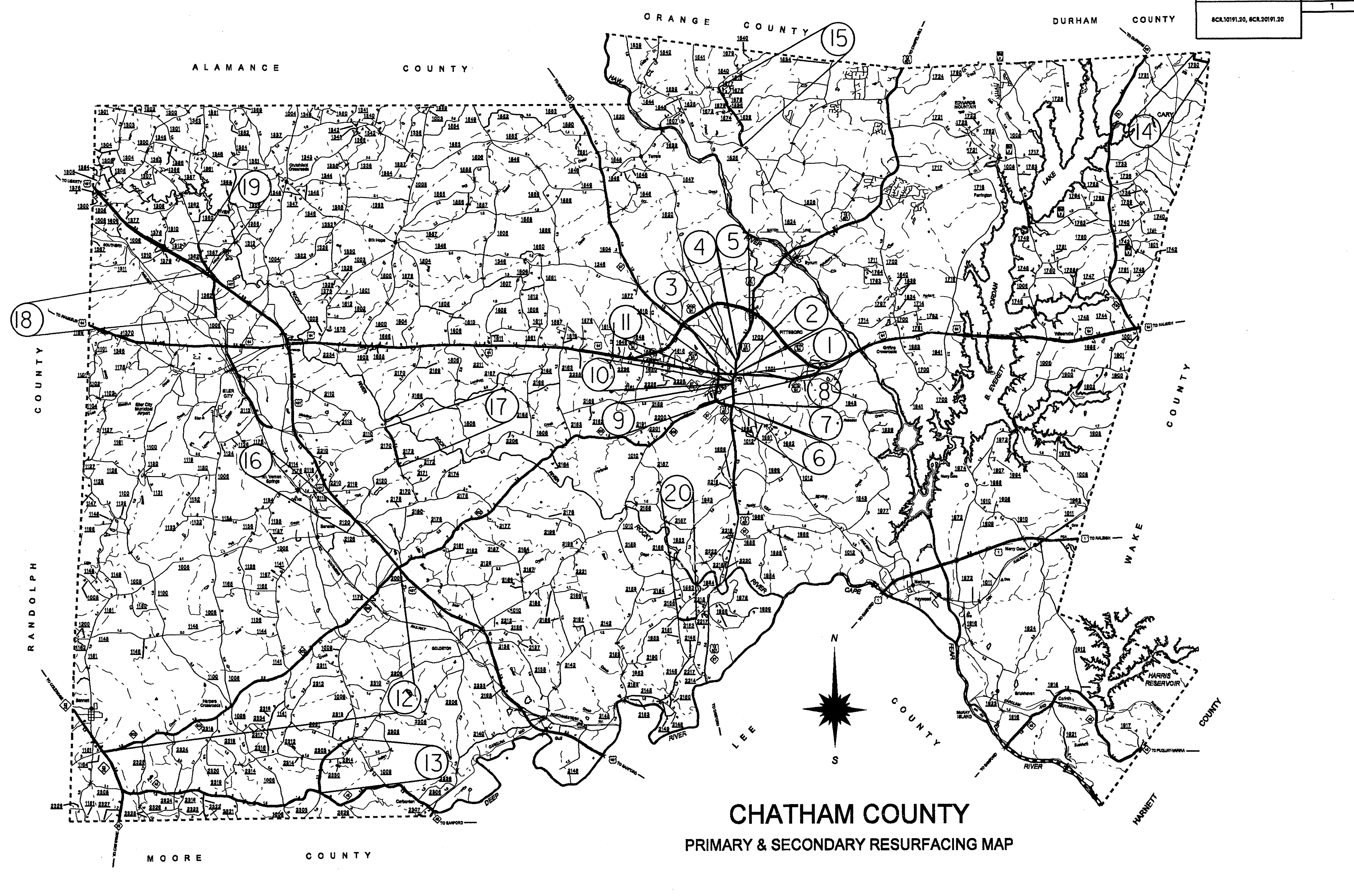
WBS ELEMENT	SHEET NO.
8CR.10191.20, 8CR.20191.20	1



CHATHAM COUNTY

PRIMARY & SECONDARY RESURFACING MAP

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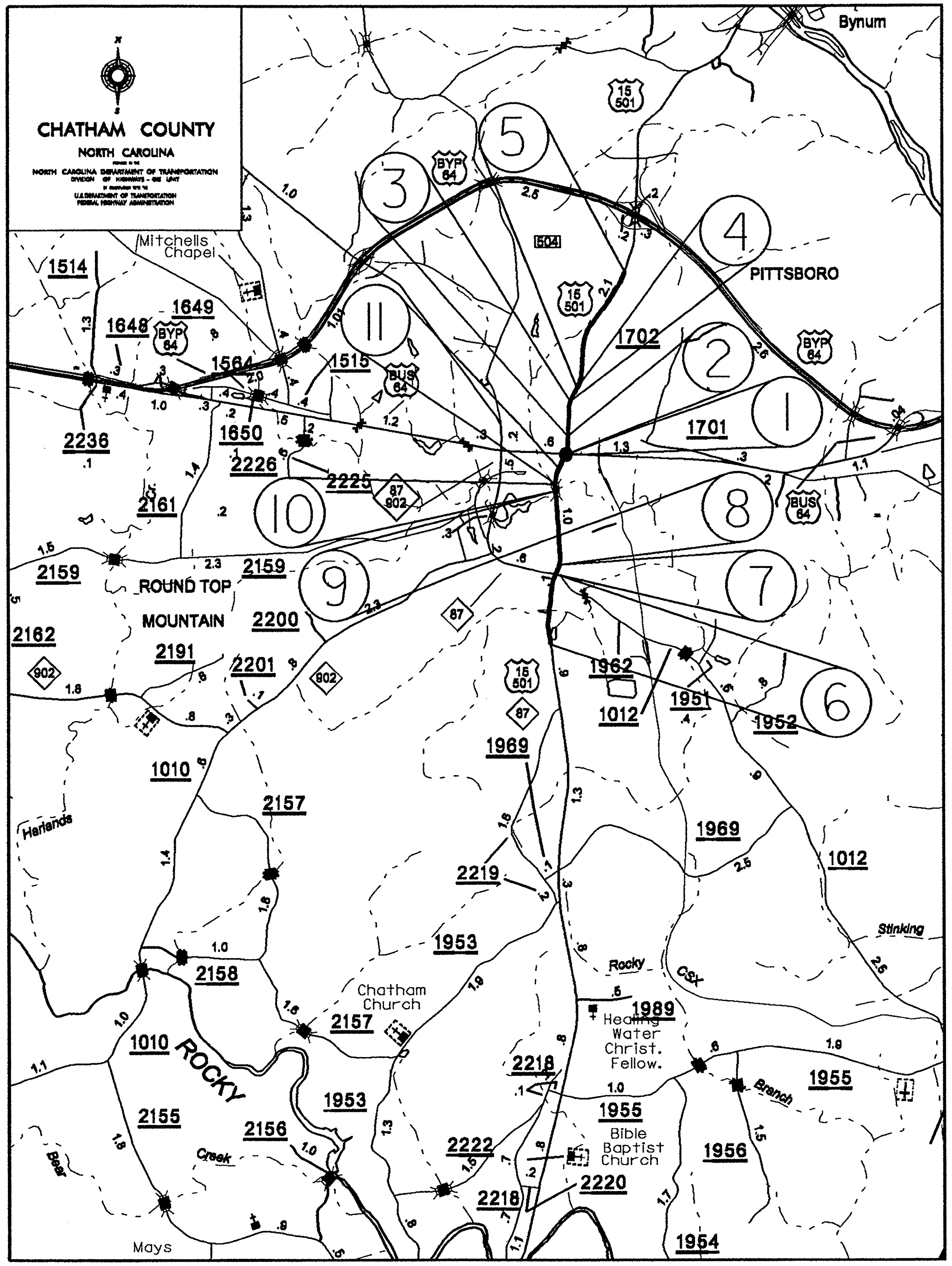
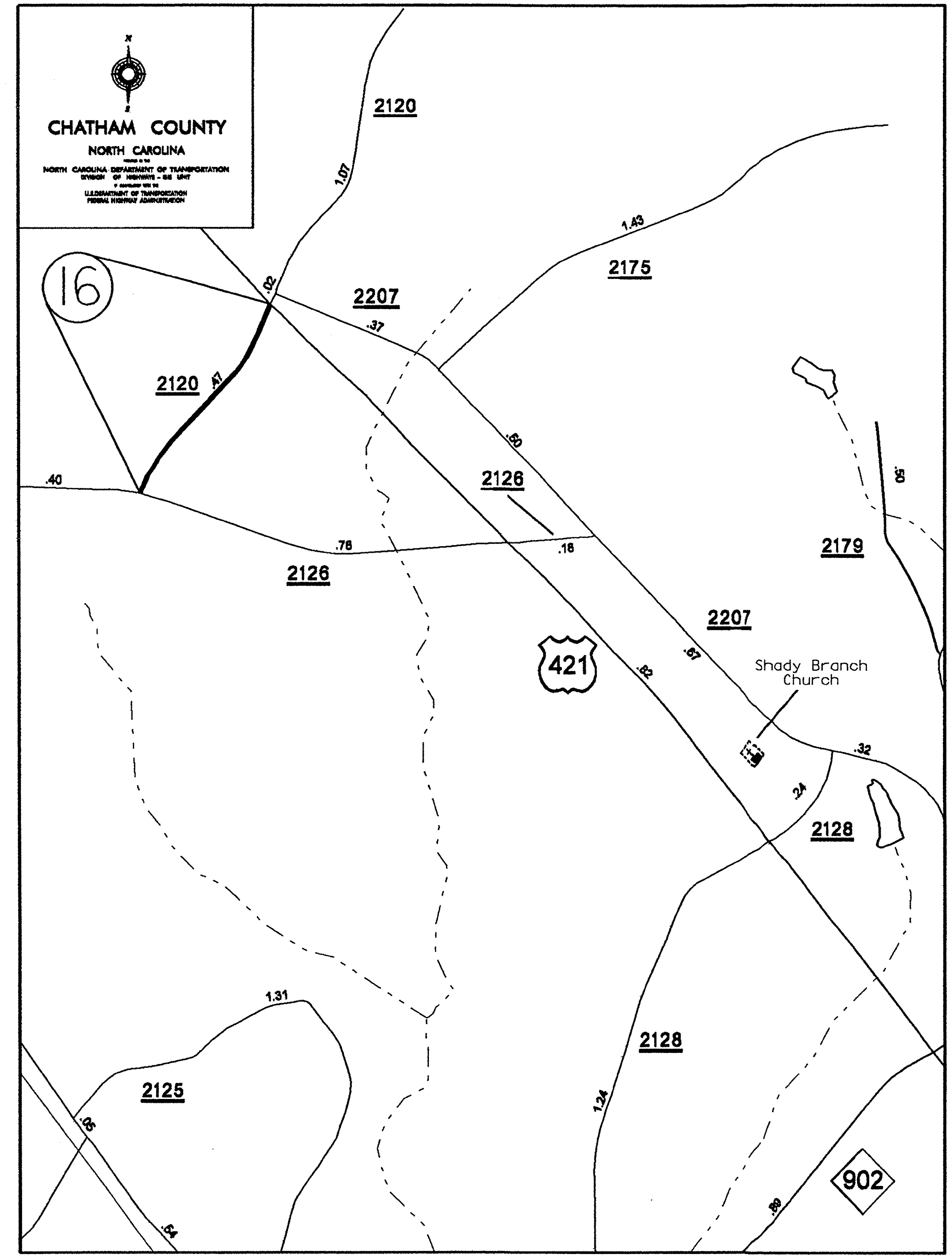
18-MAY-2013 08:12

