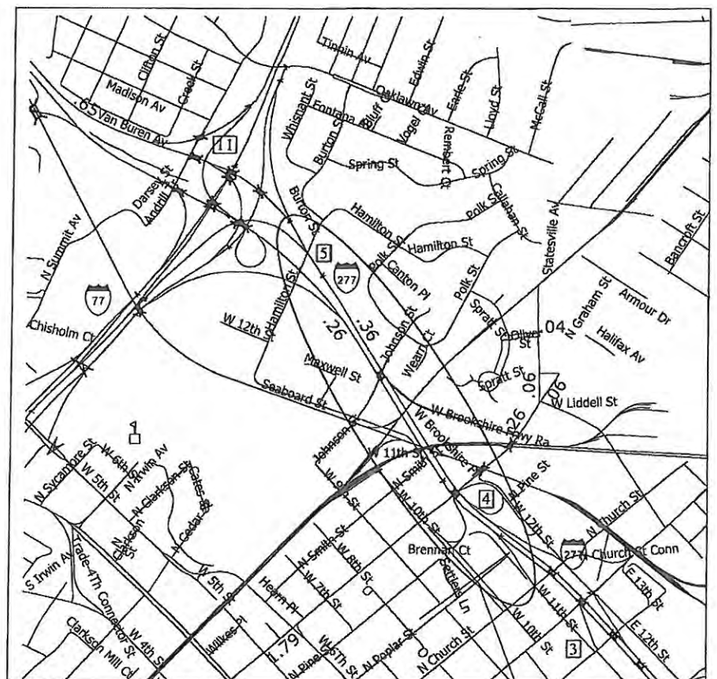
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

MECKLENBURG *COUNTY*



VICINITY MAP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND PHASING
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES AND LOCAL NOTES)
TMP-2 & 2A	I-277 LANE CLOSURE DETAIL

SHEET NO.
TMP-1

SS4910-AR

TIP PROJECT:

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

J. S. BOURNE, P.E. — *STATE TRAFFIC MANAGEMENT ENGINEER*
G.L. GETTIER, P.E. — *TRAFFIC CONTROL PROJECT ENGINEER*
J. W. WOOLARD, P.E. — *TRAFFIC CONTROL PROJECT DESIGN ENGINEER*
_____ — *TRAFFIC CONTROL DESIGN ENGINEER*

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

APPROVED: _____
DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD, JR.

06-DEC-2011 10:51
\\DOT\DFSROOT01\GROUPS-WZTCCC\TMU\WZTC\DesignGroup3\Squad3A\SS4910-AR (43313.1)\SS4910-AR_TC_TMP_TMP-1.dgn
jwoolard AT TE244T40

PROJ. REFERENCE NO.	SHEET NO.
SS4910-AR	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANAUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPS
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - (PERMANENT AND TEMPORARY)

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL
- USER DEFINED (IF NEEDED)
- USER DEFINED (IF NEEDED)

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM — SKINNY DRUM — TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY (TEMP)

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

PHASING

STEP 1 - INSTALL ADVANCE WARNING SIGNS AS SHOWN IN ROADWAY STANDARD DRAWING NO. 1101.01.

STEP 2 - CLOSE THE TWO (2) OUTSIDE LANES OF WEST-BOUND I-277 AS SHOWN ON SHEETS TMP-2 AND TMP-2A. MILL THE EXISTING SKIP LINE BETWEEN THE TWO (2) OUTSIDE LANES AND REPLACE WITH THE 12" WIDE DOTTED WHITE LANE LINE AS SHOWN IN THE FINAL PAVEMENT MARKING PLANS. INSTALL THE PAVEMENT DETECTION DEVICES AS SHOWN IN THE CONSTRUCTION PLANS.

USING ROADWAY STANDARD DRAWING NO. 1101.02 (SHEET 4 OF 15)AS NECESSARY, INSTALL SIGN NO. 1 AND SIGN NO. 2 AS SHOWN IN THE FINAL PAVEMENT MARKING PLAN.

STEP 3 - USING ROADWAY STANDARD DRAWING NO. 1101.02 (SHEET 13 OF 15), INSTALL 12" WIDE SOLID LANE LINE AS SHOWN IN THE FINAL PAVEMENT MARKING PLAN.

STEP 4 - REMOVE ALL TRAFFIC CONTROL DEVICES AND SIGNS AND OPEN ALL LANES TO TRAFFIC.

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD, JR.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS, LEGEND, AND PHASING

06-DEC-2011\\\09
\\DOT\OPSROOT\GROUPS-WZTCCC\TMU\WZTC\DesignGroup3\Squad3A\SS4910-AR (433)3JJ\SS4910-AR_TC_TMP_TMP-1A.dgn
jwoolard AT TE244T40

GENERAL NOTES / LOCAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
1 LANE OF I-277	MONDAY THROUGH FRIDAY 6:00 A.M. TO 9:00 P.M. SATURDAY 10:00 A.M. TO SUNDAY 9:00 P.M.
2 LANES OF I-277	MONDAY THROUGH FRIDAY 6:00 A.M. TO 11:00 P.M. SATURDAY 10:00 A.M. TO SUNDAY 11:00 P.M.

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME

I-277

HOLIDAY

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.

2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 6:00 A.M. DECEMBER 31st TO 11:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 11:00 P.M. THE FOLLOWING TUESDAY.

3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 11:00 P.M. MONDAY.

4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 11:00 P.M. TUESDAY.

5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 11:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 11:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 11:00 P.M. TUESDAY.

7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 11:00 P.M. MONDAY.

8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 11:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

9. FOR NASCAR AND NHRA EVENTS AT CHARLOTTE MOTOR SPEEDWAY, BETWEEN THE HOURS OF 6:00 A.M. THE WEDNESDAY BEFORE THE EVENT AND 11:00 P.M. THE MONDAY AFTER THE EVENT.

   FOR ANY EVENT OCCURRING AT BANK OF AMERICA STADIUM IN CHARLOTTE 3 HOURS BEFORE THE START OF THE EVENT AND 3 HOURS AFTER THE END OF THE EVENT.

LANE AND SHOULDER CLOSURE REQUIREMENTS

C) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

   WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

G) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

H) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

I) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

J) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

K) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MANAGEMENT STRATEGIES

USE DAY AND TIME AS WELL AS HOLIDAY LANE CLOSURE TIME RESTRICTIONS TO MAINTAIN MOBILITY THROUGH THE PROJECT. CONSTRUCTION WILL REQUIRE TWO-LANE LANE CLOSURES USING ROADWAY STANDARD DRAWINGS AS WELL AS A MOVING OPERTION TO PLACE PAVEMENT MARKINGS.

