

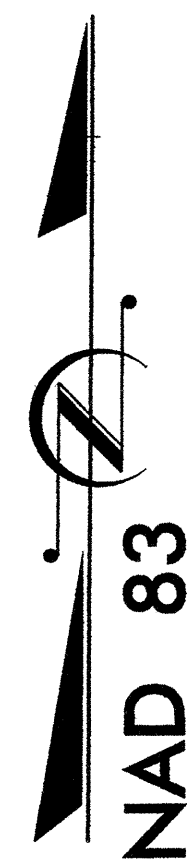
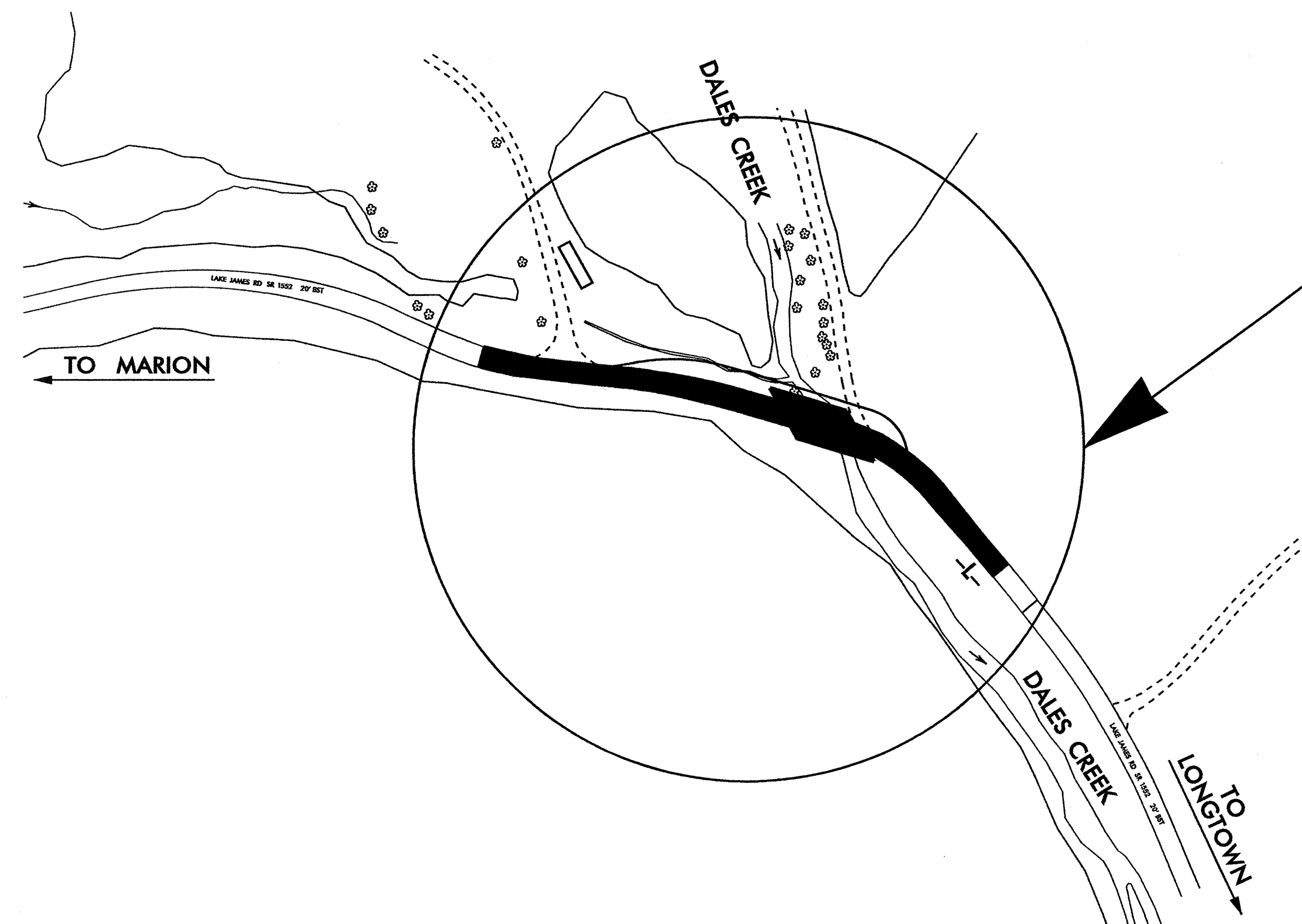
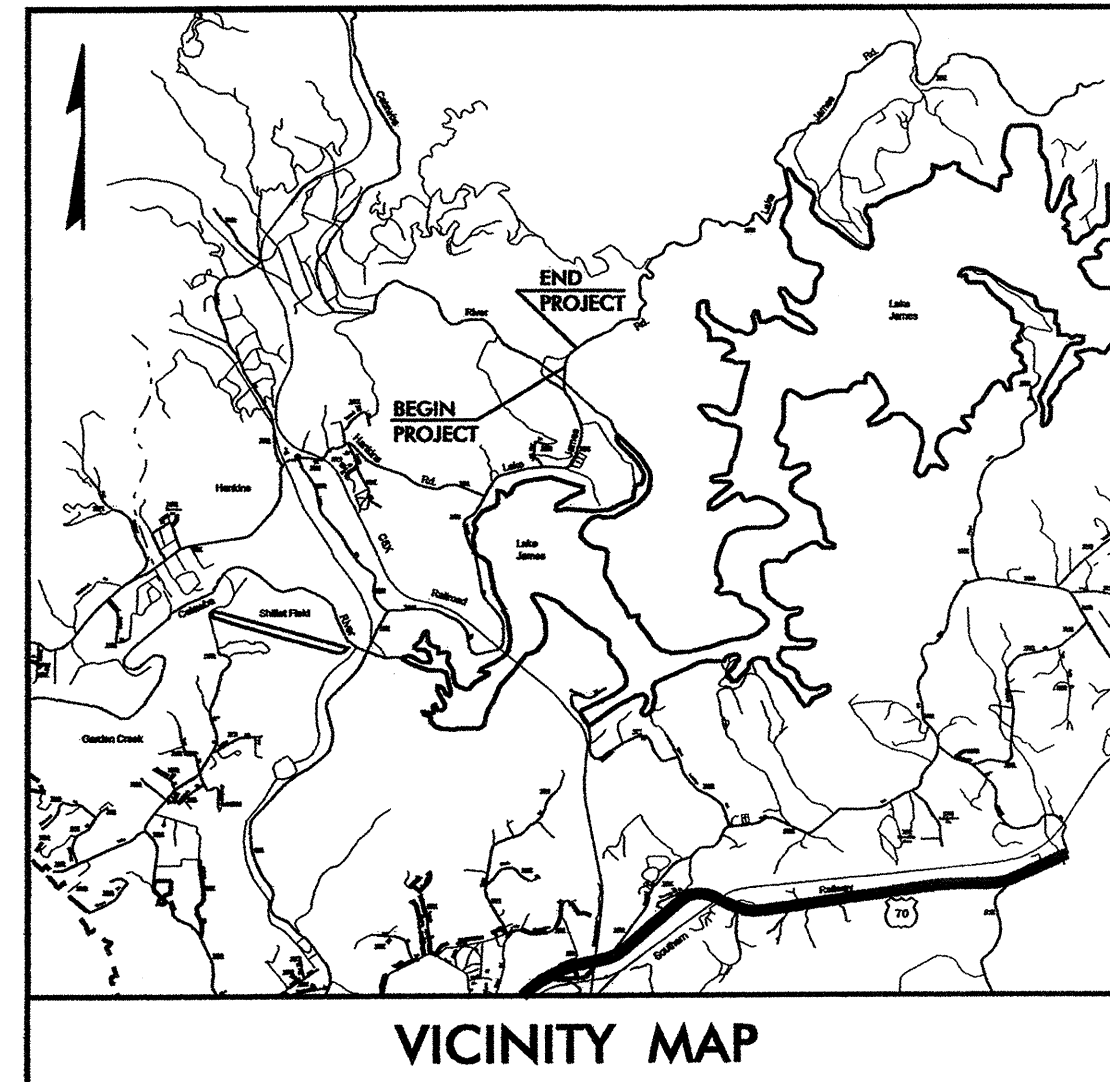
PROJECT: B-4197

