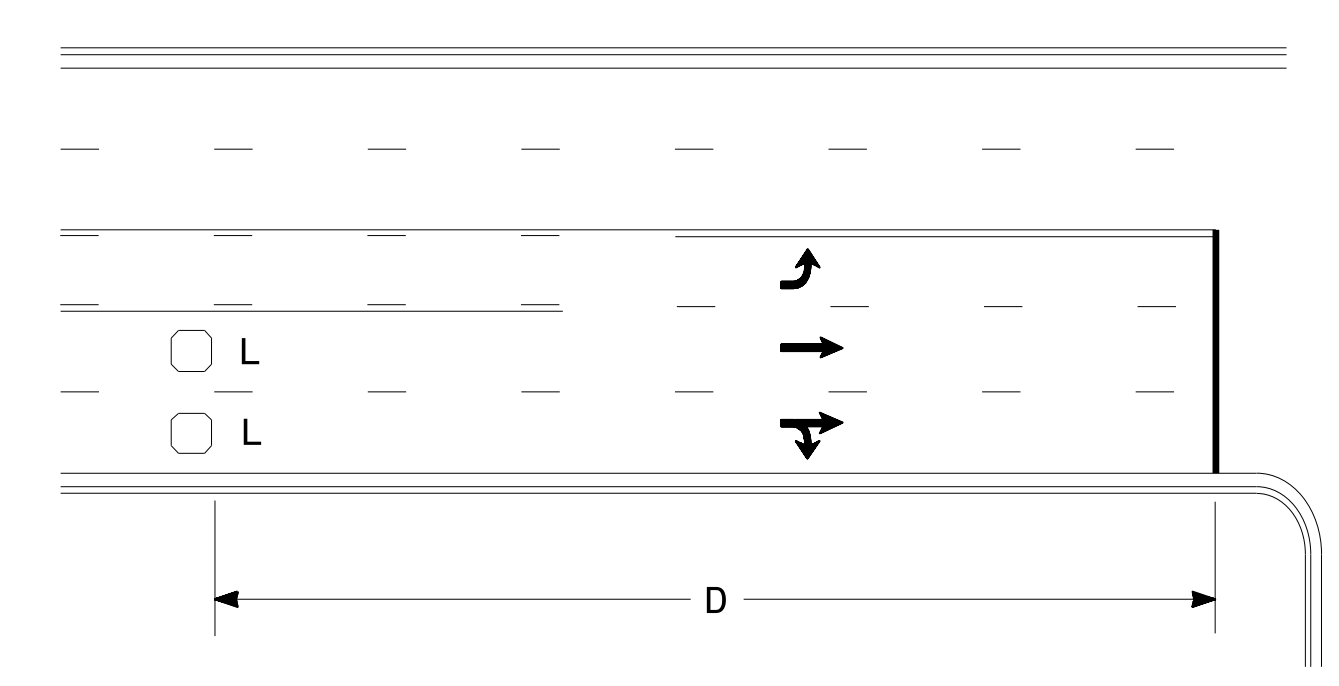


High Speed Detection (≥40 mph)

