

# ADA Self Evaluation – Supplemental Survey

## Technical Report

May 2016



*Prepared for*  
City of Seattle  
Department of Transportation



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# ADA Self Evaluation – Supplemental Survey Technical Report

## INTRODUCTION AND CONTEXT

This report summarizes a project, conducted by KFH Group under contract to the Seattle Department of Transportation, to survey and measure curb ramps throughout the City of Seattle.

### Project Purpose

The purpose of this project is to prepare an updated inventory and ADA accessibility assessment of the curb ramps installed on City of Seattle sidewalks. Under authority of the DOJ ADA regulation (28 CFR Part 35), public agencies with more than 50 employees are required to develop and implement a transition plan that identifies physical barriers in the public agency's facilities that limit the accessibility of its programs or activities to individuals with disabilities (through an ADA self-evaluation), describes in detail the methods that will be used to make the facilities accessible, and provides a schedule for coming into compliance with Federal requirements. In order for sidewalks to be accessible, there must be an accessible means for individuals with disabilities to move between sidewalk and street in order to cross the street – typically a curb ramp, sometimes a blended transition or raised crosswalk.

Identifying where curb ramps exist, as well as assessing existing curb ramp physical attributes, is an important element of a public agency's transition plan. The data collected under this project provides the basis for the City of Seattle's self-evaluation with regards to curb ramps, as part of its self-evaluation with regards to the overall pedestrian environment in the public right-of way (sidewalks, crosswalks, etc.).

### Curb Ramp Standards

The following standards and guidelines were used to determine which characteristics were collected on each curb ramp:

- US Access Board's Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (July 2011), R304 - Curb Ramps and Blended Transitions
- US DOJ's 2010 ADA Standards for Accessible Design (September 2010), 406 Curb Ramps
- Seattle Right of Way Improvement Manual, 4.11 Sidewalks and Standard Plan 422: Curb Ramp Details

## **Federal Standards and Guidelines**

The DOJ December 2010 ADA Standards for Accessible Design are the currently applicable standards in place at the time of this project. These standards apply to facilities covered by the ADA in new construction and alterations, and are based on the Access Board's ADA Accessibility Guidelines (ADAAG) which were most recently updated in 2004. Standards for Curb Ramps are specified in Chapter 4: Accessible Routes, 406 Curb Ramps.

The Access Board is still in the process of developing guidelines on accessible public right-of-way, including curb ramps and other elements of the pedestrian environment. In July 2011, the Access Board released Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROW). These proposed accessibility guidelines would apply to the design, construction, and alteration of pedestrian facilities in the public right-of-way. Once they are adopted by the DOJ, they will become enforceable standards under title II of the ADA. Though not yet finalized, the 2011 proposed guidelines can be considered the currently recommended best practices that could be followed for areas not fully addressed by present US DOJ standards.

The 2011 proposed guidelines for ramps differ significantly from the 2010 standards in terms of minimum dimensions for the width of the curb ramp (36" wide in the 2010 standards; 48" wide in the 2011 proposed guidelines) as well as the minimum width (same as ramp width) and depth (which would also increase from 36" to 48") of landing areas/turning spaces at the top and bottom of the ramp. The 2011 proposed guidelines also added a minimum ramp running slope (5%), a maximum ramp length (15 feet), and specifications for blended transitions (including a maximum running stop of 5%).

## **City Standards**

In addition to the federal ADA standards, the City's own design standards impacted the data collected as part of this project. Specifically, the Seattle Right of Way Improvement Manual, 4.11 Sidewalks and Standard Plan 422: Curb Ramp Details (Appendix A), were reviewed.

## **Curb Ramp Classifications**

The Access Board's 2011 proposed guidelines refer to two general categories of curbs ramps in Advisory R304.1:

- *Perpendicular curb ramps have a running slope that cuts through or is built up to the curb at right angles or meets the gutter break at right angles where the curb is curved.*
- *Parallel curb ramps have a running slope that is in-line with the direction of sidewalk travel and lower the sidewalk to a level turning space where a turn is made to enter the pedestrian street crossing.*

There are nuances in the proposed guidelines that are specific to perpendicular and parallel curb ramps.

Based on standard plans in the Seattle Right of Way Improvement Manual, SDOT refers to the following two general categories of curbs ramps:

- Type 422A, which shares the characteristics of what the Access Board refers to as a perpendicular ramp. Figure 1 provides an example of a Type 422A ramp.

**Figure 1: Type 422A**





- Type 422B, which shares the characteristics of what the Access Board refers to as a parallel ramp. Figure 2 provides an example of a Type 422B ramp.

**Figure 2: Type 422B Ramp**



In conducting the survey effort, the consultant team used Seattle design standards' nomenclature to classify each curb ramp found in the field.

Two other classifications of ramps/ramp alternatives were used in conducting the survey:

- Blended transitions – defined in the 2011 proposed guidelines as “a raised pedestrian street crossing, depressed corner, or similar connection between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that has a grade of 5 percent or less.” (Figure 3)

**Figure 3: Blended Transition**



- Modified ramps – any ramps that do not fall into the categories of Type 422A, Type 422B, or blended transition. Figure 4 provides an example of ramps that fell into this category were those which combined elements of both perpendicular and parallel ramps and those with highly irregular shapes.

**Figure 4: Modified**



## **SDOT’s Asset Management System and Ramp Categories**

The data to be collected under this project needed to be incorporated into the city’s existing Hansen asset management system. The Hansen system stores curb ramps as features of the sidewalk asset, and categorizes each ramp as *directional*, *diagonal*, or *diagonal-single*. As defined by SDOT’s asset management system:

1. A *directional* curb ramp is “oriented in the direction of a block segment and would only be used to cross the street parallel to that segment.”
2. A *diagonal* curb ramp is “oriented toward the center of the street intersection and shared by two block segments at the corner of a block.”
3. A *diagonal-single* curb ramp is “oriented toward the center of the street intersection and only one sidewalk is available for association.”

Each ramp classified as diagonal in the SDOT Hansen system is accounted for twice in this database—once for each of the two sidewalk block segments with which it is associated.

Like Type 422A—perpendicular/Type 422B—parallel classification, the direction/diagonal category relates orientation of the ramp to orientation of the pedestrian’s path of travel. Ramps classed as “diagonal” in the SDOT asset management are not always positioned at the apex of a corner (where a pedestrian using a wheelchair could access one direction of street crossing as readily as the other direction at that corner). Ramps classified as diagonal may not functionally allow require a wheelchair user to complete a street crossing without swerving into a travel lane to change direction at the bottom of the ramp. For this reason, the survey conducted under this project further classified each ramp as *single* or *shared* to capture the pedestrian’s perspective.

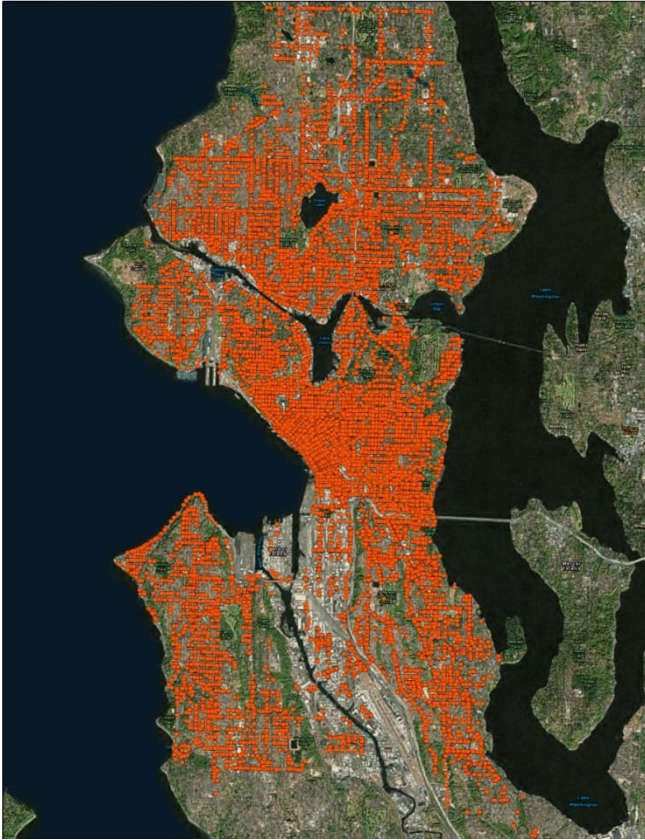
- a. A *single* ramp is positioned more to one side of the corner, and functionally only serves a single street crossing. In order to use the type of ramp to complete a crossing in the other direction, a wheelchair user would have to maneuver into a travel lane to reorient themselves. In addition to being problematic from an ADA compliance perspective, this increases safety risks to pedestrians with disabilities.
- b. A *shared* ramp is positioned at the apex of the corner and functionally serves two street crossings to an equal degree. A wheelchair user could functionally complete a street crossing without turning more than 45 degrees at the base of the ramp.

## **METHODOLOGY**

KFH Group surveyed all curb ramps in the City of Seattle for compliance with ADA requirements, including ramps in the SDOT’s Hansen asset management system as of May 2015, as well as additional ramps discovered in the field. Figure 5 provides an overview of the study area and curb ramp locations to be surveyed.



**Figure 5: Study Area and Curb Ramp Locations**



Following discussions with SDOT to finalize specific data points to be collected to address local standards, the consultant prepared the survey tool to be used in the field work and a detailed data dictionary covering each survey question (Appendix B). The data dictionary surveyed as a primary training resource for the field surveyors, to help ensure consistency across surveyors in conducting the survey work.

## **Data Collection**

The data collection phase spanned June 2015 to February 2016. Surveyors were equipped with Trimble GPS units (with which data were entered and digital photos were taken), inclinometers, rolling measuring wheels, and measuring tapes. Photos were taken to further document compliance issues and assist in the evaluation process. Data and photographs were updated daily from the Trimble units and compiled into a master database.

## **Quality Control**

In addition to training surveyors thoroughly in the data dictionary, the KFH Group employed a two-pronged approach to ensure high quality data collection:

1. Field quality control checks conducted daily on a ten percent sample of surveys throughout the first eight months of the survey period.
2. Data consistency checks were conducted on survey data to ensure that data were complete, measurements and descriptive data corresponded with ramp features in the digital photographs, and location information was accurate.

### ***Field Quality Control Process***

Curb ramps were selected for Field Quality Control checks on a daily basis. For each surveyor, ten percent of their daily records were assembled by sector and curb ramp ID. Curb ramps that were not frequently occurring types such as Type B and Modified, and new ramps found in the field were targeted to ensure the accuracy of data collection.

In the field, ramps were located based on several categories. Beginning with the sector, which was a half mile square area within the city, followed by sidewalk location (north, south, east, and west), sidewalk segment description, high end or low end block location based on the address block numbering system, and curb ramp placement, which could be an intersection, median, slip lane island, or in the middle of the block (mid-block). Surveyors photographed each ramp which aided in ramp location. The detailed location data and photographs enabled field reviews to verify that surveyors had indeed surveyed the correct ramp.

All collected data were either verified visually or by re-taking measurements. Specifically attributes such as ramp type, ramp condition, ramp surface and sidewalk surface type, presence of a detectable warning, presence of a crosswalk, ramp obstructions, and grade break connections were assessed visually. Curb ramp dimensions such as run slopes, cross slopes, ramp length and width were confirmed by measurement.

In cases when field checks revealed a pattern of problems with a surveyor's work, the surveyor was retrained in the problem areas.

### ***Data Consistency Checks***

Data consistency checks were conducted on all of the ramp records to ensure that data were complete, measurements and descriptive data corresponded with the ramp features visible in the digital photographs, and that descriptive location information entered by surveyors corresponded with SDOT descriptive location information (indicating that the correct curb ramp ID was entered). Any missing or inconsistent data were corrected by referencing the digital photos and Google Earth imagery, and resurveying if necessary.

### ***Indexing of Newly Found Ramps***

KFH Group surveyed 4,606 curb ramps that were not part of the SDOT inventory. These "newly" found ramps were surveyed as they were encountered in the field while surveying the

known ramps (ramps that were in the SDOT inventory). At the completion of the survey effort, KFH staff indexed these newly found ramps using SDOT street and sidewalk segment identifiers to aid in the integration of the newly found ramps into the SDOT Hansen asset management system.

