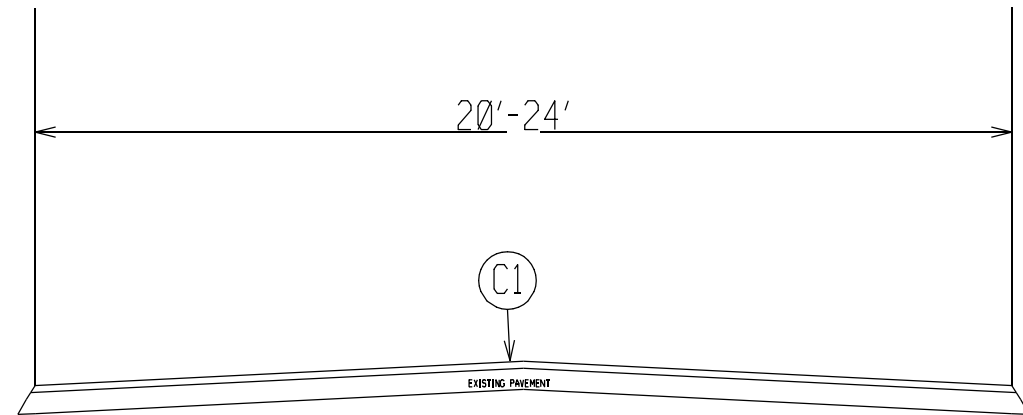
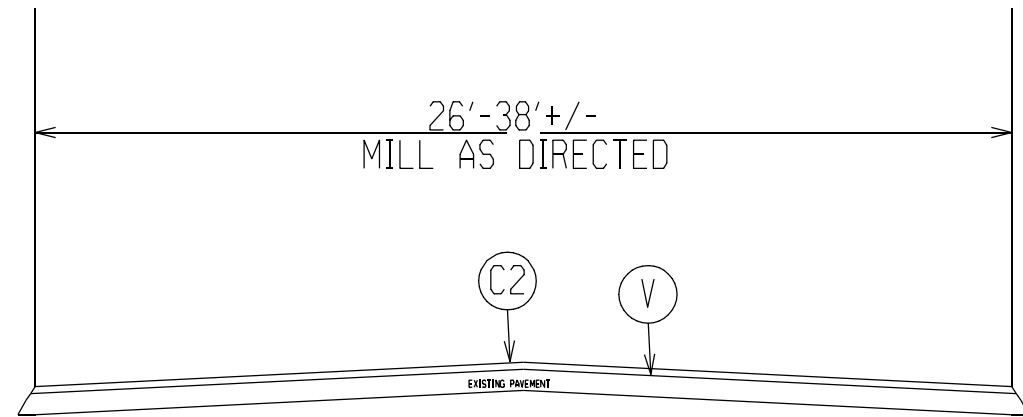


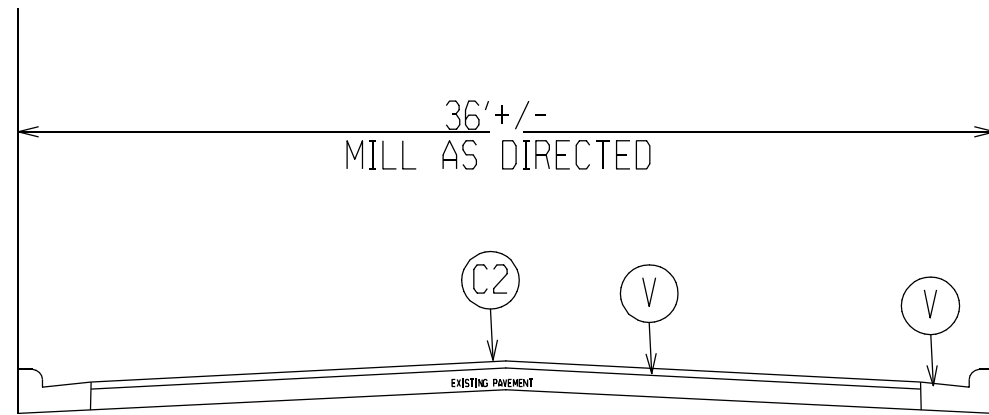
WBS	SHEET NO.	TOTAL SHEETS
2018CPT.04.05.10511	3	
2018CPT.04.05.20511		



TYPICAL SECTION 1



TYPICAL SECTION 2



TYPICAL SECTION 3

ALL WIDTHS ARE APPROXIMATE
 SR ROUTES MAY BE LESS THAN 20'
 CONTRACTOR IS RESPONSIBLE FOR APPROPRIATE
 SIZE PAVING EQUIPMENT