WBS ELEMENT	SHEET NO.
6CR.10191.20, 6CR.20191.20	2

MAPS #1 – #11

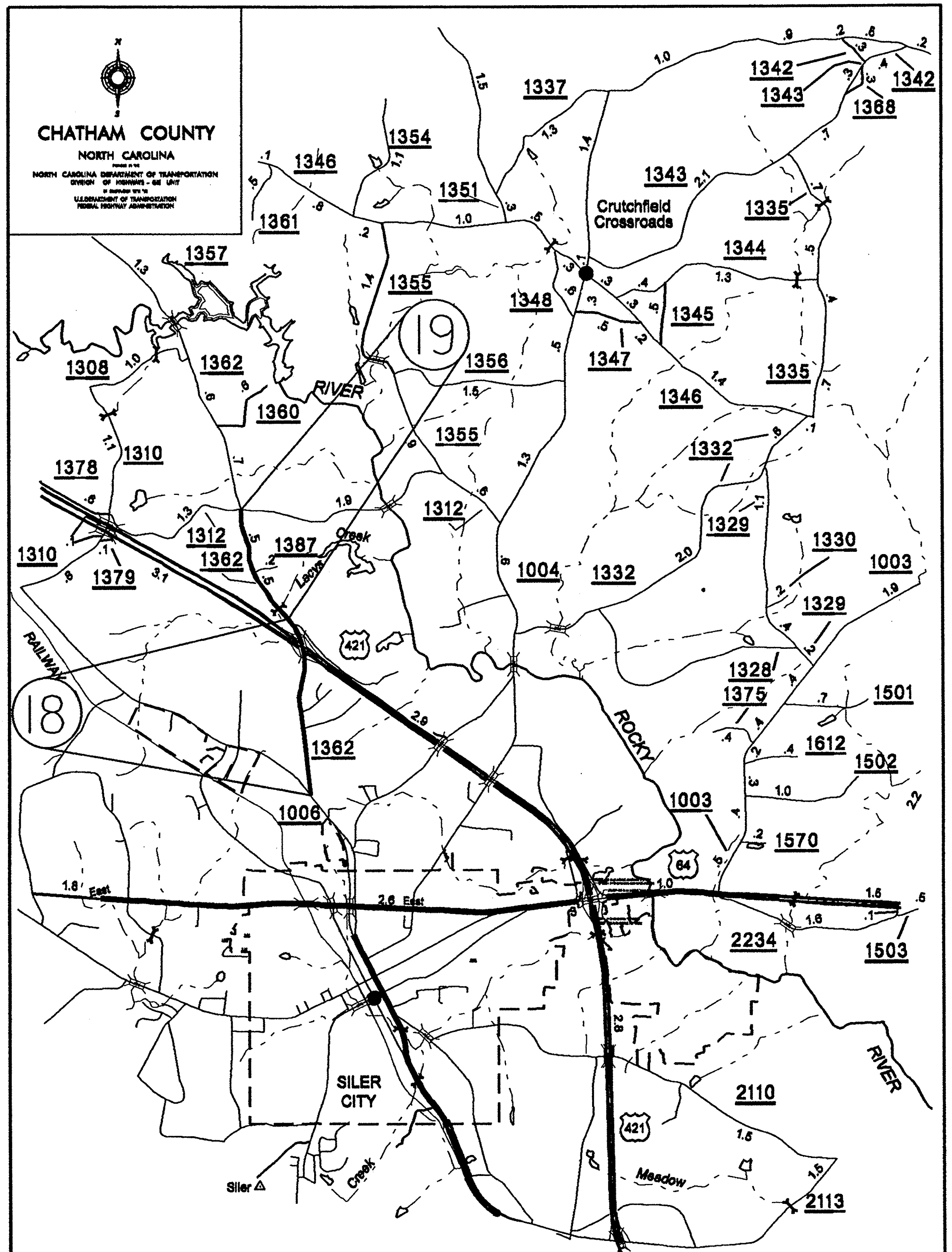


MAP #16

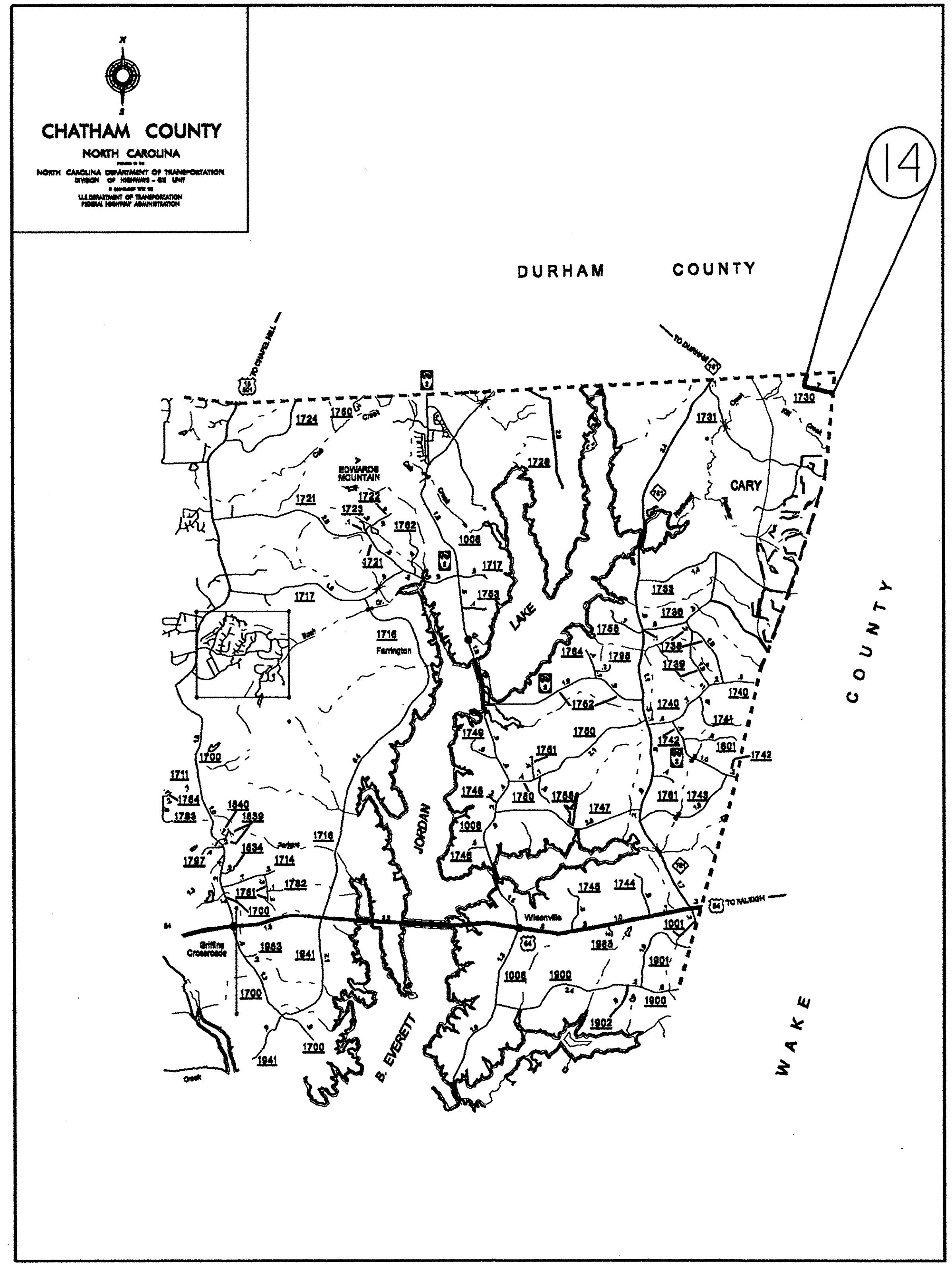


WBS ELEMENT	SHEET NO.
8CR.10191.20, 8CR.20191.20	3

MAPS #18 & #19

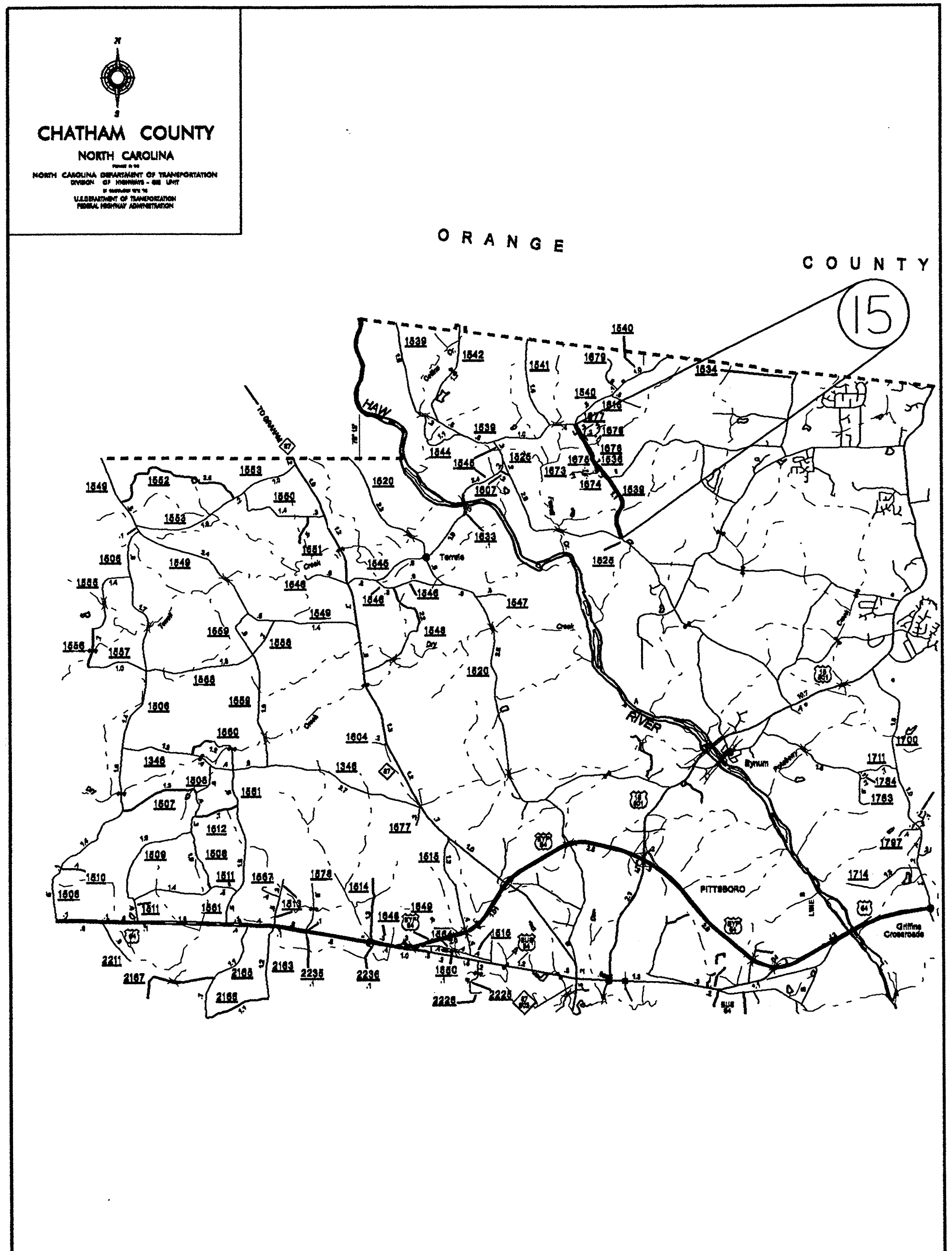


MAP #14

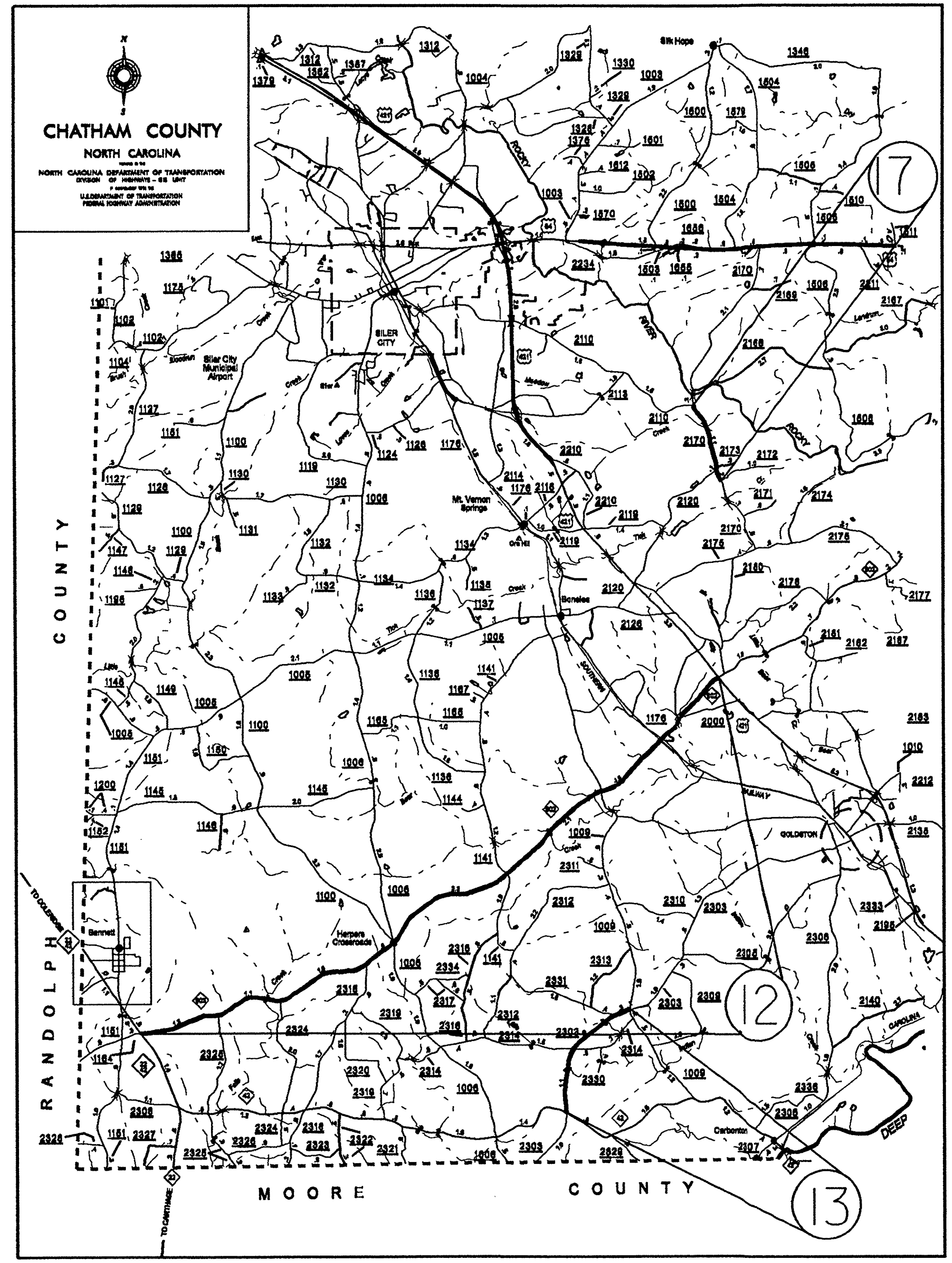


WBS ELEMENT	SHEET NO.
8CR.10191.20, 8CR.20191.20	4

MAP #15

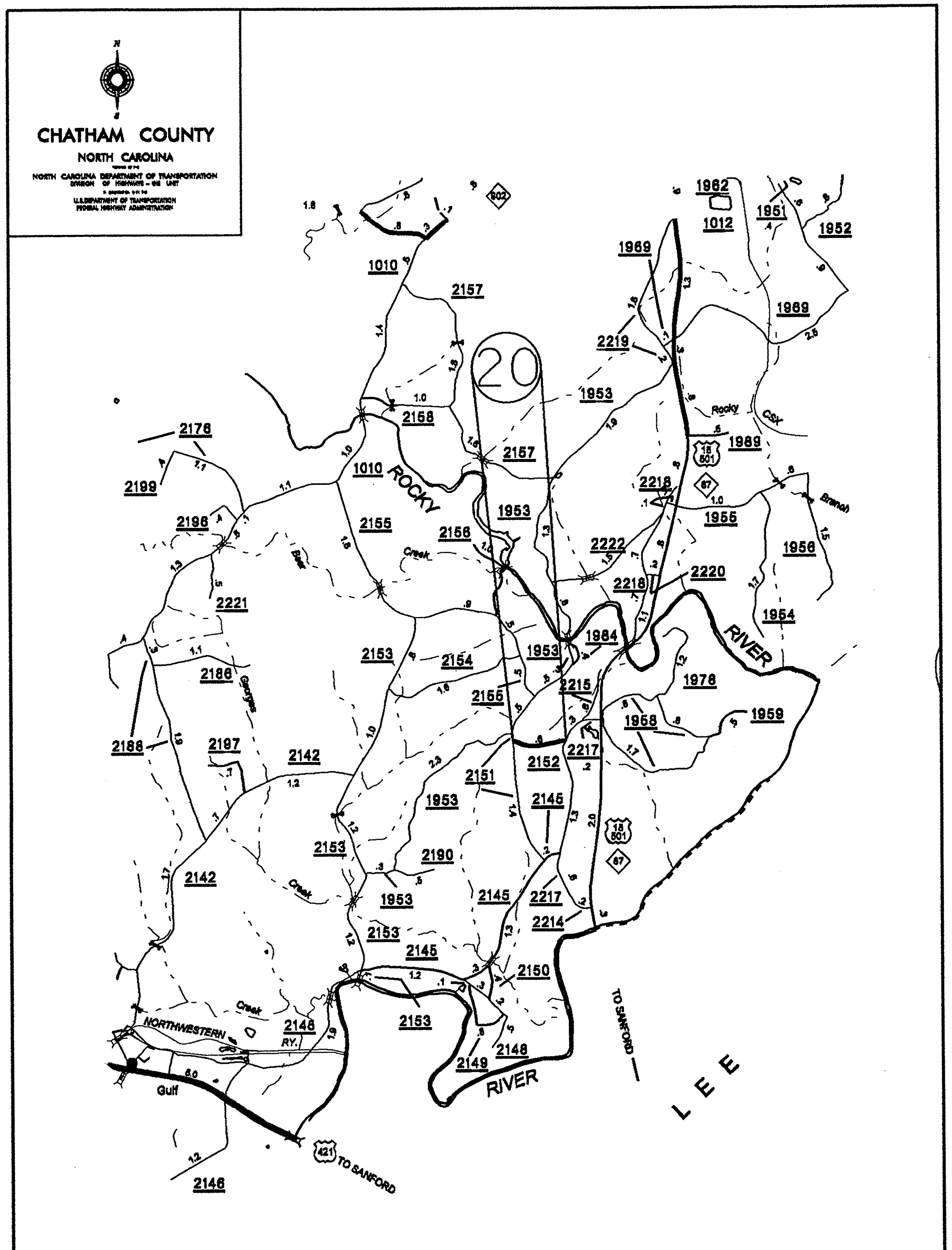


MAPS #12, #13, & #17

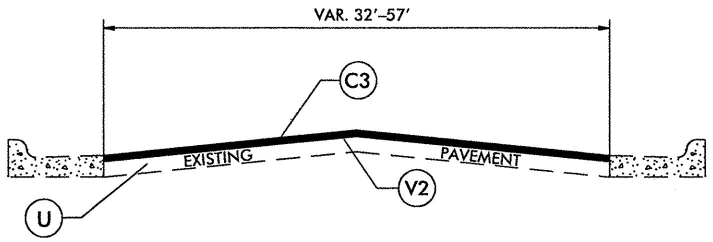


