

# INPUT FILE POSITION LAYOUT

(front	view)
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	1	2	3	4	5	6	7	8	9	10	11	12
file U "I" ,	SLOT EMP	SLOT EMP	S L OT E M P	S L O T E M P	Ø3 3A NOT	Ø3 3B NOT	S L OT E M P	S L O T E M P	S L O T E M P	S L OT E M P	S L O T E M P	S L OT E M P
	T Y	T Y	T Y	Г Т Ү	USED	USED	F T Y	T Y	T Y	T Y	F T Y	T Y
file U	S L O T	Ø 6 6A	ø 6 6C	S L O T	S L O T	S L O T	S L O T	S L O T	S L O T	S L O T	S L O T	S LOT
"J" L	E P T Y	Ø 6 6B	NOT USED	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E P T Y
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 POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	<b>I</b> 5U	58	20	7	3			Х		Х	
3B	TB4-9,10	<b>I</b> 6U	41	3	8	3			Х		Х	
6A	TB3-5,6	J2U	40	2	16	6			Х	Х	Х	
6B	TB3-7,8	J2L	44	6	17	6			Х	Х	Х	
6C	TB3-9,10	J3U	64	30	18	6			Х	Х	Х	

INPUT FILE POSITION LEGEND: J2L

FILE J -SLOT 2 -

LOWER -

- 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 plan.
- 2. Program controller to start up in phase 2 Phase Not On and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 4. The cabinet and controller are part of the NC 150 D12-02\_Mooresville CLS.

# **EQUIPMENT INFORMATION**

Controller	.2070LX
Cabinet	.332 w/ Aux
Software	.Q-Free MAXTIME
Cabinet Mount	.Base
Output File Positions	.18 With Aux. Output File
Load Switches Used	.S4, S8
Phases Used	3, 6
Overlap "1"	NOT USED
Overlap "2"	NOT USED
Overlap "3"	NOT USED
Overlap "4"	NOT USED

LOAD S1 SWITCH NO. CMU Channel No. PHASE SIGNAL HEAD NO. RED YELLOW GREEN RED ARROW YELLOW ARROW GREEN

NU = Not Used

ARROW

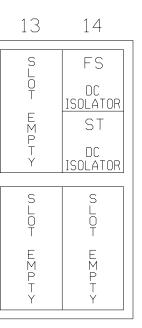
# SEQUENCE DETAIL

Front Panel

Web Interface Home >Controller >Sequence

### Sequence 1

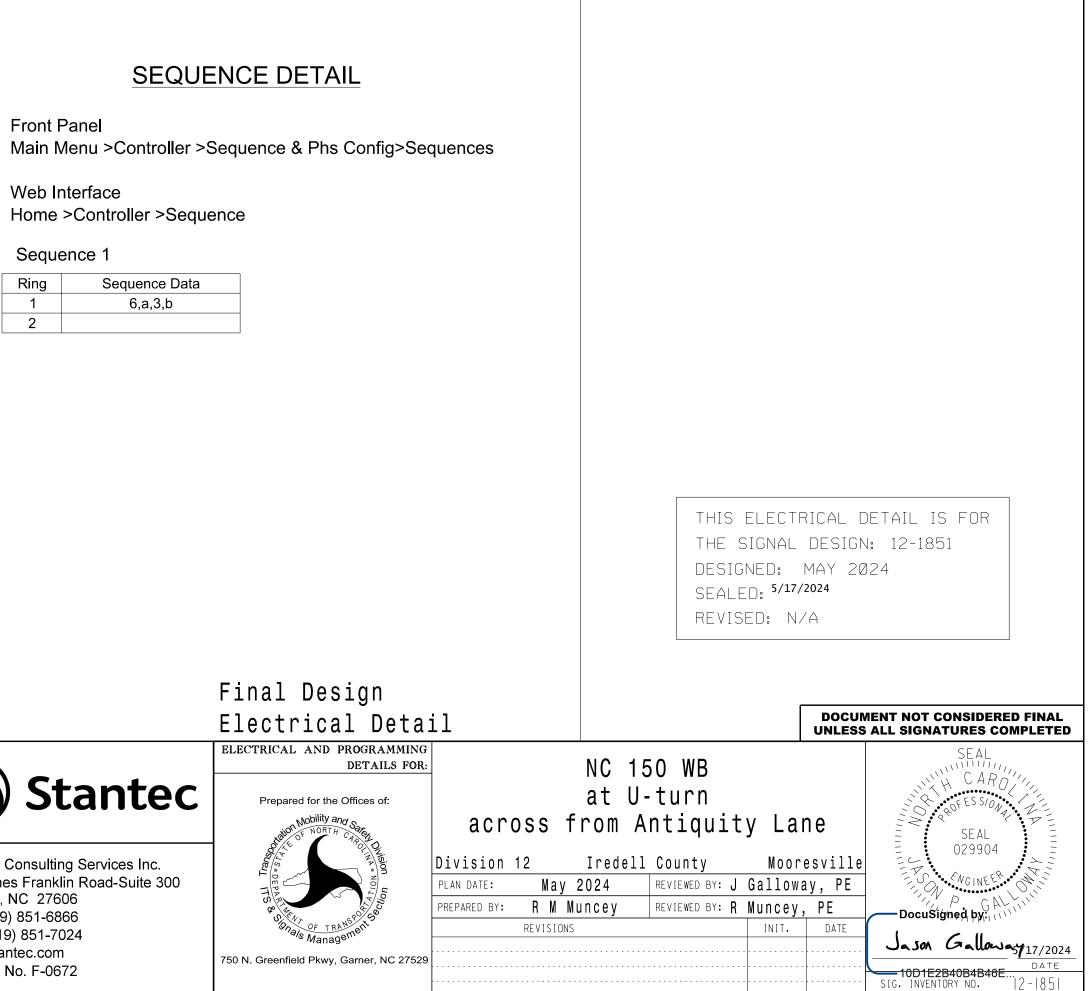
Ring	Sequence Data
1	6,a,3,b
2	



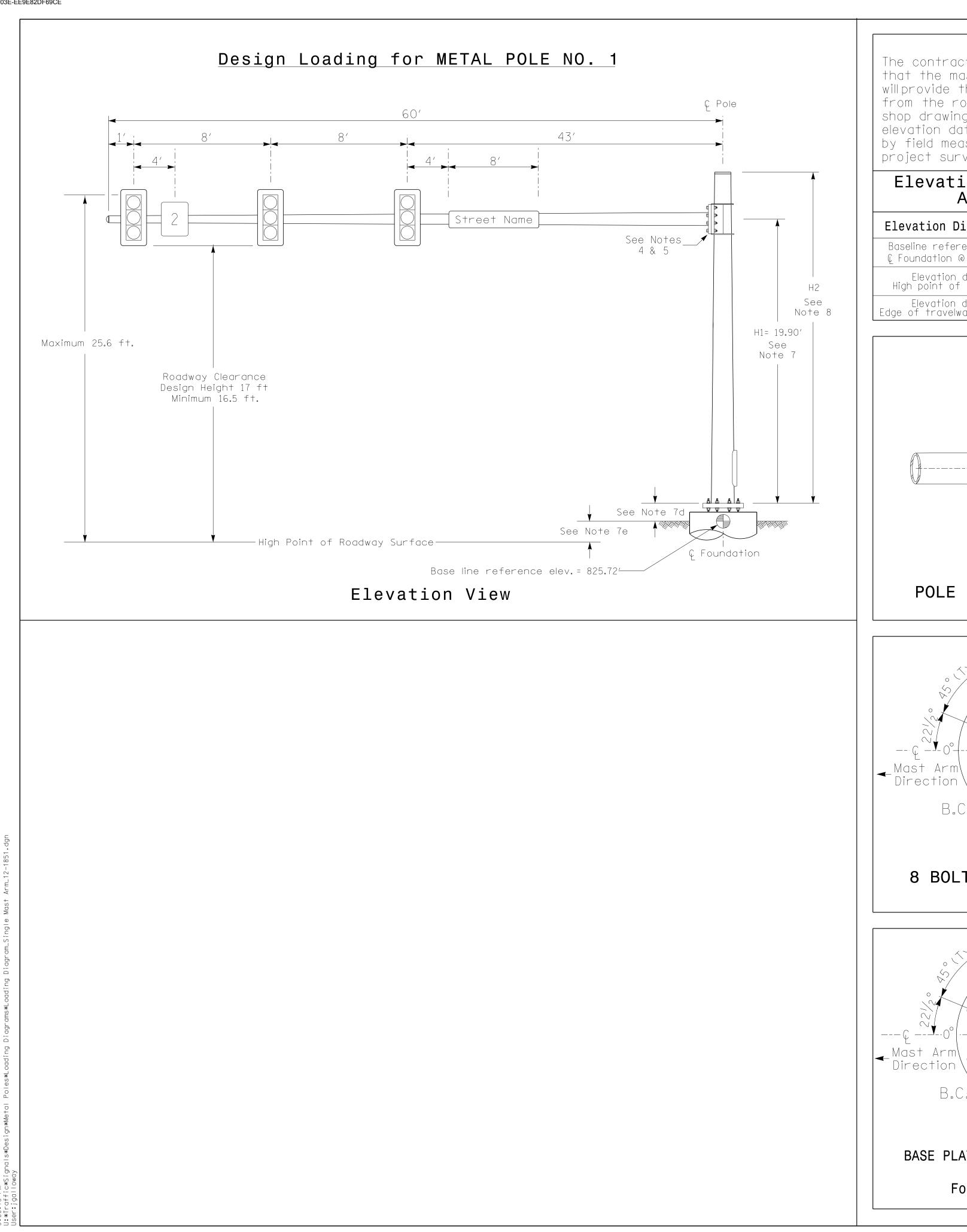
**Stantec** Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672

R - 2307B	Sig 17 1
PROJECT REFERENCE NO.	SHEET NO.

		S	IGN	IAL	HE	AD	HC	)0K	- UF	<b>°</b> C	HAF	۲T					
S2	S3	S4	S5	S6	S7	S	8	59	S1Ø	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
2	13	З	4	14	5	6	5	15	7	8	16	9	1Ø	17	11	12	18
2	2 PED	З	4	4 PED	5	(	5	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
NU	NU	31,32	NU	NU	NU	61	62,63	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
						134	134										
						135	135										
							136										
		116															
		117															
		118				136											



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400 100 100

SPECIAL NC The contractor is responsib that the mast arm attachm will provide the 'Design Heigh from the roadway before s shop drawings for approval. elevation data below which by field measurement or fr project survey data.	ple for v nent heigh nt″clearar submitting Verify was obtai	nt (H1) nce , final ined
Elevation Data fo Attachment		Arm
Elevation Differences for:	Pole 1	
Baseline reference point at © Foundation @ ground level	825.72 ft.	
Elevation difference at High point of roadway surface	+0.84 ft.	
Elevation difference at Edge of travelway or face of curb	+/-0.0 ft.	
	, Comp	rminal artment Ə 180°

POLE RADIAL ORIENTATION

270°

8 BOLT BASE PLATE DETAIL

See Note 6

BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

B.C.

B.C.

# DESIGN REQUIREMENTS

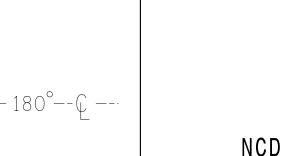
- requirements.

--180°--

Plate width

- the following:

# NCDO<sup>.</sup> Prep 50 N.Gree



METAL POLE No. 1	PROJECT REFERENCE NO. R-2307B	SHEET NO. Sig. 17.2
	11 20075	0191 1112
MAST ARM LOADING SCHEDULE		

loading Symbol	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS

### <u>NOTES</u>

### DESIGN REFERENCE MATERIAL

1. Design the traffic signalstructure and foundation in accordance with: • The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions. • The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signalproject specialprovisions. • The 2024 NCDOT Roadway Standard Drawings.

• The traffic signalproject plans and specialprovisions.

The NCDOT "MetalPole Standards" located at the following NCDOT website:

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

2. Design the traffic signalstructure 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 force ratios that do not exceed 0.9.

4. The camber design for the 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

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. Signalheads are rigidly mounted and vertically centered on the mast arm.

c. The roadway clearance height for design is as shown in the elevation views.

d. The top of the pole base plate is 0.75 feet above the ground elevation.

e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.

8. The pole manufacturer will determine the total height (H2) of each pole using the greater of

• Mast arm attachment height (H1) plus 2 feet, or

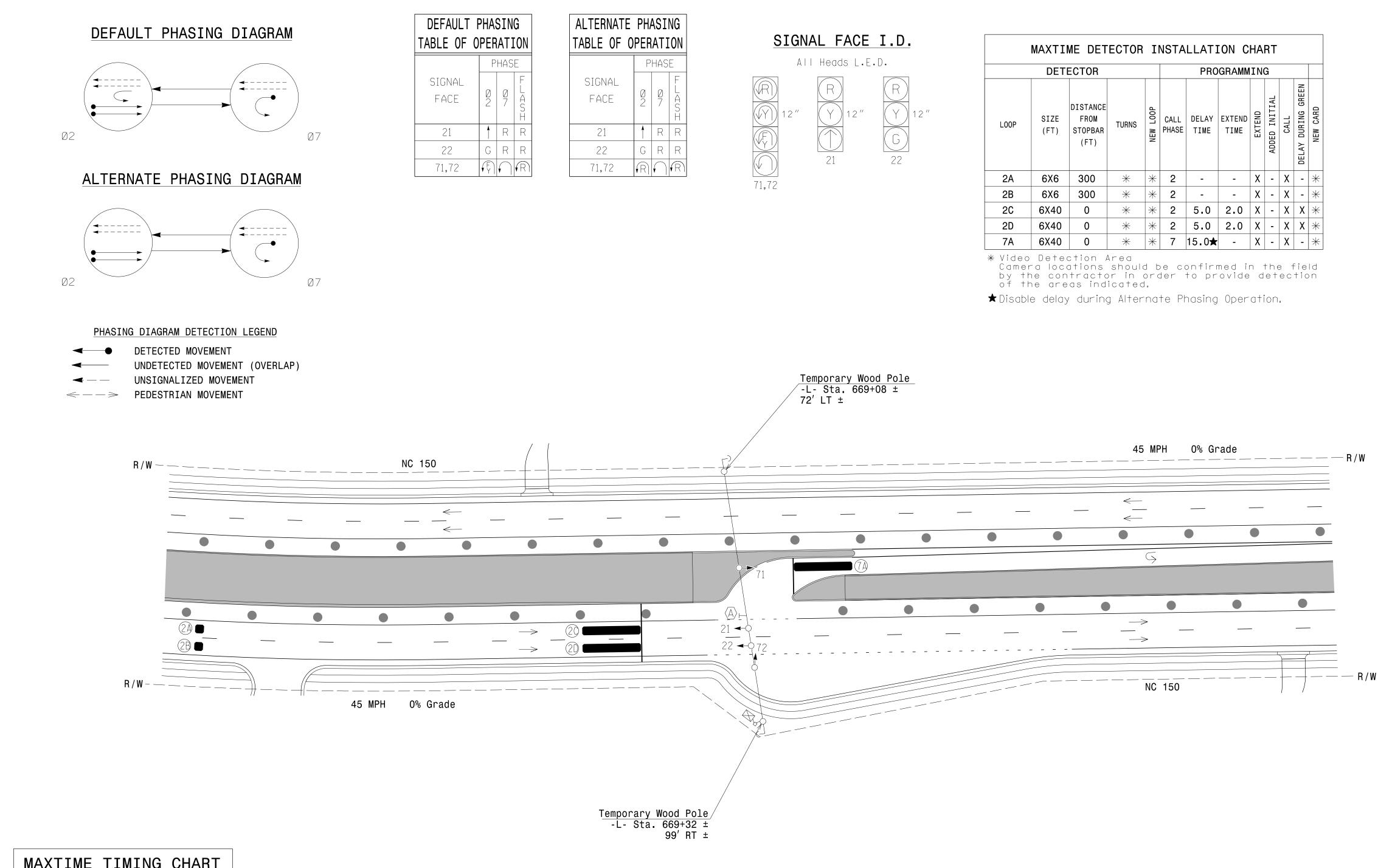
• H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.

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 SignalDesign Section Senior StructuralEngineer for assistance at (919)814-5000.

10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signalheads over the roadway.

11. The contractor is responsible for providing soilpenetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

)T Wind Zone	5 (110 mph) Stantec	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
pared for the Offices of:	NC 150 WB at U-turn across from Antiquity Lane	SEAL 029904
Sent OF TRANSPORT	Division 12Iredell CountyMoorPLAN DATE:November 2023REVIEWED BY: J. Gallow	esville
eenfield Pkwy,Garner,NC 27529		ey, PE DocuSigned, by
N/A	REVISIONS INIT.	DATE Jason Gallowasy 17/2024 100462886848466 DATE SIG. INVENTORY NO. 12-1851



than 4 seconds.

FEATURE	PHASE					
FEATURE	2	7				
Walk *	_	_				
Ped Clear *	_	_				
Min Green	12	7				
Passage *	6.0	2.0				
Max 1 *	60	30				
Yellow Change	4.5	3.0				
Red Clear	1.6	4.0				
Added Initial *	_	-				
Maximum Initial *	_	-				
Time Before Reduction *	15	-				
Time To Reduce *	30	-				
Minimum Gap	3.0	-				
Advance Walk	_	-				
Non Lock Detector	X	Х				
Vehicle Recall	MIN RECALL	-				
Dual Entry	_					
<sup>7</sup> These values may be field Green and Extension times hown. Min Green for all a	for phase 2 lo	ower than who				

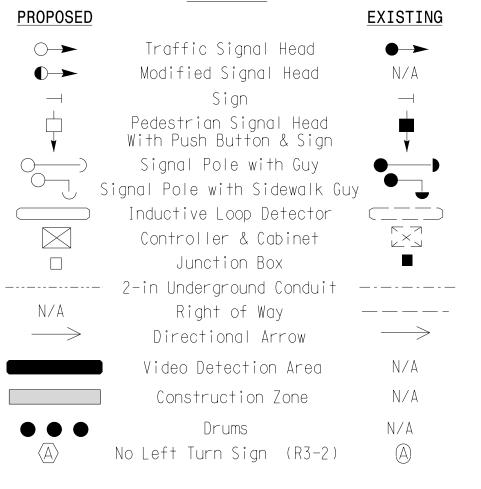


# 2 Phase Fully Actuated w/ Alternate Phasing NC 150 D12-02\_MOORESVILLE CLS

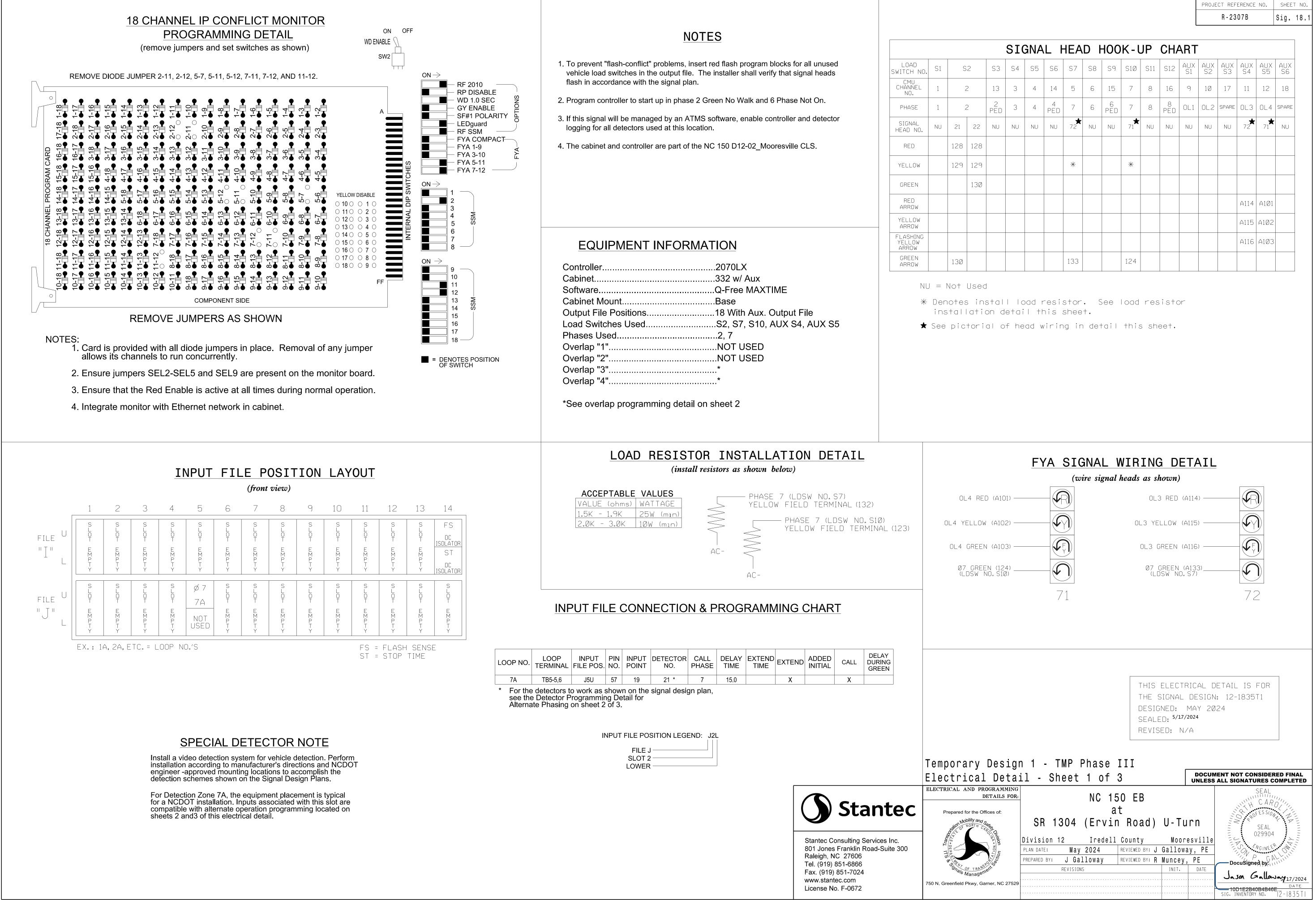
# NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Set all detector units to presence mode.
- 4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- 5. The Division Traffic Engineer will determine hours of use for each phasing plan.
- 6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 7. Field adjust temporary poles as needed.

## LEGEND



р Р	hase III	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Transport	d for the Offices of: Nobility and NORTH CALL OF Some Division	NC 150 EB at SR 1304 (Ervin Road) U-turn Division 12 Iredell County Mooresville
5.% 970	<i>OF TRANS</i> TO CONTRACTOR	PLAN DATE: May 2024 REVIEWED BY: J Galloway, PE
Greenfie	eld Pkwy,Garner,NC 27529	PREPARED BY: J Hambright REVIEWED BY: R Muncey, PE DocuSigned by:
	SCALE	REVISIONS INIT. DATE
	0 40 1″=40′	INTERVISIONS INTERVISIONS INTERVISIONS INTERVISIONS JATE 10D1E2B40B4B46E DATE SIG. INVENTORY NO. 12-1835TI



SIGNAL HEAD HOOK-UP CHART																	
S	2	S3	S4	S5	S6	S7	S8	59	S1Ø	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
,	2	13	3	4	14	5	6	15	7	8	16	9	1Ø	17	11	12	18
2	2	2 PED	3	4	4 PED	7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3		SPARE
21	22	NU	NU	NU	NU	<b>★</b> 72	NU	NU	<b>★</b>	NU	NU	NU	NU	NU	72 <b>★</b>	<b>71</b> ★	NU
128	128																
129	129					*			*								
	13Ø																
															A114	A1Ø1	
															A115	A1Ø2	
															A116	A1Ø3	
13Ø						133			124								

	<u>OUTPI</u>	JT CHAN	NEL COI	NFIGURA	TION		
	Front Panel						
	Main Menu	Controller >	More>Chan	nels>Channe	els Config		
	Web Interfac Home >Con Channel Co	troller >Adva	nced IO>Ch	annels>Cha	nnels Config	guration	
	Channel		Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
	1	Phase Vehicle	1		Х	Х	1
	2	Phase Vehicle	2		Х		2
	3	Phase Vehicle	3		Х	Х	3
NOTICE CONTROL SOURCE 7	4	Phase Vehicle	4		Х		4
ASSIGNED TO CHANNEL 5	▶ 5	Phase Vehicle	7		Х		5
	6	Phase Vehicle	6		Х	Х	6
	7	Phase Vehicle	7		Х		7
	8	Phase Vehicle	8		Х	Х	8
	9	Overlap	1		Х	Х	9
	10	Overlap	2		Х	Х	10
	11	Overlap	3		Х		11
	12	Overlap	4		Х		12
	13	Phase Ped	2				13
	14	Phase Ped	4				14
	15	Phase Ped	6				15
	16	Phase Ped	8				16
	17	Overlap	5		Х	Х	17
	18	Overlap	6		Х		18

# MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

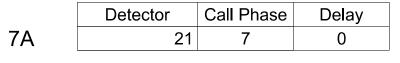
Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.



0 × 0

Front Panel

Web Interface Overlap Plan 1

Overlap

Туре Included Phase **Modifier Phase** Modifier Overlag Trail Green Trail Yellow Trail Red

Front Panel

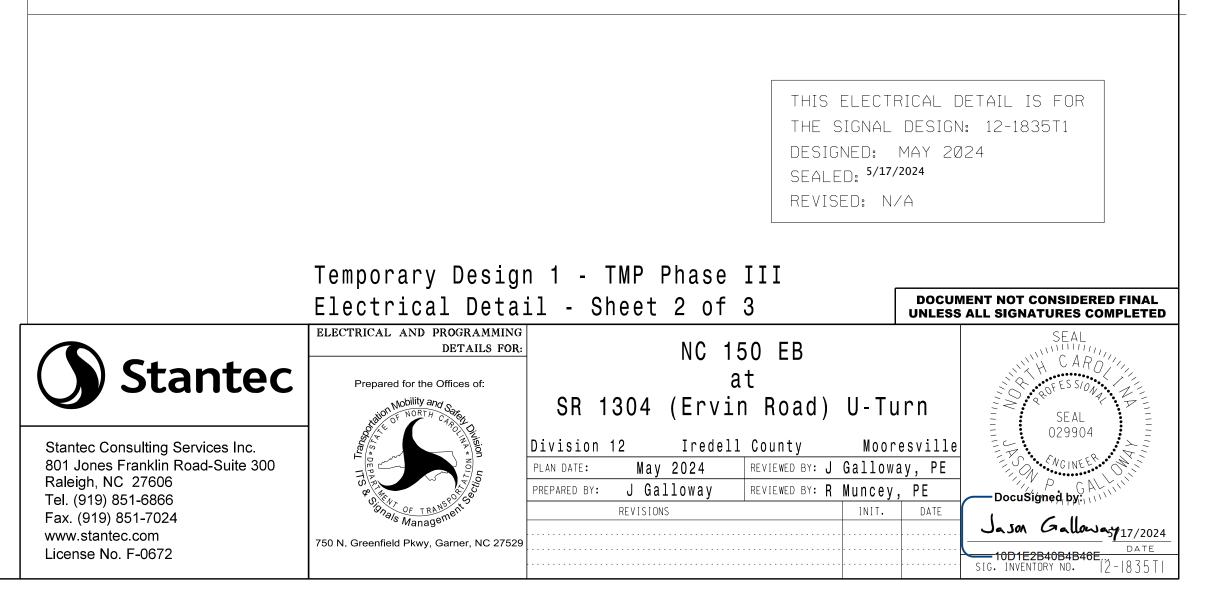
Web Interface

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap

Туре Included Phases Modifier Phases Modifier Overlaps Trail Green Trail Yellow Trail Red



R-2307B S	Sig.	
PROJECT REFERENCE NO.	SHEET	NO.

# MAXTIME OVERLAP PROGRAMMING DEFAULT PHASING

Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

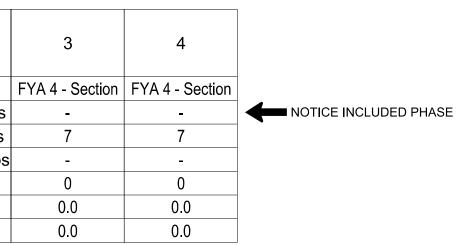
Home >Controller >Overlap Configuration >Overlaps

	3	4
	FYA 4 - Section	FYA 4 - Section
es	2	2
s	7	7
ps	-	-
	0	0
	0.0	0.0
	0.0	0.0

# MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Home >Controller >Overlap Configuration >Overlaps



# MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING

ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING

### ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for heads 71 and 72 to run protected turns only.

VEH DET PLAN 2: Reduces delay time for phase 7 call on loop 7A to 0 seconds.

