



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

April 1, 2011

ROADWAY DESIGN UNIT	
APR 05 2011	
<input type="checkbox"/> BENNETT	<input type="checkbox"/> STEPHENSON
<input checked="" type="checkbox"/> EUGENE A. CONTE JR.	<input type="checkbox"/> SECRETARY
<input checked="" type="checkbox"/> NIGHT	<input type="checkbox"/> GROC
<input checked="" type="checkbox"/> CALVE	<input type="checkbox"/> JACOB
<input checked="" type="checkbox"/> HENDERSON	<input type="checkbox"/> SPEER
<input checked="" type="checkbox"/> HARRIS	<input type="checkbox"/> THOMAS
<input checked="" type="checkbox"/> P.Y.	<input type="checkbox"/> WALLS
REVIEW/DISCUSS WITH	
PREPARE REPLY FOR	SIGNATURE

cc: Memorandum To: Mr. Jay Bennett, PE, State Roadway Design Engineer  
Division Engineers,  
Mr. Kevin Lacy, PE, State Traffic Engineer

From: R. A. Garris, PE  
State Contract Officer

Subject: NCDOT Standard Drawings for Curb Ramps and Handicap Access

Based on concerns brought to our attention, it has been determined that modifications are needed for our current "Standard Drawings for Handicap Accessible Curb Ramps" to bring them into compliance with the latest ADA requirements. Our local FHWA representative has provided us with modifications for our existing drawings and he has also provided additional details that may be used for NCDOT projects. These changes will take effect and be included in all projects beginning with the August 16, 2011 letting. The details will be placed in all projects with curb and gutter as "Details in Lieu of Standards". Contact Joel Howerton, PE with the Contract Standards and Development Unit for these details.

The following changes have been made to Standard Drawing number 848.05 and 848.06:

- The drawings names have changed from "Wheelchair Ramps" to "Curb Ramps".
- 848.05 will only be used for projects that have proposed curb and gutter.
- 848.06 will be used for projects that have existing curb and gutter or existing Curb Ramps that need to be retrofitted with Detectable Warning Domes.
- The landing areas at the top of the ramps in our current drawings are inadequate. They have been increased.
- The ramp width has increased to 4' to match the landing width.
- Ramp side slopes have increased from 12:1 to 10:1.

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
CONTRACT STANDARDS AND DEVELOPMENT UNIT  
1591 MAIL SERVICE CENTER  
RALEIGH NC 27699-1591

TELEPHONE: 919-250-4128  
FAX: 919-250-4119  
WEBSITE: WWW.NCDOT.ORG

LOCATION:  
CENTURY CENTER COMPLEX  
ENTRANCE B-2  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC 27610

There may be situations on projects where the Standard Drawings will not work. In those instances, contact Joel Howerton, PE in the Contract Standards and Development Unit. Some examples are as follows:

- In areas with limited right of way.
- Mid Block crossings.
- Small radius intersections.
- Urban areas with narrow sidewalks.

Changes to the Pay Items have also been made. The new pay item that will be used until the new Standard Drawings and Standard Specifications are published for the January 2012 letting is as follows:

- 2759000000-N SP      Generic Paving Item      EA  
   Concrete Curb Ramps

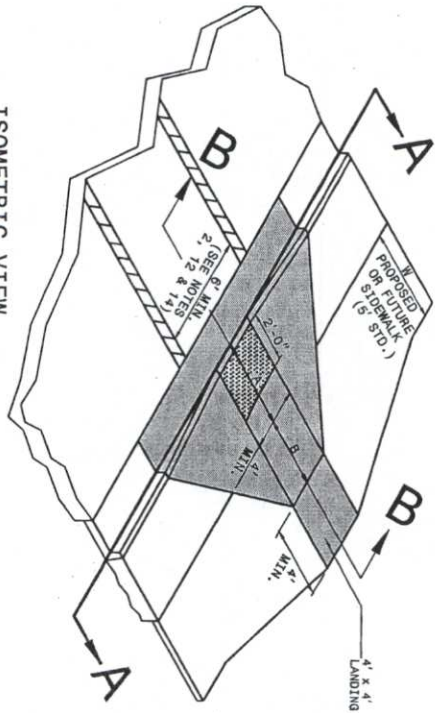
RAG/jsh

Attachments

- CC: Mr. Ron Hancock, PE (w/ attachment)  
Mr. Chris Peoples, PE (w/ attachment)  
Mr. R. A. Garris, PE (w/ attachment)  
Ms. Cynthia Perry, PE (w/ attachment)  
Mr. Brad Hibbs, PE, FHWA (w/ attachment)  
Mr. Roger Rochelle, PE (w/ attachment)

1-12

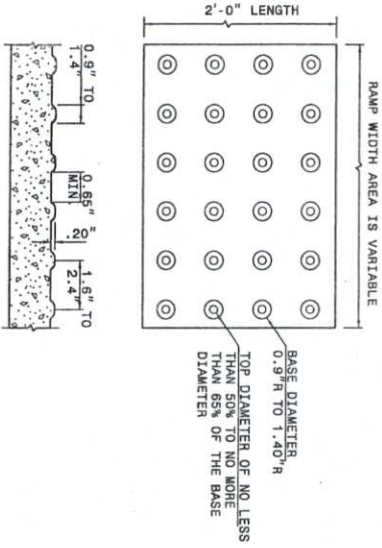
SHEET 1 OF 3  
848.05



ISOMETRIC VIEW

PAY LIMITS FOR CURB RAMP

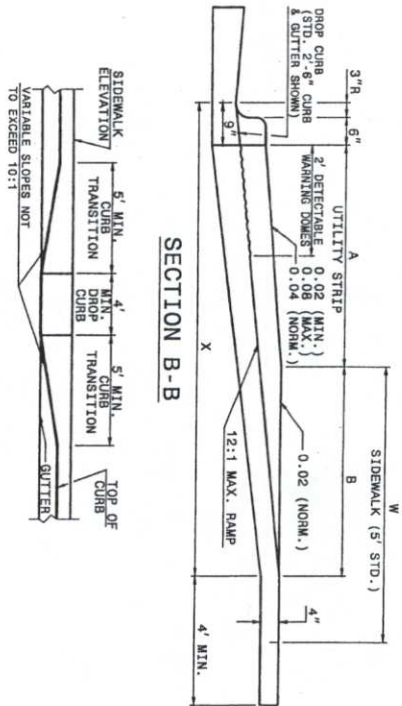
- NOTES:
1. DETECTABLE WARNING DOMES WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP.
  2. DETECTABLE WARNING DOMES SHALL BE SET AT LEAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



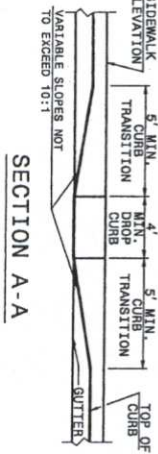
DETECTABLE WARNING DOMES

W	A	W+A+9"	X	B
5'	0.0'	5.8'	5.8'	5.0'
6'	0.0'	6.8'	6.8'	6.0'
7'	0.0'	7.8'	7.3'	6.5'
8'	0.0'	8.8'	7.3'	6.5'
5'	2.0'	7.8'	7.8'	5.0'
5'	2.5'	8.3'	8.1'	4.8'
5'	3.0'	8.8'	8.3'	4.4'
5'	3.5'	9.3'	8.4'	4.1'
5'	4.0'	9.8'	8.6'	3.8'
5'	4.5'	10.3'	8.7'	3.4'

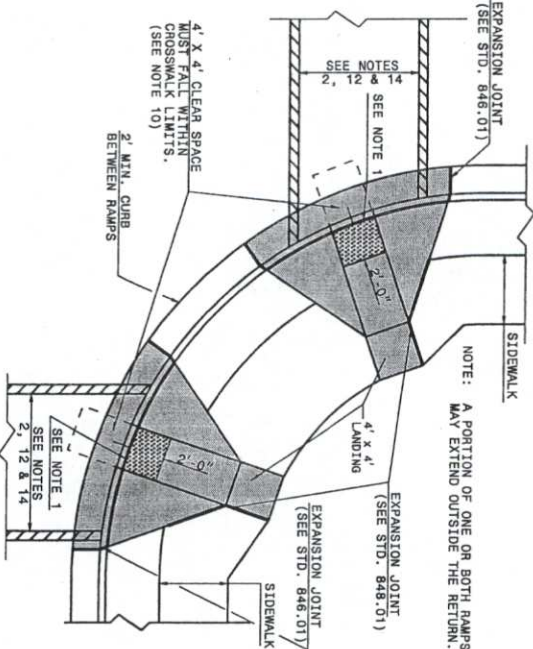
B = X - (A+9")  
 B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.  
 \* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.  
 \*\* BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPES 0.04.



SECTION B-B



SECTION A-A



PLAN VIEW

DUAL RAMPS  
ANY RADIUS  
2' MIN. FLOOR WIDTH

1-12

SHEET 1 OF 3  
848.05

1-12

ENGLISH STANDARD DRAWING FOR

**CURB RAMPS**

NOTES

- NOTES:
1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
  2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.
  3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
  4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
  5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.
  6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
  7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
  8. CONSTRUCT THE RUNNING SLOPE OF THE RAMP 8.33% MAXIMUM.
  9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
  10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
  11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
  12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5'x5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
  13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
  14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
  15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
  16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
  17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.
  18. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

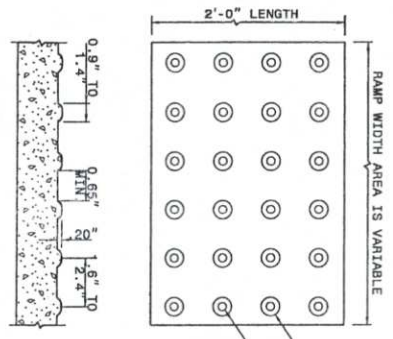
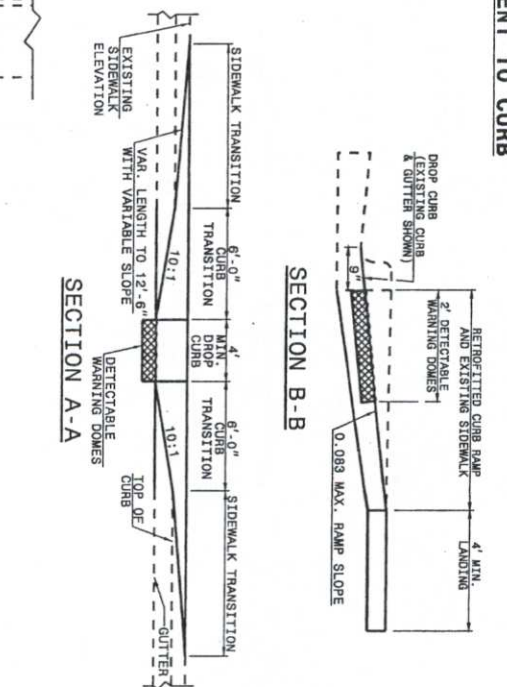
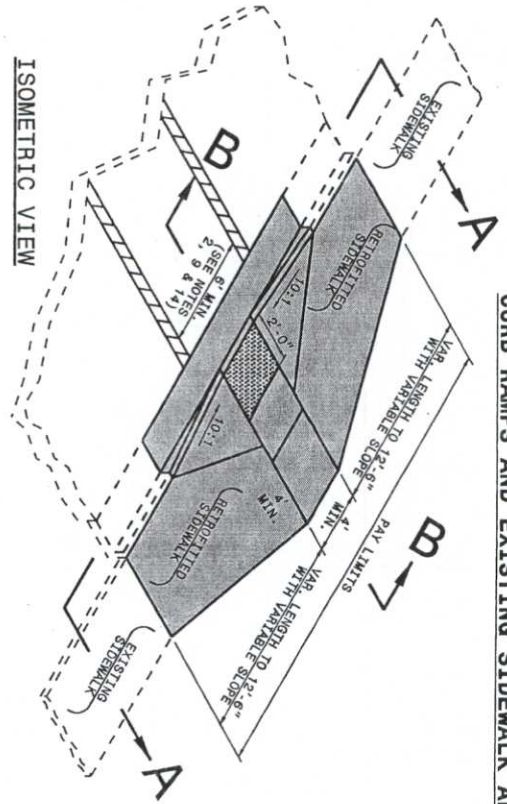
1-12

ENGLISH STANDARD DRAWING FOR

**CURB RAMPS**

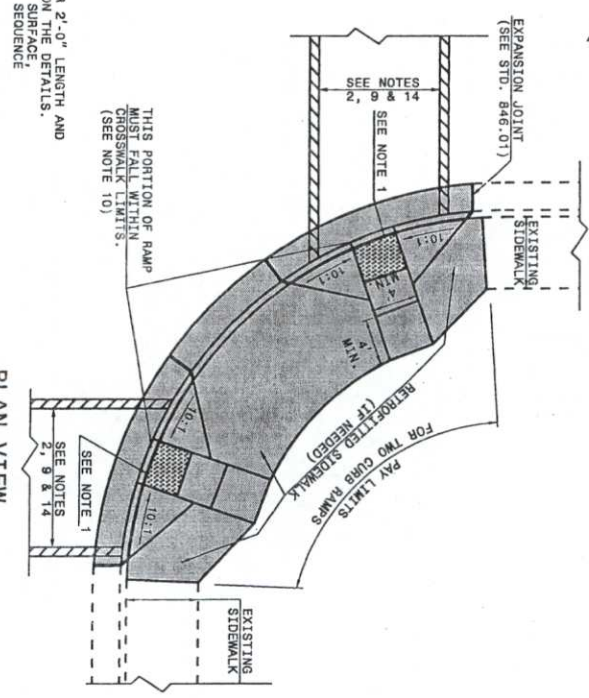
NOTES

**CURB RAMPS AND EXISTING SIDEWALK ADJACENT TO CURB**



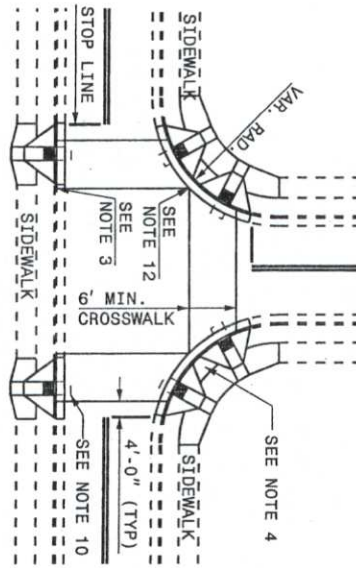
- NOTES:
1. PLACE DETECTABLE WARNING DOMES TO COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
  2. OBTAIN VISIBLE CONTRAST WITH ADJOINING SURFACE EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

**DETECTABLE WARNING DOMES**

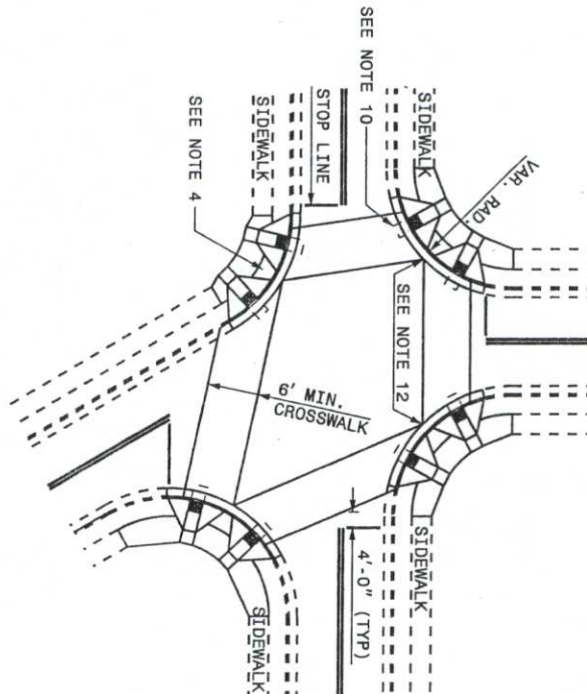


**PLAN VIEW**

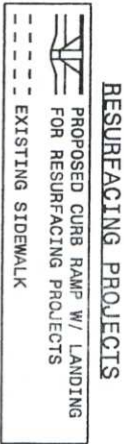
**CURB RAMPS AND EXISTING SIDEWALK**



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS,  
PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



DETAIL SHOWING TYPICAL LOCATION OF CURB  
RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES



1-12

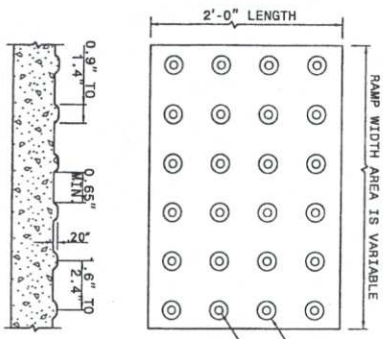
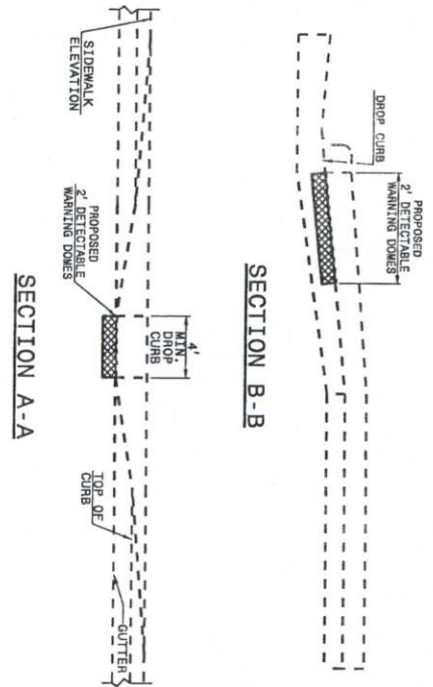
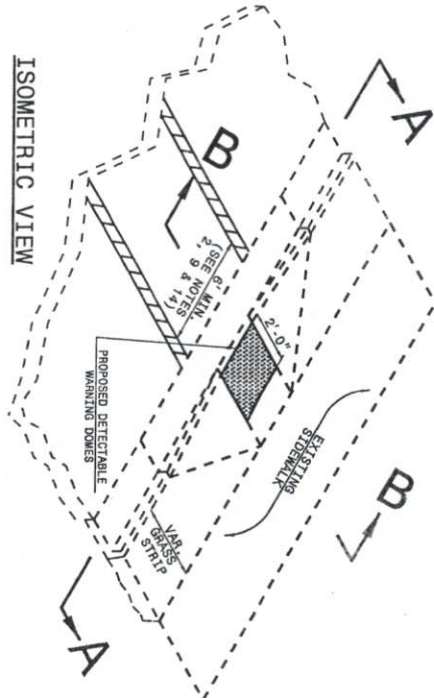
**CURB RAMP AND EXISTING SIDEWALK**

NOTES:

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9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
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14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.
18. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

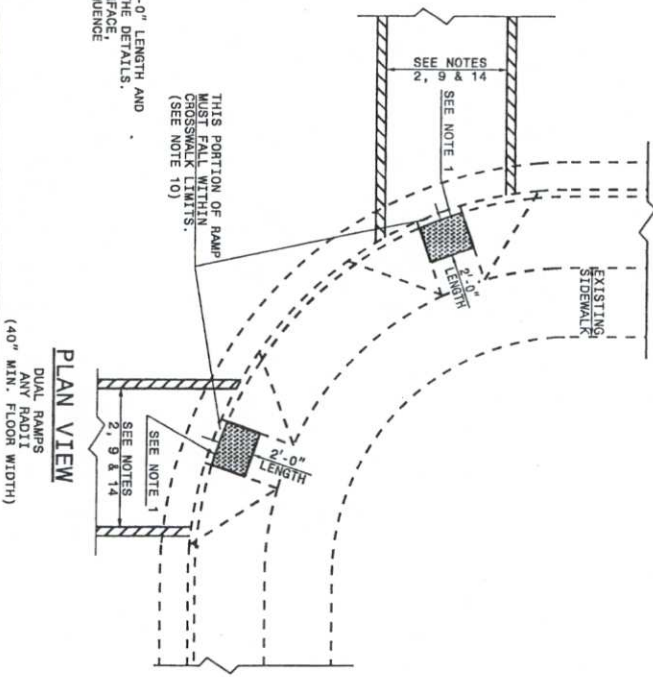
1-12

**RETROFITTING DETECTABLE WARNING DOMES ONTO EXISTING CURB RAMP**



NOTES:

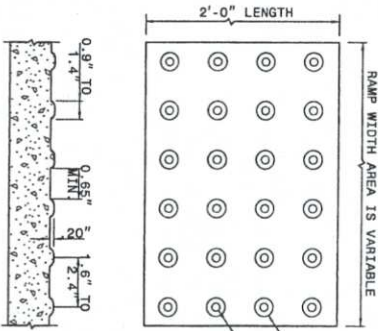
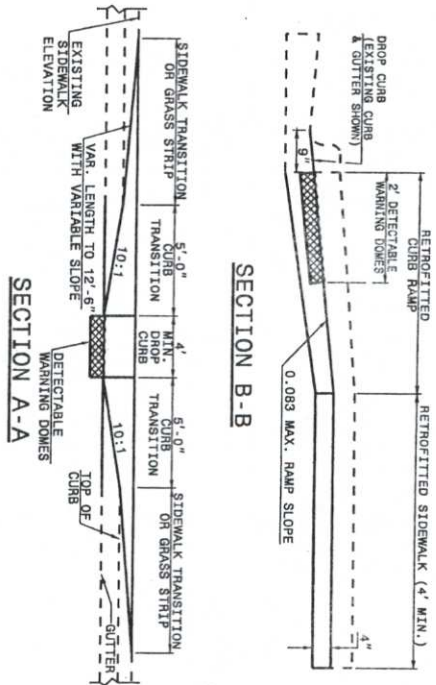
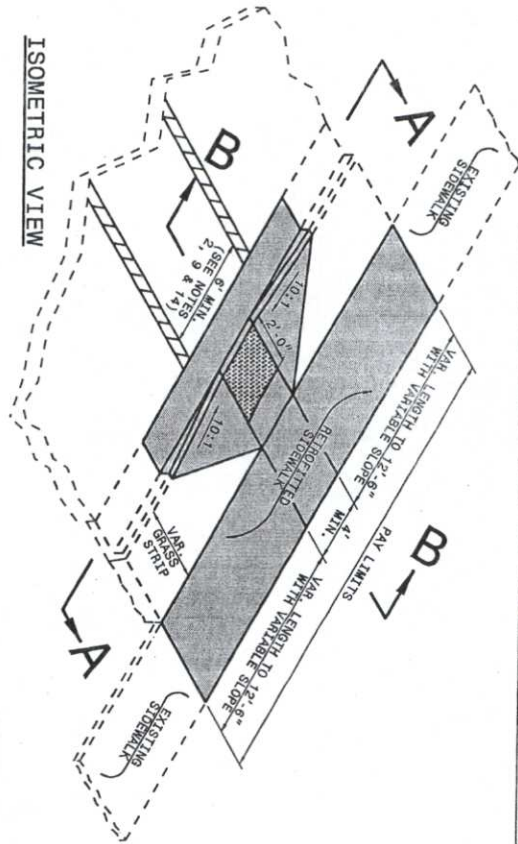
1. PLACE DETECTABLE WARNING DOMES TO COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN VISIBLE CONTRAST WITH ADJOINING SURFACE. USE LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DUAL RAMP (140" MIN. FLOOR WIDTH)



**CURB RAMP AND EXISTING SIDEWALK WITH GRASS STRIP**

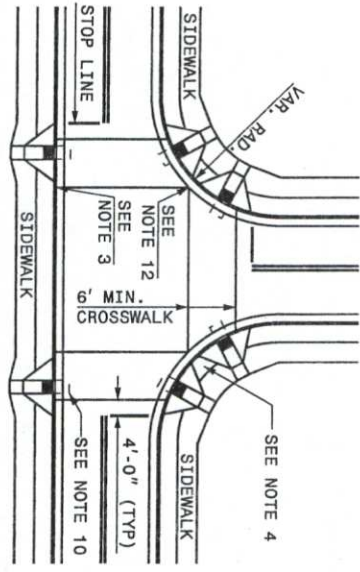


**DETECTABLE WARNING DOMES**

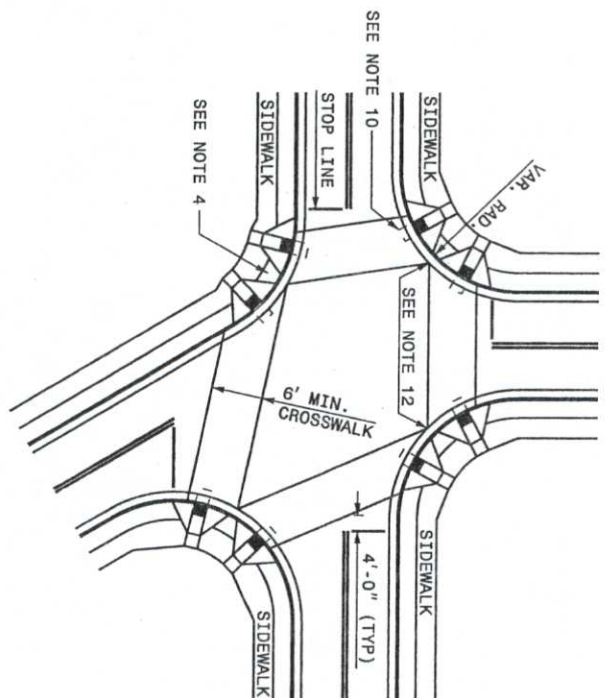
- NOTES:
1. PLACE DETECTABLE WARNING DOMES TO COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
  2. EITHER LIGHT-ON-DAK OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

**PLAN VIEW**

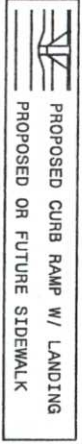
DUAL RAMPS  
ANY RADIUS  
(40" MIN. FLOOR WIDTH)



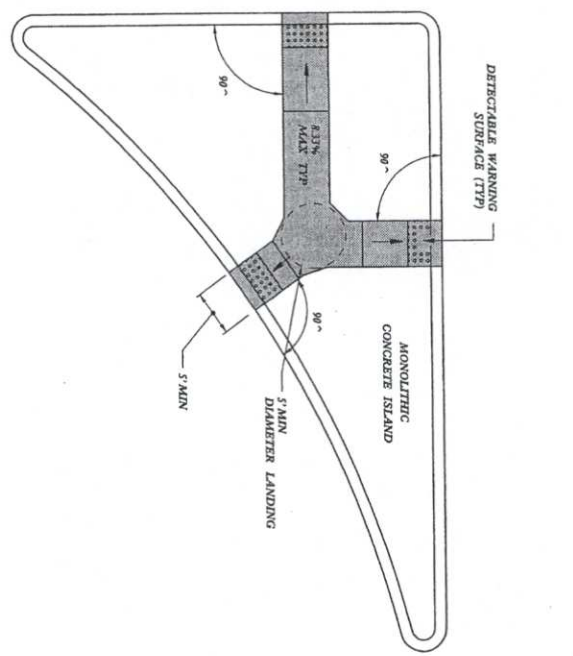
DETAIL SHOWING TYPICAL LOCATION OF CURB RAMP,  
PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



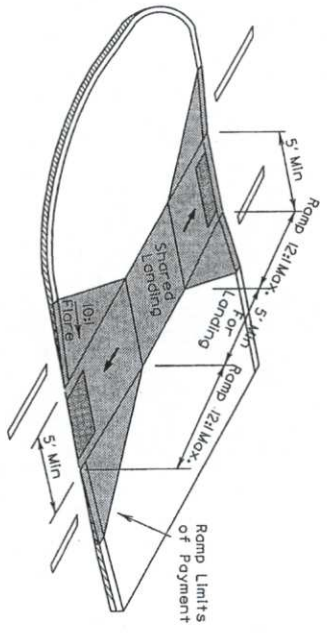
DETAIL SHOWING TYPICAL LOCATION OF CURB  
RAMP, PEDESTRIAN CROSSWALKS AND STOP LINES  
DUAL RAMP RADI



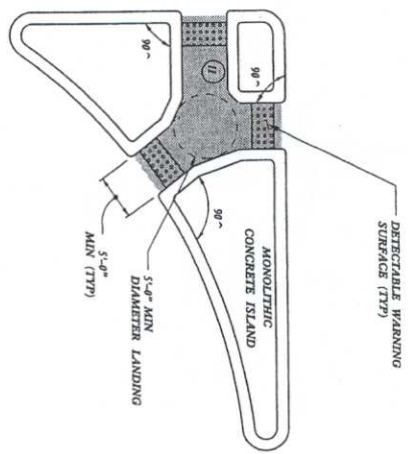
ALLOWABLE LOCATIONS  
DUAL RAMP RADI.....ANY



**LARGE ISLAND  
CURB RAMPS**



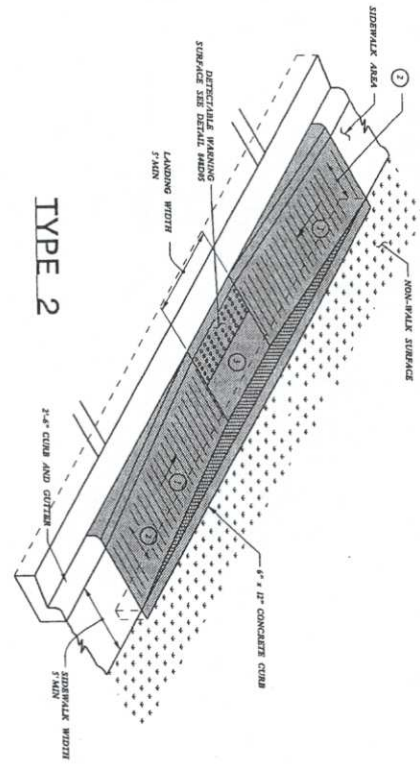
**MEDIAN ISLAND  
CURB RAMPS**



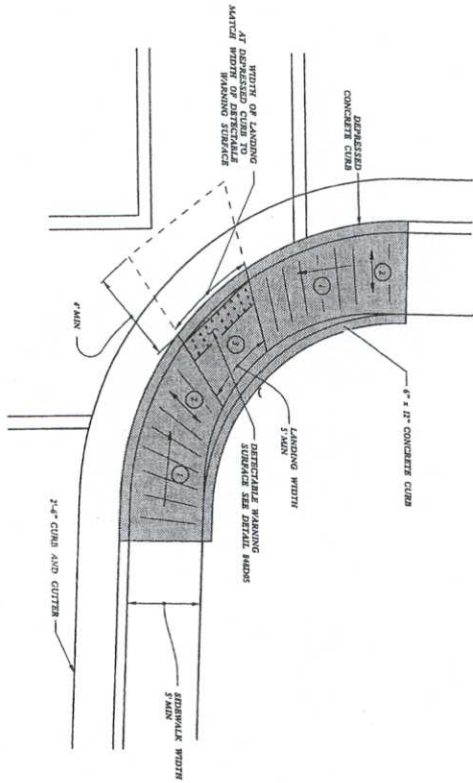
**SMALL ISLAND  
WITH CUT THROUGH**

-SEE ROADWAY DETAIL DRAWING #800 FOR DETECTABLE WARNING SURFACE  
 AND FOR RAMP NOTES.  
 -SEE ROADWAY STANDARD DRAWING #824 FOR CONCRETE ISLAND DIMENSIONS.

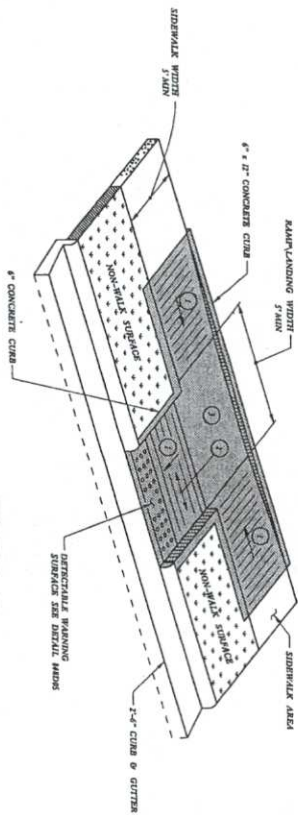
CONTRACT STANDARDS AND DEVELOPMENT UNIT OFFICE 819-707-6550 FAX 819-250-4119
Median or Turn Lane Islands <b>CURB RAMPS</b>
ORIGINAL BY: J.S. JOHNSON DATE: 7/7/11 MODIFIED BY: DATE: CHECKED BY: DATE:



TYPE 2



TYPE 2A



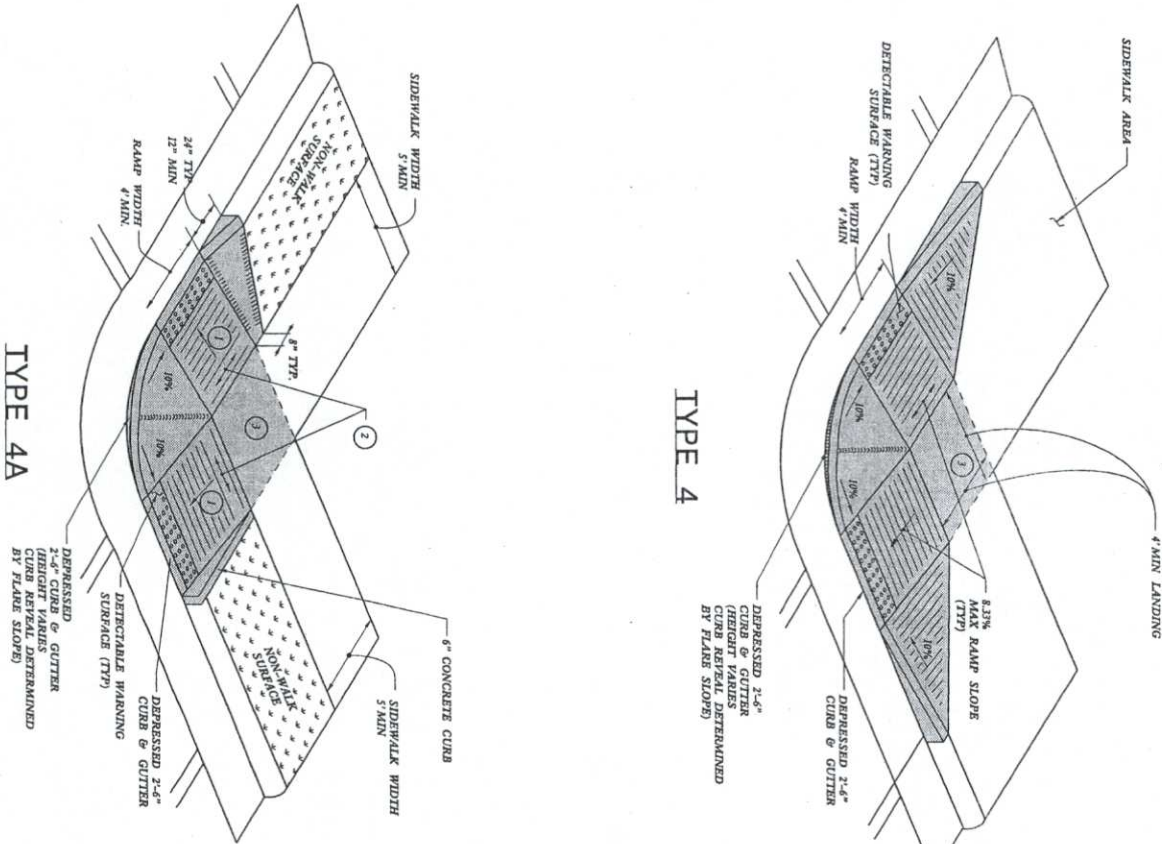
TYPE 3

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMP REQUIRE A 1'-0" MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE TO DRAIN TO CURB.

PAY LIMITS FOR CURB RAMP

REFER TO ROADWAY STANDARD DRAWING NUMBER 8405 SHEET 3 OF 3 FOR ALL RAMP NOTES

CONTRACT STANDARDS AND DEVELOPMENT UNIT	
OFFICE 919-707-8850	FAX 919-250-4119
Curb Ramps	
Parallel Ramps	
ORIGINAL BY: J.S. JOHNSON DATE: 7/7/11	
MODIFIED BY:	
DESIGNED BY:	
CHECKED BY:	
DATE:	
SCALE:	

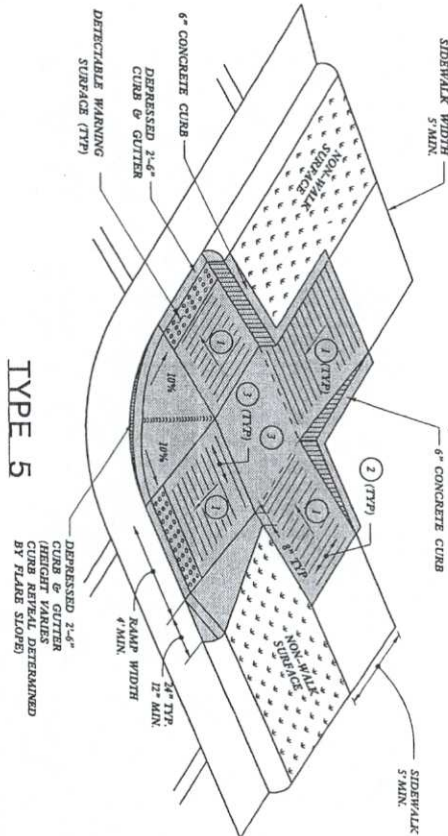


**TYPE 4A**

DEPRESSED 2'-6\"/>

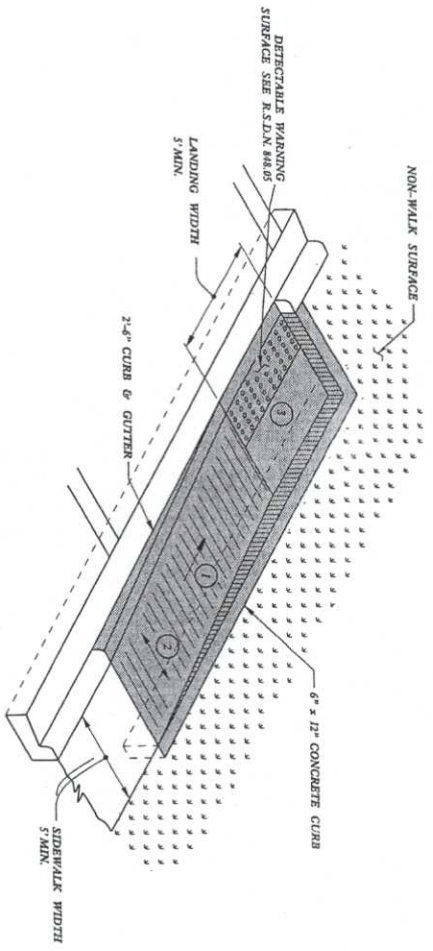
REFER TO ROADWAY STANDARD DRAWING NUMBER 8486 SHEET 3 OF 3 FOR ALL RAMP NOTES

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



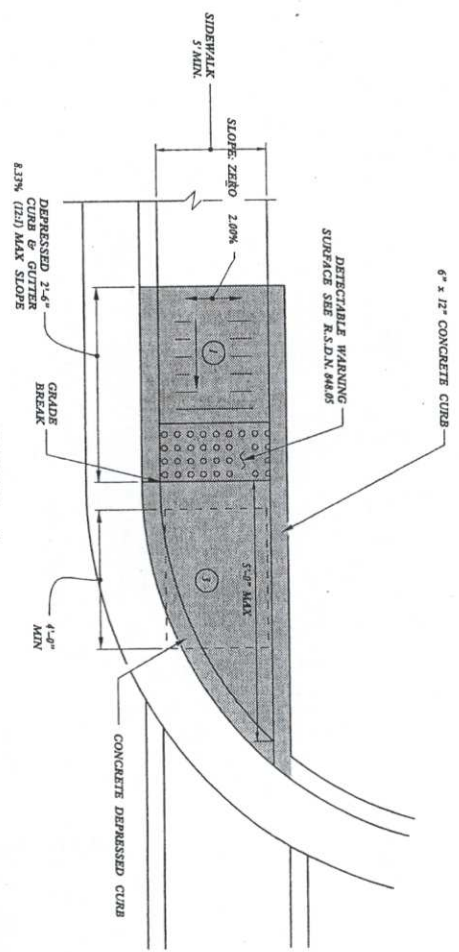
**TYPE 5**

PROJECT NUMBER: 410	SHEET NO:
PAY LIMITS FOR CURB RAMP	
CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-0850 FAX 919-250-4119 <b>CURB RAMPS</b> Shared Landing	
ORIGINAL BY: J.S. HOWERTON DATE: 7/1/11	
MODIFIED BY: DATE:	
FILE SPEC: 3486(2012)CSD(1)SHEET 3 OF 3	



TYPE 1A

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 GROSS 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 1

REFER TO ROADWAY STANDARD DRAWING NUMBER 666.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

PAY LIMITS FOR CURB RAMP

CONTRACT STANDARDS AND DEVELOPMENT UNIT <b>CURB RAMPS</b> Directional Ramps	
ORIGINAL BY: J.S. HOWERTON CHECKED BY: _____ DATE: _____ FILE SPEC: 54887830/2010/08/08/20100808.dwg	DATE: 7/17/11 OFFICE: 819-767-8850 FAX: 819-550-4119