Intro

ADA Operations Contact Info

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http://www.dot.state.mn.us/ada/construction.html

Your Destination...Our Priority

MnDOT ADA Training

Curb Ramp Construction 2017

Module II

Your Destination...Our Priority

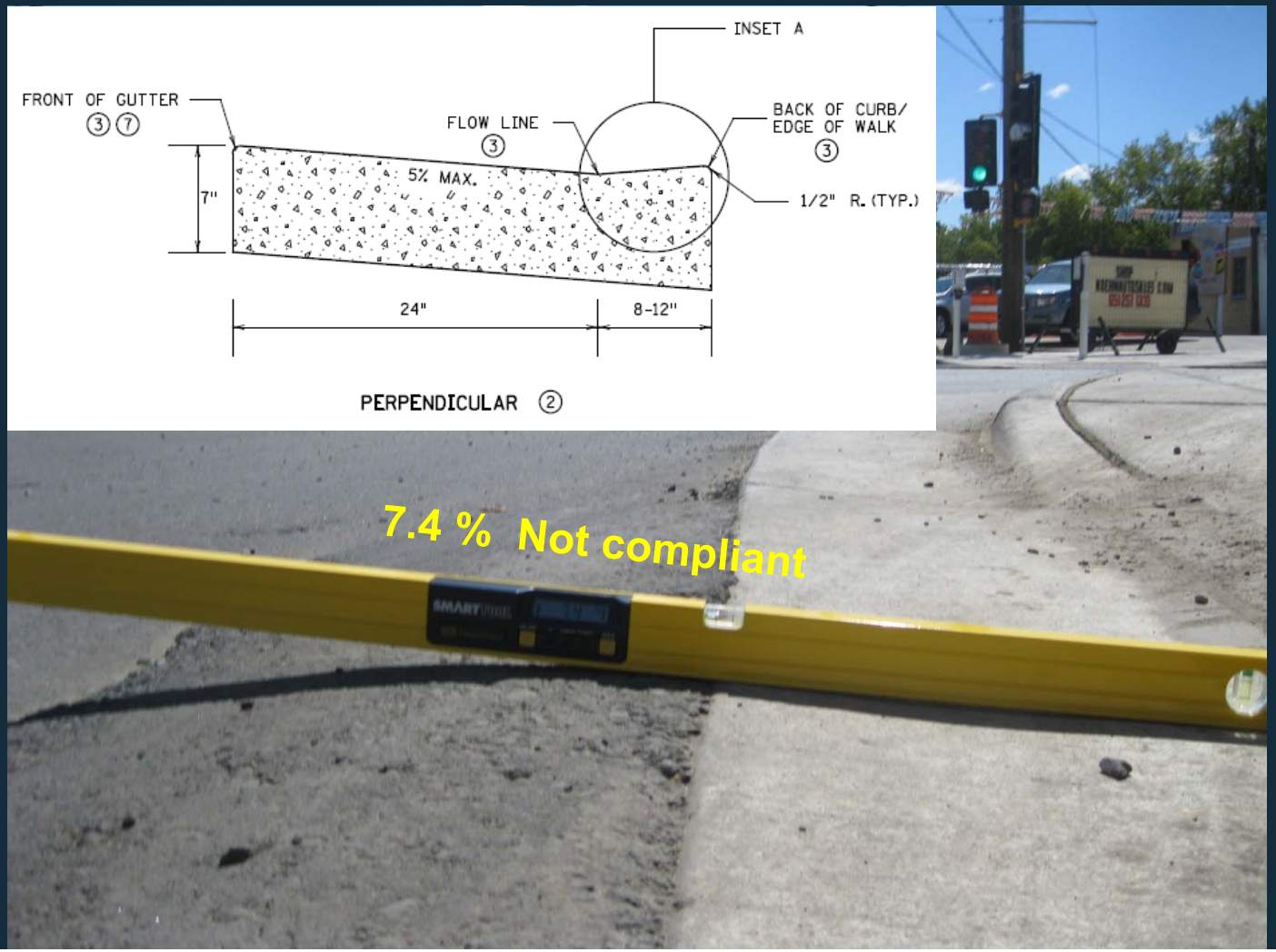
ADA Curb and Gutter

Do not overlay PAR curb and gutter.

New gutter face/flow line must match new road surface, see Standard Plans Sheet 3 note (7)

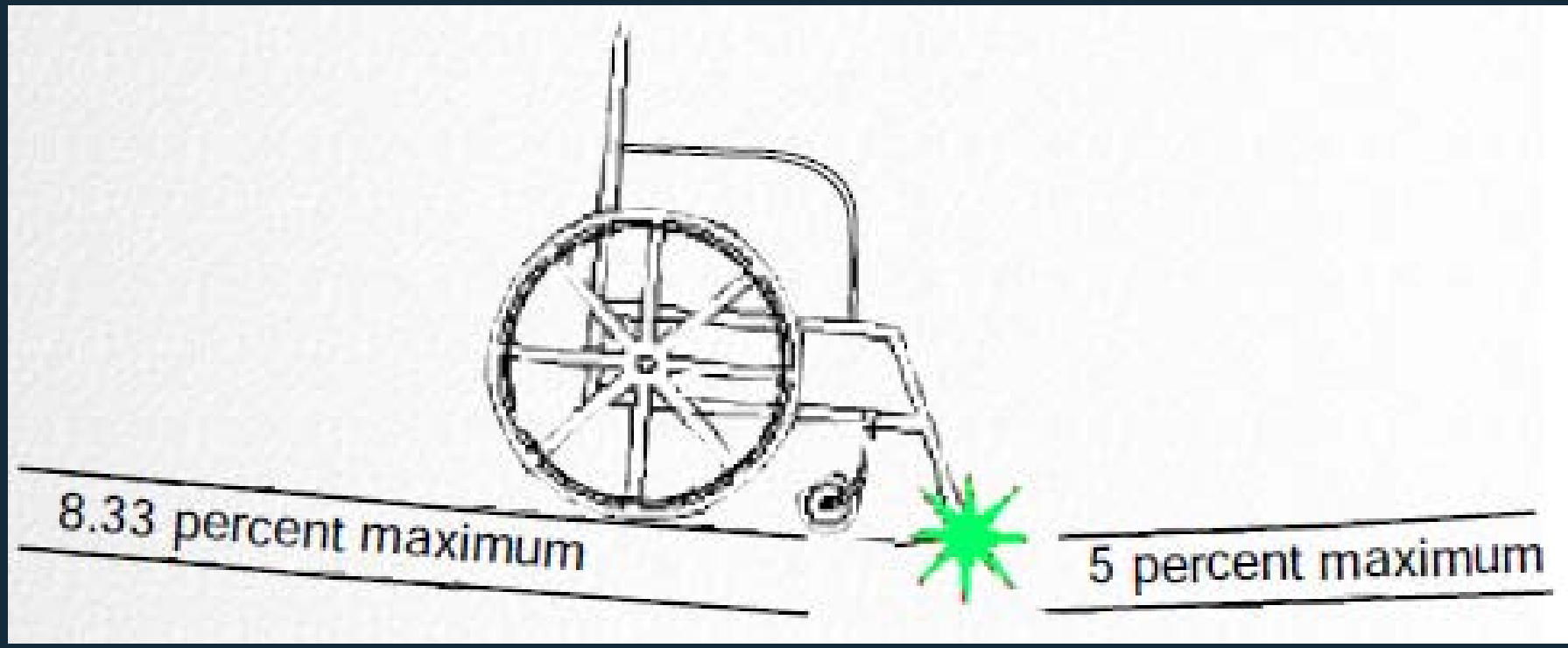
ADA Curb and Gutter

Perpendicular, tiered, parallel and diagonal ramps require 5% maximum gutter slope



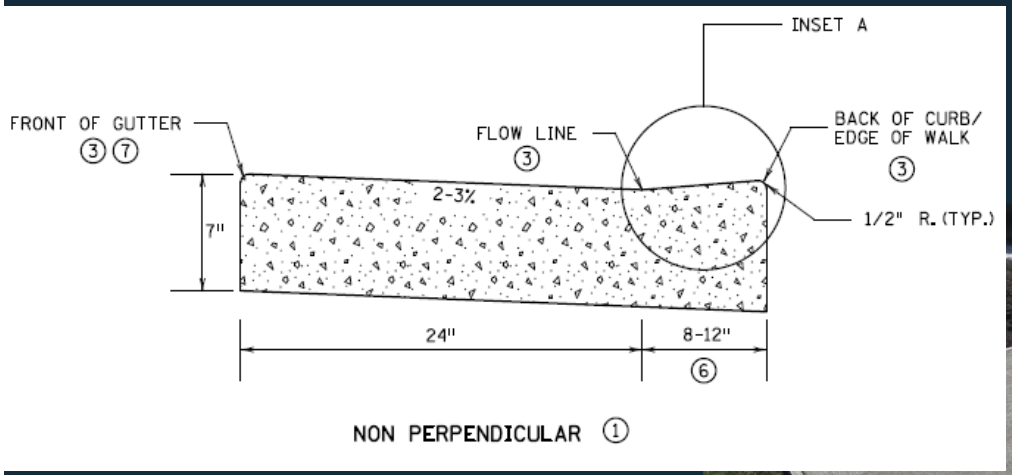
ADA Curb and Gutter

- 13% is the maximum rollover allowed.



ADA Curb and Gutter

Fans, depressed corners, one way and combined directional ramps require 2%-3% maximum gutter slope.

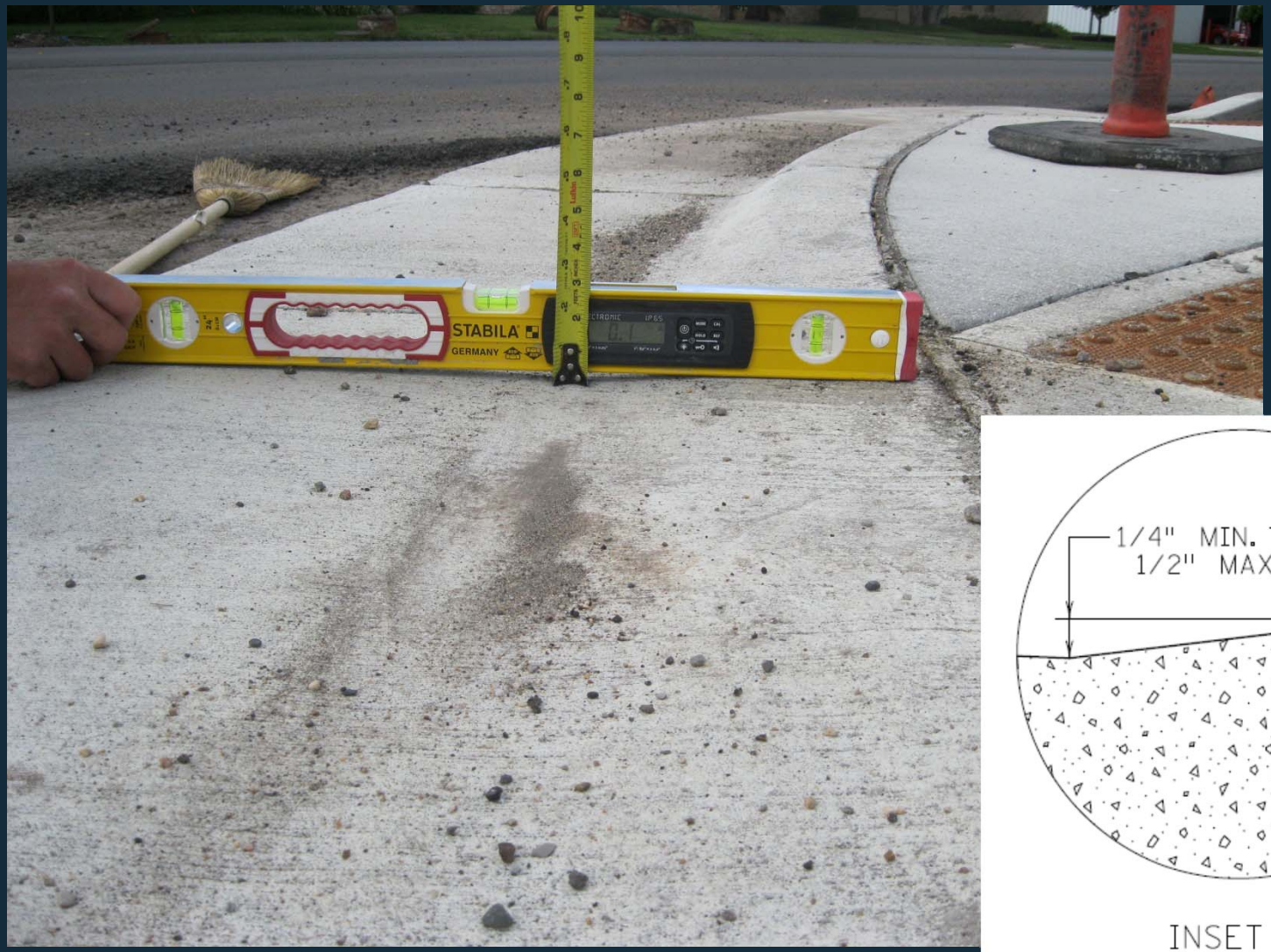


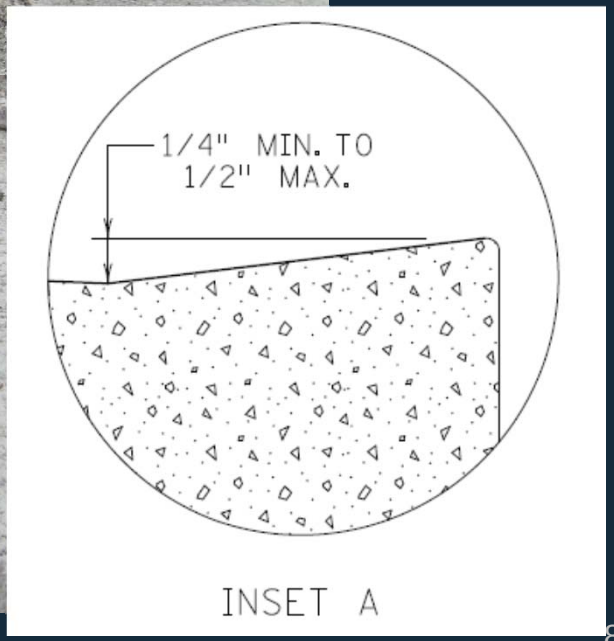
Concrete Curb & Gutter

Standard Plans Sheet 3 Note 3. For curb machine placements start gutter slope transitions 10’ outside of all curb ramps.

