

PROWAG/ADAAG Standards - Guidance For Temporary Pedestrian Access Route (TPAR) Facilities and Devices

Minnesota Department of Transportation DRAFT Document

DRAFT

INTRODUCTION:

This document was developed to identify and compile the various standards for components within a “ADA Compliant” facility. These basic features, with recommended design dimensions and preferred characteristics, will provide a guideline for determining when a pedestrian route is up to “Pedestrian Access Route” (PAR) standards. **In this draft format**, this document has NOT attempted to develop any definitions of “compliance levels” such as “maximum extend feasible” or “as closely as physically and practically possible”, or other such phrases used in this document. It is anticipated that a future document will be developed to provide guidance for that “engineering judgment” decision.

BACKGROUND:

The devices and/or features that are required to provide an “ADAAG and PROWAG compliant” Temporary Pedestrian Access Route (TPAR) may be compared to the traffic control devices and/or features required to guide traffic through a Temporary Traffic Control (TTC) zone. The driver (or pedestrian) must be warned in advance of changed conditions and their options for alternate routes. When they approach the work area, they must be given guidance on any changes from the normal route such as lane changes (or shifts in the walkway alignment). As they pass by the work area, their route must be clearly marked, be provided with a suitable surface, and they must be protected from other traffic and work operations including drop-offs. Upon exiting the work area they must be guided back to their original route and/or given information on how to proceed. The various devices and/or features must be installed in a uniform manner to provide a consistent accessible route for disabled pedestrians. National ADAAG and PROWAG standards should be followed when designing a TPAR facility to ensure that uniform features and conditions are anticipated by disabled pedestrians.

TPAR Component Standards

The following standards have been compiled from the ADAAG (ADA Accessibility Guidelines updated 2002), PROWAAC (Accessible Public Rights-of-Way Planning & Designing for Alterations Special Report – July 2007), and the FHWA (2009 Federal MUTCD Part 6 Standards and Guidance for Pedestrian & Worker Safety and TTC Devices). Mn/DOT interpretations are marked in the following text (*shown in italics*) where guidance was needed to apply ADAAG and PROWAG standards to a temporary situation. The use of **shall**, should and may in this document follows Mn/DOT’s policies. Many statements in this document use “should”, meaning that the condition is highly recommended to be followed as closely as physically and practically possible. **In this DRAFT document, some questions still remain on how to interpret the ADAAG & PROWAG Guidelines, and it is likely that changes will occur as these guidelines get further clarification. As we develop this guideline we welcome comments and suggestions to help clarify the needs of the disabled pedestrians.**

TPAR WALKWAYS and RAMP SECTIONS

TPAR Walkways may consist of a combination of existing surfaces, improved surfaces or portable devices covering existing surfaces. Whether the walkway has been modified or not, it should remain free of tripping hazards or other objects protruding into the PAR clearance area (see Figure D below).

- Surface: **Shall** be installed or improved to firm and stable condition
Slip-resistant (0.6 min. static coefficient of friction and 0.8 min. for ramps)
Shall be designed so that water will not accumulate on walking surfaces
- Width: 60" or greater recommended and 48" minimum (PROWAG).
- Passing Spaces: Required if TPAR walkway is less 60" wide
Locate every 200 feet max
60" x 60" min rectangular area
- Transition Joints: Should be smooth between changes in surface materials and grades
Non-avoidable bumps should be less than 0.5" high
Vertical edges allowed up to 0.25" max
Edges between 0.25" to 0.5" **shall** be tapered 1:2
Non-smooth joints should have contrasting marking
- Grades: Should be flatter than 20:1 with cross-slopes flatter than 50:1
- Ramps: Any section of a walkway with grades steeper than 20:1 is considered a ramp.
Ramp sections **shall** not rise greater than 30" without a landing
- Landings: Required at both ends of all ramp sections
Should be 60" min level length and width of adjacent ramp or greater
40 foot maximum spacing (length of ramp) if slope is between 20:1 and 16:1
30 feet maximum spacing (length of ramp) if slope is between 16:1 and 12:1
- Turning Areas: Recommend 60" x 60" rectangular area
Alternative turning areas are shown in Figure B.
- Detectable Edging: Should protrude 6" min. above walkway surface
1.5" max. space is allowed between the surface and the edging
Should be firmly attached to ground or other devices
Detectable edging also provides edge protection.
- Edge Protection: Ramps and landings with drop-offs **shall** have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp.
Edge side-slopes steeper than 3:1 or higher than 6" should be treated as a drop-off condition. Edge protection curbs **shall** be a minimum of 2" high. Refer to Figure A for an example of edge protection.

