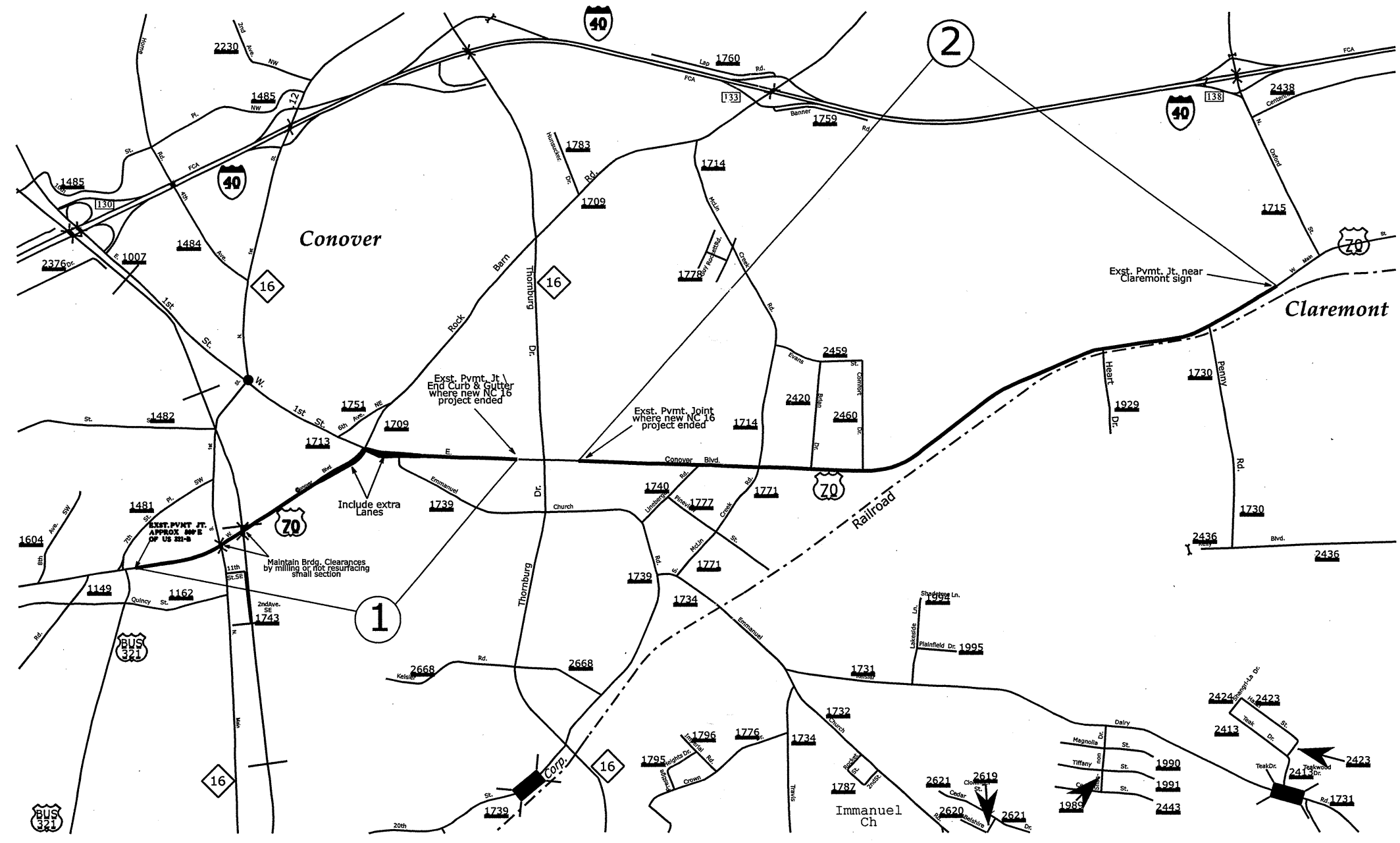


STATE	PROJECT WBS	SHEET NUMBER
NC	18CR.10181.9	1



Drawn by: G. BRITAIN

No Scale

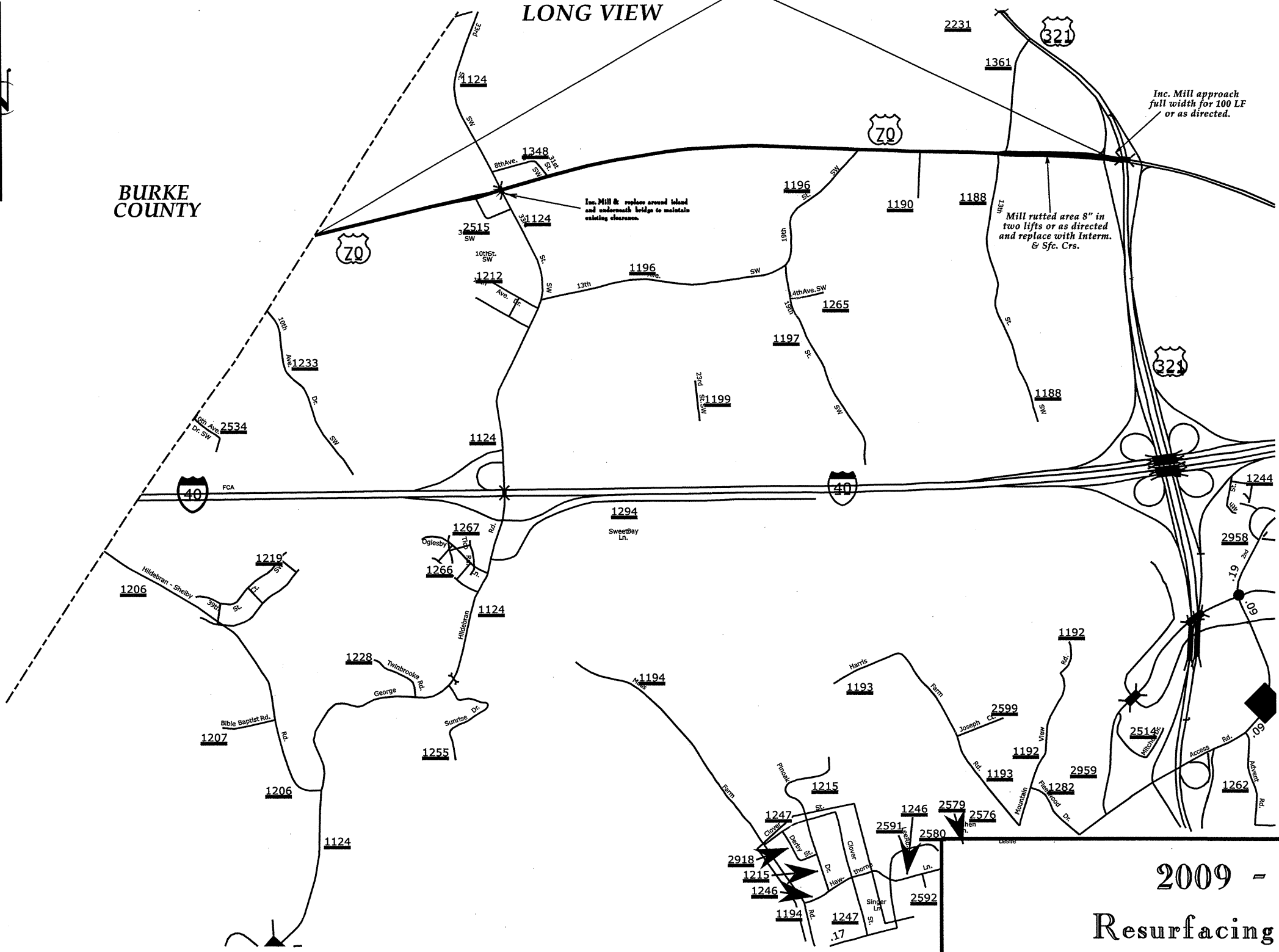
2009 - 2010
Resurfacing Map
CATAWBA COUNTY NC