STATE	PROJECT NO.	SHEET NO.
N.C.	B-4197	Sig. 1
P.A. PROJ. NO.		
PROJECT ID. NO.		

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

McDOWELL COUNTY

LOCATION: BRIDGE NO. 73 OVER DALES CREEK ON SR 1552 (LAKE JAMES RD.)
TYPE OF WORK: TEMPORARY TRAFFIC SIGNALS



INDEX OF PLANS

SHEET NO.	SIGNAL INVENTORY NO.	LOCATION /DESCRIPTION
SIG. 1	N/A	Title Sheet
SIG. 2-4	13-1205 T1 & T2	Bridge No. 73 on SR 1552 (Lake James Road)

LEGEND

##-#### SIGNAL INVENTORY NUMBER

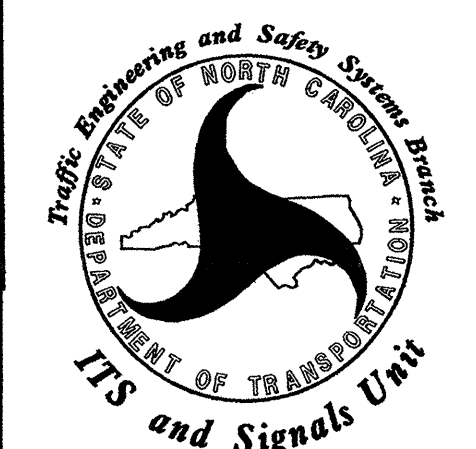
NCDOT CONTACTS:

TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

Timothy J. Williams, PE - Signals & Geometrics Contracts Engineer

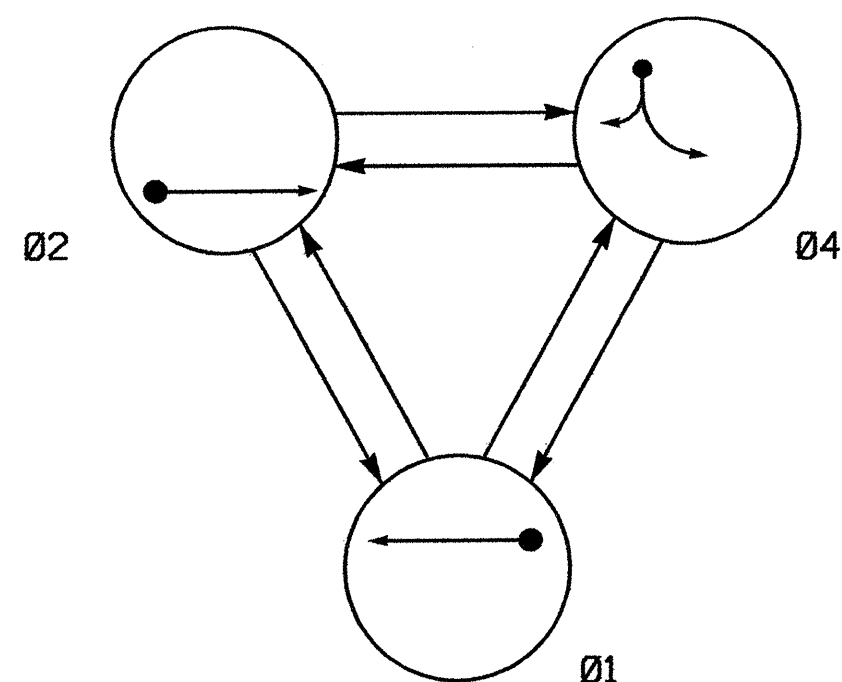
John T. Rowe Jr., PE - Signal Equipment Design Engineer

Prepared in the Offices of:



750 N. Greenfield Parkway, Garner, NC 27529

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

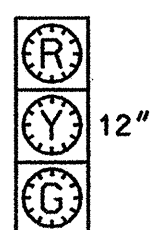
- DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 1	Ø 2	Ø 4	LOCAL
11, 12	G	R	R	R
21, 22	R	G	R	R
41, 42	R	R	G	R

SIGNAL FACE I.D.

⊙ Denotes L.E.D.



11, 12
21, 22
41, 42

2070L LOOP & DETECTOR INSTALLATION

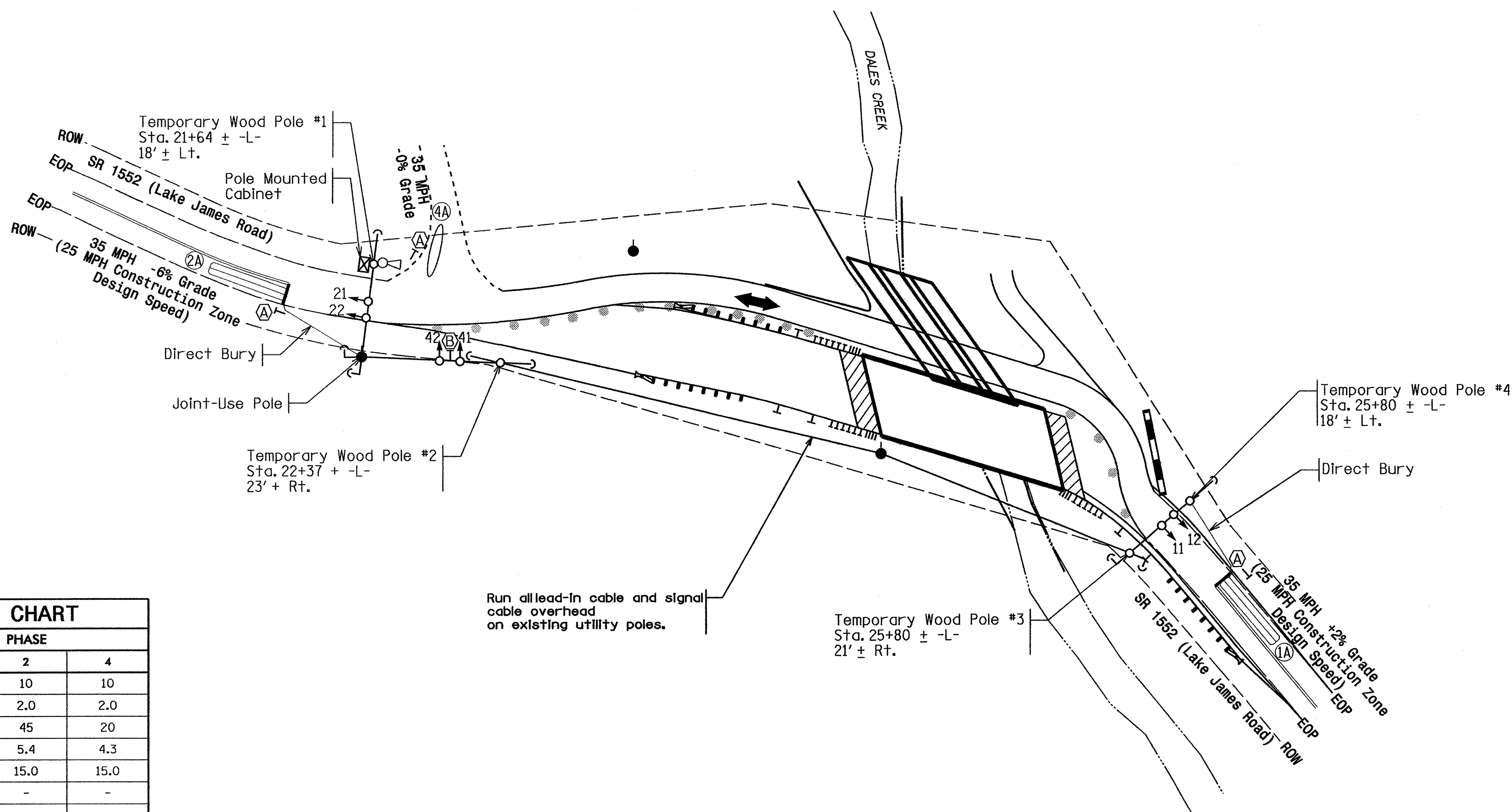
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6x40	0	2-4-2	Y	1	Y	Y	-	-	-	-	Y
2A	6x40	0	2-4-2	Y	2	Y	Y	-	-	-	-	Y
4A	**	0	**	-	4	Y	Y	-	-	3	-	Y

