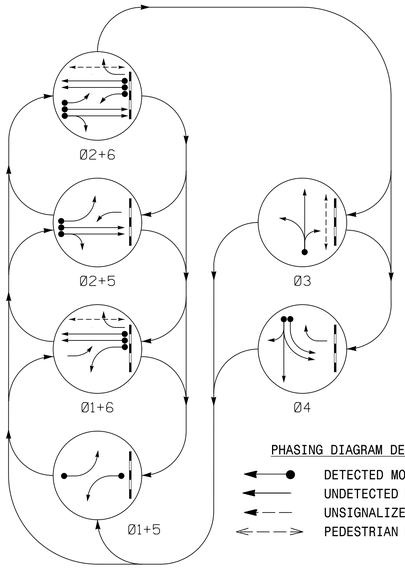
Docusign Envelope ID: BE8DFC57-5F2C-46C5-88C7-605D658A0FE3

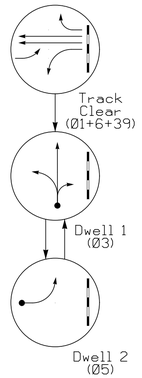
PROJECT REFERENCE NO.	SHEET NO.
U-5797	Sig. 18.0

6 Phase
Fully Actuated
w/ Railroad Preemption
Signal System #D06-18 Lumberton
NC 211 (N. Roberts Avenue)

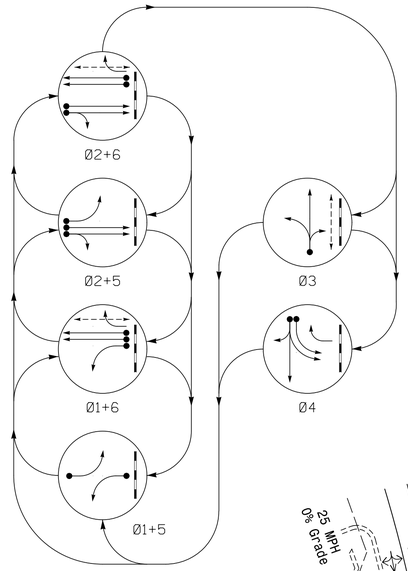
DEFAULT PHASING DIAGRAM



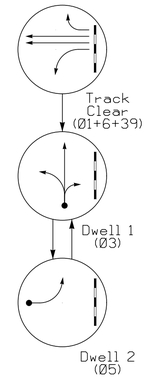
DEFAULT RAIL PREEMPT PHASES
(High Priority)



ALTERNATE PHASING DIAGRAM



ALTERNATE RAIL PREEMPT PHASES
(High Priority)



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT TABLE OF OPERATION

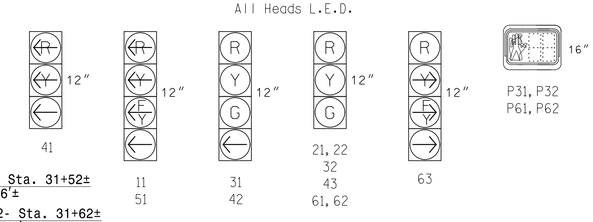
SIGNAL FACE	PHASE								
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	RRCLR	DWRRL1	DWRRL2	FLASH
11	—	—	F Y	F Y	R	R	—	R	R	R
21, 22	R	R	G	G	R	R	R	R	R	R
31	R	R	R	G	R	R	G	R	R	R
32	R	R	R	G	R	R	G	R	R	R
41	R	R	R	R	—	R	R	R	R	R
42	R	R	R	R	G	R	R	R	R	R
43	R	R	R	R	G	R	R	R	R	R
51	—	F Y	—	F Y	R	R	F Y	R	—	R
61, 62	R	G	R	G	R	R	G	R	R	R
63	R	F Y	R	F Y	R	→	F Y	R	R	R
P31, P32	DW	DW	DW	DW	W	DW	DW	DW	DW	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DW	DRK

