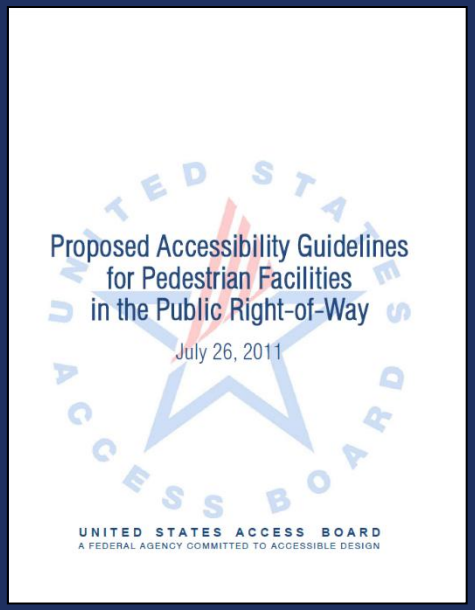
PROWAG Training Workshop



Facilitated by:
Nancy Cole, PCDOT

Presented by:
Erin P. Eurek, P.E. (TX)
Taylor Ehrick, P.E. (AZ)
Kimley-Horn and Associates, Inc.

Arizona Chapter APWA
AMERICAN PUBLIC WORKS ASSOCIATION

Schedule

Time	Item
8:05 – 8:50 AM	Training
8:50 – 9:00 AM	Break
9:00 – 9:50 AM	Training
9:50 – 10:00 AM	Break
10:00 – 10:50 AM	Training
10:50 – 11:00 AM	Break
11:00 AM – 12:00 PM	Case Studies / Q&A / Discussion

Agenda

- Overview of the ADA
- Overview of Applicable Design Standards
- Difference Between Design Standards
- PROWAG Design Requirements
- ADA Compliance Best Practices
- Case Studies
- References

Agenda

PROWAG Design Requirements

- Scoping Requirements
- Pedestrian Access Routes
- Protruding Objects
- Alternate Pedestrian Access Routes
- Curb Ramps and Blended Transitions
- Detectable Warning Surfaces
- Pedestrian Street Crossings
- Accessible Pedestrian Signals and Pedestrian Pushbuttons
- Transit Stops and Transit Shelters
- On-Street Parking Spaces
- Handrails

Overview of the Americans with Disabilities Act (ADA)

ADA Legal Background – History

- Architectural Barriers Act (ABA – originated 1968)
- Rehabilitation Act (1973) – Section 504 (49 CFR Part 27)
- Civil Rights Restoration Act (1987)
- Americans with Disabilities Act (ADA) (1990)
  - DOJ Implementing Regulations (28 CFR 35)

Five Titles of the ADA

- Title I: Employment
- Title II: State and Local Government
- Title III: Public Accommodations
- Title IV: Telecommunications
- Title V: Miscellaneous Provisions

Definition of a Disability

- Legal term rather than medical term
- A person who has a physical or mental impairment that substantially limits one or more major life activity
- Includes people who have a record of such an impairment, even if they do not currently have a disability
- Includes individuals who do not have a disability but are regarded as having a disability

Source: https://adata.org/faq/what-definition-disability-under-ada

Title II – State and Local Governments

- Protects qualified individuals with disabilities from discrimination on the basis of disability in services, programs, and activities provided by state and local government entities

- Extends the prohibition on discrimination established by Section 504 of the Rehabilitation Act of 1973 to all activities of state and local governments, regardless of federal financial assistance

Title II – State and Local Governments

- Both existing curb ramps and sidewalks need to be brought into compliance, regardless of construction date, since they are both considered programs under Title II

- Sidewalk Case Law: Barden v. Sacramento
  - (https://www.cityofsacramento.org/HR/Divisions/ADA/Barden-Lawsuit-Settlement)

ADA Enforcement

- Complaint-driven
- Access is achieved through lawsuits and settlement agreements
  - DOJ may not sue a party unless negotiations to settle the dispute have failed
  - DOJ may file lawsuits in federal court to enforce the ADA, and courts may order compensatory damages and back pay to remedy discrimination if the DOJ prevails
  - Under Title III, the DOJ may also obtain civil penalties of up to $55,000 for the first violation and $110,000 for any subsequent violation

ADA Enforcement

Project Civic Access

- Wide-ranging effort to ensure that local governments comply with the ADA
- 222 settlement agreements with 207 localities in all 50 states, District of Columbia, and Puerto Rico
- Settlement agreements are available for review online (https://www.ada.gov/civicac.htm)
- Compliance timelines set by DOJ

ADA Enforcement

Private Litigation

- Willits v. City of Los Angeles
  - Largest disability access settlement in U.S. history
  - $1.4 billion to fix sidewalks
  - $31 – 63 million annually
  - $15 million in attorneys fees
- https://www.latimes.com/local/lanow/la-me-ln-lawsuit-broken-sidewalks-20150331-story.html
- http://cao.lacity.org/sidewalks/Willits_Term%20Sheet_Redacted.pdf

Overview of Applicable Design Standards

ADA Standards Overview

US Access Board Guideline	Adopted Standard
1991 Americans with Disabilities Act Accessibility Guidelines (ADAAG)	1991 ADA Standards for Accessible Design (DOJ/DOT)
2004 Americans with Disabilities Act (ADA) Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines	2006 ADA Standards for Transportation Facilities (DOT)
	2010 ADA Standards for Accessible Design (DOJ)
2011 Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG)	N/A

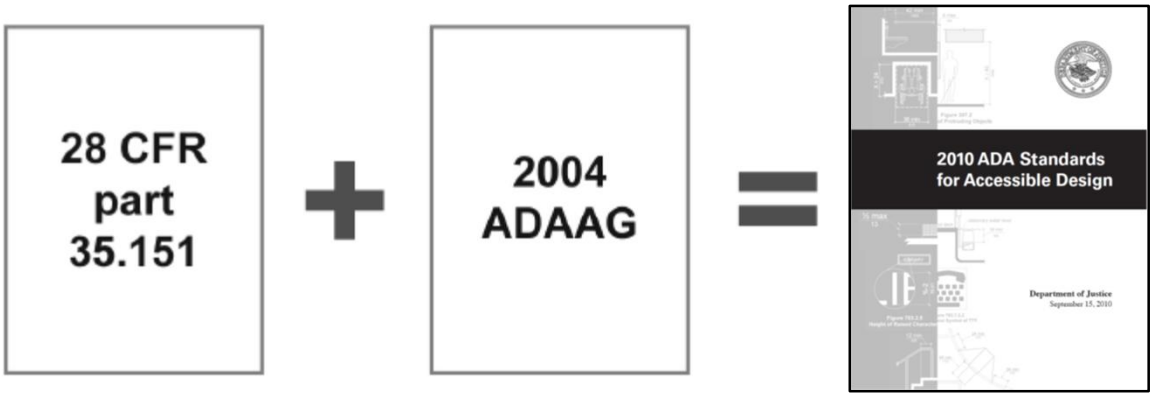
Application

- DOJ's ADA Standards apply to state and local government facilities, public accommodations, and commercial facilities

- DOT's ADA Standards apply to facilities used by state and local governments to provide designated public transportation services, including bus stops and stations, and rail stations

2010 ADA Standards for Accessible Design – Title II

- 28 CFR Part 35.151: New Construction and Alterations
- 2004 ADAAG



2010 ADA Standards for Accessible Design – Title III

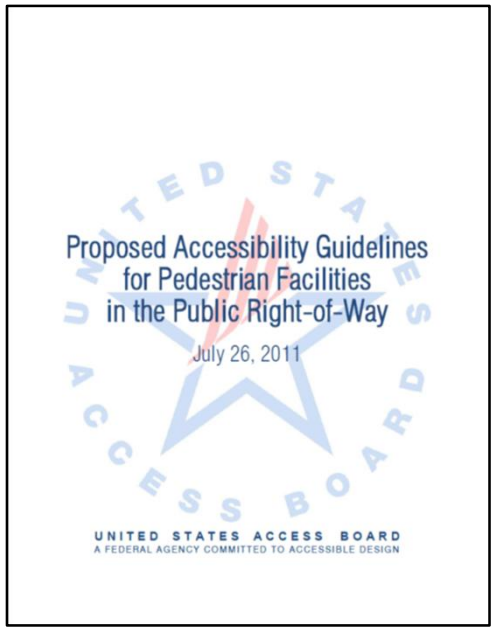
- 28 CFR Part 36 Subpart D: New Construction and Alterations
- 2004 ADAAG

History of Pedestrian Facilities in the Public Right-of-Way (PROW) Guidelines

- Proposed PROW guidelines initially issued in 1992, but additional research, education, and outreach needed
- Federal Advisory Committee established in 1999
  - 2001 – Initial recommendations
  - 2002 – Draft Guidelines
  - 2005 – Revised Draft Guidelines
  - 2011 – Proposed Guidelines

2011 Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG)

- Undergoing the rulemaking process (2011 Notice of Proposed Rule Making published w/ updated guidelines)
- FHWA Recommended Best Practices for Public Rights-of-Way
- State of the Practice that could be followed for areas not fully addressed by ADAAG



2011 PROWAG

- Currently enforceable by local government agencies who adopt the document
- Enforceable by DOJ and FHWA once adopted on a federal level

Differences Between Design Standards

ELEMENT	2010 ADA STANDARDS	2011 PROWAG
Pedestrian Signal Equipment	Not addressed, with exception of operable parts requirements	▪ Incorporates MUTCD by reference ▪ Requires installation of Accessible Pedestrian Signals (APS) and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections
Pedestrian Access Route Clear Width	36 in. min.	4 ft. min., exclusive of curb
Pedestrian Access Route Grade	5% max.	When contained within a street or highway ROW, grade of pedestrian access route shall not exceed the general grade established for the adjacent street or highway

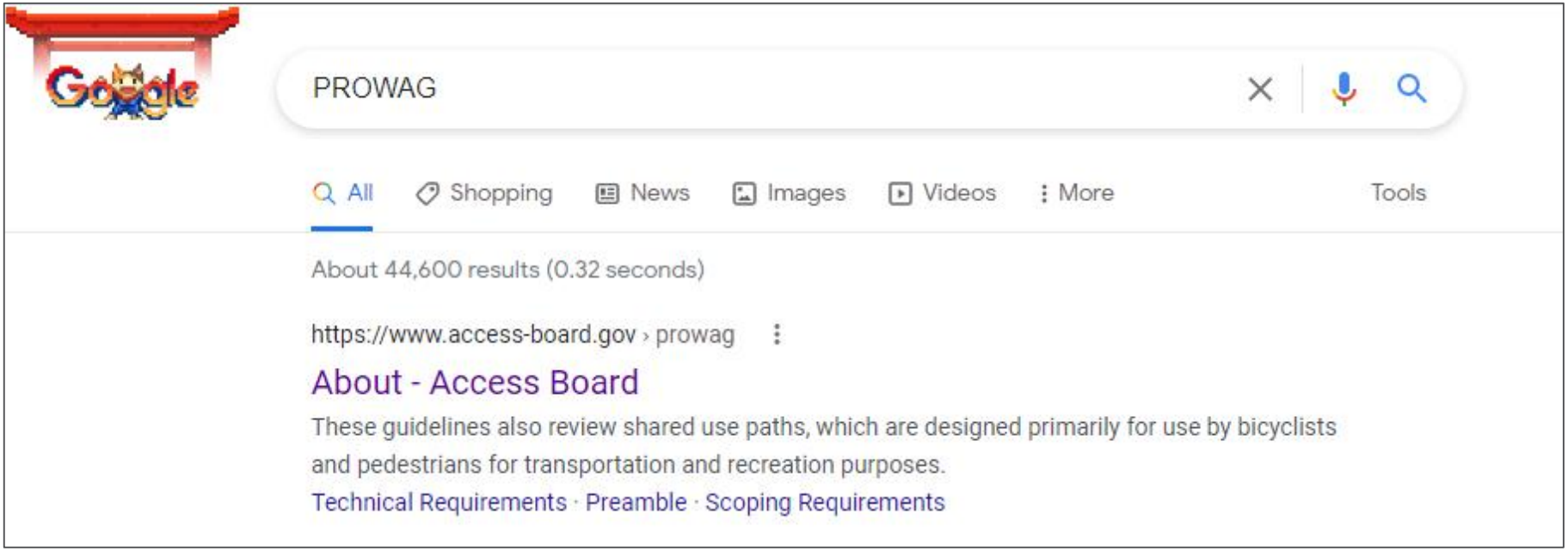
ELEMENT	2010 ADA STANDARDS	2011 PROWAG
Detectable Warning Surfaces on Curb Ramps	Not addressed	Guidance provided
Curb Ramp Length	Not addressed	15-ft. run max., to limit indefinitely "chasing grade"
Pedestrian Street Crossing Cross Slope	2% max.	▪ 5% max. for free-flow approaches ▪ Permitted to equal the street or highway grade for midblock crossings
On-Street Parking	Not addressed	Guidance provided

ELEMENT	2010 ADA STANDARDS	2011 PROWAG
Perpendicular Curb Ramp Turning Space	3 ft. min. x at least as wide as curb ramp	▪ 4 ft. min. x 4 ft. min. ▪ 4 ft. min. x 5 ft. min., if constrained at back-of-sidewalk
Parallel Curb Ramp Turning Space	Not addressed	▪ 4 ft. min. x 4 ft. min. ▪ 4 ft. min. x 5 ft. min., if constrained on two or more sides
Push Button Clear Space	2% max. slope in all directions	▪ 2% max. cross slope ▪ Running slope consistent with grade of adjacent pedestrian access route
Shared-Use Paths	Not addressed	Addressed in 2013 PROWAG Supplement

ELEMENT	PEDESTRIAN ACCESS ROUTE (2011 PROWAG)	SHARED-USE PATH (2013 PROWAG SUPPLEMENT)
Grade	When contained within a street or highway ROW, grade of pedestrian access route shall not exceed the general grade established for the adjacent street or highway	When within or not within street or highway ROW, grade of pedestrian access route serving the adjacent street or highway shall not exceed general grade established for the adjacent street or highway serving the adjacent street or highway to the extent practical where compliance is not practicable due to physical constraints and where compliance is precluded by regulatory constraints

ELEMENT	PEDESTRIAN ACCESS ROUTE (2011 PROWAG)	SHARED-USE PATH (2013 PROWAG SUPPLEMENT)
Continuous Width	4 ft. min., exclusive of curb	PAR: Full width of a shared use path
Protruding Objects	See R402	Objects shall not overhang or protrude into any portion of a shared use path at or below 2.4 m (8.0 ft.) measured from the finished surface
Curb Ramp, Blended Transition, and Turning Space Width	4 ft. min. for all	▪ Curb ramps and blended transitions: Equal to width of the shared use path ▪ Turning spaces: 4.0 ft. min.

PROWAG Design Requirements


Google
PROWAG
All
Shopping
News
Images
Videos
More
Tools
About 44,600 results (0.32 seconds)
https://www.access-board.gov › prowag
About - Access Board
These guidelines also review shared use paths, which are designed primarily for use by bicyclists and pedestrians for transportation and recreation purposes.
Technical Requirements · Preamble · Scoping Requirements

An official website of the United States government Here's how you know

U.S. Access Board

Advancing Full Access and Inclusion for All

En Español

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(Proposed) Public Rights-of-Way

Accessibility Guidelines

TABLE OF CONTENTS

- **About**
  - About the ADA and ABA Accessibility Guidelines for the Public Rights-of-Way
  - Background
  - Additional Resources
- **Preamble - Public Rights-of-way**
- **Preamble - Supplemental Notice on Shared Use Paths**
- **Chapter R1: Application and Administration**
- **Chapter R2: Scoping Requirements**
- **Chapter R3: Technical Requirements**
- **Chapter R4: Supplemental Technical Requirements**

PDF

About the ADA and ABA Accessibility Guidelines for the Public Rights-of-Way

The Access Board is developing new guidelines under the Americans with Disabilities Act (ADA) and the Architectural Barriers Act (ABA) that will address access to sidewalks and streets, crosswalks, curb ramps, pedestrian signals, on-street parking, and other components of public rights-of-way. These guidelines also review shared use paths, which are designed primarily for use by bicyclists and pedestrians for transportation and recreation purposes.

The Access Board issued proposed guidelines for public comment. The Board is in the process of finalizing these guidelines.

Technical Assistance

Contact the Access Board for assistance on these guidelines

800-872-2253 (v)
800-993-2822 (tty)
row@access-board.gov

Back to Top

PROWAG Overview

- Preamble (included in original 2011 PROWAG version)
- Chapter R1: Application and Administration
- Chapter R2: Scoping Requirements
- Chapter R3: Technical Requirements
- Chapter R4: Supplementary Technical Requirements

- Note: Current 2011 PROWAG version posted on U.S. Access Board's website also incorporates the 2013 Shared-Use Path PROWAG Supplement

Scoping Requirements

Chapter R2

R201.1/
R201.2

Application

Facilities in the Public Rights-of-Way for pedestrian circulation and use must comply, including:

- Newly constructed facilities
- Altered portions of existing facilities
- Elements added to existing facilities
- Temporary and permanent facilities

Application

- **Question**: If a bulb-out is constructed at the corner of an intersection for traffic calming purposes, is an informal pedestrian path cut through the landscaping of the bulb-out required to be accessible?

- **Answer**: Yes, the pedestrian path needs to be accessible because it is a facility in the public rights-of-way used for pedestrian circulation.

R202.2

Added Elements

Where elements are added to existing facilities, the added elements shall comply with the applicable requirements for new construction

R202.3

Alterations

- Where existing elements, spaces, or facilities are altered, each altered element, space, or facility within the scope of the project shall comply with the applicable requirements for new construction
- "Within the scope of the project"
  - Intended to focus on whether the alteration project presents an opportunity to design the altered element, space, or facility in an accessible manner
  - Not intended for additional work to be done outside the scope of the project

R202.3

Alterations

Example:

- Alteration project involves only installing pedestrian signals at existing intersections
- No detectable warning surfaces on the curb ramps at the intersections
- Required:
  - Accessible pedestrian signals
  - Accessible pedestrian push buttons
- Not Required:
  - Detectable warning surfaces to be provided on the curb ramps

R202.3

Alterations

Whenever streets, roadways, or highways are altered, curb ramps are required where street level pedestrian walkways cross curbs

Maintenance vs. Alterations

Source: DOJ Briefing Memorandum on Maintenance versus Alteration Projects

Maintenance vs. Alterations

- DOJ/FHWA Alterations Memo: https://www.fhwa.dot.gov/civilrights/programs/doj_fhwa_ta.cfm

- Glossary of Terms: https://www.fhwa.dot.gov/civilrights/programs/doj_fhwa_ta_glossary.cfm

Where are curb ramps required?

- The ADA of 1990, Section 35.150, Existing Facilities, requires that the Transition Plan include a schedule for providing curb ramps or other sloped area at existing pedestrian walkways, which applies to all facilities constructed prior to 1992.
- For any sidewalk installations constructed from 1992 to March 15, 2012, the curb ramps should have been installed as part of the sidewalk construction project per the 1991 Standards for Accessible Design, Section 4.7 Curb Ramp, which states, "curb ramps complying with 4.7 shall be provided wherever an accessible route crosses a curb."
- For sidewalk installations constructed on or after March 15, 2012 similar guidance is provided in the 2010 Standards for Accessible Design, Section 35.151 of 28 CFR Part 35, New construction and alterations, which states, "newly constructed or altered street level pedestrian walkways must contain curb ramps or other sloped area at any intersection having curb or other sloped area at intersections to streets, roads, or highways."

R207.1

Where are curb ramps required?

Non-compliant

Non-compliant

R207.1

Where are curb ramps required?

Non-compliant

Compliant

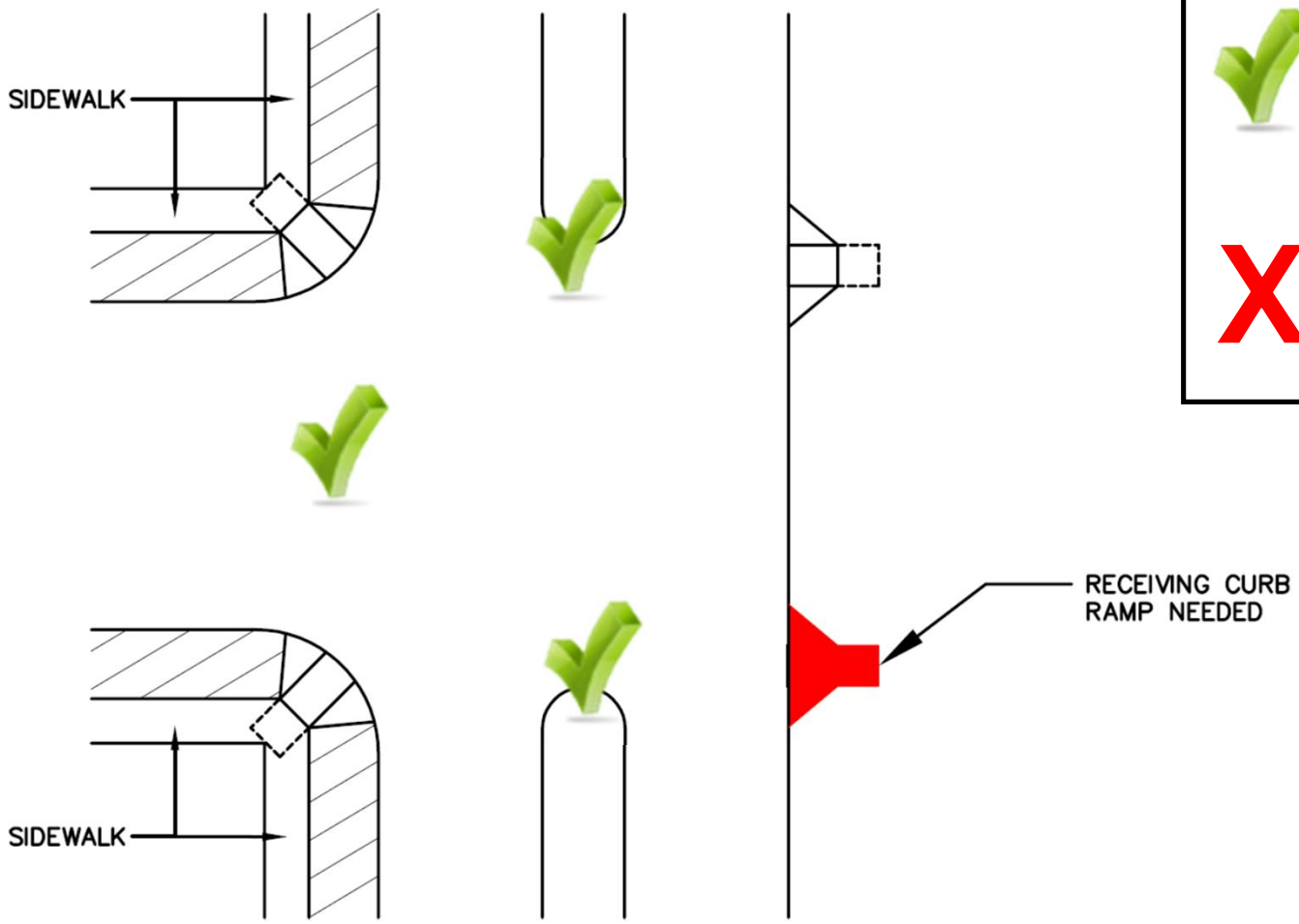
Number of Curb Ramps

- Two curb ramps must be provided at each street corner
- For alterations, a single diagonal curb ramp is permitted where existing physical constraints exist
- Project documentation should be kept indicating why two ramps were not provided

Number of Curb Ramps

Section-by-Section Analysis (R207)/ R207.1/R207.2

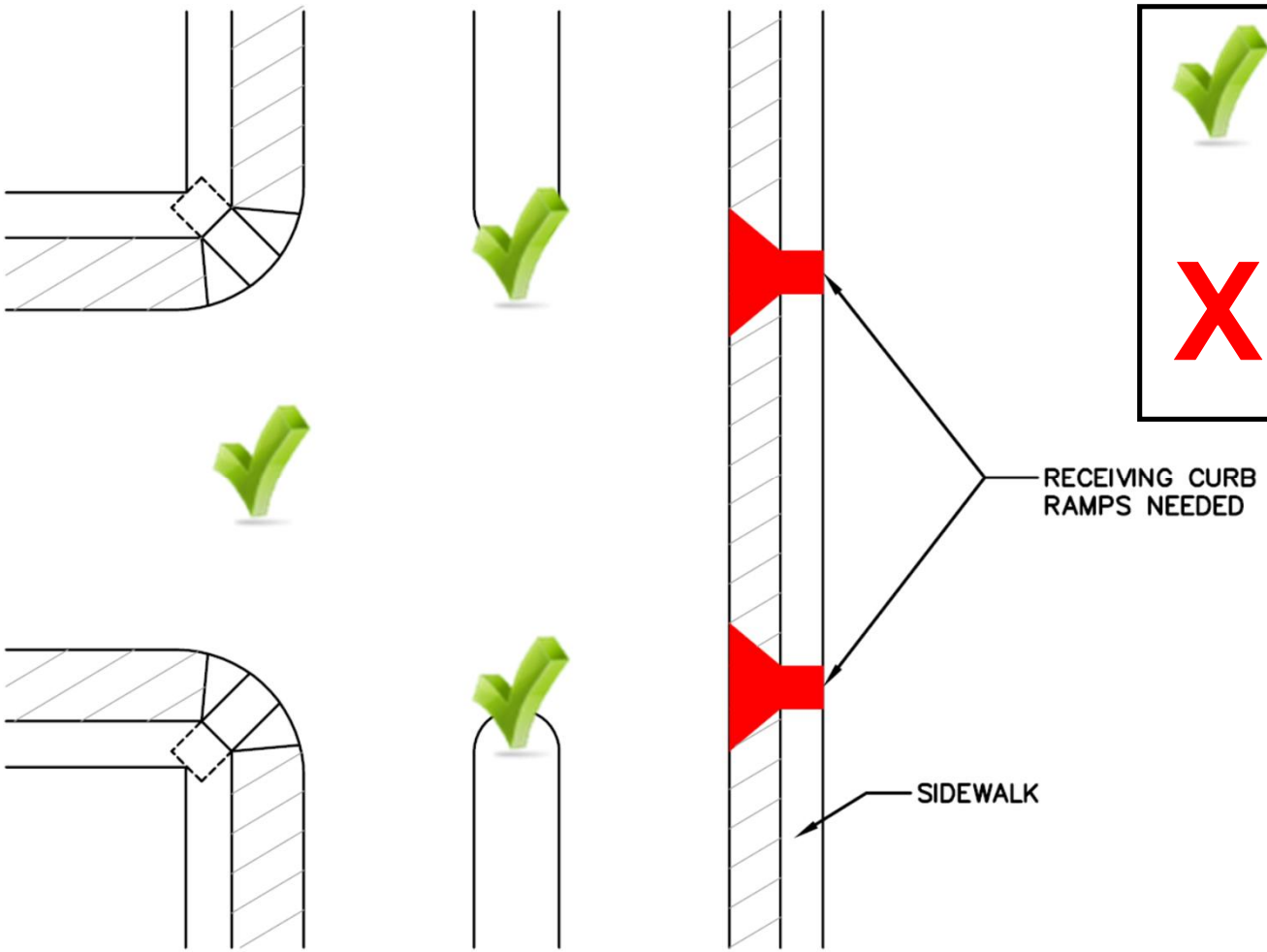
Where are curb ramps required?