# **SEQUENCE DETAIL**

### Front Panel

Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface Home >Controller >Sequence

### Sequence 1

Ring	Sequence Data
1	2,a,7,b
2	

0 × 0

OVERLAP PLAN	VEH DET PLAN
1	1
2	2

Front Panel

Web Interface

Pattern Pa Pattern



PROJECT REFERENCE NO.	SHEET NO.	
R - 2307B	Sig. 18.3	3

# MAXTIME ALTERNATE PHASING PATTERN **PROGRAMMING DETAIL**

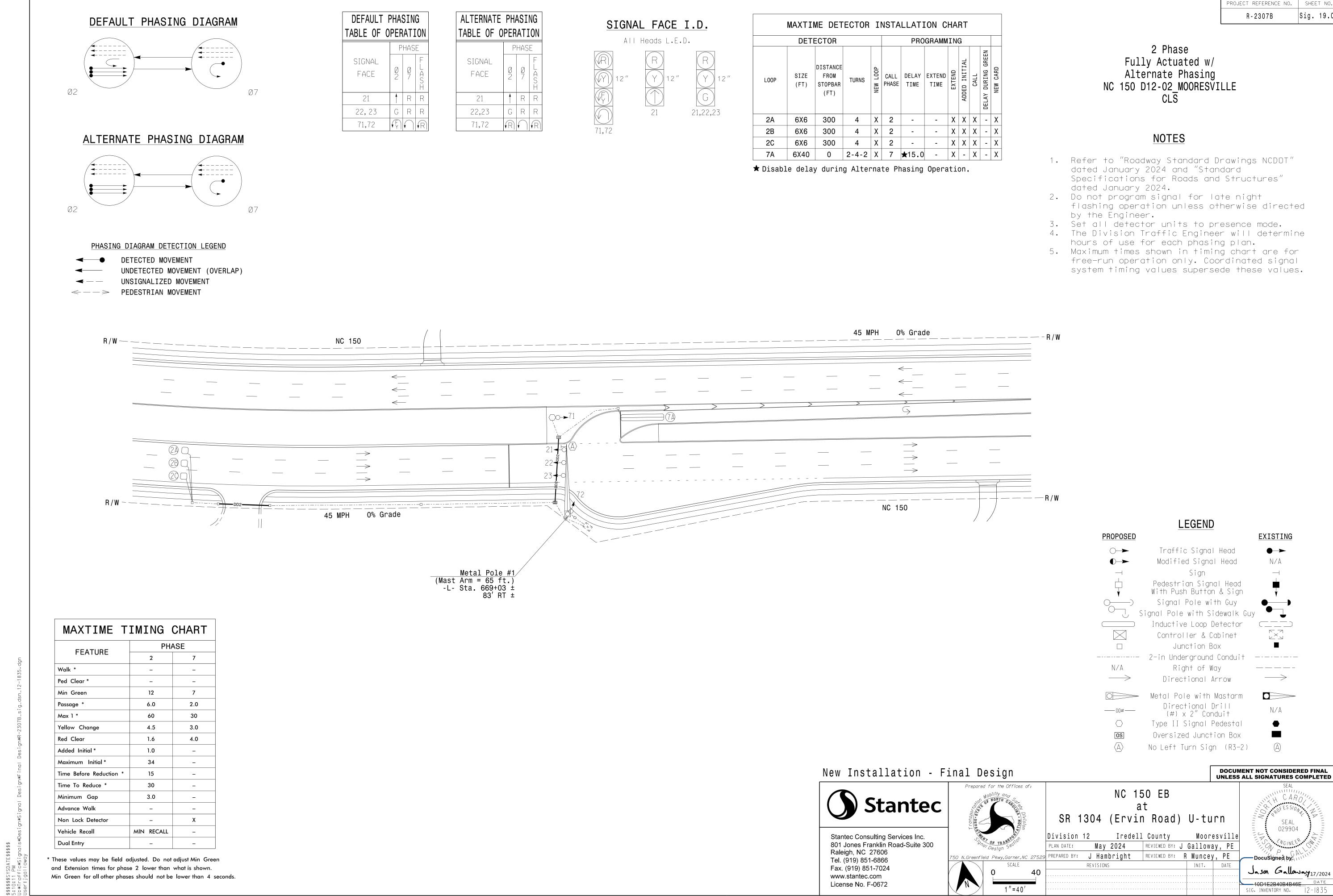
Main Menu >Controller >Coordination >Patterns

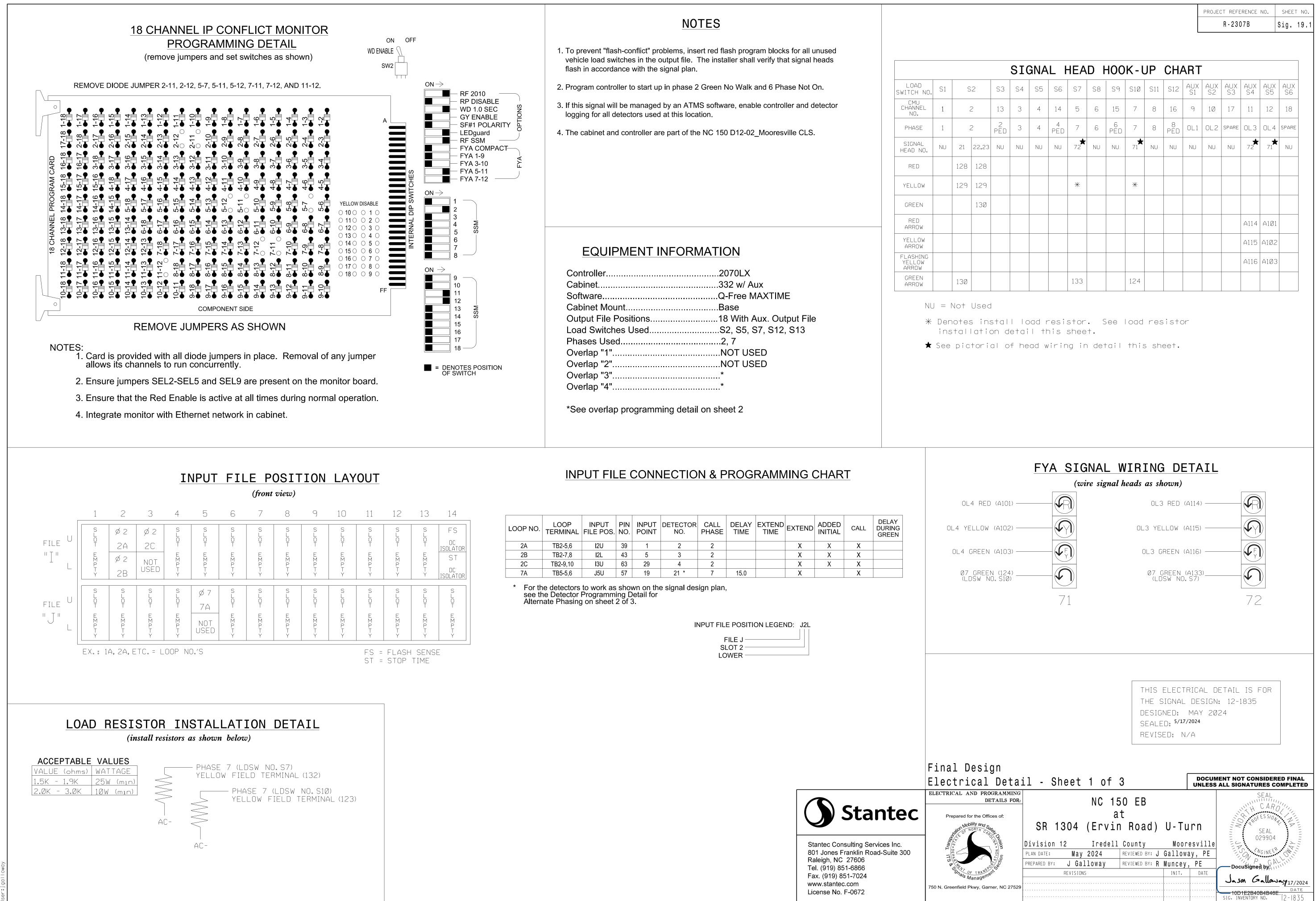
Home >Controller >Coordination >Patterns

arameters								
	Veh Det Plan	Overlap Plan						
*	2	2						

\*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

				DETAIL IS FOR
	DE		MAY 20 2024	N: 12-1835T1 024
	n 1 - TMP Phase III il - Sheet 3 of 3	]		MENT NOT CONSIDERED FINAL
ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:	NC 150 EB at SR 1304 (Ervin Road	) (J-Tu	rn	SEAL CARO
Prepared for the Offices of:	Division 12 Iredell County		esville	SEAL 029904
Contraction of the second seco	PREPARED BY: J Galloway REVIEWED BY REVISIONS	R Muncey,	, PE DATE	DocuSigned by
750 N. Greenfield Pkwy, Garner, NC 27529	I.L. ¥1310M2			Jason Gallowasy17/2024
730 N. Greeniieu r kwy, Galilei, NG 27529				<u>10D1E2B40B4B46E</u> sig. inventory no.  2- 835T





13	14	1
S LOT EMPTY	FS DC ISOLATOR ST DC ISOLATOR	
SLOT EMPTY	SLOF EXPFY	
	_	1

FOR	2A	TB2-5,6	I2U	39	1	2	2		
-	2B	TB2-7,8	I2L	43	5	3	2		
	2C	TB2-9,10	I3U	63	29	4	2		
TOR	7A	TB5-5,6	J5U	57	19	21 *	7	15.0	
	see th	e detectors ne Detector	Programm	ing D	etail for	e signal des	sign plan	,	

<b>Stantec</b>	F
Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Fel. (919) 851-6866 Fax. (919) 851-7024	
vww.stantec.com .icense No. F-0672	750 N. G

		SI	GNA		HEA	DI	H00	K-l	JP	CHA	٩RT	1				
S2	53	S4	S5	S6	S7	S8	59	S1Ø	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
2	13	3	4	14	5	6	15	7	8	16	9	1Ø	17	11	12	18
2	2 PED	3	4	4 PED	7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
22,23	NU	NU	NU	NU	<b>★</b> 72	NU	NU	<b>71</b> ★	NU	NU	NU	NU	NU	72 <b>★</b>	<b>★</b>	NU
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      I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I	S2       S3       S4       S5       S6         2       13       3       4       14         2 $\rho_{ED}^2$ 3       4 $\rho_{ED}^4$ 2 $\rho_{ED}^2$ 3       4 $\rho_{ED}^4$ 22,23       NU       NU       NU       NU         3       128       I       I       I         4       129       I       I       I       I         130       I       I       I       I       I         I       I       I       I       I       I         I       I       I       I       I       I         I       I       I       I       I       I         I       I       I       I       I       I         I       I       I       I       I       I         I     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S8       S9         <math>2</math>       13       3       4       14       5       6       15         <math>2</math>       13       3       4       <math>P^4_{ED}</math>       7       6       <math>P^6_{ED}</math> <math>2</math> <math>2</math>       NU       NU       NU       NU       72       NU       NU         <math>2</math> <math>2</math>       NU       NU       NU       NU       72       NU       NU         <math>3</math>       128       <math>128</math> <t< td=""><td>S2       S3       S4       S5       S6       S7       S8       S9       S10         <math>2</math>       13       3       4       14       5       6       15       7         <math>2</math> <math>2^2</math>       3       4       <math>4^4</math>       7       6       <math>P^6_{ED}</math>       7         <math>22,23</math>       NU       NU       NU       NU       72*       NU       NU       71*         <math>3</math>       128       I       I       III       IIII       IIIII       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I.</td><td><math>S3</math>       S4       S5       S6       S7       S8       S9       S10       S11       S12       <math>AUX</math> <math>2</math>       13       3       4       14       55       66       15       7       8       16       9         <math>2</math> <math>P_{ED}^2</math>       3       4       <math>P_{ED}^4</math>       7       6       <math>P_{ED}^6</math>       7       8       <math>P_{ED}^8</math>       0L1         <math>22,23</math>       NU       NU       NU       NU       72       NU       NU</td><td><math>2</math>       13       3       4       14       5       6       15       7       8       16       9       10         <math>2</math> <math>2^2_{PED}</math>       3       4       <math>4^4_{PED}</math>       7       6       <math>6^6_{PED}</math>       7       8       <math>8^6_{PED}</math>       0L1       0L2         <math>2^2_{2,23}</math>       NU       NU       NU       NU       <math>72^*</math>       NU       NU       71       NU       NU       NU       NU  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I.</td><td><math>S3</math>       S4       S5       S6       S7       S8       S9       S10       S11       S12       <math>AUX</math> <math>2</math>       13       3       4       14       55       66       15       7       8       16       9         <math>2</math> <math>P_{ED}^2</math>       3       4       <math>P_{ED}^4</math>       7       6       <math>P_{ED}^6</math>       7       8       <math>P_{ED}^8</math>       0L1         <math>22,23</math>       NU       NU       NU       NU       72       NU       NU</td><td><math>2</math>       13       3       4       14       5       6       15       7       8       16       9       10         <math>2</math> <math>2^2_{PED}</math>       3       4       <math>4^4_{PED}</math>       7       6       <math>6^6_{PED}</math>       7       8       <math>8^6_{PED}</math>       0L1       0L2         <math>2^2_{2,23}</math>       NU       NU       NU       NU       <math>72^*</math>       NU       NU       71       NU       NU       NU       NU         <math>2^2_{2,23}</math>       NU       NU       NU       NU       <math>72^*</math>       NU       NU       <math>71^*</math>       NU       NU       NU       NU         <math>3^1_{28}</math>       I.0       NU       NU       <math>72^*</math>       NU       NU       <math>71^*</math>       NU       NU       NU       NU         <math>3^1_{28}</math>       I.0       I.0</td><td>S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       <math>AUX</math> <math>AUX</math> <math>AUX</math> <math>2</math>       13       3       4       14       5       6       15       7       8       16       9       10       17         <math>2</math> <math>2^2</math>       3       4       <math>\frac{4}{\text{PED}}</math>       7       6       <math>\frac{6}{\text{PED}}</math>       7       8       <math>\frac{8}{\text{PED}}</math>       0.1       0.2       spare         22.23       NU       NU       NU       NU       72       NU       NU       71       NU       N</td><td>S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       <math>AUX</math> <math>AUX</math> <math>AUX</math> <math>AUX</math> <math>AUX</math> <math>AUX</math>         2       13       3       4       14       5       6       15       7       8       16       9       10       17       11         <math>2</math> <math>PED</math>       3       4       <math>PED</math>       7       6       <math>PED</math>       7       8       <math>PED</math>       0L1       0L2       <math>SPRE</math>       0L3         22,23       NU       NU       NU       NU       <math>PZ^{*}</math>       NU       <math>PZ^{*}</math>         42,23       NU       NU&lt;</td><td>S2       S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       <math>AUX</math> <math>AUX</math><!--</td--></td></t<>	S2       S3       S4       S5       S6       S7       S8       S9       S10 $2$ 13       3       4       14       5       6       15       7 $2$ $2^2$ 3       4 $4^4$ 7       6 $P^6_{ED}$ 7 $22,23$ NU       NU       NU       NU       72*       NU       NU       71* $3$ 128       I       I       III       IIII       IIIII       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	S2       S3       S4       S5       S6       S7       S8       S9       S10       S11         2       13       3       4       14       55       66       15       7       8 $2$ $2^2_{\text{PED}}$ 3       4 $9^4_{\text{PED}}$ 7       66 $9^6_{\text{PED}}$ 7       8         22,23       NU       NU       NU       NU       72       NU       NU       71       NU         3       128       I.       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	<u>OUTPI</u>	JT CHAN	NEL COI	NFIGURA	ATION							
	Front Panel Main Manu > Controller > Mare> Channele> Channele Config											
		Main Menu >Controller >More>Channels>Channels Config										
Web Interface Home >Controller >Advanced IO>Channels>Channels Configuration												
	Channel Co	onfiguration										
	Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel					
	1	Phase Vehicle	1		Х	Х	1					
	2	Phase Vehicle	2		Х		2					
	3	Phase Vehicle	3		Х	Х	3					
NOTICE CONTROL SOURCE 7	4	Phase Vehicle	4		Х		4					
ASSIGNED TO CHANNEL 5	▶ 5	Phase Vehicle	7		Х		5					
	6	Phase Vehicle	6		Х	Х	6					
	7	Phase Vehicle	7		Х		7					
	8	Phase Vehicle	8		Х	Х	8					
	9	Overlap	1		Х	Х	9					
	10	Overlap	2		Х	Х	10					
	11	Overlap	3		Х		11					
	12	Overlap	4		Х		12					
	13	Phase Ped	2				13					
	14	Phase Ped	4				14					
	15	Phase Ped	6				15					
	16	Phase Ped	8				16					
	17	Overlap	5		Х	Х	17					
	18	Overlap	6		Х		18					

# MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

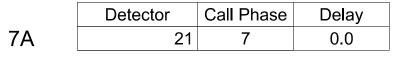
Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.



- \* ;

Front Panel

Web Interface Overlap Plan 1

Overlap

Туре Included Phases **Modifier Phase** Modifier Overlap Trail Green Trail Yellow Trail Red

# MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

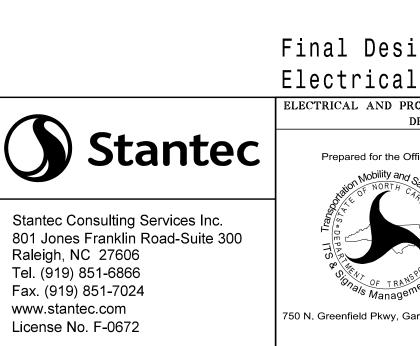
Web Interface

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap

Туре Included Phases Modifier Phases Modifier Overlaps Trail Green Trail Yellow Trail Red



# MAXTIME OVERLAP PROGRAMMING DEFAULT PHASING

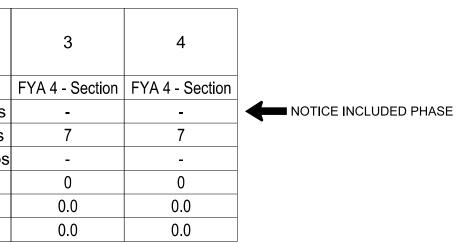
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Home >Controller >Overlap Configuration >Overlaps

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	FYA 4 - Section	FYA 4 - Section
es	2	2
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ps	-	-
	0	0
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	0.0	0.0

Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Home >Controller >Overlap Configuration >Overlaps



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1835 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

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ctrical Detai	il - Sheet 2 of 3	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
RICAL AND PROGRAMMING DETAILS FOR:		SEAL
Prepared for the Offices of:	at	FESSION T
Nobility and Same	SR 1304 (Ervin Road)	
1*S7 10 10 10 10 10 10 10 10 10 10 10 10 10	Division 12 Iredell County	Mooresville
TT-	PLAN DATE: May 2024 REVIEWED BY: J	Galloway, PE
	PREPARED BY: J Galloway REVIEWED BY: R	Muncey, PE DocuSióned by:
Grade Managements	REVISIONS	INIT. DATE
		Jason Gallowasy 17/2024
Greenfield Pkwy, Garner, NC 27529		
		SIG. INVENTORY NO. 2-1835

attern that is programmed to run Overland scheduler or manually by changing	rnate phasing, select a F an be selected through t
OV	
AULT PHASING	EQUIRED TO RUN DEF
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ALTERNATE PHASING CHANGE SUMMA	
G IS A SUMMARY OF WHAT TAKES PLACE 2 AND VEHICLE DETECTOR PLAN 2 ACTI TERNATE PHASING":	OVERLAP PLAN
Modifies overlap included phases for heads 71 and 72 to run protected turns only.	OVERLAP PLAN 2
Reduces delay time for phase 7 call on loop 7A to 0 seconds.	VEH DET PLAN 2
SEQUENCE DETAIL	
anel lenu >Controller >Sequence & Phs Config	Front F Main N
terface >Controller >Sequence	
	Seque
Sequence Data 2,a,7,b	Ring 1 2

5:11:11 P U:\*Traffi User:igal

# CTIVATION DETAIL

lap Plan 2 and Detector Plan 2. the Operational Mode.

OVERLAP PLAN	VEH DET PLAN
1	1
2	2

WHEN VATE

>Sequences

Front Panel

Web Interface

Pattern Pa Pattern



PROJECT REFERENCE NO.	SHEE	T NO.
R - 2307B	Sig.	19.3

# MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Main Menu >Controller >Coordination >Patterns

Home >Controller >Coordination >Patterns

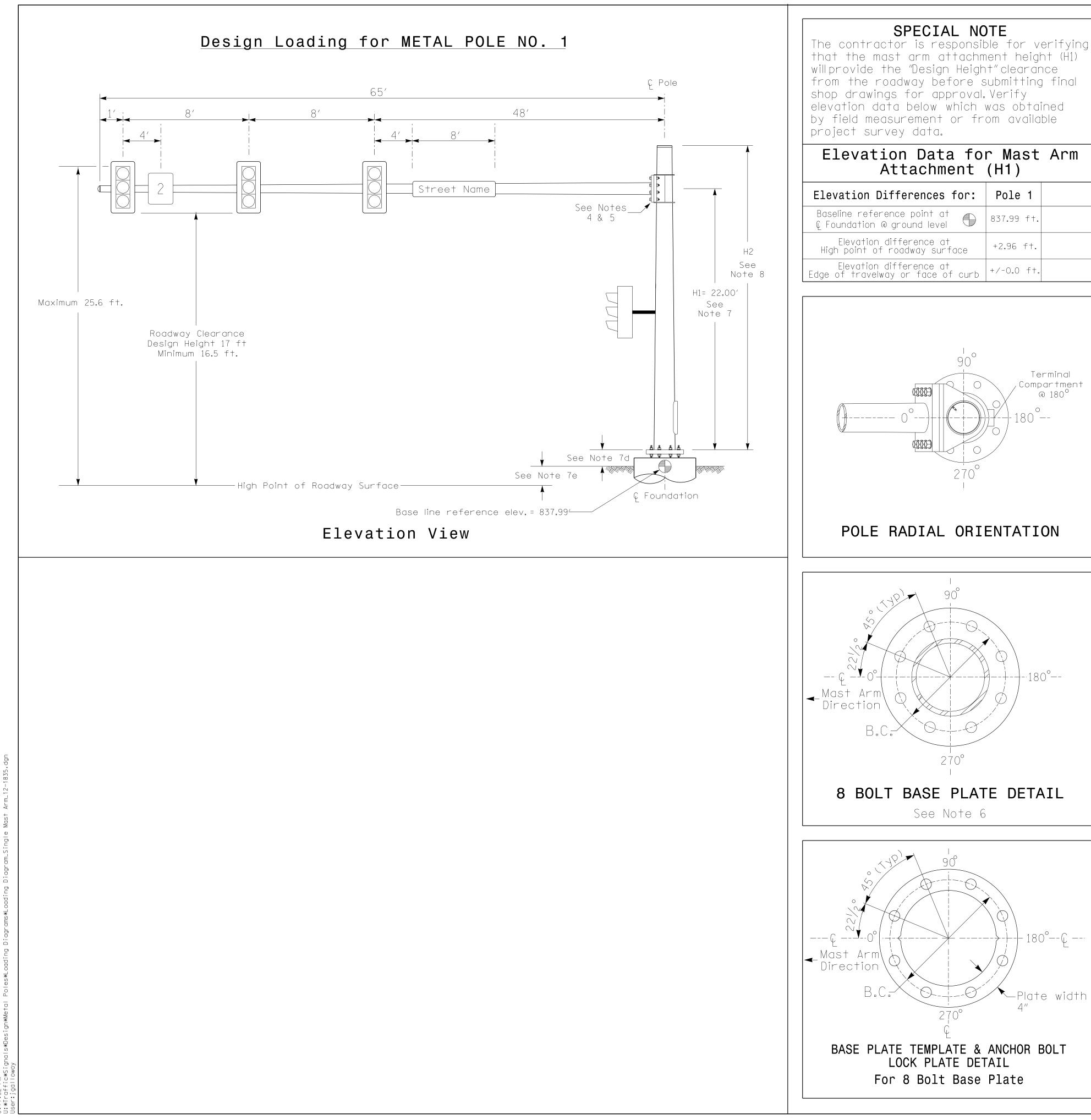
arameters								
	Veh Det Plan	Overlap Plan						
*	2	2						

\* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

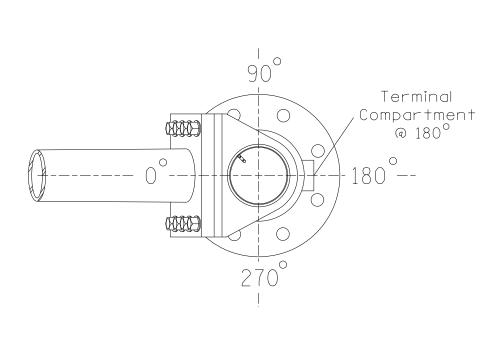
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1835
DESIGNED: MAY 2024
SEALED: <sup>5/17/2024</sup>
REVISED: N/A

	Final Design								
Flactrical Detail - Sheet 3 of 3								IMENT NOT CONSIDERED FINAL S ALL SIGNATURES COMPLETED	
	ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:	SR	1304	NC 15 a (Ervin	50 EB t n Road)	U-Tı	ırn	SEAL CARO SEAL SEAL	
	Constant In the second	Divisior Plan date:		Iredell 2024	County REVIEWED BY: J		esville ay, PE	029904	
		PREPARED BY	: JGa	lloway	REVIEWED BY: R	Muncey	, PE	DocuSigned, by:	
	Onals Management		REVISIO	NS		INIT.	DATE	Jason Galloway 17/2024	
	750 N. Greenfield Pkwy, Garner, NC 27529	· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	10D1E2B40B4B46E         Date           SIG. INVENTORY NO.         2-1835	

DocuSign Envelope ID: 20FCD354-4A07-457D-B03E-EE9E82DF69CE



The contractor is responsible for verifying



### DESIGN REFERENCE MATERIAL

### DESIGN REQUIREMENTS

- requirements.

- the following:

# NCDO Pre 50 N.Gree

Μ	IETAL POLE No. 1	PR	OJECT REFER	RENCE NO.	SHEET NO.	
14			R - 230	7 B	Sig. 19.4	
	MAST ARM LOADING SC	HEDU	LE			
loading Symbol	DESCRIPTION	AREA	SIZE	WEIGHT		
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS		
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS		
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS		

### NOTES

1. Design the traffic signalstructure and foundation in accordance with: • The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions. • The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signalproject specialprovisions. • The 2024 NCDOT Roadway Standard Drawings.

• The traffic signalproject plans and specialprovisions.

• The NCDOT "MetalPole Standards" located at the following NCDOT website:

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

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 force ratios that do not exceed 0.9.

4. The camber design for the 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

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. Signalheads are rigidly mounted and vertically centered on the mast arm.

c. The roadway clearance height for design is as shown in the elevation views.

d. The top of the pole base plate is 0.75 feet above the ground elevation.

e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.

8. The pole manufacturer will determine the total height (H2) of each pole using the greater of

• Mast arm attachment height (H1) plus 2 feet, or

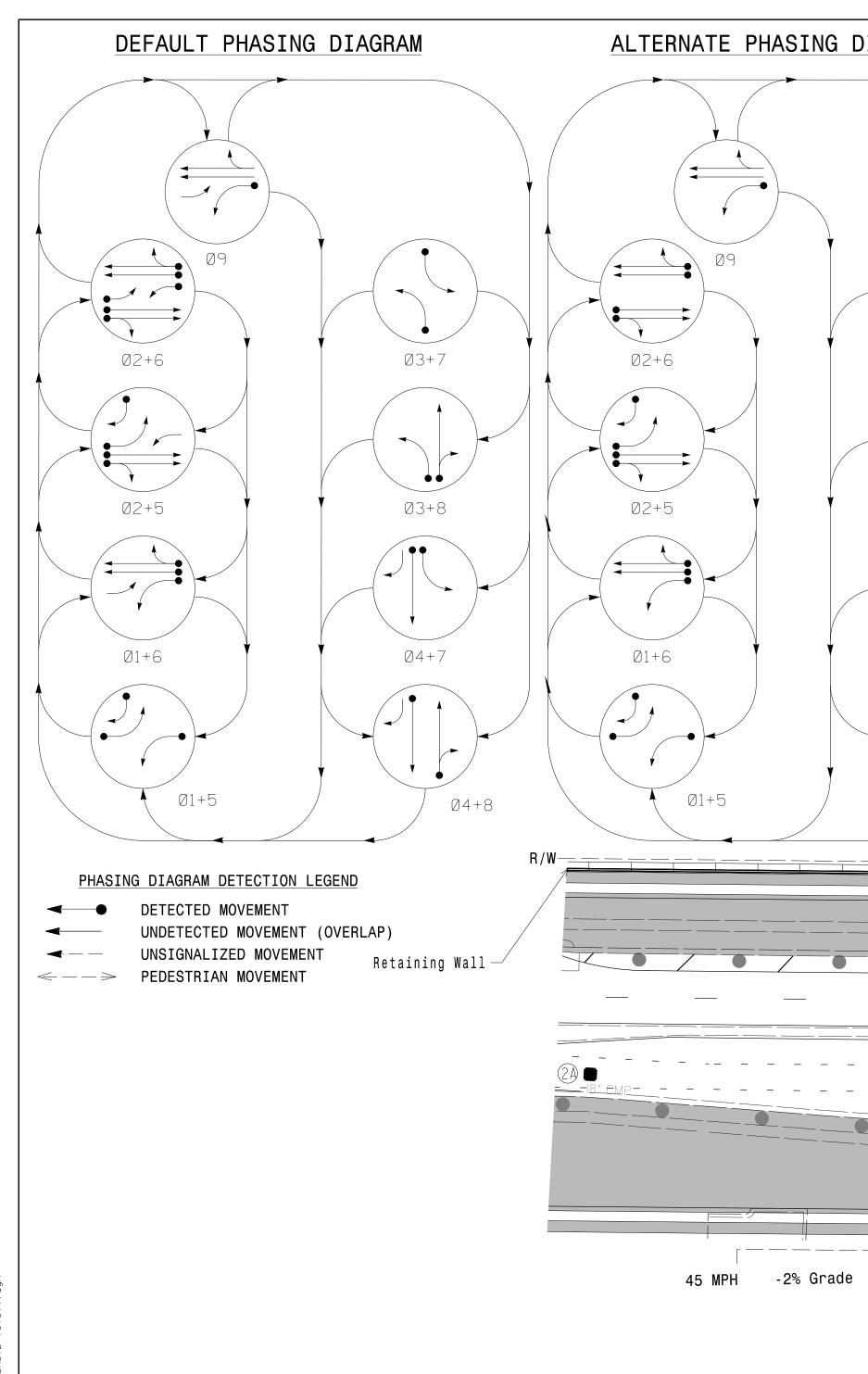
• H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.

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 SignalDesign Section Senior StructuralEngineer for assistance at (919)814-5000.

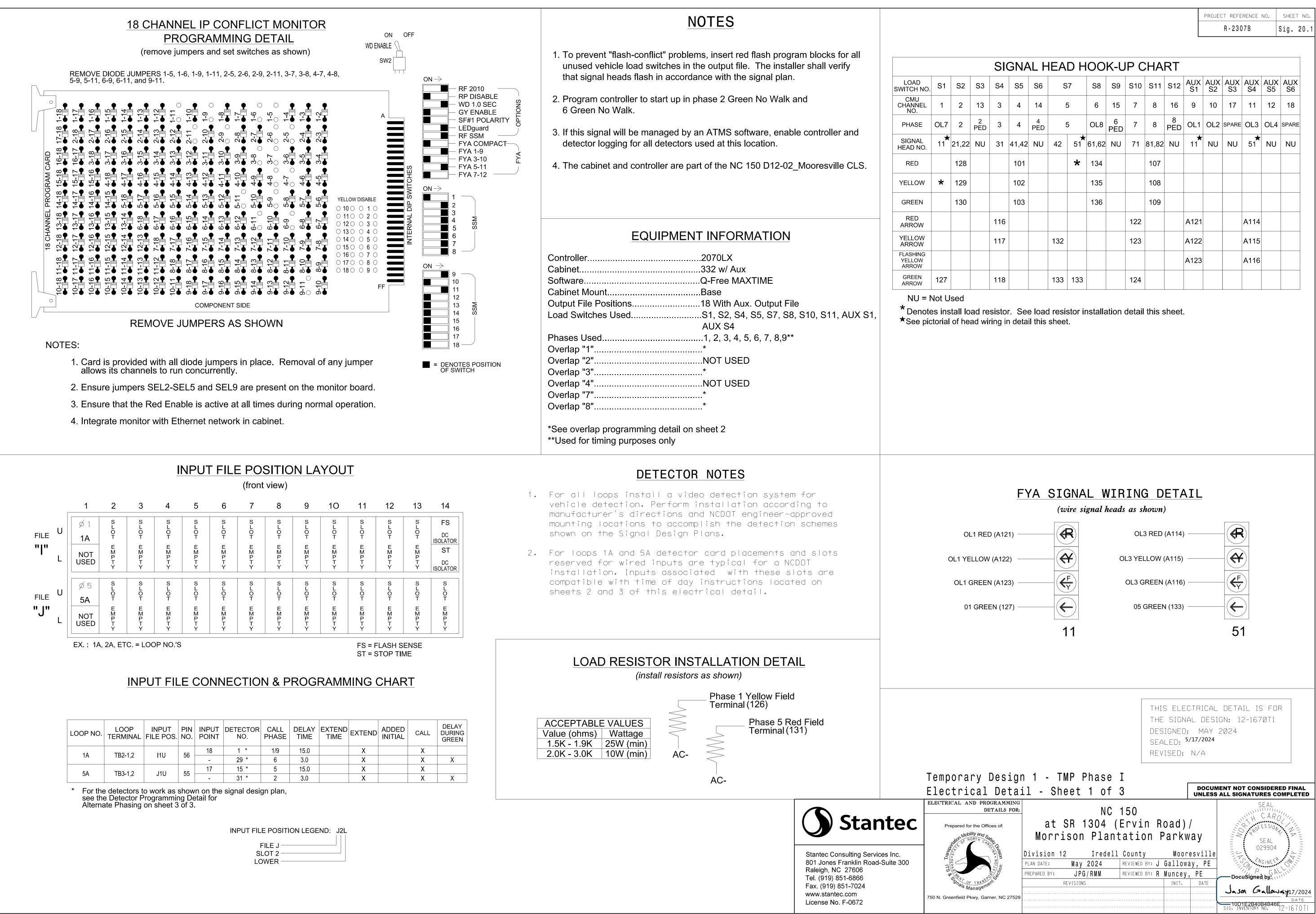
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signalheads over the roadway.

