALL CABLE(S) IN EXISTING CONDUIT

18 INSTALL CABLE(S) IN NEW CONDUIT

19 INSTALL CABLE(S) IN EXISTING RISER

20 INSTALL CABLE(S) IN NEW RISER

21 INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS

22 INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)

23 INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)

24 INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET

25 INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET

26 TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET

27 INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET

28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET

29 INSTALL UNDERGROUND SPLICE ENCLOSURE

30 INSTALL AERIAL SPLICE ENCLOSURE

31 INSTALL POLE MOUNTED SPLICE CABINET

32 INSTALL BASE MOUNTED SPLICE CABINET

33 REMOVE EXISTING SPLICE CABINET

34 INSTALL CABINET FOUNDATION

35 REMOVE EXISTING CABINET FOUNDATION

36 INSTALL CCTV CAMERA ASSEMBLY

37 INSTALL CCTV CAMERA WOOD POLE

38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION

39 INSTALL JUNCTION BOX

40 INSTALL OVERSIZED JUNCTION BOX

41 REMOVE EXISTING JUNCTION BOX

42 INSTALL WOOD POLE

43 REMOVE EXISTING WOOD POLE

44 INSTALL AERIAL GUY ASSEMBLY

45 INSTALL STANDARD GUY ASSEMBLY

46 INSTALL SIDEWALK GUY ASSEMBLY

47 INSTALL MESSENGER CABLE

48 REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE

49 REMOVE EXISTING COMMUNICATIONS CABLE

50 INSTALL TELEPHONE SERVICE

51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE

52 INSTALL DELINEATOR MARKER

53 STORE 20 FEET OF COMMUNICATIONS CABLE

54 LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE

55 LASH CABLE(S) TO EXISTING MESSENGER CABLE

56 LASH CABLE(S) TO NEW MESSENGER CABLE

57 MODIFY EXISTING ELECTRICAL SERVICE

58 INSTALL NEW ELECTRICAL SERVICE

LEGEND

F. O. — NEW FIBER OPTIC COMMUNICATIONS CABLE

TWIST. PR. — NEW TWISTED PAIR COMMUNICATIONS CABLE

EXIST. — EXISTING COMMUNICATIONS CABLE

REM. — EXISTING COMMUNICATIONS CABLE TO BE REMOVED

NEW AERIAL GUY ASSEMBLY

NEW CONDUIT

EXISTING CONDUIT

D D — NEW DIRECTIONAL DRILLED CONDUIT

B & J — NEW BORED AND JACKED CONDUIT

NEW JUNCTION BOX

EXISTING JUNCTION BOX

NEW WOOD POLE

EXISTING WOOD POLE

S — NEW AERIAL SPLICE ENCLOSURE

NEW METAL POLE

EXISTING METAL POLE

NEW CCTV CAMERA ASSEMBLY

NEW STANDARD GUY ASSEMBLY

NEW SIDEWALK GUY ASSEMBLY

NEW CABLE STORAGE RACKS (SNOW SHOES)

EXISTING CONTROLLER AND CABINET

S — EXISTING SPLICE CABINET

S — NEW SPLICE CABINET

SP — SIGNAL POLE

XX-XXXX — SIGNAL INVENTORY NUMBER

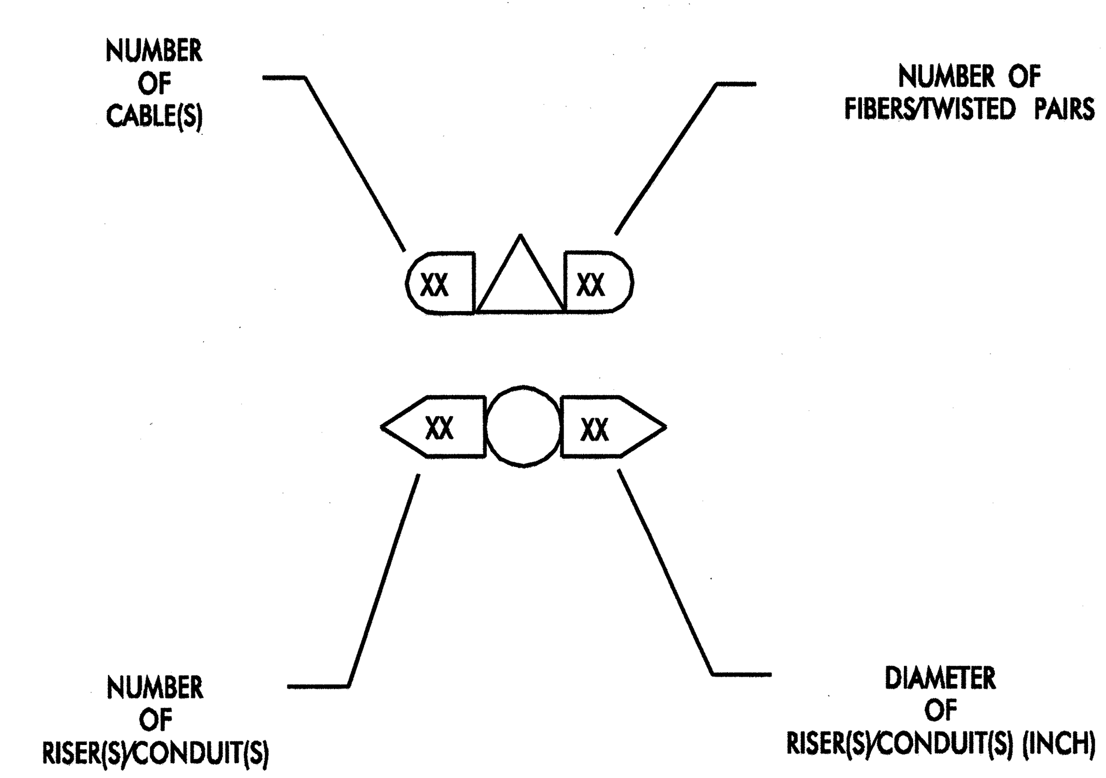
CONSTRUCTION NOTE SYMBOLOGY KEY

XX — INDICATES NUMBER OF CABLES, LOOPS, ETC.

XX — INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.

XX — INDICATES NUMBER OF RISER(S)/CONDUIT(S)

XX — INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch
State of North Carolina Department of Transportation
Traffic Management Systems
750 Greenfield Pkwy., Garner, NC 27529

CONSTRUCTION NOTES

SR 1100 (Brawley School Rd)

Division 12	Iredell County	Mooresville	
PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	J.M. Bryan	RKA PROJ. No.:	08034 (040)

