

09/05/14

WBS ELEMENT: ICR.20461.63, ETC.

CONTRACT NO.: DA00228

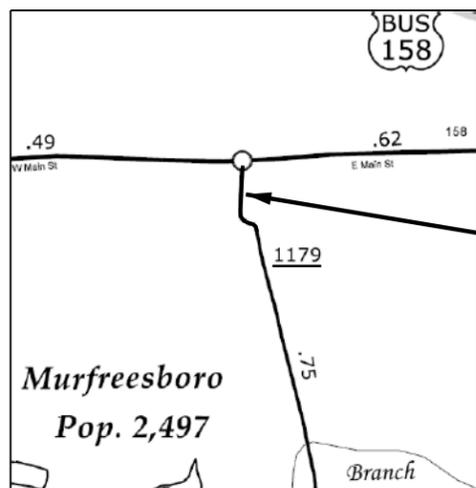
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HERTFORD COUNTY

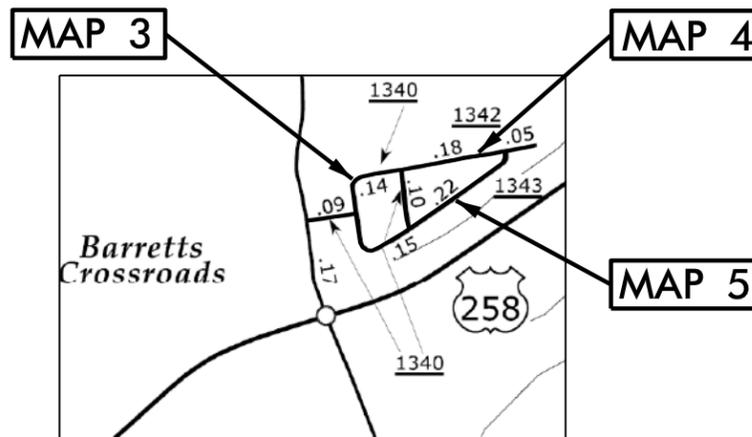
LOCATION: MAP 1 SR 1179 FROM US 158 BUS TO HIGH STREET
 MAP 2 SR 1424 FROM SR 1423 TO NC 561
 MAP 3 SR 1340 FROM SR 1310 TO SR 1343
 MAP 4 SR 1342 FROM SR 1340 TO END
 MAP 5 SR 1343 FROM SR 1342 TO SR 1340
 MAP 6 SR 1345 FROM OLD US 158 TO END
 MAP 7 SR 1241 FROM SR 1105 TO END

TYPE OF WORK: MILLING & RESURFACING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	ICR.20461.63, ETC.	1	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
1CR.20461.63		MAP 1	
1CR.20461.64		MAP 2	
1CR.20461.65		MAP 3	
1CR.20461.66		MAP 4	
1CR.20461.67		MAP 5	
1CR.20461.68		MAP 6	
1CR.20461.69		MAP 7	



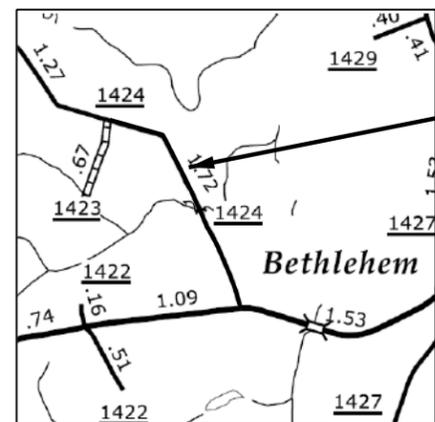
MAP 1



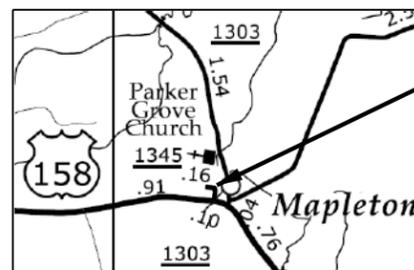
MAP 3

MAP 4

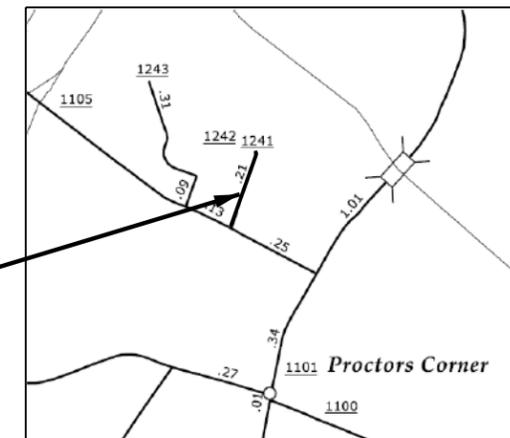
MAP 5



MAP 2



MAP 6



MAP 7



NTS

PROJECT LENGTH

- LENGTH OF ROADWAY PROJECT MAP 1 = 0.15 MI.
- LENGTH OF ROADWAY PROJECT MAP 2 = 1.68 MI.
- LENGTH OF ROADWAY PROJECT MAP 3 = 0.30 MI.
- LENGTH OF ROADWAY PROJECT MAP 4 = 0.27 MI.
- LENGTH OF ROADWAY PROJECT MAP 5 = 0.35 MI.
- LENGTH OF ROADWAY PROJECT MAP 6 = 0.17 MI.
- LENGTH OF ROADWAY PROJECT MAP 7 = 0.19 MI.

Prepared In the Office of:
DIVISION OF HIGHWAYS

113 Airport Dr., Edenton NC, 27932

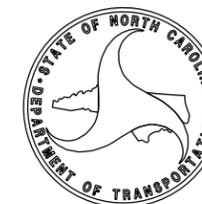
2012 STANDARD SPECIFICATIONS

LETTING DATE:
MARCH 25, 2015

W.B. HOBBS, P.E.
DIVISION PROJECT MANAGER

C.E. SLACHTA
DIVISION PROPOSALS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



09/05/14

CONTRACT NO.: DA00228 WBS ELEMENT: ICR.20461.63, ETC.