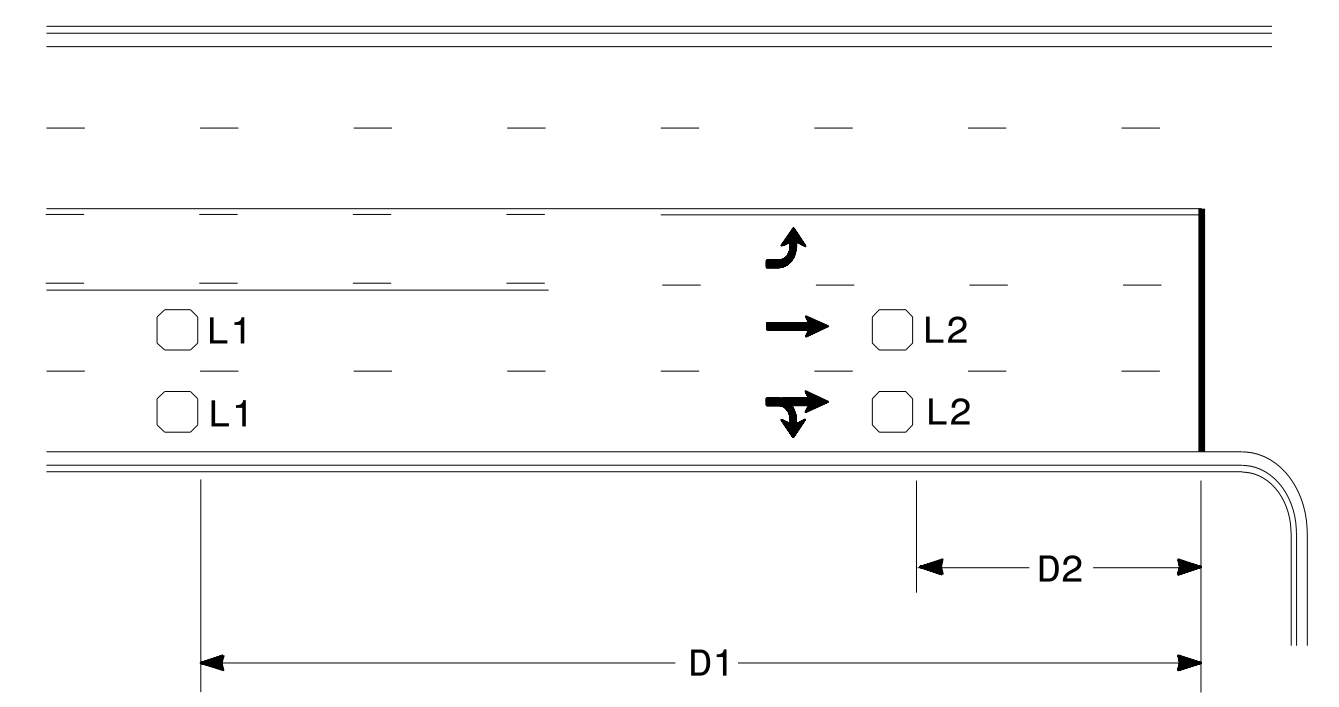


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

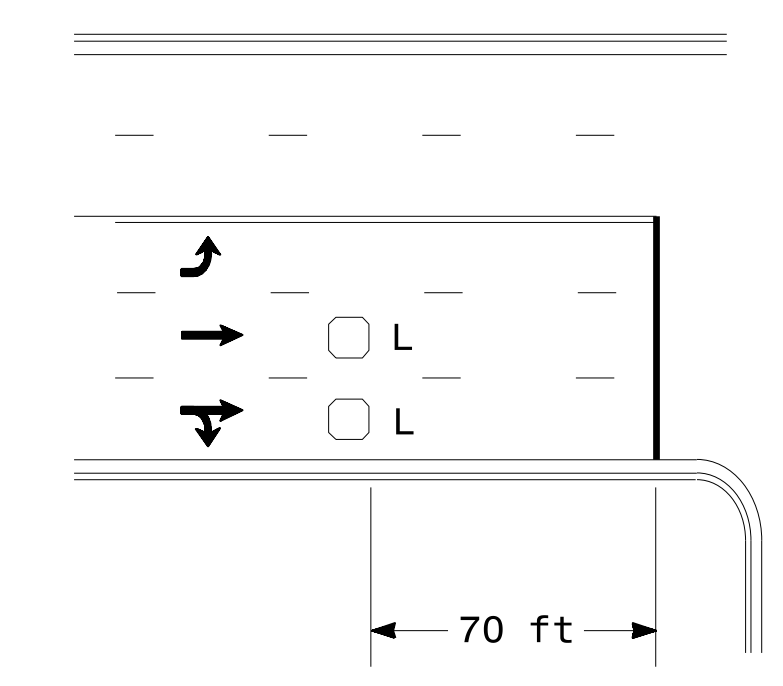


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

L1 = 6ft X 6ft
Wired in series
L2 = 6ft X 6ft
Wired in series

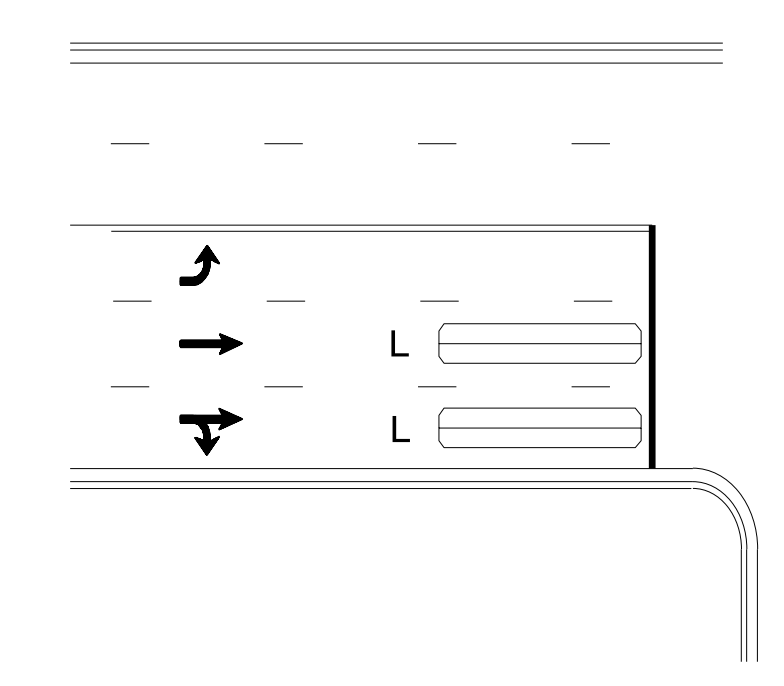
"Stretch" Operation

Low Speed Detection (≤35 mph)



