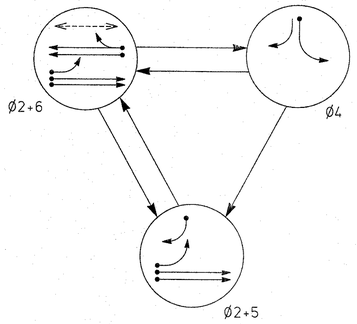
PROJECT REFERENCE NO.	SHEET NO.
	SIG. 1

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

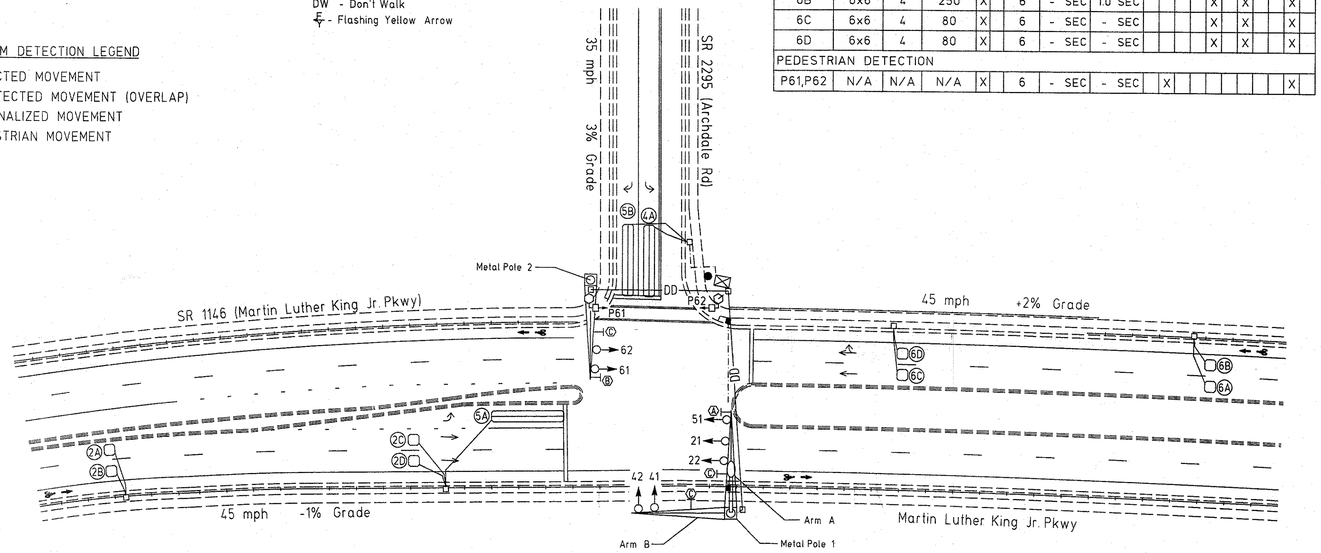
TABLE OF OPERATION

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

DRK - Dark Signal Face
W - Walk
DW - Don't Walk
F Y - Flashing Yellow Arrow

2070E LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING														
							TIMING		ATTRIBUTES 1	2	3	4	5	6	7	8	SYSTEM LOOPS	STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	NEMA PHASE	DELAY	CARRY (STRETCH)	FAIL TIME DELAY	FUTURE USE	RECALL	RESERVED	COUNT	EXTENDED	TYPE 3	CALLING		NEW	EXISTING
2A	6x6	4	250	X		2	- SEC	1.0 SEC						X		X			X
2B	6x6	4	250	X		2	- SEC	1.0 SEC						X		X			X
2C	6x6	4	80	X		2	- SEC	- SEC						X		X			X
2D	6x6	4	80	X		2	- SEC	- SEC						X		X			X
4A	6x40	2-4-2	0	X		4	- SEC	- SEC						X		X			X
5A	6x40	2-4-2	0	X		5	10 SEC	- SEC						X		X			X
						2	- SEC	- SEC						X		X			X
5B	6x40	2-4-2	0	X		5	15 SEC	- SEC						X		X			X
						4	15 SEC	- SEC								X			X
6A	6x6	4	250	X		6	- SEC	1.0 SEC						X		X			X
6B	6x6	4	250	X		6	- SEC	1.0 SEC						X		X			X
6C	6x6	4	80	X		6	- SEC	- SEC						X		X			X
6D	6x6	4	80	X		6	- SEC	- SEC						X		X			X
PEDESTRIAN DETECTION																			
P61,P62	N/A	N/A	N/A	X		6	- SEC	- SEC		X								X	