STATE	PROJECT WBS	SHEET NUMBER
NC	ISCR.1018.9	2

3

LONG VIEW

BURKE COUNTY

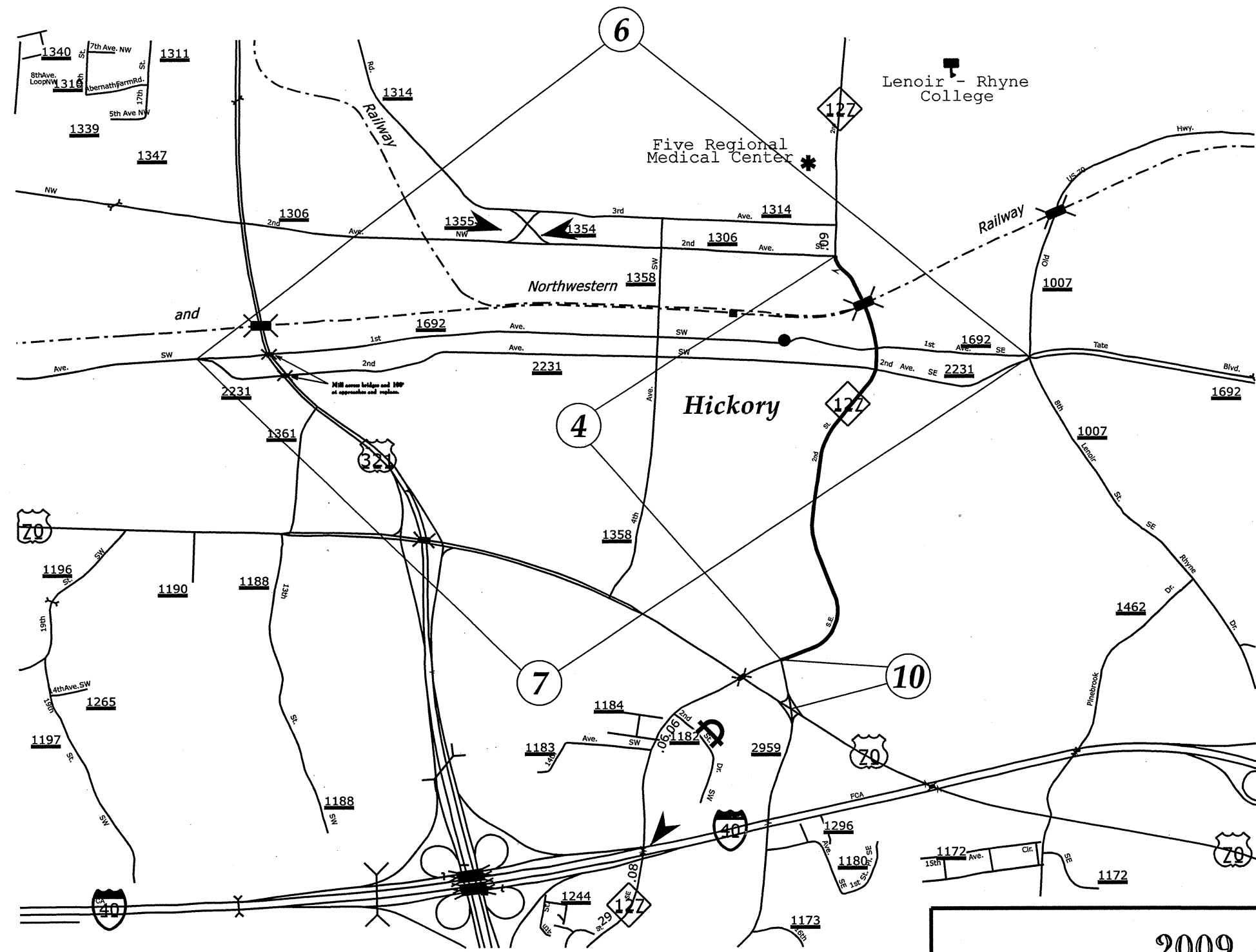


G. BRITTAIN
Drawn by

No Scale

2009 - 2010
Resurfacing Map

CATAWBA COUNTY NC

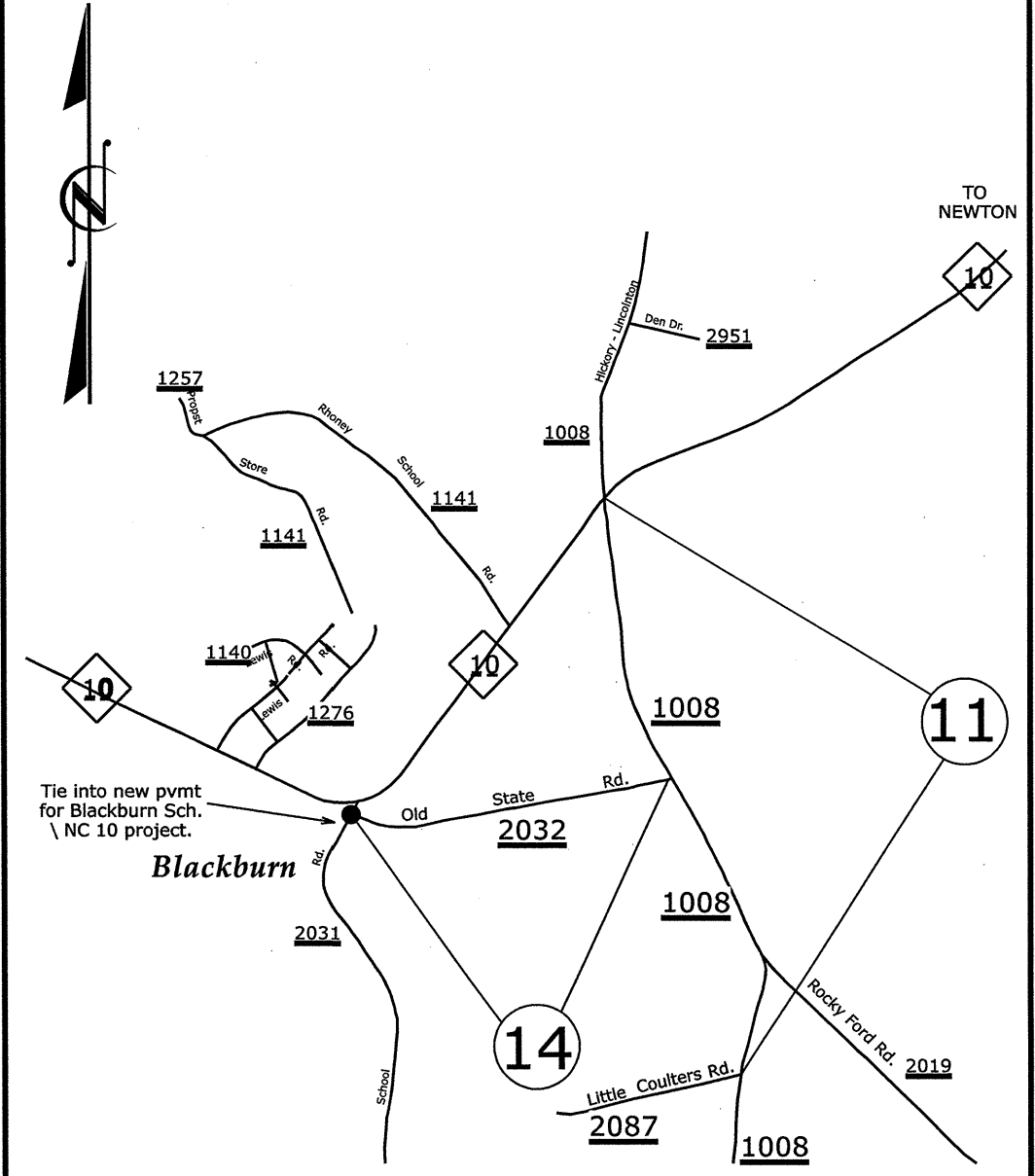
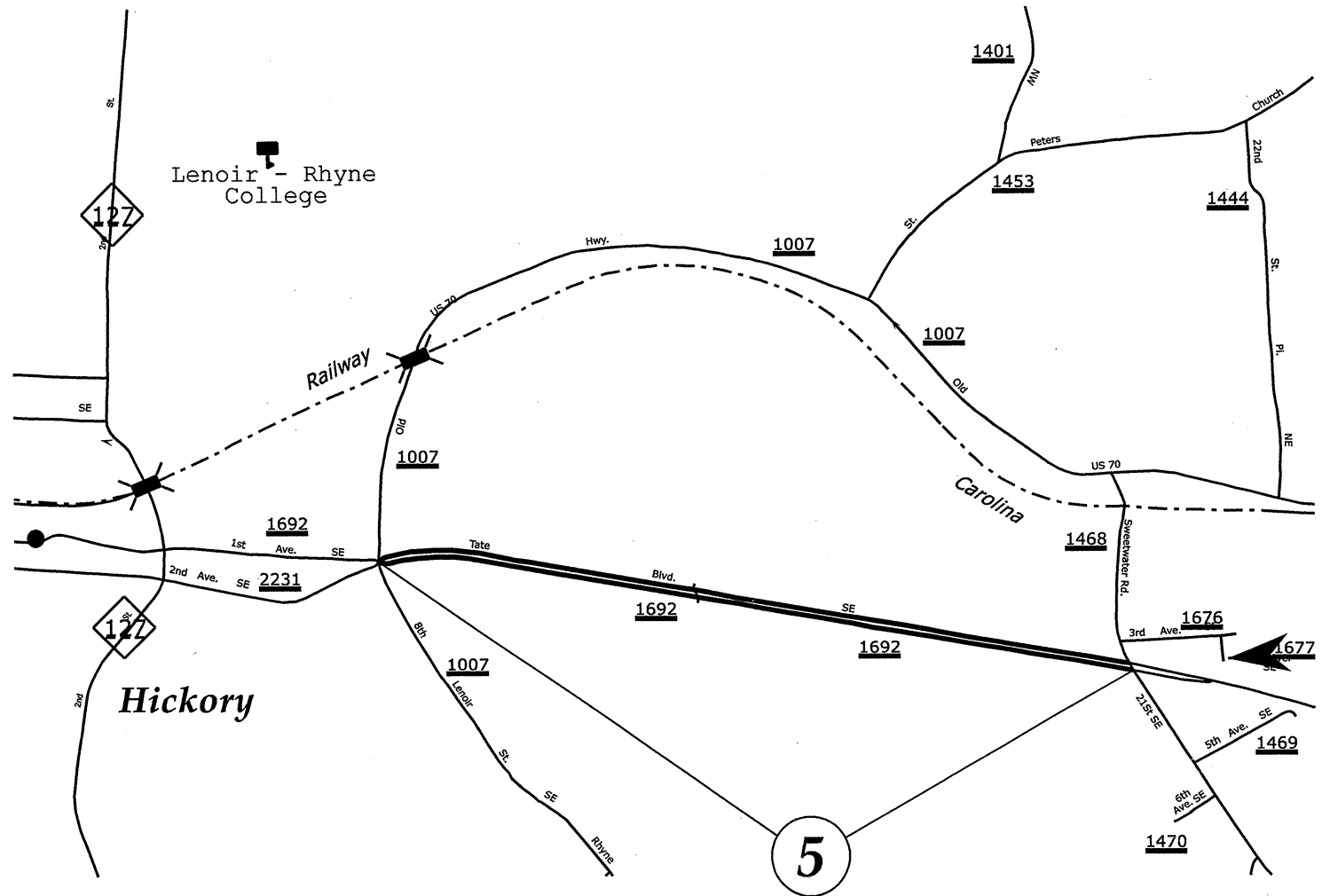


G. BRITAIN
Drawn by:

No Scale

2009 - 2010
Resurfacing Map
CATAWBA COUNTY NC

STATE	PROJECT WBS	SHEET NUMBER
NC	12CR.2010L10	4



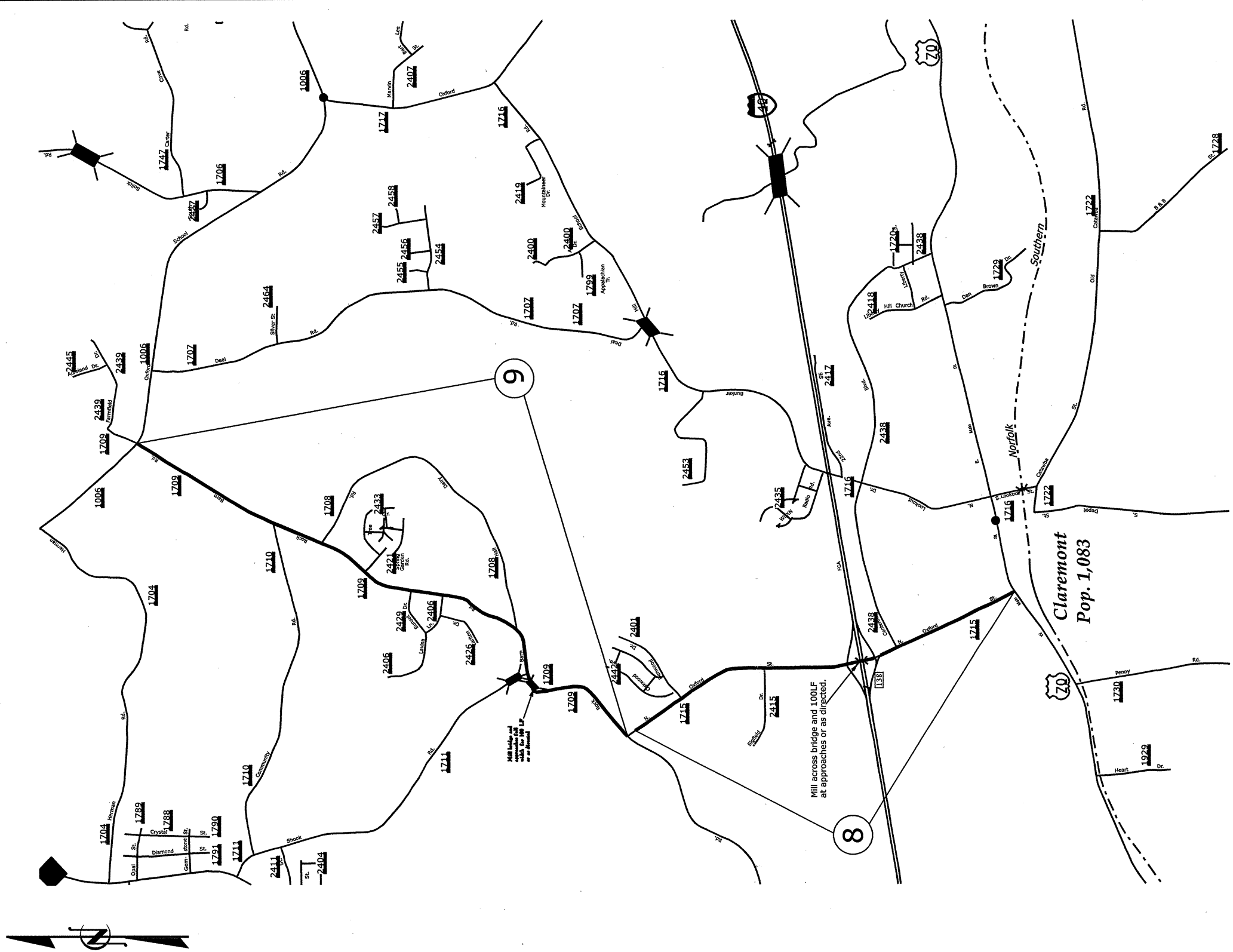
Drawn by: G. BRITAIN



No Scale

2009 - 2010
Resurfacing Map
CATAWBA COUNTY NC

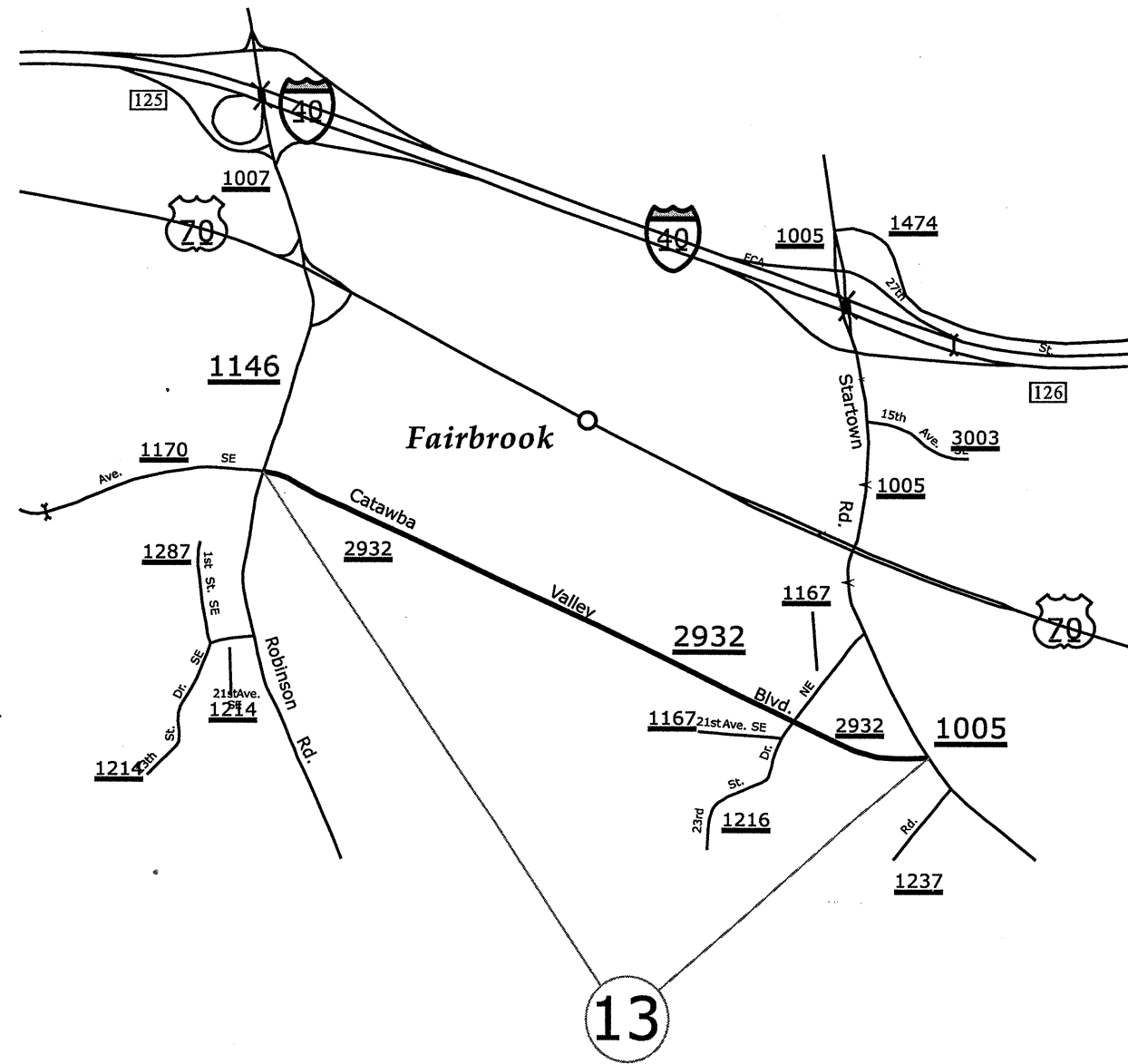
STATE	PROJECT WBS	SHEET NUMBER
NC	REEL/WALLS	5