ALTERNATE TABLE OF OPERATION

SIGNAL FACE	PHASE								
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	RRCLR	DWRRL1	DWRRL2	FLASH
11	—	—	R	R	R	R	—	R	R	R
21, 22	R	R	G	G	R	R	R	R	R	R
31	R	R	R	R	G	R	R	G	R	R
32	R	R	R	G	R	R	G	R	R	R
41	R	R	R	R	—	R	R	R	R	R
42	R	R	R	R	G	R	R	R	R	R
43	R	R	R	R	G	R	R	R	R	R
51	—	R	—	R	R	R	R	R	—	R
61, 62	R	G	R	G	R	R	G	R	R	R
63	R	F Y	R	F Y	R	→	F Y	R	R	R
P31, P32	DW	DW	DW	DW	W	DW	DW	DW	DW	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



NOTES

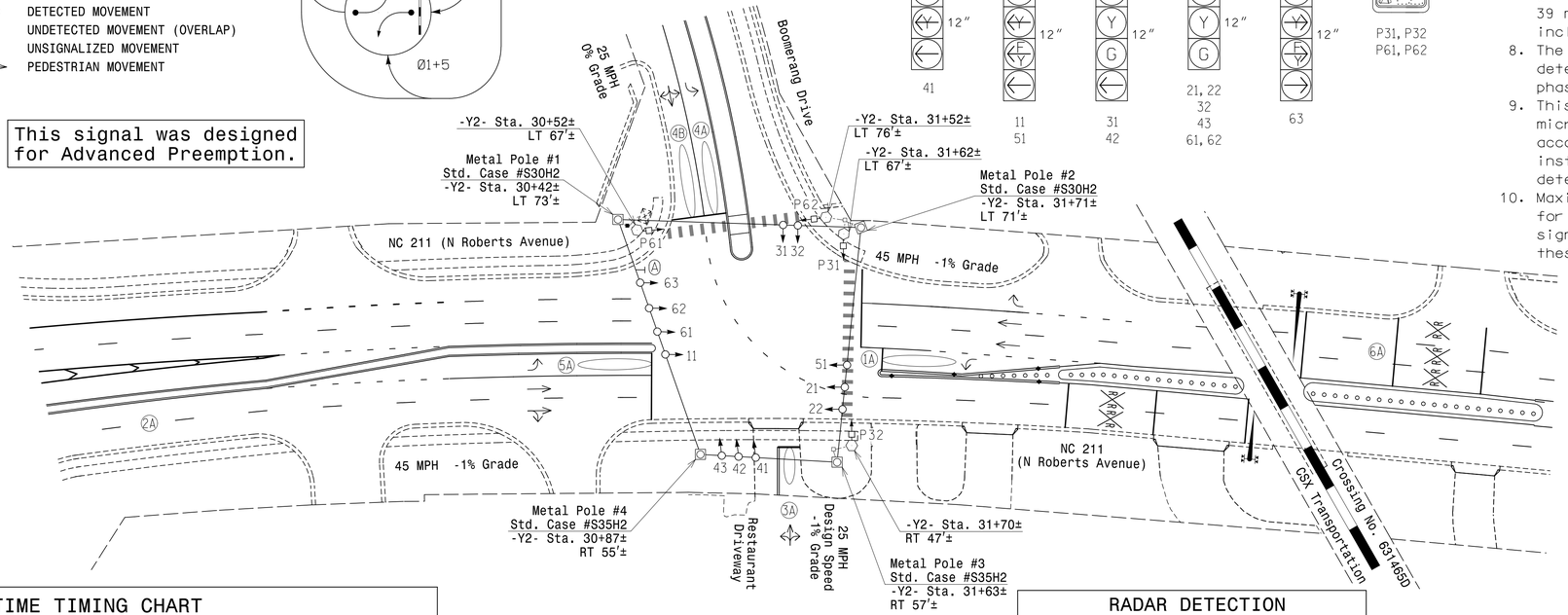
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Program phase 40 to run concurrently with all phases during normal operation. Phase 39 must be incompatible with phase 40 and included as a track clear phase.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

MAXTIME PREEMPTION CHART

FUNCTION	PRE 1
Type	RAIL ROAD
Exit Phases	2, 6
Delay	0.0
Max Presence	0
Enter Min Green	1
Enter Walk	1
Enter Ped Clear	4
Enter Yellow Change	4.6
Enter Red Clear	3.7
Track Green	37
Track Yellow Change	4.6
Track Red Clear	2.4
Dwell Green	7
Exit Min Green	255 *
Exit Yellow Change	25.5 *
Exit Red Clear	25.5 *
Call Extend Time	1.0
Exit Type	EXIT PHASES
Ped Clear Through Yellow	Y
Require All Red Entry	N

* Directs controller to use default phase timing.

This signal was designed for Advanced Preemption.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
DD	Directional Drill	N/A
	Out of Pavement Detector	
	Microwave Detection Zone	
N/A	Railroad Tracks	
N/A	Railroad Gate and Flasher	
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ

MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	39	40
Walk *	–	–	13	–	–	14		
Ped Clear *	–	–	22	–	–	17		
Min Green	7	12	7	7	7	12		
Passage *	2.0	2.0	2.0	2.0	2.0	2.0		
Max 1 *	15	90	20	20	15	90		
Yellow Change	3.0	4.6	3.2	3.2	3.0	4.6	4.6	4.6
Red Clear	2.4	1.8	3.3	3.7	3.4	1.8	2.4	3.7
Added Initial *	–	–	–	–	–	–		
Maximum Initial *	–	–	–	–	–	–		
Time Before Reduction *	–	–	–	–	–	–		
Time To Reduce *	–	–	–	–	–	–		
Minimum Gap	–	–	–	–	–	–		
Advance Walk	–	–	6	–	–	7		
Non Lock Detector	X	–	–	X	X	–		
Vehicle Recall	–	MIN RECALL	–	–	–	MIN RECALL		MIN RECALL
Dual Entry	–	–	–	–	–	–		

* 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.

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
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
1A	6X40	0	✳	✳	1	15**	-	X	-	X	-	✳
					6 #	-	-	X	-	X	-	✳
3A	6X20	0	✳	✳	3	5	-	X	-	X	-	✳
4A	6X40	0	✳	✳	4	-	-	X	-	X	-	✳
4B	6X40	0	✳	✳	4	5	-	X	-	X	-	✳
5A	6X40	0	✳	✳	5	15**	-	X	-	X	-	✳
					2 #	-	-	X	-	X	-	✳

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
\# Disable Phase Call for Loop During Alternate Phasing

RADAR DETECTION SYSTEM

FUNCTION	SENSOR 1 - (2A)	SENSOR 2 - (6A)
Channel	1	2
Phase	2	6
Direction of Travel	EB	WB
Detection Zone (ft)	500 – 100	500 –100
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	35 – 100
Enable Estimated Time of Arrival	Y	Y
Estimated Time of Arrival (sec)	2.5 – 6.5	2.5 – 6.5

Signal Upgrade - Final Design

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
(704) 372-1885
NC License Number F-0991

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

SCALE 0 40 1"=40'

NC 211 (N Roberts Avenue) at Boomerang Drive / Restaurant Driveway
Division 6 Robeson County Lumberton

PLAN DATE:	Feb 2025	REVIEWED BY:	H.M. Surti
PREPARED BY:	J.C. Grimm	REVIEWED BY:	T.M. Moody

REVISIONS | INIT. | DATE

DocuSigned by: Trent Moody 03/19/2025
ENGINEER'S SIGNATURE | DATE

SIG. INVENTORY NO. 06-1387

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

2/21/2025
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Leonard, R