EXHIBIT A: UTA ADA VIOLATION SPREADSHEET, ISSUES NUMBERED 1-8

ELEMENT ISSUE	ADA STANDARD	VIOLATION & MODEL
1. Egress Illumination **Requested Relief:** UTA to install light fixture(s) as necessary to raise the platform, walkway, and sidewalk lighting to at least 1 f.c. as required by **ADA 207.1.** Light fixtures identified on the Pleasant View design drawings that were never installed by UTA would likely satisfy this element. *See* Parsons UTA Design, pp. 409-13, Ex. I **Illumination Levels** Recommended Average Minimum Maintained Illumination at Ground Levels (fc) ***Open platform 5*** Bus boarding platforms 5 ***Pedestrian walkways 3*** Entrance and exit roads 3 UTA Commuter Rail Design Criteria, p. 8-25 (emphasis). "Lighting -- Stations shall be well lighted at night, both for the protection of passengers . . . " UTA Design Criteria, 8-19; "Provide adequate lighting" *Id.*, 8-6; "safe... lighting"8-8. Ex. I "Means of egress lighting is required . . . shall not be less than 1 foot candle at the floor levels.'" Jody Hilton, UTA expert, Opinion ¶ 6, Ex.E.	**DOT ADA 2006** **207.1 General**. Means of egress shall comply with section 1003.2.13 of the International Building Code (2000 edition and 2001 Supplement) or section 1007 of the International Building Code (2003 edition). **810.2.3 Connection.** Bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an *accessible* route complying with 402. **IBC 2000** **1003.2.13.1 General.** Each required accessible means of egress shall be continuous to a public way . . . **1003.2.11 Means of egress illumination.** The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied. **1003.2.11.1 Illumination level.** The means of egress illumination level shall not be less than 1 foot-candle (11 lux) at the floor level.	**See Worksheet, Ex. B:** **Pleasant View Violations:** north ramp landing, 0.4-0.8* walkway north east side, 0.6 walkway center south, 0.5 sidewalk north, 0.2 sidewalk south, 0.2 sidewalk fare machine, 0.5 platform under light, 0.1 **Ogden Violations:** walkway north 0.4 walkway south 0.9 **Farmington Violations**: north ramp landing 0.9 **Model Satisfies ADA:** Ogden north landing, 2.6 f.c., and Ogden north sidewalk, 2.1, are examples that satisfy 207.1. *Prior readings at 0.4 and 0.5 f.c. on the PV north landing may be due to bulbs out, brighter replacement bulbs, and/or weather conditions, average is 0.56 f.c.

Advisory 206.7.5 Existing Site Constraints. This exception applies where topography or other similar existing site constraints necessitate the use of a platform lift as the only feasible alternative. While the site constraint must reflect exterior conditions, the lift can be installed in the interior of a building. For example, a new building constructed between and connected to two existing buildings may have insufficient space to coordinate floor levels and also to provide ramped entry from the public way. In this example, an exterior or interior platform lift could be used to provide an accessible entrance or to coordinate one or more interior floor levels.

206.7.6 Guest Rooms and Residential Dwelling Units. Platform lifts shall be permitted to connect levels within *transient lodging* guest rooms required to provide mobility features complying with 806.2 or *residential dwelling units* required to provide mobility features complying with 809.2 through 809.4.

206.7.7 Amusement Rides. Platform lifts shall be permitted to provide *accessible* routes to load and unload areas serving *amusement rides*.

206.7.8 Play Areas. Platform lifts shall be permitted to provide *accessible* routes to *play components* or *soft contained play structures*.

206.7.9 Team or Player Seating. Platform lifts shall be permitted to provide *accessible* routes to team or player seating areas serving *areas of sport activity*.

Advisory 206.7.9 Team or Player Seating. While the use of platform lifts is allowed, ramps are recommended to provide access to player seating areas serving an area of sport activity.

206.7.10 Recreational Boating Facilities and Fishing Piers and Platforms. Platform lifts shall be permitted to be used instead of *gangways* that are part of *accessible* routes serving recreational boating *facilities* and fishing piers and platforms.

206.8 Security Barriers. Security barriers, including but not limited to, security bollards and security check points, shall not obstruct a required *accessible* route or *accessible means of egress*.

EXCEPTION: Where security barriers incorporate *elements* that cannot comply with these requirements such as certain metal detectors, fluoroscopes, or other similar devices, the *accessible* route shall be permitted to be located adjacent to security screening devices. The *accessible* route shall permit persons with disabilities passing around security barriers to maintain visual contact with their personal items to the same extent provided others passing through the security barrier.

207 Accessible Means of Egress

207.1 General. Means of egress shall comply with section 1003.2.13 of the International Building Code (2000 edition and 2001 Supplement) or section 1007 of the International Building Code (2003 edition) (incorporated by reference, see “Referenced Standards” in Chapter 1).

EXCEPTIONS: 1. Where means of egress are permitted by local *building* or life safety codes to share a common path of egress travel, *accessible means of egress* shall be permitted to share a common path of egress travel.

2. Areas of refuge shall not be required in detention and correctional *facilities*.

207.2 Platform Lifts. Standby power shall be provided for platform lifts permitted by section 1003.2.13.4 of the International Building Code (2000 edition and 2001 Supplement) or section 1007.5 of the International Building Code (2003 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1) to serve as a part of an *accessible means of egress*.

208 Parking Spaces

208.1 General. Where parking *spaces* are provided, parking *spaces* shall be provided in accordance with 208.

EXCEPTION: Parking *spaces* used exclusively for buses, trucks, other delivery vehicles, law enforcement vehicles, or vehicular impound shall not be required to comply with 208 provided that lots accessed by the public are provided with a passenger loading zone complying with 503.

208.2 Minimum Number. Parking *spaces* complying with 502 shall be provided in accordance with Table 208.2 except as required by 208.2.1, 208.2.2, and 208.2.3. Where more than one parking *facility* is provided on a *site*, the number of *accessible spaces* provided on the *site* shall be calculated according to the number of *spaces* required for each parking *facility*.

Table 208.2 Parking Spaces

Total Number of Parking Spaces Provided in Parking Facility	Minimum Number of Required Accessible Parking Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20, plus 1 for each 100, or fraction thereof, over 1000

CHAPTER 10
MEANS OF EGRESS

SECTION 1001
ADMINISTRATION

1001.1 General. Buildings or portions thereof shall be provided with a means of egress system as required by this chapter. The provisions of this chapter shall control the design, construction and arrangement of means of egress components required to provide an approved means of egress from structures and portions thereof.

1001.2 Minimum requirements. It shall be unlawful to alter a building or structure in a manner that will reduce the number of exits or the capacity of the means of egress to less than required by this code.

[F] 1001.3 Maintenance. Means of egress shall be maintained in accordance with the *International Fire Code*.

SECTION 1002
DEFINITIONS

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ACCESSIBLE MEANS OF EGRESS. A continuous and unobstructed way of egress travel from any point in a building or facility that provides an accessible route to an area of refuge, a horizontal exit or a public way.

AISLE ACCESSWAY. That portion of an exit access that leads to an aisle.

ALTERNATING TREAD DEVICE. A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

AREA OF REFUGE. An area where persons unable to use stairways can remain temporarily to await instructions or assistance during emergency evacuation.

BLEACHERS. A grandstand where the seats are not provided with backrests.

COMMON PATH OF EGRESS TRAVEL. That portion of exit access which the occupants are required to traverse before two separate and distinct paths of egress travel to two exits are available. Paths that merge are common paths of travel. Common paths of egress travel shall be included within the permitted travel distance.

CORRIDOR. An enclosed exit access component that defines and provides a path of egress travel to an exit.

DOOR, BALANCED. A door equipped with double-pivoted hardware so designed as to cause a semi-counter-balanced swing action when opening.

EGRESS COURT. A court or yard which provides access to a public way for one or more exits.

EMERGENCY ESCAPE AND RESCUE OPENING. An operable window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

EXIT. That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge. Exits include exterior exit doors at ground level, exit enclosures, exit passageways, exterior exit stairs, exterior exit ramps and horizontal exits.

EXIT ACCESS. That portion of a means of egress system that leads from any occupied point in a building or structure to an exit.

EXIT DISCHARGE. That portion of a means of egress system between the termination of an exit and a public way.

EXIT DISCHARGE, LEVEL OF. The horizontal plane located at the point at which an exit terminates and an exit discharge begins.

EXIT ENCLOSURE. An exit component that is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a vertical or horizontal direction to the exit discharge or the public way.

EXIT, HORIZONTAL. A path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith.

EXIT PASSAGEWAY. An exit component that is separated from all other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to the exit discharge or the public way.

FIRE EXIT HARDWARE. Panic hardware that is listed for use on fire door assemblies.

FLOOR AREA, GROSS. The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no openings or interior courts.

FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

FOLDING AND TELESCOPIC SEATING. A structure that is used for tiered seating of occupants, and has an overall shape and size that, for purposes of moving or storing, is capable of being reduced without being dismantled.

FOOTBOARDS. The walking surface of aisle accessways in reviewing stands, grandstands and bleachers.

GRANDSTAND. A structure providing tiered or stepped seating.

GUARD. A building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

HANDRAIL. A horizontal or sloping rail intended for grasping by the hand for guidance or support.

MEANS OF EGRESS. A continuous and unobstructed path of vertical and horizontal egress travel from any point in a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

NOSING. The leading edge of treads of stairs and of landings at the top of stairway flights.

OCCUPANT LOAD. The number of persons for which the means of egress of a building or portion thereof is designed.

OPEN AIR SEATING GRANDSTANDS AND BLEACHERS. Seating facilities that are located so that the side toward which the audience faces is unroofed and without an enclosing wall.

PANIC HARDWARE. A door-latching assembly incorporating a device that releases the latch upon the application of a force in the direction of egress travel.

PUBLIC WAY. A street, alley or other parcel of land open to the outside air leading to a street, that has been deeded, dedicated or otherwise permanently appropriated to the public for public use and which has a clear width and height of not less than 10 feet (3048 mm).

RAMP. A walking surface that has a running slope steeper than one unit vertical in 20 units horizontal (5-percent slope).

REVIEWING STANDS. Elevated platforms that accommodate not more than 50 persons.

SMOKE-PROTECTED ASSEMBLY SEATING. Seating served by means of egress that is not subject to smoke accumulation within or under a structure.

STAIR. A change in elevation, consisting of one or more risers.

STAIRWAY. One or more flights of stairs, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another.

STAIRWAY, EXTERIOR. A stairway that is open on at least one side, except for required structural columns, beams, handrails, and guards. The adjoining open areas shall be either yards, courts or public ways. The other sides of the exterior stairway need not be open.

STAIRWAY, INTERIOR. A stairway not meeting the definition of an exterior stairway.

STAIRWAY, SPIRAL. A stairway having a closed circular form in its plan view with uniform section-shaped treads attached to and radiating about a minimum-diameter supporting column.

SECTION 1003
GENERAL MEANS OF EGRESS

1003.1 General requirements. The general requirements specified in this section shall apply to all three elements of the means of egress system, in addition to those specific requirements for the exit access, the exit and the exit discharge detailed elsewhere in this chapter.

1003.2 System design requirements. The means of egress system shall comply with the design requirements of Sections 1003.2.1 through 1003.2.13.7.1.

1003.2.1 Multiple occupancies. Where a building contains two or more occupancies, the means of egress requirements shall apply to each portion of the building based on the occupancy of that space. Where two or more occupancies utilize portions of the same means of egress system, those egress components shall meet the more stringent requirements of all occupancies that are served.

1003.2.2 Design occupant load. In determining means of egress requirements, the number of occupants for whom means of egress facilities shall be provided shall be established by the largest number computed in accordance with Sections 1003.2.2.1 through 1003.2.2.3.

1003.2.2.1 Actual number. The actual number of occupants for whom each occupied space, floor or building is designed.

1003.2.2.2 Number by Table 1003.2.2.2. The number of occupants computed at the rate of one occupant per unit of area as prescribed in Table 1003.2.2.2.

TABLE 1003.2.2.2
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

OCCUPANCY	FLOOR AREA IN SQ. FT. PER OCCUPANT
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Assembly with fixed seats	See 1003.2.2.9
Assembly without fixed seats	
Concentrated (chairs only—not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	100 gross
Courtrooms—other than fixed seating areas	40 net
Dormitories	50 gross

(continued)

TABLE 1003.2.2.2—continued
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

OCCUPANCY	FLOOR AREA IN SQ. FT. PER OCCUPANT
Educational	
Classroom area	20 net
Shops and other vocational room areas	50 net
Exercise rooms	50 gross
H-5 Fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	
Inpatient treatment areas	240 gross
Outpatient areas	100 gross
Sleeping areas	120 gross
Kitchens, commercial	200 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Locker rooms	50 gross
Mercantile	
Basement and grade floor areas	30 gross
Areas on other floors	60 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Decks	15 gross
Stages and platforms	15 net
Accessory storage areas, mechanical equipment room	300 gross
Warehouses	500 gross

For SI: 1 square foot = 0.0929 m^2.

1003.2.2.3 Number by combination. Where occupants from accessory spaces egress through a primary area, the calculated occupant load for the primary space shall include the total occupant load of the primary space plus the number of occupants egressing through it from the accessory space.

1003.2.2.4 Increased occupant load. The occupant load permitted in any building or portion thereof is permitted to be increased from that number established for the occupancies in Table 1003.2.2.2 provided that all other requirements of the code are also met based on

1003.2.8 Means of egress continuity. The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component as specified in this chapter. Obstructions shall not be placed in the required width of a means of egress except projections permitted by this chapter. The required capacity of a means of egress system shall not be diminished along the path of egress travel.

1003.2.9 Elevators, escalators, and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress from any other part of the building.

Exception: Elevators used as an accessible means of egress in accordance with Section 1003.2.13.3.

1003.2.10 Exit signs. Exit signs shall comply with Sections 1003.2.10.1 through 1003.2.10.5.

1003.2.10.1 Where required. Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. Access to exits shall be marked by readily visible exit signs in cases where the exit or the path of egress travel is not immediately visible to the occupants. Exit sign placement shall be such that no point in an exit access corridor is more than 100 feet (30 480 mm) from the nearest visible exit sign.

Exceptions:

1. Exit signs are not required in rooms or areas which require only one exit or exit access.
2. Main exterior exit doors or gates which obviously and clearly are identifiable as exits need not have exit signs where approved by the building official.
3. Exit signs are not required in occupancies in Group R-3 as applicable in Section 101.2, Group U, guestrooms in Group R-1, dwelling units in Group R-2 as applicable in Section 101.2 and sleeping rooms.
4. Exit signs are not required in sleeping room areas in occupancies in Group I-3.
5. In occupancies in Groups A-4 and A-5 that include grandstand seating arrangements, exit signs are not required on the seating side of vomitories or openings into seating areas where exit signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.

1003.2.10.2 Graphics. Every exit sign and directional exit sign shall have plainly legible letters not less than 6 inches (152 mm) high with the principal strokes of the letters not less than 0.75 inch (19.1 mm) wide. The word "EXIT" shall have letters having a width not less than 2 inches (51 mm) wide except the letter "I", and the minimum spacing between letters shall not be less than 0.375 inch (9.5 mm). Signs larger than the minimum established in this section shall have letter widths, strokes and spacing in proportion to their height.

The word "EXIT" shall be in high contrast with the background and shall be clearly discernible when the exit sign illumination means is or is not energized. If an arrow is provided as part of the exit sign, the construction shall be such that the arrow direction cannot be readily changed.

1003.2.10.3 Stairway exit signs. A tactile sign stating EXIT and complying with Chapter 11 shall be provided adjacent to each door to an egress stairway.

1003.2.10.4 Exit sign illumination. Exit signs shall be internally or externally illuminated. The face of an exit sign illuminated from an external source shall have an intensity of not less than 5 foot-candles (54 lux). Internally illuminated signs shall provide equivalent luminance and be listed for the purpose.

Exceptions:

1. Approved self-luminous exit signs that provide evenly illuminated letters shall have a minimum luminance of 0.06 foot-lamberts (0.21 cd/m^2).
2. Tactile signs required by Section 1003.2.10.3 need not be provided with illumination.

1003.2.10.5 Power source. Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the exit signs shall be connected to an emergency electrical system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with the ICC *Electrical Code*.

Exception: Approved exit signs that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.

1003.2.11 Means of egress illumination. The means of egress, including the exit discharge, shall be illuminated at

all times the building space served by the means of egress is occupied.

Exceptions:

1. Occupancies in Group U.
2. Aisle accessways in Group A.
3. Guestrooms in Group R-1, dwelling units and sleeping rooms in Groups R-2 and R-3 as applicable in Section 101.2.
4. Sleeping rooms and areas of Group I occupancies.

1003.2.11.1 Illumination level. The means of egress illumination level shall not be less than 1 foot-candle (11 lux) at the floor level.

Exception: For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the floor level is permitted to be reduced during performances to not less than 0.2 foot-candle (2.15 lux) provided that the required illumination is automatically restored upon activation of a premise's fire alarm system where such system is provided.

1003.2.11.2 Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premise's electrical supply.

