

09/08/09

CONTRACT NO.: WBS ELEMENT: ICR.10581.17, ETC.

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS MARTIN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	ICR.10581.17, ICR.10581.19	1	5
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	



LOCATION: US 17 FROM US 64 ALT. SOUTH FOR 2.6 MILES TO END OF 4 LANES
 TYPE OF WORK: MILLING, RESURFACING, LONG LIFE PAVEMENT MARKINGS AND MARKERS

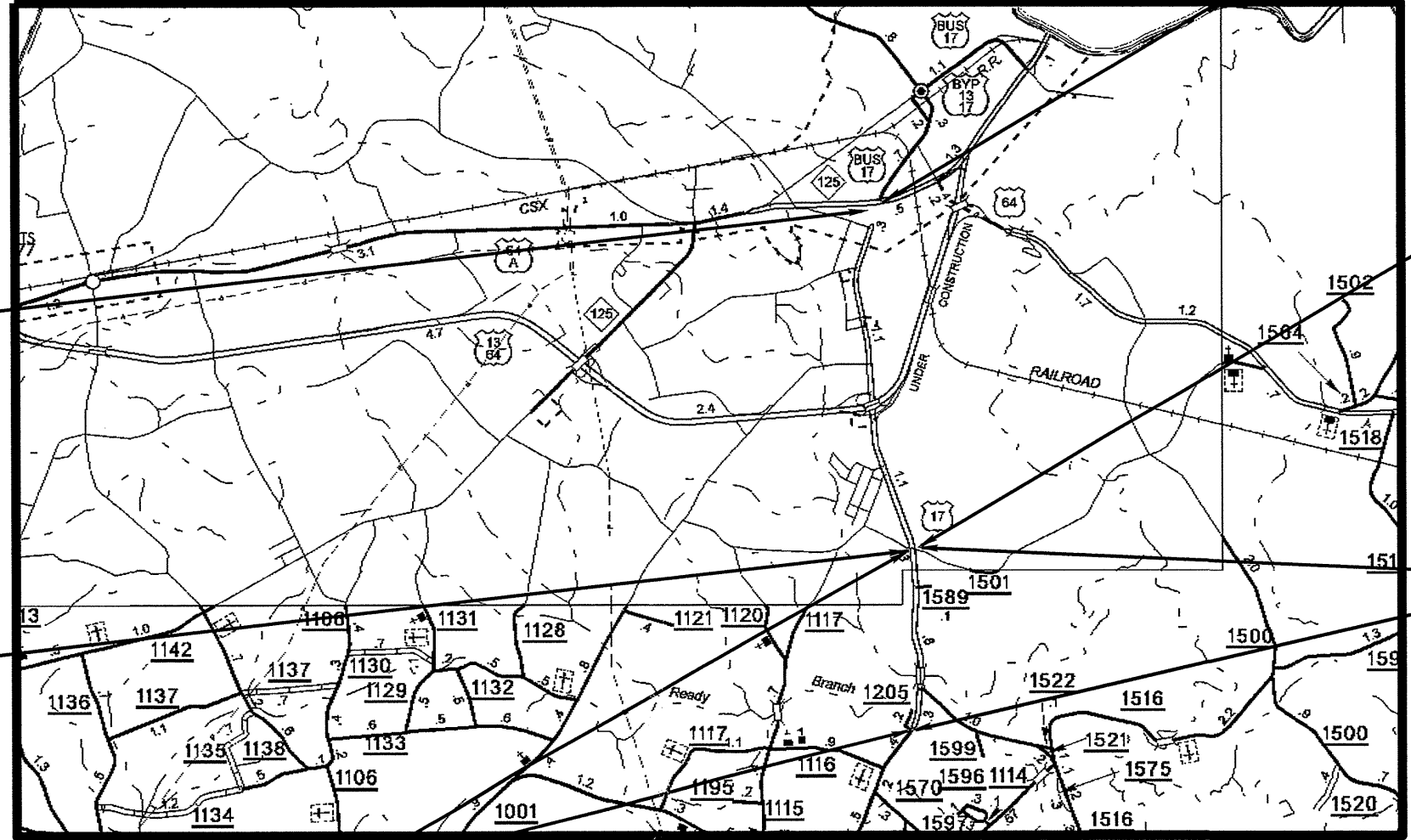
US 17 NBL MAP # 2

US 17 SBL MAP # 1

US 17 NBL MAP # 2

US 17 SBL MAP # 1

US 17 NBL MAP # 6

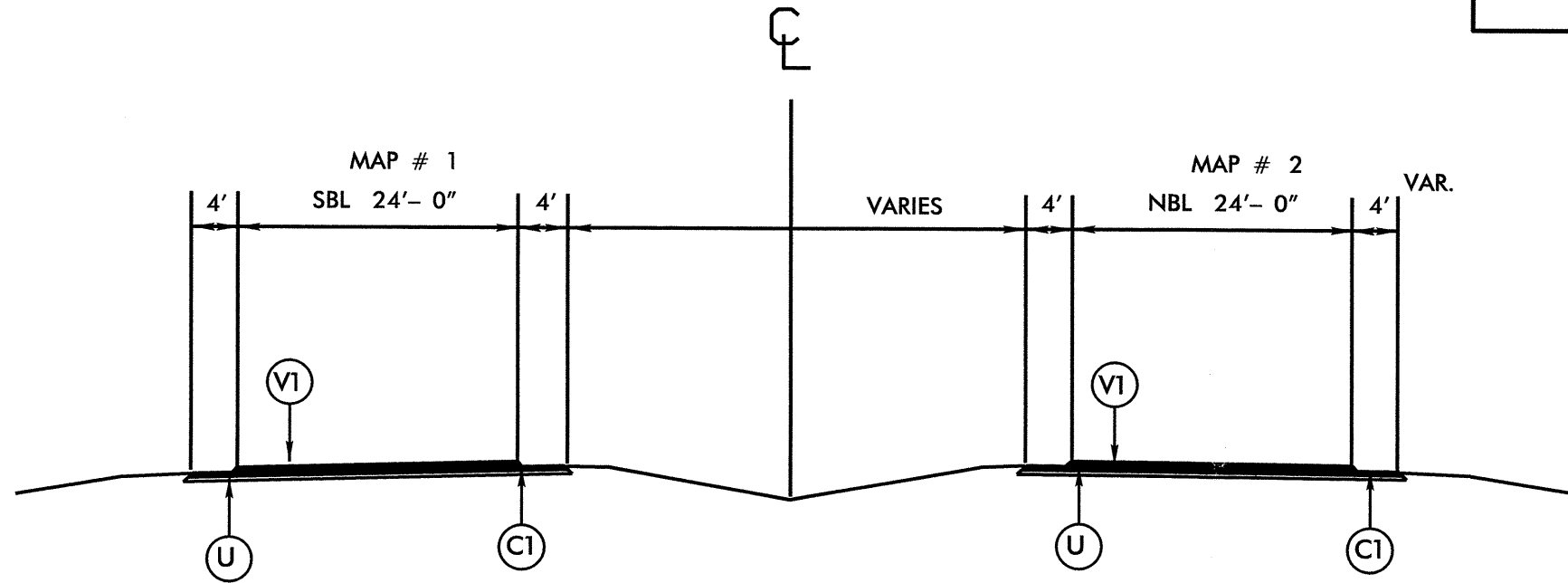


NOTES:

1. ALL PAVED INTERSECTIONS, CROSS OVERS AND TURN LANES ARE TO BE MILLED AND RESURFACED TO THE ENDS OF THE RADII OR AS DIRECTED BY THE ENGINEER
2. EDGES, PAVEMENT WIDENING, INTERSECTIONS, CROSSOVERS AND TURN LANES ARE INCLUDED IN SUMMARY OF QUANTITIES
3. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE
4. SHOULDERS AND DITCHES ARE TO BE CONSTRUCTED BY OTHERS