SCALE	REVISIONS	INIT.	DATE
NONE			

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY

4-28-2008

SIGNATURE DATE

CADD File Name R3833Acable.dgn

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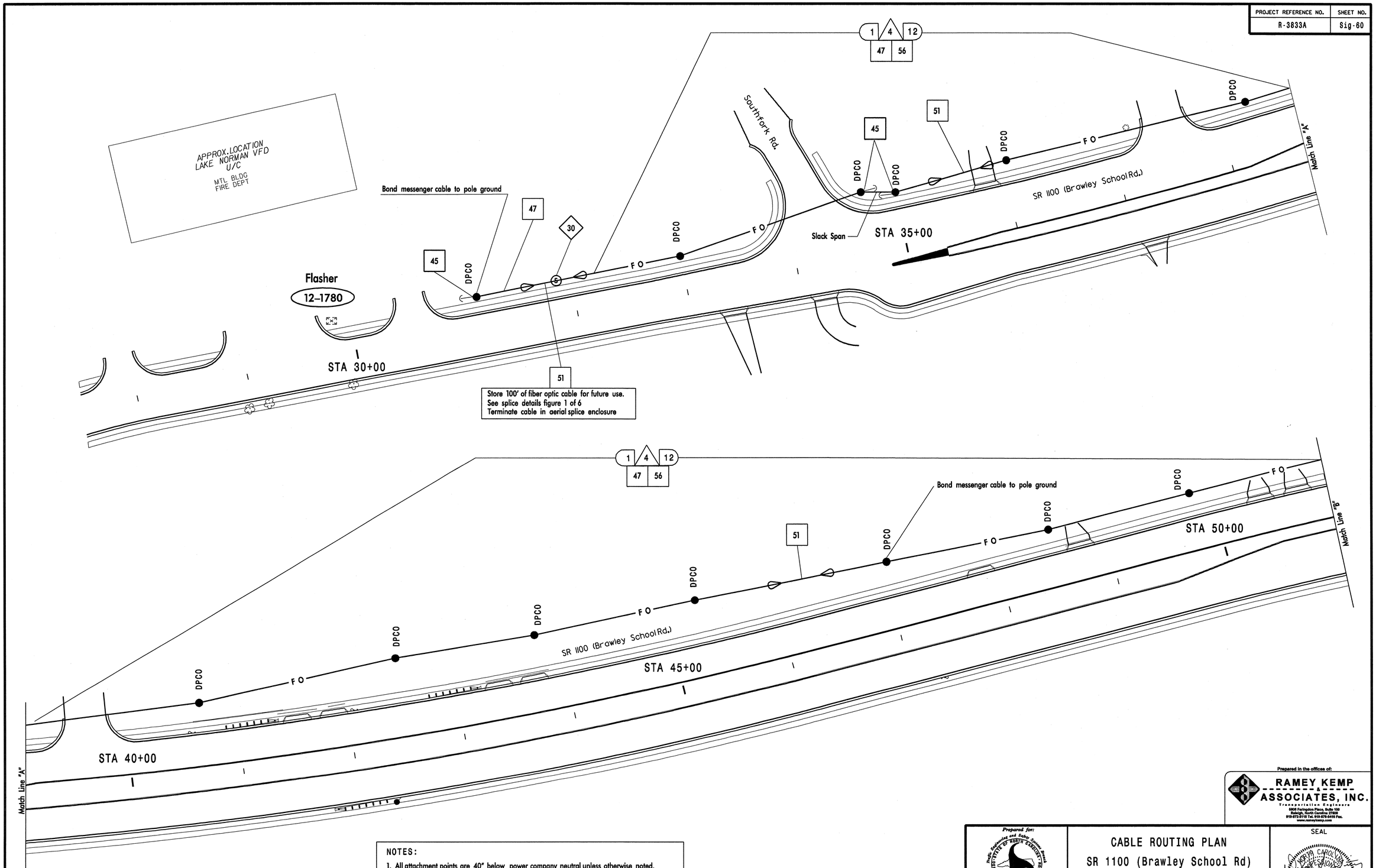
PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-60



NOTES:

1. All attachment points are 40" below power company neutral unless otherwise noted.
2. At the direction of the Engineer, in TCP-Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP-Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.

Prepared in the offices of:

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5808 Farlington Place, Suite 100
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919-872-5115 Tel. 919-872-5416 Fax.
www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Traffic Management Systems
750 Greenfield Pkwy., Garner, NC 27529

CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	J.M. Bryan	RKA PROJ. No.:	08034 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

CADD File Name R3833Acable.dgn

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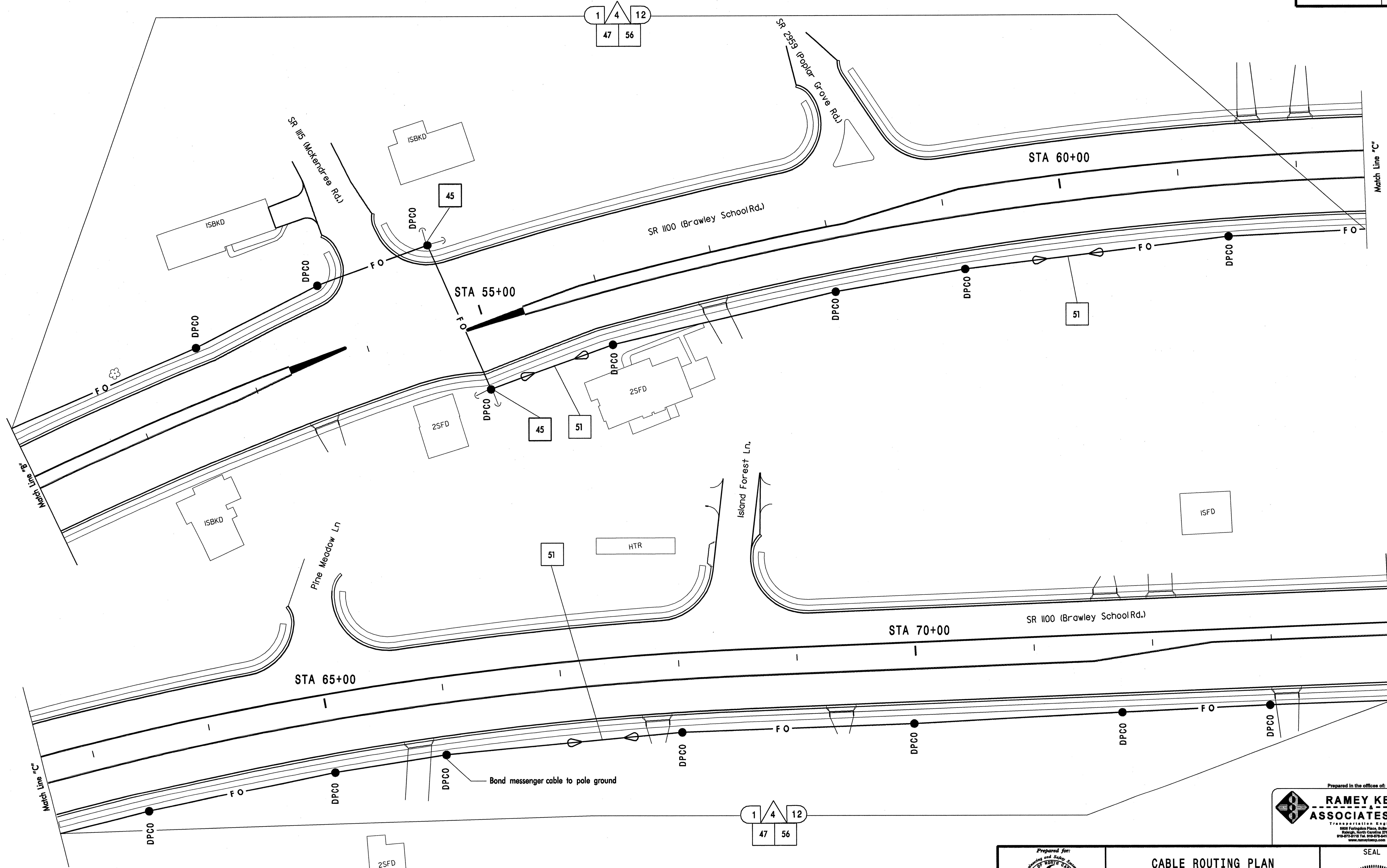
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-61



NOTES:

1. All attachment points are 40" below power company neutral unless otherwise noted.
2. At the direction of the Engineer, in TCP–Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP–Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.

