



# PEDESTRIAN ACCESSIBILITY ALONG ROADWAYS



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## Overview

More than 54 million Americans, almost 20 percent of the U.S. population, have a disability. A disability is a physical or mental impairment that substantially limits a person's major life activities. There are several laws that protect Americans with disabilities by prohibiting discrimination against them. These laws require facilities to be accessible to and usable by persons with disabilities. Compliance with these laws is mandatory and is intended to help integrate those with disabilities into mainstream society. The Department of Defense (DoD) has adopted standards to implement the laws. All military departments, including installations, are directed to meet the standards to the maximum extent feasible.

Compliance with accessibility standards is an ongoing issue on military bases. There are two primary reasons for these issues: facilities being built to obsolete standards predating current requirements; and facilities being built incorrectly to meet current standards. Regarding the latter, it is essential that designers, construction contractors, and inspectors be aware of and understand current standards; and recognize the importance of following them correctly. TEA is available for guidance, plan reviews, or design questions.

The intent of this bulletin is to address pedestrian accessibility related to transportation infrastructure and therefore focuses on the use of the 2011 (Proposed) Public Rights-of-Way Accessibility Guidelines (PROWAG). As part of that, this bulletin provides an overview of the requirements (specific to curb ramps), shows examples of how they are applied correctly, and provides answers to frequently asked questions relating to accessibility. It is important to note that while accessibility standards also apply to buildings, the applicable requirements for building accessibility are beyond the scope of this bulletin.

## What Regulations Apply?

There are three laws that apply to accessibility compliance.

☑ **The Architectural Barriers Act (ABA) of 1968** requires that buildings and facilities that are designed, constructed, or altered with Federal funds, or leased by a federal agency, comply with Federal standards for physical accessibility. As the ABA requires accessibility for all Federal buildings, which includes those on military installations, the Deputy Secretary of Defense (DepSecDef) published a memorandum, dated 31 October 2008, that states the ABA Guidelines are adopted by the DoD, and that they apply to all facilities worldwide.

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☑ **The Rehabilitation Act of 1973** prohibits discrimination against persons with disabilities in any Federally funded program or activity. In addition, as it was realized that a single central agency for enforcing and developing accessibility standards was needed, the law established The United States Access Board for that purpose.

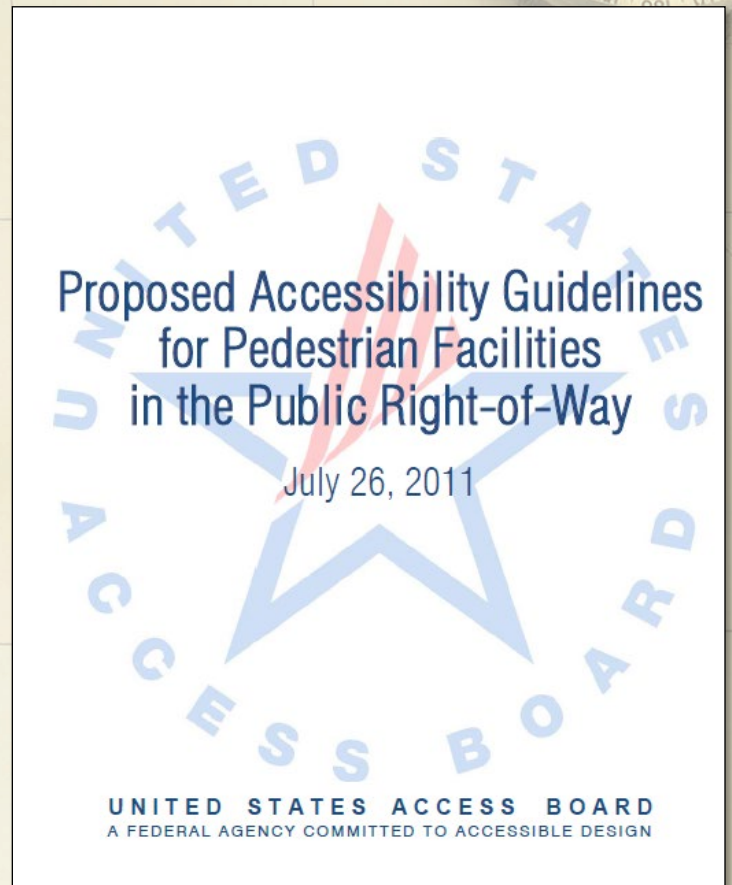
☑ **The Americans with Disabilities Act (ADA) of 1990** is a major civil rights law that prohibits discrimination against persons with disabilities in all areas of public life, including transportation, and all public and private places that are open to the general public. The ADA establishes the minimum standards for accessibility for new construction or alteration of facilities (i.e., public accommodations), and for public transportation systems. It applies to state and local government, and private sector facilities. The Department of Justice and Department of Transportation (DOT) maintain standards under the ADA.