Must Accommodate Crossing

X Do Not Need to Accommodate Crossing

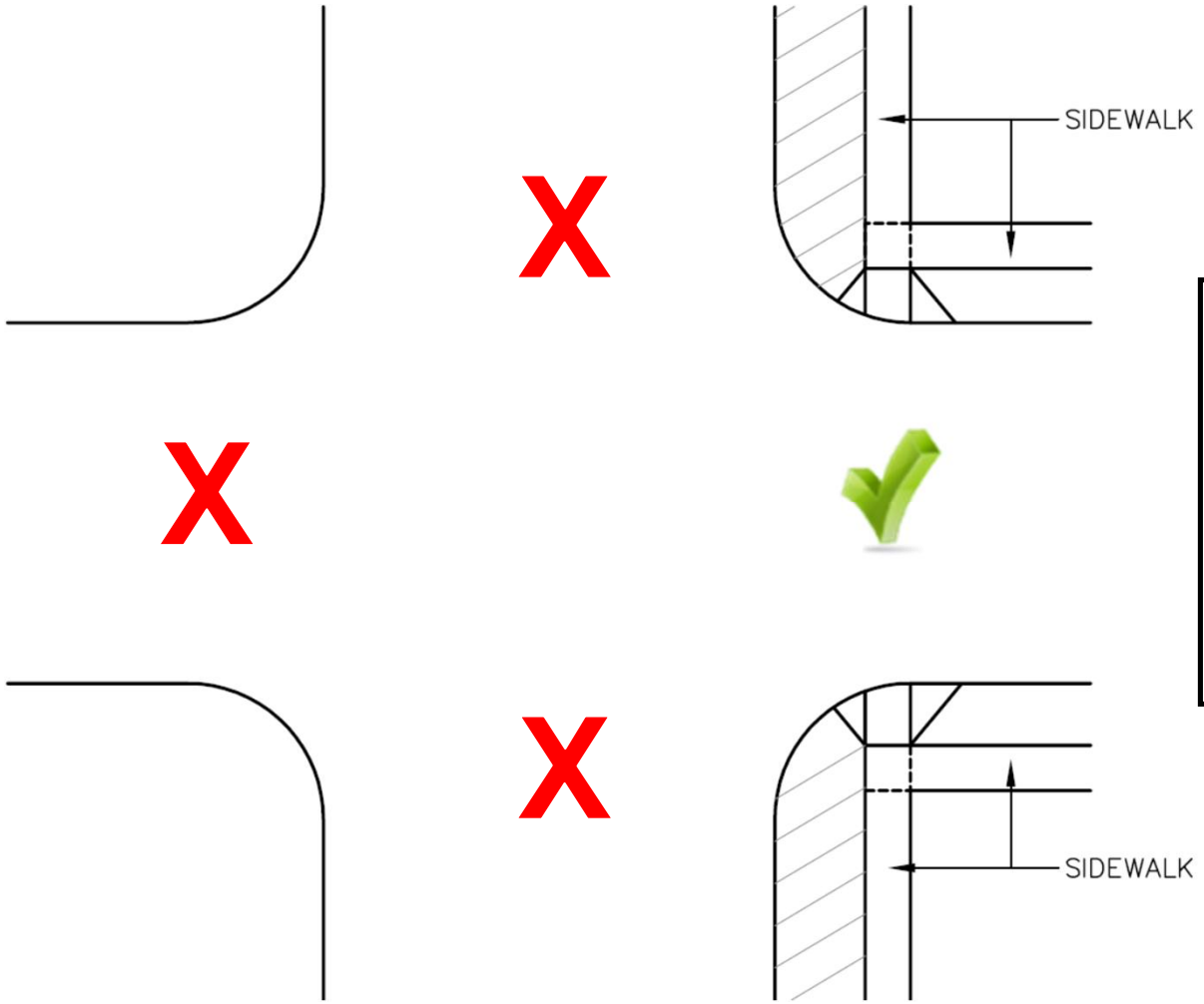
Where are curb ramps required?



Must Accommodate Crossing

X Do Not Need to Accommodate Crossing

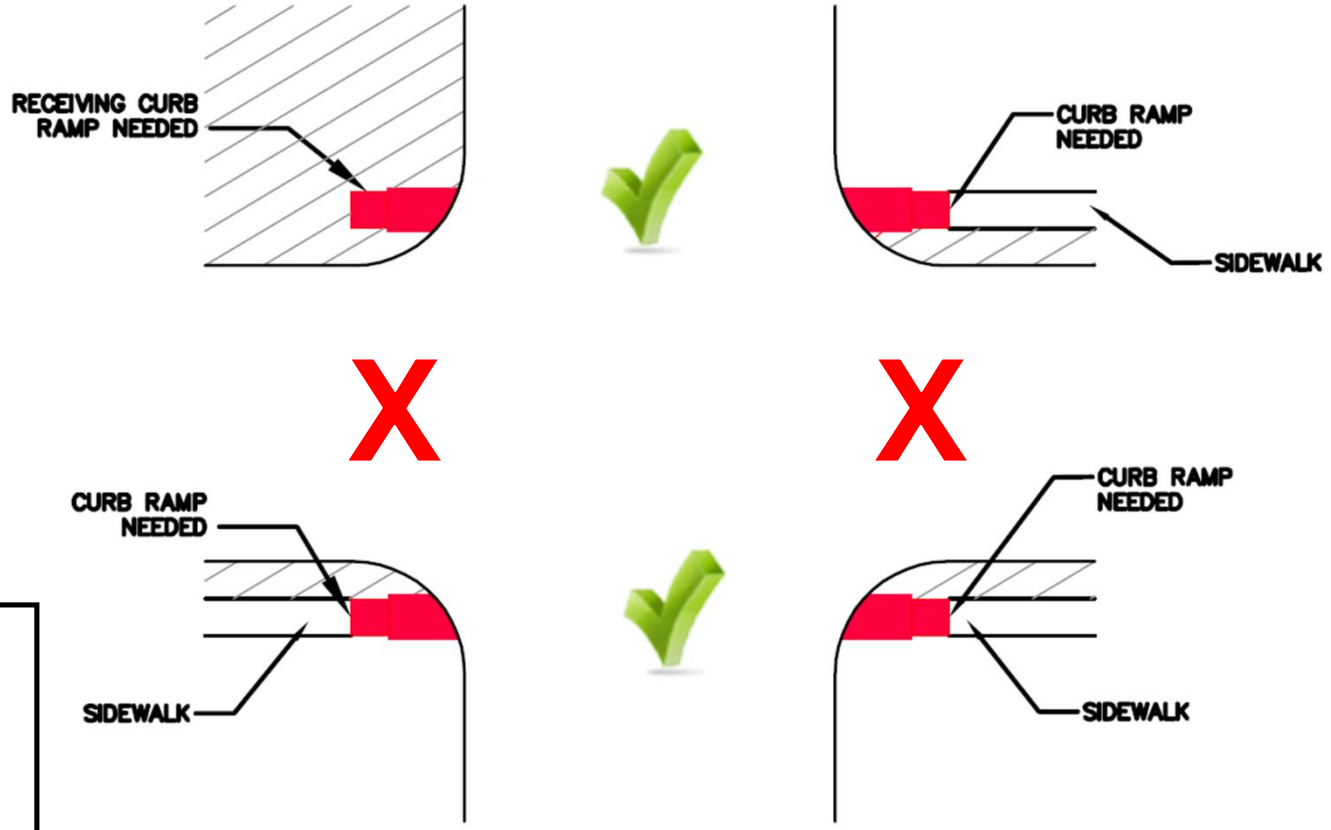
Where are curb ramps required?



Must Accommodate Crossing

Do Not Need to Accommodate Crossing

Where are curb ramps required?



Must Accommodate Crossing

X Do Not Need to Accommodate Crossing

R202.3.3

Reduction in Access Prohibited

An alteration shall not decrease or have the effect of decreasing the accessibility of a facility or an accessible connection to an adjacent building or site below the requirements for new construction in effect at the time of the alteration

Closing a Pedestrian Crossing

Perform engineering study to determine if the crossing is safe for any user. If it is not safe:

- Provide a physical barrier (a strip of grass or other non-traversable material between the sidewalk and the curb is acceptable)
- Install no pedestrian crossing signage
- Adopt a reasonable and consistent policy on how to determine if a crossing should be closed

R202.3.1

Existing Physical Constraints – Examples

- Underlying terrain
- Right-of-way availability
- Underground structures
- Adjacent developed facilities
- Drainage
- Presence of notable natural or historical features
- Cost of an improvement is NOT a constraint!!

MUST PROVIDE ACCESS TO THE

MAXIMUM EXTENT FEASIBLE

Technical Infeasibility

"…Something that has little likelihood of being accomplished because existing structural conditions would require removing or altering a load-bearing member that is an essential part of the structural frame; or because other existing physical or site constraints prohibit modification or addition of elements, spaces, or features that are in full and strict compliance with the minimum requirements."

Source: 2006 Standards, Section 106.5

R202.3.1

Physical Constraints

Constrained ROW

Source: Google Maps, New Orleans, LA

Underlying Terrain

Source: Google Maps, San Francisco, CA

R202.3.2

Transitional Segments

- Transitional segments of pedestrian access routes shall connect to existing unaltered segments of the pedestrian circulation paths

- Required to comply with R302 to the extent practicable

Transitional Segments

Example Minimum Pedestrian Access Route
Tie-In Transition Lengths

Proposed Pedestrian Access Route Cross Slope	Existing Pedestrian Access Route Cross Slope					
	1%	2%	3%	4%	5%	6%
1.0%		5'	5'	10'	10'	10'
1.5%	5'	5'	5'	5'	10'	10'
2.0%	5'		5'	5'	10'	10'

Note: Transition length is based on wheelbase of standard wheelchair

R202.3.3

Alternations to Qualified Historic Facilities

Where the State Historic Preservation Officer or Advisory Council on Historic Preservation determines that compliance with a requirement would threaten or destroy historically significant features of a qualified historic facility, compliance shall be required to the extent that it does not threaten or destroy historically significant features of the facility

Design Balance

A design that has several features slightly out of compliance may be a more favorable design as opposed to a design that only has one feature that is extremely out of compliance

Pedestrian Access Routes

Section R302

R204.2

Scoping

- A pedestrian access route shall be provided within sidewalks and other pedestrian circulation paths located in the public right-of-way
- The pedestrian access route shall connect to accessible elements, spaces, and facilities required by PROWAG and to accessible routes required by section 206.2.1 of appendix B to 36 CFR part 1191 or section F206.2.1 of appendix C to 36 CFR 1191 that connect building and facility entrances to public streets and sidewalks

Key Differences Between Routes

Accessible Routes —An accessible route is a continuous, unobstructed path that connects all accessible elements and spaces of a building or facility. Interior accessible routes may include corridors, floors, ramps, elevators, lifts, and clear floor space at fixtures. Exterior accessible routes may include accessible parking space access aisles, curb ramps, crosswalks at vehicular ways, walks, ramps, and platform lifts.

Source: U.S. Access Board Outdoor Developed Areas

Key Differences Between Routes

Pedestrian Access Routes —A pedestrian access route, often called a sidewalk, is located in a public right-of-way and typically is parallel to a roadway. Consequently, side-walk grades (running slopes) must generally be consistent with roadway grades so that they fit into the right-of-way. Sidewalks are designed for pedestrian transportation and are not designed for bicycles or other recreational purposes.

Source: U.S. Access Board Outdoor Developed Areas

Key Differences Between Routes

Pedestrian Trails —A trail typically is not parallel to a roadway and is designed primarily for recreational purposes. Trails are not necessarily part of an infrastructure connecting elements or facilities, but typically are designed to provide a recreational experience. Trails may also be used by multiple types of users, but most are not designed for bicycles, nor do they have a transportation purpose.

Source: U.S. Access Board Outdoor Developed Areas

R302.2

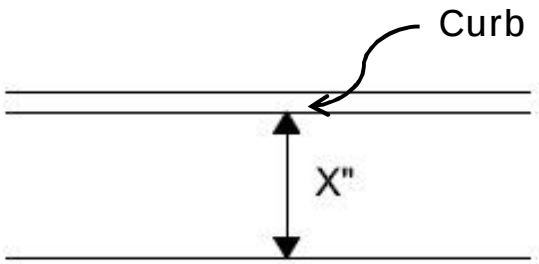
Pedestrian Access Route Components

- Sidewalks
- Pedestrian street crossings
- At-grade rail crossings
- Pedestrian overpasses and underpasses
- Curb ramps and blended transitions
- Ramps
- Elevators
- Platform lifts
- Doors, doorways, and gates

R302.3/
2013 PROWAG Supplement

Continuous Width

- Sidewalk
  - PROWAG: 4.0’ min., exclusive of curb



  - Where sidewalks are wider than 4.0’, only a portion of sidewalk is required to comply with R302.3 – R302.7
- Shared Use Path: full width of shared use path
- Medians/Pedestrian Refuge Islands: 5.0’ min.

Continuous Width

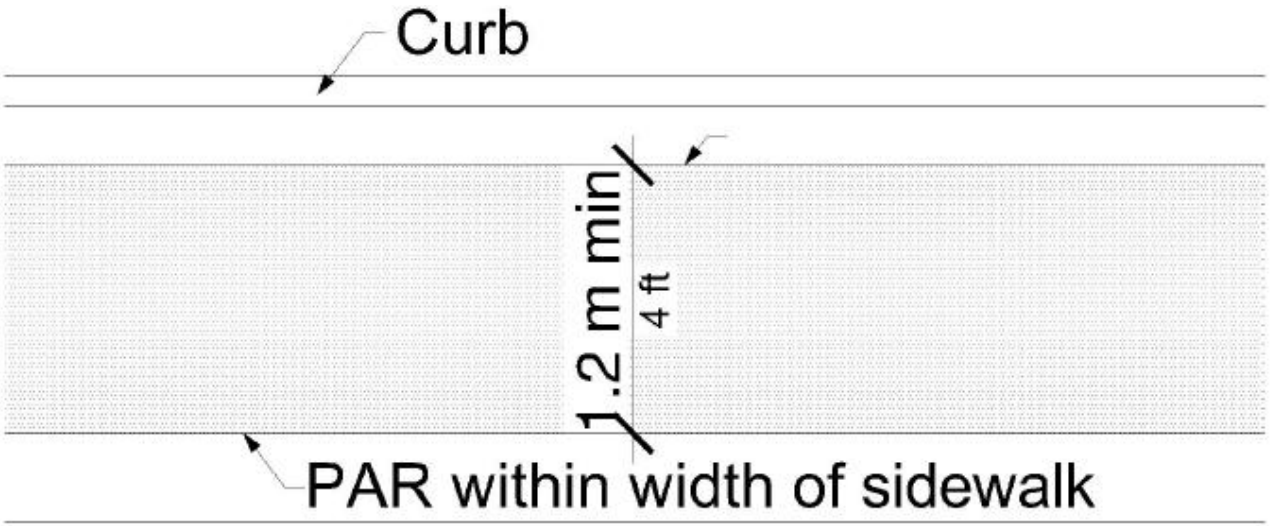


Figure R302.3
Continous Width

Clear Width

R302.3/
2013 PROWAG Supplement

Clear Width

R302.3/
2013 PROWAG Supplement

2010 ADA
403.5.1

Clear Width – Pinch Points

- 2010 ADA
  - 36” min.
  - Exception: 32” (24” max. distance and 48” min. separation)
- PROWAG: Not addressed; comments have been submitted to include this requirement

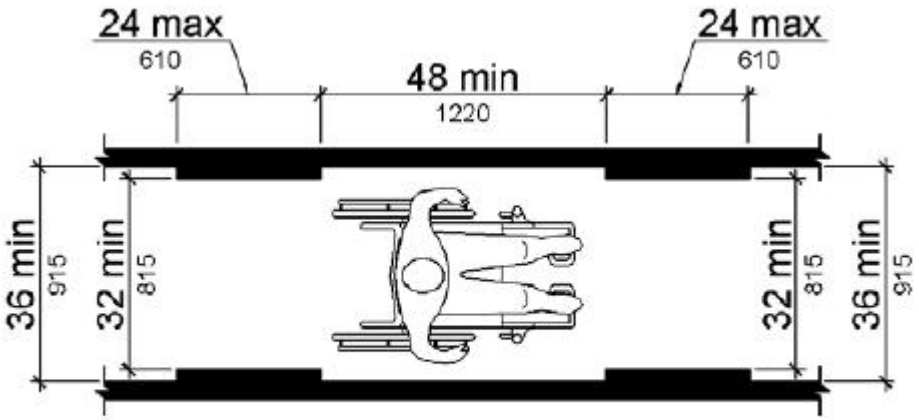


Figure 403.5.1
Clear Width of an Accessible Route

Clear Width

2010 ADA 403.5.1

Source: civilnews.com

Source: streetblog.org

R302.6

Clear Width – Driveways

Compliant

Non-compliant

R302.4

Passing Spaces

- If clear width < 5.0’, required every 200.0’ max.
- Passing space dimensions: 5.0’ x 5.0’
- May overlap pedestrian access routes
- Driveways and lead walkways serving residences or businesses meeting requirements may be used as passing zones

Passing Spaces

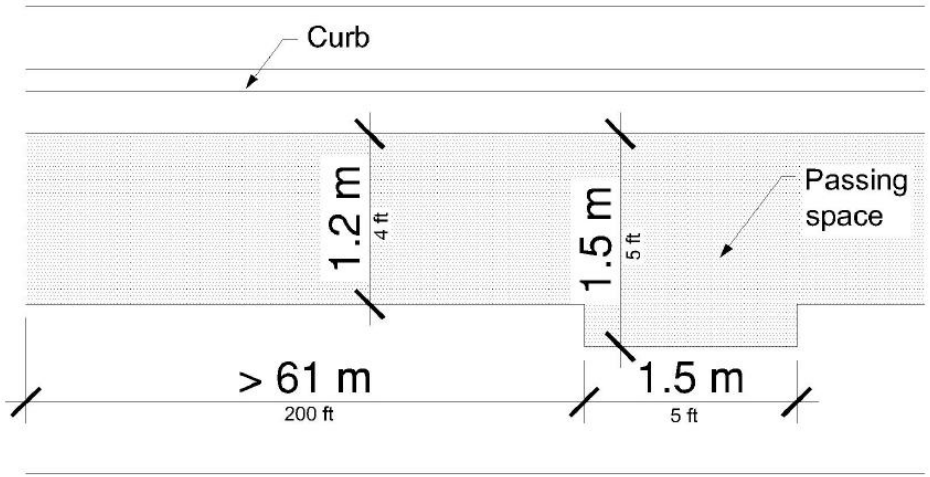
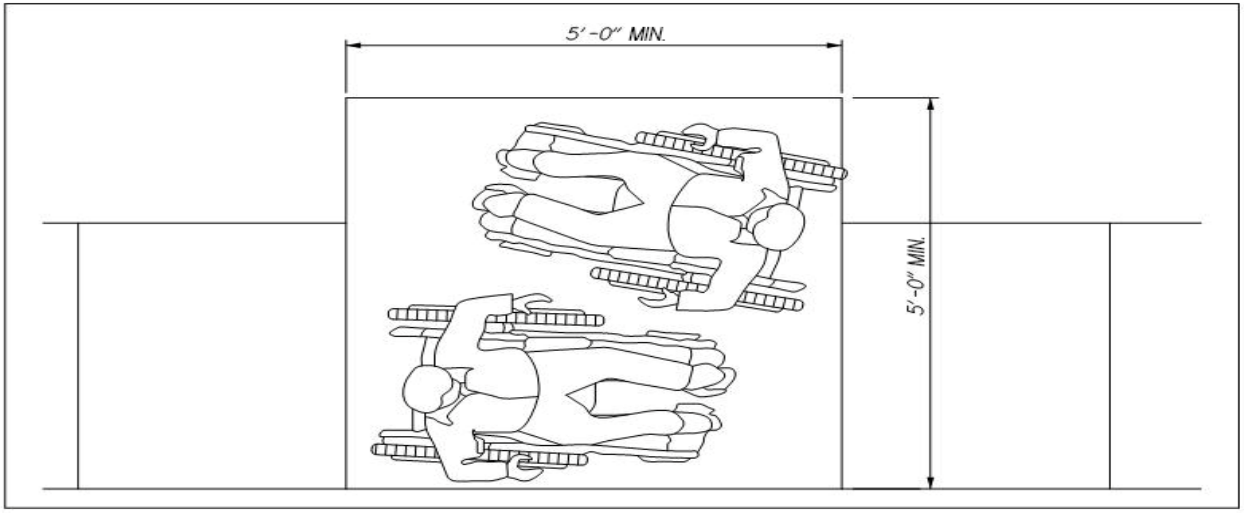


Figure R302.4
Passing Spaces



R302.5

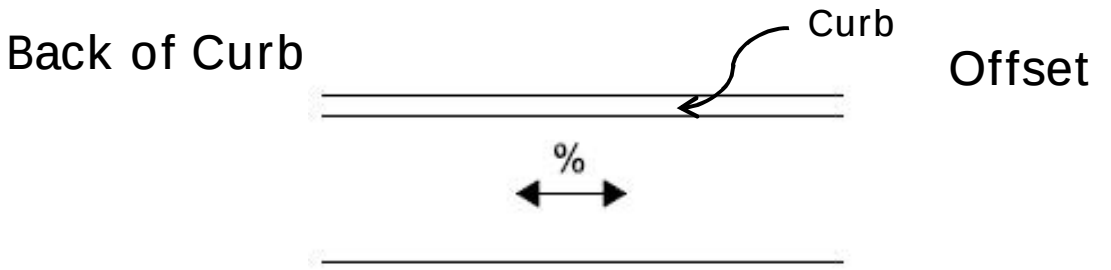
Grade (Running Slope)

Measured parallel to the direction of pedestrian travel

Location	Sidewalk	Pedestrian Street Crossings	Shared Use Path
Inside ROW and serving adjacent street or highway	May follow grade of adjacent street or highway	5% max.	May follow grade of adjacent street or highway to the extent practical where compliance is not practicable due to physical constraints and where compliance is precluded by regulatory constraints
Inside ROW but not serving adjacent street or highway	5% max.		
Outside ROW	5% max.		

Grade (Running Slope)

Sidewalk within the ROW serving adjacent street



R302.5

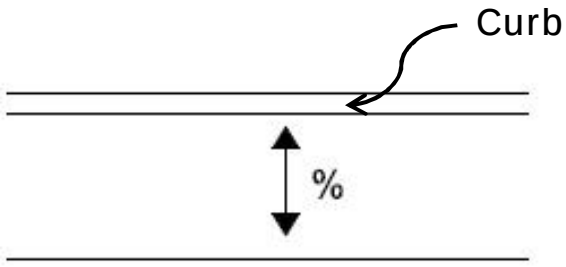
Grade – Driveways

Non-compliant

R302.6

Cross Slope

- Measured perpendicular to direction of pedestrian travel
- Includes driveway and entrance crossings
- Sidewalk: 2% max.



R302.6

Cross Slope – Driveways

Compliant

Non-compliant

R302.6

Cross Slope

- Street Crossings
  - With Yield or Stop Control: 2% max.
    - Unsignalized, yield control approaches
    - Unsignalized, stop control approaches
  - Without Yield or Stop Control: 5% max.
    - Unsignalized, free-flow approaches
    - Signalized, all approaches
  - Midblock: may equal grade of street or highway

R302.7

Surfaces

- All pedestrian access route surfaces must be firm, stable, and slip resistant
- Typical materials
  - Concrete
  - Bituminous Concrete Asphalt

Surfaces – Research

Exterior Surfaces

- Development of Surface Roughness Standards for Pathways Used by Wheelchair Users: Final Report (2014)
- Engineered Wood Fiber - Play Surfaces (2003)
  - Play Surfaces: Installation and Serviceability Results (2004)
  - Accessible Trails: Installation and Serviceability Results (2006)
- A Longitudinal Study of Playground Surfaces to Evaluate Accessibility (2013) National Center on Accessibility
- National Trail Surfaces Study: Final Report (2014) National Center on Accessibility

Source: https://www.access-board.gov/research/

R302.7.1/
R302.7.2

Surfaces

- Vertical Alignment
  - Generally planar and smooth (easy “rollability”)
  - Consider vibrations when choosing surface material
  - Flush grade breaks
  - At rail crossings, level and flush with rails
- Vertical Surface Discontinuities
  - With beveled edge across entire vertical surface discontinuity: 0.5” max.
  - Without beveled edge: 0.25” max.