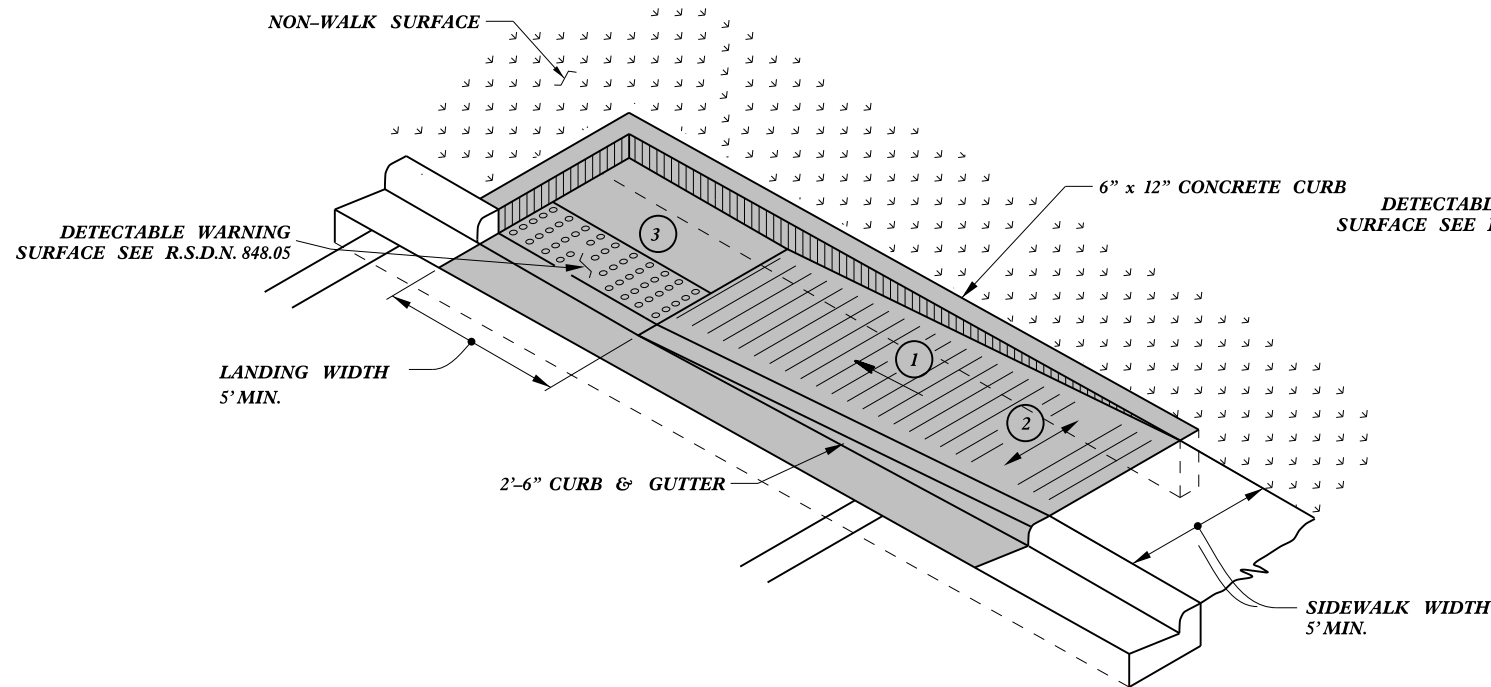
SHOULDER RECONSTRUCTION WILL BE
 DONE USING STATE FORCES

ALL PATCH AND REPAIR WORK WILL
 BE DONE BY STATE FORCES PRIOR
 TO RESURFACING

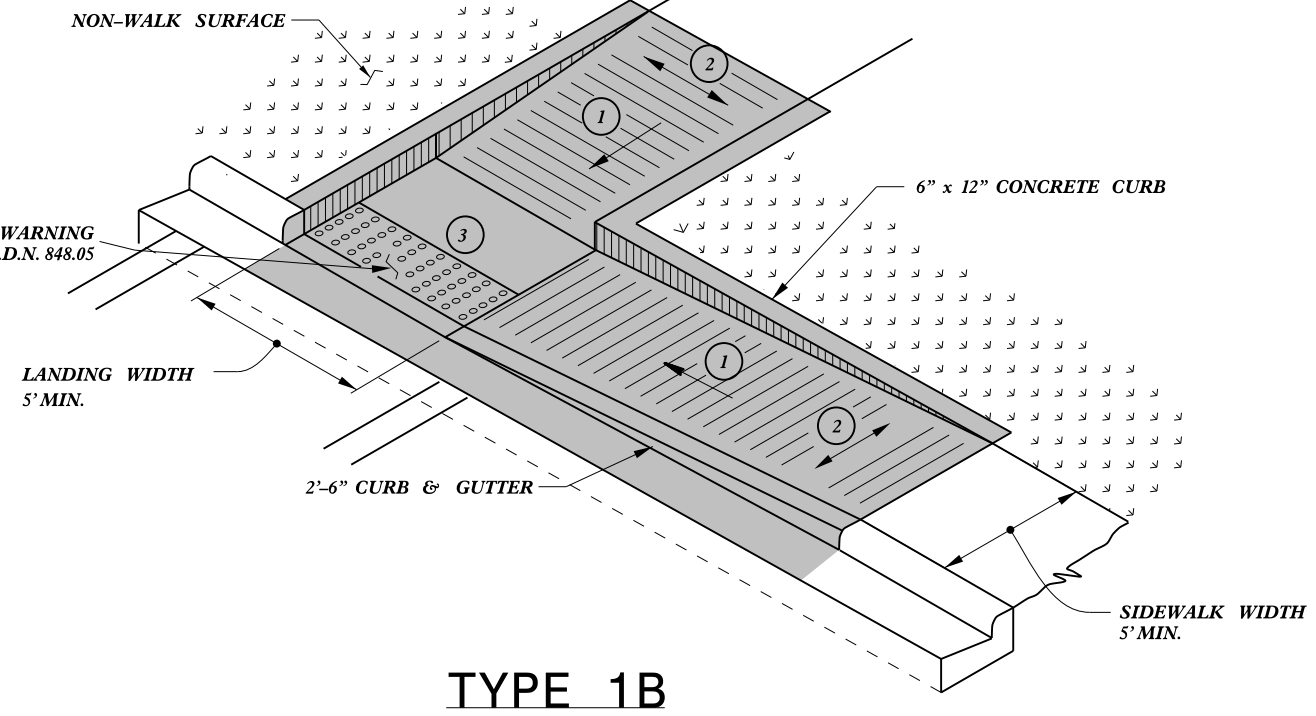
Ⓢ APPROX 1.5" OF SF9.5A AT AN AVERAGE
 RATE OF 165 LB/SY

Ⓢ APPROX 2" OF S9.5B AT AN AVERAGE
 RATE OF 224 LB/SY

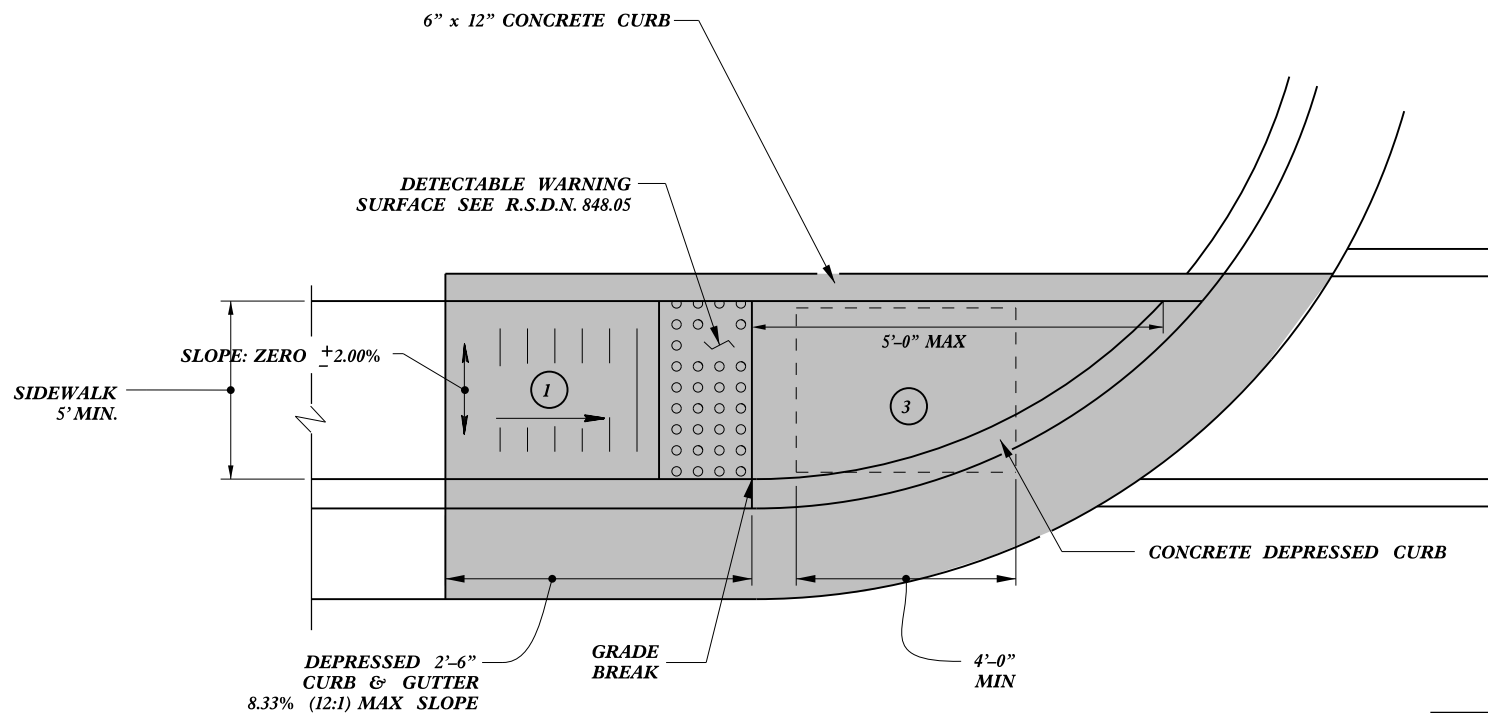
Ⓢ MILL 2" AS DIRECTED BY THE ENGINEER



TYPE 1A



TYPE 1B

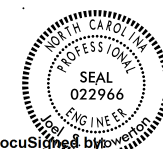


TYPE 1

PAY LIMITS FOR 1 CURB RAMP

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES



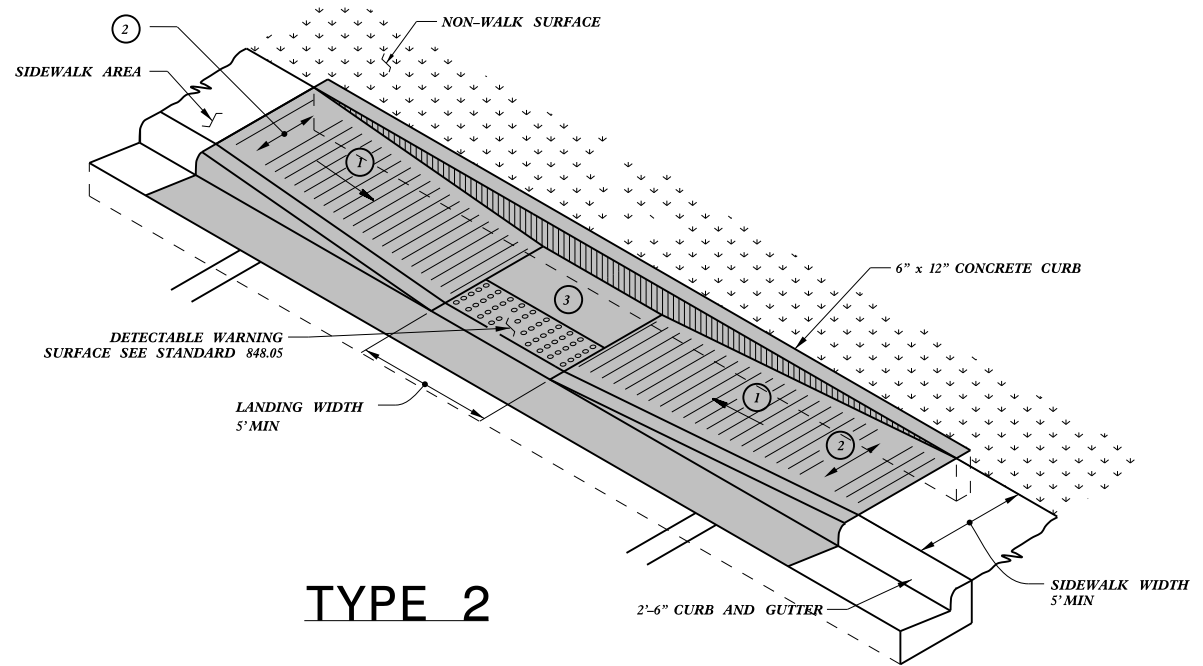
DocuSign by
Joel S. Howerton

449E8E25522144F...

