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<http://www.dot.state.mn.us/ada/tools.html>

Your Destination... Our Priority





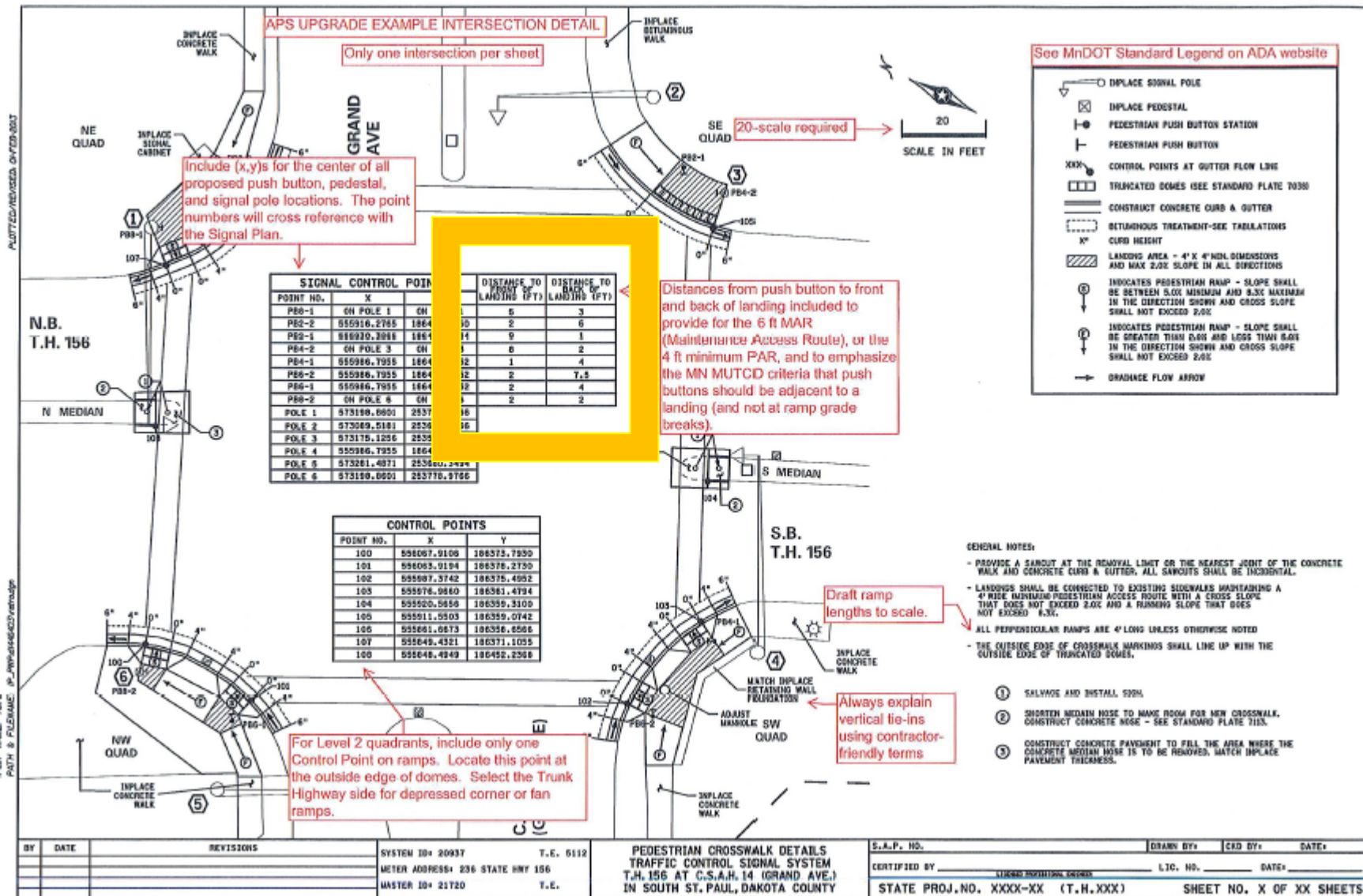
MnDOT ADA Training

Curb Ramp Construction

Your Destination...Our Priority



APS Signals New for 2013

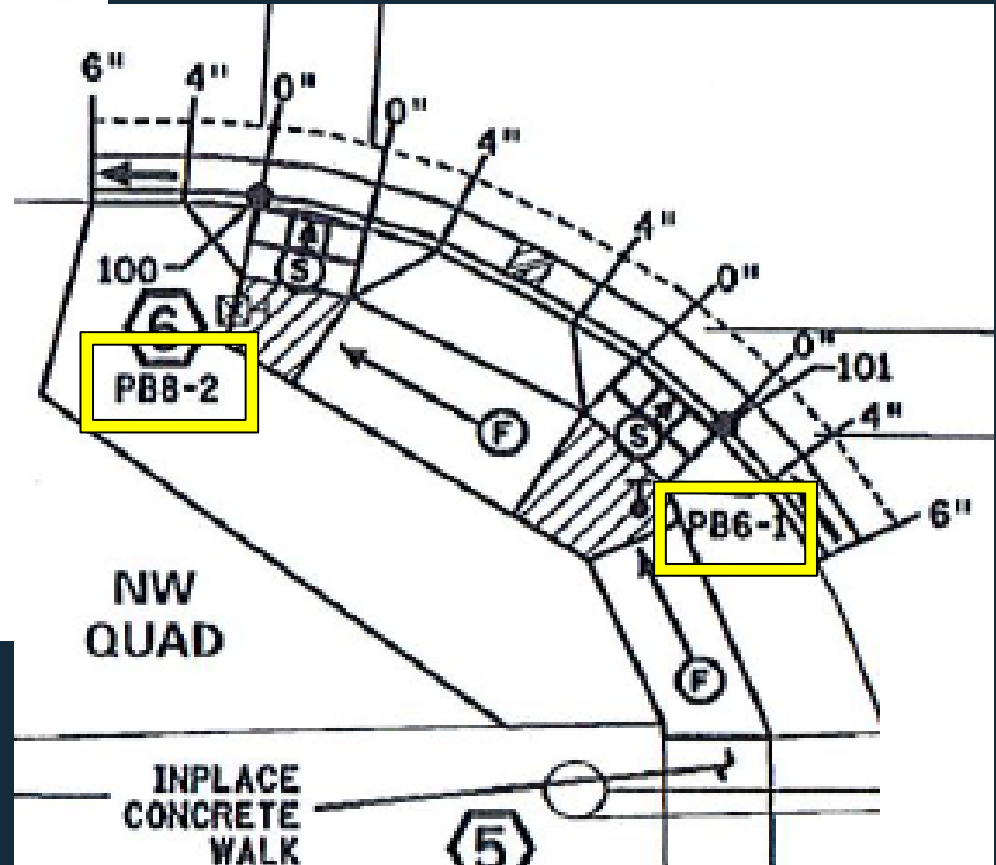


APS Signals New for 2013

- Signal Control Points
- PB8-2 and PB6-1

SIGNAL CONTROL POINTS			DISTANCE TO FRONT OF LANDING (FT)	DISTANCE TO BACK OF LANDING (FT)
POINT NO.	X	Y		
PB8-1	ON POLE 1	ON POLE 1	5	3
PB2-2	555916.2765	186470.6450	2	6
PB2-1	555930.3865	186471.5934	9	1
PB4-2	ON POLE 3	ON POLE 3	8	2
PB4-1	555986.7955	186457.9452	1	4
PB6-2	555986.7955	186457.9452	2	7.5
PB6-1	555986.7955	186457.9452	2	4
PB8-2	ON POLE 6	ON POLE 6	2	2
POLE 1	573198.8601	253778.9766		
POLE 2	573089.5181	253699.4266		
POLE 3	573175.1256	253599.9369		
POLE 4	555986.7955	186457.9452		
POLE 5	573281.4871	253680.3494		
POLE 6	573198.8601	253778.9766		

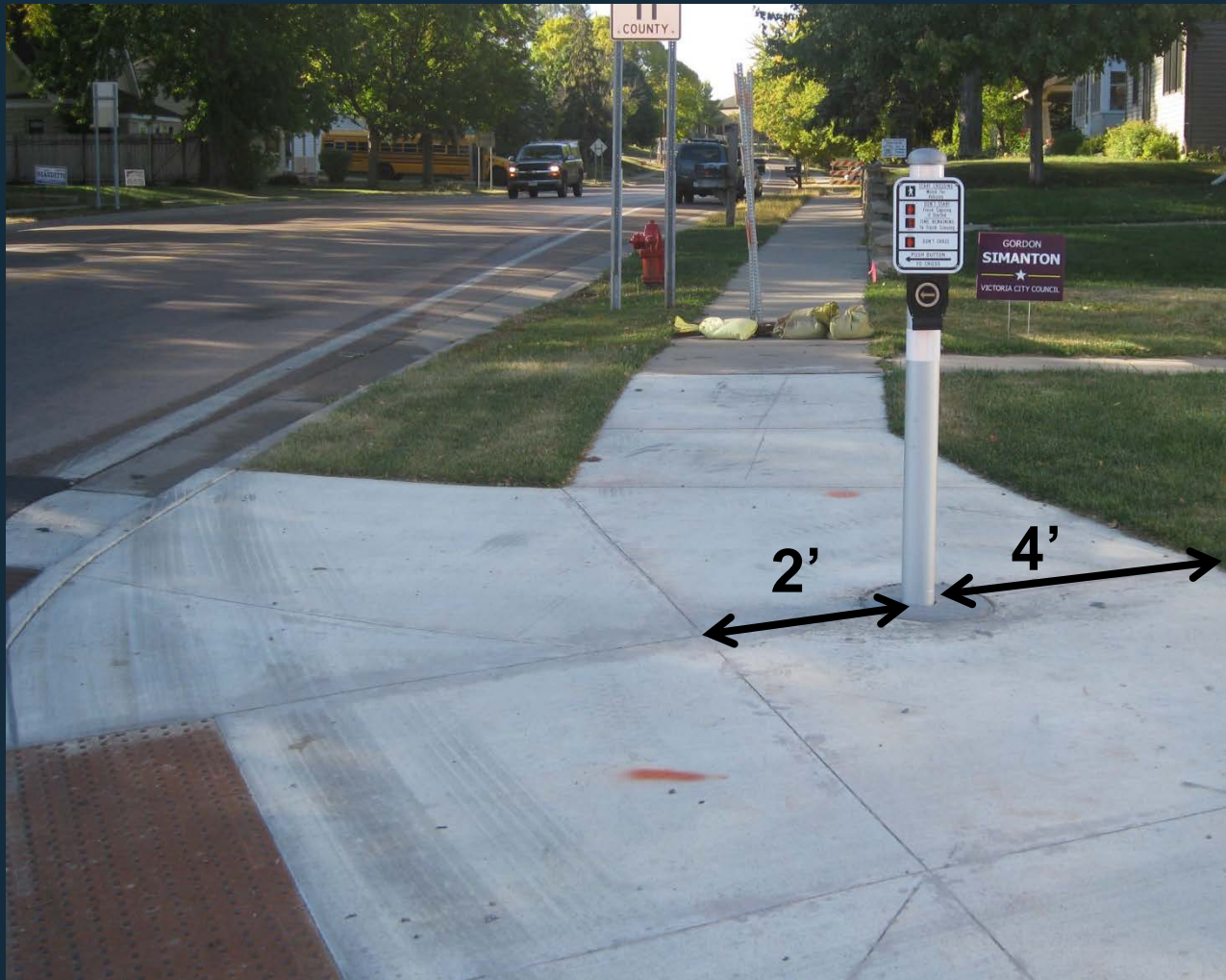
CONTROL POINTS		
POINT NO.	X	Y
100	558067.9106	186373.7930
101	558063.9194	186378.2730
102	555987.3742	186375.4952
103	555976.9660	186361.4794
104	555920.5656	186359.3100
105	555911.5503	186359.0742
106	555861.6673	186358.6566
107	555849.4321	186371.1055
108	555848.4949	186452.2368



ADA Curb Ramp New for 2013



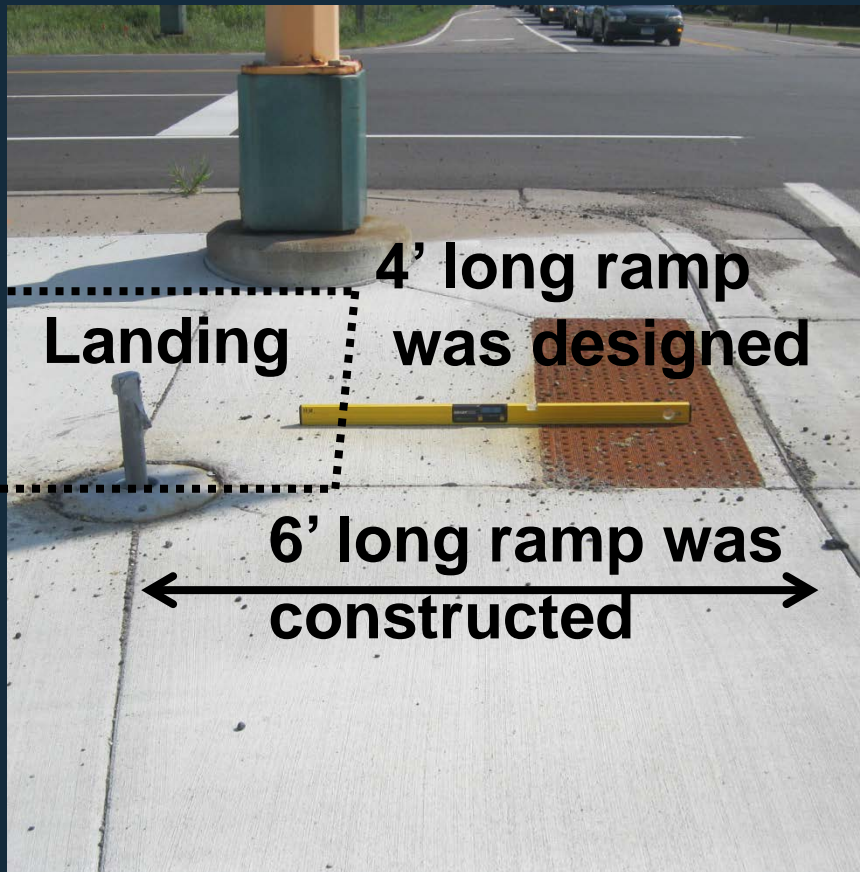
- Additional plan information will provide construction more guidance.



ADA Curb Ramp New for 2013



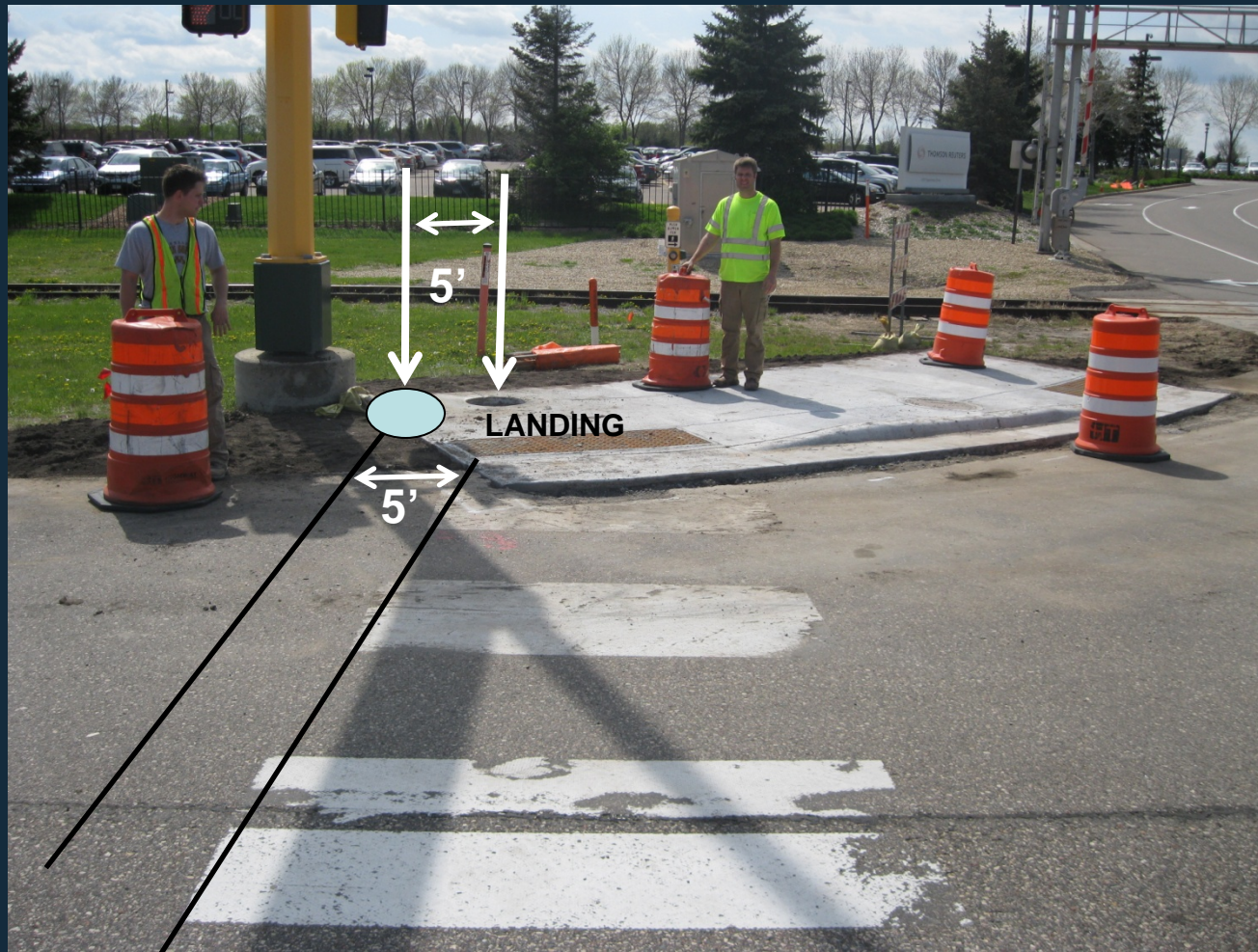
- Additional plan information will minimize rework



ADA Curb Ramp New for 2013







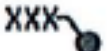








- APS push button layout provides for up to a 5' off set from projected outside edge of crosswalk



ADA Curb Ramp New for 2013



See MnDOT Standard Legend on ADA website

-  INPLACE SIGNAL POLE
-  INPLACE PEDESTAL
-  PEDESTRIAN PUSH BUTTON STATION
-  PEDESTRIAN PUSH BUTTON
-  XXX CONTROL POINTS AT GUTTER FLOW LINE
-  TRUNCATED DOMES (SEE STANDARD PLATE 7038)
-  CONSTRUCT CONCRETE CURB & GUTTER
-  BITUMINOUS TREATMENT-SEE TABULATIONS
-  X"
CURB HEIGHT
-  LANDING AREA - 4' X 4' MIN. DIMENSIONS
AND MAX 2.0% SLOPE IN ALL DIRECTIONS
-  INDICATES PEDESTRIAN RAMP - SLOPE SHALL
BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM
IN THE DIRECTION SHOWN AND CROSS SLOPE
SHALL NOT EXCEED 2.0%
-  INDICATES PEDESTRIAN RAMP - SLOPE SHALL
BE GREATER THAN 2.0% AND LESS THAN 5.0%
IN THE DIRECTION SHOWN AND CROSS SLOPE
SHALL NOT EXCEED 2.0%
-  → DRAINAGE FLOW ARROW

ADA Curb Ramp New for 2013



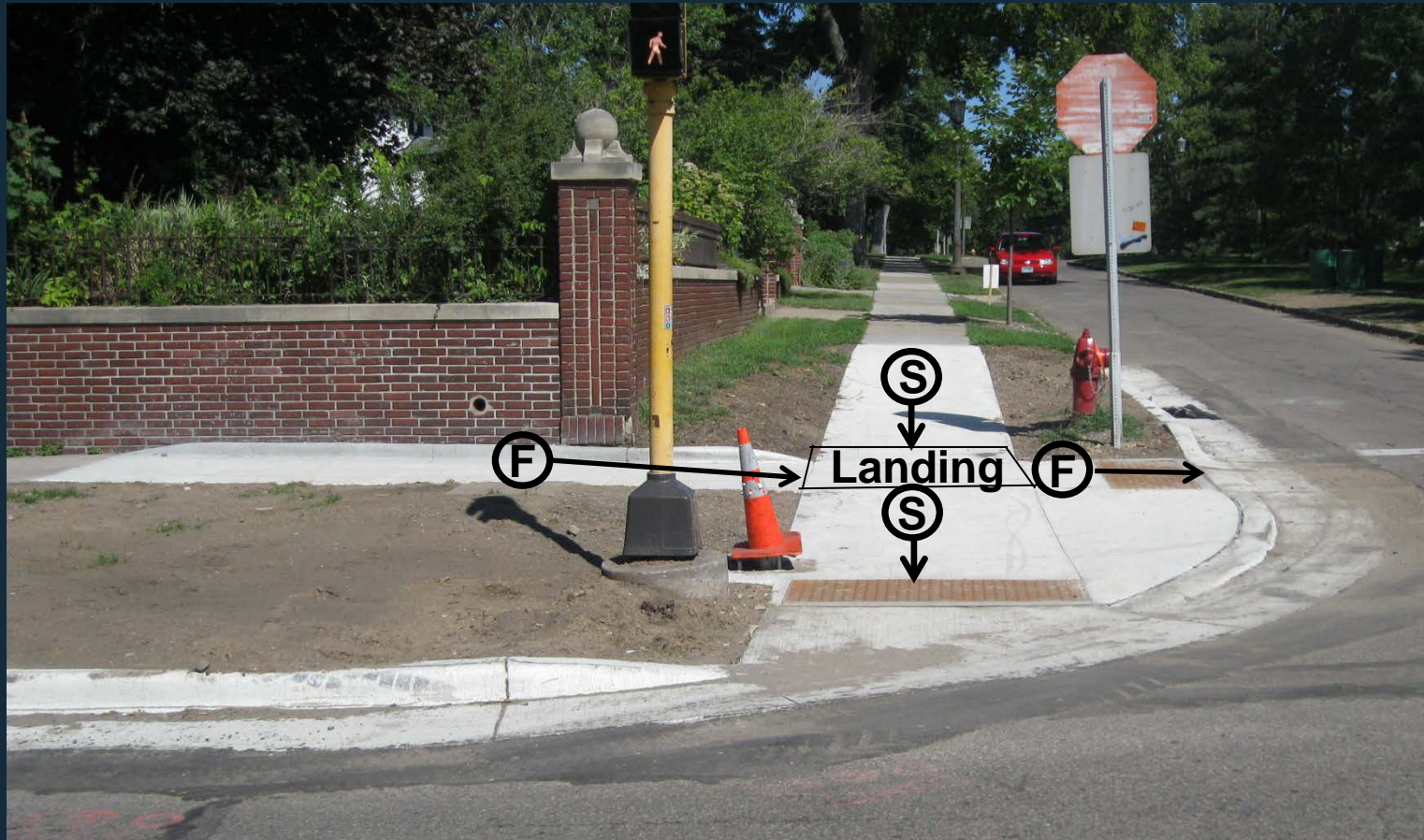
Indicates pedestrian ramp – slope shall be between 5% minimum and 8.3% maximum in the direction shown and the cross slope shall not exceed 2%



ADA Curb Ramp New for 2013



F Indicates pedestrian ramp – slopes shall be greater than 2% and less than 5% in the direction shown and cross slope shall not exceed 2%



ADA Curb Ramp New for 2013



This ramp should have risen up to a 4" curb height to maintain drainage and eliminate v-curb.



ADA Curb Ramp New for 2013



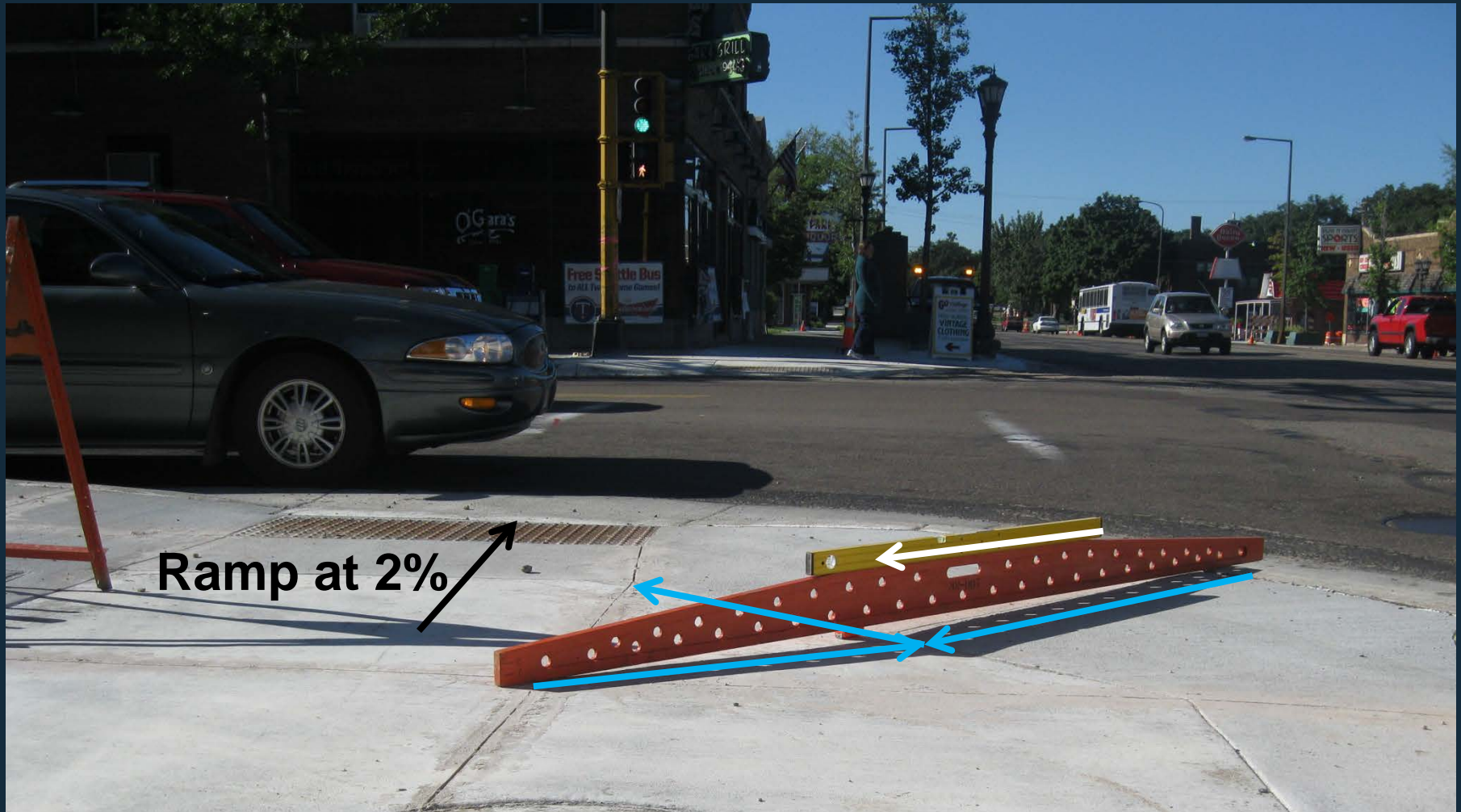
2% ramp was constructed with landing lower than top of curb



ADA Curb Ramp New for 2013

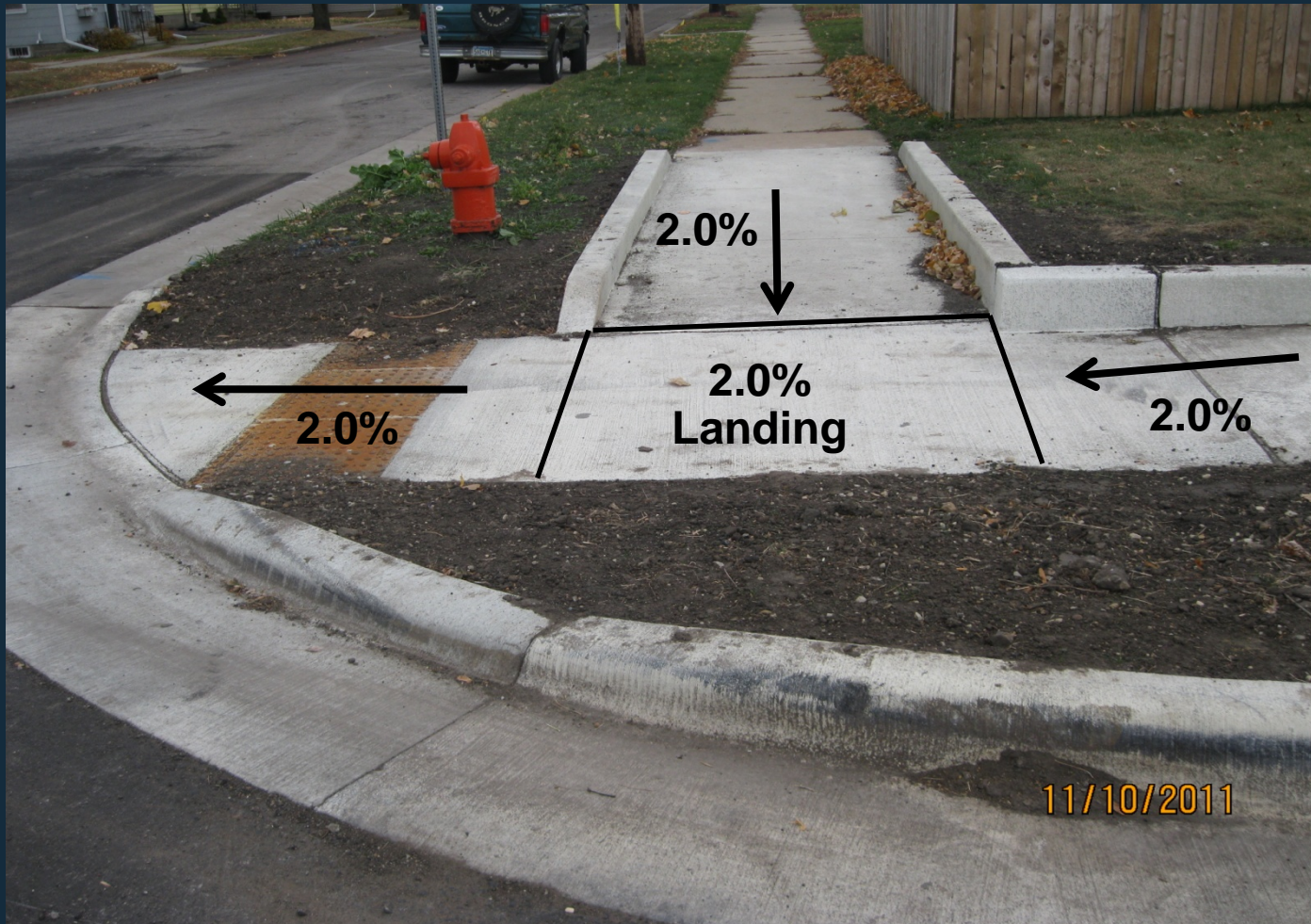


2% ramp created a drainage valley/swale



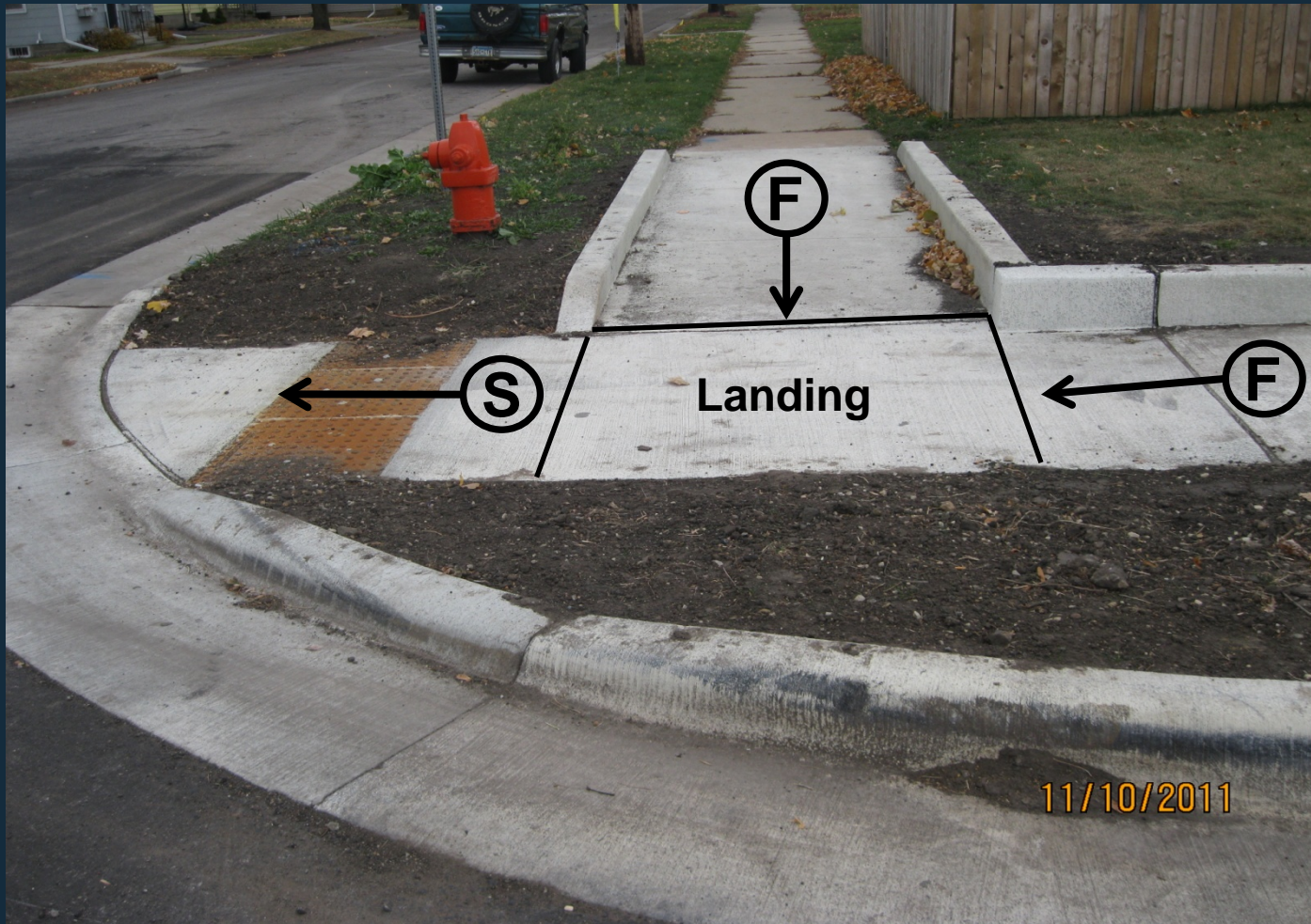
Over use of V-Curb

- Use of v-curb only where the Plan shows or by authorization of the Engineer.



Over use of V-Curb

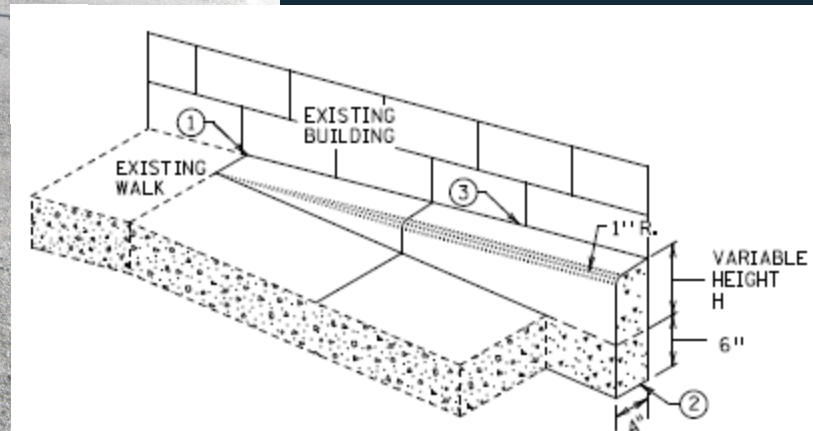
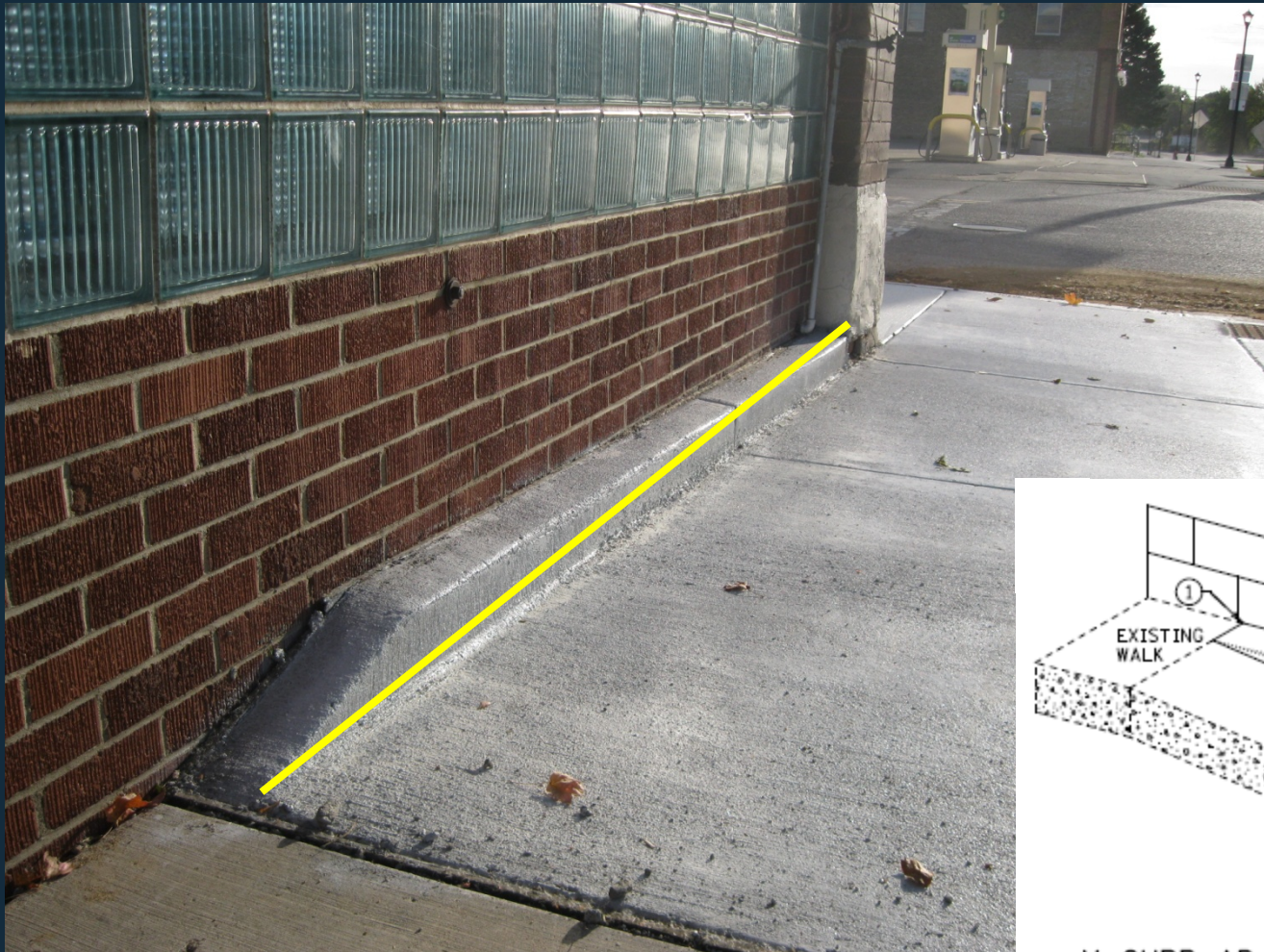
- Slopes shown and adjacent side grading would eliminate all v-curb



ADA Curb Ramp V-Curb



- V-curb follow standard plans (sheet 5) for design and construction

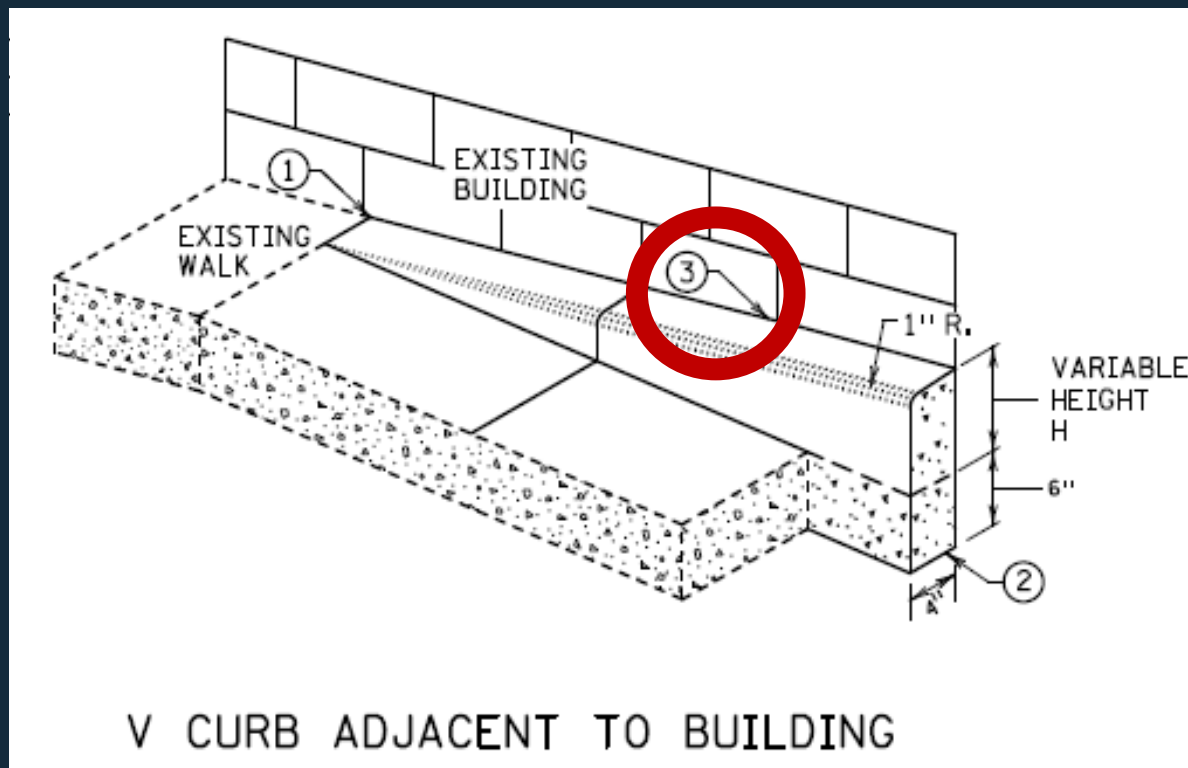


V CURB ADJACENT TO BUILDING

ADA Curb Ramp V-Curb



- Note (3) edge between new v-curb and in-place structure shall be sealed and bond breaker shall be used between existing structure and placed v-curb.



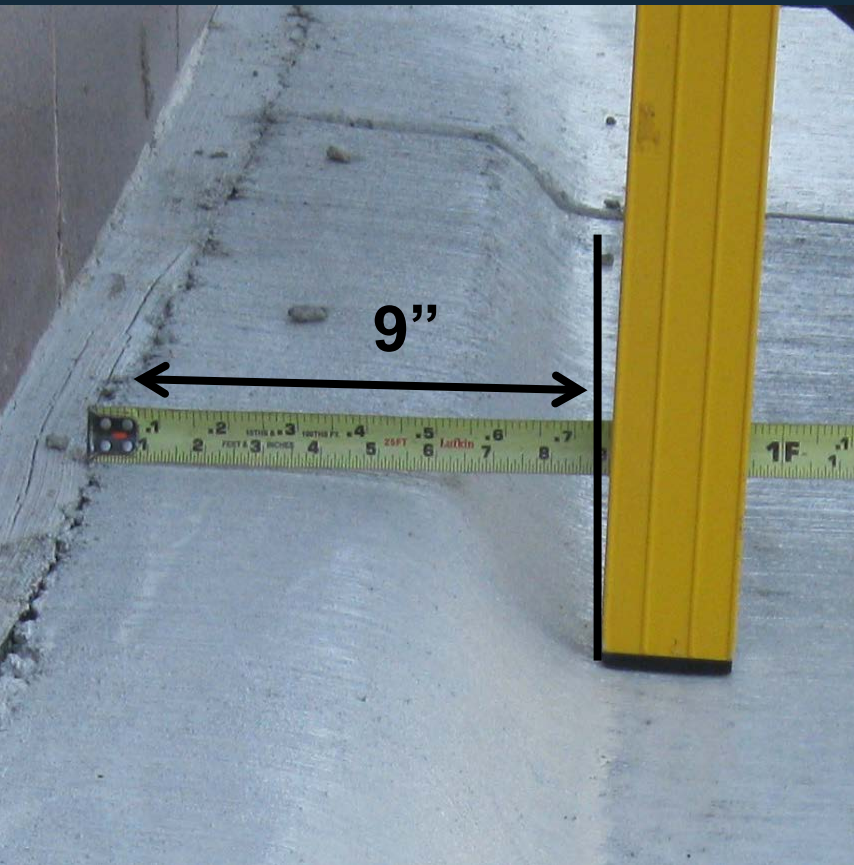
ADA Curb Ramp V-Curb

- Work next to existing building or structures.



ADA Curb Ramp V-Curb

- Constructed with a vertical face.
- Always 4" width v-curb when adjacent to building.



ADA Curb Ramp V Curb

- V-curb adjacent to building that also provides 6' minimum Maintenance Access Route (MAR)



ADA Curb Ramp New for 2013



Landings shall be located anywhere the PAR changes direction, at the top of ramps having a running slope greater than 5%, and if the approaching sidewalk is inverse grade. (Standard Plan Sheet 2 of 5) also avoid “tenting” of the PAR



ADA Removal limits

1803 (C) 1 the contractor shall use the appropriate ramp details in the plan and identify the removal limits for sidewalk and C&G



ADA Removal limits



Increase removal limits to avoid (Tenting) of PAR



ADA Curb and Gutter New 2013



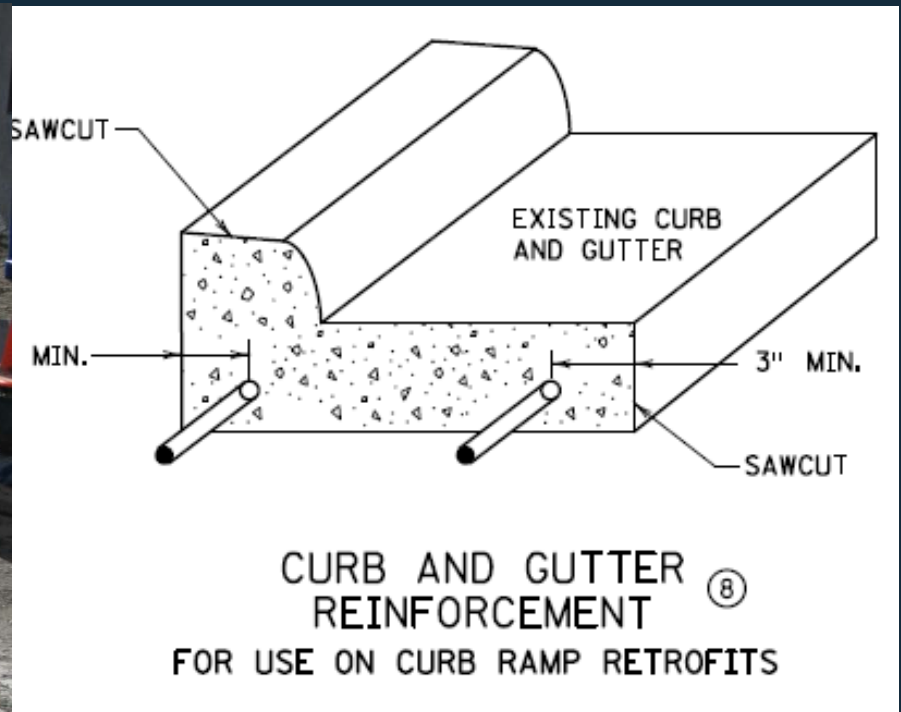
Top front of gutter shall be constructed flush with proposed adjacent pavement elevation. PAR gutter shall not be overlaid. (Standard Plan Sheet 3 of 5)



ADA Curb Ramp New for 2013



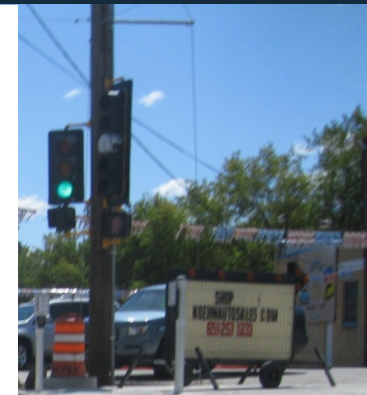
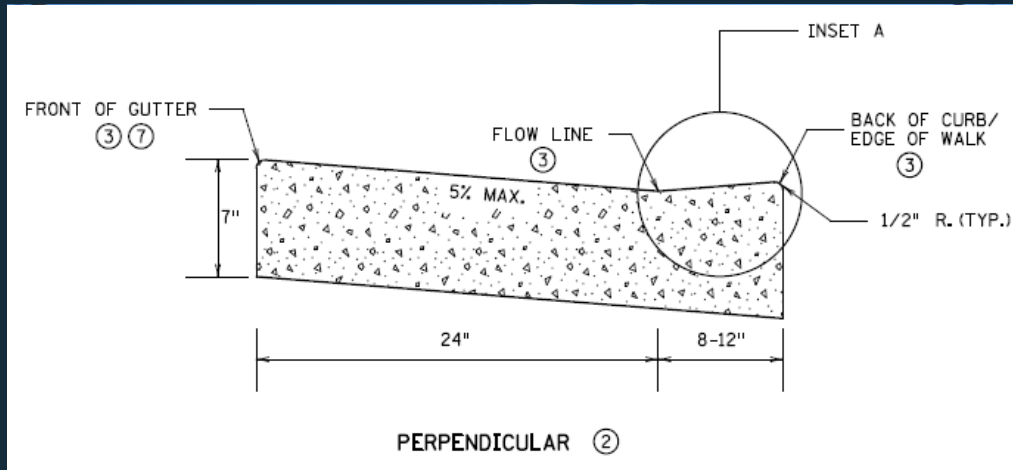
Curb: Drill and Grout 2-No. 4 by 12" long deformed reinforcement bars (Epoxy Coated)



2302-Drill and Grout Reinforcement Bars (Epoxy Coated) Each

ADA Curb and Gutter

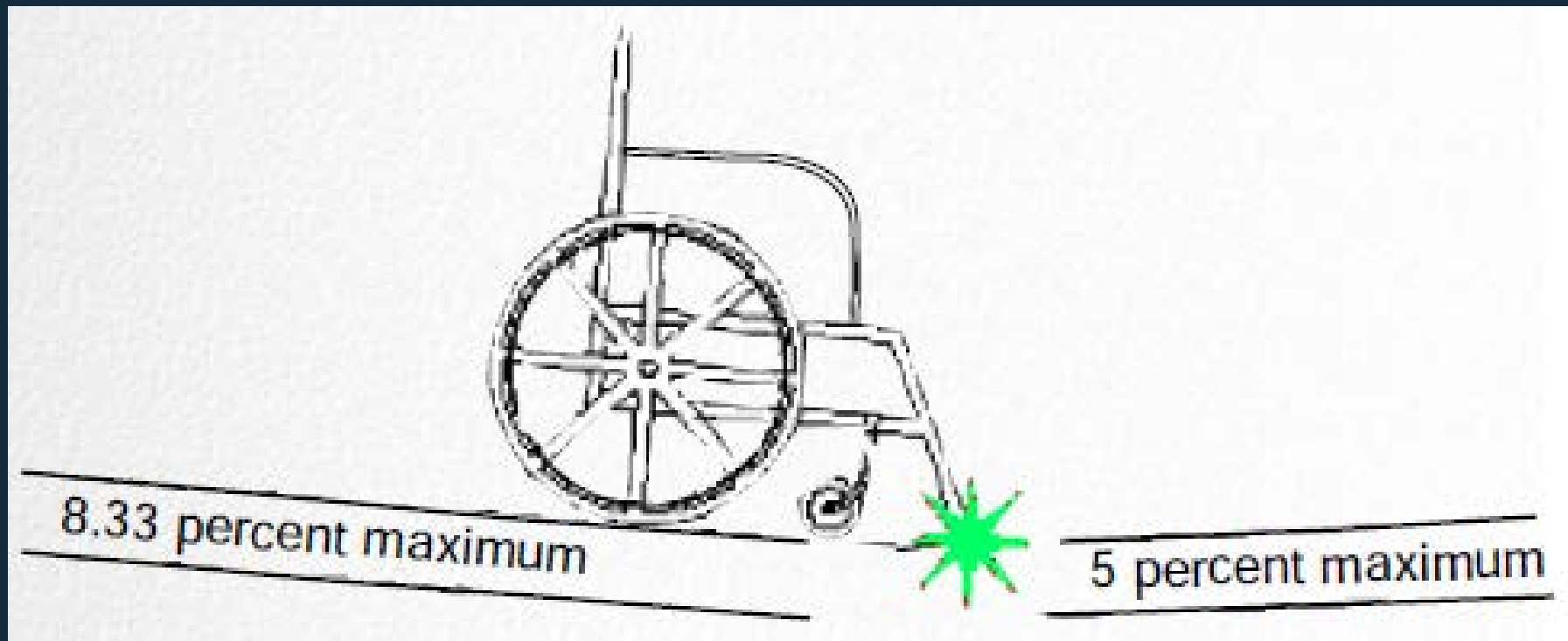
Perpendicular, tiered, parallel and diagonal ramps require 5% maximum gutter slope



ADA Curb and Gutter

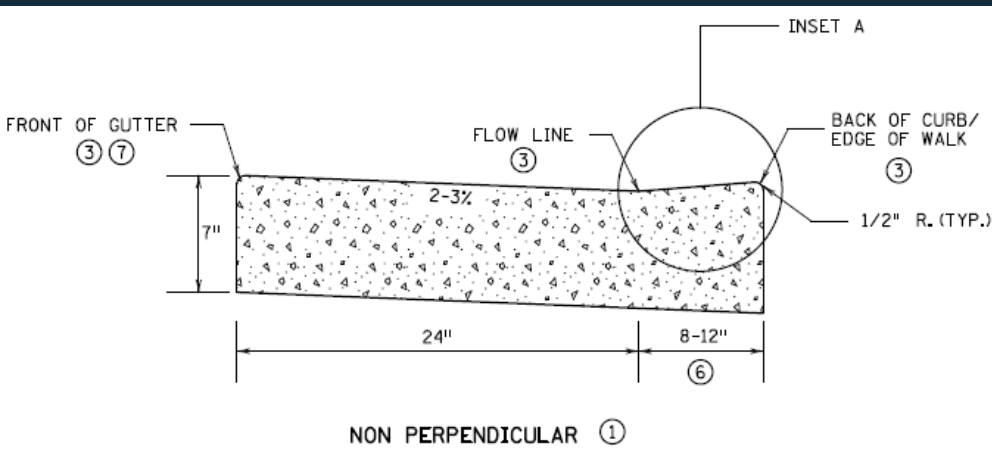


- The gentler the transition between the gutter and the ramp, the easier it is to traverse with a wheelchair.



ADA Curb and Gutter

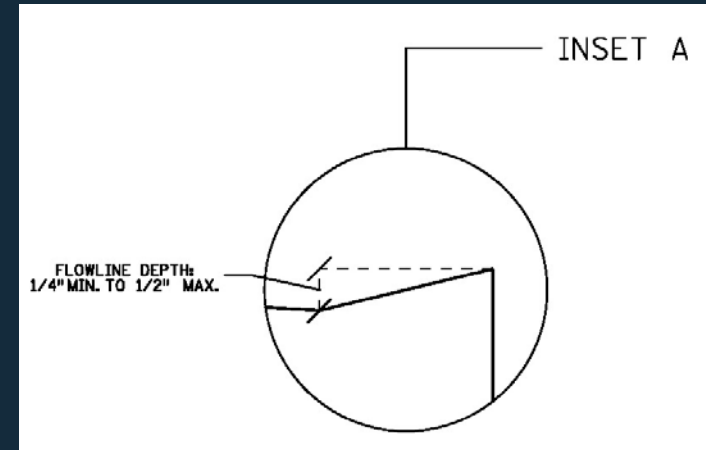
Fans, depressed corners, one way and combined directional ramps require 2%-3% maximum gutter slope.



ADA Curb and Gutter

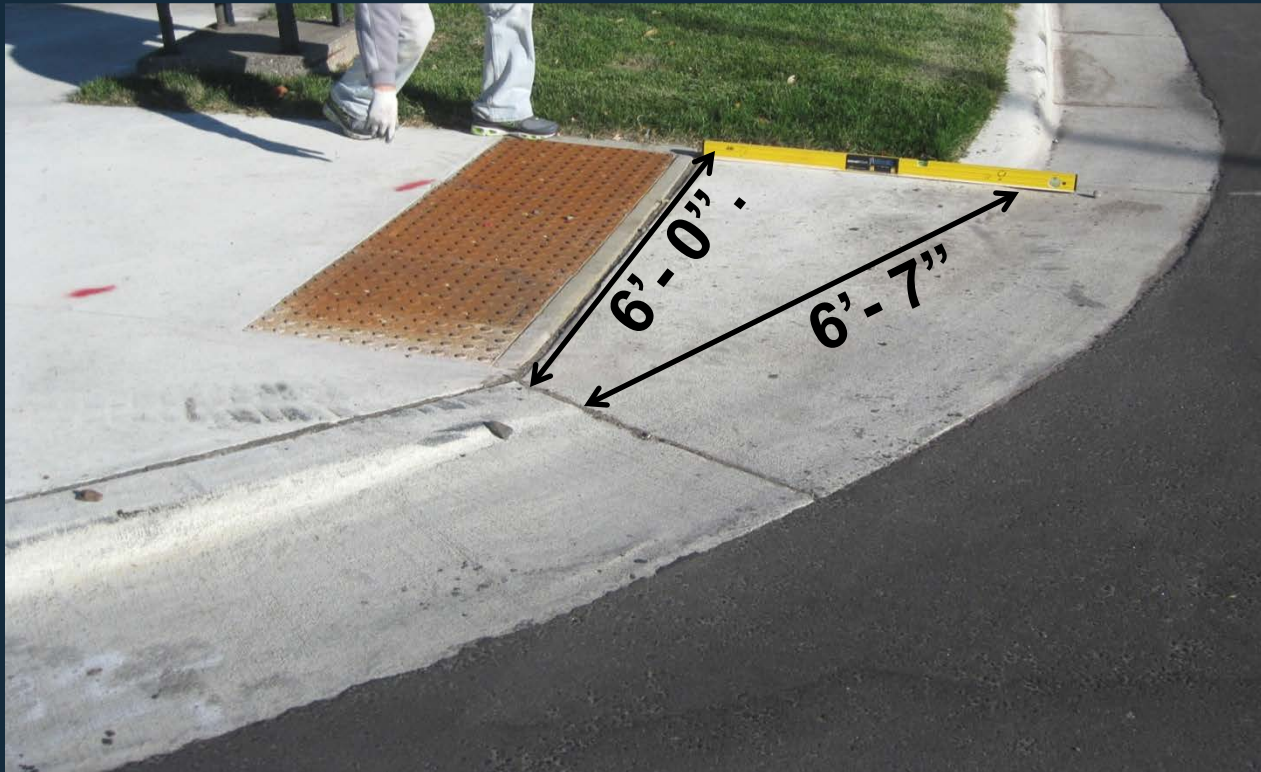


- A continuous gutter flow line shall be constructed



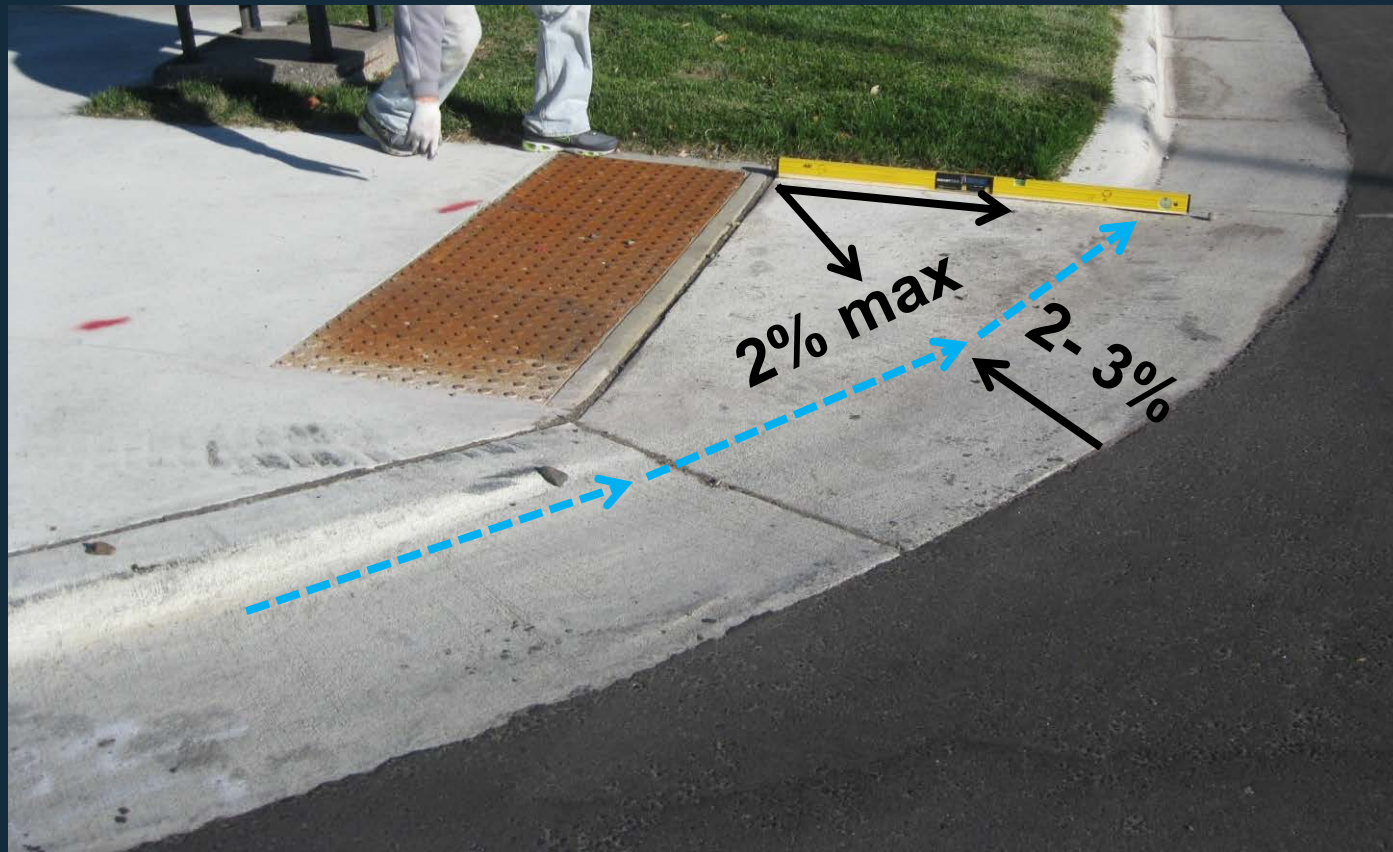
ADA Curb and Gutter

- Plan ahead on directional ramp construction during layout of curb and gutter verify ramp dimensions.



ADA Curb and Gutter

- When constructing directional ramps, the “triangular” concrete piece shall be poured integral with the curb and gutter “directional curb”. (Standard Plans Sheet 2 of 5)



ADA Curb and Gutter



- Spec. 2531 Concrete Curb and Gutter ADA : if gutter flow line exceeds 2% The flow line should be adjusted to allow a flatter slope, but still provide positive drainage



ADA Curb and Gutter



- Spec. 2531 Concrete Curb and Gutter ADA : the Contractor must consult with the engineer before modifying any flow line that will result in the cross slope of the adjacent patching (running slope of crosswalk) exceeding 5%



ADA Curb and Gutter



Curb joints should be located outside of PAR



ADA Curb and Gutter



If curb joints are located in the curb ramp zone
Use the same criteria as the sidewalks joints.

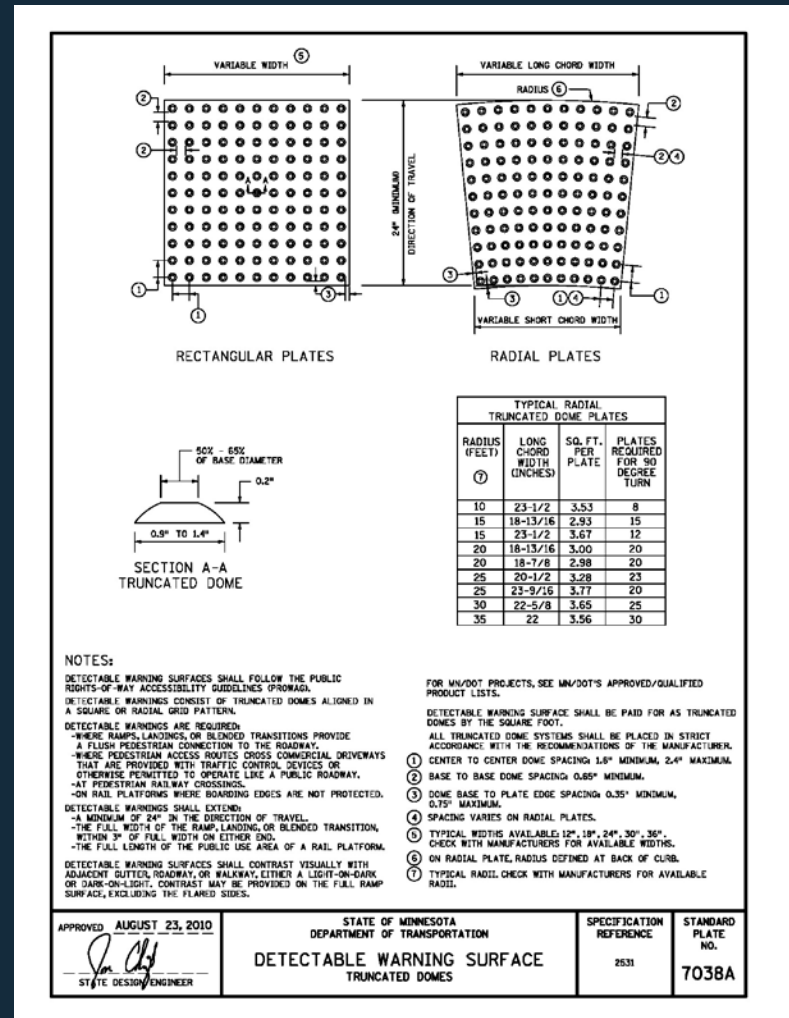


Standard Plate 7038A



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



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.



Truncated Dome Directionality

- Directionality should be done only when it works.
- Directional ramps are more difficult to construct with APS criteria.



ADA Detectable Edge

(2531) Construction requirements-Truncated Domes Shall be placed in the concrete and pressed firmly into the concrete to the point the concrete fills the vent holes.



ADA Detectable Edge

(2531) Construction Requirements

Any swelling of the concrete that occurs around the truncated domes must be screeded off and the surrounding concrete shall be finished flush with the truncated dome plate edge ... contractor should provide a 3" minimum concrete border.



ADA Detectable Edge

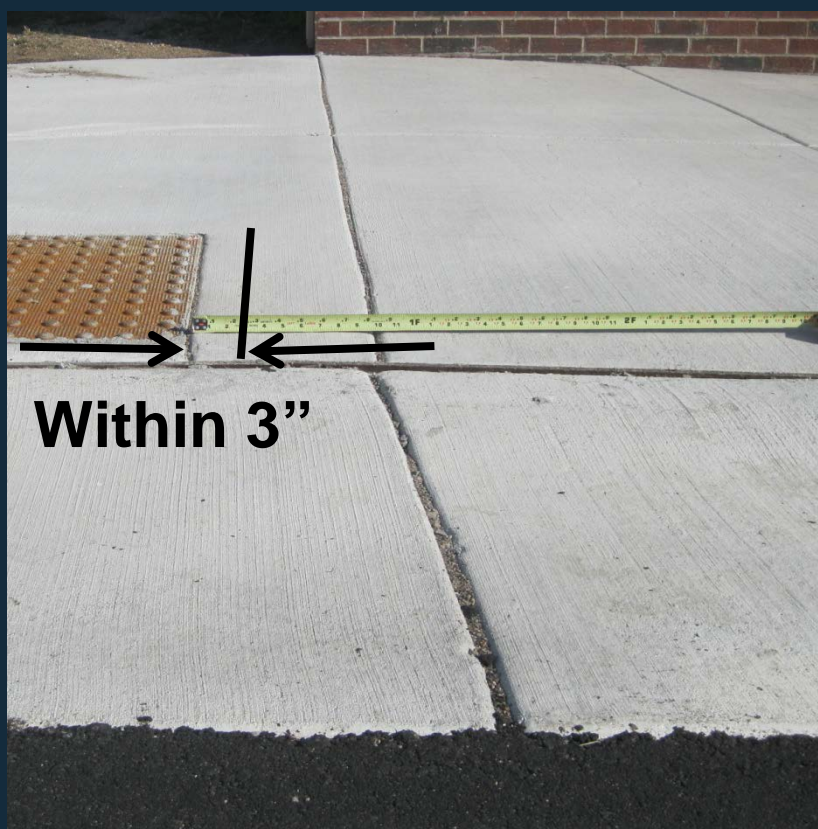
(2531) Construction Requirements

No cutting of the Truncated Domes will be allowed unless approved by the Engineer.



ADA Detectable Edge

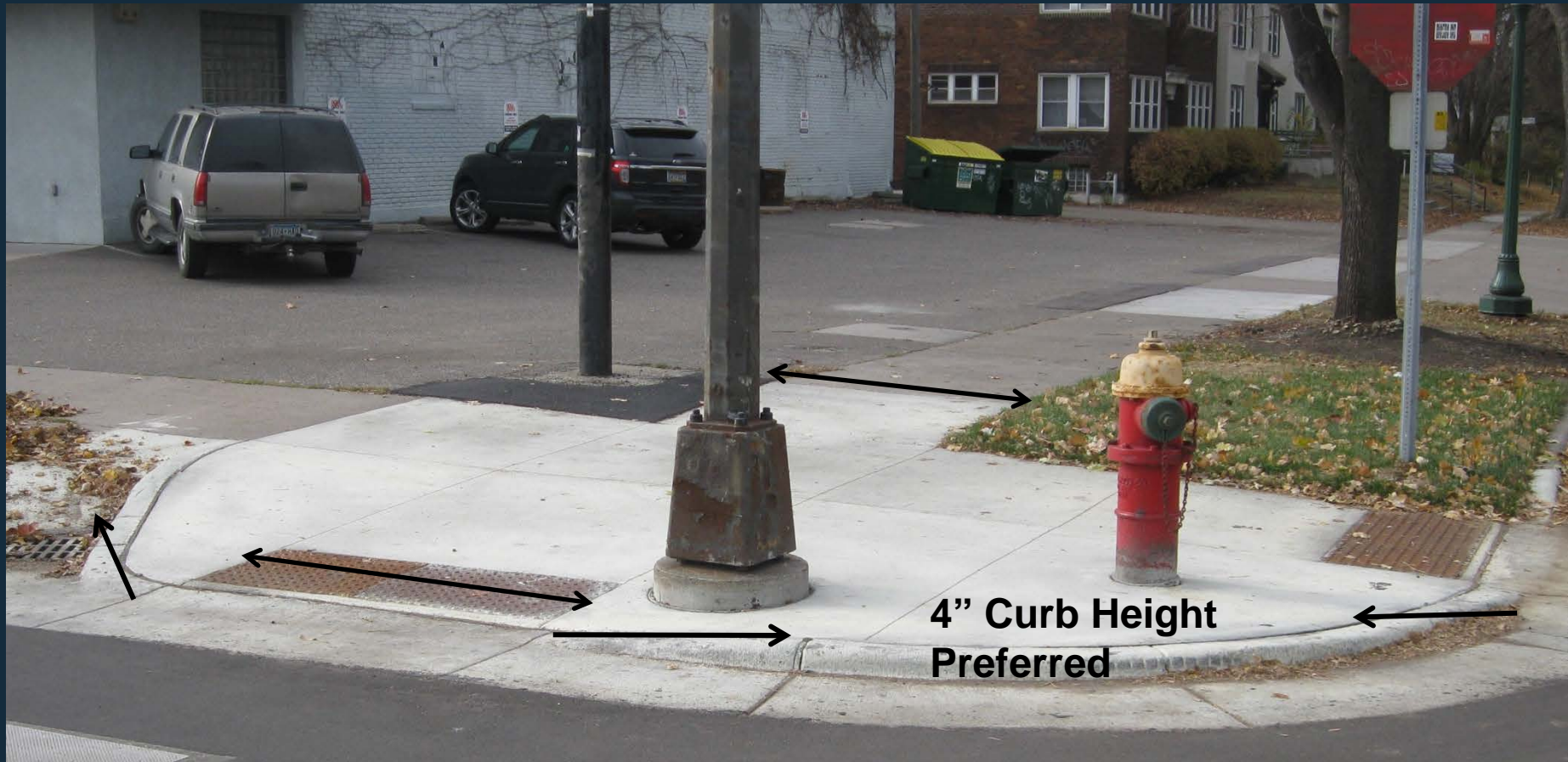
Curb tapers are considered detectable edge when the taper starts within 3" of the edge of the truncated domes – detectable warnings shall continuously extend for a minimum 24" in the path of travel.



ADA Detectable Edge



A good continuous detectable edge construction
Truncated Domes shall extend the full width of the
PAR (Ramp width matches sidewalk width).



ADA Detectable Edge

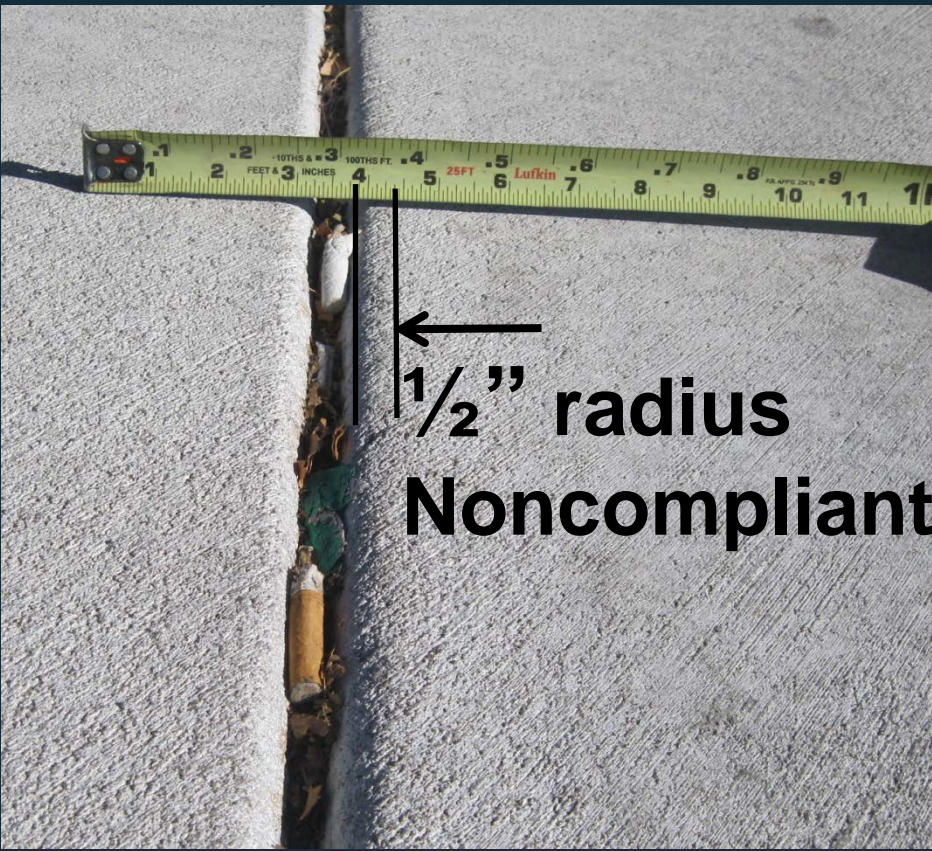


Good detectable edge with not so good placement



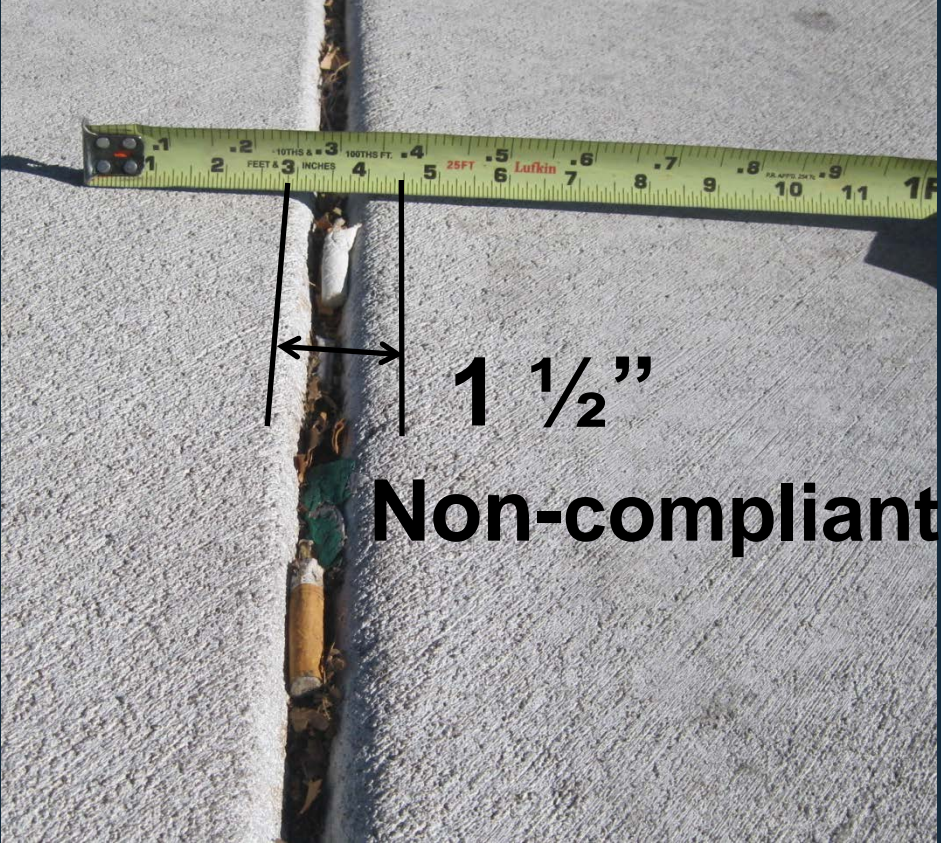
ADA Construction Joints

Joint Construction: Spec 2521.3C all joints and edges of the walk shall be rounded with a ($\frac{1}{4}$ inch radius edging tool).



ADA Construction Joints

Joint Construction : Spec2521.3C contraction joints shall extend to at least 30 percent of the walk thickness and shall be **approximately** 1/8 inch wide.



Total Spec. joint width
 $1/4'' + 1/8'' + 1/4'' = 5/8''$

ADA Construction Joints

Joint Construction : Spec2521.3C contraction joints shall extend to at least **30 percent** of the walk thickness and shall be **approximately** 1/8 inch wide.

Marshalltown Co.

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

EDI: 17553



- Made from high quality, long wear
- Finely finished to make smooth, cl
- Two thumbscrews are used to tight attachment to the bull float
- Slides easily over any bull float
- Gives the bull float the ability to fo or expansion joints
- Groove radius - 1/4"
- Groove width - 3/8"
- Groove depth - 2"

Click Image to Enlarge



HAIVALA HAND GROOVER

ADA Construction Joints



Spec 1503 Conformity with Plans and Specification

When a maximum or minimum value is specified, the production and processing of materials and the performance of the work shall be so controlled that the material or workmanship will not be of borderline quality or dimension. The Engineer will allow an industry standard tolerance where working tolerances are not specified.



ADA Construction Joints



1803 Prosecution of Work (F)

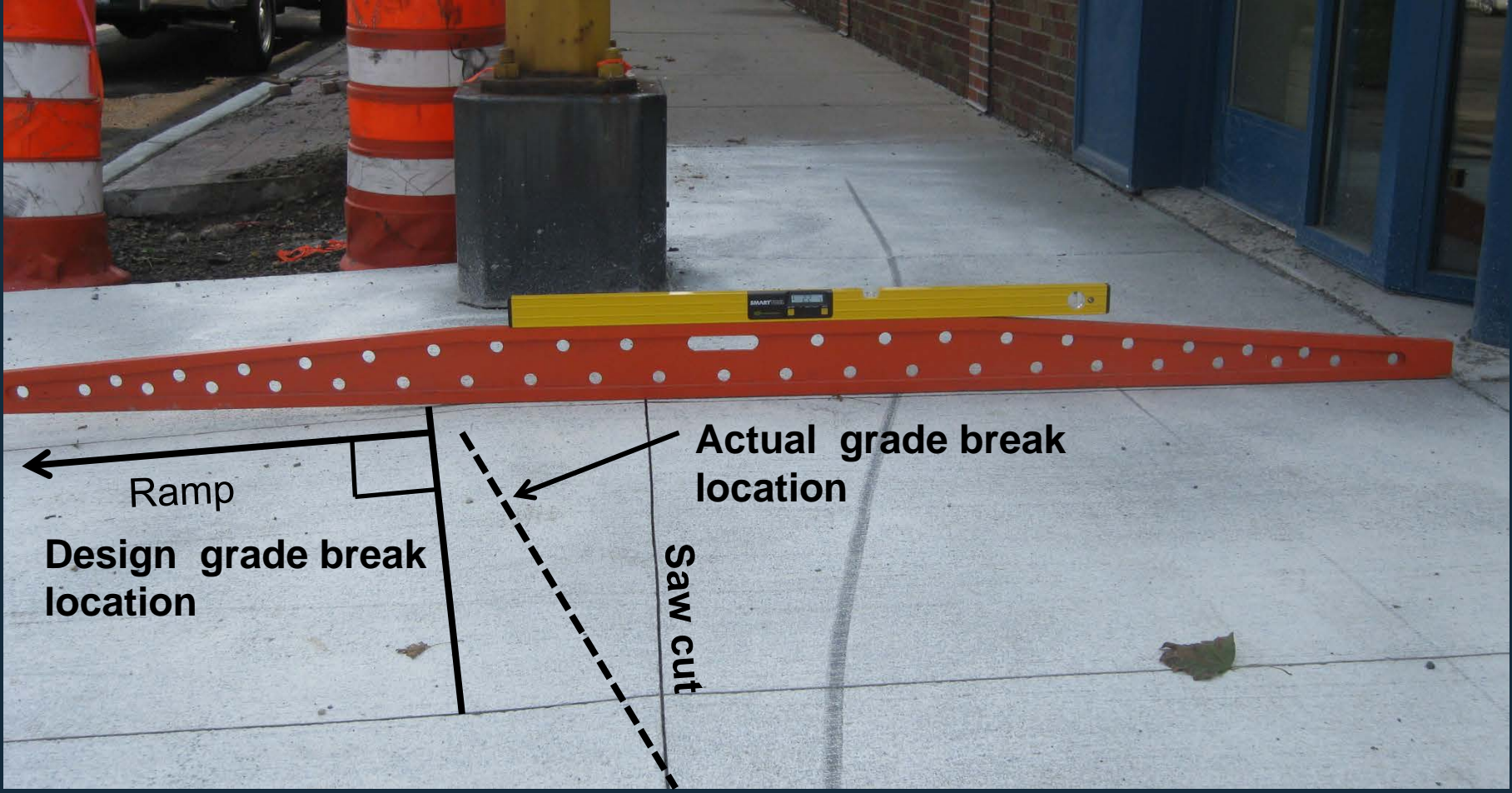
The Contractor shall also have the option of providing saw cuts to construct the sidewalk joints. This work shall be considered incidental and no extra compensation paid.



Saw cut or tooled joints ?

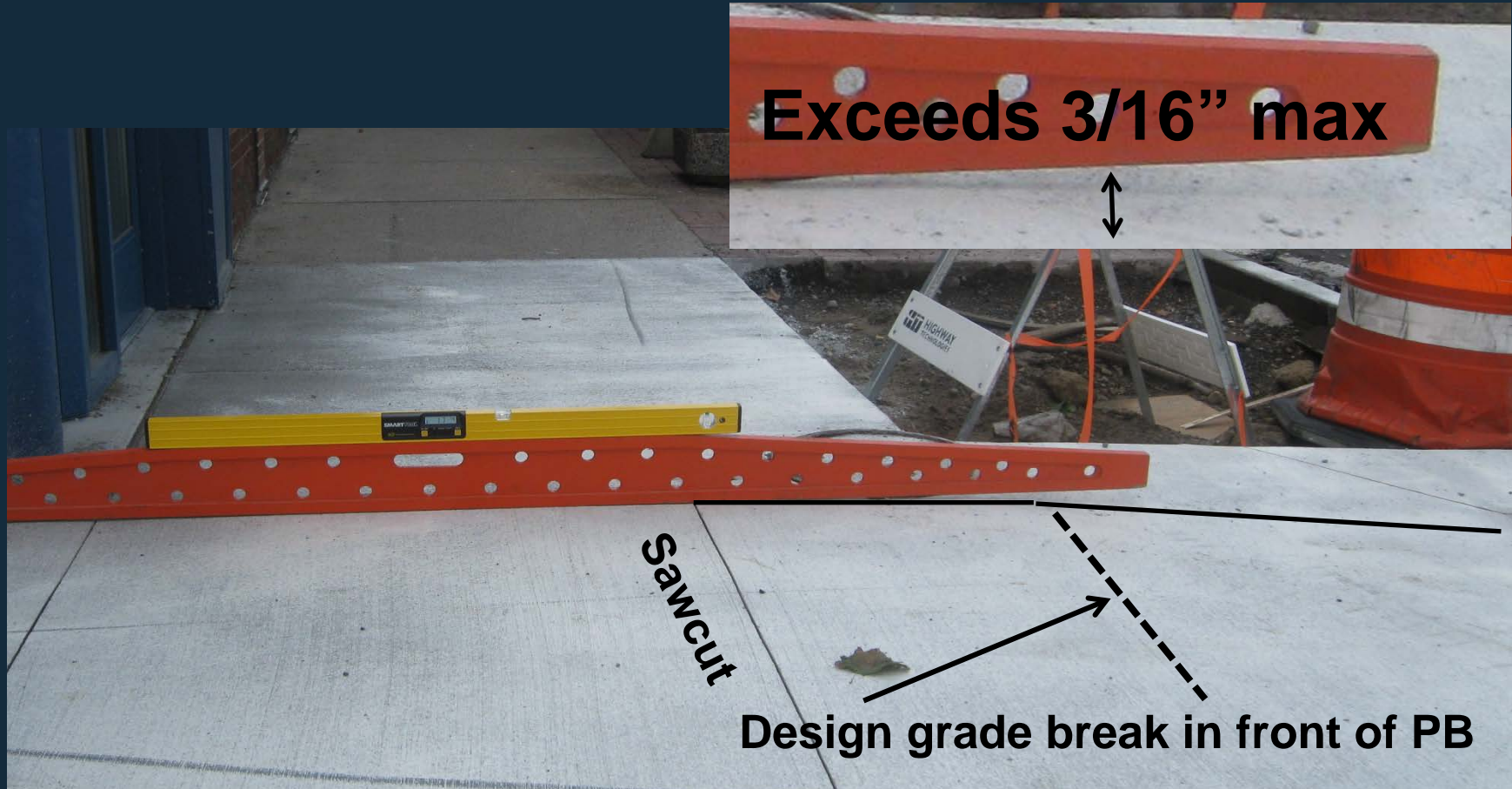
ADA Construction grade Breaks

Saw cut joints are allowed ... but contraction joints shall be constructed along all grade breaks in the PAR



ADA Construction Grade Breaks

Contractor shall use appropriate methods for intermediate grade control to ensure all grade breaks are constructed properly



ADA Construction Finishing

Spec 1503 Conformity with Plans and Specification

All work performed and all materials furnished shall be in conformance with the lines, grades, cross sections, dimensions, and material requirements including tolerances shown in the plan or indicated in the specifications.....

Spec 2521.3C The surface shall not vary more than 3/16" from a 10' straight edge.



ADA Construction Finishing

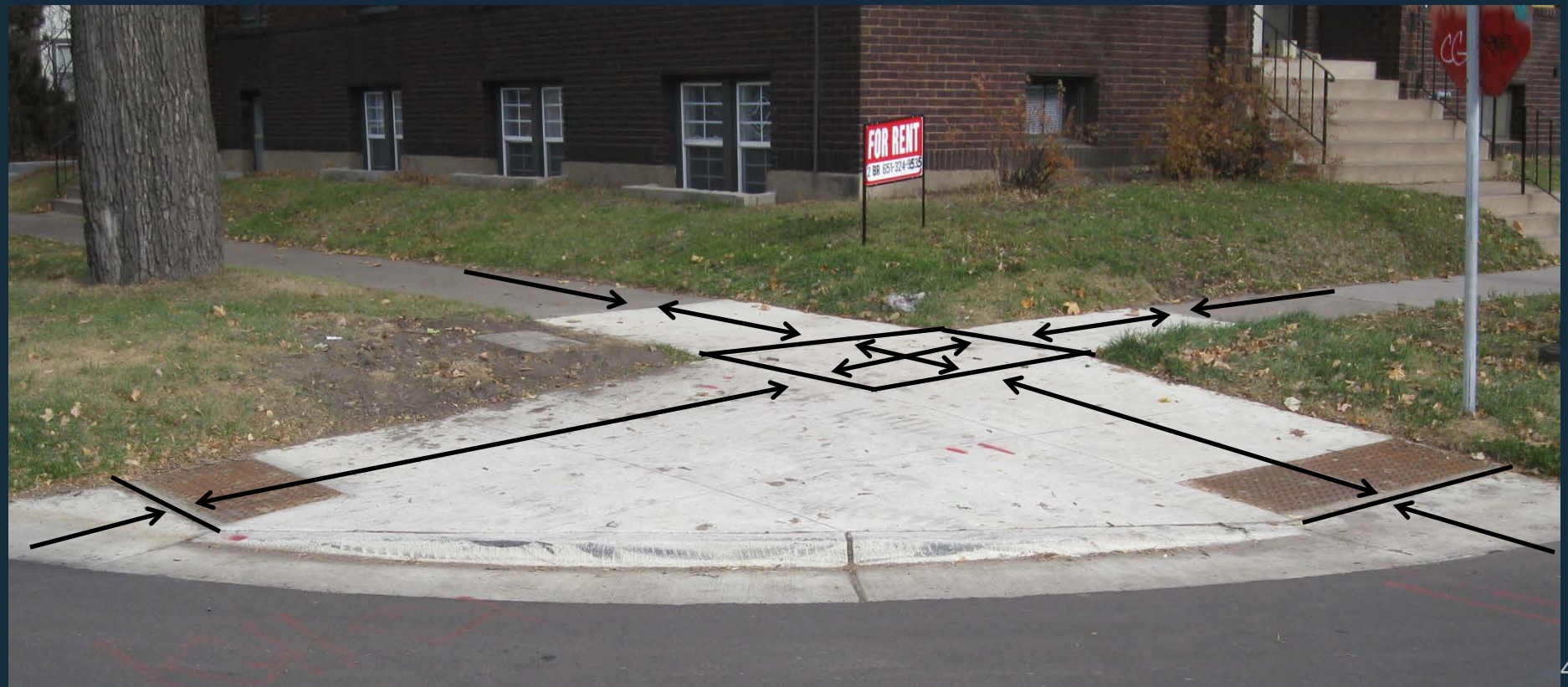


Spec 2521.3C. Look for any bellies or ridges in the concrete ramp surface area greater than 3/16"



ADA Construction Grade Breaks

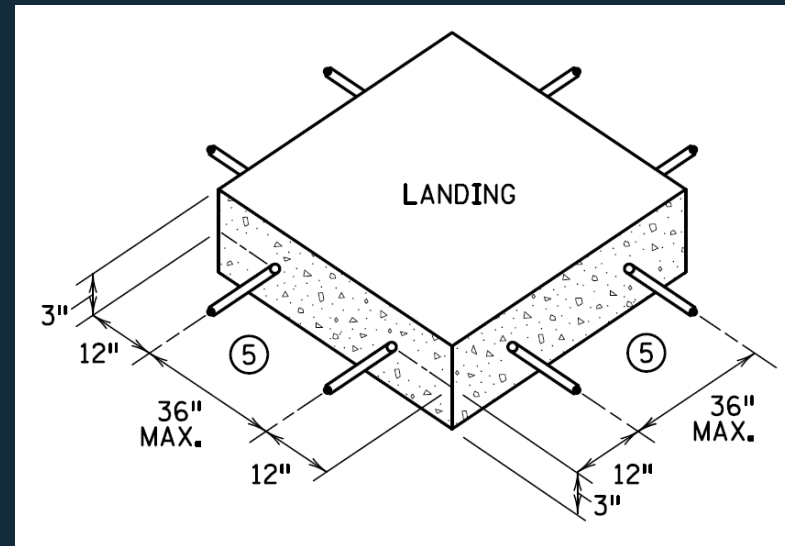
- Contraction joints shall be constructed along all grade breaks.
- All grade breaks within the PAR shall be perpendicular to the path of travel



ADA Curb Ramp New for 2013



Separate Landing pour options with sidewalk reinforcement

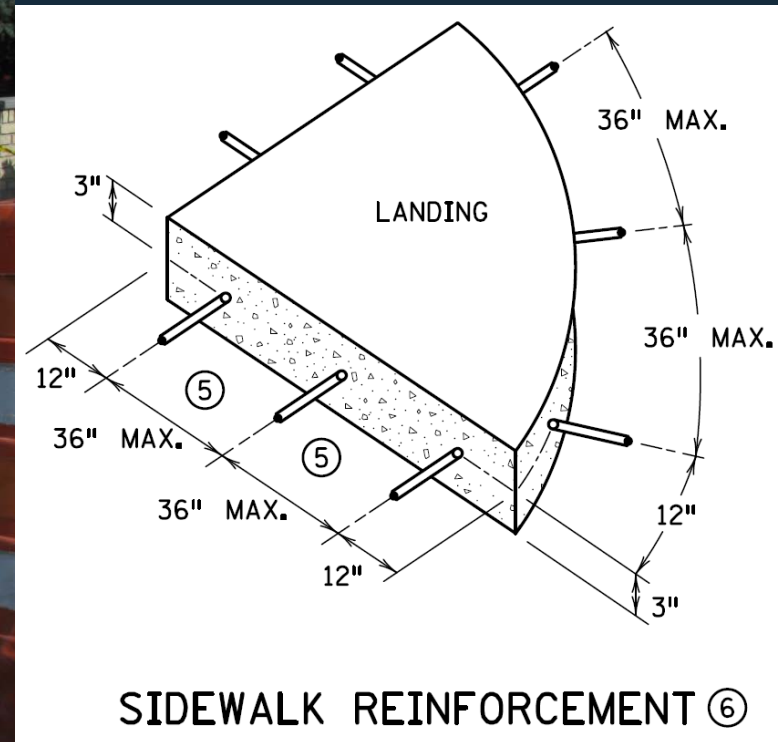


2302-Drill and Grout
Reinforcement Bars
(Epoxy Coated) Each

ADA Curb Ramp New for 2013



Separate Landing pour options with sidewalk reinforcement



ADA Construction Fan Ramps

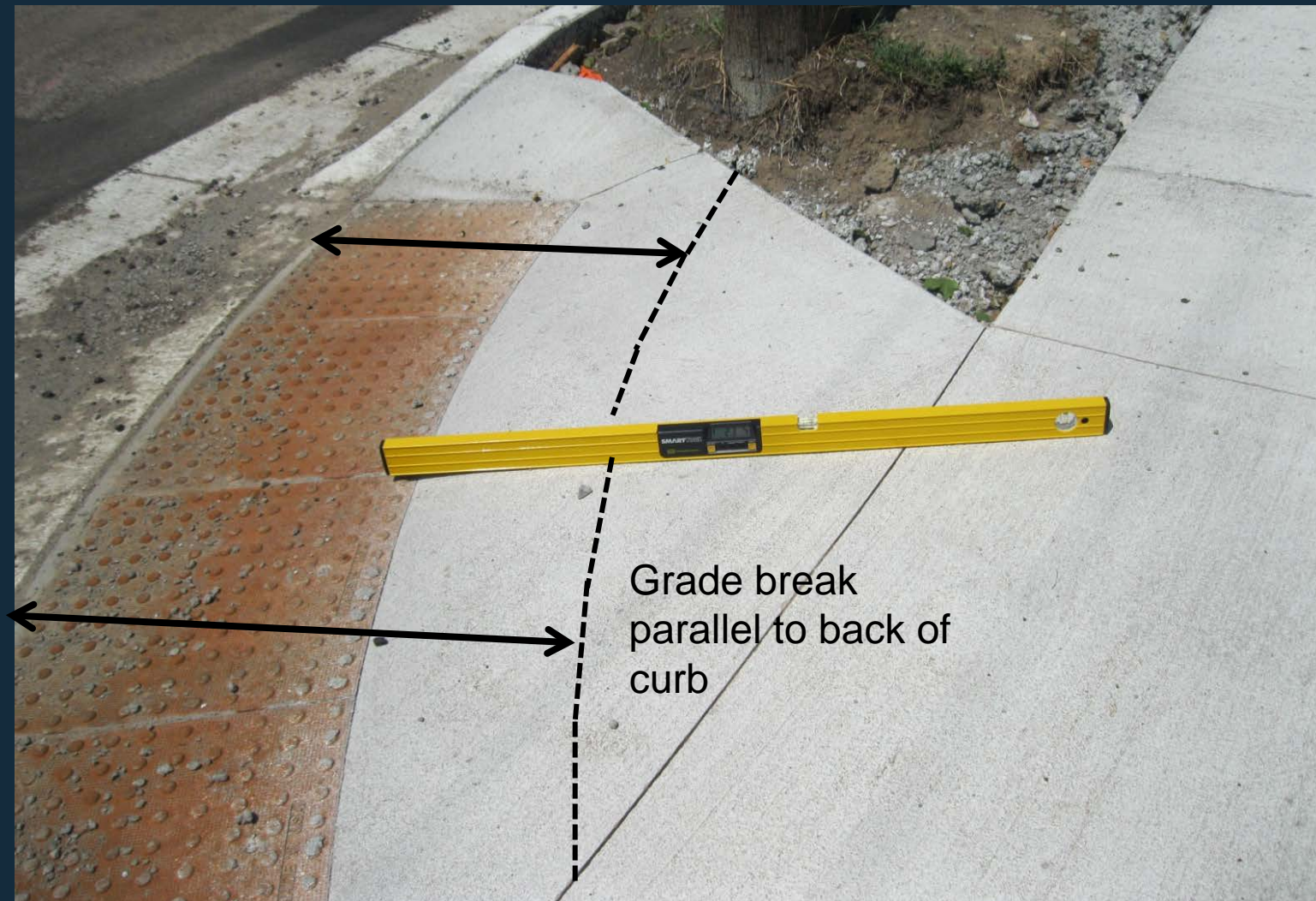


The Fan design works best when constructed in staged concrete placements.



ADA Construction Fan Ramps

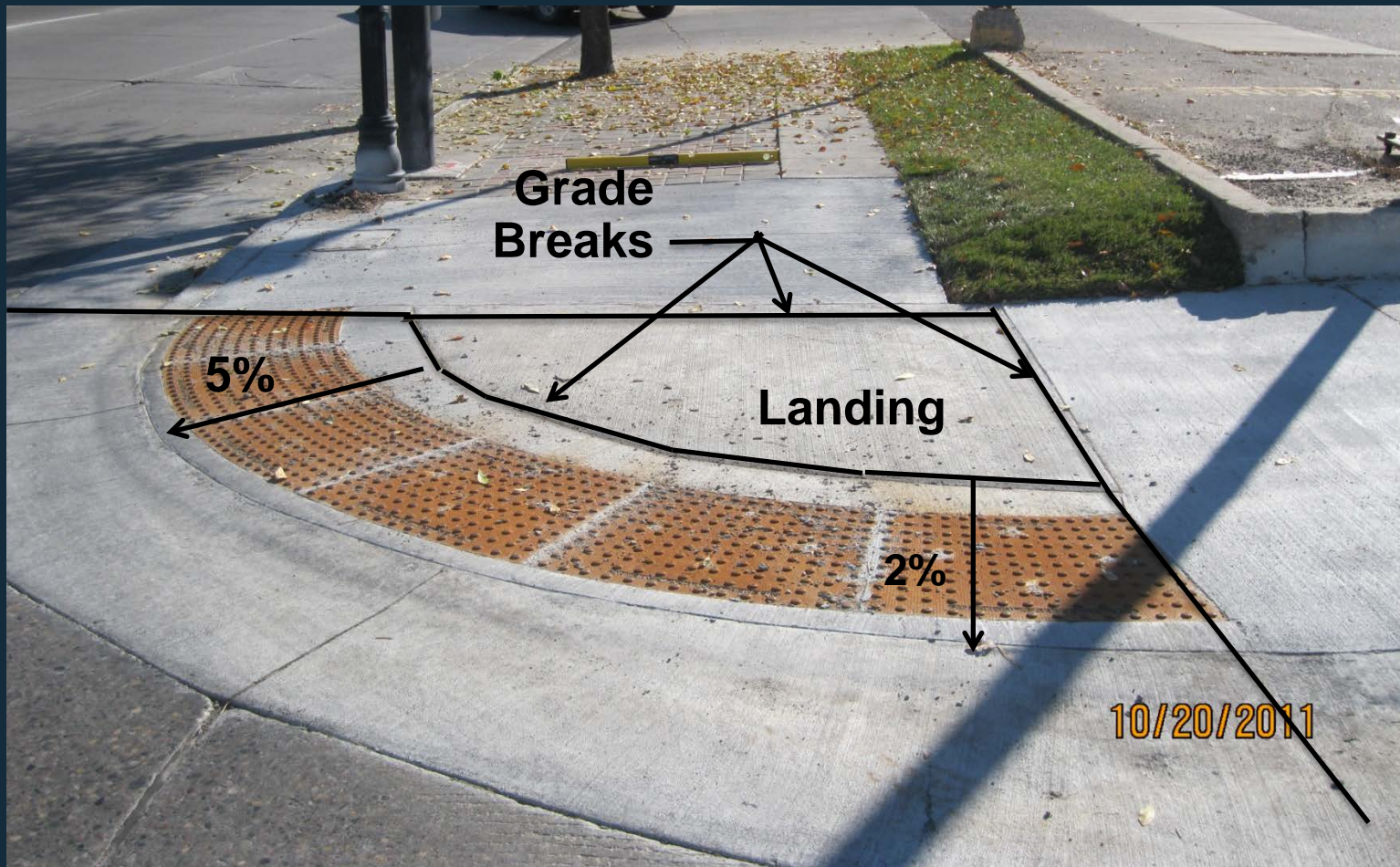
Fan Constructed with incorrect grade break (not perpendicular to the path of travel)



ADA Construction Fan Ramps



Fan Design with greater than 2% flow line adjacent to concrete pavement



ADA Construction Unique Situation

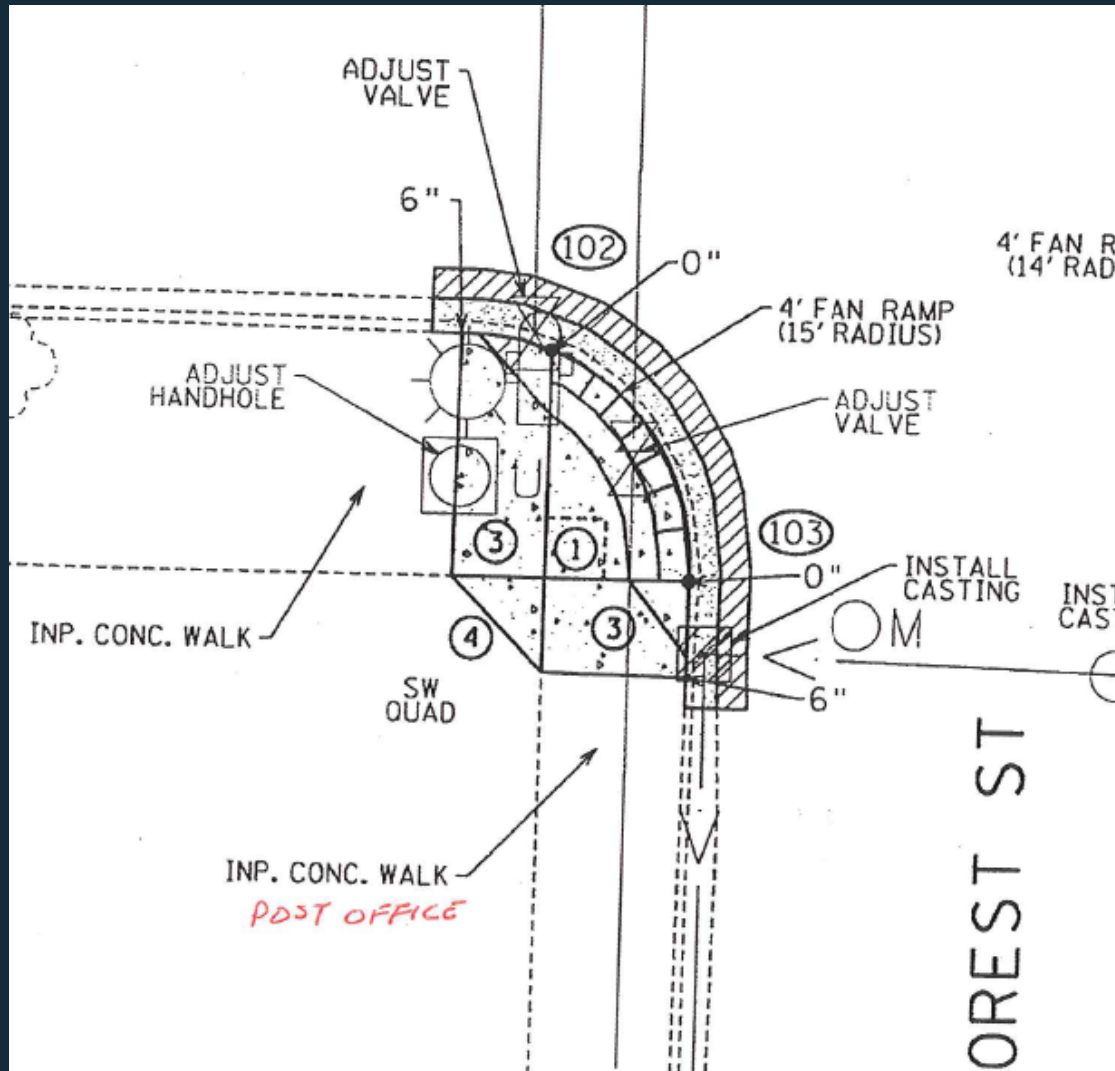
Maximum Extent Feasible



ADA Construction Unique Situation



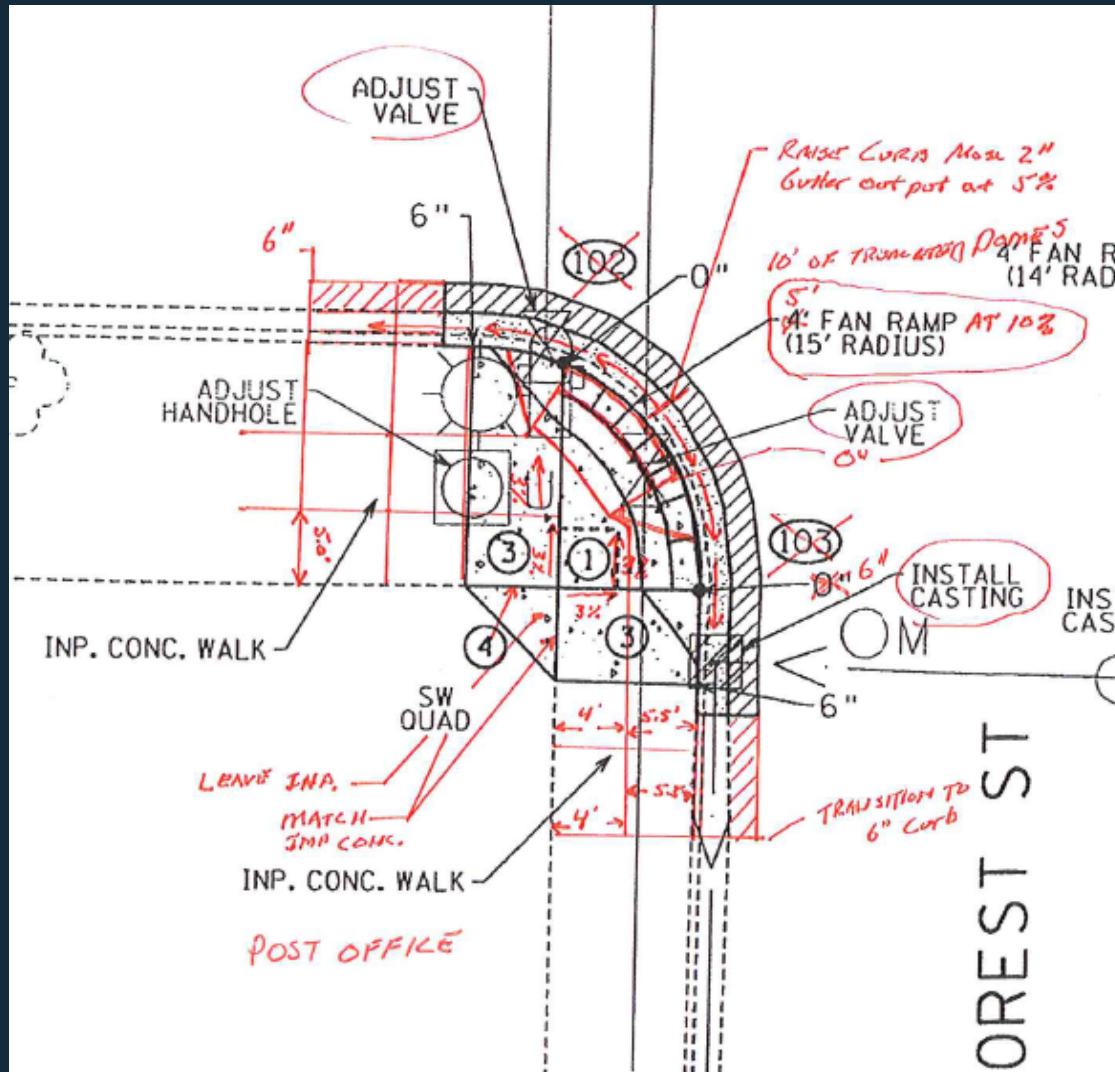
Old design without adequate survey information



ADA Construction Unique Situation



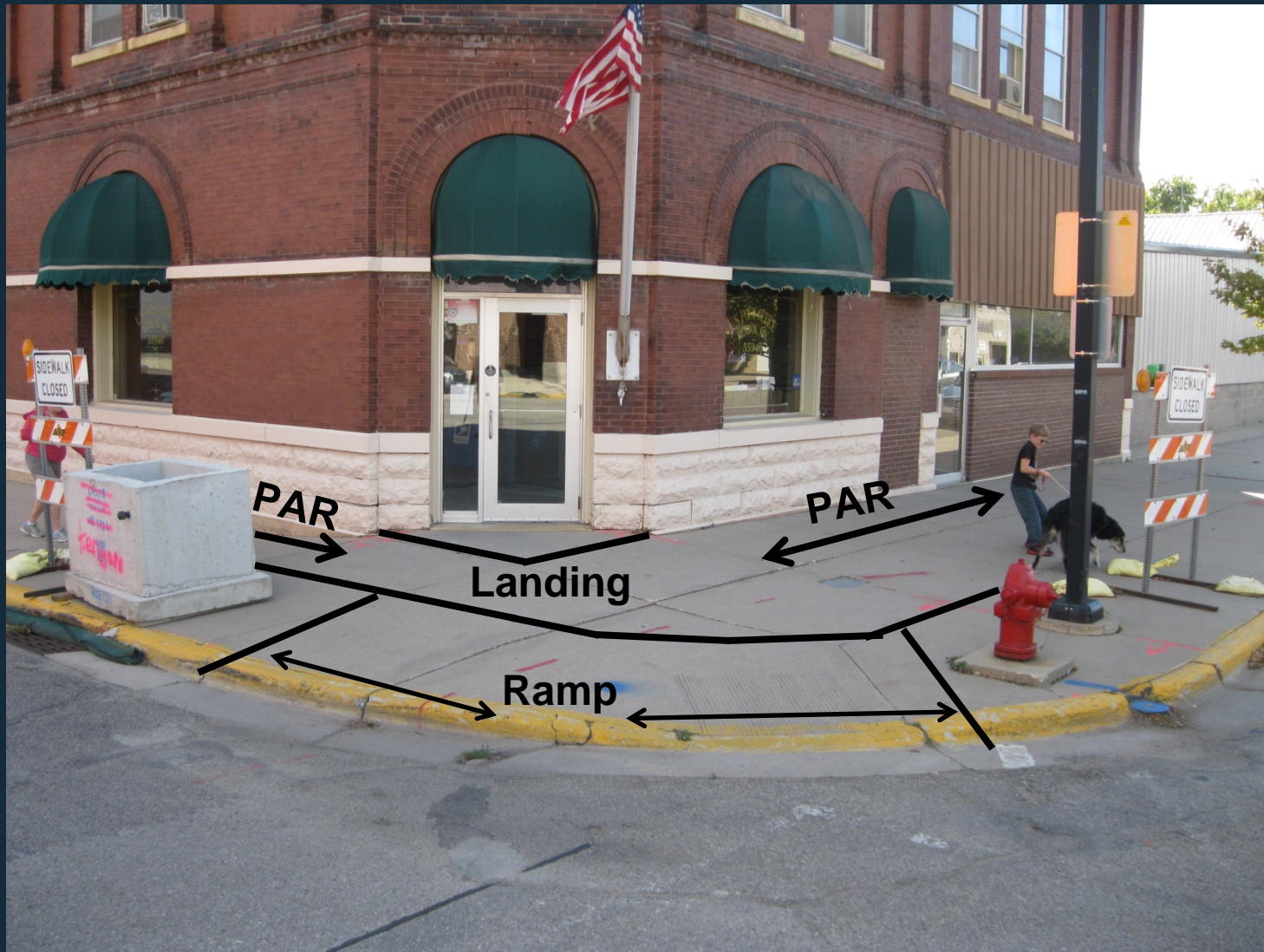
Revised design with constrained tie in elevations



ADA Construction Unique Situation



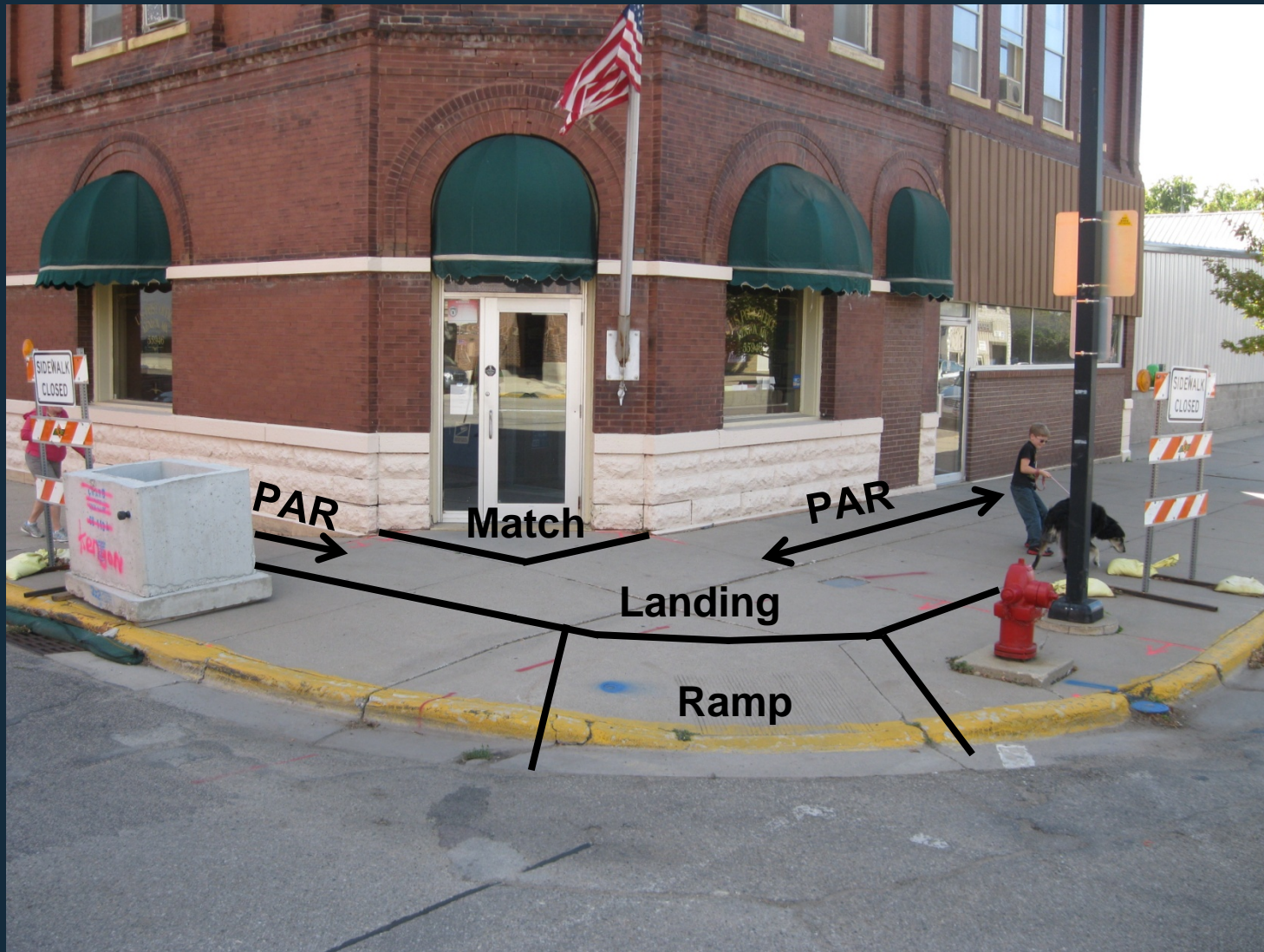
Original Curb Ramp 14' Fan Design



ADA Construction Unique Situation



New design 10' Fan with 5% reverse gutter



ADA Construction Unique Situation



Verify Roadway cross slope will allow 3" curb Raise



ADA Construction Unique Situations



Raise Curb and Gutter 3"



ADA Construction Unique Situations



Construct reverse grade curb and gutter at 5%



ADA Construction Unique Situations



Setting forms to line and grade



ADA Construction Unique Situations



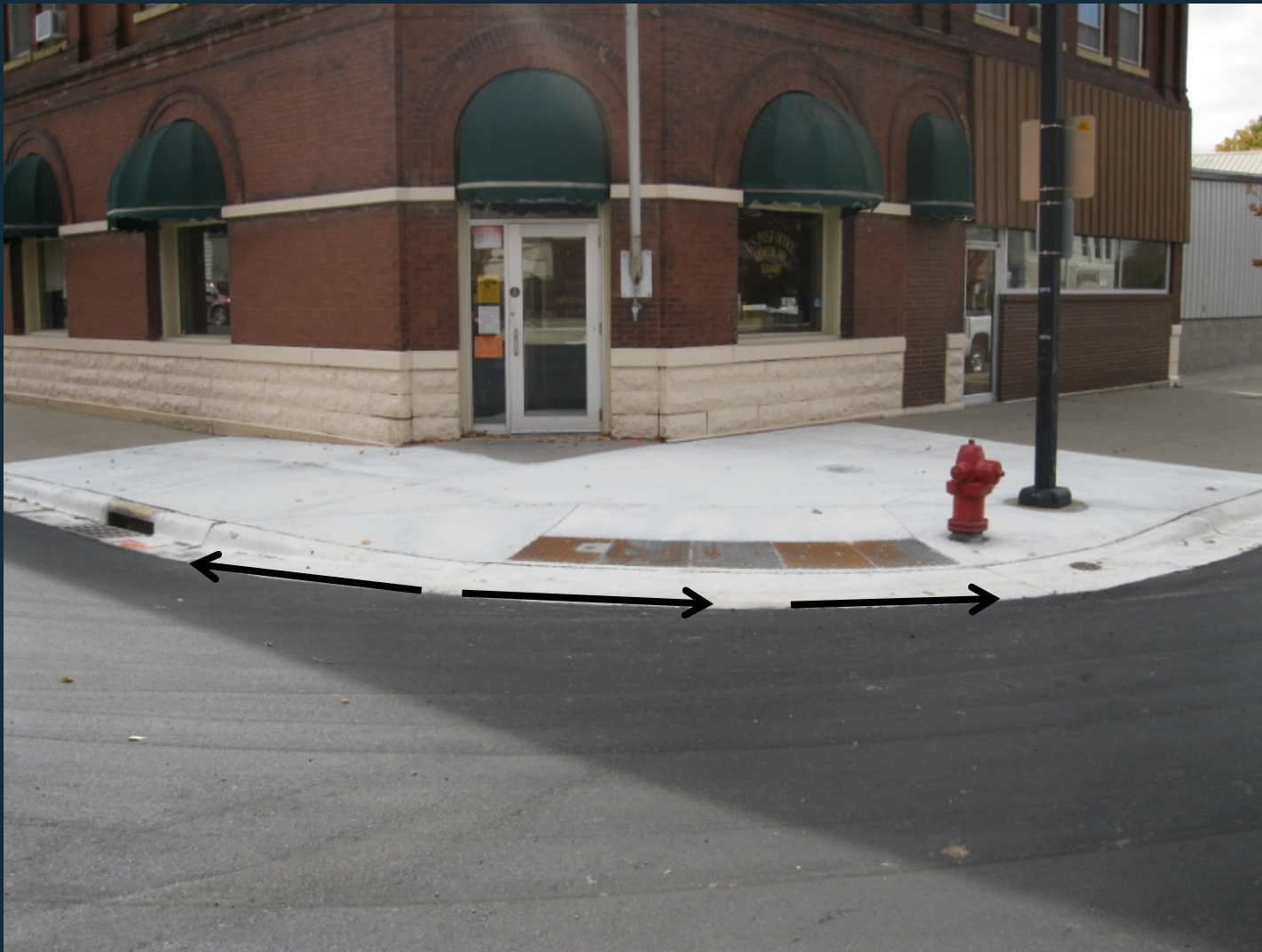
Staged concrete placement



ADA Construction Unique Situations



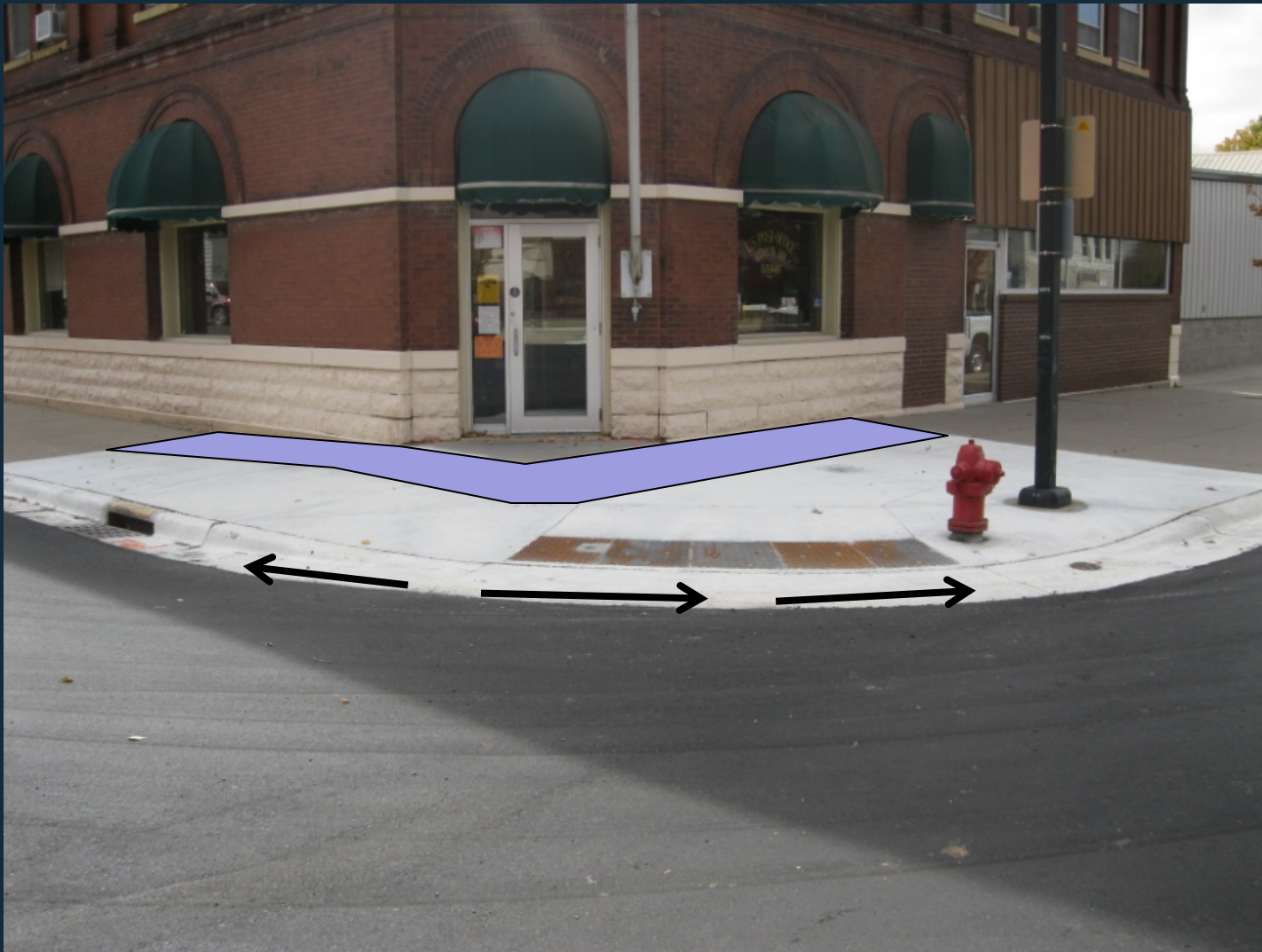
Maintain positive drainage



ADA Construction Unique Situations



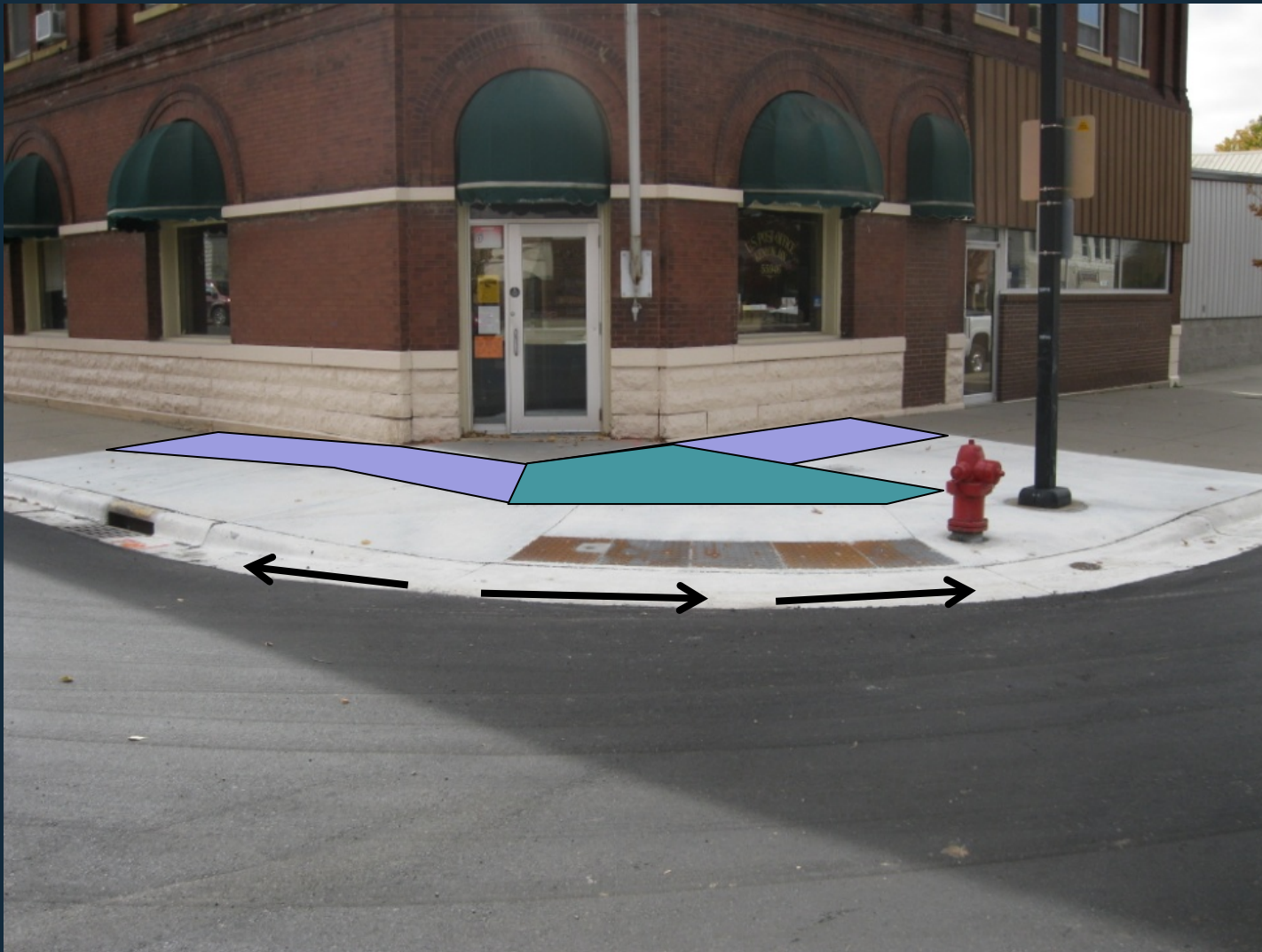
Improved Pedestrian Access Route (PAR)



ADA Construction Unique Situations



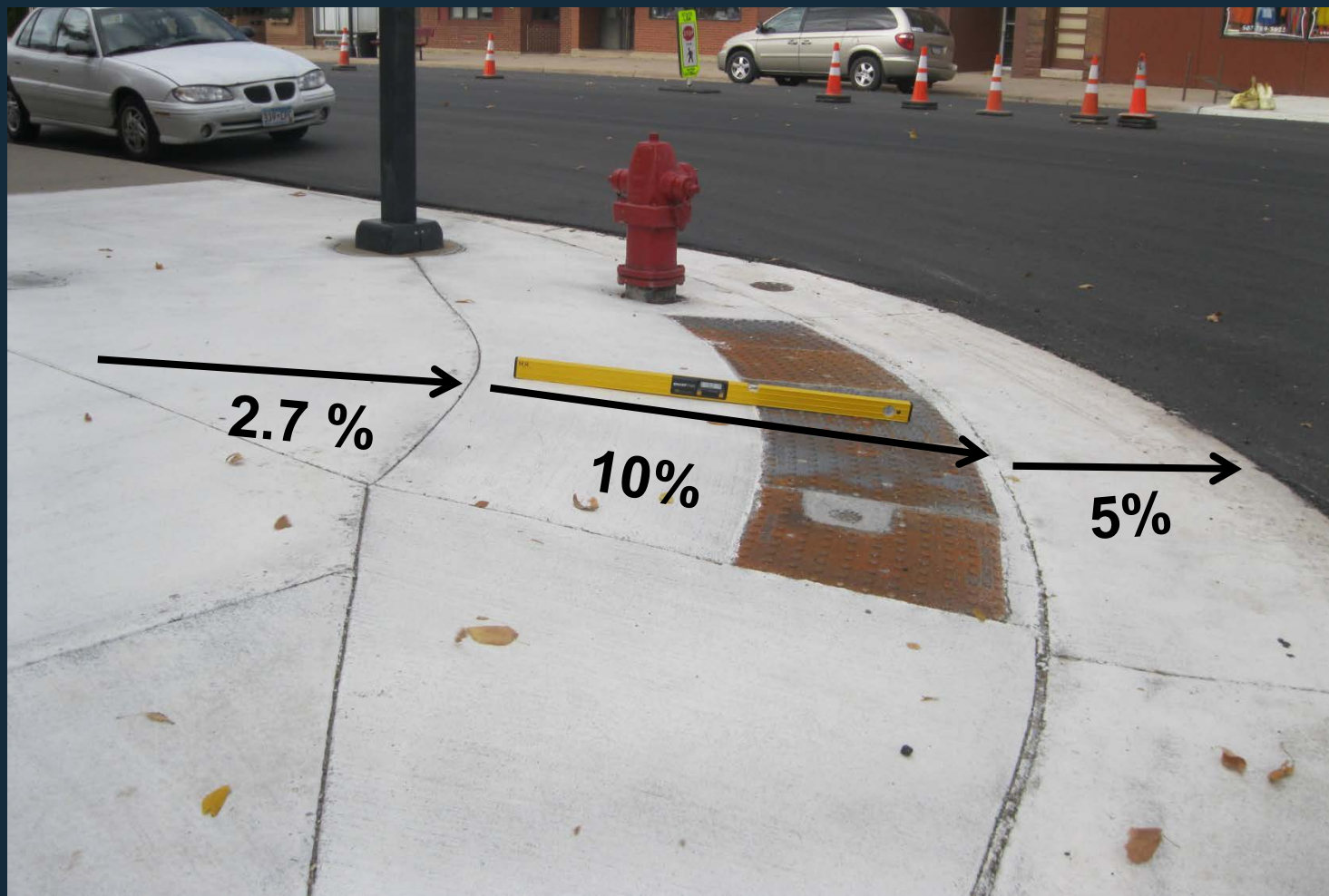
Improved curb ramp landing area



ADA Construction Unique Situations



We achieved the best design possible. Ramp will be made fully compliant when highway is reconstructed.





Accessibility

Making transportation accessible to everyone



[Accessibility Home](#) | [Policy](#) | [Accommodations](#) | [Design/Construction Tools](#) | [Calendar](#) | [Contacts](#)

Design and construction tools

Misc

- [ADA project design guide memo](#) (PDF)
- [ADA project design guide](#) (DOCX)
- [ADA tech memo](#) (PDF)
- [Curb ramp guidelines](#) (PDF)

Pedestrian curb ramp standard plans

- [5-297.250 sheet one](#) (PDF)
- [5-297.250 sheet two](#) (PDF)
- [5-297.250 sheet three](#) (PDF)
- [5-297.250 sheet four](#) (PDF)
- [5-297.250 sheet five](#) (PDF)

Training classes

[Sign up for ADA policy and design training classes](#)

Standard plates

- [7035N driveways and sidewalks](#) (PDF)

Compliance checklists

- [ADA compliance checklist for APS](#) (PDF)
 - [Checklist guidance](#) (PDF)
- [ADA compliance checklist for curb ramps](#) (PDF)
 - [Checklist guidance](#) (PDF)

Special provisions

(for information only - see [Special Provisions website](#) for most up to date)

- [1803 prosecution of work - special project ADA requirements](#) (PDF)
- [Special provisions for ADA pay items](#) (PDF)

Pay items

- [Pay items guidance](#) (XLS)
- [Pay item example projects](#) (PDF)



Speakers and raised arrows on [accessible pedestrian signals](#) provide information about the intersection to pedestrians with hearing and visual impairments.

Questions?



ADA : Curb Ramp Construction

Your Destination...Our Priority

