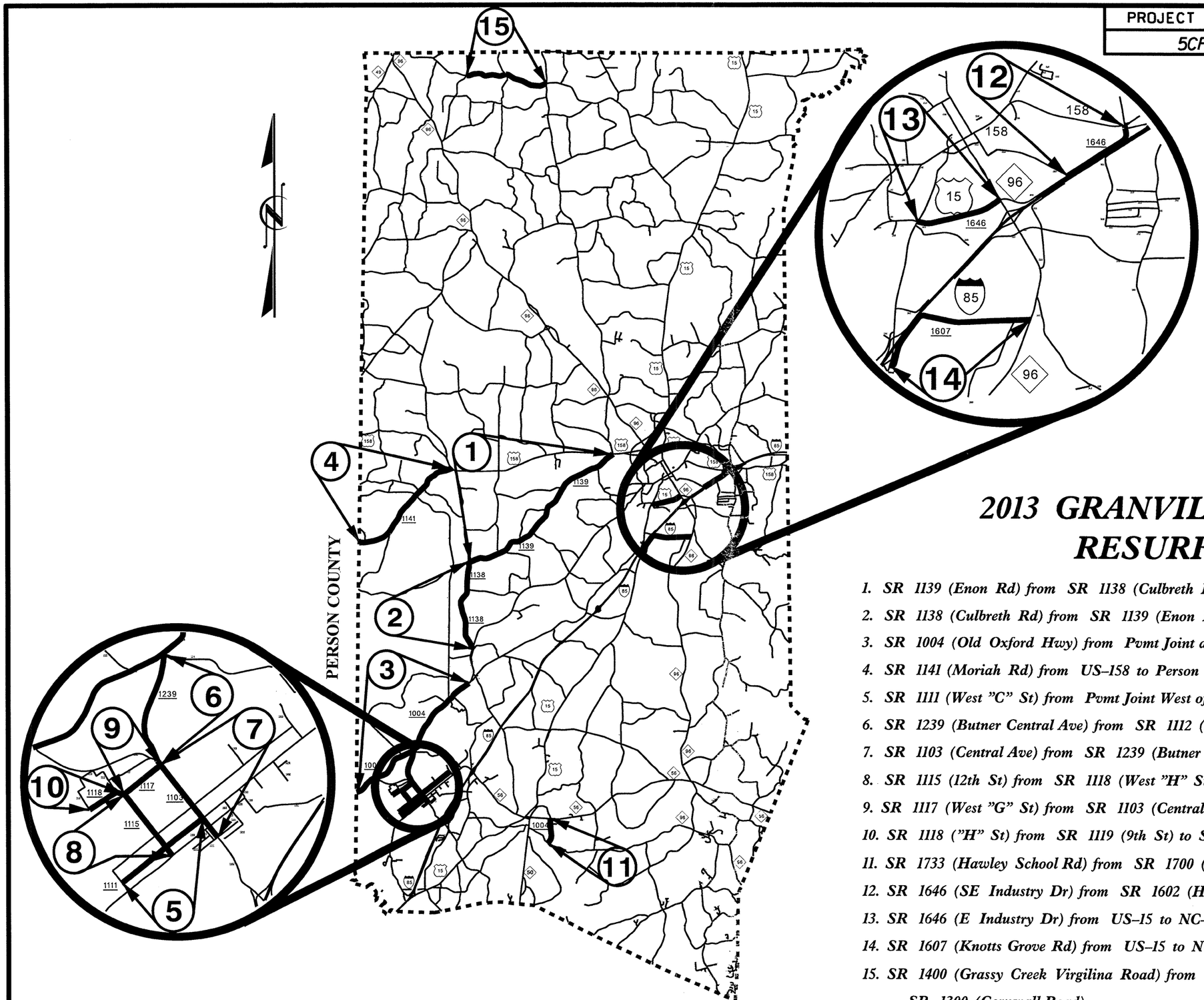
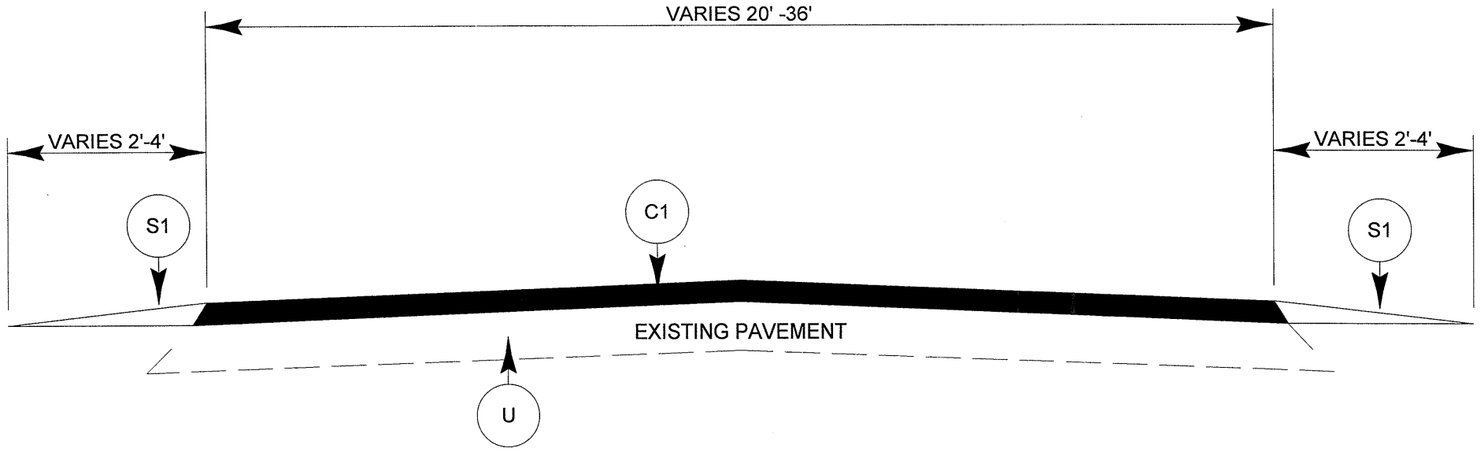
PROJECT REFERENCE NO.	SHEET NO.
5CR.203911J3	1