WBS ELEMENT	SHEET NO.
8CR.10191.20, 8CR.20191.20	5

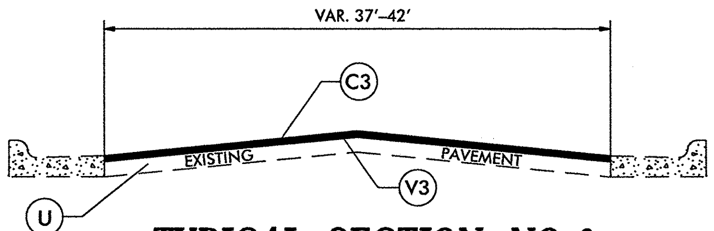
MAP #20



WBS ELEMENT	SHEET NO.
BCR.10191.20, BCR.20191.20	6



TYPICAL SECTION NO. 1



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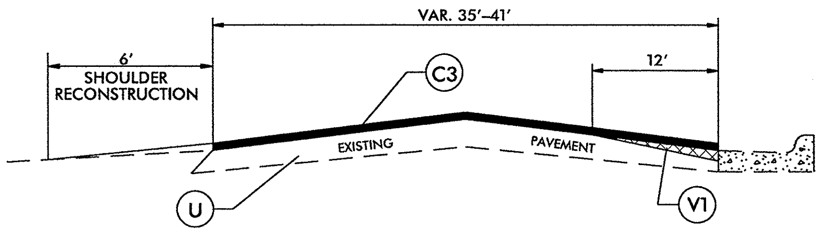

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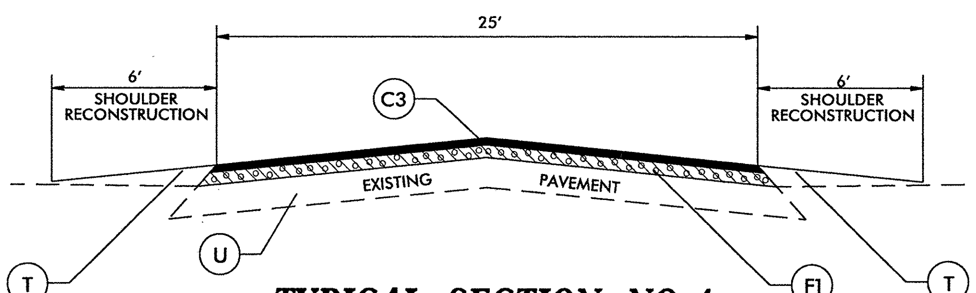

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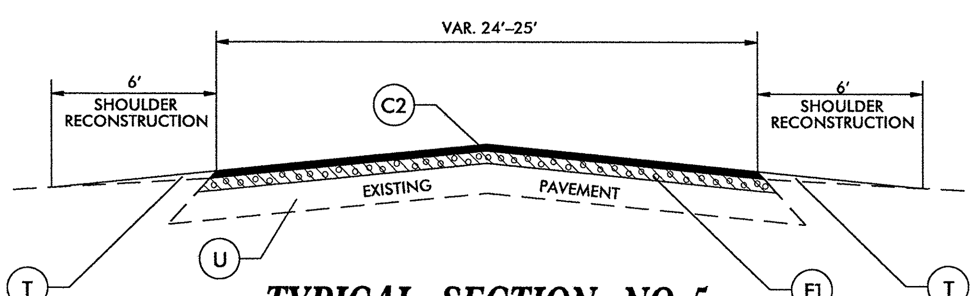