11. The contractor is responsible for providing soilpenetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

	<b>Stantec</b>	
)T Wind Zone	5 (110 mph)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
pared for the Offices of:	NC 150 EB at SR 1304 (Ervin Road) U-turn	SEAL 029904
Section Section	Division 12Iredell CountyMoorPLAN DATE:November 2023REVIEWED BY: J. Gallow	esville /av. PE
eenfield Pkwy,Garner,NC 27529		
N/A	REVISIONS INIT.	DATE Jason Gallowa5717/2024 10012284684846E DATE SIG. INVENTORY NO. 12-1835



A3A75E8E639					
DEFAULT PHASING DIAGRAM	ALTERNATE PHASING DIAGRAM	DEFAULT PHASING	ALTERNATE PHASING	MAXTIME DETECTOR INSTALLATION CHART	PROJECT REFERENCE NO.SHEET NO.R-2307BSig. 20.0
		TABLE OF OPERATION	TABLE OF OPERATION	DETECTOR PROGRAMMING	
		PHASE           SIGNAL         Ø	PHASE SIGNAL ØØØØØØØØØ		9 Phase Fully Actuated w/
		FACE     1     1     2     2     0     3     3     4     4     L       +     +     +     +     +     9     +     +     +     +     A	FACE     1     1     2     2     0     3     3     4       +     +     +     +     +     9     +     +     +	Image: Ward of the second s	Alternate Phasing
		$5 6 5 6 7 8 7 8 H$ $11  \bullet  \bullet  \bullet  \bullet  \bullet  \bullet  \bullet  \bullet  \bullet $	5 6 5 6 7 8 7	C   C   C   C   C   C   C   C   C   C	NC 150 D12-02_MOORESVILLE CLS
		21,22 R R G G R R R R R R	21,22 R R G G R R R R		
		31 <del>-R -R -R -R -R</del>	31 <del>-R</del> <del>-R</del> <del>-R</del> <del>-R</del> <del>-R</del> <del>-</del>	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	. Refer to "Roadway Standard
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	G       R       2A       6X6       300       *       *       2       -       -       X       -       *         G       G       R       2B       6X40       0       *       *       2       -       -       X       -       *	Drawings NCDOT" dated January 2024 and "Standard
Ø2+6 Ø3+7	Ø2+6 Ø3+7	51  -  -  -  -  -  -  -  -  -	51	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Specifications for Roads and Structures" dated January 2024.
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	61,62 R G R G G R R R 71 <del>R R R R R R - R - R</del> -	R       A       6X40       0       *       *       3       -       -       X       -       X       -       *       2         -       -       -       A       6X40       0       *       *       3       -       -       X       -       X       -       *       2         -       -       -       X       -       X       -       X       -       *       2	• Do not program signal for late night flashing operation unless
		81,82 R R R R R R G R G R	81,82 R R R R R G R	C     G     R     5     15.0★     -     X     -     X     -     *       5A     6X40     0     *     *     2#     3.0     -     X     -     *	otherwise directed by the Engineer.
				5B       6X40       0 $*$ $*$ 5       15.0       -       X       - $*$ $^3$	• Phase 1 and/or phase 5 may be lagged.
Ø2+5 Ø3+8	Ø2+5 Ø3+8	N H SI		6A       6X6       300       *       *       6       -       -       X       -       X       -       *       4         6B       6X6       300       *       *       6       -       -       X       -       X       -       *       4	<ul> <li>Phase 3 and/or phase 7 may be lagged.</li> </ul>
		35		6C       6X40       0 $*$ $*$ 6       5.0       2.0       X       -       X       X $*$ $^5$	· Set all detector units to presence mode.
		MPH (F		6D       6X40       0       *       *       6       5.0       2.0       X       -       X       X       *         7A       6X40       0       *       *       7       -       -       X       -       X       *       6	• Locate new cabinet so as not to obstruct sight distance of
			5. 5	8A       6X40       0       *       *       8       10.0       -       X       -       X       -       *         * Video Detection Area       7	<ul><li>vehicles turning right on red,</li><li>This signal utilizes a special</li></ul>
Ø1+6 Ø4+7	Ø1+6 Ø4+7	4% Gr	A0ad)	Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas	ring configuration. See electrical details.
		ade		#Disable Phase(s) callduring Alternate Phasing Operation.	<ul> <li>Phase 9 is used only during coordination.</li> </ul>
		ing Wood Pole	Tomporary Wood Polo		• The Division Traffic Engineer will determine hours of use for
Ø1+5	Ø1+5	ing Wood Pole Sta. 679+81 ± 97' LT ±	Temporary Wood Pole -L- Sta. 681+12 ± 95' LT ±	Retaining Wall 1	each phasing plan. O. Maximum times shown in timing
	04+0			45 MPH - 2% Grade	chart are for free-run operation only. Coordinated signal system
PHASING DIAGRAM DETECTION LEGEND	R/WNC_150			<u> </u>	timing values supersede these values.
DETECTED MOVEMENT					1. Field adjust temporary poles as needed.
UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT Detaining Wall					2. See TMP Phase I For Pedestrian detour and sidewalk closures.
<pre>     CONSIGNALIZED MOVEMENT     Retaining Wall     </pre> Consignalized movement     Retaining Wall		62			
	2A				
			21 - 0		
					LEGEND
					POSED EXISTING
					→ Traffic Signal Head → Modified Signal Head N/A
	45 MPH -2% Grade <u>Tempo</u> -L-	rary Wood Pole Sta. 680+04 ± 109' RT ±			Pedestrian Signal Head     With Push Button & Sign     ✓     Signal Pole with Guy
		109' RI ±	Temp -L-	Sta. 681+79 ± SIGNAL FACE I.D.	Signal Pole with Guy
		tion tion			Inductive Loop Detector       Inductive Loop Detector         Controller & Cabinet       Image: State Sta
MA	XTIME TIMING CHART	lanta			□ Junction Box ■ 2-in Underground Conduit
FEATURE 1 2 3 4	PHASE         5         6         7         8         9         OL7	(1+9) OL8 (6+9) Jacob	a l	12''	N/A Right of Way
Walk *             Dath Chara *	·	Pa	MPH MPH	$\begin{array}{c} \left(\begin{array}{c} F \\ F \end{array}\right) \\ \left(\begin{array}{c} F \\ F \end{array} \\ \left(\begin{array}{c} F \\ F \end{array}\right) \\ \left(\begin{array}{c} F \\ F \end{array} \\ \left(\begin{array}{c} F \\ F \end{array}\right) \\ \left(\begin{array}{c} F \\ F \end{array} \\ \left(\begin{array}{c} F \\ F \end{array} \\ \\ \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \\ \end{array} \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \\ \end{array} \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \\ \end{array} \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \\ \end{array} \\ \\ \\ \end{array} \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \\ \end{array} \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \\ \end{array} \\ \left(\begin{array}{c} F \end{array} \\ \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \\$	Directional Arrow Video Detection Area N/A
Ped Clear *         - <th< td=""><td>-         -</td><td></td><td>35   35   35   44% G</td><td><math display="block">\begin{array}{c c} &amp; &amp; &amp; &amp; &amp; &amp; &amp; &amp; &amp; \\ \hline &amp; &amp; &amp; &amp; &amp; &amp; &amp; \\ 11 &amp; &amp; 31 &amp; &amp; 2122 &amp; &amp; &amp; 42 \end{array}</math></td><td>Construction Zone N/A</td></th<>	-         -		35   35   35   44% G	$\begin{array}{c c} & & & & & & & & & \\ \hline & & & & & & & \\ 11 & & 31 & & 2122 & & & 42 \end{array}$	Construction Zone N/A
Passage *         2.0         6.0         2.0         2.0           Max 1 *         15         90         15         35			,   <u> </u>    ă	JI /I 4	● Drums N/A "DO NOT BLOCK INTERSECTION" Sign (R10-7) ④
Yellow Change         3.0         4.7         3.0         4.	1 3.0 4.7 3.0 3.6 3.0	3.0 4.7		al Upgrade	
Red Clear         3.6         1.9         3.3         2.1           Added Initial*         -          -         -	0 3.4 1.9 3.2 2.2 3.6 S	3.6 1.9	<pre>~ Tempo</pre>	orary Design 1 - TMP Phase I	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Maximum Initial *				Prepared for the Offices of: NO Dility and NC 1	
Time Before Reduction *         -         15         -         -           Time To Reduce *         -         30         -         -	- 15 - 30			Stantec at SR 1304 (En Morrison Planta	ation Parkway
Minimum Gap         -         3.0         -         -           Advance Walk         -         -         -         -         -	- <u>3.0</u>			c Consulting Services Inc.	Ξ 029904 Ξ
Advance Walk     –     –     –       Non Lock Detector     X     X     X	-         -		801 Joi Raleigh	h, NC 27606	REVIEWED BY: J Galloway, PE
Vehicle Recall     –     MIN RECALL     –     –       Dual Entry     –     –     –     –	-         MIN RECALL         -         -         -           -         -         -         -         -         -		Fax. (9	19) 851-6866     750 N.Greent Teld Pkwy, Garner, NC 27529 THET ALLO DT: 0 Training Tight       019) 851-7024     SCALE       tantec.com     0	INIT. DATE Jason Gallowsy17/2024
	es for phases 2 and 6 lower than what is shown. Min Green for all other phases should not b	be lower than 4 seconds.		e No. F-0672	
			L. L		



LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	
1A	TB2-1,2	1411	56	18	1 *	1/9	15.0		Х		
IA	102-1,2	I1U	50	-	29 *	6	3.0		Х		
5A	TB3-1,2	J1U	55	17	15 *	5	15.0		Х		
JA	103-1,2	JIU	55	-	31 *	2	3.0		Х		

FILE J SLOT 2 LOWER	

R -	2307B	Sig.
PROJECT F	REFERENCE NO.	SHE

	SIGNAL HEAD HOOK-UP CHART																	
1	S2	S3	S4	S5	S6	S	57	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
	2	13	3	4	14	Ļ	5	6	15	7	8	16	9	10	17	11	12	18
.7	2	2 PED	3	4	4 PED	Ę	5	OL8	6 PED	7	8	8 PÉD	OL1	OL2	SPARE			SPARE
★	21,22	NU	31	41,42	NU	42	<b>★</b> 51	61,62	NU	71	81,82	NU	★ 11	NU	NU	<b>*</b> 51	NU	NU
	128	-		101			*	134		-	107				-			-
	129			102			-	135			108				-			
	130			103				136		-	109				-			
		-	116				-			122			A121		-	A114		
			117			132				123			A122			A115		
		-								-			A123			A116	÷	
7		-	118			133	133			124					-			

# MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3	7	8
Туре	FYA 4 - Section	FYA 4 - Section	Normal	Normal
Included Phases	2	6,9	1,9	6,9
Modifier Phases	1,9	5	-	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	3.0	4.7
Trail Red	0.0	0.0	3.6	1.9

# **OUTPUT CHANNEL CONFIGURATION**

Front Panel

Main Menu >Controller >More>Channels>Channels Config

Web Interface Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

	Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
NOTICE CONTROL TYPE			7		X	N N	
& CONTROL SOURCE	1	Overlap	7		Х	Х	1
	2	Phase Vehicle	2		Х		2
	3	Phase Vehicle	3		Х	Х	3
	4	Phase Vehicle	4		Х		4
NOTICE CONTROL TYPE	5	Phase Vehicle	5		Х		5
& CONTROL SOURCE	6	Overlap	8		Х	Х	6
	7	Phase Vehicle	7		Х		7
	8	Phase Vehicle	8		Х	Х	8
	9	Overlap	1		Х	Х	9
	10	Overlap	2		Х	Х	10
	11	Overlap	3		Х		11
	12	Overlap	4		Х		12
	13	Phase Ped	2				13
	14	Phase Ped	4				14
	15	Phase Ped	6				15
	16	Phase Ped	8				16
	17	Overlap	5		Х	Х	17
	18	Overlap	6		Х		18

5:13:17 | U: \*Traff ||ser: :00

# MAXTIME OVERLAP PRO FOR ALTERNAT

Front Panel Main Menu >Controller >Overlap

Web Interface Home >Controller >Overlap Confi

In the table view of the web interfa "Overlap" in the top left corner of entire contents of Overlap Plan 1. into Overlap Plan 2. Modify Overla below and save changes.

# Overlap Plan 2

Overlap	1	3
Туре	FYA 4 - Section	FYA 4 - Se
Included Phases	-	<u> -</u>
Modifier Phases	1,9	5
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

# SEQUENCE

Front Panel Main Menu >Controller >Se

Web Interface Home >Controller >Sequen

### Sequence 1

Ring	Sequence
1	1,2,a,3,4,b
2	5,6,a,7,8,b

## Sequence 2

Ring	Sequence
1	1,2,a,9,b,3,4
2	5,6,a,b,7,8,c

# Elec ELECTR Stantec 🗍 Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Ę. 7 Fax. (919) 851-7024 www.stantec.com 750 N. Gree License No. F-0672

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1670T1 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

		REFERENCE NO. SHEET NO. -2307B Sig. 20.2
		-2307B Sig. 20.2
PROGRAMMING DETAIL		
NATE PHASING		
erlap >Overlap Parameters/Overlap Timings		
Configuration >Overlaps		
interface, right click on her of the table. Copy the Plan 1. Paste Overlap Plan 1 Overlap Plan 2 as shown		
3		
YA 4 - Section		
- NOTICE INCLUDED PHASE		
<u> </u>		
0.0		
0.0		
NCE PARAMETERS		
er >Sequence & Phs Config >Sequences		
equence		
•		
quence Data		
,a,3,4,b		
,a,7,8,b		
quence Data Phase Sequence Plan 2 is for use	during coordination only	
,a,9,b,3,4,c		
,a,b,7,8,c		
Tampapapy Design 1 TMD Dessa T		
Temporary Design 1 - TMP Phase I Electrical Detail - Sheet 2 of 3		T NOT CONSIDERED FINAL SIGNATURES COMPLETED
ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 1		SEAL
	rvin Road)/	SFESSION
Morrison Planta		SEAL 029904
Prepared for the Offices of:	Dunty Mooresville VIEWED BY: J Galloway, PE	E C C C C C C C C C C C C C C C C C C C
PREPARED BY: JPG/RMM RE	VIEWED BY: R Muncey, PE	-DocuSigned by
750 N. Greenfield Pkwy, Garner, NC 27529		Jason Gallowsy17/2024 DATE
	SI-	<b>-10D1E2B40B4B46E</b> G. INVENTORY NO. 12-1670T1

# MAXTIME ALTI

To run alternate phasing, select A Pattern can be selected throug

PHASING

ACTIVE PLAN REQUIRED TO RUN

ACTIVE PLAN REQUIRED TO RUN

F	ALIERNAIE PHASING CHANG
OVERLAP PLAN 2	S A SUMMARY OF WHAT TA AND VEHICLE DETECTOR PL ERNATE PHASING":
OVERLAP PLAN 2:	Modifies overlap included pha for heads 11 and 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 6 call on loop and reduces delay time for pha call on loop 1A to 0 seconds.
	Disables phase 2 call on loop and reduces delay time for pha

# MA

TERNATE PHASIN	NG ACTIVATION	DETAIL		
lect a Pattern that is programmed to rough the scheduler or manually by	o run Overlap Plan 2 and Detect y changing the Operational Mode	or Plan 2. e.		
				MAXTIME DETECTOR PROC
	OVERLAP PLAN	VEH DET PLAN		FOR ALTERNATE PHASIN
JN DEFAULT PHASING	1	1		Front Panel
JN ALTERNATE PHASING	2	2		Main Menu >Controller >Detector >\
				Web Interface Home >Controller >Detector Configu
				In the table view of web interface rig
ALTERNATE PHASING CHAN	NGE SUMMARY			the top left corner of the table. Copy Detector Plan 1. Paste Detector Plar
LOWING IS A SUMMARY OF WHAT TA P PLAN 2 AND VEHICLE DETECTOR F				Modify Detector Plan 2 as shown be
THE "ALTERNATE PHASING":				Plan 2 Detector Call Phase Delay
PLAN 2: Modifies overlap included ph for heads 11 and 51 to run protected turns only.	ases		14	
PLAN 2: Disables phase 6 call on loop				
and reduces delay time for pl call on loop 1A to 0 seconds.			54	0.1 0
Disables phase 2 call on loop and reduces delay time for pl	hase 5			31 0 -
call on loop 5A to 0 seconds.				
MAXTIME ALTERNATI	E PHASING PATTEF	RN		
PROGRAMM	IING DETAIL			
Front Panel Main Menu >Controller >Coor	dination >Patterns			
Web Interface				
Home >Controller >Coordinati	on >Patterns			
Pattern ParametersPatternVeh Det Plan*2	erlap Plan 2			
* The Pattern number(s) are to be				
the Division and/or City Traffic E				Temporary Design 1 - TMP P Electrical Detail - Sheet
				ELECTRICAL AND PROGRAMMING DETAILS FOR:
			<b>Stanted</b>	Prepared for the Offices of: at SR 1 Mobility and Sec. Morrison
			Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300	Division 12
			Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024	PREPARED BY: JPG
			www.stantec.com License No. F-0672	750 N. Greenfield Pkwy, Garner, NC 27529

13:22 \*Traf

750	N.	Gre

R - 2307B	Sig. 20.3
PROJECT REFERENCE NO.	SHEET NO.

# OGRAMMING DETAIL ING LOOPS 1A & 5A

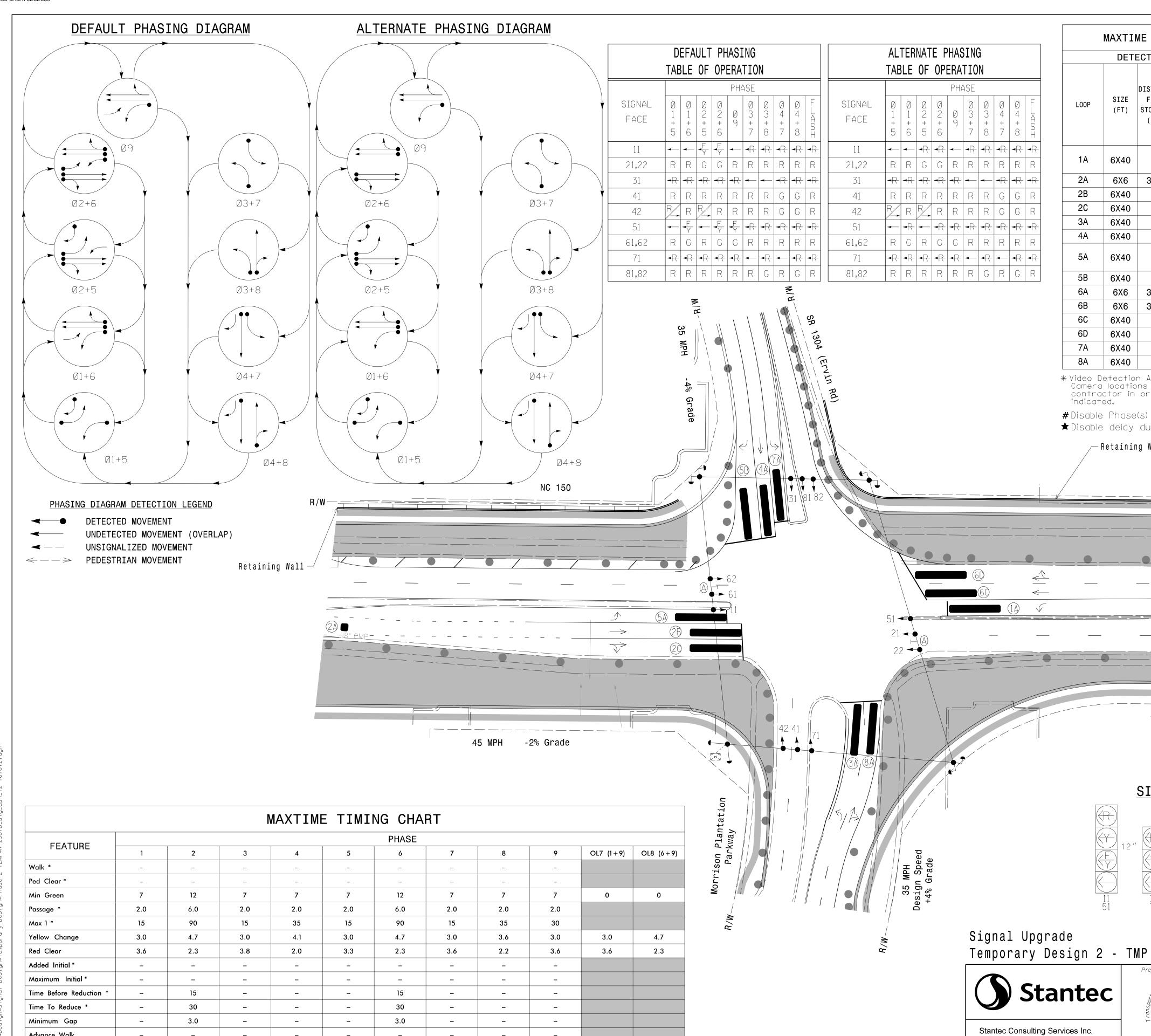
>Veh Det Plans

figuration >Vehicle Detectors

right click on "Detector" in ppy the entire contents of Plan 1 into Detector Plan 2. below and save changes.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1670T1
DESIGNED: MAY 2024
SEALED: <sup>5/17/2024</sup>
REVISED: N/A

### Phase I DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED t 3 of 3 SFA NC 150 C. A A 1304 (Ervin Road)/ on Plantation Parkway SEAL 029904 Iredell CountyMooresvilleay 2024REVIEWED BY: J Galloway, PE JPG/RMM REVIEWED BY: R Muncey, PE — DocuSigned, þy: INIT. DATE Jason Gallow 5/17/2024 s Manage<sup>n</sup> eenfield Pkwy, Garner, NC 27529 10D1E2B40B4B46E. SIG. INVENTORY NO. 12-1670T



+ 7 <del>8</del> + 7 <del>8</del>

Advance Walk

Vehicle Recall

Dual Entry

Non Lock Detector

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MIN RECALL

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MIN RECALL

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\_ \_\_\_\_ \* 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.

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Fax. (919) 851-7024 www.stantec.com License No. F-0672

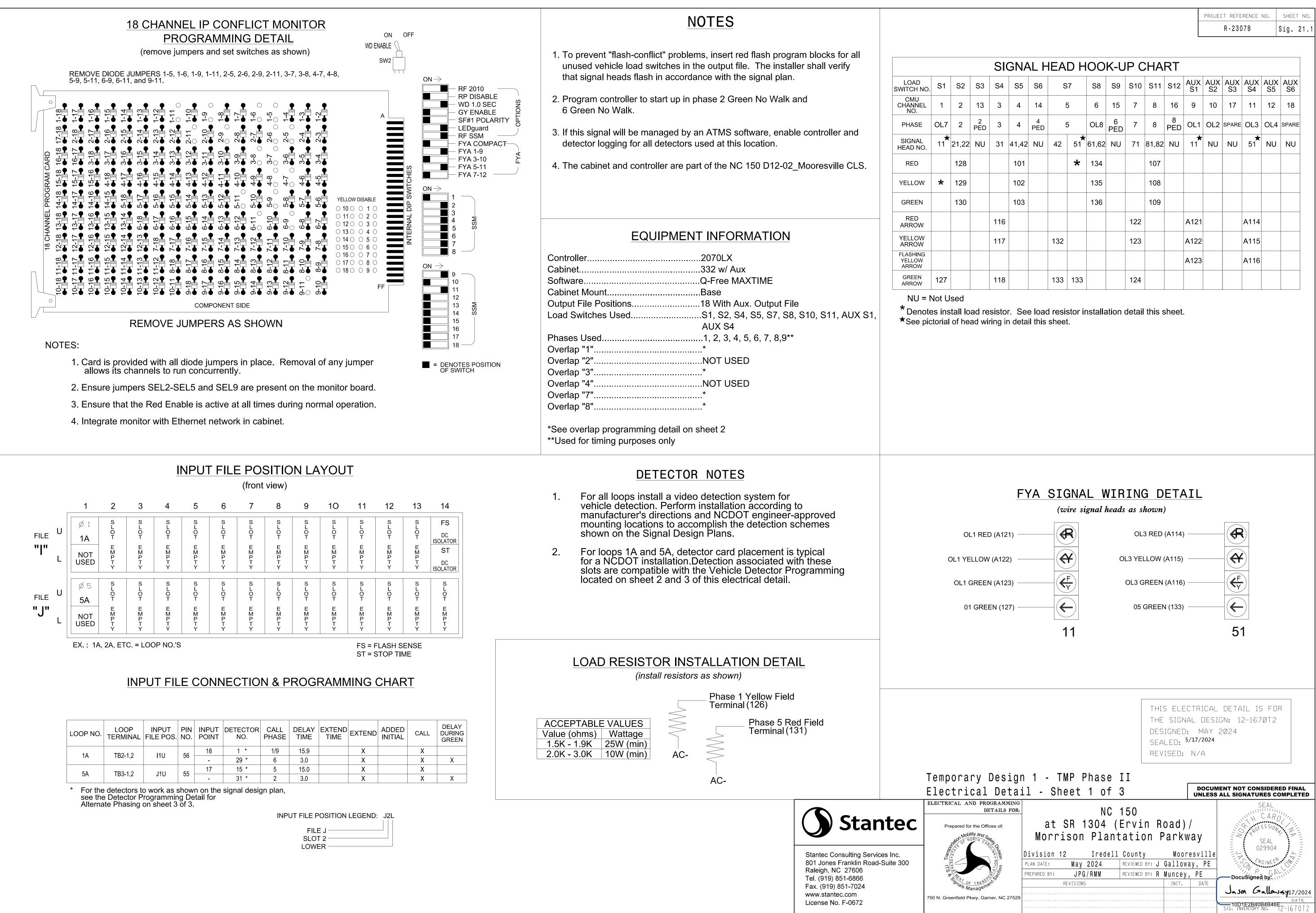
Raleigh, NC 27606

Tel. (919) 851-6866

801 Jones Franklin Road-Suite 300



E DET	ECTOR	I	NSTA		ION C						PROJECT REFERENCE NO. SHEET NO. R-2307B Sig. 21.0
ISTANCE FROM TOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY	EXTEND TIME	0	ADDED INITIAL G	CALL	DELAY DURING GREEN	NEW CARD	9 Phase Fully Actuated w/ Alternate Phasing NC 150 D12-02_MOORESVILLE CLS
0	*	*	1/9 6 <i>#</i>	15.0★ 3.0	-	X X	-	X X	- X	*	NOTES
300	*	*	2	-	-	Х	-	X	-	*	1 Defer to "Decdway Standard
0	*	*	2 2	5.0	2.0	X X	-	X X	X X		1. Refer to "Roadway Standard Drawings NCDOT" dated
0	*	*	3	5.0 -	2.0	X	-	X		*	January 2024 and "Standard Specifications for Roads and
0	*	*	4	-	-	Χ	-	Х	-	*	Structures" dated January 2024.
0	*	*	5 2 <i>#</i>	15 0★ 3 0	_	X X	-	X X	- X	*	2. Do not program signal for
0	*	*	2 <i>#</i> 5	15.0	-	^ Х	-	^ Х		*	late night flashing operation unless otherwise
300	*	*	6	_	-	Х	-	Х	-	*	directed by the Engineer. 3. Phase 1 and/or phase 5 may
300	*	*	6	-	-	X	-	X	- V	*	be lagged.
0	*	*	6 6	5.0 5.0	2.0	X X	-	X X	X X		4. Phase 3 and/or phase 7 may be lagged,
0	*	*	_	-		X	-	X		*	5. Set all detector units to presence mode.
0	*	*	8	10.0	-	Х	-	Х	-	*	6. Reposition existing signal
	ld be d										heads numbered # 31,41,42,71,81, and 82.
rder ·	to pro	VID	e det	ection	ot tr	ne	are	eas			7. This signal utilizes a special ring configuration.
	uring Alterr							ati	on.	D	See electrical details.
Wall			0 1 11	donig	oporc						8. Phase 9 is used only during coordination.
Wall											9. The Division Traffic Engineer will determine the
											hours of use for each
45	MPH	+2	2% Gr 	ade						R/W	phasing plan. 10. Maximum times shown in
										,	timing chart are for
											free-run operation only. Coordinated signal system
											timing values supersede these values.
											11. See TMP Phase II for
						<b>D</b> (6	B	2			pedestrian detour and sidewalk closures.
			-							PR	LEGEND OPOSED EXISTING
			 150	<u>}</u>				F	?/W	<u>, 1 11</u>	→ Traffic Signal Head →
			100							(	D→ Modified Signal Head N/A
	L FA		FΤ	П						$\bigcirc$	Signal Pole with Guy
	Heads									$\square$	Inductive Loop Detector
ATT			L • D •								Controller & Cabinet
$(\mathbf{R})$	R								-		□ Junction Box ■ 2-in Underground Conduit
1	2 "	$\overline{)}$ 1	12″	Y							N/A Right of Way
$\qquad \qquad $		$\leq$				12′	/			_	
31	21 (	<u> </u>		<u> </u>	$\square$						Video Detection AreaN/AConstruction ZoneN/A
31 71	41 61_6	52		ΤĽ							● ● Drums N/A
	61,6 81,8	32								<	A "DO NOT BLOCK INTERSECTION" A Sign (R10-7)
P Pha	ase :	ТΤ									DOCUMENT NOT CONSIDERED FINAL
Prepared f	or the Offic		of:								UNLESS ALL SIGNATURES COMPLETED
Mot Mot	NORTH CAR	2 20.		~	+ 00		10			1 (Er	son Road) /
Transport	Other	N Divi									tion Parkway
DIL L		NOIS:									E 029904 E
S. Onol T	PE TRANSPOR	on	-	Divisi Plan date		Mav	/ 2				County Mooresville
	Pkwy,Garne		27529	PREPARED	BY: J	На	mbr				WIEWED BY: R Muncey, PE DocuSigned, py;
	SCAL	.C	40		RE V	1SI0 					INIT. DATE Jason Gallowsy17/2024
<											



R - 2307B	Sig.
PROJECT REFERENCE NO.	SHE

			SI	GNA		IEA	DΗ	00	K-U	PC	ΉА	RT						
1	S2	S3	S4	S5	S6	S	7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
	2	13	3	4	14	Ę	5	6	15	7	8	16	9	10	17	11	12	18
7	2	2 PED	3	4	4 PED	Ę	5	OL8	6 PED	7	8	8 PED	OL1		SPARE		OL4	SPARI
*	21,22	NU	31	41,42	NU	42	★ 51	61,62	NU	71	81,82	NU	★ 11	NU	NU	51 <b>*</b>	NU	NU
	128	-		101			*	134		-	107				-			
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	130	-		103				136			109							
			116							122			A121			A114		
			117			132				123			A122			A115		
		- -											A123			A116		
7			118			133	133			124								

# MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3	7	8
Туре	FYA 4 - Section	FYA 4 - Section	Normal	Normal
Included Phases	2	6,9	1,9	6,9
Modifier Phases	1,9	5	-	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	3.0	4.7
Trail Red	0.0	0.0	3.6	1.9

# **OUTPUT CHANNEL CONFIGURATION**

Front Panel

Main Menu >Controller >More>Channels>Channels Config

Web Interface Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

	Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
NOTICE CONTROL TYPE			7		X		
& CONTROL SOURCE	1	Overlap	7		Х	Х	1
	2	Phase Vehicle	2		Х		2
	3	Phase Vehicle	3		Х	Х	3
	4	Phase Vehicle	4		Х		4
NOTICE CONTROL TYPE	5	Phase Vehicle	5		Х		5
& CONTROL SOURCE	6	Overlap	8		Х	Х	6
	7	Phase Vehicle	7		Х		7
	8	Phase Vehicle	8		Х	Х	8
	9	Overlap	1		Х	Х	9
	10	Overlap	2		Х	Х	10
	11	Overlap	3		Х		11
	12	Overlap	4		Х		12
	13	Phase Ped	2				13
	14	Phase Ped	4				14
	15	Phase Ped	6				15
	16	Phase Ped	8				16
	17	Overlap	5		Х	Х	17
	18	Overlap	6		Х		18

5:15:31 | U: \*Traff ||ser: :00

# MAXTIME OVERLAP PRO FOR ALTERNAT

Front Panel Main Menu >Controller >Overlap

Web Interface Home >Controller >Overlap Confi

In the table view of the web interfa "Overlap" in the top left corner of entire contents of Overlap Plan 1. into Overlap Plan 2. Modify Overla below and save changes.

# Overlap Plan 2

Overlap	1	3
Туре	FYA 4 - Section	FYA 4 - Se
Included Phases	-	-
Modifier Phases	1,9	5
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

# SEQUENCE

Front Panel Main Menu >Controller >Se

Web Interface Home >Controller >Sequen

### Sequence 1

Ring	Sequence
1	1,2,a,3,4,b
2	5,6,a,7,8,b

### Sequence 2

Ring	Sequence
1	1,2,a,9,b,3,4
2	5,6,a,b,7,8,c

### Elec ELECTR Stantec 🛛 Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Ę. 1 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com 750 N. Gree License No. F-0672

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1670T2 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

	PROJECT REFERENCE R-2307B	NO. SHEET NO. SIG. 21.2
PROGRAMMING DETAIL		
NATE PHASING		
erlap >Overlap Parameters/Overlap Timings		
Configuration >Overlaps		
interface, right click on her of the table. Copy the Plan 1. Paste Overlap Plan 1 Overlap Plan 2 as shown		
3		
YA 4 - Section		
- NOTICE INCLUDED PHASE		
0 0.0		
0.0		
NCE PARAMETERS		
er >Sequence & Phs Config >Sequences		
equence		
quence Data		
,a,3,4,b		
,a,7,8,b		
quence Data Phase Sequence Plan 2 is for use du	ring coordination only	
a,9,b,3,4,c ,a,b,7,8,c		
, , , , , , , , , , , , , , , , , , , ,		
Temporary Design 2 - TMP Phase II		
Electrical Detail - Sheet 2 of 3	DOCUMENT NOT CONS UNLESS ALL SIGNATUR	
ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 150		EAL CARD''
Prepared for the Offices of: A Constraint of the Offices of the O	ion Parkway 🔰 🖂 🏹	SSION T
Prepared for the Offices of:		SEAL 29904
PREPARED BY: JPG/RMM REVIEW	WED BY: J Galloway, PE	GINEER M
Snavs Management REVISIONS	INIT. DATE .	1. PX: 11111 allow 5/17/2024
750 N. Greenfield Pkwy, Garner, NC 27529		<b>34B46E</b> No. 12-167072

# MAXTIME ALT

To run alternate phasing, selec A Pattern can be selected throu

PHASING

ACTIVE PLAN REQUIRED TO RUN

ACTIVE PLAN REQUIRED TO RUN

	ALIERNAIE PHASING CHANG
OVERLAP PLAN 2	IS A SUMMARY OF WHAT TA AND VEHICLE DETECTOR PL ERNATE PHASING":
OVERLAP PLAN 2:	Modifies overlap included pha for heads 11 and 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 6 call on loop and reduces delay time for pha call on loop 1A to 0 seconds.
	Disables phase 2 call on loop and reduces delay time for pha

# M

			1		
TERNATE PHASIN	IG ACTIVATION	DETAII			
lect a Pattern that is programmed to rough the scheduler or manually by	o run Overlap Plan 2 and Detect / changing the Operational Mode	or Plan 2. e.			
			Γ	MAXTIME DETECT	
	OVERLAP PLAN	VEH DET PLAN		FOR ALTERNATE	E PHASIN
				Front Donal	
JN DEFAULT PHASING JN ALTERNATE PHASING	1 2	1 2		Front Panel Main Menu >Controlle	r >Detector >\
				Web Interface	
				Home >Controller >De	etector Configu
				In the table view of we the top left corner of th	
ALTERNATE PHASING CHAN				Detector Plan 1. Paste Modify Detector Plan 2	
P PLAN 2 AND VEHICLE DETECTOR P THE "ALTERNATE PHASING":				-	
PLAN 2: Modifies overlap included ph	2505			Plan 2 Detector Call Phase	e Delay
for heads 11 and 51 to run protected turns only.			1A	1 1 29 0	0.0
PLAN 2: Disables phase 6 call on loop					Datasa
and reduces delay time for ph call on loop 1A to 0 seconds.			5A	DetectorCall Phase155310	0.0
Disables phase 2 call on loop and reduces delay time for ph	nase 5			51 0	-
call on loop 5A to 0 seconds.					
MAXTIME ALTERNAT		RN			
PROGRAMN	<u>IING DETAIL</u>				
Front Panel Main Menu >Controller >Coord	dination >Patterns				
Web Interface					
Home >Controller >Coordination	on >Patterns				
Pattern Parameters Pattern Veh Det Plan Ove					
* 2	2				
* The Pattern number(s) are to be the Division and/or City Traffic E				Temporary Design	2 - TMP P
				Electrical Detai	l - Sheet
			<b>Stantec</b>		at SR 1
				- CAROL NORTH CAROL	Morrison
			Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606	T TEPP	IVISION 12 LAN DATE: May
			Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com	GNAV OF TRANSPORT	REPARED BY: JPG, REVISIONS
			License No. F-0672	750 N. Greenfield Pkwy, Garner, NC 27529	

- 10 - 10 - 1

750	N.	Gre

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PROJECT REFERENCE NO.	SHEET NO.