** Microwave Detection Zone

3 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation.
- Program controller to start-up in Phases 2 red clearance.
- Set all detector units to presence mode.
- Program all phase for "Red Rest"



2070L TIMING CHART

FEATURE	PHASE		
	1	2	4
Min Green 1 *	10	10	10
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	45	45	20
Yellow Clearance	4.0	5.4	4.3
Red Clearance	15.0	15.0	15.0
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	LOCK	LOCK	LOCK
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

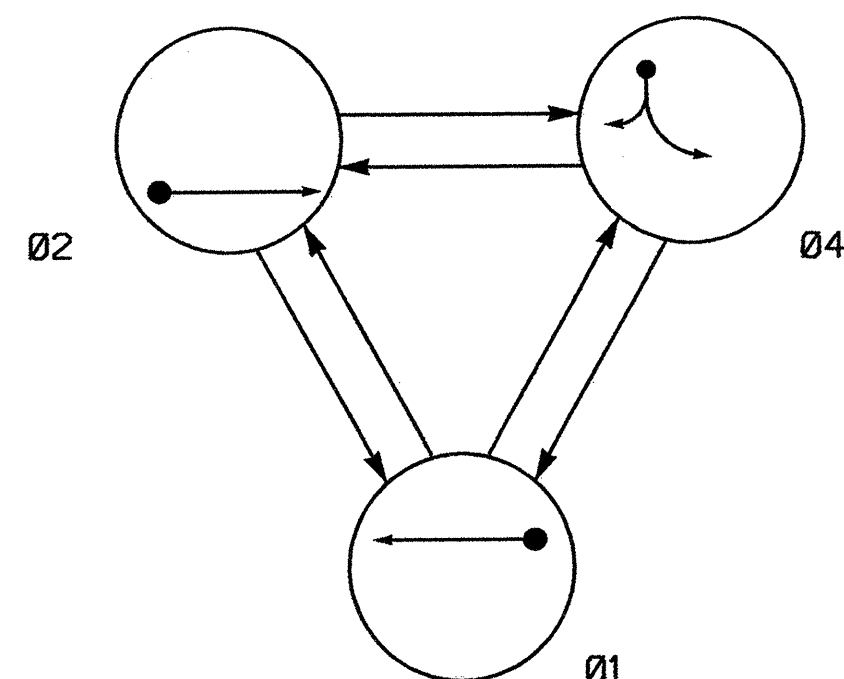
LEGEND

- | PROPOSED | EXISTING |
|--|-----------------------------------|
| ○ → Traffic Signal Head | ● → N/A |
| ● → Modified Signal Head | ○ → N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Sign |
| ○ Signal Pole with Guy | ⊙ Signal Pole with Guy |
| ○ Signal Pole with Sidewalk Guy | ⊙ Signal Pole with Sidewalk Guy |
| ⊠ Inductive Loop Detector | ⊠ Inductive Loop Detector |
| ⊠ Controller & Cabinet | ⊠ Junction Box |
| ⊠ Junction Box | ⊠ Junction Box |
| 2-in Underground Conduit | 2-in Underground Conduit |
| N/A Right of Way | Right of Way |
| → Directional Arrow | → Directional Arrow |
| → Pavement Marking Arrow | → Pavement Marking Arrow |
| ⊠ "STOP HERE ON RED" Sign (R10-6) | ⊠ "STOP HERE ON RED" Sign (R10-6) |