Prepared in the offices of:

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Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch
State of North Carolina Department of Transportation
Traffic Management Systems
750 Greenfield Pkwy., Garner, NC 27529

SCALE 0 40 1"=40'

CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

PLAN DATE: Apr 2008	REVIEWED BY: D.J. Darity
PREPARED BY: J.M. Bryan	RKA PROJ. No.: 08034 (040)

REVISIONS	INIT.	DATE

SEAL
North Carolina Professional Engineer Seal 19713 Donald J. Darity
4-28-2008
SIGNATURE DATE

CADD File Name R3833Acable.dgn

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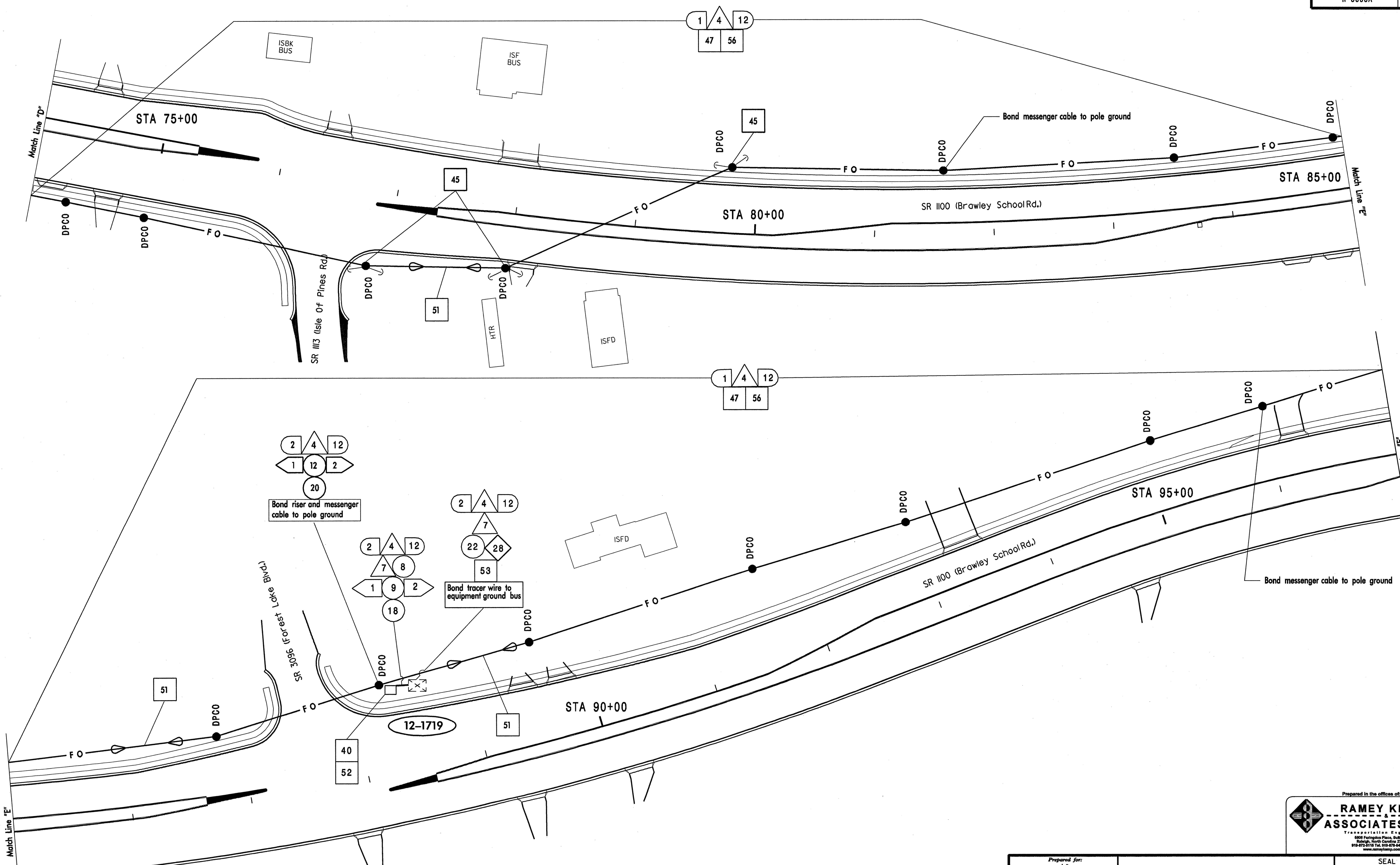
PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-62



NOTES:

1. All attachment points are 40" below power company neutral unless otherwise noted.
2. At the direction of the Engineer, in TCP-Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP-Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.
3. Seal all conduit entrances into junction boxes with mechanical sealing devices.

Prepared in the offices of:

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5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Prepared for:
Traffic Engineering and Safety Systems Branch, State of North Carolina Department of Transportation, Traffic Management Systems
750 Greenfield Pkwy., Garner, NC 27529

SCALE 0 40 1"=40'

CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

PLAN DATE: Apr 2008	REVIEWED BY: D.J. Darity
PREPARED BY: J.M. Bryan	RKA PROJ. No.: 08034 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008

SIGNATURE DATE

CADD File Name R3833Acable.dgn

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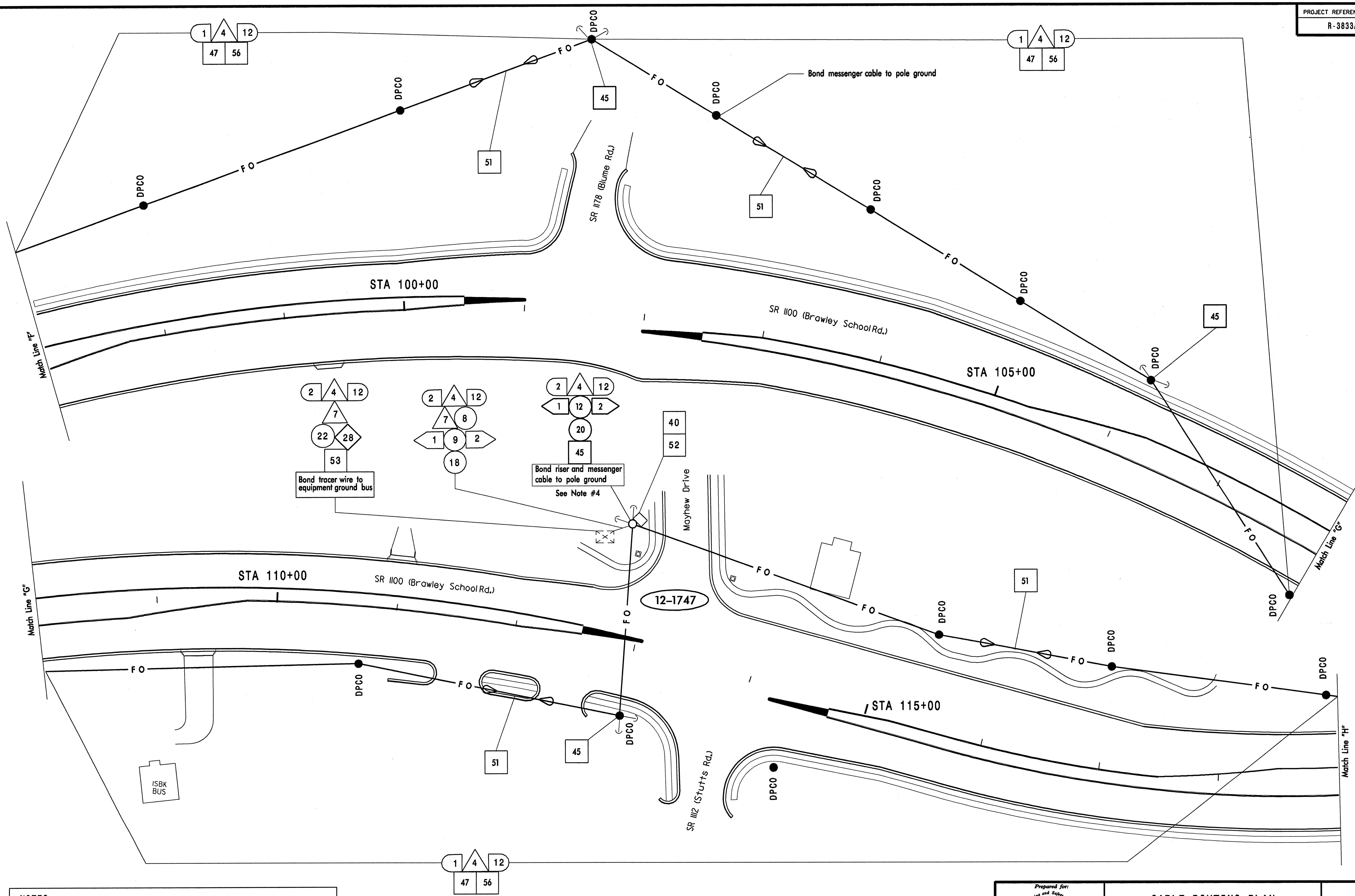


NOTES:

1. All attachment points are 40" below power company neutral unless otherwise noted.
2. At the direction of the Engineer, in TCP–Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP–Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.
3. Seal all conduit entrances into junction boxes with mechanical sealing devices.
4. Install 50 ft. wood pole for clearance above future metal poles.

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-5416 Fax.
www.rameykemp.com

Prepared for:

Traffic Engineering and Safety Systems Branch
State of North Carolina Department of Transportation
Traffic Management Systems
750 Greenfield Pkwy., Garner, NC 27529

SCALE 0 40
1"=40'

CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

PLAN DATE: June 2008	REVIEWED BY: D.J. Darity
PREPARED BY: J.M. Bryan	RKA PROJ. No.: 08034 (241)

REVISIONS	INIT.	DATE

SEAL

North Carolina Professional Seal 19713 Engineer Donald J. Darity

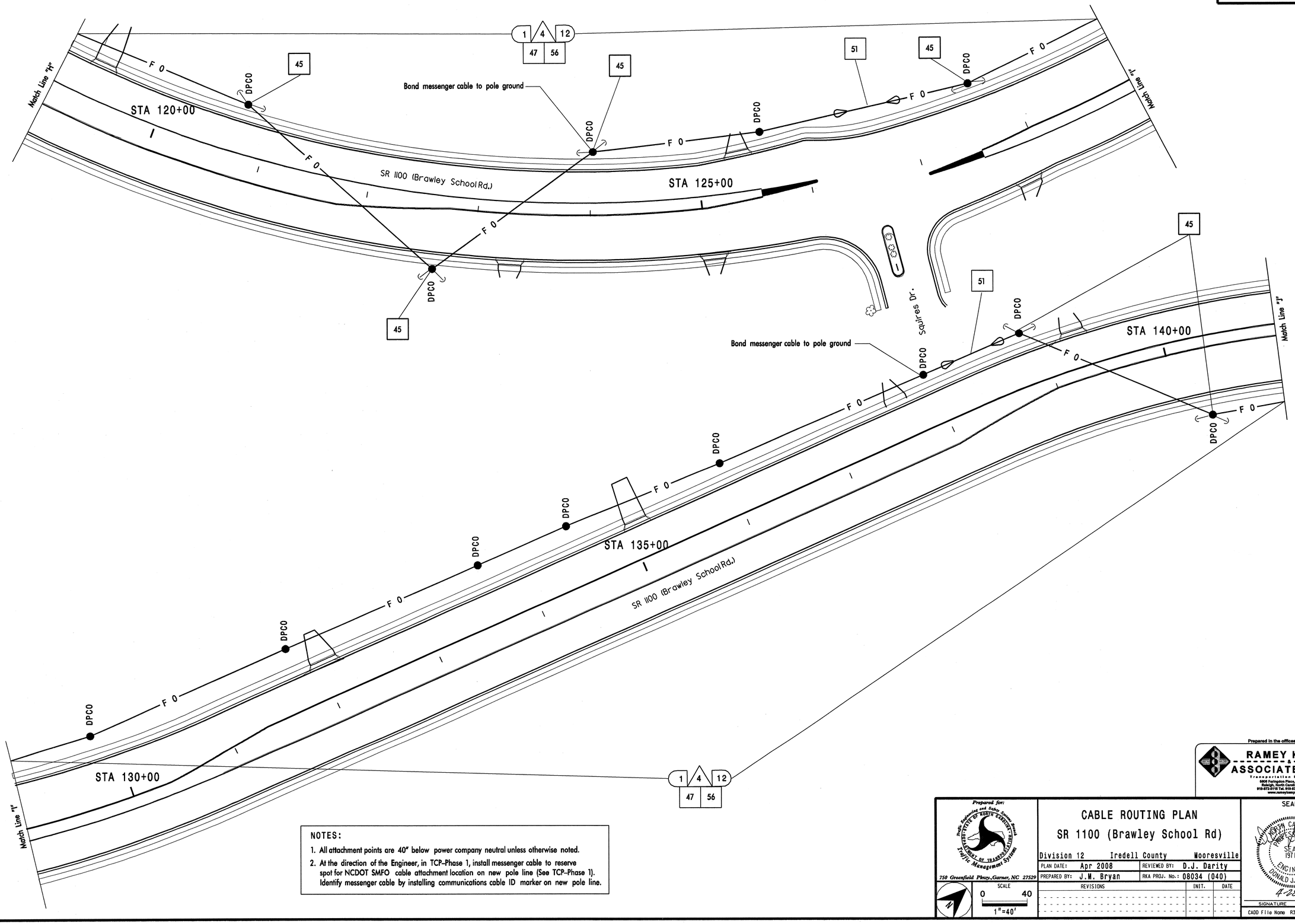
7-8-2008

SIGNATURE DATE

CADD File Name R3833Acable.dgn

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-64



NOTES:

1. All attachment points are 40" below power company neutral unless otherwise noted.
2. At the direction of the Engineer, in TCP-Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP-Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.

Prepared in the offices of:

RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel. 919-878-8498 Fax.
www.rameykemp.com

Prepared for:
Traffic Management Systems
750 Greenfield Pkwy., Garner, NC 27529

CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	J.M. Bryan	RKA PROJ. No.:	08034 (040)

REVISIONS	INIT.	DATE

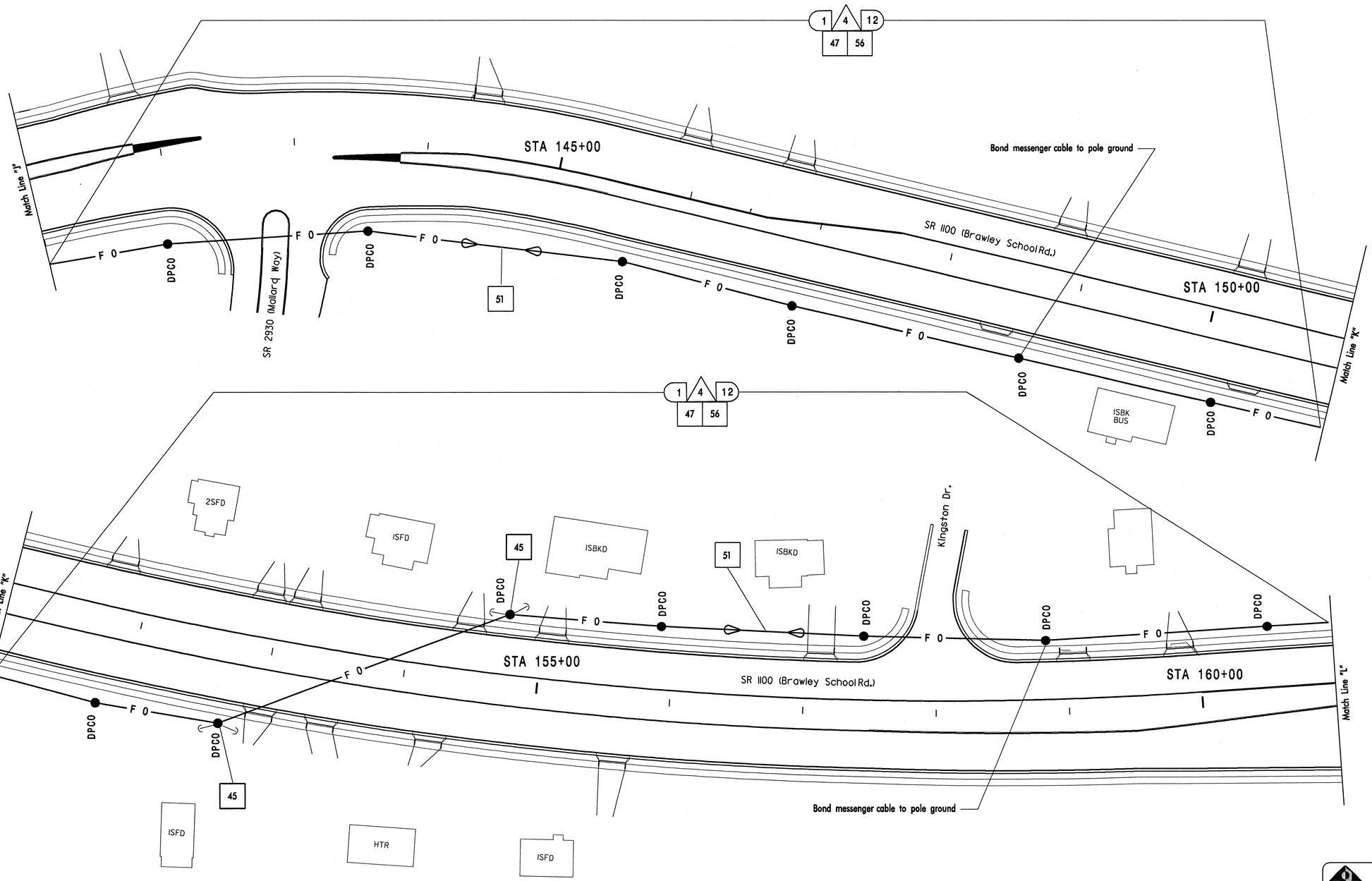
SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 DONALD J. DARITY
4-29-2008
SIGNATURE DATE

CADD File Name R3833Acable.dgn

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-65



NOTES:

1. All attachment points are 40" below power company neutral unless otherwise noted.
2. At the direction of the Engineer, in TCP-Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP-Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.

Prepared in the offices of:

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Prepared for:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Traffic Management Systems
750 Greenfield Pkwy, Garner, NC 27529

CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	J.M. Bryan	RKA PROJ. No.:	08034 (040)

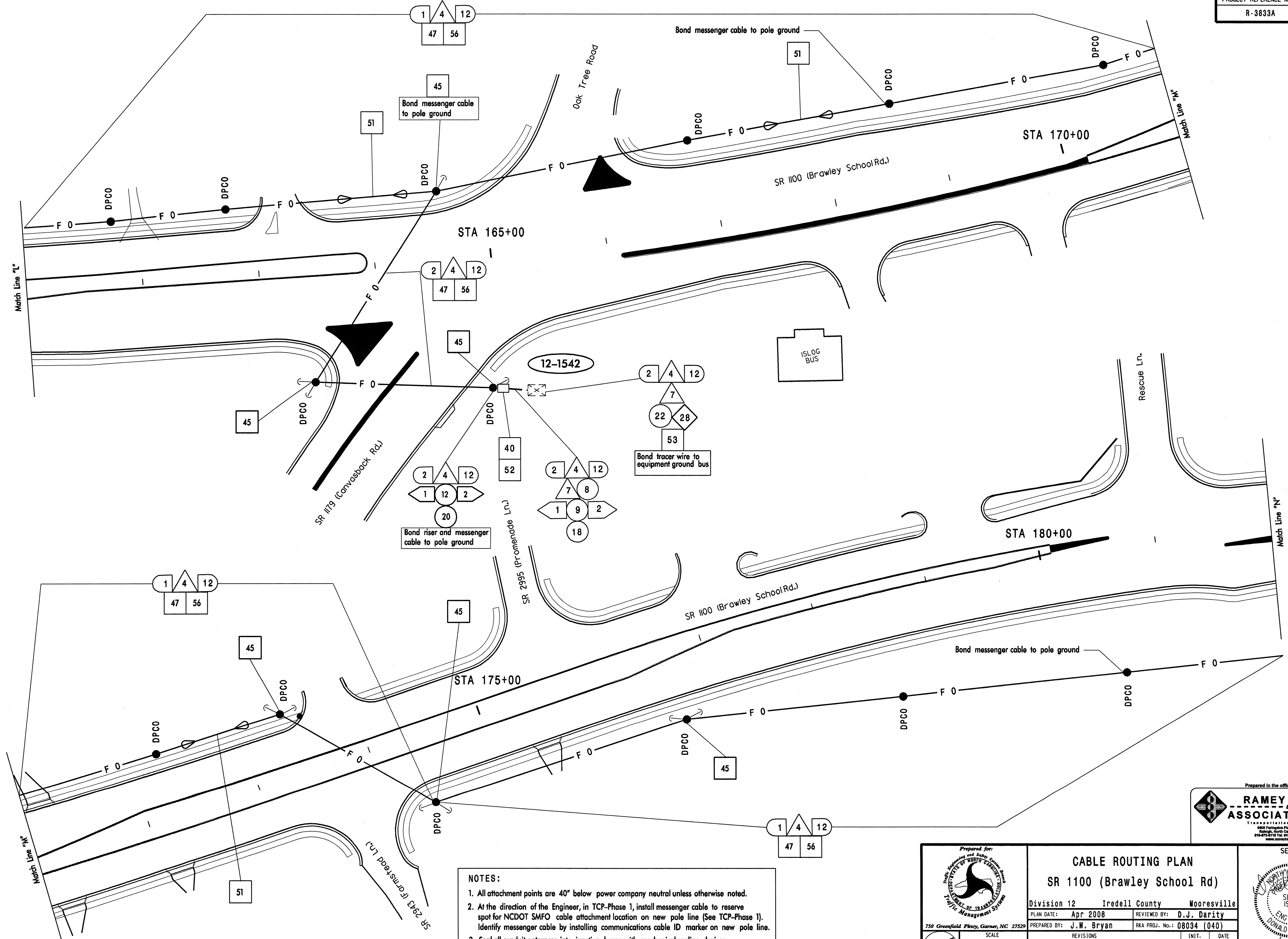
SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE
CADD File Name R3833Acable.dgn

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

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-66



NOTES:

1. All attachment points are 40" below power company neutral unless otherwise noted.
2. At the direction of the Engineer, in TCP-Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP-Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.
3. Seal all conduit entrances into junction boxes with mechanical sealing devices.

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CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

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SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