PROJECT REFERENCE NO.	SHEET NO.
1CR.10581.17	3 OF 5

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S 9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ.YD.
V1	MILLING ASPHALT PAVEMENT DEPTH 1.5"
U	EXISTING PAVEMENT.



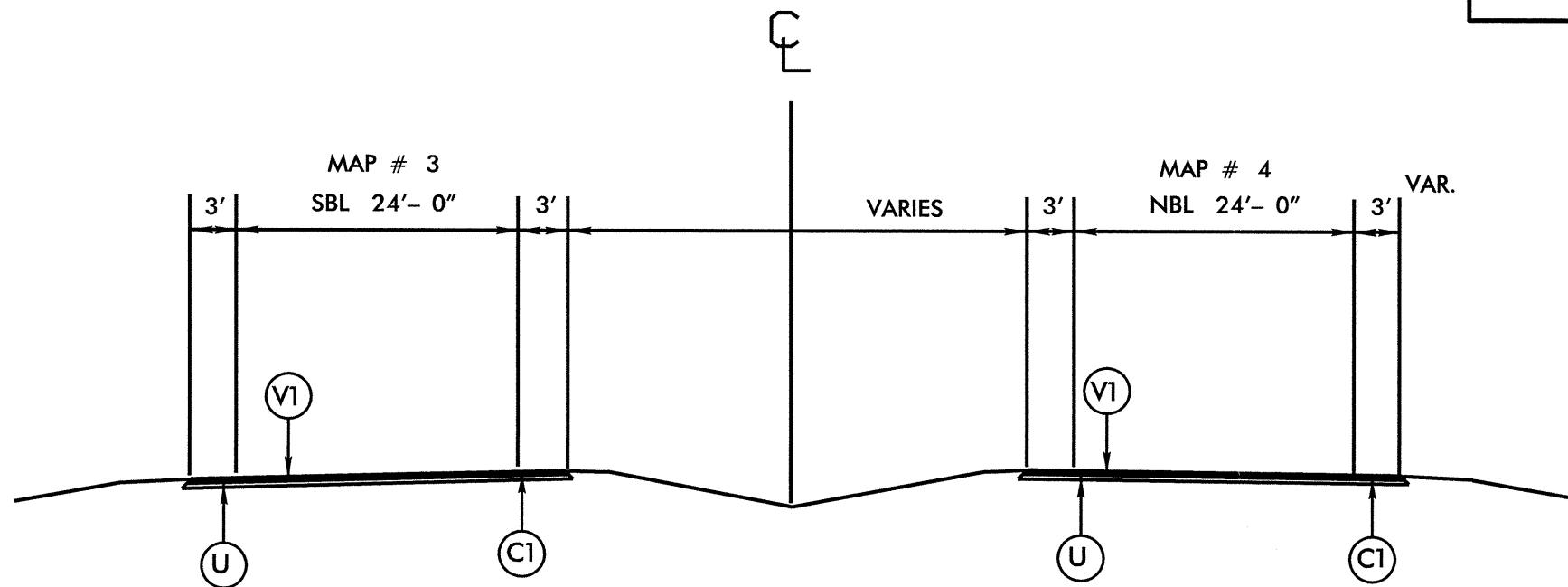
TYPICAL SECTION #1
 USE WITH MAP'S 1 & 2

NOTES:

1. ALL PAVED INTERSECTIONS, CROSS OVERS AND TURN LANES ARE TO BE MILLED AND RESURFACED TO THE ENDS OF THE RADII OR AS DIRECTED BY THE ENGINEER
2. EDGES, PAVEMENT WIDENING, INTERSECTIONS, CROSSOVERS AND TURN LANES ARE INCLUDED IN SUMMARY OF QUANTITIES
3. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE
4. SHOULDERS AND DITCHES ARE TO BE CONTRUCTED BY OTHERS

PROJECT REFENCE NO.	SHEET NO.
1CR.10581.18	4 OF 5

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S 9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ.YD.
V1	MILLING ASPHALT PAVEMENT DEPTH 2.0"
U	EXISTING PAVEMENT.