11/18/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

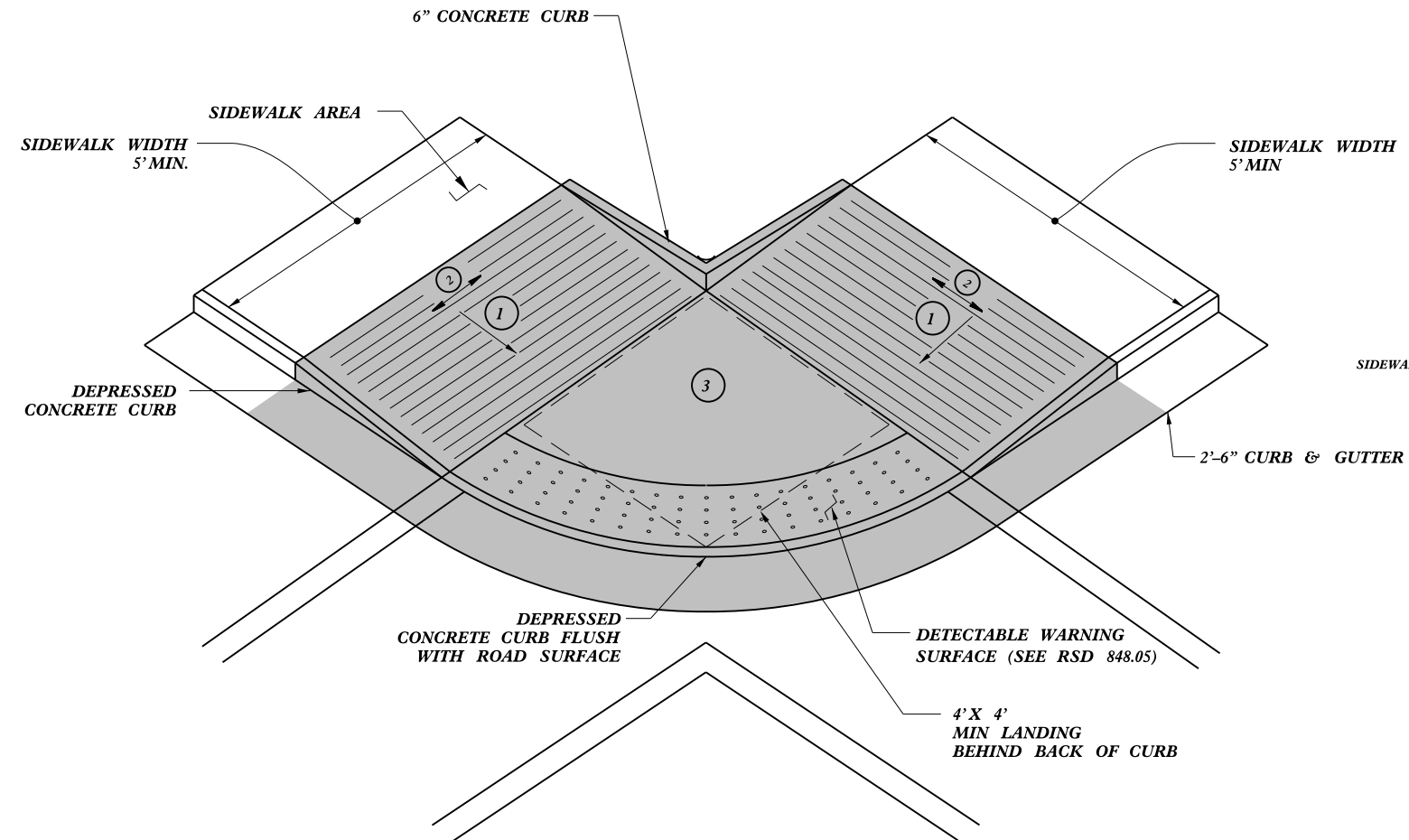
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
CURB RAMPS	
Directional Ramps	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dwg	



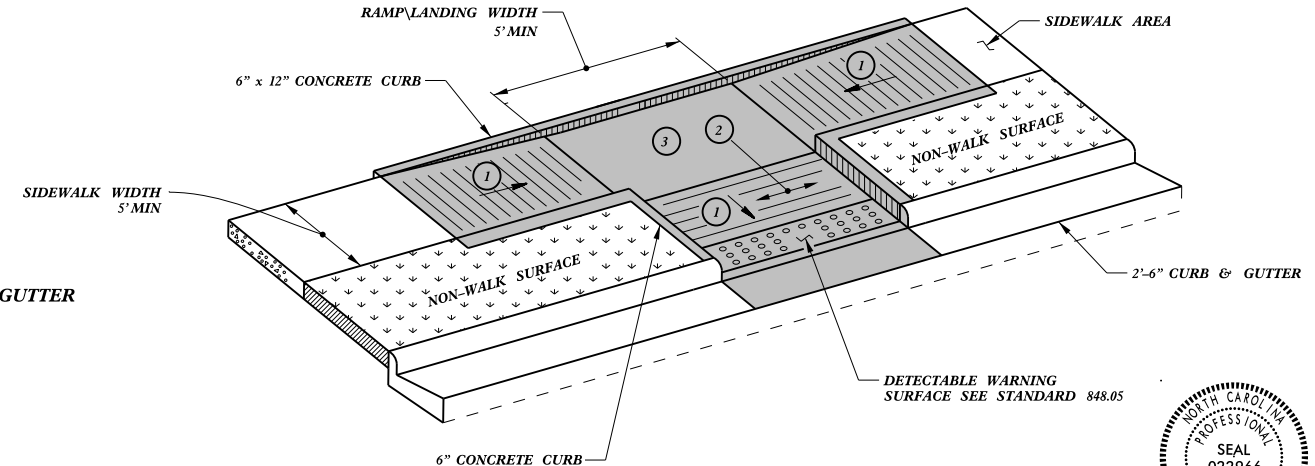
TYPE 2

PAY LIMITS FOR 1 CURB RAMP

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



TYPE 2A



TYPE 3



11/18/2015

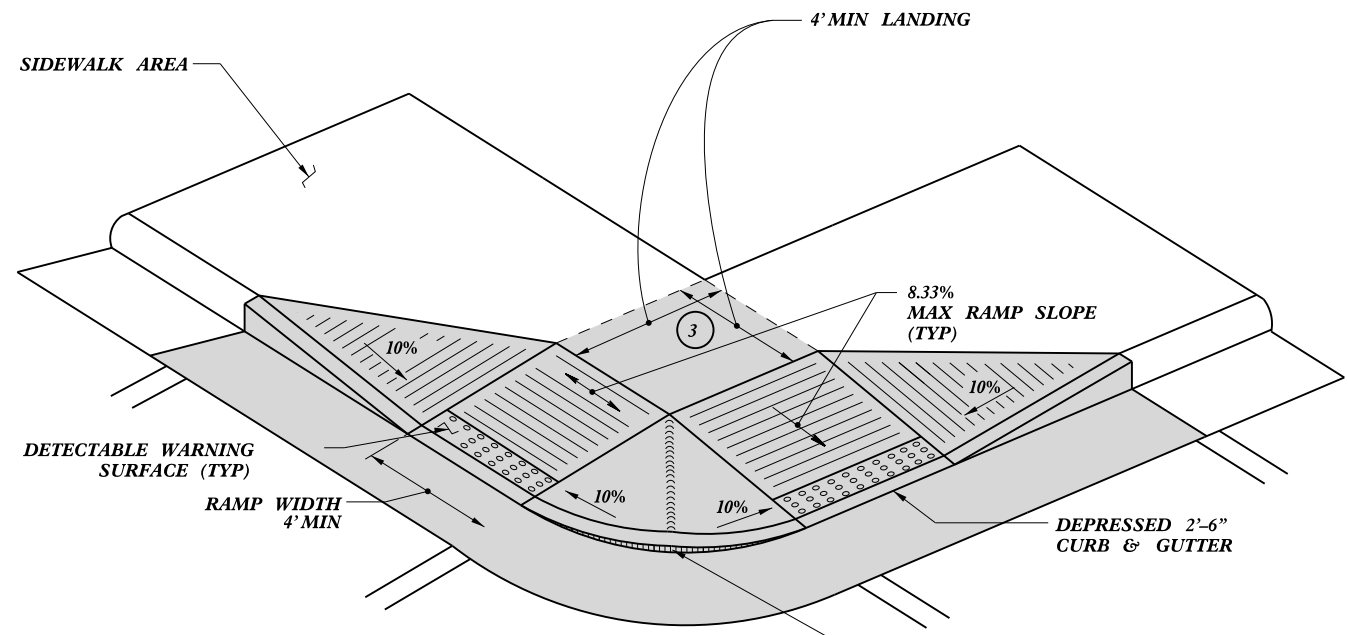
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