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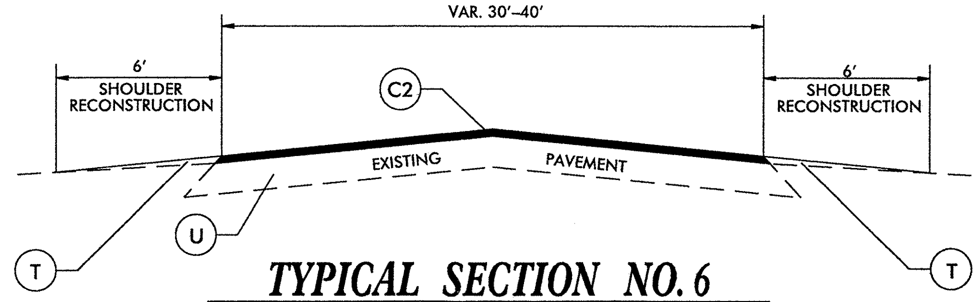
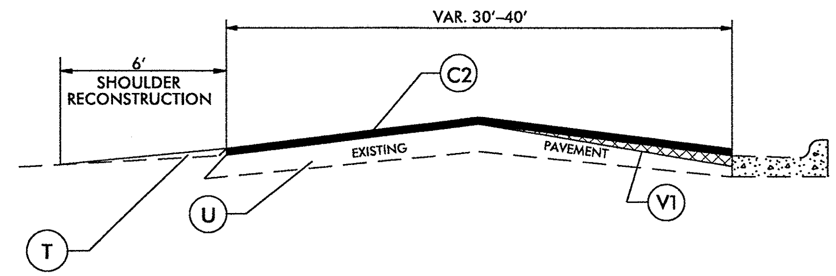
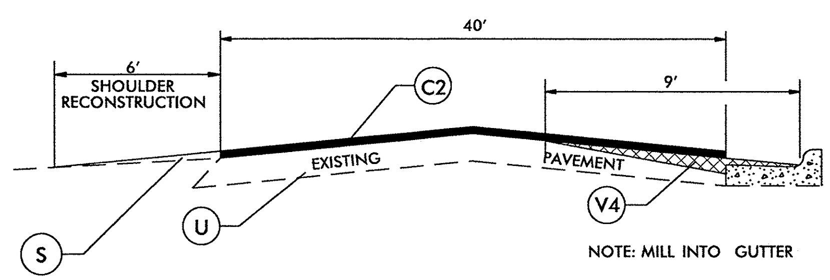


TYPICAL SECTION NO. 6



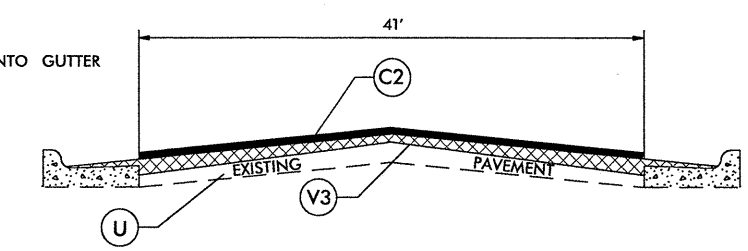
TYPICAL SECTION NO. 7



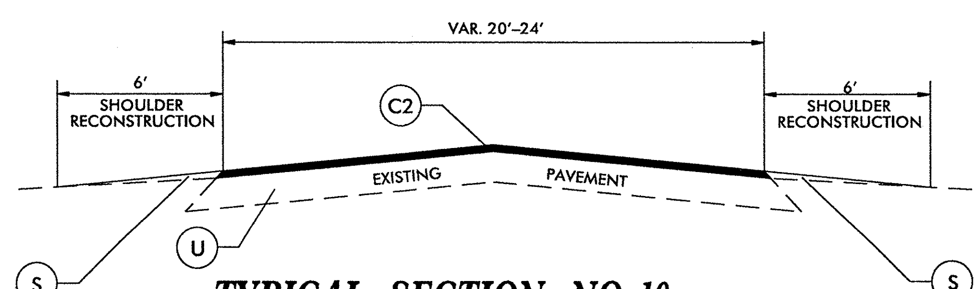
NOTE: MILL INTO GUTTER

TYPICAL SECTION NO. 8

NOTE: MILL INTO GUTTER



TYPICAL SECTION NO. 9



TYPICAL SECTION NO. 10

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
F1	PROPOSED ASPHALT SURFACE TREATMENT, MAT COAT WITH #6M STONE
F2	PROPOSED ASPHALT SURFACE TREATMENT, TRIPLE SEAL
S	AGGREGATE SHOULDER BORROW
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILLING 1.5" TO 0" IN DEPTH
V2	MILLING 1.5" IN DEPTH
V3	MILLING TO 1.5" BELOW GUTTER (1.5" TO 3") IN DEPTH
V4	MILLING TO 1.5" BELOW GUTTER (0" TO 3") IN DEPTH
Z	TRENCHING FOR INTERMEDIATE COURSE – BEGIN 6" INSIDE EX. PAVEMENT

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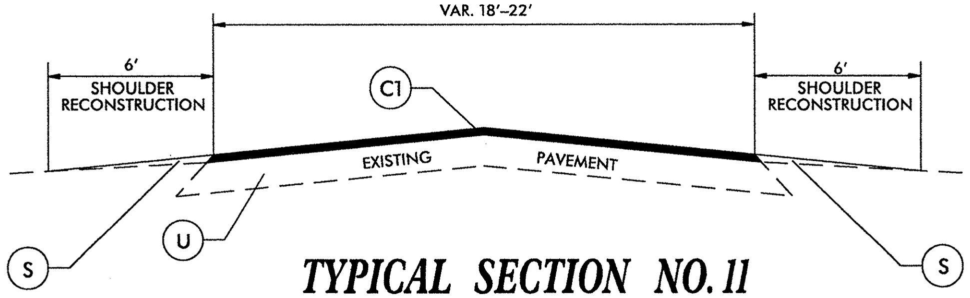
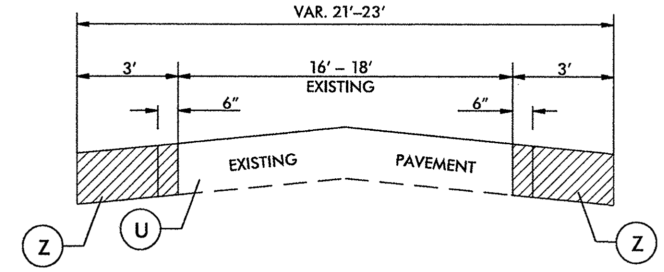
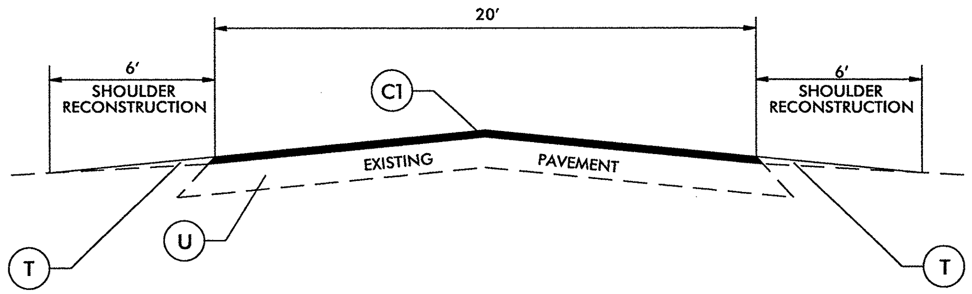


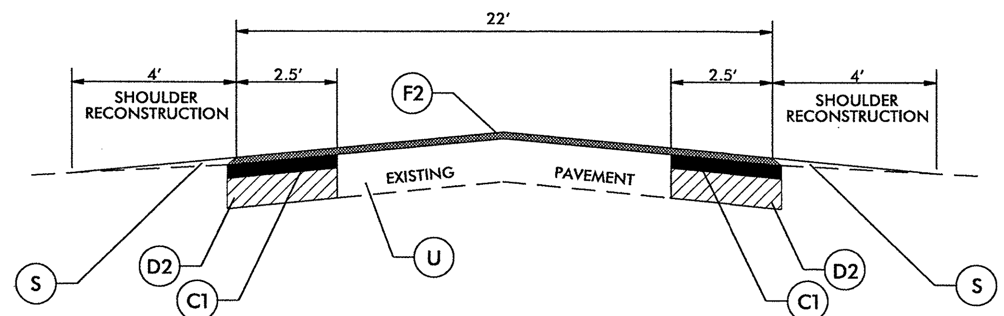
TYPICAL SECTION NO. 11



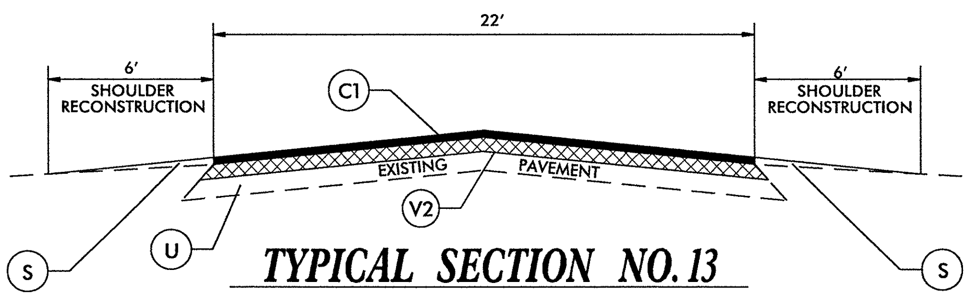
TYPICAL SECTION NO. 14



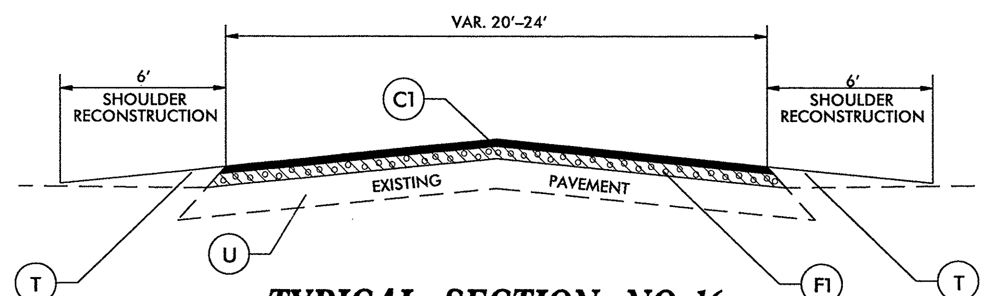
TYPICAL SECTION NO. 12



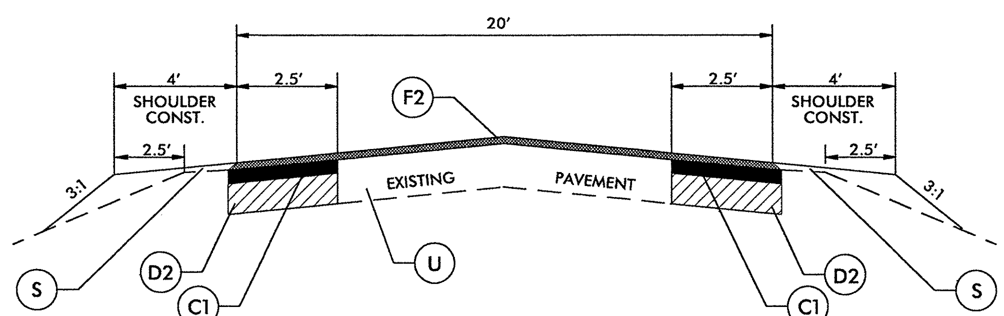
TYPICAL SECTION NO. 15



TYPICAL SECTION NO. 13



TYPICAL SECTION NO. 16



TYPICAL SECTION NO. 17

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
F1	PROPOSED ASPHALT SURFACE TREATMENT, MAT COAT WITH #6M STONE
F2	PROPOSED ASPHALT SURFACE TREATMENT, TRIPLE SEAL
S	AGGREGATE SHOULDER BORROW
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILLING 1.5" TO 0" IN DEPTH
V2	MILLING 1.5" IN DEPTH
V3	MILLING TO 1.5" BELOW GUTTER (1.5" TO 3") IN DEPTH
V4	MILLING TO 1.5" BELOW GUTTER (0" TO 3") IN DEPTH
Z	TRENCHING FOR INTERMEDIATE COURSE – BEGIN 6" INSIDE EX. PAVEMENT