TYPICAL SECTION #2

USE WITH MAP'S 3, 4, 5 & 6

PROJECT NO.	SHEET NO.	TOTAL NO.
1CR.10581.17, 1CR.10581.18, 1CR.10581.19	5	5

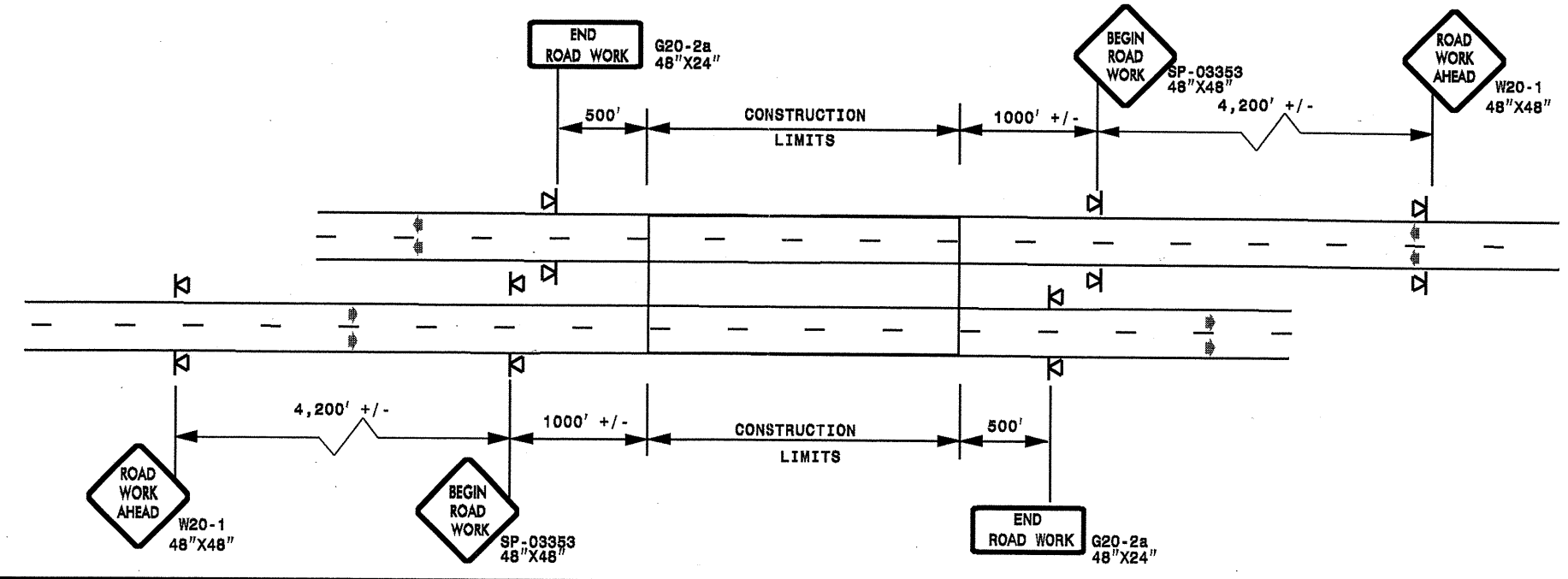
SUMMARY OF QUANTITIES

PROJECT	COUNTY	MAP	ROUTE	DESCRIPTION	TYP	FINAL SURFACE TESTING REQUIRED	LENGTH	WIDTH	MOBILIZATION	MILLING ASPHALT PAVEMENT, 1 1/2" DEPTH	MILLING ASPHALT PAVEMENT, 2" DEPTH	SURFACE COURSE, S9.5B	PG 64-22 PLANT MIX	ADJ. OF MANHOLES	TRAFFIC CONTROL	
NO		NO			NO		MI	FT	LS	SY	SY	TONS	TONS	EA	LS	
1CR.10581.17	Martin	1	US 17 SOUTH BOUND LANE	SOUTH BOUND LANE FROM US64 ALT TO SR 1501	1	NO	2.6	32	1	54,294		6,720	403		1	
1CR.10581.17	Martin	2	US 17 NORTH BOUND LANE	NORTH BOUND LANE FROM SR1501 TO US 64 ALT	1	NO	2.6	32	*	54,294		6,720	403		*	
TOTAL FOR 1CR.10581.17										108,588		13,440	806			
1CR.10581.18	Martin	3	US 13/ 17 SOUTH BOUND LANE	FROM RONOAKE RIVER BRIDGE TO NEW PAVEMENT	2	NO	0.81	30	*		17,288	2,000	120	3	*	
1CR.10581.18	Martin	4	US 13/17 NORTH BOUND LANE	FROM NEW PAVEMENT TO RONOAKE RIVER BRIDGE	2	NO	0.81	30	*		17,288	2,000	120	3	*	
TOTAL FOR 1CR.10581.18											34,576	4,000	240	3		
1CR.10581.19	Martin	5	US 17 SOUTH BOUND LANE	SOUTH BOUND LANE FROM SR 1501 TO END 4 LANE	1	NO	1.5	32	*		30,976	3,487	209		*	
1CR.10581.19	Martin	6	US 17 NORTH BOUND LANE	FROM END 4 LANE TO SR 1501	1	NO	1.5	32	*		30,976	3,487	209		*	
TOTAL FOR 1CR.10581.19											61,952	6,974	418			
GRAND TOTAL								9.82		1	108,588	96,528	24,414	1,464	3	1