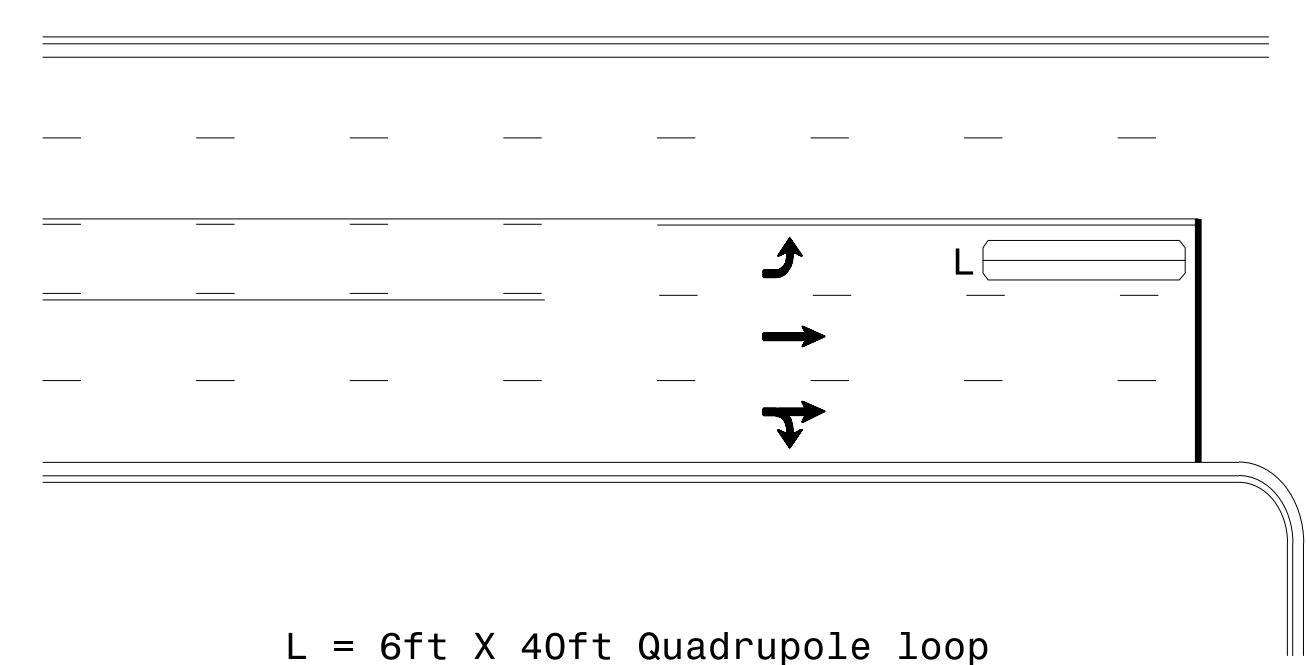
L = 6ft X 6ft
Wired in series

OR



L = 6ft X 40ft
Quadrupole loop, wired separately

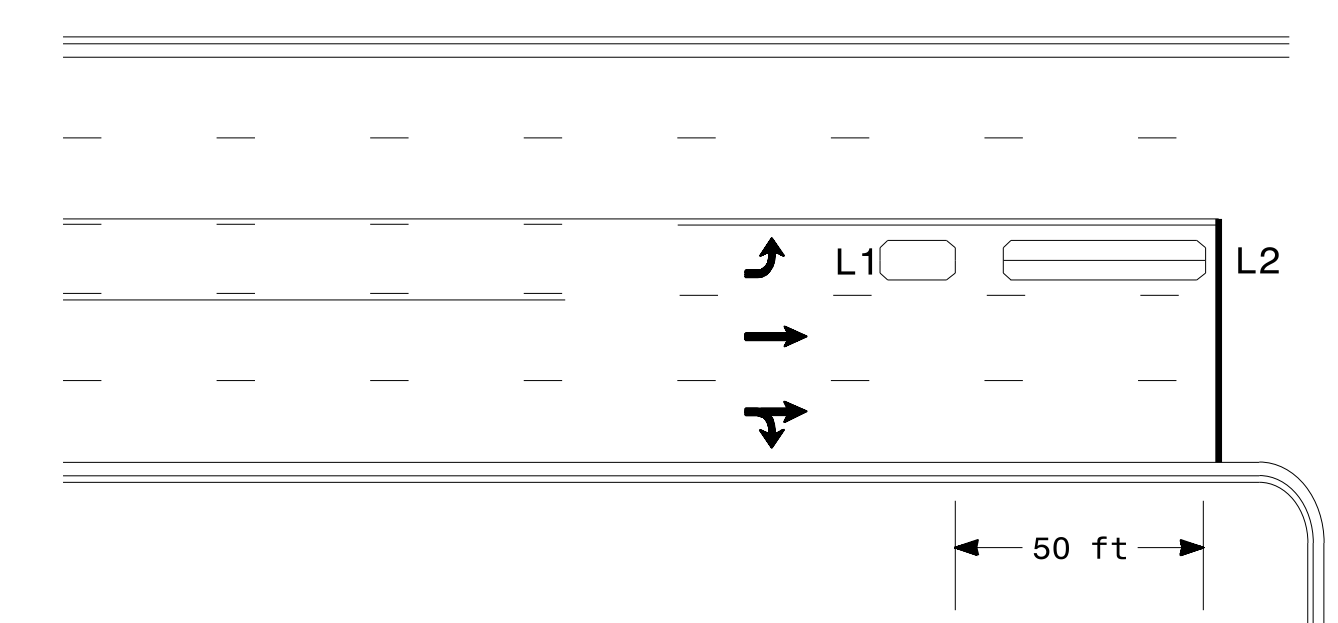
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