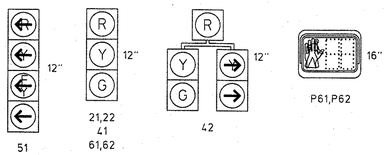
2070E TIMING CHART

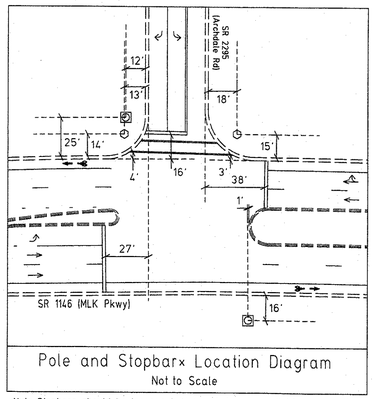
PHASE	Ø2	Ø4	Ø5	Ø6
MINIMUM INITIAL×	12 SEC	7 SEC	7 SEC	12 SEC
VEHICLE EXTENSION×	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC
YELLOW CHANGE INTERVAL	4.6 SEC	3.0 SEC	3.0 SEC	4.6 SEC
RED CLEARANCE	1.3 SEC	2.6 SEC	2.8 SEC	1.3 SEC
MAXIMUM LIMIT×	60 SEC	45 SEC	30 SEC	60 SEC
RECALL POSITION	VEH RECALL	NONE	NONE	VEH RECALL
VEHICLE CALL MEMORY	YELLOW LOCK	NONE	NONE	YELLOW LOCK
DOUBLE ENTRY	OFF	OFF	OFF	OFF
WALK×	- SEC	- SEC	- SEC	7 SEC
FLASHING DON'T WALK	- SEC	- SEC	- SEC	12 SEC
TYPE 3 LIMIT	- SEC	- SEC	- SEC	- SEC
ADD PER VEHICLE×	- SEC	- SEC	- SEC	- SEC
MAXIMUM INITIAL×	- SEC	- SEC	- SEC	- SEC
MAXIMUM GAP×	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC
REDUCE 0.1 SEC EVERY×	- SEC	- SEC	- SEC	- SEC
MINIMUM GAP×	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC

× 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 FACE I.D.

All Heads L.E.D.





Pole and Stopbar× Location Diagram
Not to Scale

×Note: Stopbars should be located 4 feet behind and parallel to crosswalks.

3 Phase
Fully Actuated
(Durham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: http://www.ncdot.org/doh/preconstruct/traffic/itss/
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Program all timing information into phase banks 1, 2 and 3 unless otherwise noted.
6. Set phase bank 3 maximum limit to 250 seconds for phases used.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to count down the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Install backplates for signal heads numbered 21, 22, 51, 61 and 62.
11. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
12. If necessary, use optically programmed heads for the westbound direction.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
⊣	Sign	⊣
⊡	Pedestrian Signal Head With Push Button & Sign	■
◁▭	Metal Pole with Mastarm	◁▭
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Pull Box	■
----------	2 in. Underground Conduit	----------
DD	Directional Drill	N/A
→	Directional Arrow	→
⊸	Luminaire on Metal Pole	▬
⬡	Signal Pedestal	⬢
N/A	Guardrail	~~~~~
▬	Stop Bar	▬
◭	Wheelchair Ramp	◭
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ
Ⓑ	No U-Turn Sign (R3-4)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FINAL DRAWING Date: 11/13/13
R. W. Hess
Traffic Engineering Branch

NEW SIGNAL

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

DURHAM
1869
City of Durham
City of Durham
101 City Hall Plaza
Durham, NC 27701
(919) 560-4366

SCALE 0 40 1" = 40'

SR 1146 (Martin Luther King Jr. Parkway) at SR 2295 (Archdale Road)

DIVISION 5 DURHAM COUNTY DURHAM

PLAN DATE: JUNE 2013 REVIEWED BY: P NICHOLAS
PREPARED BY: L TRACEY REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038734 ENGINEER LESLIE M. TRACEY