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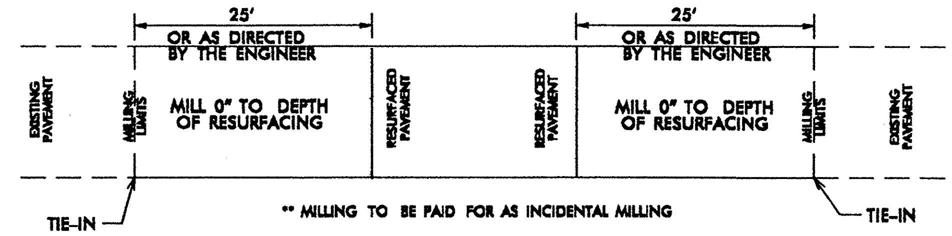
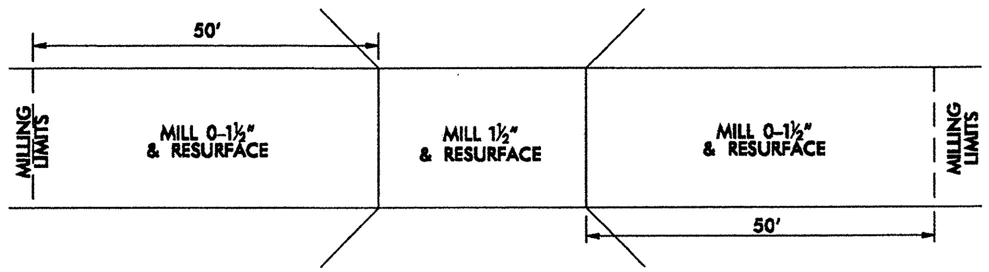
July-2013 Resurfacing\District1\Chatham\chatham-randolph typicals.dgn

WBS ELEMENT	SHEET NO.
8CR.10191.20, 8CR.20191.20	8

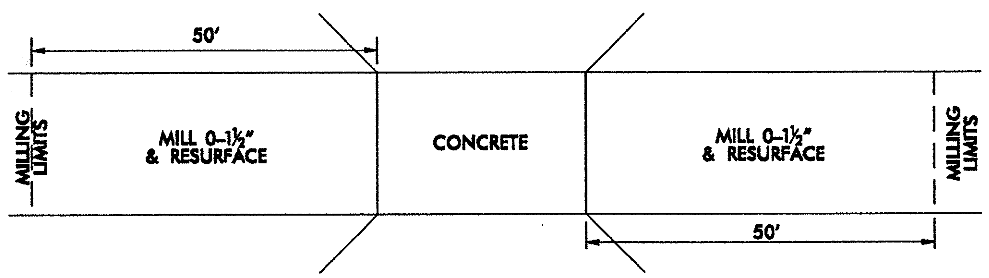


PAVEMENT TIE-IN DETAIL



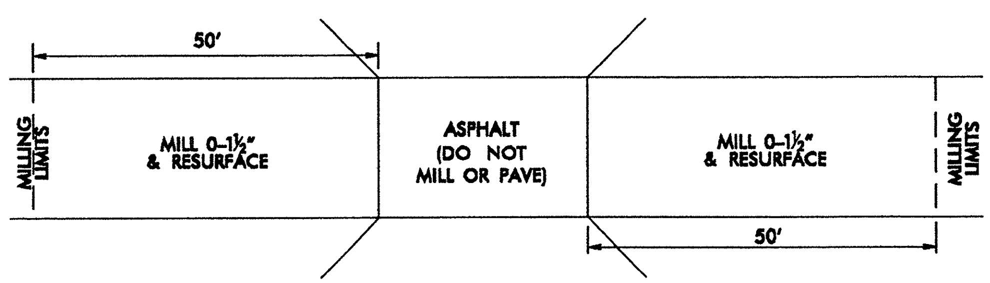
BRIDGE DRAWING FOR NC 902
USE FOR MAP #12

* MILLING SHALL BE PAID FOR UNDER INCIDENTAL MILLING



BRIDGE DRAWING FOR SR 1362
USE FOR MAP #18

* MILLING SHALL BE PAID FOR UNDER INCIDENTAL MILLING

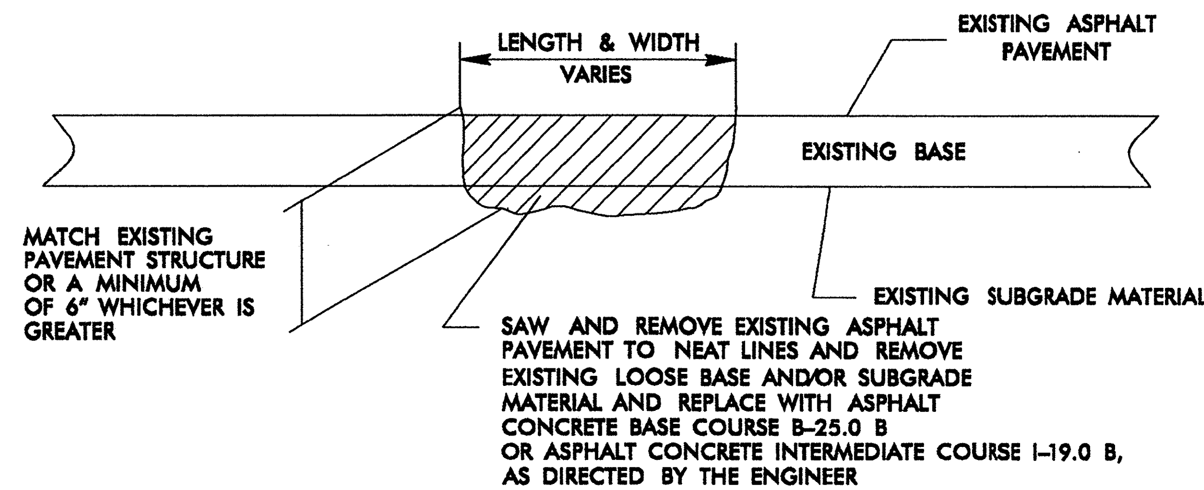


BRIDGE DRAWING FOR SR 2170
USE FOR MAP #17

* MILLING SHALL BE PAID FOR UNDER INCIDENTAL MILLING

DETAILS OF PATCHING EXISTING PAVEMENT PRIOR TO RESURFACING

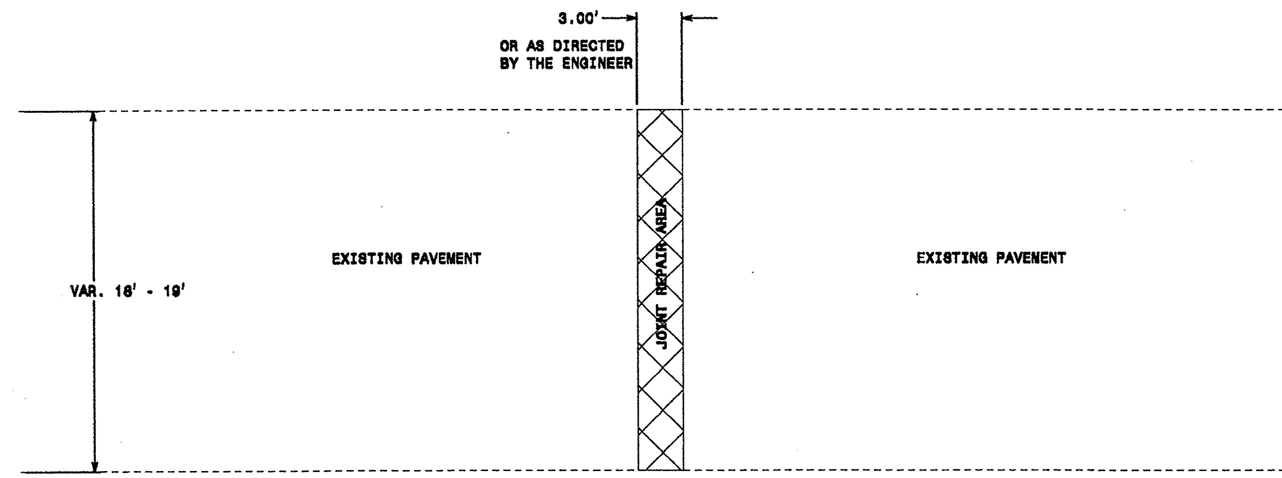
DETAIL



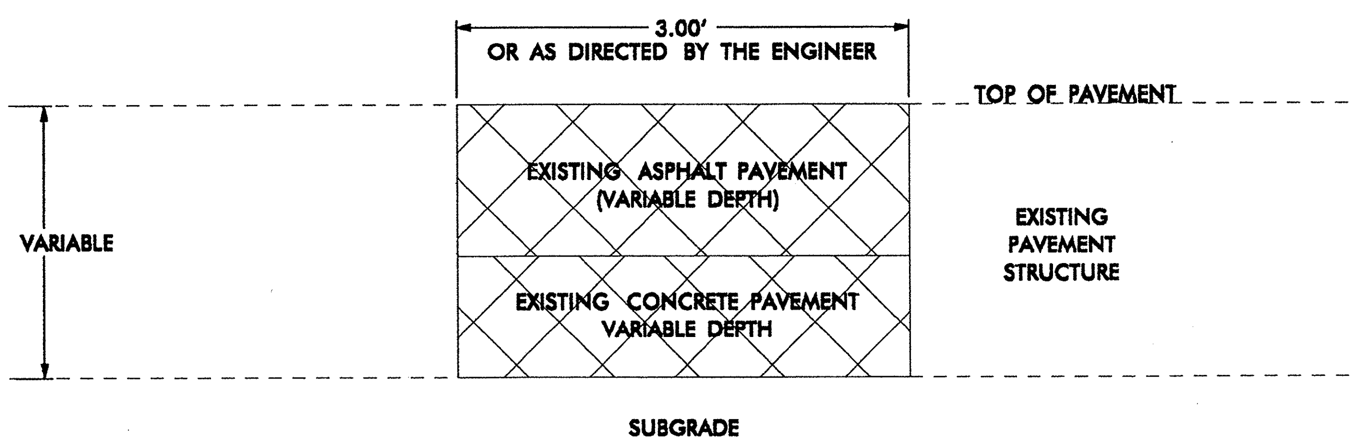
JOINT REPAIR DETAIL

JOINT SCHEDULE	
MAP	# JOINTS
5	25
9	3
11	3

CONTRACTOR SHALL COORDINATE WITH RESIDENT ENGINEER'S OFFICE FOR LOCATION OF JOINTS TO BE REPAIRED.