In the event of power supply failure, an emergency system shall automatically illuminate all of the following areas:

1. Exit access corridors, passageways, and aisles in rooms and spaces which require two or more means of egress.
2. Exit access corridors and exit stairways located in buildings required to have two or more exits.
3. Interior exit discharge elements, as permitted in Section 1006.1, in buildings required to have two or more exits.
4. The portion of the exterior exit discharge immediately adjacent to exit discharge doorways in buildings required to have two or more exits.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with the ICC *Electrical Code*.

1003.2.11.3 Performance of system. Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 foot-candle (6 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

1003.2.12 Guards. Guards shall be located along open-sided walking surfaces, mezzanines, industrial equipment platforms, stairways, ramps and landings which are located more than 30 inches (762 mm) above the floor or grade below. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1008.12 are permitted and provided.

1003.2.12.1 Height. Guards shall form a protective barrier not less than 42 inches (1067 mm) high, measured vertically above the leading edge of the tread, adjacent walking surface or adjacent seatboard.

Exception: For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, both as applicable in Section 101.2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from the leading edge of the stair tread nosing.

1003.2.12.2 Opening limitations. Open guards shall have balusters or ornamental patterns such that a 4-inch-diam-

eter (102 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm). From a height of 34 inches (864 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.

Exceptions:

1. The triangular openings formed by the riser, tread and bottom rail at the open side of a stairway shall be of a maximum size such that a sphere of 6 inches (152 mm) in diameter cannot pass through the opening.
2. At elevated walking surfaces for access to and use of electrical, mechanical, or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
3. In occupancies in Group I-3, F, H or S, balusters, horizontal intermediate rails or other construction shall not permit a sphere with a diameter of 21 inches (533 mm) to pass through any opening.
4. In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies, and galleries shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.

1003.2.12.3 Screen porches. Porches and decks which are enclosed with insect screening shall be provided with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.

1003.2.12.4 Mechanical equipment. Guards shall be provided where appliances, equipment, fans or other components that require service are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a 21-inch-diameter (533 mm) sphere.

1003.2.13 Accessible means of egress. Accessible means of egress shall comply with Sections 1003.2.13.1 through 1003.2.13.7.1. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress is required from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exception: Accessible means of egress are not required in alterations to existing buildings.

1003.2.13.1 General. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Stairways within exit enclosures complying with Sections 1003.2.13.2 and 1005.3.2.
3. Elevators complying with Section 1003.2.13.3.
4. Horizontal exits.
5. Smoke barriers.

Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue must be provided in accordance with Section 1003.2.13.7.
2. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1003.2.13.5 or an exterior area for assisted rescue in accordance with Section 1003.2.13.7.

1003.2.13.1.1 Buildings with four or more stories. In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with Section 1003.2.13.3.

Exceptions:

1. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a horizontal exit and located at or above the level of exit discharge.
2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a ramp conforming to the provisions of Section 1003.3.4.

1003.2.13.2 Enclosed stairways. An enclosed stairway, to be considered part of an accessible means of

egress, shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1003.2.13.5 or a horizontal exit.

Exceptions:

1. Stairways serving a single guestroom or dwelling unit.
2. Stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. The clear width of 48 inches (1219 mm) between handrails is not required for enclosed stairways accessed from a horizontal exit.
4. Stairways serving open parking garages.

1003.2.13.3 Elevators. An elevator to be considered part of an accessible means of egress shall comply with the emergency operation and signaling devices requirements of Section 211 of ASME A17.1. Standby power shall be provided in accordance with Sections 2702 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1003.2.13.5 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

1003.2.13.4 Platform lifts. Platform (wheelchair) lifts shall not serve as part of an accessible means of egress, except where allowed as part of a required accessible route in Section 1108.7. Platform lifts shall be installed in accordance with ASME A17.1.

1003.2.13.5 Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1004.2.4. Every required area of refuge shall have direct access to an enclosed stairway complying with Sections 1003.2.13.2 and 1005.3.2 or an elevator complying with Section 1003.2.13.3. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1005.3.2.5 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

1003.2.13.5.1 Size. Each area of refuge shall be sized to accommodate one wheelchair space of 30 inches (762 mm) by 48 inches (1219 mm) for each 200 occupants or portion thereof, based on the occupant load of the area of refuge and areas served by the area of refuge. Such wheelchair spaces shall not reduce the required means of egress width. Access to any of the required wheelchair spaces in an area of refuge shall not be obstructed by more than one adjoining wheelchair space.

1003.2.13.5.2 Separation. Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 709. Each area of refuge shall be designed to minimize the intrusion of smoke.

Exceptions:

1. Areas of refuge located within a stairway enclosure.
2. Areas of refuge where the area of refuge and areas served by the area of refuge are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

1003.2.13.5.3 Two-way communication. Areas of refuge shall be provided with a two-way communication system between the area of refuge and a central control point. If the central control point is not constantly attended, the area of refuge shall also have controlled access to a public telephone system. Location of the central control point shall be approved by the fire department. The two-way communication system shall include both audible and visible signals.

1003.2.13.5.4 Instructions. In areas of refuge that have a two-way emergency communications system, instructions on the use of the area under emergency conditions shall be posted adjoining the communications system. The instructions shall include all of the following:

1. Directions to find other means of egress.
2. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.

3. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.
4. Directions for use of the emergency communications system.

1003.2.13.5.5 Identification. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign complying with ICC/ANSI A117.1, stating: AREA OF REFUGE, and including the International Symbol of Accessibility. Where exit sign illumination is required by Section 1003.2.10.4, the area of refuge sign shall be illuminated. Additionally, tactile signage complying with ICC/ANSI A117.1 shall be located at each door to an area of refuge.

1003.2.13.6 Signage. At exits and elevators serving a required accessible space but not providing an approved accessible means of egress, signage shall be installed indicating the location of accessible means of egress.

1003.2.13.7 Exterior area for assisted rescue. The exterior area for assisted rescue must be open to the outside air and meet the requirements of Section 1003.2.13.5.1. Separation walls shall comply with the requirements of Section 704 for exterior walls. Where walls or openings are between the area for assisted rescue and the interior of the building, the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall be constructed as required for a minimum 1-hour fire-resistance rating with 0.75-hour opening protectives. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower.

1003.2.13.7.1 Openness. The exterior area of refuge shall be at least 50 percent open, and the open area above the guards shall be so distributed as to minimize the accumulation of smoke or toxic gases.

1003.3 Means of egress components. Doors, gates, stairways and ramps shall comply with the applicable requirements of Section 1003.

1003.3.1 Doors. Means of egress doors shall meet the requirements of this section. Doors serving a means of egress system shall meet the requirements of this section and Section 1005.3.1. Where additional doors are provided for egress purposes, they shall conform to the requirements of this section.

Means of egress doors shall be readily distinguishable from the adjacent construction such that the doors are easily recognizable as means of egress doors. Mirrors or similar reflecting materials shall not be used on means of egress doors. Means of egress doors shall not be concealed by curtains, drapes, decorations or similar materials.

1003.3.1.1 Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of not less than 32 inches (813 mm). Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in an occupancy in Group I-2 used for the movement of beds shall provide a clear width not less than 41.5 inches (1054 mm). The height of doors shall not be less than 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in occupancies in Groups R-2 and R-3 as applicable in Section 101.2.
2. Door openings to resident sleeping rooms in occupancies in Group I-3 shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum width.
4. Width of door leafs in revolving doors that comply with Section 1003.3.1.3.1 shall not be limited.
5. Door openings within a dwelling unit shall not be less than 78 inches (1981 mm) in height.
6. Exterior door openings in dwelling units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
7. Interior egress door within a dwelling unit which is not required to be adaptable or accessible.
8. Door openings required to be accessible within Type B dwelling units shall have a minimum clear width of 31.75 inches (806 mm).

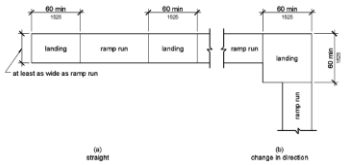
2. Landing Edge Protection **Requested Relief:** UTA to install landing *edge protection* along ramp landings on the east side of the of the Pleasant View platform, which includes the north ramp landing where Mitch fell off, as required by **ADA 405.9.** "Edge protection" and "guards" are separate safety concepts: **IBC 2009, GUARDS, 1013.2 Commentaries** (emphasis added). "Because of ***safety concerns***, the designer may want to install a guard where there is a ***drop-off of less than 30 inches*** (762 mm). Decorative guards may be utilized to support handrails or serve as part of the edge protection along a ramp. . . " East side of the 60" landing vertical drop-off where Mitch fell was 22 inches down (Fact 2), meaning greater than "vertical drop-off of 1/2 inch," and the ballast slopes east to approximately 40 inches below the landing. Fact 2.	**405.7 Landings.** *Ramps* shall have landings at the top and the bottom of each *ramp* run. Landings shall comply with 405.7. **405.7.3 Length.** The landing clear length shall be 60 inches (1525 mm) long minimum. **405.9 Edge Protection.** Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of *ramp* runs and at each side of *ramp* landings. **EXCEPTIONS:** . . . **3.** Edge protection shall not be required on the sides of *ramp* landings having a vertical drop-off of ½ inch (13 mm) maximum within 10 inches (255 mm) horizontally of the minimum landing area specified in 405.7. **405.9.1 Extended Floor or Ground Surface.** The floor or ground surface of the *ramp* run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505. **405.9.2 Curb or Barrier.** A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface.  	**Pleasant View Violations**: No landing edge protection on the east side of the north landing. **Model Satisfies ADA:** Farmington 48" high chain-link fencing along all ramp landings on the east side platform is an example that satisfies 405.9.2.

Table 405.2 Maximum Ramp Slope and Rise for Existing Sites, Buildings, and Facilities

Slope[1]	Maximum Rise
Steeper than 1:10 but not steeper than 1:8	3 inches (75 mm)
Steeper than 1:12 but not steeper than 1:10	6 inches (150 mm)

1. A slope steeper than 1:8 is prohibited.

Advisory 405.2 Slope. To accommodate the widest range of users, provide ramps with the least possible running slope and, wherever possible, accompany ramps with stairs for use by those individuals for whom distance presents a greater barrier than steps, e.g., people with heart disease or limited stamina.

405.3 Cross Slope. *Cross slope* of *ramp* runs shall not be steeper than 1:48.

Advisory 405.3 Cross Slope. Cross slope is the slope of the surface perpendicular to the direction of travel. Cross slope is measured the same way as slope is measured (i.e., the rise over the run).

405.4 Floor or Ground Surfaces. Floor or ground surfaces of *ramp* runs shall comply with 302. Changes in level other than the *running slope* and *cross slope* are not permitted on *ramp* runs.

405.5 Clear Width. The clear width of a *ramp* run and, where handrails are provided, the clear width between handrails shall be 36 inches (915 mm) minimum.

EXCEPTION: Within *employee work area*s, the required clear width of *ramps* that are a part of *common use circulation path*s shall be permitted to be decreased by *work area equipment* provided that the decrease is essential to the function of the work being performed.

405.6 Rise. The rise for any *ramp* run shall be 30 inches (760 mm) maximum.

405.7 Landings. *Ramps* shall have landings at the top and the bottom of each *ramp* run. Landings shall comply with 405.7.

Advisory 405.7 Landings. Ramps that do not have level landings at changes in direction can create a compound slope that will not meet the requirements of this document. Circular or curved ramps continually change direction. Curvilinear ramps with small radii also can create compound cross slopes and cannot, by their nature, meet the requirements for accessible routes. A level landing is needed at the accessible door to permit maneuvering and simultaneously door operation.

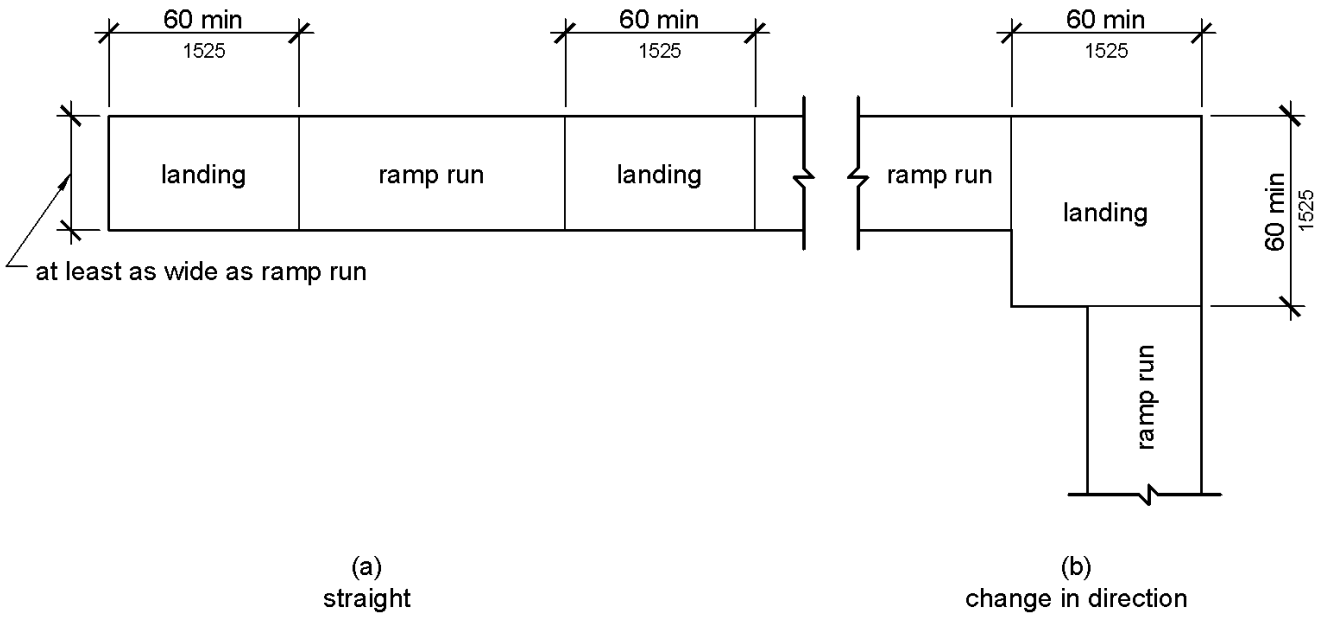


Figure 405.7
Ramp Landings

405.7.1 Slope. Landings shall comply with 302. Changes in level are not permitted.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

405.7.2 Width. The landing clear width shall be at least as wide as the widest *ramp* run leading to the landing.

405.7.3 Length. The landing clear length shall be 60 inches (1525 mm) long minimum.

405.7.4 Change in Direction. *Ramps* that change direction between runs at landings shall have a clear landing 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum.

405.7.5 Doorways. Where doorways are located adjacent to a *ramp* landing, maneuvering clearances required by 404.2.4 and 404.3.2 shall be permitted to overlap the required landing area.

405.8 Handrails. *Ramp* runs with a rise greater than 6 inches (150 mm) shall have handrails complying with 505.

EXCEPTION: Within *employee work area*s, handrails shall not be required where *ramps* that are part of *common use circulation path*s are designed to permit the installation of handrails complying with 505. *Ramps* not subject to the exception to 405.5 shall be designed to maintain a 36 inch (915 mm) minimum clear width when handrails are installed.

405.9 Edge Protection. Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of *ramp* runs and at each side of *ramp* landings.

EXCEPTIONS: 1. Edge protection shall not be required on *ramps* that are not required to have handrails and have sides complying with 406.3.
2. Edge protection shall not be required on the sides of *ramp* landings serving an adjoining *ramp* run or stairway.
3. Edge protection shall not be required on the sides of *ramp* landings having a vertical drop-off of ½ inch (13 mm) maximum within 10 inches (255 mm) horizontally of the minimum landing area specified in 405.7.

405.9.1 Extended Floor or Ground Surface. The floor or ground surface of the *ramp* run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505.

Advisory 405.9.1 Extended Floor or Ground Surface. The extended surface prevents wheelchair casters and crutch tips from slipping off the ramp surface.

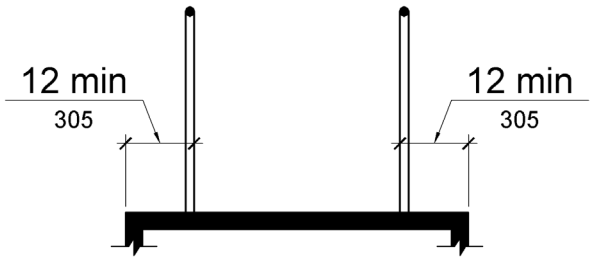


Figure 405.9.1
Extended Floor or Ground Surface Edge Protection

405.9.2 Curb or Barrier. A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface.

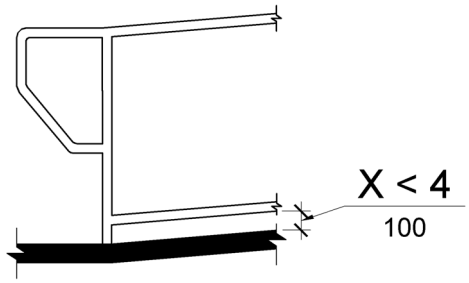


Figure 405.9.2
Curb or Barrier Edge Protection

405.10 Wet Conditions. Landings subject to wet conditions shall be designed to prevent the accumulation of water.

Top Previous Section Next Section To view the next subsection please select the Next Section option.

