

# Intro



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

*Your Destination...Our Priority*





# MnDOT ADA Training

## Curb Ramp Construction 2015

### Module I

*Your Destination...Our Priority*

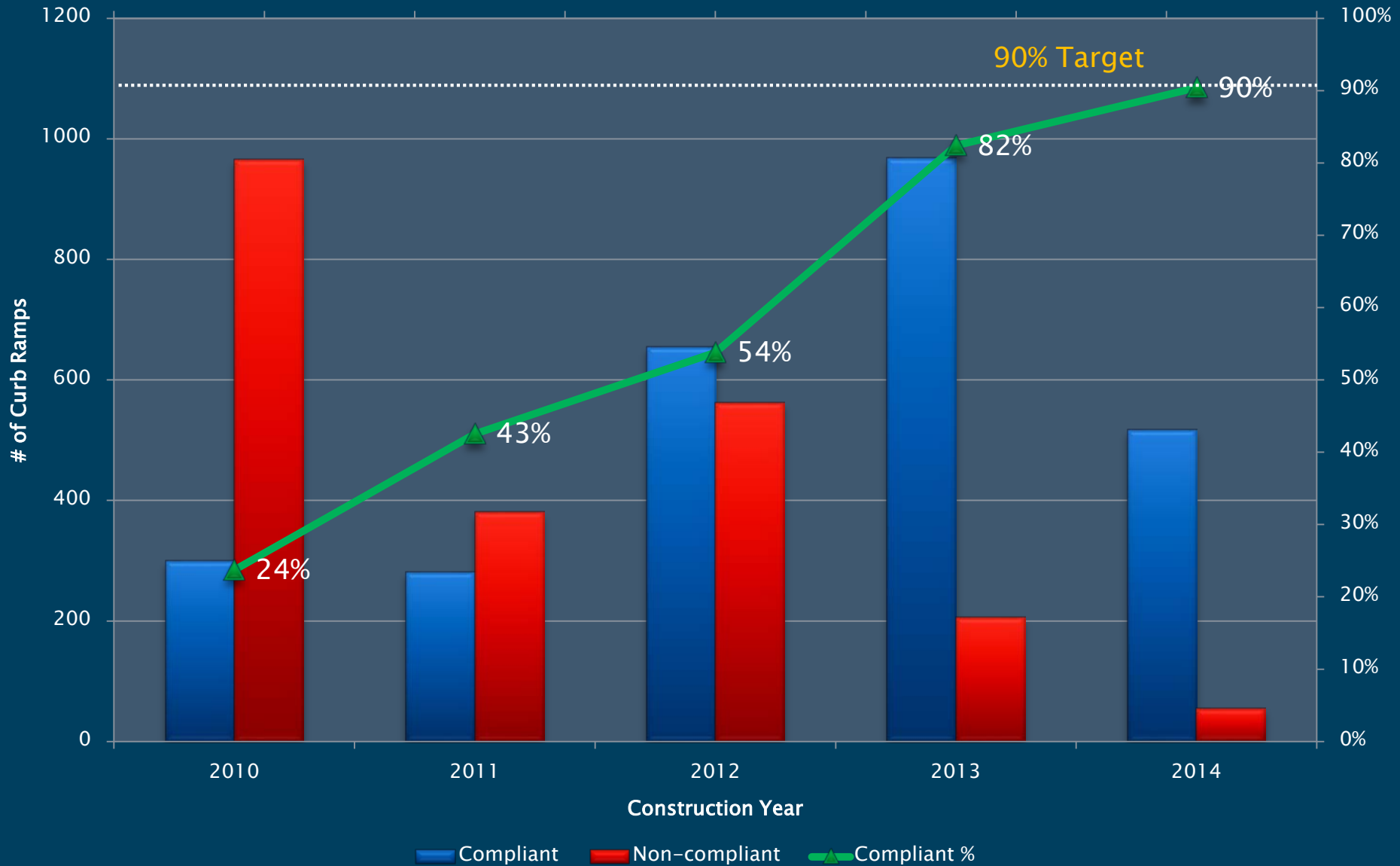


# ADA Construction

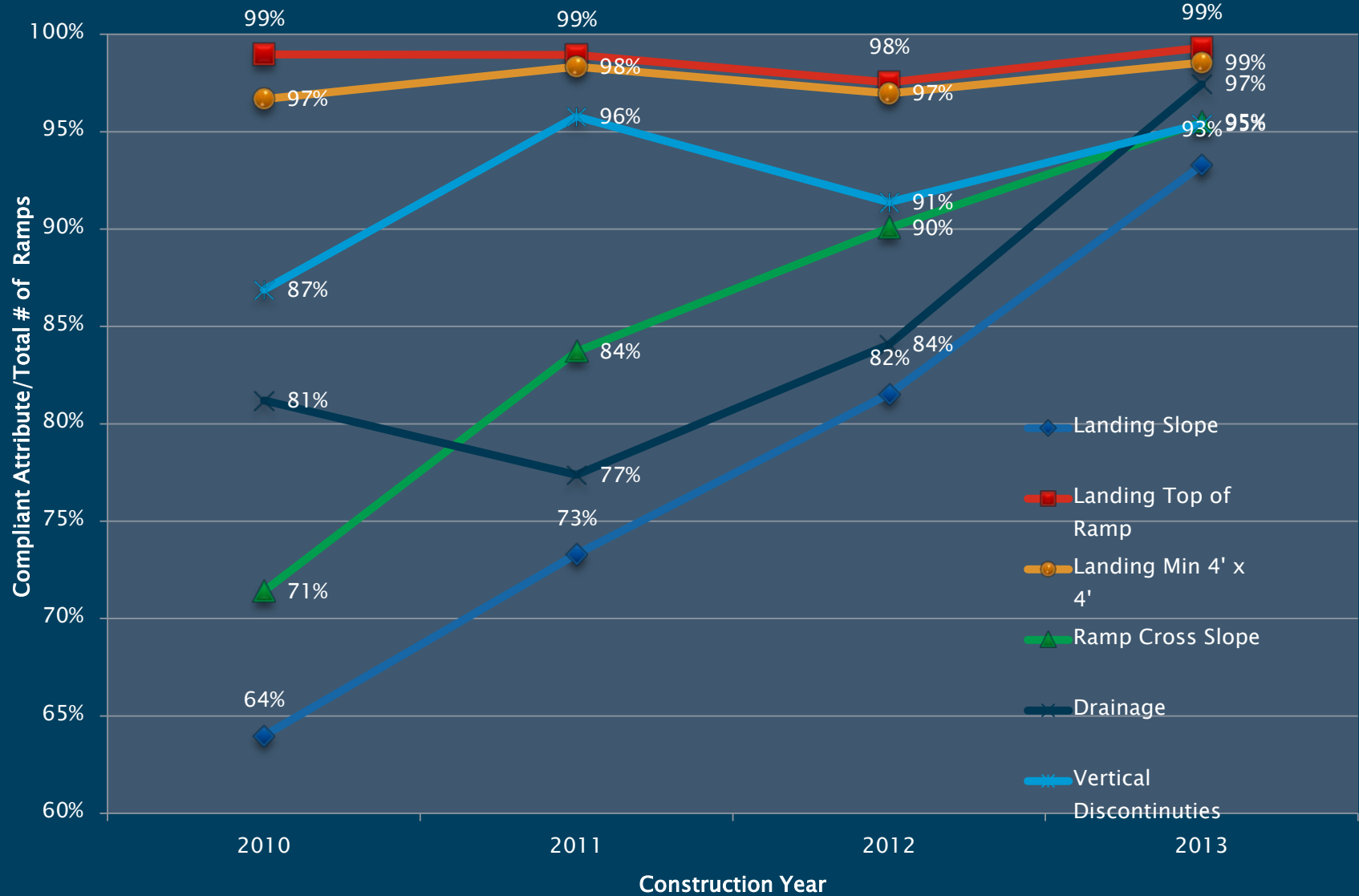
## Construction Lessons Learned



# STATEWIDE CURB RAMPS



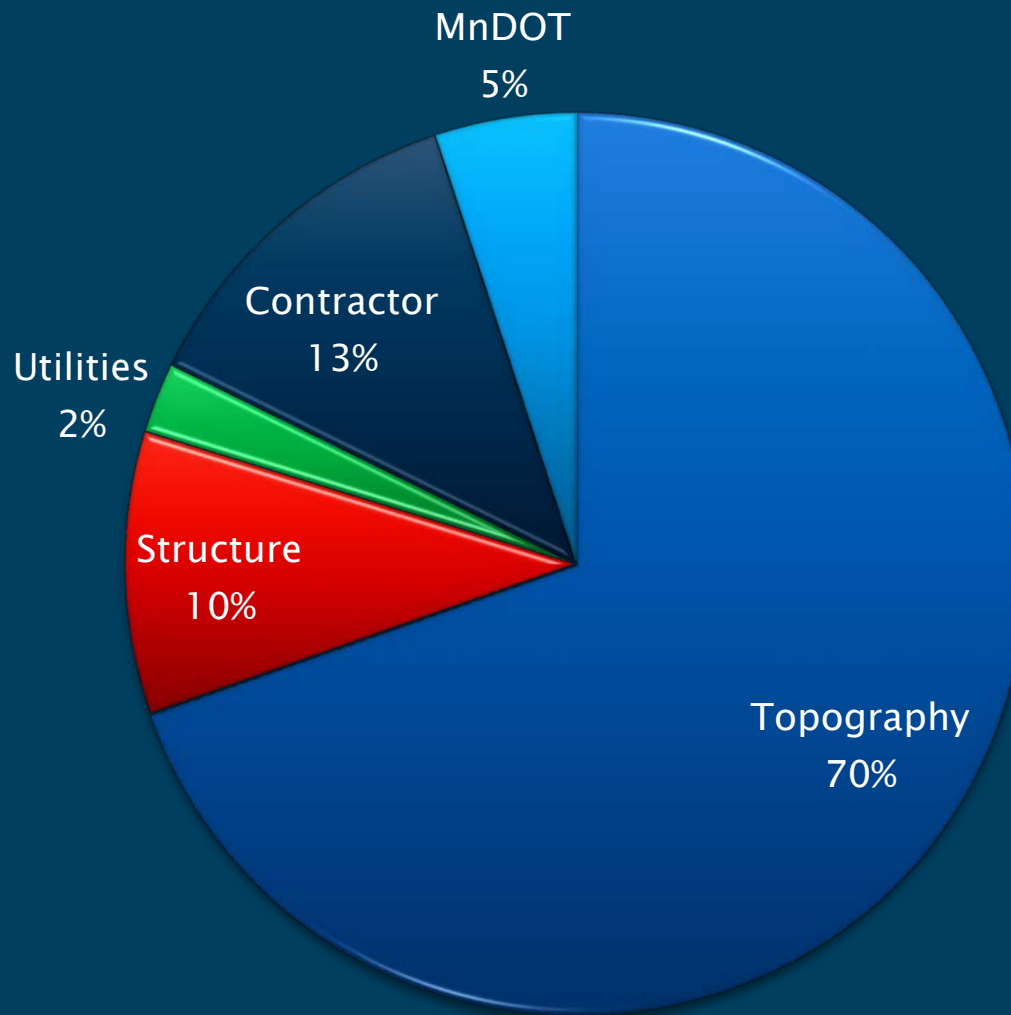
# Compliant Curb Ramp Attributes by Percentage