| ⊠ "NO TURN ON RED" Sign (R10-11a) | ⊠ "NO TURN ON RED" Sign (R10-11a) |
| ○ Microwave Detection Zone | ○ Microwave Detection Zone |
| ○ Out of Pavement Detector | ○ Out of Pavement Detector |
| ▬ Type III Barricade | ▬ Type III Barricade |
| N/A Guardrail | ▬ Guardrail |
| ▬ Construction Zone Drums | ▬ Construction Zone Drums |

New Installation - TCP Phase II

<p>Prepared in the Offices of:</p> <p>222 N. McDowell St., Raleigh, NC 27603</p>	<p>Bridge No. 73 on SR 1552 (Lake James Road)</p>		<p>SEAL</p>					
	<p>Division 13 McDowell County Near Marion</p> <p>PLAN DATE: November 2007 REVIEWED BY:</p> <p>PREPARED BY: I. O. Umzurike REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>		INIT.	DATE			
INIT.	DATE							
<p>SCALE 0 40 1" = 40'</p>	<p>SIG. INVENTORY NO. 13-1205 T1</p>							

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

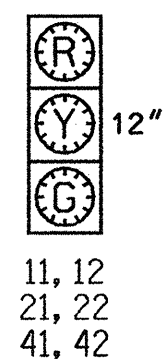
- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←---→ UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 1	Ø 2	Ø 4	FLASH
11, 12	G	R	R	R
21, 22	R	G	R	R
41, 42	R	R	G	R

SIGNAL FACE I.D.

○ Denotes L.E.D.



2070L LOOP & DETECTOR INSTALLATION

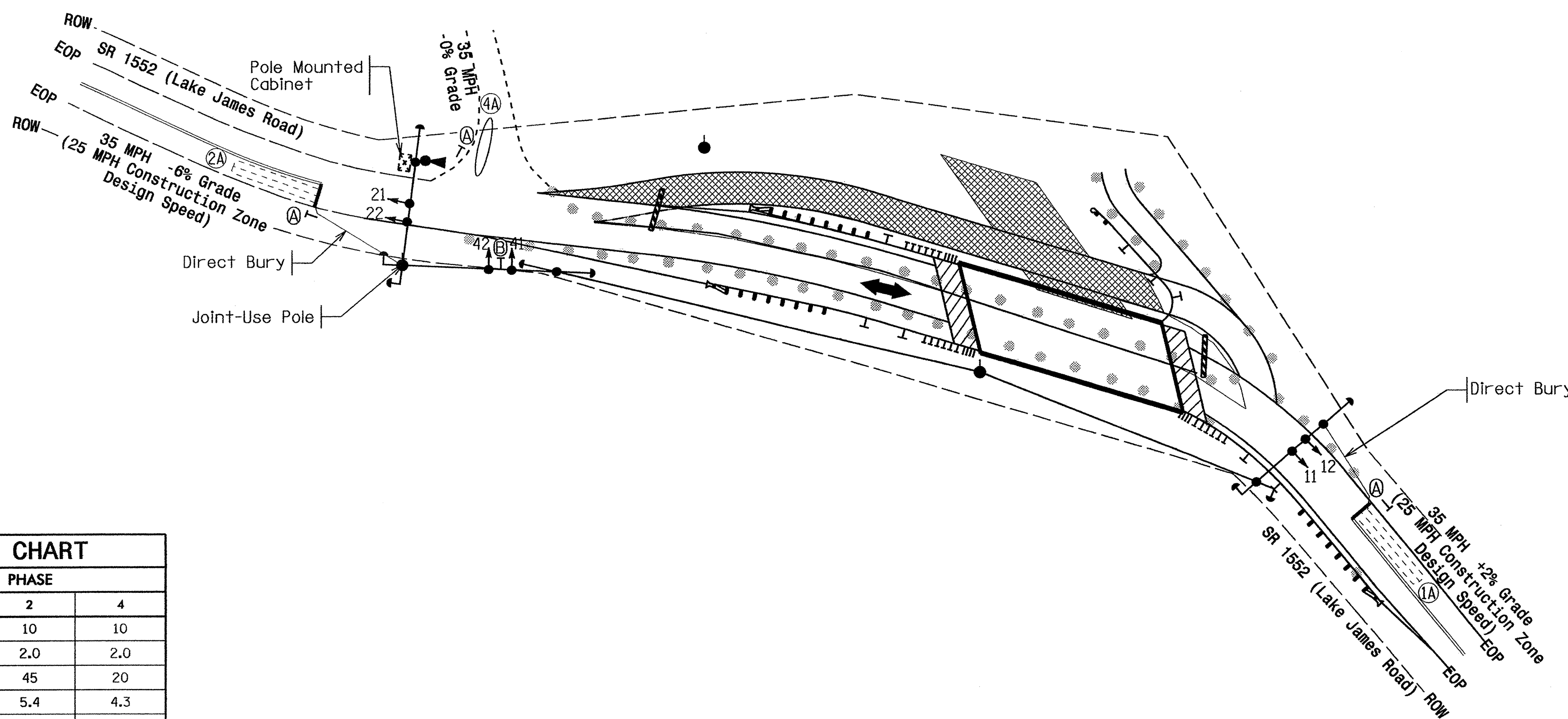
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6x40	0	2-4-2	-	1	Y	Y	-	-	-	-	-
2A	6x40	0	2-4-2	-	2	Y	Y	-	-	-	-	-
4A	**	0	**	-	4	Y	Y	-	-	3	-	-

** Microwave Detection Zone

3 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation.
- Program controller to start-up in Phases 2 red clearance.
- Set all detector units to presence mode.
- Program all phase for "Red Rest"



2070L TIMING CHART

FEATURE	PHASE		
	1	2	4
Min Green 1 *	10	10	10
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	45	45	20
Yellow Clearance	4.0	5.4	4.3
Red Clearance	15.0	15.0	15.0
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	LOCK	LOCK	LOCK
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

LEGEND

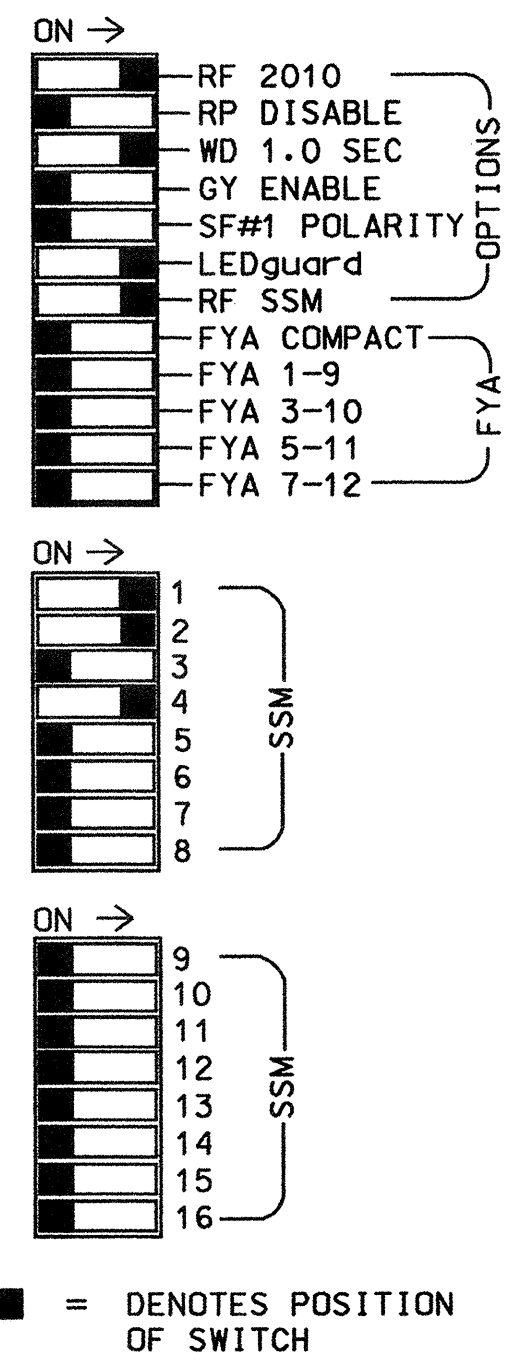
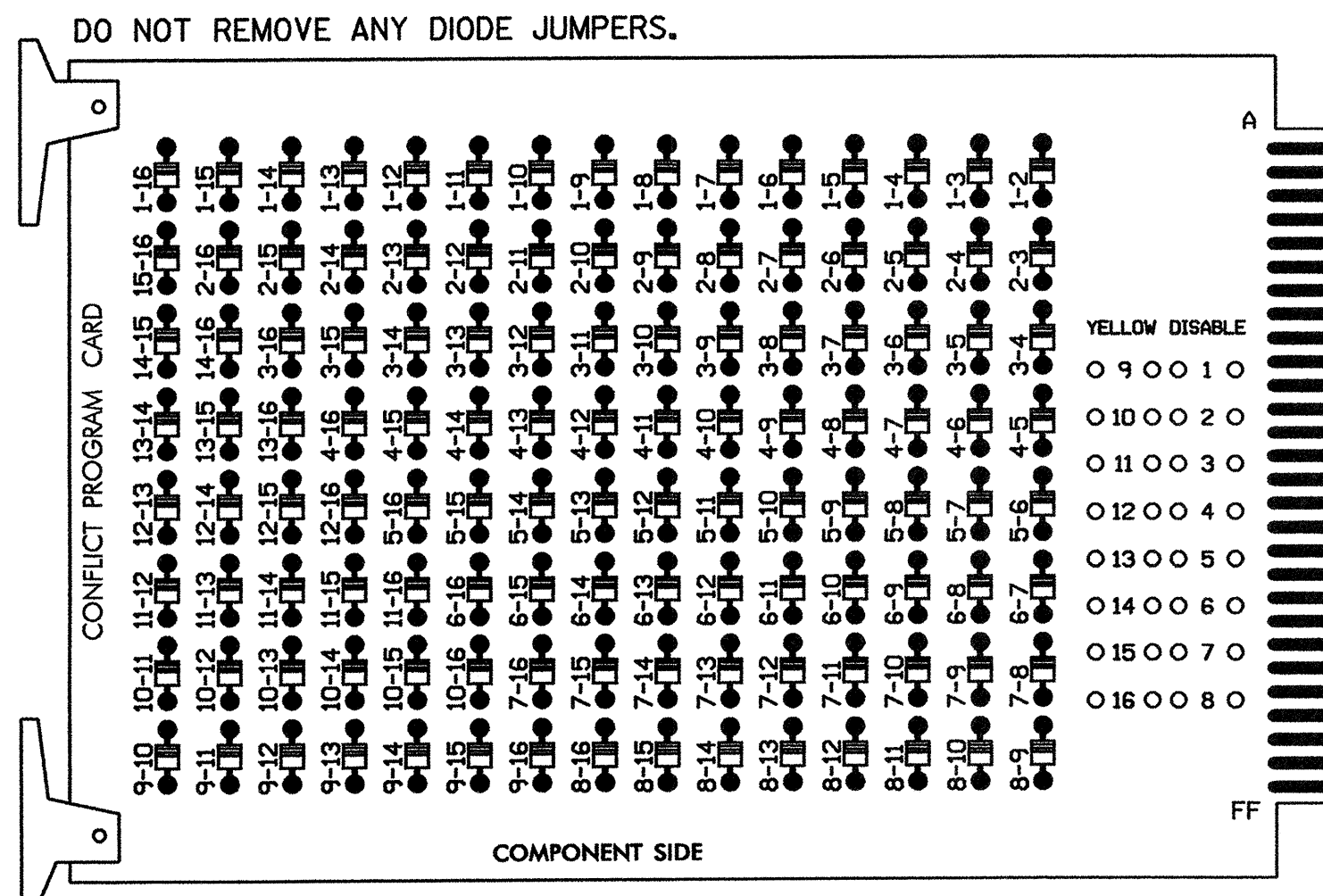
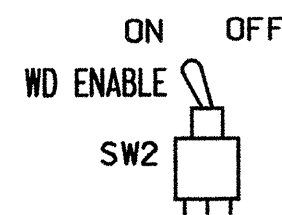
- | PROPOSED | EXISTING |
|--|--|
| ○→ Traffic Signal Head | ●→ Traffic Signal Head |
| ●→ Modified Signal Head | N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head With Push Button & Sign |
| ○→ Signal Pole with Guy | ○→ Signal Pole with Guy |
| ○→ Signal Pole with Sidewalk Guy | ○→ Signal Pole with Sidewalk Guy |
| □ Inductive Loop Detector | □ Inductive Loop Detector |