The ADA applies to state and local government and private sector facilities, while the ABA applies to federal facilities. However, for the most part, the ADA and ABA application and scoping requirements are very similar. They also have similar implementing standards. This helps to ensure consistency in access to all facilities, whether they are commercial or federal, state, or local government owned.

The ABA, as adopted by the DoD, focuses on accessibility accommodations as it relates to facilities (i.e., *buildings and site design*), and therefore is deficient in areas as it relates to transportation elements within the designated road right-of-way (ROW) area. *(A road ROW is a type of easement for roadway purposes, including utilities. Though a military roadway on an installation does not have a designated public ROW, the concept is still applicable.)* To address those deficiencies, the United States Access Board, is developing new guidelines - - PROWAG - - to address pedestrian accessibility requirements within the public ROW and specifically address issues that are not discussed in the ABA (such as accessibility along crosswalks, sidewalks along steep roadways, different types of curb ramps, placement of the detectable warning surface, and vertical discontinuities along the walking surface).

The proposed PROWAG provides accessibility standards for pedestrian features such as sidewalks, curb ramps, detectable warning surfaces, street crossings, medians, traffic islands, overpasses, underpasses, and bridges. On-

street parking, transit stops, toilet facilities, signs, and street furniture are also addressed. While the guidelines mainly address permanent facilities, they also apply to temporary facilities such as temporary routes around work zones and portable toilets.



Additionally, PROWAG offers guidance relating to transit stops; pedestrian crossings at railroad grade crossings; pedestrian signs, including requirements for visible characters on signs and alternative requirements for audible sign systems and other technologies; pedestrian push buttons, street furniture for pedestrian use, including drinking fountains; public toilet facilities, tables, counters, and benches; and ramps, stairways, escalators, handrails, doors, doorways, and gates.

Parking lots also must comply with the guidelines. Specific areas for compliance include accessible parking space requirements, sidewalks and ramps, walkways to buildings, and pedestrian signing.

As previously stated, the proposed guidelines are developed specifically for pedestrian facilities in the public right-of-way, and address conditions and constraints that exist within this area. The proposed guidelines make allowances for typical roadway geometry and permit flexibility in alterations to existing facilities where existing physical constraints make it impractical to fully comply with



new construction requirements. The proposed guidelines also include requirements for elements and facilities that exist only in the public right-of-way, such as pedestrian signals and roundabouts. Although not yet officially adopted by the DoD, for the reasons stated, TEA recommends that military installations follow PROWAG for pedestrian accessibility within the roadway corridor. These proposed guidelines are the recommended best practices, and are used when planning, designing, and constructing within the public rights-of-way (roadway corridor).

Furthermore, FHWA and AASHTO (in the 2018 AASHTO Green Book) endorse the use of PROWAG; and many, if not most, State DOTs use or have adopted the PROWAG guidelines as well.

# Sample PROWAG Guidance

The following pages show basic design guidance for curb ramps. This guidance is consistent with PROWAG requirements, but it is not complete for all scenarios covered by the scope of PROWAG. The intention is to highlight the most important and more common areas that PROWAG covers.

