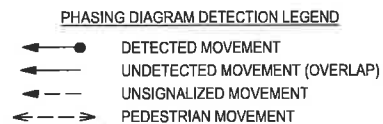


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with their signature on that page.**

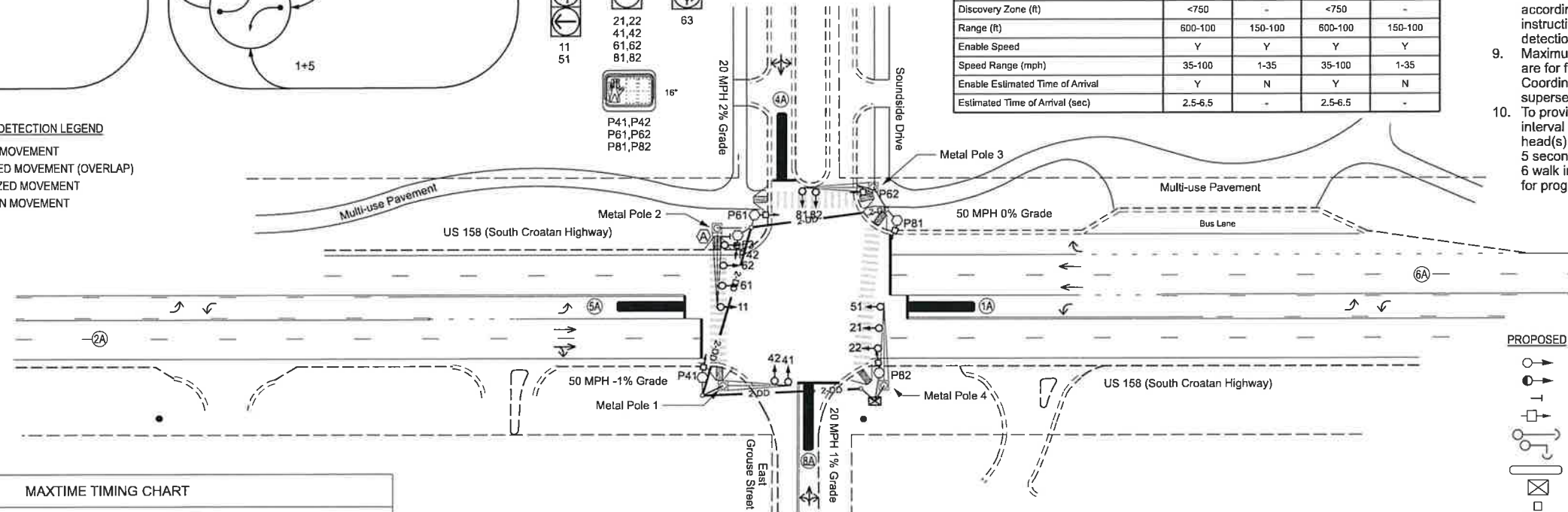
**This file or an individual page
shall not be considered a certified document.**



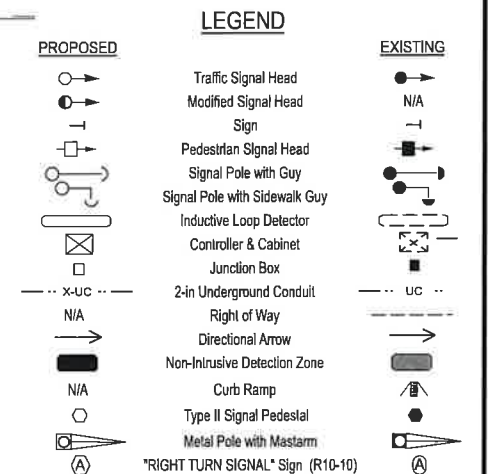
ALTERNATE TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	PHASE TIME
11	—	—	R	R	R	—
21,22	R	R	G	G	R	—
41,42	R	R	R	R	G	—
51	—	R	—	R	R	—
61,62	R	G	R	G	R	—
63	R	F	R	F	R	—
81,82	R	R	R	R	G	—
P41,P42	DW	DW	DW	DW	W	DR
P61,P62	DW	DW	DW	W	DW	DR
P81,P82	DW	DW	DW	DW	W	DR

* Multi-zone Microwave Detection.
 ** Reduce Delay to 3 Seconds During Alternate Phasing Operation.
 # Disable Phase Call for Loop(s) During Alternate Phasing Operations.

SIGNAL FACE I.D.



* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



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. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. To provide a leading pedestrian interval on phase 6, program FYA head(s) numbered 51 and 63 to delay for 5 seconds after the start of the phase 6 walk interval. See Electrical Details for programming.

Transportation Mobility and Safety Division
Signal Design Section

750 N. Greenfield Pkwy, Gaither, MD

SCALE
0

Division 01		Dare County		Nags Head	
PLAN DATE: May 2026		REVIEWED BY: KGP, Jr.			
PREPARED BY: ELC		REVIEWED BY:			
REVISONS			INT.	DATE	
1. (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100) (101) (102) (103) (104) (105) (106) (107) (108) (109) (110) (111) (112) (113) (114) (115) (116) (117) (118) (119) (120) (121) (122) (123) (124) (125) (126) (127) (128) (129) (130) (131) (132) (133) (134) (135) (136) (137) (138) (139) (140) (141) (142) (143) (144) (145) (146) (147) (148) (149) (150) (151) (152) (153) (154) (155) (156) (157) (158) (159) (160) (161) (162) (163) (164) (165) (166) (167) (168) (169) (170) (171) (172) (173) (174) (175) (176) (177) (178) (179) (180) (181) (182) (183) (184) (185) (186) (187) (188) (189) (190) (191) (192) (193) (194) (195) (196) (197) (198) (199) (200) (201) (202) (203) (204) (205) (206) (207) (208) (209) (210) (211) (212) (213) (214) (215) (216) (217) (218) (219) (220) (221) (222) (223) (224) (225) (226) (227) (228) (229) (230) (231) (232) (233) (234) (235) (236) (237) (238) (239) (240) (241) (242) (243) (244) (245) (246) (247) (248) (249) (250) (251) (252) (253) (254) (255) (256) (257) (258) (259) (260) (261) (262) (263) (264) (265) (266) (267) (268) (269) (270) (271) (272) (273) (274) (275) (276) (277) (278) (279) (280) (281) (282) (283) (284) (285) (286) (287) (288) (289) (290) (291) (292) (293) (294) (295) (296) (297) (298) (299) (300) (301) (302) (303) (304) (305) (306) (307) (308) (309) (310) (311) (312) (313) (314) (315) (316) (317) (318) (319) (320) (321) (322) (323) (324) (325) (326) (327) (328) (329) (330) (331) (332) (333) (334) (335) (336) (337) (338) (339) (340) (341) (342) (343) (344) (345) (346) (347) (348) (349) (350) (351) (352) (353) (354) (355) (356) (357) (358) (359) (360) (361) (362) (363) (364) (365) (366) (367) (368) (369) (370) (371) (372) (373) (374) (375) (376) (377) (378) (379) (380) (381) (382) (383) (384) (385) (386) (387) (388) (389) (390) (391) (392) (393) (394) (395) (396) (397) (398) (399) (400) (401) (402) (403) (404) (405) (406) (407) (408) (409) (410) (411) (412) (413) (414) (415) (416) (417) (418) (419) (420) (421) (422) (423) (424) (425) (426) (427) (428) (429) (430) (431) (432) (433) (434) (435) (436) (437) (438) (439) (440) (441) (442) (443) (444) (445) (446) (447) (448) (449) (450) (451) (452) (453) (454) (455) (456) (457) (458) (459) (460) (461) (462) (463) (464) (465) (466) (467) (468) (469) (470) (471) (472) (473) (474) (475) (476) (477) (478) (479) (480) (481) (482) (483) (484) (485) (486) (487) (488) (489) (490) (491) (492) (493) (494) (495) (496) (497) (498) (499) (500) (501) (502) (503) (504) (505) (506) (507) (508) (509) (510) (511) (512) (513) (514) (515) (516) (517) (518) (519) (520) (521) (522) (523) (524) (525) (526) (527) (528) (529) (530) (531) (532) (533) (534) (535) (536) (537) (538) (539) (540) (541) (542) (543) (544) (545) (546) (547) (548) (549) (550) (551) (552) (553) (554) (555) (556) (557) (558) (559) (560) (561) (562) (563) (564) (565) (566) (567) (568) (569) (570) (571) (572) (573) (574) (575) (576) (577) (578) (579) (580) (581) (582) (583) (584) (585) (586) (587) (588) (589) (590) (591) (592) (593) (594) (595) (596) (597) (598) (599) (600) (601) (602) (603) (604) (605) (606) (607) (608) (609) (610) (611) (612) (613) (614) (615) (616) (617) (618) (619) (620) (621) (622) (623) (624) (625) (626) (627) (628) (629) (630) (631) (632) (633) (634) (635) (636) (637) (638) (639) (640) (641) (642) (643) (644) (645) (646) (647) (648) (649) (650) (651) (652) (653) (654) (655) (656) (657) (658) (659) (660) (661) (662) (663) (664) (665) (666) (667) (668) (669) (670) (671) (672) (673) (674) (675) (676) (677) (678) (679) (680) (681) (682) (683) (684) (685) (686) (687) (688) (689) (690) (691) (692) (693) (694) (695) (696) (697) (698) (699) (700) (701) (702) (703) (704) (705) (706) (707) (708) (709) (710) (711) (712) (713) (714) (715) (716) (717) (718) (719) (720) (721) (722) (723) (724) (725) (726) (727) (728) (729) (730) (731) (732) (733) (734) (735) (736) (737) (738) (739) (740) (741) (742) (743) (744) (745) (746) (747) (748) (749) (750) (751) (752) (753) (754) (755) (756) (757) (758) (759) (760) (761) (762) (763) (764) (765) (766) (767) (768) (769) (770) (771) (772) (773) (774) (775) (776) (777) (778) (779) (780) (781) (782) (783) (784) (785) (786) (787) (788) (789) (790) (791) (792) (793) (794) (795) (796) (797) (798) (799) (800) (8					

