Most Common Errors for ADA Ramp (and Sidewalk) Construction and Other Issues

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Presentation Objectives

• Discussion of Various Standards and Issues
• Difficult Design Conditions within the ROW (Curb Ramps and Sidewalks)
• Potential Creative Solutions to Situations
• Questions (Please hold to the end)
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Who are the pedestrians in the right-of-way?
Accessible Sidewalks Video Series
Presented by the US Access Board

Part II: Design Issues for Pedestrians with Ambulatory Impairments

Standards That May Apply

• PROWAG (Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way) dated July 26, 2011 (still not adopted but is considered “best practice”)
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• Agency “typicals” – especially for curb ramps, many situations are not “typical”
Standards That May Apply

• Agency typicals can also be more stringent

PROWAG does not require grooves between detectable warning and landing

PROWAG allows 10:1 flare slopes
Curb Ramps
Curb Ramps

- Minimum 4’ wide (= PAR) with a maximum cross slope of 2.0%, flares max. slope 10% (if needed)
- Maximum ramp slope is 8.3%
- Maximum curb ramp length is 15 feet
- If longitudinal slope exceeds 5.0%, landing(s) must be provided
- Landing dimensions 4’ x 4’ minimum (full width of ramp is required) with a maximum of 2.0% slope in all directions
- DWP min. 2’ deep x 4’ width (MUST be full width of ramps)
- Blended Transitions do not require a landing UNLESS they exceed 2% in any direction and there is a change in direction
- Slopes and dimensions are absolute! PROWAG does not allow any tolerances for exceeding these maximums!
Excellent job of using short curb to reduce grading.

No flare required when lawn area is adjacent!
Curb Ramps

- Perpendicular Ramp
  - 1 Ramp

- Parallel Curb Ramps
  - 2 Ramps

- Combination of Perpendicular & Parallel Ramps
  - 3 Ramps
Difficult Conditions

Existing conditions that can present problems for designers and contractors:

- Curb Ramps
  - Contractor Errors
  - Conversion of Single Diagonal Ramp to Multiple
  - Slopes
  - Limited ROW
  - Drainage
  - Utility Structures
  - Others

- Pedestrian Access Route
  - Slopes
  - Driveways
  - Trees
  - Obstructions
  - Utility Structures
  - Others
Common Ramp Errors

- Contractor error
- Not providing proper landing(s)
- Cross slopes are too steep (2% maximum)
- Lip at curb line
- Not considering the pedestrian path of travel during the design
- Not considering drainage, especially on parallel ramps
- Selecting the wrong ramp type – combination ramps are not used enough (IMO)
- Not using retaining walls or curbs to reduce grading with limited ROW
- Not working around existing obstructions (often cheaper than relocation, not always an option)
Curb Ramp Issue – Contractor Errors

One MI client found 54% of curb ramps were not done to required standards due to “minor” field adjustments by contractor!

- Need to eliminate the “I’ve been doing this for 30 years” mentality
- Suggested that the designer provide as much guidance as possible in difficult situations – detailed grades with tight tolerances
  - Not OK to label drawings at maximums (2% cross slope or 8.33% running slope)
  - Provide tighter guidelines with some allowance for field adjustments (1.5% ± 0.5%). Be sure your grade tolerances don’t conflict!! 2% is only ¼” per foot! Suggest design as flat as possible to provide drainage!
  - Clearly outline penalty for non-compliance (tear out and start over) because once it is accepted it is YOUR problem.
Curb Ramp Issue – Contractor Errors

Contractor used 48” DWP on ramps that are 60” (NOT full width).
Curb Ramp Issue – Contractor Errors

Contractor installed new ramps with 15-20% slope tapers.
Bad flare can be corrected by adding a permanent, cane-detectable obstacle. Need to consider the context – some "obstacles" won’t be appropriate in some settings. In this downtown setting, a planter, etc. might work.
Curb Ramp Issue – Contractor Errors

Not sure of history here but very poor job. By adding these mounted, collapsible bollards, it creates a barrier to pedestrians. Was verified with the Access Board as acceptable!
Curb Ramp Issue – Contractor Errors

Two perpendicular blended transitions without detectable edge between them.
Curb Ramp Issue – Contractor Errors

Single blended transition with DWP oriented incorrectly and doesn’t meet 24” depth requirement.
Curb Ramp Issue – Contractor Errors

Poor use of DWP, excessive slope on landing. Should have done a 2nd ramp & used a parallel ramp!

Should have been parallel ramp

Should have been “flat”
Curb Ramp Issue – Contractor Errors

Single diagonal ramp with DWP oriented incorrectly and doesn’t meet 24” depth requirement, crosswalk striped wrong, landing??.

Pole reduces PAR to <48”, should have been addressed!

< 24” deep
Curb Ramp Issue – Contractor Errors

How to determine where landing needs to be. May find you need more than 1 and/or it may be large.
Curb Ramp Issue – Contractor Errors

Contractor for local utility “fixed” the sidewalk and ramp. Got a “you won’t believe this e-mail” from a client looking for options.

HELP!

Gentlemen,

I am attaching pictures from the Intersection at west park and Lafontaine street. XXXXXX was replacing gas mains in the area and the contractor did this work and then called us out there after the fact and asked us if we were ok with this ... quite frankly no, but not quite sure how to handle the situation. The two sidewalk between the two poles is about 40” and the drop offs are about 7-8” tall. Maybe this would be the best way (without redesigning the intersection or moving the poles), but maybe a handrail is required? Just not sure. Looking for some guidance.

Thanks
Curb Ramp Issue – Contractor Errors

This was a POSSIBLE solution offered to the contractor provided all the slopes and dimensions were compliant.
Curb Ramp Issue – Convert Single Ramp to Multiple

- PROWAG does not permit new diagonal ramps (except in extreme conditions)
- For blended transitions (“ramps” less than 5% running slope) they are discouraged
- Movement to try and provide directional cues to the blind with orientation of ramps and detectable warning (when and how?)
Single Diagonal Ramp
Least Preferred

• Diagonal ramp is a single ramp located at the apex of the corner.

• Problematic:
  – Difficult for blind to determine correct crossing direction and travel direction
  – Need landing at the bottom that is in the street
  – Increased interaction with turning vehicles
  – Drivers can’t tell which direction pedestrians are planning to cross until pedestrian turns.
Curb Ramp Issue – Convert Single Ramp to Multiple

Issues
- Single ramp
- No top landing or landing for change of direction (COD)
- No DWP
- Ponding at bottom landing, which is in the street
Curb Ramp Issue – Convert Single Ramp to Multiple

Two perpendicular blended transition ramps with flares and detectable edge between them.

Probably need larger level area for both top landings and change of direction.

Fixed object eliminates need for adjacent flare on this side of the ramp!

Need detectable curb.
Curb Ramp Issue – Convert Single Ramp to Multiple

Issues
- Single ramp
- No DWP
- Level changes of adjacent PAR
- No top landing or for COD
- Need to lower area to reduce grading
- Bottom landing is in the street
- This situation is probably the most common in residential areas!
Curb Ramp Issue – Convert Single Ramp to Multiple

Two perpendicular ramps with level landings and COD area, may need combination ramps, sidewalk work corrects level change, no flares needed due to tree lawn.
Curb Ramp Issue – Convert Single Ramp to Multiple

Two perpendicular ramps with flares on non-tree lawns sides and detectable edge between them. Combination ramps likely required.

Need small detectable curb
Slope Issues

Issues

• Single ramp serving only one direction of crossing
• Top landing does not line up with sidewalk for COD
• No DWP
• Steep ramp
Slope Issues

Two parallel ramps. Need to ensure landings line up with CODs. Need to be very aware of potential for drainage problem at bottom of ramp.

Need top landings on parallel ramps if they exceed 5%!
Slope Issues

- Single diagonal ramp serving only one crossing direction
- Utility structure in ramp/landing
- Top landing does not line up with sidewalk for COD and slopes exceed 2%
- Tall curb
- No DWP
- Very steep ramp
Slope Issues

Two parallel ramps. Bottom landing serves both bottom of parallel ramps and COD. Need to be very aware of potential for drainage problem at bottom of ramp. Relocate manhole cover if possible to get it out of the new ramp.
Utility Structures

Need to either move the structure (not likely) or convert to 2 separate ramps. May be ROW dependent.
Missing Ramps with Existing Curbs

Existing high curb with short length to landing. What is the best likely solution?
Missing Ramps with Curbs

Likely that some additional sidewalk work from what is shown will be required, but is a good solution.

Pole is permanent obstruction, eliminates need for flare!
Curb Ramp Summary

- There are an infinite number of curb ramp configurations, many of which will require more thought and design effort than a "typical" situation might allow.

- Be sure to know what you are dealing with when constructing a curb ramp to make it compliant! Don’t try to make a situation fit a standard detail.

- Make sure the contractor understands the importance of making it compliant and the repercussions of not making it so!!

- Continue to seek assistance with peers – chances are someone has run into a similar situation at some time.
Pedestrian Access Route (PAR)
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• Pedestrian Access Route (PAR) – all pedestrian facilities within the ROW (sidewalks).

  • Running Slope: must be less than 5% or the slope of the existing adjacent roadway, whichever is greater
  • Cross Slope: cannot exceed 2%
  • Width: 48” minimum, 60” preferred. If longer than 200 feet and < 60” width, must provide 60”x60” passing spaces
  • Separations/gaps: cannot exceed ½”
  • Displacements: ¼” or ½” if beveled. Can be significant safety hazard to all users!
  • Protrusions: cannot obstruct PAR or protrude over 4” into PAR between 27”-80”
  • Obstructions: cannot provide an obstacle that reduces the PAR width to less than 48”.
  • Drainage Issues: PAR should not have any ponded water
Pedestrian Access Route (PAR)

- PAR is reserved for pedestrians and must be clear of obstructions and protruding objects.
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- PAR is reserved for pedestrians and must be clear of obstructions and protruding objects.
- PAR is not continuous, blocked by outdoor seating – difficult for blind.
- What happens here when a bike is locked to the loop? Often overlooked in design (loop is OK).
PAR Issues – Slopes

• The running slope of the PAR may match, BUT NOT EXCEED, that of the adjacent roadway. *(PROWAG 2011 change)*

• Not going to spend time due to variability.

• Cross slopes of PAR are biggest slope issue!
PAR Issues – Slopes

Building entrance elevations create problems on severely sloped streets.
Many businesses have elevation changes to access, especially in older towns and cities.
Some communities have extreme issues and have addressed it creatively. This solution really eats into your sidewalk.
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PAR Issues – Slopes

If you have the space this works great but most places don’t have room.
PAR Issues – Slopes

Could raise the curb; but what issues can this create?

Tall curb can damage cars and be a safety concern.
PAR Issues – Slopes

• If the slopes are not too severe this can be done also but not recommended if the “X” exceeds 8.33%. Has potential safety issues for blind (and walking “texters”).
PAR Issues – Slopes

- Better solution? Flower boxes or vertical ornamental fence at grade change with ramps/step?

Construct ramp
PAR Issues – Slopes

2% slope = \( \frac{1}{4} \)” per foot. If you have a 4% cross slope on an 8’ walk, you need to raise the walk edge at least 2”. Where you have a 6” curb this would equal two, 4” curbs.

Here the curb is stepped to allow diagonal on-street parking & sidewalks with good cross slope.
At noncompliant driveways, sidewalk users encounter:

- Steep Cross slopes
- Rapid grade change at driveway flare
PAR Issues – Driveways

• Sidewalk needs to be built through the driveway, not the other way, to maintain compliant cross slopes!
PAR Issues – Driveways

• This 7% running slope driveway is a 7% sidewalk cross slope! This could easily cause a wheelchair user to tip!
PAR Issues – Driveways

• Here is an extreme condition – driveway rollercoaster. Common in older residential areas, though not this extreme. This is accomplished only where there is apathy towards pedestrians.
PAR Issues – Driveways

Various options exist – as with curb ramps you need to be flexible and creative!
PAR Issues – Driveways

Some very steep driveways can be problematic, especially if they are very short in length (residential). Comply to the extent possible/feasible and consider signage to inform those that might have issues to seek another route.
PAR Issues – Level Changes/Gaps

Can be caused by a variety of means

• Trees are very common cause
PAR Issues – Level Changes/Gaps

Can be caused by a variety of means
• Trees are very common cause
• Differential settlement/movement
PAR Issues – Level Changes/Gaps

Can be caused by a variety of means

- Trees are very common cause
- Differential settlement/movement
- Cracked/broken walks
A thorough self-evaluation is needed. Minor changes can be beveled by grinding.
PAR Issues – Level Changes/Gaps

Can pump flowable fill to raise walks. Has some limitations.
Look for opportunities to at least make things better and safer for all users, such as temporary patches
PAR Issues – Level Changes/Gaps
Obstructions that block or reduce the PAR to under 48” are problematic. Can include:

- Utility poles
PAR Issues – Obstructions

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PAR Issues – Obstructions

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- Utility poles
- Hydrants
- Vegetation
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- Utility poles
- Hydrants
- Vegetation (including turf!).

Another good reason to go with 60” sidewalks!
Obstructions that block or reduce the PAR to under 48” are problematic. Can include:

- Utility poles
- Hydrants
- Vegetation
- Signs
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Obstructions that block or reduce the PAR to under 48” are problematic. Can include:

- Utility poles
- Hydrants
- Vegetation
- Signs 
  - Even temporary ones
PAR Issues – Obstructions

Some fixes are easier than others, but may be dependent on available space/ROW.
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PAR Issues – Obstructions

Some fixes are easier than others, but may be dependent on available space/ROW.
Horizontal openings no more than ½ inch in the direction of travel. Can include trench drains, catch basins, manhole covers, tree grates, etc.
PAR Issues – Utility Structures

Even a princess can fall victim!
PAR Issues – Utility Structures

Need to use compliant covers, make corrective actions, etc.

Use of Wire Mesh Screen

Use of Straps Welded to Existing Grate
PAR Issues – Other Issues

Protruding objects

- Any objects that extend into the PAR more than 4” above 27” and below 80” (aren’t cane detectable)
PAR Issues – Other Issues

Can be:
- Signs (MUTCD requires 7’ height to bottom)
- Flower baskets
- Pole- or wall-mounted objects
Conclusions

Need to prioritize curb ramp and sidewalk corrections based on several factors:
• Presence of community facilities (schools, etc.)
• Routes from residential areas to services
• Community input, especially a demonstrated use by disabled users

Most older communities have literally millions of sidewalk corrections needed, money just isn’t there, which makes prioritization and public input critical! For example, Oklahoma City identified nearly $12 million in sidewalk and $3 million in curb ramp projects to meet ADA standards when performing their self-evaluation.
Questions??