

PROJECT NO.	SHEET NO.	TOTAL NO.
2022CPT.11.02.10951	1	2
2022CPT.11.02.20951		

### SUMMARY OF QUANTITIES

Project No.	County	Map No.	Route	Route Name	From Description	To Description	Mile Post From	Mile Post To	TYP NO	LANE TYPE	LENGTH	WIDTH	0106000000-E	1220000000-E	1245000000-E	1297000000-E	1308000000-E	1330000000-E	1519000000-E	1520000000-E	1575000000-E	1704000000-E	2815000000-N	2830000000-N	2845000000-N	7288000000-E	7300000000-E	7324000000-N	7444000000-E	7456000000-E	6084000000-E									
													BORROW EXCAVATION	INCIDENTAL STONE BASE	SHOULDER RECONSTRUCTION	1.5" MILLING	0-3" MILLING	INCIDENTAL MILLING	SURFACE COURSE, S9.5B	SURFACE COURSE, S9.5B (LEVELING)	ASPHALT BINDER FOR PLANT MIX	PATCHING EXISTING ASPHALT	ADJ. OF DROP INLETS	ADJ. OF MANHOLES	ADJ. OF METER OR VALVE BOX	PAVED TRENCHING (***** LF	UNPAVED TRENCHING (***** LF	JUNCTION BOX (STANDARD SIZE)	INDUCTIVE LOOP	LEAD-IN CABLE	SEED & MULCHING									
												MI	FT	CY	TONS	SMI	SY	SY	SY	TON	TON	TON	TON	EA	EA	EA	LF	LF	EA	LF	LF	AC								
2022CPT.11.02.10951	Watauga	1	US 221	Blowing Rock Blvd	SR 1602	NC 105	13.82	15.18	1	MU	1.36	61				48,813		1,000	4,631		310			2	10	10	300	300	5	6,250	300									
2022CPT.11.02.10951	Watauga	2	US 421	US 421	WILKES	SR 1361	0.00	1.55	2	MU	1.55	65	155	30	1.55		1,200	500	5,364		359	536											0.56							
2022CPT.11.02.10951	Watauga	3	US 421	US 421	SR 1361	BEG MEDIAN	1.55	2.62	2	MU	1.07	85	107	15	1.07		600	500	4,842		324	484											0.39							
2022CPT.11.02.10951	Watauga	4	US 421	US 421 NB Lanes	Begin Median	R-2915A Project Limits	2.62	2.95	3	MD	0.33	42	33	10	0.33	8,131		500	738		49	74											0.12							
2022CPT.11.02.10951	Watauga	5	US 421	US 421 SB Lanes	R-2915A Project Limits	End Median	23.59	23.92	4	MD	0.33	45	66	10	0.66			500	791		53	79											0.24							
2022CPT.11.02.10951	Watauga	6	NC 194	NC 194 S	SR 1112	US 321	5.34	9.06	5	2WU	3.72	20	744	75	7.44		700	750	3,961		265	396											2.71							
2022CPT.11.02.10951	Watauga	7	NC 194	Jefferson Rd	US 221/US 421	New Market Blvd (NS)	15.75	16.05	6	2WU	0.3	36				6,336		250	575		39			2	2	2														
2022CPT.11.02.10951	Watauga	8	NC 194	Jefferson Rd/NC 194 NB	New Market Blvd (NS)	SR 1306	16.05	17.35	5	2WU	1.3	30	65	15	1.30			1,000	2,076		139	208		2	2	2							0.47							
2022CPT.11.02.10951	Watauga	9	NC 194	NC 194 NB	SR 1306	SR 1339	17.35	21.94	5	2WU	4.59	20	918	90	9.18			600	4,887		327	489											3.34							
<b>TOTAL FOR PROJ NO. 2022CPT.11.02.10951</b>												<b>14.55</b>		<b>2,088</b>	<b>245</b>	<b>21.53</b>	<b>63,280</b>	<b>2,500</b>	<b>5,600</b>	<b>27,866</b>	<b>1,867</b>	<b>2,266</b>	<b>6</b>	<b>14</b>	<b>14</b>	<b>300</b>	<b>300</b>	<b>5</b>	<b>6,250</b>	<b>300</b>			<b>7.83</b>							
2022CPT.11.02.20951	Watauga	10	SR 1530	Aho Rd	Blue Ridge Parkway	SR 1533	0.03	1.96	5	2WU	1.93	18	386	40	3.86			125	1,850	617	165												1.40							
2022CPT.11.02.20951	Watauga	11	SR 1533	Aho Rd	Bridge # 136 Project C203918 Resurfacing Joint	SR 1530	0.09	0.44	5	2WU	0.35	18	70	10	0.70			125	335	112	22												0.25							
<b>TOTAL FOR PROJ NO. 2022CPT.11.02.20951</b>												<b>2.28</b>		<b>456</b>	<b>50</b>	<b>4.56</b>			<b>250</b>	<b>2,185</b>	<b>728</b>	<b>188</b>																		<b>1.66</b>
<b>GRAND TOTAL</b>												<b>16.83</b>		<b>2,544</b>	<b>295</b>	<b>26.09</b>	<b>63,280</b>	<b>2,500</b>	<b>5,850</b>	<b>30,051</b>	<b>728</b>	<b>2,055</b>	<b>2,266</b>	<b>6</b>	<b>14</b>	<b>14</b>	<b>300</b>	<b>300</b>	<b>5</b>	<b>6,250</b>	<b>300</b>			<b>9.49</b>						

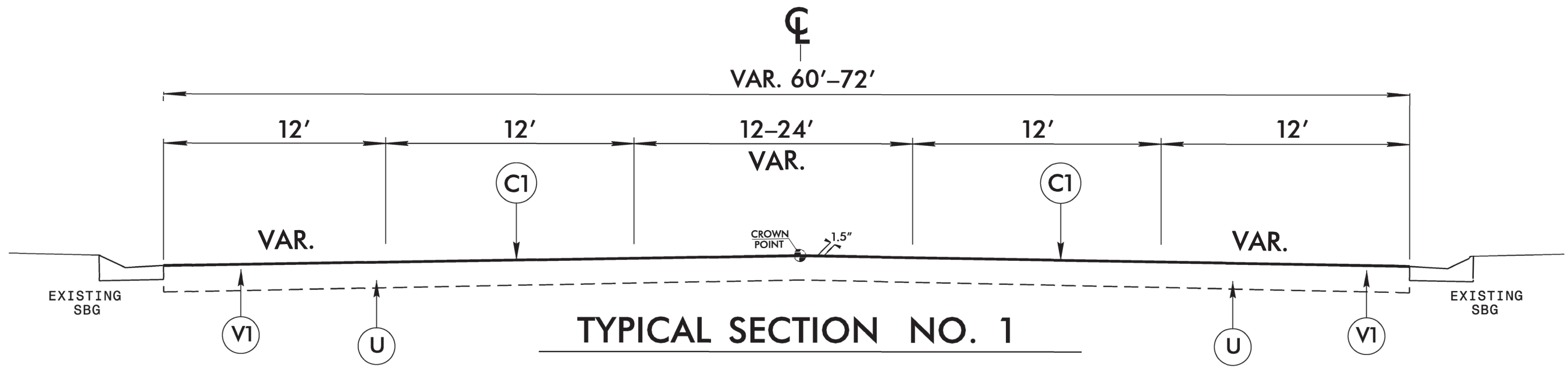
PROJECT NO.	SHEET NO.	TOTAL NO.
2022CPT.11.02.10951	2	2
2022CPT.11.02.20951		

**THERMOPLASTIC AND PAINT QUANTITIES**

Project No.	County	Map No.	Route	Route Name	FROM Description	To Description	Mile Post From	Mile Post To	TYP NO	LANE TYPE	LENGTH		441300000-E		445700000-N		451000000-N		525500000-N		481000000-E		482000000-E		483500000-E		484000000-N				484500000-N		489500000-N	
											MI	FT	WORK ZONE ADVANCE/GENERAL WARNING SIGNING	TEMPORARY TRAFFIC CONTROL	LAW ENFORCEMENT	PORTABLE LIGHTING	4" WHITE PAINT	4" YELLOW PAINT	8" WHITE PAINT	8" YELLOW PAINT	24" WHITE PAINT	PAINT CHARACTER 'SCHOOL'	PAINT CHARACTER 'ONLY'	PAINT STR & RIGHT ARROW	PAINT STR & LEFT ARROW	PAINT STRAIGHT ARROW	PAINT LEFT ARROW	PAINT RIGHT ARROW	NON-CAST IRON SNOW PLOWABLE MARKERS					
											SF	LS	HR	LS	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA						
2022CPT.11.02.10951	Watauga	1	US 221	Blowing Rock Blvd	SR 1602	NC 105	13.82	15.18	1	MU	1.36	61	177	1	24	1	5,000	36,010	250		2,500						20		52	130	16	450		
2022CPT.11.02.10951	Watauga	2	US 421	US 421	WILKES	SR 1361	0.00	1.55	2	MU	1.55	65	202				40,920	32,736		150									4	4	307			
2022CPT.11.02.10951	Watauga	3	US 421	US 421	SR 1361	BEG MEDIAN	1.55	2.62	2	MU	1.07	85	139				28,248	28,248		100	70								70		282			
2022CPT.11.02.10951	Watauga	4	US 421	US 421 NB Lanes	Begin Median	Project Limits	2.62	2.95	3	MD	0.33	42	43				5,227	3,485		150	80								8		22			
2022CPT.11.02.10951	Watauga	5	US 421	US 421 SB Lanes	Project Limits	End Median	23.59	23.92	4	MD	0.33	45	43				5,227	3,485											4		22			
2022CPT.11.02.10951	Watauga	6	NC 194	NC 194 S	SR 1112	US 321	5.34	9.06	5	2WU	3.72	20	484				78,566	78,566			80	12									246			
2022CPT.11.02.10951	Watauga	7	NC 194	Jefferson Rd	US 221/US 421	New Market Blvd (NS)	15.75	16.05	6	2WU	0.30	36	39		16		3,168	6,336	100	100	200	12	8		2	4	8	6		20				
2022CPT.11.02.10951	Watauga	8	NC 194	Jefferson Rd/NC 194 NB	New Market Blvd (NS)	SR 1306	16.05	17.35	5	2WU	1.30	30	169				27,456	27,456			80	12									86			
2022CPT.11.02.10951	Watauga	9	NC 194	NC 194 NB	SR 1306	SR 1339	17.35	21.94	5	2WU	4.59	20	597				96,941	96,941													303			
<b>TOTAL FOR PROJ NO. 2022CPT.11.02.10951</b>												14.55		1,892	1	40	1	290,754	313,262	350	500	3,010	36	8	20	2	56	220	30	1,737				
												604,016						604,016		850		44		328										
2022CPT.11.02.20951	Watauga	10	SR 1530	Aho Rd	Blue Ridge Parkway	SR 1533	0.03	1.96	5	2WU	1.93	18	251				40,762	40,762																
2022CPT.11.02.20951	Watauga	11	SR 1533	Aho Rd	Bridge # 136 Project C203918 Resurfacing Joint	SR 1530	0.09	0.44	5	2WU	0.35	18	46				7,392	7,392																
<b>TOTAL FOR PROJ NO. 2022CPT.11.02.20951</b>												2.28		296				48,154	48,154															
												96,307						96,307																
<b>GRAND TOTAL</b>												16.83		2,188	1	40	1	338,907	361,416	350	500	3,010	36	8	20	2	56	220	30	1,737				
												700,323						700,323		850		44		328										

8/17/99

\* INCIDENTAL MILLING ON ALL MAPS AT LOCATIONS AS DIRECTED BY THE ENGINEER

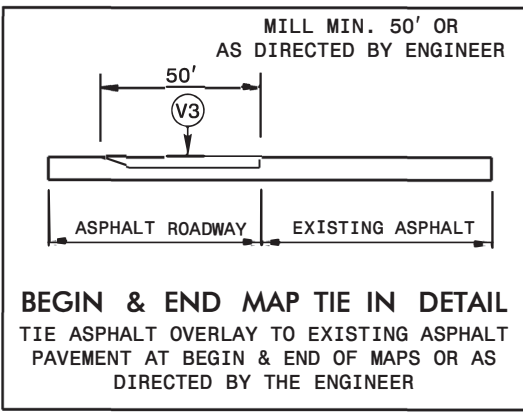
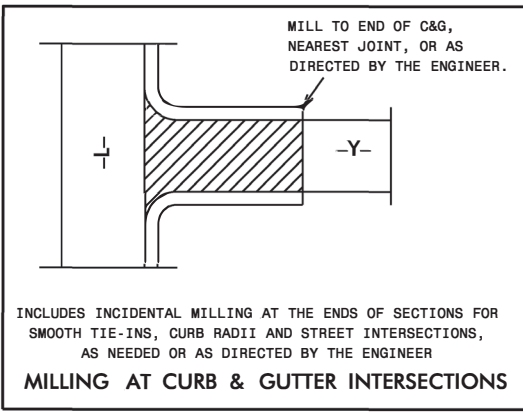


### TYPICAL SECTION NO. 1

MAP 1 - US 221 FROM SR 1602 TO NC 105\*\*

\*\* (Note: End limits for Map 1 are to include all 4 legs of the NC 105 intersection)

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
T	SHOULDER RECONSTRUCTION
U	EXISTING PAVEMENT
V1	MILLING OF EXISTING ASPHALT PAVEMENT AT DEPTH OF 1½"
V3	INCIDENTAL MILLING (See Tie in Detail)



**WATAUGA COUNTY  
PRIMARY & SECONDARY ROADS  
ASPHALT RESURFACING**

REVISIONS	INIT.	DATE

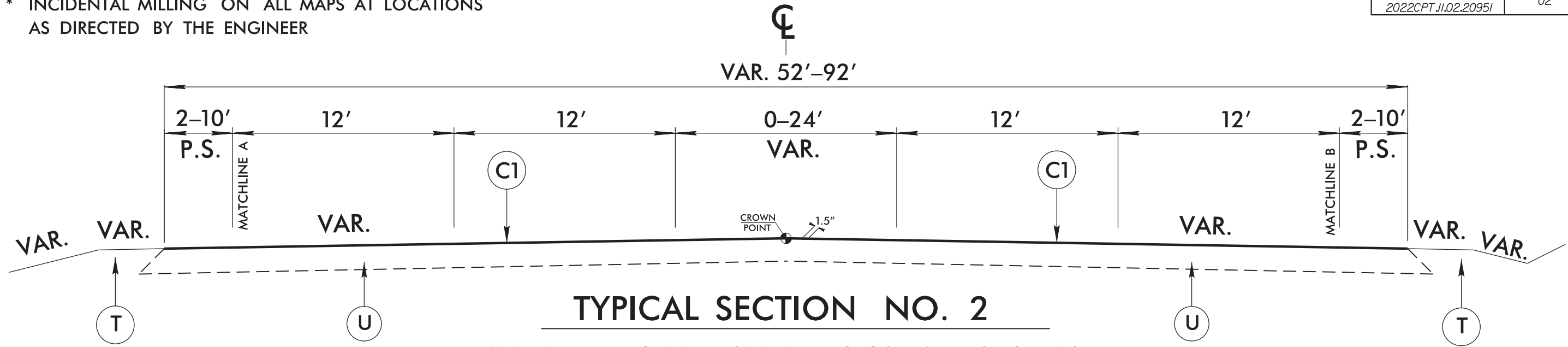
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DIVISION of HIGHWAYS  
DIVISION ELEVEN

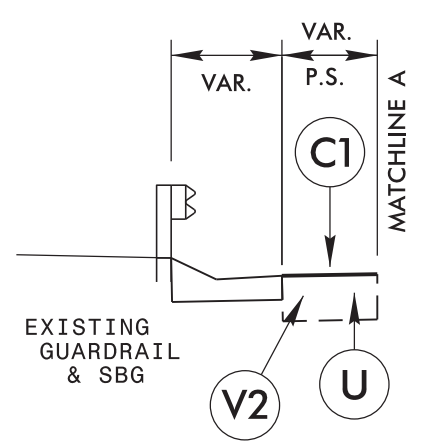


PREPARED BY: DLH  
REVIEWED BY:

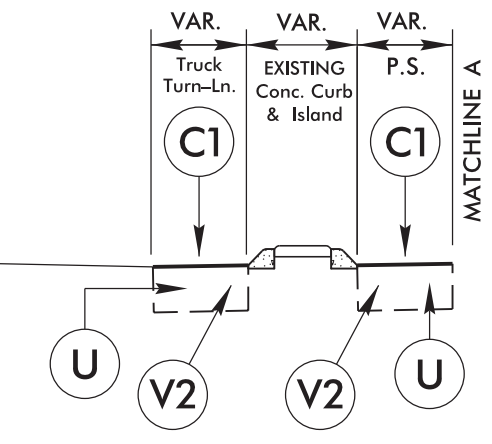
\* INCIDENTAL MILLING ON ALL MAPS AT LOCATIONS AS DIRECTED BY THE ENGINEER



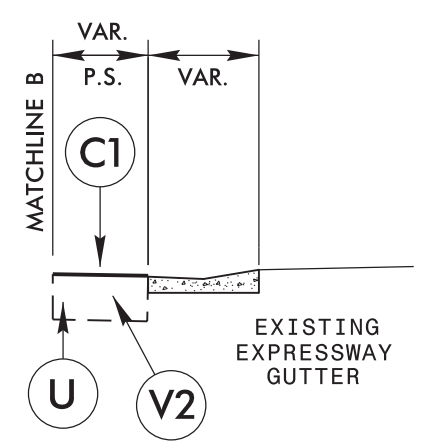
MAP 2 - US 421 FROM WILKES CO. LINE TO SR 1361\*\*  
 MAP 3 - US 421 FROM SR 1361 TO MP 2.62 (BEGIN MEDIAN)\*, \*\*\*



**INSET NO. 2A \***  
 \* INSET NO. 2A IS LEFT SIDE ONLY  
 MAP 3 - VARIOUS SPOT LOCATIONS

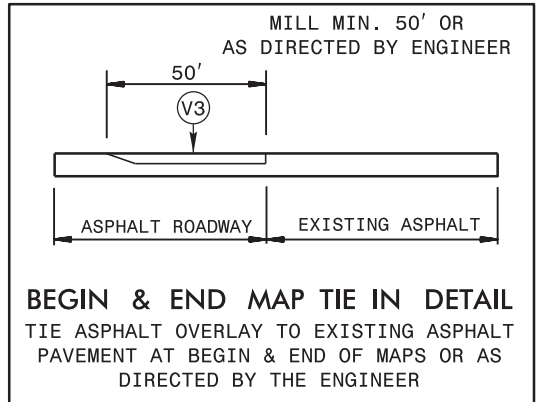


**INSET NO. 2B \*\***  
 \* INSET NO. 2B IS LEFT SIDE ONLY  
 MAP 2 - US 421 FROM MP 0.24 TO MP 0.31



**INSET NO. 2C \*\*\***  
 \* INSET NO. 2C IS RIGHT SIDE ONLY  
 MAP 3 - US 421 FROM MP 2.50 TO 2.62

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
T	SHOULDER RECONSTRUCTION
U	EXISTING PAVEMENT
V2	MILLING OF EXISTING ASPHALT PAVEMENT AT VAR. DEPTH OF 0" - 3"
V3	INCIDENTAL MILLING (See Tie in Detail)



**WATAUGA COUNTY  
 PRIMARY & SECONDARY ROADS  
 ASPHALT RESURFACING**

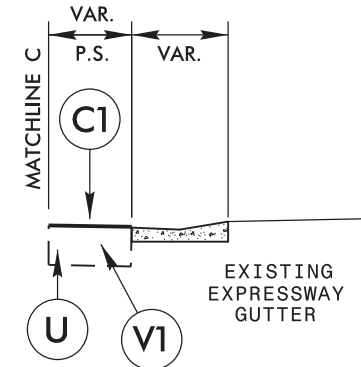
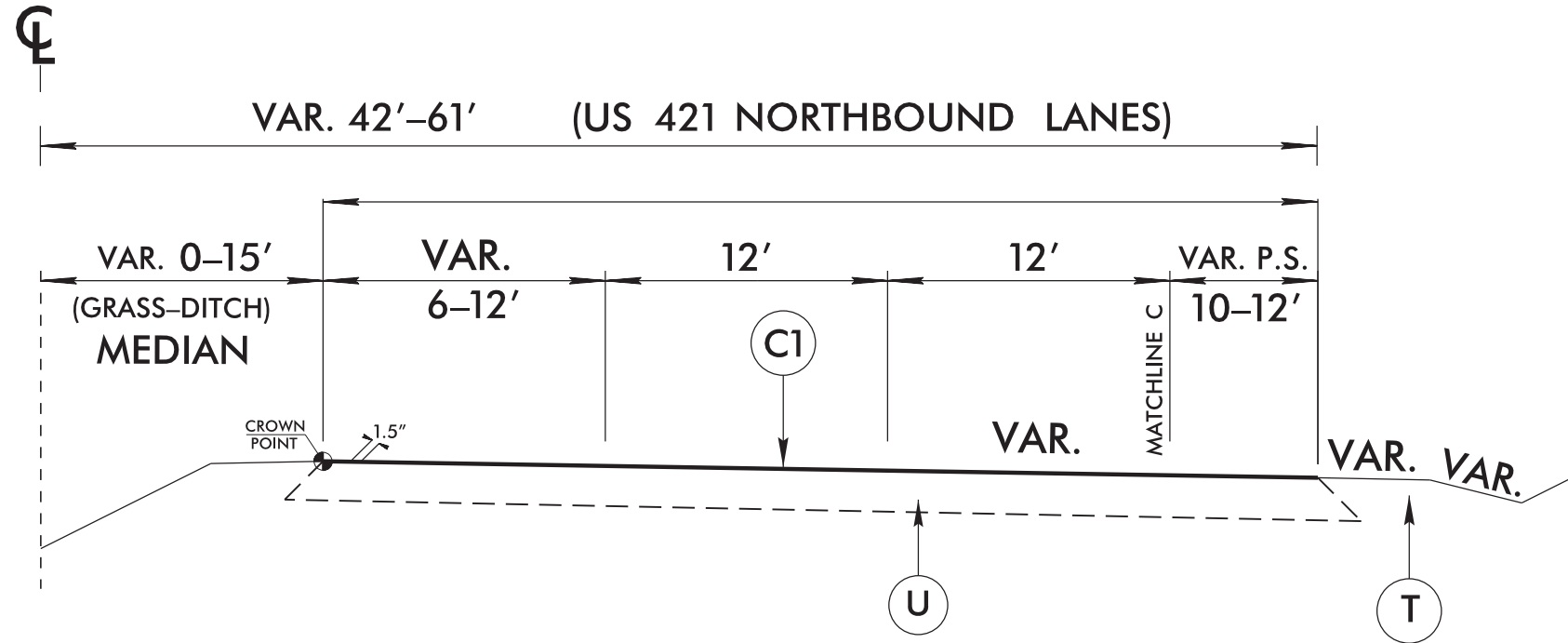
REVISIONS	INIT.	DATE

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 DIVISION of HIGHWAYS  
 DIVISION ELEVEN

SCALE: N/A DATE: 9/15/2021  
 PREPARED BY: DLH  
 REVIEWED BY:   
 REVIEWED BY:

8/17/199

\* INCIDENTAL MILLING ON ALL MAPS AT LOCATIONS AS DIRECTED BY THE ENGINEER

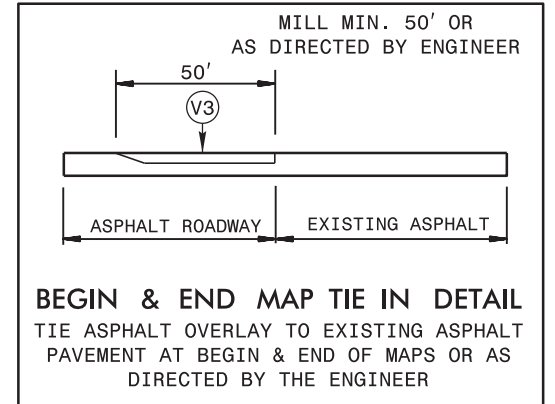


**INSET NO. 3A \*\***

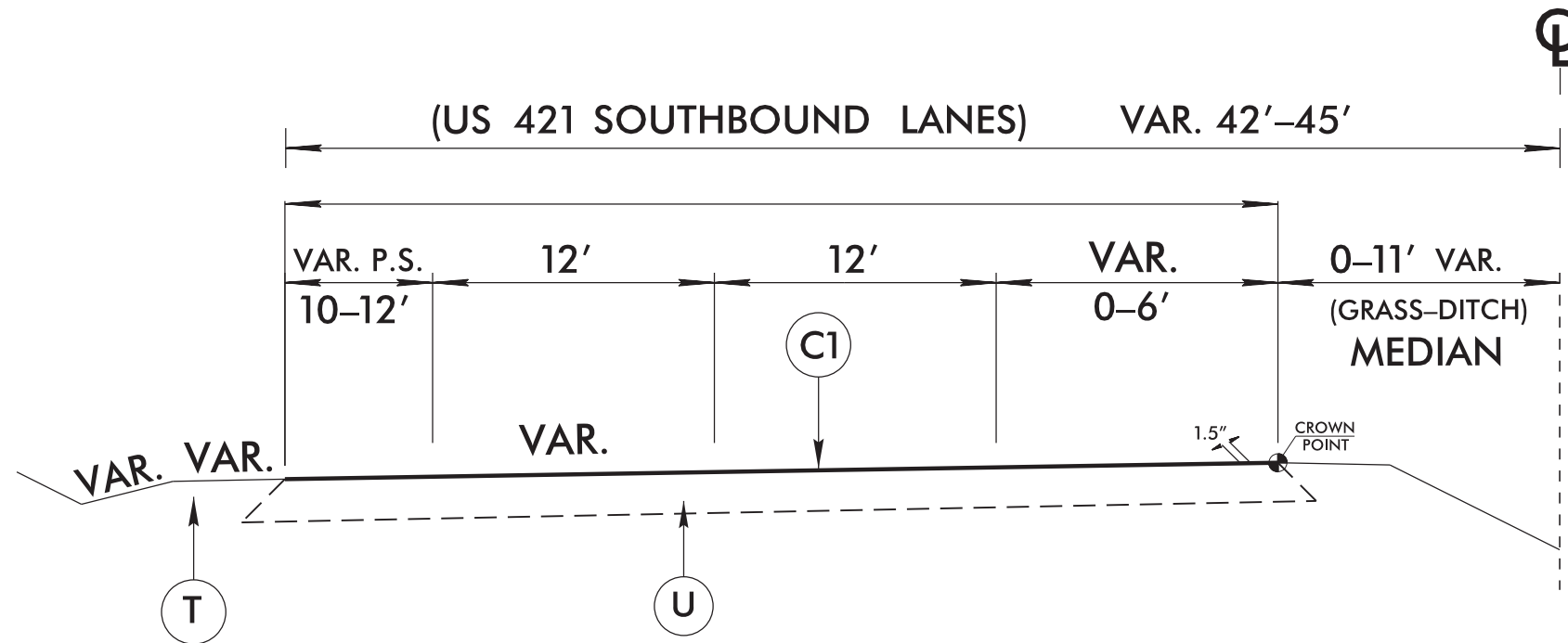
\* INSET NO. 3A IS RIGHT SIDE ONLY  
 MAP 4 - US 421 FROM MP 2.62 TO 2.71 AND MP 2.75 TO 2.92

**TYPICAL SECTION NO. 3**

MAP 4 - US 421 NB FROM MP 2.62 (BEGIN MEDIAN) TO MP 2.95\*\*



**BEGIN & END MAP TIE IN DETAIL**  
 TIE ASPHALT OVERLAY TO EXISTING ASPHALT PAVEMENT AT BEGIN & END OF MAPS OR AS DIRECTED BY THE ENGINEER



**TYPICAL SECTION NO. 4**

MAP 5 - US 421 SB FROM MP 23.59 TO MP 23.92 (END MEDIAN)

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
T	SHOULDER RECONSTRUCTION
U	EXISTING PAVEMENT
V1	MILLING OF EXISTING ASPHALT PAVEMENT AT DEPTH OF 1½"
V3	INCIDENTAL MILLING (See Tie in Detail)

**WATAUGA COUNTY  
 PRIMARY & SECONDARY ROADS  
 ASPHALT RESURFACING**

REVISIONS	INIT.	DATE

SCALE: N/A DATE: 9/15/2021

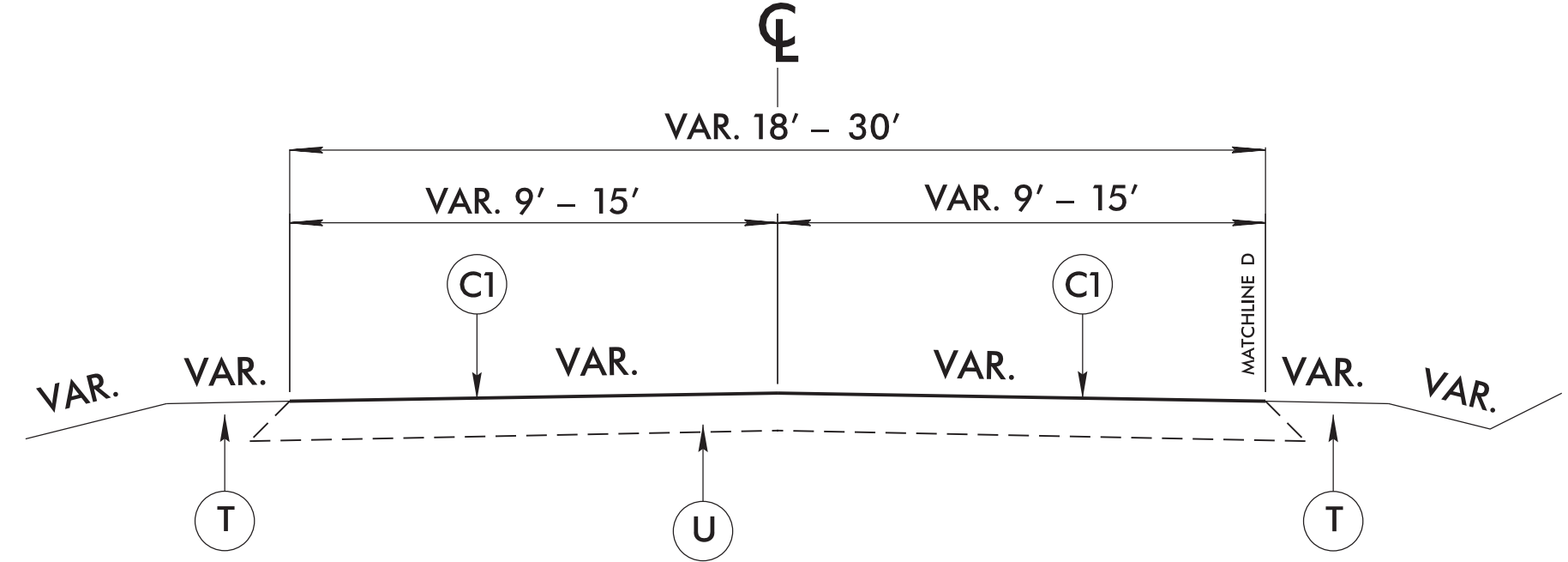
PREPARED BY: DLH  
 REVIEWED BY:  
 REVIEWED BY:

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 DIVISION of HIGHWAYS  
 DIVISION ELEVEN



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 SYSTEMS ENGINEERING  
 PLANNING  
 DESIGN  
 CONSTRUCTION  
 MAINTENANCE  
 OPERATIONS  
 MANAGEMENT

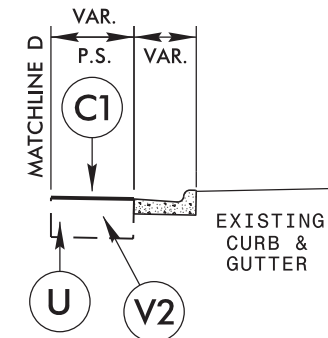
\* INCIDENTAL MILLING ON ALL MAPS AT LOCATIONS AS DIRECTED BY THE ENGINEER



PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
T	SHOULDER RECONSTRUCTION
U	EXISTING PAVEMENT
V1	MILLING OF EXISTING ASPHALT PAVEMENT AT DEPTH OF 1 1/2"
V2	MILLING OF EXISTING ASPHALT PAVEMENT AT VAR. DEPTH OF 0" - 3"
V3	INCIDENTAL MILLING (See Tie in Detail)

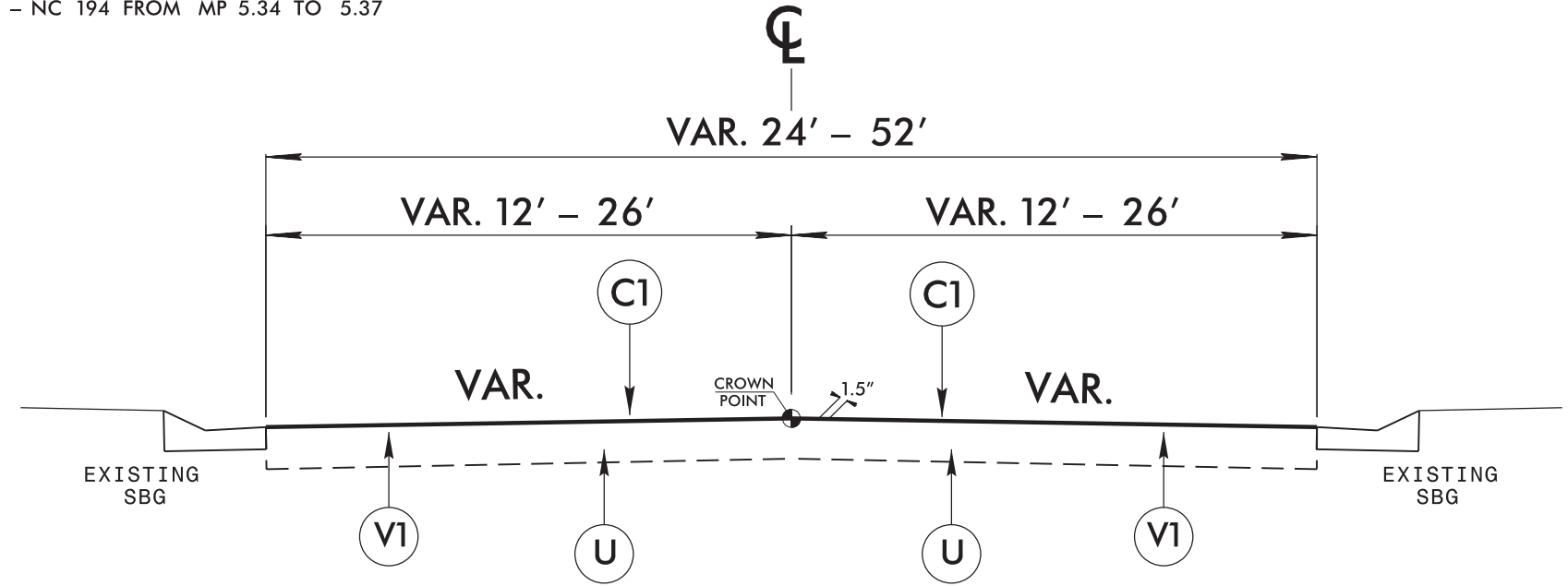
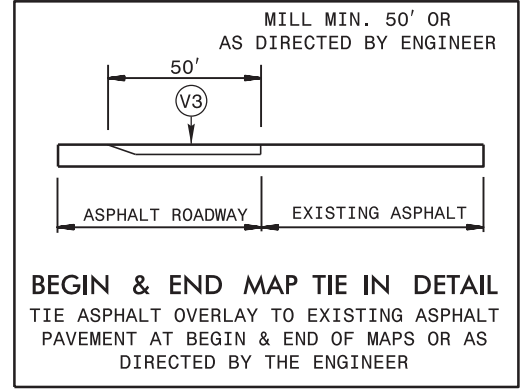
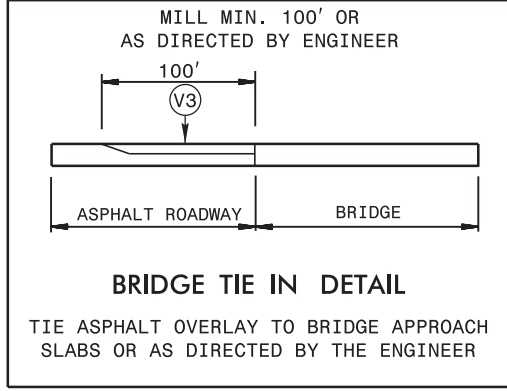
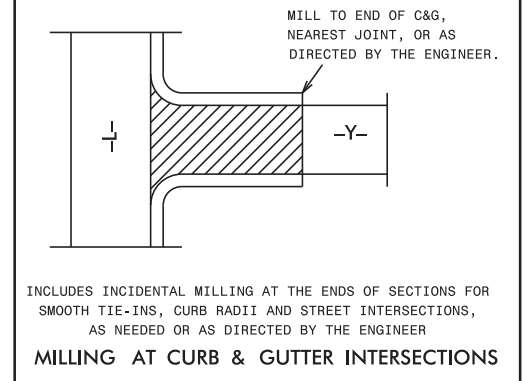
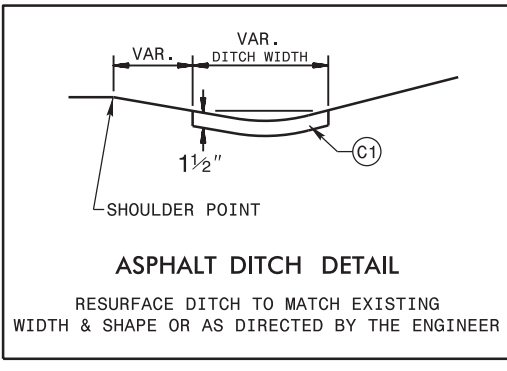
### TYPICAL SECTION NO. 5

- MAP 6 - NC 194 FROM SR 1112 TO US 321\*\*
- MAP 8 - NC 194 FROM New Market Blvd TO SR 1306\*\*\*
- \*\*\* (Note: See Asphalt Ditch Detail for Map 8 - locations TBD in the field)
- MAP 9 - NC 194 FROM SR 1306 TO SR 1339
- MAP 10 - SR 1530 FROM BLUE RIDGE PKWY. TO SR 1533
- MAP 11 - SR 1533 FROM MP 0.09 TO SR 1530



### INSET NO. 5A \*\*

\* INSET NO. 5A IS RIGHT SIDE ONLY  
 MAP 6 - NC 194 FROM MP 5.34 TO 5.37



### TYPICAL SECTION NO. 6

- MAP 7 - NC 194 FROM US 221 / 421 TO New Market Blvd

**WATAUGA COUNTY  
 PRIMARY & SECONDARY ROADS  
 ASPHALT RESURFACING**

REVISIONS	INIT.	DATE

SCALE: N/A DATE: 9/15/2021

PREPARED BY: DLH  
 REVIEWED BY:  
 REVIEWED BY:

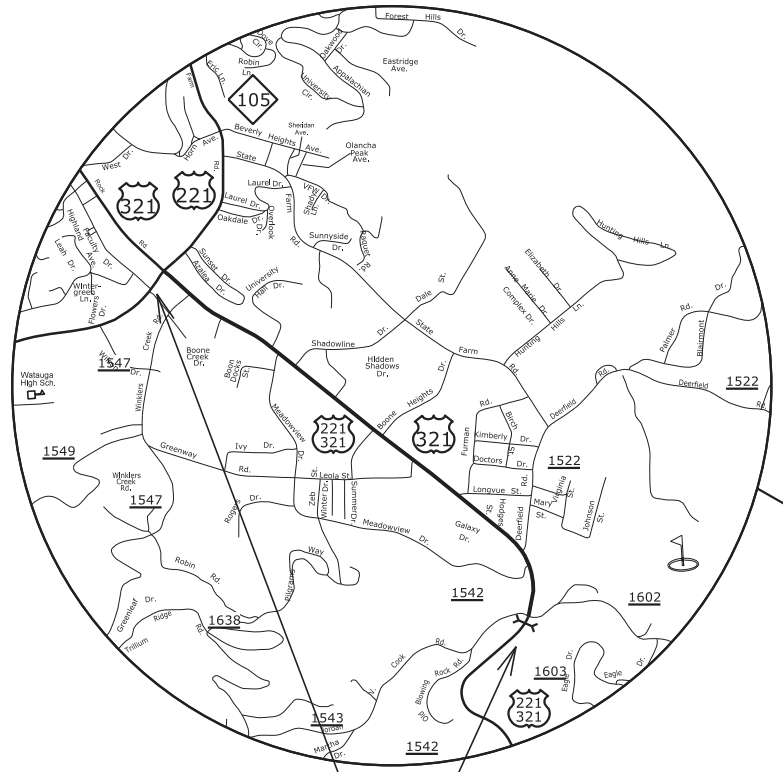
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 DIVISION of HIGHWAYS  
 DIVISION ELEVEN



8/17/99  
 SYSTEMS DESIGN & CONSTRUCTION  
 1115 S. W. 24th Ave., Suite 100  
 Fort Lauderdale, FL 33311  
 (305) 441-9999  
 FAX (305) 441-9998  
 WWW.SDCON.COM

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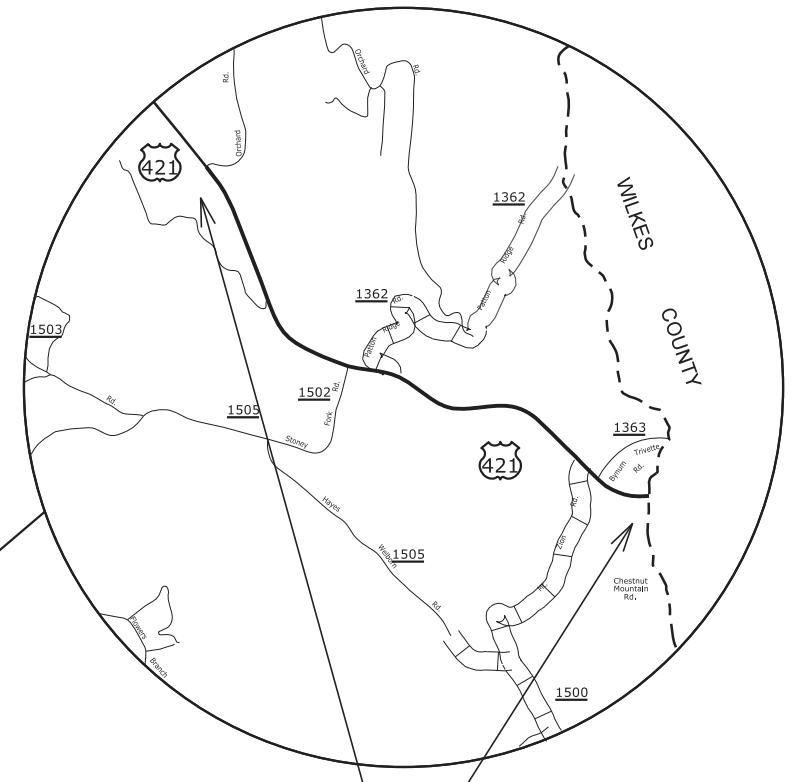
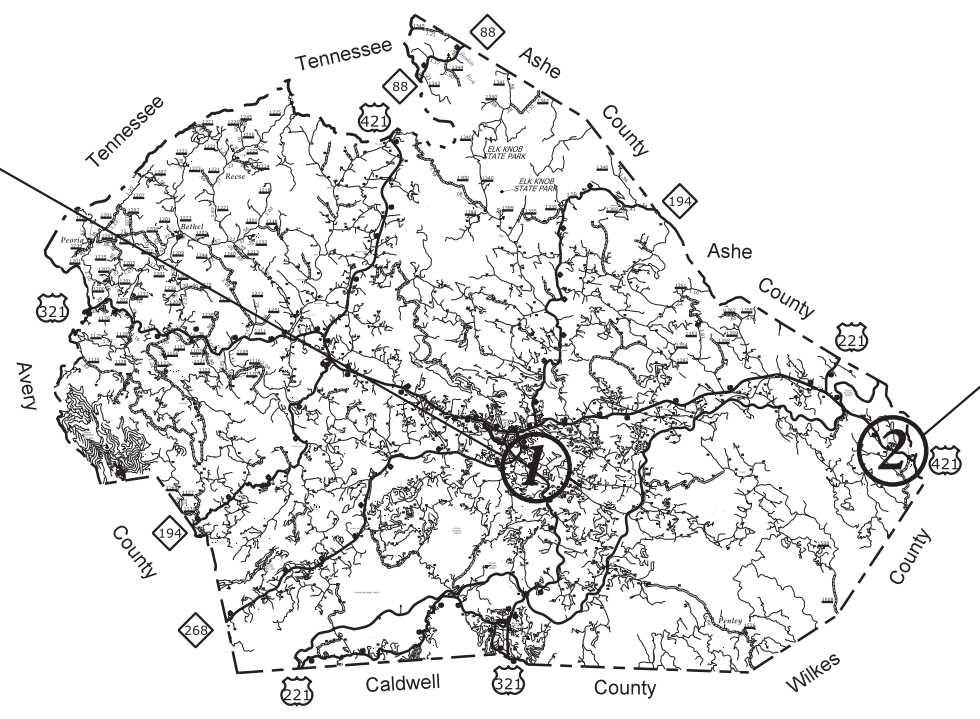
## 2022 ASPHALT RESURFACING MAPS #1 & #2



**MAP #1**

★ **US 221 – (1.36 mi.)**  
**(FROM SR 1602 TO NC 105)**

*See typical #1 (on sheet no. 01) in regard to  
a note on Map #1 end limits.*



**MAP #2**

★ **US 421 – (1.55 mi.)**  
**(FROM WILKES CO. TO SR 1361)**

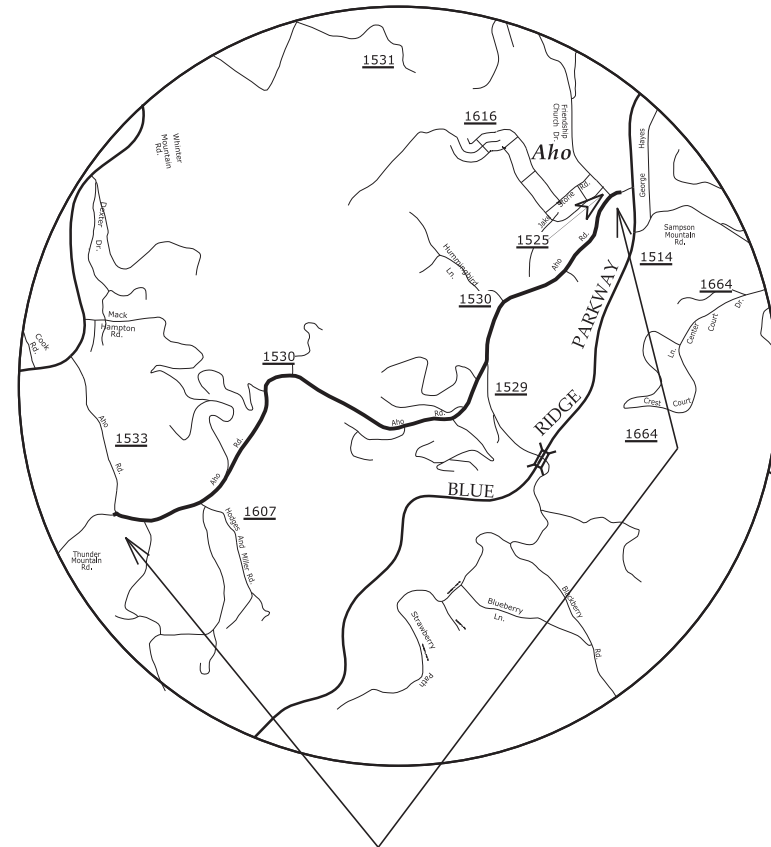
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# WATAUGA COUNTY

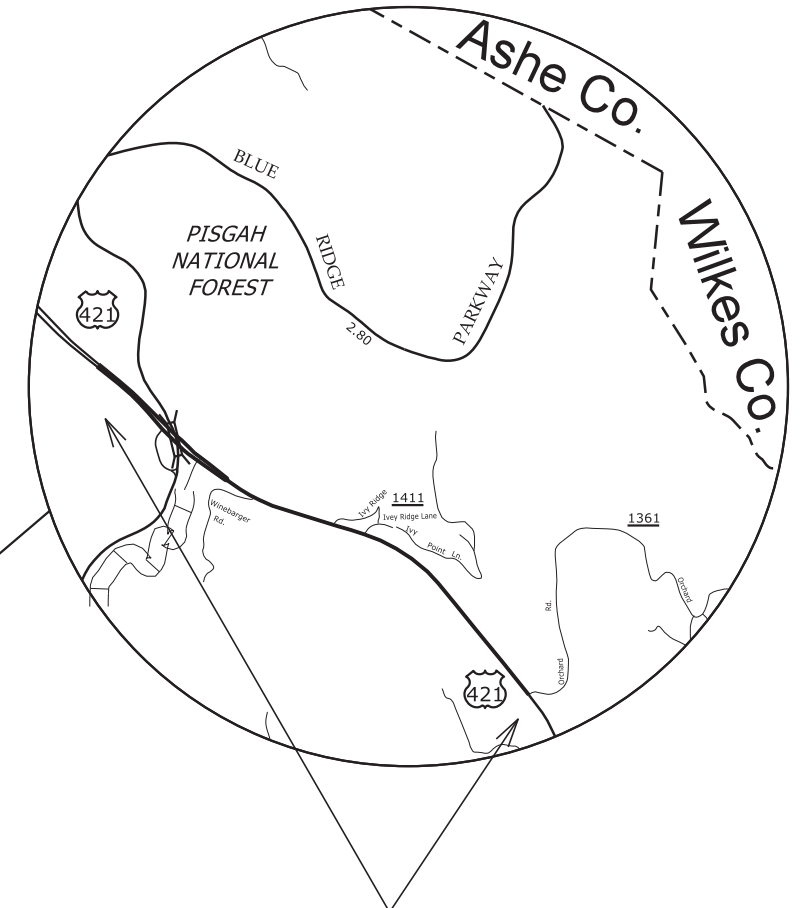
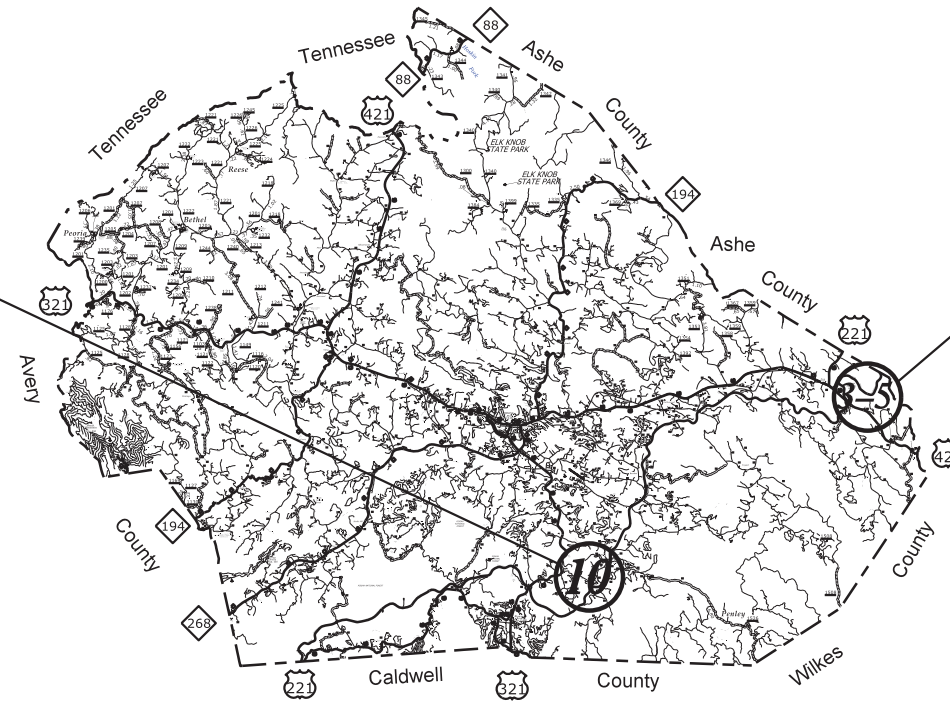
2022 ASPHALT RESURFACING  
MAPS #3 THRU #5, & #10

N



MAP #10

★ SR 1530 – (1.93 mi.)  
(FROM BLUE RIDGE PKWY. TO SR 1533)



MAPS #3 - #5

★ US 421 – (1.07 mi.)  
(FROM SR 1361 TO BEGIN MEDIAN)

★ US 421 (NB Lane) – (0.33 mi.)  
(FROM BEGIN MEDIAN  
TO PROJECT LIMITS)

★ US 421 (SB Lane) – (0.33 mi.)  
(FROM PROJECT LIMITS  
TO END MEDIAN)

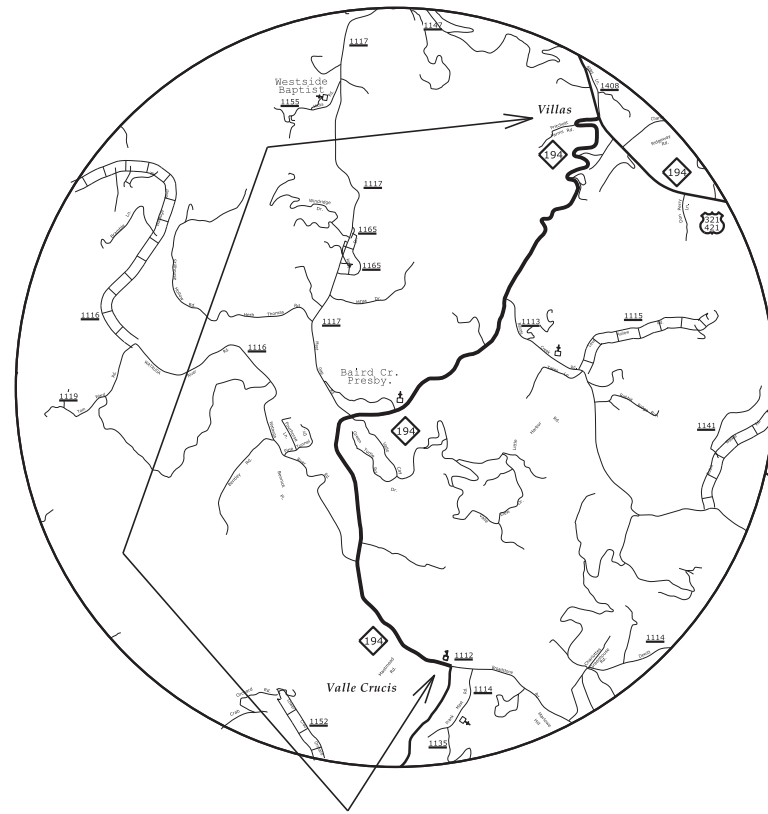
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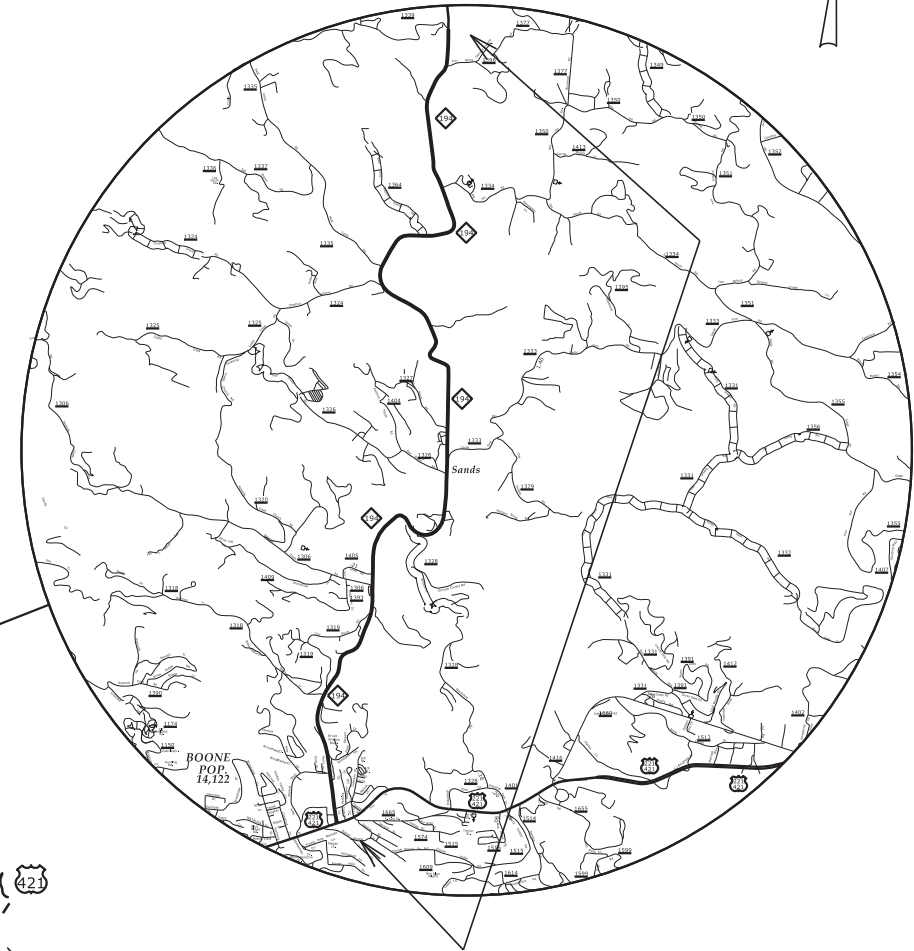
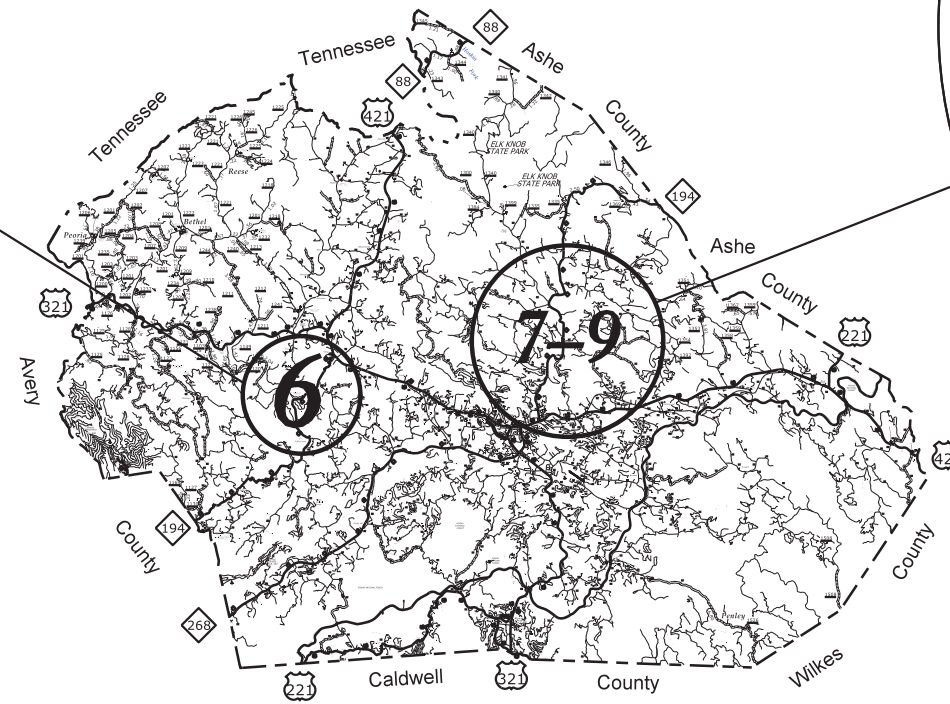
# WATAUGA COUNTY

2022 ASPHALT RESURFACING  
MAPS #6 THRU #9



MAP #6

★ NC 194 – (3.72 mi.)  
(FROM SR 1113 TO US 321)

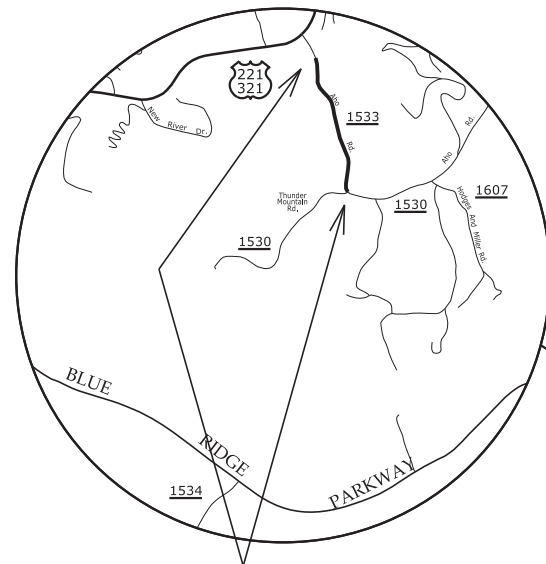


MAPS #7 - #9

- ★ NC 194 – (0.30 mi.)  
(FROM US 221/421 TO  
New Market Blvd [NS] )
- ★ NC 194 – (1.30 mi.)  
(FROM New Market Blvd [NS] TO SR 1306)
- ★ NC 194 – (4.59 mi.)  
(FROM SR 1306 TO SR 1339)

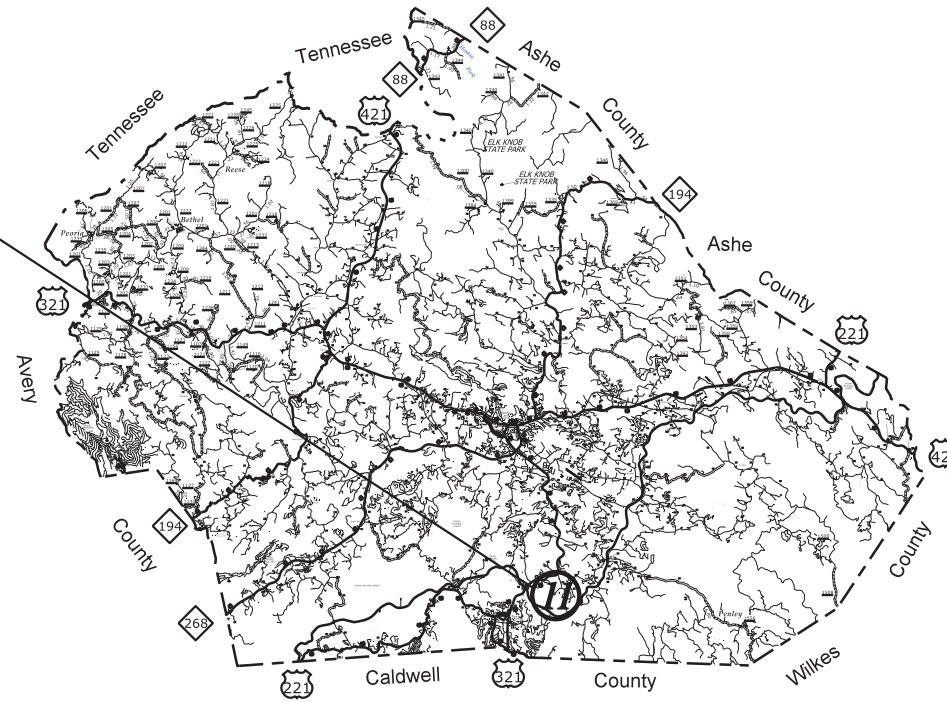
# WATAUGA COUNTY

## 2022 ASPHALT RESURFACING MAP # 11



**MAP #11**

★ **SR 1533 – (0.35 mi.)**  
**(FROM bridge resurf. joint of C203918 project**  
**TO SR 1530)**

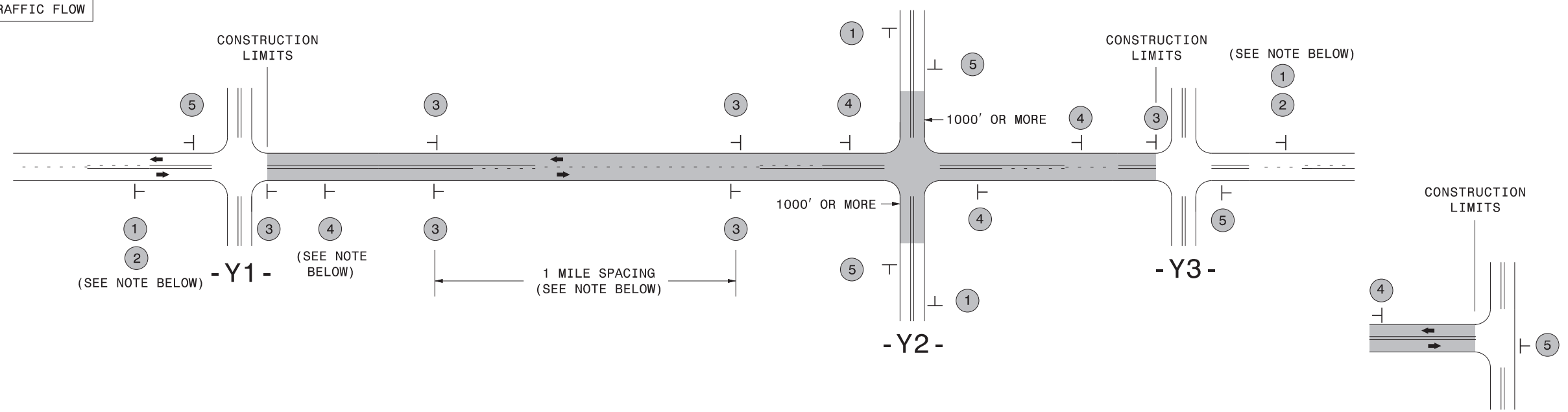


# SIGNING FOR RESURFACING PROJECTS

**LEGEND**

┆ STATIONARY SIGN

← DIRECTION OF TRAFFIC FLOW



## MAINLINE (-L-) SIGNING

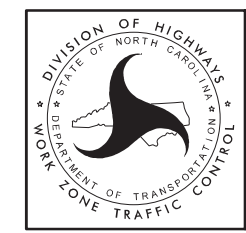
## -Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	1		PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.	<p>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</p> <ol style="list-style-type: none"> <li>1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE</li> <li>2) SUBDIVISION ROADS</li> <li>3) DEAD END ROADS</li> </ol> <p>WHEN PAVING/CONSTRUCTION ACTIVITIES PROCEED ACROSS AN UNSIGNED -Y- LINE, PORTABLE ADVANCE WARNING SIGNS SHALL BE USED ALONG THE -Y- LINE AS SHOWN BELOW. REMOVE UPON COMPLETION OF WORK.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">               W20-1 48" X 48"              PLACED 500' IN ADVANCE OF FLAGGER.         </div> <div style="text-align: center;">               W20-7 A 48" X 48"              PLACED 250' IN ADVANCE OF FLAGGER.         </div> </div>
	2		#2 SIGN ONLY USED WHEN CONSTRUCTION LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER. (NO FRACTIONAL OR DECIMAL NUMBERS)	
	3		<ul style="list-style-type: none"> <li>- PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACE 1 MILE APART THEREAFTER.</li> <li>- AT TEE INTERSECTIONS INSTALL INITIALLY 1/2 MILE FROM INTERSECTION AND SPACE 1 MILE APART THEREAFTER.</li> </ul>	
	4		<ul style="list-style-type: none"> <li>- THESE ARE FOR -Y- LINES THAT ARE "THROUGH" ROADWAYS.</li> <li>- DEAD END AND SUBDIVISION ROADS ARE NOT "THROUGH" ROADWAYS.</li> <li>- INSTALL 500' +/- FROM EACH -Y- LINE APPROACH AS SHOWN ABOVE.</li> <li>- 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.</li> <li>- A MAXIMUM OF 2 SIGN SETS PER MILE. DO NOT INSTALL WHEN -Y- LINES ARE WITHIN 0.5 MILES FROM "END ROAD WORK" SIGN.</li> <li>- FOR TEE INTERSECTIONS, INSTALL WITHIN 500' +/- OF THE INTERSECTION ALONG -L- LINE.</li> </ul>	
	5		PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS OR AS SHOWN WHEN WORK ENDS AT A 3-WAY TEE INTERSECTION.	

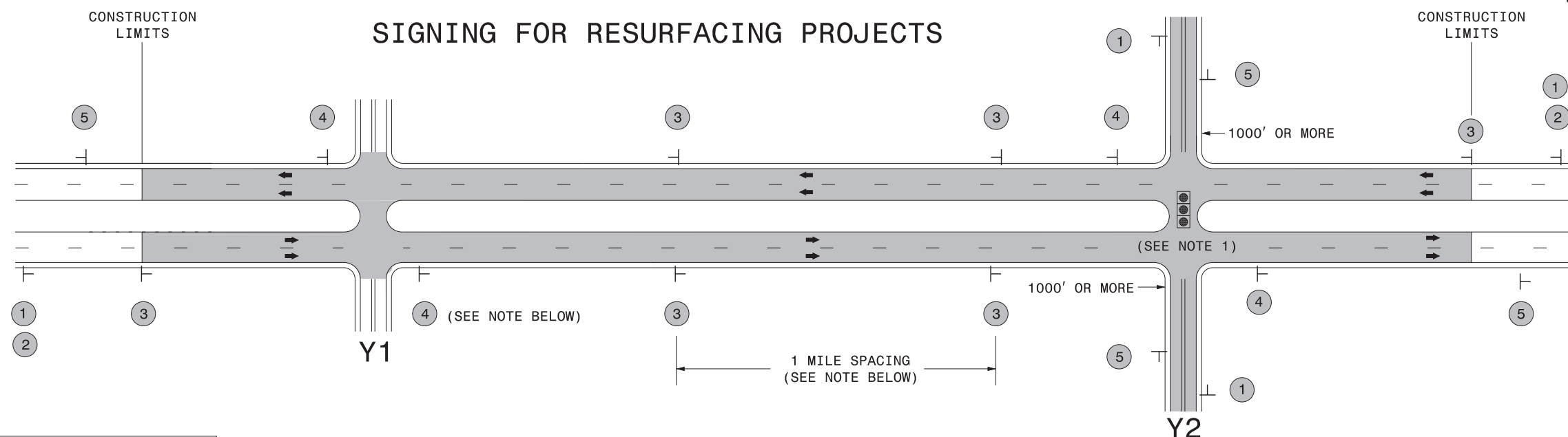
THE ABOVE SIGNS ARE ALL THAT ARE REQUIRED FOR A CONTRACTOR TO BEGIN A RESURFACING CONTRACT. ANY ADDITIONAL SIGNS REQUESTED BY NCDOT DIVISIONS SHALL BE INSTALLED WITHIN 7 BUSINESS DAYS OF THE START OF CONTRACT WORK.

**MAPS LESS THAN 2 MILES**

FOR RESURFACING MAPS WITH CONSTRUCTION LIMITS LESS THAN 2 MILES IN LENGTH, NO STATIONARY SIGNS ARE REQUIRED. USE PORTABLE "ROAD UNDER CONSTRUCTION" OR "ROAD WORK AHEAD" SIGNS IN LIEU OF STATIONARY ADVANCE WARNINGS SIGNS.



**ADVANCE WARNING SIGNS FOR RURAL AND SUBURBAN 2-LANE ROADWAY RESURFACING**



**LEGEND**  
 ┆ STATIONARY SIGN  
 ← DIRECTION OF TRAFFIC FLOW

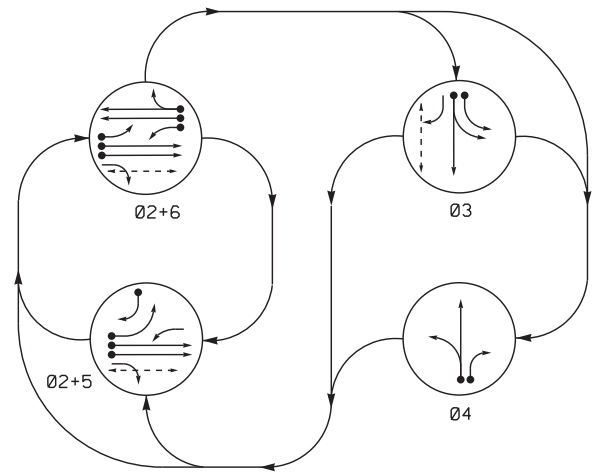
### MAINLINE (-L-) SIGNING

### -Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	 	<p>PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.</p> <p>#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)</p>	<p><b>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</b></p> <ol style="list-style-type: none"> <li>1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE</li> <li>2) SUBDIVISION ROADS</li> <li>3) DEAD END ROADS</li> </ol> <p>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.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">   <small>W20-1 48" X 48"</small> </div> <div style="text-align: center;">   <small>W20-7 A 48" X 48"</small> </div> </div> <p>PLACED 500' IN ADVANCE OF FLAGGER. PLACED 250' IN ADVANCE OF FLAGGER.</p> <p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1) MAY USE LAW ENFORCEMENT TO CONTROL TRAFFIC AT SIGNALIZED INTERSECTIONS AS DIRECTED BY THE ENGINEER. PROVIDE PORTABLE "ROAD WORK AHEAD" (W20-1) SIGNS 500' IN ADVANCE ALONG BOTH APPROACHES FROM THE SIDE STREETS WHEN PAVING PROCEEDS THROUGH THE INTERSECTION.</li> </ol>
		<p>PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET 1/2 MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.</p>	
		<p>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.</p>	
		<p>PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.</p>	

**RESURFACING  
ADVANCE WARNING SIGNS  
FOR RURAL AND SUBURBAN  
MULTI-LANE ROADWAYS  
W/ SHOULDER SECTIONS**

PHASING DIAGRAM



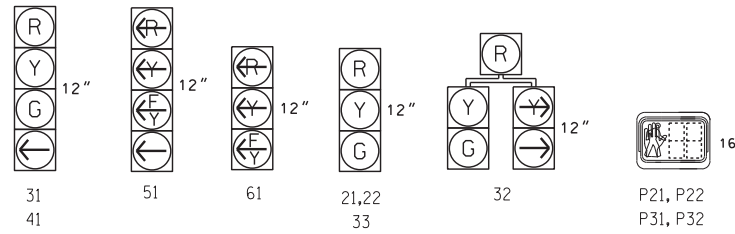
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE				
	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21,22	G	G	R	R	Y
31	R	R	G	R	R
32	R	R	G	R	R
33	R	R	G	R	R
41	R	R	R	G	R
42	R	R	R	G	R
51	-	F	R	R	Y
61	-	F	R	R	Y
62,63	R	G	R	R	Y
P21,P22	W	W	DW	DW	DRK
P31,P32	DW	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

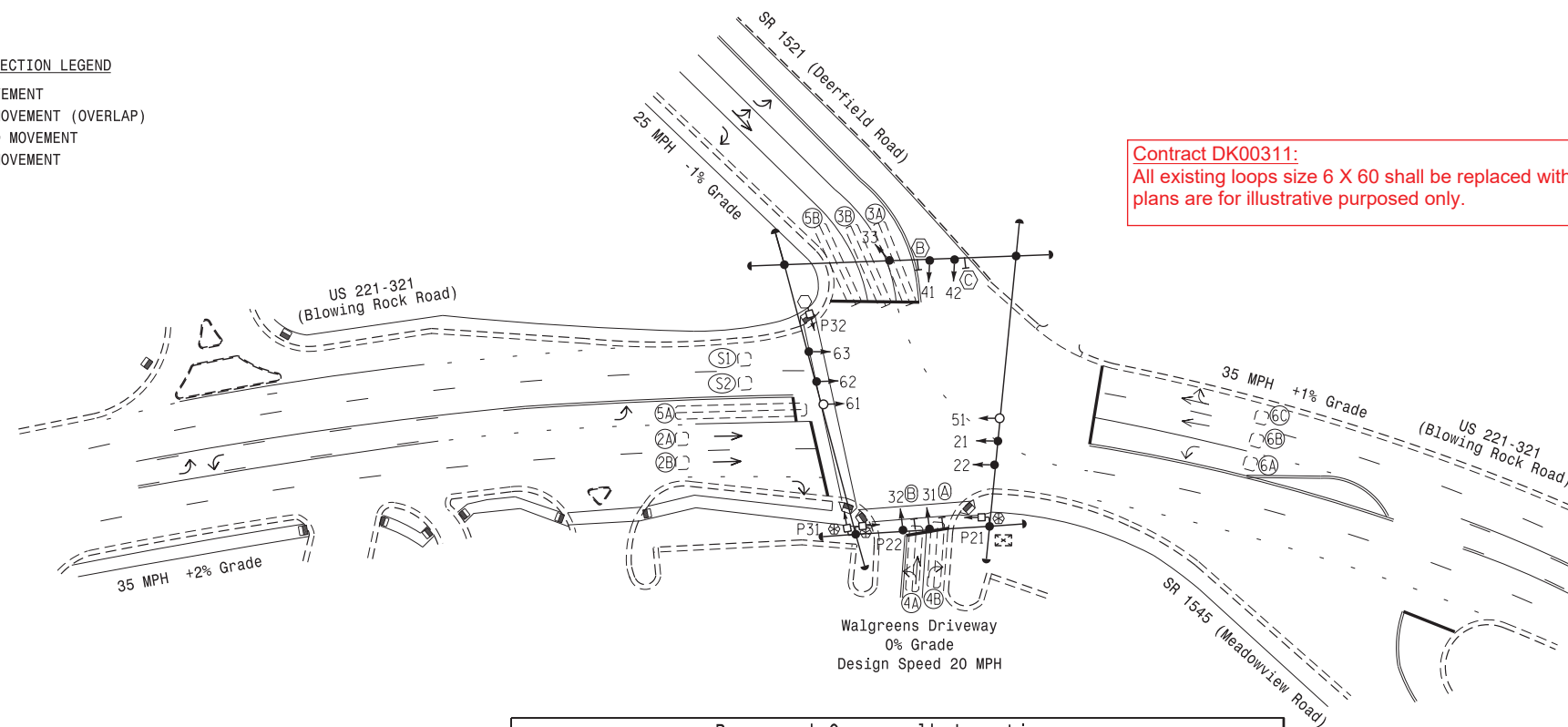


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	LOOP SYSTEM	NEW CARD
2A,2B	6X6	70	3	-	2	Y	Y	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	3	-
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-
4A	6X30	+5	2-4-2	-	4	Y	Y	-	-	3	-
4B	6X30	+5	2-4-2	-	4	Y	Y	-	-	15	-
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	15	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-
6A,6B,6C	6X6	70	4	-	6	Y	Y	-	-	-	-
S1	6X6	+160	4	-	-	-	-	-	-	-	Y
S2	6X6	+160	4	-	-	-	-	-	-	-	Y

4 Phase Fully Actuated D11-10\_Boone

NOTES

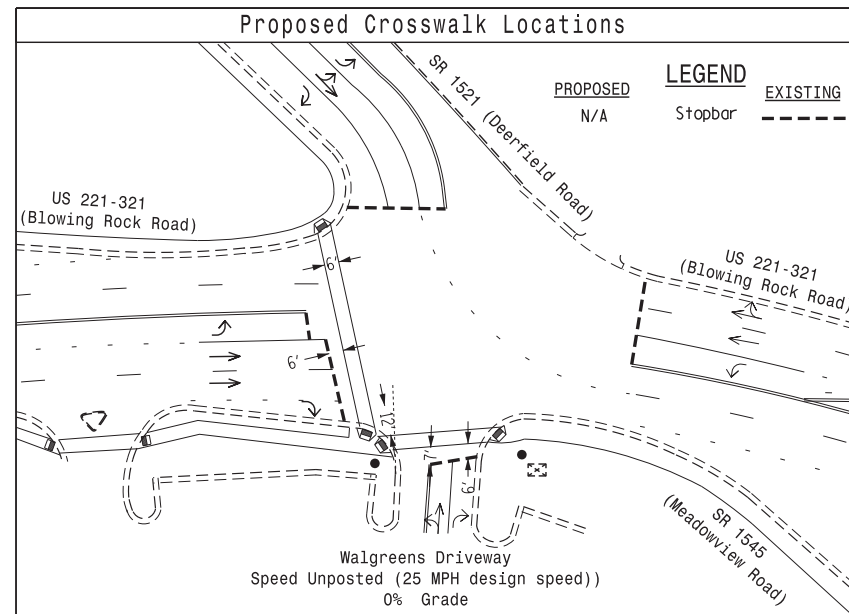
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Phase 5 may be lagged.
3. The order of phase 3 and phase 4 may be reversed.
4. Renumber existing signal heads numbered 22, 23, 61, & 62 to 21, 22, 62, & 63
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



Contract DK00311:  
All existing loops size 6 X 60 shall be replaced with size 6 X 40, plans are for illustrative purposes only.

OASIS 2070 TIMING CHART					
FEATURE	PHASE				
	2	3	4	5	6
Min Green 1 *	10	7	7	7	10
Extension 1 *	3.0	2.0	2.0	1.0	2.0
Max Green 1 *	60	25	25	15	60
Yellow Clearance	3.8	3.2	3.0	3.0	3.8
Red Clearance	2.6	2.6	3.4	2.4	2.6
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	7	7	-	-	-
Don't Walk 1	10	22	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



LEGEND	
PROPOSED	EXISTING
	Traffic Signal Head
	Modified Signal Head
	Sign
	Pedestrian Signal Head With Push Button & Sign
	Type I Pushbutton Post
	Type II Signal Pedestal
	Signal Pole with Guy
	Signal Pole with Sidewalk Guy
	Inductive Loop Detector
	Controller & Cabinet
	Junction Box
	2-in Underground Conduit
	Right of Way
	Directional Arrow
	Curb Ramp
	Left Arrow "ONLY" Sign (R3-5L)
	Combined Through and Left Arrow Sign (R3-6L)
	Right Arrow "ONLY" Sign (R3-5R)

Signal Upgrade

750 N. Greenfield Pkwy, Garner, NC 27529

US 221-321 (Blowing Rock Road)  
at  
SR 1521 (Deerfield Road) /  
Walgreens Driveway

Division 11 Watauga County Boone

PLAN DATE: March 2021 REVIEWED BY: T.J. Williams

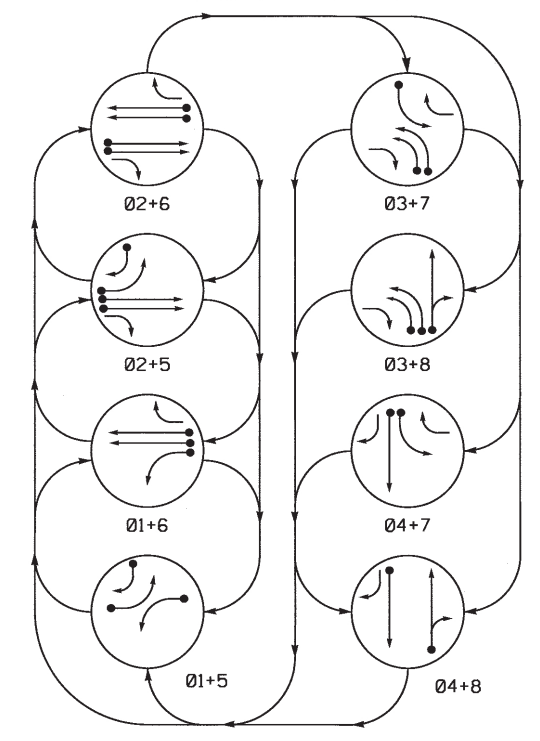
PREPARED BY: EM Minshew REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/19/2021



### PHASING DIAGRAM



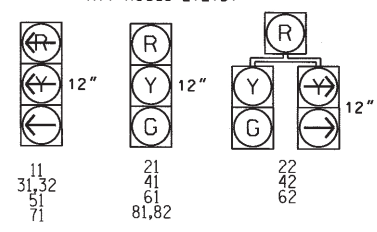
**PHASING DIAGRAM DETECTION LEGEND**

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- - - UNSIGNALIZED MOVEMENT
- - -> PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE							
	01 +5	02 +5	02 +6	03 +7	03 +8	04 +7	04 +8	FLASH
11	→	→	→	→	→	→	→	→
21	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31,32	→	→	→	→	→	→	→	→
41	R	R	R	R	R	G	G	R
42	R	R	R	R	R	G	G	R
51	→	→	→	→	→	→	→	→
61	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
71	→	→	→	→	→	→	→	→
81,82	R	R	R	R	R	G	R	G

### SIGNAL FACE I.D.

All Heads L.E.D.



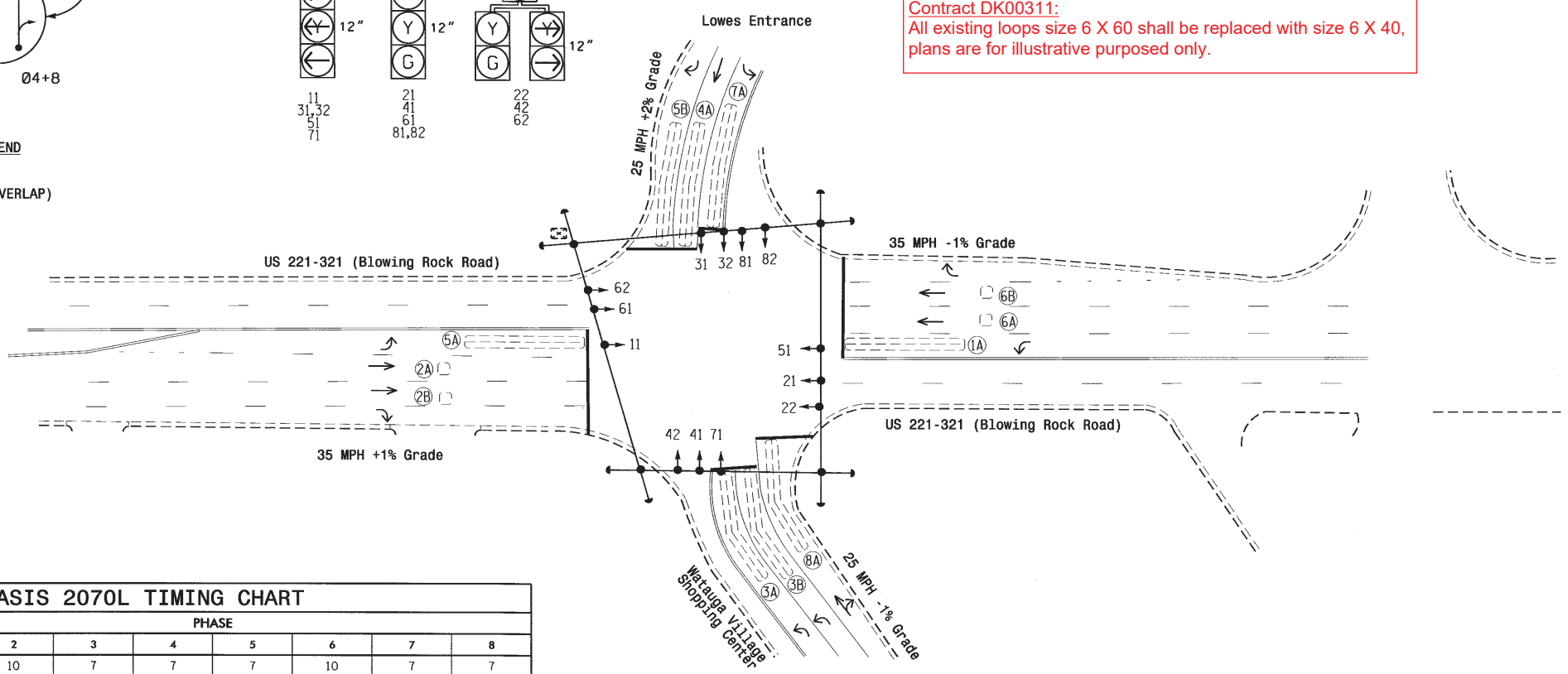
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING			STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
					PHASE	CALLING EXTENSION	FULL TIME DELAY					
1A	6X60	0	2-4-2	-	1	Y	Y	-	3	-	-	
2A,2B	6X6	70	4	-	2	Y	Y	-	-	-	-	
3A	6X60	0	2-4-2	-	3	Y	Y	-	3	-	-	
3B	6X60	0	2-4-2	-	3	Y	Y	-	-	-	-	
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	
5A	6X60	0	2-4-2	-	5	Y	Y	-	3	-	-	
5B	6X60	0	2-4-2	-	5	Y	Y	-	15	-	-	
6A,6B	6X6	70	4	-	6	Y	Y	-	-	-	-	
7A	6X60	0	2-4-2	-	7	Y	Y	-	3	-	-	
8A	6X60	0	2-4-2	-	8	Y	Y	-	-	-	-	

### 8 Phase Fully Actuated US 321 Boone CLS

#### NOTES

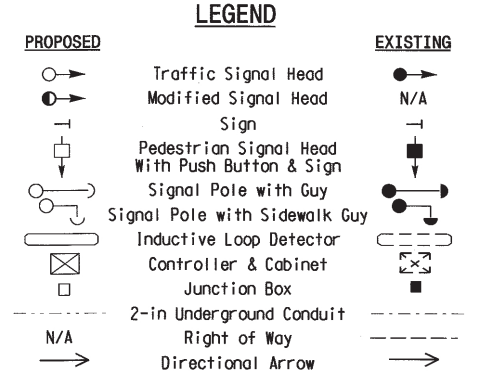
1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Closed loop system data: Controller Asset # 0973.

**Contract DK00311:**  
All existing loops size 6 X 60 shall be replaced with size 6 X 40, plans are for illustrative purposes only.



FEATURE	OASIS 2070L TIMING CHART							
	1	2	3	4	5	6	7	8
Min Green 1*	7	10	7	7	7	10	7	7
Extension 1*	1.0	3.0	1.0	1.0	1.0	3.0	1.0	1.0
Max Green 1*	15	60	15	20	15	60	15	20
Yellow Clearance	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Red Clearance	2.5	2.0	2.5	2.0	2.0	2.0	2.5	2.0
Walk 1*	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation*	-	-	-	-	-	-	-	-
Max Variable Initial*	-	-	-	-	-	-	-	-
Time Before Reduction*	-	-	-	-	-	-	-	-
Time To Reduce*	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



**Plan of Record**

PREPARED BY: Jeff Spence DATE: September 2011  
 REVIEWED BY: P.L. Alexander DATE: October 2011  
 SIGNATURE: [Signature] DATE: 11/17/11  
 COMMENTS: Upgraded to 2070.

This plan of record reflects existing field conditions as submitted by field personnel. This plan may have been modified from its original state.

**Plan of Record**

Prepared in the Office of:  
  
 TRANSPORTATION MOBILITY AND SIGNAL DESIGN SECTION  
 DIVISION OF TRANSPORTATION SIGNAL DESIGN SECTION  
 750 N. Greenfield Pkwy, Garner, NC 27529

**US 221-321 (Blowing Rock Road) at Lowe's and Watauga Village Shopping Center**

Division 11 Watauga County Boone  
 PLAN DATE: 9/14/01 REVIEWED BY: CET  
 PREPARED BY: DJD REVIEWED BY:

SCALE: 0 40  
 1"=40'

Not a certified document. This document originally issued and sealed by Donald J. Darity, PE, #19713, on 9/14/01. This document shall not be considered a certified document.

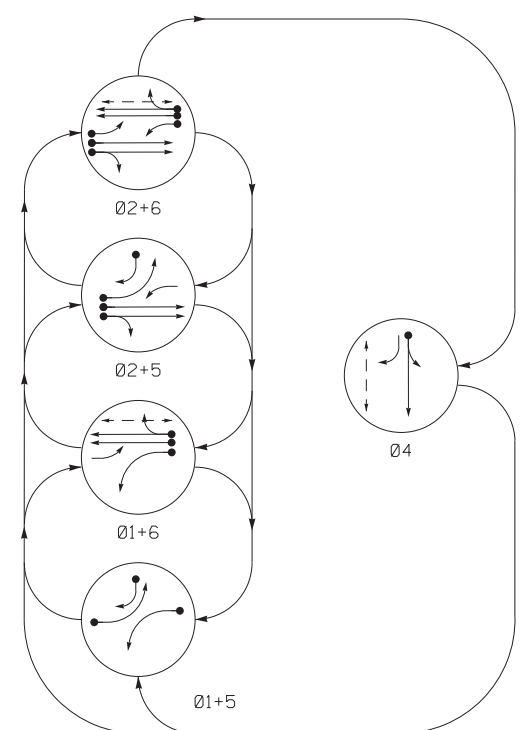
SIG. INVENTORY NO. 11-0973

17-Nov-2011 09:49 S:\17535\17535\17535.dwg User: jspence

**5 Phase Fully Actuated US 221-321 Boone Closed Loop System NOTES**

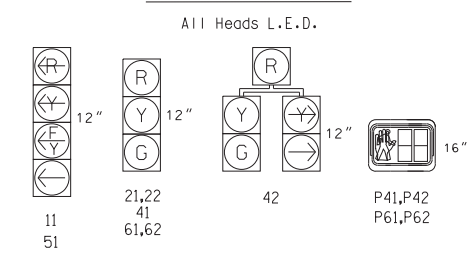
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: "http://connect.ncdot.gov/resources/safety/pages/its-and-signals.aspx"
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset # 0027.

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**  
 -> DETECTED MOVEMENT  
 -> UNDETECTED MOVEMENT (OVERLAP)  
 -> UNSIGNALIZED MOVEMENT  
 -> PEDESTRIAN MOVEMENT

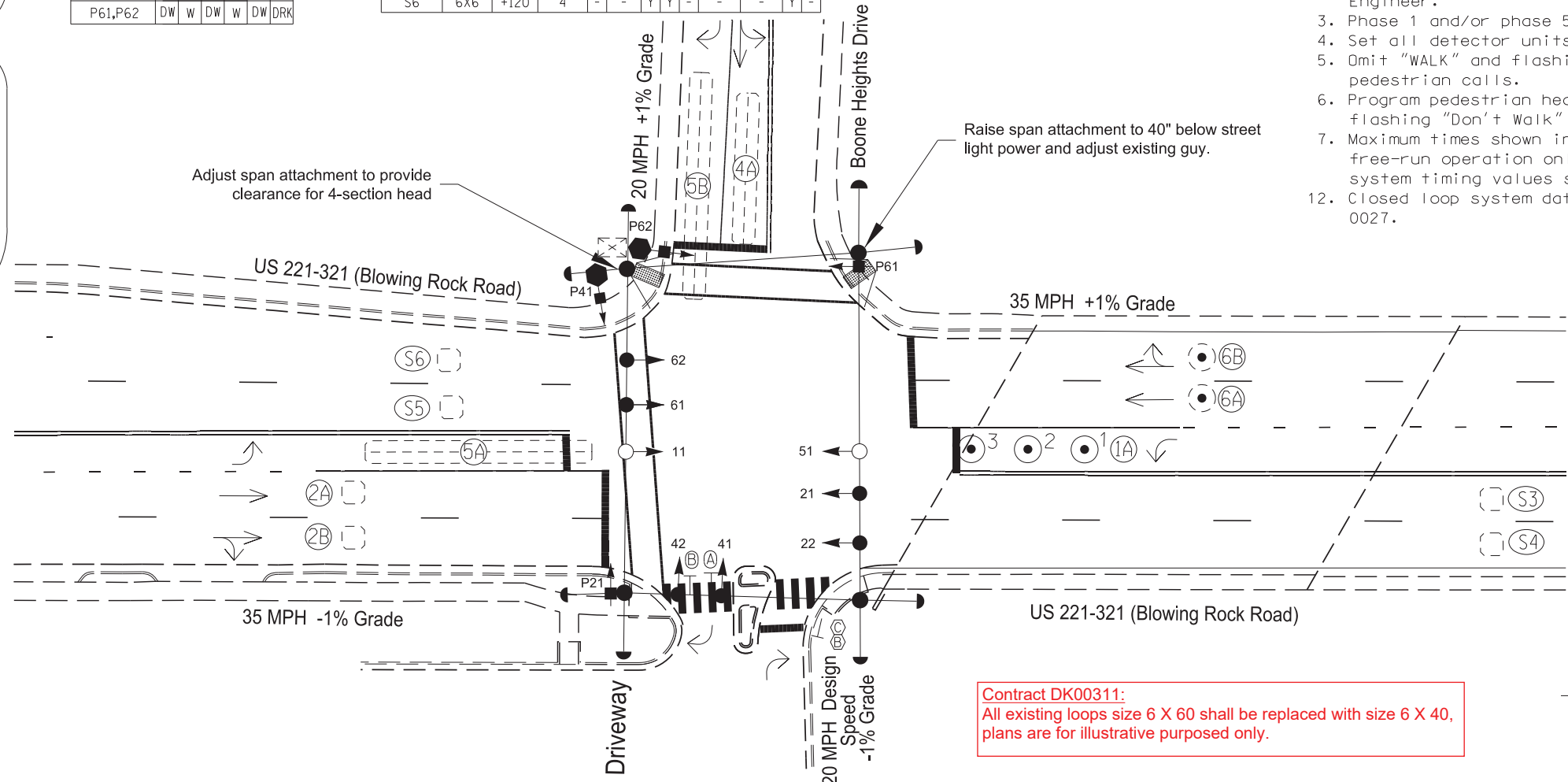
**SIGNAL FACE I.D.**



SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	04	F L S H
11						
21,22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51						
61,62	R	G	R	G	R	Y
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS				DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
2A,2B	6X6	55	EXIST	-	2	Y	Y	-	-	-	-	
4A	6X40	0	2-4-2	-	4	Y	Y	-	3	-	-	
5A	6X60	+5	2-4-2	-	5	Y	Y	-	15	-	-	
5B	6X60	+15	2-4-2	-	5	Y	Y	-	15	-	-	
S3	6X6	+225	4	-	-	Y	Y	-	-	Y	-	
S4	6X6	+225	4	-	-	Y	Y	-	-	Y	-	
S5	6X6	+120	4	-	-	Y	Y	-	-	Y	-	
S6	6X6	+120	4	-	-	Y	Y	-	-	Y	-	

OASIS 2070 WIRELESS DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS				DETECTOR PROGRAMMING								
SENSYS DETECTION	DISTANCE FROM STOPBAR (FT)	SENSYS TYPE	NEW SENSYS	Detection Size (FT)	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM		
1A-1	3	F	Y	6X6	1	Y	Y	-	15	-		
1A-2	18	F	Y	6X6	6	Y	Y	-	-	-		
1A-3	33	F	Y	6X6	6	Y	Y	-	-	-		
6A	70	F	-	6X6	6	Y	Y	-	-	-		
6B	70	F	-	6X6	6	Y	Y	-	-	-		



Adjust span attachment to provide clearance for 4-section head

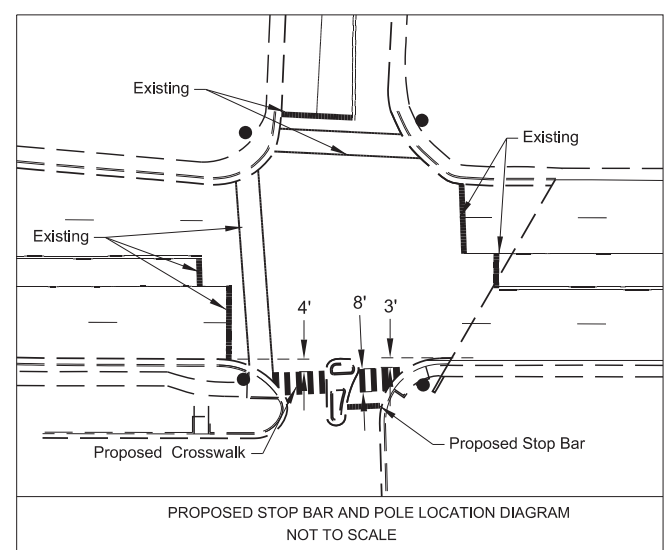
Raise span attachment to 40" below street light power and adjust existing guy.

**Contract DK00311:**  
All existing loops size 6 X 60 shall be replaced with size 6 X 40, plans are for illustrative purposes only.

PROPOSED	EXISTING
	N/A
N/A	Right of Way

OASIS 2070 TIMING CHART					
FEATURE	PHASE				
	1	2	4	5	6
Min Green 1 *	7	10	7	7	10
Extension 1 *	1.0	3.0	2.0	1.0	3.0
Max Green 1 *	40	50	25	40	50
Yellow Clearance	3.0	3.9	3.0	3.0	3.9
Red Clearance	2.6	1.8	3.1	2.4	1.8
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	7	-	7
Don't Walk 1	-	-	17	-	11
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



NC Dept of Transportation  
 Division of Highways  
 Final Drawing Date: 04-05-17  
 Drawn by: R.N. Zinan  
 1750 N. Greenfield Pkwy, Garner, NC 27529

Project #: 160010

**DAVENPORT**  
 HOME OFFICE  
 305 WEST FOURTH STREET, SUITE 2A  
 WINSTON-SALEM, NC 27101  
 336.744.1636 www.davenportinc.com  
 NCSELS FIRM LICENSE NO. C-2532

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**Signal Upgrade**

US 221-321 (Blowing Rock Road) at Boone Heights Drive

Division 11 Watauga County Boone

PLAN DATE: September 2016 REVIEWED BY: [Signature]  
 PREPARED BY: J. Townsend REVIEWED BY: [Signature]

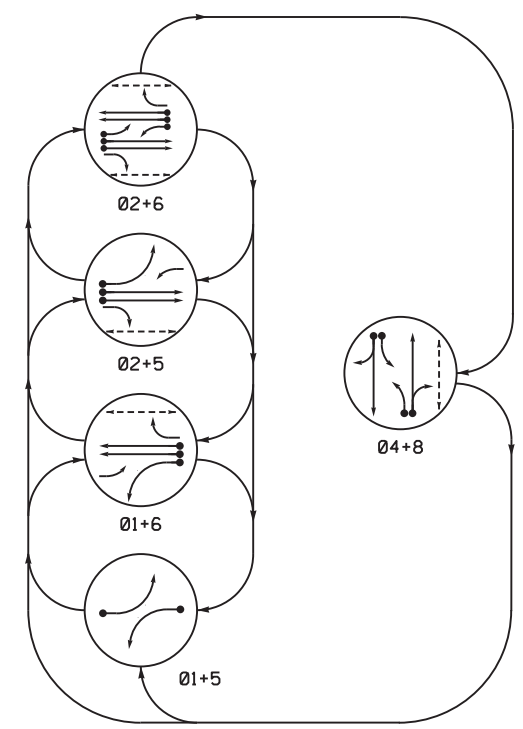
750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 20 1"=20'

REVISIONS: [Table]  
 INIT. DATE

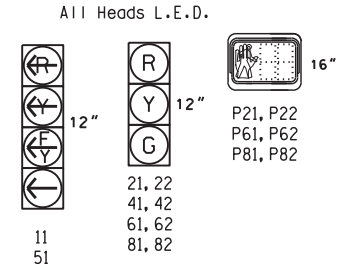
1FC90805A912483  
 5/3/2016 11:08:11 AM  
 DATE: 04/2017  
 SIG. INVENTORY NO. 11-0027

PHASING DIAGRAM



SIGNAL FACE	PHASE					FLASH
	01+5	02+5	02+6	04+8		
11		F	F	R	Y	
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51		F	F	R	Y	
61,62	R	G	R	G	R	Y
81,82	R	R	R	G	R	
P21,P22	DW	DW	W	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	W	DRK	

SIGNAL FACE I.D.



2070L LOOP & DETECTOR INSTALLATION

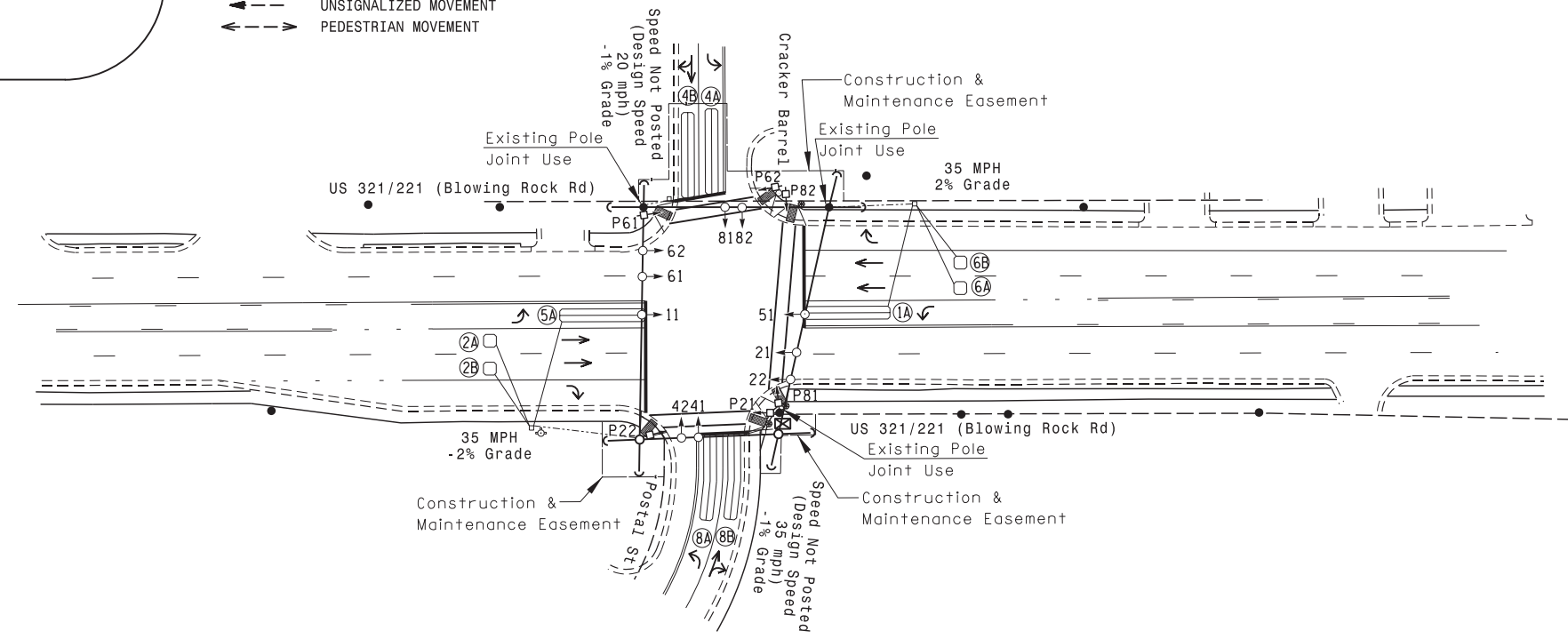
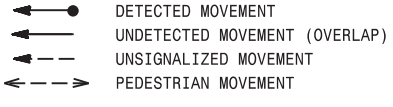
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY			
1A	6x40	0	2-4-2	Y	1	Y	Y	-	15	-	Y
2A,2B	6x6	70	4	Y	2	Y	Y	-	-	-	Y
4A	6x40	0	2-4-2	Y	4	Y	Y	-	-	3	-
4B	6x40	0	2-4-2	Y	4	Y	Y	-	-	10	-
5A	6x40	0	2-4-2	Y	5	Y	Y	-	-	15	-
6A,6B	6x6	70	4	Y	6	Y	Y	-	-	-	-
8A	6x40	0	2-4-2	Y	8	Y	Y	-	-	3	-
8B	6x40	0	2-4-2	Y	8	Y	Y	-	-	10	-

5 Phase Fully Actuated (US 321 Boone Closed Loop System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pedestrian pedestal locations are conceptual and for reference only. See sheets P1 - P3 for guidance.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Signal System Data:  
Controller Asset #: 1437.

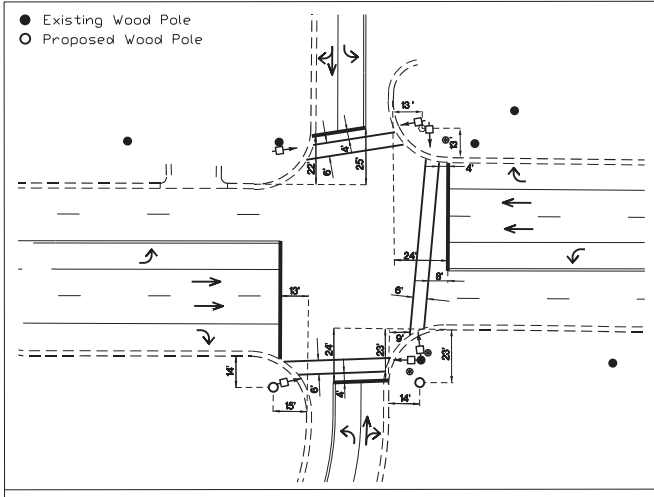
PHASING DIAGRAM DETECTION LEGEND



OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	8		
Min Green 1 *	7	10	7	7	10	7		
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0		
Max Green 1 *	20	60	15	15	60	20		
Yellow Clearance	3.0	4.0	3.0	3.0	4.0	3.9		
Red Clearance	2.6	1.9	3.3	2.3	1.9	2.1		
Walk 1 *	-	7	-	-	7	7		
Don't Walk 1	-	9	-	-	8	18		
Seconds Per Actuation *	-	-	-	-	-	-		
Max Variable Initial *	-	-	-	-	-	-		
Time Before Reduction *	-	-	-	-	-	-		
Time To Reduce *	-	-	-	-	-	-		
Minimum Gap	-	-	-	-	-	-		
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-		
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-		
Dual Entry	-	-	ON	-	-	ON		
Simultaneous Gap	ON	ON	ON	ON	ON	ON		

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



PROPOSED STOP BAR, CROSSWALK AND POLE LOCATION DIAGRAM NOT TO SCALE

NC Dept of Transportation  
Division of Highways  
Final Drawing Date: 3/28/2016  
Designed by: *Lorin M. Boyer*  
0231EF04F5341F

Project #: 15-023

HOME OFFICE:  
305 WEST FOURTH STREET, SUITE 2A  
WINSTON-SALEM, NC 27101  
336.744.1636 www.davenportworld.com  
NCBELS FIRM LICENSE NO. C-2522

LEGEND

PROPOSED	EXISTING
	N/A
N/A	

New Installation

US 321 (Blowing Rock Road) at Blowing Rock Market/ Cracker Barrel

Division 11 Watauga County Boone

PLAN DATE: March 2016 PREPARED BY: R Hinshaw

PREPARED BY: L Boyer REVIEWED BY:

REVISIONS

NO.	INIT.	DATE

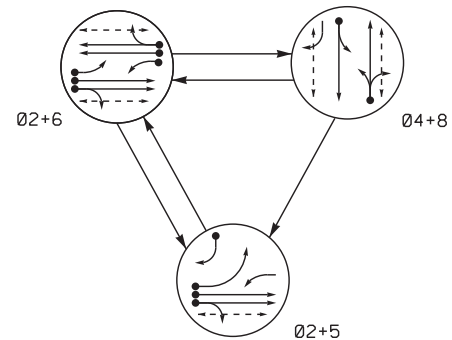
SCALE: 1"=40'

Seal: Lori M. Boyer, Professional Engineer, License No. 030912

SIG. INVENTORY NO. 11-1437



PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

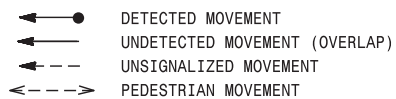
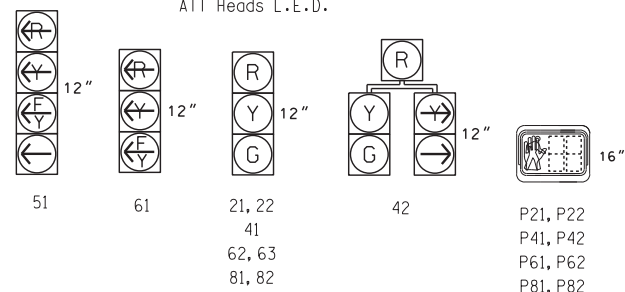


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	F	F	R	Y
61	F	F	R	Y
62,63	R	G	R	Y
81,82	R	R	G	R
P21,P22	W	W	DW	DRK
P41,P42	DW	DW	W	DRK
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

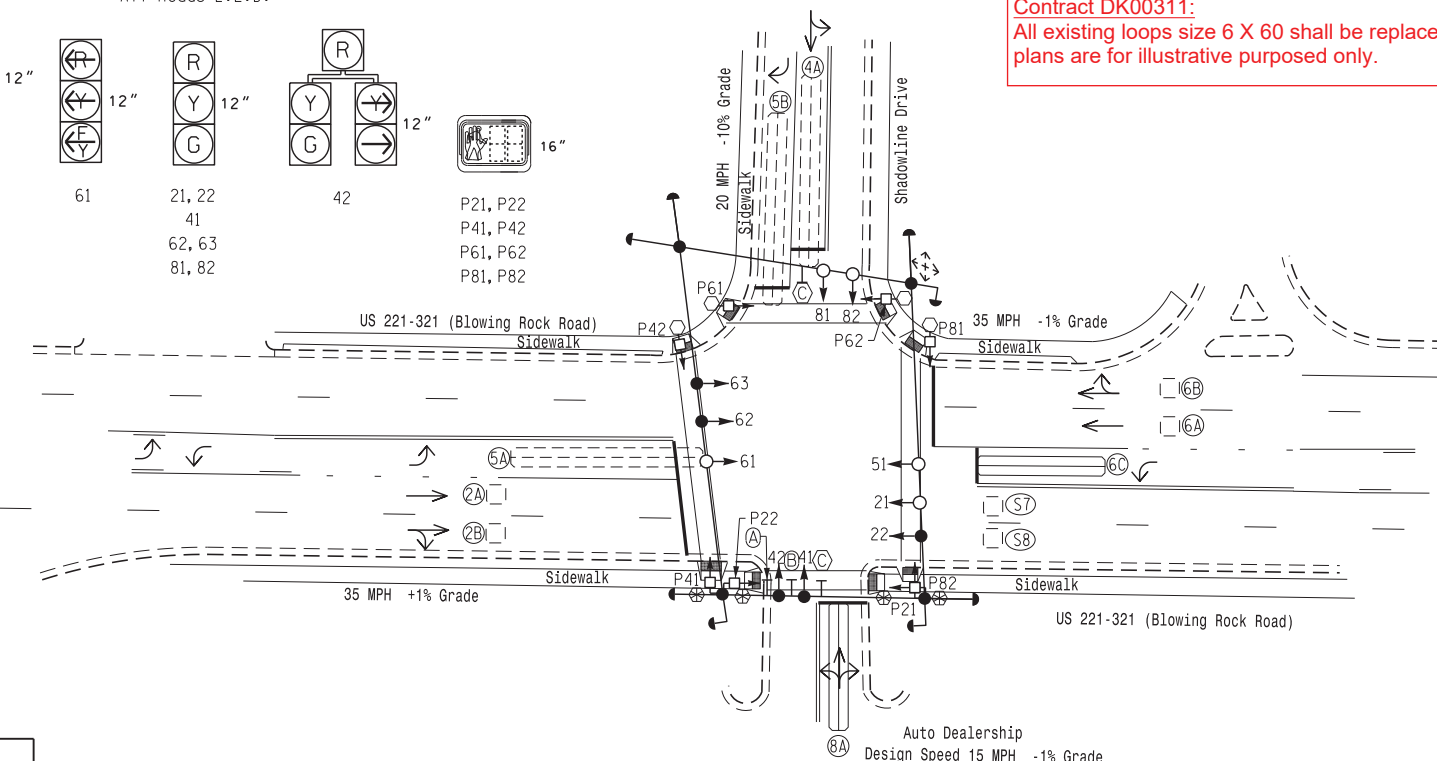
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A,2B	6X6	54	4	-	2	Y	Y	-	-	-	-	-
4A	6X60	+5	2-4-2	-	4	Y	Y	-	-	3	-	-
5A	6X40	+10	2-4-2	-	5	Y	Y	-	-	15	-	-
5B	6X60	+5	2-4-2	-	5	Y	Y	-	-	15	-	-
6A,6B	6X6	70	4	-	6	Y	Y	-	-	-	-	-
6C	6X40	0	2-4-2	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	-	-	-	-	10	-	Y
S7	6X6	+95	4	-	-	-	-	-	-	-	-	Y
S8	6X6	+95	4	-	-	-	-	-	-	-	-	Y

Contract DK00311:  
All existing loops size 6 X 60 shall be replaced with size 6 X 40, plans are for illustrative purposes only.

3 Phase Fully Actuated D11-10\_Boone

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Renumber existing signal heads numbered 61 & 62 to 62 & 63 respectively.
- Reposition existing signal head numbered 22.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



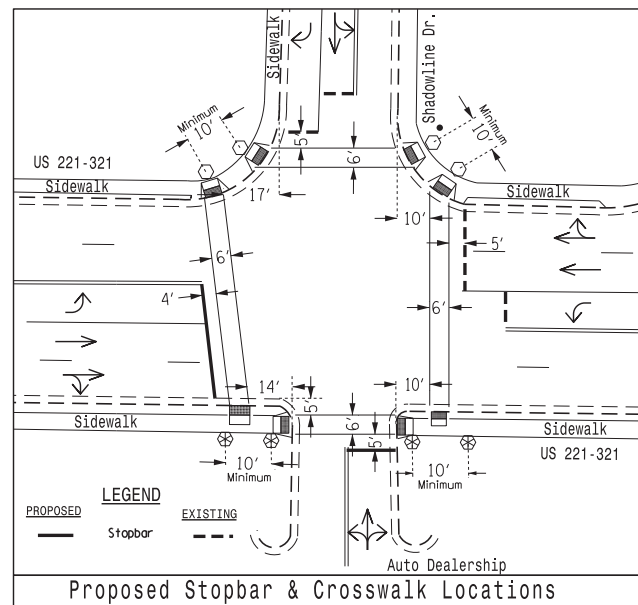
LEGEND

PROPOSED	EXISTING
○	●
○ with arrow	N/A
○ with T	○ with T
○ with P	○ with P
○ with PB	○ with PB
○ with SP	○ with SP
○ with SG	○ with SP
○ with SL	○ with SL
○ with CC	○ with CC
○ with CB	○ with CB
○ with JB	○ with JB
○ with UC	○ with UC
○ with RW	○ with RW
○ with DA	○ with DA
○ with CR	○ with CR
○ with CA </td <td>○ with CA</td>	○ with CA
○ with RA </td <td>○ with RA</td>	○ with RA
○ with LT	○ with LT

OASIS 2070 TIMING CHART

FEATURE	PHASE				
	2	4	5	6	8
Min Green 1 *	10	7	7	10	7
Extension 1 *	3.0	1.0	1.0	3.0	2.0
Max Green 1 *	60	20	15	60	20
Yellow Clearance	3.9	3.4	3.0	3.9	3.4
Red Clearance	2.0	3.6	2.4	2.0	3.6
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	7	7	-	7	7
Don't Walk 1	6	16	-	9	17
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



Signal Upgrade

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 221-321 (Blowing Rock Road)  
at  
Shadowline Drive / Auto Dealership

Division 11 Watauga County Boone

PLAN DATE: March 2021 REVIEWED BY: T.J. Williams

PREPARED BY: EM Minshew REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

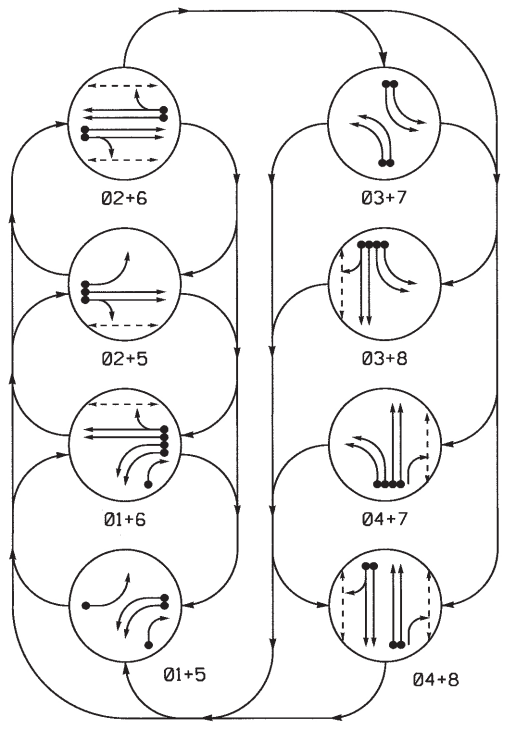
SEAL

DocuSign by: J. Williams 3/19/2021

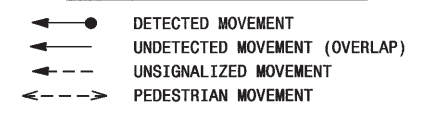
REVISIONS	INIT.	DATE



**PHASING DIAGRAM**



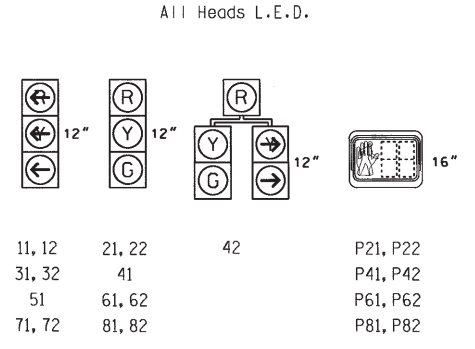
**PHASING DIAGRAM DETECTION LEGEND**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE								FLASH	
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8		
11,12	←	←	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R	R	Y	
31,32	←	←	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G	R	
42	R	R	R	R	R	R	G	G	R	
51	←	←	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	R	Y	
71,72	←	←	←	←	←	←	←	←	←	←
81,82	R	R	R	R	R	G	R	G	R	
P21,P22	DW	DW	W	W	DW	DW	W	W	DRK	
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK	
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK	
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK	

**SIGNAL FACE I.D.**



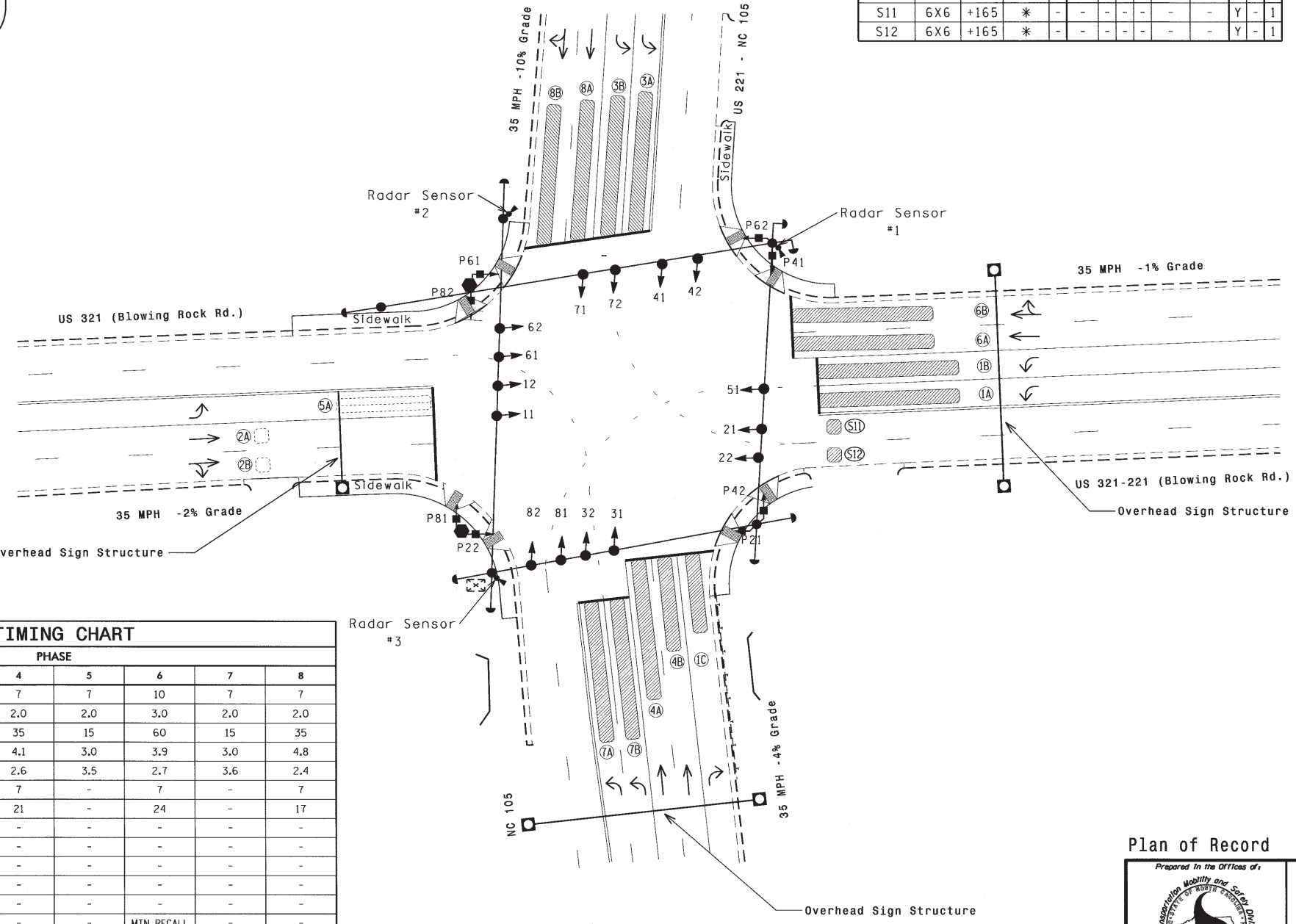
**OASIS 2070L LOOP & DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	Sensor No.	
					PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME				
1A	6X70	0	*	-	1	Y	Y	-	-	3	-	-	1
1B	6X70	0	*	-	1	Y	Y	-	-	-	-	-	1
1C	6X34	0	*	-	1	Y	Y	-	-	15	-	-	3
2A,2B	6X6	70	3	-	2	Y	Y	-	-	-	-	-	-
3A	6X70	0	*	-	3	Y	Y	-	-	3	-	-	2
3B	6X70	0	*	-	3	Y	Y	-	-	-	-	-	2
4A	6X60	0	*	-	4	Y	Y	-	-	-	-	-	3
4B	6X44	0	*	-	4	Y	Y	-	-	-	-	-	3
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	3	-	-	-
6A	6X70	0	*	-	6	Y	Y	-	-	-	-	-	1
6B	6X70	0	*	-	6	Y	Y	-	-	-	-	-	1
7A	6X70	0	*	-	7	Y	Y	-	-	3	-	-	3
7B	6X70	0	*	-	7	Y	Y	-	-	-	-	-	3
8A	6X70	0	*	-	8	Y	Y	-	-	-	-	-	2
8B	6X70	0	*	-	8	Y	Y	-	-	10	-	-	2
S11	6X6	+165	*	-	-	-	-	-	-	-	Y	-	1
S12	6X6	+165	*	-	-	-	-	-	-	-	Y	-	1

**8 Phase Fully Actuated US 321 Boone Closed Loop System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 or phase 5 may be lagged.
- Phase 3 or phase 7 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 0883.



**OASIS 2070L TIMING CHART**

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	10	7	7	7	10	7	7
Extension 1 *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max Green 1 *	25	60	25	35	15	60	15	35
Yellow Clearance	3.0	4.0	3.4	4.1	3.0	3.9	3.0	4.8
Red Clearance	3.9	2.8	3.4	2.6	3.5	2.7	3.6	2.4
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	24	-	21	-	24	-	17
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

**Plan of Record**

PREPARED BY: N. D'Aiuto    DATE: June 2012  
 REVIEWED BY: P.L. Alexander    DATE: October 2012  
 SIGNATURE: [Signature]    DATE: 10/2/12

COMMENTS  
 Added Radar Sensor Information

This plan of record reflects existing field conditions as submitted by field personnel. This plan may have been modified from its original state.

**LEGEND**

PROPOSED	EXISTING
	N/A
N/A	

**Plan of Record**

Prepared in the Offices of:  
  
 US 321 / US 321 - 221 (Blowing Rock Road) at US 221-NC 105 / NC 105

Division 11    Watauga County    Boone

PLAN DATE: April 2011    REVIEWED BY: [Signature]  
 PREPARED BY: B.E. Wynn    REVIEWED BY: [Signature]

750 N. Greenfield Hwy, Garner, NC 27529

SCALE: 1" = 30'

REVISIONS	INIT.	DATE

Not a certified document. This document originally issued and sealed by Zachary M. Little, PE #30530 on June 6, 2011. This document shall not be considered a certified document.

SIG. INVENTORY NO. 11-0883

09-001-0012\_09\_05  
 S:\TSS\SW\TSS\Signal\845\Signal\Des\gn\_Sect1\an\eastern\_Reg\an01.v\11-0883\110883\_sig.por\_2012.002.dgn  
 PLO: Alexander

County	Map #	Route	Route Name	BMU Comments
Watauga	1	US 221	Blowing Rock Blvd	Culvert 60 - No Issues Bridge 67 - Bridge has Concrete Deck Surface and Approaches. Mill and Fill Asphalt Approaches. <b>Do not place Asphalt on Concrete Deck. Do Not Track Tack across bridge.</b>
Watauga	2	US 421	US 421	No Issues
Watauga	3	US 421	US 421	No Issues
Watauga	4	US 421	US 421 NB Lanes	Bridge 8 - BRP Overhead - Clearance doesn't seem to be an issue.
Watauga	5	US 421	US 421 SB Lanes	Bridge 8 - BRP Overhead - Clearance doesn't seem to be an issue.
Watauga	6	NC 194	NC 194 S	Bridge 2 - Steel Plank Floor with Asphalt Overlay - Bridge is just past project limits at the intersection of SR 1112. If project limits are expanded, it is recommended to Mill and Fill across bridge deck and 50'+/- past bridge. Latest inspection report is showing 5" of wearing surface. Not sure is that is from top of corrugation. Please confirm asphalt depth before milling. The approaches are pretty rough at joints. It is recommended to contact David Scott (Boone Bridge Supervisor) at 336-964-1354 once milling is scheduled. This will allow him to review to see if there are any further items that need addressing at the ends of bridge. Bridge 27 - Concrete Deck Surface - Bridge has Concrete Deck Surface and Approaches. Mill and Fill Asphalt Approaches. <b>Do not place Asphalt on Concrete Deck. Do Not Track Tack across bridge.</b> Pipes 243 - No Issues. Culverts 45, 53, 62, 68, 70 - No issues.
Watauga	7	NC 194	Jefferson Rd	No Issues
Watauga	8	NC 194	Jefferson Rd/NC 194 NB	No Issues
Watauga	9	NC 194	NC 194 NB	Bridge 73 - Bridge has Epoxy Overlay on Concrete Deck Surface and Approaches. Mill and Fill Asphalt Approaches. <b>Do not place Asphalt on Concrete Deck. Do Not Track Tack across bridge.</b> Pipes 255, 254, and 253 - No Issues. Culverts 74 and 377 - No Issues. Recommend a close review around the pipes and culverts listed due to most of them along this route have little to no shoulder. May want to Mill and Fill to retain shoulder width.
Watauga	10	SR 1530	Aho Rd	No Issues
Watauga	11	SR 1533	Aho Rd	<b>Bridge 136 - Cored Slab with Asphalt Overlay - New Construction. Tie to construction joint, do not overlay new asphalt.</b>