R302.7.1/
R302.7.2

Surfaces

Allowance intended for sidewalk expansion joints and utilities that cannot be placed outside sidewalks (not curb ramps and blended transitions)

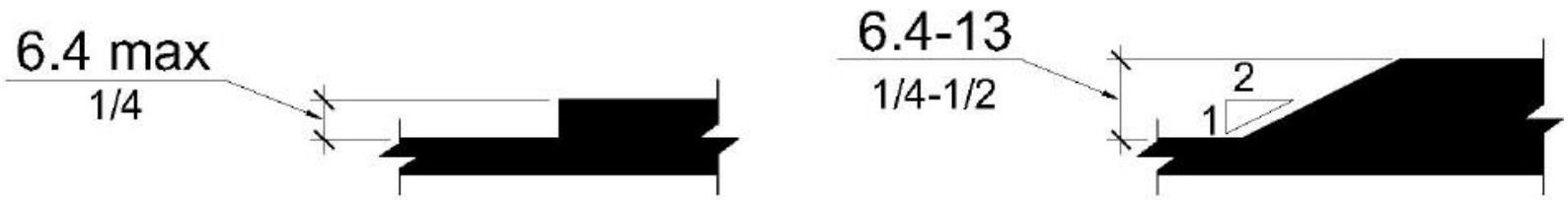


Figure R302.7.2
Vertical Surface Discontinuities

Surfaces

R302.7.1/
R302.7.2

Surfaces

R302.7.1/
R302.7.2

R302.7.1/
R302.7.2

Surfaces

Utility covers and property access covers

- Do not locate in pedestrian access route
- If must be located in pedestrian access route, covers and approaches must be ADA compliant
  - Firm, stable, slip-resistant
  - No vertical elevations greater than ¼”
  - No gaps greater than ½”

R302.7.1/
R302.7.2

Surfaces

Avoid utility covers in pedestrian street crossings

R302.7.1/
R302.7.2

Surfaces

Avoid utility covers in curb ramps

Surfaces – Vertical Discontinuities

R302.7.1/
R302.7.2

Heaving

Ponding

Cracking/Sinking

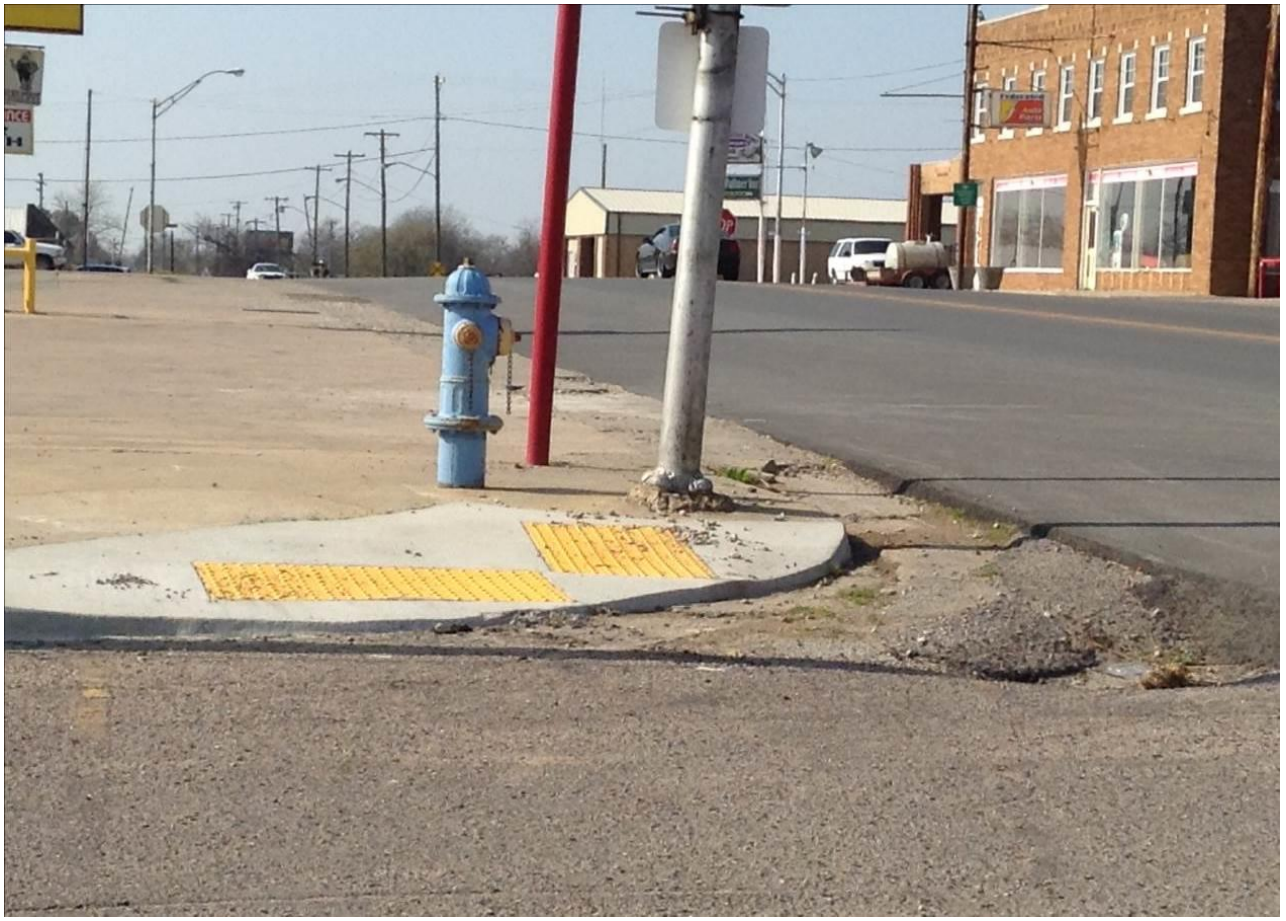
Surfaces – Vertical Discontinuities

R302.7.1/
R302.7.2

Non-Flush Curb Ramp Transition

Surfaces – Vertical Discontinuities

R302.7.1/
R302.7.2



Non-Flush Curb Ramp Transition

Surfaces – Vertical Discontinuities

R302.7.1/
R302.7.2

Non-Flush Curb Ramp Transition

R302.7.3

Surfaces – Horizontal Openings

- Includes gratings and lateral sidewalk joints
- Shall not permit passage of a sphere 0.5” in diameter
- Orientation: Elongated openings in gratings must be placed with long dimension perpendicular to dominant direction of travel

Surfaces – Horizontal Openings

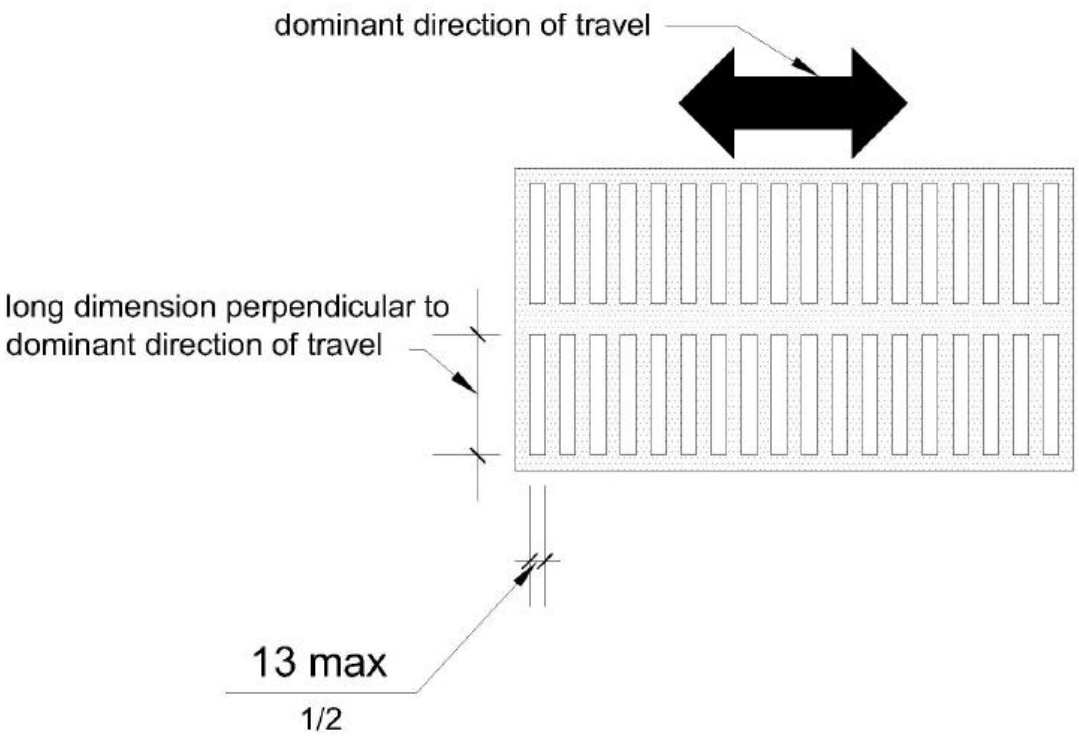


Figure R302.7.3
Horizontal Openings

R302.7

Surfaces – Horizontal Openings

Surfaces – Horizontal Openings

Non-Compliant

Source: universaldesignstyle.com

Surfaces

Flangeway Gaps

- Non-Freight rail track: 2.5” max.
- Freight rail track: 3” max.

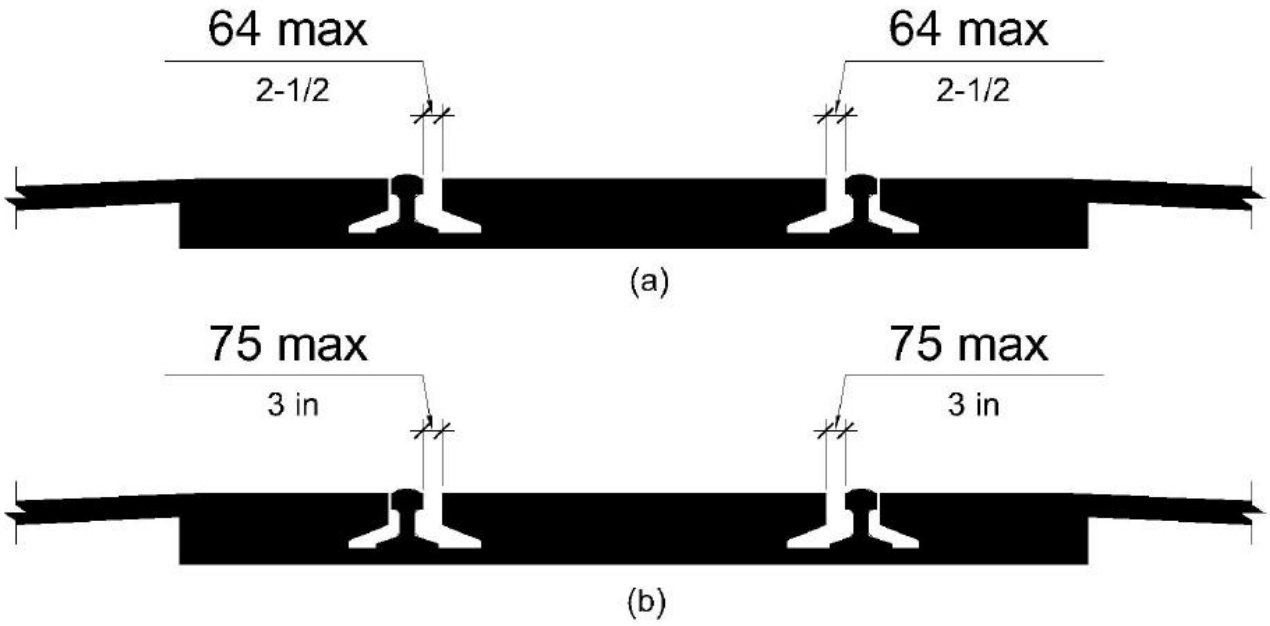


Figure R302.7.4
Flangeway Gaps

Pre-fabricated Plates

No Pre-fabricated Plates

Protruding Objects

Section R402

R105.5

Defined Terms

- **Pedestrian Circulation Path**: A prepared exterior or interior surface provided for pedestrian travel in the public ROW

- **Pedestrian Access Route**: A continuous unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a pedestrian circulation path

R210

Scoping

- Objects along or overhanging any portion of a ***pedestrian circulation path*** shall not reduce the clear width required for ***pedestrian access routes***
- Requirements for protruding objects apply across the entire width of the ***pedestrian circulation path***, not just the ***pedestrian access route***

R210

Protruding Objects

Examples:

- Utility poles
- Mailboxes
- Signal poles
- Signal cabinets
- Signs
- Trees
- Shrubs
- Other obstructions

R402.2

Protrusion Limits

- If objects height is:
  - Sidewalks: 27” – 80” above finish surface
  - Shared Use Paths: 8.0’ below finished surface
- Then horizontal overhang: 4” max.

Protrusion Limits

“Cane detectable range”

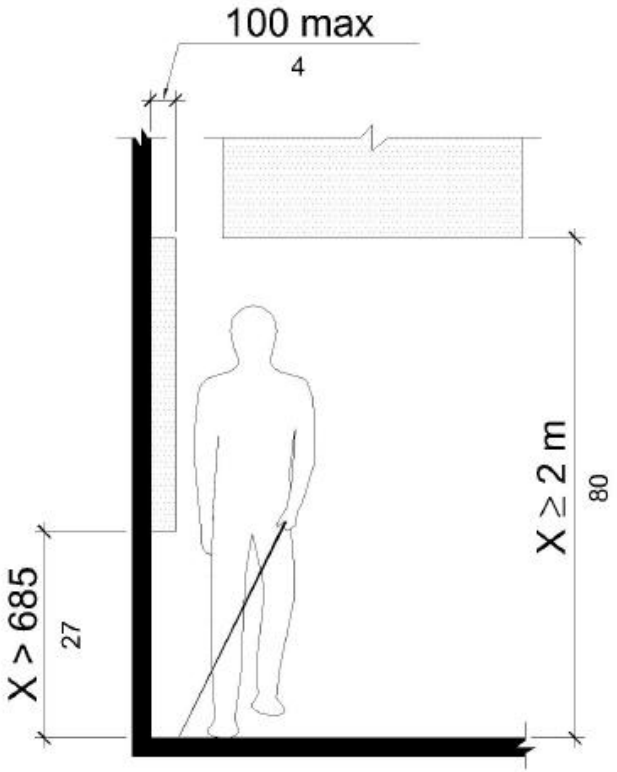


Figure R402.2
Protrusion Limits

R402.2

Protrusion Limits

Temporary obstructions such as overgrown bushes and trees must also be considered

R402.2

Protrusion Limits

Temporary obstructions such as trash cans and vehicles must also be considered

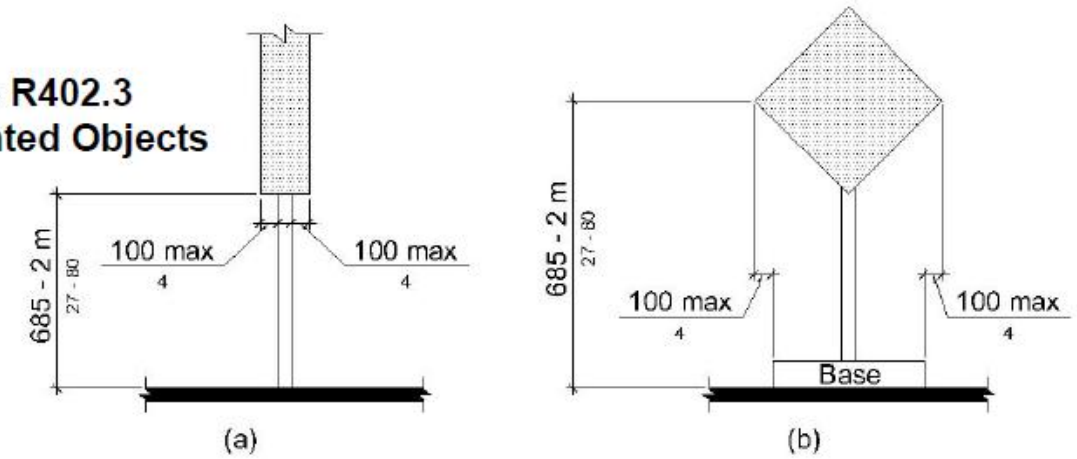
Post-Mounted Objects

R402.3/
MUTCD
2A.18

Mounted on free-standing posts or pylons

- If object height: 27” – 80” above finish surface
- Then horizontal overhang: 4” max. from post or pylon
- If base, base thickness: 2.5” min.
- Regulatory, warning, or guide signs: mount 84” above finish surface

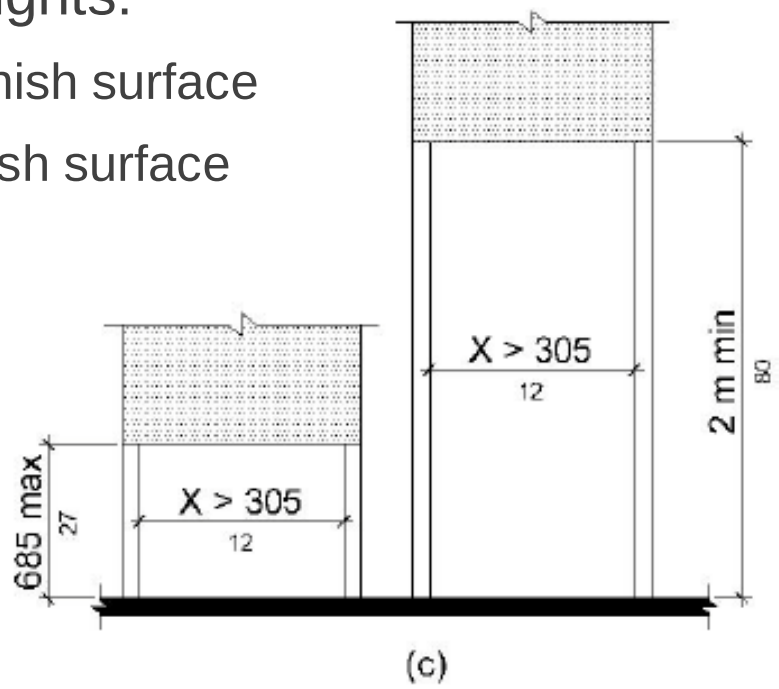
Figure R402.3
Post-Mounted Objects



Post-Mounted Objects

Mounted between posts or pylons and clear distance between posts or pylons is greater than 1.0’

- Allowable Object Heights:
  - 2.25’ max. above finish surface
  - 6.7’ max. above finish surface



(c)

R402.3

Post-Mounted Objects

Compliant

Non-Compliant -
More than 4” overhang in
“protected zone”

Reduced Vertical Clearance

- Guardrails or other barriers (e.g., planters or benches) to pedestrian travel must be provided when vertical clearance is less than 80” high
- Leading edge of guardrail must be located 27” max. above finish surface

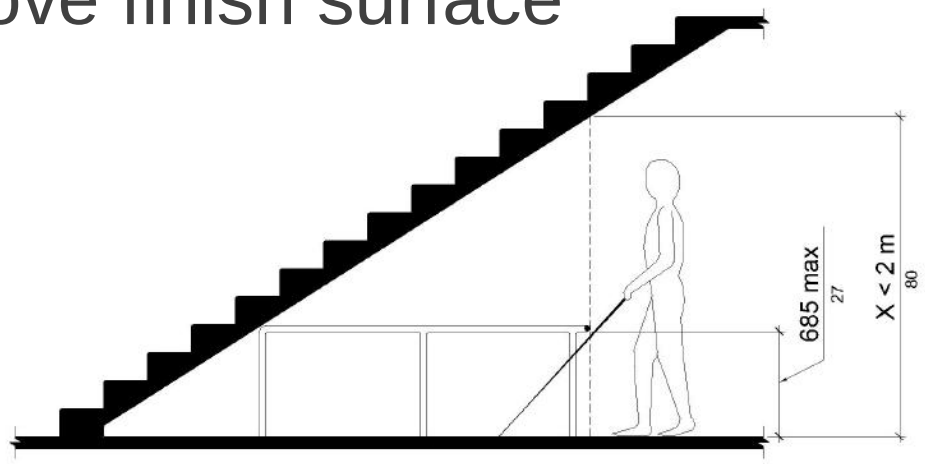
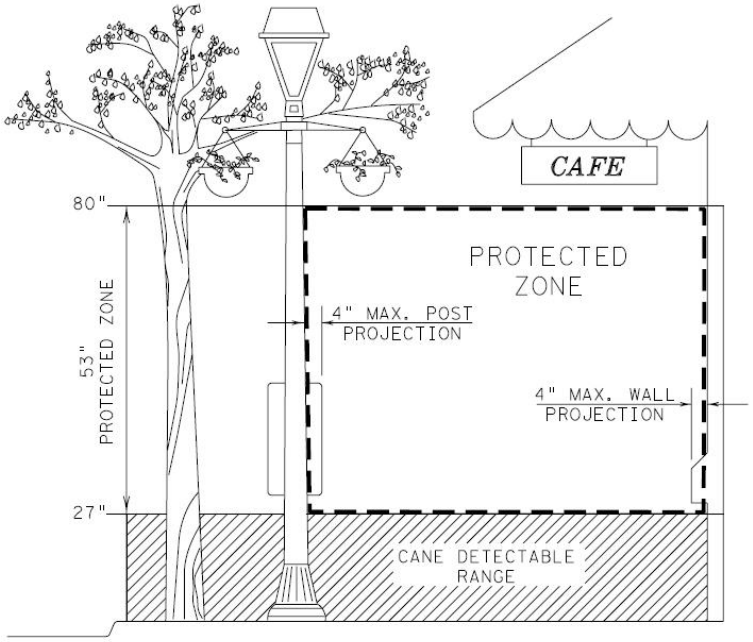


Figure R402.4
Reduced Vertical Clearance

R402.4

Reduced Vertical Clearance

Temporary obstructions such as low-hanging tree branches must also be considered



PROTECTED ZONE

In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.

Alternate Pedestrian Routes

Section R205/R303

R205

Alternate Pedestrian Access Routes

- Alternate pedestrian access routes must be provided when a pedestrian circulation path is temporarily closed:
  - Construction
  - Alterations
  - Maintenance Operations
  - Other conditions

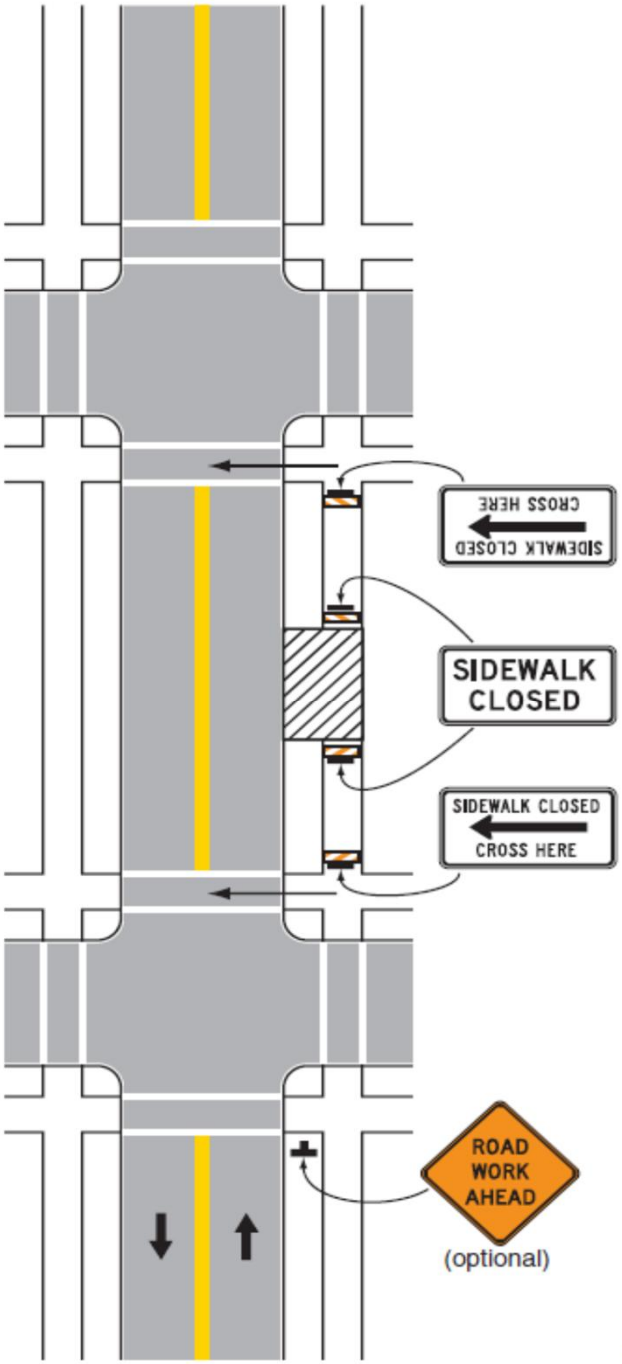
R205

Alternate Pedestrian Access Routes

- Alternate routes must comply with MUTCD Sections 6D.01, 6D.02, 6G.05

- Pedestrian barricades and channelizing devices must comply with MUTCD Sections 6F.63, 6F.68, and 6F.71

Sidewalk Detour



SIDEWALK DETOUR

Notes:

Standard. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Only the traffic control devices controlling pedestrian flows are shown. Other devices may be needed to control traffic on the streets. Use lane closure signing, ROAD NARROWS, or LANE NARROWS signs as needed.

Fort nighttime closures, Type A flashing warning lights may be used on barricades that support signs and close walkways. Temporary street lighting may also be considered.

MUTCD

Alternate Pedestrian Access Routes

Curb Ramps and Blended Transitions

Section R304

R105.5

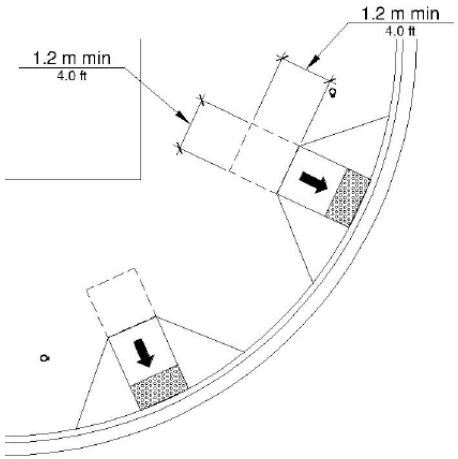
Defined Terms

Curb Ramp: A ramp that cuts through or is built up to the curb. Curb ramps can be perpendicular or parallel, or a combination of parallel and perpendicular ramps. A short ramp cutting through a curb or built up to it.

