

PROJECT NO.	SHEET NO.	TOTAL NO.
3CR.10821.49, 3CR.10311.49	3	

SUMMARY OF QUANTITIES

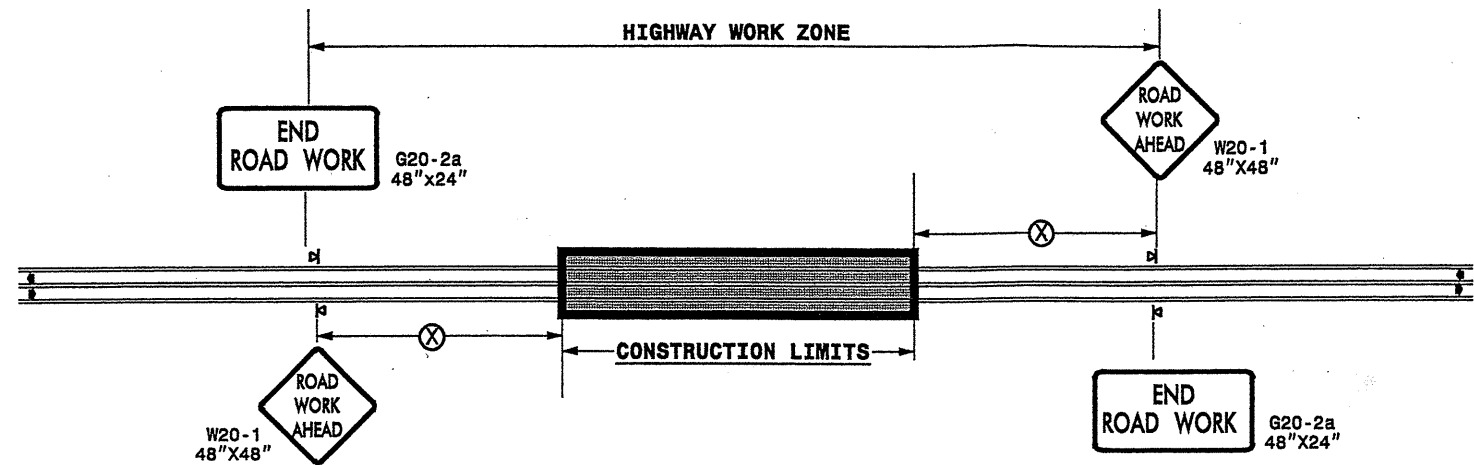
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP	LENGTH MI	WIDTH FT	ADJ WATER VALVE EA	BORROW EXCAVATION CY	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	INCIDENTAL MILLING SY	SURFACE COURSE, S9.5C TONS	PG 70-22 PLANT MIX TONS	TEMPORARY SILT FENCE LF	STONE FOR EC, CLASS B TON	SEDIMENT CONTROL STONE TON	TEMPORARY MULCHING ACR	SEED FOR TEMPORARY SEEDING LBS	FERTILIZER FOR TEMPORARY SEEDING TON	1/4" HARDWARE CLOTH LF	SEED & MULCHING AC
3CR.10821.49	Sampson	1	US 421	PENDER CO. LINE TO DUPLIN CO. LINE	1	3.84	32		1152	307	7.68		6,991.00	419.00	384.00	96.00	96.00	4.00	192.00	1.00	192.00	3.84
		"	"	FULL WIDTH	1	0.32	46		96	26	0.64		836.00	50.00								0.32
		"	"	TAPER 32' - 45'	1	0.13	38.5		39	10	0.26		285.00	17.00								0.13
		"	"	TAPER 32' - 46'	1	0.26	39		78	21	0.52		576.00	35.00								0.26
		"	"	TAPER 32' - 47'	1	0.07	39.5		21	6	0.14		157.00	9.00								0.07
		"	"	TAPER 45' - 46'	1	0.12	45.5		36	10	0.24		310.00	19.00								0.12
		"	"	TAPER 45' - 47'	1	0.16	46		48	13	0.32		418.00	25.00								0.16
TOTAL FOR MAP NO. 1						4.9			1470	393	9.80		9,573.00	574.00	384.00	96.00	96.00	4.00	192.00	1.00	192.00	4.90
		3	US 421	DUPLIN CO. LINE TO BEGIN DIVIDED HIGHWAY	1	16.46	32		4938	1317	32.92		29,967.00	1,798.00	1,646.00	411.50	411.50	16.00	823.00	4.00	823.00	16.46
		"	"	TAPER 32' - 45'	1	0.14	38.5	2	42	11	0.28		306.00	18.00								0.14
		"	"	TAPER 32' - 47'	1	0.13	39.5		39	10	0.26		292.00	18.00								0.13
		"	"	FULL WIDTH	1	0.16	45		48	13	0.32	1,500.00	409.00	25.00								0.16
		"	"	FULL WIDTH	1	0.31	47		93	25	0.62		828.00	50.00								0.31
TOTAL FOR MAP NO. 3						17.2		2	5160	1376	34.40	1,500.00	31,802.00	1,909.00	1,646.00	411.50	411.50	16.00	823.00	4.00	823.00	17.20
TOTAL FOR PROJ NO. 3CR.10821.49						22.1		2	6630	1769	44.20	1,500.00	41,375.00	2,483.00	2,030.00	507.50	507.50	20.00	1,015.00	5.00	1,015.00	22.10
3CR.10311.49	Duplin	2	US 421	SAMPSON CO LINE TO SAMPSON CO LINE	1	0.23	32		69	18	0.46		419.00	25.00	23.00	5.75	5.75		12.00		11.50	0.23
TOTAL FOR PROJ NO. 3CR.10311.49						0.23			69	18	0.46		419.00	25.00	23.00	5.75	5.75		12.00		11.50	0.23
GRAND TOTAL						22.33		2	6699	1787	44.66	1,500.00	41,794.00	2,508.00	2,053.00	513.25	513.25	20.00	1,027.00	5.00	1,026.50	22.33

PROJECT NO.	SHEET NO.	TOTAL NO.
3CR.10821.49, 3CR.10311.49	4	

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	4685000000-E	4686000000-E		4695000000-E		4710000000-E	4721000000-E	4725000000-E				4905000000-N	4905000000-N	4520000000-N
					4" X 90 M WHITE THERMO LF	4" X 120 M YELLOW THERMO LF	4" X 120 M WHITE THERMO LF	8" X 90 M WHITE THERMO LF	8" X 90 M YELLOW THERMO LF	24" X 120 M WHITE THERMO LF	THERMO MSG SCHOOL 120 M EA	THERMO LT ARROW 90 M EA	THERMO STR ARROW 90 M EA	THERMO RT ARROW 90 M EA	THERMO STR & RT ARROW 90 M EA	SNOW PLOWABLE MARKERS (Y/Y) EA	SNOW PLOWABLE MARKERS (C/R) EA	TUBULAR MARKERS (FIXED) EA
3CR.10821.49	Sampson	1	US 421	PENDER CO. LINE TO DUPLIN CO. LINE	41,318	25,344		1,350	600	100	12	17	10	3	15	253		
		"	"	FULL WIDTH	3,443	5,069									42	10		
		"	"	TAPER 32' - 45'	1,399	2,746									34			
		"	"	TAPER 32' - 46'	2,798	5,491									69			
		"	"	TAPER 32' - 47'	753	1,478									18			
		"	"	TAPER 45' - 46'	1,291	1,584	320								16			
		"	"	TAPER 45' - 47'	1,722	2,112	420								21			
TOTAL FOR MAP NO. 1					52,724	43,824	740	1,350	600	100	12	17	10	3	15	453	10	
		3	US 421	DUPLIN CO. LINE TO BEGIN DIVIDED HIGHWAY	177,110	108,636			600	100		17	10		15	1,086		
		"	"	TAPER 32' - 45'	1,506	1,478									18			
		"	"	TAPER 32' - 47'	1,399	1,373									18		25	
		"	"	FULL WIDTH	1,722	2,112	420								21	10		
		"	"	FULL WIDTH	3,336	4,092	820		600	100		17	10		15	1,184	20	25
TOTAL FOR MAP NO. 3					185,072	117,691	1,240		600	100		17	10		15	1,184	20	25
TOTAL FOR PROJ NO. 3CR.10821.49					237,796	161,515	1,980	1,350	1,200	200	12	34	20	3	30	1,638	30	25
						163,495		2,550				87						
3CR.10311.49	Duplin	2	US 421	SAMPSON CO LINE TO SAMPSON CO LINE	2,475	2,429									15			
					2,475	2,429									15			
TOTAL FOR PROJ NO. 3CR.10311.49						2,429												
GRAND TOTAL					240,271	163,944	1,980	1,350	1,200	200	12	34	20	3	30	1,653	30	25
						165,924		2,550				87						

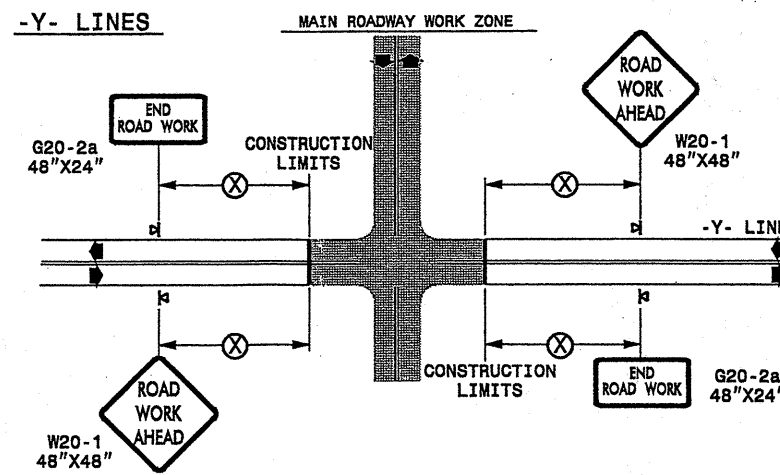
TWO-WAY UNDIVIDED ** (L-LINES)



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

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

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



GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED 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

