Project: B-3830

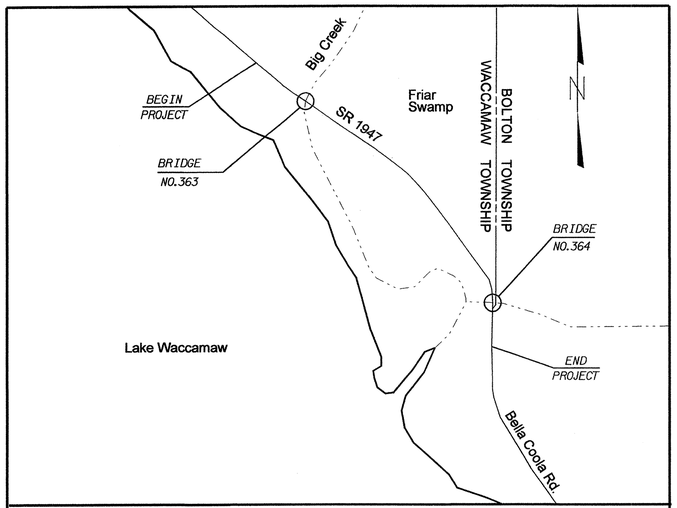
Project No.	Sheet No.
B-3830	Sig. 1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

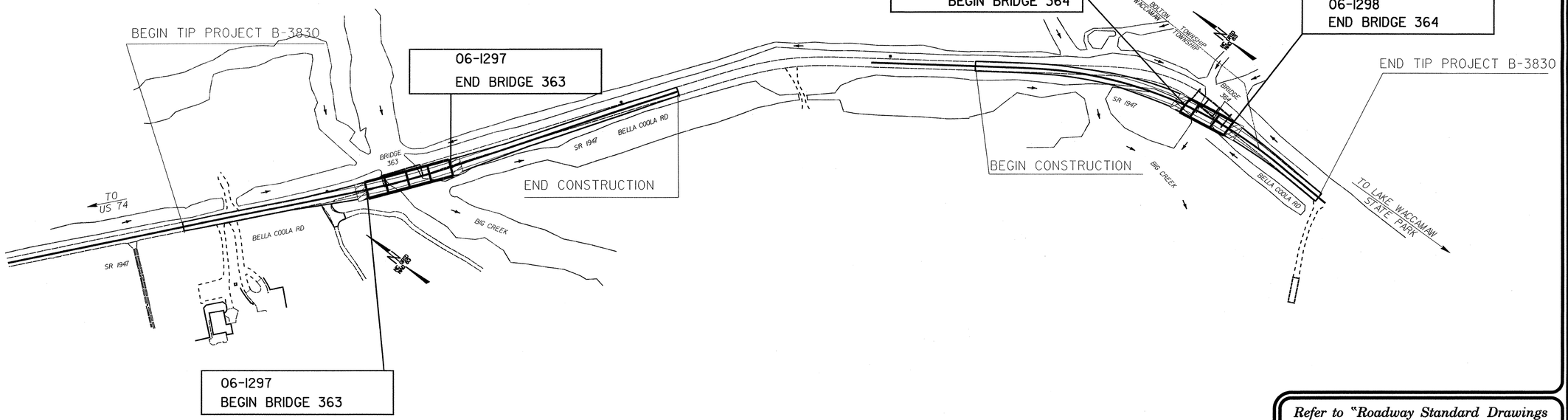
COLUMBUS COUNTY

LOCATION: BRIDGE NO. 363 AND NO. 364 OVER BIG CREEK AND FRIAR SWAMP ON SR 1947 (BELLA COOLA RD)

TYPE OF WORK: TEMPORARY TRAFFIC SIGNALS



VICINITY MAP



Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.

Index of Plans

Sheet #	*Reference #*	*Location/Description*
Sig. 1		*Title Sheet*
Sig. 2–4	*06–1297*	*Bridge No. 363 on SR 1947 (Bella Coola Road)*
Sig. 5–7	*06–1298*	*Bridge No. 364 on SR 1947 (Bella Coola Road)*
Sig. 8–10	*N/A*	*Inductive Detection Loops Details*

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
Contacts:

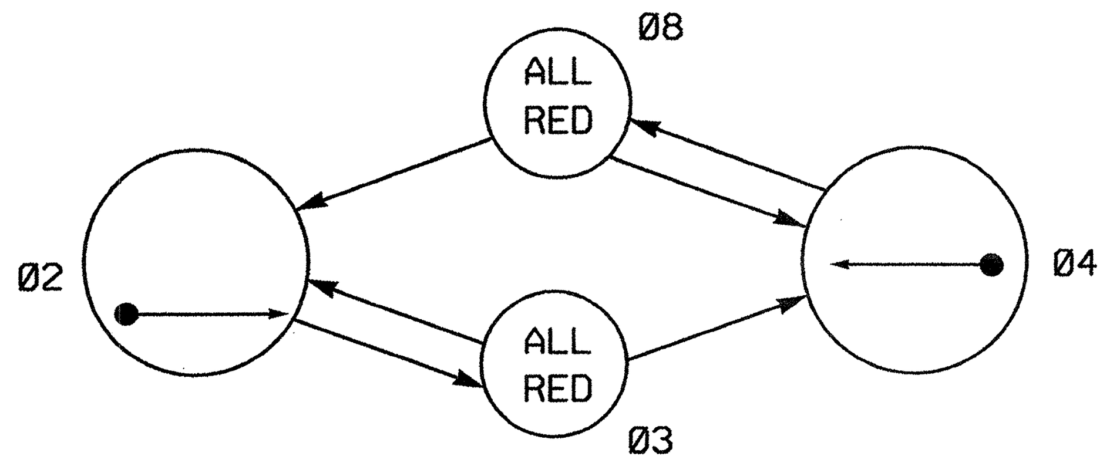
Timothy J. Williams, PE – Signals & Geometrics Contracts Engineer
John T. Rowe Jr., PE – Signal Equipment Design Engineer

Prepared In the Office of:
DIVISION OF HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH
750 N. Greenfield Parkway, Garner, NC 27529

30-MAY-2008 13:25
S:\TTS Signals\workgroups\tip projects\B-3830\Signals\Design\TItlesheet\signalstitlesht.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 2

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2	Ø3	Ø4	Ø8	FLASH
21, 22	G	R	R	R	R
41, 42	R	R	G	R	R

SIGNAL FACE I.D.

Denotes L.E.D.

R Y G 12"

21, 22
41, 42

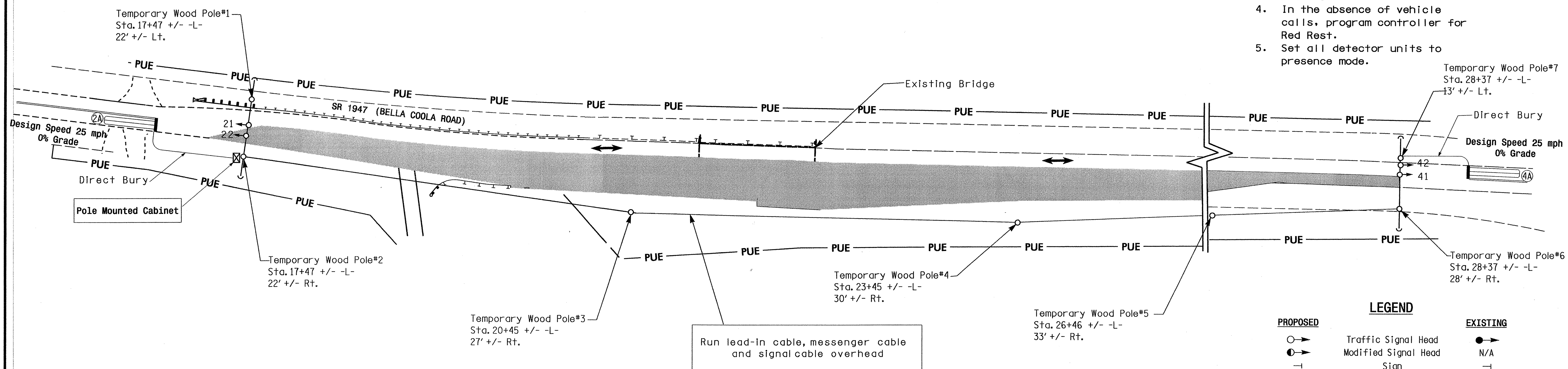
2070L LOOP & DETECTOR INSTALLATION

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	6X40	0	2-4-2	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y

2 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation.
3. Program controller to start-up in Phase 2 Red Clearance. Program "First Phases" as Phase 3.
4. In the absence of vehicle calls, program controller for Red Rest.
5. Set all detector units to presence mode.