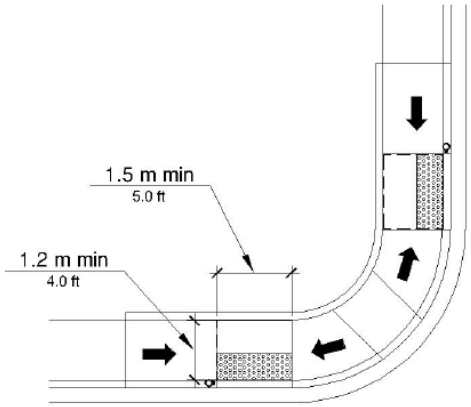
- Perpendicular
- Parallel
- Combination

R105.5

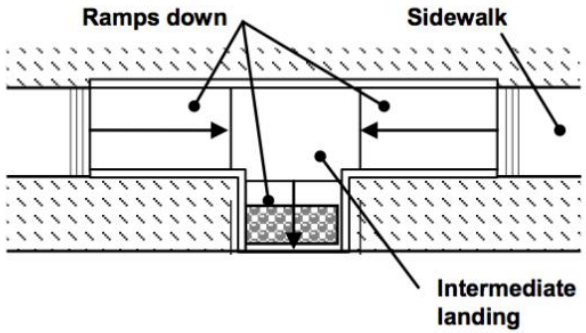
Defined Terms



Perpendicular Curb Ramp



Parallel Curb Ramp



Combination Curb Ramp

Source: http://www.cselandscapearchitect.com/

R105.5

Defined Terms

Blended Transition: A raised pedestrian street crossing, depressed corner, or similar connection between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that has a grade of 5% or less.

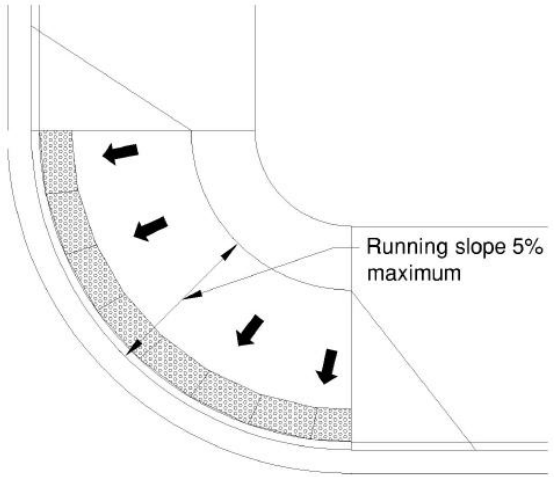


Figure R304.4.1
Running Slope

R207.1

Scoping

A curb ramp, blended transition, or a combination of curb ramps and blended transitions complying with R304 shall connect the pedestrian access routes at each pedestrian street crossing

R207.1

Scoping

The curb ramp (excluding any flared sides) or blended transition shall be contained wholly within the width of the pedestrian street crossing served

R304.1

General

Type	Application
Perpendicular curb ramp	Sidewalk ≥ 12.0’ wide
Parallel curb ramp	Sidewalk ≥ 4.0’ wide
Combination curb ramp	Sidewalk ≥ 6.0’ wide
Blended transition	Range of sidewalk conditions

R304.2.1

Perpendicular Curb Ramps

Turning Space (Landing)

- Located at top of curb ramp
- May overlap other turning spaces and clear spaces

Condition	Turn Space Size
Unconstrained by back of sidewalk	4.0’ x 4.0’ min.
Constrained by back of sidewalk	• 4.0’ x 5.0’ min. • 5.0’ dimension provided in direction of ramp run
Shared Use Paths	4.0’ x 4.0’ min.

Perpendicular Curb Ramps

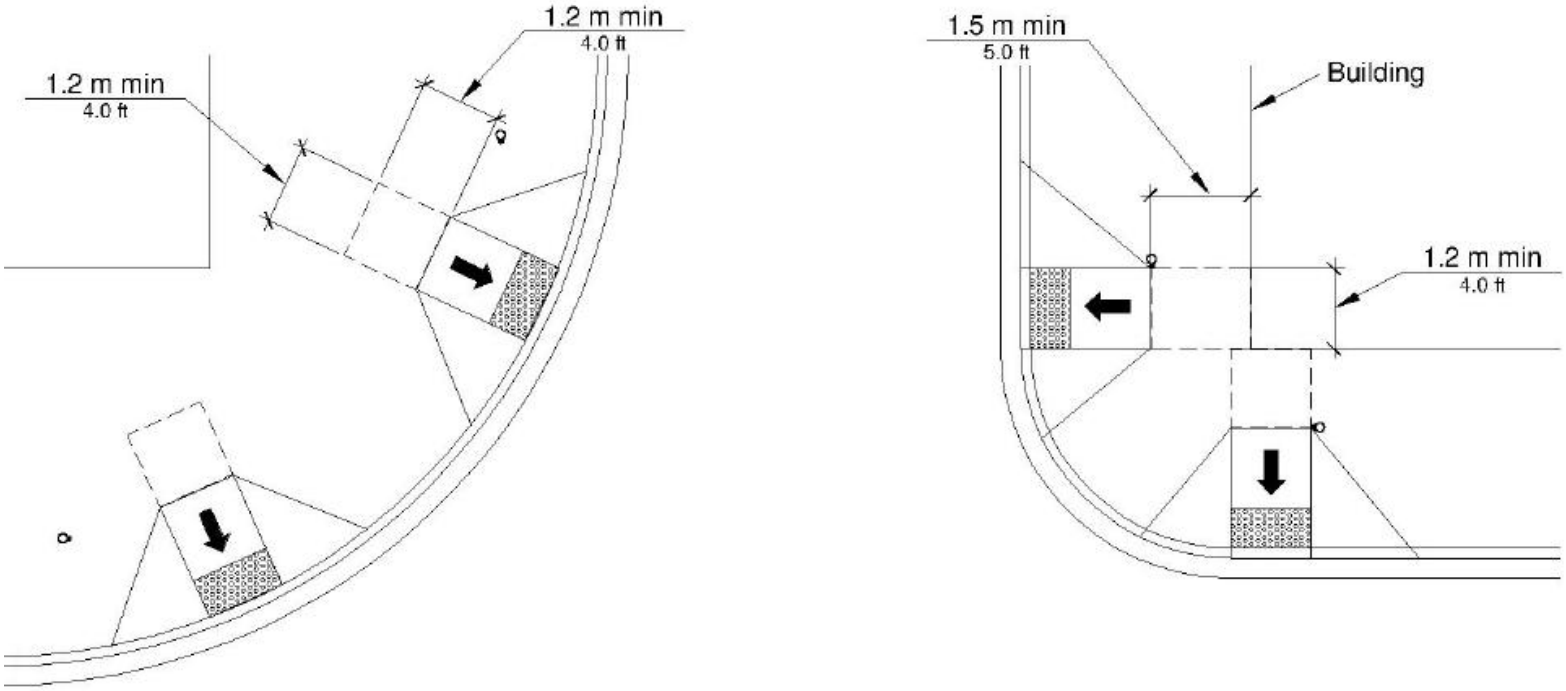
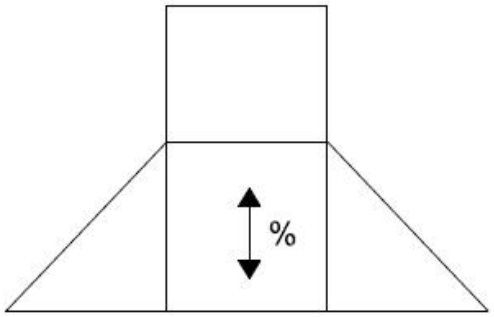


Figure R304.2.1
Turning Space

R304.2.2

Perpendicular Curb Ramps – Running Slope

- Curb Ramps
  - Cut through, built up to curb at right angles, or meets gutter grade breaks at right angles where curb is curved
  - Min: 5% (for ramp length considerations)
  - Max: 8.3%
  - Ramp Length Max: 15.0’



- Turning Spaces
  - Max: 2%

R304.2.2

Perpendicular Curb Ramps – Running Slope

R304.2.2

Perpendicular Curb Ramps

Non-compliant:
Sides not 90˚

R304.2.2

Perpendicular Curb Ramps

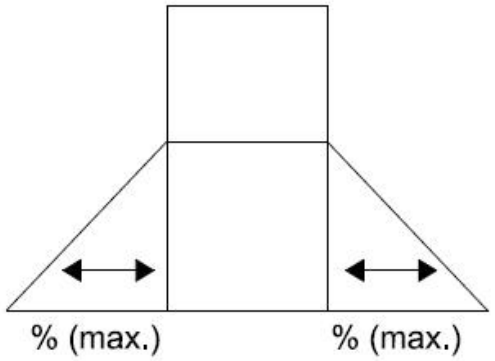
Compliant:
Sides 90˚

R304.2.3

Perpendicular Curb Ramps

Flared Sides

- Required where pedestrian circulation path crossed curb ramp
- Flared sides not allowed where curb ramp is adjacent to a non-walking surface
- Max. slope: 10%
- Measured parallel to curb line



R304.2.3

Perpendicular Curb Ramps

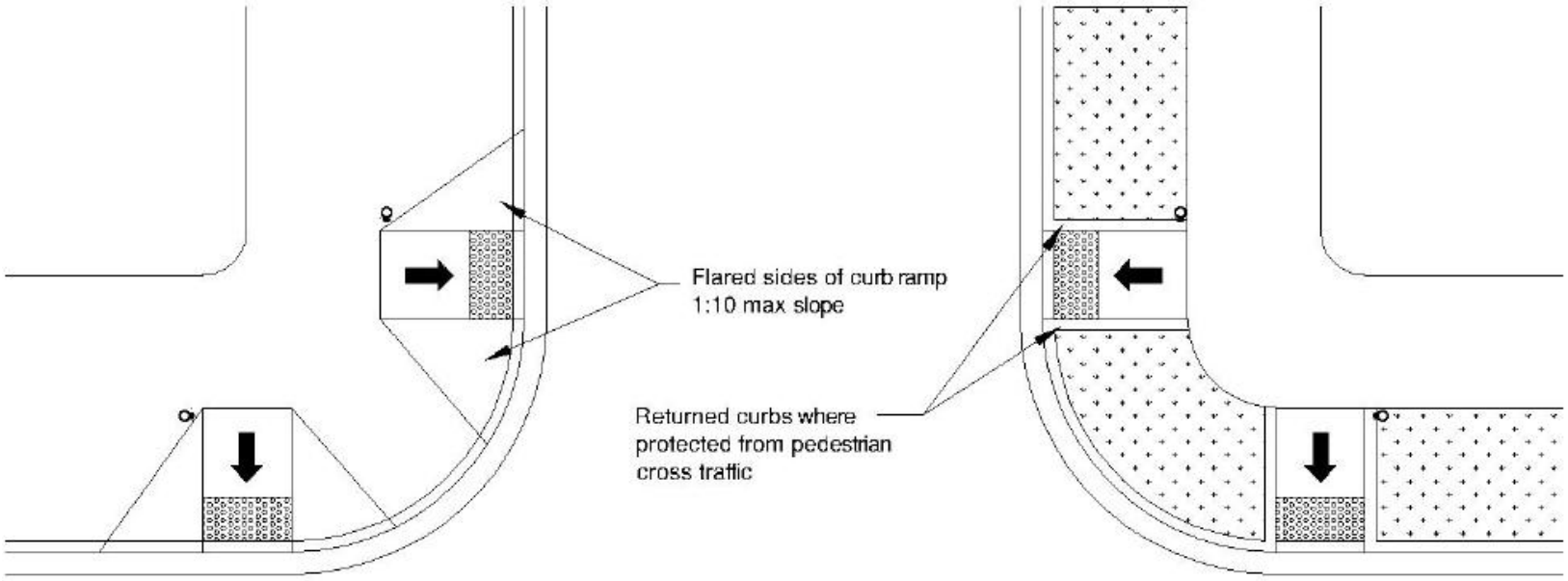


Figure R304.2.3
Flared Sides

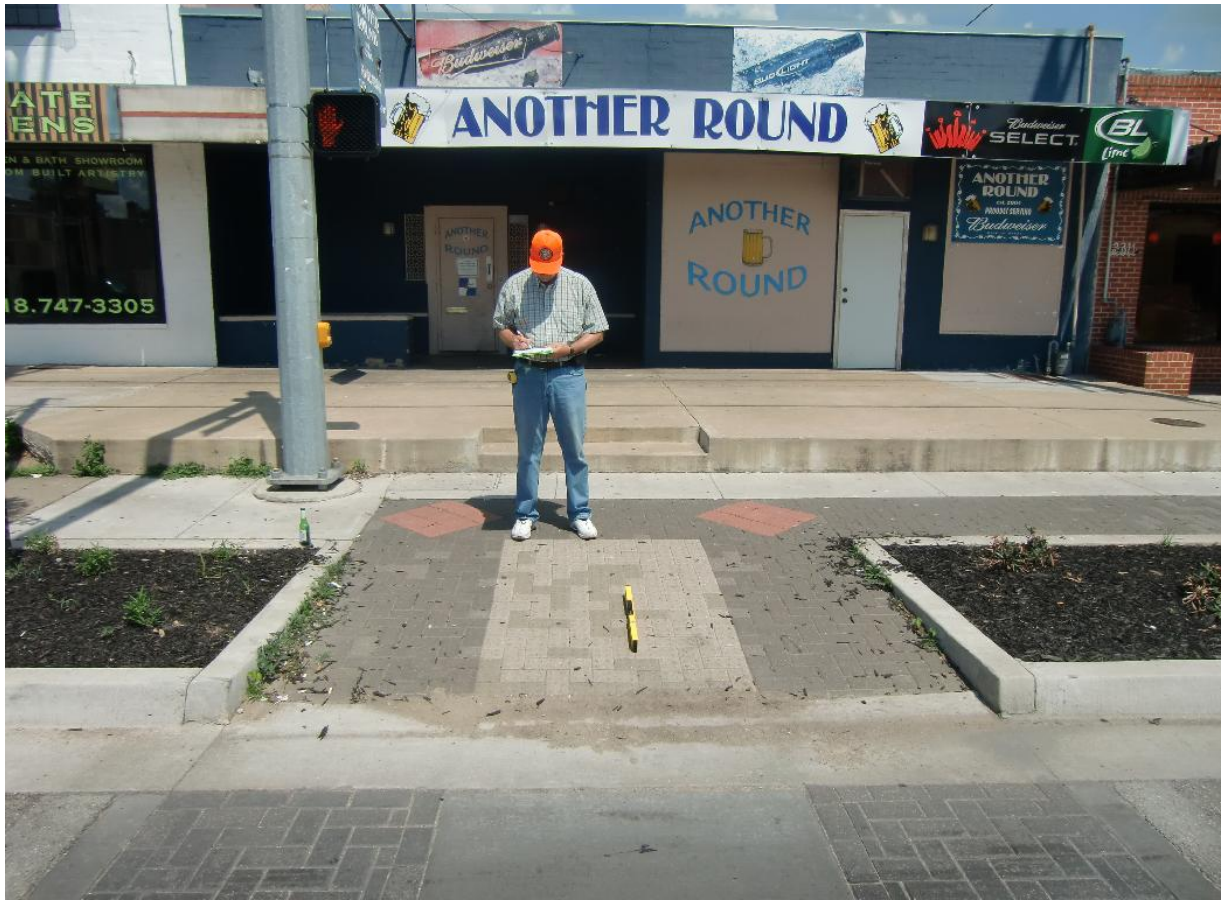
R304.2.3

Perpendicular Curb Ramps

NON-COMPLIANT
(traversable adjacent surface)

R304.2.3

Perpendicular Curb Ramps



COMPLIANT
(protected with landscaping;
non-traversable)

R304.3.1

Parallel Curb Ramps

Turning Space (Landing)

- Located at bottom of curb ramp
- May overlap other turning spaces and clear spaces

Condition	Turn Space Size
Unconstrained on 2 or more sides	4.0’ x 4.0’ min.
Constrained on 2 or more sides	• 4.0’ x 5.0’ min. • 5.0’ dimension provided in direction of pedestrian street crossing
Shared Use Paths	4.0’ x 4.0’ min.

R304.3.1

Parallel Curb Ramps

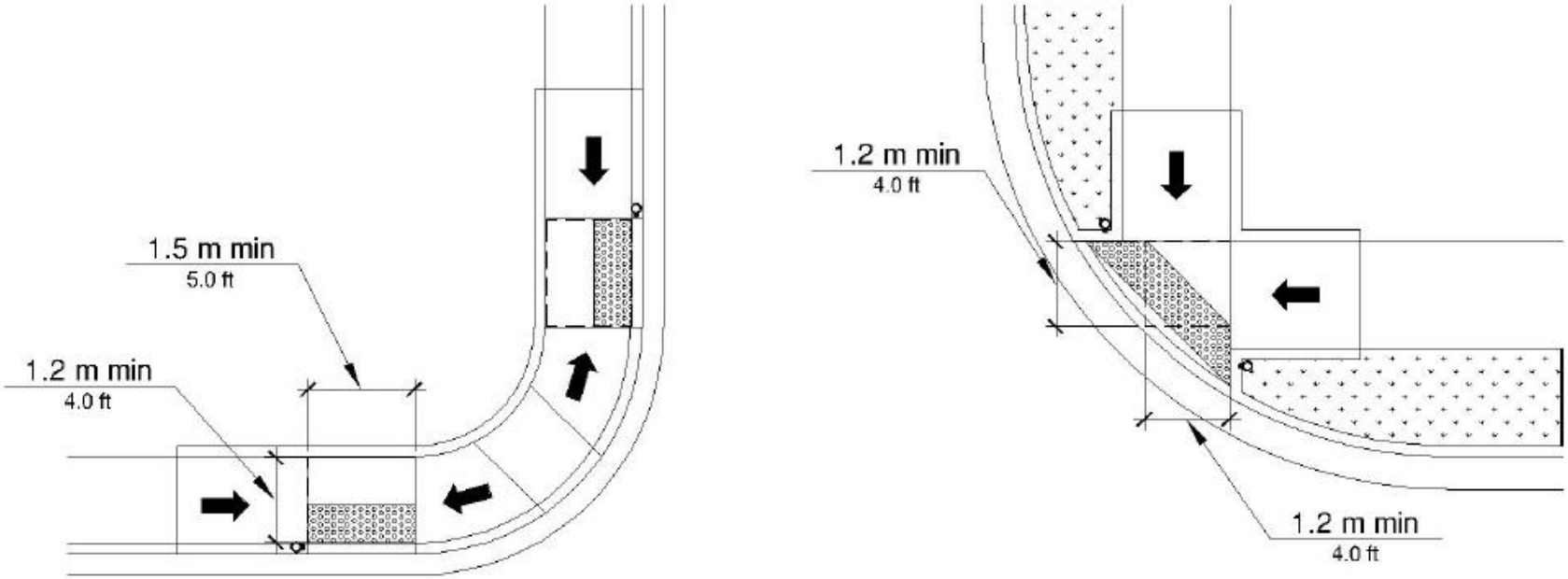
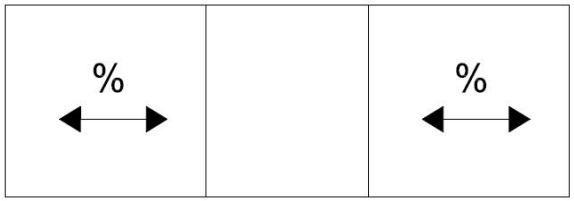


Figure R304.3.1
Turning Space

R304.3.2

Parallel Curb Ramps – Running Slope

- Curb Ramps
  - In-line with direction of sidewalk travel
  - Min: 5%
  - Max: 8.3%
  - Ramp Length Max: 15.0’
- Turning Spaces
  - Max: 2%



Blended Transitions

- Treatment type for entire curb radius
- Running Slope: 5% max.

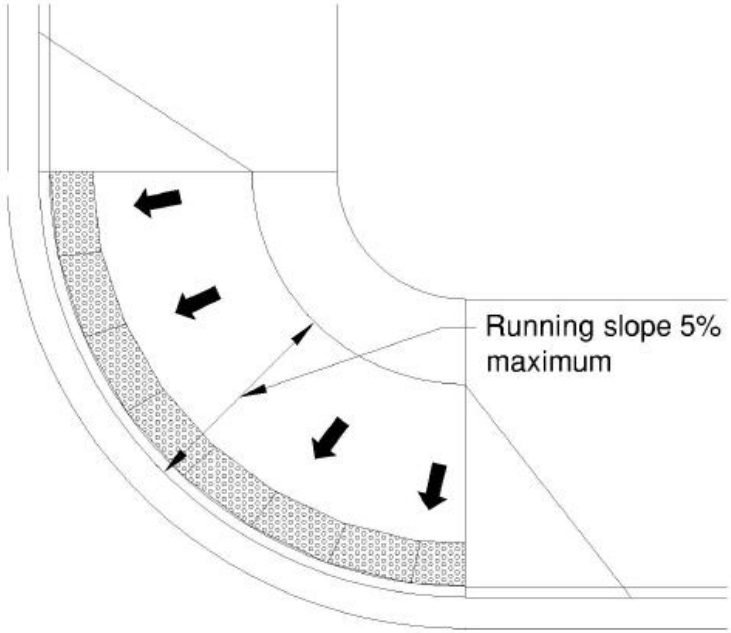


Figure R304.4.1
Running Slope

R304.5.1

Common Requirements – Width

- Sidewalk
  - 4.0’ min.
  - Excludes any flared sides
- Shared Use Path
  - At least as wide as path width
  - Excludes any flared sides

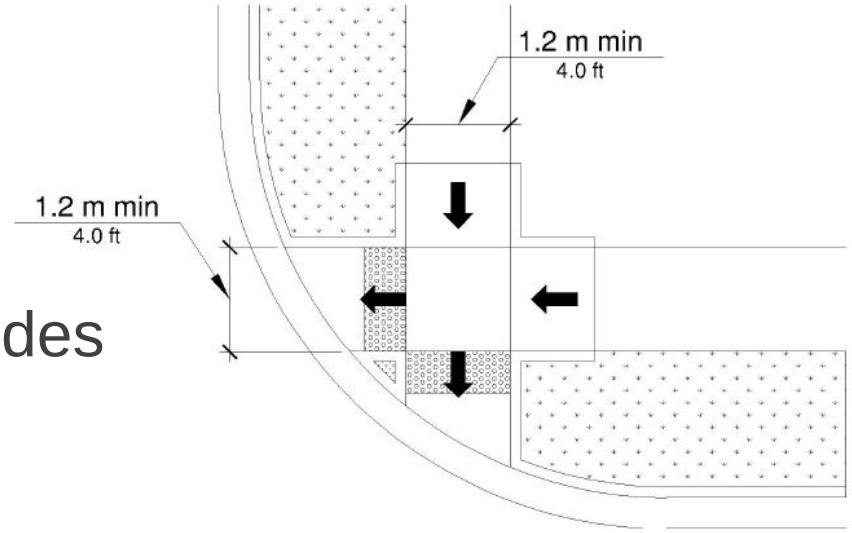


Figure R304.5.1
Width

R304.5.2

Common Requirements – Grade Breaks

- Must be perpendicular to direction of ramp run at top and bottom of curb ramps
- Not permitted on surface of ramp runs and turning spaces
- Surface slope that meet at grade breaks must be flush

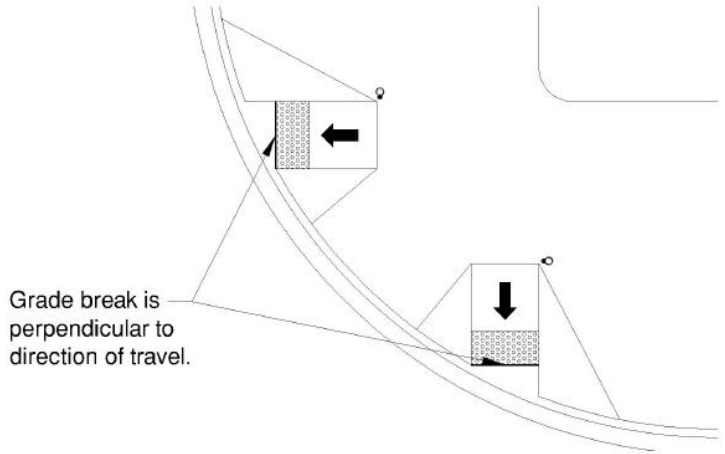
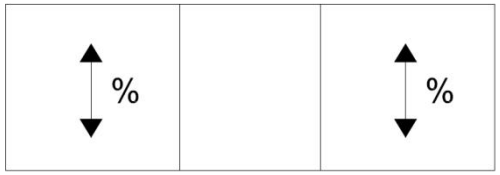


Figure R304.5.2
Grade Breaks

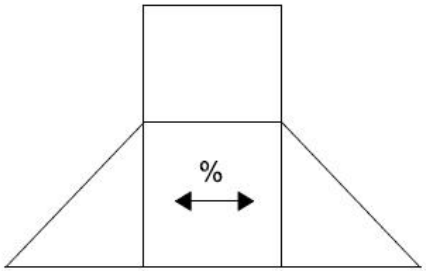
R304.5.3

Common Requirements – Cross Slope

- Measured perpendicular to the pedestrian path of travel
- 2% max.