# OGRAMMING DETAIL ING LOOPS 1A & 5A

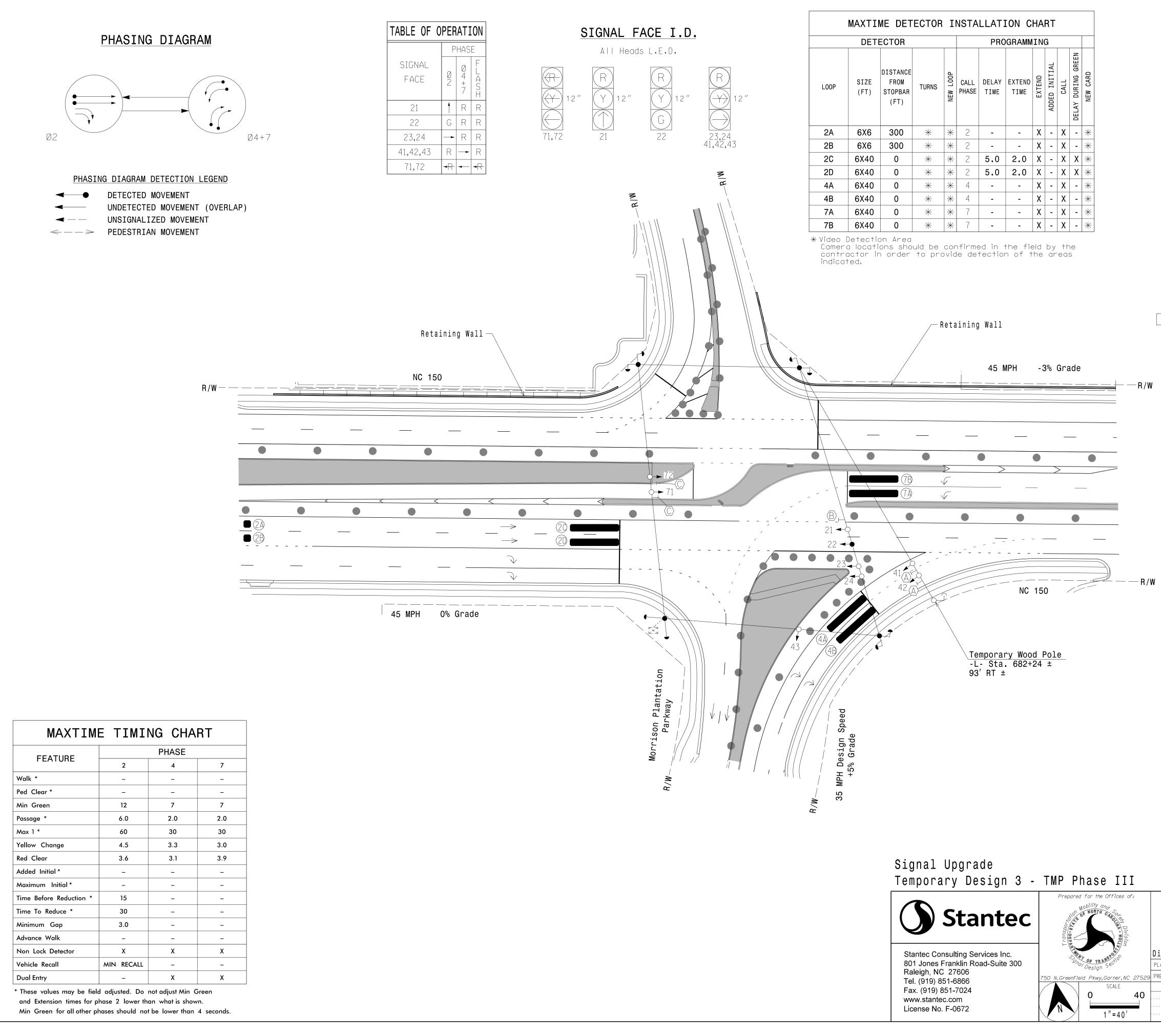
>Veh Det Plans

figuration >Vehicle Detectors

right click on "Detector" in ppy the entire contents of Plan 1 into Detector Plan 2. below and save changes.

THIS ELECTRICAL	DETAIL	IS FOR
THE SIGNAL DESIG	GN: 12-1	67ØT2
DESIGNED: MAY 2	2024	
SEALED: 5/17/2024		
REVISED: N/A		

### Phase II DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED t 3 of 3 SFA NC 150 C. A A 1304 (Ervin Road)/ on Plantation Parkway SEAL 029904 Iredell CountyMooresvilleay 2024REVIEWED BY: J Galloway, PE JPG/RMM REVIEWED BY: R Muncey, PE — DocuSigned, by: INIT. DATE Jason Gallowsy17/2024 s Manage<sup>n</sup> eenfield Pkwy, Garner, NC 27529 10D1E2B40B4B46E SIG. INVENTORY NO. 12-1670T



MAXTIM	E TIMI	NG CHA	RT	
	PHASE			
FEATURE	2	4	7	
Walk *	_	_	_	
Ped Clear *	_	_	_	
Min Green	12	7	7	
Passage *	6.0	2.0	2.0	
Max 1 *	60	30	30	
Yellow Change	4.5	3.3	3.0	
Red Clear	3.6	3.1	3.9	
Added Initial *	_	-	-	
Maximum Initial *	_	_	-	
Time Before Reduction *	15	_	-	
Time To Reduce *	30	_	-	
Minimum Gap	3.0	_	-	
Advance Walk	_	_	-	
Non Lock Detector	Х	Х	Х	
Vehicle Recall	MIN RECALL	-	_	
Dual Entry	_	Х	Х	

\$ ~ ⊢ \$ <del>~</del> \*

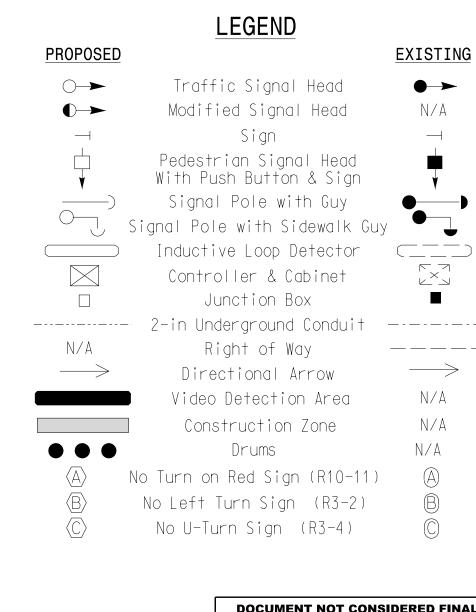
R - 2307B	Sig.	22.0
PROJECT REFERENCE NO.	SHEE	ET NO.



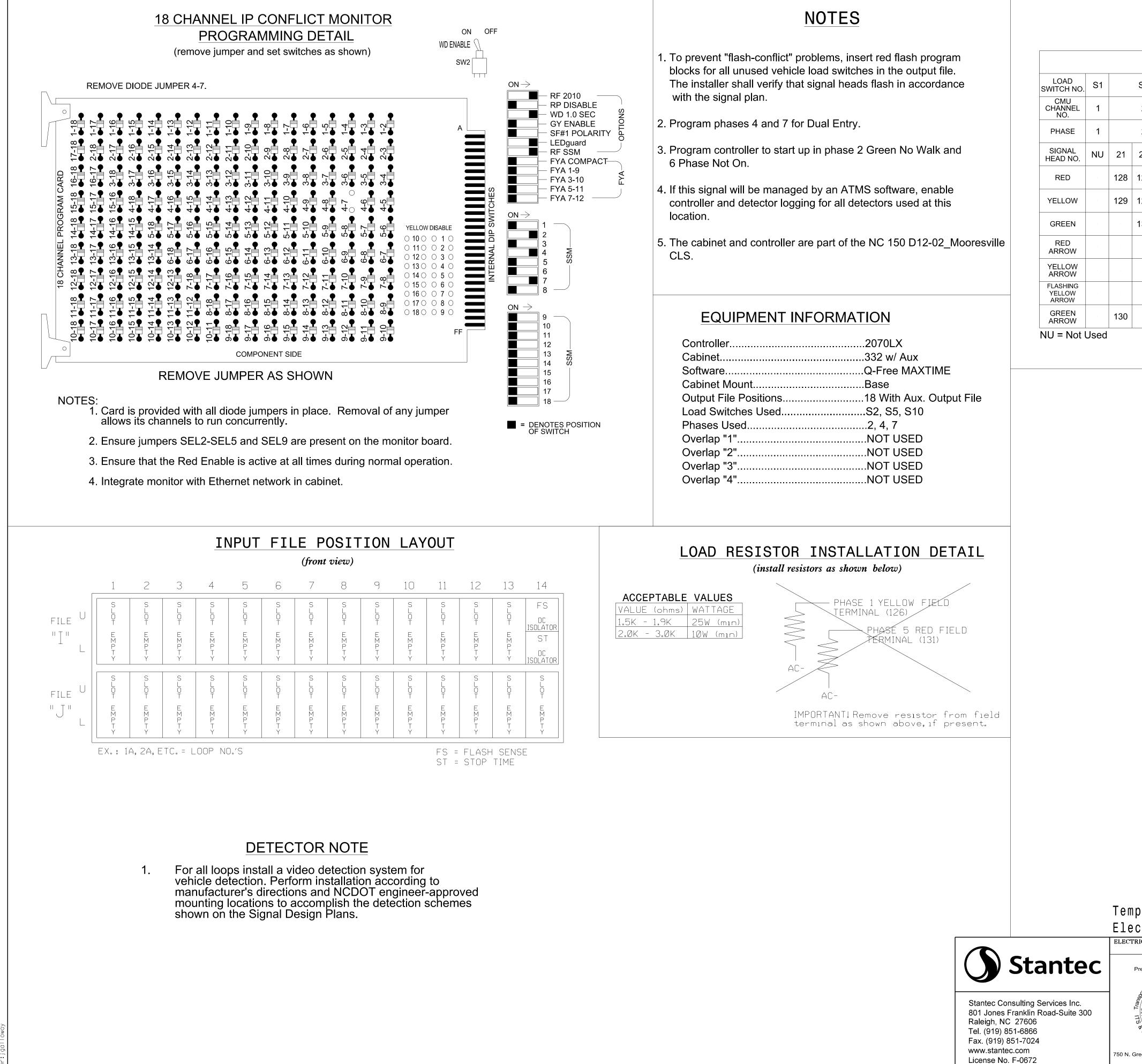
# 2 Phase Fully Actuated NC 150 D12-02\_MOORESVILLE CLS

# NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Set all detector units to presence mode.
- 4. Reposition existing signal head number #22. 5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values. 6. See TMP Phase III for pedestrian detour and
- <u>sidewalk closures.</u> 7. Field adjust temporary pole as needed.



P Phase III		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared for the Offices of:	NC 150 EB at Morrison Plantation Parkw	way
Sonor Design Section		resville
Greenfield Pkwy,Garner,NC 27529 SCALE	PREPARED BY: J Hambright REVIEWED BY: R Munce REVISIONS INIT.	
0 40		Jason Gallowsy17/2024           1001E2B40B4B46E           SIG. INVENTORY NO.           12-1670T3



5:17:38 PM U:\*Traffic\*Signals\*Design#Electrical Details\*Temporary Design\*MAXTIME\*R-2307B\_sm\_ele\_12-1670t3.dgn

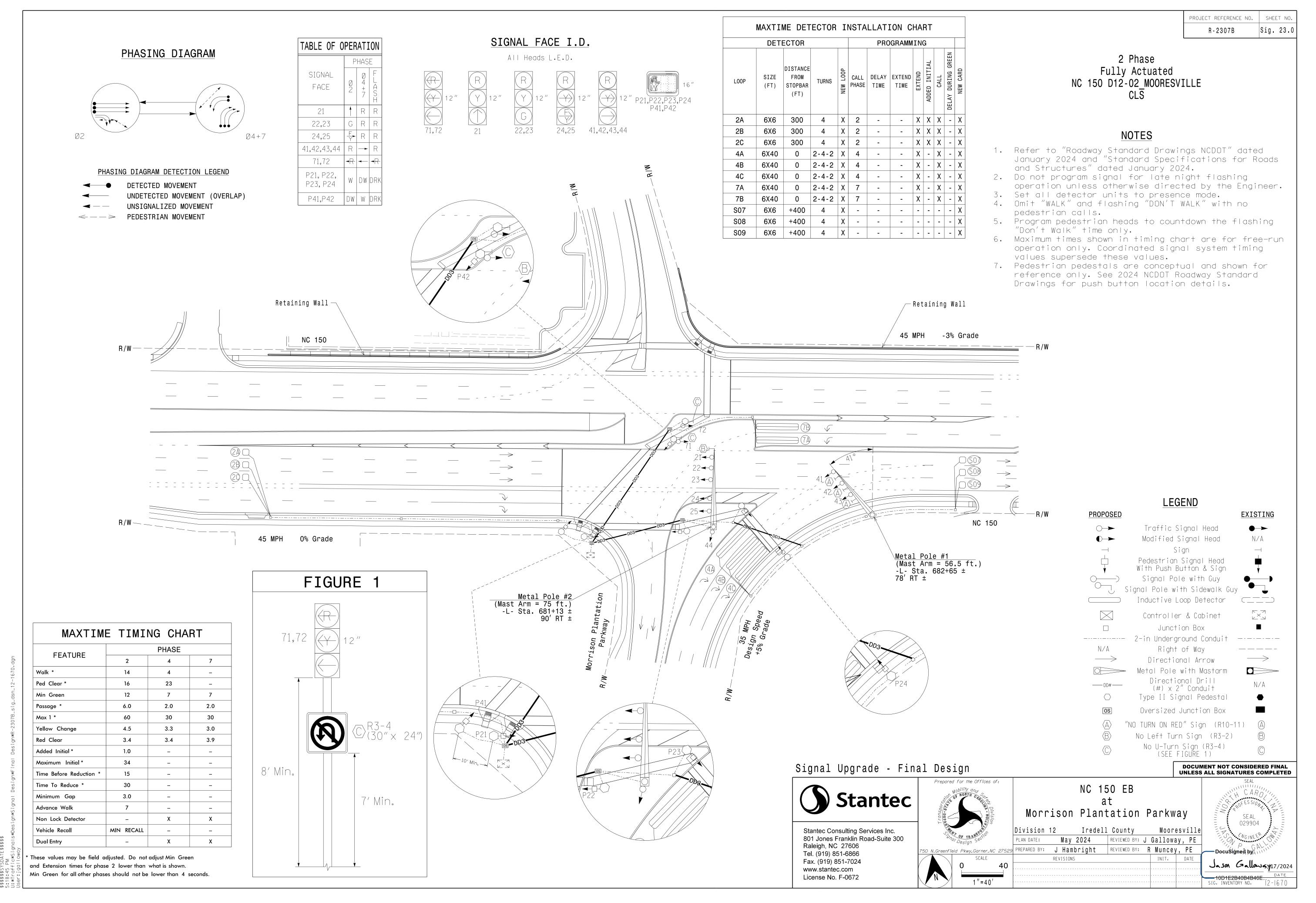
22.
NO.

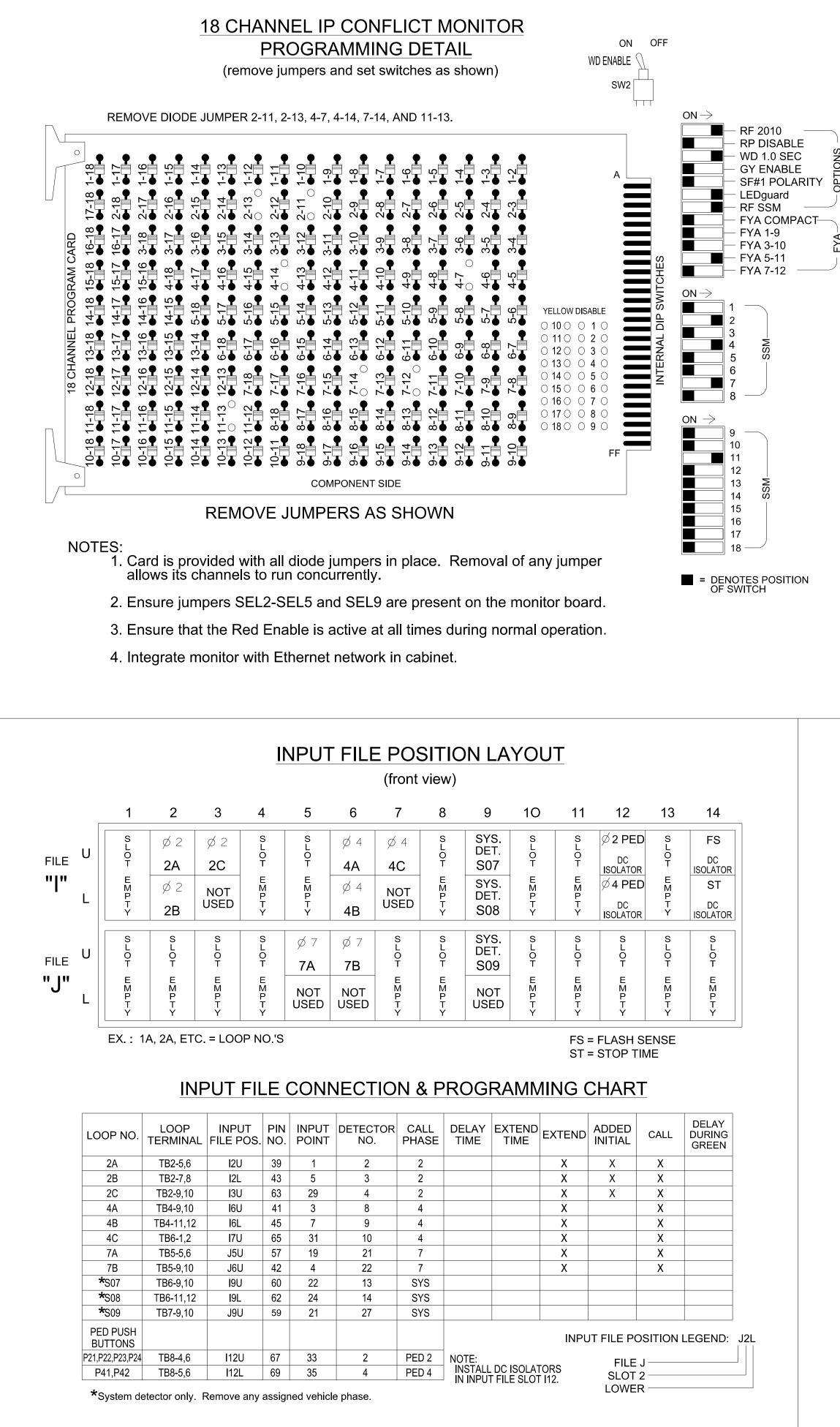
	SIGNAL HEAD HOOK-UP CHART																
S2		S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
2		13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
2		2 PED	3	4	4 PED	7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
22	23,24	NU	NU	41, 42,43	NU	NU	NU	NU	71,72	NU	NU	NU	NU	NU	NU	NU	NU
128	128			101					122								
129						-			-	·	-			-			
130	-								-					-			
e.															·		
	129			102					123								
a.	130			103					124								

THIS ELECTRICAL DETAIL IS FOR The signal design: 12-1670T3 Designed: May 2024 Sealed: <sup>5/17/2024</sup> Revised: N/A

# Temporary Design 3 - TMP Phase III

ctrical Deta:	.1		UMENT NOT CONSIDERED FINAL SS ALL SIGNATURES COMPLETED
TRICAL AND PROGRAMMING DETAILS FOR:	NC 150 E	В	SEAL
Prepared for the Offices of:	at Morrison Plantati		SEAL 029904
Trans	Division 12 Iredell Coun	ty Mooresvil	
TEPP	PLAN DATE: May 2024 REVIEWE	рву: J Galloway, PE	
	PREPARED BY: JPG/RMM REVIEWE	D BY: R Muncey, PE	DocuSiáned by:
Grads Managements	REVISIONS	INIT. DATE	
Greenfield Pkwy, Garner, NC 27529			Jason Gallowsy17/2024
<i>,,</i>			<b>10D1E2B40B4B46E</b> SIG. INVENTORY NO. 12-167073





- 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 plan.
- 2. Program phase 4 and 7 for Dual Entry.
- 3. Program controller to start up in phase 2 Green No Walk and 6 Phase Not On.
- 4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 5. The cabinet and controller are part of the NC 150 D12-02 Mooresville CLS.

# EQUIPMENT INFORMATION

Controller	2070LX
Cabinet	332 w/ Aux
Software	Q-Free MAXTIME
Cabinet Mount	Base
Output File Positions	18 With Aux. Output File
Load Switches Used	
Phases Used	2, 2PED, 4, 4PED, 7
Overlap "1"	NOT USED
Overlap "2"	NOT USED
Overlap "3"	*
Overlap "4"	NOT USED

\*See overlap programming detail on sheet 2



# 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.

Web Interface

**Overlap Plan 1** 

Overlap

Туре Included Ph Modifier Ph Modifier Ove Trail Gre Trail Yell Trail Re

> Fina Elec ELECTR



SHEET NO. Sig 23

		S	GIGI	NAL	HE	AD	HO	OK	-UP	CH	AR	Т					
S	62	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
	2	2 PED	3	4	4 PED	7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
1	22,23	P21,P22, P23,P24	NU	41,42 43,44	P41,P42	NU	NU	NU	71,72	NU	NU	NU	NU	NU	<b>★</b> 24,25	NU	NU
28	128			101	-					-					A114		
29	129				-					-					-		
	130				-										-		
			i.			i.			122		i.						
				102	-				123	-					A115		
					-										A116		
30				103					124								
		113			104												
		115			106												

\*See pictorial of head wiring in detail this sheet.

# FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

OL3 RED (A114)

OL3 YELLOW (A115)

OL3 GREEN (A116)



24,25

# OVERLAP PROGRAMMING

## Front Panel

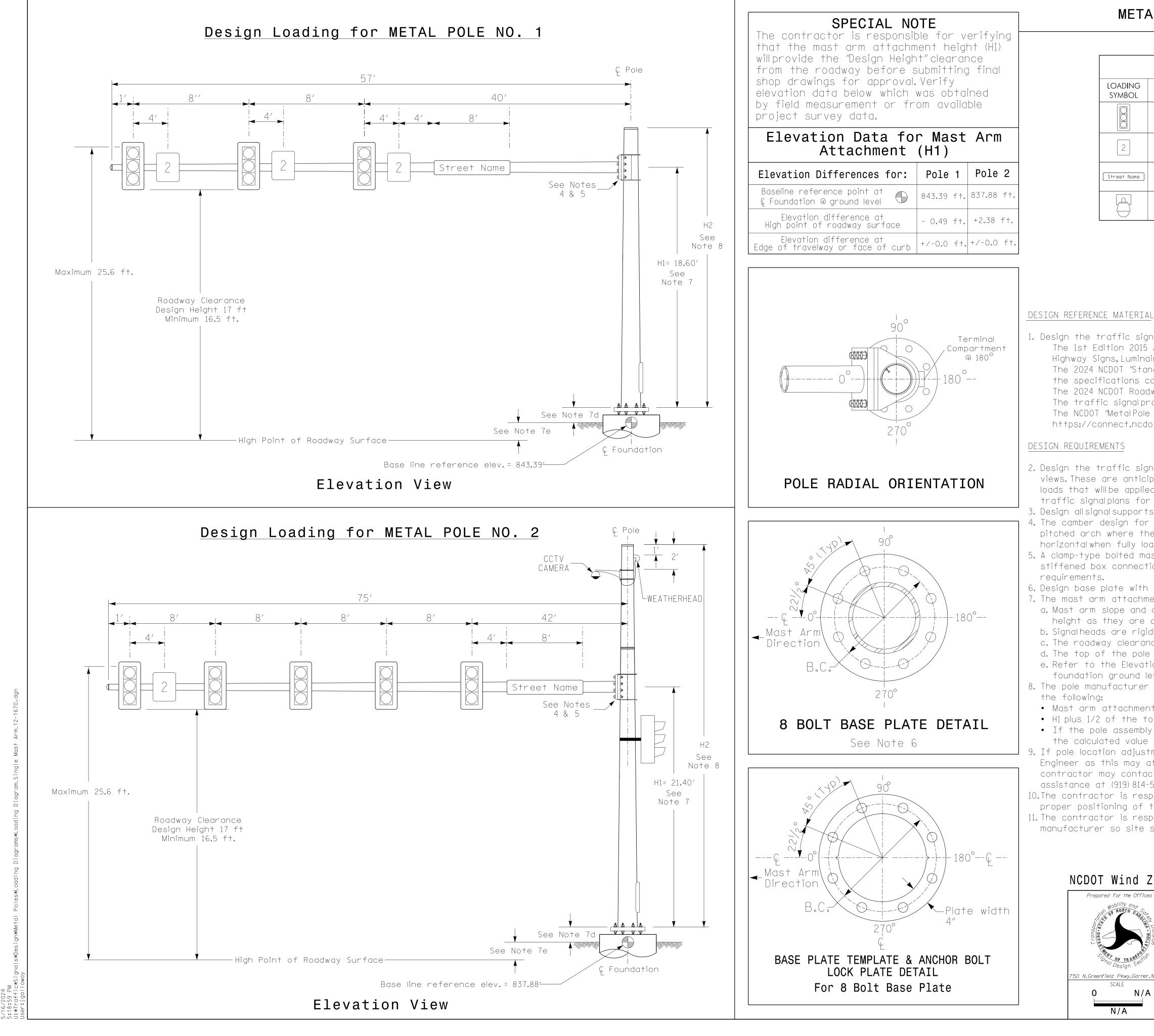
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Home >Controller >Overlap Configuration >Overlaps

D	3				
	FYA 4 - Section				
nases	2				
nases	-				
erlaps	-				
en	0				
ow	0.0				
ed	0.0				

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1670 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

l Design								
trical Detai	il					ALL SIGNA		
ICAL AND PROGRAMMING DETAILS FOR:		NC 15	50 EB				SEAL	L <sub>11</sub> ,
repared for the Offices of:		а	t				H CARC	
all OF NORTH CARE	Morrison	Plant	ation	Parkw	lay	//////////////////////////////////////	SEAL	1111111 1111111
Solution Solution	Division 12	Iredell			esville		029904	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
NOIL US	PLAN DATE: May	2024	REVIEWED BY:	J Gallow	ay, PE	, ON	CNGINEE	
	PREPARED BY: JPG	i/RMM	REVIEWED BY:	R Muncey	, PE	DocuSi	aned by:	, · · · · · · · · · · · · · · ·
OF TRANSPERT	REVISION	5		INIT.	DATE			
<sup>-7</sup> <sup>s</sup> Manag <sup>e</sup> <sup>()</sup> eenfield Pkwy, Garner, NC 27529						Jason	Gallow	5 <b>%</b> 17/2024
Serificial r kwy, Garrier, NO 27323				· · · · · · · · · · · · · · · · · · ·		10D1E2 SIG. INVENT	<b>B40B4B46</b> E ORY NO.	 12-1670



METAL	POLES	No.	1	&	2	

R - 2307B	Sig 23 2
PROJECT REFERENCE NO.	SHEET NO.

	MAST ARM LOADING SC	HEDU	LE	
loading symbol	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS
	CCTV CAMERA ARM-MOUNTED	1.0 S.F.	11.0″W X 11.0″L	30 LBS

### NOTES

1. Design the traffic signalstructure and foundation in accordance with: The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions. The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signalproject specialprovisions. The 2024 NCDOT Roadway Standard Drawings.

The traffic signalproject plans and specialprovisions.

The NCDOT "MetalPole Standards" located at the following NCDOT website:

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

2. Design the traffic signalstructure 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 force ratios that do not exceed 0.9.

4. The camber design for the 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

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. Signalheads are rigidly mounted and vertically centered on the mast arm.

c. The roadway clearance height for design is as shown in the elevation views.

d. The top of the pole base plate is 0.75 feet above the ground elevation.

e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.

8. The pole manufacturer will determine the total height (H2) of each pole using the greater of

• 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. • If the pole assembly includes a CCTV camera, the total height of the pole (H2) will be the calculated value of the mast arm attachment height (H1) plus 10 feet. 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 SignalDesign Section Senior StructuralEngineer for

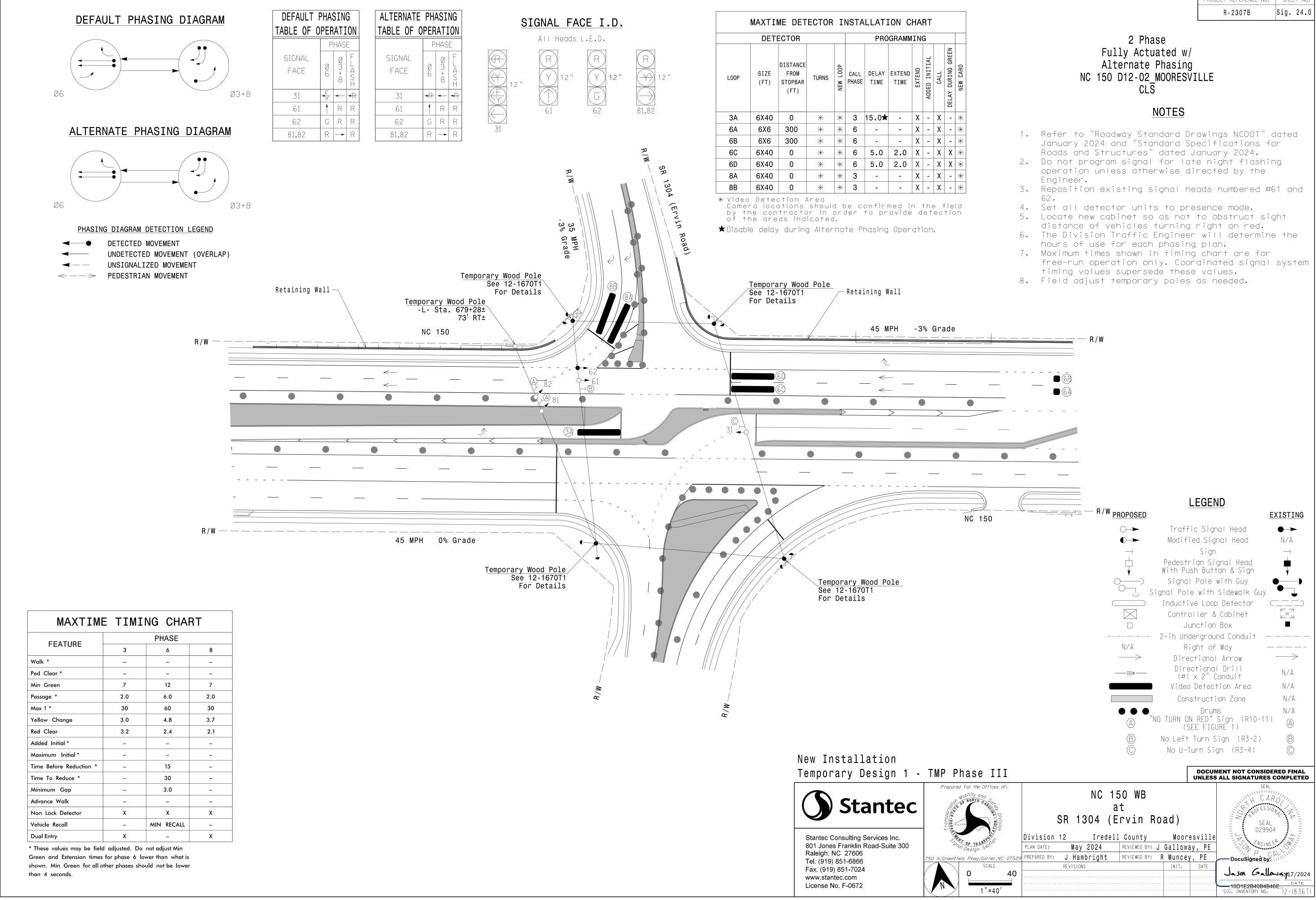
assistance at (919)814-5000.

10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signalheads 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.