(remove jumpers and set switches as shown)

18 CHANNEL PROGRAM CARD

COMPONENT SIDE

YELLOW DISABLE

REMOVE JUMPERS AS SHOWN

-
- ON OFF
- WD ENABLE
- SW2
- A
- E
- FF
- INTERNAL DIP SWITCHES
- ON →
- 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
- OPTIONS
- FYA
- ON →
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- SSM
- ON →
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- SSM
- = DENOTES POSITION OF SWITCH

(front view)

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

FS = FLASH SENSE
ST = STOP TIME

(install resistors as shown)

Phase 1 Yellow Field Terminal (126)

Phase 5 Yellow Field Terminal (132)

AC-

AC-

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.

- ### EQUIPMENT INFORMATION

*See overlap programming detail on Sheet 3

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	-	-	-	*	33★	1	15		X		X	
				*	125★	6			X		X	
2A	-	-	-	★	38	2			X		X	
4A	-	-	-	★	44	4	5		X		X	
5A	-	-	-	★	35★	5	15		X		X	
				*	127★	2		X		X		
6A	-	-	-	★	54	6			X		X	
8A	-	-	-	★	60	8	5		X		X	
PED PUSH BUTTONS							INPUT FILE POSITION LEGEND:					
P41, P42	T88-5,6	I12L	69	35	4	PED 4	NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113. FILE J _____ SLOT 2 _____ LOWER					
P61, P62	T88-7,9	I13U	68	34	6	PED 6						
P81, P82	T88-8,9	I13L	70	36	8	PED 8						

★ For the detectors to work as shown on the signal plan, see the Detector Programming Detail for Alternate Phase on Sheet 3.

* For Input Point Numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

NU = Not Used

Install a multizone microwave 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.

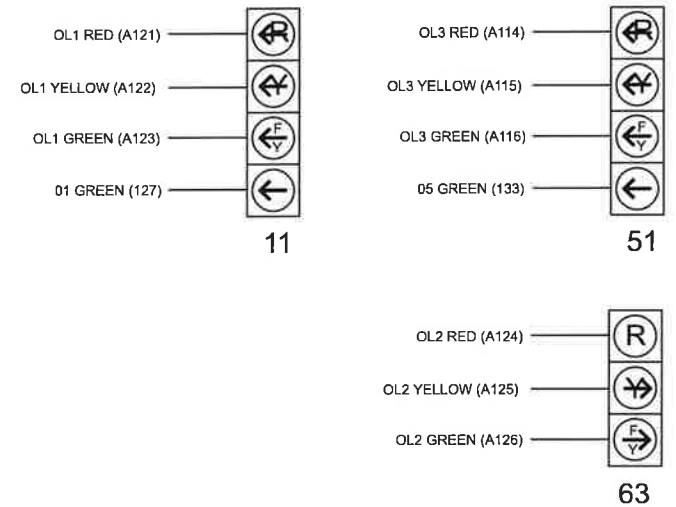
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CML CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	P41, P42	51★	61,62	P61, P62	NU	81,82	P81, P82	11★	63★	NU	51★	NU	NU
RED		128			101			134				107		A124				
YELLOW	★	129			102		★	135				108						
GREEN		130			103			136				109						
RED ARROW													A121			A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133											
						104			119			110						
						106			121			112						

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0768
DESIGNED: May 2026
SEALED: 7/31/2026
REVISED:

Electrical Detail - Sheet 1 of 3

Electrical and Programming
Details For

Prepared in the Offices of:

 U.S. Department of Transportation
Federal of South Carolina
Transportation Mobility and Safety Division
Traffic & Signal Management Section

10 N. Greenfield Pkwy, Garner, NC

US 158
(South Croatan Highway)
at
Grouse Street / Soundside Drive

Division 01	Dare County	Nags Head
PLAN DATE: June 2026	REVIEWED BY: DJC	
PREPARED BY: ELC	REVIEWED BY:	

REVISIONS	INIT.	DATE
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[illegible]

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

AL



— Disc Signed By: 93 John Braddock 08/03/2026

DATE

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

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

Channel Configuration

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

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Call	125	Is Module A input B ON	Number	2	Number	1	0.0	0.0
2	Veh Detector Call	127	Is Module A input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 33 to vehicle detector 125

Statement 2 Description: Mirrors vehicle detector 35 to vehicle detector 127

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operations.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0768
DESIGNED: May 2026
SEALED: 7/31/2026
REVISED:

Electrical Detail - Sheet 2 of 3

Electrical and Programming Details For

Prepared In the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 158
(South Croatan Highway)
at
Grouse Street / Soundside Drive

Division D1
PLAN DATE: June 2026
PREPARED BY: ELC

Date County
Nags Head
REVIEWED BY: DJC

REVISIONS
INT.
DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
061379
D. JAKE CRADDOCK

08/03/2026
DATE

SIG INVENTORY NO. 01-0768

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 PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	2	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 heads 11 and 51 to 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.

MAXTIME DETECTOR PROGRAMMING DETAIL
FOR ALTERNATE PHASING LOOPS 1A & 5A

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.

1A	Plan 2		
	Detector	Call Phase	Delay
	33 125	1 0	3 -

5A			
	Detector	Call Phase	Delay
	35 127	5 0	3 -

MAXTIME ALTERNATE PHASING PATTERN
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters		
Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

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 (11)	2 (63)	3 (51)
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	6	6
Modifier Phases	1	-	5
Modifier Overlaps	-	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0
FYA Ped Delay	0.0	5.0	5.0

NOTICE FYA PED DELAY

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 (11)	2 (63)	3 (51)
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	6	-
Modifier Phases	1	-	5
Modifier Overlaps	-	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0
FYA Ped Delay	0.0	5.0	0.0