1013.2 Height. Required *guards* shall be not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edges of the treads.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.

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2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the *guard* also serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

3. The height in assembly seating areas shall be in accordance with Section 1028.14.

4. Along *alternating tread devices* and ship ladders, *guards* whose top rail also serves as a *handrail*, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread *nosing*.

Guards must not be less than 42 inches (1067 mm) in height as measured vertically from the top of the guard down to the leading edge of the tread along steps or to an adjacent walking surface for floors and ramps [see Figures 1013.1(1), 1013.2 and 1010.8(4)]. When there is a fixed seat next to a walking surface that requires a guard, the guard height is measured from the top of the seat surface [see Figure 1013.1 (2)]. Experience has shown that 42 inches (1067 mm) or more provides adequate height for protection purposes. This puts the top of the guard above the center of gravity of the average adult. Note that with this height requirement, at locations where both a guard and handrail are required, the handrail cannot be at the top of the guard except as permitted in Exception 2.

The requirement for measuring the height of the guard from a fixed seat is due to concerns that people may stand on the seat, even if it is not a walking surface. Remember, the requirement for a guard is measured from the floor in accordance with Section 1013.1. This requirement is not intended to regulate such items as planters or loose furniture next the drop off.

Because of safety concerns, the designer may want to install a guard where there is a drop-off of less than 30 inches (762 mm). Decorative guards may be utilized to support handrails or serve as part of the edge protection along a ramp. When nonrequired guards/ barriers are provided, the 42-inch (1067 mm) minimum height is not required.

Exceptions 1 and 2 are for nontransient residential occupancies and address guard heights only along the stairways. The handrail provisions allow some residential stairways to only have one handrail (see Section 1009.12). Exceptions 1 and 2 allow for a reduced guard height not only when the guard is also used as a handrail but also when it just serves the purpose of a guard along a stairway. The reduced allowable guard height along stairways is consistent with current construction practice.

Exception 3 references the lower guards permitted at locations where a line of sight for assembly spaces is part of the consideration.

Exception 4 permits a reduction in guard heights based on the limited used and unique design considerations for alternating tread devices and ship ladders (see Sections 1009.10 and 1009.11).

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3. Ramp Handrail **Requested Relief:** UTA to install handrails on the east side of the Pleasant View platform ramps as required by **ADA 405.8.** **8.3.4.2 Ramps** "All ramps shall be accessible under the provisions of ADA and comply with the following requirements: . . . • Ramps with gradients between 5% and 8% require handrails and intermediate level landings in accordance with UBC, ADA, and other accessibility requirements. • ***Handrails*** (where required) ***shall be provided on both sides*** and shall be continuous above nonskid surface of ramp. . . " UTA Commuter Rail Design Criteria 8-11 (emphasis added). Ex. I. Q [Fuller]: "And does this meet the ramp requirements?" A: [Mr. Hilton, UTA expert]: "It did not except -- . . . It seems to me that, you know -- and Mr. Brunetti [Plaintiffs' code expert] was right, that, you know, ***they should have had them***." Hilton Depo., 101:8-102:25 (brackets and emphasis added). Q: "[T]hey violated the handrail code on the slope, is that true?" A: "I would say with special consideration." Hilton Depo., 104:14-16.	**405.1 General.** *Ramps* on *accessible* routes shall comply with 405. **405.5 Clear Width.** The clear width of a *ramp* run and, where handrails are provided, the clear width between handrails shall be 36 inches (915 mm) minimum. **405.8 Handrails.** *Ramp* runs with a rise greater than 6 inches (150 mm) shall have handrails complying with 505. **405.9 Edge Protection.** Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of *ramp* runs and at each side of *ramp* landings. **405.9.1 Extended Floor or Ground Surface.** The floor or ground surface of the *ramp* run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505. **405.9.2 Curb or Barrier.** A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface. **505.2 Where Required.** Handrails shall be provided on both sides of stairs and *ramps*.	**Pleasant View Violations:** No handrail on the east side of the north ramp, which rises greater than 6 inches. **Model Satisfies ADA:** Farmington 36" high white steel tubular handrails along the east sides of the platform ramps are examples that satisfy 405.8. Farmington also has a handrail on the west side of the southwest ramp along the tactile strip. Purpose of extended floor is not to serve as a walkway: **"Advisory 405.9.1 Extended Floor or Ground Surface.** The extended surface prevents wheelchair casters and crutch tips from slipping off the ramp surface."

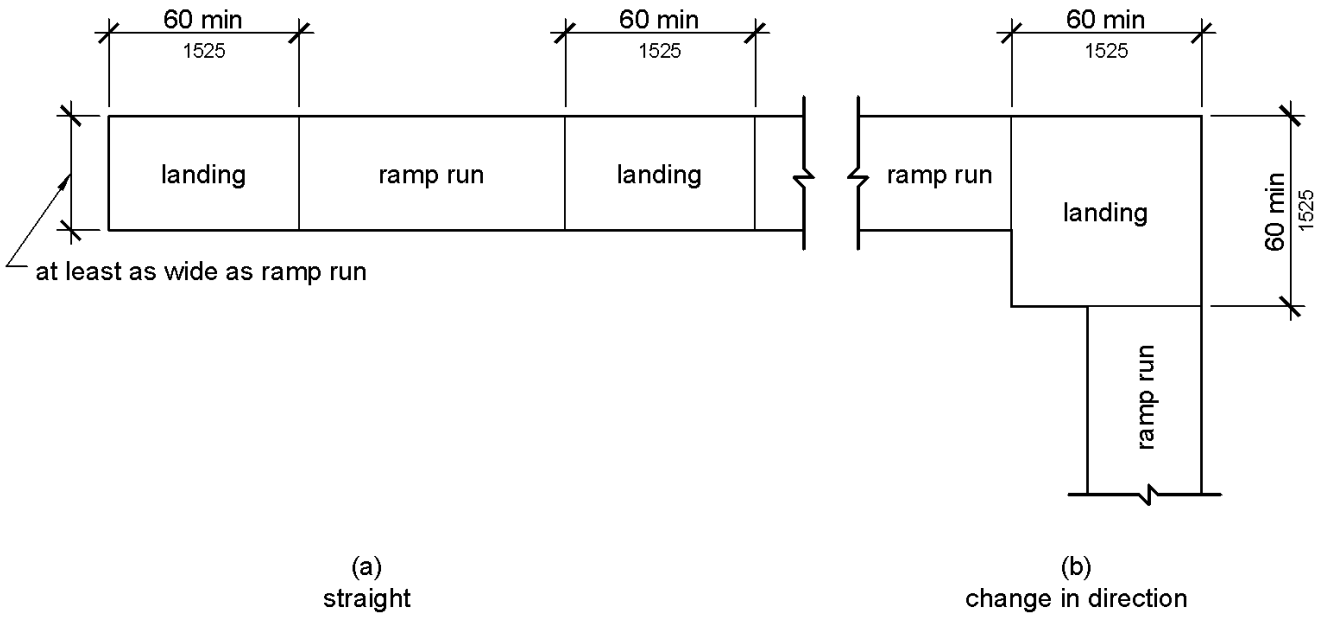


Figure 405.7
Ramp Landings

405.7.1 Slope. Landings shall comply with 302. Changes in level are not permitted.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

405.7.2 Width. The landing clear width shall be at least as wide as the widest *ramp* run leading to the landing.

405.7.3 Length. The landing clear length shall be 60 inches (1525 mm) long minimum.

405.7.4 Change in Direction. *Ramps* that change direction between runs at landings shall have a clear landing 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum.

405.7.5 Doorways. Where doorways are located adjacent to a *ramp* landing, maneuvering clearances required by 404.2.4 and 404.3.2 shall be permitted to overlap the required landing area.

405.8 Handrails. *Ramp* runs with a rise greater than 6 inches (150 mm) shall have handrails complying with 505.

EXCEPTION: Within *employee work area*s, handrails shall not be required where *ramps* that are part of *common use circulation path*s are designed to permit the installation of handrails complying with 505. *Ramps* not subject to the exception to 405.5 shall be designed to maintain a 36 inch (915 mm) minimum clear width when handrails are installed.

405.9 Edge Protection. Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of *ramp* runs and at each side of *ramp* landings.

EXCEPTIONS: 1. Edge protection shall not be required on *ramps* that are not required to have handrails and have sides complying with 406.3.
2. Edge protection shall not be required on the sides of *ramp* landings serving an adjoining *ramp* run or stairway.
3. Edge protection shall not be required on the sides of *ramp* landings having a vertical drop-off of ½ inch (13 mm) maximum within 10 inches (255 mm) horizontally of the minimum landing area specified in 405.7.

405.9.1 Extended Floor or Ground Surface. The floor or ground surface of the *ramp* run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505.

Advisory 405.9.1 Extended Floor or Ground Surface. The extended surface prevents wheelchair casters and crutch tips from slipping off the ramp surface.

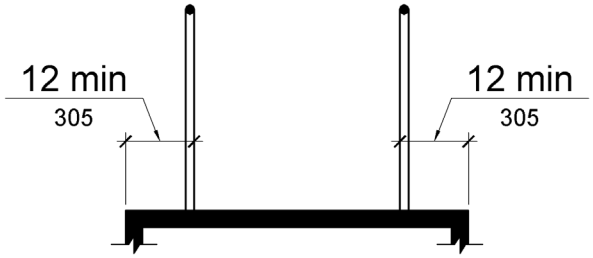


Figure 405.9.1
Extended Floor or Ground Surface Edge Protection

405.9.2 Curb or Barrier. A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface.

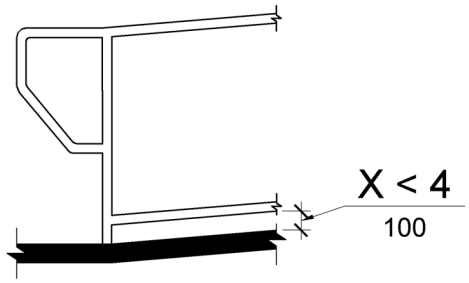


Figure 405.9.2
Curb or Barrier Edge Protection

405.10 Wet Conditions. Landings subject to wet conditions shall be designed to prevent the accumulation of water.

505 Handrails

505.1 General. Handrails provided along walking surfaces complying with 403, required at *ramps* complying with 405, and required at stairs complying with 504 shall comply with 505.

> **Advisory 505.1 General.** Handrails are required on ramp runs with a rise greater than 6 inches (150 mm) (see 405.8) and on certain stairways (see 504). Handrails are not required on walking surfaces with running slopes less than 1:20. However, handrails are required to comply with 505 when they are provided on walking surfaces with running slopes less than 1:20 (see 403.6). Sections 505.2, 505.3, and 505.10 do not apply to handrails provided on walking surfaces with running slopes less than 1:20 as these sections only reference requirements for ramps and stairs.

505.2 Where Required. Handrails shall be provided on both sides of stairs and *ramps*.

EXCEPTION: In *assembly areas*, handrails shall not be required on both sides of aisle *ramps* where a handrail is provided at either side or within the aisle width.

505.3 Continuity. Handrails shall be continuous within the full length of each stair flight or *ramp* run. Inside handrails on switchback or dogleg stairs and *ramps* shall be continuous between flights or runs.

EXCEPTION: In *assembly areas*, handrails on *ramps* shall not be required to be continuous in aisles serving seating.

505.4 Height. Top of gripping surfaces of handrails shall be 34 inches (865 mm) minimum and 38 inches (965 mm) maximum vertically above walking surfaces, stair nosings, and *ramp* surfaces. Handrails shall be at a consistent height above walking surfaces, stair nosings, and *ramp* surfaces.

> **Advisory 505.4 Height.** The requirements for stair and ramp handrails in this document are for adults. When children are the principal users in a building or facility (e.g., elementary schools), a second set of handrails at an appropriate height can assist them and aid in preventing accidents. A maximum height of 28 inches (710 mm) measured to the top of the gripping surface from the ramp surface or stair nosing is recommended for handrails designed for children. Sufficient vertical clearance between upper and lower handrails, 9 inches (230 mm) minimum, should be provided to help prevent entrapment.

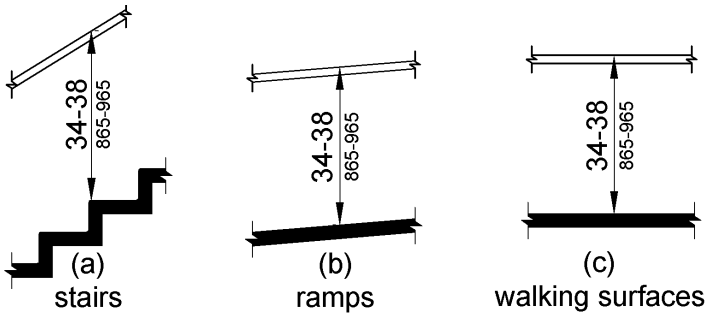


Figure 505.4
Handrail Height

505.7.2 Non-Circular Cross Sections. Handrail gripping surfaces with a non-circular cross section shall have a perimeter dimension of 4 inches (100 mm) minimum and 6¼ inches (160 mm) maximum, and a cross-section dimension of 2¼ inches (57 mm) maximum.

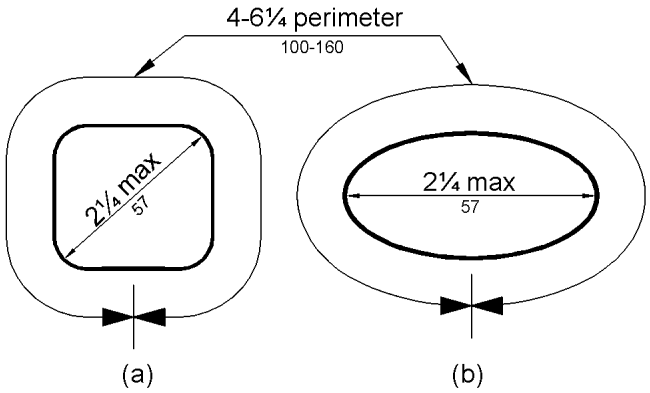


Figure 505.7.2
Handrail Non-Circular Cross Section

505.8 Surfaces. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive *elements* and shall have rounded edges.

505.9 Fittings. Handrails shall not rotate within their fittings.

505.10 Handrail Extensions. Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and *ramp* runs in accordance with 505.10.

EXCEPTIONS: 1. Extensions shall not be required for continuous handrails at the inside turn of switchback or dogleg stairs and *ramps*.

2. In *assembly areas*, extensions shall not be required for *ramp* handrails in aisles serving seating where the handrails are discontinuous to provide access to seating and to permit crossovers within aisles.

3. In *alterations*, full extensions of handrails shall not be required where such extensions would be hazardous due to plan configuration.

505.10.1 Top and Bottom Extension at Ramps. *Ramp* handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent *ramp* run.

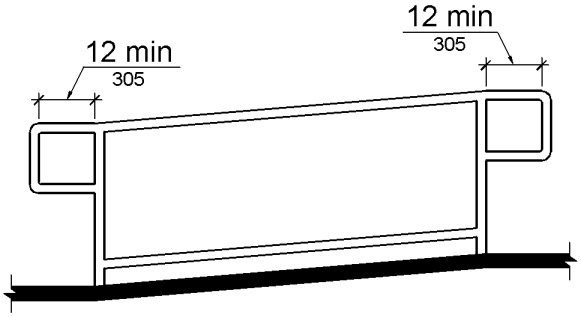


Figure 505.10.1
Top and Bottom Handrail Extension at Ramps

505.10.2 Top Extension at Stairs. At the top of a stair flight, handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

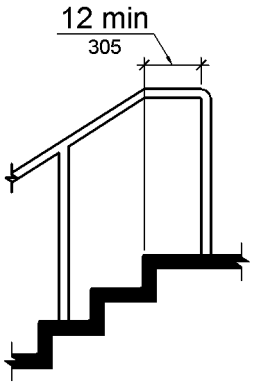


Figure 505.10.2
Top Handrail Extension at Stairs

505.10.3 Bottom Extension at Stairs. At the bottom of a stair flight, handrails shall extend at the slope of the stair flight for a horizontal distance at least equal to one tread depth beyond the last riser nosing. Extension shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

4. Ramp Slope **Requested Relief:** UTA to replace or otherwise eliminate all ramp runs with slopes exceeding 8.33% within the running slopes in order to satisfy **ADA 405.2.** Parsons UTA Standard Module plans: Note 2 "ramp down, shall not exceed slope of 1:15" [6.6%]; Note 3 "shall not exceed slope of 1:12.5" [8%]. Ex. I. **8.3.2.4 ADA Access** "ADA access to and from the train should be via a 24-inch platform. . . . The raised platform shall be located at the south end of the platform . . .The slope of ramps to the raised platform shall be ***no greater than 1:15*** . . . " UTA Commuter Rail Design Criteria, p. 8-9 (emphasis to 6.6% slope added). **8.3.4.2 Ramps** "All ramps shall be accessible under the provisions of ADA and comply with the following requirements: • The maximum allowed gradient is 5%; ***up to 8.0% (1:12.5 maximum)*** may be used with prior approval by UTA. • Ramps with gradients between 5% and 8% require handrails and intermediate level landings in accordance with UBC, ADA, . . ." UTA Commuter Rail Design Criteria, 8-11(emphasis added). Ex. I.	**405.2 Slope.** *Ramp* runs shall have a *running slope* not steeper than 1:12. **106.5 Defined Terms.** **Running Slope.** The slope that is parallel to the direction of travel (see *cross slope*).	**Pleasant View Violation:** upper to lower ramp, 9.2% **Ogden Violation** upper to lower ramp, 9.2% **Farmington Violation:** west platform, 9.3% **Model Satisfies ADA:** Although the Farmington east platform slope does not satisfies the UTA 1:15 [6.6%] standard, it does satisfy the minimum 1:12 [8.3%] ADA standard.

by reference, see “Referenced Standards” in Chapter 1). Low-energy and power-assisted doors shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see “Referenced Standards” in Chapter 1).

