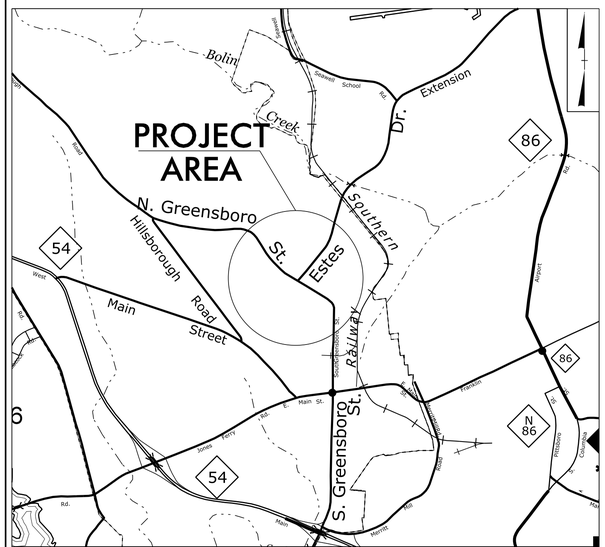
09/08/99
TIP PROJECT: U-5846
CONTRACT:
R/W REVISION 8/8/17 - REVISED LET DATE
04-JUN-2018 14:35
\\z400\public\2018 - SIGNAL DESIGN PROJECTS\U-5846 ChapelHill\U-5846\Roadway\Prop_Sig\Title_Sheet_Sig.dgn
BMekuria

See Sheet 1-A For Index of Sheets
See Sheet 1B For Conventional symbols
See Sheet 1C For Survey Control Sheet



VICINITY MAP

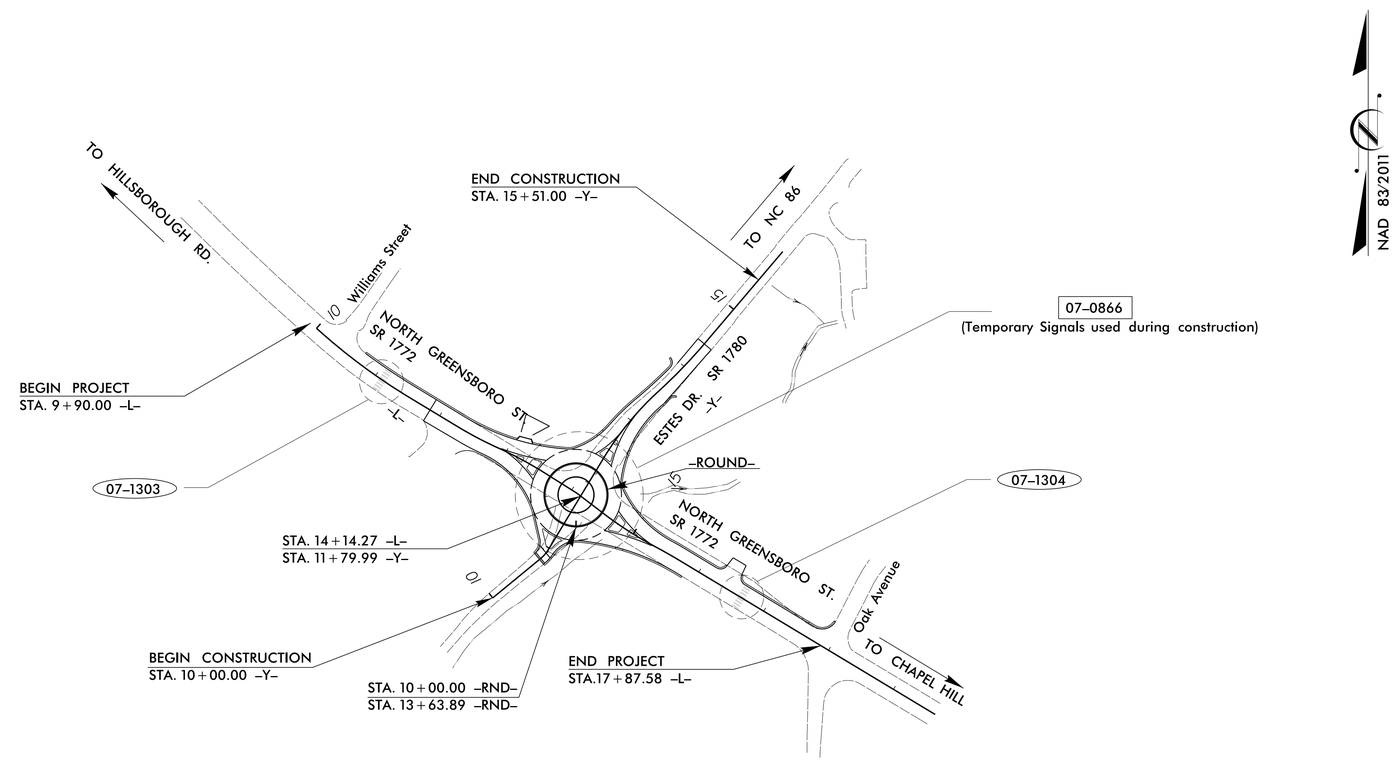
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	U-5846	Sig. 1

ORANGE COUNTY

LOCATION: INTERSECTION IMPROVEMENT AT SR 1772 (NORTH GREENSBORO STREET) AND SR 1780 (ESTES DRIVE)

TYPE OF WORK: TRAFFIC SIGNALS



07-XXXX New Traffic Signal

07-XXXX Existing Traffic Signal to be Removed

THIS PROJECT IS WITHIN CARBORO MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

20 10 0 20 40
PROFILE (VERTICAL)

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1	--------	Title Sheet
Sig. 2.0-2.3	07-1303	Pedestrian Hybrid Signal
Sig. 3.0-4.1	07-0866	SR 1772 (N. Greensboro St.) at SR 1780 (Estes Drive)
Sig. 5.0-5.3	07-1304	Pedestrian Hybrid Signal
	--------	Standard Plate Sheets

Prepared in the Office of:

MEKURIA ENGINEERING, INC
2517. FARLOW GAP LANE
Raleigh, North Carolina 27603

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
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License: C-2197

PLANS PREPARED FOR:

TRANSPORTATION MOBILITY AND SAFETY DIVISION

ROBERT ZIEMBA, P.E. - CENTRAL REGION SIGNALS ENGINEER

SIGNAL DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER MAYEH D. MEKURIA

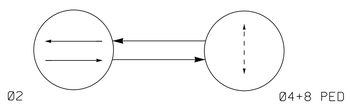
P.E.

SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE: Ø2 DARK	ACTIVATION	STEADY YELLOW	ALL RED	Ø4+8 PED WALK	Ø4+8 PED CLEAR	FLASH
21, 22	DRK	FY	Y	R	R	FR*	Y
23, 24	DRK	FY	Y	R	R	FR*	Y
P41, P81	DW	DW	DW	DW	W	DW	DRK

* ALTERNATING FLASH

Y - Steady Yellow
FY- Flashing Yellow
R- Steady Red
FR- Flashing Red
W - Walk
DW - Don't Walk
DRK - Dark

