09/03/09

CONTRACT: WBS NO: 3CR.10671.78 & 3CR.10711.78

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

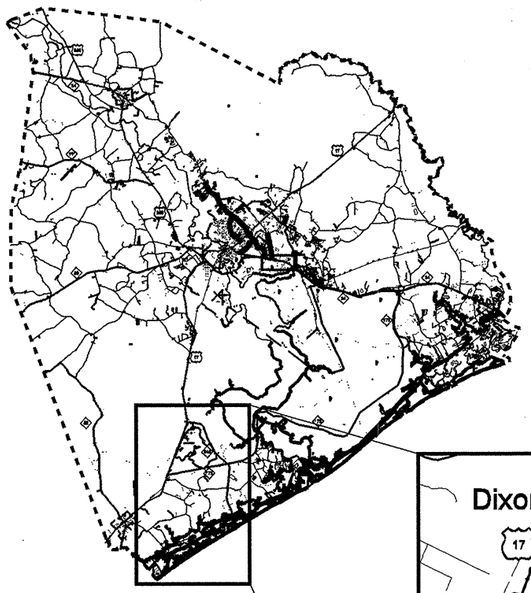
ONSLOW PENDER COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	3CR.10671.78 & 3CR.10711.78	1	

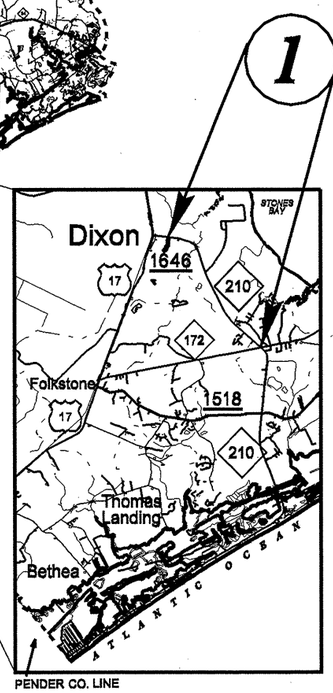
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

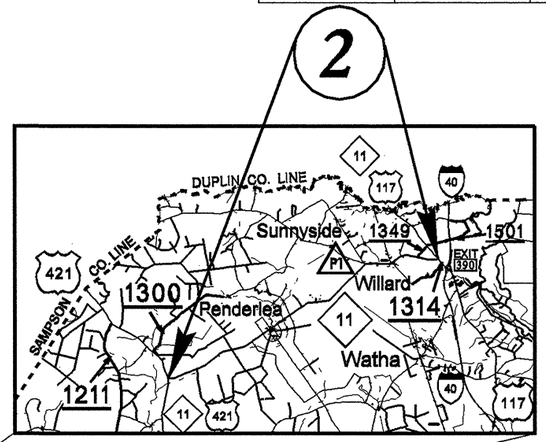
LOCATION: ONSLOW CO. – NC 210 (SR 1646 TO NC 172)
PENDER CO. – NC 11 (US 421 TO US 117)

TYPE OF WORK: RESURFACING, MILLING, PAVEMENT MARKERS AND MARKINGS, ETC.



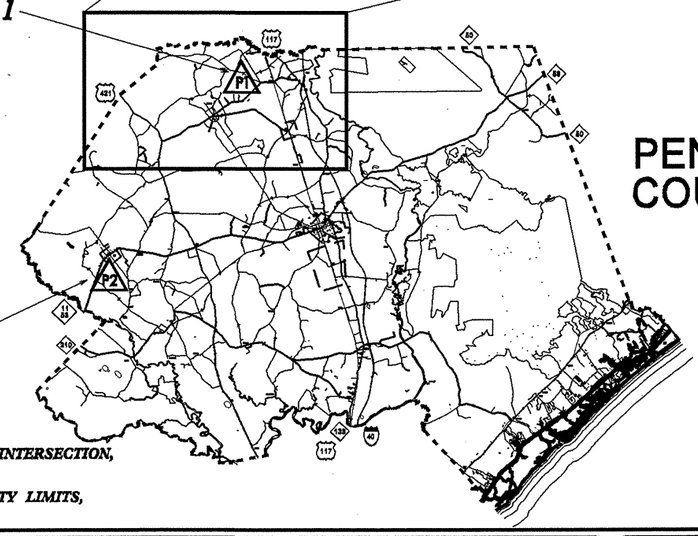
ONSLOW COUNTY





PIT NO. 1

PIT NO. 2



PENDER COUNTY

NOT TO SCALE

P1 = *PIT NO. 1, LOCATED OFF SR 1001, APPROX. 1.1 MI. FROM NC 11 /SR 1001 INTERSECTION, APPROX. 1.1 MI. FROM MAP NO. 2*

P2 = *PIT NO. 2, LOCATED OFF NC 53, BETWEEN US 421 AND ATKINSON CITY LIMITS, APPROX. 13.6 MI. FROM MAP NO. 2*

GRAPHIC SCALES

PLANS

PROFILE (HORIZONTAL)

PROFILE (VERTICAL)

DESIGN DATA

ADT =
ADT =
DHV = %
D = %
T = % *
V = MPH

* TTST DUAL

PROJECT LENGTH

MAP NO. 1 = 3.71 MI.

MAP NO. 2 = 10.32 MI.

TOTAL = 14.03 MI.

Prepared In the Office of:
DIVISION OF HIGHWAYS
124 Division Dr., Wilmington, NC 28401

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:
NOVEMBER 2009

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN TECHNICIAN
DNL

SIGNATURE:

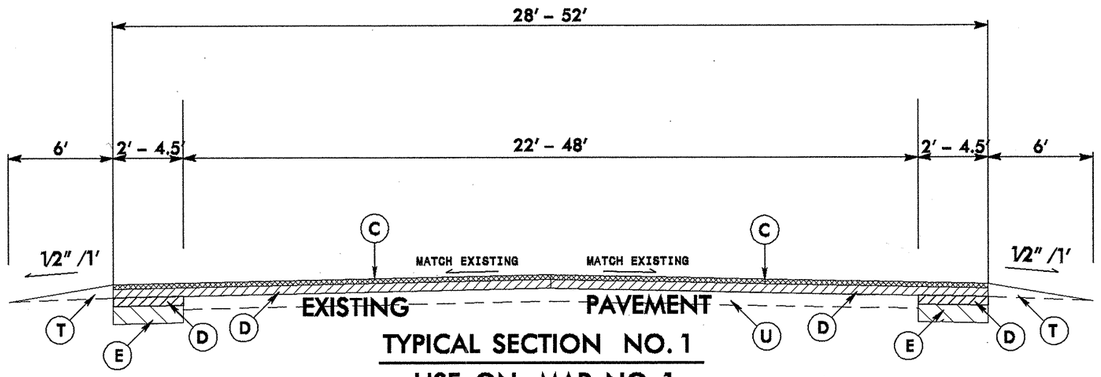
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 20224 ENGINEER CHARLES A. SCHOONOVER