NOTICE INCLUDED PHASE

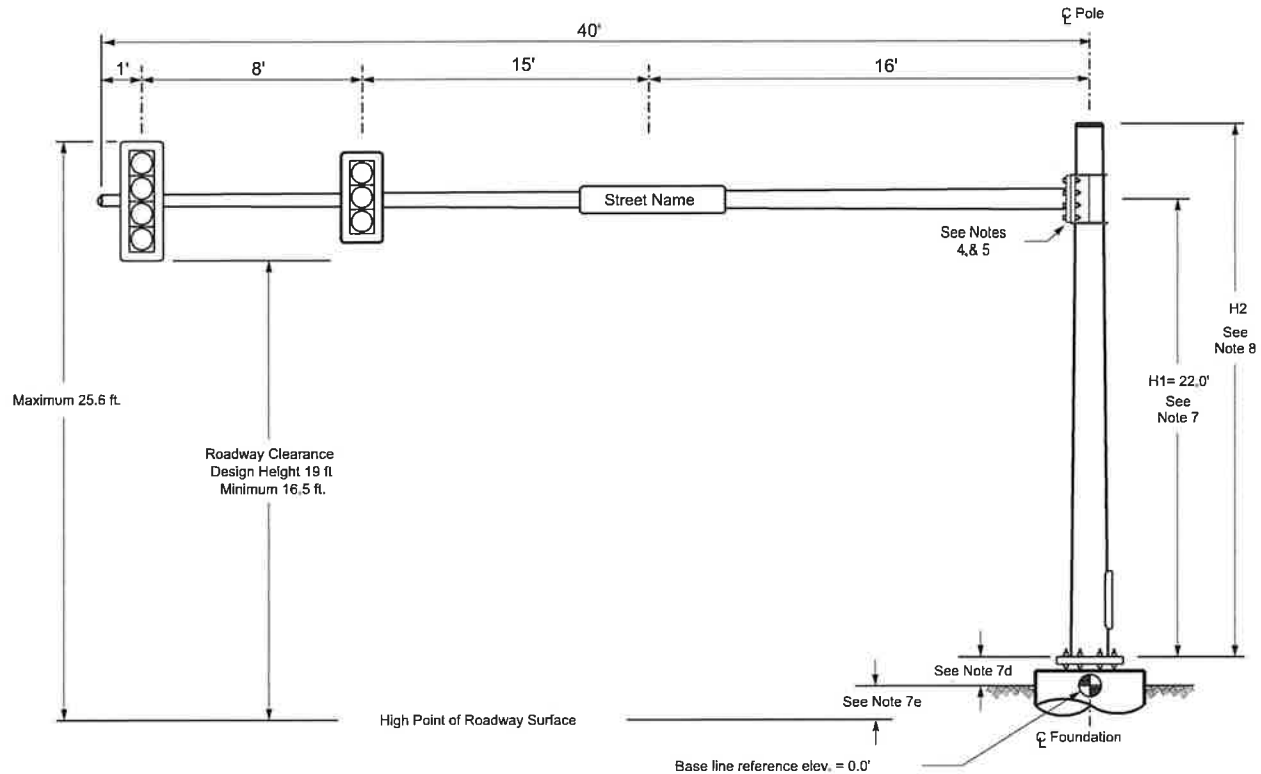
NOTICE FYA PED DELAY

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0768
DESIGNED: May 2026
SEALED: 7/31/2026
REVISED:

Electrical Detail - Sheet 3 of 3

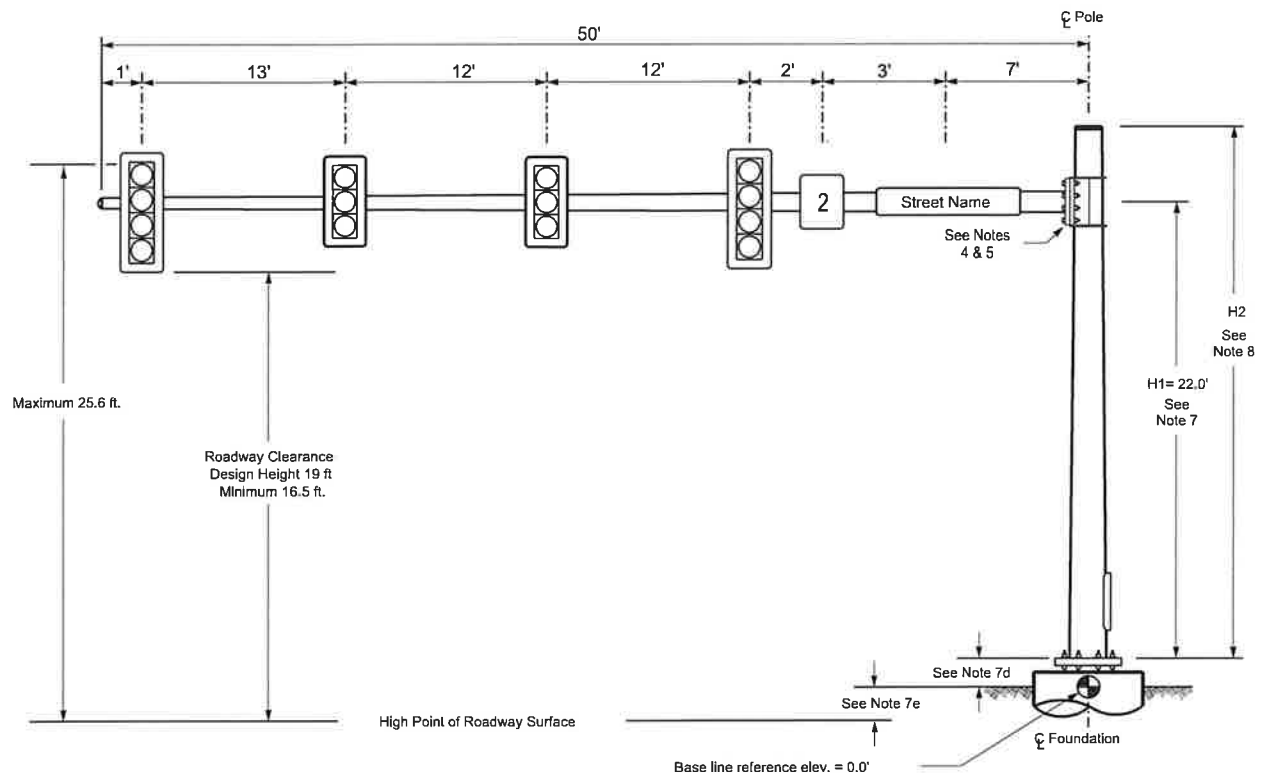
Electrical and Programming Details For:		US 158 (South Croatan Highway) at Grouse Street / Soundside Drive		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	Division 01 Dare County Nags Head		SEAL NORTH CAROLINA PROFESSIONAL SEAL 061379 ENGINEER JAKE CRADDOCK	
	PLAN DATE: June 2026 REVIEWED BY: DJC		DATE 08/03/2026	
	PREPARED BY: ELC REVIEWED BY:		DATE	
	REVISIONS		DATE	
SIG INVENTORY NO. 01-0768				

Design Loading for METAL POLE NO. 1



Elevation View

Design Loading for METAL POLE NO. 2



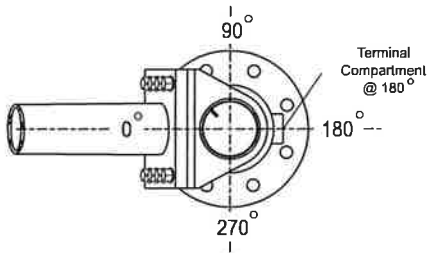
Elevation View

SPECIAL NOTE

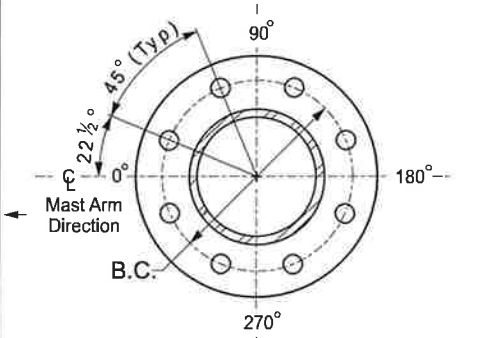
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.46 ft.	+0.72 ft.
Elevation difference at Edge of travelway or face of curb	-0.02 ft.	+0.58 ft.

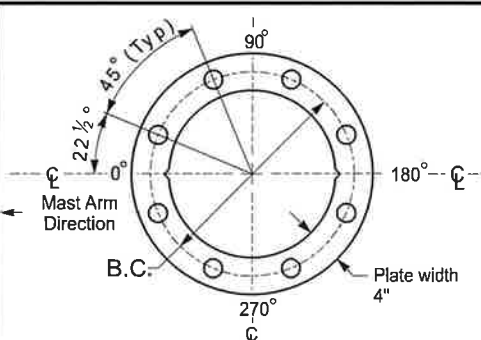


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE No. 1 and 2

MAST ARM LOADING SCHEDULE				
LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12" 4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12" 3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS

NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure 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 signal project special provisions.
 - The 2024 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>

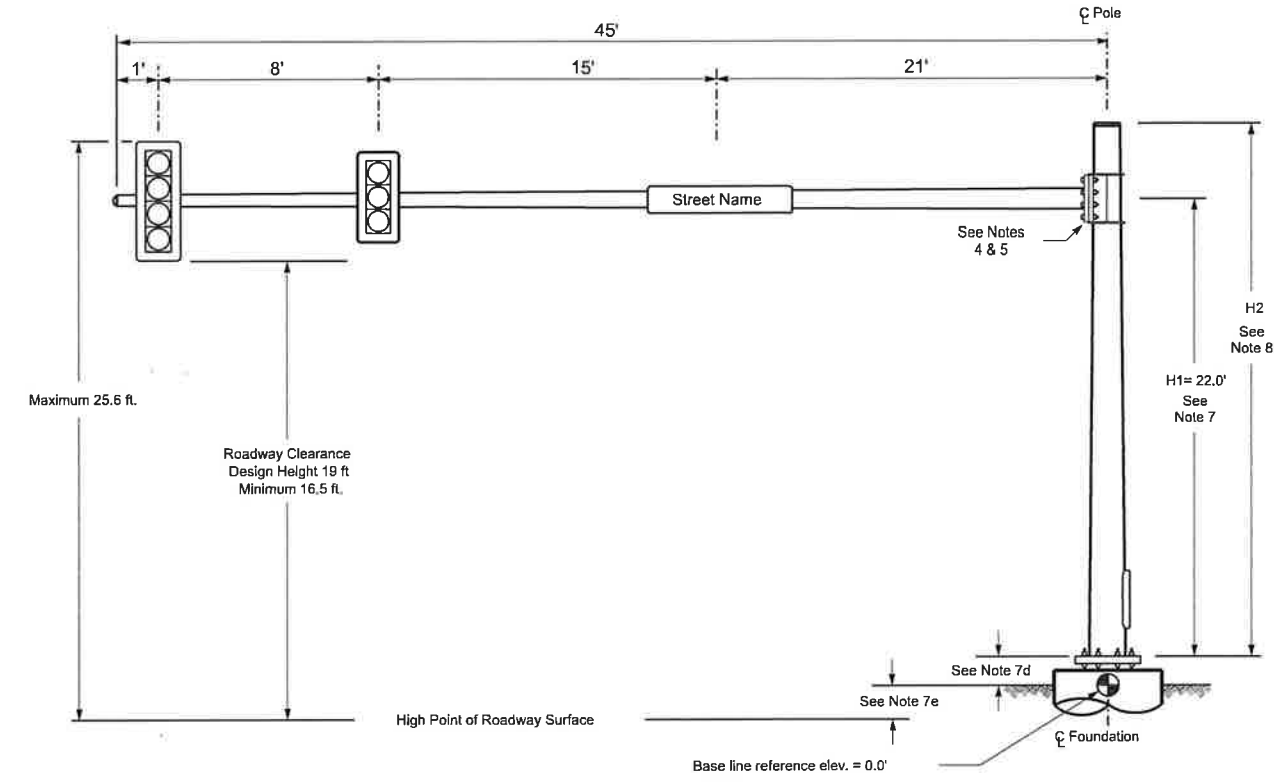
DESIGN REQUIREMENTS

- 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.
- Design all signal supports using force ratios that do not exceed 0.9.
- 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.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2 (140 mph)

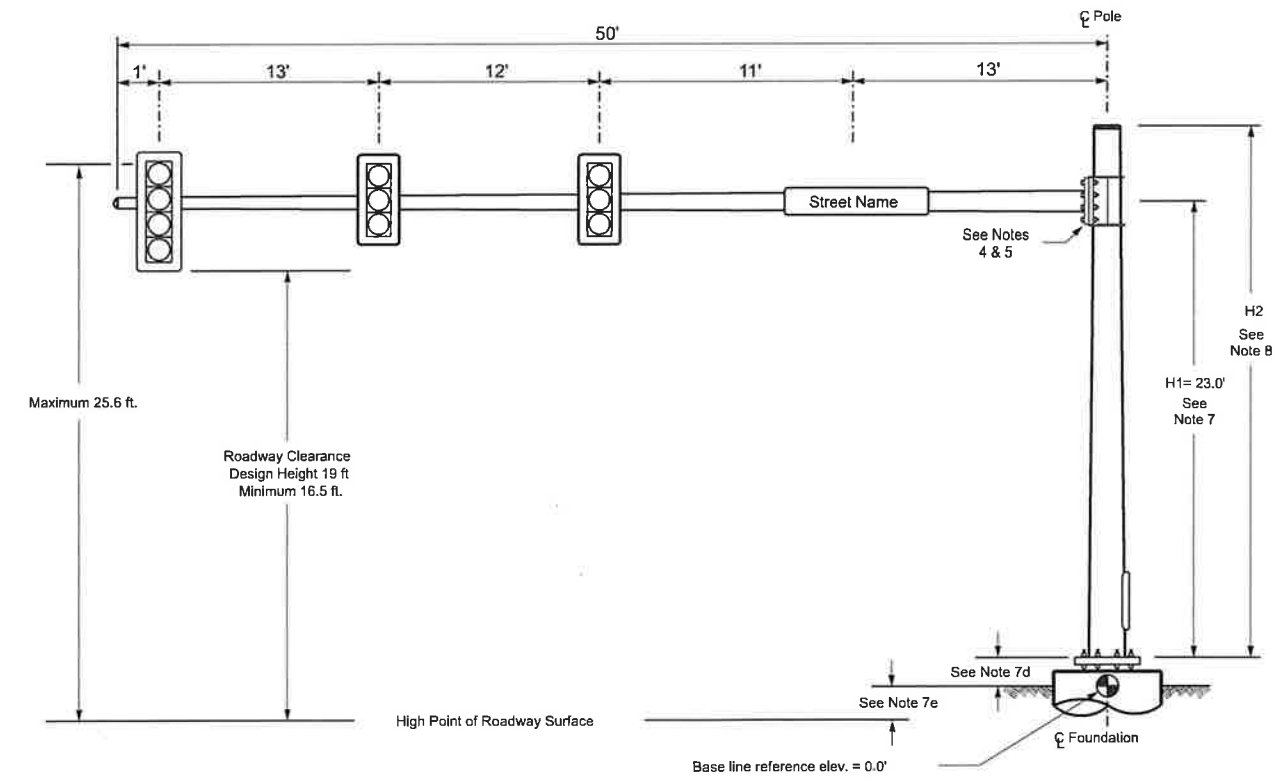
Prepared in the Offices of: 750 N. Greenfield Parkway, Garner, NC 27529	US 158 (South Croatan Highway) at Grouse Street / Soundside Drive Division 1 Dare County Nags Head PLAN DATE: May 2026 PREPARED BY: ELC REVIEWED BY: ZML REVISIONS INIT. DATE SCALE: 0 N/A N/A	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA SEAL 030530 ENGINEER JACUARY M. LITTLE Signed by: 08/07/2026 DATE SIG INVENTORY NO: 01-0768
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Design Loading for METAL POLE NO. 3



Elevation View

Design Loading for METAL POLE NO. 4



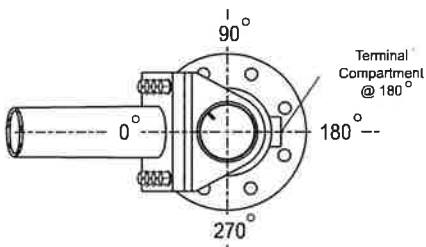
Elevation View

SPECIAL NOTE

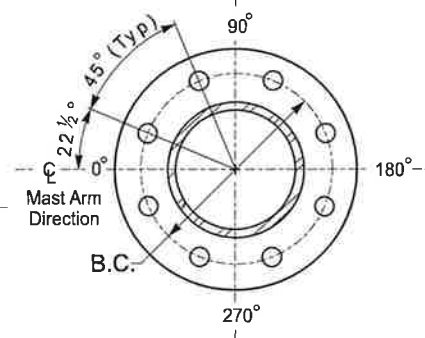
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

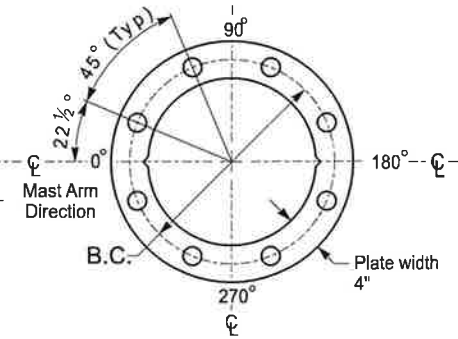
Elevation Differences for:	Pole 3	Pole 4
Baseline reference point at Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.48 ft.	+1.47 ft.
Elevation difference at Edge of travelway or face of curb	+0.03 ft.	+0.67 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL
See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE No. 3 and 4

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 1.5

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

NOTES

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- Design the traffic signal structure and foundation in accordance with:
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 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>

DESIGN REQUIREMENTS

- 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.
- Design all signal supports using force ratios that do not exceed 0.9.
- 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.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2 (140 mph)

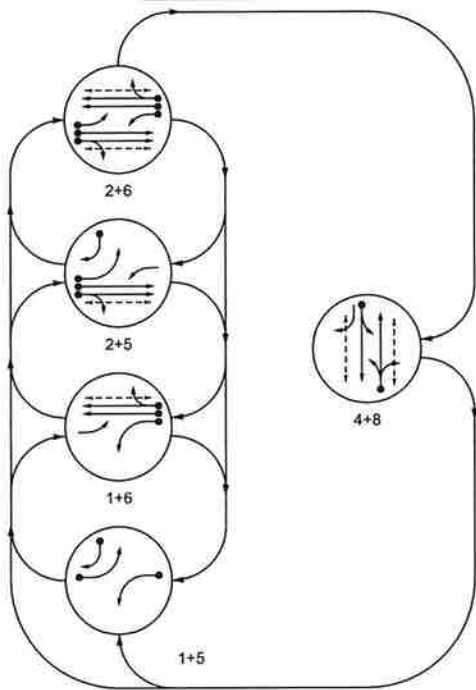
 Prepared in the Office of: Transportation Mobility and Safety Division Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	US 158 (South Croatan Highway) at Grouse Street / Soundside Drive		
	Division 1 PLAN DATE: May 2026 PREPARED BY: ELC	Dare County REVIEWED BY: ZML Nags Head	
SCALE 0 N/A N/A	REVISIONS	INITIALS	DATE
SIGNED BY:		08/07/2026	
SIGNED BY:		01-0768	

5 Phase
Fully Actuated
US 158 (Croatan Hwy) South
D01-07_Kitty Hawk

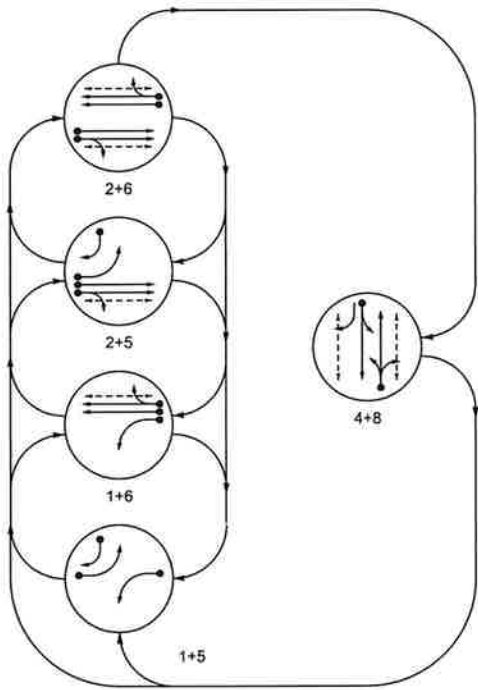
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

DEFAULT
PHASING DIAGRAM



ALTERNATE
PHASING DIAGRAM



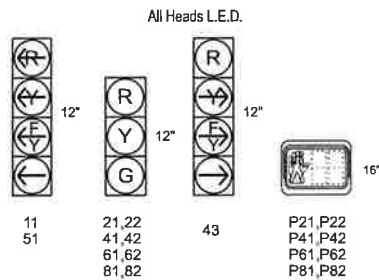
DEFAULT TABLE OF OPERATION	
SIGNAL FACE	PHASE
	1 2 3 4 5 6 7 8 9 10 11 12
11	1 2 3 4 5 6 7 8 9 10 11 12
21,22	R R G G R R R R
41,42	R R R R G G R R
43	R R R R G G R R
51	R R R R G G R R
61,62	R G R G R R R R
81,82	R R R R G G R R
P21,P22	DW DW W W DW DRK
P41,P42	DW DW DW DW W DRK
P61,P62	DW W DW W DW DRK
P81,P82	DW DW DW DW W DRK

ALTERNATE TABLE OF OPERATION	
SIGNAL FACE	PHASE
	1 2 3 4 5 6 7 8 9 10 11 12
11	1 2 3 4 5 6 7 8 9 10 11 12
21,22	R R G G R R R R
41,42	R R R R G G R R
43	R R R R G G R R
51	R R R R G G R R
61,62	R G R G R R R R
81,82	R R R R G G R R
P21,P22	DW DW W W DW DRK
P41,P42	DW DW DW DW W DRK
P61,P62	DW W DW W DW DRK
P81,P82	DW DW DW DW W DRK

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURN	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAYING GREEN	NEW CARD
1A	*	0	*	*	1 15**	-	-	X	-	X	*
2A	*	*	*	*	2	-	-	X	-	X	*
4A	*	+5	*	*	4 3	-	-	X	-	X	*
5A	*	0	*	*	5 15**	-	-	X	-	X	*
5B	*	+5	*	*	2#	-	-	X	-	X	*
6A	*	*	*	*	5 15	-	-	X	-	X	*
8A	*	+5	*	*	8 5	-	-	X	-	X	*

* Multi-zone Microwave Detection.
** Reduce Delay to 3 Seconds During Alternate Phasing Operation.
Disable Phase Call for Loop(s) During Alternate Phasing Operation.

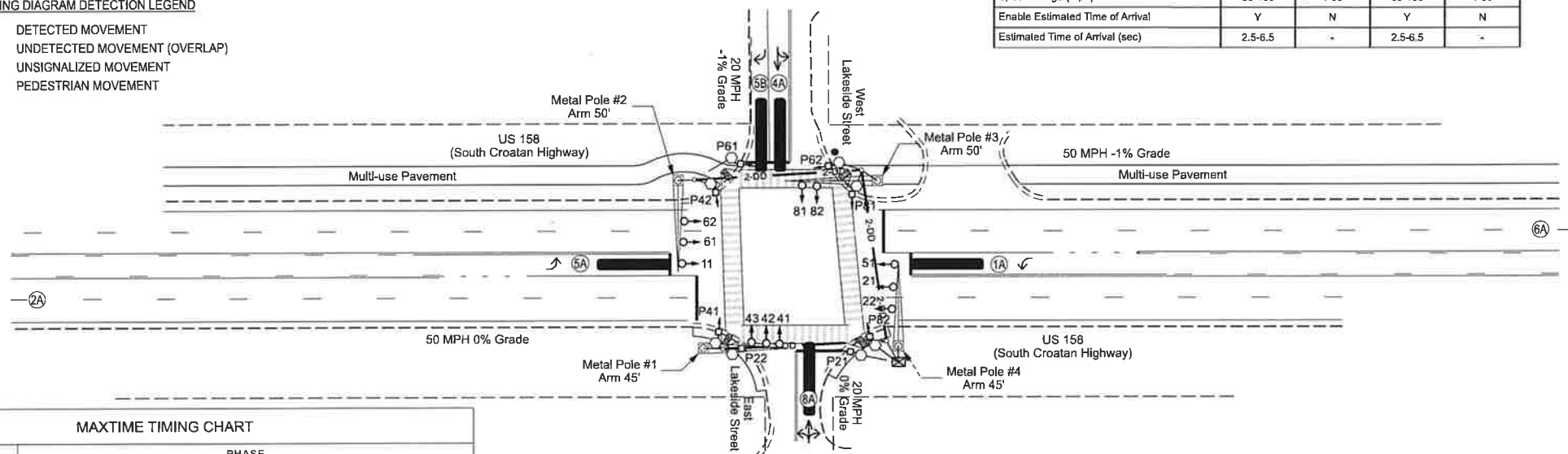
SIGNAL FACE I.D.



Microwave Detection System				
FUNCTION	Sensor 1 (2A)	Sensor 2 (5A)	Sensor 3 (6A)	Sensor 4 (8A)
Channel	1	1	1	1
Phase	2	6	6	6
Direction of Travel	NB	SB	SB	SB
Type	Priority	Priority	Priority	Priority
Level	2	2	2	2
Discovery Zone (ft)	<750	<750	<750	<750
Range (ft)	600-100	150-100	600-100	150-100
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35-100	1-35	35-100	1-35
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5-6.5	-	2.5-6.5	-

PHASING DIAGRAM DETECTION LEGEND

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

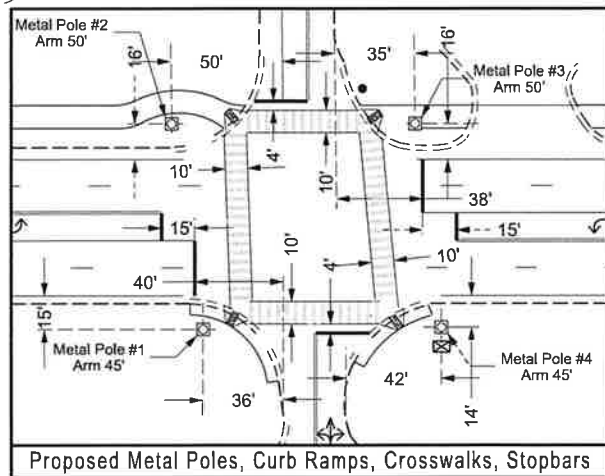


LEGEND

- | PROPOSED | EXISTING |
|------------------------------------|----------|
| Traffic Signal Head | N/A |
| Modified Signal Head | N/A |
| Sign | N/A |
| Pedestrian Signal Head | N/A |
| Signal Pole with Guy | N/A |
| Signal Pole with Sidewalk Guy | N/A |
| Inductive Loop Detector | N/A |
| Controller & Cabinet | N/A |
| Junction Box | N/A |
| 2-in Underground Conduit | N/A |
| Right of Way | N/A |
| Directional Arrow | N/A |
| Multizone Microwave Detection Zone | N/A |
| Metal Pole with Mastarm | N/A |
| Curb Ramp | N/A |
| Type II Signal Pedestal | N/A |

MAXTIME TIMING CHART							
FEATURE	PHASE						
	1	2	4	5	6	8	
Walk *	-	14	14	-	14	14	
Ped Clear	-	15	22	-	13	22	
Min Green *	7	14	7	7	14	7	
Passage *	2.0	2.0	2.0	2.0	2.0	2.0	
Max 1 *	20	90	30	20	90	30	
Yellow Change	3.0	4.9	3.0	3.0	4.9	3.0	
Red Clear	2.6	1.1	3.1	2.9	1.1	3.1	
Added Initial *	-	-	-	-	-	-	
Maximum Initial *	-	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	-	
Advance Walk	-	7	7	-	7	7	
Non Lock Detector	X	-	X	X	-	X	
Vehicle Recall	-	MIN RECALL	-	MIN RECALL	-	-	
Dual Entry	-	-	X	-	-	X	
Simultaneous Start	-	-	X	-	-	X	

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 8 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

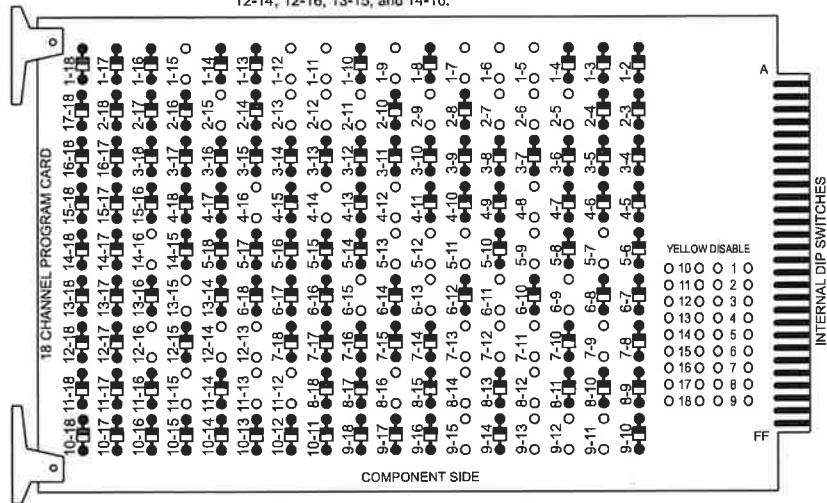


New Installation

Prepared in the Office of: 750 N. Greenfield Pkwy, Garner, NC 27529	US 158 (South Croatan Highway) at East Lakeside St. / West Lakeside St. Division 01 Dare County Nags Head PLAN DATE: May 2026 PREPARED BY: KGP, Jr. REVIEWED BY: ZMH REVISIONS INT. DATE	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA SEAL 030530 ENGINEER ZACHARY M. LITTLE DATE 07/29/2026 SIG INVENTORY NO 01-0769
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18 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

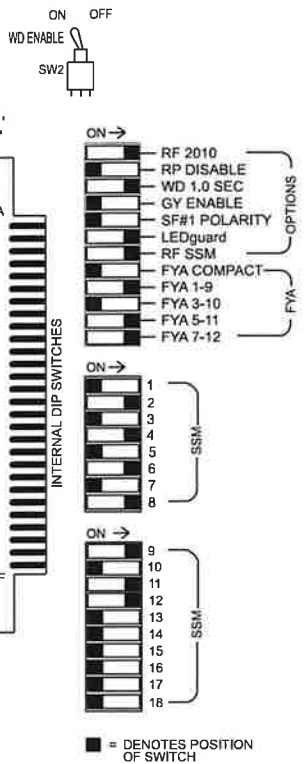
(remove jumpers and set switches as shown)
REMOVE DIODE JUMPERS 1-5, 1-6, 1-7, 1-9, 1-11, 1-12, 1-15, 2-5, 2-6, 2-7, 2-9, 2-11, 2-12, 2-13, 2-15, 4-8, 4-12, 4-14, 4-16, 5-7, 5-9, 5-11, 5-12, 5-13, 6-9, 6-11, 6-13, 6-15, 7-9, 7-11, 7-12, 7-13, 8-12, 8-14, 8-16, 9-11, 9-12, 9-13, 9-15, 11-12, 11-13, 11-15, 12-13, 12-14, 12-16, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- Program phases 4 and 8 for Simultaneous Start.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the US 158 (Croatan Hwy) South D01-07_Kitty Hawk System.

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.....S1, S2, S3, S5, S6, S7, S8, S9, S10, S11, S12, AUX S1, AUX S4, AUX S5
Phases Used.....1, 2, 2PED, 4, 4PED, 5, 6, 6PED, 8, 8PED
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "7".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	OL7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	41,42	P41, P42	51	61,62	P61, P62	43	81,82	P81, P82	11	NU	NU	51	43	NU
RED		128			101			134			107						A101	
YELLOW	*	129			102		*	135		*	108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115	A102	
FLASHING YELLOW ARROW													A123			A116	A103	
GREEN ARROW	127						133			124								
Hand			113			104			119		110							
Walking			115			106			121		112							

* Denotes install load resistor. See load resistor installation detail on this sheet. NU = Not Used
* See pictorial of head wiring in detail this sheet.
NOTE: Load switch S10 has been reassigned. See Programming Details on sheet 2.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	U	U	U	U	U	U	U	U	U	U	U	U	U
FILE "J"	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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
1A	-	-	-	*	33	1	15.0		X		X	
2A	-	-	-	*	38	2			X		X	
4A	-	-	-	*	44	4	3.0		X		X	
5A	-	-	-	*	35	5	15.0		X		X	
5B	-	-	-	*	127	2			X		X	
6A	-	-	-	*	51	5	15.0		X		X	
8A	-	-	-	*	54	6			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

- * For the detectors to work as shown on the signal plan, see the Detector Programming Detail for Alternate Phasing on sheet 2 of this plan.
* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	1A	49	NU
2	34	NU	50	NU
3	35	5A	51	5B
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

SPECIAL DETECTOR NOTE

Install a multizone microwave 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.

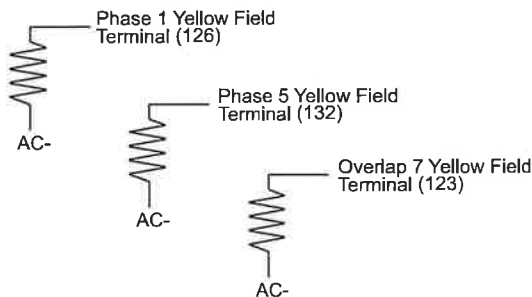
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

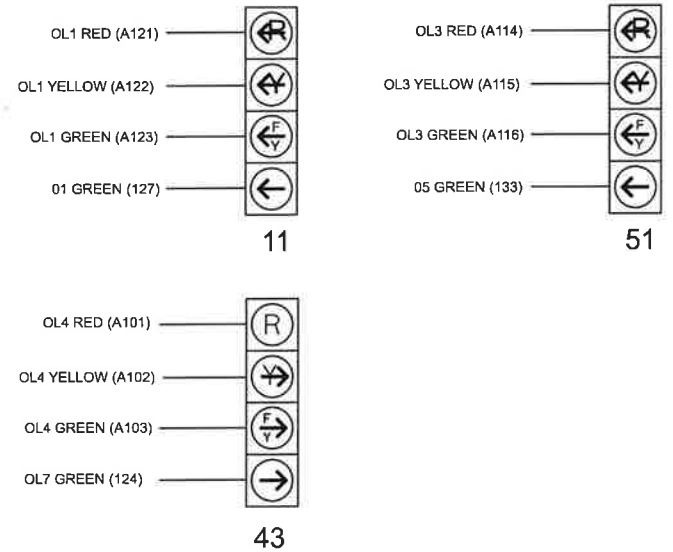
(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0769
DESIGNED: May 2026
SEALED: 7/29/2026
REVISED:

Electrical Detail - Sheet 1 of 3

Electrical and Programming Details For:	US 158 (South Croatan Highway) at East Lakeside St. / West Lakeside St.	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared in the Offices of:	Division 01 Date County Nags Head	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER D. J. CRADDOCK 061379
	PLAN DATE: July 2026 REVIEWED BY: DJC	Seal of the State of North Carolina Professional Engineer D. J. CRADDOCK 061379
	PREPARED BY: N. Moser REVIEWED BY:	Reviewed by: D. J. Craddock 07/30/2026
	REVISIONS	DATE
	750 N. Greenfield Pkwy, Garner, NC 27529	SIG INVENTORY NO. 01-0769

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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	2	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 heads 11 and 51 to 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.

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home > Controller > Advanced IO > Cabinet Configuration > IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Expected
1	Veh Detector Call	125	Is Module A input B ON	Number	2	Number	1	0.0	0.0
3	Veh Detector Call	127	Is Module A input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 33 to vehicle detector 125

Statement 3 Description: Mirrors vehicle detector 35 to vehicle detector 127

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

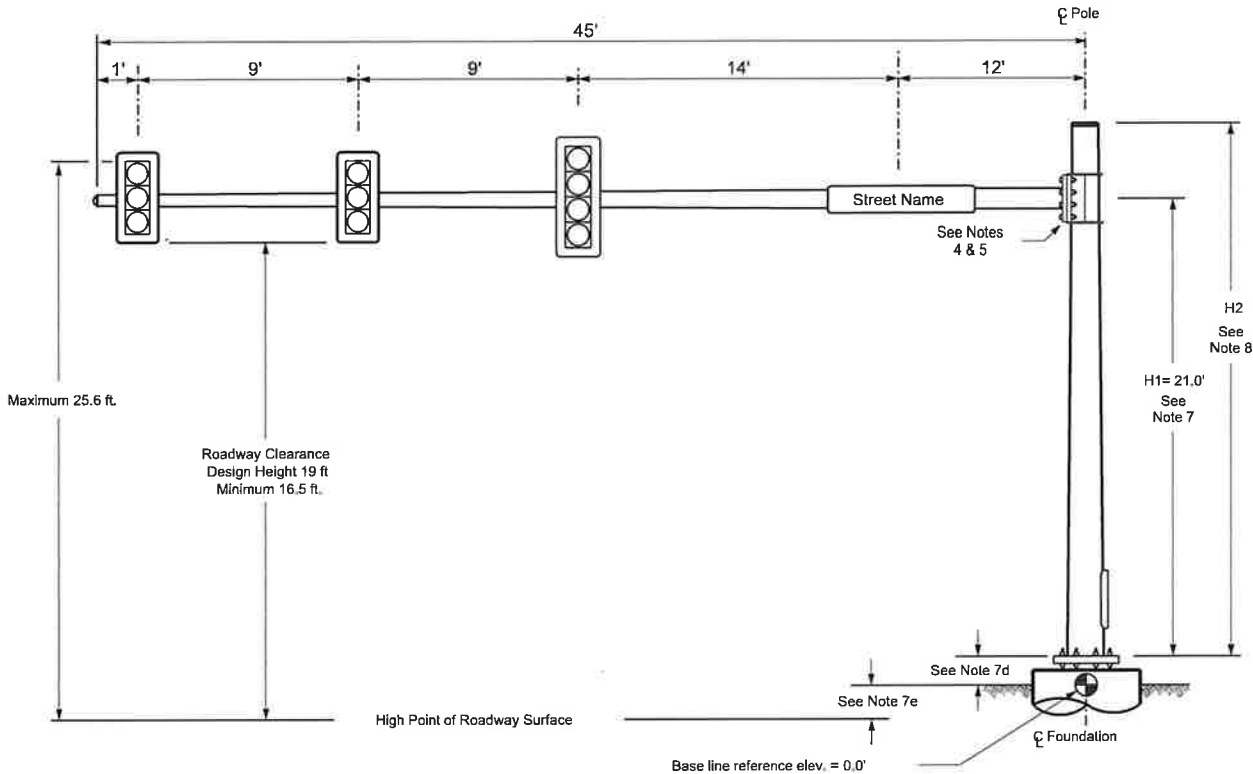
1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0769
DESIGNED: May 2026
SEALED: 7/29/2026
REVISED:

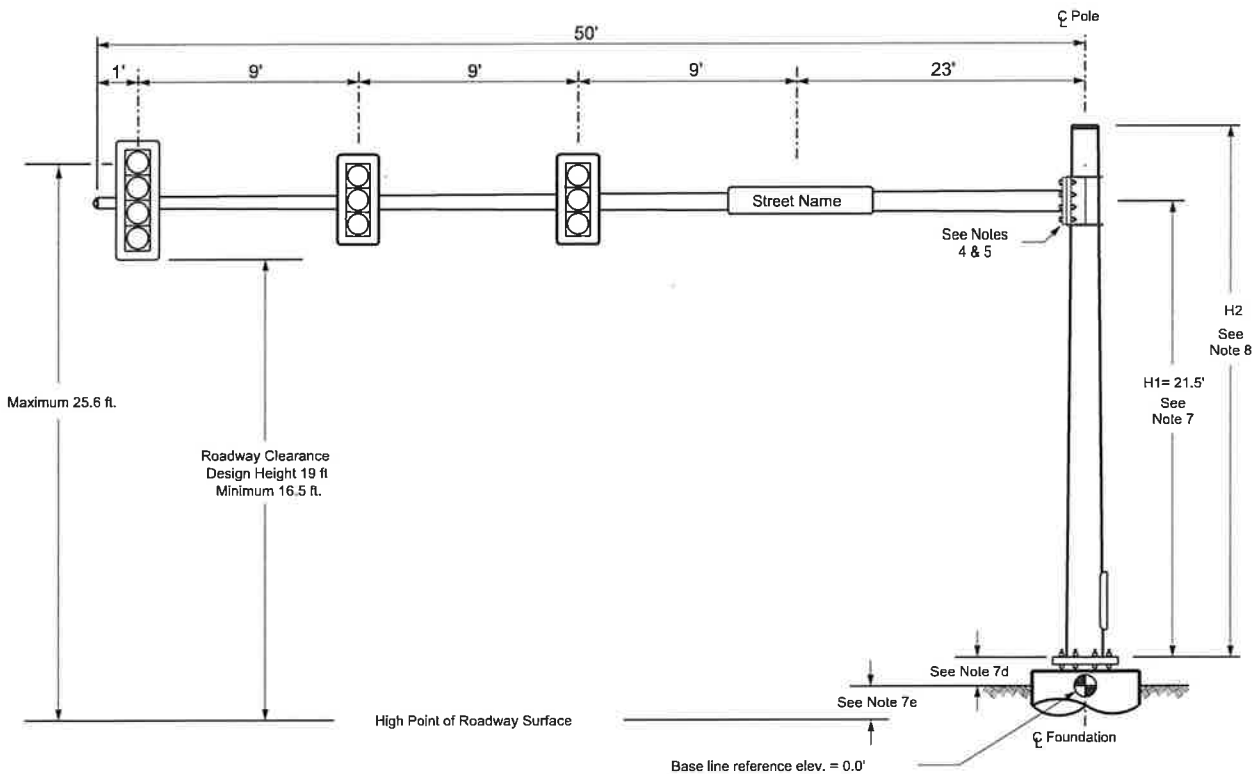
Electrical and Programming Details For: Prepared in the Office of:  Seal of the State of North Carolina 750 N. Greenfield Pkwy, Garner, NC 27529	US 158 (South Croatan Highway) at East Lakeside St. / West Lakeside St.	SEAL  Professional Engineer Seal State Seal 061379 J. Mike Craddock																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Division 01</td> <td style="width: 33%;">Date County</td> <td style="width: 34%;">Nags Head</td> </tr> <tr> <td>PLAN DATE: July 2026</td> <td colspan="2">REVIEWED BY: DJC</td> </tr> <tr> <td>PREPARED BY: N. Moser</td> <td colspan="2">REVIEWED BY:</td> </tr> <tr> <td colspan="3" style="text-align: center;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">REVISONS</th> <th style="width: 20%;">INT.</th> <th style="width: 20%;">DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> </td> </tr> </table>			Division 01	Date County	Nags Head	PLAN DATE: July 2026	REVIEWED BY: DJC		PREPARED BY: N. Moser	REVIEWED BY:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">REVISONS</th> <th style="width: 20%;">INT.</th> <th style="width: 20%;">DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			REVISONS	INT.	DATE			
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Backsigned by: <u><i>D. John Craddock</i></u> 07/30/2026 DATE SIG. INVENTORY NO. 01-0769																				

Design Loading for METAL POLE NO. 1



Elevation View

Design Loading for METAL POLE NO.2



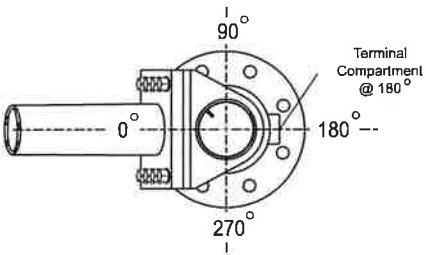
Elevation View

SPECIAL NOTE

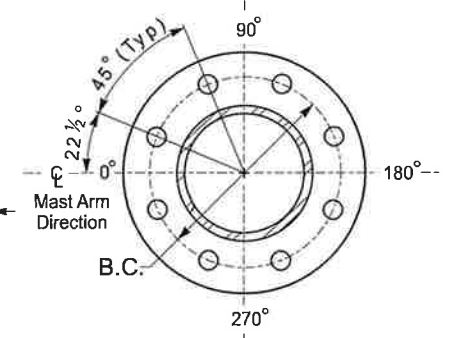
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	0.00 ft.	+0.50 ft.
Elevation difference at Edge of travelway or face of curb	-0.30 ft.	-0.22 ft.

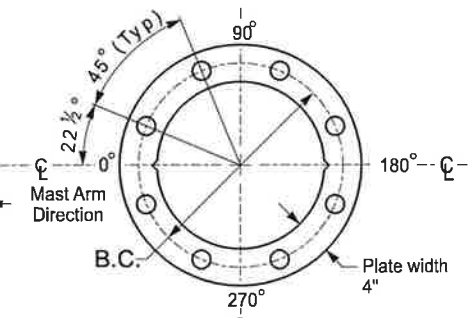


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE No. 1 and 2

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
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS

NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure 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 signal project special provisions.
 - The 2024 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>

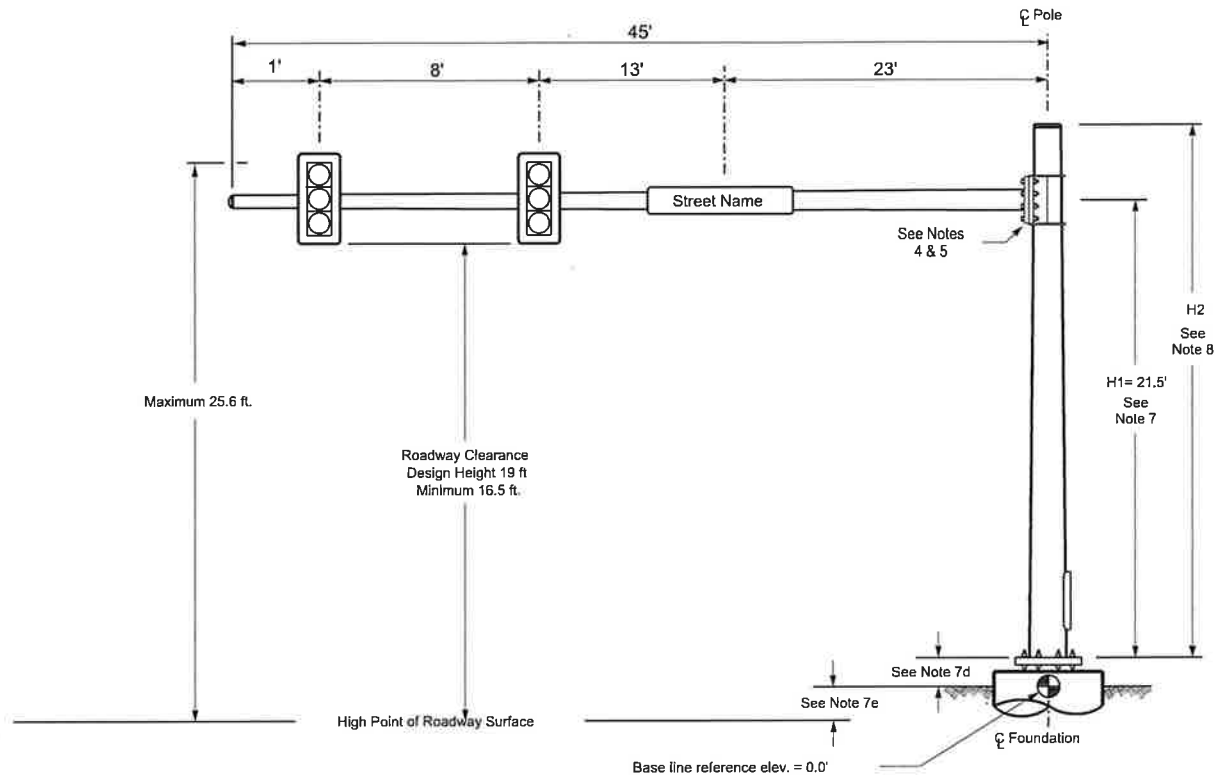
DESIGN REQUIREMENTS

- 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.
- Design all signal supports using force ratios that do not exceed 0.9.
- 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.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2 (140 mph)

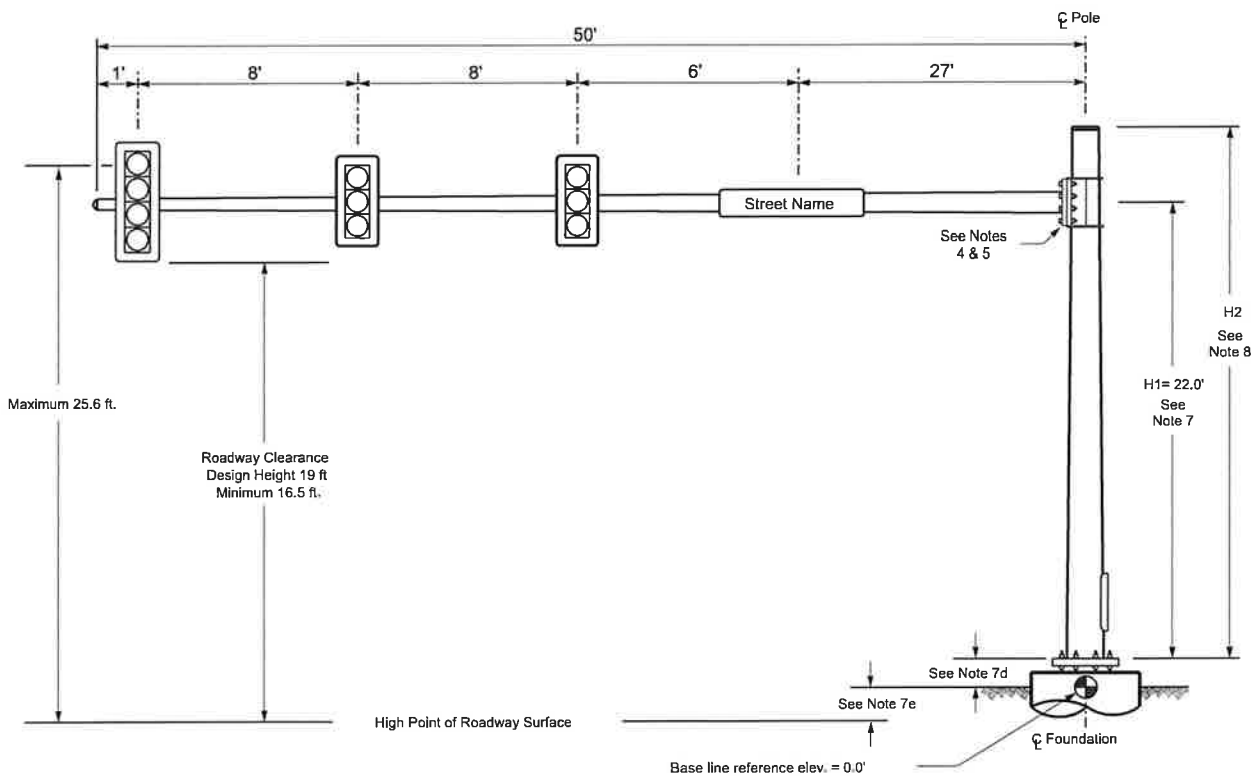
Prepared in the Office of: 750 N. Greenfield Pkwy, Garner, NC 27529	US 158 (South Croatan Highway) at East Lakeside St. / West Lakeside St. Division 01 PLAN DATE: May 2026 PREPARED BY: KGP, Jr. REVIEWED BY: ZML	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530 JERRY M. LITTLE Signed by: 08/07/2026 DATE SIG INVENTORY NO 01-0769
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Design Loading for METAL POLE NO. 3



Elevation View

Design Loading for METAL POLE NO. 4



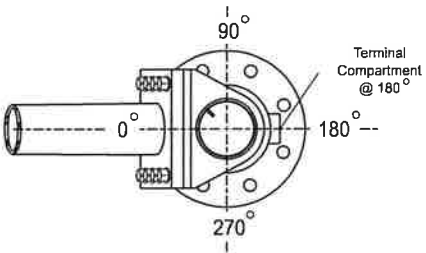
Elevation View

SPECIAL NOTE

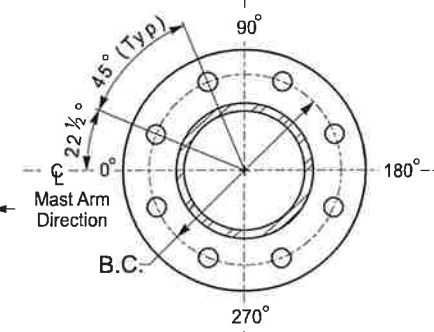
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Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 3	Pole 4
Baseline reference point at Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.20 ft.	+0.62 ft.
Elevation difference at Edge of travelway or face of curb	-0.13 ft.	-0.05 ft.

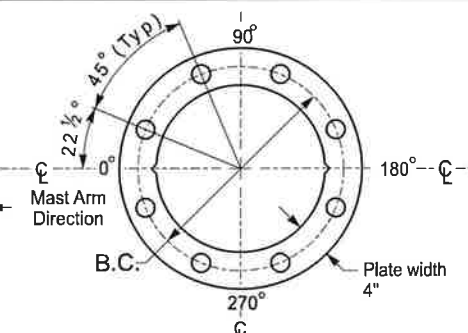


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE No. 3 and 4

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 1.5

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
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
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- 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.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
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 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
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- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2 (140 mph)

 Prepared in the Office of: Transportation Mobility and Safety Division Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	US 158 (South Croatian Highway) at East Lakeside St. / West Lakeside St.		 NORTH CAROLINA SEAL 030530 ENGINEER JACOBARY M. LITTLE
	Division 01 Date County Nags Head	Division 01 Date County Nags Head	
SCALE 0 N/A N/A	PREPARED BY: KGP, Jr. REVIEWED BY: ZMH	DATE May 2025	SIG INVENTORY NO. 01-0769