ADA Field Guide

Charlotte Department of Transportation

July 31, 2018

Revised December 2024

The City of Charlotte is committed to making our services and programs accessible to all. Upon request, auxiliary aids, written materials in alternative formats, language access and other reasonable accommodations or modifications will be provided. To make a request, please email charlottedot@charlottenc.gov or call 704-336-4119.

This document is a general guide to aid in field review. All elements must be built in accordance with the approved plans. Any discrepancies between plans and field conditions require redesign by the person(s) signing and sealing the plans. No changes shall be allowed without prior approval.

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General Information

PROWAG: Public Right-of-Way Accessibility Guidelines

Definitions

(taken from PROWAG Section R104.3 unless otherwise noted)

Accessible Pedestrian Signal (APS) (Section R209) – An 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.

Alteration or Altered - A change to a facility in the public right-of-way that affects or could affect pedestrian access, circulation, or use. Alterations include, but are not limited to, resurfacing, rehabilitation, reconstruction, historic restoration, or changes or rearrangement of structural parts or elements of a facility.

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.

Crosswalk – It is an extension of the pedestrian circulation path within the roadway that is an indication to motorists, non-motorists, and pedestrians of the preferred crossing location. Crosswalks may be marked or unmarked.

Cross Slope – The grade* that is perpendicular to the direction of pedestrian travel.

Curb Line – A line at the face of the curb that marks the transition between the curb and gutter, street, or highway.

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.

Detectable Warning Surface (DWS) (Section R305) - consist of truncated domes aligned in a square or radial grid pattern. They must contrast visually with adjacent gutter, street or highway, or pedestrian access route surface, either light on dark or dark on light.

Element – An architectural or mechanical component of a building, facility, space, site or public right-of-way.

Facility – All or any portion of buildings, structures, improvements, elements, and pedestrian or vehicular routes located in the public right-of-way.

Grade Break – The line where two surface planes with different grades* meet.

Non-walkable area – An area that is obstructed or grass/non-paved area adjacent to the pedestrian access route that is not used by the pedestrian for access.

Operable Part – A component of an element used to insert or withdraw objects, or to activate, deactivate, or adjust the element.

Pedestrian Access Route (PAR) – A continuous and unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a pedestrian circulation path.

Pedestrian Circulation Path – A prepared exterior or interior surface provided for pedestrian travel in the public right-of-way.

Public Right-of-Way – Public land or property, usually in interconnected corridors, that is acquired for or dedicated to transportation purposes.

Roundabout – A circular non-signalized intersection which permits a vehicle on a circular roadway to proceed, and with deflection of the approaching vehicle counterclockwise around a central island. Entry to roundabout will be determined by laneage.

Running Slope – The grade* that is parallel to the direction of pedestrian travel.

Shared-Use Path (Multi-Use Path) – A facility designed to provide off-road transportation and recreation for various users, including pedestrians, bicyclists, skaters, and others, including people with disabilities.

* Grade refers to finished grade not of stringline, forms, or wet concrete

Basic ADA Requirements:

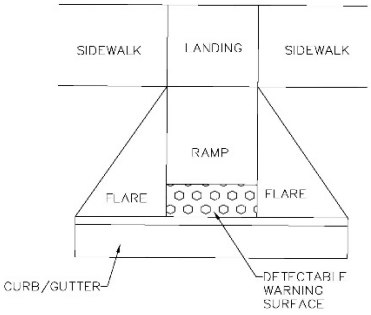
Pedestrian Access Routes (R302):

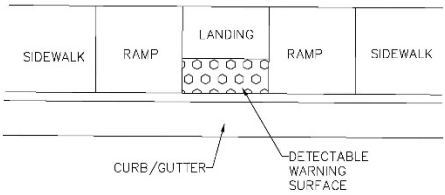
- 2.1% maximum cross slope (1.5% design slope).
- Running slope cannot exceed 5% **OR** the roadway profile grade, whichever is greater.
- PAR width is a minimum of 4 feet (5 feet desirable by City Standard). Top of curb not included.
- Minimum 4 feet (48" continuous clear width) **shall** be free of obstructions.
- Any field changes shall be redesigned by the design engineer and approved by the project manager.
- Vertical curb/hard returns are permitted to be used only when there is a non-walkable surface adjacent to ramp or a vertical obstruction such as a mast arm or signal pole.
- Midblock crossing cross slope are permitted to be equal to street grade.

Accessibility Obligations:

- New construction is required to be accessible.
- Alterations to existing facilities must be accessible to the maximum extent feasible within the scope of the project, as shown in approved plans.
- Existing facilities that have not been altered cannot deny access to persons with disabilities.