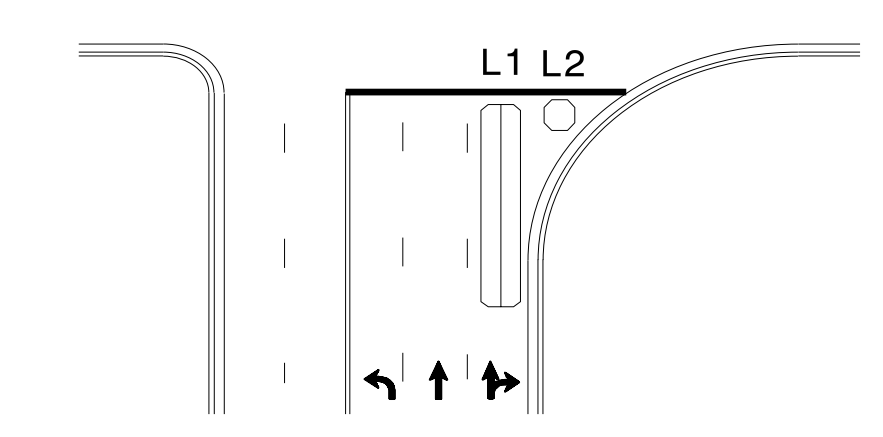
OR



L1 = 6ft X 15ft Queue detector
L2 = 6ft X 40ft Quadrupole loop

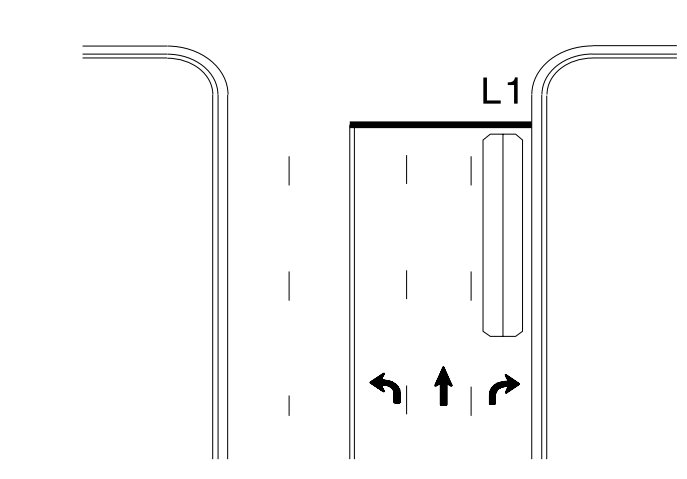
Queue Loop Detection

Right Turn Lane Detection

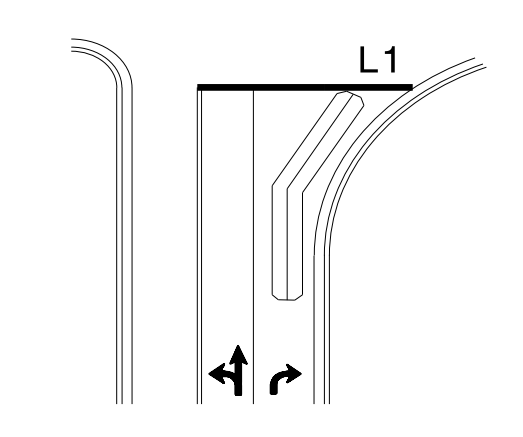


Shared Lane/
Wide Radius Turn

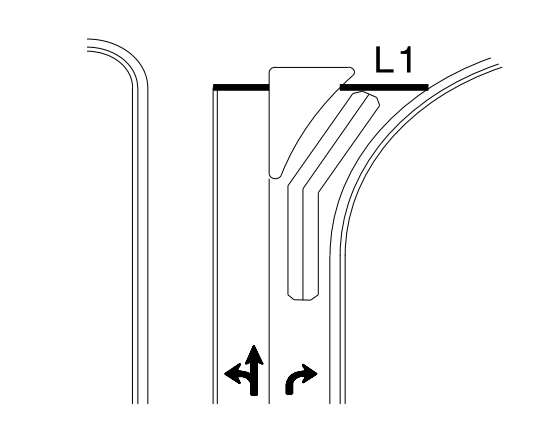
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

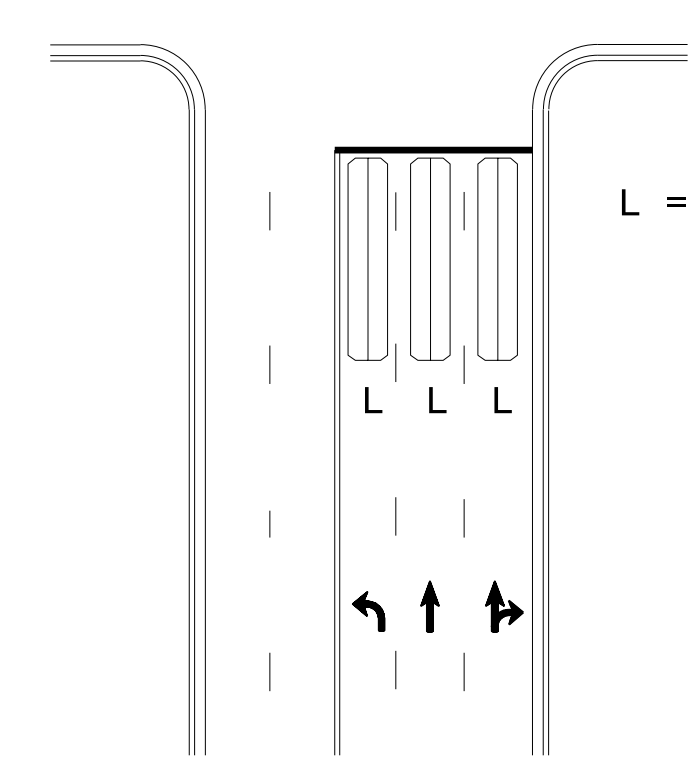


Wide Radius Turn



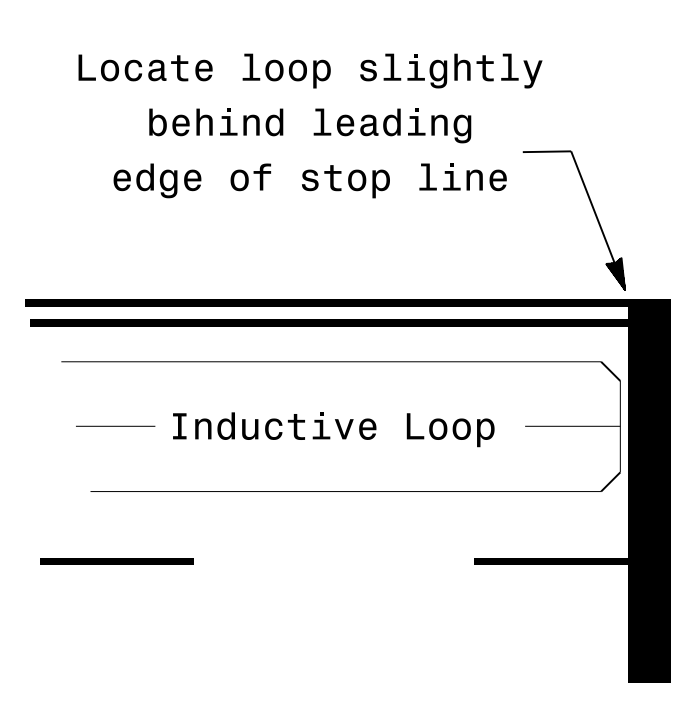
Channelized Turn

Side Street Detection



L = 6ft X 40ft
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 under any of the
following conditions:
1) stop line is greater than 15'
from edge of intersecting
roadway
2) loop detects a permissive or
protected/permissive left turn
3) for an exclusive right turn
lane

Recommended Number of Turns

Single 6' X 6' loop
(when wired separately):

Length of Lead-in ft	Number of Turns
< 250	3
250-375	4
375-525	5
> 525	6

Quadrupole loops: Use 2-4-2 turns
6' X 15' Loops:
Lead-in < 150', use 2 turns
Lead-in > 150', use 3 turns

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Signal Loop Locations

PLAN DATE: January 2015	REVIEWED BY: JPG
PREPARED BY: PLA	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
PAMELA L. ALEXANDER
23489

1/30/2015

3D:\116-2015-12-29
 S:\116\2015-12-29\Signal Design Section\Eastern Region\loop\ypj\ca\2015.dgn
 paalexander