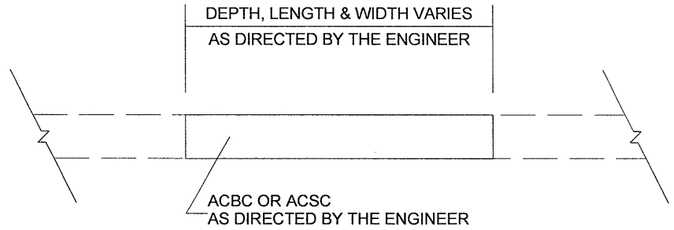
2013 GRANVILLE COUNTY RESURFACING

1. *SR 1139 (Enon Rd) from SR 1138 (Culbreth Rd) to US–158*
2. *SR 1138 (Culbreth Rd) from SR 1139 (Enon Rd.) to SR 1004 (Old Oxford Hwy)*
3. *SR 1004 (Old Oxford Hwy) from Pvmt Joint at Stem CL to Durham County Line*
4. *SR 1141 (Moriah Rd) from US–158 to Person County Line*
5. *SR 1111 (West "C" St) from Pvmt Joint West of SR 1103 to SR 1334 (5th St)*
6. *SR 1239 (Butner Central Ave) from SR 1112 (33rd St) to SR 1103 (Central Ave)*
7. *SR 1103 (Central Ave) from SR 1239 (Butner Central Ave) to SR 1201 ("A" St)*
8. *SR 1115 (12th St) from SR 1118 (West "H" St) to SR 1100 (West "B" St)*
9. *SR 1117 (West "G" St) from SR 1103 (Central Ave) to SR 1115 (12th St)*
10. *SR 1118 ("H" St) from SR 1119 (9th St) to SR 1115 (12th St)*
11. *SR 1733 (Hawley School Rd) from SR 1700 (Brassfield Rd) to Hwy. 56*
12. *SR 1646 (SE Industry Dr) from SR 1602 (Henderson St) to US–158*
13. *SR 1646 (E Industry Dr) from US–15 to NC–96*
14. *SR 1607 (Knotts Grove Rd) from US–15 to NC–96*
15. *SR 1400 (Grassy Creek Virgilina Road) from SR 1403 (Amis Chapel Road) to SR 1300 (Cornwall Road)*

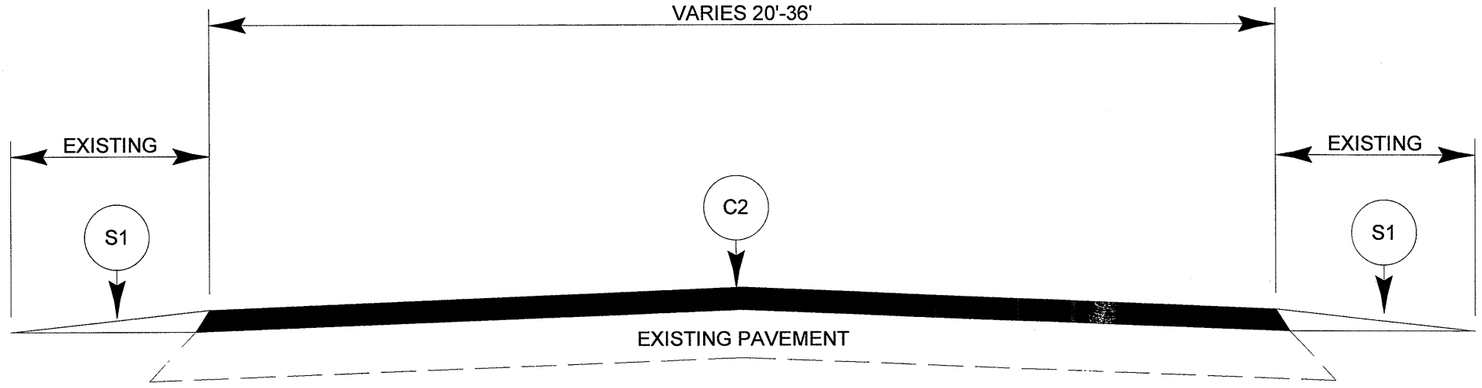
PROJECT NO.	SHEET NO.	TOTAL SHEETS
5CR.20391.13	2	