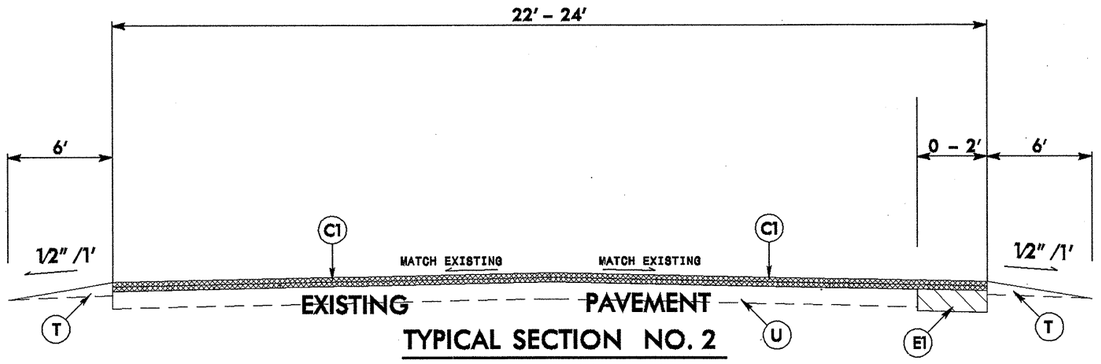
DIVISION DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
3CR.10671.78 & 3CR.10711.78	2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



TYPICAL SECTION NO. 1

USE ON MAP NO. 1



TYPICAL SECTION NO. 2

USE ON MAP NO. 2

NOTE: SPRIAL WIDENING. SEE TABLE.

PAVEMENT SCHEDULE

C	PROP. APPROX. 1½″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C1	PROP. APPROX. 3″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LIFTS.
D	PROP. APPROX. 2 1/2″ DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E	PROP. APPROX. 5″ DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E1	PROP. APPROX. 5½″ DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
T	EARTH MATERIAL (SHOULDER RECONSTRUCTION)
U	EXISTING PAVEMENT.

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
SEE STD. DRAWING 1205.01, SHEET 2 OF 2, TABLE 1 FOR EDGE LINE OFFSETS.
M.E. = MATCH EXISTING

SPRIAL WIDENING M.P. TABLE

SPRIAL WIDENING MAP NO. 2		
FROM MP	TO MP	
1.27	1.36	
6.03	6.08	
8.27	8.31	
8.52	8.59	
9.02	9.07	
9.2	9.28	

APPROXIMATE LOCATIONS

REVISIONS

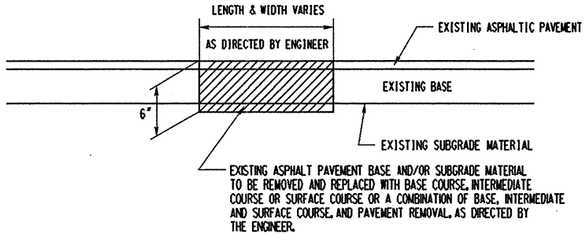
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
3CRJ067178 & 3CRJ071178	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

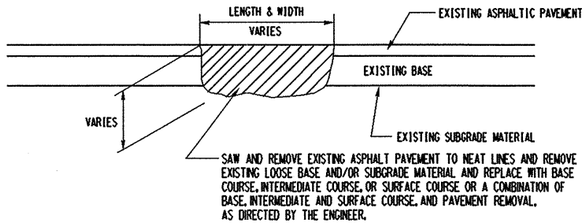
REVISIONS

8/27/2009

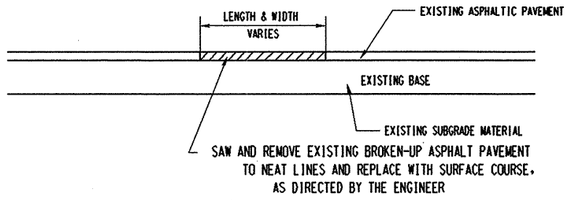
DETAILS OF REPAIRING EXISTING PAVEMENT PRIOR TO RESURFACING FOR FULL DEPTH AND MILLING