PROJECT NO.	SHEET NO.	TOTAL NO.
2016CPT.04.10.10511.1	5	

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP	LANES	LANE TYPE	LENGTH	WIDTH	4688000000-E		469000000	4695000000-E		4700000000-E	4702000000-E	4705000000-E	4710000000-E	4721000000-E	4725000000-E								
										6" X 90 M YELLOW THERMO	6" X 90 M WHITE THERMO	6" X 120 M WHITE THERMO	8" X 90 M WHITE THERMO	8" X 90 M YELLOW THERMO	12" X 90 M WHITE THERMO	12" X 120 M WHITE THERMO	16" X 120 M WHITE THERMO	24" X 120 M WHITE THERMO	THERMO RXR 120 M	THERMO MSG ONLY 120 M EA	THERMO STR ARROW 90 M EA	THERMO STR & RT ARROW 90 M EA	THERMO STR & LT ARROW 90 M EA	THERMO RT ARROW 90 M EA	THERMO MERGE ARROW 90 M EA	THERMO LT ARROW 90 M EA		
2016CPT.04.10.10511.1	Johnston	1	US70 BUS. WEST BOUND	FROM US 70 BYPASS BRIDGE TO WAKE COUNTY LINE	1	2	MD	7.88	24-36	41,606	41,606	10,741	2,712	2,750	2,085	1,460	100	783	4	32	60	2	72	58	3			
		2	US70 BUS. EAST BOUND	WAKE COUNTY LINE TO BRIDGE AT US70 BYPASS	1	2	MD	7.83	24-36	41,184	41,184	12,490	2,560	40	2,085	2565		576		48	60	2		55		66		
		3	US70 BUS. RAMP WEST BOUND	ENTRANCE RAMP FROM US 70 TO US 70 BUS.	2	2	2WU	0.7	16	3,700	3,700				395													
		4	BARBOUR /HAMBY ST.	FROM US HWY 70 BUS. TO NC HWY 42 WEST	3	2	2WU	0.21	24-36																			
GRAND TOTAL FOR PROJ NO. 2016CPT.04.10.10511.1									16.62		86,490	86,490	23,231	5,272	2,790	4,565	4,025	100	1,359	4	80	120	4	72	113	3	66	
											172,980			8,062						84			378					

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP	LANES	LANE TYPE	LENGTH	WIDTH	481000000	4815000000-E		4820000000-E		4825000000-E	4830000000-E	4835000000-E	4840000000-N		4845000000-N							05000000	4935000000-N	4945000000-N
										4" WHITE PAINT	6" WHITE PAINT	6" YELLOW PAINT	8" WHITE PAINT	8" YELLOW PAINT	12" WHITE PAINT	16" WHITE PAINT	24" WHITE PAINT	PAINT MSG RXR	PAINT MSG ONLY	PAINT STR ARROW	PAINT STR & RT ARROW	PAINT STR & LT ARROW	PAINT RT ARROW	PAINT MERGE ARROW	PAINT LT ARROW	SNOW PLOWABLE	FLEXIBLE DELINEATORS (CRYSTAL)	FLEXIBLE DELINEATORS	
2016CPT.04.10.10511.1	Johnston	1	US70 BUS. WEST BOUND	FROM US 70 BYPASS BRIDGE TO WAKE COUNTY LINE	1	2	MD	7.88	24-36		52,347	41,606	2,712	275	1,500	100	783	4	32	60	2	72	58	3		1,110		48	
		2	US70 BUS. EAST BOUND	WAKE COUNTY LINE TO BRIDGE AT US70 BYPASS	1	2	MD	7.83	24-36		53,674	41,184	2,560	40	1,500		576		48	60	2		55		66	1,280			
		3	US70 BUS. RAMP WEST BOUND	ENTRANCE RAMP FROM US 70 TO US 70 BUS.	2	2	2WU	0.7	16		3,700	3,700																	
		4	BARBOUR /HAMBY ST.	FROM US HWY 70 BUS. TO NC HWY 42 WEST	3	2	2WU	0.21	24-36	2,400																		8	
GRAND TOTAL FOR PROJ NO. 2016CPT.04.10.10511.1									16.62	2,400	109,721	86,490	5,272	315	3,000	100	1,359	4	80	120	4	72	113	3	66	2,390	8	48	
											196,211			5,587					84			378							

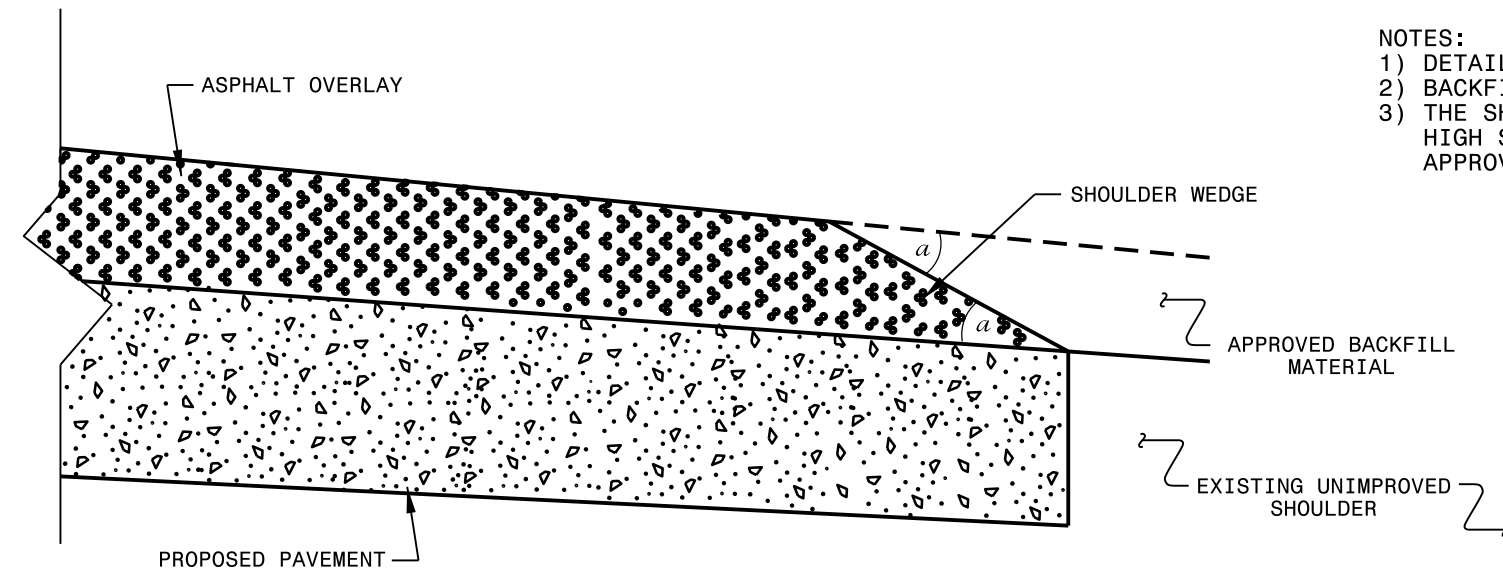
PROJECT NO.	SHEET NO.	TOTAL NO.
2016CPT.04.10.10511.1	4	

