

# New WSDOT-Developed Job Aids for ADA Curb Ramp Evaluation and Design: Show and Tell

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## Introducing the CREF

The Curb Ramp Evaluation Form (CREF) is a tool developed to ensure completeness of data collection when performing curb ramp investigations in the field.

The CREF also can generate standardized, legible and professional looking hard-copy and electronic documentation for scoping files, project files, design documentation, and other databases.

The CREF is NOT a checklist of ADA curb ramp requirements. Rather, the CREF is designed to ensure that all data relevant to making a determination of compliance with state and federal accessibility standards is collected.

Washington State Department of Transportation		Curb Ramp Evaluation Form		Reset Form
		Sheet 1 of <input type="text"/>		
Date of Investigation	<input type="text"/> / <input type="text"/> / <input type="text"/>	Project Title <input type="text"/>		
Region (Area)	<input type="text"/>	Field Investigator(s) <input type="text"/>		
Incorporated City	<input type="checkbox"/> No <input type="checkbox"/> Yes	If "Yes," Name of City <input type="text"/>		Project Development Phase <input type="text"/>
Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)				Northbound
North Leg	<input type="text"/>	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
South Leg	<input type="text"/>	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
West Leg	<input type="text"/>	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
East Leg	<input type="text"/>	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
Curb Ramp - General Information				
Curb Ramp Type	<input type="checkbox"/> Perpendicular	<input type="checkbox"/> Parallel	<input type="checkbox"/> Combination	<input type="checkbox"/> Missing
If Parallel Curb Ramp, number of ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2		
If Combination Curb Ramp, number of perpendicular ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2		
If Combination Curb Ramp, number of parallel ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
Number of Landings (Turning Spaces)	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	
Single Curb Ramp serving two crosswalks (aka Diagonal Curb Ramp)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Ramp #1 - General Accessibility Criteria [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]				
Curb ramp connection to the roadway completely within crosswalk markings?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - <input type="text"/>	
Matched by another curb ramp/landing at the other end of the crosswalk?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - <input type="text"/>	
Ramp alignment meets the gutter grade break at a right angle?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - Ramp does not connect to roadway	
Does a Pedestrian Circulation Path intersect the ramp at a right angle?	<input type="checkbox"/> Yes, from both sides		<input type="checkbox"/> Yes, from one side	<input type="checkbox"/> No
If "Yes," is a flare present on each intersected side of the ramp?	<input type="checkbox"/> Yes	<input type="checkbox"/> No (e.g.; vertical curb present)	<input type="checkbox"/> N/A	
Grade breaks at top and bottom of the ramp are perpendicular to the direction of wheeled mobility device travel?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - Ramp does not connect to roadway	
Is the ramp's vertical alignment planar [i.e.; its vertical profile does not contain angle point(s)]?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Is the connection between the curb ramp and gutter flush?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - Ramp does not connect to roadway	
Are the grade breaks where the curb ramp connects to its landing and/or the walkway flush?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Is there a grating, access cover, or utility object located on the ramp?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	if "Yes," Describe <input type="text"/>	
Grating, access cover, or utility object located in gutter at base of ramp?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	if "Yes," Describe <input type="text"/>	
Standing water at base of ramp?	<input type="checkbox"/> Yes	<input type="checkbox"/> Unknown (i.e.; observed in dry conditions)	<input type="checkbox"/> No - Verified during precipitation event	
Ramp #1 - Slopes and Dimensions [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]				
Clear width (ft.)	<input type="text"/>	Cross slope (%)	<input type="text"/>	Running slope (%)
		Counter slope (%)	<input type="text"/>	Flare slope #1 (%)
Ramp #1 - Detectable Warning Surface [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]				Flare slope #2 (%)
				<input type="checkbox"/> N/A - Ramp does not connect to roadway
Detectable Warning Surface present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Installed at back of curb?	<input type="checkbox"/> Yes <input type="checkbox"/> No - <input type="text"/>
Depth (ft.)	<input type="text"/>	Width (ft.)	<input type="text"/>	Contrast (light on dark/dark on light)?
				<input type="checkbox"/> Yes <input type="checkbox"/> No Color? <input type="text"/>
				Truncated domes aligned perpendicular to the grade break in the gutter?
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				Print Form

# CREF\* User's Manual

## [\*Curb Ramp Evaluation Form]

Curb Ramp Form\_version1\_2.pdf - Adobe Acrobat Pro

File Edit View Document Comments Forms Tools Advanced Window Help

Create Combine Collaborate Secure Sign Forms Multimedia Comment

1 / 8 69.6% Find Sticky Note Highlight Fields

Please fill out the following form. If you are a form author, choose Distribute Form in the Forms menu to send it to your recipients.

Pages

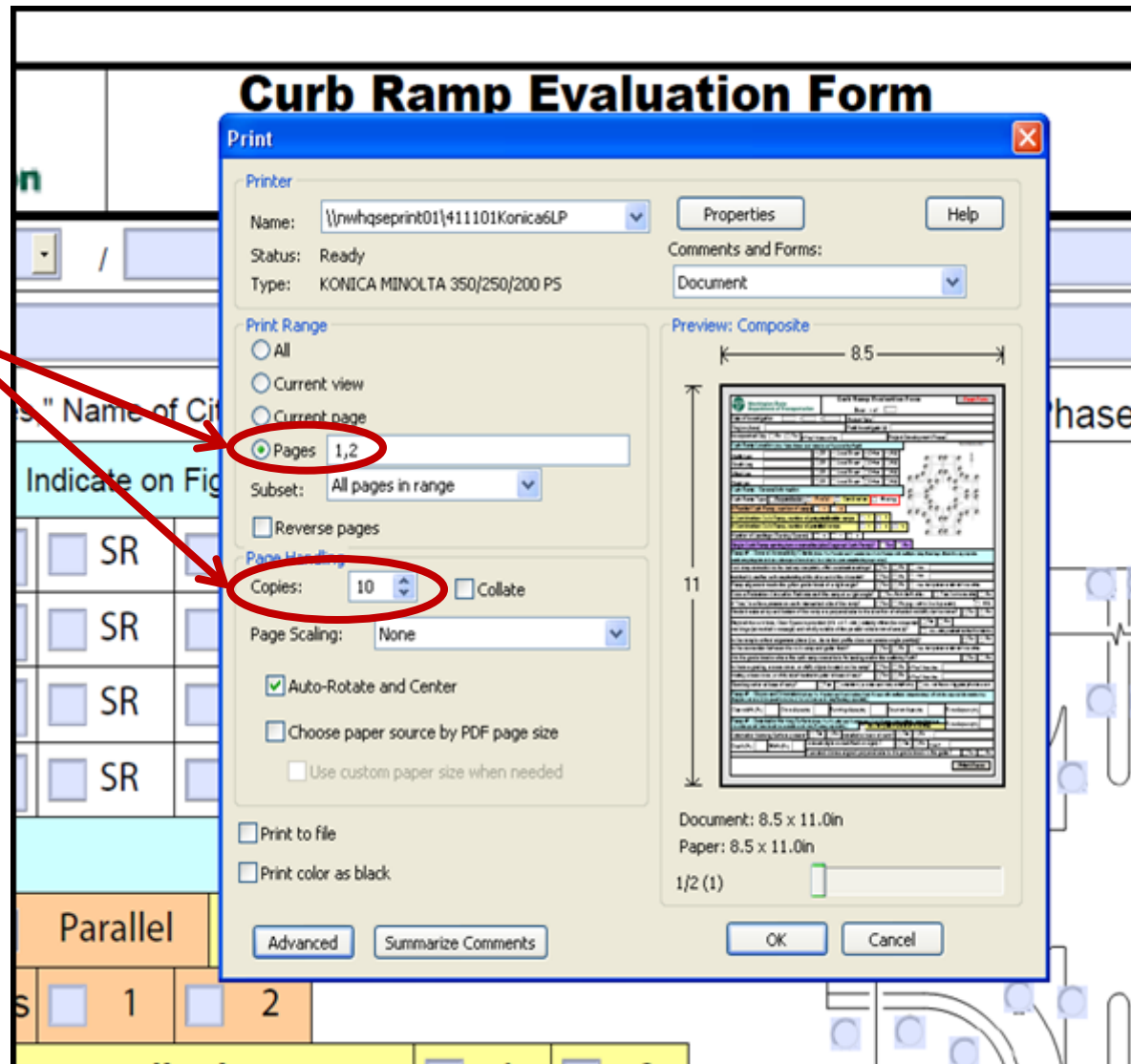
Washington State Department of Transportation		Curb Ramp Evaluation Form		Reset Form
Date of Investigation		Project Title		
Region (Area)		Field Investigator(s)		
Incorporated City	<input type="checkbox"/> No <input type="checkbox"/> Yes	If "Yes," Name of City		Project Development Phase
Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)				
North Leg	<input type="checkbox"/> SR <input type="checkbox"/> Local Street <input type="checkbox"/> Other	N/A		
South Leg	<input type="checkbox"/> SR <input type="checkbox"/> Local Street <input type="checkbox"/> Other	N/A		
West Leg	<input type="checkbox"/> SR <input type="checkbox"/> Local Street <input type="checkbox"/> Other	N/A		
East Leg	<input type="checkbox"/> SR <input type="checkbox"/> Local Street <input type="checkbox"/> Other	N/A		
Curb Ramp - General Information				
Curb Ramp Type	<input type="checkbox"/> Perpendicular <input checked="" type="checkbox"/> Parallel <input type="checkbox"/> Combination <input type="checkbox"/> Missing			
If Parallel Curb Ramp, number of ramps	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2			
If Combination Curb Ramp, number of perpendicular ramps	<input type="checkbox"/> 1 <input type="checkbox"/> 2			
If Combination Curb Ramp, number of parallel ramps	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Number of Landings (Turning Spaces)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2			
Single Curb Ramp serving two crosswalks (aka Diagonal Curb Ramp)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Ramp #1 - General Accessibility Criteria (Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately)				
Curb ramp connection to the roadway completely within crosswalk markings?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
Matched by another curb ramp/landing at the other end of the crosswalk?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
Ramp alignment meets the gutter grade break at a right angle?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A - Ramp does not connect to roadway			
Does a Pedestrian Circulation Path intersect the ramp at a right angle?	<input type="checkbox"/> Yes, from both sides <input type="checkbox"/> Yes, from one side <input type="checkbox"/> No			
If "Yes" is a flare present on each intersected side of the ramp?	<input type="checkbox"/> Yes <input type="checkbox"/> No (e.g., vertical curb present)	N/A		
Grade breaks at top and bottom of the ramp are perpendicular to the direction of wheeled mobility device travel?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A - Ramp does not connect to roadway			
Is the ramp's vertical alignment planar [i.e., its vertical profile does not contain angle point(s)]?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is the connection between the curb ramp and gutter flush?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A - Ramp does not connect to roadway			
Are the grade breaks where the curb ramp connects to its landing and/or the walkway flush?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is there a grating, access cover, or utility object located on the ramp?	<input type="checkbox"/> Yes <input type="checkbox"/> No # "Yes," Describe			
Grating, access cover, or utility object located in gutter at base of ramp?	<input type="checkbox"/> Yes <input type="checkbox"/> No # "Yes," Describe			
Standing water at base of ramp?	<input type="checkbox"/> Yes <input type="checkbox"/> Unknown (i.e., observed in dry conditions) <input type="checkbox"/> No - Verified during precipitation event			
Ramp #1 - Slopes and Dimensions (Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.)				
Clear width (Ft)	Cross slope (%)	Running slope (%)	Counter slope (%)	Flare slope #1(%)
Ramp #1 - Detectable Warning Surface (Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.)				Flare slope #2(%)
Detectable Warning Surface present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Installed at back of curb?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Depth (Ft)	Width (Ft)	Contrast (light on dark/dark on light)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Color?
Truncated domes aligned perpendicular to the grade break in the gutter? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Print Form				

## Preparing for the field evaluation

- Open the CREF file
- Estimate the number of curb ramps to be evaluated and print out the appropriate number of both page 1 and page 2 of the file.