APPROVED:_____ DATE:_____

SEAL

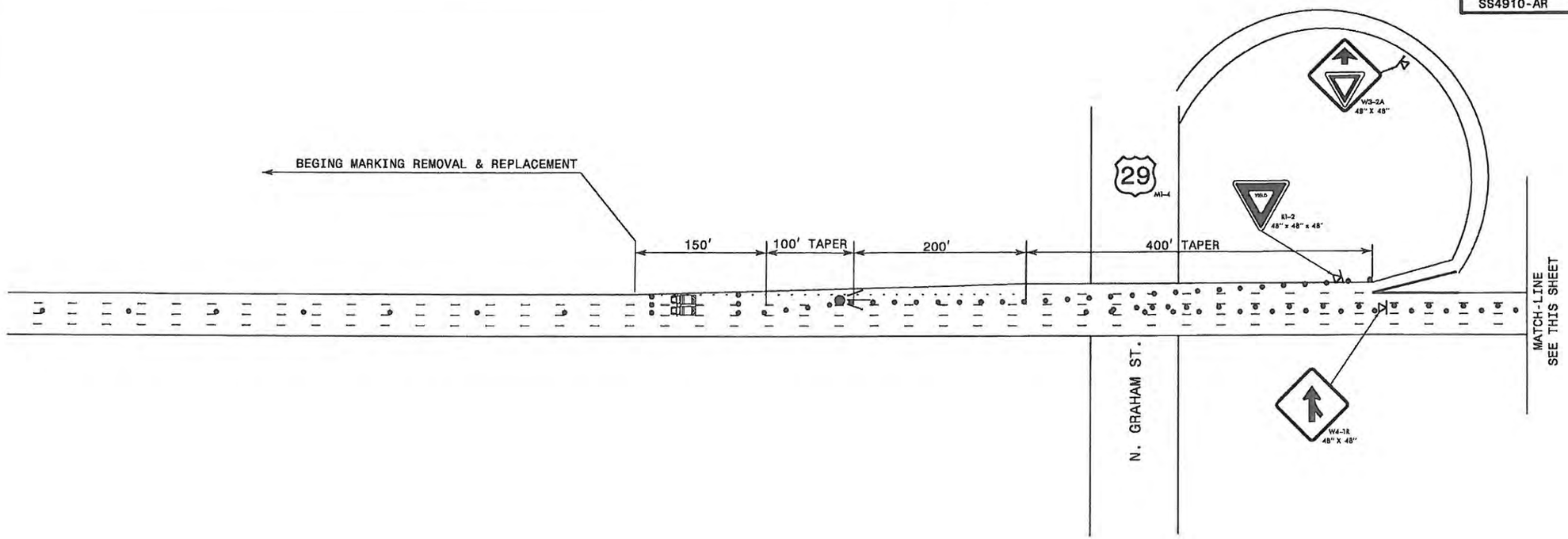
NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER W. WOOLARD JR.

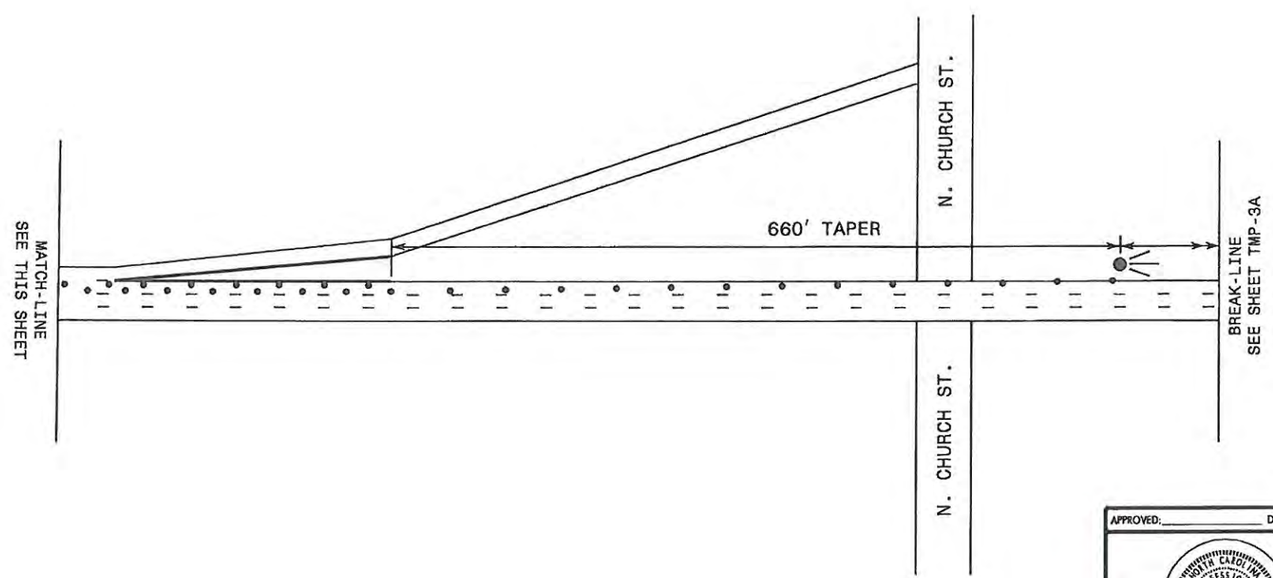
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

06-DEC-2011 15:10
\\DOT\GPSROOTO\GROUPS-WZTCCC\TMU\WZTC\DesignGroup3\Squad3A\SS4910-AR (43313.1)\SS4910-AR_TC_TMP_TMP-1B.dgn
lwoolard AT TE244740

PROJ. REFERENCE NO.	SHEET NO.
SS4910-AR	TMP-2





- FLASHING ARROW PANEL

- TRUCK MOUNTED ATTENUATOR

APPROVED: _____ DATE: _____

SEAL

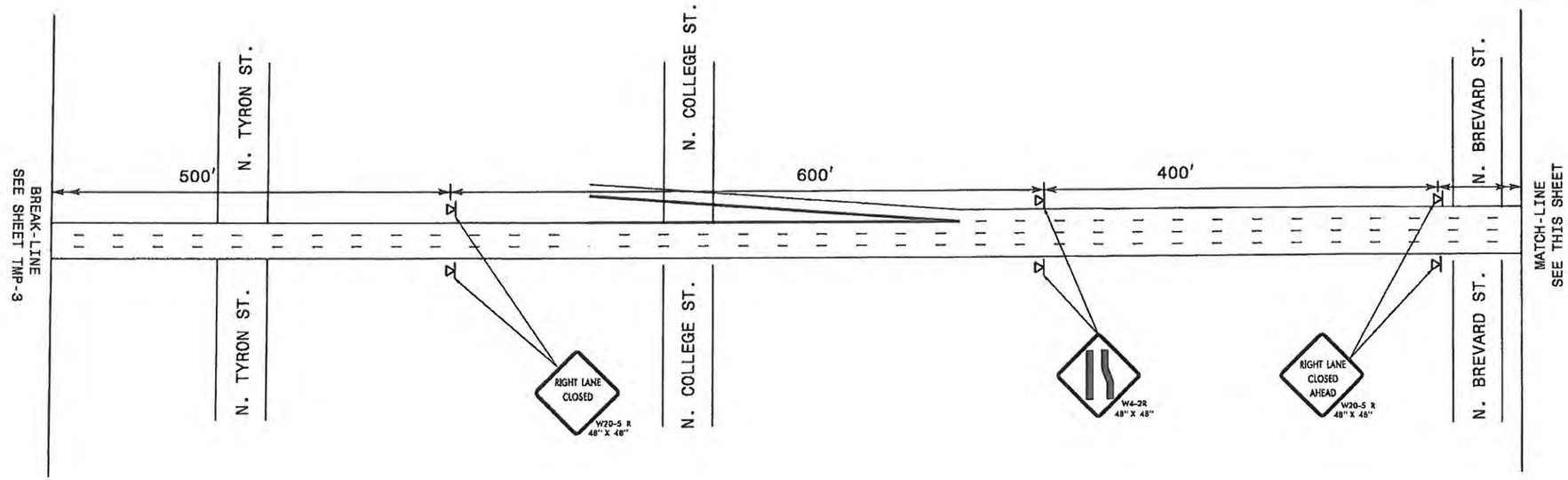
NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD, JR.

DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • WORK ZONE TRAFFIC CONTROL

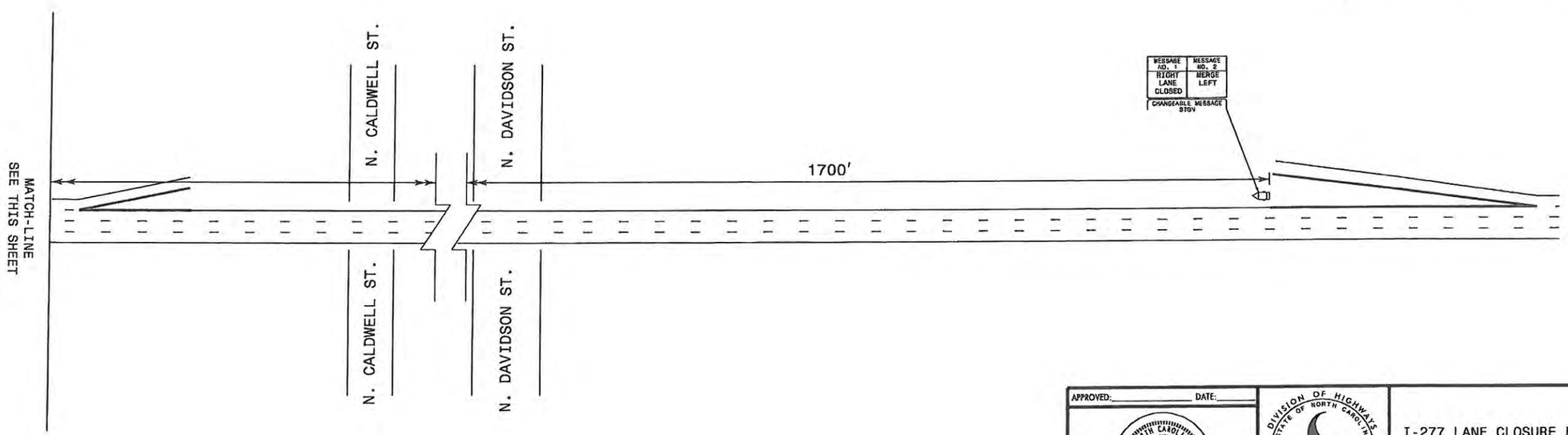
I-277 LANE CLOSURE FOR PAVEMENT MARKING REMOVAL AND REPLACEMENT

06-DEC-2011 11:11
\\DOT\DFSROOT01\GROUPS-WZTCCC\TMU\WZTC\DesignGroup3\Squad3A\SS4910-AR (43313.1)\SS4910-AR_TC_TMP_TMP-2&2A.dgn
jwoolard AT TE244740

PROJ. REFERENCE NO.	SHEET NO.
SS4910-AR	TMP-2A



- CHANGEABLE MESSAGE SIGN



APPROVED: _____ DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOODLAND, JR.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

I-277 LANE CLOSURE FOR PAVEMENT MARKING REMOVAL AND REPLACEMENT

05-DEC-2011 13
\\ROOT\DESIGN\STATION GROUPS-WZTCCC\TMU\WZTC\DesignGroup3\Squad3A\SS4910-AR (43313.1.1)\SS4910-AR_TC_TMP_TMP-2&2A.dgn
Woodard AT TE2447140

BROOKSHIRE FREEWAY EXIT 5

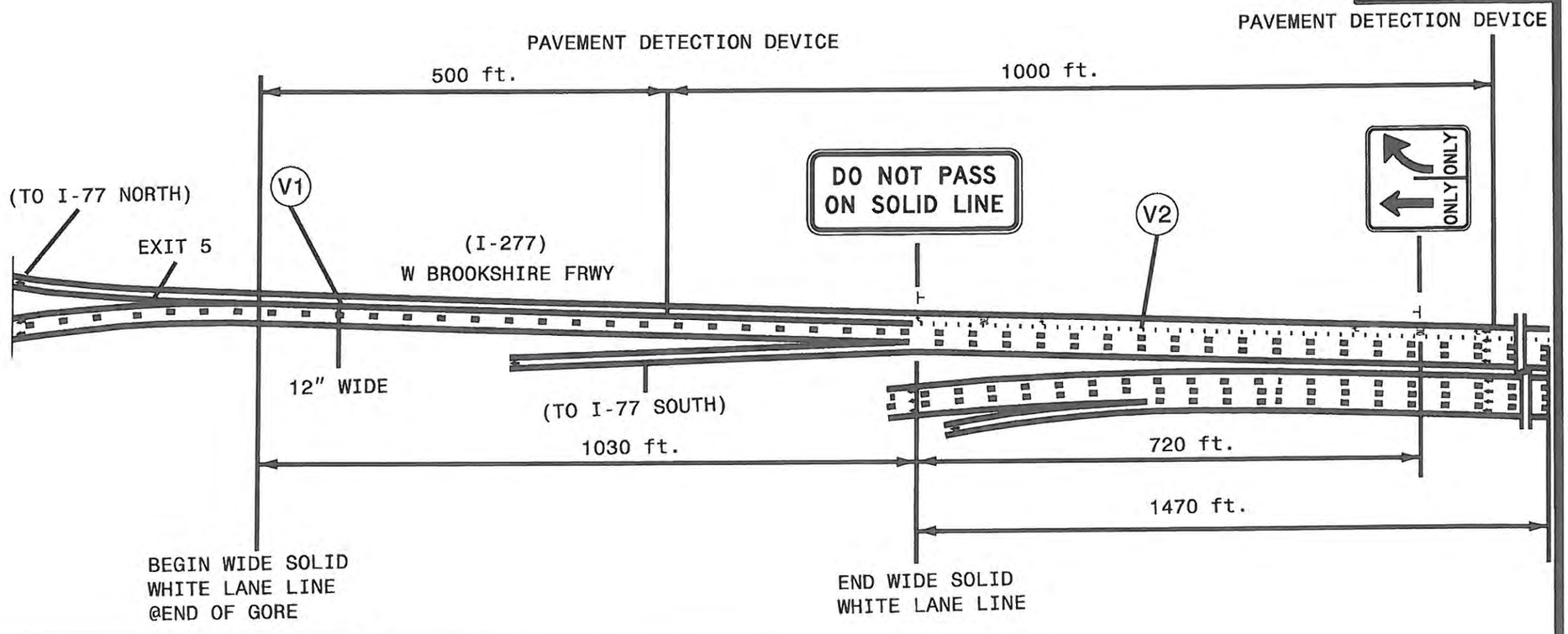
PMP-11

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

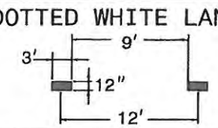


EXISTING MARKINGS

PROPOSED MARKINGS

TRAFFIC FLOW

WIDE DOTTED WHITE LANE LINE



PM MATERIAL: POLYUREA WITH HIGHLY REFLECTIVE ELEMENTS

SYMBOL	DESCRIPTION	TOTAL
V1	12" WIDE SOLID WHITE LANE LINE	1430 ft
V2	12" WIDE DOTTED WHITE LANE LINE	370 ft
	PAVEMENT MARKING REMOVAL (10ft WHITE SKIPS 6")	650 ft
HEATED -IN PLACED THERMOPLASTIC (90 MIL)		
UB	RIGHT TURN ARROW	4 ea
UI	ALPHANUMERIC CHARACTER	8 ea

NOTE:

-SEE ATTACHED SHEETS FOR SIGN DESIGNS.

-SPACING BETWEEN PAVEMENT MARKING ARROWS AND CHARACTERS IS 75'.

-SPACING BETWEEN SETS OF SYMBOLS IS 450'.