PROJECT	COUNTY	MAP	ROUTE	DESCRIPTION	4685000000-E		4686000000-E		4695000000-E	4710000000-E	4725000000-E				4810000000-E		4835000000-N	4900000000-N		7444000000-E	7456000000-E	
					4" X 90 M WHITE THERMO	4" X 90 M YELLOW THERMO	4" X 120 M WHITE THERMO	4" X 120 M YELLOW THERMO	8" X 90 M YELLOW THERMO	24" X 120 M WHITE THERMO	THERMO LT ARROW 90 M	THERMO RT ARROW 90 M	THERMO STR ARROW 90 M	THERMO STR & RT ARROW 90 M	4" WHITE PAINT	4" YELLOW PAINT	24" WHITE PAINT	CRYSTAL & RED MARKERS	YELLOW & YELLOW MARKERS	INDUCTIVE LOOP SAWCUT	LEAD-IN CABLE (18-4)	
NO		NO			LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF	LF	LF	EA	EA	LF	LF	
1CR.10581.17	Martin	1	US 17 SOUTH BOUND LANE	SOUTH BOUND LANE FROM US64 ALT TO SR 1501	15,250	15,250	5,300			128	23	20	40	40	22,550	15,250	128	300		5,100	5,000	
1CR.10581.17	Martin	2	US 17 NORTH BOUND LANE	NORTH BOUND LANE FROM SR1501 TO US 64 ALT	15,250	15,250	5,300			128	23	20	40	40	22,550	15,250	128	300		5,100	5,000	
TOTAL FOR 1CR.10581.17					30,500	30,500	10,600			256	46	40	80	80	45,100	30,500	256	600		10,200	10,000	
					61,000		10,600				256	246			75,600		256	600		10,200	10,000	
1CR.10581.18	Martin	3	US 13/ 17 SOUTH BOUND LANE	SOUTH BOUND LANE FROM RONOAKE RIVER BRIDGE TO NEW PAVEMENT	8,716	6,500	1,069			65	7	2	2	2	9,716	6,500	65	50	60			
1CR.10581.18	Martin	4	US 13/17 NORTH BOUND LANE	FROM NEW PAVEMENT TO RONOAKE RIVER BRIDGE	8,716	6,500	1,100			50	8	2	6		9,816	6,500	50	50	60			
TOTAL FOR 1CR.10581.18					17,432	13,000	2,169			115	15	4	8	2	19,532	13,000	115	100	120			
					30,432		2,169				115	29			32,532			220				
1CR.10581.19	Martin	5	US 17 SOUTH BOUND LANE	SOUTH BOUND LANE FROM SR 1501 TO END 4 LANE	8,220	7,920	1,980	914	40		4				3,960					132		
1CR.10581.19	Martin	6	US 17 NORTH BOUND LANE	FROM END 4 LANE TO SR 1501	8,220	7,920	2,303	110			6				3,960					132		
TOTAL FOR 1CR.10581.19					16,440	15,840	4,283	1,024	40		10				7,920					264		
					32,280		5,307		40		10	10			7,920			264				
GRAND TOTAL					64,372	59,340	17,052	1,024	40		71	44	88	82	72,552	43,500		964	120		10,200	10,000
					123,712		18,076		40		371	285			116,052		371	1,084		10,200	10,000	

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

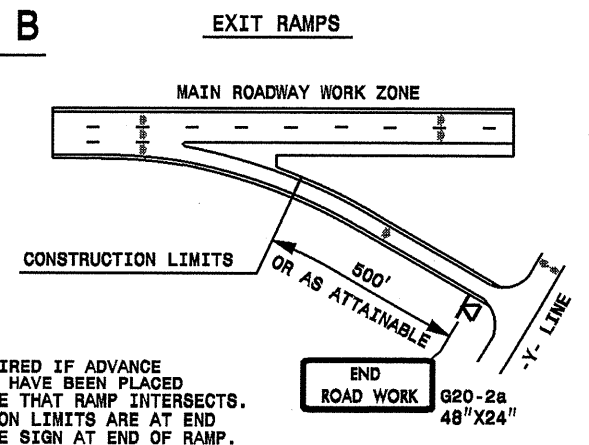
DETAIL A



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DIVISION OF HIGHWAYS
RALEIGH, N.C.