					Stantec	
OT Win	d Zone	5	(110	mph)	e cance e	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETEI

		UNLESS ALL SIGNATURES COMPLETED
Nobility and Same	NC 150 EB at	CARO
DIMISION	Morrison Plantation Parkway Division 12 Iredell County Moon	resville
Design Section	PLAN DATE: November 2023 REVIEWED BY: J. Gallo	
eenfield Pkwy,Garner,NC 27529	PREPARED BY: J. Hambright REVIEWED BY: R. Munc	ey, PE DocuSigned, by
D N/A	REVISIONS INIT.	DATE Jason Gallowsy17/2024
N/A	· · · · · · · · · · · · · · · · · · ·	1δ/61/628/46848466 SIG. INVENTORY NO. 12-1670

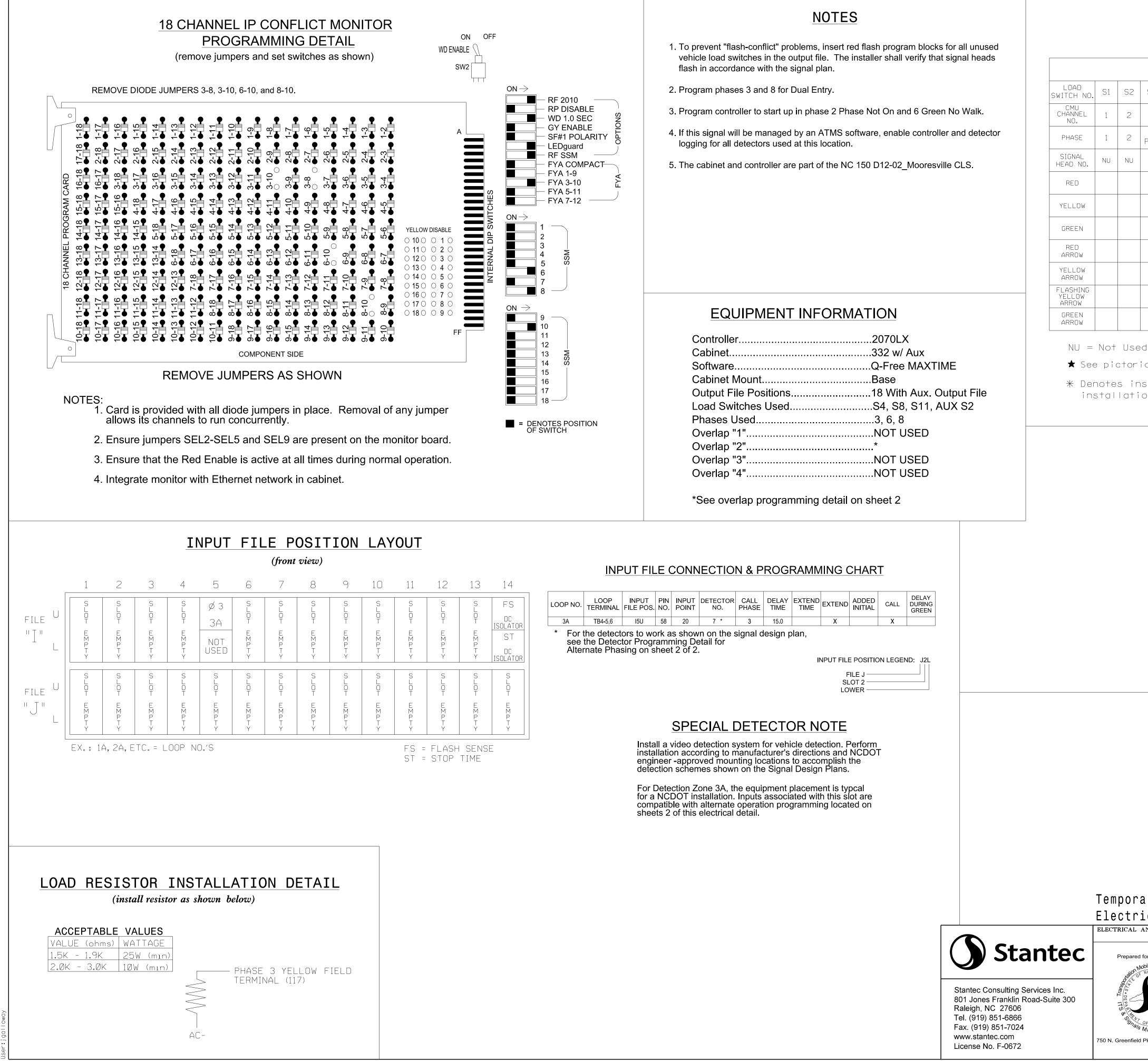


MAXTIME	E TIMII	NG CHA	RT				
	PHASE						
FEATURE	3	6	8				
Walk *	_	_	_				
Ped Clear *	_	_	_				
Min Green	7	12	7				
Passage *	2.0	6.0	2.0				
Max 1 *	30	60	30				
Yellow Change	3.0	4.8	3.7				
Red Clear	3.2	2.4	2.1				
Added Initial *	_	_	_				
Maximum Initial *	_	_	_				
Time Before Reduction *	_	15	_				
Time To Reduce *	_	30	_				
Minimum Gap	_	3.0	_				
Advance Walk	_	_	_				
Non Lock Detector	Х	Х	х				
Vehicle Recall	_	MIN RECALL	_				
Dual Entry	Х	_	х				
These values may be field	adjusted. Do	not adjust Min					

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B-2307B	Sig. 24.0
PROJECT REFERENCE NO.	SHEET NO.



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DC ISOLATOR	
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PROJECT REFERENCE NO. R-2307B	SHEET NO.	
h-2307D	Sig 24 1	

	SIGNAL HEAD HOOK-UP CHART																
S2	53	S4	S5	S6	S7	S	8	59	S1Ø	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
2	13	3	4	14	5	6	6		7	8	16	q	1Ø	17	11	12	18
2	2 PED	3	4	4 PED	5	6	6		7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
NU	NU	<b>★</b>	NU	NU	NU	61	62	NU	NU	81,82	NU	NU	<b>★</b> 31	NU	NU	NU	NU
						134	134			107							
		*				135	135										
							136										
													A124				
										108			A125				
													A126				
		118				136				109							

 $\star$  See pictorial of head wiring in detail this sheet.

\* Denotes install load resistor. See load resistor

installation detail this sheet.

# FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

OL2 RED (A124) — OL2 YELLOW (A125) —

() $\left( \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \right)$ OL2 GREEN (A126) —— Ø3 GREEN (118) ----- $\leftarrow$ 

31

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1836T1 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

# Temporary Design 1 - TMP Phase III Electrical Detail - Sheet 1 of 2

ctrical Deta.		UNLESS ALL SIGNATURES COMPLETED
RICAL AND PROGRAMMING DETAILS FOR:		SEAL
Prepared for the Offices of:	at SR 1304 (Ervin Road)	SEAL
		resville
Schon Strand	PLAN DATE:     May 2024     REVIEWED BY:     J Gallov       PREPARED BY:     J Galloway     REVIEWED BY:     R Muncey	
Onals Management	REVISIONS INIT.	DATE Jason Gallowsy17/2024
Greenfield Pkwy, Garner, NC 27529		10D1E2B40B4B46E.         2 - 1836TI           SIG. INVENTORY NO.         12 - 1836TI

DOCUMENT NOT CONSIDERED FINAL

# MAXTIME OVERLAP PROGRAMMING DEFAULT PHASING

# Front Panel

Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

# Web Interface Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	2
Туре	FYA 4 - Section
Included Phases	6
Modifier Phases	3
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

# MAXTIME ALTERNATE PHASING

To run alternate phasing, select a Pattern that is programmed to run A Pattern can be selected through the scheduler or manually by cha

## PHASING

ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING

	ALTERNATE PHASING CHANGE SUMMARY
OVERLAP PLAN 2	IS A SUMMARY OF WHAT TAKES PLACE WHEN AND VEHICLE DETECTOR PLAN 2 ACTIVATE FERNATE PHASING":
OVERLAP PLAN 2:	Modifies overlap included phases for head 31 to run protected turns only.
VEH DET PLAN 2:	Reduces delay time for phase 3 call on loop 3A to 0 seconds.

. <u>−</u> \_ /

	VERLAP PROGRAMMING R ALTERNATE PHASING			ME DETE DR ALTEF
Front Panel Main Menu >0	Controller >Overlap >Overlap Param	neters/Overlap Timings		Panel Menu >Contro
Web Interface Home >Contr	oller >Overlap Configuration >Overla	aps		Interface >Controller >
"Overlap" in the entire content	ew of the web interface, right click or le top left corner of the table. Copy t s of Overlap Plan 1. Paste Overlap F lan 2. Modify Overlap Plan 2 as sho re changes.	he Plan 1	the to Detec	table view of p left corner o tor Plan 1. Pa y Detector Pla
Overlap Plan	-		De	etector Call P
Overlap	2		3A	7 3
Turne	EVA 4 Section			
Type Included Phases	FYA 4 - Section			
Modifier Phases	3			
Modifier Overlaps				
Trail Green	0			
Trail Yellow	0.0			
Trail Red	0.0			
	IDETAIL			MAXTIME Front Pane
				Main Menu
verlap Plan 2 and Deten ng the Operational Mc	ctor Plan 2.			
ng the Operational Mo	ue.			Web Interfa
				Home >Co
VERLAP PLAN	VEH DET PLAN			Pattern Pa Pattern
1	1			* The Patte
2	2			the Divisi

PROJECT REFERENCE NO. SHEET NO. R-2307B Sig. 24.2

# ECTOR PROGRAMMING DETAIL **RNATE PHASING LOOP 3A**

roller >Detector >Veh Det Plans

>Detector Configuration >Vehicle Detectors

f web interface right click on "Detector" in of the table. Copy the entire contents of Paste Detector Plan 1 into Detector Plan 2. lan 2 as shown below and save changes.

Phase	Delay
3	0.0

# E ALTERNATE PHASING PATTERN **PROGRAMMING DETAIL**

a >Controller >Coordination >Patterns

ace

Stantec

Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606

Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com

License No. F-0672

ontroller >Coordination >Patterns

arameters

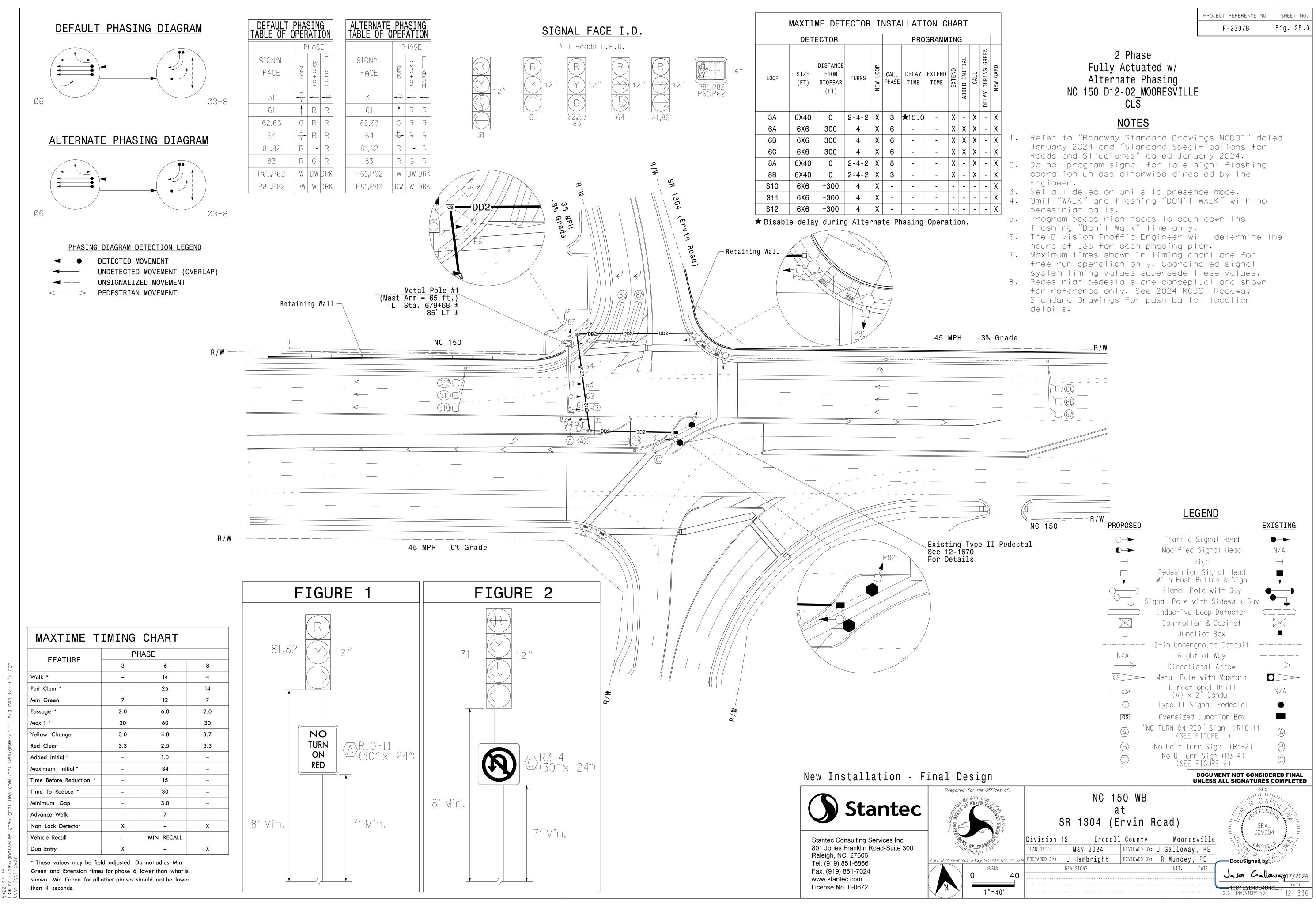
Veh Det Plan Overlap Plan \* 2 2

tern number(s) are to be determined by the Division and/or City Traffic Engineer.

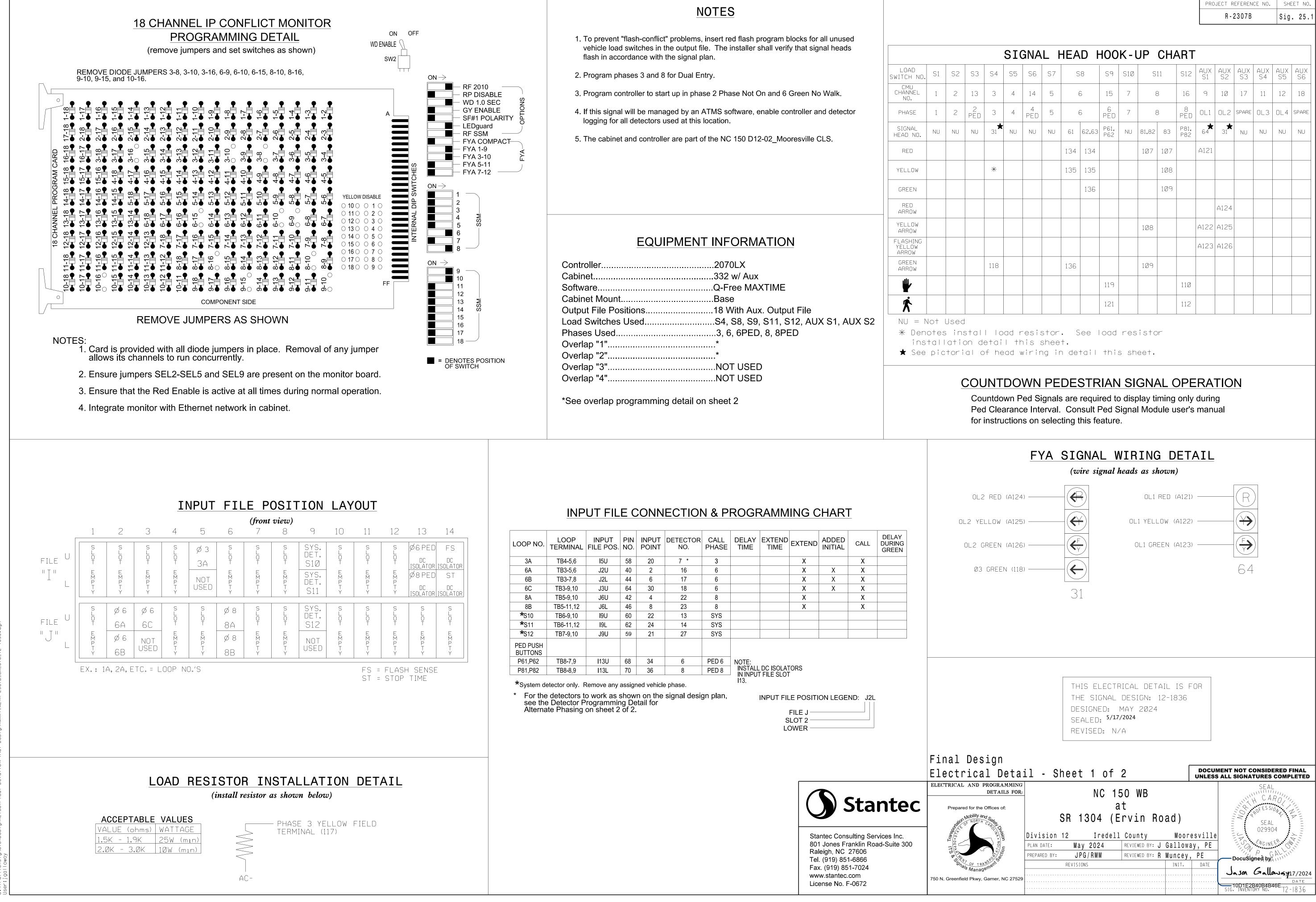
> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1836T1 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

# Temporary Design 1 - TMP Phase III Electrical Detail - Sheet 2 of 2

Electrical Deta:	il - Sheet 2 of 2			MENT NOT CONSIDERED FINAL SALL SIGNATURES COMPLETED
ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 150 W	3		SEAL
Prepared for the Offices of:	at			APFESSION
Start Cr NOBILITY and Sach	SR 1304 (Ervin	Road)		SEAL 029904
Step 1	Division 12 Iredell Count	y Moor	resville	
TEPP	PLAN DATE: May 2024 REVIEWED	BY: J Gallow	ay, PE	
	PREPARED BY: J Galloway REVIEWED	BY: R Muncey	, PE	Docu Signed by:
OF TRANSPORT	REVISIONS	INIT.	DATE	
750 N. Greenfield Pkwy, Garner, NC 27529				Jason Gallowsy17/2024 DATE
				10D1E2B40B4B46E. SIG. INVENTORY NO. 12-1836T1



 $\mathfrak{S} \sim \mathbb{H}$ 



LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I5U	58	20	7 *	3			Х		Х	
6A	TB3-5,6	J2U	40	2	16	6			Х	Х	Х	
6B	TB3-7,8	J2L	44	6	17	6			Х	Х	Х	
6C	TB3-9,10	J3U	64	30	18	6			Х	Х	Х	
8A	TB5-9,10	J6U	42	4	22	8			Х		Х	
8B	TB5-11,12	J6L	46	8	23	8			Х		Х	
<b>*</b> S10	TB6-9,10	I9U	60	22	13	SYS						
<b>*</b> S11	TB6-11,12	I9L	62	24	14	SYS						
<b>*</b> S12	TB7-9,10	J9U	59	21	27	SYS						
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6	NOTE:					
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

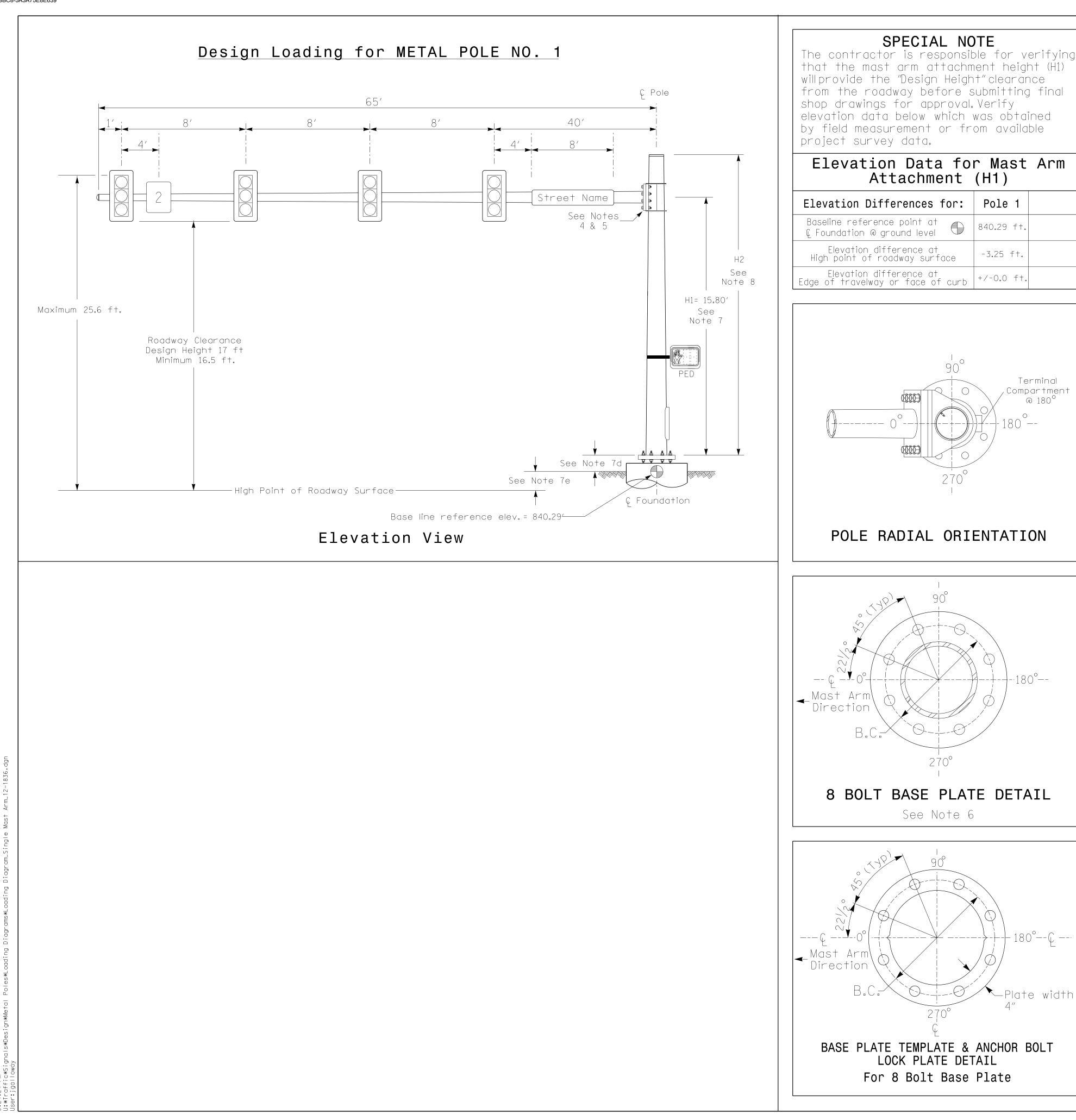
S12AUX<br/>S1AUX<br/>S2AUX<br/>S3AUX<br/>S4AUX<br/>S5AUX<br/>S6 16 9 10 17 11 12 18 8 PED 0L1 0L2 SPARE 0L3 0L4 SPARE 61 62,63 P61, NU 81,82 83 P81, 64 31 NU NU NU

Prepared for the Offices of:		SR 13	a 304 (E	rvin Rc	ad)		0N	SEAL
Super Stranger	Division	12	Iredell	County	Moore	sville		029904
DE PR	PLAN DATE:	May	2024	REVIEWED BY: J	Gallowa	y, PE		CNGINEER ON S
	PREPARED BY:	JPG	/RMM	REVIEWED BY: R	Muncey,	ΡE	DocuSi	áned by:
OF TRANSPORT		REVISIONS	5		INIT.	DATE	(	
manay							Jason	Gallow 5/17/2024
reenfield Pkwy, Garner, NC 27529								<b>B40B4B46E</b> .

				PROJECT REFERENCE NO.SHEET NO.R-2307BSig. 25.2
MAXTIME ALTERNATE PHAS	ING ACTIVATION	DETAIL	MAXT	TIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING
o run alternate phasing, select a Pattern that is programme Pattern can be selected through the scheduler or manually	d to run Overlap Plan 2 and Detect / by changing the Operational Mod	or Plan 2. e.	Front Par Main Mer	nel nu >Controller >Overlap >Overlap Parameters/Overlap Timings
G	OVERLAP PLAN	VEH DET PLAN	Web Inter Home >C	Controller >Overlap Configuration >Overlaps
PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u> PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	1 2	1 2	Overla Type Included F Modifier F Modifier O	ap12neFYA 4 - SectionPhases6Overlaps3
ALTERNATE PHASING CH THE FOLLOWING IS A SUMMARY OF WHAT OVERLAP PLAN 2 AND VEHICLE DETECTO TO CALL THE "ALTERNATE PHASING":	T TAKES PLACE WHEN		Trail Gr Trail Ye Trail F	ellow 0.0 0.0
OVERLAP PLAN 2: Modifies overlap included for head 31 to run protect	ed turns only.			
VEH DET PLAN 2: Reduces delay time for p call on loop 3A to 0 secon				MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING
			MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL Front Panel Main Menu >Controller >Coordination >Patterns Web Interface Home >Controller >Coordination >Patterns Pattern Parameters	N       Front Panel         Main Menu >Controller >Overlap Parameters/Overlap Timings         Web Interface         Home >Controller >Overlap Configuration >Overlaps         In the table view of the web interface, right click on         "Overlap" in the top left corner of the table. Copy the         entire contents of Overlap Plan 1. Paste Overlap Plan 1         into Overlap Plan 2. Modify Overlap Plan 2 as shown         below and save changes.
MAXTIME DETECTOR PROGRAM			PatternVeh Det PlanOverlap Plan*22*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.	Overlap Plan 2       Overlap     1       Type     FYA 4 - Section
Front Panel Main Menu >Controller >Detector >Veh Det Web Interface Home >Controller >Detector Configuration > In the table view of web interface right click	>Vehicle Detectors			Included Phases6-Modifier Phases-3Modifier Overlaps-Trail Green000Trail Yellow0.00.00.0
the top left corner of the table. Copy the ent Detector Plan 1. Paste Detector Plan 1 into Modify Detector Plan 2 as shown below and Plan 2	Detector Plan 2.			Final Design         Electrical Detail - Sheet 2 of 2         ELECTRICAL AND PROGRAMMING
Plan 2DetectorCall PhaseDelay3A730.0			THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1836 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A	Prepared for the Offices of: Services Inc. Road-Suite 300  Prepared for the Offices of: Bread-Suite 300  Prepared for the Offices of: SR 1304 (Ervin Road) Division 12 Iredell County Mooresville PLAN DATE: May 2024 REVIEWED BY: J Galloway, PE
			REVISED: N/A Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	Image     Image

					PROJECT REFERENCE NO.SHEET NO.R-2307BSig. 25.2
MAXTIME ALTERNATE PHASING ACTIVATION DET	AIL			RLAP PROGRAMMING DETAIL DEFAULT PHASING	
To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2 A Pattern can be selected through the scheduler or manually by changing the Operational Mode.	2		Front Panel Main Menu >Controller :	>Overlap >Overlap Parameters/Overlap Timings	
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING 1	H DET PLAN 1		Overlap Plan 1	erlap Configuration >Overlaps	
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING       2         ALTERNATE PHASING CHANGE SUMMARY         THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN         OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE         TO CALL THE "ALTERNATE PHASING":         OVERLAP PLAN 2: Modifies overlap included phases         for head 31 to run protected turns only.	2		Overlap1TypeFYA 4 - SecIncluded Phases6Modifier Phases-Modifier Overlaps-Trail Green0Trail Yellow0.0Trail Red0.0	2         tion       FYA 4 - Section         6         3         -         0         0.0         0.0         0.0	
VEH DET PLAN 2: Reduces delay time for phase 3 call on loop 3A to 0 seconds.	Front Panel Main Menu > Web Interfac	ALTERNATE PHASING PA PROGRAMMING DETAIL Controller >Coordination >Patterns e roller >Coordination >Patterns	ATTERN	MAXTIME OVERLAP PROGRAMMING DE FOR ALTERNATE PHASING Front Panel Main Menu >Controller >Overlap >Overlap Parameters/O Web Interface Home >Controller >Overlap Configuration >Overlaps In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown	
MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 3A Front Panel Main Menu >Controller >Detector >Veh Det Plans Web Interface Home >Controller >Detector Configuration >Vehicle Detectors In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2.		Veh Det Plan Overlap Plan		below and save changes. Overlap Plan 2 Verlap 1 2 Type FYA 4 - Section FYA 4 - Section Included Phases 6 - Modifier Phases - 3 Modifier Overlaps Trail Green 0 0 Trail Yellow 0.0 0.0 Trail Red 0.0 0.0	ΙASE
Modify Detector Plan 2 as shown below and save changes. Plan 2 <u>Detector Call Phase Delay</u> 3A 7 3 0.0	THIS ELECTRICAL THE SIGNAL DES DESIGNED: MAY SEALED: 5/17/2024 REVISED: N/A	DETAIL IS FOR IGN: 12-1836 2024 Stant 801 - Ralei Tel. ( Fax. www.	A state of the service of the servic	$[1 \circ 0 + 0 ]$ $[0 \circ 1 \circ 1]$	PE DocuSigned by:

Detector	Call Phase	Delay
7	3	0.0



5.24 5:24 1:\*T

# The contractor is responsible for verifying

### DESIGN REQUIREMENTS

- requirements.

- the following:

# 0

METAL POLE No. 1	PROJECT REFERENCE NO.	SHEET NO.
WILTAL FULL NU. I	R - 2307B	Sig. 25.3

	MAST ARM LOADING SC	HEDU	LE	
loading Symbol	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″W X 17.0″L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS

### NOTES

### DESIGN REFERENCE MATERIAL

1. Design the traffic signalstructure and foundation in accordance with: • The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions. • The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signalproject specialprovisions. • The 2024 NCDOT Roadway Standard Drawings.

• The traffic signalproject plans and specialprovisions.

• The NCDOT "MetalPole Standards" located at the following NCDOT website:

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

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 signalplans for the actualloads that willbe applied at the time of the installation. 3. Design all signal supports using force ratios that do not exceed 0.9.

4. The camber design for the 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

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. Signalheads are rigidly mounted and vertically centered on the mast arm.

c. The roadway clearance height for design is as shown in the elevation views.

d. The top of the pole base plate is 0.75 feet above the ground elevation.

e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.

8. The pole manufacturer will determine the total height (H2) of each pole using the greater of

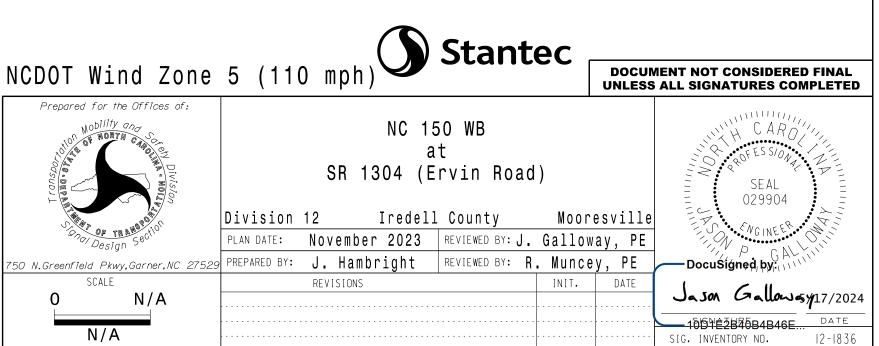
• Mast arm attachment height (H1) plus 2 feet, or

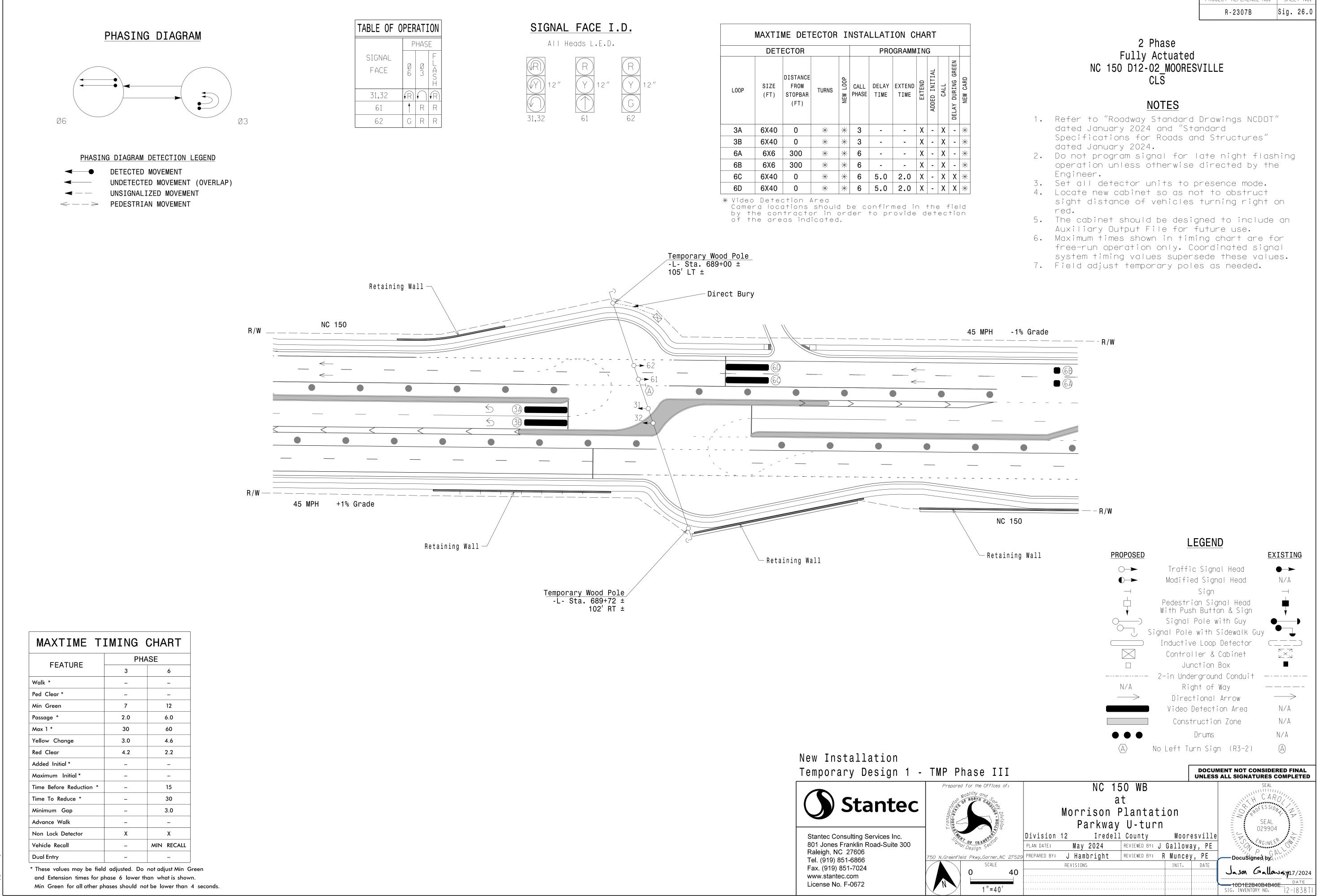
• H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.