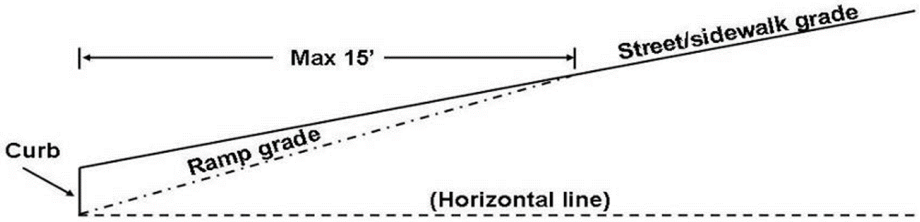
Curb Ramp Terminology:





- **Landing -** where turning maneuvers are performed.
- **Ramp – Running Slope** shall not exceed 8.3%. In some cases, this may not be possible – ramp length need not exceed 15 feet (to avoid chasing grade). If 10% is the best that can be achieved in 15 feet, it is acceptable but extending ramp a few extra feet to meet full compliance should be considered. (see pg. 8 for example)
- **Flares** are not part of PAR**.**
- **Detectable Warning Surface** must be placed at all intersections to streets the entire width of the ramp.
- **Ramp** must be contained within crosswalk (flares do not have to be included). (see pg. 47)

Running Slope (R304.3.1):



- Ramp grades shall have a running slope between 5% minimum and 8.3% maximum but shall not require the ramp length to exceed 15 feet. Exception "15 Foot Rule": The running slope for a curb ramp is not limited to 8.3% maximum if the constructed curb ramp length exceeds 15 feet in length.

Example: Parallel Ramp running slope is 20% for 15 feet in order to tie ramp to existing street crossing

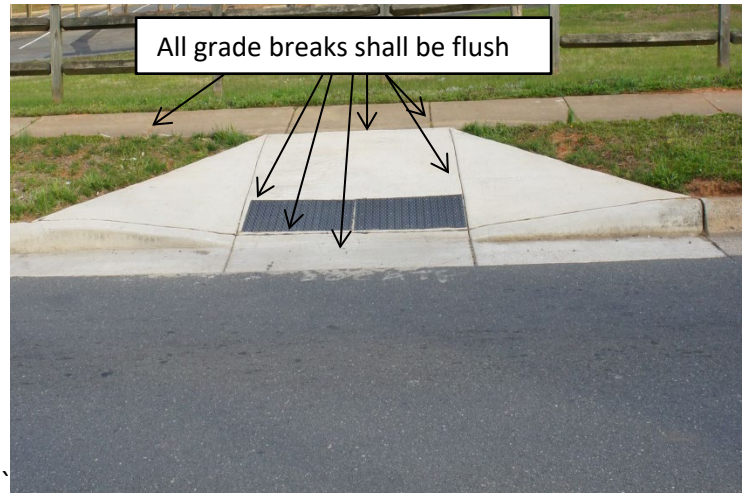
Example: Directional Ramp running slope is 14% for 15 feet in order to tie ramp to existing street crossing

Note: Ramp should be one consistent slope across panels.

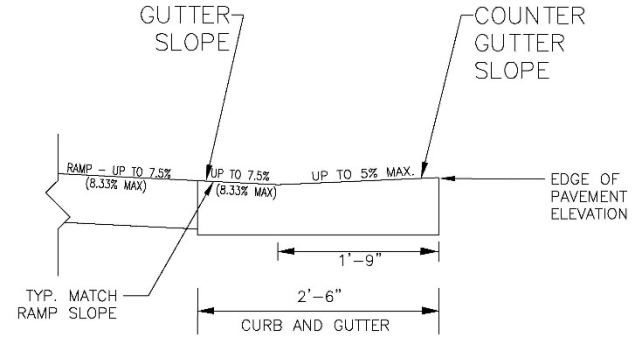
Note: Ramp should be one consistent slope across panels.

Grade Breaks (R302.6.1):

- Surfaces can generally be considered planar when all of the measured cross slopes and running slopes on a surface are equal. If there are low spots greater than 1/4” under a 2-foot level, then the surface will not be considered planar.



Gutter Counter Slope / Change of Grade (R304.5.2)

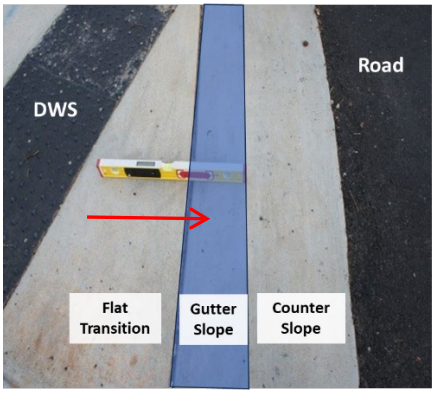


2'–6" CURB AND GUTTER RAMP DETAIL

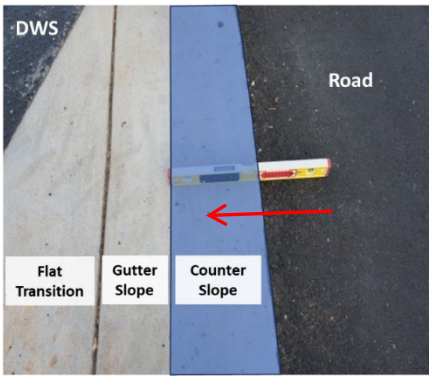
MAXIMUM SLOPES FOR CURB AND GUTTER DEPRESSION AT RAMPS

In an alternation, if the ramp slope is less than 8.3% then the gutter slope can exceed 5.0% but the gutter and counter gutter slope combined cannot exceed 13.3%.

