PROJECT: R-5514

CONTRACT: C203436

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

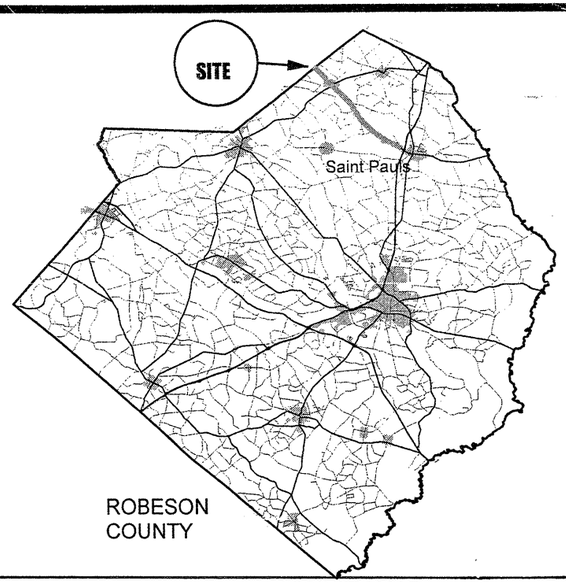
ROBESON COUNTY

LOCATION: NC 20, LOCATED BETWEEN SR 1732 AND THE HOKE COUNTY LINE

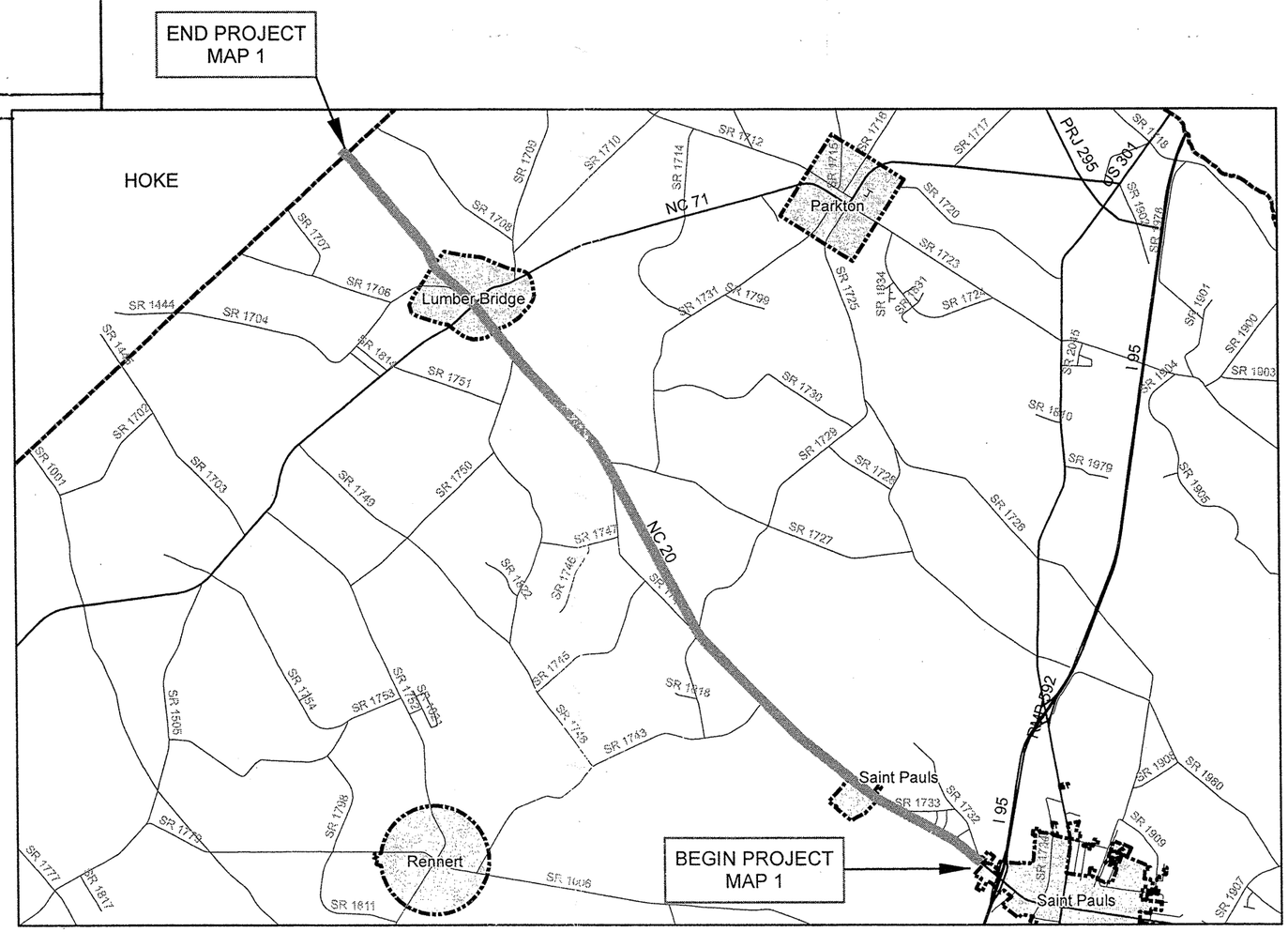
TYPE OF WORK: WIDENING AND RESURFACING

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	R-5514	1	

STATE PROJ. NO.	F.A. PROJ. NO.
45468.3.F R1	STP-0020(7)



VICINITY MAP



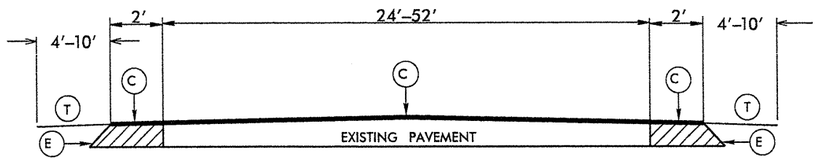
N

Legend

- Project
- Primary Routes
- Secondary Routes
- MunicipalBoundaries
- CountyBoundary