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	
	Construction Zone	N/A

2070L TIMING CHART

FEATURE	PHASE 2	3 (All RED)	4	8 (All RED)
Min Green 1 *	10	5	10	5
Extension 1 *	3.0	-	3.0	-
Max Green 1 *	45	5	45	5
Yellow Clearance	3.2	3.0	3.2	3.0
Red Clearance	25.0	2.0	25.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	-	-	-
Vehicle Call Memory	-	-	-	-
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 4 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Temporary Signal 1 - TCP Phase I
(To Be Removed After Construction)

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch — State of North Carolina Department of Transportation — Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 0 40
1"=40'

SR 1947 (Bella Coola Road)
at
Bridge 363

Division 6 Columbus County Waccamaw

PLAN DATE:	April 2008	REVIEWED BY:	T. Thigpen
PREPARED BY:	C. Pierce	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24393 TIMOTHY W. WILLIAMS

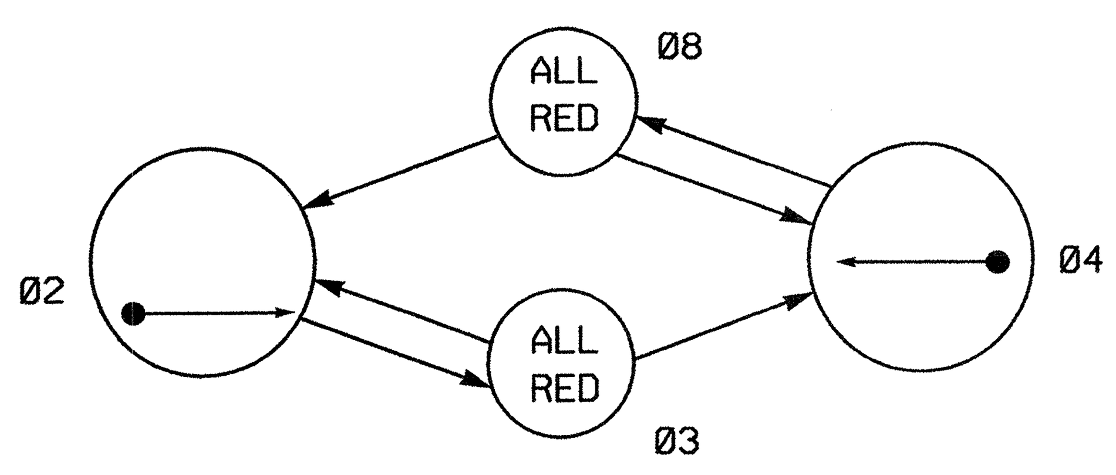
T. D. Willi[signature] 5/13/08
SIGNATURE DATE

SIG. INVENTORY NO. 06-1297 T1

12-MAY-2008 16:22
s:\its signals\workgroups\tip projects\B-3830\signals\designs\signals\06-xxxx\06-xxxt1_sig_dsn_2008mod.dgn
cpierce

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 3

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

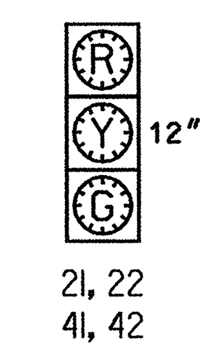
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2	Ø3	Ø4	Ø8	FLASH
21, 22	G	R	R	R	R
41, 42	R	R	G	R	R

SIGNAL FACE I.D.

Denotes L.E.D.



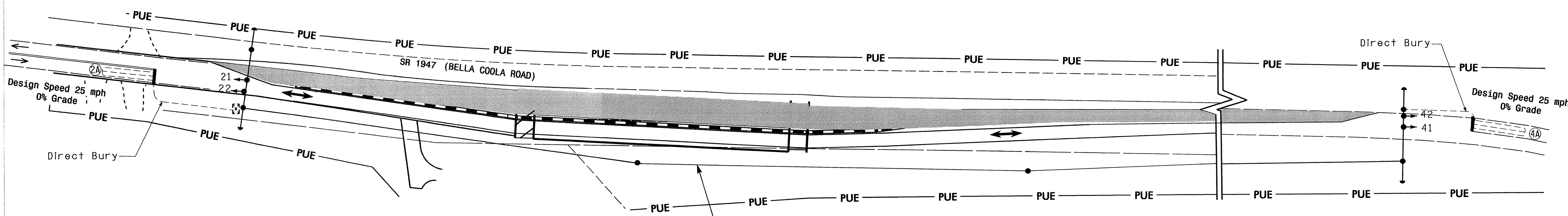
2070L LOOP & DETECTOR INSTALLATION

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	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-

2 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation.
3. Program controller to start-up in Phase 2 Red Clearance. Program "First Phases" as Phase 3.
4. In the absence of vehicle calls, program controller for Red Rest.
5. Set all detector units to presence mode.



Run lead-in cable, messenger cable and signal cable overhead

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	
	Construction Zone	N/A

2070L TIMING CHART

FEATURE	PHASE 2	3 (All RED)	4	8 (All RED)
Min Green 1 *	10	5	10	5
Extension 1 *	3.0	-	3.0	-
Max Green 1 *	45	5	45	5
Yellow Clearance	3.2	3.0	3.2	3.0
Red Clearance	25.0	2.0	25.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	-	-	-
Vehicle Call Memory	-	-	-	-
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 4 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Temporary Signal 2 - TCP Phase II
(To Be Removed After Construction)

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1947 (Bella Coola Road)
at
Bridge 363

Division 6 | Columbus County | Waccamaw

PLAN DATE:	April 2008	REVIEWED BY:	T. Thiggen
PREPARED BY:	C. Pierce	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24393 TIMOTHY A. WILLIAMS

