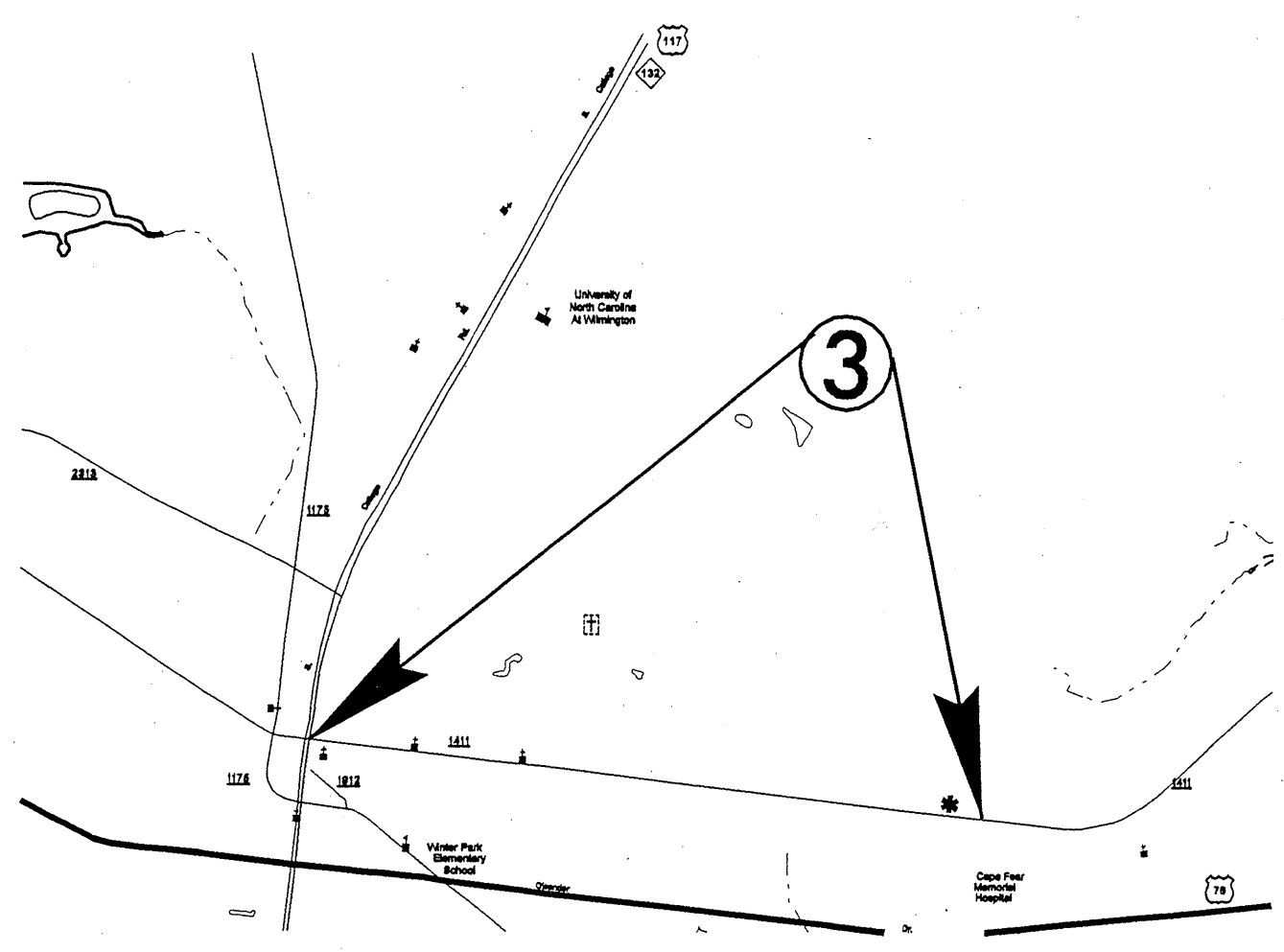
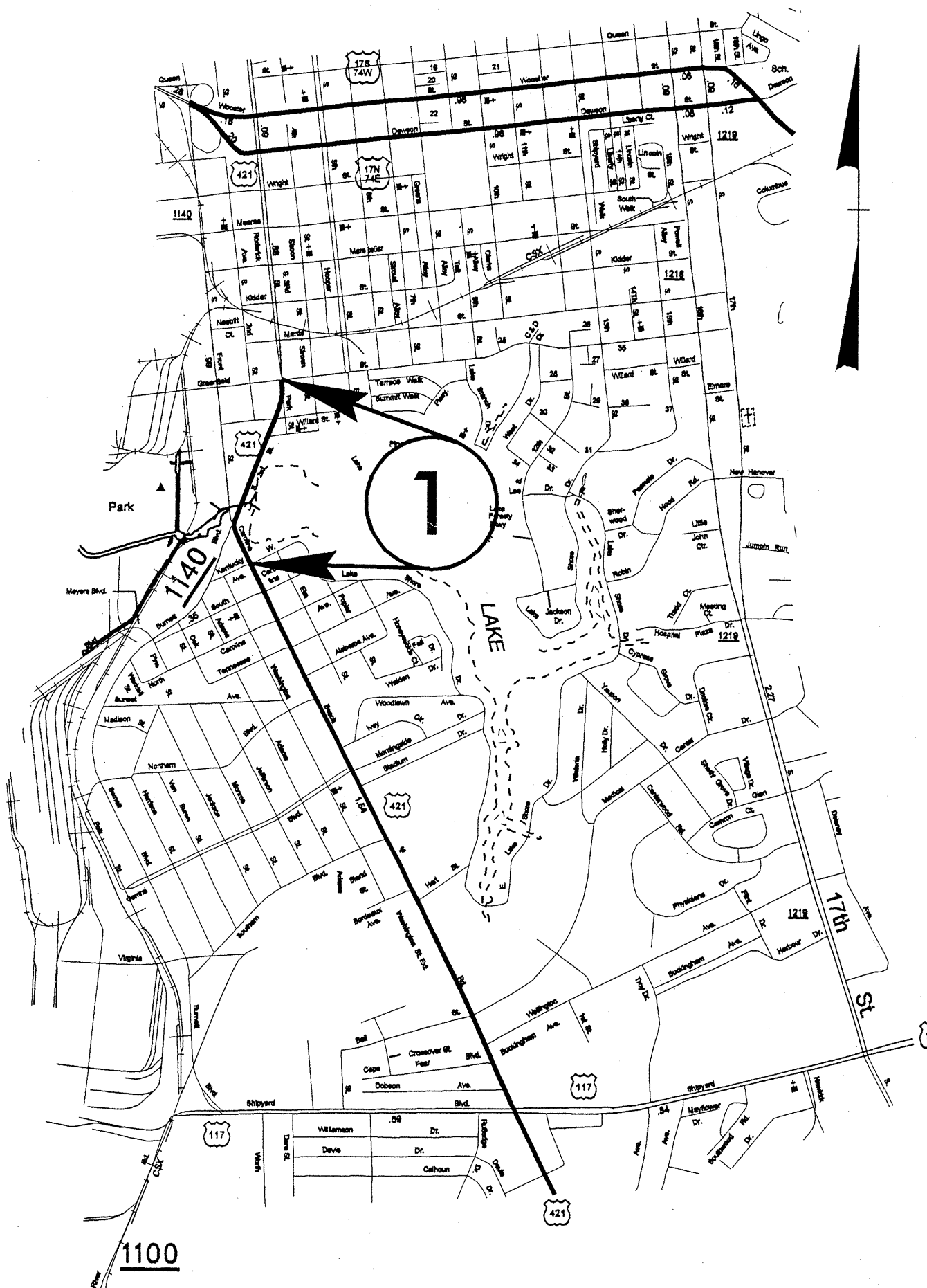


C201686

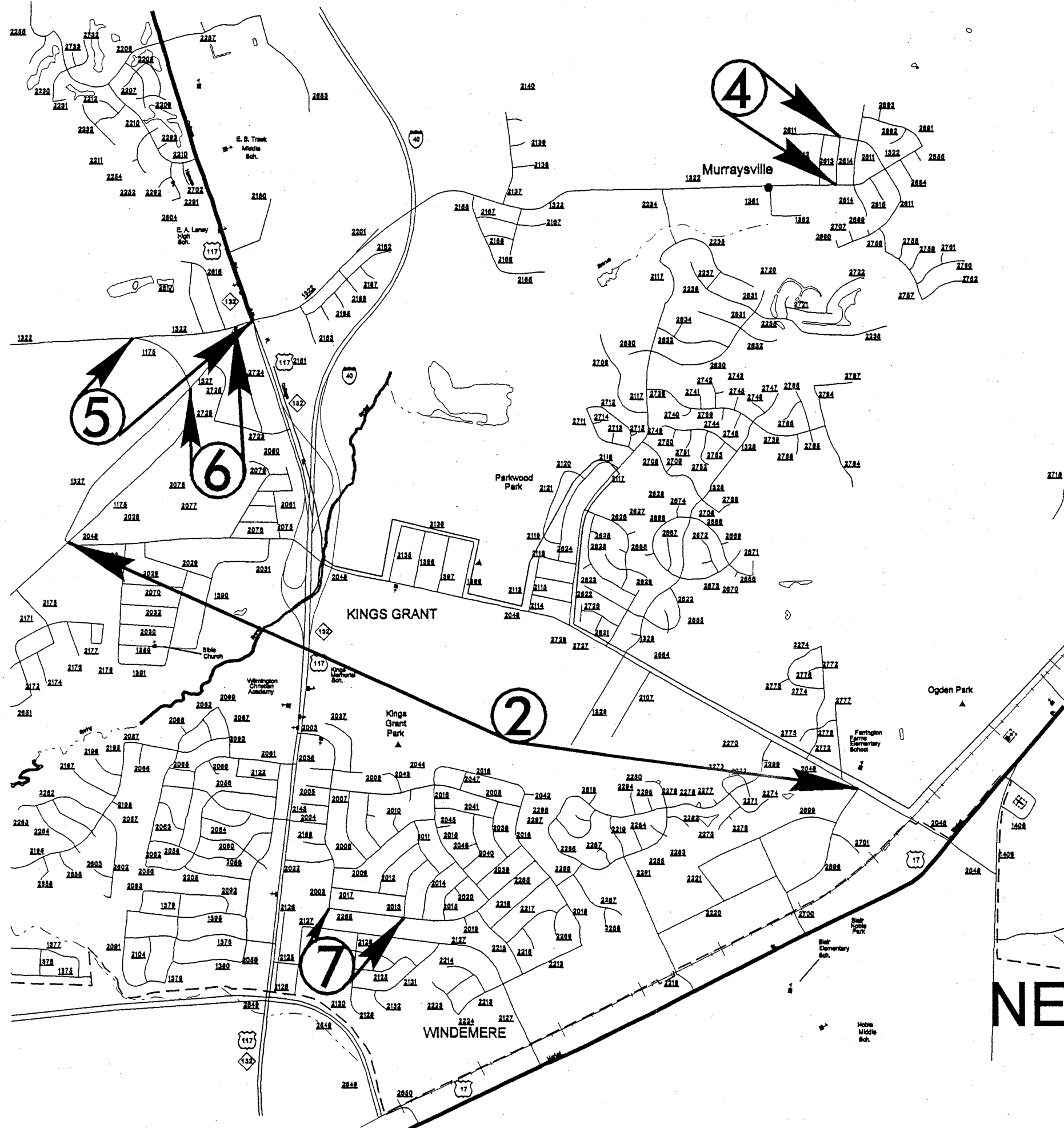
WBS ELEMENT	SHEET 1 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	