Parallel Curb Ramp

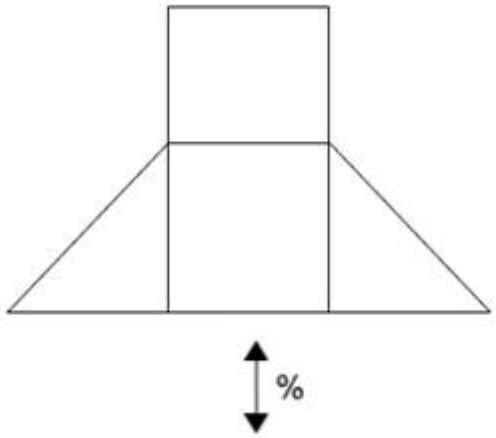


Perpendicular Curb Ramp

R304.5.4

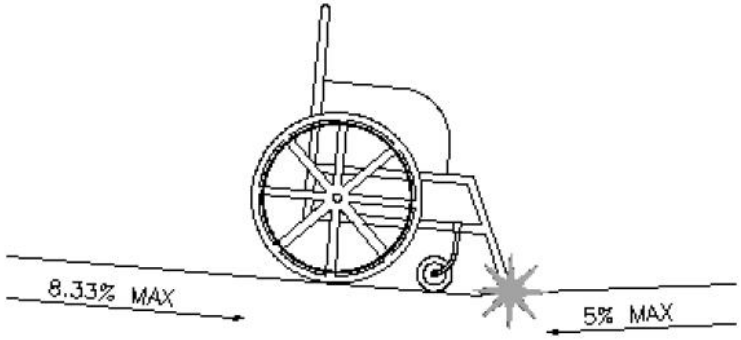
Common Requirements – Counter Slope

- Measured in gutter or street at foot of curb ramp runs, blended transitions, and turning spaces
- PROWAG: 5% max.
- Alternative when full compliance it not technically feasible: G = g2 – g1 = 11 % max.
  - g1: curb ramp running slope
  - g2: crosswalk slope

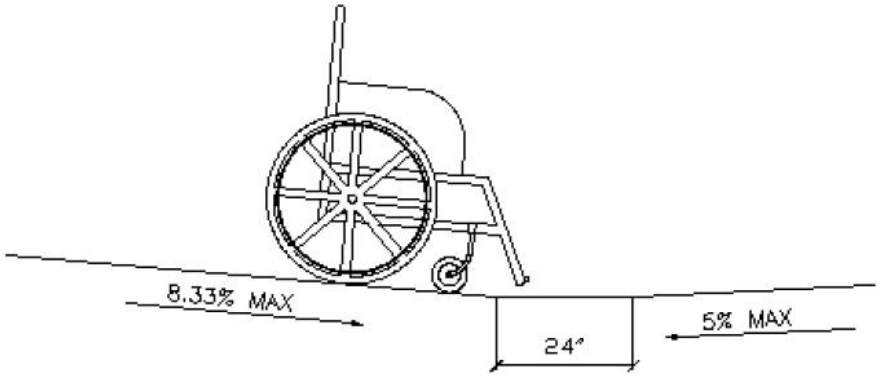


Counter Slope Alternative

PROW Access Advisory Committee Final Report (Jan. 2001)



ALGEBRAIC DIFFERENCE GREATER THAN 11% NOT PERMITTED



PROVIDE 24" LEVEL STRIP IF ALGEBRAIC DIFFERENCE EXCEEDS 11%

Common Requirements – Clear Space

PROWAG R304.5
2010 ADA 406.6

- Measure beyond the bottom grade break
- 4.0’ x 4.0’ min.
- Within the width of pedestrian street crossing
- Wholly outside the parallel vehicle travel lane

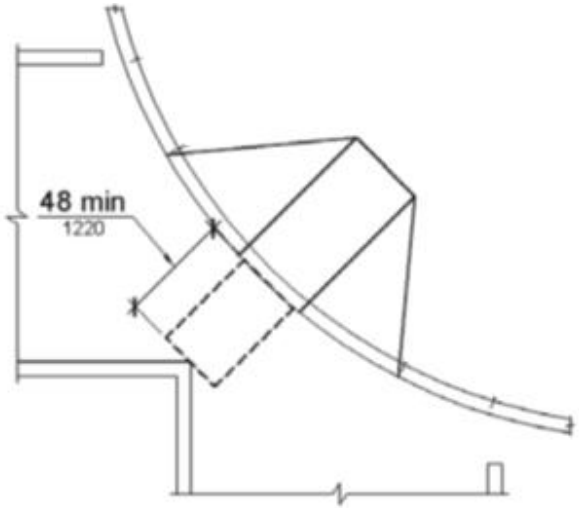


Figure 406.6
Diagonal or Corner Type Curb Ramps

R304.5

Common Requirements – Clear Space

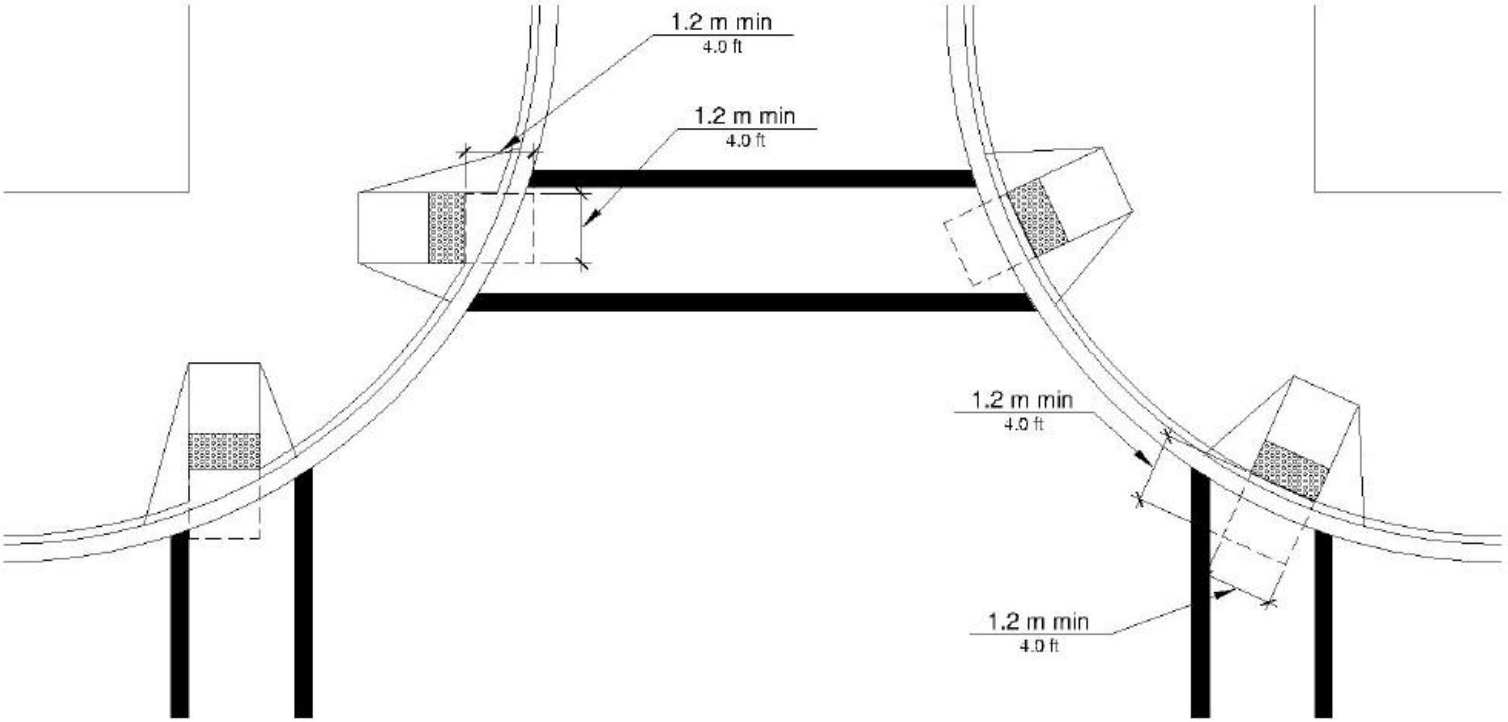


Figure R304.5.5
Clear Space

Detectable Warning Surfaces

Section R208.1/Section R305

R208.1

Where Required

- Curb ramps and blended transitions at street crossings
- Pedestrian refuge islands ≥ 6’ in length
- Pedestrian at-grade rail crossings not located within street or highway
- Boarding and alighting areas at sidewalk or street level transit stops for rail vehicles where the side of the boarding and alighting areas facing the rail vehicles is not protected by screens or rails
- Commercial driveways with yield or stop control

R208.1/
R308.2

Where Not Required

- Residential driveways
- Commercial driveways without yield or stop control (NOTE: driver handbook implies stop or yield control, even if not posted)
- Refuge islands that are cut-through at street level and less than 6.0’ in length in direction of pedestrian travel

History

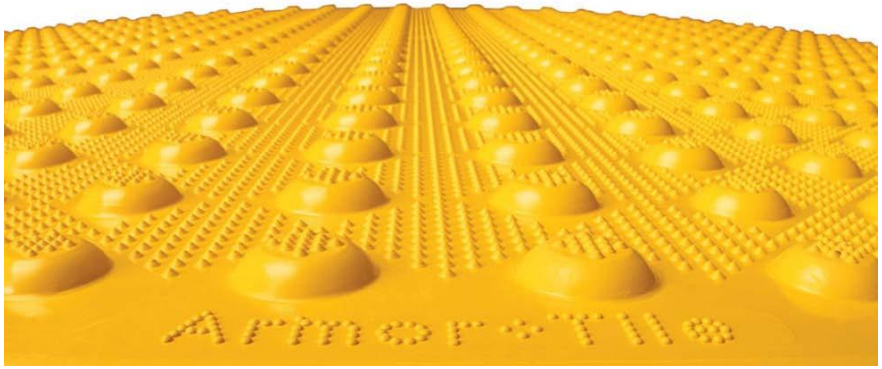
Element	Standard				
	1991	2004	2006*	2010	PROWAG (2011)
Where Required	All curb ramps	Not required on curb ramps	All curb ramps	Not required on curb ramps	All curb ramps at intersections/ select driveways
Width	Full width of curb ramp	N/A	Full width of curb ramp	N/A	Full width of curb ramp
Depth	Full depth of curb ramp	N/A	Full depth of curb ramp or 2 ft. min.	N/A	2 ft. min.
Contrast	70% contrast	N/A	Light-on-dark or dark-on-light	N/A	Light-on-dark or dark-on-light

*Suspension of DWS installations (to allow for additional research) expired on July 26, 2001. 2006 Standards apply to facilities used by state and local governments to provide public transportation.

R305.1

General

- Detectable warning surfaces
  - Truncated domes
  - Aligned in a square or radial pattern

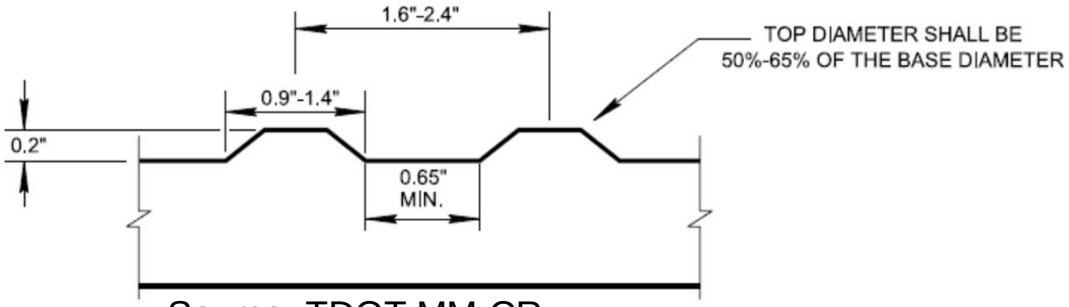


Source: armor-tile.com

R305.1.1

General – Dome Size

- Base Diameter
  - 0.9” min.
  - 1.4” max.
- Top Diameter
  - 50% of base diameter min.
  - 65% of base diameter max.
- Height: 0.2”



Source: TDOT MM-CR-1

General – Dome Size

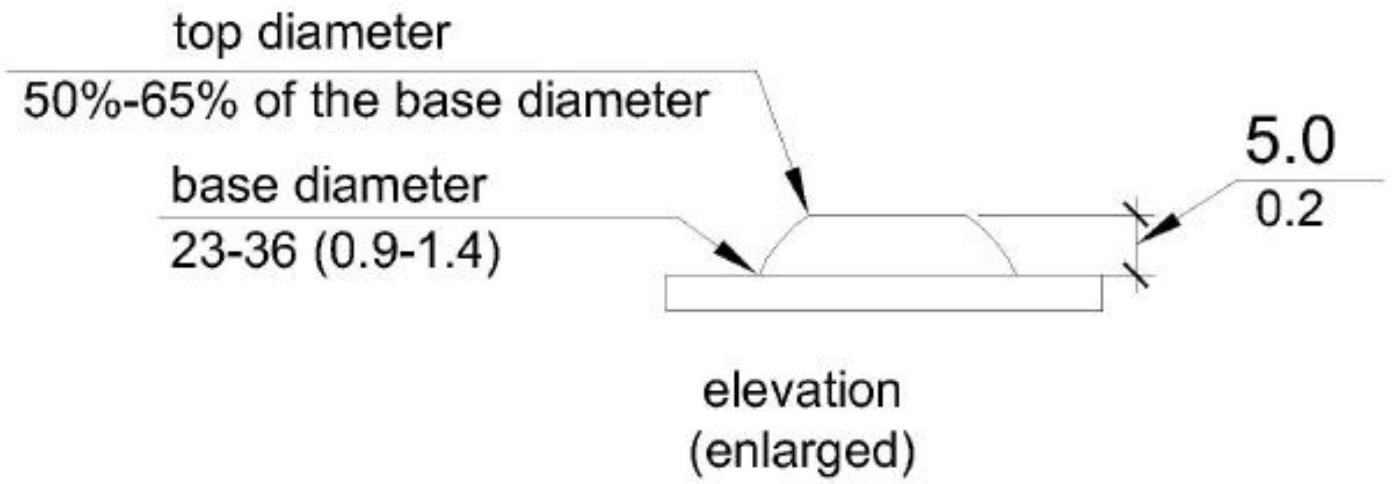


Figure R305.1.1
Dome Size

R305.1.2

General – Dome Spacing

- Center-to-Center Spacing
  - 1.6” min.
  - 2.4” max.
- Base-to-Base Spacing
  - 0.65” min.
  - Measured between the most adjacent domes

General – Dome Spacing

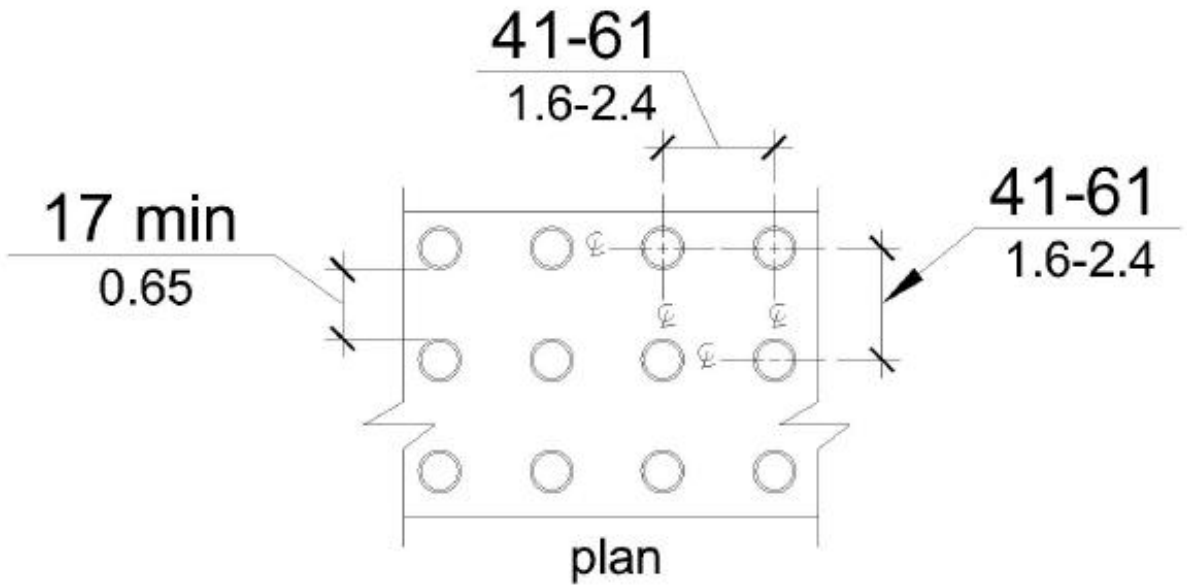
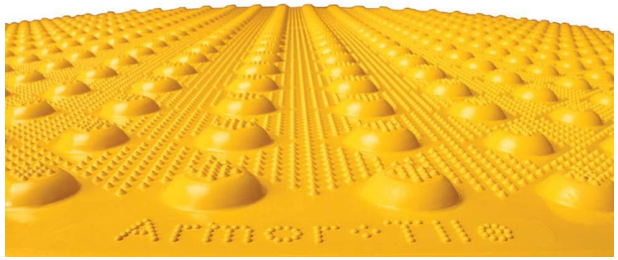


Figure R305.1.2
Dome Spacing

R305.1.3

General – Contrast

- Must contrast visually with adjacent gutter, street or highway, or pedestrian access route surface
- Either light-on-dark or dark-on-light



Source: armor-tile.com

R305.1.3

General – Contrast

Non-compliant
(No contrast)

General – Contrast

FHWA Technical Brief on Color and Contrast of Detectable Warnings:

https://www.access-board.gov/research/prow/visual-detection-detectable-warning/

Source: saferouteproducts.com

R305.1.4

General – Size

- Length: 2.0’ min. in direction of pedestrian travel
- Width:

Location	Installation width
Perpendicular Curb Ramps	Full width of ramp run (excluding flares)
Parallel Curb Ramps	Full width of turning space
Blended Transitions	Full width of blended transition
At-grade Rail Crossings	Full width of crossing

R305.1.4

General – Size

Non-compliant:
Detectable warning surface required full width of curb ramp

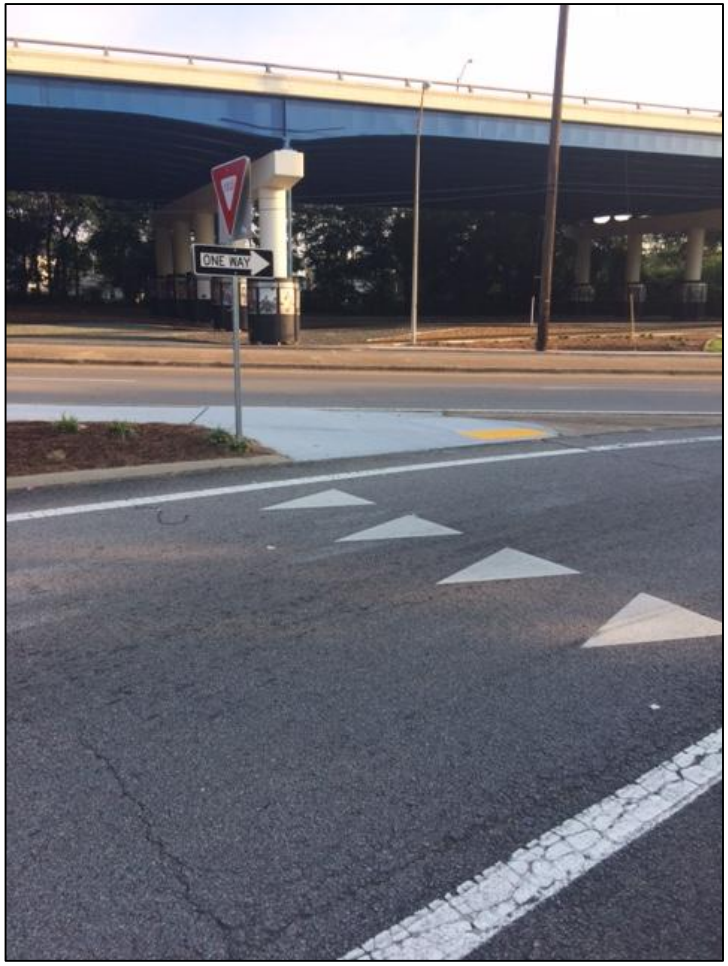
R305.1.4

General – Size

Non-compliant:
Detectable warning surface required across entire length of curb removal

R305.1.4

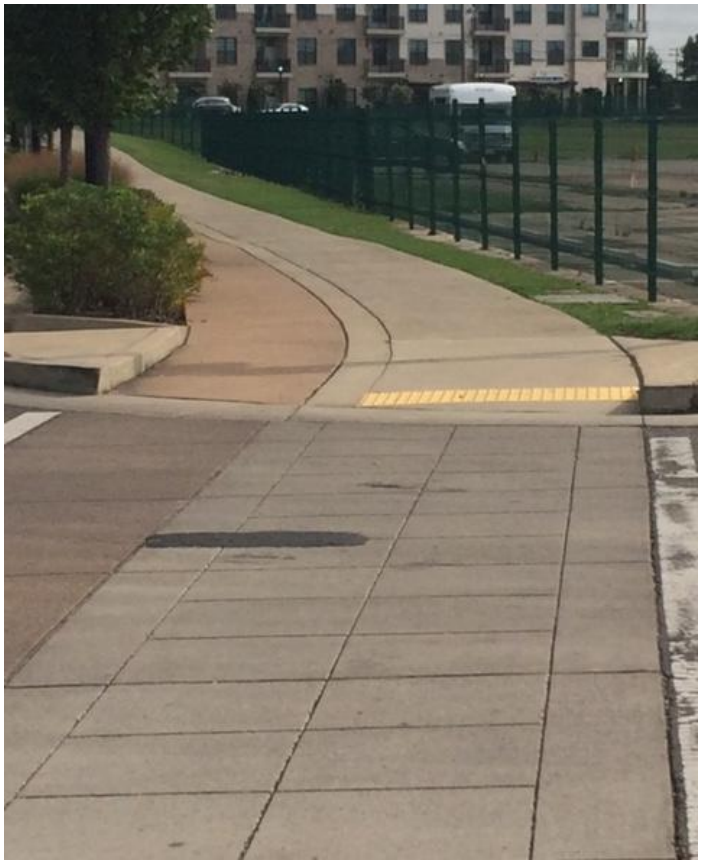
General – Size



Non-compliant:
Detectable warning surface required across entire length of curb removal

R305.1.4

General – Size (Shared-Use Path)



Non-compliant:
Detectable warning surface required across entire shared use path curb ramp width

R305.1.4

General – Size

- NOT needed on entire ramp run
- Avoid using brick pavers – the dimensions will become non-compliant over time

Source: armor-tile.com

R305.1

General – Size

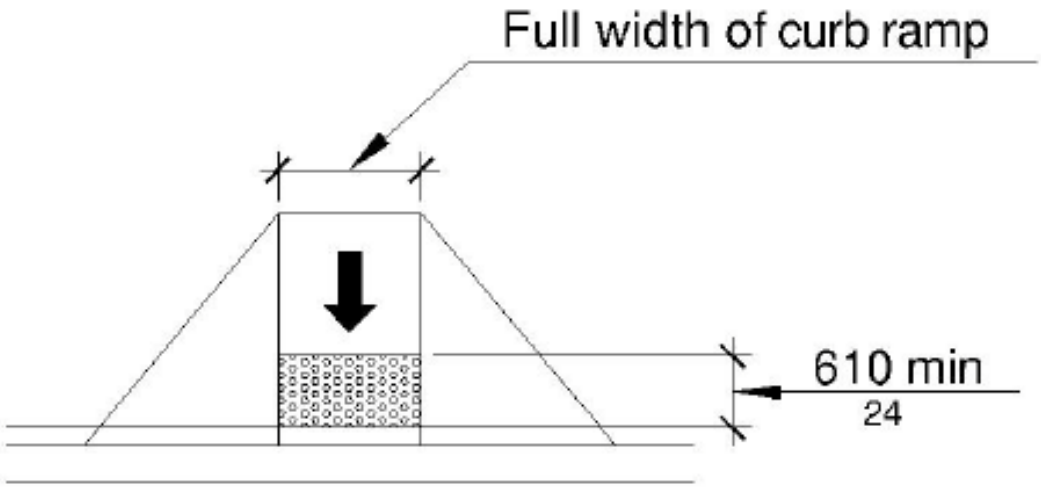
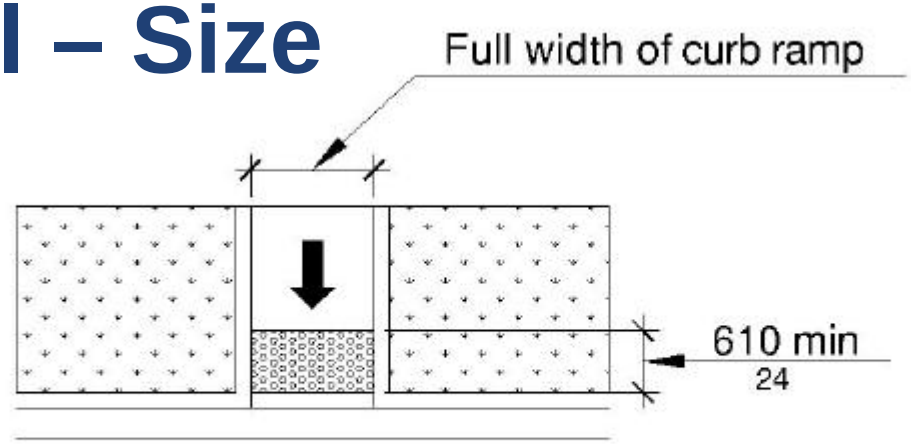
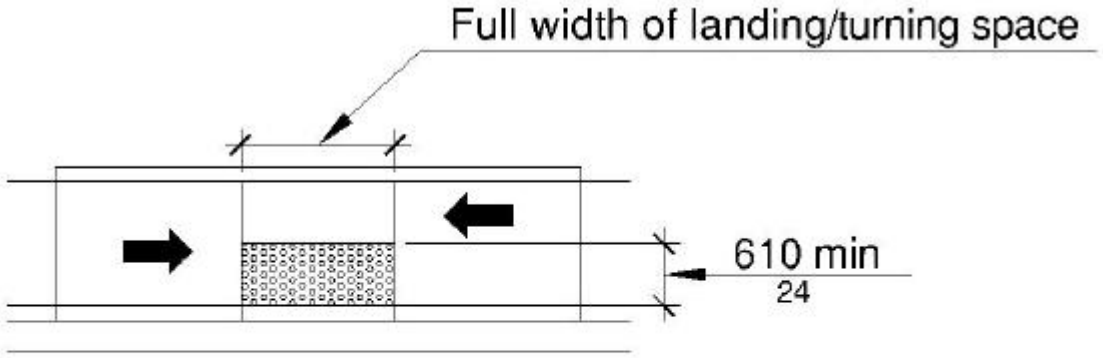