Gutter Slope



Counter Slope



Curb Ramps and Blended Transitions:

Perpendicular Ramp (pg 15-19)

Parallel Ramp (pg. 20-23)

Combination Ramp (pg 24-28)

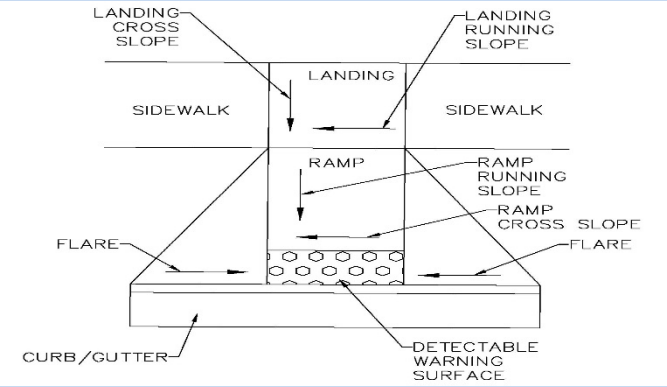
Two Ramps with Shared Landing (pg 29-33)

Directional Ramp (pg. 34-37)

Blended Transition (pg. 38-40)

Curb Ramp Details:

Perpendicular Curb Ramp (R304.2)



Measurements:

- Landing Running Slope = 2.1% or less**
- Landing Cross Slope = 2.1% or less
- Landing Length = match sidewalk width (min 4 feet)
- Landing Width = match sidewalk width (min 4 feet)
- Ramp Running Slope = 8.3% or less
- Ramp Cross Slope = match roadway grade (in alteration, ideally 2.1%)
- Flare Slope = 10.00% or less
- Detectable Warning Surface = 2-foot minimum length x full width of ramp
- Sidewalk Cross Slope = 2.1% or less
- Gutter Slope = 8.3% or less* (see pg. 11)
- Counter Gutter Slope = 5.0% or less* (see pg. 11)

**allowed to match up to road grade, verify on plans

Where to Measure each Element:

Step 1

Check landing cross slope

Place level on the landing perpendicular to road

Step 2

Check landing running slope

Place level on the landing parallel to road

Step 3

Check ramp running slope

Place level on the left, right, and center of the ramp perpendicular to the road

Step 4

Check ramp cross slope

Place level on the front and back of the ramp parallel to the road

Step 5

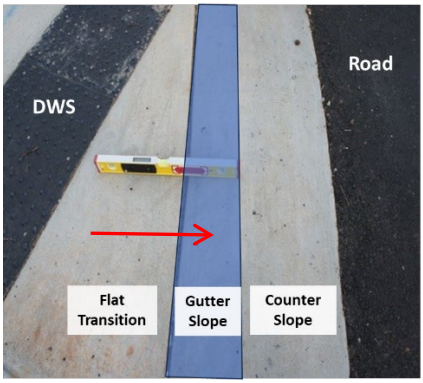
Check left flare slope

Place level on the left flare at the back of curb parallel to the road

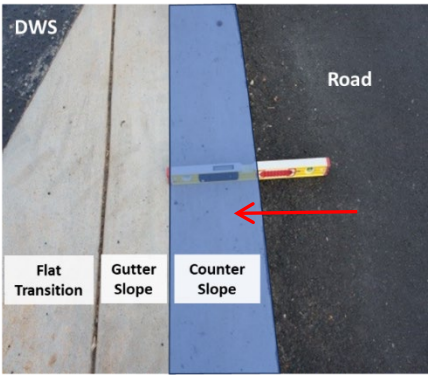
Step 6

Check right flare slope

Place level on the right flare at the back of curb parallel to the road



GUTTER SLOPE



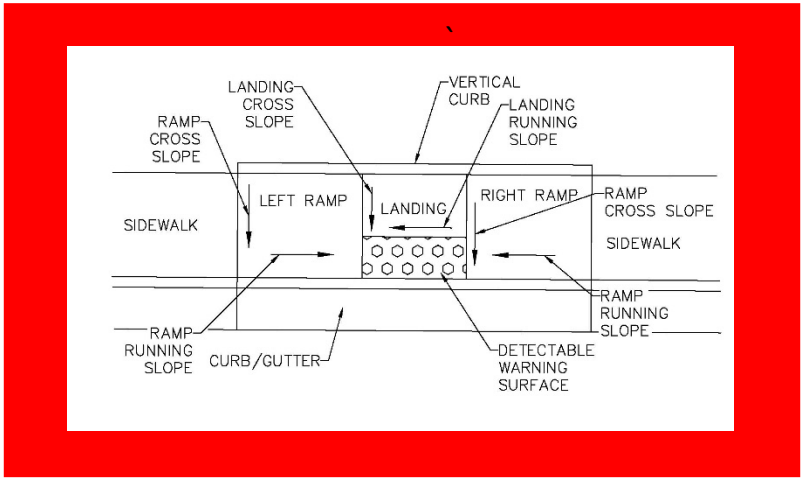
COUNTER SLOPE

Step 7

Check gutter/counter slope

Place level on the gutter to check the gutter slope and counter slope

Parallel Curb Ramp (R304.3)



