

CONTRACT: DJ00407 TIP PROJECT: HL-0038A

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

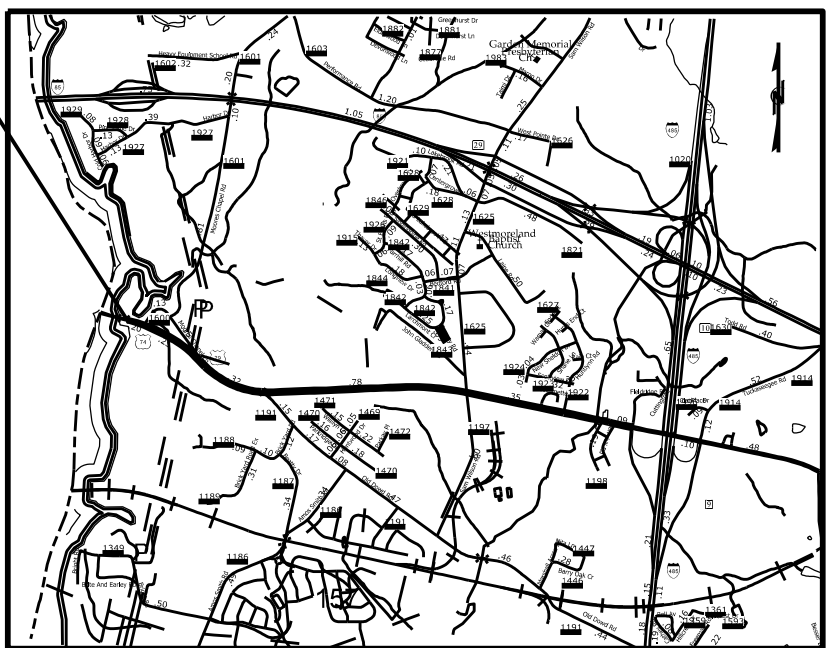
MECKLENBURG COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0038A	1	18
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
49859.3.5	1003182	CONST.	

**LOCATION:** US 29 WILKINSON BLVD FROM FIELD RIDGE RD TO THE BRIDGE AT CATAWBA RIVER  
 MP 20.59 TO MP 22.67  
 US 29 NORTH TRYON STREET FROM W. SUGAR CREEK RD TO OLD CONCORD RD  
 MP 13.76 TO MP 15.06

**TYPE OF WORK:** MILLING AND PAVING WITH HOT MIX ASPHALT  
 PAVEMENT MARKINGS & SNOWPLOWABLE  
 PAVEMENT MARKERS

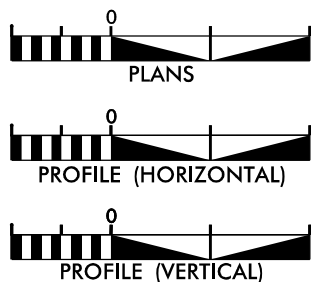
PROJECT AREA #1  
WILKINSON BLVD



PROJECT AREA #2  
N. TRYON ST.



**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2020 = 23,500  
 ADT 2020 = 35,500  
 K = %  
 D = %  
 T = % \*  
 V = 45 MPH  
 \* TTST = DUAL

**PROJECT LENGTH**

LENGTH OF ROADWAY PROJECT 49859.3.5 = 5.92 MILES  
 TOTAL LENGTH OF STATE PROJECT 49859.3.5 = 5.92 MILES

*Prepared in the Office of*

**DIVISION OF HIGHWAYS**

DIVISION 10

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

N/A

LETTING DATE:

APRIL 20, 2022

JOHN H. EDMONDS

PROJECT ENGINEER

JOHN H. EDMONDS

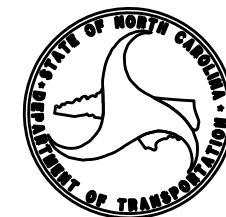
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

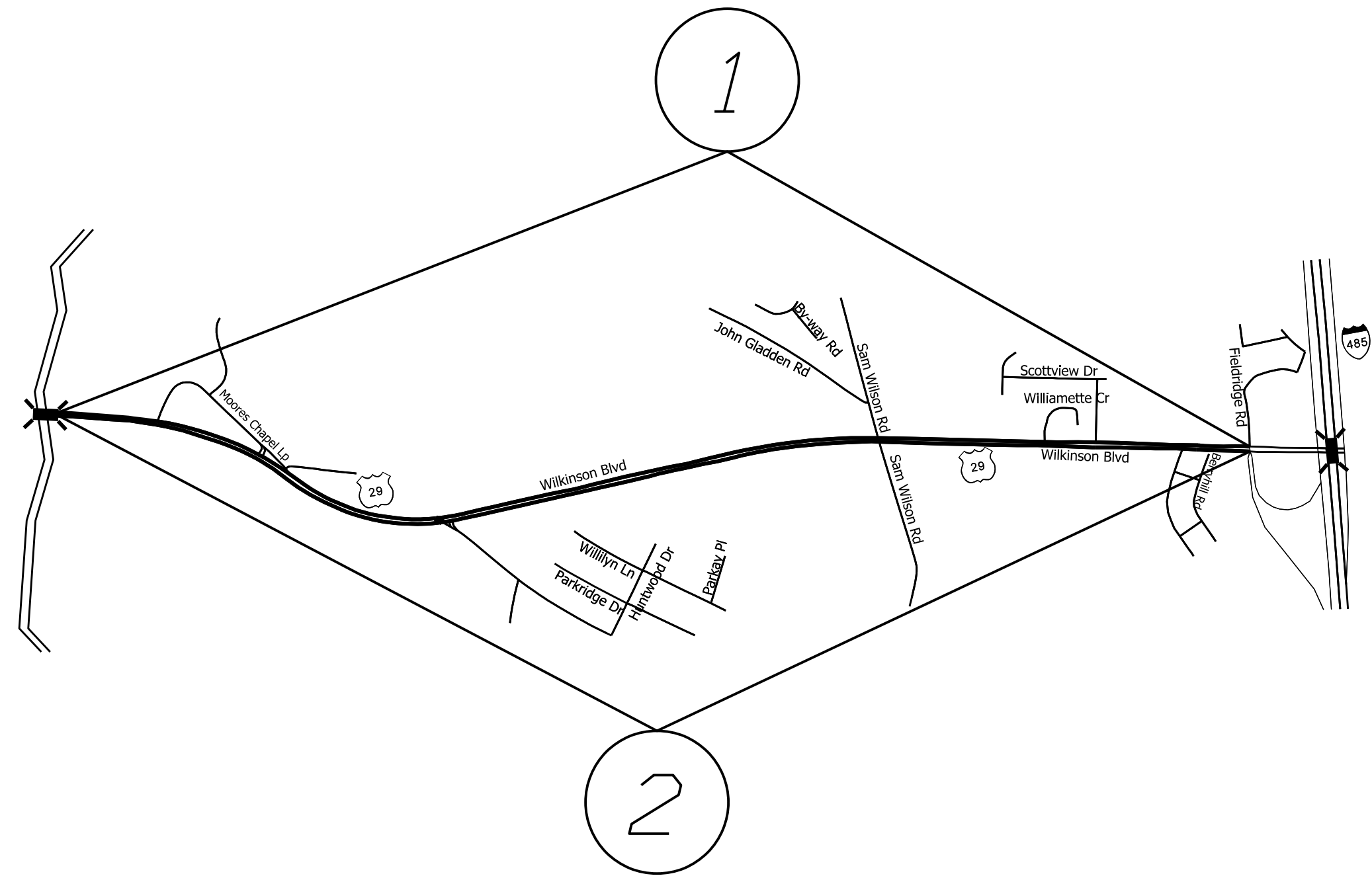
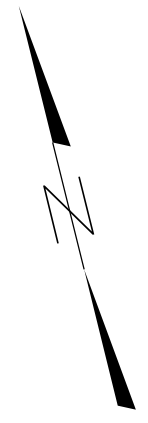
SIGNATURE: \_\_\_\_\_ P.E.

ROADWAY DESIGN  
ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.



FEDERAL	PROJECT NO.	SHEET NO.	TOTAL SHEETS
FA	HL-0038A	2	18
WBS NO. 49859.3.5			



MAP

# 1 US 29 WB WILKINSON BLVD

# 2 US 29 EB WILKINSON BLVD

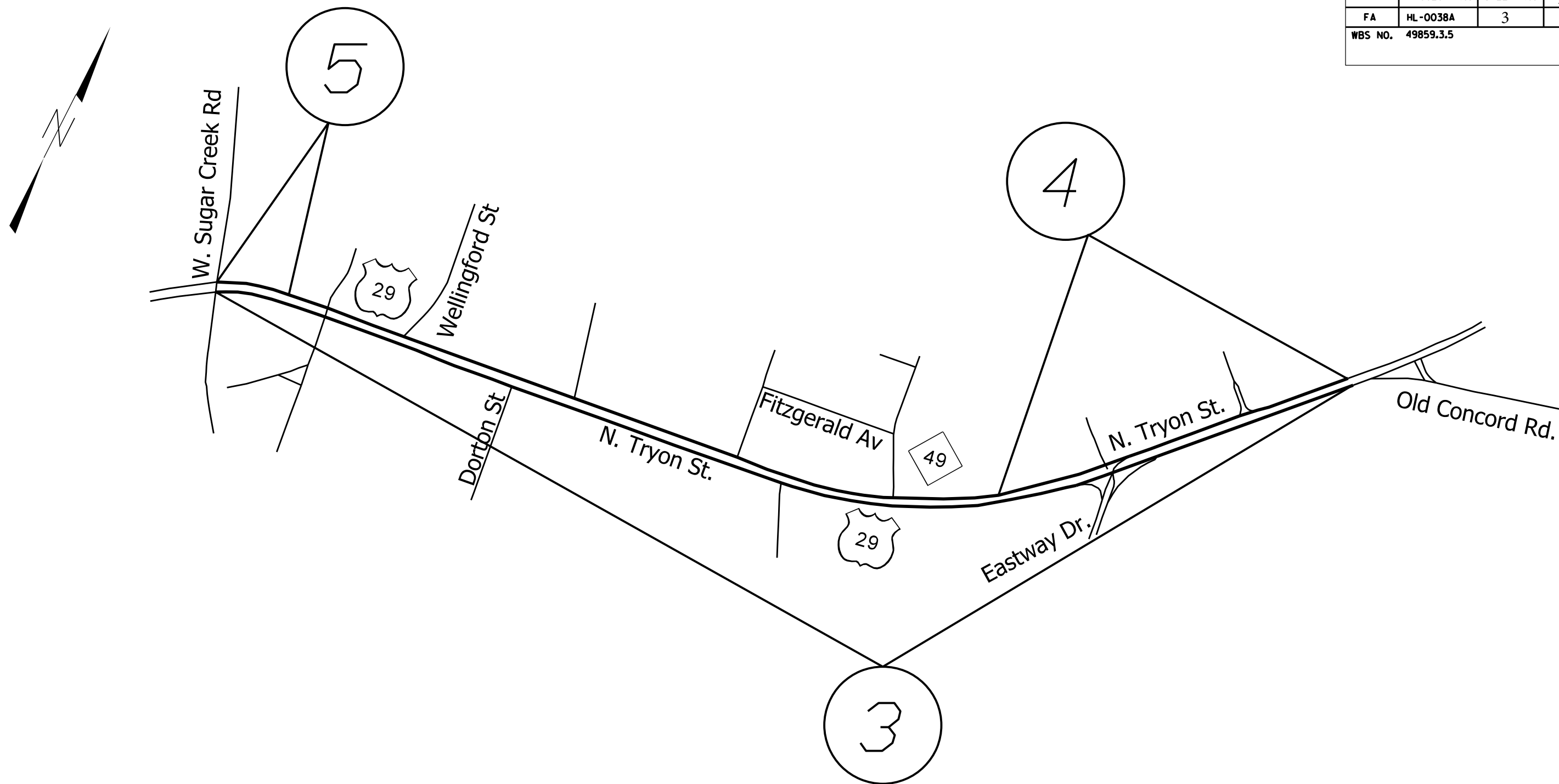
DESCRIPTION

FROM FIELD RIDGE RD TO BRIDGE AT CATAWBA RIVER

FROM BRIDGE AT CATAWBA RIVER TO FIELD RIDGE RD

<b>HL-0038A</b> <b>2022 MECKLENBURG COUNTY</b> <b>RESURFACING</b>		
SCALE	-NA-	
DATE	2/22	
DWG. BY	JHE	
DESIGN BY	JHE	
APPROVED		
		REVISIONS

FEDERAL	PROJECT NO.	SHEET NO.	TOTAL SHEETS
FA	HL-0038A	3	18
WBS NO. 49859.3.5			



MAP

DESCRIPTION

# 3 US 29 NB N. TRYON ST.


FROM W. SUGAR CREEK RD TO PAVEMENT JOINT AT OLD CONCORD RD

# 4 US 29 SB N. TRYON ST.

FROM PAVEMENT JOINT AT OLD CONCORD RD TO END DIVIDE

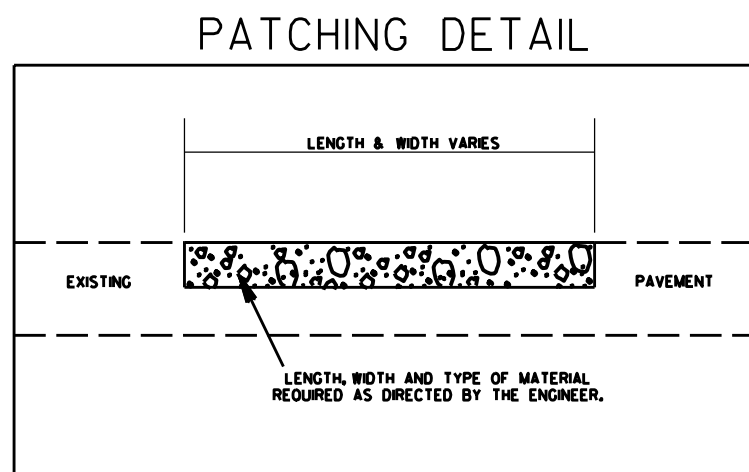
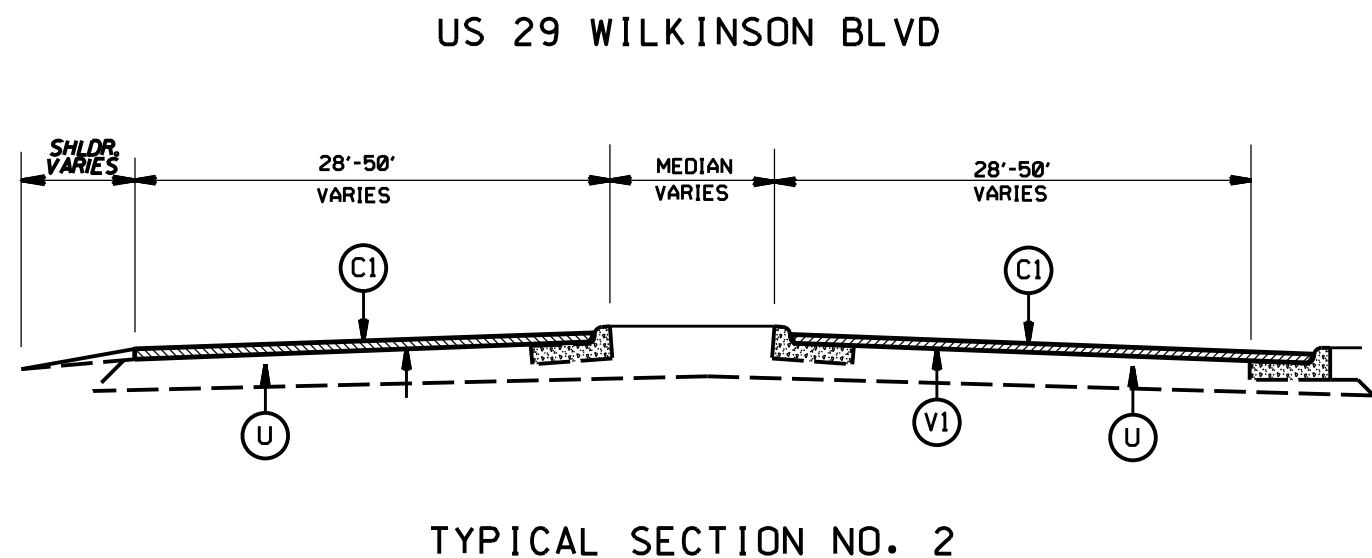
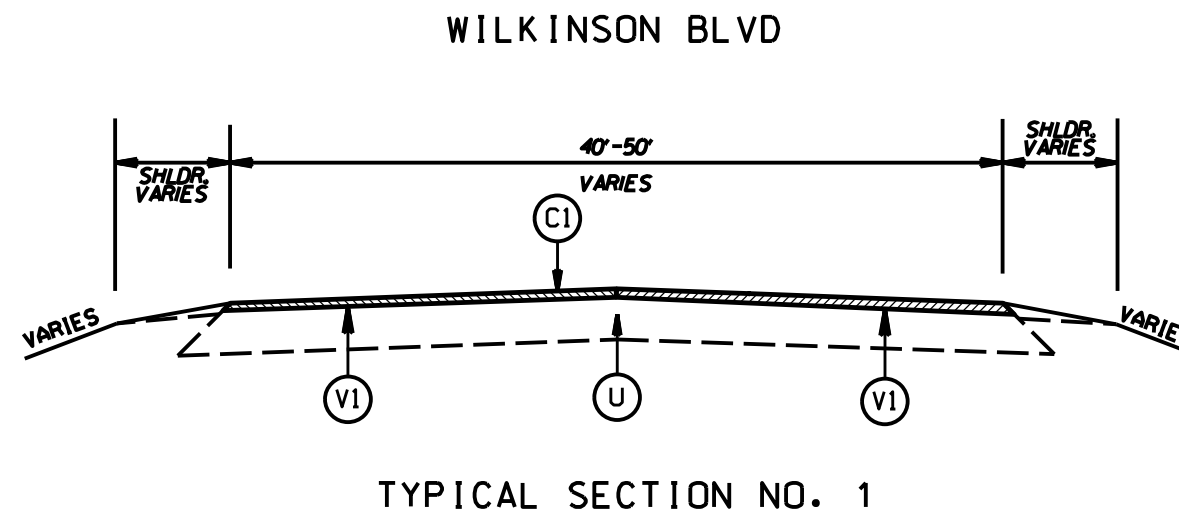
# 5 US 29 SB N. TRYON ST.