Figure R305.1.4
Size

General – Size



(b) returned curb



(c) parallel

Figure R305.1.4
Size

R305.2.1

Placement – Perpendicular Curb Ramps

Grade Break Location	Warning Surface Placement
Where ends of bottom grade break are in front of back of curb	At back of curb
Where ends of bottom grade break are behind back of curb and distance from either end of bottom grade break to back of curb is 5.0’ or less	On ramp run within one dome spacing of bottom grade break
Where ends of bottom grade break to back of curb is more than 5.0’	On lower landing at back of curb

Placement – Perpendicular Curb Ramps

Advisory R305.2.1

Rows of truncated domes shall be aligned perpendicular to the grade break between curb ramp run and street so wheelchair wheels can “track” between domes

R305.2.1

Placement – Perpendicular Curb Ramps

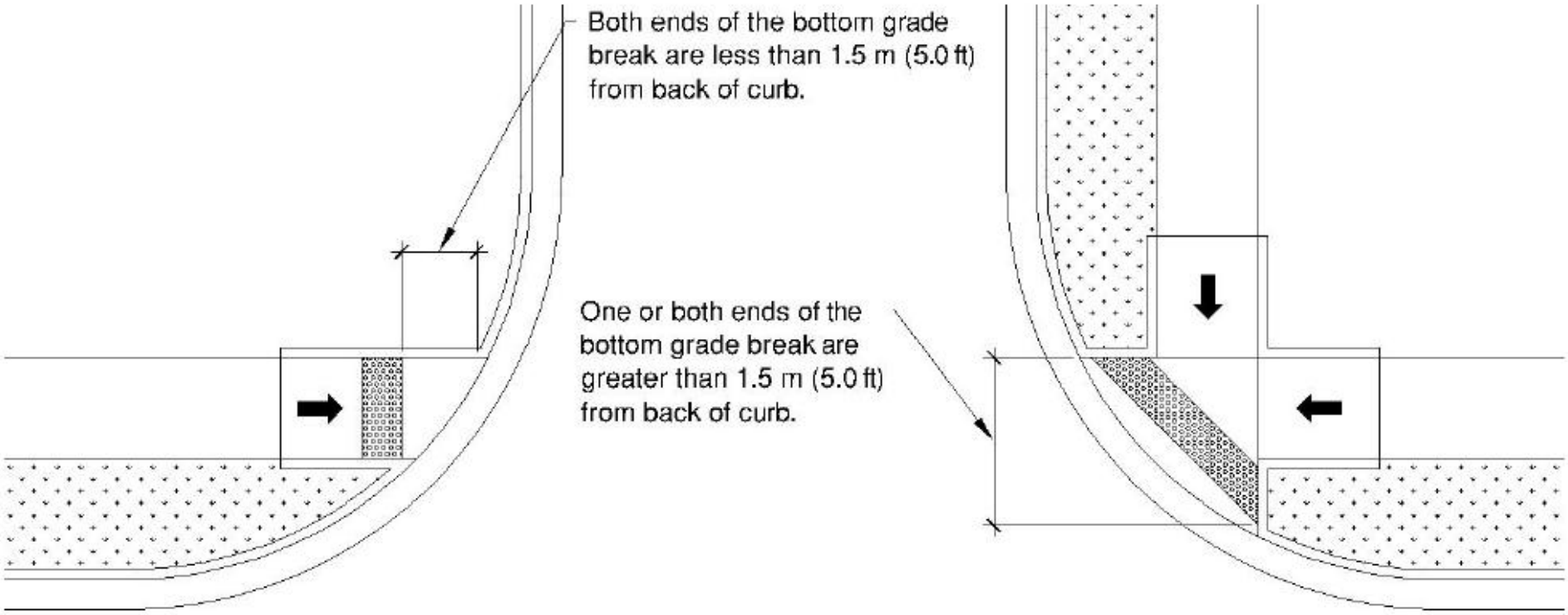


Figure R305.2.1
Perpendicular Curb Ramps

R305.2.1

Detectable Warning Surface – Retrofit Installation

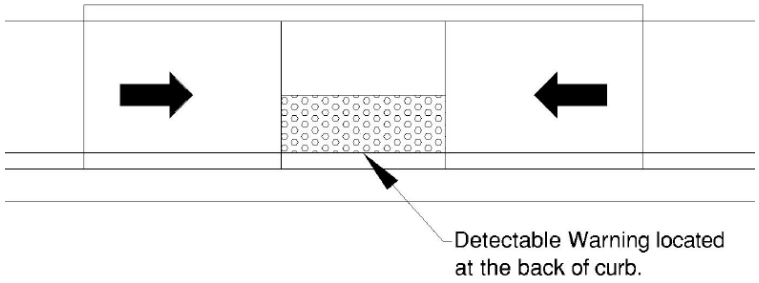
Retrofit installation on non-compliant curb ramp

R305.2.2

Placement – Parallel Curb Ramps

INCORRECT

CORRECT



R305.2.3

Placement – Blended Transitions

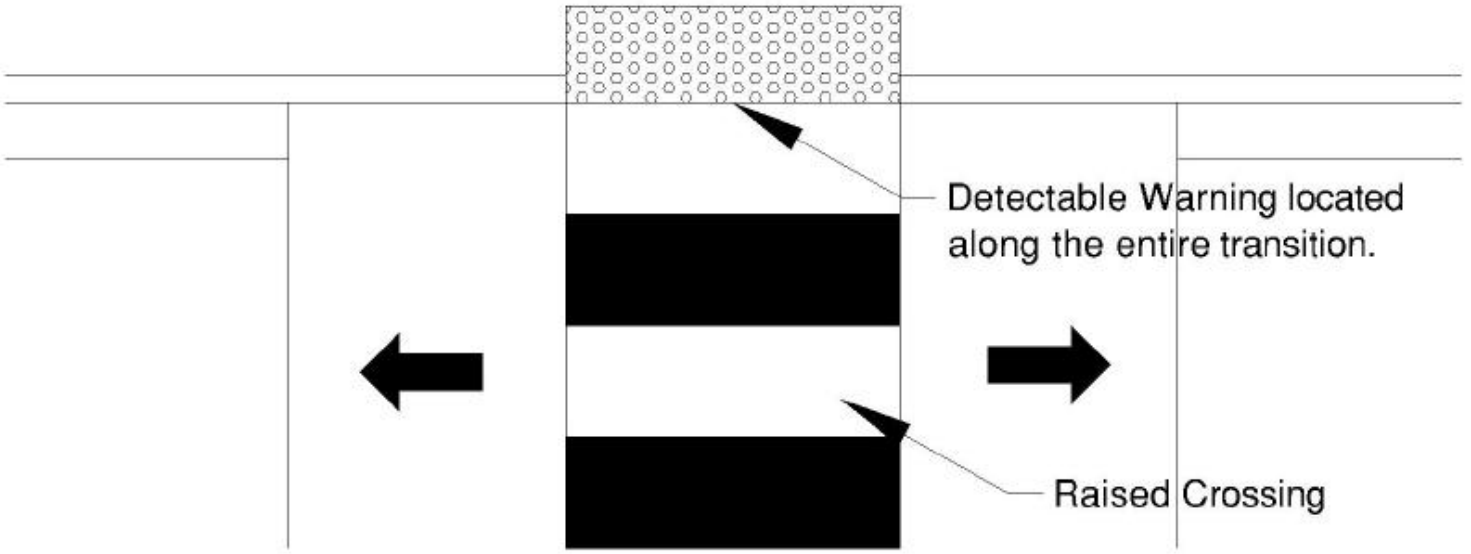


Figure R305.2.3
Blended Transitions

R305.2.3

Placement – Blended Transitions

- Need domes along entire length of removed curb
- INCORRECT:

R305.2.4

Placement – Pedestrian Refuge Islands

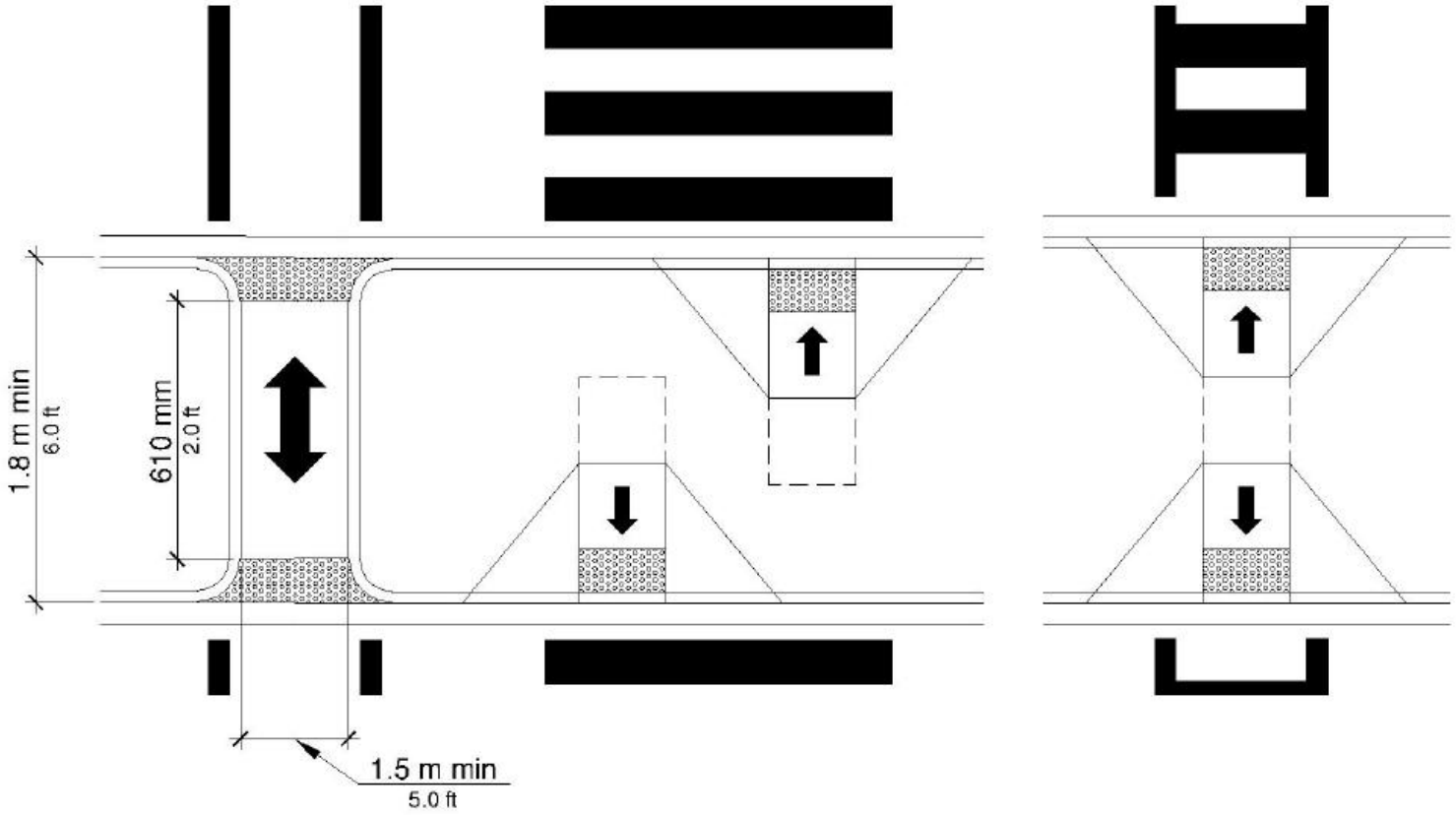


Figure R305.2.4
Pedestrian Refuge Islands

R305.2.5

Placement – At-grade Rail Crossings

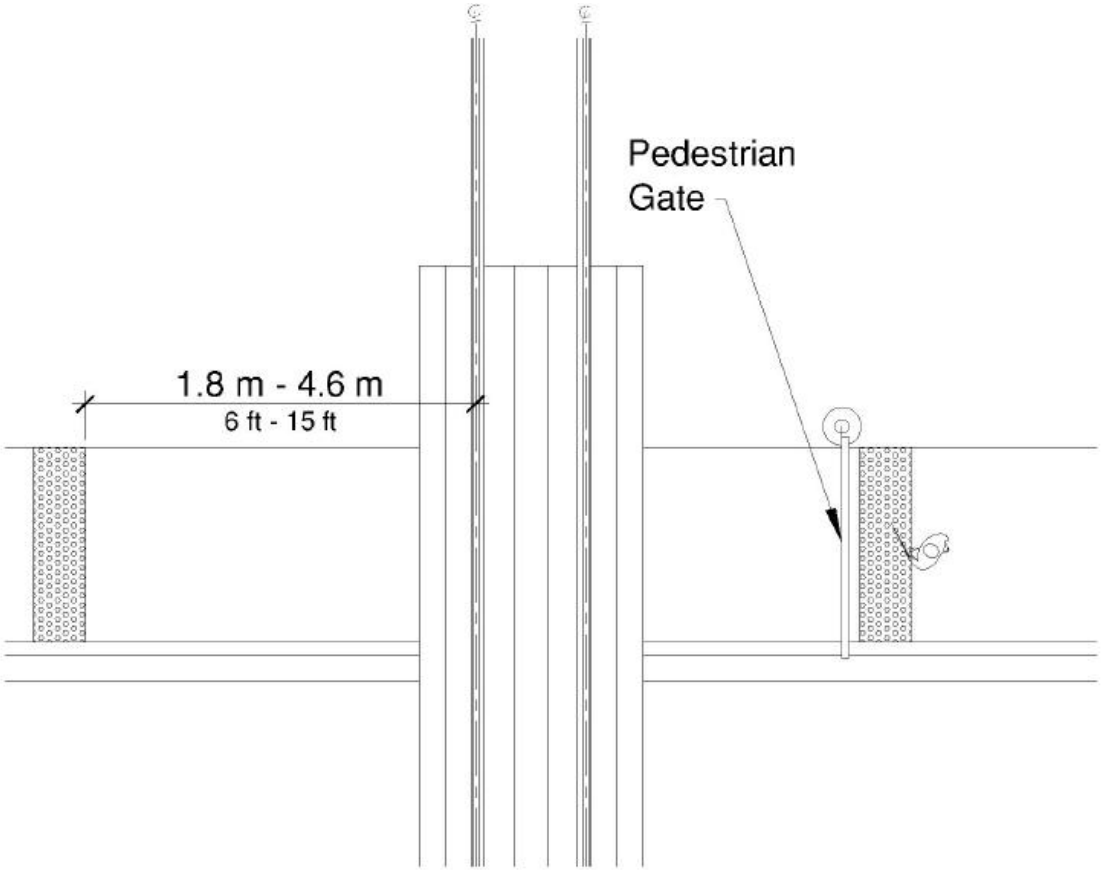


Figure R305.2.5
Pedestrian At-Grade Rail Crossings

Pedestrian Street Crossings

Section R302 / Section R306

R204.3

Scoping

- A pedestrian access route shall be provided within pedestrian street crossings, including:
  - Medians
  - Pedestrian refuge islands
  - Pedestrian at-grade rail crossings
- The pedestrian access route shall connect departure and arrival sidewalks

MUTCD 3B.18

Crosswalk Markings

- Standard: Solid white lines not less than 6 inches or greater that 24 inches
- Guidance:
  - At midblock crossings, crosswalk markings legally establish the crosswalk
  - Install where engineering judgement indicates they are needed to direct pedestrian to the proper crossing paths. Engineering study for midblock crossings.
  - Markings should be location so that the curb ramps are within the extension of the crosswalk markings

MUTCD 3B.16

Crosswalk Markings

- Guidance:
  - Stop and yield lines should be placed a minimum of 4 feet in advance of the nearest crosswalk line at controlled intersections
  - In absence of marked crosswalk, the stop and yield lines should be placed at the desired stopping or yielding point, but should not be placed more than 30 feet or less than 4 feet from the nearest edge of the intersecting travel way

R306.2

Pedestrian Signal Phase Timing

- Must comply with Manual on Uniform Traffic Control Devices (MUTCD) Section 4E.06
- Clearance times must be calculated using a pedestrian walking speed of 3.5 feet/sec or less

R306.3.1

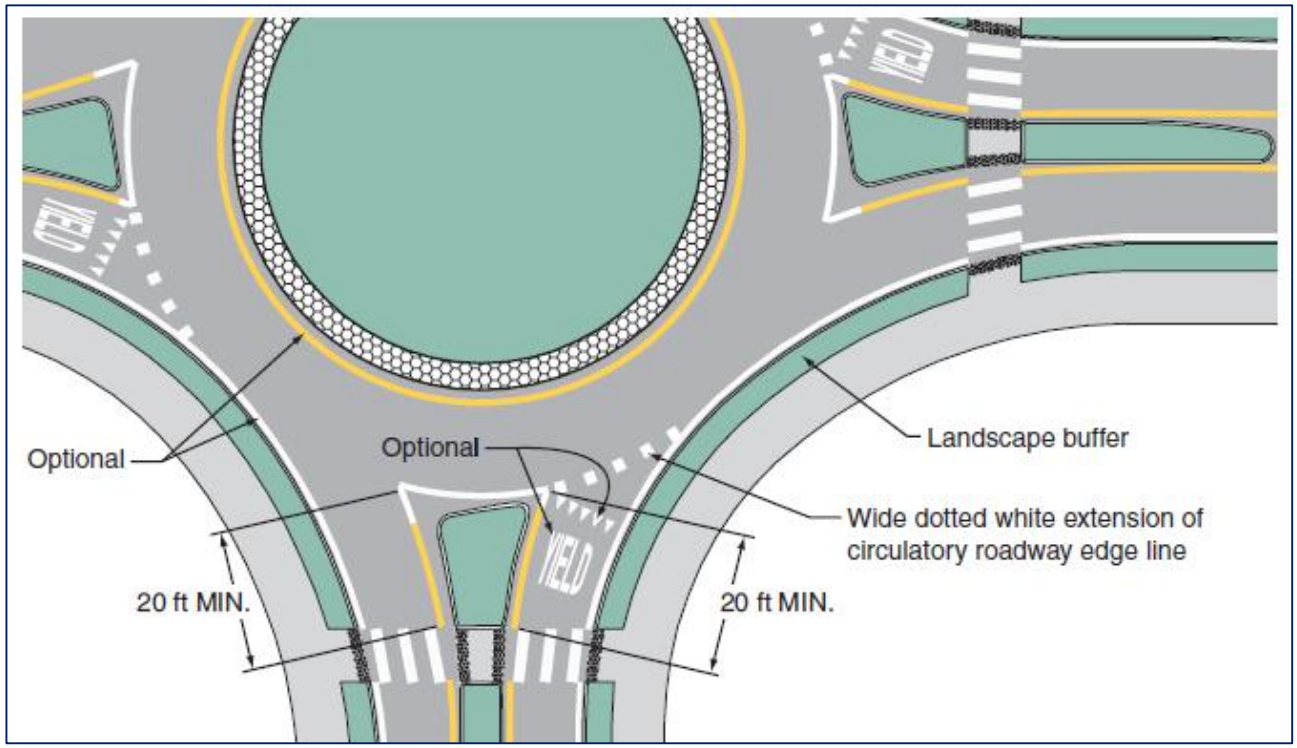
Roundabouts – Separation

Where sidewalks are flush against the curb and pedestrian street crossing is not intended

- Install continuous and detectable edge treatment along street side of sidewalk (e.g., plantings or other defined edges)
- Detectable warning surfaces cannot be used as edge treatment
- If chains, fencing, or rails used for edge treatment, bottom edge must be 15” max. above sidewalk

R306.3.1

Roundabouts – Separation



Source: MUTCD

Roundabouts – Pedestrian Activated Signals

R306.3.2/
R306.3.4

- At roundabouts with multi-lane street crossings, provide a pedestrian activated signal
  - For each multi-lane segment of each pedestrian crossing
  - For each splitter island
  - Channelized right turn lanes
- Pedestrian activated signal must comply with PROWAG Section R209: Accessible Pedestrian Signal and Pedestrian Pushbuttons

R306.5

Channelized Turn Lanes at Other Signalized Intersections

At signalized intersections other than roundabouts with pedestrian street crossings, pedestrian activated signals complying with PROWAG R209 shall be provided at pedestrian street crossings at multi-lane channelized turn lanes

Accessible Pedestrian Signals and Pedestrian Pushbuttons

Section R209 / Section R307

R209.1

Scoping

Where pedestrian signals are provided at pedestrian street crossings, they must include accessible pedestrian signals and pedestrian pushbuttons complying with Sections 4E.08-4E.13 of the Manual on Uniform Traffic Control Devices (MUTCD)

Associated PROWAG Sections

- R403: Operable Parts
- R404: Clear Spaces
- R406: Reach Ranges

R209.1

Scoping

- Accessible Pedestrian Signals (APS) and Pedestrian Pushbutton

- Integrated device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision

Source: Polara.com

R209.2

Scoping – Alterations

Existing pedestrian signals must be upgraded to APS when the signal controller and software are altered, or the [pedestrian] signal head is replaced.

- PROWAG does not provide definitions of what constitutes a controller or software alteration and there is no guidance currently available from FHWA or DOJ
- The requirement that pushbuttons be upgraded to APS when the controller software is altered may be removed in the final version of PROWAG

MUTCD
4E.08

Pedestrian Detectors

Location Requirements

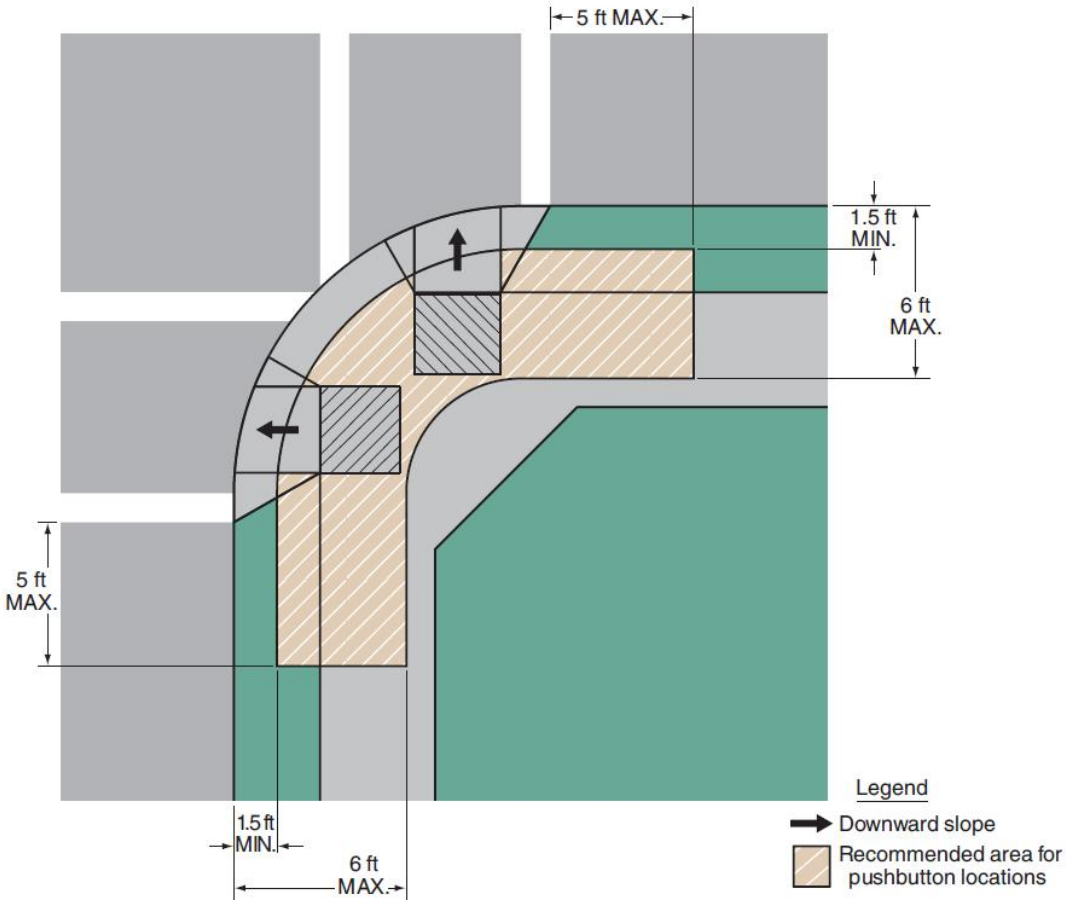
- Unobstructed and adjacent to a level all-weather surface to provide access from a wheelchair
- Where there is an all-weather surface, provide a wheelchair accessible route from the pushbutton to the ramp
- Between the edge of the crosswalk line (extended) farthest from the center of the intersection and the side of a curb ramp (if present), but not greater than 5’ from said crosswalk line
- Between 1.5’ – 6’ from edge of curb, shoulder, or pavement. Where physical constraints make it impractical to place a button less than 6’ from curb, 10’ is the max.

MUTCD
4E.08

Pedestrian Detectors

Location Requirements

Figure 4E-3. Pushbutton Location Area



Pedestrian Detectors

Pedestrian Detectors

MUTCD 4E.08/
PROWAG R406.3

- Pushbutton Orientation
  - Face of button must be parallel to crosswalk to be used
- Pushbutton Mounting Height
  - Measured from top of sidewalk
  - Approximately 3.5’
  - Min: 1.25’
  - Max: 4’

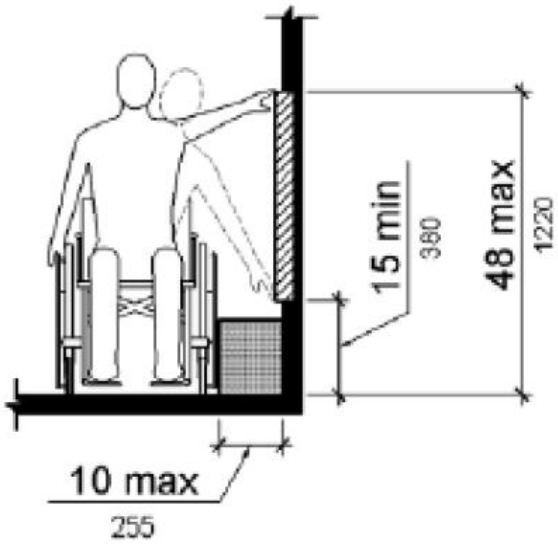


Figure 308.3.1 Unobstructed Side Reach

Pedestrian Detectors

MUTCD 4E.08/
PROWAG R406.3

Incorrect pushbutton orientation

MUTCD 4E.08/ 4E.10

Pedestrian Detectors

- Pushbutton Separation
  - Where two pushbuttons are provided on same corner they should be separated by a distance of 10’
  - Where there are physical constraints on a particular corner that make a 10’ separation impractical, the pushbutton may be placed closer together or on the same pole
  - If pushbuttons are placed less than 10’ apart or on same pole, each pushbutton must have:
    - Locator tone
    - Tactile arrow
    - Speech walk message of the WALKING PERSON (symbolized WALK) indication
    - Speech pushbutton information message

MUTCD
4E.08

Pedestrian Detectors

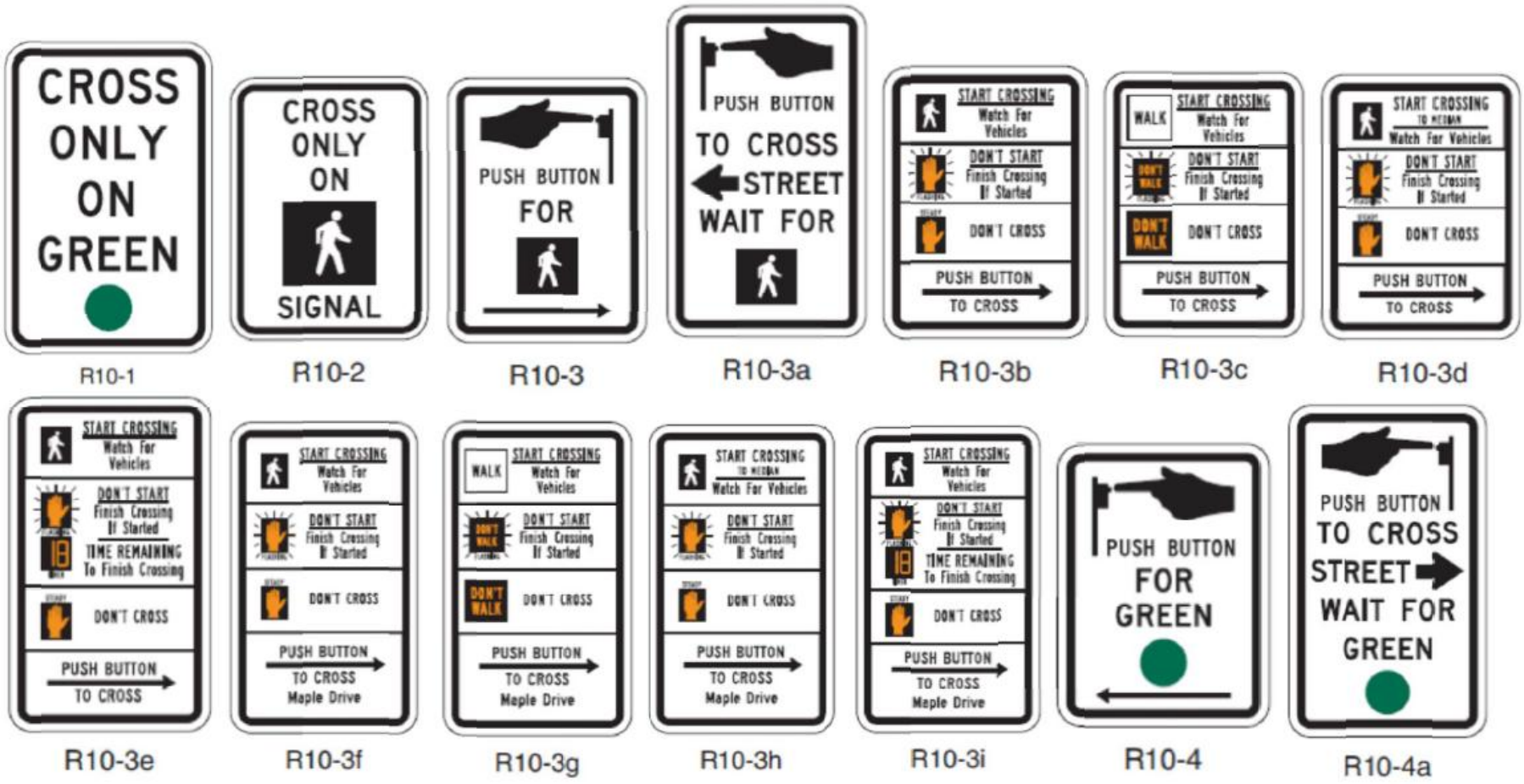
Pushbutton Signs

- Must be mounted adjacent or integral with the pedestrian pushbuttons, explaining their purpose and use
- Positioning and legends on sign must clearly indicate which signal is actuated by each pedestrian pushbutton
- If additional crossing time is provided by mean of an extended pushbutton press, and PUSH BUTTON FOR 2 SECONDS FOR EXTRA CROSSING TIME (R10-32P) plaque must be displayed

MUTCD 4E.08/ 4E.10

Pedestrian Detectors

MUTCD Pushbutton Signs



MUTCD 4E.08/ 4E.10

Pedestrian Detectors

Pushbuttons in Medians

- If the pedestrian clearance time at an actuated signal is sufficient only to cross from curb or shoulder to a median of sufficient width for pedestrians to wait, an additional pedestrian detector shall be provided in the median

Pedestrian Detectors

MUTCD
4E.08/4E.09
4E.11 - 4E.13

- Pilot Lights – See MUTCD
- APS Operations – See MUTCD
  - Walk Indications
  - Tactile Arrows and Locator Tones
  - Extended Pushbutton Press Features

Pedestrian Detectors

Pushbutton Diameter

- Requirement was in 2005 Draft Version of PROWAG Section R306.3.3 Size and Contrast
- Deleted it from the later versions to prevent duplication and potential conflict and were relying on MUTCD (2009) which was reported to include it
- Inadvertently left out of MUTCD (2009)

R406.3

Pedestrian Detectors

Pushbutton Side Reach

- An obstruction shall be permitted between the clear space and the element where the depth of the obstruction is 10” max.

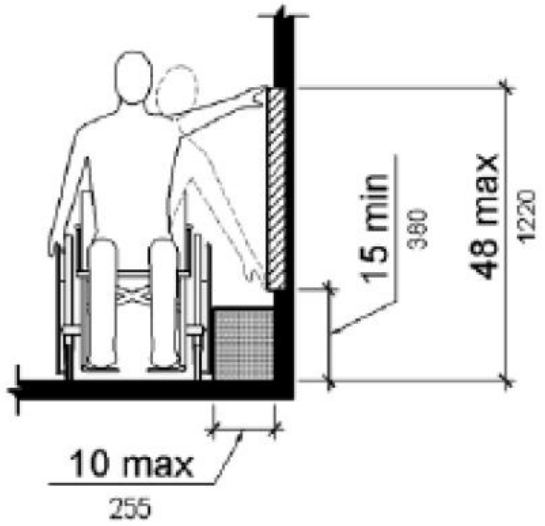


Figure 308.3.1 Unobstructed Side Reach

R406.3

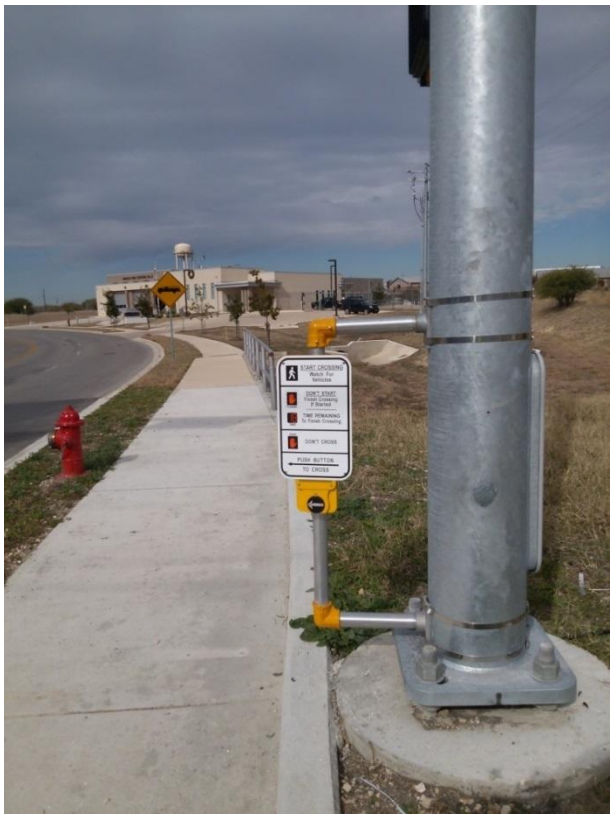
Pedestrian Detectors

No access to clear space

Pedestrian Detectors

MUTCD 4E.08/ PROWAG R406.3

Pushbutton Extenders



R403.4

Pushbutton Detectors – Operation

- Must be operable with one hand
- Force required to activate must be 5 pounds max.

R404.2

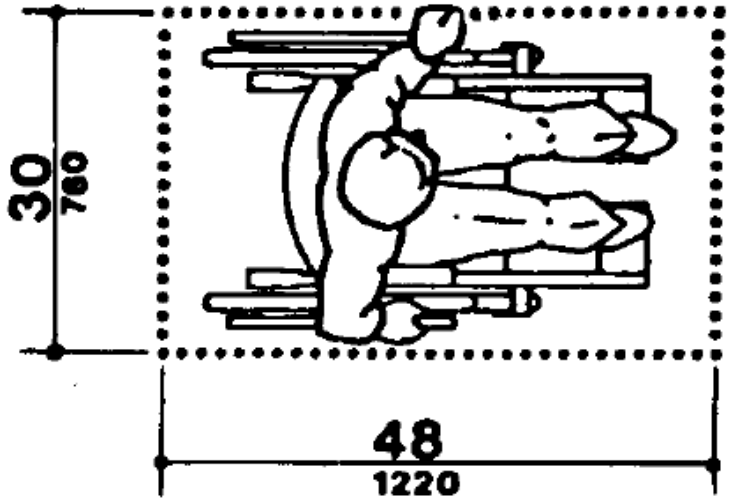
Clear Space – Surfaces

- Must comply with R302.7
- Running slope: May match grade of adjacent pedestrian access route
- Cross slope: 2% max.

R403.3

Clear Space – Size

2.5’ min. x 4.0’ min.



(a)
Clear Floor Space

Fig. 4
Minimum Clear Floor Space for Wheelchairs

(ADAAG)

R403.3

Clear Space – Size

No clear space

R403.5/
R403.6

Clear Space – Position/Approach

- Positioned for either forward or parallel approach to an element

- One full unobstructed side of a clear space shall adjoin a pedestrian access route or adjoin another clear space

R403.6

Clear Space – Approach

One full unobstructed side of a clear space shall adjoin a pedestrian access route or adjoin another clear space

R403.7

Clear Space – Maneuvering Space

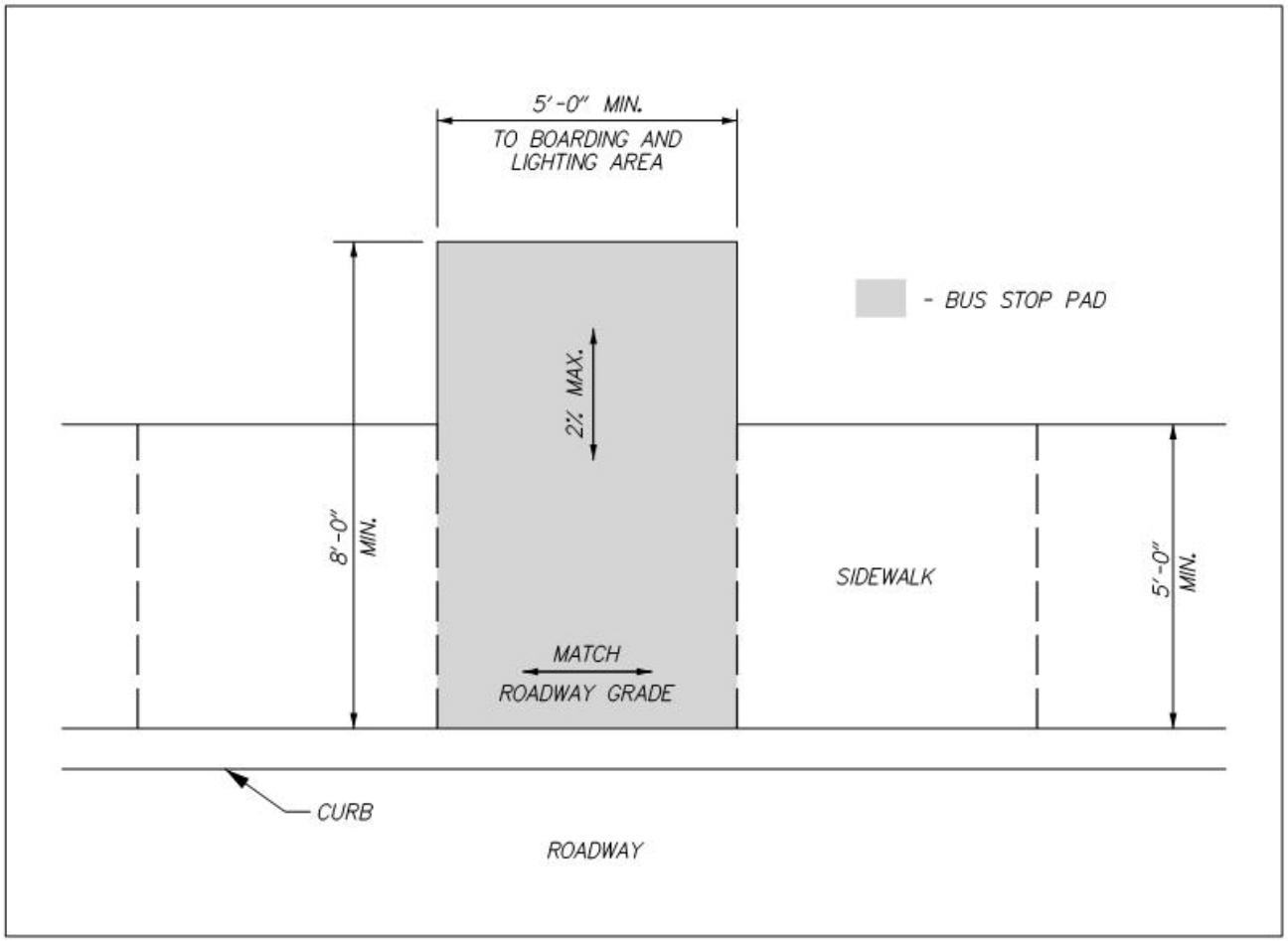
Where clear space is confined on all or part of three (3) sides, additional maneuvering space must be provided

Approach	Width	Depth
Forward	3.0’	2.0’
Parallel	5’	1.25’

Transit Stops and Transit Shelters

Section R308

Boarding and Alighting Areas



R308.1.3.2

Connection

Boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian circulation paths by pedestrian access routes complying with R302

Connection

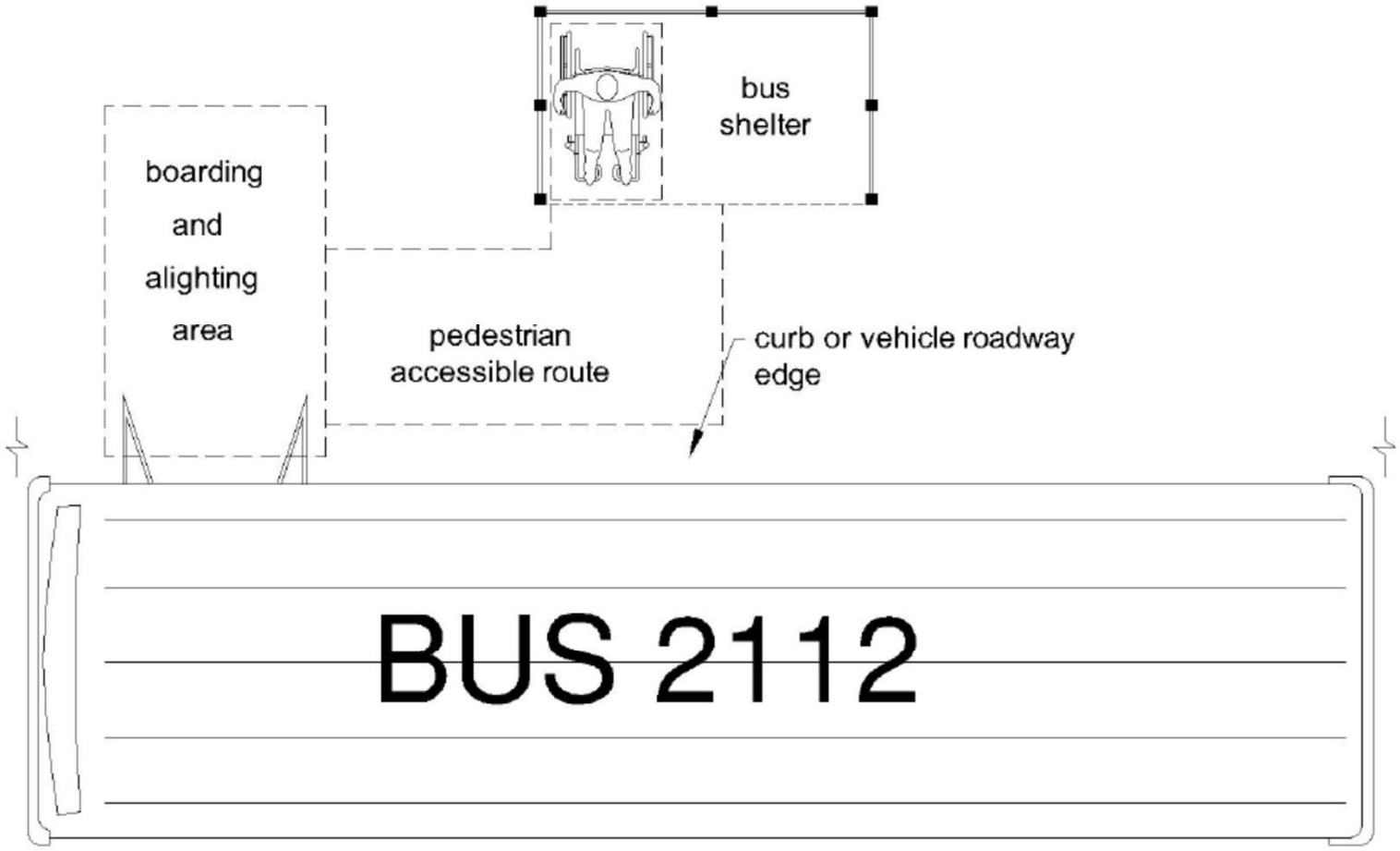


Figure R308.1.3.2
Connection

R212.6

Benches

- At least 50%, but no less than one, of benches at each location shall provide clear space complying with R404 adjacent to the bench
- Clear space shall be located either at one end of the bench or shall not overlap the area within 1.5’ from the front edge of the bench
- Benches at tables are not required to comply

Programmatic Access

- Agencies must have accessible programs, services, and activities, including transit services
- Transit services must be readily accessible to and usable by individuals with disabilities
- If no existing access to transit stop, consider:
  - Installing sidewalk connecting the transit stop boarding and alighting area to the nearest public rights-of-way sidewalk or nearest cross street
  - Relocating the transit stop to a different location along existing sidewalk that connects to a cross street

Visual Characters on Signs

Section R211 / Section R410

R211.2

Pedestrian Signs

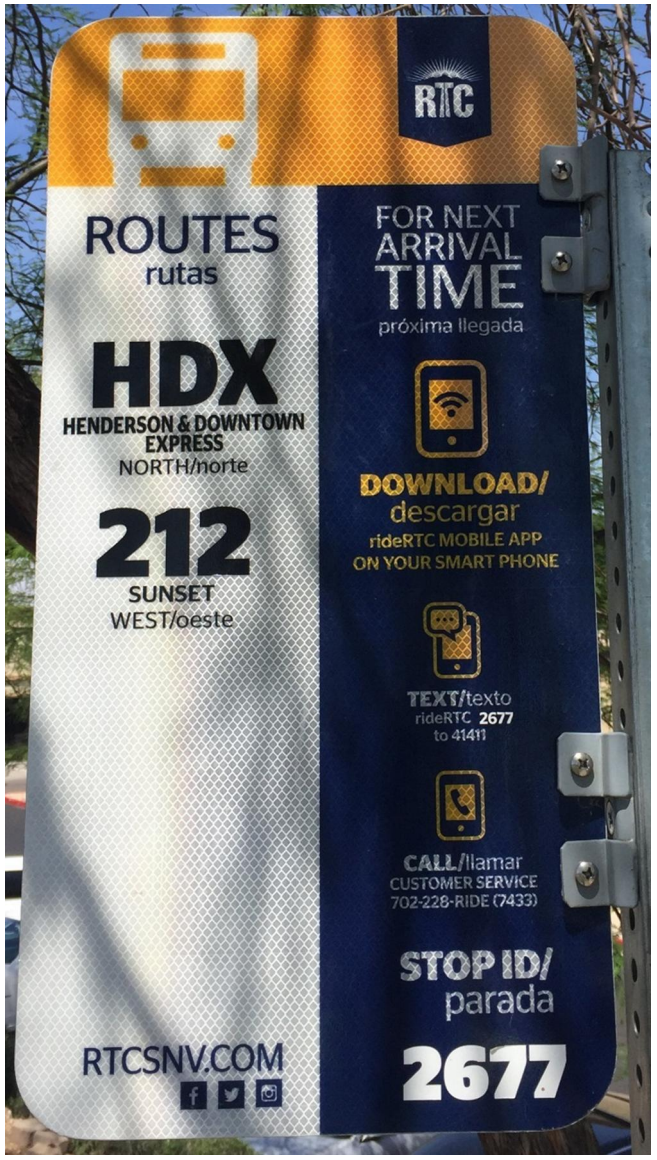
- Signs that provide directions, warnings, or other information for pedestrians only are required to comply with 410
  - Pedestrian route signs along an historic trail
  - Sidewalk closure and pedestrian detour signs
  - Tourist information signs

- Signs provided for motorists and pedestrians (e.g., highway and street name signs) are not required to comply

R211.3

Transit Signs

Signs that identify the routes served by transit stops are required to comply with R410



R211.3

Transit Signs

Transit schedules, timetables, and maps are not required to comply

Sign Design Elements

- Finish and Contrast
- Case
- Style
- Character Proportions
- Character Height
- Height from Finished Surface
- Stroke Thickness
- Character Spacing
- Line Spacing

International Symbol of Accessibility

Section R411

R411

International Symbol of Accessibility

Figure R411
International Symbol of Accessibility

- Non-glare finish
- Symbol must contrast with its background
  - Dark on light
  - Light on dark

R411

International Symbol of Accessibility

- These are not allowed
- Use of the word “handicapped” can be offensive, shows poor etiquette, and has a negative connotation

On-Street Parking Spaces

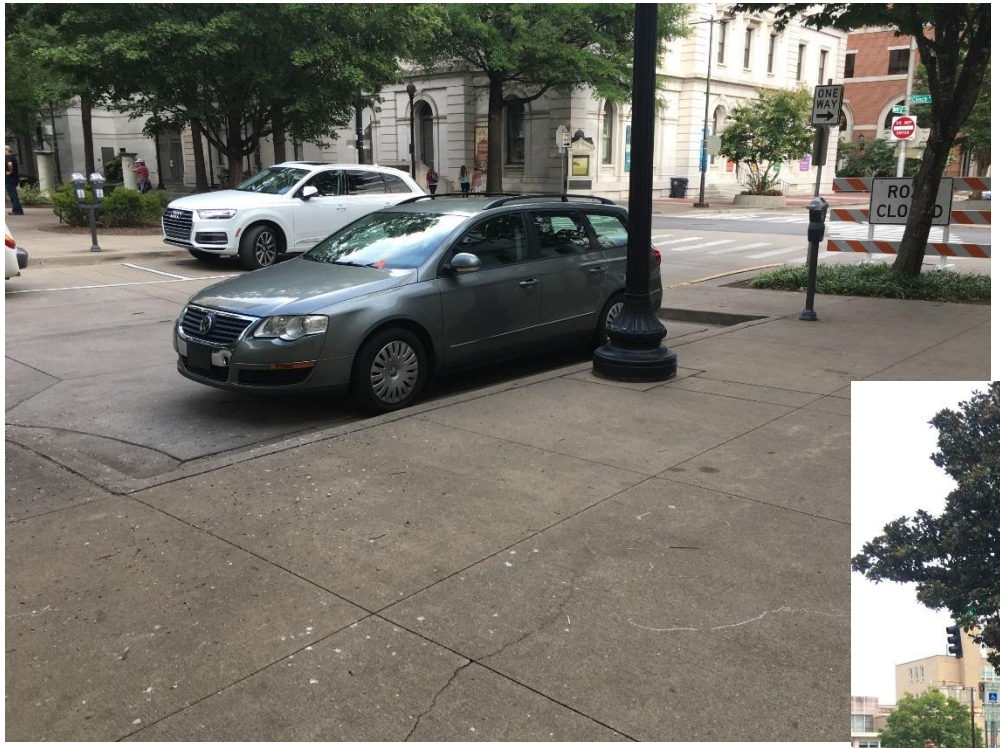
Section R214/ Section R309

R214

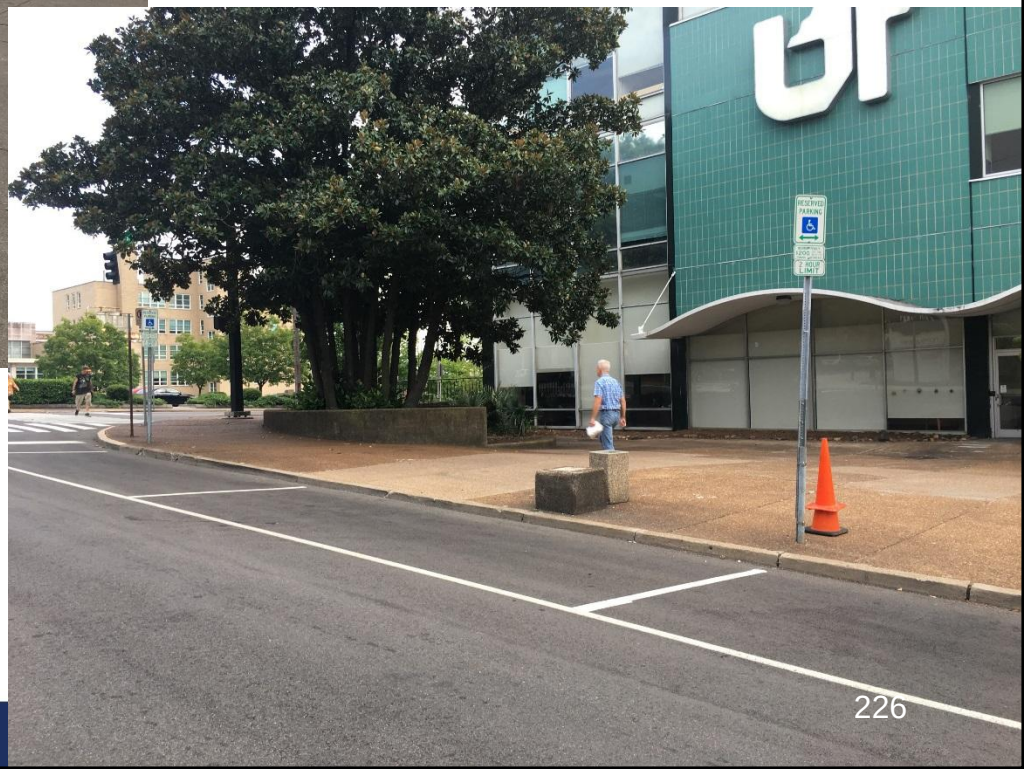
On-Street Parking Spaces

- Where on-street parking is provided on the block perimeter and parking is marked or metered, accessible parking spaces must comply with R309
- Where parking pay stations are provided and parking is not marked, each 20 ft. of block perimeter where parking is permitted shall be counted as one parking space

On-Street Parking Spaces



Obstructions in vehicle lift deployment area



On-Street Parking Spaces

Table R214 On-Street Parking Spaces

Total Number of Marked or Metered Parking Spaces on the Block Perimeter	Minimum Required Number of Accessible Parking Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 and over	4 percent of total

R103.2

Calculation of Percentages

Where the required number of elements or facilities to be provided is determined by calculations of ratios or percentages and remainders or fractions result, the next greater whole number of such elements or facilities shall be provided

R103.2

Calculation of Percentages – Example

On-Street Parking Spaces

203 marked parking spaces on block perimeter; 4% of total required to be accessible

203 * 0.04 = 8.12 → roundup to nearest whole number

9 accessible parking spaces required

R309.2.1

On-Street Parking Spaces – Access Aisles

Parallel Parking: Wide Sidewalk (> 14 ft.)