### Notes:

1. **Page 1** is for evaluating a ramp while **page 2** is for evaluating a landing. Thus a typical perpendicular curb ramp with landing requires two sheets for the evaluation.
2. If there are “Type A” parallel curb ramps (i.e.; two ramps and a landing) to be evaluated, print the appropriate number of copies of **page 3** to cover the additional ramps.
3. Similarly, if there are any combination curb ramps to be evaluated then extra copies of landing (page 4) and ramp (pages 3 & 5-7) sheets will be needed.



# Preparing for the field evaluation

For economy of State resources, the form pages can be printed Black & White for the field evaluation...saving the Color printing for the final product after data entry back at the office.

**Washington State Department of Transportation** **Curb Ramp Evaluation Form** Print Form

Sheet 1 of 1

Date of Investigation: / / Project Title: \_\_\_\_\_

Region (Area): \_\_\_\_\_ Field Investigator(s): \_\_\_\_\_

Incorporated City:  No  Yes if "Yes," Name of City Project Development Phase: \_\_\_\_\_

Curb Ramp Location (See Table Below and Indicate on Figure to the Right) Northbound

North Leg	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
South Leg	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
West Leg	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
East Leg	<input type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A

Curb Ramp - General Information

Curb Ramp Type:  Perpendicular  Parallel  Combination  Missing

If Parallel Curb Ramp, number of ramps:  1  2

If Combination Curb Ramp, number of perpendicular ramps:  1  2

If Combination Curb Ramp, number of parallel ramps:  1  2  3

Number of Landings (Turning Spaces):  0  1  2

Single Curb Ramp serving two crosswalks (aka Diagonal Curb Ramp)?  Yes  No

Ramp #1 - General Accessibility Criteria (Note: For Parallel and Combination Curb Ramps with multiple ramp/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.)

Curb ramp connection to the roadway completely within crosswalk markings?  Yes  No  N/A

Matched by another curb ramp/landing at the other end of the crosswalk?  Yes  No  N/A

Ramp alignment meets the gutter grade break at a right angle?  Yes  No  N/A - Ramp does not connect to roadway

Does a Pedestrian Circulation Path intersect the ramp at a right angle?  Yes, from both sides  Yes, from one side  No

If "Yes," is a flare present on each intersected side of the ramp?  Yes  No (e.g., vertical curb present)  N/A

Grade breaks at top and bottom of the ramp are perpendicular to the direction of wheeled mobility device travel?  Yes  No

Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?  Yes  No  N/A - Ramp does not connect to roadway

Is the ramp's vertical alignment planar (i.e., its vertical profile does not contain angle point(s))?  Yes  No

Is the connection between the curb ramp and gutter flush?  Yes  No  N/A - Ramp does not connect to roadway

Are the grade breaks where the curb ramp connects to its landing and/or the walkway flush?  Yes  No

Is there a grating, access cover, or utility object located on the ramp?  Yes  No if "Yes," Describe \_\_\_\_\_

Grating, access cover, or utility object located in gutter at base of ramp?  Yes  No if "Yes," Describe \_\_\_\_\_

Standing water at base of ramp?  Yes  Unknown (i.e., observed in dry conditions)  No - Verified during precipitation event

Ramp #1 - Slopes and Dimensions (Note: For Parallel and Combination Curb Ramps with multiple ramp/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.)

Clear width (ft.) \_\_\_\_\_ Cross slope (%) \_\_\_\_\_ Running slope (%) \_\_\_\_\_ Counter slope (%) \_\_\_\_\_ Flare slope #1 (%) \_\_\_\_\_

Ramp #1 - Detectable Warning Surface (Note: For Parallel and Combination Curb Ramps with multiple ramp/landings use subsequent form sheets to evaluate each ramp/landing separately.)  N/A - Ramp does not connect to roadway

Detectable Warning Surface present?  Yes  No Installed at back of curb?  Yes  No

Depth (ft.) \_\_\_\_\_ Width (ft.) \_\_\_\_\_ Contrast (light on dark/dark on light)?  Yes  No Color? \_\_\_\_\_

Truncated domes aligned perpendicular to the grade break in the gutter?  Yes  No

**Print Form**

**Curb Ramp Evaluation Form** Print Form

Sheet 1 of 1

Project Title: \_\_\_\_\_

Northbound

Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A

are perpendicular to the direction of wheeled mobility device travel?  Yes  No

entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?  Yes  No  N/A - Landing does not connect to roadway

ical profiles do not contain angle point(s)?  Yes  No

ing, access cover, or utility object located on the landing?  Yes  No if "Yes," Describe \_\_\_\_\_

Grating, access cover, or utility object located in gutter where landing connects to roadway?  Yes  No if "Yes," Describe \_\_\_\_\_

Standing water in landing?  Yes  Unknown (i.e., observed in dry conditions)  No - Verified during precipitation event

Landing #1 - Slopes and Dimensions (Note: For Parallel and Combination Curb Ramps with multiple ramp/landings use subsequent form sheets to evaluate each ramp/landing separately.)

Clear width (ft.) \_\_\_\_\_ Clear length (ft.) \_\_\_\_\_ Cross slope (%) \_\_\_\_\_ Running slope (%) \_\_\_\_\_ Counter slope (%) \_\_\_\_\_

Landing #1 - Detectable Warning Surface (Note: For Parallel and Combination Curb Ramps with multiple ramp/landings use subsequent form sheets to evaluate each ramp/landing separately.)  N/A - Landing not connected to roadway

Detectable Warning Surface present?  Yes  No Installed at back of curb?  Yes  No

Depth (ft.) \_\_\_\_\_ Width (ft.) \_\_\_\_\_ Contrast (light on dark/dark on light)?  Yes  No Color? \_\_\_\_\_

Truncated domes aligned perpendicular to the grade break in the gutter?  Yes  No

Field Notes (Site-Specific Observations) -

**Print Form**

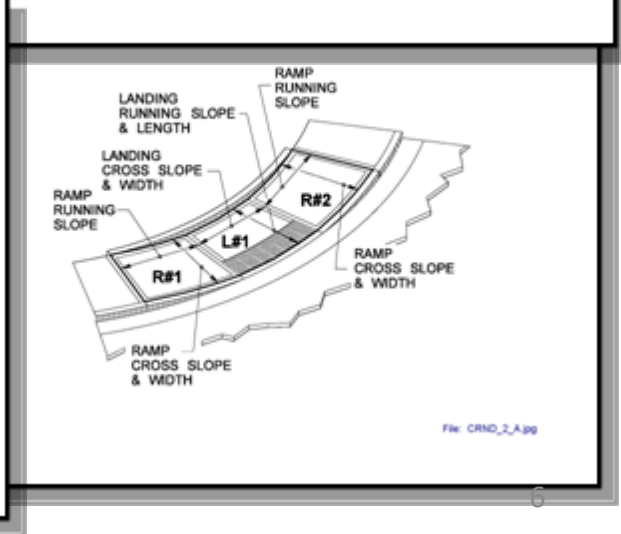
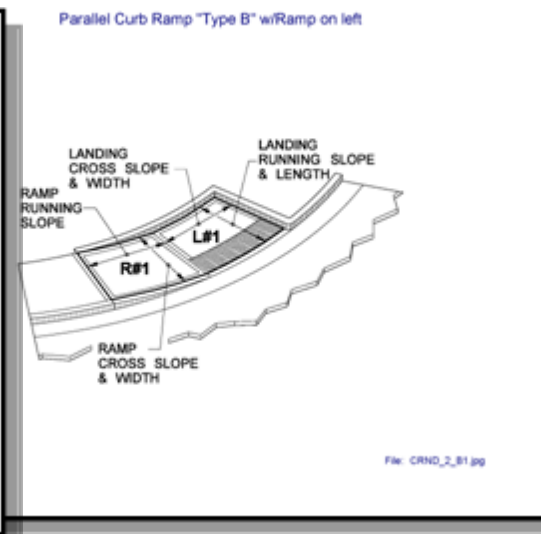
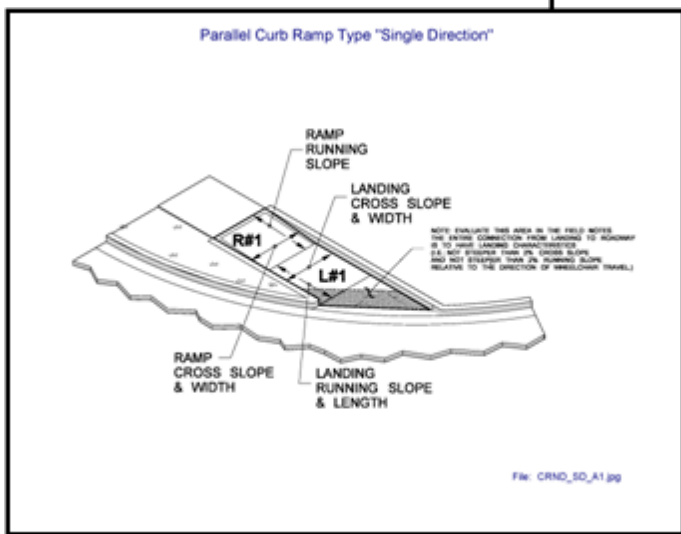
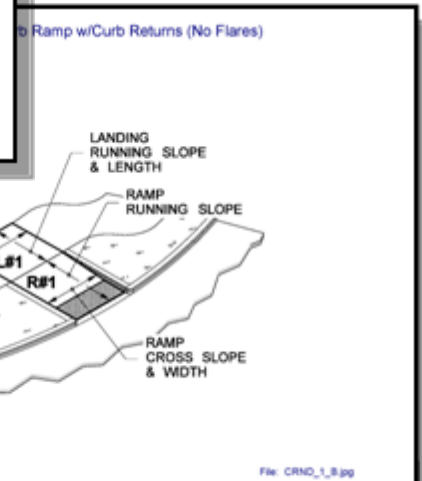
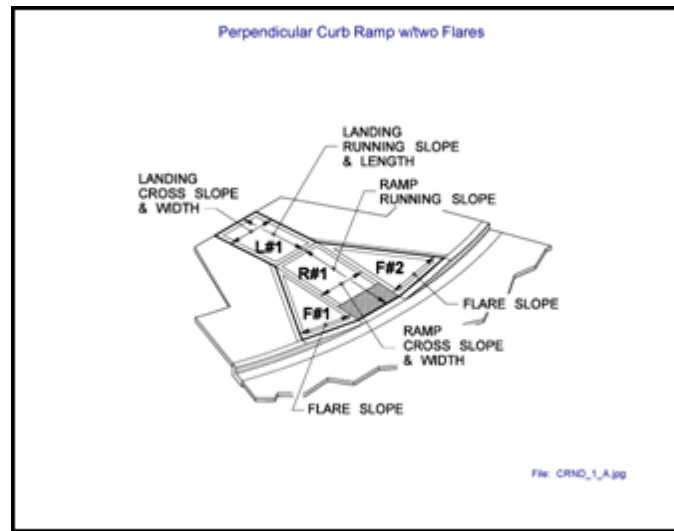


# Preparing for the field evaluation

Also, print out a copy of the Curb Ramp Numbering Diagram (CRND) Index for reference out in the field.

The CRNDs are designed to promote consistent data entry on the CREF.