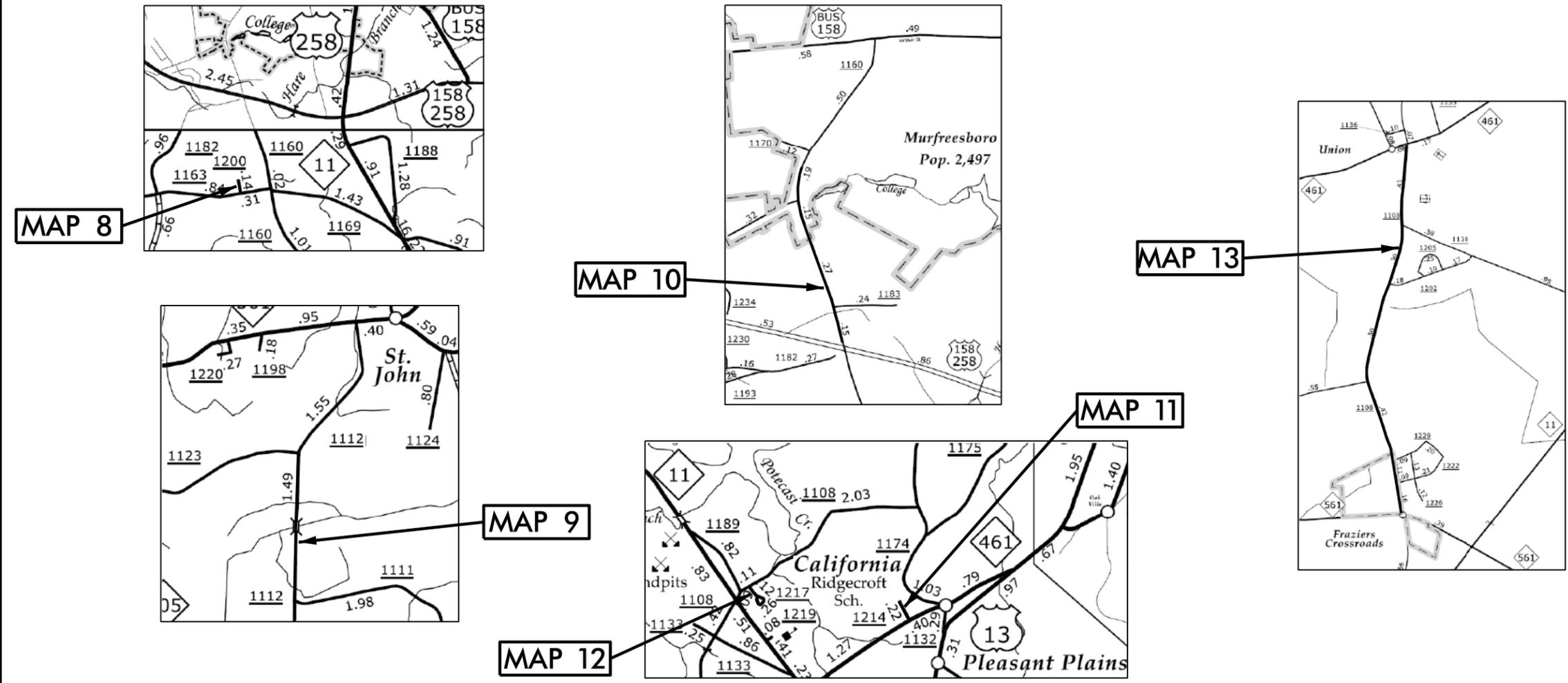
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HERTFORD COUNTY

LOCATION: MAP 8 SR 1200 FROM SR 1163 TO END
 MAP 9 SR 1112 FROM SR 1111 TO SR 1123
 MAP 10 SR 1160 FROM US 158 BYP TO BEGIN C&G
 MAP 11 SR 1214 FROM NC 461 TO END
 MAP 12 SR 1217 FROM SR 1108 TO END
 MAP 13 SR 1108 FROM NC 461 TO NC 561

TYPE OF WORK: ASPHALT SURFACE TREATMENT & RESURFACING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	ICR.20461.63, ETC.	2	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
1CR.20461.70		MAP 8	
1CR.20461.71		MAP 9	
1CR.20461.72		MAP 10	
1CR.20461.73		MAP 11	
1CR.20461.74		MAP 12	
1CR.20461.75		MAP 13	



NTS

PROJECT LENGTH	
LENGTH OF ROADWAY PROJECT MAP 8	= 0.14 MI.
LENGTH OF ROADWAY PROJECT MAP 9	= 1.49 MI.
LENGTH OF ROADWAY PROJECT MAP 10	= 0.65 MI.
LENGTH OF ROADWAY PROJECT MAP 11	= 0.22 MI.
LENGTH OF ROADWAY PROJECT MAP 12	= 0.37 MI.
LENGTH OF ROADWAY PROJECT MAP 13	= 1.90 MI.

Prepared In the Office of:
DIVISION OF HIGHWAYS
 113 Airport Dr., Edenton NC, 27932

2012 STANDARD SPECIFICATIONS

LETTING DATE:
 MARCH 25, 2015

W.B. HOBBS, P.E.
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 STATE OF NORTH CAROLINA

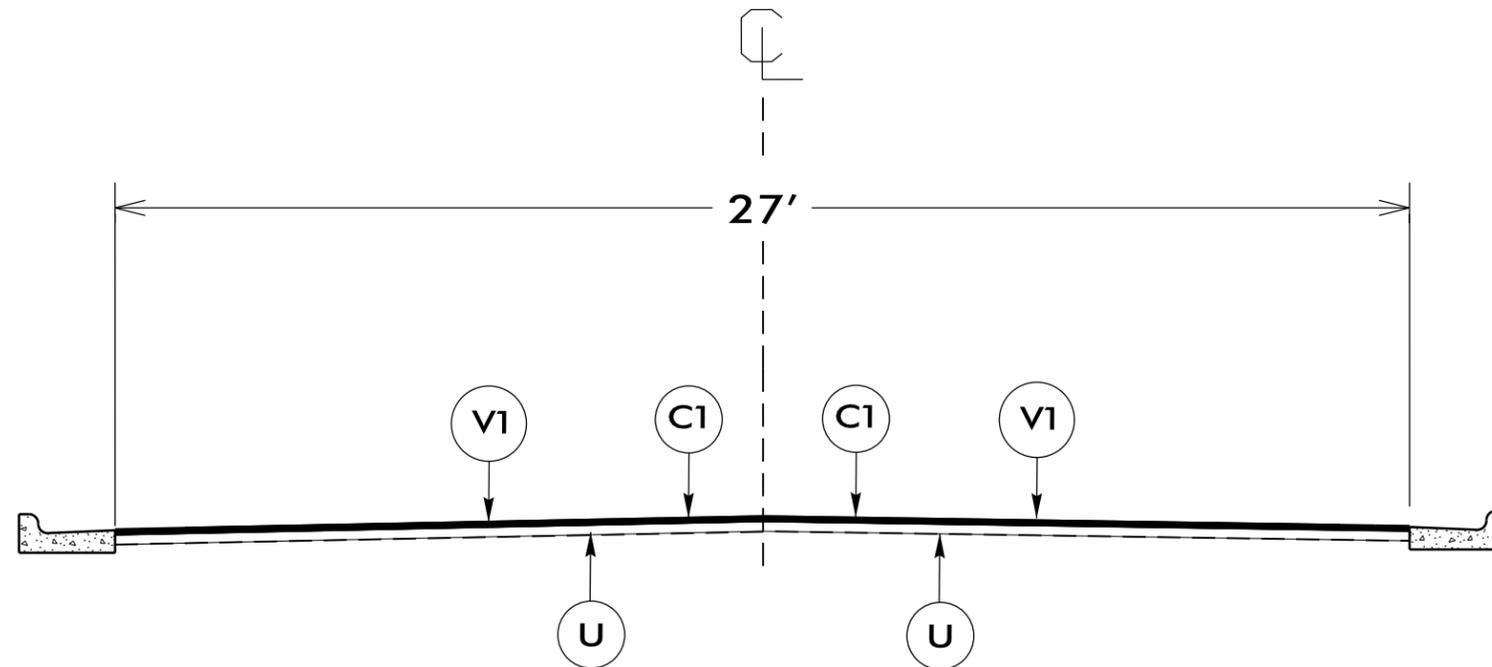
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
V1	MILLING BITUMINOUS PAVEMENT. 1.5" IN DEPTH.
U	EXISTING PAVEMENT.