CURB RAMPS
Parallel Ramps

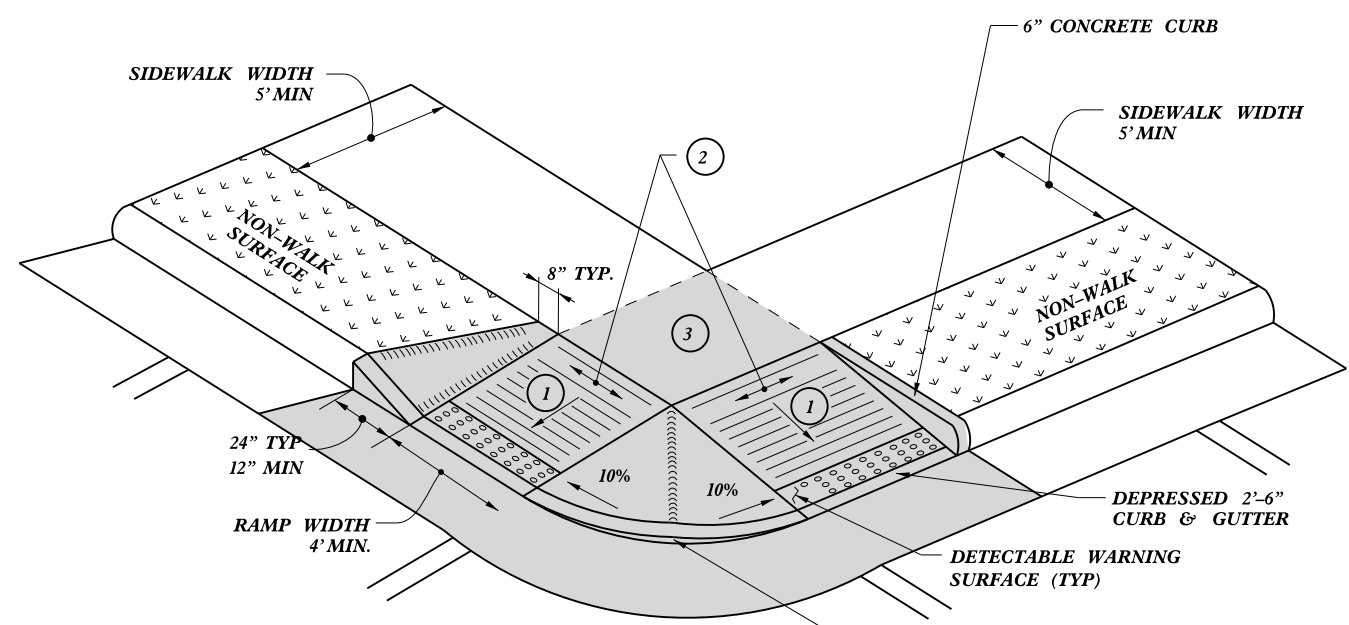
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dwg

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

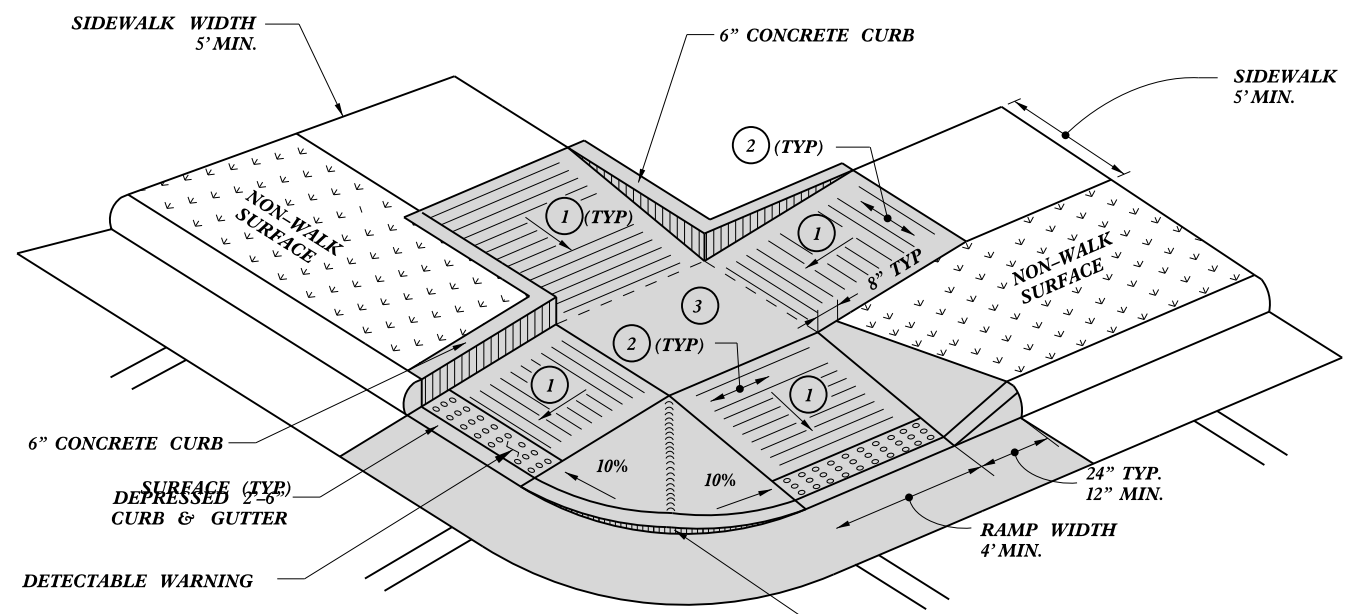
5/14/99
SYNOPSIS OF CONSTRUCTION DETAILS
TIME TO CONSTRUCTION
DATE: 11/18/2015



TYPE 4



TYPE 4A

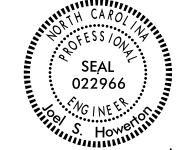


TYPE 5

PAY LIMITS FOR 2 CURB RAMPS

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.

DocuSigned by:
Joel S Howerton
449E8E25522144F...



11/18/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

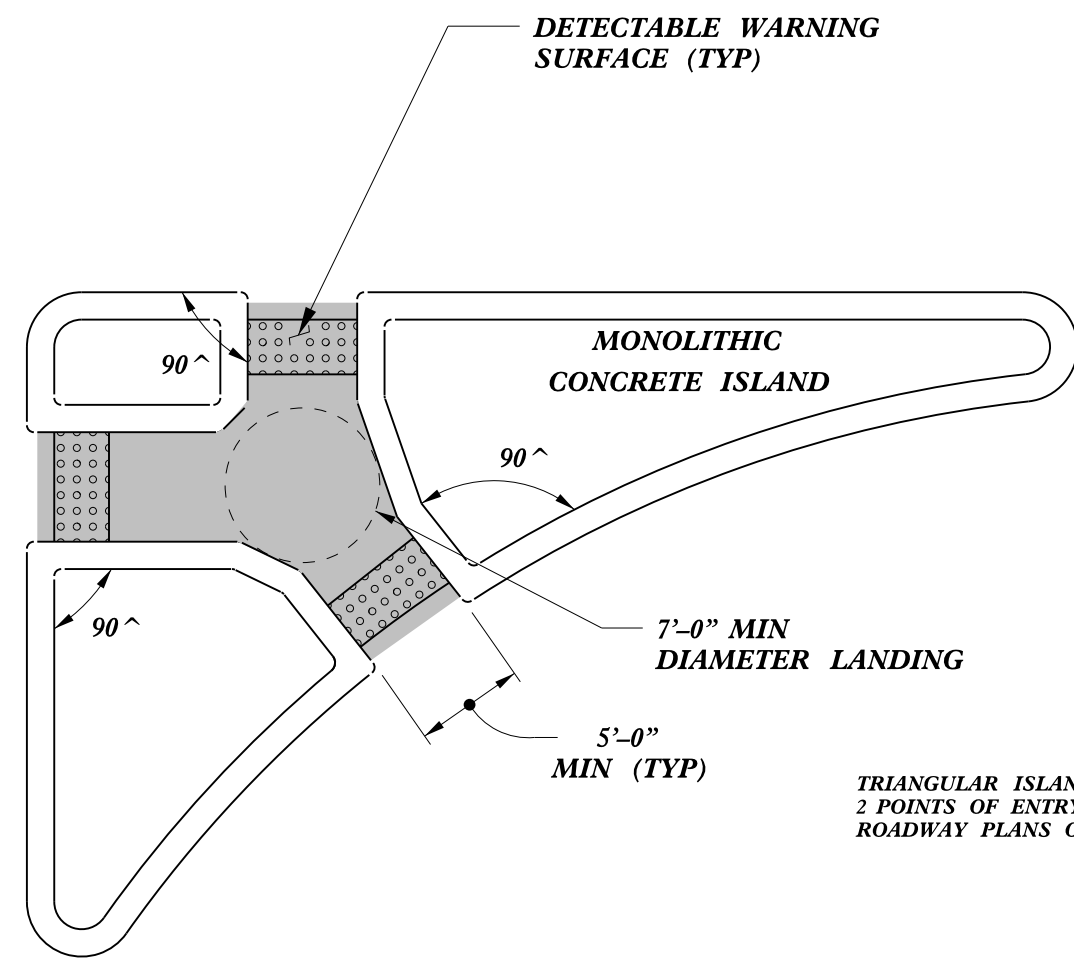
CURB RAMPS
Shared Landing

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC. :stds/2012CurbRamp/CurbRampDetails.dwg