TYPICAL SECTION NO. 1



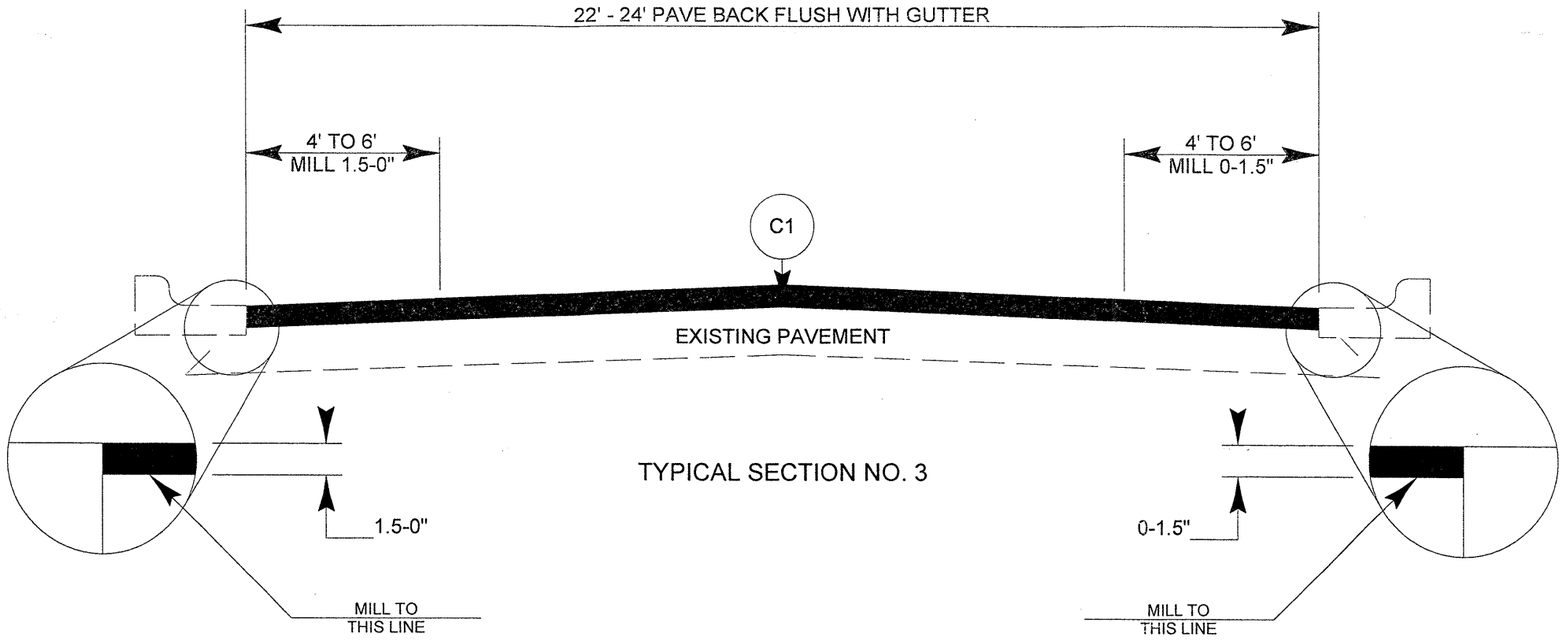
PATCHING EXISTING PAVEMENT



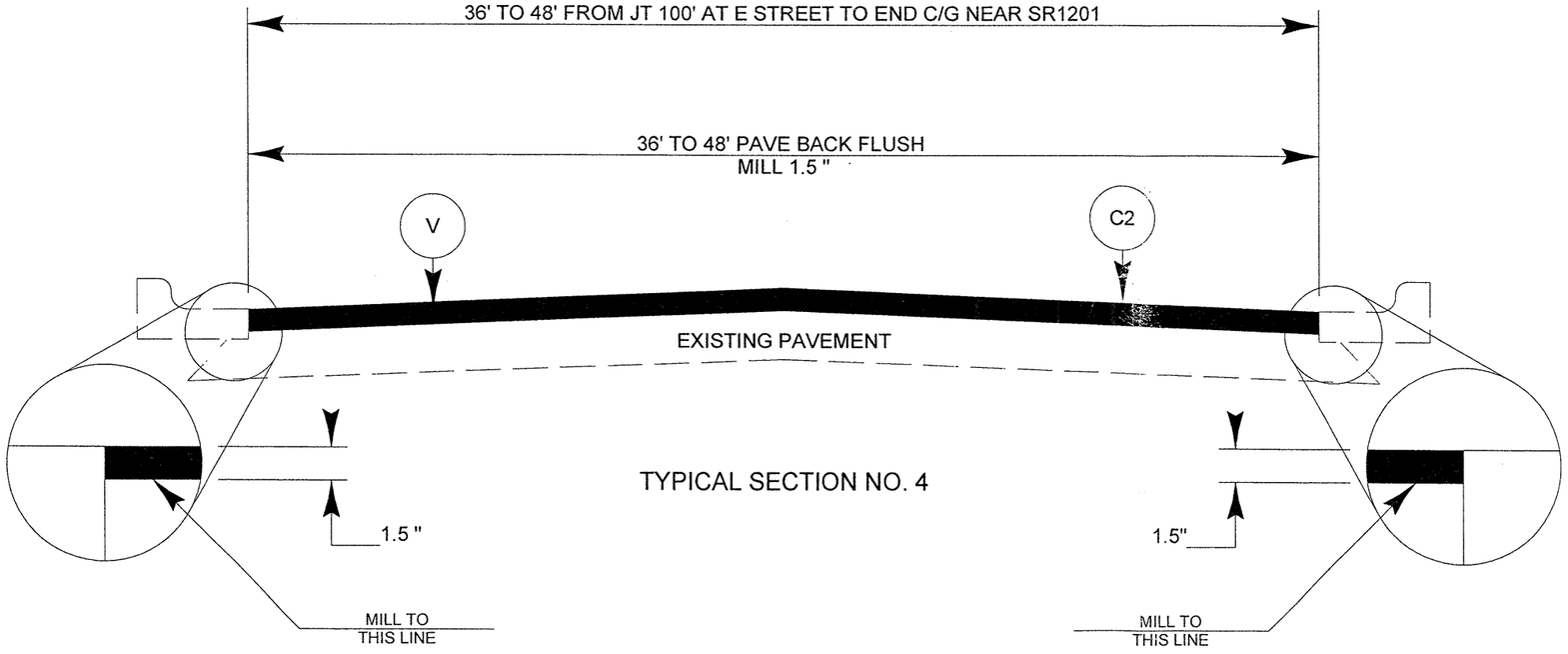
TYPICAL SECTION NO. 2

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2 " ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS PER SY
C2	PROP. APPROXI. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS PER SY
S1	SHOULDER RECONSTRUCTION WHERE APPLICABLE
S2	STATE FORCES TO PERFORM SHOULDER WORK AND SEEDING AND MULCHING IF NEEDED
V	PROPOSED 1.5 " MILLING TO REMOVE EXISTING ASPHALT

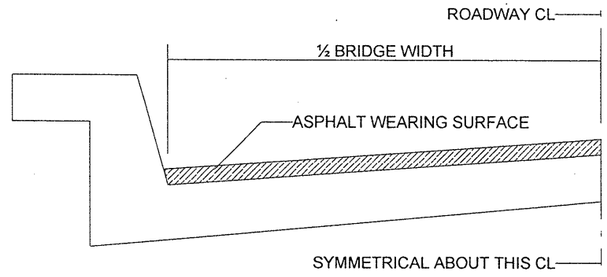
PROJECT NO.	SHEET NO.	TOTAL SHEETS
5CR.20391.13	3	



TYPICAL SECTION NO. 3



TYPICAL SECTION NO. 4



BRIDGE HALF TYPICAL SECTION

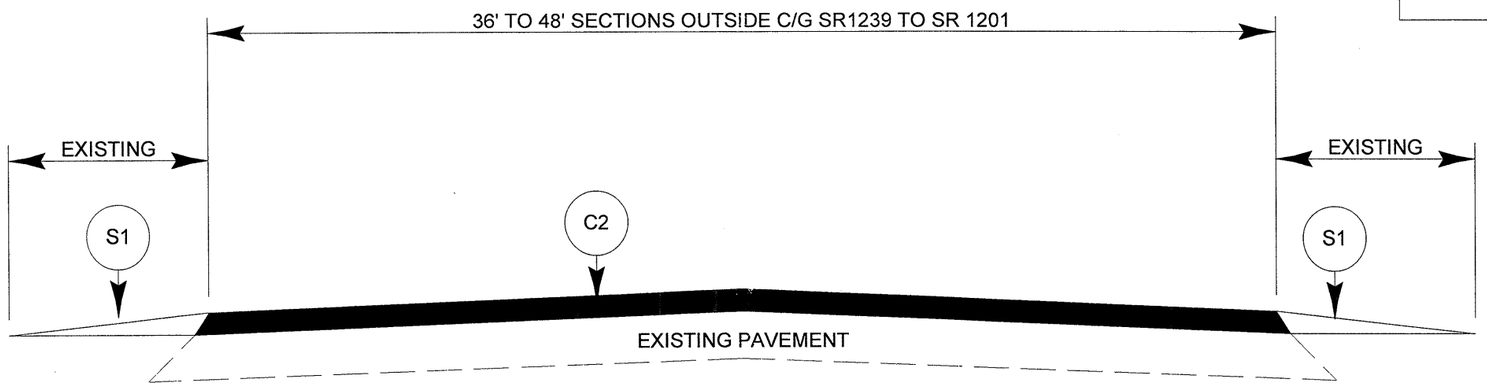
FOR BRIDGES WITH FLOOR DRAINS, CARE SHALL BE EXERCISED IN PLACING THE WEARING SURFACE AROUND FLOOR DRAINS SO AS NOT TO HINDER EFFECTIVE DRAINAGE. ALL DRAINS SHALL BE LEFT OPEN

THE PROPOSED WEARING SURFACE SHALL VARY IN THICKNESS AS NECESSARY TO PROVIDE A SMOOTH RIDING SURFACE. THE MINIMUM THICKNESS SHOULD DEPEND ON PAVEMENT TYPE AS FOLLOWS: S4.75A ½", SF9.5A 1.0", S9.5X 1.5", S12.5X 2.0", ULTRATHIN HOT MIX ASPHALT-TYPE A ¾", ULTRATHIN HOT MIX ASPHALT-TYPE B 5/8", ULTRATHIN HOT MIX ASPHALT-TYPE C ½".THE MAXIMUM THICKNESS SHOULD DEPEND ON PAVEMENT TYPE AS FOLLOWS: S4.75A 1.0", SF9.5A 1.5",S9.5X 2.0", S12.5X 2.0", ULTRATHIN HOT MIX ASPHALT-TYPE A ¾", ULTRATHIN HOT MIX ASPHALT-TYPE B 5/8", ULTRATHIN HOT MIX ASPHALT-TYPE C ½".

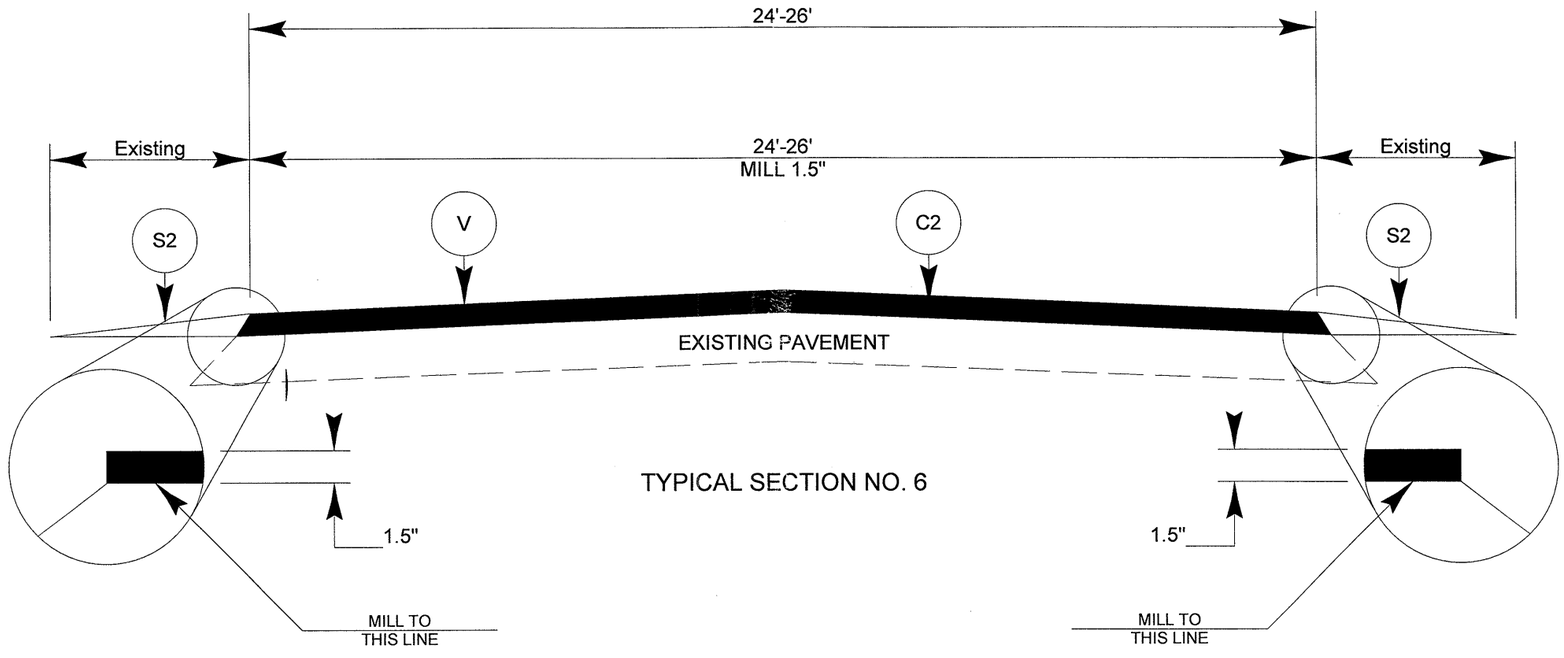
NOTES

ALL UNPAVED ROADS TO BE RESURFACED 50' FROM EDGE OF PAVEMENT OF MAIN PROJECT.
ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII, OR AS DIRECTED BY THE ENGINEER.
EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.
SHOULDERS AND DITCHES ARE TO BE CONSTRUCTED BY OTHERS UNLESS OTHERWISE INDICATED.
BRIDGES ARE TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5CR.20391.13	4	

