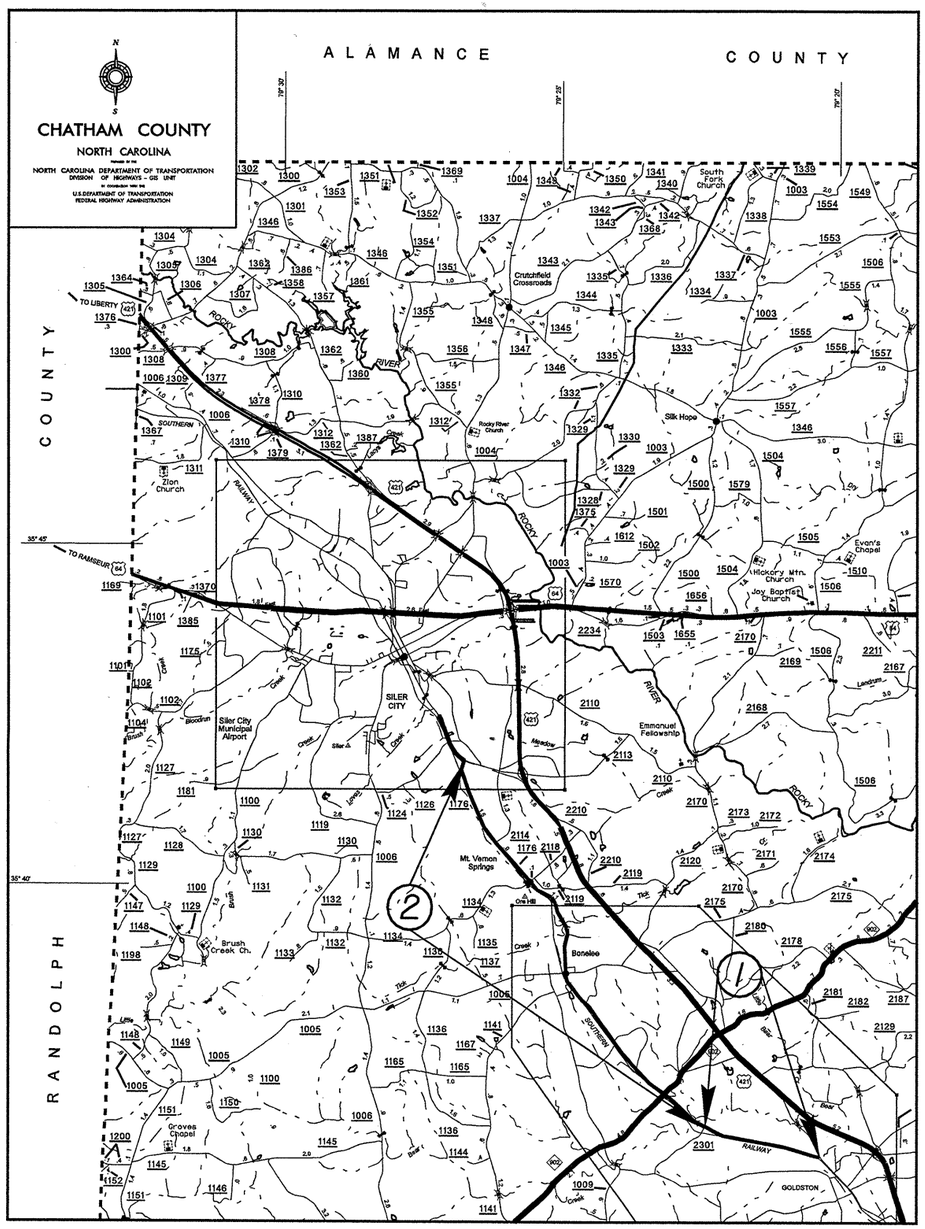
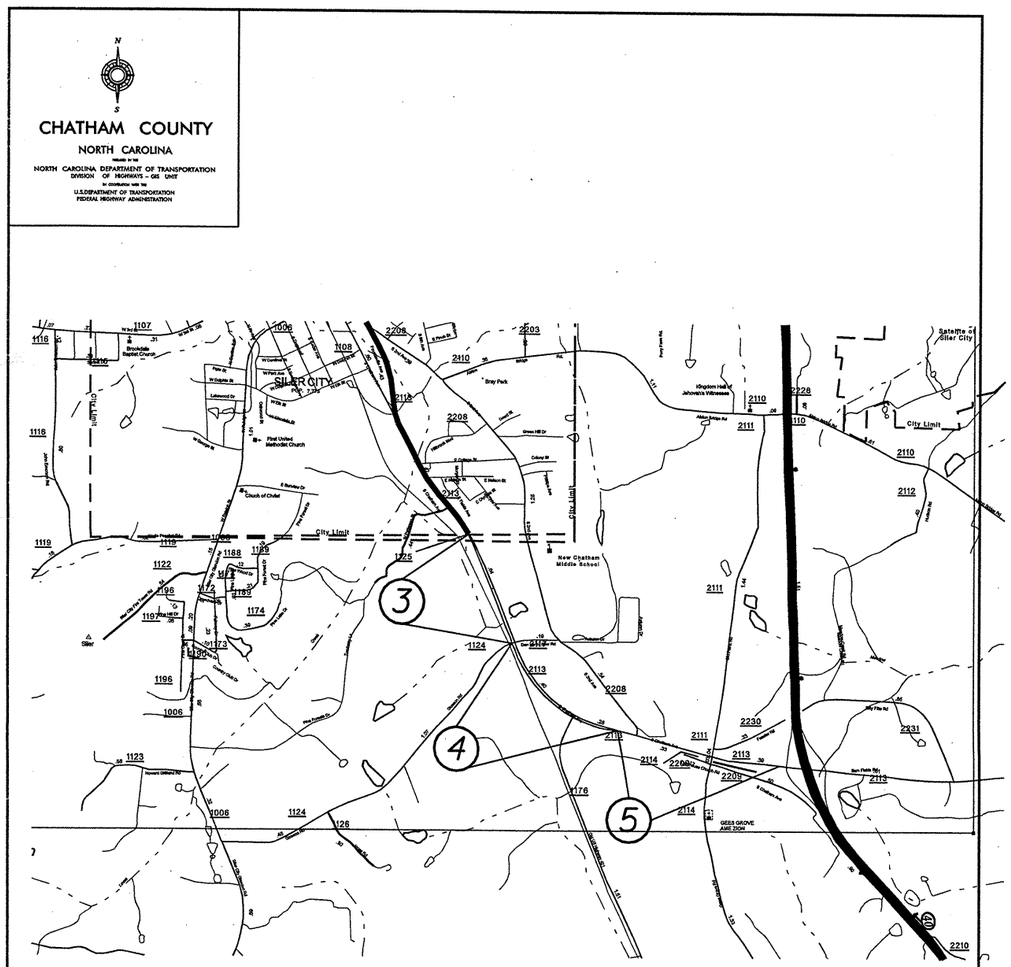
040397