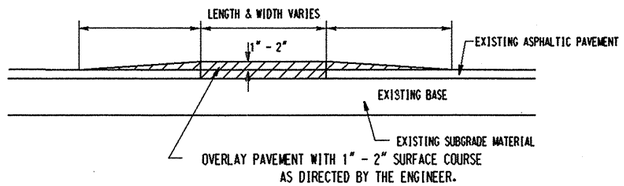
DETAIL NO. 1



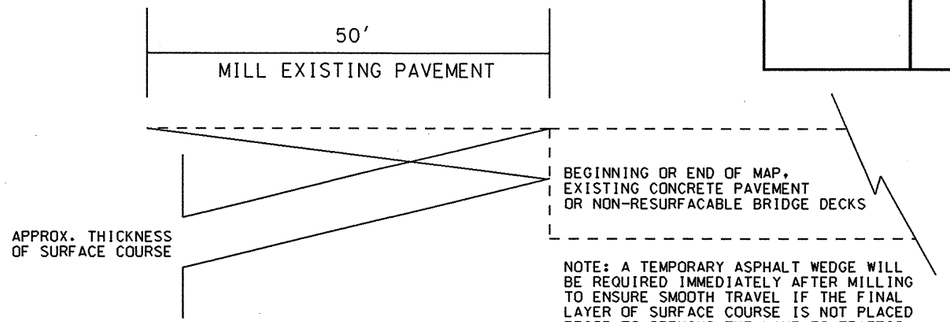
DETAIL NO. 2



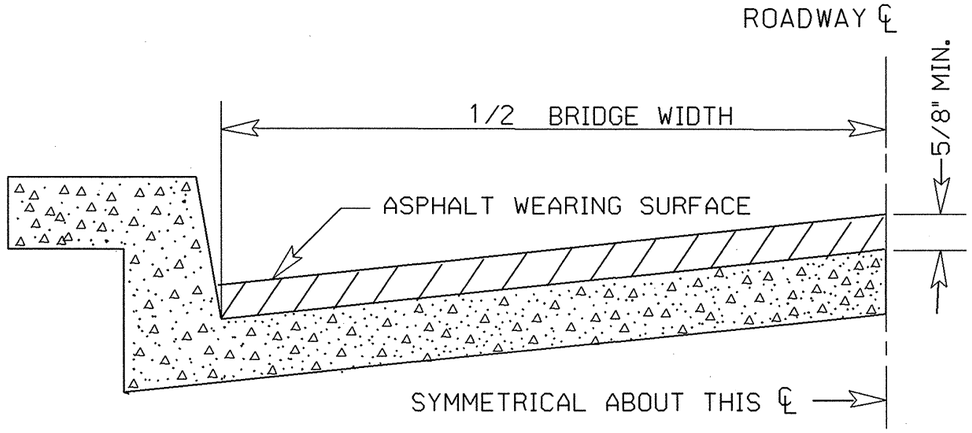
DETAIL NO. 3



DETAIL NO. 4



NOTE: A TEMPORARY ASPHALT WEDGE WILL BE REQUIRED IMMEDIATELY AFTER MILLING TO ENSURE SMOOTH TRAVEL IF THE FINAL LAYER OF SURFACE COURSE IS NOT PLACED PRIOR TO OPENING THE LANE TO TRAFFIC.



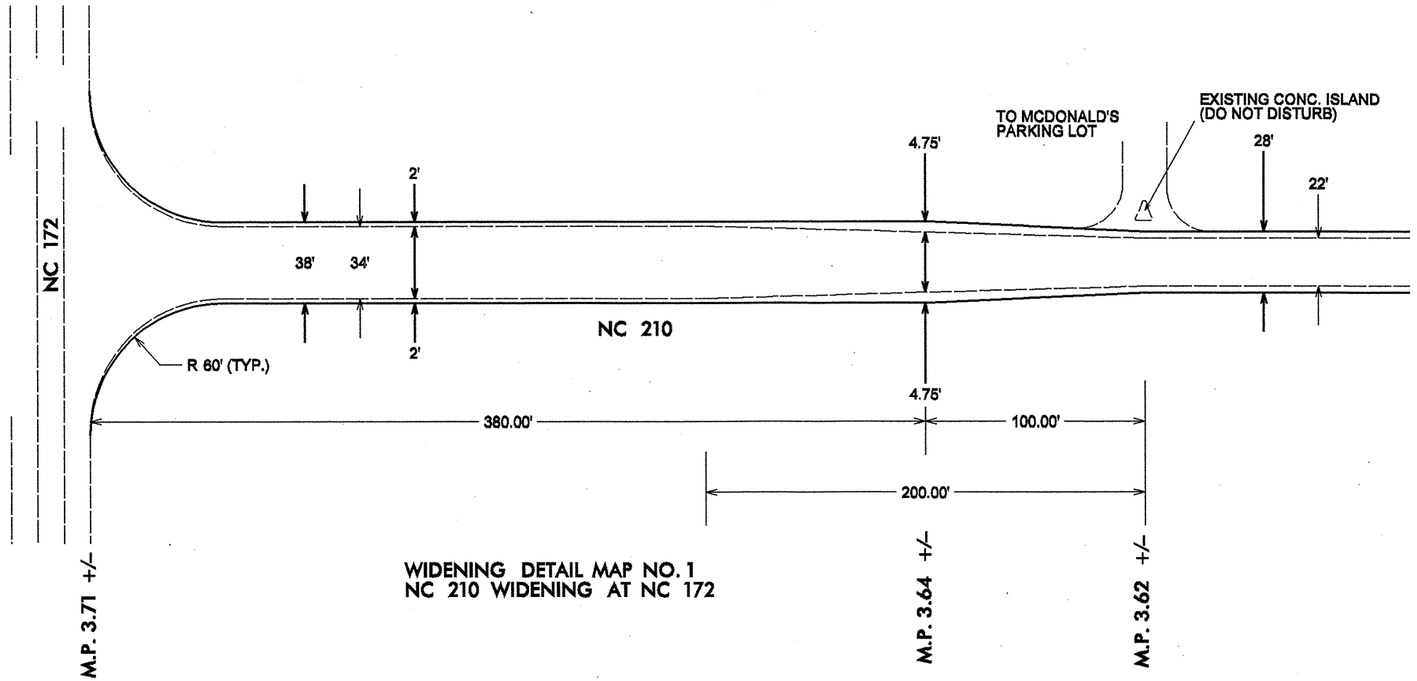
BRIDGE HALF TYPICAL SECTION

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.

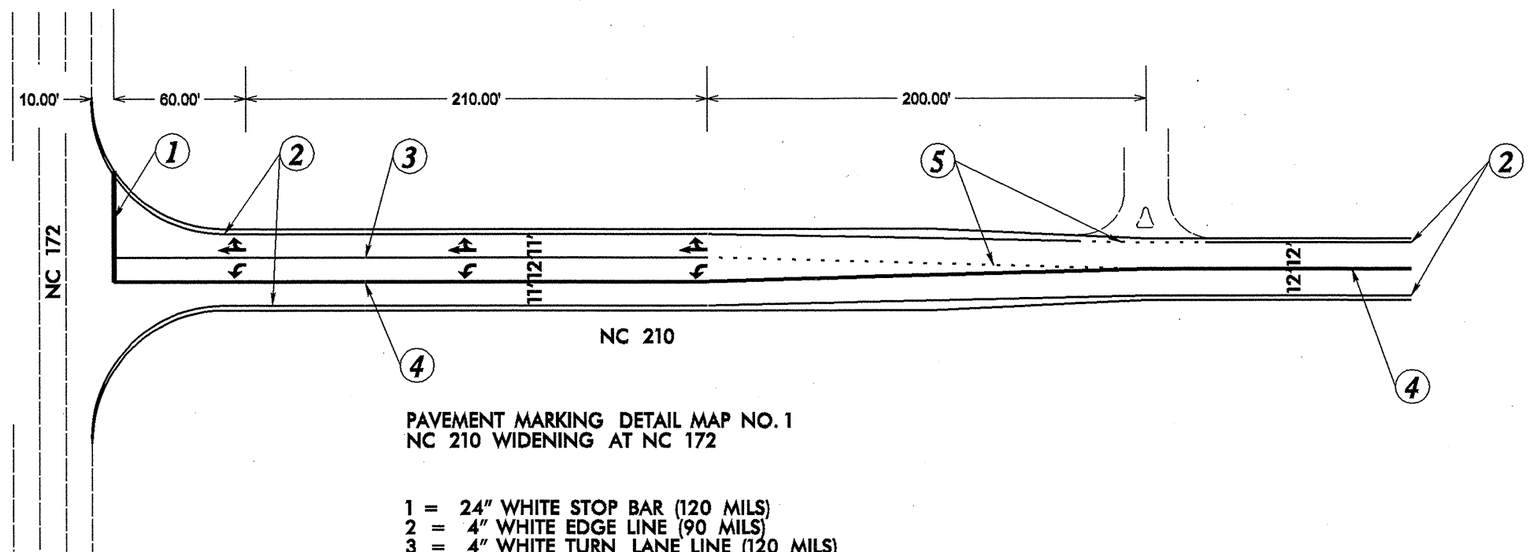
THE PROPOSED WEARING SURFACE SHALL VARY IN THICKNESS AS NECESSARY TO PROVIDE A SMOOTH RIDING SURFACE. A THICKNESS OF NOT LESS THAN 5/8" SHALL BE PROVIDED. THE MAXIMUM THICKNESS SHALL PREFERABLY BE 1-1/2" UNLESS IT IS IMPRACTICAL TO PROVIDE A SMOOTH RIDING SURFACE OTHERWISE.

29-SEP-2009 11:23
$s\contracts\contracts\resurfacing projects\division 3\3cr.10671.78onslowpender\2010_resurf_onslow_pend_rdy_tsh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
3CR.10671.78 & 3CR.10711.78	2-B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



WIDENING DETAIL MAP NO. 1
NC 210 WIDENING AT NC 172



PAVEMENT MARKING DETAIL MAP NO. 1
NC 210 WIDENING AT NC 172

1 = 24" WHITE STOP BAR (120 MILS)
2 = 4" WHITE EDGE LINE (90 MILS)
3 = 4" WHITE TURN LANE LINE (120 MILS)
4 = 4" DOUBLE YELLOW CENTER LINE (120 MILS)
5 = 4" WHITE MINI-SKIP (120 MILS)

REVISIONS

8/17/99

29-SEP-2009 11:21
$$USERNAME$$

PROJECT NO.	SHEET NO.	TOTAL NO.
3CR.10671.78, 3CR.10711.78	3	

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LENGTH MI	WIDTH FT	BORROW EXC. CY	BORROW EXC. (STATE FURNISHED SOURCES) CY	REMOVAL OF CONC. ISLAND SY	INC. STONE BASE TONS	SHOULDER RECON. SMI	INC. MILLING SY	BASE COURSE, B25.0B TONS	BASE COURSE, B25.0C TONS	INT. COURSE, I19.0C TONS	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, S9.5C TONS	PG 64-22 PLANT MIX TONS	PG 70-22 PLANT MIX TONS	PATCHING (MILL) TON	PATCHING (FULL DEPTH) TONS	INC. CONC SY	ADJ. METER OR VALVE BOX EA	TEMP. SILT FENCE LF	STONE FOR EC CLASS B TON	SEDIMENT CONTROL STONE TON	TEMP. MULCHING ACR	SEED FOR TEMP. SEEDING LBS	FERTILIZER FOR TEMP. SEEDING TON	MATTING (EROSION CONTROL) SY	1/4" HARDWARE CLOTH LF	SEED & MULCHING AC	INDUCTIVE LOOP LF	LEAD-IN CABLE LF
3CR.10671.78	Onslow	1	NC 210 (1-22)	SR 1646 TO NC 172, WIDEN TO 28' (MP 0.00-0.60, 0.81-1.24, 1.68-2.67,2.99-3.54, 3.60-3.62)	1	2.59	28	3,349			150	5.18	467		3,057	8,198		4,128	517	248	565	55	75	2	371	93	93	3.71	186	0.93	25	186	3.89	350	50
		"	"	NO WORK (MP 0.60-0.81)		0.21	34																												
		"	"	TAPER (WIDEN TO 28'-40') (MP 1.24-1.30, 2.67-2.73)	1	0.12	34	155				0.24			120	434		232	26	14														0.18		
		"	"	WIDEN TO 40' (MP 1.30-1.37, 2.73-2.80)	1	0.14	40	181				0.28			114	572		318	32	19														0.21		
		"	"	WIDEN TO 52' (MP 1.37-1.41, 2.80-2.88)	1	0.12	52	155				0.24			97	622		354	33	21														0.18		
		"	"	TAPER (WIDEN TO 52-28) (MP 1.41 1.48, 2.88-2.95)	1	0.14	38	181				0.28			114	546		302	31	18														0.21		
		"	"	2.99)	1	0.24	28	310				0.48			195	716		383	42	23														0.36		
		"	"	WIDEN TO 38' (MP 3.54-3.60)	1	0.06	38	78				0.12			49	234		130	13	8														0.09		
		"	"	TAPER (WIDEN TO 28'-38') (MP 3.62-3.3.64)	1	0.02	33	26				0.04			25	73		38	5	2														0.03		
		"	"	WIDEN TO 38' (MP 3.64-3.71)	1	0.07	38	91				0.14	211		83	286		151	17	9														0.11		
TOTAL FOR MAP NO. 1						**3.71**		**4,526**			**150**	**7.00**	**678**		**3,854**	**11,681**		**6,036**	**716**	**362**	**565**	**55**	**75**	**2**	**371**	**93**	**93**	**3.71**	**186**	**0.93**	**25**	**186**	**5.26**	**350**	**50**
TOTAL FOR PROJ NO. 3CR.10671.78						**3.71**		**4,526**			**150**	**7.00**	**678**		**3,854**	**11,681**		**6,036**	**716**	**362**	**565**	**55**	**75**	**2**	**371**	**93**	**93**	**3.71**	**186**	**0.93**	**25**	**186**	**5.26**	**350**	**50**
3CR.10711.78	Pender	2	NC 11 (2-24)	US 421 TO US 117, FULL WIDTH (MP 0.00-0.83, 3.54-6.03, 6.08-7.79)	2	5.03	24		5,116		1,000	10.06	450				13,455		807		750	75			1,032	258	258	10.32	516	2.58	25	516	7.55		
		"	"	FULL WIDTH (MP 0.83-1.27, 1.36-3.54, 7.79-8.27, 8.31-8.52, 8.59-9.02, 9.07-9.20, 9.28-10.32)	2	4.91	22		4,993	30		9.82	575				12,045		723														7.37		
		"	"	SPRIAL WIDENING (MP 1.27-1.36, 6.03-6.08, 8.27-8.31, 8.52-8.59, 9.02 9.07, 9.20-9.28)	2	0.38	24		318			0.76		189			1,017		69														0.57		
		"	"	21 SECONDARY ROAD INTERSECTIONS													231		14																
TOTAL FOR MAP NO. 2						**10.32**			**10,427**	**30**	**1,000**	**20.64**	**1,025**	**189**			**26,748**		**1,613**		**750**	**75**			**1,032**	**258**	**258**	**10.32**	**516**	**2.58**	**25**	**516**	**15.49**		
TOTAL FOR PROJ NO. 3CR.10711.78						**10.32**			**10,427**	**30**	**1,000**	**20.64**	**1,025**	**189**			**26,748**		**1,613**		**750**	**75**			**1,032**	**258**	**258**	**10.32**	**516**	**2.58**	**25**	**516**	**15.49**		
GRAND TOTAL						**14.03**		**4,526**	**10,427**	**30**	**1,150**	**27.64**	**1,703**	**189**	**3,854**	**11,681**	**26,748**	**6,036**	**2,329**	**362**	**1,315**	**130**	**75**	**2**	**1,403**	**351**	**351**	**14.03**	**702**	**3.51**	**50**	**702**	**20.75**	**350**	**50**