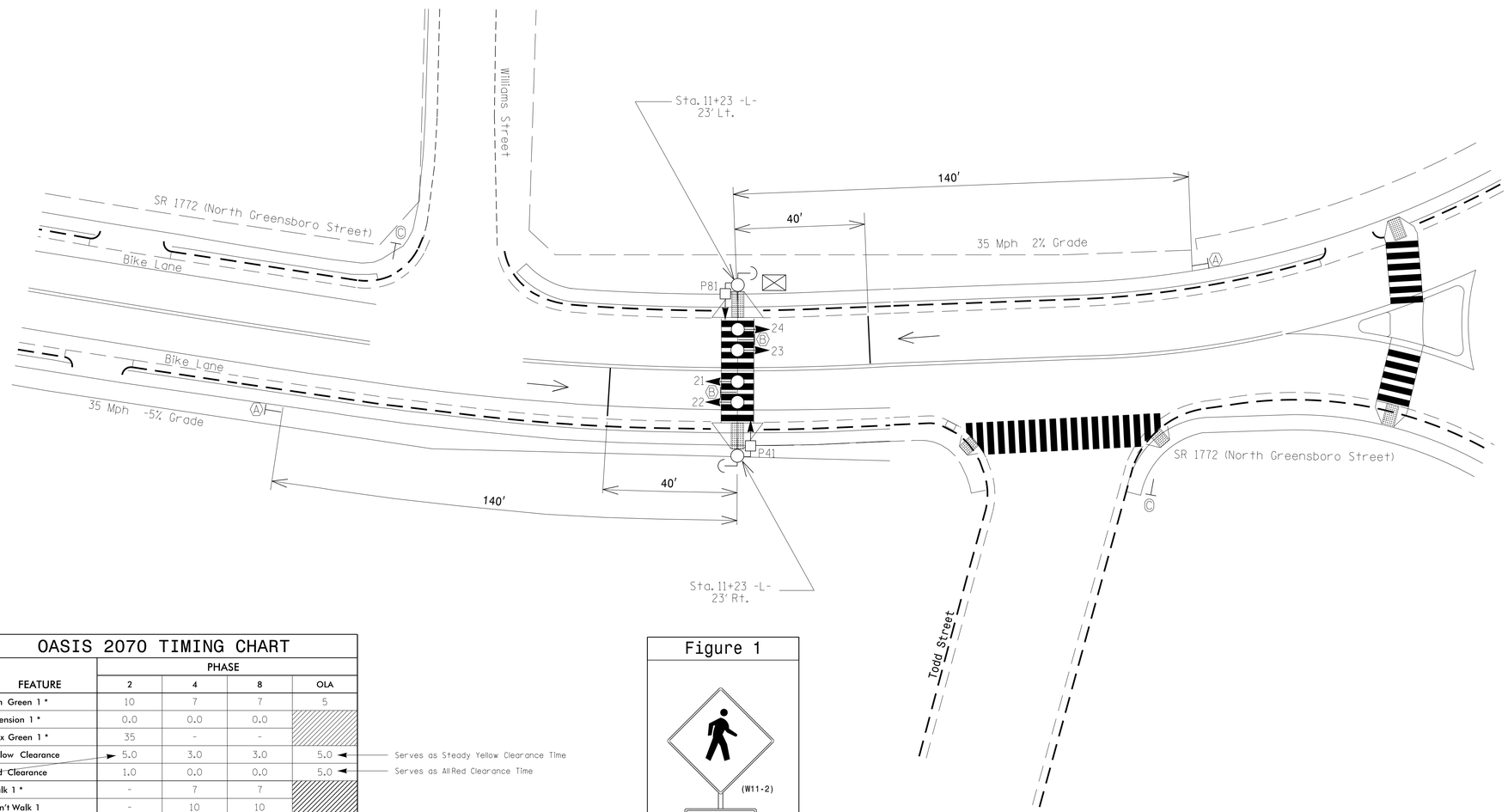
SIGNAL FACE I.D.

All Heads L.E.D.

2 Phase
Semi-Actuated
Pedestrian Hybrid Beacon
(Chapel Hill-Carrboro Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
3. Enable Ped Yellow Clear for phase 4 PED.
4. Locate Pedestrian and Crosswalk advanced warning signs in accordance with Table 2C-4 in Section 2C.05 of the 2009 MUTCD or as otherwise directed by the engineer.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Pedestrian Warning Sign (W11-2) with "AHEAD" Plaque (W16-9P) (See Figure 1)	Ⓐ
Ⓑ	"CROSSWALK-STOP ON RED" Sign (R10-23)	Ⓑ
Ⓒ	"STOP" Sign	Ⓒ

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	4	8	OLA
Min Green 1 *	10	7	7	5
Extension 1 *	0.0	0.0	0.0	
Max Green 1 *	35	-	-	
Yellow Clearance	5.0	3.0	3.0	5.0
Red Clearance	1.0	0.0	0.0	5.0
Walk 1 *	-	7	7	
Don't Walk 1	-	10	10	
Seconds Per Actuation *	-	-	-	
Max Variable Initial *	-	-	-	
Time Before Reduction *	-	-	-	
Time To Reduce *	-	-	-	
Minimum Gap	-	-	-	
Recall Mode	MAX RECALL	-	-	
Vehicle Call Memory	-	-	-	
Dual Entry	-	-	-	
Simultaneous Gap	ON	ON	ON	

Serves as Flashing Yellow Time

Serves as Steady Yellow Clearance Time

Serves as AllRed Clearance Time

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

Figure 1

New Installation

Prepared in the Offices of:

MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number: (919)-833-8743

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 20 1"=20'

Pedestrian Hybrid Beacon on SR 1772 (North Greensboro St.) East of Williams Street

Division 7 Orange County Carrboro

PLAN DATE: April 2018	REVIEWED BY: B. Mekuria
PREPARED BY: B.E. Wynn	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL BENJAMIN D. MEKURIA
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

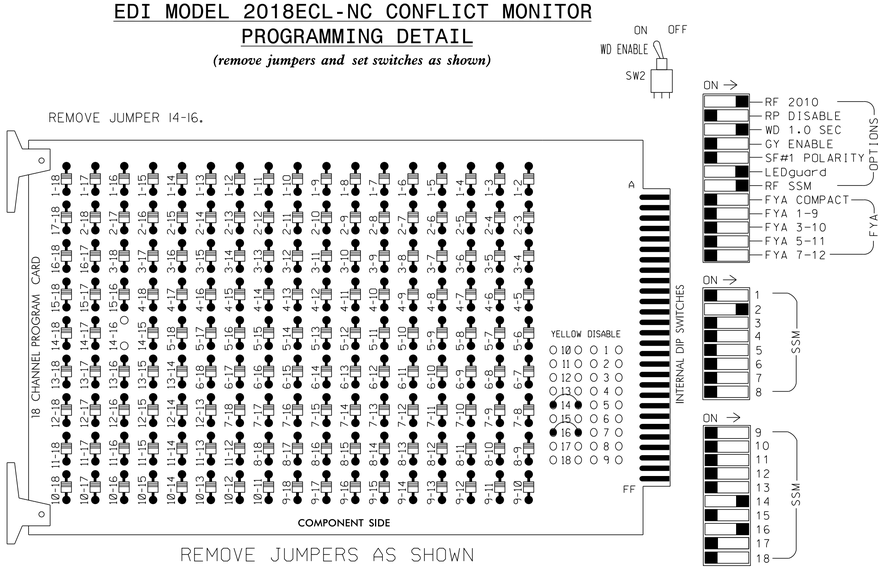
SIGNATURE DATE

SIG. INVENTORY NO. 07-1303

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 2.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.
5. BE SURE TO INSTALL YELLOW DISABLE JUMPER FOR CHANNELS 14 (4 PED) AND 16 (8PED).

NOTES

1. Insert yellow flash program blocks for phases 1 and 2. Insert red flash program blocks for all remaining unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phase 2 for Startup In Green.
3. Program phases 4 and 8 for Startup Ped Call.
4. Program Phase 2 for Yellow Flash.
5. Program Phases 4 and 8 for Ped Yellow Clear.
6. The cabinet and controller are part of the Chapel Hill-Carrboro Signal System.

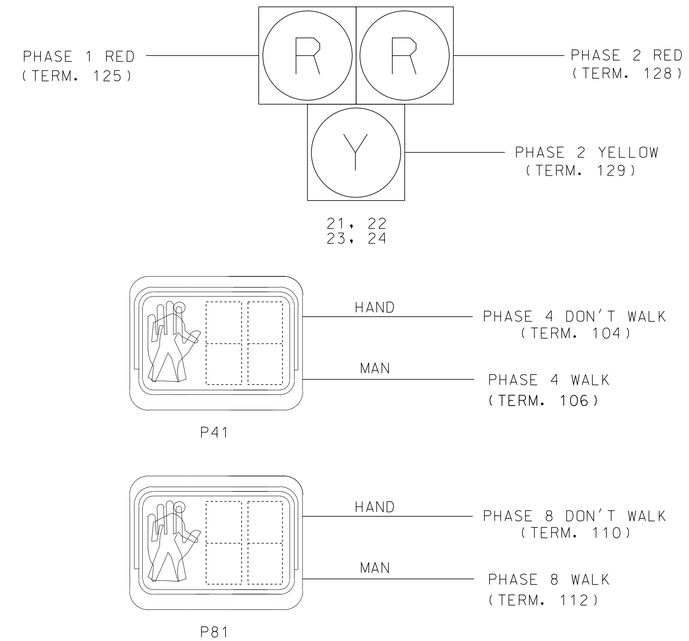
EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S6,S12
PHASES USED.....2,4*,8*,4PED,8PED
OVERLAP "A".....2**
OVERLAP "B".....NONE
OVERLAP "C".....NONE
OVERLAP "D".....NONE

* Phase used for timing purposes only.
** Used to control clearance intervals.

SIGNAL HEAD WIRING DETAIL

(wire signal heads as shown)



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	NOT USED	NOT USED	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	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

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
PED PUSH BUTTONS											
P41	TB8-5,6	I12L	69	31	PED 4	4/8 PED	*				
P81	TB8-8,9	I13L	70	32	PED 8	4/8 PED	*				

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

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

* See Pedestrian Detector Programming Detail on Sheet 3.