KFH staff indexed 3,677 of the 4,606 newly found ramps. The remaining 929 ramps were classified as either “NOSIDEWALK” or “COMPLEX”. For the 502 ramps marked “NOSIDEWALK” there are no sidewalk segments in the SDOT sidewalk inventory that correspond to the locations of the new ramps.

The remaining 427 un-indexed ramps were classified as “COMPLEX”. These curb ramps were classified as “COMPLEX” for the following reasons:

1. Curb ramps were located on slip lane islands or medians where it is not clear what sidewalk asset to associate the ramp to and/or there are no sidewalk segments at that location.
2. KFH staff believe there is a corresponding sidewalk segment in the SDOT inventory but the street/sidewalk network at that location is too complex to confidently index a ramp.
3. Streets and sidewalks in the SDOT inventory have been reconstructed or altered since the inventory was last updated.
4. KFH staff were able to confidently identify the corresponding sidewalk segment, but were unable to index the new ramp due to limitations of the SDOT database. Each sidewalk segment in the SDOT inventory can support up to three curb ramps: one on the low end of the block, one in the middle, and one on the high end of the block. In some situations there are either more than three ramps along a given sidewalk segment or there are two ramps at a given block location. Indexing the curb ramp would duplicate an existing curb ramp asset at that block location.

## FINAL DELIVERABLES

The primary final deliverables provided to SDOT under this project are a curb ramp database and digital photo library with a photo of each surveyed curb ramp that is linked to each record of the database with a Photo ID. The code table for the database is attached as Appendix C.

**Table 1: Curb Ramp Database**

Curb Ramps	Number
Existing (in SDOT Hansen inventory – not including duplicates/shared ramps)	23,678
New (discovered in field but not in SDOT Hansen inventory)	4,606
<b>Total Curb Ramps Surveyed</b>	<b>28,284</b>
Duplicates (ramp shared by two sidewalks in SDOT Hansen inventory)	5,883
<b>Total Database Records</b>	<b>34,167</b>

A total of 34,167 curb ramp records are in the database. Of the 34,167 records, 28,284 curb ramps are identified and surveyed, of which 4,606 are “new” ramps (curb ramps that were not in the SDOT inventory), and 5,883 are duplicate records for those ramps classified as diagonal ramps in the SDOT Hansen system.

## RECOMMENDATIONS FOR MAINTAINING THE DATA

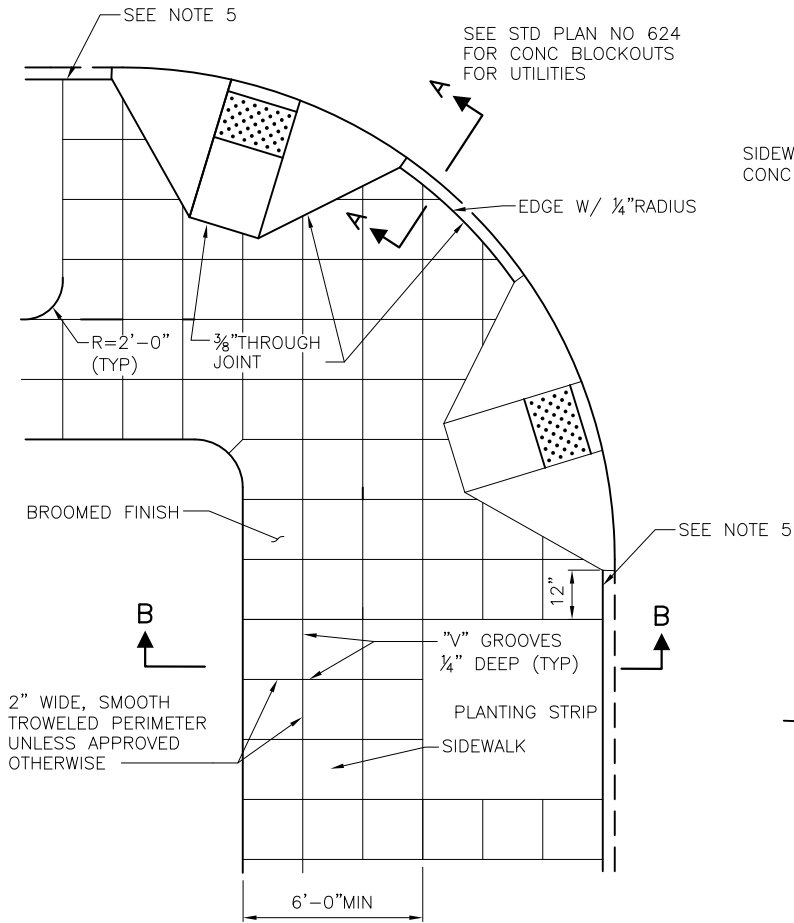
It is important to note that this database presents a snapshot of conditions at each curb ramp at the point of time when each was surveyed in the field. Updating the data is recommended for any new sidewalks or curb ramps constructed after June 15, 2015. During the 8.5 months when the field work was conducted, the city improved sidewalks at numerous intersections and corridors, and land use development was robust. Therefore, some records in the database may already be out-of-date, and follow-up surveys are recommended along those corridors and at those intersections and land use developments which were under way on or after June 15, 2015.



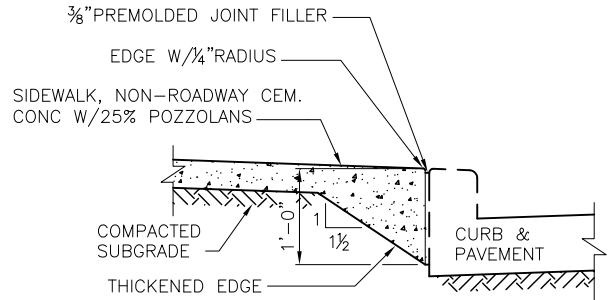
# **APPENDIX A**

## **CITY OF SEATTLE**

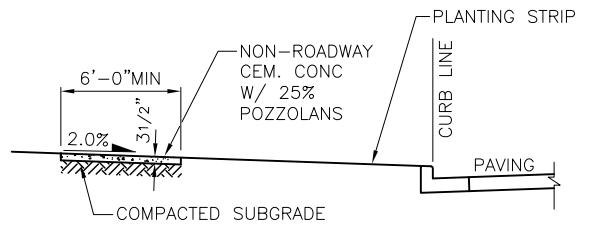
### **CURB RAMP DESIGN DETAILS**



TYPICAL SIDEWALK & CURB RAMP DETAIL



THROUGH JOINT @ SECTION A-A  
UNLESS CURB IS MONOLITHIC WITH SIDEWALK



SECTION B-B

**NOTES:**

1. 3/8" THROUGH AND CONTRACTION JOINTS SHALL BE LOCATED AS REQUIRED BY SECTION 8-14.3(6).
2. "V" GROOVE SCORING SHALL MATCH PATTERN IN ADJACENT EXISTING SIDEWALK OR SHALL BE A 2" SQUARE SCORING PATTERN UNLESS OTHERWISE OTHERWISE APPROVED BY THE ENGINEER.
3. FOR CURB RAMPS, SEE STANDARD PLAN NO 422.
4. FOR TREE PITS, SEE STANDARD PLAN NO 424.
5. 12" MINIMUM BETWEEN EDGE OF RAMP WING AND PLANTING STRIP IS DESIRABLE.
6. ALL SIDEWALK SHALL BE NON-ROADWAY CEM CONC W/ 25% POZZOLANS.

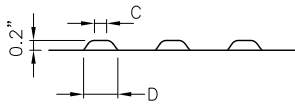
REF STD SPEC SEC 8-14



City of Seattle

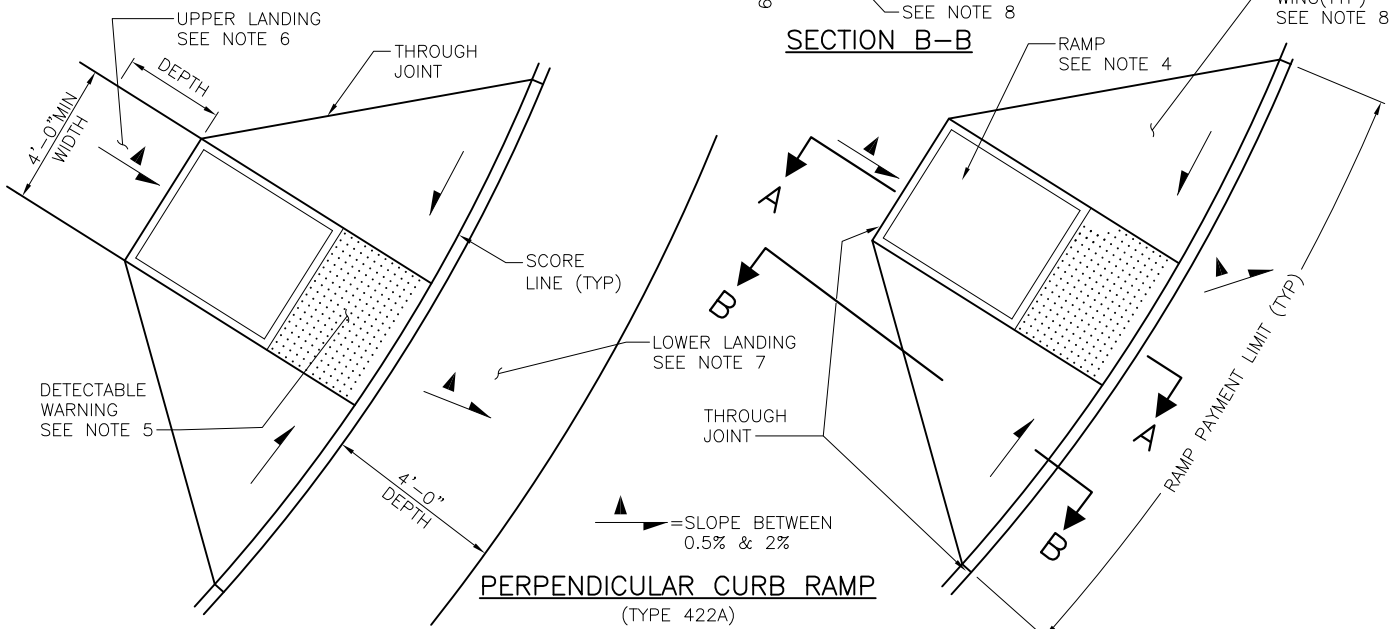
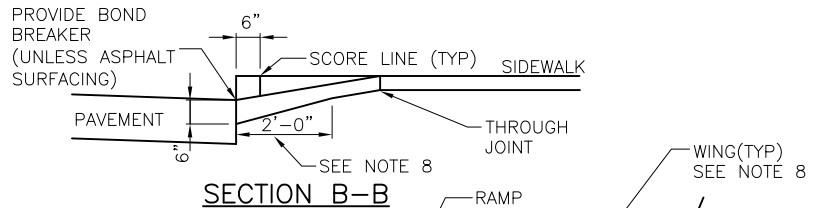
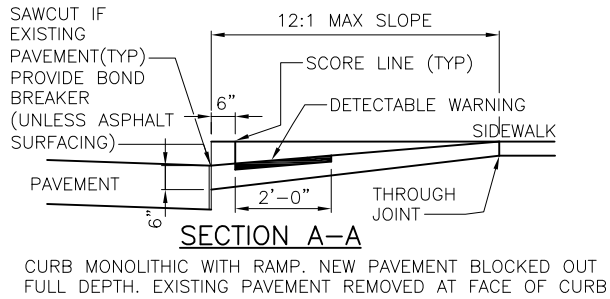
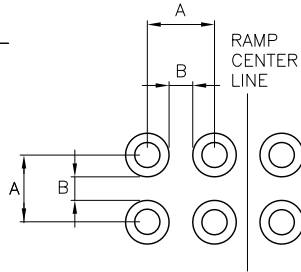
NOT TO SCALE

CONCRETE SIDEWALK DETAILS



	MIN.	MAX.
A	1.6"	2.4"
B	0.65"	1.5"
C	50% TO 65% OF D	
D	0.9"	1.4"