PROJECT NO.	SHEET NO.	TOTAL NO.
3CR.10671.78, 3CR.10711.78	4	

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	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	4710000000-E 24" X 120 M WHITE THERMO LF	4721000000-E THERMO MSG SCHOOL 120 M EA	4725000000-E THERMO STR ARROW 90 M EA	4725000000-E THERMO LT ARROW 90 M EA	4725000000-E THERMO RT ARROW 90 M EA	4725000000-E THERMO STR & RT ARROW 90 M EA	4810000000-E 4" WHITE PAINT LF	4810000000-E 4" YELLOW PAINT LF	4820000000-E 8" YELLOW PAINT LF	4835000000-E 24" WHITE PAINT LF	4840000000-E PAINT PAVEMENT CHARACTERS 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	4905000000-N SNOW PLOWABLE MARKERS (Y/Y) EA	4905000000-N SNOW PLOWABLE MARKERS (C/R) EA
3CR.10671.78	Onslow	1	NC 210 (1-22)	SR 1646 TO NC 172, WIDEN TO 28' (MP 0.00-0.60, 0.81-1.24, 1.68-2.67,2.99-3.54, 3.60-3.62)	27,350	18,803			100	12					27,350	18,803			12					171	
		"	"	NO WORK (MP 0.60-0.81)																					
		"	"	TAPER (WIDEN TO 28'-40') (MP 1.24-1.30, 2.67-2.73)	1,267	2,534		150							1,267	2,534	150						24	
		"	"	WIDEN TO 40' (MP 1.30-1.37, 2.73-2.80)	1,478	1,478	739	150			4	6			2,218	1,478	150			4	6		9	37
		"	"	WIDEN TO 52' (MP 1.37-1.41, 2.80-2.88)	1,267	634	401	150				2	2		1,669	634	150				2	2	4	16
		"	"	TAPER (WIDEN TO 52-28) (MP 1.41 1.48, 2.88-2.95)	1,478	1,478	2,218	150			4		3		3,696	1,478	150			4		3	20	37
		"	"	WIDEN TO 28' (MP 1.48-1.68, 2.95-2.99)	2,534	1,742									2,534	1,742							16	
		"	"	WIDEN TO 38' (MP 3.54-3.60)	634	634	317						3		950	634						3	4	16
		"	"	TAPER (WIDEN TO 28'-38') (MP 3.62-3.3.64)	211	211	106								317	211							1	5
		"	"	WIDEN TO 38' (MP 3.64-3.71)	739	739	370		50			3		3	1,109	739		50			3		5	18
TOTAL FOR MAP NO. 1					**36,958**	**28,253**	**4,151**	**600**	**150**	**12**	**8**	**11**	**8**	**3**	**41,110**	**28,253**	**600**	**50**	**12**	**8**	**11**	**8**	**3**	**254**	**129**
TOTAL FOR PROJ NO. 3CR.10671.78					**36,958**	**28,253**	**4,151**	**600**	**150**	**12**	**8**	**11**	**8**	**3**	**41,110**	**28,253**	**600**	**50**	**12**	**8**	**11**	**8**	**3**	**254**	**129**
						32,404					**30**				**69,363**					**30**					
3CR.10711.78	Pender	2	NC 11 (2-24)	US 421 TO US 117, FULL WIDTH (MP 0.00-0.83, 3.54-6.03, 6.08-7.79)	53,117	36,518									53,117	36,518							332	
		"	"	FULL WIDTH (MP 0.83-1.27, 1.36-3.54, 7.79-8.27, 8.31-8.52, 8.59-9.02, 9.07-9.20, 9.28-10.32)	51,850	35,647									51,850	35,647							324	
		"	"	SPRIAL WIDENING (MP 1.27-1.36, 6.03-6.08, 8.27-8.31, 8.52-8.59, 9.02-9.07, 9.20-9.28)	4,013	2,759									4,013	2,759							25	
		"	"	21 SECONDARY ROAD INTERSECTIONS																				
TOTAL FOR MAP NO. 2					**108,980**	**74,924**									**108,980**	**74,924**							**681**	
TOTAL FOR PROJ NO. 3CR.10711.78					**108,980**	**74,924**									**108,980**	**74,924**							**681**	
						74,924									**183,904**									
GRAND TOTAL					**145,938**	**103,177**	**4,151**	**600**	**150**	**12**	**8**	**11**	**8**	**3**	**150,090**	**103,177**	**600**	**50**	**12**	**8**	**11**	**8**	**3**	**935**	**129**
						107,328					**30**				**253,267**					**30**				**1,064**	

PROJECT REFERENCE NO.	SHEET NO.
3CRJ067178 & 3CRJ071178	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