Date: 8/14/2013

PROJECT REFERENCE NO.	SHEET NO.
R-5514	2



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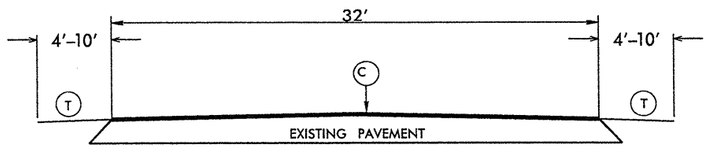

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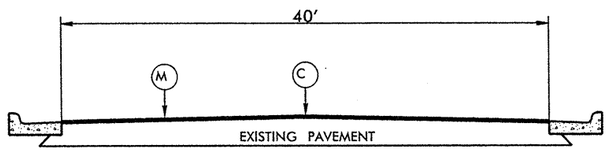
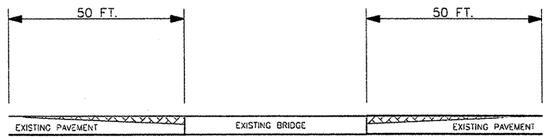


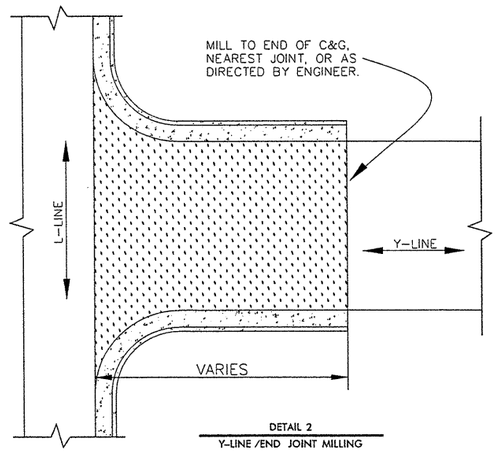
TYPICAL SECTION NO. 3



DETAIL 1

MILLING APPROACHES
AND CONSTRUCTION JOINTS

NOTE:
INCIDENTAL MILLING SHALL BE PERFORMED AT BRIDGES, RAILROAD APPROACHES, AND CONSTRUCTION JOINTS AS DIRECTED BY THE ENGINEER IN ACCORDANCE WITH DETAIL 1.