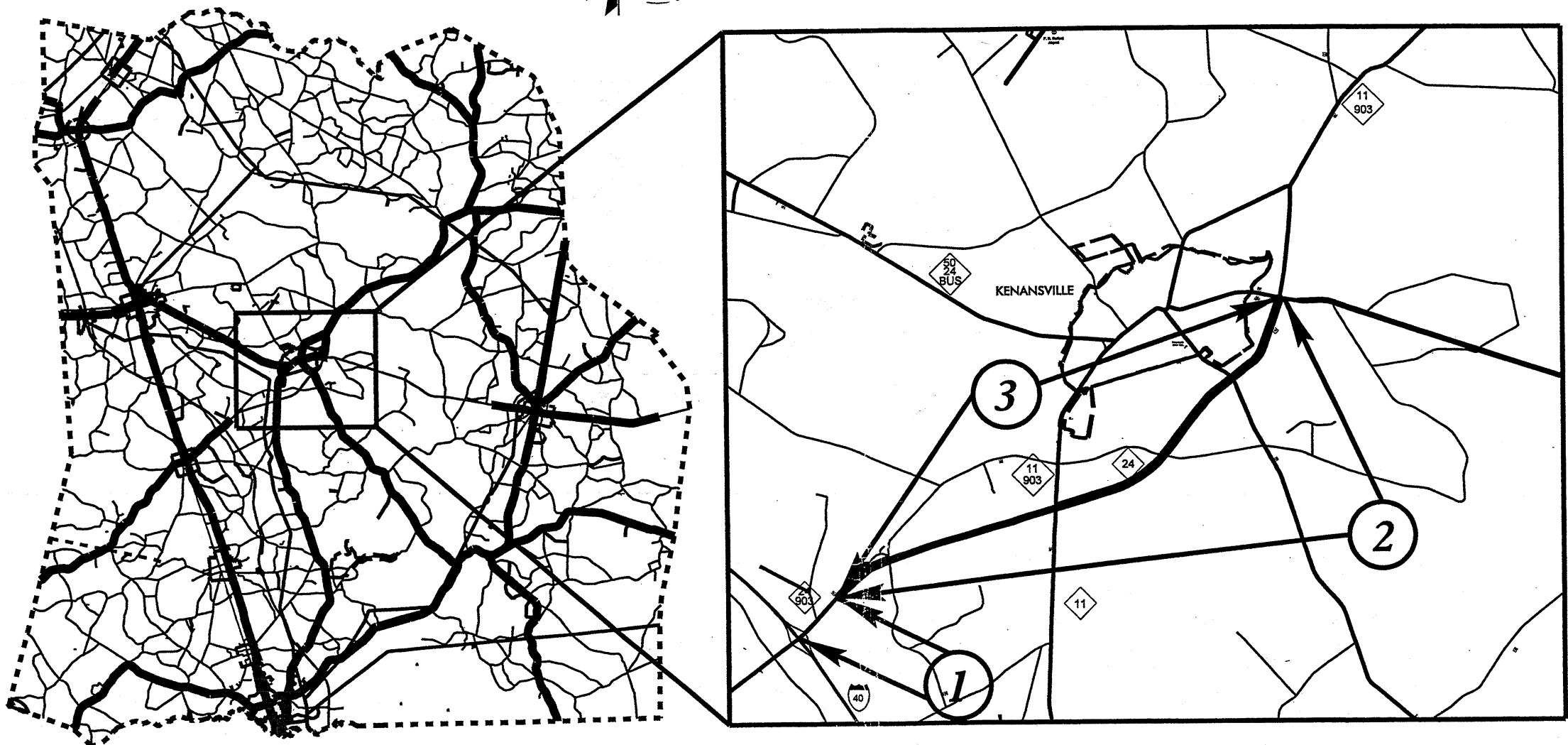
DETAIL DRAWING
FOR TWO-WAY UNDIVIDED
WORK ZONE WARNING SIGNS

SHEET 1 OF 1

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

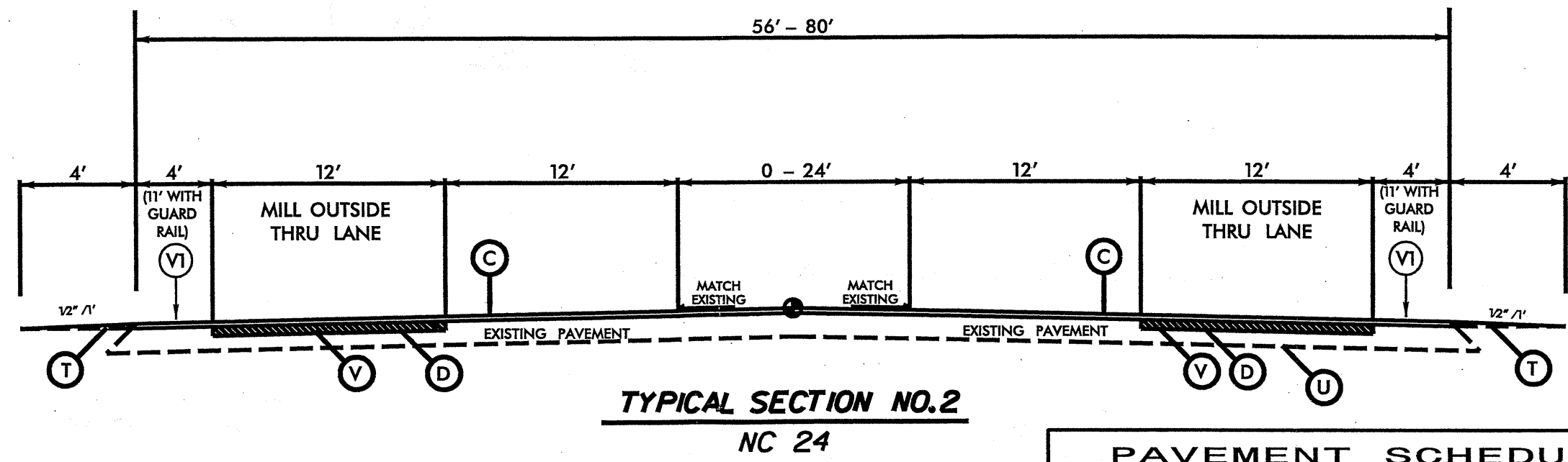
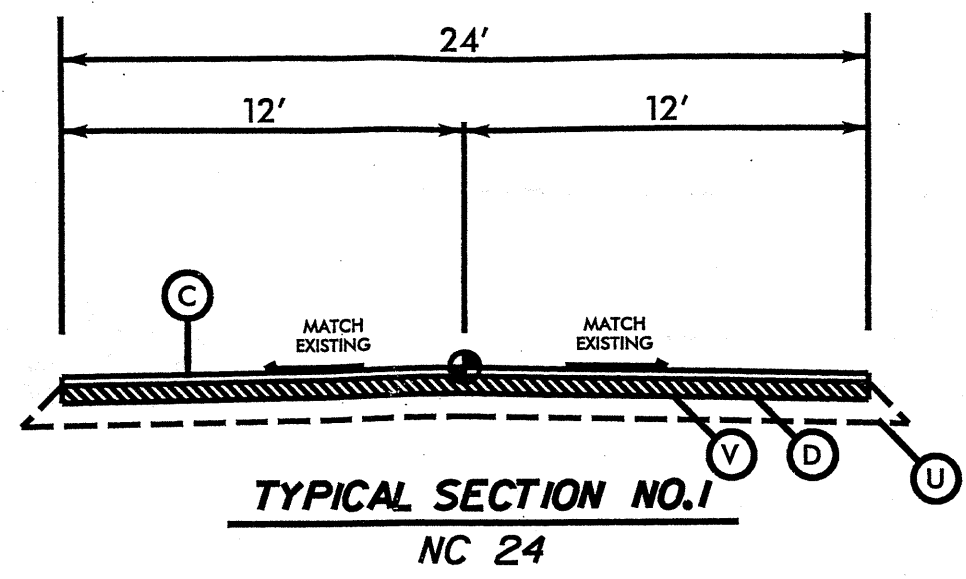
22-FEB-2008 17:35
 \DOT\DF\SRD\01\GROUPS-W\TCCC\design\group\resurfacing\resurfacing2007\dlv03\c202054_3cr1031149etc_sompsonduplin_usf21\c202054_3cr1031149etc_2wayundivurbfrwysjuly2006.dgn
 pseymore AT WZ1231502

PROJECT REFERENCE NO. 3CR1031150	SHEET NO. 1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



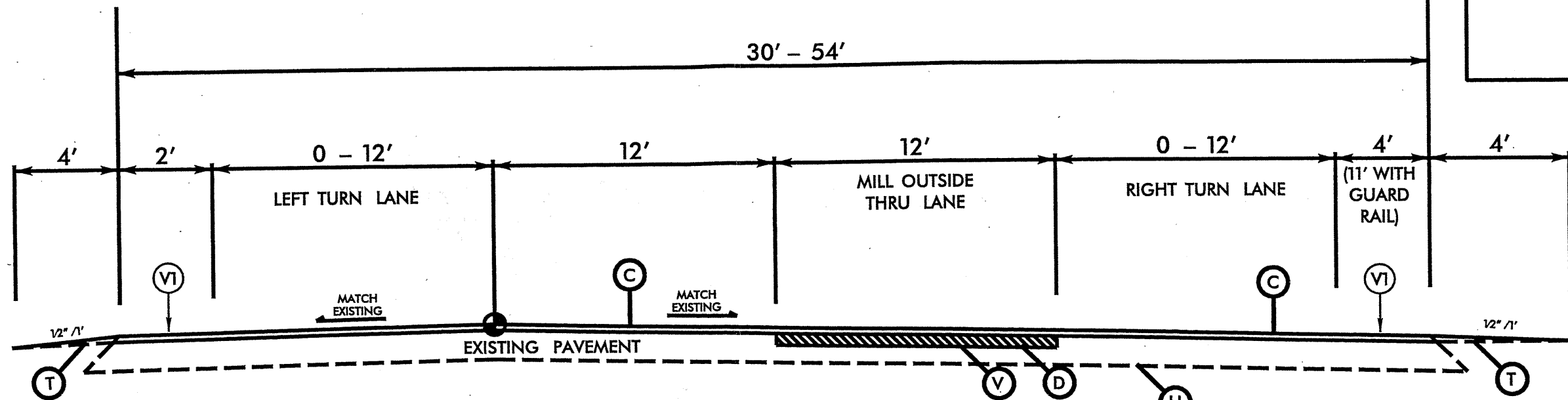
DUPLIN COUNTY

6/22/99
*****SYSTEMS*****
*****3/28/2008*****
*****7:44:12 AM*****

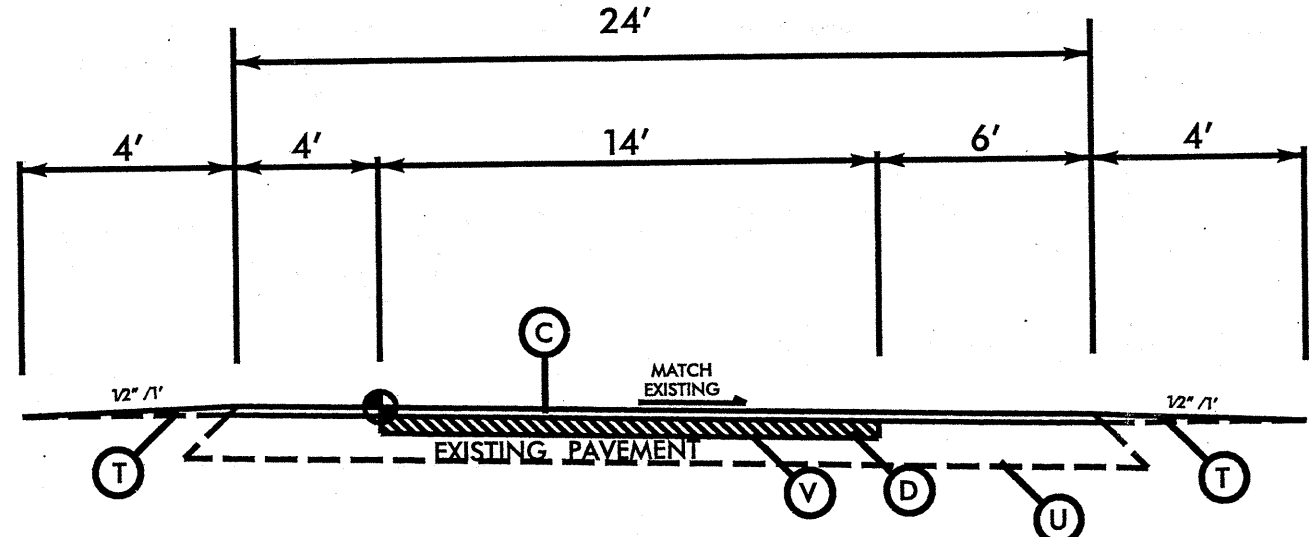


PAVEMENT SCHEDULE	
C	PROP. APPROX. 1½" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D	PROP. APPROX. 2½" DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT. 2½" DEPTH.
V1	MILLED RUMBLE STRIP
T	EARTH MATERIAL

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO.3
NC 24



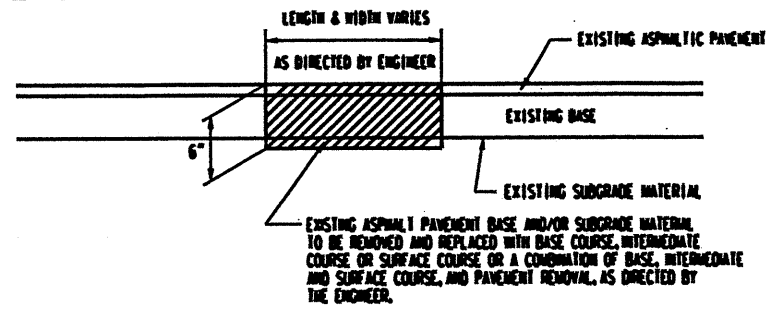
TYPICAL SECTION NO.4
NC 24

PAVEMENT SCHEDULE	
C	PROP. APPROX. 1 1/2" DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D	PROP. APPROX. 2 1/2" DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT. 2 1/2" DEPTH.
V1	MILLED RUMBLE STRIPS
T	EARTH MATERIAL

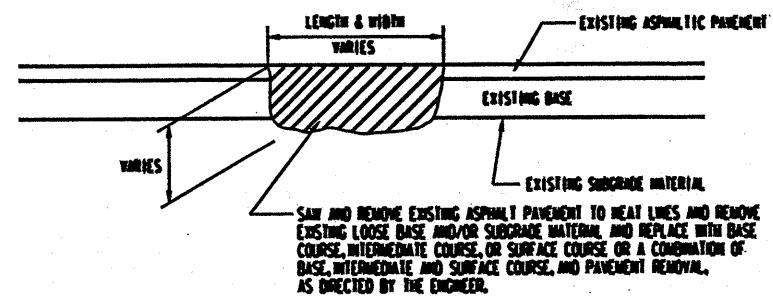
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO. 3CR.10311.50	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

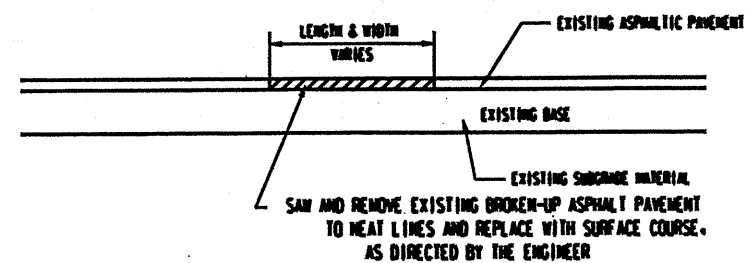
DETAILS OF REPAIRING EXISTING PAVEMENT PRIOR TO RESURFACING FOR FULL DEPTH AND MILLING



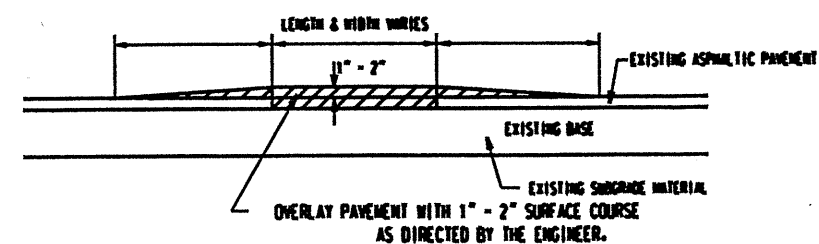
DETAIL NO. 1



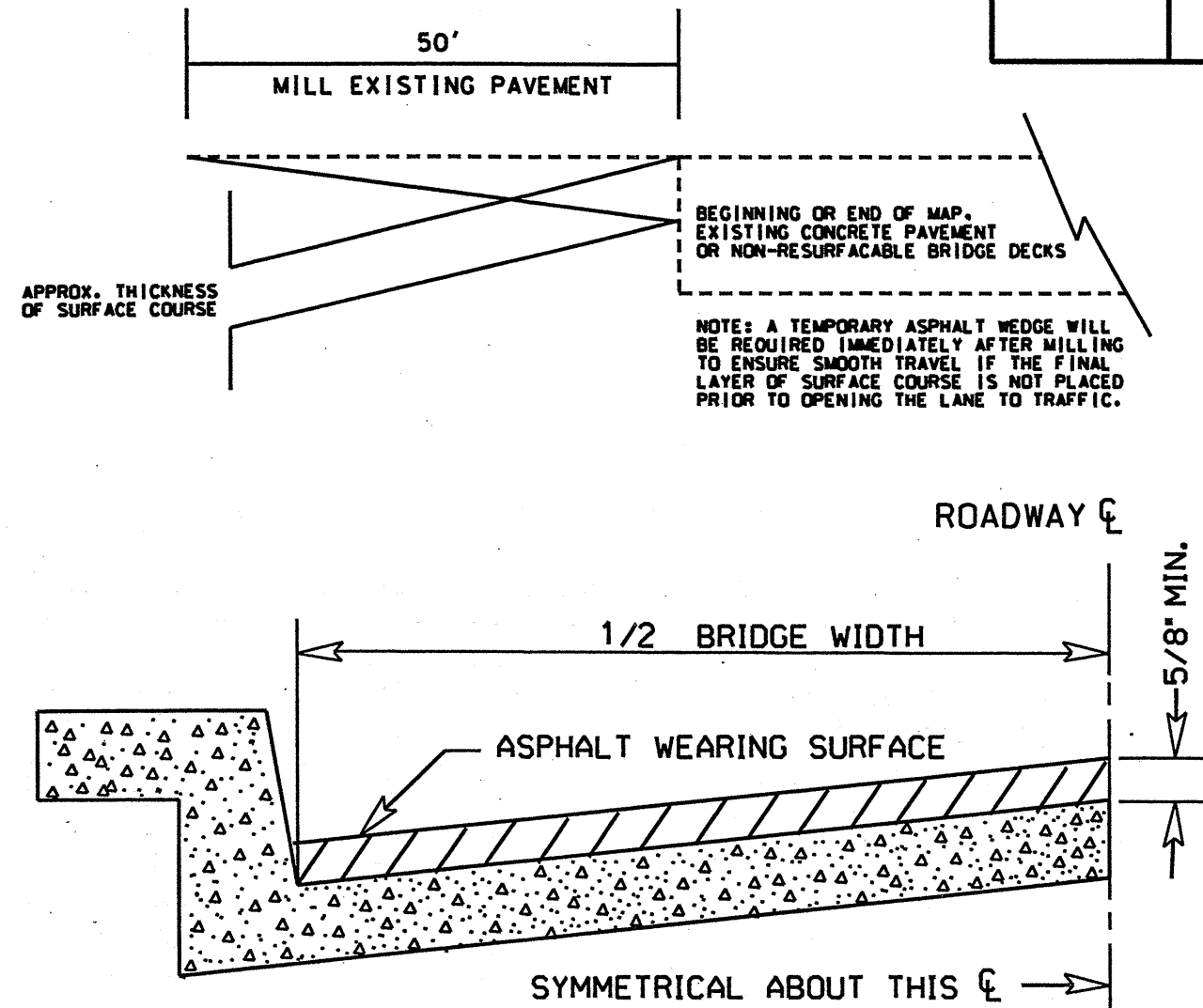
DETAIL NO. 2



DETAIL NO. 3



DETAIL NO. 4



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.

REVISIONS

PROJECT NO.	SHEET NO.	TOTAL NO.
3CR.10311.50	5	

SUMMARY OF QUANTITIES

PROJECT NO.	COUNTY	MAP NO.	ROUTE	DESCRIPTION	TYP	LENGTH MI	WIDTH FT	BORROW EXCAVATION CY	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	2 1/2" MILLING SY	INCIDENTAL MILLING SY	INTERMEDIATE COURSE, I19.0C TONS	SURFACE COURSE, S9.5C TONS	PG 64-22 PLANT MIX TONS	PG 70-22 PLANT MIX TONS	PATCHING EXISTING PAVEMENT(MILL) TON	PATCHING EXISTING PAVEMENT(FULL DEPTH) TONS	MILLED RUMBLE STRIPS LF	TEMPORARY SILT FENCE LF	STONE FOR EC CLASS B TON	SEDIMENT CONTROL STONE TON	TEMPORARY MULCHING ACR	SEED FOR TEMPORARY SEEDING LBS	FERTILIZER FOR TEMPORARY SEEDING TON	1/4" HARDWARE CLOTH LF	SEED & MULCHING AC	INDUCTIVE LOOP LF	LEAD-IN CABLE (18-4) LF						
3CR.10311.50	Duplin	1	NC 24	FROM BRIDGE SEAM TO I-40 RAMP	1	0.07	24				986	133	156	96	7	6			739	7	2	2		4		4									
		*	*	FROM I-40 RAMP TO BEG. DIVIDED HWY	2	0.83	68	353		1.66	11686		1,848	3,204	87	192			8,765	83	21	21	1	42		42	1.00								
TOTAL FOR MAP NO. 1								353		1.66	12672	133	2,004	3,300	94	198			9,504	90	23	23	1	46		46	1.00								
		2	NC 24 EBL	FROM BEG. DIVIDED HWY TO NC 24 BUSINESS	3	3.47	30	1475	200	6.94	24429		3,896	6,327	183	380	50	25	36,643	347	87	87	3	174	1	174	4.16								
		*	*	TAPER FOR TURN LANES (30'-42')	3	0.7	36	298		1.4	4928		786	1,433	37	86			7,392	70	18	18	1	35		35	0.84								
		*	*	FULL WIDTH TURN LANES (42')	3	0.63	42	268		1.26	4435	467	707	1,504	33	90			6,653	63	16	16	1	32		32	0.76	863	200						
		*	*	TAPER FOR TURN LANES (30'-54')	3	0.12	42	51		0.24	845		135	286	6	17			1,267	12	3	3		6		6	0.14								
		*	*	FULL WIDTH TURN LANES (54')	3	0.08	54	34		0.16	563	600	90	245	4	15			845	8	2	2		4		4	0.10								
		*	*	RAMP TO NC 24 BUSINESS EBL	4	0.07	24	30		0.14	574	133	91	96	4	6			739	7	2	2		4		4	0.08								
TOTAL FOR MAP NO. 2								2156	200	10.14	35774	1,200	5,705	9,891	267	594	50	25	53,539	507	128	128	5	251	1	251	1	255	6.08	863	200				
		3	NC 24 WBL	FROM NC 24 BUSINESS TO BEG. DIVIDED HWY	3	1.94	30	782	200	3.68	12954	167	2,066	3,647	97	219	50	25	19,430	184	46	46	2	92		92	2.21								
		*	*	TAPER FOR TURN LANES (30'-42')	3	1.43	36	608		2.86	10067		1,605	2,928	75	176			15,101	179		36	1	72		72	1.72								
		*	*	FULL WIDTH TURN LANES	3	1.31	42	557		2.62	9222	233	1,471	3,127	69	188			13,634	131	33	33	1	66		66	1.57	863	200						
		*	*	TAPER FOR TURN LANES (30'-54')	3	0.24	42	102		0.48	1690		269	573	13	34			2,534	24	6	6		12		12	0.29								
		*	*	FULL WIDTH FOR TURN LANES (54')	3	0.18	54	77		0.36	1267	300	202	552	9	33			1,901	18	5	5		9		9	0.22								
TOTAL FOR MAP NO. 3								5	200	10	35200	700	5,613	10,827	263	650	50	25	52,800	536	90	138	4	242	9	239	9	239	6.01	863	200				
TOTAL FOR PROJ NO. 3CR.10311.50								4635	400	21.8	83646	2,033	13,322	24,016	624	1,442	100	50	115,843	1,133	241	289	10	539	10	540	13.09	1,726	400						
GRAND TOTAL						10.97		4635	400	21.8	83646	2,033	13,322	24,016	624	1,442	100	50	115,843	1,133	241	289	10	539	10	540	13.09	1,726	400						

PROJECT NO.	SHEET NO.	TOTAL NO.
3CR.10311.50	6	

THERMOPLASTIC AND PAINT QUANTITIES







PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	4685000000-E		4686000000-E		4695000000-E		4710000000-E	4721000000-E	4725000000-E			4810000000-E	4835000000-E	4845000000-N	4905000000-N	4905000000-N
					4" X 90 M WHITE THERMO LF	4" X 90 M YELLOW THERMO LF	4" X 120 M YELLOW THERMO LF	4" X 120 M WHITE THERMO LF	8" X 90 M WHITE THERMO LF	8" X 90 M YELLOW THERMO LF	24" X 120 M WHITE THERMO LF	THERMO MSG ONLY 120 M EA	THERMO RT ARROW 90 M EA	THERMO LT ARROW 90 M EA	THERMO STR ARROW 90 M EA	4" WHITE PAINT LF	24" WHITE PAINT LF	PAINT STR ARROW EA	SNOW PLOWABLE MARKERS (Y/Y) EA	SNOW PLOWABLE MARKERS (C/R) EA
3CR.10311.50	Duplin	1	NC 24	FROM BRIDGE SEAM TO I-40 RAMP	753		739									753			5	
		"	"	FROM I-40 RAMP TO BEG. DIVIDED HWY	9,097		10,956	2,922	100	100		8	3	16	2	12,019			58	
TOTAL FOR MAP NO. 1					9,850		11,695	2,922	100	100		8	3	16	2	12,772			63	
		2	NC 24 EBL	FROM BEG. DIVIDED HWY TO NC 24 BUSINESS	18,322	18,322		6,107								24,429	60	33		243
		"	"	TAPER FOR TURN LANES (30' - 42')	3,696	3,696		1,232								1,232				49
		"	"	FULL WIDTH TURN LANES (42')	3,326	3,326		4,435			150		19	37	74	4,435				44
		"	"	TAPER FOR TURN LANES (30' - 54')	634	634		211								211				8
		"	"	FULL WIDTH TURN LANES (54')	422	422		986			100					986				6
		"	"	RAMP TO NC 24 BUSINESS EBL	753				100											5
TOTAL FOR MAP NO. 2					27,153	26,400		12,971	100		250		19	37	74	31,293	60	33		355
		3	NC 24 WBL	FROM NC 24 BUSINESS TO BEG. DIVIDED HWY	9,715	9,715		3,238								12,953	60	33		129
		"	"	TAPER FOR TURN LANES (30' - 42')	7,550	7,550		2,517								2,517				100
		"	"	FULL WIDTH TURN LANES	6,917	6,917		9,222			100		19	37	74	9,222				92
		"	"	TAPER FOR TURN LANES (30' - 54')	1,267	1,267		422								422				17
		"	"	FULL WIDTH FOR TURN LANES (54')	950	950		2,218			100					2,218				13
TOTAL FOR MAP NO. 3					26,400	26,400		17,618			200		19	37	74	27,332	60	33		350
TOTAL FOR PROJ NO. 3CR.10311.50					63,403	52,800	11,695	33,510	200	100	450	8	41	90	150	71,397	120	66	63	705
					116,203		45,206		300				281						768	
GRAND TOTAL					63,403	52,800	11,695	33,510	200	100	450	8	41	90	150	71,397	120	66	63	705
					116,203		45,206		300				281						768	