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

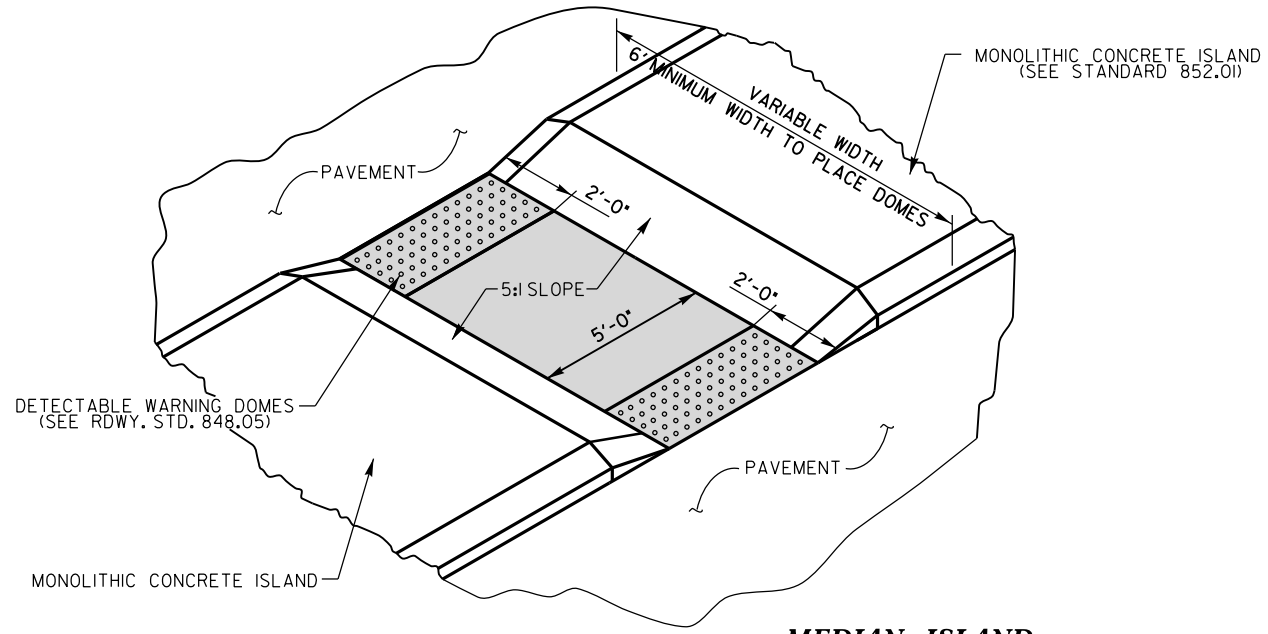
5/14/1999

PAY LIMITS FOR 2 OR 3 CURB RAMPS
 (CALCULATE BASED ON NUMBER OF
 SETS OF TRUNCATED DOMES)

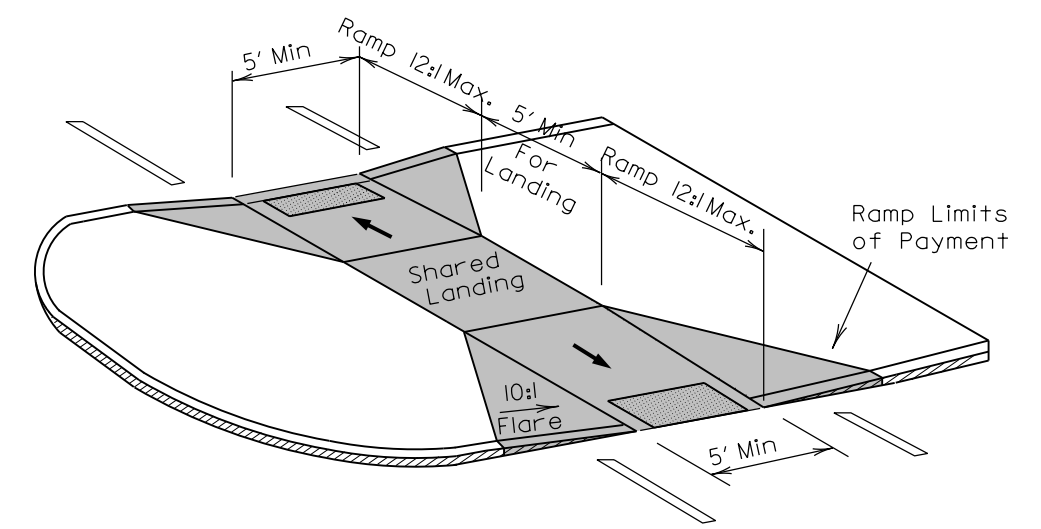


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY
 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE
 ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

**TRIANGULAR ISLAND
WITH CUT THROUGH**



**MEDIAN ISLAND
WITH CUT THROUGH**



**MEDIAN ISLAND
CURB RAMPS**

5/14/99
 \$\$\$\$SYTIME\$\$\$\$
 \$\$\$\$CONGN\$\$\$\$
 \$\$\$\$USERNAME\$\$\$\$
 \$\$\$\$\$\$\$\$

11/18/2015

DocuSign
 Seal
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 022966
 ENGINEER
 Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

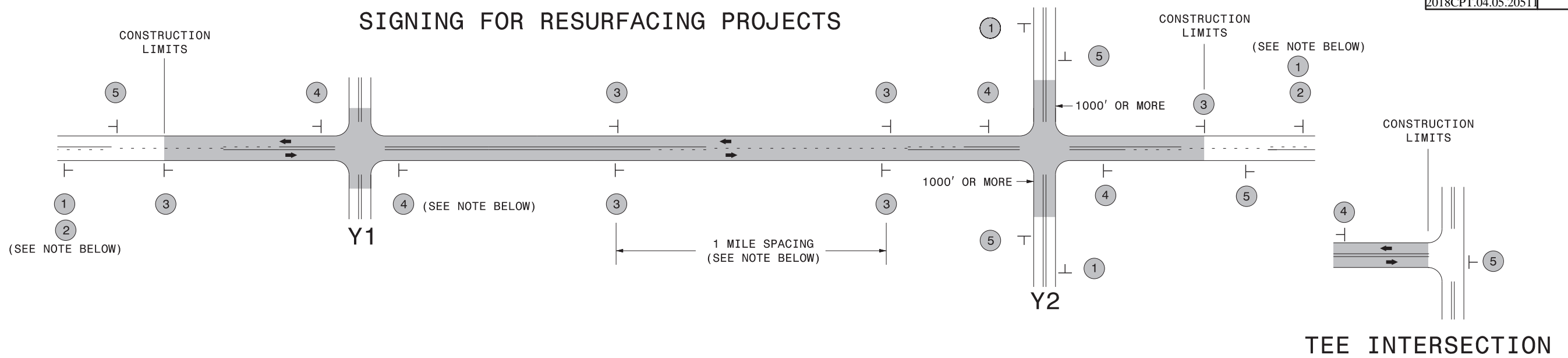
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
CURB RAMPS	
Median or Turn Lane Islands	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dwg	