Measurements:

- Landing Cross Slope = 2.1% or less
- Landing Running Slope = match roadway grade (in alteration, ideally 2.1%)
- Landing Length = sidewalk width (min 4 feet)
- Landing Width = sidewalk width (min 4 feet, min 5 feet with vertical curb)
- Ramp Running Slope = 8.3% or less
- Ramp Cross Slope = 2.1% or less
- Detectable Warning Surface = 2-foot minimum length by full width of sidewalk
- Sidewalk Cross Slope = 2.1% or less
- Gutter Slope = 8.3% or less* (see pg. 11)
- Counter Gutter Slope = 5.0% or less* (see pg. 11)
- Vertical Curb behind Landing (if necessary)

Where to Measure each Element

Step 1

Check landing running slope

Place level at back and front of landing parallel to road

Step 2

Check landing cross slope

Place level perpendicular to road on the left, right, and center.

Step 3

Check ramp (left) running slope

Place level at the curb parallel with the road.

Step 4

Check ramp (left) cross slope

Place level at left and right side of left ramp perpendicular to road

Step 5

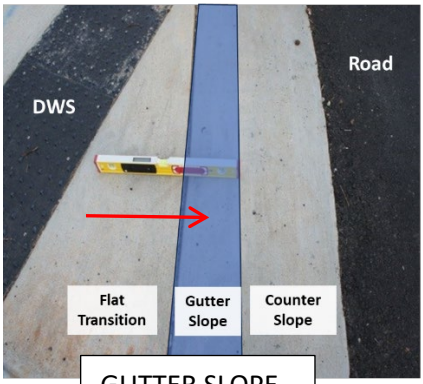
Check ramp (right) running slope

Place level at the curb parallel with the road.

Step 6

Check ramp (right) cross slope

Place level at left and right side of right ramp perpendicular to road

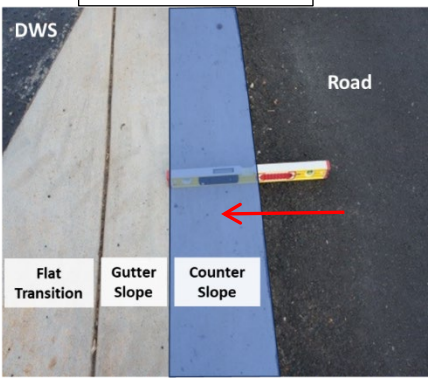


GUTTER SLOPE

Step 7

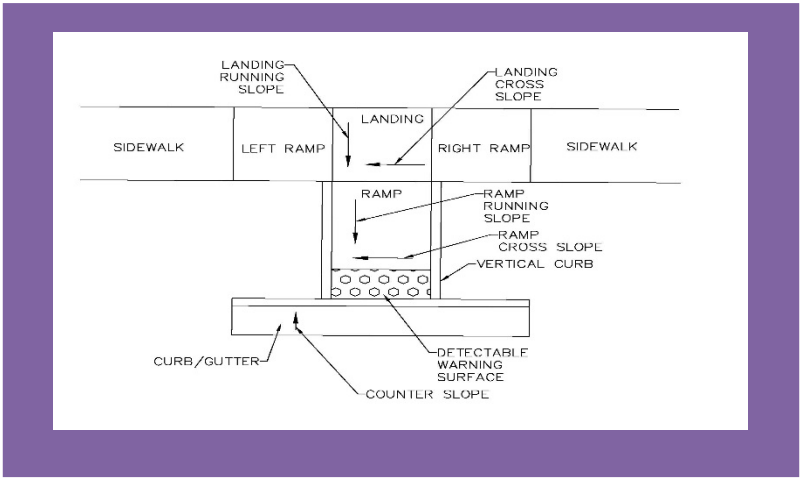
Check gutter/counter slope

Place level at the curb perpendicular towards the ramp and away from the ramp



COUNTER SLOPE

Combination Curb Ramp



Measurements:

- Landing Running Slope = 2.1% or less
- Landing Cross Slope = 2.1% or less**
- Landing Length = match sidewalk width (min 4 feet)
- Landing Width = match sidewalk width (min 4 feet)
- Ramp (Left/Right/Center) Running Slope = 8.3% or less
- Ramp (Left/Right) Cross Slope = 2.1% or less
- Ramp (Center) Cross Slope = match roadway grade (in alteration, ideally 2.1%)
- Detectable Warning Surface = 2-foot minimum length by full width of ramp
- Sidewalk Cross Slope = 2.1% or less
- Gutter Slope = 8.3% or less* (see pg. 11)
- Counter Gutter Slope = 5.0% or less* (see pg. 11)