SIGNATURE 5/13/08 DATE

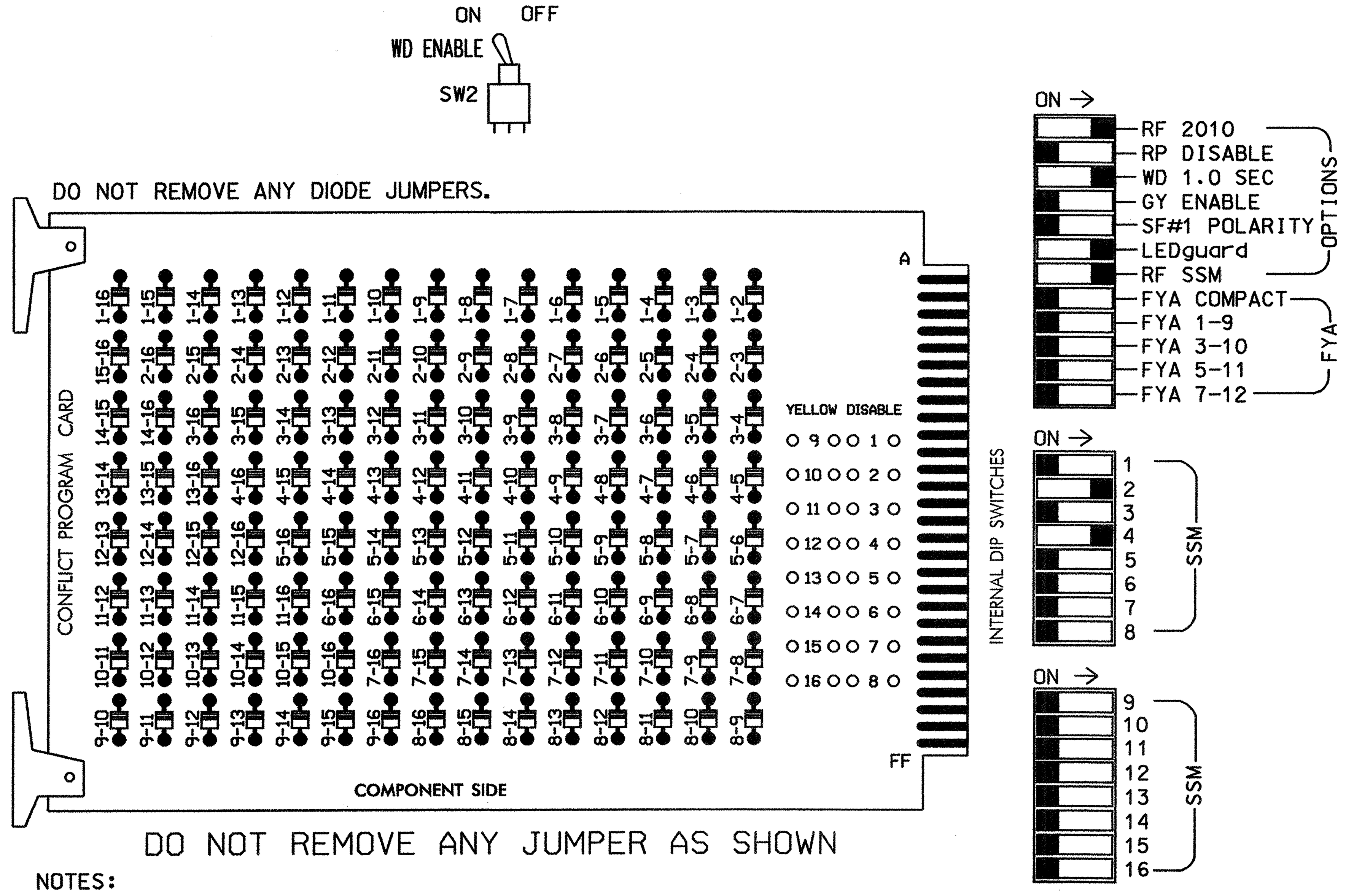
SIG. INVENTORY NO. 06-1297 T2

12-MAY-2008 16:24
s:#its signals#workgroups#tip projects#b-3830#signals#design#signals#06-xxx1#06-xxx1_sig_dsn_2008mmdd.dgn
cpierce

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig.4

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



DO NOT REMOVE ANY JUMPER 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 1,3,5,6, 7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phase 2, on the controller unit, for Start Up Red Clearance.
4. Program phase 3, on the controller unit, as First Phase.
5. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
6. Program phases 3 and 8, on the controller unit, for Red Rest.

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 336
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S2,S4
PHASES USED.............2,*3,4,*8
OVERLAPS................NONE

*Dummy phases used for timing purposes only.

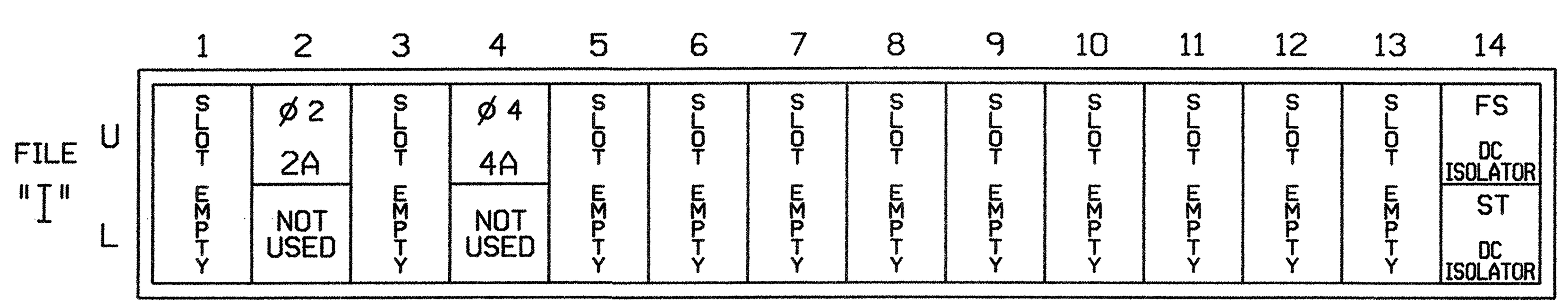
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



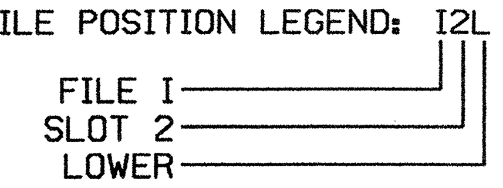
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB21-3,4	I2U	39	1	2	2	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			