PROJECT REFERENCE NO. 1CR.20461.63, ETC.	SHEET NO. 3 of 11
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NOTES:

- *ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII., OR AS DIRECTED BY THE ENGINEER
- *EDGES, PAVEMENT WIDENING, INTERSECTIONS, AND BRIDGE FLARES ARE INCLUDED IN THE SUMMARY OF QUANTITIES
- *CONTRACTOR SHALL MILL 1.5" BELOW EXISTING EDGE OF CONC. CURB & GUTTER.
- *PAVEMENT MARKINGS TO BE PERFORMED BY OTHERS
- *INDUCTIVE LOOPS SHALL BE INSTALLED PRIOR TO THE FINAL LIFT OF SURFACE BEING PLACED



TYPICAL SECTION NO. 1

USE WITH MAP 1

NTS

C:\MAR-2015\517\Projects\DIVISION PROJECT WORKING FILES\District Two\DA02228 Hertford County Resurfacing (2015 - 2016)\1) Pre-Bid Documents\DA02228 Plans (Plan Sheets 1-6).dgn

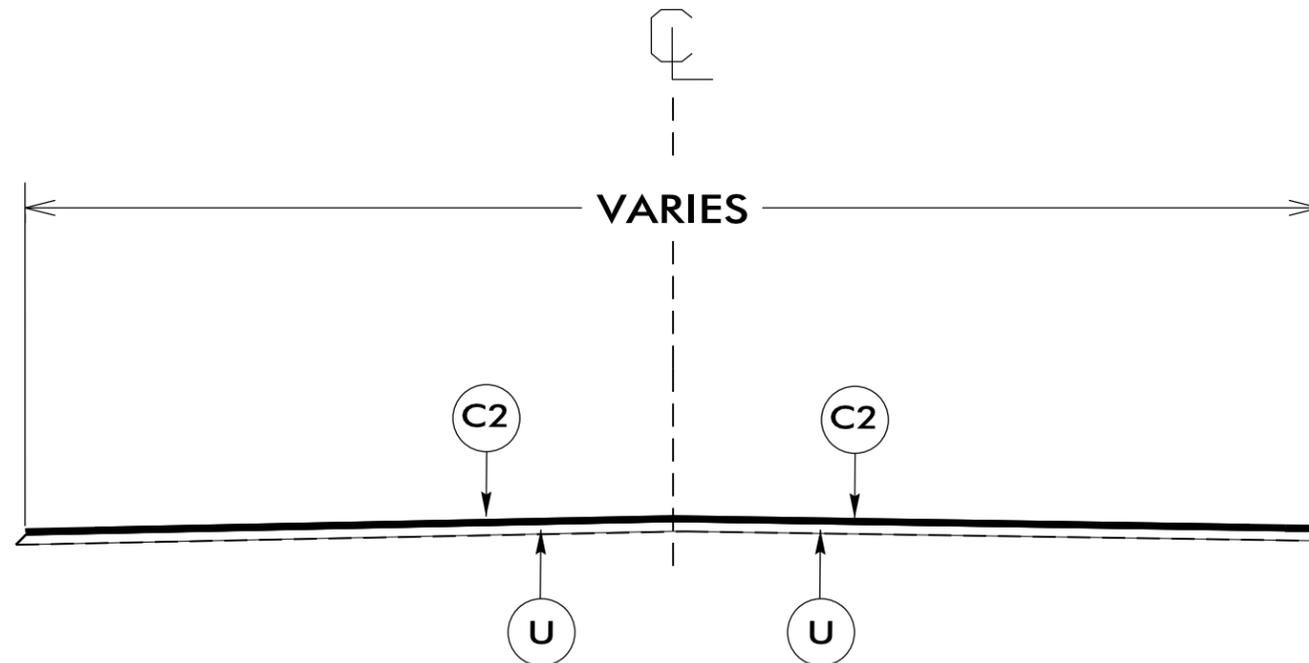
P A V E M E N T S C H E D U L E

C2	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
U	EXISTING PAVEMENT.

PROJECT REFERENCE NO. 1CR.20461.63, ETC.	SHEET NO. 4 of 11
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NOTES:

- *ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII., OR AS DIRECTED BY THE ENGINEER
- *EDGES, PAVEMENT WIDENING, INTERSECTIONS, AND BRIDGE FLARES ARE INCLUDED IN THE SUMMARY OF QUANTITIES
- *SHOULDER RECONSTRUCTION TO BE PERFORMED BY OTHERS
- *PAVEMENT MARKINGS TO BE PERFORMED BY OTHERS



TYPICAL SECTION NO. 2

USE WITH MAPS 2 - 8, 11 & 12

NTS

C:\MAR-2015\1518\Projects\DIVISION PROJECT WORKING FILES\District Two\DA0228 Hertford County Resurfacing (2015 - 2016)\1) Pre-Bid Documents\DA0228 Plans (Plan Sheets 1-6).dgn

PAVEMENT SCHEDULE

C2	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C3	PROP. ASPHALT SURFACE TREATMENT, DOUBLE SEAL, AT AN APPLICATION RATE TO BE DETERMINED BY FIELD CONDITIONS IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS
U	EXISTING PAVEMENT.