EP-2006\_06:37  
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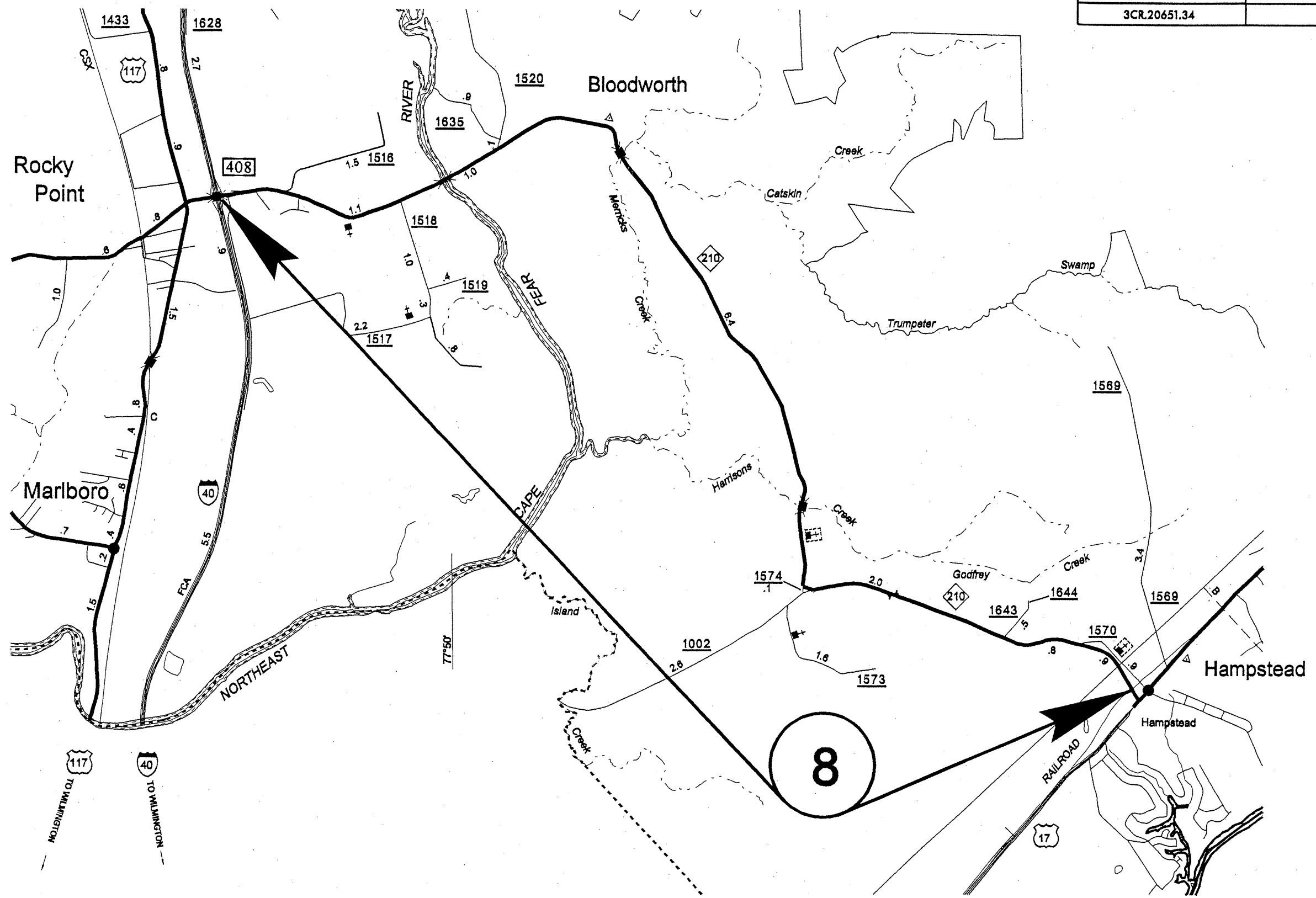
# NEW HANOVER COUNTY

WBS ELEMENT	SHEET 2 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	



**NEW HANOVER  
COUNTY**

WBS ELEMENT	SHEET 3 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	



# PENDER COUNTY

SUMMARY OF QUANTITIES

WBS ELEMENT	COUNTY	MAP NO.	ROUTE	DESCRIPTION	TYP NO.	LENGTH	WIDTH FT.	ASPHALT BINDER 64-22 TON	ASPHALT BINDER 70-22 TON	PATCH EXISTING PAV'T MILLING TON	PATCH EXISTING PAV'T FULL DEPTH TON	MILLING 1 1/2" SY	MILLING 1 1/2" TO 4 1/2" SY	INCIDENT. MILLING SY	SURFACE COURSE SF9.5A TON	SURFACE COURSE S9.5B TON	SURFACE COURSE S9.5C TON	BASE COURSE B25.0B TON	LEVELING S9.5B TON	PORTABLE LIGHTING	INDUCTIVE LOOP SAWCUT LF	PULL BOX EA			
3CR.10651.34	NEW HANOVER	1	US 421	WEST LAKE SHORE DRIVE TO GREENFIELD STREET	1	0.13	45		19			3,435					317								
					1	0.18	56		33					5,915					546						
					2	0.05	77		13						2,260					209					
					1	0.07	45-52	2	11						2,000					184	50				
					1	0.03	52-56		5						950					88					
				4 NON SYSTEM INTERSECTIONS @ 12.5 TONS PER					2								50								
TOTAL FOR WBS ELEMENT 3CR.10651.34						0.46		2	83	180	20	14,560		1,600			1,394	50		1	750	1			
3CR.20651.34	NEW HANOVER	2	SR 2048	SR 1175 TO SR 2698		2.96		8		1,080	120								125						
				US 117 TO WEST OF HUNTINGTON RD.	3	SR 1411	3	0.04	37	5					875				80						
							3	0.25	39	32			5,725			529									
							4	1.02	24	80					1,327										
							4	0.09	29	8					141										
							4	0.10	24-39	10					171										
											18 NON-SYSTEM INTERSECTIONS @ 7 TONS PER			8						126					
TOTAL FOR MAP No. 3						1.50		151		810	90		6,600	200		2,374									
		4	SR 2613	SR 1322 TO SR 2611	5	0.16	21	10		70	10				149										
		5	SR 1322	SR 1175 TO US 117		0.37				235	25														
		6	SR 1327	SR 1322 TO SR 1175		0.26				180	20														
		7	SR 2265	SR 2003 TO SR 2013	5	0.27	30	23		180	20				359										
TOTAL FOR WBS ELEMENT 3CR.20651.34						5.52		183		2,555	285		6,600	200	508	2,374			125						
3CR.10711.34	PENDER	8	NC210	I-40 TO 0.2 MILE NW OF US 17		13.05				4,610	515														
GRAND TOTAL						19.03		185	83	7,345	820	14,560	6,600	1,800	508	2,374	1,394	50	125	1	750	1			