| □ Controller & Cabinet | □ Controller & Cabinet |
| □ Junction Box | □ Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A Right of Way | --- Right of Way |
| → Directional Arrow | → Directional Arrow |
| → Pavement Marking Arrow | → Pavement Marking Arrow |
| ⊙ "STOP HERE ON RED" Sign (R10-6) | ⊙ "STOP HERE ON RED" Sign (R10-6) |
| ⊙ "NO TURN ON RED" Sign (R10-11a) | ⊙ "NO TURN ON RED" Sign (R10-11a) |
| ○ Microwave Detection Zone | ○ Microwave Detection Zone |
| ○ Out of Pavement Detector | ○ Out of Pavement Detector |
| ▬ Type III Barricade | ▬ Type III Barricade |
| N/A Guardrail | ▬ Guardrail |
| ▬ Construction Zone Drums | ▬ Construction Zone Drums |

TCP Phase III Signal Upgrade - To Be Removed upon Project Completion

	Bridge No. 73 on SR 1552 (Lake James Road)	
	Division 13 McDowell County Near Marion	
PLAN DATE: November 2007 PREPARED BY: I. O. UMOZURIKE	REVIEWED BY:	SIGNATURE: <i>I. O. UMOZURIKE</i> DATE: 11/19/07
SCALE: 1"=40' 	REVISIONS:	INIT. DATE:
SIG. INVENTORY NO. 13-1205 T2		

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.