\*2014 data incomplete – not included



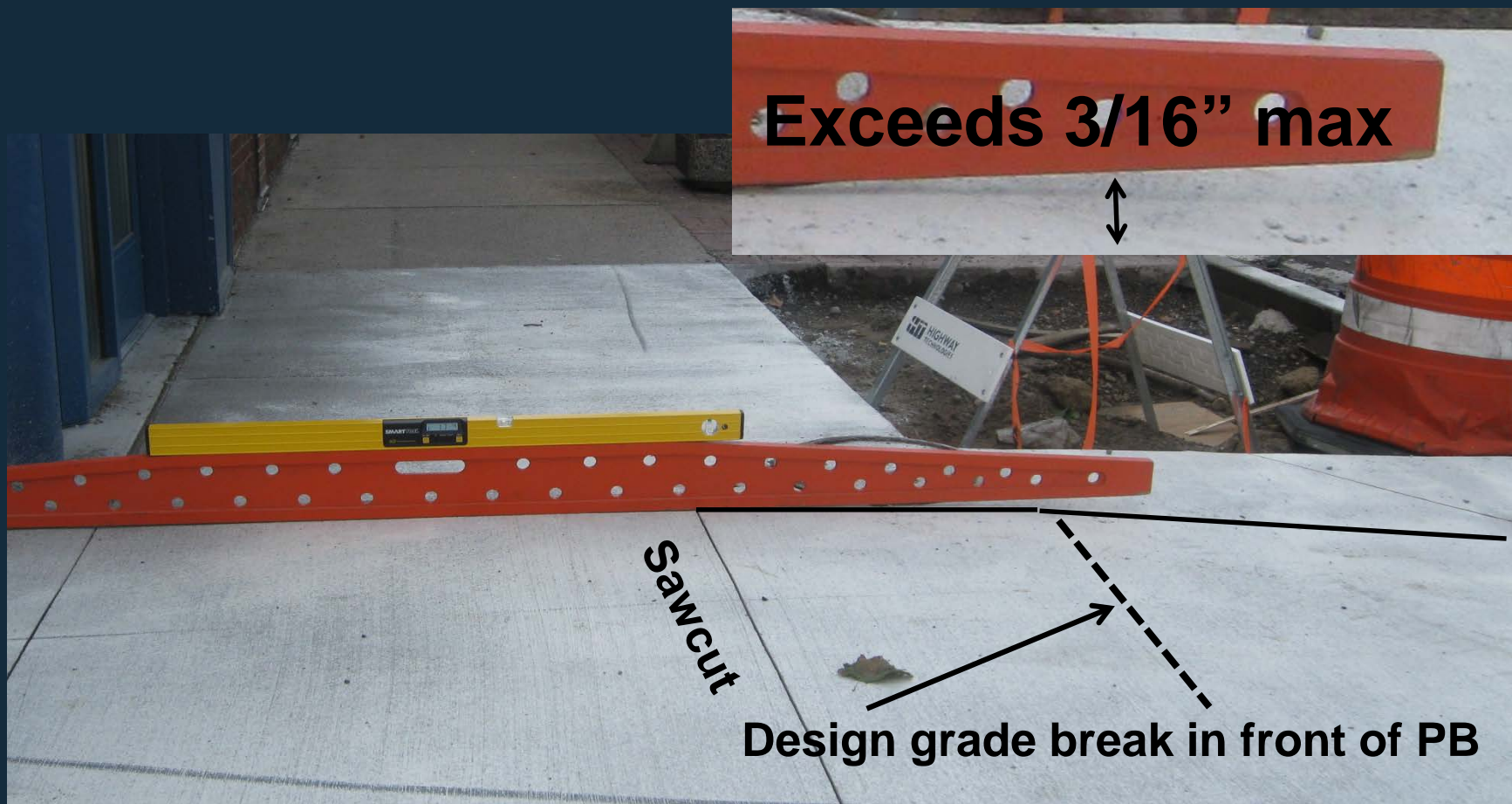
# REASON FOR NON-COMPLIANT RAMPS IN 2014



# ADA Construction Grade Breaks



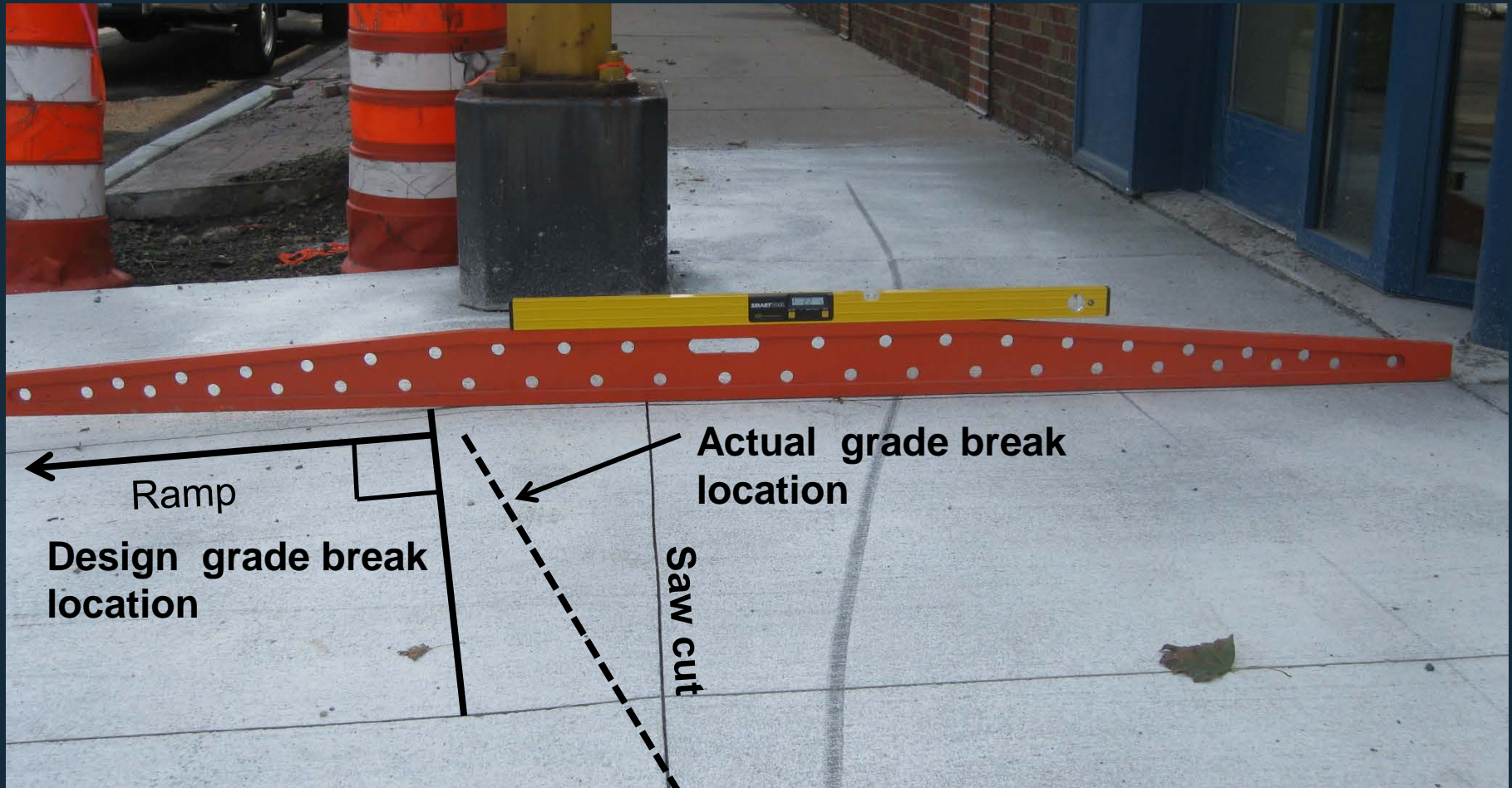
Contraction joints shall be constructed along all grade breaks in the PAR ( See Notes Standard Plans sheets 1 & 2 )



# ADA Construction grade Breaks



All grade breaks within the PAR shall be perpendicular to the path of travel ( See Notes Standard Plans sheets 1 & 2 )



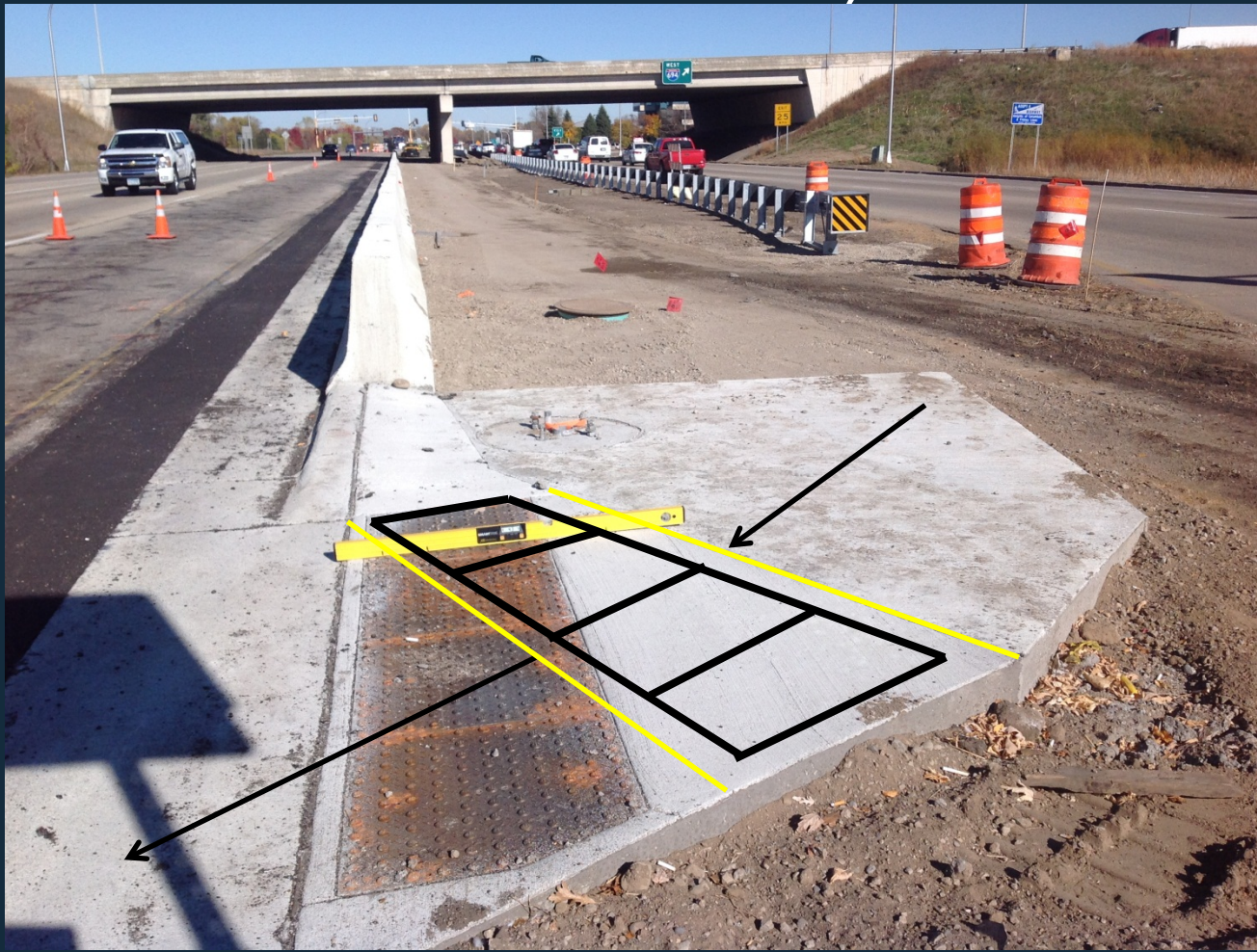
# ADA Ramp / Concrete Walk Joints

All grade breaks within the PAR shall be perpendicular to the path of travel ( See Notes Standard Plans sheets 1 & 2 )



# ADA Ramp / Concrete Walk Joints

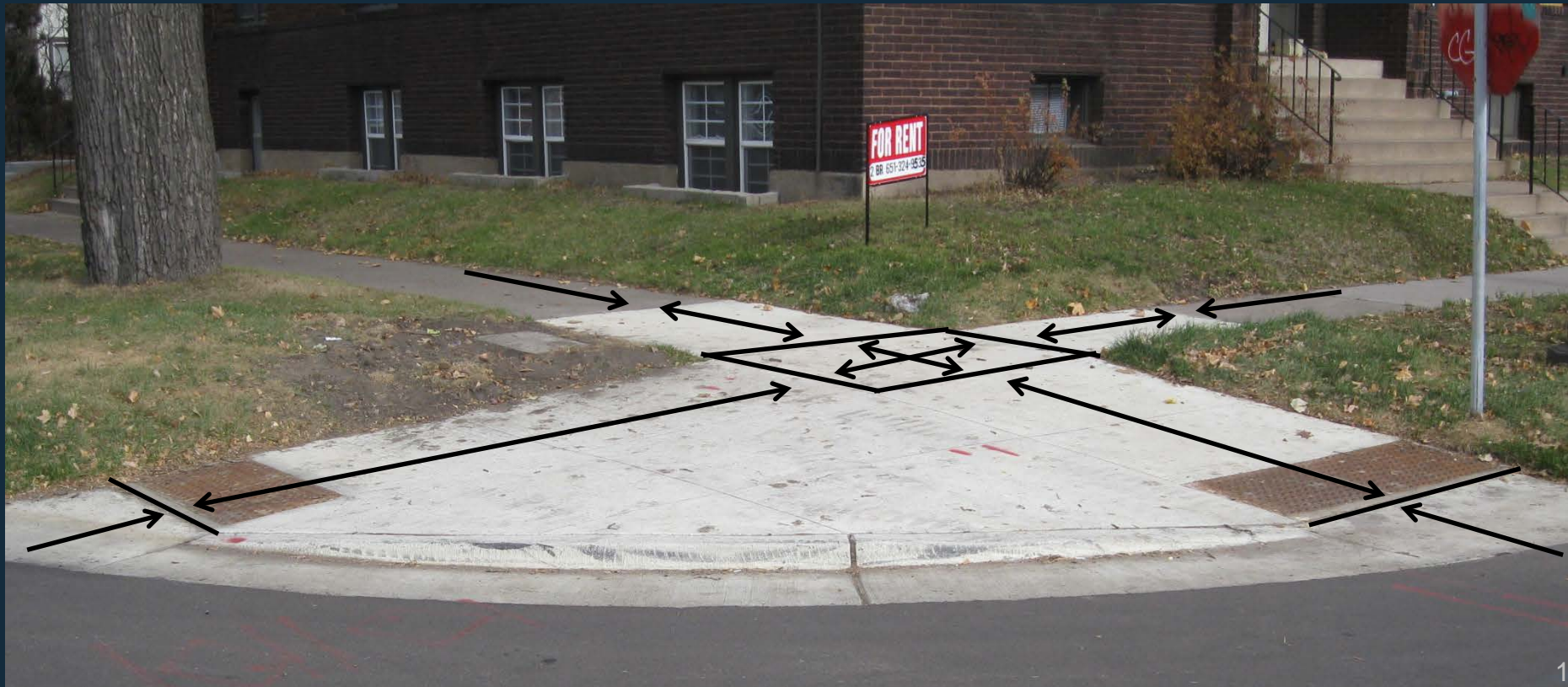
All grade breaks within the PAR shall be perpendicular to the path of travel ( See Notes Standard Plans sheets 1 & 2 )



# ADA Ramp / Concrete Walk Joints



- 2521.3D2 Provide vertical and straight joints parallel with or at right angles to the walk centerline
- Align the joints with joints in adjoining work unless isolated by a  $\frac{1}{2}$ " preformed joint filler.



# ADA Curb Ramp Construction

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



# ADA Curb Ramp Construction



Flat ramp created a drainage valley/swale.

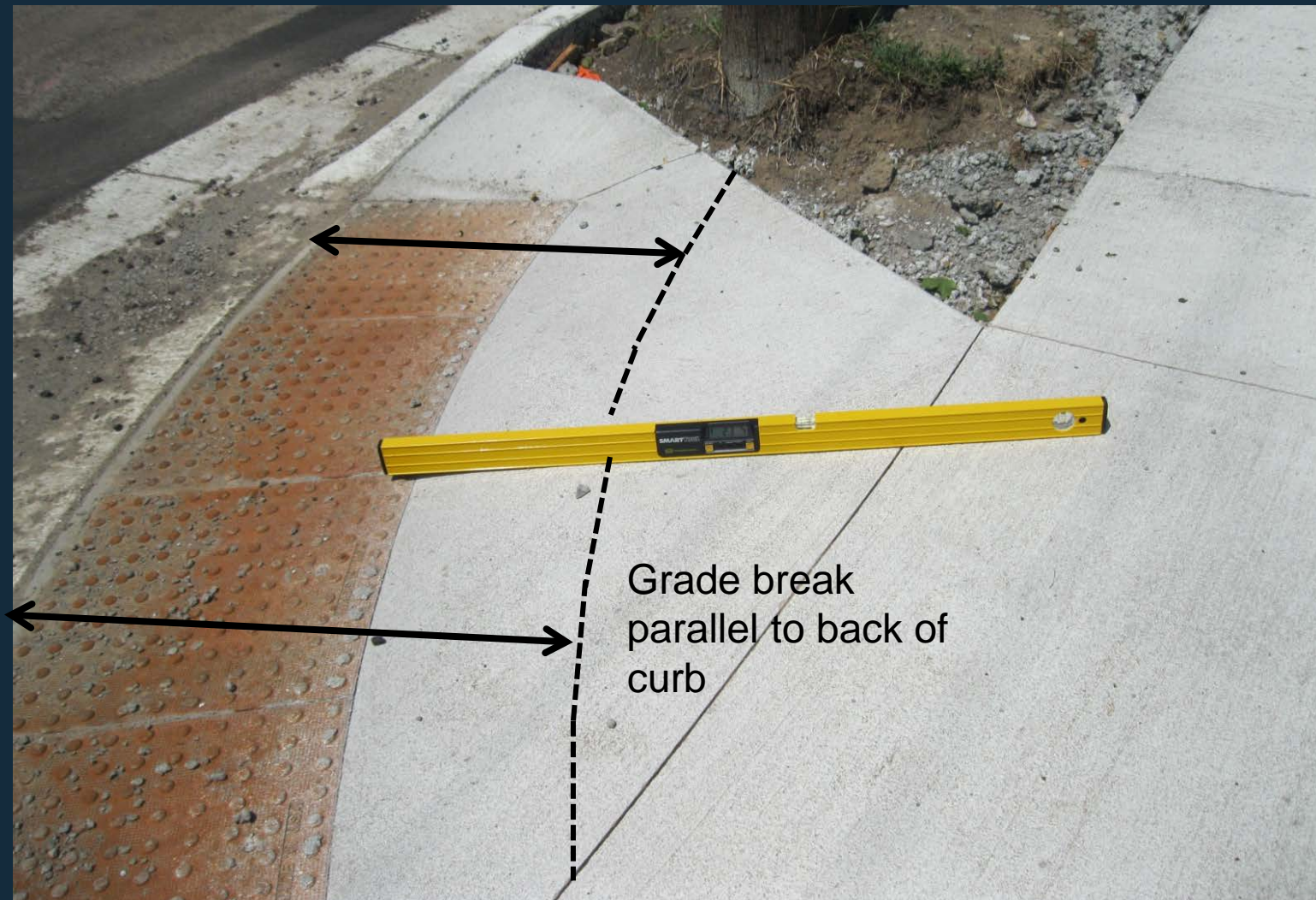
This ramp should have risen up to match 4" curb height to maintain better drainage and eliminate v-curb.



# ADA Construction Fan Ramps



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



# ADA Construction Fan Ramps



Fan Constructed with incorrect grade break. 3' Fan with undefined grade break at 4'?



# 2521 Concrete Walk ADA Landings



## S-3.1 CONSTRUCTION REQUIREMENTS

(A) **Concrete Walk** – The walk shall be constructed as detailed in the Plan and conform to the requirements of MnDOT 2521, Walks.

To avoid corner breaks, all walk edges shall be formed and constructed perpendicular to the back of curb and gutter sections and concrete structures for a one foot minimum distance.

All existing signs shall be salvaged and reinstalled as directed by the Engineer or as indicated in the Plan.

(B) **Grading** – If not otherwise detailed in the Plan, all fill sections shall be graded flush with the top of walk for a minimum 18 inches from the edge of walk and then down at a maximum 1:3 slope to existing terrain. The Contractor shall blend in the toe of fill slope and adjacent areas so as not to adversely affect drainage.

(C) **Landings** – An initial landing is the first required landing of a pedestrian ramp. All initial landings required at the top of a ramped sloped surface ( $>2\%$  longitudinal slope), shall be formed and placed separately in an independent concrete pour. This does not include initial landings placed at roadway grade such as depressed corners, parallel ramps, rural flat landings, or flat cut-throughs. Secondary landings consist of all landings beyond the initial landing. These secondary landings do not require a separate landing pour.

Wet casting or drill and grouting of dowel bars will be required in accordance with the details shown in Standard Plan 5-297.250 Sheet 5 of 5. These bars may be either smooth or deformed and shall be installed with 2" minimum concrete cover.

When not accounted for in the Plan, payment for these bars will be made under Item 2301.602 (Drill & Grout Reinforcement Bar (Epoxy Coated)) by the Each at the Predetermined Price of \$ 10.00 per bar furnished and installed. All necessary subgrade preparation and aggregate base placement for the entire ramp construction limit shall be done before the initial landing is constructed at each location.

## S-3.2 METHOD OF MEASUREMENT

# Concrete Walk

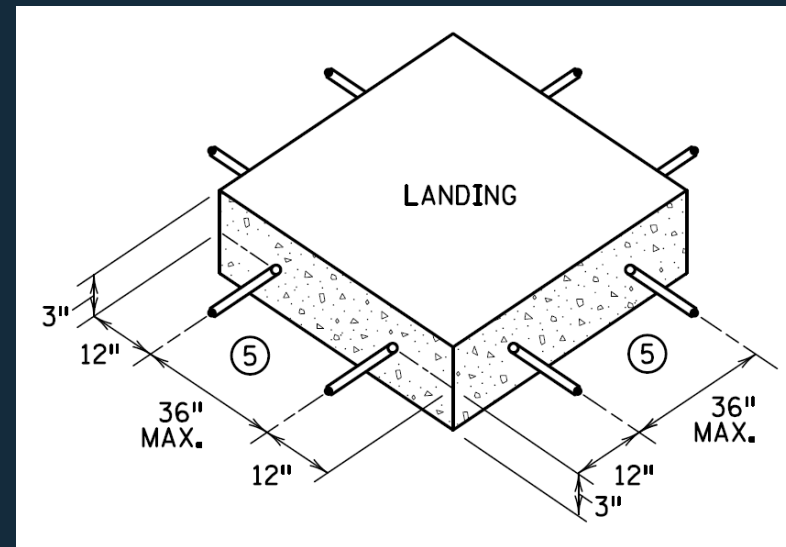
To ensure ramps and landings are properly constructed, landings shall be cast separately. Follow sidewalk reinforcement detail.



# ADA Curb Ramp New for 2013

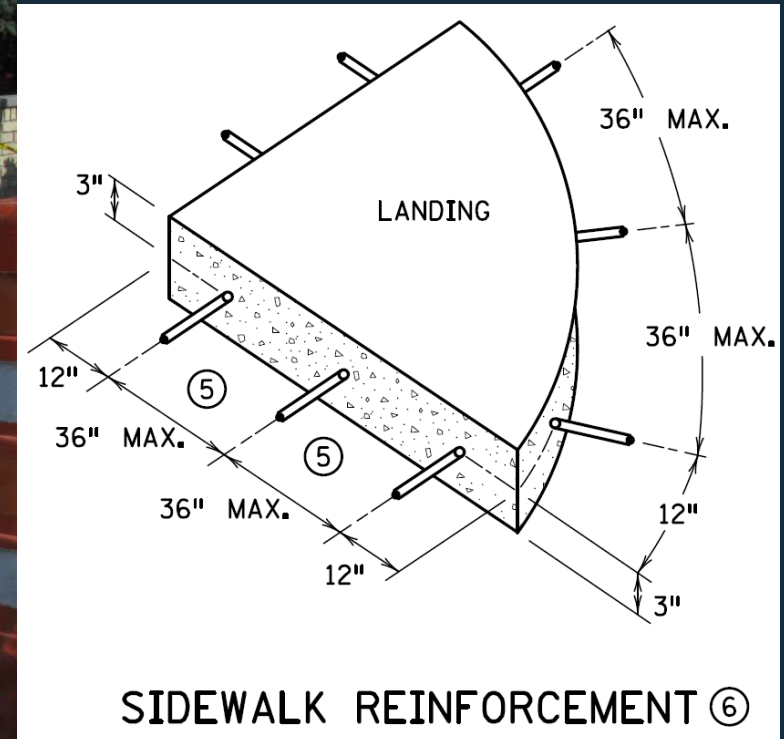


Separate Landing pour options with sidewalk reinforcement.



# ADA Curb Ramp New for 2013

Separate Landing pour Fan Ramp options with sidewalk reinforcement.



# ADA Construction Fan Ramps



The Fan Ramp constructed with separate concrete placements.



## Standard Plans 2013

### LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

(S)



INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%

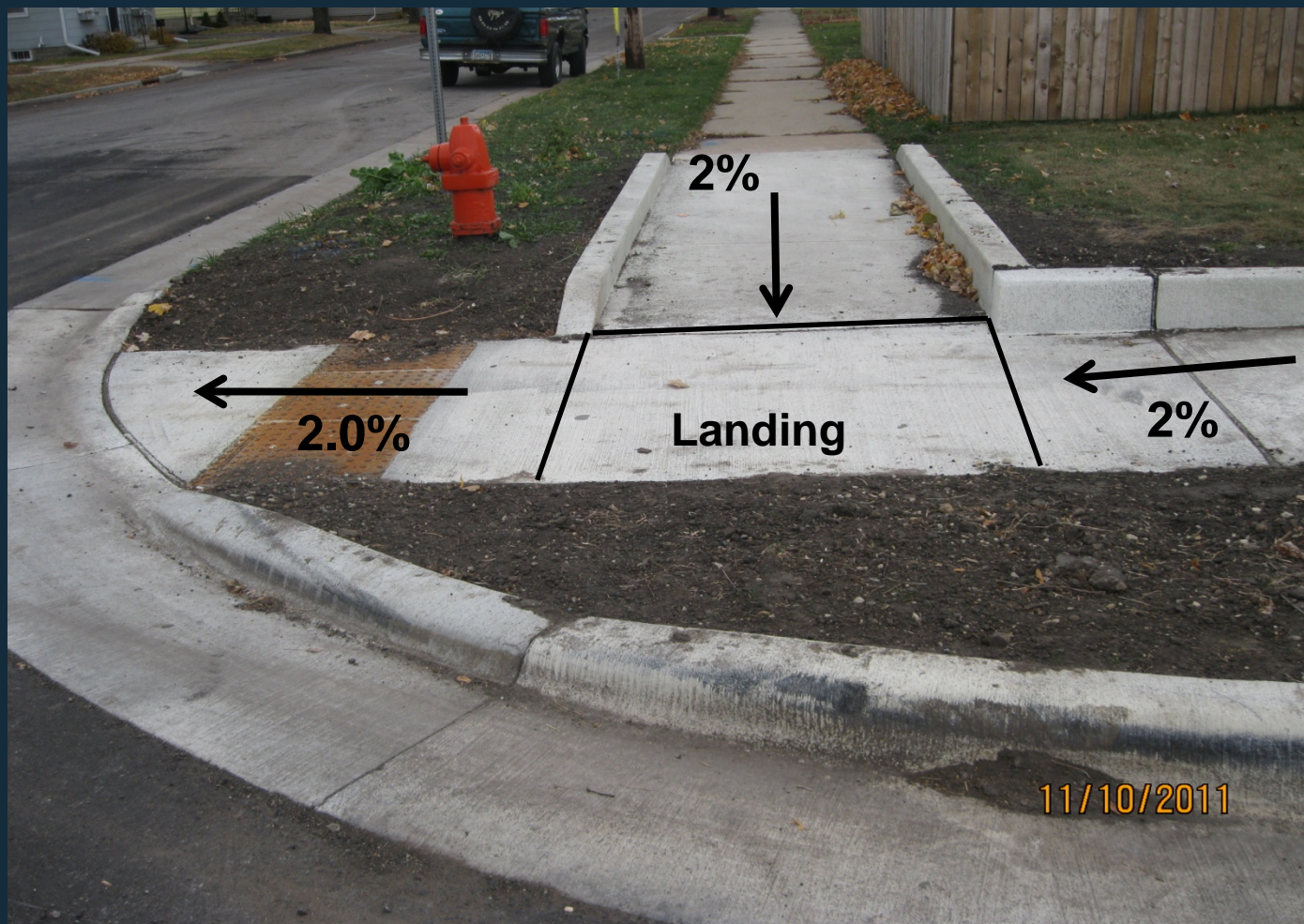
(F)



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%

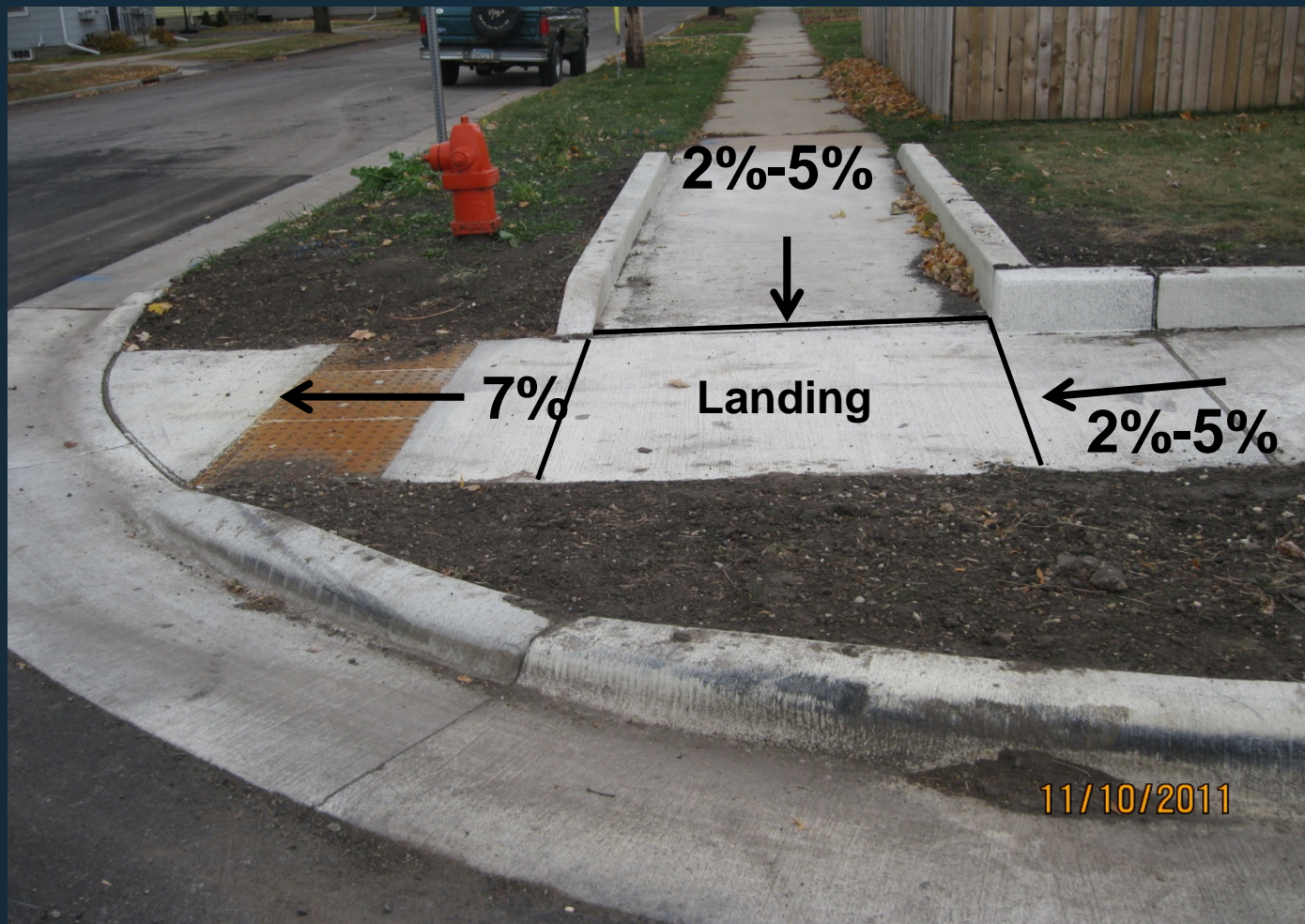
# ADA Curb Ramp Construction

- Curb ramp is complaint, but it fits poorly into its surroundings, and will be difficult to maintain.



# Curb Ramp Construction

- Slopes shown are preferred and side slopes could have been grade flush, thus eliminating V-curb.



# ADA Curb Ramp Standard Plans



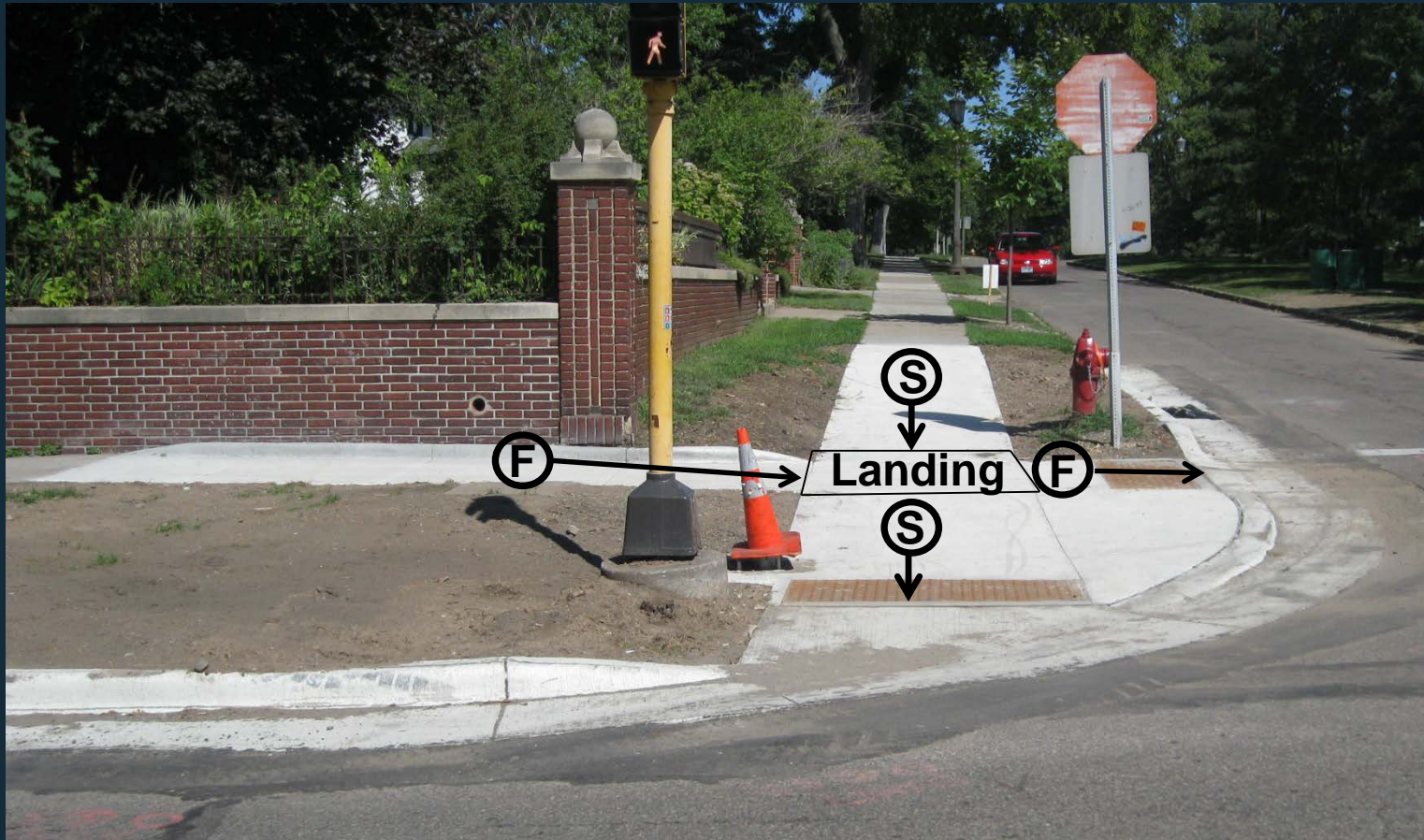
Ⓢ Indicates pedestrian ramp – slope shall be between 5% minimum and 8.3% maximum in the direction shown and the cross slope shall not exceed 2%.



# ADA Curb Ramp Standard Plans



**(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%.



# 1803 Special Provisions

3) After the curb has been correctly poured, the Contractor has set the sidewalk forms, and prior to placing the concrete curb ramps/sidewalks, the Contractor shall verify the requirements in S-1.1B will be achieved.

In addition, the longitudinal slopes shown in the Construction Plans and the Standard Plans shall be utilized unless these conditions cannot be met. The starting point for setting the forms on the controlling ramp leg should be the following:

Steep (S) = 7%

Flat (F) = 4%

Landing = 1.5%

Sidewalk Cross Slope = 1.5%

Fan ramp = 4%



# ADA Curb Ramp Construction



Table curb if necessary. Determine controlling elevation (usually lowest elevation) and set at 7%.



# ADA Curb Ramp Construction

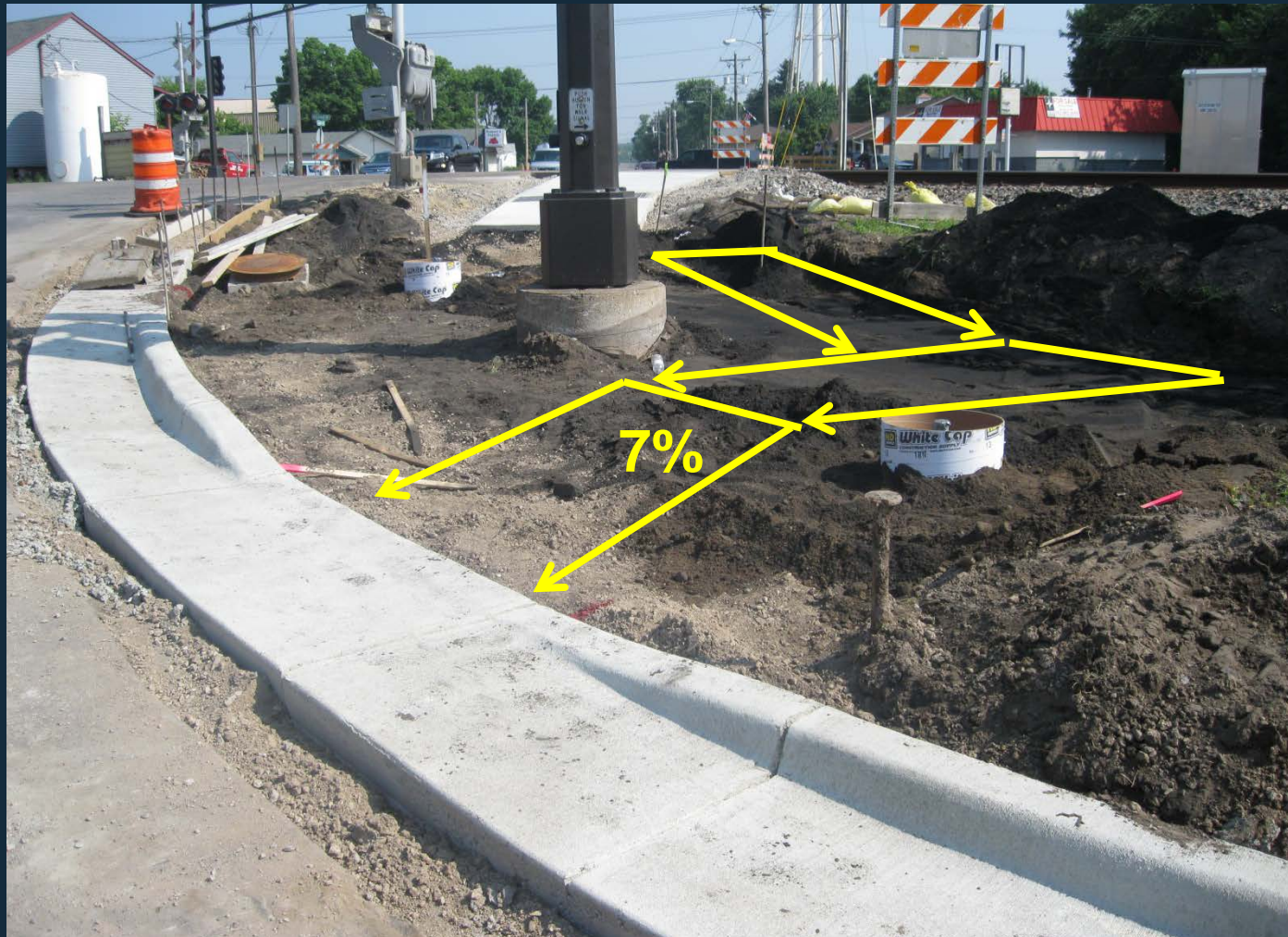


Verify ramp length, landing dimensions, push button location, and perpendicular grade breaks.



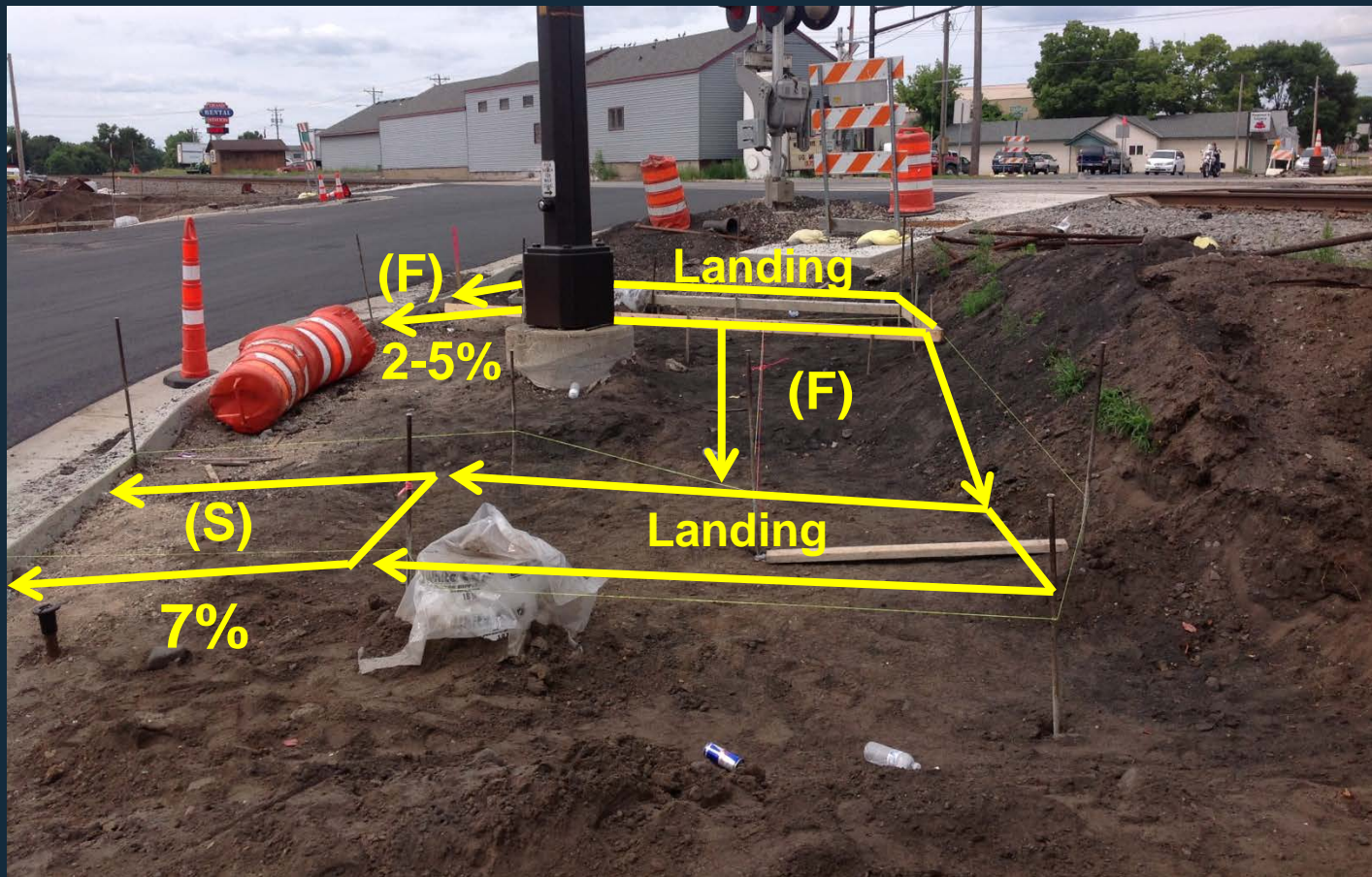
# ADA Curb Ramp Construction

Verify landing is connected to the PAR with perpendicular grade breaks.



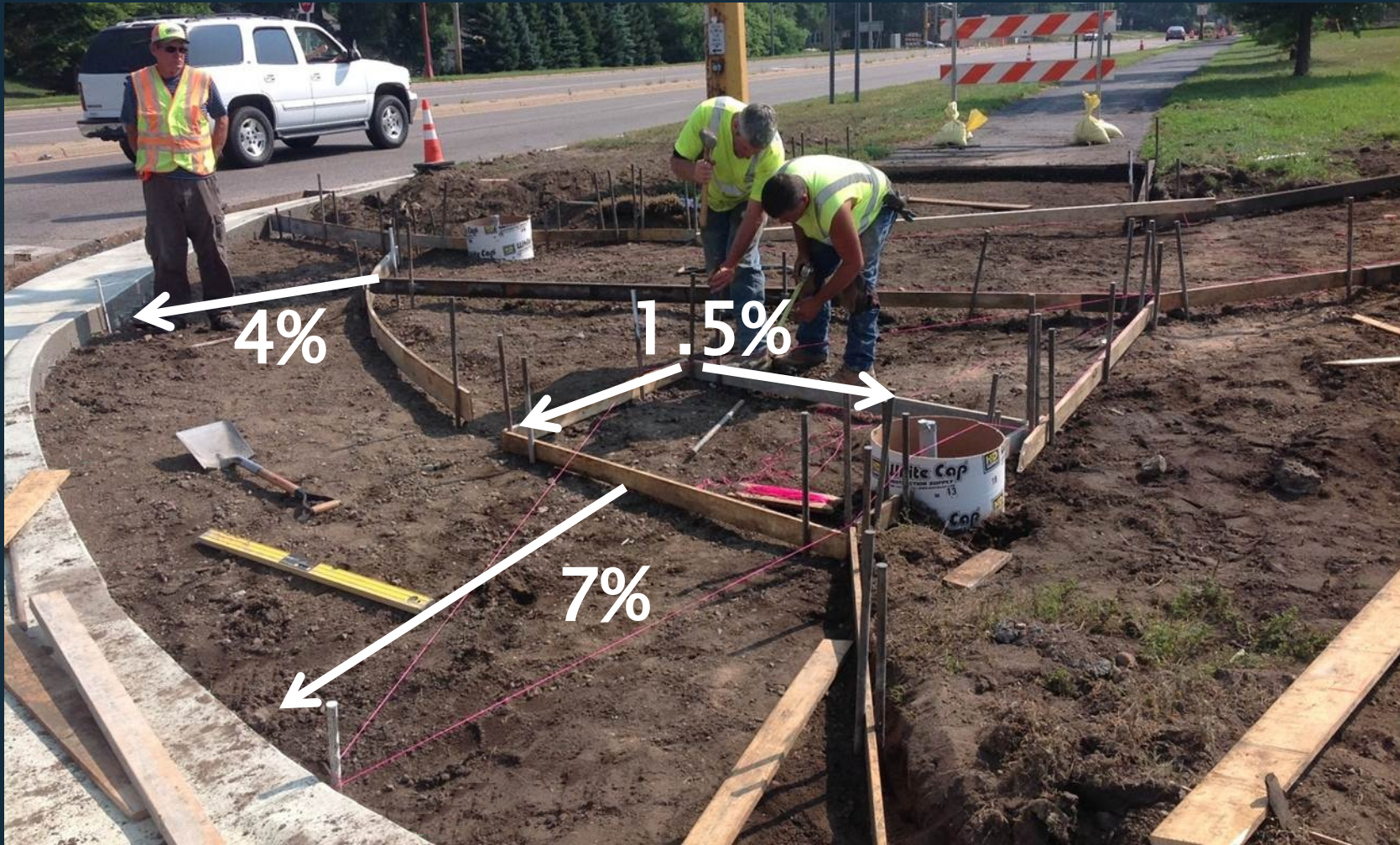
# Curb Construction

Establish both landings with perpendicular grade breaks, verify second ramps is between 2% and 5%.

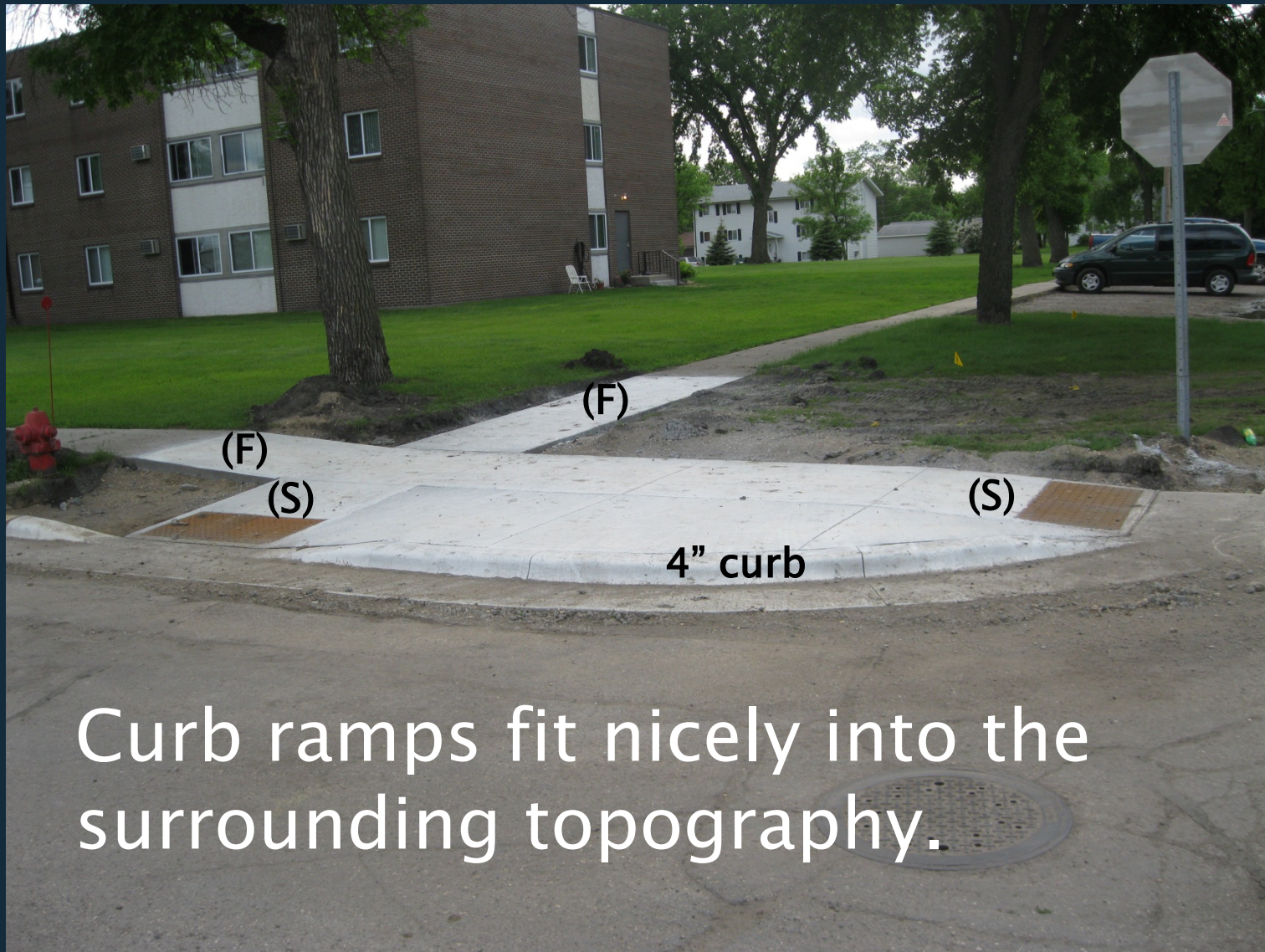


# ADA Curb Ramp Construction

Whenever possible set grades to work within concrete finishing tolerances.



# ADA Curb Ramp Construction



# Concrete Curb Placement

When placing curb, check the plan for secondary landings and adjust top of curb to match landing grades.



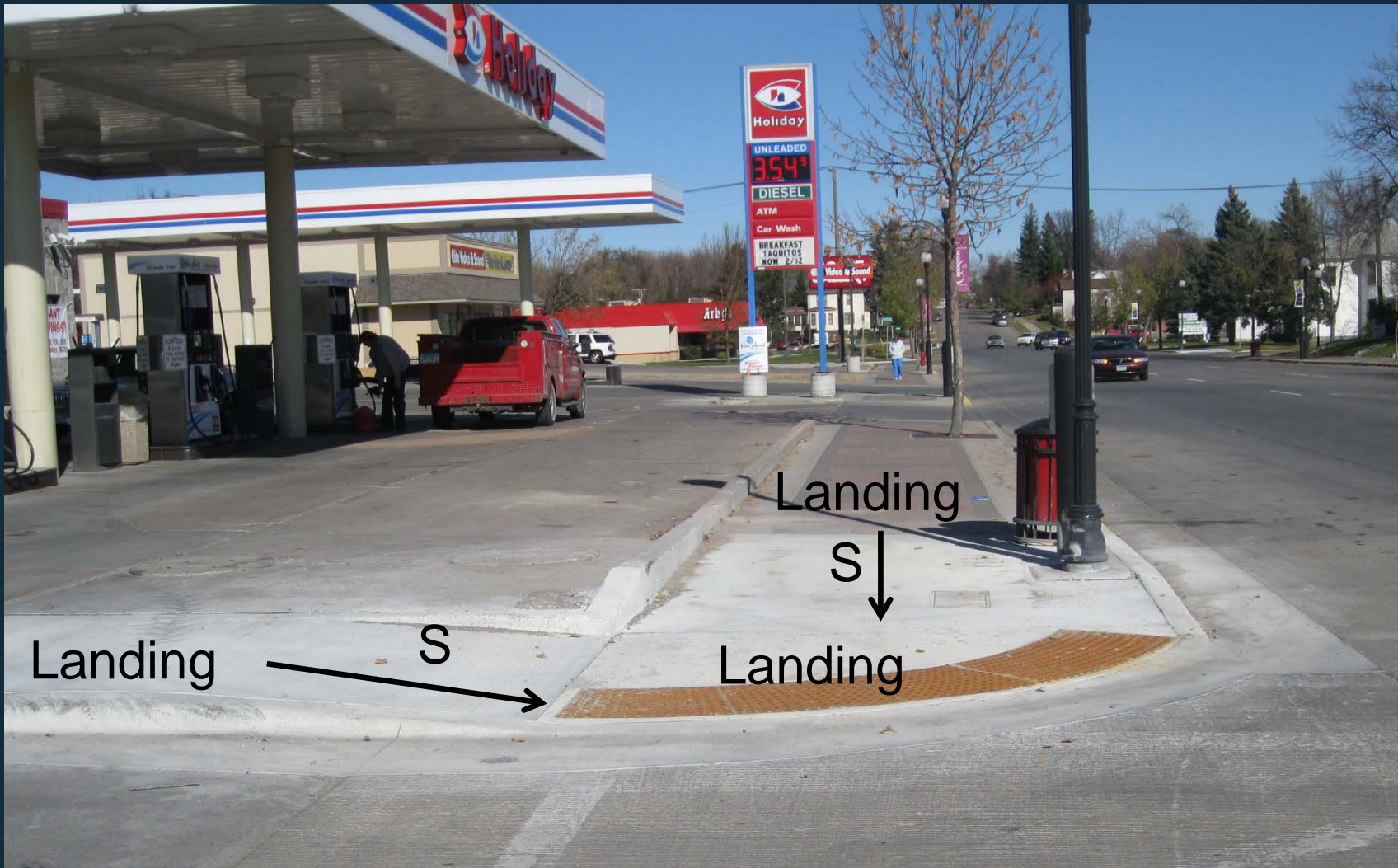
# Concrete Curb Placement

When placing curb, check for doorways, steps, bus stops, or any other features that requires a landing at the back of curb.



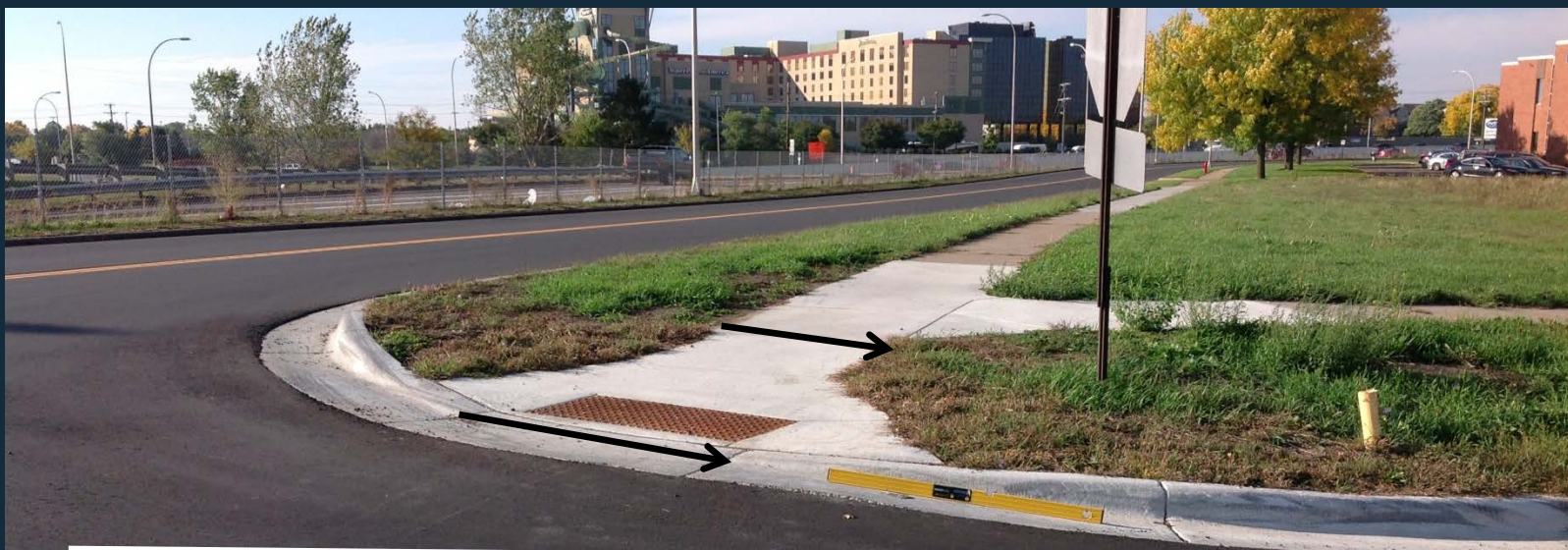
# ADA Curb Ramp Construction

Typically a depressed corner will require secondary landings.



# ADA Curb Ramp Construction

## ADA Preferred Construction cross slopes



### Ramp

Min. 0.5%

Max. 2.0%

Preferred 1.5%

### Gutter Flow lines

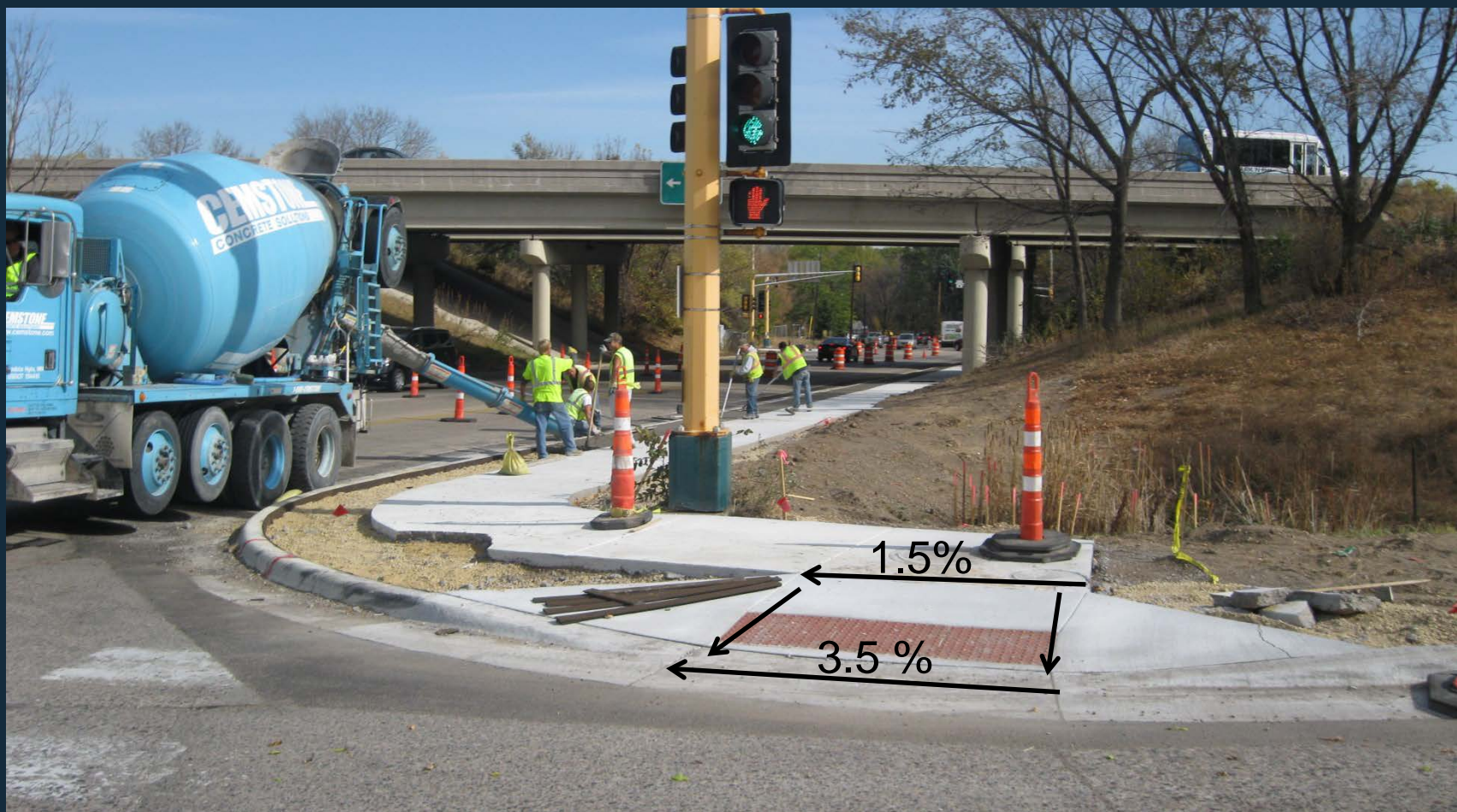
Min. positive flow

Max. 2%

Preferred 1% - 1.5%

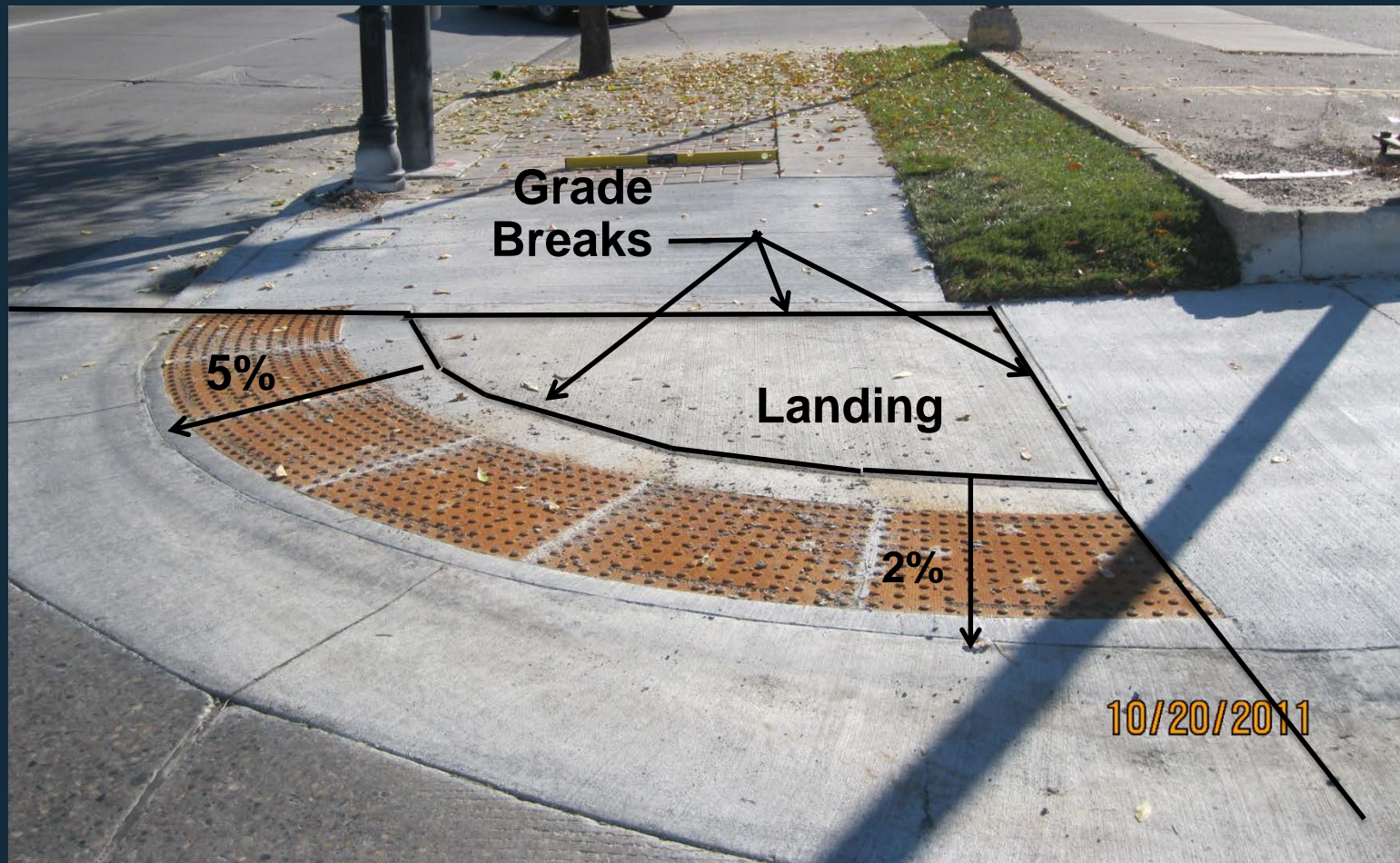
# ADA Curb Ramp Construction

Ramp adjacent to concrete pavement with gutter flow line that exceeds 2%. Make correction over the entire length of the ramp.



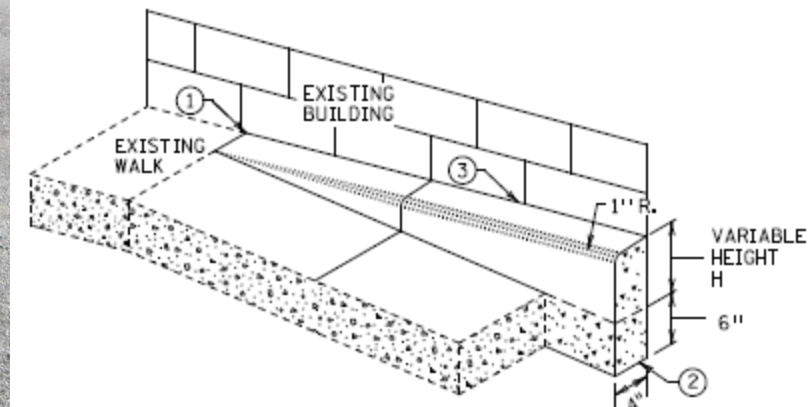
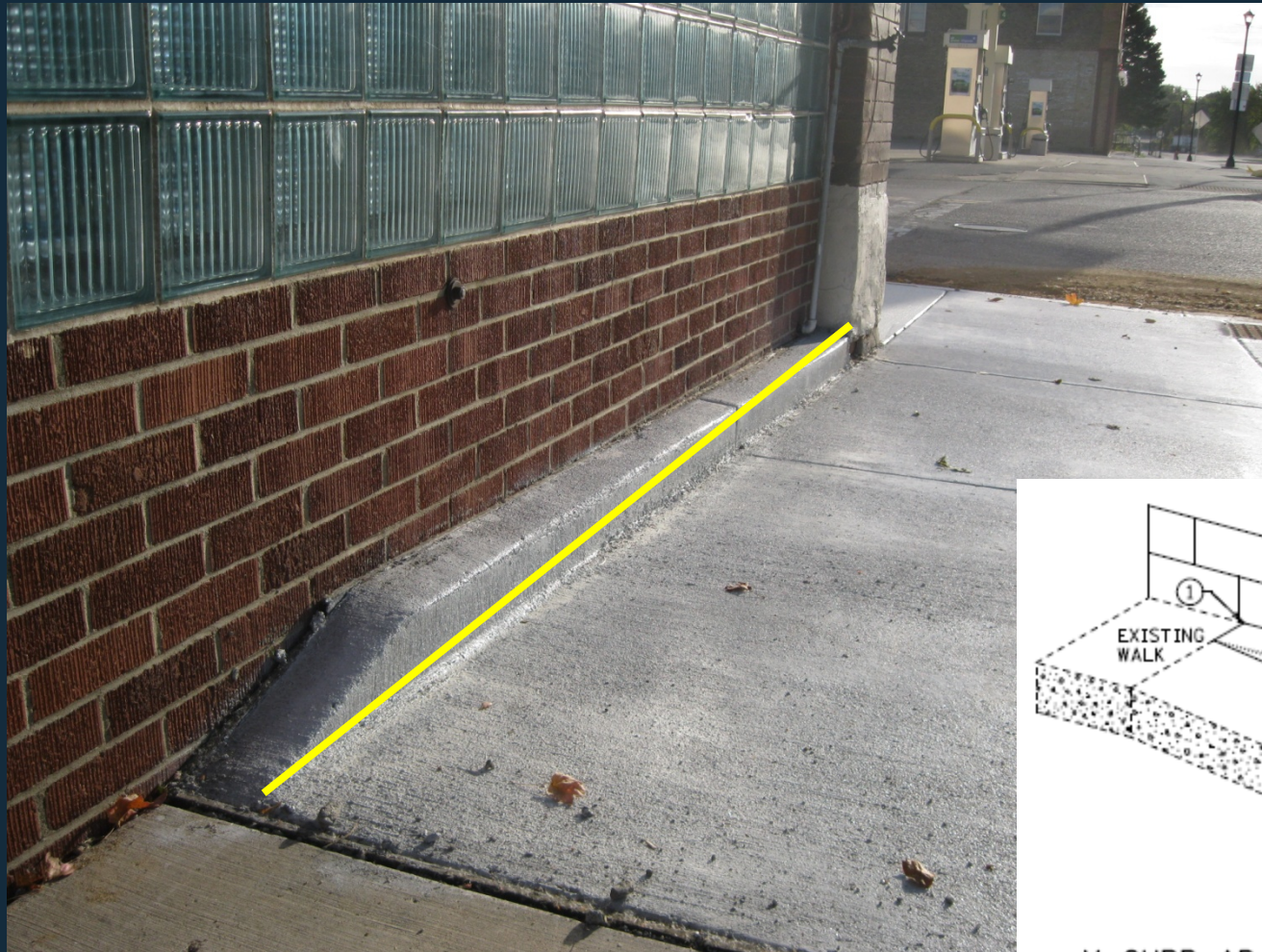
# ADA Curb Ramp Construction

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



# ADA Curb Ramp V-Curb

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



V CURB ADJACENT TO BUILDING

# Concrete Curb Design V



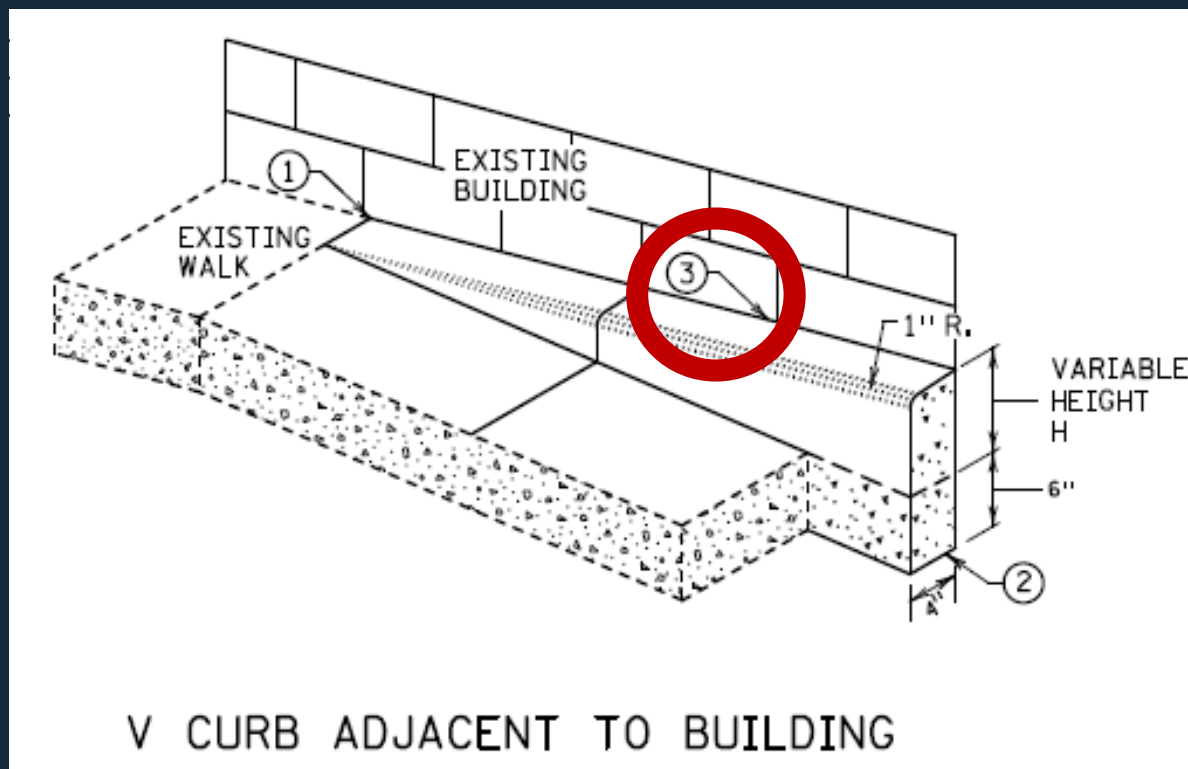
- **(2531) Concrete Curb Design V – Lin Ft**  
Concrete Curb design V may be constructed independent of or integral to the adjacent sidewalk.



When V-Curb is constructed independent of the sidewalk, the portion of the V- Curb that will have new walk placed against it shall be clean so as to maximize bonding between the walk and the V- Curb

# 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.



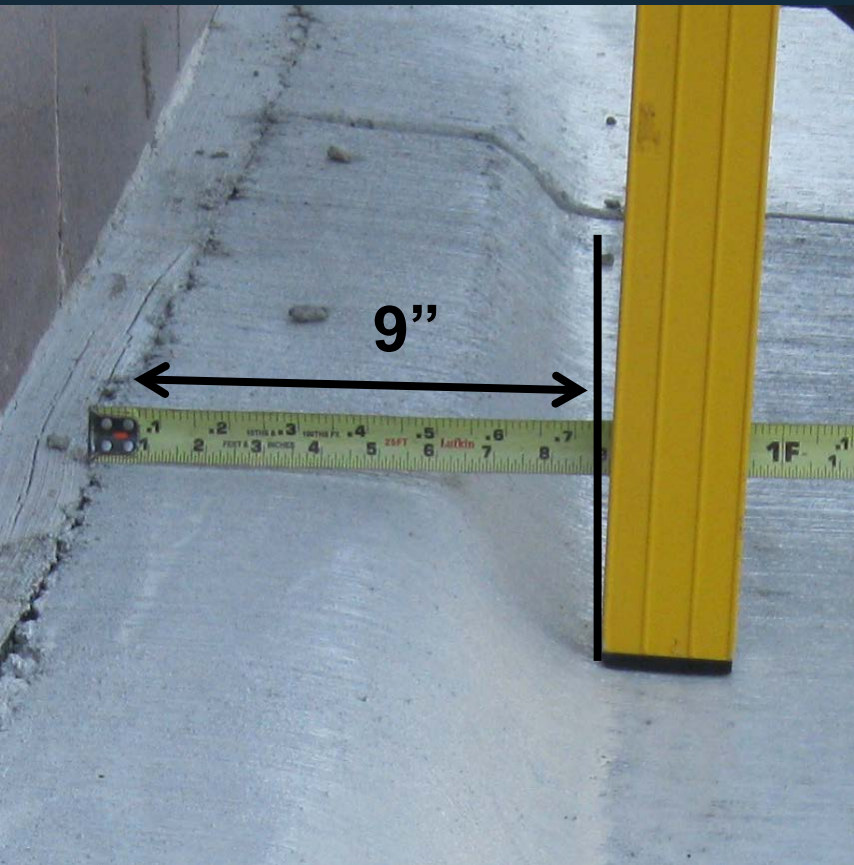
# ADA Curb Ramp V-Curb

- 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 Removal limits

( 1803 ) The contractor shall use the appropriate ramp details in the plan and identify the removal limits for sidewalk and curb and gutter.



# ADA Removal limits



If the Contractor determines the removal limits are not adequate to meet PROWAG / MnDOT specifications the Contractor shall stop work on that quadrant immediately and consult the Engineer.



# ADA Removal limits



Landings required if the approaching sidewalk is inverse grade, also avoid “Tenting” of sidewalk.



# ADA Removal limits Transition Panels



The transition panels cross slope corrections should be a maximum 0.5% per 1 ft. of linear sidewalk panel ( per 5' width of PAR).

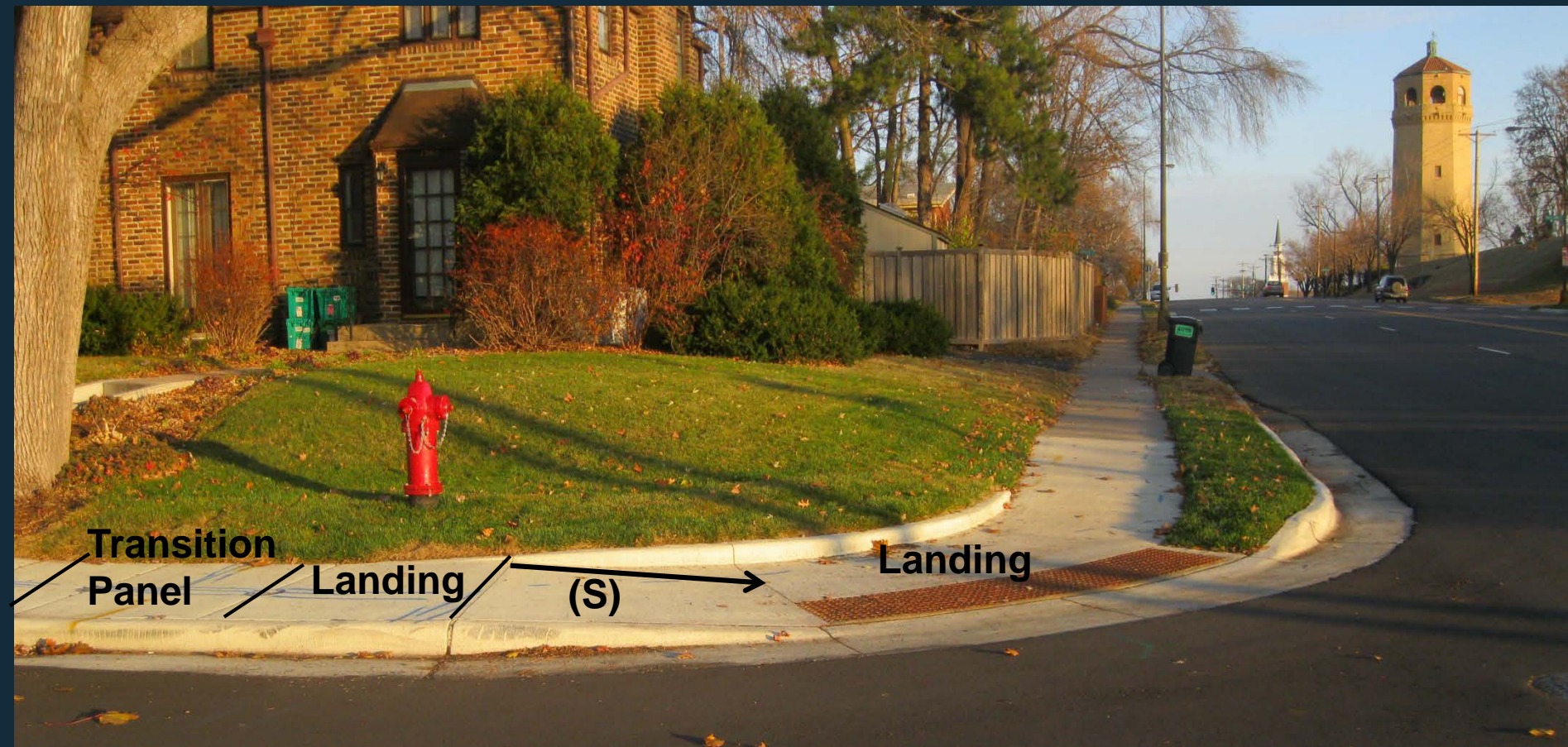


Example: A transition panel from in place sidewalk 4.5% cross slope, to new sidewalk 2% cross slope over 5 ft. would be maximum.

# ADA Removal limits



If a secondary landing is necessary, check to see if a transition panel will also be needed to make the landing compliant.



# ADA Removal limits

Verify removal limits will provide positive drainage as well as maintain existing drainage patterns.



# ADA Removal limits



Once the Engineer and Contractor reach agreement on how to proceed the contractor may finish removals.



# ADA Construction