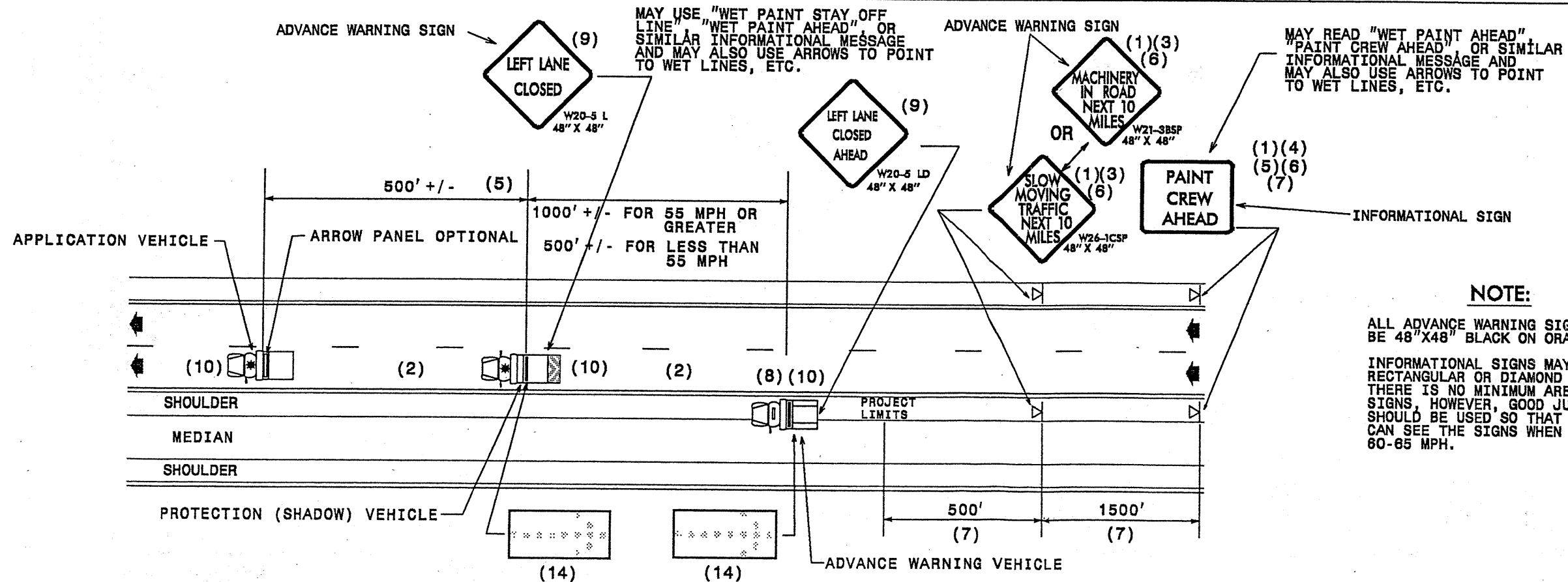
GENERAL NOTES

- (1) THE FOLLOWING OPTIONS MAY BE USED FOR ADVANCE WARNING SIGNS:
 - A. TRUCK MOUNTED ADVANCE WARNING SIGNS
 - B. TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (CMS)
 - C. GROUND MOUNTED ADVANCE WARNING SIGNS
(MUST USE 'NEXT 10 MILES' AND CIRCLE TO PICK UP SIGNS)
 - D. GROUND MOUNTED CHANGEABLE MESSAGE SIGN (CMS)
(MUST USE 'NEXT 10 MILES' AND CIRCLE TO PICK UP CMS)
- (2) ADDITIONAL VEHICLES SHOULD BE USED IN WORK CARAVAN TO FACILITATE DRYING OF PAVEMENT MARKING MATERIAL - TMIA'S ARE OPTIONAL ON THESE ADDITIONAL VEHICLES. HOWEVER, THE FIRST VEHICLE MOTORISTS SEE SHOULD HAVE A TMIA.
- (3) ROUND UP MILEAGE TO NEXT WHOLE MILE. WORK ZONE SHOULD NOT EXCEED TEN (10) MILES IN LENGTH.
- (4) SIGNS SHOULD BE ACTIVITY SPECIFIC I.E., PAINT CREW AHEAD (W21-001 C 48"X48")
- (5) DISTANCE BETWEEN APPLICATION VEHICLE AND PROTECTION VEHICLE WILL VARY AS DRYING TIMES VARY, HOWEVER, THE CRITICAL FACTOR IS PASSING MOTORISTS. IF THE GAP BETWEEN VEHICLES IS TOO GREAT, MOTORISTS WILL ATTEMPT TO PASS AND ULTIMATELY APPEAR IN THE MIDDLE OF THE OPERATION.
- (6) MOUNTING HEIGHT DIMENSIONS FROM ROADWAY TO SIGN SHOULD BE A MINIMUM OF FIVE (5) FEET FOR INTERSTATES, OTHER HIGH VOLUME ROADWAYS, OR ROADWAYS THAT MAY REQUIRE A MOUNTING HEIGHT OF FIVE (5) FEET FOR INCREASED VISIBILITY AND A MINIMUM OF ONE (1) FOOT FOR ALL OTHER ROADWAYS.
- (7) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES.
- (8) USE AN ADVANCE WARNING VEHICLE(S) WITH FLASHING ARROW PANELS ON SHOULDERS TO SUPPLEMENT TRAFFIC SHIFTS. USE OF CMS ON THIS VEHICLE(S) IS OPTIONAL.
- (9) SIGN W20-5L SHOULD BE PLACED ON BACK OF PROTECTION VEHICLE AND SIGN W20-5LD ON BACK OF ADVANCE WARNING VEHICLE IN MULTILANE DIVIDED TRAFFIC SO VEHICLES APPROACHING FROM REAR ARE NOTIFIED OF OPERATION.
- (10) RADIO COMMUNICATION BETWEEN VEHICLES IS RECOMMENDED.
- (11) USE OF A LIGHT BAR ON THE ADVANCE WARNING VEHICLE IS PREFERRED, BUT A ROTATING BEACON MAY BE USED INSTEAD.
- (12) USE OF A CMS ON ADVANCED WARNING VEHICLES IS OPTIONAL.
- (13) IF WORK IS PERFORMED AT NIGHT, THE FOLLOWING PROVISIONS MUST BE MADE:
 - A. GROUND MOUNTED SIGNS MUST HAVE TYPE B FLASHING LIGHTS ATTACHED (TRUCK MOUNTED SIGNS DO NOT REQUIRE TYPE B FLASHING LIGHTS)
 - B. OPERATION MUST INCLUDE A CHANGEABLE MESSAGE SIGN (CMS)
 - C. WORK AREA MUST BE ILLUMINATED WITH MACHINE AND/OR TOWER LIGHTS AS APPROVED BY THE ENGINEER.
- (14) USE A TYPE "B" FLASHING ARROW PANEL.

PANEL TYPE	MIN. SIZE
B	60"X30"

LEGEND

-  PORTABLE SIGN
-  DIRECTION OF TRAFFIC FLOW
-  APPLICATION VEHICLE WITH ROTATING BEACON
-  PROTECTION VEHICLE WITH TRUCK MOUNTED IMPACT ATTENUATOR (TMIA) AND ROTATING BEACON (SEE ROADWAY STANDARD NO. 1185.01)
-  ADVANCE WARNING VEHICLE 1.8 PICKUP TRUCK WITH MOUNTED SIGN
-  FLASHING ARROW PANEL, TYPE "B" APPROPRIATE DIRECTION INDICATED



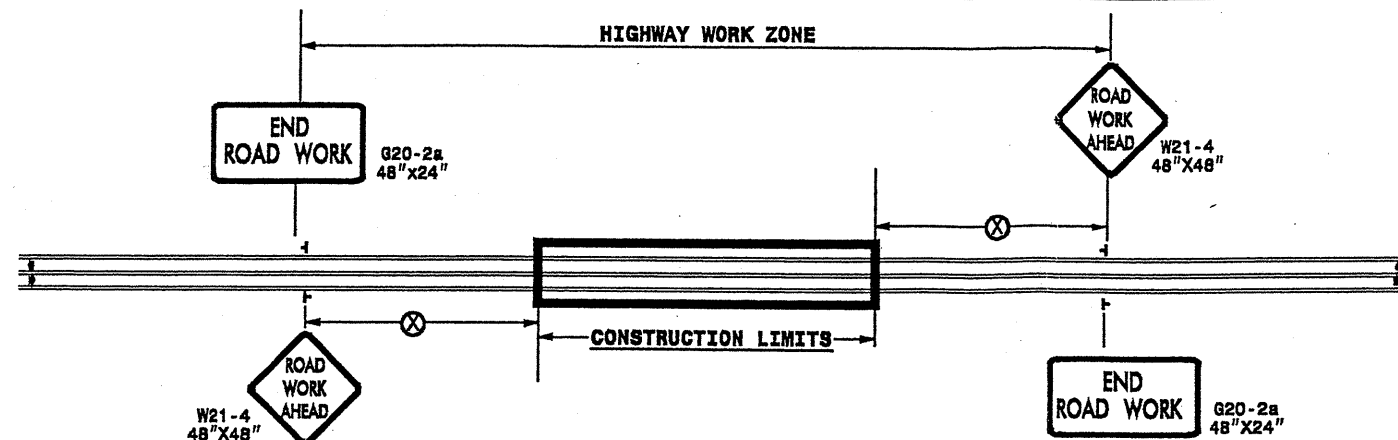
NOTE:
 ALL ADVANCE WARNING SIGNS MUST BE 48"X48" BLACK ON ORANGE.
 INFORMATIONAL SIGNS MAY BE RECTANGULAR OR DIAMOND SHAPED. THERE IS NO MINIMUM AREA FOR THESE SIGNS, HOWEVER, GOOD JUDGEMENT SHOULD BE USED SO THAT MOTORISTS CAN SEE THE SIGNS WHEN TRAVELING 60-65 MPH.

MOVING OPERATION CARAVAN

(OPERATIONS TRAVELING 3 MPH OR FASTER)
 PLACING PAVEMENT MARKING OR MARKERS ON
 INTERSTATE & MULTILANE DIVIDED ROADWAYS

DRAWING NUMBER 7
 IMPLEMENTATION DATE: 07/01/97
 REVISED: 04/25/97

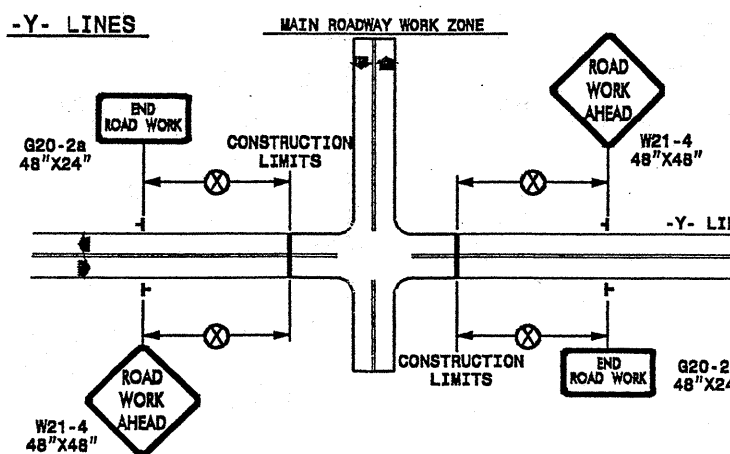
TWO-WAY UNDIVIDED ** (L-LINES)



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

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

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



GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01. REMOVE ENTIRE POST WHEN REMOVING SIGNS WITH SPLICED POSTS.
- DO NOT BACK BRACE SIGN SUPPORTS.
- ** 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

- ┆ STATIONARY SIGN
- ◀ DIRECTION OF TRAFFIC FLOW

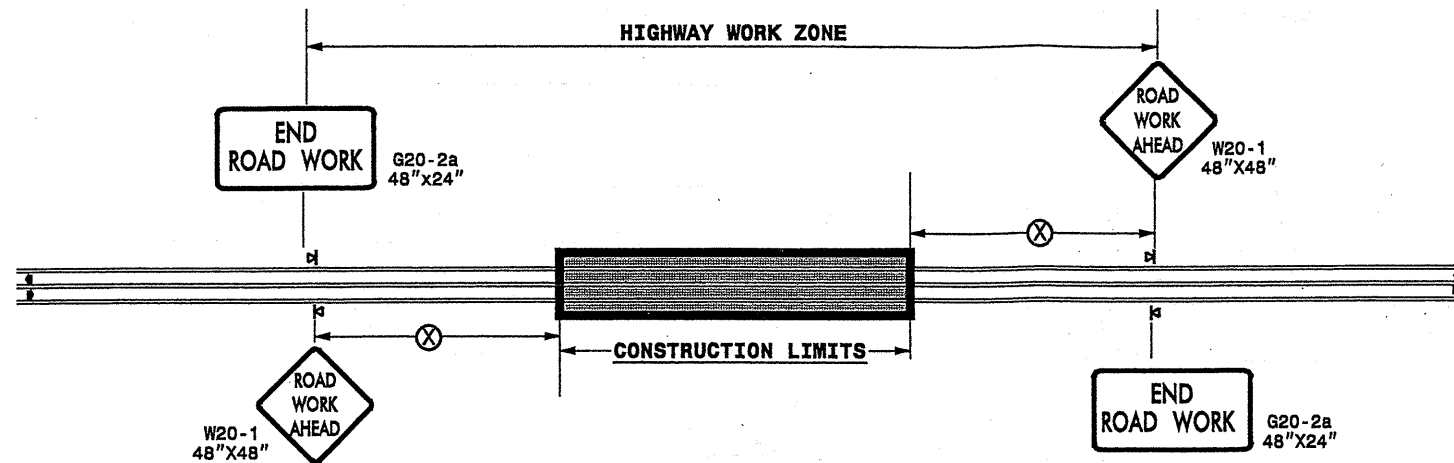
SHEET 1 OF 1

DETAIL DRAWING FOR
TWO-WAY UNDIVIDED
WORK ZONE WARNING SIGNS

APPROVED: _____	DATE: _____	DETAIL DRAWING FOR TWO-WAY UNDIVIDED AND URBAN FREEWAYS ADVANCED WORK ZONE WARNING SIGNS	
SEAL	SCALE: NONE	REVISIONS	
	DATE: _____	7-98	10/01
	DWG. BY: _____	10-98	03/04
	DESIGN BY: _____	01/01	11/04
REVIEWED BY: _____			

29-JAN-2008 11:21
C:\p\d\work\2008\nc24_2008_reSURF.dwg\paper\work\3or103150.rdy.tah.dwg
dlc/ave AT 03/02/05 09:59

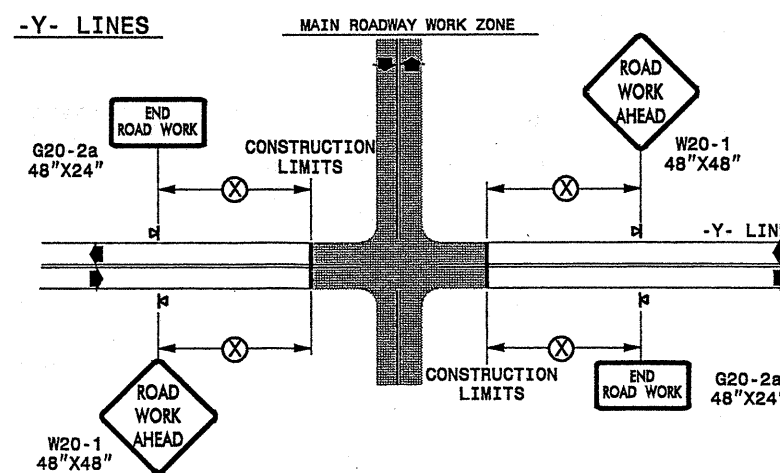
TWO-WAY UNDIVIDED ** (L-LINES)



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

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

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



GENERAL NOTES

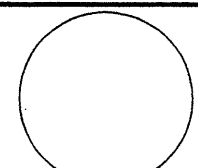
- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH 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

DETAIL DRAWING
FOR TWO-WAY UNDIVIDED
WORK ZONE WARNING SIGNS

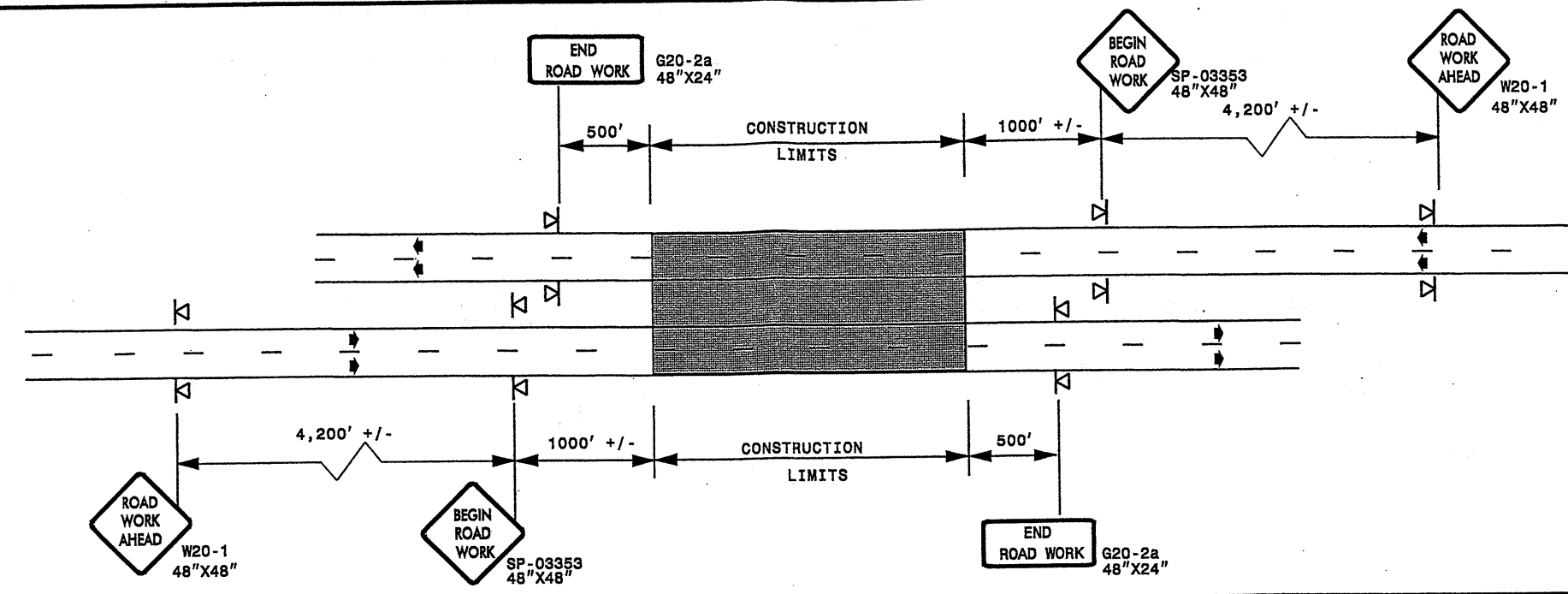
SHEET 1 OF 1

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

02-MAR-2008 19:02 \\\NDOT\DP\SR001\11\11\TCCC\design\group4\resurfacing\resurfacing2007\div03\c202053_3cr1031150_duplin.nc24\c202053_3cr1031150_2wayundivurbfrwysJuly2006.dgn

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

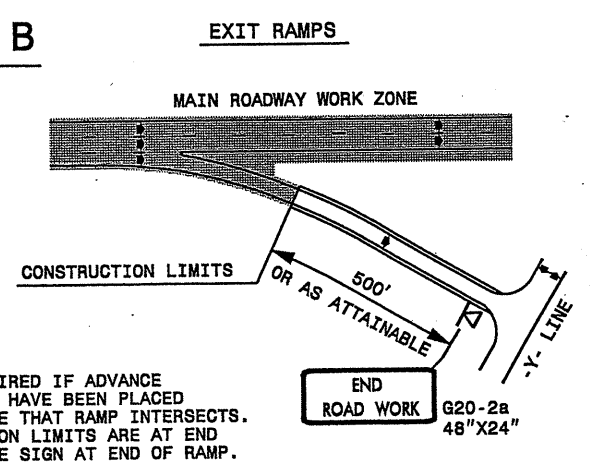
DETAIL A



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

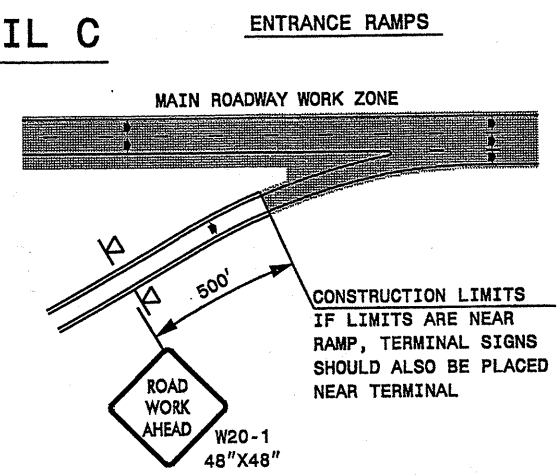
ROADWAYS INTERSECTING ALONG FREEWAY WORK ZONE (Y-LINES)

DETAIL B



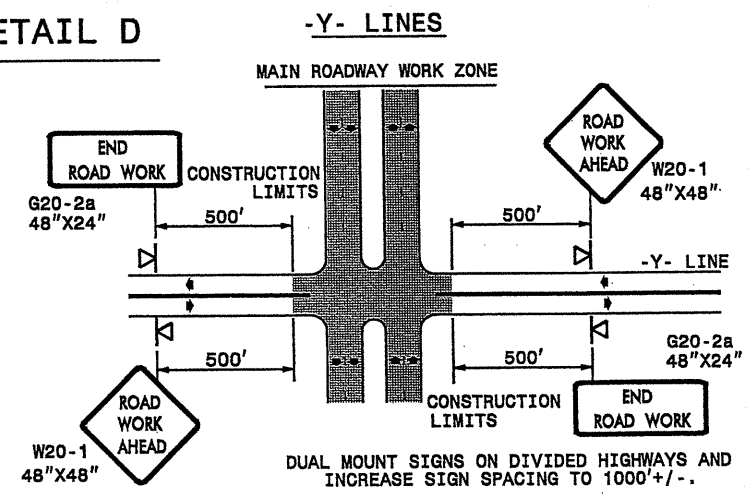
NOTE:
SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

DETAIL C



CONSTRUCTION LIMITS IF LIMITS ARE NEAR RAMP, TERMINAL SIGNS SHOULD ALSO BE PLACED NEAR TERMINAL

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.

LEGEND

- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

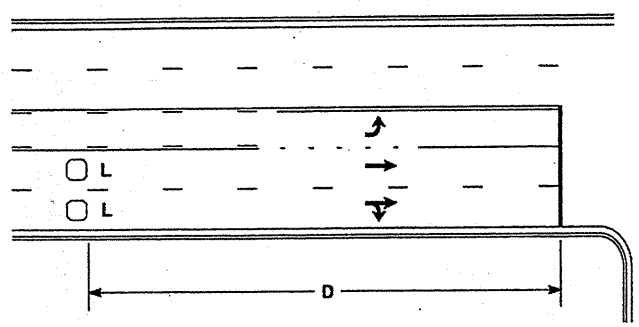
DETAIL DRAWING
FOR FREEWAYS
WORK ZONE WARNING SIGNS
(SHORT-DURATION LANE CLOSURES)

SHEET 1 OF 1

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

02-MAR-2008 10:02 C:\PROPS-WZTCCC\design\group4\resur\facimg\resur\facimg2007\div03\ce202053_3cr1031150_duplin_nc24\C202053_3CR1031150_freeway4lanesgreat-july2006.dgn

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

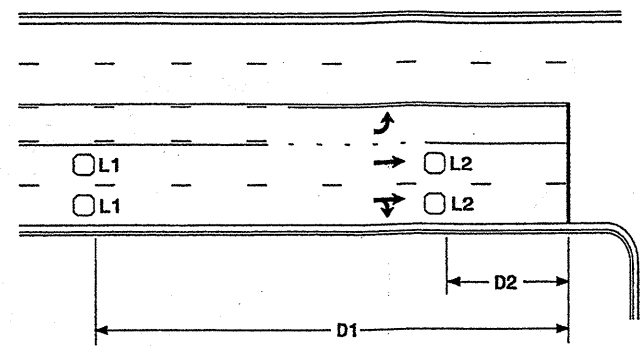


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

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

OR



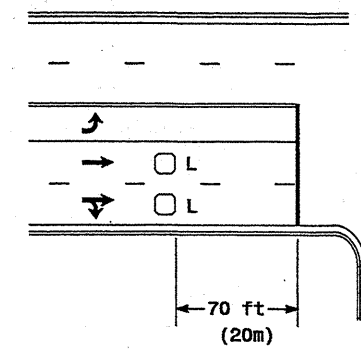
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

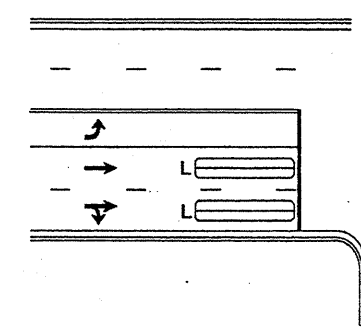
Low Speed Detection [≤35 mph (56 km/hr)]

3CR.10311.50



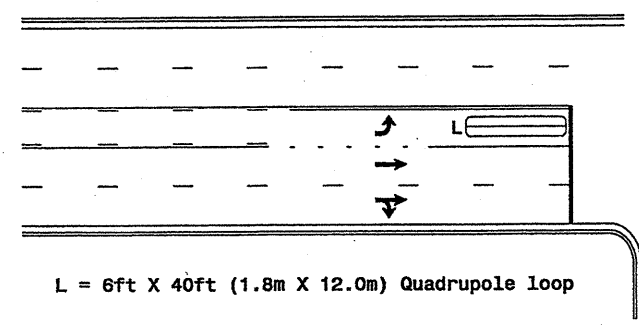
L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

OR



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

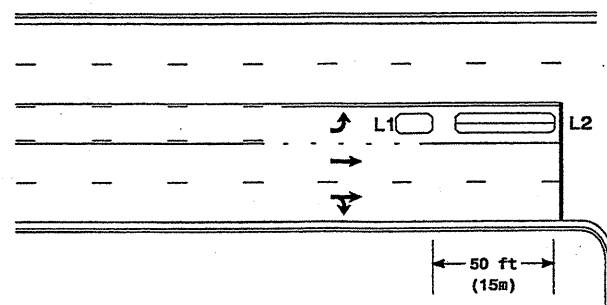
Left Turn Lane Detection



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

Presence Loop Detection

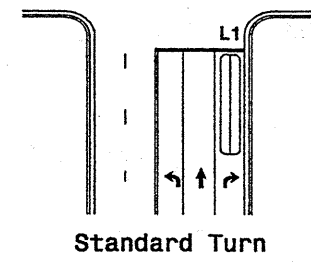
OR



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

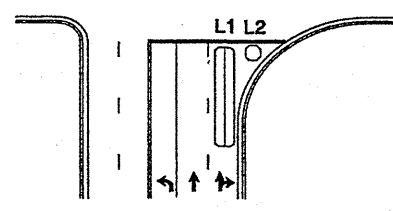
Queue Loop Detection

Right Turn Lane Detection

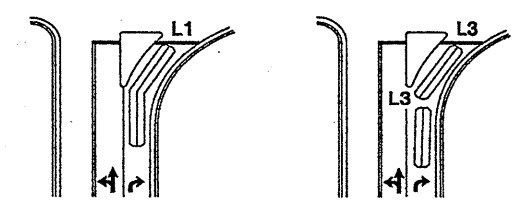


Standard Turn

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

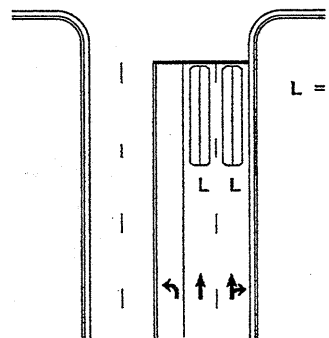


Wide Radius Turn



Channelized Turn

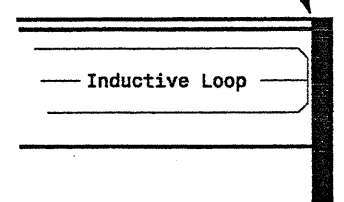
Side Street Detection



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 Office of

Typical Loop Locations
 PLAN DATE: June 2006 REVISIONS: _____
 PREPARED BY: P L Alexander REVISIONS: _____
 SCALE: N/A
 SIGNATURE: _____ DATE: 6/6/06
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23488
 SIGNATURE: _____ DATE: 6/6/06
 SIG. INVENTORY NO. _____

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

5-07

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

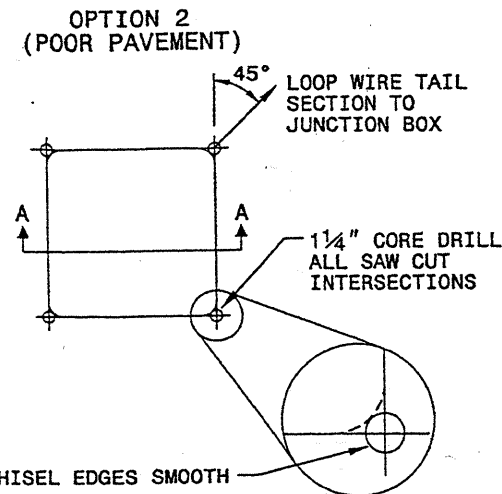
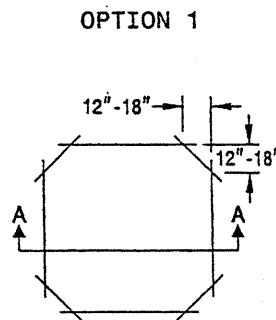
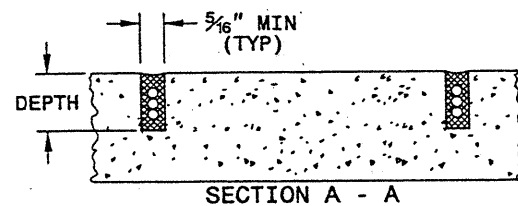
SHEET 1 OF 3
1725D01

CONVENTIONAL 4-SIDED LOOP

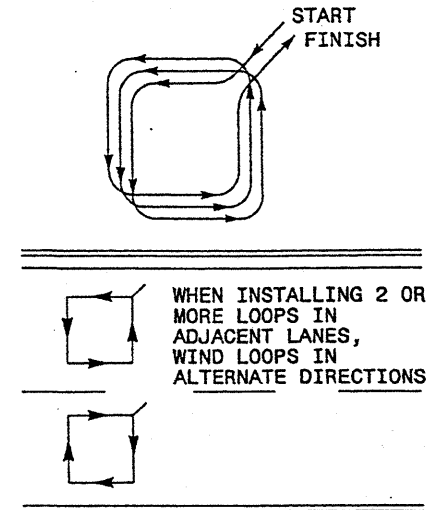
SAW CUT OPTIONS

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

INCORRECT WAY TO TWIST WIRE



CORRECT WAY TO TWIST WIRE

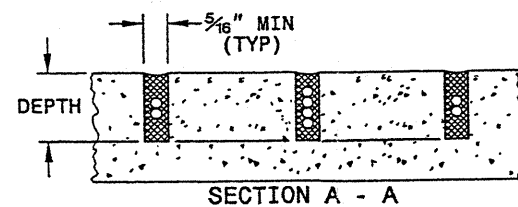
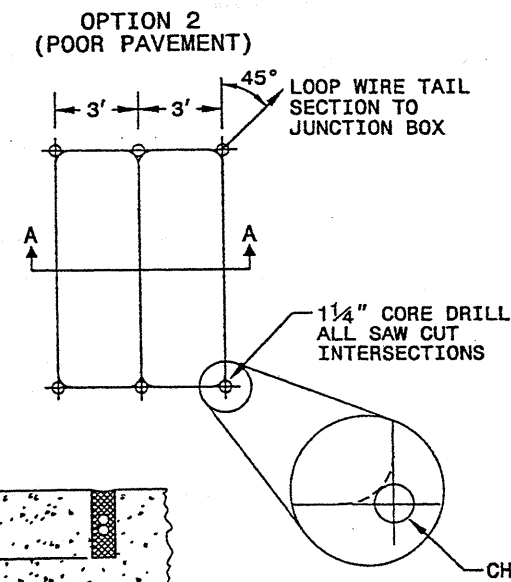
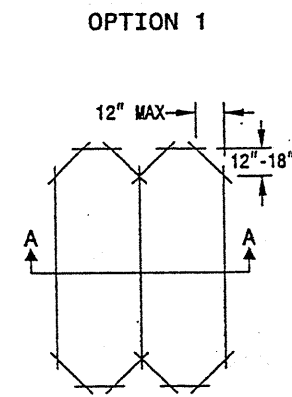


NOTES

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.

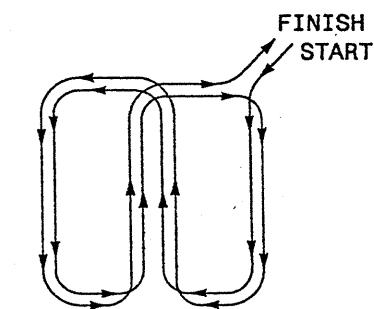
QUADRUPOLE LOOP

SAW CUT OPTIONS



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



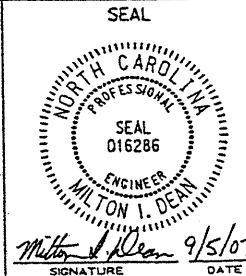
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

5-07

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3
1725D01

See Plate for Title



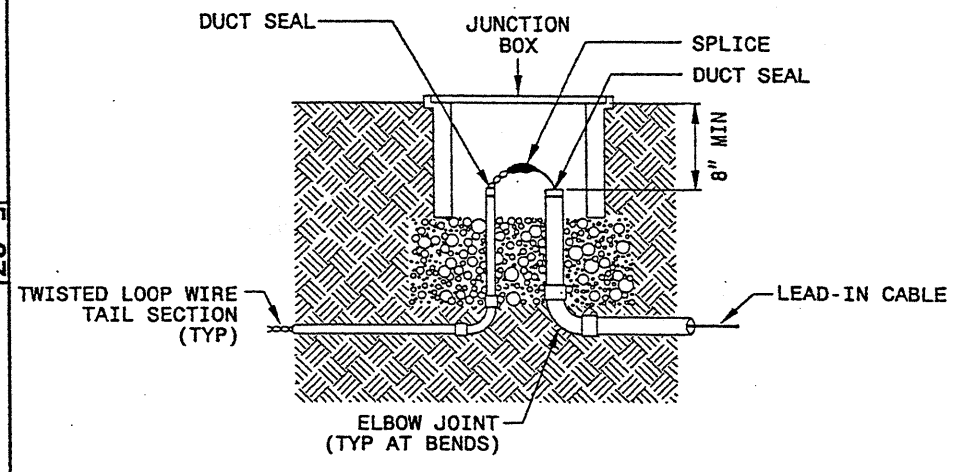
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

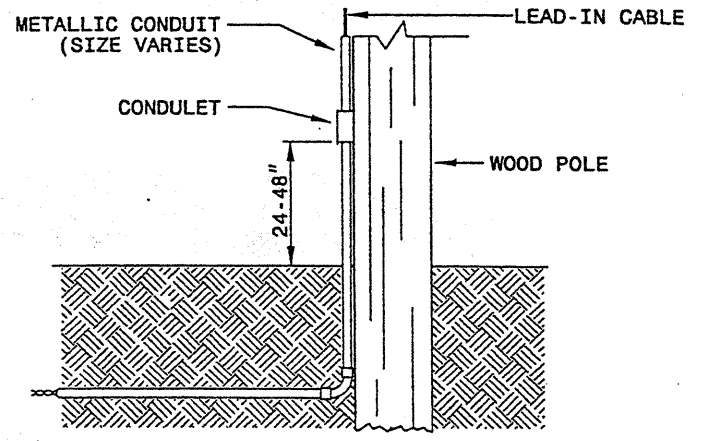
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

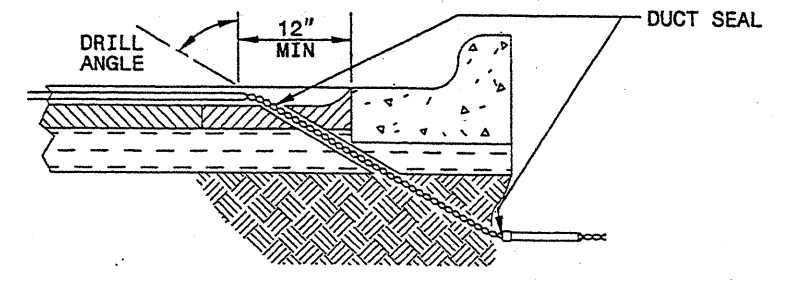


NOTE

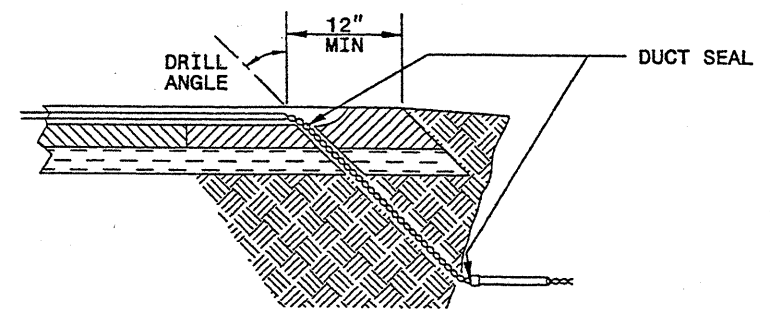
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

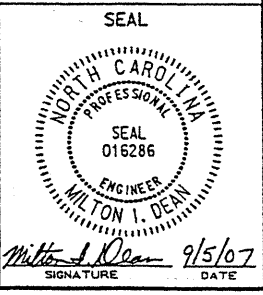
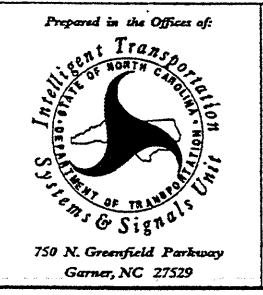
1. DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
2. TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
3. BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE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

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

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title



05-SEP-2007 14:00
 c:\documents and settings\ngazam\11\1a.dot\sdaktops\standard metal pole sheets\1725D01.mxd_072307.dgn
 2/11/11

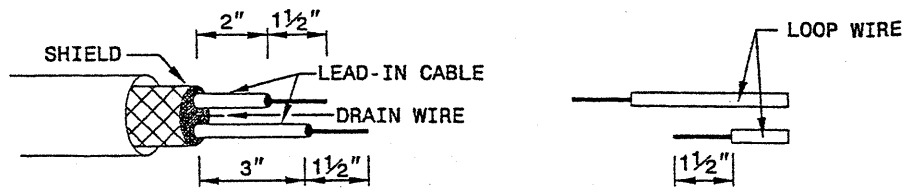
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

5-07

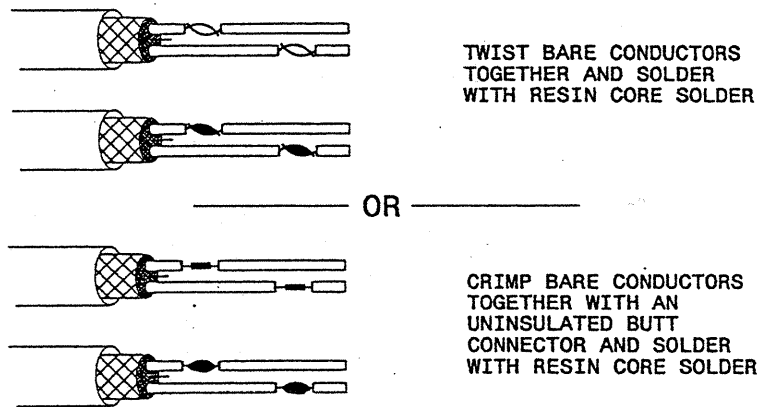
ENGLISH DETAIL DRAWING FOR
INDUCTION DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

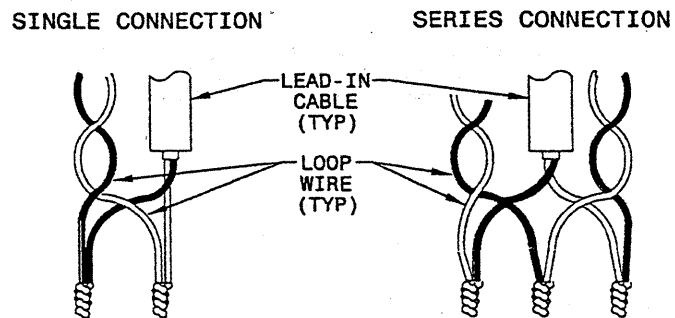


STEP 2. CONNECT AND SOLDER

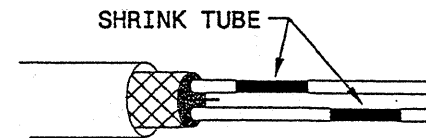


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

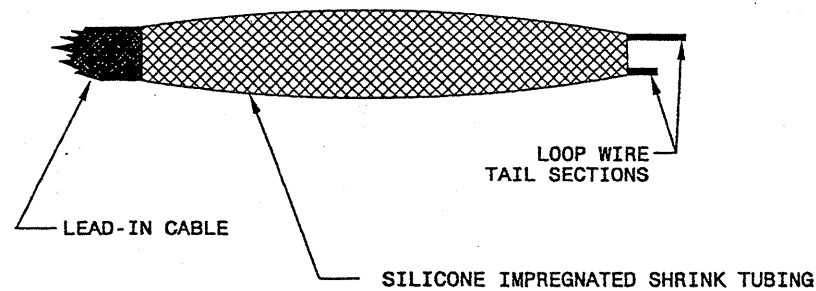
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
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

See Plate for Title

Prepared in the Office of:

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

SEAL
016286
ENGINEER
WILTON I. DEAN

Wilton I. Dean 9/5/07
SIGNATURE DATE