PROJECT NO.	SHEET NO.	TOTAL NO.
2018CPT.04.05.10511	10	
2018CPT.04.05.20511		

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	2" MILLING SY	INCIDENTAL MILLING SY	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, SF9.5A TONS	ASPHALT BINDER FOR PLANT MIX TONS	RETROFIT EXIST. CURB RAMP (STD. 848.06) EA	CONCRETE CURB RAMPS (STD. 848.06 OR DETAILS) EA	ADJ. OF MANHOLES EA	ADJ. OF METER OR VALVE BOX EA	INDUCTIVE LOOP SAWCUT LF
2018CPT.04.05.20511	Johnston	1	SR 1009 DEVILS RACETRACK RD	SR 1185 TO SR 1008	1	2	2WU	NO	NO	5.8	22		1,400		6,451	432					
TOTAL FOR MAP NO. 1										5.8			1,400		6,451	432					
2018CPT.04.05.20511	Johnston	2	SR 1179 STEWART RD	US 701 TO SR 1178	1	2	2WU	NO	NO	1.6	20				1,377	92					
TOTAL FOR MAP NO. 2										1.6					1,377	92					
2018CPT.04.05.20511	Johnston	3	SR 1182 BOYETTE RD	US 301 TO SR 1178	1	2	2WU	NO	NO	2	24				2,485	167					
TOTAL FOR MAP NO. 3										2					2,485	167					
2018CPT.04.05.20511	Johnston	4	SR 1552 AMELIA CHURCH	NC HWY 42 TO SR 1555	1	2	2WU	NO	NO	1.04	24				1,386	93					400
TOTAL FOR MAP NO. 4										1.04					1,386	93					400
2018CPT.04.05.20511	Johnston	5	SR 1554 CORBETT RD	SR 1552 TO 1627	1	2	2WU	NO	NO	1.2	20		445		1,489	100					
TOTAL FOR MAP NO. 5										1.2			445		1,489	100					
2018CPT.04.05.20511	Johnston	6	SR 1557 JACK RD	SR 1556 TO SR 1562	1	2	2WU	NO	NO	4.4	22				4,792	321					
TOTAL FOR MAP NO. 6										4.4					4,792	321					
2018CPT.04.05.20511	Johnston	7	SR 1587 OLD EVANS RD	SR 1525 TO END MAINT	1	2	2WU	NO	NO	0.71	22				760	51					
TOTAL FOR MAP NO. 7										0.71					760	51					
2018CPT.04.05.20511	Johnston	8	SR 1735 JORDAN NARRON RD	NC HWY 96 TO CONSTRUCTION LIMITS	1	2	2WU	NO	NO	4.3	20		977		4,508	302					
TOTAL FOR MAP NO. 8										4.3			977		4,508	302					
2018CPT.04.05.20511	Johnston	9	SR 1181 SPRING LAKE RD	US 701 TO NC 96	1	2	2WU	NO	NO	1.1	20				1,071	72					
TOTAL FOR MAP NO. 9										1.1					1,071	72					
TOTAL FOR PROJ NO. 2018CPT.04.05.20511										22.15			2,822		24,319	1,630					400
2018CPT.04.05.10511	Johnston	10	NC HWY 50	NC HWY 27 TO WAKE COUNTY LINE	2	2	2WU	NO	NO	13.3	26-38	202,869		24,387		1,463		15			
TOTAL FOR MAP NO. 10										13.3		202,869		24,387		1,463		15			
2018CPT.04.05.10511	Johnston	11	NC HWY 50	NC 27 TO US 301	3	2	MU	NO	NO	0.51	36	10,771		1,332		80	15		4	2	300
TOTAL FOR MAP NO. 11										0.51		10,771		1,332		80	15		4	2	300
TOTAL FOR PROJ NO. 2018CPT.04.05.10511										13.81		213,640		25,719		1,543	15	15	4	2	300
GRAND TOTAL										35.96		213,640	2,822	25,719	24,319	3,173	15	15	4	2	700

SIGNING FOR RESURFACING PROJECTS



LEGEND	
┆	STATIONARY SIGN
←	DIRECTION OF TRAFFIC FLOW

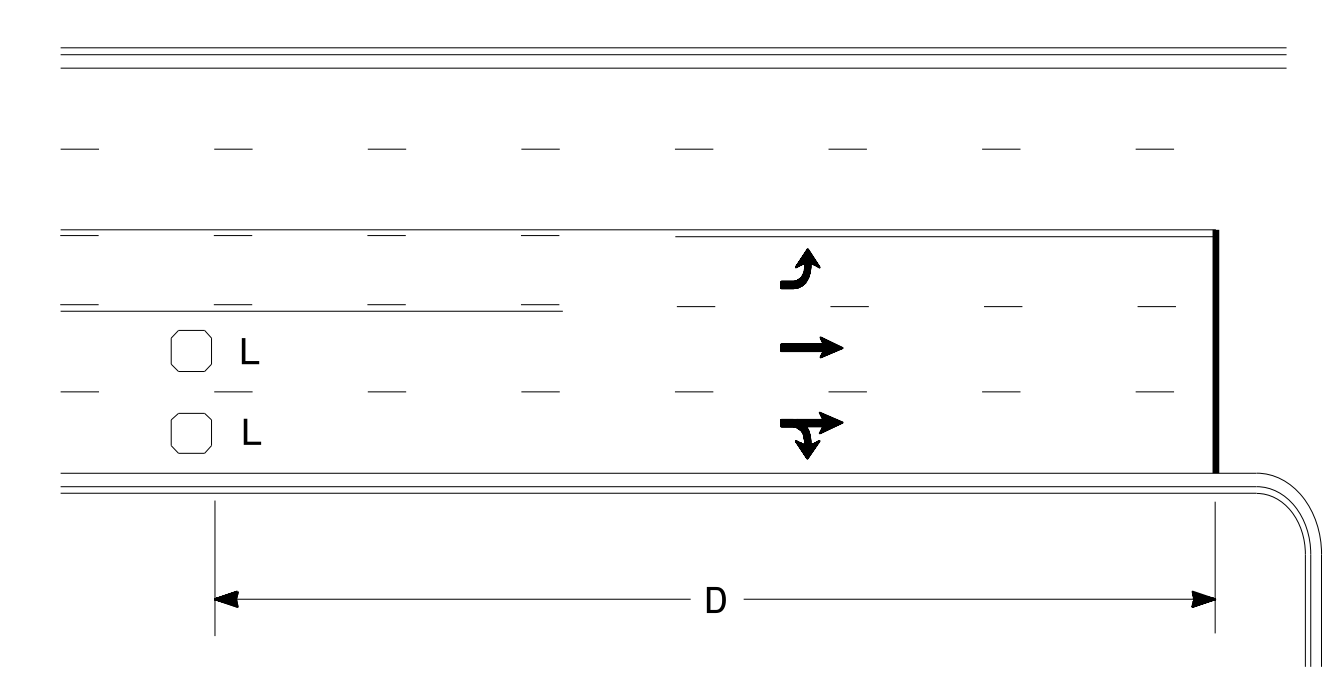
MAINLINE (-L-) SIGNING

-Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	1	2	3	4	5	
			<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>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>		
			<p>- PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACE 1 MILE APART THEREAFTER.</p> <p>- AT TEE INTERSECTIONS INSTALL INITIALLY 0.5 MILE FROM INTERSECTION AND SPACE 1 MILE APART THEREAFTER.</p>			
			<p>- THESE ARE FOR -Y- LINES THAT ARE "THROUGH" ROADWAYS. DEAD END AND SUBDIVISION ROADS ARE NOT "THROUGH" ROADWAYS.</p> <p>- INSTALL 500' +/- FROM EACH -Y- LINE APPROACH AS SHOWN ABOVE.</p> <p>- 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.</p> <p>- 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>- FOR TEE INTERSECTIONS, INSTALL WITHIN 500' +/- OF THE INTERSECTION ALONG -L- LINE.</p>	<p>PLACED 500' IN ADVANCE OF FLAGGER. PLACED 250' IN ADVANCE OF FLAGGER.</p>		
			<p>PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS OR AS SHOWN WHEN WORK ENDS AT A 3-WAY TEE INTERSECTION.</p>			

**RESURFACING
ADVANCE WARNING SIGNS
FOR
RURAL AND SUBURBAN
2 LANE ROADWAYS**

High Speed Detection (≥40 mph)

