

TIP PROJECT: I-5837

CONTRACT: DJ00391

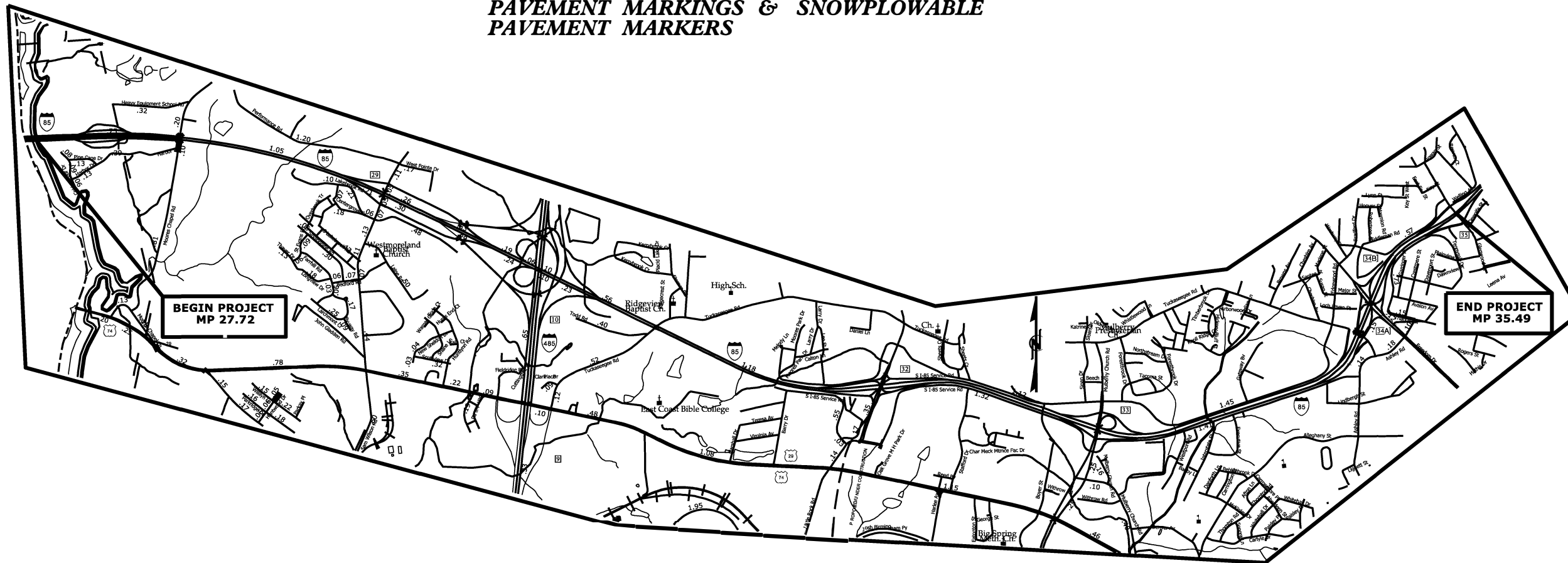
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG COUNTY

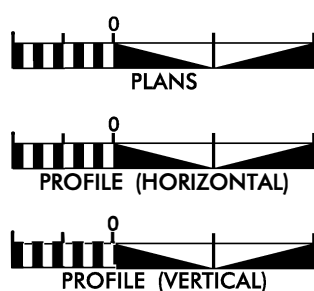
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5837	1	23
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
53043.3.1	0085-063	CONST.	

LOCATION: I-85 FROM THE BRIDGE JOINT AT THE CATAWBA RIVER TO THE CONCRETE PAVEMENT JOINT JUST NORTH OF THE WEIGHT STATION, MP 27.72 TO MP 28.36
IN ADDITION, MILL & FILL RAMPS AT THE INTERCHANGES OF SAM WILSON RD, LITTLE ROCK RD, BILLY GRAHAM PKWY, TUCKASEEGEE RD, FREEDOM DR, AND GLENWOOD DR.

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



GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 148,000
ADT =
K = %
D = %
T = % *
V = 60 MPH
* TTST = DUAL

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT 53043.3.1 = 7.77 MILES
TOTAL LENGTH OF STATE PROJECT 53043.3.1 = 7.77 MILES

Prepared in the Office of
DIVISION OF HIGHWAYS
DIVISION 10

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
JANUARY 19, 2022

JOHN H. EDMONDS
PROJECT ENGINEER

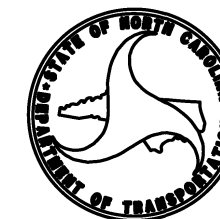
JOHN H. EDMONDS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

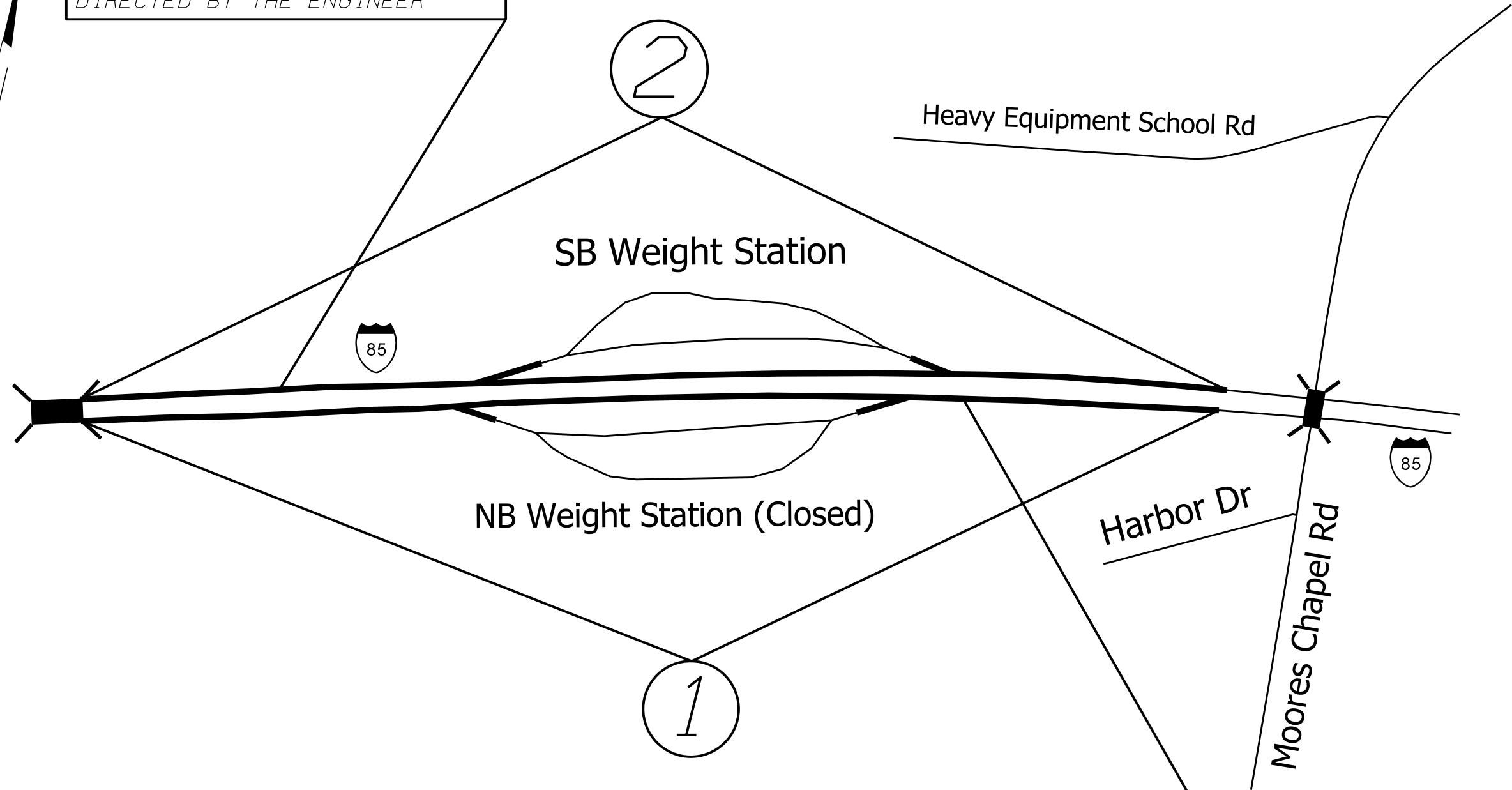
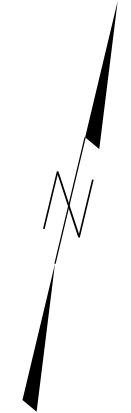
ROADWAY DESIGN
ENGINEER

SIGNATURE: _____ P.E.



STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	1-5837		
WBS NO. 53043.3.1			

CONTRACTOER SHALL RECONSTRUCT EXISTING LOW SHOULDERS AS DIRECTED BY THE ENGINEER



CONTRACTOER SHALL RECONSTRUCT EXISTING LOW SHOULDERS AS DIRECTED BY THE ENGINEER

MAPS

1 I-85 NB MAINLINE

2 I-85 SB MAINLINE

DESCRIPTION

FROM GASTON COUNTY LINE TO CONCRETE PAVEMENT JOINT

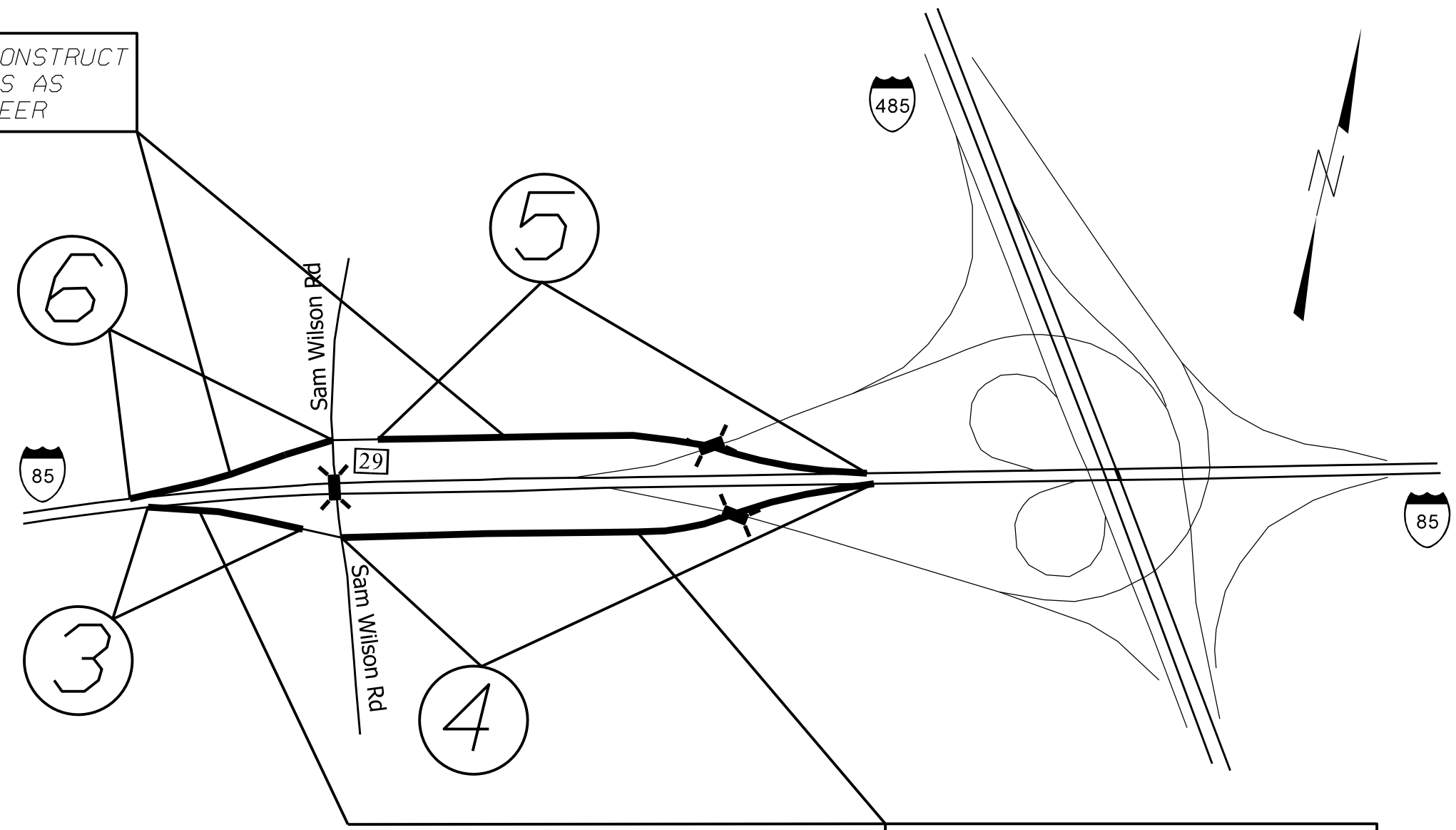
FROM CONCRETE PAVEMENT JOINT TO GASTON COUNTY LINE

I-5837
I-85 PAVEMENT PRESERVATION

SCALE	-NA-		REVISIONS
DATE	9/21		
DWG. BY	JHE		
DESIGN BY	JHE		
APPROVED			

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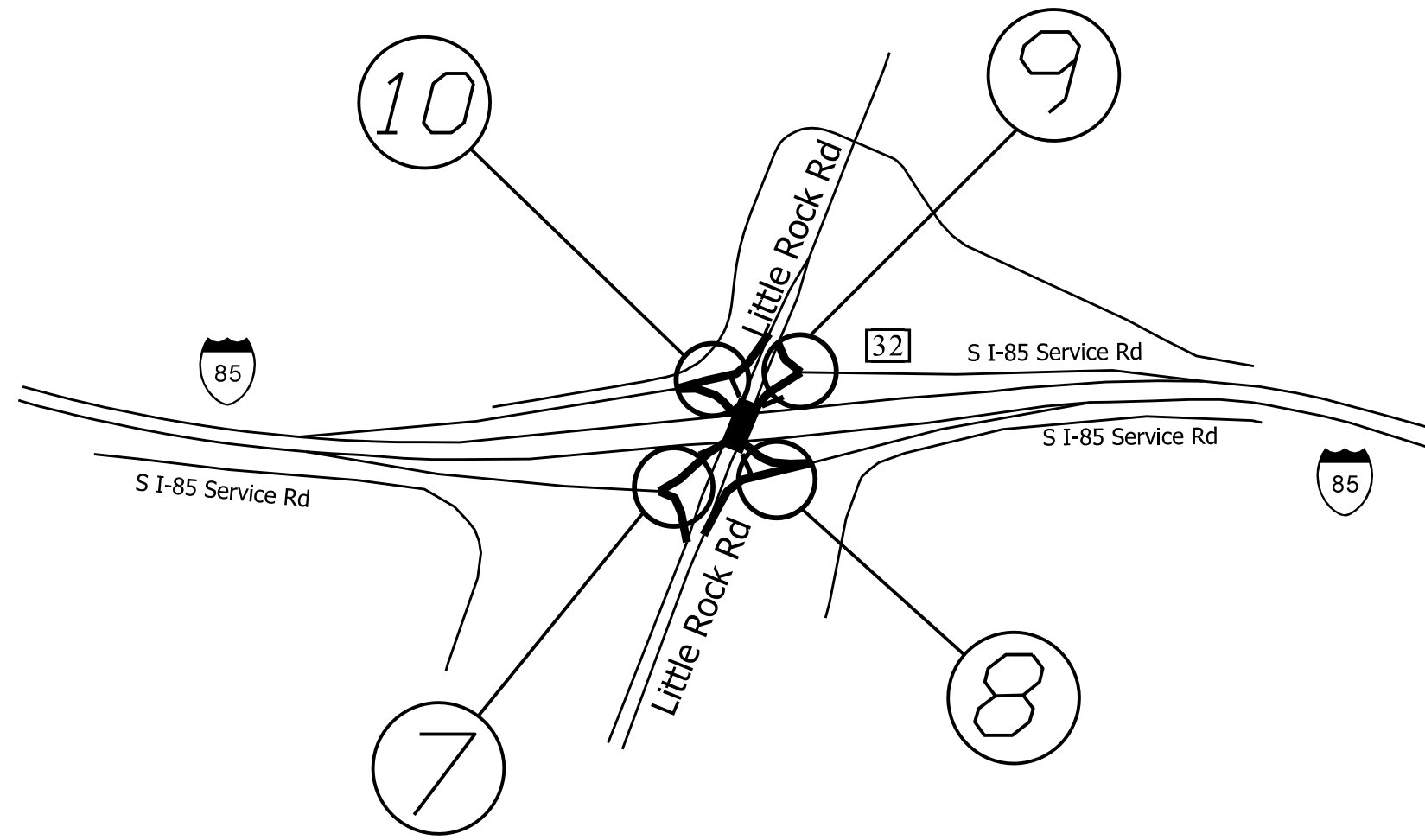
MAPS

DESCRIPTION

- | | |
|-------------------------------|--|
| # 3 SAM WILSON RD NB OFF RAMP | FROM PHYSICAL GORE TO ASPHALT PAVEMENT JOINT |
| # 4 SAM WILSON RD NB ON RAMP | FROM ASPHALT PAVEMENT JOINT TO PHYSICAL GORE |
| # 5 SAM WILSON RD SB OFF RAMP | FROM PHYSICAL GORE TO ASPHALT PAVEMENT JOINT |
| # 6 SAM WILSON RD SB ON RAMP | FROM ASPHALT PAVEMENT JOINT TO PHYSICAL GORE |

1-5837 I-85 PAVEMENT PRESERVATION		
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DWG. BY	JHE	
DESIGN BY	JHE	
APPROVED		REVISIONS

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N.C.	1-5837		
WBS NO.		53043.3.1	



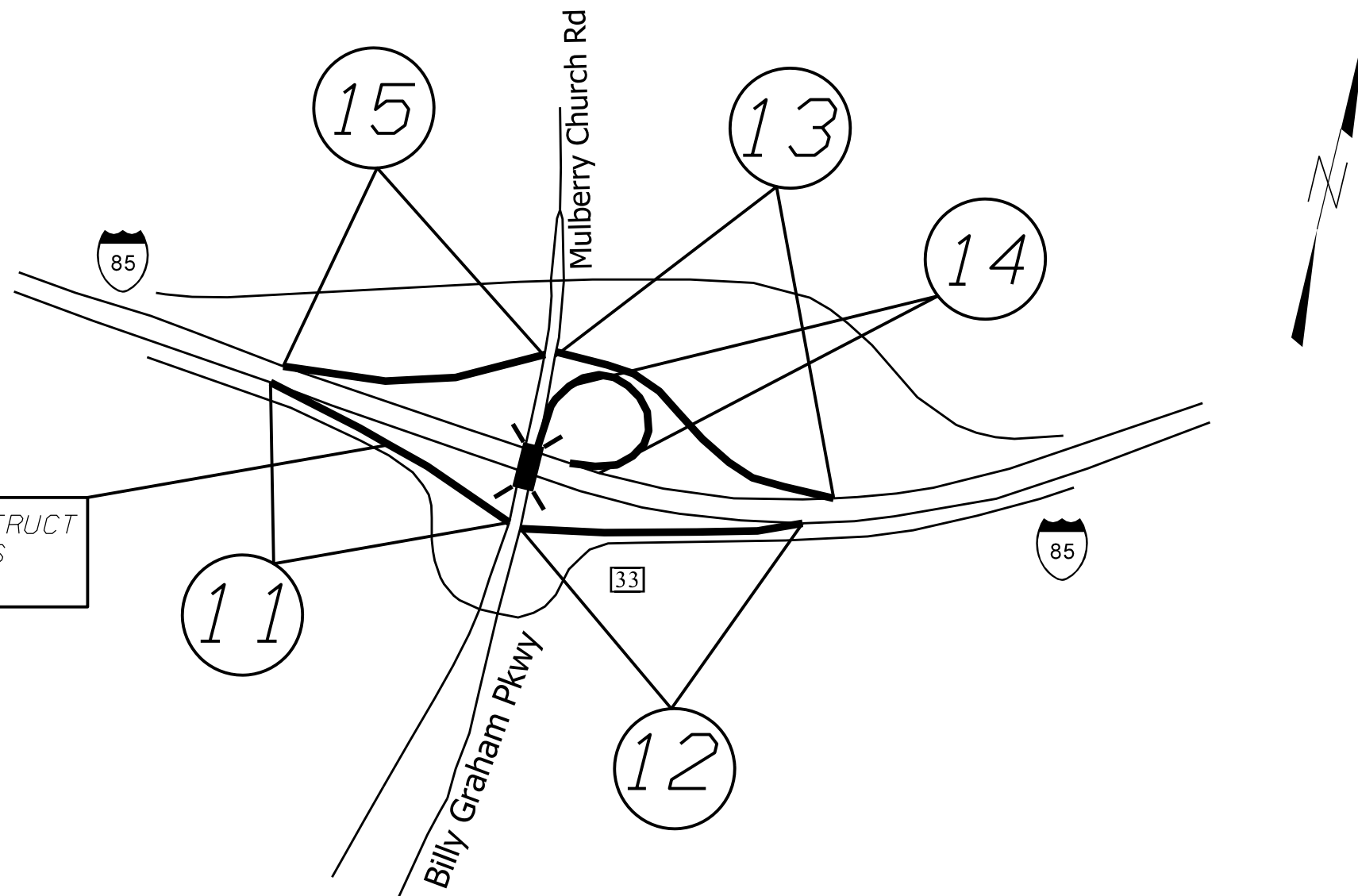
MAPS

DESCRIPTION

- | | | |
|------|----------------------------|---|
| # 7 | LITTLE ROCK RD NB OFF RAMP | FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINTS |
| # 8 | LITTLE ROCK RD NB ON RAMP | FROM ASPHALT PAVEMENT JOINTS TO CONCRETE PAVEMENT JOINT |
| # 9 | LITTLE ROCK RD SB OFF RAMP | FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINTS |
| # 10 | LITTLE ROCK RD SB ON RAMP | FROM ASPHALT PAVEMENT JOINTS TO CONCRETE PAVEMENT JOINT |