**allowed to match up to road grade, verify on plans

Where to Measure each Element

Step 1

Check landing running slope

Place level left, right, and center of landing perpendicular to road

Step 2

Check landing cross slope

Place level at back and front of landing parallel to road

Step 3

Check ramp(left) running slope

Place level at back and front of sidewalk on left ramp parallel to road

Step 4

Check ramp(left) cross slope

Place level at left, and right on left ramp perpendicular to road

Step 5

Check ramp(right) running slope

Place level at back and front of sidewalk on right ramp parallel to road

Step 6

Check ramp(right) cross slope

Place level at left, and right on right ramp perpendicular to road

Step 7

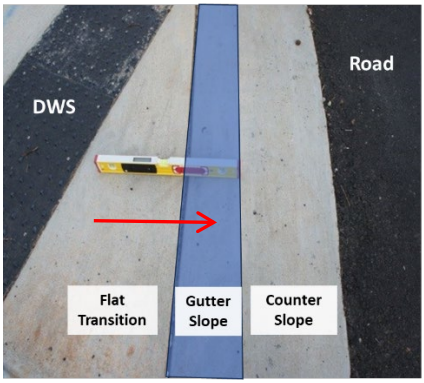
Check ramp(center) running slope

Place level on right, left and in the middle of the center ramp perpendicular to road

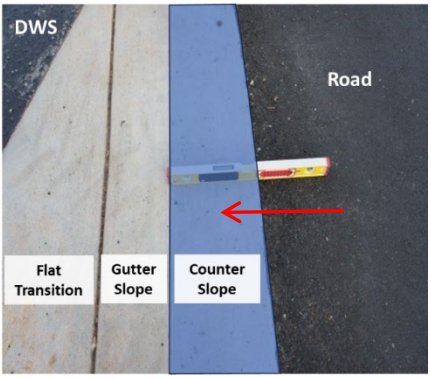
Step 8

Check ramp(center) cross slope

Place level at front and back of center ramp parallel to the road



GUTTER SLOPE



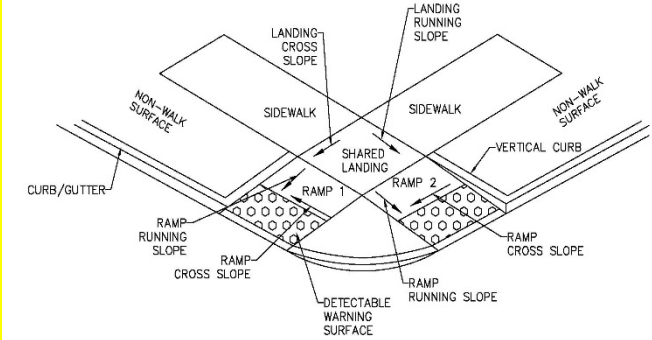
COUNTER SLOPE

Step 9

Check gutter/counter slope

Place level on the gutter to check the gutter slope and counter slope

Two Ramps with Shared Landing



Measurements:

- Landing (Shared) Running Slope = 2.1% or less**
- Landing (Shared) Cross Slope = 2.1% or less**
- Landing Length = same as sidewalk width (min 4 feet)
- Landing Width = same as sidewalk width (min 4 feet)
- Ramp (1 and 2) Running Slope = 8.3% or less
- Ramp (1 and 2) Cross Slope = match roadway grade (in alteration, ideally 2.1%)
- Detectable Warning Surface = 2-foot minimum length by full width of sidewalk
- Sidewalk Cross Slope = 2.1% or less
- Gutter Slope = 8.3% or less* (see pg. 11)
- Counter Gutter Slope = 5.0% or less* (see pg. 11)