404.3.1 Clear Width. Doorways shall provide a clear opening of 32 inches (815 mm) minimum in power-on and power-off mode. The minimum clear width for automatic door systems in a doorway shall be based on the clear opening provided by all leaves in the open position.

404.3.2 Maneuvering Clearance. Clearances at power-assisted doors and gates shall comply with 404.2.4. Clearances at automatic doors and gates without standby power and serving an *accessible means of egress* shall comply with 404.2.4.

EXCEPTION: Where automatic doors and gates remain open in the power-off condition, compliance with 404.2.4 shall not be required.

404.3.3 Thresholds. Thresholds and changes in level at doorways shall comply with 404.2.5.

404.3.4 Doors in Series and Gates in Series. Doors in series and gates in series shall comply with 404.2.6.

404.3.5 Controls. Manually operated controls shall comply with 309. The clear floor *space* adjacent to the control shall be located beyond the arc of the door swing.

404.3.6 Break Out Opening. Where doors and gates without standby power are a part of a means of egress, the clear break out opening at swinging or sliding doors and gates shall be 32 inches (815 mm) minimum when operated in emergency mode.

EXCEPTION: Where manual swinging doors and gates comply with 404.2 and serve the same means of egress compliance with 404.3.6 shall not be required.

404.3.7 Revolving Doors, Revolving Gates, and Turnstiles. Revolving doors, revolving gates, and turnstiles shall not be part of an *accessible* route.

405 Ramps

405.1 General. *Ramps* on *accessible* routes shall comply with 405.

EXCEPTION: In *assembly areas*, aisle *ramps* adjacent to seating and not serving *elements* required to be on an *accessible* route shall not be required to comply with 405.

405.2 Slope. *Ramp* runs shall have a *running slope* not steeper than 1:12.

EXCEPTION: In existing *sites*, *buildings*, and *facilities*, *ramps* shall be permitted to have *running slopes* steeper than 1:12 complying with Table 405.2 where such slopes are necessary due to *space* limitations.

Table 405.2 Maximum Ramp Slope and Rise for Existing Sites, Buildings, and Facilities

Slope[1]	Maximum Rise
Steeper than 1:10 but not steeper than 1:8	3 inches (75 mm)
Steeper than 1:12 but not steeper than 1:10	6 inches (150 mm)

1. A slope steeper than 1:8 is prohibited.

Advisory 405.2 Slope. To accommodate the widest range of users, provide ramps with the least possible running slope and, wherever possible, accompany ramps with stairs for use by those individuals for whom distance presents a greater barrier than steps, e.g., people with heart disease or limited stamina.

405.3 Cross Slope. *Cross slope* of *ramp* runs shall not be steeper than 1:48.

Advisory 405.3 Cross Slope. Cross slope is the slope of the surface perpendicular to the direction of travel. Cross slope is measured the same way as slope is measured (i.e., the rise over the run).

405.4 Floor or Ground Surfaces. Floor or ground surfaces of *ramp* runs shall comply with 302. Changes in level other than the *running slope* and *cross slope* are not permitted on *ramp* runs.

405.5 Clear Width. The clear width of a *ramp* run and, where handrails are provided, the clear width between handrails shall be 36 inches (915 mm) minimum.

EXCEPTION: Within *employee work area*s, the required clear width of *ramps* that are a part of *common use circulation path*s shall be permitted to be decreased by *work area equipment* provided that the decrease is essential to the function of the work being performed.

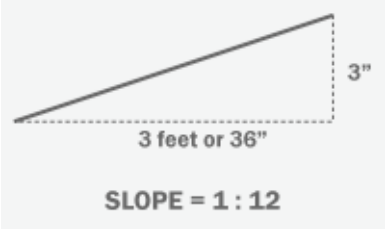
405.6 Rise. The rise for any *ramp* run shall be 30 inches (760 mm) maximum.

405.7 Landings. *Ramps* shall have landings at the top and the bottom of each *ramp* run. Landings shall comply with 405.7.

Advisory 405.7 Landings. Ramps that do not have level landings at changes in direction can create a compound slope that will not meet the requirements of this document. Circular or curved ramps continually change direction. Curvilinear ramps with small radii also can create compound cross slopes and cannot, by their nature, meet the requirements for accessible routes. A level landing is needed at the accessible door to permit maneuvering and simultaneously door operation.

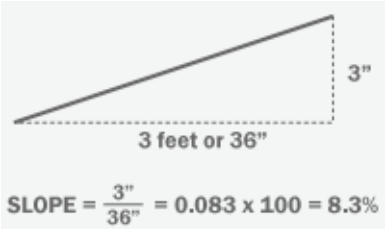
Calculating Slope

There are three different ways to indicate the slope of a surface relative to the horizontal plane: degrees, gradient, and percentage.



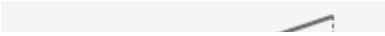
Calculating a Slope Gradient

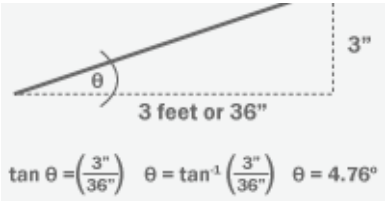
Slope gradients are written as Y:X, where Y is a single unit in rise and X is the run. Both numbers must use the same units. For instance, if you travel 3 inches vertically and 3 feet (36 inches) horizontally, the slope would be 3:36 or 1:12. This is read as a "one in twelve slope."



Calculating the Slope Percentage

Slope percentage is calculated in much the same way as the gradient. Convert the rise and run to the same units and then divide the rise by the run. Multiply this number by 100 and you have the percentage slope. For instance, 3" rise divided by 36" run = .083 x 100 = an 8.3% slope.





Calculating a Slope in Degrees

The most complicated way to calculate slope is in degrees and it requires a bit of high-school math. The tangent of a given angle (in degrees) is equal to the rise divided by the run. Therefore, the inverse-tangent of the rise divided by the run will give the angle.

Table of Common Slopes

The table below shows some common slopes. 1:20 slopes do not require handrails. 1:12 slopes are the maximum slope allowed by ADA codes, but they require handrails.

Degrees	Gradient	Percent	Degrees	Gradient	Percent
0.6	1 : 95.49	1.0%	30	1 : 1.73	57.7%
1	1 : 57.29	1.7%	45	1 : 1	100%
2.86	1 : 20	5%	56.31	1: 0.67	150%
4.76	1 : 12	8.3%	60	1 : 0.6	173.2%
7.13	1 : 8	12.5%	63.43	1 : 0.5	200%
10	1 : 5.67	17.6%	78.69	1: 0.2	500%
14.04	1 : 4	25%	89.43	1 : 0.1	1000%
15	1 : 3.73	26.8%	90	1 : 0	inf.
26.57	1 : 2	50%			

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UDY ADA EX. A, P. 28

5. Track Crossing **Requested Relief:** UTA to eliminate the outside (field) gaps by raising the rubber flange flush and to reduce the inside (gauge) gap to 2-1/2" as required by **ADA 810.10.** "Design pedestrian at-grade track crossings to maximize passenger safety. . . • Provide safe and secure pedestrian access through the appropriate use of wayfinding and lighting." UTA Commuter Rail Design Criteria, 8-8. Ex. I	**810.1 General. Transportation *facilities* shall comply with 810.** **810.10 Track Crossings.** Where a *circulation path* serving boarding platforms crosses tracks, it shall comply with 402. **EXCEPTION:** Openings for wheel flanges shall be permitted to be 2½ inches (64 mm) maximum.  	**Model Satisfies ADA:** Farmington center track crossing serves as an example of a conforming FrontRunner circulation path, with flush rubber flanges to eliminate any gap on the outside and 2.5" or narrower gaps on the inner flange sides as follows: north east outside - flush north east inside - 2-1/2" north west outside - flush north west inside - 2-3/8" **Ogden Violations:** north east outside - 2-1/2" north east inside - 2-5/8" north west outside - 1-1/8" north west inside - 3-3/8" south east outside - 1-7/8" south east inside - 3-1/2" south west outside - 1-1/2" southwest inside - 3" **Farmington Violations:** south east outside - 1-7/8" south east inside - 3-1/8" south west outside -1-3/4" southwest inside - 2-3/4" (Salt Lake City and most other FrontRunner stations have similar gap violations.)

810.6.1 Entrances. Where signs identify a station or its *entrance*, at least one sign at each *entrance* shall comply with 703.2 and shall be placed in uniform locations to the maximum extent practicable. Where signs identify a station that has no defined *entrance*, at least one sign shall comply with 703.2 and shall be placed in a central location.

810.6.2 Routes and Destinations. Lists of stations, routes and destinations served by the station which are located on boarding areas, platforms, or *mezzanines* shall comply with 703.5. At least one *tactile* sign identifying the specific station and complying with 703.2 shall be provided on each platform or boarding area. Signs covered by this requirement shall, to the maximum extent practicable, be placed in uniform locations within the system.

EXCEPTION: Where sign *space* is limited, *characters* shall not be required to exceed 3 inches (75 mm).

Advisory 810.6.2 Routes and Destinations. Route maps are not required to comply with the informational sign requirements in this document.

810.6.3 Station Names. Stations covered by this section shall have identification signs complying with 703.5. Signs shall be clearly visible and within the sight lines of standing and sitting passengers from within the vehicle on both sides when not obstructed by another vehicle.

Advisory 810.6.3 Station Names. It is also important to place signs at intervals in the station where passengers in the vehicle will be able to see a sign when the vehicle is either stopped at the station or about to come to a stop in the station. The number of signs necessary may be directly related to the size of the lettering displayed on the sign.

810.7 Public Address Systems. Where public address systems convey audible information to the public, the same or equivalent information shall be provided in a visual format.

810.8 Clocks. Where clocks are provided for use by the public, the clock face shall be uncluttered so that its *elements* are clearly visible. Hands, numerals and digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are installed overhead, numerals and digits shall comply with 703.5.

810.9 Escalators. Where provided, escalators shall comply with the sections 6.1.3.5.6 and 6.1.3.6.5 of ASME A17.1 (incorporated by reference, see “Referenced Standards” in Chapter 1) and shall have a clear width of 32 inches (815 mm) minimum.

EXCEPTION: Existing escalators in *key stations* shall not be required to comply with 810.9.

810.10 Track Crossings. Where a *circulation path* serving boarding platforms crosses tracks, it shall comply with 402.

EXCEPTION: Openings for wheel flanges shall be permitted to be 2½ inches (64 mm) maximum.

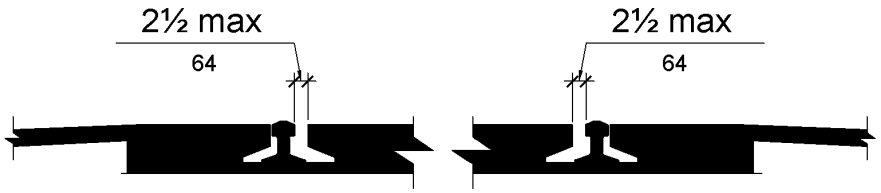


Figure 810.10 (Exception)
Track Crossings

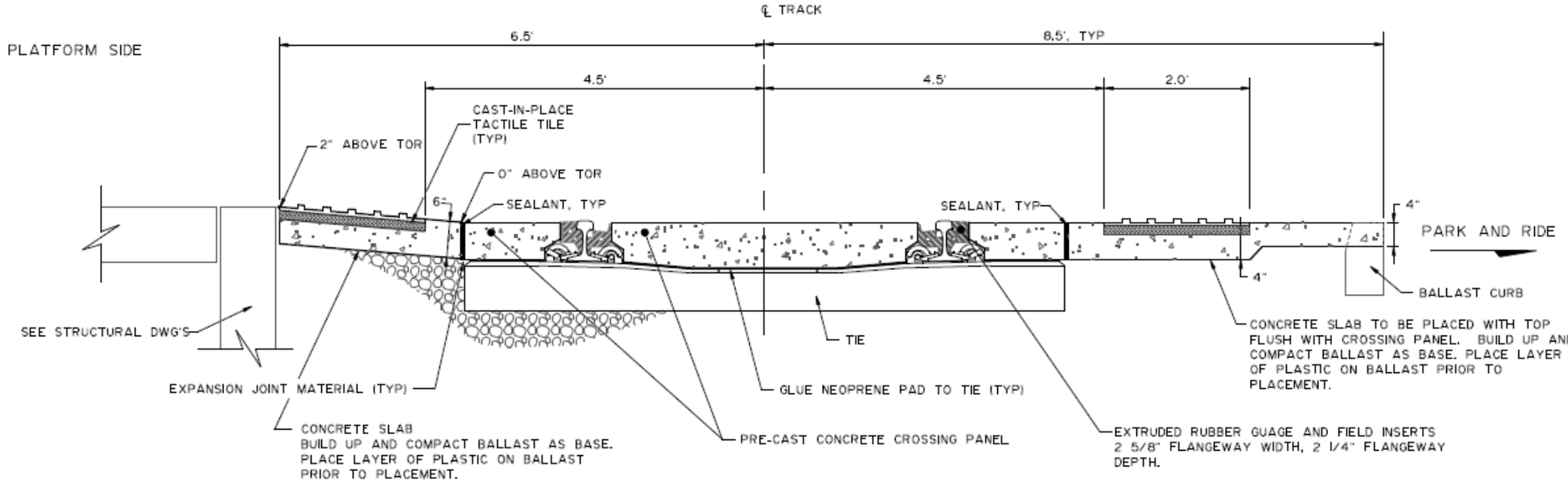
811 Storage

811.1 General. Storage shall comply with 811.

811.2 Clear Floor or Ground Space. A clear floor or ground *space* complying with 305 shall be provided.

811.3 Height. Storage *elements* shall comply with at least one of the reach ranges specified in 308.

811.4 Operable Parts. *Operable parts* shall comply with 309.



SECTION AT PEDESTRIAN CROSSING (TYP) A

NTS --

DATE	Description	

RECOMMENDED FOR APPROVAL

CIVIL STANDARDS — DATE

CAPITAL DEVELOPMENT DEPUTY CHEIF — DATE

UDY ADA EX A P 82

UTA

UTAH TRANSIT AUTHORITY

REFERENCE DRAWINGS

Designed By:

Drawn By:

Checked By:

Approved By:

Pedestrian Crossings

Pedestrian Crossings

Image Gallery
Printer Friendly pdf
Click to email CENTURY GROUP Railroad Products Division

As the leader in the railroad grade crossing industry, Century Group Inc. has become the supplier of choice when it comes to pedestrian grade crossings for commuter, transit intercity and rapid rail systems. Safety is the number one priority when it comes to pedestrian crossings and Century Group can meet that challenge. Century Group manufactures pedestrian grade crossings with an anti skid surface and furnishes a flangeway system which meet ADA requirements.

Pedestrian Crossing at Commuter Rail Passenger Station

For over three decades Century Group Inc.'s experienced staff has worked with architects, planners and engineers across North America assisting in the design and manufacture of safe, economical and attractive pedestrian crossings

for light rail transit and commuter railroads. Century Group is the name that stands for experience, innovation, performance and the test of time.

Pedestrian Crossing at Commuter Rail Passenger Station

As a supplier, Century Group Inc. is proactive in the railroad industry by ensuring that all sales and technical field representatives have been through the Class I Railroad's e-rail safe program, the Roadway Worker On-Track Safety program overseen by the Federal Railroad Administration (FRA) and the Transportation Worker Identification Credential Program (TWIC) implemented by Transportation Security Agency (TSA) and the U. S. Coast Guard. Safety and security at jobsites is the highest priority at Century Group Inc.

Light Rail Transit Authority 9' Pedestrian Crossing

Applications & Uses:

- Textured surfaces to match adjacent pavements and structures at commuter railroad, light rail transit stations and historical areas
- Custom colors
- ADA compliant flangeway filler
- Anti-skid surface for added safety
- Built-in tapered ends available
- Custom sizes and shapes

VERSATILITY

For decades, Century Group Inc.'s goal has been to provide innovative ideas to meet the challenges of pedestrian grade crossings at suburban loading platforms, commuter rail stations, emergency access crossings in tunnels, jogging / bicycle paths, etc… Working hand in hand with our clients, Century Group not only provides the safest pedestrian crossings but also manufactures precast concrete pedestrian crossing panels in different colors and textured surfaces, such as brick or paver patterns to compliment the architectural themes of loading stations and platforms.