SUMMARY OF QUANTITIES

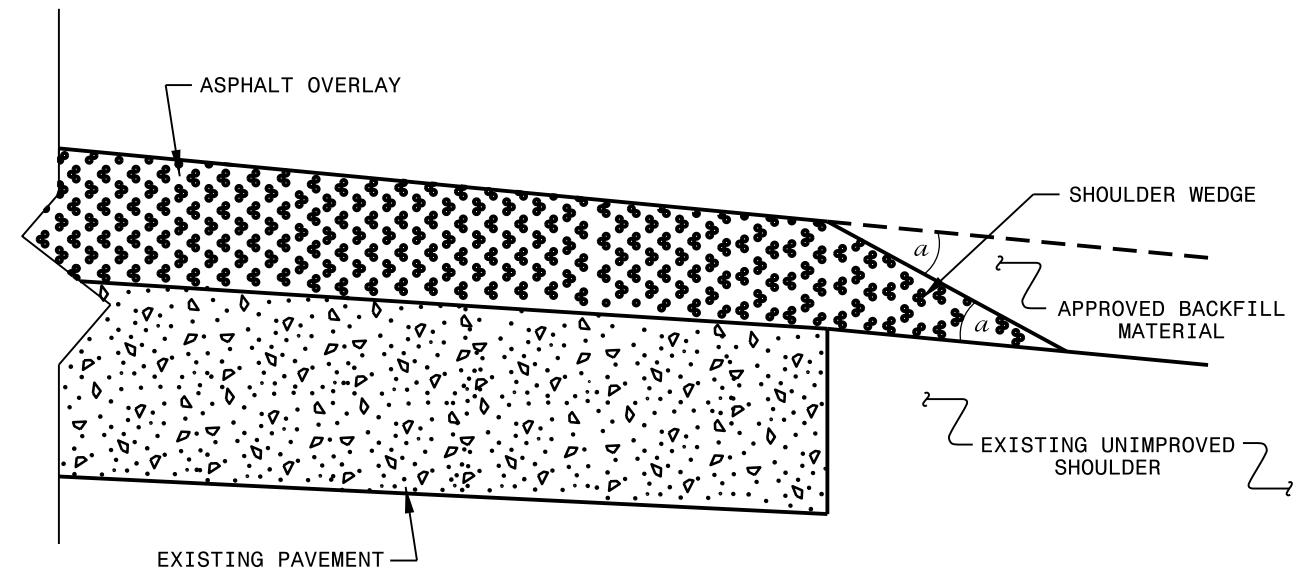
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH MI	WIDTH FT	1.5" MILLING SY	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, S9.5C TONS	ASPHALT BINDER FOR PLANT MIX TONS	ADJ. OF MANHOLES EA	RETROFIT EXSITING CURB RAMP (STD. 848.06) EA	ADJ. OF METER OR VALVE BOX EA	PORTABLE LIGHTING LS	INDUCTIVE LOOP LF
2016CPT.04.10.10511.1	Johnston	1	US70 BUS. WEST BOUND	FROM US 70 BYPASS BRIDGE TO WAKE COUNTY LINE	1	2	MD	YES	NO	7.88	24-36	196,594		16,562	977	3			*	2,200
TOTAL FOR MAP NO. 1										7.88		196,594		16,562	977	3				2,200
2016CPT.04.10.10511.1	Johnston	2	US70 BUS. EAST BOUND	WAKE COUNTY LINE TO BRIDGE AT US70 BYPASS	1	2	MD	YES	NO	7.83	24-36	212,356		18,120	1,069	1		2	*	1,800
TOTAL FOR MAP NO. 2										7.83		212,356		18,120	1,069	1		2		1,800
2016CPT.04.10.10511.1	Johnston	3	US70 BUS. RAMP WEST BOUND	ENTRANCE RAMP FROM US 70 TO US 70 BUS.	2	2	2WU	YES	NO	0.7	16	6,570	556		33				*	
TOTAL FOR MAP NO. 3										0.7		6,570	556		33					
2016CPT.04.10.10511.1	Johnston	4	BARBOUR /HAMBY ST.	FROM US HWY 70 BUS. TO NC HWY 42 WEST	3	2	2WU	NO	NO	0.21	24-36	3,942	332		20	1	2			
TOTAL FOR MAP NO. 4										0.21		3,942	332		20	1	2			
TOTAL FOR PROJ NO. 2016CPT.04.10.10511.1										16.62		419,462	888	34,682	2,099	5	2	2	1	4,000
GRAND TOTAL										16.62		419,462	888	34,682	2,099	5	2	2	1	4,000

NOTES:

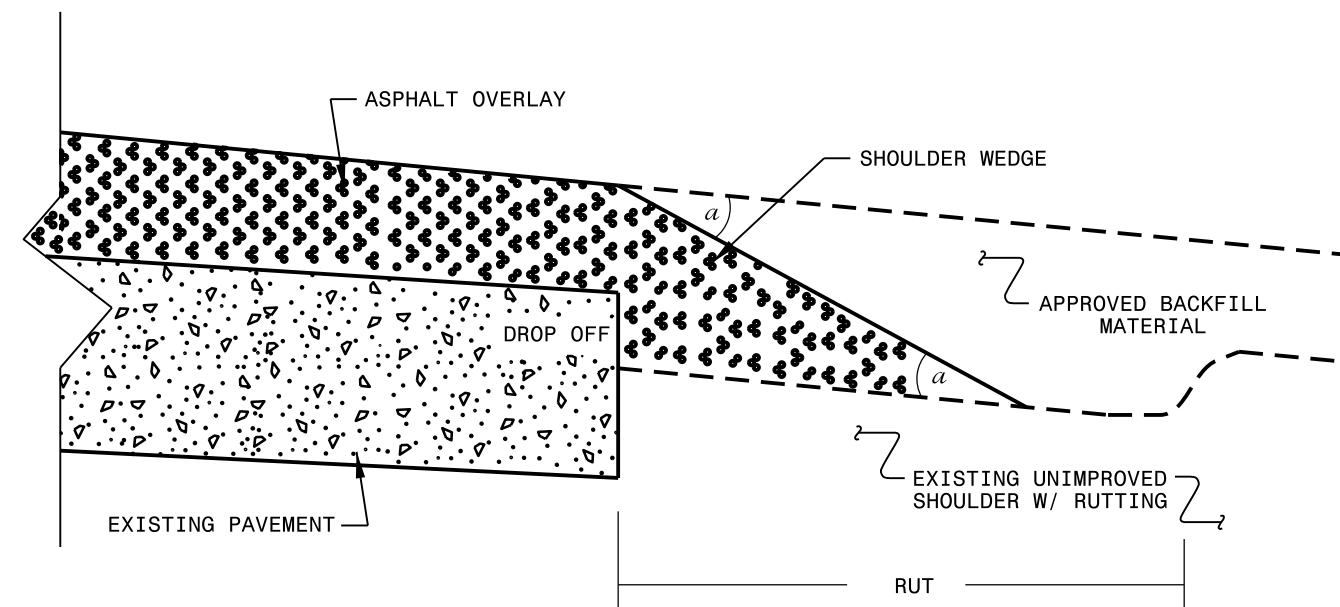
- 1) DETAIL DOES NOT APPLY TO OGAFB AND ULTRA-THIN BONDED WEARING COURSE.
- 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
- 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS, SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS APPROVED BY THE ENGINEER.



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



SHOULDER WEDGE DETAIL
 (Resurfacing Projects w/ NO Widening)



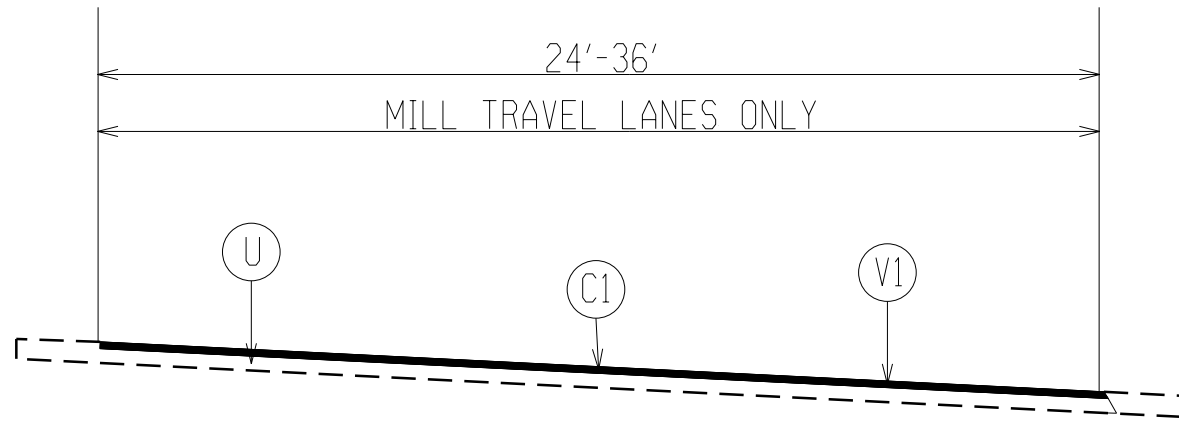
SHOULDER WEDGE DETAIL
 (Resurfacing Adjacent to
 Rutted Shoulder)

- SHOULDER WEDGE ANGLE = 30°

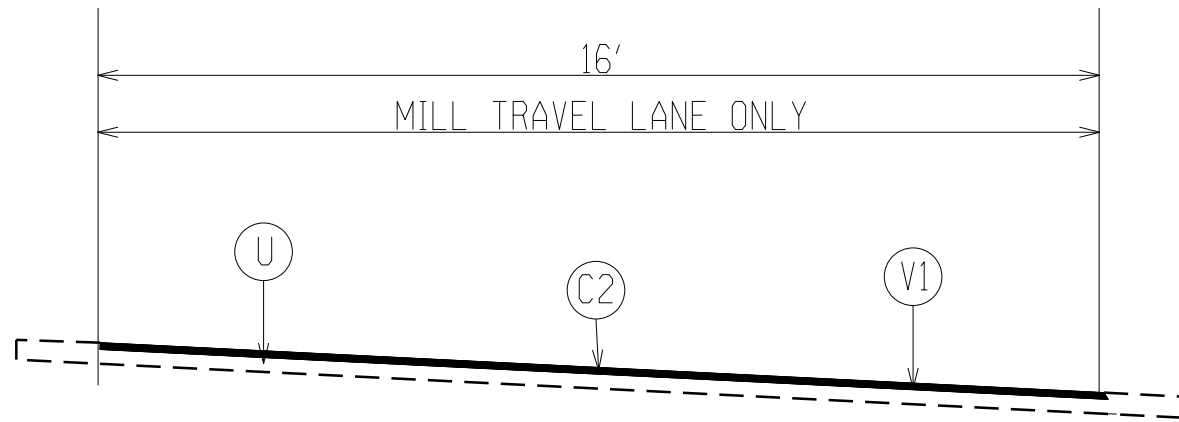
CONTRACT STANDARDS AND DEVELOPMENT UNIT			
Office 919-707-6950		FAX 919-250-4119	
SHOULDER WEDGE DETAILS			
ORIGINAL BY: T.SPELL	DATE: 7-19-11		
MODIFIED BY:	DATE: 2/2/16		
CHECKED BY:	DATE:		
FILE SPEC.: szusr/details/stand/shoulderwedgedetail.dgn			