2009 - 2010
Resurfacing Map

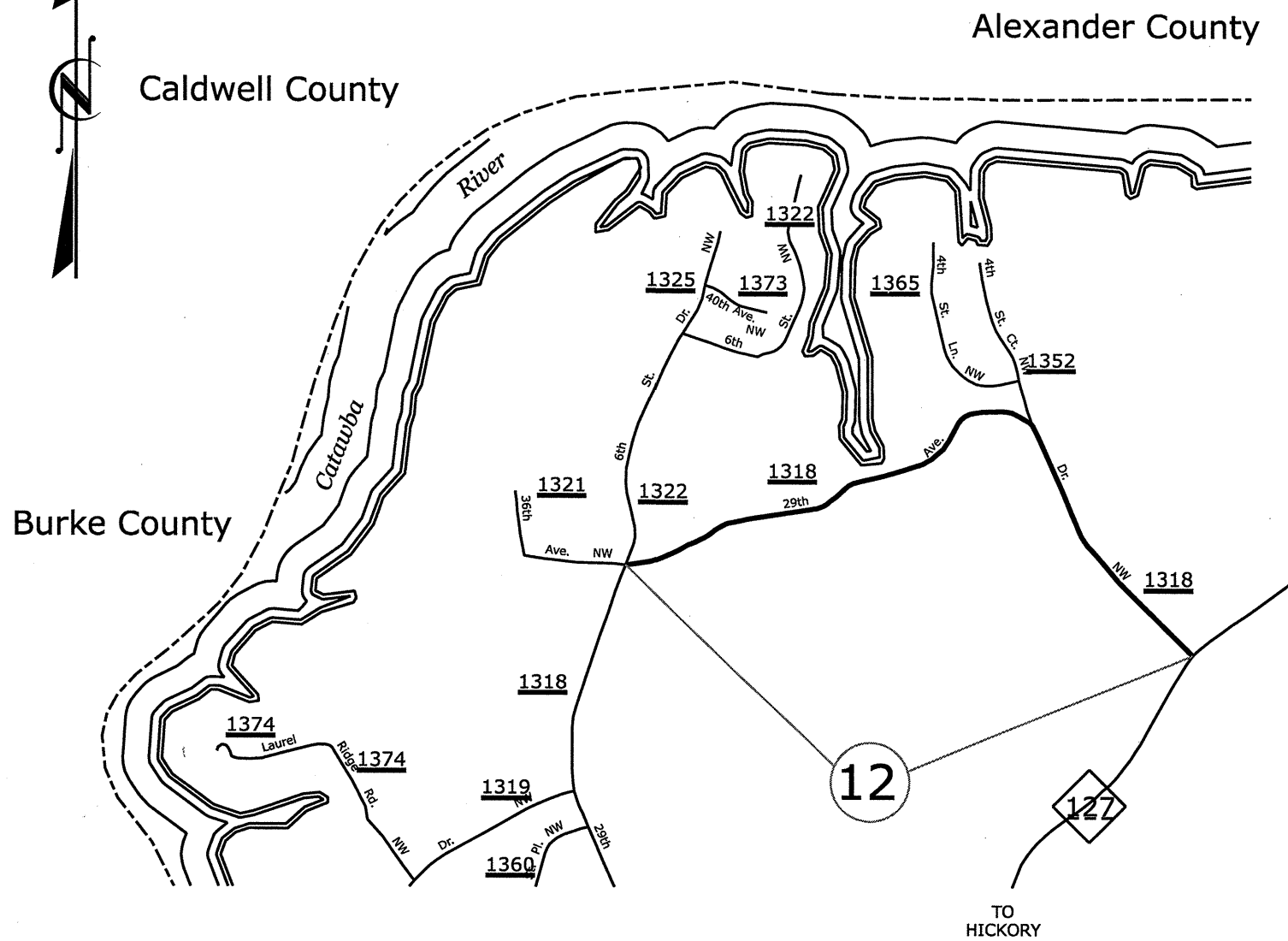
CATAWBA COUNTY NC

No Scale



G. BRITTAIN
Drawn by:

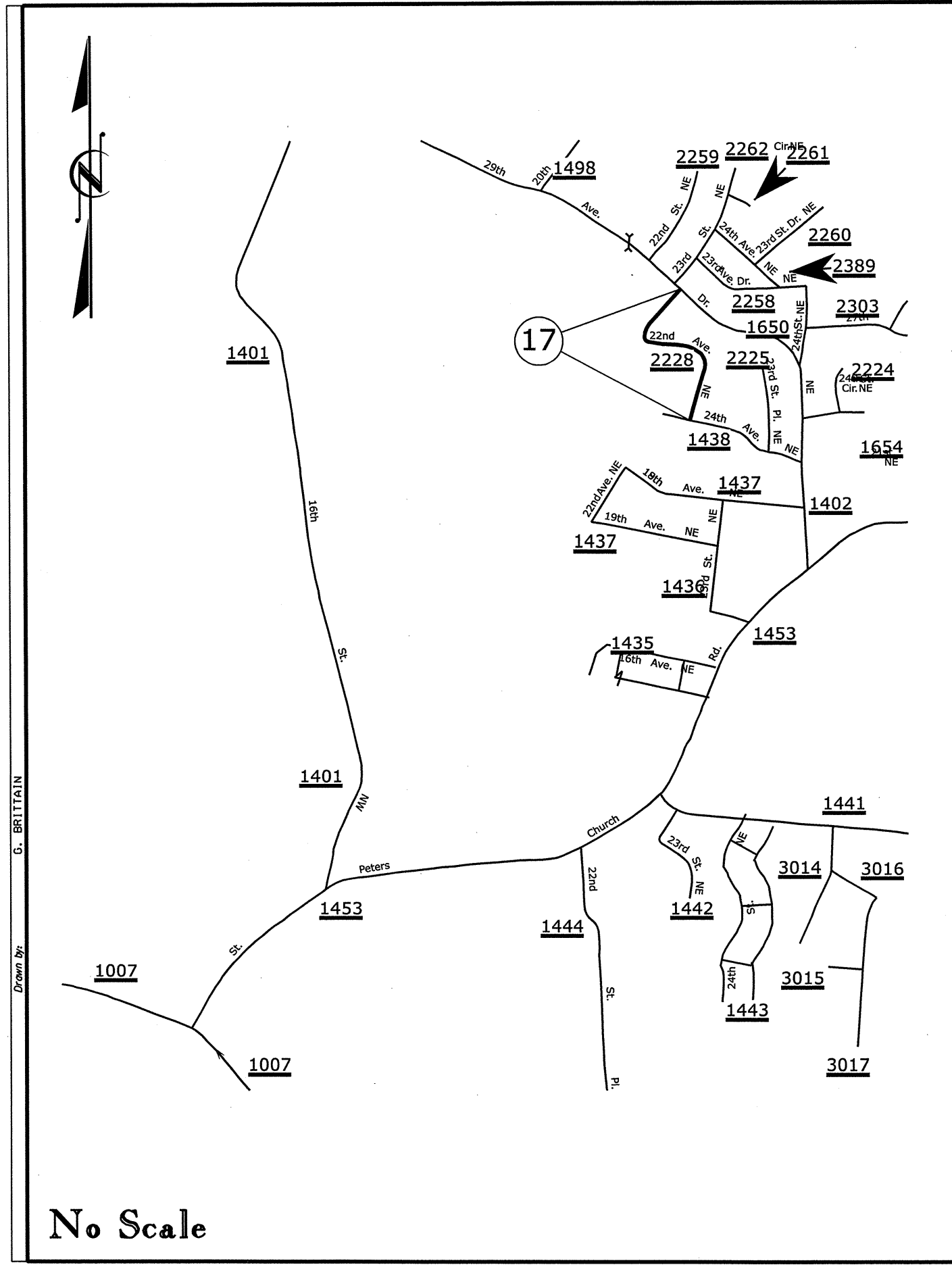
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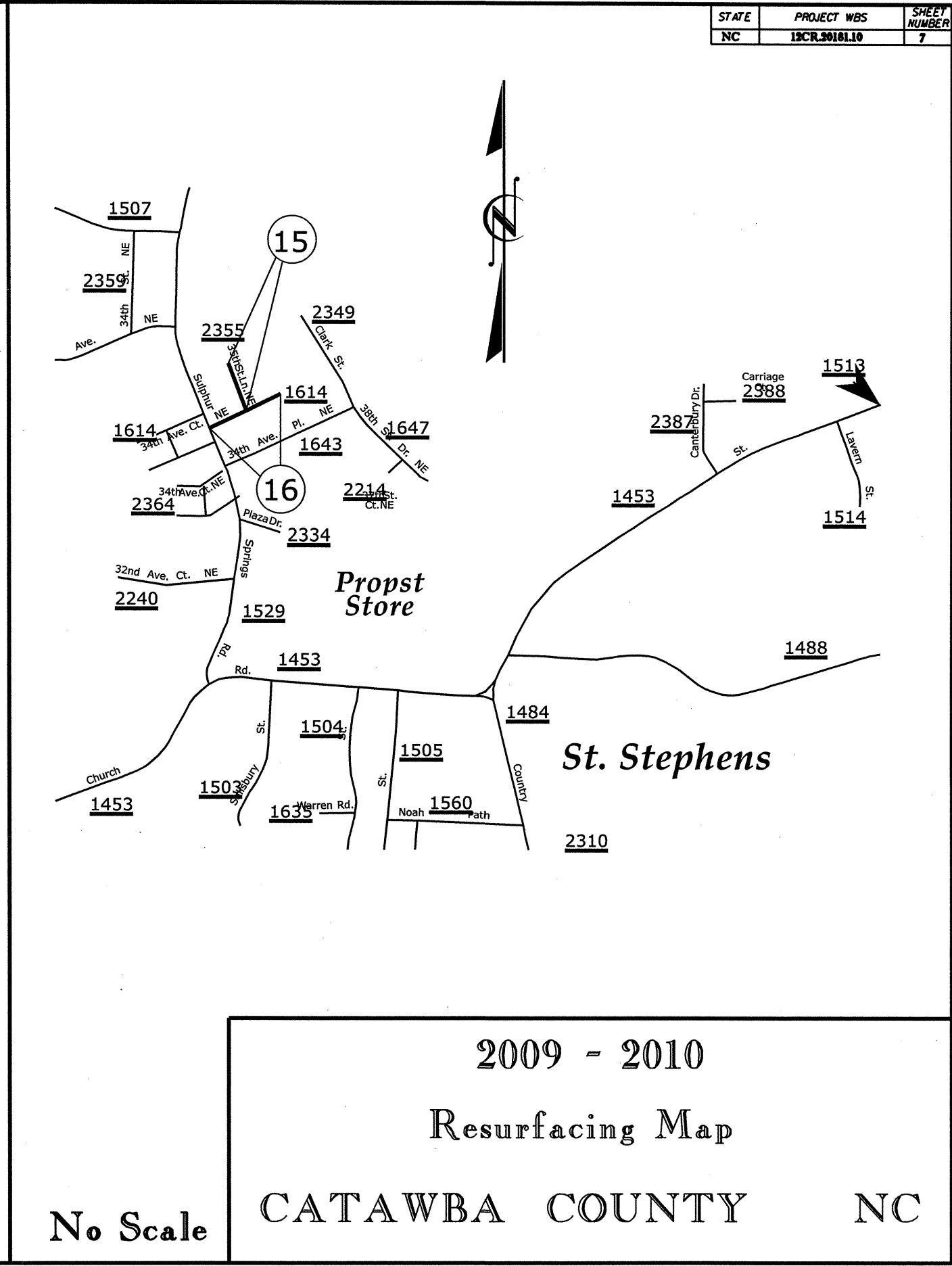
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2009 - 2010
Resurfacing Map
CATAWBA COUNTY NC

STATE	PROJECT WBS	SHEET NUMBER
NC	19CR.30161.10	7



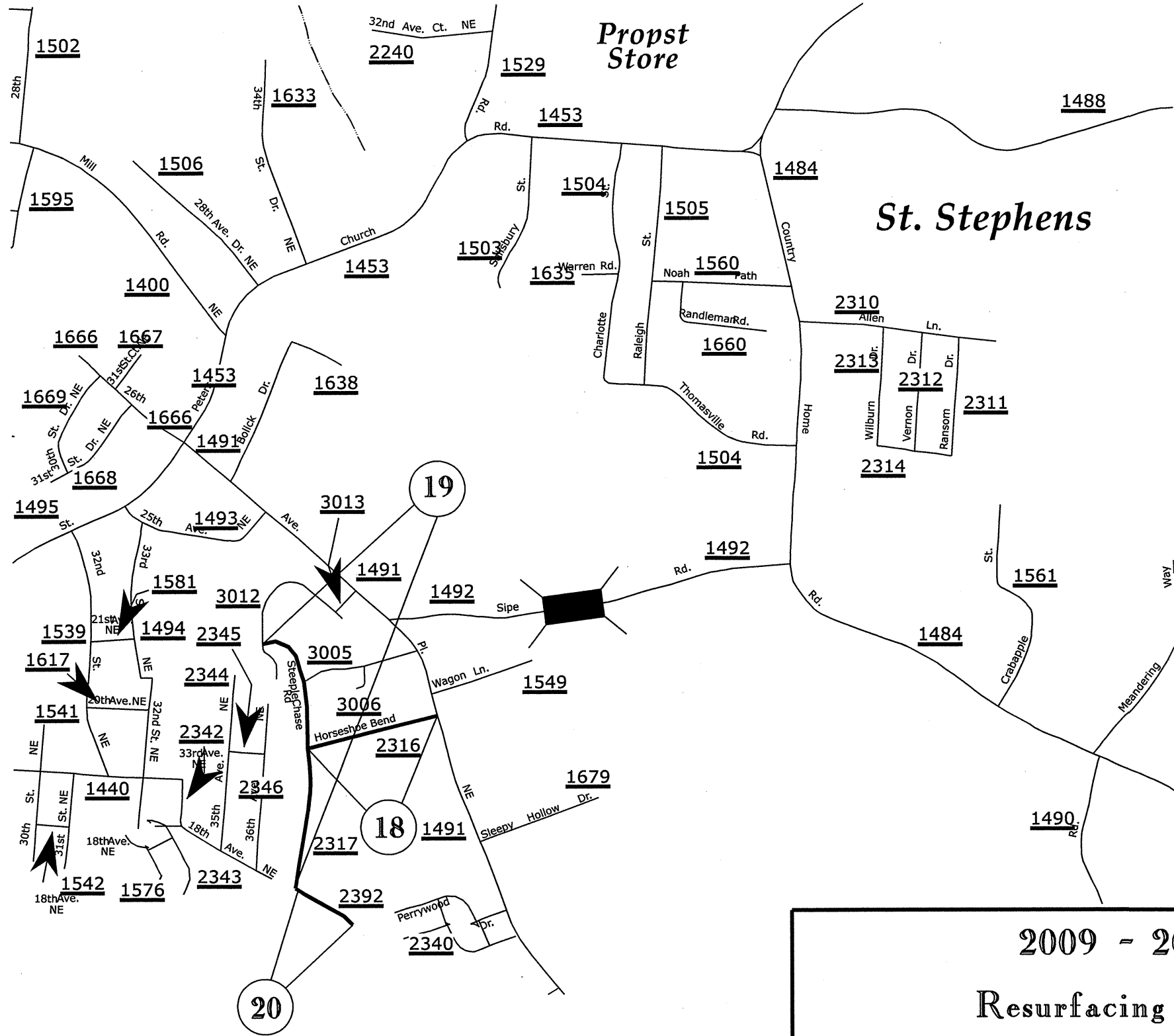
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No Scale

2009 - 2010
Resurfacing Map
CATAWBA COUNTY NC

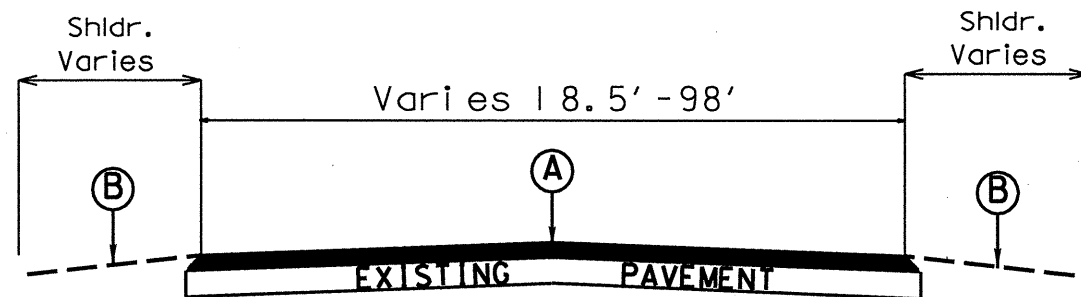
G. BRITTAIN
Drawn by



2009 - 2010
Resurfacing Map
CATAWBA COUNTY NC

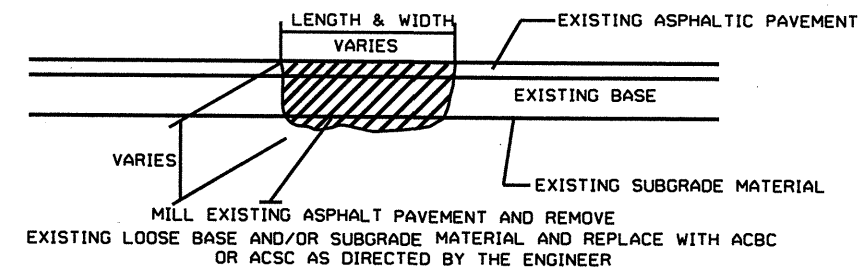
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G. BRITTAIN
Drawn by

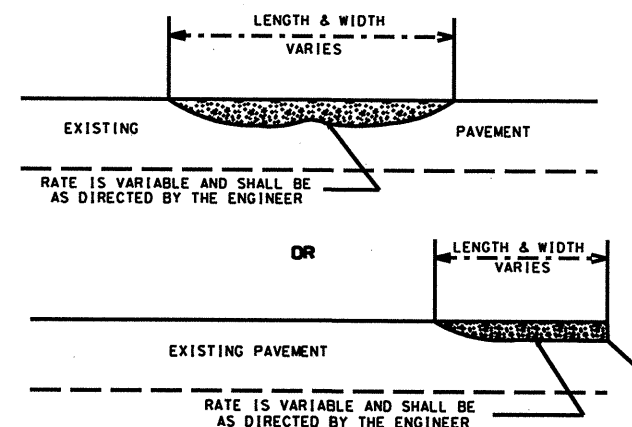


TYPICAL SECTION NO. 1

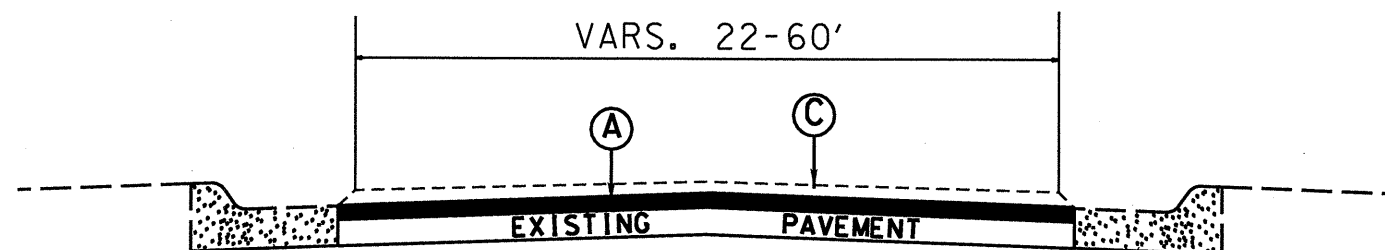
- MAP # 1 STA 0+00 TO 28+00
STA 50+00 TO 68+50
- MAP # 2 STA 20+00 TO 137+00
- MAP # 3 STA 0+00 TO 125+50
STA 132+50 TO 134+50
- MAP # 6 STA 99+50 TO 112+00
STA 117+50 TO 120+50
- MAP # 7 STA 6+50 TO 22+50
STA 41+00 TO 45+25
- MAP # 8 STA 28+00 TO 82+00
- MAP # 9 (entire map)
- MAP #11 - #12 (entire map)
- MAP #15 - MAP #20 (entire maps)



PATCHING EXISTING PAVEMENT



**ASPHALT CONCRETE SURFACE COURSE
TYPE S9.5B. (LEVELING COURSE)**



TYPICAL SECTION NO. 2

- MAP # 4 (entire map)
- MAP # 6 STA 0+00 TO 11+00
STA 38+00 TO 44+00
STA 120+50 TO 125+00
- MAP # 7 STA 0+00 TO 6+50
STA 22+50 TO 41+00
STA 69+50 TO 76+25
- MAP # 10 (entire map)

PAVEMENT SCHEDULE	
A	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
B	EARTH MATERIAL (SHOULDER RECONSTRUCTION)
C	MILL ASPHALT PVMT. APPROX. 1.5" TO 3.0" AS DIRECTED BY ENGINEER
D	PROP. APPROX. 6½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I 19.0C, IN TWO 3¼" LIFTS AT AN AVERAGE RATE OF 370.5 LBS. PER SQ. YD.
E	MILL ASPHALT PAVEMENT APPROX. 8.0" IN TWO 4.0" LIFTS

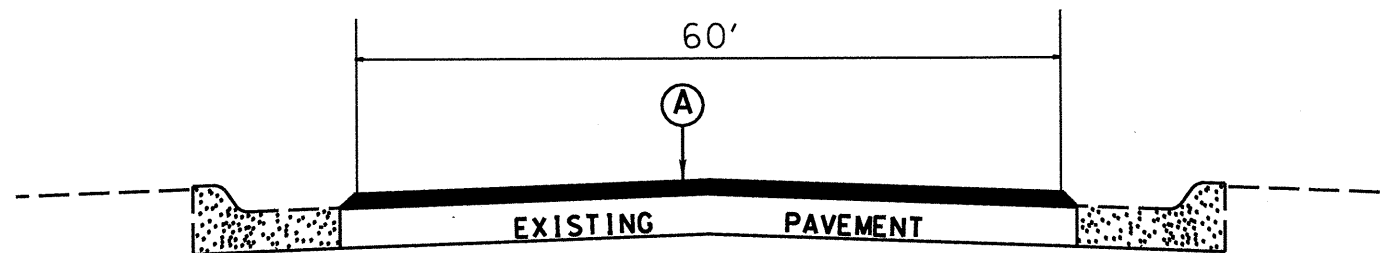
General Notes:

- * Pavement edge slopes are 1:1 unless specified otherwise.
- * Mill bridge approaches 100' to provide a smooth transition or as directed by the Engineer.

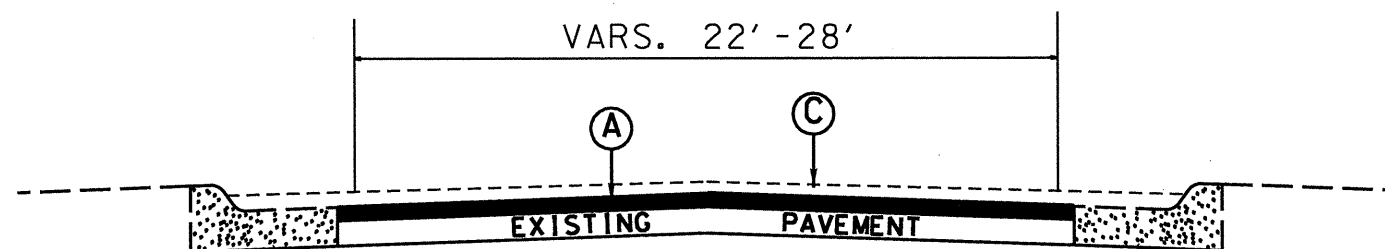
** All Stations increase to the N & E except Map #6 which increase to the west.

**2009 - 2010
Resurfacing Program
Typical Sections
Catawba County NC**

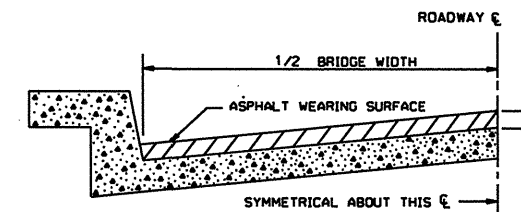
Checked by: Drawn by: G. Brittain



TYPICAL SECTION NO. 3
MAP # 13 (entire map)



TYPICAL SECTION NO. 4
MAP # 6 STA 11+00 TO 38+00
STA 44+00 TO 94+00
STA 94+00 TO 99+50
STA 112+00 TO 117+50
MAP # 7 STA 45+25 TO 69+50
STA 76+25 TO 127+00
MAP # 8 STA 0+00 TO 22+00



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.

NOTES

ALL UNPAVED S.R. ROADS TO BE SURFACED 50' FROM EDGE OF PAVEMENT OF MAIN PROJECT.

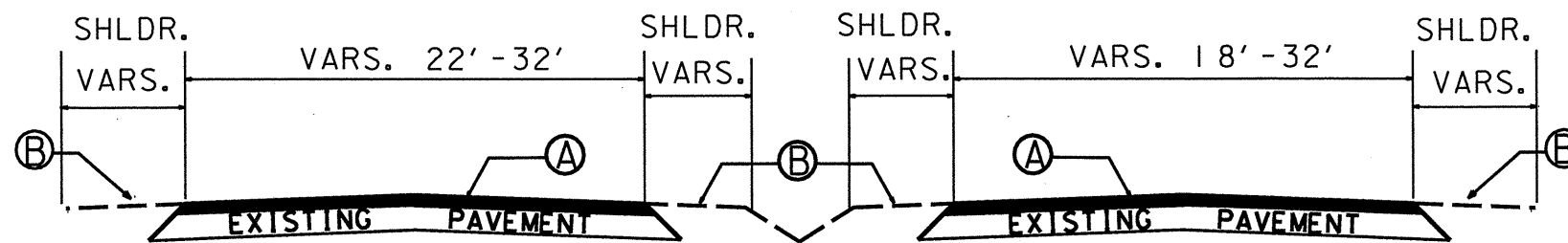
ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE ROAD, OR AS DIRECTED BY THE ENGINEER.

EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.

SHOULDERS AND DITCHES ARE TO BE CONSTRUCTED BY OTHERS UNLESS OTHERWISE NOTED.

BRIDGES TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.

PAVEMENT SCHEDULE	
A	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
B	EARTH MATERIAL (SHOULDER RECONSTRUCTION)
C	MILL ASPHALT PVMT. APPROX. 1.5" TO 3.0" AS DIRECTED BY ENGINEER
D	PROP. APPROX. 6 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I 19.0C, IN TWO 3 1/4" LIFTS AT AN AVERAGE RATE OF 370.5 LBS. PER SQ. YD.
E	MILL ASPHALT PAVEMENT APPROX. 8.0" IN TWO 4.0" LIFTS



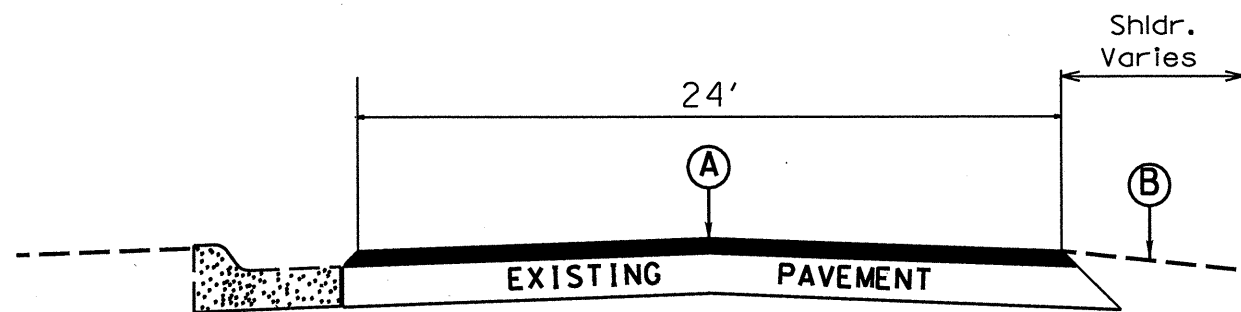
TYPICAL SECTION NO. 5
MAP # 1 STA. 42+00 TO 50+00
MAP # 5 (ENTIRE MAP)

** All Stations increase to the N & E except Map #6 which increase to the west.

General Notes:

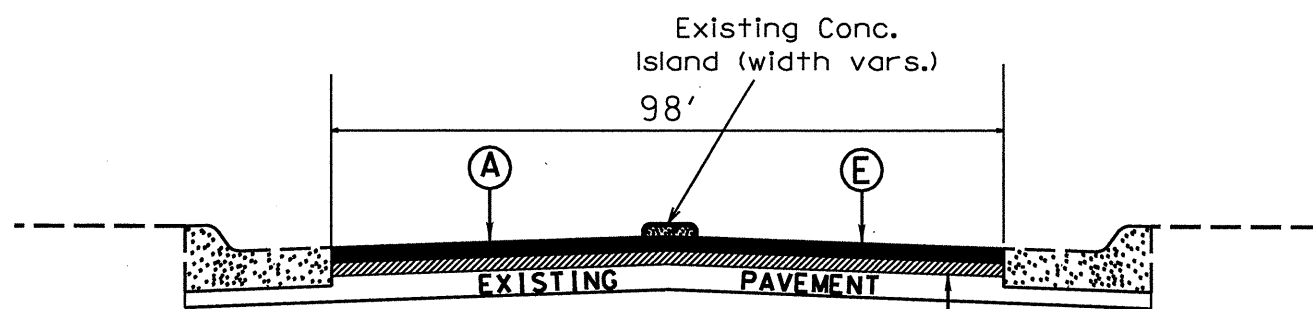
- * Pavement edge slopes are 1:1 unless specified otherwise.
- * Mill bridge approaches 100' to provide a smooth transition or as directed by the Engineer.

2009 - 2010
Resurfacing Program
Typical Sections
Catawba County NC



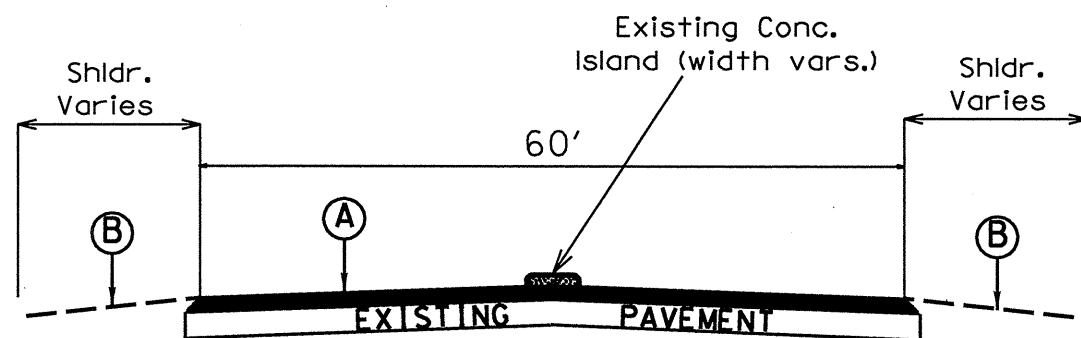
TYPICAL SECTION NO. 6

MAP # 2 STA 0+00 TO 20+00
 MAP # 3 STA 125+50 TO 127+50
 MAP # 8 STA 22+00 TO 28+00



TYPICAL SECTION NO. 7

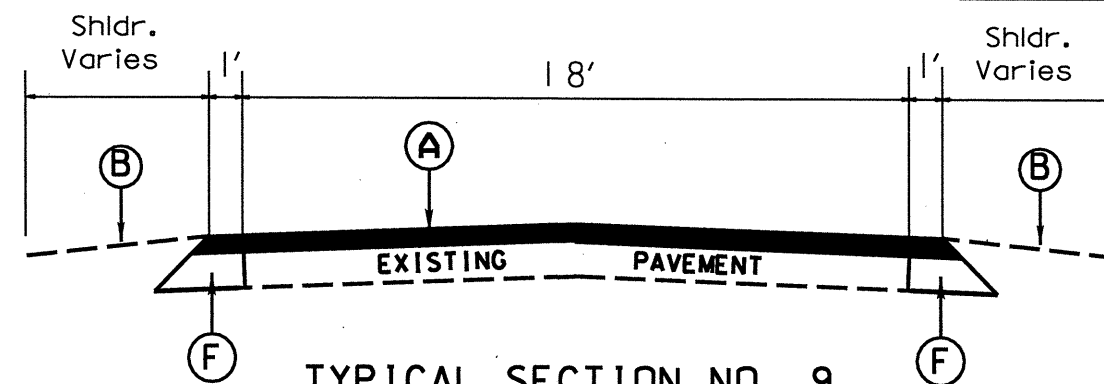
MAP # 3 STA. 127+50 TO 132+50
 ** OR AS DIRECTED BY ENGINEER



TYPICAL SECTION NO. 8

MAP # 1 STA. 28+00 TO 42+00

** All Stations increase to the N & E except Map #6 which increase to the west.



TYPICAL SECTION NO. 9

MAP # 14 (ENTIRE MAP)



**DETAIL A
 MILLING BRIDGE APPROACHES**

PAVEMENT SCHEDULE	
A	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
B	EARTH MATERIAL (SHOULDER RECONSTRUCTION)
C	MILL ASPHALT PAVEMENT APPROX. 1.5" TO 3.0" AS DIRECTED BY ENGINEER
D	PROP. APPROX. 6 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I 19.0C, PLACED IN TWO 3 1/4" LIFTS AT AN AVERAGE RATE OF 370.5 LBS. PER SQ. YD.
E	MILL ASPHALT PAVEMENT APPROX. 8.0" IN TWO 4.0" LIFTS
F	PROP. APPROX 8" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, PLACED IN TWO 4" LIFTS AT AN AVERAGE RATE OF 456 LBS PER SQ. YD.
Y1	MIILL ASPHALT PVMT. APPROX. 0 - 1.5" FOR INCIDENTAL MILLING

General Notes:

- * Pavement edge slopes are 1:1 unless specified otherwise.
- * Mill bridge approaches 100' to provide a smooth transition or as directed by the Engineer.

**2009 - 2010
 Resurfacing Program
 Typical Sections
 Catawba County NC**

PROJECT NO.	SHEET NO.	TOTAL NO.
12CR.10181.9 & 12CR.20181.10	12	13

SUMMARY OF QUANTITIES

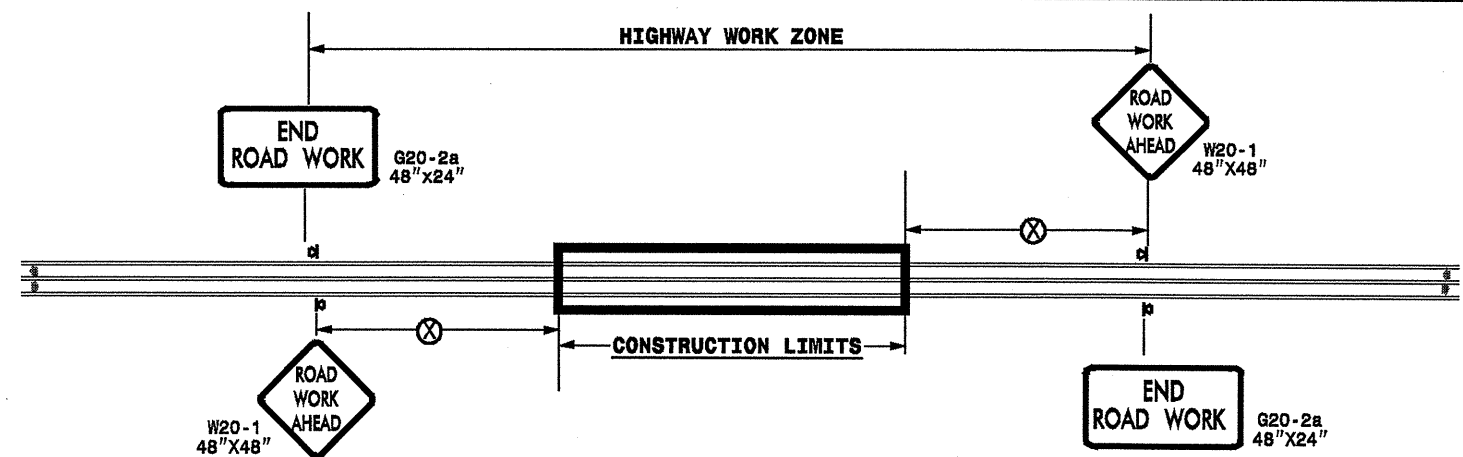
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	FINAL SURFACE TESTING REQUIRED	LENGTH MI	WIDTH FT	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	1.5" TO 3" MILLING SY	4" MILLING SY	INCIDENTAL MILLING SY	BASE COURSE, B25.0B TONS	INTER-MEDIATE COURSE, I19.0C TONS	SURFACE COURSE, S9.5B TONS	LEVELING COURSE, S9.5B TONS	PG 64-22 PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	AST MAT COAT #6 SY	CATCH BASIN EA	DROP INLET EA	MANHOLES EA	METER OR VALVE BOX EA	PORTABLE LIGHTING LS	INDUCTIVE LOOP SAWCUT LF
12CR.10181.9	Catawba	1	US 70	FROM EXST. PVT. JT APPROX. 800' E OF US 321-B TO C & G FOR NEW NC 16 (THORNBURG DR)	1,5,8	NO	1.30	vars. 22-60	40	2.90			500			2,218	220	147	300							
12CR.10181.9	Catawba	2	US 70	FROM EXST. PVT. JT. FOR NEW NC16(THORNBURG DR.) TO EXST. PVT. JT. NEAR CITY OF CLAREMONT SIGN	1,6	NO	2.59	22	40	4.81						3,264	320	217	500				1	4		
12CR.10181.9	Catawba	3	US 70	FROM BURKE CO. LINE TO US 321	1,6,7	NO	2.55	vars. 52-98	20	4.85		11,000	1,100		2,200	8,428	600	646	800			3	5	3		500
12CR.10181.9	Catawba	4	NC 127	FROM SR 2959 TO SR 1306	2	NO	1.34	vars. 48-60	0	0	40,000					3,534	350	235	600		1		10	20		1,250
TOTAL FOR PROJ NO. 12CR.10181.9							7.78		100	12.56	40,000	11,000	1,600		2,200	17,444	1,490	1,245	2,200		1	3	16	27		1,750
12CR.20181.10	Catawba	5	1692 (TATE BLVD)	FROM SR 1007 TO SR 1468	5	NO	1.56	64	60	6.24						6,045	600	399	600				1	1	1	
12CR.20181.10	Catawba	6	1692 (1ST. AVE. SW)	FROM SR 1007 TO SR 2231	1,2,4	NO	2.37	vars. 22-35	40	0.60	33,500					3,421	680	242	680				52	28		2,000
12CR.20181.10	Catawba	7	2231 (2ND AVE SW)	FROM SR 1692 EAST TO SR 1692	1,2,4	NO	2.40	vars. 22-30	40	0.77	28,250					3,257	1,500	286	1,500			1	54	42		1,800
12CR.20181.10	Catawba	8	SR 1715 (N. OXFORD ST.)	FROM US 70 TO EXST. PVT. JT. 900' S. OF SR 1709	1,4,6	NO	1.55	vars 20-28	60	2.16	7,100		1,000			2,056	200	136	300			1	8	6		200
12CR.20181.10	Catawba	9	SR 1709 (ROCKBARN RD.)	FROM 300' N. OF SR 1715 TO SR 1006	1	NO	2.44	20	60	4.88			750			2,662	400	184	600							
12CR.20181.10	Catawba	10	SR 2959 (CENTER ST.)	FROM US 70 TO NC 127	2	NO	0.12	44	20	0	3,100					294	30	20	30					3		400
12CR.20181.10	Catawba	11	SR 1008 (HICKORY - LINC. HWY)	FROM SR 2087 TO NC 10	1	NO	1.16	20	20	2.32						1,265	360	99	400	13,611						
12CR.20181.10	Catawba	12	SR 1318 (29TH AVE DR NW)	FROM NC 127 TO SR 1321	1	NO	1.30	18.5	40	2.60						1,346	140	90	140				1	4		
12CR.20181.10	Catawba	13	SR 2932 (CATAWBA VALLEY BLVD)	FROM SR 1146 TO SR 1005	3	NO	1.29	60	0							4,235	400	280	600							
12CR.20181.10	Catawba	14	SR 2032 (OLD STATE RD)	FROM SR 1008 TO NEW PVT. AT SR 2031	9	NO	0.60	20	20	1.20				500		655	80	66	100							
12CR.20181.10	Catawba	15	SR 1614 (34TH AVE CT NE)	FROM SR 1614 TO THE END OF PAVEMENT	1	NO	0.30	20	20	0.60						312	40	21	60							
12CR.20181.10	Catawba	16	SR 2355 (35TH ST LN NE)	FROM SR 1529 TO THE END OF PAVEMENT	1	NO	0.10	20	0	0.20						109	10	7	15							
12CR.20181.10	Catawba	17	SR 2228 (23RD ST NE & 22ND AVE NE)	FROM SR 1402 TO SR 1438	1	NO	0.38	19.5	20	0.76						386	40	26	60				3	1		
12CR.20181.10	Catawba	18	SR 2316 (HORSHOE BEND RD)	FROM SR 1491 TO SR 2317	1	NO	0.25	20	20	0.50						260	20	17	30							
12CR.20181.10	Catawba	19	SR 2317 (STEEPLECHASE RD)	FROM SR 3012 TO SR 2392	1	NO	0.54	20	20	1.08						560	40	36	60							
12CR.20181.10	Catawba	20	SR 2392 (HORSHOE BEND RD)	FROM SR 2317 TO END OF PVT	1	NO	0.14	20	20	0.30						160	20	11	20							
TOTAL FOR PROJ NO. 12CR.20181.10							16.50		460	24.21	71,950	0	1,750	500	0	27,023	4,560	1,920	5,195	13,611	0	2	119	85	1	4,400
GRAND TOTAL							24.28		560	36.77	111,950	11,000	3,350	500	2,200	44,467	6,050	3,165	7,395	13,611	1	5	135	112	1	6,150

PROJECT NO.	SHEET NO.	TOTAL NO.
12CR.10181.9 & 12CR.20181.10	13	13

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	4685000000-E	4686000000-E		4697000000-E	4710000000-E	4721000000-E		4725000000-E					4810000000-E		4905000000-N
					4" X 90 M WHITE THERMO LF	4" X 120 M YELLOW THERMO LF	4" X 120 M WHITE THERMO LF	8" X 120 M WHITE THERMO LF	24" X 120 M WHITE THERMO LF	THERMO MSG ONLY 120 M EA	THERMO MSG SCHOOL 120 M EA	THERMO STR & RT ARROW 90 M EA	THERMO LT ARROW 90 M EA	THERMO RT ARROW 90 M EA	THERMO STR & LT ARROW 90 M EA	THERMO STR ARROW 90 M EA	4" WHITE PAINT LF	4" YELLOW PAINT LF	SNOW PLOWABLE MARKERS EA
12CR.10181.9	Catawba	1	US 70	FROM EXST. PVT. JT APPROX. 800' E OF US 321-B TO C & G FOR NEW NC 16 (THORNBURG DR)	13,700	14,500	1,750		150	8		5	22	3	3	10			135
12CR.10181.9	Catawba	2	US 70	FROM EXST. PVMT. JT. FOR NEW NC16(THORNBURG DR.) TO EXST. PVMT. JT. NEAR CITY OF CLAREMONT SIGN	25,500	27,350			100				7						240
12CR.10181.9	Catawba	3	US 70	FROM BURKE CO. LINE TO US 321	25,500	33,650	7,500		330	8		6	60	7		32			400
12CR.10181.9	Catawba	4	NC 127	FROM SR 2959 TO SR 1306		15,000	4,500	1,400	200			12	8	6	2	22			125
TOTAL FOR PROJ NO. 12CR.10181.9					64,700	90,500	13,750	1,400	780	16		23	97	16	5	64			900
					64,700	104,250				16		205							
12CR.20181.10	Catawba	5	1692 (TATE BLVD)	FROM SR 1007 TO SR 1468	17,500	17,500	7,500		300			7	24	14		45			325
12CR.20181.10	Catawba	6	1692 (1ST. AVE. SW)	FROM SR 1007 TO SR 2231		200	3,750	350	200			14		7	24	10			175
12CR.20181.10	Catawba	7	2231 (2ND AVE SW)	FROM SR 1692 EAST TO SR 1692		200	4,500	200	260			22	4		20	4			175
12CR.20181.10	Catawba	8	SR 1715 (N. OXFORD ST.)	FROM US 70 TO 900' BEFORE SR 1709					30					5			25,000	33,000	
12CR.20181.10	Catawba	9	SR 1709 (ROCKBARN RD.)	FROM 300' N. OF SR 1715 TO SR 1006													51,500	50,000	
12CR.20181.10	Catawba	10	SR 2959 (CENTER ST.)	FROM US 70 TO NC 127					60			1	7	2		1	750	2,600	30
12CR.20181.10	Catawba	11	SR 1008 (HICKORY - LINC. HWY)	FROM SR 2087 TO NC 10													24,500	24,500	
12CR.20181.10	Catawba	12	SR 1318 (29TH AVE DR NW)	FROM NC 127 TO SR 1321				75	30					2	2		27,500	27,500	
12CR.20181.10	Catawba	13	SR 2932 (CATAWBA VALLEY BLVD)	FROM SR 1146 TO SR 1005		17,000	4,000		325	8		4	32	10		6			175
12CR.20181.10	Catawba	14	SR 2032 (OLD STATE RD)	FROM SR 1008 TO NEW PVMT. AT SR 2031.					50		6						12,350	12,350	
12CR.20181.10	Catawba	15	SR 1614 (34TH AVE CT NE)	FROM SR 1614 TO END PAVEMENT															
12CR.20181.10	Catawba	16	SR 2355 (35TH ST LN NE)	FROM SR 1529 TO END PAVEMENT															
12CR.20181.10	Catawba	17	SR 2228 (23RD ST NE & 22ND AVE NE)	FROM SR 1402 TO SR 1438															
12CR.20181.10	Catawba	18	SR 2316 (HORSHOE BEND RD)	FROM SR 1491 TO SR 2317															
12CR.20181.10	Catawba	19	SR 2317 (STEEPLECHASE RD)	FROM SR 3012 TO SR 2392															
12CR.20181.10	Catawba	20	SR 2392 (HORSESHOE BEND RD)	FROM SR 2317 TO END PVMT															
TOTAL FOR PROJ NO. 12CR.20181.10					17,500	34,900	19,750	625	1,255	8	6	48	67	40	46	66	141,600	149,950	880
					17,500	54,650				14		267					291,550		
GRAND TOTAL					82,200	125,400	33,500	2,025	2,035	24	6	71	164	56	51	130	141,600	149,950	1,780
					82,200	158,900				30		472					291,550		

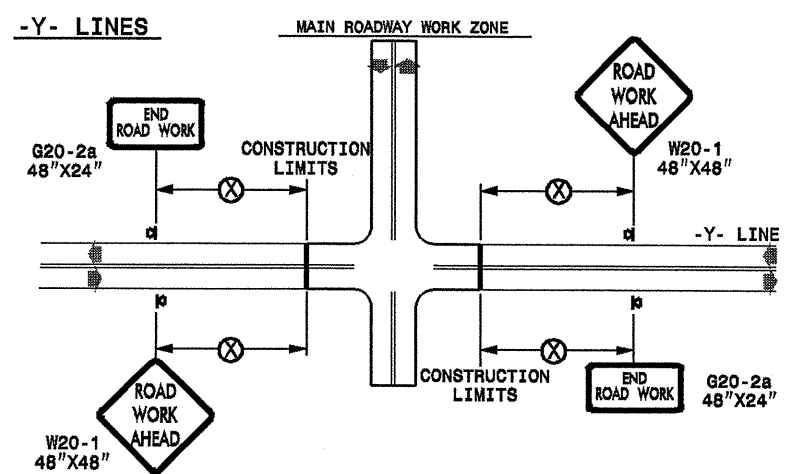
TWO-WAY UNDIVIDED ** (L-LINES)



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)



DETAIL DRAWING
FOR TWO-WAY UNDIVIDED
WORK ZONE WARNING SIGNS

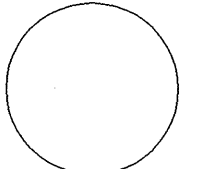

GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCE WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH PORTABLE WORK ZONE SIGN STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER. PORTABLE WORK ZONE SIGNS MAY BE ROLL UP OR APPROVED COMPOSITE.
- PROVIDE PORTABLE WORK ZONE SIGN STANDS, PORTABLE SIGNS AND SIGN SHEETING WHICH ARE LISTED ON THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCT LIST OR ACCEPTED AS TRAFFIC QUALIFIED BY THE TRAFFIC CONTROL UNIT.
- ** TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND

- ◀ PORTABLE SIGN
- ➔ DIRECTION OF TRAFFIC FLOW

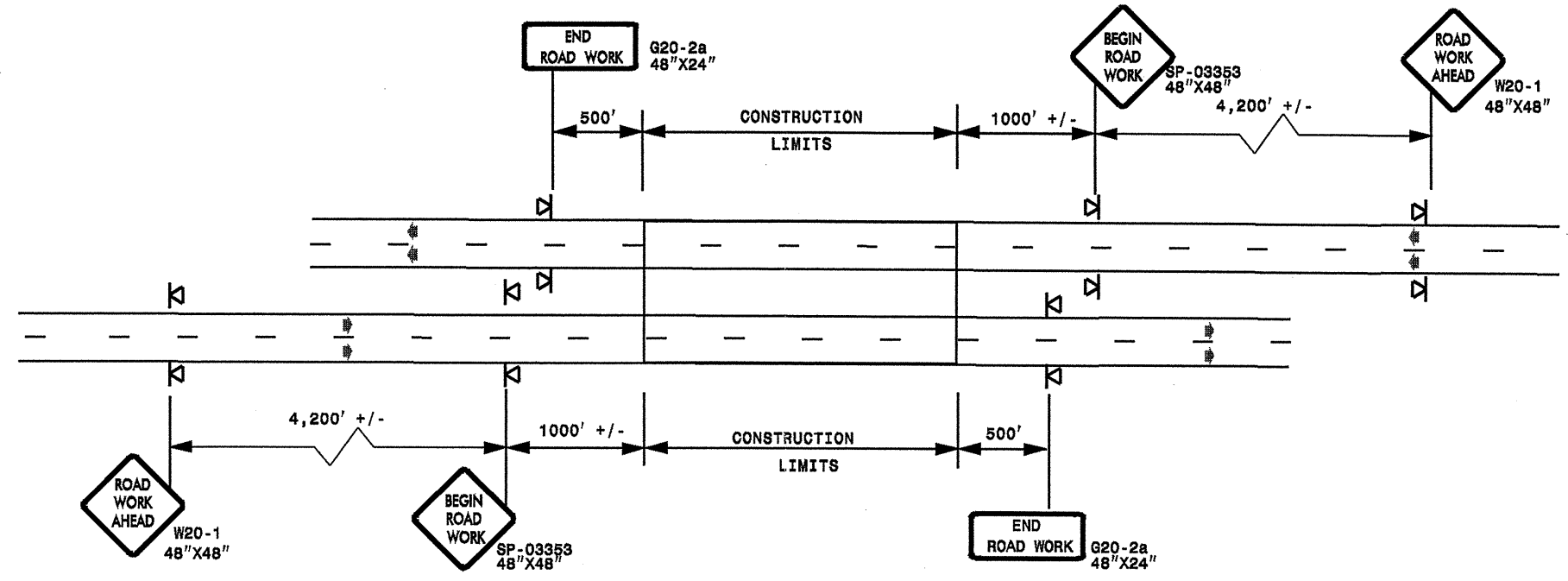
SHEET 1 OF 1

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:			

28-OCT-2009 14:36
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 28-OCT-2009 14:36
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ADVANCE WORK ZONE WARNING SIGNING FOR FREEWAYS (4 LANES OR GREATER)

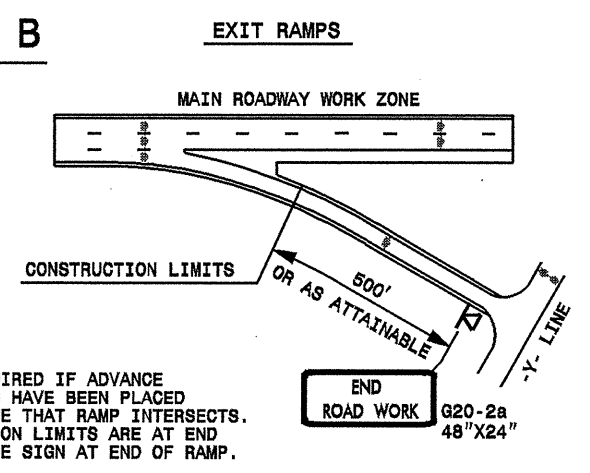
DETAIL A



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

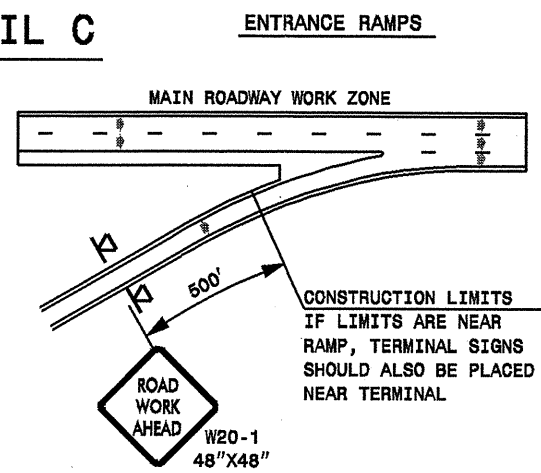
ROADWAYS INTERSECTING ALONG FREEWAY WORK ZONE (Y-LINES)

DETAIL B



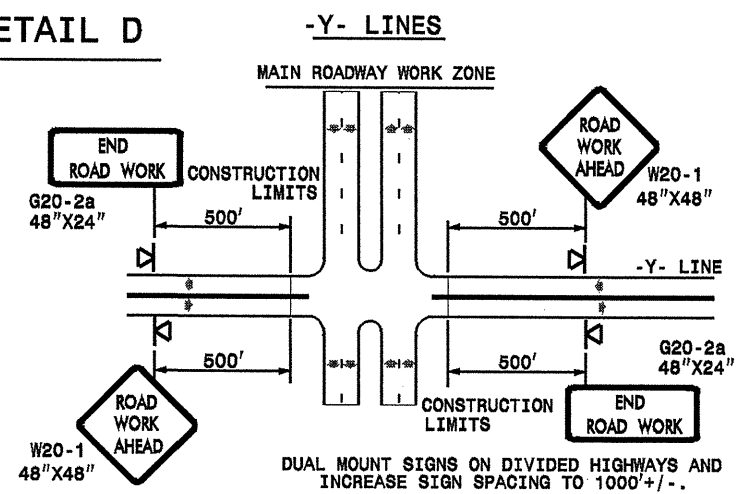
NOTE:
SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

DETAIL C



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

DETAIL D



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

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

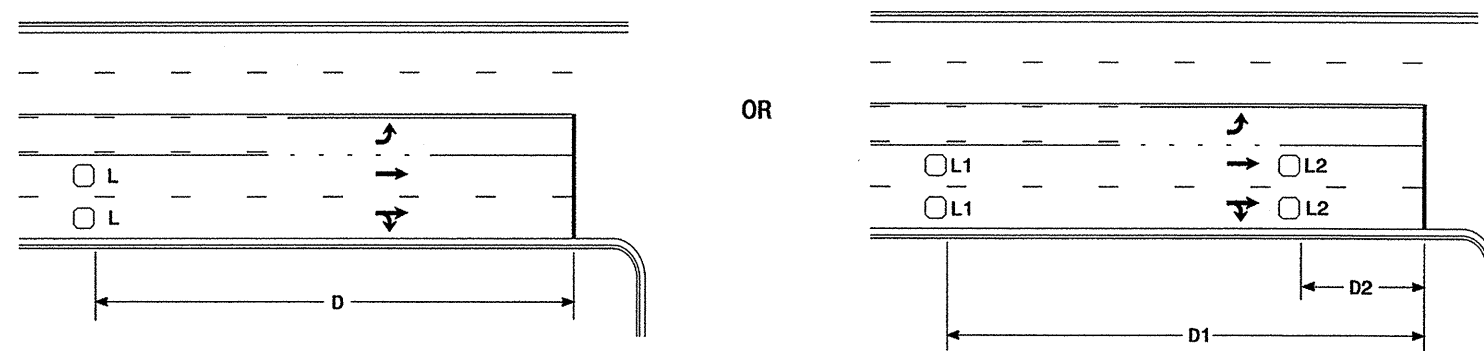
➡ DIRECTION OF TRAFFIC FLOW

SHEET 1 OF 1

28-OCT-2009 14:35 s:\signing\resur\resur_facing2009\div\12cr10181.9x2.ctb\c:\atawba.us\m20\c202499a-b_12cr10181.9x2_freeway4lanesgreat\july2006_portable.dgn p:\psymore AT #ZTC237502

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

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

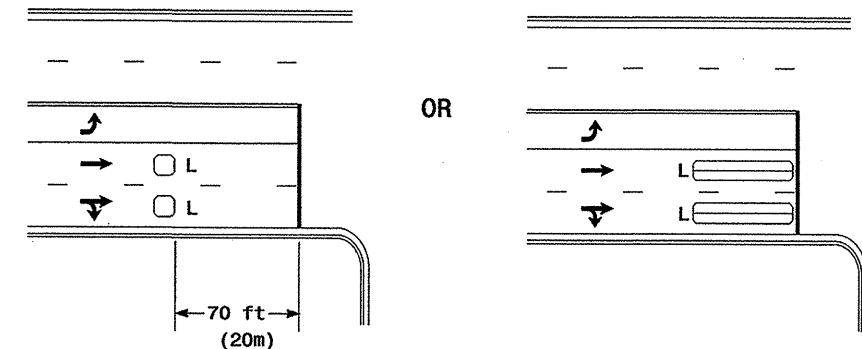
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

Volume Density Operation

"Stretch" Operation

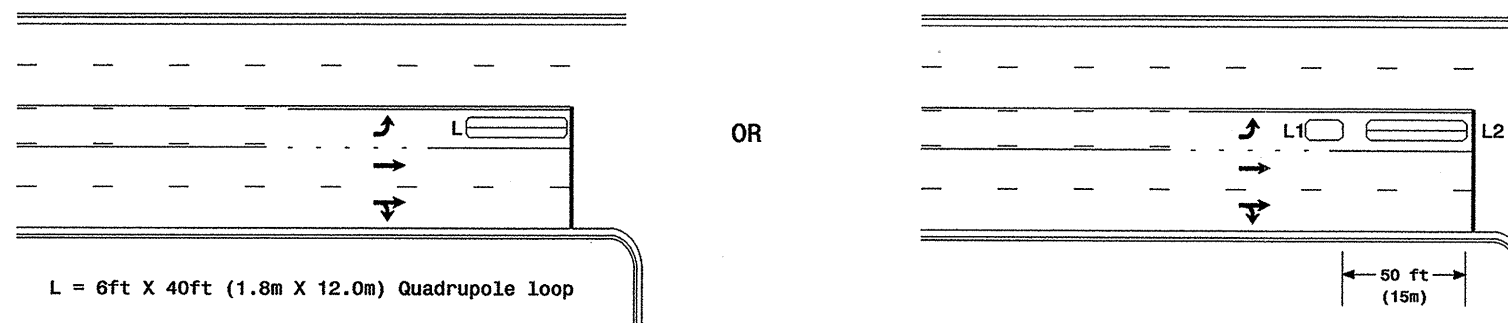
Low Speed Detection [≤35 mph (56 km/hr)]



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



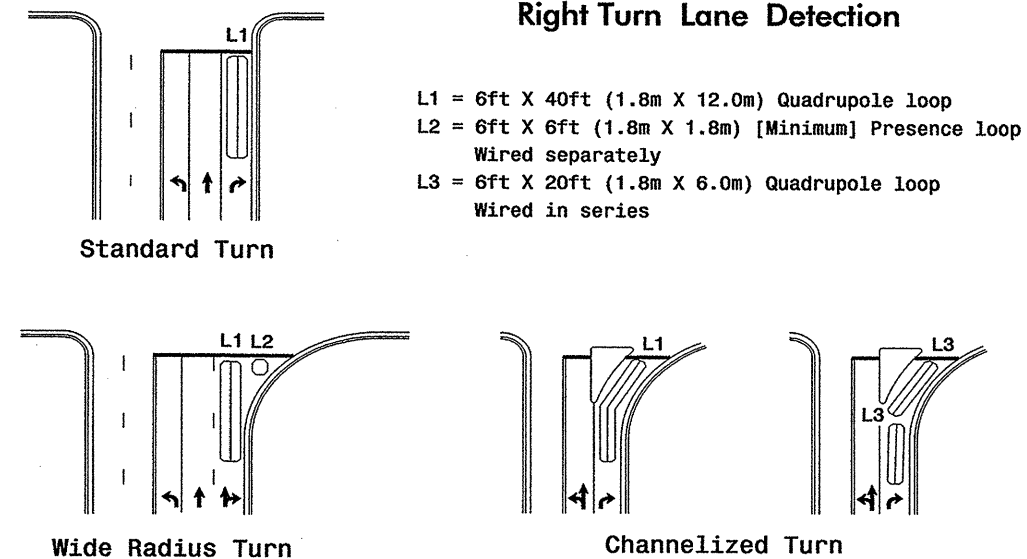
L = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

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

Presence Loop Detection

Queue Loop Detection

Right Turn Lane Detection



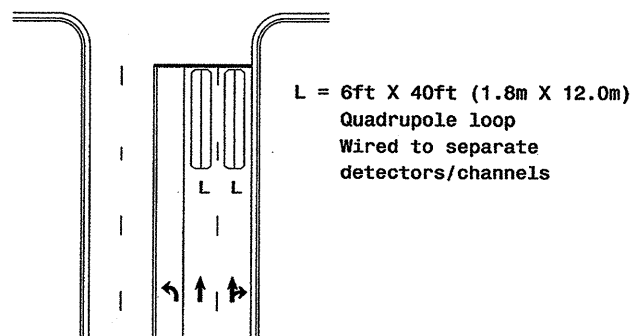
L1 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop
Wired separately
L3 = 6ft X 20ft (1.8m X 6.0m) Quadrupole loop
Wired in series

Standard Turn

Wide Radius Turn

Channelized Turn

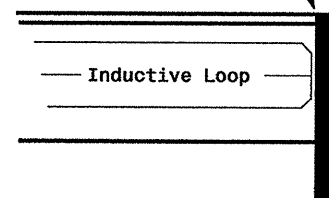
Side Street Detection



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:
The State of North Carolina
Department of Transportation
Bureau of Traffic Engineering
122 N. McDowell St., Raleigh, NC 27603

SCALE: N/A

Typical Loop Locations

PLAN DATE: June 2006
PREPARED BY: P L Alexander
REVIEWED BY: [Signature]

REVISIONS: [Table with 3 columns: No., Description, Date]

INITIALS: [Signature]
DATE: 12/1/06

SIGNATURE: [Signature]
DATE: 12/1/06

SEAL: [Professional Engineer Seal]

SIG. INVENTORY NO.:

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

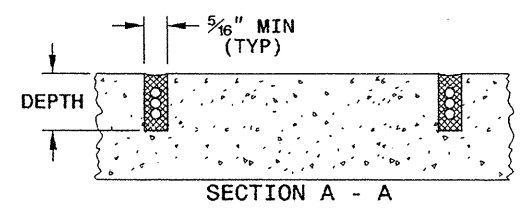
11-08

INDUCTIVE DETECTION LOOPS
 ENGLISH DETAIL DRAWING FOR

SHEET 1 OF 3
 1725D01

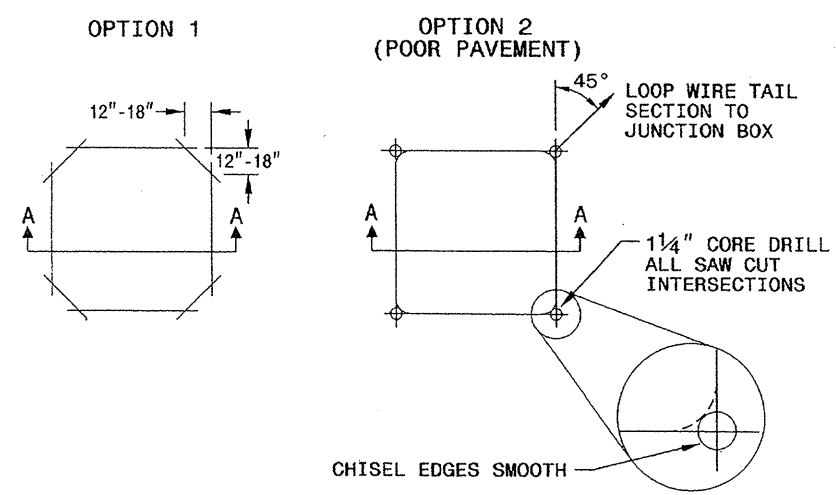
SAW SLOT DEPTH CHART

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

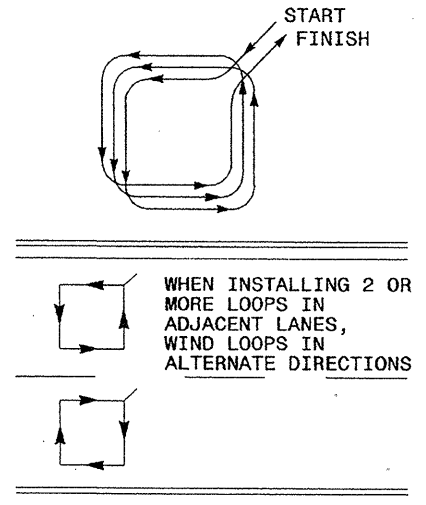


CONVENTIONAL 4-SIDED LOOP

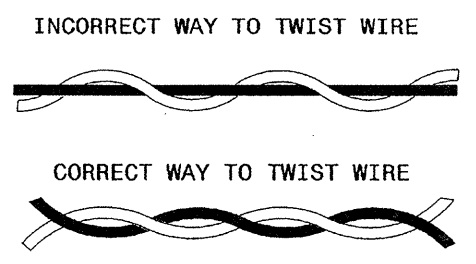
SAW CUT OPTIONS



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

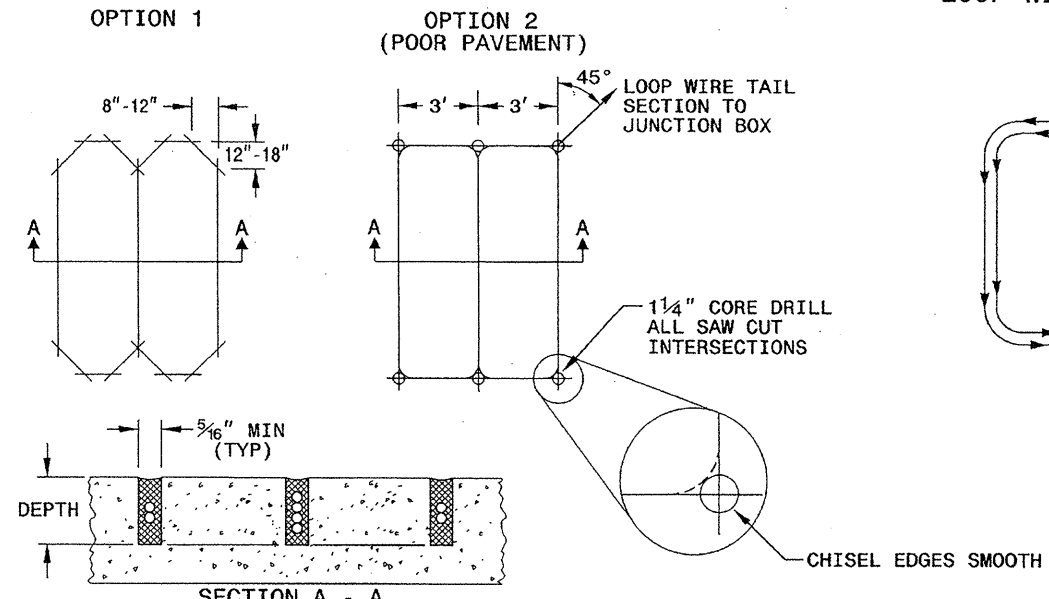


NOTES

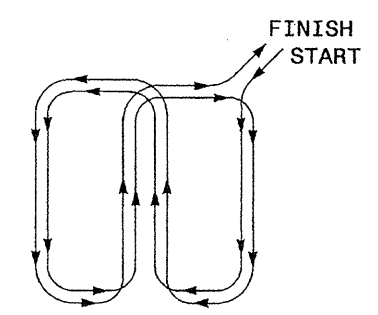
- OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
- MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
- WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
- LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

QUADRUPOLE LOOP

SAW CUT OPTIONS



LOOP WINDING METHOD



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

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

11-08

INDUCTIVE DETECTION LOOPS
 ENGLISH DETAIL DRAWING FOR

SHEET 1 OF 3
 1725D01

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
 Garner, NC 27529

SEAL

Milton I. Dean 4/24/08
 SIGNATURE DATE

24-Nov-2008 09:28
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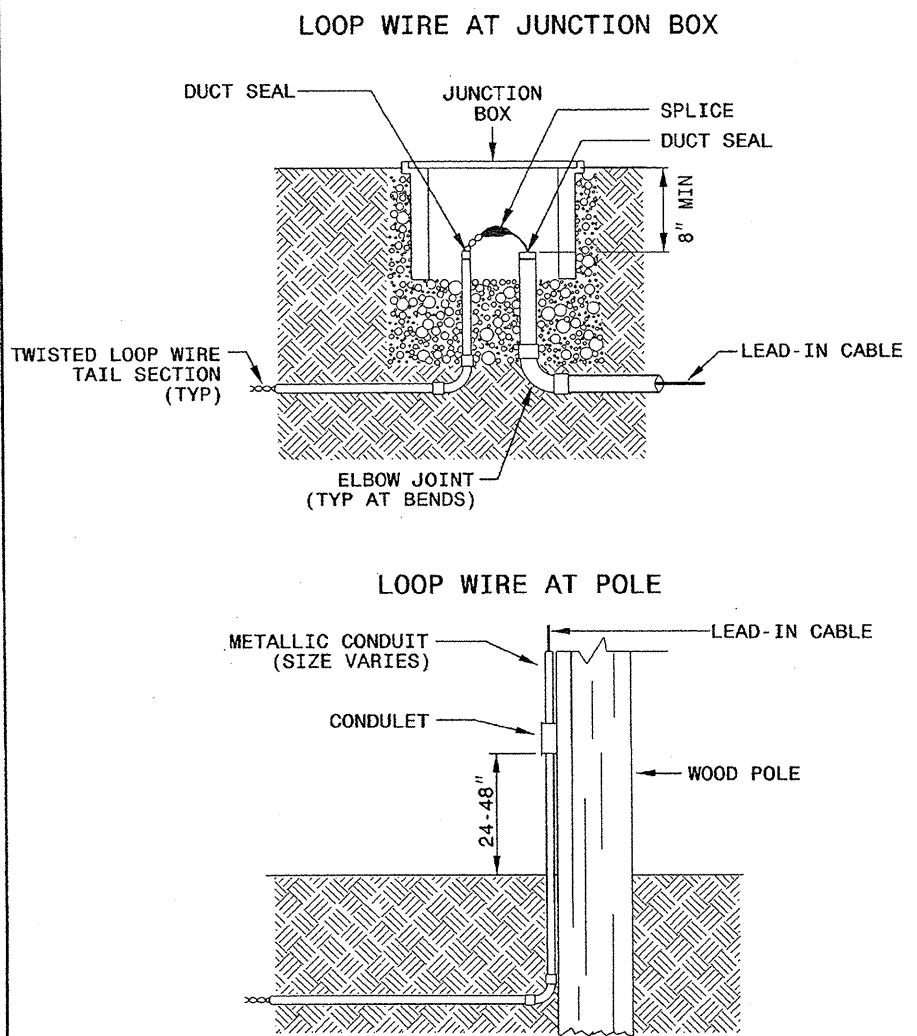
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

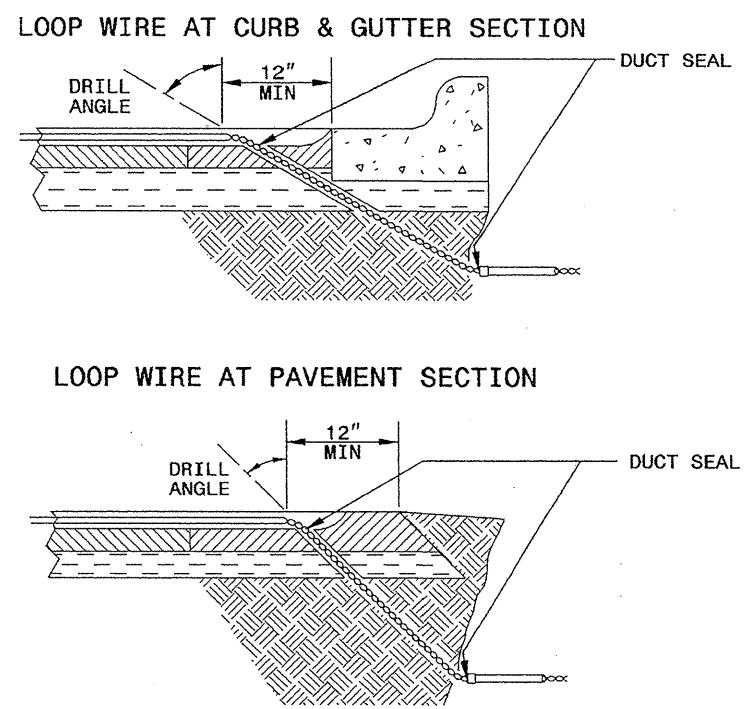
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS



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

LOOP WIRE PAVEMENT EDGE DETAILS



- 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.

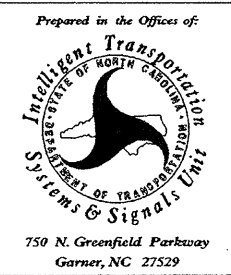
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

11-08

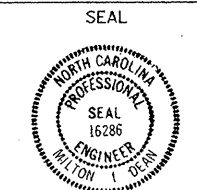
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title



750 N. Greenfield Parkway
 Garner, NC 27529



Milton I. Dean 11/24/08
 SIGNATURE DATE

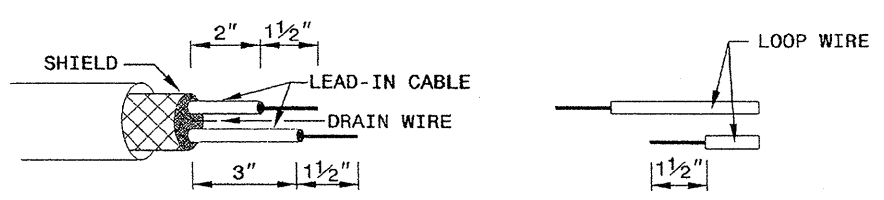
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

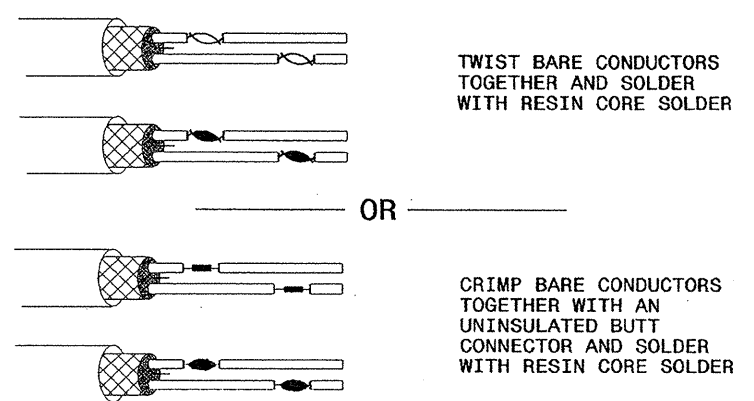
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

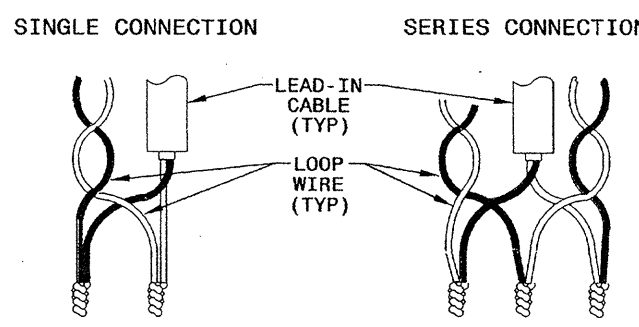


STEP 2. CONNECT AND SOLDER

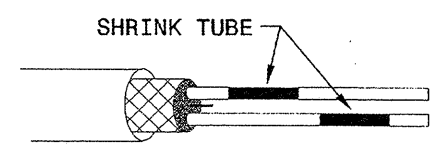


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

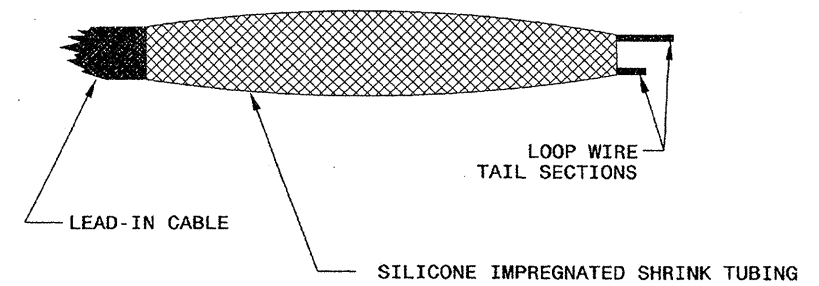
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

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

SHEET 3 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

Milton I. Dean 11/24/08
SIGNATURE DATE

24-Nov-2008 09:35
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