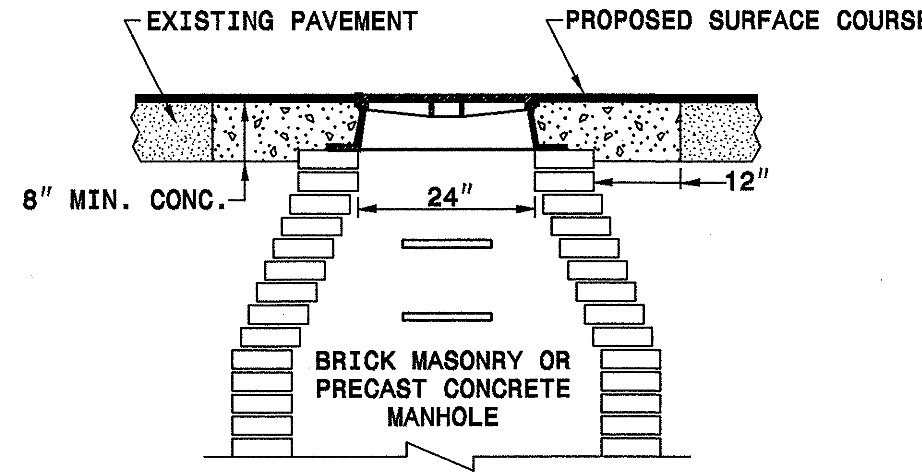
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

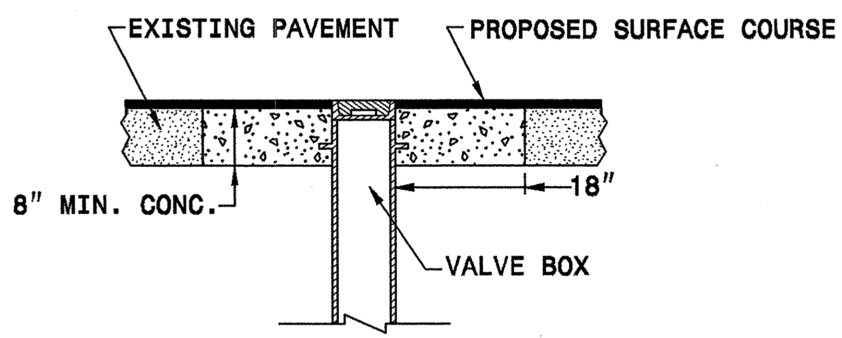
MANHOLE AND VALVE BOX ADJUSTMENTS

GENERAL NOTES:

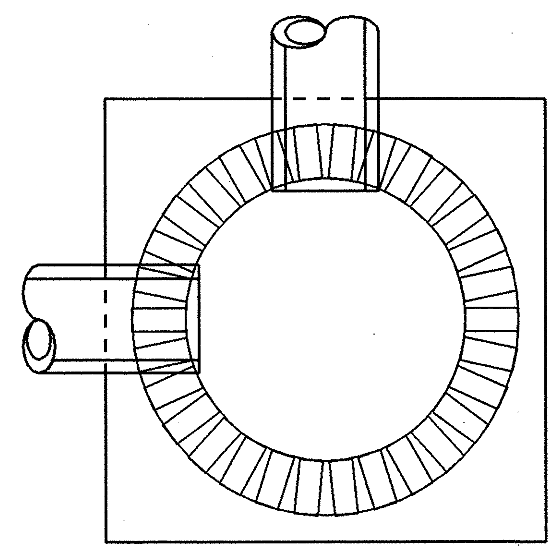
1. RAPID SET GROUT, MORTAR, OR CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGHT OF 4000 PSI.
2. ALL FAULTY EXISTING BRICKWORK TO BE REMOVED AND REPLACED WITH NEW BRICK MASONRY.
3. EXCAVATION FOR THE ADJUSTMENT SHALL BE SHEER CUT ON ALL SIDES.
4. AREA BELOW 8" DEPTH CAN BE FILLED WITH 78M OR NO. 57 CLEAN STONE.
5. MORTAR SHALL BE MIXED TO NCDOT SPECIFICATIONS.
6. MORTAR JOINTS 1/2" +/- 1/8"



MANHOLE CONCRETE ENCASEMENT



VALVE BOX CONCRETE ENCASEMENT



ELEVATION VIEW

PLACE BRICK ACCORDING TO ELEVATION VIEW

SHEET 1 OF 1

840D55

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

ENGLISH DETAIL DRAWING FOR
MANHOLE AND VALVE BOX ADJUSTMENTS

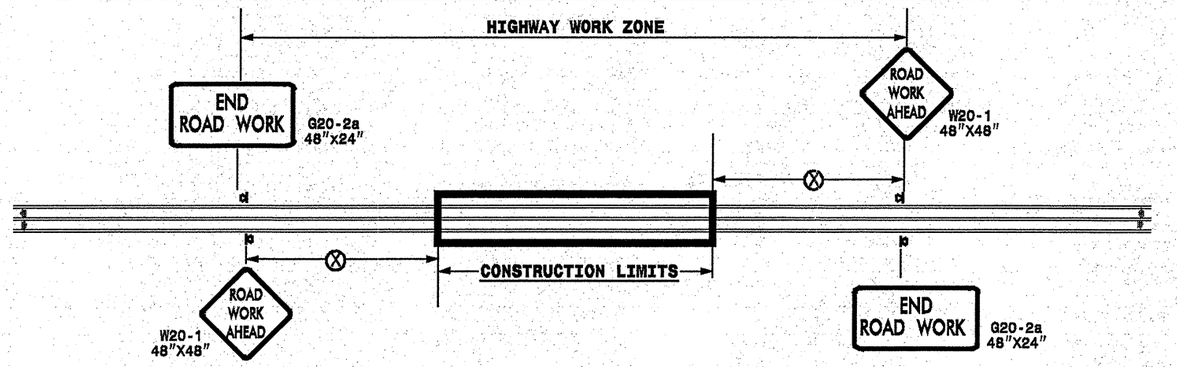
SHEET 1 OF 1
840D55

REVISIONS

29-SEP-2009 11:22

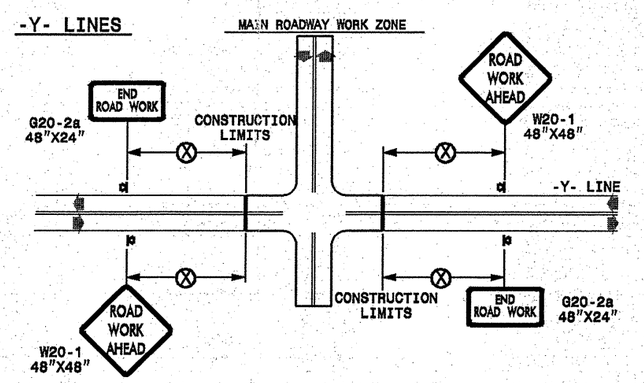
PROJ. REFERENCE NO.	SHEET NO.
3CR.10671.78 & 3CR.10711.78	TCP-1

