

**Department of Public Works  
Engineering, Highway Division, & Fleet Services**  
O: 719-520-6460  
F: 719-520-6879  
3275 Akers Drive  
Colorado Springs, CO 80922

**Board of County Commissioners**  
Holly Williams, District 1  
Mark Waller, District 2  
Stan VanderWerf, District 3  
Longinos Gonzalez, Jr., District 4  
Cami Bremer, District 5

---

**TO:** Planning Commission  
**FROM:** Jennifer Irvine P.E. MPA, County Engineer/ECM Administrator  
**DATE:** June 2, 2020  
**RE:** Engineering Criteria Manual (ECM) Revisions

Planning Commission Hearing Date:	06/16/2020
Board of County Commissioners Hearing Date:	06/23/2020

The Engineering Criteria Manual (ECM) was completed in 2004 and adopted by the Board of County Commissioners on December 23, 2004. Revisions were made in 2006, 2007, 2009, 2011, 2015 and 2019. Staff is recommending ECM changes that pertain to Americans with Disabilities Act (ADA) Public Right of Way Accessibility Guidelines (PROWAG) compliance including adding a new Accessibility chapter to the ECM. As part of the El Paso County ADA Transition Plan requirements for Public Right of Way, El Paso County Department of Public Works (DPW) is proposing revisions the ECM to include ADA PROWAG compliance.

Recommended changes to the ECM were collected in about 4 months. DPW, the El Paso County Planning and Community Development (PCD), members of the Housing and Building Association of Colorado Springs (HBA), and consulting engineers have recommended revisions to the ECM. A committee consisting of DPW, PCD, members of the HBA and consulting engineers have reviewed each recommended change. After review and discussion, a list of proposed changes has been developed.

The Housing and Building Association (HBA) has endorsed these changes to the ECM in a letter dated May 22, 2020. The El Paso County Highway Advisory Committee endorsed the recommended changes to the ECM at their meeting held April 22, 2020.

These revisions include a new chapter specific to ADA Accessibility guidelines and the associated revisions throughout the ECM for consistency and updated standard drawings are summarized in the attachments.

This request is for the Planning Commission to recommend approval of the proposed new chapter and the associated attached administrative revisions to the El Paso County Engineering Criteria Manual to the Board of County Commissioners.

Attachments:

ECM Chapter 6 Accessibility

ECM Associated Revisions

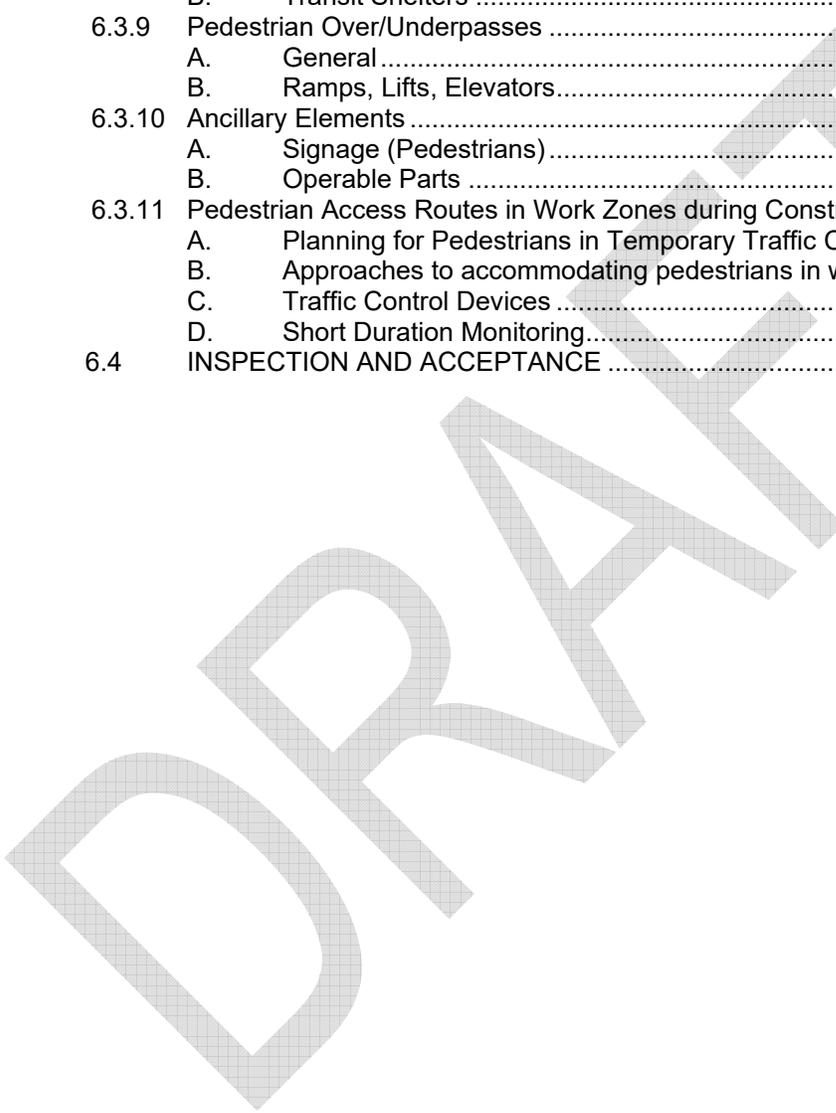
Standard Drawings

HBA Letter

## CHAPTER 6 ACCESSIBILITY

6.1	OVERVIEW .....	3
6.1.1	Purpose .....	3
6.1.2	Chapter Content and References .....	4
6.1.3	Standard Drawings .....	4
6.1.4	Relationship between ECM, ADA, and PROWAG .....	5
6.2	PLANNING AND APPLICABILITY .....	6
6.2.1	Definitions & Building Blocks of Accessible Design .....	6
	A. Definitions .....	6
	B. Construction Tolerances .....	6
6.2.2	Accessibility for New Construction .....	6
6.2.3	Accessibility for Alteration Projects .....	7
	A. Transitional Segments .....	7
	B. Reduction in Access Prohibited .....	7
	C. Technical Infeasibility .....	7
	D. Projects Solely to Improve Accessibility .....	8
6.2.4	Accessibility for Maintenance Projects .....	8
6.3	ACCESSIBLE DESIGN .....	8
6.3.1	Sidewalks (Pedestrian Access Routes/Pedestrian Circulation Paths) .....	8
	A. General Requirements .....	8
	B. Clear Width .....	8
	C. Vertical Alignment .....	9
	D. Grade .....	9
	E. Cross slope .....	9
	F. Surface .....	10
	G. Ramps .....	14
	H. Sidewalk at Driveways .....	16
6.3.2	Pedestrian Street Crossings (Crosswalks) .....	16
	A. General .....	16
	B. Running Slope .....	16
	C. Cross slope .....	16
	D. Roundabouts .....	18
6.3.3	Curb Ramps/Blended Transitions .....	18
	A. Common Requirements for Curb Ramps & Blended Transitions .....	19
	B. Perpendicular Curb Ramps .....	19
	C. Parallel Curb Ramps .....	20
	D. Blended Transitions .....	21
	E. Diagonal Curb Ramps .....	22
6.3.4	Detectable Warning Surfaces (DWS) .....	22
6.3.5	Medians/Pedestrian Refuge Islands .....	22
	A. Clear Width .....	22
	B. Grade .....	22
	C. Cross slope .....	22
	D. Curb Ramps .....	22
	E. Detectable Warning Surfaces .....	22
	F. Pedestrian Signals .....	22
6.3.6	Pedestrian Signals/Pushbuttons .....	23
	A. General Requirements .....	23
	B. Applicability in Alterations .....	23
	C. Pedestrian Signal Phase Timing .....	23
	D. Pushbutton Separation .....	23
	E. Pushbutton Locations .....	23
	F. Pushbutton Mounting Heights and Reach Length .....	24

	G.	Accessible Pedestrian Signals (APS).....	24
6.3.7		Shared Use Paths.....	24
	A.	General.....	24
	B.	Clear Width.....	24
	C.	Grade.....	24
	D.	Cross slope.....	24
	E.	Curb Ramps.....	24
6.3.8		Transit Stops.....	25
	A.	Boarding and Alighting Areas.....	25
	B.	Transit Shelters.....	25
6.3.9		Pedestrian Over/Underpasses.....	26
	A.	General.....	26
	B.	Ramps, Lifts, Elevators.....	26
6.3.10		Ancillary Elements.....	26
	A.	Signage (Pedestrians).....	26
	B.	Operable Parts.....	26
6.3.11		Pedestrian Access Routes in Work Zones during Construction and Maintenance.....	29
	A.	Planning for Pedestrians in Temporary Traffic Control (TTC) Zones.....	29
	B.	Approaches to accommodating pedestrians in work zones.....	29
	C.	Traffic Control Devices.....	29
	D.	Short Duration Monitoring.....	30
6.4		INSPECTION AND ACCEPTANCE.....	30



## 6.1 OVERVIEW

This chapter addresses the standards and technical criteria to be used to plan, design, construct, choose materials for, locate, repair, maintain, reconstruct, and use accessible pedestrian facilities within and adjacent to public roadways, whether such pedestrian facilities are located within the public right-of-way, easements, or tracts, and on Shared Use Paths.

Design criteria and requirements presented in this chapter shall apply to pedestrian facilities within and adjacent to public roadways, whether such pedestrian facilities are located within right-of-way, easements, or tracts, and whether such public roadways are dedicated to use by the public or in fact used by the general public, regardless of the entity responsible for operation and maintenance. Other pedestrian facilities outside of the public right-of-way or easements or tracts adjacent thereto may be required, however, to comply with ADA Standards and requirements based on other codes and regulations.

All pedestrian facilities shall be designed and constructed in accordance with current Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG), including the Shared Use Paths Supplement.

This chapter provides key design criteria for ADA Compliance. All new construction and alterations shall adhere to all PROWAG criteria to the maximum extent feasible. All new construction and alterations shall meet the requirements of this chapter unless a deviation request detailing the specific existing site constraints and technical infeasibility is approved by the ECM Administrator. Traditional maintenance activities that do not affect the public's access to or usability of the roadway are not required to comply with requirements of this chapter.

### 6.1.1 Purpose

The purpose of this chapter is to provide detailed design guidelines and criteria relating to accessibility for the preparation of plans for and access to all roadways dedicated to use by the public or in fact used by the general public, regardless of the entity responsible for operation and maintenance. These facilities include sidewalks, curb ramps, street crossings, and other elements within and adjacent to public roadways.

### 6.1.2 Chapter Content and References

**Table 6-1** outlines the chapter content and references used as a basis for the standards established in Chapter 6.

**Table 6-1. Contents and Basis of Accessibility Standards**

Intent Use	ECM Content	ECM Section(s)	Reference Document(s)
<b>Design</b>			
	Sidewalks	6.3.1	1, 8
	Pedestrian Street Crossings	6.3.2	1
	Curb Ramps/Blended Transitions	6.3.3	1, 9
	Detectable Warning Surfaces	6.3.4	1, 9
	Medians/Pedestrian Refuge Islands	6.3.5	1
	Pedestrian Signals/Pushbuttons	6.3.6	1, 3, 4, 9
	Shared Use Paths	6.3.7	1, 2, 3, 4, 7
	Transit Stops	6.3.8	1
	Pedestrian Over/Underpasses	6.3.9	1
	Ancillary Elements	6.3.10	1, 3, 4, 8
	Pedestrian Access in Work Zones	6.3.11	1, 3, 4, 9
<b>Construction</b>			
	Inspections	Ch. 5, 6.4, App. J	1, 3, 4
	Acceptance	Ch. 5, 6.4	1, 3, 4

#### References

1. United States Access Board, Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG), 2011
2. United States Access Board, Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way; Shared Use Paths Supplement, 2013
3. FHWA, Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), 2009 with Revisions 1 and 2, 2012
4. CDOT, Supplement to the Federal Manual on Uniform Traffic Control Devices, 2009
5. United States Department of Justice, 2010 ADA Standards for Accessible Design (ADA Standards), 2010
6. United States Department of Justice, Americans With Disabilities Act Title II Regulations (ADA Regulations), 2010
7. AASHTO, AASHTO Guide for the Development of Bicycle Facilities, 2012
8. AASHTO, AASHTO Roadside Design Guide, 4<sup>th</sup> Edition, 2011
9. CDOT, M&S Standards
10. CDOT, Roadway Design Guide, 2018

### 6.1.3 Standard Drawings

**Table 6-2** identifies the standard drawings that are included in Appendix F as an enforceable part of these Standards. The Standard Drawings shall be used when designing improvements for County-owned and maintained facilities. Any change to a Standard Drawing shall be approved by the ECM Administrator and noted in the construction plans. CDOT standard drawings adopted in the ECM are also applicable to the design of pedestrian facilities. Where noted in this chapter, El Paso County standard drawings supersede CDOT standard drawings.

**Table 6-2. Standard Drawings**

File Name	Detail/Description	Approval Date
SD_2-1	Urban Local Roadway (low volume)	6/23/2020
SD_2-2	Urban Local Roadway	6/23/2020
SD_2-3	Urban NonResidential Collector Roadway	6/23/2020
SD_2-4	Urban Residential Collector Roadway	6/23/2020
SD_2-5	Urban Minor Arterial Roadway	6/23/2020
SD_2-6	Urban Principal 4-Lane Arterial Roadway	6/23/2020
SD_2-7	Urban Principal 6-Lane Arterial Roadway	6/23/2020
SD_2-8	Urban Expressway 4-Lane Roadway	6/23/2020
SD_2-9	Urban Expressway 6-Lane Roadway	6/23/2020
SD_2-20	Typical Curb and Gutter Details	6/23/2020
SD-2-24	Driveway Detail w/ Attached Sidewalk	6/23/2020
SD_2-25	Driveway Detail w/ Detached Sidewalk	6/23/2020
SD_2-40	Pedestrian Curb Ramp Detail	6/23/2020
SD_2-41	Pedestrian Curb Ramp Detail	6/23/2020
SD_2-42	Detectable Warning Surface Details	6/23/2020
SD_2-50	Parallel Pedestrian Curb Ramp Detail	6/23/2020

#### 6.1.4 Relationship between ECM, ADA, and PROWAG

The Americans with Disabilities Act (ADA) of 1990 is the civil rights law that prohibits discrimination against individuals with disabilities and is the basis for creating accessibility in the private and state and local government sectors. It is often referred to as the ADA Regulations. The ADA Standards establish the design requirements for the construction and alteration of facilities, including sites and buildings. Although they are related and based on similar concepts, these standards are not directly applicable to the public rights-of-way. In order to address elements within and adjacent to public roadways, the United States Access Board created the Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG). These guidelines establish the design requirements for construction and alteration of elements within and adjacent to public roadways. The United States Access Board has also created a supplement to PROWAG to address specific design requirements for Shared Use Paths.

El Paso County requires that all pedestrian facilities within and adjacent to public roadways be designed and constructed in accordance with current PROWAG requirements, including the Shared Use Paths Supplement. The design criteria and requirements presented in this chapter are taken directly from PROWAG. Recommendations and best practices are provided to facilitate compliance during design and construction. Where additional guidance is required beyond what is presented in the ECM, refer to the ADA Regulations, 2010 ADA Standards, PROWAG (2011) with Shared Use Path Supplement (2013), MUTCD (2009 with revisions and Colorado Supplement), and other guidance and resources provided by the United States Access Board.

## 6.2 PLANNING AND APPLICABILITY

### 6.2.1 Definitions & Building Blocks of Accessible Design

#### A. Definitions

**Pedestrian Circulation Path:** A prepared exterior or interior surface provided for pedestrian travel within or adjacent to public roadways. The Pedestrian Circulation Path does not have to be accessible; however, the Pedestrian Access Route contained within the Pedestrian Circulation Path shall be accessible to those with disabilities.

**Pedestrian Access Route:** A continuous and unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a Pedestrian Circulation Path. The Pedestrian Access Route shall comply with PROWAG.

**Alteration:** A change to a facility within or adjacent to public roadways that affects or could affect pedestrian access, circulation, or use. Alterations include, but are not limited to, resurfacing, rehabilitation, reconstruction, historic restoration, or changes or rearrangement of structural parts or elements of a facility. Many modifications to traffic signals are also considered alterations. See Section 6.3.6.

**Maximum Extent Feasible:** Where existing physical constraints make it impracticable for altered elements, spaces, or facilities to fully comply with the requirements for new construction, compliance is required to the extent practicable within the scope of the project. Also referred to as "Maximum Extent Practicable".

**Technically Infeasible:** With respect to an alteration of a facility within or adjacent to public roadways, something that has little likelihood of being accomplished because existing physical or site constraints prohibit modification or addition of elements, spaces, or features that are in full and strict compliance with minimum requirements.

#### B. Construction Tolerances

The requirements and guidance provided in this chapter recognize the conventional tolerances associated with construction within or adjacent to public roadways. In accordance with PROWAG R103, "Dimensions are subject to conventional industry tolerances except where dimensions are stated as a range" and "Conventional industry tolerances include tolerances for field conditions and tolerances that may be a necessary consequence of a particular manufacturing process. Conventional industry tolerances do not apply to design work."

### 6.2.2 Accessibility for New Construction

All new construction projects, where pedestrian access is included, shall be accessible and compliant with the Engineering Criteria Manual.

### 6.2.3 Accessibility for Alteration Projects

Whenever existing facilities are altered, they shall meet accessibility requirements within the scope and limits of the project as determined by the ECM Administrator. Alterations include projects such as reconstruction, rehabilitation, resurfacing, widening, and projects of similar scope and scale. For example, if a project requires resurfacing of an intersection, then the curb ramps and sidewalks within the project limits shall be updated to comply with the requirements contained in the ECM.

#### A. Transitional Segments

Transitional segments of Pedestrian Access Routes shall connect to existing unaltered segments of Pedestrian Circulation Paths and shall comply with Section 6.3.1 to the maximum extent practicable.

#### B. Reduction in Access Prohibited

An alteration shall not decrease or have the effect of decreasing the accessibility of a facility or an accessible connection to an adjacent building or site below the requirements for new construction in effect at the time of the alteration.

#### C. Technical Infeasibility

In alterations, it can be infeasible to make facilities fully compliant with the requirements of the ECM due to existing site constraints. Improvements at certain locations may be deemed "Technically Infeasible" when engineering judgement is used and the County concurs. If full compliance with the ECM is deemed technically infeasible, facilities being altered shall be made accessible to the maximum extent practicable. If full compliance cannot be achieved, a deviation request shall be made to the County in accordance with ECM Section 1.9 and Section 5.8. In the Deviation Request and Decision Form, the designer should fully and specifically document the existing site constraints that result in technical infeasibility and the efforts made to comply to the maximum extent practicable.