CROSS-SECTION



NOTE:
REMOVE ASPHALT AND CONCRETE AT JOINT LOCATIONS AS DIRECTED BY THE ENGINEER (BY SAWING CLEAN JOINTS).
REMOVE A TOTAL WIDTH OF 3' (APPROX. 1.5' EACH SIDE OF JOINT).
REMOVE AND REPLACE WITH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B.
THERE WILL BE NO DIRECT PAY FOR THIS WORK AS IT WILL BE CONSIDERED INCIDENTAL TO TO THE LINE ITEM, JOINT REPAIR (TONNAGE)

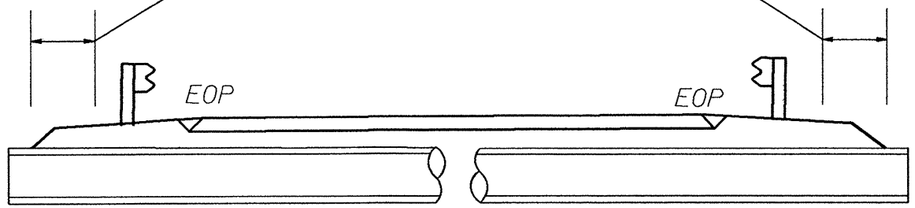
PROJECT REFERENCE NO.	SHEET NO.
8CR.10191.20, 8CR.20191.20	10

EROSION CONTROL DETAIL

NOTES: Less than 5' – 10' undisturbed buffer from ROW, ditchline, water feature, or drainage inlet, add BMP.

BMP Options: Wattle or Silt Fence

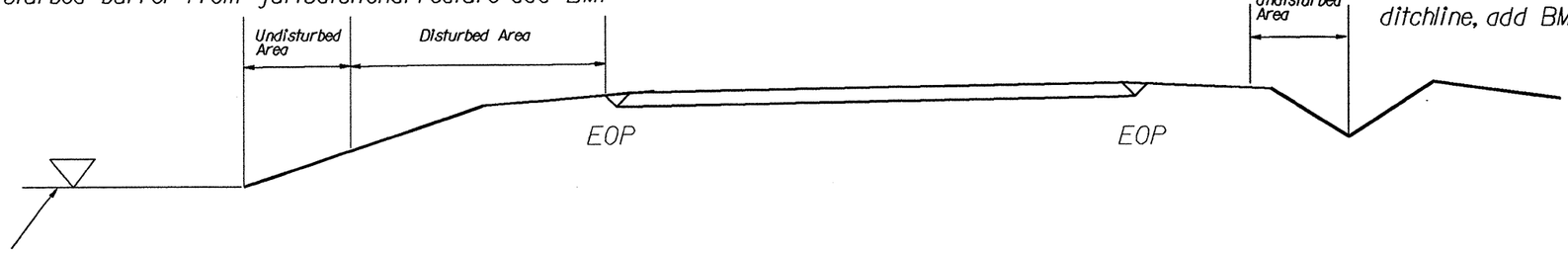
< 5' – 10' Undisturbed buffer add BMP



Pipe/Culvert

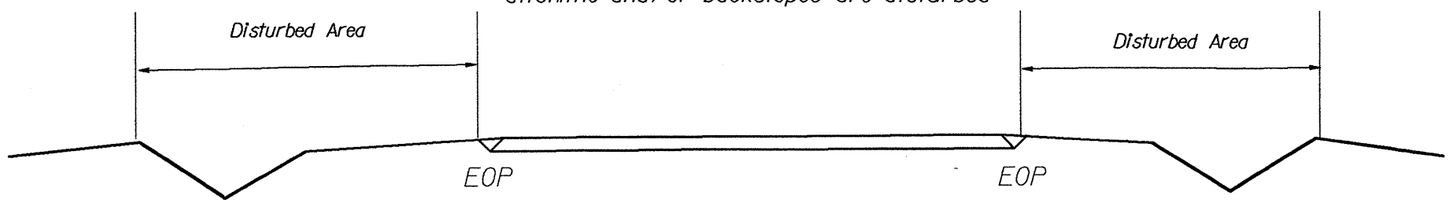
< 5' – 10' Undisturbed buffer from jurisdictional feature add BMP

< 5' – 10' Undisturbed buffer from ditchline, add BMP

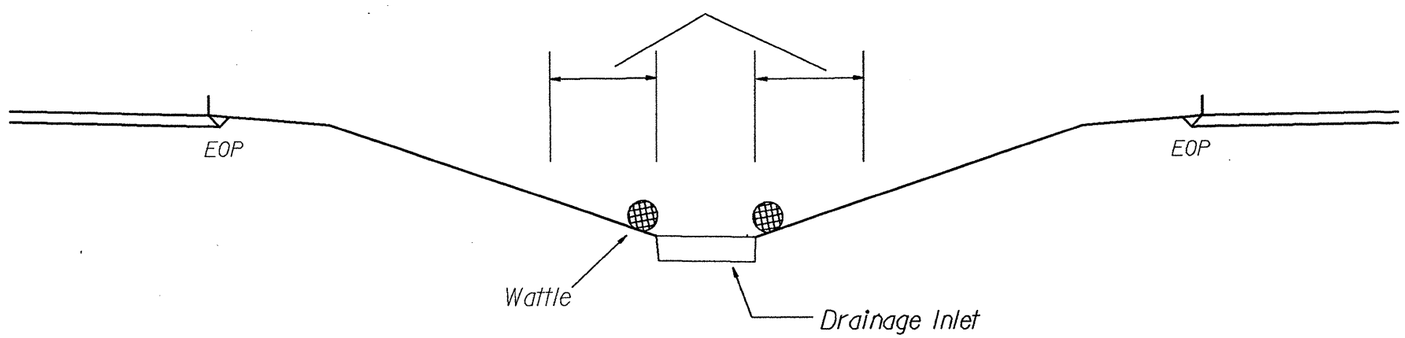


Jurisdictional Feature

Use BMP's if shoulders and/or frontslopes and/or ditchline and/or backslopes are disturbed



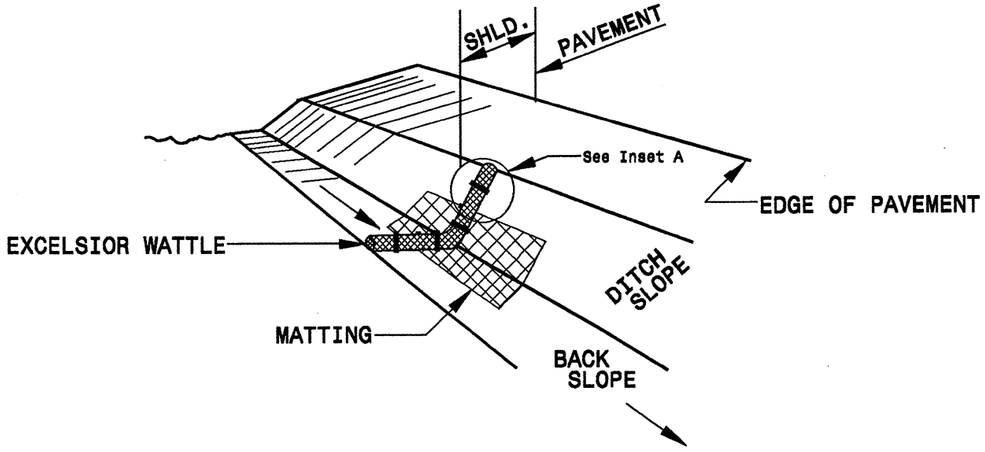
< 5' – 10' Undisturbed buffer from inlet, add wattle



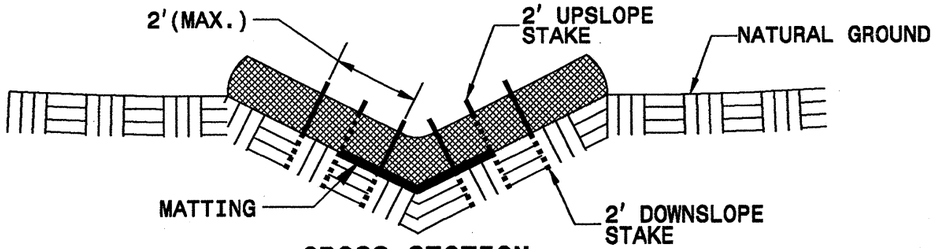
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
8CR.10191.20, 8CR.20191.20	11

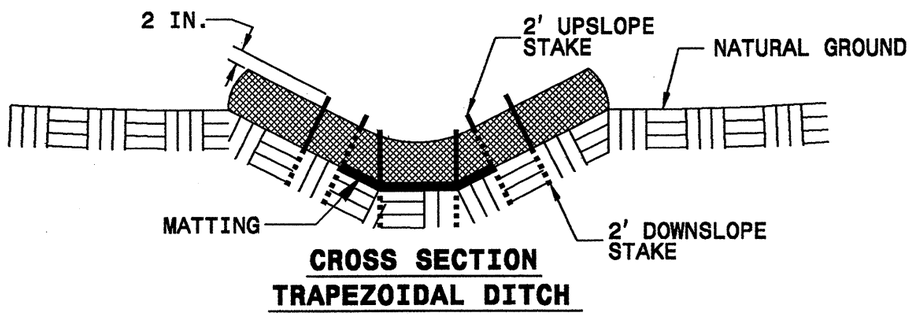
WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

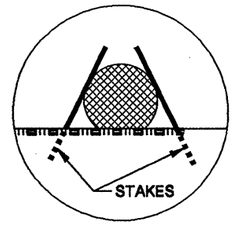
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

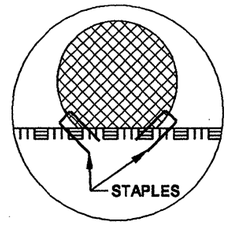
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

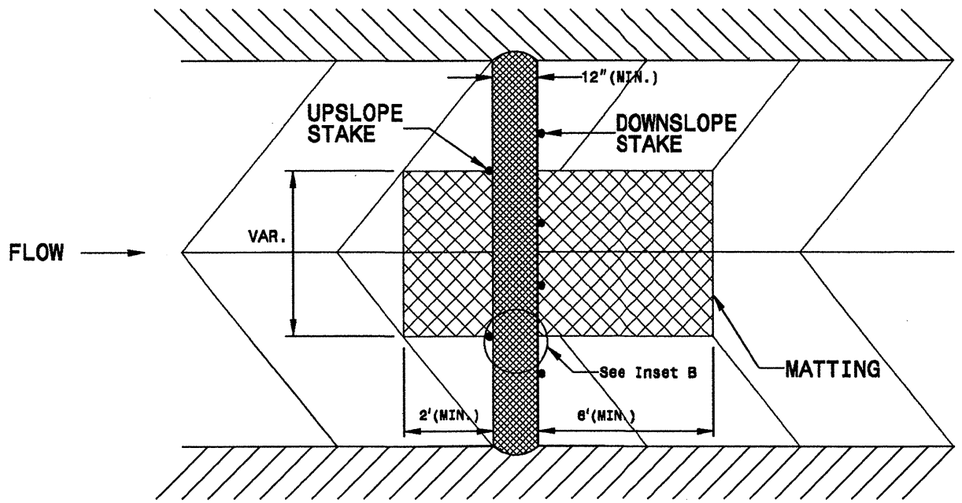
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