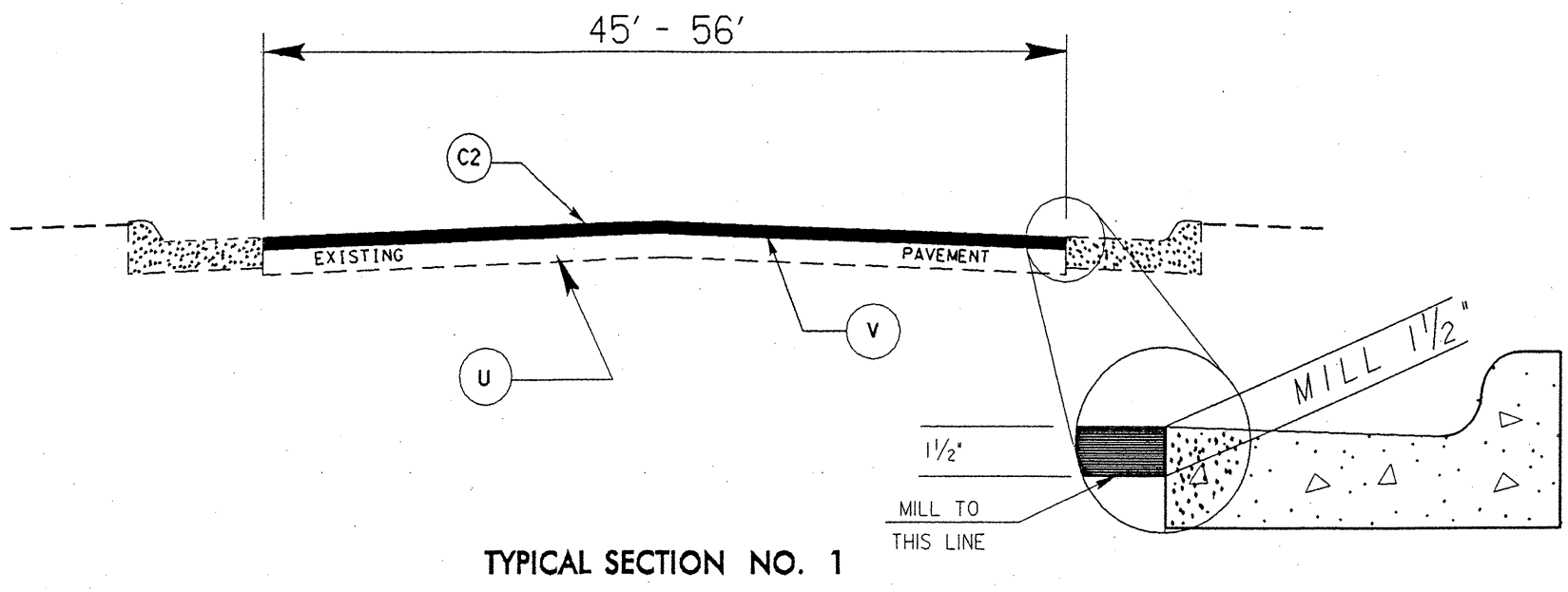
SUMMARY OF QUANTITIES

WBS ELEMENT	COUNTY	MAP NO.	ROUTE	DESCRIPTION	LEAD IN CABLE LF	GUY ASSEMBLY EA	AMPS AND HARNESS EA	REMOVE CURB & GUTTER LF	REPAIR CURB & GUTTER LF	WHEEL CHAIR RAMP EA	SHOULDER RECONSTR. SHDR MI.	BORROW EXCAVATION CY	SEEDING & MULCHING AC	PIPE CLEANING EA	TEMPORARY SILT FENCE LF	SEDIMENT CONTROL STONE TON	1/4" HARDWARE CLOTH LF	INCIDENTAL STONE TON	ADJ MANHOLE EA	ADJ DI EA	ADJ MON/WW/VB EA	
3CR.10651.34	NEW HANOVER	1	US 421	WEST LAKE SHORE DRIVE TO GREENFIELD STREET																		
				4 NON SYSTEM INTERSECTIONS @ 12.5 TONS PER																		
TOTAL FOR WBS ELEMENT 3CR.10651.34					350	1	1	60	625	1				4	16	0.07	16		1			2
3CR.20651.34	NEW HANOVER	2	SR 2048	SR 1175 TO SR 2698																		
		3	SR 1411	US 117 TO WEST OF HUNTINGTON RD.																	3	
											2.04	224	1.63									
											0.18	20	0.14									
											0.20	22	0.16									
				18 NON-SYSTEM INTERSECTIONS @ 7 TONS PER																		
TOTAL FOR MAP No. 3											2.42	266	1.94					125	4	3	3	
		4	SR 2613	SR 1322 TO SR 2611															1			
		5	SR 1322	SR 1175 TO US 117																		
		6	SR 1327	SR 1322 TO SR 1175																		
		7	SR 2265	SR 2003 TO SR 2013																		
TOTAL FOR WBS ELEMENT 3CR.20651.34											2.42	266	1.94					125	5	3	3	
3CR.10711.34	PENDER	8	NC210	I-40 TO 0.2 MILE NW OF US 17																		
GRAND TOTAL					350	1	1	60	625	1	2.42	266	1.94	4	16	0.07	16	125	6	3	5	

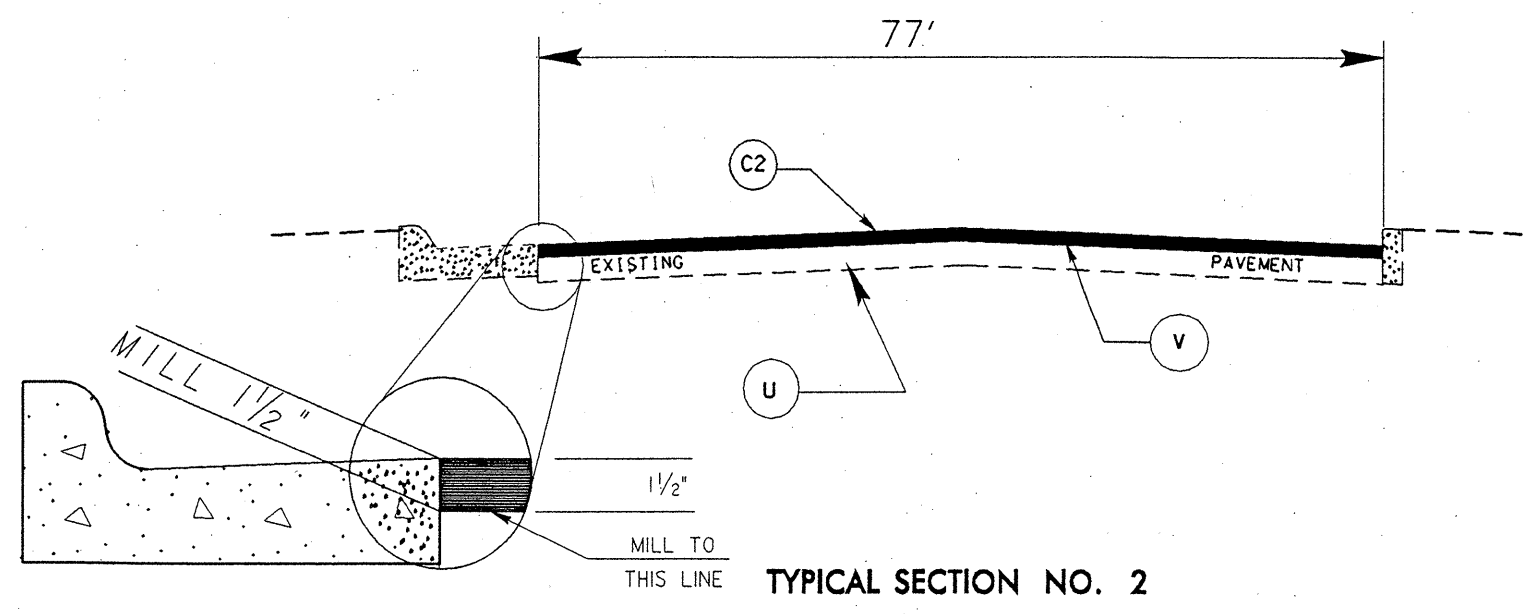
THERMO PLASTIC PAVEMENT MARKINGS													PAINT PAVEMENT MARKINGS								PAVEMENT MARKERS				
WBS ELEMENT	COUNTY	MAP NO.	4"WHITE 90 MILS (E/L) LF	4"WHITE 120 MILS (S & MS) LF	4"YELLOW 120 MILS (C/L) LF	8"YELLOW 120 MILS (DIAG) LF	24"WHITE 120 MILS (ST. BARS) LF	LT TURN ARROW 90 MILS EA	RT TURN ARROW 90 MILS EA	STRAIGHT ARROW 90 MILS EA	COMB. STR. & RT ARROW 90 MILS EA.	COMB. STR. & LT ARROW 90 MILS EA.	4"WHITE LF	4"YELLOW LF	8" YELLOW LF	24" WHITE LF	LT TURN ARROW EA	RT TURN ARROW EA	STR ARROW EA	COMB STR & RT ARROW EA	COMB STR & LT ARROW EA	RAISED MARKERS (Y/Y) EA.	RAISED MARKERS (C/R) EA	S/P RAISED (Y/Y) EA	S/P RAISED (C/R) EA
3CR.10651.34	NEW HANOVER	1		3,500	5,300	540	150	8	5	6	1	3	3,500	5,300	540	150	8	5	6	1	3			70	140
				8,800						23			8,800						23					210	
3CR.20651.34	NEW HANOVER	2											125	125											
		3	15,000	500	18,000	60	120	13		2	9		3,100	6,125	60							115	25		
TOTAL FOR 3CR.20651.34			15,000	500	18,000	60	120	13		2	9		3,225	6,250	60							115	25		
				18,500						24			9,475									140			
3CR.10711.34	PENDER	8											300	300								25			
													600									25			
GRAND TOTAL			15,000	4,000	23,300	600	270	21	5	8	10	3	7,025	11,850	600	150	8	5	6	1	3	140	25	70	140
				27,300						47			18,875						23			165		210	



WBS ELEMENT	SHEET 8 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	



**TYPICAL SECTION NO. 1**

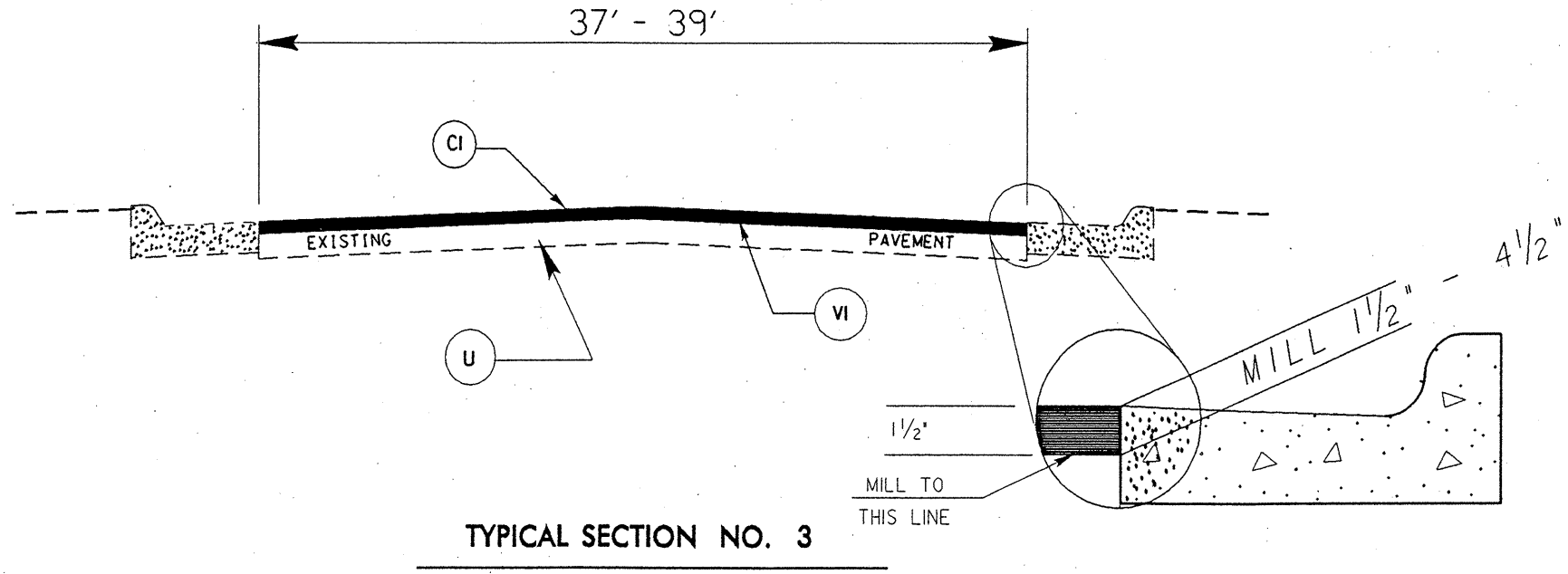


**TYPICAL SECTION NO. 2**

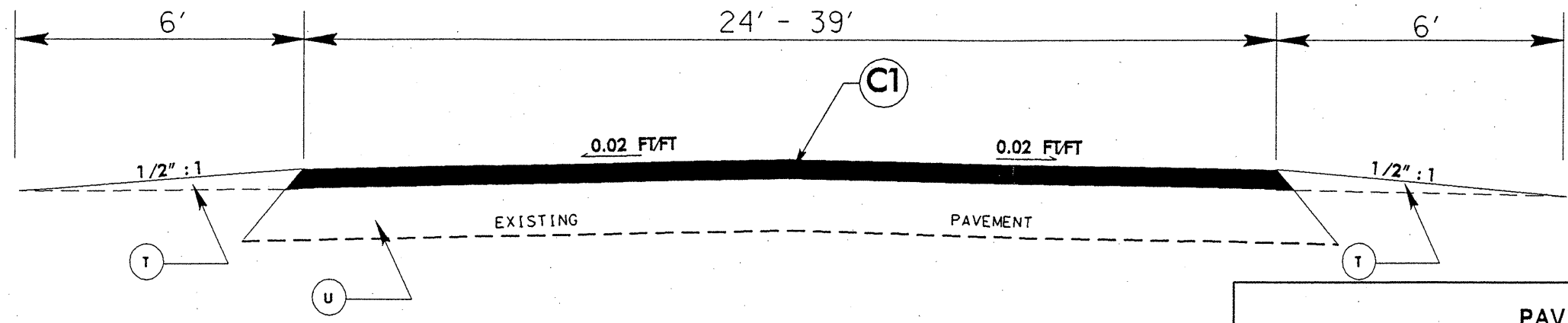
PAVEMENT SCHEDULE	
C	PROP. APPROX. 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.
C1	PROP. APPROX. 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
V	MILLING ASPHALT PAVEMENT, 1 1/2" DEPTH.
VI	MILLING ASPHALT PAVEMENT, 1 1/2" TO 4 1/2" DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT.



