Americans with Disabilities Act and Curb Ramps

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Two Items to Remember

- All curb ramps, sidewalks and sidewalk driveway crossings will be designed and detailed in the stamped construction plans.

- Curb ramps, sidewalks and sidewalk driveway crossings are to be designed in accordance with the Public Rights-of-Way Accessibility Guidelines (PROWAG)
Why PROWAG?

  - The best practice ADA guidelines for sidewalk design within the public rights of way.
  - It takes into account conditions unique to facilities within the public rights of way.
  - INDOT has developed a transition plan, that identifies all the curb ramps with non-compliant elements along state facilities. This transition plan was created using the PROWAG guidelines to determine curb ramp deficiencies.
Why Design All Curb Ramps?

- All field conditions are different and very few are ideal; sufficient right of way, lack of obstructions and level terrain.
- Provides sufficient information for:
  - Level One review
  - Allows the curb ramp or sidewalk to be constructed with little to no guess work.
ADAAG vs. PROWAG

Americans with Disabilities Act
Accessibility Guidelines (ADAAG)

VS.

Public Rights-of-Way Accessibility Guidelines (PROWAG)
There is no construction tolerance for slopes. If the cross slope is 2.00% maximum, 2.01% is not compliant.
A sidewalk adjacent to a roadway does not require a landing area or a handrail regardless of the roadway grade. There is not a limit of 5% to trigger the addition of a landing area or handrail, within the public right of way.
ADAAG vs. PROWAG

- A landing at the top or bottom of a ramp is referred to as a turning space.

PROWAG R304.2, R304.3 and R304.5
The minimum width of ramp, turning space, or sidewalk is 4 ft. A 3 ft. pinch point will no longer be compliant!
A detectable warning element is now a detectable warning surface.
The part of a curb ramp that lowers the sidewalk to the street is a ramp or a blended transition.
ADAAG vs. PROWAG

- A ramp that lowers a sidewalk to the street in a public right of way is part of a Curb Ramp. They are designed differently and have different design elements and criteria than a ramp that is outside of the public right of way.
Curb Ramp Design

What changes should you expect when designing a project using the new INDOT Standards?
Curb Ramp Design

- **New Standard Drawings**
  - Series 604-SWCR
  - Series 604-SDWK

- **Revised Indiana Design Manual**
  - Section 51-1.0 Rewritten

- **Revision to Specification Book**
  - RSP 604-R-633
  - New Pay Items
Curb Ramp Design

Curb Ramp Dimensions

- Dimensions are no longer given on the Standard Drawings.
- All Dimensions and slopes will be designed and shown on the construction plans.
Curb Ramp Design

- Preferred Slopes vs. Maximum Slopes (IDM)
  - Ramp Running Slope: 8.00% preferred (8.33% maximum)
  - Cross Slope: 1.50% preferred (2.00% maximum)

- Projects at Stage 2 on or after July 1, 2016
  - The curb ramp should be designed and detailed in the stamped construction plans with the preferred slope.
  - Reduce the likelihood of exceeding the maximum allowable slope during construction.
Curb Ramp Design

- Curb Ramp types will no longer be referred to by a “letter” but rather by a name.
  - Perpendicular curb ramp
  - Parallel curb ramp
  - Blended transition curb ramp
  - Depressed corner, and
  - Diagonal curb ramp (Prohibited for New Construction)

- List above is in order of INDOT preference.
Curb Ramp Design

- Perpendicular curb ramp

PROWAG R304.2 and R304.5
Curb Ramp Design

- One-way-directional perpendicular curb ramp

PROWAG R304.2 and R304.5, No Turning Space
Curb Ramp Design

- Parallel curb ramp

PROWAG R304.3 and R304.5
Curb Ramp Design

- Blended transition curb ramp

PROWAG R304.4 and R304.5
Curb Ramp Design

- Depressed corner curb ramp

Same as Parallel Curb Ramp
Curb Ramp Design

- Diagonal curb ramp

Prohibited in New Construction

Same as Perpendicular Curb Ramp
Curb Ramp Design

- Median Cut-Through

PROWAG R302.3.1 and R305.2.1
Curb Ramp Components

- Turning Space
- Ramp
- Return Curb
- Flared Side
- Clear Space
- Detectable Warning Surface
Design Criteria

- Each design element has design criteria that is governed by the PROWAG.
Turning Space:

- Used where a change in direction is required.
  - Top of a Perpendicular curb ramp
  - Bottom of a Parallel curb ramp
  - Bottom of a Depressed corner, and
  - Top of a Diagonal curb ramp

Minimum clear dimension of 4 ft. x 4 ft.

- If the back of the turning space is constrained by a curb or other feature over 2 inches, the dimension in the direction of the ramp run shall be 5 ft. A turning space may be share by two ramps.

PROWAG R304.2, R304.3 and R304.5
Ramp Components & Design Elements

- Perpendicular curb ramp turning space

Unconstrained

4 ft.

4 ft.
Ramp Component & Design Elements

- Perpendicular curb ramp turning space

Diagram:
- 4 ft. Ramp Running Slope
- 5 ft. Turning Space
- Constrained by Curb or Building
Ramp Components & Design Elements

- Parallel curb ramp turning space

Constrained by Curb

Ramp Running Slope

Ramp

5 ft.

Turning Space
Ramp Components & Design Elements

- Depressed corner curb ramp Turning Space
Ramp Components & Design Elements

- Diagonal curb ramp Turning Space
Ramp Components & Design Elements

- **Turning Space:**
  - **Cross Slope:** May be equal to the grade established for the pedestrian street crossing.
    - 4.50% preferred (5.00% maximum) for streets with traffic signals or no stop or yield control.
    - 1.50% preferred (2.00% maximum) for streets with stop or yield control.
    - Equal to or less than the established street grade for midblock crossings.

- **Running Slope:**
  - 1.50% preferred (Maximum of 2.00%)
    - PROWAG R302.6, R304.2.2, R304.3.2 and R304.5.3
Ramp Components & Design Elements

Pedestrian Crossing

2.00% Max

Stop Controlled

Turning Space Cross Slope can be 1.50% Preferred
Ramp Components & Design Elements

- Pedestrian Crossing
- Turning Space Cross
  - Slope can be 4.50% Preferred
- Signal Controlled (Non-Stop Controlled)
Ramp Components & Design Elements

- Turning Space Cross Slope and Running Slope

Cross slope grade established by the pedestrian street crossing.

Running slope 1.50% Preferred

Pedestrian street crossing grade

Direction of pedestrian travel
Ramp Components & Design Elements

- **Ramp:**
  - Cross Slope: May be equal to the grade established for the pedestrian street crossing.
    - 4.50% preferred (5.00% maximum) for streets with traffic signals for no stop or yield control.
    - 1.50% preferred (2.00% maximum) for streets with stop or yield control
    - Equal to or less than the established street grade for midblock crossings.
  - Running Slope: 8.00% preferred (8.33% maximum)  
    **10% for 6” curb is not acceptable**
  - Width: Minimum 4 ft.

PROWAG R302.6, R304.2.2, R304.3.2 and R304.5.3
Ramp Components & Design Elements

- Ramp Design Elements:
  - Cross slope grade established by the pedestrian street crossing
  - Running slope 8.00% Preferred
  - Width, 4 ft. min.
  - Pedestrian street crossing grade
  - Direction of pedestrian travel
Ramp Components & Design Elements

Ramp:

- The ramp length need not exceed 15 ft., PROWAG R304.2.2. What????
- On roadways that has a grade greater than about 7%, a ramp with 8.00% can cause a ramp to have a length that exceeds 15 ft. In a sense, the ramp is chasing the grade.
- For these situations, we suggest the ramp should not exceed 15 ft. The grade of the sidewalk outside of the ramp should not exceed the roadway grade plus 2%.
Ramp Components & Design Elements

- Ramp: 15 ft. Maximum Length

One-Way Directional Ramp Profile

8.00% Preferred

Sidewalk extension prevents chasing the grade.

9% (Existing Grade)

15 ft Max. Ramp Length

19 ft, at 11% (9% + 2%)
Ramp Components & Design Elements

- **Blended Transition Design Elements:**
  - Typically used to move a high volume of pedestrian traffic.
  - **Running Slope:** Maximum of 2.00% or 5.00%
    - Where a sidewalk width behind the blended transition is 4 ft. or greater, the running slope may be a 4.50% preferred (5.00% maximum).
    - Where a sidewalk width behind the blended transition is less than 4 ft., the running slope may be a 1.50% preferred (2.00% maximum).

PROWAG R304.4 and R304.5.1
Blended Transition Design Elements:

- Width of sidewalk above the Blended Transition

OR, Running slope 1.50% preferred with sidewalk width above the Blended Transition less than 4 ft.

Running slope 4.50% preferred with sidewalk width above the Blended Transition 4 ft. or greater.
Ramp Component & Design Elements

- Blended Transition:
  - Cross Slope: May be equal to the grade established for the pedestrian street crossing.
    - 4.50% preferred (5.00% maximum) for streets with traffic signals for no stop or yield control.
    - 1.50% preferred (2.00% maximum) for streets with stop or yield control.
    - Equal to or less than the established street grade for midblock crossings.
  - Width: Minimum 4 ft.
  - Length: Minimum 4 ft.

PROWAG R302.6 and R304.5.3
Ramp Component & Design Elements

- Blended Transition Design Elements:
  - Width, 4 ft. minimum
  - Length, 4 ft. minimum
  - Cross slope grade established by the pedestrian street crossing
Clear Space:

- Minimum clear dimension of 4 ft. x 4 ft.
- The clear dimension shall be wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.

Location

- Bottom of a Perpendicular curb ramp
- Bottom of a Diagonal curb ramp
- Bottom of a Blended Transition
- Bottom of a Parallel and Depressed Corner Curb Ramp, however it overlaps with the turning space.
Clear Space Component:

- Clear Space Component:
- Wholly outside parallel traffic
- Wholly contained within the crosswalk
- 4 ft. x 4 ft. Clear Space
- Wholly outside parallel traffic
- Clear Space Component:

- Wholly outside parallel traffic

- Wholly contained within the crosswalk

- 4 ft.
Ramp Components & Design Elements

- Clear Space:

  4 ft. Wholly outside parallel traffic
Clear Space, Counter Slope Design Element:

- This counter slope criteria has not changed.
- 5% Maximum
- Maximum algebraic difference between the ramp, blended transition or turning space running slope and counter slope shall be 13%.
- Where the algebraic difference is greater than 11%, a 2 ft. minimum level strip shall be provided at the bottom of the ramp, blended transition or turning space.

PROWAG R304.5.4
Counter Slope Design Element:

This will prevent a wheelchair from getting stuck between the two opposing grades.

8.33% + 5% = 13.33% > 11%

Ramp Components & Design Elements

Level is 2.00% or less

CHANGE OF GRADE > 11%
Ramp Components & Design Elements

- Flared Side: 9.50% preferred running slope (10.00% maximum)

  Flared Side Running Slope is Parallel to the curb

  Flared side can be placed adjacent walkable or non-walkable surface

PROWAG R304.2.3
Ramp Components & Design Elements

- Flared Sides Used for Paired Ramps

3 inch Minimum Curb Height to service as a detectable edge
This is a good design, there is enough room for the 9.50% flared slope to be placed and a 3” or more curb height to be developed.
This is NOT a good design. All flush areas of the curb must be proceeded with a detectable warnings surface to indicate the crossing of a roadway.
Return Curb: Perpendicular to the roadway curb

Return curb can be placed adjacent to a non-walkable surface only.
Detectable Warning Surface:

- For a curb ramp a detectable warning surface shall be placed at each street, highway or railroad crossing.
- Detectable warning surface shall extend the entire width of a ramp, Blended Transition or turning space, depending on the type of curb ramp.
- Detectable warning surface shall extend a minimum of 2ft. in the direction of pedestrian travel.
Detectable Warning Surface Placement:

Parallel Curb Ramp

- Entire width of the turning space
- 2 ft.

Direction of pedestrian travel
Detectable Warning Surface Placement for Perpendicular Curb Ramp:
- Follow the bottom ramp grade break, straight, or
- Follow the back of the curb, radial

Note: A detectable warning surface cannot cross a grade break.

< 5 ft. Parallel to ramp grade break

> 5 ft. Placed at back of curb
Detectable Warning Surface Placement:

For Blended Transitions and Depressed Corners placed at back of curb, radial
Crosswalk Markings

- In the revised chapter 51, there are notes that call out crosswalk markings as “Preferred” or “Required.”

- Preferred markings should be considered for placement. The District Traffic Engineer should be consulted.
  - Curb ramps that only serve one direction of pedestrian travel, crosswalk markings are preferred.

- Required markings are mandatory.
  - Curb ramps that serve more than one direction of pedestrian travel, crosswalks are required.
Crosswalk Markings

Crosswalk Markings: Preferred

Each curb ramp serves one direction of pedestrian traffic
Crosswalk Markings

- Crosswalk Markings: Required

This curb ramp serves two direction of pedestrian travel.
Plan Details (Retrofit)

All curb ramps should be designed, how is this to be done?

- Resurface Projects
  - Plan View to show neat lines of the curb ramp components
  - Slopes and lengths of the components shown on the plan view or tabulated
  - Spot elevations for the corners of each curb ramp component shown on the plan view or tabulated
Tabulate Cross Slopes and Running Slopes
All curb ramps should be designed, how is this to be done?

- New Construction Projects
  - Curb ramps labeled or called out by station and the component design criteria; slopes, widths and lengths shown in a table or detail for each curb ramp.
Plan Details (New Construction)

Show Profile Grade of Back of Sidewalk and Curb Ramp Running Slopes
Plan Details (New Construction)

Spot Elevation Sheet With Tabulated Elevations and General Detail Showing Cross Slope
Technical Infeasibility or Inquiry

- What if my curb ramp can not be design to meet PROWAG standards?
- Submit a Technical Infeasibility or Inquiry Request.
  - Technical infeasibility and technical inquiry requests should be submitted to the Director of Highway Design & Technical Services, John Wright.
Technical Inquiry

- Technical Inquiry Request is appropriate for curb ramp retrofits, e.g. on a resurface project where purchasing right-of-way or moving utilities to fully comply with PROWAG is outside the scope of work.

- PROWAG Question

- Review a Curb Ramp Design
  - The designer should design the curb ramp to the maximum extent possible.
  - The proposed curb ramp should always improve the existing curb ramp.
Technical Inquiry Request Example

A resurface project, the existing perpendicular curb ramp has ramp running slope greater than 8.33%, no turning space and a cross slope of 4%. A utility at the back of the curb ramp can not be moved without exurbanite funds being spent to put in a fully compliant perpendicular curb ramp. However the perpendicular curb ramp can be construction with a slightly less ramp running slope, a 1.50% cross slope and no turning space. This curb ramp as been designed to the maximum extent possible and improves the existing conditions.
Technical Infeasibility

- Technical Infeasibility Request is appropriate for a curb ramp that cannot be constructed to comply with PROWAG because of an obstacle that cannot be removed, e.g. a historical building.

- Lack of right-of-way and need for utility relocation do not meet the threshold for infeasibility.

- Technical infeasibility approvals will be rare. No matter what the obstacle is, the designer should try to make the curb ramp better, even if the curb ramp is not fully compliant.
Technical Infeasibility & Inquiry

- Technical infeasibility or Inquiry is approved, then what?
  - Designer
    - An approved technical infeasibility request should be filed with the coordination files and attached to the level one checklist. Details and notes should be added to the construction plans.
    - An approved technical inquiry request should be filed with the design calculations and attached to the level one checklist. Details and notes should be added to the construction plans.
Technical Infeasibility & Inquiry

- Technical infeasibility or Inquiry is approved, then what?
  - INDOT
    - For an approved technical infeasibility, the curb ramp is removed from the Transition Plan. (Not easy to get!)
    - For an approved technical inquiry, the curb ramp will remain on the Transition Plan but the Transition Plan will be updated to reflect any improvements made to that curb ramp.
Updates to Section 604

- Detectable Warning Elements is now Detectable Warning Surface
- Pinch points may not exceed 4 ft.
- Defined allowable vertical discontinuities
  - No greater than ½”, ¼” or greater use a 1V:2H beveled edge.
- Slope percents listed not ratios
- No construction tolerance
- Contractor should check the slopes with a 2 ft. level.
  - Help eliminate discrepancies between a 2 ft. and 4 ft. level.
Updates to Section 604 (Cont)

- Curb ramp pay item
  - CURB RAMP, CONCRETE (SYS)
  - Will no longer call out a “Type” on the pay item

- Detectable Warning Surface pay items
  - Detectable Warning Surface (SYS)
  - Detectable Warning Surface, Retrofit (SYS)

Projects let on or after September 1, 2016 will need to submit the cost estimate with the new pay items listed above.
Curb Ramp Pay Item

- The curb ramps will still be paid for by the SYS, however the pay item name will not longer call out a “Type.”

- The curb ramp area will include the ramp, turning space, flared side(s), return curb(s) and detectable warning surface area.
  - If two curb ramps share a turning space, the turning space shall only be paid for once.
Curb Ramp Pay Item

- Curb Ramp, Concrete Area

**LEGEND**
- **TS**: Turning Space
- **Detectable Warning Surface**: Area to be paid for as Detectable Warning Surface
- **Crosswalk Markings**: Curb

**CURB RAMP, CONCRETE**
Curb Ramp Pay Item

- Detectable warning surfaces will now be paid for separately, by the SYS.
- For curb ramps being constructed or reconstructed with a detectable warning surface, the pay item will be Detectable Warning Surfaces (SYS)
  - Includes the detectable warning surface, placement of the detectable warning surface, thin set mortar and fine aggregate for filling joints.
Curb Ramp Pay Item

- For a detectable warning surface being replaced or placed without curb ramp construction, the pay item will be Detectable Warning Surface, Retrofit (SYS)
  - Includes the removal, disposal, and replacement of portions of the concrete curb ramp, concrete base, including border, detectable warning surface, placement of the detectable warning surface, thin set mortar and fine aggregate for filling joints.
Detectable Warning Surface Area

- Curb as Required
- Sidewalk
- Return Curb As Required
- Flared Side
- Curb
- TS
- Turning Space
- Detectable Warning Surface
- Area to be paid for as Detectable Warning Surface

DETECTABLE WARNING SURFACE
Dates to Remember

- **July 1, 2016**
  - Projects at stage 2 will be required to have the preferred minimum running slope and cross slope designed and shown on the plan details.

- **September 1, 2016**
  - Projects that let on or after September 1, 2016 will use the new pay items for Curb Ramp, Concrete and Detectable Warning Surfaces in the cost estimate. In addition all “letter” curb ramp callouts should be removed from the plans.
Two Items to Remember

- All curb ramps, sidewalks and sidewalk driveway crossings will be designed and detailed in the stamped construction plans.

- Curb ramps, sidewalks and sidewalk driveway crossings are to be designed in accordance with the Public Rights-of-Way Accessibility Guidelines (PROWAG)
Good or Bad?
Office of Standards and Policy

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