INSET B



TOP VIEW

PROJECT NO.	SHEET NO.	TOTAL NO.
8CR.10191.20,	12	
8CR.20191.20		

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH MI	WIDTH FT	BORROW EXCAVATION CY	GENERIC GRADING ITEM - AGGREGATE SHOULDER BORROW TON	INCIDENTAL STONE BASE TONS	SHOULDER CON-STRUCTION SMI	SHOULDER RECON-STRUCTION SMI	1.5" MILLING SY	1.5" TO 3" MILLING SY	0" TO 1.5" MILLING SY	0" TO 3" MILLING SY	INCIDENTAL MILLING SY	INTER-MEDIATE COURSE, I19.0B TONS	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, S9.5C TONS	SURFACE COURSE, SF9.5A TON	ASPHALT BINDER FOR PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	ASPHALT SURFACE TREATMENT, MATCOAT, #6M STONE SY	ASPHALT SURFACE TREATMENT, TRIPLE SEAL SY	GENERIC PAVING ITEM, JOINT REPAIR TON	ADJUST MANHOLES EA	ADJUST METER OR VALVE BOX EA	TEMPORARY SILT FENCE LF	WATTLE LF	SEED & MULCHING AC	INDUCTIVE LOOP SAWCUT LF
8CR.10191.20	Chatham	1	US 15-501/US 64BUS	TRAFFIC CIRCLE	1	2	2WU	NO	NO	0.124	32						2,328							385		23				250	5	3					
		2	US 15-501	FROM TRAFFIC CIRCLE TO HANK STREET	1	2	2WU	NO	YES	0.108	57						3,612							335		20					4	6					200
		3	US 15-501	FROM HANK STREET TO END 2-SIDED C&G	2	2	2WU	NO	NO	0.291	37			35				6,315						596		35					9	3					
		4	US 15-501	FROM END 2-SIDED C&G TO END 1-SIDED C&G	3	2	2WU	NO	NO	0.138	41	10				0.14			972				390		23					1	1	3	25	0.07		
		5	US 15-501	FROM END OF CURB AND GUTTER TO PVMT JT S OF POWELL PLACE SIGNAL	4	2	2WU	NO	NO	1.034	25	155		80		2.07					139			1,504		89	20	16,200		250	1		21		1.03		
		6	US 15-501	FROM 0.70 MI S. OF SR 1012 TO NC 87	5	2	2WU	NO	NO	0.66	25	99		25		1.32					278		1,054			63	25	9,680					13		0.66		200
		7	US 15-501	FROM NC 87 TO BEGIN 1-SIDE C&G	6	3	2WU	NO	NO	0.128	40	19				0.26							289			17							3		0.13		
		8	US 15-501	FROM BEGIN 1-SIDE C&G TO BEGIN RIBBON PVMT	7	2	2WU	NO	NO	0.2	30	15				0.20			1,760				379		23	20					3			4		0.20		
		9	US 15-501	FROM BEGIN RIBBON PVMT TO BEGIN 1-SIDED C&G	6	2	2WU	NO	NO	0.371	30	56				0.74					333		713			43	25			36	1	1	7		0.37		
		10	US 15-501	FROM BEGIN 1-SIDED C&G TO LIGHT AT PITTSBORO ELEM. SCHOOL DR. (BEGIN 2-SIDED C&G)	8	2	2WU	NO	NO	0.32	40		7			0.32				1,690			633		38	20										
		11	US 15-501	FROM SIGNAL AT PITTSBORO ELEM. SCH. RD (BEGIN C&G BOTH SIDES) TO JOINT S OF TRAFFIC CIRCLE	9	2	2WU	NO	NO	0.154	41							3,704				365			22				36						200
		12	NC 902	FROM NC 22 TO US 421	10	2	2WU	NO	NO	11.685	20		3,272			23.37					1,450		12,915			775	690									
TOTAL FOR PROJ NO. 8CR.10191.20										15.213		354	3,279	140		28.42	5,940	10,019	2,732	1,690	2,200		16,348	3,210		1,171	800	25,880		322	24	14	51	25	2.46	600
8CR.20191.20	Chatham	13	SR 2303 (GOLDSTON GLENDON RD)	FROM SR 1009 (BONLEE CARBONTON RD) TO NC 42	11	2	2WU	NO	NO	2.22	18		622			4.44					400				2,362	158	300									
		14	SR 1730 (WAKE RD/GRANDALE RD)	FROM WAKE CO. LINE TO DURHAM CO. LINE	12	2	2WU	NO	NO	0.7	20	105		54		1.40					111				772	52	375						14	25	0.70	
		15	SR 1539 (JONES FERRY RD)	FROM SR 1525 (HAMLETS CHAPEL RD) TO SR 1540 (CRAWFORD DAIRY RD)	10	2	2WU	NO	NO	2.144	22		600			4.29					489		2,791			167	100									
		16	SR 2120 (IKE BROOKS RD)	FROM US 421 TO SR 2126 (ELMER MOORE RD	13	2	2WU	NO	NO	0.46	22		129			0.92	5,937							652	44	60									
		17	SR 2170 RIVES CHAPEL RD	FROM SR 2110 (ALSTON BRIDGE RD) TO SR 2172 (JIM MOODY RD)	14,15	2	2WU	NO	NO	1.35	18		378			2.70					400	1,144			440	84	200		17,430							
		18	SR 1362 (PINEY GROVE CHURCH RD)	FROM (SR 1006 OLD US 421) TO PVT JOINT 275 FT N OF SR 1314 (PLANT RD)	16	2	2WU	NO	NO	1.48	23	222		81		2.96					831				2,537	170	60	22,650					30			
		19	SR 1362 (PINEY GROVE CHURCH RD)	FROM 275 FT N. OF SR 1314 (PLANT RD) TO SR 1312 (ED CLAPP RD)	11	2	2WU	NO	NO	1.045	18		293			2.09					250				1,173	79	175									
		20	SR 2152 (WADE BRIGHT RD)	FROM SR 2217 (WALTER BRIGHT RD) TO SR 2151 (ASBURY CHURCH RD)	14,17	2	2WU	NO	NO	0.59	16		165		1.18						178	500			192	37	275		6,930							
TOTAL FOR PROJ NO. 8CR.20191.20										9.989		327	2,187	135	1.18	18.80	5,937				2,659	1,644	2,791		8,128	791	1,545	22,650	24,360	0			44	25	0.70	
GRAND TOTAL										25.202		681	5,466	275	1.18	47.22	11,877	10,019	2,732	1,690	4,859	1,644	19,139	3,210	8,128	1,962	2,345	48,530	24,360	322	24	14	95	50	3.16	600

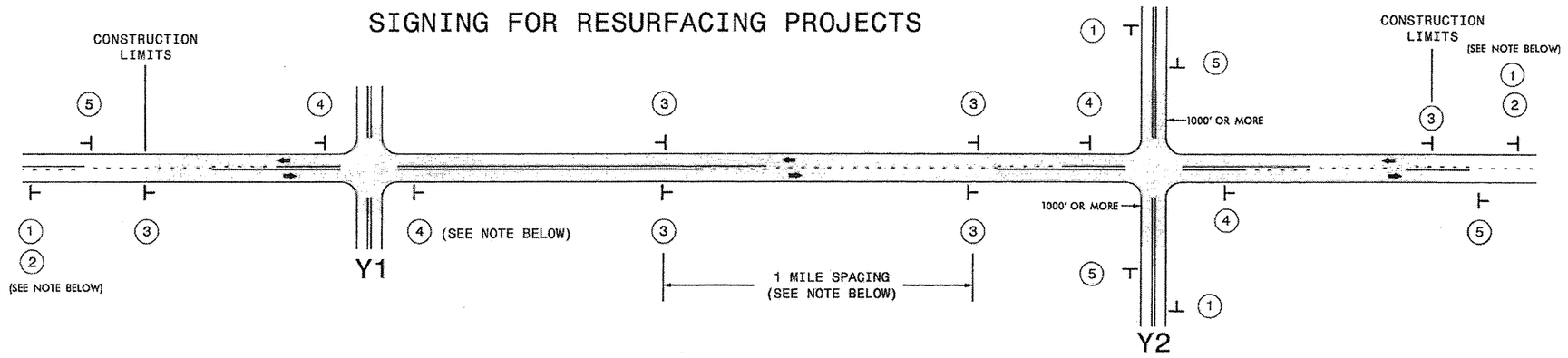
PROJECT NO.	SHEET NO.	TOTAL NO.
8CR.10191.20, 8CR.20191.20	13	

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	4399000000-N TEMPORARY TRAFFIC CONTROL LS	4510000000-N LAW ENFORCEMENT HR	4366000000-E WORK ZONE ADVANCE/ GENERAL WARNING SIGNING SF	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 WHITE THERMO LF	4695000000-E 8" X 90 M YELLOW THERMO LF	4705000000-E 16" X 120 M WHITE THERMO LF	4710000000-E 24" X 120 M WHITE THERMO LF	4721000000-E THERMO MSG SCHOOL 120 M EA	4721000000-E THERMO RXR 120 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	4900000000-N YELLOW & YELLOW MARKERS EA	4900000000-N CRYSTAL & RED MARKERS EA	4905000000-N SNOW PLOWABLE MARKERS Y & Y MARKERS EA	4905000000-N SNOW PLOWABLE MARKERS C & R MARKERS EA	5255000000-N PORTABLE LIGHTING LS
8CR.10191.20	Chatham	1	US 15-501/US 64BUS	TRAFFIC CIRCLE	1	2	2WU	0.124	32			141							825													*
		2	US 15-501	FROM TRAFFIC CIRCLE TO HANK STREET	1	2	2WU	0.108	57		40	141	590	1,142		300			114						870					14		*
		3	US 15-501	FROM HANK STREET TO END 2-SIDED C&G	2	2	2WU	0.291	37			141	3,076	3,076	100		35		100			1								38	7	*
		4	US 15-501	FROM END 2-SIDED C&G TO END 1-SIDED C&G	3	2	2WU	0.138	41			141	1,459		550				40			6	2							18	8	*
		5	US 15-501	FROM END OF CURB AND GUTTER TO PVMT JT S OF POWELL PLACE SIGNAL	4	2	2WU	1.034	25			141	11,126	10,929	390		107					3	1							103	68	*
		6	US 15-501	FROM 0.70 MI S. OF SR 1012 TO NC 87	5	2	2WU	0.66	25		40	141	7,102	6,098	220		340		151			2		2						87	7	*
		7	US 15-501	FROM NC 87 TO BEGIN 1-SIDE C&G	6	3	2WU	0.128	40			141	1,350	1,357	120				25			4		2						17	5	*
		8	US 15-501	FROM BEGIN 1-SIDE C&G TO BEGIN RIBBON PVMT	7	2	2WU	0.2	30			141	2,114	2,120	100		61					3								26	7	*
		9	US 15-501	FROM BEGIN RIBBON PVMT TO BEGIN 1-SIDED C&G	6	2	2WU	0.371	30			141	3,992	4,897	250		160		50	6		7								49	8	*
		10	US 15-501	FROM BEGIN 1-SIDED C&G TO LIGHT AT PITTSBORO ELEM. SCHOOL DR. (BEGIN 2-SIDED C&G)	8	2	2WU	0.32	40			141	3,382	3,382			100		22											42		*
		11	US 15-501	FROM SIGNAL AT PITTSBORO ELEM. SCH. RD (BEGIN C&G BOTH SIDES) TO JOINT S OF TRAFFIC CIRCLE	9	2	2WU	0.154	41		40	141	1,628	1,628			100		86	6									20		*
		12	NC 902	FROM NC 22 TO US 421	10	2	2WU	11.685	20	*		141	125,731	105000	225			100	260		4							771				
TOTAL FOR PROJ NO. 8CR.10191.20								15.213		*	120	1,692	161,550	139,629	1,955	300	903	100	1,673	12	4	26	3	4	870			771		414	110	
														141,584		1,203				16		33			870			771		524		
8CR.20191.20	Chatham	13	SR 2303 (GOLDSTON GLENDON RD)	FROM SR 1009 (BONLEE CARBONTON RD) TO NC 42	11	2	2WU	2.22	18			143.4													46,886	46,886		147				
		14	SR 1730 (WAKE RD/GRANDALE RD)	FROM WAKE CO. LINE TO DURHAM CO. LINE	12	2	2WU	0.7	20			141													14,784	14,784						
		15	SR 1539 (JONES FERRY RD)	FROM SR 1525 (HAMLETS CHAPEL RD) TO SR 1540 (CRAWFORD DAIRY RD)	10	2	2WU	2.144	22			141													45,281	45,281		142				
		16	SR 2120 (IKE BROOKS RD)	FROM US 421 TO SR 2126 (ELMER MOORE RD)	13	2	2WU	0.46	22			141													9,715	9,715						
		17	SR 2170 RIVES CHAPEL RD	FROM SR 2110 (ALSTON BRIDGE RD) TO SR 2172 (JIM MOODY RD)	14,15	2	2WU	1.35	18			141													28,512	28,512						
		18	SR 1362 (PINEY GROVE CHURCH RD)	FROM (SR 1006 OLD US 421) TO PVT JOINT 275 FT N OF SR 1314 (PLANT RD)	16	2	2WU	1.48	23			141										6	4		31,700	32,010	600	98	14			
		19	SR 1362 (PINEY GROVE CHURCH RD)	275 FT N. OF SR 1314 (PLANT RD) TO SR 1312 (ED CLAPP RD)	11	2	2WU	1.045	18			141													22,070	22,070		69				
		20	SR 2152 (WADE BRIGHT RD)	FROM SR 2217 (WALTER BRIGHT RD) TO SR 2151 (ASBURY CHURCH RD)	14,15	2	2WU	0.59	16	*		141													12,461	12,461						
TOTAL FOR PROJ NO. 8CR.20191.20								9.989		*		1,130.4										6	4		211,409	211,719	600	456	14			
																						10			423,128			470				
GRAND TOTAL								25.202		1	120	2,822.4	161,550	139,629	1,955	300	903	100	1,673	12	4	32	7	4	212,279	211,719	600	1,227	14	414	110	1
														141,584		1,203				16		43			423,998			1,241		524		