OPERATIONAL NOTES

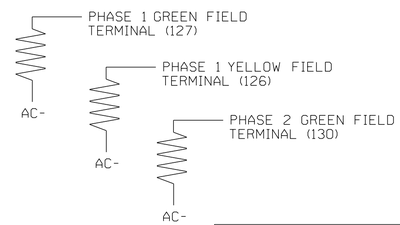
1. In order for controller to perform the "Pedestrian Hybrid Beacon" (aka. HAWK signal) sequence, special logic and output programming is necessary. See programming details on sheet 2 of this electrical detail.
2. This sequence uses PHASE 2 YELLOW to produce "flashing yellow clearance" and also uses overlap "A" assigned as phase 2 to provide "steady yellow" clearance interval. Time for this interval shall be implemented in "OL A YELLOW CLEAR" timing. See signal plan for timing.
3. Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal. This is necessary so that when flashing yellow clear ends, the steady yellow clear begins.
4. Phases 4 and 8 RED CLEAR times must be set to 0.0 sec.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1303
DESIGNED: April 2018
SEALED: TBD
REVISED: N/A

ELECTRICAL AND PROGRAMMING DETAIL FOR PEDESTRIAN HYBRID BEACON ("HAWK") SIGNAL

Electrical Detail — Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Pedestrian Hybrid Beacon on SR 1772 (North Greensboro St.) East of Williams Street

Division 7 — Orange County — Carrboro

PLAN DATE: April 2018 — REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch — REVISIONS — INIT. — DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026161 J. O. DEATON — PRELIMINARY PLANS — NOT FOR CONSTRUCTION

SIGNATURE — DATE
SIG. INVENTORY NO. 07-1303

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

Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 839-6070

NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
ITS & Signals Unit

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BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 2.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL PEDESTRIAN HYBRID BEACON 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  PED CLEAR ON PHASE #4  IS ON
AND OUTPUT  ASSIGNMENT #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #11 OFF
```

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  PED CLEAR ON PHASE #4  IS ON
AND OUTPUT  ASSIGNMENT #1  IS OFF

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #14 OFF
```

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  VEH CALL ON PHASE  #4  IS ON

SCROLL DOWN

THEN:
SET INPUT  ASSIGNMENT  #31 ON
```

NOTE: LOGIC TO ENSURE THAT PHASE 4 PED IS ALWAYS SERVED WITH PHASE 4 VEHICLE.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

I/O REFERENCE SCHEDULE

OUTPUT 1 = PHASE 4 DON'T WALK
OUTPUT 4 = PHASE 4 YELLOW
OUTPUT 11 = OLA RED
OUTPUT 14 = OLA RED (DUPLICATE)
INPUT 31 = PHASE 4 PED CALL

OUTPUT REMAPPING DETAIL FOR
SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "11"

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
OUTPUT ASSIGNMENT #................11
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
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..........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE.
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
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' KEY AFTER INPUTING DATA.
THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY TO ADVANCE TO OUTPUT 12

```
PAGE:1  C1 PIN:13  VEHICLE PHASE
OUTPUT ASSIGNMENT #................12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
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..........................
```

MODIFY DATA AS SHOWN TO MAKE OUTPUT 12 A FLASHING OUTPUT

NOTE: THIS MODIFIES THE PHASE 2 YELLOW LOAD SWITCH DRIVER TO FLASH. WHICH WILL PROVIDE THE FLASHING YELLOW CLEARANCE INTERVAL.

PRESS "+" KEY TWICE TO ADVANCE TO OUTPUT 14

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
OUTPUT ASSIGNMENT #................14
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..........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE.
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
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' KEY AFTER INPUTING DATA.
THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S1 RED.

PRESS "+" KEY TO MULTIPLE TIMES TO ADVANCE TO OUTPUT 51

CHANGE C1 PIN NUMBER FROM 98 TO 13 AS SHOWN

```
PAGE:1  C1 PIN:13  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................51
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................Y
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: THIS CHANGE REMAPS THE OVERLAP "A" YELLOW DRIVER TO THE SAME PIN AS PHASE 2 YELLOW. WHICH WILL PROVIDE THE OUTPUT FOR THE STEADY YELLOW CLEARANCE.

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1303
DESIGNED: April 2018
SEALED: TBD
REVISED: N/A

Electrical Detail — Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Pedestrian Hybrid Beacon on SR 1772 (North Greensboro St.) East of Williams Street

Division 7 — Orange County — Carrboro

PLAN DATE:	April 2018	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

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

Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 539-6070

NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
ITS & Signals Unit

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026905 — J. O. DEATON
PRELIMINARY PLANS — NOT FOR CONSTRUCTION OR RECORDING

SIGNATURE	DATE

SIG. INVENTORY NO. 07-1303

04-JUN-2018 11:35
\\mk2400\pw\jlc\42018 - SIGNAL DESIGN PROJECTS\U-5846 Chapel Hill\Signal Designs\Electrical Details\U-5846 HAWK 100\07-1303e-01-211 East.dgn
BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 2.3

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:              ¦123456789101112131415 16
VEH OVL PARENTS:¦ X
VEH OVL NOT VEH:¦
VEH OVL NOT PED:¦
VEH OVL GRN EXT:¦ X
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)........5
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..5.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...5.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE TIMING INTERVALS

OVERLAP PROGRAMMING COMPLETE

PEDESTRIAN DETECTOR ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS). PRESS '+' UNTIL PED DETECTOR #4 IS REACHED.

```
PED DETECTOR #4  SETTINGS   (+/- DET)
PHASE#           ¦123456789101112131415 16
PHASES ASSIGNED ¦   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................Y
ENABLE DIAGNOSTICS.................N
RECALL IF FAILED...................Y
MAX CALLS/MINUTE (0-255)...........255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%)...........100
```

PRESS '+' UNTIL PED DETECTOR #8 IS REACHED.

```
PED DETECTOR #8  SETTINGS   (+/- DET)
PHASE#           ¦123456789101112131415 16
PHASES ASSIGNED ¦   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................Y
ENABLE DIAGNOSTICS.................N
RECALL IF FAILED...................Y
MAX CALLS/MINUTE (0-255)...........255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%)...........100
```

PROGRAMMING COMPLETE

TIMING INTERVAL SCHEDULE

PHASE 2 YELLOW CLEAR TIME = FLASHING YELLOW CLEARANCE INTERVAL
OVERLAP "A" YELLOW CLEAR TIME = STEADY YELLOW CLEARANCE INTERVAL
OVERLAP "A" RED CLEAR TIME = ALL RED CLEARANCE INTERVAL

NOTE: Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal.

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: 07-1303
DESIGNED: April 2018
SEALED: TBD
REVISED: N/A

NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
_____
ITS & Signals Unit

Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 539-6070

Electrical Detail — Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Pedestrian Hybrid Beacon on SR 1772 (North Greensboro St.) East of Williams Street

Division 7 — Orange County — Carrboro

PLAN DATE:	April 2018	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER JAMES O. DEATON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

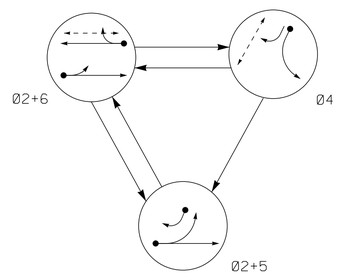
SIGNATURE — DATE

SIG. INVENTORY NO. 07-1303

04-JUN-2018 11:47
w:\ITS-Eng01\ica2018 - SIGNAL DESIGN PROJECTS\U-5846 Chapel Hill\Signal Designs\Electrical Details\U-5846 HAWK 100%\07-1303e-01-211 East.dgn
BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 3.0

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
P41,P42	DW	DW	W	DRK
P61,P62	DW	W	DW	DRK