DETAIL 2
Y-LINE /END JOINT MILLING

NOTE: INCLUDES INCIDENTAL MILLING AT THE ENDS OF SECTIONS FOR SMOOTH TIE-INS, CURB RADII, AND STREET INTERSECTIONS, AS NEEDED, OR AS DIRECTED BY THE ENGINEER.

PAVEMENT SCHEDULE	
C	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
E	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
M	MILLING BITUMINOUS PAVEMENT. 1½" DEPTH. FULL WIDTH.
T	SHOULDER RECONSTRUCTION

PROJECT NO.	SHEET NO.	TOTAL NO.
R-5514	3	

SUMMARY OF QUANTITIES

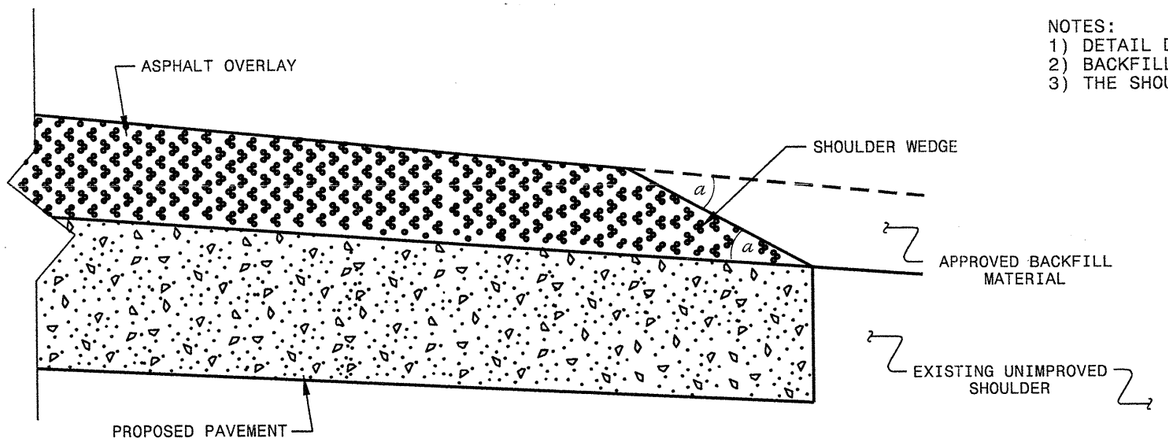
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LENGTH MI	WIDTH FT	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	REMOVAL OF EXISTING ASPHALT CURBING LF	REMOVAL OF EXISTING ASPHALT PAVEMENT SY	AGGREGATE SHOULDER BORROW TON	1¼" MILLING SY	INCIDENTAL MILLING SY	BASE COURSE, B25.0B TONS	SURFACE COURSE, S9.5B TONS	ASPHALT BINDER FOR PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	5" MONOLITHIC CONCRETE ISLANDS(SURFACE MOUNTED) SY	PAVED TRENCHING (1 CONDUIT-2") LF	UNPAVED TRENCHING (1 CONDUIT-2") LF	JUNCTION BOX (STANDARD SIZE) EA	JUNCTION BOX (OVER-SIZED, HEA-VY DUTY) EA	2" RISER WITH WEATHERHEAD EA	INDUCTIVE LOOP SAWCUT LF	LEAD-IN CABLE (14-2) LF
R-5514	Robeson	1	NC 20	FROM SR 1732 (MP 8.97) TO THE HOKE CO LINE (MP 0.00)	1	7.42	28	NO	NO			965			4,962	10,440	845			30	300	3	3	3	2,700	300
		"	"	FROM SR 1732 TO HOKE CO LINE	1	0.6	46	NO	NO			78			401	1,360	99									
		"	"	FROM SR 1732 TO HOKE CO LINE	3	0.45	40	NO	NO				10,560	400		887	53	50								
		"	"	FROM SR 1732 TO HOKE CO LINE	2	0.5	32	NO	NO	75	10	65				789	47		10							
TOTAL FOR MAP NO. 1						**8.97**				**75**	**10**	**1,108**	**10,560**	**400**	**5,363**	**13,476**	**1,044**	**50**	**10**	**30**	**300**	**3**	**3**	**3**	**2,700**	**300**
TOTAL FOR PROJ NO. R-5514						**8.97**				**75**	**10**	**1,108**	**10,560**	**400**	**5,363**	**13,476**	**1,044**	**50**	**10**	**30**	**300**	**3**	**3**	**3**	**2,700**	**300**
GRAND TOTAL						**8.97**				**75**	**10**	**1,108**	**10,560**	**400**	**5,363**	**13,476**	**1,044**	**50**	**10**	**30**	**300**	**3**	**3**	**3**	**2,700**	**300**