WBS ELEMENT	SHEET NO.
8CR.20191.12	1

MAPS #1 & #2

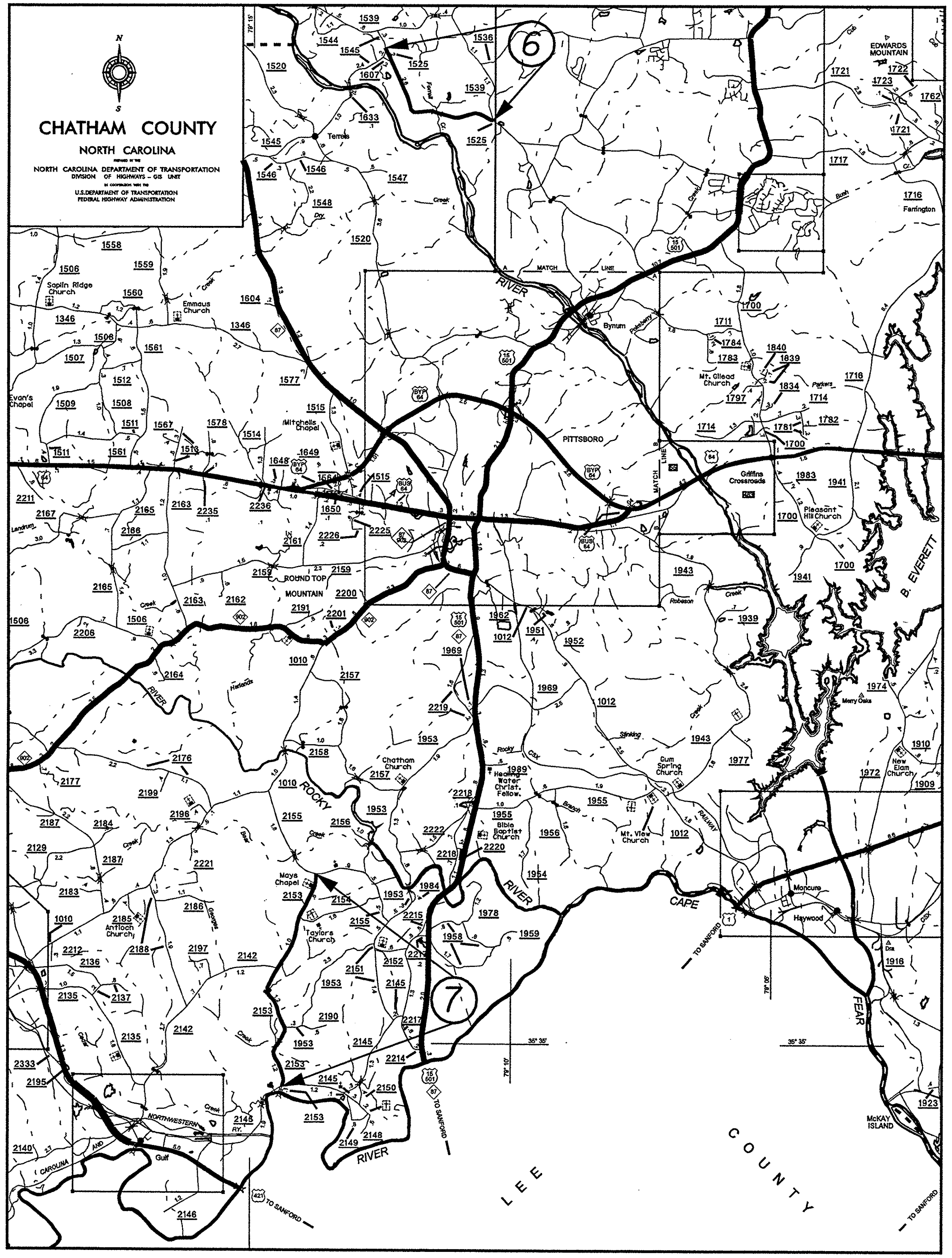


MAPS #3 – #5

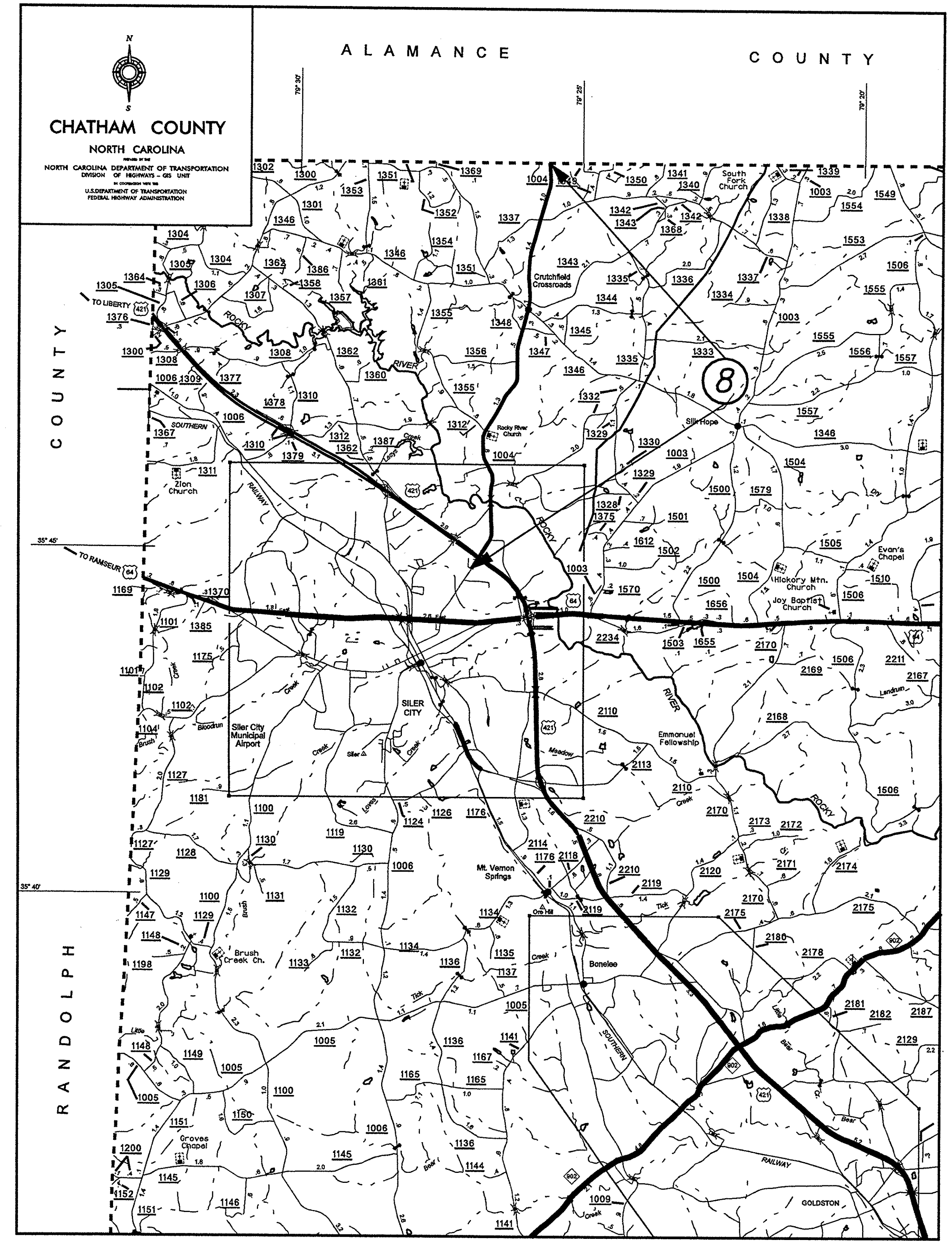


WBS ELEMENT	SHEET NO.
8CR.20191.12	2

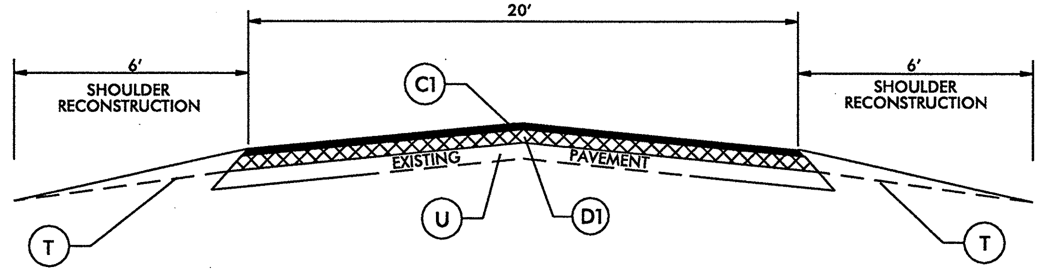
MAPS #6 & #7



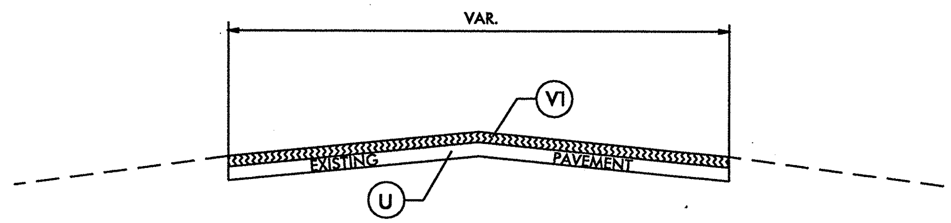
MAP #8



WBS ELEMENT	SHEET NO.
8CR.20191.12	3

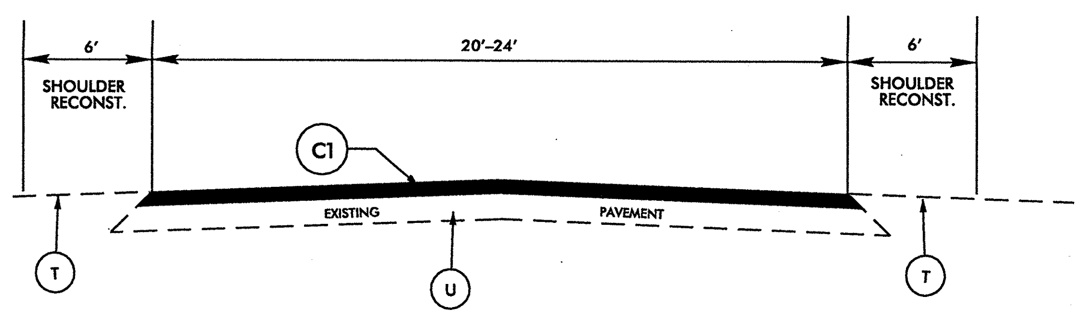


TYPICAL SECTION NO. 1

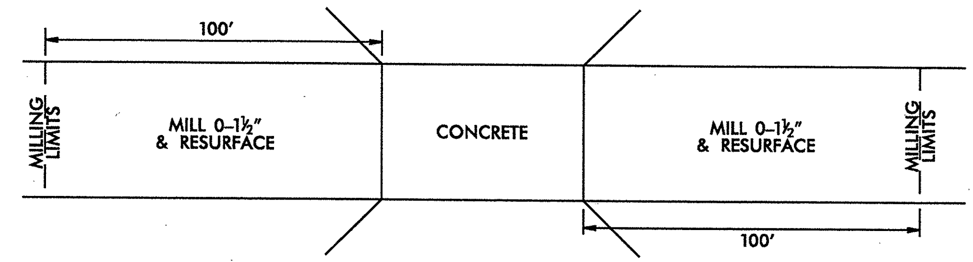


TYPICAL SECTION NO. 2

* CONTRACTOR SHALL MILL RUTS IN THE INTERSECTION OF SR 1176 AND SR 1005 AND OTHER LOCATIONS AS DIRECTED BY THE ENGINEER.



TYPICAL SECTION NO. 3



BRIDGE APPROACH MILLING

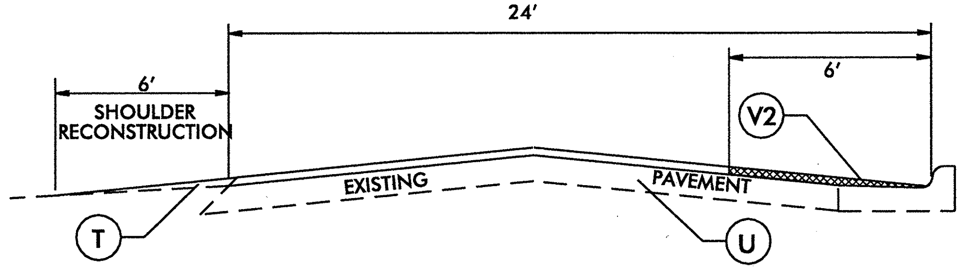
* MILLING SHALL BE PAID FOR UNDER INCIDENTAL MILLING

PAVEMENT SCHEDULE

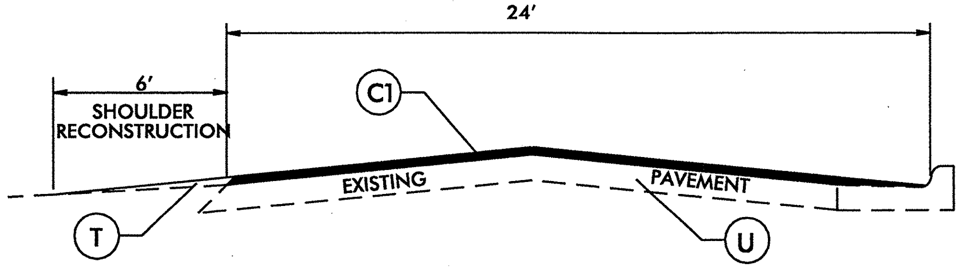
C1	PROP. APPROX. 1.5"ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1.5"ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	INCIDENTAL MILLING
V2	0 - 1.5" MILLING

24-AUG-2009 16:45
XIs\Stimulus Resurfacing\Chatham\Chatham-Central Let\SR1176.typ
AT D8CADD-246463

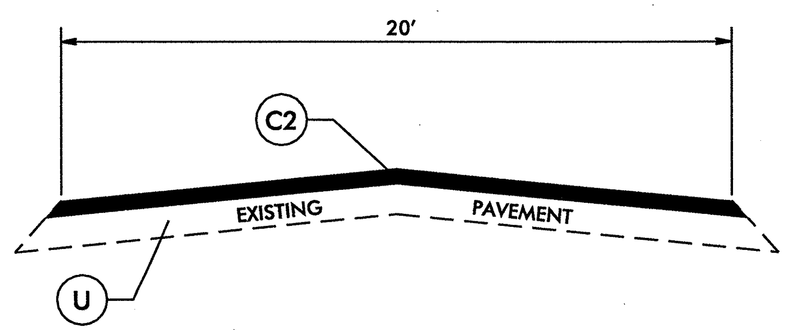
WBS ELEMENT	SHEET NO.
8CR.20191.12	4



TYPICAL SECTION NO. 4

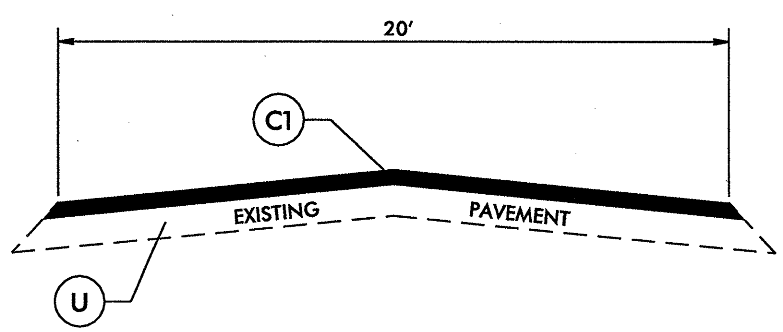


TYPICAL SECTION NO. 5



TYPICAL SECTION NO. 6

STATE FORCES SHALL PERFORM SHOULDER RECONSTRUCTION AND SEEDING & MULCHING ACTIVITIES

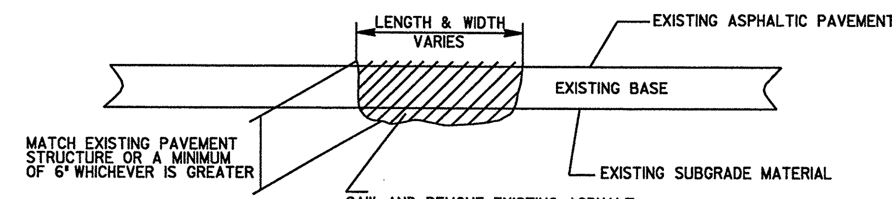


TYPICAL SECTION NO. 7

STATE FORCES SHALL PERFORM SHOULDER RECONSTRUCTION AND SEEDING & MULCHING ACTIVITIES

DETAILS OF PATCHING EXISTING PAVEMENT PRIOR TO RESURFACING

DETAIL NO. 1



PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5"ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1.5"ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	INCIDENTAL MILLING
V2	0-1.5" MILLING

049397

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AT D8CADD-246463

PROJECT NO.	SHEET NO.	TOTAL NO.
8CR.20191.12	5	6

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	FINAL SURFACE TESTING REQUIRED	LENGTH MI	WIDTH FT	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	0" TO 1.5" MILLING SY	INCIDENTAL MILLING SY	INTERMEDIATE COURSE, I19.0B TONS	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, SF9.5A TON	PG 64-22 PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	6" DRIVEWAYS SY	METER OR VALVE BOX EA	SEED & MULCHING AC	INDUCTIVE LOOP LF
8CR.20191.12	Chatham	1	SR 1176	SR 2333 TO SR 2301	1, 2	NO	2	20	200	4.00		1,100	5,715	2,085		394	105	150		2.90	
TOTAL FOR MAP NO. 1							**2**		**200**	**4.00**		**1,100**	**5,715**	**2,085**		**394**	**105**	**150**		**2.90**	
		2	SR 1176	FROM SR 2301 TO SR 2113	2, 3	NO	7.66	20	766	15.32		1,600		8,425		506	210	575	5	11.11	1,000
TOTAL FOR MAP NO. 2							**7.66**		**766**	**15.32**		**1,600**	**0**	**8,425**		**506**	**210**	**575**	**5**	**11.11**	**1,000**
		3	SR 2113 SB	FROM BEG DIV HWY TO END C&G	4,5	NO	0.64	24		0.64	2,245			900		54				0.47	
TOTAL FOR MAP NO. 3							**0.64**			**0.64**	**2,245**	**0**	**0**	**900**		**54**	**0**			**0.47**	
		4	SR 2113 SB	FROM END OF C&G TO END OF DIV HWY	3	NO	0.44	24		0.88				605		36				0.64	
TOTAL FOR MAP NO. 4							**0.44**			**0.88**	**0**	**0**	**0**	**605**		**36**	**0**			**0.64**	
		5	SR 2113	FROM END OF DIV HWY TO BEG OF 20' PAVEMENT 0.6 MILES SOUTH OF SR 2111	3	NO	1.01	24		2.02		135		1,460		88	100			1.46	
TOTAL FOR MAP NO. 5							**1.01**			**2.02**	**0**	**135**	**0**	**1,460**		**88**	**100**			**1.46**	
		6	SR 1525	FROM SR 1539 TO SR 1545	6	NO	2.77	20	275			100			2,775	180	100				
TOTAL FOR MAP NO. 6							**2.77**		**275**		**0**	**100**	**0**	**0**	**2,775**	**180**	**100**				
		7	SR 2153	FROM LEE CO TO SR 2155	6	NO	4.28	20	430			100			4,395	286	50				
TOTAL FOR MAP NO. 7							**4.28**		**430**		**0**	**100**	**0**	**0**	**4,395**	**286**	**50**				
		8	SR 1004	FROM SR 1365 TO ALAMANCE CO LINE	7	NO	7.07	20	710			100		7,340		440	100				
TOTAL FOR MAP NO. 8							**7.07**		**710**		**0**	**100**	**0**	**7,340**	**0**	**440**	**100**				
TOTAL FOR PROJ NO. 8CR.20191.12							**25.87**		**2,381**	**22.86**	**2,245**	**3,135**	**5,715**	**20,815**	**7,170**	**1,984**	**665**	**725**	**5**	**16.58**	**1,000**
GRAND TOTAL							**25.87**		**2,381**	**22.86**	**2,245**	**3,135**	**5,715**	**20,815**	**7,170**	**1,984**	**665**	**725**	**5**	**16.58**	**1,000**

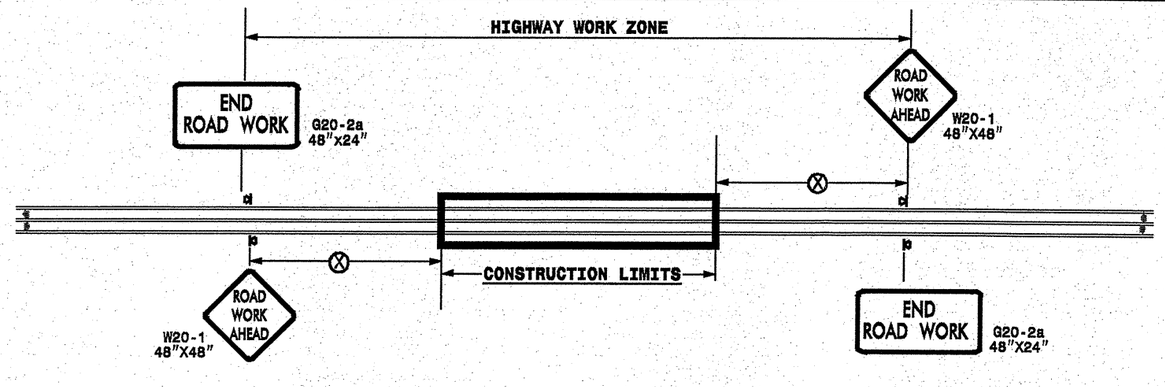
PROJECT NO.	SHEET NO.	TOTAL NO.
8CR.20191.12	6	6

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 WHITE THERMO LF	4686000000-E 4" X 120 M YELLOW THERMO LF	4695000000-E 8" X 90 M YELLOW THERMO LF	4710000000-E 24" X 120 M WHITE THERMO LF	4725000000-E THERMO STR ARROW 90 M EA	4725000000-E THERMO LT ARROW 90 M EA	4725000000-E THERMO STR & RT ARROW 90 M EA	4725000000-E THERMO RT ARROW 90 M EA	4810000000-E 4" WHITE PAINT LF	4810000000-E 4" YELLOW PAINT LF	4900000000-N YELLOW & YELLOW MARKERS EA	4900000000-N CYAN & RED MARKERS EA
8CR.20191.12	Chatham	1	SR 1176	FROM SR 2333 TO SR 2301											63,400	50,750	132	
TOTAL FOR MAP NO. 1															**63,400**	**50,750**	**132**	
		2	SR 1176	FROM SR 2301 TO SR 2113						60					162,000	129,600	506	
TOTAL FOR MAP NO. 2										**60**					**162,000**	**129,600**	**506**	
		3	SR 2113 SB	FROM BEG DIV HWY TO END C&G	3,635	3,635	1,000				2	2	2					47
TOTAL FOR MAP NO. 3					**3,635**	**3,635**	**1,000**				**2**	**2**	**2**					**47**
		4	SR 2113 SB	FROM END OF C&G TO END OF DIV HWY	4,735	4,735	750				6			2				34
TOTAL FOR MAP NO. 4					**4,735**	**4,735**	**750**				**6**			**2**				**34**
		5	SR 2113	FROM END OF DIV HWY TO BEG OF 20' PAVEMENT 0.6 MILES SOUTH OF SR 2111	10,875		165	5,415	400			7		10			106	25
TOTAL FOR MAP NO. 5					**10,875**		**165**	**5,415**	**400**			**7**		**10**			**106**	**25**
		6	SR 1525	FROM SR 1539 TO SR 1545											58,700	47,000		
TOTAL FOR MAP NO. 6															**58,700**	**47,000**		
		7	SR 2153	FROM LEE CO TO SR 2155											90,400	72,300		
TOTAL FOR MAP NO. 7															**90,400**	**72,300**		
		8	SR 1004	FROM SR 1365 TO ALAMANCE CO LINE	76,100			61,000									470	
TOTAL FOR MAP NO. 8					**76,100**			**61,000**									**470**	
TOTAL FOR PROJ NO. 8CR.20191.12					**95,345**	**8,370**	**1,915**	**66,415**	**400**	**60**	**8**	**9**	**2**	**12**	**374,500**	**299,650**	**1,214**	**106**
					103,715		**68,330**				**31**				**674,150**		**1,320**	
GRAND TOTAL					**95,345**	**8,370**	**1,915**	**66,415**	**400**	**60**	**8**	**9**	**2**	**12**	**374,500**	**299,650**	**1,214**	**106**
					103,715		**68,330**				**31**				**674,150**		**1,320**	

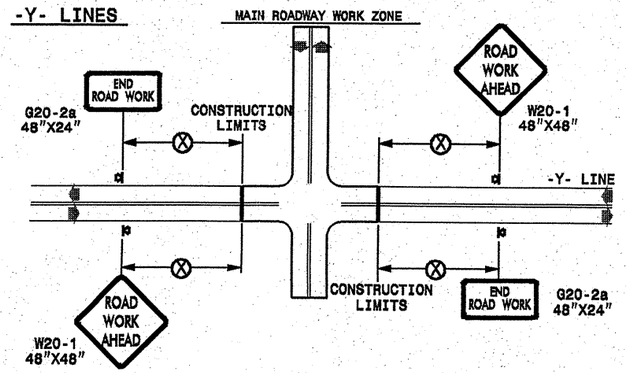
PROJ. REFERENCE NO.	SHEET NO.
8CR.20191.12	TCP-1

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	

27-AUG-2009 18:59
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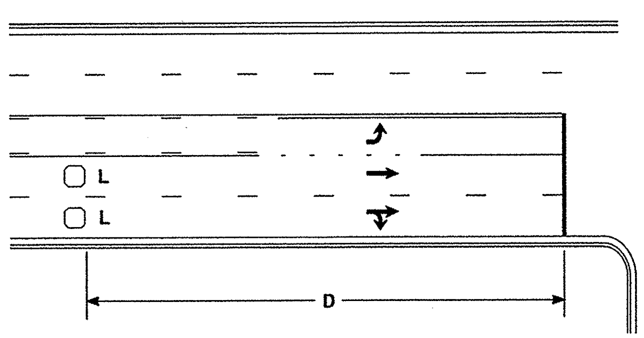
pseymore AT WZTC237502

PROJECT REFERENCE NO.	SHEET NO.
8CR.20191.12	SIG 1

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



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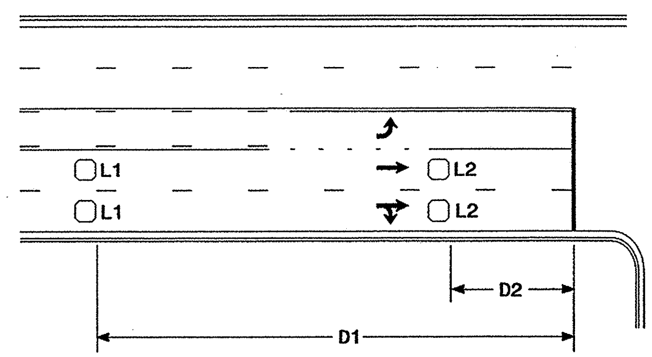


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

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

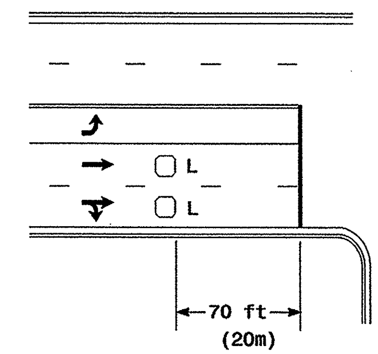
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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)]



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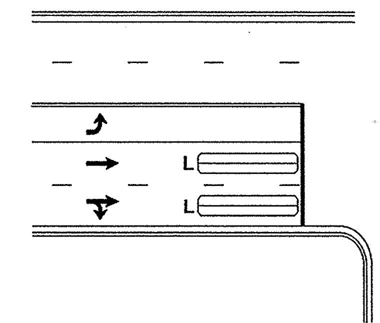
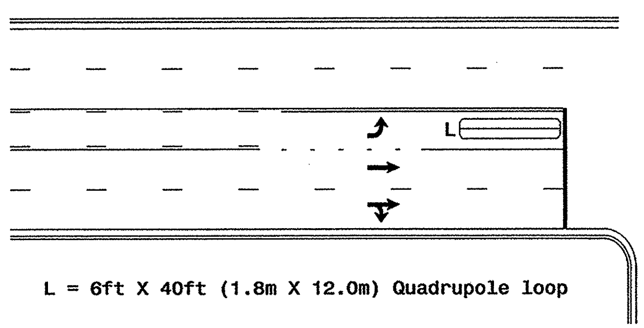


L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

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

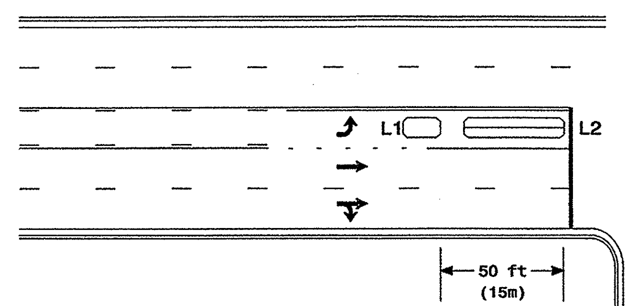
Left Turn Lane Detection



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

Presence Loop Detection

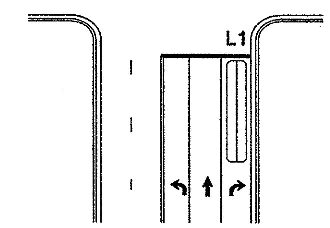
OR



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

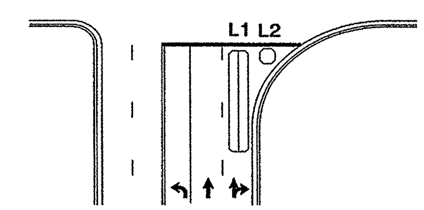
Queue Loop Detection

Right Turn Lane Detection

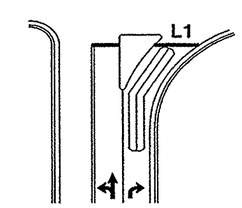


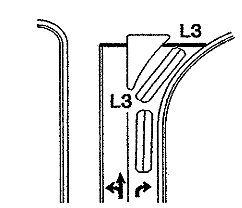
Standard Turn

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



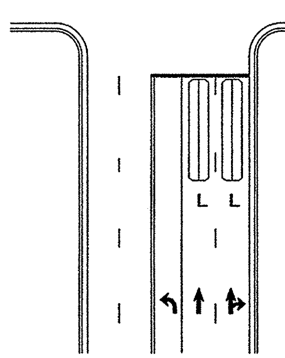
Wide Radius Turn





Channelized Turn

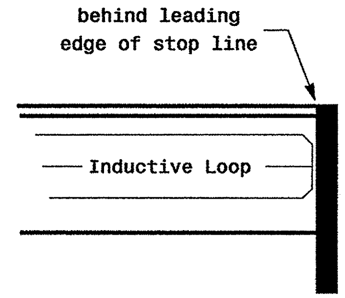
Side Street Detection



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, North Carolina Department of Transportation
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 PAUL ALEXANDER
SIGNATURE 6/6/06 DATE
SIG. INVENTORY NO.

19-DEC-2006 14:29
s:\its signals\lb turn inmisc\looptypical2006.dgn
polexander

PROJECT REFERENCE NO.	SHEET NO.
8CR.20191.12	Sig. 2

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

5-07

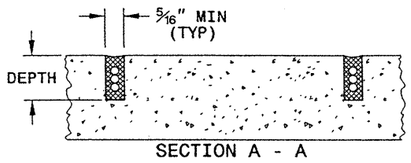
ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

CONVENTIONAL 4-SIDED LOOP

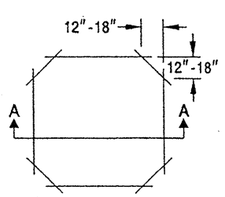
SAW SLOT DEPTH CHART

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

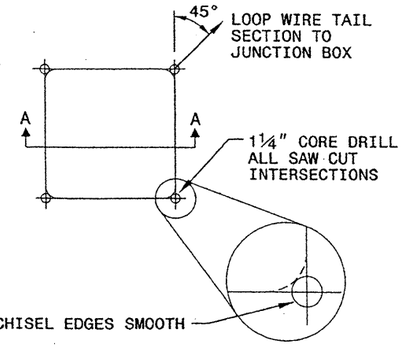


SAW CUT OPTIONS

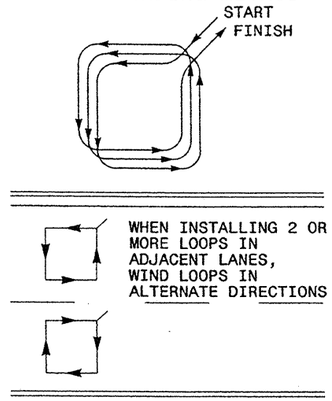
OPTION 1



OPTION 2
(POOR PAVEMENT)

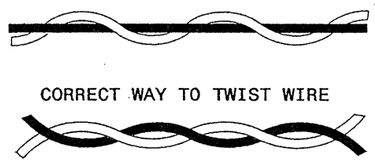


LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE



CORRECT WAY TO TWIST WIRE

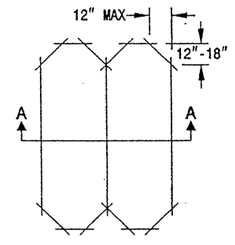
NOTES

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.

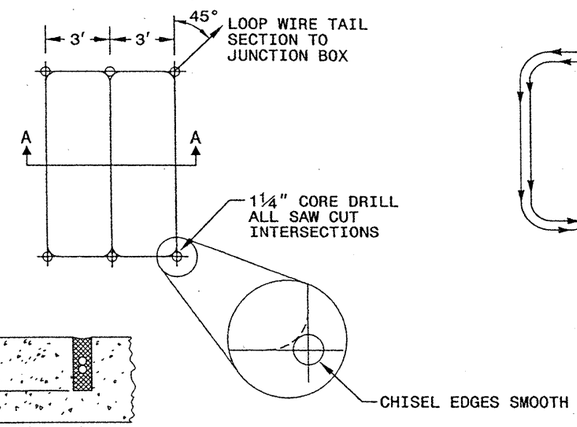
QUADRUPOLE LOOP

SAW CUT OPTIONS

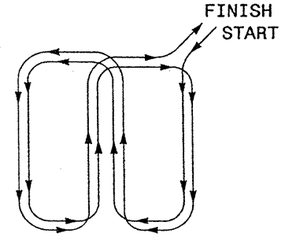
OPTION 1

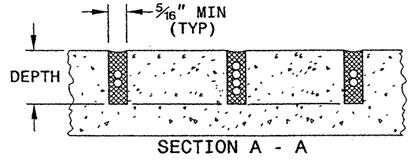


OPTION 2
(POOR PAVEMENT)



LOOP WINDING METHOD





DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

SHEET 1 OF 3
1725D01

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

5-07

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
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 016286 ENGINEER MILTON I. DEAN
Milton I. Dean 9/5/07
SIGNATURE DATE

05-SEP-2001 14:00
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STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

5-07

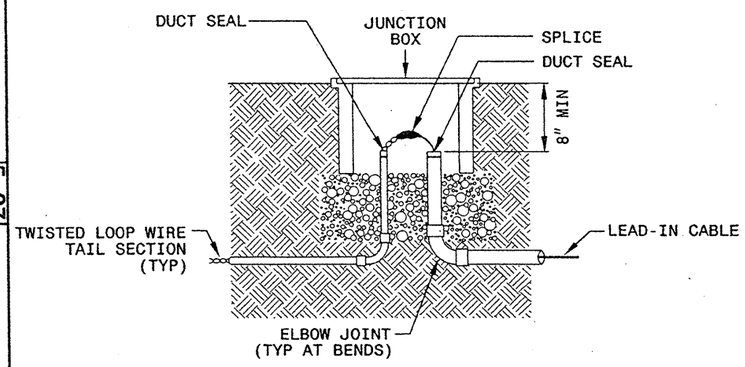
ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

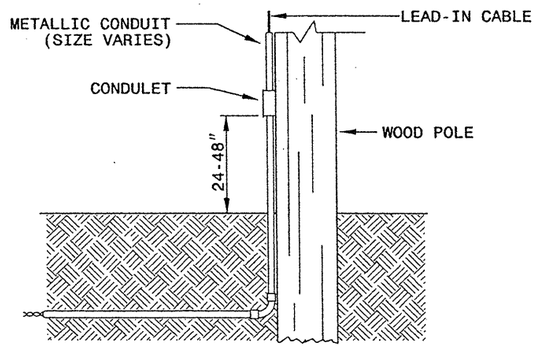
LOOP WIRE DETAILS

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

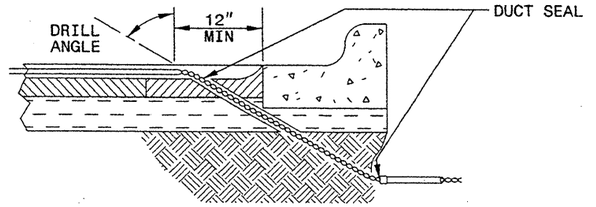


NOTE

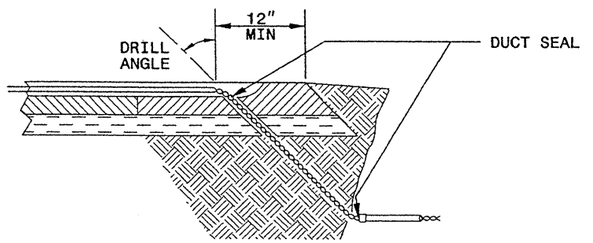
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

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
1725D01

See Plate for Title

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 016286 ENGINEER MILTON I. DEAN

Milton I. Dean 9/5/07
SIGNATURE DATE

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mlittle

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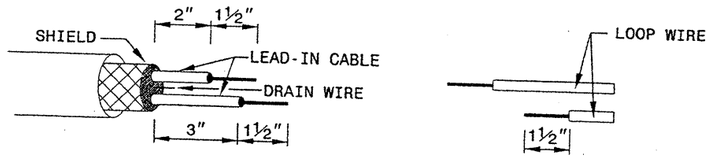
RALEIGH, N.C.
5-07

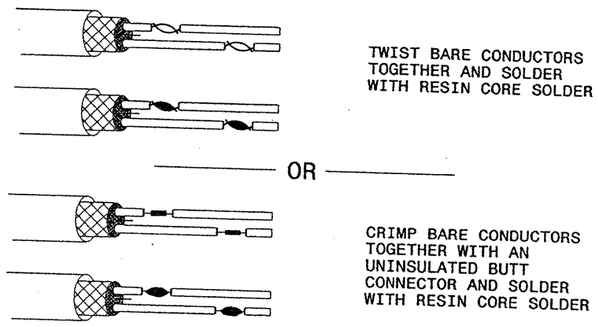
ENGLISH DETAIL DRAWING FOR
INDUCTION DETECTION LOOPS
SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

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

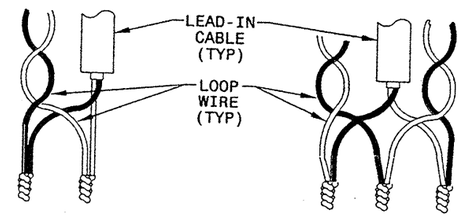
CRIMP BARE CONDUCTORS TOGETHER WITH AN UNINSULATED BUTT CONNECTOR AND SOLDER WITH RESIN CORE SOLDER

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

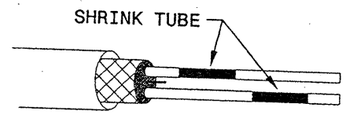
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS

SINGLE CONNECTION

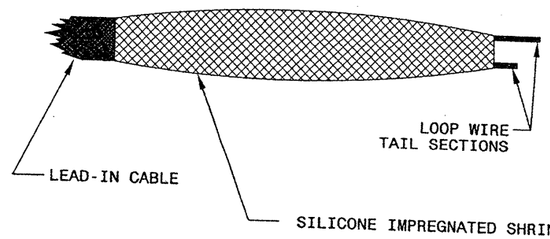
SERIES CONNECTION



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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RALEIGH, N.C.
5-07

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

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