As of 3/9/12, the CRND library covers all perpendicular and parallel curb ramps. In the near future, the CRND library will be expanded to cover the wide variety of combination curb ramps as well as blended transitions.



## Field data entry

The CREF is designed to be legible in the field for field data entry.

The heading data can be entered later during final data entry back at the office...

**Washington State Department of Transportation** **Curb Ramp Evaluation Form** Sheet 1 of 1 Reset Form

Date of Investigation 5 / 9 / 2022 Project Title \_\_\_\_\_

Region (Area) \_\_\_\_\_ Field Investigator(s) \_\_\_\_\_

Incorporated City  No  Yes If "Yes," Name of City \_\_\_\_\_ Project Development Phase \_\_\_\_\_

Curb Ramp Location (Use Table Below and Indicate on Figure to the Right) \_\_\_\_\_

North Leg	<u>SR 999</u>	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
South Leg	<u>SR 999</u>	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
West Leg	<u>ELM ST.</u>	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
East Leg	<u>ELM ST.</u>	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A

Curb Ramp - General Information

Curb Ramp Type  Perpendicular  Parallel  Combination  Missing

If Parallel Curb Ramp, number of ramps  1  2

If Combination Curb Ramp, number of perpendicular ramps  1  2

If Combination Curb Ramp, number of parallel ramps  1  2  3

Number of Landings (Turning Spaces)  0  1  2

Single Curb Ramp serving two crosswalks (aka Diagonal Curb Ramp)?  Yes  No

Ramp #1 - General Accessibility Criteria [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]

Curb ramp connection to the roadway completely within crosswalk markings?  Yes  No  N/A - UNMARKED

Matched by another curb ramp/landing at the other end of the crosswalk?  Yes  No  N/A - \_\_\_\_\_

Ramp alignment meets the gutter grade break at a right angle?  Yes  No  N/A - Ramp does not connect to roadway

Does a Pedestrian Circulation Path intersect the ramp at a right angle?  Yes, from both sides  Yes, from one side  No

If "Yes," is a flare present on each intersected side of the ramp?  Yes  No (e.g.; vertical curb present)  N/A

Grade breaks at top and bottom of the ramp are perpendicular to the direction of wheeled mobility device travel?  Yes  No

Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?  Yes  No  N/A - Ramp does not connect to roadway

Is the ramp's vertical alignment planar [i.e.; its vertical profile does not contain angle point(s)]?  Yes  No

Is the connection between the curb ramp and gutter flush?  Yes  No  N/A - Ramp does not connect to roadway

Are the grade breaks where the curb ramp connects to its landing and/or the walkway flush?  Yes  No

Is there a grating, access cover, or utility object located on the ramp?  Yes  No If "Yes," Describe \_\_\_\_\_

Grating, access cover, or utility object located in gutter at base of ramp?  Yes  No If "Yes," Describe \_\_\_\_\_

Standing water at base of ramp?  Yes  Unknown (i.e.; observed in dry conditions)  No - Verified during precipitation event

Ramp #1 - Slopes and Dimensions [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]

Clear width (Ft.) 3 Cross slope (%) 3.4 Running slope (%) 11.6 Counter slope (%) 5.7 Flare slope #1(%) 17.0

Ramp #1 - Detectable Warning Surface [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]  N/A - Ramp does not connect to roadway Flare slope #2(%) 4.3

Detectable Warning Surface present?  Yes  No Installed at back of curb?  Yes  No \_\_\_\_\_

Depth (Ft.) \_\_\_\_\_ Width (Ft.) \_\_\_\_\_ Contrast (light on dark/dark on light) ?  Yes  No Color? \_\_\_\_\_

Truncated domes aligned perpendicular to the grade break in the gutter?  Yes  No

**Print Form**



## Field data entry

However, it is **very important** that the location data for each evaluated ramp and landing be carefully entered in the location data fields on each page.

This is to prevent “mis-matching” of data back at the office (i.e.; to ensure that the correct landing data is attached to the correct ramp data).

Washington State Department of Transportation		Curb Ramp Evaluation Form		Reset Form
Date of Investigation		Sheet 1 of 1		
Date of Investigation: 5 / 9 / 2022		Project Title: _____		
Region (Area): _____		Field Investigator(s): _____		
Incorporated City: <input type="checkbox"/> No <input type="checkbox"/> Yes [If "Yes," Name of City: _____]		Project Development Phase: _____		
Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)				
North Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
South Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
West Leg	ELM ST.	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
East Leg	ELM ST.	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
Curb Ramp - General Information				
Curb Ramp Type: <input checked="" type="checkbox"/> Perpendicular <input type="checkbox"/> Parallel <input type="checkbox"/> Combination <input type="checkbox"/> Missing				
If Parallel Curb Ramp, number of ramps: <input type="checkbox"/> 1 <input type="checkbox"/> 2				
If Combination Curb Ramp, number of perpendicular ramps: <input type="checkbox"/> 1 <input type="checkbox"/> 2				
If Combination Curb Ramp, number of parallel ramps: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3				
Number of Landings (Turning Spaces): <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2				
Single Curb Ramp serving two crosswalks (aka Diagonal Curb Ramp)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Ramp #1 - General Accessibility Criteria [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]				
Curb ramp connection to the roadway completely within crosswalk markings? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A - UNMARKED				
Matched by another curb ramp/landing at the other end of the crosswalk? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A -				
Ramp alignment meets the gutter grade break at a right angle? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A - Ramp does not connect to roadway				
Does a Pedestrian Circulation Path intersect the ramp at a right angle? <input checked="" type="checkbox"/> Yes, from both sides <input type="checkbox"/> Yes, from one side <input type="checkbox"/> No				
If "Yes," is a flare present on each intersected side of the ramp? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (e.g.; vertical curb present) <input type="checkbox"/> N/A				
Grade breaks at top and bottom of the ramp are perpendicular to the direction of wheeled mobility device travel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A - Ramp does not connect to roadway				
Is the ramp's vertical alignment planar [i.e.; its vertical profile does not contain angle point(s)]? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Is the connection between the curb ramp and gutter flush? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A - Ramp does not connect to roadway				
Are the grade breaks where the curb ramp connects to its landing and/or the walkway flush? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Is there a grating, access cover, or utility object located on the ramp? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No [If "Yes," Describe: _____]				
Grating, access cover, or utility object located in gutter at base of ramp? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No [If "Yes," Describe: _____]				
Standing water at base of ramp? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Unknown (i.e.; observed in dry conditions) <input type="checkbox"/> No - Verified during precipitation event				
Ramp #1 - Slopes and Dimensions [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]				
Clear width (Ft.)	3	Cross slope (%)	3.4	Running slope (%)
				11.6
Counter slope (%)	5.7	Flare slope #1 (%)	17.0	
		Flare slope #2 (%)	4.3	
Ramp #1 - Detectable Warning Surface [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.] <input type="checkbox"/> N/A - Ramp does not connect to roadway				
Detectable Warning Surface present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Installed at back of curb? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Depth (Ft.)		Width (Ft.)		Contrast (light on dark/dark on light)? <input type="checkbox"/> Yes <input type="checkbox"/> No Color? _____
Truncated domes aligned perpendicular to the grade break in the gutter? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Print Form				





# Field data entry

Pages 2 – 8 of the CREF include areas to write field notes of site-specific observations.

Washington State Department of Transportation		Curb Ramp Evaluation Form	
Date of Investigation		Sheet <input type="checkbox"/> of <input type="checkbox"/>	
Date of Investigation		Project Title	
Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)			
North Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
South Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
West Leg	ELM ST	<input type="checkbox"/> SR <input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
East Leg	ELM ST	<input type="checkbox"/> SR <input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
Landing #1 - General Accessibility Criteria [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]			
Landing connection to the roadway completely within crosswalk markings?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Matched by another curb ramp/landing at the other end of the crosswalk?		<input checked="" type="checkbox"/> N/A - <input type="checkbox"/> Yes <input type="checkbox"/> No	
Grade breaks where landing connects to ramp(s)/walkway are perpendicular to the direction of wheeled mobility device travel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No			
<input checked="" type="checkbox"/> N/A - Landing does not connect to roadway			
Is the landing's vertical alignments planar [i.e.; its vertical profiles do not contain angle point(s)]? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is the connection between the landing and gutter flush? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A - Landing does not connect to roadway			
Are the grade breaks where the landing connects to its ramp(s), the roadway, and/or the walkway flush? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Grating, access cover, or utility object located on the landing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes," Describe <input type="text"/>			
Grating, access cover, or utility object located in gutter where landing connects to roadway? <input type="checkbox"/> Yes <input type="checkbox"/> No If "Yes," Describe <input type="text"/>			
<input checked="" type="checkbox"/> N/A - Landing does not connect to roadway			
Standing water on landing? <input type="checkbox"/> Yes <input type="checkbox"/> Unknown (i.e.; observed in dry conditions) <input checked="" type="checkbox"/> No - Verified during precipitation event			
Landing #1 - Slopes and Dimensions [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]			
Clear width (Ft.)	3	Clear length (Ft.)	4
Cross slope (%)	3.6	Running slope (%)	4.2
Counter slope (%)	N/A		
Landing #1 - Detectable Warning Surface [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]			
<input checked="" type="checkbox"/> N/A - Landing not connected to roadway			
Detectable Warning Surface present? <input type="checkbox"/> Yes <input type="checkbox"/> No Installed at back of curb? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Depth (Ft.)		Width (Ft.)	
Contrast (light on dark/dark on light)?		<input type="checkbox"/> Yes <input type="checkbox"/> No Color? <input type="text"/>	
Truncated domes aligned perpendicular to the grade break in the gutter? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Field Notes (Site-Specific Observations) -			
			<b>Print Form</b>



## Data Entry and Form Function

**Curb Ramp Evaluation Form**

Sheet 1 of  |   
2  
3  
4  
5  
6  
7  
8

Warning! Clears ALL user entered data from ALL sheets of the form.

Project Title

Field Investigator(s)

City

Project Development Phase

Figure to the Right) Northbound

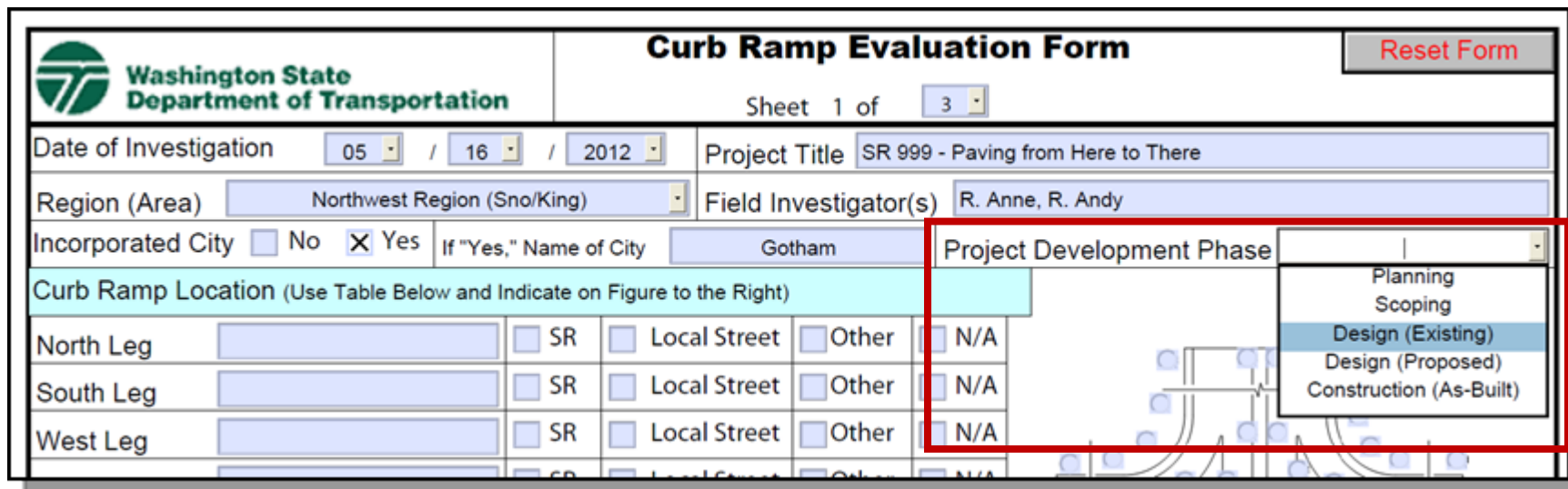
<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A

The “**Reset Form**” button will clear ALL user entered data from every sheet in the form file.

Note that the “**of #**” sheet pull down menu does not contain the number 1.

That is because the last sheet (page 8) of the form file should always be included with the evaluation. The minimum number of sheets of 2 results either when a curb ramp is “missing” from a location - OR – when evaluating a ramp that is missing its required landing. **A typical curb ramp consisting of a ramp and a landing will have a total of 3 sheets** (pages 1, 2, and 8 of the file). As discussed previously, curb ramp types that incorporate more ramps/landings will require more sheets (1 sheet per ramp and 1 sheet per landing).

## Data Entry and Form Function



**Washington State Department of Transportation**

### Curb Ramp Evaluation Form

Sheet 1 of 3

Reset Form

Date of Investigation: 05 / 16 / 2012

Project Title: SR 999 - Paving from Here to There

Region (Area): Northwest Region (Sno/King)

Field Investigator(s): R. Anne, R. Andy

Incorporated City:  No  Yes. If "Yes," Name of City: Gotham

Project Development Phase: [Dropdown Menu]

Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)

Leg	SR	Local Street	Other	N/A
North Leg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
South Leg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
West Leg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Project Development Phase options: Planning, Scoping, Design (Existing), Design (Proposed), Construction (As-Built)

The general project and site information to be entered into the form header should be readily available.

“**Incorporated City**” information could be relevant for maintenance responsibilities and application of design standards.

The “**Project Development Phase**” pull down is designed to encourage use of the CREF for a variety of project purposes.

Note: Applicable heading information that is entered into sheet 1 is automatically transferred to the other sheets in the form file.

# Data Entry and Form Function

Incorporated City	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	If "Yes," Name of City	Gotham		Project Development Phase	Design (Existing)	
Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)							
North Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A		
South Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A		
West Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A		
East Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A		
Curb Ramp - General Information							
Curb Ramp Type	<input type="checkbox"/> Perpendicular	<input type="checkbox"/> Parallel	<input type="checkbox"/> Combination	<input checked="" type="checkbox"/> Missing			
If Parallel Curb Ramp, number of ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2					
If Combination Curb Ramp, number of <b>perpendicular</b> ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2					
If Combination Curb Ramp, number of <b>parallel</b> ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3				
Number of Landings (Turning Spaces)	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2				

Northbound

The Curb Ramp Location Table and the intersection schematic with radio buttons are to be used in tandem to identify the location of the curb ramp location being evaluated.

Checking the **"Other"** box indicates that the intersection leg is a high ADT commercial driveway or a private road.

Checking the **"N/A"** box indicates that the intersection leg does not exist at this intersection (such as at a "T-intersection").

Note: The Curb Ramp Location information entered into sheet 1 is automatically transferred to the other sheets in the form file.



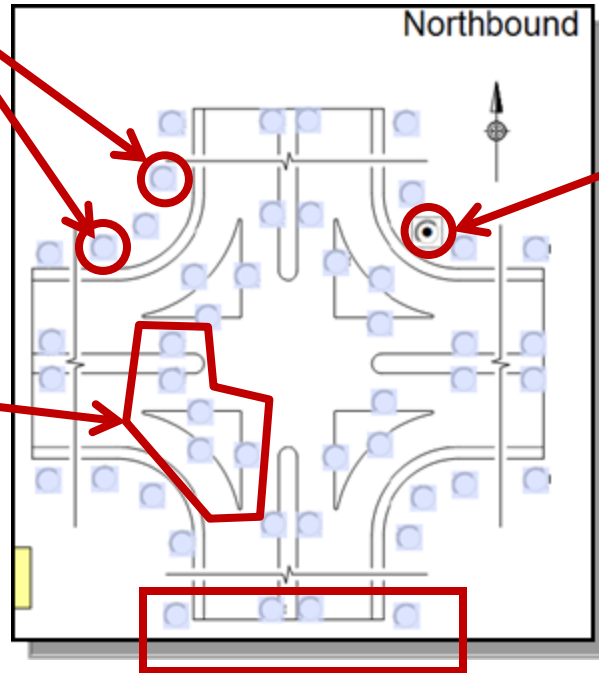
# Data Entry and Form Function

The intersection schematic with radio buttons is designed to cover all the potential locations for curb ramps at an intersection and at midblock crossings as well.

Locations to indicate a curb ramp location when the quadrant has a separate curb ramp for each crosswalk

Location centered on radius indicates either a single curb ramp serving two crosswalks (aka "diagonal curb ramp") – OR – a Combination style curb ramp serving two crosswalks

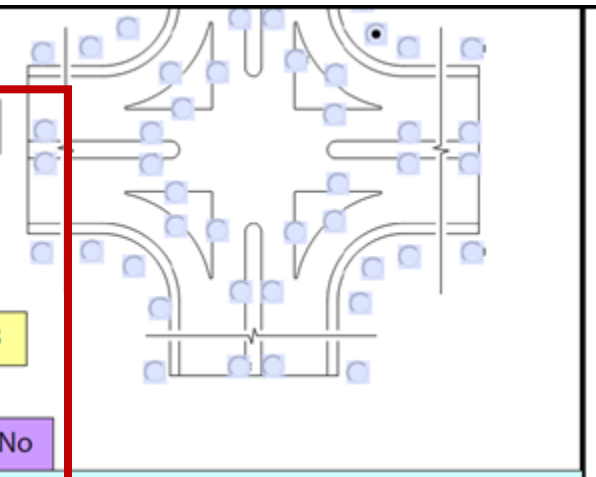
Locations on traffic islands or medians



Areas beyond the break lines indicate locations at midblock crossings

# Data Entry and Form Function

West Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
East Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
<b>Curb Ramp - General Information</b>					
Curb Ramp Type	<input checked="" type="checkbox"/> Perpendicular	<input type="checkbox"/> Parallel	<input type="checkbox"/> Combination	<input type="checkbox"/> Missing	
If Parallel Curb Ramp, number of ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2			
If Combination Curb Ramp, number of <b>perpendicular</b> ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2			
If Combination Curb Ramp, number of <b>parallel</b> ramps	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		
Number of Landings (Turning Spaces)	<input type="checkbox"/> 0	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2		
Single Curb Ramp serving two crosswalks (aka Diagonal Curb Ramp)?	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No		



The Curb Ramp General Information section is used to indicate the type of curb ramp at the location, which in turn sets the expectation of how many ramps/landings need to be evaluated and thus how many total sheets should be included in the CREF (1 sheet per each ramp or landing + the last sheet {page 8} in the form file).



**Perpendicular**



**Parallel**



**Combination**

# Data Entry and Form Function

Ramp #1 - General Accessibility Criteria [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]			
Curb ramp connection to the roadway completely within crosswalk markings?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A - <input type="text" value="Unmarked Crossing"/>
Matched by another curb ramp/landing at the other end of the crosswalk?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - <input type="text"/>
Ramp alignment meets the gutter grade break at a right angle?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - Ramp does not connect to roadway
Does a Pedestrian Circulation Path intersect the ramp at a right angle?	<input checked="" type="checkbox"/> Yes, from both sides		<input type="checkbox"/> Yes, from one side <input type="checkbox"/> No
If "Yes," is a flare present on each intersected side of the ramp?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No (e.g.; vertical curb present) <input type="checkbox"/> N/A	
Grade breaks at top and bottom of the ramp are perpendicular to the direction of wheeled mobility device travel?	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No
Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - Ramp does not connect to roadway
Is the ramp's vertical alignment planar [i.e.; its vertical profile does not contain angle point(s)]?	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No
Is the connection between the curb ramp and gutter flush?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A - Ramp does not connect to roadway
Are the grade breaks where the curb ramp connects to its landing and/or the walkway flush?	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No
Is there a grating, access cover, or utility object located on the ramp?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If "Yes," Describe <input type="text"/>
Grating, access cover, or utility object located in gutter at base of ramp?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If "Yes," Describe <input type="text" value="Catch Basin"/>
Standing water at base of ramp?	<input type="checkbox"/> Yes	<input type="checkbox"/> Unknown (i.e.; observed in dry conditions)	<input checked="" type="checkbox"/> No - Verified during precipitation event

The General Accessibility Criteria section for each ramp/landing is used to gather information needed to determine compliance with state and federal accessibility standards. **Each question asked of the evaluator in this section is directly related to an ADA/WSDOT Design Manual requirement.** Contact either the Statewide ADA Trainer or your Regional ADA Coordinator if you have questions.

# Data Entry and Form Function

Ramp #1 - Slopes and Dimensions [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]									
Clear width (Ft.)	3.0	Cross slope (%)	4.2	Running slope (%)	10.6	Counter slope (%)	+ 4.5	Flare slope #1(%)	14.2
Ramp #1 - Detectable Warning Surface [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]								Flare slope #2(%)	4.6
		<input type="checkbox"/> N/A - Ramp does not connect to roadway							
Detectable Warning Surface present?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	Installed at back of curb?		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Depth (Ft.)		Width (Ft.)		Contrast (light on dark/dark on light) ?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	Color?	
Truncated domes aligned perpendicular to the grade break in the gutter?								<input type="checkbox"/> Yes	<input type="checkbox"/> No
									<b>Print Form</b>

The Slopes and Dimensions section for each ramp/landing is used to input the physical measurements of the ramp/landing that are needed to determine compliance with state and federal accessibility standards.

Enter “**Counter slope**” data with either a (+) or a (-) sign depending on whether the crosswalk slopes up away from the connection to the gutter (+) or rather down away from the connection to the gutter (-).

If flares are not present, or if counter slope evaluation is not applicable because the feature does not connect to the crosswalk, then “**N/A**” can be entered into these boxes.



## Data Entry and Form Function

Ramp #1 - Detectable Warning Surface [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]						Flare slope #2(%) 4.6				
<input type="checkbox"/> N/A - Ramp does not connect to roadway										
Detectable Warning Surface present?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Installed at back of curb?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	- 2 inches from back of curb		
Depth (Ft.)	2.0	Width (Ft.)	2.6	Contrast (light on dark/dark on light) ?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Color?	Federal Yellow	
Truncated domes aligned perpendicular to the grade break in the gutter?							<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
<b>Print Form</b>										

The Detectable Warning Surface section for each ramp/landing is used to evaluate the placement and other criteria for the DWS if the ramp/landing is connected to the roadway.

Note: For DWS evaluation, it is important that the correct Curb Ramp Numbering Diagram is used and that measurements for ramp/landing width are taken in the directions shown on the diagram.

# Data Entry and Form Function

In this example, the perpendicular curb ramp's landing is then evaluated on sheet 2.

Data entry is similar to sheet 1.

The project and location data from sheet 1 is automatically transferred to all sheets upon input, and if the data is changed on any sheet then it will automatically update on all sheets.

Washington State Department of Transportation		Curb Ramp Evaluation Form	
Date of Investigation 05 / 16 / 2012		Sheet 2 of 2	
Project Title SR 999 - Paving from Here to There		Northbound	
Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)			
North Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
South Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
West Leg	Elm Street	<input type="checkbox"/> SR <input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
East Leg	Elm Street	<input type="checkbox"/> SR <input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other <input type="checkbox"/> N/A
Landing #1 - General Accessibility Criteria [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]			
Landing connection to the roadway completely within crosswalk markings?		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A - Landing not connected to roadway
Matched by another curb ramp/landing at the other end of the crosswalk?		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A - Landing not connected to roadway
Grade breaks where landing connects to ramp(s)/walkway are perpendicular to the direction of wheeled mobility device travel?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input checked="" type="checkbox"/> N/A - Landing does not connect to roadway
Is the landing's vertical alignments planar [i.e.; its vertical profiles do not contain angle point(s)]?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Is the connection between the landing and gutter flush?			<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A - Landing does not connect to roadway
Are the grade breaks where the landing connects to its ramp(s), the roadway, and/or the walkway flush?			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Grating, access cover, or utility object located on the landing?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If "Yes," Describe
Grating, access cover, or utility object located in gutter where landing connects to roadway?		<input type="checkbox"/> Yes <input type="checkbox"/> No	If "Yes," Describe
		<input checked="" type="checkbox"/> N/A - Landing does not connect to roadway	
Standing water in landing?		<input type="checkbox"/> Yes <input type="checkbox"/> Unknown (i.e.; observed in dry conditions)	<input checked="" type="checkbox"/> No - Verified during precipitation event
Landing #1 - Slopes and Dimensions [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.]			
Clear width (Ft.)	3.0	Clear length (Ft.)	4.0
Cross slope (%)	4.2	Running slope (%)	3.6
Counter slope (%)	N/A		
Landing #1 - Detectable Warning Surface [Note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.]			
Detectable Warning Surface present?		<input type="checkbox"/> Yes <input type="checkbox"/> No	Installed at back of curb? <input type="checkbox"/> Yes <input type="checkbox"/> No
Depth (Ft.)		Width (Ft.)	
Contrast (light on dark/dark on light)?		<input type="checkbox"/> Yes <input type="checkbox"/> No	Color?
Truncated domes aligned perpendicular to the grade break in the gutter?			<input type="checkbox"/> Yes <input type="checkbox"/> No
Field Notes (Site-Specific Observations) -			
Most grades and dimensions could be fixed if curb/short wall installed at back of landing.			
<a href="#">Print Form</a>			

## Data Entry and Form Function

Sheets that are not used in the form file (due to the type of curb ramp being evaluated and its Curb Ramp Numbering Diagram) can be marked "N/U."

This is recommended both as a reminder not to print the sheet and, if the sheet is accidentally printed, as a reminder that the sheet does not belong in the final product.

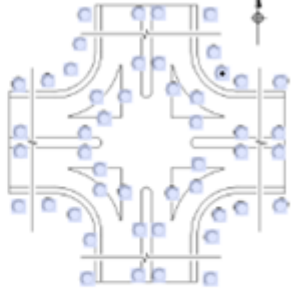
Curb Ramp Evaluation Form			
Sheet		<input type="text" value="N/U"/>	of <input type="text" value="3"/>
<input type="text" value="2012"/>	Project Title <input type="text" value="SR 999 - Paving from Here to T"/>		
Indicate on Figure to the Right)			
<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A

## Data Entry and Form Function

After filling out the necessary form pages based on the number of ramps/landings at the curb ramp location, it is then time to fill out page 8 of the form file.

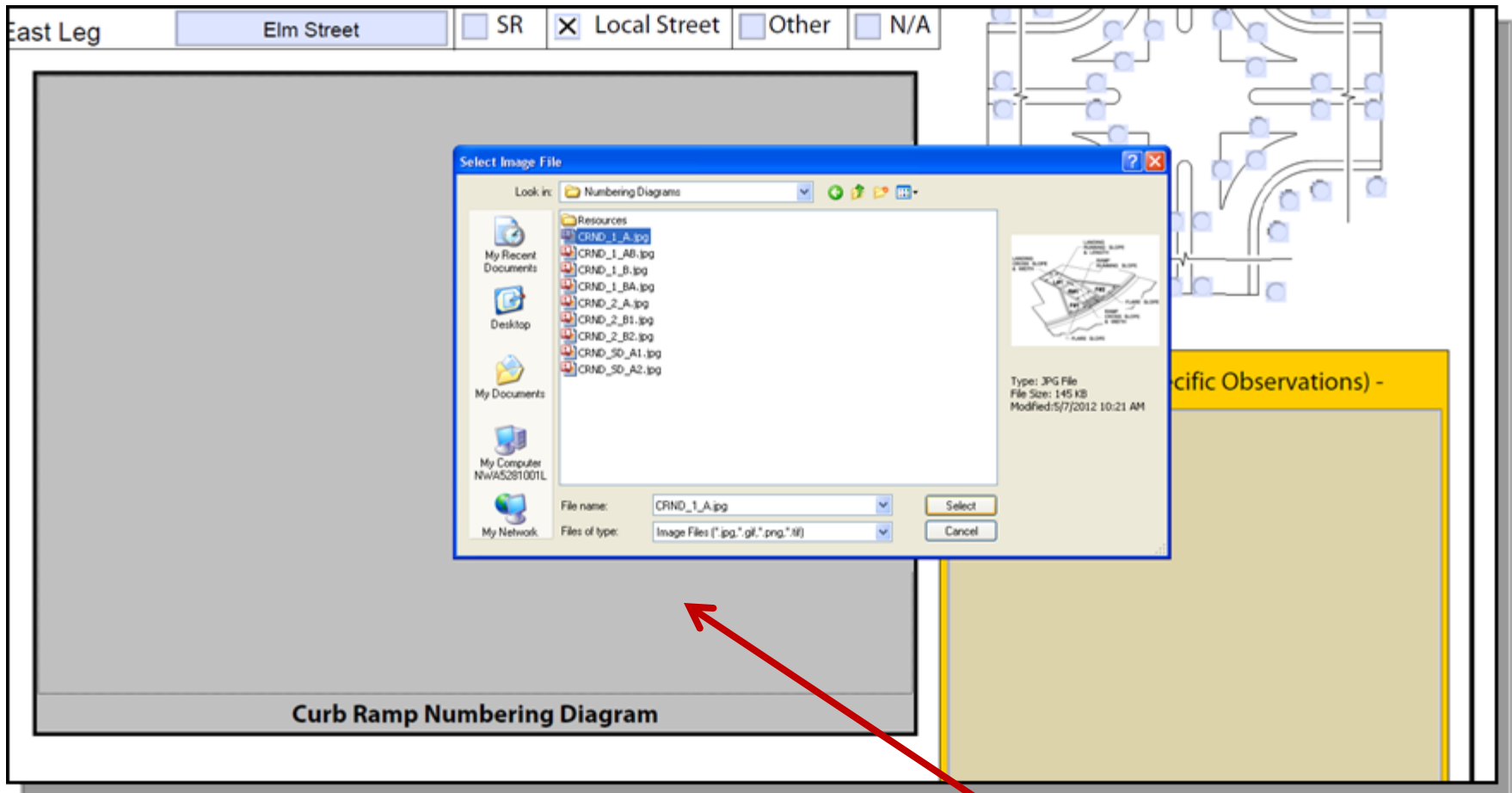
As explained earlier, **page 8 of the form file is to be included as the last sheet of each evaluation package.**

Thus in our perpendicular curb ramp example walkthrough (since our curb ramp has 1 ramp and 1 landing that we evaluated) page 8 becomes **“Sheet 3 of 3”** in our final product.

Washington State Department of Transportation		Curb Ramp Evaluation Form	
Date of Investigation 05 / 16 / 2012		Project Title SR 999 - Paving from Here to There	
Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)			
North Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
South Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
West Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
East Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street <input type="checkbox"/> Other <input type="checkbox"/> N/A
Curb Ramp Numbering Diagram		Northbound	
			
Photograph		Field Notes (Site-Specific Observations) -	
		<div style="border: 1px solid black; height: 150px;"></div>	
Is this Curb Ramp Location fully compliant with state and federal standards?			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Undetermined at this time <input type="checkbox"/> Yes			
If "No," select all that apply -			
MEF documentation included in DDP <input type="checkbox"/>			
Other justification included in DDP <input type="checkbox"/>			
This project will bring this curb ramp location into full compliance <input type="checkbox"/>			
Solution Pending Design Analysis <input type="checkbox"/>			
<b>Print Form</b>			



# Data Entry and Form Function



Left click anywhere on the Curb Ramp Numbering Diagram box on the form sheet.

Navigate to where you saved the jpeg photo file and select it.

# Data Entry and Form Function

Then left click anywhere on the Photograph box.

Navigate to a photograph of the curb ramp location that is being evaluated and select it.

[Note: Try to choose a photo that shows all the elements evaluated in the form.]

The screenshot displays a software interface for data entry and form function. The main window is divided into several sections:

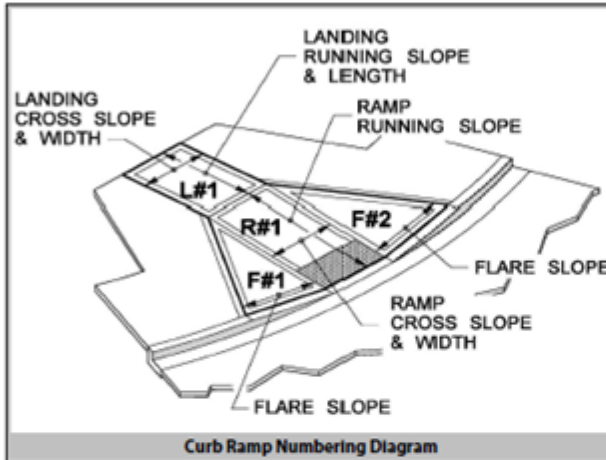
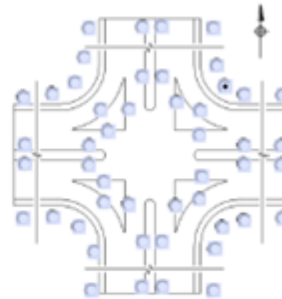
- Diagram:** A technical drawing of a curb ramp labeled "Curb Ramp Numbering Diagram". It shows various components with labels: "LANDING CROSS SLOPE & WIDTH", "LANDING RUNNING SLOPE & LENGTH", "RAMP RUNNING SLOPE", "FLARE SLOPE", "RAMP CROSS SLOPE & WIDTH", and "FLARE SLOPE". Specific areas are numbered: "L#1", "R#1", "F#1", and "F#2".
- Field Notes:** A yellow box labeled "Field Notes (Site-Specific Observations) -" is currently empty.
- Photograph:** A large gray box labeled "Photograph" is intended for a site photo. A red arrow points from the yellow instruction box to this area.
- Select Image File Dialog:** A file selection window is open, showing a grid of image files in the "Duval" folder. The file "P4150005.JPG" is selected. The dialog shows the file name, type ("Image Files (\*.jpg;\*.gif;\*.png;\*.tif)"), and "Select" and "Cancel" buttons.
- Form Fields:** At the bottom right, there are two checkboxes with associated text: "This project will bring this curb ramp location into full compliance" and "Solution Pending Design Analysis".

Date of Investigation 05 / 16 / 2012 Project Title SR 999 - Paving from Here to There

Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)

North Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
South Leg	SR 999	<input checked="" type="checkbox"/> SR	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
West Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
East Leg	Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A

Northbound



Field Notes (Site-Specific Observations) -

Most deficient grades could be fixed with a short curb/wall at the back of sidewalk.  
I wonder how many vehicles use this curb ramp as a driveway out of the adjacent parking lot.