Pedestrian Crossing

Century Group has the ability to manufacture pedestrian crossing panels to fit on standard wood or concrete crossties, mono-block ties and direct fixation track. Century Group remains the largest manufacturer of precast concrete pedestrian crossing panels for the light rail transit and commuter rail industry across the U. S. and sets the standard for safety, durability, and service.

Pedestrian Crossing at Light Rail Passenger Station

Should a pedestrian crossing encroach the limits of a turnout, custom panels can be manufactured to fit around frogs, switch points, etc… Century Group's decades of experience in railroad construction and precast concrete manufacturing allows us to understand our client's needs and be able to design the best pedestrian crossing system for your project. Our vast experience, diversity and flexibility allows us to manufacture and deliver the exact pedestrian crossing system to ensure that it is a perfect fit with your project.

Pedestrian Crossings With Devil Strip Panels At Commuter Rail Station

SERVICE

Century Group Inc. is the only company with the resources and commitment to handle your most complicated pedestrian grade crossing projects. With over four decades of railroad construction experience, Century Group offers a network of sales and technical staff to assist our clients with onsite layout, as-built field measurements and assistance with actual pedestrian crossing installations.

Light Rail Pedestrian Crossing Passenger Station

UDY ADA EX. A, P. 35

ADA COMPLIANT PEDESTRIAN CROSSINGS

As light rail transportation becomes a more popular mode of transportation, so does the concern for safety issues regarding people with disabilities at pedestrian rail crossings, transit stations, sidewalks and emergency exits in railway tunnels. Over the last three decades, Century Group Inc. has manufactured pedestrian grade crossing systems for railroads, light rail transits, municipalities and industry across North America.

ADA Wheelchair Friendly Pedestrian Grade Crossing

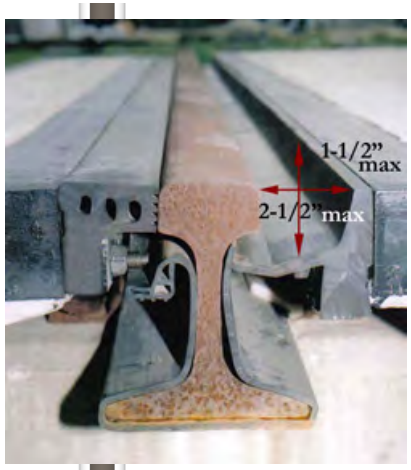
Having been involved in precast concrete manufacturing and railroad construction for over six decades, Century Group Inc. has utilized its immense experience and resources to identify and develop a pedestrian grade crossing system that addresses safety issues and meets current ADA (American with Disabilities Act) regulations. While there are always safety issues when pedestrians encroach the right-of-way of railroads and light rail transit lines, Century Group Inc. is focused and committed to providing the safest and most innovative pedestrian grade crossing for the general public with special attention given to those persons that are handicapped or disabled.

ADA Pedestrian Friendly Flangeway Filler

FLANGEWAYS

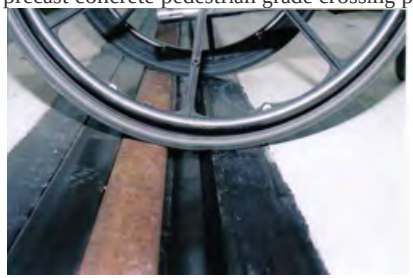
The most debated subject regarding pedestrian grade crossings is the minimization of the flangeway area between the inside ball of rail to the grade crossing surface. The ADA (Americans with Disability Act) requires that the

flangeway widths be a maximum of 2 ½" wide from inside ball of rail to the grade crossing surface and depth of the flangeway area should be approximately 1 ½" deep from top of rail to bottom of flangeway. Potentially, the flangeway is an area for wheelchair or scooter entrapment, tripping, the lodging of a shoe, walking cane, walker or bicycle tire when being traversed by the general public.



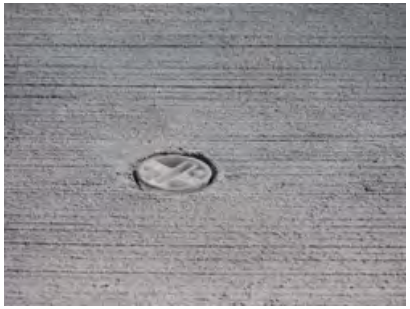
ADA Flangeway Filler at Pedestrian Crossing

Century Group Inc. has developed an ADA compliant elastomeric flangeway filler system that is integral to its precast concrete pedestrian grade crossing panel system for installation at newly constructed light, rapid, commuter rail station platforms. The Century ADA filler minimizes the flangeway area to meet the ADA requirements that flangeways be a maximum of 2 ½" wide at passenger loading platforms and stations. The Century ADA flangeway filler is manufactured out of a high-strength elastomeric rubber that has a high electrical resistivity. The Century ADA flangeway filler is attached to the concrete crossing panels with high tensile threaded steel studs welded to the angle surround of the Century concrete crossing panels. An additional steel member runs longitudinally under the filler to provide additional support to prevent collapsing of the flangeway filler in the event that it is encroached by a wheelchair, scooter, walking cane, shoe heel, etc... The Century ADA compliant flangeway filler is also compatible with most elastomeric rail boots that are common on electrified light and commuter rail lines. One should consult with a Century Group technical representative for rail boot compatibility at 1-800-527-5232, Ext. 118.



LEVEL / UNIFORM SURFACE

The Century pedestrian crossing panels are manufactured to insure that the walking surface is level and there are no surface deflections caused by lag screw holes and/or lifting units. All Century pedestrian crossing panels are manufactured with threaded lifting inserts that terminate below the walking surface and are capped with a plastic setting plug that fits flush with the walking surface. This eliminates any surface deflections or trip hazards and



provides long term protection to the lifting units. The Century pedestrian crossings are of a lagless design which eliminates the need for lag screws and the challenge of having to install plugs or patches to cover screw holes or raised screw heads that could cause a trip hazard or obstruction to wheelchairs and/or walkers.

Flush Mount Plastic Setting Plug in Pedestrian Crossing

ADA COMPLIANT NON-SKID SURFACE

Our skilled and highly experienced workforce applies a uniformed broomed non-skid finish (parallel to the running rails) that has a static coefficient of friction (ASTM) that meets or exceeds ADA and International Building Code specifications for stairs and steps. This non-slip surface helps provide a safe walking surface available even in the most challenging situations where snow, icing or wet conditions are prevalent.

Pedestrian Crossing

SAFE WHEELCHAIR / SCOOTER MANEUVERING AREA

Century Group Inc. has designed its pedestrian crossings with safety as its number one priority. One of the concerns over the years has been maneuverability and adequate room for passing pedestrian traffic. Although there are no specific ADA or building code regulations regarding width of a railroad pedestrian crossing, Century Group Inc. feels that it is prudent to manufacture pedestrian crossings that allows for safe maneuvering and navigation of wheelchairs and/or scooters across the crossings. Century's pedestrian crossings are designed to meet or exceed ADA space allowances for wheelchair passage and passing on "clear floor and ground space for wheelchairs" as described in ADA regulations Accessibility Guidelines 4.2.1. With this safety aspect in mind, it is Century Group's recommendation that the minimum width of a pedestrian crossing be no less than 9 foot. The Century Group design allows for the safe navigation of a wheelchair, scooter or handicap walker across a pedestrian crossing in one direction while allowing on coming pedestrian or wheelchair/scooter/walker traffic to pass safely with ample room. Click on the drawing view.

ADA Scooter Chair Friendly Pedestrian Grade Crossing

UDY ADA EX. A, P. 38

6. Platform to Car Gap **Requested Relief:** UTA to eliminate platform to car gaps by attaching additional TREX to the platforms or otherwise reduce the Bombardier horizontal (h) gaps to ≤ 3 inches; reduce the NJT Comet gaps to ≤ 4 inches to satisfy **ADA 810.5.3.** (a) A public entity shall construct any new facility . . . so that the ***facility is readily accessible to and usable by individuals with disabilities***, . . . ***commuter rail*** . . . after October 7, 1991. (b) (1) . . . Full compliance will be considered ***structurally impracticable only in those rare circumstances*** when the ***unique characteristics of terrain*** prevent the incorporation of accessibility features. (2) . . . In that case, ***any portion of the facility that can be made accessible shall be made accessible*** to the extent that it is not structurally impracticable. (3) If providing accessibility in conformance with this section to individuals with certain disabilities (e.g., those who use wheelchairs) would be structurally impracticable, ***accessibility shall nonetheless be ensured*** to persons with other types of disabilities (e.g., . . . ***sight***, . . . impairments) . . . 49 CFR §37.41	[DOT ADA] **810.5.3 Platform and Vehicle Floor Coordination.** Station platforms shall be positioned to coordinate with vehicles in accordance with the applicable requirements of 36 CFR part 1192. Low-level platforms shall be 8 inches (205 mm) minimum above top of rail. *In light rail, commuter rail, and intercity rail systems where it is not operationally or structurally feasible to meet the horizontal gap or vertical difference requirements of part 1192 or 49 CFR part 38, mini-high platforms, car-borne or platform-mounted lifts, ramps or bridge plates or similarly manually deployed devices, meeting the requirements of 49 CFR part 38, shall suffice.* *Coordination with boarding platform*—(1) *Requirements.* Cars operating in stations with high platforms, or mini-high platforms, shall be coordinated with the boarding platform design such that the ***horizontal gap*** between a car at rest and the platform shall be no greater than ***3 inches*** and the height of the car floor shall be within plus or minus ***⅝ inch*** of the platform height. . . . * * * (4) *Exception.* Retrofitted vehicles . . . horizontal gap shall be no greater than ***4 inches*** and the height of the vehicle floor, . . . plus or minus ***2 inches*** of the platform height. 36 CFR 1192.93(d) (emphasis added).	**Pleasant View Violations:** Upper - Bombardier: 5"h x 0"v; 4-1/2"h x 2-1/8"v Lower - Comet: 9" (5-1/2"h x 7-1/4"v) **Ogden Violations:** Upper - Bombardier: 6"h x 0"v; 5-1/2"h x 0"v Lower - Comet: 9-1/2" (5-1/2"h x 6-1/2"v) **Farmington Violations:** Upper - Bombardier: 6"h x 0"v Lower - Comet: 11" (Gaps are much wider (>12") when the train stops with doorways lined up on ramp areas, see example photos, Ex. A.6)

810.5.3 Platform and Vehicle Floor Coordination. Station platforms shall be positioned to coordinate with vehicles in accordance with the applicable requirements of 36 CFR Part 1192. Low-level platforms shall be 8 inches (205 mm) minimum above top of rail.

EXCEPTION: Where vehicles are boarded from sidewalks or street-level, low-level platforms shall be permitted to be less than 8 inches (205 mm).

Note to Reader: The Department of Transportation's ADA standards note permitted alternatives where compliance is not operationally or structurally feasible in light rail, commuter rail, or intercity rail systems:

810.5.3 Platform and Vehicle Floor Coordination. Station platforms shall be positioned to coordinate with vehicles in accordance with the applicable requirements of 36 CFR part 1192. Low-level platforms shall be 8 inches (205 mm) minimum above top of rail. *In light rail, commuter rail, and intercity rail systems where it is not operationally or structurally feasible to meet the horizontal gap or vertical difference requirements of part 1192 or 49 CFR part 38, mini-high platforms, car-borne or platform-mounted lifts, ramps or bridge plates or similarly manually deployed devices, meeting the requirements of 49 CFR part 38, shall suffice.*

EXCEPTION: Where vehicles are boarded from sidewalks or street- level, low-level platforms shall be permitted to be less than 8 inches (205 mm).

Advisory 810.5.3 Platform and Vehicle Floor Coordination. The height and position of a platform must be coordinated with the floor of the vehicles it serves to minimize the vertical and horizontal gaps, in accordance with the ADA Accessibility Guidelines for Transportation Vehicles (36 CFR Part 1192). The vehicle guidelines, divided by bus, van, light rail, rapid rail, commuter rail, intercity rail, are available at www.access-board.gov. The preferred alignment is a high platform, level with the vehicle floor. In some cases, the vehicle guidelines permit use of a low platform in conjunction with a lift or ramp. Most such low platforms must have a minimum height of eight inches above the top of the rail. Some vehicles are designed to be boarded from a street or the sidewalk along the street and the exception permits such boarding areas to be less than eight inches high.

810.6 Rail Station Signs. Rail station signs shall comply with 810.6.

EXCEPTION. Signs shall not be required to comply with 810.6.1 and 810.6.2 where audible signs are remotely transmitted to hand-held receivers, or are user- or proximity-actuated.

Advisory 810.6 Rail Station Signs Exception. Emerging technologies such as an audible sign systems using infrared transmitters and receivers may provide greater accessibility in the transit environment than traditional Braille and raised letter signs. The transmitters are placed on or next to print signs and transmit their information to an infrared receiver that is held by a person. By scanning an area, the person will hear the sign. This means that signs can be placed well out of reach of Braille readers, even on parapet walls and on walls beyond barriers. Additionally, such signs can be used to provide wayfinding information that cannot be efficiently conveyed on Braille signs.

E108.3 Bus shelters. Where provided, new or replaced bus shelters shall provide a minimum clear floor or ground space complying with ICC/ANSI A117.1. Such shelters shall be connected by an accessible route to the boarding area required by E108.2.

E108.4 Signs. New bus route identification signs shall comply with ICC/ANSI A117.1.

Exception: Bus schedules, timetables and maps that are posted at the bus stop or bus bay are not required to comply with this requirement.

E108.5 Bus stop siting. Bus stop sites shall be chosen such that, to the maximum extent practicable, the areas where lifts or ramps are to be deployed comply with Sections E108.2 and E108.3.

SECTION E109
FIXED TRANSPORTATION FACILITIES AND STATIONS

E109.1 General. Fixed transportation facilities and stations shall comply with the applicable provisions of Sections E109.2 through E109.4.

E109.2 New construction. New stations in rapid rail, light rail, commuter rail, intercity bus, intercity rail, high speed rail and other fixed guideway systems shall comply with Sections E109.2.1 through E109.2.9.

E109.2.1 Station entrances. Where different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall comply with Section 1104 and ICC/ANSI A117.1. Accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public. In below ground subway stations, at least one entrance to each station shall comply with Section 1104 and ICC/ANSI A117.1.

E109.2.2 Signs. Signage in fixed transportation facilities and stations shall comply with Sections E109.2.2.1 through E109.2.2.3.

E109.2.2.1 Tactile signs. Where signs are provided at entrances to stations identifying the station or the entrance, or both, at least one sign at each entrance shall be tactile and shall comply with ICC/ANSI A117.1. Such signs shall be placed in uniform locations at entrances within the transit system to the maximum extent practicable.

Exception: Where the station has no defined entrance but signs are provided, the tactile signs shall be placed in a central location.

E109.2.2.2 Identification signs. Stations covered by this section shall have identification signs complying with ICC/ANSI A117.1. Signs shall be clearly visible and within the sightlines of a standing or sitting passenger from within the train on both sides when not obstructed by another train.

E109.2.2.3 Informational signs. Lists of stations, routes and destinations served by the station which are located on boarding areas, platforms, or mezzanines shall comply with ICC/ANSI A117.1. A minimum of one tactile sign identifying the specific station and complying with ICC/ANSI A117.1 shall be provided on each platform or boarding area. Signs covered by this provision shall, to the maximum extent practicable, be placed in uniform locations within the transit system.

Exception: Where sign space is limited, track numbers, train destination names, directions to the ticket office, and information essential to using the transit system shall have a character height of 3 inches (76 mm) minimum and shall comply with ICC/ANSI A117.1. Specific exit street names, directional information, and other information not essential to use of the transit system shall have a character height of 1.5 inches (38 mm) minimum and shall comply with ICC/ANSI A117.1.

E109.2.3 Fare machines. Self-service fare vending, collection and adjustment machines shall comply with ICC/ANSI A117.1. Where self-service fare vending, collection or adjustment machines are provided for the use of the general public, at least one accessible machine of each type provided shall be provided at each accessible point of entry or exit.

E109.2.4 Rail-to-platform height. In stations covered by this section, rail-to-platform height shall be coordinated with the floor height of new vehicles so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 0.625 inch (15.9 mm) under normal passenger load conditions. For rapid rail, light rail, commuter rail, high speed rail, and intercity rail systems in new stations, the horizontal gap, measured when the new vehicle is at rest, shall be 3 inches (76 mm) maximum. For slow-moving automated guideway "people mover" transit systems, the horizontal gap in new stations shall be 1 inch (25.4 mm) maximum.

Exceptions:

1. For existing vehicles operating in new light rail, commuter rail, high speed rail, and intercity rail stations, the maximum vertical difference with respect to the new platform shall be plus or minus 1.5 inches (38 mm).