## Curb Ramps

Curb Ramps allow pedestrians to transition between the street and sidewalks. They are typically installed at:

- ☑ Intersections (curb ramp at each end of each crosswalk)
- ☑ Mid-block crossings (including trail crossings)
- ☑ Accessible on-street parking spaces
- ☑ Passenger loading zones & bus stops

The following are curb ramp requirements:

- ☑ 5% min - 8.33% max running slope
- ☑ 5% max running slope for blended transitions
- ☑ Minimum 4-foot ramp width
- ☑ Maximum 15-foot ramp length
- ☑ Align with crosswalk
- ☑ 2% maximum cross slope

- ☑ Cross slope may match roadway grade for midblock crossings and intersection crossings without stop or yield signs

There are four types of curb ramps as listed below (along with the applicable PROWAG section) and illustrated in the PROWAG figures shown below:

- ☑ PROWAG R304.2.1 - Perpendicular curb ramps
- ☑ PROWAG R305.2.2 - Parallel curb ramps
- ☑ PROWAG R304.4.1 - Blended transitions
- ☑ Diagonal Curb Ramps

These are depicted as follows.

Below Images Source: U.S. Access Board

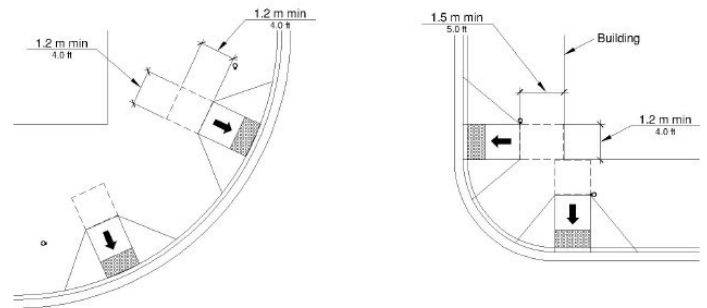


Figure R304.2.1

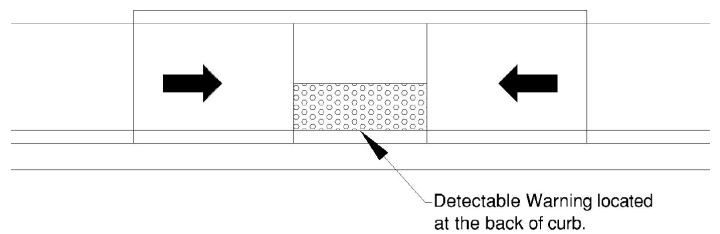


Figure R305.2.2  
Parallel Curb Ramps

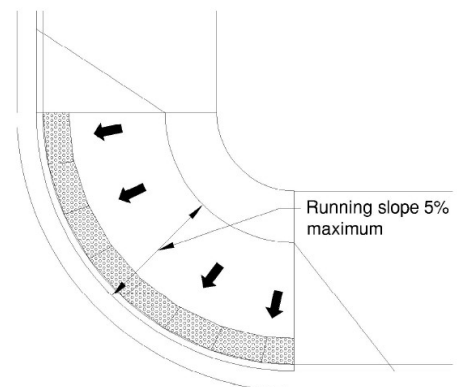


Figure R304.4.1

A diagonal ramp is a single ramp (usually perpendicular) located at the apex of the corner. It occurs when a single ramp is constructed for two crosswalks. Since they are not aligned with the crosswalk, they should be avoided in new construction because the design directs pedestrians



to the center of the intersection See the image below for an example of a diagonal ramp.

### Intersection with Diagonal Ramps



### Flared Sides

Flared sides are used where a pedestrian circulation path crosses the curb ramp. This is the slope of the sides of the ramp which are not used for walking. The maximum slope is 10% and is intended to eliminate an abrupt drop off for pedestrians. At right is the PROWAG figure, followed by an image, to illustrate Flared Sides.