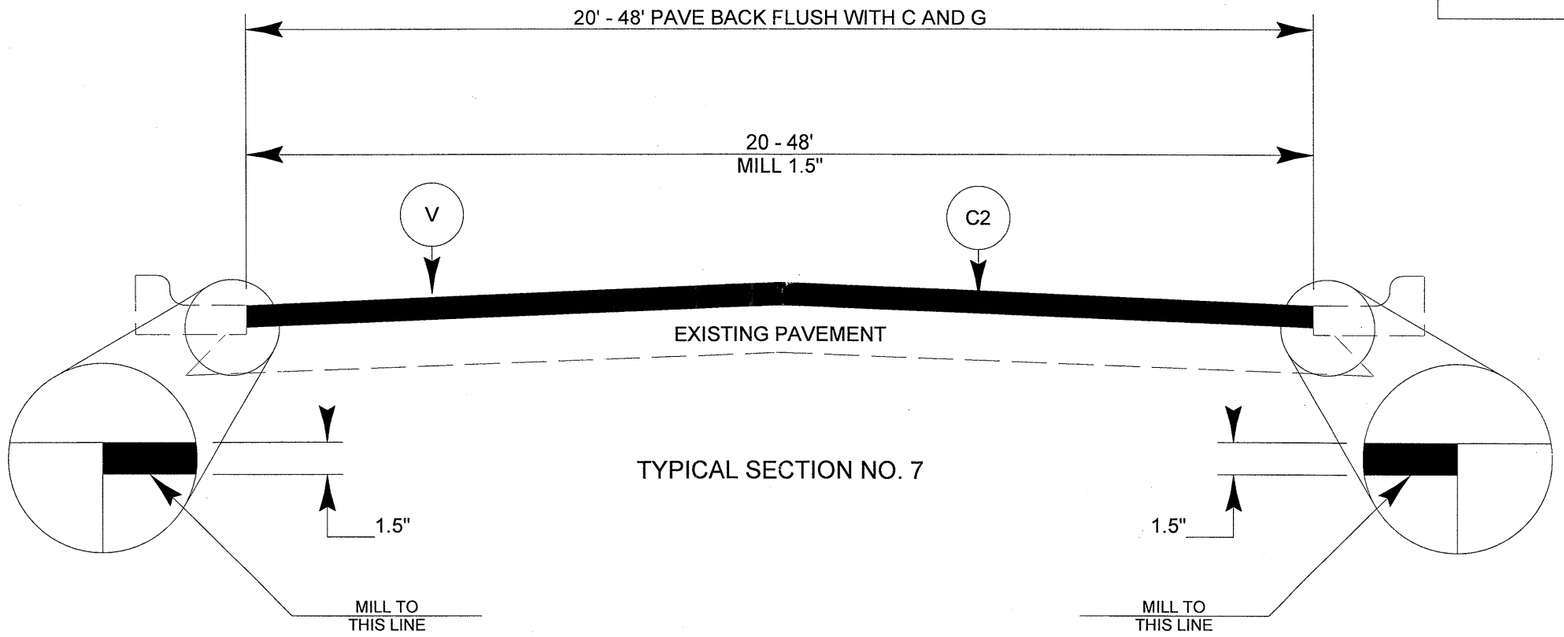


TYPICAL SECTION NO. 5

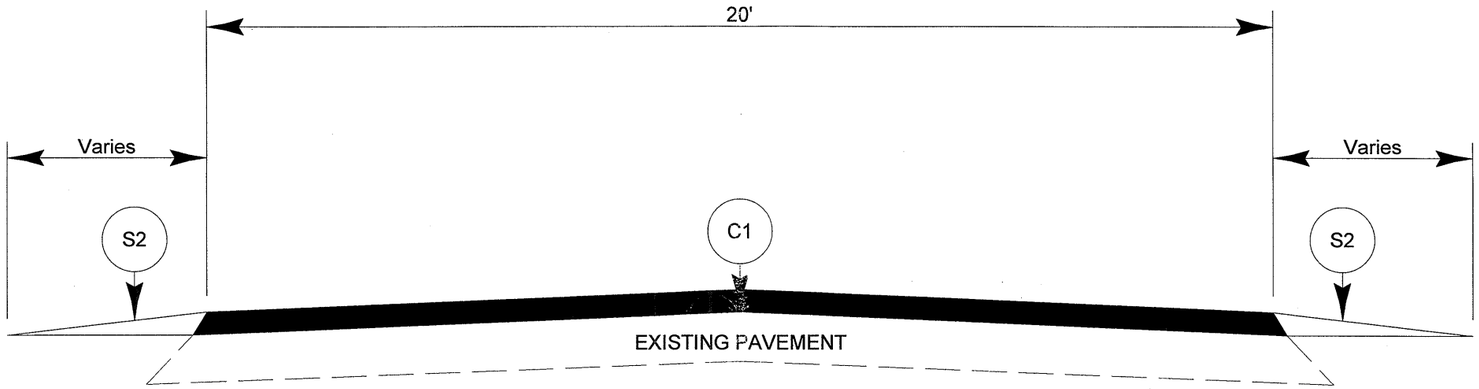


TYPICAL SECTION NO. 6

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5CR.20391.13	5	

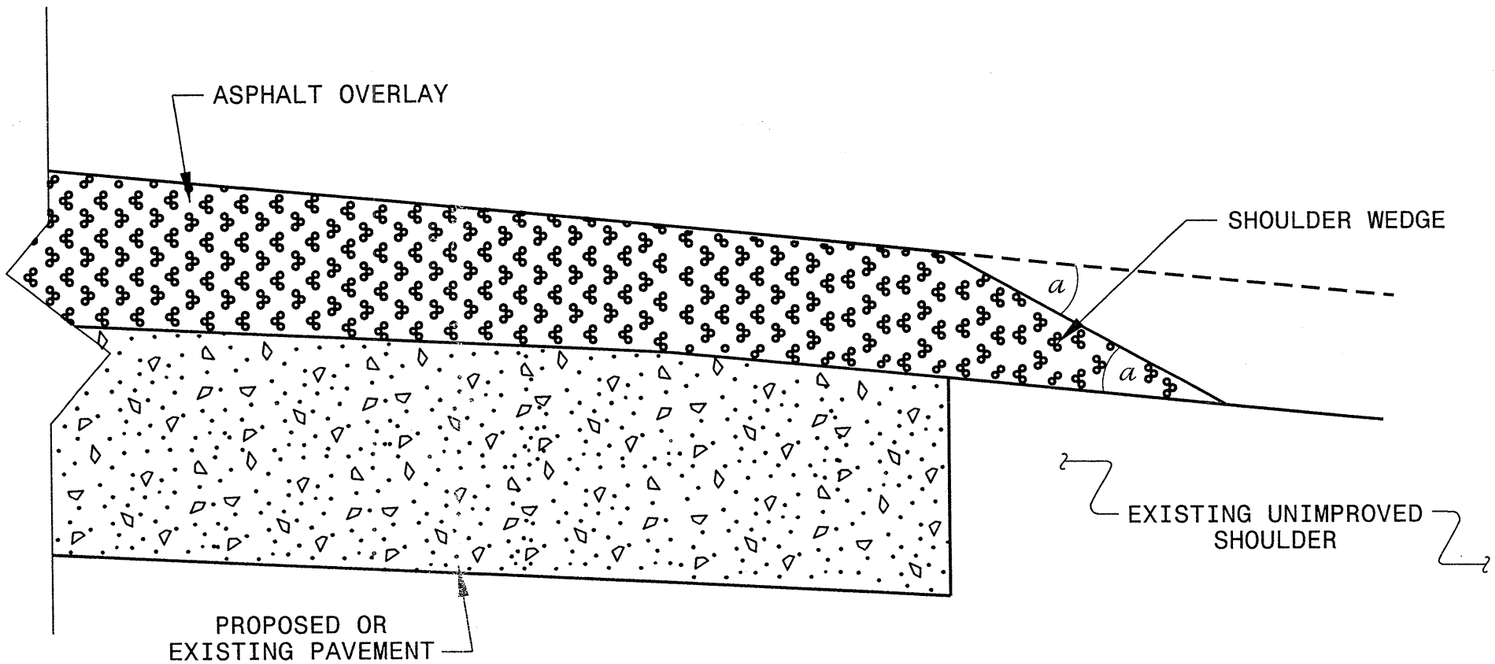


TYPICAL SECTION NO. 7



TYPICAL SECTION NO. 8

PROJECT REFERENCE NO.	SHEET NO.
5CR.20391.13	6



a - SHOULDER WEDGE ANGLE

SHOULDER WEDGE DETAIL

09-APR-2012 12:08
S:\Contracts\Contracts\Special Details\jhowerton\shoulderwedgedetail.dgn
$$$$USERNAME$$$$

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

SHOULDER WEDGE DETAIL

ORIGINAL BY: T.SPELL DATE: 7-19-11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: s:usr/details/stand/shoulderwedgedetail.dgn

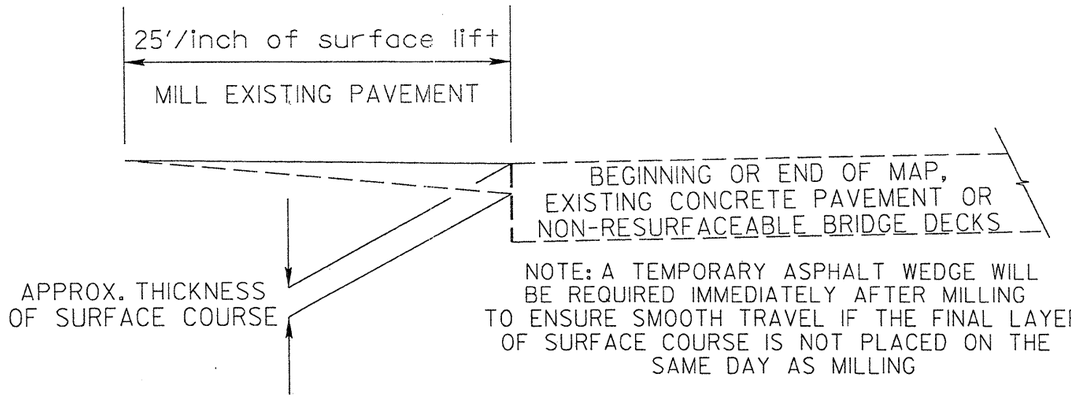
PROJECT NO.	SHEET NO.	TOTAL NO.
5CR.20391.13	7	