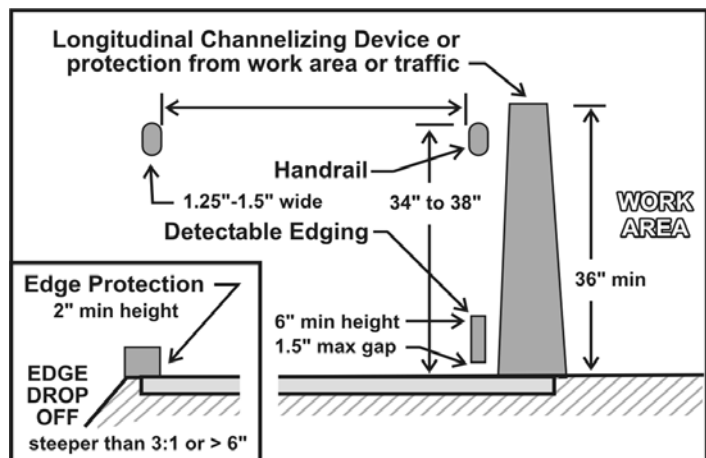


FIGURE A. Example of Handrail, Detectable Edging and Edge Protection Placement

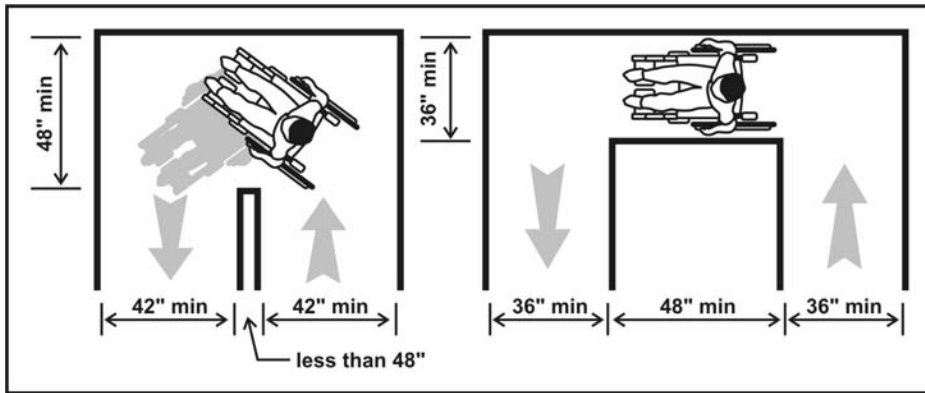


FIGURE B. Minimum widths of alternative turning configurations for wheelchair accessibility

TPAR HANDRAILS vs. GUIDERAILS

Handrails are only required to assist ambulatory-disabled pedestrians navigate steep grades along walkways as per the standards listed. Guiderail devices are different from Handrails, as described below, and are NOT intended to provide the required support as specified for handrails.

HANDRAILS:

- TPAR Ramps rising greater than 6" or longer than 72" should have handrails on both sides.
- Handrails should be mounted between 34" to 38" above the walkway surface (to top of rail), maintain 36" min between the handrails, and should have a clearance of 1.5" min behind and 18" min above. The front face of the handrail should be aligned within +/- 4" of the detectable edge face.
- Handrails should have a width between 1.25" to 1.5" and be a graspable cross-section.
- Handrails **shall** not rotate within their fittings, and it **shall** be free of any sharp or abrasive elements. Edges **shall** have a minimum radius of 1/8 in.
- Handrails should have a continuous gripping surface, but when handrails are not continuous, they should extend 12" min beyond the end of ramps. On switchback or dogleg ramps the inside handrail **shall** be continuous.
- Handrails should be parallel with the walkway surface and have rounded ends or turn towards the ground, wall or post.
- The structural strength of handrails, fasteners, and mounting devices **shall** meet the following specification:
 - Bending stress in a handrail induced by the maximum bending moment from the application of 250 lbf **shall** be less than the allowable stress for the material of the handrail.
 - Shear stress induced in a handrail by the application of 250 lbf **shall** be less than the allowable shear stress for the handrail. If the connection between the handrail and its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses **shall** be totaled for the combined shear stress, which **shall** not exceed the allowable shear stress.
 - Shear force induced in a fastener or mounting device from the application of 250 lbf **shall** be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.

- Tensile force induced in a fastener by a direct tension force of 250 lbf plus the maximum moment from the application of 250 lbf **shall** be less than the allowable withdrawal load between the fastener and the supporting structure.

GUIDERAILS:

Guiderails provide visual and tactile guidance to all pedestrians along a designated route, but they do not provide the support features of a handrail. General specifications for a guiderail may include:

- *Guiderails are **NOT** TPAR standard devices and do not provide TPAR standards without the addition of approved detectable edging. They do **NOT** substitute for handrails on ramps and care must be taken to prevent pedestrian confusion. It is recommended that the use of guiderails be limited to pedestrian routes (TPAR or non-TPAR) which need special guidance through turns, curves or crowd directional control.*
- *Guiderails should only be used along near level walkway surfaces, and **shall NOT** be used along walkways with slopes steeper than 20:1.*
- *By touch, the guiderail **shall** be readily distinguishable from a handrail to visually impaired pedestrians, such that it is not mistaken for a stronger handrail device. This may most readily be achieved by allowing the guiderail to be semi-flexible, have a non-rigid mounting and/or be an ungraspable shape.*
- *Guiderails should have a top surface width of 0.5" min to allow the hand to feel the surface. The surface **shall** be smooth and free of any sharp or abrasive elements. Edges **shall** have a minimum radius of 1/8 in.*
- *Guiderails should be mounted at the same height as handrails with the same clearance considerations. Guiderails should generally be parallel with the walkway surface, but may be allowed to sag slightly between mounting locations.*
- *When a guiderail is used to guide pedestrians along a TPAR, the guiderail surface should be continuous for length of TPAR. The guiderail may be interrupted by posts or short gaps. The length of gap should not permit pedestrians to maneuver through the gap.*

PEDESTRIAN CHANNELIZERS

Channelizing devices for pedestrians should provide understandable guidance along the intended pedestrian route. There are many different types of pedestrian channelizing devices available and each device provides the guidance through a different method. Each method is suited for various pedestrians' abilities to interpret the guidance. The following listing describes the various types of pedestrian channelizing devices and who may benefit.

- Detectable Edging provides the channelizing for long-cane users. Detectable edging used alone will provide guidance to sighted pedestrians, and visually impaired pedestrians (if high contrast colors are utilized), but may introduce a tripping hazard and has limited effect for preventing non-disabled pedestrians from leaving the route. Detectable Edging specifications are listed above.
- TTC Barricades provide visual channelizing to non-disabled pedestrians and visually impaired pedestrians (if high contrast colors are utilized). See the MnMUTCD for Specifications on Type I, II or III Barricades.

NOTE: Typical TYPE III Barricades may provide adequate visual guidance, but the standard legs would present a tripping hazard and would not provide any guidance for long-cane users.

- Longitudinal Channelizers provide visual channelizing to non-disabled pedestrians, visually impaired (if high contrast colors are utilized), and the long-cane users (if a detectable edge is incorporated into the channelizer design). Longitudinal Channelizers may also provide a suitable mounting surface for a handrail or guiderail. See the MnMUTCD for Specifications on Longitudinal Channelizing Devices.
- Handrails (if high contrast colors are utilized) provide channelizing guidance to all pedestrians through vision and tactile. Handrail specifications are listed above.
- Guiderails (if high contrast colors are utilized) provide channelizing guidance to all pedestrians through vision and tactile. Guiderail specifications are listed above.
- Temporary Traffic Barriers provide channelizing benefits similar to Longitudinal Channelizers, but they must be manufactured and installed such that gaps are within specifications for detectable edging and adequate contrasting colors are provided.
- Pavement Markings such as crosswalk markings provide visual channelizing to non-disabled pedestrians and visually impaired (if high contrast colors are utilized). Painted markings have no benefit for long-cane users. See the MnMUTCD and TEM for Specifications on pedestrian markings.