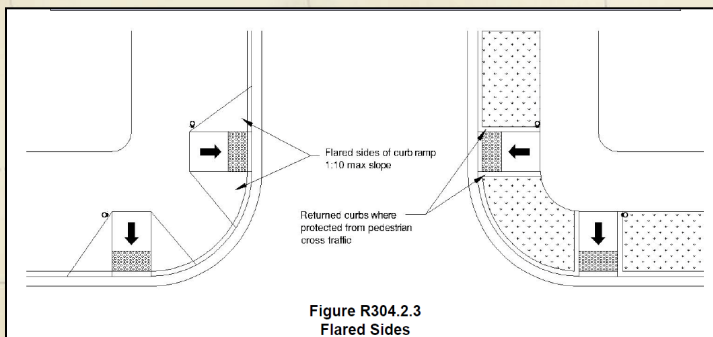


Image Source: U.S. Access Board

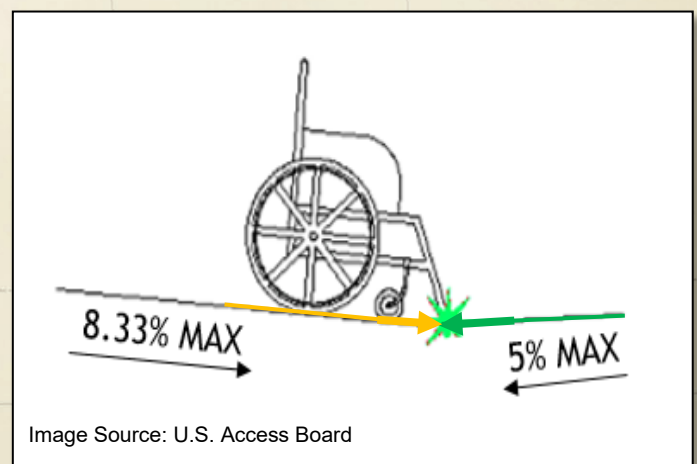
### Flared Side on Ramp



### Grade Breaks

Grade breaks occur where the ramp slope intersects the roadway slope. This could be the ramp running slope leading to the roadway cross slope. The grade break shall be perpendicular to the ramp run.

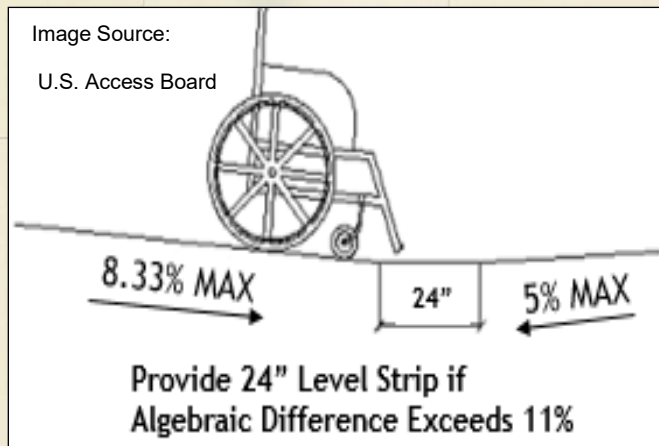
PROWAG allows 8.33% ramp plus 5% grade at the adjacent street (counter slope), for a 13.33% difference.





Recommendation calls for:

- ✓ 11% maximum algebraic difference for two grades to meet.
- ✓ Provide 2-foot level area if the slope difference is greater than 11%.



- ✓ 4-foot x 4-foot minimum for two ramps joining at 90 degrees
- ✓ 5-foot x 4-foot minimum for two ramps joining at opposite sides.
- ✓ 2% maximum cross slope in all directions
- ✓ 2% maximum cross slope. Exception: Cross slope may match roadway grade for midblock crossings and intersection crossings without stop or yield signs

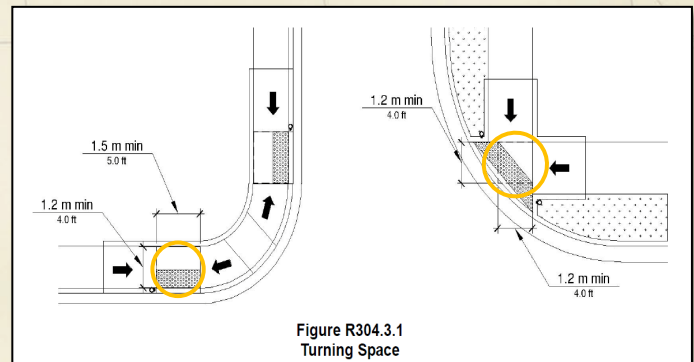


Image Source: U.S. Access Board

## Clear Spaces

Clear spaces are required for ramps to provide a pedestrian refuge, after the ramp, that is outside the vehicular traveled way. It shall be provided within the width of the pedestrian street crossing and have dimensions of 4 feet x 4 feet with a 2% maximum cross slope. The exception to this is that the cross slope may match the roadway grade for midblock crossings and intersection crossings without stop or yield signs.