SUMMARY OF QUANTITIES

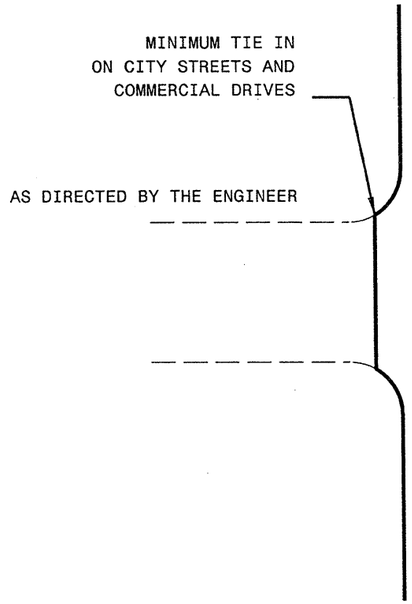
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	SHOULDER WEDGE REQUIRED	FINAL SURFACE TESTING REQUIRED	LENGTH MI	WIDTH FT	BORROW CY	AGGREGATE BASE COURSE TONS	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	1½" MILLING SY	0" TO 1.5" MILLING SY	INCIDENTAL MILLING SY	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, SF9.5A TON	ASPHALT BINDER FOR PLANT MIX TON	PATCHING EXISTING PAVEMENT TONS	ADJUST MANHOLES EA	ADJUST METER OR VALVE BOX EA	PORTABLE LIGHTING LS	TEMPORARY SILT FENCE LF	WATTLE LF	SEED & MULCHING AC	INDUCTIVE LOOP LF
5CR.20391.13	Granville	1	SR 1139 ENON ROAD	FROM SR 1138 CULBRETH ROAD TO US 158	1	NO	NO	7.215	20	940		50	14.43	525		100		7,239	485	600						3.50	
		2	SR 1138 CULBRETH ROAD	FROM SR 1139 ENON ROAD TO SR 1004 OLD OXFORD HWY	1	NO	NO	3.5	20	225		25	7.00			60		3,511	235	500				50		0.85	
		3	SR 1004 OLD OXFORD HWY	FROM JOINT AT STEM CL TO DURHAM COUNTY LINE	2	YES	NO	6	26	590		65	12.00			250	8,425		506	400				200	50	2.90	
		4	SR 1141 MORIAH ROAD	FROM US 158 TO PERSON COUNTY LINE	1	NO	NO	4.79	20	480		20	9.60			75		4,806	322	300				50		2.33	
		5	SR 1111 "C" STREET	FROM PVT JOINT ON C STREET TO 5TH STREET	1, 3	NO	NO	1.31	24	65		20	2.62		88	100		1,576	106	100						0.32	800
		6	SR 1239 BUTNER CENTRAL	FROM SR 1112 TO SR 1103"CENTRAL"	1, 3	NO	NO	1.3	24	145	10	5	2.60		30	30		1,563	105	25				200		1.50	
		7	SR 1103 CENTRAL AVE	FROM SR 1239 BUTNER CENTRAL TO JOINT NEAR SR 1201 "A" STREET	4, 5	NO	NO	0.95	36-48	30		2	0.60	22,070		100	1,776		107	20	1	1	0.50	50		0.08	1,500
		8	SR 1115 "12TH" STREET	FROM SR 1118 "H" STREET TO SR 1100 "B" STREET	2	NO	NO	1	22	60		5	2.00			150	1,123		67	300		2				0.25	
		9	SR 1117 "G" STREET	FROM SR 1103 TO SR 1115 "12TH" STREET	2	NO	NO	0.5	36	25			1.00			20	917		55	20						0.13	
		10	SR 1118 "H" STREET	FROM SR 1119 TO SR 1115	2	NO	NO	0.35	22	17			0.70			50	393		24	50						0.10	
		11	SR 1733 HAWLEY SCHOOL ROAD	FROM 1700 BRASSFIELD TO NC 56	6	NO	NO	1.16	24			20		17,000		65	1,420		85	300							
		12	SR 1646 SE INDUSTRY DRIVE	FROM US 158 TO SR 1602 HENDERSON STREET	6	NO	NO	1.091	26			5		17,000		100	1,447		87	500				100			
		13	SR 1646 EAST INDUSTRY DRIVE	FROM US 15 TO NC 96	7	NO	NO	1.1	36			10		19,500		100	2,363		142	10	1	5	0.50				800
		14	SR 1607 KNOTTS GROVE ROAD	FROM US 15 TO NC 96	2, 7	NO	NO	2.2	20	80		50	4.00	6,300		555	2,395		144	300						0.80	
		15	SR 1400 GRASSY CREEK VIRGILINA	FROM SR 1403 TO SR 1300	8	NO	NO	3.2	20									3,210	215	750							
TOTAL FOR PROJ NO. 5CR.20391.13								**35.666**		**2,657**	**10**	**277**	**56.55**	**82,395**	**118**	**1,755**	**20,259**	**21,905**	**2,685**	**4,175**	**2**	**8**	**1.00**	**650**	**50**	**12.76**	**3,100**
GRAND TOTAL								**35.666**		**2,657**	**10**	**277**	**56.55**	**82,395**	**118**	**1,755**	**20,259**	**21,905**	**2,685**	**4,175**	**2**	**8**	**1.00**	**650**	**50**	**12.76**	**3,100**

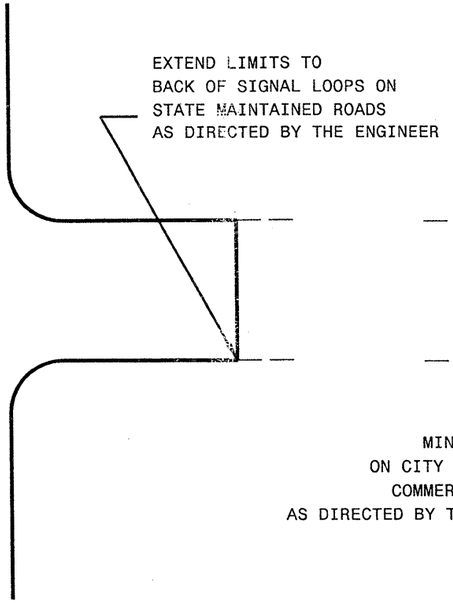
THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	LENGTH	WIDTH	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	4697000000-E 8" X 120 M WHITE THERMO LF	4710000000-E 24" X 120 M WHITE THERMO LF	4721000000-E THERMO MSG ONLY 120 M EA	4721000000-E THERMO MSG SCHOOL 120 M EA	4725000000-E THERMO LT ARROW 90 M EA	4725000000-E THERMO STR & RT ARROW 90 M EA	4725000000-E THERMO STR ARROW 90 M EA	4725000000-E THERMO RT ARROW 90 M EA	4725000000-E THERMO YIELD TRIANGLE 90M EA	4810000000-E 4" YELLOW PAINT LF	4810000000-E 4" WHITE PAINT LF	4820000000-E 8" WHITE PAINT LF	4820000000-E 8" YELLOW PAINT LF	4835000000-E 24" WHITE PAINT LF	4840000000-N PAINT MSG ONLY EA	4840000000-N PAINT MSG SCHOOL EA	4845000000-N PAINT STR ARROW EA	4845000000-N PAINT LT ARROW EA	4845000000-N PAINT RT ARROW EA	4845000000-N PAINT STR & RT ARROW EA
5CR.20391.13	Granville	1	SR 1139 ENON ROAD	FROM SR 1138 CULBRETH ROAD TO US 158	7.215	20	77,633	47,619	45			20																	
		2	SR 1138 CULBRETH ROAD	FROM SR 1139 ENON ROAD TO SR 1004 OLD OXFORD HWY	3.5	20	37,660	23,100	50			20																	
		3	SR 1004 OLD OXFORD HWY	FROM JOINT AT STEM CL TO DURHAM COUNTY LINE	6	26	64,560	40,500	350	160		120			7	2	2	2											
		4	SR 1141 MORIAH ROAD	FROM US 158 TO PERSON COUNTY LINE	4.79	20	51,540	31,614	30																				
		5	SR 1111 "C" STREET	FROM PVT JOINT ON C STREET TO 5TH STREET	1.31	24	14,096	8,646	50			60			2	3													
		6	SR 1239 BUTNER CENTRAL	FROM SR 1112 TO SR 1103"CENTRAL"	1.3	24	12,912	7,920	120	80		50			2			1											
		7	SR 1103 CENTRAL AVE	FROM SR 1239 BUTNER CENTRAL TO JOINT NEAR SR 1201 "A" STREET	0.95	36	3,168	12,540	850		300	80	12		41		6	4		12,540	3,168	300		80	48		6	41	4	
		8	SR 1115 "12TH" STREET	FROM SR 1118 "H" STREET TO SR 1100 "B" STREET	1	22	10,760	6,600				20																	
		9	SR 1117 "G" STREET	FROM SR 1103 TO SR 1115 "12TH" STREET	0.5	36	5,380	5,280				10																	
		10	SR 1118 "H" STREET	FROM SR 1119 TO SR 1115	0.35	22		2,310			100																		
		11	SR 1733 HAWLEY SCHOOL ROAD	FROM 1700 BRASSFIELD TO NC 56	1.16	24	12,482	7,656	30			60		6						7,656				60		6			
		12	SR 1646 SE INDUSTRY DRIVE	FROM US 158 TO SR 1602 HENDERSON STREET	1.091	26	11,739	7,201	40		25	20					5		5	7,201				20					
		13	SR 1646 EAST INDUSTRY DRIVE	FROM US 15 TO NC 96	1.1	36	11,836	7,920	200	150		110			10	2	2	1		13,200			150	110			2	10	1	2
		14	SR 1607 KNOTTS GROVE ROAD	FROM US 15 TO NC 96	2.2	20	23,672	14,520	200			20								14,520	200			20					
		15	SR 1400 GRASSY CREEK VIRGILINA	FROM SR 1403 TO SR 1300	3.2	20	34,432	21,120	50																				
TOTAL FOR PROJ NO. 5CR.20391.13					**35.666**		**371,870**	**244,546**	**2,015**	**390**	**425**	**590**	**12**	**6**	**62**	**7**	**15**	**8**	**5**	**55,117**	**3,368**	**300**	**150**	**290**	**48**	**6**	**8**	**51**	**5**	**2**
								246,561					**18**				**97**			**58,485**		**450**			**54**		**66**		
GRAND TOTAL					**35.666**		**371,870**	**244,546**	**2,015**	**390**	**425**	**590**	**12**	**6**	**62**	**7**	**15**	**8**	**5**	**55,117**	**3,368**	**300**	**150**	**290**	**48**	**6**	**8**	**51**	**5**	**2**
								246,561					**18**				**97**			**58,485**		**450**			**54**		**66**		

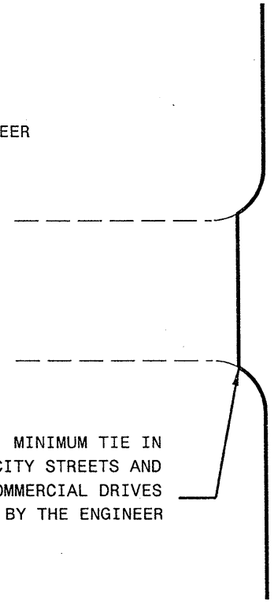


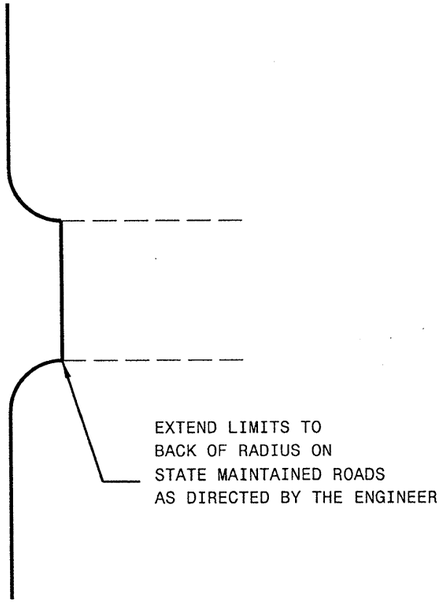
DETAIL OF INCIDENTAL MILLING





DETAIL OF PROJECT LIMITS AT SIGNALIZED Y LINES





DETAIL OF PROJECT LIMITS AT UNSIGNALIZED Y LINES

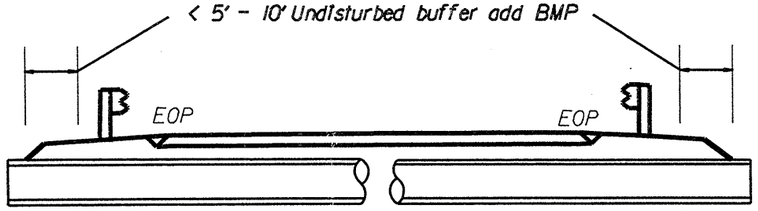
PROJECT NO.
5CR.20391.13

NOTES: Less than 5' - 10' undisturbed buffer from ROW, ditchline, water feature, or drainage inlet, add BMP.

BMP Options: Wattle, Silt Fence, or Hardened Aggregate.

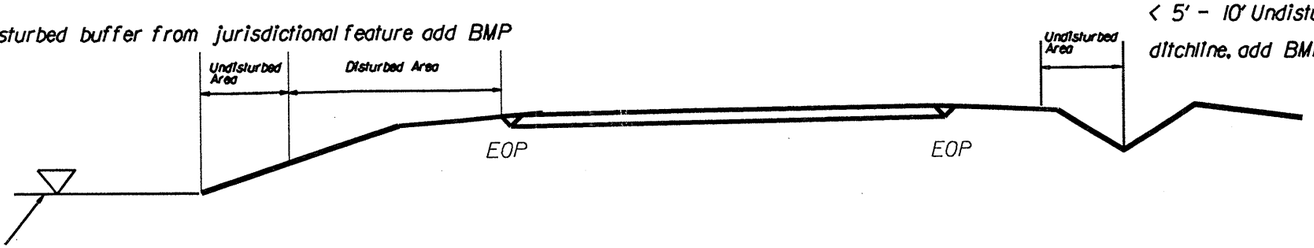
EROSION CONTROL DETAIL

< 5' - 10' Undisturbed buffer add BMP



Pipe/Culvert

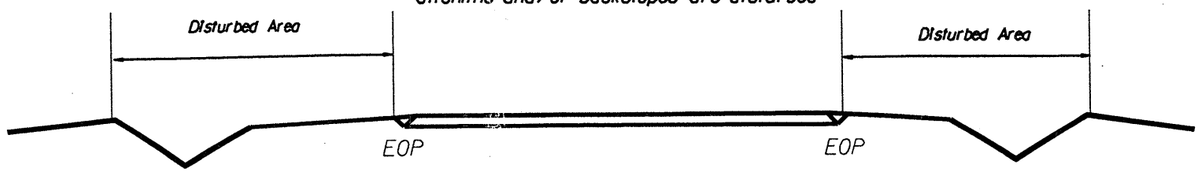
< 5' - 10' Undisturbed buffer from jurisdictional feature add BMP



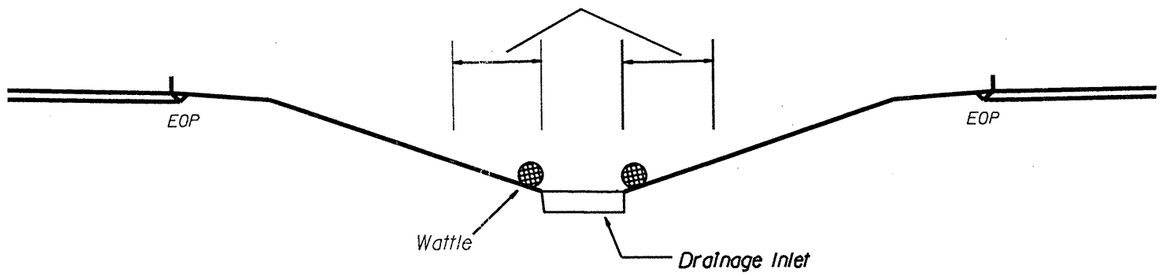
Jurisdictional Feature

< 5' - 10' Undisturbed buffer from ditchline, add BMP

Use BMP's if shoulders and/or frontslopes and/or ditchline and/or backslopes are disturbed



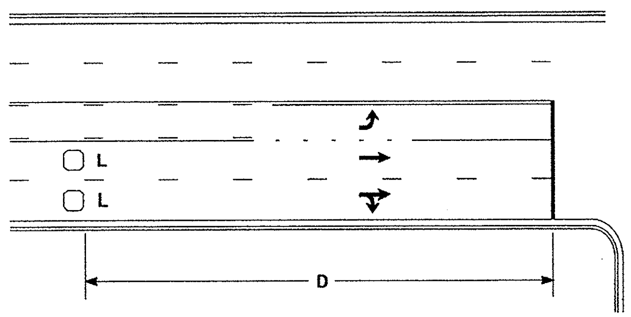
< 5' - 10' Undisturbed buffer from inlet, add wattle



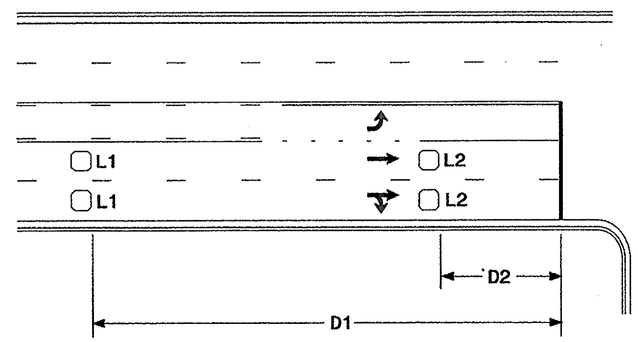
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
5CR.20391.13	SIG 1

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



OR



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

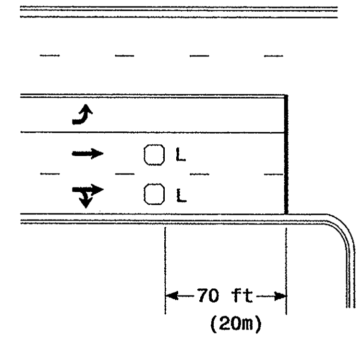
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

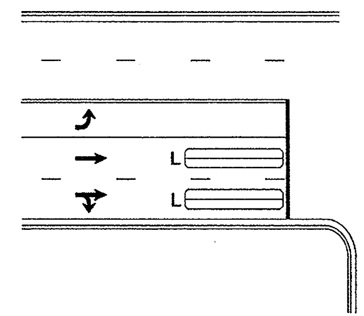
L2 = 6ft X 6ft (1.8m X 1.8m) Wired in series

"Stretch" Operation

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



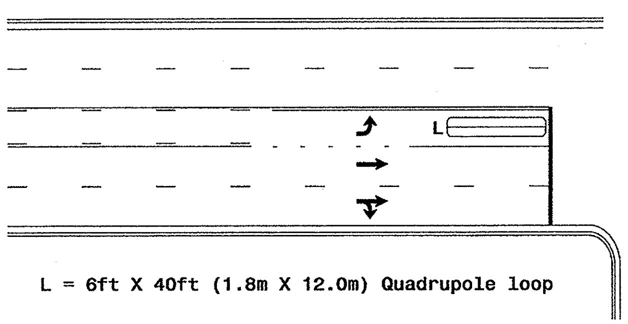
OR



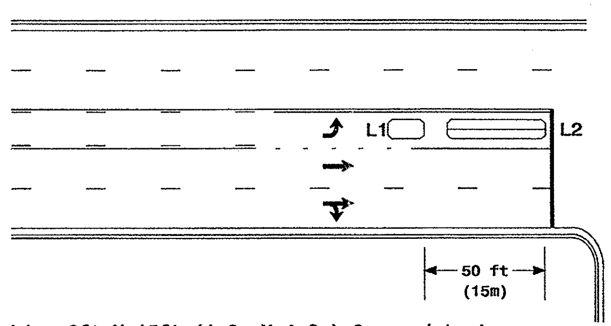
L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

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

Left Turn Lane Detection



OR



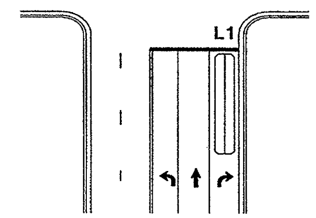
L = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

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

Presence Loop Detection

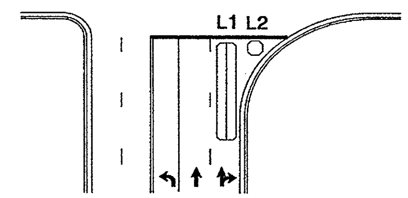
Queue Loop Detection

Right Turn Lane Detection

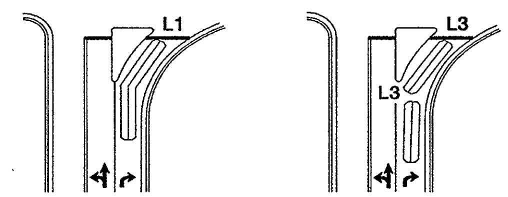


Standard Turn

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

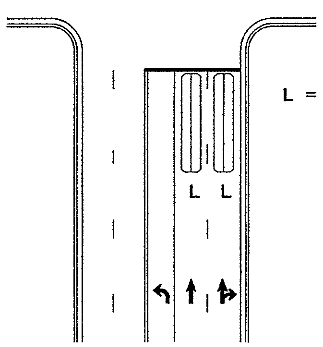


Wide Radius Turn



Channelized Turn

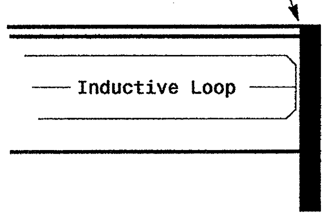
Side Street Detection



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: 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	INIT.	DATE
Revise pavement markings		

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23486 P. L. ALEXANDER

SIGNATURE 6/6/06 DATE

SIG. INVENTORY NO.

19-DEC-2006 14:29
s:\its signals\lb turn\... loop typical 2006.dgn
palexander