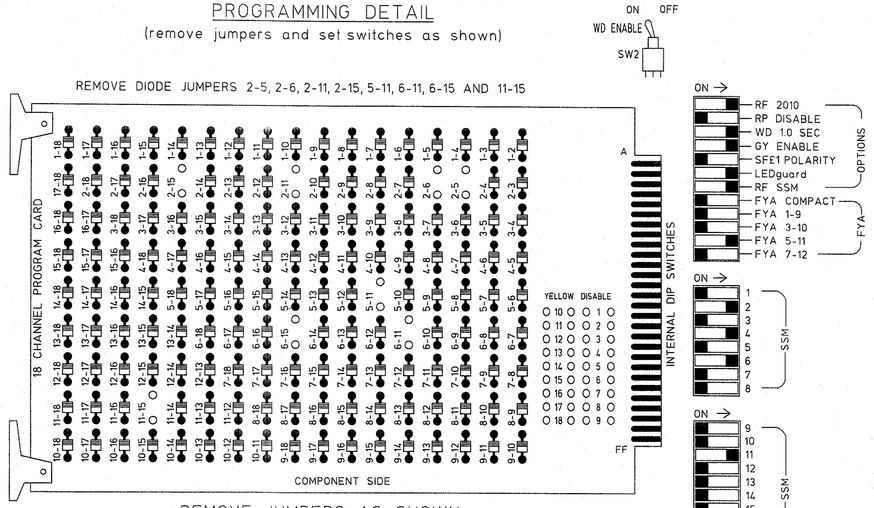
SIGNATURE DATE 9-19-13

SIG. INVENTORY NO. 05-0052

PROJECT REFERENCE NO.	SHEET NO.
	SIG. 2

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. 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. Ensure conflict monitor communicates with 2070 controller.

■ = 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. Program controller to start up in phases 2 and 6 green.
3. Program phase 6 for "STARTUP PED CALL."
4. Set power-up flash time to 0 seconds within the controller programming. The conflict monitor will govern start-up flash time. Ensure STARTUP "RED START" is set to 0 seconds.
5. Enable simultaneous gap-out feature, on the controller unit, for all phases.
6. Set the Red Revert interval, on the controller unit, to 1 second.
7. Ensure start up flash phases are coordinated with flash program block assignments.
8. This controller and cabinet are to be programmed and wired to be a part of the Durham Computerized Signal System. The Contractor is responsible for the proper interconnection of this signal within the system.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....McCAIN 2033×
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS.....18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S5,S7,S8,S9,AUX S4
PHASES USED.....2,4,5,6,6PED
OVERLAPS.....NONE

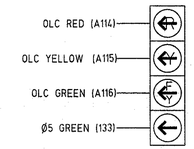
×Software to be supplied by City of Durham.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51 ★	42	61,62	P61 P62	NU	NU	NU	NU	NU	NU	51 ★	NU	NU
RED		128			101				134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW																	A114		
YELLOW ARROW								132									A115		
FLASHING YELLOW ARROW																	A116		
GREEN ARROW							133	133											
✋										119									
🚶										121									

NU = Not Used
★ See pictorial of head wiring in detail below.

4-SECTION FYA WIRING DETAIL



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	ø2 2C	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		ø2 2B	ø2 2D			NOT USED							NOT USED	ST DC ISOLATOR
FILE "J"	U	ø5,2 5A	ø6 6A	ø6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø5,4 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B	ø6 6D						NOT USED					

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	DETECTOR NO.	PIN NO.	ATTRIBUTES	NEMA PHASE
2A	TB2-5,6	I2U	1	39	5, 7	2
2B	TB2-7,8	I2L	5	43	5, 7	2
2C	TB2-9,10	I3U	21	63	5, 7	2
2D	TB2-11,12	I3L	29	76	5, 7	2
4A	TB4-9,10	I6U	3	41	5, 7	4
5A	TB3-1,2	J1U	13	55	5, 7	5
			9	55	5, 7	2
5B	TB7-9,10	J9U	17	59	5, 7	5
			11	59	7	4
6A	TB3-5,6	J2U	2	40	5, 7	6
6B	TB3-7,8	J2L	6	44	5, 7	6
6C	TB3-9,10	J3U	22	64	5, 7	6
6D	TB3-11,12	J3L	30	77	5, 7	6
PEDESTRIAN PUSHBUTTONS						
P61,P62	TB8-7,9	I13U	26	68	2	6

NOTE: Program detector delay and carryover times as specified on signal design plans.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

DETECTOR ATTRIBUTES LEGEND:
1-FULL TIME DELAY
2-PED CALL
3-RESERVED
4-COUNTING
5-EXTENSION
6-TYPE 3
7-CALLING
8-ALTERNATE

FLASHING YELLOW ARROW PROGRAMMING

1. PROGRAM FLASHING YELLOW ARROW PHASES AS FOLLOWS:
Main Menu > (1) PHASE > (2) PHASE FUNCTIONS PAGE TWO
PPLT FYA = ø5
2. ASSIGN OUTPUT PIN FOR FLASHING YELLOW ARROW AS FOLLOWS:
Main Menu > (6) OUTPUTS > (F) FYA PPLT
Phase 5 = 90
3. REDIRECT RED AND YELLOW OUTPUTS FOR THE LEFT TURN PHASES AS FOLLOWS:
Main Menu > (6) OUTPUTS > (8) REDIRECT PHASE
Phase 5 RED = 88, Phase 5 YELLOW = 89