INPUT FILE POSITION LEGEND: I2L



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 and 2.
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     ¦
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     ¦
CALL PHASES     ¦       X
```

BACKUP PROTECTION PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1297 T
DESIGNED: April 2008
SEALED: 05-13-08
REVISED: N/A

Temporary Signal 1 and 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1947 (Bella Coola Road)
at
Bridge 363

Division 6 | Columbus County | Waccamaw

PLAN DATE: April 2008 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS | INIT. | DATE

Prepared in the Offices of: Signals Management Section, Traffic Engineering and Safety Systems Branch, North Carolina Department of Transportation
122 N. McDowell St., Raleigh, NC 27603

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 5-14-08 DATE

SIG. INVENTORY NO. 06-1297 T

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 5

PHASING DIAGRAM

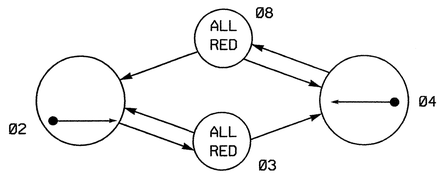


TABLE OF OPERATION					
SIGNAL FACE	PHASE Ø2	Ø3	Ø4	Ø8	FLASH
21, 22	G	R	R	R	R
41, 42	R	R	G	R	R

SIGNAL FACE I.D.

Denotes L.E.D.

21, 22
41, 42

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	6X40	0	2-4-2	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y

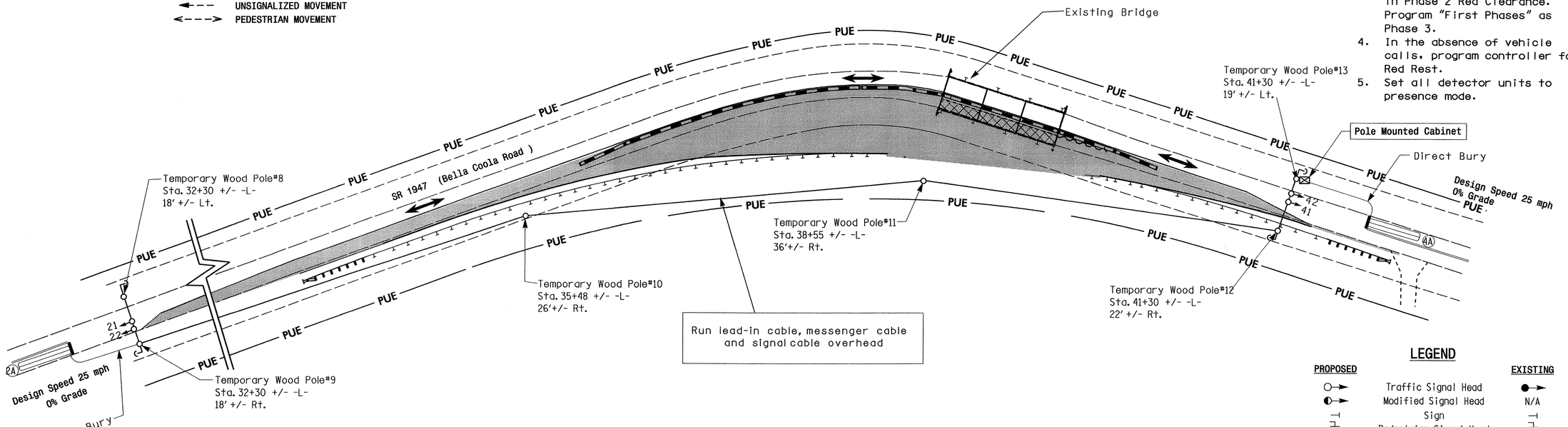
2 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation.
3. Program controller to start-up in Phase 2 Red Clearance. Program "First Phases" as Phase 3.
4. In the absence of vehicle calls, program controller for Red Rest.
5. Set all detector units to presence mode.

PHASING DIAGRAM DETECTION LEGEND

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



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	
	Construction Zone	N/A

2070L TIMING CHART

FEATURE	PHASE 2	3 (All RED)	4	8 (All RED)
Min Green 1 *	10	5	10	5
Extension 1 *	3.0	-	3.0	-
Max Green 1 *	45	5	45	5
Yellow Clearance	3.2	3.0	3.2	3.0
Red Clearance	25.0	2.0	25.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	-	-	-
Vehicle Call Memory	-	-	-	-
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 4 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Temporary Signal 1 - TCP Phase I
(To Be Removed After Construction)

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
DIVISION OF HIGHWAYS
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1947 (Bella Coola Road)
at
Bridge 364

Division 6 Columbus County Waccamaw
PLAN DATE: April 2008 REVIEWED BY: T. Thigpen
PREPARED BY: C. Pierce REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 24393 ENGINEER TIMOTHY A. WILLIAMS
SIGNATURE 5/13/08 DATE
SIG. INVENTORY NO. 06-1298 T1

12-MAY-2008 14:21
s:\ts signals\workgroups\ttip projects\b-3830\signals\designs\signals\06-xxx1\06-xxx12_sig_dsn_2008mmdd.dgn
osterle

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 6

PHASING DIAGRAM

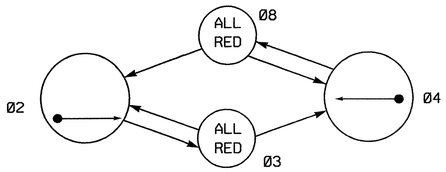


TABLE OF OPERATION					
SIGNAL FACE	PHASE Ø2	Ø3	Ø4	Ø8	FLASH
21, 22	G	R	R	R	R
41, 42	R	R	G	R	R

SIGNAL FACE I.D.

Denotes L.E.D.

21, 22
41, 42

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	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-

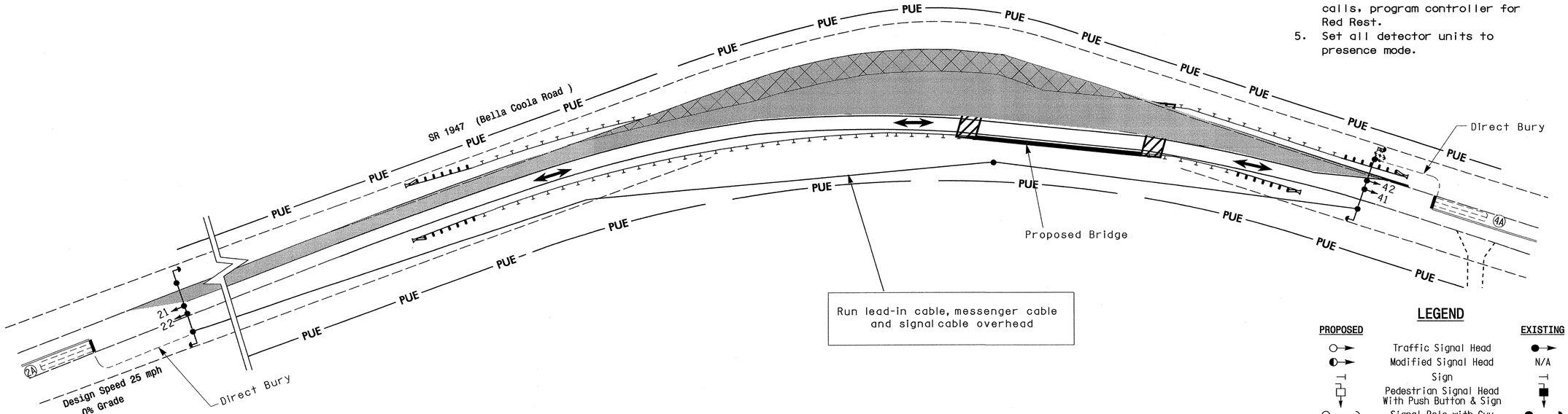
2 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation.
3. Program controller to start-up in Phase 2 Red Clearance. Program "First Phases" as Phase 3.
4. In the absence of vehicle calls, program controller for Red Rest.
5. Set all detector units to presence mode.

PHASING DIAGRAM DETECTION LEGEND

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



Run lead-in cable, messenger cable and signal cable overhead

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	
	Construction Zone	N/A

2070L TIMING CHART				
FEATURE	PHASE 2	3 (All RED)	4	8 (All RED)
Min Green 1 *	10	5	10	5
Extension 1 *	3.0	-	3.0	-
Max Green 1 *	45	5	45	5
Yellow Clearance	3.2	3.0	3.2	3.0
Red Clearance	25.0	2.0	25.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	-	-	-
Vehicle Call Memory	-	-	-	-
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 4 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Temporary Signal 2 - TCP Phase II
(To Be Removed After Construction)

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1947 (Bella Coola Road)
at
Bridge 364

Division 6 Columbus County Waccamaw

PLAN DATE:	April 2008	REVIEWED BY:	T. Thigpen
PREPARED BY:	C. Pierce	REVIEWED BY:	

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 24393 ENGINEER TIMOTHY A. WILLIAMS
SIGNATURE 5/13/08 DATE

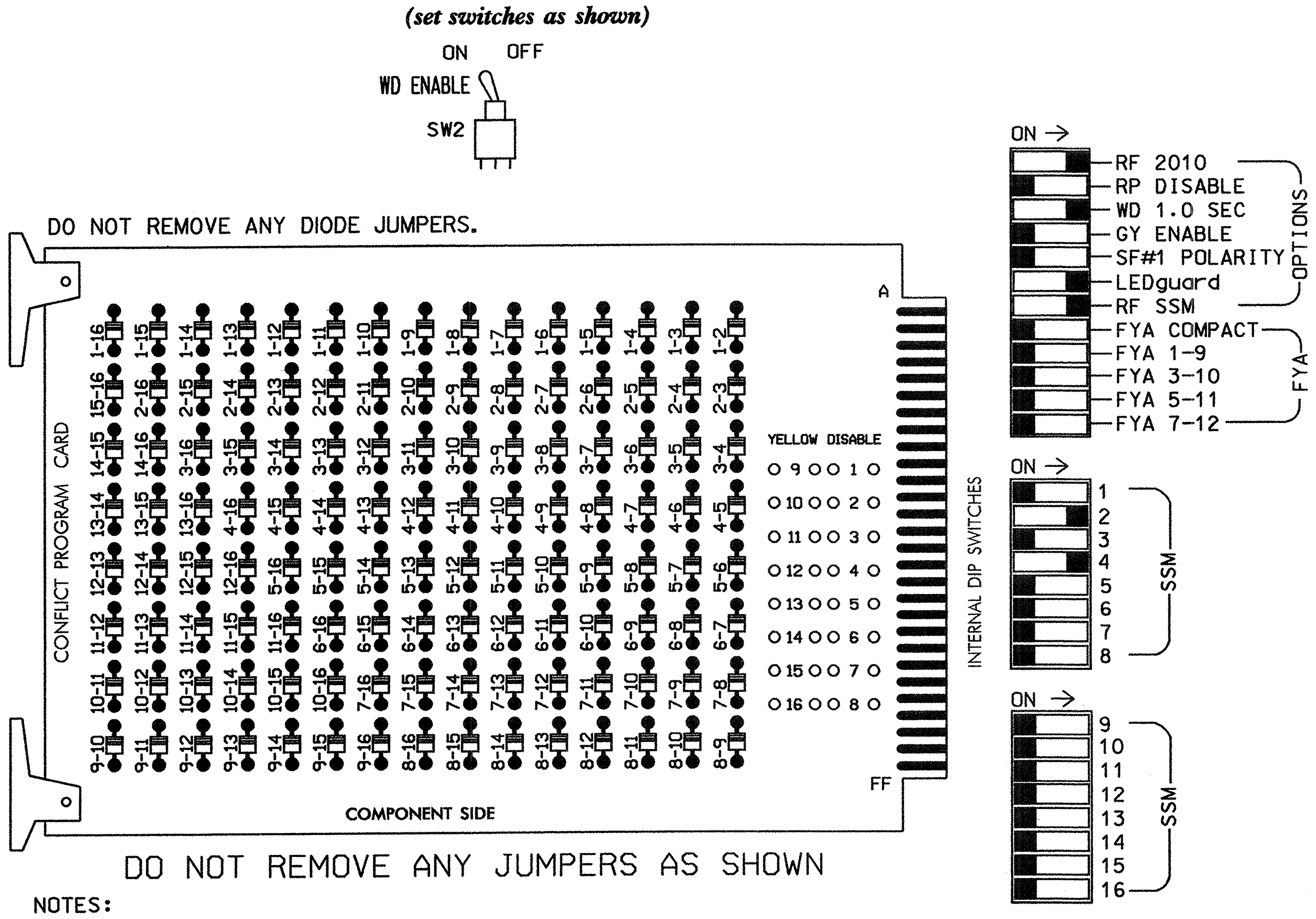
SIG. INVENTORY NO. 06-1298 T2

13-MAY-2008 08:42
s:\its signals\workgroups\tip projects\b-3830\signals\designs\signals#06-xxx1#06-xxxt2.sig_dsn_2008mdd.dgn
cepierce

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 7

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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

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 1,3,5,6, 7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phase 2, on the controller unit, for Start Up Red Clearance.
4. Program phase 3, on the controller unit, as First Phase.
5. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
6. Program phases 3 and 8, on the controller unit, for Red Rest.

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 336
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S2,S4
PHASES USED.............2,*3,4,*8
OVERLAPS................NONE

*Dummy phases used for timing purposes only.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

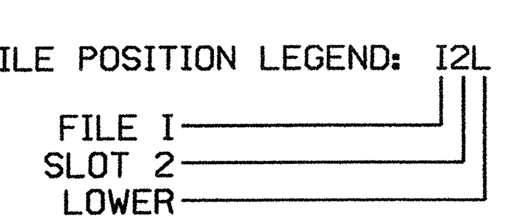
FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT EMPTY	ø2 2A	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L		NOT USED		NOT USED										ST DC ISOLATOR

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	TB21-3,4	I2U	39	1	2	2	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			



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 and 2.
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     ¦
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     ¦
CALL PHASES     ¦        X
```