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

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	21,22	NU	NU	41,42	NU	NU	NU	NU	NU	NU	NU
RED	125	128			101							
YELLOW	126	129			102							
GREEN	127	130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

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,S4
 PHASES USED.....1,2,4
 OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(from view)

FILE U	1	2	3	4	5	6	7	8	9	10	11	12	13	14	FS
∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	FS	
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	DC ISOLATOR	
NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	DC ISOLATOR	

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

FS = FLASH SENSE
 ST = STOP TIME

NOTE: INSTALL MODEL 252 AC ISOLATOR IN SLOT 14 FOR USE WITH MICROWAVE DETECTOR. SEE MICROWAVE DETECTOR WIRING ON THIS PAGE.

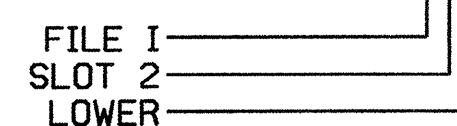
IMPORTANT: For proper operation of the microwave detector, remove surge protection from TB21-7 and TB21-8. A DIRECT SHORT WILL OCCUR IF THIS IS NOT DONE. Tie TB21-8 to AC neutral.

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	TB21-1,2	I1U	56	18	1	1	Y	Y			
2A	TB21-3,4	I2U	39	1	2	2	Y	Y			
**4A	TB21-7,8	I4U	41	3	4	4	Y	Y			3

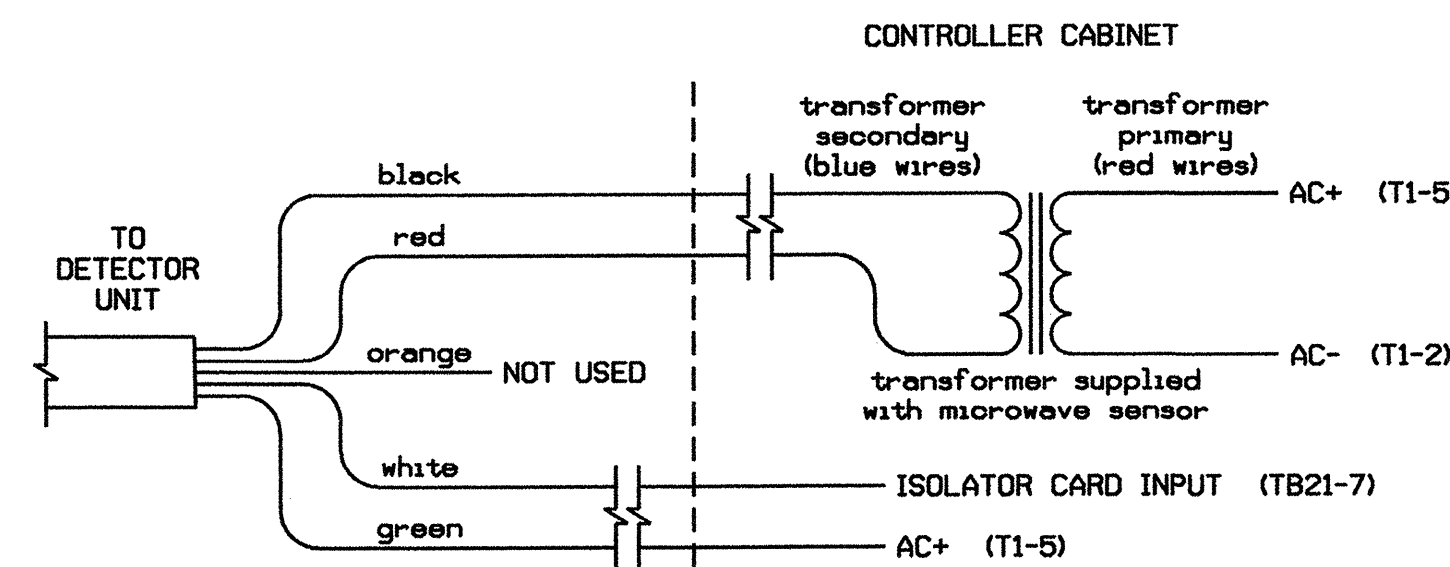
**Microwave Detector. (see wiring detail this page)

INPUT FILE POSITION LEGEND: I2L



MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a Microwave Sensors, Inc. Model TC-26B microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Configure model 252 AC isolator to place call upon removal of AC+ from the input. This is accomplished by setting a "DIP" switch on the isolator circuit board.

3. Important: For proper operation of the microwave detector, remove surge protection from TB21-7 and TB21-8. Tie TB21-8 to AC neutral.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 13-1205 T1&T2
 DESIGNED: November 2007
 SEALED: 11/19/07
 REVISED: N/A

New Installation - Temp. 1 and Temp. 2

Electrical and Programming Details For:

Bridge No. 73
 on
SR 1552 (Lake James Road)

Division 13 McDowell County Near Marion

PLAN DATE: November 2007 REVIEWED BY: JTK

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

Signature: John T. Rowland DATE: 11-20-07

Sig. Inventory No. 13-1205