I-5837 I-85 PAVEMENT PRESERVATION										
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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							
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CONTRACTOR SHALL RECONSTRUCT EXISTING LOW SHOULDERS AS DIRECTED BY THE ENGINEER

MAPS

DESCRIPTION

11 BILLY GRAHAM PKWY NB OFF RAMP

FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINT

12 BILLY GRAHAM PKWY NB ON RAMP

FROM ASPHALT PAVEMENT JOINT TO CONCRETE PAVEMENT JOINT

13 BILLY GRAHAM PKWY SB OFF RAMP

FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINT

14 BILLY GRAHAM PKWY SB LOOP ON RAMP

FROM PHYSICAL GORE TO CONCRETE PAVEMENT JOINT

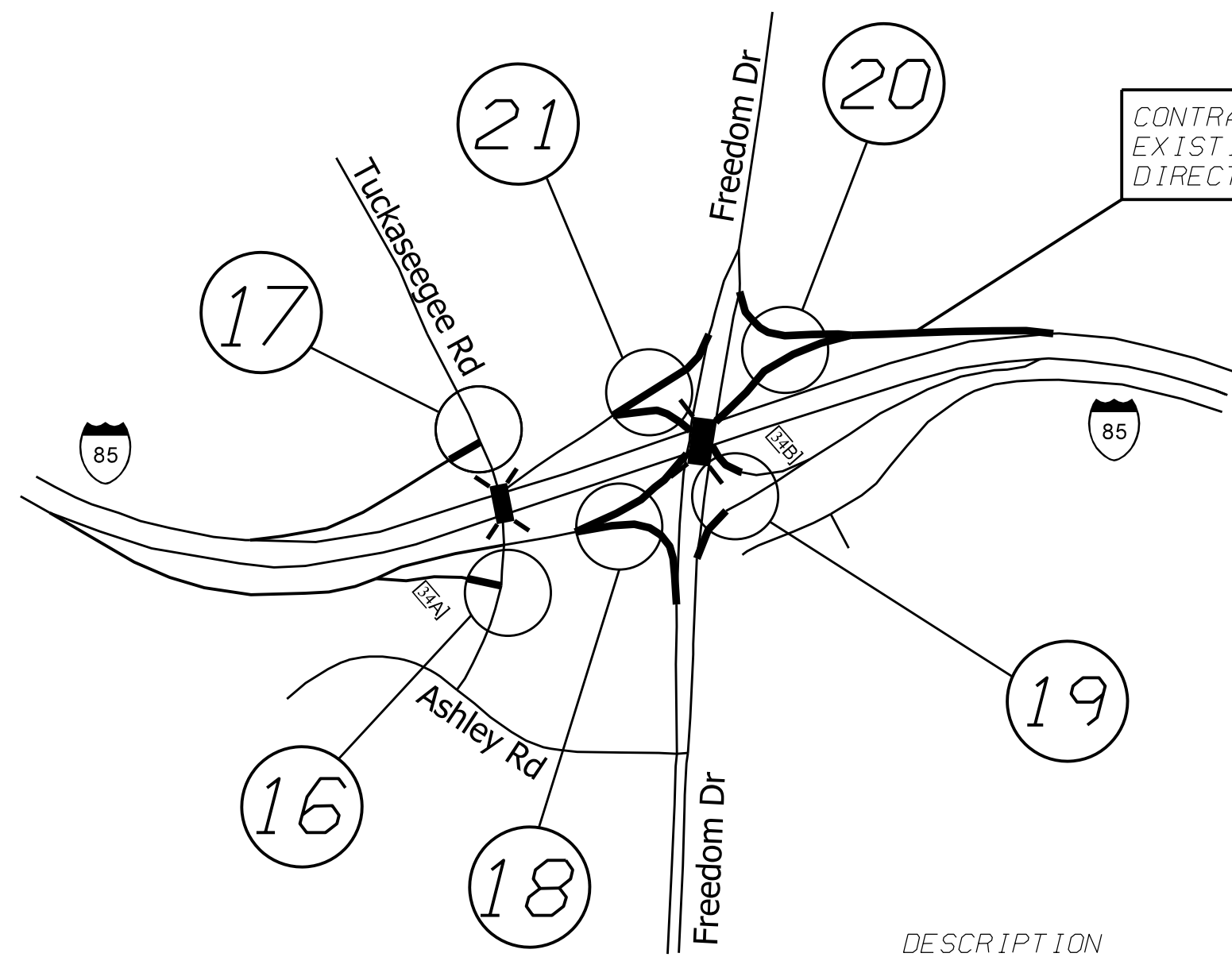
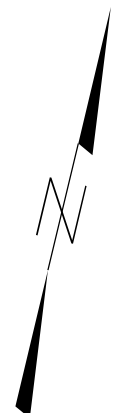
15 BILLY GRAHAM PKWY SB ON RAMP

FROM ASPHALT PAVEMENT JOINT TO CONCRETE PAVEMENT JOINT

I-5837
I-85 PAVEMENT PRESERVATION

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MAPS

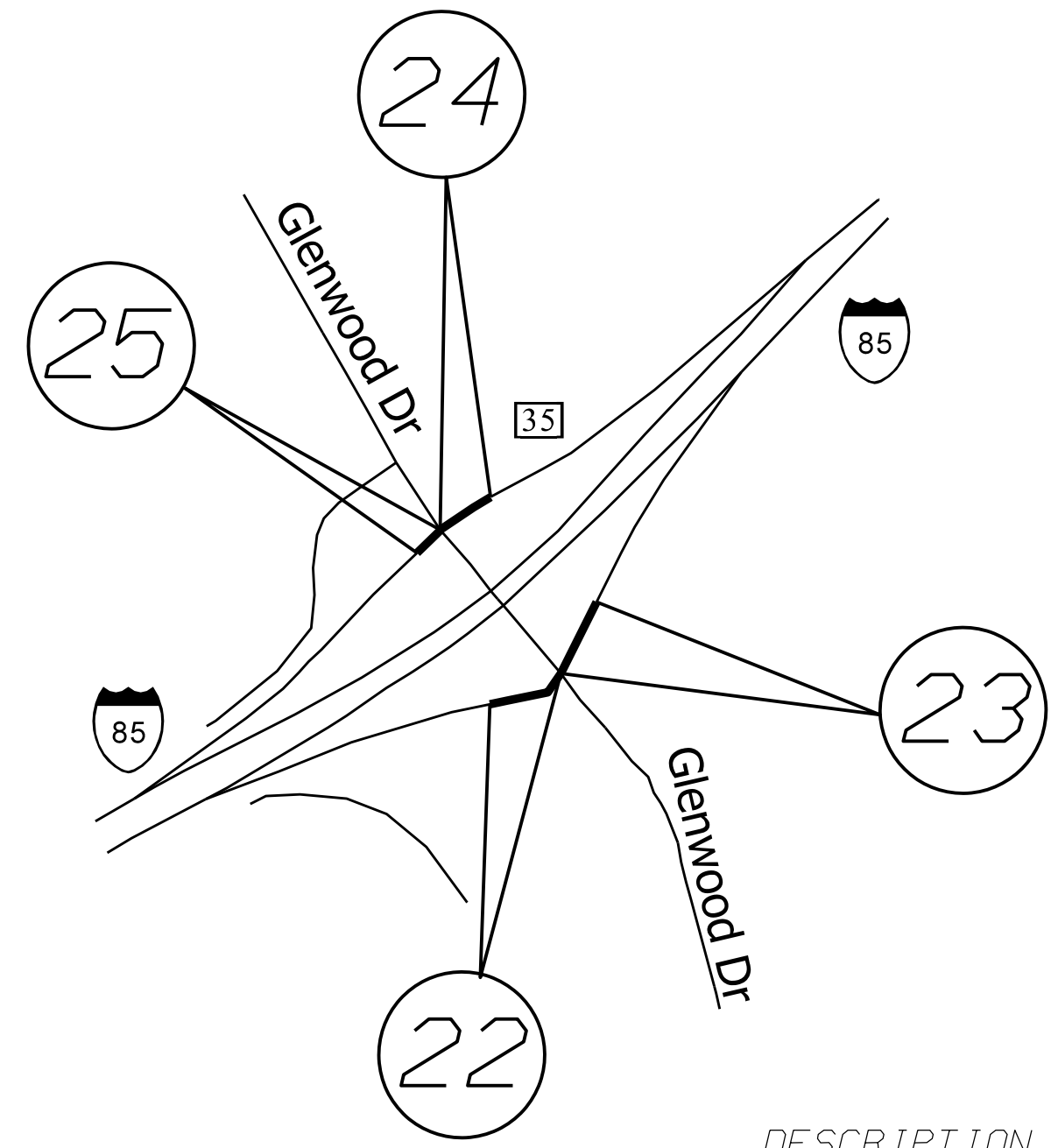
- # 16 TUCKASEEGEE RD NB OFF RAMP
- # 17 TUCKASEEGEE RD SB ON RAMP
- # 18 FREEDOM DR NB OFF RAMP
- # 19 FREEDOM DR NB ON RAMP
- # 20 FREEDOM DR SB OFF RAMP
- # 21 FREEDOM DR SB ON RAMP

DESCRIPTION

- FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINT
- FROM ASPHALT PAVEMENT JOINT TO CONCRETE PAVEMENT JOINT
- FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINT & BRIDGE DECK
- FROM BRIDGE DECK & ASPHALT PAVEMENT JOINT TO CONCRETE PAVEMENT JOINTS
- FROM CONCRETE PAVEMENT JOINTS TO ASPHALT PAVEMENT JOINT & BRIDGE DECK
- FROM ASPHALT PAVEMENT JOINT & BRIDGE DECK TO CONCRETE PAVEMENT JOINT

I-5837 I-85 PAVEMENT PRESERVATION			
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WBS NO. 53043.3.1			




MAPS

DESCRIPTION

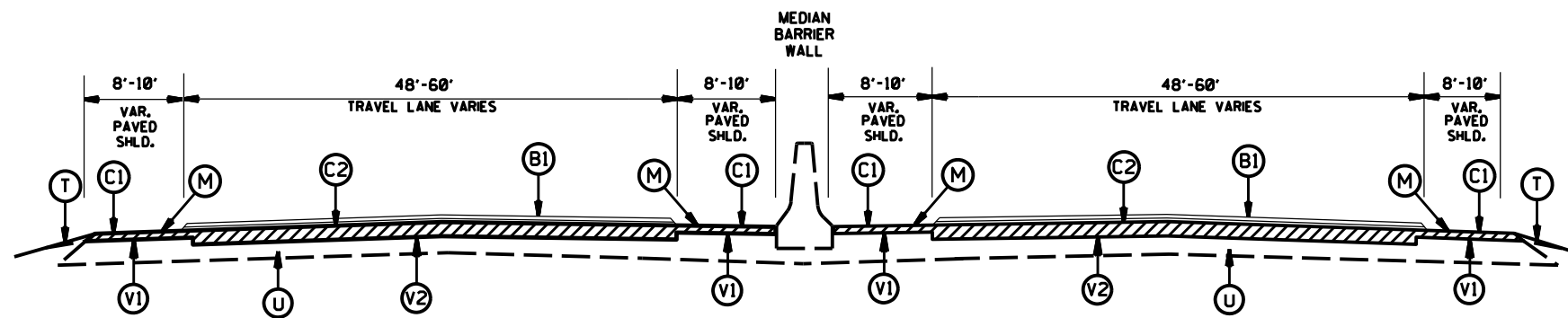
- # 22 GLENWOOD DR NB OFF RAMP
- # 23 GLENWOOD DR NB ON RAMP
- # 24 GLENWOOD DR SB OFF RAMP
- # 25 GLENWOOD DR SB ON RAMP

- FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINT
- FROM ASPHALT PAVEMENT JOINT TO CONCRETE PAVEMENT JOINT
- FROM CONCRETE PAVEMENT JOINT TO ASPHALT PAVEMENT JOINT
- FROM ASPHALT PAVEMENT JOINT TO CONCRETE PAVEMENT JOINT

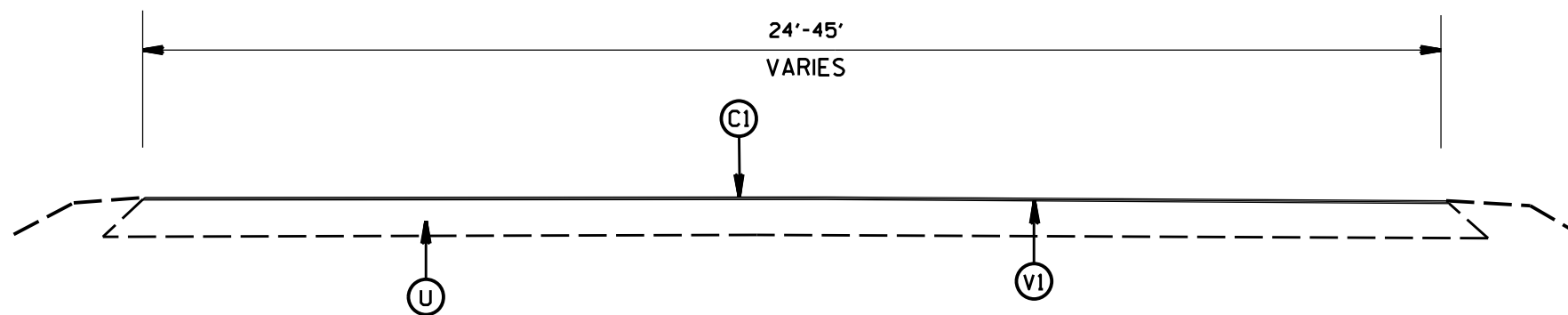
I-5837 I-85 PAVEMENT PRESERVATION										
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REVISIONS										

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
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WBS NO. 53043.3.J			


PAVEMENT SCHEDULE	
B1	PROP. APPROX. 5/8" ULTRA-THIN BONDED WEARING COURSE, AT AN AVERAGE RATE OF 70 LBS. PER SQ. YD.
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 2.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
M	MILLED RUMBLE STRIPS
T	SHOULDER RECONSTRUCTION
U	EXISTING PAVEMENT
V1	MILLING 1.5" DEPTH
V2	MILLING, 2.0" DEPTH



TYPICAL SECTION NO. 1
I-85 NORTH & SOUTH BOUND
MAINLINE

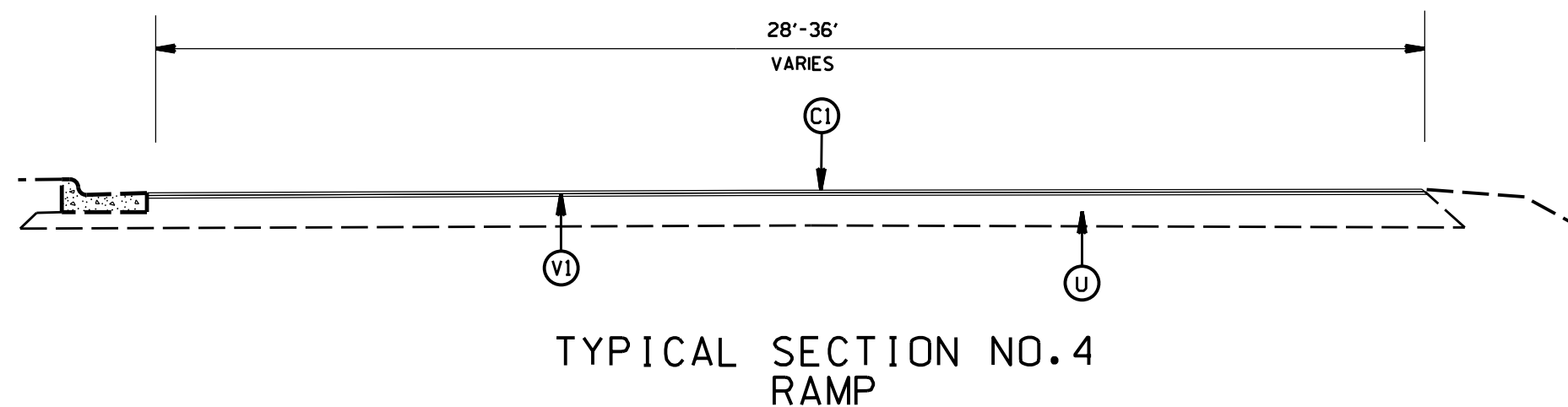
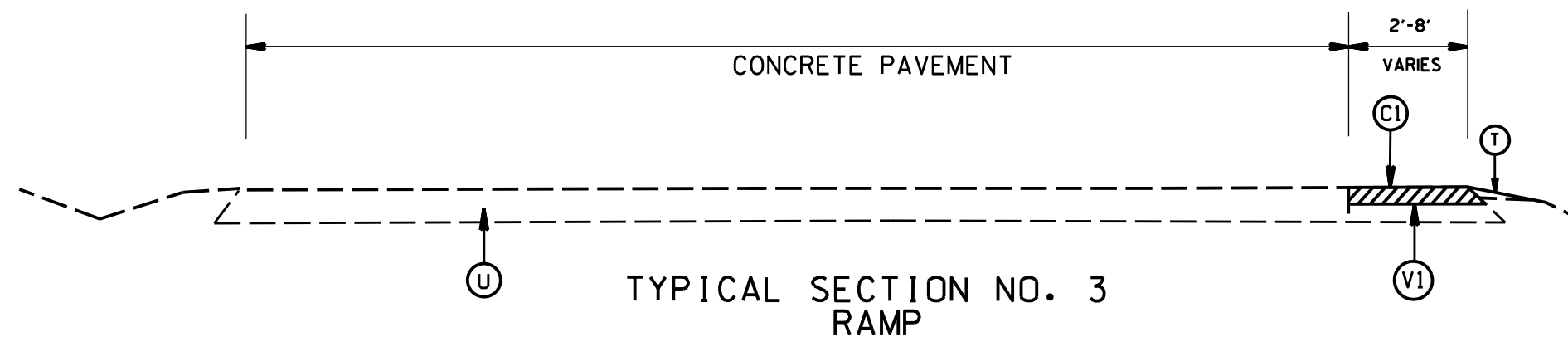



TYPICAL SECTION NO. 2
RAMP

I-5837 I-85 PAVEMENT PRESERVATION MECKLENBURG COUNTY		
SCALE	-NA-	
DATE	9/21	
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DESIGN BY	JHE	
APPROVED		
REVISIONS		

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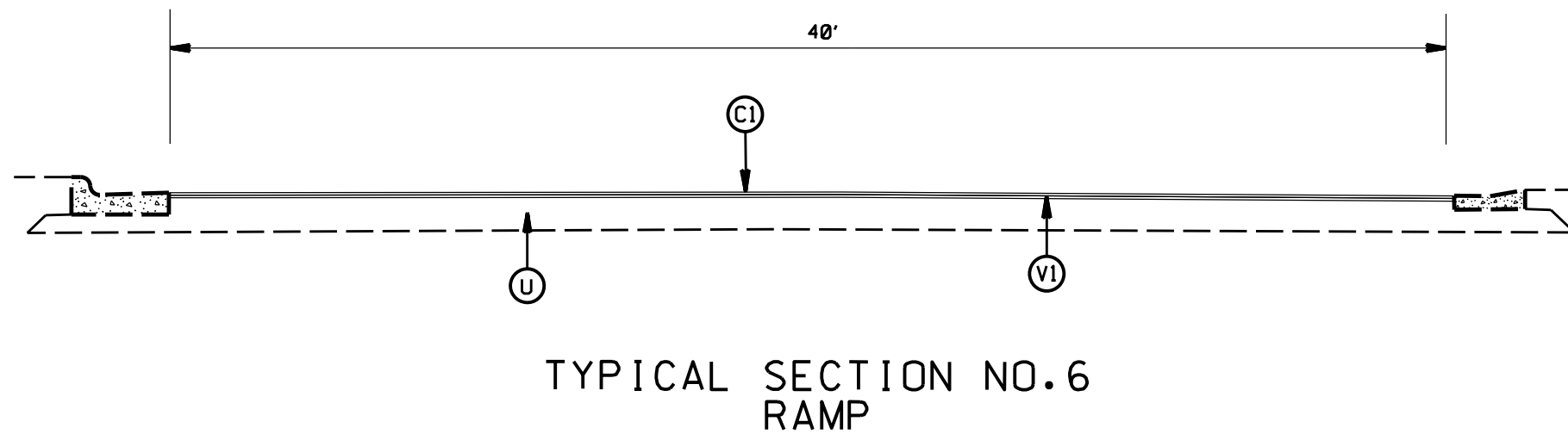
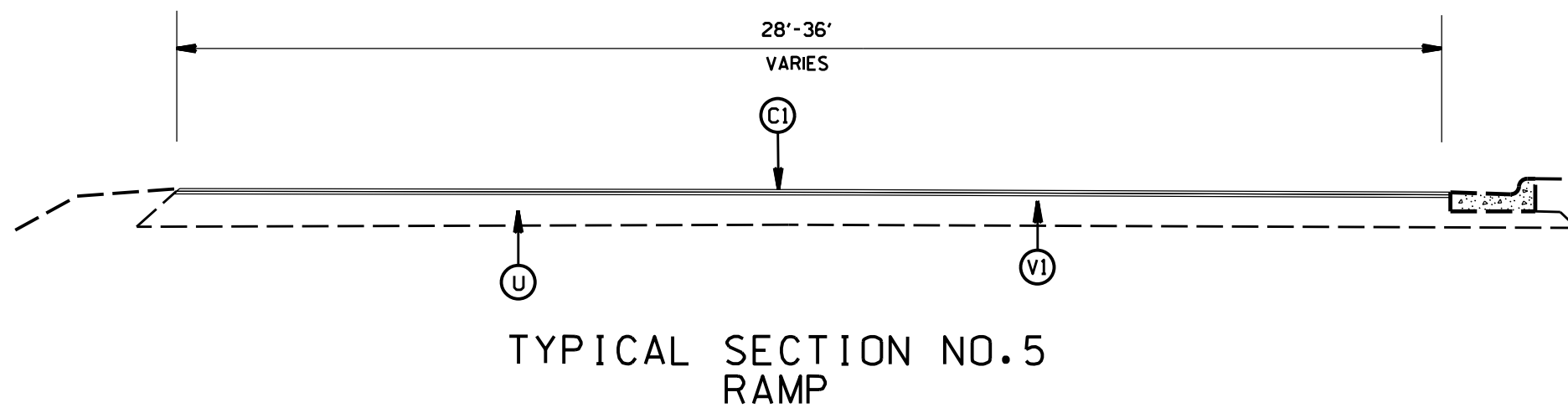
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DESIGN BY	JHE		
APPROVED			

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5837		
WBS NO. 53043.3A			

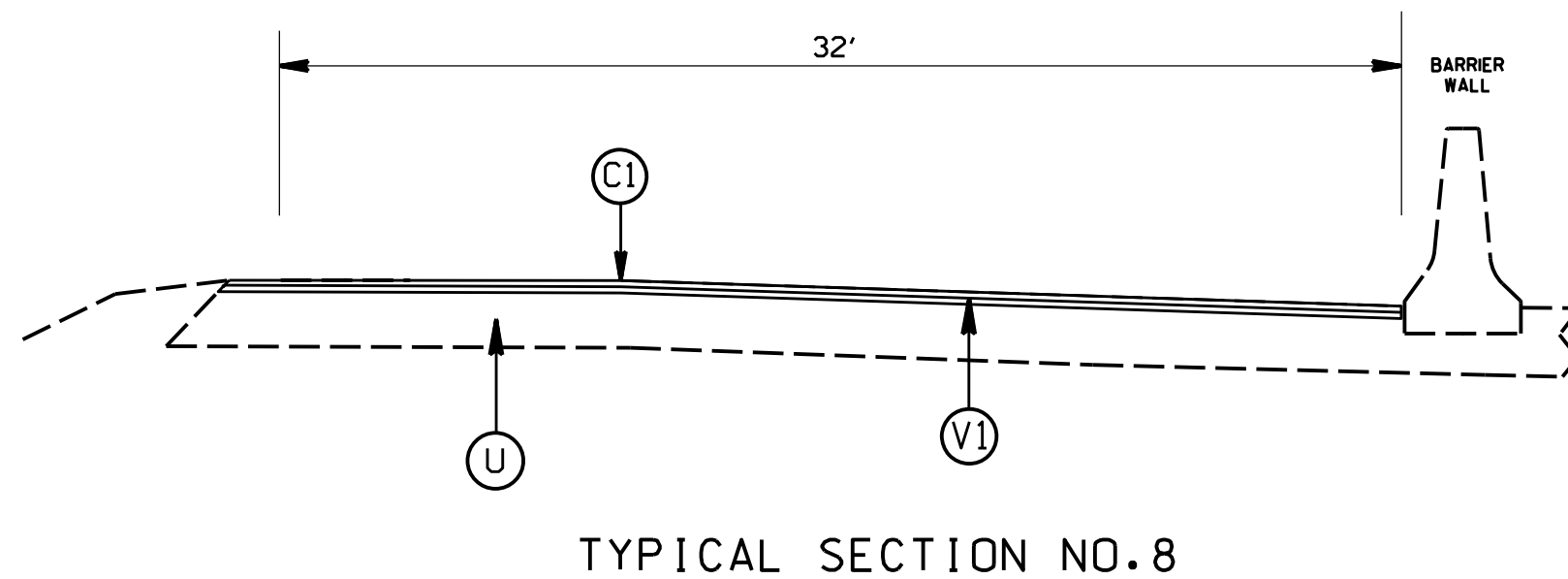
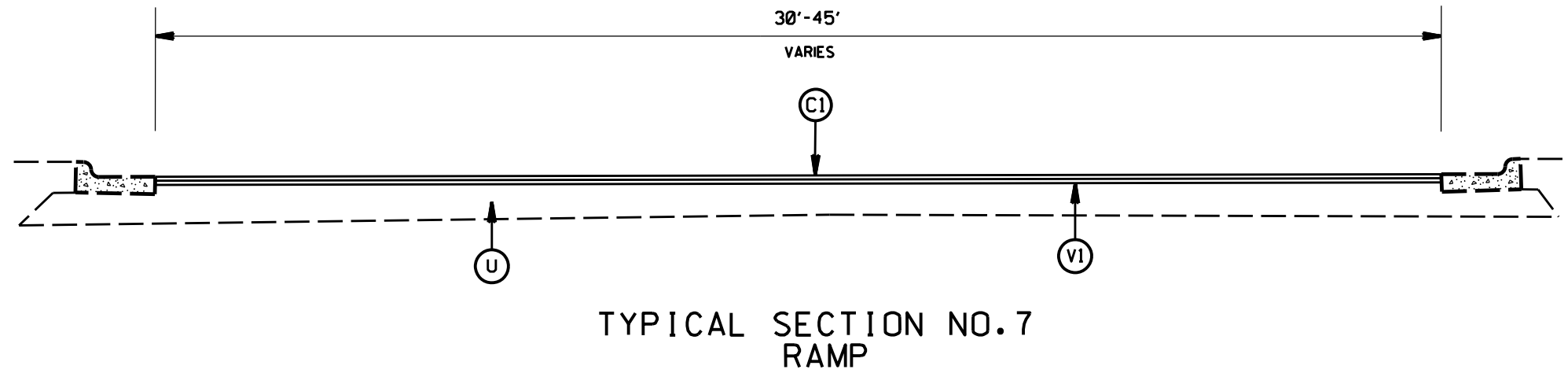
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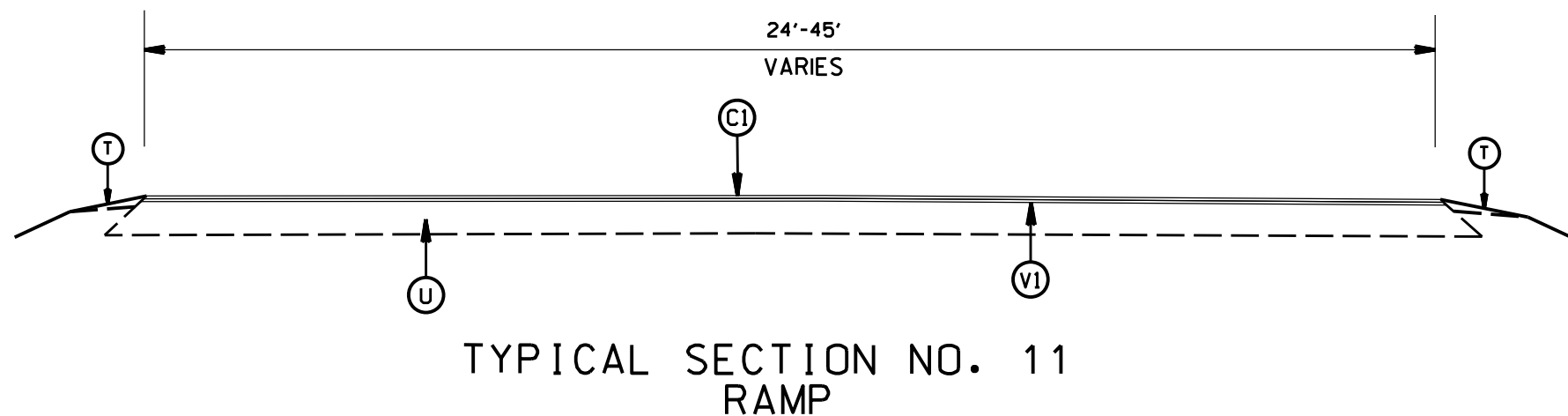
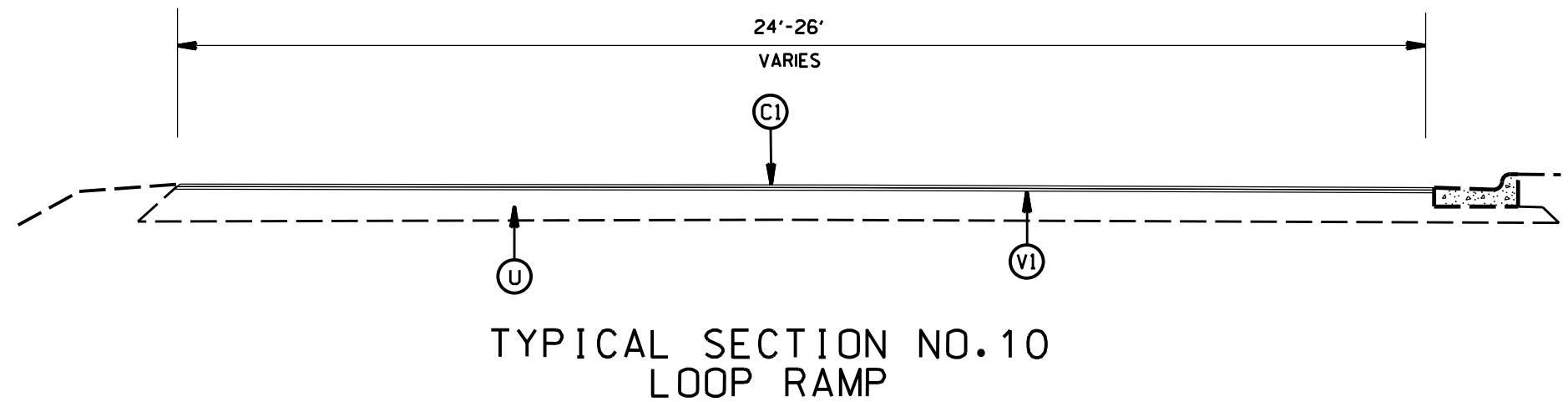
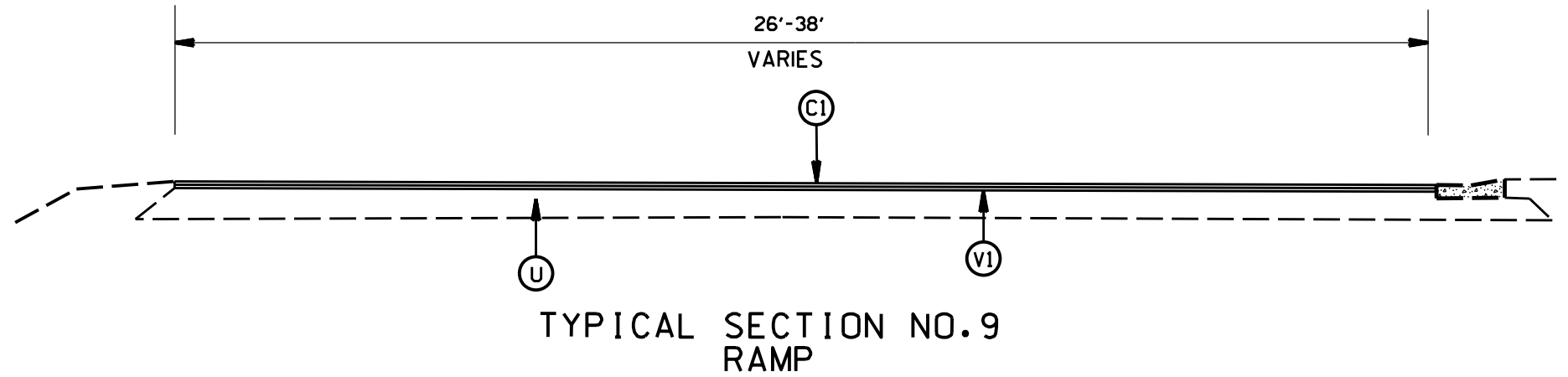



1-5837 1-85 PAVEMENT PRESERVATION MECKLENBURG COUNTY		
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APPROVED		



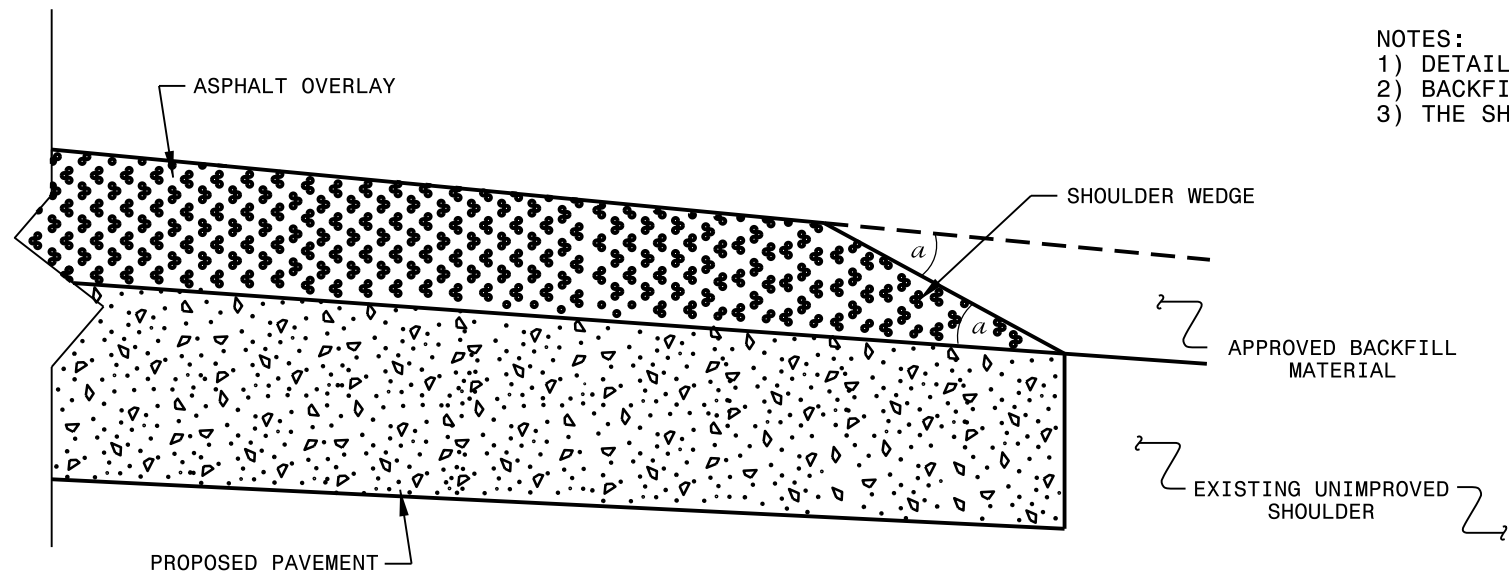
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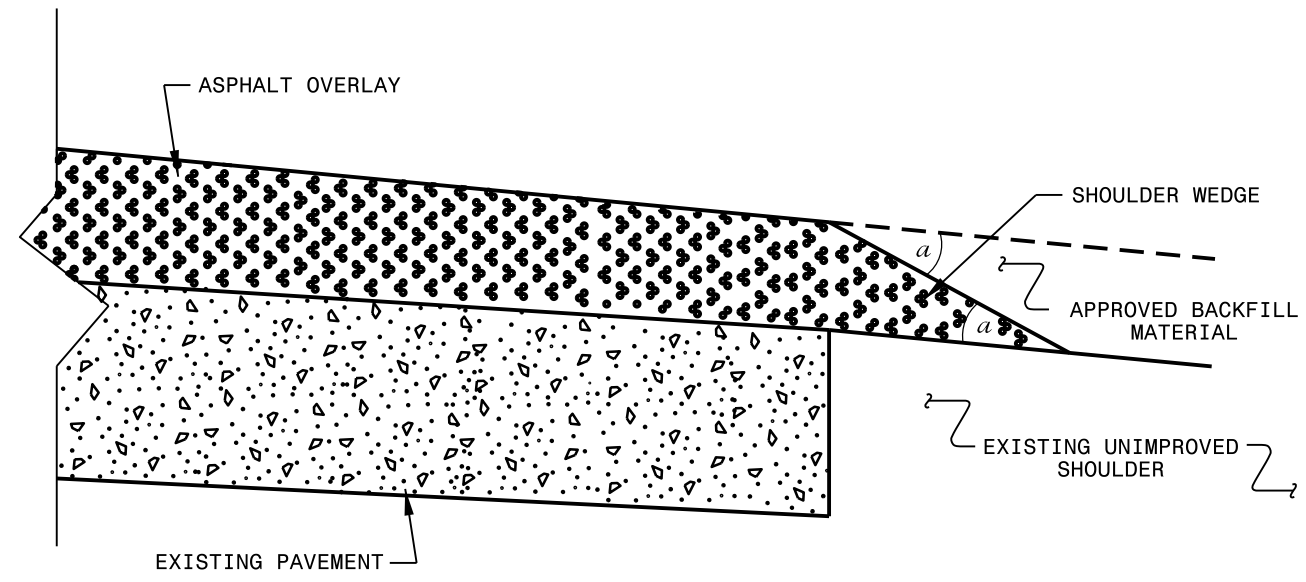


I-5837 I-85 PAVEMENT PRESERVATION MECKLENBURG COUNTY			REVISIONS	
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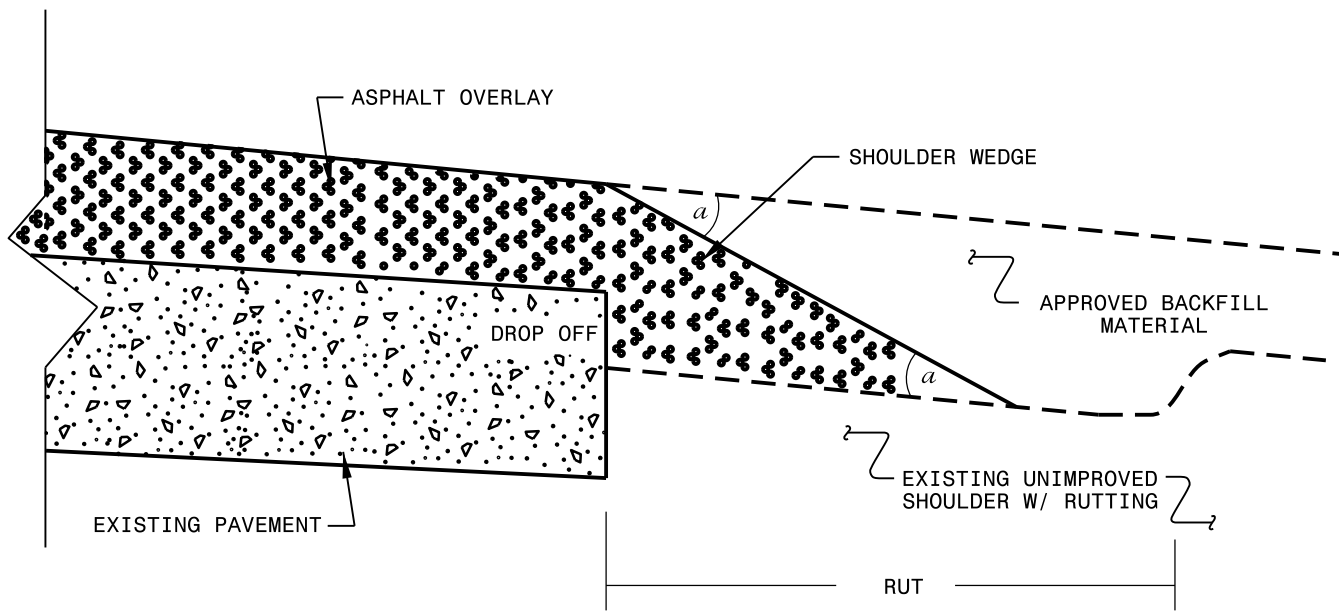
- NOTES:
 1) DETAIL DOES NOT APPLY TO OGAFD AND ULTRA-THIN BONDED WEARING COURSE.
 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