**allowed to match up to road grade, verify on plans

Where to Measure each Element

Step 1

Check landing running slope

Place level on shared landing parallel to road

Step 2

Check landing cross slope

Place level on Shared landing perpendicular to road to check cross slope

Step 3

Check Ramp 1 running slope on ramp

Place level on ramp left and right perpendicular to road

Step 4

Check Ramp 1 cross slope on ramp

Place level on ramp front and back parallel to road

Step 5

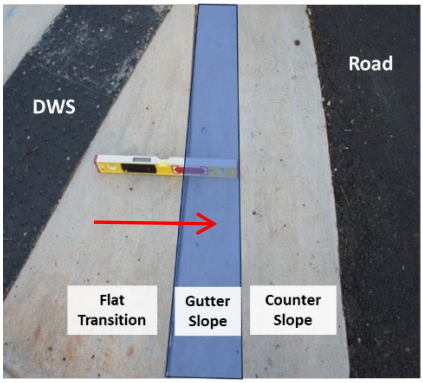
Check Ramp 2 running slope on ramp

Place level on ramp left and right perpendicular to road

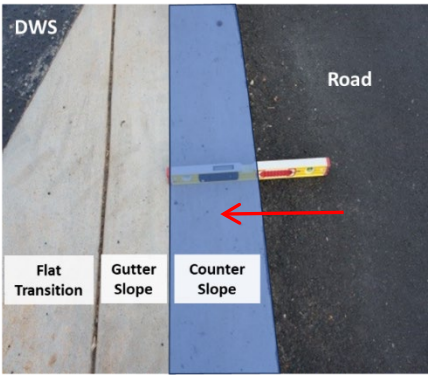
Step 6

Check Ramp 2 cross slope on ramp

Place level on ramp front and back parallel to road



GUTTER SLOPE



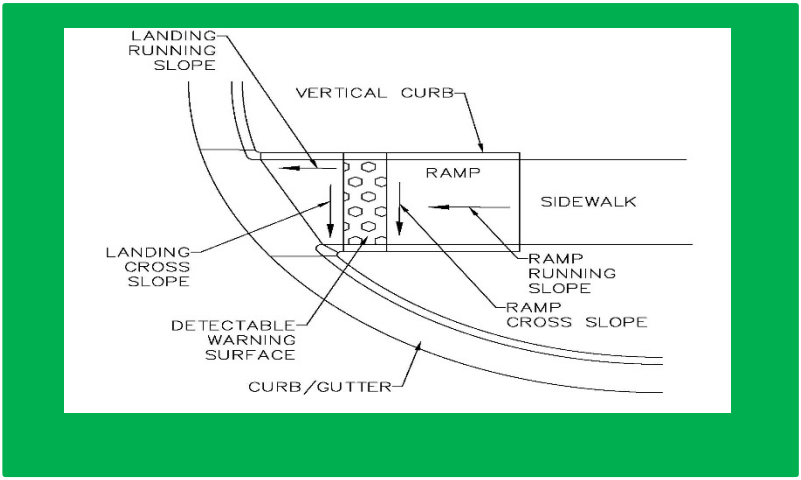
COUNTER SLOPE

Step 7

Check gutter/counter slope

Place level on the gutter to check the gutter slope and counter slope

Directional Curb Ramp



Measurements:

- Landing Cross Slope = match road grade (ideally 2.1%)
- Landing Running Slope = 2.1% or less
- Landing Length = sidewalk width (min 4 feet)
- Landing Width = sidewalk length (min 4 feet)
- Ramp Running Slope = 8.3% or less
- Ramp Cross Slope = match roadway grade (alterations, ideally 2.1%)
- Detectable Warning Surface = 2-foot minimum length by full width of sidewalk
- Sidewalk Cross Slope = 2.1% or less
- Gutter Slope = 8.3% or less* (see pg. 11)
- Counter Gutter Slope = 5.0% or less* (see pg. 11)

Where to Measure each Element:

Step 1

Check landing cross slope

Place level parallel with road in front of domes

Step 2

Check landing running slope

Place level perpendicular to road

Step 3

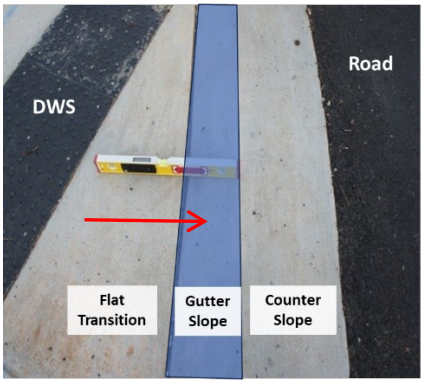
Check ramp running slope

Place level perpendicular to road, place level left, right and center

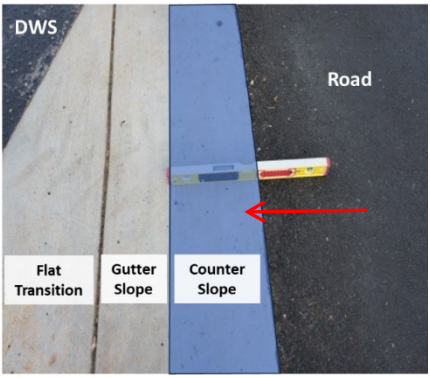
Step 4

Check ramp cross slope

Place level parallel to road



GUTTER SLOPE



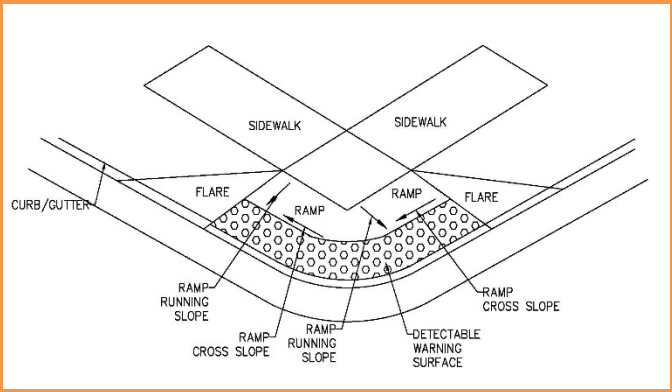
COUNTER SLOPE

Step 5

Check gutter/counter slope

Place level at the curb perpendicular towards the ramp and away from the ramp

Blended Transition (R304.4)



Measurements:

- Running Slope = 5.0% max
- Cross Slope = match roadway grade (alterations, ideally 2.1%)
- Detectable Warning Surface = 2-foot minimum length by full width of blended transition
- Sidewalk Cross Slope = 2.1% or less
- Gutter Slope = 5.0% or less* (see pg. 11)
- Counter Gutter Slope = 5.0% or less* (see pg. 11)

Where to Measure each Element:

Step 1

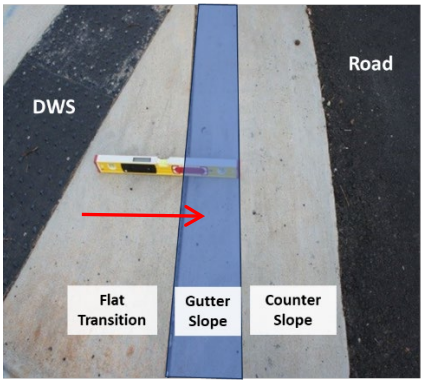
Check ramp cross slope

Place level perpendicular to road in front of domes

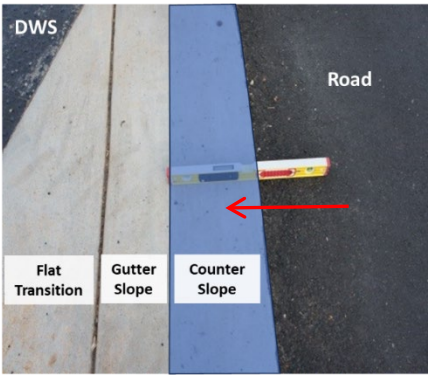
Step 2

Check ramp running slope

Place level parallel to road



GUTTER SLOPE



COUNTER SLOPE

Step 3

Check gutter/counter slope

Place level at the curb perpendicular towards the ramp and away from the ramp

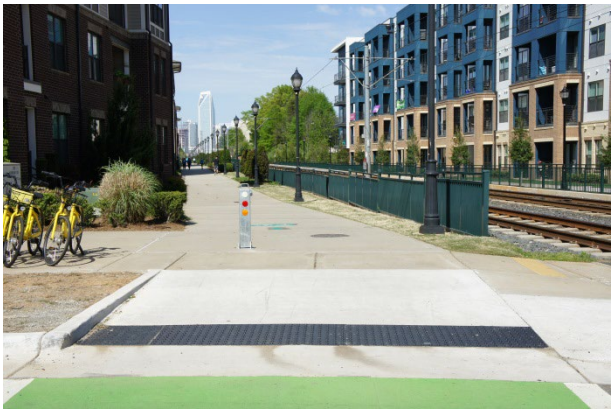
Changes in Level (R302.6.2):

Vertical differences in level between two adjacent surfaces.

- There can be no more than a ¼” maximum vertical elevation difference between sidewalk surfaces.
- Any Changes between a ¼” and a ½” should be beveled.

Shared-Use Path (R302.2.2 & R304):

- Running slope (path not parallel to roadway) is 5.0% or less.
- Running slope (path parallel to roadway) should match road grade or be less than or equal to 5.0% if roadway grade is less than 5.0%.
- Cross slope is 2.1% or less for the entire width of the path.
- Ramp width shall match shared-use path width.



Median/Traffic Island/Pedestrian Refuge (R302.2.1):

- PAR is provided that connects to each crosswalk.
- Detectable Warning Surfaces should be placed at least 2 feet apart from each other and extend the entire width of the opening.
- Minimum width of a median/island/refuge shall be 6 feet to require detectable warning surface.

Driveways (R205.7):

Driveways with Planting Strip:

- Driveways with yield or stop-control devices or traffic signals, must have detectable warning surfaces where the sidewalk meets the driveway (R305.2.8).
- Sidewalk through the driveway width shall be no more than 2.1% max cross slope for 4 feet minimum.

Check cross slope at driveway

Place level on the sidewalk perpendicular to the road through the driveway to check the cross slope. Check at the beginning, middle and end of the driveway.

Driveways at Back of Curb:

- Sidewalk through the driveway width shall be no more than 2.1% max cross slope for 4 feet minimum.
- The sidewalk will ramp down on either side of the driveway at no more than 8.3% max (7.5% design)
- Ramps shall be considered parallel ramps (see pg. 20-23).

Check cross slope at driveway

Place level on the sidewalk perpendicular to the road through the driveway to check the cross slope. Check at the beginning, middle and end of the driveway.

Check ramp slope at driveway

Place level on the sidewalk parallel to the road on the ramp down to the driveway to check the running slope. Check at both ramps to the driveway.

Crosswalks (R304.5.3 & R306):

- Detectable Warning Surface on the ramp must be contained within the crosswalk.

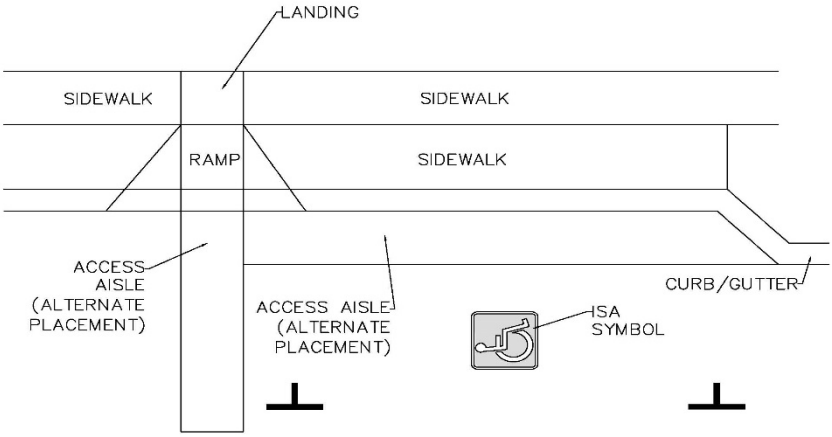
- If there is one ramp serving both crosswalks confirm that there is a 4’x4’ space not in the travel lane to serve as a turning space.

- In new road construction, pedestrian crossings **without** yield or stop control can be 5.0% maximum.
- In new road construction, pedestrian crossings **with** yield or stop control can be 2.1% maximum.

Roundabouts (R306.4)

- Where crossings are not intended:
    - DWS may not be used for roundabout edge detection.
    - If the pedestrian circulation path is not attached to the curb, it must be separated with a minimum 24-inch-wide landscaping or other nonprepared surface. A planting strip is an example of this.

Accessible Parking Spaces (R310):



- Ramp to the parking space shall be inspected per guidelines on pages 15-37 depending on ramp type. Truncated domes are not required, nor desired if the ramp leads into the access aisle.
- Tick marks shall be placed at the start and end of the parking stall.
- Access aisle shall be free of obstructions and width should be a 5-foot minimum.
- The sidewalk adjacent to the accessible aisle shall be free of obstructions and shall be 2.1% max cross slope.
- Two accessible spaces are allowed to share a ramp if they are next to each other.

- An access aisle shall be provided if the width of the sidewalk or right of way is greater than 9 feet. (R310.2.1)
- Markings shall be installed as per standard including a blue background and white border around the ISA (International Symbol of Accessibility) symbol.
- Refer to Charlotte Land Development Standards Manual Std 50.09D for more information.

Transit (Bus) Stops (R210 and R309):

- Bus pad cross slope shall be 2.0% max, but not to exceed 2.1%, as identified by PROWAG.
- Bus pad running slope shall match road grade.
- Bus stops shall follow CATS standard plans.

To Measure a Bus Waiting Pad

Step 1

Check bus pad cross slope

Place level on the left, center, and right side of bus pad perpendicular to the road

Step 2

Check bus pad running slope

Place level at front, middle and back of bus pad parallel to the road

Technical Infeasibility Form

When it is not possible to meet PROWAG requirements due to physical constraints, a Technical Infeasibility Form is required to be filled out and submitted to the Technical Infeasibility Committee for review and approval.

Please contact:

Krystal Bright at krystal.bright@charlottenc.gov for the form.

Final Thoughts:

1. Level landings are required where pedestrians perform turning maneuvers. Running and cross slopes cannot exceed 2.1%.
2. Ramps **must** be contained within the crosswalk (excludes flares).
3. Flares between ramps can have a minimum curb height of 2 inches to meet compliance.
4. Slopes indicated are maximum slopes and cannot be exceeded.
5. To avoid chasing grade, the **curb ramp** length need not exceed 15 feet. If ramp is 15 feet long and the **running slope** is 10.0% - that is okay. However, if full compliance can be met by increasing ramp to another foot or two – consider doing so. This does NOT mean that you must maintain the 8.3% for 15 feet nor does it mean that you can make the ramp shorter than 15 feet with a steep grade. Also, the grade must be constant for the 15 (or more) feet. For example, an elevation change of 1.5 feet in 15 feet must be a constant 10.0% slope and cannot be broken into a 5-foot section of 5.0% and a 10-foot section of 12.5%.
6. **Detectable Warning Surfaces** should only be used at commercial garage entrances/exits that have audible and visual warnings.
7. Remember “as a rule of thumb”, grades measured perpendicular to the curb ramp must meet ALL grade requirements, but grades measured parallel to road can exceed maximum slopes, but NOT exceed road grades.
8. As a practice, the City of Charlotte uses a 2 – foot digital level to measure accessible features. The level should be calibrated per the manufacturer’s guidelines. To help prevent measuring errors, the level should be calibrated before each use, or after a heavy impact of fluctuations in temperatures.

For more information:

- Public Right-of-Way Accessibility Guidelines (PROWAG) can be found on the U.S. Access Board Website

- City of Charlotte's Americans with Disability Act Program webpage

- Charlotte Department of Transportation at 704-336-4119

Notes:

Notes: