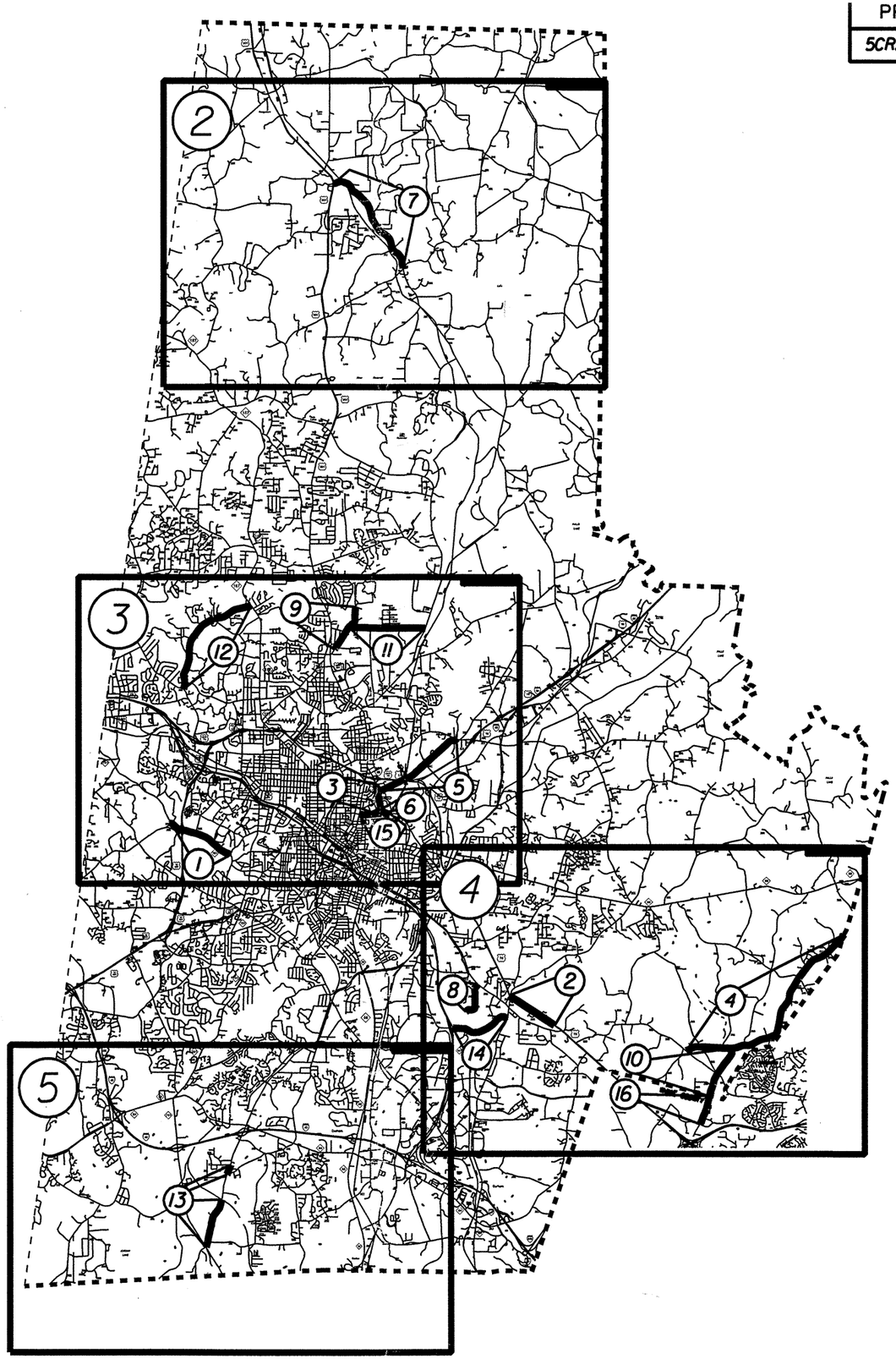
PROJECT REFERENCE NO.	SHEET NO.
5CRJ0321J3, 5CR.20321J3, 5CR.20921.24	1

2010 DURHAM CO. RESURFACING



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PROJECT REFERENCE NO.	SHEET NO.
5CR1032U3, 5CR2032U3, 5CR2092L24	2

2

7

Rougemont

Lake Obie

Lake Michie

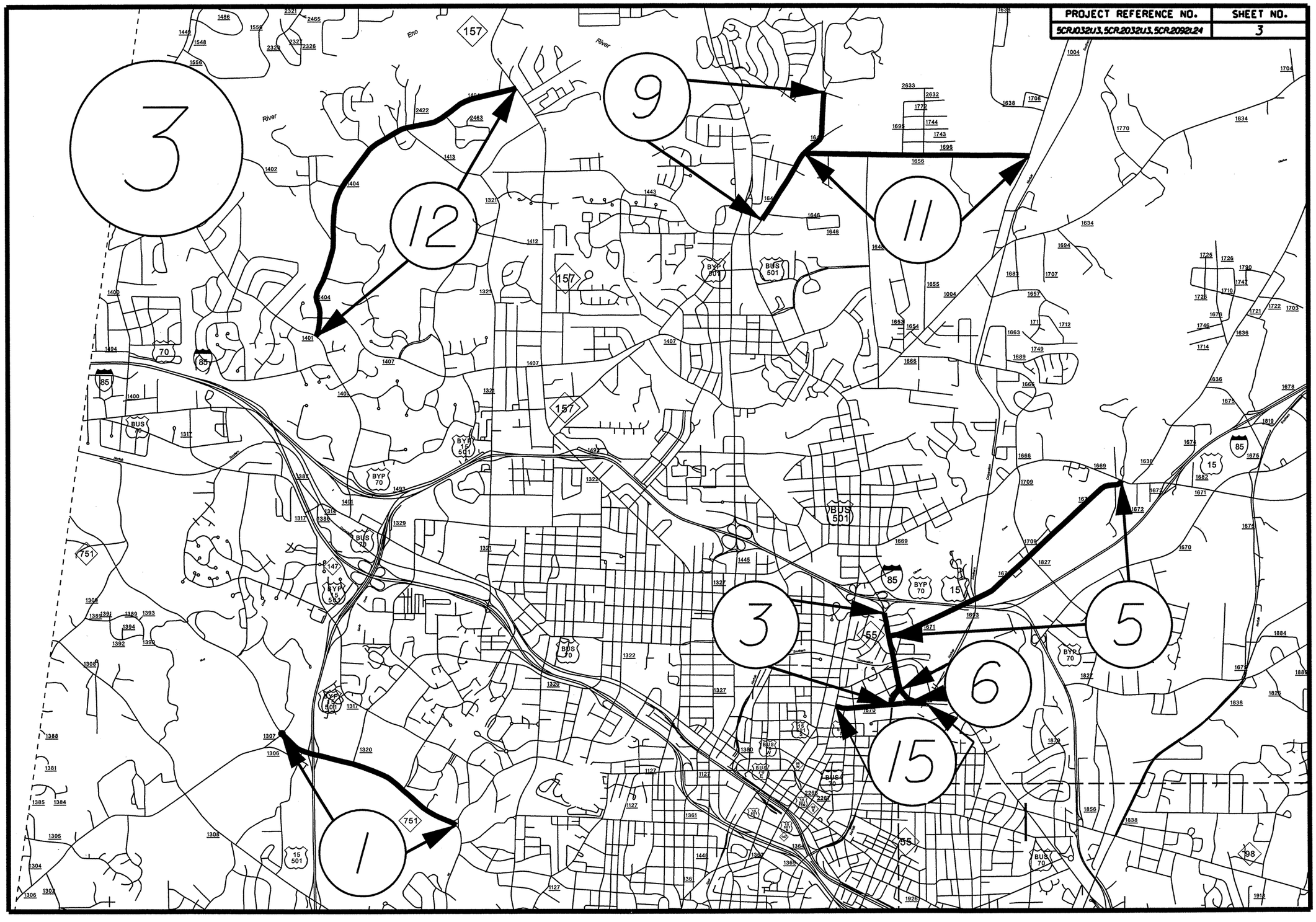
Little River Reservoir

501

157

2010vicinitymap.dgn 11/24/2009 9:27:06 AM

PROJECT REFERENCE NO.	SHEET NO.
5CR1032U3, 5CR2032U3, 5CR2092L24	3



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PROJECT REFERENCE NO.	SHEET NO.
5CRJ032U3, 5CR2032U3, 5CR2092L24	4

4

8

2

14

10

16

4

WAKE COUNTY

2010vicinitymap.dgn 11/24/2009 9:28:04 AM

PROJECT REFERENCE NO.	SHEET NO.
5CRJ0321J3, 5CR20321J3, 5CR2092L24	5

5

13

Durham

Lowes Grove

Parkwood

Genlee

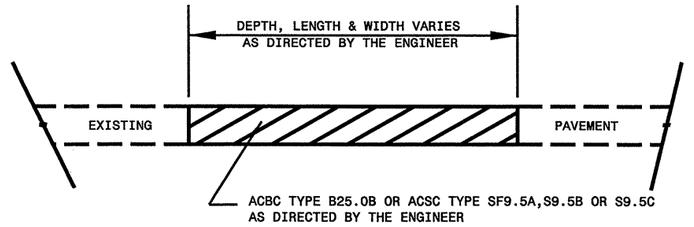
JORDAN LAKE

PROJECT REFERENCE NO.	SHEET NO.
	6

5CR.10321.13, 5CR.20321.13, 5CR.20921.24

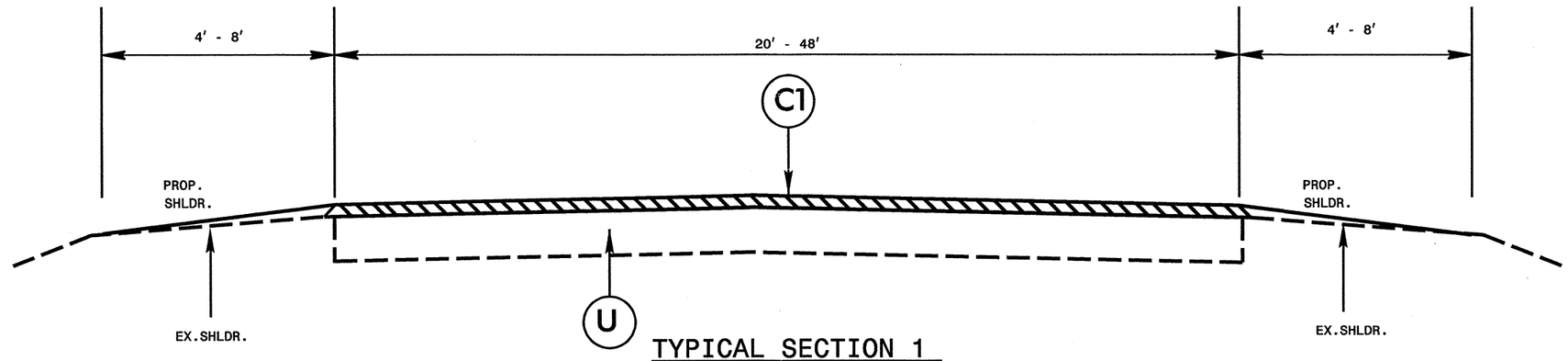
PAVEMENT SCHEDULE

C1	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D	3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E	6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 684 LBS. PER SQ. YD.
V1	MILL 1½" IN DEPTH
V2	MILL 1½" TO 2½" IN DEPTH (PAVE BACK FLUSH WITH GUTTER)
U	EXISTING PAVEMENT



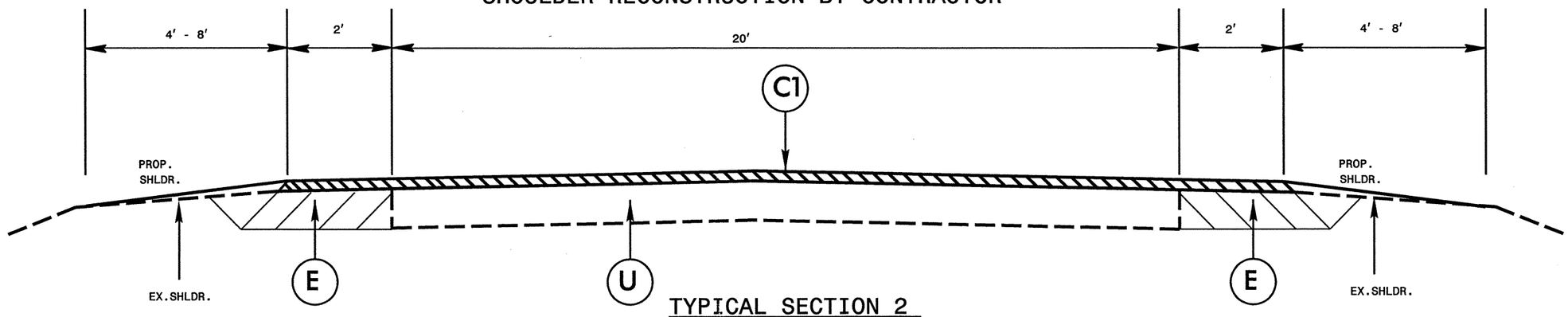
PATCHING EXISTING PAVEMENT

PATCHING TO BE PERFORMED PRIOR TO MILL AND FILL OPERATION



TYPICAL SECTION 1

*SHOULDER RECONSTRUCTION BY CONTRACTOR



TYPICAL SECTION 2

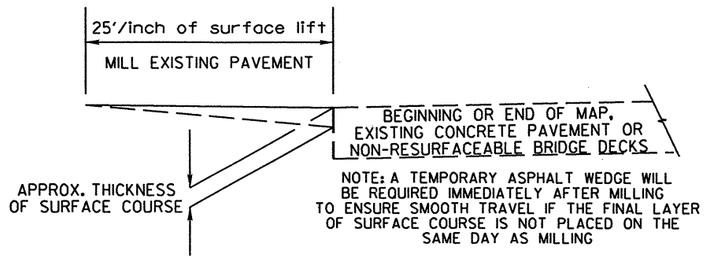
*SHOULDER RECONSTRUCTION BY CONTRACTOR

PROJECT REFERENCE NO.	SHEET NO.
	7

5CR.10321.13, 5CR.20321.13, 5CR.20921.24

PAVEMENT SCHEDULE

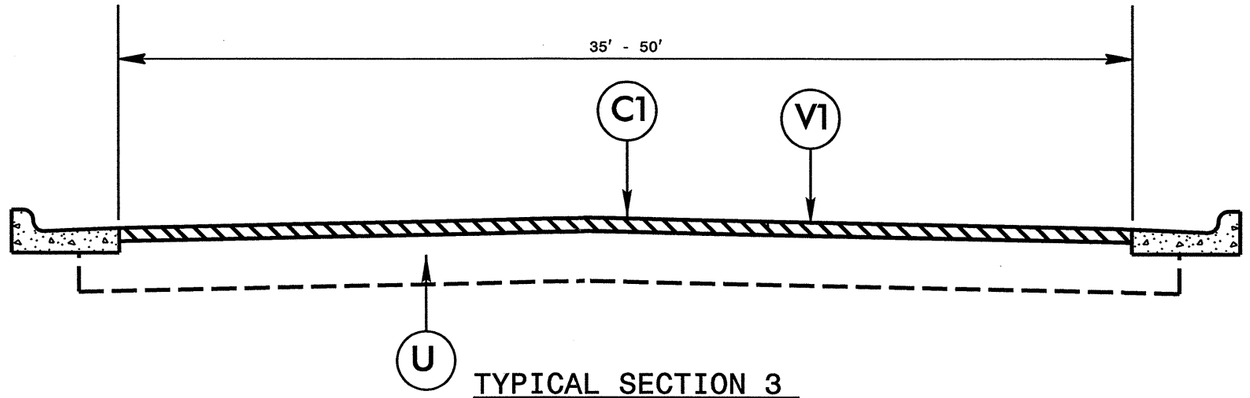
C1	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D	3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E	6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 684 LBS. PER SQ. YD.
V1	MILL 1½" IN DEPTH
V2	MILL 1½" TO 2½" IN DEPTH (PAVE BACK FLUSH WITH GUTTER)
U	EXISTING PAVEMENT



DETAIL OF INCIDENTAL MILLING
AT BEGINNING OR END OF MAP, EXISTING CONCRETE PAVEMENT OR NON-RESURFACEABLE BRIDGE DECKS

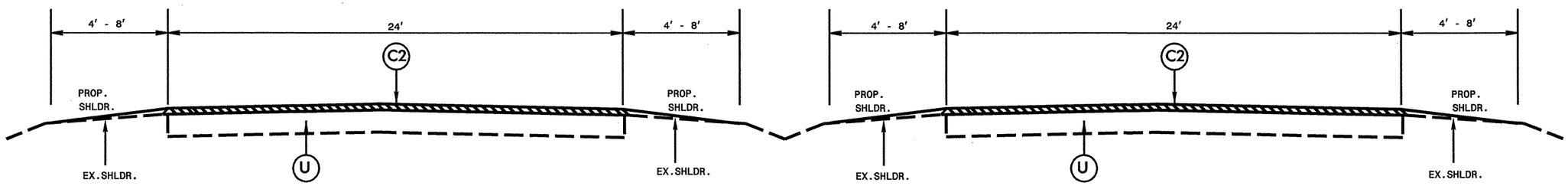
NOTES

ALL UNPAVED S.R. 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.
BRIDGES TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.



TYPICAL SECTION 3

NOTE: A PORTION OF MAP 15 HAS CURB AND GUTTER ON ONE SIDE ONLY AND A PORTION OF MAP 1 HAS NO CURB AND GUTTER



TYPICAL SECTION 4

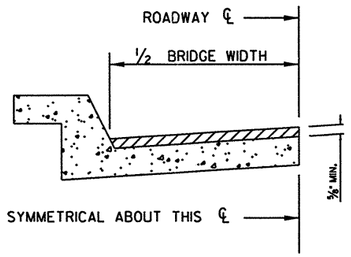
*SHOULDER RECONSTRUCTION BY CONTRACTOR

PROJECT REFERENCE NO.	SHEET NO.
	8

5CR.10321.13, 5CR.20321.13, 5CR.20921.24

PAVEMENT SCHEDULE

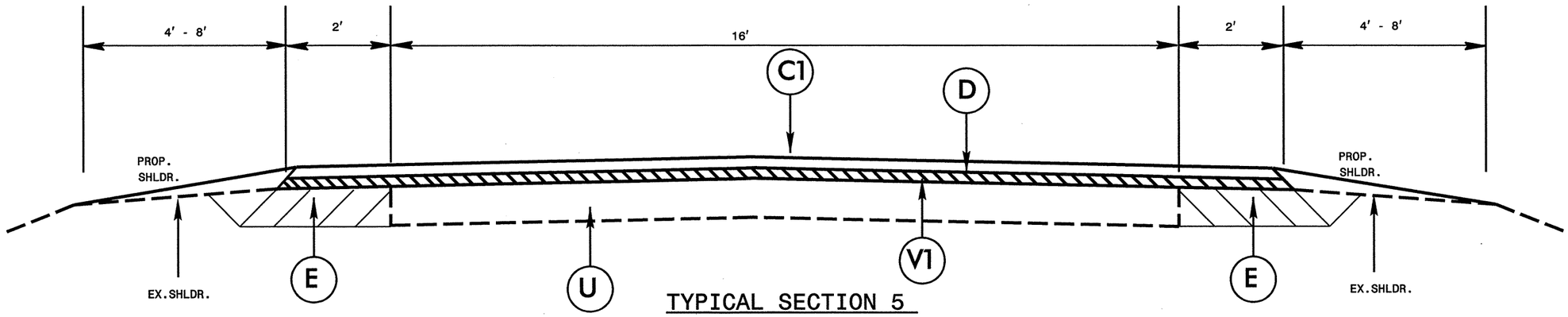
C1	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D	3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E	6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 684 LBS. PER SQ. YD.
V1	MILL 1½" IN DEPTH
V2	MILL 1½" TO 2½" IN DEPTH (PAVE BACK FLUSH WITH GUTTER)
U	EXISTING PAVEMENT



BRIDGE HALF TYPICAL SECTION

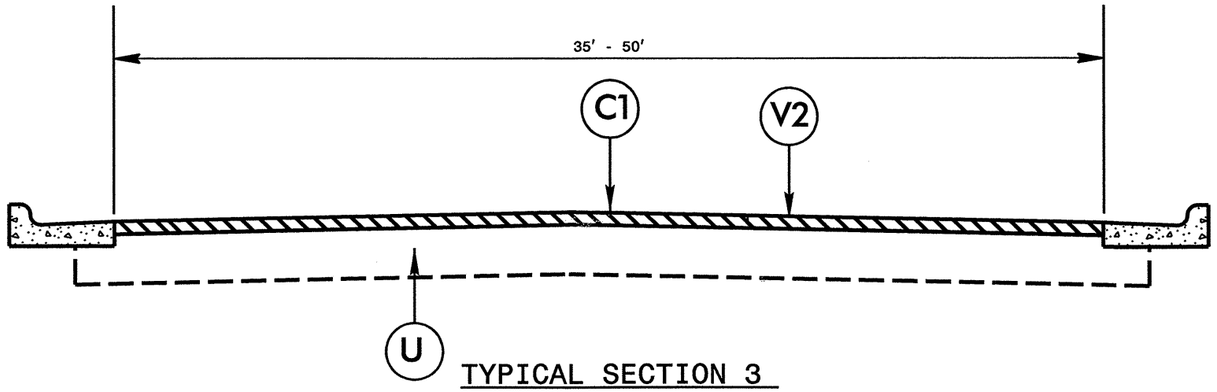
FOR BRIDGES WITH FLOOR DRAINS, CARE SHALL BE EXERCISED IN PLACING THE WEARING SURFACE AROUND FLOOR DRAINS SO AS NOT TO HINDER EFFECTIVE DRAINAGE. ALL DRAINS SHALL BE LEFT OPEN.

THE PROPOSED WEARING SURFACE SHALL VARY IN THICKNESS AS NECESSARY TO PROVIDE A SMOOTH RIDING SURFACE. A THICKNESS OF NOT LESS THAN ⅝" SHALL BE PROVIDED. THE MAXIMUM THICKNESS SHALL PREFERABLY BE 1 ½" UNLESS IT IS IMPRACTICAL TO PROVIDE A SMOOTH RIDING SURFACE OTHERWISE.



TYPICAL SECTION 5

*SHOULDER RECONSTRUCTION BY CONTRACTOR
NOTE:CONTRACTOR SHALL PLACE BASE WIDENING PRIOR TO MILLING
PLACE BASE 1½" BELOW EXISTING PAVEMENT



TYPICAL SECTION 3

NOTE: NEW PAVEMENT SHOULD BE FLUSH WITH EXISTING GUTTER

PROJECT NO.	SHEET NO.	TOTAL NO.
5CR.10321.13, 5CR.20321.13	7	
5CR.20921.24,		

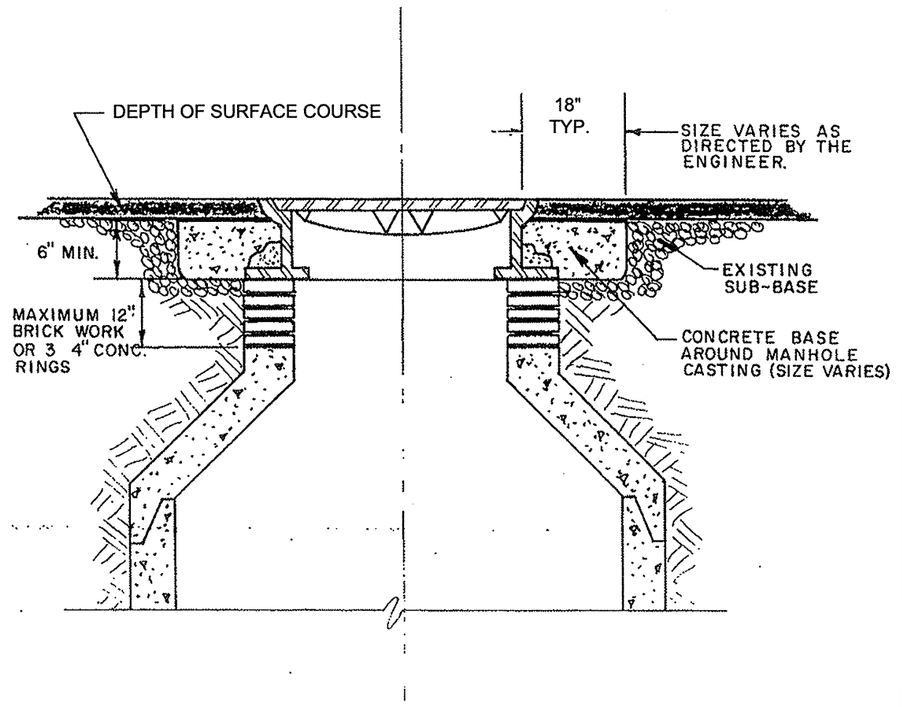
SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	FINAL SURFACE TESTING REQUIRED	LENGTH MI	WIDTH FT	BORROW CY	INCIDENTAL STONE BASE TONS	SHOULDER RECON-STRUCTION SMI	1½" MILLING SY	1.5" TO 2.5" MILLING SY	INCIDENTAL MILLING SY	BASE COURSE, B25.0B TONS	INTER-MEDIATE COURSE, I19.0B TONS	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, S9.5C TONS	PG 64-22 PLANT MIX TONS	PG 70-22 PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	ADJUST MANHOLES EA	ADJUST METER OR VALVE BOX EA	SEED & MULCHING AC	INDUCTIVE LOOP LF
5CR.10321.13	Durham	1	NC-751	FROM THE ROUNDABOUT TO BEGINNING OF CURB AND GUTTER (INCLUDE ROUNDABOUT)	3	NO	0.9	48				26677					2,471		148		150				3,500
		"	"	FROM CURB AND GUTTER TO DUKE UNIVERSITY ROAD	3	NO	0.5	48				14080					1,304		78		150				3,000
TOTAL FOR MAP NO. 1							1.4					40757					3,775		226		300				6,500
		2	US 70	US 70 FROM MIAMI BLVD TO NEW PAVEMENT JOINT	4	NO	1.2	48	96	100	4.8			436				3,344		201	4,000			3	1,000
TOTAL FOR MAP NO. 2							1.2		96	100	4.8	0		436				3,344		201	4,000			3	1,000
		3	NC-55	NC-55 (AVONDALE DRIVE) FROM I-85 TO GEER STREET	3	NO	0.7	35				14373					1,333		80		500				4,000
TOTAL FOR MAP NO. 3							**0.7**		**0**	**0**	**0**	**14373**		**0**			**1,333**		**80**		**500**				**4,000**
TOTAL FOR PROJ NO. 5CR.10321.13							**3.3**		**96**	**100**	**4.8**	**55130**		**436**			**5,108**	**3,344**	**306**	**201**	**4,800**			**3**	**11,500**
5CR.20321.13	Durham	4	SR 1901 CARPENTER POND RD	FROM SR 1906 LEESVILLE RD TO WAKE COUNTY LINE	1	NO	4.7	20	188	300	9.4			550			5,220		313		3,000		3	6	
TOTAL FOR MAP NO. 4							4.7		188	300	9.4	0		550			5,220		313		3,000		3	6	
		5	SR 1671 CAMDEN BLVD	FROM NC 55 TO SR 1669 (CLUB BLVD)	6, 1	NO	2.1	25	21		1.05		24922	275			3,404		204			27	6	2	
TOTAL FOR MAP NO. 5							2.1		21	0	1.05	0	24922	275			3,404		204			27	6	2	
		6	SR 1357 AVONDALE DR	FROM NC 55 TO SR 1670 GEER ST	3	NO	0.2	35				4107					381		23		20				
TOTAL FOR MAP NO. 6							0.2		0	0	0	4107	0	0			381		23		20				
		7	SR 1615 QUAIL ROOST RD	FROM US 501 TO SR 1616 BAHAMA RD	1	NO	2.46	20	98	50	4.92			350			2,684		161		1,000			3	
TOTAL FOR MAP NO. 7							2.46		98	50	4.92	0	0	350			2,684		161		1,000			3	
		8	SR 1955 WRENN RD	FROM SR 1926 ANGIER AVE TO INTERSECTION PAST RXR TRACK	5	NO	0.2	20	8		0.4	2347		50	199	447	218		43			2		0	
		"	"	FROM INTERSECTION TO DEAD END	1	NO	0.4	20	16		0.8						436		26		200			0	
TOTAL FOR MAP NO. 8							0.6		24	0	1.2	2347	0	50	199	447	654		69		200	2		1	
		9	SR 1641 DENFIELD ST	FROM END OF CURB AND GUTTER NE OF US 501 BUS TO END OF STATE MAINTENANCE NEAR COMMUNICATION DR	1	NO	1	20	40		2			188			1,091		65		300			1	
TOTAL FOR MAP NO. 9							1		40	0	2	0	0	188	0	0	1,091		65		300			1	
		10	SR 1981 SHADY GROVE RD	FROM SR 1901 CARPENTER POND ROAD TO WAKE COUNTY LINE	2	NO	1.1	20	44		2.2			100	1092		1,439		133		1,200			1	
TOTAL FOR MAP NO. 10							1.1		44	0	2.2	0	0	100	1092	0	1,439		133		1,200			1	
		11	SR 1656 HEBRON RD	FROM SR 1641 DENFIELD ST TO SR 1004 OLD OXFORD HWY	1	NO	1.54	21	62	100	3.08			250			1,764		106		1,500	5	7	2	1,000
TOTAL FOR MAP NO. 11							1.54		62	100	3.08	0	0	250	0	0	1,764		106		1,500	5	7	2	1,000
		12	SR 1404 ROSE OF SHARON RD	FROM SR 1401 COLE MILL RD TO NC 157 (GUESS RD)	1	NO	2.2	20	87	50	4.4			450			2,491		149		2,500	1	4	3	5,000
TOTAL FOR MAP NO. 12							2.2		87	50	4.4	0	0	450	0	0	2,491		149		2,500	1	4	3	5,000
		13	SR 1118 FAYETTEVILLE ROAD	FROM JOINT S OF SR 2212 KENTINGTON DR. TO JOINT N OF MASSEY CHAPEL	1	NO	0.2	20	8	50	0.4			176			218		13		400	9		0	
		"	"	FROM STRUCTURE OVER AMERICAN TOBACCO TRIAL TO NC 751	1	NO	1	21	40	50	2			218			1,145		69		1,500	1		1	1,000
TOTAL FOR MAP NO. 13							1.2		48	100	2.4	0	0	394	0	0	1,363		82		1,900	10		1	1,000
		14	SR 1954 ELLIS RD	FROM BEGINNING OF 2 LANE ROAD EAST OF NC 147 TO JOINT AT SR 1959 MIAMI BLVD	1	NO	1.25	20	50		2.5			260			1,364		82		2,500			2	3,000
TOTAL FOR MAP NO. 14							1.25		50	0	2.5	0	0	260	0	0	1,364		82		2,500			2	3,000
		15	SR 1670 GEER STREET	FROM US 15/501 N (ROXBORO ST) TO THE Y SPLIT	3	NO	0.61	24				8589					798		48		500				1,000
		"	"	FROM Y SPLIT TO TRAIN BRIDGE	3	NO	0.08	50				2347					217		13		100				
TOTAL FOR MAP NO. 15							**0.69**		**0**	**0**	**0**	**10936**	**0**	**0**	**0**	**0**	**1,015**		**61**		**600**				**1,000**
TOTAL FOR PROJ NO. 5CR.20321.13							**19.04**		**662**	**600**	**33.15**	**17390**	**24922**	**2867**	**1291**	**447**	**22,870**		**1,448**		**14,720**	**45**	**20**	**21**	**11,000**
5CR.20921.24	Wake	16	SR 1646 - MT. HERMAN ROAD	FROM DURHAM CO LINE TO SR 3100 (ACC BLVD.)	2	NO	0.62	20	22	31	1.12			450	700		890		83		620			1	
TOTAL FOR MAP NO. 16							**0.62**		**22**	**31**	**1.12**	**0**	**0**	**450**	**700**	**0**	**890**		**83**		**620**			**1**	
TOTAL FOR PROJ NO. 5CR.20921.24							**0.62**		**22**	**31**	**1.12**	**0**	**0**	**450**	**700**	**0**	**890**		**83**		**620**			**1**	
GRAND TOTAL							**22.96**		**780**	**731**	**39.07**	**72520**	**24922**	**3753**	**1991**	**447**	**28,868**	**3,344**	**1,837**	**201**	**20,140**	**45**	**20**	**25**	**22,500**

PROJECT NO.	SHEET NO.	TOTAL NO.
5CR.10321.13, 5CR.20321.13	10	
5CR.20921.24,		

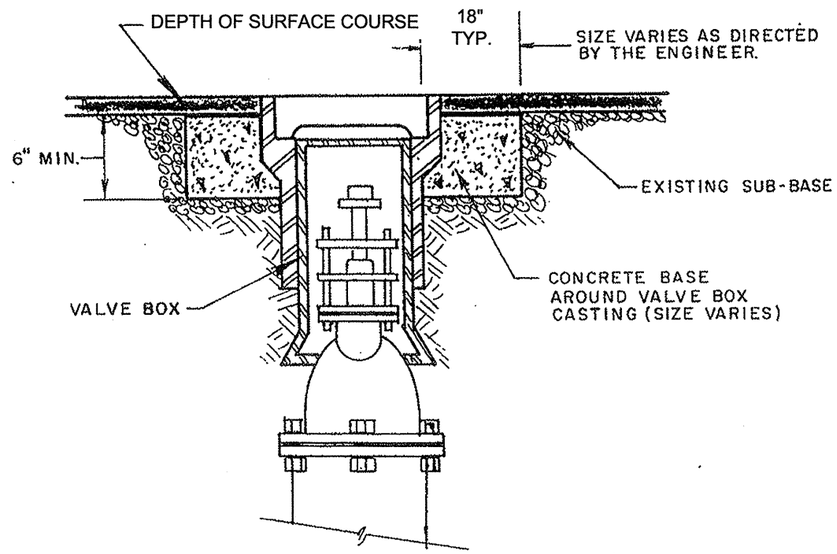
THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	4685000000-E 4" X 90 M WHITE THERMO LF	4685000000-E 4" X 90 M YELLOW 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	4702000000-E 12" X 120 M WHITE THERMO LF	4705000000-E 16" 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	4721000000-E THERMO RXR 120 M EA	4725000000-E THERMO STR ARROW 90 M EA	4725000000-E THERMO STR & RT ARROW 90 M EA	4725000000-E THERMO LT ARROW 90 M EA	4725000000-E THERMO RT ARROW 90 M EA	4725000000-E THERMO YIELD TRIANGLE 90M EA	4770000000-E 4" WHITE COLD APPLIED PLASTIC, TYPE III LF	4770000000-E 4" YELLOW COLD APPLIED PLASTIC, TYPE III LF	4810000000-E 4" WHITE PAINT LF	4810000000-E 4" YELLOW PAINT LF	4820000000-E 8" WHITE PAINT LF	4830000000-E 16" WHITE PAINT LF	4835000000-E 24" WHITE PAINT LF	4840000000-N PAINT MSG ONLY EA	4840000000-N PAINT MSG RXR EA	4845000000-N PAINT YIELD TRIANGLE EA	4845000000-N PAINT LT ARROW EA	4845000000-N PAINT STR ARROW EA	4845000000-N PAINT STR & RT ARROW EA	4845000000-N PAINT RT ARROW EA	4900000000-N YELLOW & YELLOW MARKERS EA	4900000000-N CRYSTAL & RED MARKERS EA
5CR.10321.13	Durham	1	NC-751	FROM THE ROUNDABOUT TO BEGINNING OF CURB AND GUTTER (INCLUDE ROUNDABOUT)	9,864		9,504	2,376		80		200	250				5	1	3	1	18			12,240	9,504		200.00	250			18	3	5	1	1	65	130
		"	"	FROM CURB AND GUTTER TO DUKE UNIVERSITY ROAD			5,280	1,320		300			50	4					5					1,320	5,280	300		50	4			5				40	80
TOTAL FOR MAP NO. 1					9,864		14,784	3,696		380		200	300	4			5	1	8	1	18			13,560	14,784	300	200.00	300	4		18	8	5	1	1	105	210
		2	US 70	US 70 FROM MIAMI BLVD TO NEW PAVEMENT JOINT	13,152	12,672		3,868									6		18	8																200
TOTAL FOR MAP NO. 2					13,152	12,672		3,868									6		18	8																200
		3	NC-55	NC-55 (AVONDALE DRIVE) FROM I 85 TO GEER STREET			7,392	924		570			165						7					924	7,392			165				7					
TOTAL FOR MAP NO. 3							7,392	924		570			165						7					924	7,392			165				7					
TOTAL FOR PROJ NO. 5CR.10321.13					23,016	12,672	22,176	8,488		950		200	465	4			11	1	33	9	18			14,484	22,176	300	200.00	465	4		18	15	5	1	1	105	410
					35,688		30,664							4			72							36,660				4			40					
5CR.20321.13	Durham	4	SR 1901 CARPENTER POND RD	FROM SR 1906 LEESVILLE RD TO WAKE COUNTY LINE	50,572		31,020	500					30				2		2	2															350	20
TOTAL FOR MAP NO. 4					50,572		31,020	500					30				2		2	2															350	20
		5	SR 1671 CAMDEN BLVD	FROM NC 55 TO SR 1669 (CLUB BLVD)			13,860						60						3	3					7,788			30								
TOTAL FOR MAP NO. 5							13,860						60						3	3					7,788			30								
		6	SR 1357 AVONDALE DR	FROM NC 55 TO SR 1670 GEER ST	2,112		4,224						30											2,112	4,224			30							20	
TOTAL FOR MAP NO. 6					2,112		4,224						30											2,112	4,224			30							20	
		7	SR 1615 QUAIL ROOST RD	FROM US 501 TO SR 1616 BAHAMA RD	26,470		16,236						110		12																			170	
TOTAL FOR MAP NO. 7					26,470		16,236						110		12																			170	
		8	SR 1955 WRENN RD	FROM SR 1926 ANGIER AVE TO INTERSECTION PAST RXR TRACK	2,152		1,320					100	50			4								2,152	1,320		100.00	50		4						
		"	"	FROM INTERSECTION TO DEAD END	4,304		2,640																													
TOTAL FOR MAP NO. 8					6,456		3,960					100	50			4								2,152	1,320		100.00	50		4						
		9	SR 1641 DENFIELD ST	FROM END OF CURB AND GUTTER NE OF US 501 BUS TO END OF STATE MAINTENANCE NEAR COMMUNICATION DR	10,760		6,600																												66	
TOTAL FOR MAP NO. 9					10,760		6,600																												66	
		10	SR 1981 SHADY GROVE RD	FROM SR 1901 CARPENTER POND ROAD TO WAKE COUNTY LINE	11,836		11,616																												73	
TOTAL FOR MAP NO. 10					11,836		11,616																												73	
		11	SR 1656 HEBRON RD	FROM SR 1641 DENFIELD ST TO SR 1004 OLD OXFORD HWY	16,570		16,262	1,000											8	4															120	25
TOTAL FOR MAP NO. 11					16,570		16,262	1,000											8	4															120	25
		12	SR 1404 ROSE OF SHARON RD	FROM SR 1401 COLE MILL RD TO NC 157 (GUESS RD)	23,672		23,232		26		100		100		12				3																165	
TOTAL FOR MAP NO. 12					23,672		23,232		26		100		100		12				3																165	
		13	SR 1118 FAYETTEVILLE ROAD	FROM JOINT S OF SR 2212 KENTINGTON DR. TO JOINT N OF MASSEY CHAPEL	2,152		1,320																												15	
		"	"	FROM STRUCTURE OVER AMERICAN TOBACCO TRIAL TO NC 751	10,760		10,560																	300	300											66	25
TOTAL FOR MAP NO. 13					12,912		11,880																	300	300										81	25
		14	SR 1954 ELLIS RD	FROM BEGINNING OF 2 LANE ROAD EAST OF NC 147 TO JOINT AT SR 1959 MIAMI BLVD	13,450		13,200	2,000				100	250		24	4	31	2	11	15															95	25
TOTAL FOR MAP NO. 14					13,450		13,200	2,000				100	250		24	4	31	2	11	15															95	25
		15	SR 1670 GEER STREET	FROM US 15/501 N (ROXBORO ST) TO THE Y SPLIT	3,465		6,442					50	76						5					1,193	6,442		50.00	76				5				40	20
		"	"	FROM Y SPLIT TO TRAIN BRIDGE			845	211		440														100	300	211	845	440								10	11
TOTAL FOR MAP NO. 15					3,465		7,286	211		440		50	76						5					100	300	1,404	7,287	440	50	76			5			50	31
TOTAL FOR PROJ NO. 5CR.20321.13					178,275		159,377	3,711	26	440	100	250	706	48	8		33	2	32	24				400	600	5,668	20,619	440	150	186		4	5			1,190	126
					178,275		163,088							56			91							1,000		26,287				4			5			
5CR.20921.24	Wake	16	SR 1646 - MT. HERMAN ROAD	FROM DURHAM CO LINE TO SR 3100 (ACC BLVD.)	6,671		4,092						12																						41	5
TOTAL FOR MAP NO. 16					6,671		4,092						12																						41	5
TOTAL FOR PROJ NO. 5CR.20921.24					6,671		4,092						12																						41	5
					6,671		4,092																													
GRAND TOTAL					207,962	12,672	185,645	12,199	26	1,390	100	450	1,183	4	48	8	44	3	65	33	18	400	600	20,152	42,795	740	350	651	4	4	18	20	5	1	1	1,336	541
					220,634		197,844							60			163					1,000		62,947				8				45			1877	



MANHOLE ADJUSTMENTS IN PAVED STREETS

CITY OF DURHAM 1869 NORTH CAROLINA	Engineering Department Water and Sewer Engineering Division, Durham, N.C.	Scale NONE Date OCT., 1990



VALVE BOX ADJUSTMENTS IN PAVED STREETS

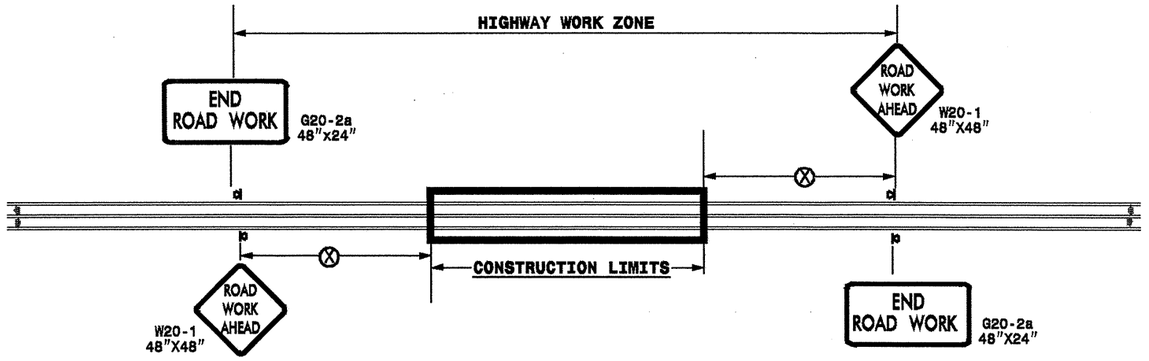
CITY OF DURHAM 1869 NORTH CAROLINA	Engineering Department Water and Sewer Engineering Division, Durham, N.C.	Scale NONE Date OCT.; 1990

DUNCAN-PARNELL, INC., RALEIGH 4 84

WBS Elements: 5CR.10321.13, 5CR.20321.13 & 5CR.20921.24

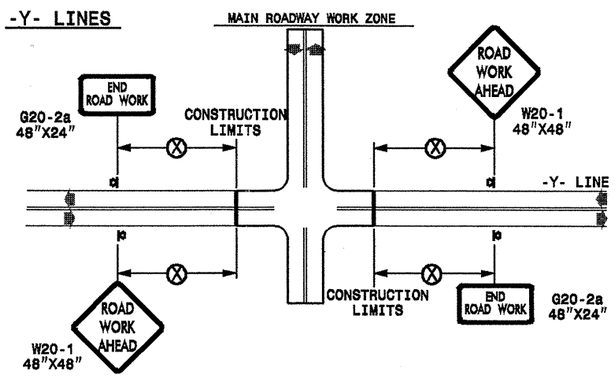
PROJ. REFERENCE NO.	SHEET NO.
See to the Left	TCP-1

TWO-WAY UNDIVIDED ** (L-LINES)



POSTED SPEED LIMIT (M.P.H.)	RECOMMENDED MINIMUM SIGN SPACING Ⓧ
≤ 50	500'
≥ 55	1000'

ROADWAYS INTERSECTING ALONG 2 WAY UNDIVIDED WORK ZONE (Y-LINES)



GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCE WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH PORTABLE WORK ZONE SIGN STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER. PORTABLE WORK ZONE SIGNS MAY BE ROLL UP OR APPROVED COMPOSITE.
- PROVIDE PORTABLE WORK ZONE SIGN STANDS, PORTABLE SIGNS AND SIGN SHEETING WHICH ARE LISTED ON THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCT LIST OR ACCEPTED AS TRAFFIC QUALIFIED BY THE TRAFFIC CONTROL UNIT.
- ** TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND

PORTABLE SIGN

DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

DETAIL DRAWING FOR TWO-WAY UNDIVIDED WORK ZONE WARNING SIGNS

SHEET 1 OF 1

APPROVED:_____ DATE:_____

SEAL

DETAIL DRAWING
FOR TWO-WAY UNDIVIDED
ADVANCED WORK ZONE WARNING SIGNS

SCALE: NONE	REVISIONS	
DATE:	7-98	10/01
DWG. BY:	10-98	03/04
DESIGN BY:	01/01	11/04
REVIEWED BY:	CADD FILE	

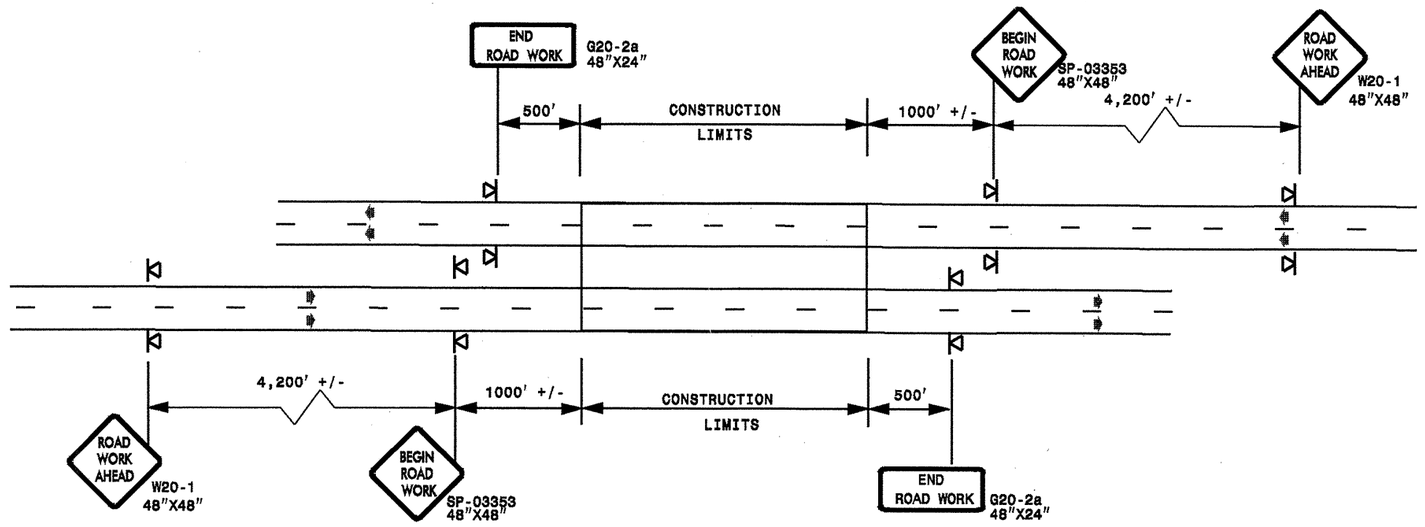
04-DEC-2009 16:13
st:\dgn\roadway\traffic\tcp\tcp_030509\resurfacing2000\dlv05\c202538a-c_5cr1032ll3x3_2wayundivurbfrwysjuly2006_portable.dgn
pdeymore AT WZTCC17502

WBS Elements: 5CR.10321.13, 5CR.20321.13 & 5CR.20921.24

PROJ. REFERENCE NO.	SHEET NO.
See to the Left	TCP-2

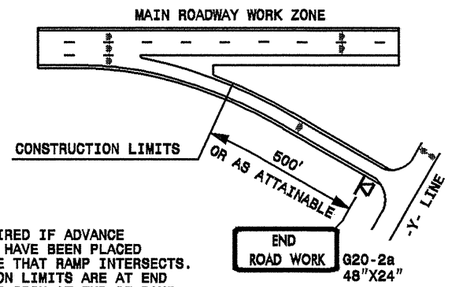
ADVANCE WORK ZONE WARNING SIGNING FOR FREEWAYS (4 LANES OR GREATER)

DETAIL A



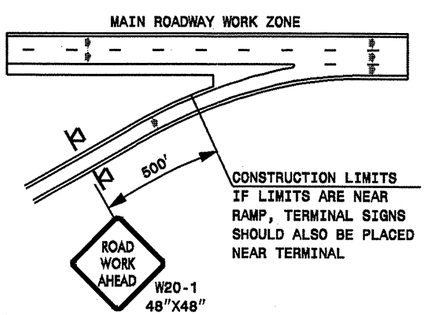
ROADWAYS INTERSECTING ALONG FREEWAY WORK ZONE (Y-LINES)

DETAIL B — EXIT RAMPS

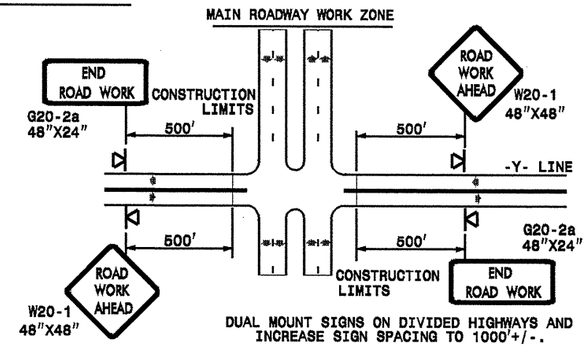


NOTE:
SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

DETAIL C — ENTRANCE RAMPS



DETAIL D — -Y- LINES



DUAL MOUNT SIGNS ON DIVIDED HIGHWAYS AND INCREASE SIGN SPACING TO 1000'+/-.

GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCE WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH PORTABLE WORK ZONE SIGN STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER. PORTABLE WORK ZONE SIGNS MAY BE ROLL UP OR APPROVED COMPOSITE.
- PROVIDE PORTABLE WORK ZONE SIGN STANDS, PORTABLE SIGNS AND SIGN SHEETING WHICH ARE LISTED ON THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCT LIST OR ACCEPTED AS TRAFFIC QUALIFIED BY THE TRAFFIC CONTROL UNIT.
- ** TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND

- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

DETAIL DRAWING FOR FREEWAYS WORK ZONE WARNING SIGNS (SHORT-DURATION LANE CLOSURES)

SHEET 1 OF 1

APPROVED: _____ DATE: _____

SEAL

DETAIL DRAWING
FOR FREEWAYS
WORK ZONE WARNING SIGNS

SCALE:	NONE
DATE:	
DWG. BY:	
DESIGN BY:	
REVIEWED BY:	

REVISIONS	
7-98	10/01
10-98	03/04
01/01	11/04
CADD FILE	

04-DEC-2009 16:44
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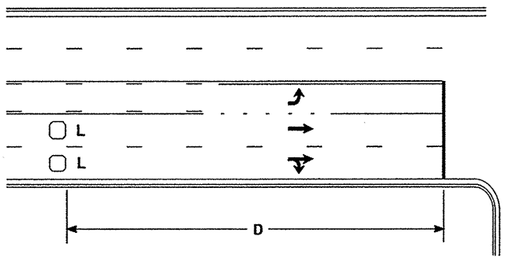
pseymore
AT WZTC237502

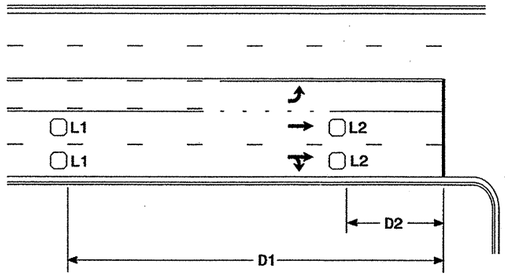
PROJECT REFERENCE NO.	SHEET NO.
	SIG 1

5CR.10321.13, 5CR.20321.13 & 5CR.20921.24

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

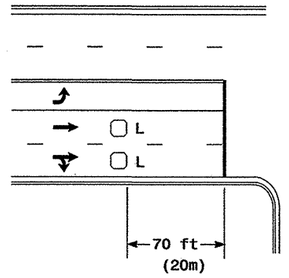
Speed Limit mph	(km/hr)	D1 ft	(m)	D2 ft	(m)
40	(64)	250	(75)	80	(25)
45	(72)	300	(90)	90	(27)
50	(80)	355	(110)	100	(30)
55	(88)	420	(130)	110	(35)

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)]



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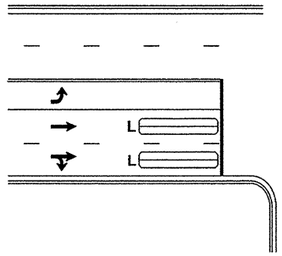
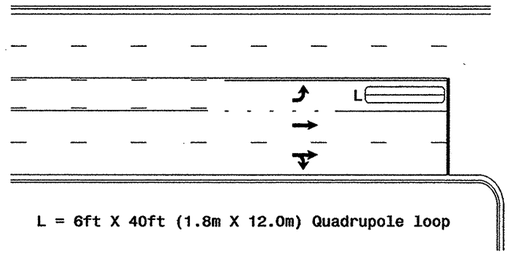


L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

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

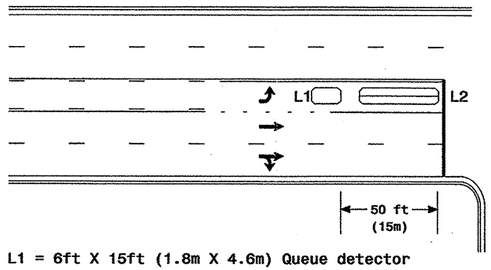
Left Turn Lane Detection



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

Presence Loop Detection

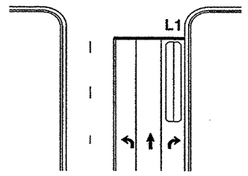
OR



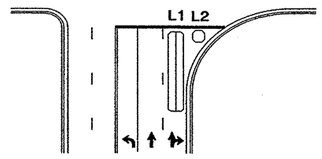
L1 = 6ft X 15ft (1.8m X 4.6m) Queue detector
L2 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

Queue Loop Detection

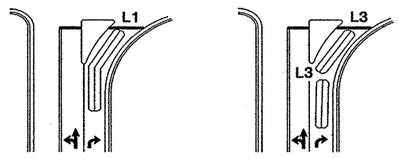
Right Turn Lane Detection



Standard Turn



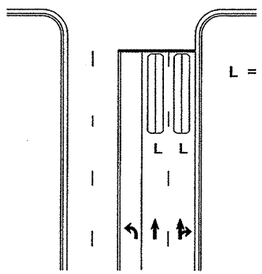
Wide Radius Turn



Channelized Turn

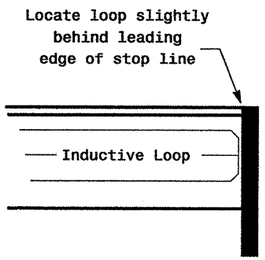
L1 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop
Wired separately
L3 = 6ft X 20ft (1.8m X 6.0m) Quadrupole loop
Wired in series

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



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
Division of Highways
North Carolina Department of Transportation
Signals and Geometrics Section
322 N. McDonald St., Raleigh, NC 27603

Typical Loop Locations

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

REVISIONS	INIT.	DATE
Revise pavement markings	ag	12/19/06

SCALE: N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23488 ENGINEER PAMELA L ALEXANDER
SIGNATURE | DATE 6/6/06
SIG. INVENTORY NO.

19-DEC-2006 14:29
s:\eits signals\lib turn lns\miscsel\loopstypical2006.dgn
plalexander

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 2

5CR.10321.13, 5CR.20321.13 & 5CR.20921.24

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

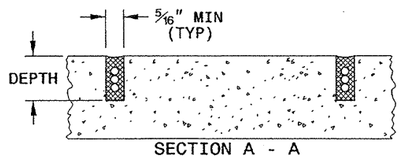
SHEET 1 OF 3

1725D01

CONVENTIONAL 4-SIDED LOOP

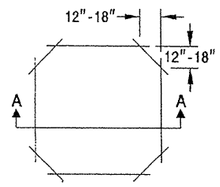
SAW SLOT DEPTH CHART

DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0

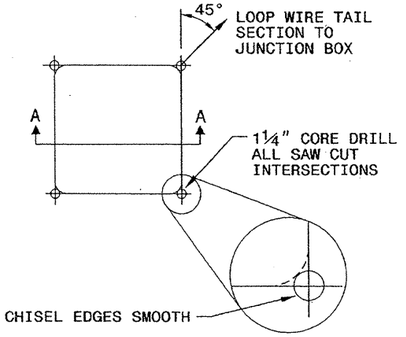


SAW CUT OPTIONS

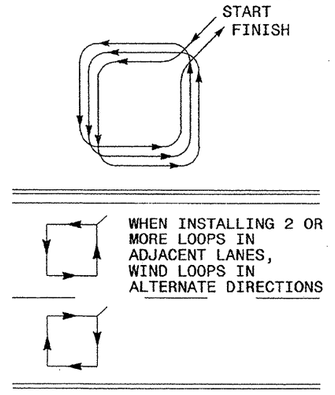
OPTION 1



OPTION 2
(POOR PAVEMENT)



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE

CORRECT WAY TO TWIST WIRE

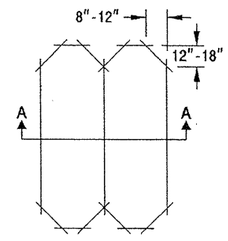
NOTES

1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

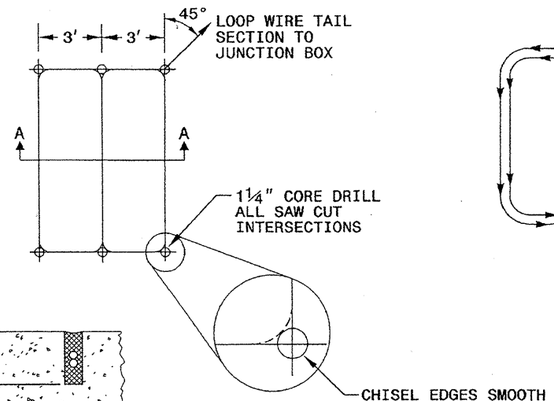
QUADRUPOLE LOOP

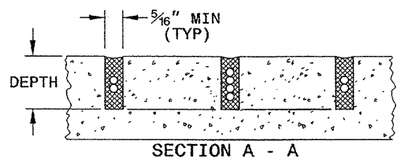
SAW CUT OPTIONS

OPTION 1



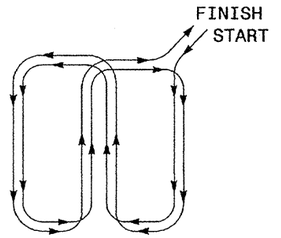
OPTION 2
(POOR PAVEMENT)





DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3

1725D01

See Plate for Title

Prepared in the Offices of:
Intelligent Transportation Systems & Signals Unit
750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16286 ENGINEER MILTON I DEAN

SIGNATURE

11/24/08
DATE

24-NOV-2008 09:28
d:\work files\640-standard plate sheets\1725D101_mdy2307.dgn
mdy2307

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 3

5CR.10321.13, 5CR.20321.13 & 5CR.20921.24

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

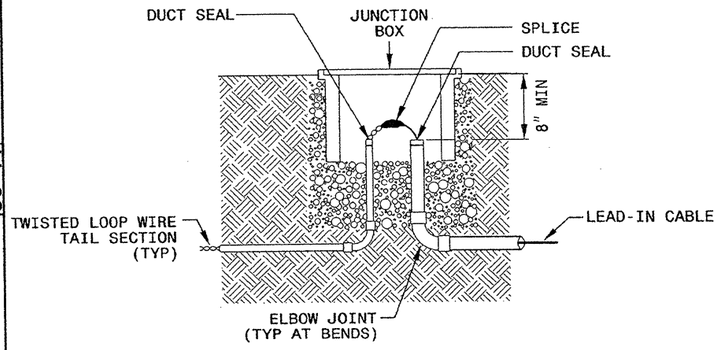
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

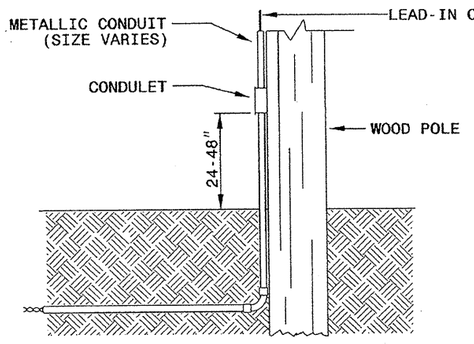
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

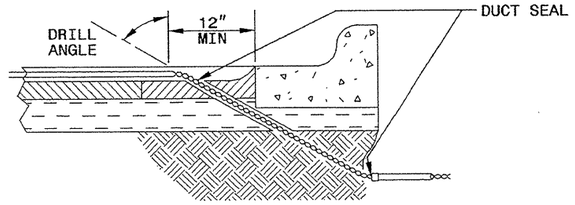


NOTE

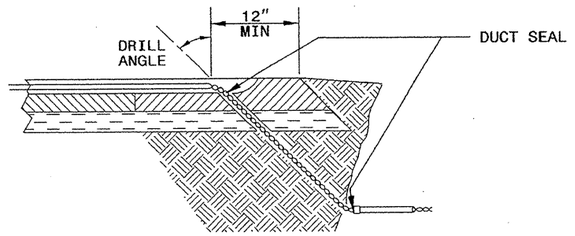
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

1. DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
2. TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
3. BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE OF CONDUIT TO JUNCTION BOX.

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ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

SHEET 2 OF 3
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See Plate for Title

Prepared in the Offices of:
Intelligent Transportation Systems & Signals Unit
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 16286 ENGINEER MILTON J. DEAN
Milton J. Dean 11/24/08
SIGNATURE DATE

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

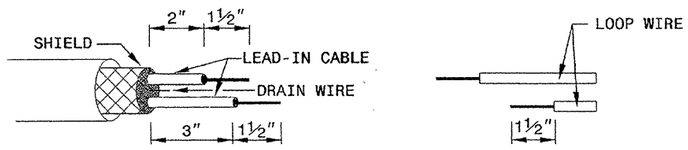
INDUCTIVE DETECTION LOOPS

SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

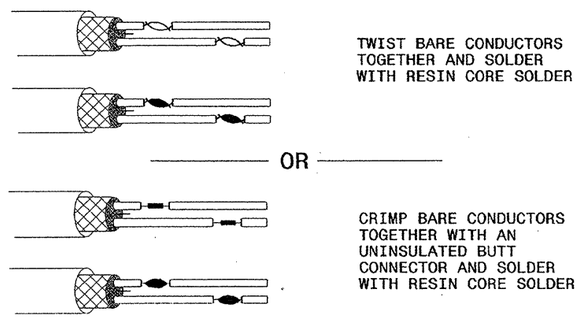
SHEET 3 OF 3

1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE



STEP 2. CONNECT AND SOLDER



TWIST BARE CONDUCTORS TOGETHER AND SOLDER WITH RESIN CORE SOLDER

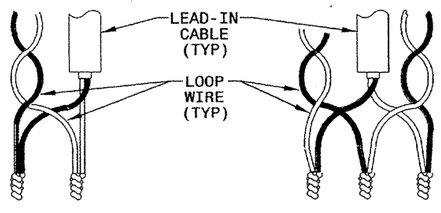
OR

CRIMP BARE CONDUCTORS TOGETHER WITH AN UNINSULATED BUTT CONNECTOR AND SOLDER WITH RESIN CORE SOLDER

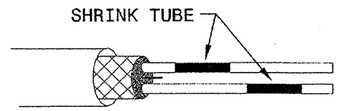
BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS

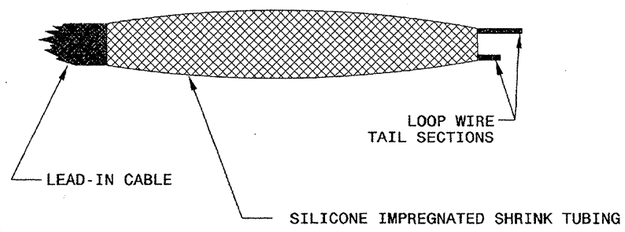
SINGLE CONNECTION SERIES CONNECTION



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3

1725D01

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