BROOKSHIRE FREEWAY

PMP-2

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

SIGN NUMBER: name
TYPE: D
QUANTITY: 1

SIGN WIDTH: 8'-0"
HEIGHT: 3'-0"
TOTAL AREA: 24.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0.63"
WIDTH: 0.88"
RADII: 2.25"

NO. Z BARS: 2
LENGTH: 88

BACKG COLOR: White
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM

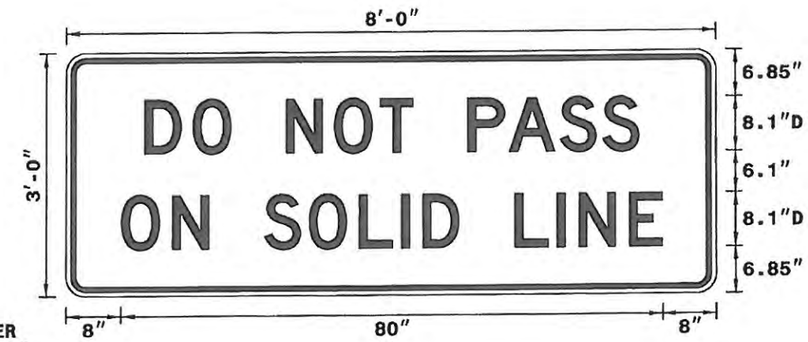
USE NOTES: 1,2

1. Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.

DESIGN BY: cwj
PROJECT ID: SS-4910

CHECKED BY:
DIV: 10

DATE: Oct 05, 2011



BORDER
R=2.25"
TH=0.88"
IN=0.63"

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																												Series/Size Text Length
		D	O		N	O	T		P	A	S	S																D 2000
	11.4	7.1	5.7	8.1	7.2	6.8	5	8.1	6	7.5	6.3	5.5	11.4															73.1
		O	N		S	O	L	I	D		L	I	N	E														D 2000
	8	7.5	5.5	8.1	6.7	7.5	6.2	3.2	5.5	8.1	6.2	3.2	7.4	5	8													80

FILENAME: SS4910 SOGNS

NORTH CAROLINA D.O.T. SIGN DETAIL

SS4910-AR	Sign 2

APPROVED: _____

DATE: _____

SEAL

SIGN NUMBER: name
TYPE: E
QUANTITY: 1
SIGN WIDTH: 4'-0"
HEIGHT: 4'-0"
TOTAL AREA: 16.0 Sq.Ft.
BORDER TYPE: FLUSH
RECESS: 0.75"
WIDTH: 1.25"
RADII: 3"
NO. Z BARS:
LENGTH:

BACKG COLOR: Green
COPY COLOR: White

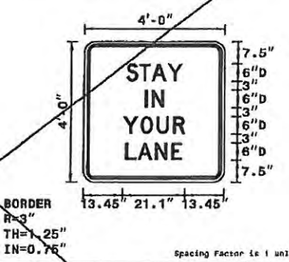
SYMBOL	X	Y	WID	HT

MAT'L: 0.063" (1.6 mm) ALUMINUM
0.080" (2.0 mm) ALUMINUM
0.125" (3.2 mm) ALUMINUM

DESIGN BY: WJ
PROJECT ID: BS 4910
CHECKED BY:
DIV: 10
DATE: Oct 04, 2011

USE NOTES: 1,2

Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
Background shall be Grade C reflective sheeting.



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

							Series/Size Text Length
	S	T	A	Y			D 2000
14.4	4.8	4.1	8.8	8.2	14.4		19.3
	E	N					D 2000
20.8	2.4	4.1	20.8				8.5
	Y	O	U	R			D 2000
13.4	3.8	5.6	3.5	4.1	13.4		21.1
	L	A	N	E			D 2000
14.3	4.1	6	3.5	3.7	14.3		19.3

FILENAME: SS4910 SIGN3

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER: name
TYPE: E
QUANTITY: 1
SIGN WIDTH: 4'-0"
HEIGHT: 4'-0"
TOTAL AREA: 16.0 Sq.Ft.
BORDER TYPE: RECESS
RECESS: 0.75"
WIDTH: 1.25"
RADII: 3"
NO. Z BARS:
LENGTH:

BACKG COLOR: White
COPY COLOR: Black

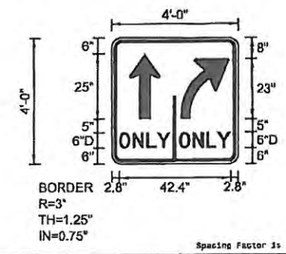
SYMBOL	X	Y	WID	HT
M5-1	5.7	17	11.9	23
ARROW1	26.2	17	16.5	23

MAT'L: 0.125" (3.2 mm) ALUMINUM

DESIGN BY: WJ
PROJECT ID: BS 4910
CHECKED BY:
DIV: 10
DATE: Oct 04, 2011

USE NOTES: 1,2

1. Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

							Series/Size Text Length
	O	N	L	Y			D 2000
2.8	5.2	5.2	4	5.2	26.6		19.6
	O	N	L	Y			D 2000
26.6	5.2	5.2	4	5.2	2.8		19.6

FILENAME: Regulatory

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN DESIGNS

SS4910-AR	Sign 1

APPROVED: _____

DATE: _____

SEAL

SIGN NUMBER: name
TYPE: A
QUANTITY: 1

SIGN WIDTH: 10'-0"
HEIGHT: 6'-6"
TOTAL AREA: 65.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0.5"
WIDTH: 0.75"
RADII: 1.38"

NO. Z BARS: 2
LENGTH: 112.0

BACKG COLOR: Yellow/Black
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM

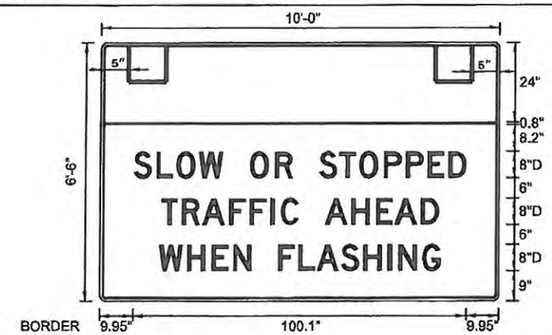
DESIGN BY: none
PROJECT ID: ID

CHECKED BY:
DIV: DIV

DATE: May 08, 2012

USE NOTES: 1,2

1. Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

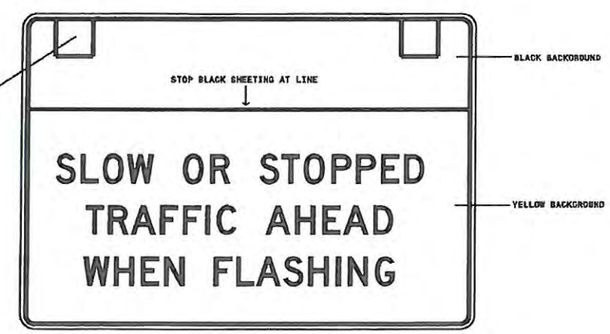
Letter spacings are to start of next letter

																												Series/Size Text Length
		S	L	O	W		O	R		S	T	O	P	P	E	D												D 2000
	10	6.8	6	6.7	7.1	6	7.4	5.4	8	6.1	6	7.4	6.6	6.6	6.3	5.4	10											100.1
		T	R	A	F	F	I	C		A	H	E	A	D														D 2000
	10.3	6.2	6.1	6	6.2	6.2	3	5.4	8	8	7.4	5.6	8	5.4	10.3													83.4
		W	H	E	N		F	L	A	S	H	I	N	G														D 2000
	17.8	8.3	7.4	6.3	5.4	8	6.2	5.4	7.4	6.8	7.4	3.2	7.2	5.4	17.8													84.5

FILENAME: Div 10 spot safety warning lights2

NORTH CAROLINA D.O.T. SIGN DETAIL

Cut-Out For Traffic Signal
To Be 15.0" x 15.0"



SIGN DESIGNS

55491O-AB	Sign 3

APPROVED: _____

DATE: _____

SEAL

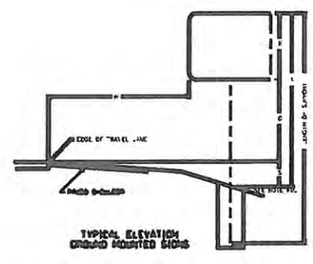
	SIGN NO.	SIGN TYPE	SIGN SIZE (in.) w x h	ROADWAY STATION	NO. OF SUP.	BEAM SECTION	SUPPORT TYPE BA or S	ATTACH METHOD	MOUNTING METHOD	HORIZ CLR. (ft.)	LENGTH (ft) SNS HT H	MTG HT C	EMBED-MENT	LEFT SUPPORT (ft) S	L	TOTAL LENGTH	CENTER SUPPORT (ft) S	L	TOTAL LENGTH	RIGHT SUPPORT (ft) S	L	TOTAL LENGTH	FOOTING DIAMETER (ft.)	FOOTING DEPTH (ft.)	B/A SUPPORT WEIGHTS (lbs.)	SIMPLE SUPPORT WEIGHTS (lbs.)	REINF. FTGS. (c.y.)	PLAIN FTGS. (c.y.)	FIELD VERIFIED SEE NOTE 2 (mm/dd/yy)
Sign 1	101	A	120 X78	_____	2	W6x16	BA	N/A	N/A	18.00	6.50	7.00	4.5	4.80	18.30	22.80	0.00	0.00	0.00	6.20	19.70	24.20	1.5	5	884.38	0.00	0.65	0.00	
Sign 2	102	A	120 X78	_____	2	W6x16	BA	N/A	N/A	10.00	6.50	7.00	5	6.80	####	25.30	0.00	0.00	0.00	8.20	21.70	26.70	1.5	5.5	964.38	0.00	0.72	0.00	
																									TOTAL 1848.76	TOTAL 0.00	TOTAL 1.37	TOTAL 0.00	
					USE:																				1849	0	2	0	

NOTES

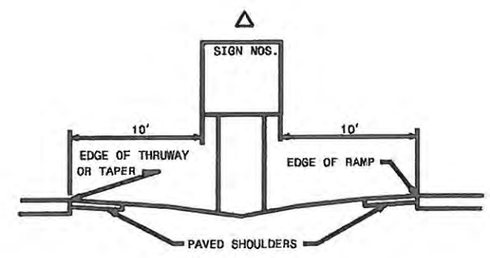
1. DIMENSION "S" REPRESENTS AN INCREASE (+), OR A DECREASE (-) IN POLE LENGTH, RELATIVE TO THE ELEVATION OF THE EDGE OF PAVEMENT.

2. FIELD VERIFICATIONS SHALL BE REQUIRED FOR ALL SUPPORTS, SEE (*) ARTICLE 903-3. FABRICATORS SHALL BE AISC CERTIFIED IN CATEGORY 1, SEE (*) ARTICLE 1072-1. (*) = N.C.D.O.T. STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES

3. PLAN LOCATIONS FOR EXISTING UTILITIES ARE BASED ON THE BEST AVAILABLE INFORMATION AND, THEREFORE MAY NOT BE PRECISELY ACCURATE. THEREFORE, IT IS INCUMBENT UPON THE CONTRACTOR TO DETERMINE THE EXACT LOCATION OF UTILITIES BEFORE BEGINNING WORK IN A LOCATION.

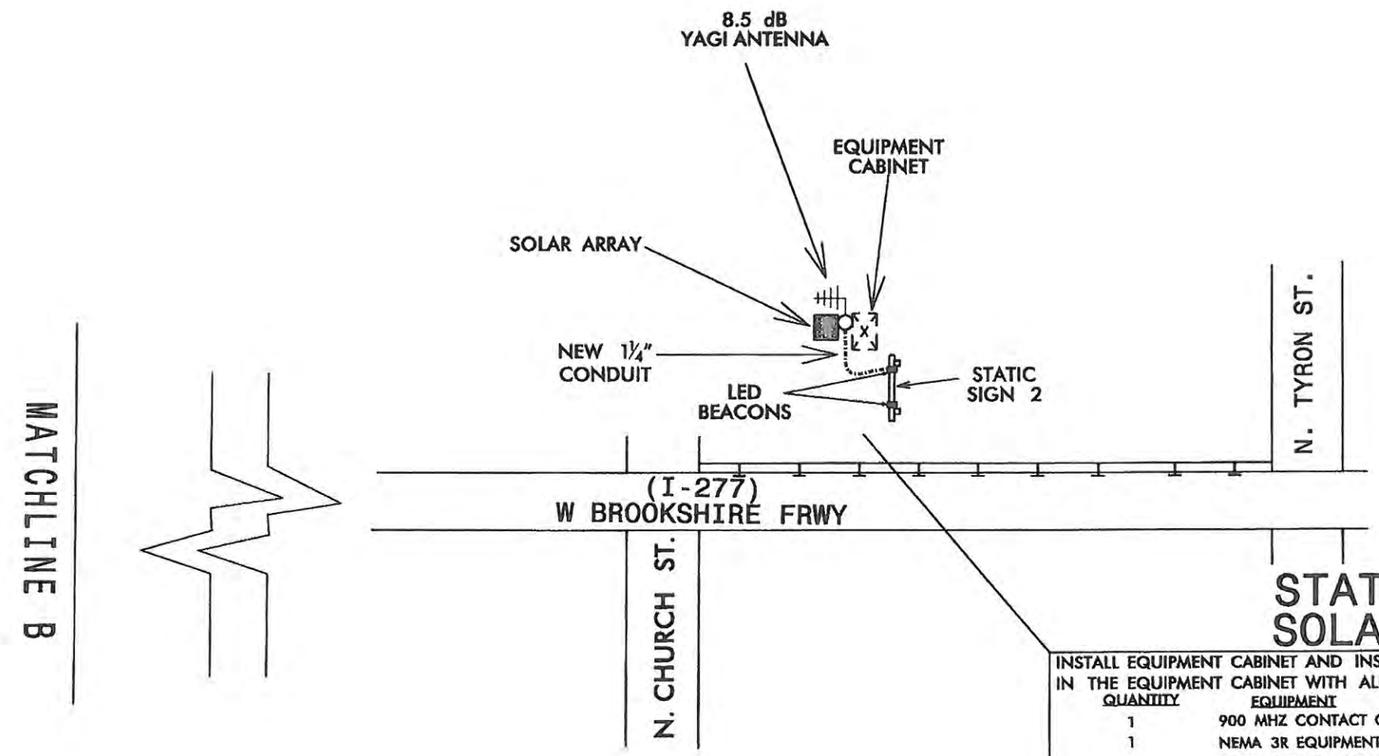


TYPICAL ELEVATION
GROUND MOUNTED SIGNS



TYPE "A" AND TYPE "B" GROUND MOUNTED SIGNS

PROJECT REFERENCE NO.	SHEET NO.
SS-4910AR	ITS. 5



STATIC SIGN 2
SOLAR POWERED

INSTALL EQUIPMENT CABINET AND INSTALL THE FOLLOWING ITEMS IN THE EQUIPMENT CABINET WITH ALL ASSOCIATED HARDWARE:

QUANTITY	EQUIPMENT
1	900 MHZ CONTACT CLOSURE RADIO WITH 8.5 dB YAGI ANTENNA
1	NEMA 3R EQUIPMENT CABINET
1	SOLAR POWER ASSEMBLY
1	DC FLASHER EQUIPMENT
1	1½ INCH RISER WITH WEATHERHEAD FOR COAXIAL CABLE
1	1½ INCH RISER WITH WEATHERHEAD FOR HYBRID POWER AND SERIAL COMMUNICATIONS CABLE
1	WOOD POLE (CLASS 4, 40')
2	DC FLASHING BEACONS
15'	1¼ INCH CONDUIT

STATIC SIGN 2 LOCATION

1) REFERENCE PAVEMENT MANAGEMENT PLANS (PMP2-2A) FOR LOCATION OF SIGN STRUCTURES.
2) MARK THE WOOD POLE LOCATION AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO INSTALLING. LOCATE WOOD POLE SO AS NOT TO OBSTRUCT VIEWING OF THE SIGN.
3) MOUNT THE EQUIPMENT CABINET ON THE WOOD POLE. ENSURE THE CENTER OF THE CABINET IS 4 FEET ABOVE GRADE AND DOES NOT OBSTRUCT VIEWING OF THE SIGN.
4) AT STATIC SIGN 2 LOCATION, MOUNT THE SOLAR ARRAY ON THE WOOD POLE A MINIMUM OF 25 FEET ABOVE GRADE. MOUNT THE SOLAR ARRAY FOR OPTIMAL SUNLIGHT EXPOSURE.
5) MOUNT AND ALIGN THE ANTENNA FOR MAXIMUM SIGNAL STRENGTH.
6) USE STAINLESS STEEL MOUNTING HARDWARE TO SECURE THE SOLAR ARRAY, ANTENNA, AND EQUIPMENT CABINET TO THE STRUCTURE.

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

WEST BROOKSHIRE FREEWAY
QUEUE DETECTION SYSTEM
FROM TRYON STEET
TO I-77

DIVISION 10 MECKLENBURG CO. CHARLOTTE

PLAN DATE: APRIL 2012 REVIEWED BY: I. NEIL AVERY
PREPARED BY: HEIDI T BERGGREN REVIEWED BY: G. A. FULLER, PE

SCALE: 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
SIGNATURE 4/10/12 DATE
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
SS-4910AR	ITS. 1

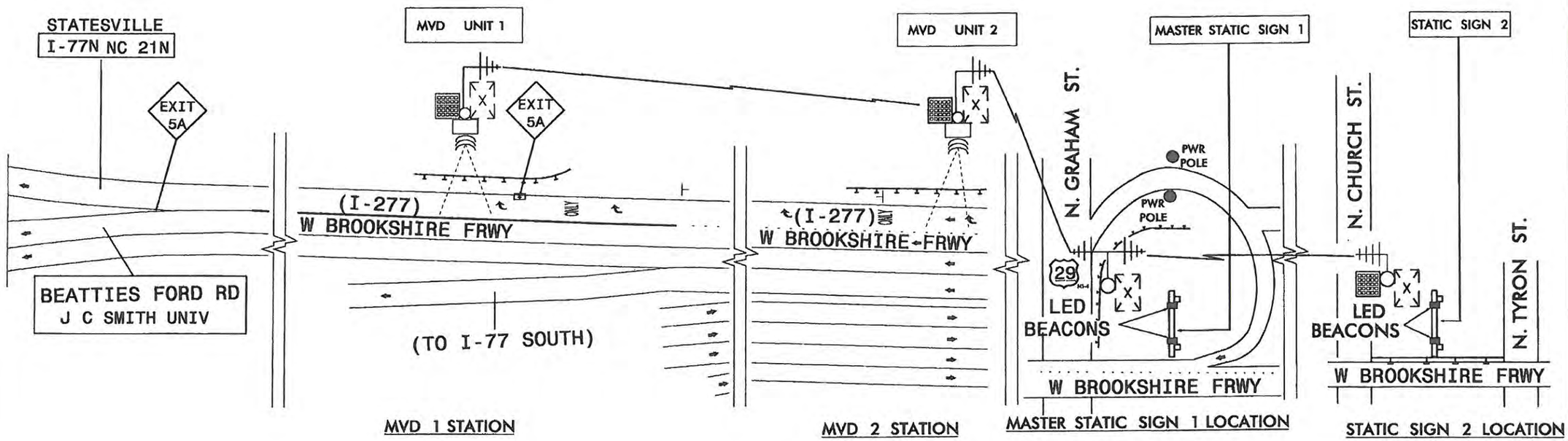
SYSTEM OVERVIEW

WHEN MVD UNIT 1 DETECTS THAT THE AVERAGE VEHICLE SPEED IS BETWEEN 0 TO 20 MPH:
SIGN #1 FLASHING BEACONS WILL BECOME ACTIVATED IN A BOUNCING BALL PATTERN TO NOTIFY MOTORISTS WITH THE FOLLOWING STATIC SIGN DISPLAY:

SLOW OR STOPPED
TRAFFIC
AHEAD

WHEN MVD UNIT 2 DETECTS THAT THE AVERAGE VEHICLE SPEED IS BETWEEN 0 TO 20 MPH:
SIGN #1 FLASHING BEACONS WILL BECOME ACTIVATED IN A BOUNCING BALL PATTERN
AND
SIGN #2 FLASHING BEACONS WILL BE ACTIVATED IN A BOUNCING BALL PATTERN TO NOTIFY MOTORISTS WITH THE FOLLOWING STATIC SIGN DISPLAY:

SLOW OR STOPPED
TRAFFIC
AHEAD



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

SCALE 0

WEST BROOKSHIRE FREEWAY
QUEUE DETECTION SYSTEM
SYSTEM OVERVIEW

DIVISION 10 MECKLENBURG CO. CHARLOTTE

PLAN DATE:	APRIL 2012	REVIEWED BY:	I. NEIL AVERY
PREPARED BY:	HEIDI T BERGGREN	REVIEWED BY:	G. A. FULLER, PE

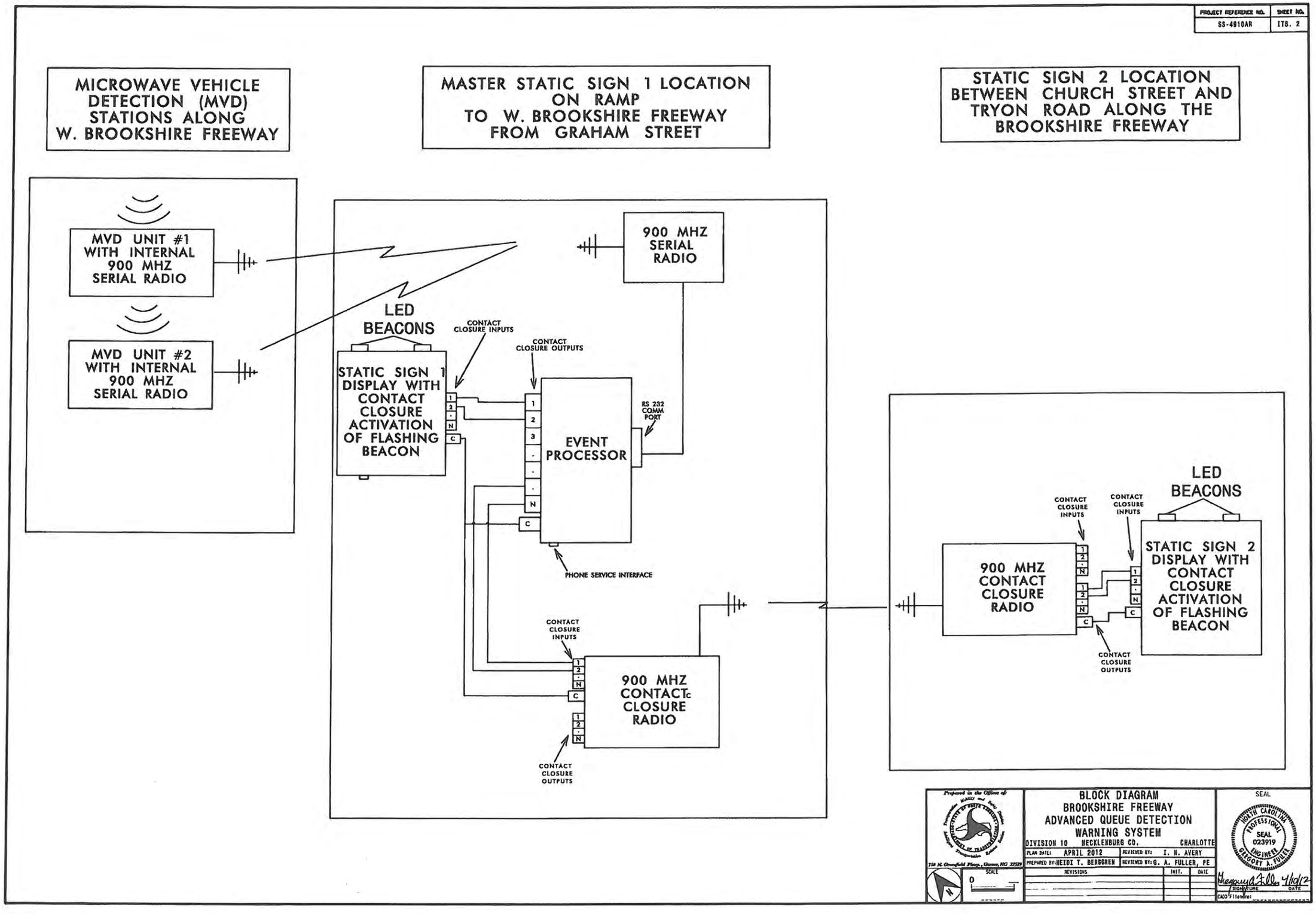
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE 4/13/12 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
SS-4910AR	ITS. 2



Prepared in the Offices of:
Traffic Engineering Branch
Traffic Management Unit
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Raleigh, North Carolina
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

BLOCK DIAGRAM
BROOKSHIRE FREEWAY
ADVANCED QUEUE DETECTION WARNING SYSTEM

DIVISION 10 MECKLENBURG CO. CHARLOTTE

PLAN DATE: APRIL 2012		REVIEWED BY: I. N. AVERY	
PREPARED BY: HEIDI T. BERGGREN		REVIEWED BY: G. A. FULLER, PE	
REVISIONS		INIT.	DATE

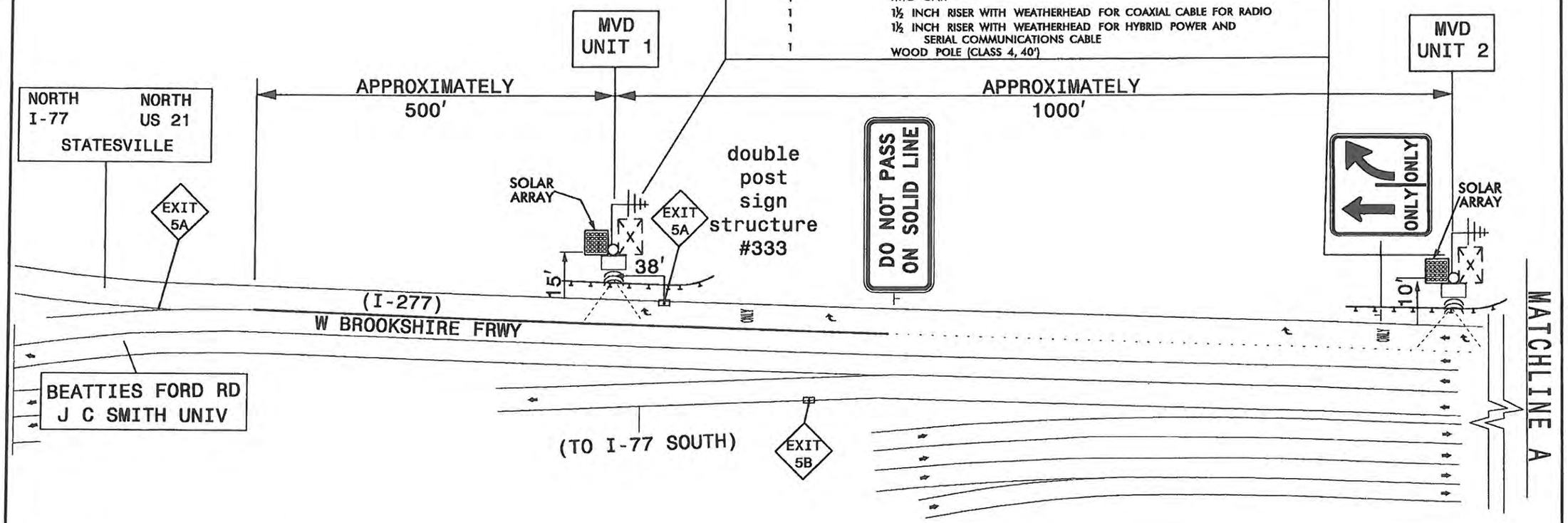
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
SIGNATURE Gregory A. Fuller DATE 4/10/12
CADD File/Ref:

PROJECT REFERENCE NO.	SHEET NO.
SS-4910AR	ITS. 3

VEHICLE DETECTION STATIONS MVD UNIT 1 AND MVD UNIT 2

INSTALL EQUIPMENT CABINET AND INSTALL THE FOLLOWING ITEMS IN THE EQUIPMENT CABINET WITH ALL ASSOCIATED HARDWARE:

QUANTITY	EQUIPMENT
1	NEMA 3R EQUIPMENT CABINET
1	900 MHZ SERIAL RADIO WITH 8.5 dB YAGI ANTENNA
1	SOLAR POWER ASSEMBLY
1	MVD UNIT
1	1½ INCH RISER WITH WEATHERHEAD FOR COAXIAL CABLE FOR RADIO
1	1½ INCH RISER WITH WEATHERHEAD FOR HYBRID POWER AND SERIAL COMMUNICATIONS CABLE
1	WOOD POLE (CLASS 4, 40')



VEHICLE DETECTION STATIONS

1) MARK THE WOOD POLE LOCATION AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO INSTALLING.
2) MOUNT THE EQUIPMENT CABINET ON THE WOOD POLE. ENSURE THE CENTER OF THE CABINET IS 4 FEET ABOVE GRADE.
3) MOUNT THE MVD A MAXIMUM OF 17 FEET ABOVE GRADE TO OBTAIN OPTIMAL DETECTION OF THE INSIDE LANE OF ROADWAY.
4) MOUNT THE SOLAR ARRAY ON THE WOOD POLE A MINIMUM OF 25 FEET ABOVE GRADE. MOUNT THE SOLAR ARRAY FOR OPTIMAL SUNLIGHT EXPOSURE.
5) USE STAINLESS STEEL MOUNTING HARDWARE TO SECURE THE SOLAR ARRAY, ANTENNA, AND EQUIPMENT CABINET TO THE STRUCTURE.
6) MOUNT AND ALIGN THE ANTENNA FOR MAXIMUM SIGNAL STRENGTH.