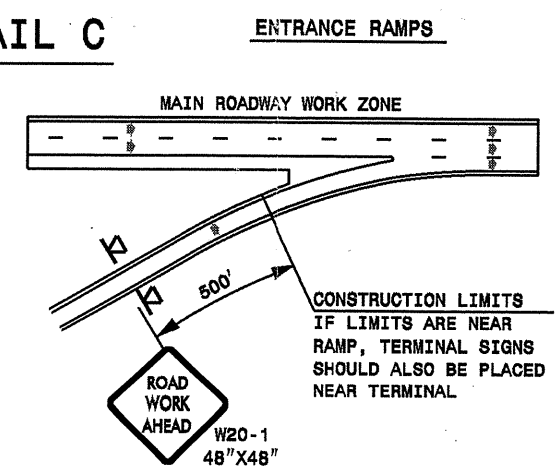
ROADWAYS INTERSECTING ALONG FREEWAY WORK ZONE (Y-LINES)

DETAIL B

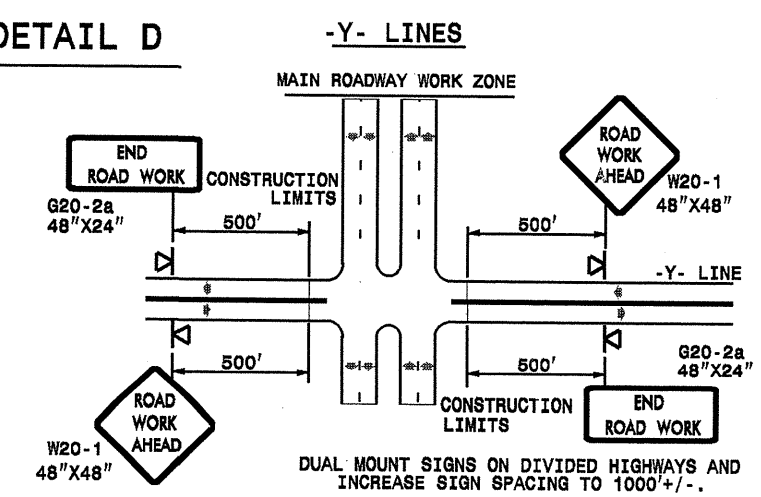


NOTE:
SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

DETAIL C



DETAIL D



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.

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

SHEET 1 OF 1

LEGEND

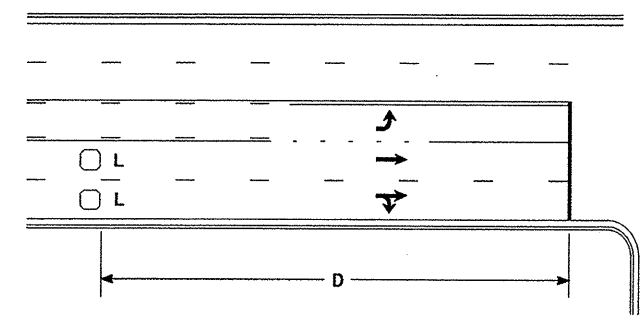
◀ PORTABLE SIGN

→ DIRECTION OF TRAFFIC FLOW

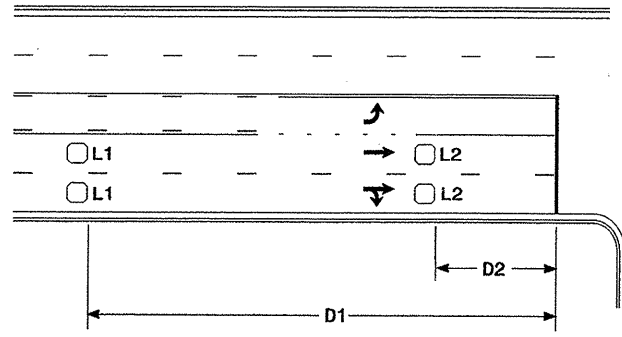
APPROVED: _____	DATE: _____
SEAL	
DETAIL DRAWING FOR FREEWAYS WORK ZONE WARNING SIGNS	
SCALE: NONE	REVISIONS
DATE: _____	7-98 10/01
DWG. BY: _____	10-98 03/04
DESIGN BY: _____	01/01 11/04
REVIEWED BY: _____	CADD FILE

24-MAY-2010 10:49 S:\Signing\Resur facing2010\Div\1\202604A&B_1CR105817x2_Morfin_USJ317m4\C202604A&B_1CR105817x2_freewaylanesgreatJuly2006_portable.dgn

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

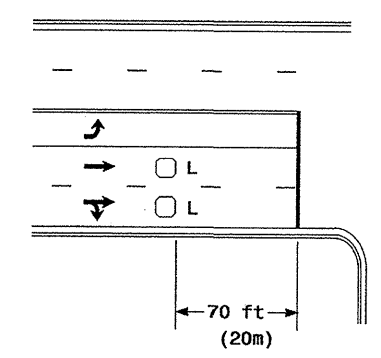
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

L1 = 6ft X 6ft
(1.8m X 1.8m)
Wired in series
L2 = 6ft X 6ft
(1.8m X 1.8m)
Wired in series

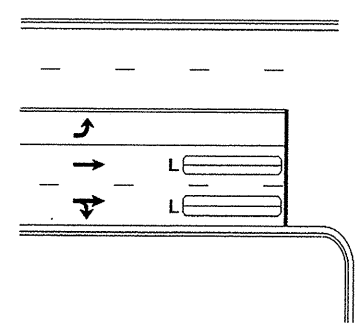
Volume Density Operation

"Stretch" Operation

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



OR



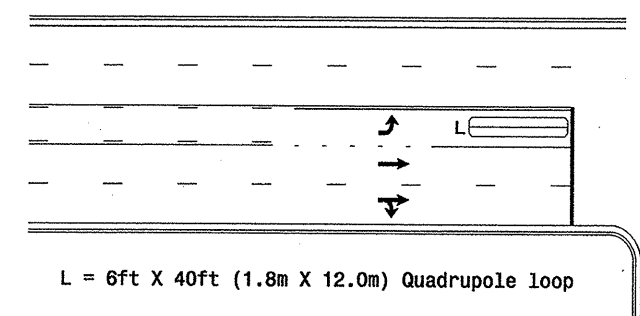
L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