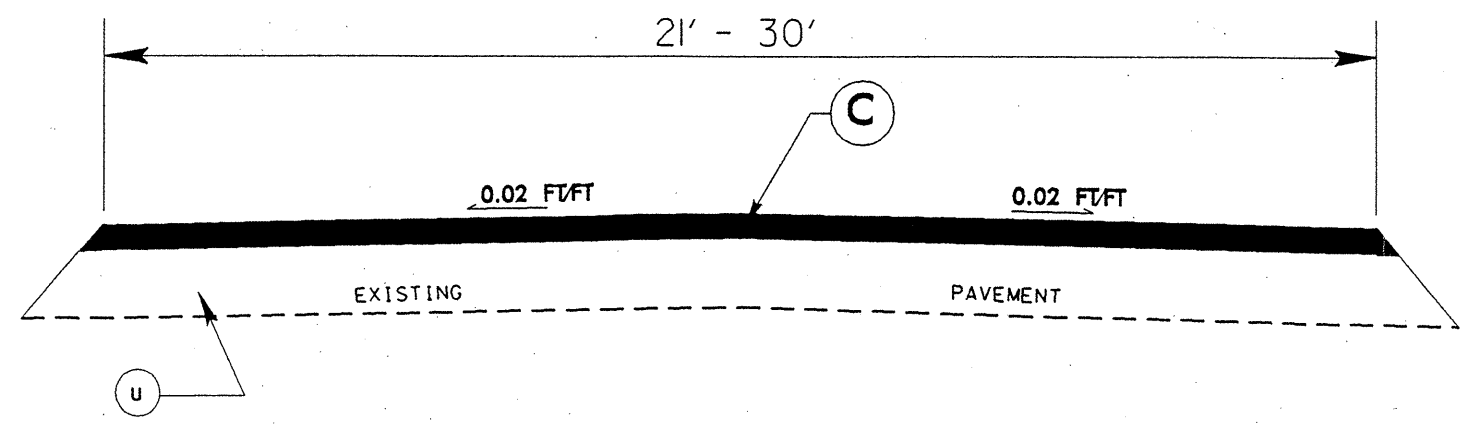
WBS ELEMENT	SHEET 9 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	



TYPICAL SECTION NO. 3



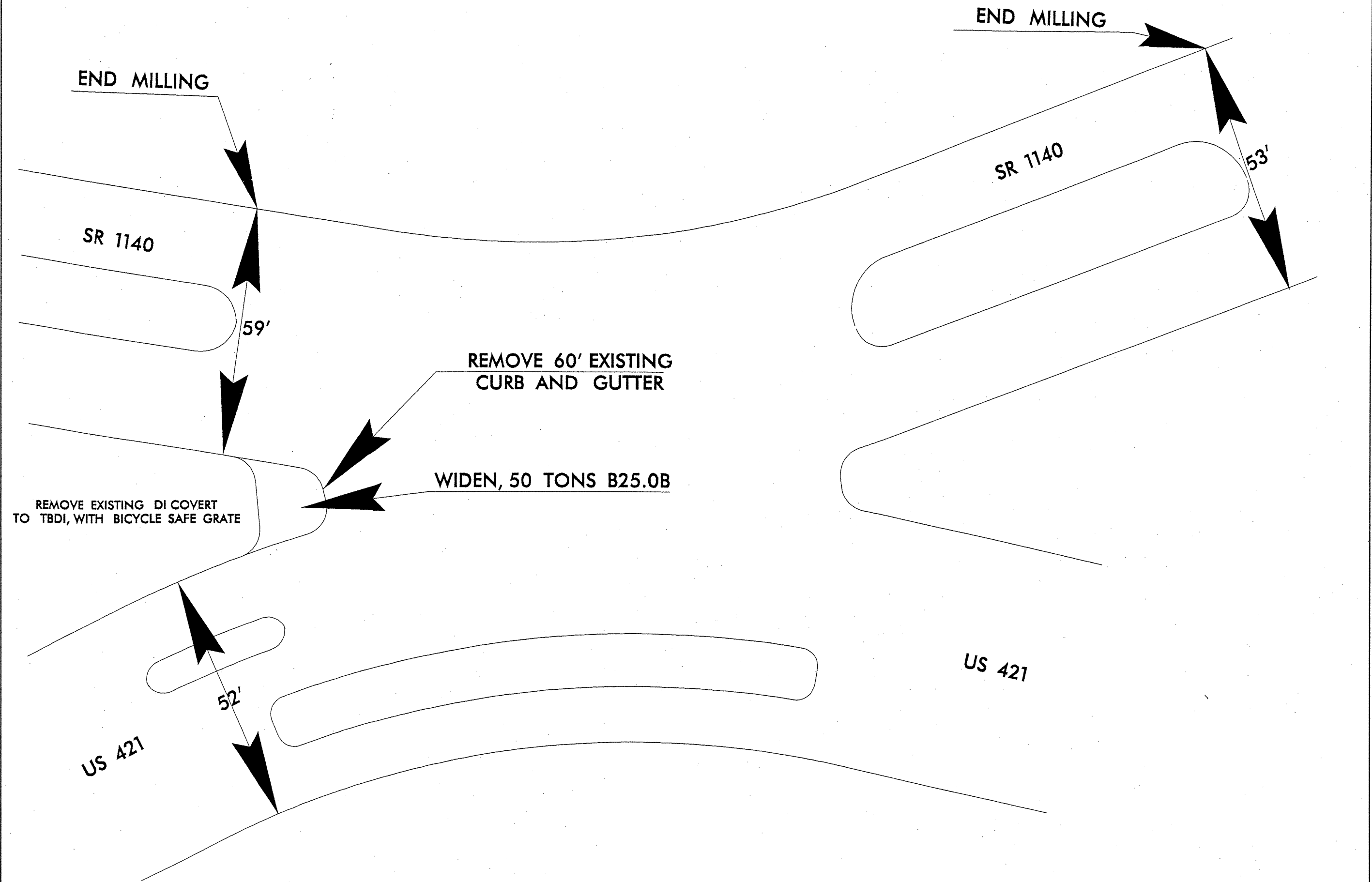
TYPICAL SECTION NO. 4



TYPICAL SECTION NO. 5

PAVEMENT SCHEDULE	
C	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A. AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.
CI	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B. AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C. AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
V	MILLING ASPHALT PAVEMENT. 1 1/2" DEPTH.
VI	MILLING ASPHALT PAVEMENT. 1 1/2" TO 4 1/2" DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT.

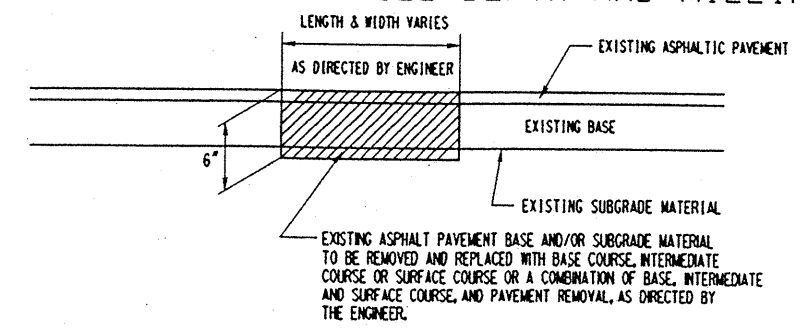
WBS ELEMENT	SHEET 10 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	



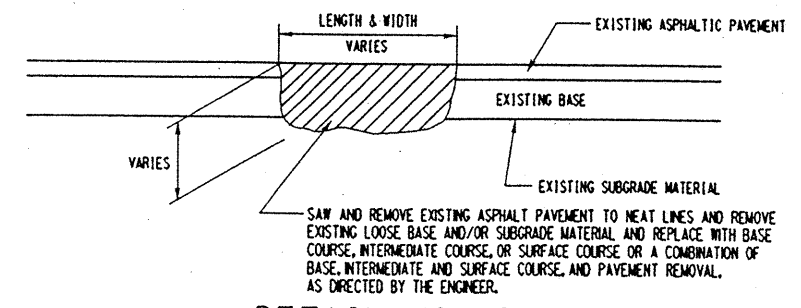
6/2/99

WBS ELEMENT	SHEET 11 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	

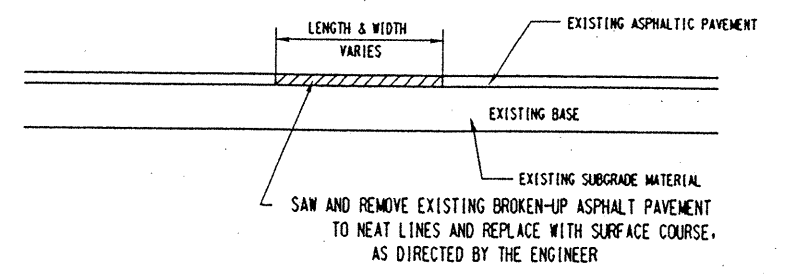
DETAILS OF REPAIRING EXISTING PAVEMENT PRIOR TO RESURFACING FOR FULL DEPTH AND MILLING



