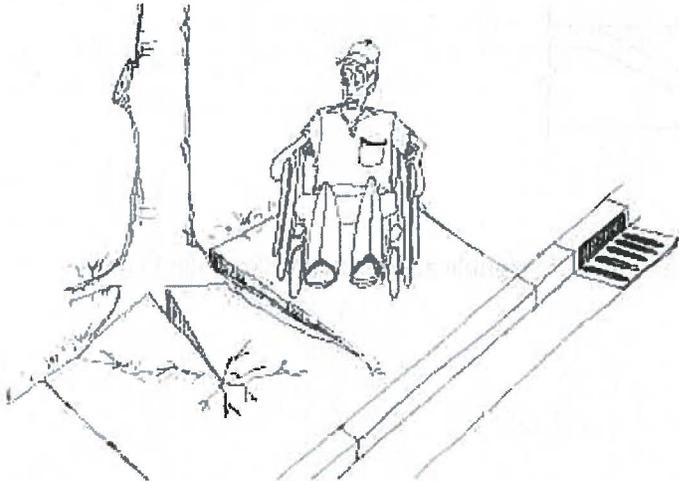


Federal Highway Administration

4.3.6 Changes in Level

Changes in level are defined as vertical height transitions between adjacent surfaces or along the surface of a path. In the sidewalk environment, curbs without curb ramps, cracks (Figure 4-10), and dislocations in the surface material are common examples of changes in level. Changes in level also can result at expansion joints between elements such as curb ramps and gutters.

Figure 4-10: Changes in level are often caused by tree roots that break through the sidewalk surface.



Changes in level can cause ambulatory pedestrians to trip or catch the casters of a manual wheelchair, causing the chair to come to an abrupt stop. People who are blind or who have low vision might not anticipate changes in level such as a buckling brick sidewalk.

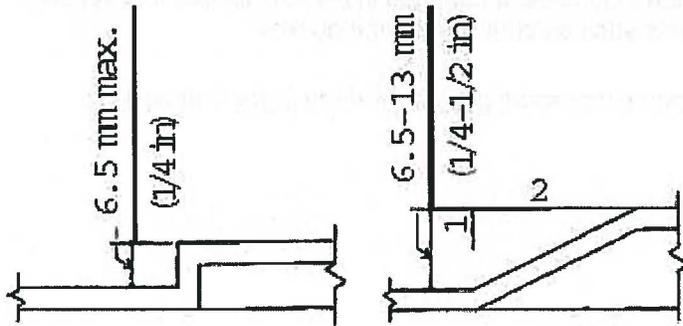
The following conditions were observed to cause changes in level:

- Buckled bricks
- Cracks
- Curbs without ramps
- Drainage grates
- Grooves in concrete
- Heaving and settlement due to frost
- Lips at curb ramp frames
- Railroad tracks
- Roots
- Small steps
- Tree grates
- Uneven transitions between streets, gutters, and ramps

The guidelines and recommendations that were reviewed for changes in level are included in Tables 4-2.1 through 4-2.4 at the end of this chapter. The Federal accessibility standards permit changes in level less than 6 mm (0.25 in) high to be vertical but require changes in level between 6 mm and 13

mm (0.25 in and 0.50 in) to have a maximum bevel of 50 percent, as shown in Figure 4-11. A ramp is required for changes in level that exceed 13 mm (0.50 in) (US DOJ, 1991; UFAS,U.S. DoD et al., 1984).

Figure 4-11: Vertical and beveled changes in level [ADAAG, Figure 7 (c, d), U.S. Access Board, 1991].



http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalks/chap4a.cfm