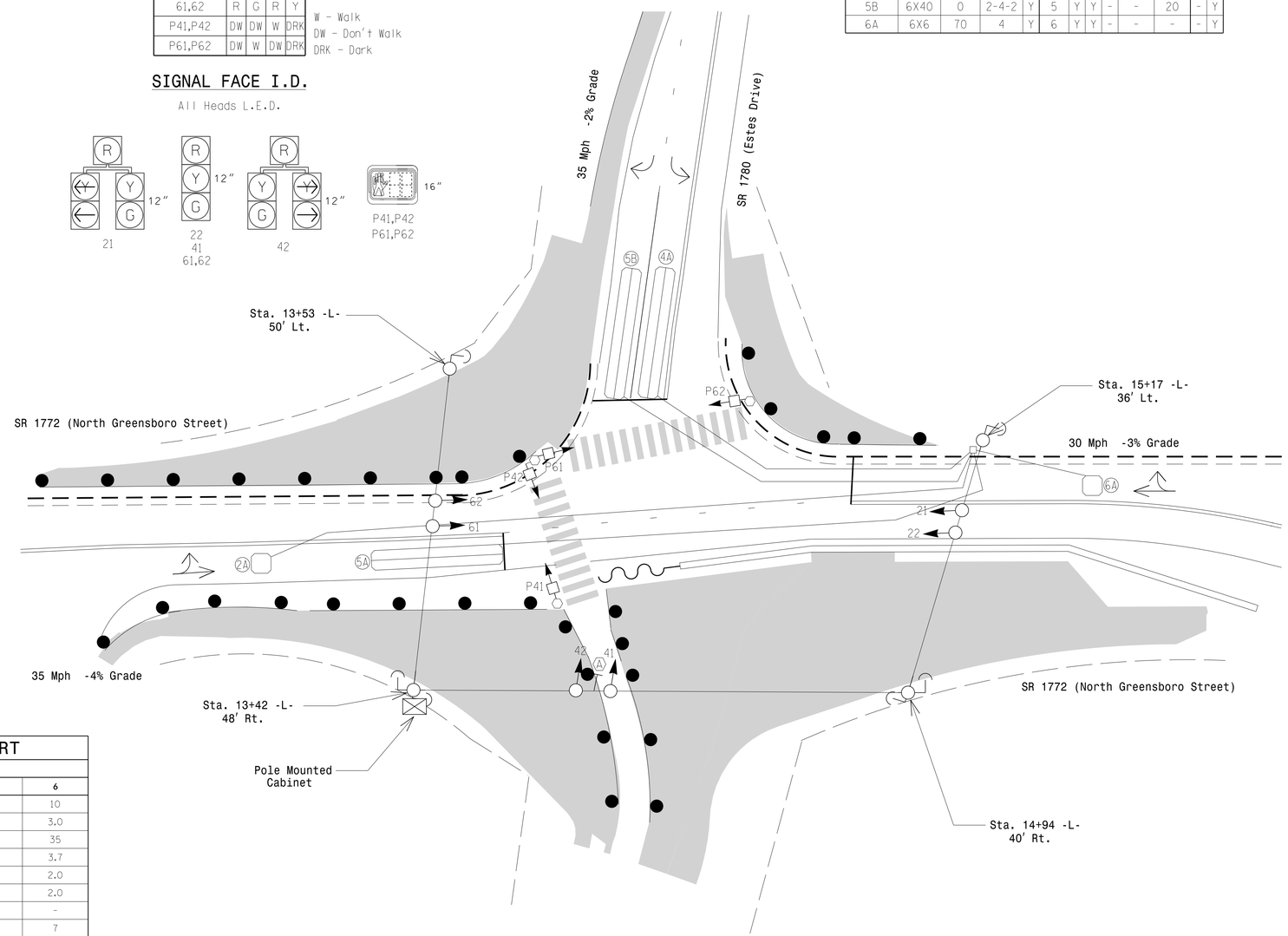
W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	6	Y	2	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	-	-	20	-	Y
					2	Y	Y	-	-	-	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	20	-	Y
6A	6X6	70	4	Y	6	Y	Y	-	-	-	-	Y



3 Phase
Fully Actuated
(Chapel Hill-Carrboro Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Abandon existing system loops S01 & S02.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
	"Turning Traffic Must Yield To Pedestrians" Sign (R10-15)	

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	10	7	7	10
Extension 1 *	3.0	2.0	2.0	3.0
Max Green 1 *	35	20	25	35
Yellow Clearance	4.1	3.0	3.0	3.7
Red Clearance	1.3	1.6	2.1	2.0
Red Revert	2.0	2.0	2.0	2.0
Leading Ped Interval	-	5	-	-
Walk 1 *	-	7	-	7
Don't Walk 1	-	8	-	12
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.

Signal Upgrade
Temporary Design 1 - TMP Phase I

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number: (919)-833-8743

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

SCALE 0 20 1"=20'

SR 1772 (North Greensboro Street)
at
SR 1780 (Estes Drive)

Division 7 Orange County Carrboro

PLAN DATE:	March 2018	REVIEWED BY:	B. Mekuria
PREPARED BY:	B.E. Wynn	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19401 BRIAN E. WYNN
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION D. MEKURIA

SIGNATURE DATE

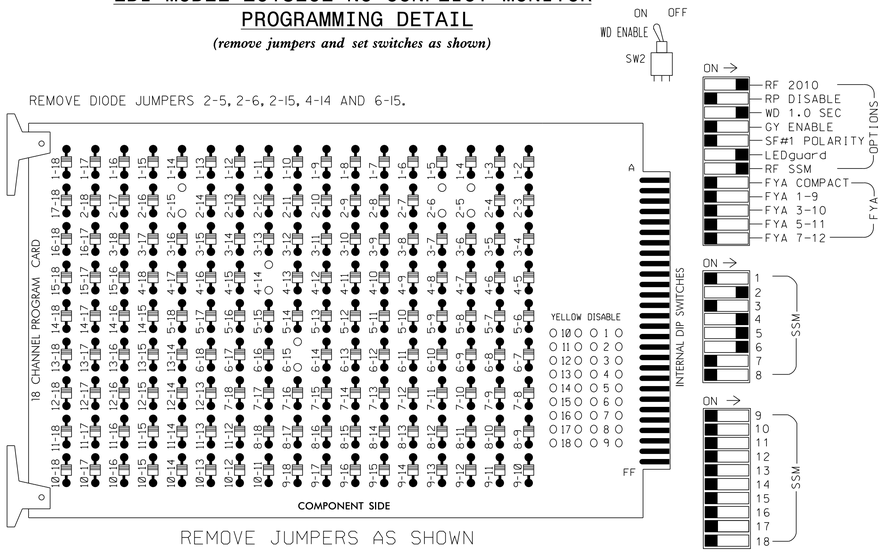
SIG. INVENTORY NO. 07-0866 TI

04-JUN-2018 11:51
W:\ODOT\Public\42018 - SIGNAL DESIGN PROJECTS\U-5846 Chapel Hill\Signal Designs\Signal Temp 1.dgn
BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 3.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phase 6 for Startup Ped Call.
5. Program Phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Chapel Hill-Carrboro Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S6,S7,S8,S9
PHASES USED.....2,4,5,6,4PED,6PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

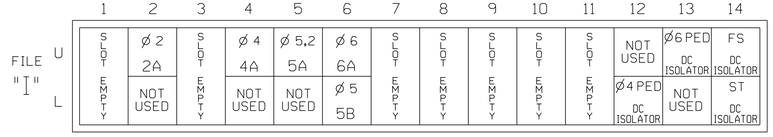
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	P41, P42	21,42	61,62	P61, P62	NU	NU	NU
RED		128			101		*	134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW							132					
GREEN ARROW							133					
✋						104			119			
🚶						106			121			

NU = Not Used

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

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			3
5A[1]	TB21-9,10	I5U	55	17	5	5	Y	Y			20
	-	-	63	25	32	2	Y	Y			
6A	TB21-11,12	I6U	40	2	6	6	Y	Y			
5B	TB23-11,12	I6L	44	6	16	5	Y	Y			20
PED PUSH BUTTONS											
P41,P42	TB24-9,10	I12L	69	31	PED 4	4 PED					
P61,P62	TB22-11,12	I13U	68	30	PED 6	6 PED					

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

[1] Add jumper from I5-F to I5-SP, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

ADVANCED WALK NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 4 for 'Advanced Walk'. Make sure the Leading Ped Interval time shown on the Signal Design plans is programmed in the 'Phase Timing' menu.

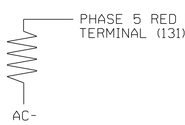
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0866T1
DESIGNED: March 2018
SEALED: TBD
REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES

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



NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
ITS & Signals Unit

Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 539-6070

Temporary Design 1 - TMP Phase 1
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1772 (North Greensboro Street)
at
SR 1780 (Estes Drive)

Division 7 Orange County Carrboro

PLAN DATE:	March 2018	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER J. O. DEATON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

SIGNATURE DATE
SIG. INVENTORY NO. 07-0866T1

04-JUN-2018 11:59
★★2400★Solid★2018 - SIGNAL DESIGN PROJECTS★U-5846 Chapel Hill★Signal Designs★Electrical Details★U-5846 HAWK 100★07-0866T1e-01-211.dgn
BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 4.0

PHASING DIAGRAM

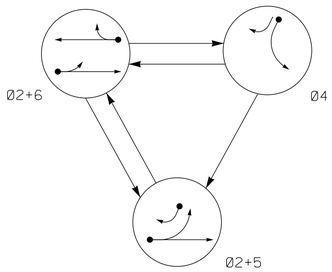


TABLE OF OPERATION

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

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	3	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	20	-	-
					2	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	20	-	-
6A	6X6	70	4	Y	6	Y	Y	-	-	-	-	-