PEDESTRIAN PHASE PROGRAMMING

PROGRAM PEDESTRIAN OUTPUT 6P AS FOLLOWS:
Main Menu > (6) OUTPUTS > (7) PEDS
PED 6P = ø6

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:	05-0052
DESIGNED:	June 2013
SEALED:	Sept. 19, 2013
REVISED:	

SIGNAL SYSTEM DATA:	
Drop	21
Area	3
Area Address	107
Comm Channel	C-4

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FINAL DRAWING OK: 11/13/13
R.W. Nash
Traffic Engineering Branch

DURHAM
1869 CITY OF MEDICINE
City of Durham
101 City Hall Plaza
Durham, NC 27701
(919) 560-4366

NEW SIGNAL

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 Greenfield Pkwy, Garner, NC 27529

SR 1146 (Martin Luther King Jr. Parkway) at SR 2295 (Archdale Road)

DIVISION 5 DURHAM COUNTY DURHAM

PLAN DATE:	JUNE 2013	REVIEWED BY:	P NICHOLAS
PREPARED BY:	L TRACEY	REVIEWED BY:	

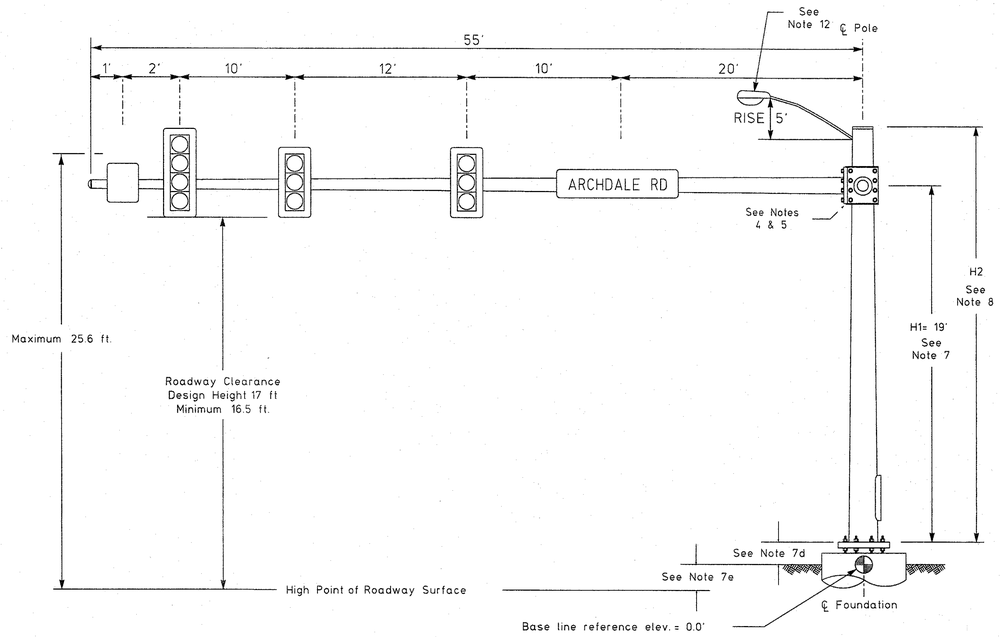
REVISIONS	INT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038734 ENGINEER LESLIE M. TRACEY