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

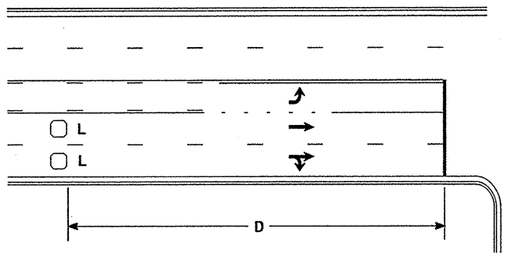
SCALE:	NONE
DATE:	
DWG. BY:	
DESIGN BY:	
REVIEWED BY:	

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

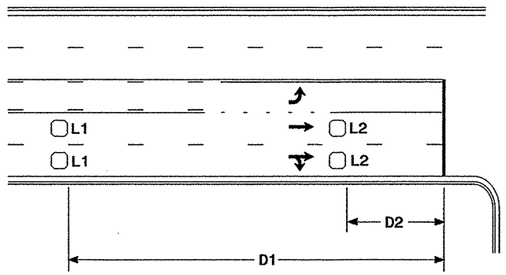
PROJECT REFERENCE NO.	SHEET NO.
	SIG 1

3CR.10671.78 & 3CR.10711.78

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

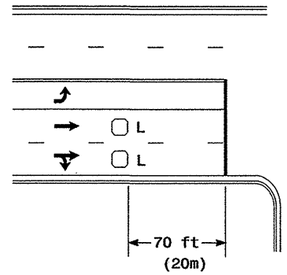
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

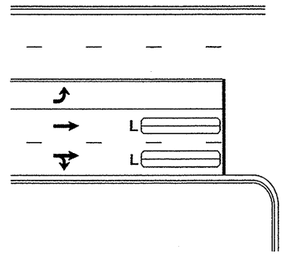
L2 = 6ft X 6ft (1.8m X 1.8m) Wired in series

"Stretch" Operation

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



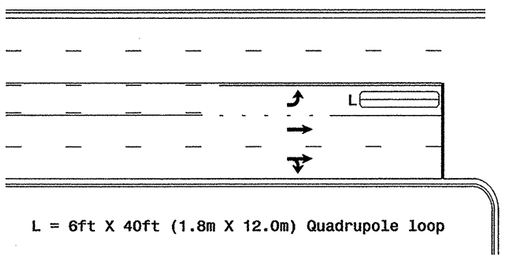
OR



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

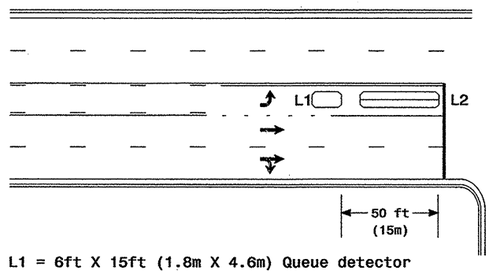
Left Turn Lane Detection



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

Presence Loop Detection

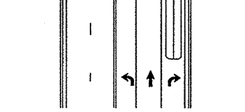
OR



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

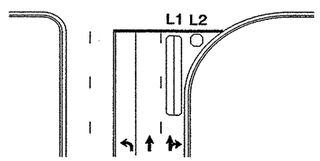
Queue Loop Detection

Right Turn Lane Detection

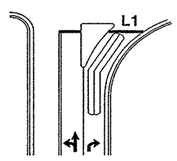


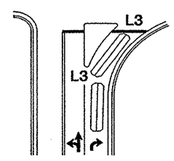
Standard Turn

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



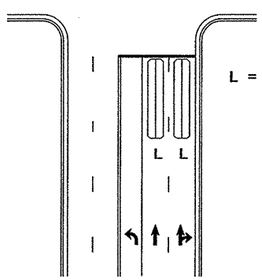
Wide Radius Turn





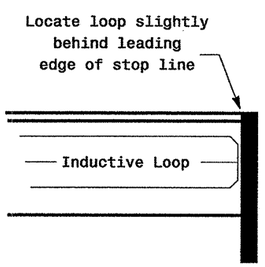
Channelized Turn

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



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, North Carolina Department of Transportation, 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:

REVISIONS	INIT.	DATE
▽Revise pavement markings	gs	12/19/06

SCALE: N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23486 ENGINEER PAUL L ALEXANDER
SIGNATURE | DATE: 6/16/06
SIG. INVENTORY NO.

19-DEC-2006 14:29
s:\traffic_eng\standards_turn lns\misc#loop\typical2006.dgn
palexander

PROJECT REFERENCE NO.	SHEET NO.
	Sig. 2

STATE OF
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RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

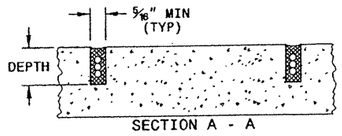
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3

1725D01

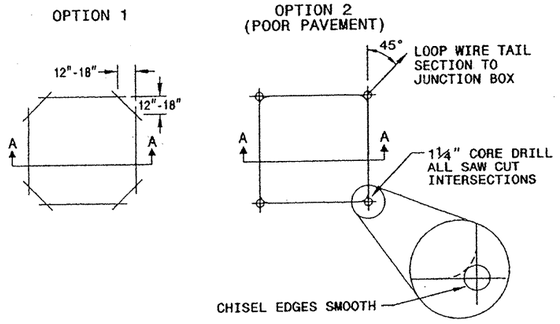
SAW SLOT DEPTH CHART

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

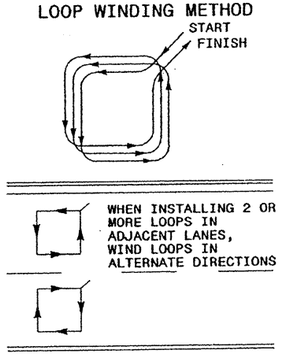


CONVENTIONAL 4-SIDED LOOP

SAW CUT OPTIONS



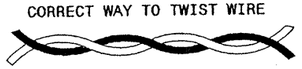
LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE

CORRECT WAY TO TWIST WIRE

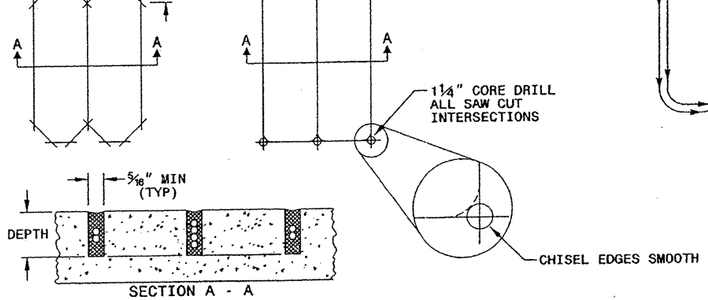


NOTES

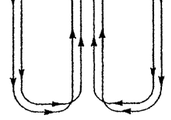
1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

QUADRUPOLE LOOP

SAW CUT OPTIONS



LOOP WINDING METHOD



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

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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 16286 ENGINEER MILTON I. DEAN

SIGNATURE

11/24/08
DATE

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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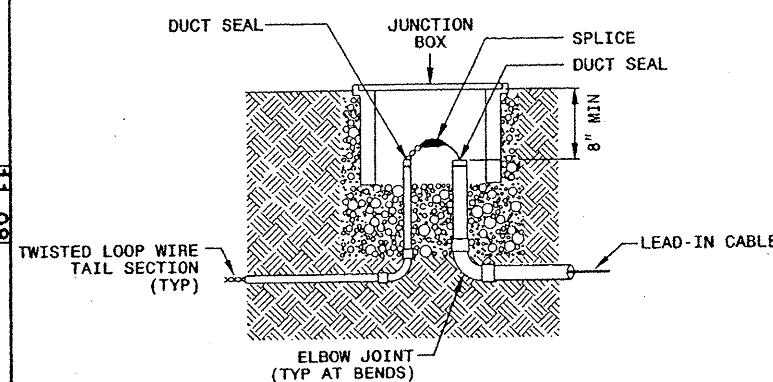
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

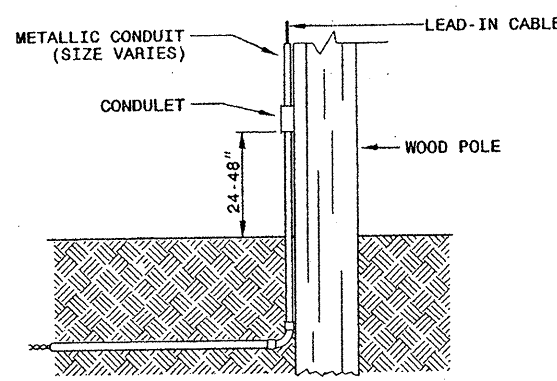
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

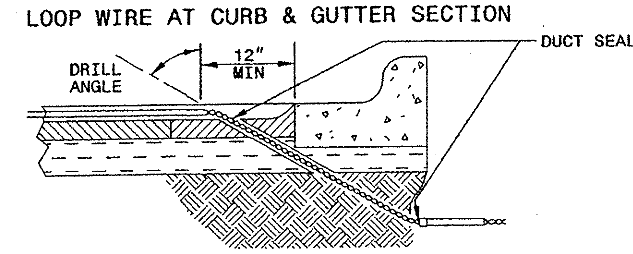


NOTE

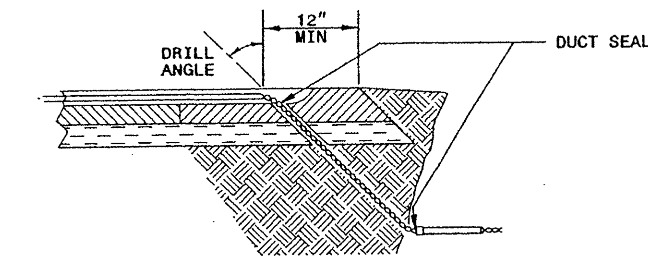
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

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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11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

SHEET 2 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 ENGINEER SEAL 16286 MILTON J. DEAN
SIGNATURE: Milton J. Dean
DATE: 11/24/08

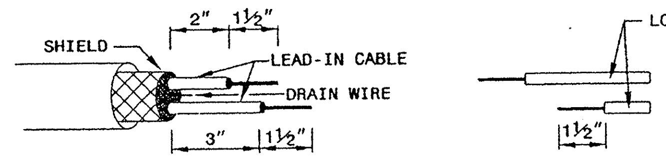
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

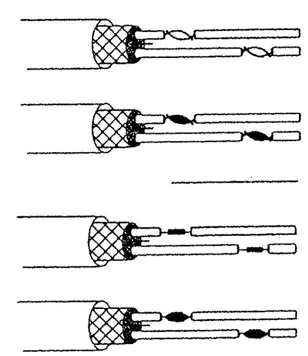
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

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

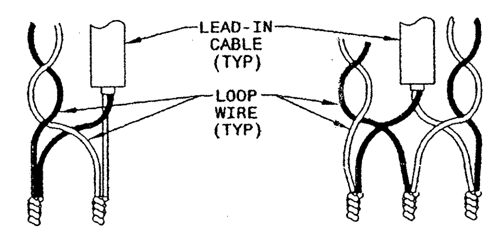
OR

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

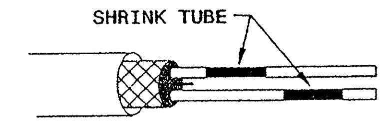
BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS

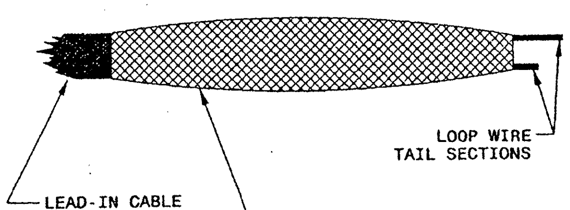
SINGLE CONNECTION | SERIES CONNECTION



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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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

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 ENGINEER SEAL 16286 MILTON I. DEAN

SIGNATURE 11/24/08 DATE