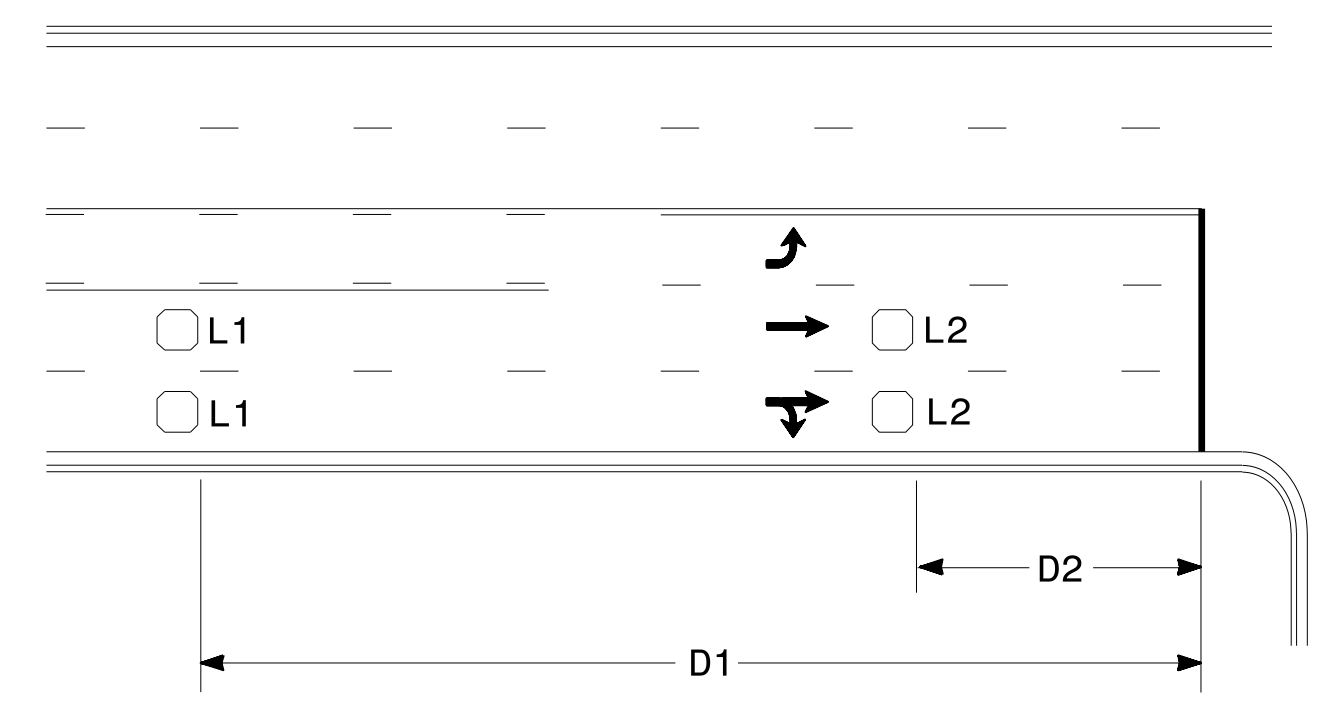


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

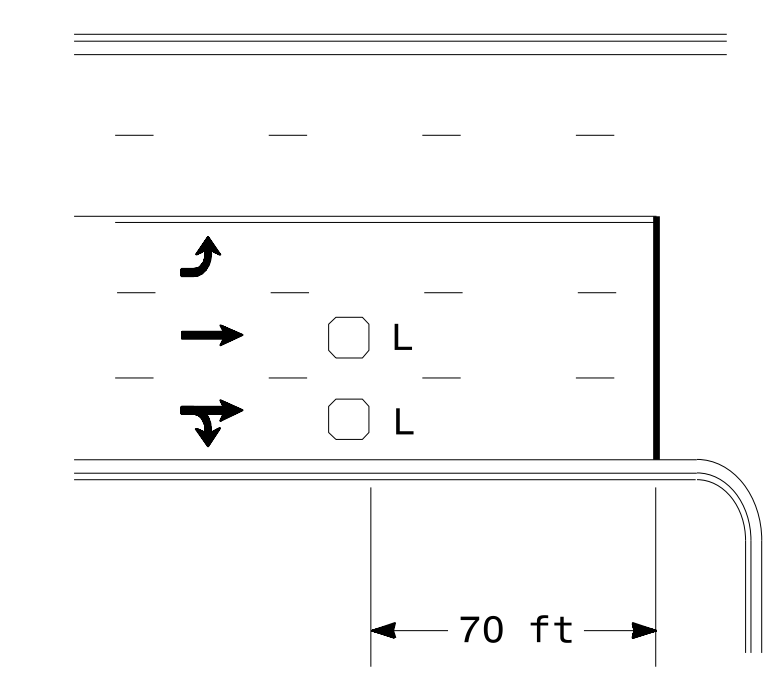


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

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

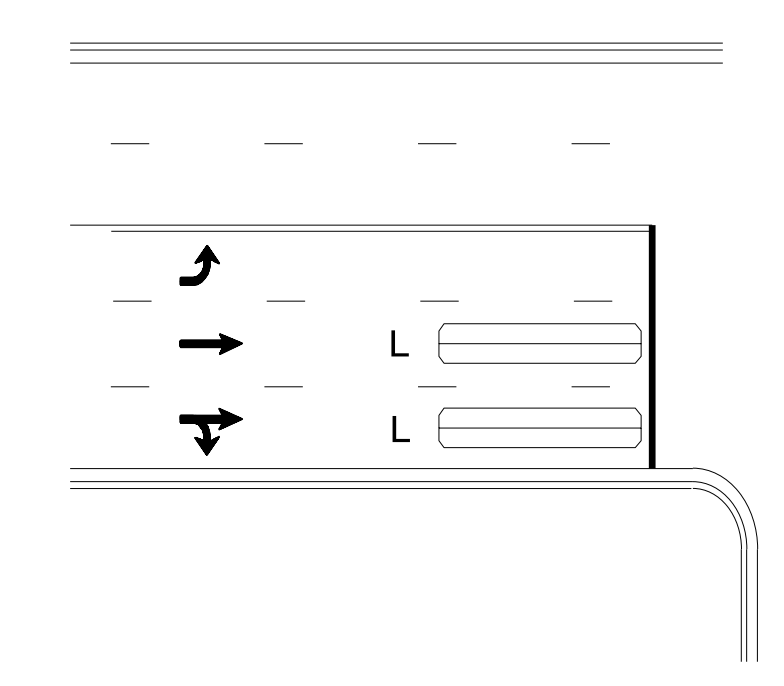
"Stretch" Operation

Low Speed Detection (≤35 mph)



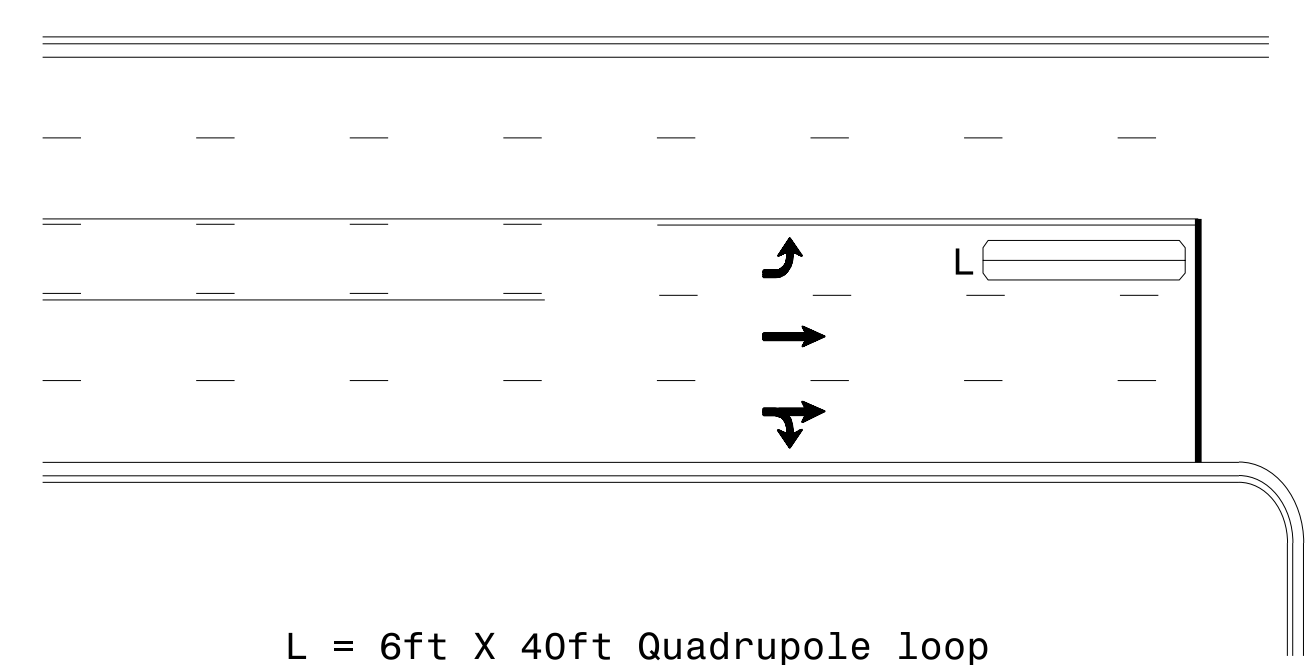
L = 6ft X 6ft
Wired in series

OR



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

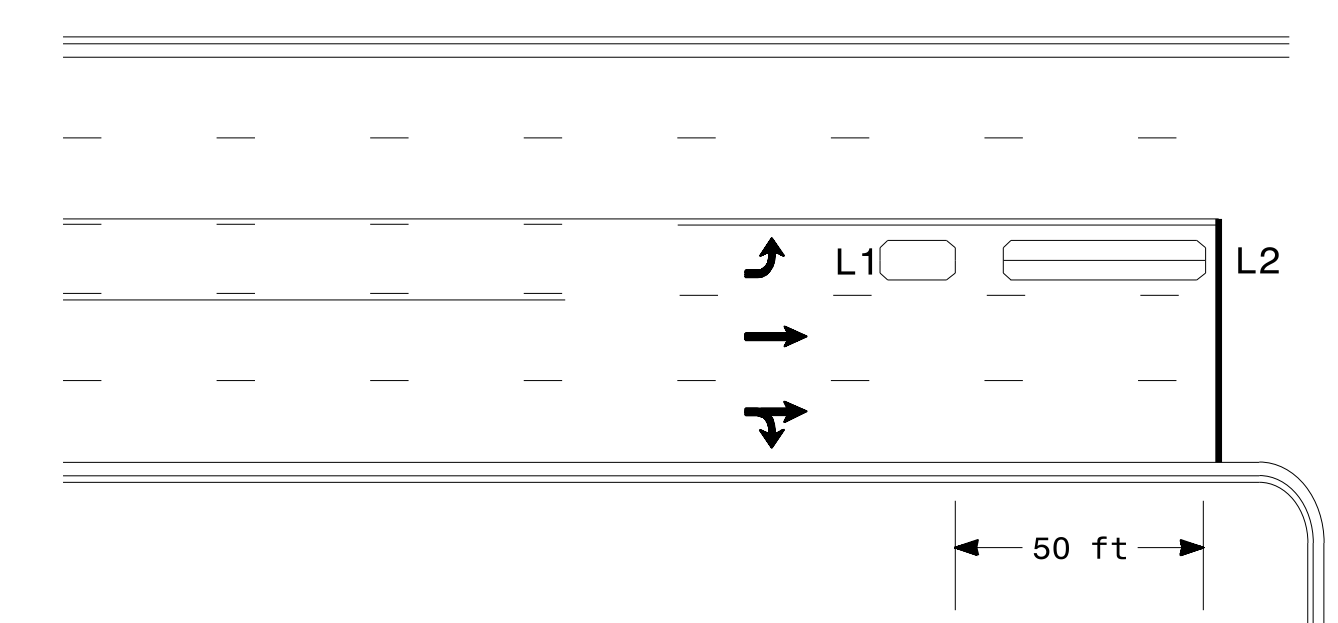
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