2. In light rail, commuter rail and intercity rail systems where it is not operationally or structurally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, carborne or platform-mounted lifts, ramps or bridge plates, or similar manually deployed devices meeting the applicable requirements of 36 CFR Part 1192, or 49 CFR Part 38 shall suffice.

E109.2.5 TTYs. Where a public pay telephone is provided in a transit facility (as defined by the Department of Transportation) at least one public TTY complying with ICC/ANSI A117.1 shall be provided in the station. Where four or more public pay telephones serve a particular entrance to a rail station, at least one TTY telephone complying with ICC/ANSI A117.1 shall be provided to serve that entrance.

E109.2.6 Track crossings. Where it is necessary to cross tracks to reach boarding platforms, the route surface shall be level with the rail top at the outer edge and between the rails, except for a 2.5 inch (64 mm) maximum gap on the inner edge of each rail to permit passage of wheel flanges. Where gap reduction is not practicable, an above-grade or below-grade accessible route shall be provided.

E109.2.7 Public address systems. Where public address systems are provided to convey information to the public in terminals, stations or other fixed facilities, a means of conveying the same or equivalent information to persons with hearing loss or who are deaf shall be provided.

E109.2.8 Clocks. Where clocks are provided for use by the general public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals and digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are mounted overhead, numerals and digits shall comply with ICC/ANSI A117.1.

E109.2.9 Escalators. Where provided in below-grade stations, escalators shall have a clear width of 32 inches (813 mm) minimum.

E109.3 Existing facilities: key stations. Rapid, light and commuter rail key stations, as defined under criteria established by the Department of Transportation in Subpart C of 49 CFR Part 37, and existing intercity rail stations shall comply with Sections E109.3.1 through E109.3.3.

E109.3.1 Accessible route. At least one accessible route from an accessible entrance to those areas necessary for use of the transportation system shall be provided. The accessible route shall include the features specified in Section E109.2, except that escalators shall not be required to comply with Section E109.2.9. Where technical infeasibility in existing stations requires the accessible route to lead from the public way to a paid area of the transit system, an accessible fare collection machine complying with Section E109.2.3 shall be provided along such accessible route.

E109.3.2 Rail-to-platform height. In light rail and commuter rail key stations, the platform or a portion thereof and the vehicle floor shall be coordinated so that the vertical difference, measured when the vehicle is at rest, within plus or minus 1.5 inches (38 mm) under normal passenger load conditions, and the horizontal gap, measured when the vehicle is at rest, is 3 inches (76 mm) maximum for at least one door of each vehicle or car required to be accessible by 49 CFR Part 37.

Exceptions:

1. Existing vehicles retrofitted to meet the requirements of 49 CFR Part 37.93 (one-car-per-train rule) shall be coordinated with the platform such that, for at least one door, the vertical difference between the vehicle floor and the platform, measured when the vehicle is at rest with 50 percent normal passenger capacity, is within plus or minus 2 inches (51 mm) and the horizontal gap is 4 inches (102 mm) maximum.
2. Where it is not structurally or operationally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, carborne or platform mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 CFR Part 1192 shall suffice.

E109.3.3 Direct connections. New direct connections to commercial, retail or residential facilities shall, to the maximum extent feasible, have an accessible route complying with Section 3408.6 from the point of connection to boarding platforms and transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and transportation system elements used by the public.

E109.4 Existing facilities: alterations. For the purpose of complying with 3408.6, an area of primary function shall be as defined by applicable provisions of 49 CFR Part 37.43(c) or 28 CFR Part 36.403.

SECTION E110
AIRPORTS

E110.1 New construction. New construction of airports shall comply with Sections E110.2 through E110.4.

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Title 36: Parks, Forests, and Public Property

PART 1192—AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES FOR TRANSPORTATION VEHICLES

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Subpart C—Rapid Rail Vehicles and Systems

Subpart D—Light Rail Vehicles and Systems

Subpart E—Commuter Rail Cars and Systems

Subpart F—Intercity Rail Cars and Systems

Authority: 42 U.S.C. 12204.

Source: 56 FR 45558, Sept. 6, 1991, unless otherwise noted.

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Subpart A—General

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§1192.1 Purpose.

This part provides minimum guidelines and requirements for accessibility standards to be issued by the Department of Transportation in 49 CFR part 37 for transportation vehicles required to be accessible by the Americans with Disabilities Act (ADA) of 1990 (42 U.S.C. 12101 *et seq*).

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§1192.2 Equivalent facilitation.

Departures from particular technical and scoping requirements of these guidelines by use of other designs and technologies are permitted where the alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the vehicle. Departures are to be considered on a case-by-case

unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plate, and station platform and ramp or bridge plate, shall not exceed 5/8 inch.

(ii) *Exception.* Ramps or bridge plates which are attached to, and deployed from, station platforms are permitted in lieu of vehicle devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

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§1192.85 Between-car barriers.

Where vehicles operate in a high-platform, level-boarding mode, devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors or other suitable devices.

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§1192.87 Public information system.

(a) Each vehicle shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved]

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Subpart E—Commuter Rail Cars and Systems

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§1192.91 General.

(a) New, used and remanufactured commuter rail cars, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with this subpart.

(b) If portions of the car are modified in such a way that it affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible cars be retrofitted with lifts, ramps or other boarding devices.

(c)(1) Commuter rail cars shall comply with §§1192.93(d) and 1192.109 for level boarding wherever structurally and operationally practicable.

(2) Where level boarding is not structurally or operationally practicable, commuter rail cars shall comply with §1192.95.

(d) Existing vehicles retrofitted to comply with the “one-car-per-train rule” at 49 CFR 37.93 shall comply with §§1192.93(e), 1192.95(a) and 1192.107 and shall have, in new and key stations, at least one door on each side from which passengers board which complies with §1192.93(d). Vehicles previously designed and manufactured in accordance with the program accessibility requirements of section 504 of the Rehabilitation Act of 1973, or implementing regulations issued by the Department of Transportation that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of 49 CFR 37.93.

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§1192.93 Doorways.

(a) *Clear width.* (1) At least one door on each side of the car from which passengers board opening onto station platforms and at least one adjacent doorway into the passenger coach compartment, if provided, shall have a minimum clear opening of 32 inches.

(2) If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have, to the maximum extent practicable in accordance with the regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR parts 229 and 231), a clear opening of 30 inches.

(b) *Passageways.* A route at least 32 inches wide shall be provided from doorways required to be accessible by paragraph (a)(1) of this section to seating locations complying with §1192.95(d). In cars where such doorways

require passage through a vestibule, such vestibule shall have a minimum width of 42 inches. (See Fig. 3)

(c) *Signals.* If doors to the platform close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platform*—(1) *Requirements.* Cars operating in stations with high platforms, or mini-high platforms, shall be coordinated with the boarding platform design such that the horizontal gap between a car at rest and the platform shall be no greater than 3 inches and the height of the car floor shall be within plus or minus $\frac{5}{8}$ inch of the platform height. Vertical alignment may be accomplished by car air suspension, platform lifts or other devices, or any combination.

(2) *Exception.* New vehicles operating in existing stations may have a floor height within plus or minus $1\frac{1}{2}$ inches of the platform height. At key stations, the horizontal gap between at least one accessible door of each such vehicle and the platform shall be no greater than 3 inches.

(3) *Exception.* Where platform set-backs do not allow the horizontal gap or vertical alignment specified in paragraph (d) (1) or (2) of this section, car, platform or portable lifts complying with §1192.95(b), or car or platform ramps or bridge plates, complying with §1192.95(c), shall be provided.

(4) *Exception.* Retrofitted vehicles shall be coordinated with the platform in new and key stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

(e) *Signage.* The International Symbol of Accessibility shall be displayed on the exterior of all doors complying with this section unless all cars are accessible and are not marked by the access symbol (See Fig. 6). Appropriate signage shall also indicate which accessible doors are adjacent to an accessible restroom, if applicable.

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§1192.95 Mobility aid accessibility.

(a)(1) *General.* All new commuter rail cars, other than level entry cars, covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) complying with either paragraph (b) or (c) of this section; sufficient clearances to permit a wheelchair or mobility aid user to reach a seating location; and at least two wheelchair or mobility aid seating locations complying with paragraph (d) of this section.

(2) *Exception.* If portable or platform lifts, ramps or bridge plates meeting the applicable requirements of this section are provided on station platforms or other stops, or mini-high platforms complying with §1192.93(d) are provided, at stations or stops required to be accessible by 49 CFR part 37, the car is not required to be equipped with a car-borne device. Where each new car is compatible with a single platform-mounted access system or device, additional systems or devices are not required for each car provided that the single device could be used to provide

access to each new car if passengers using wheelchairs or mobility aids could not be accommodated on a single car.

(b) *Car Lift*—(1) *Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls*—(i) *Requirements.* The controls shall be interlocked with the car brakes, propulsion system, or door, or shall provide other appropriate mechanisms or systems, to ensure that the car cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all platform levels normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where physical or safety constraints prevent the deployment at some stops of a lift having its long dimension perpendicular to the car axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the car axis and which pivots into or out of the car while occupied (i.e., “rotary lift”). The requirements of paragraph (b)(2)(i) of this section prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(iii) *Exception.* The brake or propulsion system interlock requirement does not apply to a platform mounted or portable lift provided that a mechanical, electrical or other system operates to ensure that cars do not move when the lift is in use.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground or platform level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift intended to be stowed while occupied.

(4) *Power or equipment failure.* Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers.* The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the car until the lift is in its fully raised position. Each

side of the lift platform which, in its raised position, extends beyond the car shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with maneuvering into or out of the car. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground or station platform level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift platform is more than 3 inches above the station platform and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface.* The lift platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The lift platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the lift platform surface to 30 inches above the surface, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface. (See Fig. 1)

(7) *Platform gaps.* Any openings between the lift platform surface and the raised barriers shall not exceed ⅝ inch wide. When the lift is at car floor height with the inner barrier down (if applicable) or retracted, gaps between the forward lift platform edge and car floor shall not exceed ½ inch horizontally and ⅝ inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1½ inches by 4½ inches located between the edge barriers.

(8) *Platform entrance ramp.* The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, when measured on level ground, for a maximum rise of 3 inches, and the transition from station platform to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection.* The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the lift platform.

(10) *Platform movement.* No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction.* The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids.

(12) *Use by standees.* Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise

have difficulty using steps. The lift may be marked to indicate a preferred standing position.

(13) *Handrails.* Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(c) *Car ramp or bridge plate*—(1) *Design load.* Ramps or bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp or bridge plate distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps or bridge plates shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface.* The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than ¼ inch high, shall have a clear width of 30 inches and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold.* The transition from station platform to the ramp or bridge plate and the transition from car floor to the ramp or bridge plate may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers.* Each side of the ramp or bridge plate shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope.* Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment*—(i) *Requirement.* When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plates, and station

platform and ramp or bridge plate, shall not exceed 5/8 inch.

(ii) *Exception.* Ramps or bridge plates which are attached to, and deployed from, station platforms are permitted in lieu of car devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the car while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(d) *Mobility aid seating location.* Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor space 48 inches by 30 inches. Such spaces shall adjoin, and may overlap, an accessible path. Not more than 6 inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 inches from the floor to the lowest part of the seat overhanging the space. Seating spaces may have fold-down or removable seats to accommodate other passengers when a wheelchair or mobility aid user is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required. (See Fig. 2)

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§1192.97 Interior circulation, handrails and stanchions.

(a) Where provided, handrails or stanchions within the passenger compartment shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location, complying with §1192.95(d), from an accessible entrance. The diameter or width of the gripping surface of interior handrails and stanchions shall be 1¼ inches to 1½ inches or shall provide an equivalent gripping surface. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface.

(b) Where provided, handrails or stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(c) At entrances equipped with steps, handrails or stanchions shall be provided in the entrance to the car in a

configuration which allows passengers to grasp such assists from outside the car while starting to board, and to continue using such assists throughout the boarding process, to the extent permitted by 49 CFR part 231.

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§1192.99 Floors, steps and thresholds.

(a) Floor surfaces on aisles, step treads, places for standees, and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All thresholds and step edges shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light.

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§1192.101 Lighting.

(a) Any stepwell or doorway with a lift, ramp or bridge plate shall have, when the door is open, at least 2 footcandles of illumination measured on the step tread, ramp, bridge plate, or lift platform.

(b) The doorways of cars not operating at lighted station platforms shall have outside lights which, when the door is open, provide at least 1 footcandle of illumination on the station platform surface for a distance of 3 feet perpendicular to all points on the bottom step tread edge. Such lights shall be shielded to protect the eyes of entering and exiting passengers.

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§1192.103 Public information system.

(a) Each car shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved]

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§1192.105 Priority seating signs.

(a) Each car shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities and that other passengers should make such seats available to those who wish to use them.

(b) Characters on signs required by paragraph (a) shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of $\frac{5}{8}$ inch, with "wide" spacing (generally, the space between letters shall be $\frac{1}{16}$ the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light.

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§1192.107 Restrooms.

(a) If a restroom is provided for the general public, it shall be designed so as to allow a person using a wheelchair or mobility aid to enter and use such restroom as specified in paragraphs (a) (1) through (5) of this section.

(1) The minimum clear floor area shall be 35 inches by 60 inches. Permanently installed fixtures may overlap this area a maximum of 6 inches, if the lowest portion of the fixture is a minimum of 9 inches above the floor, and may overlap a maximum of 19 inches, if the lowest portion of the fixture is a minimum of 29 inches above the floor, provided such fixtures do not interfere with access to the water closet. Fold-down or retractable seats or shelves may overlap the clear floor space at a lower height provided they can be easily folded up or moved out of the way.

(2) The height of the water closet shall be 17 inches to 19 inches measured to the top of the toilet seat. Seats shall not be sprung to return to a lifted position.

(3) A grab bar at least 24 inches long shall be mounted behind the water closet, and a horizontal grab bar at least 40 inches long shall be mounted on at least one side wall, with one end not more than 12 inches from the back wall, at a height between 33 inches and 36 inches above the floor.

(4) Faucets and flush controls shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N). Controls for flush valves shall be mounted no more than 44 inches above the floor.

(5) Doorways on the end of the enclosure, opposite the water closet, shall have a minimum clear opening width of 32 inches. Doorways on the side wall shall have a minimum clear opening width of 39 inches. Door latches and hardware shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

(b) Restrooms required to be accessible shall be in close proximity to at least one seating location for persons using mobility aids and shall be connected to such a space by an unobstructed path having a minimum width of 32 inches.

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§1192.109 Between-car barriers.

Where vehicles operate in a high-platform, level-boarding mode, and where between-car bellows are not provided, devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors or other suitable devices.

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Subpart F—Intercity Rail Cars and Systems

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§1192.111 General.

(a) New, used and remanufactured intercity rail cars, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with this subpart to the extent required for each type of car as specified below.

(1) Single-level rail passenger coaches and food service cars (other than single-level dining cars) shall comply with §§1192.113 through 1192.123. Compliance with §1192.125 shall be required only to the extent necessary to meet the requirements of paragraph (d) of this section.

(2) Single-level dining and lounge cars shall have at least one connecting doorway complying with §1192.113(a)(2), connected to a car accessible to persons using wheelchairs or mobility aids, and at least one space complying with §1192.125(d)(2) and (3), to provide table service to a person who wishes to remain in his or her wheelchair, and space to fold and store a wheelchair for a person who wishes to transfer to an existing seat.

(3) Bi-level dining cars shall comply with §§1192.113(a)(2), 1192.115(b), 1192.117(a), and 1192.121.

(4) Bi-level lounge cars shall have doors on the lower level, on each side of the car from which passengers board, complying with §1192.113, a restroom complying with §1192.123, and at least one space complying with §1192.125(d)(2) and (3) to provide table service to a person who wishes to remain in his or her wheelchair and space to fold and store a wheelchair for a person who wishes to transfer to an existing seat.

(5) Restrooms complying with §1192.123 shall be provided in single-level rail passenger coaches and food service cars adjacent to the accessible seating locations required by paragraph (d) of this section. Accessible restrooms are required in dining and lounge cars only if restrooms are provided for other passengers.

(6) Sleeper cars shall comply with §§1192.113(b) through (d), 1192.115 through 1192.121, and 1192.125, and have at least one compartment which can be entered and used by a person using a wheelchair or mobility aid and complying with §1192.127.

ELECTRONIC CODE OF FEDERAL REGULATIONS

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Title 49: Transportation
PART 37—TRANSPORTATION SERVICES FOR INDIVIDUALS WITH DISABILITIES (ADA)
Subpart C—Transportation Facilities

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§37.41 Construction of transportation facilities by public entities.

(a) A public entity shall construct any new facility to be used in providing designated public transportation services so that the facility is readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. This requirement also applies to the construction of a new station for use in intercity or commuter rail transportation. For purposes of this section, a facility or station is "new" if its construction begins (*i.e.*, issuance of notice to proceed) after January 25, 1992, or, in the case of intercity or commuter rail stations, after October 7, 1991.