ADA Curb and Gutter

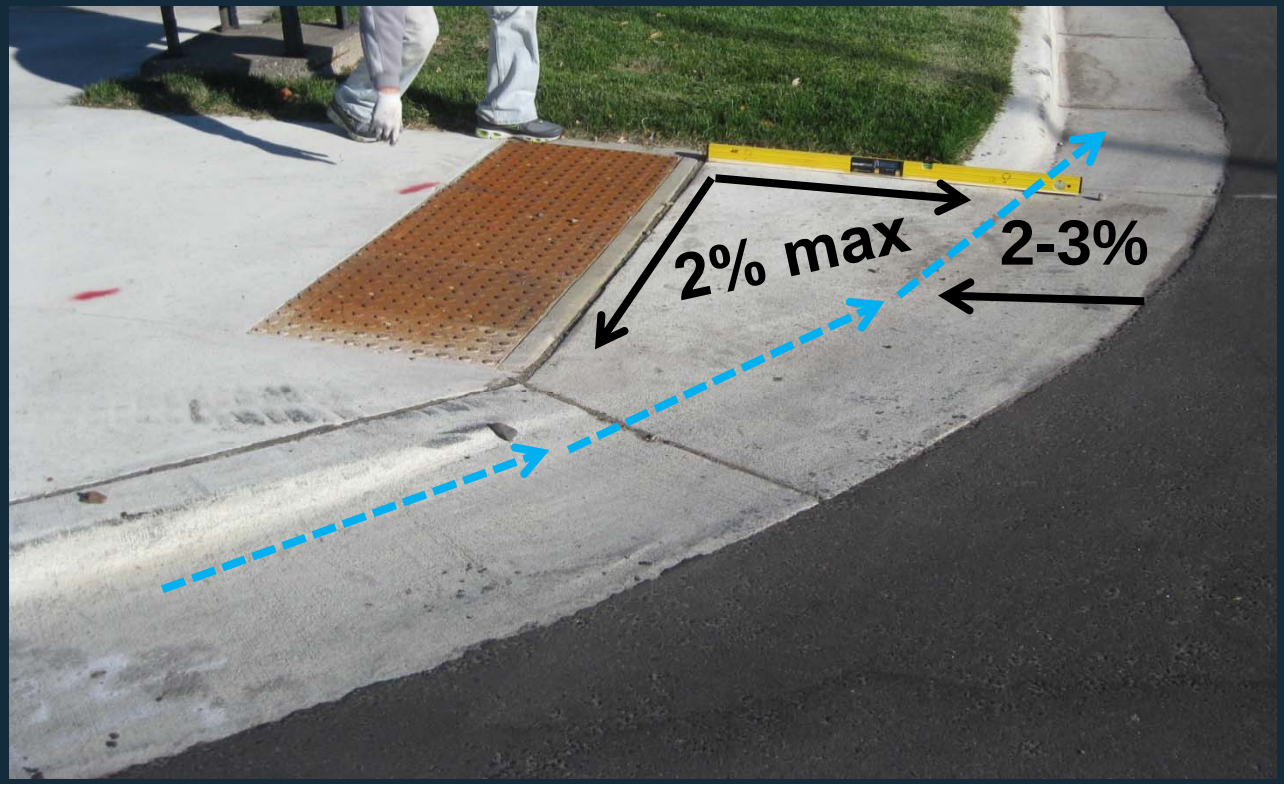
- Flow line Depth ¼’’ to ½’’





ADA Curb and Gutter

- When constructing directional ramps, the “triangular” concrete piece shall be poured integral with the curb and gutter (directional curb).

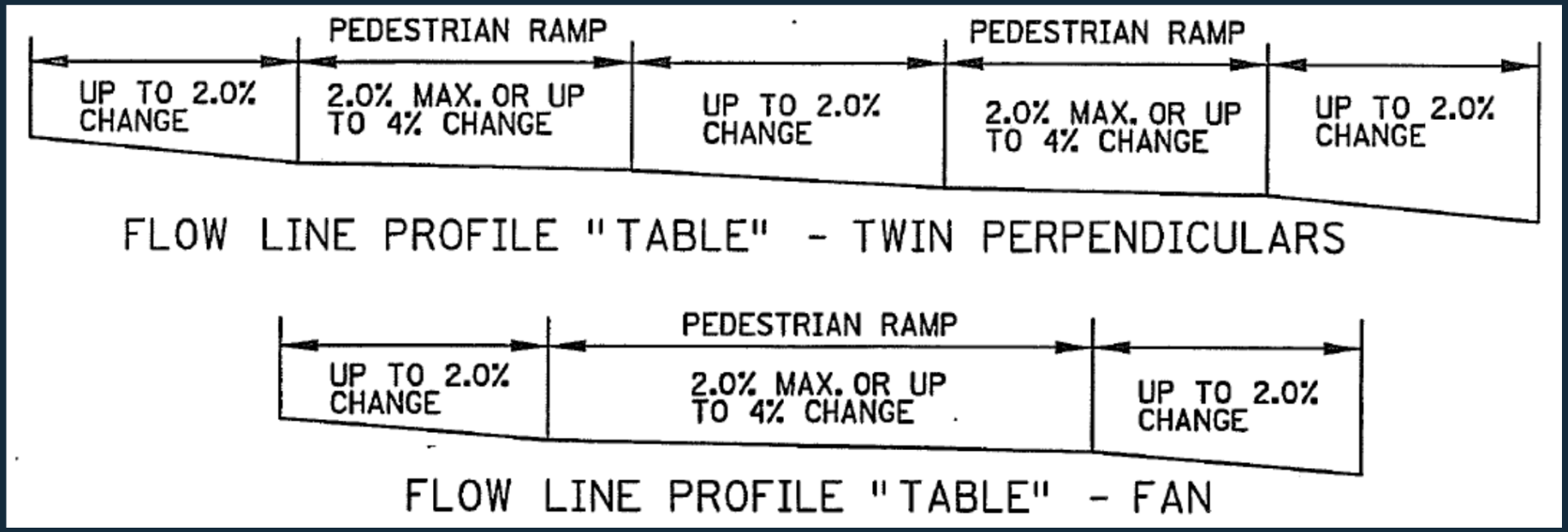


ADA Curb and Gutter

- When constructing directional ramps, maintain positive flow.

ADA Curb and Gutter

- Flow Line Profile “ Table” of Ramps



“Tabling” of a crosswalk means maintaining less than 2% cross slope within a crosswalk, and is required when a roadway is in a stop or yield condition and the project scope allows.

ADA Curb and Gutter

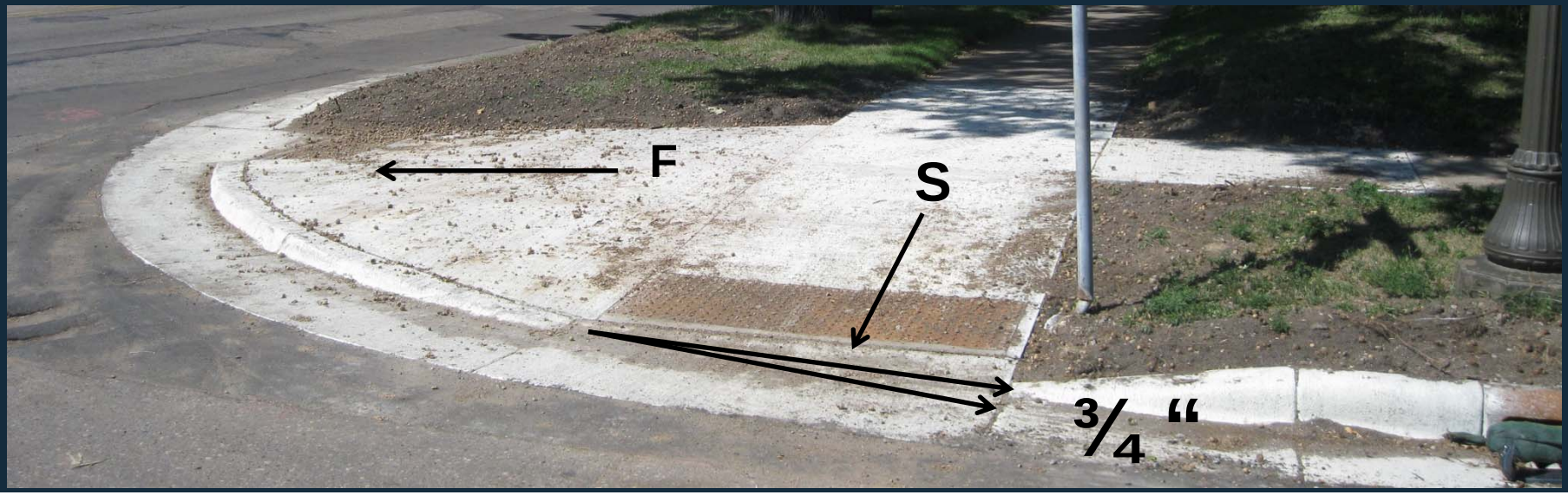
- Standard Plans “ Tabling” flow lines

MILL & OVERLAY PROJECTS: "TABLING" OF FLOW LINES, IN FRONT OF THE PEDESTRIAN RAMP, IS REQUIRED WHEN THE EXISTING FLOW LINE IS GREATER THAN 2%. WARPING OF THE BITUMINOUS PAVEMENT CAN NOT EXTEND INTO THE THROUGH LANE. TABLE THE FLOW LINE TO 2% OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA;

1) 1.0% MIN. CROSS-SLOPE OF THE ROAD
2) 5.0% MAX. CROSS-SLOPE OF THE ROAD
3) "TABLE" FLOW LINE UP TO 4% CHANGE FROM EXISTING SLOPE IN FRONT OF PEDESTRIAN RAMP
4) UP TO 2% CHANGE IN FLOW LINE FROM EXISTING SLOPE BEYOND THE PEDESTRIAN CURB RAMP

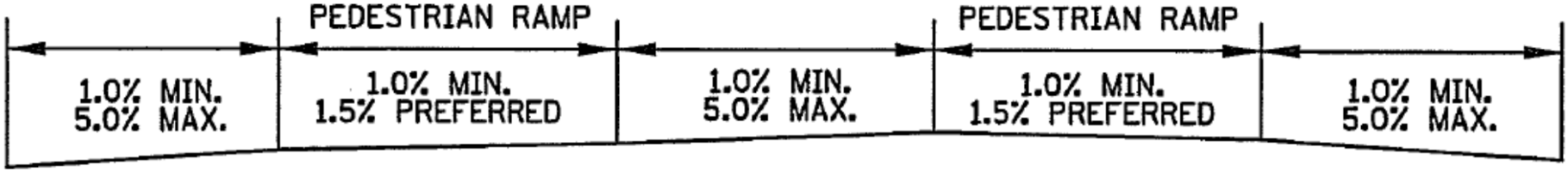
ADA Curb and Gutter

- Adjustments in the curb flow line to achieve 2% max. cross slope without changing drainage patterns.
- Example: 6’ wide ramp at 3% / corrected to 2% would be ¾’’ adjustment.



Curb ramp Construction

- Flow Line Profile " Raise" of Ramps



FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS

FLOW LINE PROFILE RAISE - FAN

•"Raising" of a curb lines should occur in vertically constrained areas. Raise the curb lines enough to allow compliant ramps or as much as possible while adhering to the following criteria.

Curb ramp Construction

- Flow Line Profile “ Raise” of Ramps

•1) 1.0% Min. and 5.0% Max. cross slope of the road.

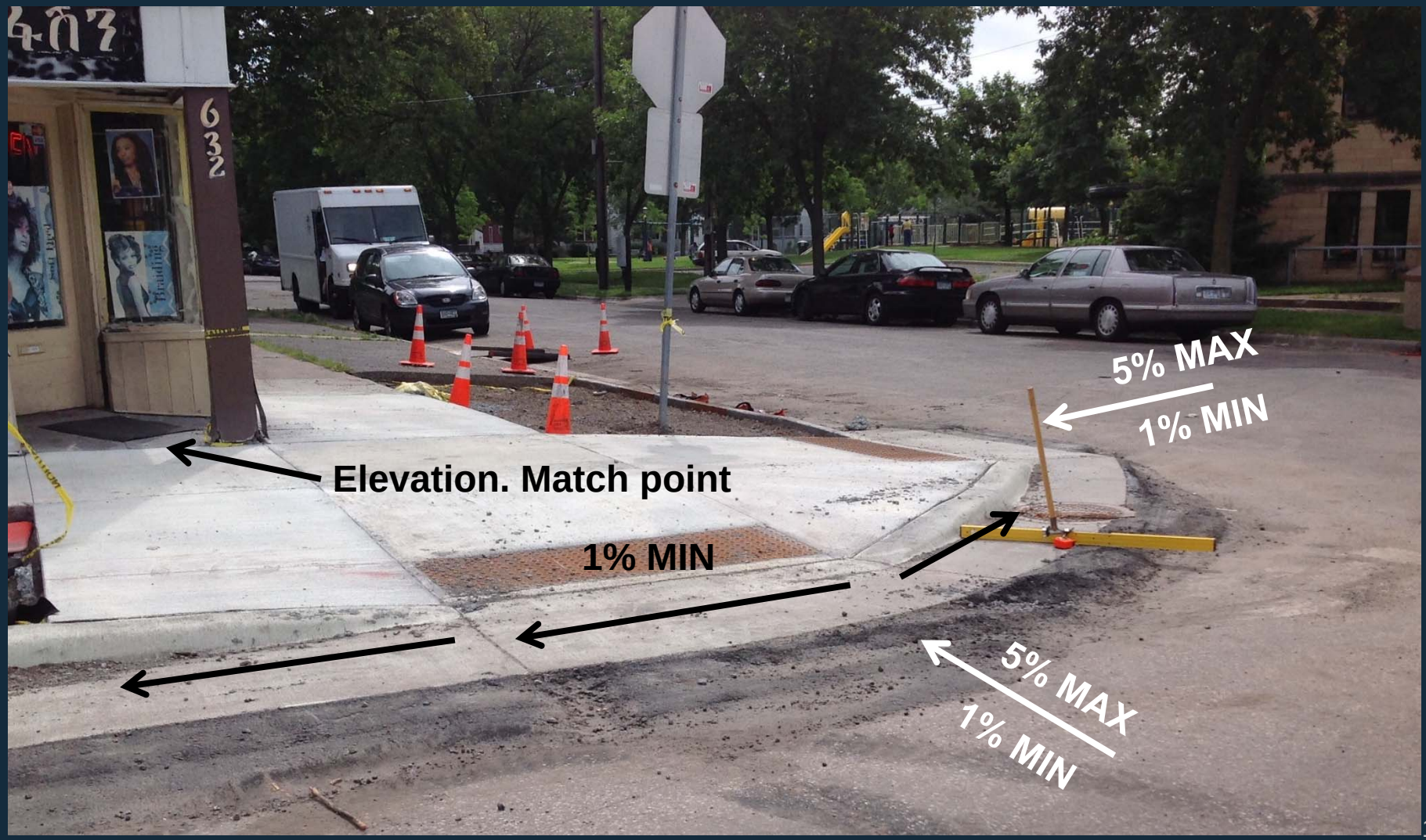
•2) 1.0% min. flow line (on either side of pedestrian ramp) to maintain positive drainage.

•3) 5.0% recommended max. flow line.

•4) longitudinal through lane roadway tapers should be 1” vertical per 15’ horizontal

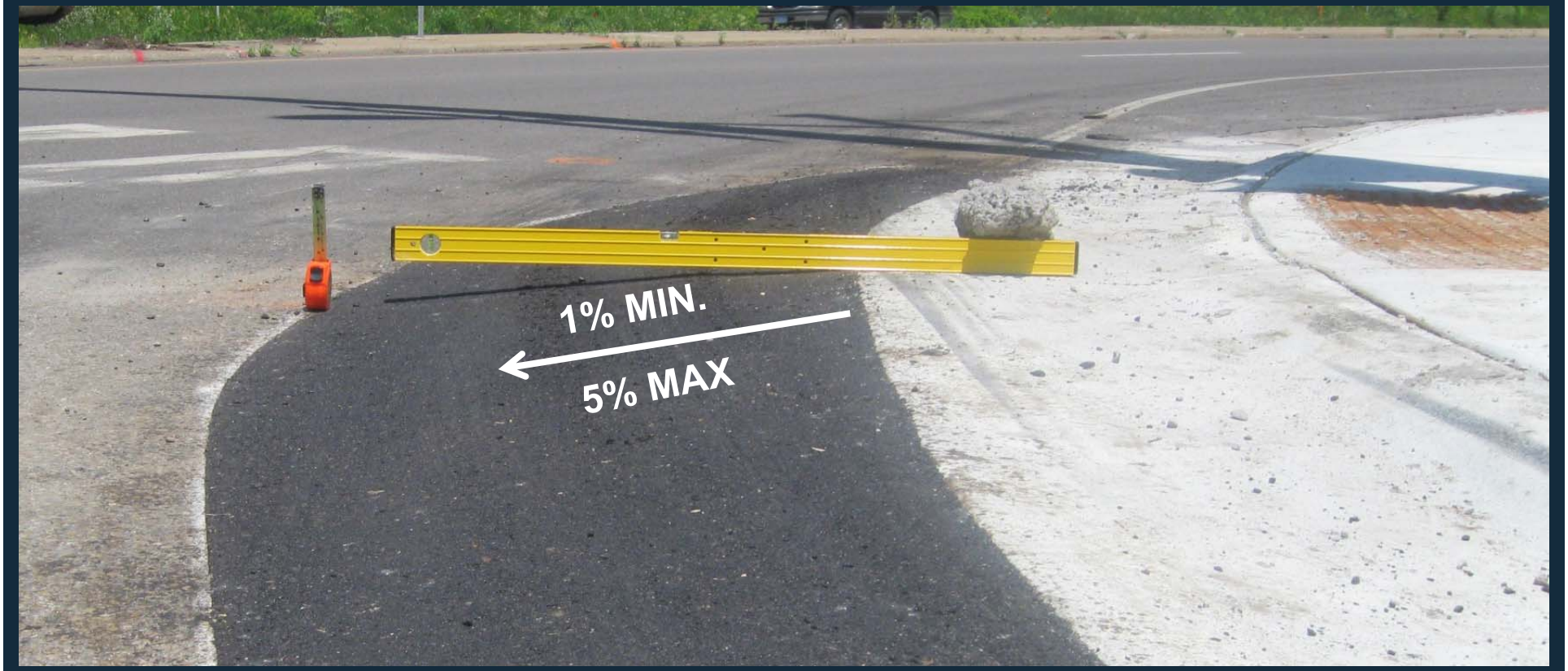
Curb ramp Construction

- Flow Line Profile “ Raise” of Ramps



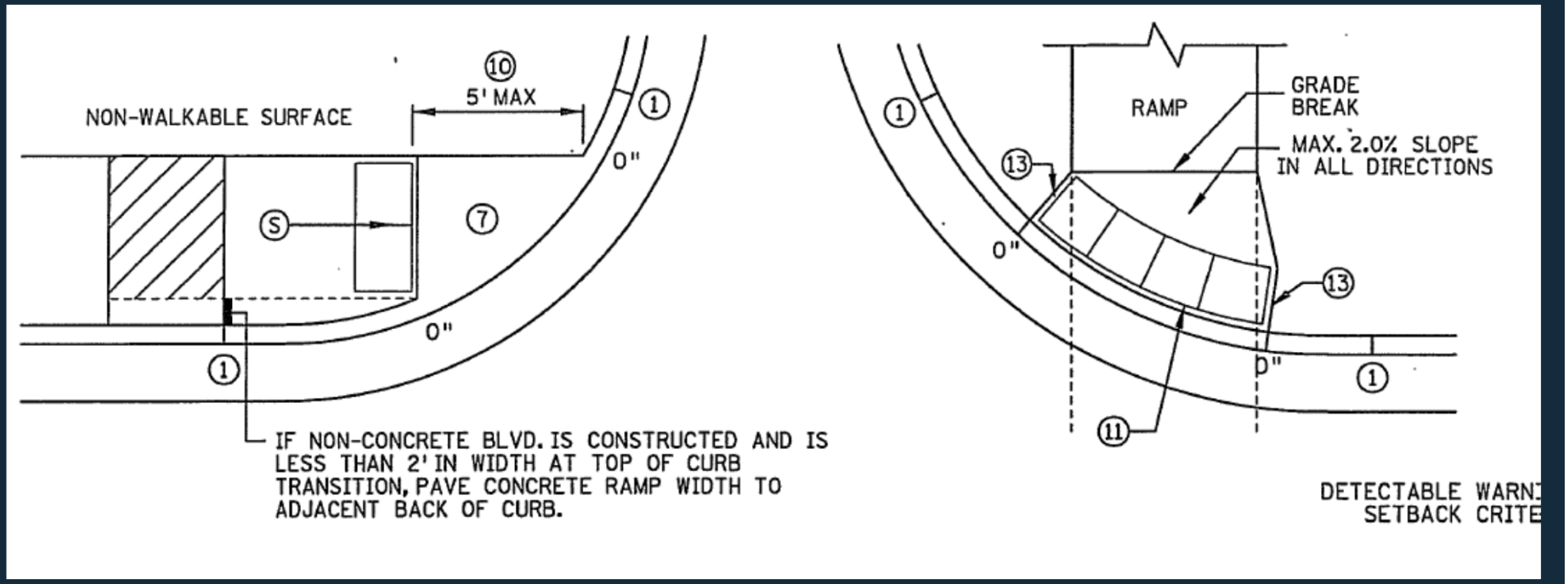
ADA Curb and Gutter

- Bituminous patching on ADA stand alone projects 1.0% min. – 5.0% max.



Side Treatments

- (Sheet 2 Note 1) One Way Directional Ramps:
- Match Full Curb Height



Side Treatments

- Standard Plans Sheets 1&2 Notes
- Top of curb shall match proposed adjacent walk grade.

Side Treatments

- Sheet 2 of 6 Notes:When the boulevard is 4’ wide or less, the top of curb taper shall match the ramp slopes to reduce negative boulevard slopes from the top back of curb to the PAR.

ADA Curb and Gutter

2531 - The contractor shall construct a contraction joint through the curb and gutter section at the bottom of the curb height transition (zero height curb).

ADA Curb and Gutter

If curb joints fall within the PAR they shall meet MnDOT 2521.3D

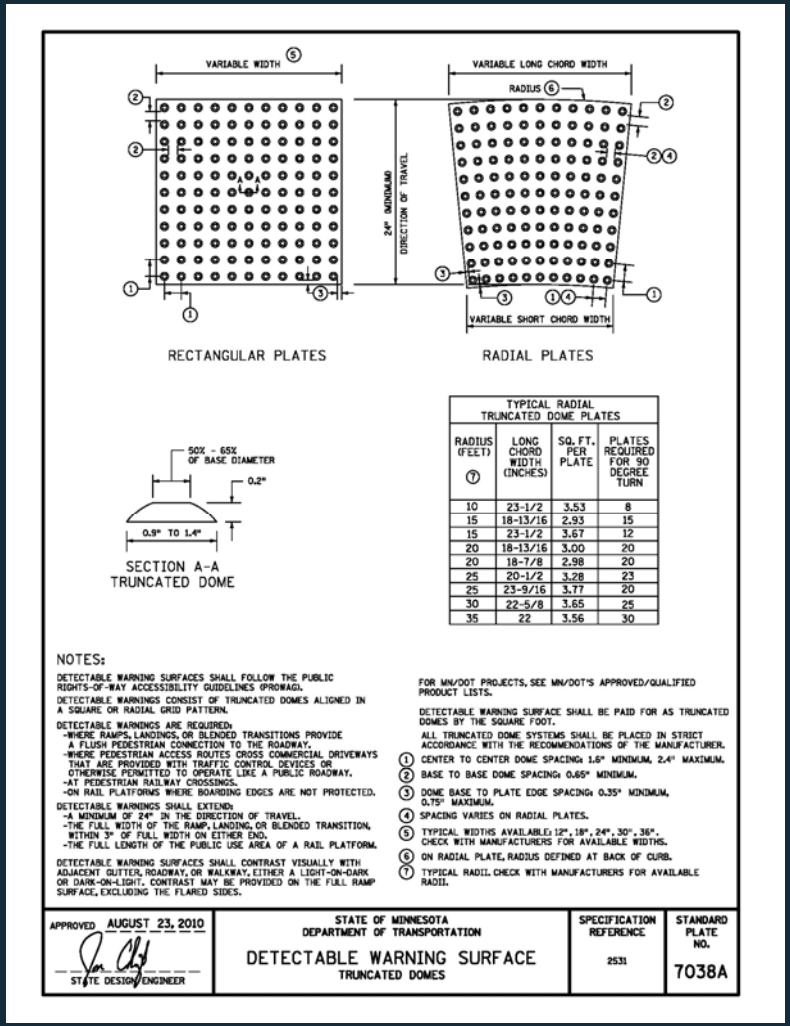
Truncated Dome Directionality

- Purpose of domes is to inform the user that they are at the edge of the roadway.
- Directionality only works in certain circumstances.
- Directionality should be done only when it works.
- Directional ramps are more difficult to construct with APS criteria.

Standard Plate 7038A

Detectable Warning Surface (Truncated Domes)

- Approved August 2010
- Includes both rectangular and radial detectable warning surfaces
- Radial detectable warnings must accommodate existing radius dimensions to nearest 5 ft. increment



ADA Detectable Edge

Notes: Detectable Warning Surface Shall contrast visually with adjacent gutter, roadway, or walkway, either a light-on-dark or dark-on-light.

Detectable Warnings

(2531) The truncated domes shall be placed in concrete and shall be pressed firmly into the concrete to the point that concrete fills the vent holes on the truncated dome plates.

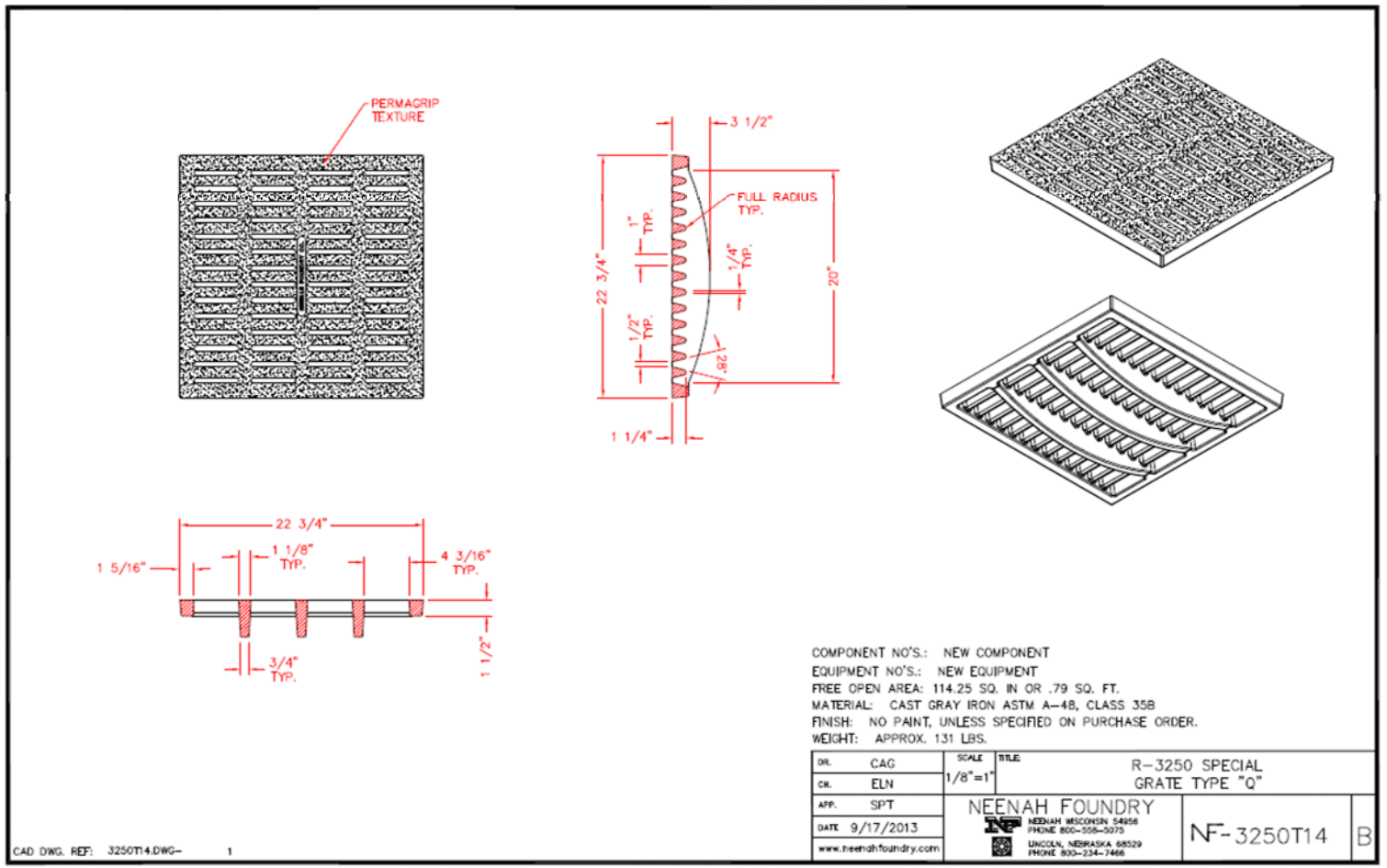
Result of domes not installed correctly.

ADA Detectable Edge

Good detectable edge with not so good placement. Always check for structures in the PAR.

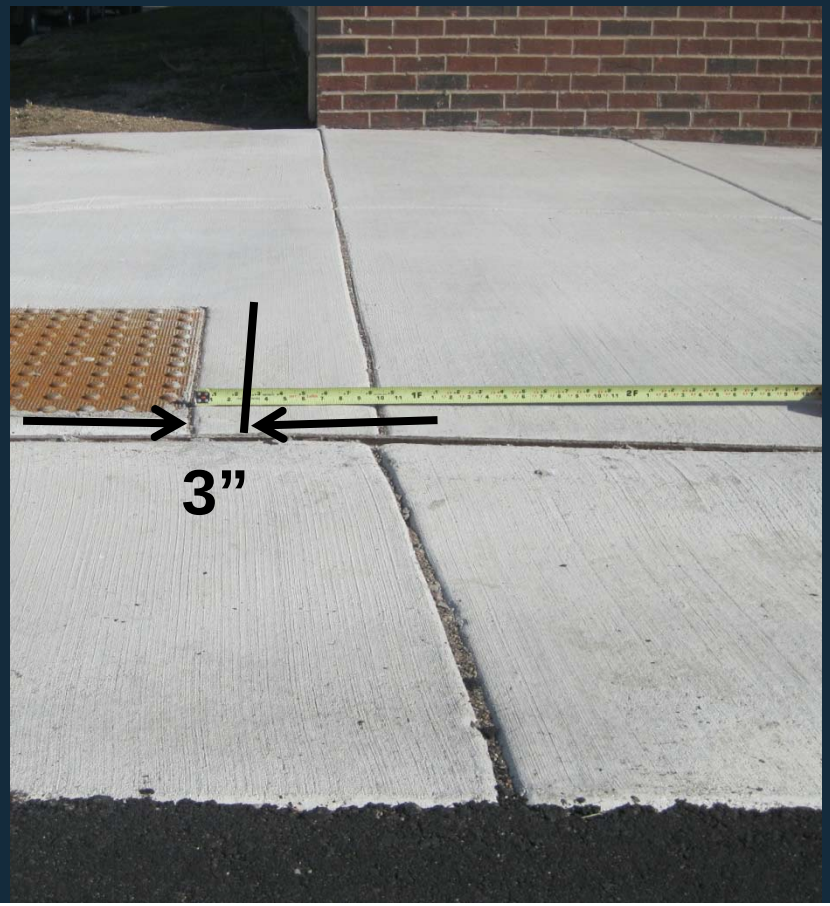
ADA GRATE

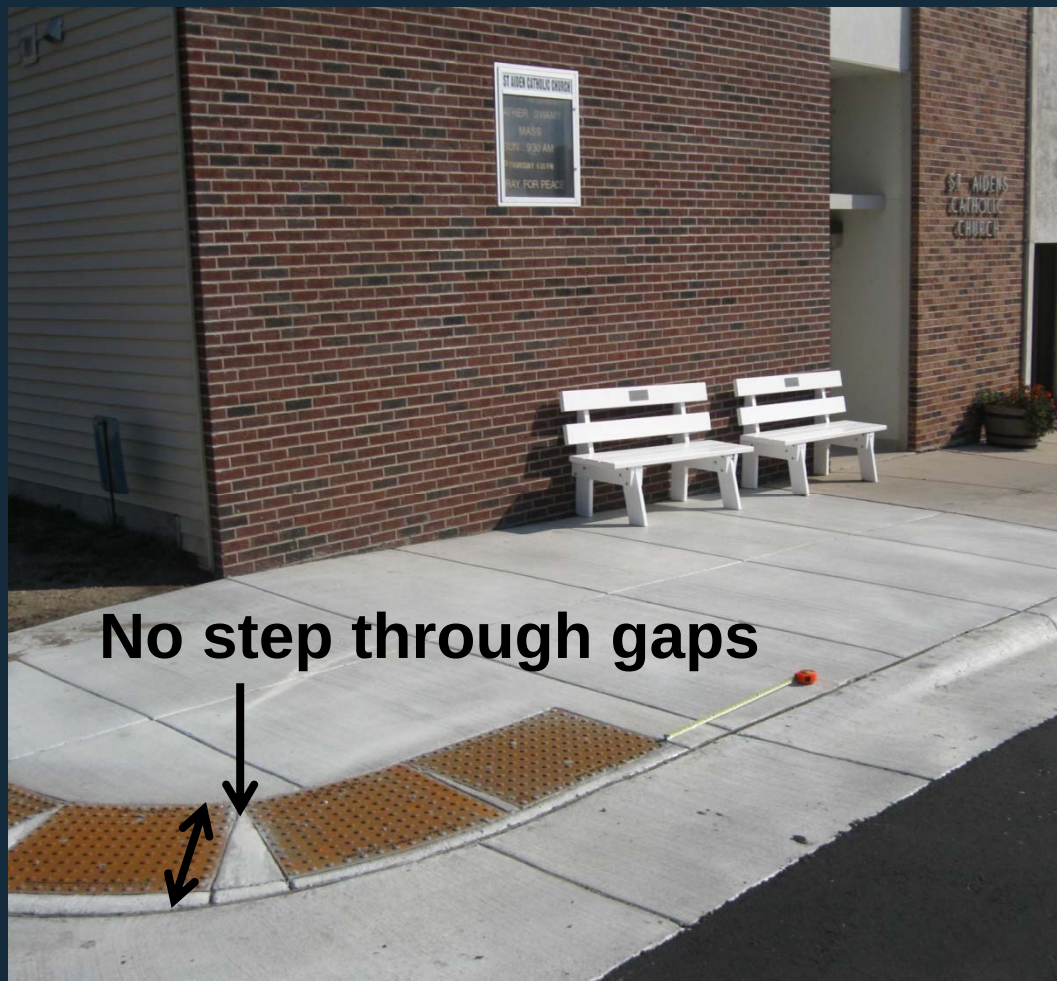
ADA Grate R3250 Special type “Q” can be installed per plan or when approved by the Engineer.



ADA Detectable Edge

Curb tapers are considered detectable edge when the taper starts within 3” of the edge of the truncated domes. Maintain a 2’ continuous detectable edge.





ADA Construction Finishing

Spec 1503 Conformity with Contract Documents

If the Contract requires a maximum or minimum dimension or value, the Contractor shall control the production and processing of the material and the performance of work so that the material or workmanship is not of borderline quality or dimension.

Spec 2521.3D The Engineer will use a 10” straight edge to measure the surface.

ADA Construction Finishing

Spec 2521.3D The department considers deviations in the surface greater than 3/16 inch and deviations in formed concrete greater than ½ inch from the required location as unacceptable work.

ADA Construction Finishing

Spec 2521.3D The department considers deviations in the surface greater than 3/16 inch and deviations in formed concrete greater than ½ inch from the required location as unacceptable work.

ADA Construction Finishing

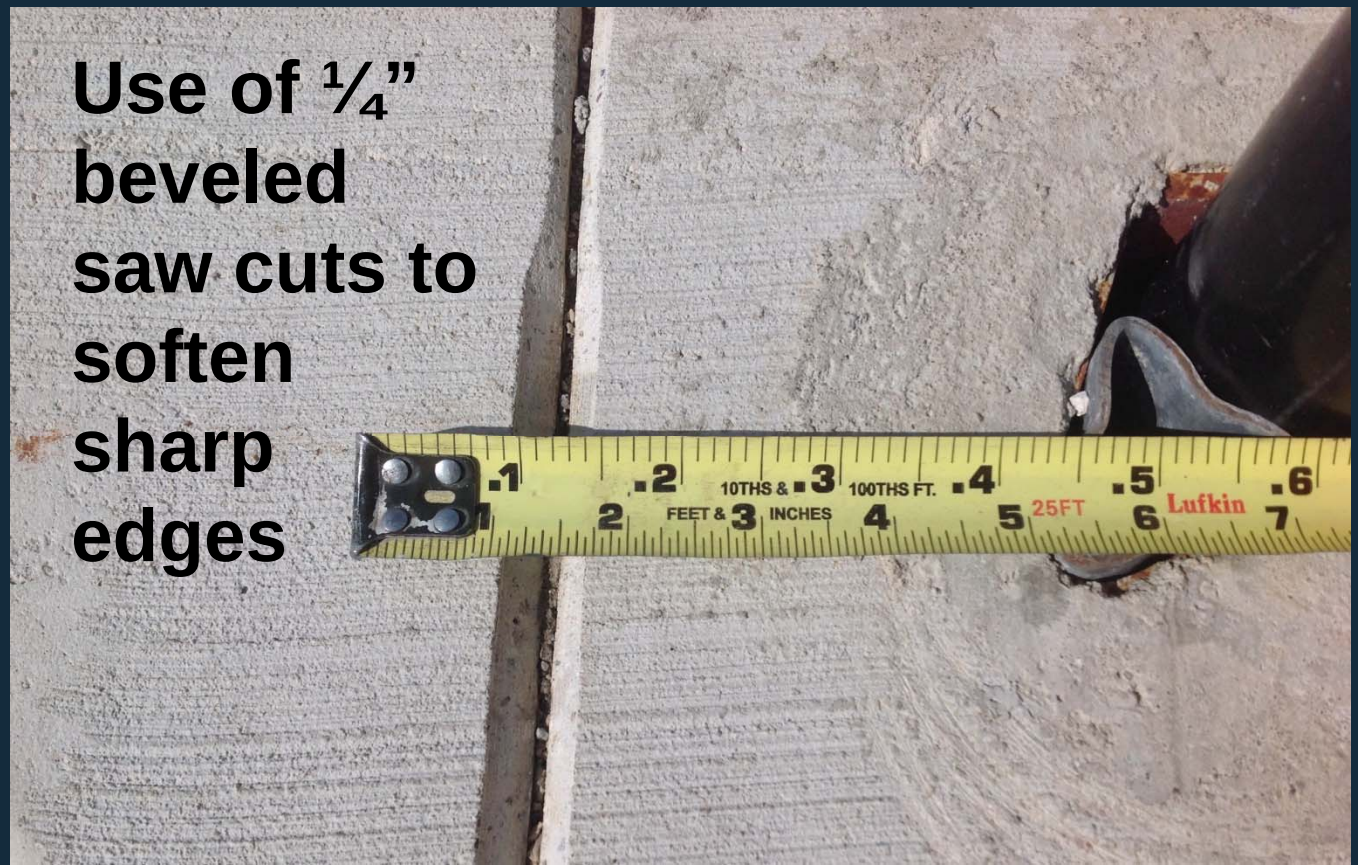
Spec 2521.3D **Remove and replace unacceptable work as directed by the Engineer.**

ADA Construction Joints

Joint Construction : Spec. 2521.3D2 The Contractor may form or saw the joints in walking surfaces as approved by the Engineer.

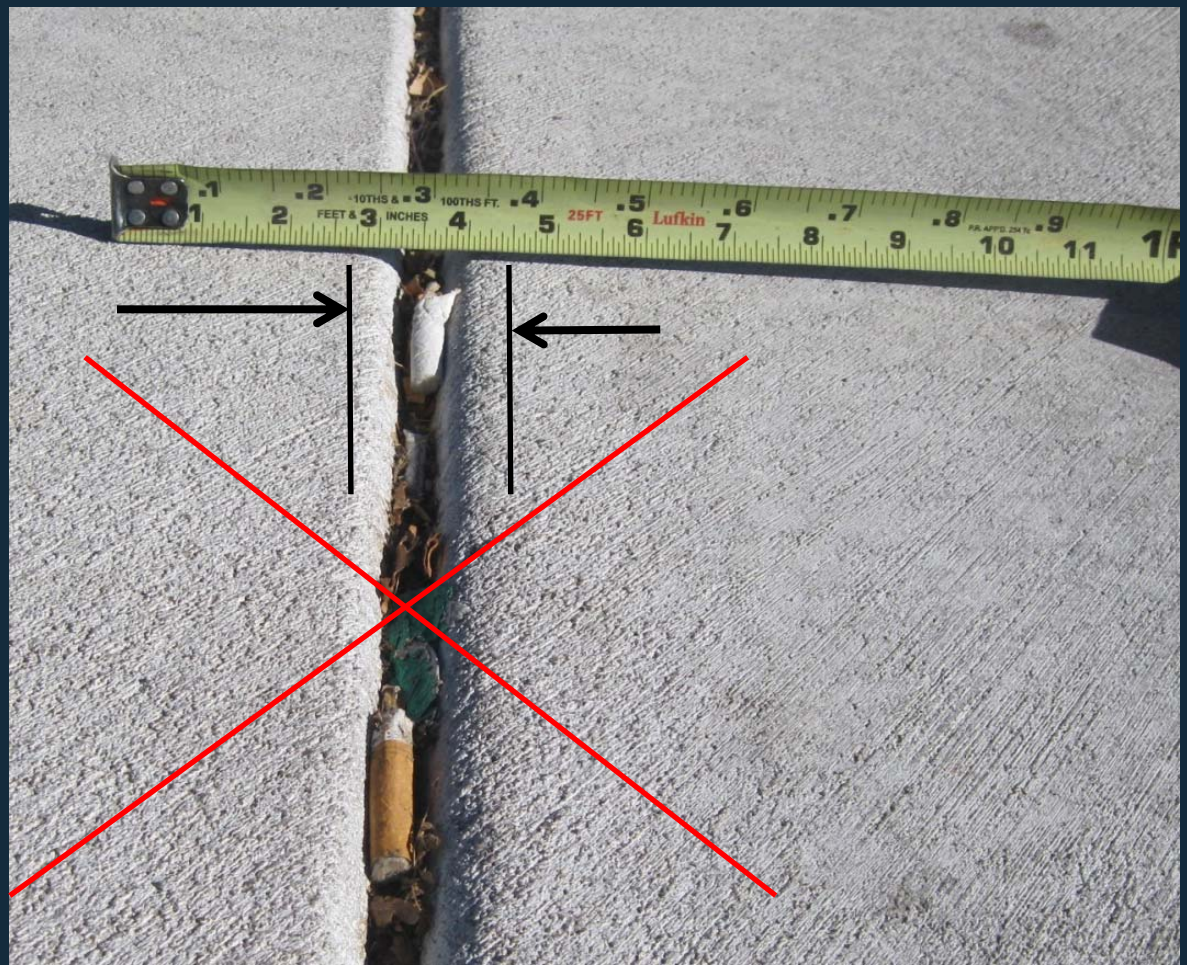
ADA Construction Joints

Joint Construction : Spec. 2521.3D2 Extend contraction joints to a depth of at least 30% of the walk thickness. If saw cutting, provide 1/8” wide contraction joints.



ADA Construction Joints

Joint Construction: Spec 2521.3D If forming the joints, round joints within the walking surface with a with a ¼ inch radius edge grooving tool.



ADA Construction Joints

Joint Construction : Spec2521.3D contraction joints shall extend to at least 30 percent of the walk thickness.

Bull Float Groover Attachment

Bronze Bull Float Groover Attachment; 1/4" Radius, 3/8" Wide, 2" Deep

Login

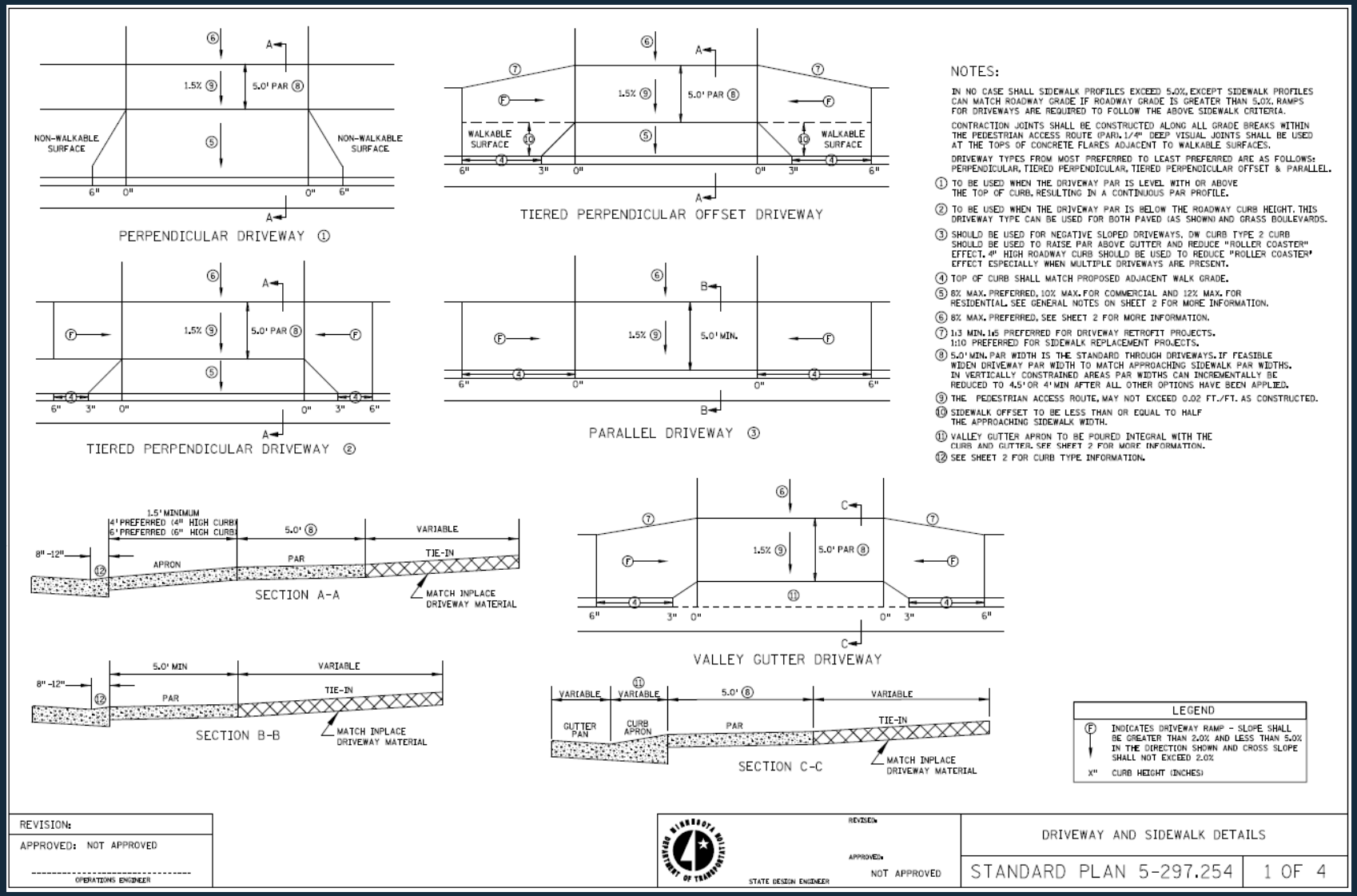
EDI: 17553

Click Image to Enlarge

- Made from high quality, long wearing bronze
- Finely finished to make smooth, clean edges
- Two thumbscrews are used to tighten the attachment to the bull float
- Slides easily over any bull float
- Gives the bull float the ability to form grooves or expansion joints
- Groove radius - 1/4"
- Groove width - 3/8"
- Groove depth - 2"

ADA Driveway Construction

Standard Plans 5-297.254 Sheet 1 of 4



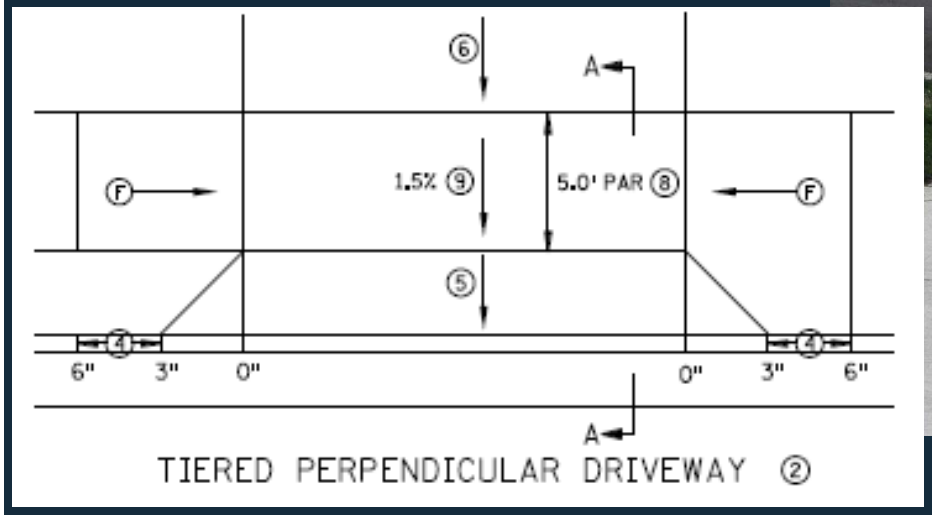
ADA Driveway Construction

Commercial apron slope 10% max.
Residential apron slope 12% max.

Both have a Preferred 8% max.

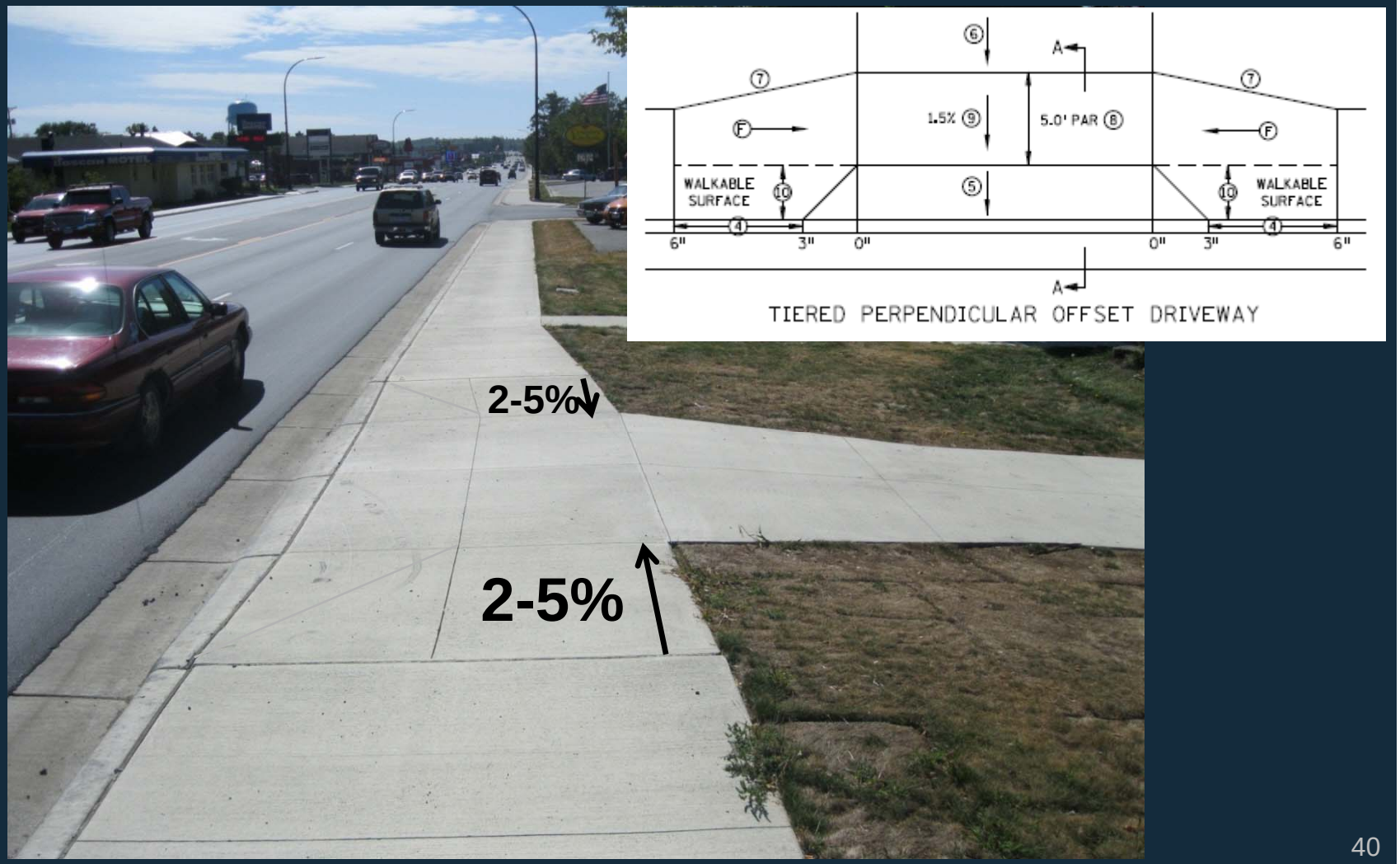
5’ Min. PAR width is the standard.

4.5’ to 4’ Min. width after all other option have been applied.



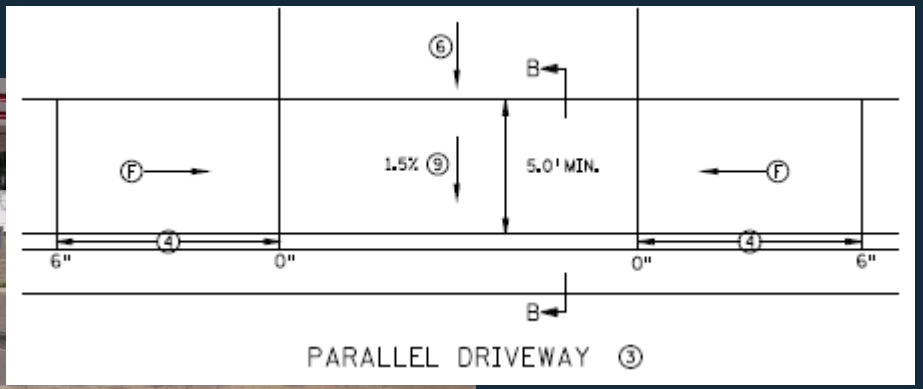
ADA Driveway Construction

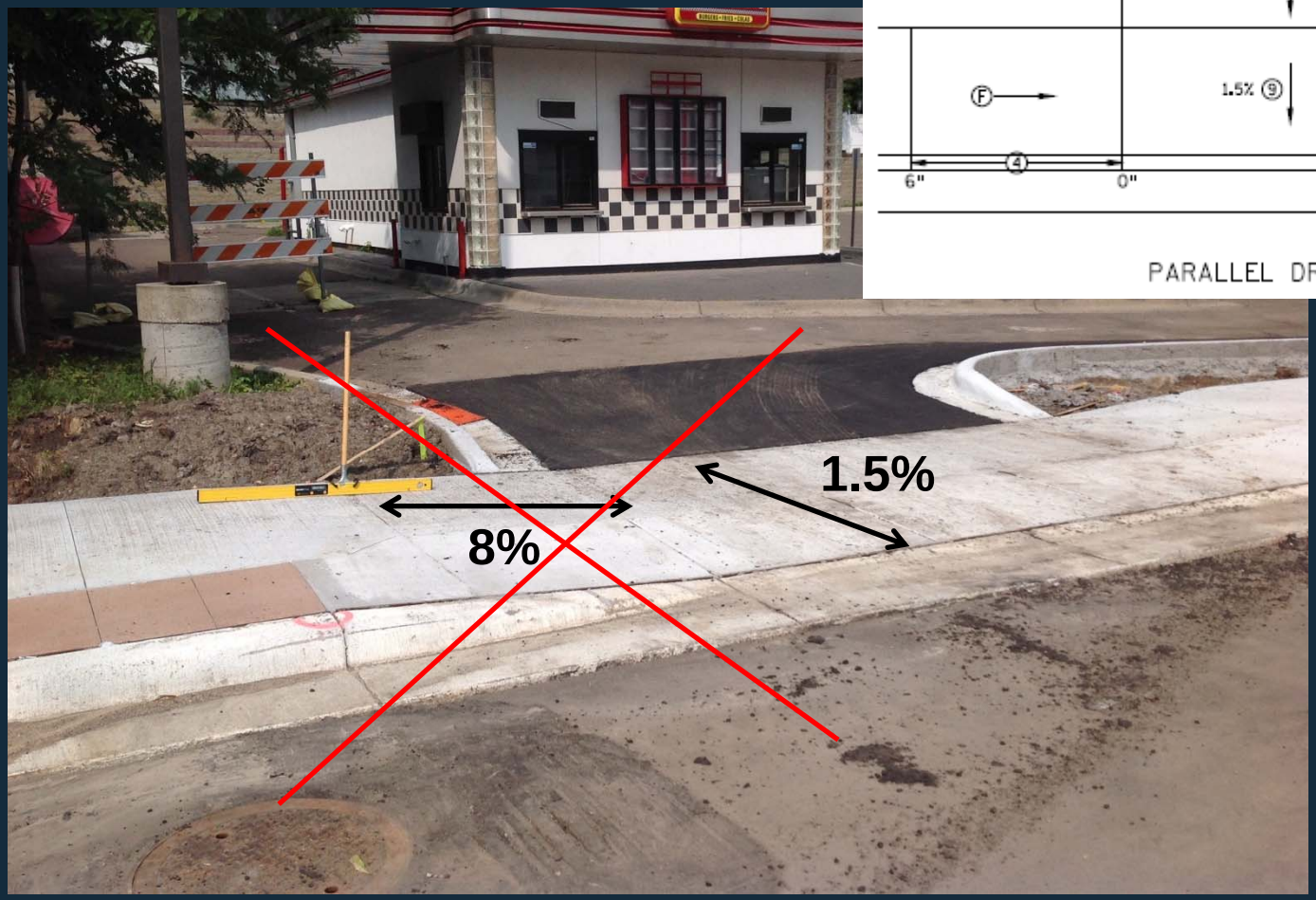
PAR Height: Minimize sidewalk roller coaster affect



ADA Driveway Construction

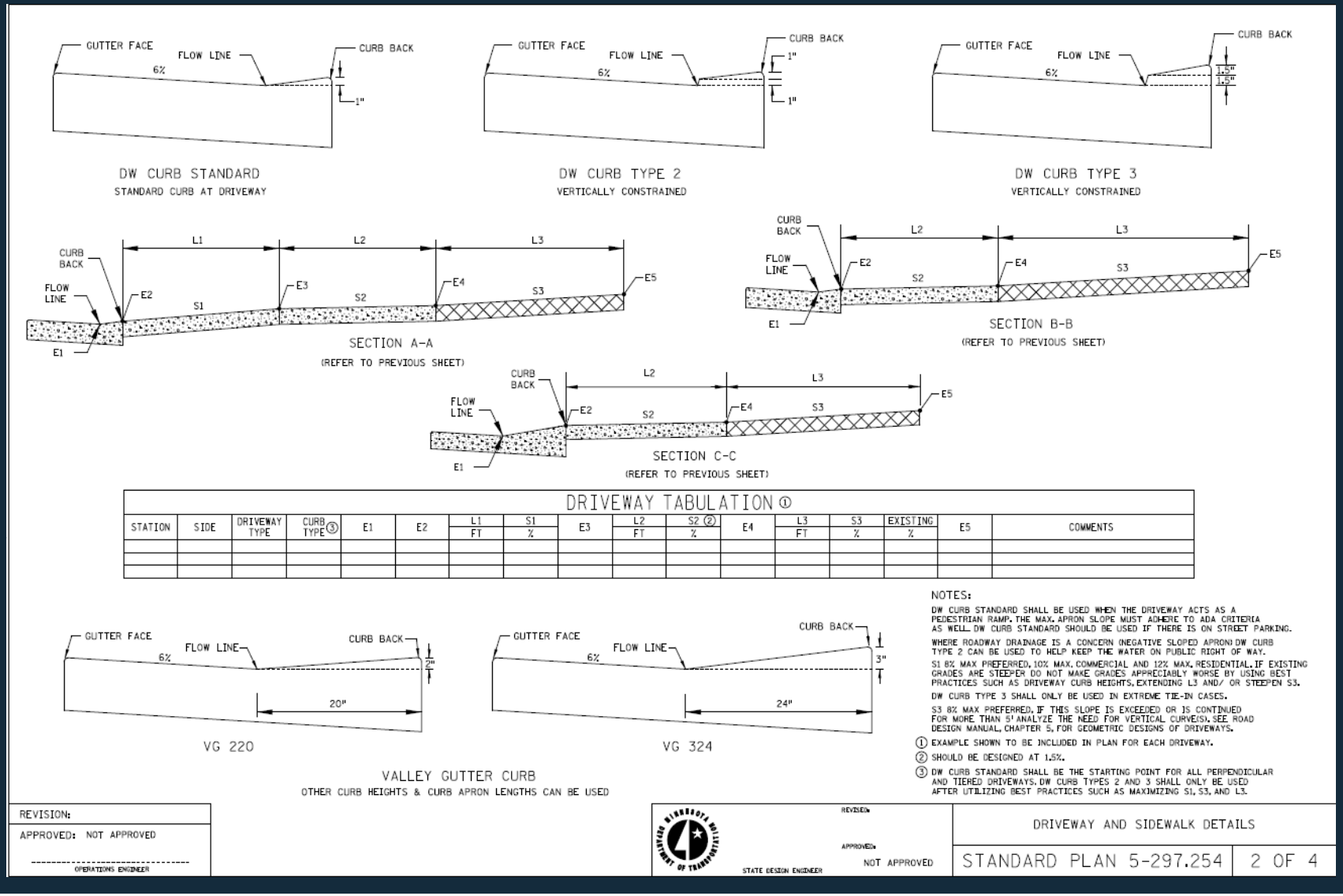
Maximize apron slopes to avoid the roller coaster effect when driveway match in elevations are higher than roadway elevations.





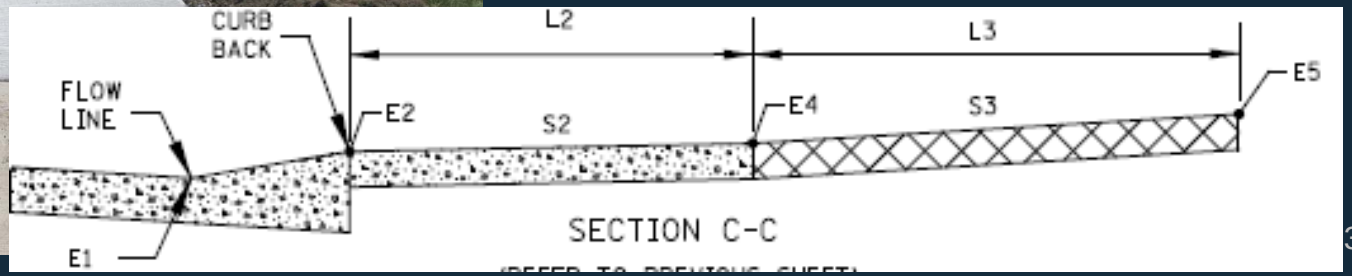
ADA Driveway Construction

Standard Plan 5-297.254 Sheet 2 of 4



ADA Driveway Construction

Review removal limits to verify grades.



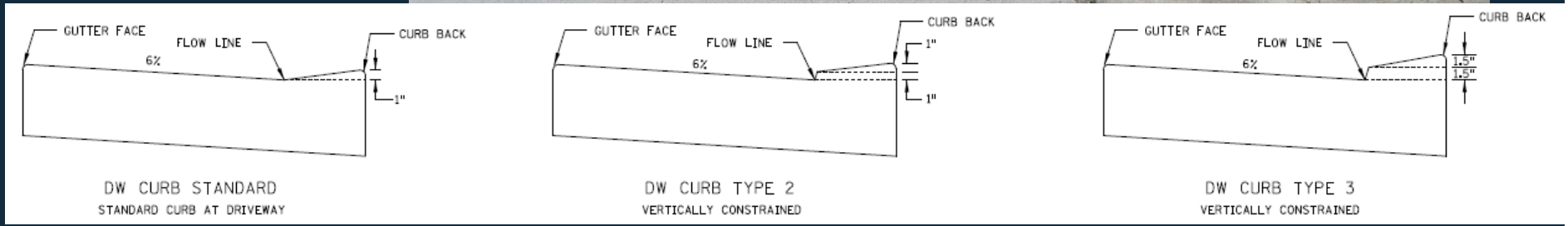
ADA Driveway Construction

Back of curb Heights at Driveway Apron

- DW Curb Standard 1”

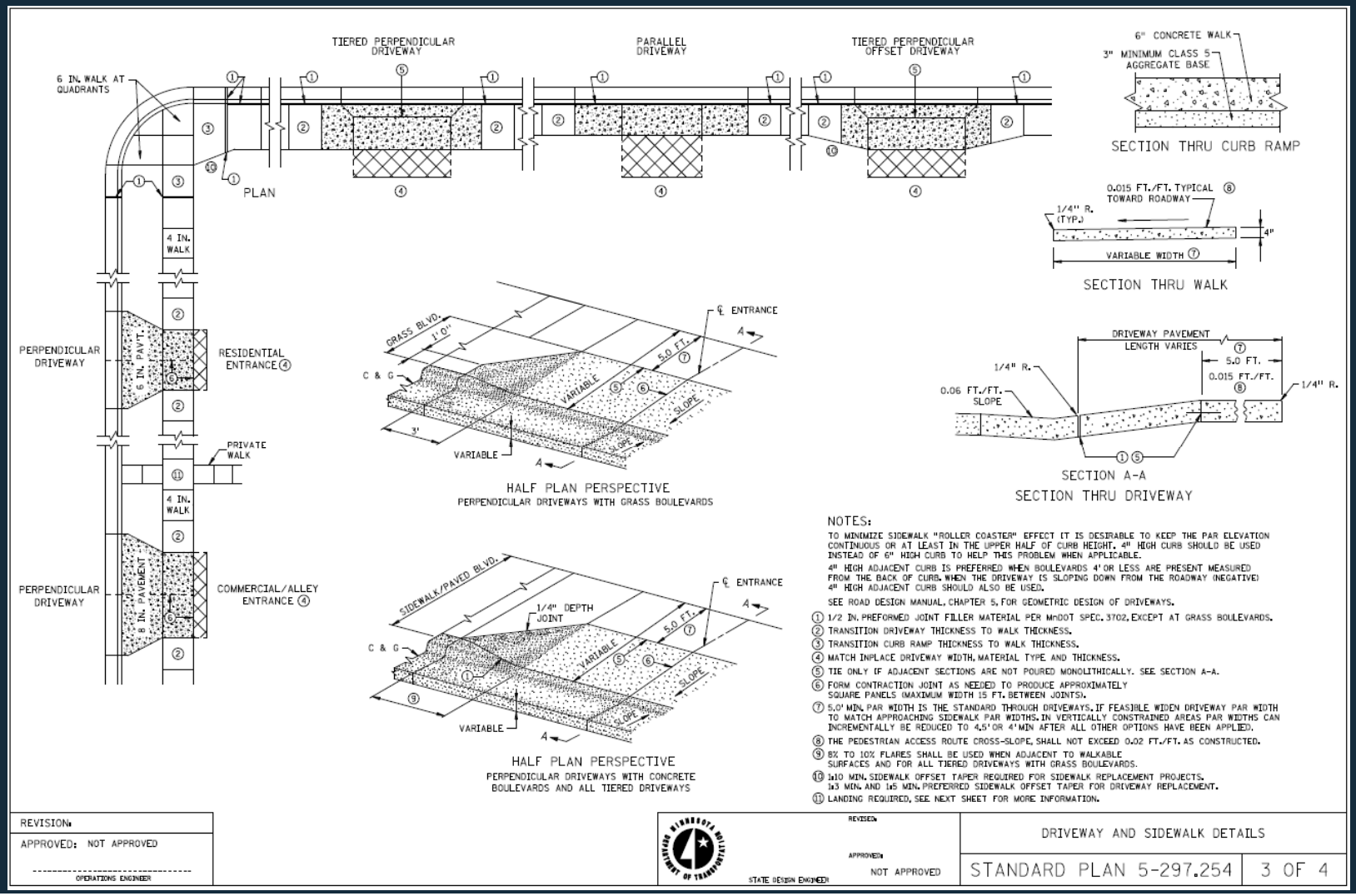
- DW Curb Type 2 Vertically Constrained 2”

- DW Curb Type 3 Vertically Constrained 3”



ADA Sidewalk Construction

Standard Plan Sheet 3 of 4 5-297.254
Replaces Standard Plate 7035N



NOTES:

TO MINIMIZE SIDEWALK "ROLLER COASTER" EFFECT IT IS DESIRABLE TO KEEP THE PAR ELEVATION CONTINUOUS OR AT LEAST IN THE UPPER HALF OF CURB HEIGHT. 4" HIGH CURB SHOULD BE USED INSTEAD OF 6" HIGH CURB TO HELP THIS PROBLEM WHEN APPLICABLE.

4" HIGH ADJACENT CURB IS PREFERRED WHEN BOULEVARDS 4' OR LESS ARE PRESENT MEASURED FROM THE BACK OF CURB. WHEN THE DRIVEWAY IS SLOPING DOWN FROM THE ROADWAY (NEGATIVE) 4" HIGH ADJACENT CURB SHOULD ALSO BE USED.

SEE ROAD DESIGN MANUAL, CHAPTER 5, FOR GEOMETRIC DESIGN OF DRIVEWAYS.

① 1/2 IN. PREFORMED JOINT FILLER MATERIAL PER MnDOT SPEC. 3702, EXCEPT AT GRASS BOULEVARDS.
② TRANSITION DRIVEWAY THICKNESS TO WALK THICKNESS.
③ TRANSITION CURB RAMP THICKNESS TO WALK THICKNESS.
④ MATCH INPLACE DRIVEWAY WIDTH, MATERIAL TYPE AND THICKNESS.
⑤ TIE ONLY IF ADJACENT SECTIONS ARE NOT POURED MONOLITHICALLY. SEE SECTION A-A.
⑥ FORM CONTRACTION JOINT AS NEEDED TO PRODUCE APPROXIMATELY SQUARE PANELS (MAXIMUM WIDTH 15 FT. BETWEEN JOINTS).
⑦ 5.0' MIN. PAR WIDTH IS THE STANDARD THROUGH DRIVEWAYS. IF FEASIBLE WIDEN DRIVEWAY PAR WIDTH TO MATCH APPROACHING SIDEWALK PAR WIDTHS. IN VERTICALLY CONSTRAINED AREAS PAR WIDTHS CAN INCREMENTALLY BE REDUCED TO 4.5' OR 4' MIN AFTER ALL OTHER OPTIONS HAVE BEEN APPLIED.
⑧ THE PEDESTRIAN ACCESS ROUTE CROSS-SLOPE, SHALL NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.
⑨ 8% TO 10% FLARES SHALL BE USED WHEN ADJACENT TO WALKABLE SURFACES AND FOR ALL TIERED DRIVEWAYS WITH GRASS BOULEVARDS.
⑩ 1x10 MIN. SIDEWALK OFFSET TAPER REQUIRED FOR SIDEWALK REPLACEMENT PROJECTS. 1x3 MIN. AND 1x5 MIN. PREFERRED SIDEWALK OFFSET TAPER FOR DRIVEWAY REPLACEMENT.
⑪ LANDING REQUIRED, SEE NEXT SHEET FOR MORE INFORMATION.

REVISION:
APPROVED: NOT APPROVED
OPERATIONS ENGINEER

REVISED:
APPROVED: NOT APPROVED
STATE DESIGN ENGINEER

DRIVEWAY AND SIDEWALK DETAILS
STANDARD PLAN 5-297.254 | 3 OF 4

ADA Sidewalk Construction

Total system consists of over 600 miles of sidewalk on MnDOT right of way.

20 Year Sidewalk Program

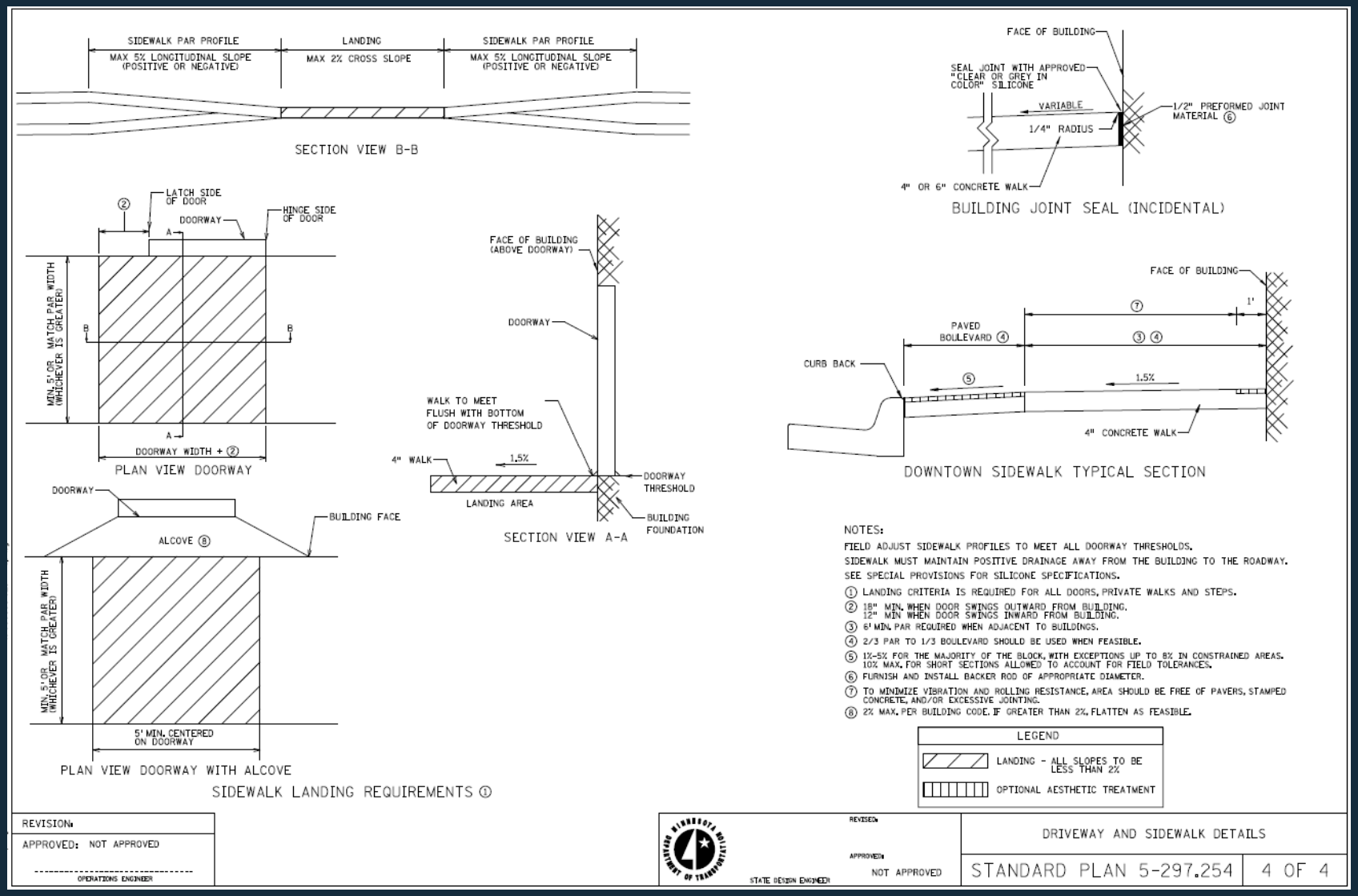
Of that 600 miles only 260 miles are considered fully compliant.

ADA Sidewalk Construction

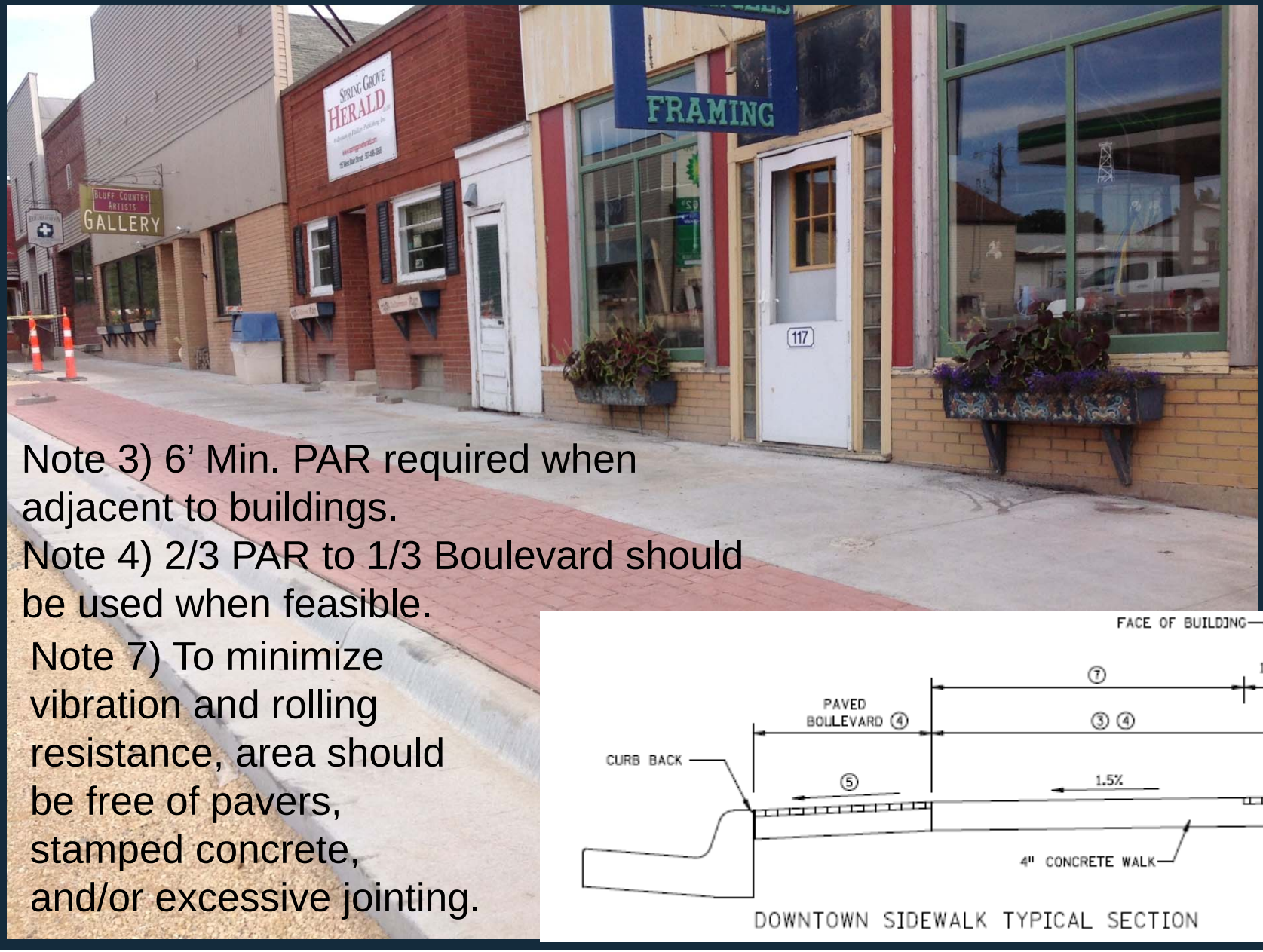
Note: 8) Pedestrian Access route cross-slope shall not exceed 0.02 Ft. / Ft. as constructed.

Typical Doorway Landings

Standard Plan 5-297.254 Sheet 4 of 4



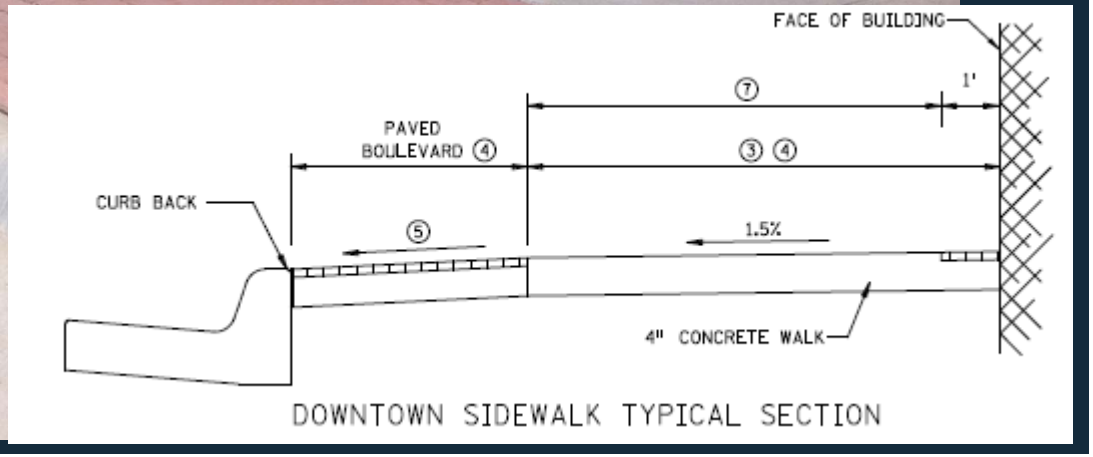
Typical Doorway Landings



Note 3) 6’ Min. PAR required when adjacent to buildings.

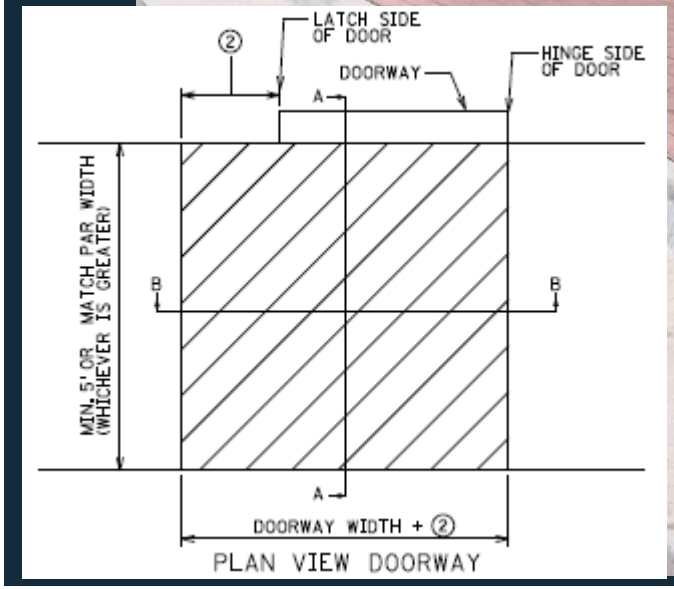
Note 4) 2/3 PAR to 1/3 Boulevard should be used when feasible.

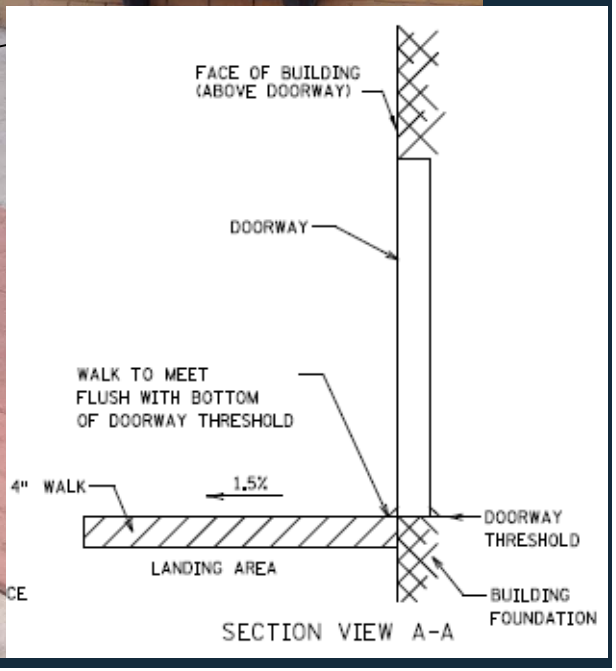
Note 7) To minimize vibration and rolling resistance, area should be free of pavers, stamped concrete, and/or excessive jointing.



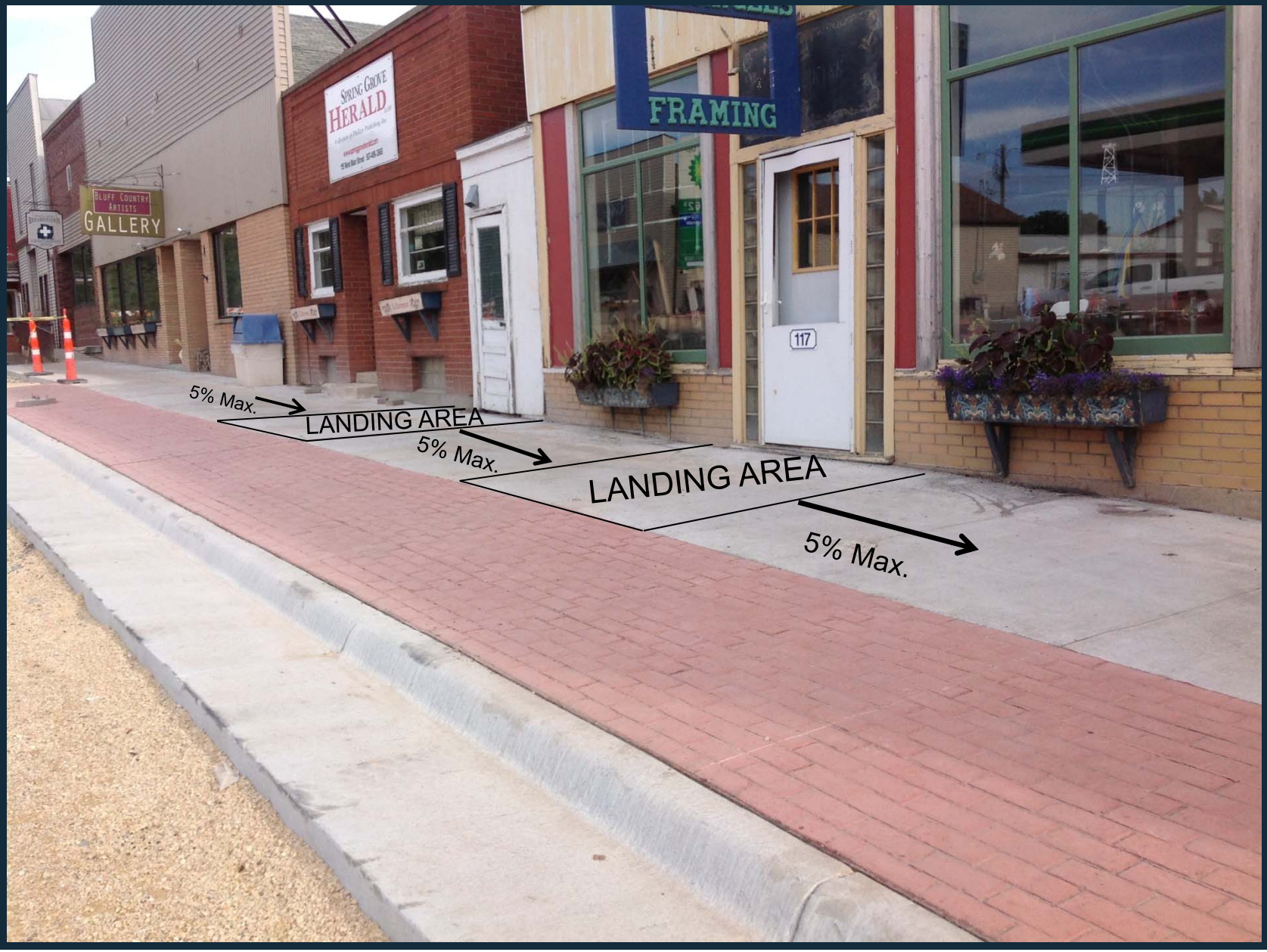
DOWNTOWN SIDEWALK TYPICAL SECTION

Typical Doorway Landings

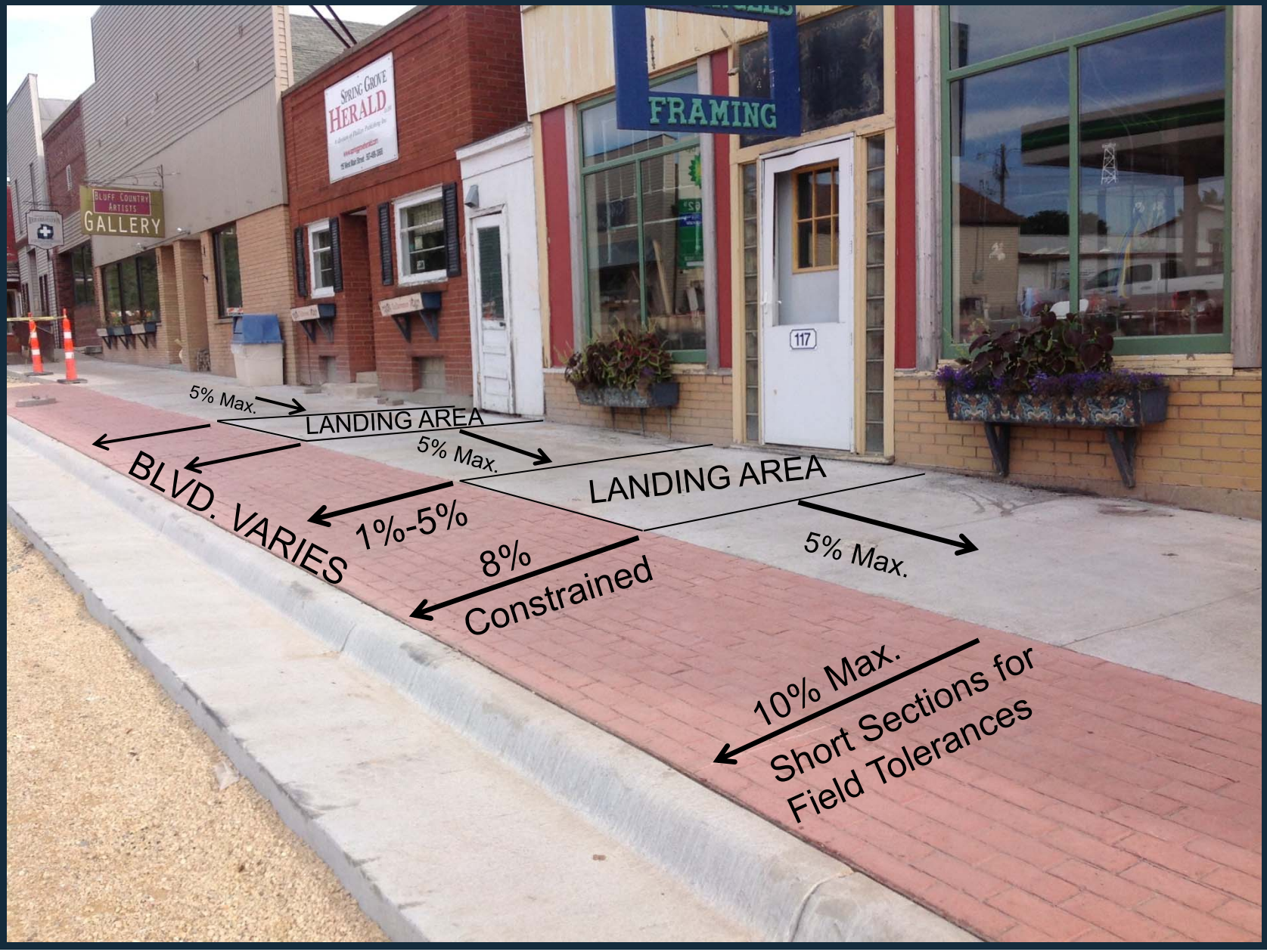




Typical Doorway Landings



Typical Doorway Landings

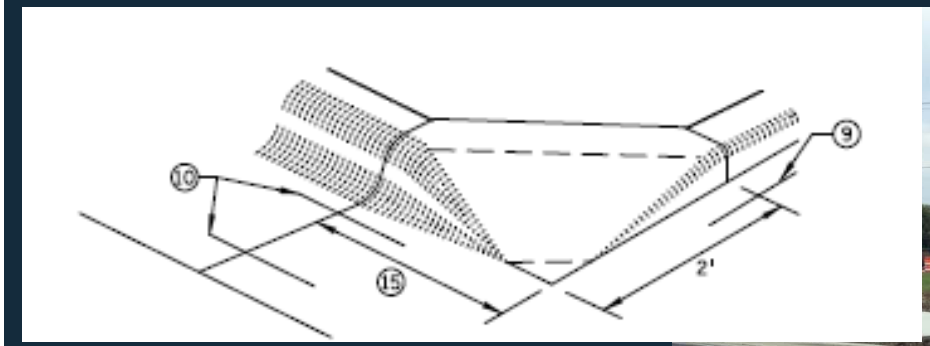


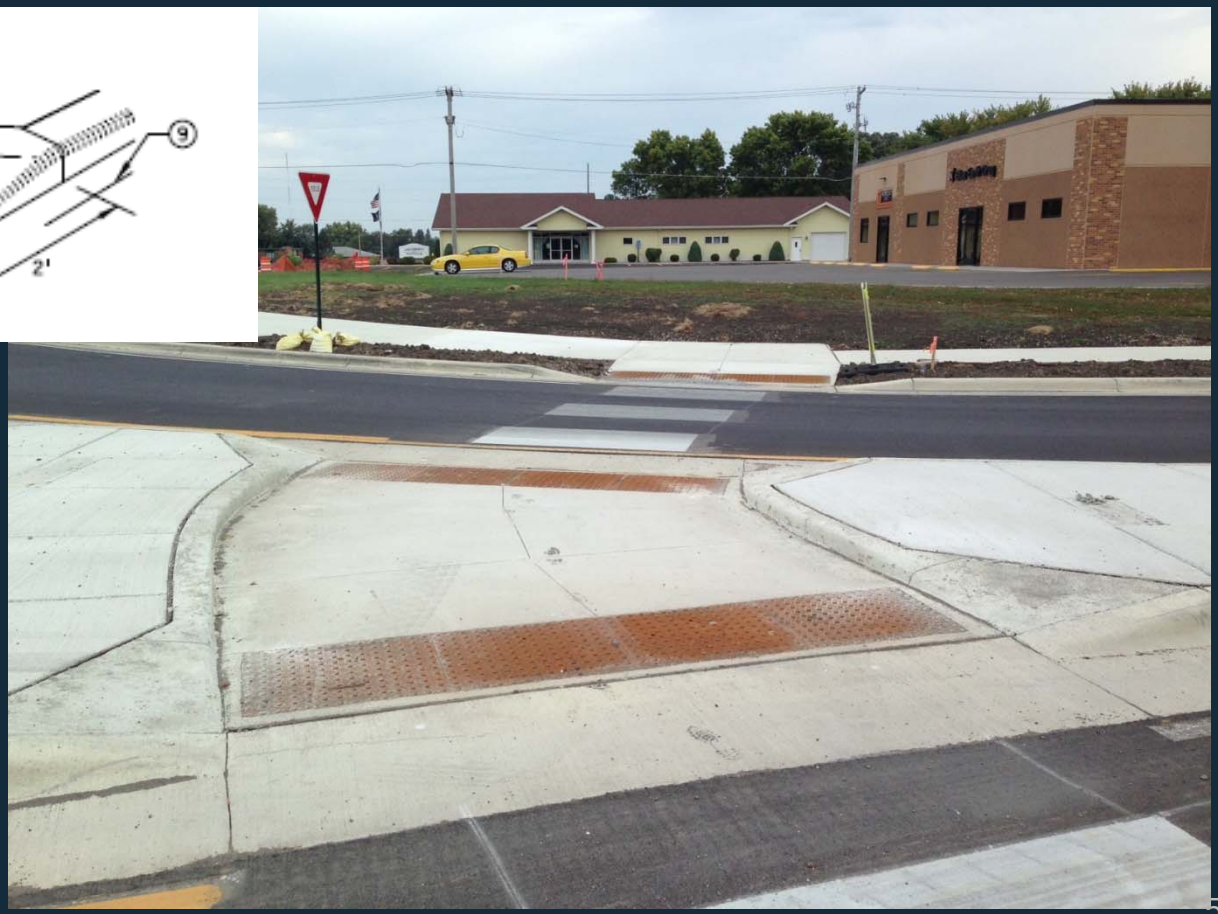
Roundabouts and Median Islands

- Approach nose detail for downstream side of traffic. Truncated domes need to be behind curb.

Roundabouts and Median Islands

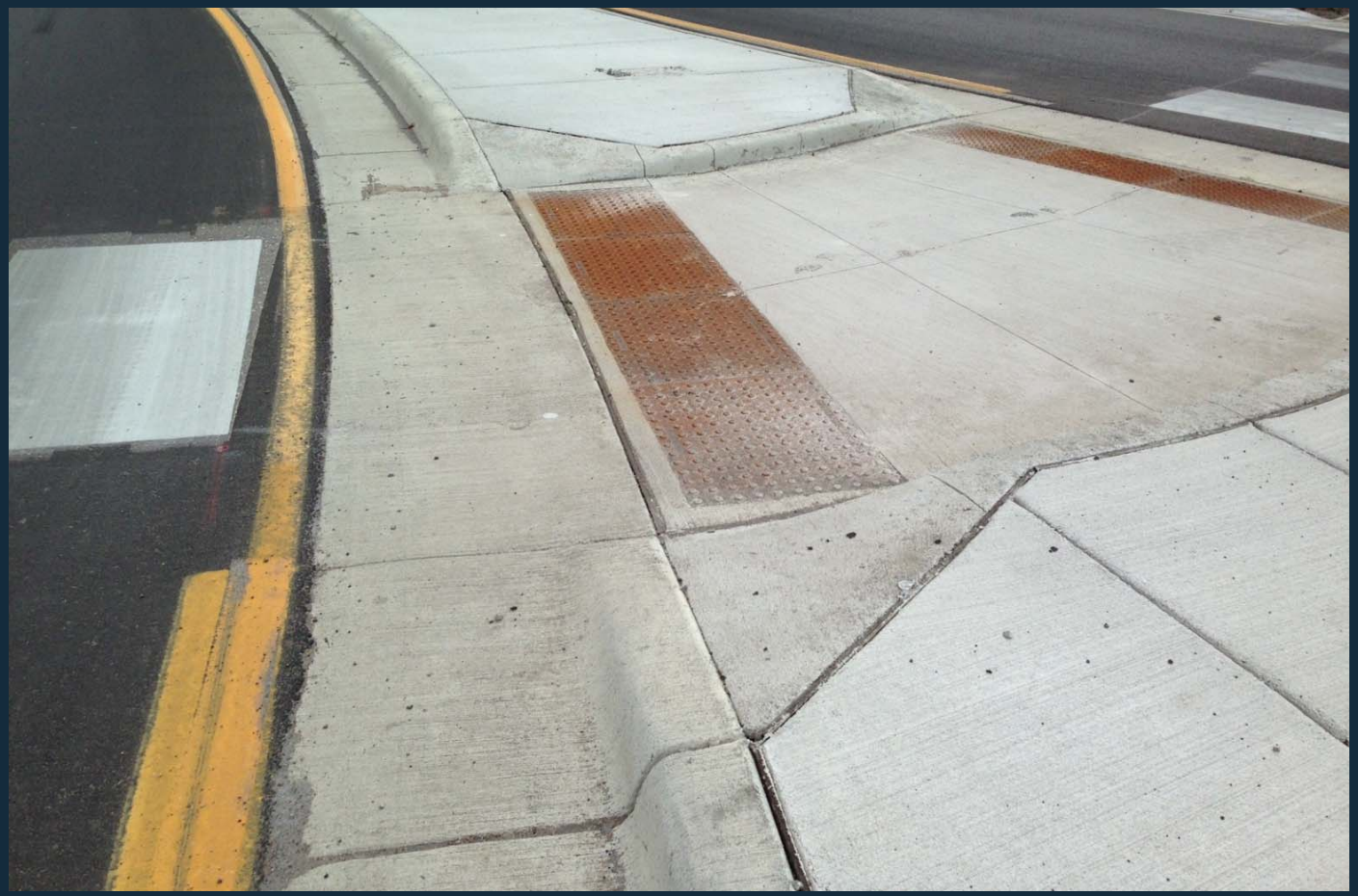
- Pedestrian Approach Nose Detail
- Note 15) 3’ for medians and splitter islands can be reduced to 2’ on free right islands roadway 2’





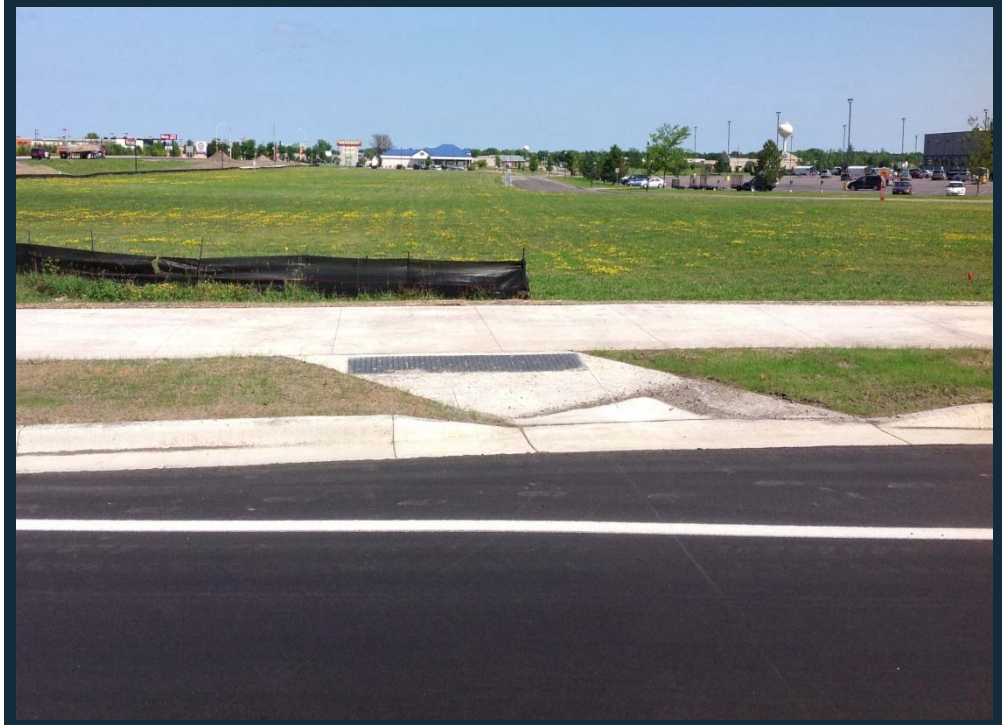
Roundabouts and Median Islands

- Use Pedestrian Approach Nose Details at all four corners. Follow reinforcement details if not poured integral with curb and gutter or with V- curb.



Roundabouts and Median Islands

- Recommendations from the NCHRP (National Cooperative Highway Research Program)
- At ramps located where slip ramp “T” into trail place domes at the top of ramp
- At locations where trail comes off roadway place domes in the direction of travel.



Roundabouts and Median Islands

- Roundabout and Bicycle slip ramps.
- Place the domes in the direction of travel and domes should provide visual contrast.

Curb and Gutter Adjustments

Special situations: “Maximum Extent Feasible”

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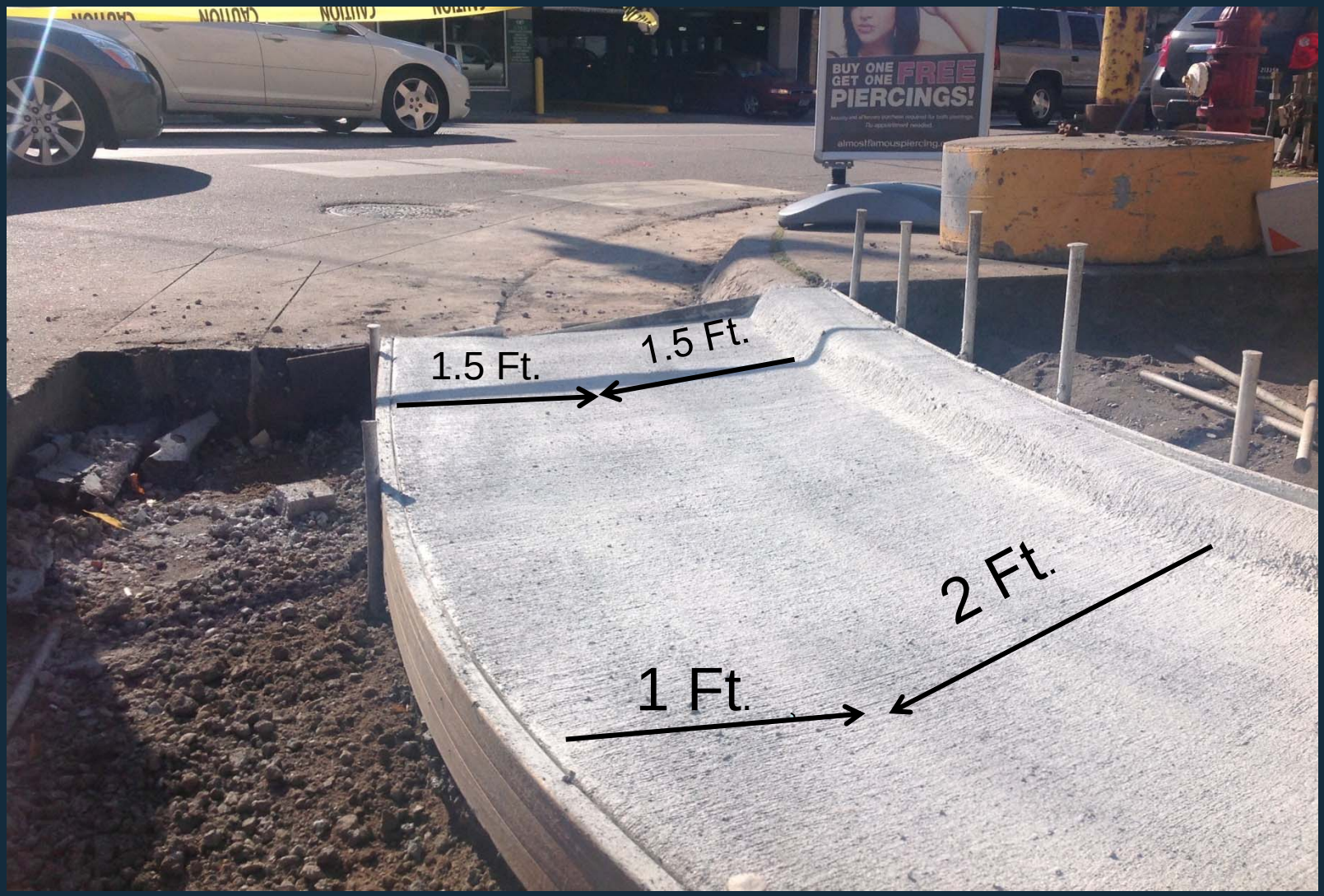

Curb and Gutter Adjustments

Special situations: “Maximum Extent Feasible”

ADA Construction

Questions ?