ADA Ramp Construction

Department of Public Works
Office of Disability Affairs
February 16, 2016
Presented by Jason Koch, PE
Agenda

- Opening Statements/Welcome
- PROWAG vs. ADAAG
- Inspector Expectations
- Ramp Elements/Fundamentals
- Pedestrian Signals
- Pedestrian MOT
- Summary & Resources
- Question & Answers
Welcome

• The Americans with Disabilities Act was passed by Congress in 1990 and is the civil rights law for individuals with disabilities

• Twenty percent, or 1 in 5, of Indianapolis residents have some sort of disability

• Indianapolis has a tradition of universal inclusion and physical accessibility, as recognized by the National Organization on Disability.
Civil Rights

• The ADA is a civil rights law

• An inaccessible sidewalk is considered a segregated facility
ADAAG vs. PROWAG

• **Americans with Disabilities Act Accessibility Guidelines (ADAAG)**

• **Public Right-Of-Way Accessibility Guidelines (PROWAG)**
ADAAG

• Developed primarily for buildings & on-site facilities starting in 1991
• Does not address all situations (especially those that are unique to the public right-of-way)
• INDOT Standard Drawings reflect ADAAG standards
PROWAG

• Draft federal guidelines
• Originally intended to supplement ADAAG
• Covers pedestrian features in new or altered public rights-of-way
• Considered best practice for ADA issues
• INDOT Design Memo 15-20 covers applicability

• [link to guidelines]
• [link to memo]

ADAAG vs. PROWAG

1. The minimum width of a curb ramp, landing, or sidewalk, is 4 feet. A 3-ft pinch point is not acceptable.
   - Avoid obstructions like street furnishings, utilities, vegetation, signs, etc
   - Infrastructure must be a material that is stable, firm, and slip resistant
ADAAG vs. PROWAG

• **Vertical Protrusions**
  – Between 27” and 80” vertically from grade, no protrusion > 4” into sidewalk

• **Think:**
  – Gas meters on buildings
  – Sheet signs
  – Vegetation
  – Car/truck mirrors
ADAAG vs. PROWAG

2. The grade (running slope) of the sidewalk may match the adjacent roadway profile grade.
   – Prior rules had sidewalk grades not able to exceed 5%, even if roadway profile was >5%
ADAAG vs. PROWAG

3. A sidewalk adjacent to a roadway does not require a landing area or handrail, regardless of the roadway grade.
   - ADAAG required handrails on any rises greater than 6”
   - Handrails will still be required where drop-off heights warrant handrail.
ADAAG vs. PROWAG

4. The maximum cross slope is 2.00%. There is no construction tolerance for cross slope.

   – Only exceptions for the 2% cross slope:
     
     • Pedestrian street crossings without yield or stop control, the cross slope shall be 5% percent maximum.
     
     • At midblock pedestrian street crossings, the cross slope shall be permitted to equal the street or highway grade.
ADAAG vs. PROWAG

5. The maximum ramp running slope is 8.33% (12:1). There is no construction tolerance for running slope.
   - A running slope of 10% for a 6-in. rise is not acceptable.
ADAAG vs. PROWAG

6. Detectable warning elements must extend the full width of the ramp.
   - Some detectable warning products require a concrete border for proper installation. The concrete border should not exceed 2 inches. Where the back of curb edge is tooled to provide a radius, the border dimension should be measured from the end of the radius.
ADAAG vs. PROWAG

7. A landing area (turning space) must be provided at the top of each perpendicular curb ramp and the bottom of each parallel curb ramp.

- Ramp types A, B, C, D, E, and L are perpendicular ramps.
- Ramp types F and K are parallel ramps.
- Ramp types G and H are defined as one-way-directional perpendicular ramps, but do not require a landing area because a change in direction at the top of the ramp is not required.
- The minimum dimensions of the landing area are 4 ft x 4 ft. Where the landing area is constrained by a curb or other feature the minimum dimensions are 4 ft x 5 ft, with the 5-ft dimension in the direction of travel.
1. The curb ramp type includes the ramp and flared sides as indicated on the details. A level landing shall be provided at the high end of every curb ramp.

2. For details of sidewalk curb ramp types see Standard Drawings E 604-SWCR-03 to -11.

3. The curb ramps shall be placed within the marked crosswalk area.

4. Flared side of sidewalk curb ramp next to utility strip shall be sodded.

Ramp Types

• Perpendicular Ramps
  – INDOT Type A, C, D, L
  – Most preferred by DPW

Minimum 4’x4’ landing at the top

Minimum 5’x4’ landing at the top (curbed)
Ramp Types

• Parallel Ramps
  – INDOT Type F, G, H, & K
  – Preferred by DPW where perpendicular is not possible

Minimum 5’x4’ landing at the bottom (curbed)
Ramp Types

- **Diagonal**
  - INDOT Type B & E
  - Not preferred by DPW: only to be used as a last resort

Minimum 4’x4’ landing at the top

AND minimum 4’x4’ landing at the bottom
Inspector Expectations

• Ramp and sidewalk work requires full time inspection
• Must be able to visualize constructability
  – Field checks every location
  – Approve contractor layout
  – Use your tools: Smart Level, Tape Measure, Straightedge
Inspector Expectations

• Review plans immediately upon assignment

• Walk the project with the design PM & the construction PM soon after pre-con meeting

• Identify to construction PM any ramps that have constructability issues
  – Document your work
  – This should be done prior to the Contractor’s mobilization
  – Prevents delay between demo and replacement
Every plan set should have a Ramp Summary Sheet:
Inspector needs to keep up on the documentation and field change with this form from the RPR manual
Inspector Expectations

• City is committed to providing access

• Emphasis is largely concentrated on:
  – Mobility impaired
  – Visual impaired

• There can be conflicting requirements/elements
  – Truncated domes are good for visually impaired but not mobility impaired
  – Slopes are good for mobility impaired but can be disorienting for visually impaired
Ramp & Sidewalk Elements

Inspector must understand each aspect of a ramp or sidewalk:

• Preliminary Layout
• Clear Distances/Widths
• Slopes
• Landings & Flares
• Grooves
• Truncated Domes
• Drainage/Gaps
• Maintenance of Traffic
• Traffic Signals
Preliminary Layout

Why this is needed:

In Indianapolis, most new ramps are retrofits to the existing sidewalk network. Picking the appropriate ramp in the appropriate location is critical.

Don’t assume the designer made a field visit.

*It is important for RPR to inspect every contractor layout before it is placed.*
Preliminary Layout

Considerations:

• Is there a larger than normal amount of pedestrian traffic at this location?

• How tall are your curbs?

• Any existing drainage problems?

• Obstructions?

• Ramp vs. Transition
  • Only difference is the need for detectable warnings
  • Ramps only installed at public street intersections
  • Sidewalk transitions are appropriate for:
    • Public alleys
    • Commercial or residential driveways
Preliminary Layout

Construction tolerance:

– No tolerance for maximum criteria

– For Example:
  • 0-2% slope means no more than 2% (2.1 does not comply!)
  • 4’ minimum width means no less than 4’ (3.9’ does not comply!)
  • 7’-10’ mounting height means no less than 7’, no more than 10’

– Set forms to less than maximum to have “play”
  – Set to 7.7% running slope and/or 1.5% cross-slope
Clear Distances/Width

Possible Solutions:

- Utility Relocation
- Ramp Realignment
- Casting Adjustments
- Acquire R/W or Easements
Slopes

Why this is important:

Proper slopes gives people with mobility disabilities access to public spaces without undue hardship.
Slopes

Sidewalks
- 2% max transverse (cross slope)
- 5% max longitudinal (or match road profile grade)

ADA Ramps
- 12:1 (8.3%) max
Slopes

Bottom of Ramps

- Maximum 11% difference in grades
- Diagonal ramps (Type B or E) must have a 4’ flat landing at the bottom so user can reorient

\[
8.33\% + 5\% = 13.33\% > 11\%
\]

Provide 2'-0 level strip if algebraic difference exceeds 11%

Provide curb as required, may be monolithic with level strip.
Landings & Flares

**Why this is needed:**

Landing areas are a transition area between the sidewalk and the ramp. Landing areas allow users to comfortably orient themselves in the direction of travel.
Landings & Flares

Incorrect:

Ramp Type F or K would be better solution
Hard to turn a wheelchair on a slope
Landings & Flares

When to use flares vs. curbs

- Flares needed when you are within the “walkable” sidewalk area

- Curbs can be used adjacent to “non-walkable” areas like landscaping beds or grass
Grooves

Why this is needed:

Grooves serve as supplementary detectable warning to street crossing

Grooves are not intended for directional guidance: follow current INDOT standards for implementation

DETAIL OF RAMP GROOVES
INDOT Construction Memo

• INDOT Construction Memo 13-07
• Allows omission of ramp grooves
• DPW policy currently requires grooves regardless of this INDOT Construction Memo
Grooves

Incorrect:

> 2” spaced grooves

Do not groove the wings
Grooves

Correct:

Type G Ramp (far side) and Type H Ramp (near side)
Truncated Domes

**Purpose:**

To warn visually impaired pedestrians of the transition between the sidewalk and the roadway

**Key Specifications**

- Material must comply with INDOT Spec 905.05
- Must be a **contrasting color** to adjacent sidewalk
- If using brick elements:
  - Lay in a running or stacked bond pattern
  - Joint width less than 1/8”
  - Set on mortar setting bed of 3/8” to 3/4” thick
  - Sand joints
- Must be butt up against the curb at street
- 24” wide ribbon
Truncated Domes

Incorrect:

Joint spacing > 1/8”
Not set on mortar bed

Warnings must butt up against curb
Truncated Domes

Correct:

Incorrect:
Drainage & Gaps

Why this is needed:

Ramps are used during and after rainfall. Proper drainage around the ramp will keep people who use the ramp from getting muddy and wet and provide proper traction.
Drainage & Gaps

Have a solution for drainage

• Standing water on a ramp is unacceptable
• Possible solutions to consider:
  – New installation of inlets or relocation of existing inlets
  – Warping the pavement to drain away from ramp
  – Adjust ramp location –
    BUT ONLY if it makes sense
• Discuss possible solutions with
  PM for consensus

*This does not count as a solution.
Drainage & Gaps

• Gaps must be ½” or less
  – Expansion joints
  – Drainage structures
  – Tree grates in the “walkable” sidewalk area
Maintenance of Traffic

**Why this is needed:**

We must guide all pedestrians through the work zone safely through effective closures, alternate routing, and temporary facilities.
Maintenance of Traffic

Considerations:

Not all locations are the same. RPR must be able to decide level of accommodation.

Temporary ramps should always be in place where pedestrians have not been detoured to another accessible location.

Pedestrians should be detoured across the street to another accessible route at controlled intersection.

IMUTCD Part 6:
Maintenance of Traffic

• Pedestrian MOT should be shown in the plans
  – Note crossing locations prior to actual closure
  – Address vertical lip caused by milling/ paving

• Barricades should:
  – High visibility color (orange / yellow)
  – Be detectible by cane
  – Shield both work area and roadway
## Maintenance of Traffic

<table>
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<tr>
<th>Reference</th>
<th>Title</th>
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<tr>
<td>PROWAG R205</td>
<td>Alternate Pedestrian Access Routes</td>
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<tr>
<td>IMUTCD 6D.01 &amp;6D.02</td>
<td>Pedestrian Considerations &amp; Accessibility Considerations</td>
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<td>IMUTCD 6F.63, 6F68, 6F.70, 6F.71</td>
<td>Channelizing Devices, Barricades, TTB as Channelizing Devices, Longitudinal Channelizing Devices</td>
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<td>Sidewalk Detour or Diversion, Crosswalk Closures and Pedestrian Detours</td>
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Maintenance of Traffic

Incorrect:
Traffic Signals

Why this is needed:

Where a pedestrian actuated traffic signal exists, the push button must be accessible to all users.
Traffic Signals

Location Standards:

- Not greater than 5’ away from the edge of a ramp and crosswalk
- Between 1.5’ and 6’ from the edge of the curb, shoulder, or pavement (*but no greater than 10’*)
- Face of the pushbutton parallel to the crosswalk to be used
- Mounting height of approximately 3.5’, but no more than 4’, above the sidewalk
- Side reach over an obstruction of no more than 10”
Traffic Signals

Figure R406.2 Unobstructed Forward Reach

Figure R406.3 Unobstructed Side Reach
Traffic Signals
Traffic Signals

Other Considerations:

• Signs shall be mounted adjacent to or integral with pedestrian pushbuttons, explaining their purpose and use.

• The positioning of pedestrian pushbuttons and the legends on the pedestrian pushbutton signs shall clearly indicate which crosswalk signal is actuated by each pedestrian pushbutton.

• When adding new pedestrian pushbutton locations, be sure to coordinate with Nathan Sheets to get them on a list for programming.
Summary

• Inspectors must put more effort into ADA ramps
  – Quality of life for everyone
  – Constructability & rework

• If additional survey is needed for layout – do it!
  – Meet elevation/landing requirements
  – Make water flow downhill

• Fit the situation

• Take ownership of your project

• PM and Office of Disability Affairs are resources
Resources

• **INDOT Standard Drawings:**
  
  [http://www.in.gov/dot/div/contracts/standards/drawings/sep13/e/600e/e600%20combined%20pdfs/E604-SWCR.pdf](http://www.in.gov/dot/div/contracts/standards/drawings/sep13/e/600e/e600%20combined%20pdfs/E604-SWCR.pdf)

• **United States Access Board:**
  

• **Manual of Uniform Traffic Control Devices:**
  

• **Department of Public Works:**
  
  [http://www.indy.gov/eGov/City/DPW/Business/Specs/Pages/home.aspx](http://www.indy.gov/eGov/City/DPW/Business/Specs/Pages/home.aspx)
Questions?

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