

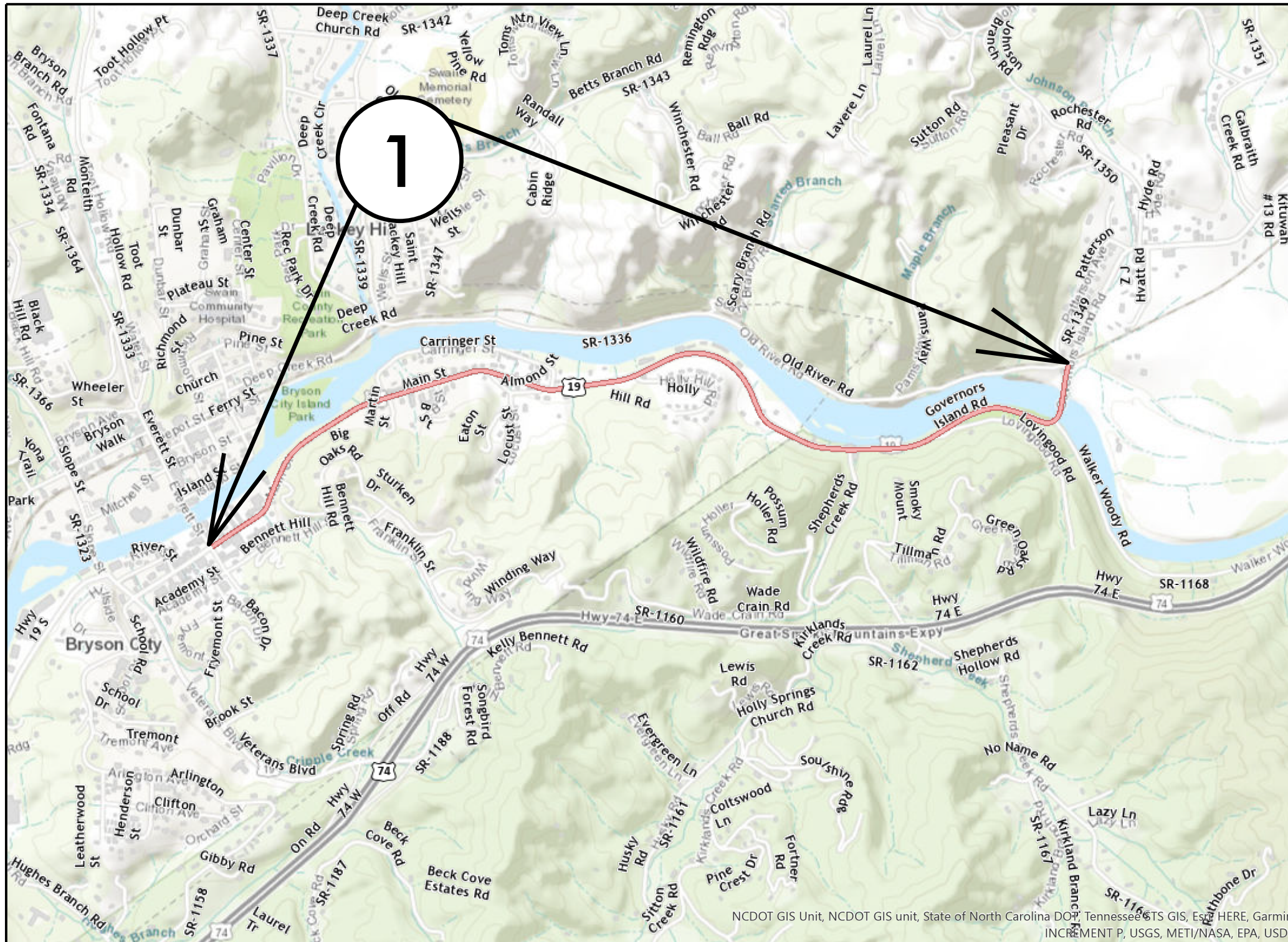
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for the convenience of the user  
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and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

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

# SWAIN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	2026CPT.14.06.10871	1	19
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
2026CPT.14.06.10871		CON	
50943.3.3		CON	



MAP 1



BEG



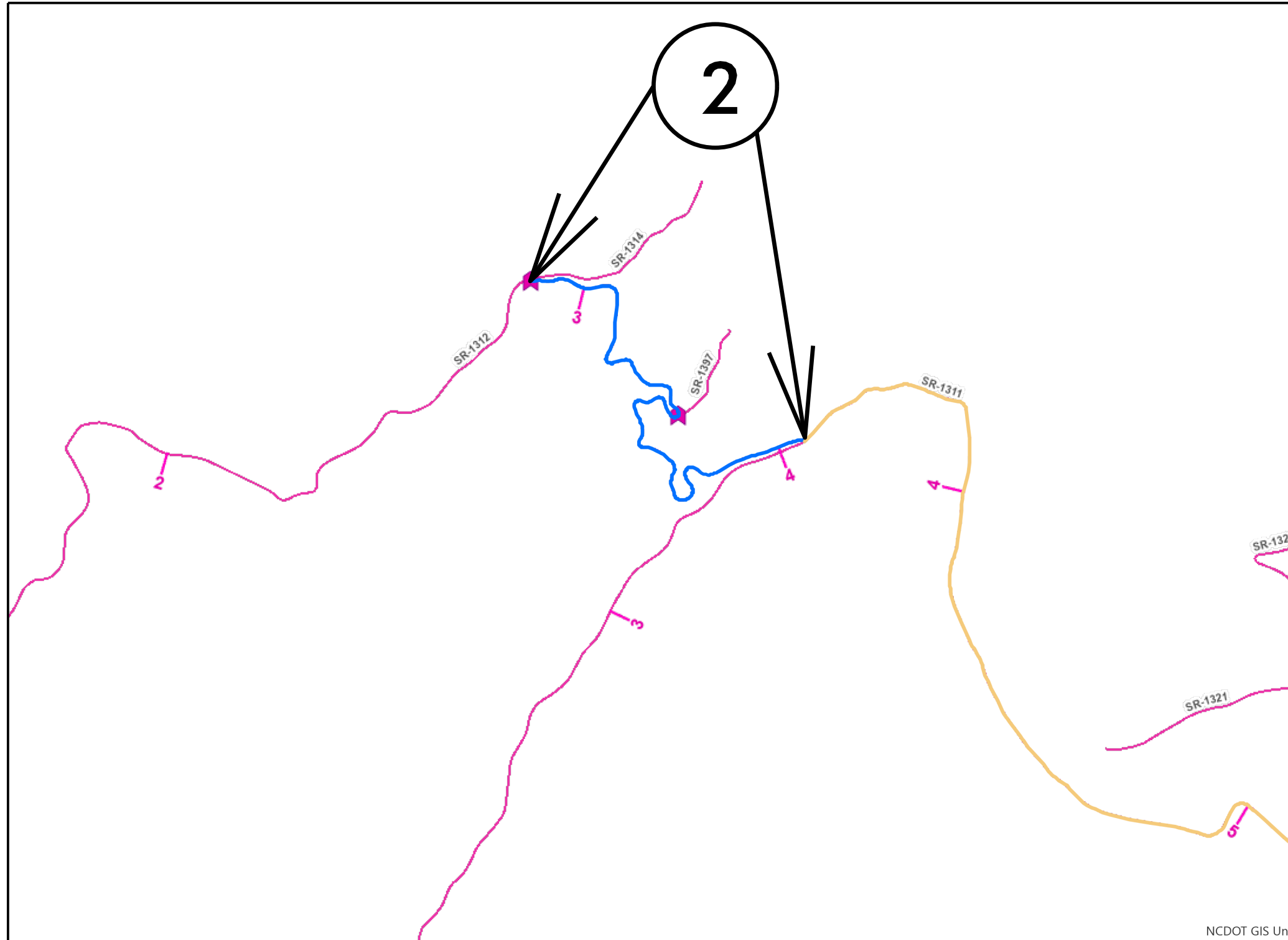
END

CONTRACT: DN01136

NCDOT GIS Unit, NCDOT GIS unit, State of North Carolina DOT, Tennessee GIS, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	2026CPT.14.06.20871	2	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

# SWAIN COUNTY



## MAP 2



**BEG**

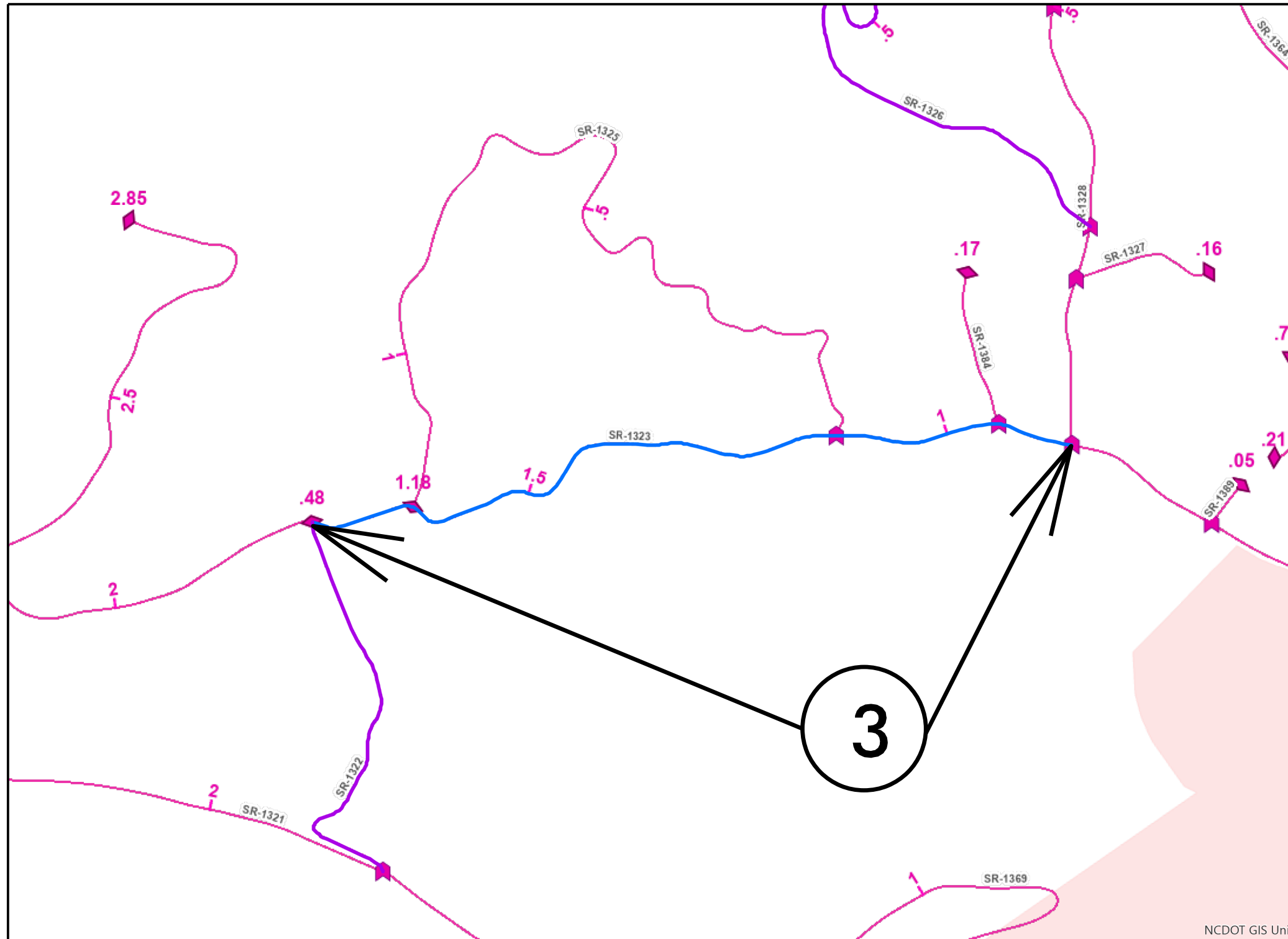


**END**

CONTRACT: DN01136

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	2026CPT.14.06.20871	3	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

# SWAIN COUNTY



## MAP 3



BEG



END

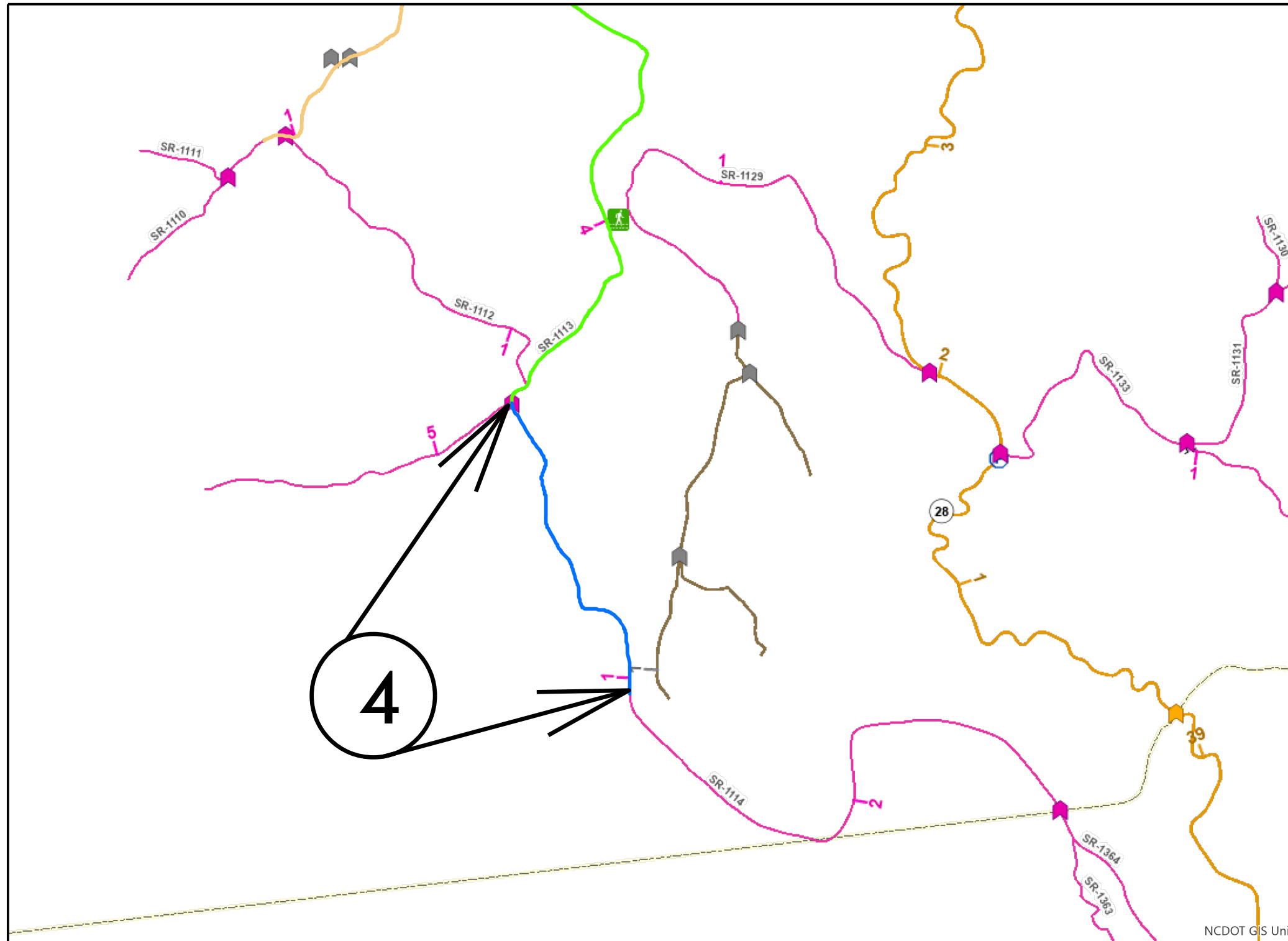
NCDOT GIS Unit

CONTRACT: DN01136

09/08/09

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	2026CPT.14.06.20871	4	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