CADD File Name R3833Acable.dgn

$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$
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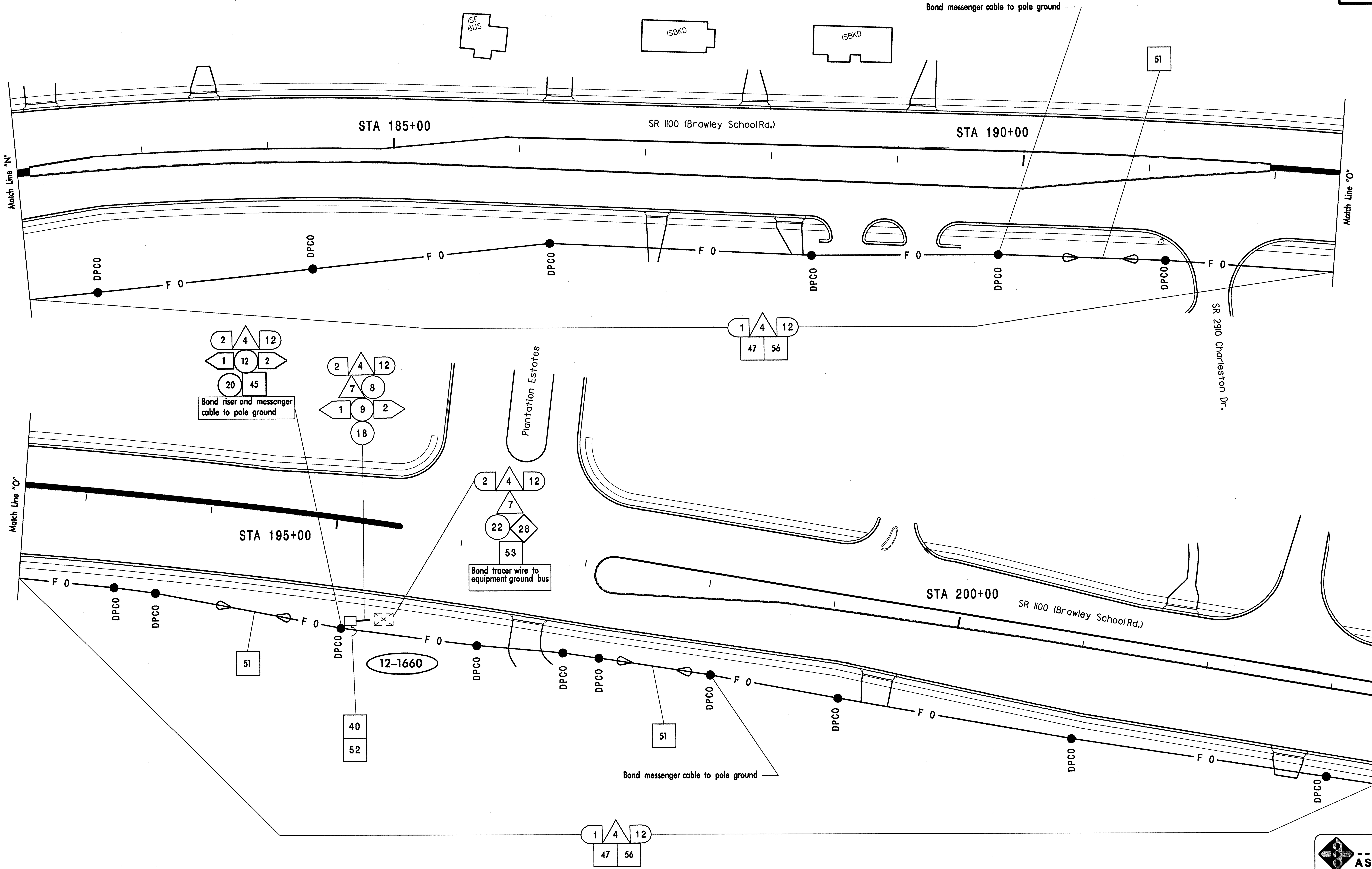
PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-67



NOTES:

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$$$$USERNAME$$$$

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CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 | Iredell County | Mooresville

PLAN DATE:	Apr 2008	REVIEWED BY:	D.J. Darity
PREPARED BY:	J.M. Bryan	RKA PROJ. No.:	08034 (040)

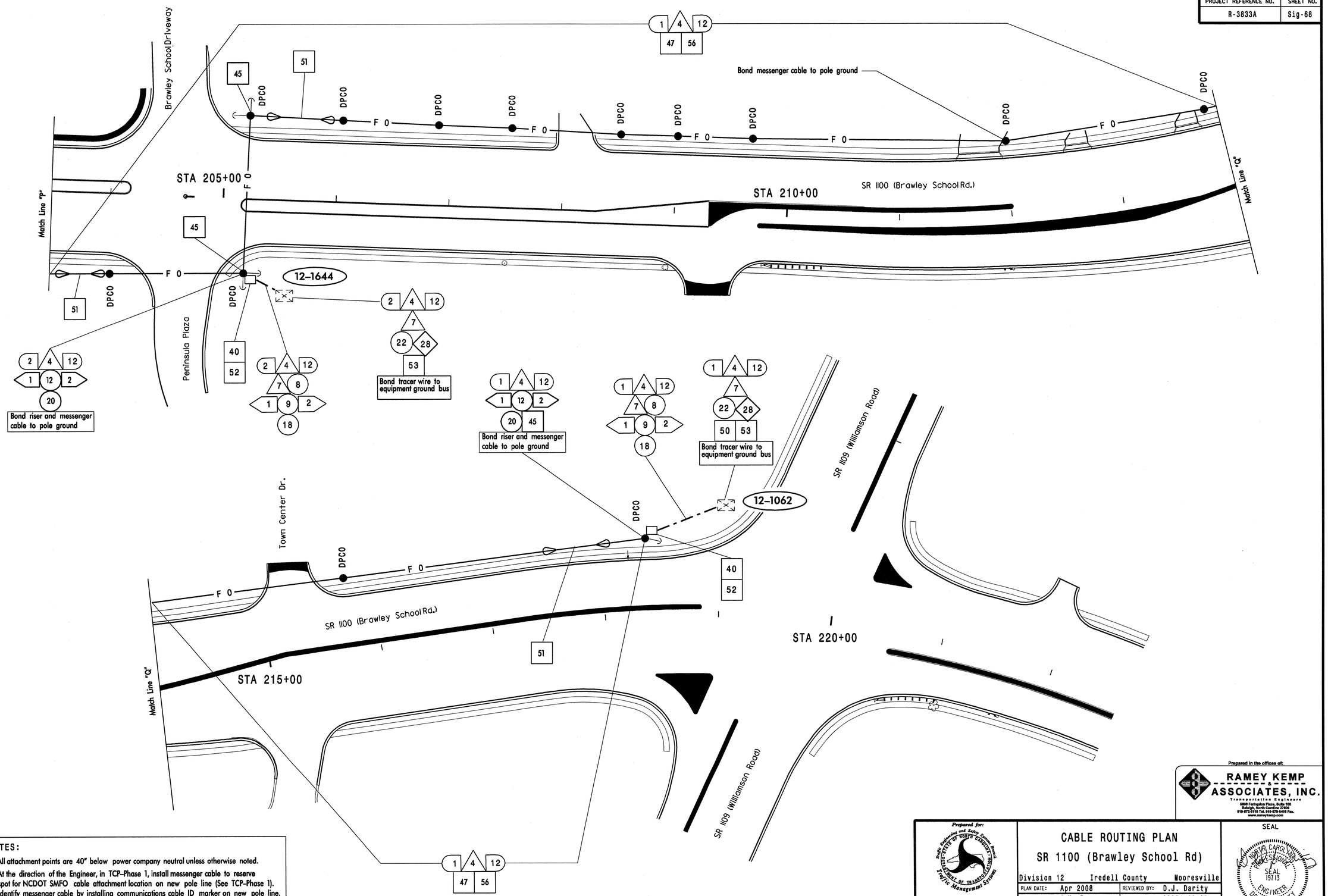
SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
North Carolina Professional Seal 19713 Engineer Donald J. Darity
4-28-2008
SIGNATURE DATE

CADD File Name R3833Acable.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-68



NOTES:

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2. At the direction of the Engineer, in TCP-Phase 1, install messenger cable to reserve spot for NCDOT SMFO cable attachment location on new pole line (See TCP-Phase 1). Identify messenger cable by installing communications cable ID marker on new pole line.
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CABLE ROUTING PLAN
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

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REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE DATE

CADD File Name R3833Acable.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-69