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LENGTH	WIDTH	4589000000-N GENERIC TRAFFIC CONTROL ITEM TEMPORARY TRAFFIC CONTROL LS	4595000000-E GENERIC SIGNING ITEM WORK ZONE ADVANCE GENERAL WARNING SIGNING SF	4510000000-N LAW ENFORCEMENT HR	4685000000-E 4" X 90 M WHITE THERMO LF	4686000000-E 4" X 120 M YELLOW THERMO LF	4686000000-E 4" X 120 M WHITE THERMO LF	4695000000-E 8" X 90 M YELLOW THERMO LF	4705000000-E 16" X 120 M WHITE THERMO LF	4710000000-E 24" X 120 M WHITE THERMO LF	4721000000-E THERMO RXR 120 M EA	4725000000-E THERMO LT ARROW 90 M EA	4725000000-E THERMO RT ARROW 90 M EA	4810000000-E 4" WHITE PAINT LF	4810000000-E 4" YELLOW PAINT LF	4830000000-E 16" WHITE PAINT LF	4835000000-E 24" WHITE PAINT LF	4840000000-N PAINT MSG RXR EA	4900000000-N CRYSTAL & RED MARKERS EA	4900000000-N YELLOW & YELLOW MARKERS EA
R-5514	Robeson	1	NC 20	FROM SR 1732 (MP 8.97) TO THE HOKE CO LINE (MP 0.00)	1	7.42	28	1	1,004.64	40	101,000	85,850	550	300	100	125	4	19	4	6,000	5,300	100	100	4	25	650
		"	"	FROM SR 1732 TO HOKE CO LINE	1	0.6	46																				
		"	"	FROM SR 1732 TO HOKE CO LINE	3	0.45	40																				
		"	"	FROM SR 1732 TO HOKE CO LINE	2	0.5	32																				
TOTAL FOR MAP NO. 1						**8.97**		**1**	**1,004.64**	**40**	**101,000**	**85,850**	**550**	**300**	**100**	**125**	**4**	**19**	**4**	**6,000**	**5,300**	**100**	**100**	**4**	**25**	**650**
TOTAL FOR PROJ NO. R-5514						**8.97**		**1**	**1,004.64**	**40**	**101,000**	**85,850**	**550**	**300**	**100**	**125**	**4**	**19**	**4**	**6,000**	**5,300**	**100**	**100**	**4**	**25**	**650**
												86,400						**23**		**11,300**					**675**	
GRAND TOTAL						**8.97**		**1**	**1,004.64**	**40**	**101,000**	**85,850**	**550**	**300**	**100**	**125**	**4**	**19**	**4**	**6,000**	**5,300**	**100**	**100**	**4**	**25**	**650**
												86,400						**23**		**11,300**					**675**	

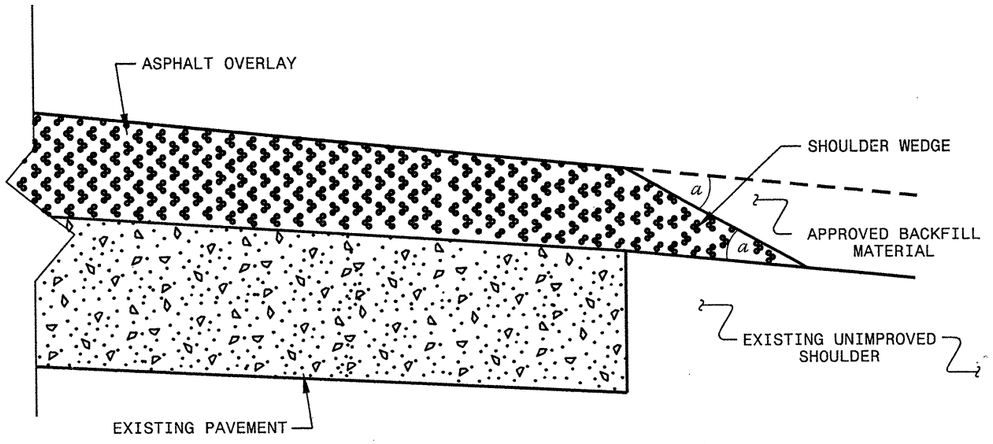
PROJECT REFERENCE NO.	SHEET NO.
R-5514	4

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.