# Data Entry and Form Function

Add any field notes you want displayed on the form sheet.

Is this Curb Ramp Location fully compliant with state and federal standards?

No  Undetermined at this time  Yes

If "No," select all that apply -

MEF documentation included in DDP

Other justification included in DDP

This project will bring this curb ramp location into full compliance


Solution Pending Design Analysis

Print Form

# Data Entry and Form Function

FLARE SLOPE

Curb Ramp Numbering Diagram



Photograph

Is this Curb Ramp Location fully compliant with state and federal standards?

No  Undetermined at this time  Yes

If "No," select all that apply -

MEF documentation included in DDP

Other justification included in DDP

This project will bring this curb ramp location into full compliance

Solution Pending Design Analysis

Print Form

Fill in the Compliance Evaluation box.

# Generating Curb Ramp Documentation

The form is now complete and ready to generate documentation of the evaluation.

The form can be printed with a number of different commands -

“Print Form” button from any form sheet

Print Icon

File>Print command

Ctrl-click sheet selection from pages/bookmarks menu

The screenshot shows the Adobe Acrobat Pro interface with a 'Curb Ramp Evaluation Form' open. The 'Print Form' button is highlighted in red. The form includes a table for curb ramp location, a diagram of the curb ramp, a photograph, and a 'Print Form' button.

Leg	Street	SR	SR	Local Street	Other	N/A
North Leg	SR 999	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
South Leg	SR 999	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
West Leg	Elm Street	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
East Leg	Elm Street	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Curb Ramp Numbering Diagram**

LANDING CROSS SLOPE & WIDTH  
LANDING RUNNING SLOPE & LENGTH  
RAMP RUNNING SLOPE  
FLARE SLOPE  
RAMP CROSS SLOPE & WIDTH  
FLARE SLOPE

Field Notes (Site-Specific Observations) -  
Most deficient grades could be fixed with a short curb/wall at the back of sidewalk.  
I wonder how many vehicles use this curb ramp as a driveway out of the adjacent parking lot.

Is this Curb Ramp Location fully compliant with state and federal standards?  
 No  Undetermined at this time  Yes

If "No," select all that apply -  
MEF documentation included in DDP   
Other justification included in DDP   
This project will bring this curb ramp location into full compliance   
Solution Pending Design Analysis

**Print Form**



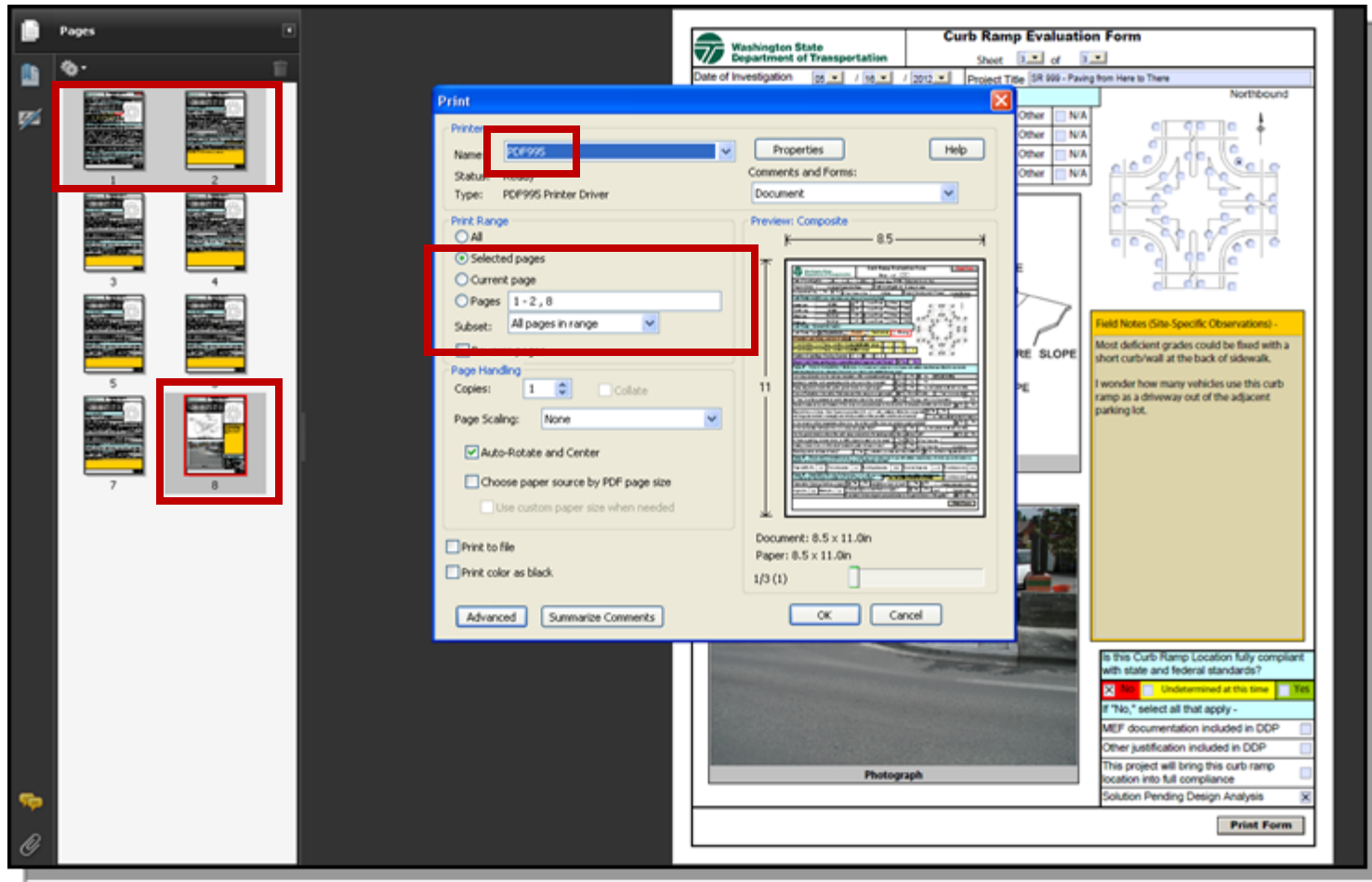
# Generating Curb Ramp Documentation

To create electronic file documentation of the evaluation that can be printed to hard-copy as needed –

Select “PDF995” as your printer (“Adobe PDF” for Adobe Pro users)

Select the pages used in the evaluation (for a typical curb ramp with one ramp and one landing {like this walkthrough example} that will be **pages 1-2, 8**)

Select “OK” to save the file to your hard drive



# Generating Curb Ramp Documentation

You now have an electronic PDF file documenting the evaluation that consists ONLY of the sheets actually used in the evaluation for that particular curb ramp location (in this case, 3 sheets).

It is recommended that you develop a unique project-specific file naming system for cataloguing the electronic documentation files.

The screenshot shows the Adobe Acrobat Pro interface. The title bar indicates the file is 'SR999\_CREF...1.pdf'. The left sidebar shows a page thumbnail grid with pages 1, 2, and 8 highlighted in red. The main window displays the 'Curb Ramp Evaluation Form' for Washington State Department of Transportation. The form includes fields for project information, ramp details, and accessibility criteria.

**Washington State Department of Transportation**  
**Curb Ramp Evaluation Form** Sheet 1 of 3

Date of Investigation: 05 / 16 / 2012  
Project Title: SR 999 - Paving from Here to There  
Region (Area): Northwest Region (ShoKing) Field Investigator(s): R. Anna, R. Andy  
Incorporated City:  No  Yes if "Yes," Name of City: Gotham Project Development Phase: Design (Existing)

Curb Ramp Location (Use Table Below and Indicate on Figure to the Right)

Leg	SR	Local Street	Other	N/A
North Leg	<input checked="" type="checkbox"/> SR 999	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
South Leg	<input checked="" type="checkbox"/> SR 999	<input type="checkbox"/> Local Street	<input type="checkbox"/> Other	<input type="checkbox"/> N/A
West Leg	<input type="checkbox"/> Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other
East Leg	<input type="checkbox"/> Elm Street	<input type="checkbox"/> SR	<input checked="" type="checkbox"/> Local Street	<input type="checkbox"/> Other

Curb Ramp - General Information  
Curb Ramp Type:  Perpendicular  Parallel  Combination  Missing

If Parallel Curb Ramp, number of ramps:  1  2  
If Combination Curb Ramp, number of perpendicular ramps:  1  2  
If Combination Curb Ramp, number of parallel ramps:  1  2  3  
Number of Landings (Turning Spaces):  0  1  2  
Single Curb Ramp serving two crosswalks (aka Diagonal Curb Ramp)?  Yes  No

Ramp #1 - General Accessibility Criteria (note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.)

Curb ramp connection to the roadway completely within crosswalk markings?  Yes  No  N/A - Unmarked Crossing  
Matched by another curb ramp/landing at the other end of the crosswalk?  Yes  No  N/A  
Ramp alignment meets the gutter grade break at a right angle?  Yes  No  N/A - Ramp does not connect to roadway  
Does a Pedestrian Circulation Path intersect the ramp at a right angle?  Yes, from both sides  Yes, from one side  No  
If "Yes," is a flare present on each intersected side of the ramp?  Yes  No (e.g., vertical curb present)  N/A  
Grade breaks at top and bottom of the ramp are perpendicular to the direction of wheeled mobility device travel?  Yes  No  
Beyond the curb face, Clear Space is provided (4 ft. x 4 ft. min.) entirely within the crosswalk markings (at marked crossings) and wholly outside of the parallel vehicle travel lane(s)?  Yes  No  N/A - Ramp does not connect to roadway  
Is the ramp's vertical alignment planar (i.e.: its vertical profile does not contain angle point(s))?  Yes  No  N/A - Ramp does not connect to roadway  
Is the connection between the curb ramp and gutter flush?  Yes  No  N/A - Ramp does not connect to roadway  
Are the grade breaks where the curb ramp connects to its landing and/or the walkway flush?  Yes  No  
Is there a grating, access cover, or utility object located on the ramp?  Yes  No # "Yes," Describe: \_\_\_\_\_  
Grating, access cover, or utility object located in gutter at base of ramp?  Yes  No # "Yes," Describe: \_\_\_\_\_ Catch Basin  
Standing water at base of ramp?  Yes  Unknown (i.e., observed in dry conditions)  No - Verified during precipitation event

Ramp #1 - Slopes and Dimensions (note: For Parallel and Combination Curb Ramps with multiple ramps/landings attach the appropriate numbering diagram and use subsequent form sheets to evaluate each ramp/landing separately.)

Clear width (Ft.)	3.0	Cross slope (%)	4.2	Running slope (%)	10.6	Counter slope (%)	+ 4.5	Flare slope #1 (%)	14.2
-------------------	-----	-----------------	-----	-------------------	------	-------------------	-------	--------------------	------

Ramp #1 - Detectable Warning Surface (note: For Parallel and Combination Curb Ramps with multiple ramps/landings use subsequent form sheets to evaluate each ramp/landing separately.)

Detectable Warning Surface present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Installed at back of curb?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2 inches from back of curb	Flare slope #2 (%)	4.6
-------------------------------------	---	----------------------------	---	----------------------------	--------------------	-----

Depth (Ft.) 2.0 Width (Ft.) 2.6 Contrast (light on dark/dark on light)?  Yes  No Color: Federal Yellow  
Truncated domes aligned perpendicular to the grade break in the gutter?  Yes  No

Print Form

# Curb Ramp Accessibility Criteria Challenge

**Curb Ramp Evaluation Form**

Washington State Department of Transportation

Date of investigation: [ ] / [ ] / [ ] Project ID: [ ]

Region: [ ] Field Investigator(s): [ ]

Investigation City: [ ] State: [ ] Year: [ ]

Project/Development Phase: [ ]

Curb Ramp Location: [ ]

North Leg	[ ]	Local Street	Other	N/A
South Leg	[ ]	Local Street	Other	N/A
West Leg	[ ]	Local Street	Other	N/A
East Leg	[ ]	Local Street	Other	N/A

Curb Ramp - General Information

Curb Ramp Type	Perpendicular	Parallel	Combination	Mixing
# Parallel Curb Ramps, number of ramps	[ ]	[ ]	[ ]	[ ]
# Combination Curb Ramps, number of perpendicular ramps	[ ]	[ ]	[ ]	[ ]
# Combination Curb Ramps, number of parallel ramps	[ ]	[ ]	[ ]	[ ]

Number of parking/traveling lanes: [ ]

Height Curb Ramps (above finished grade): [ ]

Form #1 - General Accessibility (Metric Data For Parallel and Combination Curb Ramps with multiple ramping directions about the approach parking, diagonal and/or sidewalk turn-outs to include self-empting vehicles)

Curb ramps accessible to the roadway pavement within minimum curb height?	Yes	No	Other
Adjacent to another curb (perpendicular or other side of the approach)?	Yes	No	Other
Ramp alignment meets the gutter grade break at a right angle?	Yes	No	Other
Does a Pedestrian-Accessible Path cross the ramp at a right angle?	Yes	No	Other
Is there a flare present on each intersected side of the ramp?	Yes	No	Other
Grade breaks at top and bottom of the ramp are perpendicular to the direction of approach roadway travel?	Yes	No	Other

Form #2 - Slope and Orientation Data For Parallel and Combination Curb Ramps with multiple ramping directions about the approach parking (see also sidewalk turn-outs to include self-empting vehicles)

Clear width (ft)	From slope (ft)	Running slope (ft)	Number slope (ft)	Face slope (ft)
Clear width (ft)	From slope (ft)	Running slope (ft)	Number slope (ft)	Face slope (ft)

Form #3 - Detection Warning Surface Data For Parallel and Combination Curb Ramps with multiple ramping directions about the approach parking (see also sidewalk turn-outs to include self-empting vehicles)

Detection Warning Surface present?	Yes	No	Other
Depth (ft)	Width (ft)	Orientation	Alignment

Form #4 -

Depth (ft)	Width (ft)	Orientation	Alignment
------------	------------	-------------	-----------

Print Form





# Curb Ramp Design Tools\_v6

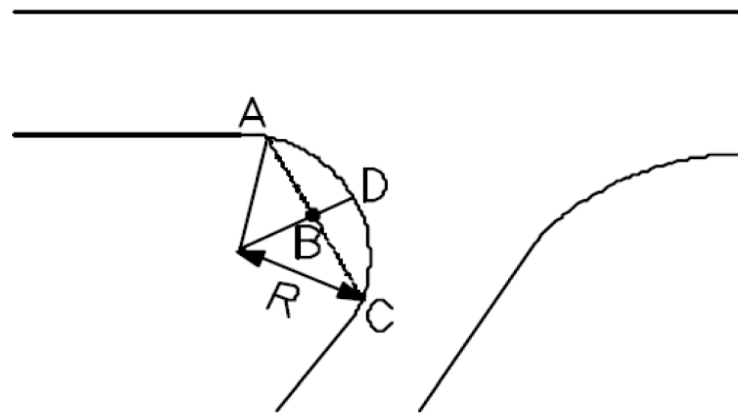
## Determining Radii of Sharp Curves by Field Measurements

AC =  ft.

BC =  ft.

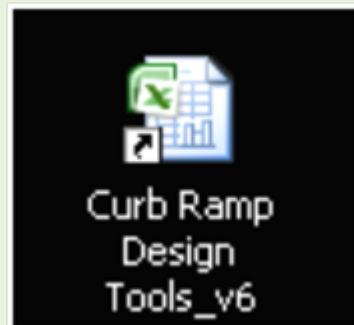
BD =  ft.

Radius =  ft.

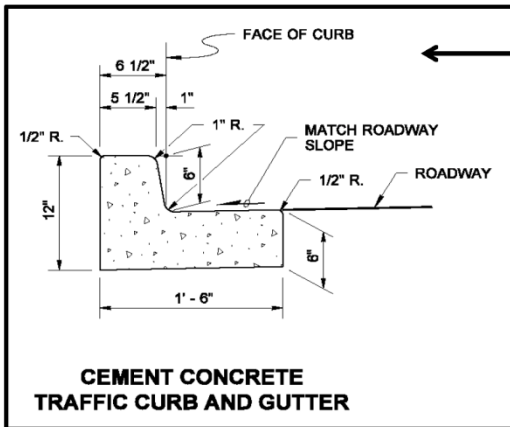
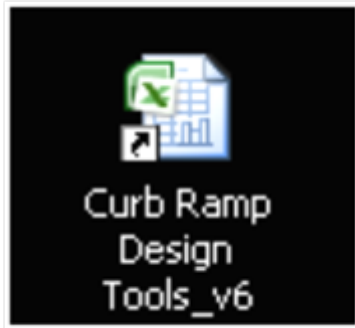


$$R = \frac{BC^2}{2BD} + \frac{BD}{2}$$
$$BC = \frac{AC}{2}$$

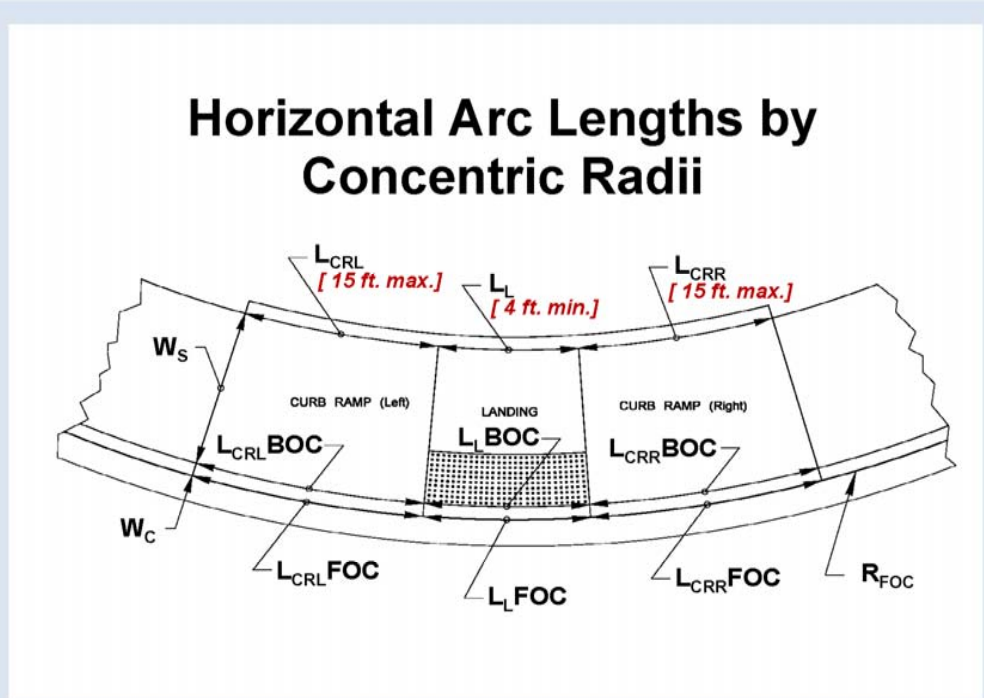
Note: Points A and C may be any two points on the curve







\*  
Back of Curb (BOC) to Face of Curb (FOC)



Radius at Face of Curb  $R_{FOC} =$   ft.

Sidewalk Width (excluding curb)  $W_S =$   ft.

Curb Width \*  $W_C =$   ft.

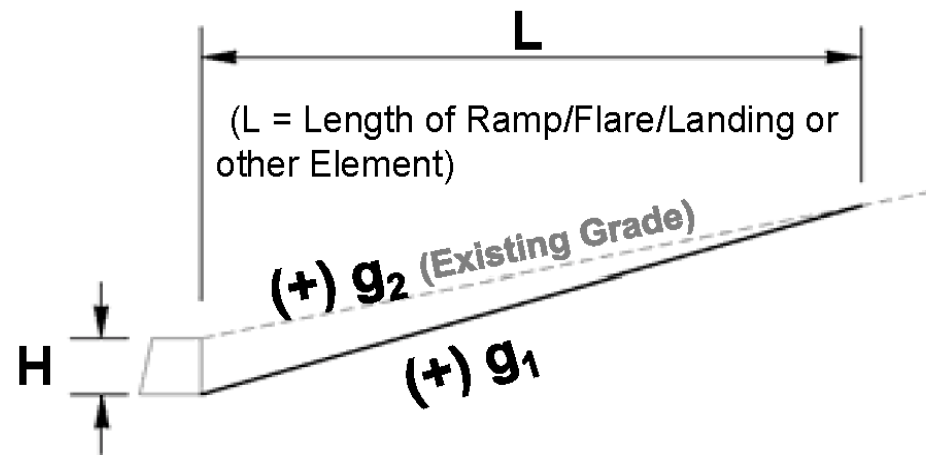
$L_{CRL} =$ <input type="text"/> ft.	$L_L =$ <input type="text"/> ft.	$L_{CRR} =$ <input type="text"/> ft.
$R =$ <input type="text"/> 0 ft.	$R =$ <input type="text"/> 0 ft.	$R =$ <input type="text"/> 0 ft.
$\Delta =$ <input type="text"/> 0 degrees	$\Delta =$ <input type="text"/> 0 degrees	$\Delta =$ <input type="text"/> 0 degrees
$L_{CRL\ BOC} =$ <input type="text"/> ft.	$L_L\ BOC =$ <input type="text"/> ft.	$L_{CRR\ BOC} =$ <input type="text"/> ft.
$R =$ <input type="text"/> 0 ft.	$R =$ <input type="text"/> 0 ft.	$R =$ <input type="text"/> 0 ft.
$\Delta =$ <input type="text"/> 0 degrees	$\Delta =$ <input type="text"/> 0 degrees	$\Delta =$ <input type="text"/> 0 degrees
$L_{CRL\ FOC} =$ <input type="text"/> ft.	$L_L\ FOC =$ <input type="text"/> ft.	$L_{CRR\ FOC} =$ <input type="text"/> ft.
$R =$ <input type="text"/> 0 ft.	$R =$ <input type="text"/> 0 ft.	$R =$ <input type="text"/> 0 ft.
$\Delta =$ <input type="text"/> 0 degrees	$\Delta =$ <input type="text"/> 0 degrees	$\Delta =$ <input type="text"/> 0 degrees

Formulas of note -

$$\Delta = \frac{180^\circ}{\pi} \cdot \frac{L}{R}$$

$$L = \frac{\pi}{180} \cdot R\Delta$$

# Intersection of Grades (Chasing)



( $H$  = Height of curb or other initial elevation deficit)

$H$  =  ft.

$g_1$  (%) =

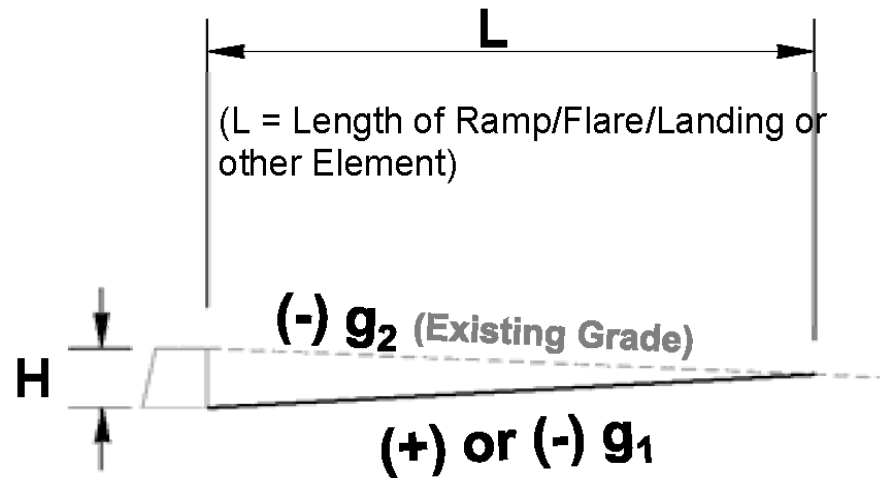
$g_2$  (%) =

$L$  =  ft.



Curb Ramp  
Design  
Tools\_v6

# Intersection of Grades (Opposing)



(H = Height of curb or other initial elevation deficit)

H =  ft.

$g_1$  (%) =

$g_2$  (%) =

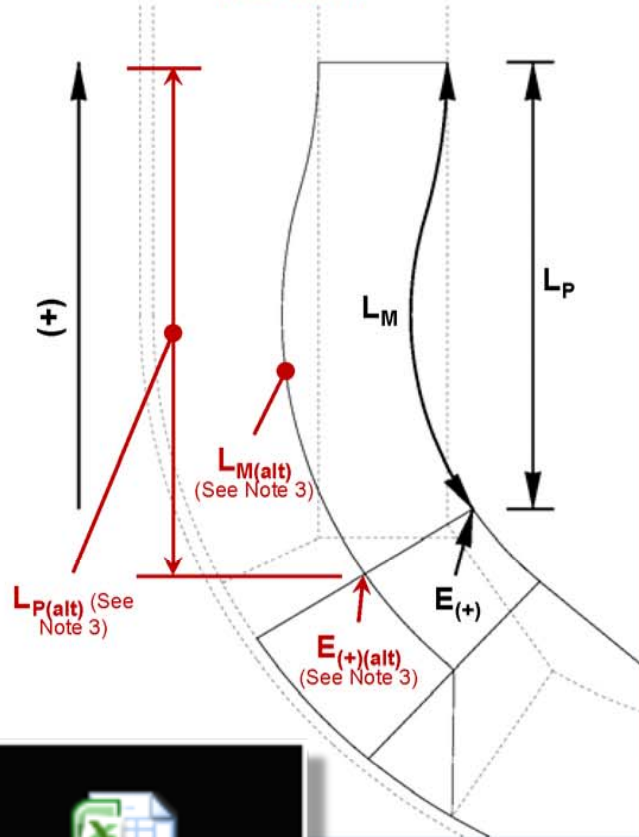
L =  ft.



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# Intersection of Grades by Sidewalk Meander at Roadway Grade (Chasing)

(See Notes)



$E_{(+)} =$   ft.

$g_{rdwy} (\%) =$   Grade must be positive  $L_M =$   ft.

$L_p =$   ft.

## Legend:

$E_{(+)}$  = Elevation difference between proposed surface and existing sidewalk surface at corner of grade break [See other tabs in this workbook for tools to assist in determining this value]

$g_{rdwy}$  = General grade of the adjacent roadway

$L_p$  = Linear distance between the origin and the proposed match existing point measured parallel to the roadway

$L_M$  = Linear distance of total meander at roadway grade required to match existing measured along the meander

## Notes:

1. On steep roadways where space is available, this design solution can eliminate the potentially hazardous grade break (i.e.; with an algebraic difference  $>13\%$  and/or skewed) that could result if a 15 ft. long ramp with a running slope steeper than the roadway grade was used. This solution will reduce the algebraic difference of the grade break and enable the grade break to be at a right angle to the path

2. No credit can be taken toward achieving the required  $L_M$  distance for any segment of the meander that runs parallel to the roadway.

3. If the  $E_{(+)}$  value for the forward point on the landing happens to be greater than at the back of the landing (this will not typically be the case), then the required  $L_M$  distance should be evaluated based on the roadway side of the sidewalk.

4. If the corner of the grade break being used to evaluate the  $E_{(+)}$  value is slightly offset from the existing sidewalk (such as is shown in the diagram to the left), then use the existing sidewalk elevation extended perpendicular to the roadway to determine  $E_{(+)}$  (or extended parallel to the roadway to determine  $E_{(+)}$ (alt)).



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## Grade Calculators and Converters

Grade =  Run =  ft. Rise =  ft.

Rise =  ft. Run =  ft. Grade =

Grade =  Rise =  ft. Run =  ft.

Percentage Grade =  Slope Ratio = 1V:  H

Slope Ratio = 1V:  H Percentage Grade =

## Basic Calculator

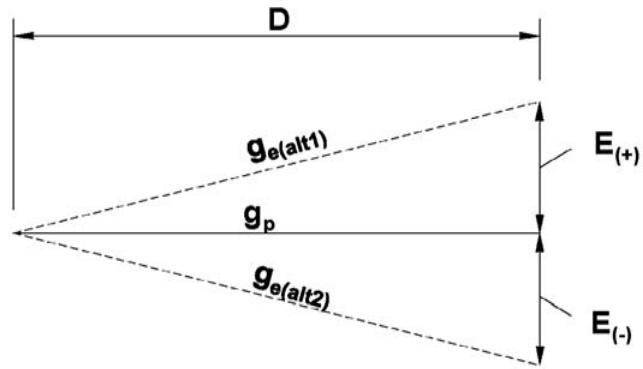
<input type="text"/>	+	<input type="text"/>	<input type="text"/> 0.00
<input type="text"/>	-	<input type="text"/>	<input type="text"/> 0.00
<input type="text"/>	X	<input type="text"/>	<input type="text"/> 0.00
<input type="text"/>	÷	<input type="text"/>	<input type="text"/> 0.00



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## Elevation Difference Produced on Coincident Differing Gradients



$D =$   ft.

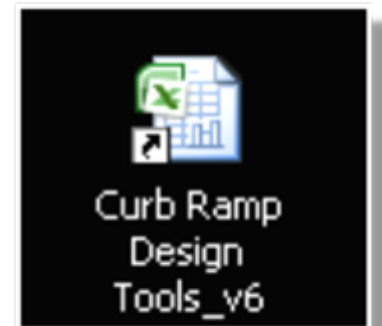
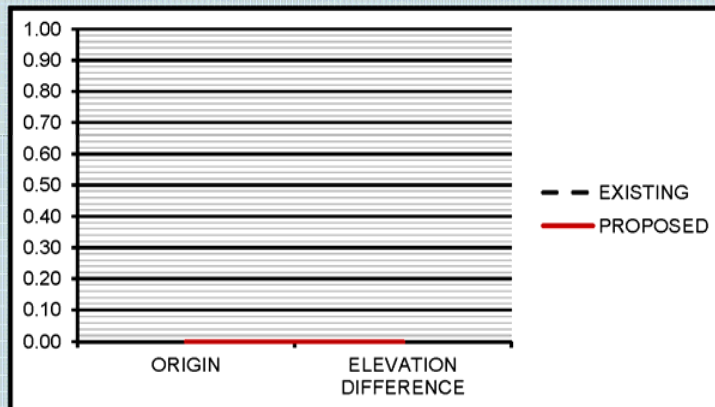
$g_e$  (%) =

$g_p$  (%) =

$E =$   ft.

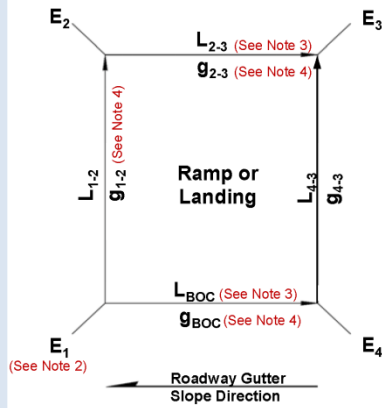
- or -

in.





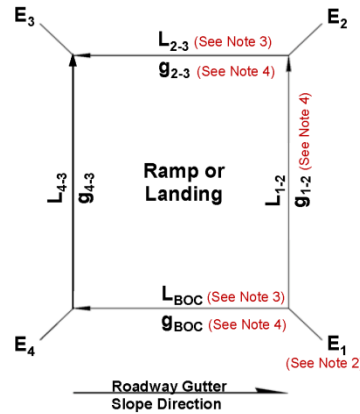
### Warped Element - Low Side Left (See Note 1)



Input Order

$E_1 =$   ft.  
 $L_{BOC} =$   ft.  
 $g_{BOC} =$    $E_4 = 0.00$  ft.  
 $L_{1,2} =$   ft.  
 $g_{1,2} =$    $E_2 = 0.00$  ft.  
 $L_{2,3} =$   ft.  
 $g_{2,3} =$    $E_3 = 0.00$  ft.  
 $L_{4,3} =$   ft.  $g_{4,3} =$

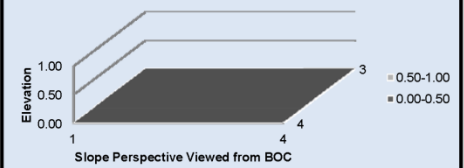
### Warped Element - Low Side Right (See Note 1)



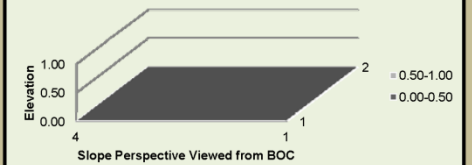
Input Order

$E_1 =$   ft.  
 $L_{BOC} =$   ft.  
 $g_{BOC} =$    $E_4 = 0.00$  ft.  
 $L_{1,2} =$   ft.  
 $g_{1,2} =$    $E_2 = 0.00$  ft.  
 $L_{2,3} =$   ft.  
 $g_{2,3} =$    $E_3 = 0.00$  ft.  
 $L_{4,3} =$   ft.  $g_{4,3} =$

### Low Side Left



### Low Side Right



#### Notes:

- As a general rule, warping of pedestrian facility elements should be avoided if at all possible. However, when regrading of the roadway is beyond the scope of a project then warping an element to meet the existing gutter line profile is sometimes necessary. The need for Maximum Extent Feasible documentation is often triggered by this scenario. The purpose of these tools are to evaluate the extent of the warp and provide the ability to play "what if" with the design and tweak the grades to develop the most accessible design possible in these circumstances. As a rule of thumb, grade  $g_{1,2}$  (on the downhill side of the element) should be designed as the steeper grade on the element (8.3% max./7.5% or less desirable for ramps and 2% max./1.5% or less desirable for landings), allowing in most cases for flatter grades along the backside of the element (grade  $g_{2,3}$ ) and the uphill side of the element (grade  $g_{4,3}$ ).
- Enter either an assumed (i.e.; 100 ft.) or actual elevation for  $E_1$ .
- If  $L_{2,3}$  and  $L_{BOC}$  are on concentric radii, see the Radius Tools tab for a tool to assist in calculating the length of  $L_{BOC}$ .
- If either of grades  $g_{BOC}$ ,  $g_{1,2}$ , or  $g_{2,3}$  are downhill in the direction indicated by the arrows on the schematic, then the downhill grade(s) will need to be entered with a negative sign (-). [This will not typically be the case.]
- An alert message of "TWISTED!" indicates that two opposite sides of the element are sloped in opposite directions. This situation should be carefully analyzed for potential drainage, accessibility, and/or constructability issues.



Curb Ramp  
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Training available through Washington State Local Technical Assistance Program (LTAP) Training Program -

## “Pedestrian Accommodation Workshop”

– {16 hours}



Questions ?