24-MAR-2016 11:45
 S:\Contracts\Resurfacing Projects\Shoulder Wedge Details\Revised Shoulder Wedge Detail.dgn
 *****USERNAME*****

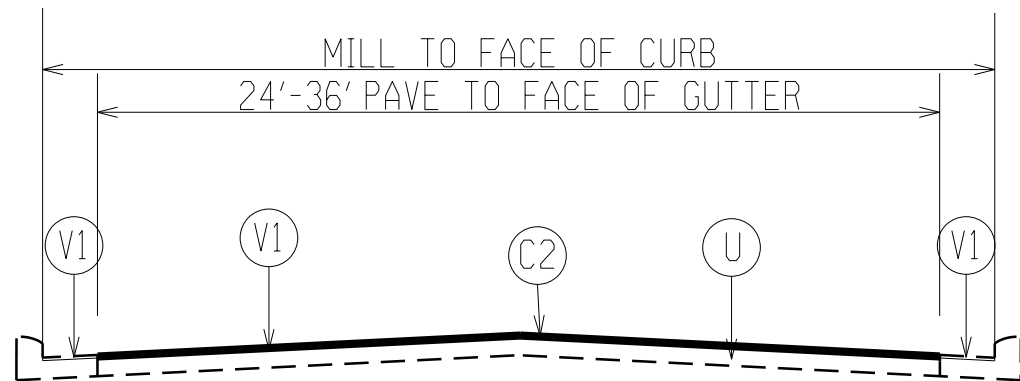
WBS	SHEET NO.	TOTAL SHEETS
2016CPT.04.10.10511.1	2	



TYPICAL SECTION 1



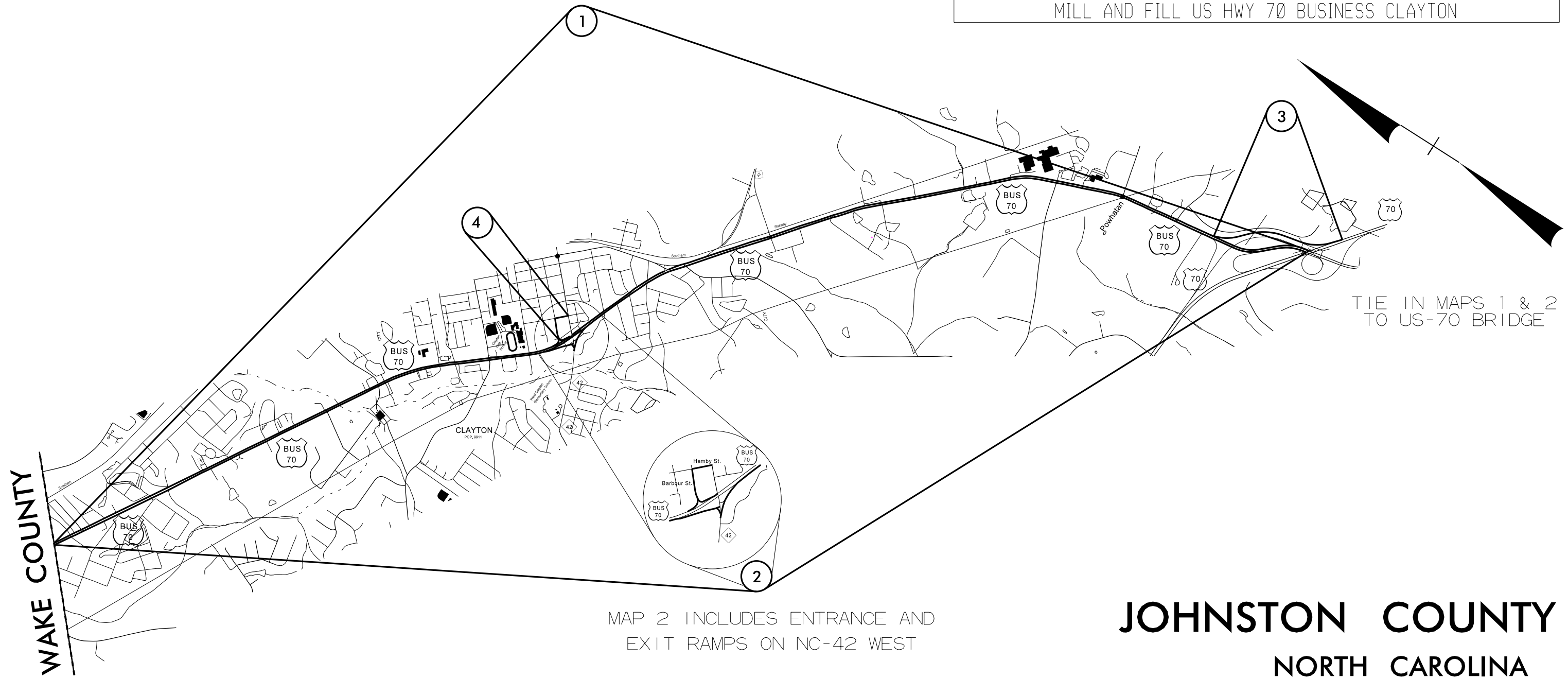
TYPICAL SECTION 2



TYPICAL SECTION 3

PAVEMENT SCHEDULE
ⓐ APPROX 1.5" OF S9.5C AT AN AVERAGE RATE OF 168 LB/SY
ⓑ APPROX 1.5" OF S9.5B AT AN AVERAGE RATE OF 168 LB/SY
ⓓ EXISTING PAVEMENT
Ⓥ MILL TRAVEL LANES, TURN LANES AND INTERSECTIONS 1.5" PRIOR TO RESURFACING DO NOT MILL/PAVE SHOULDERS UNLESS DIRECTED BY ENGINEER

WBS ELEMENT	SHEET NO.	TOTAL SHEETS
2016CPT.04.10.10511.1	1	
DESCRIPTION		
MILL AND FILL US HWY 70 BUSINESS CLAYTON		



WAKE COUNTY

JOHNSTON COUNTY
NORTH CAROLINA