Examples of site constraints that may make it technically infeasible to make a facility fully compliant include:

- Underground structures or utilities that would need to be altered to make a facility compliant and would expand the project scope.
- Adjacent development or buildings that would need to be moved or altered to make a facility fully compliant.
- Required improvements that would alter the status of a Historic property.
- Drainage that could not be maintained if an area is made fully accessible.
- Underlying terrain that would require significant expansion of the project scope to achieve full compliance. An example would be altering an existing roadway profile to make the cross slope of a crosswalk fully compliant.

Project scope, not cost, shall determine when existing constraints make it technically infeasible to make a facility accessible. For example, if a roadway resurfacing project that does not include utility relocations would require relocating underground utilities to make a curb ramp accessible, then making the curb ramp fully accessible could be considered technically infeasible. If, however, a project requires relocation of utilities and widening of a roadway, then that same curb ramp should be made fully accessible.

**D. Projects Solely to Improve Accessibility**

If the sole purpose of a project is to improve accessibility, the scope of the project is not required to be expanded to make other adjacent portions of the Pedestrian Access Route and/or Pedestrian Circulation Path accessible. For example, a project whose sole purpose is to repair and replace sidewalk in poor condition would not be required to be expanded to fix adjacent noncompliant curb ramps. In these cases, documentation of the sole purpose to improve accessibility shall be documented during project development and written approval obtained from the ECM Administrator.

**6.2.4 Accessibility for Maintenance Projects**

Traditional maintenance activities do not require that the adjacent pedestrian facilities be made accessible. These activities include crack sealing, graveling, chip sealing, cover coating, pavement patching, restriping, and similar activities meant to seal and protect the road surface and improve friction and that do not significantly affect the public's access to or usability of the road.

**6.3 ACCESSIBLE DESIGN**

**6.3.1 Sidewalks (Pedestrian Access Routes/Pedestrian Circulation Paths)**

**A. General Requirements**

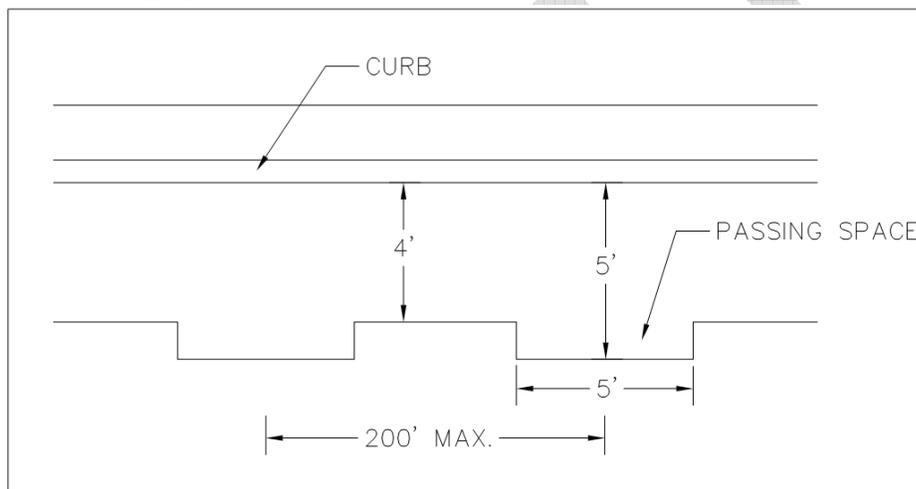
Accessible sidewalks provide a safe route and continuous path for users with disabilities. All new sidewalk and sidewalk that is being replaced as part of an alteration project shall comply with the requirements contained within this section. Pedestrian Access Routes shall be provided within Pedestrian Circulation Paths to connect with accessible elements, spaces, and facilities within and adjacent to public roadways.

**B. Clear Width**

Minimum-required sidewalk widths by roadway classification are specified in Table 2-4 through Table 2-7 and Appendix F. The minimum clear width of accessible sidewalk is 4 feet in all cases, excluding the width of the curb. If the designer chooses to use a 4 ft. wide sidewalk, then 5 ft. x 5 ft. passing spaces are required to be included and spaced a maximum of every 200 feet, as shown in **Figure 6-1**. Utilizing a 5 ft. wide (or wider) sidewalk eliminates the need for passing spaces. When sidewalk wider than the minimum 4 ft. width is provided (for example in an urban commercial area), only part of the sidewalk area is classified as the Pedestrian Access Route and must comply with the requirements of Section 6.3.1. Providing at least

the minimum width accessible Pedestrian Access Route ensures that persons with disabilities can access all accessible elements, spaces, and features along the roadway. If approved by the ECM Administrator, the remainder (classified as Pedestrian Circulation Path) may have street furniture, utility poles, etc. that would not be acceptable in the Pedestrian Access Route. Designers shall ensure that, where approved by the ECM Administrator, street furniture and other elements in the Pedestrian Circulation Path are detectable and will not present a hazard to pedestrians. All protruding objects within the Pedestrian Circulation Path shall meet the requirements of Section 6.3.1.F.6. Where feasible, designers are also encouraged to comply with slope and other requirements to improve the accessibility of the sidewalk area.

**Figure 6-1. Passing Spaces**



**C. Vertical Alignment**

The vertical alignment of all elements within a Pedestrian Access Route (sidewalks, curb ramps, blended transitions, turning spaces, and gutter areas, etc.) shall be planar. Grade breaks shall be flush.

**D. Grade**

The grade of Pedestrian Access Routes within and adjacent to public roadways shall not exceed 5%. When, however, the grade of the adjacent street is greater than 5%, the grade of adjacent Pedestrian Access Routes shall not exceed the general grade of the adjacent street or highway. In these cases, the Pedestrian Access Route is not considered a ramp even though its grade exceeds 5%. In all other areas, Pedestrian Access Routes with grades between 5% and 8.3% must comply with the requirements of Section 6.3.1.G.

**E. Cross slope**

The cross slope of all sidewalk contained within the Pedestrian Access Route shall not exceed 2%. Typical sidewalk cross slope of 1.5% is recommended for design to allow for construction tolerance.

**F. Surface**

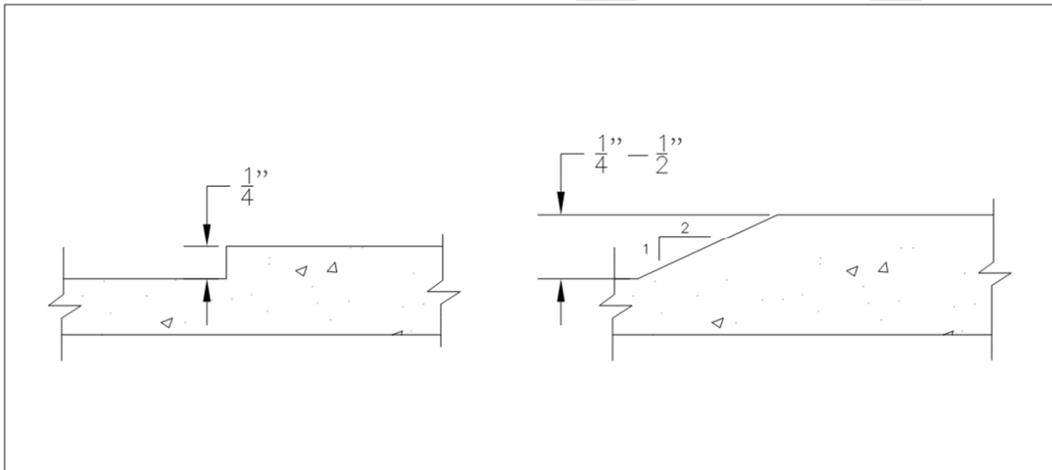
**1. General**

The surface of all elements contained within the Pedestrian Access Route shall be firm, stable, and slip resistant (e.g. concrete sidewalk with broom finish or slip-resistant plate over a drainage chase). Soft loose surfaces such as sand, gravel, or cobblestones can make it difficult for people using wheelchairs to move with ease.

**2. Level Change**

The maximum level change for a non-beveled surface is 0.25 inches. The maximum level change for a beveled surface is 0.50 inches. The beveled surface shall have a slope not steeper than 50% (2:1 H:V). See **Figure 6-2**.

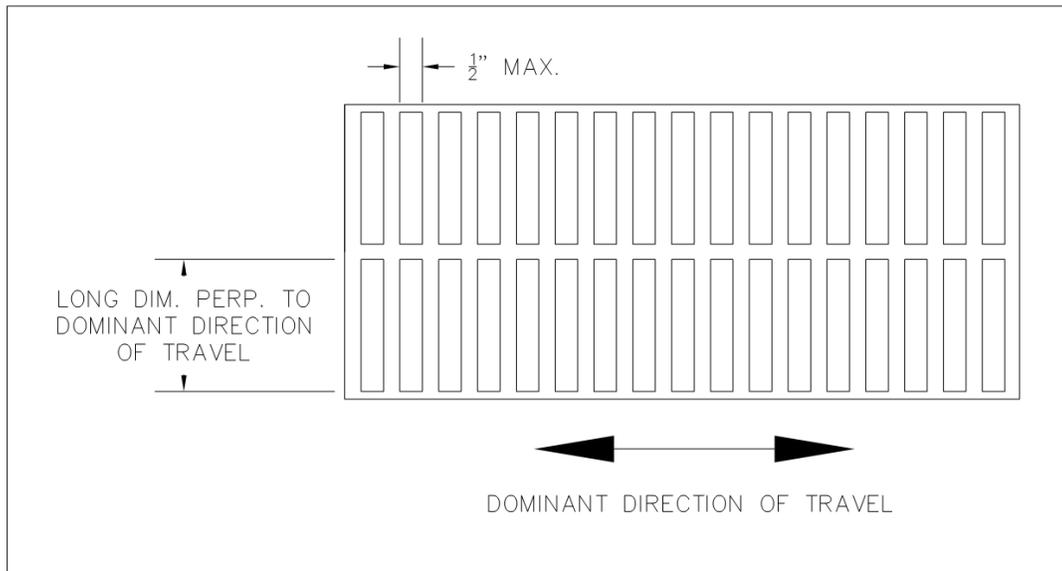
**Figure 6-2. Vertical Surface Discontinuities**



### 3. Horizontal Opening (Grates & Joints)

The maximum horizontal openings in gratings and joints shall not permit passage of a 0.50-inch diameter sphere. Elongated openings in grating shall be oriented such that the long dimension is perpendicular to the main direction of travel. See **Figure 6-3**.

**Figure 6-3. Horizontal Openings**



### 4. Surface Obstructions

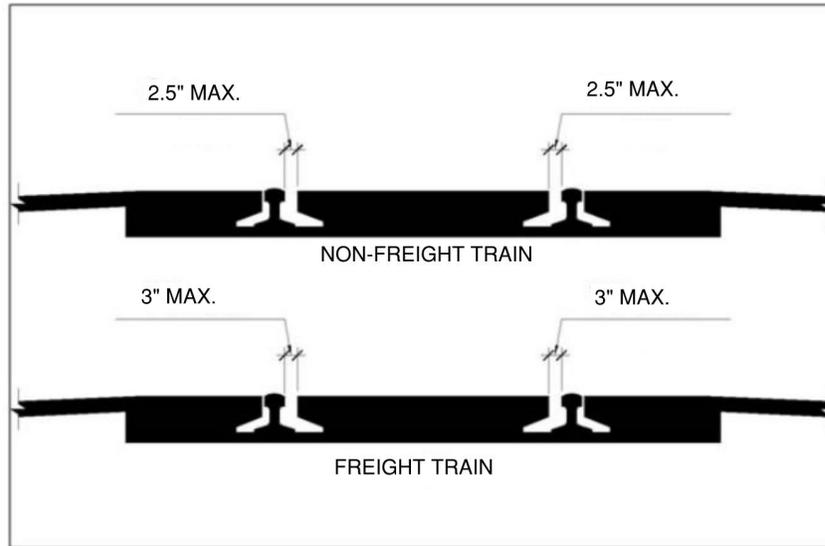
Utility vaults, covers, frames, and other elements should be located outside of Pedestrian Access Routes, curb ramps, and turning spaces whenever possible. Over time, differential settlement at these interfaces can lead to vertical discontinuities.

### 5. Railroad Crossings

Railroad crossings shall be level with the top of rail.

- The flangeway gap for a non-freight train rail shall not exceed 2.5 inches. See **Figure 6-4**.
- The flangeway gap for a freight train rail shall not exceed 3 inches. See **Figure 6-4**.

**Figure 6-4. Flangeway Gaps**

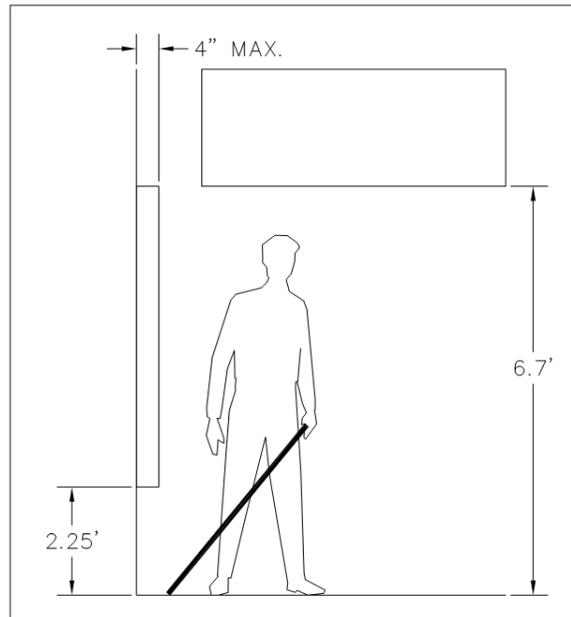


### 6. Protruding Objects

Roadside objects shall not be permitted to encroach upon or protrude into pedestrian routes including Pedestrian Access Routes and Pedestrian Circulation Paths. In cases where it is infeasible to locate objects outside of these pedestrian routes, a deviation must be approved by the ECM Administrator and these objects must be designed to be detectable and not present a hazard to pedestrians or vehicles. Objects include, but are not limited to, signs, street furniture, landscaping, and above ground utility poles and boxes. See Section 2.5.2.B.8 and Figure 2-35 for horizontal and vertical clearance requirements.

- **General:** Requirements for protruding objects extend along the entire width of the Pedestrian Circulation Path. Protruding objects shall not decrease the minimum required clear width of the Pedestrian Access Route.
- **Protrusion Limits:** Objects with leading edges more than 2.25 ft. and not more than 6.7 ft. above the finished surface shall not protrude more than 4 inches maximum into the Pedestrian Circulation Path. See **Figure 6-5**.

**Figure 6-5. Protrusion Limits**

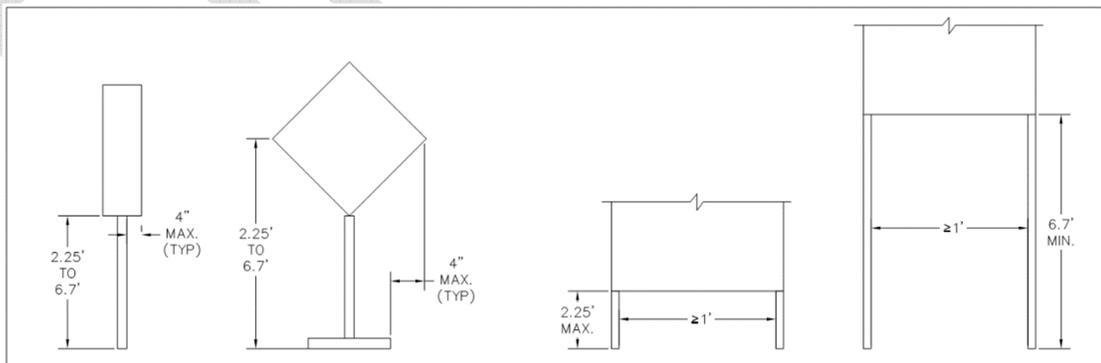


- **Post-Mounted Objects:**

When objects are mounted on free-standing posts or pylons and the object is between 2.25 ft. and 6.7 ft. above the finished surface, the maximum protrusion into the Pedestrian Circulation Path is 4 in., measured horizontally from the outside edge of the post or pylon.

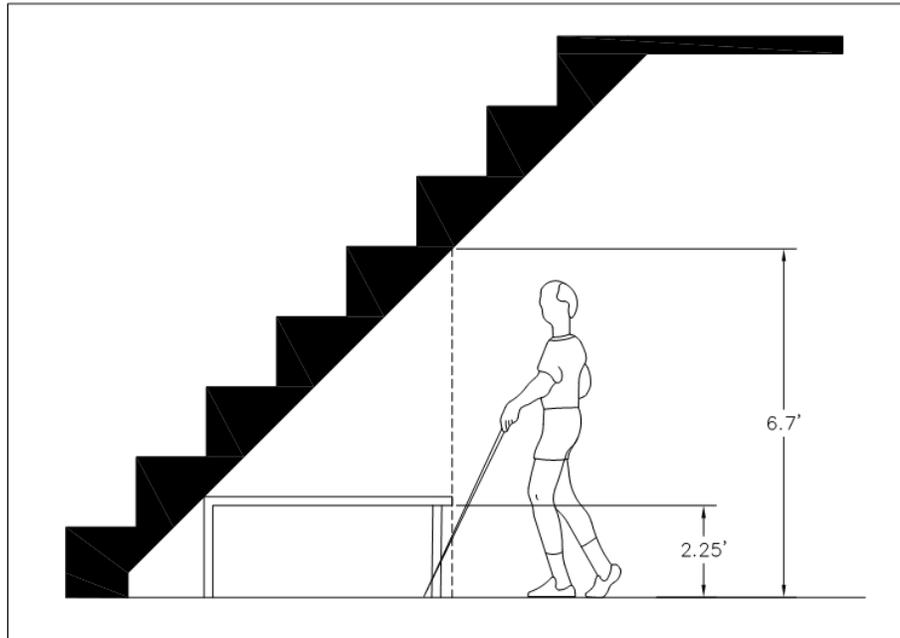
Where objects are mounted between 2 or more posts or pylons and the clear distance between the posts is 1 ft. or greater, the lowest edge of the object shall be 2.25 ft. maximum or 6.7 ft. minimum above the finished grade. See **Figure 6-6**.

**Figure 6-6. Protrusion Limits for Post-Mounted Objects**



- **Reduced Vertical Clearance:**  
Railing or other barriers to pedestrian travel shall be provided where the vertical clearance is less than 6.7 ft. high. The leading edge of the railing or barrier shall be located 2.25 ft. maximum above the finished surface. See **Figure 6-7**.

**Figure 6-7. Reduced Vertical Clearance**



## **G. Ramps**

Ramps (not to be confused with curb ramps) include Ramp Runs and Landings. See **Figure 6-8**. Ramps are required where the running slope of the sidewalk within a Pedestrian Access Route exceeds 5%.

### **1. Running Slope**

The running slope of ramp runs is between 5% and 8.3%. Utilize the flattest slope feasible on ramp runs. A suggested maximum running slope of 7.5% is recommended for design to allow for variability during construction, since no construction tolerance is allowed.

### **2. Cross slope**

The cross slope of ramps within the Pedestrian Access Route shall not exceed 2%. Typical ramp cross slope of 1.5% is recommended for design to allow for construction tolerance.

### **3. Clear Width**

The minimum clear width of ramps is 4 ft. if handrails are not provided. If handrails are provided, the minimum clear width of ramps between handrails is 3 ft.

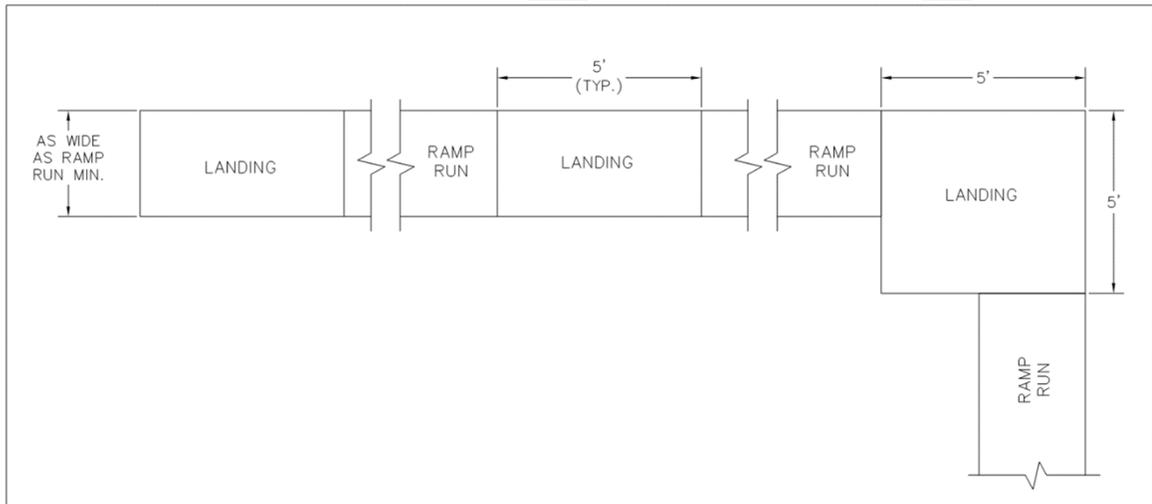
**4. Rise**

The maximum rise of a ramp run is limited to 2.5 ft. There is no limit to the number of consecutive ramp runs a Pedestrian Access Route may have, as long as intermediate landings are provided.

**5. Landings**

Landings shall be provided at the top and bottom of every ramp run, and intermediate landings shall be provided for every 2.5 ft. of ramp rise. The slope of the landing in any direction shall not exceed 2%. It is recommended that the slopes of the landing be designed with a 1.5% slope to allow for construction tolerance. The clear width of the landing shall be at least as wide as the ramp run leading to the landing. The length of the landing shall be 5 ft. minimum. For ramps that change direction between runs, landings shall have minimum dimensions of 5 ft. x 5 ft. See **Figure 6-8**.

**Figure 6-8. Landing Requirements in Ramps**



**6. Edge Protection**

Edge protection is required on all ramps and ramp landings. Edge protection can be provided by either extending the width of the ramp and landings 1 ft. minimum beyond the inside face of the handrails or providing a curb or barrier that prevents the passage of a 4 in. diameter sphere, where any portion of the sphere is within 4 in. of the finished surface.

**7. Handrails**

PROWAG compliant handrails are required on all ramps that have a ramp rise of 6 in. or greater. Handrails should be continuous the full length of the ramp and shall be between 2.8 ft and 3.2 ft above the finished surface of the ramp. Handrails shall extend 1 ft. beyond the top and bottom of the ramp runs. See PROWAG Section R409 for additional physical requirements for handrails including, but not limited to, height, cross section, and extensions. Handrails should be designed and located in accordance with requirements of the AASHTO Roadside Design Guide. Where required, handrails should

be located outside of the roadway clear zone whenever feasible. When they cannot be located outside of the clear zone, the designer should refer to the methodology of the AASHTO Roadside Design Guide to reduce the likelihood and severity of the obstacle being struck.

### **8. Stairs**

As a best practice, providing stairways along with ramps, where possible, benefits pedestrians with heart disease, limited stamina, and others for whom distance presents a greater barrier than steps. Stairs should be designed and located in accordance with requirements of the AASHTO Roadside Design Guide. Where required, stairs should be located outside of the roadway clear zone whenever feasible. When they cannot be located outside of the clear zone, the designer should refer to the methodology of the AASHTO Roadside Design Guide to reduce the likelihood and severity of the obstacle being struck.

### **H. Sidewalk at Driveways**

#### **1. General**

Sidewalk across driveways shall comply with the general requirements for accessible sidewalk (running slope, cross slope, surface, clear width). Accessible sidewalk configurations at driveways are shown in Standard Drawings SD\_2-24 and SD\_2-25.

### **6.3.2 Pedestrian Street Crossings (Crosswalks)**

#### **A. General**

Pedestrian street crossings are roadway crossings that connect Pedestrian Access Routes on opposite sides of a roadway. A Pedestrian Access Route shall be provided where pedestrian access across a roadway is permitted. Where pedestrian street crossings are deemed to be unsafe or unsuitable for all pedestrians, the designer should consider measures to prohibit pedestrian crossings, such as signage, landscaping, and pedestrian barriers.

#### **B. Running Slope**

Where Pedestrian Access Routes are contained within the pedestrian street crossing, the running slope of the Pedestrian Access Route shall not exceed 5%. This is generally equal to the roadway cross slope in perpendicular crossings.

#### **C. Cross slope**

The cross slope of pedestrian street crossings is generally equal to the roadway profile in perpendicular crossings. Designers should consider this requirement for initial, interim, and ultimate configurations when setting roadway grades to allow for compliant pedestrian crossings. For example, if an intersection is initially constructed as a Two-Way-Stop-Controlled intersection but expected to ultimately be converted to an All-Way-Stop-

Controlled intersection, all roadway grades must be set at 2% or flatter to accommodate compliant crosswalks in the ultimate condition.

**1. Yield or stop controlled intersections:**

The cross slope of a pedestrian street crossing at an intersection with yield or stop control that is within the Pedestrian Access Route shall not exceed 2%. A cross slope of 1.8% is recommended for design to allow for construction tolerance. This requirement may require the roadway profile to be “tabled” across the pedestrian street crossing. See **Figure-6-9**.

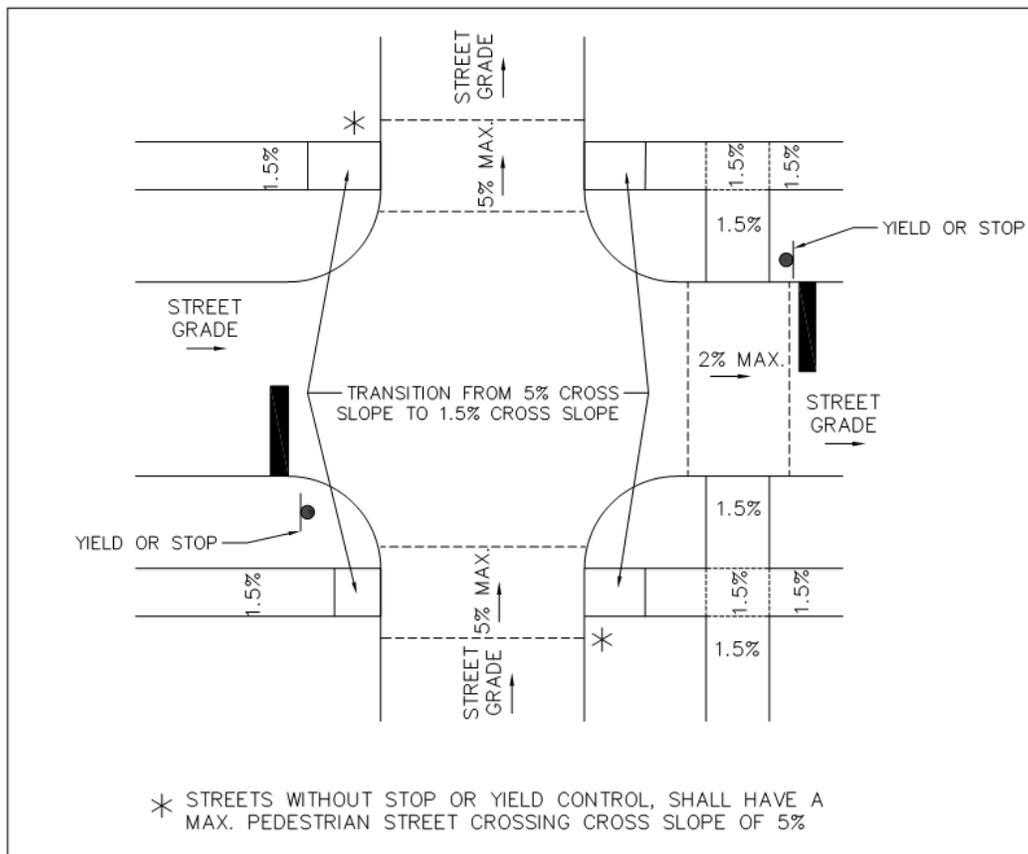
**2. Intersections without yield or stop control:**

The cross slope of a pedestrian street crossing at an intersection without yield or stop control or at a signalized intersection that is within the Pedestrian Access Route shall not exceed 5%. When traffic signals are designed to allow for arrival during the green phase on an approach, that approach is considered to be without stop or yield control because vehicles could traverse the intersection without slowing or stopping. See **Figure-6-9**.

**3. Midblock Crossings:**

Where a midblock crosswalk is approved by the ECM Administrator, the cross slope of the midblock pedestrian street crossing within the Pedestrian Access Route shall not exceed the profile grade of the street or highway.

**Figure 6-9. Example Street Intersection**



#### **D. Roundabouts**

Design of accessible Pedestrian Access Routes at roundabouts requires careful design to provide guidance to pedestrians who are blind or have low vision because the crossings are located off to the side of the Pedestrian Circulation Path around the street or highway. Water fountains and other features that produce background noise should not be used in the middle of the roundabouts as pedestrians who are blind or have low vision rely on audible cues to help detect gaps in traffic.

Designers should refer to PROWAG R306.3 and other roundabout guidance when designing pedestrian facilities. Care should be taken to provide directional cues, separating the Pedestrian Access Route from the roadway with a landscape buffer, and locating the pedestrian street crossings set-back from the central island. Roundabouts with multi-lane approaches involve an increased risk of pedestrian exposure to accident when compared to those with single-lane approaches.

#### **6.3.3 Curb Ramps/Blended Transitions**

Curb ramps and blended transitions are used to transition the Pedestrian Access Route (sidewalk) to a pedestrian street crossing (crosswalk). Curb ramps and blended transitions shall comply with the requirements of this section. Selection of the type of curb ramp to be used at a given location should be based on:

- Intersection geometry
- Attached or detached sidewalk configuration
- Drainage
- Coordination with utilities and other roadside elements

Designers should design curb ramps individually, check critical slopes, ensure drainage does not pond in ramps, and consider directionality of the crossing. Designers are encouraged to use flatter slopes, where possible, to allow for flexibility during construction. Designers should use ramps conforming with standard drawings SD\_2-40, SD\_2-41, SD\_2-42, and SD\_2-50 whenever feasible. When physical constraints prevent the application of these standard ramp designs, the designer should develop a design that fits project constraints and conforms with the requirements of this section to be approved by the ECM Administrator on a case-by-case basis. Designers are advised to see CDOT M-608-1 standard drawings for guidance in these cases.

**A. Common Requirements for Curb Ramps & Blended Transitions****1. Clear Width**

The minimum clear width of curb ramps, blended transitions, and turning spaces is 4 ft. Widths should generally match the approaching sidewalk.

**2. Grade Breaks**

Grade breaks at the top and bottom of curb ramps shall be perpendicular to the direction of the ramp running slope. Grade breaks are not permitted within curb ramps and turning spaces. Surface slopes that meet at grade breaks shall be flush.

**3. Counter Slope**

The maximum counter slope of the gutter or street at the bottom of a curb ramp, blended transition, or turning space is 5%.

**4. Clear Space**

A minimum clear space of 4 ft. x 4 ft. shall be provided at the bottom of all curb ramps and blended transitions. The clear space shall be contained within the width of the pedestrian street crossing and be completely outside of the parallel vehicle travel lane. The cross slope of the clear space shall be equal to the street or highway grade. The maximum running slope of the clear space is 5% to comply with counter slope requirements.

**B. Perpendicular Curb Ramps****1. General**

Perpendicular curb ramps have a running slope that cuts through or is built up to the gutter grade break at right angles.

**2. Running Slope**

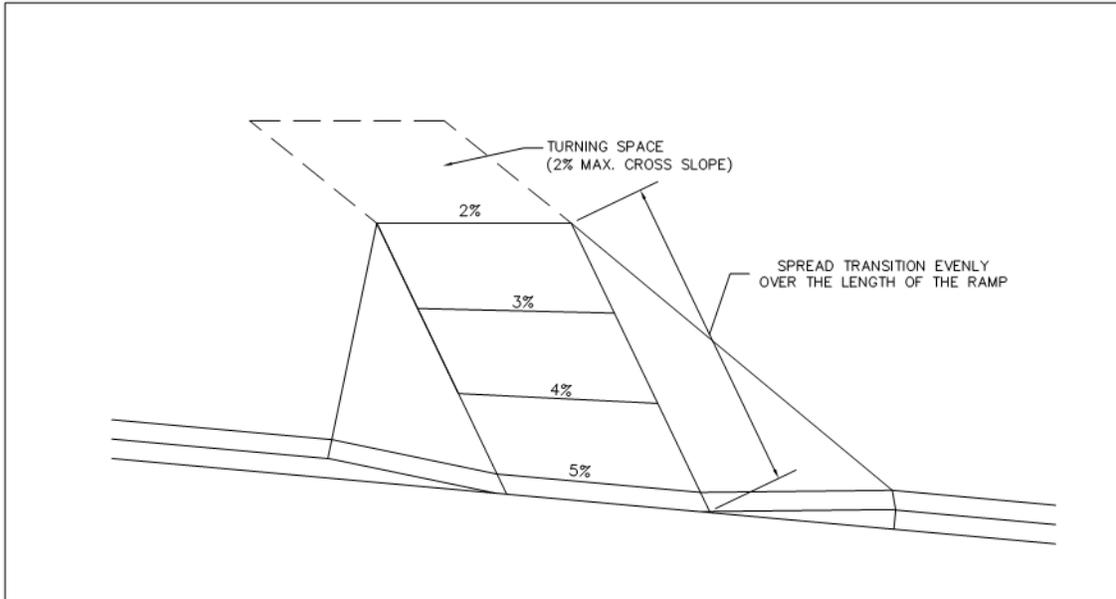
Provide the flattest running slope possible on curb ramps, while maintaining adequate drainage. The running slope of a curb ramp is between 5% and 8.3%, but shall not require the ramp length to exceed 15 ft. A maximum running slope of 7.5% is recommended for design to allow for variability during construction, since construction tolerance is not allowed.

**3. Cross slope**

The cross slope of curb ramps within the Pedestrian Access Route and at a stop or yield-controlled intersection shall not exceed 2%. A cross slope of 1.5% is recommended for design to allow for construction tolerance. The cross slope at intersections without stop or yield control shall not exceed 5%.

The cross slope at midblock crossings can match the street or highway running slope. Where the ramp cross slope must exceed 2% in order to match a roadway grade greater than 2% at the end of the ramp, transition the ramp above the clear space to match the roadway grade. Spread the transition evenly over the length of the ramp. See **Figure 6-10**.

**Figure 6-10. Transitioning Cross Slope Across Curb Ramp**



#### **4. Turning Space**

A 4 ft. x 4 ft. minimum turning space shall be provided at the top of the curb ramp and may overlap other turning and clear spaces. If the turning space is constrained at the back of the sidewalk, the turning space shall be 4 ft. x 5 ft. minimum. The 5 ft. dimension shall be provided in the direction of the ramp running slope. The maximum running slope of a turning space is 2%. Use 1.5% where practicable to allow for construction tolerance.

#### **5. Flared Sides & Returned Curbs**

Where the Pedestrian Circulation Path crosses the curb ramp, the slope of the side flares shall not exceed 10%. A side flare slope of 9.5% is recommended to allow for construction tolerance. If the sides of a perpendicular ramp are not contained within the Pedestrian Circulation Path (e.g., detached sidewalk configurations) and are protected from cross travel by landscaping, street furniture, or other elements, 1'-6" flared sides should be used as shown in the standard drawings. Returned curbs in lieu of 1'-6" flared sides may be approved by the ECM Administrator on a case-by-case basis if the directional cues they provide to pedestrians who are blind or have low vision are important in the design.

### **C. Parallel Curb Ramps**

#### **1. General**

Parallel curb ramps have a running slope that is aligned with the direction of sidewalk travel and lower the sidewalk to a level turning space where a turn is made to enter the pedestrian street crossing.

## 2. Running Slope

Provide the flattest running slope possible on curb ramps, while maintaining adequate drainage. The running slope of a curb ramp is between 5% and 8.3%, but shall not require the ramp length to exceed 15 ft. A recommended maximum running slope of 7.5% is recommended for design to allow for variability during construction, since construction tolerance is not allowed.

## 3. Cross slope

The cross slope of parallel curb ramps within the Pedestrian Access Route shall not exceed 2%. A typical cross slope of 1.5% is recommended for design to allow for construction tolerance.

## 4. Turning Space

A 4 ft. x 4 ft. minimum (5 ft. x width of sidewalk is preferred) turning space shall be provided between the parallel ramps to allow the pedestrian to turn and cross the street. The maximum running slope of the turning space is 2%. A running slope of 1.5% is recommended for design to allow for construction tolerance. The maximum cross slope of the turning space at a stop or yield-controlled intersection is 2%. The cross slope at intersections without stop or yield control shall not exceed 5%. The cross slope of the turning space at midblock crossings can match the street or highway running slope. If the turning space is confined (by a building or other adjacent feature that would impact a pedestrian turning) on two or more sides, the turning space shall be 4 ft. x 5 ft. minimum. The 5 ft. dimensions shall be provided in the direction of the pedestrian street crossing.

## D. Blended Transitions

### 1. General

Blended transitions are raised pedestrian street crossings, depressed corners, or similar connections at the level of the sidewalk and the pedestrian street crossing that have a running slope of 5% or less.

### 2. Running Slope

Provide the flattest running slope possible on blended transitions, while maintaining adequate drainage. The maximum running slope of blended transitions is 5%.

### 3. Cross slope

The cross slope of blended transitions within the Pedestrian Access Route and at a stop or yield-controlled intersection shall not exceed 2%. A cross slope of 1.5% is recommended for design to allow for construction tolerance. The cross slope at intersections without stop or yield control shall not exceed 5%. The cross slope at midblock crossings can match the street or highway running slope. When the blended transition cross slope must exceed 2% in order to match a roadway grade greater than 2% at the end of the blended transition, transition the blended transition to match the roadway grade. Spread the transition evenly over the length of the blended transition. See

**Figure 6-10.**

**E. Diagonal Curb Ramps**

A single diagonal curb ramp is not permitted to serve two pedestrian street crossings on a corner. Single diagonal curb ramps must be approved by the ECM Administrator and will only be considered as part of an alteration project where existing physical site constraints prevent two curb ramps from being installed. Diagonal curb ramps are not desirable because they can provide directional cues that lead pedestrians, especially those that are blind or have low vision, into the middle of an unsafe intersection.

**6.3.4 Detectable Warning Surfaces (DWS)**

Detectable warning surfaces shall consist of truncated domes aligned in a square or radial grid pattern. Detectable warning surfaces shall be provided where a curb ramp, landing, or Shared Use Path connects to a pedestrian street crossing, railroad crossing, traffic island or median. Detectable warning surfaces shall be made of cast iron with a patina natural finish and in accordance with the requirements of PROWAG Section R305. See SD\_2-40, SD\_2-41, SD\_2-42, and SD\_2-50 for details. See CDOT standard drawings M-608-1 for location and placement of DWS.

**6.3.5 Medians/Pedestrian Refuge Islands**

**A. Clear Width**

The minimum clear width of Pedestrian Access Routes contained within a median or pedestrian refuge island is 5 feet.

**B. Grade**

The grade of the Pedestrian Access Route through medians and pedestrian refuge islands shall comply with the running slope requirements for crosswalks. See Section 6.3.2.

**C. Cross slope**

The cross slope of the Pedestrian Access Route through medians and pedestrian refuge islands shall comply with the cross slope requirements for crosswalks. See Section 6.3.2.

**D. Curb Ramps**

Curb ramps and blended transitions in medians and pedestrian refuge islands shall meet the requirements of Section 6.3.3.

**E. Detectable Warning Surfaces**

When a cut-through pedestrian refuge island is 6 feet wide or greater from the face of curb to face of curb, Detectable Warning Surfaces shall be installed. When installed, the Detectable Warning Surfaces must be separated by a surface without Detectable Warning Surface that is a minimum of 2 feet in length (parallel to pedestrian travel). If this 2-foot space cannot be provided, Detectable Warning Surfaces shall not be installed because the island is not wide enough to be considered a pedestrian refuge island.

**F. Pedestrian Signals**

Where pedestrian signals are provided and the pedestrian crossing phase is not designed to be long enough to permit crossing across the entire street, additional pushbuttons complying with Section 6.3.6 should be provided in the pedestrian refuge islands to actuate the pedestrian phase in order for pedestrians to complete the crossing.

**6.3.6 Pedestrian Signals/Pushbuttons****A. General Requirements**

Requirements for application of pedestrian signals shall be in accordance with Section 4.03 of the MUTCD. Where installed, including at Shared Use Path crossings, all accessible pedestrian signals and pushbuttons shall be designed in accordance with Sections 4E.08 through 4E.13 of the latest version of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). See CDOT standard drawings S-614-45 for guidance on location of pedestrian pushbuttons.

**B. Applicability in Alterations**

Per PROWAG requirements, if the existing signal controller and software are altered, or if the existing signal head is replaced, the pedestrian pushbuttons and pedestrian signal heads shall be updated to meet the accessible pedestrian signal requirements contained in this section, unless a deviation is approved by the ECM Administrator.

**C. Pedestrian Signal Phase Timing**

All pedestrian signal timing shall be based on a pedestrian clearance time that is calculated using a pedestrian walking speed of 3.5 ft/s or less and a crossing distance from the end of the curb ramp to the far side of the traveled way or the near side of a pedestrian refuge island with secondary pushbutton.

**D. Pushbutton Separation**

Pedestrian pushbuttons shall be spaced a minimum of 10 feet apart to allow for pedestrians who are blind or have low vision to identify the correct crosswalk. If it is not feasible for the pedestrian pushbuttons to be spaced 10 feet apart, they may be placed closer than 10 ft apart or on the same pole. In these cases, the accessible pedestrian signals shall use speech messages. See Section 6.3.6.G.

**E. Pushbutton Locations**

Pushbuttons should be located as close as possible to the curb ramp they are servicing and be adjacent to a clear and level (< 2% slope in all directions) platform. The pushbutton should be located within 5 ft. of the edge of the far crosswalk line and between 1.5 ft. to 6 ft. from the face of the curb or edge of pavement. Where there are physical constraints that make locating the pushbutton within 6 feet from the face of curb or edge of pavement infeasible, they should not be located farther than 10 feet from the face of curb or edge of pavement.

**F. Pushbutton Mounting Heights and Reach Length**

Pushbuttons shall be mounted between 42 inches and 48 inches above the surface of the accessible route. The preferred mounting height is 42 inches. The pushbutton should not require a pedestrian to reach more than 10 inches to activate it. See Section 6.3.10.B.2.

**G. Accessible Pedestrian Signals (APS)**

Accessible Pedestrian Signals shall have audible and vibrotactile walk indications located on the pushbutton, locator tones, and tactile arrows.

1. Where pedestrian pushbuttons on one corner are separated by at least 10 feet, the audible walk indication shall be a percussive tone. Where two accessible pedestrian signals on one corner are on the same pole or separated by less than 10 feet, the audible walk indication shall be a speech message patterned after the model, "Broadway. Walk sign is on to cross Broadway."

**6.3.7 Shared Use Paths**

Shared Use Paths are facilities on separate right-of-way, easements, or tracts or otherwise physically separated from roadways that are designed for use by bicycles, pedestrians, and other non-automotive modes of recreation and transportation. Because these facilities are used by pedestrians, they shall be accessible and in compliance with the requirements of this chapter. Shared Use Paths are also called Multi-Use Paths in other ECM Chapters. The two terms are synonymous.

**A. General**

Design of accessible Shared Use Paths should comply with the requirements in the ECM. Designers should also refer to the current version of the *AASHTO Guide for the Development of Bicycle Facilities* for additional design guidance.

**B. Clear Width**

The requirements of a Pedestrian Access Route shall be met for the full width of the Shared Use Path, i.e. the entire width of the Shared Use Path must be fully accessible. The minimum clear width of a Shared Use Path is 10 ft. See Section 2.5.7.

**C. Grade**

The grade of a Shared Use Path within or adjacent to public roadways shall be less than or equal to the adjacent street grade. Whenever feasible, the grade of the Shared Use Path shall be less than or equal to 5%.

**D. Cross slope**

The cross slope of Shared Use Paths shall not exceed 2%. A cross slope of 1.5% is recommended for design to allow for variability during construction.

**E. Curb Ramps**

Curb ramps on Shared Use Paths shall meet the requirements of Section 6.3.3, except that the width of the curb ramp shall be equal to the full width of the Shared Use Path.

### 6.3.8 Transit Stops

Transit stops and facilities shall comply with requirements of Section 2.5.4 and those of the transit provider.

#### A. Boarding and Alighting Areas

##### 1. Location

Wherever feasible, transit stops should be located where the adjacent street grade is less than 2.5% to facilitate passenger boarding. Bollards and other potential obstructions shall be located so as not to protrude into the boarding and alighting area or Pedestrian Access Route or obstruct the boarding process.

##### 2. Surface

The surface of transit stops shall meet the requirements of Section 6.3.1.F.

##### 3. Connectivity

Transit platforms, shelters, and boarding/alighting areas shall be connected to streets, sidewalks, and Pedestrian Circulation Paths by accessible Pedestrian Access Routes.

##### 4. Dimensions

Boarding and alighting areas shall provide a minimum clear length of 8 ft. measured perpendicular to the curb and a minimum clear width of 5 ft. measured parallel to the roadway. See **Figure 6-11**.

##### 5. Slope

The slope of the boarding and alighting area parallel to the roadway should be the same as the roadway grade. The maximum running slope of the boarding and alighting area perpendicular to the roadway is 2%. A running slope of 1.5% is recommended for design to allow for construction tolerance. See **Figure 6-11**.

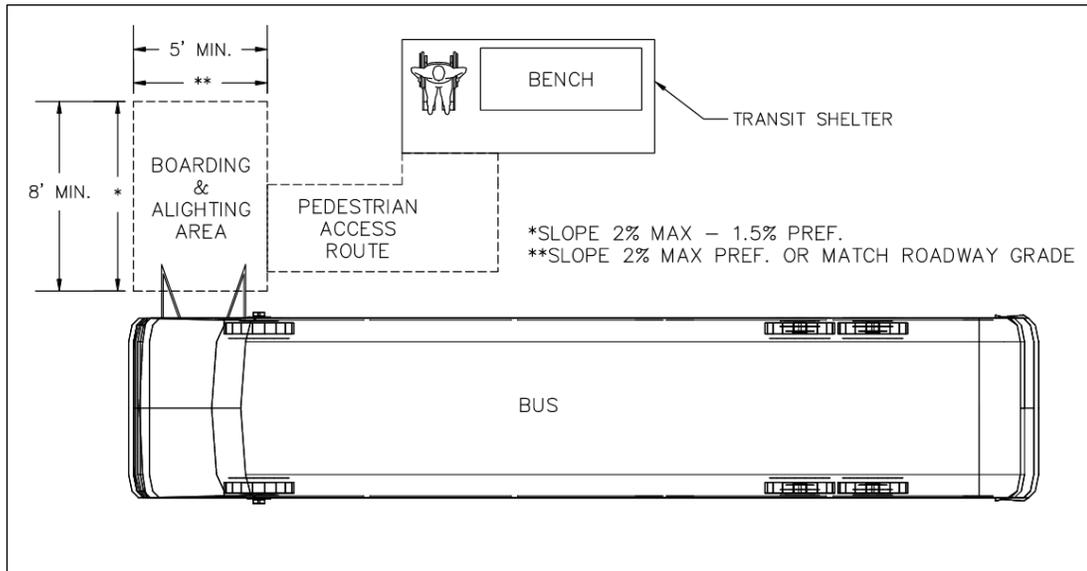
##### 6. Detectable Warning Surfaces

Detectable warning surfaces are not required at boarding and alighting areas for bus-only transit stops. They are required for boarding and alighting areas for rail vehicles and buses AND rail vehicles.

#### B. Transit Shelters

Transit shelters shall be connected to boarding and alighting areas by Pedestrian Access Routes. The boarding and alighting area may be located either within or outside of the shelter. Transit shelters shall provide a minimum 2.5 ft. x 4 ft. clear space entirely within the shelter. If seating is provided within the shelter, the clear space shall be located at one end of the seating or shall not overlap the area within 1.5 ft. of the front of the seating. The clear space shall have a running slope consistent with the grade of the adjacent Pedestrian Access Route and cross slope of 2% maximum. See **Figure 6-11**.

**Figure 6-11. Boarding & Alighting Area Connection to Transit Shelter**



### 6.3.9 Pedestrian Over/Underpasses

#### A. General

Provide Pedestrian Access Routes on overpasses and underpasses to connect with Pedestrian Access Routes on both sides of the structure. If pedestrian bridges over waterways are installed as part of Pedestrian Access Routes or Shared Use Paths, they shall comply with the requirements of a Pedestrian Access Route.

#### B. Ramps, Lifts, Elevators

If the approach slopes of the overpass or underpass exceed 5%, then a ramp, lift, or elevator shall be provided to provide access.

### 6.3.10 Ancillary Elements

#### A. Signage (Pedestrians)

Signs providing directions, warnings, or other information for pedestrians only, excluding transit signs, shall comply with PROWAG R410 in addition to the MUTCD with revisions and supplements.

#### B. Operable Parts

Operable parts consist of pedestrian signals, pushbuttons, and other similar elements that are to be operated by pedestrians.

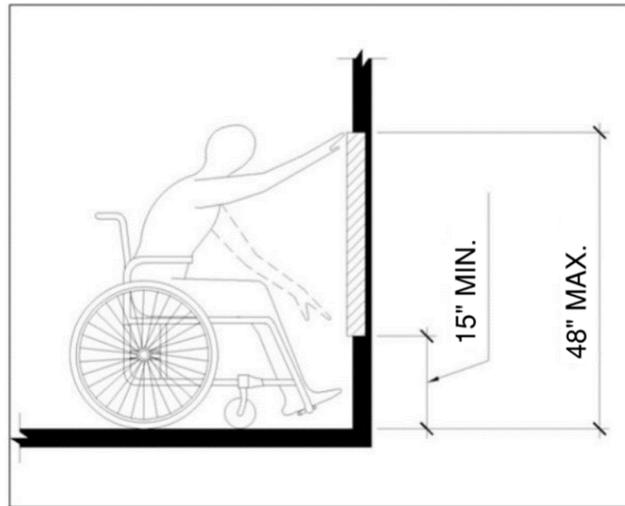
##### 1. Clear Space

Provide a 2.5 ft. x 4 ft. minimum clear space adjacent to the operable part. The cross slope of all sidewalk contained within the Pedestrian Access Route shall not exceed 2%. A cross slope of 1.5% is recommended for design to allow for construction tolerance. The running slope of the clear space shall match the grade of the adjacent Pedestrian Access Route.

**2. Height/Reach Ranges**

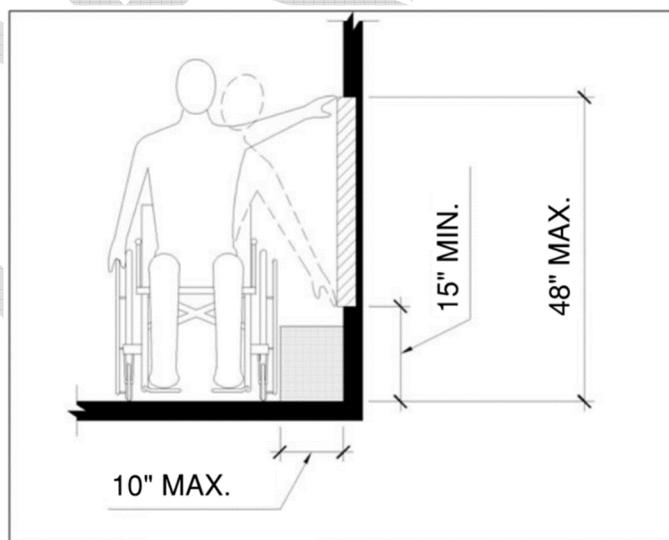
- **Forward Reach:** An operable part shall be located between 15 in. and 48 in. above the finished surface when a forward reach is required to activate the operable part. An obstruction is not allowed between the operable part and the clear space. See **Figure 6-12**.

**Figure 6-12. Forward Reach Range**



- **Side Reach:** An operable part shall be located between 15 in. and 48 in. above the finished surface when a side reach is required to activate the operable part. An obstruction is allowed between the operable part and the clear space if the obstruction protrudes less than 10 inches from the operable part. See **Figure 6-13**.

**Figure 6-13. Side Reach Range**



### **3. Operation**

Operable parts shall be able to be operated with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The maximum force required to operate the operable parts is 5 pounds.

### **4. Mailboxes**

Both single and cluster mailboxes shall be located along an accessible Pedestrian Access Route within accessible reach ranges and with clear spaces in accordance with the requirements of this section. Mailbox locations must also comply with U.S. Postal Service and other requirements. See Section 4.4.

### **5. Elements not permitted in ECM**

The items listed below are not permitted by the ECM without a deviation approved by the ECM Administrator. If a deviation is approved, the designer shall refer to PROWAG for specific accessibility requirements.

- Street furniture other than at transit stops
- On-Street Parking (Marked or Metered)
- Access Aisles (Marked or Metered On-Street Parking or Passenger Loading Zones)
- Parking Meters and Pay Stations
- Passenger Loading Zones
- Stairs, Elevators, Escalators, and Lifts
- Doors, Doorways, and Gates

**6.3.11 Pedestrian Access Routes in Work Zones during Construction and Maintenance**

Pedestrian access in Work Zones and Temporary Traffic Control (TTC) Zones shall be provided in accordance with MUTCD Section 6D.01.04, *“If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided. If the TTC zone affects an accessible and detectable pedestrian facility, the accessibility and detectability shall be maintained along the alternate pedestrian route.”* Pedestrian accommodation in TTC zones shall not conflict with adopted CDOT Traffic Control Standards.

**A. Planning for Pedestrians in Temporary Traffic Control (TTC) Zones**

Planning for pedestrians should be incorporated in the development of Traffic Control Plans for all projects within or adjacent to public roadways. In some cases, pedestrian demand will be low and accommodation measures will be minimal. In other cases where pedestrian demand is high, dedicated temporary pedestrian facilities will be required. In accordance with MUTCD Section 6D.01.07, *“The following three items should be considered when planning for pedestrians in TTC zones:*

1. *Pedestrians should not be led into conflicts with vehicles, equipment, and operations.*
2. *Pedestrians should not be led into conflicts with vehicles moving through or around the worksite.*
3. *Pedestrians should be provided with a convenient and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk(s) or footpath(s).”*

**B. Approaches to accommodating pedestrians in work zones**

Technical requirements of Pedestrian Access Routes are also applicable in temporary work zones to the extent feasible. In order, the preferred methods for maintaining or providing Pedestrian Access Routes in TTC Zones are:

1. Maintain the existing pedestrian facilities (sidewalks, footpaths, etc.) whenever feasible.
2. When the existing Pedestrian Access Route must be closed or blocked, develop an Alternate Pedestrian Route and Pedestrian Circulation Path parallel to the existing pedestrian facility on the same side of the street.
3. When a parallel alternative Pedestrian Access Route cannot be developed on the same side of the street, an alternative pedestrian route (detour) may be provided on the other side of the street or outside of the TTC zone.

**C. Traffic Control Devices**

All barricades, signs, and other temporary traffic control devices used to protect and direct pedestrians in TTC Zones shall be compliant with the MUTCD. The temporary facilities shall be detectable and include accessibility features consistent with the features of the existing pedestrian facilities. Pedestrian barriers and channelizing devices shall be detectable.

Pedestrian barricades should be placed between the Pedestrian Access Route and the work site in a location that protects pedestrians from hazards and provides guidance to the location of the alternate pedestrian route.

**D. Short Duration Monitoring**

For short durations, such as those required for moving equipment or traffic control set-up and phase changes, the Pedestrian Access Route may be monitored by construction personnel who can provide guidance and direction to pedestrians until the Pedestrian Access Route through the work zone is restored or completed.

**6.4 INSPECTION AND ACCEPTANCE**

Inspection and acceptance of all accessible pedestrian facilities shall be based on the requirements in this chapter and in accordance with Chapter 5 and Appendix J. According to the ADA and PROWAG, ALL portions of the Pedestrian Access Route and associated elements must be accessible. Pedestrian facilities may be inspected at one or more locations, as determined by the project inspector, to verify that the facilities meet the requirements of this chapter. Standard Pedestrian Access Route and Curb Ramp Inspection Forms will be used for inspection and acceptance.