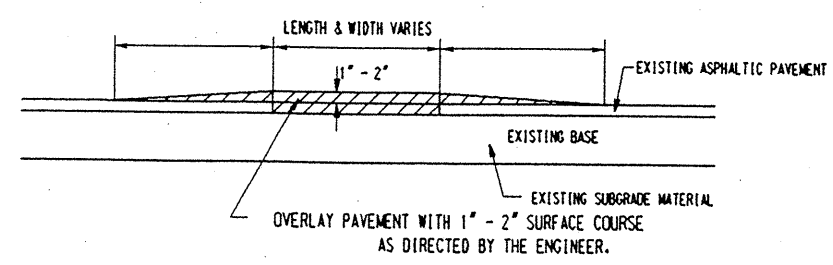
DETAIL NO. 1



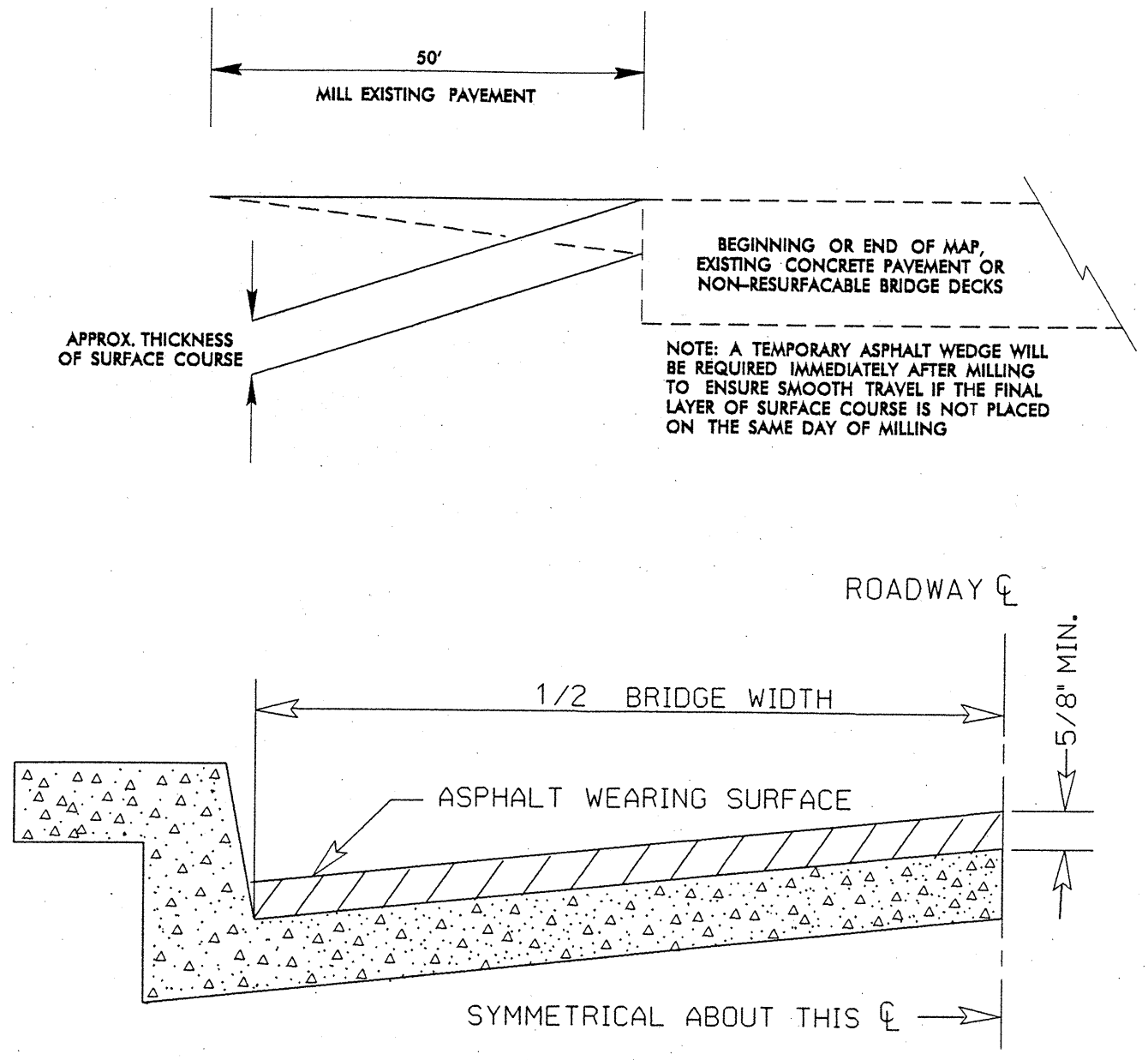
DETAIL NO. 2



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.

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6/2/99

WBS ELEMENT	SHEET 12 OF 14
3CR.10651.34	3CR.10711.34
3CR.20651.34	

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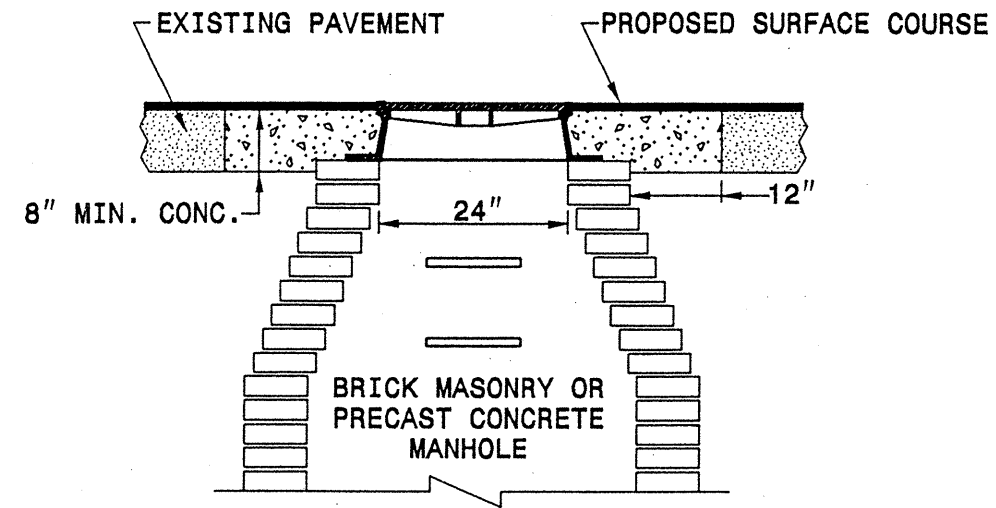
STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**MANHOLE AND VALVE BOX ADJUSTMENTS**

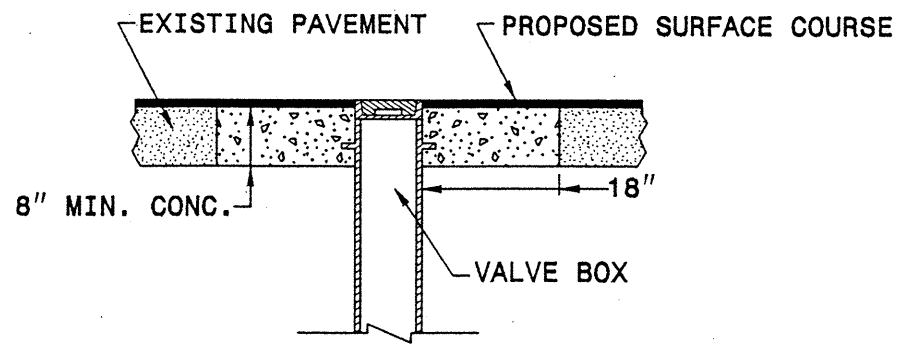
SHEET 1 OF 1  
**840D55**

GENERAL NOTES:

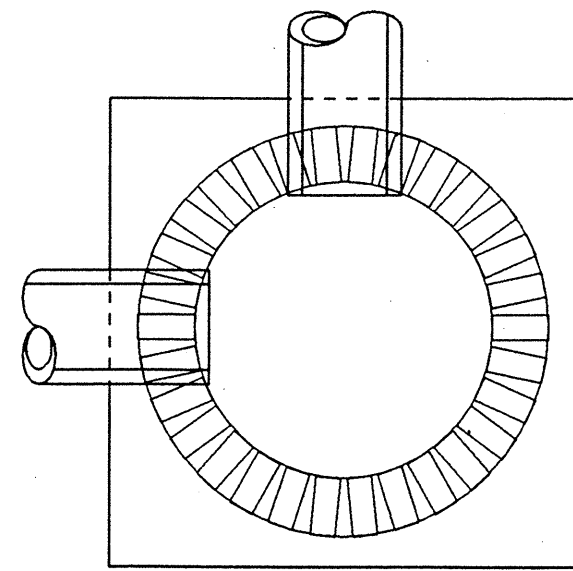
1. RAPID SET GROUT, MORTAR, OR CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI.
2. ALL FAULTY EXISTING BRICKWORK TO BE REMOVED AND REPLACED WITH NEW BRICK MASONRY.
3. EXCAVATION FOR THE ADJUSTMENT SHALL BE SHEER CUT ON ALL SIDES.
4. AREA BELOW 8" DEPTH CAN BE FILLED WITH 78M OR NO. 57 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**