(b) (1) Full compliance with the requirements of this section is not required where an entity can demonstrate that it is structurally impracticable to meet the requirements. Full compliance will be considered structurally impracticable only in those rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features.

(2) If full compliance with this section would be structurally impracticable, compliance with this section is required to the extent that it is not structurally impracticable. In that case, any portion of the facility that can be made accessible shall be made accessible to the extent that it is not structurally impracticable.

(3) If providing accessibility in conformance with this section to individuals with certain disabilities (e.g., those who use wheelchairs) would be structurally impracticable, accessibility shall nonetheless be ensured to persons with other types of disabilities (e.g., those who use crutches or who have sight, hearing, or mental impairments) in accordance with this section.

[56 FR 45621, Sept. 6, 1991, as amended at 71 FR 63266, Oct. 30, 2006]

Railroad Accident Brief

Passenger Fatality on Long Island Rail Road

Queens, New York

August 5, 2006

NTSB Number: RAB-09-01

Adopted: March 13, 2009

PDF

Accident Synopsis

On August 5, 2006, about 3:53 p.m. [1], a 5-foot 6-inch, 110-pound, 18-year-old female passenger exiting a Long Island Rail Road (LIRR) commuter train at Woodside station in Queens, New York, fell through a 7 7/8-inch horizontal gap between the rail car and the station platform. (See figure 1.) After falling through the gap to track level beneath the platform, she did not follow instructions from the train conductor and her friends to remain still and wait to be rescued. Instead, the woman crawled under the platform and into the path of an oncoming passenger train. She sustained fatal injuries. Toxicology testing showed that her blood alcohol concentration (BAC) was 0.23 gram percent. [2] The weather at the time of the accident was sunny, clear, and warm.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the passenger fatality on August 5, 2006, at the Long Island Rail Road Woodside station in Queens, New York, was the passenger falling through a gap between the rail car and the platform while attempting to disembark the train, not following instructions from the train conductor to remain still until help arrived, and then crawling under the platform and into the path of a moving train on the opposite side of the platform. Contributing to the accident was the passenger's alcohol-impaired condition.

The Accident

The passenger was part of a group en route to a concert on Randall's Island in New York City. Some of the group had met earlier and had begun to drink alcohol before arriving at the LIRR Merrick station, where they met with more friends. They planned to travel on the LIRR from Merrick station to Jamaica station and then change trains for Woodside station, where they would take a bus to Randall's Island. At Jamaica station, they boarded train 6113 (car 7548) to Woodside station. According to witnesses, many in the group had brought alcoholic beverages on board and were drinking on the train.

Figure 1. Gap into which passenger fell.

The event recorder from the locomotive showed that train 6113 stopped at the Woodside station alongside platform B on main line track 3 about 3:52 p.m. Platform B is an open, center, high-level platform [3] that allows trains to operate on both sides. (See figure 2.) After the train had stopped, the conductor opened the doors and the passengers began to exit. One passenger said that she noticed the gap between the car and the platform and yelled to the others, "watch the gap." One of the group of friends traveling together said that as she exited the train, she turned and saw the door begin to close and her friend grab the door with both hands to prevent it from closing. Passengers on the platform yelled to the conductor to reopen the doors. When the conductor reopened the doors, the friend lost her balance and fell forward into the gap and onto the ground beneath the platform. [4]

7. Fare Machines **Requested Relief:** UTA to install one ticket machine near the north access walkway of the Pleasant View station to satisfy **ADA 220.1.** **8.8 Fare Collection Equipment** "There shall be two ticket vending machines and a minimum of two electronic fare card readers ***at each station entrance point***, but not on the platform." UTA Commuter Rail Design Criteria, 8-20 (emphasis added). Ex. I.	**220.1 General.** Where automatic teller machines or self-service fare vending, collection, or adjustment machines are provided, at least one of each type provided at each location shall comply with 707. **Advisory 220.1 General.** If a bank provides both interior and exterior ATMs, each such installation is considered a separate location. **IBC 2006** **E109.2.3 Fare machines.** Self-service fare vending, collection and adjustment machines shall comply with ICC A117.1, Section 707. Where self-service fare vending, collection or adjustment machines are provided for the use of the general public, at least ***one accessible machine of each type provided shall be provided at each accessible point of entry*** and exit. (Emphasis added.) **IBC 2009 E109.2.3 Fare Machines Commentary:** . . .The requirements are the same as for ATM machines. If self-service machines are provided, at least one accessible machine must be provided along the ***accessible route between the entrance and the platform.***(Emphasis added).	**Pleasant View Violation:** North Access Machine - none South Access Machine - yes **Model Satisfies ADA:** Ogden has fare vending machines at north and south accessible routes: North Access Machine - yes South Access Machine - yes

220 Automatic Teller Machines and Fare Machines

220.1 General. Where automatic teller machines or self-service fare vending, collection, or adjustment machines are provided, at least one of each type provided at each location shall comply with 707. Where bins are provided for envelopes, waste paper, or other purposes, at least one of each type shall comply with 811.

> **Advisory 220.1 General.** If a bank provides both interior and exterior ATMs, each such installation is considered a separate location. Accessible ATMs, including those with speech and those that are within reach of people who use wheelchairs, must provide all the functions provided to customers at that location at all times. For example, it is unacceptable for the accessible ATM only to provide cash withdrawals while inaccessible ATMs also sell theater tickets.

221 Assembly Areas

221.1 General. *Assembly areas* shall provide *wheelchair spaces*, companion seats, and designated aisle seats complying with 221 and 802. In addition, lawn seating shall comply with 221.5.

221.2 Wheelchair Spaces. *Wheelchair spaces* complying with 221.2 shall be provided in *assembly areas* with fixed seating.

221.2.1 Number and Location. *Wheelchair spaces* shall be provided complying with 221.2.1.

221.2.1.1 General Seating. *Wheelchair spaces* complying with 802.1 shall be provided in accordance with Table 221.2.1.1.

Table 221.2.1.1 Number of Wheelchair Spaces in Assembly Areas

Number of Seats	Minimum Number of Required Wheelchair Spaces
4 to 25	1
26 to 50	2
51 to 150	4
151 to 300	5
301 to 500	6
501 to 5000	6, plus 1 for each 150, or fraction thereof, between 501 through 5000
5001 and over	36, plus 1 for each 200, or fraction thereof, over 5000

E108.3 Bus shelters. Where provided, new or replaced bus shelters shall provide a minimum clear floor or ground space complying with ICC/ANSI A117.1. Such shelters shall be connected by an accessible route to the boarding area required by E108.2.

E108.4 Signs. New bus route identification signs shall comply with ICC/ANSI A117.1.

Exception: Bus schedules, timetables and maps that are posted at the bus stop or bus bay are not required to comply with this requirement.

E108.5 Bus stop siting. Bus stop sites shall be chosen such that, to the maximum extent practicable, the areas where lifts or ramps are to be deployed comply with Sections E108.2 and E108.3.

SECTION E109
FIXED TRANSPORTATION FACILITIES AND STATIONS

E109.1 General. Fixed transportation facilities and stations shall comply with the applicable provisions of Sections E109.2 through E109.4.

E109.2 New construction. New stations in rapid rail, light rail, commuter rail, intercity bus, intercity rail, high speed rail and other fixed guideway systems shall comply with Sections E109.2.1 through E109.2.9.

E109.2.1 Station entrances. Where different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall comply with Section 1104 and ICC/ANSI A117.1. Accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public. In below ground subway stations, at least one entrance to each station shall comply with Section 1104 and ICC/ANSI A117.1.

E109.2.2 Signs. Signage in fixed transportation facilities and stations shall comply with Sections E109.2.2.1 through E109.2.2.3.

E109.2.2.1 Tactile signs. Where signs are provided at entrances to stations identifying the station or the entrance, or both, at least one sign at each entrance shall be tactile and shall comply with ICC/ANSI A117.1. Such signs shall be placed in uniform locations at entrances within the transit system to the maximum extent practicable.

Exception: Where the station has no defined entrance but signs are provided, the tactile signs shall be placed in a central location.

E109.2.2.2 Identification signs. Stations covered by this section shall have identification signs complying with ICC/ANSI A117.1. Signs shall be clearly visible and within the sightlines of a standing or sitting passenger from within the train on both sides when not obstructed by another train.

E109.2.2.3 Informational signs. Lists of stations, routes and destinations served by the station which are located on boarding areas, platforms, or mezzanines shall comply with ICC/ANSI A117.1. A minimum of one tactile sign identifying the specific station and complying with ICC/ANSI A117.1 shall be provided on each platform or boarding area. Signs covered by this provision shall, to the maximum extent practicable, be placed in uniform locations within the transit system.

Exception: Where sign space is limited, track numbers, train destination names, directions to the ticket office, and information essential to using the transit system shall have a character height of 3 inches (76 mm) minimum and shall comply with ICC/ANSI A117.1. Specific exit street names, directional information, and other information not essential to use of the transit system shall have a character height of 1.5 inches (38 mm) minimum and shall comply with ICC/ANSI A117.1.

E109.2.3 Fare machines. Self-service fare vending, collection and adjustment machines shall comply with ICC/ANSI A117.1. Where self-service fare vending, collection or adjustment machines are provided for the use of the general public, at least one accessible machine of each type provided shall be provided at each accessible point of entry or exit.

E109.2.4 Rail-to-platform height. In stations covered by this section, rail-to-platform height shall be coordinated with the floor height of new vehicles so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 0.625 inch (15.9 mm) under normal passenger load conditions. For rapid rail, light rail, commuter rail, high speed rail, and intercity rail systems in new stations, the horizontal gap, measured when the new vehicle is at rest, shall be 3 inches (76 mm) maximum. For slow-moving automated guideway "people mover" transit systems, the horizontal gap in new stations shall be 1 inch (25.4 mm) maximum.

Exceptions:

1. For existing vehicles operating in new light rail, commuter rail, high speed rail, and intercity rail stations, the maximum vertical difference with respect to the new platform shall be plus or minus 1.5 inches (38 mm).

PLEASANT VIEW STATION OVERALL VIEW

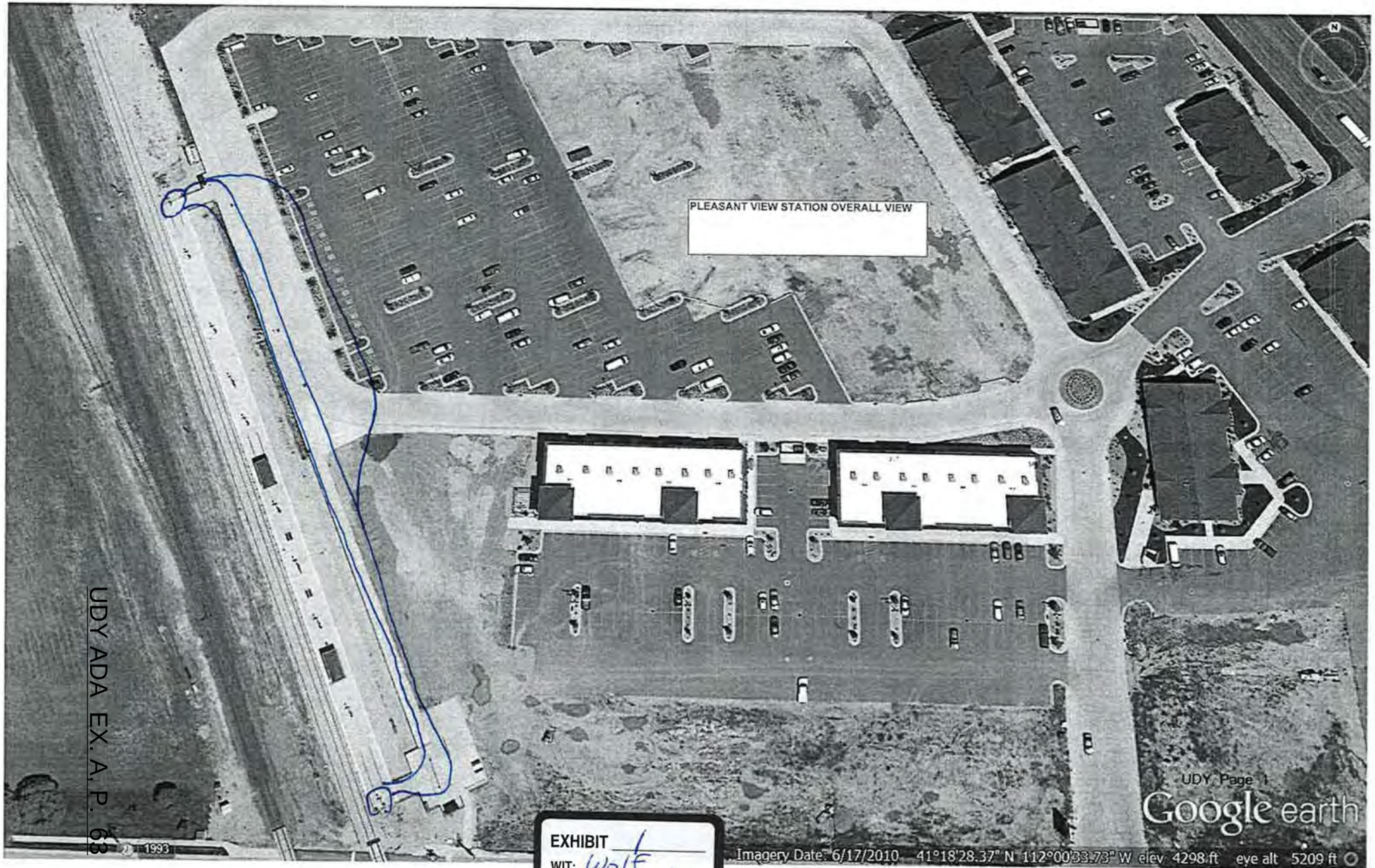
N

1993

Imagery Date: 6/17/2010 41°18'28.37" N 112°00'33.73" W elev 4298 ft eye alt 5209 ft

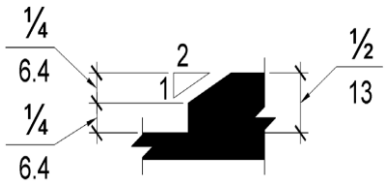
Google earth

UDY ADA EX. A, P. 62



UDY ADA EX. A, P. 63

EXHIBIT 1
WIT: Wolf
DATE: 12/23/13
Jennifer A. Russell, RPR

8. Tactile & Maintenance **Requested Relief.** UTA to timely : (a) remove the tactile strip from the Pleasant View walkway access per (**ADA 810.5.2**); (b) replace malfunctioning light bulbs, eliminate the existing trip hazards (exceeding 1/2 inch, per **ADA 303.3** and **49 CFR §37.161**), which includes remove snow from the 60 inch wide disabled parking access aisles. **ADA 502.4**.	**705.2 Platform Edges.** *Detectable warning* surfaces at platform boarding edges shall be 24 inches (610 mm) wide and shall extend the full length of the *public use* areas of the platform. **810.5.2 Detectable Warnings.** Platform boarding edges not protected by platform screens or guards shall have *detectable warnings* complying with 705 along the full length of the *public use* area of the platform. **plat·form :** a flat surface that is raised higher than the floor or ground . . . : a flat area next to railroad tracks where people wait for a train or subway . . . http://www.merriam-webster.com/dictionary/platform **502.4 Floor or Ground Surfaces.** Parking *spaces* and access aisles serving them shall comply with 302. Access aisles shall be at the same level as the parking *spaces* they serve. Changes in level are not permitted. **303.3 Beveled.** Changes in level between ¼ inch (6.4 mm) high minimum and ½ inch (13 mm) high maximum shall be beveled with a slope not steeper than 1:2.  	"The detectable warning surface shall be located so that the edge nearest the rail crossing is 6 foot (1830 mm) minimum and 15 foot (4570 mm) maximum from the centerline of the nearest rail." **ICC A117.1-2009805.10** **Maintenance of accessible features: General.** "(a) Public and private entities providing transportation services shall maintain in operative condition those features of facilities and vehicles that are required to make the vehicles and facilities readily accessible to and usable by individuals with disabilities. . . . (b) Accessibility features shall be repaired promptly if they are damaged or out of order." **49 CFR §37.161**

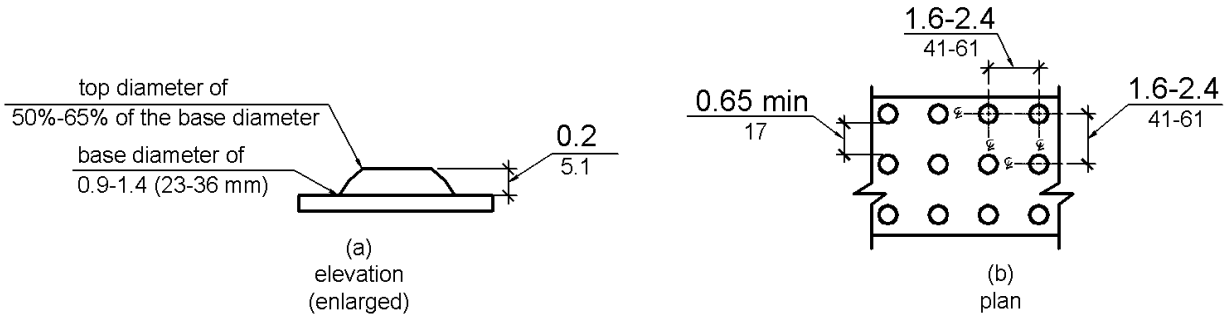


Figure 705.1
Size and Spacing of Truncated Domes

705.2 Platform Edges. *Detectable warning* surfaces at platform boarding edges shall be 24 inches (610 mm) wide and shall extend the full length of the *public use* areas of the platform.