BACKUP PROTECTION PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1298 T
DESIGNED: April 2008
SEALED: 05-13-08
REVISED: N/A

Temporary Signal 1 and 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of: Signals Management Section, Traffic Engineering and Safety Systems Branch, Department of Transportation, North Carolina
122 N. McDowell St., Raleigh, NC 27603

SR 1947 (Bella Coola Road)
at
Bridge 364

Division 6 — Columbus County — Waccamaw

PLAN DATE: April 2008 — REVIEWED BY: JTR
PREPARED BY: James Peterson — REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 008453
JOHN T. ROWE, JR.
John T. Rowe, Jr. (signature) 5-14-08
SIGNATURE DATE

SIG. INVENTORY NO. 06-1298 T

14-MAY-2008 07:35
s:\its signals\workgroups\sig man\peterson\061298_sm_ele_xxx.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 8

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

5-07

ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

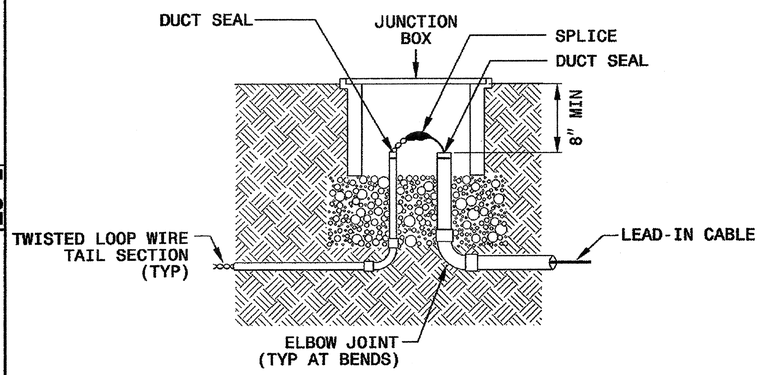
LOOP WIRE DETAILS

SHEET 2 OF 3

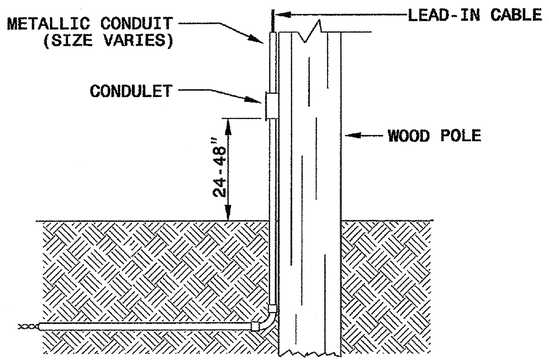
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

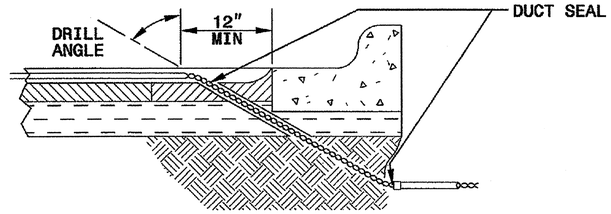


NOTE

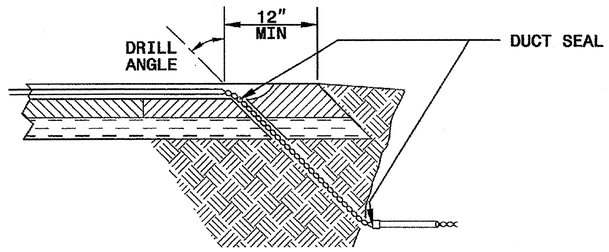
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

1. DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
2. TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
3. BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE OF CONDUIT TO JUNCTION BOX.

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

5-07

ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

LOOP WIRE DETAILS

SHEET 2 OF 3

1725D01

See Plate for Title

Prepared in the Offices of:

Intelligent Transportation Systems & Signals Unit
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 016286 ENGINEER MILTON I. DEAN

Milton I. Dean 9/5/07
SIGNATURE DATE

05-SEP-2007 14:00
c:\documents and settings\mdean\desktop\standards\standard metal pole sheets\1725102_mxy2307.dgn
mdean

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 9

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

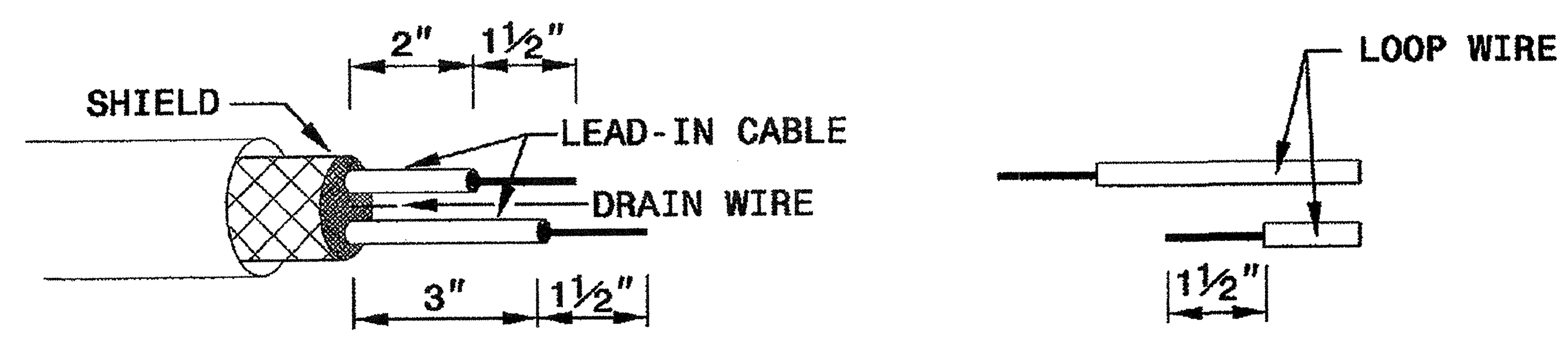
5-07

ENGLISH DETAIL DRAWING FOR
INDUCTION DETECTION LOOPS
SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

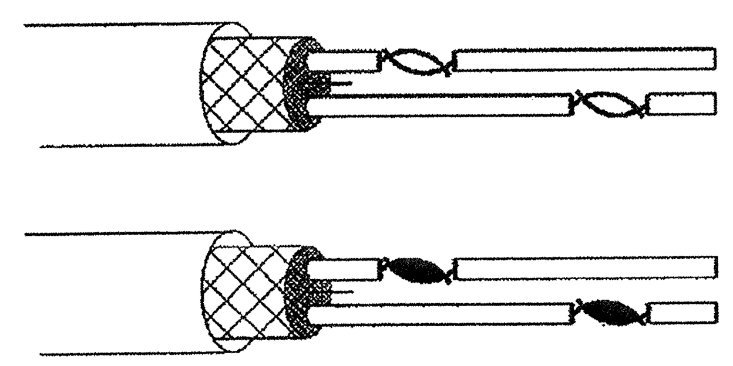
SHEET 3 OF 3

1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

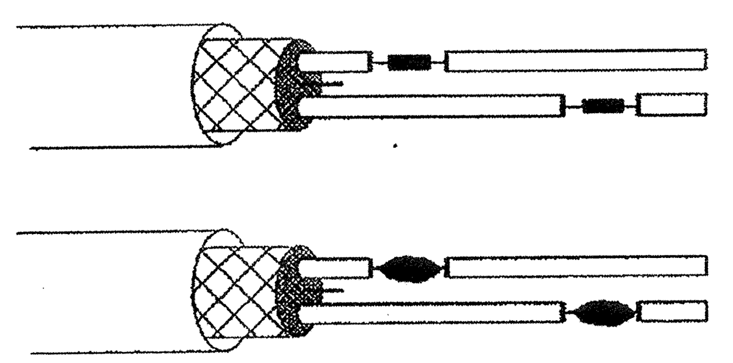


STEP 2. CONNECT AND SOLDER



TWIST BARE CONDUCTORS TOGETHER AND SOLDER WITH RESIN CORE SOLDER

OR

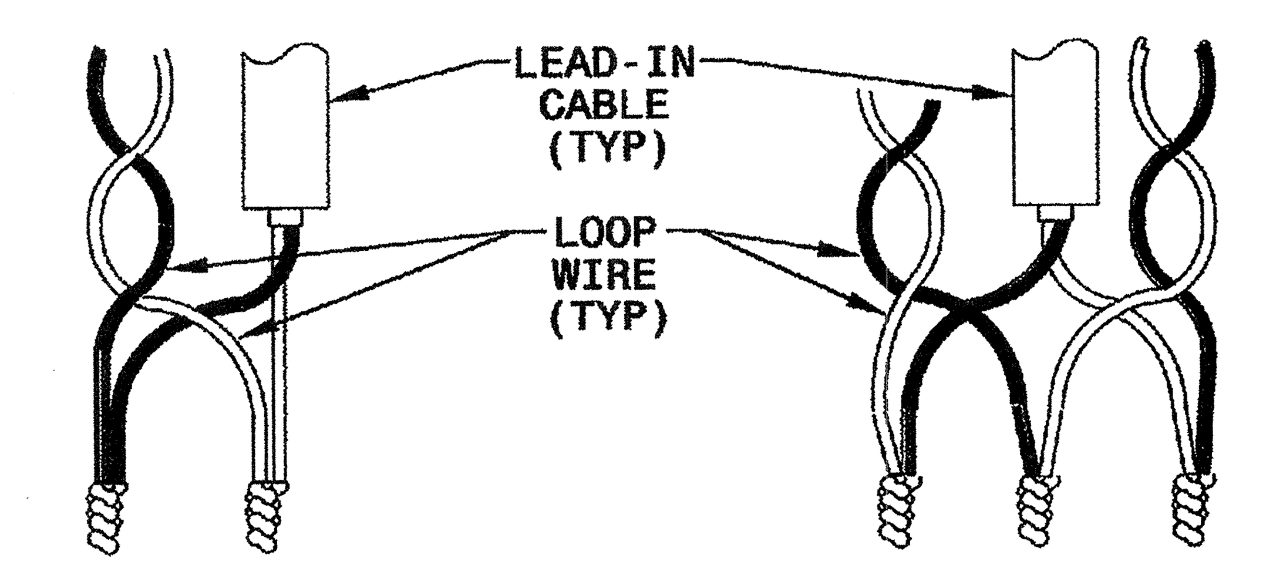


CRIMP BARE CONDUCTORS TOGETHER WITH AN UNINSULATED BUTT CONNECTOR AND SOLDER WITH RESIN CORE SOLDER

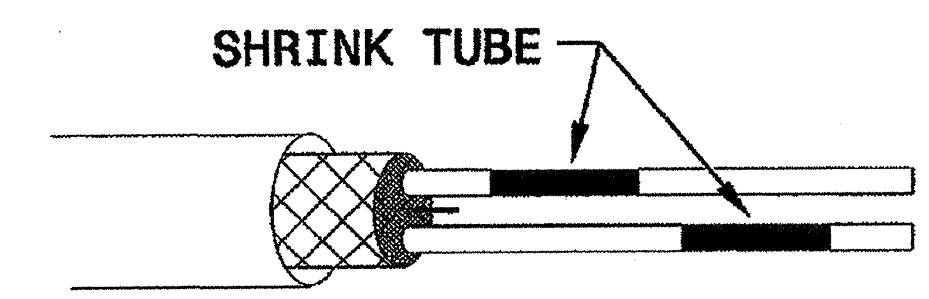
BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS

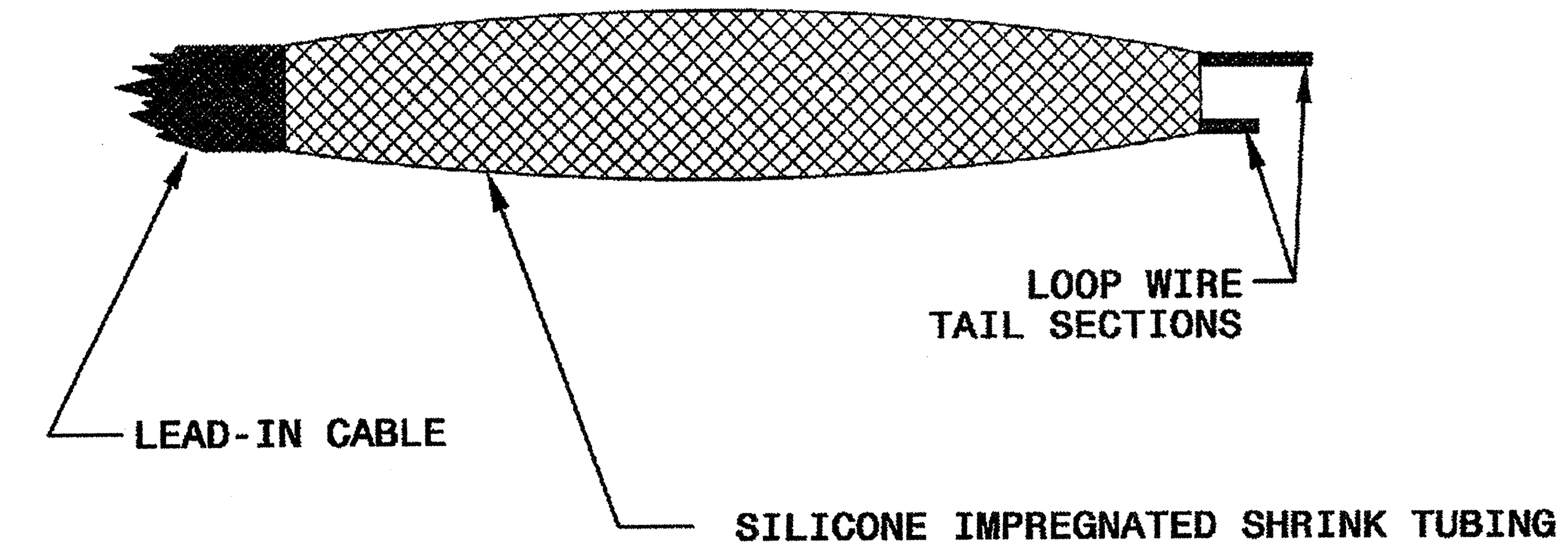
SINGLE CONNECTION | SERIES CONNECTION



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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

5-07

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3

1725D01

See Plate for Title

Prepared in the Offices of:

Intelligent Transportation Systems & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 016286 ENGINEER MILTON I. DEAN

SIGNATURE 9/5/07 DATE

PROJECT REFERENCE NO.	SHEET NO.
B-3830	Sig. 10

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

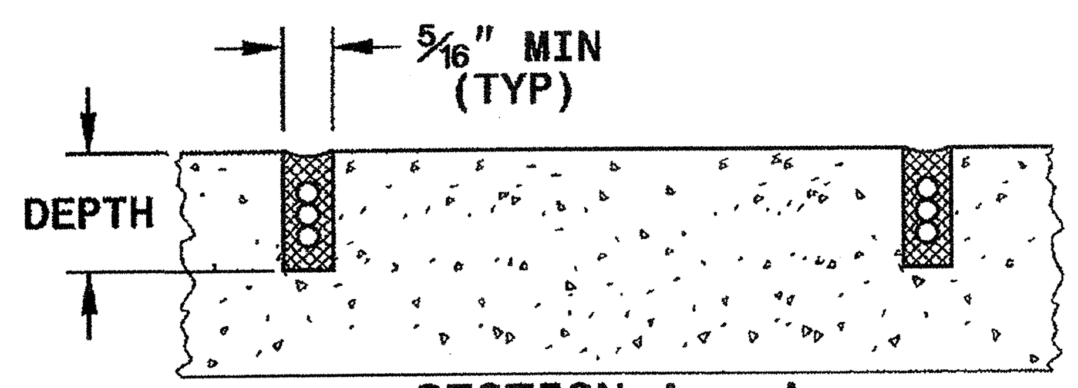
5-07

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

CONVENTIONAL 4-SIDED LOOP

SAW SLOT DEPTH CHART

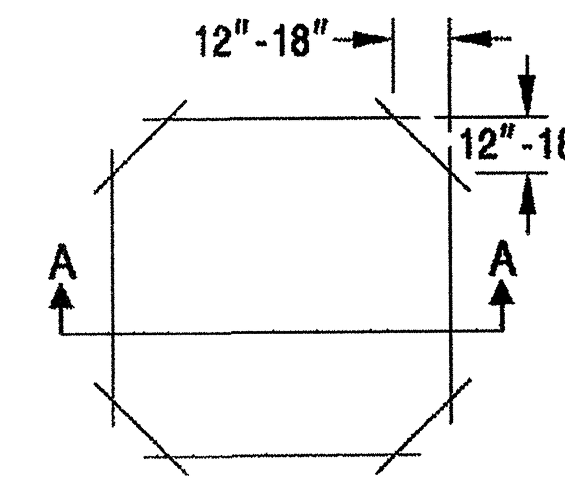
DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0