FROM BEGIN DIVIDE TO W. SUGAR CREEK RD

HL-0038A 2022 MECKLENBURG COUNTY RESURFACING										
SCALE	-NA-									
DATE	2/22									
DWG. BY	JHE									
DESIGN BY	JHE									
APPROVED		<table border="1"> <thead> <tr> <th colspan="2">REVISIONS</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS							
REVISIONS										

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.		4	18
WBS NO. 49859.3.5			

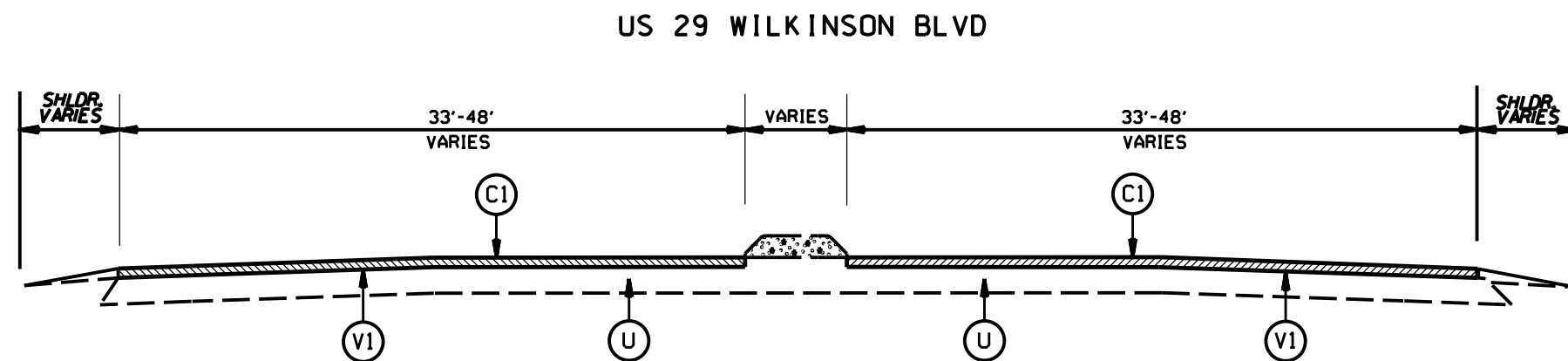
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
U	EXISTING PAVEMENT
V1	MILLING 1.5" DEPTH
V2	INCIDENTAL MILLING



HL-0038A MECKLENBURG COUNTY RESURFACING		
SCALE	-NA-	
DATE	2/22	
DWG. BY	JHE	
DESIGN BY	JHE	
APPROVED		
		REVISIONS

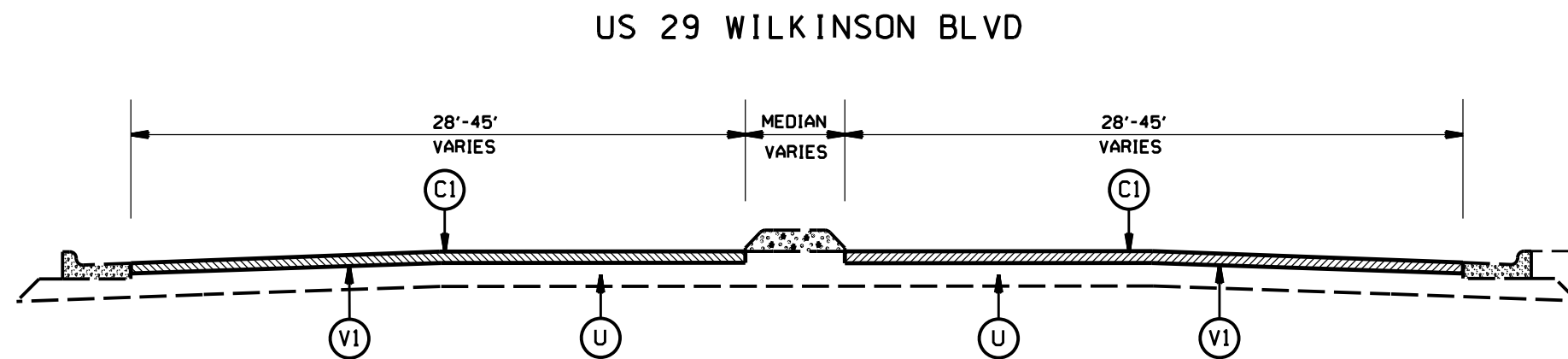
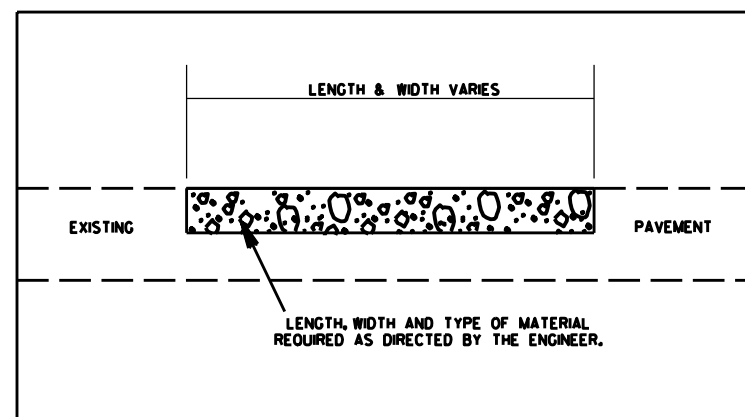
STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.		5	18
WBS NO. 49859.3.5			

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
U	EXISTING PAVEMENT
V1	MILLING 1.5" DEPTH
V2	INCIDENTAL MILLING



TYPICAL SECTION NO. 3

PATCHING DETAIL



TYPICAL SECTION NO. 4

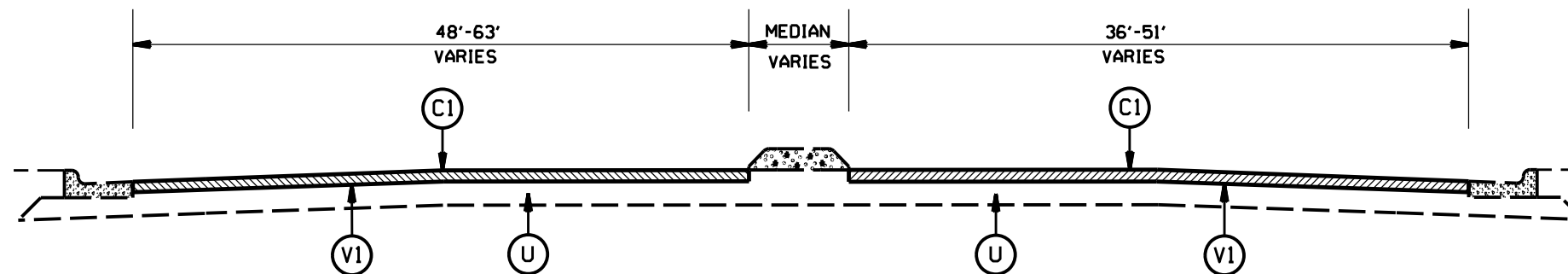
HL-0038A  
MECKLENBURG COUNTY  
RESURFACING

SCALE	-NA-		REVISIONS
DATE	2/22		
DWG. BY	JHE		
DESIGN BY	JHE		
APPROVED			

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.		6	18
WBS NO.	49859.3.5		

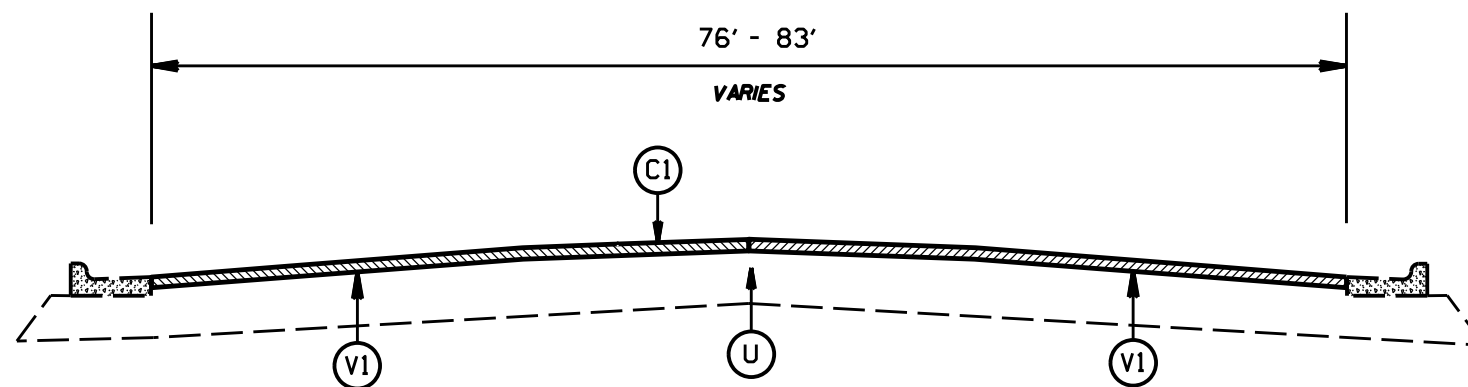
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
U	EXISTING PAVEMENT
V1	MILLING 1.5" DEPTH
V2	INCIDENTAL MILLING

US 29 N. TRYON ST.



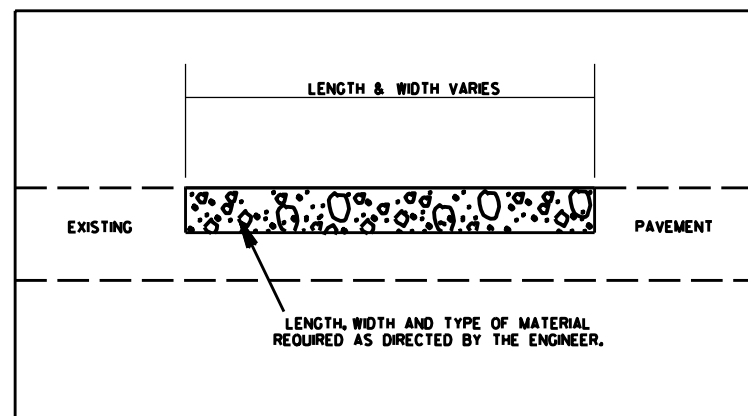
TYPICAL SECTION NO. 5


US 29 N. TRYON ST.



TYPICAL SECTION NO. 6

PATCHING DETAIL



HL-0038A MECKLENBURG COUNTY RESURFACING		
SCALE	-NA-	
DATE	2/22	
DWG. BY	JHE	
DESIGN BY	JHE	
APPROVED		REVISIONS

PROJECT NO.	SHEET NO.	TOTAL NO.
49859.3.5	7	18

**SUMMARY OF QUANTITIES**

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH	WIDTH	1297000000-E	1330000000-E	1523000000-E	1575000000-E	1704000000-E	2600000000-N	2605000000-N	2830000000-N	2845000000-N	5255000000-N	6000000000-E	7444000000-E		
												1 1/2" MILLING	INCIDENTAL MILLING	SURFACE COURSE, S9.5C	ASPHALT BINDER FOR PLANT MIX	PATCHING EXISTING PAVEMENT	RETROFIT EXISTING CURB RAMPS	CONCRETE CURB RAMPS	ADJ. OF MANHOLES	ADJ. OF METER OR VALVE BOX	PORTABLE LIGHTING	TEMPORARY SILT FENCE	INDUCTIVE LOOP SAWCUT		
												MI	FT	SY	SY	TONS	TONS	TONS	EA	EA	EA	EA	LS	LF	LF
49859.3.5	Mecklenburg	1	US 29 WB WILKINSON BLVD	FROM FIELD RIDGE RD TO BRIDGE AT CATAWBA RIVER (MP 20.59 TO MP 22.67)		2	MD	NO	NO	2.08	32	39,276	2,086	3,823	229	733	1	1	1	2	0.20	100	1,427		
<b>TOTAL FOR MAP NO. 1</b>											<b>2.08</b>		<b>39,276</b>	<b>2,086</b>	<b>3,823</b>	<b>229</b>	<b>733</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0.20</b>	<b>100</b>	<b>1,427</b>	
49859.3.5	Mecklenburg	2	US 29 EB WILKINSON BLVD	FROM BRIDGE AT CATAWBA RIVER TO FIELD RIDGE RD (MP 0.09 TO MP 2.17)		2	MD	NO	NO	2.08	32	38,353	3,664	3,883	233	431		1		1	0.20	100	1,241		
<b>TOTAL FOR MAP NO. 2</b>											<b>2.08</b>		<b>38,353</b>	<b>3,664</b>	<b>3,883</b>	<b>233</b>	<b>431</b>		<b>1</b>		<b>1</b>	<b>0.20</b>	<b>100</b>	<b>1,241</b>	
49859.3.5	Mecklenburg	3	US 29 NB N. TRYON ST.	FROM W. SUGAR CREEK RD TO PAVEMENT JOINT AT OLD CONCORD RD (MP 13.76 TO MP 15.06)		2	MU	NO	NO	1.30	68	44,856	121	3,995	240	440			6	13	0.20		695		
<b>TOTAL FOR MAP NO. 3</b>											<b>1.30</b>		<b>44,856</b>	<b>121</b>	<b>3,995</b>	<b>240</b>	<b>440</b>			<b>6</b>	<b>13</b>	<b>0.20</b>		<b>695</b>	
49859.3.5	Mecklenburg	4	US 29 SB N. TRYON ST.	FROM PAVEMENT JOINT AT OLD CONCORD RD TO END DIVIDE (MP 7.70 TO MP 8.10)		2	MD	NO	NO	0.40	33	9,534	95	890	53	220	1		2	3	0.20		1,002		
<b>TOTAL FOR MAP NO. 4</b>											<b>0.40</b>		<b>9,534</b>	<b>95</b>	<b>890</b>	<b>53</b>	<b>220</b>	<b>1</b>		<b>2</b>	<b>3</b>	<b>0.20</b>		<b>1,002</b>	
49859.3.5	Mecklenburg	5	US 29 SB N. TRYON ST.	FROM BEGIN DIVIDE TO W. SUGAR CREEK RD (MP 8.94 TO MP 9.00)		2	MD	NO	NO	0.06	46	1,609		150	9	110					0.20		769		
<b>TOTAL FOR MAP NO. 5</b>											<b>0.06</b>		<b>1,609</b>		<b>150</b>	<b>9</b>	<b>110</b>					<b>0.20</b>		<b>769</b>	
<b>TOTAL FOR PROJ NO. 49859.3.5</b>											<b>5.92</b>		<b>133,628</b>	<b>5,966</b>	<b>12,741</b>	<b>764</b>	<b>1,934</b>	<b>2</b>	<b>2</b>	<b>9</b>	<b>19</b>	<b>1</b>	<b>200</b>	<b>5,134</b>	
<b>GRAND TOTAL</b>											<b>5.92</b>		<b>133,628</b>	<b>5,966</b>	<b>12,741</b>	<b>764</b>	<b>1,934</b>	<b>2</b>	<b>2</b>	<b>9</b>	<b>19</b>	<b>1</b>	<b>200</b>	<b>5,134</b>	

PROJECT NO.	SHEET NO.	TOTAL NO.
49859.3.5	8	18

### THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	4413000000-E	4447000000-E	4510000000-N	4457000000-N	4600000000-N		4685000000-E		4695000000-E		4720000000-E		4725000000-E				
										WORK ZONE ADVANCE/GENERAL WARNING SIGNING	PEDESTRIAN CHANNELIZING DEVICES	LAW ENFORCEMENT	TEMPORARY TRAFFIC CONTROL	AUDIBLE WARNING DEVICES	TEMPORARY CURB RAMP	THERMOPLASTIC PAVEMENT MARKING LINES WHITE TYPE II (4", 90 MILS)	THERMOPLASTIC PAVEMENT MARKING LINES YELLOW TYPE II (4", 90 MILS)	THERMOPLASTIC PAVEMENT MARKING LINES WHITE TYPE II (8", 90 MILS)	THERMOPLASTIC PAVEMENT MARKING LINES YELLOW LINES II (8", 90 MILS)	THERMO SCHOOL (90 MILS)	THERMO ONLY (90 MILS)	THERMO LT ARROW 90 M	THERMO RT ARROW 90 M	THERMO STR ARROW 90 M	THERMO STR & RT ARROW 90 M	
									MI	FT	SF	LF	HR	LS	EA	EA	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
49859.3.5	Mecklenburg	1	US 29 WB WILKINSON BLVD	FROM FIELD RIDGE RD TO BRIDGE AT CATAWBA RIVER (MP 20.59 TO MP 22.67)		2	MD	2.08	32	126							14,647	10,416	1,454			16	4	6	2	
<b>TOTAL FOR MAP NO. 1</b>									<b>2.08</b>		<b>126</b>						<b>14,647</b>	<b>10,416</b>	<b>1,454</b>			<b>16</b>	<b>4</b>	<b>6</b>	<b>2</b>	
49859.3.5	Mecklenburg	2	US 29 EB WILKINSON BLVD	FROM BRIDGE AT CATAWBA RIVER TO FIELD RIDGE RD (MP 0.09 TO MP 2.17)		2	MD	2.08	32	126							14,477	10,516	1,182			16	1	13	6	
<b>TOTAL FOR MAP NO. 2</b>									<b>2.08</b>		<b>126</b>						<b>14,477</b>	<b>10,516</b>	<b>1,182</b>			<b>16</b>	<b>1</b>	<b>13</b>	<b>6</b>	
49859.3.5	Mecklenburg	3	US 29 NB N. TRYON ST.	FROM W. SUGAR CREEK RD TO PAVEMENT JOINT AT OLD CONCORD RD (MP 13.76 TO MP 15.06)		2	MU	1.30	68	126							6,036	12,213	1,294		6	20	34	14	8	
<b>TOTAL FOR MAP NO. 3</b>									<b>1.30</b>		<b>126</b>						<b>6,036</b>	<b>12,213</b>	<b>1,294</b>		<b>6</b>	<b>20</b>	<b>34</b>	<b>14</b>	<b>8</b>	
49859.3.5	Mecklenburg	4	US 29 SB N. TRYON ST.	FROM PAVEMENT JOINT AT OLD CONCORD RD TO END DIVIDE (MP 7.70 TO MP 8.10)		2	MD	0.40	33	126							2,274	1,546	733	36	6		9	2	4	
<b>TOTAL FOR MAP NO. 4</b>									<b>0.40</b>		<b>126</b>						<b>2,274</b>	<b>1,546</b>	<b>733</b>	<b>36</b>	<b>6</b>		<b>9</b>	<b>2</b>	<b>4</b>	
49859.3.5	Mecklenburg	5	US 29 SB N. TRYON ST.	FROM BEGIN DIVIDE TO W. SUGAR CREEK RD (MP 8.94 TO MP 9.00)		2	MD	0.06	46	126							775	275	300			4	3	2	4	
<b>TOTAL FOR MAP NO. 5</b>									<b>0.06</b>		<b>126</b>						<b>775</b>	<b>275</b>	<b>300</b>			<b>4</b>	<b>3</b>	<b>2</b>	<b>4</b>	
<b>TOTAL FOR PROJ NO. 49859.3.5</b>									<b>5.92</b>		<b>630</b>	<b>22</b>	<b>400</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>38,209</b>	<b>34,966</b>	<b>4,963</b>	<b>36</b>	<b>12</b>	<b>24</b>	<b>78</b>	<b>23</b>	<b>35</b>	<b>8</b>
<b>GRAND TOTAL</b>									<b>5.92</b>		<b>630</b>	<b>22</b>	<b>400</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>38,209</b>	<b>34,966</b>	<b>4,963</b>	<b>36</b>	<b>12</b>	<b>24</b>	<b>78</b>	<b>23</b>	<b>35</b>	<b>8</b>
											<b>73,175</b>	<b>34,966</b>	<b>4,999</b>	<b>36</b>	<b>144</b>											
											<b>73,175</b>	<b>34,966</b>	<b>4,999</b>	<b>36</b>	<b>144</b>											

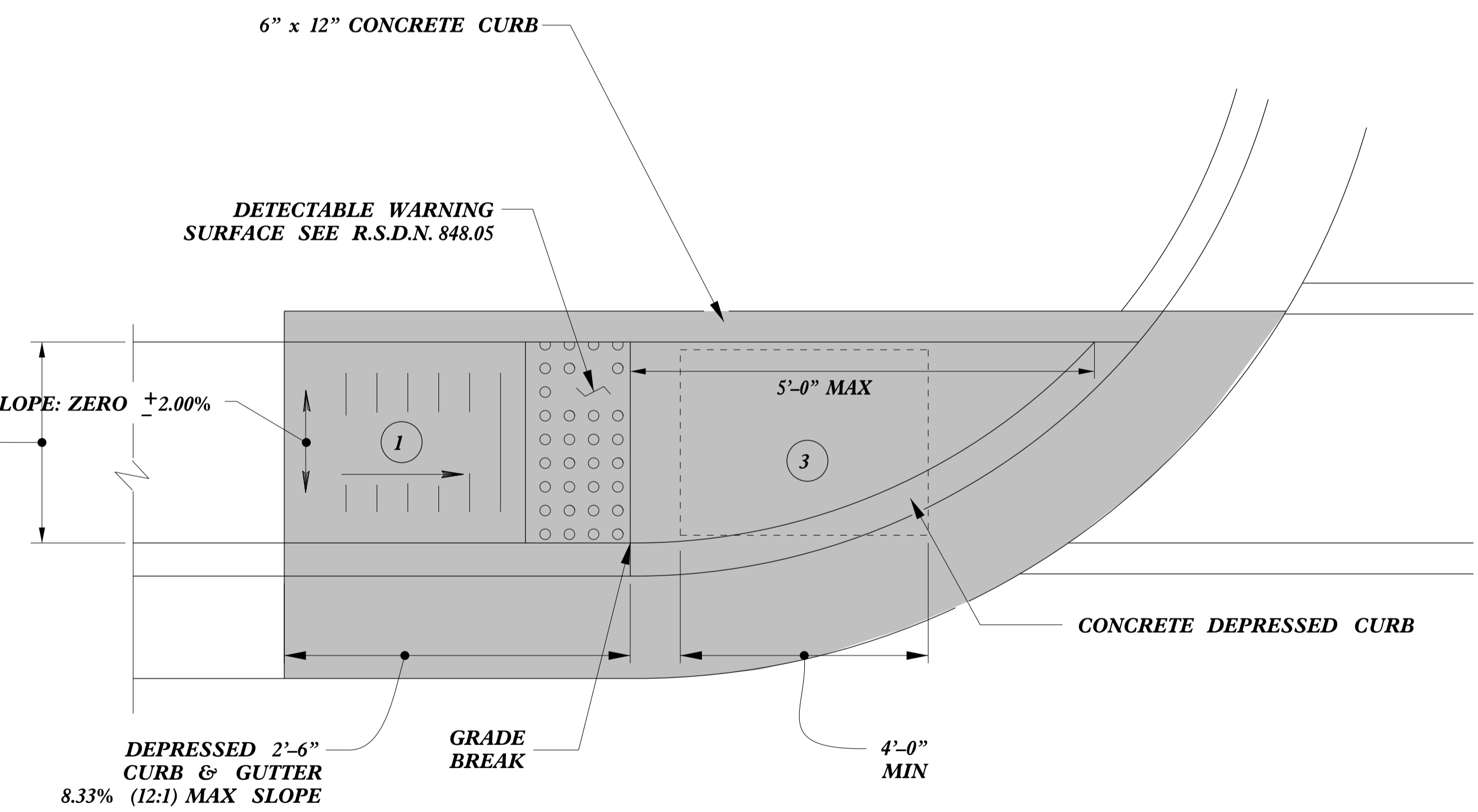
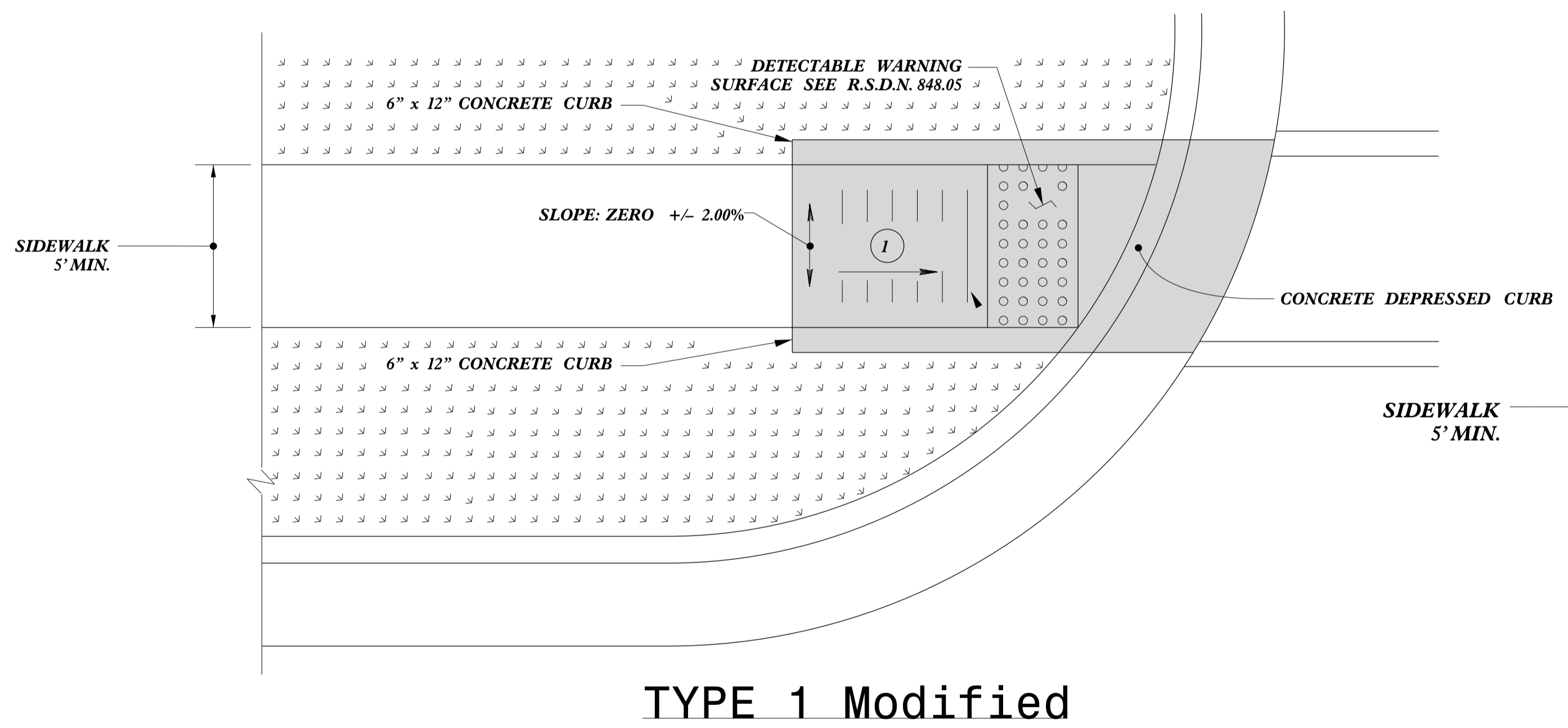
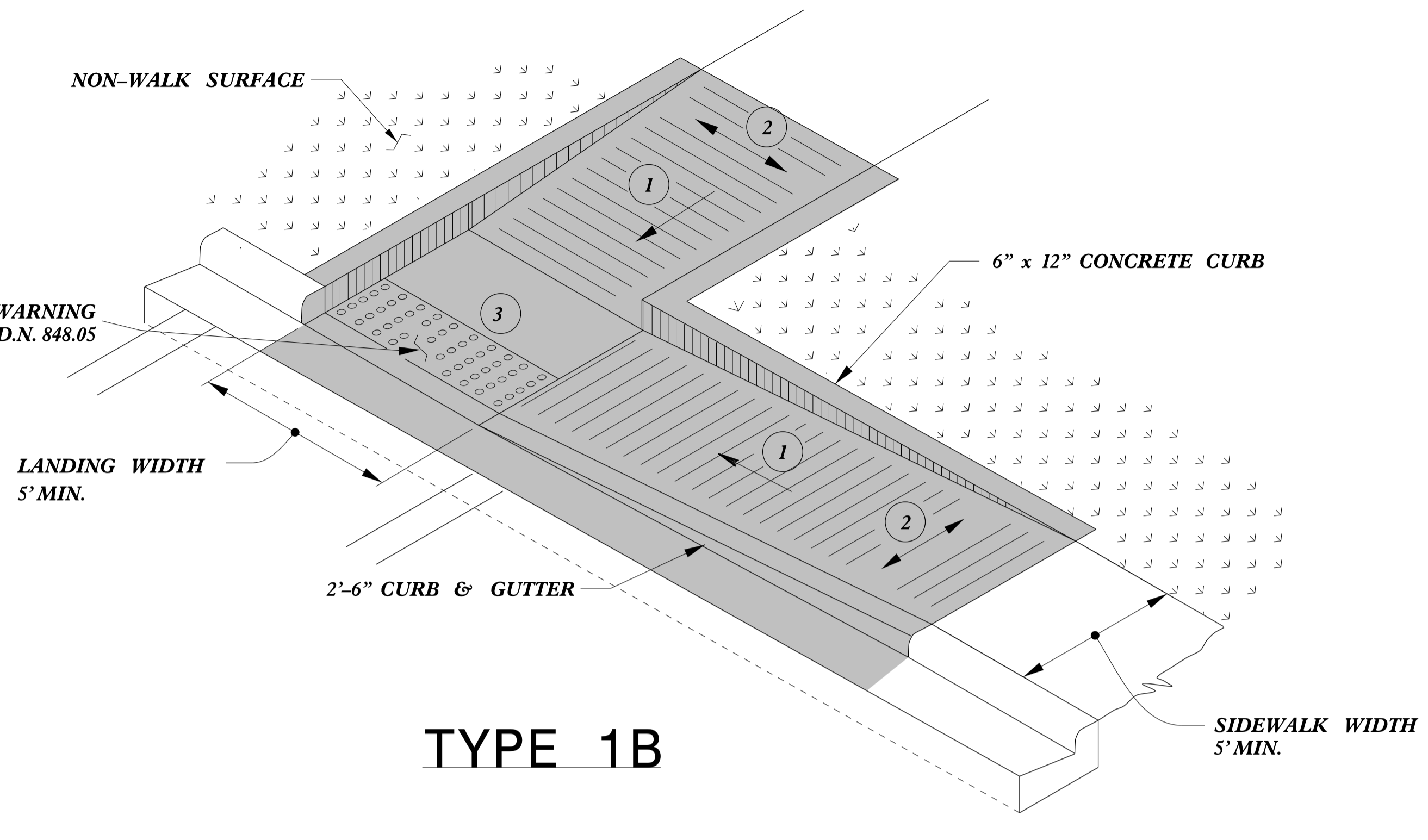
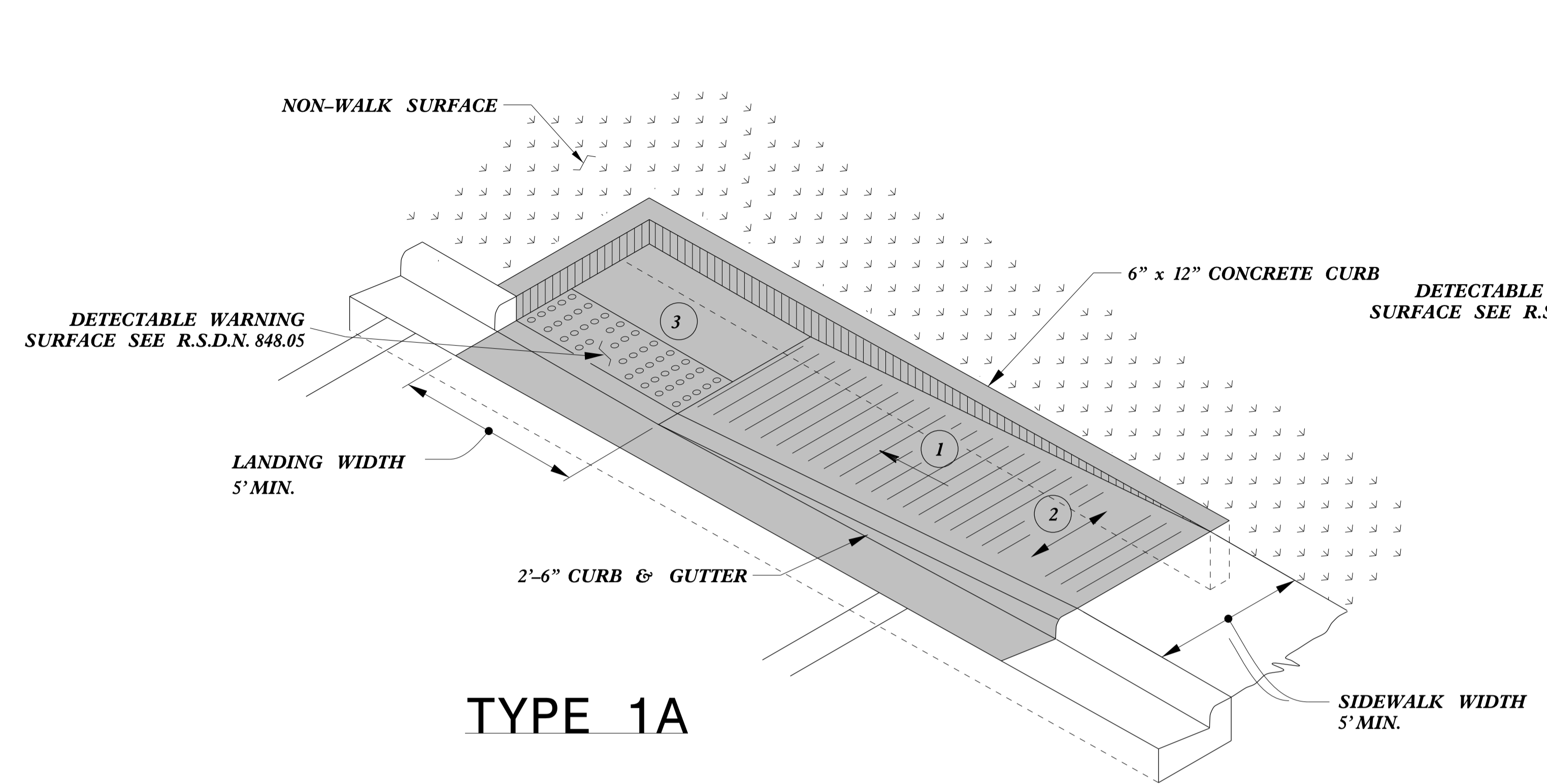


PROJECT NO.	SHEET NO.	TOTAL NO.
49859.3.5	9	18

### THERMOPLASTIC AND PAINT QUANTITIES (Continued)

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	4810000000-E		4820000000-E		4835000000-E	4840000000-N		4845000000-N				4891000000-E	4895000000-N	
										4" WHITE PAINT	4" YELLOW PAINT	8" WHITE PAINT	8" YELLOW PAINT	24" WHITE PAINT	PAINT MSG SCHOOL	PAINT MSG ONLY	PAINT LT ARROW	PAINT RT ARROW	PAINT STR ARROW	PAINT STR & RT ARROW	THERMOPLASTIC PAVEMENT MARKING LINES WHITE TYPE II (24", 90 MILS)	NON-CAST IROM SNOWPLOWABLE PAVEMENT MARKERS	
										MI	FT	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA
49859.3.5	Mecklenburg	1	US 29 WB WILKINSON BLVD	FROM FIELD RIDGE RD TO BRIDGE AT CATAWBA RIVER (MP 20.59 TO MP 22.67)		2	MD	2.08	32	14,647	10,416	1,454		85			16	4	6	2	85	243	
<b>TOTAL FOR MAP NO. 1</b>										<b>2.08</b>	<b>14,647</b>	<b>10,416</b>	<b>1,454</b>	<b>85</b>			<b>16</b>	<b>4</b>	<b>6</b>	<b>2</b>	<b>85</b>	<b>243</b>	
49859.3.5	Mecklenburg	2	US 29 EB WILKINSON BLVD	FROM BRIDGE AT CATAWBA RIVER TO FIELD RIDGE RD (MP 0.09 TO MP 2.17)		2	MD	2.08	32	14,477	10,516	1,182		138			16	1	13	6	138	292	
<b>TOTAL FOR MAP NO. 2</b>										<b>2.08</b>	<b>14,477</b>	<b>10,516</b>	<b>1,182</b>	<b>138</b>			<b>16</b>	<b>1</b>	<b>13</b>	<b>6</b>	<b>138</b>	<b>292</b>	
49859.3.5	Mecklenburg	3	US 29 NB N. TRYON ST.	FROM W. SUGAR CREEK RD TO PAVEMENT JOINT AT OLD CONCORD RD (MP 13.76 TO MP 15.06)		2	MU	1.30	68	6,036	12,213	1,294		174	6	20	34	14	8		174	290	
<b>TOTAL FOR MAP NO. 3</b>										<b>1.30</b>	<b>6,036</b>	<b>12,213</b>	<b>1,294</b>	<b>174</b>	<b>6</b>	<b>20</b>	<b>34</b>	<b>14</b>	<b>8</b>		<b>174</b>	<b>290</b>	
49859.3.5	Mecklenburg	4	US 29 SB N. TRYON ST.	FROM PAVEMENT JOINT AT OLD CONCORD RD TO END DIVIDE (MP 7.70 TO MP 8.10)		2	MD	0.40	33	2,274	1,546	733	36	196	6		9	2	4		196	125	
<b>TOTAL FOR MAP NO. 4</b>										<b>0.40</b>	<b>2,274</b>	<b>1,546</b>	<b>733</b>	<b>36</b>	<b>196</b>	<b>6</b>	<b>9</b>	<b>2</b>	<b>4</b>		<b>196</b>	<b>125</b>	
49859.3.5	Mecklenburg	5	US 29 SB N. TRYON ST.	FROM BEGIN DIVIDE TO W. SUGAR CREEK RD (MP 8.94 TO MP 9.00)		2	MD	0.06	46	775	275	300		45		4	3	2	4		45	37	
<b>TOTAL FOR MAP NO. 5</b>										<b>0.06</b>	<b>775</b>	<b>275</b>	<b>300</b>		<b>45</b>		<b>4</b>	<b>3</b>	<b>2</b>	<b>4</b>		<b>45</b>	<b>37</b>
<b>TOTAL FOR PROJ NO. 49859.3.5</b>										<b>5.92</b>	<b>38,209</b>	<b>34,966</b>	<b>4,963</b>	<b>36</b>	<b>638</b>	<b>12</b>	<b>24</b>	<b>78</b>	<b>23</b>	<b>35</b>	<b>8</b>	<b>638</b>	<b>987</b>
<b>GRAND TOTAL</b>																							
										<b>5.92</b>	<b>38,209</b>	<b>34,966</b>	<b>4,963</b>	<b>36</b>	<b>638</b>	<b>12</b>	<b>24</b>	<b>78</b>	<b>23</b>	<b>35</b>	<b>8</b>	<b>638</b>	<b>987</b>
											<b>73,175</b>		<b>4,999</b>		<b>36</b>		<b>144</b>						

5/14/99



- 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.



PAY LIMITS FOR 1 CURB RAMP

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



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

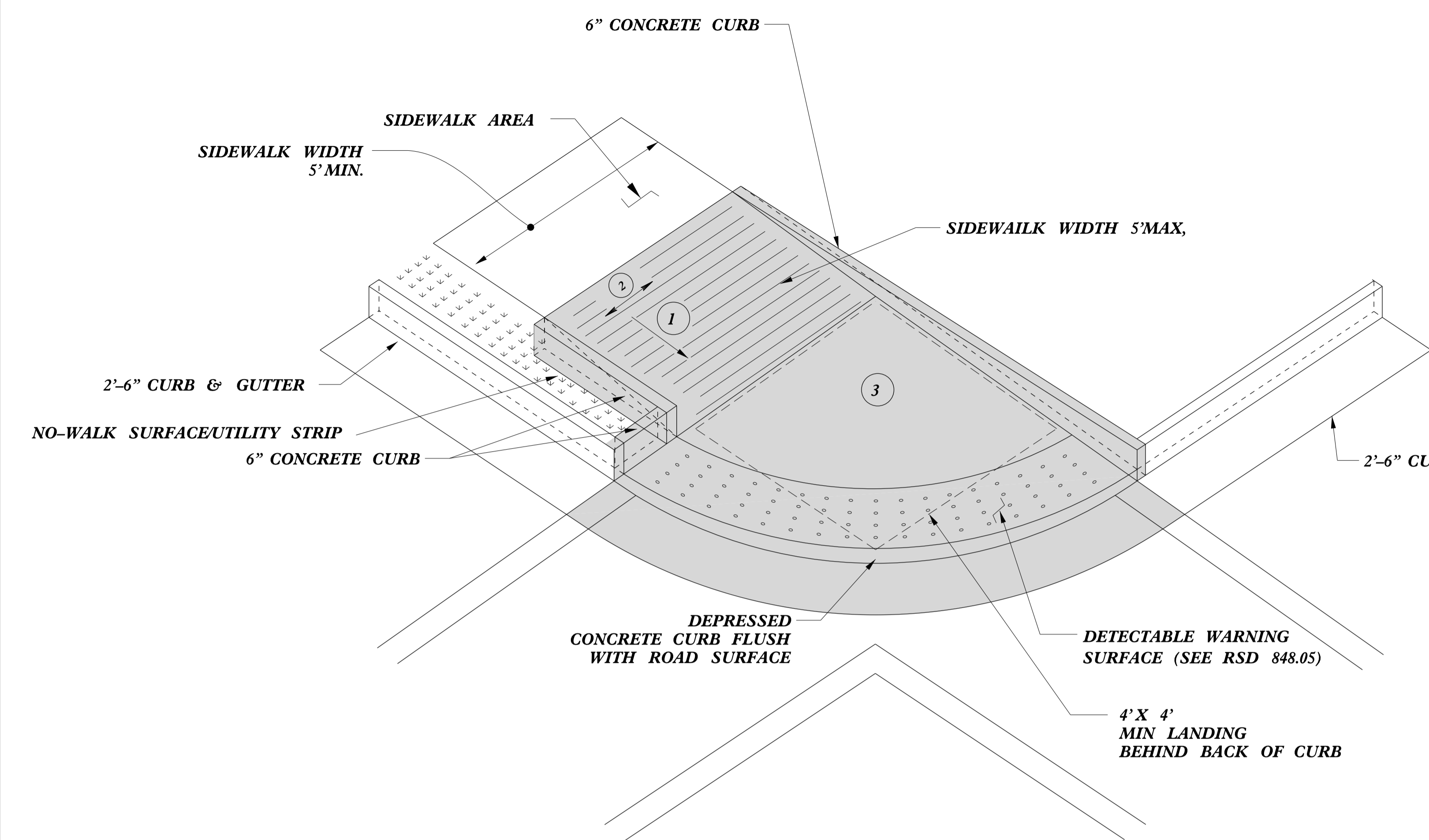
**CONTRACT STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**CURB RAMPS**  
Directional Ramps

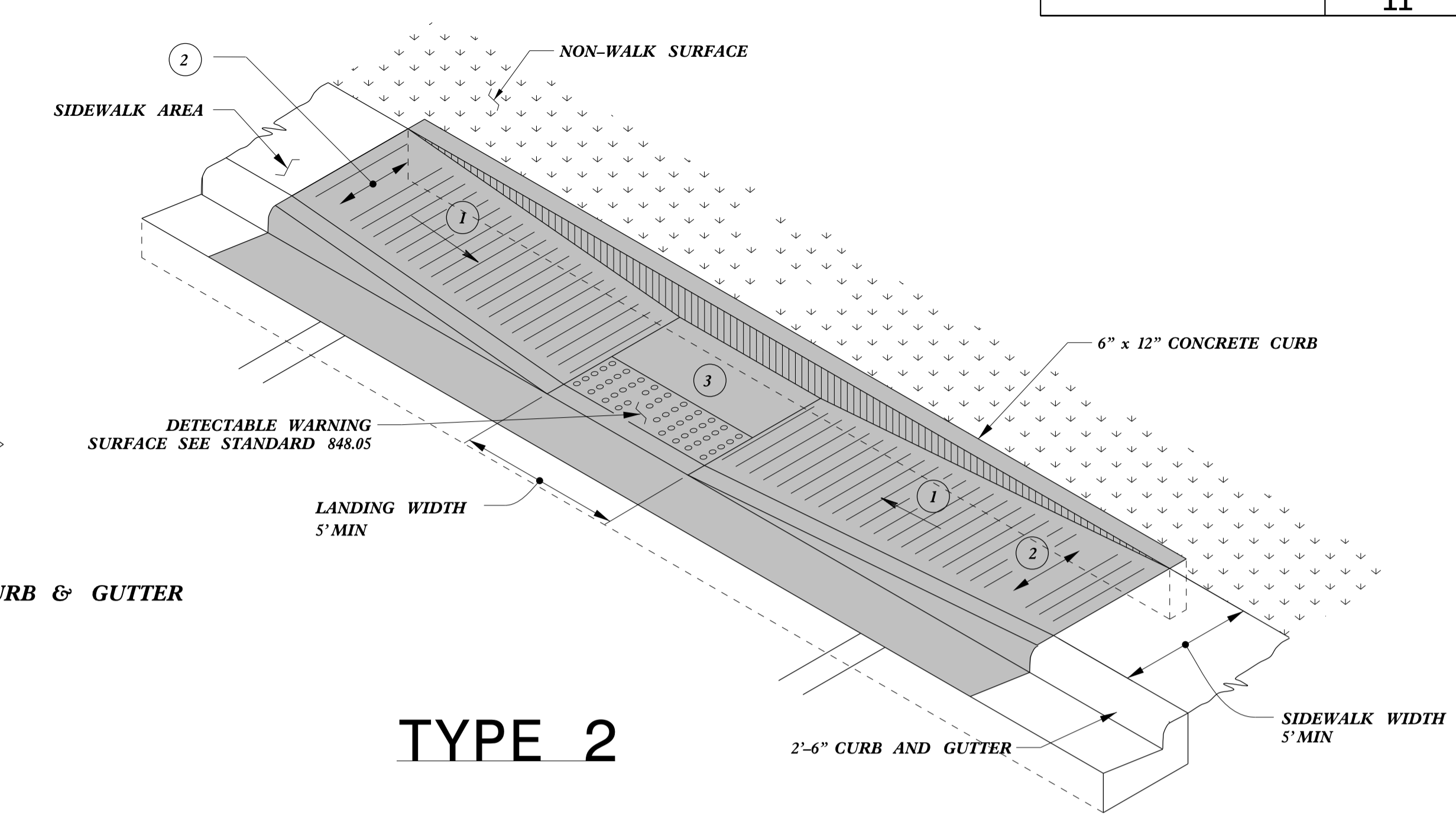
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 MODIFIED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

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 J.S. HOWERTON  
 87350170DCD45F

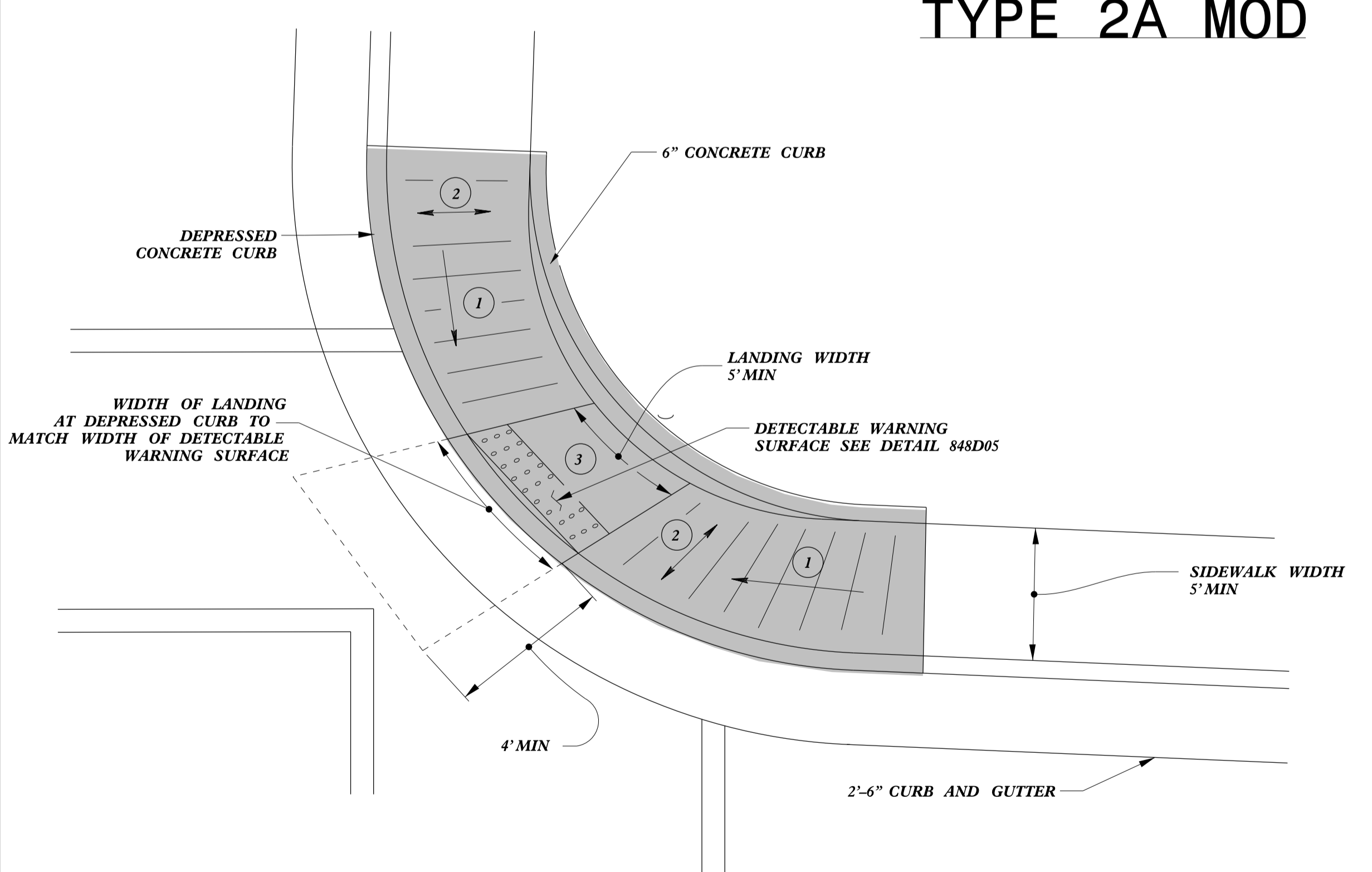
5/14/99



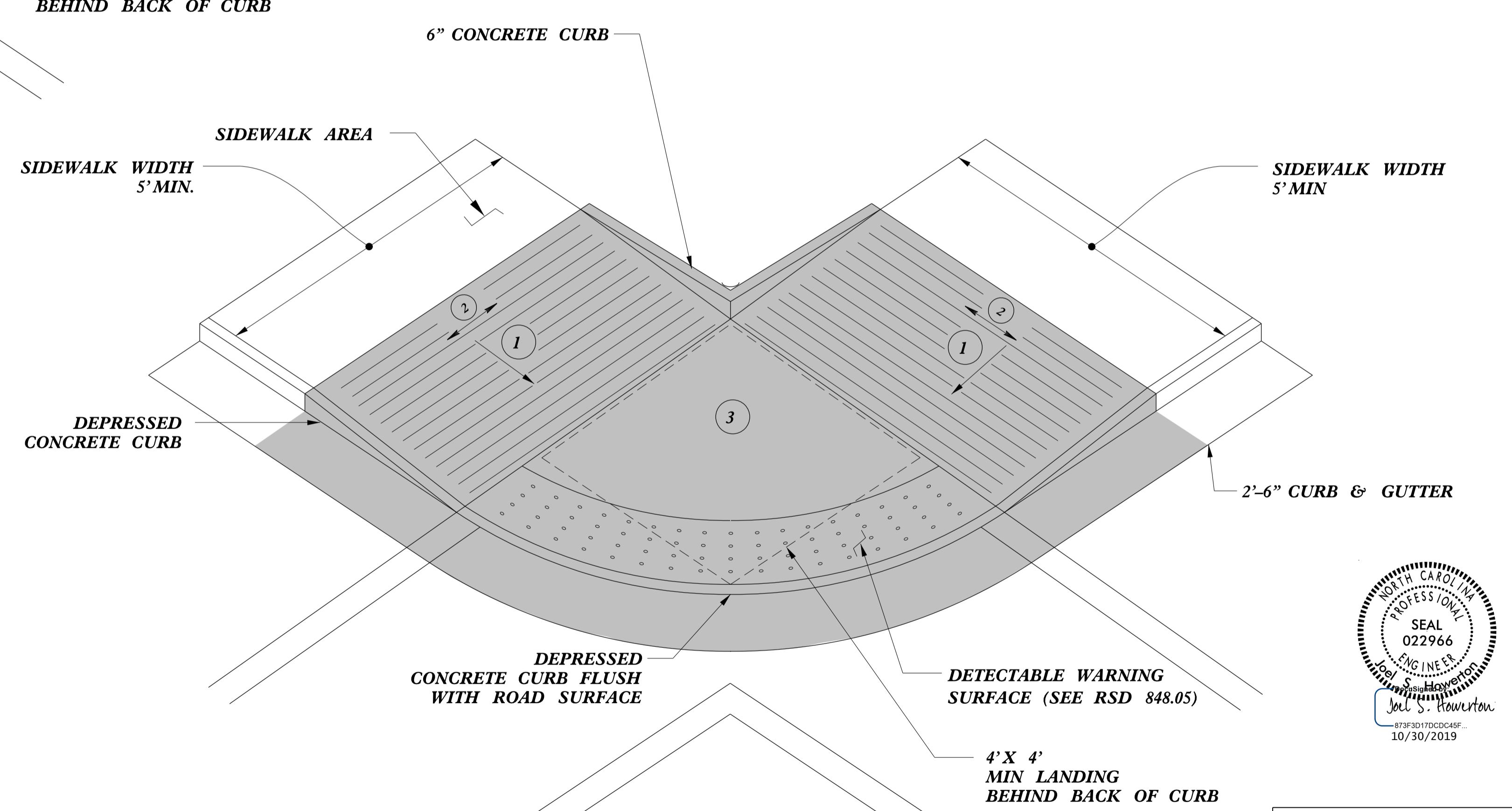
**TYPE 2A MOD**



**TYPE 2**



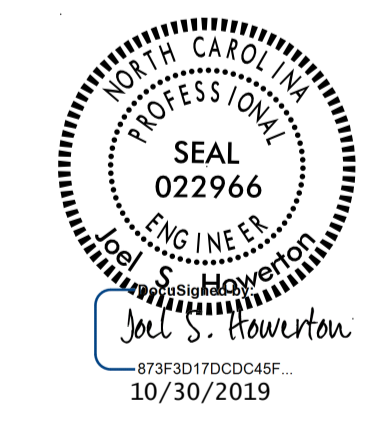
**TYPE 2B**



**TYPE 2A**

- 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.

PAY LIMITS FOR 1 CURB RAMP

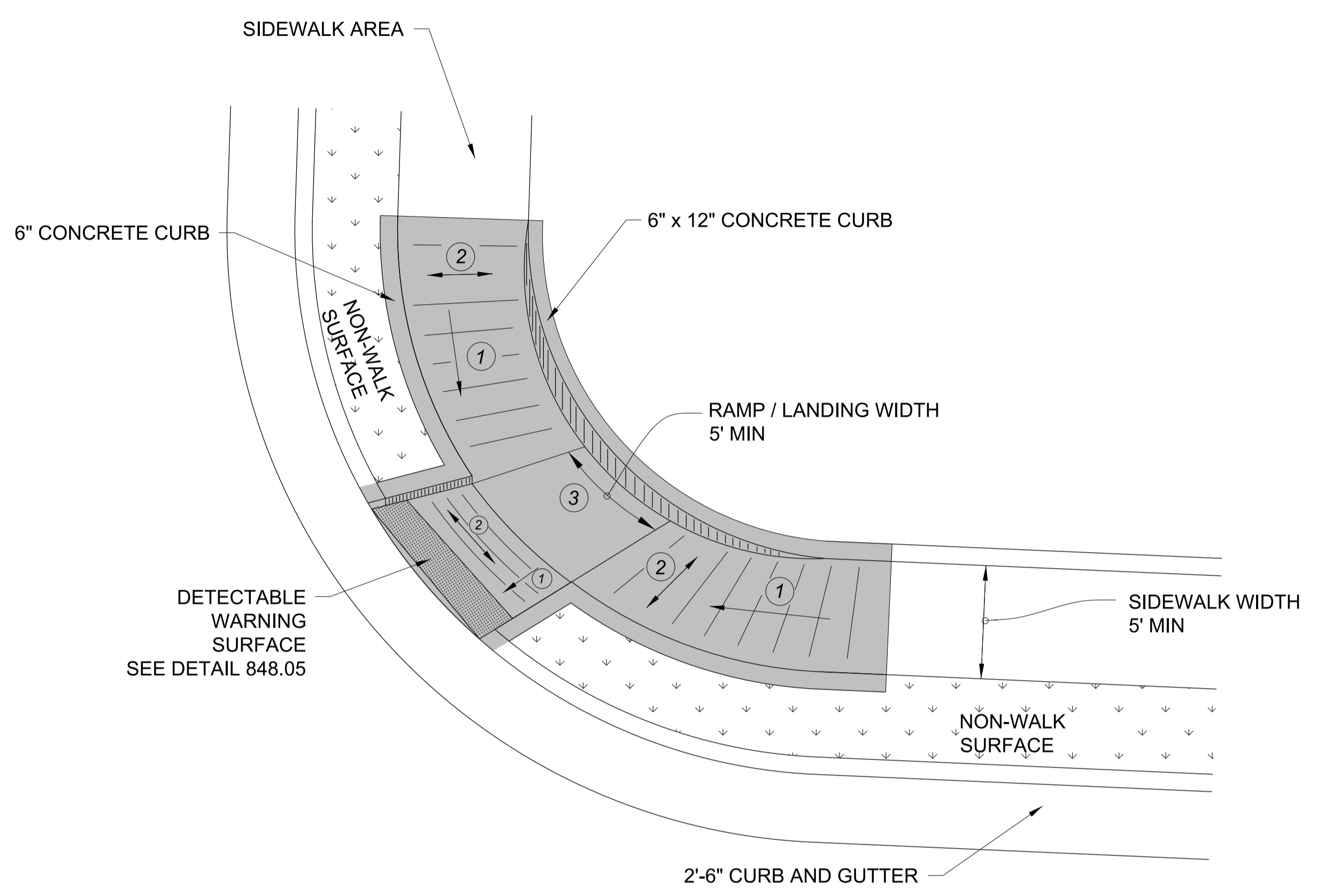


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

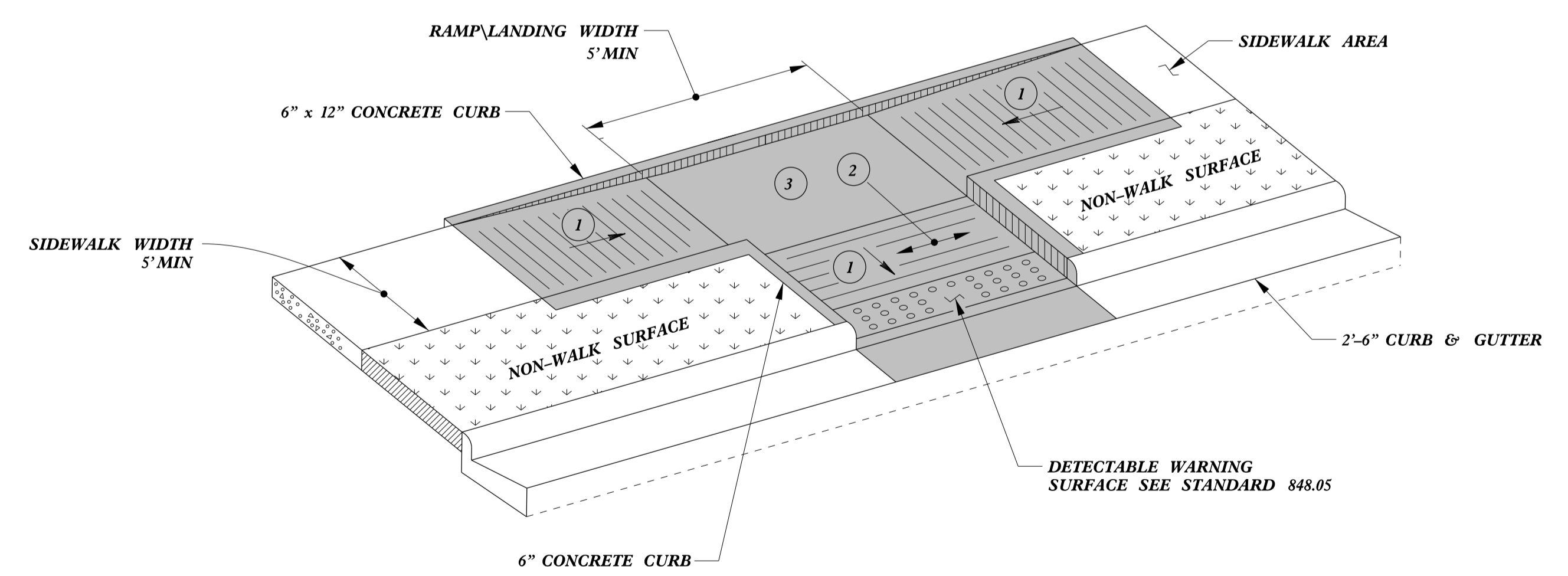
<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950	FAX 919-250-4119
<b>CURB RAMPS</b>	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn	

TIME: 11:58 AM 10/30/2019  
 CURB RAMPS.dwg  
 USER: JSH  
 PLOT: 10/30/2019 11:58 AM  
 PLOTTER: HP DesignJet T1100

PAY LIMITS FOR 1 CURB RAMP



**TYPE 3 MODIFIED  
INSTALLATION IN A RADIUS**



**TYPE 3**

- 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.



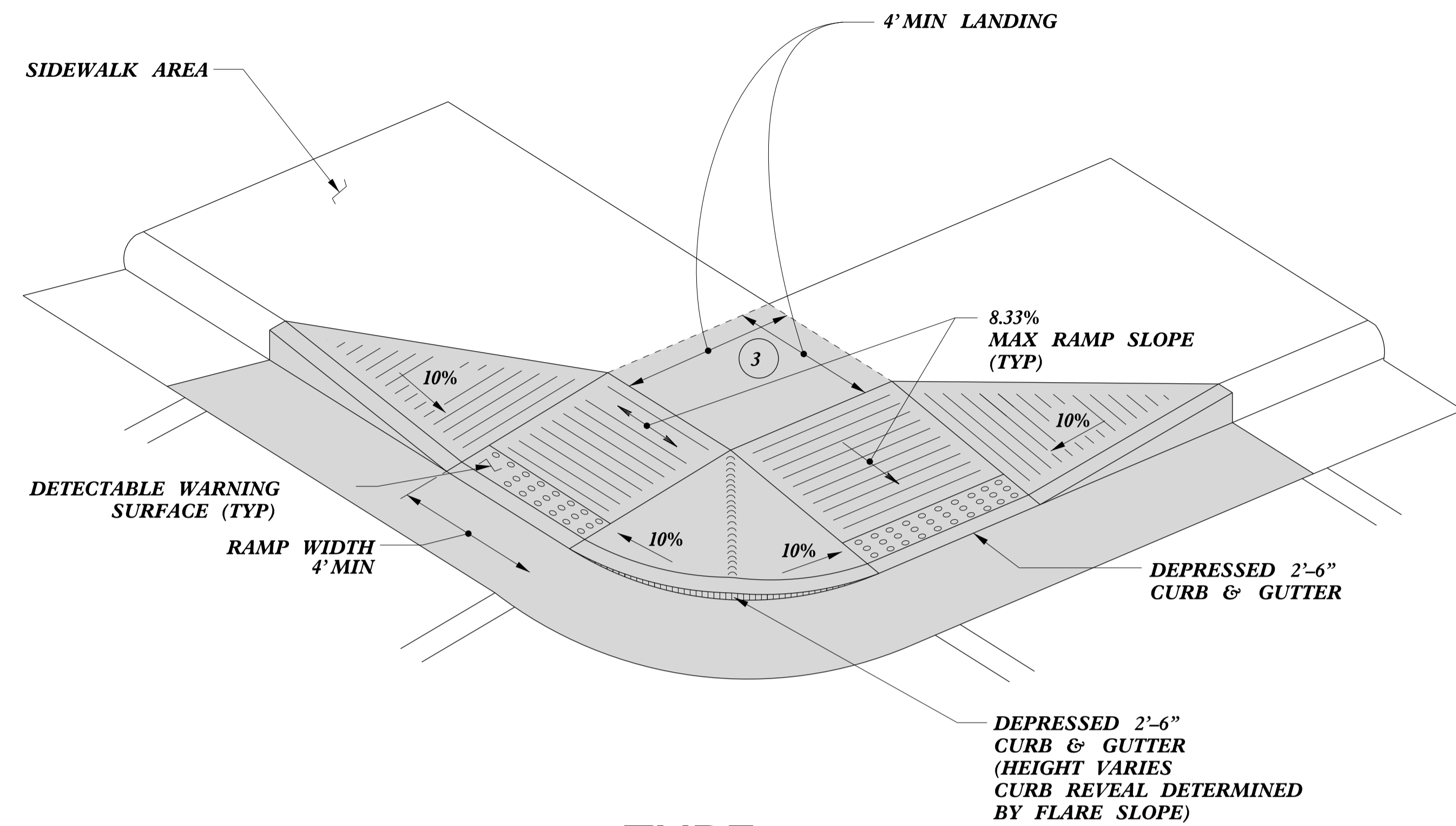
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**CONTRACT STANDARDS AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

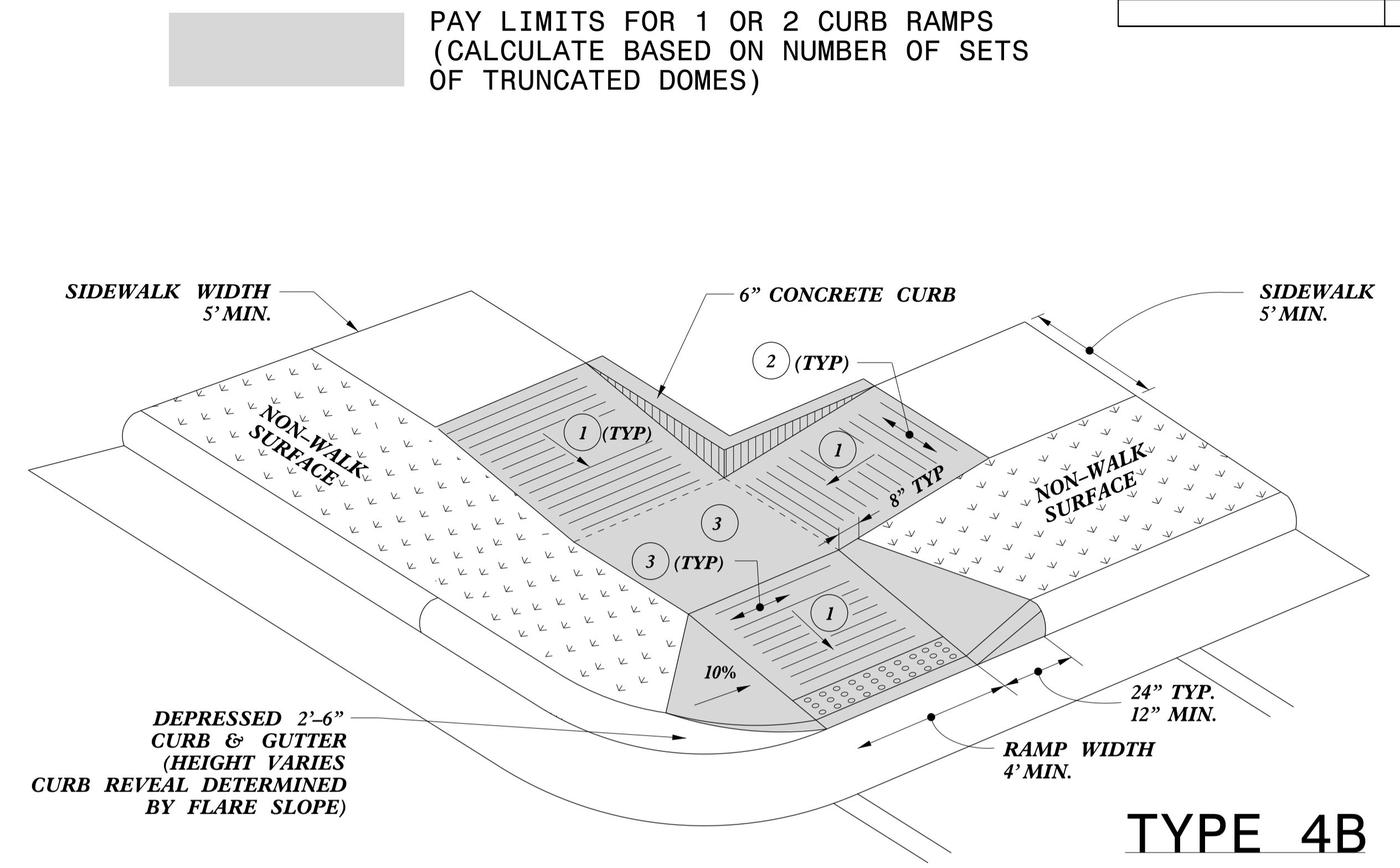
**CURB RAMPS**

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

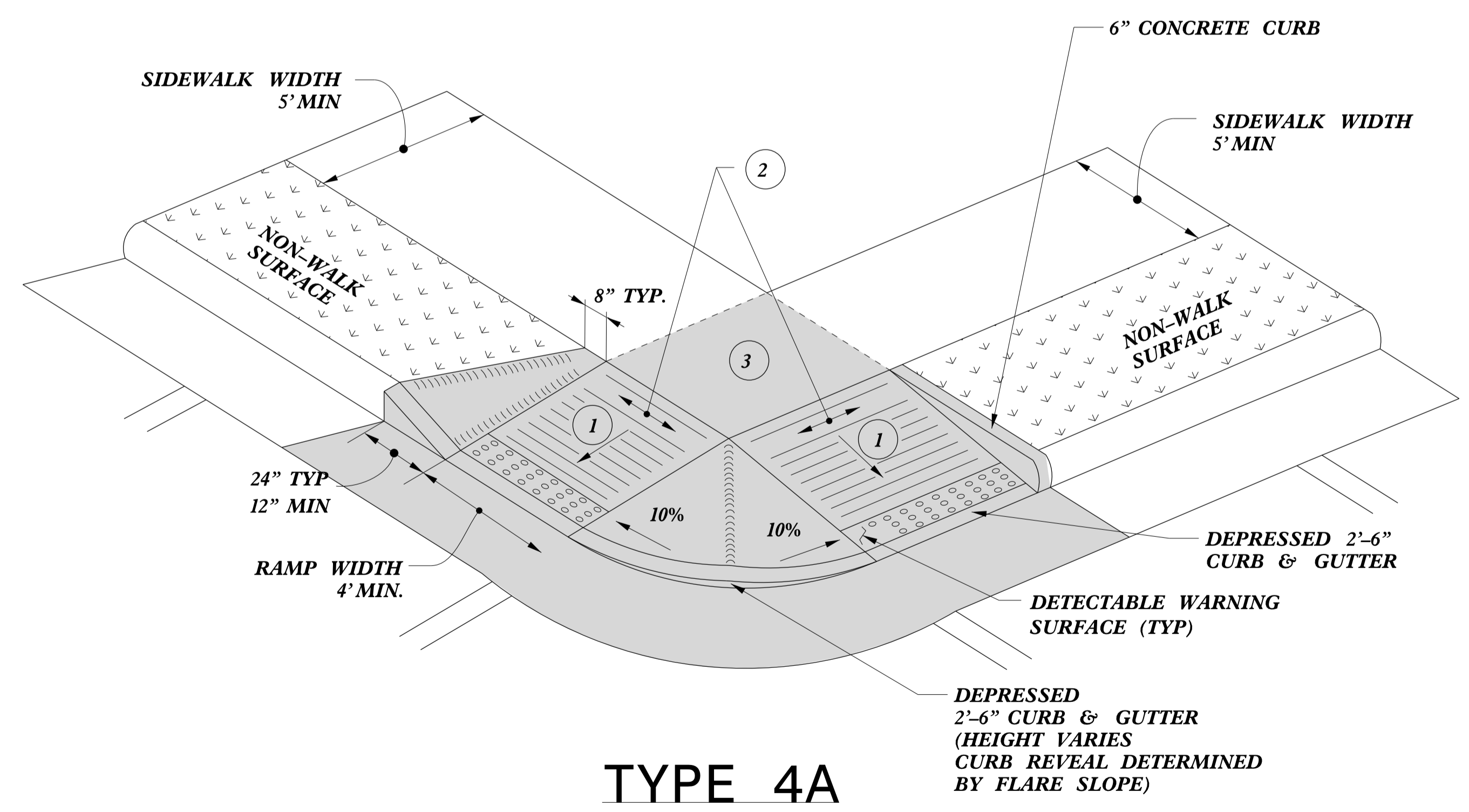
5/14/99  
 CURB RAMPS  
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 J.S. HOWERTON  
 10/30/2019



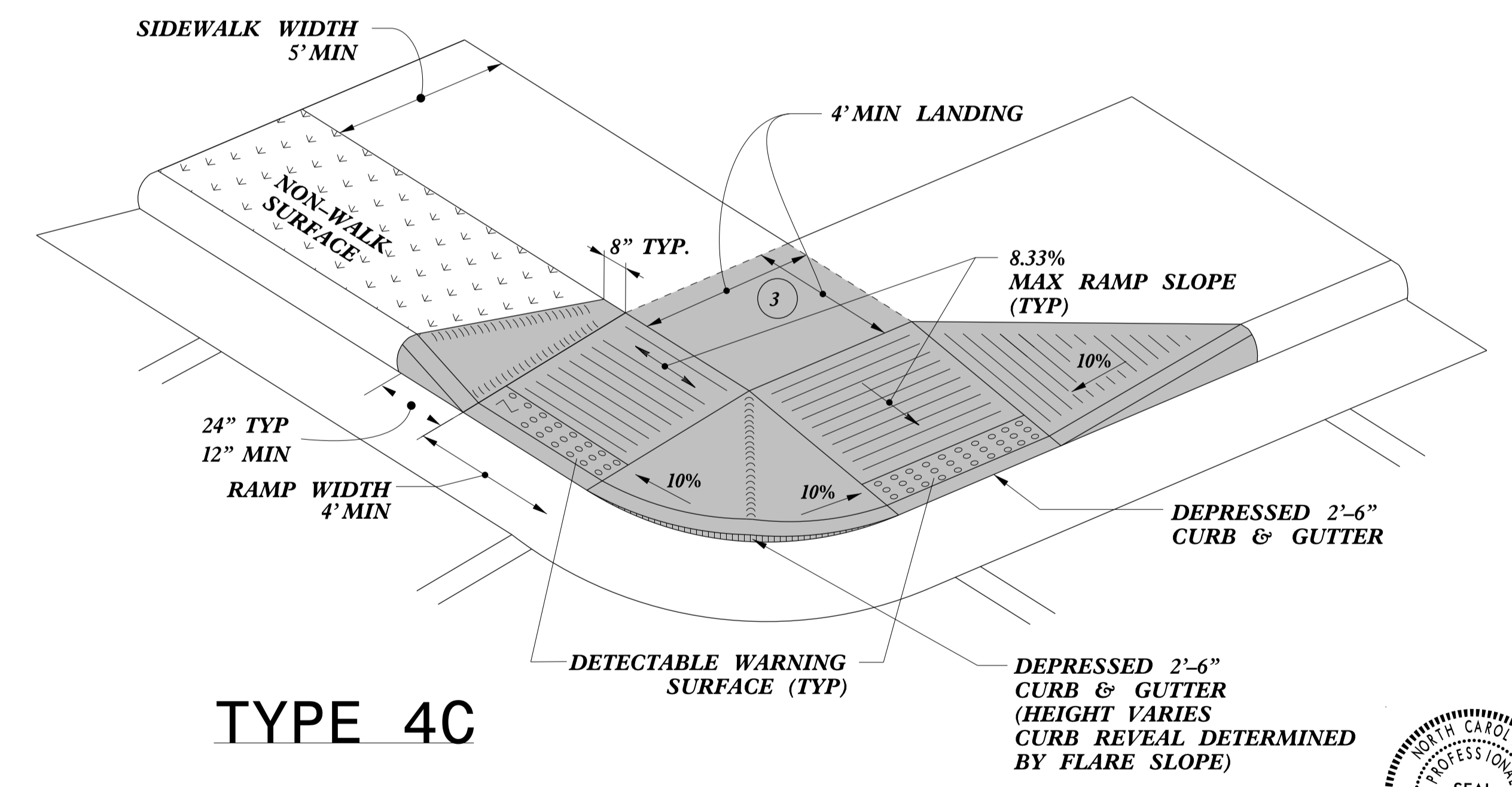
**TYPE 4**



**TYPE 4B**

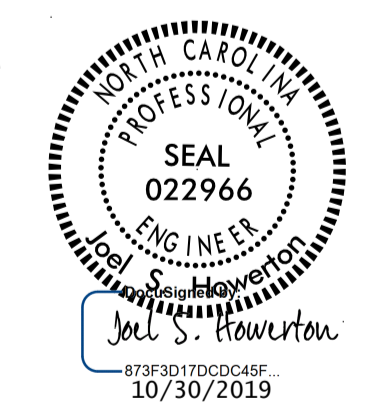


**TYPE 4A**



**TYPE 4C**

- 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.



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

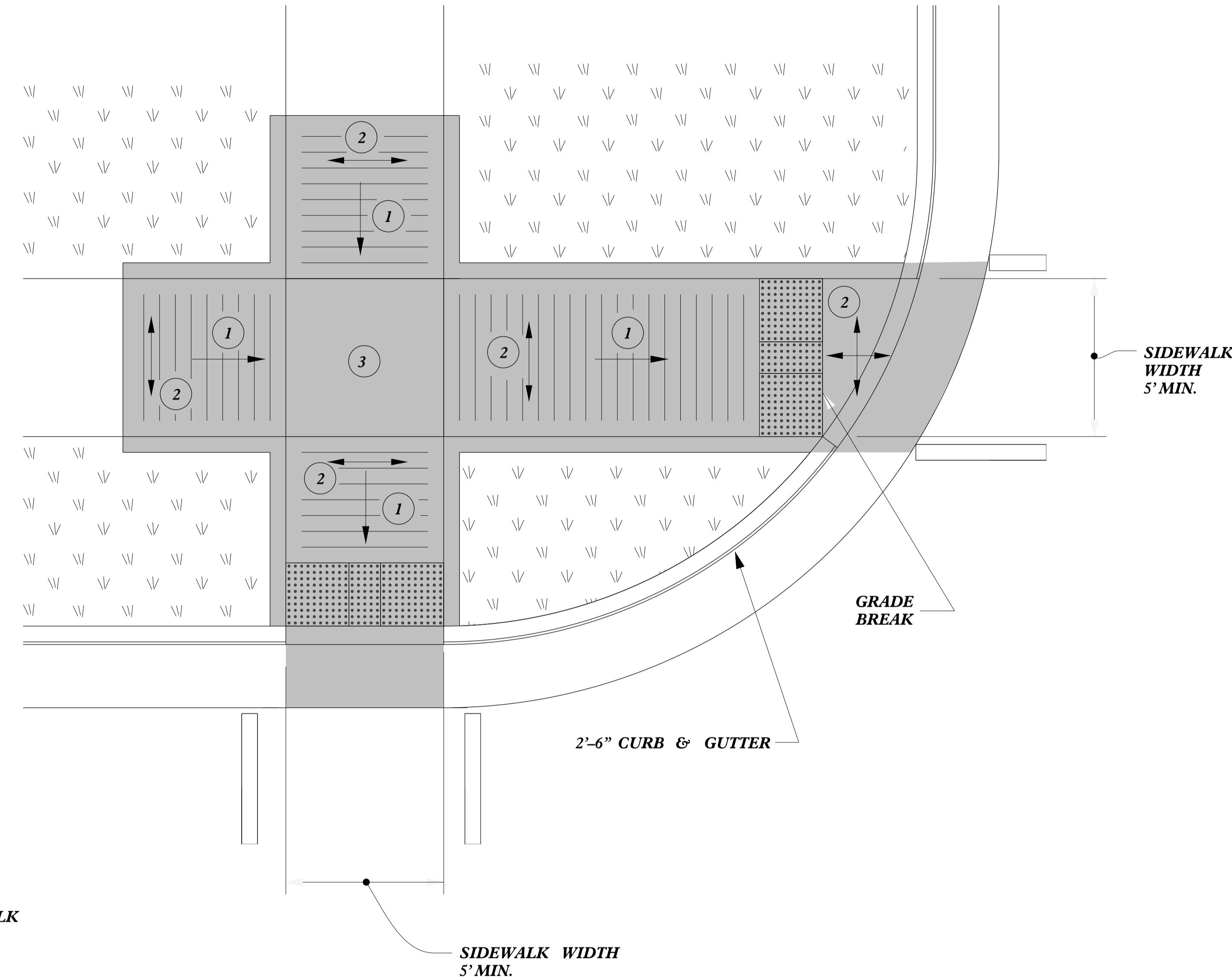
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 MODIFIED BY: DATE:  
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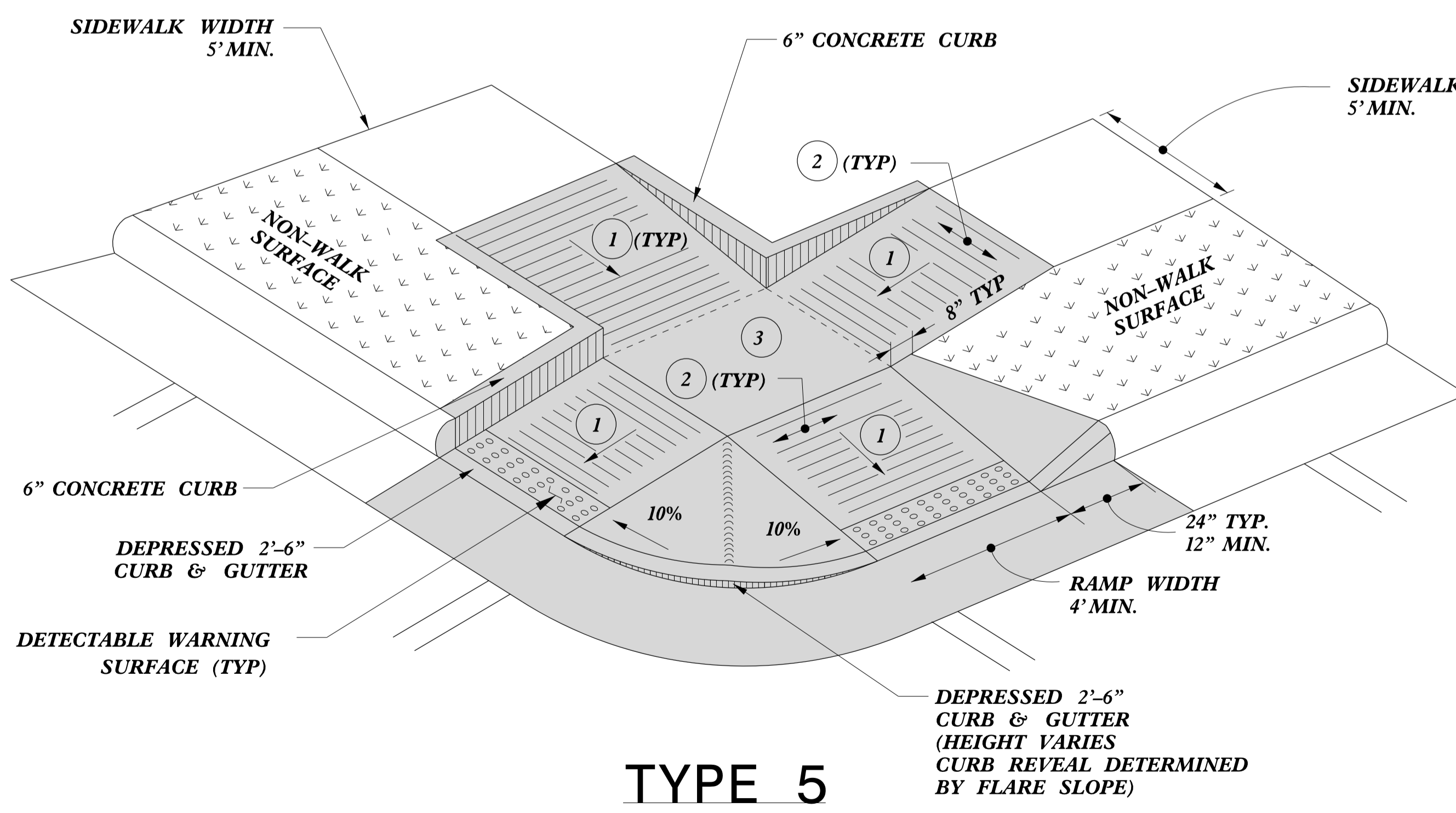
REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

5/14/99  
 C:\P\2012\848.05\848.05.dwg  
 USER: J.S.HOWERTON  
 DATE: 10/30/2019

PAY LIMITS FOR 1 OR 2 CURB RAMPS  
(CALCULATE BASED ON NUMBER OF SETS  
OF TRUNCATED DOMES)

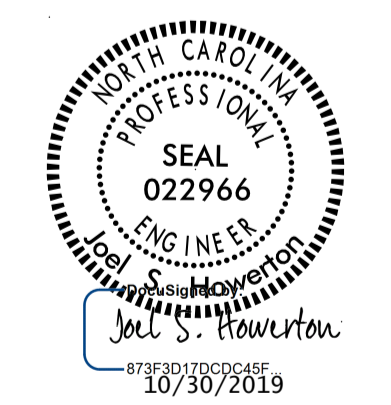


**TYPE 5A**



**TYPE 5**

- 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.



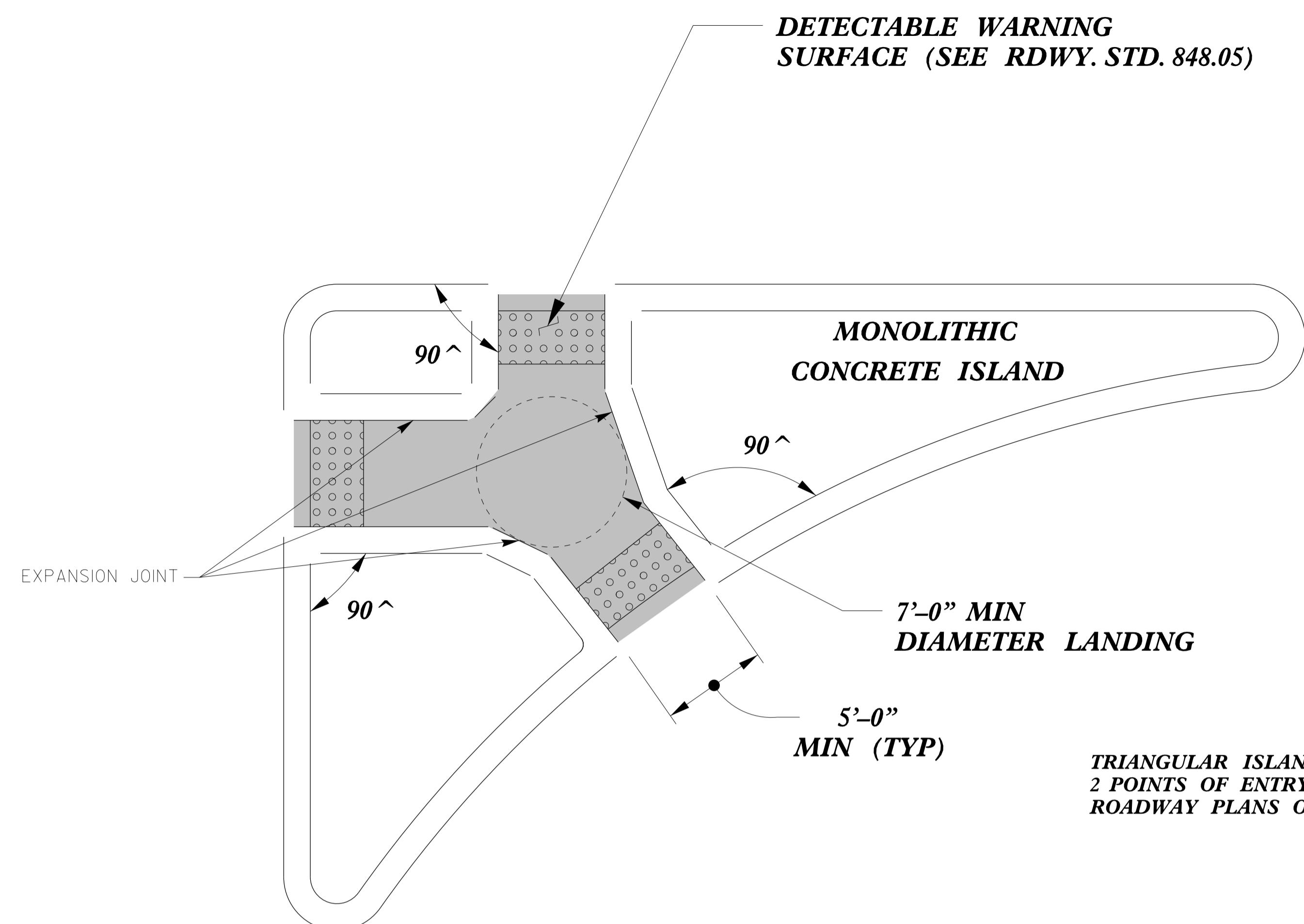
**CONTRACT STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**CURB RAMPS**

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11  
 MODIFIED BY: DATE:   
 CHECKED BY: DATE:   
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REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

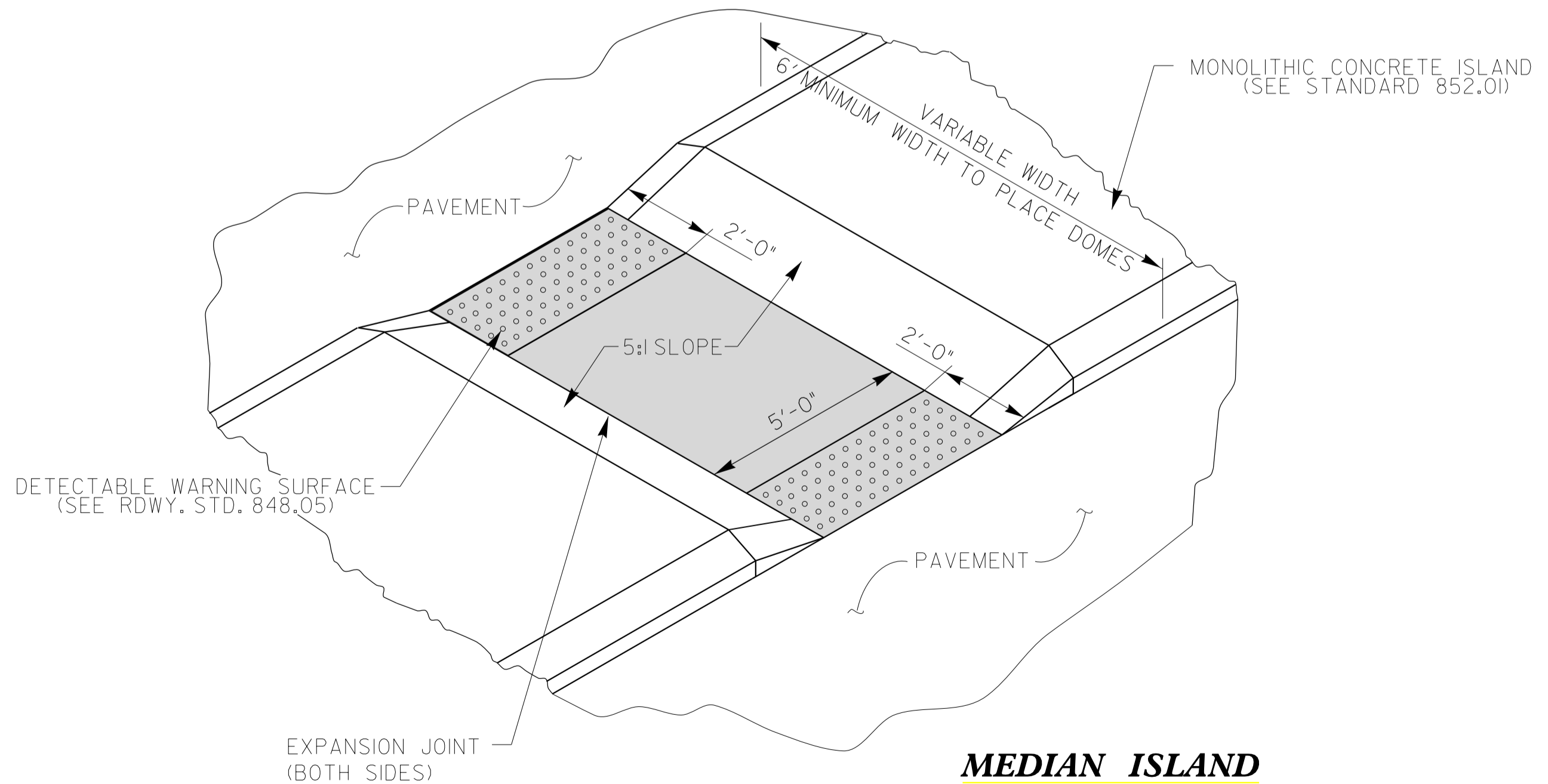
5/14/99  
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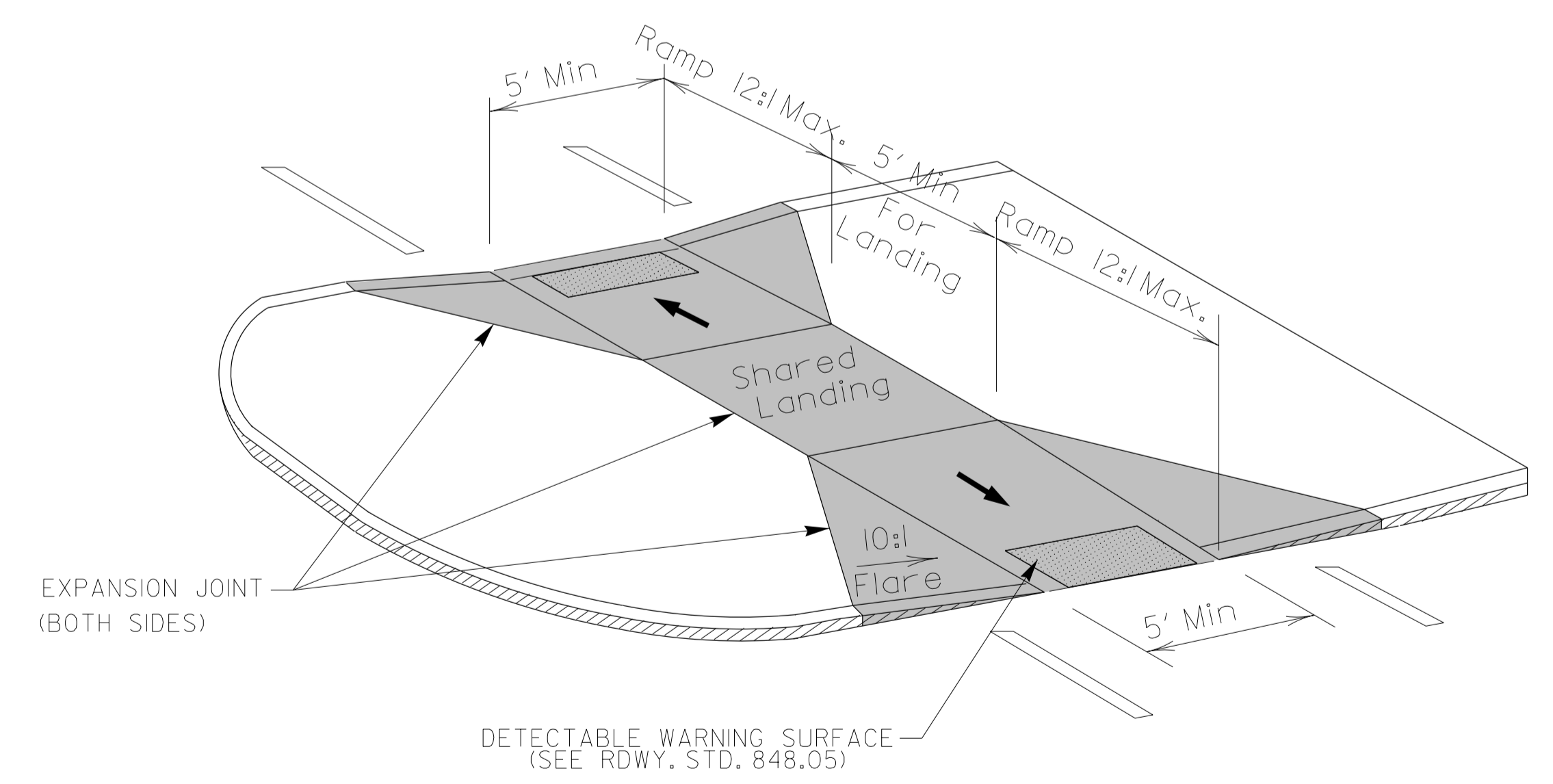
PAY LIMITS FOR 2 OR 3 CURB RAMPS  
(CALCULATE BASED ON NUMBER OF  
SETS OF TRUNCATED DOMES)

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  
TYPE 6**



**MEDIAN ISLAND  
WITH CUT THROUGH  
TYPE 7**



**MEDIAN ISLAND  
CURB RAMPS  
TYPE 8**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

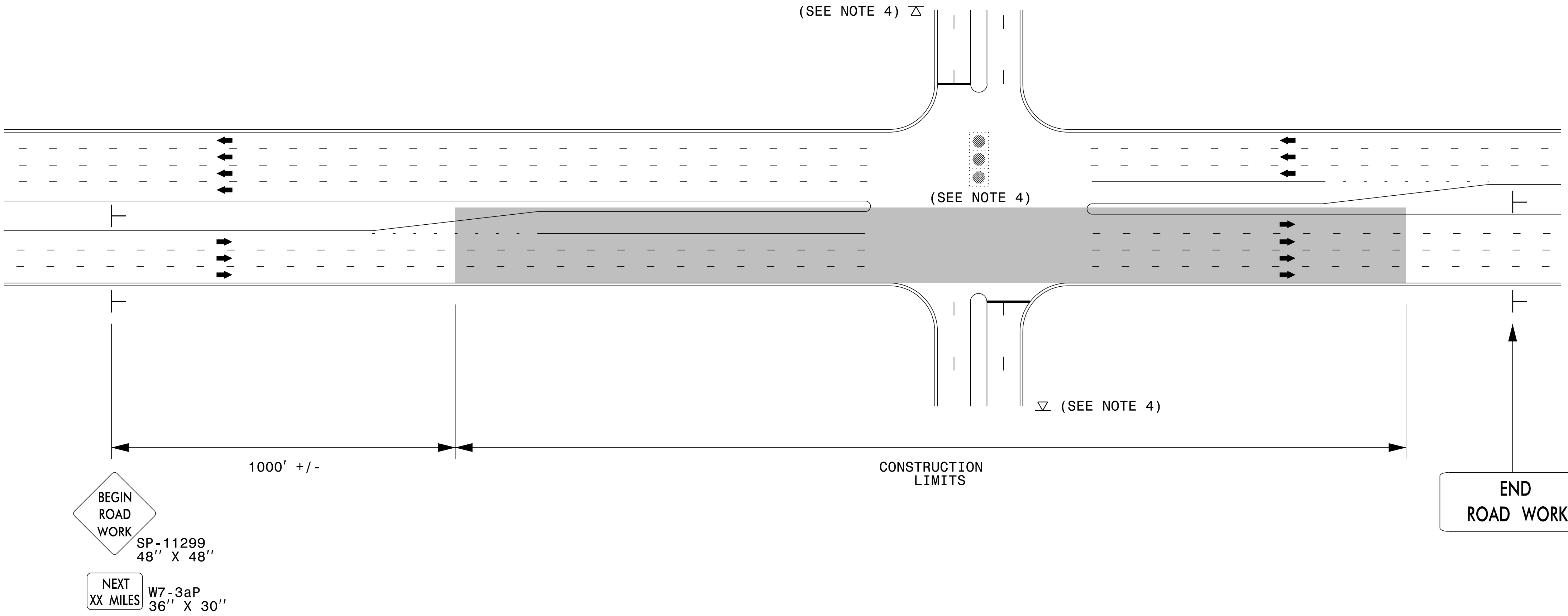
**CURB RAMPS**  
Median or Turn Lane Islands

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



5/14/99  
C:\TIME\99\CON\CON\USER\NAME

# URBAN / SUBURBAN WORKZONES



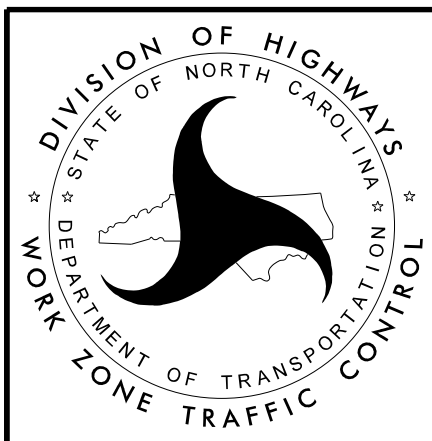
**NOTES:**

- 1) 48" x 48" SIZED SIGNS (SP- 11299) MAY BE REDUCED TO 36" X 36" ON ROADWAYS WITH SPEED LIMITS OF 40 MPH OR LESS.
- 2) MOUNT SIGNS THAT ARE LARGER THAN 10 SQUARE FEET IN AREA ON TWO OR MORE WOOD OR U-CHANNEL SUPPORTS. PERFORATED SQUARE TUBING SUPPORT SYSTEMS MAY SUPPORT LARGER AREAS ON A SINGLE SUPPORT. FOLLOW MANUFACTURER'S RECOMMENDATIONS. THESE SYSTEMS SHALL BE NCHRP 350 COMPLIANT AND NCDOT APPROVED.
- 3) ADVANCE WARNING SIGNS NOT REQUIRED ON NON-SIGNALIZED SIDE STREETS.
- 4) 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.
- 5) LATERAL CLEARANCE AT ALL SIGN LOCATIONS SHALL BE 2' AS MEASURED FROM THE EDGE OF PAVEMENT OR THE FACE OF THE CURB. WHEN UNABLE TO OBTAIN THE LATERAL CLEARANCE WITHIN THE MEDIAN AREA USE SHOULDER MOUNTS ONLY.
- 6) SIGN MOUNT LOCATIONS SHALL NOT BLOCK SIDEWALKS OR DRIVEWAYS.
- 7) IF STATIONARY GENERAL WARNING SIGNS ARE USED, THEY WILL BE PAID FOR PER SECTION 104 OF THE NCDOT STANDARD SPECIFICATIONS AS EXTRA WORK.
- 8) IF MILLED AREAS ARE NOT PAVED BACK BY THE END OF THE WORK DAY, PORTABLE SIGNS SHALL BE USED TO WARN DRIVERS OF THE PRESENT CONDITIONS. THESE ARE TO INCLUDE, BUT NOT LIMITED TO "ROUGH ROAD" W8-8, "UNEVEN LANES" W8-11, "GROOVED PAVEMENT" W8-15 w/MOTORCYCLE PLAQUE MOUNTED BELOW. THESE ARE TO BE DOUBLE INDICATED ON MULTI-LANE ROADWAYS WITH SPEED LIMITS 45 MPH AND GREATER WHERE LATERAL CLEARANCE CAN BE OBTAINED WITHIN THE MEDIAN AREAS. THESE PORTABLE SIGNS ARE INCIDENTAL TO THE OTHER ITEMS OF WORK INCLUDED IN THE TEMPORARY TRAFFIC CONTROL (LUMP SUM) PAY ITEM.

**LEGEND**

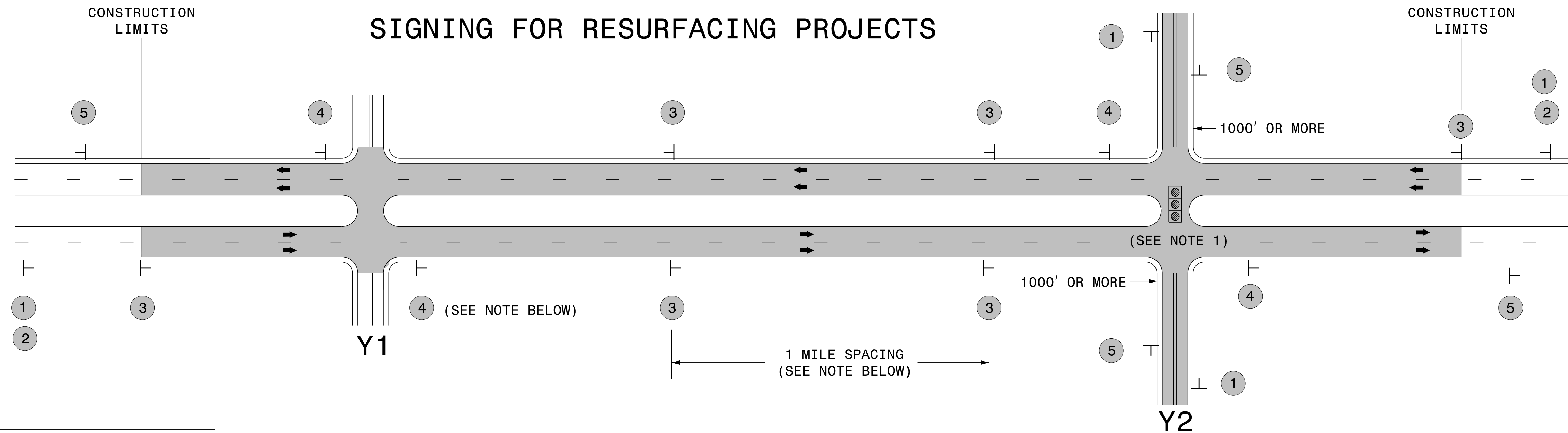
┆ STATIONARY SIGN

➔ DIRECTION OF TRAFFIC FLOW



**RESURFACING ADVANCE  
WARNING SIGNS FOR  
URBAN / SUBURBAN  
FACILITIES**



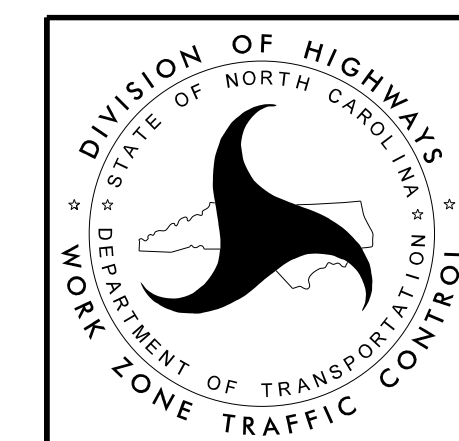


LEGEND	
┆	STATIONARY SIGN
←	DIRECTION OF TRAFFIC FLOW

### MAINLINE (-L-) SIGNING

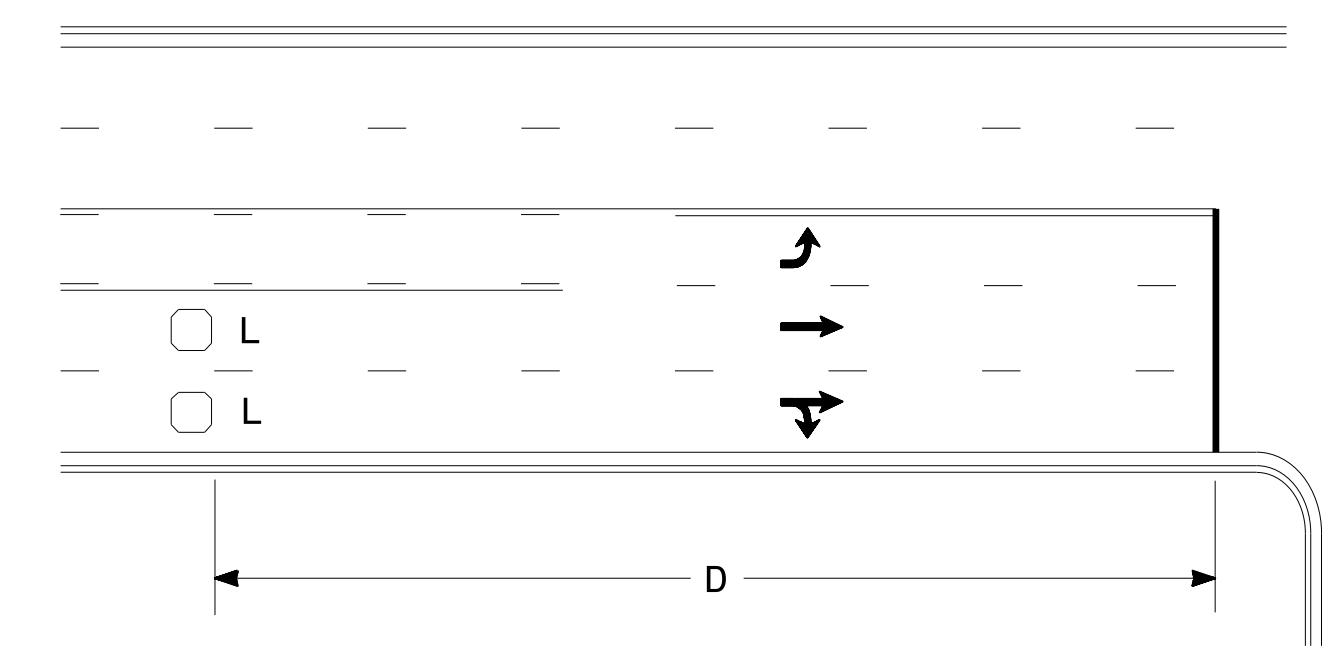
### -Y- LINE SIGNING

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"> <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;"> <div style="text-align: center;"> <p>W20-1 48" X 48"</p> </div> <div style="text-align: center;"> <p>W20-7 A 48" X 48"</p> </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.		
			<p>NOTES:</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>	



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

### High Speed Detection (≥40 mph)

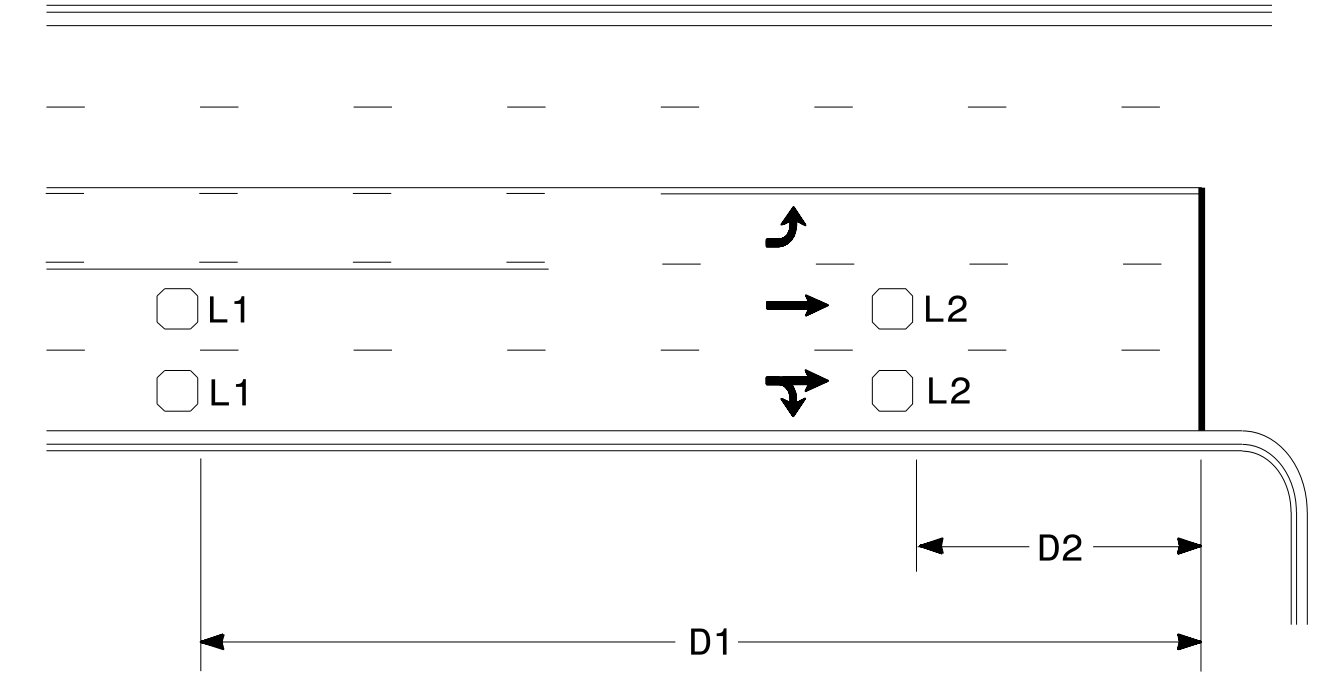


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

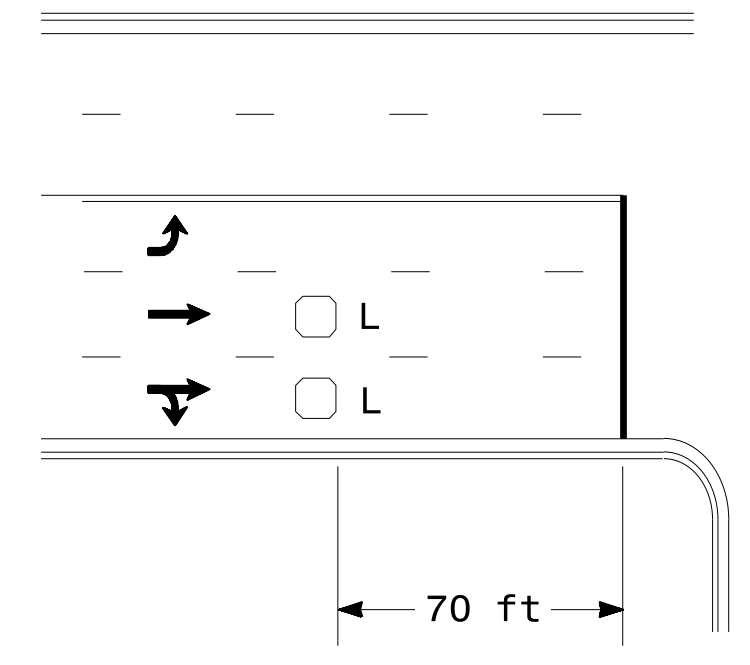


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

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

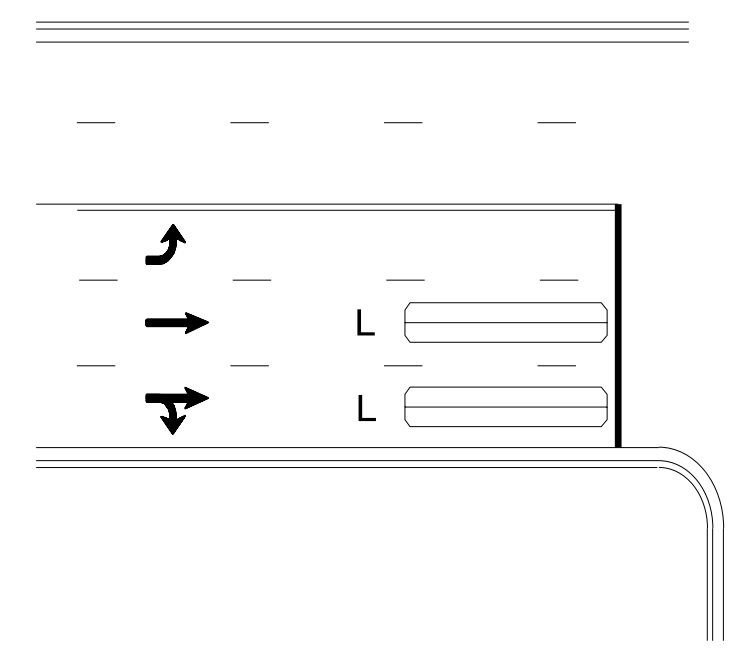
"Stretch" Operation

### Low Speed Detection (≤35 mph)



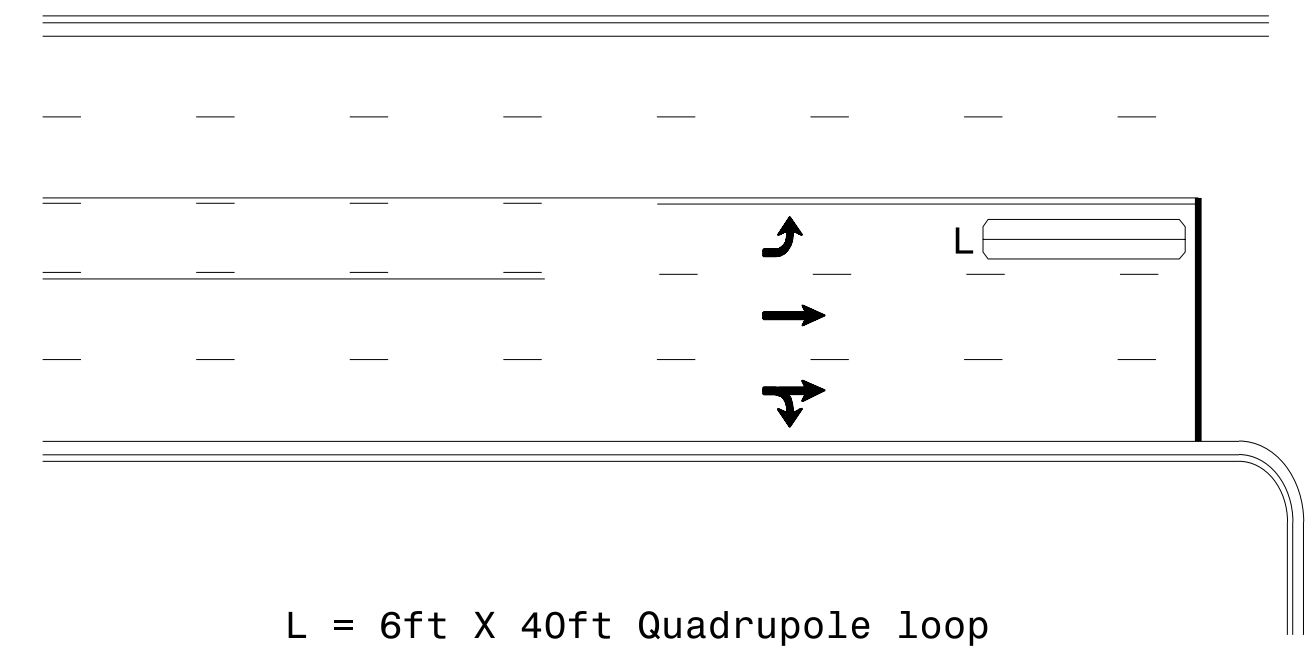
L = 6ft X 6ft  
Wired in series

OR



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

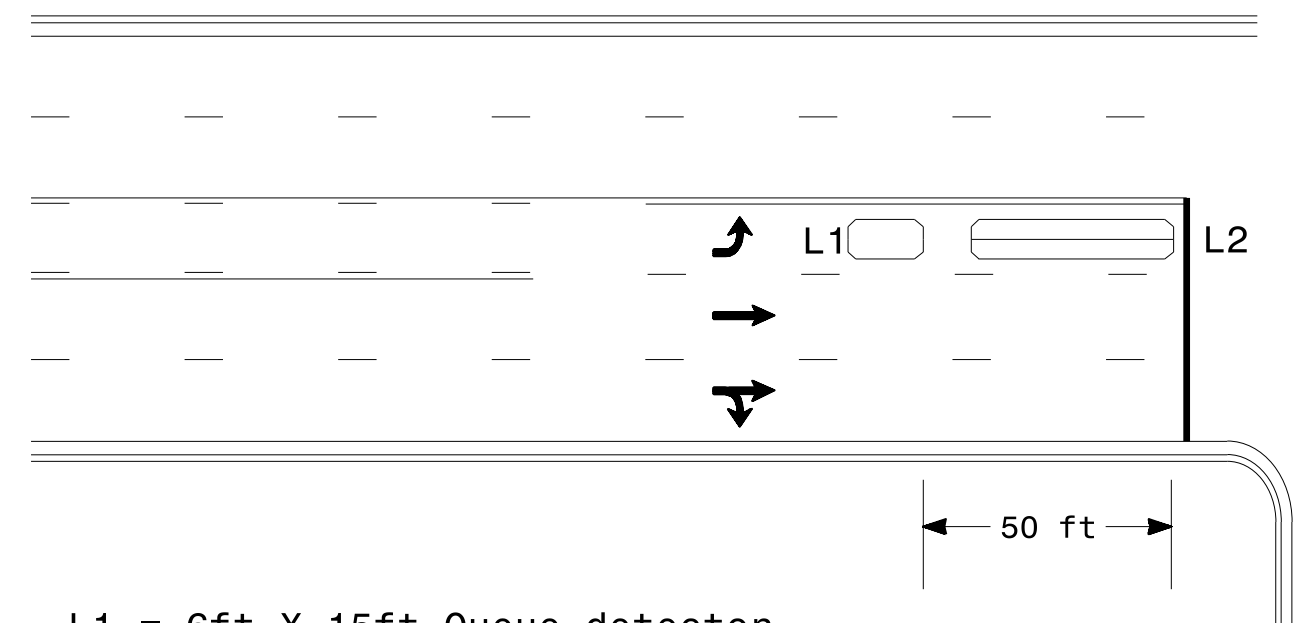
### Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

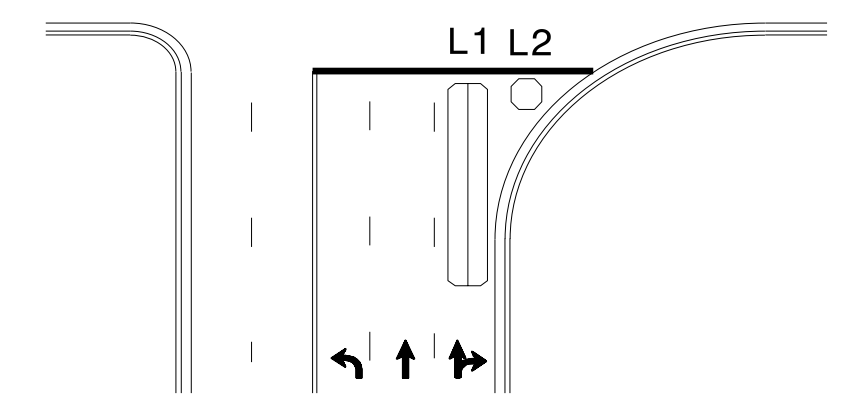
OR



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

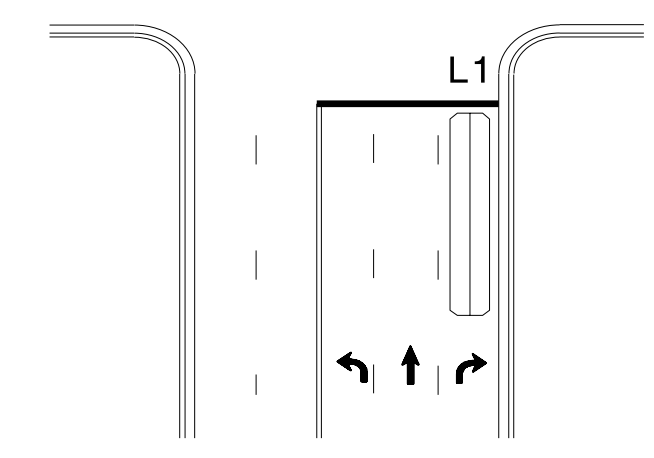
Queue Loop Detection

### Right Turn Lane Detection

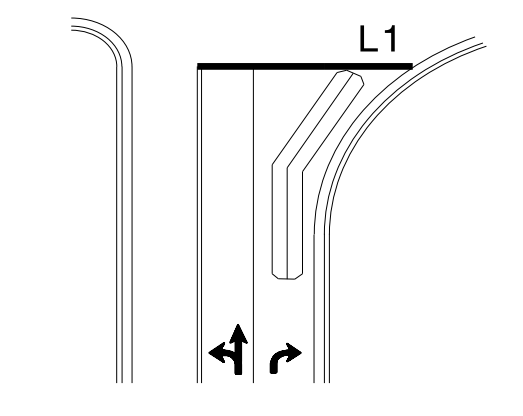


Shared Lane/  
Wide Radius Turn

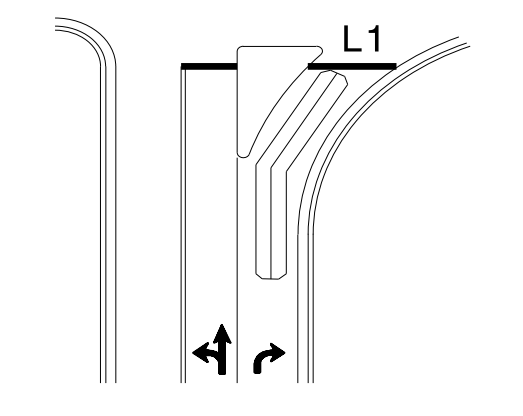
L1 = 6ft X 40ft Quadrupole loop  
L2 = 6ft X 6ft [Minimum] Presence loop  
Wired separately



Standard Turn

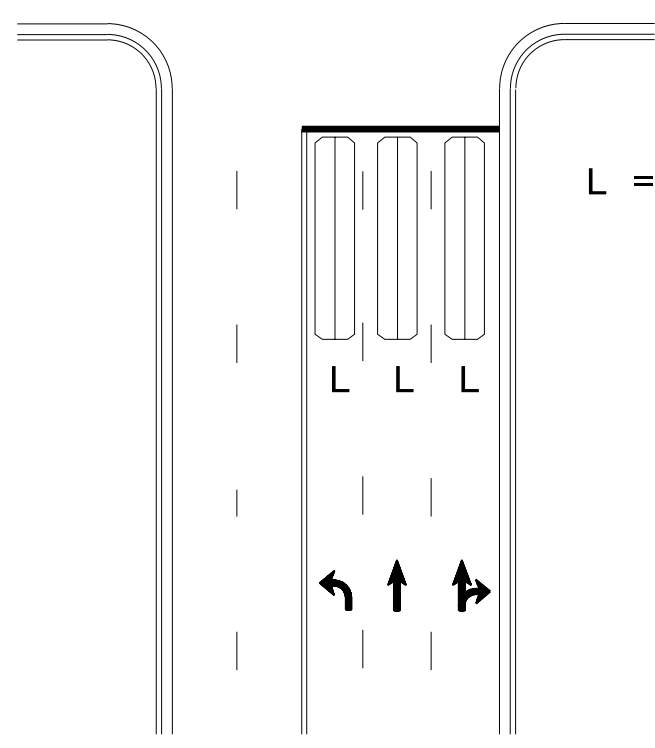


Wide Radius Turn



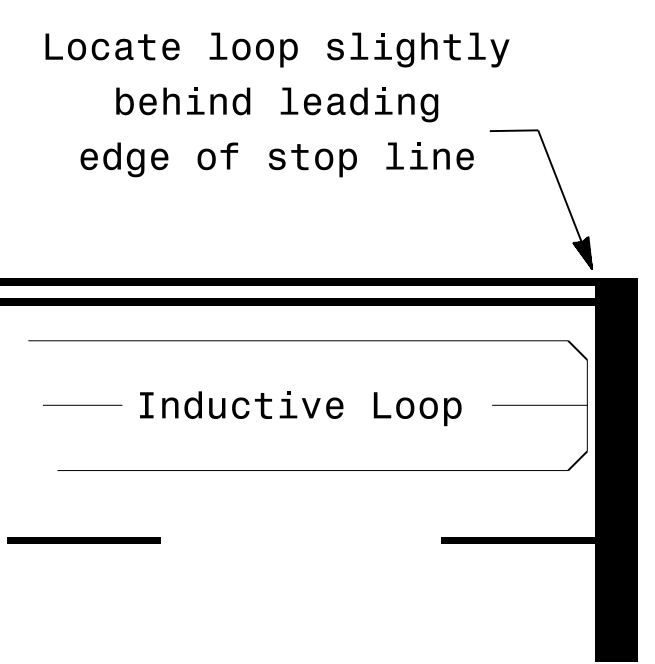
Channelized Turn

### 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:

SEAL  
NORTH CAROLINA  
PROFESSIONAL ENGINEER  
PAMELA L. ALEXANDER  
1/30/2015

3D:\146-2015-12-29-SIGNAL\15-SIGNAL\Signal Design Section\Eastern Region\loop\loop\yp\lca\2015.dgn  
 paalexander