Prepared in the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems Unit, Department of Transportation, 750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

WEST BROOKSHIRE FREEWAY
QUEUE DETECTION SYSTEM
FROM TRYON STEET
TO I-77

DIVISION 10 MECKLENBURG CO. CHARLOTTE

PLAN DATE: APRIL 2012 REVIEWED BY: I. NEIL AVERY

PREPARED BY: HEIDI T BERGGREN REVIEWED BY: G. A. FULLER, PE

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE Gregory A. Fuller DATE 4/1/12

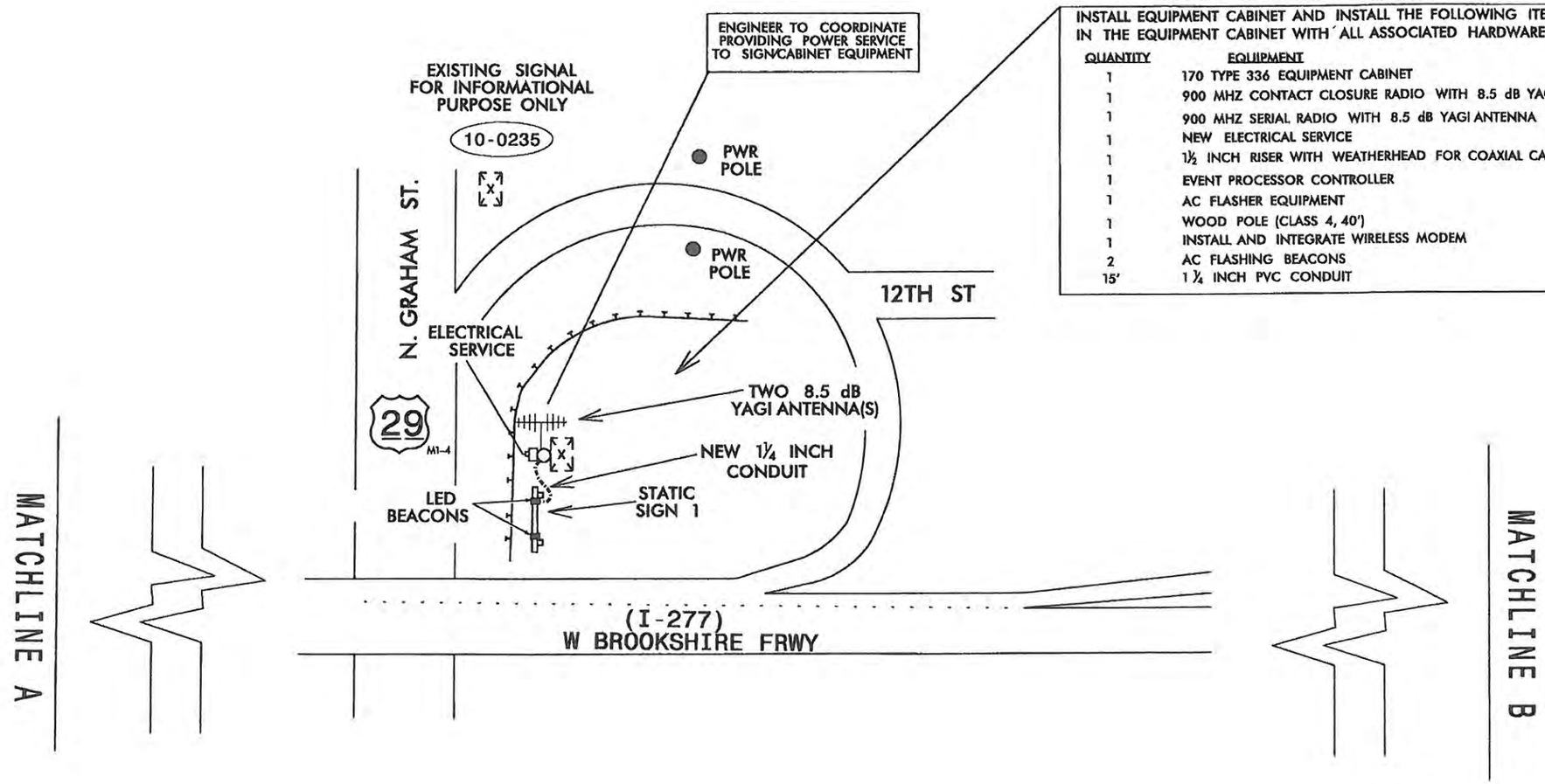
CADD filename:

PROJECT REFERENCE NO.	SHEET NO.
SS-4910AR	ITS. 4

MASTER LOCATION STATIC SIGN 1

INSTALL EQUIPMENT CABINET AND INSTALL THE FOLLOWING ITEMS IN THE EQUIPMENT CABINET WITH ALL ASSOCIATED HARDWARE:

QUANTITY	EQUIPMENT
1	170 TYPE 336 EQUIPMENT CABINET
1	900 MHZ CONTACT CLOSURE RADIO WITH 8.5 dB YAGI ANTENNA
1	900 MHZ SERIAL RADIO WITH 8.5 dB YAGI ANTENNA
1	NEW ELECTRICAL SERVICE
1	1½ INCH RISER WITH WEATHERHEAD FOR COAXIAL CABLE FOR RADIO
1	EVENT PROCESSOR CONTROLLER
1	AC FLASHER EQUIPMENT
1	WOOD POLE (CLASS 4, 40')
1	INSTALL AND INTEGRATE WIRELESS MODEM
2	AC FLASHING BEACONS
15'	1 ¼ INCH PVC CONDUIT



STATIC SIGN 1 LOCATION

1) REFERENCE PAVEMENT MANAGEMENT PLANS (PMP2-2A) FOR LOCATION OF SIGN STRUCTURES.
2) ENGINEER TO COORDINATE WITH POWER COMPANY TO PROVIDE POWER TO MASTER STATIC SIGN 1 LOCATION.
3) MARK WOOD POLE LOCATION AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO INSTALLING. LOCATE WOOD POLE SO AS NOT TO OBSTRUCT VIEWING OF THE SIGN.
4) MOUNT THE EQUIPMENT CABINET ON THE WOOD POLE. ENSURE THE CENTER OF THE CABINET IS 4 FEET ABOVE GRADE AND DOES NOT OBSTRUCT VIEWING OF THE SIGN.
5) MOUNT AND ALIGN THE ANTENNA(S) FOR MAXIMUM SIGNAL STRENGTH.
5) USE STAINLESS STEEL MOUNTING HARDWARE TO SECURE THE ANTENNA, AND EQUIPMENT CABINET TO THE STRUCTURE.

Prepared in the Offices of: Parsons Brinckerhoff Quade & Douglas, Inc. — Department of Transportation State of North Carolina — 739 N. Greenfield Pkwy., Garner, NC 27529

WEST BROOKSHIRE FREEWAY
QUEUE DETECTION SYSTEM
FROM TRYON STEET
TO I-77

DIVISION 10 MECKLENBURG CO. CHARLOTTE

PLAN DATE: APRIL 2012 REVIEWED BY: I. NEIL AVERY

PREPARED BY: HEIDI T BERGGREN REVIEWED BY: G. A. FULLER, PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE DATE 4/10/12

CADD Filename: