

ADA Inspection Guide

Curb Ramps and Push Buttons



For general support, contact a member of the ADA Inventory team:
Call (503) 986-3524 or E-mail ODOTStandards@odot.state.or.us



Table of Contents:

Location	1
Intersection Condition Types	3
Identifying Curb Ramp Styles	4
Curb Ramp Measurements	6
Slopes	7
Dimensions	14
Detectable Warning Systems	19
Standard Comments	20
<i>Failures Captured with Comments</i>	22
Required and Recommended Tools	33
Calibrating Smarttool™ levels	34
Push-Button Measurements	36
<i>Clear Space Slopes & Dimensions</i>	36
<i>Reach Range & Height</i>	37
References	38
<i>Design Exception Tolerances</i>	38
<i>Measurement Rounding Guide</i>	39

Produced by ODOT Traffic-Roadway Unit to serve as an inspection guide for ODOT certified ADA inspectors. This guide provides a general overview of definitions, methods of measure and documentation requirements that are relevant at the time of publication.

Always refer to contract documents, including: Project Plans, Special Provisions and any Contract Change Orders when question arise about built features on the project.

Direct any questions to the ADA Technical Team by calling (503) 986-3524, or e-mail at ODOTStandards@odot.state.or.us.

[ODOT's Engineering for Accessibility webpage](#)

On this webpage is information about design requirements for projects that impact ADA accessibility. Topics include: pedestrian curb ramps, sidewalks, bridges, pushbuttons, and pavement surface treatments.

Links on that page will also provide information on processes such as design exception requests, technical guidance, standard drawings and more.

More information about the inspection process is also found there. For example, the "Exhibit A" referenced on the inspection forms and the curb ramp inspection training's frequently asked questions.

Location

LRM / Corner & Ramp Numbering

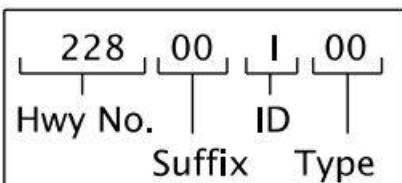
Linear Reference Method (LRM)

Hwy # – will always be three digits e.g. 001, 009, 243, etc.

Suffix – 00 is used for mainlines; connections & frontages will always use a two-lettered suffix.

Roadway ID – This is always either I (increasing) or D (decreasing)

Mileage Type – This will be 00 unless the milepoint is on a section of road listed as Z mileage (*i.e.* the road has been realigned)



Refer to TransGIS for existing corner numbering and for LRM verification.

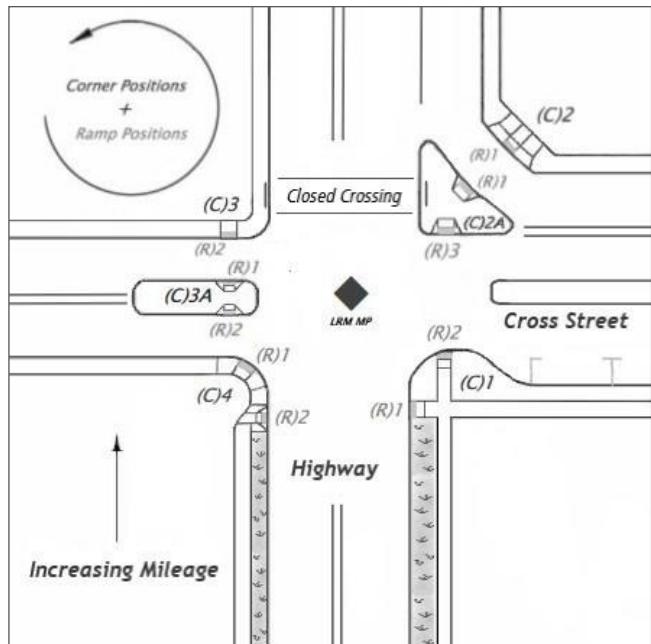
Corner & Ramp Numbering

- Always goes counter-clockwise
- Uses numbers 1 – 8 & 1A – 8A
- Corners only have 2 ramps
- Islands only have 3 ramps

When determining which highway the intersection lays on:

- Mainlines always supercede connections.
- Lower numbered highways always supercede higher numbered highways (except Hwy 091 & Hwy 081).

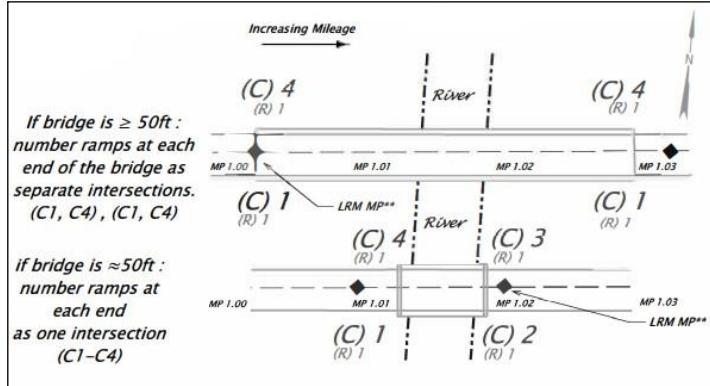
Corner & Curb Ramp Numbering example



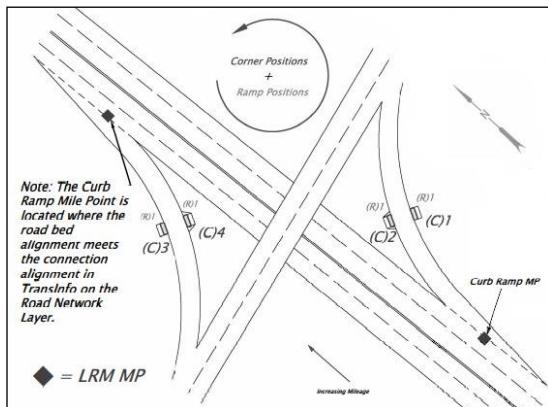
Corner 1 is always the first corner on the **right** side while facing the direction of increasing milepoints

Location

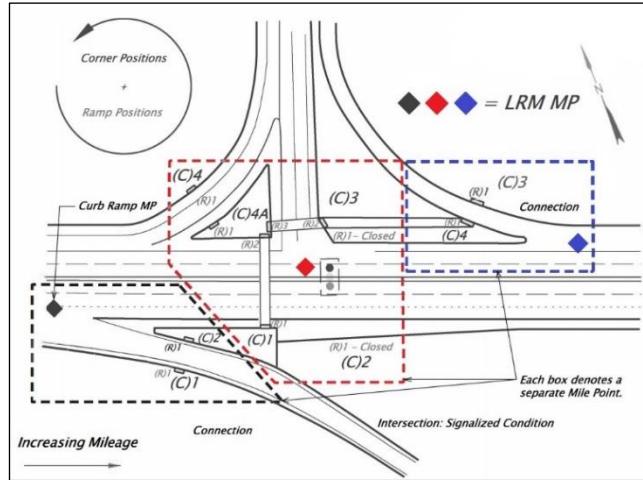
LRM / Corner & Ramp Numbering



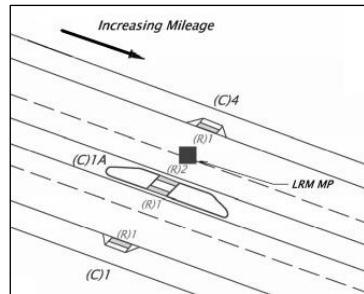
** If the ramp falls between two milepoints, use the closest milepoint to the bridge. It can be either side, before the start of the bridge or after the bridge ends. (note that this is only for bridges less than 50 feet in length or right around 50 feet).



Corner & Curb Ramp Numbering at other locations



Each diamond is a different intersection.



Note - Midblock locations always use corner numbers 1 and 4, plus 1A if there is an island.

Intersection Condition Types (ICT)

There are three different intersection Condition Types which act as controls for different aspects of a curb ramp system. They set the limits for:

- Gutter Flow Slope
- Directional Curb Cross Slope
- Cross Slope One (Ramp Run One cross slope)

Intersection Condition Types / Gutter Flow Slope

Signalized or Uncontrolled (SU) – **5.0% max.**

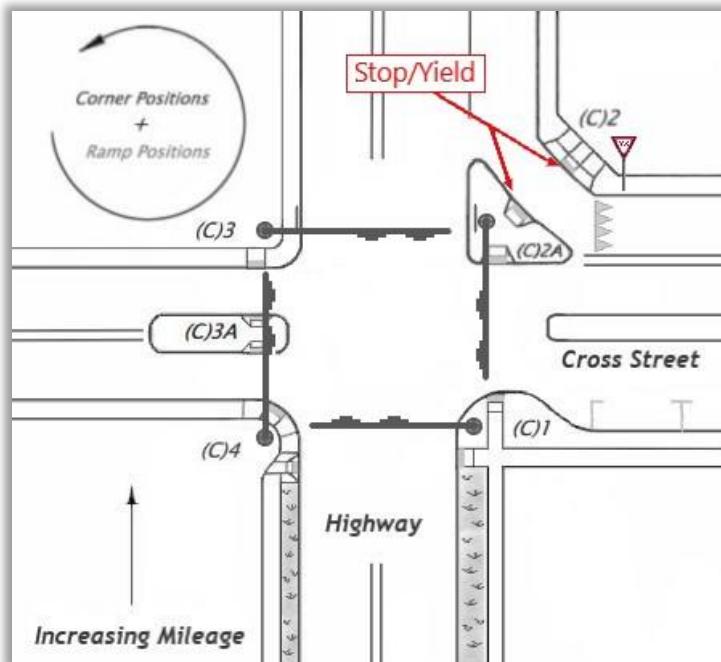
Stop or Yield (SY) – **2.0% max.**

Midblock (MB) – **Roadway Grade**

Exhibit: In the figure to the right, all the curb ramps at this signalized intersection have a *Signalized or Uncontrolled* ICT except the curb ramps that cross the separated right-turn lane. Since there is a yield sign controlling traffic for that lane, even though the intersection is signalized, those ramps have a *Stop or Yield* ICT.

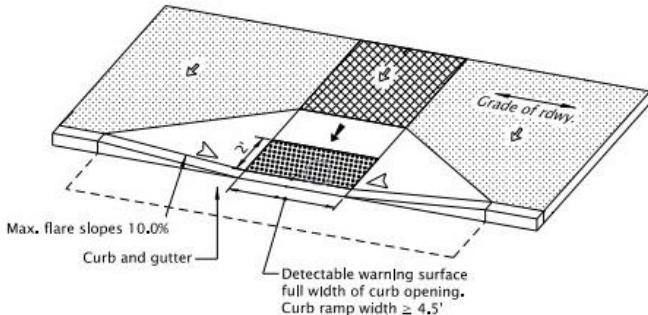
Notes on ICT:

- Each curb ramp has its own ICT that is based on the traffic operation of the curb ramp
- If the curb ramp crosses a non-signalized commercial entrance, it's a Stop or Yield

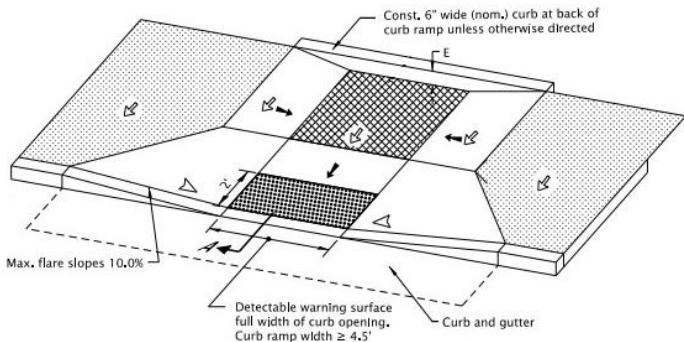


Identifying ODOT Curb Ramp Styles

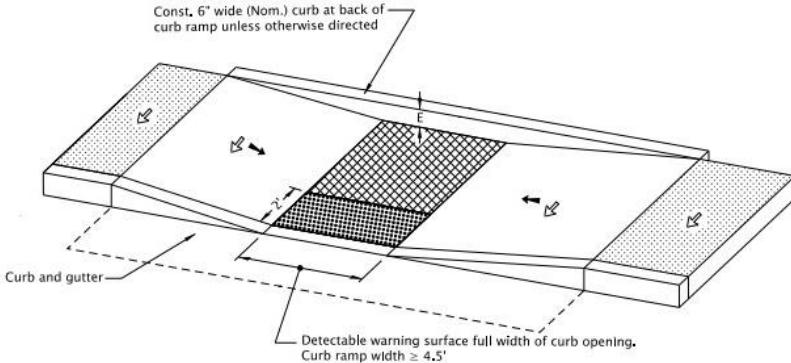
Perpendicular



Combination



Parallel

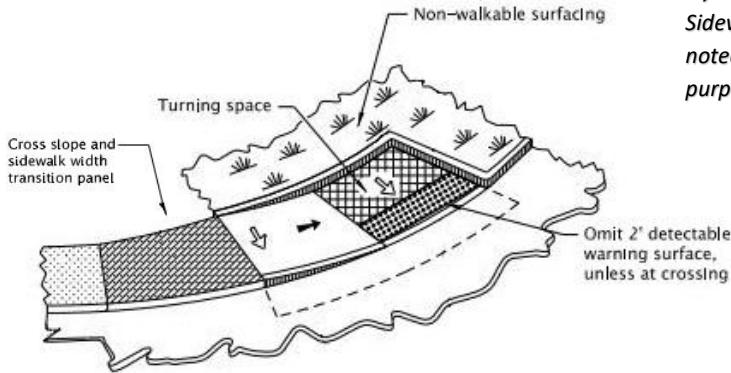


There are seven (7) different ramp styles, each with a corresponding ramp inspection form. Those ramp styles are:

- | | |
|----------------------|----|
| • Perpendicular | PR |
| • Combination | C |
| • Parallel | PL |
| • Unique Design | UD |
| • Blended Transition | BT |
| • End-of-Walk | EW |
| • Cut-Through | CT |

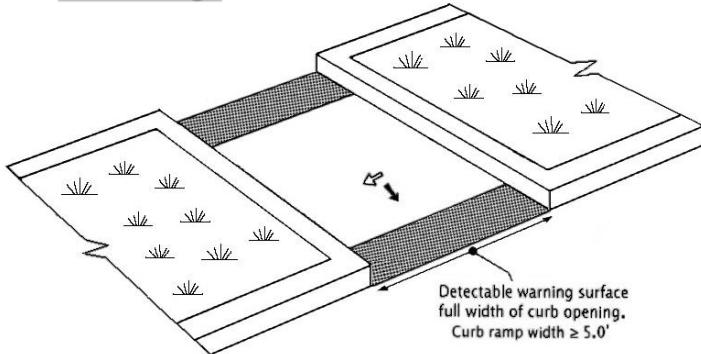
Identifying ODOT Curb Ramp Styles

Unique Design *PHOTO REQUIRED

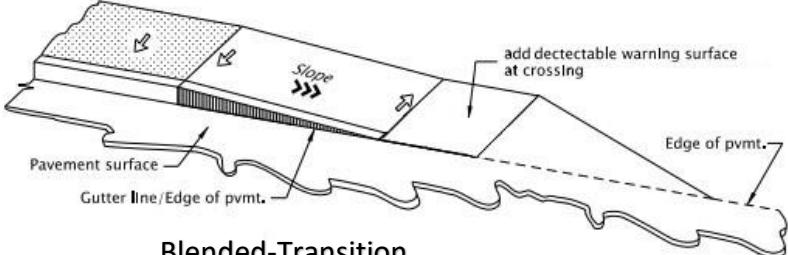


*At the point where a sidewalk facility terminates, many times a "Unique Design" ramp style is present instead of an "End-of-Walk" ramp style.. The End-of-Sidewalk, Start-of-Sidewalk, Access to bridge, or Access to shoulder locations always get noted in the Cross Street field on the inspection form if the curb ramp is serving that purpose.

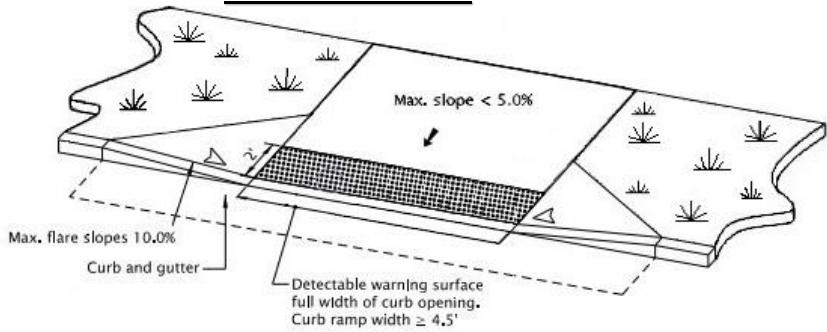
Cut-Through



End-of-Walk



Blended-Transition



Curb Ramp Measurements

Important to Know!

Dimensional measurements are recorded in 1/10ths of a foot (e.g. 1.5 ft.) and must be written with a zero if it's under 1 foot, e.g. 0.8 ft.

Slope measurements are also recorded in 1/10ths (e.g. 7.5%) using a zero if it's under 1%, e.g. 0.5%

Surface Markers:

Red – used for slope measurements.

Yellow – used for dimensional measurements.

Soap Stone – used to circle issues like cracks, lips or other surface deformities. Brief notes can be written over an area; for example, writing “< 1ft BT FLR”* and then taking a photo of that area with a tape measure and the note in view.

*Standard comments found on pg. 17-18

Consistently using this color scheme allows for easy identification of measurements or notes when others are viewing photos or the physical ramp.

Required tools for measuring ramps:

- M-D Building Products SMARTTOOL™ digital level (hereafter referred to as Smarttool™ digital level) two-foot and six-inch sizes.
- Engineer scale tape measure.



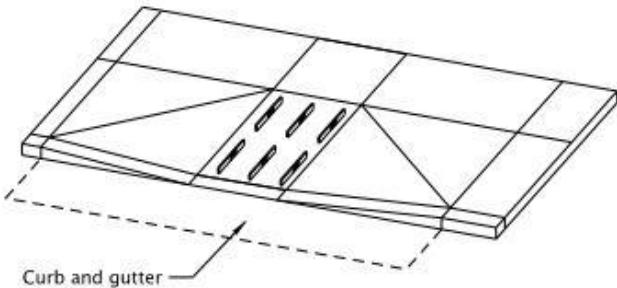
The engineer scale is the lower set of numbers
Curb ramp measurements round differently in different situations
Refer to the rounding guidance table on pg. 39

Curb Ramp Measurements

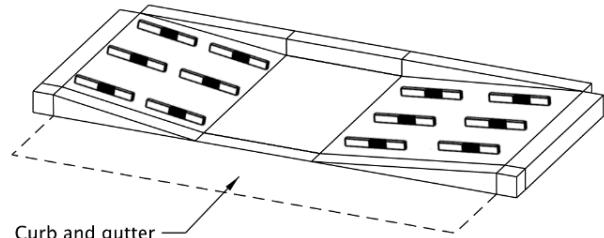
Run Slope 1, 2 and 3 for Ramp Runs & D.C.'s

Ramp Runs

Run Slope 1

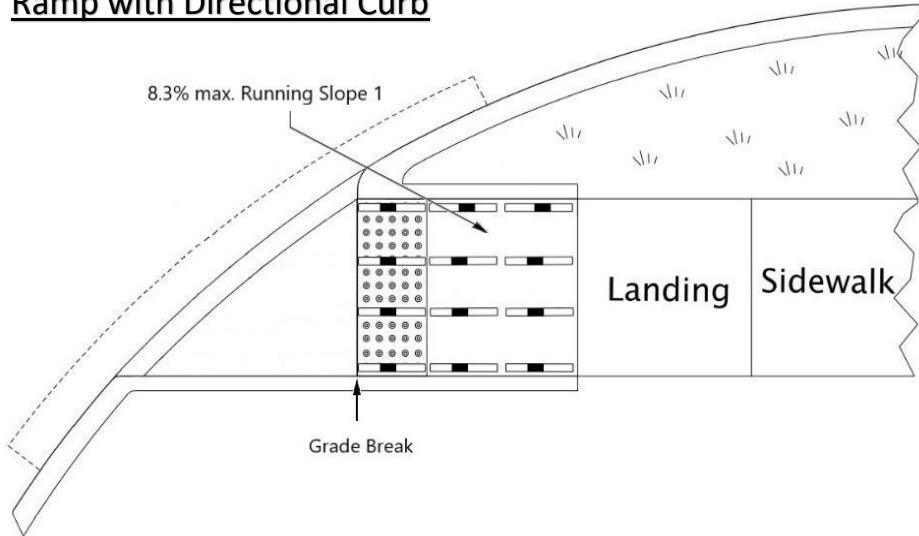


Run Slope 2 & 3



- A curb ramp's **Run Slope** is measured in the direction of pedestrian travel, the *highest value* taken from any portion of the ramp run is recorded on the inspection form.
- **Every sloped panel must be measured.** Do not stop at the first contraction joint. Every panel over 4.9% is a ramp run.

Ramp with Directional Curb

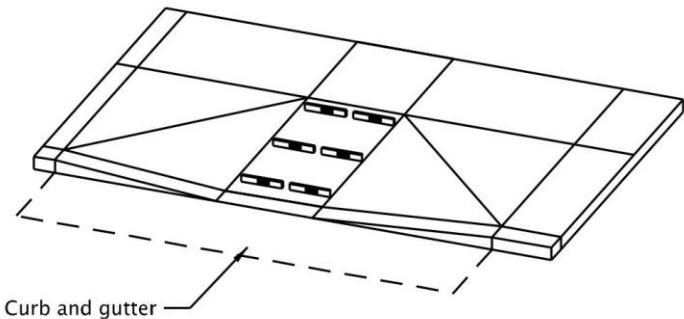


Curb Ramp Measurements

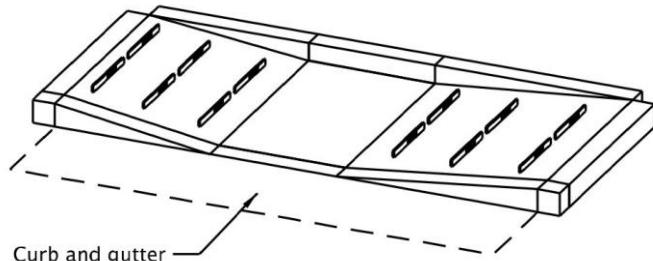
Cross Slope 1, 2 and 3 for Ramp Runs & D.C.'s

Ramp Runs

Cross Slope 1

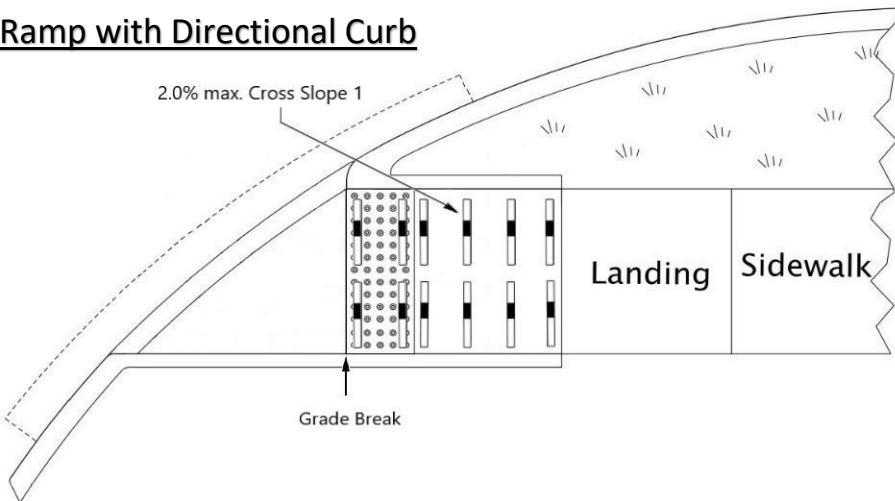


Cross Slope 2 & 3



- The **Cross Slope** of a ramp run is measured perpendicular to the direction of pedestrian travel; for Cross Slope 2 and Cross Slope 3, the *highest value* taken from any portion of the ramp run is recorded on the inspection form.
- When recording Cross Slope 1, if the entire ramp run measures under the ICT maximum, then record only the highest value taken in the top 6 inches of the ramp.

Ramp with Directional Curb

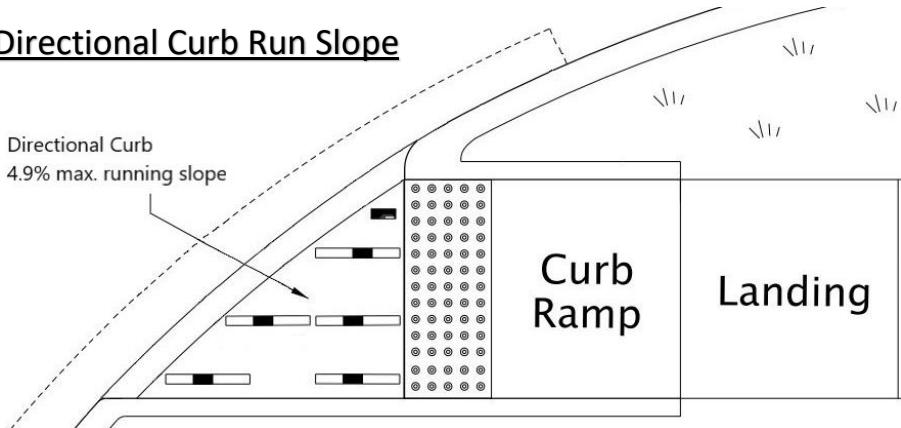


Curb Ramp Measurements

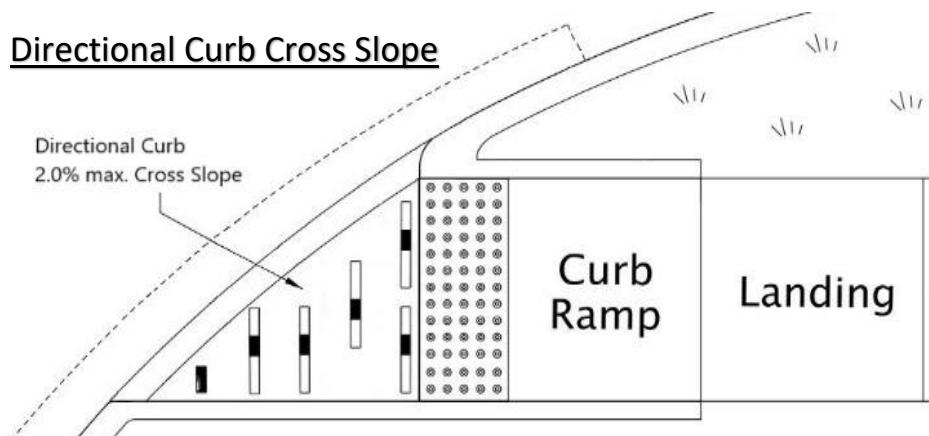
Directional Curb Run Slope & Cross Slope

Directional Curbs

Directional Curb Run Slope



Directional Curb Cross Slope



- The Cross Slope requirements for Directional Curbs are dependent on the Intersection Condition Type.
- Use the 6 inch digital level anywhere a 2-foot level cannot fit.
- Directional Curb Cross Slope is not dependent on the Gutter Flow Slope measurement. It cannot exceed the Intersection Condition Type maximum.
- If the Directional Curb is too small to fit a level on it, lay the two-foot level where it covers the Directional Curb and the Detectable Warning System. If that slope measures 5.0% or more then the Run Slope of the Directional Curb fails.

Note - As with the 2-foot Smarttool™ level, it is recommended that *at least* two 6-inch Smarttool™ levels be available during inspections.

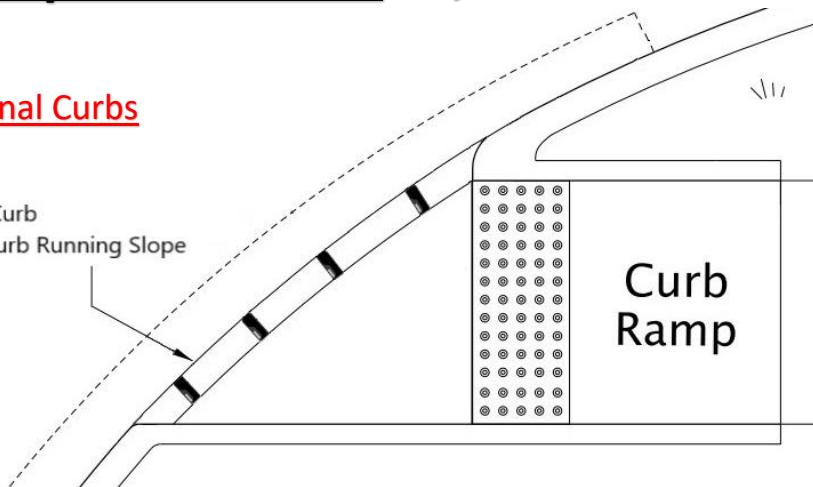
Curb Ramp Measurements

CRS for all curbs

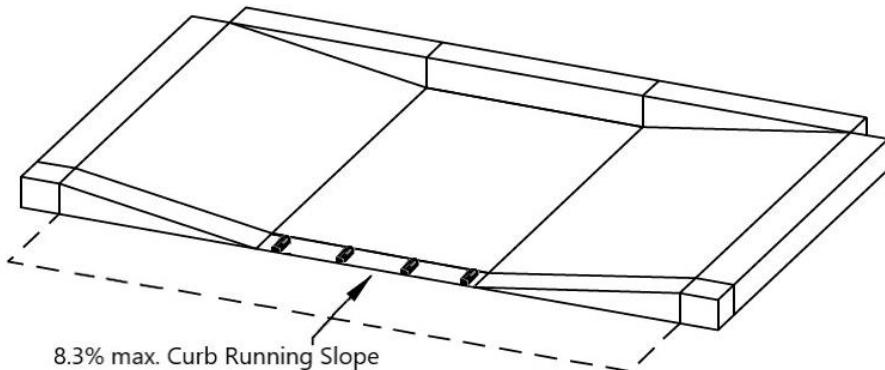
Directional Curbs

Directional Curb

4.9% max. Curb Running Slope



All Other Curbs



Curb Running Slope

- Curb Running Slope is always measured perpendicular to the curb-line.
- A six-inch Smarttool™ level is always used to measure the Curb Running Slope.
- A 5.0% Curb Running Slope on a Directional Curb **will fail the ramp**.

The *Curb Running Slope* is the only field on the inspection forms where the average measurement is recorded.

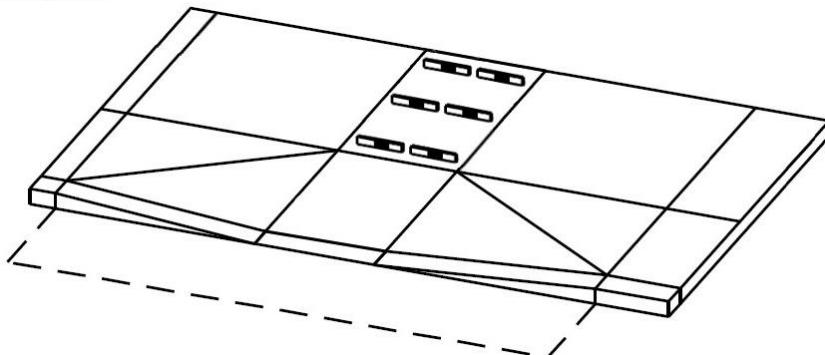
Best practice is to take at least 4 measurements.

Curb Ramp Measurements

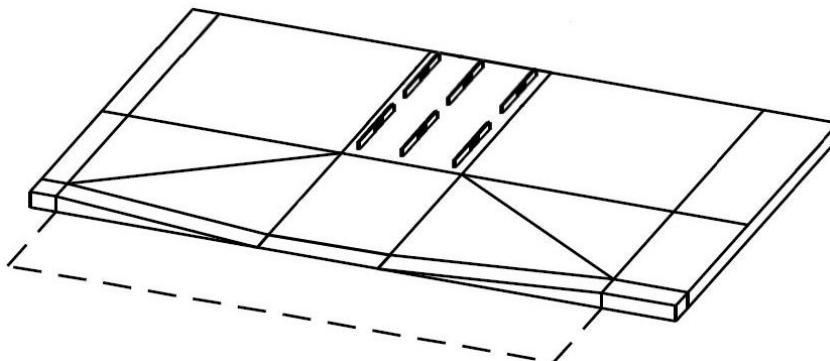
TS / LND Slope X & Slope Y

Turn Space/Landing

Slope X



Slope Y



Turn Spaces and Landings are measured and recorded the same way. The difference between the two is that a **Landing** serves *one direction of travel* (a straight through movement where a change in direction is blocked by a curb, soft non-walkable surface or some type of barrier) whereas a **Turn Space** serves *multiple directions of travel*.

Notes on Turn Spaces & Landings:

Some Cut-Through style ramps and all Blended Transition style ramps do not have Turn Spaces or Landings. If this is the case during inspection, there is an option on the form for "N/A" when selecting if there's a Turn Space or Landing.

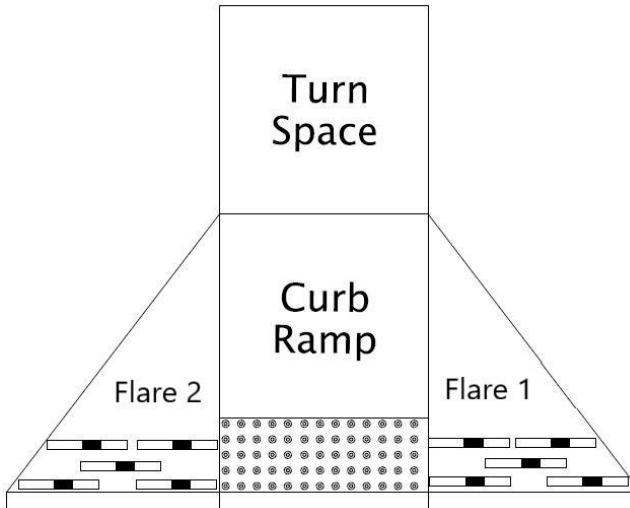
Curb Ramp Measurements

FLR 1 & FLR 2 & Counter Slope

Flares & Counter Slope

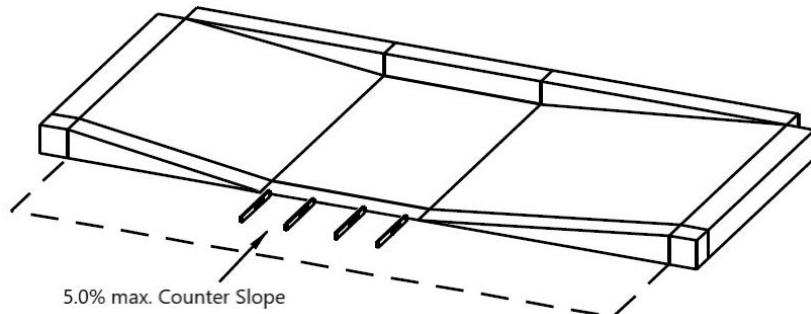
Flares

- 10.0% max. Slope.
 - **Traversable** = If a hard surface a pedestrian can walk on is adjacent to flare.
- Non-traversable** = If a soft, non-walkable surface is adjacent to flare.
- Slope is measured from true zero (level horizon).
 - Measurements are taken parallel to the curb-line (do not extend measurements beyond the Detectable Warning System).



Counter Slope

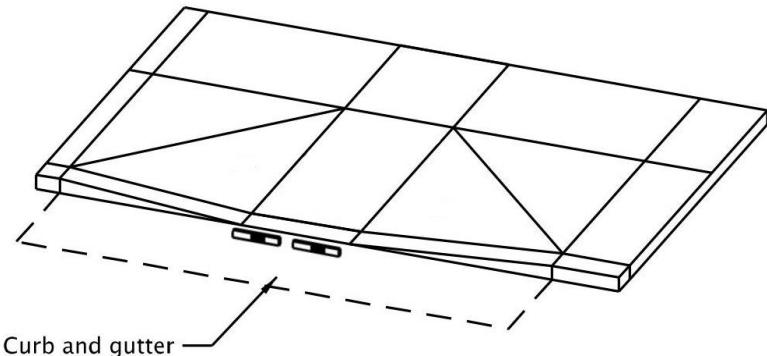
- Use a 2-foot level where it fits. If it overhangs the road pavement or sits flush against it but a true reading of Counter Slope is taken, this is OK.
- If there's no concrete gutter pan, only use a 2-foot level.



Curb Ramp Measurements

GFS & Road Slope

Gutter Flow Slope



Notes on Gutter Flow Slope

- Gutter Flow Slope (GFS) maximums are determined by the Intersection Condition Type (ICT).
- Slope is not recorded as positive or negative

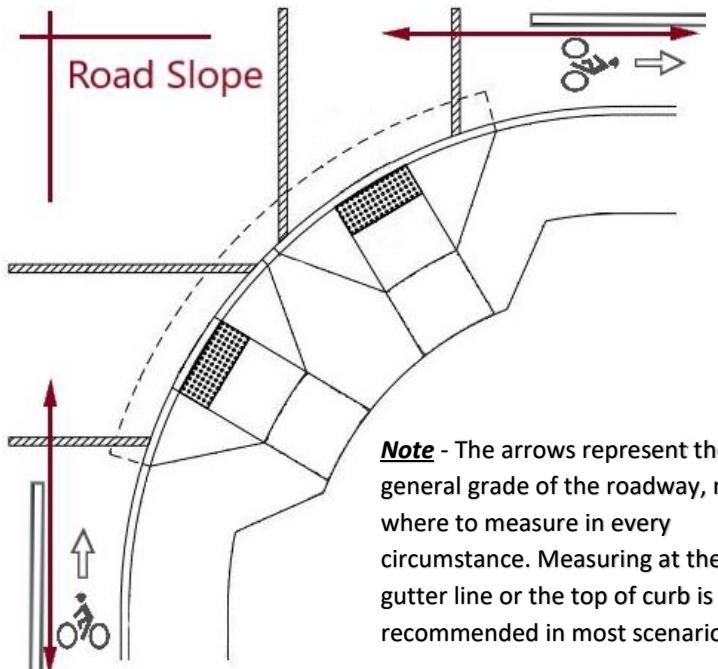
Intersection Condition Type maximums

- Stop or Yield (SY) – **2.0% max.**
- Signalized/Uncontrolled (SU) – **5.0% max.**
- Midblock (MB) – **Roadway Grade** (recorded as Road Slope on the forms).

Gutter Flow Slope & Road Slope

Road Slope

A minimum of three measurements should be taken to find the nominal and most representative slope.

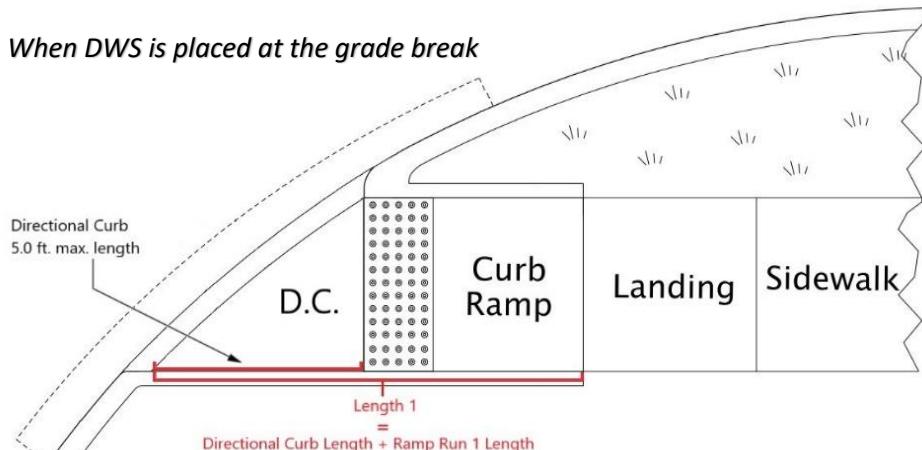


Note - The arrows represent the general grade of the roadway, not where to measure in every circumstance. Measuring at the gutter line or the top of curb is recommended in most scenarios.

Ramp Measurements

Ramp Dimensions

When DWS is placed at the grade break



Directional Curbs

Remember...

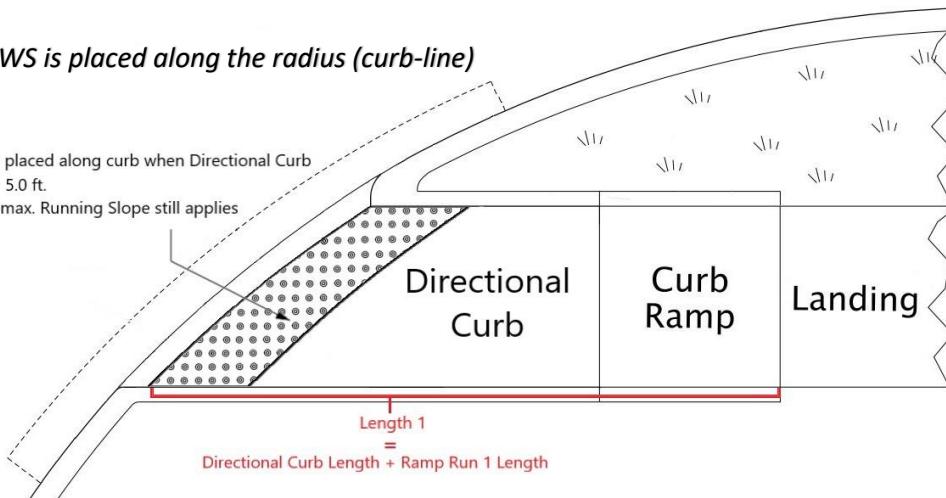


Use the engineer scale!

When DWS is placed along the radius (curb-line)

DWS to be placed along curb when Directional Curb length is > 5.0 ft.

4.9% max. Running Slope still applies



Run Length 1 is the length of the Directional Curb as measured along the return curb, plus the length of the Ramp Run.

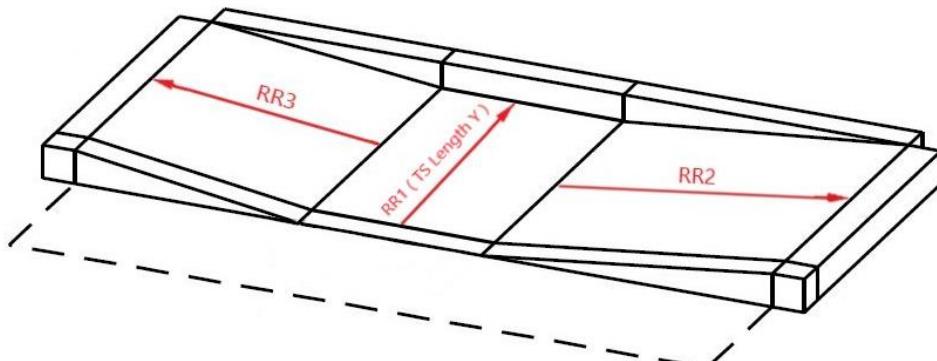
There is no maximum for this length as a whole, only the Directional Curb when the Detectable Warning System is placed at the grade break (with this design there is a 5.0 foot maximum length).

Ramp Measurements

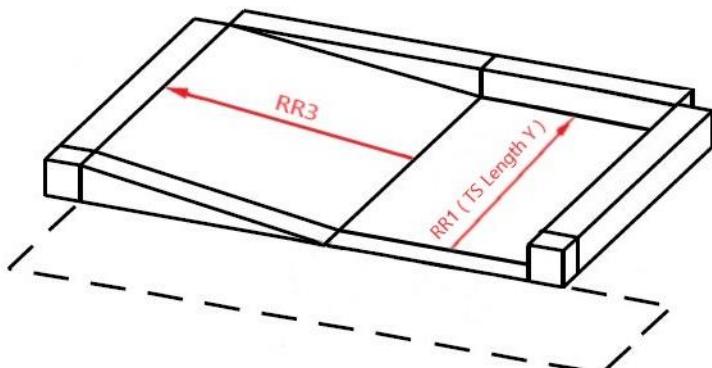
Ramp Dimensions

Ramp Lengths

Run Lengths



Unique Design (PL type)



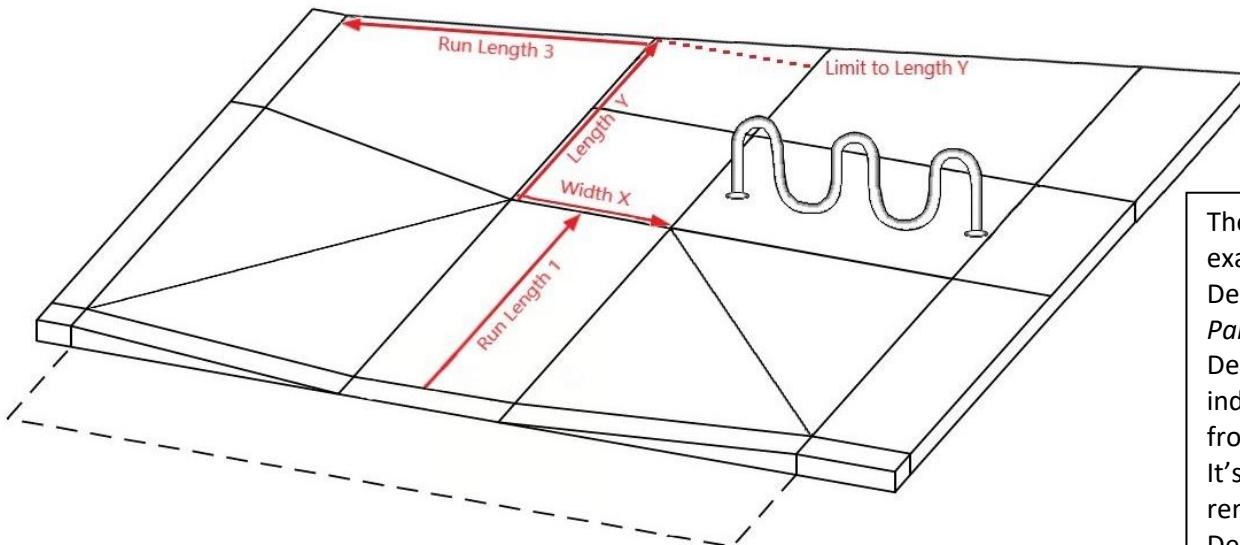
Parallel Ramp Styles

- Run Slope 1 and Cross Slope 1 will be the same measurements recorded in the Turn Space's Y & X slopes.
- The Detectable Warning System is always included in the TS Length Y measurement.

Unique Design Ramp Styles

- Can be seen as having just a TS and RR2, or a TS and RR3, or it could be only a single pad of concrete to serve a pushbutton (recording both RR1/TS just like a *Parallel* style ramp).
- A ramp that has more than three Ramp Runs isn't considered a *Unique Design*; but when Ramp Run 2, Ramp Run 3, or both do not exist, the ramp style is considered a *Unique Design*.

Unique Design (Combo type)



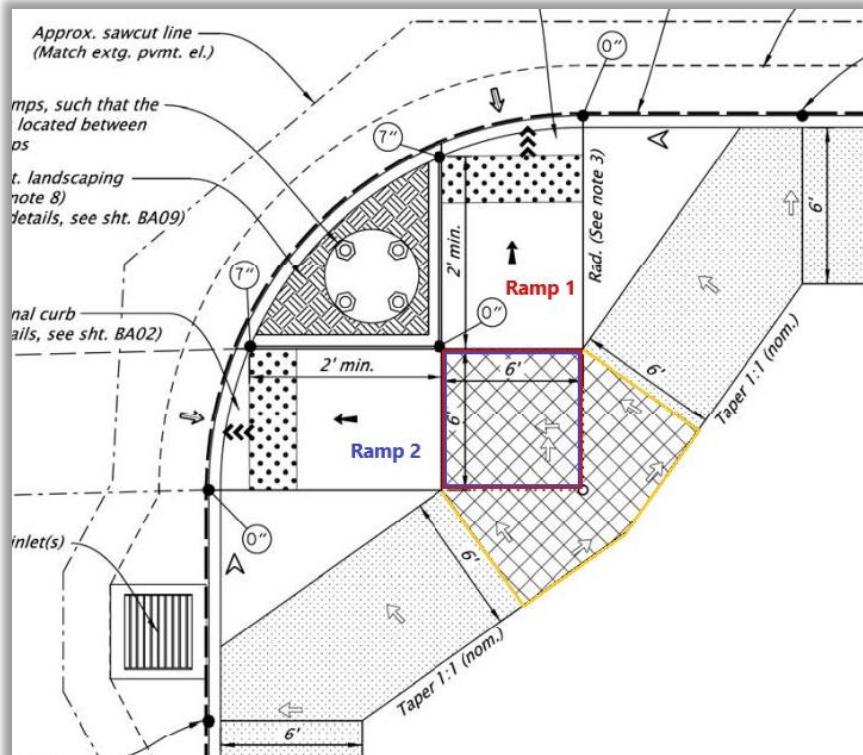
When recording dimensions for irregular shaped Turn Spaces, for both the X and Y lengths the largest measurements that can be used *while still retaining a square or rectangular shape* is recorded.

Looking at the example drawing, the longer (right side) Y length would not be measured to the end of the panel because it is restricted by the shorter (left) side.

The ramp style in this example is a Unique Design, but unlike the Parallel Style Unique Designs, it has an independent RR1 Length from its TS Length Y. It's important to remember Unique Designs can be any sort of quasi-style ramp, that's why photos of these are important for the data's Quality Assurance/Quality Check process.

Ramp Measurements

Ramp Dimensions



Familiarization of the construction plans is an important preparatory step for curb ramp inspections.

Irregular Turn Spaces

This snip is from a typical plan set that shows a ramp system with an irregularly shaped shared Turn Space.

When inspecting a ramp system like this, record the largest square or rectangular shaped area (the red and blue outlines) that can fit within the designated level area.

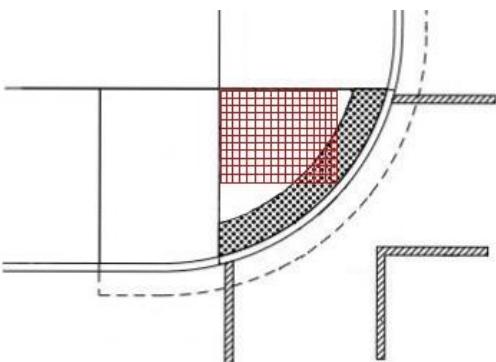
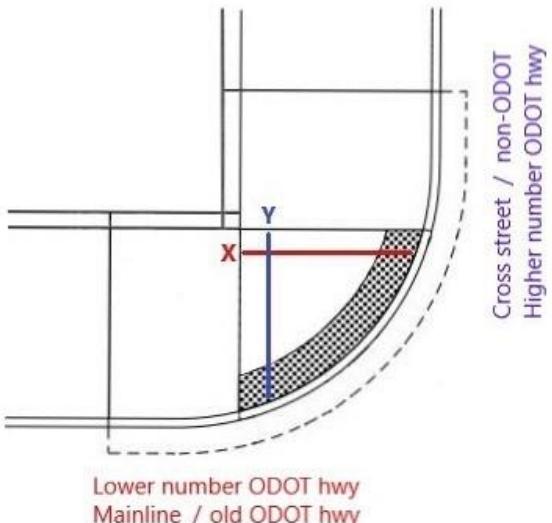
What's illustrated as the Turn Space/Level Area is the hatched area shown in the plans (the combined red/blue plus the yellow outline).

Most plans will designate the level area in some way. Shown in this exhibit is the ODOT hatching pattern. Although only the square or rectangular area is recorded, it is required to inspect the entire area that the plans designate as the level area.

If any of the level area outside of the recorded Turn Space is failing, the Turn Space will be recorded as failing. The entire level area as shown on the plans must pass inspection, not just the "square" that's recorded on the form.

Ramp Measurements

Ramp Dimensions



Fully-Lowered Radial Turn Spaces

It is important to measure fully-lowered wedge shaped Turn Spaces in a consistent manner. The X and Y slopes for the Turn Spaces on these ramps will always be parallel and perpendicular to the primary roadway.

What determines the direction of the X and Y slopes is the ODOT highway, or if both roadways are ODOT, the lower numbered highway. If the ramp is off-system from a jurisdictional transfer, use the old ODOT highway as the primary roadway.

For local agency projects, use the road with the higher functional class or possibly whichever road is parallel to an ODOT highway as the primary roadway. If questions arise about off-system intersections, contact the ADA Inventory Team (contact info listed on title page).

The Y axis is oriented in the same direction as the crossing for the ODOT Mainline or higher functional class roadway (the primary roadway), while the X axis (Cross Slope) is perpendicular to the crossing.

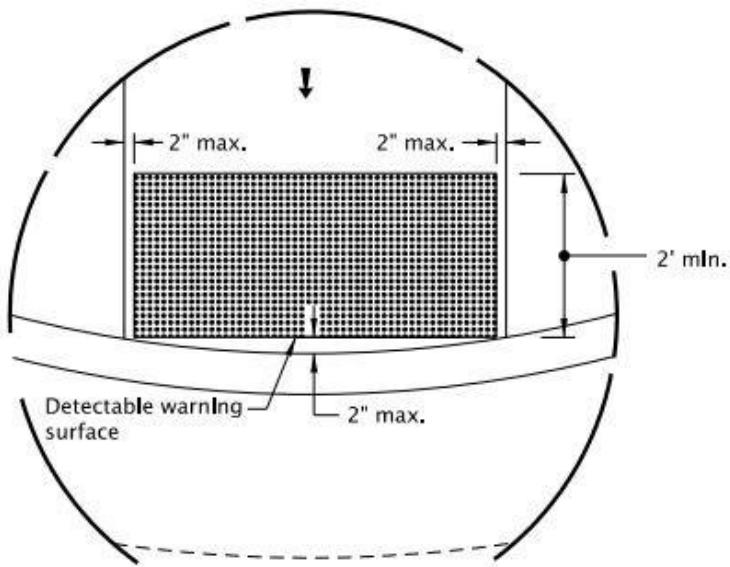
Turn Space dimensions

Measure the largest square that fits within the wedge shaped Turn Space for the X and Y lengths. Remember though that the slopes in the entire Turn Space area need to be compliant.

Detectable Warning Systems DWS or Truncated Domes (TD)

- The DWS must completely cover the full width of the ramp opening for a depth of 2 feet.
- The leading edges of the DWS panel may have a gap no larger than 2 inches around the sides or to the back of the curb.
- A damaged panel will fail the ramp. Damage can be cracks, major chips or warping.
- Safety Yellow is the ODOT standard for the DWS high contrast color. Other colors require a Design Exception.
- Bubbling under a DWS panel that causes lips or a failing slope will fail the ramp and is recorded as an Improperly Installed Truncated Domes (IITD).
- Cut panels *must maintain dome spacing* by visual inspection.

DWS Inspection Criteria



Note - On cut-through islands where there is no curb the DWS is placed up to the pavement and the 2" gap still applies.

Standard Comments

COMMENTS:	FORMAT:	DESCRIPTION:
	CRK [LOCATION]	Crack on a specified location of concrete from the list on the next page
	DO	Drop Off within proximity limits
	EXP	Curb Exposure is less than 3 inches
	GB [LOCATION]	Grade Breaks are NOT perpendicular on specified area from list on the next page
	ICRR#	Inconsistent Ramp Run #
	INLET XING	Inlet is within the Crossing
	STR	Striping Issue
	#FT BT RR/DR	Length of Sidewalk Between Ramp Runs or Driveway
	COMMENTS THAT DO NOT FAIL RAMPS	
LIPS	[MEASURE] IN LIP AT [LIP LOCATION] /[OBJECT*]	Depth in Inches of Lip at a Location or Object listed on the next page
	[MEASURE] IN [LIP TYPE] LIP	Depth in Inches from certain Lip Type listed on the next page
TRUNCATED DOME	[OBJECT] ON TD	Object, from list on next page, ON Truncated Dome
	CIR TD	Cast Iron Truncated Domes
	RED TD	Red Truncated Domes
BACK OF RAMP OBSTRUCTION	BORO [OBJECT]	Back Of Ramp Obstruction by Object, from list on next page
OBSTRUCTING PEDESTRIAN ROUTE	[OBJECT] OPRT	Object, from list on next page, Obstructing Pedestrian Route
OBJECT ON RAMP	[OBJECT] ON [LOCATION]	Object, from list on next page, ON a Location from the next page
OBJECT BETWEEN RAMPS	[OBJECT] BT RP	Object, from list on next page, Between Ramps
WITHIN PROXIMITY LIMITS	[OBJECT] WPL	Object, from list on next page, Within Proximity Limits
INLET/CATCH BASIN	INLET [INLET LOCATION]	Inlet AT Location from list on next page
END OF WALK	BMTS	Bottom Turn Space
	BMTS X [TURN SPACE X] AND Y [TURN SPACE Y]	Bottom Turn Space In Comments when two Turn Spaces exist
SURFACE TYPE	AC RP	Asphalt Ramp
	BRK RP	Brick Ramp
	MST	Mixed Surface Type
OTHER COMMENTS	CRS OPP	Curb Running Slope Sloping Opposite Direction
	NO RR#	No ramp run 2 and/or 3
	RCRB 1	Return Curb on 1 Side
	RCRB 2	Return Curb on Both Sides
	RR# NO SWLK	Ramp Run leads to no where
	RR# OPP	Ramp Run (1, 2, or 3) Sloping Opposite Direction
	SWLK EQL RR#	Sidewalk Consistent With Ramp Run (2 or 3)
	#FT SWLK BT RR# TS	Length of Sidewalk Between Ramp Run and Turn Space

Standard Comments



ADA Ramp Inspection Forms

List of New Construction

Standard Comments

OBJECT	BCH	Bench	EM	Electric Meter	LP	Light Pole	SGP	Traffic Signal Pole
	BR	Bike Rack	FD*	French Drain	MB	Mailbox	SM	Survey Marker
	BIO	Bioswale	FNC	Fence	MH*	ManHole	TLP	Utility Pole
	BOL	Bollards	FRH	Fire Hydrant	PCC	Raised Concrete	BARR	Concrete Barrier/Guardrail
	BLDG	Building	GV*	Gas Valve	PDP	Pedestrian Pole	TC	Trash Can
	BST	Bus Stop	GWR	Guy Wire	RPB	Raised Planting Bed	TR	Tree
	CBX	Communication Box	INLET*	Inlet/Catch Basin	RWL	Retaining Wall	WH	Weep Hole
	CRB	Curb	JBX*	Junction Box	RXP	Railroad Crossing Pole	WM*	Water Meter
	CV*	Communication Vault	LD	Loop Detector	SGCC	Traffic Signal Controller Cabinet	WV*	Water Valve
			LND	Landscaping	SGN	Sign		

[MEASURE]: HALF, 1, 2,
3, etc . . .

[INLET LOCATION]: BT RP Between Ramp

FOC Face Of Curb

FOG Front Of Gutter

[LIP LOCATION]: BOC Back Of Curb

NR FLR Near Flare

BRR1 Bottom of Ramp Run 1 (Only if no curb exists)

NR RR# Near Ramp Run 2 or 3

WPL Within Proximity Limits

ETS Edge Of Turn Space

BT RP Between Ramps

FLR Flare

FOC Face of Curb

RR# Ramp Run

FOG Front Of Gutter

TS Turn Space

TD Truncated Domes

WPL Within Proximity Limits

TRR# Top of Ramp Run 1, 2, or 3

[LOCATION]:

WPL Within Proximity Limit

[TURN SPACE X]

SL# W# Slope X and Turn Space Width

[TURN SPACE Y]

SL# L# Slope Y and Turn Space Length

[LIP TYPE]: AC Asphalt
BVL Beveled

Standard Comments

Failing comments on the inspection forms

1. **CRK – Crack:** cracks anywhere on the ramp system; RR1, RR2, TS, etc.
2. **DO – Drop Off:** a vertical drop off greater than 6 inches anywhere in the circulation path (not counting the curb to the street).
3. **EXP – Exposure:** if the height of the curb between the two ramps is under 3 inches tall.
4. **GB – Grade Break:** any *non-perpendicular* grade break in the pedestrian path*, e.g. between any Ramp Run and the Turn Space.
5. **ICRR – Inconsistent Ramp Run #:** when there is a variance of run slope of more than 1.5% (uses number of Ramp Run e.g. ICRR1, ICRR3, etc.).
6. **INLET XING – Inlet in Crossing:** when a sewer grate is within the marked crossing.
7. **STR – Striping:** used when there is no 4x4ft. Clear Space outside the ramp opening within the marked crossing.
8. **FT BT – [#] Feet Between [ramp element]:** when there is less than the required distance between flares, ramps, or a ramp run and driveway.

Failures captured with comments

Physical Condition (G,P)		Functional Condition (G,P)				
		Fail	DE	Fail	DE	
CRK				ICRR		Add
DO				INLET XING		Clear
EXP				STR		
GB				FT BT		
Comment: <i>See also Standard Comments for full list of acceptable comments</i>						

- These standard comments record issues that will result in a ramp's failure but that aren't captured in any of the form fields.
- Be sure to record these issues in the Comment box if one of these scenarios exists... *even if the ramp has a Design Exception for it.*

*The Grade Break comment is not only for non-perpendicular grade breaks. A panel that is rounded down or cupped up on the edges from poor finish work could also be captured as a GB comment. If there's a grade break in a panel and an ICRR comment doesn't seem applicable, use the GB comment.

Standard Comments

Failures captured with comments

Inconsistent Ramp Run - ICRR1, ICRR2, ICRR3, etc.

Defining ICRR...

ICRR: A general rule of thumb is that the difference in the Running Slope greater than 1.5% anywhere along the Ramp Run causes an Inconsistent Ramp Run.

Note:

Some ramp systems have more than the typical number of Ramp Runs, sometimes a plan set will show Ramp Run 4 or 5. In these cases, Ramp Run 2 or 3 leads to a second level area. The ramp run continuing from the second level area would then be Ramp Run 4 or 5 depending on the layout.

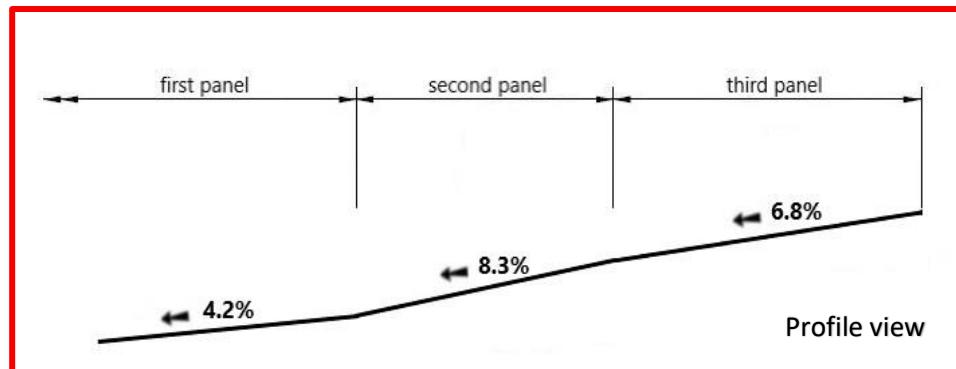
When this is the case, ***if a long ramp run has one or more level rest areas within its length, it is not an Inconsistent Ramp Run.***

Be sure to use the correct Ramp Run number given in the plans when entering the applicable standard comments into the *Comment* box.

The idea behind the *Inconsistent Ramp Run* comment is to capture when the surface of a ramp run is not a planar line. A 1.5% difference between two adjacent panels often times won't cause any issues or even be distinguishable, but it's up to the inspector to determine if a ramp run is true and straight and free from visible humps or sags.

In the 2021 Standard Specifications section 00759.50

¶ a) "The top and face of structures shall be true and straight, free from humps, sags, or other irregularities. The surface shall not vary more than $\frac{1}{4}$ inch from the edge of a 12 foot long straightedge laid on the top or face of the structure, except in curves."



Standard Comments

Inconsistent Ramp Run – ICRR1, ICRR2, ICRR3, etc.

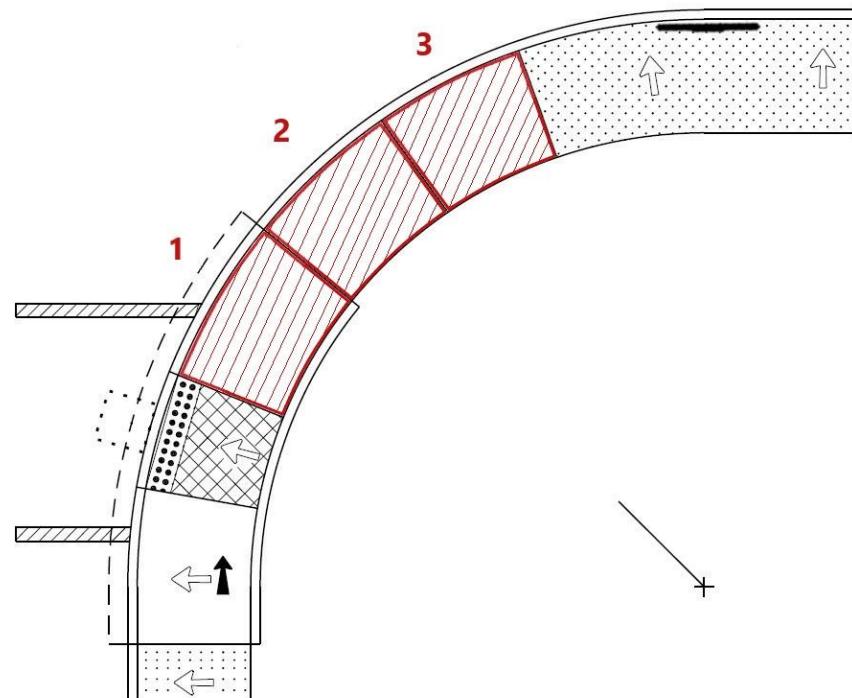
Failures captured with comments

Where to compare slope measurements to check for an ICRR...

Compare the slope measurement from one panel to the next to check for an inconsistent ramp run. When looking at the ramp, the entire ramp run should look straight and true without any humps or sags.

Any surface deformities should be checked. The 1.5% number is not a hard rule to follow to determine an inconsistent ramp run, but if the ICRR comment is used, the difference between the two measured run slopes is typically at least 1.5%.

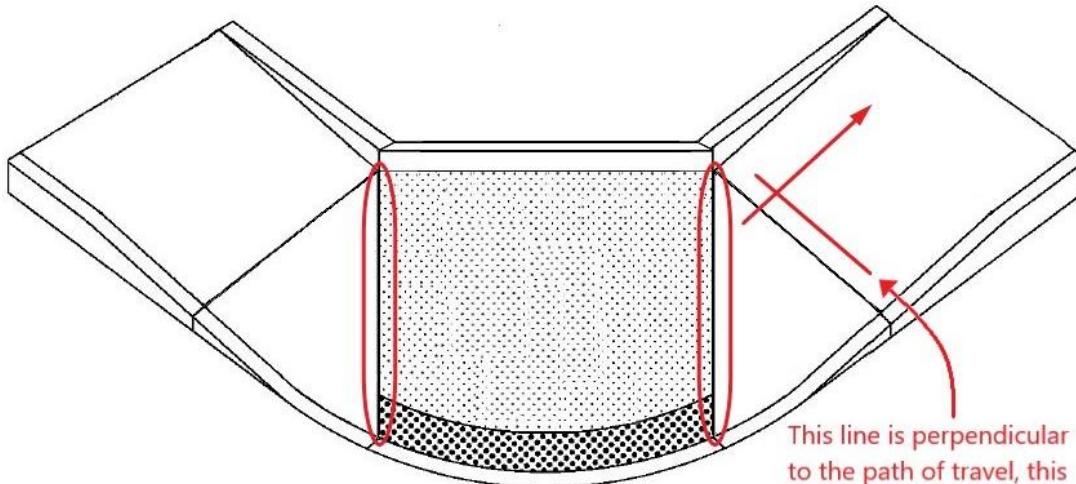
When checking for an ICRR, compare panel 1 to panel 2, then panel 2 to panel 3. Panel 1 will not be compared to panel 3.



Standard Comments

Failures captured with comments

Grade Break - GB TS, GB RR1, GB FLR, etc.



Grade Break –
This comment can also be used to show that there's a Grade Break on a *Turn Space, Ramp Run, Flare, Between Ramps, or Within Proximity Limits*.

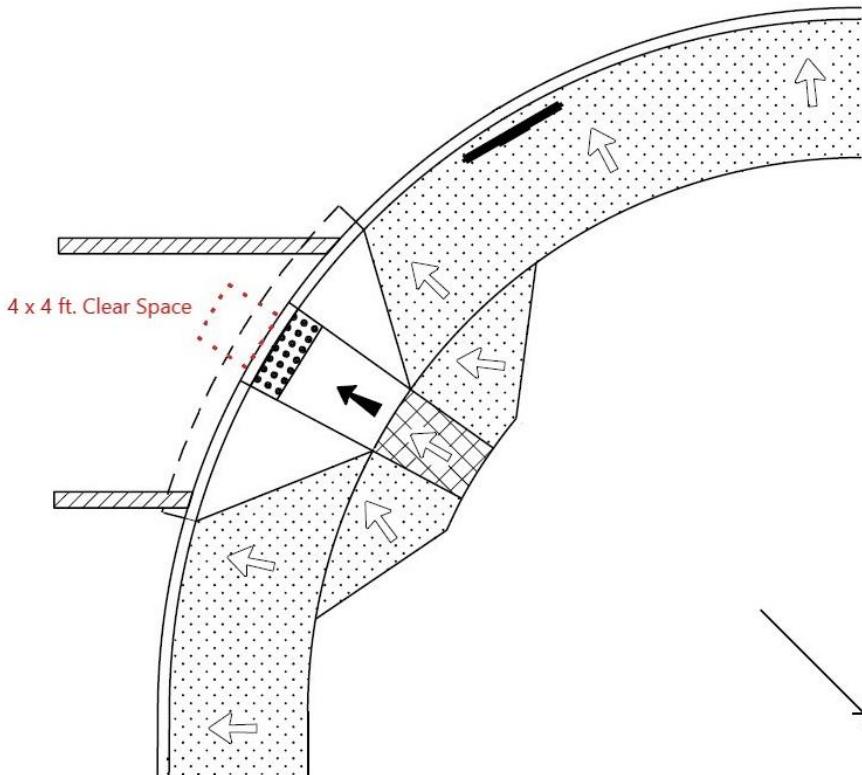


Grade Break comments that are **not** referencing perpendicular grade break issues are referring to areas of a panel that either round off on the edges or otherwise have a change in grade that an Inconsistent Ramp Run comment wouldn't accurately capture (*i.e.* a break in the Cross Slope direction).

Standard Comments

Failures captured with comments

Striping - STR



Striping – This comment is used when Ramp Run One is not parallel to the crossing and there is a restricted *Clear Space* in front of the ramp. This *Clear Space* is a 4 foot by 4 foot (4'x4') area outside the ramp opening *within the marked crossing*.

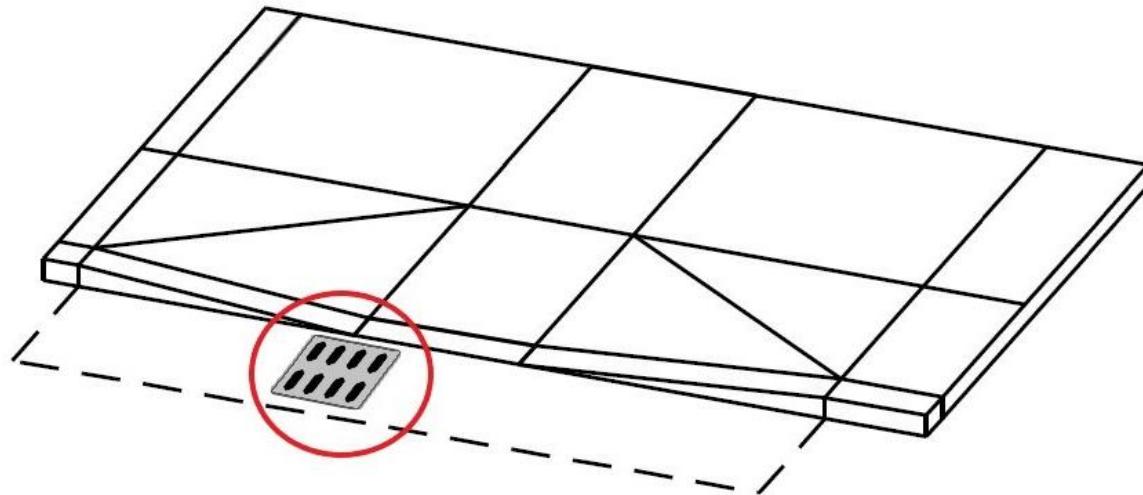
This is different from a *Clear Space* for **Pushbuttons** (see pg. 36).

The *Clear Space* should be free from any portion of the striping that marks the crossing. If circumstances allow, this area should also be clear of any sort of gas valve, manhole cover, or other objects that could make traversing the area problematic.

Standard Comments

Failures captured with comments

Inlet in Crossing – INLET XING



If any part of an inlet is in front of the ramp opening the INLET XING comment is used, even if there is an approved grate with a Design Exception.

Standard Comments

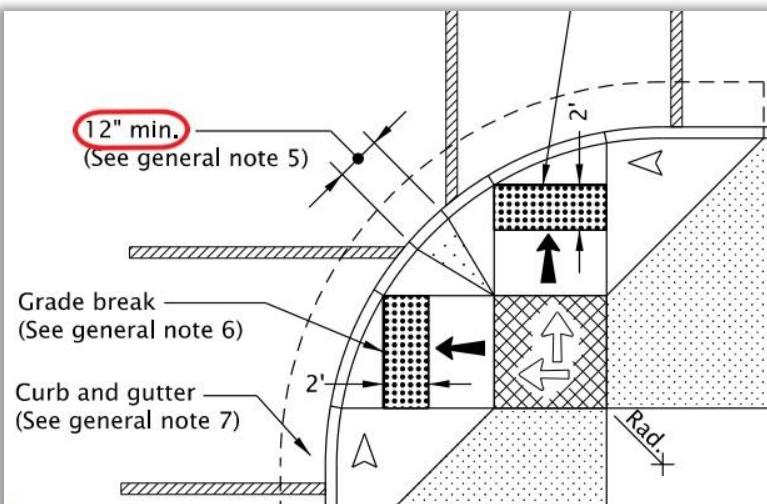
Failures captured with comments

... feet Between [RAMP ELEMENT] 0.0FT BT FLR, 0.0FT BT RP, 0.0FT BT DR

Anytime the minimum distance requirements are not met in these scenarios, the measurement (as constructed) is used in the first half of the comment followed by the ramp element.

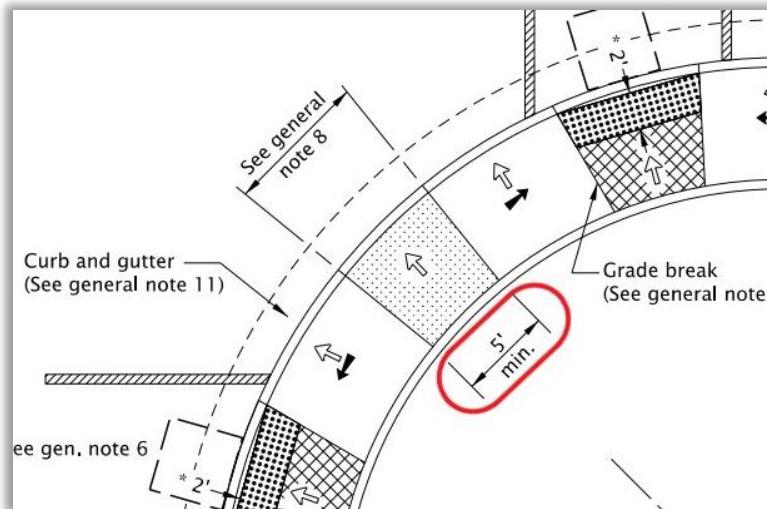
Feet Between Flares

Standard Drawing RD912



Feet Between Ramps

Standard Drawing RD920



Standard Comments

Failures captured with comments

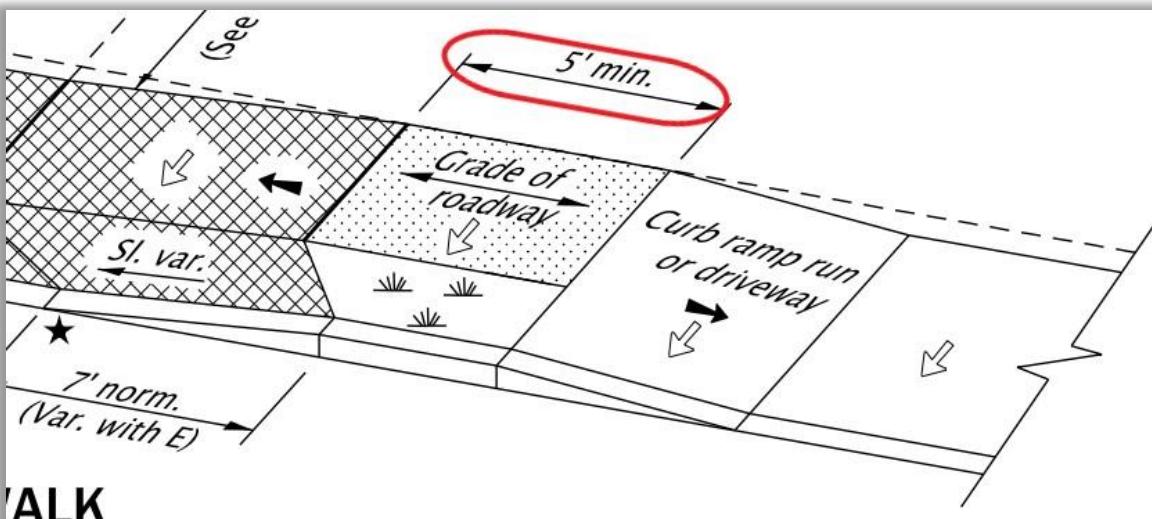
... feet Between [RAMP ELEMENT] 0.0FT BT FLR, 0.0FT BT RP, 0.0FT BT DR

The 5 foot standard separation is required between two parallel style ramp runs whether the ramp run is on a curb ramp or a driveway. See applicable drawings for the style of driveway near the curb ramp system. A *Design Exception* will be required if this standard is not met.

Note - This 5.0 foot separation applies only on ODOT right-of-way. Inspectors should measure the separation between curb ramps and driveways only on the ODOT right-of-way.

Feet Between Driveway

Standard Drawing RD725

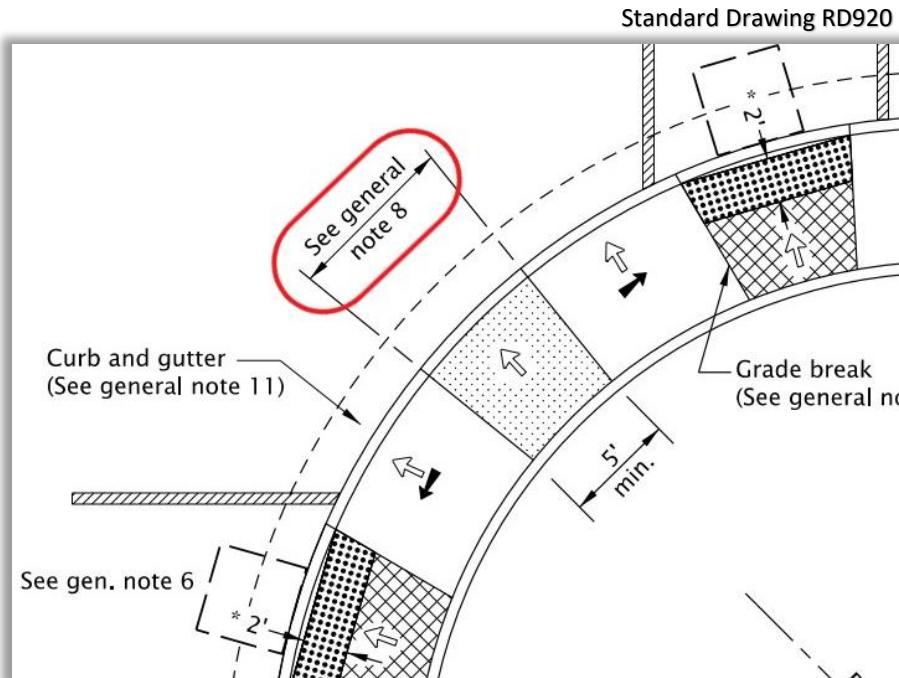


Anytime the minimum distance requirements are not met in these scenarios, the measurement (as constructed) is used in the first part of the comment followed by the ramp element.

Standard Comments

Exposure - EXP

Failures captured with comments



Curb Exposure

The *Exposure* comment is for noting when the curb reveal is under 3 inches between **either**:

- two adjacent Ramp Runs
- OR
- two adjacent Flares

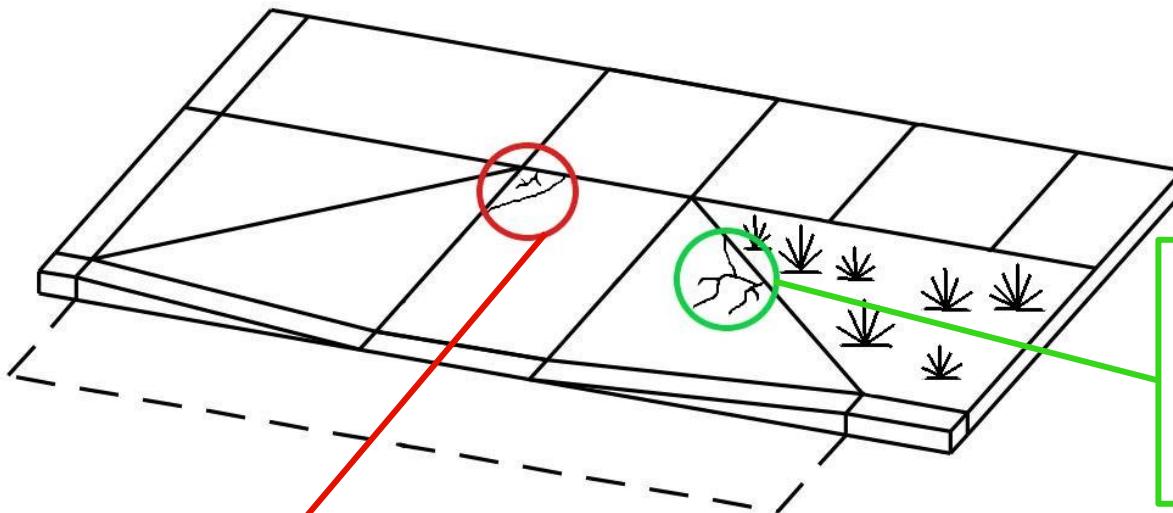
The requirement as defined in Standard Drawings RD912 and RD920 (RD920 pictured) is that the entire length of curb between these two points be anywhere from 3 inches to full curb-height.

8. When 2 ramp runs are immediately adjacent, the curb exposure (E) between the adjacent side may range between 3" and full design exposure.

Standard Comments

Failures captured with comments

Cracks - CRK



Cracks that *are in the pedestrian path* will fail the ramp (except for hairline cracks that may form during the curing process).

These comments would be “CRK FLR 1” or “CRK FLR 2”. If it fails the ramp, make sure that is clear on the form. The current version has a checkbox to select if the crack fails the ramp.

Cracks that *are not in the pedestrian path* will not fail the ramp (major damage caused by a vehicle, etc. should be noted and passed on to the Project Manager).

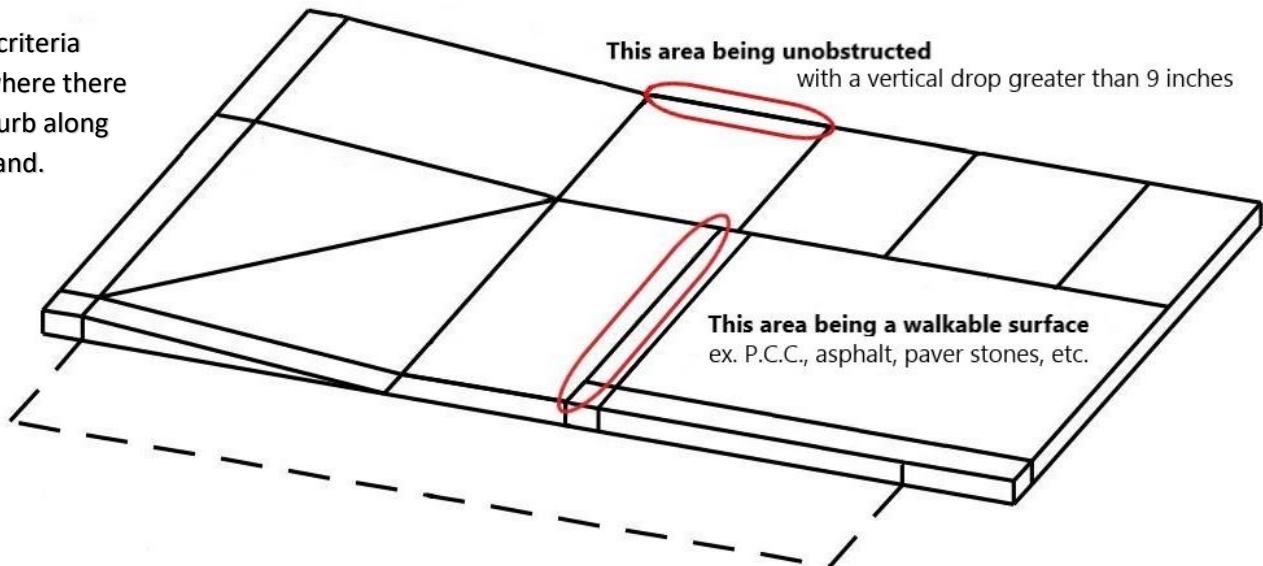
Standard Comments

Failures captured with comments

Drop Off - DO

Where to look and when to comment for Drop Offs:

Note – Drop Off criteria does not apply where there is a continuous curb along a cut-through island.



A Return Curb that has *no obstruction preventing pedestrians* from stepping off of it is an example of a Drop Off. There are other situations that could require a Drop Off comment and further discussion with the ADA group may be needed.

Required & Recommended Tools

Required tools

- Two-foot Smarttool™ digital level (preferably two, either Gen 2 or 3)
- Six-inch Smarttool™ digital level (preferably two)
- Plumb Bob
- Engineer scale measuring tape
- Concrete markers (lumber crayons, paint crayons if removable with water)
- A tablet to fill out the inspection forms electronically or paper Inspection forms with writing instrument

Recommended tools

- Push broom
- Flat-nosed shovel
- Leaf blower
- Toolbox
- Infra-red temperature gun
- Replacement batteries



Example field inspection kit

• Per ODOT Specifications, only the M-D Smarttool™ digital level (two-foot & six-inch) can be used for curb ramp inspections.

Calibrating Smarttool™ Levels

Instructions:

(These apply to both the Gen 2 and six-inch digital levels)

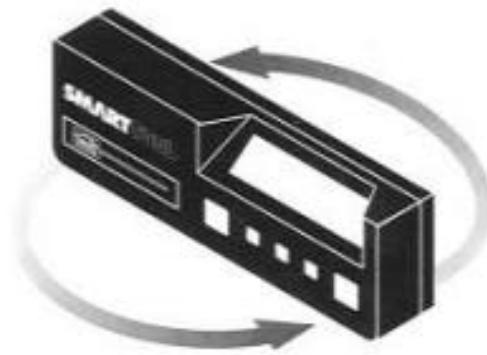
Note - Gen 3 levels (water resistant with the back-light) have an auto-calibration process where the button only needs to be pressed once to begin the calibration process. The level will need to be placed in the same positions as the Gen 2 when it beeps. The display will show which way should face up, then beep to indicate when to change orientation.

Figure 1

1. Place the level on a flat surface and mark two of its edges, so that it can be replaced in the same spot for each step.
2. Once the reading on the LCD display settles, press the CAL1 button.
3. Rotate the level 180°, and once again after the reading on the display settles, press CAL2.



FIG. 1



Calibrating Smarttool™ Levels

Figure 2

4. Place the level upside down, and repeat the previous steps.

*Be sure the level is placed in the same spot as before.

Figure 3

5. To calibrate for plumb, the same procedure as steps 1 – 4 are followed, but with the level placed against a vertical surface. After this, calibration is complete.



FIG. 2

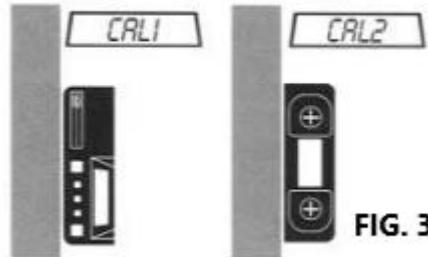


FIG. 3

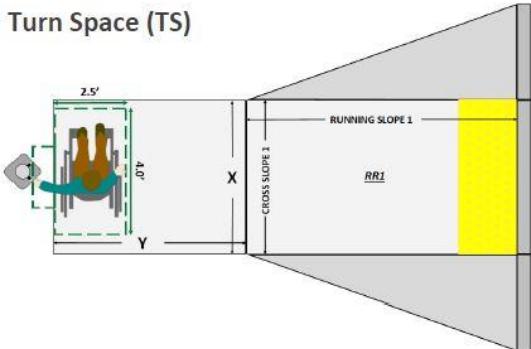
Tip for calibrating:

Find a smooth, flat surface to use for calibration. Use the soap stone to mark around the edges of the level, making an “L” shape. Using this mark, replace the level to the same spot for each step in the calibration process.

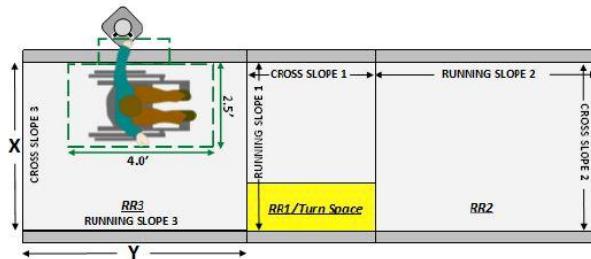
Push Button Measurements

Clear Space Slopes & Dimensions

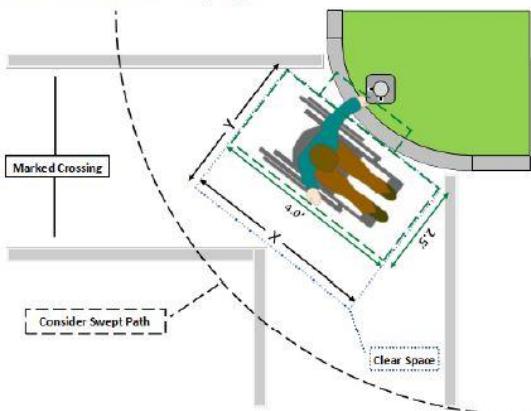
Turn Space (TS)



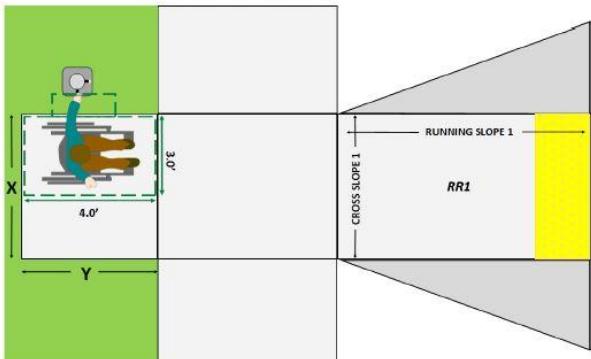
Ramp Run (RR)



Paved Shoulder (PS)



Back-In Maneuver (BM)



X and Y slope requirements for Clear Spaces are a maximum of 2.0% for both directions.

The requirement for the X and Y lengths are different and vary depending on the Clear Space Surface Type. The location of the push button (PB) and placement can be found in the plans, which defines the Clear Space.

For other Clear Space Surface Types, see [Exhibit "C"](#).

Push Button Measurements

The maximum allowable reach range is 0.83 of a foot (10 inches), and the acceptable height is anywhere between 3.5 to 4.0 feet. ODOT's standard is that a button be accessed using a side-reach or head on, with the pedestrian parallel to the crossing.

A curb or sloped area of concrete may be underneath the ten inch reach zone and the pushbutton still considered accessible. As long as every part of the Clear Space's slope is 2.0% or less.

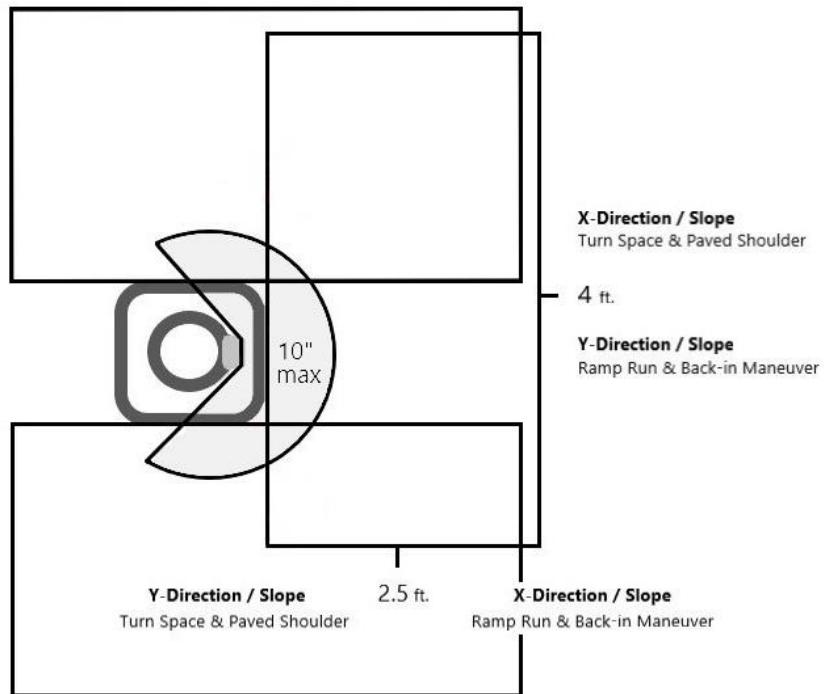
There must be a 12 inch buffer from the back of the Clear Space to the foundation of the pedestrian pole.

The plumb bob is used to measure reach range. Hold the line to where the weight is above the closest edge of the Clear Space. Measure from the center of the pushbutton to the string-line and that is the Reach Range distance.

The arrow embossed on the pushbutton or on a sign near the pushbutton should point in the direction of the crossing, being parallel with the direction of travel.

Push Button Reach Range & Height

With the Push Button in this orientation, the Clear Space can be in any of these out-lined positions **or** in between them. The button can be thought of as an anchor, with the button and a pedestrian having an arm extended sideways being the determining factors in how far the rectangular Clear Space can rotate around the pole.



References

Design Exception Tolerances

From Roadway Tech Bulletin RD19-02B, 12/16/2020:

Curb Ramp Criteria	Approved Design Exception Value Exceeds	Construction Tolerance	Example Approved Design Exception Value	Example Allowed Inspection Value	
Running Slope	7.5%	+0.8 %	7.7%	8.5% max	
Curb Running Slope	7.5%	+0.8%	8.0%	8.8% max	
Counter Slope	4.0%	+1.0%	4.8%	5.8% max	
Cross Slope	1.5%	+0.5%	1.8%	2.3% max	
Gutter Slope	Stop/Yield Controlled	1.5%	+0.5%	2.5%	3.0% max
Gutter Slope	Uncontrolled	4.5%	+0.5%	6.0%	6.5% max
Gutter Slope	Midblock	Roadway Profile Grade	+0.5%	5.5%	6.0% max
Flare Slope		10%	+0.8%	11.5%	12.3% max

References

Ramp measurement rounding guide

Rounding Guide:

Rounding to the nearest tenth	Round up	Round down
Ramp Runs	✓	
Turn Space/Push Button Clear Space		✓
Push Button Height (3.8 and up)	✓	
Push Button Height (under 3.8)		✓
Push Button Reach Range	No rounding, measure to hundredths	
FT Between Flares, Ramps, Driveways		✓