3 Phase
Fully Actuated
(Chapel Hill-Carrboro Signal System)

NOTES

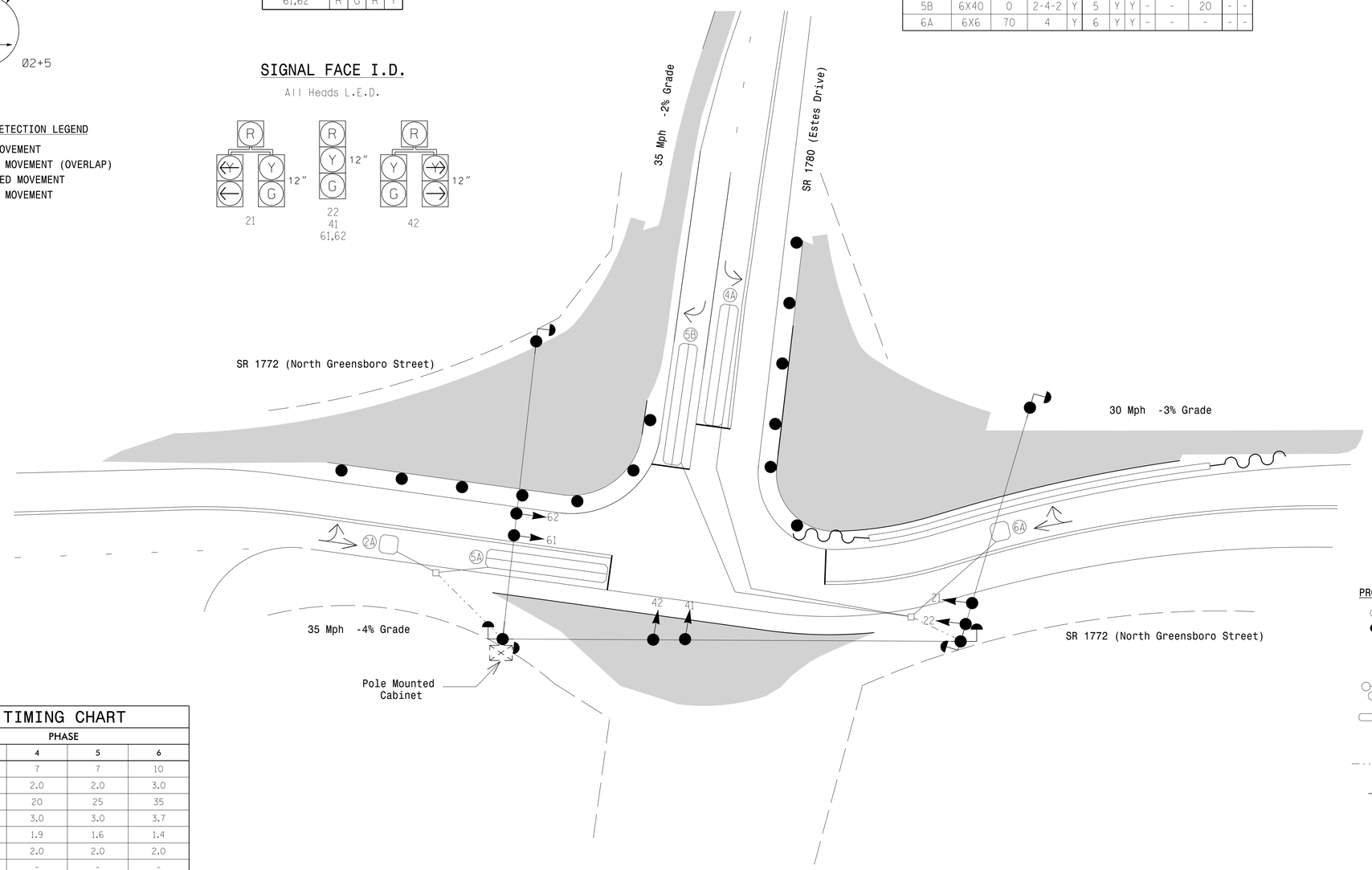
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 21,22,61&62.
5. Set all detector units to presence mode.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

SIGNAL FACE I.D.

All Heads L.E.D.

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	

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	10	7	7	10
Extension 1 *	3.0	2.0	2.0	3.0
Max Green 1 *	35	20	25	35
Yellow Clearance	4.1	3.0	3.0	3.7
Red Clearance	1.0	1.9	1.6	1.4
Red Revert	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	-	-	-	-
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.

23-MAY-2018 16:33
$$WORKDIR\mkuria$$
BMkuria
$$CHPROJ$$ ~ SIGNAL DESIGN PROJECTS$$U-5846 Chapel Hill$$Signal Designs$$Signal Temp 2.dgn

Signal Upgrade
Temporary Design 2 - TMP Phase II

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:

MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number: (919)-833-8743

Prepared for the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 20 1"=20'

SR 1772 (North Greensboro Street)
at
SR 1780 (Estes Drive)

Division 7 Orange County Carrboro

PLAN DATE:	March 2018	REVIEWED BY:	B. Mekuria
PREPARED BY:	B.E. Wynn	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19 B. D. MEKURIA

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

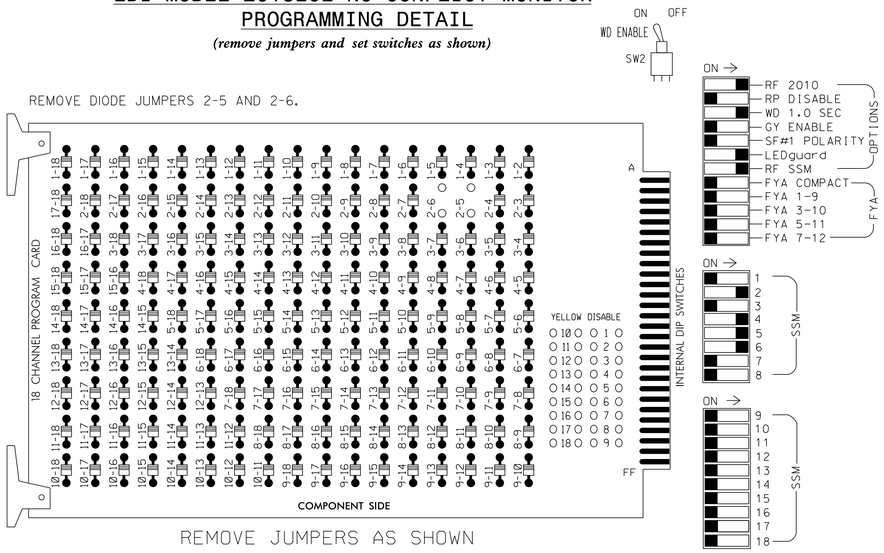
SIGNATURE DATE

SIG. INVENTORY NO. 07-0866 T2

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 4.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program Phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Chapel Hill-Carrboro Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S7,S8
PHASES USED.....2,4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

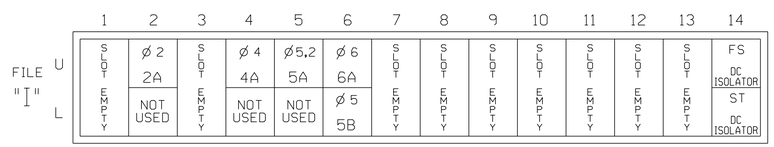
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	21,42	61,62	NU	NU	NU	NU
RED		128			101		*	134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW							132					
GREEN ARROW							133					

NU = Not Used

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

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			3
5A[1]	TB21-9,10	I5U	55	17	5	5	Y	Y			20
	-	-	63	25	32	2	Y	Y			
6A	TB21-11,12	I6U	40	2	6	6	Y	Y			
5B	TB23-11,12	I6L	44	6	16	5	Y	Y			20

[1]Add jumper from I5-F to I5-SP, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

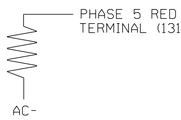
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0866T2
DESIGNED: March 2018
SEALED: TBD
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1772 (North Greensboro Street)
at
SR 1780 (Estes Drive)

Division 7 Orange County Carrboro

PLAN DATE:	March 2018	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER J. O. DEATON — PRELIMINARY PLANS NOT FOR CONSTRUCTION

SIGNATURE DATE

SIG. INVENTORY NO. 07-0866T2

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

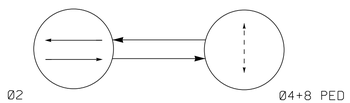
Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 539-6070

NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
ITS & Signals Unit

04-JUN-2018 12:04
★★2400★QUALCOMM18 — SIGNAL DESIGN PROJECTS★U-5846 Chapel Hill★Signal Designs★Electrical Details★U-5846 HAWK 100W07-086612e-01-211.dgn
BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 5.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE: Ø2 DARK	ACTIVATION	STEADY YELLOW	ALL RED	Ø4+8 PED WALK	Ø4+8 PED CLEAR	FLASH
21, 22	DRK	FY	Y	R	R	FR*	Y
23, 24	DRK	FY	Y	R	R	FR*	Y
P41, P81	DW	DW	DW	DW	W	DW	DRK

* ALTERNATING FLASH

Y - Steady Yellow
FY- Flashing Yellow
R- Steady Red
FR- Flashing Red
W - Walk
DW - Don't Walk
DRK - Dark