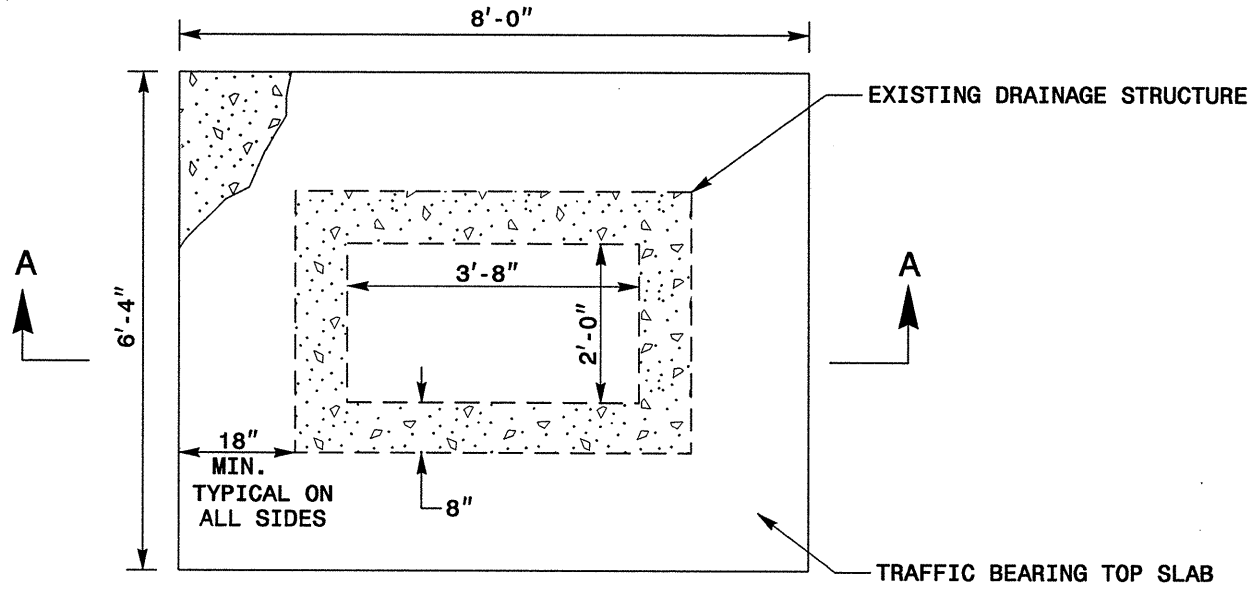
PLACE BRICK ACCORDING TO ELEVATION VIEW

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

ENGLISH DETAIL DRAWING FOR  
**MANHOLE AND VALVE BOX ADJUSTMENTS**

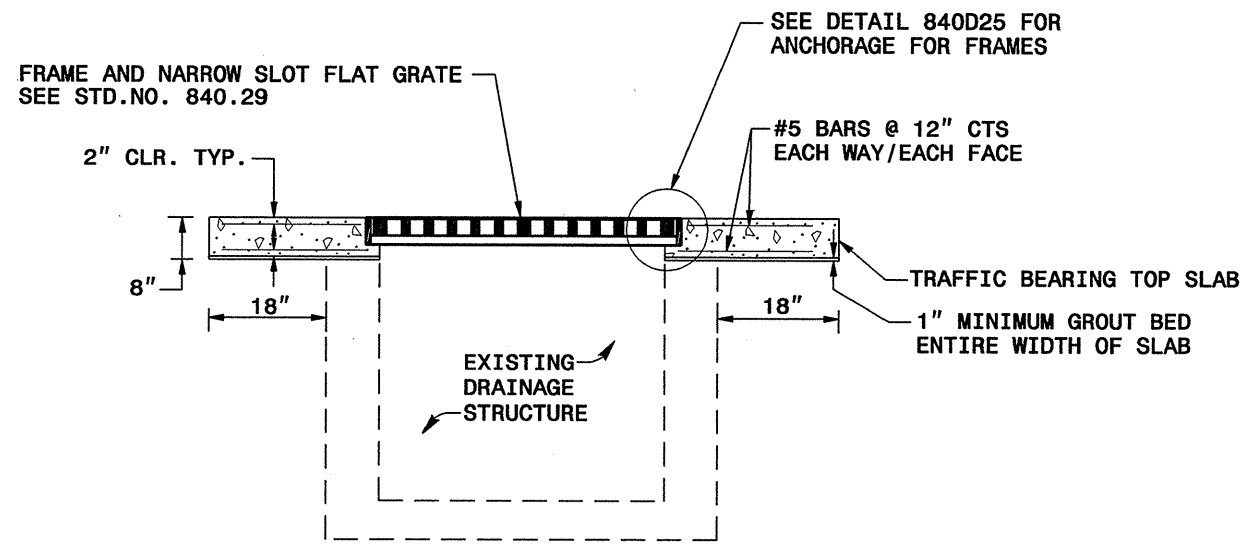
SHEET 1 OF 1  
**840D55**

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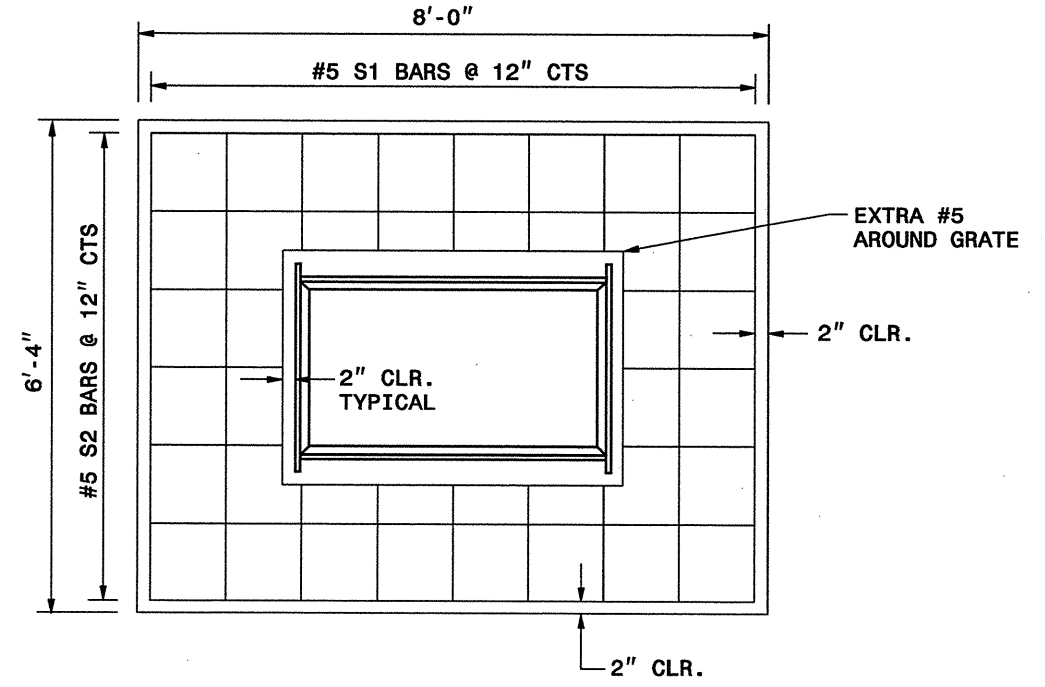


**PLAN**

<b>BILL OF MATERIAL</b>				
TRAFFIC BEARING TOP SLAB				
BAR	NO.	SIZE	LENGTH	WEIGHT
S1	7	#5	7'-8"	56.0
S2	9	#5	6'-0"	56.3
TOTAL REINF. STEEL (lbs.)				112.3
CONCRETE TOTAL- (cu. yds.)				1.07



**SECTION A-A**



**PLAN**

**GENERAL NOTES:**

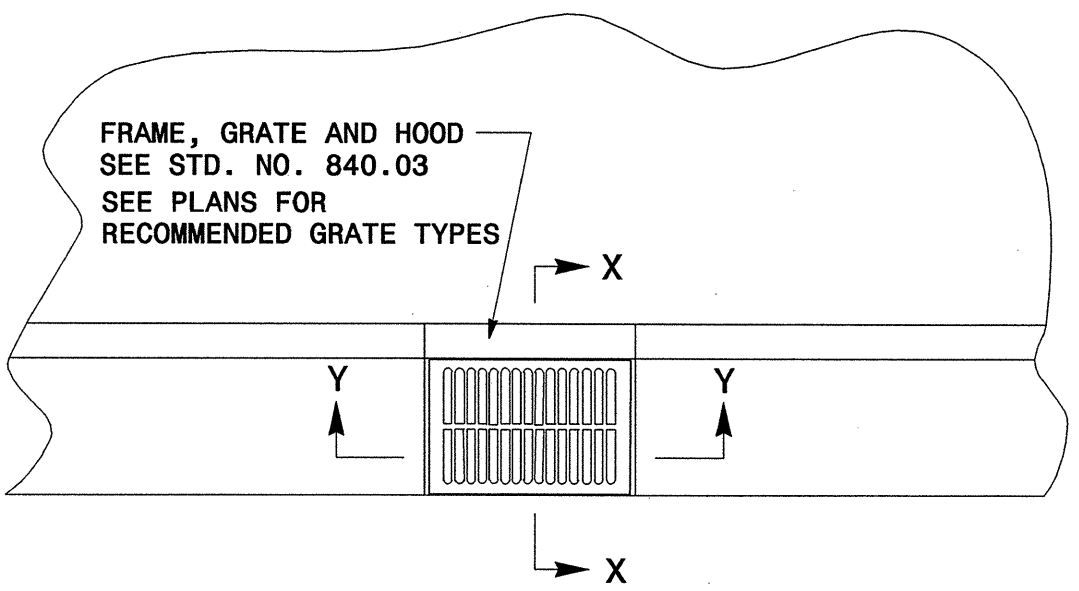
- QUANTITIES ARE FOR FRAME AND NARROW SLOT FLAT GRATE (STD. 840.29) OPENING
- USE 4000 PSI MINIMUM COMPRESSIVE STRENGTH CONCRETE
- CONFIRM DIMENSIONS ON EACH INDIVIDUAL DROP INLET FOR CONVERSION

**PROJECT SERVICES UNIT  
STANDARDS AND SPECIAL DESIGN**  
Office 919-250-4128 FAX 919-250-4119

**DETAIL TO CONVERT EXISTING  
DROP INLET TO A TRAFFIC  
BEARING DROP INLET**

ORIGINAL BY: E.E. WARD DATE: 11-08-06  
 MODIFIED BY: DATE:  
 CHECKED BY: DATE:  
 FILE SPEC.: /usr/detail/stand/trfbearingslab.dgn