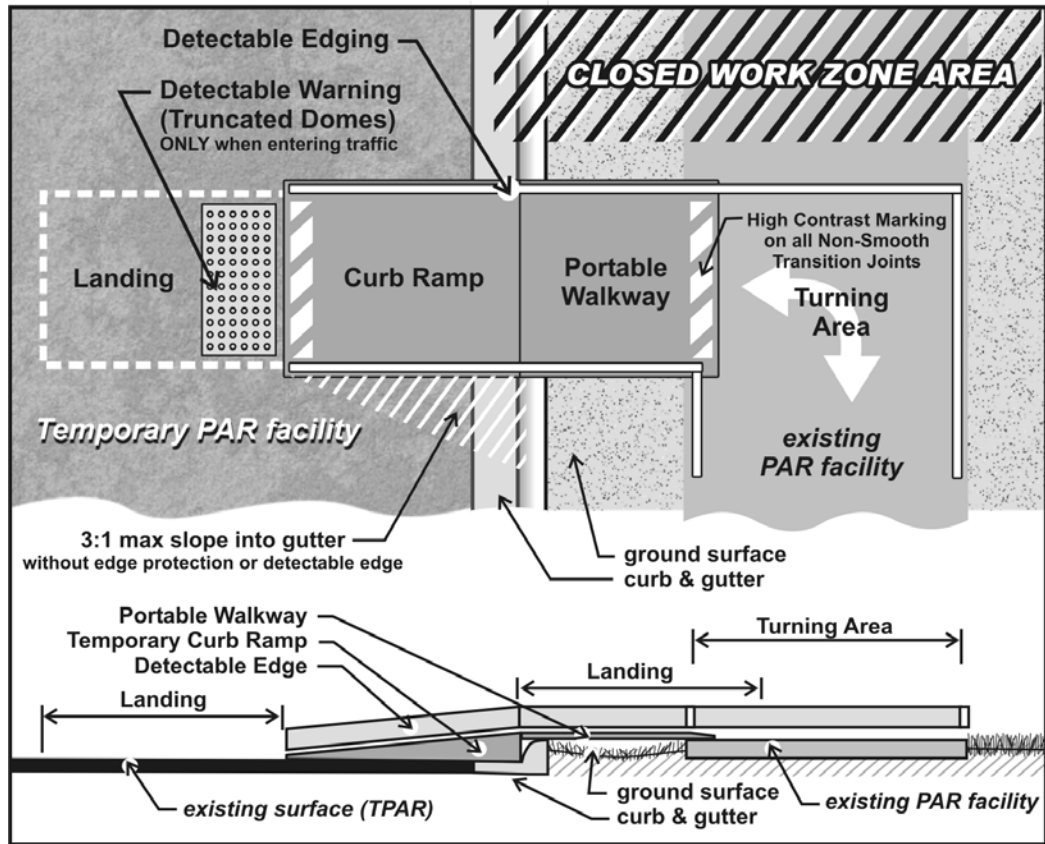
NOTE: Typical crosswalk locations should have detectable warnings such as truncated domes and/or APS to provide the required guidance to long-cane users.

TPAR CURB RAMPS

- Should meet standards for TPAR walkways for Surface, Width, Transition Joints and Edge Protection.
- Grades: 12:1 to 10:1 max slope for a max 6" rise (maximum length is 72")
10:1 to 8:1 max slope for a max 3" rise (steeper than 8:1 is not allowed)
- Landings for curb ramps should allow for a minimum of 48" of clear, near level area top and bottom of the ramp. The level area should be at least as wide as the curb ramp.
- Detectable edging should be continued along the curb ramp if provided on approach to the curb ramp.
- 3:1 or flatter side slope of ramp into existing gutter except when detectable edging or edge protection is installed
- 10:1 or flatter side slope cut into upper walkway area (not shown on diagram). This is the standard flare slope for permanent curb cuts, but should be followed for any short slope approach area.
- Do not restrict gutter water flow (consider duration and location of catch-basins)
- Detectable Warnings: Only ramps leading into traffic **shall** be equipped with detectable warnings such as truncated domes. Refer to the information on detectable warnings.
NOTE: This needs clarification, but it appears the presence of truncated domes should indicate that a traffic lane exists immediately beyond the domes and should not be used where the pedestrian is protected from traffic.

- Handrails on curb ramps are NOT required unless:
 - Curb ramp is part of a TPAR Walkway requiring handrails.
 - Curb ramp exceeds 6" rise and 72" length standards.

FIGURE C. Typical layout and profile views for temporary curb ramp, detectable edging, portable walkway, landings and detectable warning on a TPAR facility.



TPAR DETECTABLE WARNINGS

When a walkway crosses or adjoins a vehicular way, and the walking surfaces are not separated by curbs, railings, or other elements between the pedestrian areas and vehicular areas, the boundary between the areas **shall** be defined by a continuous detectable warning 36" min wide.

NOTE: 36" wide truncated dome section???. We need clarification on how to interpret this requirement. Is "width" considered as a stripe placed laterally across a walkway, or as the width of a stripe placed longitudinally alongside a walkway? This was taken from ADAAG 4.29.5 Detectable Warnings at Hazardous Vehicular Areas.

When raised truncated domes are utilized as detectable warnings, they **shall** have a diameter of nominal 0.9", a height of nominal 0.2" and a center-to-center spacing of nominal 2.35" and **shall** contrast visually with adjoining surfaces. The material used to provide contrast **shall** be an integral part of the walking surface. *When the truncated domes will not be permanently installed, it is recommended that orange or fluorescent orange color be utilized.*

TPAR INFORMATIONAL DEVICES

When existing pedestrian accessible routes (PAR) are disrupted, closed, or relocated in a TTC, maintaining a detectable, channelized TPAR close to the original PAR alignment is much more useful to pedestrians who have visual disabilities than detouring a walkway especially when the TPAR may involve additional traffic crossings or a complex route. When rerouting is necessary, information **shall** be provided to all pedestrians that clearly directs the pedestrian along the TPAR, and guides them to return to the original PAR. In addition to the informational devices, a barrier that is detectable by a person with a visual disability traveling with the aid of a long cane **shall** be placed across the full width of the closed walkways.

When TPAR compliant channelizing devices alone cannot make an modified pedestrian route evident to pedestrians with visual disabilities, then the most desirable way to provide TPAR information is with an audible information device. For pedestrians with visual disabilities an audible information device is equivalent to visual signing for notification of sidewalk closures. Devices that provide speech messages in response to passive pedestrian actuation (such as motion sensitive) are the most desirable. Other devices that continuously emit a message, or that emit a message in response to use of a pushbutton, may also be considered for sight-specific conditions. If a pushbutton is used to activate the device, the device should be equipped with a locator tone to notify pedestrians with visual disabilities that a special accommodation is available and to help them locate the pushbutton. Information can also be transmitted to personal receivers, but currently such receivers are not likely to be carried or used by pedestrians with visual disabilities in TTC zones.

Audible Message Device (AMD) Features: (preliminary listing)

- Activation:* Various categories may be developed, such as motion sensitive, push-button, and continuous.
- Color:* Should contrast with “typical” surrounding background. This is highly recommended if the pedestrian is required to find a pushbutton to activate the audible message.
- Weather Proof:* The device should be weather proof for typical Minnesota weather conditions, including extremes in temperature, moisture and wind.
- Power Source:* Various power source categories may be developed, including replaceable batteries, solar-charging batteries, external power feeds, or other alternatives.
- Message Length:* The device **shall** provide adequate recording length for clear informational message needs. The minimum time will be determined, but assume 30 seconds min.
- Mounting:* The device should be capable of being mounted on a standard TTC channelizing device or be integral with its own deployment system.
- Security:* The device should be designed with theft and vandalism deterrents.
- Volume Control:* The device **shall** playback the recorded message at a level that readily overcomes typical ambient sound levels such as traffic, construction and crowd noise. Volume control categories may be developed such as automatic volume control (dependent on ambient levels) and manually adjusted volume control. Note that APS systems require 5 decibels over ambient, which may also be the final spec for AMDs.

TPAR CLEAR AREA and INTRUSION PROTECTION

The TPAR should protect the pedestrian from typically encountered traffic and work zone area dangers along the walkway. All pedestrians should be provided the equivalent level of safety or higher from typical walkway hazards encountered prior to the work zone conditions. The TPAR should be free of intruding objects (such as tools, materials, signs, ballast, and protruding parts of other TTC or TPAR devices) within a space as shown in Figure D.

When a TPAR is established within areas previously designated for vehicular traffic, and traffic should be physically separated from the TPAR except for designated crosswalks. Longitudinal barrier such as concrete or steel barrier may be required to protect the pedestrians from adjacent roadway traffic and/or work zone construction vehicles. When barriers are provided, they **shall** not protrude into the pedestrian clear area. Temporary barriers and barricades may be utilized as longitudinal channelizing devices if they meet standards for the clear area, and detectable edging if needed.

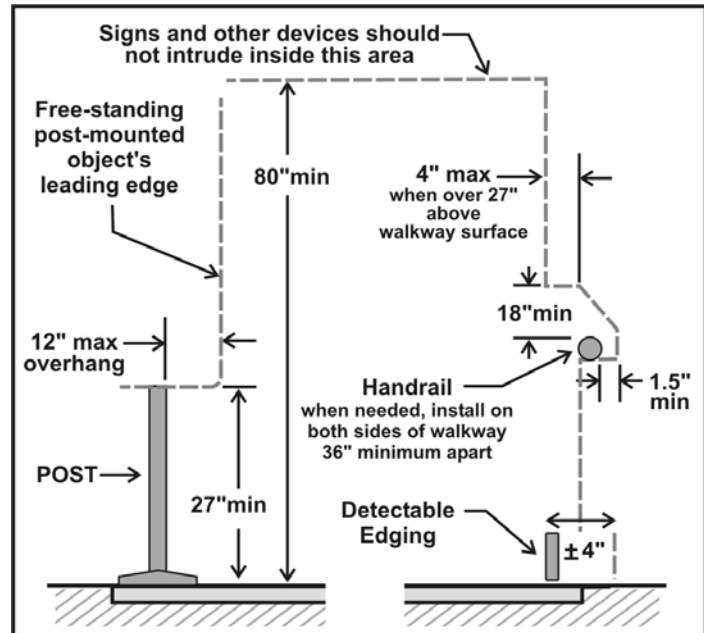


FIGURE D. Pedestrian Clear Area

***PRELIMINARY LISTING of “TPAR and Non-TPAR DEVICES”
and DRAFT PAY ITEMS***

Approved Product List (APL) Category: Temporary Pedestrian Access Route (TPAR) Devices

Product Description:	Pay Item Name:	Unit:
Temporary Walkway Surface	TPAR Walkway	foot only length required to improve surface to TPAR standards
Detectable Edging <i>Product spec includes rigid support and mounting system</i> Options: Approved as a Guiderail	TPAR Edging	foot may be incidental with other devices
Handrail <i>Product spec includes rigid support and mounting system</i> Options: Detectable Edging may be included	TPAR Handrail	foot
Temporary Ramp Panels Options: May be supplied with or without Detectable Warnings (incidental to ramp)	TPAR Curb Ramp	each
Detectable Warning Currently this only includes Temporary Truncated Domes	TPAR Warning	foot or each?
Audible Message Device List Available Options: Activation methods Power Source Max Message length Volume control	TPAR Audible	each

APL Category: Pedestrian Channelizing Devices

Product Description:	Pay Item Name:	Unit:
Guiderail <i>Product spec includes support and mounting system</i>	Guiderail	foot (may be incidental with other devices)
Pedestrian Signs	Temporary Ped. Sign	sq. foot (may be included with other signage)
Longitudinal Channelizer Options: Approved as Detectable Edge Approved as Handrail Approved as Guiderail Approved as TTC Barrier	Longitudinal Channelizer	foot