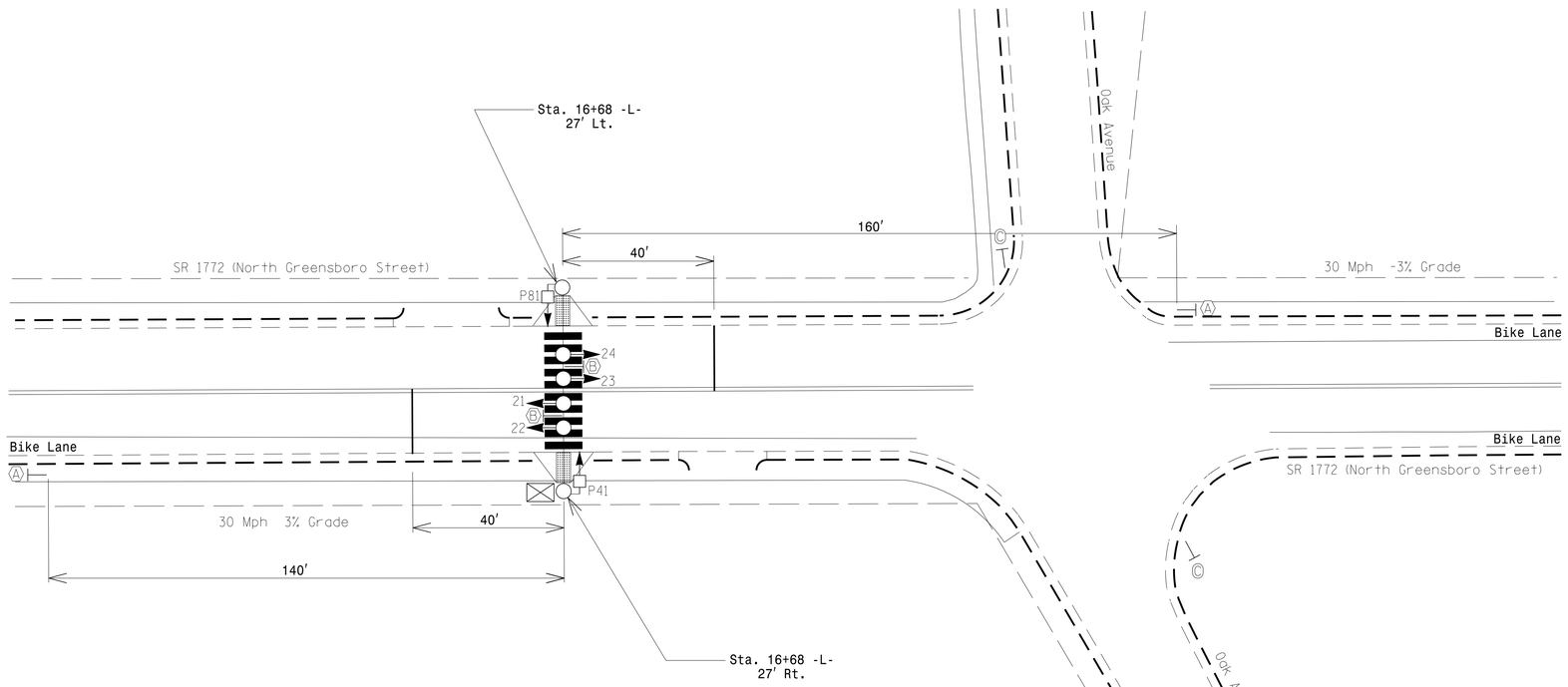
SIGNAL FACE I.D.

All Heads L.E.D.

2 Phase
Semi-Actuated
Pedestrian Hybrid Beacon
(Chapel Hill-Carrboro Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
3. Enable Ped Yellow Clear for phase 4 PED.
4. Locate Pedestrian and Crosswalk advanced warning signs in accordance with Table 2C-4 in Section 2C.05 of the 2009 MUTCD or as otherwise directed by the engineer.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	4	8	OLA
Min Green 1 *	10	7	7	5
Extension 1 *	0.0	0.0	0.0	
Max Green 1 *	35	-	-	
Yellow Clearance	5.0	3.0	3.0	5.0
Red Clearance	1.0	0.0	0.0	5.0
Walk 1 *	-	7	7	
Don't Walk 1	-	10	10	
Seconds Per Actuation *	-	-	-	
Max Variable Initial *	-	-	-	
Time Before Reduction *	-	-	-	
Time To Reduce *	-	-	-	
Minimum Gap	-	-	-	
Recall Mode	MAX RECALL	-	-	
Vehicle Call Memory	-	-	-	
Dual Entry	-	-	-	
Simultaneous Gap	ON	ON	ON	

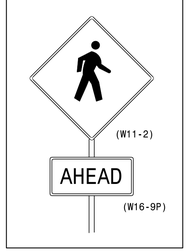
Serves as Flashing Yellow Time

Serves as Steady Yellow Clearance Time

Serves as AllRed Clearance Time

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

Figure 1



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Pedestrian Warning Sign (W11-2) with "AHEAD" Plaque (W16-9P) (See Figure 1)	Ⓐ
Ⓑ	"CROSSWALK-STOP ON RED" Sign (R10-23)	Ⓑ
Ⓒ	"STOP" Sign	Ⓒ

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:

MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number: (919)-833-8743

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 20
1"=20'

Pedestrian Hybrid Beacon
SR 1772 (North Greensboro St.)
West of Oak Ave.

Division 7 Orange County Carrboro

PLAN DATE: April 2018	REVIEWED BY: B. Mekuria
PREPARED BY: B.E. Wynn	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19811 BRIAN E. WYNN
PRELIMINARY PLANS
NOT FOR CONSTRUCTION
B. MEKURIA

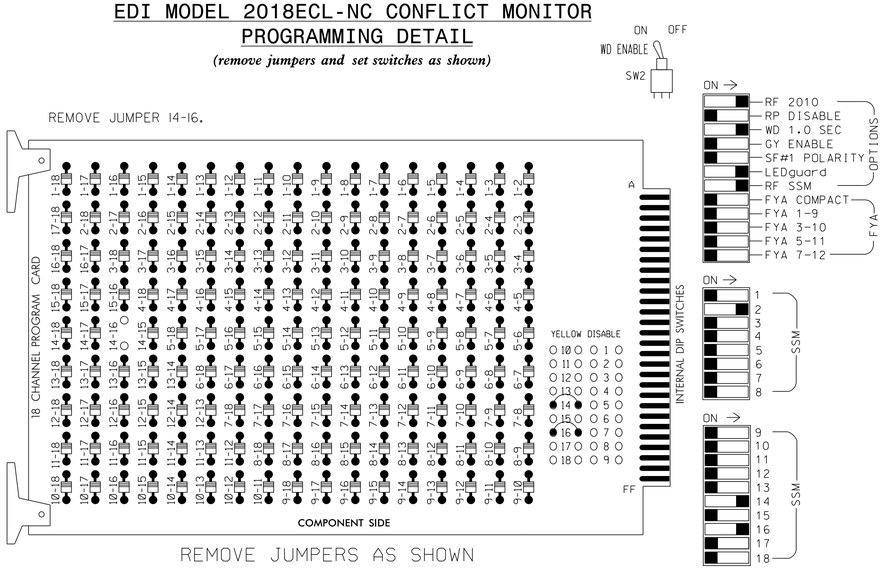
SIGNATURE DATE

SIG. INVENTORY NO. 07-1304

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 5.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.
5. BE SURE TO INSTALL YELLOW DISABLE JUMPER FOR CHANNELS 14 (4 PED) AND 16 (8PED).

NOTES

1. Insert yellow flash program blocks for phases 1 and 2. Insert red flash program blocks for all remaining unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phase 2 for Startup In Green.
3. Program phases 4 and 8 for Startup Ped Call.
4. Program Phase 2 for Yellow Flash.
5. Program Phases 4 and 8 for Ped Yellow Clear.
6. The cabinet and controller are part of the Chapel Hill-Carrboro Signal System.

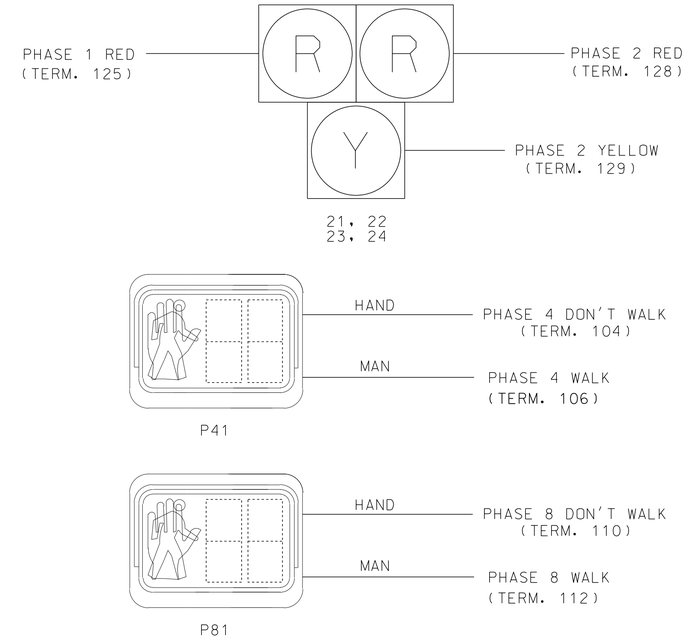
EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S6,S12
PHASES USED.....2,4*,8*,4PED,8PED
OVERLAP "A".....2**
OVERLAP "B".....NONE
OVERLAP "C".....NONE
OVERLAP "D".....NONE

* Phase used for timing purposes only.
** Used to control clearance intervals.

SIGNAL HEAD WIRING DETAIL

(wire signal heads as shown)



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	NOT USED	NOT USED	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	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

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
PED PUSH BUTTONS											
P41	TB8-5,6	I12L	69	31	PED 4	4/8 PED	*				
P81	TB8-8,9	I13L	70	32	PED 8	4/8 PED	*				

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

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

* See Pedestrian Detector Programming Detail on Sheet 3.

OPERATIONAL NOTES

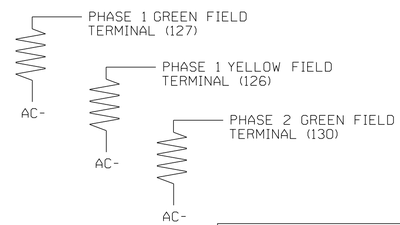
1. In order for controller to perform the "Pedestrian Hybrid Beacon" (aka. HAWK signal) sequence, special logic and output programming is necessary. See programming details on sheet 2 of this electrical detail.
2. This sequence uses PHASE 2 YELLOW to produce "flashing yellow clearance" and also uses overlap "A" assigned as phase 2 to provide "steady yellow" clearance interval. Time for this interval shall be implemented in "OL A YELLOW CLEAR" timing. See signal plan for timing.
3. Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal. This is necessary so that when flashing yellow clear ends, the steady yellow clear begins.
4. Phases 4 and 8 RED CLEAR times must be set to 0.0 sec.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1304
DESIGNED: April 2018
SEALED: TBD
REVISED: N/A

ELECTRICAL AND PROGRAMMING DETAIL FOR PEDESTRIAN HYBRID BEACON ("HAWK") SIGNAL

Electrical Detail — Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Pedestrian Hybrid Beacon
SR 1772 (North Greensboro St.)
West of Oak Ave.

Division 7 — Orange County — Carrboro

PLAN DATE:	April 2018	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for the Offices of: Mobility and Safety Division, Signals Management Section, Traffic Engineering Branch, Division of Highways, N.C. Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026161 J. O. DEATON — PRELIMINARY PLANS NOT FOR CONSTRUCTION

SIGNATURE — DATE
SIG. INVENTORY NO. 07-1304

NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
ITS & Signals Unit

Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 539-6070

04-JUN-2018 12:17
★★★DGN Model:2018 - SIGNAL DESIGN PROJECTS★U-5846 Chapel Hill★Signal Designs★Electrical Details★U-5846 HAWK 100★07-1304e-01-211 West.dgn
BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 5.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL PEDESTRIAN HYBRID BEACON 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  PED CLEAR ON PHASE #4  IS ON
AND OUTPUT  ASSIGNMENT #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #11 OFF
```

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  PED CLEAR ON PHASE #4  IS ON
AND OUTPUT  ASSIGNMENT #1  IS OFF

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #14 OFF
```

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  VEH CALL ON PHASE  #4  IS ON

SCROLL DOWN

THEN:
SET INPUT  ASSIGNMENT  #31 ON
```

NOTE: LOGIC TO ENSURE THAT PHASE 4 PED IS ALWAYS SERVED WITH PHASE 4 VEHICLE.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

I/O REFERENCE SCHEDULE

OUTPUT 1 = PHASE 4 DON'T WALK
OUTPUT 4 = PHASE 4 YELLOW
OUTPUT 11 = OLA RED
OUTPUT 14 = OLA RED (DUPLICATE)
INPUT 31 = PHASE 4 PED CALL

OUTPUT REMAPPING DETAIL FOR
SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "11"

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
OUTPUT ASSIGNMENT #................11
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................
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.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE.
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
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' KEY AFTER INPUTING DATA.
THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY TO ADVANCE TO OUTPUT 12

```
PAGE:1  C1 PIN:13  VEHICLE PHASE
OUTPUT ASSIGNMENT #................12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH).............1
SELECT ASSIGNMENT:
NOT ENABLED........................
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.........................
```

MODIFY DATA AS SHOWN TO MAKE OUTPUT 12 A FLASHING OUTPUT

NOTE: THIS MODIFIES THE PHASE 2 YELLOW LOAD SWITCH DRIVER TO FLASH. WHICH WILL PROVIDE THE FLASHING YELLOW CLEARANCE INTERVAL.

PRESS "+" KEY TWICE TO ADVANCE TO OUTPUT 14

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
OUTPUT ASSIGNMENT #................14
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.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE.
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
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' KEY AFTER INPUTING DATA.
THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S1 RED.

PRESS "+" KEY TO MULTIPLE TIMES TO ADVANCE TO OUTPUT 51

CHANGE C1 PIN NUMBER FROM 98 TO 13 AS SHOWN

```
PAGE:1  C1 PIN:13  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................51
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................
VEHICLE PHASE......................
PEDESTRIAN PHASE...................
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................Y
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: THIS CHANGE REMAPS THE OVERLAP "A" YELLOW DRIVER TO THE SAME PIN AS PHASE 2 YELLOW. WHICH WILL PROVIDE THE OUTPUT FOR THE STEADY YELLOW CLEARANCE.

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1304
DESIGNED: April 2018
SEALED: TBD
REVISED: N/A

Electrical Detail — Sheet 2 of 3

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NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
ITS & Signals Unit

Prepared in the Offices of:
MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 539-6070

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

Pedestrian Hybrid Beacon
SR 1772 (North Greensboro St.)
West of Oak Ave.

Division 7 — Orange County — Carrboro

PLAN DATE:	April 2018	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

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SIGNATURE — DATE

SIG. INVENTORY NO. 07-1304

04-JUN-2018 12:20
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BMekuria

PROJECT REFERENCE NO.	SHEET NO.
U-5846	Sig. 5.3

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:              ¦123456789101112131415 16
VEH OVL PARENTS:¦ X
VEH OVL NOT VEH:¦
VEH OVL NOT PED:¦
VEH OVL GRN EXT:¦ X
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........5
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..5.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...5.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE TIMING INTERVALS

OVERLAP PROGRAMMING COMPLETE

PEDESTRIAN DETECTOR ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS). PRESS '+' UNTIL PED DETECTOR #4 IS REACHED.

```
PED DETECTOR #4  SETTINGS   (+/- DET)
PHASE#           ¦123456789101112131415 16
PHASES ASSIGNED ¦   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................Y
ENABLE DIAGNOSTICS.................N
RECALL IF FAILED...................Y
MAX CALLS/MINUTE (0-255)...........255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%)...........100
```

PRESS '+' UNTIL PED DETECTOR #8 IS REACHED.

```
PED DETECTOR #8  SETTINGS   (+/- DET)
PHASE#           ¦123456789101112131415 16
PHASES ASSIGNED ¦   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................Y
ENABLE DIAGNOSTICS.................N
RECALL IF FAILED...................Y
MAX CALLS/MINUTE (0-255)...........255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%)...........100
```

PROGRAMMING COMPLETE

TIMING INTERVAL SCHEDULE

PHASE 2 YELLOW CLEAR TIME = FLASHING YELLOW CLEARANCE INTERVAL
OVERLAP "A" YELLOW CLEAR TIME = STEADY YELLOW CLEARANCE INTERVAL
OVERLAP "A" RED CLEAR TIME = ALL RED CLEARANCE INTERVAL

NOTE: Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal.

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: 07-1304
DESIGNED: April 2018
SEALED: TBD
REVISED: N/A

NC Dept of Transportation
Division of Highways
Final Drawing Date: _____
_____
ITS & Signals Unit

Prepared in the Offices of:

MEKURIA ENGINEERING, INC
P. O. Box 10505
Raleigh, North Carolina 27605
Phone Number (919) 539-6070

Electrical Detail — Sheet 3 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

Transportation Mobility and Safety Division of NORTH CAROLINA — DIVISION OF TRANSPORTATION — Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

Pedestrian Hybrid Beacon
SR 1772 (North Greensboro St.)
West of Oak Ave.

Division 7 — Orange County — Carrboro

PLAN DATE:	April 2018	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER JAMES O. DEATON — PRELIMINARY PLANS NOT FOR CONSTRUCTION

SIGNATURE — DATE

SIG. INVENTORY NO. 07-1304

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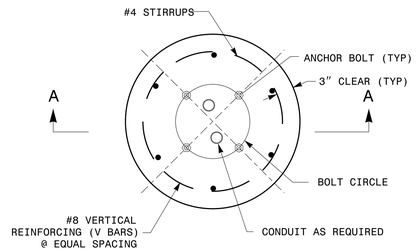
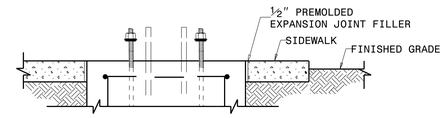
PROJECT NO.	SHEET NO.
	Sig.



PEDESTAL FOUNDATION - PLAN VIEW

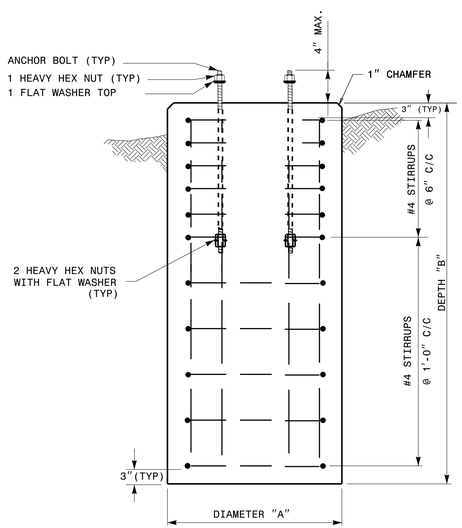


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK

NOTES:

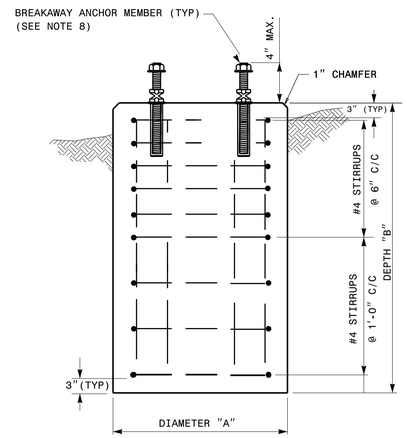
1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF F'c= 3000 PSI (MIN.).
4. USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
5. GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
   A. SANDY TYPE SOIL
   B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
   C. WIND SPEED NOT TO EXCEED 140 MPH

   IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
6. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
7. ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
8. USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4½" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6⅝". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



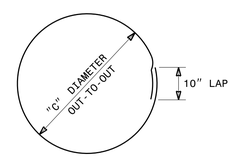
TYPES I, II & III

SECTION A-A

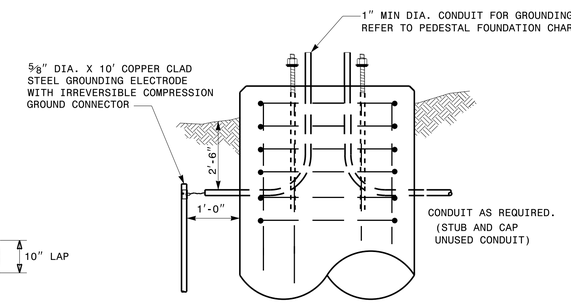


TYPES I & II ONLY

SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	½	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	¾	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

REINFORCING STEEL SCHEDULE

TYPE	V-BAR				STIRRUP								TOTAL STEEL WEIGHT LBS
	SIZE #	QTY	LENGTH	WEIGHT LBS	SIZE #	QUANTITY VERTICAL SPACING ON 6" CENTERS	QUANTITY VERTICAL SPACING ON 12" CENTERS	QUANTITY TOTAL	LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

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

1-18

ENGLISH STANDARD DRAWING FOR
PEDESTALS
FOUNDATIONS

SHEET 1 OF 1

1743D01

See Plate for Title

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Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

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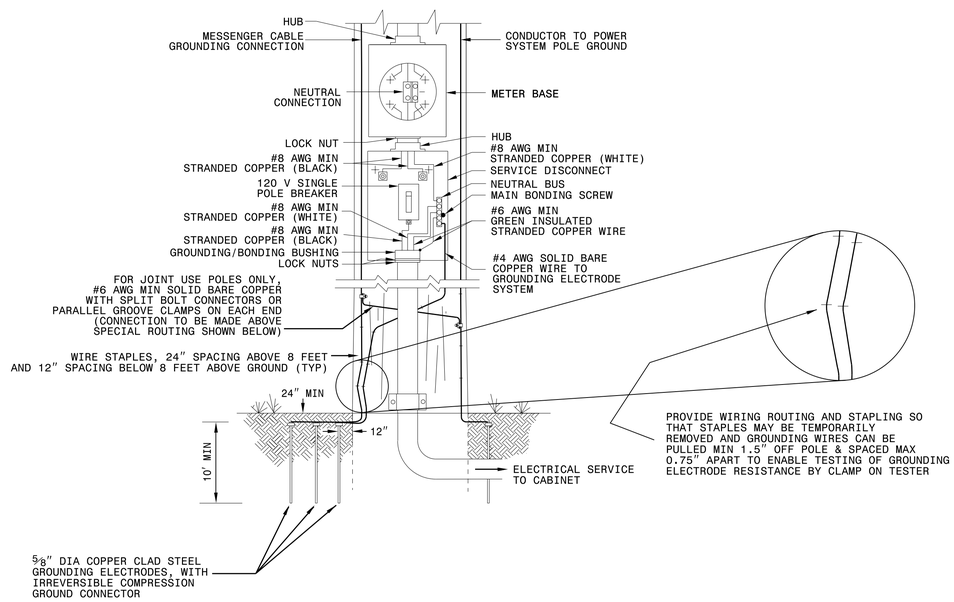


1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

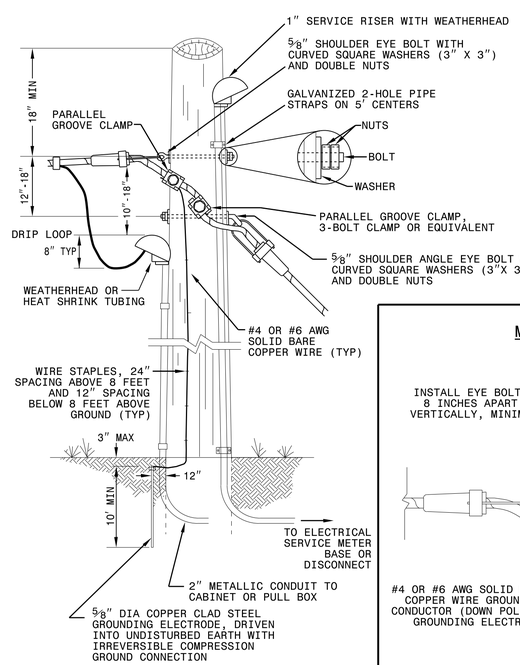
ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

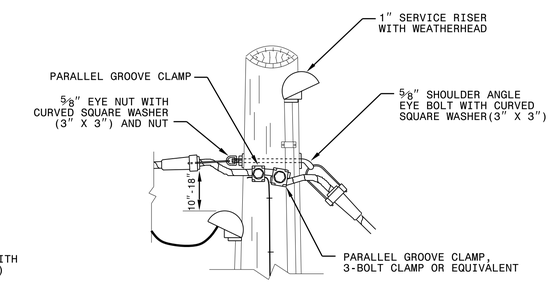
SHEET 1 OF 1

1700D01

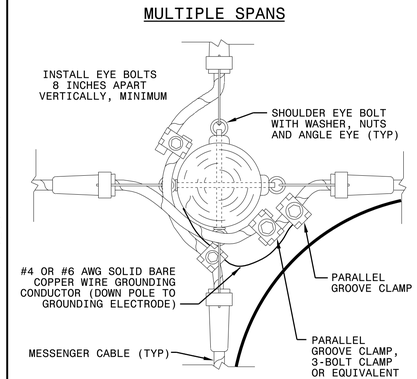
TWO-BOLT METHOD (PREFERRED)



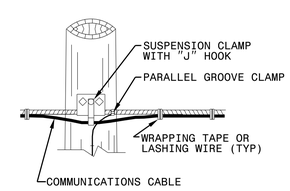
ONE-BOLT METHOD



MULTIPLE SPANS



COMMUNICATIONS CABLE AT INTERMEDIATE POLE



NOTE

FOR CONNECTING MESSENGER TO MESSENGER, USE PARALLEL GROOVE CLAMP, 3-BOLT CLAMP OR EQUIVALENT. FOR CONNECTING COPPER WIRE TO MESSENGER, USE PARALLEL GROOVE CLAMP.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

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750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032108 ENGINEER MOHD A. ASLAMI

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