



COLORADO

Department of
Transportation

Curb Ramps for Accessibility



Statewide Curb Ramp Accessibility Program

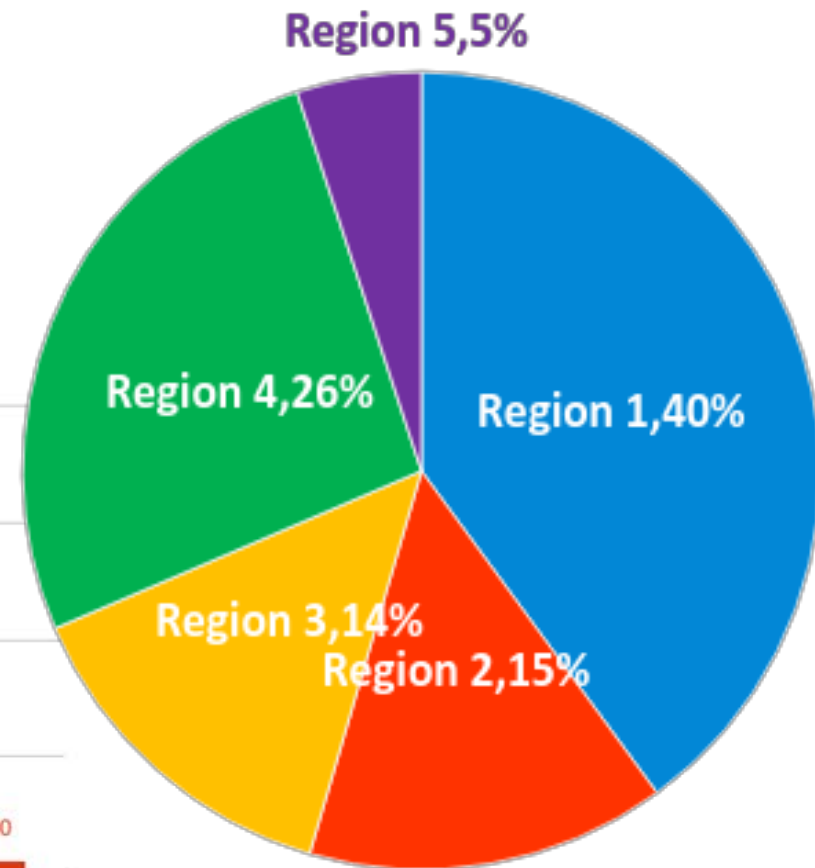
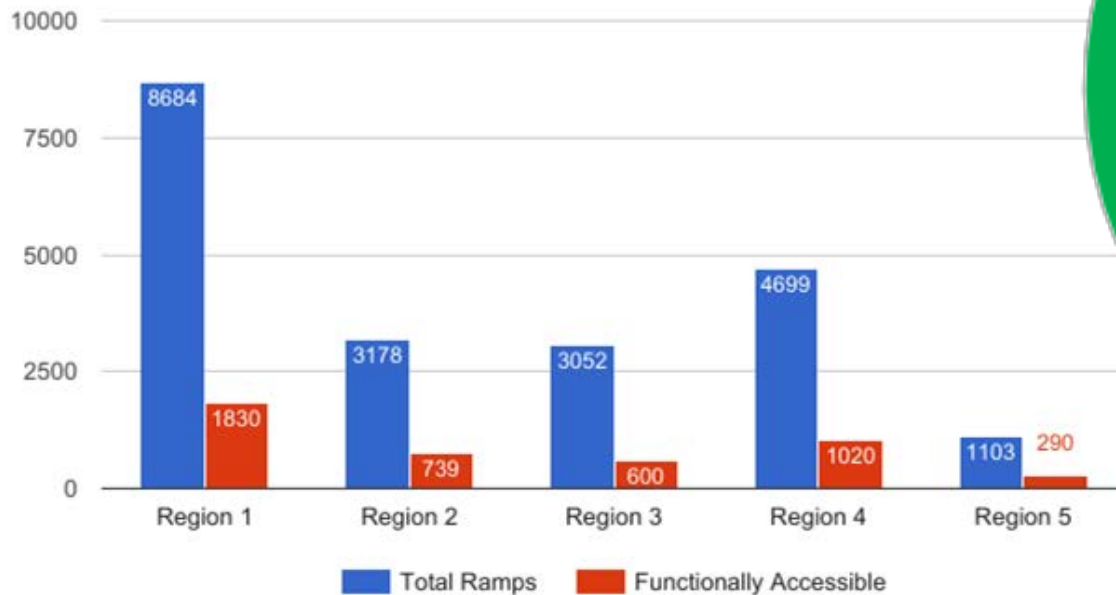
- Federal requirement - **ADA**
- Designing and inspecting to **PROWAG** standards
- CDOT taking aggressive statewide approach to becoming **functionally accessible**
- Prioritizing - **ramps that are required but do not exist** and those with **running slope >12.5%**



Regional Distribution

Curb Ramp Distribution by Region

Functionally Accessible Curb Ramps by Region





Region 5 Prioritization Plan

Approach

- Concentrate efforts in: survey, ROW acquisition, design, and construction for Tier I and Tier II / Category Green ramps in 5 key urban areas
- Combine ramps with no ROW concerns into Design Build projects; combine ramps with ROW acquisition concerns into Design Bid Build projects
- Solicit local agencies for interest in partnering on projects

Goals

- At least two ESB projects under construction in FY18
- 4 projects under construction in FY17 addressing 67 ramps
- 2 projects under construction in FY18 addressing 42 ramps
- 5 DB and DBB packages in FY19 addressing 252 ramps
- Local agency projects as feasible



Changes to CDOT Processes

- More Rigorous **Inspections**
 - Accountability for functional accessibility
- New **Reporting and Data Management**
 - Survey123 for ArcGIS linked to statewide **inventory** database
- New CDOT **Documentation Process**
 - Design Exception Variance Request (Form 464) and Curb Ramp Variance Support Document



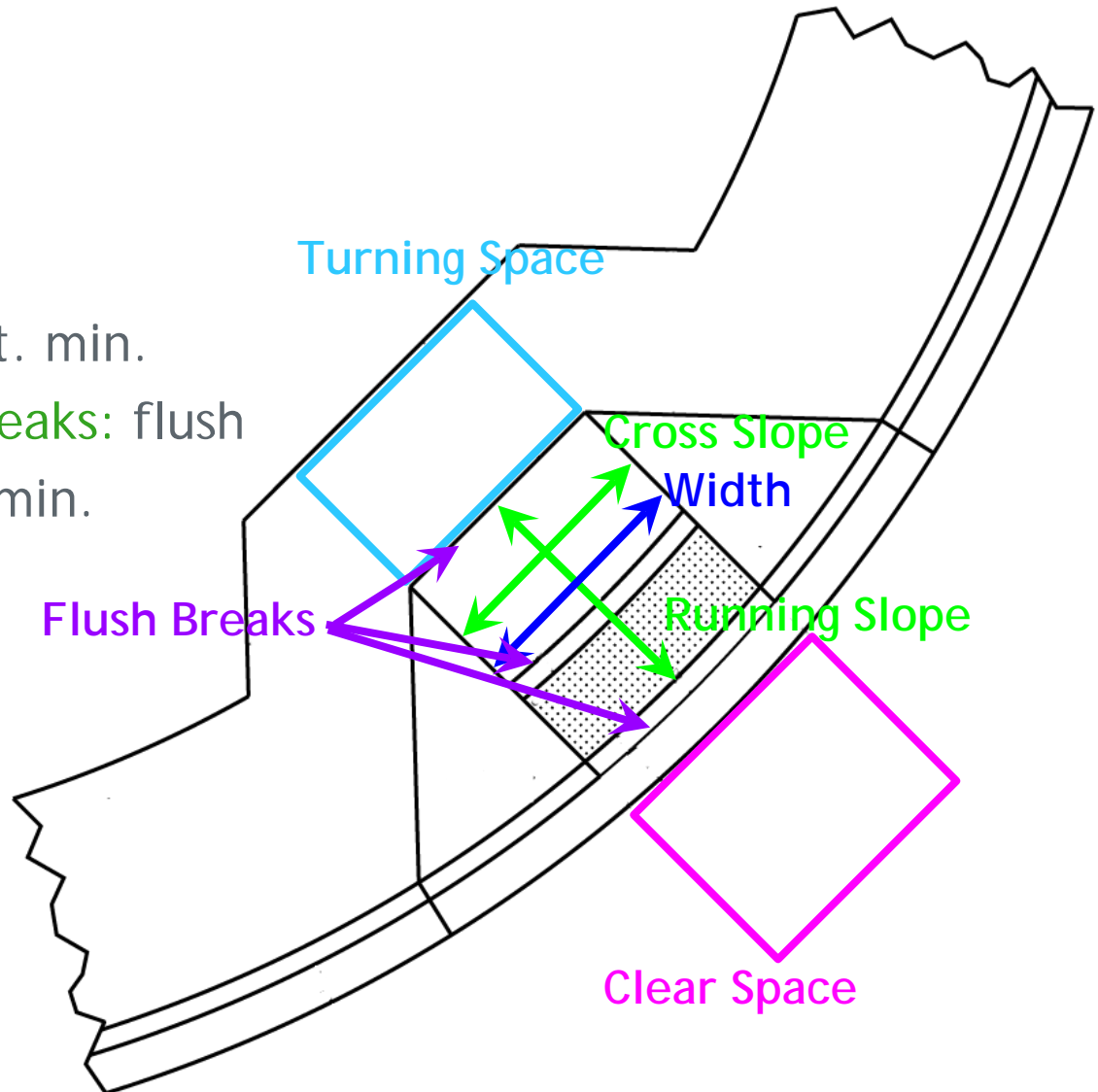
Quality Assurance

- PE/PM reviews measurements
 - Works with Contractor to resolve issues
 - Add Form 464 Design Variance and Curb Ramp Variance Support Document if necessary
- CRBRC reviews non-compliant measurements that *don't* have a Design Variance and Support Document



Functional Accessibility

- Running Slope: 8.3% max.
- Cross Slope: 2% max.
- Width: 4 ft. min.
- Turning Space: 4 ft. x 4 ft. min.
- Ramp joints and grade breaks: flush
- Clear Space: 4 ft. x 4 ft. min.
(diagonal ramps)

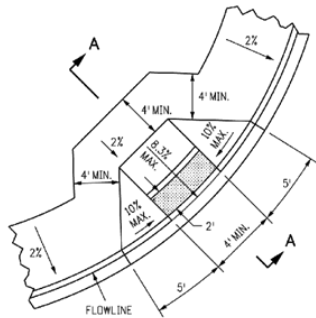




Curb Ramp M Standards (M-608-1)

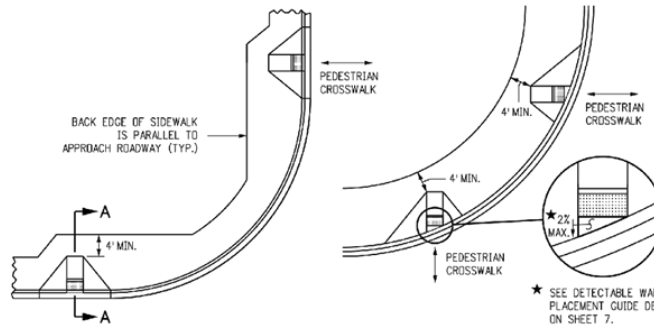
GENERAL NOTES

1. THE DETECTABLE WARNINGS SHALL BE INSTALLED AT SIDEWALK TO STREET TRANSITIONS. THEY SHALL HAVE A TRUNCATED DOME SURFACE. THE DOMES SHALL BE IN A SQUARE GRID PATTERN AND ALIGNED WITH PEDESTRIAN TRAFFIC.
2. ALL DETECTABLE WARNING SURFACES SHALL START A MINIMUM OF 6 INCHES FROM THE FLOWLINE OF THE CURB AND NOT BE MORE THAN A MAXIMUM OF 8 INCHES FROM ANY POINT ON THE FLOWLINE OF THE CURB, WITH EXCEPTION FOR TYPES 1B MODIFIED AND 3B MODIFIED CURB RAMP AS THIS DIMENSION MAY BE GREATER THAN 8 INCHES ON ONE SIDE OF THE RADIUS.
3. THE RAMP SLOPE AND DETECTABLE WARNING SURFACE SHALL BE 8.3% OR FLATTER.
4. TOLERANCE LIMITS ON THE RAMP RUNNING SLOPE AND FLARED SIDE SLOPES SHALL BE +0.5% MAXIMUM. THE DEPARTMENT WILL MEASURE THE SLOPES AND THOSE EXCEEDING THE MAXIMUM TOLERANCE WILL NOT BE ACCEPTED.
5. THE MINIMUM WIDTH FOR SIDEWALK IS 4 FEET.
6. DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, OR OTHER OBSTRUCTIONS SHALL NOT BE INSTALLED IN THE CURB RAMP OR TURNING SPACE AREAS.
7. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB SHALL BE INCLUDED IN THE BID PRICE OF THE CONCRETE CURB RAMP.
8. IF THE PLACEMENT OF THE PEDESTRIAN PUSH BUTTON ASSEMBLY ON A TRAFFIC SIGNAL MAST POLE WILL NOT BE WITHIN REACH (10 INCHES OR LESS UNOBSTRUCTED) OF ALL PEDESTRIANS (IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT), THEN A SEPARATE PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA) SHALL BE INSTALLED WITHIN ADA REACH RANGES. THE PPBPA SHALL MEET THE PROVISIONS FOUND IN "SECTION 4E.08 THROUGH 4E.13 - PEDESTRIAN DETECTORS" OF THE 2009 MUTCD MANUAL WITH REVISIONS 1 AND 2.
9. DIAGONAL CURB RAMP (ON THE APEX) ARE NOT PREFERRED IN NEW CONSTRUCTION. A SINGLE DIAGONAL CURB RAMP (ON THE APEX) WILL ONLY BE PERMITTED DURING RECONSTRUCTION OR ALTERATION WHERE PHYSICAL OR SITE CONSTRAINTS PREVENT TWO CURB RAMP FROM BEING INSTALLED. THE ENGINEER SHALL PROVIDE APPROVED JUSTIFICATION DOCUMENTATION (CDOT CURB RAMP DESIGN VARIANCE REQUEST FORM). ALL CURB RAMP INSTALLED ON THE APEX MUST MEET THE STANDARDS AS DEFINED IN M-608-1.
10. CURB RAMP (EXCLUDING FLARED SIDES OR BLENDED TRANSITIONS) SHALL BE WHOLLY CONTAINED WITHIN THE WIDTH OF THE CROSSWALK AND/OR THE PEDESTRIAN STREET CROSSING THEY SERVE.
11. ALL CURB RAMP JOINTS AND GRADE BREAKS SHALL BE FLUSH (0" ± 1/4"). THE JOINT BETWEEN THE ROADWAY SURFACE AND GUTTER PAN SHALL BE FLUSH.
12. THE CONTRACTOR SHALL VERIFY REMOVAL LIMITS ARE SUFFICIENT TO PROVIDE POSITIVE DRAINAGE, MAINTAIN EXISTING DRAINAGE PATTERNS, AND AVOID PONDING IN THE FINAL CONFIGURATION.
13. TO AVOID CHASING GRADE INDEFINITELY WHEN TRAVERSING THE HEIGHT OF CURB, THE RAMP LENGTH SHALL NOT EXCEED 15 FEET. ADJUST THE RAMP SLOPE AS NEEDED TO PROVIDE ACCESS TO THE MAXIMUM EXTENT TECHNICALLY FEASIBLE.
14. THE CHANGE IN GRADE AT THE BOTTOM OF THE CURB RAMP AND ADJOINING ROAD SURFACE SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 13.33%. THE COUNTER SLOPE OF THE GUTTER OR ROAD AT THE FOOT OF A CURB RAMP, TURNING SPACE, OR BLENDED TRANSITION SHALL NOT EXCEED 5.0%.
15. FLARED SIDE SLOPES MAY EXCEED 10% ONLY WHERE THEY ABUT A NON-WALKABLE SURFACE OR THE ADJACENT CIRCULATION PATH IS BLOCKED.
16. THE STANDARD TURNING SPACE IS 4 FEET BY 4 FEET. WHERE THE TURNING SPACE IS CONSTRAINED, THE TURNING SPACE SHALL BE 4 FEET MINIMUM BY 5 FEET MINIMUM. THE 5 FOOT DIMENSION SHALL BE PROVIDED IN THE DIRECTION OF THE RAMP RUN.



CURB RAMP TYPE 1A

SEE NOTE 9.

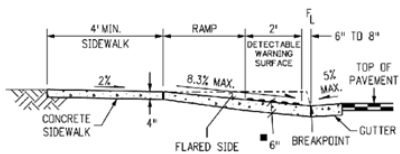


CURB RAMP TYPE 1B

CURB RAMP TYPE 1B MODIFIED

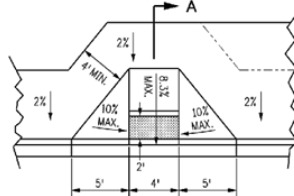
NOTE: GRADE BREAKS SHALL NOT BE PERMITTED IN RAMP, TURNING SPACES, AND SURFACE SLOPES.

* SEE DETECTABLE WARNING PLACEMENT GUIDE DETAIL ON SHEET 7.



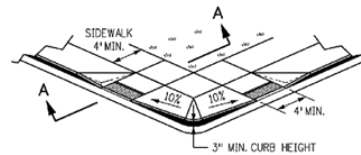
SECTION A-A

INCREASES TO 8" FOR BRICK PAVERS.

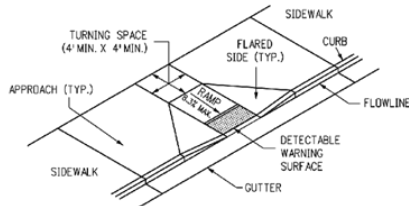


CURB RAMP TYPE 1B DETAIL

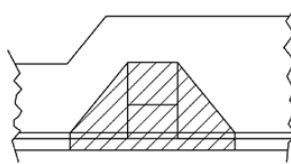
MAY BE USED IN MID-BLOCK.



CURB RAMP TYPE 1B OR 3B REDUCED CURB HEIGHT

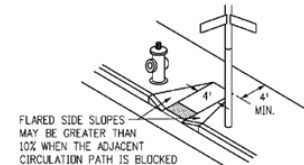


ISOMETRIC VIEW



RAMP PAY AREA

FOR CURB RAMP TYPES 1A AND 1B.



STEEP FLARED SIDE SLOPES

SEE NOTE 15.

PERCENT SLOPE	1.0%	2.0%	5.0%	7.1%	8.3%	10.0%
EQUIVALENT SLOPE	100:1	50:1	20:1	14:1	12:1	10:1

SLOPE TABLE

Computer File Information	
Creation Date: 07/04/12	Initials: uBK
Last Modification Date: 02/23/17	Initials: LTA
Full Path: www.coloradodot.info/business/designsupport/	
Drawing File Name: 60801010.dgn	
CAD Ver: MicroStation V8	Scale: Not to Scale Units: English

Sheet Revisions	
Date:	Comments
02/23/17	Added and revised the Curb Ramp details and general notes.

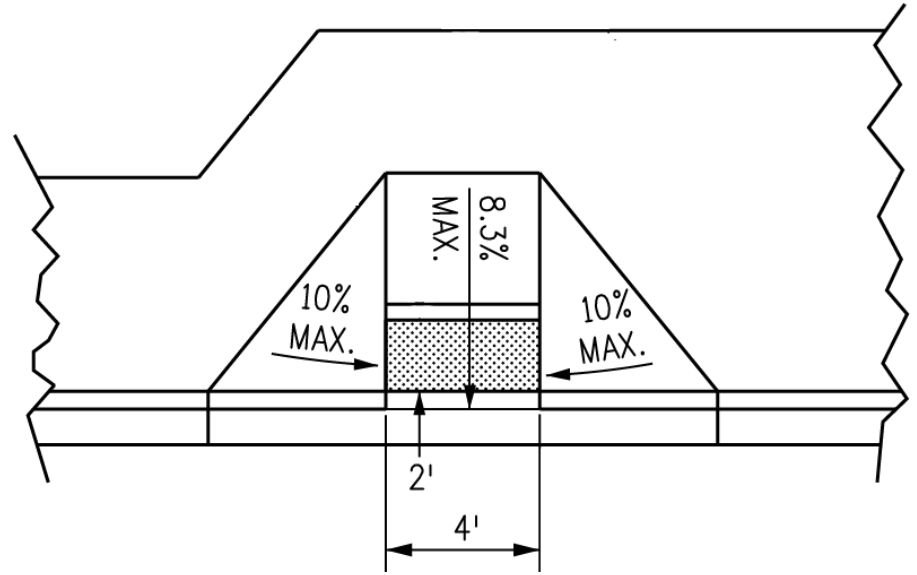
Colorado Department of Transportation
 4201 East Arkansas Avenue
 Denver, Colorado 80222
 Phone: (303) 757-9021
 Fax: (303) 757-9820
Project Development Branch JBK/LTA

CURB RAMPS
 Issued By: Project Development Branch on July 4, 2012

STANDARD PLAN NO.
M-608-1
Sheet No. 1 of 10



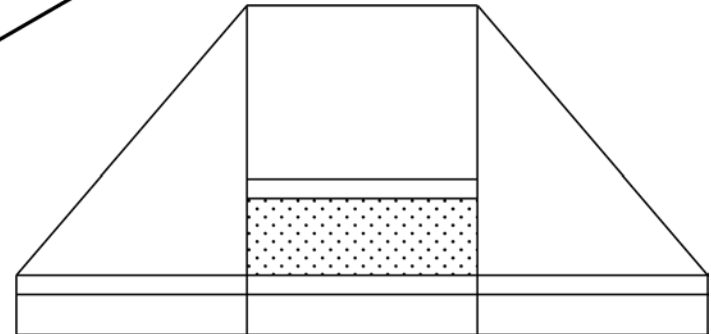
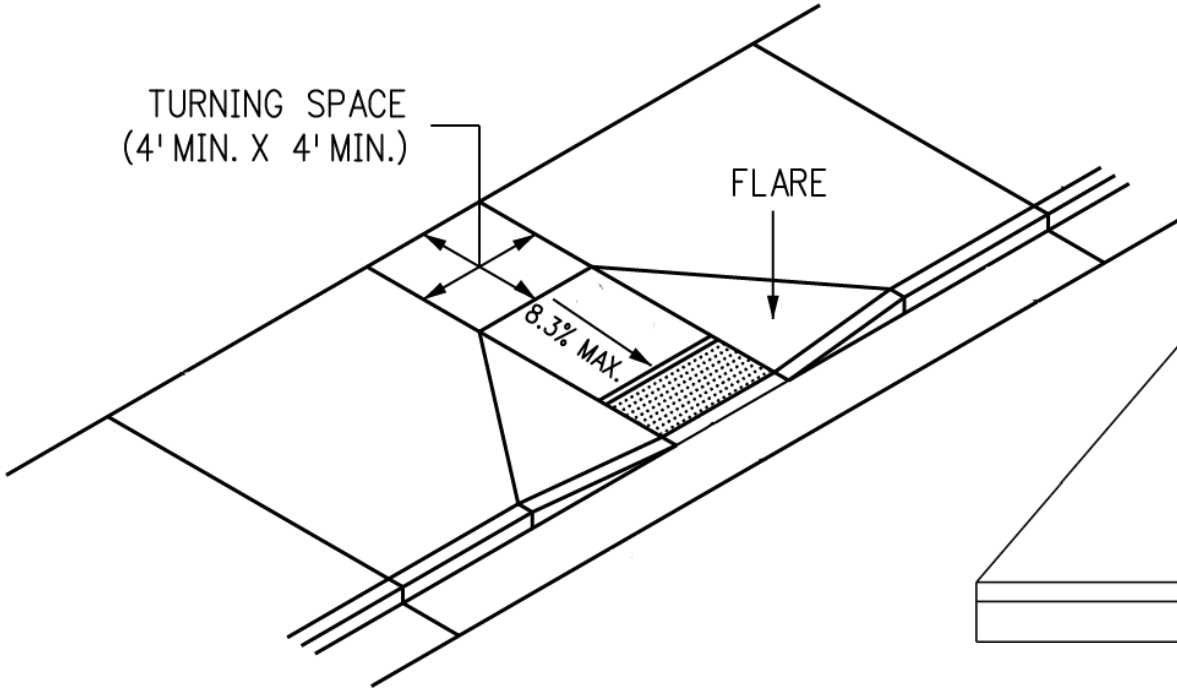
Type 1



TURNING SPACE
(4' MIN. X 4' MIN.)

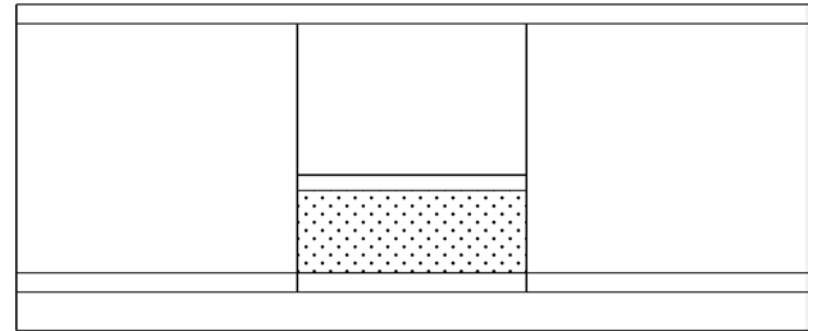
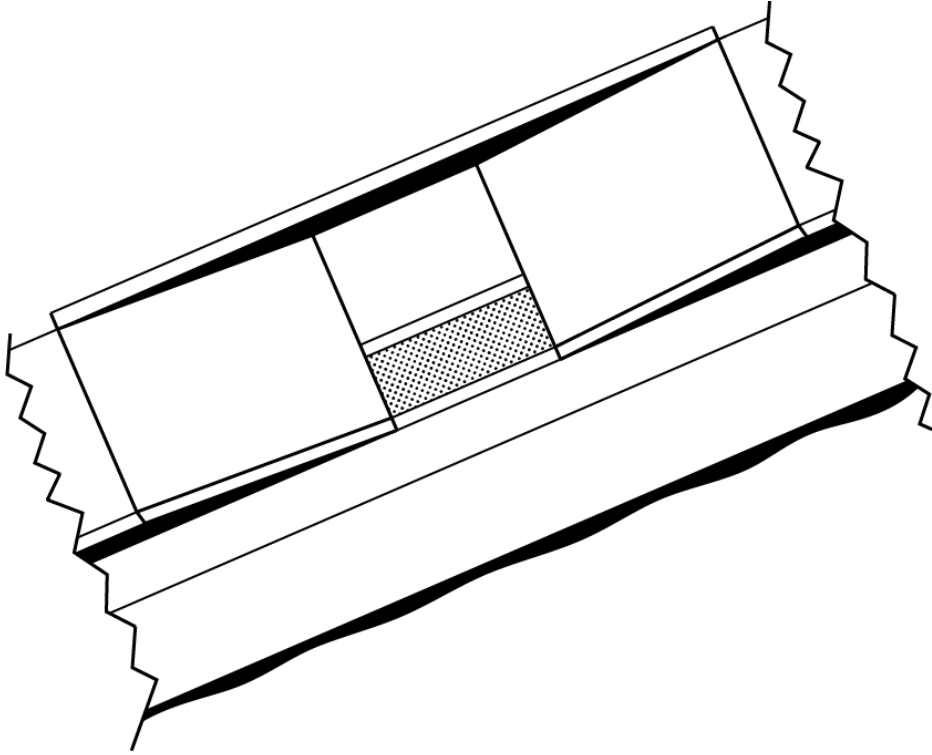
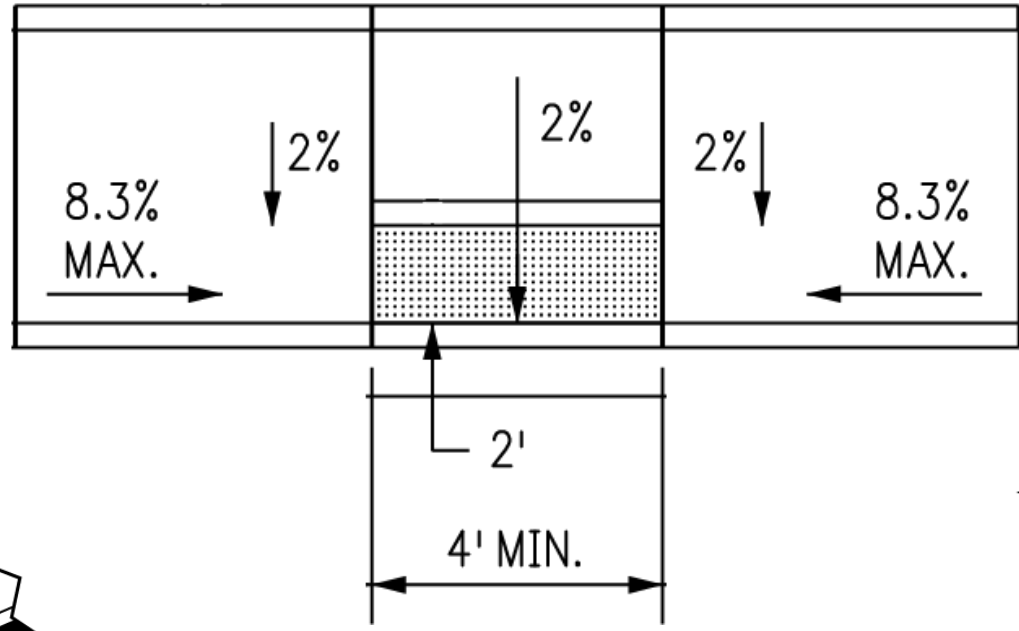
FLARE

8.3% MAX.



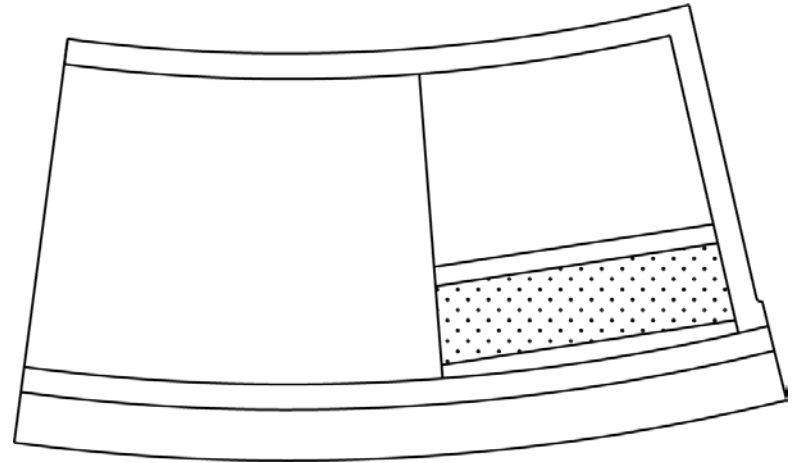
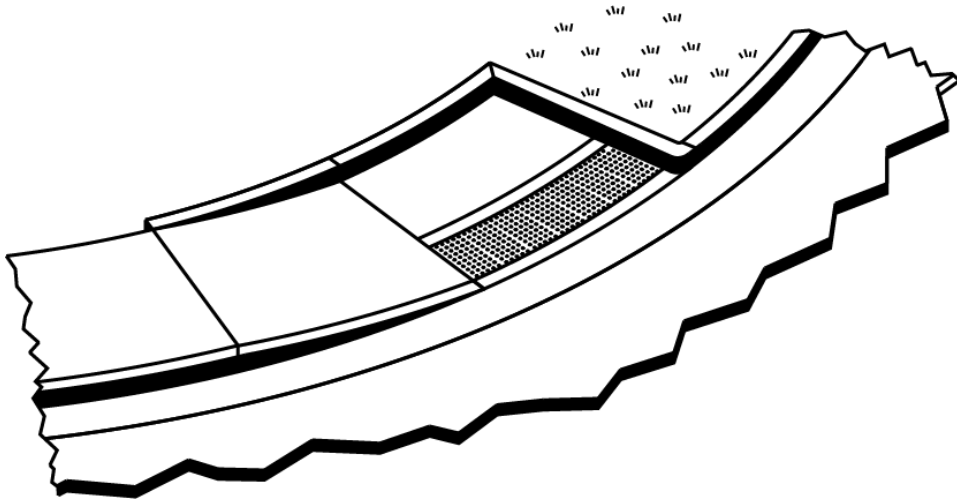
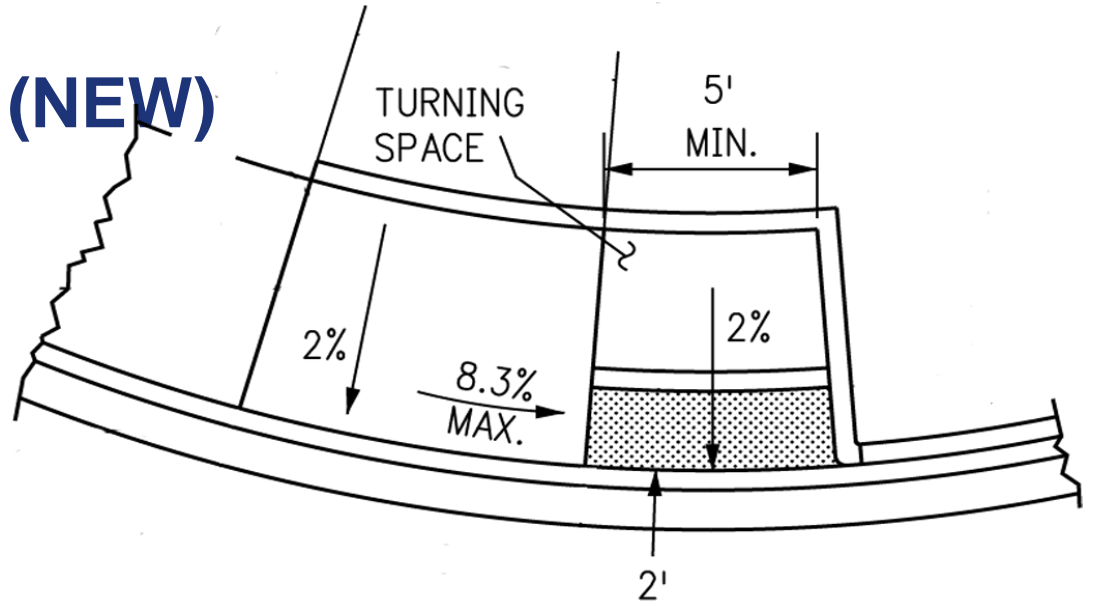


Type 2



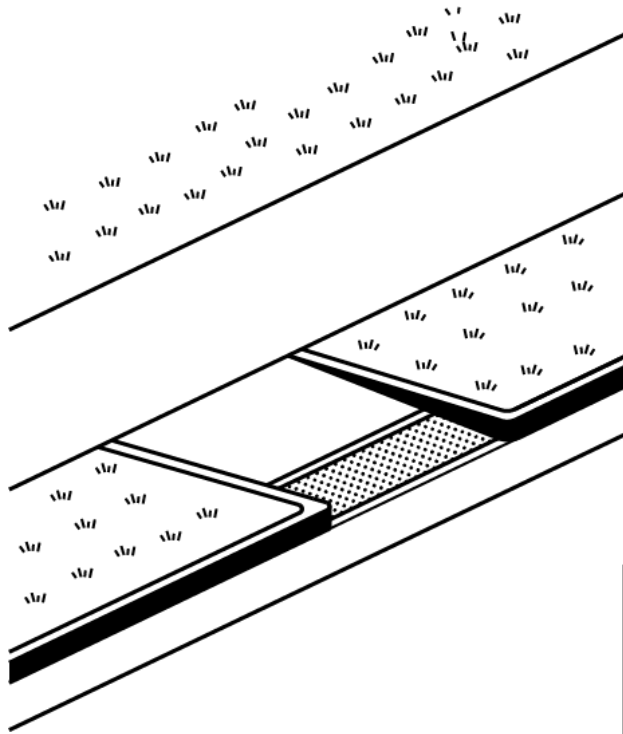


Type 2C (NEW)

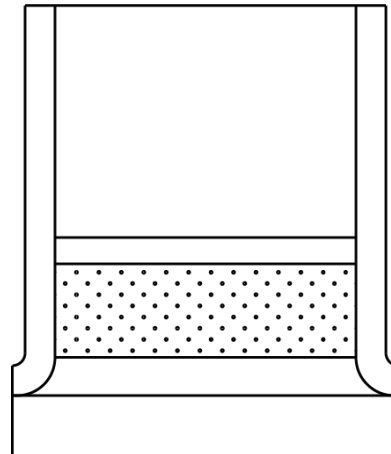
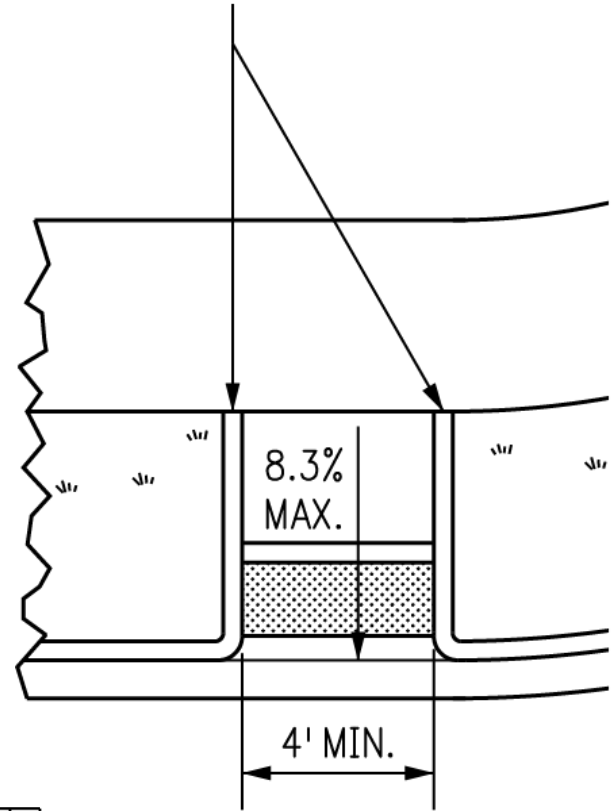




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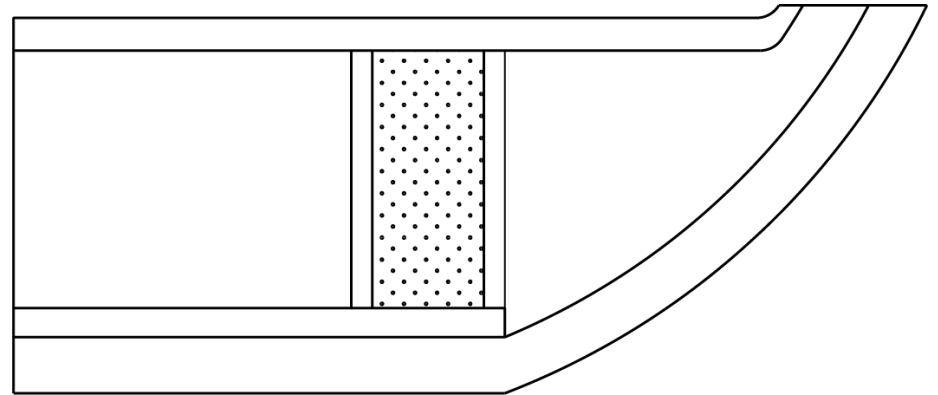
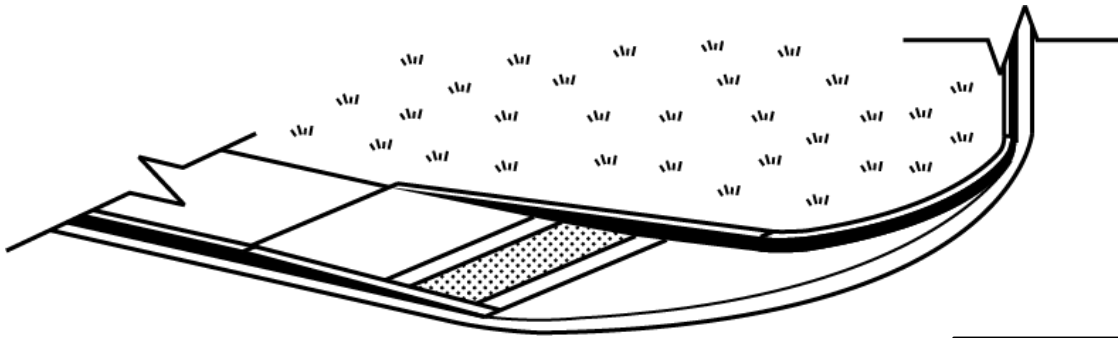
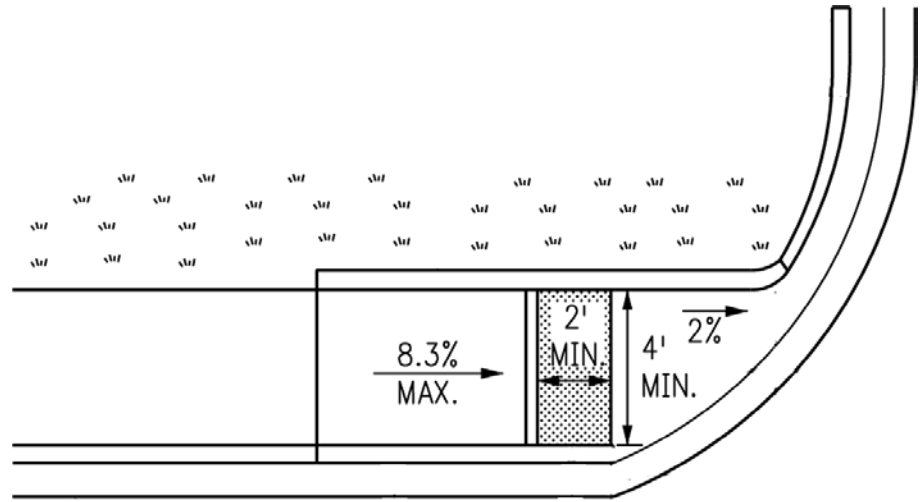


CONCRETE
PEDESTRIAN CURBS



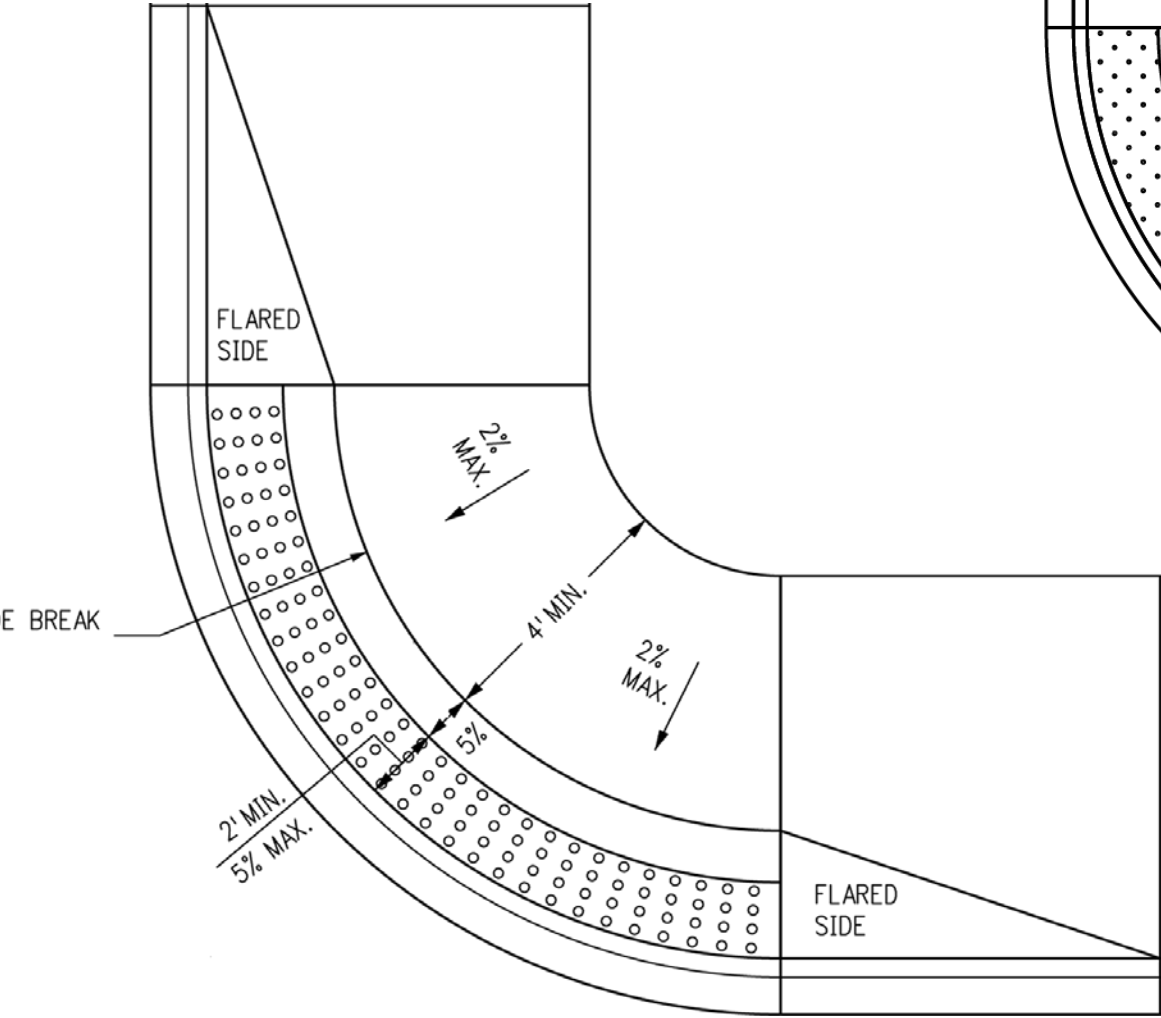
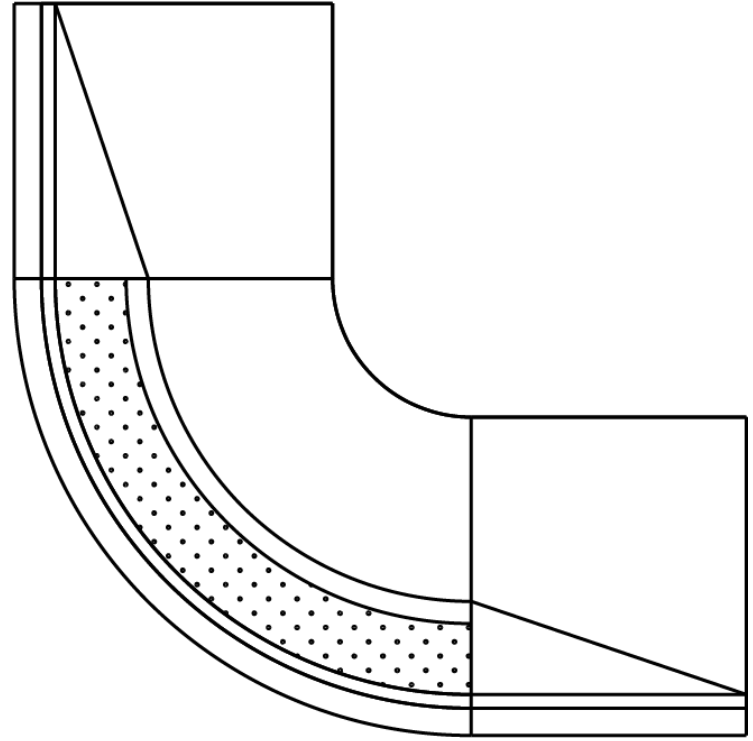


Type 4 (NEW)





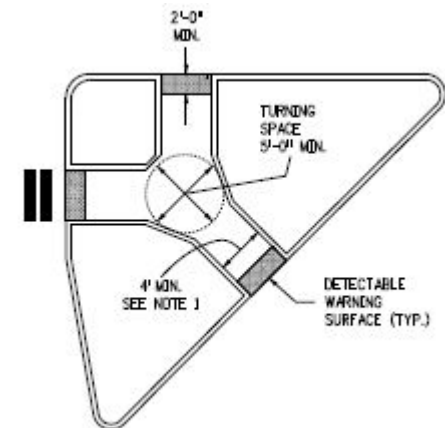
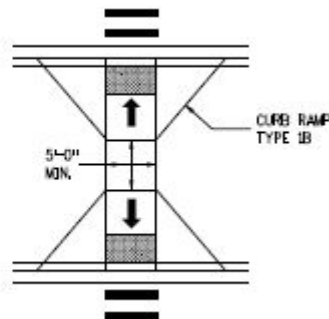
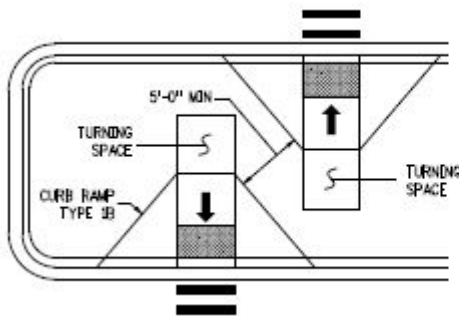
Type 5A (NEW)





Other Elements of Revised M&S Standard Plans

- Detectable Warnings
- Cut-Through & Raised Islands and Median Crossing Islands
- Temporary Perpendicular & Parallel Curb Ramps





Upcoming R5 ADA Ramps Projects

- SH 145 Dolores ADA (ESB Restricted)
- US 160 & 550 Durango (Possibly ESB Restricted)
- US 160 Cortez (Local Agency)
- Alamosa, Monte Vista, Salida, Cortez







ADA Resources

- ADA Documents & Resources Website
 - <https://www.codot.gov/business/civilrights/ada/documents>
 - Link to ADA program overview & training presentations
 - Link to PROWAG
 - Link to M&S Standard Plans
 - Much more
- CDOT Resources
 - CDOT ADA Title II Coordinator: Anna Mariotti
anna.mariotti@state.co.us
 - CDOT ADA Title II Analyst: Greg Martinez
greg.martinez@state.co.us
 - CDOT Region 5 ADA Representative: Nathan Shawcroft
nathan.shawcroft@state.co.us



Q&A



THANK YOU!