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 SignalDesign Section Senior StructuralEngineer for assistance at (919)814-5000.

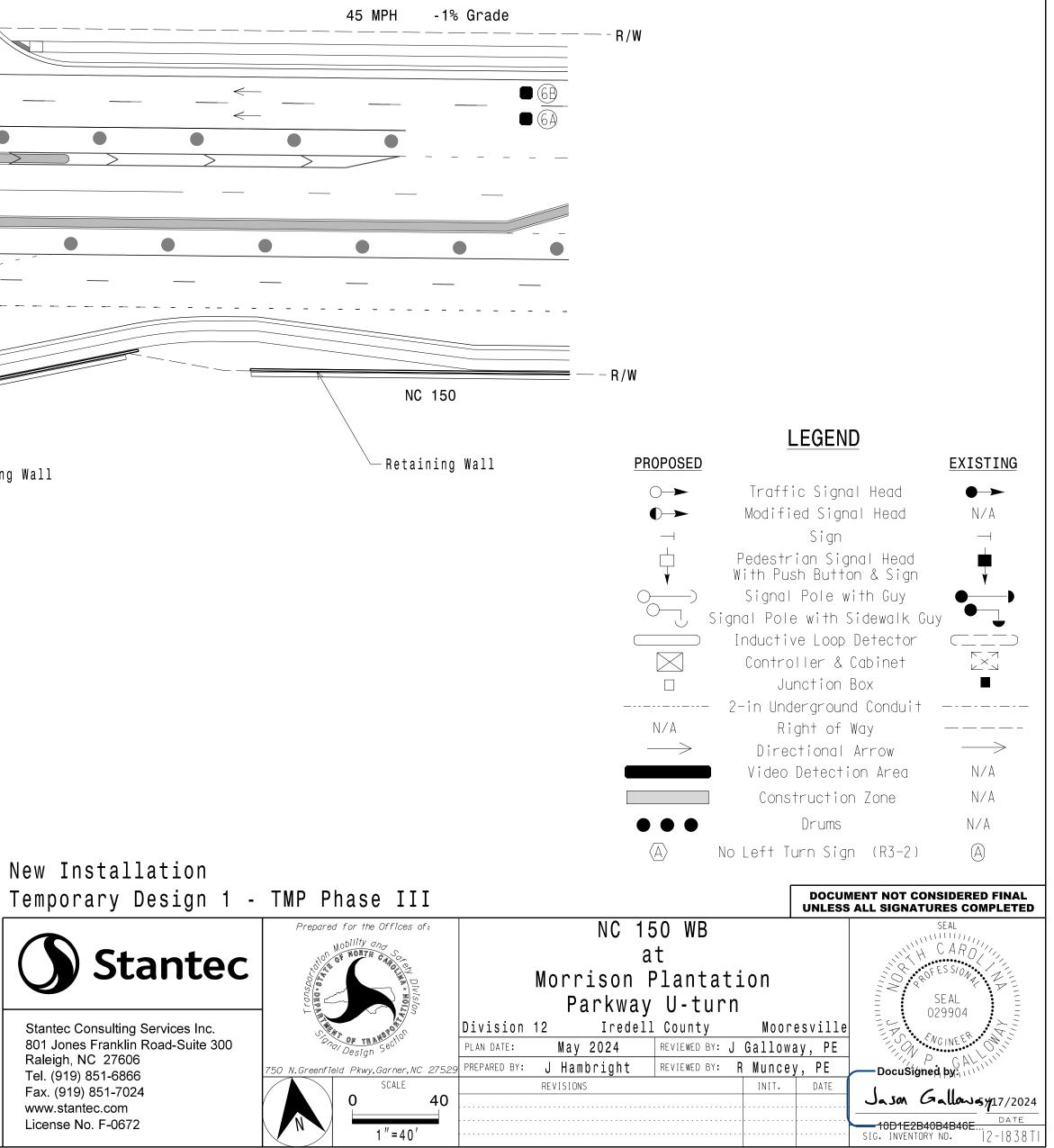
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signalheads over the roadway.

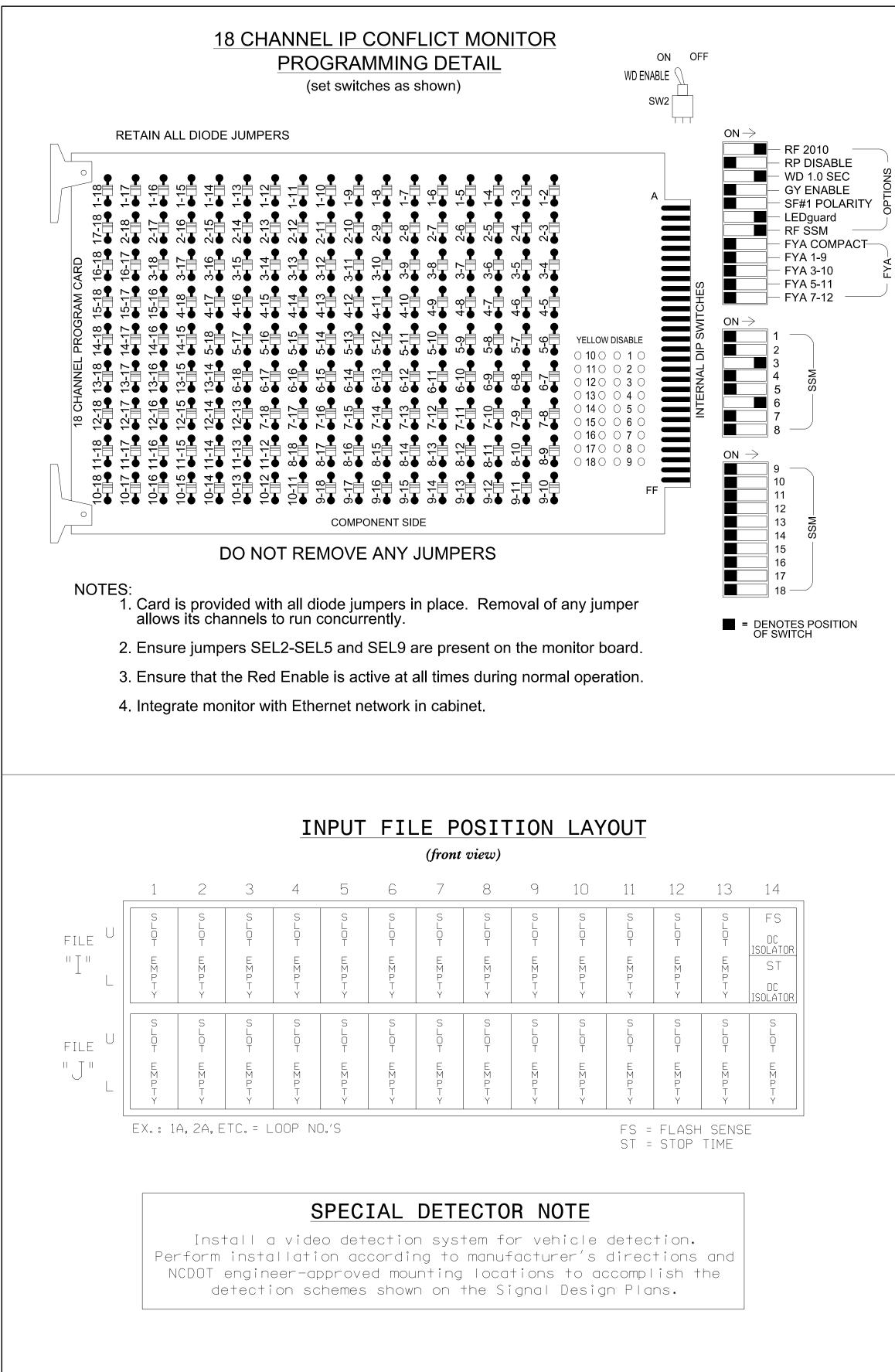
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.





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# 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 plan.
- 2. Program controller to start up in phase 2 Phase Not On and 6 Green No Walk.
- 4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 5. The cabinet and controller are part of the NC 150 D12-02\_Mooresville CLS.

# EQUIPMENT INFORMATION

Load Switches Used Phases Used Overlap "1" Overlap "2" Overlap "3"	
Overlap "3" Overlap "4"	

				S	SIG	NAL	HE	AD	HO	OK-	-UP	CH	AR <sup>-</sup>	Т					
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S	8	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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	NU	NU	31,32	NU	NU	NU	61	62,63	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED								134	134										
YELLOW								135	135										
GREEN									136										
RED ARROW				116															
YELLOW ARROW				117															
FLASHING YELLOW ARROW																			
GREEN ARROW				118				136											
NU = Not U	Jsed																		

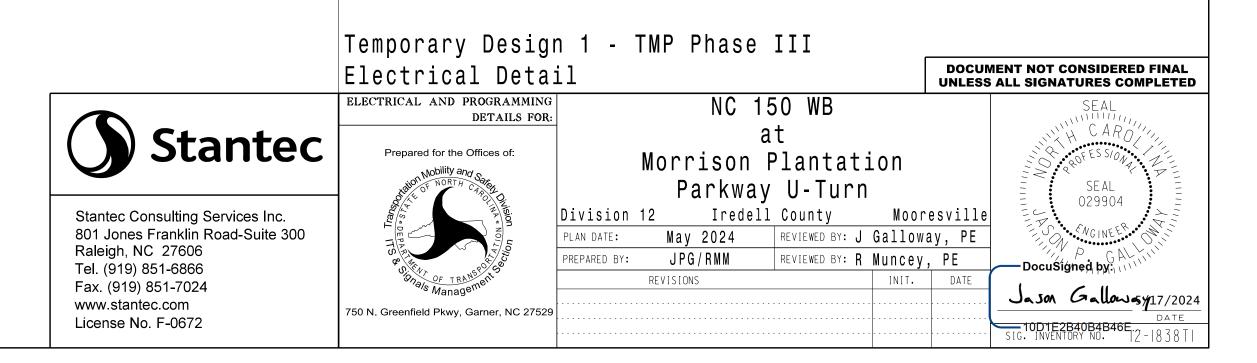
# SEQUENCE DETAIL

Front Panel Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface Home >Controller >Sequence

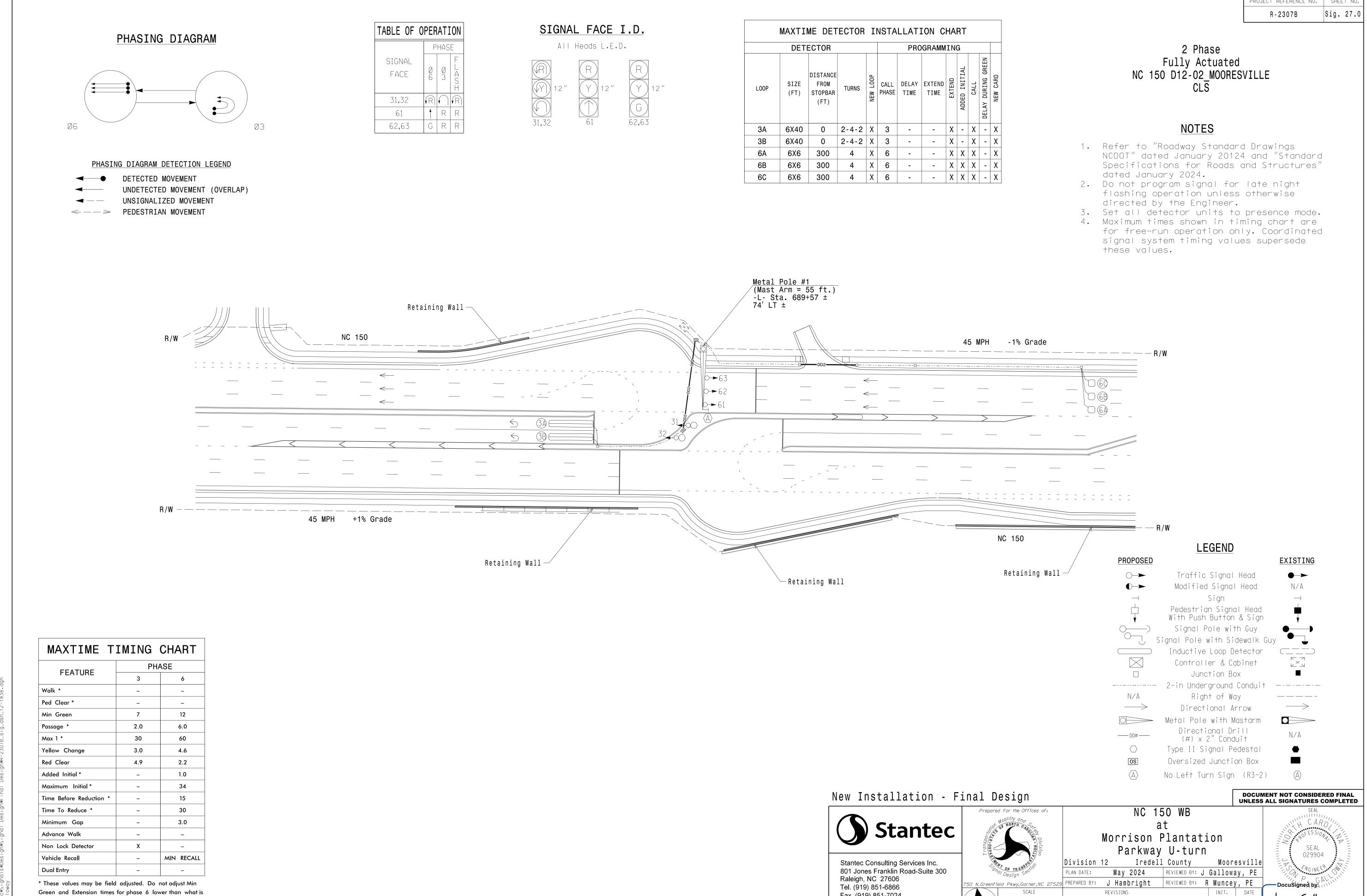
### Sequence 1

Ring	Sequence Data
1	6,a,3,b
2	



R - 2307B	Sia 26 1
R - 2307B	Sig. 26.1

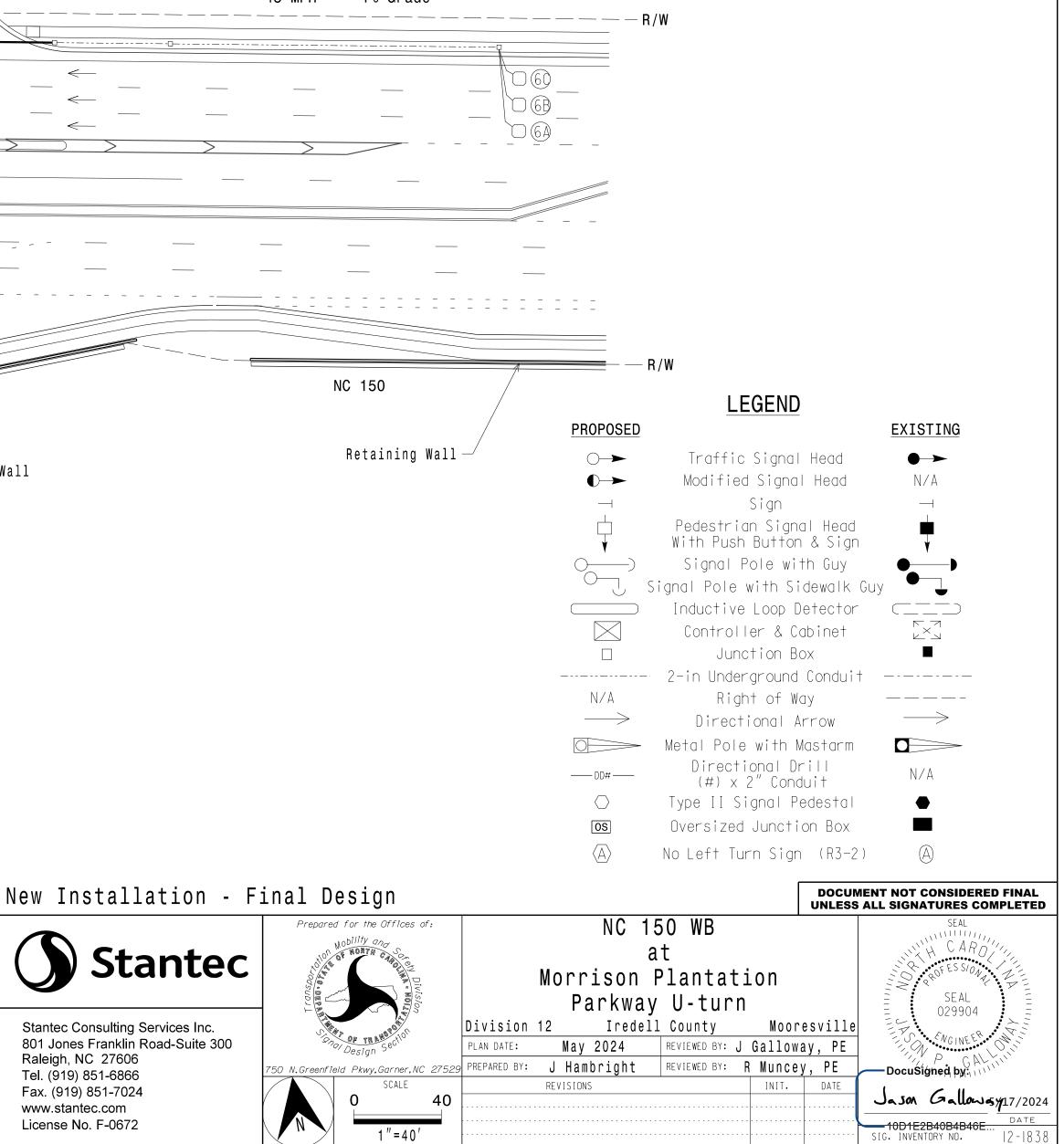
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1838T1 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

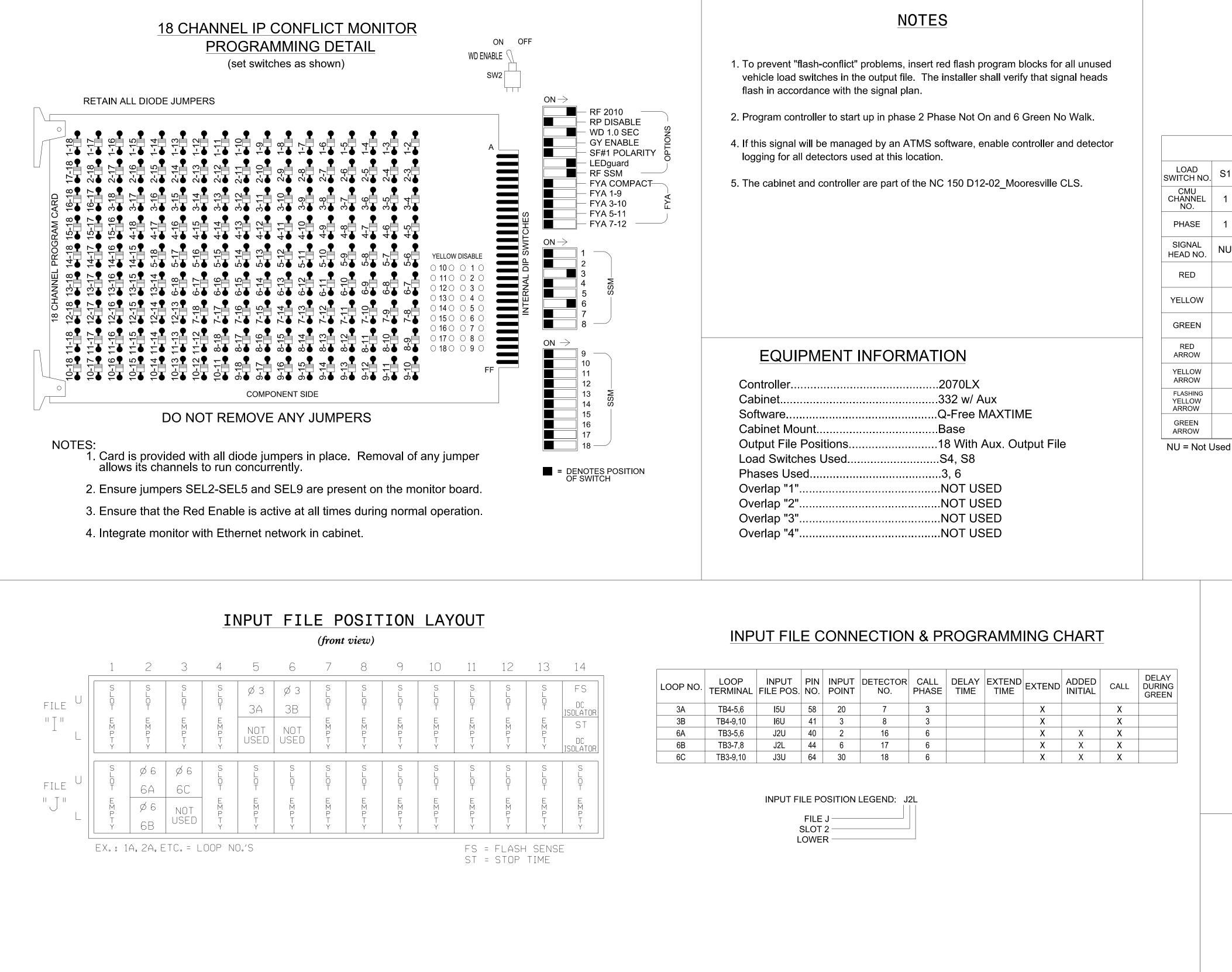


shown. Min Green for all other phases should not be lower than 4 seconds.

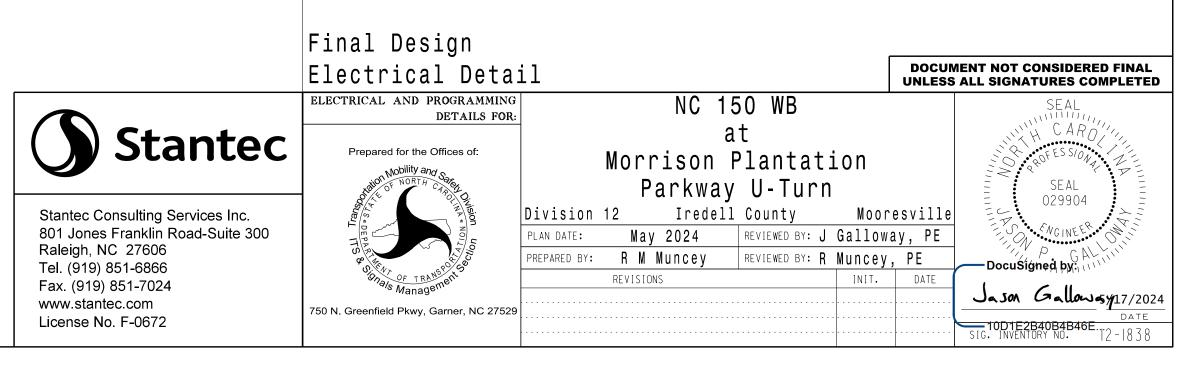
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LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELA DURIN GREE
3A	TB4-5,6	I5U	58	20	7	3			Х		Х	
3B	TB4-9,10	I6U	41	3	8	3			Х		Х	
6A	TB3-5,6	J2U	40	2	16	6			Х	Х	Х	
6B	TB3-7,8	J2L	44	6	17	6			Х	Х	Х	
6C	TB3-9,10	J3U	64	30	18	6			Х	Х	Х	



PROJECT REFERENCE NO.	SHEET NO.
R - 2307B	Sig. 27 1

			S	SIG	NAL	HE	AD	HO	OK-	-UP	СН	AR	Т					
1	S2	S3	S4	S5	S6	S7	S	88	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
	2	13	3	4	14	5		6		7	8	16	9	10	17	11	12	18
	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
J	NU	NU	31,32	NU	NU	NU	61	62,63	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
							134	134										
							135	135										
							136	136										
			116															
			117															
			118															

# SEQUENCE DETAIL

Front Panel

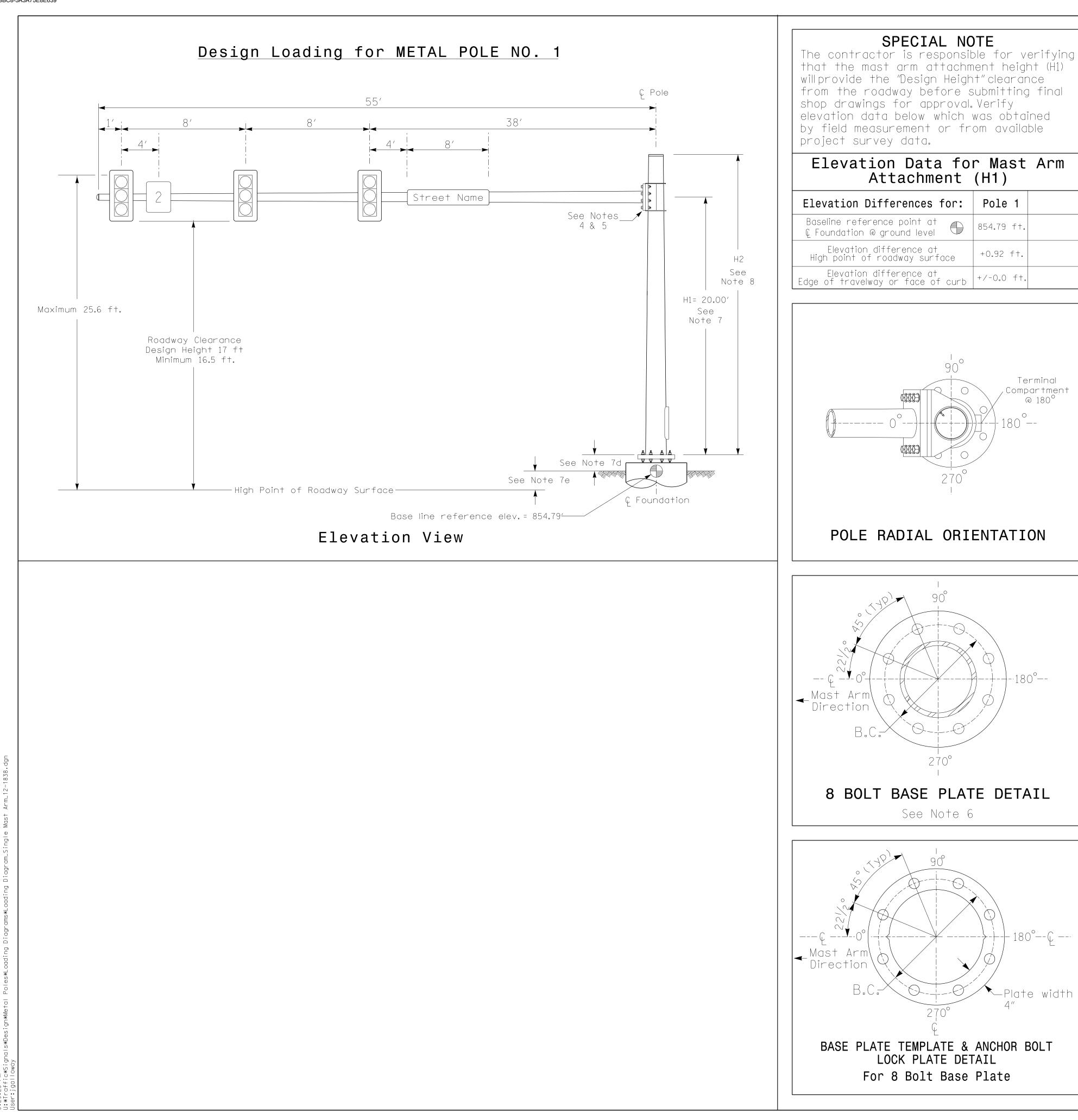
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface Home >Controller >Sequence

Sequence 1

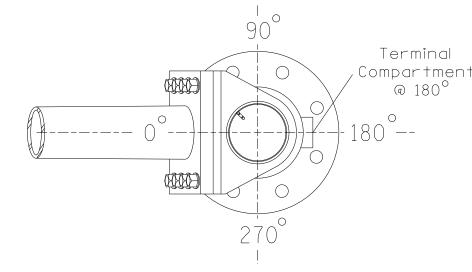
Ring	Sequence Data
1	6,a,3,b
2	

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1838 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A



o 6 - ∼ \*

<b>SPECIAL NO</b> The contractor is responsible that the mast arm attaching will provide the "Design Heigh from the roadway before s shop drawings for approval. elevation data below which by field measurement or fr project survey data.	ple for ve nent heigh t"clearar submitting Verify was obtai	nt (H1) nce i final ned
Elevation Data fo	r Mast	Arm
Attachment		,
Elevation Differences for:	Pole 1	
Baseline reference point at © Foundation @ ground level	854.79 ft.	
Elevation difference at High point of roadway surface	+0.92 ft.	
Elevation difference at Edge of travelway or face of curb	+/-0.0 ft.	
90		



### DESIGN REFERENCE MATERIAL

### DESIGN REQUIREMENTS

- requirements.

- the following:

# NCDO Pre 50 N.Gree

METAL POLE No. 1	PROJECT REFERENCE NO.	SHEET NO.
WETAL FULE NU. I	R - 2307B	Sig. 27.2

	MAST ARM LOADING SC	HEDU	LE	
loading Symbol	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS

### <u>NOTES</u>

1. Design the traffic signalstructure and foundation in accordance with: • The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions. • The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signalproject specialprovisions. • The 2024 NCDOT Roadway Standard Drawings.

• The traffic signalproject plans and specialprovisions.

The NCDOT "MetalPole Standards" located at the following NCDOT website:

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

2. Design the traffic signalstructure 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 force ratios that do not exceed 0.9.

4. The camber design for the 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

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. Signalheads are rigidly mounted and vertically centered on the mast arm.

c. The roadway clearance height for design is as shown in the elevation views.

d. The top of the pole base plate is 0.75 feet above the ground elevation.

e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.

8. The pole manufacturer will determine the total height (H2) of each pole using the greater of

• Mast arm attachment height (H1) plus 2 feet, or

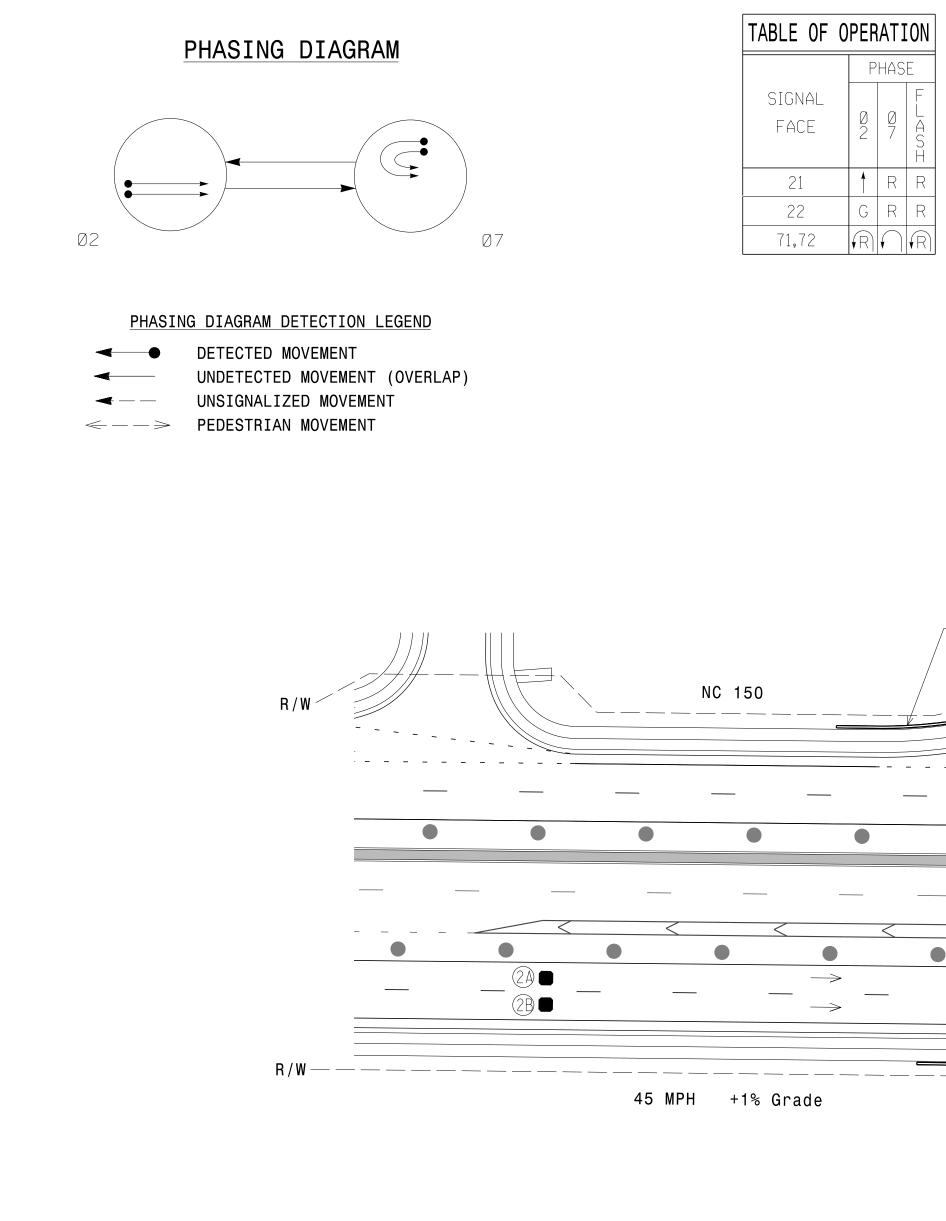
• H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot. 9. If pole location adjustments are required, the contractor must gain approval from the

Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the SignalDesign Section Senior StructuralEngineer for assistance at (919)814-5000.