PROJ. REFERENCE NO.	SHEET NO.
8CR.10191.20 8CR.20191.20	SIGN-1

SIGNING FOR RESURFACING PROJECTS



LEGEND
- ⊢ STATIONARY SIGN
- ← DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION

1	ROAD WORK AHEAD W20-1 48" X 48"	PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.
2	NEXT XX MILES W7-3aP 24" X 18"	#2 SIGN ONLY USED WHEN RESURFACING LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER.(NO FRACTIONAL OR DECIMAL NUMBERS)
3	LOW/SOFT SHOULDER SP 13107 48" X 48"	PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET ½ MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.
4	ROAD UNDER CONST SP 13106 48" X 48"	THESE ARE FOR -Y- LINES THAT ARE "THROUGH" ROADWAYS. DEAD END AND SUBDIVISION ROADS ARE NOT "THROUGH" ROADWAYS. INSTALL 500' +/- FROM EACH -Y- LINE APPROACH AS SHOWN ABOVE. FOR MULTIPLE -Y- LINES THAT ARE SEPARATED BY 0.25 MILES OR LESS, TREAT AS A SINGLE UNIT AND INSTALL WITHIN 500' OF EACH APPROACH. A MAXIMUM OF 2 SIGN SETS PER MILE. DO NOT INSTALL WHEN -Y- LINES ARE WITHIN 0.5 MILES FROM "END ROAD WORK" SIGN.
5	END ROAD WORK G20-2 A 48" X 24"	PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.

-Y- LINE SIGNING

NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:

1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE
2) SUBDIVISION ROADS
3) DEAD END ROADS

WHEN PAVING/CONSTRUCTION ACTIVITIES PROCEED ACROSS AN UNSIGNED -Y- LINE, ADVANCE WARNING PORTABLE SIGNS SHALL BE USED ALONG THE -Y- LINE AS SHOWN BELOW. REMOVE UPON COMPLETION OF WORK.

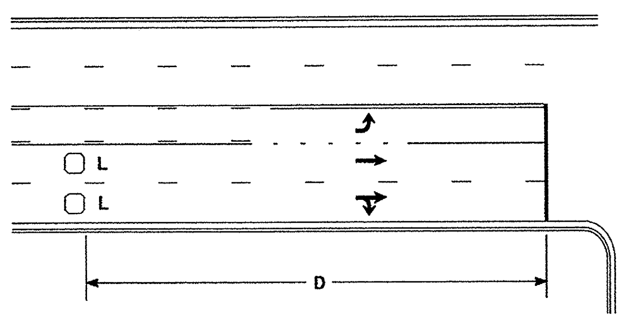
ROAD WORK AHEAD W20-1 48" X 48" — PLACED 500' IN ADVANCE OF FLAGGER.

W20-7 A 48" X 48" — PLACED 250' IN ADVANCE OF FLAGGER.

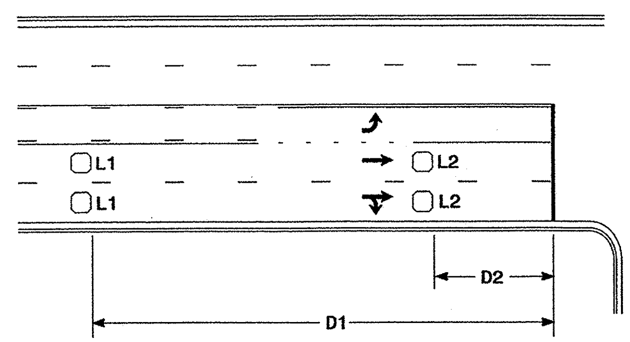
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

RESURFACING
ADVANCE WARNING SIGNS
FOR
RURAL AND SUBURBAN
2 LANE ROADWAYS

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

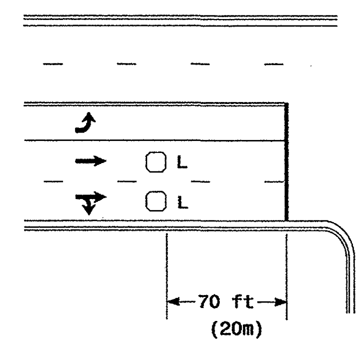
Speed Limit mph (km/hr)	D1 ft	(m)	D2 ft	(m)
40 (64)	250	(75)	80	(25)
45 (72)	300	(90)	90	(27)
50 (80)	355	(110)	100	(30)
55 (88)	420	(130)	110	(35)

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)]



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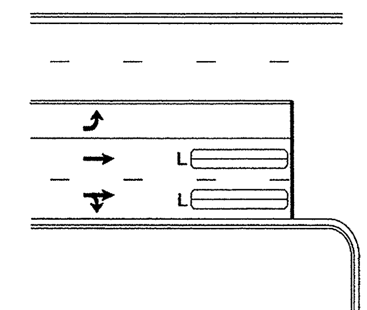
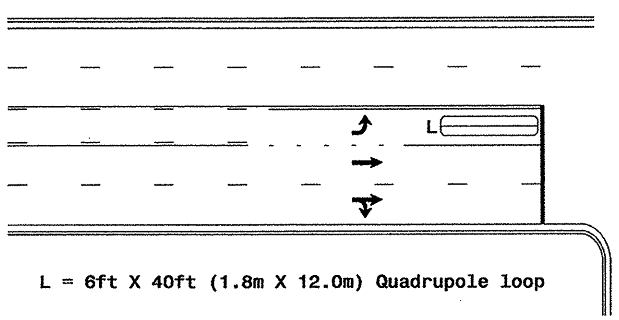


L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

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

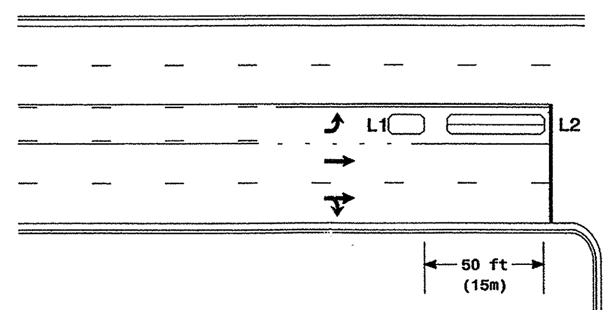
Left Turn Lane Detection



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

Presence Loop Detection

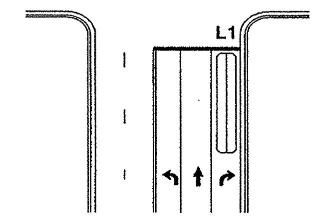
OR



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

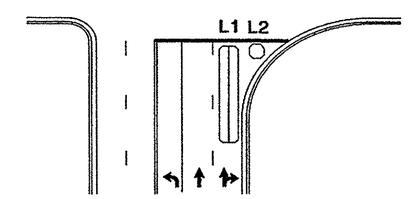
Queue Loop Detection

Right Turn Lane Detection

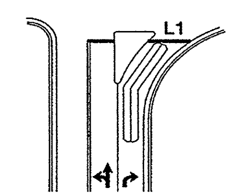


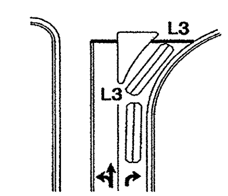
Standard Turn

L1 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop
Wired separately
L3 = 6ft X 20ft (1.8m X 6.0m) Quadrupole loop
Wired in series



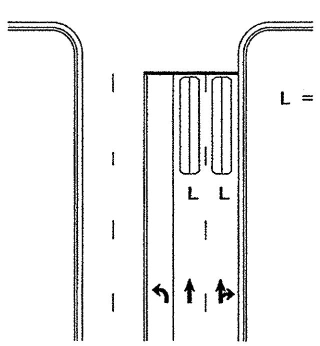
Wide Radius Turn





Channelized Turn

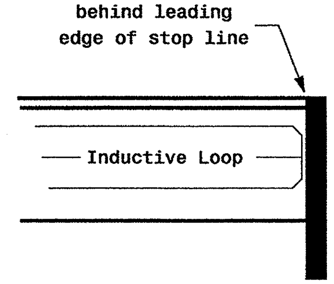
Side Street Detection



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

Presence Loop Placement at Stop Lines

Locate loop slightly behind leading edge of stop line



Note:
Loop may be located in advance of stop line when stop line is greater than 15′ (4.5m) from edge of intersecting roadway; or, when loop detects a permissive or protected/permissive left turn.

Recommended Number of Turns

Single 6′ X 6′ (1.8m X 1.8m) loop (wired separately):

Length of Lead-in ft (m)	Number of Turns
< 250 (75)	3
250-375 (75-115)	4
375-525 (115-160)	5
> 525 (160)	6

Quadrupole loops: Use 2-4-2 turns

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

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
State of North Carolina Department of Transportation
Signals and Geometrics Section
122 N. McDowell St., Raleigh, NC 27603

SCALE
N/A

Typical Loop Locations

PLAN DATE: June 2006	REVIEWED BY:
PREPARED BY: P L Alexander	REVIEWED BY:

REVISIONS	INIT.	DATE
Revise pavement markings	aa	12/11/06

SEAL
North Carolina Professional Engineer Seal 23480 Pamela A. Alexander

SIGNATURE 6/6/06 DATE

SIG. INVENTORY NO.

19-DEC-2006 14:29
s:*its signals*lib turn in*misc*looptypical2006.dgn
palexander