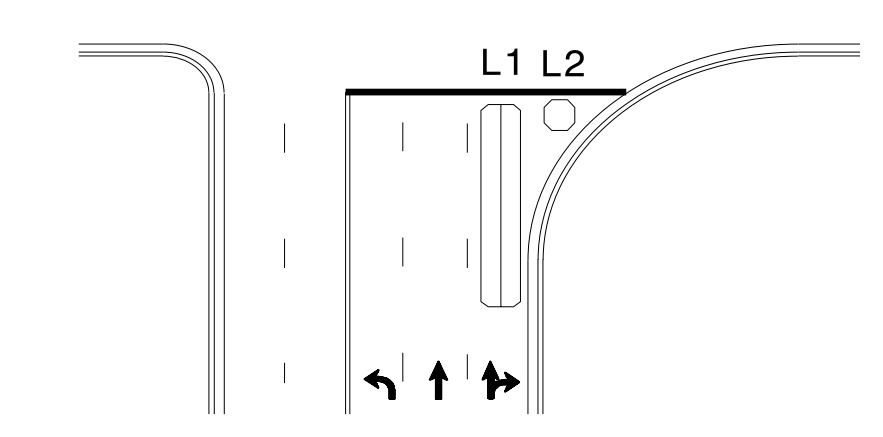
OR



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

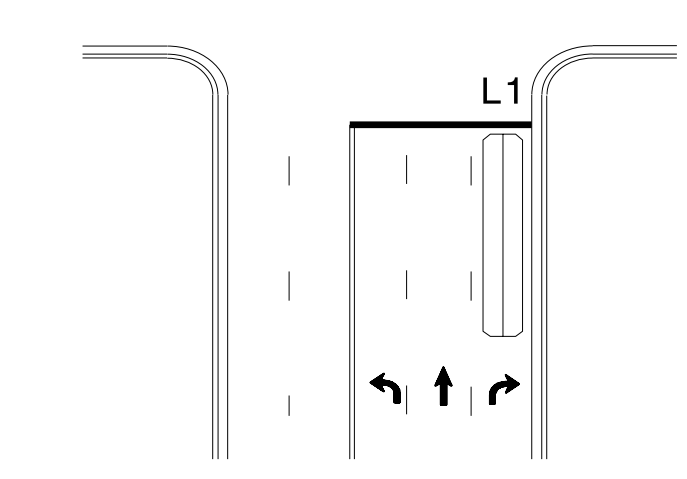
Queue Loop Detection

Right Turn Lane Detection

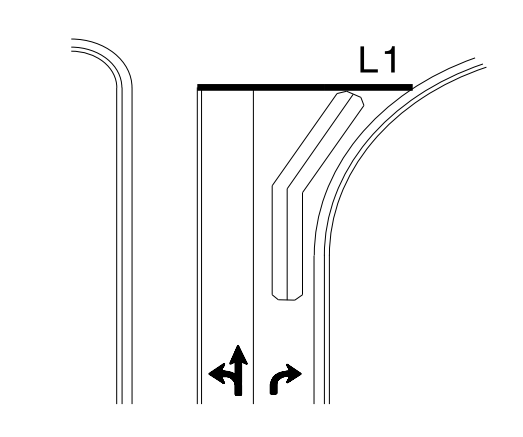


Shared Lane/
Wide Radius Turn

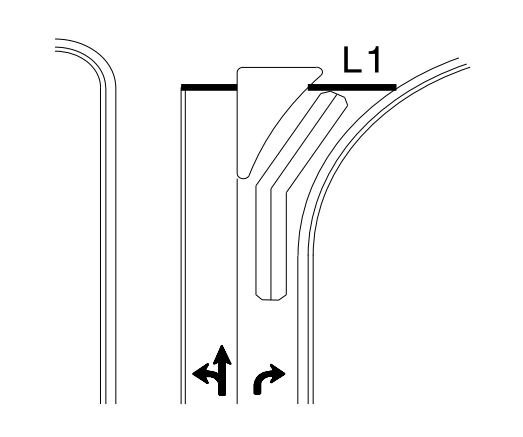
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

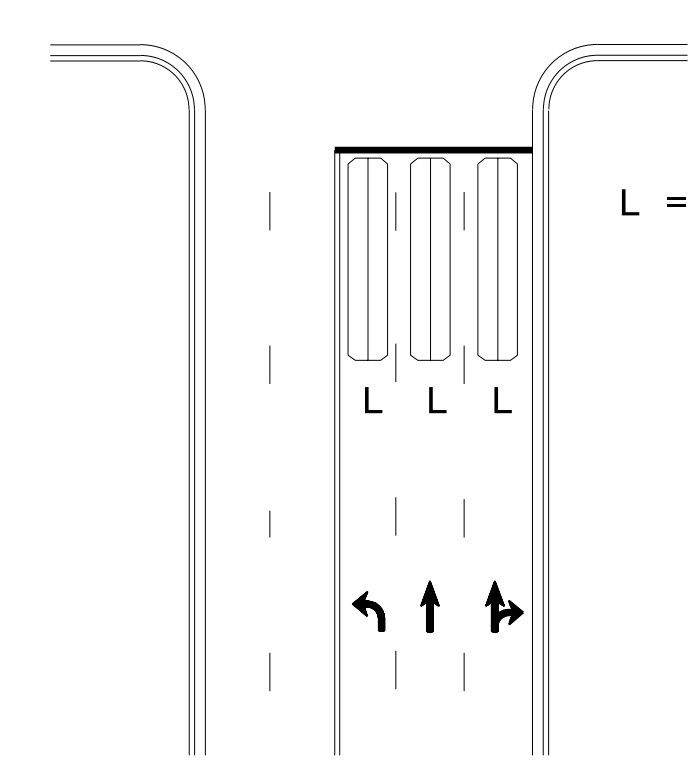


Wide Radius Turn



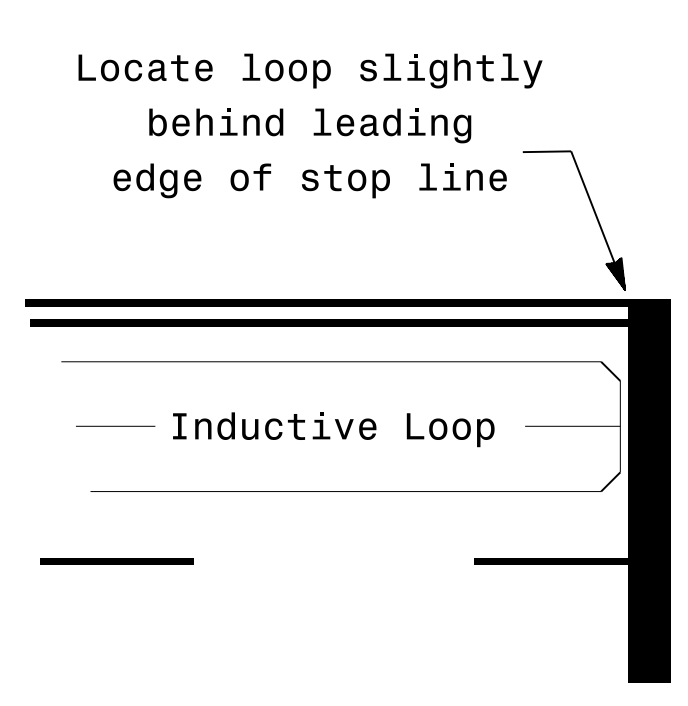
Channelized Turn

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

DocuSigned by:
P. Alexander
1/30/2015 10:44:44 AM
DATE

SIG. INVENTORY NO.

3D:\1804\2015_18139_Signals\Signal Design\Section\Eastern\Region\loop\ypj\ca\2015.dgn
 2/1/2015 10:44:44 AM
 P. Alexander