10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signalheads over the roadway.

11. The contractor is responsible for providing soilpenetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

)T Wind Zone	5 (110 mph) Stantec	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
pared for the Offices of:	NC 150 WB at Morrison Plantation Parkway U-turn	SEAL 029904
Section Section	Division 12Iredell CountyMoorPLAN DATE:November 2023REVIEWED BY: J. Gallow	esville ay, PE
eenfield Pkwy,Garner,NC 27529		
SCALE N/A	REVISIONS INIT.	DATE Jason Gallowsy17/2024
N/A		10日本での10日本



	PHA	SE
FEATURE	2	7
Walk *	_	_
Ped Clear *	_	_
Min Green	12	7
Passage *	6.0	2.0
Max 1 *	60	30
Yellow Change	4.4	3.0
Red Clear	2.3	4.8
Added Initial *	-	_
Maximum Initial *	-	_
Time Before Reduction *	15	_
Time To Reduce *	30	_
Minimum Gap	3.0	_
Advance Walk	_	_
Non Lock Detector	X	х
Vehicle Recall	MIN RECALL	_
Dual Entry	_	_

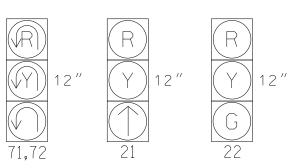
36 PM affic\*Signals\*Design\*Signal Design\*Temporary Design\*Phase 3 TEMP\*R-2307 :adlowed

\$0 ₩ 0 #

⇔ം. ട⇔ഥ = 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.



All Heads L.E.D.

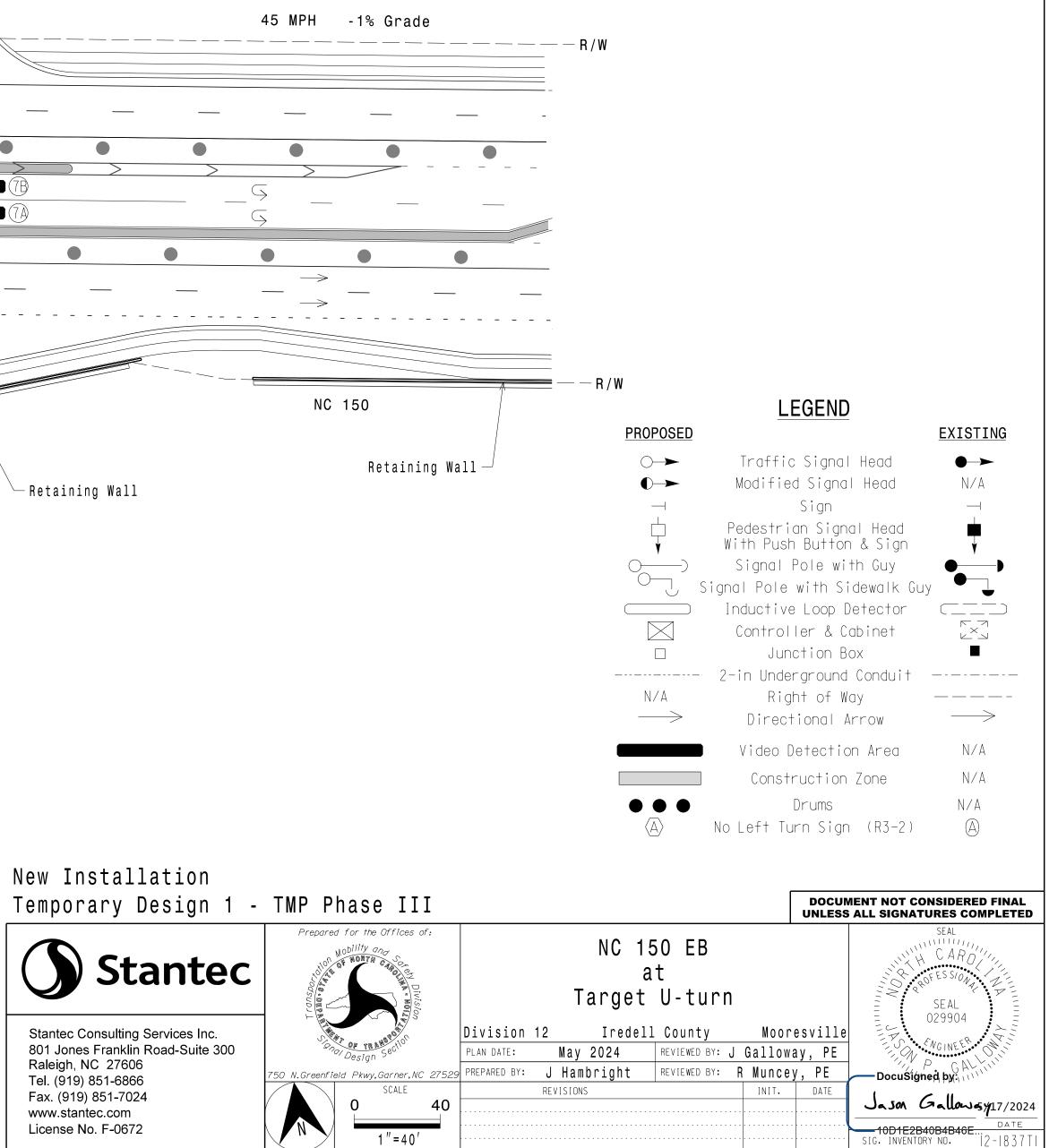


# MAXTIME DETECTOR INSTALLATION CHART

	DET	ECTOR				PRC	GRAMM	IN	G			
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	300	*	*	2	-	-	Х	-	Х	-	*
2B	6X6	300	*	*	2	-	-	Х	-	Х	-	*
20	6X40	0	*	*	2	5.0	2.0	Х	-	Х	Х	*
2D	6X40	0	*	*	2	5.0	2.0	Х	-	Х	Х	*
7A	6X40	0	*	*	7	-	-	Х	-	Х	-	*
7B	6X40	0	*	*	7	-	-	Х	-	Х	-	*

\* Video Detection Area Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

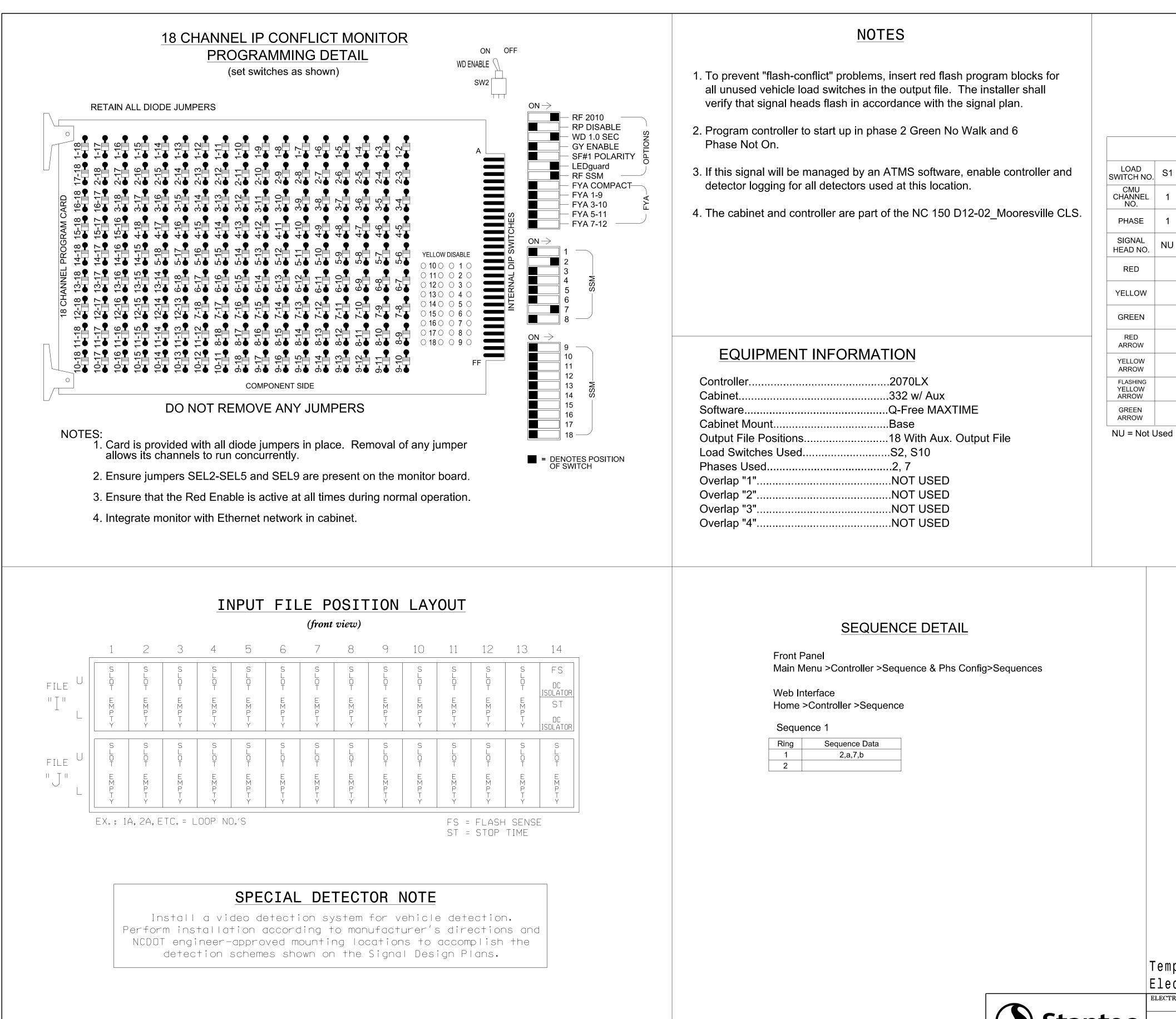
Existing Wood Pole See 12-1838T1 For Details — Retaining Wall 21 🗲 \_\_\_\_\_ 22 🔫 └─ Retaining Wall Direct Bury – Existing Wood Pole See 12-1838T1 For Details — Retaining Wall



# 2 Phase Fully Actuated NC 150 D12-02\_MOORESVILLE CLS

# <u>NOTES</u>

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
   The patient should be designed to include an
- The cabinet should be designed to include an Auxiliary Output File for future use.
   Maximum times shown in timing chart are for
- 6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



<b>y</b> Stantec	
Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Fel. (919) 851-6866 Fax. (919) 851-7024 vww.stantec.com License No. F-0672	75

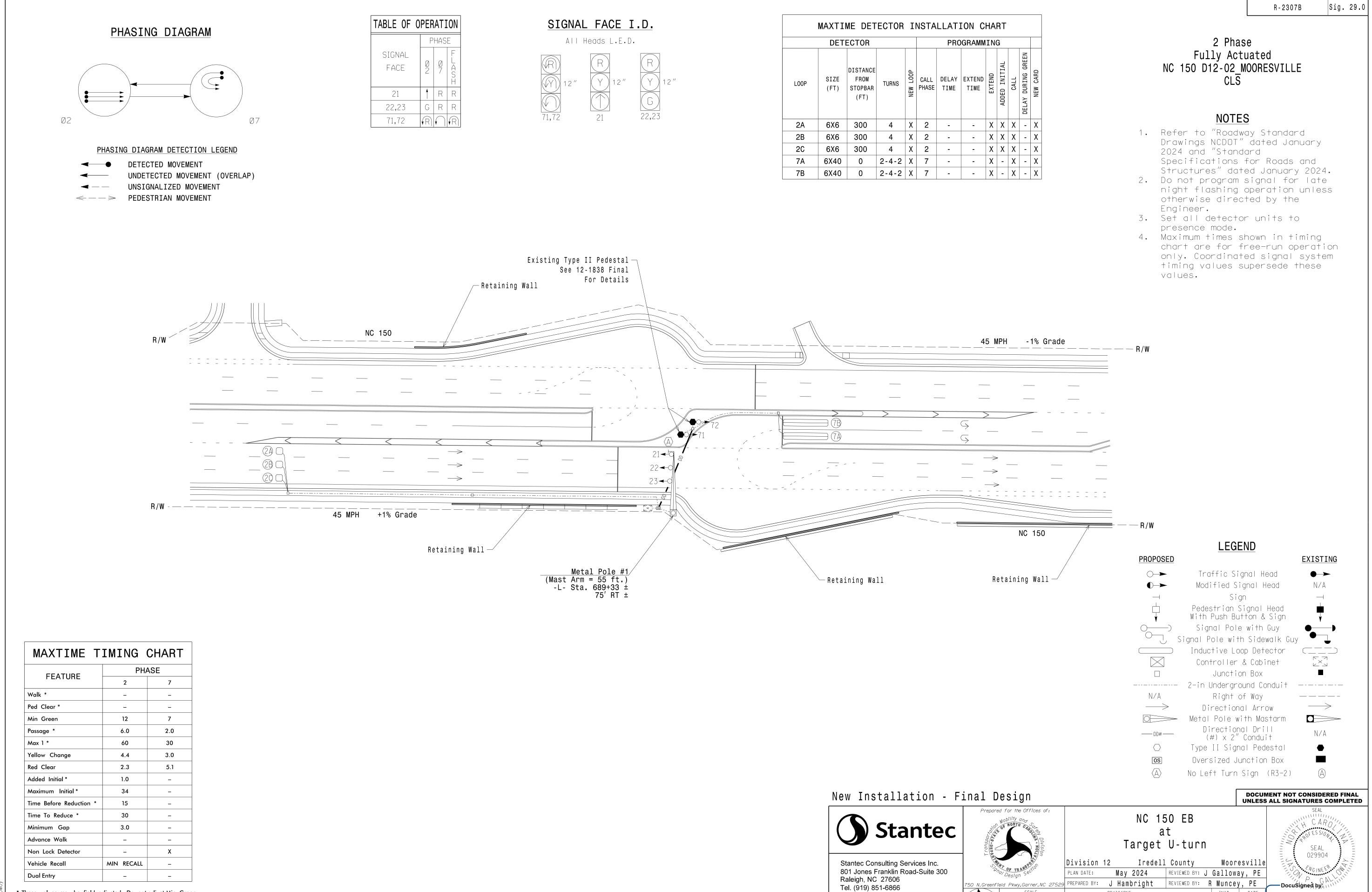
PROJECT REFERENCE NO.	SHEET NO.
R - 2307B	Sig. 28.1

		S	SIGN	NAL	HE	AD	HO	OK	-UP	CH	AR	Г					
S	2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
2	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
21	22	NU	NU	NU	NU	NU	NU	NU	71,72	NU	NU	NU	NU	NU	NU	NU	NU
128	128																
129	129																
	130																
									122								
									123								
130									124								

NI

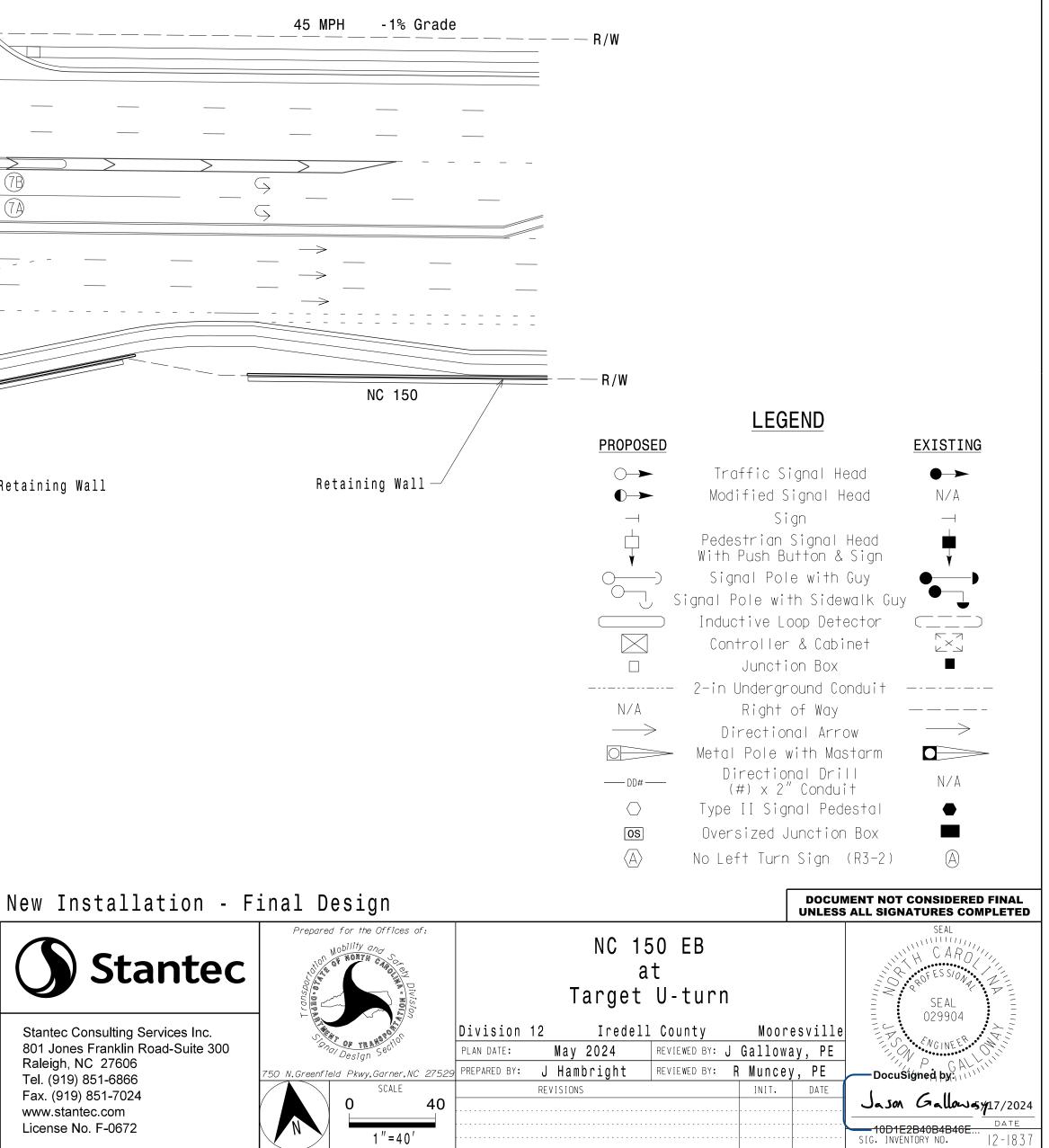
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1837T1 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A

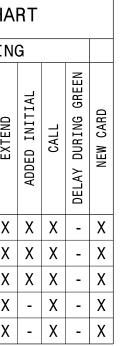
### Temporary Design 1 - TMP Phase III DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED Electrical Detail ELECTRICAL AND PROGRAMMING NC 150 EB DETAILS FOR: C. AR at Prepared for the Offices of: Target U-Turn SEAL 029904 Division 12 Iredell County Mooresville May 2024 REVIEWED BY: J Galloway, PE PLAN DATE: REVIEWED BY: R Muncey, PE PREPARED BY: JPG/RMM -DocuSigned by: REVISIONS INIT. DATE Jason Gallowsy17/2024 50 N. Greenfield Pkwy, Garner, NC 27529 10D1E2B40B4B46E. SIG. INVENTORY NO. 12-1837T

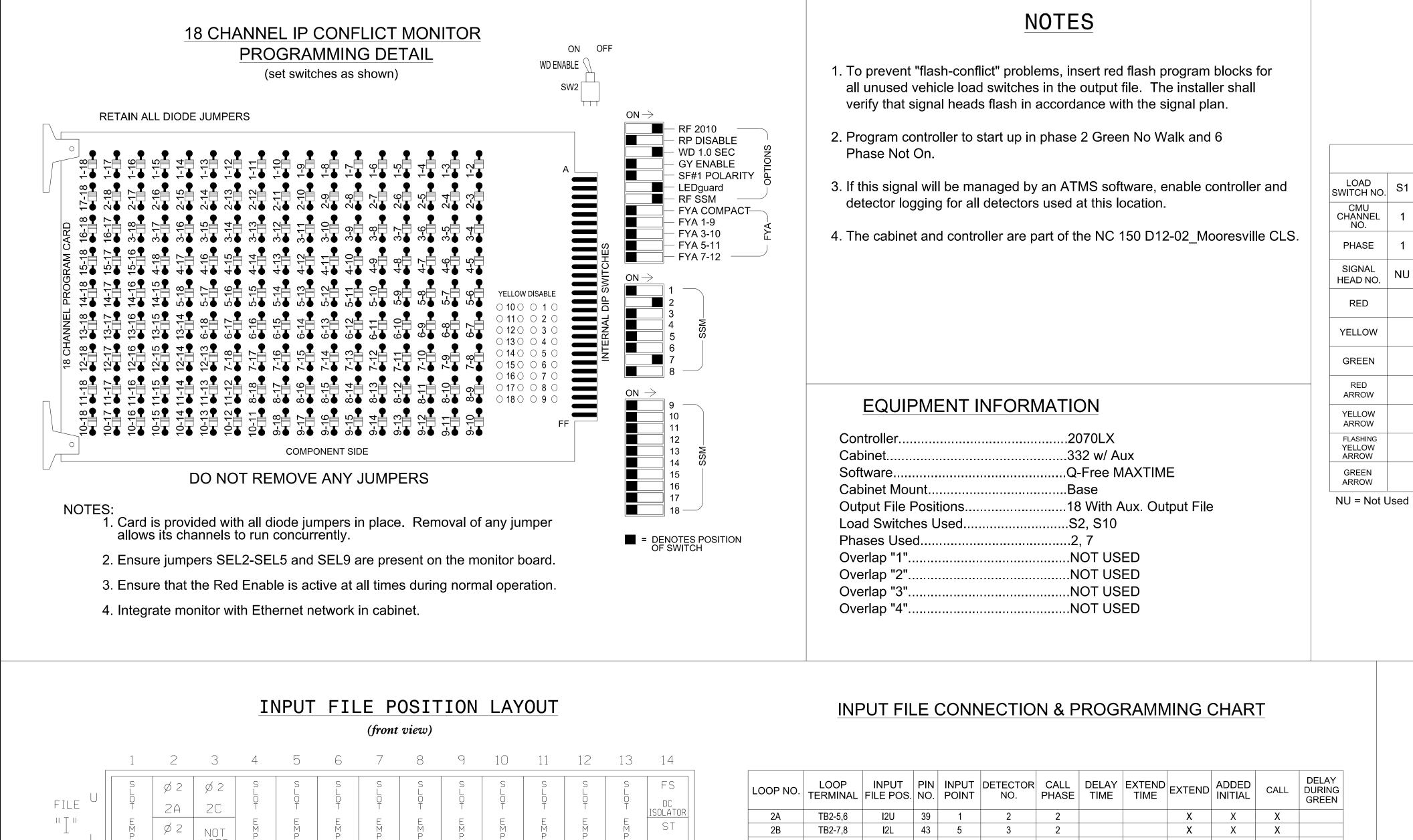


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\* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

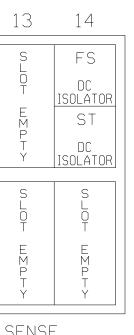






"I" _	E M P T Y	¢ 2 2B	NOT USED	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	₩∑₽⊢≻
FILE U "J" L	S LOT E MPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø7 7A NOT USED	Ø7 7B NOT USED	SLOT EMPTY	S L O T E M P T Y	SLOT EMPTY	S L O T E M P T Y	SLOT EMPTY
L	EX.: 1	A, 2A, E	TC.= L	00P N(	D.'S						FS

FS = FLASH SENSE



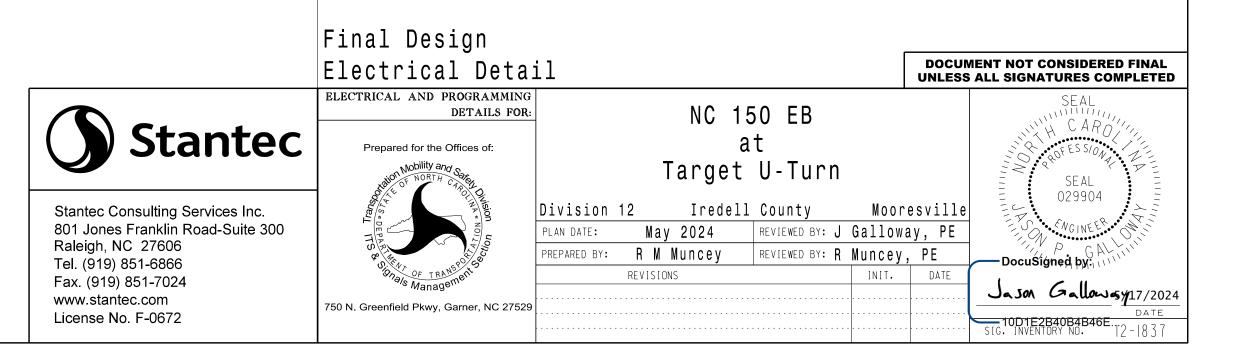
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			Х	Х	Х	
2B	TB2-7,8	I2L	43	5	3	2			Х	Х	Х	
2C	TB2-9,10	I3U	63	29	4	2			Х	Х	Х	
7A	TB5-5,6	J5U	57	19	21	7			Х		Х	
7B	TB5-9,10	J6U	42	4	22	7			Х		Х	

INPUT FILE POSITION LEGEND: J2L

FILE J -SLOT 2

LOWER

ST = STOP TIME



	Sig 29 1
PROJECT REFERENCE NO.	SHEET NO.

			S	SIGN	NAL	HE	AD	HO	OK	-UP	CH	AR	Т					
	S	2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
	4	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
I	21	22,23	NU	NU	NU	NU	NU	NU	NU	71,72	NU	NU	NU	NU	NU	NU	NU	NU
	128	128																
	129	129																
		130																
										122								
										123								
	130									124								

# SEQUENCE DETAIL

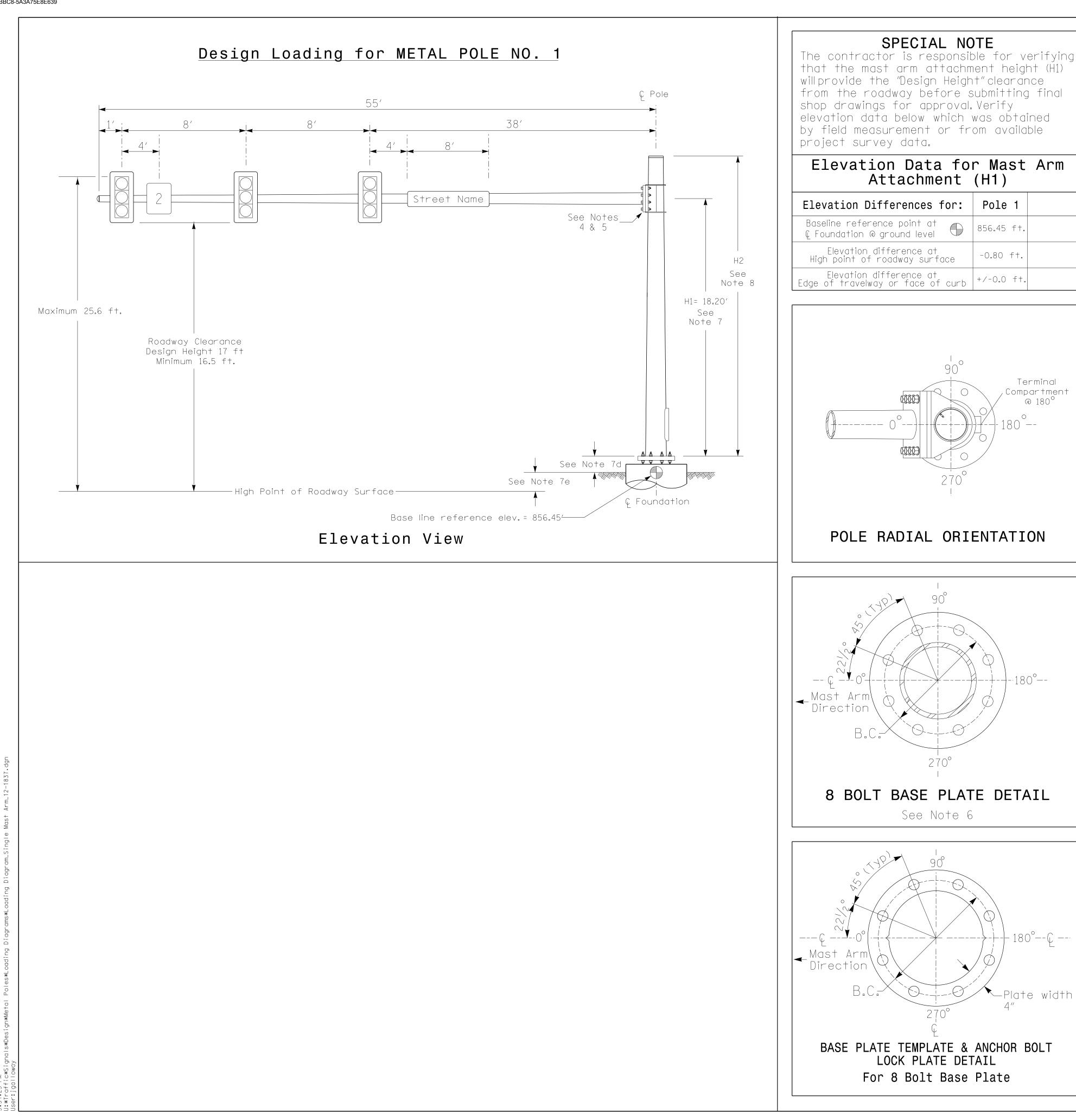
Front Panel Main Menu >Controller >Sequence & Phs Config>Sequences

### Web Interface Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	2,a,7,b
2	

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1837 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A



57/16. 5.34 8.11

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 fo Attachment		Arm					
Elevation Differences for:	Pole 1						
Baseline reference point at © Foundation @ ground level	856.45 ft.						
Elevation difference at High point of roadway surface	-0.80 ft.						
Elevation difference at Edge of travelway or face of curb	+/-0.0 ft.						

### DESIGN REQUIREMENTS

- requirements.

- the following:

# 0

METAL POLE No. 1	PROJECT REFERENCE NO.	SHEET NO.
WETAL FULE NUL I	R - 2307B	Sig. 29.2

	MAST ARM LOADING SC	HEDU	LE	
loading Symbol	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS

### <u>NOTES</u>

### DESIGN REFERENCE MATERIAL

1. Design the traffic signalstructure and foundation in accordance with: • The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions. • The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signalproject specialprovisions. • The 2024 NCDOT Roadway Standard Drawings.

• The traffic signalproject plans and specialprovisions.

The NCDOT "MetalPole Standards" located at the following NCDOT website:

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

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 force ratios that do not exceed 0.9.

4. The camber design for the 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

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. Signalheads are rigidly mounted and vertically centered on the mast arm.

c. The roadway clearance height for design is as shown in the elevation views.

d. The top of the pole base plate is 0.75 feet above the ground elevation.

e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.