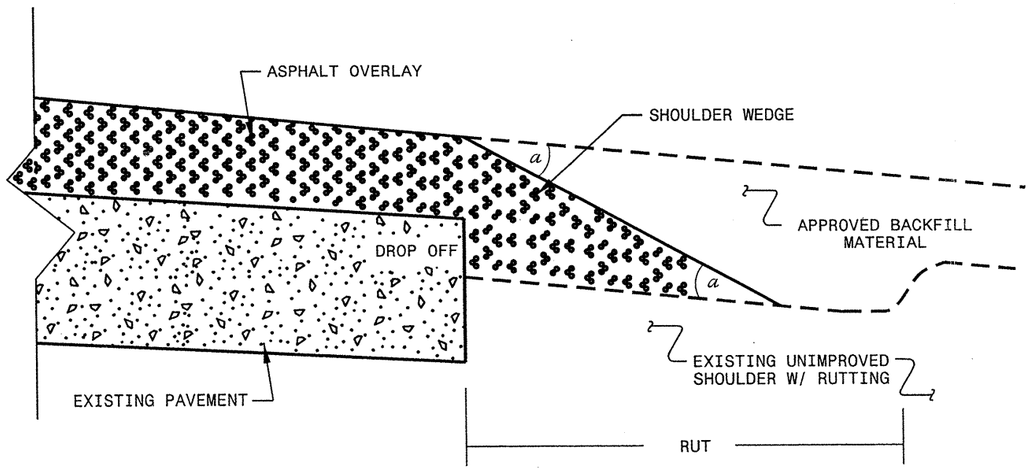
SHOULDER WEDGE DETAIL

(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°

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

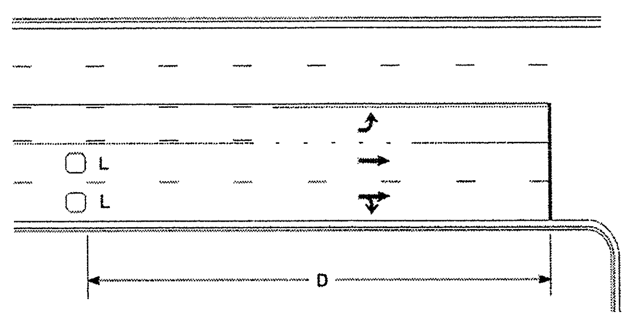
SHOULDER WEDGE DETAILS

ORIGINAL BY: T.SPELL DATE: 7-19-11
MODIFIED BY: _____ DATE: 10/16/12
CHECKED BY: _____ DATE: _____
FILE SPEC.: s:\sr\details\stand\shoulderwedgedetail.dgn

$$$$$$$SYSTIME$$$$$$$
$$$$$$$USERNAME$$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-5514	SIG 1

High Speed Detection
[≥40 mph (64 km/hr)]



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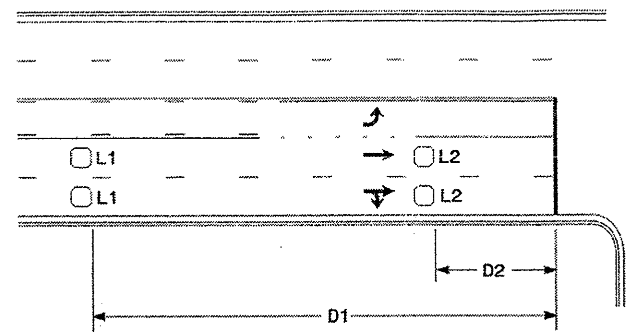


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

L = 6ft X 6ft (1.8m X 1.8m)
Wired in series for TS1 Controllers
Wired separately for TS2, 170, and 2070L Controllers