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

Volume Density Operation

"Stretch" Operation

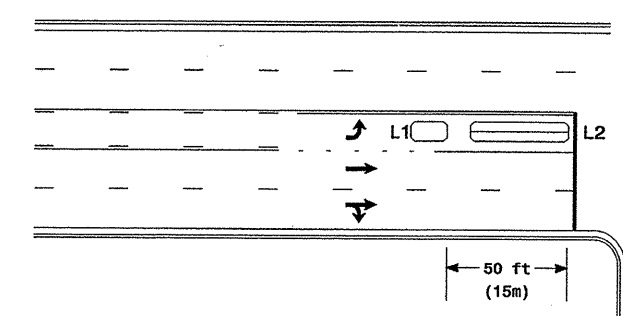
Left Turn Lane Detection



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

Presence Loop Detection

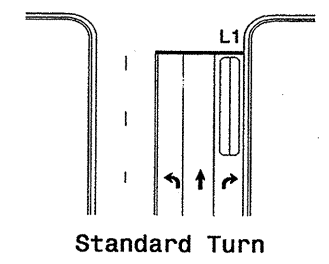
OR



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

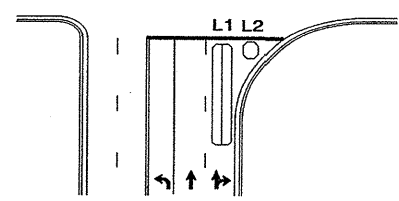
Queue Loop Detection

Right Turn Lane Detection

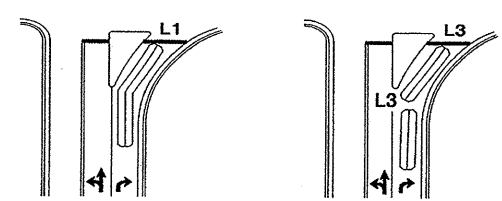


Standard Turn

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

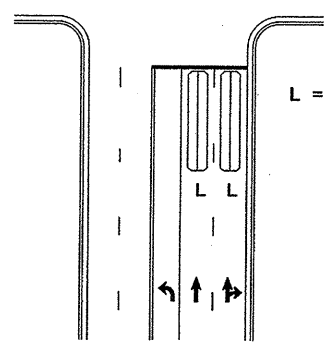


Wide Radius Turn



Channelized Turn

Side Street Detection

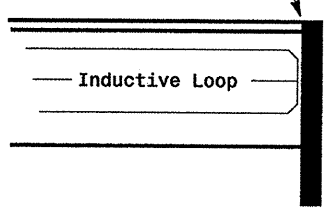


L = 6ft X 40ft (1.8m X 12.0m)
Quadrupole loop
Wired to separate
detectors/channels

Side Street Detection

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.

Presence Loop Placement at Stop Lines

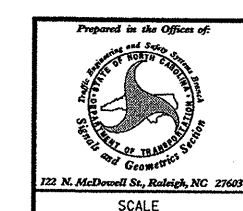
Recommended Number of Turns

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

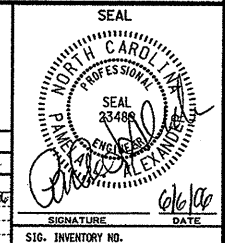
Quadrupole loops: Use 2-4-2 turns

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



Typical Loop Locations

PLAN DATE: June 2006	REVIEWED BY:
PREPARED BY: P. L. Alexander	REVIEWED BY:
REVISIONS	INIT. DATE
1. Revised pavement markings	AC 12/13/06
SIGNATURE: P. L. Alexander	DATE: 6/6/06



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

11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

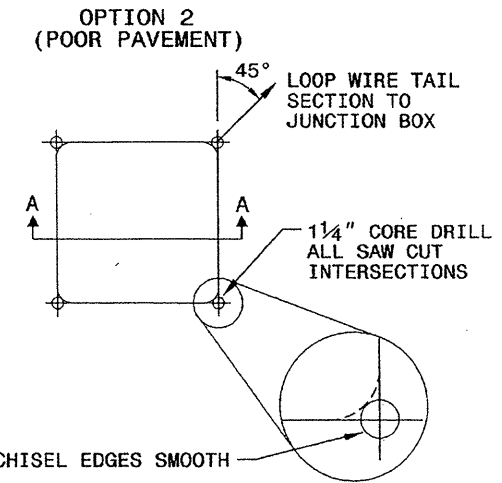
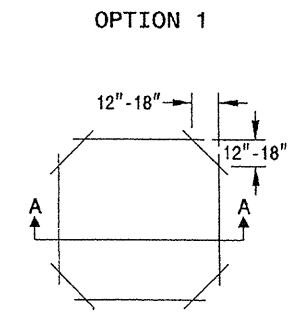
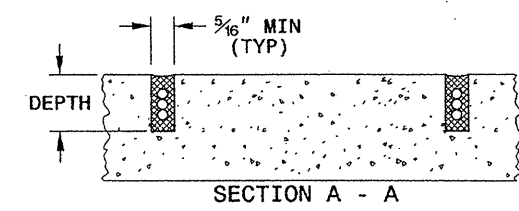
SHEET 1 OF 3
1725D01