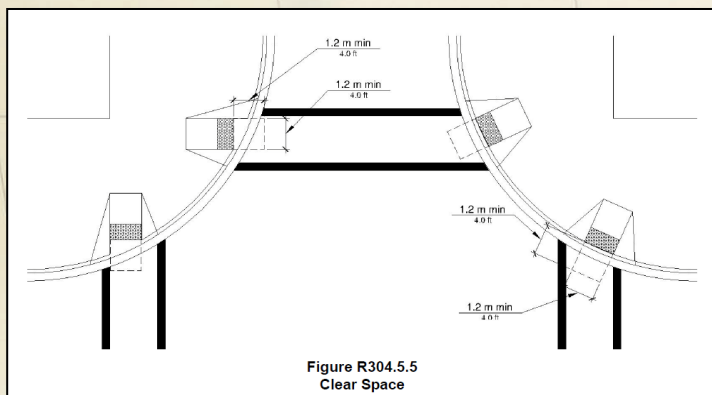
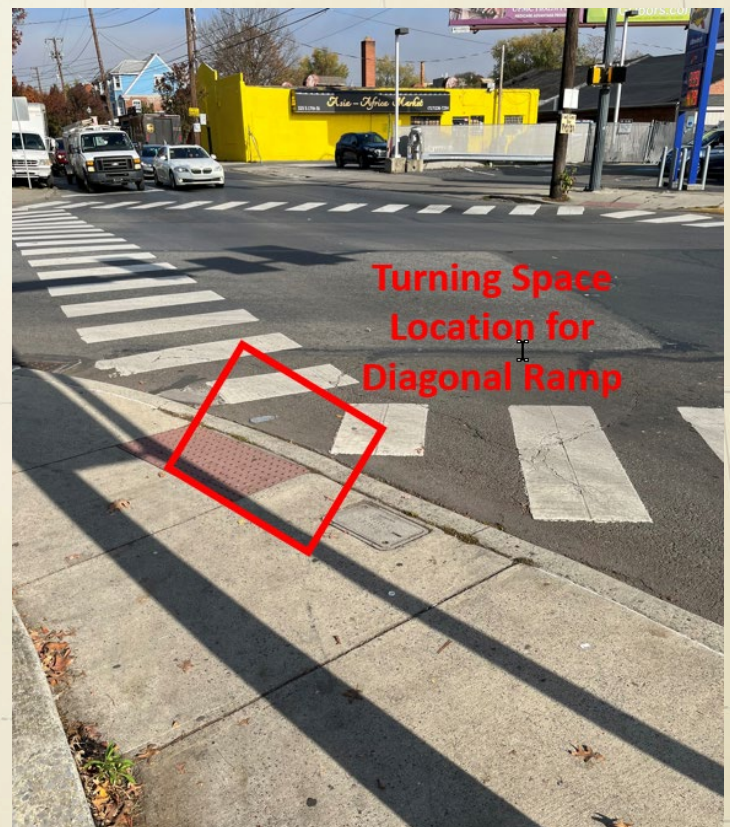


Image Source: U.S. Access Board

## Turning Spaces

Turning spaces are used when a turn is required to access the ramp from the sidewalk or street. New designs should not require a turn space to be located in the street. Required dimensions for turning spaces are:

## Turning Space

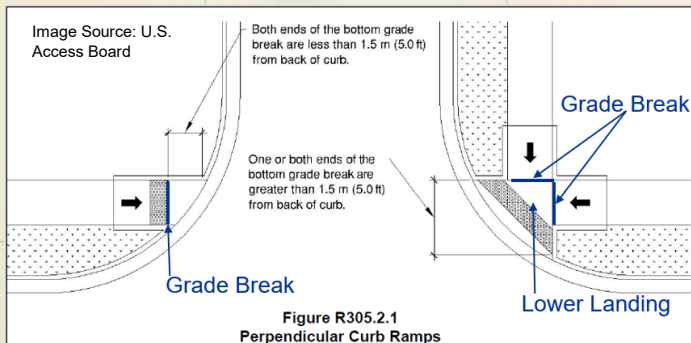




## Detectable Warning Surfaces

A detectable warning surface (DWS) aids those visually impaired to identify the end of the ramp. They shall consist of truncated domes aligned in a square or radial grid pattern. They are placed across the bottom of the curb ramp; and shall be a minimum of 24 inches wide and span the length of the ramp. They shall contrast visually with gutter, street, highway or pedestrian access route (PROWAG does not specify color but states that it must be dark on light or light on dark).

As illustrated in the following PROWAG figure, if the grade break is within 5 feet of the back of curb than the DWS shall be placed at the grade break. If the grade break is greater than 5 feet from the back of curb, then the DWS shall be placed on the lower landing at the back of curb.



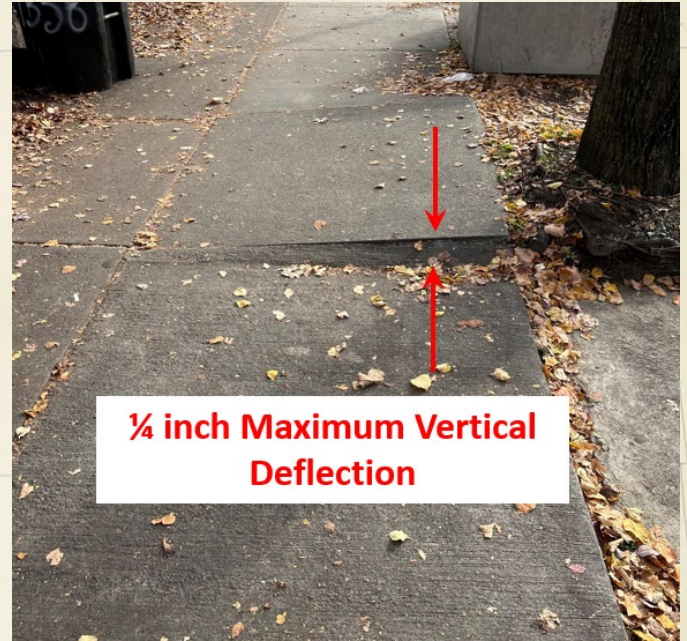
The following image illustrates the DWS at the grade break.

### Detectable Warning Surface at Grade Break



## Vertical Surface Discontinuity

A vertical surface discontinuity requires special consideration. Unexpected vertical drops or vertical rises in grade within the pedestrian path can cause falls and cause wheelchairs to bottom out. If the vertical difference is between  $\frac{1}{4}$  inch and  $\frac{1}{2}$  inch, then it must be beveled at a 50% slope max. If the vertical difference is  $\frac{1}{2}$  inch or greater, then a section of the sidewalk must be reconstructed.



## Accessible Pedestrian Signals

Accessible Pedestrian Signals are required where a pedestrian actuated traffic signal exists. The pushbutton must be accessible. Pushbuttons shall be no lower than 15 inches and no higher than 48 inches. Pushbuttons shall not be offset more than 10 in from the edge of the pedestrian pathway.

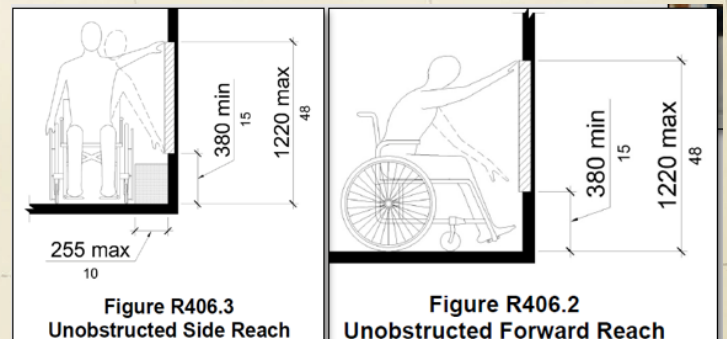


Image Source: U.S. Access Board





Image Source: Pacific ADA Center copyright 2016

## Frequently Asked Questions

TEA receives questions regarding accessibility on a regular basis. Many of which are directly related to PROWAG guidelines. Common questions with answers appear below.

### 1. *When do I have to apply accessibility standards on a project?*

Any ongoing roadway project that involves design, construction, or alterations requires accessibility for pedestrians with disabilities. Alterations include any of the following: addition of a new layer of asphalt, mill & fill / mill & overlay, hot in-place recycling, or open-graded surface course micro surfacing / thin-lift overlay. Maintenance projects not requiring accessibility upgrades include chip seals, crack filling, diamond grinding, fog seals, pavement patching, surface sealing, or pavement marking.

### 2. *Do accessibility requirements apply to outside continental United States (OCONUS) installations?*

Yes. The October 2008, DepSecDef Memo states that the ABA Guidelines are adopted by the DoD, and that they apply to all facilities worldwide. Therefore, since DoD adopted the guidelines, they are standards with which DoD must comply. Since OCONUS installations are part of the DoD, they must comply.

### 3. *How many accessible parking spaces do I need?*

The number of accessible parking spaces should be determined based on either actual building needs, or the requirement per the table below (whichever is larger). For example, parking lots for medical facilities would no doubt require more accessible spaces than shown in the table and would need to be sized based on the actual building needs. Also, of note is that some military installations may see a higher percentage of disabled (Veterans Administration, retirees, etc.) and that should be a consideration for some facilities (commissary, pharmacy, etc.)

The required number of accessible parking spaces is based on the total number of stalls for all the parking lots required to serve the facility.

One in six, or fraction of six, accessible spaces must be a van accessible space.

#### Accessible Parking Requirements

Total Number of Parking Spaces in Parking Lot or Structure, or On-street Along the Block Perimeter	Minimum Number of Required Accessible Parking Spaces for Parking Lot or Structure	Minimum Number of Required Accessible Parking Spaces for On-Street
1-25	1	1
26-50	2	2
51-75	3	3
76-100	4	4
101-150	5	5
151-200	6	6
201-300	7	4% of total
301-400	8	4% of total
401-500	9	4% of total
501-1000	2% of total	4% of total
1001 and over	20, plus 1 for each 100 or fraction thereof, over 1000	4% of total



**4. Do the accessible parking spaces need to be the closest parking spots to the buildings?**

The accessible parking spaces must be the closest space to an accessible building entrance.

**5. How do you handle drainage with curb ramps?**

Drainage is very important with curb ramps. Since curb ramps require precise slopes and a level transition leading to the street, it is easy for ramps to not drain properly. Ponding could occur at the toe of the ramp if there is a low point, which can be ice in cold weather, and can attract silt and dirt. The image below shows ponding at the foot of a curb ramp. The figure to the right shows a spot elevation plan for proper construction of a curb ramp. It is critical to determine the proper elevations and ensure that the ramp is constructed to the calculated elevation points.

**Curb Ramp with Ponding**



**6. When do you have to install accessible pedestrian signals?**

An accessible pedestrian signal and pedestrian pushbutton is an integrated device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision. The components that actually provide the accessible feature are often part of the pushbutton but work with the pedestrian signal head. Accessible pedestrian signals are required wherever new pedestrian signals are provided. For existing systems without accessibility, they must be provided when a signal controller or software is altered, or when the signal head is replaced. When used, they must comply with sections 4E.08 through 4E.13 of the MUTCD.

**Accessible Pedestrian Signal Example**





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for pamphlets, bulletins, and studies

## Reference List

- ☑ TEA Home
- ☑ *Better Military Traffic Engineering*, SDDCTEA Pamphlet 55-17. 2016
- ☑ U.S. Access Board, (Proposed) Public Rights-of-Way Accessibility Guidelines
- ☑ Deputy Secretary of Defense Memorandum, Subject: Access for People with Disabilities, 31 Oct 2008

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