SIGNATURE 10-24-13 DATE

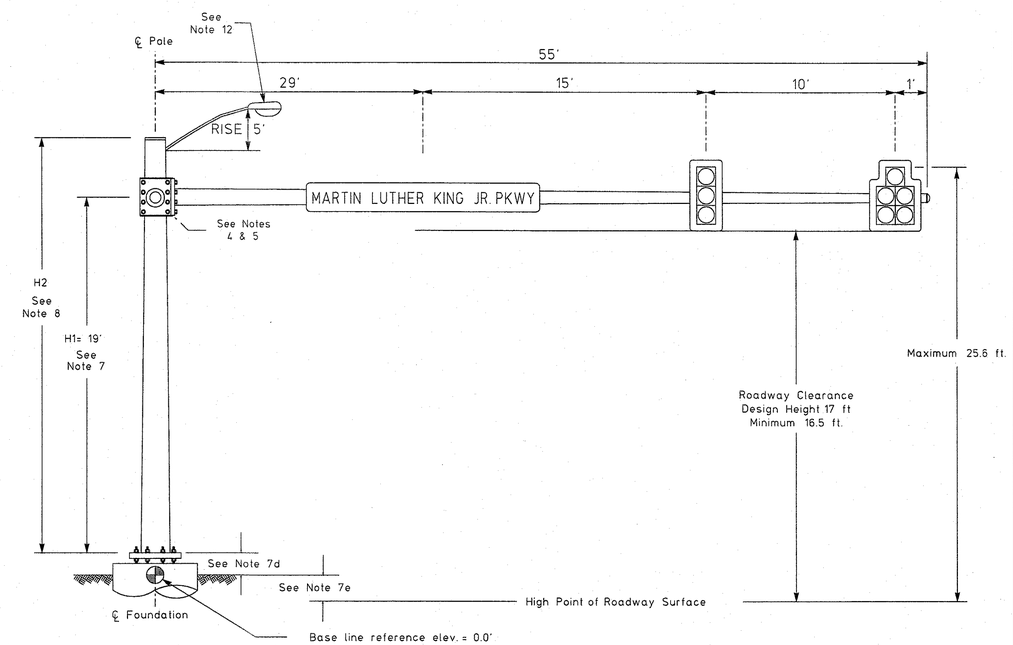
SIG. INVENTORY NO. 05-0052

Design Loading for METAL POLE NO. 1, MAST ARM A



Elevation View at 270°

Design Loading for METAL POLE NO. 1, MAST ARM B



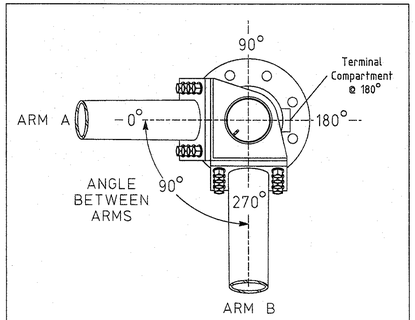
Elevation View at 0°

SPECIAL NOTE

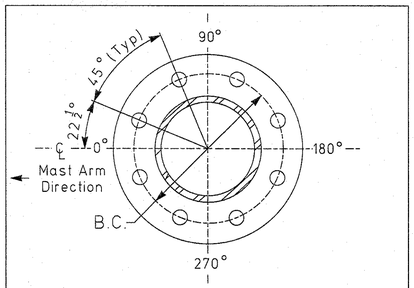
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at ℄ Foundation at ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	1.0 ft.	1.0 ft.
Elevation difference at Edge of travelway or face of curb	-1.0 ft.	-1.0 ft.

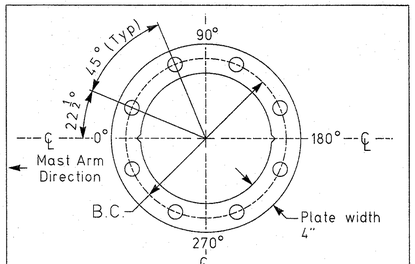


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-5 SECTION-WITH BACKPLATE AND ASTRO-BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	5.0 S.F.	24.0" W X 30.0" L	11 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS
	LUMINAIRE (Power Door Cobrahead) AEL ROADWAY SERIES 325	6.4 S.F.	22.0" W X 42.0" L	43 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 5th Edition 2009 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2012 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Structural Engineer for assistance at (919) 773-2800.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.
12. The Contractor shall verify luminaire mounting height before preparing shop drawings.

NCDOT Wind Zone 4 (90 mph)

NCDOT DEPARTMENT OF TRANSPORTATION
Performance Based Roadway Lighting
FINAL DRAWING Date: 11/13/13
R. W. Mark
Traffic Engineering Branch

Prepared in 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

SR 1146 (Martin Luther King Jr. Parkway) at SR 2295 (Archdale Road)

PLAN DATE: JUNE 2013	REVIEWED BY: P NICHOLAS
PREPARED BY: L TRACEY	REVIEWED BY:

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038734 ENGINEER LESLIE M. TRACEY