8. The pole manufacturer will determine the total height (H2) of each pole using the greater of

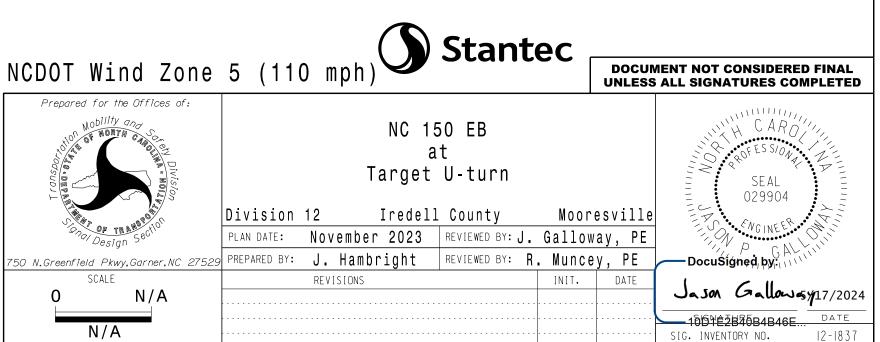
• Mast arm attachment height (H1) plus 2 feet, or

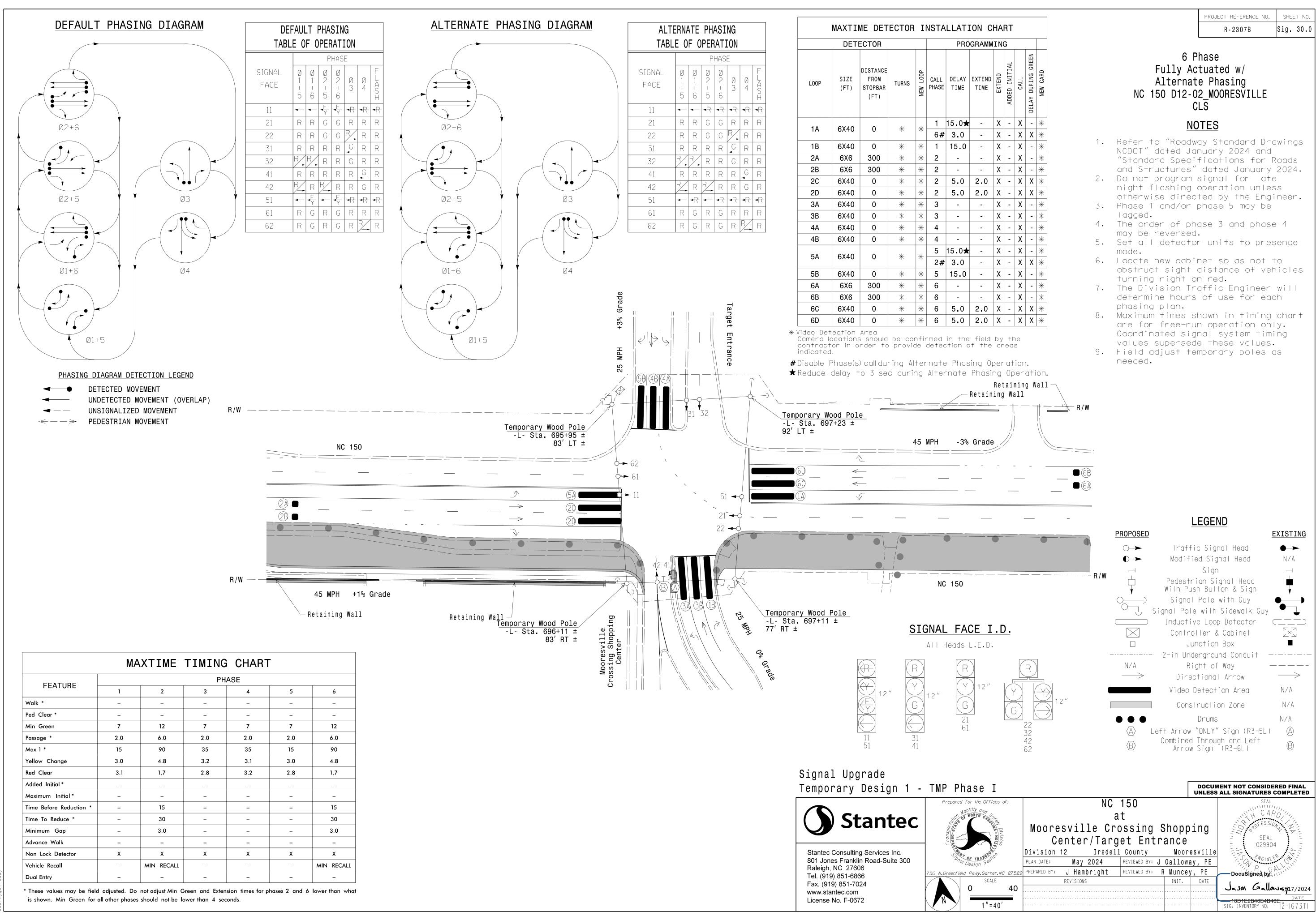
• H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.

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 SignalDesign Section Senior StructuralEngineer for assistance at (919)814-5000.

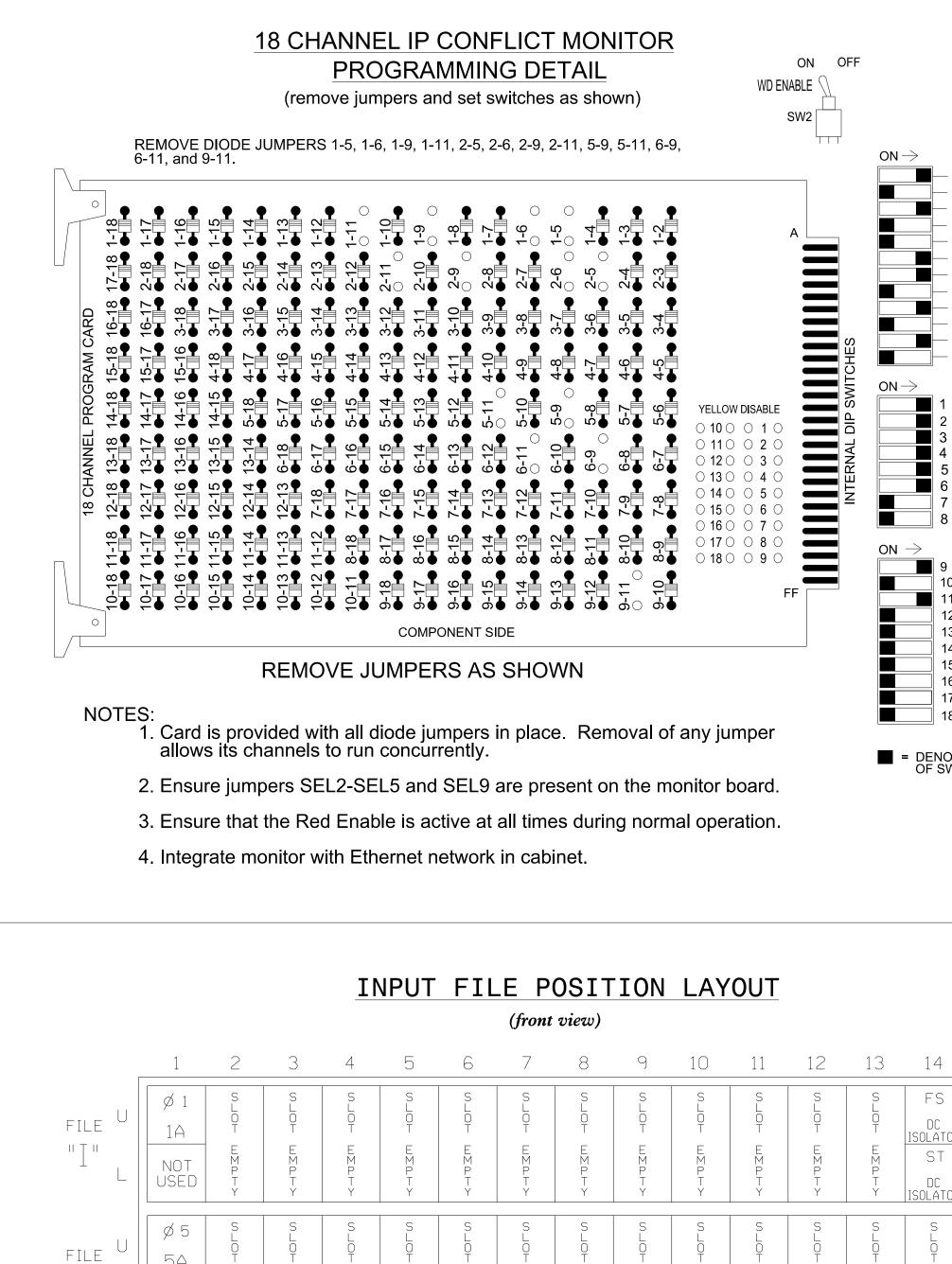
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signalheads over the roadway.

11. The contractor is responsible for providing soilpenetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.





PM FM fic*Signals*Design*Signal Design*Temporary Design*Phase			1 TEMP*R-2307B_sig_ds	
::::::::::::::::::::::::::::::::::::::				
:35:39 PM :*Traffic*Signals*Design*Signal			Design*Temporary	
:35:39 PM :*Traffic#S:	+++++		gnals*Design*Signal	
μ Ω Ω	コーヒロクークチチチチチチ	5:35:39 PM	U:*Traffic*Si	



 $\parallel \bigcup \parallel$ JSEE EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE

**INPUT FILE CONNECTION & PROGRAMMING CHART** 

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	
1A	TB2-1,2	<b>I</b> 1U	56	18	1 *	1	15.0		Х		
IA	102-1,2		50	-	29 *	6	3.0		Х		
5A	TB3-1,2	J1U	55	17	15 *	5	15.0		Х		
JA	103-1,2	JIU	55	-	31 *	2	3.0		Х		

For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on sheet 2 of 2.

INPUT FILE POSITION LEGEND: J2L

FILE J SLOT 2 LOWER

9 8 8

— RF 2010 - RP DISABLE - WD 1.0 SEC - GY ENABLE - SF#1 POLARITY — LEDguard RF SSM — FYA COMPACT— — FYA 1-9 — FYA 3-10 \_\_\_\_ FYA 5-11 FYA 7-12  $\mathsf{ON}$  ightarrow6 8 on ightarrow10 11 12 13 14 15 16 17 \_\_\_\_\_18 -DENOTES POSITION OF SWITCH

- FS ST
- ST = STOP TIME
  - DELAY CALL DURING GREEN Х Х Х 
     X

     X

     X

     X

- 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 plan.
- 2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 4. The cabinet and controller are part of the NC 150 D12-02\_Mooresville CLS.

							SI	GNA		IEA	DΗ	00	K-U	P C	HA	RT								
LOAD SWITCH NO.	S	51	S2	S3		S4			S5		S6	S	57	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	ļ	5	6	15	7	8	16	9	10	17	11	12	18
PHASE		1	2	2 PED		3			4		4 PED	Ļ	5	6	6 PED	7	8	8 PED	OL1		SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	★ 11	32	21,22	NU	22	31	32	41	42	62	NU	42	<b>★</b> 51	61,62	NU	NU	NU	NU	★ 11	NU	NU	★ 51	NU	NU
RED		*	128			116	116	101	101			*		134										
YELLOW			129			117	117	102	102					135										
GREEN			130			118	118	103	103					136										
RED ARROW																			A121			A114		
YELLOW ARROW		126			117					102		132							A122			A115		
FLASHING YELLOW ARROW																			A123			A116		
GREEN ARROW	127	127			118	118		103		103		133	133											

NU = Not Used

\*Denotes install load resistor. See load resistor installation detail this sheet. \*See pictorial of head wiring in detail this sheet.

# EQUIPMENT INFORMATION

Controller	2070LX
Cabinet	332 w/ Aux
Software	Q-Free MAXTIME
Cabinet Mount	Base
Output File Positions	18 With Aux. Output File
Load Switches Used	
Phases Used	1, 2, 3, 4, 5, 6
Overlap "1"	*
Overlap "2"	NOT USED
Overlap "3"	*
Overlap "4"	NOT USED

\*See overlap programming detail on sheet 2

# SPECIAL DETECTOR NOTE

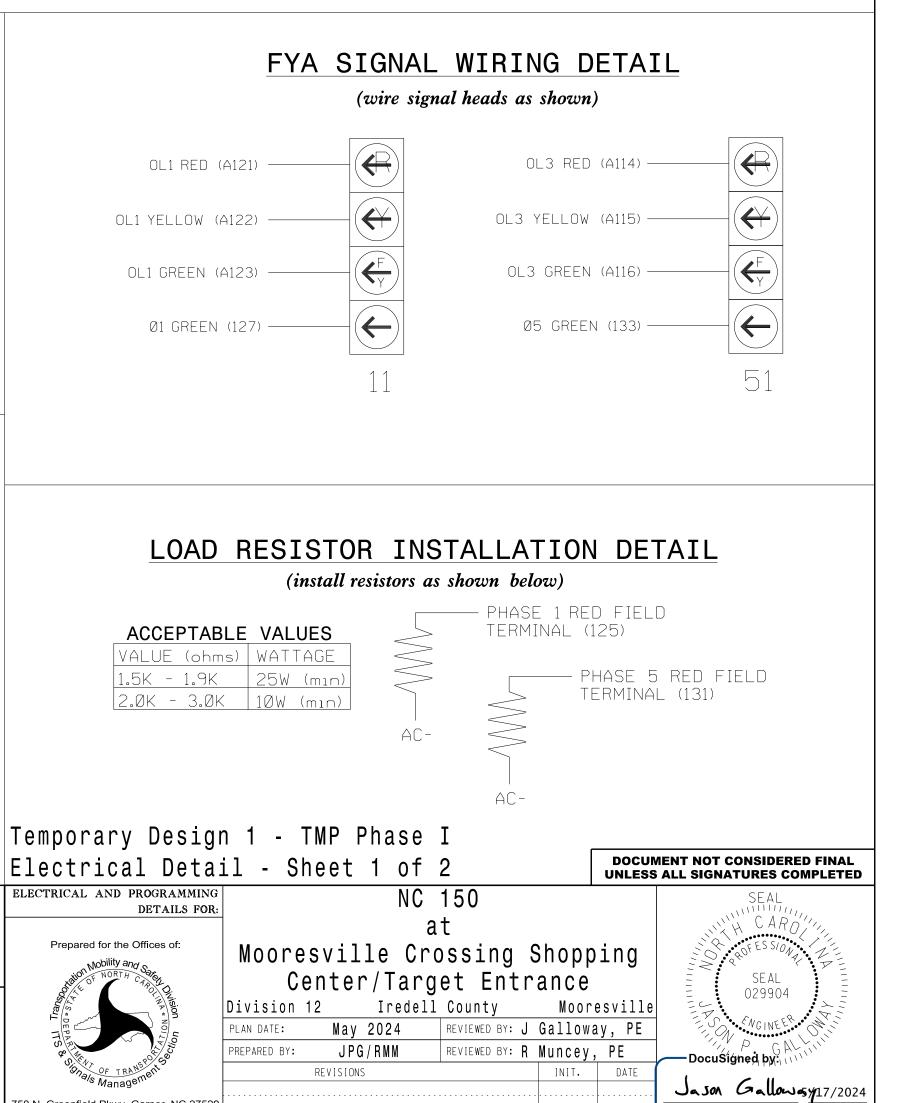
Install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For Detection Zones 1A and 5A, the equipment placement is typical for a NCDOT installation. Inputs associated with these slots are compatible with alternate operation programming located on the following sheets of this electrical detail.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1673T1 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A



PROJECT REFERENCE NO.	SHEET NO.
R - 2307B	Sig. 30.1



10D1E2B40B4B46E SIG. INVENTORY NO. 12-1673T

750 N. Greenfield Pkwy, Garner, NC 27529

# MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3		
Туре	FYA 4 - Section	FYA 4 - Section		
Included Phases	2	6		
Modifier Phases	1	5		
Modifier Overlaps	-	-		
Trail Green	0	0		
Trail Yellow	0.0	0.0		
Trail Red	0.0	0.0		

# MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PL
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2

	1	ALTERNATE PHASING CHANGE SUMMARY
	OVERLAP PLAN 2	S A SUMMARY OF WHAT TAKES PLACE WHEN AND VEHICLE DETECTOR PLAN 2 ACTIVATE ERNATE PHASING":
	OVERLAP PLAN 2:	Modifies overlap included phases for heads 11 and 51 run protected turns only.
	VEH DET PLAN 2:	Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.
		Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.
l		

36:34 \*Traft

# MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

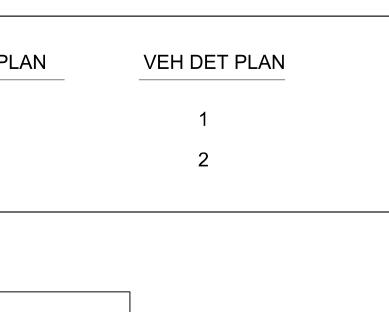
Front Panel Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

### Overlap Plan 2

Overlap	1	3	
Туре	FYA 4 - Section	FYA 4 - Section	
Included Phases	-	-	NOTICE INCLUDED PHASE
Modifier Phases	1	5	
Modifier Overlaps	-	-	
Trail Green	0	0	
Trail Yellow	0.0	0.0	
Trail Red	0.0	0.0	



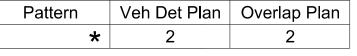
# MAXTIME ALTERNATE PHASING PATTERN **PROGRAMMING DETAIL**

Front Panel Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

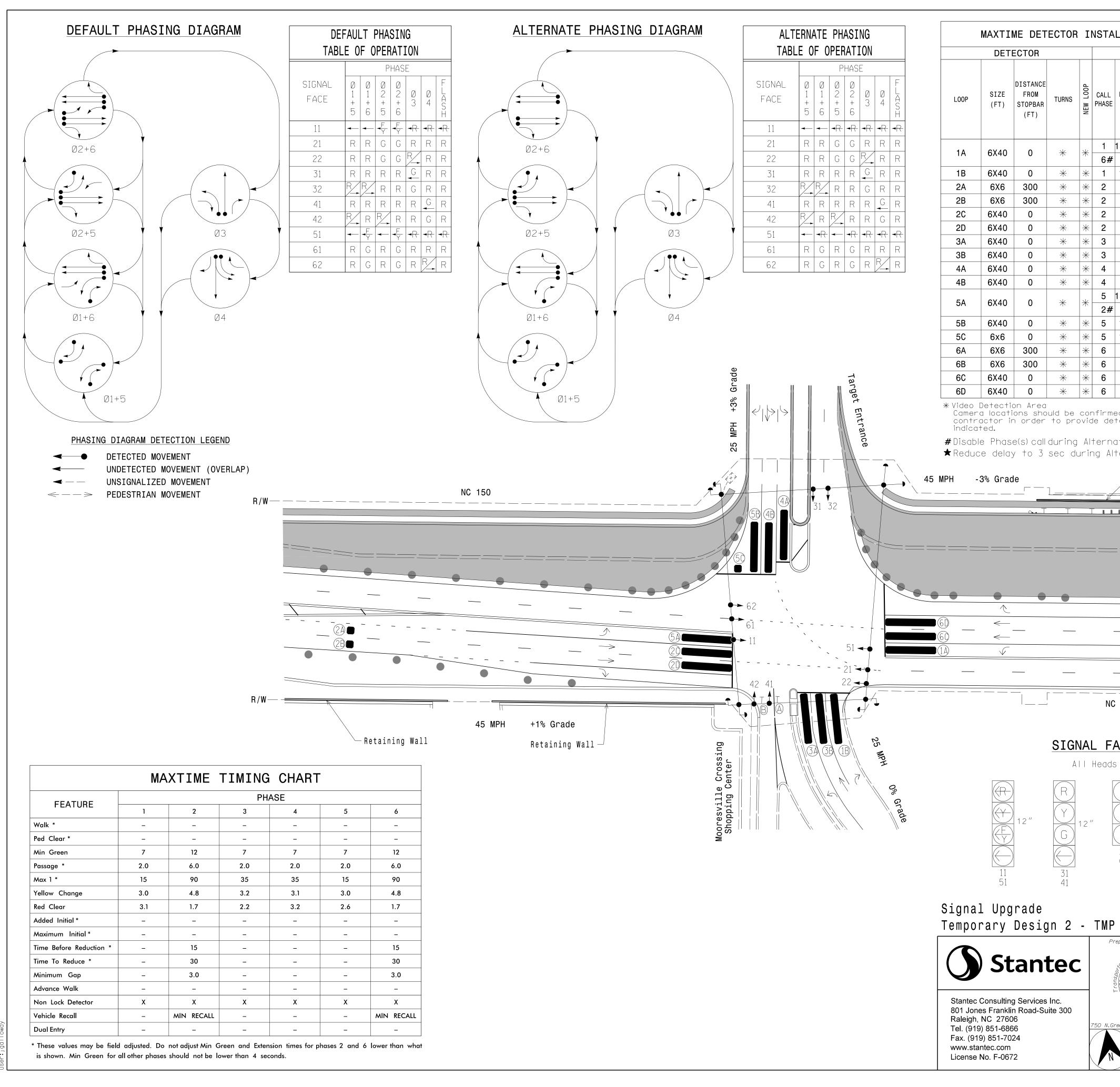


**\*** The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.



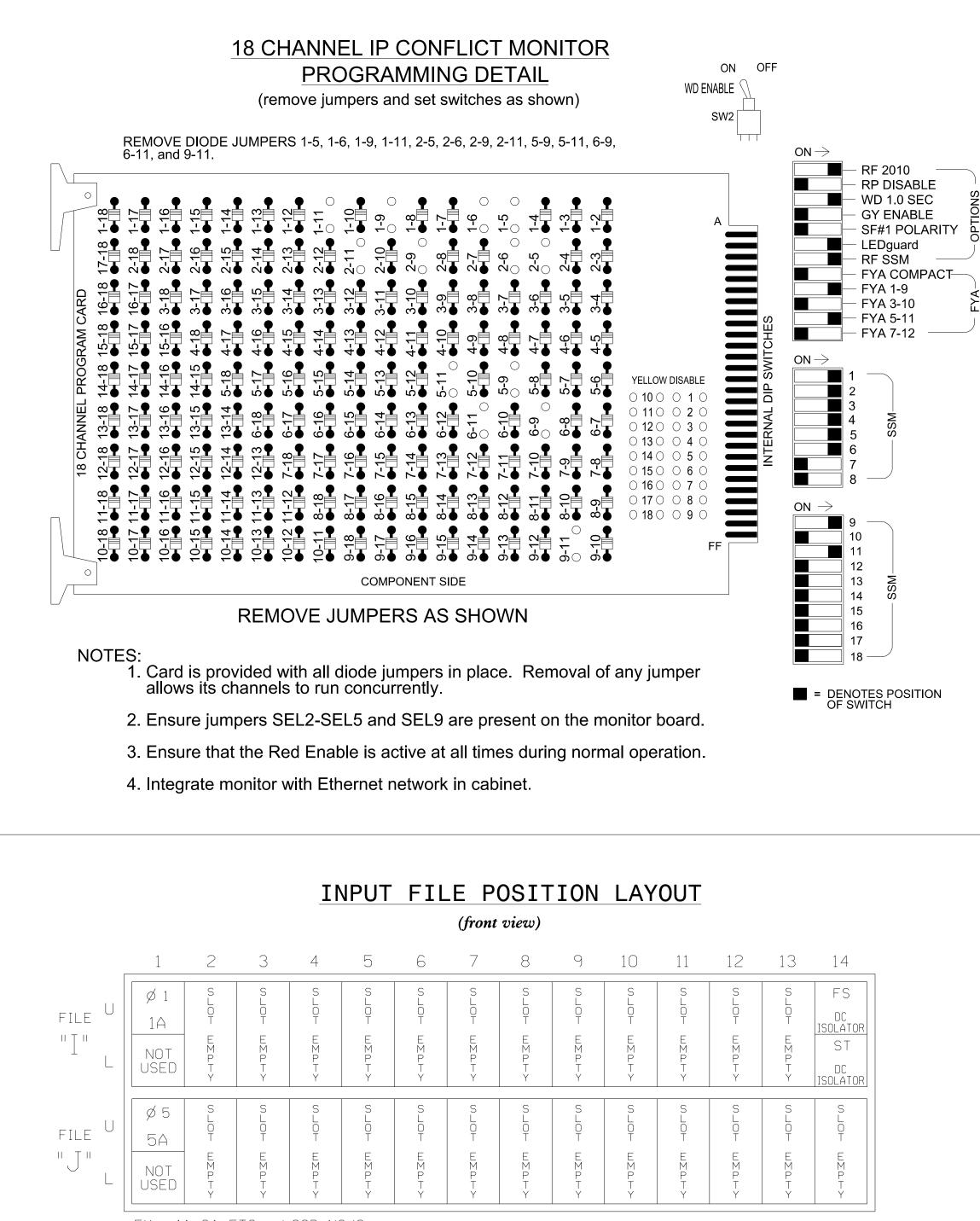
Tem Ele

-	PROJECT REFERENCE NO. R-2307B	SHEET NO. Sig. 30.2
l		
MAXTIME DETECTOR PROGRAMMING D		
FOR ALTERNATE PHASING LOOPS 1A	<u>&amp; 5A</u>	
Front Panel Main Menu >Controller >Detector >Veh Det Plans		
Web Interface Home >Controller >Detector Configuration >Vehicle De	tectors	
In the table view of web interface right click on "Detecto the top left corner of the table. Copy the entire contents Detector Plan 1. Paste Detector Plan 1 into Detector Pla Modify Detector Plan 2 as shown below and save chang	of an 2.	
Plan 2DetectorCall PhaseDelay1A13.0290-		
DetectorCall PhaseDelay5A1553.0310-		
THIS ELECTRICAL DETAIL IS FOR		
THE SIGNAL DESIGN: 12-1673T1 DESIGNED: MAY 2024		
SEALED: <sup>5/17/2024</sup> Revised: N/A		
emporary Design 1 - TMP Phase I		
lectrical Detail - Sheet 2 of 2	DOCUMENT NOT CONSIDE NLESS ALL SIGNATURES O	
DETAILS FOR: AT	SEAL CAA	
Prepared for the Offices of: Mooresville Crossing Shoppin Center/Target Entrance Division 12 Iredell County Mooresv PLAN DATE: May 2024 REVIEWED BY: J Galloway,	SEAL 029904	
PREPARED BY: JPG/RMM REVIEWED BY: R Muncey, P	PE F	
0, 1/2	Date Jason Gallo	<b>√5%/17/2024</b> DATE
	SIG. INVENTORY NO.	



PM PM C#S 

	· · · · · · · · · · · · · · · · · · ·
ALLATION CHART	PROJECT REFERENCE NO.SHEET NO.R-2307BSig. 31.0
PROGRAMMING	
DELAYEXTENDIII	ated w/ Phasing MOORESVILLE
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ES
-     -     X     -     X     -     1     Refer to "Roadway S       NCDOT" dated Januar	ry 2024 and "Standard
Image: Structure str	January 2024. hal for late night
Image: Constraint of the constra	gineer.
-       -       X       -       X       -       x       reversed.         15.0★       -       X       -       X       5.       Reposition existing numbered #11, 21, 2         4       3.0       -       X       -       X       6.       Set all detector units	22, 51, 61 and 62.
15.0 $X$ $X$ $\times$	
-       -       X       -       *       plan.         -       -       X       -       *       8.       Maximum times shown for free-run operations.         5.0       2.0       X       -       X       *       *       6.	n in timing chart are
5.0 2.0 X - X X * supersede these val	
nate Phasing Operation. Iternate Phasing Operation.	
Retaining Wall Retaining Wall	
	<u>GEND</u> EXISTING
■ ■ GA O→ Traffic S ● Modified S	Signal Head ●→ Signal Head N/A
Pedestrian	ign → Signal Head 🙀
C 150 C 150 Signal Pole wi	Button & Sign Ie with Guy Th Sidewalk Guy
ACE I.D. Controller	.oop Detector () r & Cabinet
N/A Right	round Conduit of Way onal Arrow>
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	ection Area N/A ction Zone N/A
G $G$ $O$ $Dr$ $Dr$	ums N/A _Y″Sign (R3-5L) (A)
32 Combined Thr	ough and Left In (R3-6L)
	DOCUMENT NOT CONSIDERED FINAL INLESS ALL SIGNATURES COMPLETED
Prepared for the Offices of: NC 150 at Mooresville Crossing Shoppi Center/Target Entrance	CARO
Center/Target Entrance Division 12 Iredell County Moores PLAN DATE: May 2024 REVIEWED BY: J Galloway	ville
Greenfield Pkwy.Garner.NC 27529 PREPARED BY: J Hambright REVIEWED BY: R Muncey, SCALE REVISIONS INIT.	DATE Jason Gallowsy17/2024



	1	2	3	4	5	6	7	8	9	10	11	12
file U "I" L	Ø 1 1A NOT USED	SLOT EMPTy	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EXPTY	SLOT EMPTY	SLOT EMPTy	SLOT EMPTy	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE U "J" L	Ø5 5A NOT USED	SLOT EMPTy	SLOT EMPty	S L OT E M P T Y	SLOT EMPTY	SLOT EMPty	SLOT EMPty	SLOT EMPty	SLOT EMPty	SLOT EMPTY	SLOT EMPTY	S LOT EMPTY
	EX.: 1A, 2A, ETC. = LOOP NO.'S										FS =	FLASH

**INPUT FILE CONNECTION & PROGRAMMING CHART** 

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TD2 1 2	I1U	56	18	1 *	1	15.0		Х		Х	
IA	TB2-1,2		50	-	29 *	6	3.0		Х		Х	Х
5A	TB3-1,2	J1U	55	17	15 *	5	15.0		Х		Х	
JA	103-1,2	510	55	-	31 *	2	3.0		Х		Х	Х

For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on sheet 2 of 2.

INPUT FILE POSITION LEGEND: J2L

FILE J SLOT 2 LOWER

FS = FLASH SENSE ST = STOP TIME



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 plan.

NOTES

- 2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 4. The cabinet and controller are part of the NC 150 D12-02\_Mooresville CLS.

							SIC	GNA		IEA	DH	00	K-U	JP C	HA	RT								
LOAD SWITCH NO.	S	51	S2	S3		S4			S5		S6	S	57	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	Į	5	6	15	7	8	16	9	10	17	11	12	18
PHASE		1	2	2 PED		3			4		4 PED	Ļ	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	★ 11	32	21,22	NU	22	31	32	41	42	62	NU	42	<b>★</b> 51	61,62	NU	NU	NU	NU	<b>★</b> 11	NU	NU	★ 51	NU	NU
RED		*	128			116	116	101	101			*		134										
YELLOW			129			117	117	102	102					135										
GREEN			130			118	118	103	103					136										
RED ARROW																			A121			A114		
YELLOW ARROW		126			117					102		132							A122			A115		
FLASHING YELLOW ARROW																			A123			A116		
GREEN ARROW	127	127			118	118		103		103		133	133											

NU = Not Used

\*See pictorial of head wiring in detail this sheet.

# EQUIPMENT INFORMATION

Controller	2070LX
Cabinet	332 w/ Aux
Software	Q-Free MAXTIME
Cabinet Mount	Base
Output File Positions	18 With Aux. Output File
Load Switches Used	
Phases Used	1, 2, 3, 4, 5, 6
Overlap "1"	*
Overlap "2"	NOT USED
Overlap "3"	*
Overlap "4"	NOT USED

\*See overlap programming detail on sheet 2

# SPECIAL DETECTOR NOTE

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

For Detection Zones 1A and 5A, the equipment placement is typical for a NCDOT installation. Inputs associated with these slots are compatible with alternate operation programming located on the following sheets of this electrical detail.

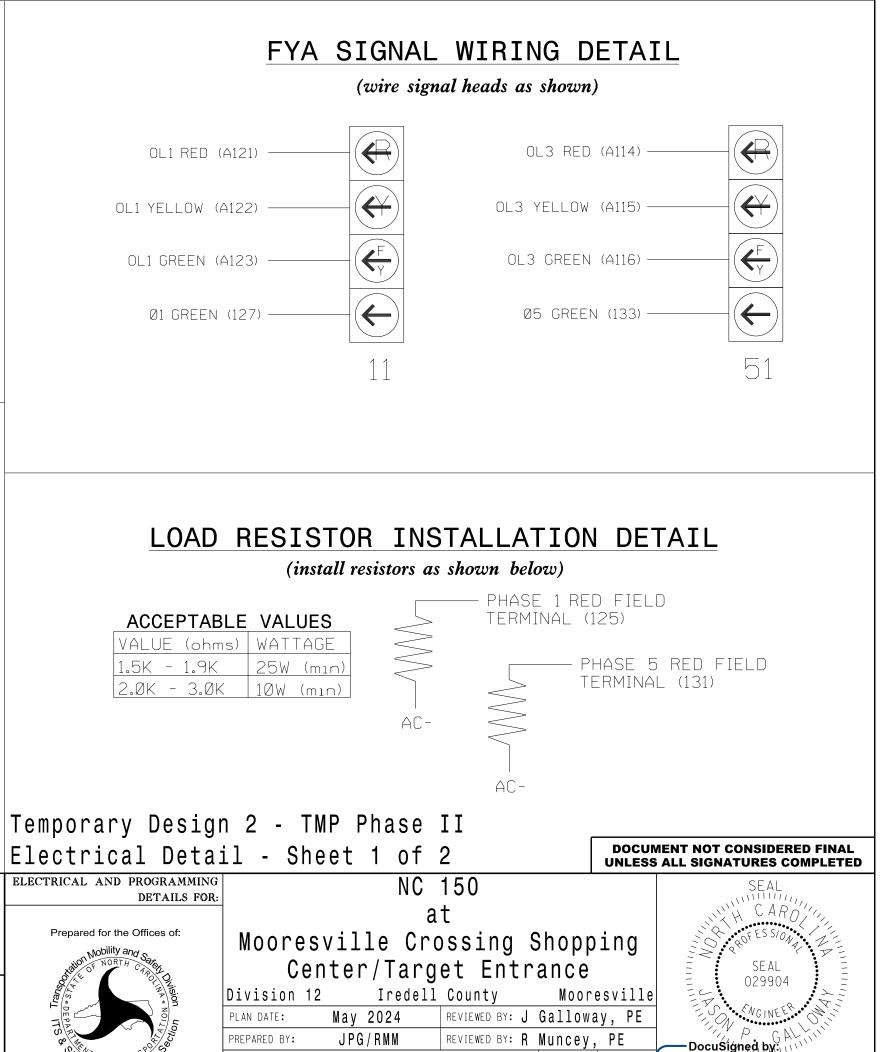
> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1673T2 DESIGNED: MAY 2024 SEALED: 5/17/2024 REVISED: N/A



License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R - 2307B	Sig. 31.1

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



INIT. DATE

Jason Gallowsy17/2024

10D1E2B40B4B46E SIG. INVENTORY NO. 12-1673T

REVISIONS