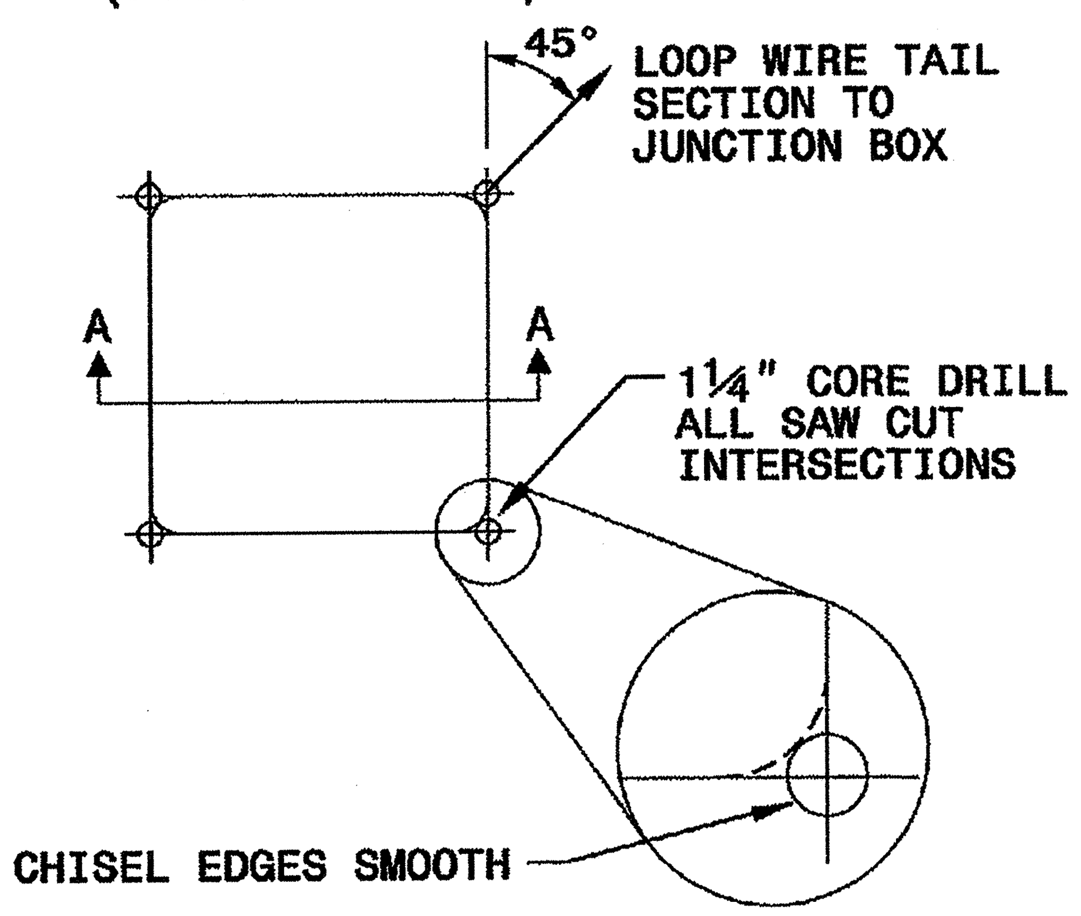
SECTION A - A

SAW CUT OPTIONS

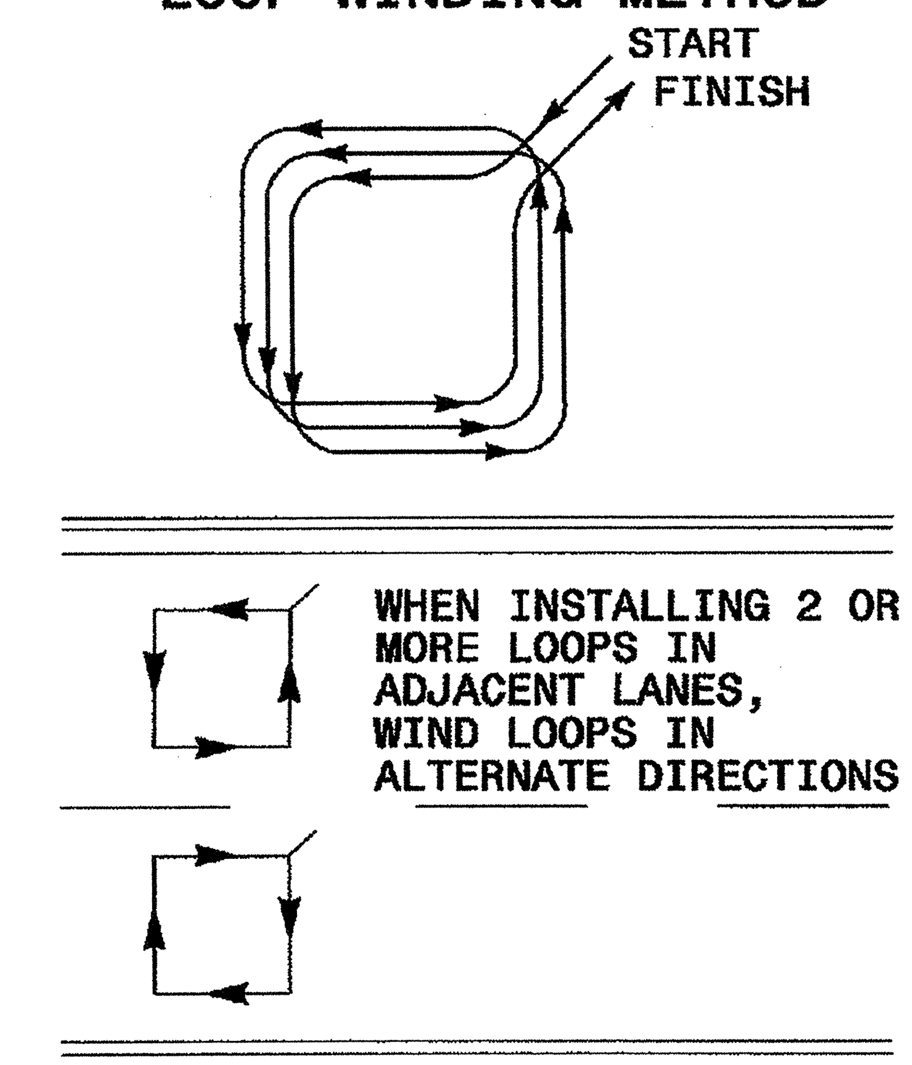
OPTION 1



OPTION 2
(POOR PAVEMENT)



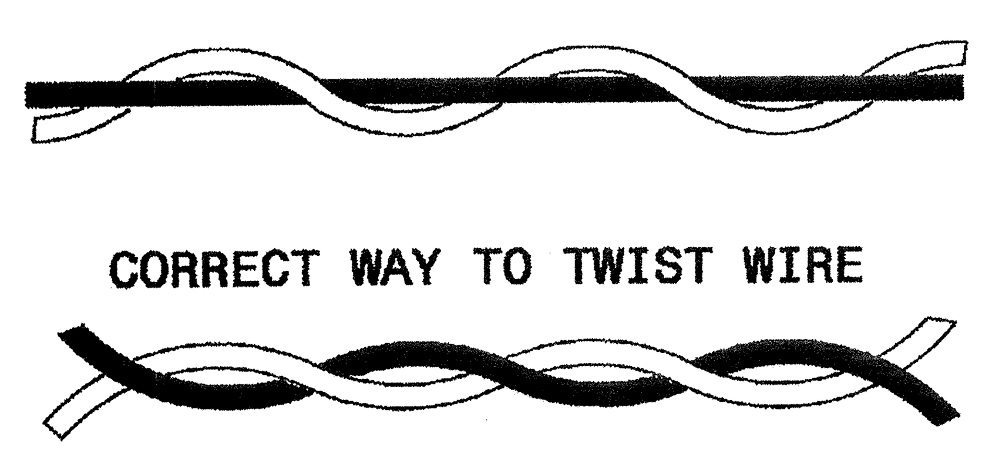
LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE

CORRECT WAY TO TWIST WIRE



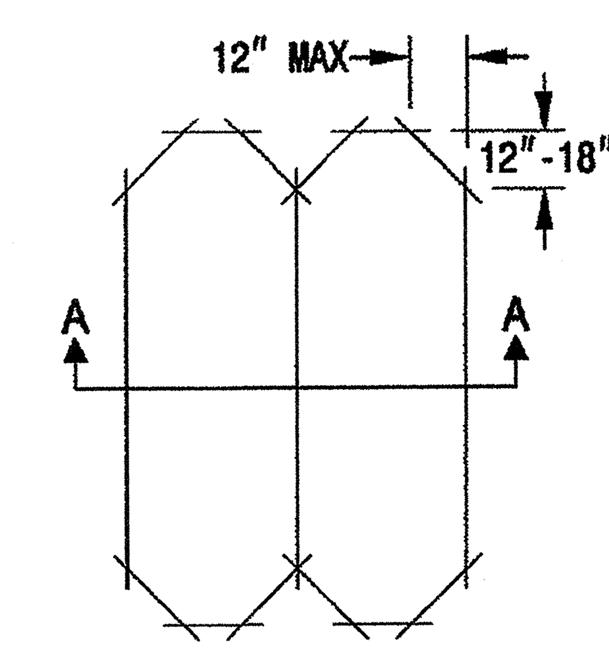
NOTES

1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

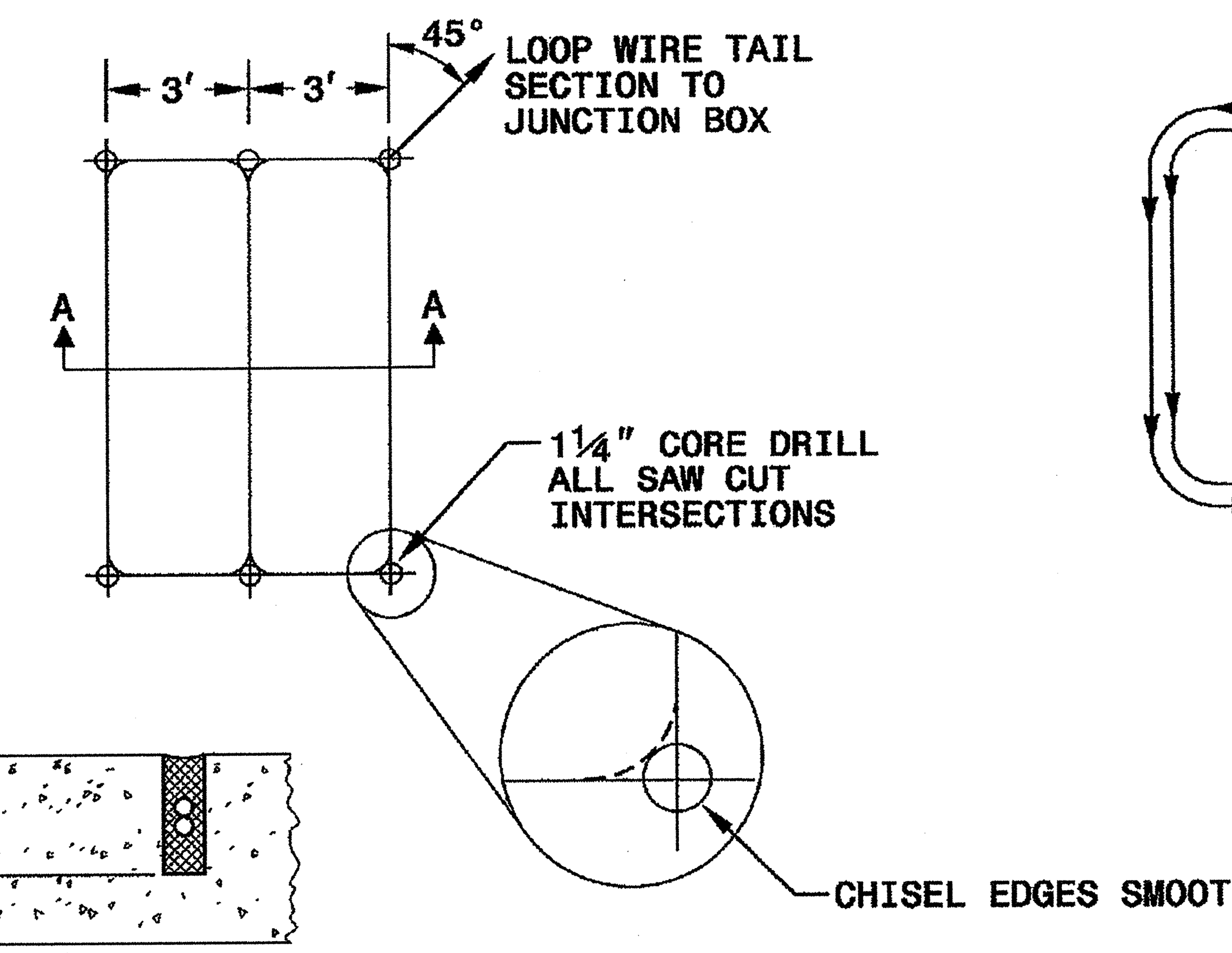
QUADRUPOLE LOOP

SAW CUT OPTIONS

OPTION 1



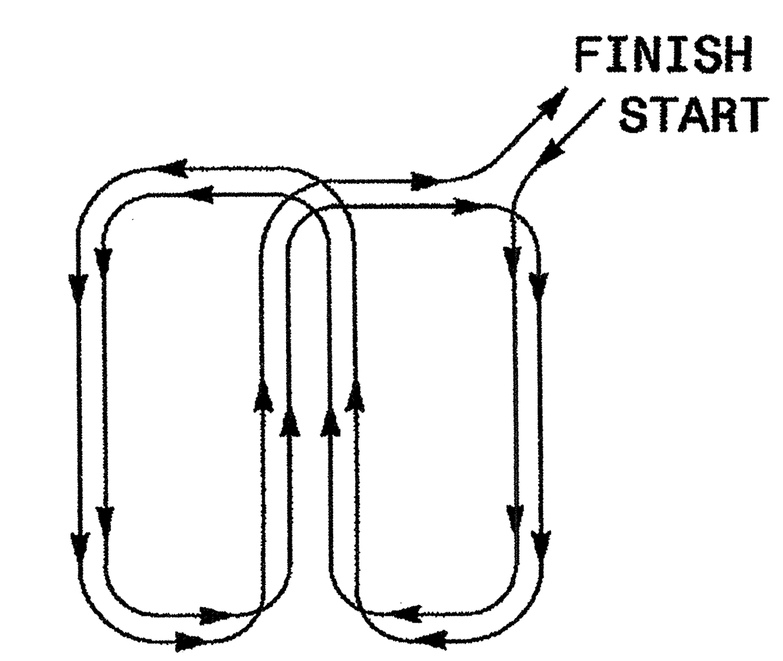
OPTION 2
(POOR PAVEMENT)



SECTION A - A

DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



SHEET 1 OF 3
1725D01

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

5-07

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

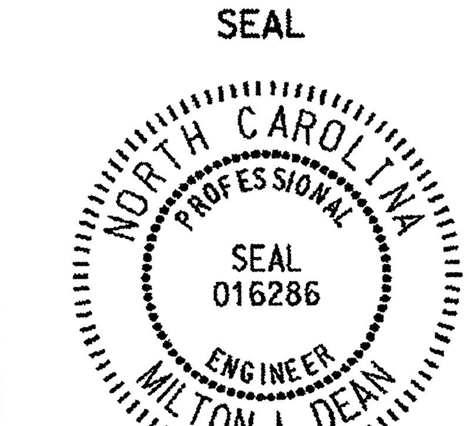
SHEET 1 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:

Intelligent Transportation Systems & Signals Unit
750 N. Greenfield Parkway
Garner, NC 27529

SEAL



9/5/07
SIGNATURE DATE