**TRUNCATED DOMES PATTERN  
DETECTABLE WARNING CONC PANELS**



**NOTES:**

- TYPE 422A PERPENDICULAR CURB RAMP SHALL BE USED UNLESS OTHERWISE DIRECTED BY ENGINEER.
- TWO CURB RAMPS SHALL BE INSTALLED AT EACH CORNER UNLESS OTHERWISE DIRECTED BY ENGINEER. RECOMMENDED MINIMUM DISTANCE BETWEEN TWO ADJACENT CURB RAMPS SHALL BE 3'-0". WHERE SPACE IS RESTRICTED THE MINIMUM DISTANCE BETWEEN TWO ADJACENT CURB RAMPS MAY BE REDUCED TO 1'-0".
- CURB RAMP SHALL BE CONSTRUCTED WITH COMPANION RAMP ON OPPOSITE SIDE OF THE ROADWAY UNLESS OTHERWISE DIRECTED BY ENGINEER.
- RAMP CENTERLINE SHALL BE RADIAL/PERPENDICULAR TO THE ALIGNMENT OF THE FACE OF CURB. RAMP SHALL HAVE A MAXIMUM SLOPE 12H:1V. AND A MINIMUM WIDTH OF 4'-0". THE CROSS SLOPE OF THE RAMP SHALL BE MAXIMUM OF 50H:1V. RAMP SURFACE SHALL HAVE A HEAVY BROOM BRUSHED SURFACE PARALLEL TO THE CURB. MAXIMUM RAMP LENGTH SHALL BE 15 FEET
- DETECTABLE WARNING SHALL HAVE A TRUNCATED DOME PATTERN AS SHOWN, A MINIMUM WIDTH OF 2'-0" AND SHALL BE PLACED AT THE RAMP BOTTOM STARTING AT THE BACK OF CURB. DETECTABLE WARNING COLOR SHALL BE "FEDERAL SAFETY YELLOW", UNLESS OTHERWISE DIRECTED.
- UPPER LANDING SHALL BE FULL WIDTH OF THE RAMP AND SHALL HAVE A MINIMUM DEPTH OF 4'-0". SLOPE ON THE UPPER LANDING SHALL BE BETWEEN 0.5% AND 2%. AVOID PLACING HANDHOLES, UTILITY CASTINGS OR OTHER OBSTRUCTIONS IN THE UPPER LANDING.
- LOWER LANDING SHALL BE FULL WIDTH OF THE RAMP AND SHALL EXTEND A MINIMUM 4'-0" BEYOND DETECTABLE WARNING. THE LOWER LANDING SHALL BE THE WIDTH OF THE RAMP AND FALL WHOLLY WITHIN THE LEGAL CROSSWALK, MARKED OR UNMARKED. SLOPE ON THE LOWER LANDING SHALL BE BETWEEN 0.5% AND 2%. GUTTER FLOW LINE SHALL BE SURVEYED BY THE CONTRACTOR PRIOR TO CONSTRUCTION TO ENSURE PONDING OF WATER SHALL NOT OCCUR ON THE LOWER LANDING.
- WINGS SHALL HAVE A MAXIMUM SLOPE OF 10H:1V. IF UPPER LANDING HAS A DEPTH LESS THAN 4'-0", THE MAXIMUM SLOPE FOR THE WINGS SHALL BE 12H:1V. WINGS SHALL HAVE A BRUSHED FINISH. PARALLEL TO THE CURB. THE CONCRETE WALK THICKENED EDGE ALONG THE CURB SHALL CONTINUE THROUGH EACH WING.
- POLES, HYDRANTS AND OTHER ABOVE GROUND OBSTRUCTIONS SHALL HAVE A MINIMUM LATERAL CLEARANCE OF 1'-0" FROM THE UPPER LANDING AND RAMP SURFACE.
- ALL CHANGES IN LEVEL ACROSS JOINTS SHALL BE FLUSH. ANY DIFFERENCE IN ELEVATION OF 3/16 INCH OR GREATER SHALL BE REPAIRED OR REPLACED.
- ALL SLOPE GRADES SHALL BE MEASURED OFF THE HORIZON-LINE. IF EXISTING SITE CONDITIONS CONFLICT WITH OBTAINING GRADES SHOWN, THE DESIGNER / CONTRACTOR SHALL MAKE MINIMUM ADJUSTMENTS TO THE GRADES SHOWN TO MEET EXISTING SITE CONDITIONS; ADJUSTMENTS ARE SUBJECT TO ENGINEER APPROVAL.

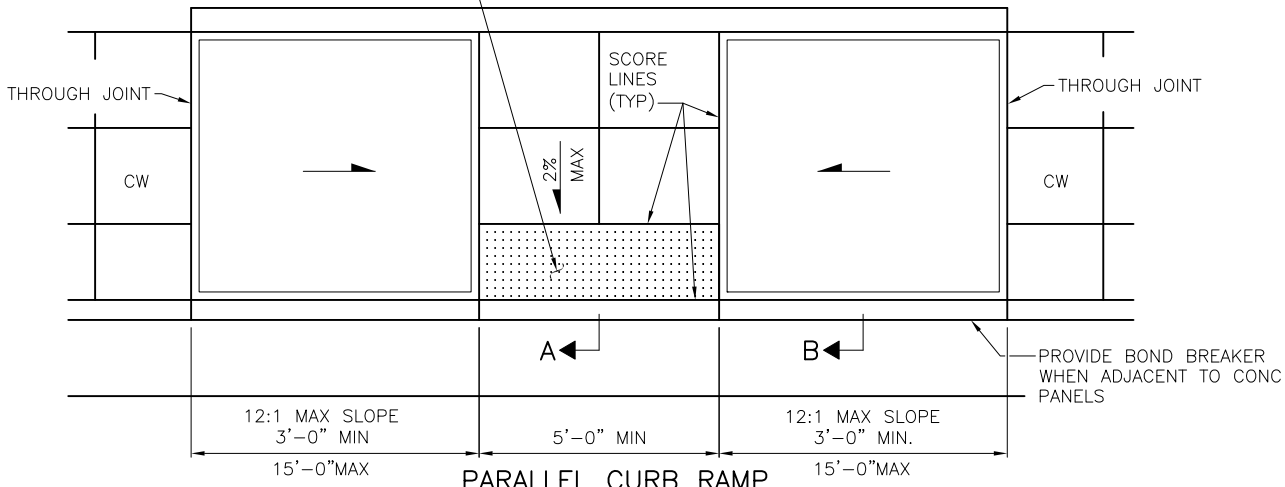
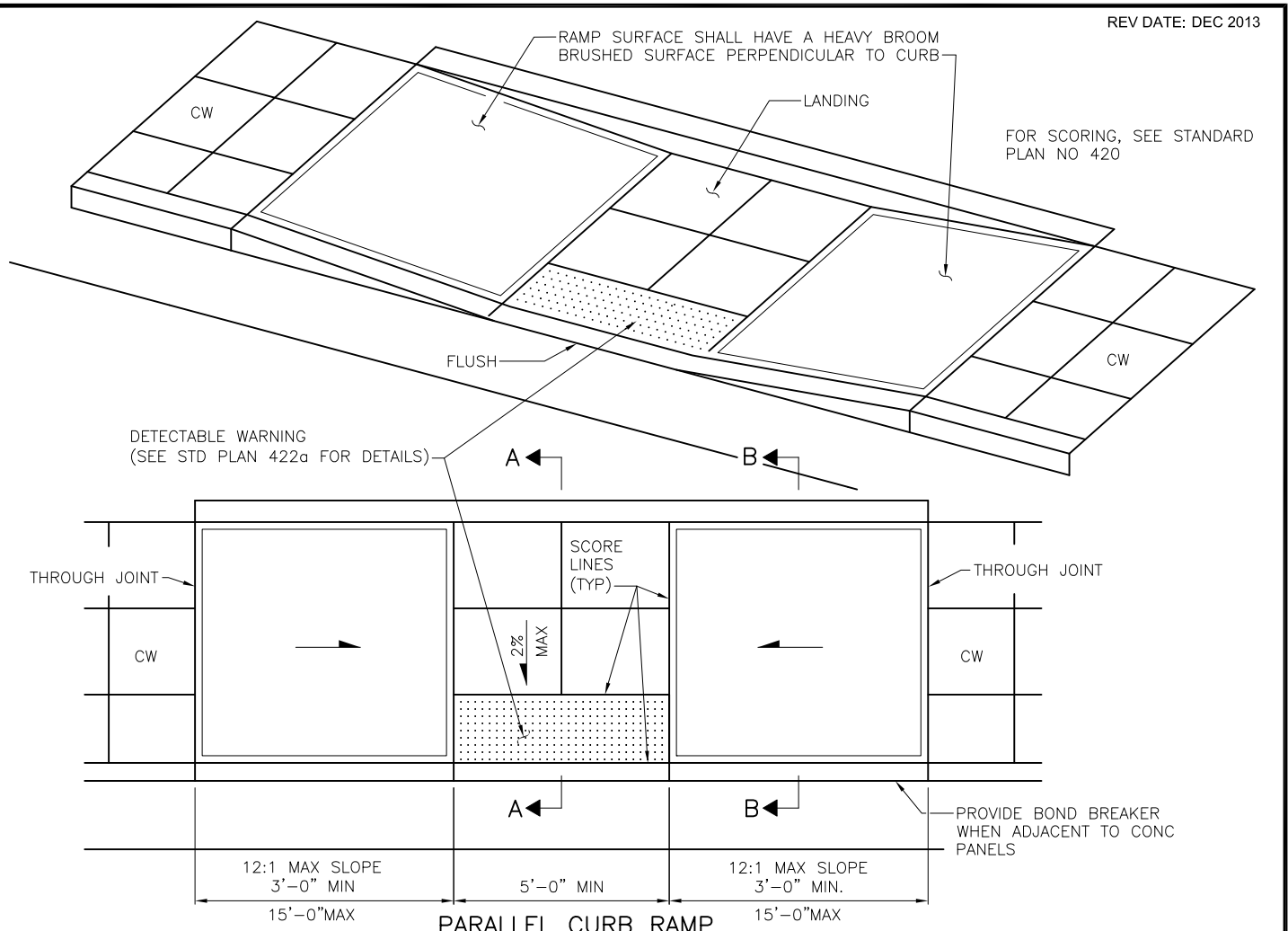
REF STD SPEC SEC 8-14



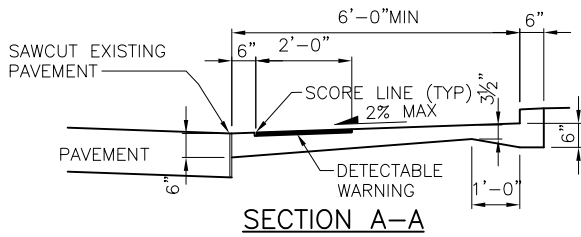
City of Seattle

NOT TO SCALE

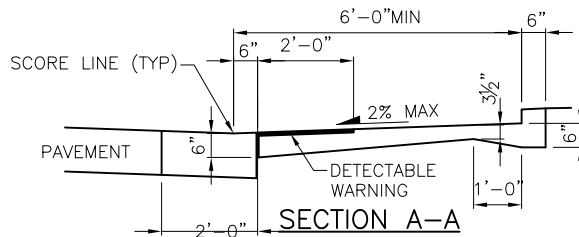
CURB RAMP DETAILS



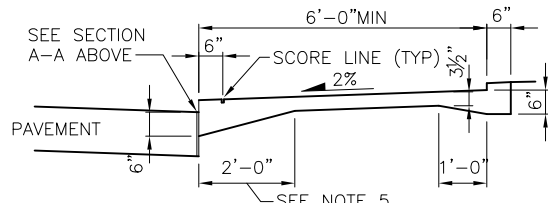
USE PARALLEL CURB RAMPS ONLY WHEN SHOWN IN DRAWINGS OR WITH APPROVAL OF ENGINEER.  
PARALLEL CURB RAMPS MAY ALSO BE USED ON CURVES; ALL REQUIREMENTS SHALL APPLY.



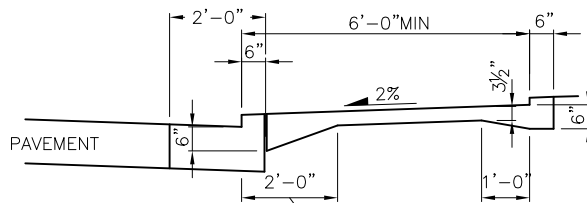
**SECTION A-A**  
**CURB MONOLITHIC WITH RAMP**  
NEW PAVEMENT BLOCKED OUT FULL DEPTH.  
EXISTING PAVEMENT REMOVED AT FACE OF CURB



**SECTION A-A**  
**DEPRESSED CURB & GUTTER SEPARATE FROM RAMP**



**SECTION B-B**  
**NON CURB & GUTTER**



**SECTION B-B**  
**WITH CURB & GUTTER**

REF STD SPEC SEC 8-14



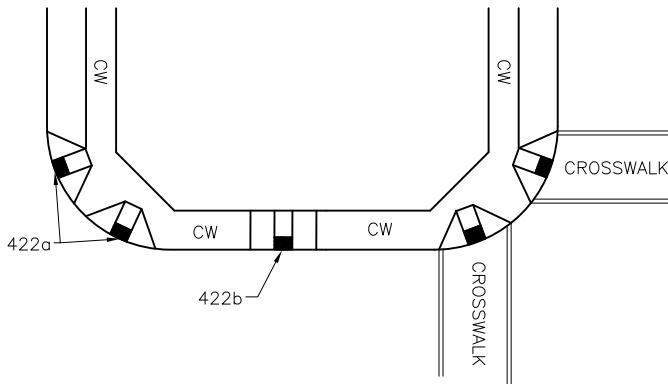
City of Seattle

NOT TO SCALE

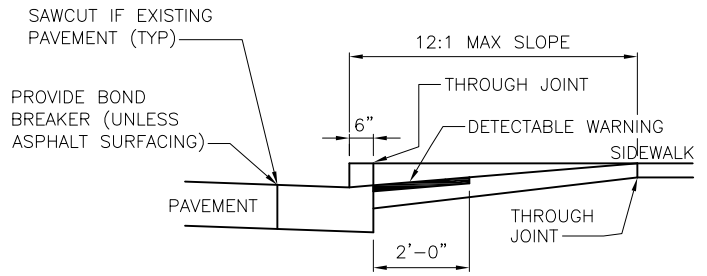
CURB RAMP DETAILS



SEE STD PLAN NO 422a FOR NOTES

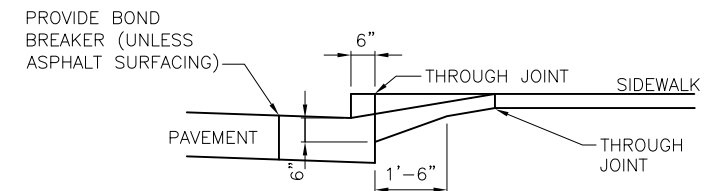


CURB RAMP LOCATIONS

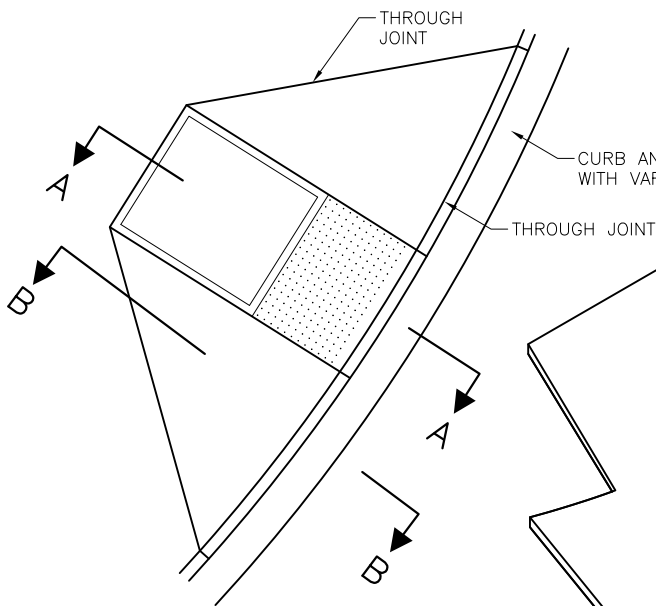


SECTION A-A

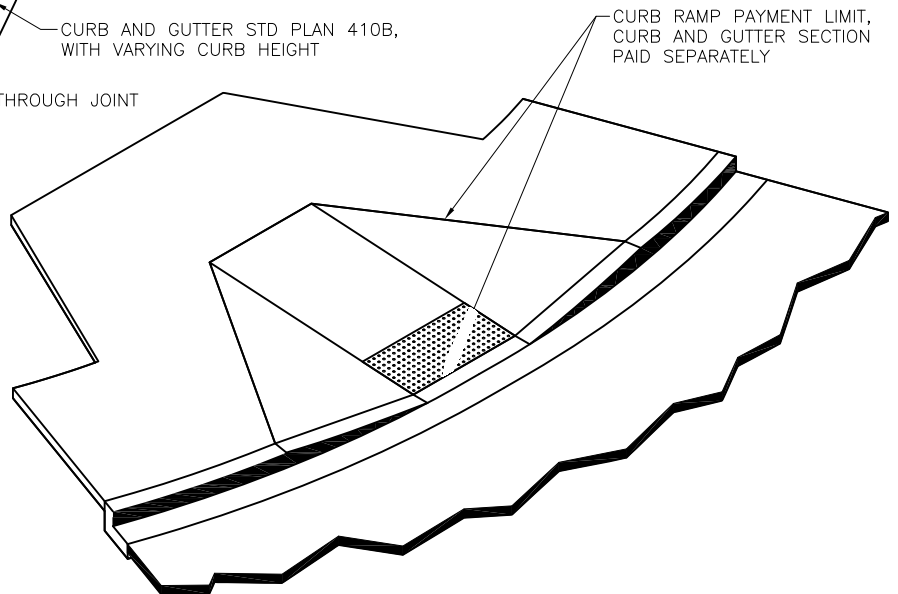
DEPRESSED CURB & GUTTER SEPARATE FROM RAMP.



SECTION B-B



PERPENDICULAR CURB RAMP  
(TYPE 422A WITH CURB AND GUTTER)



PERPENDICULAR CURB RAMP PAYMENT LIMIT  
ISOMETRIC VIEW

NOTES:

1. FOR DETECTABLE WARNING PLATE/TRUNCATED DOMES DETAILS, SEE STANDARD PLAN NO 422a.
2. FOR NOTES AND DETAILS NOT SHOWN, SEE STANDARD PLAN NO 422a.

REF STD SPEC SEC 8-14



City of Seattle

NOT TO SCALE

CURB RAMP DETAILS

# **APPENDIX B**

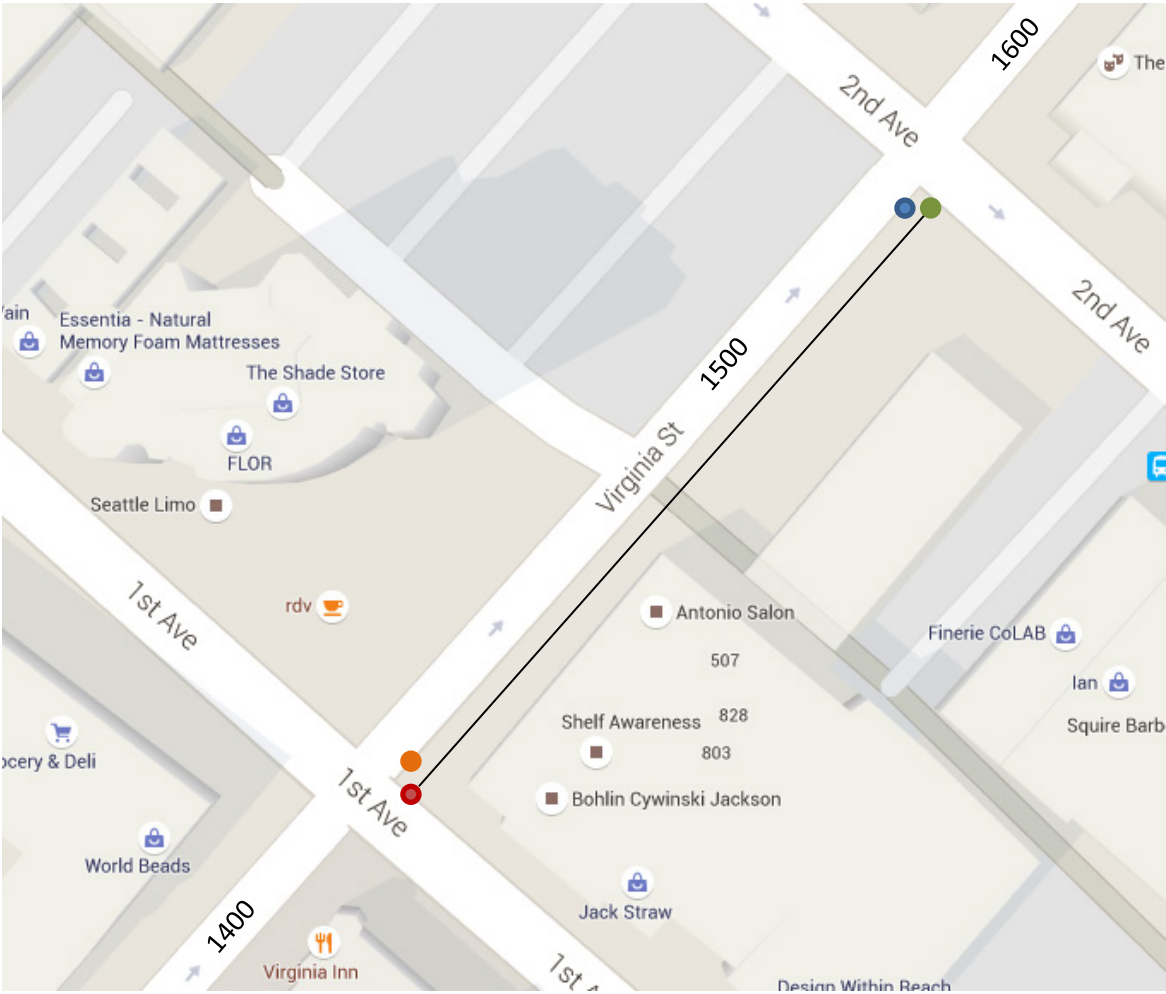
## **ANNOTATED DATA DICTIONARY**

# CURB RAMP SURVEY ANNOTATED DATA DICTIONARY

## SEGMENT DESCRIPTION

Street parallel to the sidewalk that connects to the curb ramp followed by the street that is before and after the curb ramp.

Example: Virginia St between 1<sup>st</sup> Ave and 2<sup>nd</sup> Ave



## SIDEWALK LOCATION

The side of the street the sidewalk that connects to the curb ramp is located on.

- E
- W
- N
- S
- C
- NW
- NE
- SW
- SE

## CURB RAMP BLOCK LOCATION

The location in terms of street address numbering along the block that the curb ramp is located.

- H (high)
- M (middle)
- L (Low)

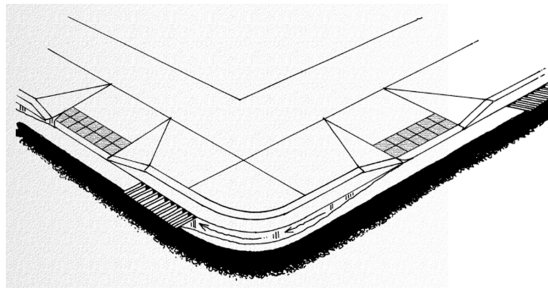
Example: H

## CURB RAMP CATEGORY

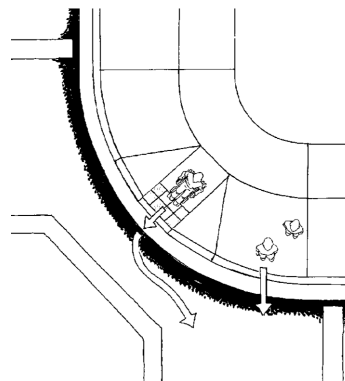
Does the curb ramp serve a single sidewalk segment or is it shared between two sidewalk segments? If no ramp, select 'No Ramp' from drop down list.



Single



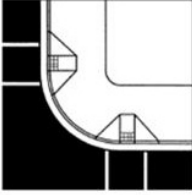
Shared



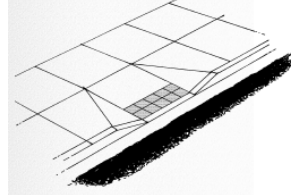


## CURB RAMP PLACEMENT

The placement of the curb ramp.



Intersection



Mid-Block



Median



Slip Lane/Island

## CURB RAMP STATUS

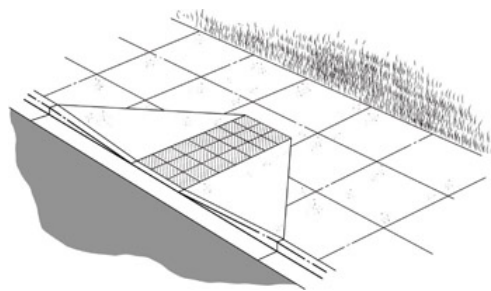
- EXISTING – Curb ramp is identified in the table.
- NEW – Curb ramp is found in the field but not listed in the table.
- UNDER CONSTRUCTION – Curb ramp is currently under construction

## CURB RAMP STYLE

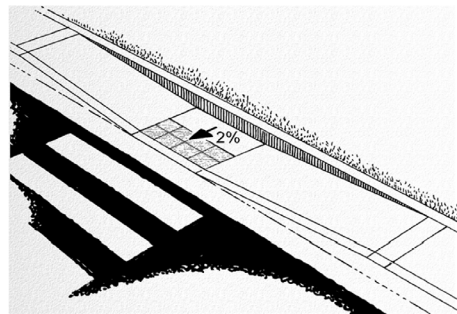
Identify the style of curb ramp – Type 422A, Type 422B, Blended Transition, or Modified. Select Modified if the style is neither a Type 422A, Type 422B, or Blended Transition.



Type 422A

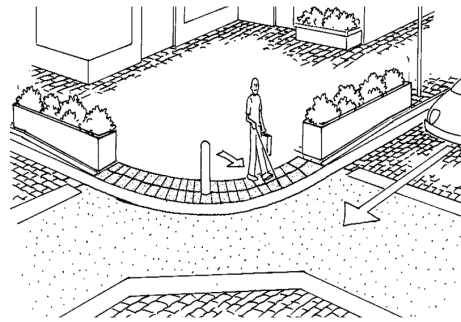


Type 422B





Blended Transition



## CURB RAMP DIRECTION

The direction of the curb ramp as you travel off the sidewalk down the street.

- N
- S
- E
- W
- NW
- SW
- NE
- NW

## CURB RAMP1 SURFACE

The surface material of the ramp. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.

- Concrete
- Brick
- Asphalt
- Stone
- Other

## CURB RAMP1 OBSTRUCTION

Any obstruction that impedes the use of the curb ramp. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.

- None
- Utility Pole
- Light Pole
- Street Sign Pole
- Pedestrian Signal Pole
- Firehydrant
- Other

## CURB RAMP1 SURFACE OBSTRUCTION

Identify any surface discontinuities on the ramp. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.

- None
- Grating
- Access Cover
- Grade Break
- Broken Pavement
- Other

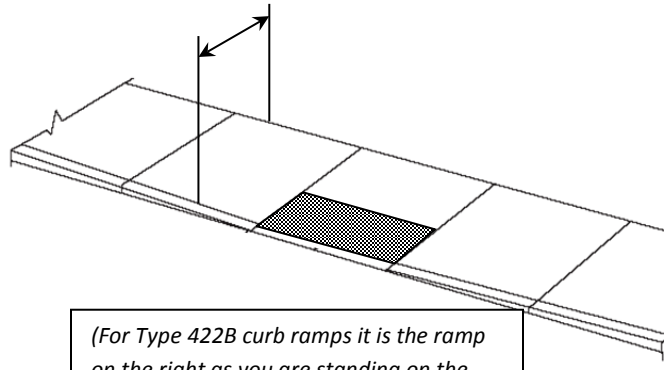
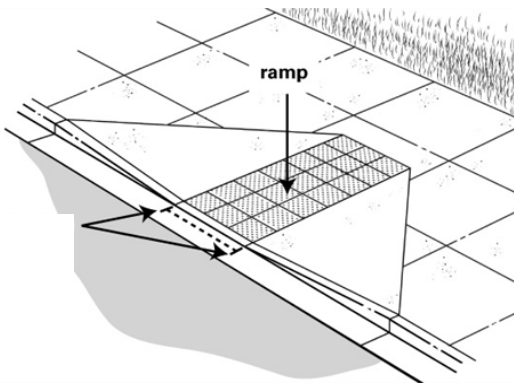
## CURB RAMP1 CONDITION

The overall condition of the curb ramp. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.

- Good – No defects, cracks, or signs of deterioration.
- Fair – Minor cracks and deterioration.
- Poor – Major cracks and deterioration.

## CURB RAMP1 WIDTH

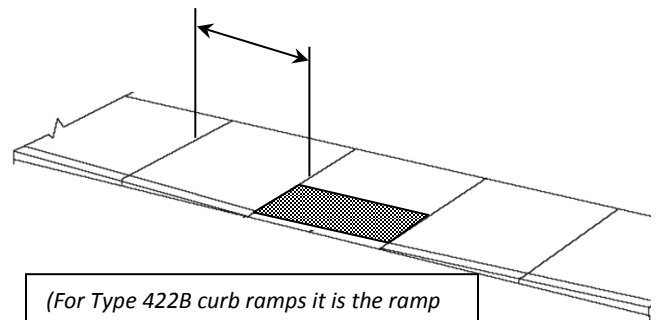
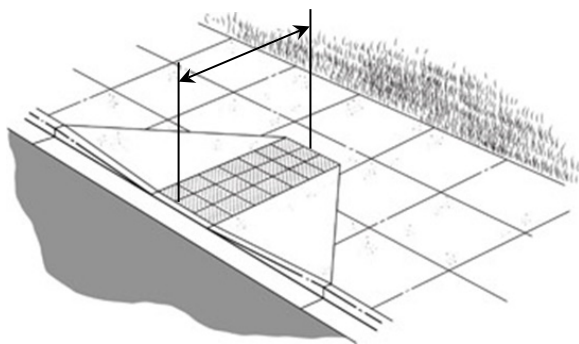
Measure the width of the curb ramp in inches. If the curb ramp has flared sides, do not include them in the measurement. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.



*(For Type 422B curb ramps it is the ramp on the right as you are standing on the bottom landing facing the street. )*

## CURB RAMP1 LENGTH

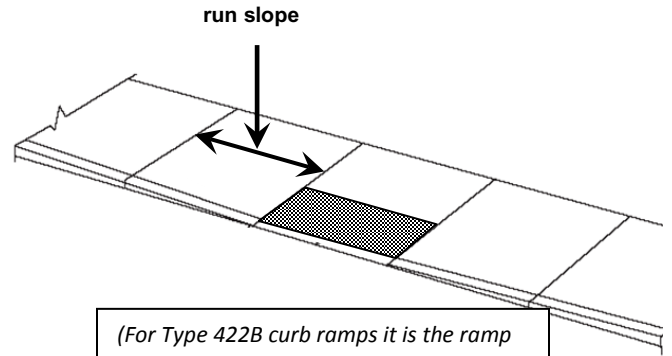
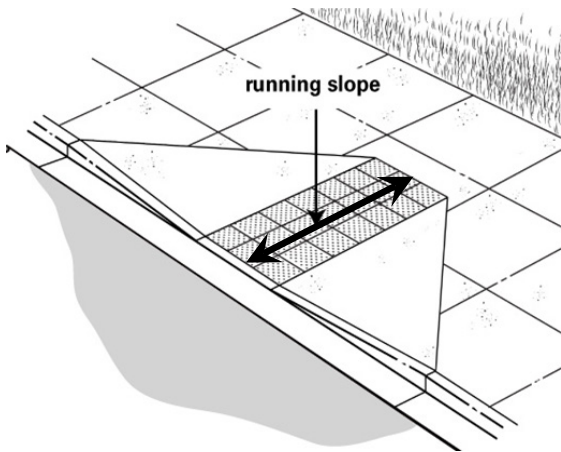
Measure the overall length of the ramp from the top edge of the ramp to the bottom edge of the ramp. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.



*(For Type 422B curb ramps it is the ramp on the right as you are standing on the bottom landing facing the street .)*

### CURB RAMP1 RUN SLOPE

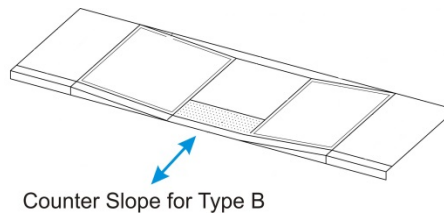
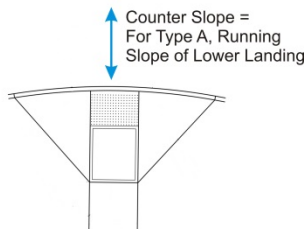
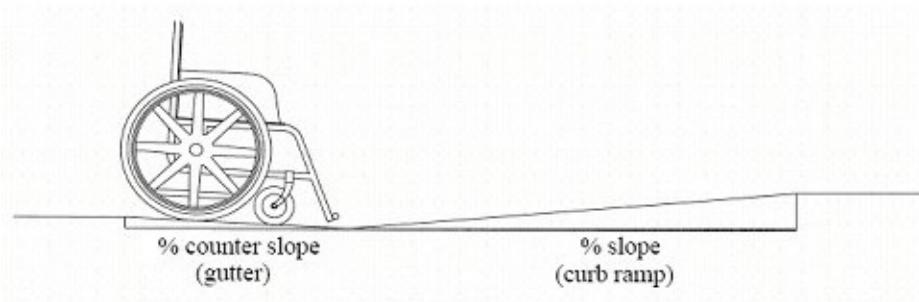
Measure the running slope (perpendicular to the curb/street) of the ramp. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.



*(For Type 422B curb ramps it is the ramp on the right as you are standing on the bottom landing facing the street.)*

### COUNTER SLOPE

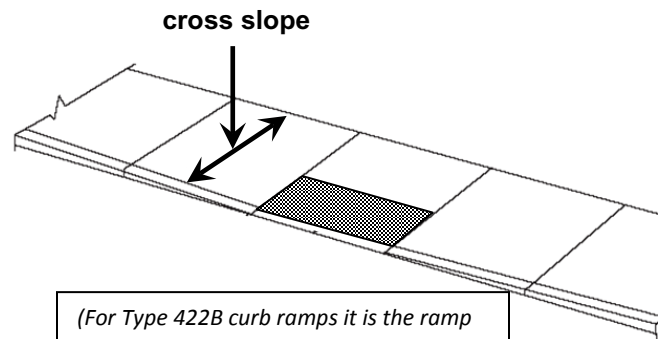
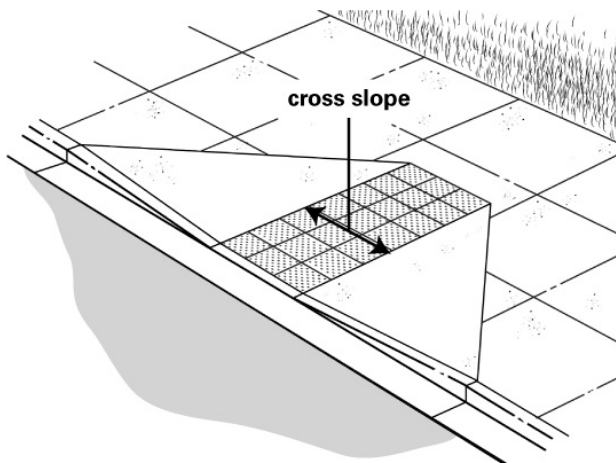
Measure beginning at the grade break into the street surface /gutter. It is the slope opposite the curb ramp slope, and perpendicular to the grade break.





### **CURB RAMP1 CROSS SLOPE**

Measure the cross slope (parallel to the curb/street) of the ramp. For Type 422B curb ramps it is the ramp on the right when standing on the bottom landing facing the street.



*(For Type 422B curb ramps it is the ramp on the right as you are standing on the bottom landing facing the street.)*

### **CURB RAMP2 SURFACE (TYPE 422B ONLY)**

The surface material of the ramp on the left when standing on the bottom landing facing the street.

- Concrete
- Brick
- Stone
- Other

### **CURB RAMP2 OBSTRUCTION (TYPE 422B ONLY)**

Any obstruction that impedes the use of the ramp on the left when standing on the bottom landing facing the street.

- None
- Utility Pole
- Light Pole
- Street Sign Pole
- Pedestrian Signal Pole
- Firehydrant
- Other

### **CURB RAMP2 SURFACE OBSTRUCTION (TYPE 422B ONLY)**

Identify any surface discontinuities of the ramp on the left when standing on the bottom landing facing the street.

- Grating
- Access Cover
- Grade Break
- Broken Pavement
- Other

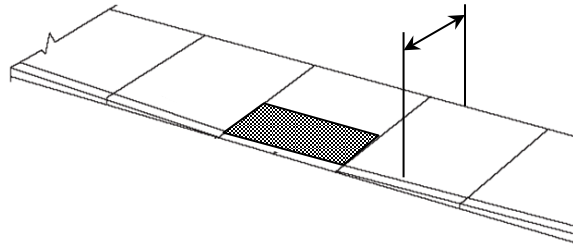
### **CURB RAMP2 CONDITION (TYPE 422B ONLY)**

The overall condition of the ramp on the left when standing on the bottom landing facing the street.

- Good – No defects, cracks, or signs of deterioration.
- Fair – Minor cracks and deterioration.
- Poor – Major cracks and deterioration.

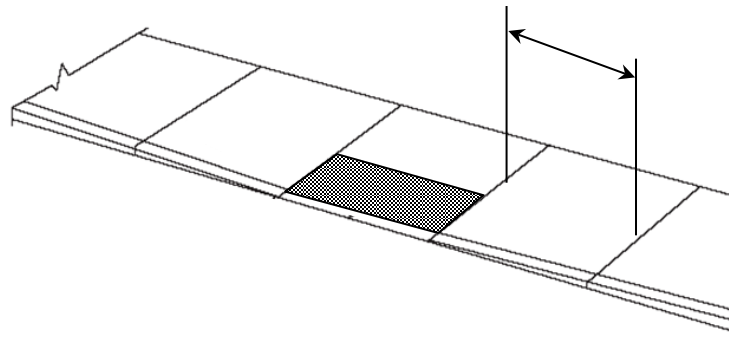
### **CURB RAMP2 WIDTH (TYPE 422B ONLY)**

Measure the width of the ramp on the left when standing on the bottom landing facing the street.



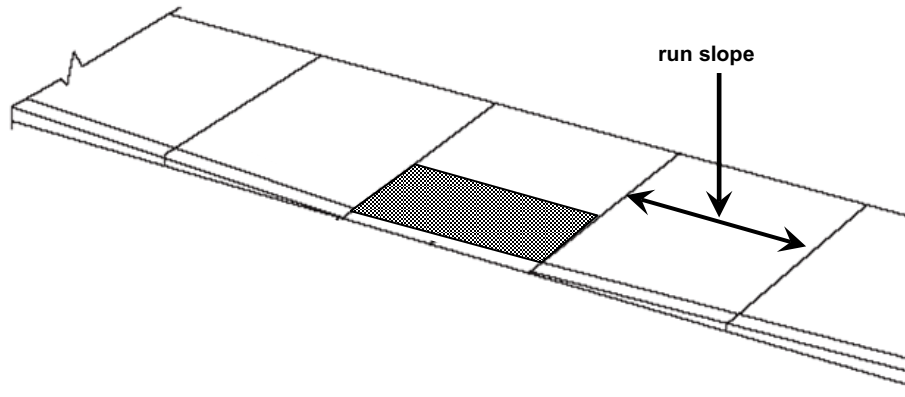
### **CURB RAMP2 LENGTH (TYPE 422B ONLY)**

The length of the ramp on the left when standing on the bottom landing facing the street.



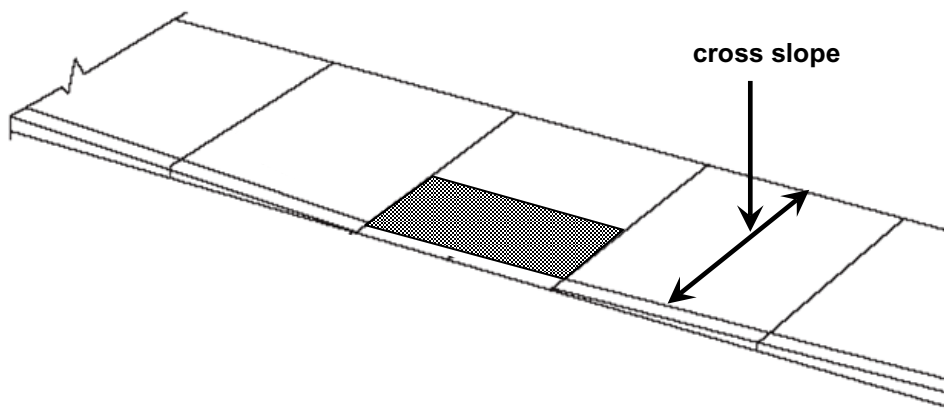
**CURB RAMP2 RUN SLOPE (TYPE 422B ONLY)**

Measure the running slope (perpendicular to the curb/street) of the ramp on the left when standing on the bottom landing facing the street.



**CURB RAMP2 CROSS SLOPE (TYPE 422B ONLY)**

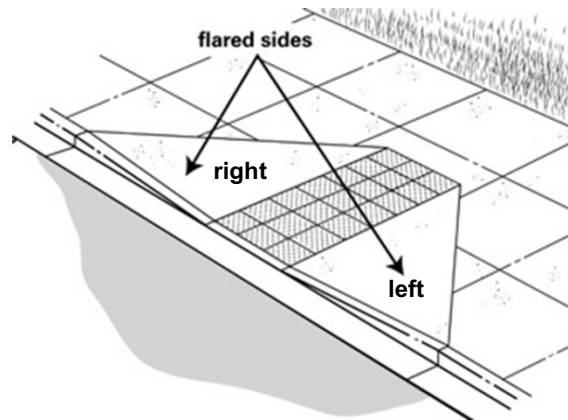
Measure the cross slope (parallel to the curb/street) of the ramp on the left when standing on the bottom landing facing the street.



## LEFT AND RIGHT FLARE

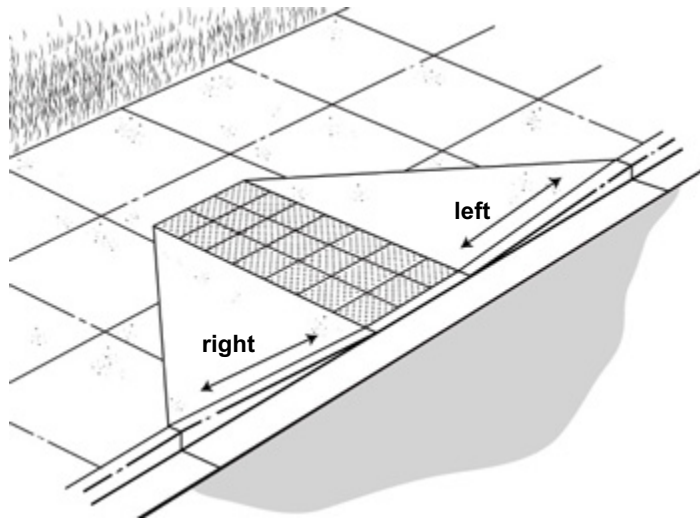
Presence of a flare on the left while you are standing on the ramp facing the street.

- YES
- NO



## LEFT AND RIGHT FLARE SLOPE

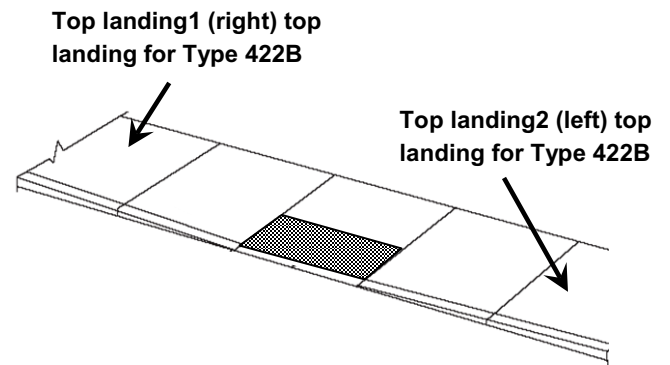
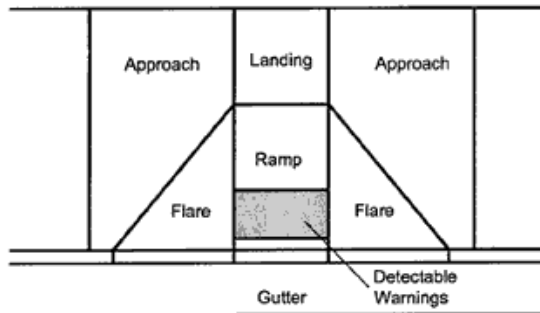
Place the level in the areas designated by the arrows to measure the slope of the flared sides.



### TOP LANDING1 SURFACE AND TOP LANDING2 (Type 422B Only) SURFACE

The surface material of the upper landing of the curb ramp. For Type 422B curb ramps top landing1 is on the right and top landing2 is on the left when standing on the bottom landing facing the street.

- CONCRETE
- BRICK
- ASPHALT
- STONE
- NO LANDING



### TOP LANDING1 AND TOP LANDING2 (Type 422B Only) CONNECT TO SIDEWALK

Identify whether the top landing connects to a sidewalk. For Type 422B curb ramps top landing1 is on the right and top landing2 is on the left when standing on the bottom landing facing the street.

- YES
- NO

### TOP LANDING1 AND TOP LANDING2 (Type 422B Only) SURFACE OBSTRUCTION

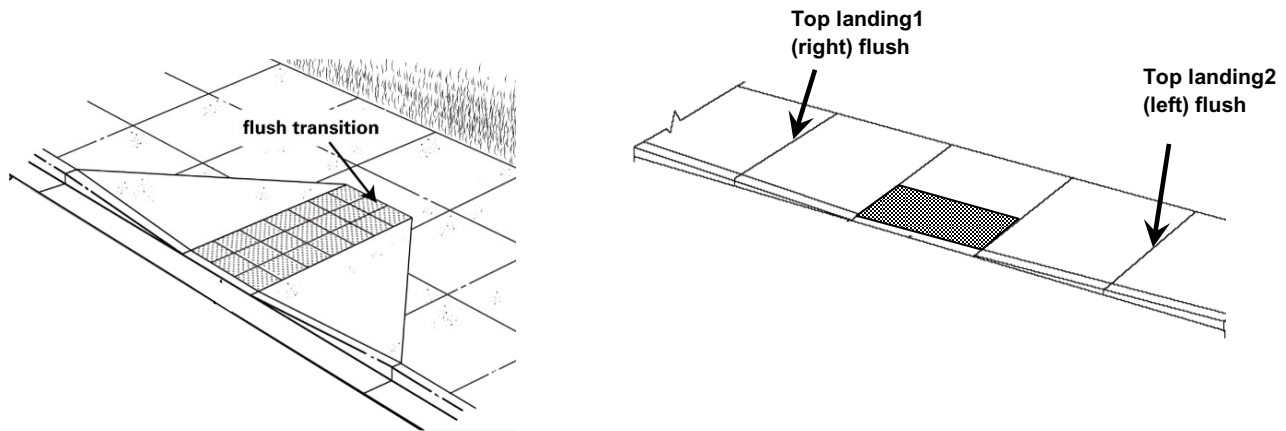
Identify any surface discontinuities on the top landing. For Type 422B curb ramps top landing1 is on the right and top landing2 is on the left when standing on the bottom landing facing the street.

- NONE
- GRATING
- ACCESS COVER
- GRADE BREAK
- BROKEN PAVEMENT
- OTHER

### TOP LANDING1 AND TOP LANDING2 (Type 422B Only) GRADE BREAK CONNECTION

Identify whether the transition from the ramp to the top landing is flush. For Type 422B curb ramps top landing1 is on the right and top landing2 is on the left when standing on the bottom landing facing the street.

- FLUSH
- NOT FLUSH



### TOP LANDING1 AND TOP LANDING2 (Type 422B Only) GRADE BREAK DIRECTION

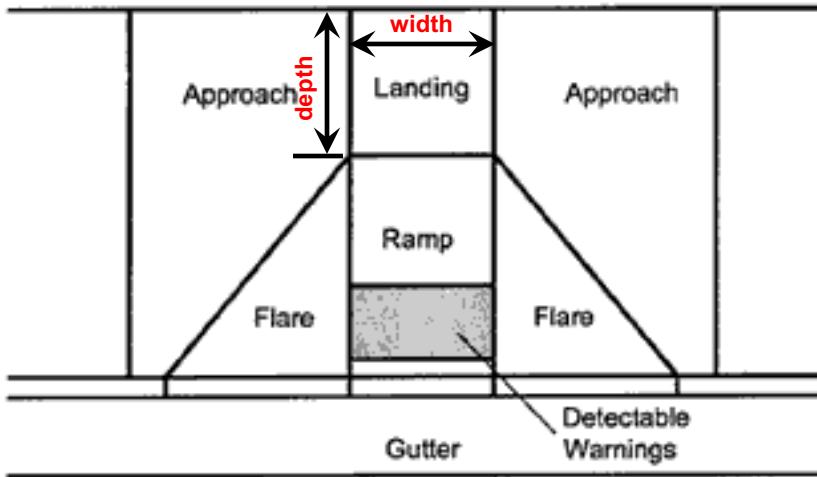
Identify whether the grade break at the top of the ramp is perpendicular to the direction of the ramp run. For Type 422B curb ramps top landing1 is on the right and top landing2 is on the left when standing on the bottom landing facing the street.

- PERPENDICULAR
- NOT PERPENDICULAR



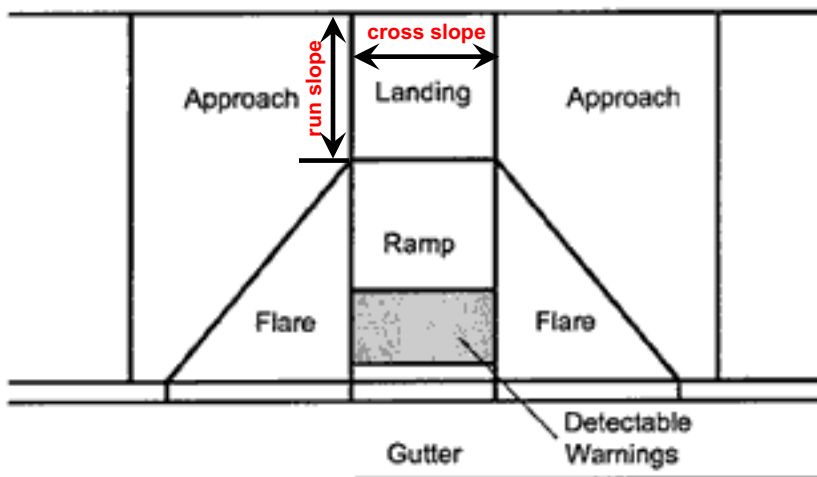
### TOP LANDING1 AND TOP LANDING2 (Type 422B Only) WIDTH AND DEPTH

Measure the width and depth of the top landing. For Type 422B curb ramps top landing1 is on the right and top landing2 is on the left when standing on the bottom landing facing the street.



### TOP LANDING1 AND TOP LANDING2 (Type 422B Only) RUN SLOPE AND CROSS SLOPE

Measure the running slope and cross slope of the top landing. For Type 422B curb ramps top landing1 is on the right and top landing2 is on the left when standing on the bottom landing facing the street.



## LOWER LANDING SURFACE

The surface material of the bottom landing of the curb ramp.

- CONCRETE
- BRICK
- ASPHALT
- STONE
- NO LANDING

## LOWER LANDING SURFACE OBSTRUCTION

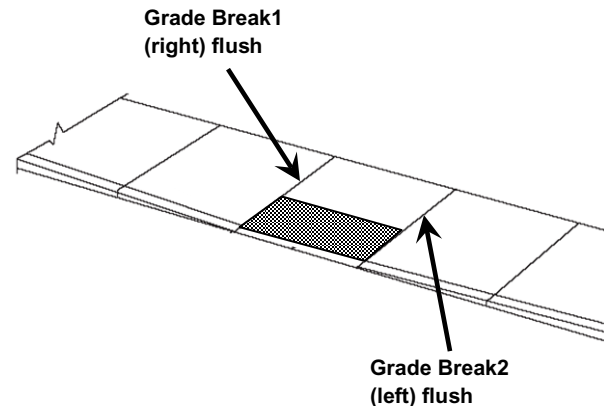
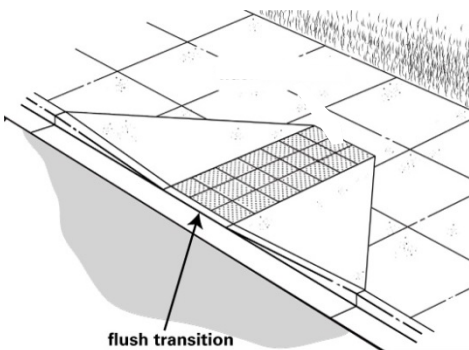
Identify any surface discontinuities on the top landing.

- NONE
- GRATING
- ACCESS COVER
- GRADE BREAK
- BROKEN PAVEMENT
- OTHER

## LOWER LANDING GRADE BREAK1 AND GRADE BREAK2 (Type 422B Only) CONNECTION

Identify whether the transition from the ramp to the bottom landing is flush. For Type 422B curb ramps grade break1 is on the right and grade break2 is on the left when standing on the bottom landing facing the street.

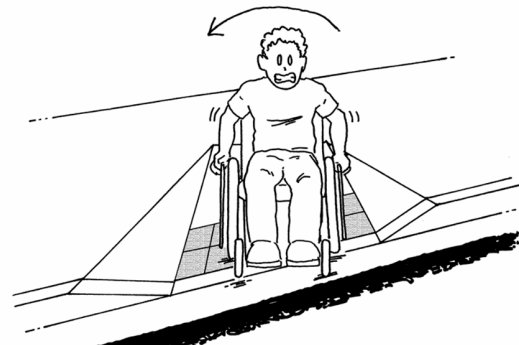
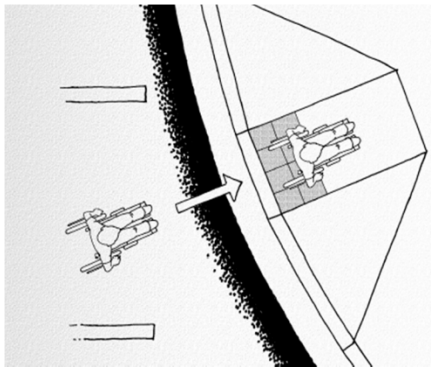
- FLUSH
- NOT FLUSH



## LOWER LANDING GRADE BREAK1 AND GRADE BREAK2 (Type 422B Only) DIRECTION

Identify whether the grade break at the bottom of the ramp is perpendicular to the direction of the ramp run. For Type 422B curb ramps grade break1 is on the right and grade break2 is on the left when standing on the bottom landing facing the street.

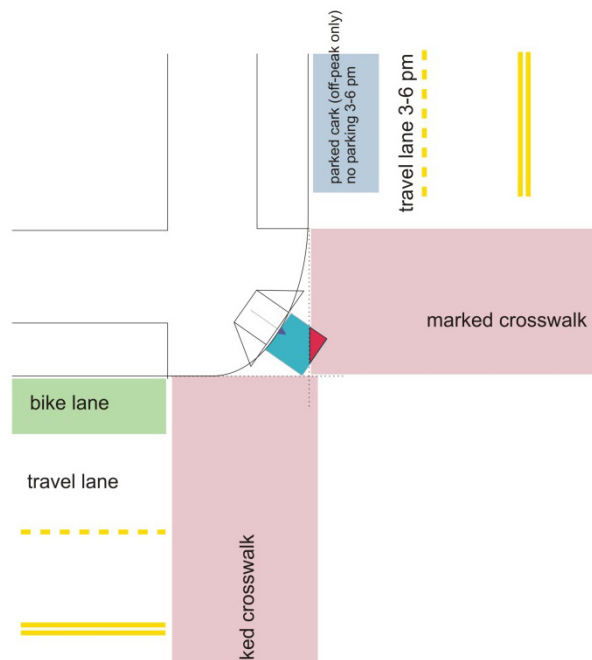
- PERPENDICULAR
- NOT PERPENDICULAR



## LOWER LANDING EXTEND PAST FACE OF CURB (Shared Style Ramps Only)

Does the far edge of the lower landing extend past the face of the curb?

- YES
- NO



### **LOWER LANDING WIDTH (Type 422B)**

Measure the width of the lower landing for Type B curb ramps.

### **LOWER LANDING DEPTH (Type 422B)**

Measure the depth of the lower landing for Type B curb ramps.

### **LOWER LANDING RUN SLOPE (Type 422B)**

Measure the running slope of the lower landing.

### **LOWER LANDING CROSS SLOPE (Type 422B)**

Measure the cross slope of the lower landing.

### **DETECTABLE WARNING**

Presence of a detectable warning surface.

- YES
- NO



### **DETECTABLE WARNING MATERIAL**

- PLASTIC
- CONCRETE
- STONE
- OTHER

### **DETECTABLE WARNING COLOR**

- WHITE
- YELLOW
- FLOURESCENT YELLOW
- RED
- BLACK
- GRAY
- NONE

### DETECTABLE WARNING MOUNT

Identify how the detectable warning is installed or mounted.

- SURFACE
- CAST
- OTHER

### DETECTABLE WARNING WIDTH

Measure the width of the detectable warning surface.

### DETECTABLE WARNING DEPTH

Measure the depth of the detectable warning surface.

### DETECTABLE WARNING CONDITION

Identify the condition of the detectable warning.

- GOOD
- FAIR
- POOR

### MARKED CROSSWALK

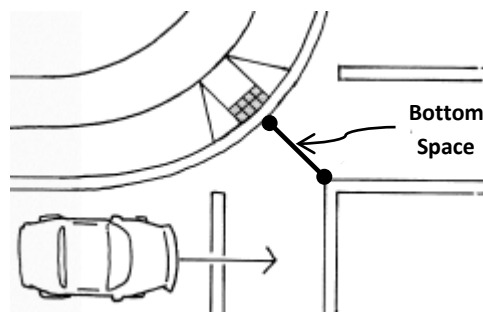
Presence of a marked crosswalk.

- YES
- NO

### CURB RAMP IN MARKED CROSSWALK

Is the bottom of the curb ramp completely within the marked crosswalk?

- YES
- NO



## REMOVABLE BARRIERS

Identifies if there are non-permanent objects obstructing use of curb ramp (i.e. an object is blocking the effective use of the ramp and/or landing).

- VENDOR BOX
- MAILBOX
- BENCH
- DEBRIS
- LANDSCAPING
- OTHER
- NONE

## MEF FACTOR

Are there any maximum extent feasible factors that may impact the compliance of the curb ramp.

- NONE
- STREET SLOPE
- RIGHT OF WAY
- LIMITED CLEARANCE

## COMPANION RAMP

Identify the presence of a curb ramp on the opposing side of the street. (i.e. Can a person in a wheelchair exit off the opposite side of the street onto the sidewalk?)

- YES
- NO
- NOT APPLICABLE

## MEDIAN OBSTRUCTION

Does the median obstruct pedestrians crossing the intersection?

- NA
- YES
- NO



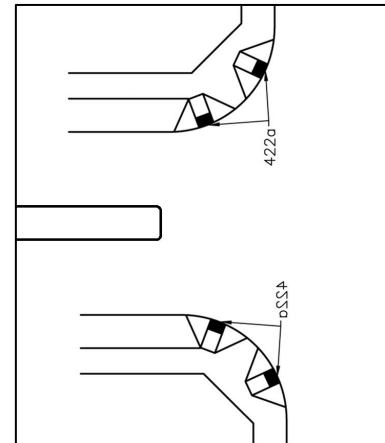
## MEDIAN ACCESS

If there is a median at the crossing what type of access is provided to go across the median?

- MEDIAN SHORT
- CUT THROUGH
- CURB RAMP



Cut-through



Median short of intersection

## MEDIAN TACTILE SURFACE

If the median access is a cut through are there presence of a detectable warning surface?

- YES, BOTH SIDES
- YES, ONE SIDE
- NONE

## SIDEWALK MATERIAL

Verify the material of the sidewalk that connects to the curb ramp.

- ASPHALT
- STONE, BLOCK, BRICK, PAVER
- GRAVEL
- OTHER
- PORTLAND CEMENT CONCRETE
- PERVIOUS OTHER TYPE
- PERVIOUS ASPHALT
- PERVIOUS CONCRETE
- BITUMINOUS SURFACE TREATMENT
- UNIMPROVED
- UNDETERMINED



# **APPENDIX C**

## **DATA CODE TABLE**

## DATA CODE TABLES

<b>SW_LOCATION</b>	<b>Sidewalk Side of Street</b>
<b>CODE</b>	<b>VALUE</b>
E	East
W	West
N	North
S	South
NW	Northwest
NE	Northeast
SW	Southwest
SE	Southeast

<b>CR_BLOCK_LOCATION</b>	<b>Curb Ramp Block Location</b>
<b>CODE</b>	<b>VALUE</b>
H	High
M	Middle
L	Low

<b>CR_PLACEMENT</b>	<b>Curb Ramp Placement</b>
<b>CODE</b>	<b>VALUE</b>
INTERSECT	Intersection
MID-BLOCK	Mid-Block
MEDIAN	Median
SLPLANEISL	Slip Lane Island

<b>CR_STATUS</b>	<b>Curb Ramp Status</b>
<b>CODE</b>	<b>VALUE</b>
EXISTING	Existing
NEW	New
UC	Under construction

<b>CR_STYLE</b>	<b>Curb Ramp Style</b>
<b>CODE</b>	<b>VALUE</b>
TYPE422A	Type 422A
TYPE422B	Type 422B
BLENDTRANS	Blended Transtion
MODIFIED	Modified

<b>CR_CATEGORY</b>	<b>Curb Ramp Category</b>
<b>CODE</b>	<b>VALUE</b>
SINGLE	Single
SHARED	Shared
NORAMP	No Ramp

**DATA CODE TABLES**

<b>CR_DIRECTION</b>	<b>Curb Ramp Direction</b>
<b>CODE</b>	<b>VALUE</b>
E	East
W	West
N	North
S	South
NW	Northwest
NE	Northeast
SW	Southwest
SE	Southeast

<b>CR1_SUR</b>	<b>Curb Ramp1 Surface</b>
<b>CODE</b>	<b>VALUE</b>
CONCRETE	Concrete
BRICK	Brick
ASPHALT	Asphalt
STONE	Stone
OTHER	Other

<b>CR1_OBS</b>	<b>Curb Ramp1 Obstruction</b>
<b>CODE</b>	<b>VALUE</b>
NONE	None
UTILITYPOL	Utility Pole
LIGHTPOLE	Light Pole
STSIGNPOLE	Street Sign Pole
PEDSIGPOLE	Pedestrian Signal Pole
FRHYDRANT	Fire Hydrant
OTHER	Other

<b>CR1_SUR_OBS</b>	<b>Curb Ramp1 Surface Obstruction</b>
<b>CODE</b>	<b>VALUE</b>
NONE	None
GRATING	Grating
ACCESSCOV	Access Cover
GRADEBREAK	Grade Break
BROKENPAV	Broken Pavement
OTHER	Other

<b>CR1_CONDITION</b>	<b>Curb Ramp1 Condition</b>
<b>CODE</b>	<b>VALUE</b>
GOOD	Good
FAIR	Fair
POOR	Poor

**DATA CODE TABLES**

<b>CR2_SUR</b>	<b>Curb Ramp2 Surface</b>
<b>CODE</b>	<b>VALUE</b>
CONCRETE	Concrete
BRICK	Brick
ASPHALT	Asphalt
STONE	Stone
OTHER	Other

<b>CR2_OBS</b>	<b>Curb Ramp2 Obstruction</b>
<b>CODE</b>	<b>VALUE</b>
NONE	None
UTILITYPOL	Utility Pole
LIGHTPOLE	Light Pole
STSIGNPOLE	Street Sign Pole
PEDSIGNPOLE	Pedestrian Signal Pole
FRHYDRANT	Fire Hydrant
OTHER	Other

<b>CR2_SUR_OBS</b>	<b>Curb Ramp2 Surface Obstruction</b>
<b>CODE</b>	<b>VALUE</b>
NONE	None
GRATING	Grating
ACCESSCOV	Access Cover
GRADEBREAK	Grade Break
BROKENPAV	Broken Pavement
OTHER	Other

<b>CR2_CONDITION</b>	<b>Curb Ramp2 Condition</b>
<b>CODE</b>	<b>VALUE</b>
GOOD	Good
FAIR	Fair
POOR	Poor

<b>FLARE_L</b>	<b>Flare on Left (facing street)</b>
<b>CODE</b>	<b>VALUE</b>
YES	Yes
NO	No

<b>FLARE_R</b>	<b>Flare on Right (facing street)</b>
<b>CODE</b>	<b>VALUE</b>
YES	Yes
NO	No

**DATA CODE TABLES**

<b>TOP_LAN1_SUR</b>	<b>Upper Landing1 Surface</b>
<b>CODE</b>	<b>VALUE</b>
CONCRETE	Concrete
BRICK	Brick
ASPHALT	Asphalt
STONE	Stone
NOLANDING	No Landing

<b>TOP_LAN1_SW</b>	<b>Upper Landing1 Connect to Sidewalk</b>
<b>CODE</b>	<b>VALUE</b>
YES	Yes
NO	No

<b>TOP_LAN1_SF_OBS</b>	<b>Upper Landing1 Surface Obstruction</b>
<b>CODE</b>	<b>VALUE</b>
NONE	None
GRATING	Grating
ACCESSCOV	Access Cover
GRADEBREAK	Grade Break
BROKENPAV	Broken Pavement
OTHER	Other

<b>TOP_LAN1_GB_CONN</b>	<b>Upper Landing1 Grade Break Connection</b>
<b>CODE</b>	<b>VALUE</b>
FLUSH	Flush
NOTFLUSH	Not Flush

<b>TOP_LAN1_GB_DIR</b>	<b>Upper Landing1 Grade Break Direction</b>
<b>CODE</b>	<b>VALUE</b>
PERPENDICULAR	Perpendicular
NOTPERPENDICULAR	Not Perpendicular

<b>TOP_LAN2_SUR</b>	<b>Upper Landing2 Surface</b>
<b>CODE</b>	<b>VALUE</b>
CONCRETE	Concrete
BRICK	Brick
ASPHALT	Asphalt
STONE	Stone
NOLANDING	No Landing

<b>TOP_LAN2_SW</b>	<b>Upper Landing2 Connect to Sidewalk</b>
<b>CODE</b>	<b>VALUE</b>
YES	Yes
NO	No

## DATA CODE TABLES

<b>TOP_LAN2_SF_OBS</b>	<b>Upper Landing2 Surface Obstruction</b>
<b>CODE</b>	<b>VALUE</b>
NONE	None
GRATING	Grating
ACCESSCOV	Access Cover
GRADEBREAK	Grade Break
BROKENPAV	Broken Pavement
OTHER	Other

<b>TOP_LAN2_GB_CONN</b>	<b>Upper Landing2 Grade Break Connection</b>
<b>CODE</b>	<b>VALUE</b>
FLUSH	Flush
NOTFLUSH	Not Flush

<b>TOP_LAN2_GB_DIR</b>	<b>Upper Landing2 Grade Break Direction</b>
<b>CODE</b>	<b>VALUE</b>
PERPENDICULAR	Perpendicular
NOTPERPENDICULAR	Not Perpendicular

<b>LOW_LAN_SUR</b>	<b>Lower Landing Surface (Type 422B Only)</b>
<b>CODE</b>	<b>VALUE</b>
CONCRETE	Concrete
BRICK	Brick
ASPHALT	Asphalt
STONE	Stone

<b>LOW_LAN_SF_OBS</b>	<b>Lower Landing Surface Obstruction (Type 422B Only)</b>
<b>CODE</b>	<b>VALUE</b>
NONE	None
GRATING	Grating
ACCESSCOV	Access Cover
GRADEBREAK	Grade Break
BROKENPAV	Broken Pavement
OTHER	Other

<b>LOW_LAN1_GB_CONN</b>	<b>Lower Landing1 Grade Break Connection</b>
<b>CODE</b>	<b>VALUE</b>
FLUSH	Flush
NOTFLUSH	Not Flush

<b>LOW_LAN1_GB_DIR</b>	<b>Lower Landing1 Grade Break Direction</b>
<b>CODE</b>	<b>VALUE</b>
PERPENDICULAR	Perpendicular
NOTPERPENDICULAR	Not Perpendicular

## DATA CODE TABLES

<b>LOW_LAN_EXT_FOC</b>	<b>Lower Landing Extend Beyond Face of Curb (Shared Curb Ramps Only)</b>
<b>CODE</b>	<b>VALUE</b>
YES	Yes
NO	No

<b>LOW_LAN2_GB_CONN</b>	<b>Lower Landing2 Grade Break Connection (Type 422B Only)</b>
<b>CODE</b>	<b>VALUE</b>
FLUSH	Flush
NOTFLUSH	Not Flush

<b>LOW_LAN2_GB_DIR</b>	<b>Lower Landing2 Grade Break Direction (Type 422B Only)</b>
<b>CODE</b>	<b>VALUE</b>
PERPENDICULAR	Perpendicular
NOTPERPENDICULAR	Not Perpendicular

<b>DETECTABLE_WARN</b>	<b>Detectable Warning</b>
<b>CODE</b>	<b>VALUE</b>
YES	Yes
NO	No

<b>DET_WARN_MAT</b>	<b>Detectable Warning Material</b>
<b>CODE</b>	<b>VALUE</b>
PLASTIC	Plastic
CONCRETE	Concrete
STONE	Stone
OTHER	Other

<b>DET_WARN_COL</b>	<b>Detectable Warning Color</b>
<b>CODE</b>	<b>VALUE</b>
WHT	White
YLW	Yellow
FL-YLW	Flourescent Yellow
RED	Red
BLK	Black
GRY	Gray

<b>DET_WARN_MOUNT</b>	<b>Detectable Warning Mounting Type</b>
<b>CODE</b>	<b>VALUE</b>
SURFACE	Surface
CAST	Cast
OTHER	Other



**DATA CODE TABLES**

<b>DET_WARN_COND</b>		<b>Detectable Warning Condition</b>
<b>CODE</b>	<b>VALUE</b>	
GOOD	Good	
FAIR	Fair	
POOR	Poor	

<b>MARK_XWALK</b>		<b>Marked Crosswalk</b>
<b>CODE</b>	<b>VALUE</b>	
YES	Yes	
NO	No	

<b>CR_IN_XWALK</b>		<b>Curb Ramp within Crosswalk</b>
<b>CODE</b>	<b>VALUE</b>	
YES	Yes	
NO	No	

<b>REM_BARRIERS</b>		<b>Removable Barriers</b>
<b>CODE</b>	<b>VALUE</b>	
VENDORBOX	Vendor box	
MAILBOX	Mailbox	
BENCH	Bench	
LANDSCAP	Landscaping	
DEBRIS	Debris	
OTHER	Other	

<b>MEF_FACTOR</b>		<b>Maximum Extent Feasible Factors</b>
<b>CODE</b>	<b>VALUE</b>	
NONE	None	
STSLOPE	Street Slope	
ROW	Right of Way	
LIMITCLEAR	Limited Clearance	

<b>COMP_RAMP</b>		<b>Companion Ramp</b>
<b>CODE</b>	<b>VALUE</b>	
YES	Yes	
NO	No	
NA	Not Applicable	

<b>MEDIAN_OBS</b>		<b>Median Obstruction</b>
<b>CODE</b>	<b>VALUE</b>	
YES	Yes	
NO	No	
NA	Not Applicable	

**DATA CODE TABLES**

<b>MEDIAN_ACCESS</b>	<b>Median Access</b>
<b>CODE</b>	<b>VALUE</b>
MED_SHORT	Yes
CUT_THRU	No
CURB_RAMP	Not Applicable

<b>MEDIAN_TAC_SUR</b>	<b>Median Tactile Surface</b>
<b>CODE</b>	<b>VALUE</b>
YES_BS	Yes Both Sides
YES_OS	Yes One Side
NONE	None

<b>SIDEWALK</b>	<b>Sidewalk Material</b>
<b>CODE</b>	<b>VALUE</b>
AC	Asphalt
BR	Stone Block, Brick, Paver
GRAVEL	Gravel
OTH	Other
PCC	Portland Cement Concrete
PV/OTHER	Pervious Other Type
PVAS	Pervious Asphalt
PVCC	Pervious Concrete
ST	Bituminous Surface Treatment
UIMPRV	Unimproved
UND	Undetermined