Leslie M. Tracey 9-19-13
SIGNATURE DATE

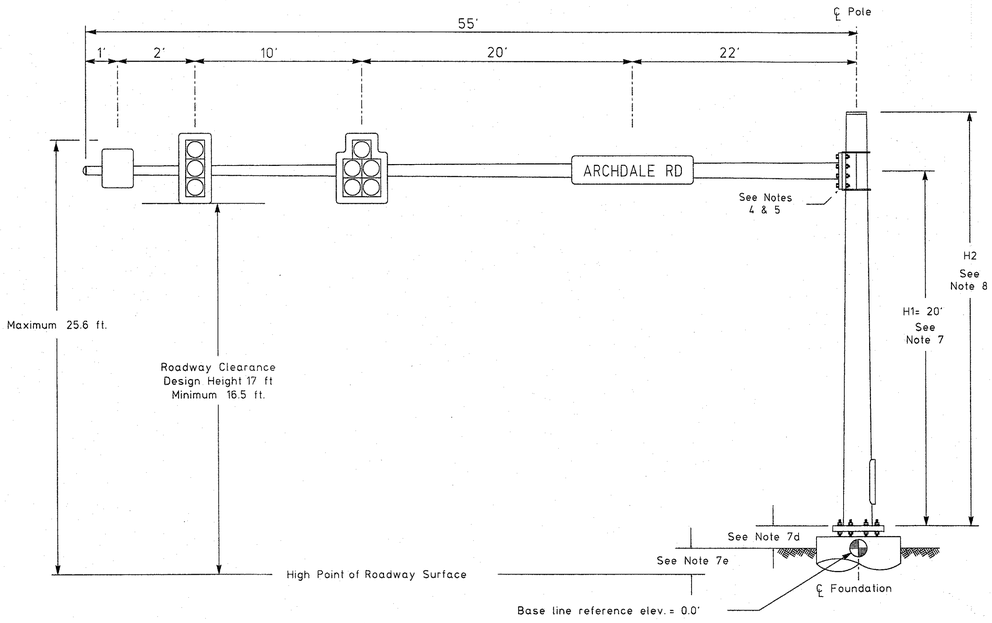
SIG. INVENTORY NO. 05-0052

CCCLUSERNAMECCCC

METAL POLE No. 2

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 4

Design Loading for METAL POLE NO. 2



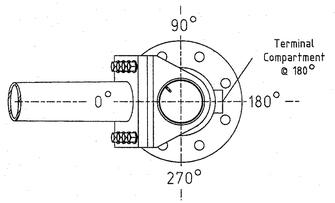
Elevation View

SPECIAL NOTE

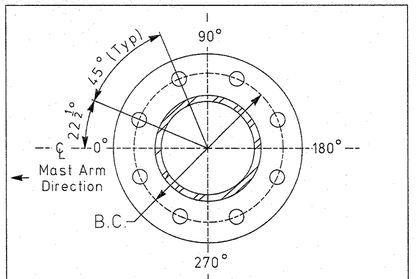
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 2
Baseline reference point at ⊕ Foundation at ground level	0.0 ft.
Elevation difference at High point of roadway surface	2.0 ft.
Elevation difference at Edge of travelway or face of curb	1.0 ft.

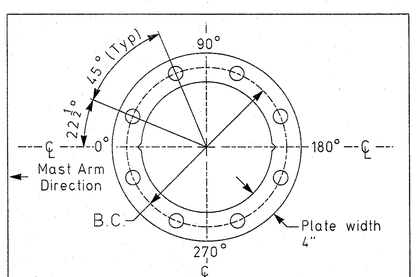


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-5 SECTION-WITH BACKPLATE AND ASTRO-BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	5.0 S.F.	24.0" W X 30.0" L	11 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 5th Edition 2009 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2012 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Structural Engineer for assistance at (919) 773-2800.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FINAL DRAWING Date: 11/12/13
R. V. Hewett
Traffic Engineering Branch

NCDOT Wind Zone 4 (90 mph)

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

SCALE
0 N/A
N/A

SR 1146 (Martin Luther King Jr. Parkway) at SR 2295 (Archdale Road)

PLAN DATE: JUNE 2013	REVIEWED BY: P NICHOLAS
PREPARED BY: L TRACEY	REVIEWED BY:

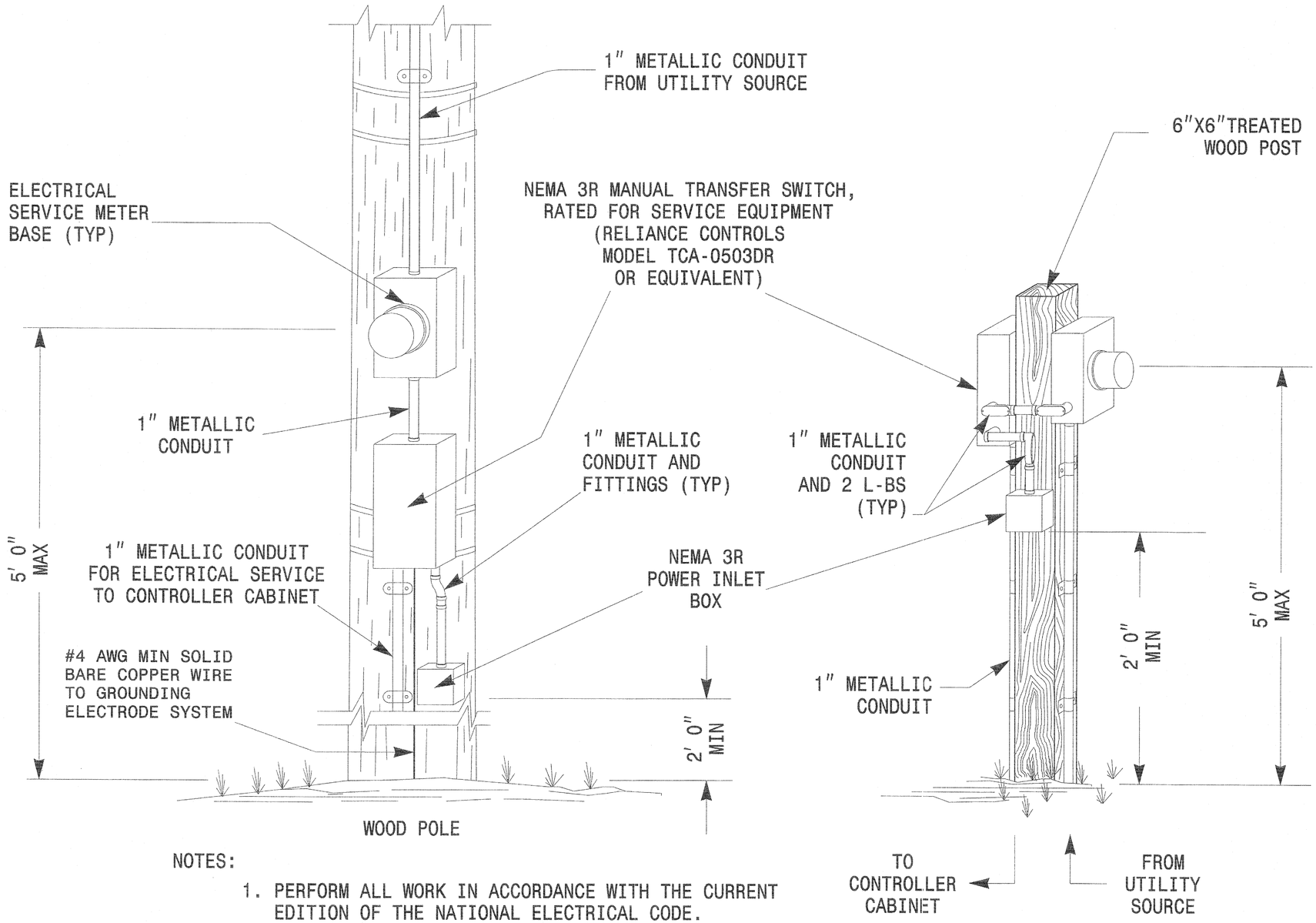
REVISIONS	INT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038734 ENGINEER LESLIE M. TRACEY

SIGNATURE 9-19-13 DATE

SIG. INVENTORY NO. 05-0052

PROJECT REFERENCE NO.	SHEET NO.
U-5150	Sig. 3



NOTES:

1. PERFORM ALL WORK IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE.
2. PROVIDE LOCKABLE POWER INLET BOX WITH L14-30P THAT RETAINS NEMA 3R RAINPROOF RATING WITH GENERATOR CORD SET CONNECTED.
3. A COMBINATION METER BASE, TRANSFER SWITCH, AND POWER INLET MAY BE USED WITH APPROVAL OF THE ENGINEER.
4. REFER TO NCDOT ROADWAY STANDARD DRAWINGS 1700.01 AND 1700.02 FOR GROUNDING ELECTRODE SYSTEM REQUIREMENTS.
5. REFER TO SHEET 2 FOR BONDING REQUIREMENTS.

SHEET 1 OF 2

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
122 N. McDowell St., Raleigh, NC 27603

TYPICAL ELECTRICAL SERVICE FOR TRAFFIC SIGNALS WITH EMERGENCY GENERATOR PROVISIONS

PLAN DATE: DECEMBER 2006	REVIEWED BY:
PREPARED BY: J.T.ROWE	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

This document originally issued and sealed by Gregory A. Fuller, #023919, on 01/04/07. This media shall not be considered a certified document.

SIGNATURE DATE

SIG. INVENTORY NO.

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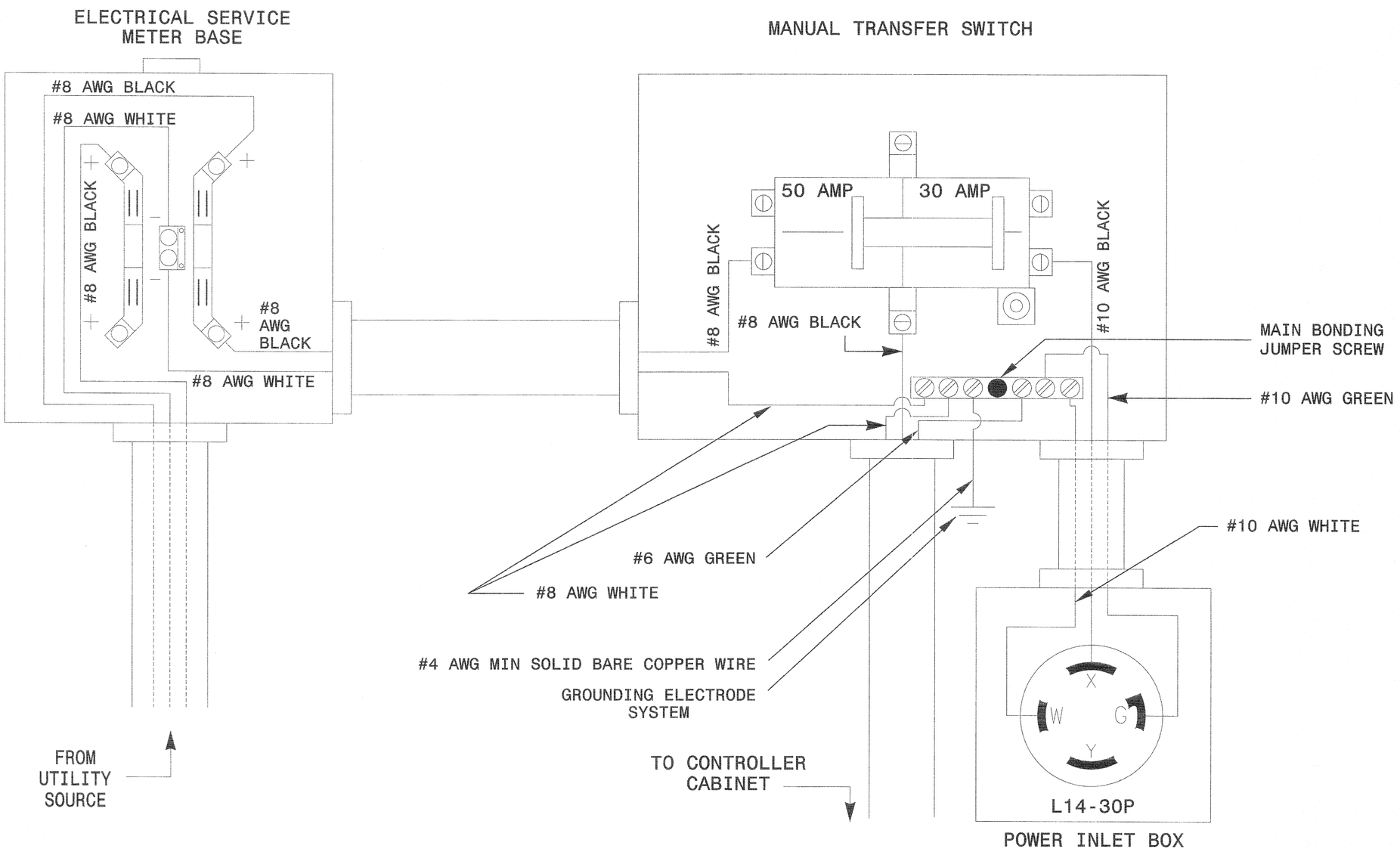
PROJECT REFERENCE NO.	SHEET NO.
U-5150	Sig. 4

ELECTRICAL SCHEMATIC



SHEET 2 OF 2

NOTES:
1. BOND ALL RACEWAYS AND EQUIPMENT IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE.
2. ALL WIRES SHOWN SHALL BE STRANDED COPPER WITH THWN INSULATION, UNLESS OTHERWISE NOTED.

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section
122 N. McDowell St., Raleigh, NC 27603

TYPICAL ELECTRICAL SERVICE FOR TRAFFIC SIGNALS WITH EMERGENCY GENERATOR PROVISIONS

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SIG. INVENTORY NO.

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