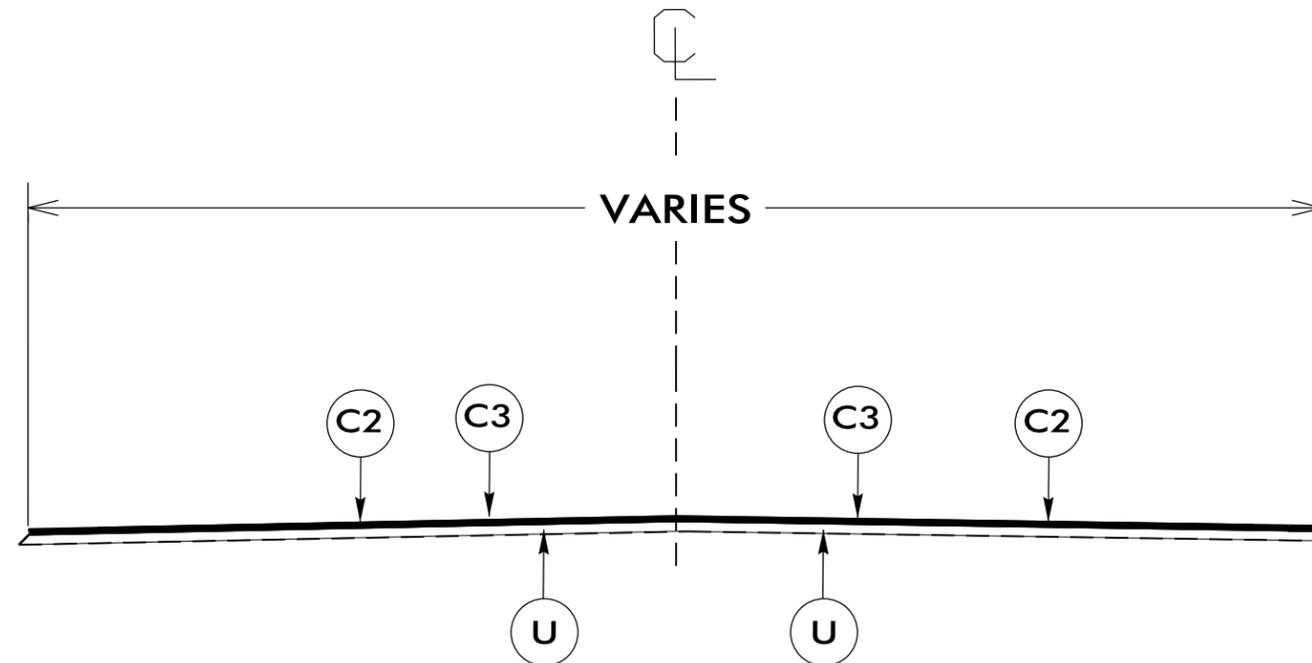
PROJECT REFERENCE NO. 1CR.20461.63, ETC.	SHEET NO. 5 of 11
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NOTES:

- *ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII., OR AS DIRECTED BY THE ENGINEER
- *EDGES, PAVEMENT WIDENING, INTERSECTIONS, AND BRIDGE FLARES ARE INCLUDED IN THE SUMMARY OF QUANTITIES
- *SHOULDER RECONSTRUCTION TO BE PERFORMED BY OTHERS
- *PAVEMENT MARKINGS TO BE PERFORMED BY OTHERS
- *ASPHALT SURFACE TREATMENT, DOUBLE SEAL, TO BE INSTALLED PRIOR TO RESURFACING WITH SF9.5A MIX
- *ASPHALT SURFACE TREATMENT, DOUBLE SEAL, CONSISTS OF TWO LAYERS OF TREATMENT:

 BOTTOM LAYER CONSISTS OF EMULSIFIED ASPHALT, GRADE CRS-2L AT A RATE OF APPROX 0.25 ± GAL/SY AND A LAYER OF 78M AGGREGATE AT A RATE OF APPROX. 16 ± LBS/SY.

 TOP LAYER CONSISTS OF EMULSIFIED ASPHALT, GRADE CRS-2L AT A RATE OF APPROX 0.22 ± GAL/SY AND A LAYER OF BLOTTING SAND (1S) AT A RATE OF APPROX. 10 ± LBS/SY.
- *ASPHALT SURFACE TREATMENT SHALL BE ALLOWED TO SET UP FOR A MINIMUM 10 DAYS BEFORE ANY OTHER WORK CAN BE PERFORMED
- *BRIDGE NO. 60 ON MAP 9 TO BE MILLED 1.25" AND RESURFACED WITH AST & 1.25" OF MIX SF9.5A.



TYPICAL SECTION NO. 3

USE WITH MAPS 9 & 13

NTS

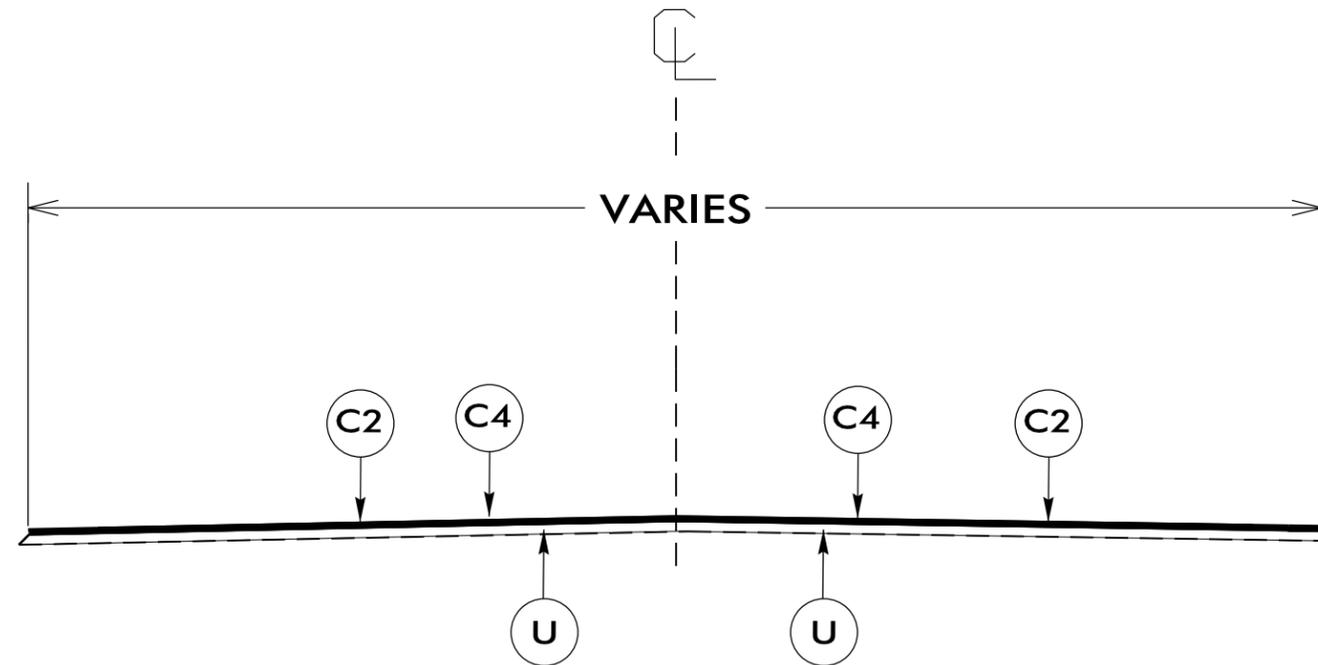
C:\MAR-2015\1519\Projects\DIVISION PROJECT WORKING FILES\District Two\DA00228 Hertford County Resurfacing (2015 - 2016)\1) Pre-Bid Documents\DA00228 Plans (Plan Sheets 1-6).dgn

PAVEMENT SCHEDULE

C2	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C4	PROP. ASPHALT SURFACE TREATMENT, SAND SEAL, AT AN APPLICATION RATE TO BE DETERMINED BY FIELD CONDITIONS IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS
U	EXISTING PAVEMENT.

NOTES:

- *ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII., OR AS DIRECTED BY THE ENGINEER
- *EDGES, PAVEMENT WIDENING, INTERSECTIONS, AND BRIDGE FLARES ARE INCLUDED IN THE SUMMARY OF QUANTITIES
- *SHOULDER RECONSTRUCTION TO BE PERFORMED BY OTHERS
- *PAVEMENT MARKINGS TO BE PERFORMED BY OTHERS
- *ASPHALT SURFACE TREATMENT, SAND SEAL, TO BE INSTALLED PRIOR TO RESURFACING WITH SF9.5A MIX
- *ASPHALT SURFACE TREATMENT, SAND SEAL, CONSISTS OF ONE LAYER OF TREATMENT:
LAYER CONSISTS OF EMULSIFIED ASPHALT, GRADE CRS-2L AT A RATE OF APPROX 0.24 ± GAL/SY AND A LAYER OF BLOTTING SAND AT A RATE OF APPROX. 13 ± LBS/SY.
- *ASPHALT SURFACE TREATMENT SHALL BE ALLOWED TO SET UP FOR A MINIMUM 10 DAYS BEFORE ANY OTHER WORK CAN BE PERFORMED



TYPICAL SECTION NO. 4

USE WITH MAPS 10

NTS

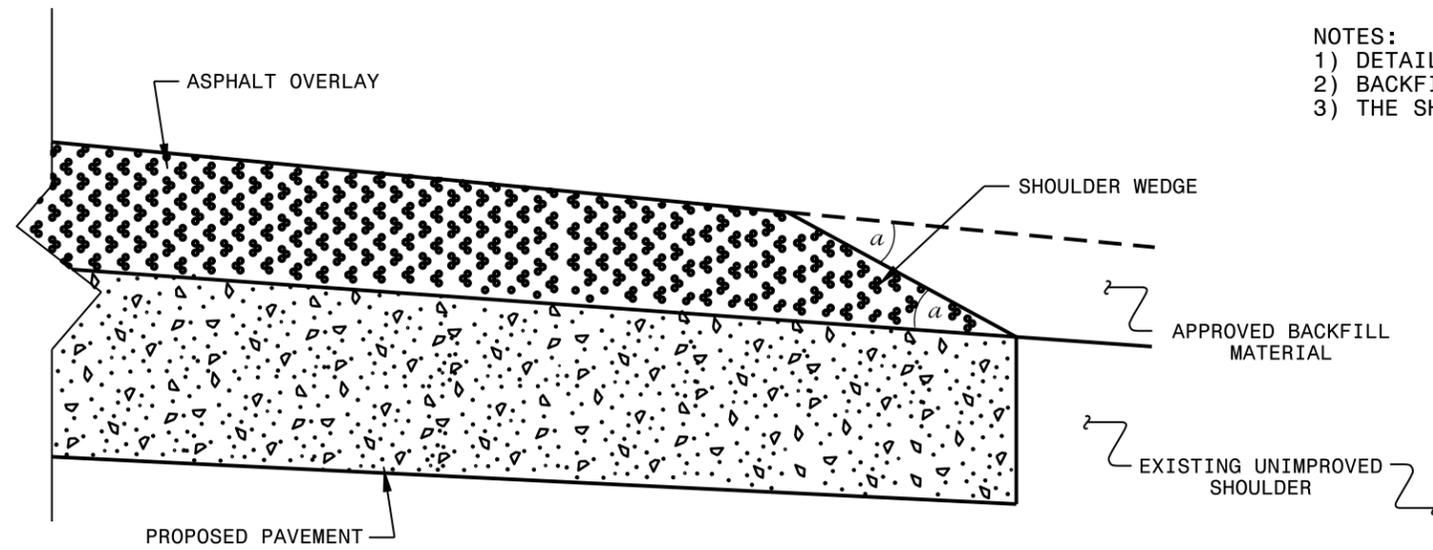
C:\MAR-2015\1519\Projects\DIVISION PROJECT WORKING FILES\District Two\DA00228 Hertford County Resurfacing (2015 - 2016)\1) Pre-Bid Documents\DA00228 Plans (Plan Sheets 1-6).dgn

PROJECT NO.	SHEET NO.	TOTAL NO.
1CR.20461.63, ETC.	7	11

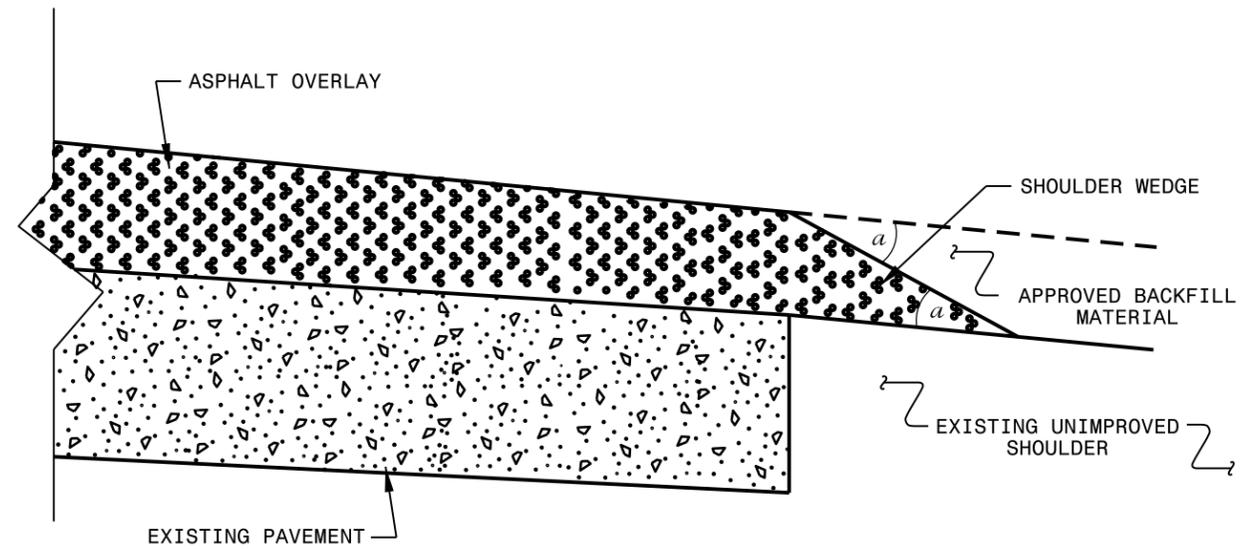
SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH		MOBILIZATION	1½"	INCIDENTAL MILLING	SURFACE COURSE, S9.5B	SURFACE COURSE, SF9.5A	ASPHALT BINDER FOR PLANT MIX	AC PLANT MIX (REPAIR)	ASPHALT SURFACE TREATMENT DOUBLE SEAL	ASPHALT SURFACE TREATMENT SAND SEAL	EMULSION FOR ASPHALT SURFACE TREATMENT	CONCRETE CURB RAMPS	ADJ. OF METER OR VALVE BOX	TEMPORARY TRAFFIC CONTROL	INDUCTIVE LOOP SAWCUT	LEAD-IN CABLE (14-2)
										MI	FT		LS		SY	SY		TONS	TONS	TONS	SY	SY	GAL	EA	EA	LS
1CR.20461.63	Hertford	1	SR 1179	FROM US 158 BUS. TO HIGH ST.	1	2	2WU	NO	NO	0.15	27	1	2,500			224	15	10				1		1	250	50
1CR.20461.64	Hertford	2	SR 1424	FROM 1423 TO NC 561	2	2	2WU	NO	NO	1.68	19.5	*		85		1,391	93							*		
1CR.20461.65	Hertford	3	SR 1340	FROM SR 1310 TO SR 1343	2	2	2WU	NO	NO	0.30	20	*		50		273	18							*		
1CR.20461.66	Hertford	4	SR 1342	FROM SR 1340 TO END	2	2	2WU	NO	NO	0.27	18.5	*				212	14							*		
1CR.20461.67	Hertford	5	SR 1343	FROM SR 1342 TO SR 1340	2	2	2WU	NO	NO	0.35	18.5	*				289	19							*		
1CR.20461.68	Hertford	6	SR 1345	FROM OLD US 158 TO END	2	2	2WU	NO	NO	0.17	18.5	*		50		133	9							*		
1CR.20461.69	Hertford	7	SR 1241	FROM SR 1105 TO END	2	2	2WU	NO	NO	0.19	18	*		70		193	13							*		
1CR.20461.70	Hertford	8	SR 1200	FROM SR 1163 TO END	2	2	2WU	NO	NO	0.14	17	*		50		103	7							*		
1CR.20461.71	Hertford	9	SR 1112	FROM SR 1111 TO SR 1123	3	2	2WU	NO	NO	1.49	19	*		260		1,275	85		16,600		7,802			*		
1CR.20461.72	Hertford	10	SR 1160	FROM US 158 BYP TO BEGIN C&G	4	2	2WU	NO	NO	0.65	24	*		200		696	47		9,200		2,208		4	*		
1CR.20461.73	Hertford	11	SR 1214	FROM NC 461 TO END	2	2	2WU	NO	NO	0.22	18	*		60		173	12							*		
1CR.20461.74	Hertford	12	SR 1217	SR 1108 TO END	2	2	2WU	NO	NO	0.37	20	*		30		320	21							*		
1CR.20461.75	Hertford	13	SR 1108	FROM NC 461 TO NC 561	3	2	2WU	NO	NO	1.90	21	*		300	2,142		129		23,400		10,998			*		
TOTAL										7.87		1	2,500	1,155	2,142	5,282	482	10	40,000	9,200	21,008	1	4	1	250	50

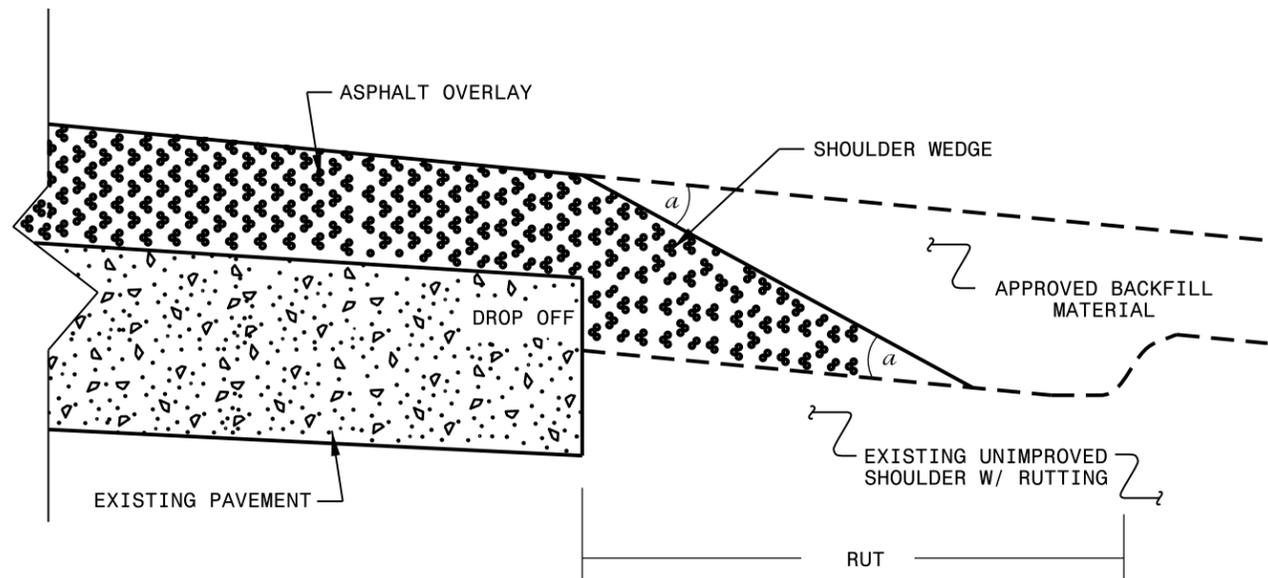
- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFD AND ULTRA-THIN BONDED WEARING COURSE.
 - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
 - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



SHOULDER WEDGE DETAIL
(Resurfacing Projects w/ Widening or
with Existing Paved Shoulder having no dropoffs)



SHOULDER WEDGE DETAIL
(Resurfacing Projects w/ NO Widening)



SHOULDER WEDGE DETAIL
(Resurfacing Adjacent to
Rutted Shoulder)

- SHOULDER WEDGE ANGLE = 30°

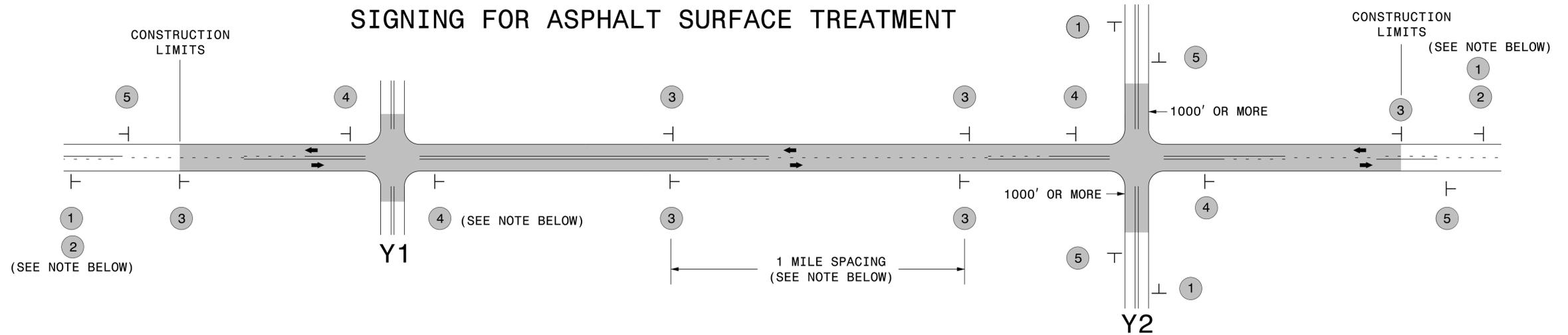
CONTRACT STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

**SHOULDER WEDGE
DETAILS**

ORIGINAL BY: T.SPELL DATE: 7-19-11
 MODIFIED BY: DATE: 10/16/12
 CHECKED BY: DATE:
 FILE SPEC.: susr/details/stand/shoulderwedgedetail.dgn

SYSTEM: 11/15/11 10:58 AM
 USER: T.SPELL
 FILE: susr/details/stand/shoulderwedgedetail.dgn

SIGNING FOR ASPHALT SURFACE TREATMENT



LEGEND	
	STATIONARY SIGN
←	DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

-Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	MAINLINE (-L-) SIGNING
1 2	<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>
3	<p>ALTERNATE THE FOLLOWING TWO SIGNS: STARTING WITH "LOOSE GRAVEL" (W8-7) FOLLOWED BY "UNMARKED PAVEMENT".</p> <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>
4	<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>
5	<p>PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.</p>

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.

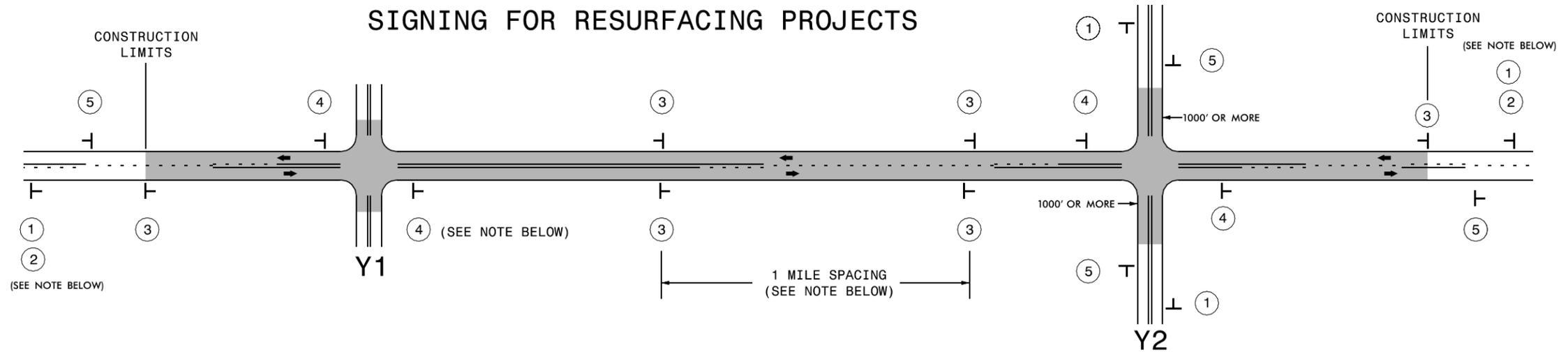


PLACED 500' IN ADVANCE OF FLAGGER. PLACED 250' IN ADVANCE OF FLAGGER.



**ADVANCE WARNING SIGNS
FOR
ASPHALT SURFACE TREATMENTS
2 LANE ROADWAYS**

SIGNING FOR RESURFACING PROJECTS

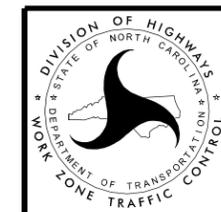


LEGEND	
⊥	STATIONARY SIGN
→	DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

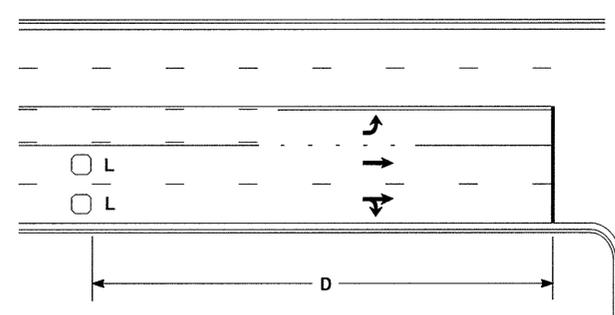
-Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	MAINLINE (-L-) SIGNING		-Y- LINE SIGNING		
	①	 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.	<p>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</p> <ol style="list-style-type: none"> 1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE 2) SUBDIVISION ROADS 3) DEAD END ROADS <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;"> <div style="text-align: center;"> W20-1 48" X 48" </div> <div style="text-align: center;"> W20-7 A 48" X 48" </div> </div> <p>PLACED 500' IN ADVANCE OF FLAGGER. PLACED 250' IN ADVANCE OF FLAGGER.</p>	
	②	 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	 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 1/2 MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.		
	④	 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	 G20-2 A 48" X 24"	PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.			



RESURFACING
ADVANCE WARNING SIGNS
FOR
RURAL AND SUBURBAN
2 LANE ROADWAYS

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

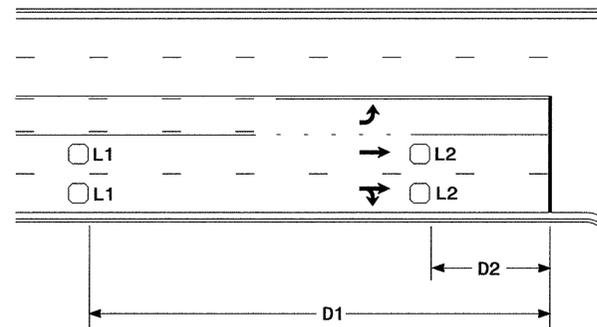


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

L = 6ft X 6ft (1.8m X 1.8m)
Wired in series for TS1
Controllers
Wired separately for TS2,
170, and 2070L Controllers

Volume Density Operation

OR

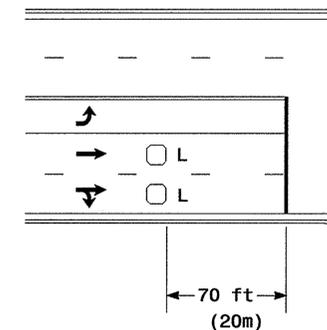


Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

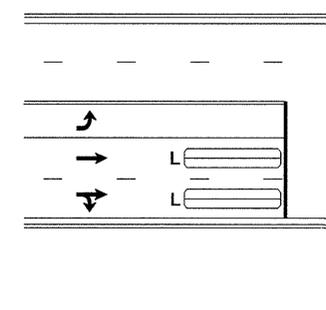
"Stretch" Operation

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



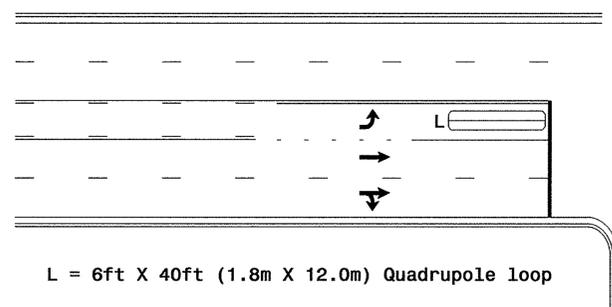
L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

OR



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

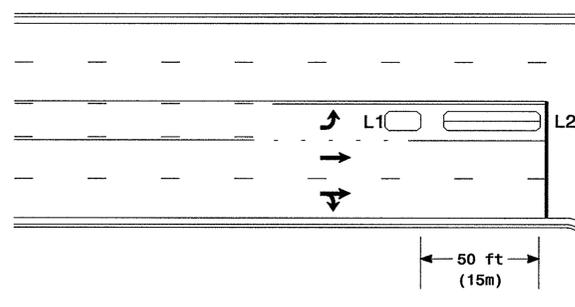
Left Turn Lane Detection



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

Presence Loop Detection

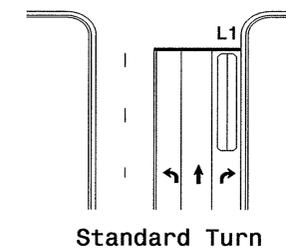
OR



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

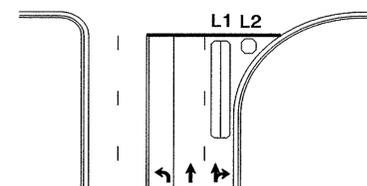
Queue Loop Detection

Right Turn Lane Detection

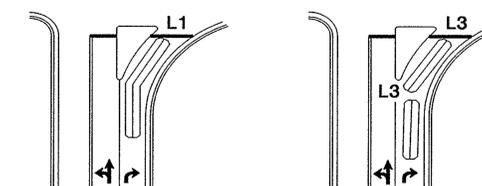


Standard Turn

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

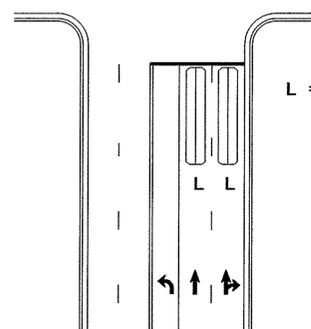


Wide Radius Turn



Channelized Turn

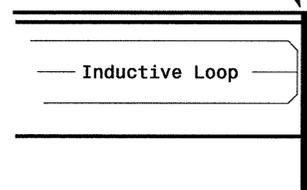
Side Street Detection



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

Presence Loop Placement at Stop Lines

Locate loop slightly
behind leading
edge of stop line



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

Recommended Number of Turns

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

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

Quadrupole loops: Use 2-4-2 turns
6' X 15' (1.8m X 4.6m) Loops:
Lead-in < 150' (45 m), use 2 turns
Lead-in > 150' (45 m), use 3 turns

	Typical Loop Locations		
	PLAN DATE: June 2006 PREPARED BY: P. L. Alexander	REVIEWED BY: REVIEWED BY:	
SCALE N/A	INIT. DATE DATE		SIGNATURE DATE