Volume Density Operation

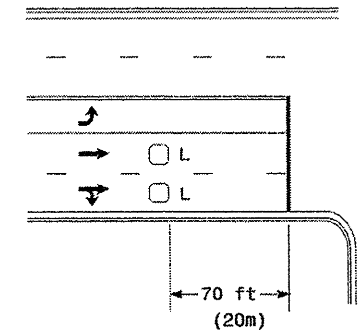
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

L1 = 6ft X 6ft (1.8m X 1.8m) Wired in series

L2 = 6ft X 6ft (1.8m X 1.8m) Wired in series

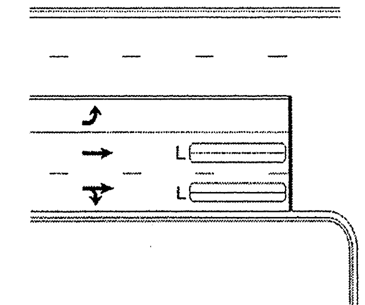
"Stretch" Operation

Low Speed Detection
[≤35 mph (56 km/hr)]



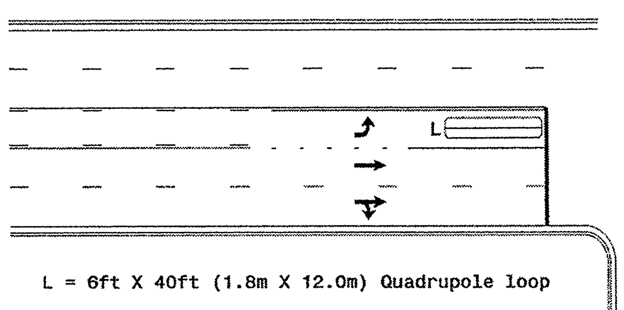
L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

OR



L = 6ft X 40ft (1.8m X 12.0m)
Quadrupole loop, wired separately

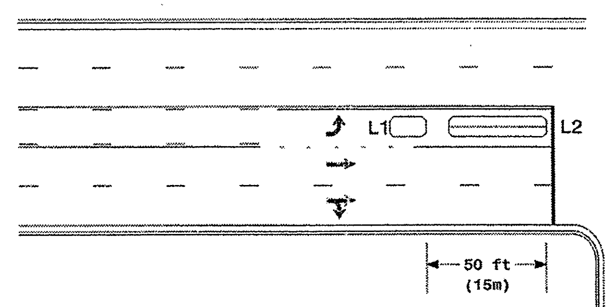
Left Turn Lane Detection



L = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

Presence Loop Detection

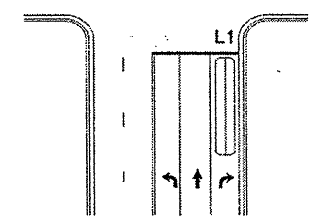
OR



L1 = 6ft X 15ft (1.8m X 4.6m) Queue detector
L2 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

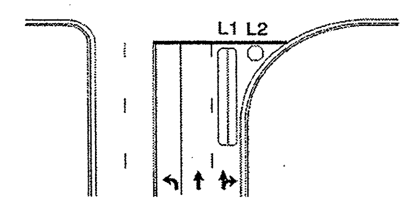
Queue Loop Detection

Right Turn Lane Detection

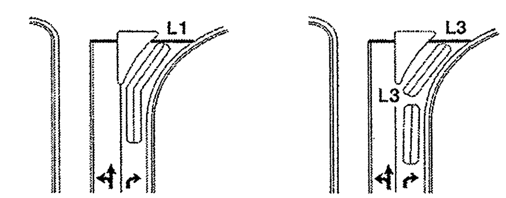


Standard Turn

L1 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop
Wired separately
L3 = 6ft X 20ft (1.8m X 6.0m) Quadrupole loop
Wired in series

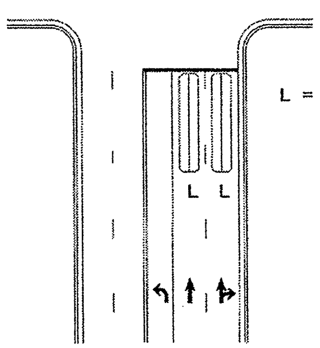


Wide Radius Turn



Channelized Turn

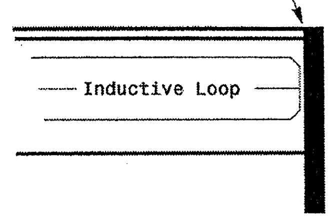
Side Street Detection



L = 6ft X 40ft (1.8m X 12.0m)
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 when stop line is greater than 15′ (4.5m) from edge of intersecting roadway; or, when loop detects a permissive or protected/permissive left turn.