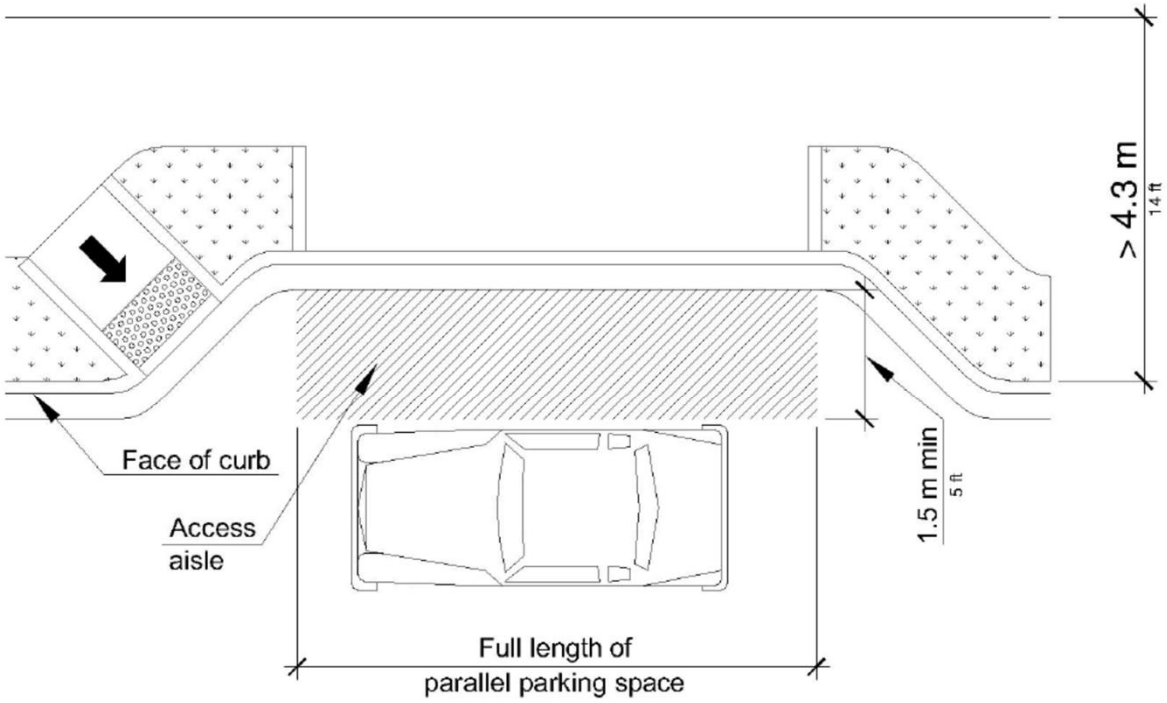


Figure R309.2.1
Wide Sidewalks

R309.2.2

On-Street Parking Spaces – Access Aisles

Parallel Parking: Narrow Sidewalk (≤ 14 ft.)

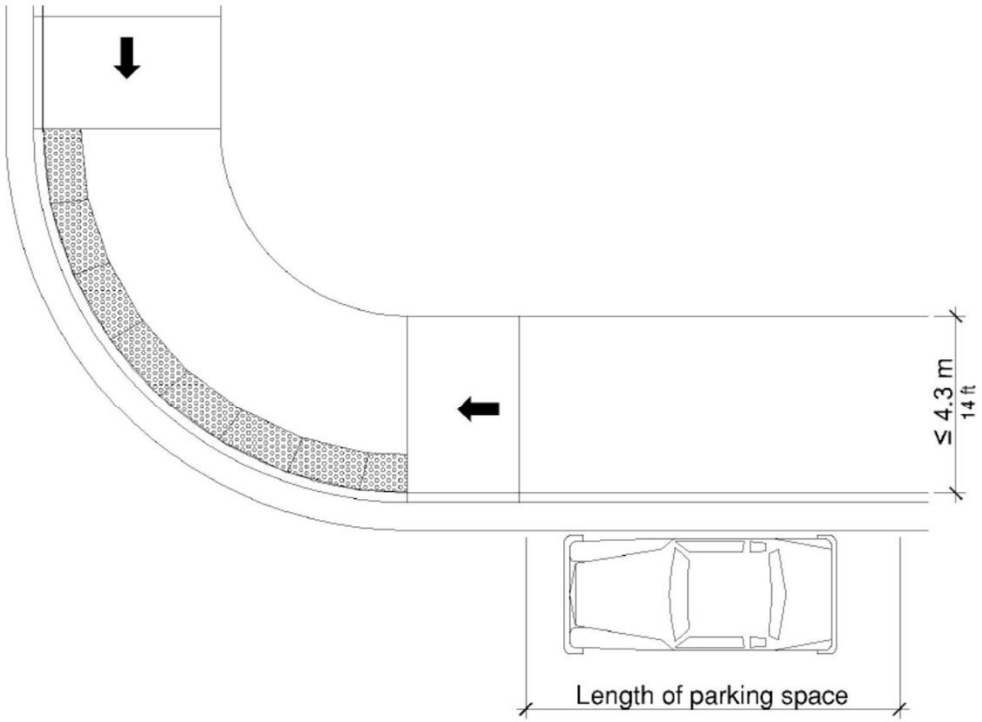


Figure R309.2.2
Narrow Sidewalks

On-Street Parking Spaces

R309.2.3 / 2010 ADA 502.7

- Curb ramps or blended transitions required to connect access aisles to pedestrian access route
- Curb ramps or blended transitions shall not be location within access aisle
- Parking spaces and access aisles shall be designed so that cars and vans, when parked, cannot obstruct the required clear width of adjacent accessible routes (e.g., use wheel stops to prevent vehicle overhang)

R309.2.3

On-Street Parking Spaces

Parking meters/pay stations

- Parallel Parking: Located at head or foot of parking space
- Displays and information shall be visible from a point located 3.3 ft. max. above center of the clear space in the front of the parking meter/pay station

On-Street Parking Spaces

Pay meters at head and foot of parking space

R211.4

Accessible Parking Space Signs

- Spaces shall be identified by displaying the International Symbol of Accessibility complying with R411
- At accessible parallel parking spaces, signs shall be located at the head or foot of the parking space

2010 ADA
502.6

Accessible Parking Space Signs

- Signs identifying van parking space shall contain the designation “VAN ACCESSIBLE”

Handrails

Section R408

Scoping

- Pedestrian Circulation Paths
  - Not required, but may be installed
  - If provided, must be compliant with R409
- Ramps & Stairways
  - Required on ramp runs with rise > 6”
  - Required on all stairways
  - If provided, must be compliant with R409
- Curb ramps
  - Not required and shall not be installed

Handrails

- Where provided, handrails or handrail extensions shall not:
  - Reduce the width of pedestrian access route
  - Constitute a protruding object
- In alterations where handrail extensions would reduce the clear width, handrail extensions are not required

ADA Compliance Best Practices

Best Practices

U.S. Access Board Guidance: *Dimensional Tolerances in Construction and for Surface Accessibility, June 2011*

- Design
- Specifications
- Pre-construction Meetings
- Construction Observations

Design

Design and label plans to create tolerances:

- If standard is a maximum, use less than the maximum
- If the standard is a minimum use more than the minimum
- If the standard is a range, use the midpoint of the range

Design

Designers should provide adequate information on design plans to allow for compliant construction

- Visit your site
- Get survey if needed
- Create location-specific detailed drawings instead of referencing standard details, especially when existing constraints are present
- Seek the feedback of contractors after projects are complete to understand how plans can be improved

Specifications

Use specifications to state requirements

1. What is wanted
2. Standards used
3. How compliance will be verified
4. Result of noncompliance

Specifications – What is Wanted

- State required (e.g., industry standard) installed tolerances for critical construction elements
- If tolerances stricter than those given in an industry standard are required for a specific project, these should be stated, with the recognition that tighter tolerances may increase construction cost or time or both
- State requirements for pre-construction meetings

Specifications – Standards Used

- List all applicable industry standards that define tolerances and measurement protocols, if any
- Set requirements for independent testing agencies that may be required to perform measurement for compliance
- Specify the measurement tools that should be used to determine compliance with the tolerances

Specifications – How Compliance will be Verified

- Define the measurement protocols to be used to check for compliance with the tolerances and standards
  - Where measurements are made
  - How many measurements should be made
  - Number or percentage of measurements that must fall within the limits to be considered acceptable
- Suggested practices are provided in this document

Specifications – How Compliance will be Verified

- Define the measurement tools that should be used
- Acceptable tools should be selected based on the accuracy required and a reasonable balance between the accuracy of the tool and the time, cost, and experience required for measurement

Specifications – Result of Noncompliance

Based on the methods for measuring compliance, define what remedial actions are acceptable when construction elements exceed tolerances

- Total replacement
- Partial replacement
- Adjustment
- Moving
- Filling
- Patching
- Other operations as appropriate for the construction element

Specifications – Result of Noncompliance

- When defining acceptable methods of correction for a non - complying element, give reasonable consideration to how the remedial action may affect construction time, cost, adjacent construction, and appearance

- If possible, give the contractor options for how the element may be brought into compliance

Pre-Construction Meetings

- Communicate the required needs of the project to all interested parties
- Designer can ask if everyone has read the specification requirements and interpreted the drawings correctly
- Unusual or particularly tight tolerances can be discussed, questions asked, construction techniques suggested, measurement methods outlined, and how compliance will be checked can all be brought into the open

Construction Observations

- Final responsibility rests with the contractor; however, design professional should be observing construction and requiring the contractor to use the measurement protocols outlined in the specifications
- For large projects for where extensive accessible surfaces are required, early checking should be done to suggest needed adjustments to construction techniques

Measurement Protocols – Measurement Tools

Measurement	Precision	Recommended Tool
Distance	1/16 in.	Tape measure with 1/16 in. divisions
Slope	• 0.1 degree • 2 ft. level	Digital inclinometers (SmartTool ADA digital slope walker)
Elevation	0.01 ft (1/8 in.)	Tape measure with 1/16 in. divisions

Confirm tools are calibrated per the manufacturer's instructions prior to evaluation

http://smarttoollevels.com/ada-slope-walker/

Measurement Protocols – Measurement Tools

The final check of a cured surface using a walking digital profiler. Image 1 shows the lift, Image 2 illustrates the twist and rotate on one foot of the device, and Image 3 shows the final placement (*i.e.* both feet down) to read the slope. By twisting the knob on the handle, the articulating feet rotate to walk the measurements continuously in 300-mm (12-in.) increments. Readings or samples are taken at every other 300-mm turn—in other words, they are collected at 600-mm (24-in.) increments.

Source: http://smarttoollevels.com/content/uploads/2015/04/ada-concrete-techniques.pdf

Case Studies

Examples


Zone 1

- https://www.google.com/maps/@33.610732,-112.1172858,3a,49.1y,152.49h,78.66t/data=!3m6!1e1!3m4!1sUrniDMeXEmBwfLEd4N-Kkg!2e0!7i16384!8i8192


TRUCKS MUST ENTER
FROM 2ND STREET
NO VISITOR PARKING
IN GARAGE AREA
Earll Dr.
Earll Dr.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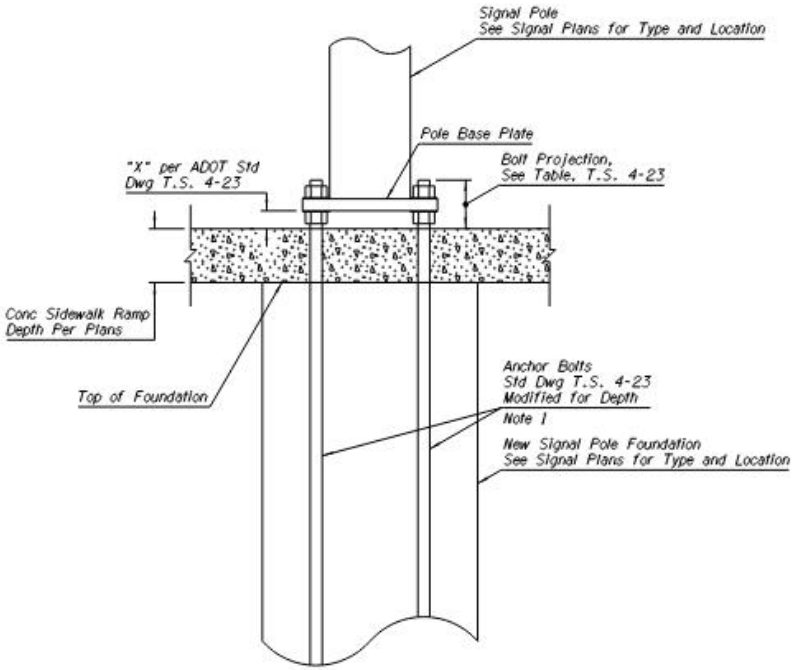
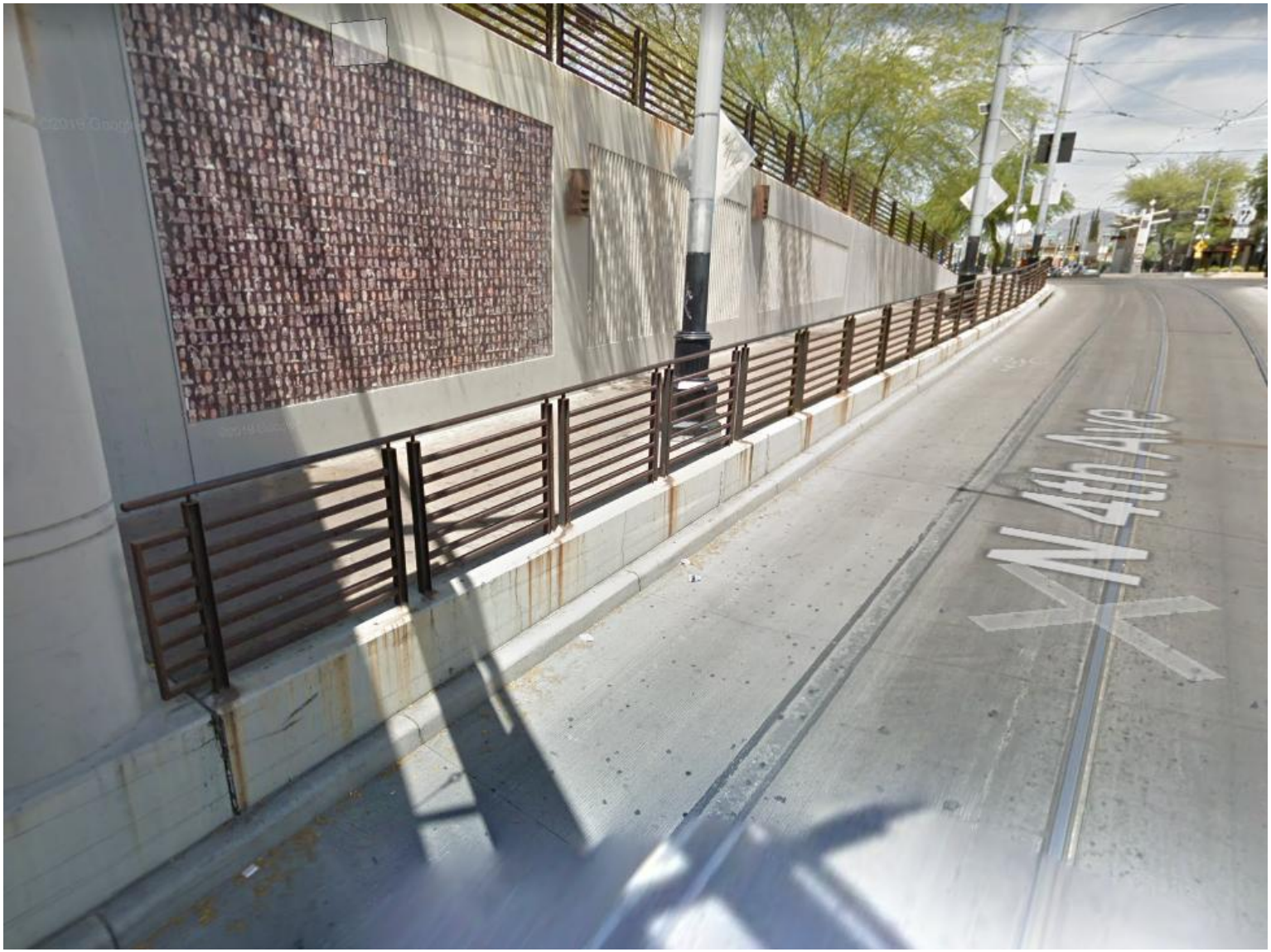

Signal Pole
See Signal Plans for Type and Location
Pole Base Plate
"X" per ADOT Std
Dwg T.S. 4-23
Bolt Projection,
See Table, T.S. 4-23
Conc Sidewalk Ramp
Depth Per Plans
Top of Foundation
Anchor Bolts
Std Dwg T.S. 4-23
Modified for Depth
Note 1
New Signal Pole Foundation
See Signal Plans for Type and Location

ELEVATION

- https://www.google.com/maps/@32.2158324,-110.9742499,3a,50.6y,3.25h,72.41t/data=!3m6!1e1!3m4!1sAy01ISulRy-zOWZ9yhhKcg!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.2158324,-110.9742499,3a,76.4y,163.69h,61.35t/data=!3m6!1e1!3m4!1sAy01ISulRy-zOWZ9yhhKcg!2e0!7i13312!8i6656



- https://www.google.com/maps/@32.2234387,-110.9657282,3a,75y,335.51h,70.18t/data=!3m6!1e1!3m4!1saGtZBw24OpA26JPMh0DOJQ!2e0!7i13312!8i6656

Before

- https://www.google.com/maps/@32.2068736,-111.0117992,3a,64.8y,124.41h,75.55t/data=!3m6!1e1!3m4!1sfm5DLrPsDRa8TmyDwddr-Q!2e0!7i13312!8i6656

After

- https://www.google.com/maps/@32.2068896,-111.011823,3a,49.9y,127.72h,85.23t/data=!3m6!1e1!3m4!1s1-RZ3MP5-kmkDsKmjbtAhg!2e0!7i13312!8i6656

Before

- https://www.google.com/maps/@32.2068896,-111.011823,3a,49.9y,127.72h,85.23t/data=!3m6!1e1!3m4!1s1-RZ3MP5-kmkDsKmjbtAhg!2e0!7i13312!8i6656

After

Before

- https://www.google.com/maps/@32.2962181,-110.9714133,3a,48.9y,183.51h,76.02t/data=!3m6!1e1!3m4!1st0Lh9mUHs_uwI4WLGq9o9g!2e0!7i13312!8i6656

After

Before

- https://www.google.com/maps/@31.9043191,-110.9899909,3a,40.1y,191.92h,81.63t/data=!3m6!1e1!3m4!1sAwxvPIw2OZX43n-Qw4ZLvA!2e0!7i13312!8i6656

After

- https://www.google.com/maps/@32.0903364,-110.9593551,3a,75y,78.29h,87.3t/data=!3m6!1e1!3m4!1sil69xymmiZSTtQjnBCZR-A!2e0!7i13312!8i6656

- https://www.google.com/maps/@31.9631679,-110.7727858,3a,75y,351h,60.89t/data=!3m6!1e1!3m4!1sj5R4G-Z0-LKb4FnNZvuc_w!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.235837,-111.0215471,3a,64.6y,245.28h,88.37t/data=!3m6!1e1!3m4!1sxYnUGELA2RY5k2HtEyrPhg!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.3085271,-110.9024861,3a,75y,340.93h,71.3t/data=!3m6!1e1!3m4!1s1xVIncUaKRWvnaywW6h4pg!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.1778452,-111.0116226,3a,88y,278.49h,82.75t/data=!3m6!1e1!3m4!1syOPrynKKjz8CBClL6cDbRw!2e0!7i13312!8i6656

Before

- https://www.google.com/maps/@32.2068636,-111.0108704,3a,75y,130.39h,70.41t/data=!3m6!1e1!3m4!1sG57hTmwuU7yvHjT3ezWl2A!2e0!7i13312!8i6656

After

- https://www.google.com/maps/@32.2068909,-111.0108651,3a,75y,141.67h,76.52t/data=!3m6!1e1!3m4!1s_BFVCNJqPzsP8M6JZLxtOA!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.3374417,-111.0248688,3a,75y,2.7h,60.21t/data=!3m6!1e1!3m4!1s41puzc2HrYibSsK5qzIAhQ!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.3374383,-111.0248528,3a,75y,0.8h,70.21t/data=!3m6!1e1!3m4!1soC732o43Qu6AWa8fGIwCJA!2e0!7i16384!8i8192

- https://www.google.com/maps/@32.2794024,-110.9601214,3a,49y,63.4h,77.91t/data=!3m6!1e1!3m4!1sQ03maOkS-K9fE5XhktAWpg!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.2624539,-110.9779963,3a,60y,72.45h,77.41t/data=!3m6!1e1!3m4!1srlbnJ3UCJmq05YV7X9xHIg!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.2361487,-110.9402611,3a,75y,357.81h,75.76t/data=!3m6!1e1!3m4!1sYQ3reouvjB5cJ8MokEgl1w!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.2361763,-110.9406034,3a,90y,16.88h,68.04t/data=!3m6!1e1!3m4!1sPKJg75t2VkgAS4bsaiMSBQ!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.3180488,-110.9951754,3a,75y,101.42h,81.15t/data=!3m6!1e1!3m4!1sJkr1lQWVuSDtcRqdCxGF4w!2e0!7i13312!8i6656

Driveway Coaster

- https://www.google.com/maps/@32.3951311,-110.995602,3a,75y,72.18h,65t/data=!3m6!1e1!3m4!1su7hgJUDSx11NzJIxLfqhGw!2e0!7i16384!8i8192

- https://www.google.com/maps/@32.3233078,-110.9949675,3a,75y,357.36h,86.08t/data=!3m6!1e1!3m4!1s9UzEo576XcDQ9jE4Uu22BQ!2e0!7i13312!8i6656

- https://www.google.com/maps/@32.250434,-110.971759,3a,48.9y,358.14h,80.21t/data=!3m7!1e1!3m5!1sq0KiusK-DM2vbDe6znTlww!2e0!6s%2F%2Fgeo0.ggpht.com%2Fcbk%3Fpanoid%3Dq0KiusK-DM2vbDe6znTlww%26output%3Dthumbnail%26cb_client%3Dmaps_sv.tactile.gps%26thumb%3D2%26w%3D203%26h%3D100%26yaw%3D302.20624%26pitch%3D0%26thumbfov%3D100!7i13312!8i6656

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https://www.google.com/maps/@32.2210901,-110.9697189,3a,50.7y,255.05h,74.16t/data=!3m6!1e1!3m4!1sM-mpk3DYiwBSldjTzHI_Fg!2e0!7i13312!8i6656

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