SR 1100 (BRAWLEY SCHOOL ROAD)
AT
LAKE NORMAN VFD
SIG. INV. # 12-1780

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

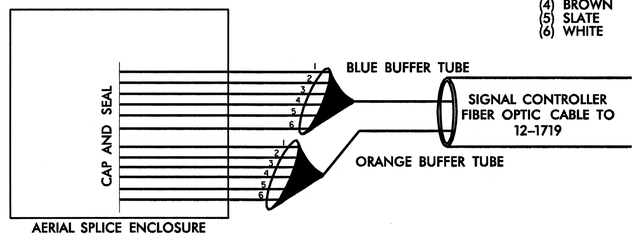

FIGURE 1 OF 7

SR 1100 (BRAWLEY SCHOOL ROAD)
AT
SR 3096 (FOREST LAKE BLVD.)
SIG. INV. # 12-1719

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

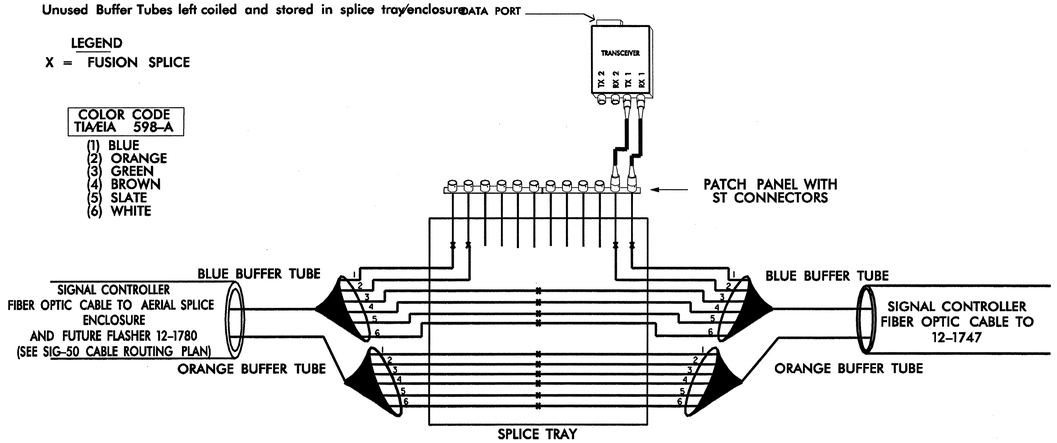

FIGURE 2 OF 7

SR 1100 (BRAWLEY SCHOOL ROAD)
AT
SR 1112 (STUTTS ROAD)
SIG. INV. # 12-1747

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

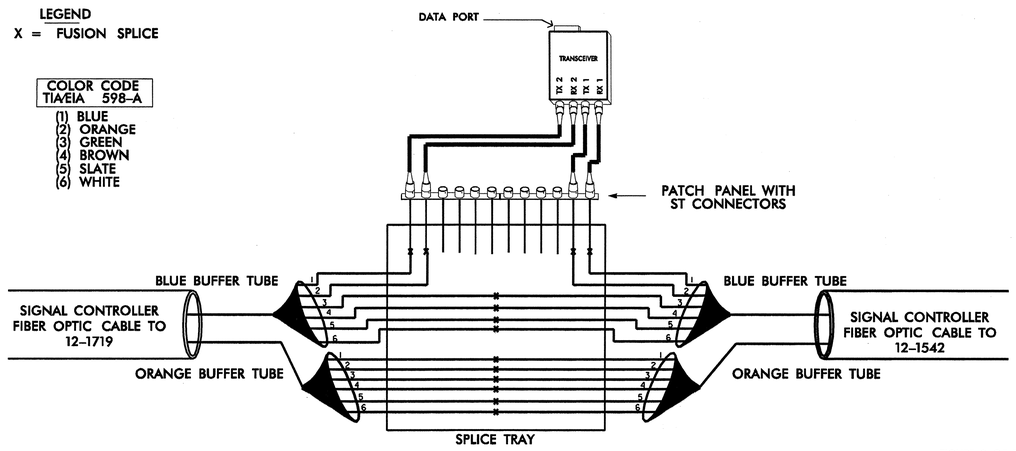

FIGURE 3 OF 7

NOTE 1. CONTRACTOR FURNISH DROP AND REPEAT TYPE TRANSCEIVER.

NOTE 2. TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING PROPER TERMINATIONS.

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750 Greenfield Pkwy, Garner, NC 27529

SPLICE DETAILS
SR 1100 (Brawley School Rd)

Division 12	Iredell County	Mooresville
PLAN DATE: Apr 2008	REVIEWED BY: D.J. Darity	
PREPARED BY: J.M. Bryan	RKA PROJ. No.: 08034 (040)	

SCALE	REVISIONS	INIT.	DATE
NONE			

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NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
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$$$$SYSTIME$$$$
$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-3833A	Sig-70

SR 1100 (BRAWLEY SCHOOL ROAD)
AT
SR 1179 (CANVASBACK RD./OAK TREE RD.)
SIG. INV. # 12–1542

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

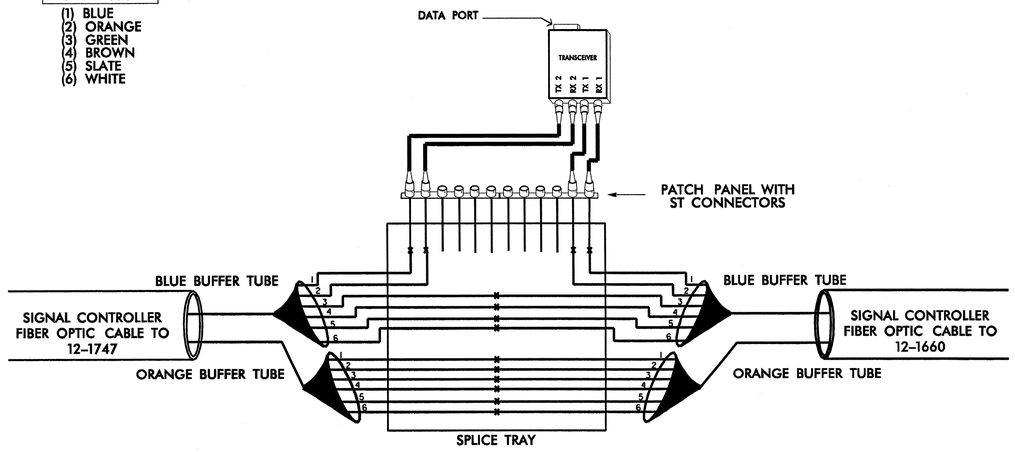

FIGURE 4 OF 7

SR 1100 (BRAWLEY SCHOOL ROAD)
AT
MORRISON PLANTATION PKWY
SIG. INV. # 12–1660

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

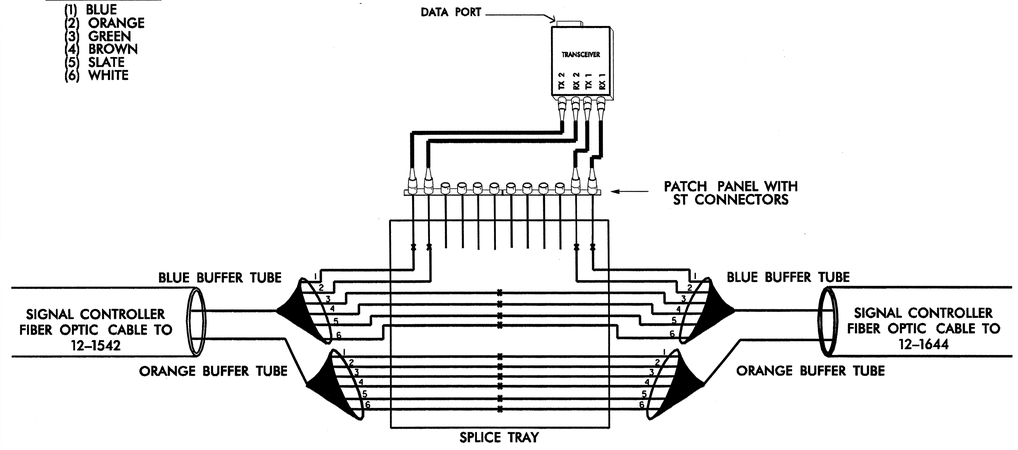

FIGURE 5 OF 7

NOTE 1. CONTRACTOR FURNISH DROP AND REPEAT TYPE TRANSCEIVER.

NOTE 2. TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING PROPER TERMINATIONS.

$$$$$$$$SETTINGS$$$$
$$$$$$$$USERNAME$$$$
$$$$USERNAME$$$$

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SPLICE DETAILS

SR 1100 (Brawley School Rd)

Division 12 | Iredell County | Mooresville

PLAN DATE: Apr 2008 | REVIEWED BY: D.J. Darity

PREPARED BY: J.W. Bryan | RKA PROJ. No.: 08034 (040)

SCALE: NONE

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
SIGNATURE | DATE

CADD File Name R3833Acable.dgn

SR 1100 (BRAWLEY SCHOOL ROAD)
AT
BRAWLEY SCHOOL DR/PENINSULA PLAZA
SIG. INV. # 12-1644

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

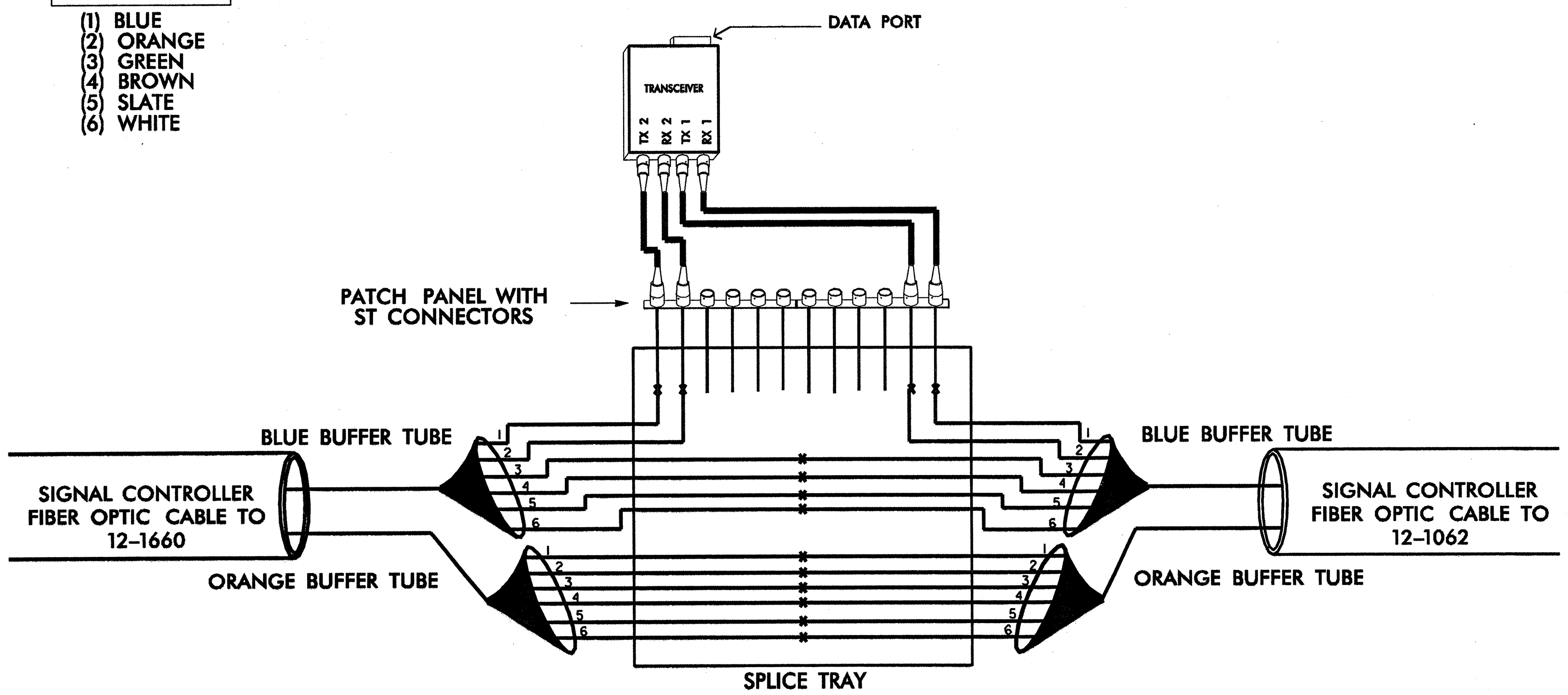

FIGURE 6 OF 7

SR 1100 (BRAWLEY SCHOOL ROAD)
AT
SR 1109 (WILLIAMSON ROAD)
SIG. INV. # 12-1062 (MASTER)

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

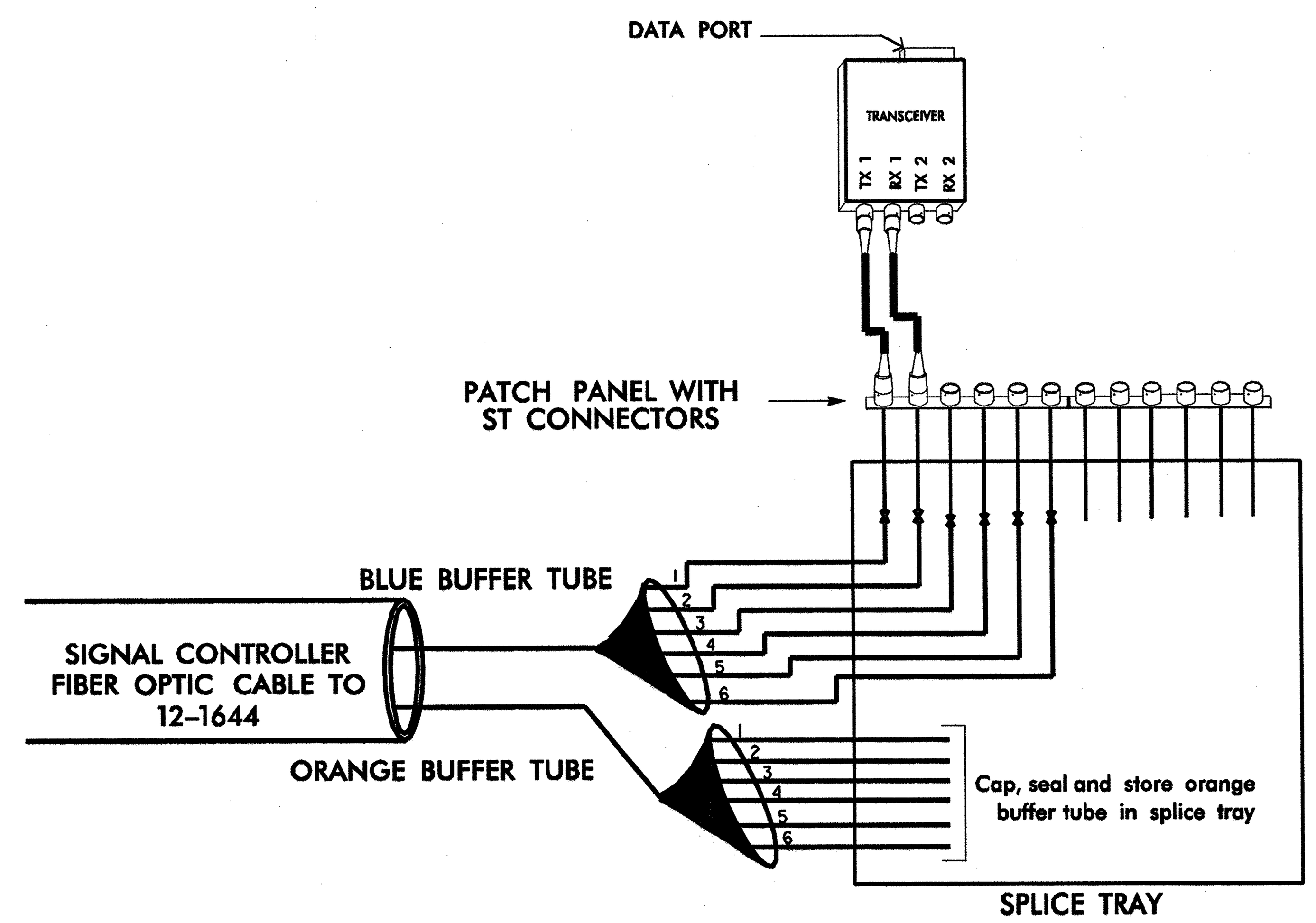

FIGURE 7 OF 7

NOTE 1. CONTRACTOR FURNISH DROP AND REPEAT TYPE TRANSCEIVER.

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SPLICE DETAILS
SR 1100 (Brawley School Rd)

Division 12 Iredell County Mooresville

PLAN DATE: Apr 2008	REVIEWED BY: D.J. Darity
PREPARED BY: J.M. Bryan	RKA PROJ. No.: 08034 (040)

SCALE: NONE

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
4-28-2008
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