Recommended Number of Turns

Single 6′ X 6′ (1.8m X 1.8m) loop (wired separately):

Length of Lead-in ft (m)	Number of Turns
< 250 (75)	3
250-375 (75-115)	4
375-525 (115-160)	5
> 525 (160)	6

Quadrupole loops: Use 2-4-2 turns

6′ X 15′ (1.8m X 4.6m) Loops:
Lead-in < 150′ (45 m), use 2 turns
Lead-in > 150′ (45 m), use 3 turns

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section
122 N. McDowell St., Raleigh, NC 27603

Typical Loop Locations

PLAN DATE: June 2006 | REVIEWED BY:
PREPARED BY: P L Alexander | REVIEWED BY:

SCALE N/A

REVISIONS: Revise pavement markings

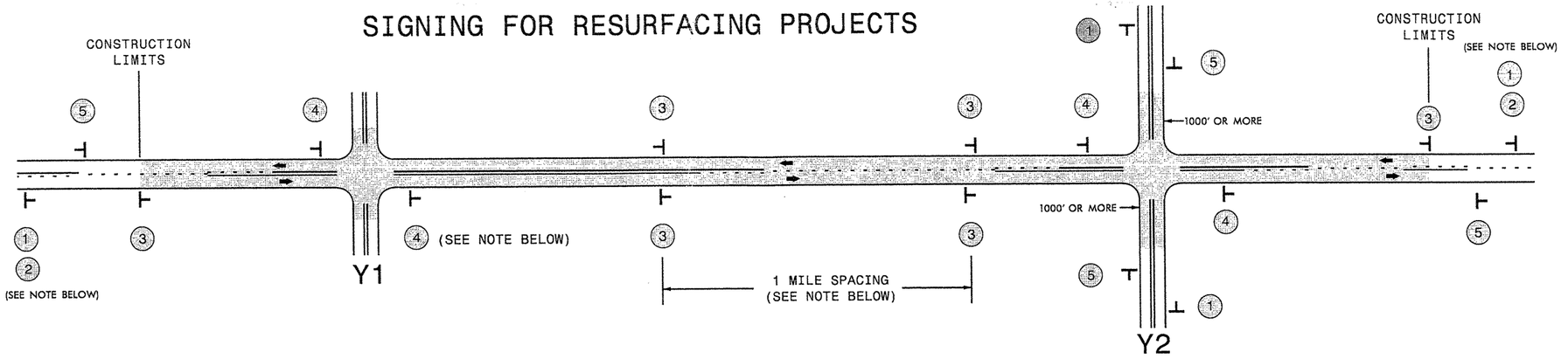
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23486 PAMELA ALEXANDER

SIGNATURE DATE 6/6/06

SIG. INVENTORY NO.

PROJ. REFERENCE NO.	SHEET NO.
R-5514	1

SIGNING FOR RESURFACING PROJECTS



LEGEND
- ⊢ STATIONARY SIGN
- ← DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION

1	ROAD WORK AHEAD 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.
2	NEXT XX MILES 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	LOW/SOFT SHOULDER 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 ½ MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.
4	ROAD UNDER CONST 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	END ROAD WORK G20-2 A 48" X 24"	PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.

-Y- LINE SIGNING

NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:

1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE
2) SUBDIVISION ROADS
3) DEAD END ROADS

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.

ROAD WORK AHEAD W20-1 48" X 48" — PLACED 500' IN ADVANCE OF FLAGGER.

W20-7 A 48" X 48" — PLACED 250' IN ADVANCE OF FLAGGER.

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

RESURFACING
ADVANCE WARNING SIGNS
FOR
RURAL AND SUBURBAN
2 LANE ROADWAYS