# SWAIN COUNTY



## MAP 4



BEG



END

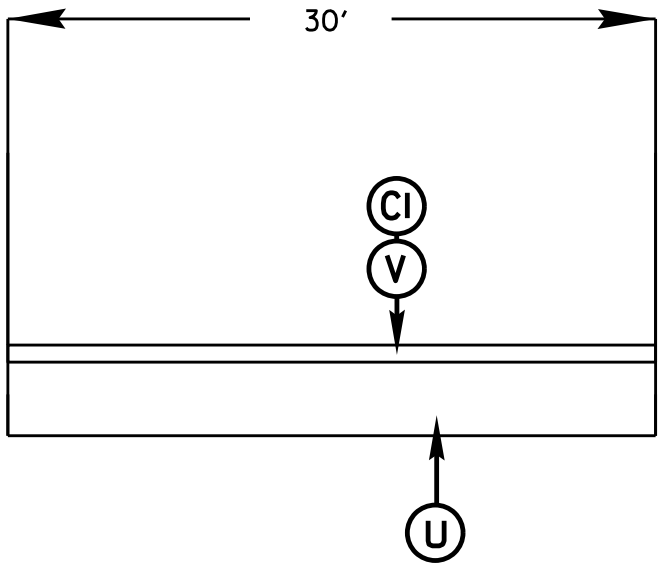
CONTRACT: DN01136

NCDOT GIS Unit

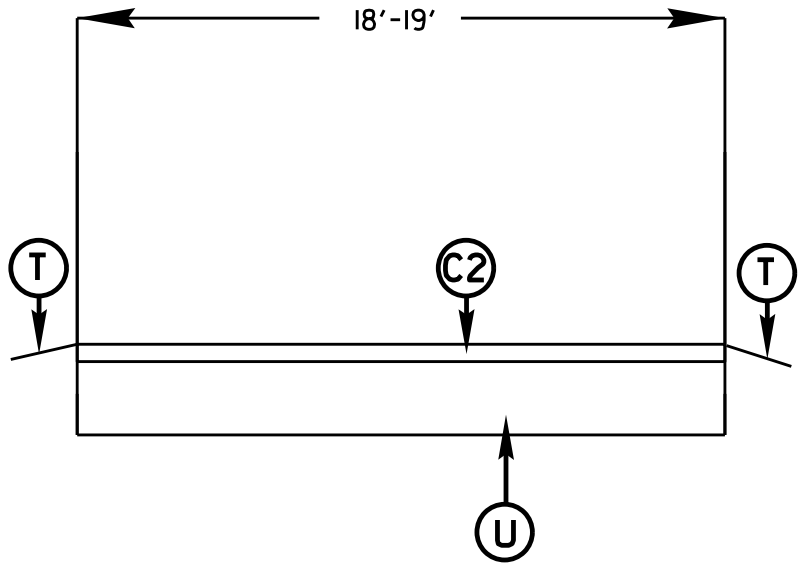
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	2026CPT.14.06.10871	5	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
2026CPT.14.06.10871			
2026CPT.14.06.20871			
50943.3.3			

SURFACING SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168LBS. PER SQ. YD.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165LBS. PER SQ. YD.
T	SHOULDER RECONSTRUCTION WITH ASB. 2' WIDE UNLESS DIRECTED BY PROJECT ENGINEER -SEE PROJECT SPECIAL PROVISIONS-
U	EXISTING PAVEMENT
V	MILLED ASPHALT PAVEMENT 1 1/2" IN DEPTH IN LOCATIONS AS DIRECTED BY PROJECT ENGINEER

TYPICAL 1



TYPICAL 2



CONTRACT: DN01136

09/08/09



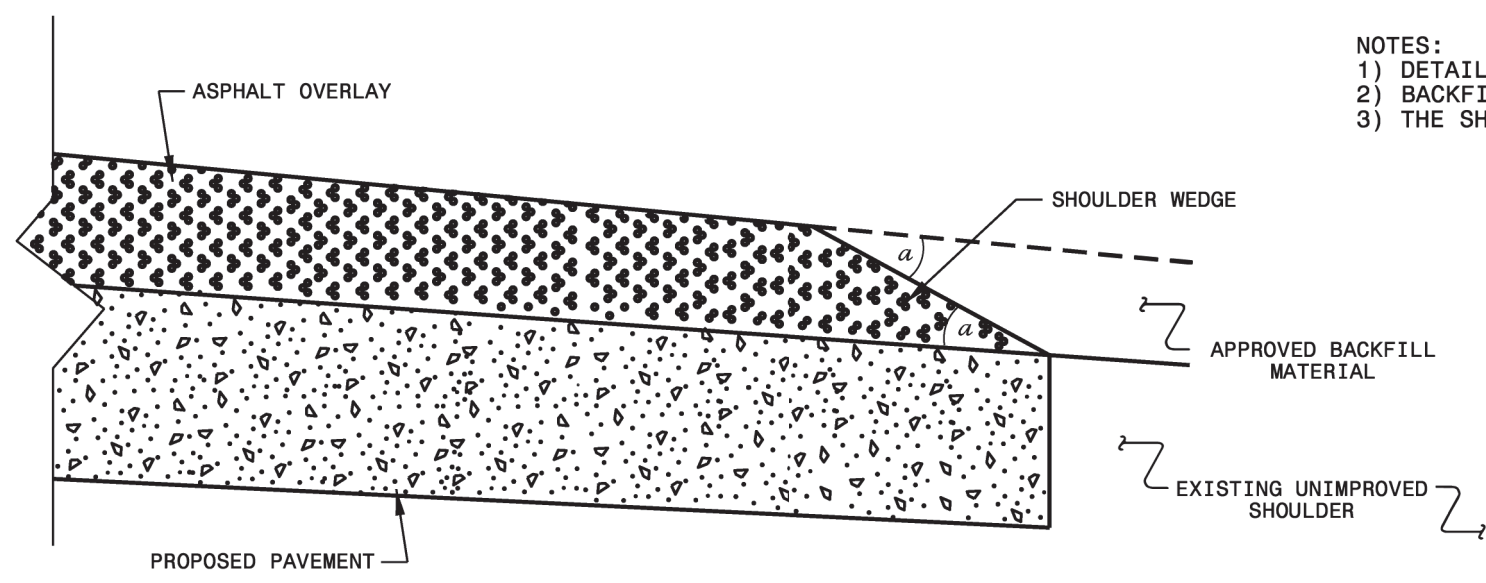
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	2026CPT.14.06.10871	7	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
2026CPT.14.06.10871			
2026CPT.14.06.20871			
50943.3.3			

### Bridge Structure Table

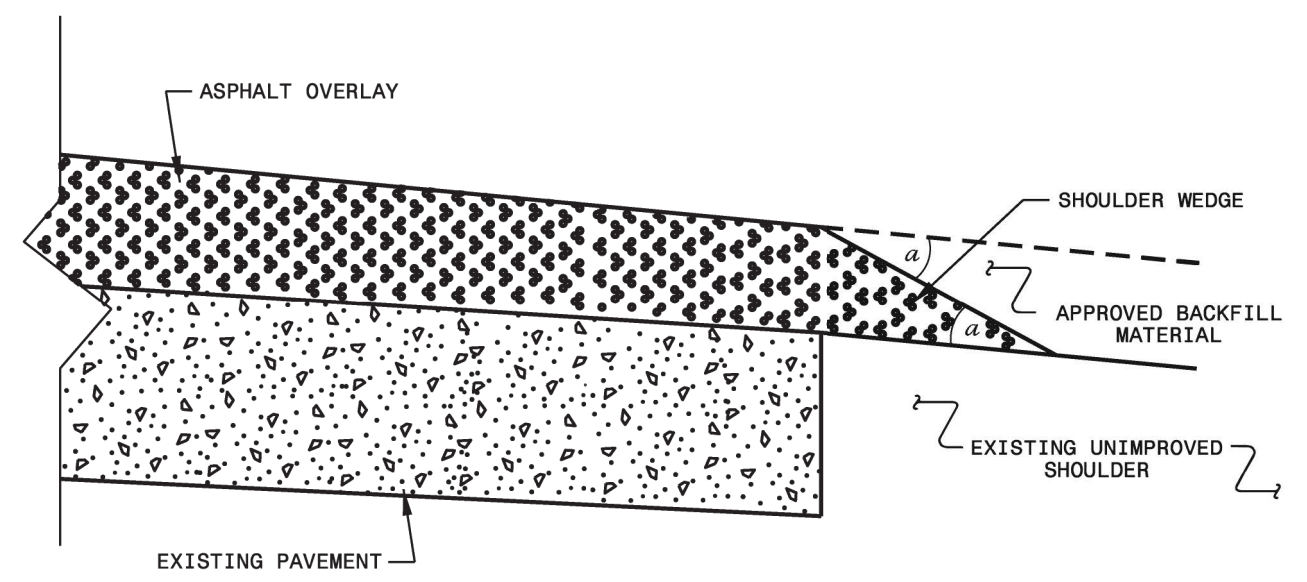
Map #	Route No.	Road Name	County	Structure No.	Posted SV (Tons)	Posted TTST (Tons)	Paving Across Bridge
1	US-19	US-19	Swain	860020	99	99	Yes

CONTRACT: DN01136

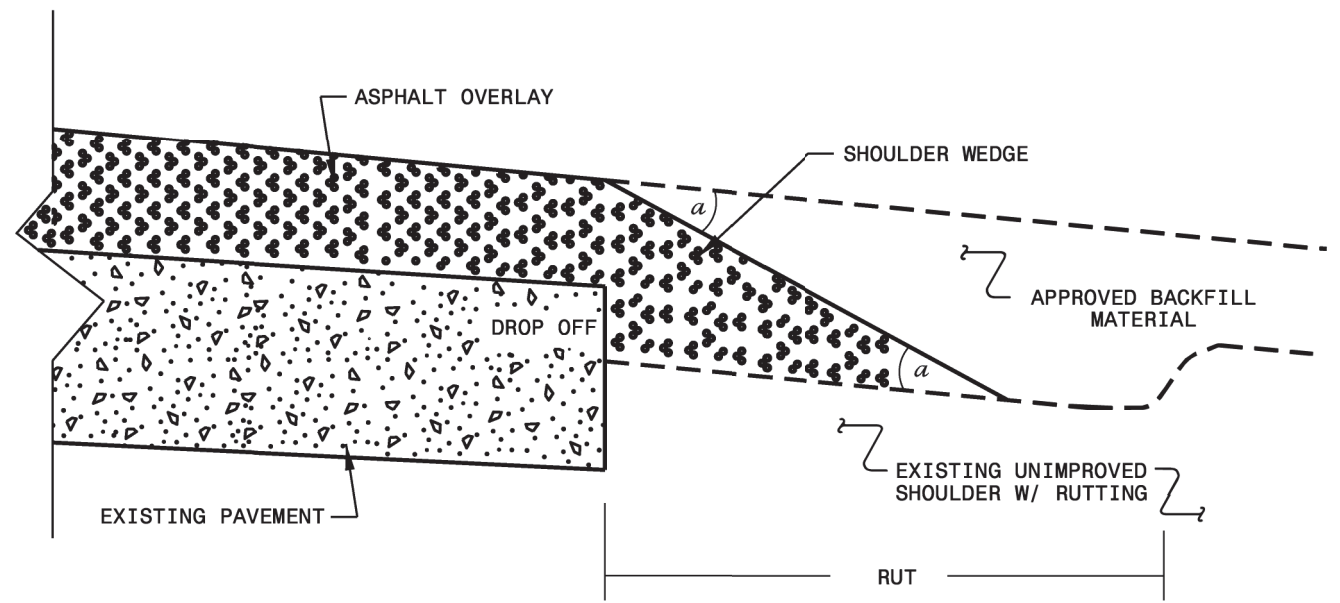
- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFC AND ULTRA-THIN BONDED WEARING COURSE.
  - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
  - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



**SHOULDER WEDGE DETAIL**  
 (Resurfacing Projects w/ Widening or  
 with Existing Paved Shoulder having no dropoffs)



**SHOULDER WEDGE DETAIL**  
 (Resurfacing Projects w/ NO Widening)



**SHOULDER WEDGE DETAIL**  
 (Resurfacing Adjacent to  
 Rutted Shoulder)

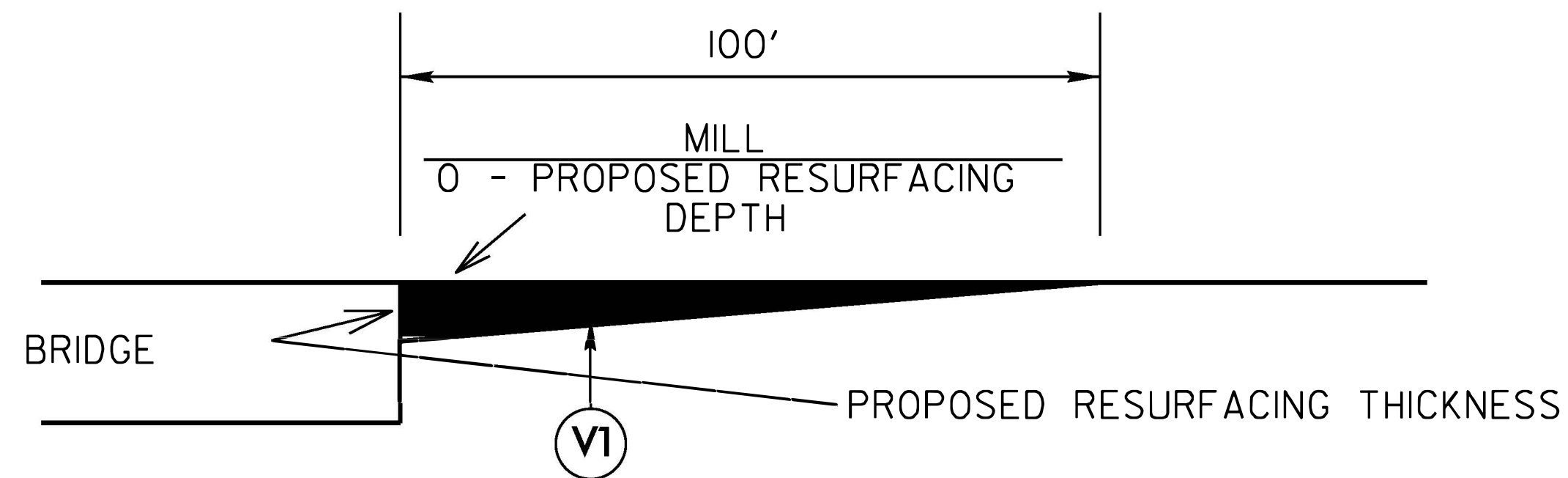
- SHOULDER WEDGE ANGLE = 30°

<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>			
Office 919-707-6950		FAX 919-250-4119	
<b>SHOULDER WEDGE DETAILS</b>			
ORIGINAL BY: T. SPELL	DATE: 7-19-11		
MODIFIED BY:	DATE: 10/16/12		
CHECKED BY:	DATE:		
FILE SPEC.: s:\usr\det_alls\stand\shoulderwedetail.dgn			

CONTRACT: DN01136

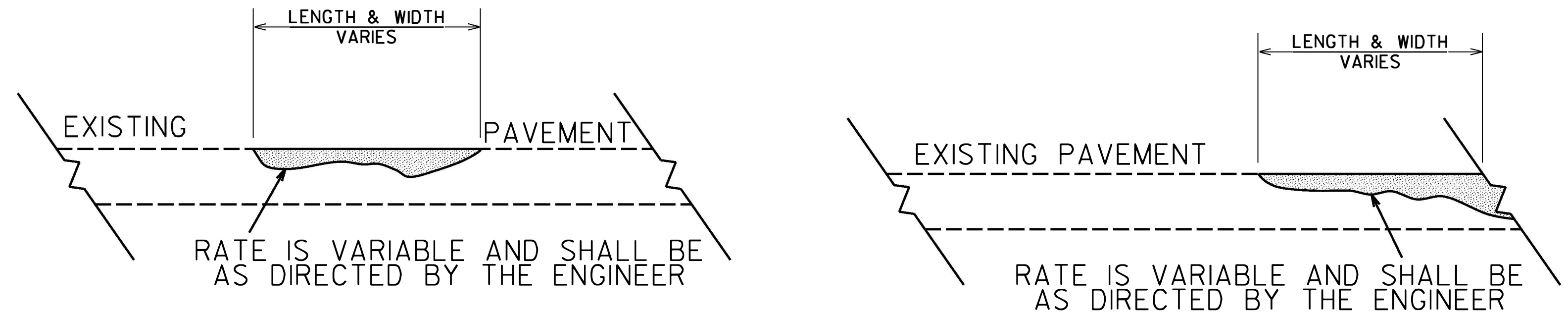
SYSTEMS CONDITIONING  
SERVICES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	2026CPT.14.06.10871	9	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
2026CPT.14.06.10871			
2026CPT.14.06.20871			



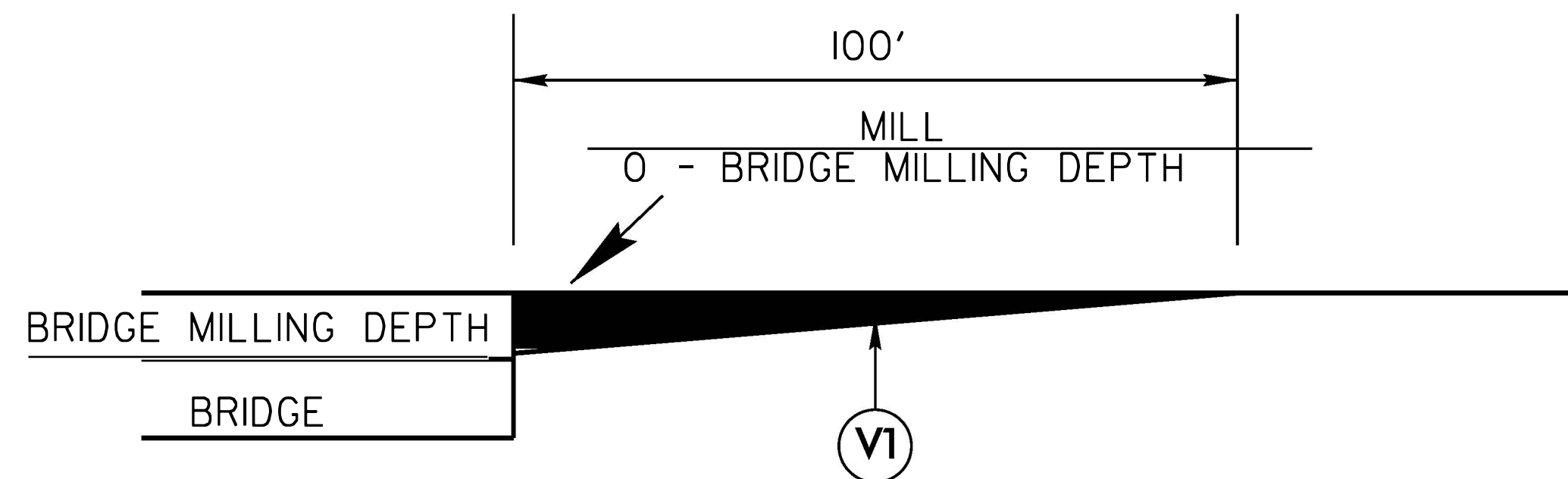
**MILLING DETAIL AT BRIDGE APPROACHES**

**WHERE BRIDGES WILL NOT BE RESURFACED. THIS WILL BE PAID FOR AS INCIDENTAL MILLING.**



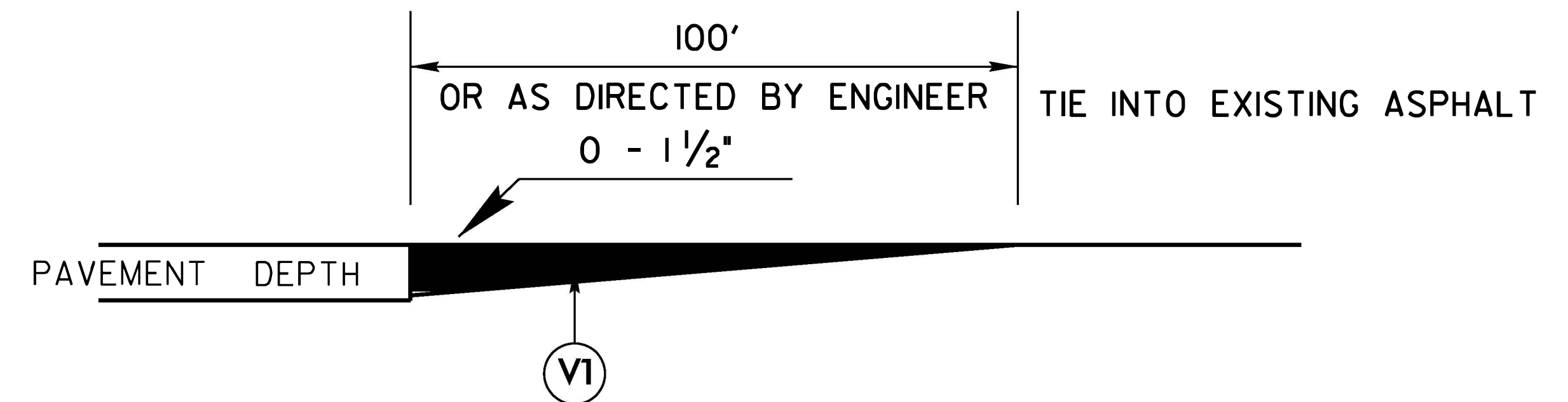
**DETAIL SHOWING METHOD OF WEDGING**

**\*PROPOSED WEDGE COURSE\* ( 114 LBS PER SQ YARD PER 1" DEPTH)**



**MILLING DETAIL AT BRIDGE APPROACHES**

**WHERE BRIDGES WILL BE MILLED THEN RESURFACED. THIS WILL BE PAID FOR AS INCIDENTAL MILLING.**



**DETAIL TO TIE INTO EXIST PAVEMENT**

**THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT HE WILL BE REQUIRED TO MILL THE EXISTING ASPHALT PAVEMENT TO ENSURE A PROPER TIE-IN WITH THE EXISTING SURFACE AT THE BEGINNING, END AND Y LINES OF EACH MAP. THIS WILL BE PAID FOR AS 1 1/2" MILLING.**

**CONTRACT: DN01136**

09/08/09

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	50943.3.3	10	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
2026CPT.14.06.10871			
2026CPT.14.06.20871			
50943.3.3			

**Concrete Repairs**

Map	Road/Intersection	WCR	4" Sidewalk	2'-6" Curb & Gutter	6" Concrete Driveway	Notes
1	US-19	2	6	10		NW Corner of US-19 and Everett St
1	US-19	2	14	25		SW Corner of US-19 and Everett St
1	US-19	2	6	10		NE Corner of US-19 and Everett St
1	US-19	2	14	25		SE Corner of US-19 and Everett St

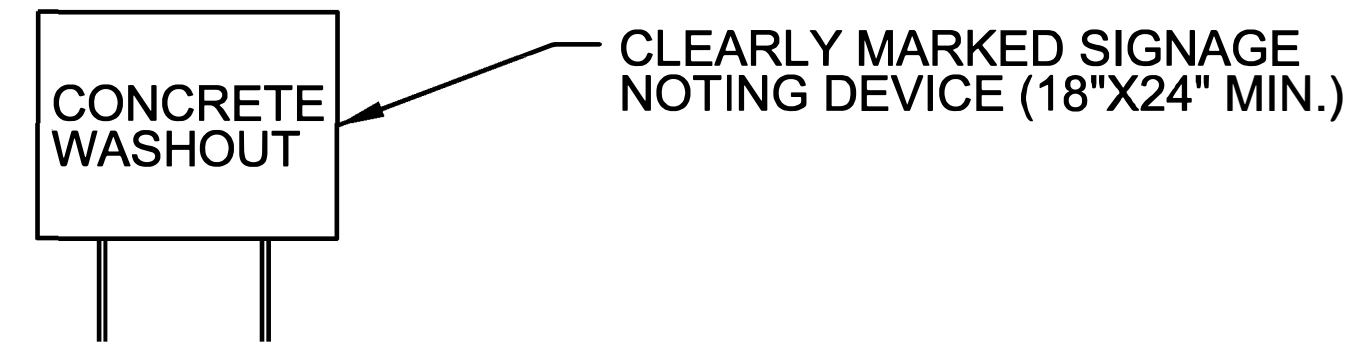
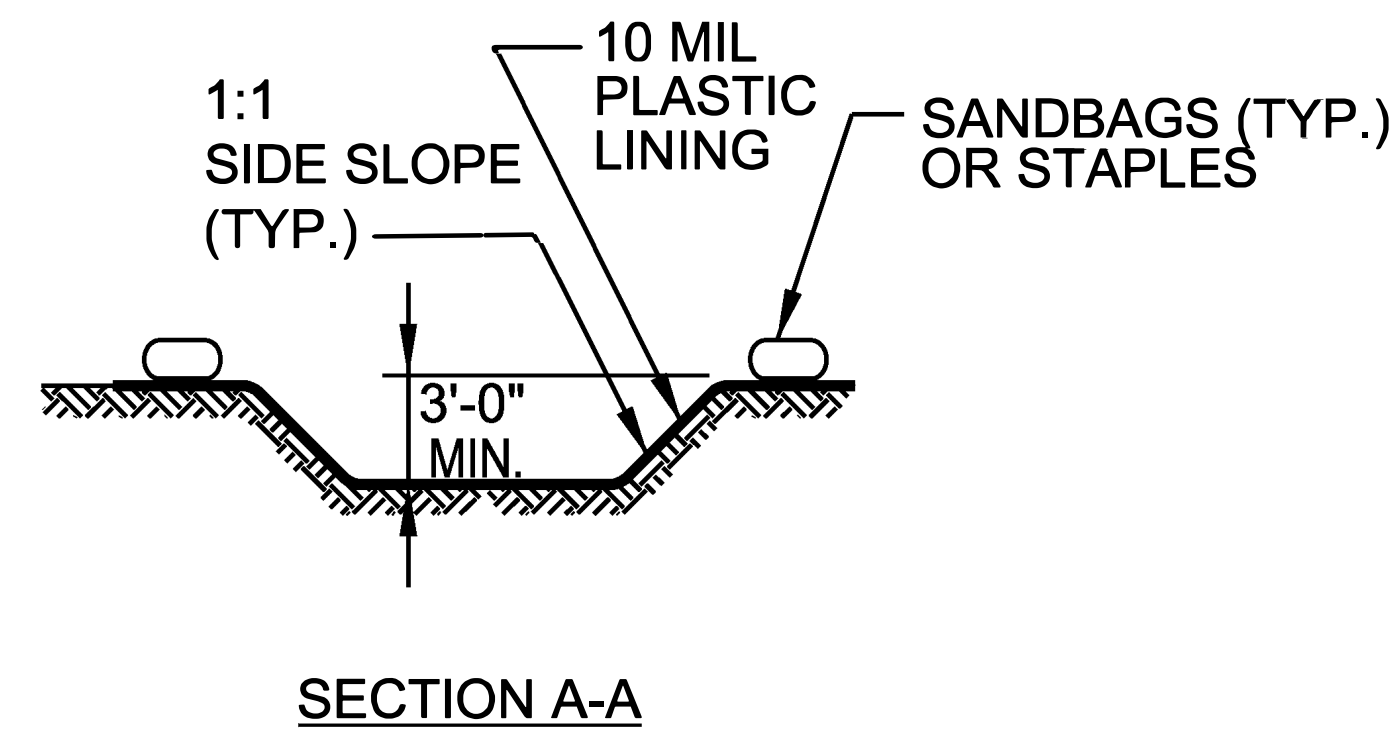
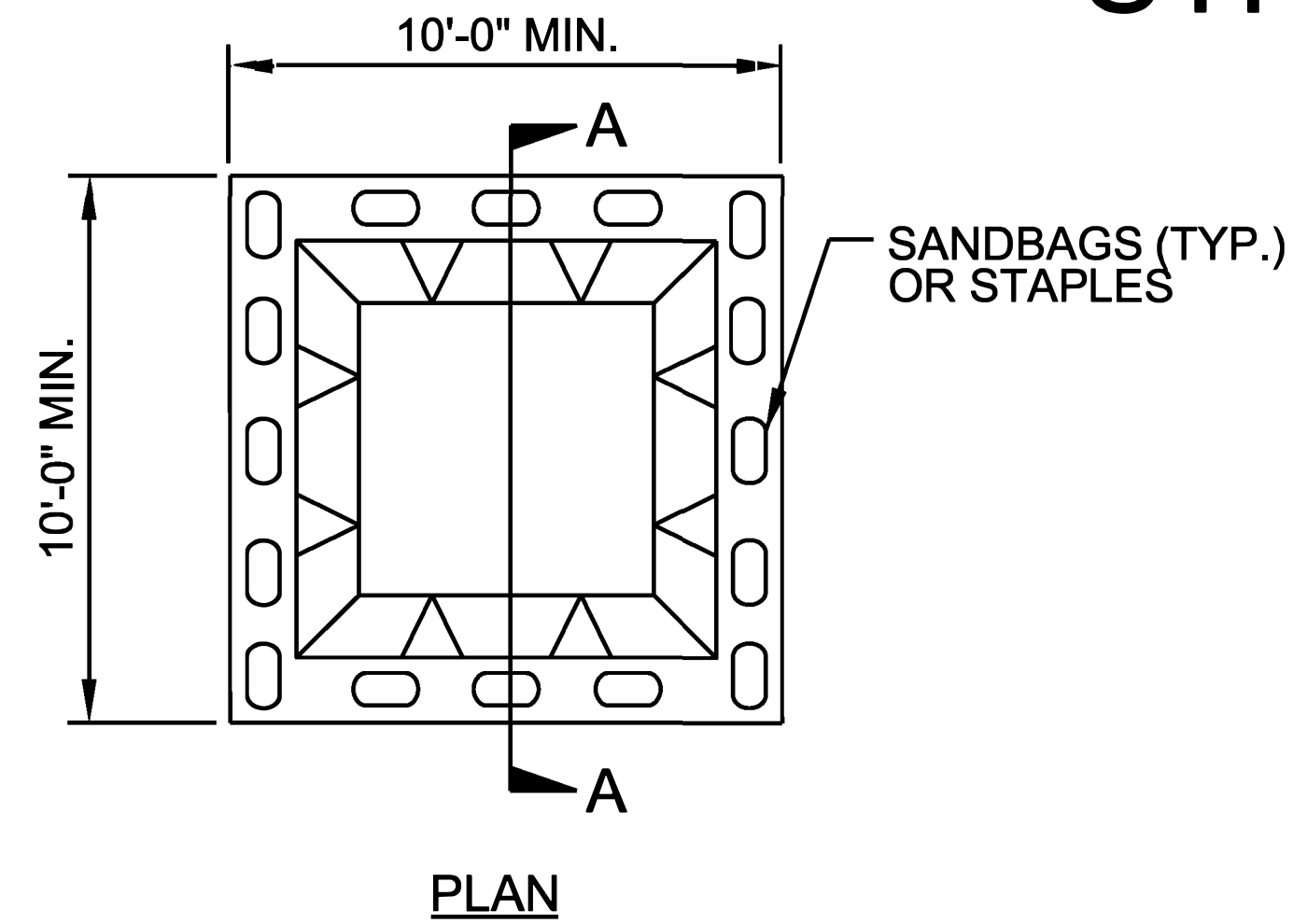
Total	8	40	70	0
	EA	SY	LF	SY

**CONTRACT: DN01136**

09/08/09

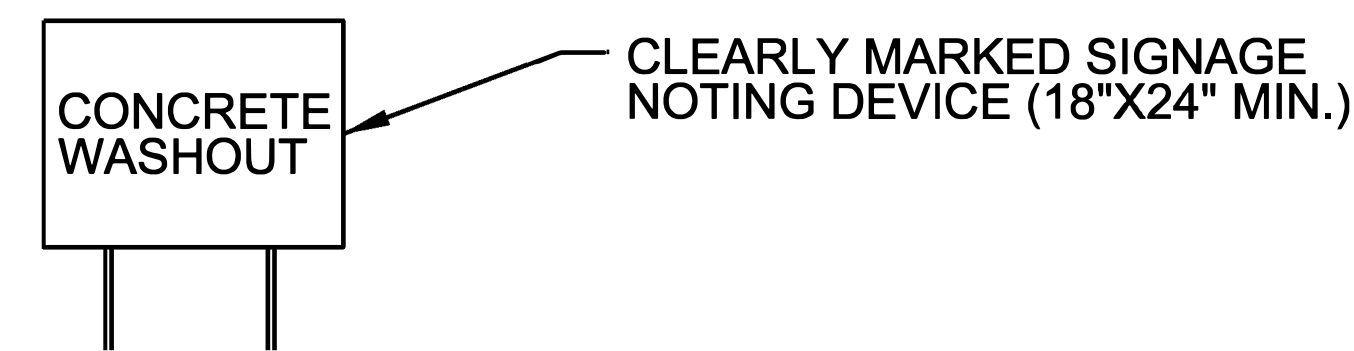
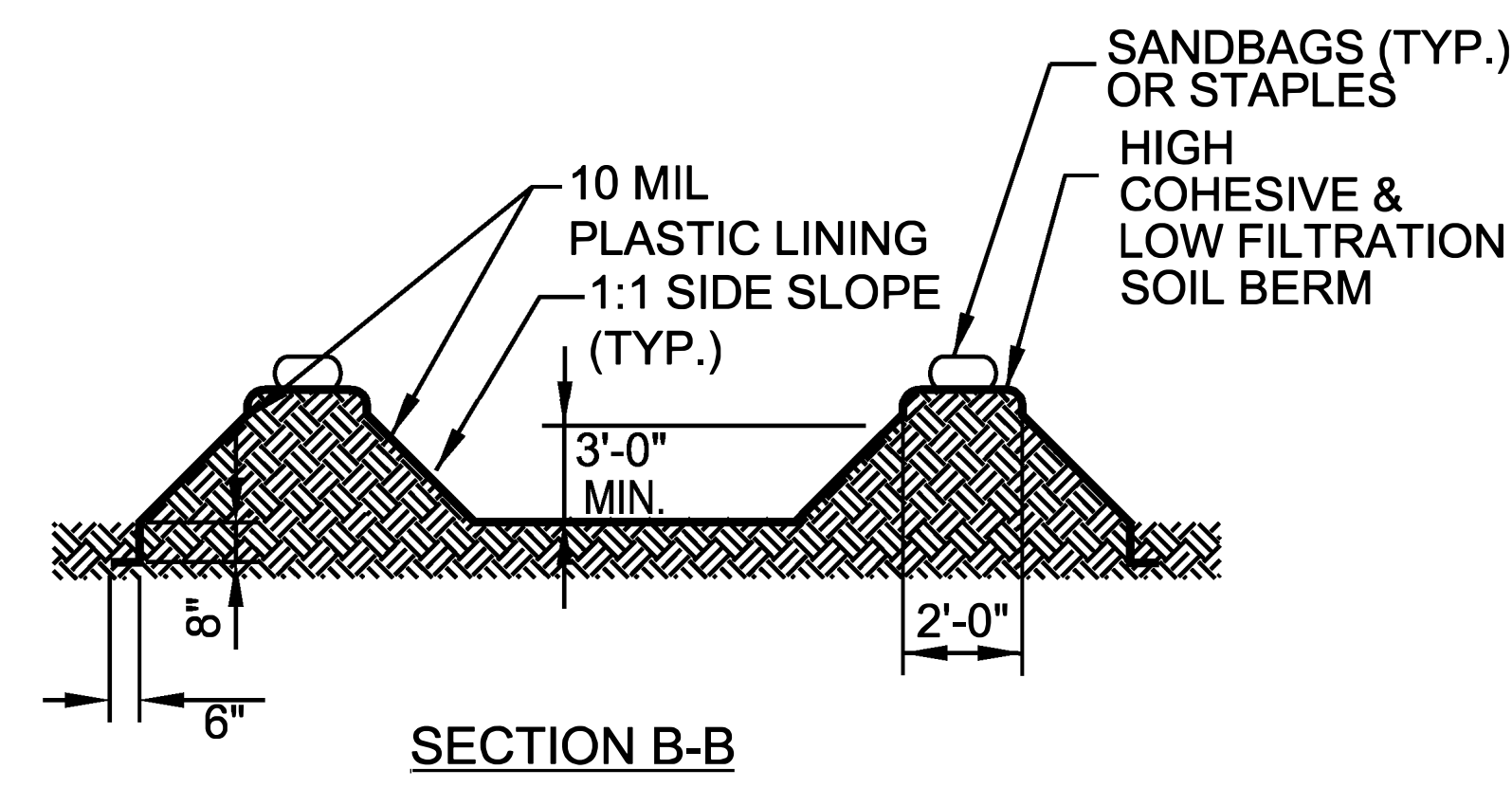
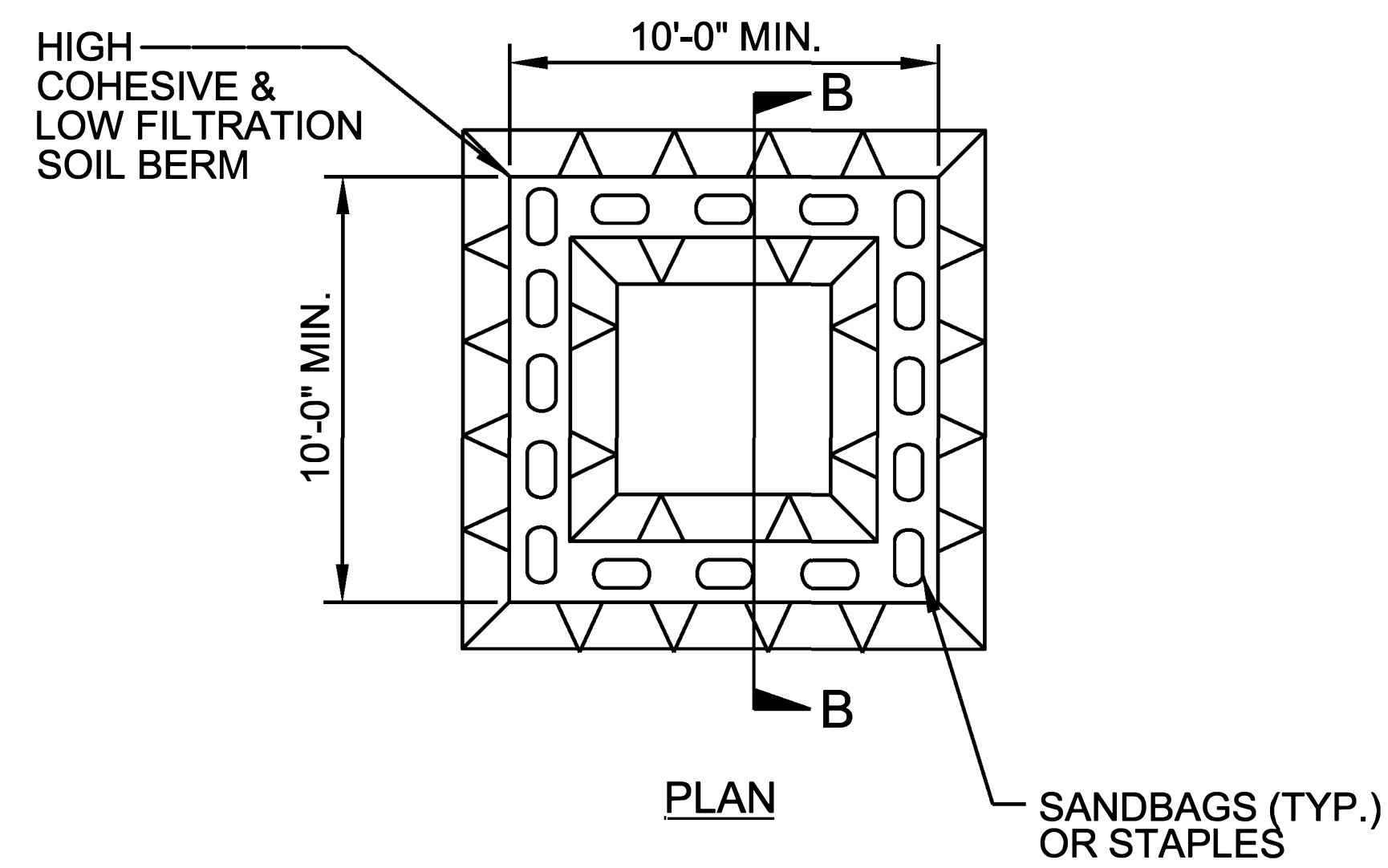
PROJECT REFERENCE NO.	SHEET NO.
2026CPT.14.06.10871	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



**BELOW GRADE WASHOUT STRUCTURE**  
NOT TO SCALE

- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
  2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
  3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



**ABOVE GRADE WASHOUT STRUCTURE**  
NOT TO SCALE

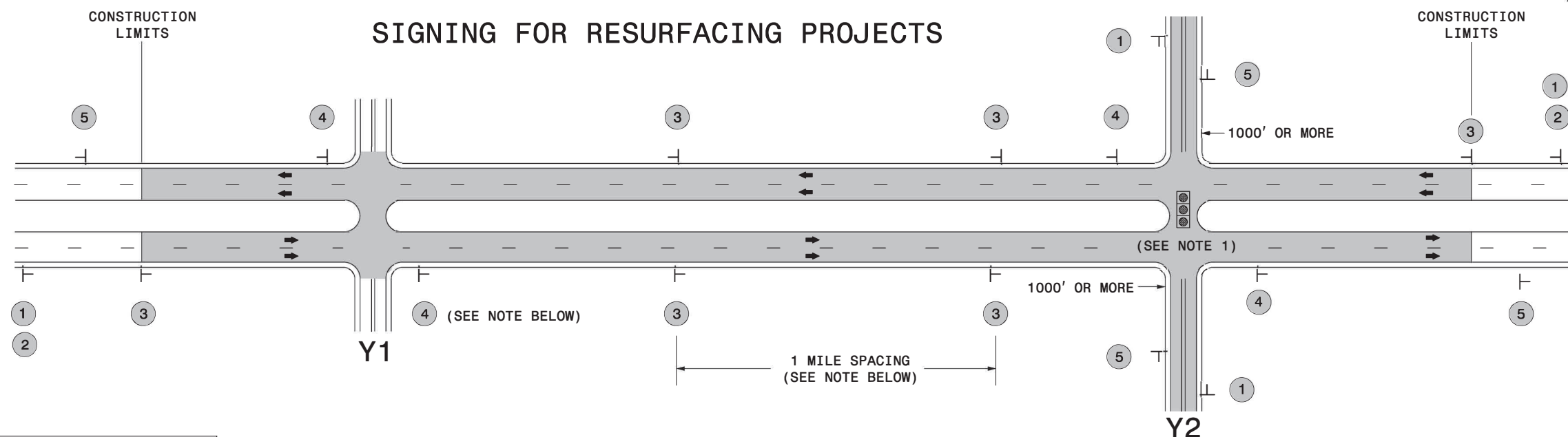
- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
  2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
  3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



PROJECT NO.	SHEET NO.	TOTAL NO.
2026CPT.14.06.10871, 2026CPT.14.06.20871, 50943.3.3	13	

**THERMOPLASTIC AND PAINT QUANTITIES**

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	4413000000-E	4447000000-E	4457000000-N	4685000000-E	4688000000-E			4700000000-E	4704000000-E	4709000000-E	4720000000-E	4725000000-E		4810000000-E	4815000000-E	4835000000-E	4890000000-E		4893000000-E	4895000000-N
												WORK ZONE ADVANCE/GENERAL WARNING SIGNING	PEDESTRIAN CHANNELIZING DEVICES	TEMPORARY TRAFFIC CONTROL	THERMOPLASTIC PAVEMENT MARKING LINES (4",90 MILS) WHITE	THERMOPLASTIC PAVEMENT MARKING LINES (6",90 MILS) YELLOW	THERMOPLASTIC PAVEMENT MARKING LINES (6",90 MILS) WHITE	THERMOPLASTIC PAVEMENT MARKING LINES (12",90 MILS)	THERMOPLASTIC PAVEMENT MARKING LINES (16",90 MILS)	THERMOPLASTIC PAVEMENT MARKING LINES (24",90 MILS)(WHITE)	THERMO RXR 90 M	THERMO RT ARROW 90 M	THERMO STR & LT ARROW 90 MILS	THERMO STR & RT ARROW 90 MILS	4" YELLOW PAINT	6" WHITE PAINT	24" WHITE PAINT	WHITE HOT SPRAY THERMOPLASTIC PAVEMENT MARKING LINES, 4", 60 MIL	YELLOW HOT SPRAY THERMOPLASTIC PAVEMENT MARKING LINES, 4", 60 MIL	DECORATIVE CROSSWALK PAVEMENT MARKING	POLYCARBONATE H-SHAPED MARKERS
							MI	FT				SF	LF	LS	LF	LF	LF	LF	EA	EA	EA	EA	LF	LF	LF	LF	LF	LF	SF	EA	
2026CPT.14.06.10871	Swain	1	US-19	FROM SR 1364 TO SR 1336	1	2	2WU	2.1	30	20.48	22.58	225		0.53	740	22,736	22,608	172	50	355	2	4	4	1	400	300	72			295.00	
<b>TOTAL FOR MAP NO. 1</b>							2.1					225		0.53	740	22,736	22,608	172	50	355	2	4	4	1	400	300	72.00			295.000	
<b>TOTAL FOR PROJ NO. 2026CPT.14.06.10871</b>							2.1					225		0.53	740	22,736	22,608	172	50	355	2	4	4	1	400	300	72.00			295.000	
																45,344															
2026CPT.14.06.20871	Swain	2	SR-1312 / ROUND HILL RD	FROM SR 1314 TO SR 1311	2	2	2WU	1.15	18	2.9	4.05	129		0.16																12,010	12,010
<b>TOTAL FOR MAP NO. 2</b>							1.15					129		0.16																12,010	12,010
2026CPT.14.06.20871	Swain	3	SR-1323 / FRANKLIN GROVE CHURCH RD	FROM SR 1328 TO SR 1322		2	2WU	0.9	18	0.86	1.76			0.13																9,504	9,504
<b>TOTAL FOR MAP NO. 3</b>							0.9							0.13																9,504	9,504
2026CPT.14.06.20871	Swain	4	SR-1114 / NEEDMORE RD	FROM SR 1113 TO EOP	1	2	2WU	1.05	19	0	1.05	118		0.19																11,088	11,088
<b>TOTAL FOR MAP NO. 4</b>							1.05					118		0.18																11,088	11,088
<b>TOTAL FOR PROJ NO. 2026CPT.14.06.20871</b>							3.1					247		0.47																32,602	32,602
																65,204															
50943.3.3	Swain	5	US-19	FROM SR 1364 TO SR 1336		2	2WU	2	36	0	2			100																	2,880
<b>TOTAL FOR MAP NO. 5</b>							2							100.000																	2,880
<b>TOTAL FOR PROJ NO. 50943.3.3</b>							2							100.000																	2,880
<b>GRAND TOTAL</b>								7.2				472	100.000	1	740	22,736	22,608	172	50	355	2	4	4	1	400	300.00	72	32,602	32,602	2,880	295
																45,344			9			65,204									



LEGEND	
┆	STATIONARY SIGN
←	DIRECTION OF TRAFFIC FLOW

### MAINLINE (-L-) SIGNING

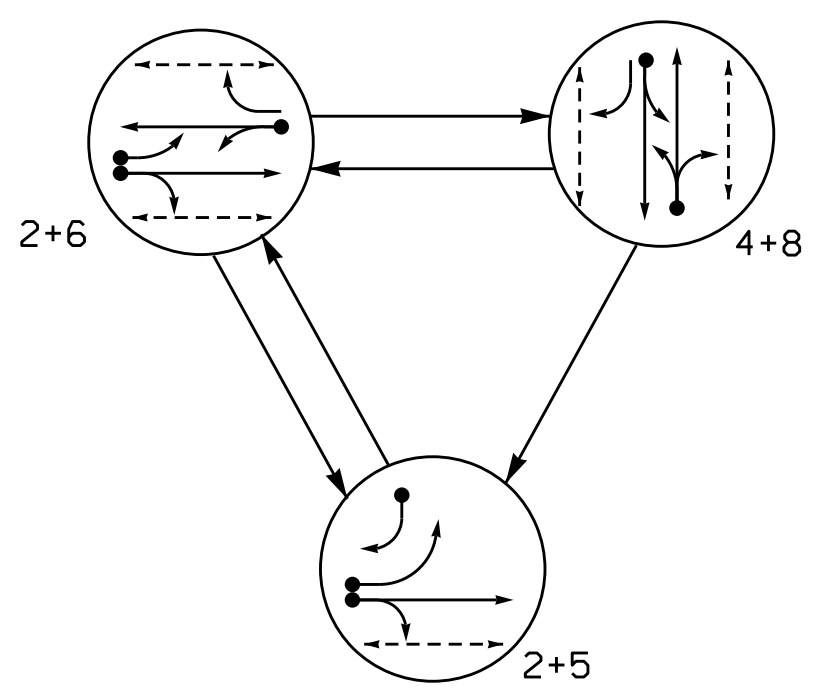
### -Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	MAINLINE (-L-) SIGNING		-Y- LINE SIGNING	
	1	 W20-1 48" X 48"	PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.	<p>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</p> <ol style="list-style-type: none"> <li>1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE</li> <li>2) SUBDIVISION ROADS</li> <li>3) DEAD END ROADS</li> </ol> <p>WHEN PAVING/CONSTRUCTION ACTIVITIES PROCEED ACROSS AN UNSIGNED -Y- LINE, ADVANCE WARNING PORTABLE SIGNS SHALL BE USED ALONG THE -Y- LINE AS SHOWN BELOW. REMOVE UPON COMPLETION OF WORK.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>W20-1 48" X 48"</p> </div> <div style="text-align: center;"> <p>W20-7 A 48" X 48"</p> </div> </div> <p>PLACED 500' IN ADVANCE OF FLAGGER. PLACED 250' IN ADVANCE OF FLAGGER.</p> <p>NOTES:</p> <ol style="list-style-type: none"> <li>1) MAY USE LAW ENFORCEMENT TO CONTROL TRAFFIC AT SIGNALIZED INTERSECTIONS AS DIRECTED BY THE ENGINEER. PROVIDE PORTABLE "ROAD WORK AHEAD" (W20-1) SIGNS 500' IN ADVANCE ALONG BOTH APPROACHES FROM THE SIDE STREETS WHEN PAVING PROCEEDS THROUGH THE INTERSECTION.</li> </ol>
	2	 W7-3aP 24" X 18"	#2 SIGN ONLY USED WHEN RESURFACING LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER. (NO FRACTIONAL OR DECIMAL NUMBERS)	
	3	 SP 13107 48" X 48"	PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET 1/2 MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.	
	4	 SP 13106 48" X 48"	THESE ARE FOR -Y- LINES THAT ARE "THROUGH" ROADWAYS. DEAD END AND SUBDIVISION ROADS ARE NOT "THROUGH" ROADWAYS. INSTALL 500' +/- FROM EACH -Y- LINE APPROACH AS SHOWN ABOVE. FOR MULTIPLE -Y- LINES THAT ARE SEPARATED BY 0.25 MILES OR LESS, TREAT AS A SINGLE UNIT AND INSTALL WITHIN 500' OF EACH APPROACH. A MAXIMUM OF 2 SIGN SETS PER MILE. DO NOT INSTALL WHEN -Y- LINES ARE WITHIN 0.5 MILES FROM "END ROAD WORK" SIGN.	
5	 G20-2 A 48" X 24"	PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.		



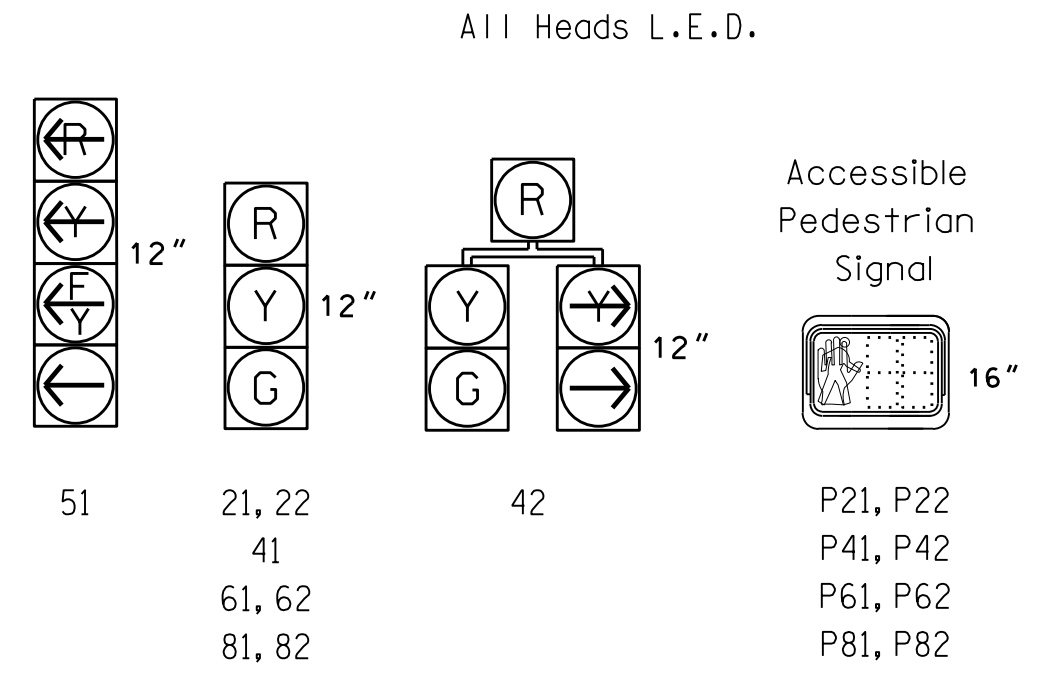
**RESURFACING  
ADVANCE WARNING SIGNS  
FOR RURAL AND SUBURBAN  
MULTI-LANE ROADWAYS  
W/ SHOULDER SECTIONS**

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	2+5	2+6	4+8	FLASH
21,22	G	G	R	R
41	R	R	G	R
42	R	R	G	R
51	←	←	←	←
61,62	R	G	R	R
81,82	R	R	G	R
P21,P22	W	W	DW	DRK
P41,P42	DW	DW	W	DRK
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

SIGNAL FACE I.D.

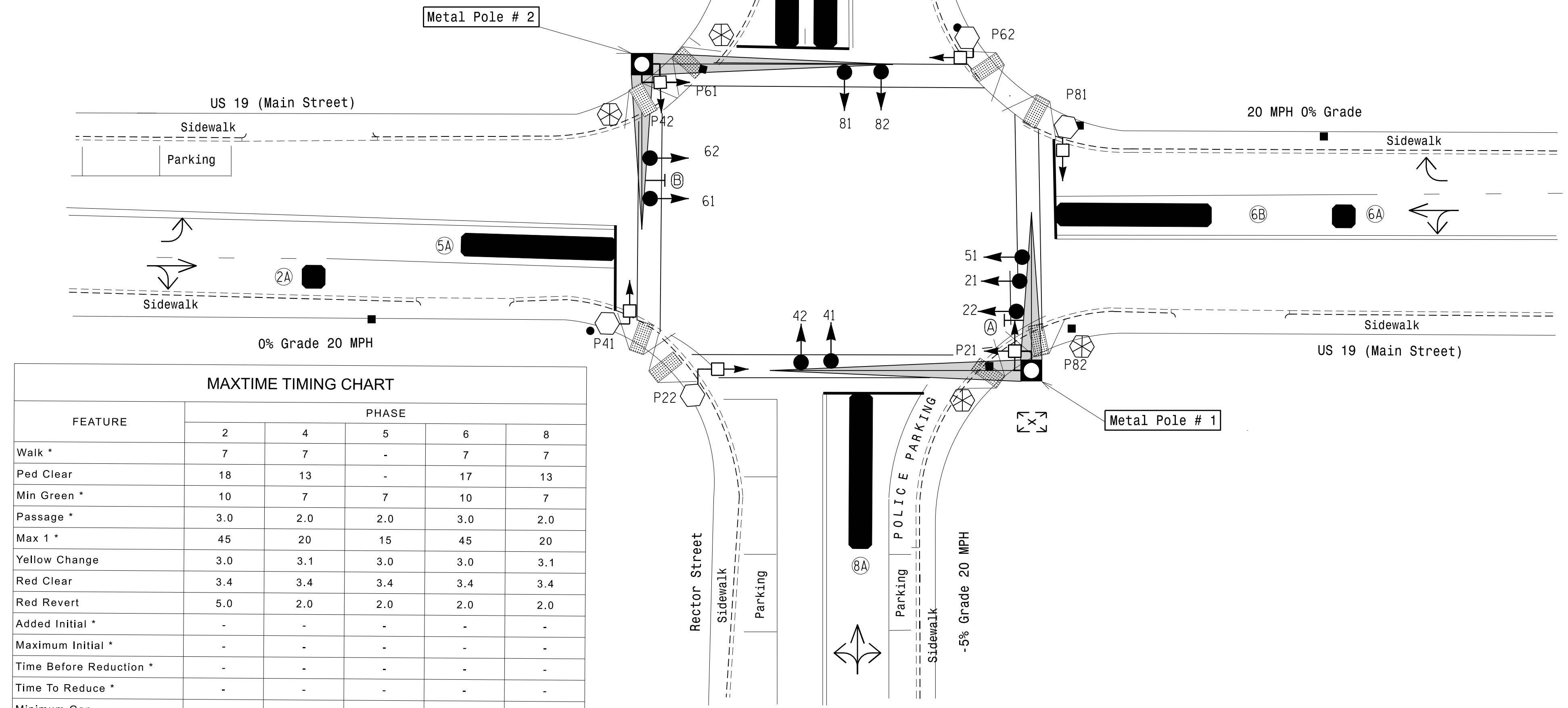
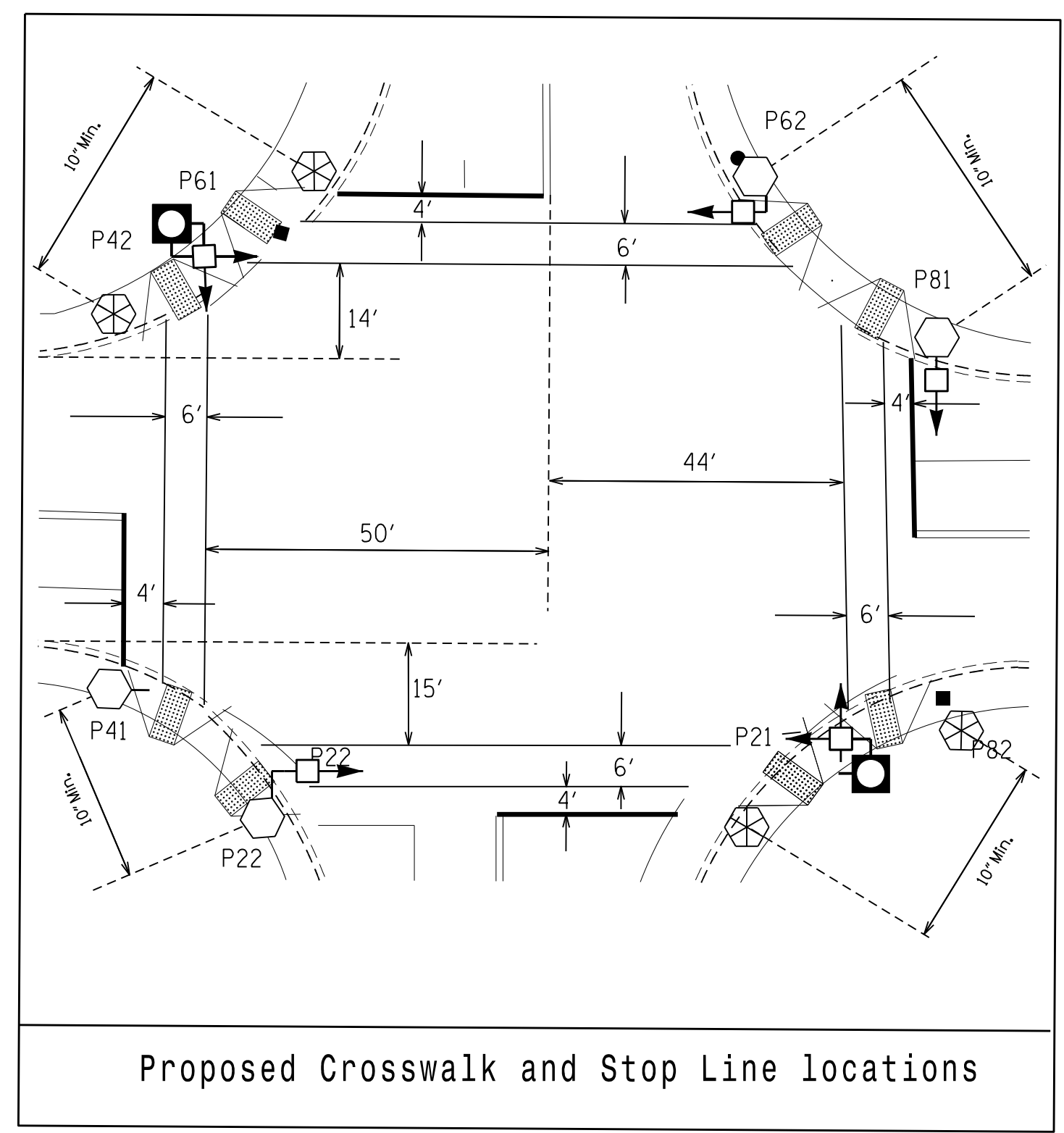
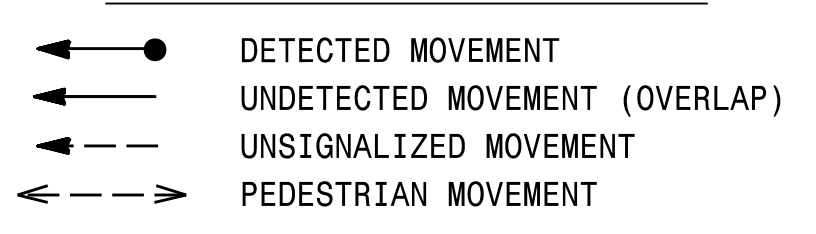


3 Phase Fully Actuated Isolated

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2024 and "Standard Specifications for Roads and Structures" dated July 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through all red display.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Install new 2070 LX controller in existing signal cabinet.

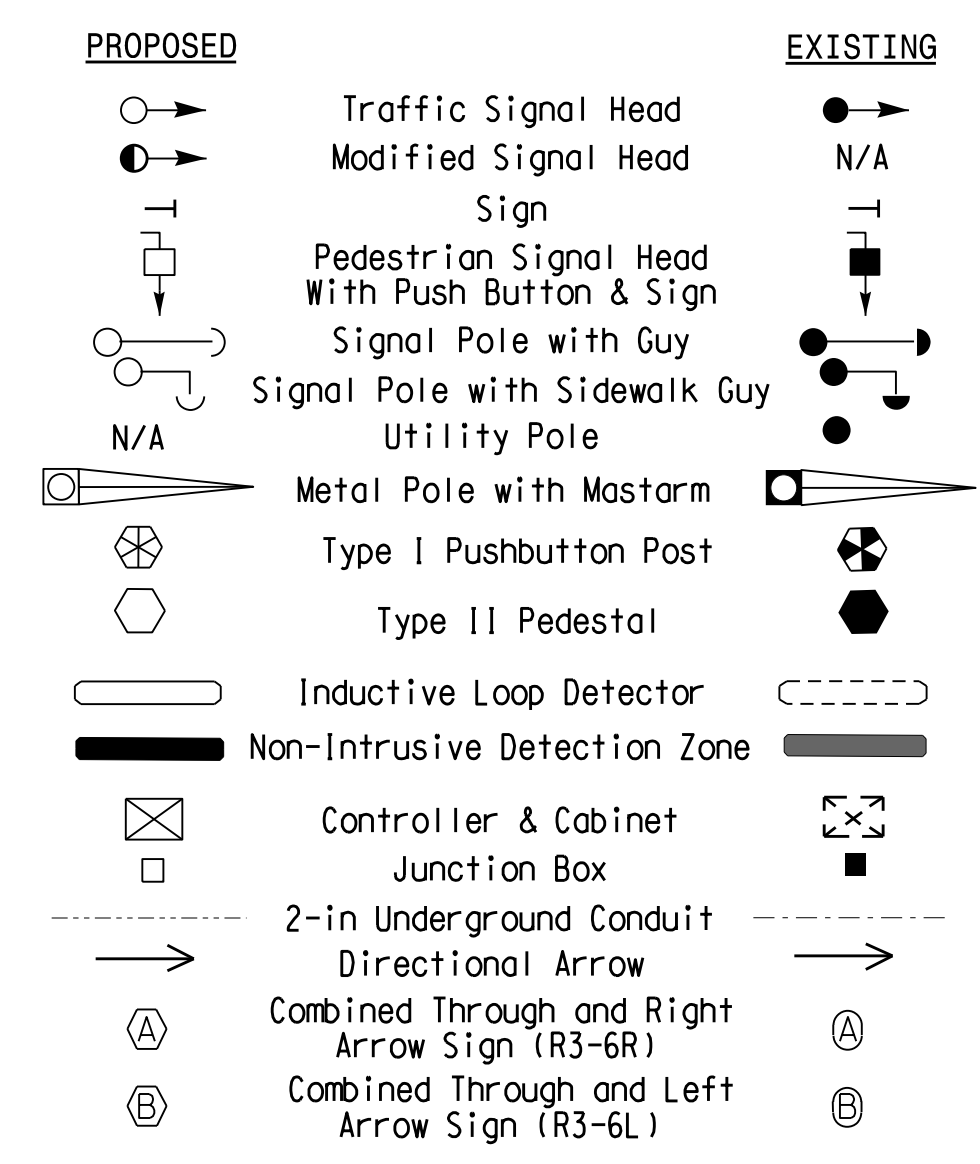
PHASING DIAGRAM DETECTION LEGEND



FEATURE	PHASE				
	2	4	5	6	8
Walk *	7	7	-	7	7
Ped Clear	18	13	-	17	13
Min Green *	10	7	7	10	7
Passage *	3.0	2.0	2.0	3.0	2.0
Max 1 *	45	20	15	45	20
Yellow Change	3.0	3.1	3.0	3.0	3.1
Red Clear	3.4	3.4	3.4	3.4	3.4
Red Revert	5.0	2.0	2.0	2.0	2.0
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Advance Walk	7	7	-	7	7
Non Lock Detector	-	X	X	-	X
Vehicle Recall	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	X	-	-	X

\* 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.

LEGEND



Signal Upgrade (Sheet 1 of 2)

750 N. Greenfield Pkwy, Garner, NC 27529

US 19 (Main Street)  
at  
SR 1364 (Everett Street) /  
Rector Street

Division 14 Swain County Bryson City

PLAN DATE: October 2025 REVIEWED BY: R.N. Zinser

PREPARED BY: Adja Fall REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

23-OCT-2025 14:57 p:\w\ncdot-pw-bent\ey.com\ncdot-pw-01\Documents\NCDOT-TSMO\SIGNAL Design\2025-10\CA00\XXXXXX\_sig\_dsm\_yyyy\mdd.dgn

3 Phase Fully Actuated Isolated

NOTES

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Rector.
P22	-	X	Walk	(Persussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Rector.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main.
P42	-	X	Walk	(Percussive)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main
P61	-	X	Walk	(Percussive)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Everett.
P62	-	X	Walk	(Percussive)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Everett.
P81	-	X	Walk	(Percussive)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main.
P82	-	X	Walk	(Percussive)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main.

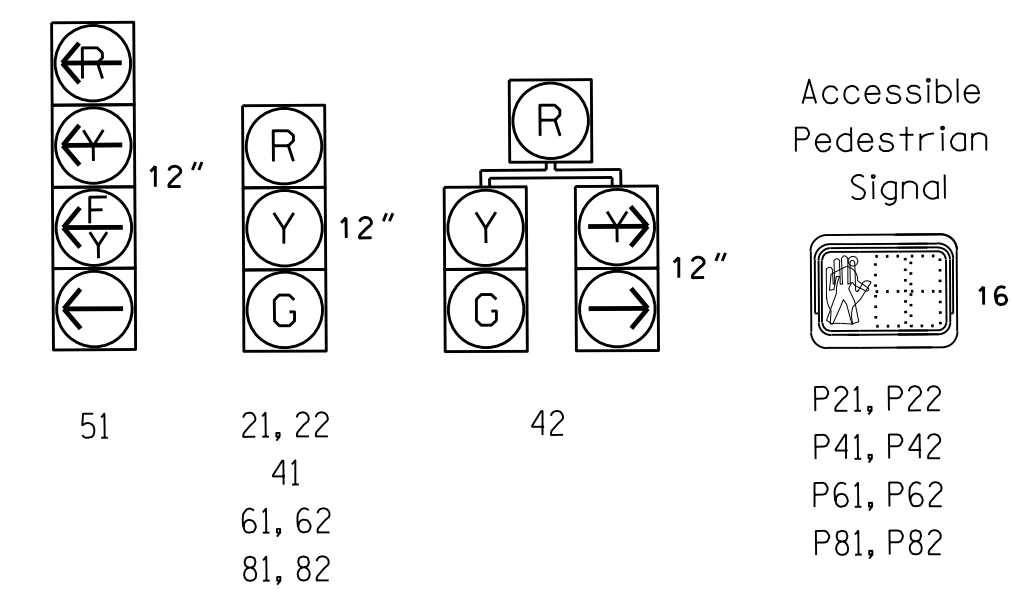
MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAY DURING GREEN	NEW CARD
2A	*	70	*	*	2	-	-	X	-	X	-
4A	*	0	*	*	4	3.0	-	X	-	X	-
5A	*	0	*	*	5	15.0	-	X	-	X	-
					2	-	-	X	-	X	X
5B	*	0	*	*	5	15.0	-	X	-	X	-
6A	*	70	*	*	6	-	-	X	-	X	-
6B	*	0	*	*	6	-	-	X	-	X	-
8A	*	0	*	*	8	10.0	-	X	-	X	-

\* Multi-Zone Microwave Detection

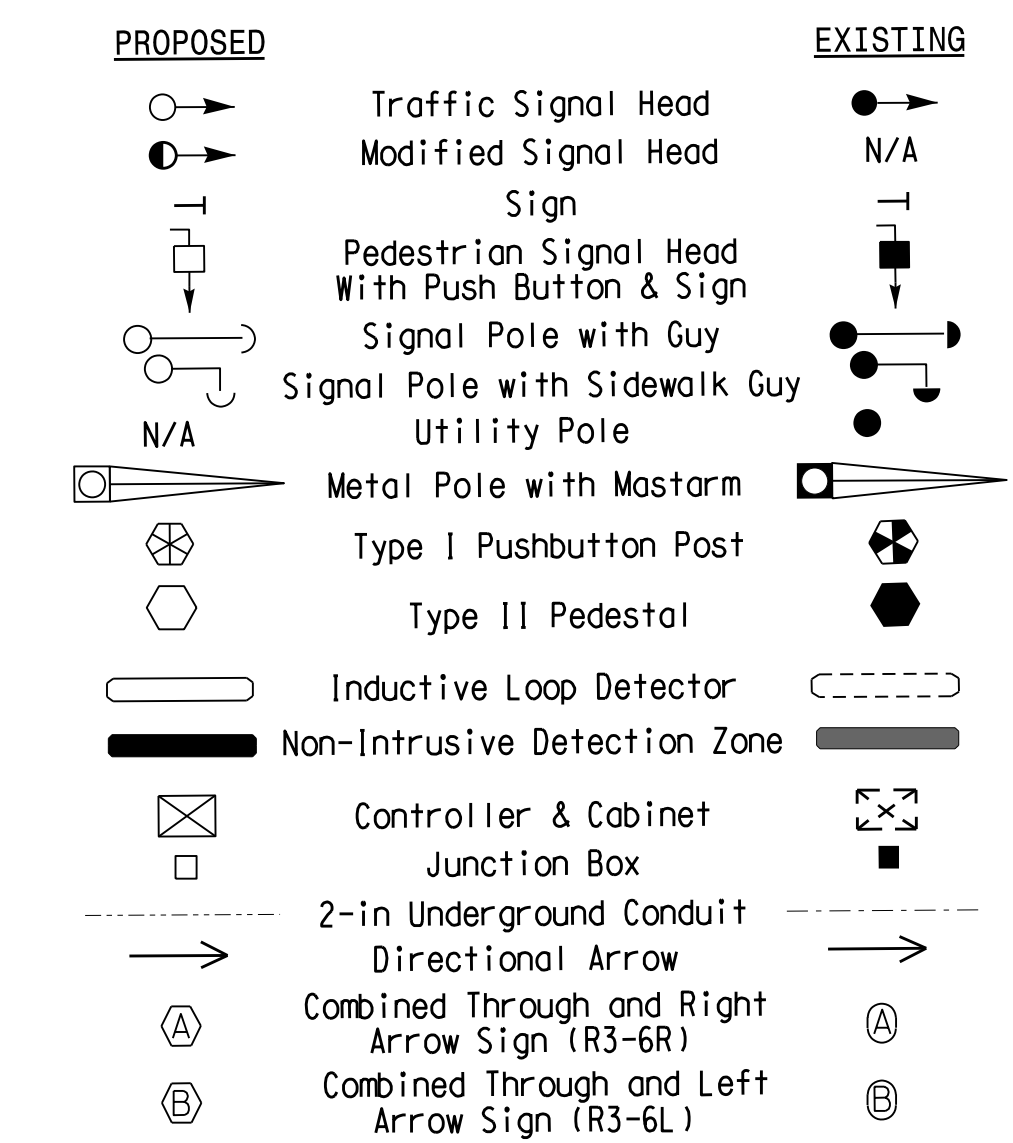
- Refer to "Roadway Standard Drawings NCDOT" dated July 2024 and "Standard Specifications for Roads and Structures" dated July 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through all red display.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Install new 2070 LX controller in existing signal cabinet.

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND



Signal Upgrade (Sheet 2 of 2)

	Prepared in the Offices of: <b>US 19 (Main Street)</b> at <b>SR 1364 (Everett Street) / Rector Street</b> Division 14 Swain County Bryson City		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL 
	PLAN DATE: October 2025 PREPARED BY: Adja Fall	REVIEWED BY: R.N. Zinser	

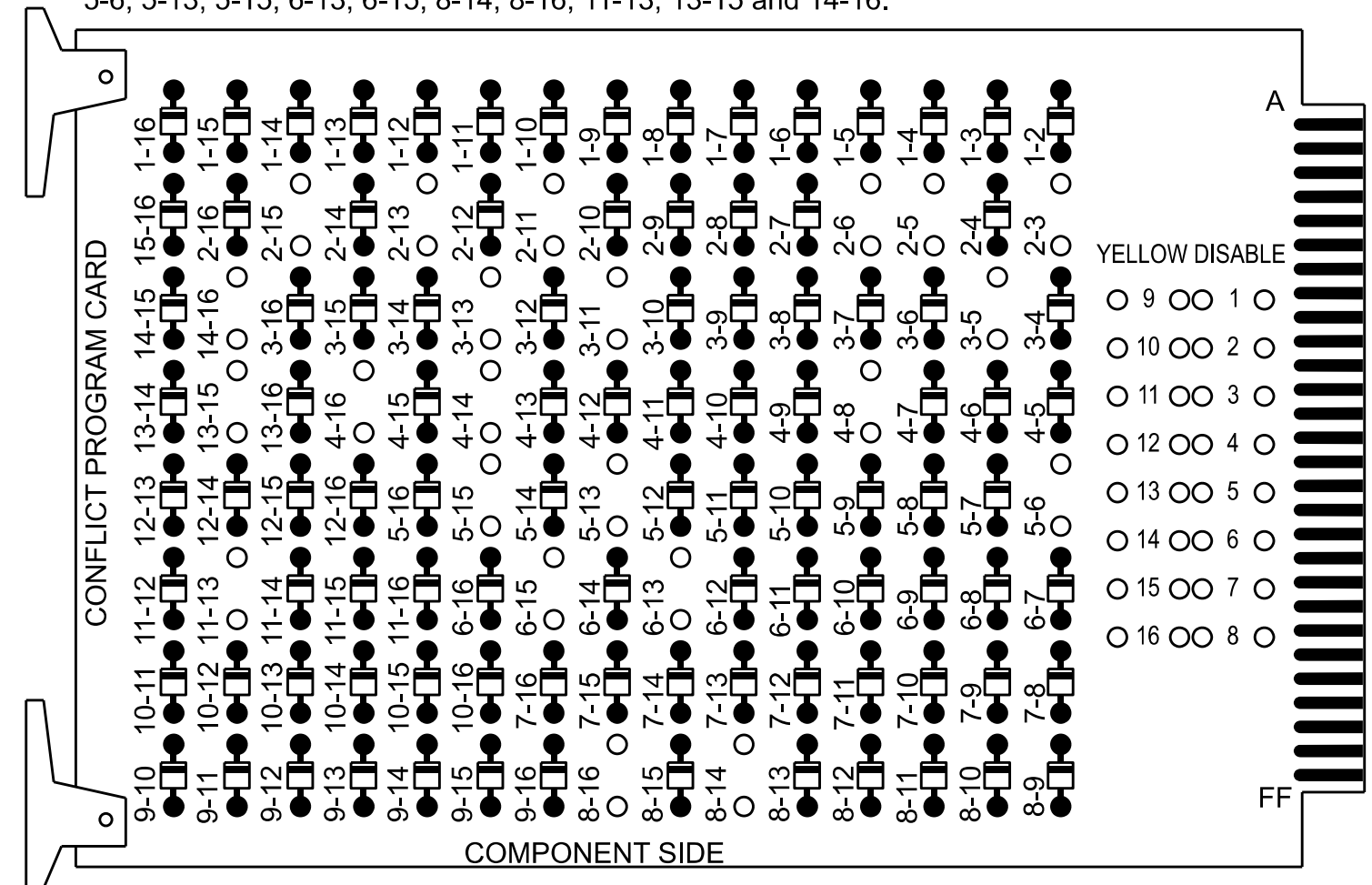
23 OCT 2025 12:20  
 P:\GIS\Projects\2025\10\Signal Design\2025-10\CA\DD\XXXXXX\_sig\_den\_000000.dgn

**16 CHANNEL CONFLICT MONITOR**

**PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

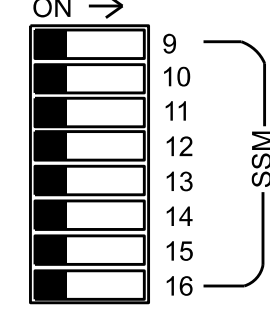
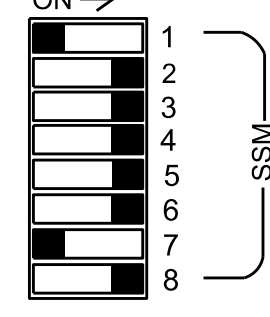
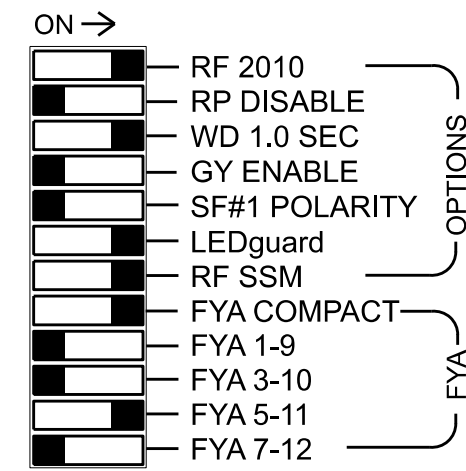
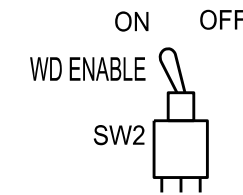
REMOVE DIODE JUMPERS 2-3, 2-5, 2-6, 2-11, 2-13, 2-15, 3-5, 3-11, 3-13, 4-8, 4-14, 4-16, 5-6, 5-13, 5-15, 6-13, 6-15, 8-14, 8-16, 11-13, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

**NOTES:**

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.
- Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on sheet 2.



■ = DENOTES POSITION OF SWITCH

**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 phases 2, 4, 6 and 8 for Simultaneous Start.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

**EQUIPMENT INFORMATION**

Controller.....2070LX  
 Cabinet.....332  
 Software.....Q-Free MAXTIME  
 Cabinet Mount.....Base  
 Output File Positions.....12  
 Load Switches Used.....S2, S2P, S3, S4, S4P, S5, S6, S6P, S8, S8P  
 Phases Used.....2, 2PED, 4, 4PED, 5, 6, 6PED, 7, 8, 8PED  
 Overlap "1".....Not Used  
 Overlap "2".....Not Used  
 Overlap "3".....\*  
 Overlap "4".....Not Used  
 Overlap "5".....\*

\*See overlap programming detail on sheet 2

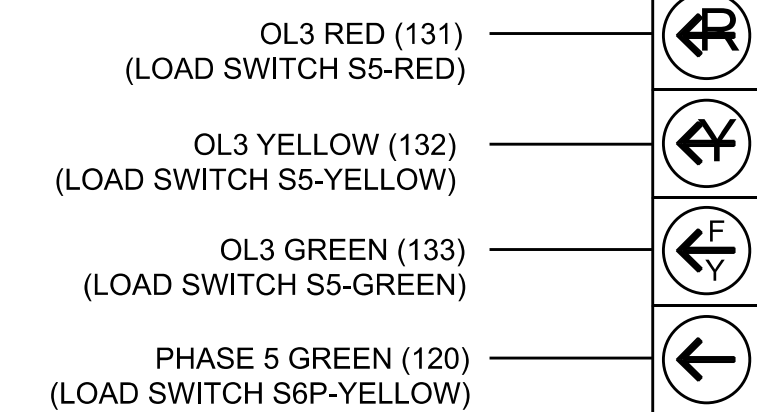
**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	11	7	8
PHASE	1	2	2 PED	OL3	4	4 PED	OL3	6	6 PED	5 GRN	7	8
SIGNAL HEAD NO.	NU	21,22	P21, P22	42	41,42	P41, P42	51	61,62	P61, P62	51	NU	81,82
RED		128		*	101			134				107
YELLOW		129			102			135				108
GREEN		130			103			136				109
RED ARROW								131				
YELLOW ARROW				117				132				
FLASHING YELLOW ARROW								133				
GREEN ARROW			113			104			119			110
FLASHING GREEN ARROW					118					120		
FLASHING GREEN ARROW						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.

**FYA SIGNAL WIRING DETAIL**

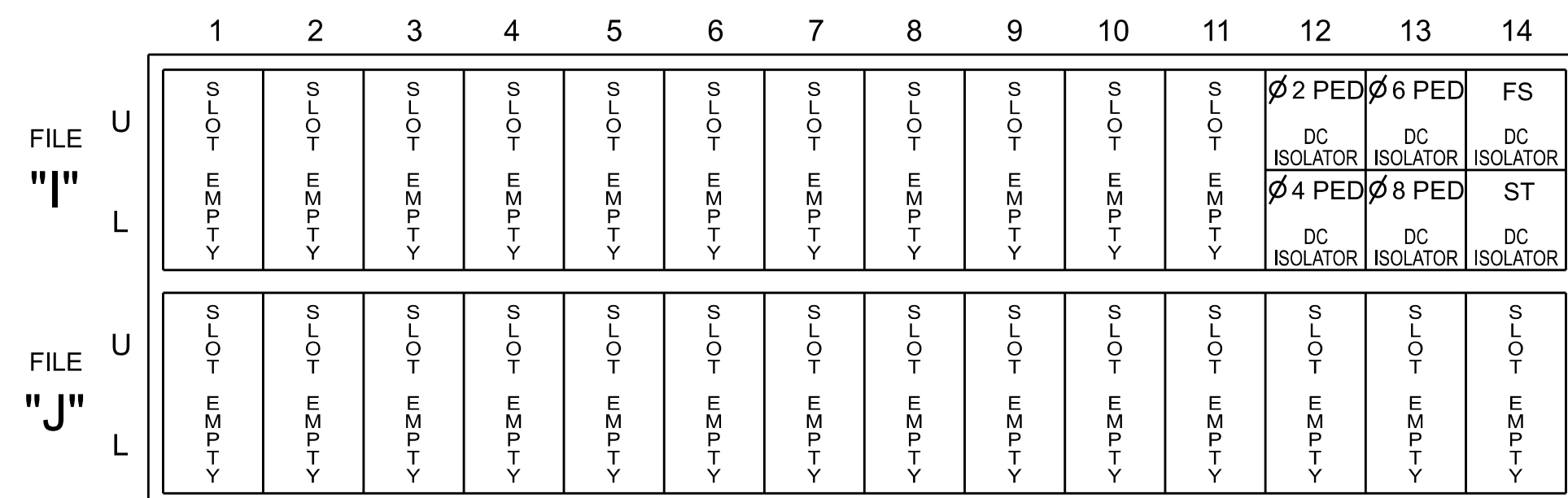
(wire signal heads as shown)



51

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

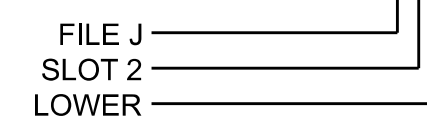
If present, remove jumper from J1-W to I4-W on rear of input file.

**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
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						

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L



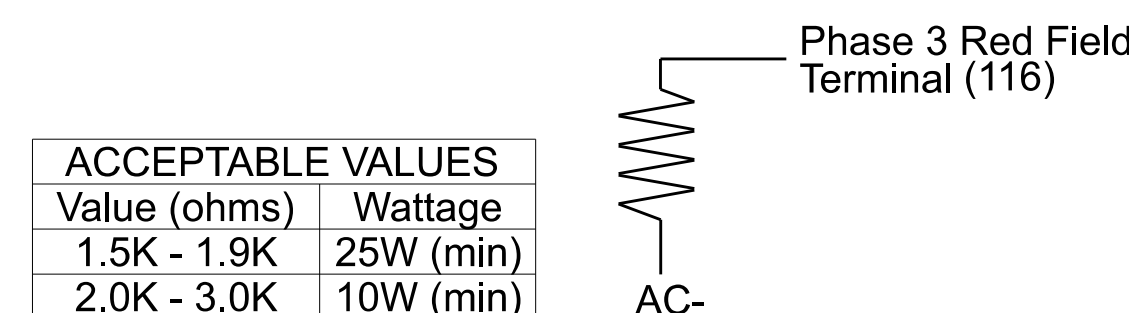
**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 14-0402  
 DESIGNED: October 2025  
 SEALED: 10/23/2025  
 REVISED: N/A

**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)

**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.

Electrical Detail - Sheet 1 of 2

Prepared in the Offices of:

US 19 (Main Street) at SR 1364 (Everett Street)/ Rector Street

Division 14 Swain County Bryson City

PLAN DATE: October 2025 REVIEWED BY:

PREPARED BY: Sarah Kirkpatrick REVIEWED BY:

REVISIONS: INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036833 RYAN W. HOUGH

Signed by: 10/24/2025 DATE

SIG. INVENTORY NO. 14-0402

### 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	Overlap	5		X	X	3
4	Phase Vehicle	4		X		4
5	Overlap	3		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

NOTE OVERLAP 5 →  
NOTE OVERLAP 3 →

### BACKUP PREVENTION PROGRAMMING

Front Panel  
Main Menu >Controller >Sequence & Phs Config >Backup Prevention > Backup Protection Plan

Web Interface  
Home >Controller> Backup Prevention >Backup Protection Plan

#### Sequence 1

No Backup Phase	1	2	3	4	5	6	7	8
Serve Phase 1	-	-	-	-	-	-	-	-
Serve Phase 2	-	-	-	-	-	-	-	-
Serve Phase 3	-	-	-	-	-	-	-	-
Serve Phase 4	-	-	-	-	-	-	-	-
Serve Phase 5	-	-	-	-	-	-	-	-
Serve Phase 6	-	-	-	-	X	-	-	-
Serve Phase 7	-	-	-	-	-	-	-	-
Serve Phase 8	-	-	-	-	-	-	-	-

### ALL RED BACKUP PROGRAMMING

Front Panel  
Main Menu >Controller >Sequence & Phs Config>Backup Prevention > Backup Through Red

Web Interface  
Home >Controller >Backup Prevention >Backup Calls Phase Plans > (scroll down) to Backup Through Red

#### Backup Through All Red

Sequence	Backup Through All Red
1	YES

### ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that point in both directions of travel shall be installed if the median separates two parallel crosswalks.

### FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 51

Front Panel  
Main Menu >Controller >More >Advanced IO >Output Points

Web Interface  
Home >Controller >Advanced IO >Cabinet Configuration >Output Points

#### IO Module 1

Output Point	Description	Output Control Type	Index
33	C1-35	Not Active	13
34	C1-36	Phase Green	5
35	C1-37	Not Active	14
36	C1-38	Not Active	16

NOTICE OUTPUT POINT 34 CONTROL TYPE & INDEX REASSIGNMENT →

### PED YELLOW CONFLICT MONITOR WIRING DETAIL (make cabinet wiring changes as shown below)

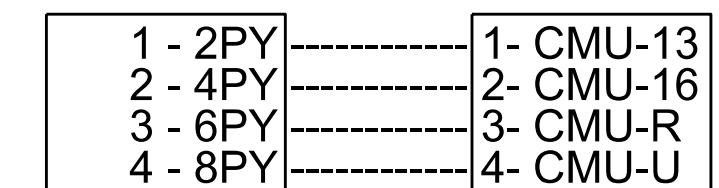
In order to use FYA COMPACT mode with the 16 or 18 Channel Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: From 6 PY (field term. 120) to chan. 10 green (monitor pin R).

Follow the instructions below to make appropriate connections:

- STEP 1: Fold down rear panel of output file.
- STEP 2: Find unused wiring harness fom conflict monitor card edge connector (which should be tied and bundled together).
- STEP 3: Find the connector that correspond to the folloeing conflict monitor card edge pins and solder wire the the appropriate terminal on the rear of the output file shown below:

CMU-R -----6PY (term. 120)

NOTE: Some cabinet manufacturers use keyed connectors to accomplish this wiring configuration. If connectors are used, fold down the rear panel of the output file and find the set of 3 keyed connectors and connect them as shown below:



### 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
-------------------------	---

### OVERLAP PROGRAMMING

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

Web Interface  
Home >Controller >Overlap Configuration >Overlaps  
Overlap Plan 1

Overlap	3	5
Type	FYA - 4 Section	Normal
Included Phases	6	5
Modifier Phases	5	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 14-0402  
DESIGNED: October 2025  
SEALED: 10/23/2025  
REVISED: N/A

Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For: **US 19 (Main Street) at SR 1364 (Everett Street)/ Rector Street**

Prepared in the Offices of:

Division 14 Swain County Bryson City

PLAN DATE: October 2025 REVIEWED BY:

PREPARED BY: Sarah Kirkpatrick REVIEWED BY:

REVISIONS: INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

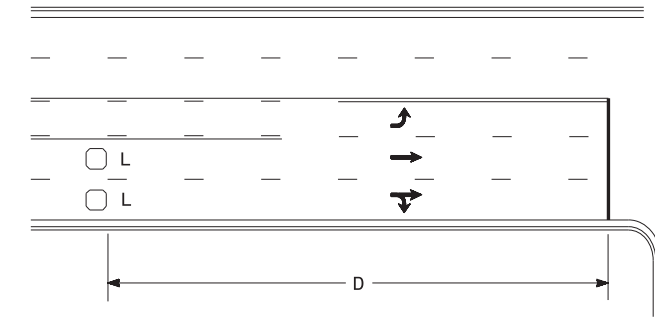
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER RYAN W. HOUGH 036833

Signed by: **Ryan W. Hough** 10/24/2025

SIG. INVENTORY NO. 14-0402

### High Speed Detection (≥35 mph)

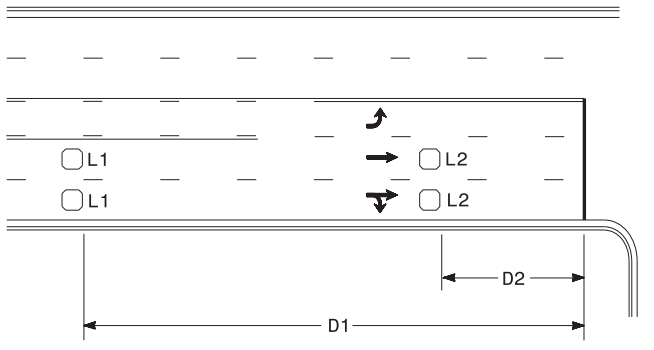


Speed Limit mph	D ft
35	200
40	250
45	300
50	355
55	420
60	475
65	550

L = 6ft X 6ft  
Wired separately

Volume Density Operation

OR

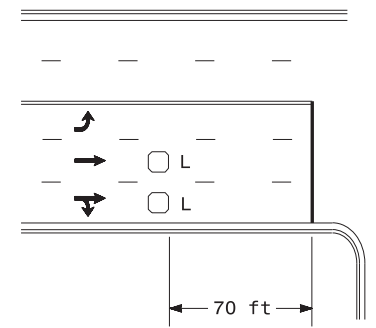


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110
60	475	120
65	550	130

L1 = 6ft X 6ft  
Wired in series  
  
L2 = 6ft X 6ft  
Wired in series

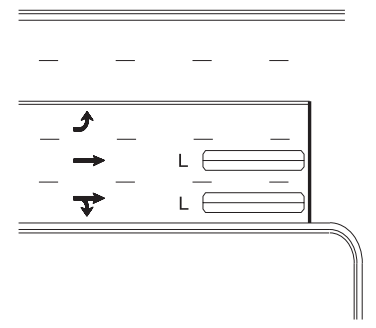
"Stretch" Operation

### Low Speed Detection (≤35 mph)



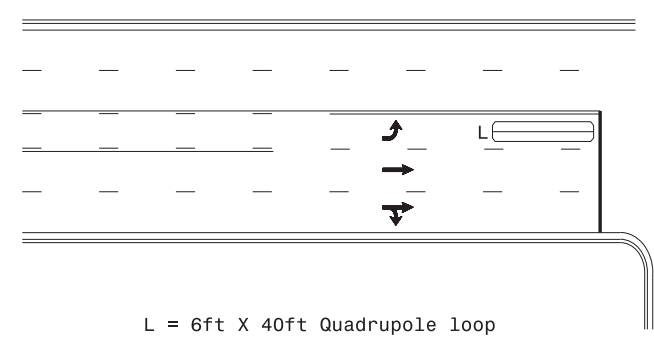
L = 6ft X 6ft  
Wired in series

OR



L = 6ft X 40ft  
Quadrupole loop, wired separately

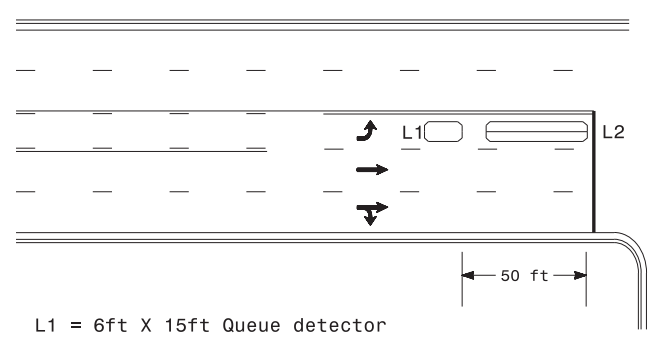
### Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

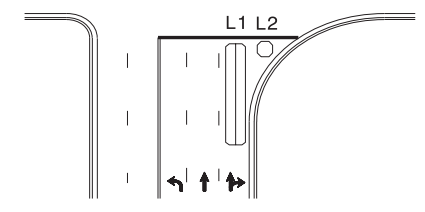
OR



L1 = 6ft X 15ft Queue detector  
L2 = 6ft X 40ft Quadrupole loop

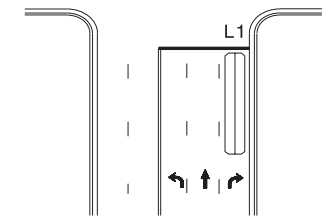
Queue Loop Detection

### Right Turn Lane Detection

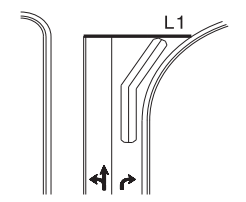


Shared Lane/  
Wide Radius Turn

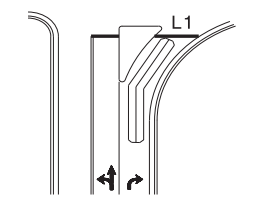
L1 = 6ft X 40ft Quadrupole loop  
L2 = 6ft X 6ft [Minimum] Presence loop  
Wired separately



Standard Turn

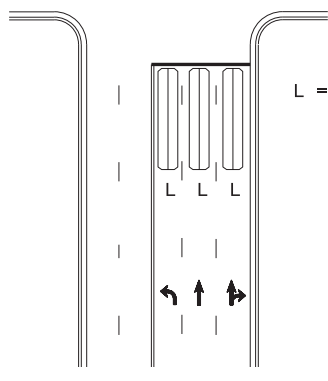


Wide Radius Turn



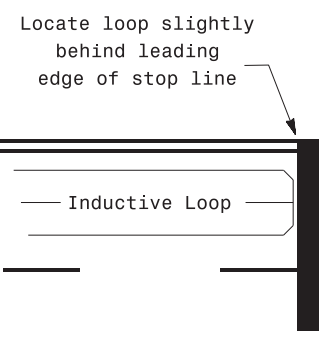
Channelized Turn

### Side Street Detection



L = 6ft X 40ft  
Quadrupole loop  
Wired to separate  
detectors/channels

### Presence Loop Placement at Stop Lines



Locate loop slightly  
behind leading  
edge of stop line

Note:  
Loop may be located in advance  
of stop line under any of the  
following conditions:  
1) stop line is greater than 15'  
from edge of intersecting  
roadway  
2) loop detects a permissive or  
protected/permissive left turn  
3) for an exclusive right turn  
lane

### Recommended Number of Turns

Single 6' X 6' loop  
(when wired separately):

Length of Lead-in ft	Number of Turns
< 250	3
250-375	4
375-525	5
> 525	6

Quadrupole loops: Use 2-4-2 turns

6' X 15' Loops:  
Lead-in < 150', use 2 turns  
Lead-in > 150', use 3 turns

Typical Signal Loop Locations

Prepared in the Offices of:		PLAN DATE: September 2025		REVIEWED BY:	
		PREPARED BY: J.A. Lohr		REVIEWED BY:	
		SCALE: N/A		INIT. DATE	
750 N. Greenfield Pkwy, Garner, NC 27529		REVISIONS		DATE	
SIGNED: J.A. Lohr		DATE: 11/25/2025		DATE	

SIG. INVENTORY NO.

17-NOV-2025 07:35 S:\IT\SSUM\15\SIGNAL\Signal Design Section\Eastern Region\Loop\_Typical\Loop\_Typical.dgn JAL