706 Assistive Listening Systems

706.1 General. *Assistive listening systems* required in *assembly areas* shall comply with 706.

Advisory 706.1 General. Assistive listening systems are generally categorized by their mode of transmission. There are hard-wired systems and three types of wireless systems: induction loop, infrared, and FM radio transmission. Each has different advantages and disadvantages that can help determine which system is best for a given application. For example, an FM system may be better than an infrared system in some open-air assemblies since infrared signals are less effective in sunlight. On the other hand, an infrared system is typically a better choice than an FM system where confidential transmission is important because it will be contained within a given space.

The technical standards for assistive listening systems describe minimum performance levels for volume, interference, and distortion. Sound pressure levels (SPL), expressed in decibels, measure output sound volume. Signal-to-noise ratio (SNR or S/N), also expressed in decibels, represents the relationship between the loudness of a desired sound (the signal) and the background noise in a space or piece of equipment. The higher the SNR, the more intelligible the signal. The peak clipping level limits the distortion in signal output produced when high-volume sound waves are manipulated to serve assistive listening devices.

Selecting or specifying an effective assistive listening system for a large or complex venue requires assistance from a professional sound engineer. The Access Board has published technical assistance on assistive listening devices and systems.

706.2 Receiver Jacks. Receivers required for use with an *assistive listening system* shall include a 1/8 inch (3.2 mm) standard mono jack.

810.3 Bus Shelters. Bus shelters shall provide a minimum clear floor or ground *space* complying with 305 entirely within the shelter. Bus shelters shall be connected by an *accessible* route complying with 402 to a boarding and alighting area complying with 810.2.

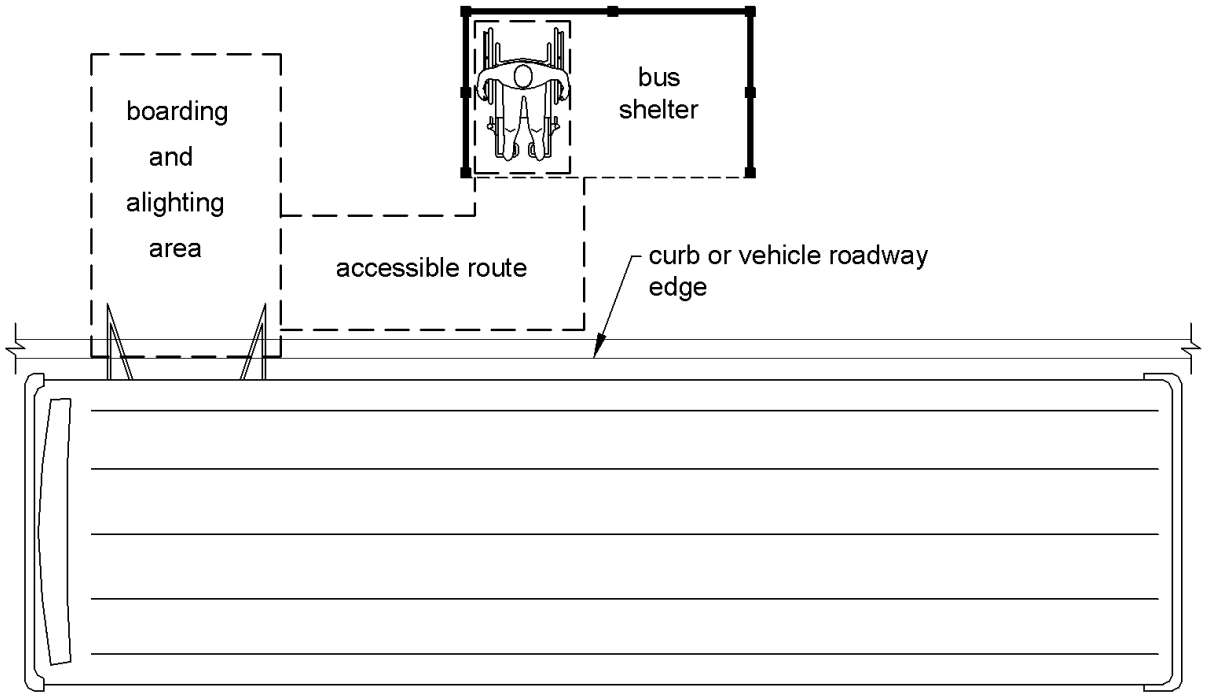


Figure 810.3
Bus Shelters

810.4 Bus Signs. Bus route identification signs shall comply with 703.5.1 through 703.5.4, and 703.5.7 and 703.5.8. In addition, to the maximum extent practicable, bus route identification signs shall comply with 703.5.5.

EXCEPTION: Bus schedules, timetables and maps that are posted at the bus stop or bus bay shall not be required to comply.

810.5 Rail Platforms. Rail platforms shall comply with 810.5.

810.5.1 Slope. Rail platforms shall not exceed a slope of 1:48 in all directions.

EXCEPTION: Where platforms serve vehicles operating on existing track or track laid in existing roadway, the slope of the platform parallel to the track shall be permitted to be equal to the slope (grade) of the roadway or existing track.

810.5.2 Detectable Warnings. Platform boarding edges not protected by platform screens or guards shall have *detectable warnings* complying with 705 along the full length of the *public use* area of the platform.

502.3 Access Aisle. Access aisles serving parking *spaces* shall comply with 502.3. Access aisles shall adjoin an *accessible* route. Two parking *spaces* shall be permitted to share a common access aisle.

Advisory 502.3 Access Aisle. Accessible routes must connect parking spaces to accessible entrances. In parking facilities where the accessible route must cross vehicular traffic lanes, marked crossings enhance pedestrian safety, particularly for people using wheelchairs and other mobility aids. Where possible, it is preferable that the accessible route not pass behind parked vehicles.

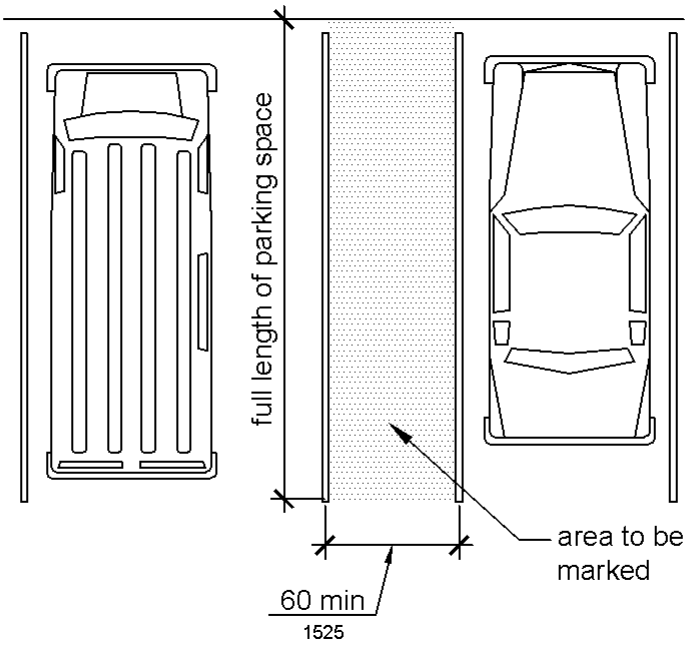


Figure 502.3
Parking Space Access Aisle

502.3.1 Width. Access aisles serving car and van parking *spaces* shall be 60 inches (1525 mm) wide minimum.

502.3.2 Length. Access aisles shall extend the full length of the parking *spaces* they serve.

502.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

Advisory 502.3.3 Marking. The method and color of marking are not specified by these requirements but may be addressed by State or local laws or regulations. Because these requirements permit the van access aisle to be as wide as a parking space, it is important that the aisle be clearly marked.

502.3.4 Location. Access aisles shall not overlap the *vehicular way*. Access aisles shall be permitted to be placed on either side of the parking *space* except for angled van parking *spaces* which shall have access aisles located on the passenger side of the parking *spaces*.

Advisory 502.3.4 Location. Wheelchair lifts typically are installed on the passenger side of vans. Many drivers, especially those who operate vans, find it more difficult to back into parking spaces than to back out into comparatively unrestricted vehicular lanes. For this reason, where a van and car share an access aisle, consider locating the van space so that the access aisle is on the passenger side of the van space.

502.4 Floor or Ground Surfaces. Parking *spaces* and access aisles serving them shall comply with 302. Access aisles shall be at the same level as the parking *spaces* they serve. Changes in level are not permitted.

EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

Advisory 502.4 Floor or Ground Surfaces. Access aisles are required to be nearly level in all directions to provide a surface for wheelchair transfer to and from vehicles. The exception allows sufficient slope for drainage. Built-up curb ramps are not permitted to project into access aisles and parking spaces because they would create slopes greater than 1:48.

502.5 Vertical Clearance. Parking *spaces* for vans and access aisles and vehicular routes serving them shall provide a vertical clearance of 98 inches (2490 mm) minimum.

Advisory 502.5 Vertical Clearance. Signs provided at entrances to parking facilities informing drivers of clearances and the location of van accessible parking spaces can provide useful customer assistance.

502.6 Identification. Parking *space* identification signs shall include the International Symbol of *Accessibility* complying with 703.7.2.1. Signs identifying van parking *spaces* shall contain the designation “van accessible.” Signs shall be 60 inches (1525 mm) minimum above the finish floor or ground surface measured to the bottom of the sign.

Advisory 502.6 Identification. The required “van accessible” designation is intended to be informative, not restrictive, in identifying those spaces that are better suited for van use. Enforcement of motor vehicle laws, including parking privileges, is a local matter.

502.7 Relationship to Accessible Routes. Parking *spaces* and access aisles shall be designed so that cars and vans, when parked, cannot obstruct the required clear width of adjacent *accessible* routes.

Advisory 502.7 Relationship to Accessible Routes. Wheel stops are an effective way to prevent vehicle overhangs from reducing the clear width of accessible routes.

805.6.1 Entrances. Where signs identify a station or a station entrance, at least one sign with raised characters and braille complying with Sections 703.3 and 703.4 shall be provided at each entrance.

805.6.2 Routes and Destinations. Lists of stations, routes and destinations served by the station that are located on boarding areas, platforms, or mezzanines shall have visual characters complying with Section 703.2. A minimum of one sign with raised characters and braille complying with Sections 703.3 and 703.4 shall be provided on each platform or boarding area to identify the specific station.

EXCEPTION: Where sign space is limited, characters shall not be required to exceed 3 inches (75 mm) in height.

805.6.3 Station Names. Stations covered by this section shall have identification signs with visual characters complying with Section 703.2. The signs shall be clearly visible and within the sight lines of a standing or sitting passenger from within the vehicle on both sides when not obstructed by another vehicle.

805.7 Public Address Systems. Where public address systems convey audible information to the public, the same or equivalent information shall be provided in a visual format.

805.8 Clocks. Where clocks are provided for use by the public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals and digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are installed overhead, numerals and digits shall be visual characters complying with Section 703.2.

805.9 Escalators. Where provided, escalators shall have a 32-inch (815mm) minimum clear width, and shall comply with Requirements 6.1.3.5.6-Step Demarcations, and 6.1.3.6.5-Flat Steps of ASME A17.1/CSA B44 listed in Section 105.2.5.

EXCEPTION: Existing escalators shall not be required to comply with Section 805.9.

805.10 Track Crossings. Where a circulation path crosses tracks, it shall comply with Section 402 and shall have a detectable warning 24 inches (610 mm) in depth complying with Section 705 extending the full width of the circulation path. The detectable warning

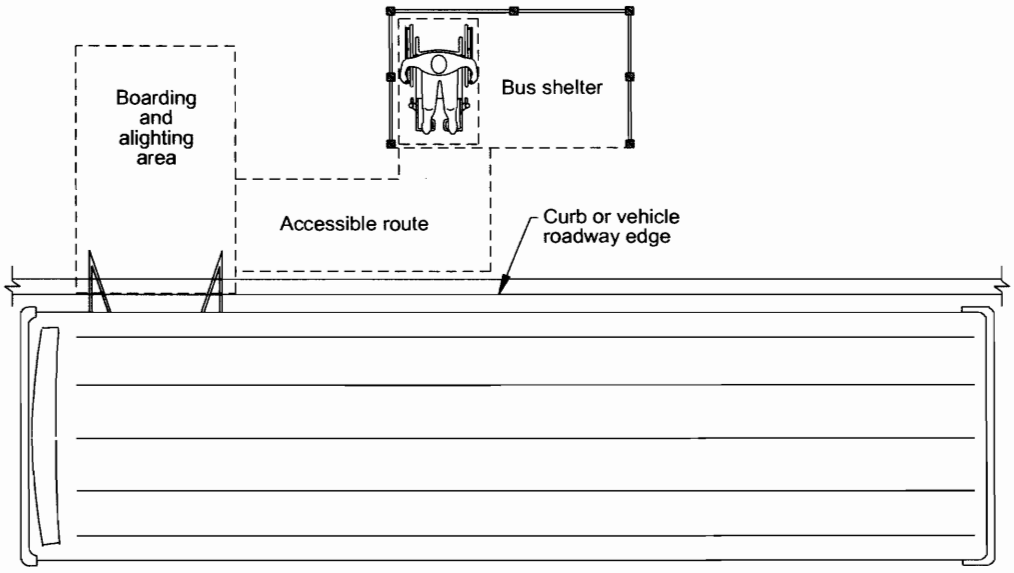


FIG. 805.3
BUS SHELTERS

FIG. 805.10
TRACK CROSSINGS

surface shall be located so that the edge nearest the rail crossing is 6 foot (1830 mm) minimum and 15 foot (4570 mm) maximum from the centerline of the nearest rail.

EXCEPTION: Openings for wheel flanges shall be permitted to be $2^1/_2$ inches (64 mm) maximum.

806 Holding Cells and Housing Cells

806.1 General. Holding cells and housing cells shall comply with Section 806.

806.2 Features for People Using Wheelchairs or Other Mobility Aids. Cells required to have features for people using wheelchairs or other mobility aids shall comply with Section 806.2.

806.2.1 Turning Space. Turning space complying with Section 304 shall be provided within the cell.

806.2.2 Benches. Where benches are provided, at least one bench shall comply with Section 903.

806.2.3 Beds. Where beds are provided, clear floor space complying with Section 305 shall be provided on at least one side of the bed. The clear floor space shall be positioned for parallel approach to the side of the bed.

806.2.4 Toilet and Bathing Facilities. Toilet facilities or bathing facilities provided as part of a cell shall comply with Section 603.

806.3 Communication Features. Cells required to have communication features shall comply with Section 806.3.

806.3.1 Alarms. Where audible emergency alarm systems are provided to serve the occupants of cells, visible alarms complying with Section 702 shall be provided.

EXCEPTION: In cells where inmates or detainees are not allowed independent means of egress, visible alarms shall not be required.

806.3.2 Telephones. Where provided, telephones within cells shall have volume controls complying with Section 704.3.

807 Courtrooms

807.1 General. Courtrooms shall comply with Section 807.

807.2 Turning Space. Where provided, each area that is raised or depressed shall provide a turning space complying with Section 304.

EXCEPTION: Levels of jury boxes not required to be accessible are not required to comply with Section 807.2.

807.3 Clear Floor Space. Within the defined area of each jury box and witness stand, a clear floor space complying with Section 305 shall be provided.

EXCEPTION: In alterations, wheelchair spaces are not required to be located within the defined area of raised jury boxes or witness stands and shall be permitted to be located outside these spaces where ramps or platform lifts restrict or project into the means of egress required by the administrative authority.

807.4 Courtroom Stations. Judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations, court reporters' stations and litigants' and counsel stations shall comply with Section 902.

807.5 Gallery seating. Gallery seating shall comply with Section 802.

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Title 49: Transportation
PART 37—TRANSPORTATION SERVICES FOR INDIVIDUALS WITH DISABILITIES (ADA)
Subpart G—Provision of Service

§37.161 Maintenance of accessible features: General.

(a) Public and private entities providing transportation services shall maintain in operative condition those features of facilities and vehicles that are required to make the vehicles and facilities readily accessible to and usable by individuals with disabilities. These features include, but are not limited to, lifts and other means of access to vehicles, securement devices, elevators, signage and systems to facilitate communications with persons with impaired vision or hearing.

(b) Accessibility features shall be repaired promptly if they are damaged or out of order. When an accessibility feature is out of order, the entity shall take reasonable steps to accommodate individuals with disabilities who would otherwise use the feature.

(c) This section does not prohibit isolated or temporary interruptions in service or access due to maintenance or repairs.

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