CONVENTIONAL 4-SIDED LOOP

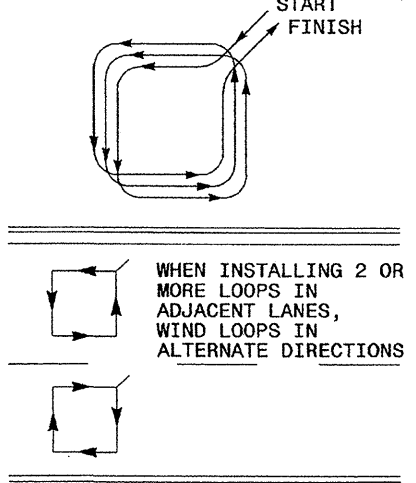
SAW CUT OPTIONS

SAW SLOT DEPTH CHART

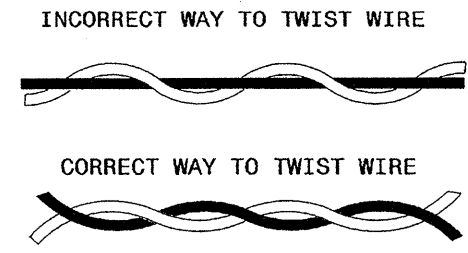
DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

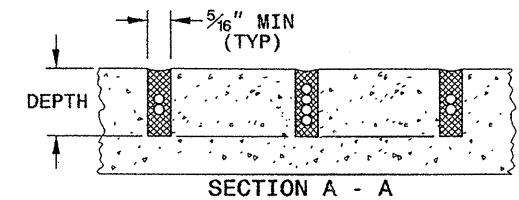
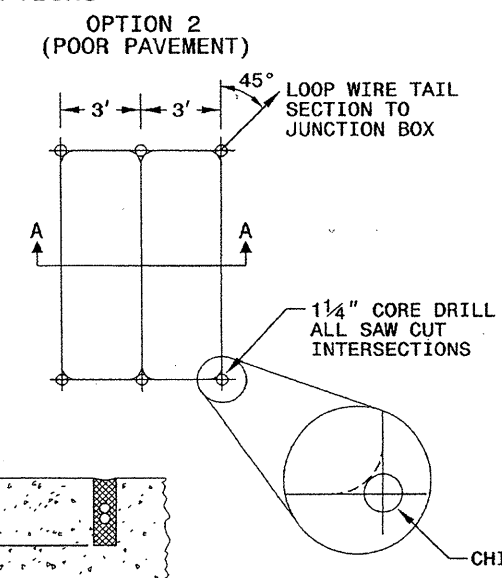
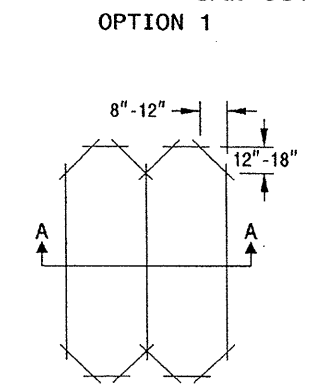


NOTES

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.

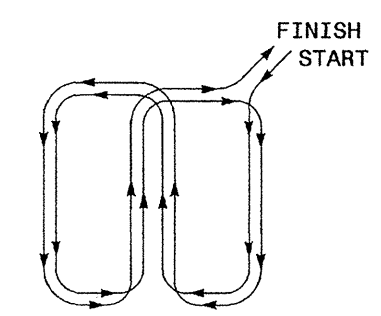
QUADRUPOLE LOOP

SAW CUT OPTIONS



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



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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:

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

SIGNATURE: *Milton Dean* DATE: 4/24/08

24-Apr-08 08:16
 c:\work\1725D-Standard plate sheets\1725D01.dwg
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STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

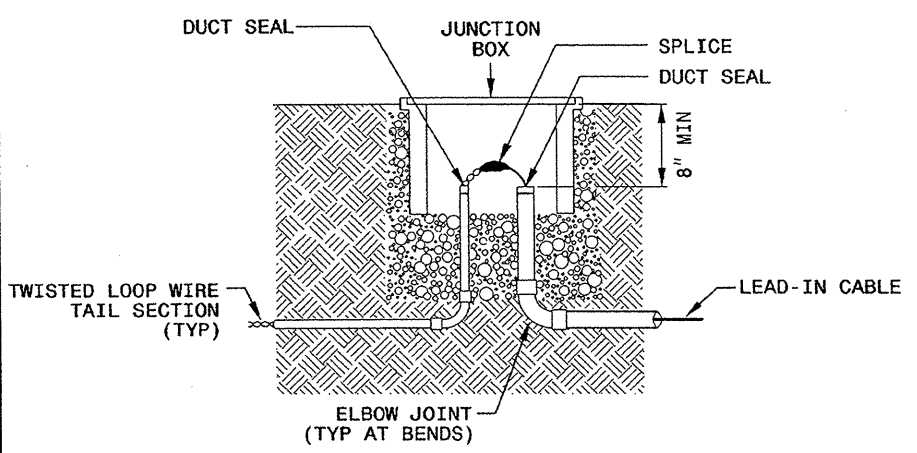
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

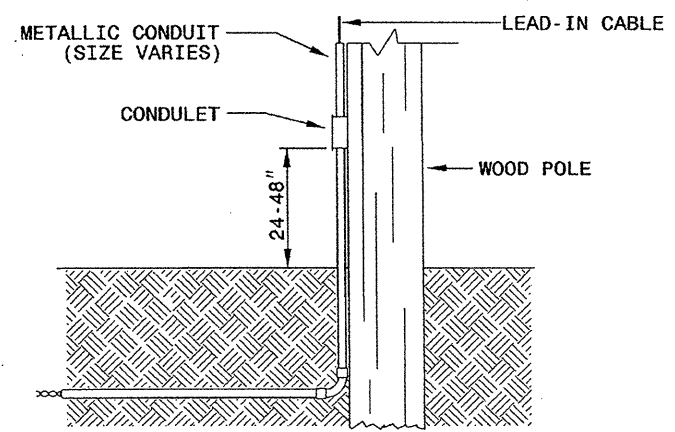
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

