

PBOT

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Chloe Eudaly Commissioner Chris Warner Interim Director

March 29, 2019

MEMORANDUM

TO: PBOT ADA Technical Advisors
FROM: Eva Huntsinger, P.E., JD, PBOT ADA CREEC Program Manager *ebh*
SUBJECT: 11% Maximum Grade Break Requirement (Ramp to Street)

Background

ADA requires **ADA compliant curb ramps to the maximum extent feasible within the scope of the project** when a roadway improvement is an alteration (like paving) or for new construction of roadway or street features.

This means that:

- When we construct a new ramp, the new curb ramp is designed to allow for a maximum 11% grade break at the bottom of the ramp.
- Where a concrete curb ramp exists that is otherwise ADA compliant except that the bottom of the ramp has a grade break that is more than 11%, good faith efforts to smooth out the grade break are required. FHWA provides an example of how one might achieve the 11% max grade break through milling before resurfacing as shown in the diagrams below.

Ramp Connection to Street Paving

In cases where the 11% maximum grade break cannot be practically achieved within the scope of the project (such as when retrofitting to an existing street grade and regrading the street is not a part of the project), we are held to making best efforts to smooth out the grade break, and then documenting the improvement in the form of an ADA curb ramp variance. Engineering judgment applies to this standard and an ADA Technical Advisor must approve of the variance and document the variance on a curb ramp design form.

For the documentation, an ADA Ramp Report approved by the ADA Technical Advisor is required documenting (a) the circumstances for the variance, and (b) efforts applied to for an improved condition to the maximum extent feasible within the scope of the project. Attached is a sample variance for vaulted basements. The form can be found at <https://www.portlandoregon.gov/transportation/article/642921>. Blanket variances by stretch of paving are allowable, provided the blanket variance is thoroughly documented.

Follows is FHWA guidance on pavement reconstruction and reducing the grade brake at the bottom of ramps. See https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks207.cfm



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7.3.7.2 Recommendations for maximum change in grade

In order to avoid difficult or potentially hazardous changes in grade, sidewalks and curb ramps should be designed with gradual grade changes whenever possible. Where abrupt changes are required, the difference in grade between adjacent surfaces should be minimized. The exact change of grade that will be problematic varies among wheelchair users and is dependent on a variety of factors including the design of the wheelchair and the speed at which the user is traveling. Additional research is needed to provide a more comprehensive evaluation of the impact of change of grade on wheelchair users.

The maximum recommended change of grade is 11 percent. Whenever possible, sidewalks and curb ramps should be designed with a maximum grade change that is less than 11 percent to ensure that the maximum grade change between the installed surfaces will remain less than 11 percent after street resurfacing or other roadway maintenance activities. Change of grade can be minimized by an addition of 230 mm (9 in) of 2 percent ramp and 230 mm (9 in) of 2 percent gutter. The 460 mm (18 in) of gradual change of grade can prevent wheelchair users from flipping forward or backward.



Figure 7-23. Overlaying existing asphalt without milling away the old asphalt can create steep slopes on either side of the centerline.

7.3.7.3 Street resurfacing

The manner in which streets are maintained significantly impacts the slope of the curb ramp approach from the street. Asphalt is an economical and durable material used to pave most roads. In the past, repairing damage to asphalt roads typically entailed overlaying the existing pavement with more asphalt. Then, as the asphalt layers built up, the roadway crown created steep slopes on either side of the centerline. This also created an abrupt transition between the gutter and the asphalt surface. These slopes significantly exaggerate the intended change of grade.

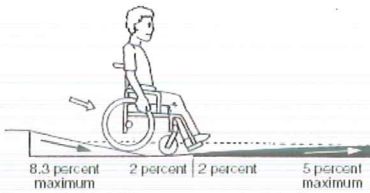


Figure 7-24. Milling away asphalt before resurfacing results in a smooth transition between curb ramps, gutters, and streets.

Recent advances in street repaving allow recycled asphalt to be used in new resurfacing projects. To take advantage of the old material, roads are milled before being resurfaced. Milling should be completed from gutter to gutter. Furthermore, if the road has maintained its original crown, the amount of asphalt removed from the road for recycling should equal the amount of asphalt being added to the road for resurfacing. However, if the road has not been milled during past resurfacing, it may be necessary to remove more asphalt than is being added to restore the crown to its original slope.

When resurfacing is done to a road, access improvements must be made to the curb ramp and driveway crossings that are adjacent to the roadway surface. The Department of Justice mandates that "resurfacing beyond normal maintenance is an alteration" (U.S. Department of Justice, 1994a) in contrast to maintenance activities, alterations such as resurfacing trigger the requirements to provide accessibility improvements such as curb ramps.

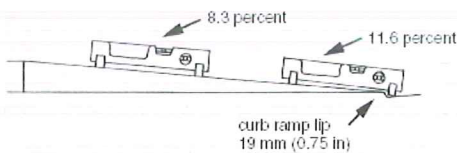


Figure 7-25. The actual slope a wheelchair user will have to negotiate on an 8.3 percent slope with a 19 mm (0.75 in) lip is 11.6 percent.

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/pdf/O8chapter7.pdf