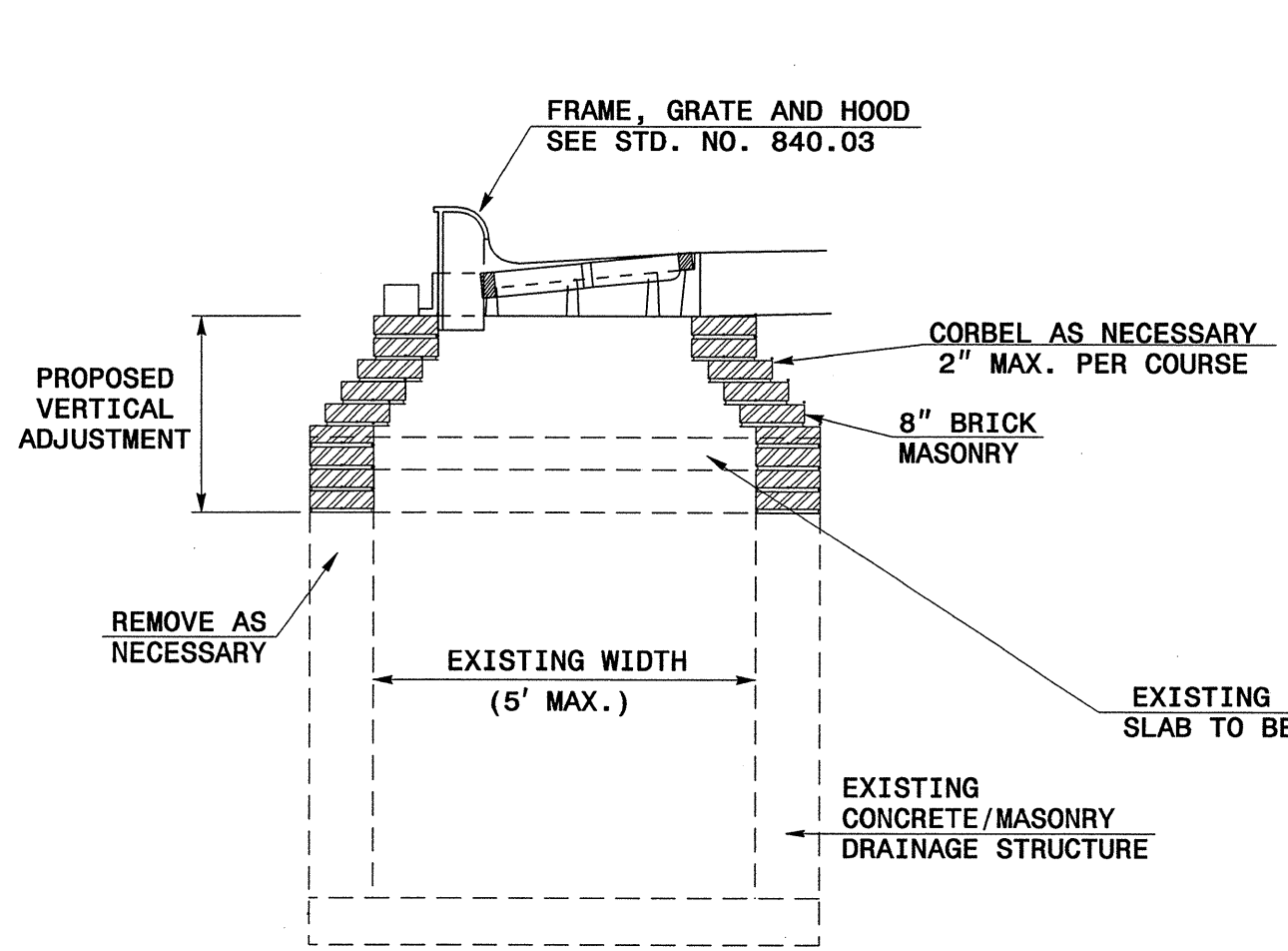
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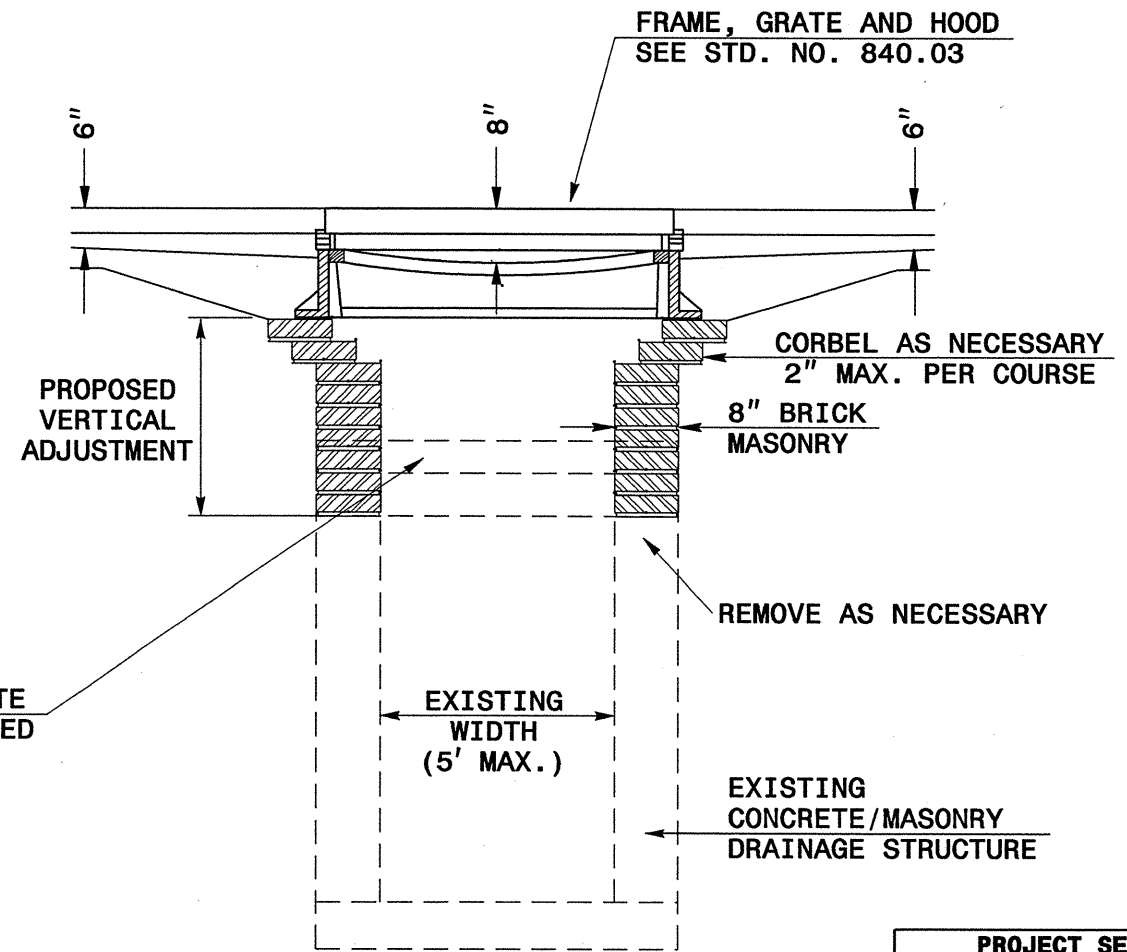
**PLAN**

**GENERAL NOTES:**

- THE ROADWAY PLANS INDICATE STRUCTURES TO BE CONVERTED.
- 4" SOLID CLAY BRICK, JUMBO BRICK, CONCRETE, OR 4" SOLID CONCRETE BLOCK MAY BE USED FOR VERTICAL ADJUSTMENT OF THE STRUCTURE.
- ALL CONVERSIONS SHALL BE IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.
- FIELD VERIFY THE DIMENSIONS FOR THE EXISTING BOX.
- DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.



**SECTION X-X**



**SECTION Y-Y**

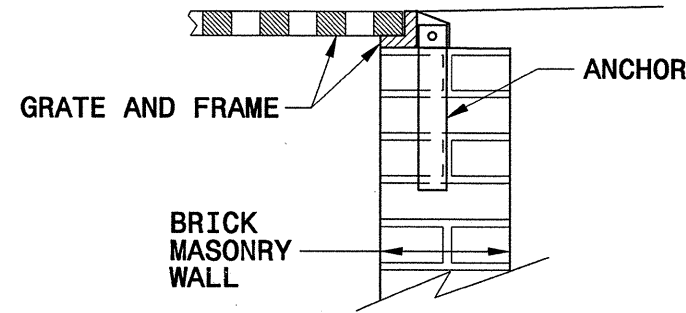
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<b>PROJECT SERVICES UNIT STANDARDS AND SPECIAL DESIGN</b>	
Office 919-250-4128 FAX 919-250-4119	
<b>DETAIL TO CONVERT EXISTING OPEN THROAT CATCH BASIN TO FRAME &amp; GRATE CATCH BASIN</b>	
ORIGINAL BY: E.E. WARD	DATE: 02-04
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: .usr\details\stand\cbtojb.e.dgn	

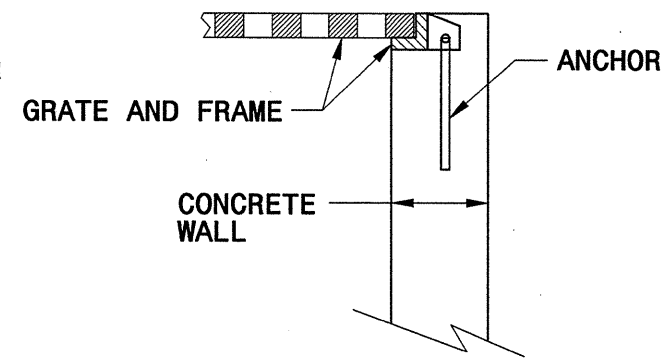
STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**ANCHORAGE FOR FRAMES**  
BRICK/CONCRETE/PRECAST CONCRETE

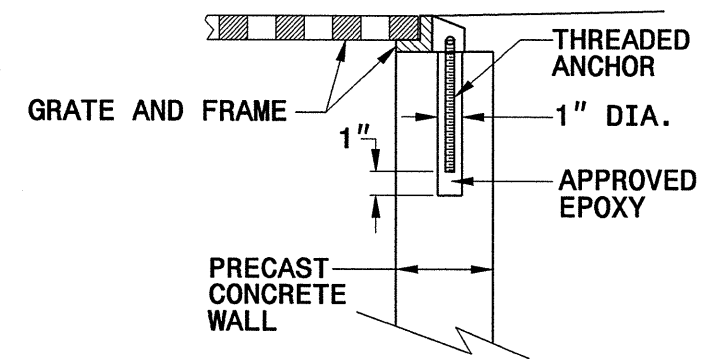
SHEET 1 OF 1  
**840D25**



**BRICK MASONRY  
CONSTRUCTION**



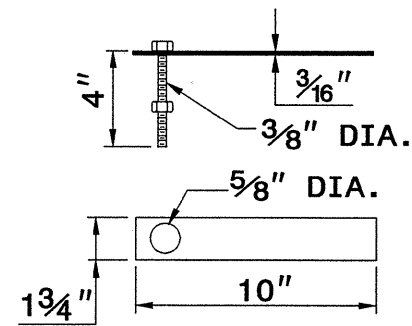
**CONCRETE  
CONSTRUCTION**



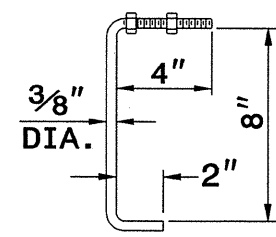
**PRECAST CONCRETE  
CONSTRUCTION**

**DETAIL SHOWING ANCHORAGE OF  
FRAME FOR GRATED DROP INLET**

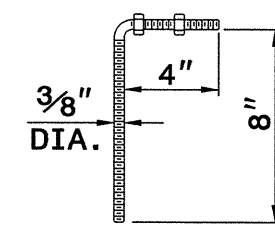
NOTE:  
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL  
OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



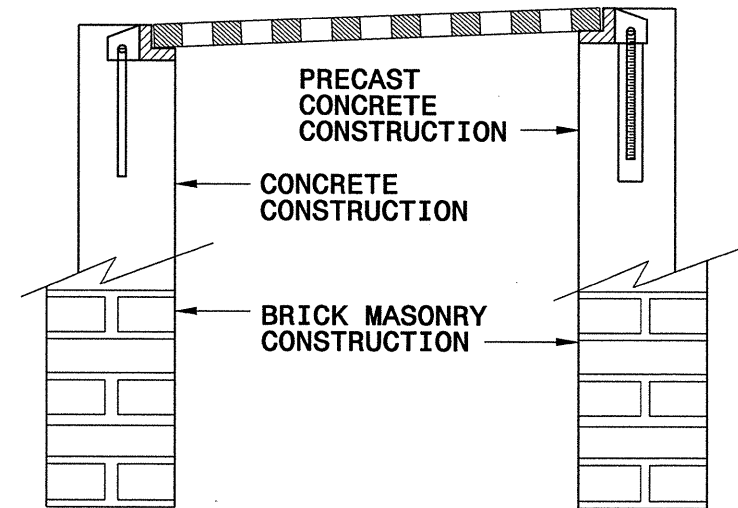
**MASONRY ANCHOR**  
3/8" DIA. BOLT WITH PLATE



**CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



**PRECAST  
CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



**FRAME AND GRATE INSTALLATION  
FOR NORMAL CROWN AND  
SUPERELEVATED SECTIONS**

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

ENGLISH DETAIL DRAWING FOR  
**ANCHORAGE FOR FRAMES**  
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1  
**840D25**

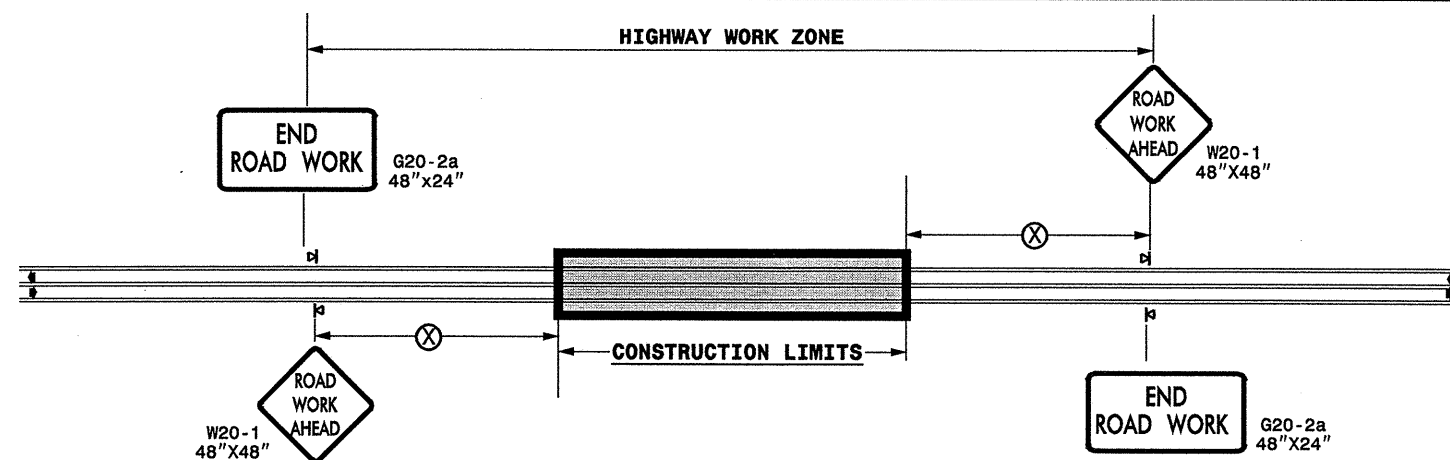
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ericard AI P222233

**PROJECT SERVICES UNIT  
STANDARDS AND SPECIAL DESIGN**  
Office 919-250-4128 FAX 919-250-4119

**SEE PLATE FOR TITLE**

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06  
MODIFIED BY: E.E. WARD DATE: 9/25/06  
CHECKED BY: DATE:  
FILE SPEC.:

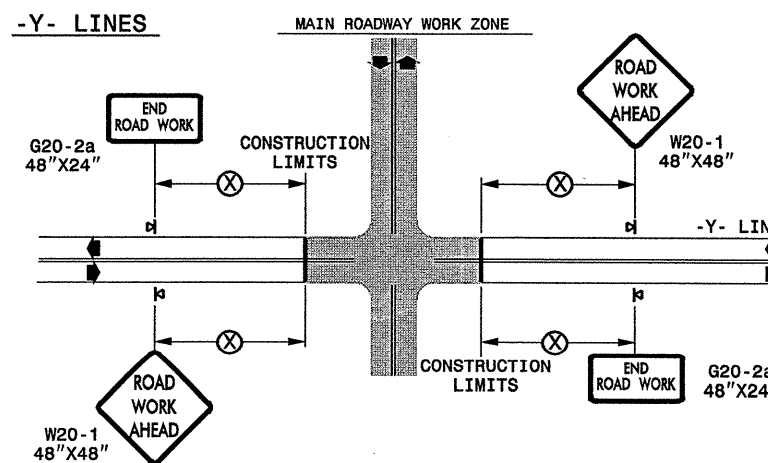
**TWO-WAY UNDIVIDED \*\* (L-LINES)**



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

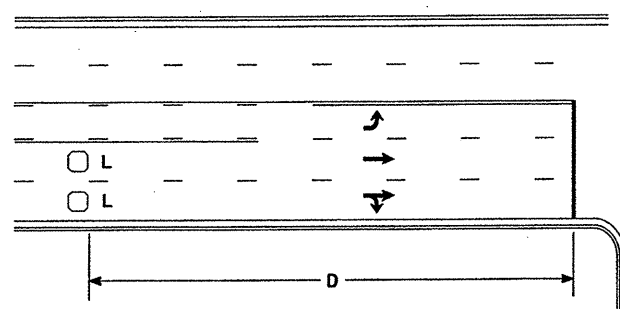
SHEET 1 OF 1

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: _____	CADD FILE		

31-OCT-2006 16:59  
 \\DOT\DESIGN\GROUPS-WZ\TCCC\design\group4\resurfacing\resurfacing2006\div03\3cr1065134etccnewhappender\3cr10651342wayundivurbfrwys\july2006.dgn  
 psymore AT WZTC206427



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

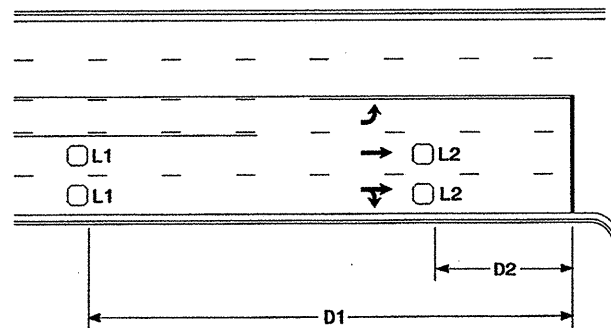


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

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



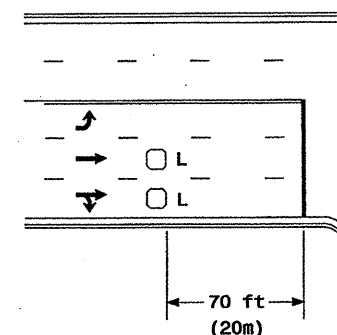
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

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

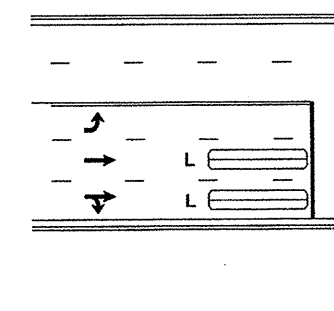
"Stretch" Operation

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



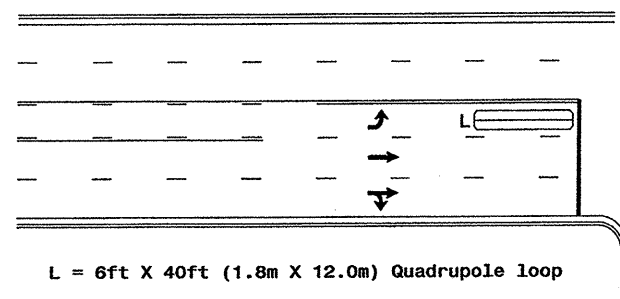
L = 6ft X 6ft (1.8m X 1.8m)  
Wired in series

OR



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

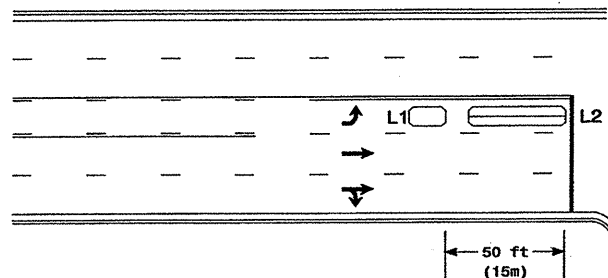
### Left Turn Lane Detection



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

Presence Loop Detection

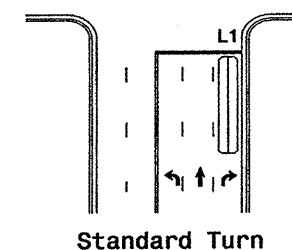
OR



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

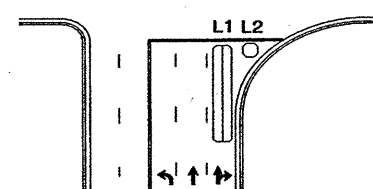
Queue Loop Detection

### Right Turn Lane Detection

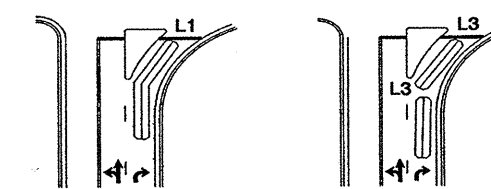


Standard Turn

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

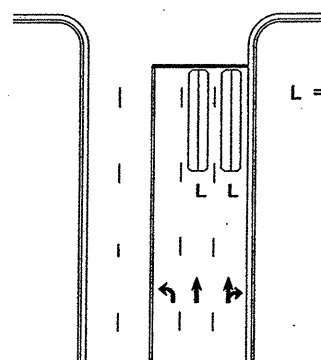


Wide Radius Turn



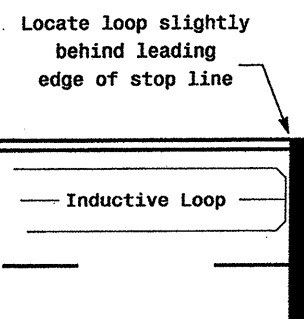
Channelized Turn

### 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.

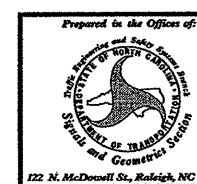
### Recommended Number of Turns

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

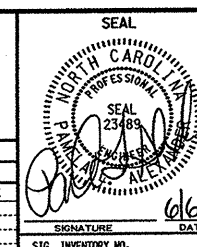
6' X 15' (1.8m X 4.6m) Loops:  
Lead-in < 150' (45 m), use 2 turns  
Lead-in > 150' (45 m), use 3 turns



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



SCALE  
N/A

SIGNATURE  
DATE  
SIG. INVENTORY NO.