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



SHOULDER WEDGE DETAIL
 (Resurfacing Projects w/ NO Widening)



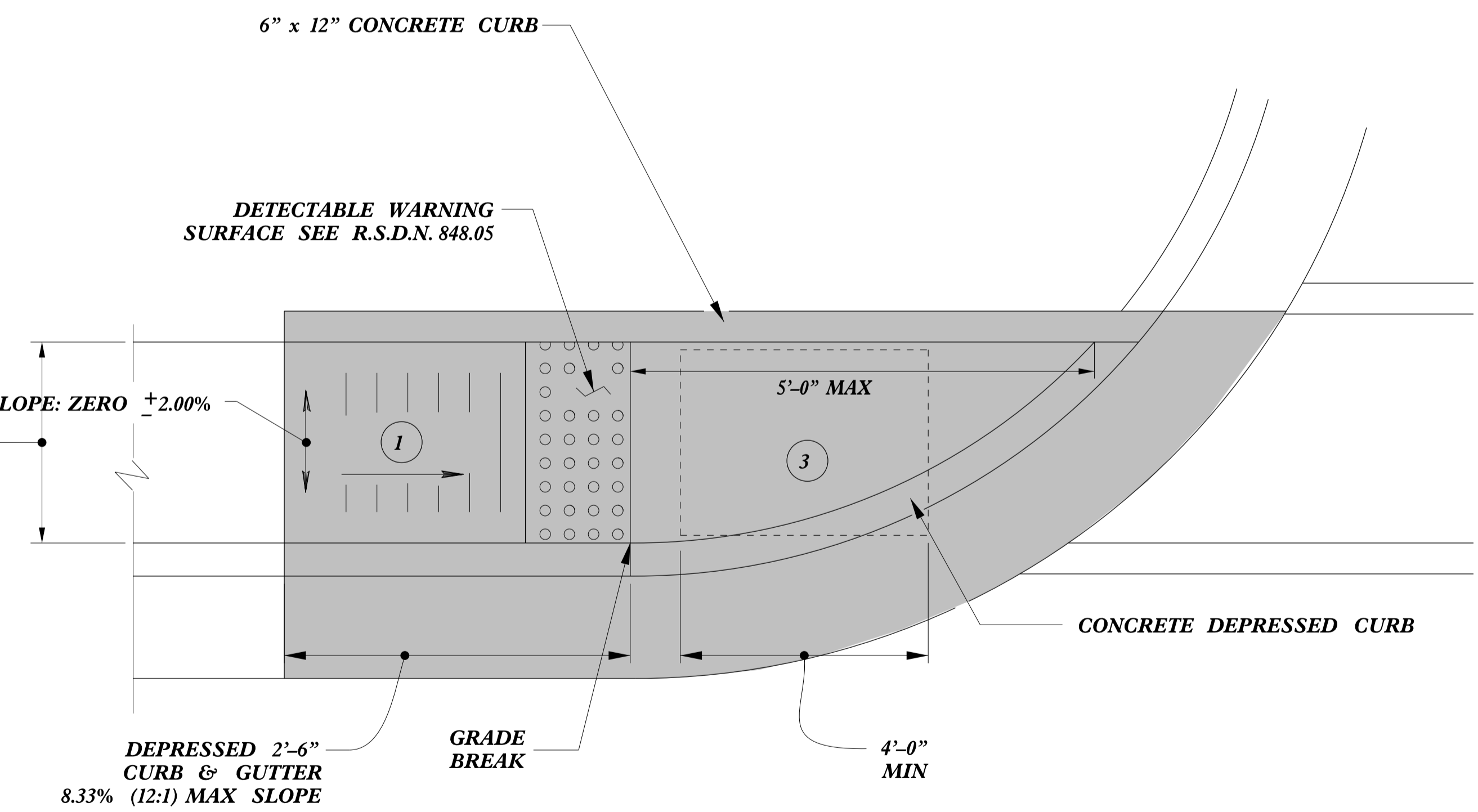
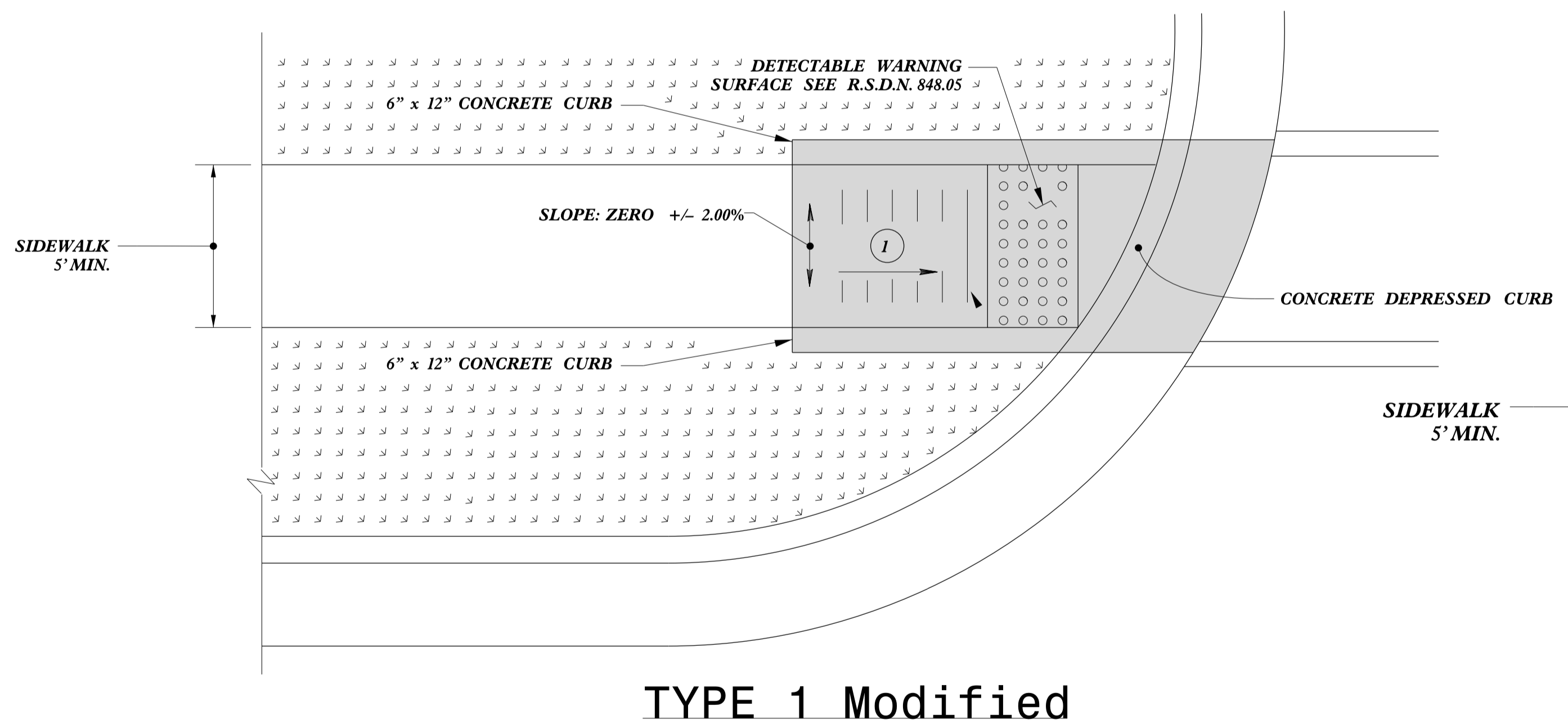
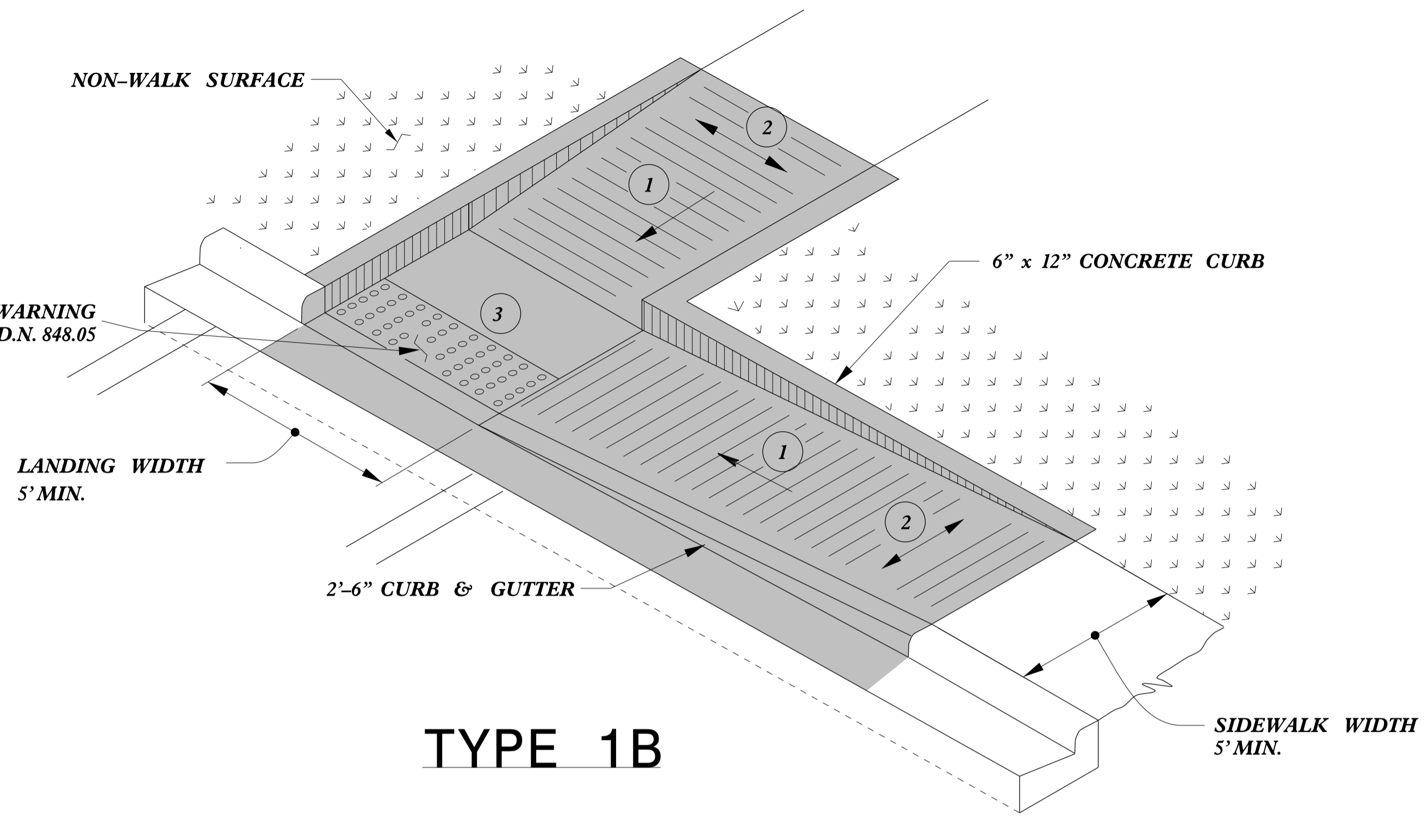
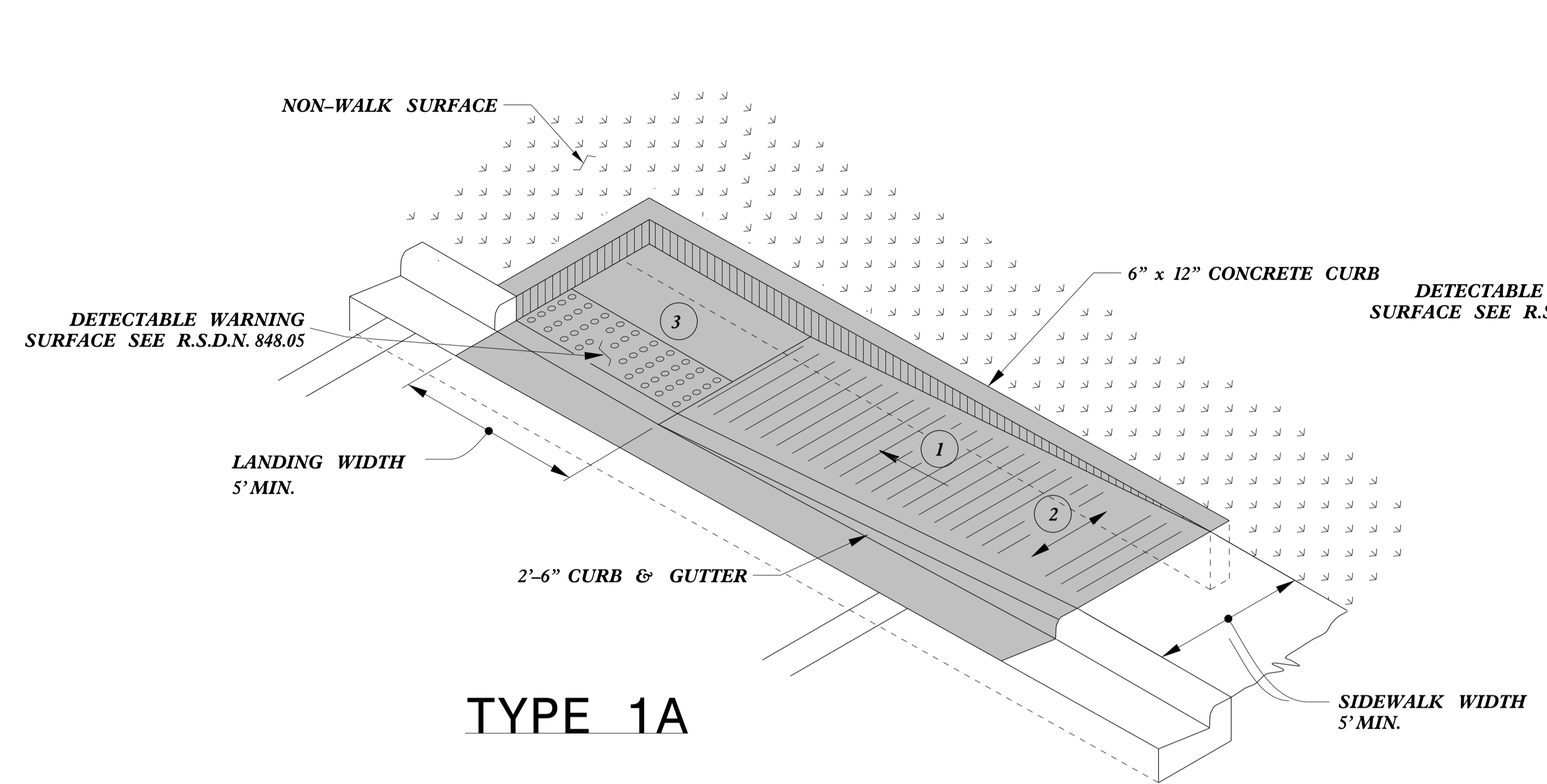
SHOULDER WEDGE DETAIL
 (Resurfacing Adjacent to
 Rutted Shoulder)

- 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			

SYSTEMS DESIGN
 USER NAME

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

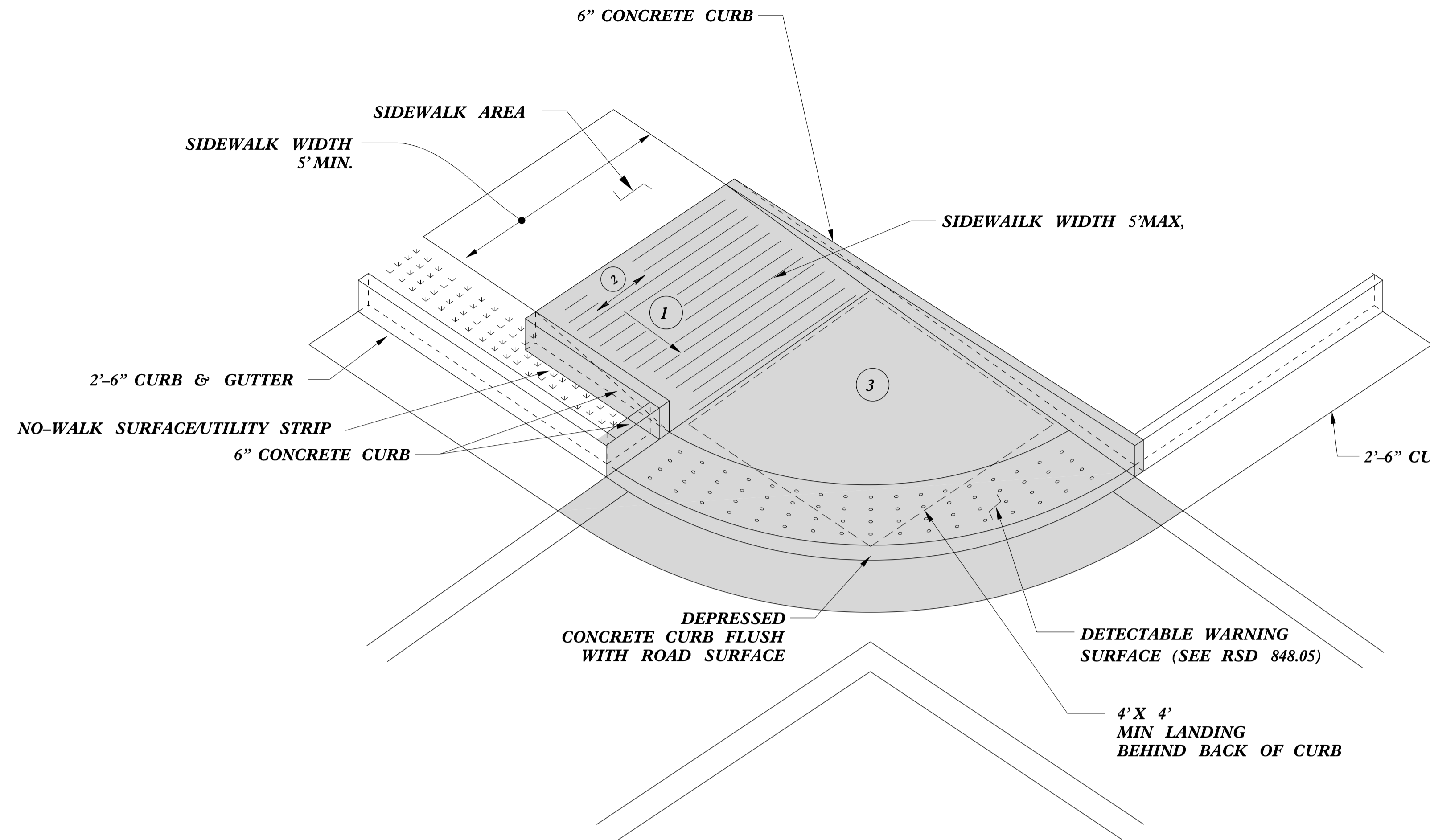


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

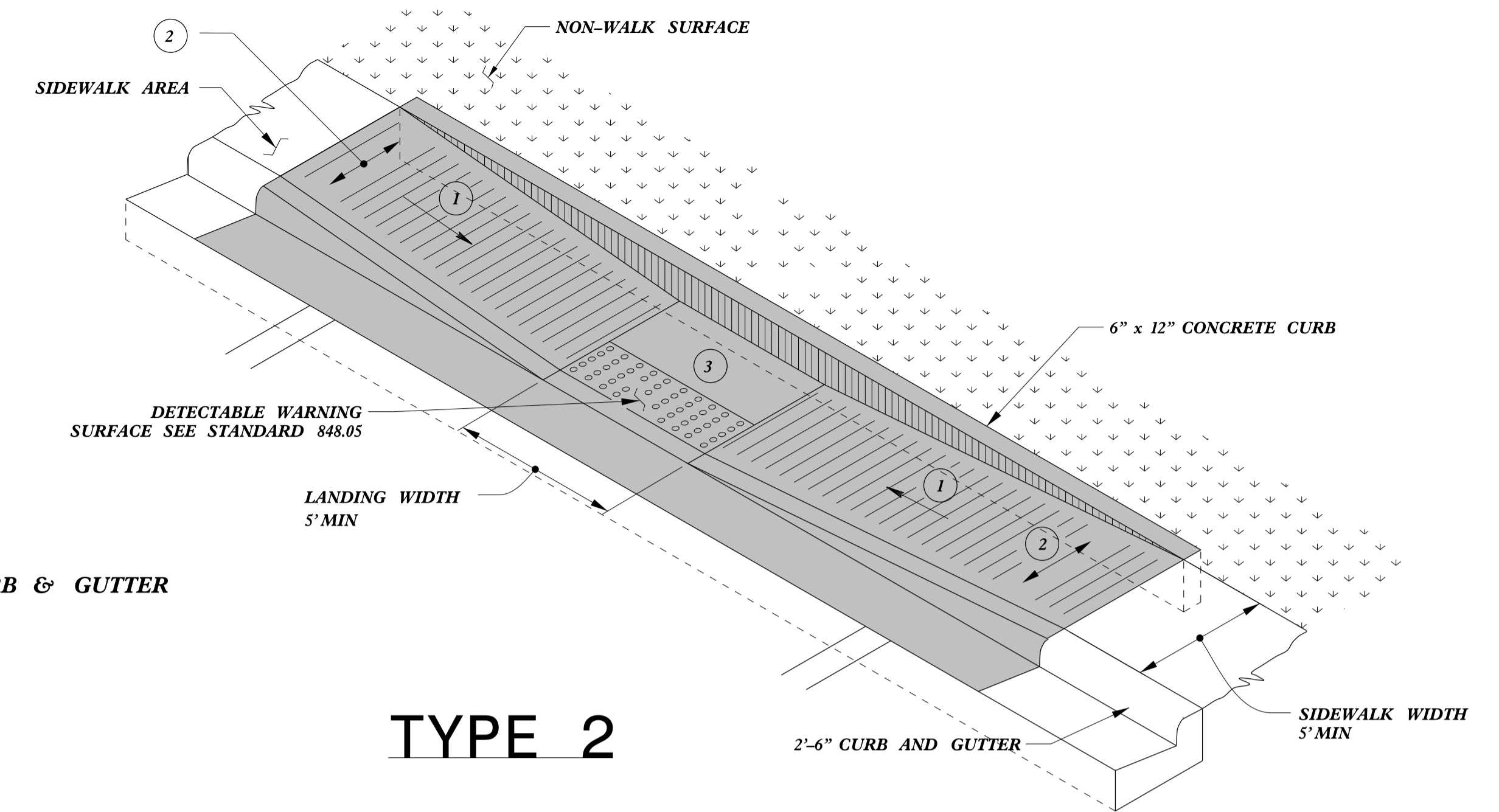
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
CURB RAMPS	
Directional Ramps	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:stds/2012CurbRamp/CurbRampDetails.dgn	

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

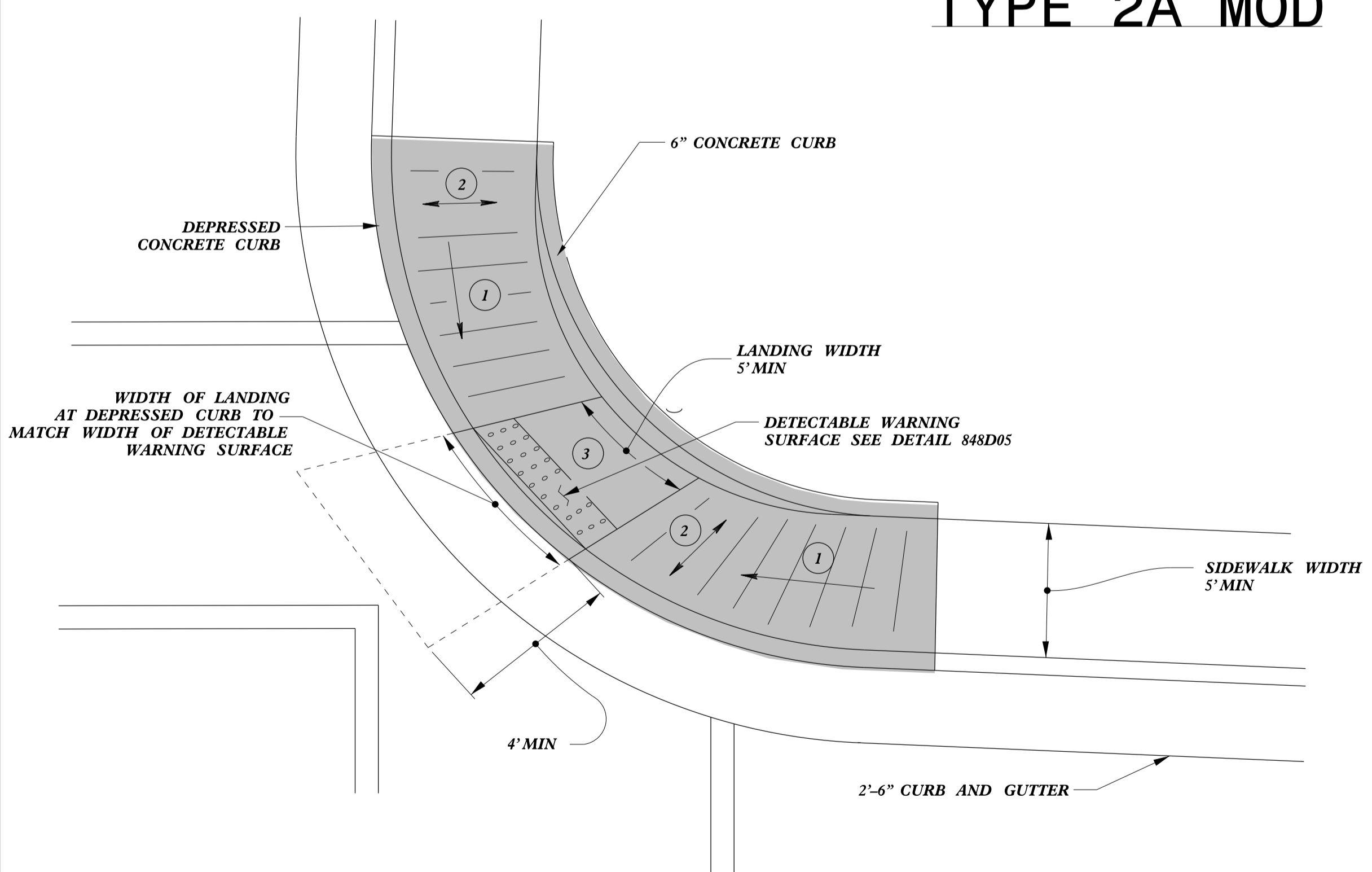
5/14/99



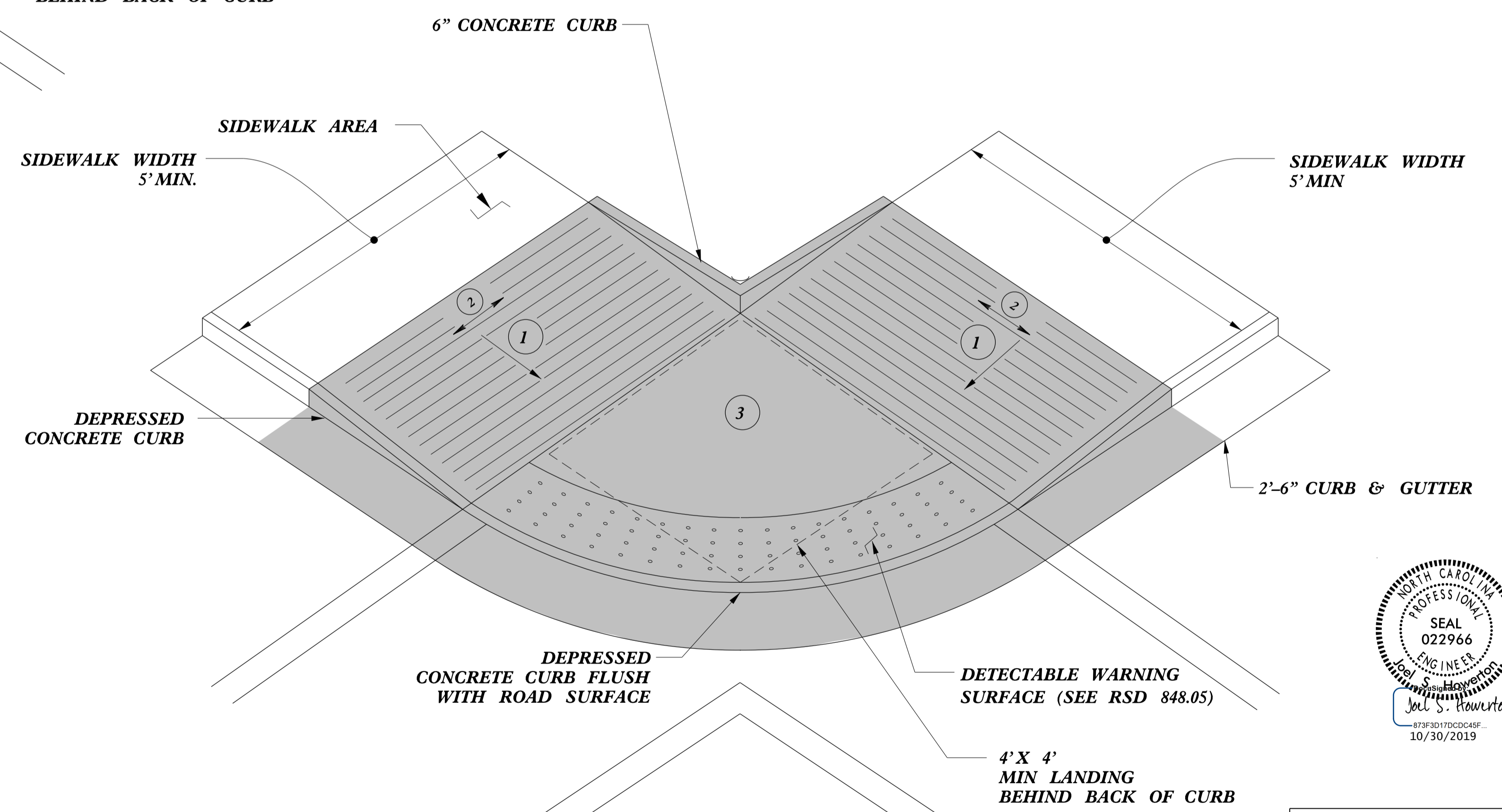
TYPE 2A MOD



TYPE 2



TYPE 2B



TYPE 2A

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
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PAY LIMITS FOR 1 CURB RAMP



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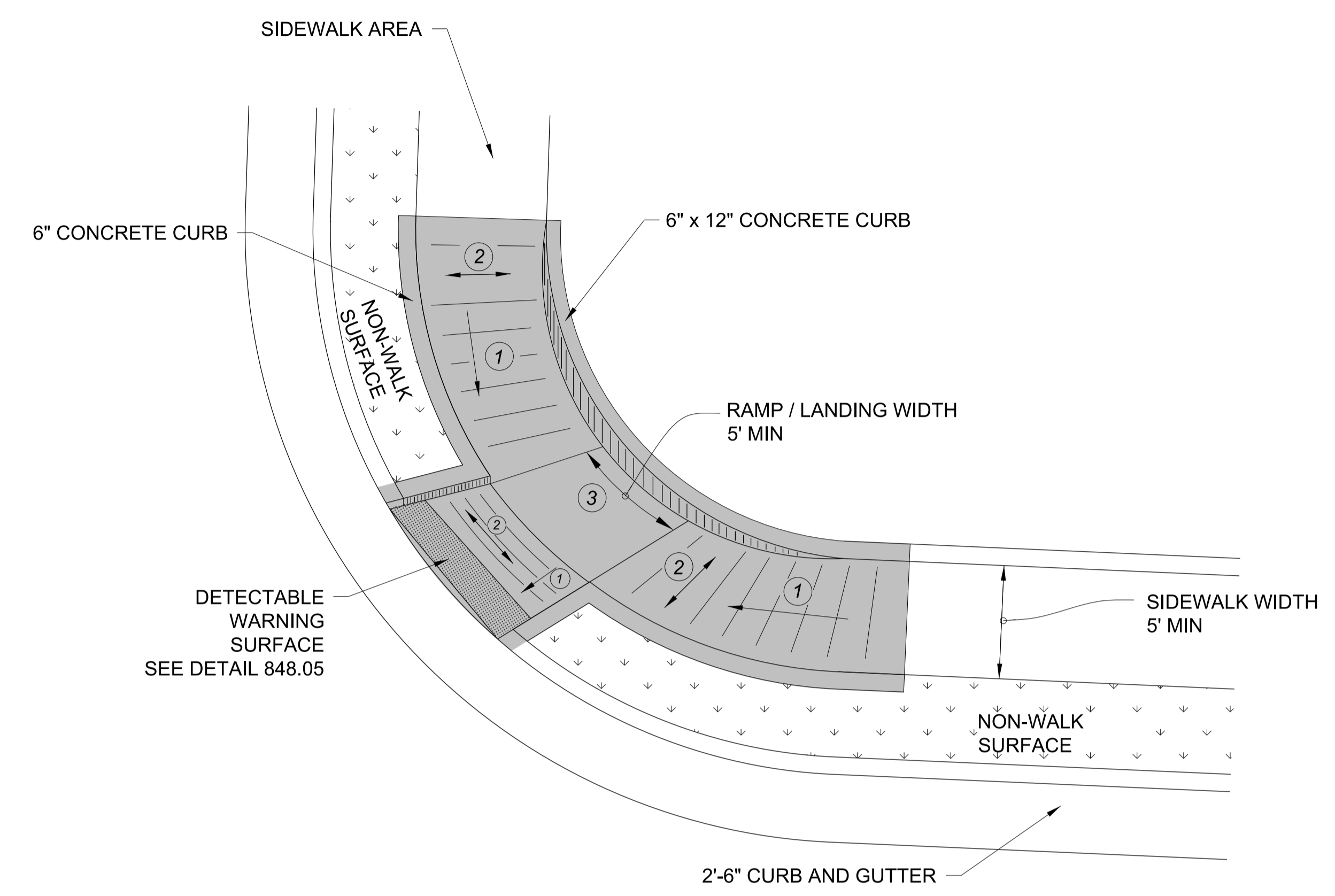
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

CURB RAMPS

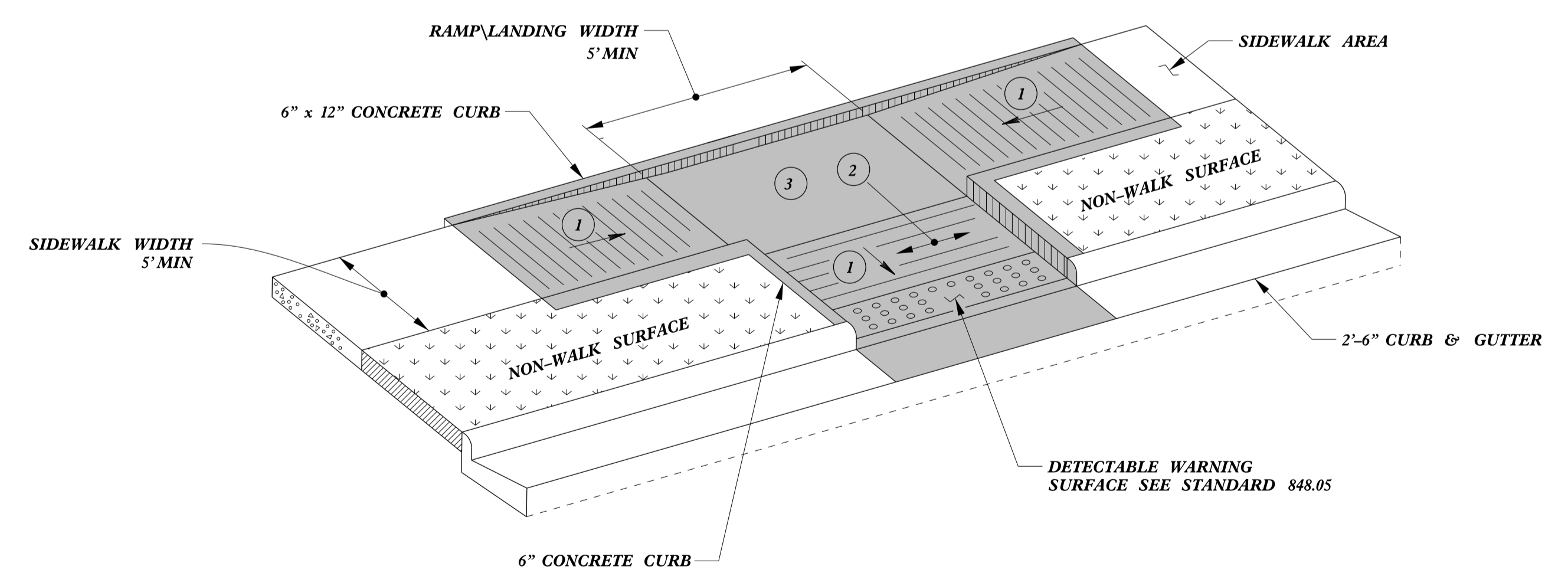
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

CURB RAMPS
 5/14/99
 J.S. HOWERTON
 PROFESSIONAL ENGINEER
 STATE OF NORTH CAROLINA
 SEAL NO. 022966
 10/30/2019

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.

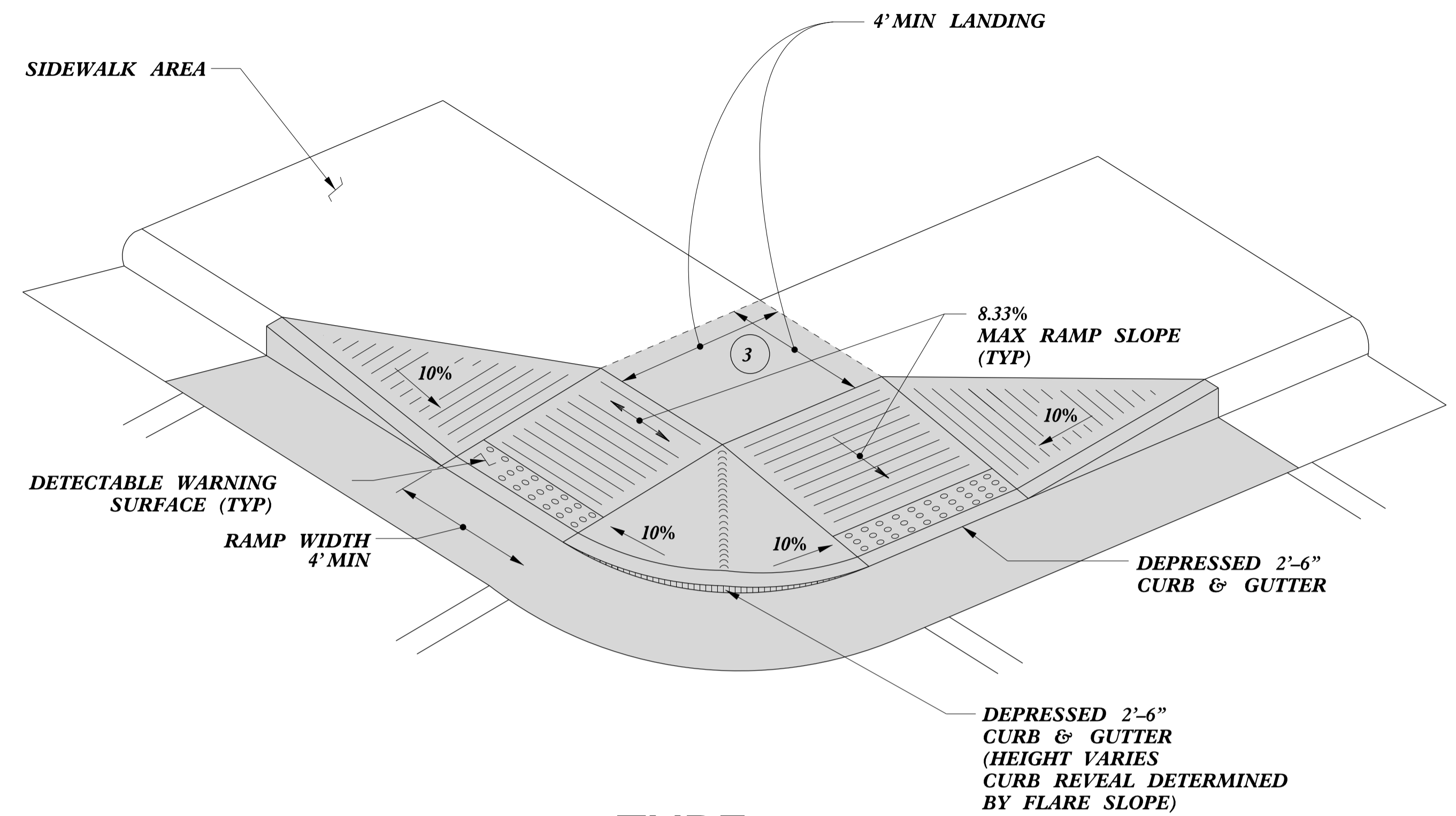


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

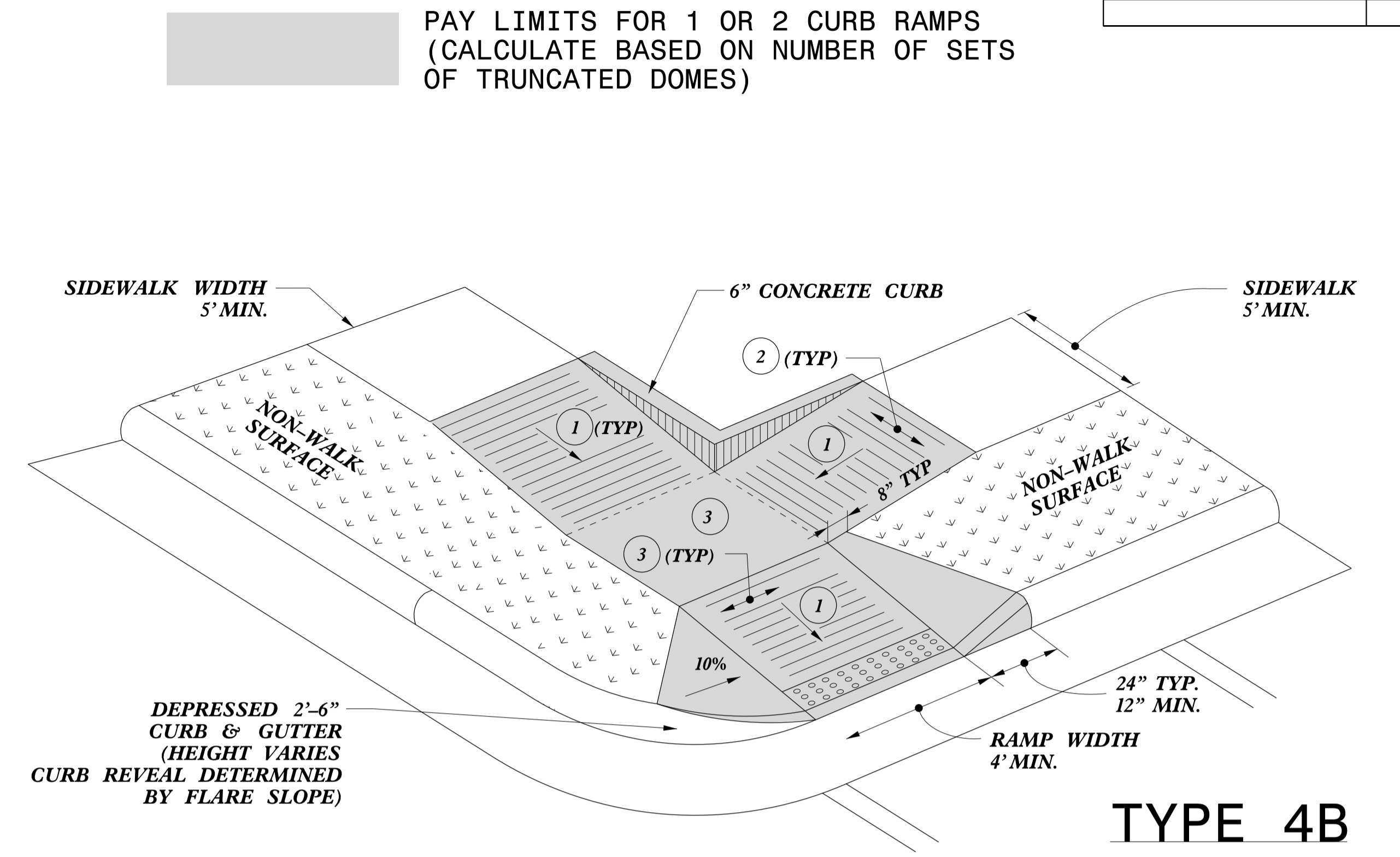
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
CURB RAMPS	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:stds/2012CurbRamp/CurbRampDetails.dgn	

5/14/99
C:\P\2012\STDS\2012CurbRamp\CurbRampDetails.dgn

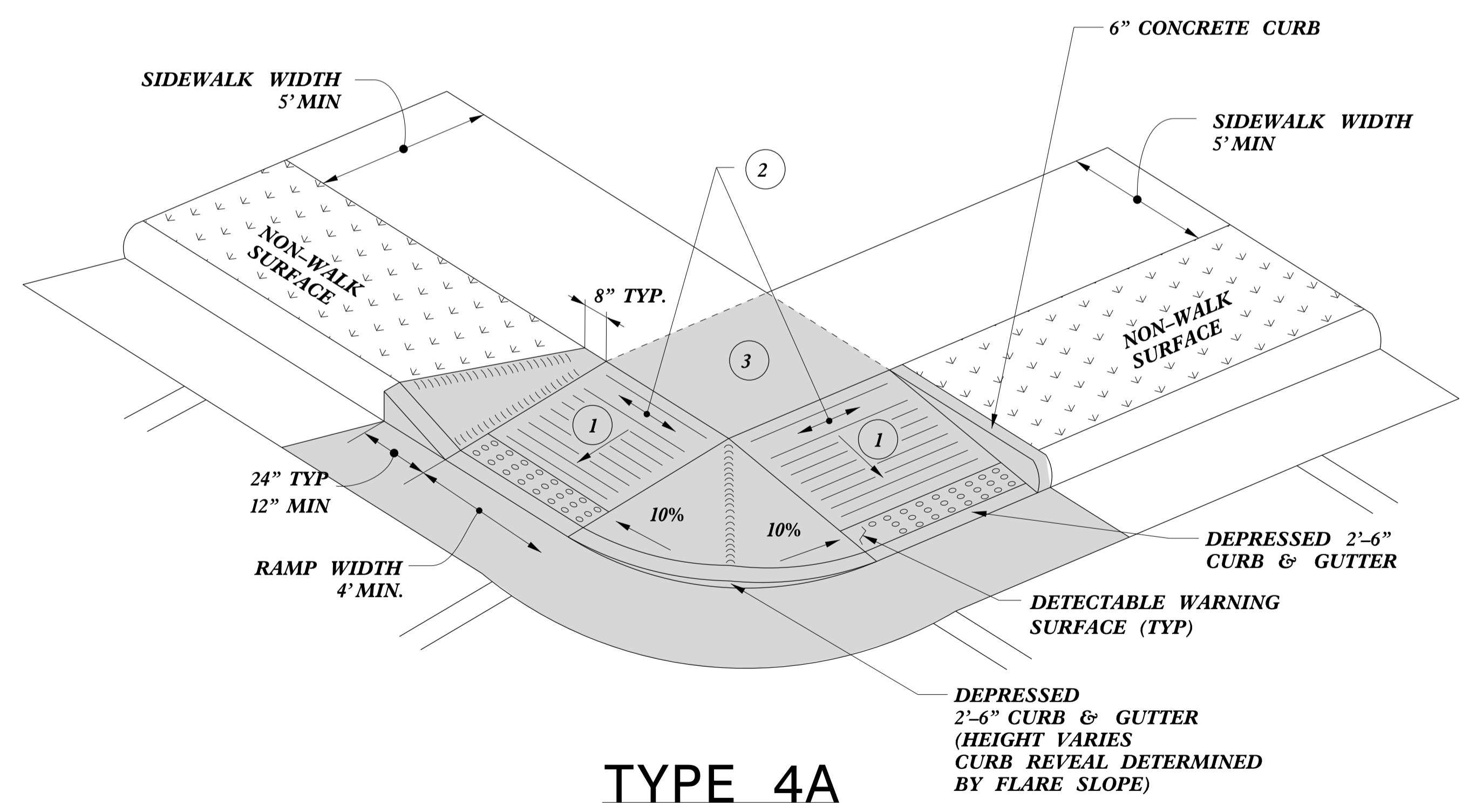
5/14/99



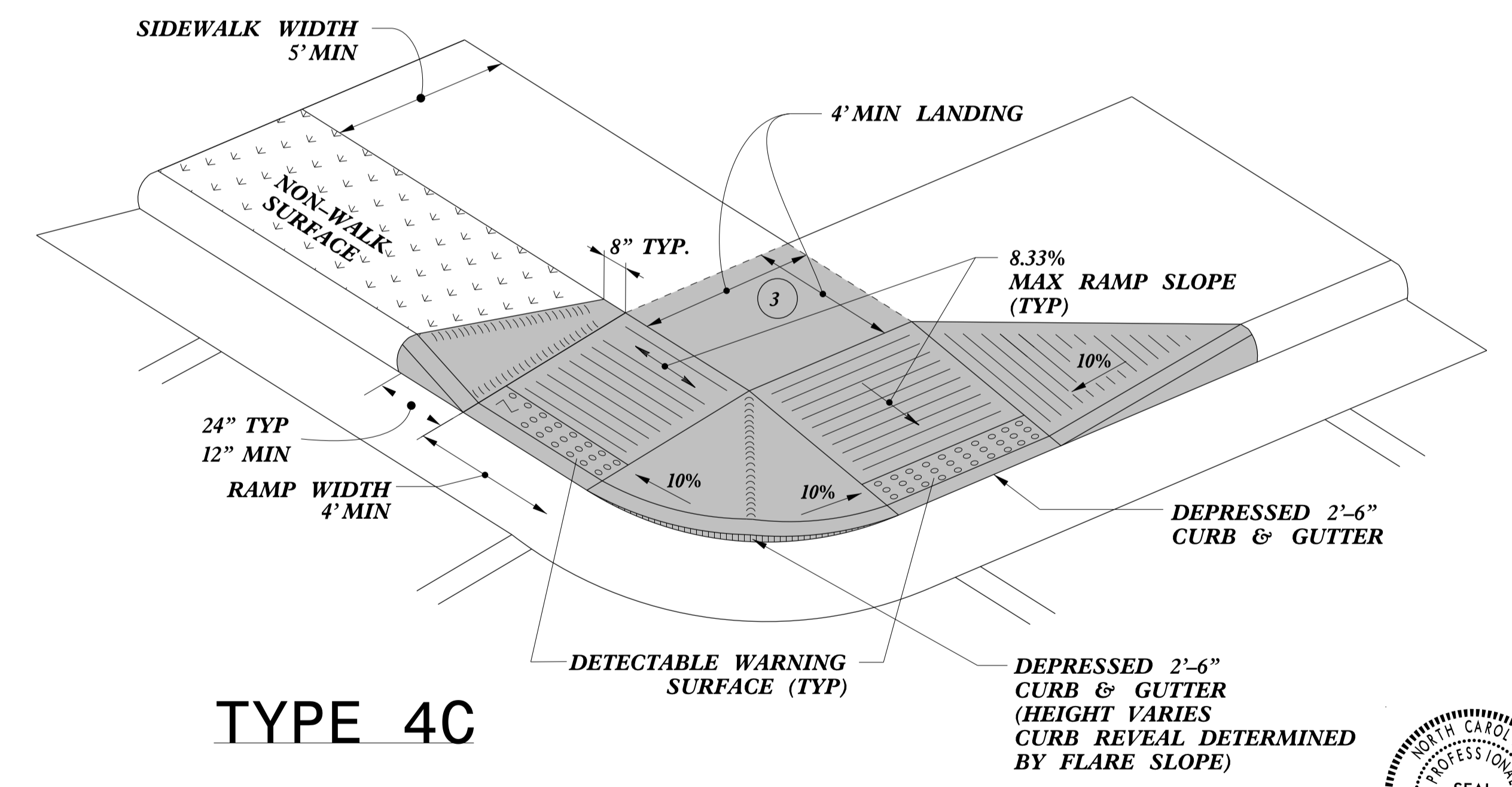
TYPE 4



TYPE 4B

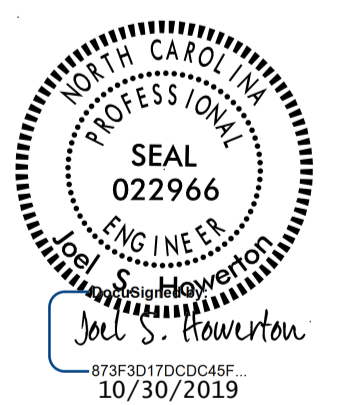


TYPE 4A



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.

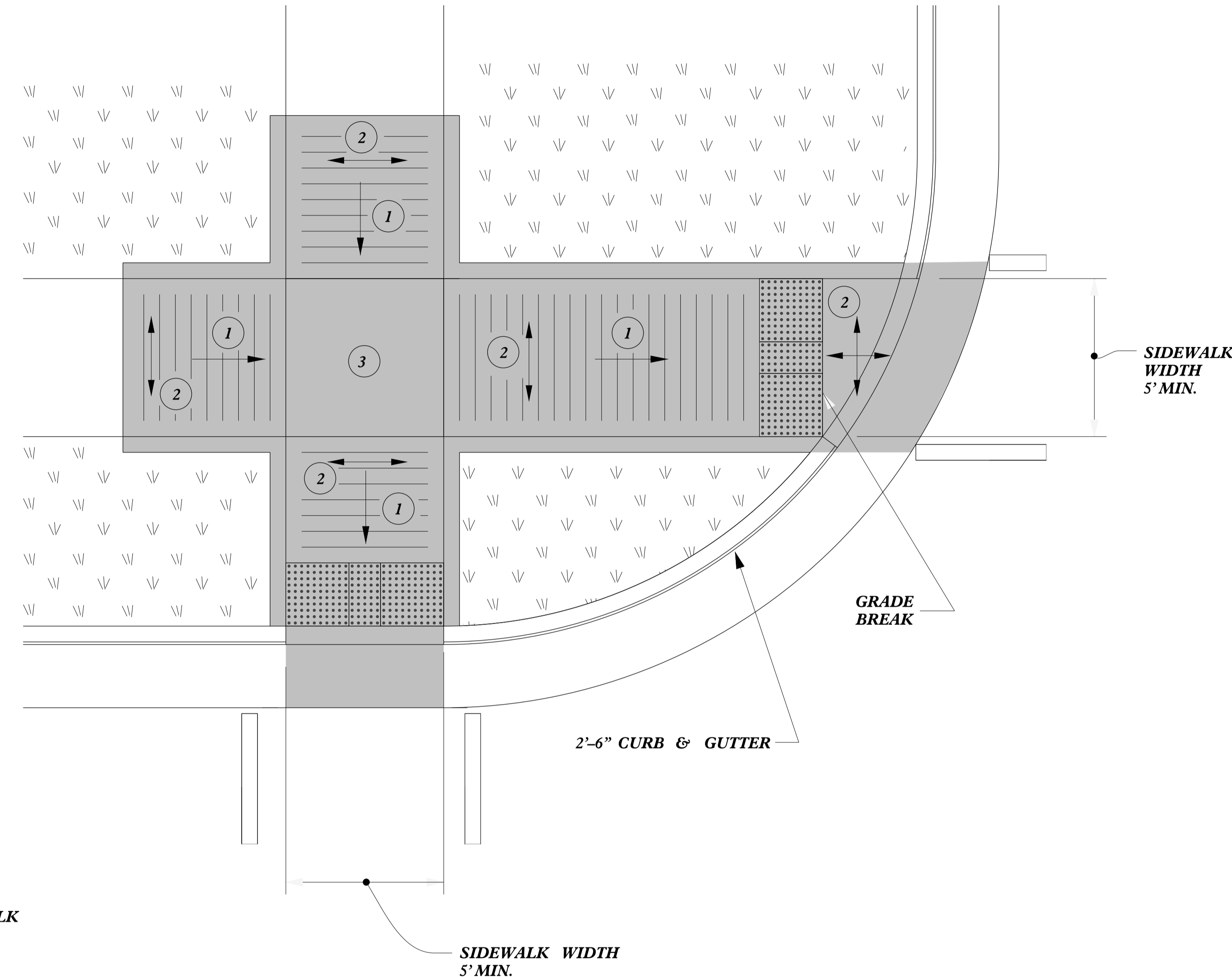


CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
CURB RAMPS	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dgn	

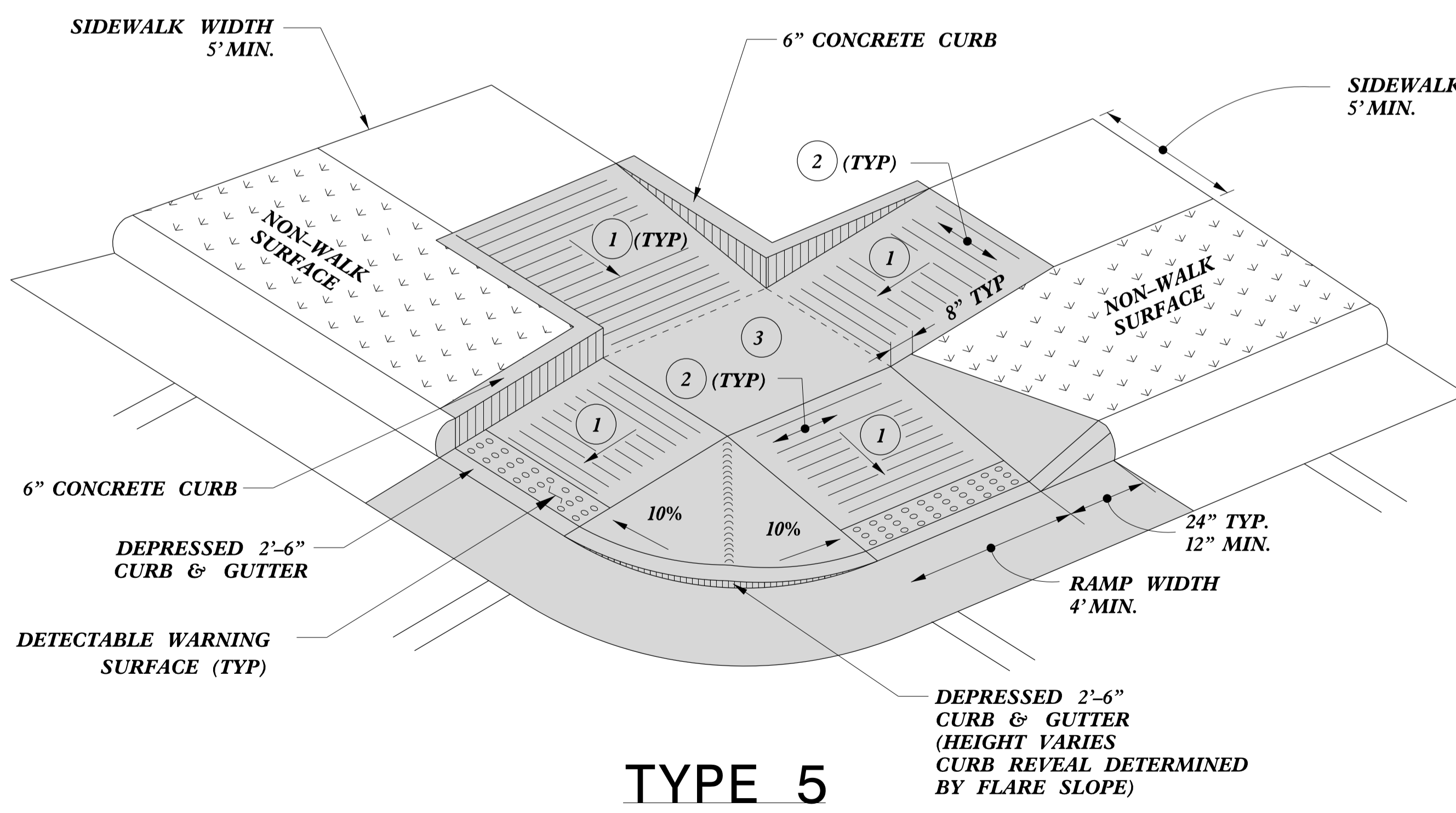
REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

\$\$\$\$ TIME\$\$\$\$
 \$\$\$ CURB RAMPS\$\$\$\$
 \$\$\$ 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)

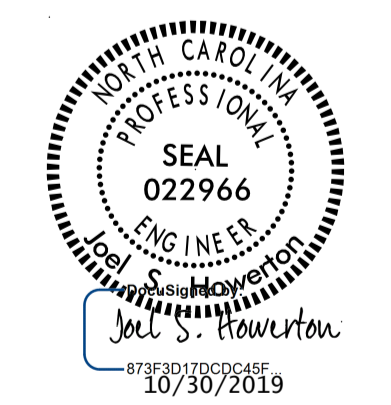


TYPE 5A



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

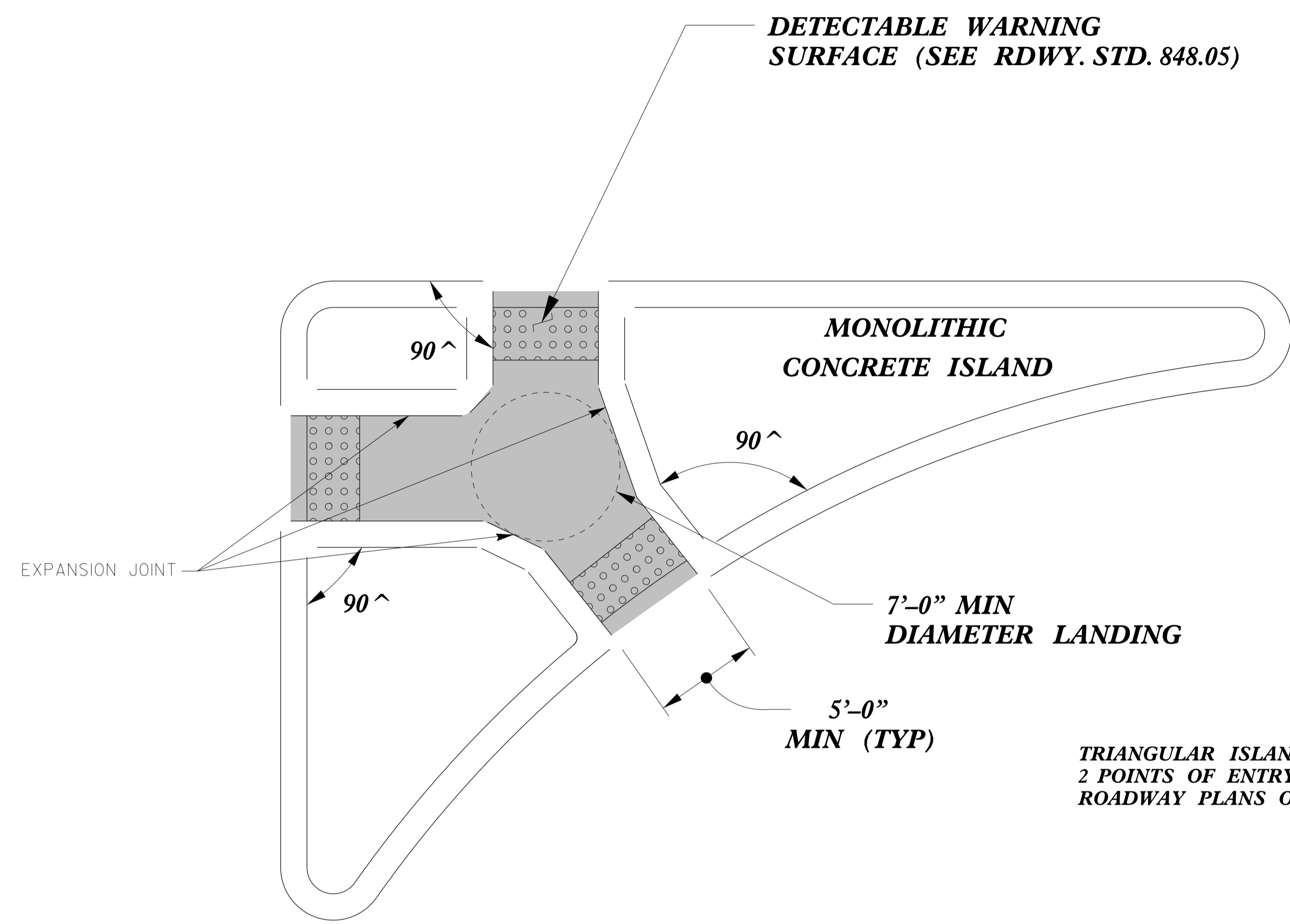
CURB RAMPS

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

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

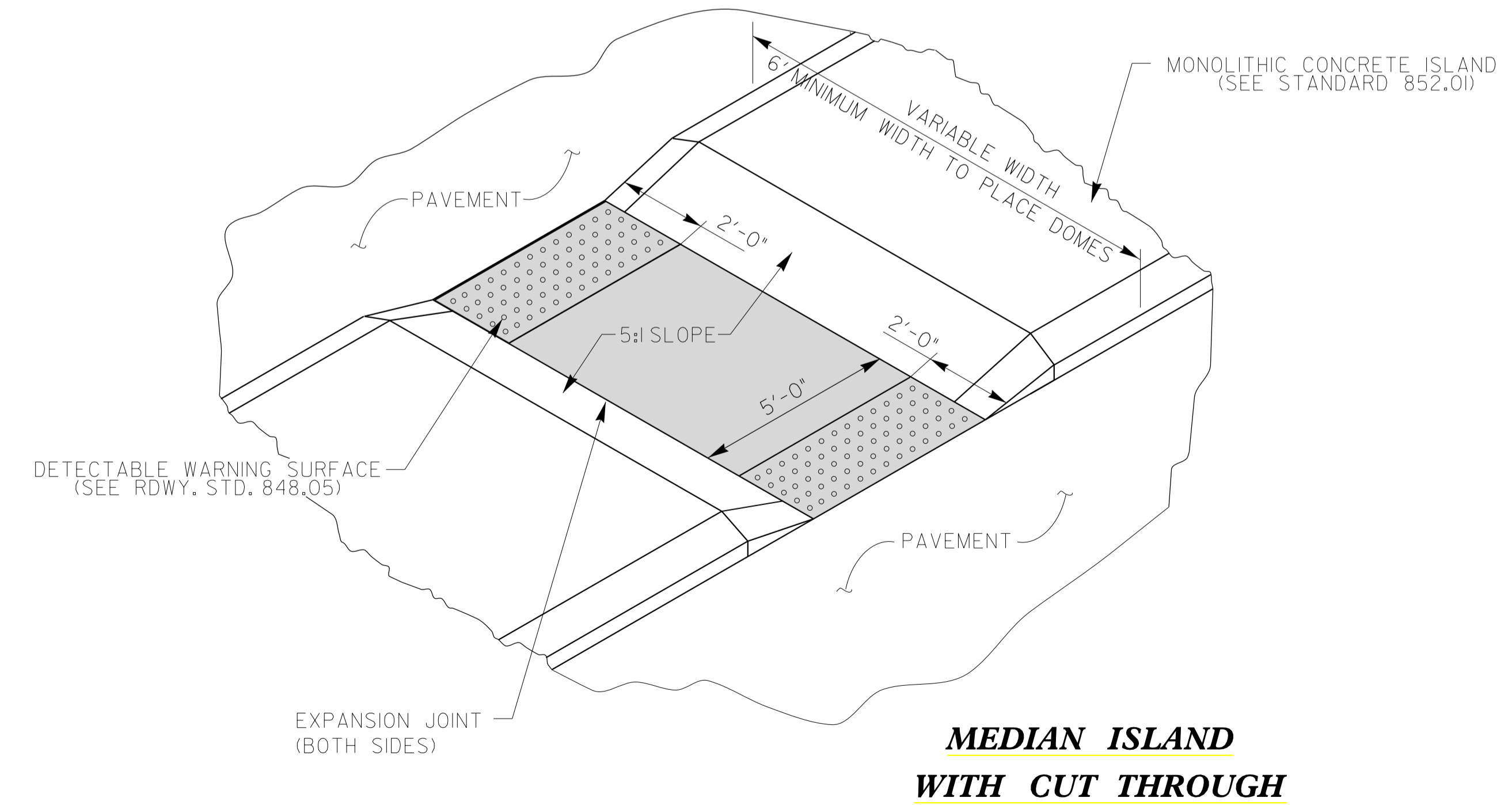
5/14/99
 TIME: 10:00 AM
 USER: JSM
 FILE: C:\P\2012\848.05\848.05.dwg
 PLOT: 10/30/2019 10:00 AM
 PLOTTER: HP DesignJet 2500C
 PLOTTING: 10/30/2019 10:00 AM

5/14/99
 C:\TEMP\DESIGN\CONCRETE\ISLANDS\DETAILS\ISLANDS.DWG
 USER: JSH

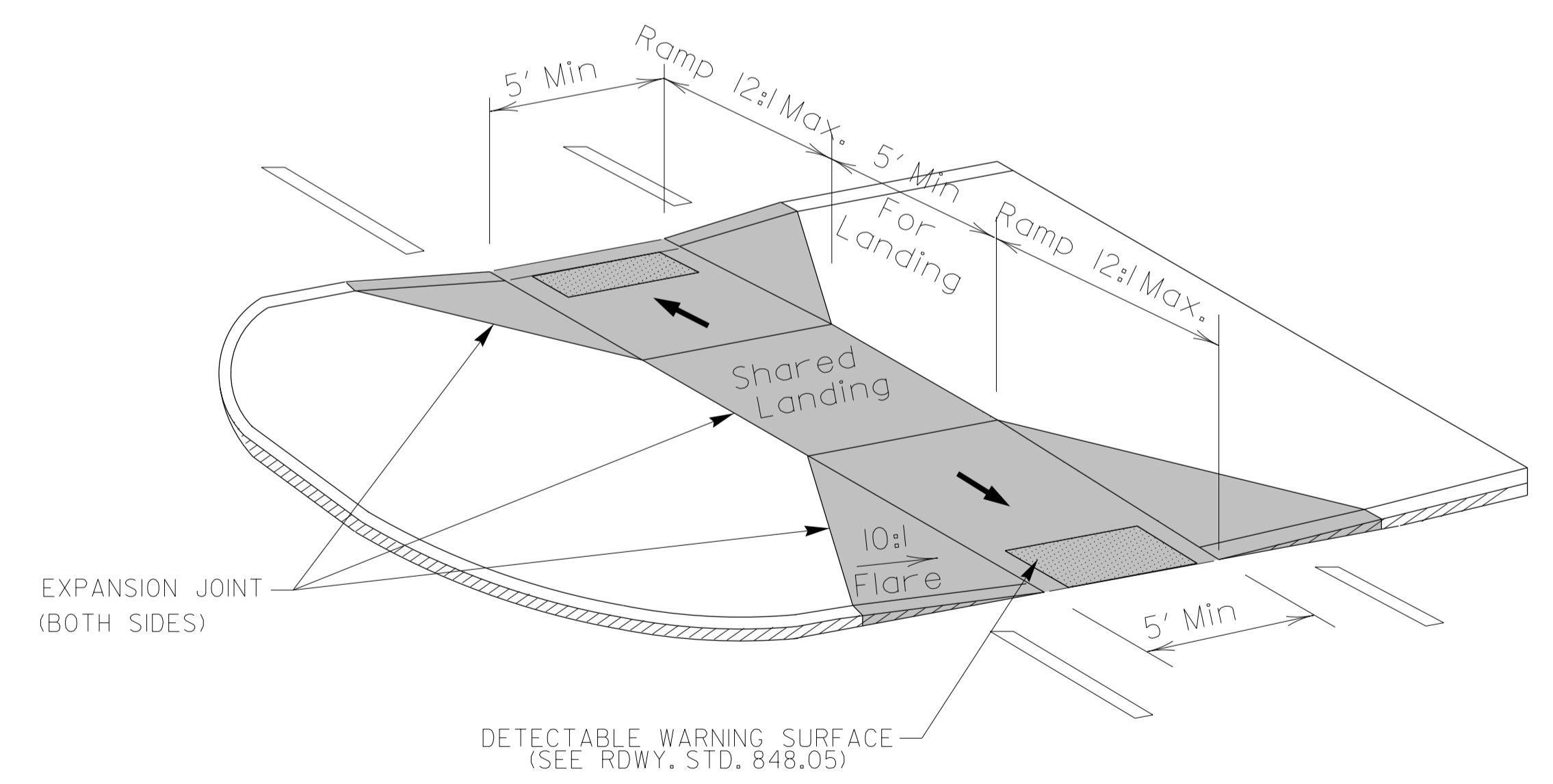


PAY LIMITS FOR 2 OR 3 CURB RAMPS
 (CALCULATE BASED ON NUMBER OF
 SETS OF TRUNCATED DOMES)

**TRIANGULAR ISLAND
 WITH CUT THROUGH
 TYPE 6**



**MEDIAN ISLAND
 WITH CUT THROUGH
 TYPE 7**



**MEDIAN ISLAND
 CURB RAMPS
 TYPE 8**

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 UNLESS ALL SIGNATURES COMPLETED

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 AND DEVELOPMENT UNIT**
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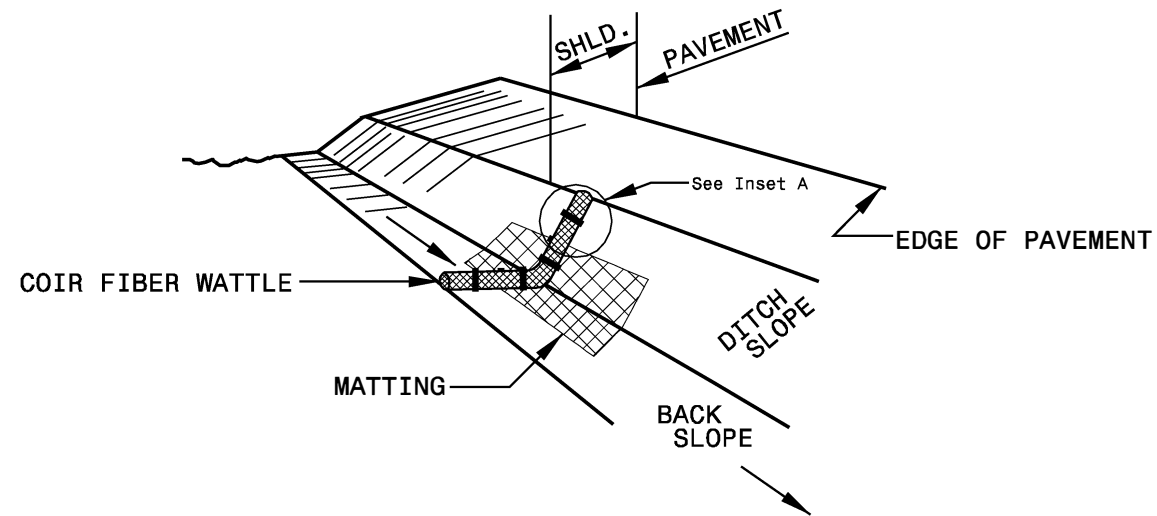
CURB RAMPS
 Median or Turn Lane Islands

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

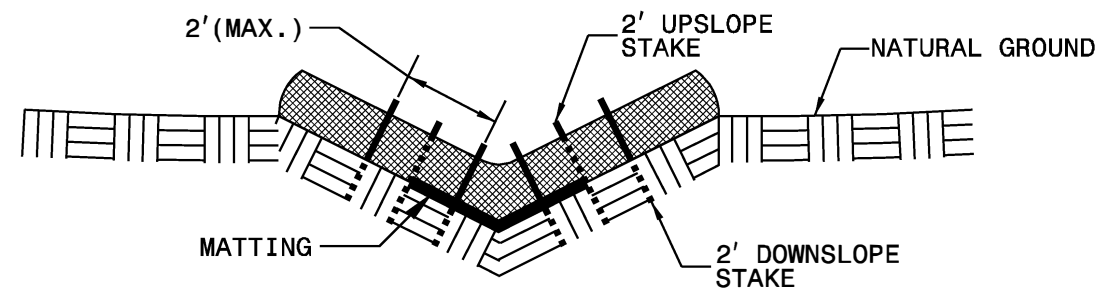


PROJECT REFERENCE NO.		SHEET NO.	
L-5738		EC-26	
RWY. SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

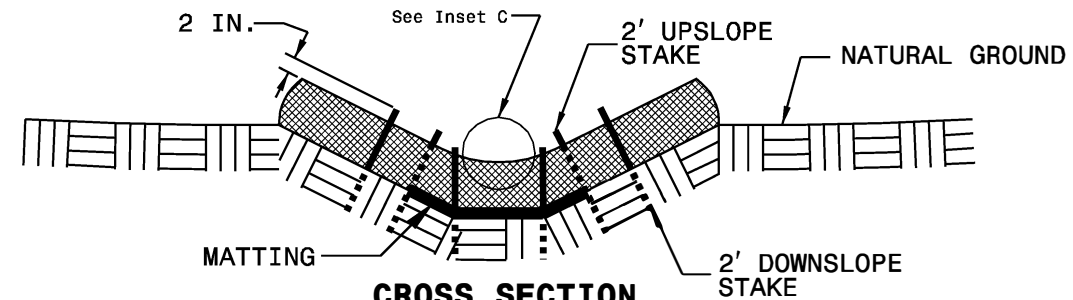
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

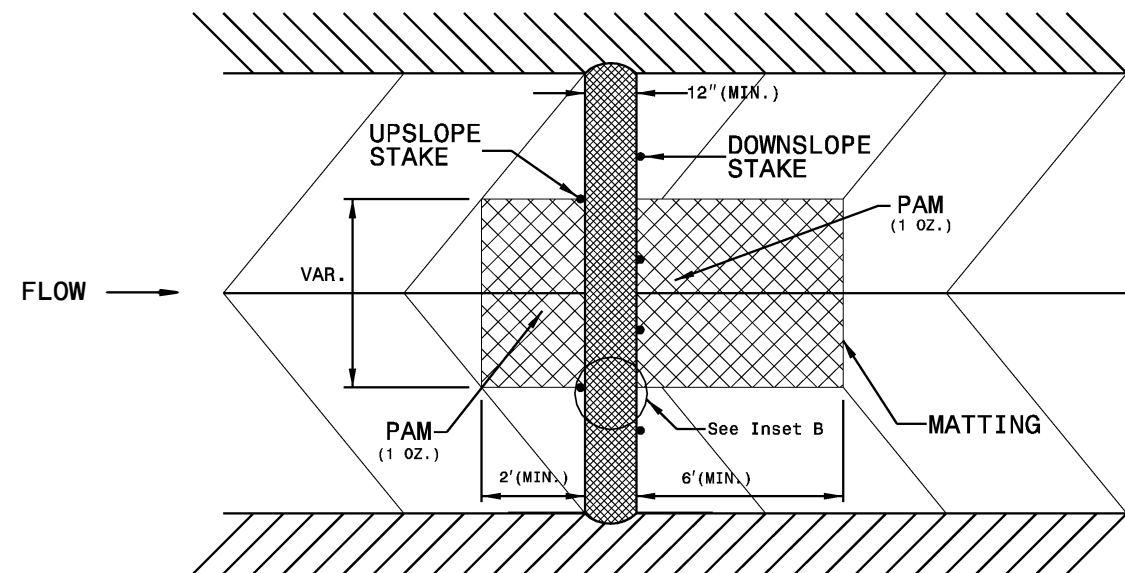
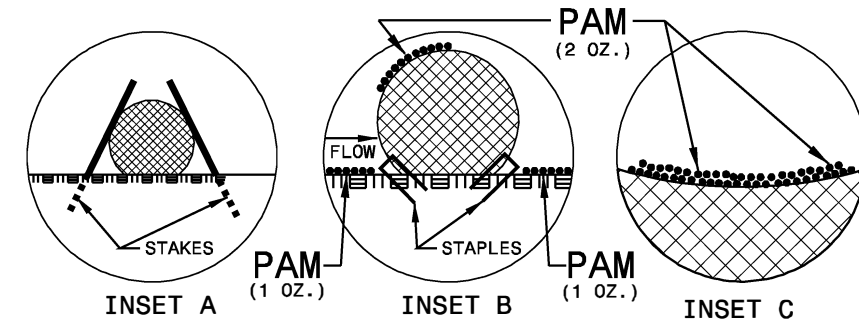
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

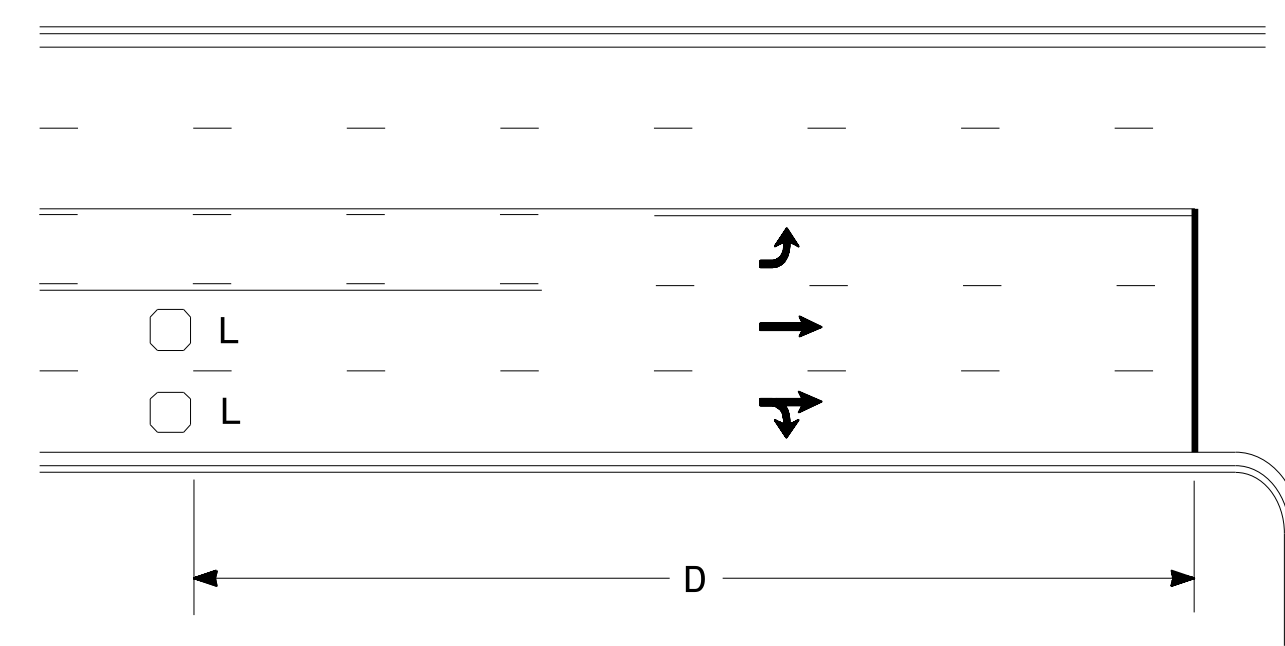
PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



TOP VIEW

High Speed Detection (≥40 mph)

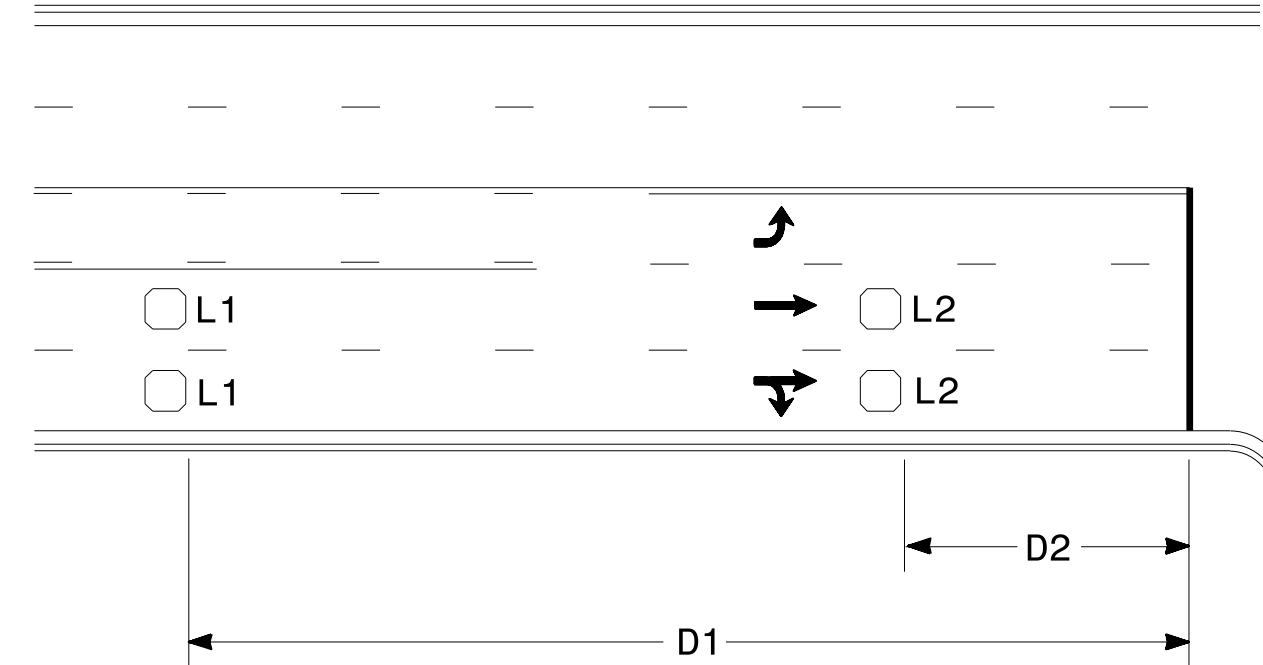


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

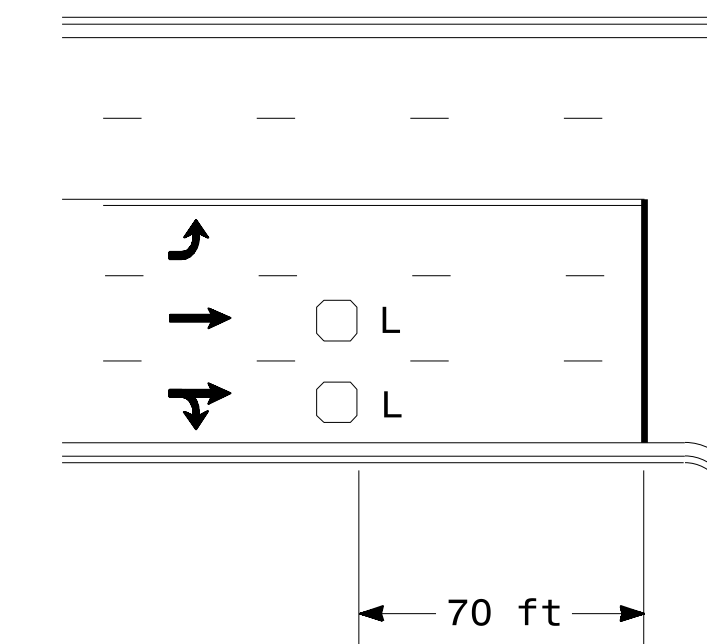


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

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

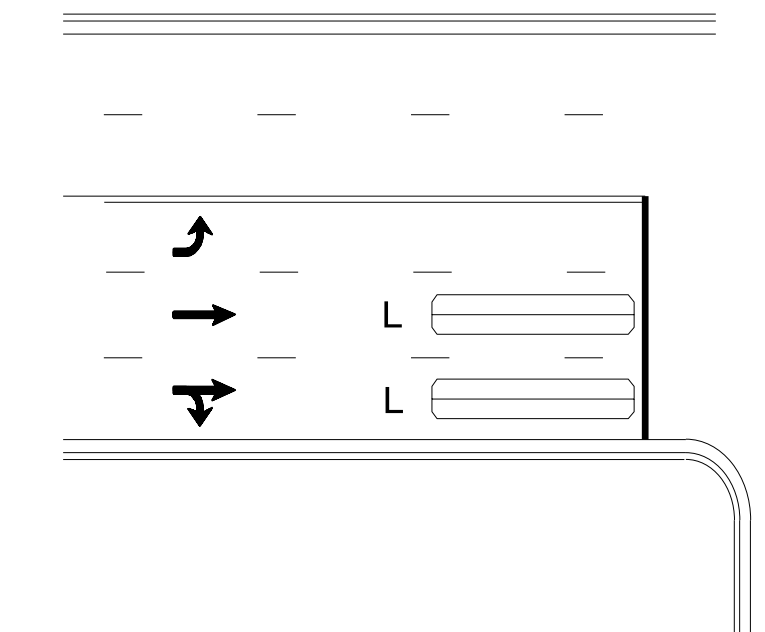
"Stretch" Operation

Low Speed Detection (≤35 mph)



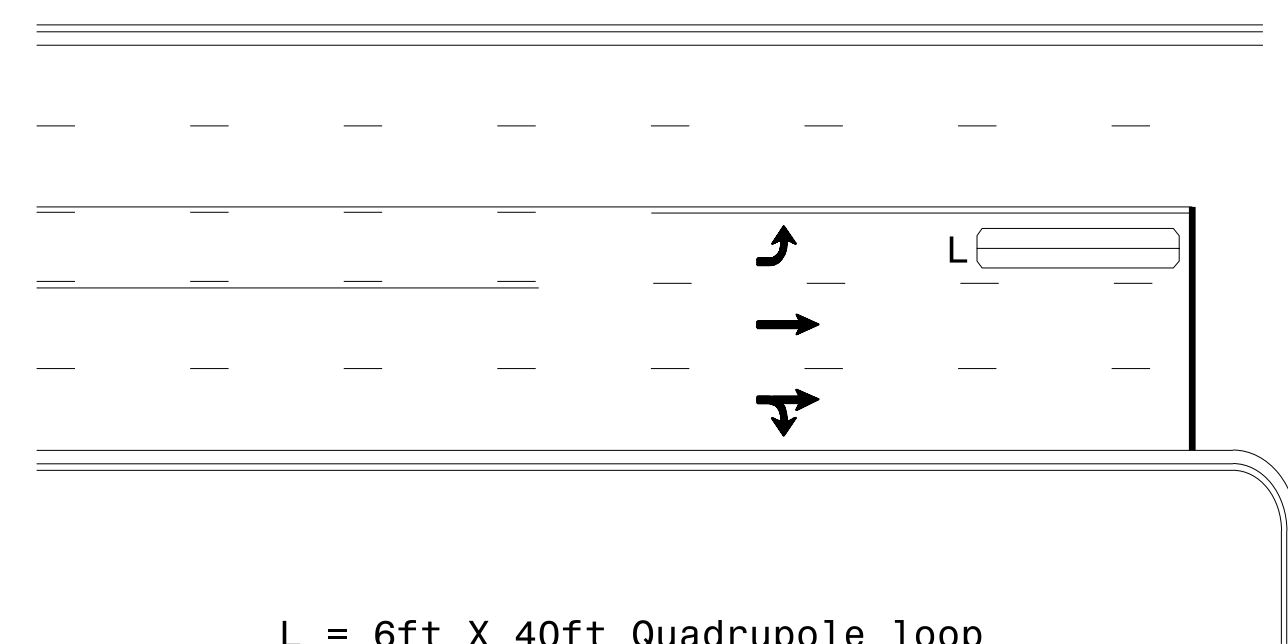
L = 6ft X 6ft
Wired in series

OR



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

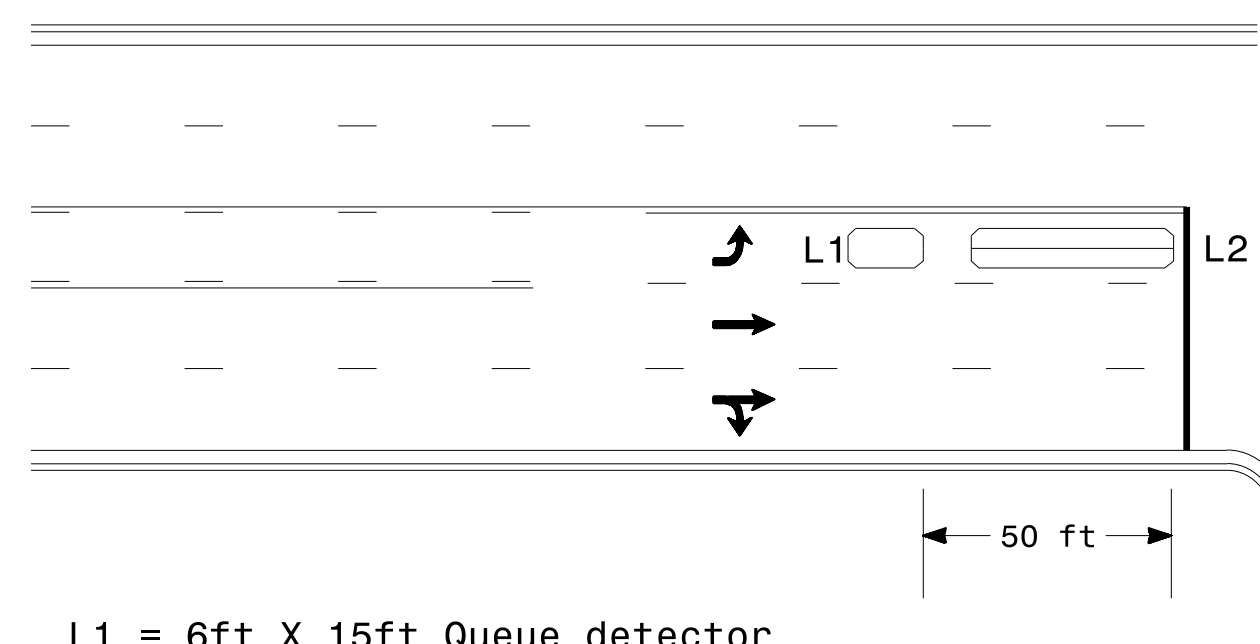
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

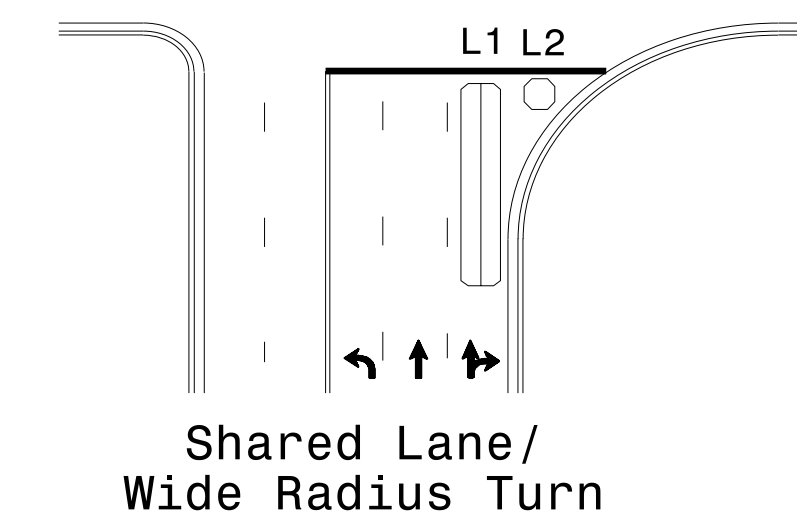
OR



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

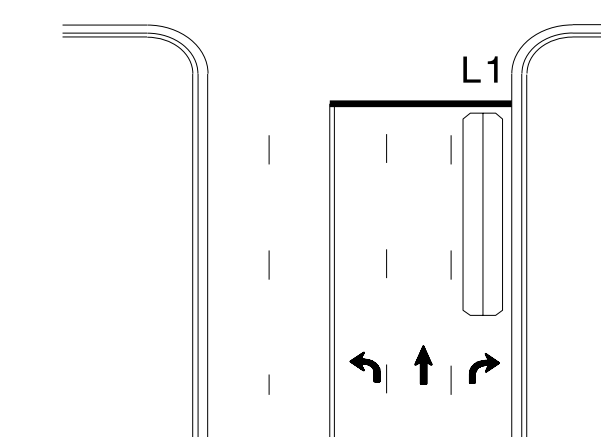
Queue Loop Detection

Right Turn Lane Detection

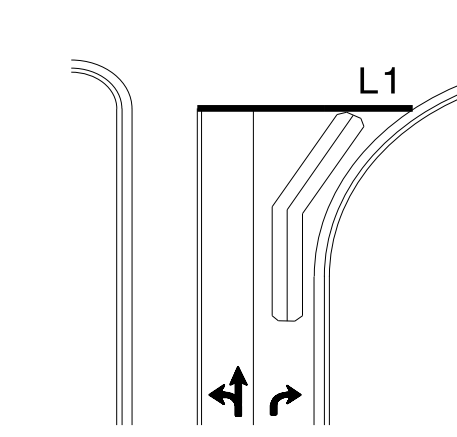


Shared Lane/
Wide Radius Turn

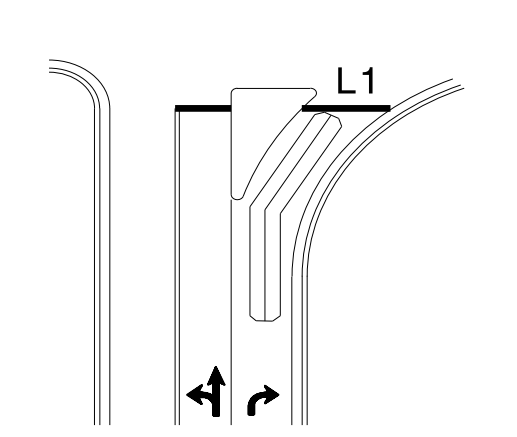
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

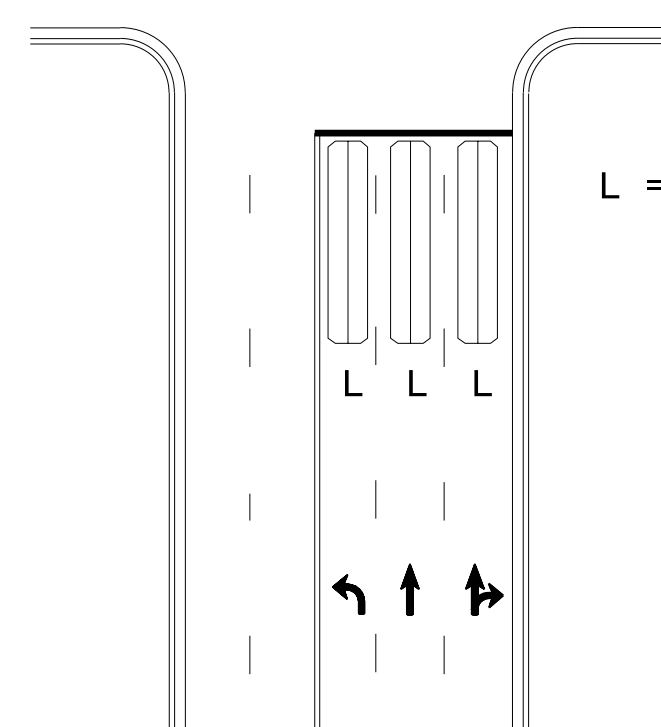


Wide Radius Turn



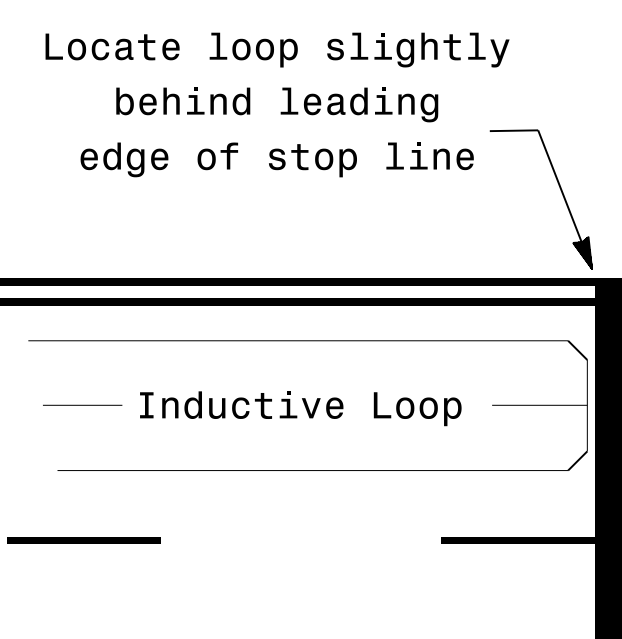
Channelized Turn

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

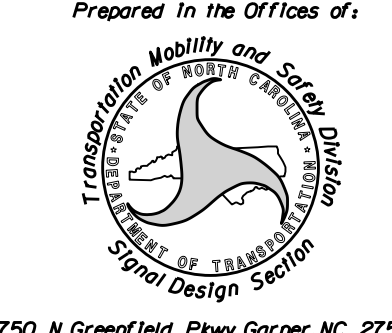
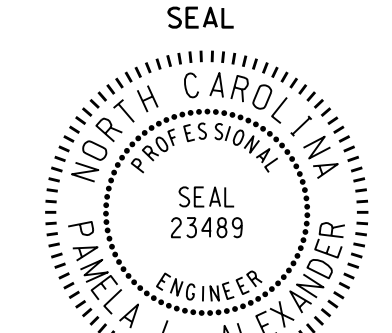
Recommended Number of Turns

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

	<h3>Typical Signal Loop Locations</h3>		
	PLAN DATE: January 2015 PREPARED BY: PLA	REVIEWED BY: JPG REVIEWED BY:	
REVISIONS:		INIT. DATE:	DocuSigned by: P. Alexander 1/30/2015 DATE:
SIG. INVENTORY NO.			