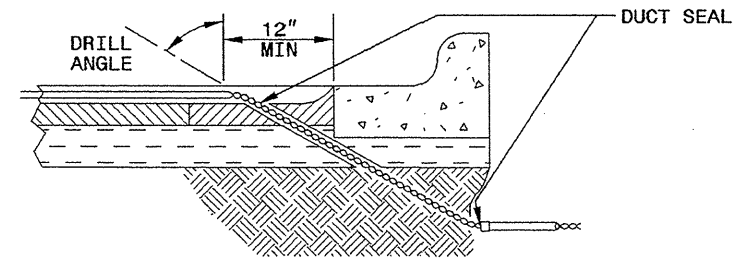


NOTE

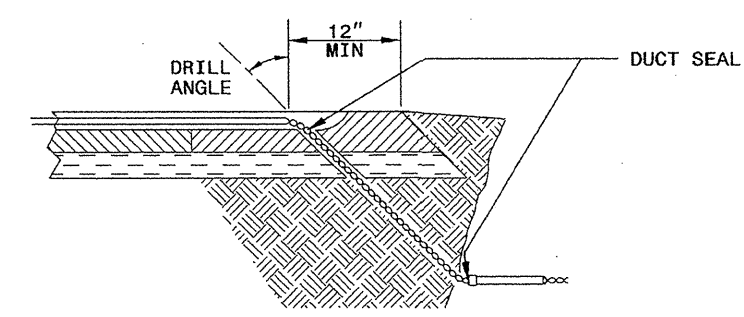
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

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

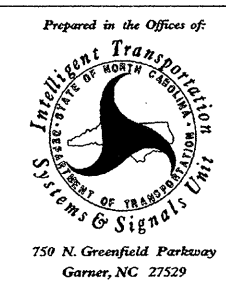
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title



SEAL

Milton A. Dean 11/24/08
SIGNATURE DATE

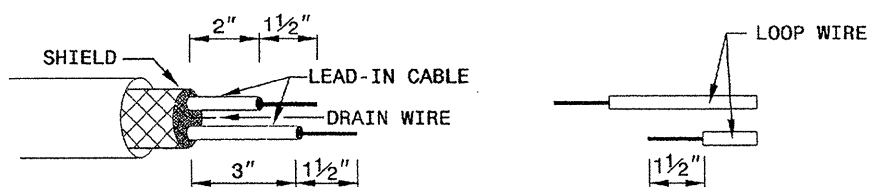
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RALEIGH, N.C.

11-08

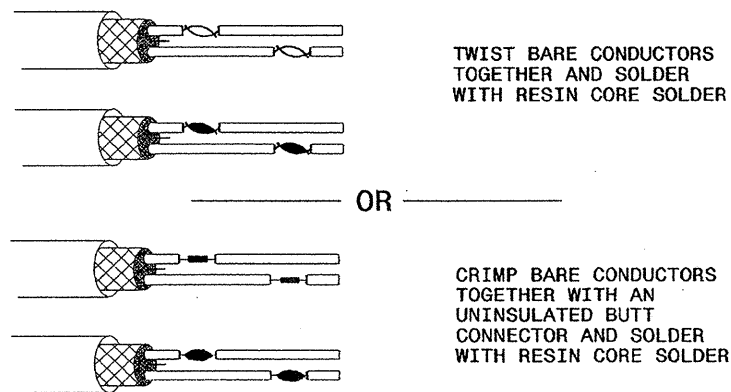
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

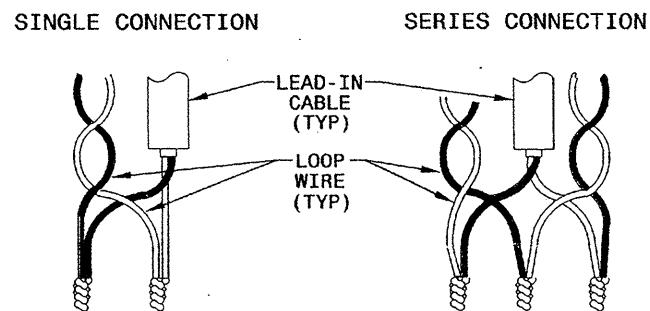


STEP 2. CONNECT AND SOLDER

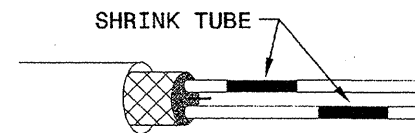


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

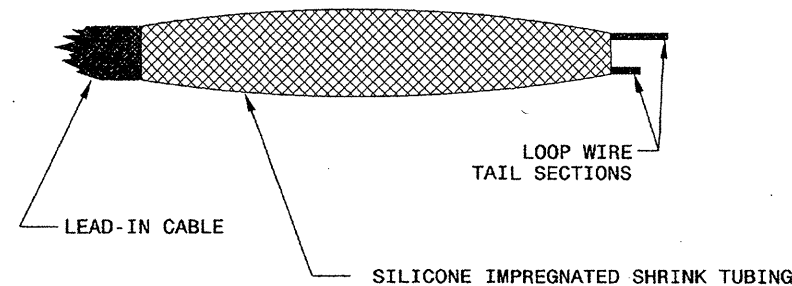
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
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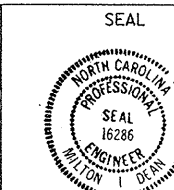
ENGLISH DETAIL DRAWING FOR
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SHEET 3 OF 3
1725D01

See Plate for Title



750 N. Greenfield Parkway
Garner, NC 27529



Milton I. Dean 11/24/08
SIGNATURE DATE