**Table 6-3** summarizes the requirements for the most common accessible pedestrian elements. In no case shall the minimum, maximum, or ranges be deviated from in design without a deviation approved by the ECM Administrator. The construction tolerances shown are ONLY applicable during construction. Designers are encouraged to utilize design values greater than the minimums and less than the maximums to reduce noncompliant and unacceptable work during construction.

DRAFT

**Table 6-3 – Common Design Values and Construction Tolerances**

Element	Design Values			Construction Tolerance
	Minimum	Maximum	Range	
P.A.R. Width	4 ft. <sup>1</sup>	--	--	- ¼"
P.A.R. Grade	N/A <sup>2</sup>	5.0% <sup>3</sup>	--	+0.5%
P.A.R. Cross Slope	N/A <sup>2</sup>	2.0%	--	+0.5%
Ramp Run Slope	--	--	5.0-8.3%	None
Ramp Run Rise	N/A	2.5 ft. <sup>4</sup>	--	+ ¼"
Ped. Street Crossing Cross Slope	N/A <sup>2</sup>	2.0% <sup>5</sup> 5.0% <sup>6</sup> Adj. Str. Gr. <sup>7</sup>	--	+0.5%
Ped. Street Crossing Running Slope	N/A <sup>2</sup>	5.0%	--	+0.5%
Curb Ramp Width	4 ft. <sup>8,13</sup>	--	--	- ¼"
Curb Ramp Cross Slope	N/A <sup>2</sup>	2.0% <sup>9</sup>	--	+0.5%
Curb Ramp Running Slope	--	--	5.0-8.3%	None
Curb Ramp Counter Slope	N/A <sup>2</sup>	5.0%	--	+0.5%
Curb Ramp Turning Space Slopes	N/A <sup>2</sup>	2.0% <sup>10</sup>	--	+0.5%
Curb Ramp Flare Slope	N/A	1'-6" Flare <sup>11</sup> 10.0% <sup>12</sup>	--	+0.5% <sup>12</sup>
Shared Use Path Width	10 ft.	--	--	- ¼"
Shared Use Path Grade	N/A <sup>2</sup>	5.0% <sup>3</sup>	--	+0.5%
Shared Use Path Cross Slope	N/A <sup>2</sup>	2.0%	--	+0.5%

NOTES:

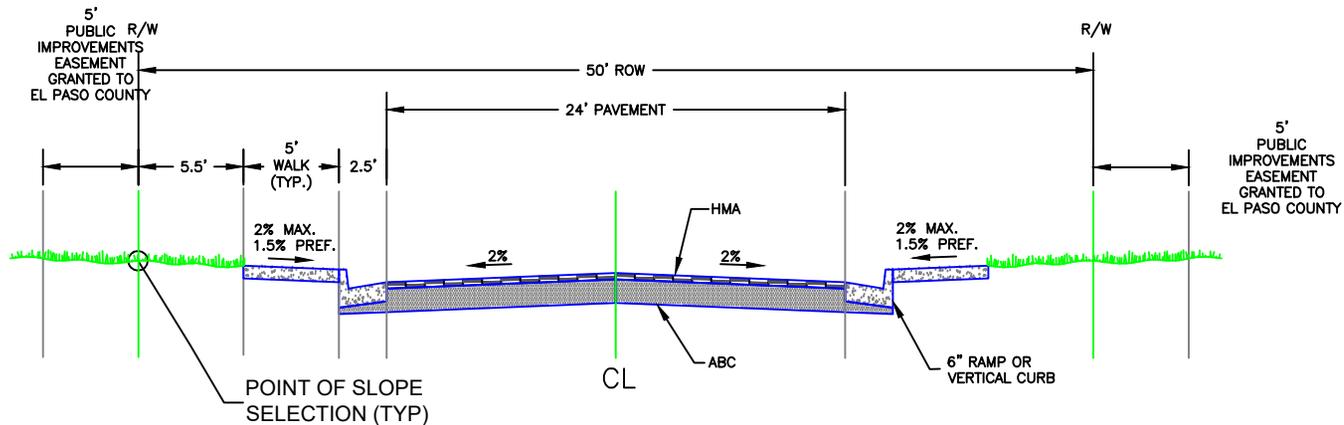
1. Minimum width for Pedestrian Access Route. Design minimum should be per design criteria in Chapter 2.
2. No minimum slope or grade specified. But positive drainage without ponding should be ensured through combination of grade and cross slope.
3. Where adjacent street grade is greater than 5.0%, P.A.R. grade may equal adjacent street grade.
4. Consecutive Ramp Runs with 2.5 ft. maximum rise may be separated by landings.
5. At intersections/approaches with stop or yield control.
6. At intersections/approaches without stop or yield control, including traffic signals.
7. At mid-block crossings.
8. Minimum for accessibility. Should also be equal to approach sidewalk widths.
9. At top of curb ramp. Transition to match compliant crosswalk cross slope at bottom of ramp.
10. Slope in any direction. May match adjacent street grade at bottom of ramps.
11. Where curb ramp flare is protected from cross travel (detached sidewalks).
12. Where curb ramp flare is in Pedestrian Circulation Path (attached sidewalks).
13. For Shared Use Paths, curb ramp width equals the full Shared Use Path width.

Revisions to other Documents/Sections Associated with new ECM Chapter 6 Accessibility					
Document	Section	Page	Recommended Revision	Required or Recommended	Potential Impacts
<b>ECM Chapter 1</b>					
	1.5	1-5	Add PROWAG and ADA Standards by Reference.	Required	Consistency with Chapter 6
	1.15.2	1-8	Add to bullet 3: See Chapter 6 for providing accessible pedestrian facilities in work zones.	Recommended	Refers designers to requirements of Chapter 6.
	1.15.5	1-12	Add: "Existing pedestrian access routes and circulation paths should be maintained through construction, alterations, and maintenance operations whenever feasible. When the pedestrian access routes and circulation paths must be closed during these operations, an alternate pedestrian access route should be provided. See Section 6.3.11 for more information."	Required	Refers designers to requirements of Chapter 6.
	1.22	1-19	Add key definitions provided in Chapter 6 to 1.22 Terms and Definitions	Recommended	Additional definitions specific to accessibility could also be added if desired by EPC. (PROWAG R105)
<b>ECM Chapter 2</b>					
	2.1.3	2-6	Modify Standard Drawings list with revised curb ramp standards	Required	Consistency with Chapter 6
	2.2.1	2-7	Add Bullet to Basis for Planning: "Accessibility - to all users, including those with disabilities.	Recommended	Encourages accessibility to be considered during initial planning.
	Table 2-4	2-27	Add footnote for Intersection Grades - "Where pedestrian crosswalks are anticipated at intersections, maximum grade at crosswalks with stop/yield control is 2%."	Required	Ensures compliant crosswalk cross slopes, but allows for interpretation of pedestrian demand in rural context. May require the designer to "table" intersections, which may require steeper approach grades.
	Table 2-5	2-27	Add footnote for Intersection Grades - "Where pedestrian crosswalks are anticipated at intersections, maximum grade at crosswalks with stop/yield control is 2%."	Required	Ensures compliant crosswalk cross slopes, but allows for interpretation of pedestrian demand in rural context. May require the designer to "table" intersections, which may require steeper approach grades.
	Table 2-6	2-28	Add footnote for Intersection Grades - "Maximum grade at crosswalks with stop/yield control is 2%."	Required	Ensures compliant crosswalk cross slopes. May require the designer to "table" intersections, which may require steeper approach grades.
	Table 2-7	2-29	Add footnote for Intersection Grades - "Maximum grade at crosswalks with stop/yield control is 2%."	Required	Ensures compliant crosswalk cross slopes. May require the designer to "table" intersections, which may require steeper approach grades.
	2.3.7.4	2-47	Add paragraph "Where crosswalks are provided at intersections, roadway grades shall be set to provide compliant crosswalk cross slopes. On approaches with stop or yield control, roadway grades shall be 2% maximum. On uncontrolled approaches or at traffic signals designed to permit arrival during the green phase, roadway grades shall be the maximum permitted for that functional classification, but in no case greater than 5%. See Section 6.3.2."	Required	Ensures compliant crosswalk cross slopes. May require the designer to "table" intersections, which may require steeper approach grades. Refers to Chapter 6 for more info.
	Table 2-22	2-47	Add footnote for Intersection Grades - "Maximum grade at crosswalks with stop/yield control is 2%."	Required	Ensures compliant crosswalk cross slopes. May require the designer to "table" intersections, which may require steeper approach grades.
	Figure 2-23		The curb ramps shown in the figure need to either be parallel ramps, or have a clear space at the top of the ramps	Required	
	Figure 2-30		Cross walk markings don't line up with the curb ramps, need to fix.	Required	
	Figure 2-33		Fix curb ramp configuration to show different ramp style as diagonal ramps are not to be used on new projects	Recommended	
	2.5.1.A	2-71	Add "Gutter slope should be modified to provide compliant counter slope at curb ramps. See Section 6.3.3.	Recommended	

Revisions to other Documents/Sections Associated with new ECM Chapter 6 Accessibility					
Document	Section	Page	Recommended Revision	Required or Recommended	Potential Impacts
	2.5.2.A	2-72	Revise paragraph: "All pedestrian facilities shall be designed in accordance with American Disabilities Act (ADA) and PROWAG requirements, AASHTO Green Book, and the requirements of these Standards. The standard that results in the greatest overall safety of pedestrians shall prevail when designing and constructing pedestrian facilities. See Chapter 6 for requirements and guidance. "	Required	Refers to Chapter 6.
	2.5.2.B.2	2-72	Revise paragraph: "Access crossings shall be designed in accordance with Standard Drawings SD_2-24 and SD_2-25 in Appendix F. Sidewalk across accesses should be accessible per the requirements of Chapter 6."	Recommended	Update SD_2-24 and SD_2-25 to clarify accessibility requirements.
	2.5.2.B.7	2-73	Modify bullets as follows: -"Maximum cross slope for sidewalks shall be 2%. 1.5% typical cross slope is suggested to allow for construction tolerances. See Chapter 6." -"Longitudinal slope of attached sidewalks shall be consistent with roadway slopes. Attached sidewalk slopes greater than 5% are only permitted where adjacent roadway slopes are steeper than 5%. See Chapter 6." -"Longitudinal slope of detached sidewalks shall be flatter than 5% wherever feasible. Sidewalk slopes greater than 5% require ramp runs. See Chapter 6."	Required	Consistency with Chapter 6. Remove reference to ADA Requirements, instead reference ECM requirements in Chapter 6.
	2.5.2.B.8	2-73	Add to end of paragraph "See Section 6.3.1 for clearance requirements related to accessibility."	Recommended	Reference to width and protruding objects requirements in Chapter 6.
	2.5.2.C	2-74	Change "Handicap and Access Ramps" to "Accessible Curb Ramps"	Required	Consistency with Chapter 6. Current accepted terminology.
	2.5.2.C.1	2-74	Revise: "Accessible curb ramps shall be installed at all intersections where pedestrian routes cross streets and at certain mid-block locations for all new construction and alteration projects to the adjacent roadway. See Chapter 6."	Required	Consistency with Chapter 6
	2.5.2.C.2	2-74	Revise "Access Ramps" to say "curb ramps"	Required	Consistency with Chapter 6
	2.5.2.C.3	2-74	Revise: "T" intersections shall have a minimum of four curb ramps as shown in Figure 2-36..."	Required	Correct number of curb ramps shown in Figure 2-36. Consistency with Chapter 6.
	Figure 2-36	2-75	Change title to "Figure 2-36. Curb Ramp Locations at "T" Intersections"	Required	Consistency with Chapter 6
	2.5.2.C.4	2-76	Revise "Access Ramps" to say "curb ramps"	Required	Consistency with Chapter 6
	2.5.2.C.5	2-76	Revise "Access Ramps" to say "curb ramps"	Required	Consistency with Chapter 6
	2.5.2.C.6	2-76	Revise "Access Ramps" to say "curb ramps"	Required	Consistency with Chapter 6
	2.5.2.C.7	2-76	Revise "Access Ramps" to say "curb ramps"	Required	Consistency with Chapter 6
	2.5.2.D	2-76	Add: "See Section 6.3.9."	Recommended	Consistency with Chapter 6
	2.5.2.F	2-76	Modify "Pedestrian Crossings" title to "Pedestrian Street Crossing (Crosswalks)"	Recommended	Consistency with Chapter 6
	2.5.2.F	2-76	Add: "See Section 6.3.2."	Recommended	Consistency with Chapter 6
	2.5.2.F.3	2-77	Add: "See Section 6.3.6."	Recommended	Consistency with Chapter 6
	2.5.2.G	2-77	Either modify "Multi-Use Paths" to "Shared Use Paths" or "Multi-Use (Shared-Use) Paths" to match Chapter 6, OR change title in Chapter 6 to "Shared Use Paths (Multi-Use Paths)." Add: "See Section 6.3.7."	Recommended	Consistency with Chapter 6
	2.5.4.C.1	2-77	Revise: "Openings shall be at least 48 inches wide and shall meet PROWAG requirements. See Section 6.3.8."	Required	Consistency with Chapter 6

Revisions to other Documents/Sections Associated with new ECM Chapter 6 Accessibility					
Document	Section	Page	Recommended Revision	Required or Recommended	Potential Impacts
	2.5.4.C.8	2-78	Revise: "...Sections 2.5.2.B.1 and 6.3.8."	Recommended	Consistency with Chapter 6
	2.5.6.A	2-80	Add: "See Section 6.3.5 for accessibility requirements."	Recommended	Consistency with Chapter 6
	2.5.7.A.2	2-82	Revise: "Accessibility Requirements. All design for off-roadway bicycle paths are considered multi-use (shared-use) paths and shall conform to the requirements of Chapter 6."	Required	Consistency with Chapter 6
	2.5.7.C.13	2-86	Revise: "The cross slope of multi-use (shared-use) paths shall not exceed 2%. 1.5% Typical cross slope is recommended to allow for variability during construction."	Recommended	Consistency with Chapter 6
	2.5.7.C.19	2-87	Revise: " <b>Curb Ramps</b> Standard sidewalk curb ramps will be provided at all bike path curb crossings to allow continuity of bike path use by bicyclists and pedestrians. Curb depressions equaling the bike path width shall be used, with the bike path surface sloping to the pavement at 8.3% maximum slope. See Section 6.3.7."	Required	Consistency with Chapter 6
	2.6.6.1	2-93	Add: "PEB bridges shall be designed to comply with the accessibility requirements of Chapter 6."	Recommended	Consistency with Chapter 6
<b>ECM Chapter 4</b>	4.2.2	4-5	Add: "E. Impact on Accessibility. Accommodation of utilities and other facilities within the County's right-of-way shall not materially degrade or affect accessibility of pedestrian facilities. See Chapter 6."	Recommended	Protects EPC from utility projects negatively affecting accessibility.
	4.3.5.D.4	4-7	Add: "See Chapter 6."	Recommended	Protects EPC from utility projects negatively affecting accessibility.
	4.4.5.E	4-15	Add bullet: "Mailboxes shall be located along accessible pedestrian route in compliance with the requirements of Chapter 6. See Section 6.3.10."	Recommended	Consistency with Chapter 6.
<b>ECM Chapter 5</b>					
	5.10.6.B	5-69	Revise second bullet: "pedestrian facilities and curb ramps".	Recommended	Expand to include sidewalks and other pedestrian facilities.
<b>ECM Appendix F</b>	SD_2-1 - SD_2-9		Add cross slope over sidewalk as 2% max. (1.5% preferred)	Recommended	Provide room for construction tolerance.
	SD_2-20		Gutter cross slope exceeds 5%. Add note to flatten at curb ramps	Required	Required for compliant counterslope at curb ramps.
	SD_2-24		Modify to provide 4' min. sidewalk width at the flared portion of sidewalk. Modify cross slope to show 2% max. (1.5% preferred). Add note to comply with ECM Chapter 6.	Recommended	Provide room for construction tolerance.
	SD_2-25		Modify to provide 4' minimum sidewalk width across driveway. Modify cross slope to show 2% max. (1.5% preferred). Add note to comply with ECM Chapter 6.	Recommended	Provide room for construction tolerance.
	Curb Ramps		Add language in ECM Chapter for other ramp designs permitted by PROWAG, and reference/utilize CDOT standard details if they are not found in EPC App F.	Recommended	
	SD_2-40		Change name to Pedestrian Curb Ramp Detail. Modify to provide 4' min. sidewalk width at the flared portion of sidewalk. Modify cross slope to show 8.3% max. (7.5% preferred). Change name to Detectable Warning Surfaces and refer to SD_2-42.	Recommended	Utilize current standard drawings, direct designers in ECM to propose other site specific designs if standard designs are not feasible-

Revisions to other Documents/Sections Associated with new ECM Chapter 6 Accessibility					
Document	Section	Page	Recommended Revision	Required or Recommended	Potential Impacts
	SD_2-41		Change name to Pedestrian Curb Ramp Detail. Modify cross slope to show 2% max. (1.5% preferred) for sidewalk and landing. Modify running slope to show 8.3% max. (7.5% max preferred). Revise Note 4 to refer to Pushbutton Location per ECM. Change name to "Detectable Warning Surface" in multiple locations. Revise Note 6 regarding DWS to state the DWS should be prefabricated cast iron type. Revise Note 10 to state that drainage structures, traffic signal...are prohibited within ramp areas or landings. Add Note 11 to clarify 5% max. counter slope. In General Notes, add (Pedestrian Circulation Path) and (Pedestrian Access Route) for clarity. Change all instances to "Pedestrian Curb Ramp."	Required	Various revisions for consistency with Chapter 6. The County no longer uses the DWS mentioned in the standard and desires only cast iron type DWS.
	SD_2-42		Modify the DWS standard to be compliant with PROWAG and specify the material to be used as cast iron.	Recommended	Consistency with Chapter 6
	SD_2-50		Change name to Parallel Pedestrian Curb Ramp Detail. Modify cross slope to show 2% max. (1.5% preferred) for turning space. Modify running slopes to show 8.3% max. (7.5% max preferred). Modify DWS to show cast iron type.	Recommended	
<b>Design Checklists</b>					
			Add design checklists for pedestrian access routes and curb ramps.	Recommended	Provides designers and contractors with a way to verify their designs meet PROWAG requirements. Checklists will not be included in ECM or required as part of official project file. They will be available as a recommended tool during project development.
<b>EPC Land Dev. Code</b>	5.2.36.D.1.i.	5-49	Add bullet: "Method for accommodating pedestrians" to requirements for Traffic Control Plan	Recommended	Consistency with Chapter 6
	6.1.3	6-1	Add reference to PROWAG when transportation facilities are within the ROW	Recommended	Consistency with Chapter 6
	6.1.3.C	6-1,2	Add at end of paragraph: "Routes outside of the public right-of-way, easements, and tracts shall comply with current ADA standards. Routes within the public right-of-way, easements, and tracts shall comply with the requirements of ECM Chapter 6."	Recommended	Consistency with Chapter 6. Clarification between pedestrian routes within and outside of public right-of-way.
	6.2.5 (4)	6-22	Add reference to PROWAG when transportation facilities are within the ROW	Recommended	Consistency with Chapter 6

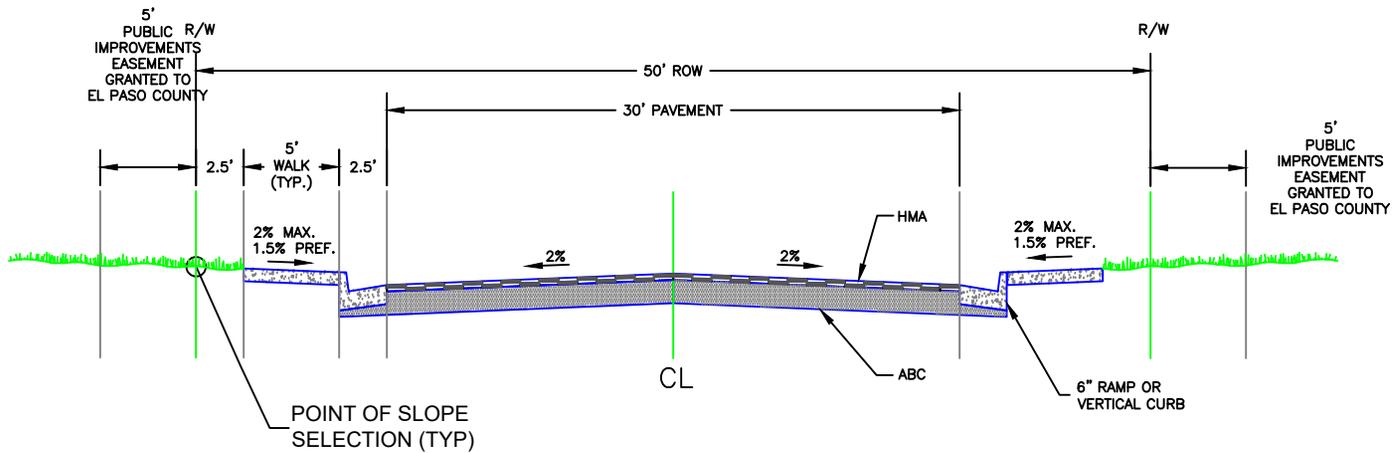


Roadway Design Parameters  
 Design Speed: 25 mph  
 Posted Speed: 20 mph  
 Maximum ADT: 300  
 Design Vehicle: SU-30

DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Urban Local (low volume)          Roadway          Standard Cross Section</p>	<p><small>C:\Documents and Settings\jirvine\My Documents\El Paso\SD Form Logo.dwg</small></p>
	<p>REVISION DATE:</p> <p>6/23/20</p>	<p>FILE NAME:</p> <p>SD_2-1</p>

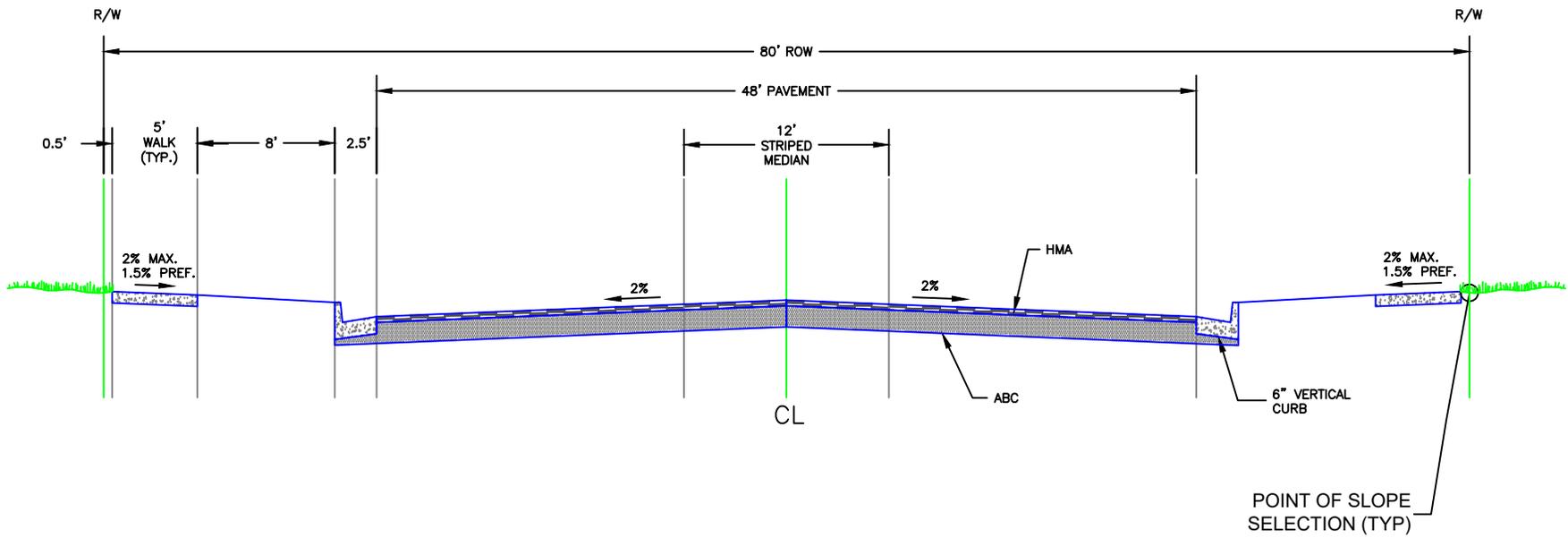


Roadway Design Parameters  
 Design Speed: 25 mph  
 Posted Speed: 25 mph  
 Maximum ADT: 3,000  
 Design Vehicle: WB-50

DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Urban Local Roadway</p> <p>Standard Cross Section</p>	<p><small>C:\Documents and Settings\jirvine\My Documents\My Pictures\JD Form Logos.jpg</small></p>
	<p>REVISION DATE:</p> <p>6/23/20</p>	<p>FILE NAME:</p> <p>SD_2-2</p>

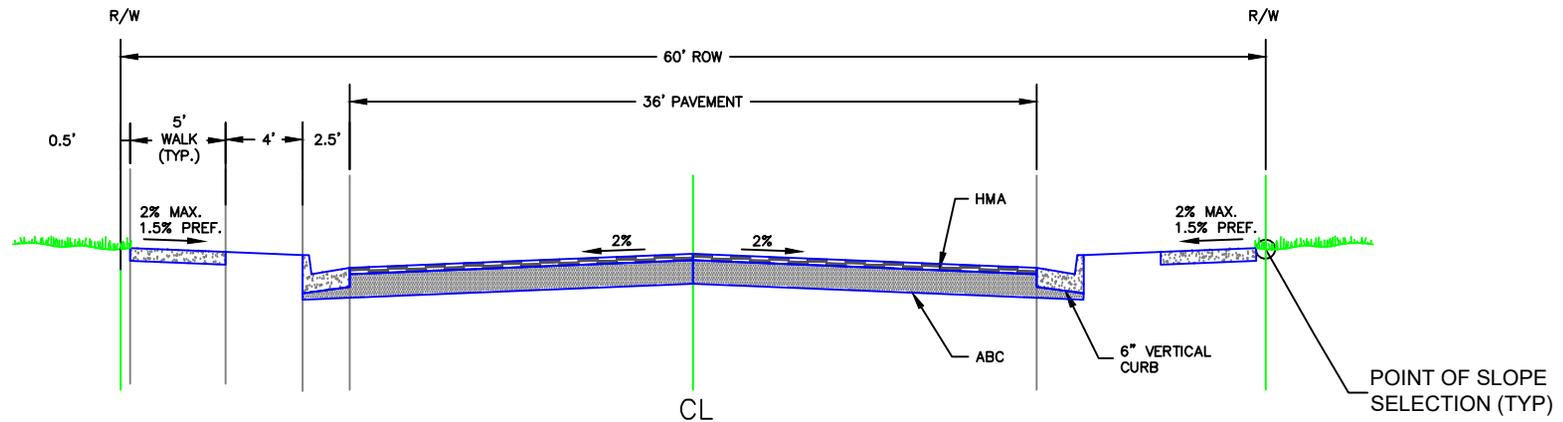


Roadway Design Parameters  
 Design Speed: 40 mph  
 Posted Speed: 35 mph  
 Maximum ADT: 20,000  
 Design Vehicle: WB-50

SCALE: NOT TO SCALE

DRAFT WORKING COPY AS OF 5/22/20

<p>6/23/20</p>	<p>Urban NonResidential          Collector Roadway          Standard Cross Section</p>		<p><small>C:\Documents and Settings\jirvine\My Documents\My Pictures\JD Plan Logo.jpg</small></p>
<p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>			

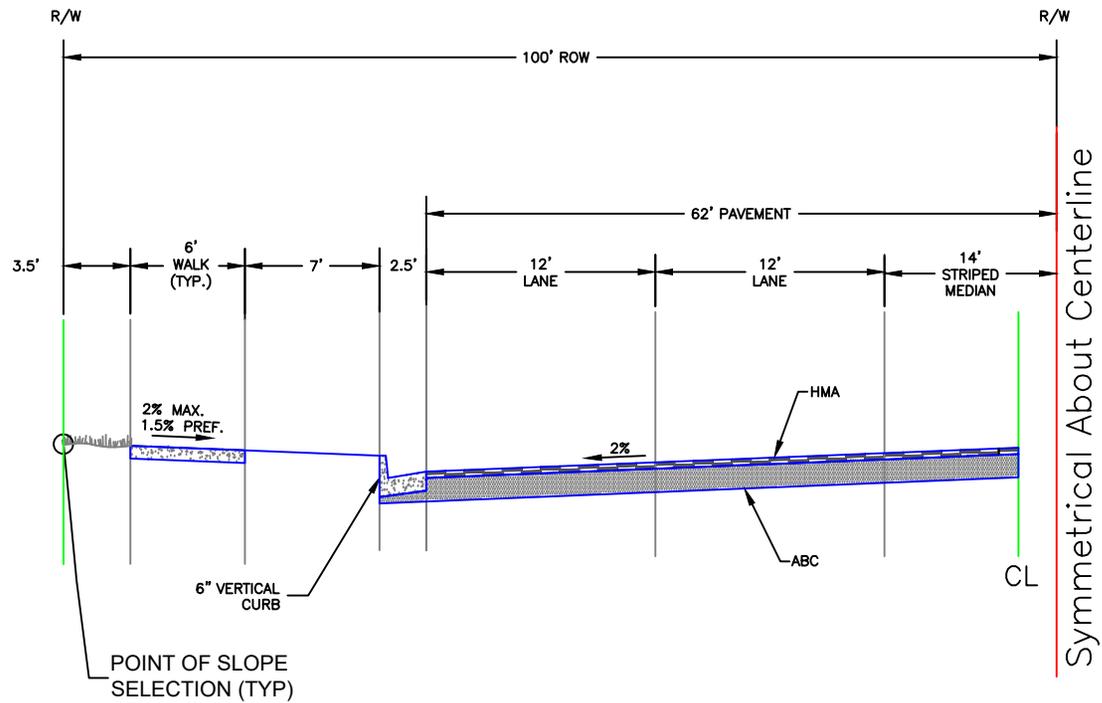


Roadway Design Parameters  
 Design Speed: 40 mph  
 Posted Speed: 35 mph  
 Maximum ADT: 10,000  
 Design Vehicle: WB-50

DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Urban Residential          Collector Roadway          Standard Cross Section</p> <p>REVISION DATE: 6/23/20</p> <p>FILE NAME: SD_2-4</p>	<p><small>C:\Documents and Settings\jirvine\My Documents\My Pictures\JD Plan Logo.jpg</small></p>
--	--	---



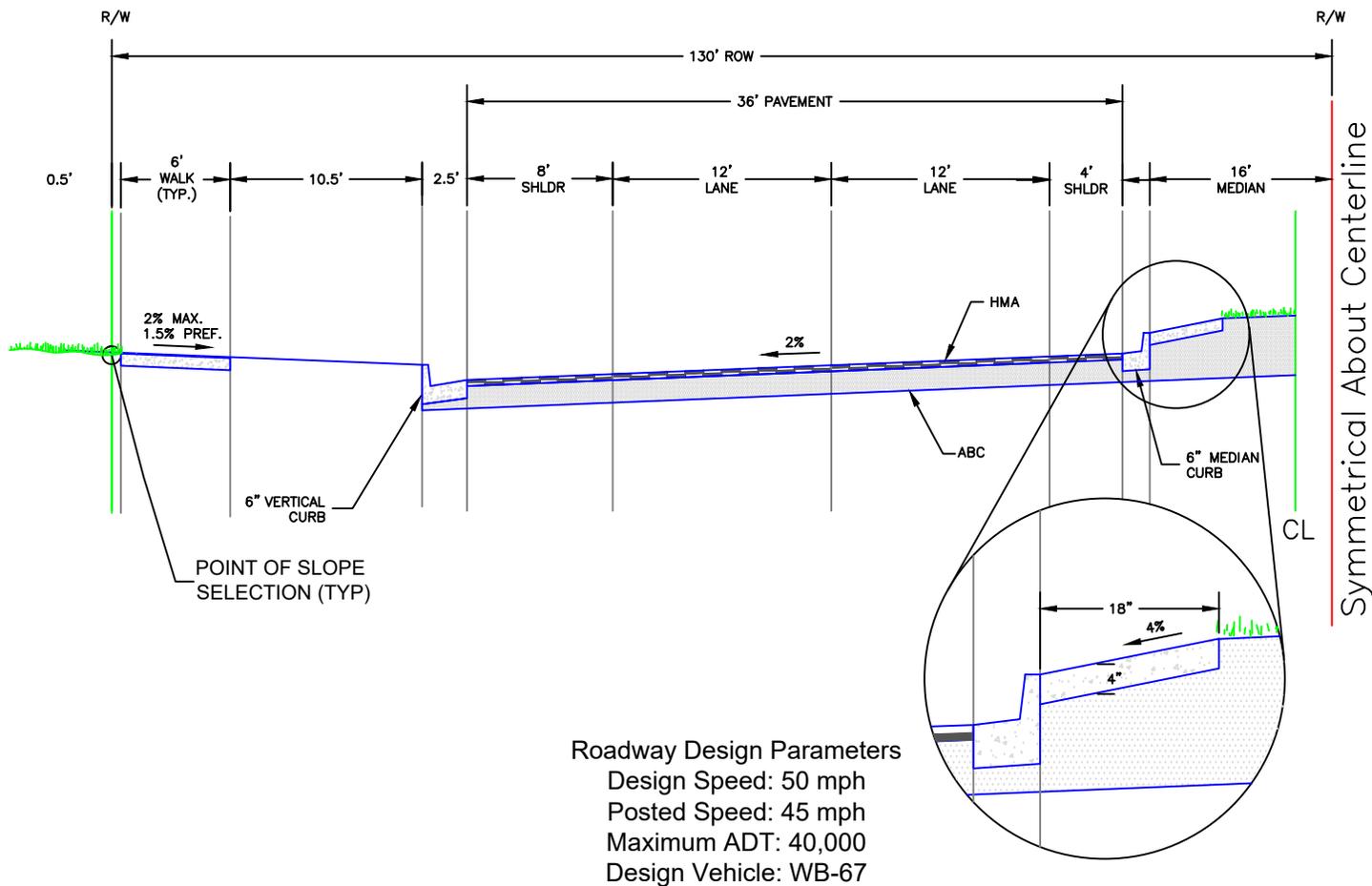
Roadway Design Parameters

Design Speed: 40 mph  
 Posted Speed: 35 mph  
 Maximum ADT: 20,000  
 Design Vehicle: WB-67

DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

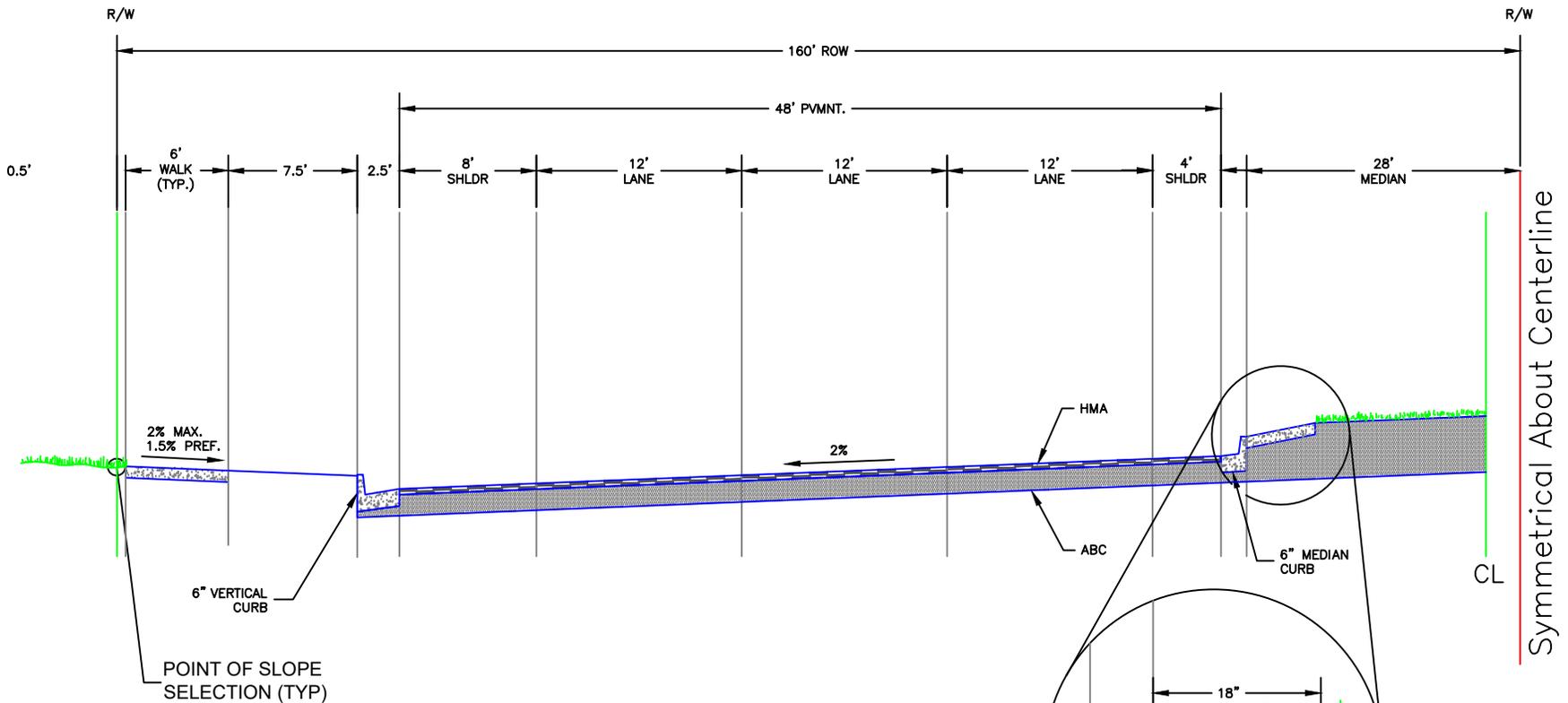
<p>6/23/20</p>	<p>Urban Minor Arterial Roadway</p>		<p><small>C:\Documents and Settings\jirvine\My Documents\My Pictures\JP Post Logo.jpg</small></p>
<p>DATE APPROVED:</p>	<p>Standard Cross Section</p>		
<p>Jennifer E. Irvine</p>	<p>REVISION DATE:</p>	<p>FILE NAME:</p>	
<p>DEPARTMENT OF PUBLIC WORKS</p>	<p>6/23/20</p>	<p>SD_2-5</p>	



DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Urban Principal 4-Lane Arterial Roadway Standard Cross Section</p>	<p><small>C:\Documents and Settings\jirvine\My Documents\My Pictures\JD Plan Logo.jpg</small></p>
<p>REVISION DATE:</p> <p>6/23/20</p>	<p>FILE NAME:</p> <p>SD_2-6</p>	

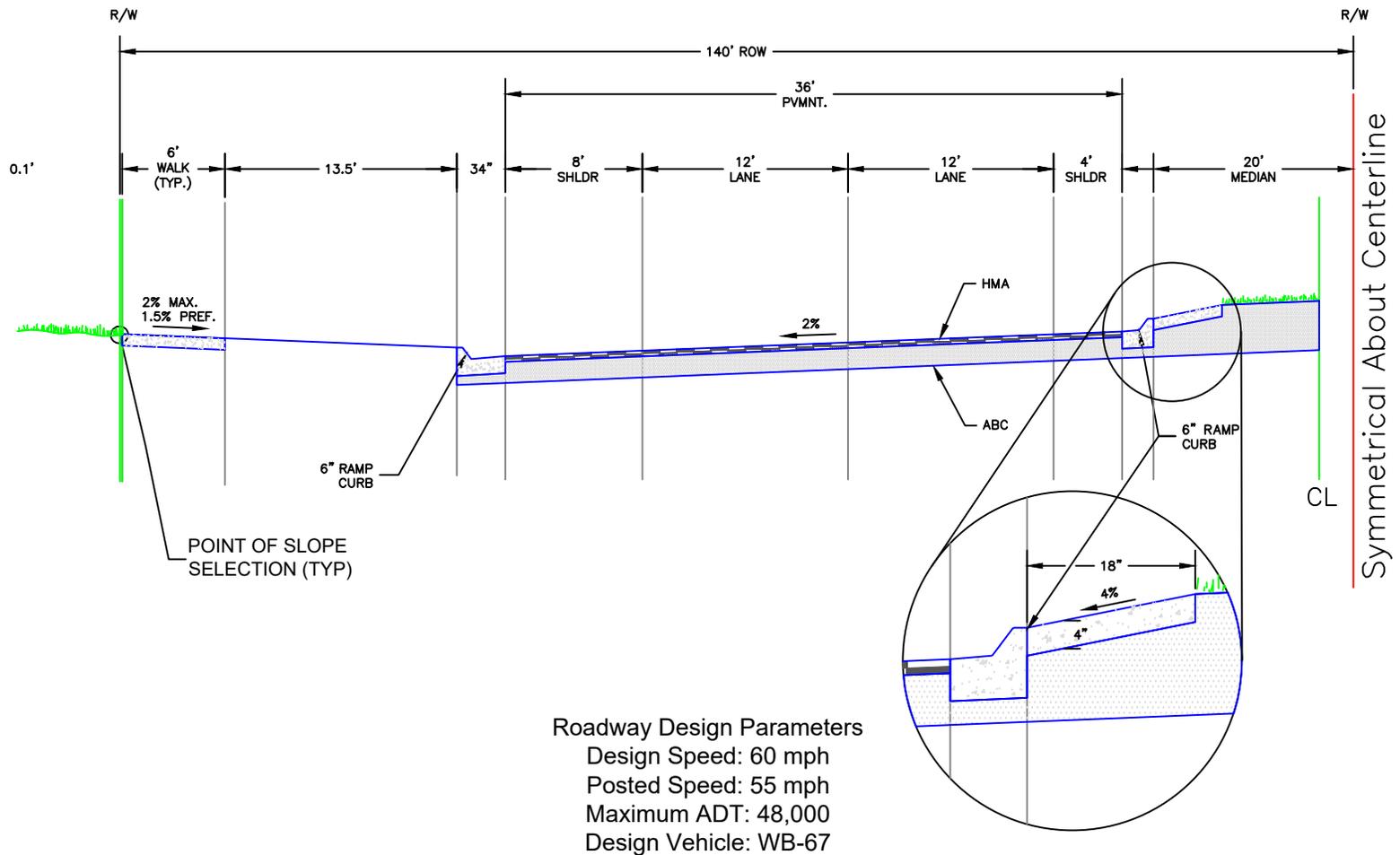


Roadway Design Parameters  
 Design Speed: 50 mph  
 Posted Speed: 45 mph  
 Maximum ADT: By Design  
 Design Vehicle: WB-67

DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Urban Principal 6-Lane          Arterial Roadway          Standard Cross Section</p> <p>REVISION DATE: 6/23/20</p> <p>FILE NAME: SD_2-7</p>	<p><small>C:\Documents and Settings\jirvine\My Documents\My Pictures\JD Plan Log.jpg</small></p>
--	--	--

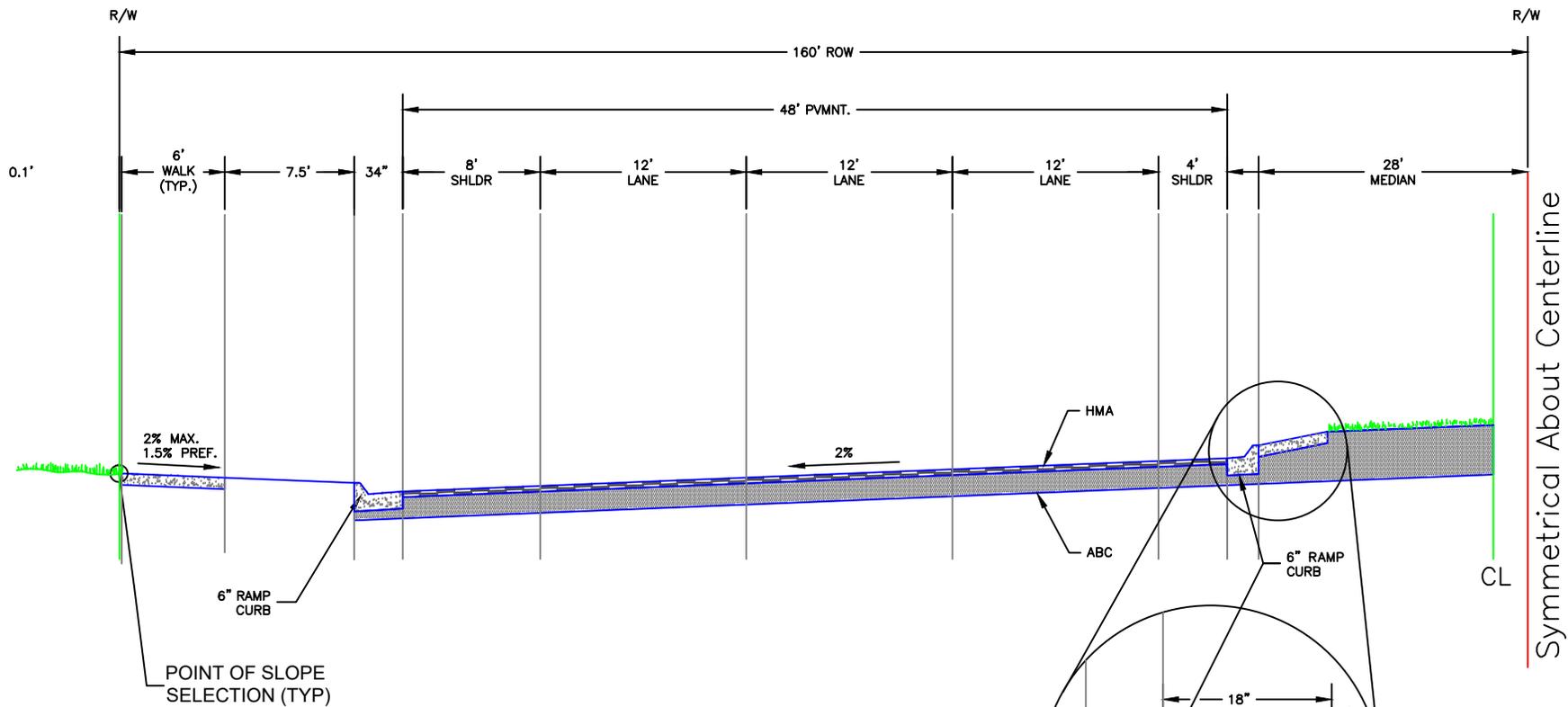


Roadway Design Parameters  
 Design Speed: 60 mph  
 Posted Speed: 55 mph  
 Maximum ADT: 48,000  
 Design Vehicle: WB-67

DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

<p>6/23/20</p>	<p>Urban Expressway          4-Lane Roadway          Standard Cross Section</p>		<p>P:\ECM\EI Paso Logo.jpg</p>
<p>DATE APPROVED:           Jennifer E. Irvine          DEPARTMENT OF PUBLIC WORKS</p>			

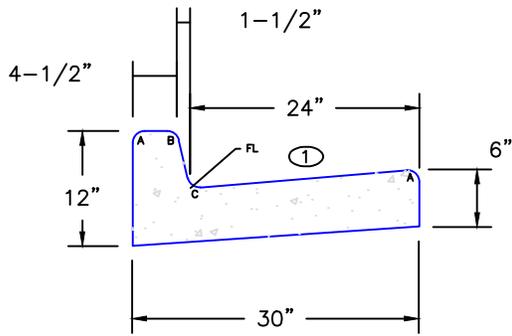


Roadway Design Parameters  
 Design Speed: 60 mph  
 Posted Speed: 55 mph  
 Maximum ADT: By Design  
 Design Vehicle: WB-67

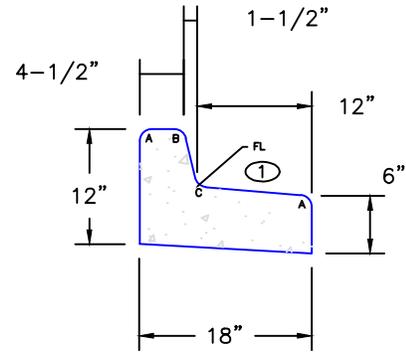
SCALE: NOT TO SCALE

DRAFT WORKING COPY AS OF 5/22/20

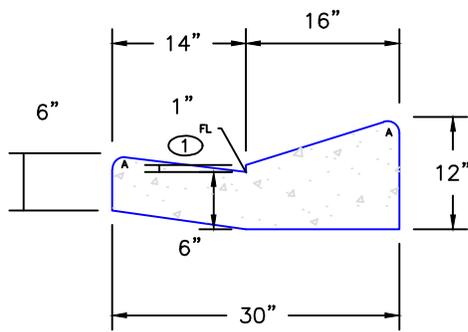
<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Urban Expressway          6-Lane Roadway          Standard Cross Section</p> <p>REVISION DATE: 6/23/20</p> <p>FILE NAME: SD_2-9</p>	<p>P:\ECM\EI Paso Logo.jpg</p>
--	--	--------------------------------



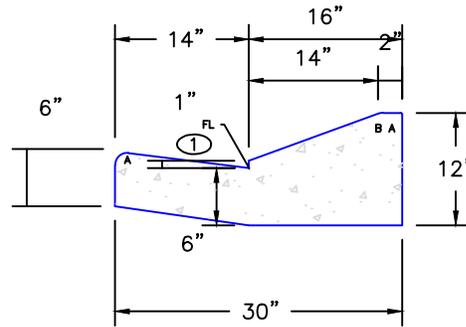
EPC TYPE A  
(REVERSE SLOPE OF PAN FOR SPILL CURB)



EPC TYPE B



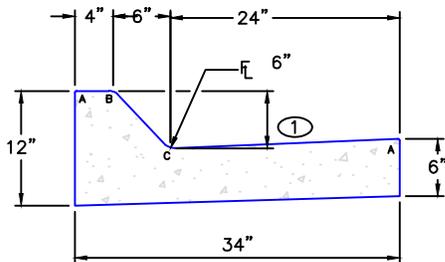
EPC TYPE C  
(REVERSE SLOPE OF PAN FOR SPILL CURB)



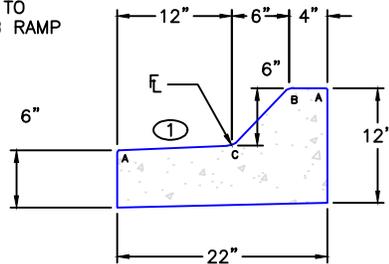
EPC OPTIONAL TYPE C

LEGEND FOR RADII	
A	1/8" TO 1/4"
B	1-1/2"
C	1-1/2" TO 2"

① - GUTTER CROSS SLOPES SHALL BE 1/2 IN./FT. WHEN DRAINING AWAY FROM CURB AND 1 IN./FT. WHEN DRAINING TOWARD CURB (WITH EXCEPTION TO IMMEDIATELY ADJACENT TO CURB RAMPS - SEE CURB RAMP STANDARDS FOR SLOPE REQUIREMENTS).



EPC TYPE D  
(6" RAMP CURB)



EPC TYPE E  
(6" RAMP CURB)

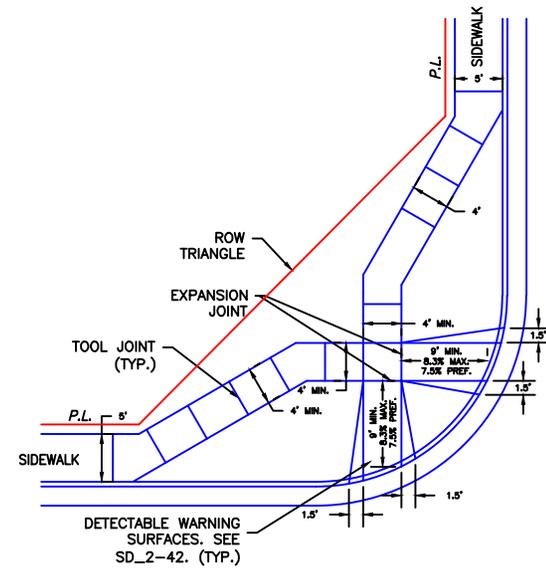
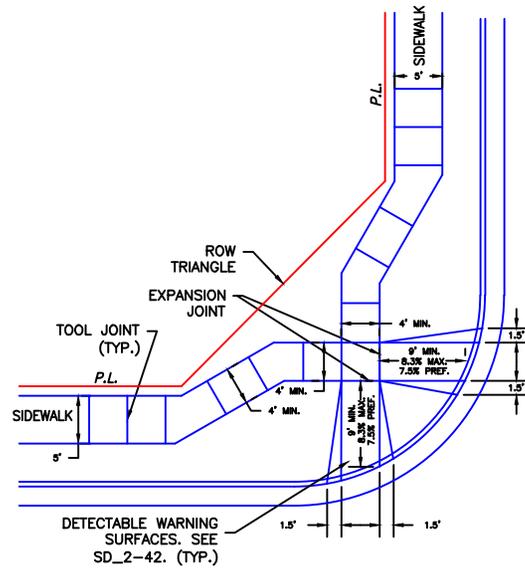
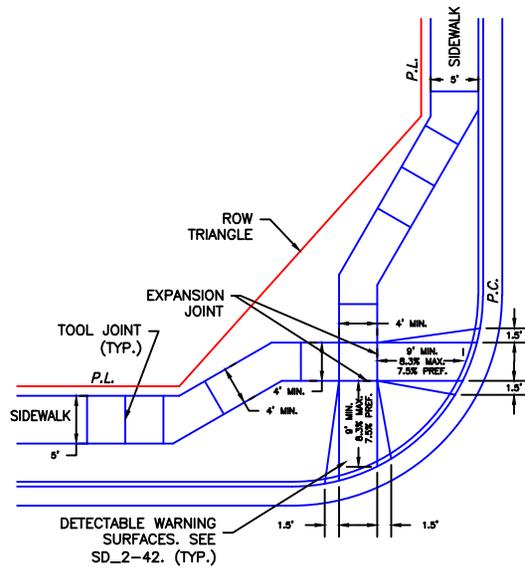
DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Typical Curb and Gutter Details Standard Drawing</p> <p>REVISION DATE: 6/23/20</p> <p>FILE NAME: SD_2-20</p>	<p>P:\ECM\EI Paso Logo.jpg</p>
--	---	--------------------------------







DRAFT WORKING COPY AS OF 5/22/20

SCALE: NOT TO SCALE

6/23/20

DATE APPROVED:

Jennifer E. Irvine

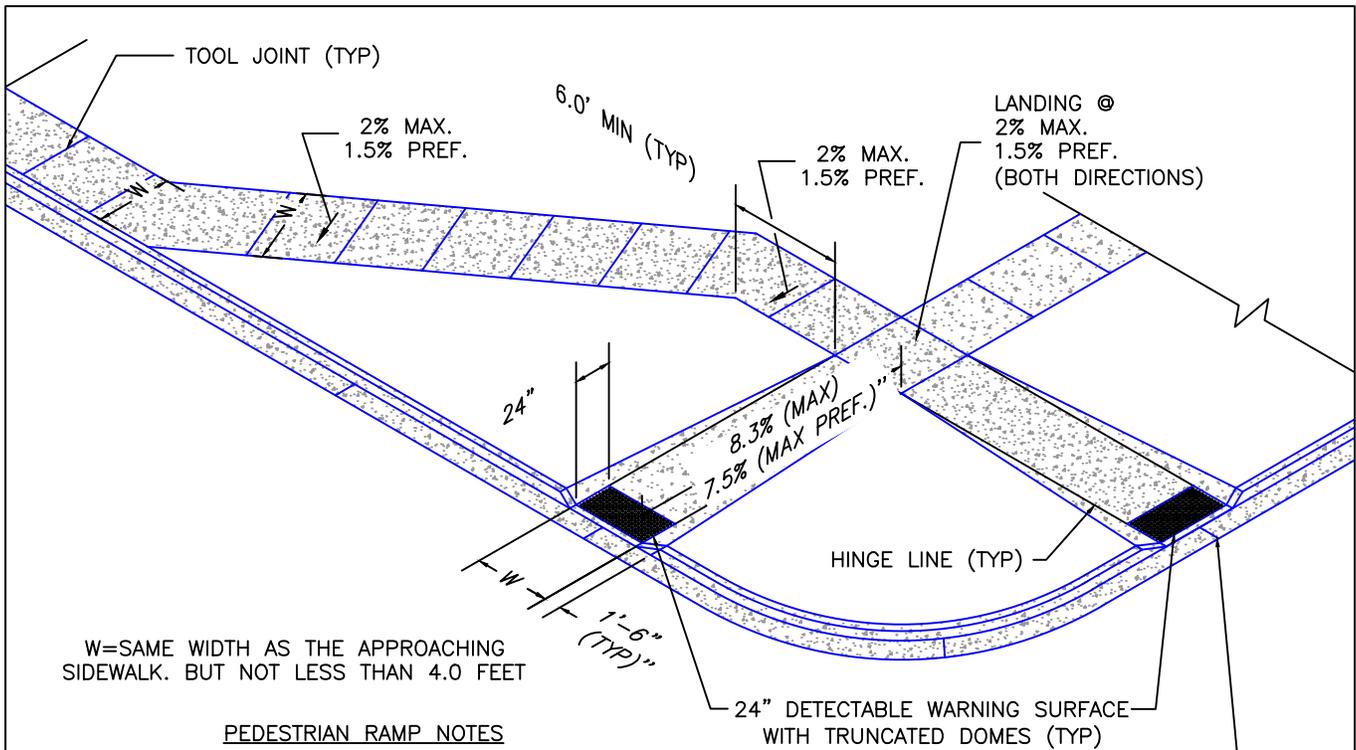
DEPARTMENT OF PUBLIC WORKS

Pedestrian Curb Ramp Detail  
Standard Drawing

REVISION DATE: 6/23/20

FILE NAME: SD\_2-40

P:\00011102\Eng\Details New\Triblock\EI Paso Logo.jpg



**PEDESTRIAN RAMP NOTES**

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT ENGINEERING CRITERIA MANUAL AND ADA REQUIREMENTS.
2. CONTRACTOR TO NOTIFY ENGINEERING DIVISION INSPECTION STAFF 48 HOURS PRIOR TO CONCRETE PLACEMENT.
3. PEDESTRIAN CURB RAMP CONSTRUCTION SHALL BE A MINIMUM 4,500 PSI CONCRETE, MINIMUM 4" THICK, NON-COLORED, NON-SCORED, COARSE BROOM FINISH.
4. PEDESTRIAN CURB RAMP LOCATION AND LENGTH MAY REQUIRE MODIFICATION TO MAINTAIN THE 8.3% MAXIMUM RUNNING RAMP SLOPE DUE TO STREET INTERSECTION GRADES AND/OR ALIGNMENTS. SEE ECM SECTION 6.3.6 FOR PEDESTRIAN PUSHBUTTON LOCATION REQUIREMENTS.
5. DETECTABLE WARNING SURFACE SHALL START A MINIMUM OF 6" BUT NOT MORE THAN 8" FROM THE FLOWLINE OF THE CURB AT ANY POINT.
6. DETECTABLE WARNING SURFACE SHALL BE PREFABRICATED, CAST IRON (PATINA NATURAL FINISH) AND IN ACCORDANCE WITH ECM CHAPTER 6 AND SD\_2-42. THERMOPLASTIC TRUNCATED DOMES AND PAVERS WILL NOT BE ACCEPTED.
7. THE DETECTABLE WARNING SURFACE SHALL BE 24" IN LENGTH AND THE FULL WIDTH OF THE RAMP.
8. PEDESTRIAN CURB RAMP WIDTH REQUIRED IS SAME AS APPROACHING SIDEWALK; 4' MINIMUM.
9. ALL PEDESTRIAN CURB RAMPs WILL BE PERPENDICULAR TO TRAFFIC WITH THE EXCEPTION OF MID-BLOCK OR TERMINAL RAMPs WHICH MAY BE PARALLEL SUBJECT TO APPROVAL.
10. DRAINAGE STRUCTURES, TRAFFIC SIGNAL/SIGNAGE, UTILITIES/JUNCTION BOXES, OR OTHER OBSTRUCTIONS WITHIN PROPOSED PEDESTRIAN CURB RAMP AREAS AND LANDINGS ARE PROHIBITED.
11. THE COUNTER SLOPE OF THE GUTTER OR ROAD AT THE FOOT OF A RAMP SHALL NOT EXCEED 5%.

LAYOUT CURB SECTIONS SO THAT AT LEAST ONE TOOL JOINT IS WITHIN RAMP THROAT

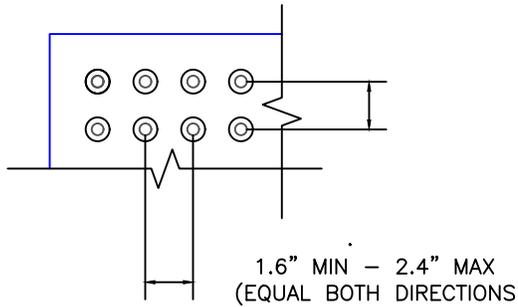
**GENERAL NOTES**

1. WHERE THE 1'-6" FLARED SIDE(S) OF A PERPENDICULAR CURB RAMP IS (ARE) CONTIGUOUS WITH A PEDESTRIAN OR HARD SURFACE AREA (PEDESTRIAN CIRCULATION PATH), THE MAXIMUM FLARE SLOPE SHALL NOT EXCEED 10:1.
2. PEDESTRIAN WALKWAY (PEDESTRIAN ACCESS ROUTE) AND/OR LOCATION OF EXISTING OR FUTURE PEDESTRIAN RAMPs ON OPPOSITE CORNERS SHALL BE REVIEWED BEFORE CONSTRUCTING NEW RAMPs.
3. AT MARKED PEDESTRIAN CROSSINGS, THE BOTTOM OF THE RAMPs, EXCLUSIVE OF THE FLARE SIDES, SHALL BE TOTALLY CONTAINED WITHIN THE MARKINGS.

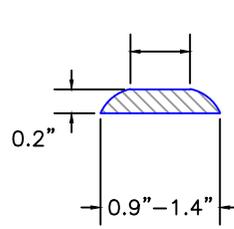
**DRAFT WORKING COPY AS OF 5/22/20**

<p>6/23/20</p> <p>DATE APPROVED:</p> <p>Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<p>Pedestrian Curb Ramp</p> <p>Standard Drawing</p>	<p>P:\M-Stds and Other Details\logo3dbutton.jpg</p>
	<p>REVISION DATE:</p> <p>6/23/20</p>	<p>FILE NAME:</p> <p>SD_2-41</p>

# TRUNCATED DOME DETAILS

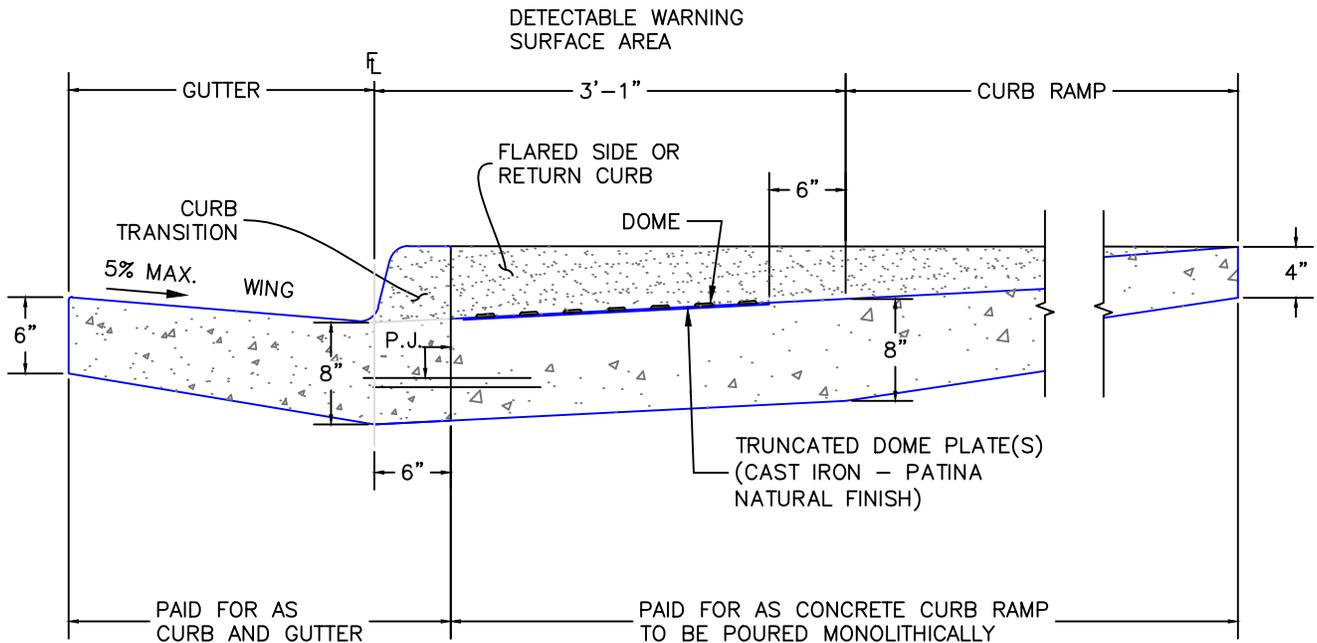


DOME SPACING



THE TOP DIAMETER OF THE TRUNCATED DOMES SHALL BE 50%-65% OF THE BASE DIAMETER

ELEVATION VIEW

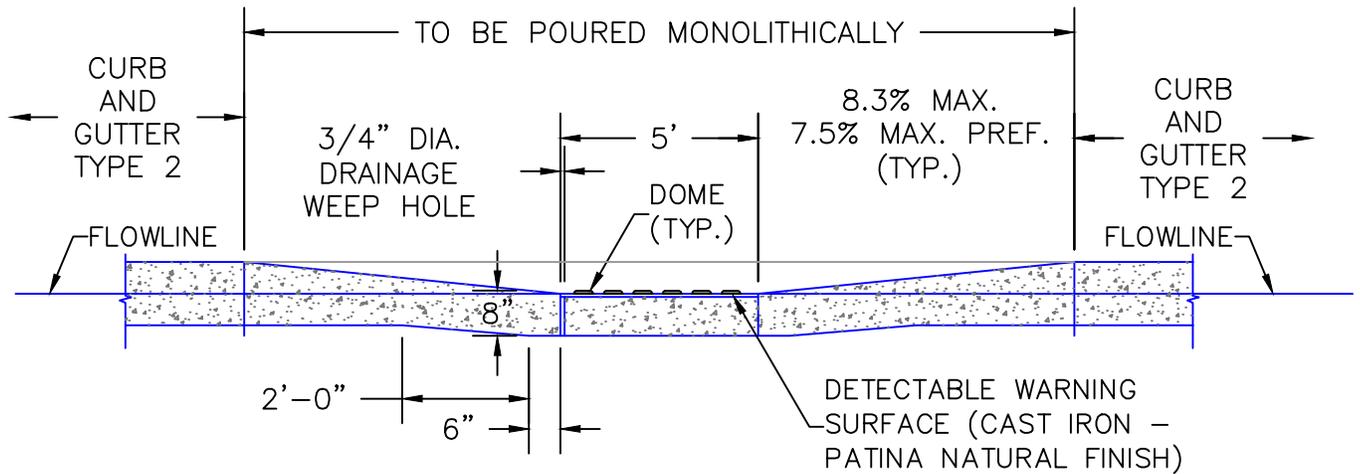
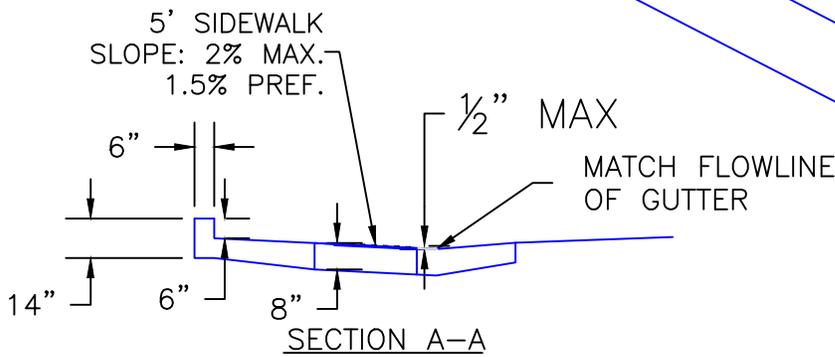
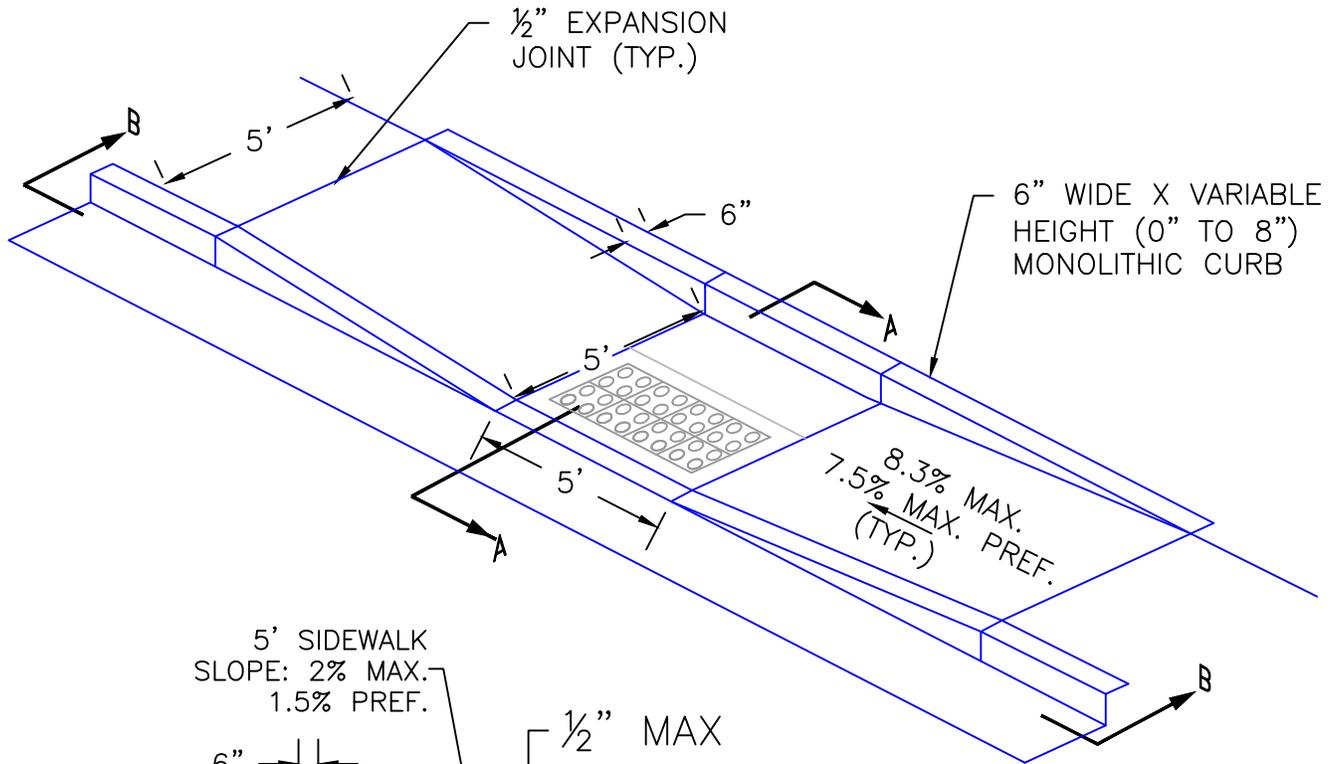


P.J.= PERMISSABLE JOINT WITH EPOXY-COATED DEFORMED NO. 4 BARS CONFORMING TO AASHTO M 284 AT 18 IN. SPACING

SIDE CROSS SECTION VIEW OF  
DETECTABLE WARNING SURFACE, CURB AND GUTTER

DRAFT WORKING COPY AS OF 5/22/20

<p style="text-align: center;">6/23/20</p> <p>DATE APPROVED:</p> <p style="text-align: center;">Jennifer E. Irvine</p> <p>DEPARTMENT OF PUBLIC WORKS</p>	<h2 style="margin: 0;">Detectable Warning Surface Details</h2> <p style="margin: 0;">Standard Drawing</p>	<p>P:\M-Stds and Other Details\logo3dbutton.jpg</p>
<p>REVISION DATE: 6/23/20</p>	<p>FILE NAME: SD_2-42</p>	



DRAFT WORKING COPY AS OF 5/22/20

SECTION B-B

SCALE: NOT TO SCALE

6/23/20  
 DATE APPROVED:  
 Jennifer E. Irvine  
 DEPARTMENT OF PUBLIC WORKS

Parallel Pedestrian  
 Curb Ramp Detail  
 Standard Drawing

REVISION DATE: 6/23/20  
 FILE NAME: SD\_2-50

P:\00011102\Eng\Details New\Titleblock\El Paso Logo.jpg



## MEMO

**To:** Jennifer Irvine, County Engineer/ECM Administrator  
**From:** HBA Public Policy Council  
**Date:** May 22, 2020  
**Subject:** El Pas County ADA Chapter/Engineering Criteria Manual

---

On behalf of the Housing & Building Association of Colorado Springs (HBA) Public Policy Council and the HBA ADA Review Sub-Committee, we would like to thank you and the engineering team at the County for conducting a collaborative review of the new ADA chapter to be included in the Engineering Criteria Manual. The HBA understands the need to create clear and concise ADA standards and fully supports the desired outcome of this process and the new criteria.

HBA members were able to meet with EPC staff and their 3rd party consulting firms to review and discuss the proposed ADA chapter and supporting documents over the last few months. Although working under a very condensed schedule, we were able to agree on the amended Accessibility Chapter language, Curb Ramp Design and Pedestrian Access Route Design checklists, and Standard drawings, that were presented on May 22, 2020, as the final revision drafts.

A couple of remaining concerns that will need attention as the ADA chapter is implemented and enforced are:

- details of the inspection criteria to include training for inspectors
- unintended drainage issues/conditions that are likely to occur

Again, thank you for the collaboration and also for the additional time to accommodate the HBA review and approval processes. We know that a full and thorough stakeholder review is not only important to the industry but also to the County.

We look forward to working through the implementation process in the field with you. Please feel free to contact us with any questions or concerns.

Respectfully,

Andrea Barlow  
2020 HBA Public Policy Chair