



Legislation Text

---

**File #: 2015-0326, Version: 1**

---

**REPEAL CHAPTER 171 STREETS AND SIDEWALKS**

AN ORDINANCE TO REPEAL CHAPTER 171 STREET AND SIDEWALKS AND ENACT A REPLACEMENT CHAPTER 171, STREETS AND SIDEWALKS OF THE UNIFIED DEVELOPMENT CODE

**WHEREAS**, it is proper and appropriate for the City Council to enact a **Purpose** section to Chapter 171, **Streets and Sidewalks** and to better define and clarify “retaining wall”; and

**WHEREAS**, the Minimum Street Standards manual needed to be updated from its 1996 version and be adopted as a technical supplement of the **Street and Sidewalks** Chapter; and

**WHEREAS**, certain technical criteria for street and sidewalk construction should be moved from this chapter and placed with the newly adopted Minimum Street Standards manual.

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FAYETTEVILLE, ARKANSAS:**

Section 1. That the City Council of the City of Fayetteville, Arkansas hereby repeals the existing Chapter 171, **Streets and Sidewalks** and enacts a replacement Chapter 171, **Streets and Sidewalks** along with the replacement Minimum Street Standards manual of the Unified Development Code as attached as Exhibit A.

**City of Fayetteville Staff Review Form**

**2015-0326**

**Legistar File ID**

**8/4/2015**

City Council Meeting Date - Agenda Item Only  
N/A for Non-Agenda Item

Chris Brown

7/15/2015

Engineering /  
Development Services Department

**Submitted By**

**Submitted Date**

**Division / Department**

**Action Recommendation:**

Approval of the updates to the Minimum Street Standards and revisions to Unified Development Code, Chapter 171, Streets and Sidewalks.

**Budget Impact:**

Account Number		Fund	
Project Number		Project Title	
<b>Budgeted Item?</b>	NA	Current Budget	
		Funds Obligated	
		Current Balance	\$ -
<b>Does item have a cost?</b>	No	Item Cost	
<b>Budget Adjustment Attached?</b>	No	Budget Adjustment	
#		Remaining Budget	\$ -

V20140710

Previous Ordinance or Resolution # \_\_\_\_\_

Original Contract Number: \_\_\_\_\_

Approval Date: \_\_\_\_\_

Comments:



# CITY COUNCIL AGENDA MEMO

**MEETING ON AUGUST 21**

**TO** Mayor and City Council

**FROM** Don Marr, Chief of Staff  
Jeremy Pate, Development Services Director

**COM** Chris Brown, City Engineer

**DATE** July 16, 2015

**SUBJECT** **PROPOSES TO THE MINIMUM STREET STANDARDS AND REVISIONS TO CHAPTER 171 STREETS AND SIDEWALKS**

**RECOMMENDATION**

Staff recommends approval of the updates to the Minimum Street Standards and revisions to Unified Development Code, Chapter 171, Streets and Sidewalks.

**BACKGROUND**

City staff has prepared the final draft of the guidance document for design and construction of streets, sidewalks and trails. This document will replace a 1996 version of the Minimum Street Standards, and will serve as a technical supplement to the City’s Unified Development Code. In addition, the associated revisions to Chapter 171 Streets and Sidewalks are attached.

The Transportation Committee has reviewed the item and recommends approval. On July 13, 2015, the Planning Commission voted to forward this item to the City Council with a recommendation for approval with a minor revision from the City Attorney.

**DISCUSSION**

The revisions proposed to Chapter 171 are summarized below:

- 171.01 A purpose statement was added to the chapter.
- 171.02 Adoption of the Minimum Street Standards added.
- 171.02 Language for retaining wall locations adjacent to the ROW was clarified.
- 171.06 Procedure for Vacations was changed to reflect the current submittal procedure.
- 171.07 Removed technical criteria for utilities within the ROW and referenced the Minimum Street Standards.
- 171.13 Changed language from Sidewalk Administrator to City Engineer.
- 171.14 Removed technical criteria for sidewalk, driveway and trail construction and referenced the Minimum Street Standards.
- 171.15 Removed technical criteria for excavations in the ROW and updated the permitting procedure.

**NET STAFF IMPACT**

None

**ATTACHMENTS**

Unified Development Code Revisions:

Chapter 171 Streets and Sidewalks

Planning Commission Memo

Chapter 171 Streets and Sidewalks as submitted to Planning Commission

Minimum Street Standards

**TITLE XV UNIFIED DEVELOPMENT CODE  
CHAPTER 171: STREETS AND SIDEWALKS**

171.01 MISCELLANEOUS PROVISIONS ..... 3

171.02 INTERSECTIONS ..... 4

171.03 RESERVED ..... 4

171.04 CROSSWALKS TO BE ACCESSIBLE TO PHYSICALLY DISABLED ..... 4

171.05 PROCEDURE FOR CLOSING UTILITY EASEMENTS AND STREET RIGHTS-OF-WAY ..... 4

171.06 OCCUPATION OF STREETS AND HIGHWAYS BY PUBLIC UTILITIES ..... 4

171.07 MAINTENANCE AND CONSTRUCTION POLICIES ..... 5

171.08 ORDER OF CITY COUNCIL OR PERMIT REQUIRED ..... 5

171.09 APPLICATION FOR PERMIT ..... 5

171.10 STANDARDS FOR ISSUANCE OF PERMIT; EXPIRATION AND REMOVAL ..... 6

171.11 INSPECTION OF WORK; REPLACEMENT OF REJECTED WORK ..... 6

171.12 PROPERTY OWNER TO CONSTRUCT SIDEWALK OR CONTRIBUTE COST OF SIDEWALK 6

171.13 SIDEWALK, DRIVEWAY AND TRAIL SPECIFICATIONS ..... 7

171.14 EXCAVATIONS ..... 8

171.15 STREET IMPROVEMENT DISTRICTS ..... 9

171.16-171.99 RESERVED ..... 10



## CHAPTER 171: STREETS AND SIDEWALKS

### 171.01 Purpose

It is the purpose of this chapter to preserve and protect the health, safety, and general welfare of citizens by providing regulations for design and construction of public streets and sidewalks; thereby providing safe, convenient, cost effective transportation systems that are accessible to all users and modes of transportation.

### 171.02 General Provisions

#### (A) *Minimum Street Standards.*

(1) *Adoption and enforcement of Minimum Street Standards.* The City Council adopts the Minimum Street Standards as recommended by the City Engineer and attached to the enacting ordinance. All technical procedures and design standards contained within the Minimum Street Standards shall be enforceable as part of the Unified Development Code through enforcement procedures of Chapter 153 as well as § 150.12 **Penalty.**

(2) *Variances to Minimum Street Standards.* When the City Engineer determines that application of the technical procedures or design standards within the Minimum Street Standards would cause undue hardship or unnecessary practical problems for a particular street or sidewalk project, the City Engineer may vary such Minimum Street Standards and may condition such variances by requiring other standards to safeguard the purposes of this chapter and the Minimum Street Standards.

(B) *Designation as streets or avenues.* All thoroughfares now or hereafter platted, which run in an east and west direction through the corporate limits of the city, shall be designated as "street," and all thoroughfares now or hereafter platted, which run in a north and south direction through the corporate limits of the city, shall be designated as "avenues." This section shall not be construed so as to prohibit the use of such descriptive names as "boulevard," "road," "way," "trail," and the like which might be used indiscriminately as a designation of the thoroughfare, and this section shall in no way be deemed applicable to any alleys or alleyways.

#### (C) *Retaining walls near sidewalk or right-of-way.*

(1) *Definition.* For purposes of this section, retaining walls are defined as vertical or near vertical walls at least 2.5 feet in height, that

require a footing or other structural reinforcement for structural stability.

(2) *City Engineer Approval.* The City Engineer may approve retaining walls within rights of way where necessary to protect adjacent property, minimize right of way widths, protect sensitive environmental areas, or for other reasons that further the purpose of this chapter.

(3) *Requirements.* Retaining walls constructed within rights of way shall:

- (a) Be constructed such that footings or other structural reinforcement do not conflict with existing or future storm drainage or utility installations.
- (b) Be of sufficient distance from sidewalks or trails so as to not impede or encroach on the minimum effective width.
- (c) Have adequate safety railings or other precautions to prevent falls.
- (d) Meet any other requirements of the City Engineer to protect the public interest.

(D) Gated streets not allowed in most residential subdivisions.

No residential subdivision or apartment complex shall be constructed with a gate across a street without prior express approval by resolution of the City Council that finds that security considerations favoring a gate outweigh aesthetic considerations and the city's policies in favor of connectivity, openness and neighborliness.

(E) *Taxi Stands.* Taxi stand shall mean such portion or portions of the public street or highway designated by the City Council of the City of Fayetteville as a place in which taxis may stand or park.

(1) No unattended parking allowed. A taxi must remain attended by its driver and ready for service while located within a taxi stand.

(2) City Council Establishment of Taxi Stands:

- (a) The City Council may establish taxi stands on portions of public streets or facilities or private areas if permitted by the owner.
- (b) The establishment, enlargement, or removal of a taxi stand shall be by City Council Resolution after a public hearing. Adjoining property owners within the block of the street or abutting the parking lot in which the taxi stand is

proposed shall be notified by mail by the Planning Division and a planning notification sign shall be placed near the taxi stand location two weeks before the public hearing at City Council.

(Ord. No. 845, 5-6-40; Ord. No. 1026, 6-23-52; Ord. No. 1262, 5-8-61; Code 1965, §18-1, 18-2, 18-7; Ord. No. 2623, 4-15-80; Code 1991, §98.01, 98.02, 98.06; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. No. 4579, 06-01-04; Ord. 4946, 11-21-06)

**Cross reference(s)**--Enforcement, Ch. 153.

**171.03 Intersections**

- (A) Streets shall be planned and designed to provide a safe system for present and prospective traffic and shall be approved by the City Engineer.
- (B) Proposed streets shall be planned in such a manner as to provide safe access to proposed lots.

(Code 1965, App. C., Art. IV, §E; Ord. No. 2196, 2-17-76; Code 1991, §159.50; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.04 Reserved**

(Code 1965, App. C., Art. IV, §J; Ord. No. 2935, 8-2-83; Ord. No. 3302, 10-20-87; Code 1991, §159.55; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. 5296, 12-15-09)

**171.05 Crosswalks To Be Accessible To Physically Disabled**

Adequate and reasonable access for the safe and convenient movement of physically handicapped persons, including those in wheelchairs, across curbs constructed or replaced shall be provided

(Code 1965, §18-14; Ord. No. 2267, 8-17-76; Code 1991, §98.12; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.06 Procedure For Closing Public Utility Easements And Street Rights-Of-Way**

The procedure for closing of streets and alleys shall hereafter be as follows:

(A) *Information to City Planning Division.* Petitioners shall present to the City Planning Division in duplicate the following information before processing shall begin:

- (1) *Petition* Petition to vacate public easement or right-of-way, including a certified or photostatic copy of the plat on record in the Circuit Clerk's office.
- (2) *Documentation of Ownership.* Abstractor's certificate of ownership or other acceptable documentation of ownership of the area to be

vacated and properties adjacent to the vacated area.

(3) *Utilities comments.* Comments from owners or agents, of all utility companies concerning public easements or rights of way to be vacated and its relationship to existing or planned utilities, with recommendations, as to what action should be taken.

(B) *Information to Planning Commission.* One copy of the above shall be presented by the Planning Division to the Planning Commission for review and recommendation.

(C) *Recommendation to City Council.* The recommendation of the Planning Commission shall be forwarded to the City Council.

(D) *Record with Circuit Clerk.* If an ordinance is adopted vacating the public easement or right of way, it shall be published and reported in the Circuit Clerk's office.

(E) *Exception.* The vacation request need not be presented to the Planning Commission before being submitted to the City Council if the City Council finds the following by a vote of at least two-thirds of its membership and the Mayor:

- (1) The public easement or right-of-way to be vacated has not been constructed or has not been used by the public for at least five years or the easement does not contain any utilities within the area to be vacated; and
- (2) Special circumstances exist which require prompt consideration of the vacation request and justify the bypass of the Planning Commission.

(Code 1965, §18-15; Ord. No. 1685, 7-7-69; Ord. No. 1898, 1-16-73; Code 1991, §98.13; Ord. No. 3925, §1, 10-3-95; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. 5127, 4-01-08)

**Cross reference(s)**--Notifications and Public Hearings, Ch. 157, Fees, Ch. 159.

**171.07 Occupation Of Streets And Highways By Public Utilities**

Any public utility, as defined by state law, which occupies the streets, highways or other public places of the city under a franchise granted by the city or the state shall occupy said streets, highways or other public places in accordance with the requirements of the Minimum Street Standards and subject to the following terms and conditions:

(A) *Written approval.* A public utility shall not erect or place any facility more than seven (7) feet inside the right-of-way line for any street without the

TITLE XV UNIFIED DEVELOPMENT CODE

prior written approval of the City Engineer, who shall grant such approval only if he determines that the facility will not impair or obstruct present or future vehicular and pedestrian traffic.

(B) *Relocation.* Whenever public utility facilities which are located within a public right-of-way must be relocated in order not to impair or obstruct vehicular or pedestrian traffic on any new or existing street, highway, road, or sidewalk, the public utility shall be required to relocate its facilities within a reasonable time from receipt of written notice from the City, and shall bear its own relocation costs; provided, where any project is funded with federal or state funds and said funds are received by the city for the purpose of reimbursing utility relocation expenses, the utility shall receive such reimbursement. This division shall not be construed as requiring a utility to relocate its facilities within or from a private easement without payment of just compensation.

(C) *City Engineer approval.* All proposed locations and utility designs shall be reviewed and subject to approval by the City Engineer to ensure that the proposed construction will not cause avoidable interference with existing or planned street facilities, or with street operation or maintenance. The procedure for submitting plans and information to the City Engineer for approval shall be developed and agreed upon by each utility and the City Engineer.

(D) *Street design.* When plans for street improvement and development are formulated, utility line locations should be recognized and the street designed so as to minimize conflict with existing utilities.

(Code 1965, §18-17.1; Ord. No. 2850, 8-17-82; Ord. No. 2926, 6-7-83; Ord. No. 3245, 3-3-87; Code 1991, §98.14; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.08 Maintenance And Construction Policies**

The city's policies concerning and regarding the maintenance and construction of streets, curbs, gutters, and sidewalks shall be as follows:

(A) *Maintenance.* The city shall maintain roadways in the city which have been accepted by the city as city streets, or which have come under the jurisdiction of the city by or through annexation.

(B) *Priorities.* The following factors shall be considered in establishing priorities for roadway resurfacing and rebuilding:

(1) *Function.* The function of the street, that is, the streets which carry or are expected to

carry heavy amounts of traffic shall have priority over lesser streets.

(2) *Condition.* The condition of the pavement, in general, roadways which are more deteriorated shall have priority over those streets of lesser deterioration. However those streets of lesser deterioration may have priority when it is determined that the benefits of resurfacing the roadways of lesser deterioration may be greater.

(C) *Sidewalks.*

(1) *Repair/replacement.* Existing city sidewalks shall be repaired and replaced by the city, as needed.

(2) *Priorities.* In establishing priorities for sidewalk repair or replacement, the factors to be considered shall include, but not be limited to the following:

- (a) The conditions of the sidewalk;
- (b) The expected level of pedestrian traffic; and,
- (c) The use of the sidewalk by school children.

(Code 1965, 18-47; Ord. No. 1725, 1-8-70; Ord. No. 2647, 7-15-80; Ord. No. 2655, 8-5-80; Ord. No. 2724, 5-19-81; Code 1991, §98.15; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**Cross reference(s)**--Sidewalks, §158.06.

**171.09 Order Of City Council Or Permit Required**

No person shall begin to construct, reconstruct, repair, alter or grade any sidewalk, curb, curb-cut, driveway or street on the public streets, unless the same has been properly ordered by the City Council, or plans for such have been approved by the city as site improvements for a subdivision, or a permit has been issued by the city's official charged with the administration of this chapter.

(Code 1965, §18-25; Ord. No. 1790, 3-15-71; Code No. 1991, §98.61; Ord. No. 4100, §2 (Ex.), 6-16-98)

**Cross reference(s)**--Penalty, §98.99; Sidewalks, §158.06.

**171.10 Application For Permit**

An applicant for a permit hereunder shall file with the city official an application showing:

- (A) Name and address of the owner, or agent in charge, of the property abutting the proposed work area;
- (B) Name and address of the party doing the work;

- (C) Location of the work area;
- (D) A plan or clear description of the work to be done;
- (E) Such other information as the city official shall find reasonably necessary to the determination of whether a permit should be issued hereunder.

(Code 1965, §18-26; Ord. No. 1790, 3-15-71; Code 1991, §98.62; Ord. No. 4100, §2 (Ex. A), 6-16-98)

### **171.11 Standards For Issuance Of Permit; Expiration And Removal**

- (A) The city official shall issue a permit hereunder when he/she finds:
  - (1) That the plans have been approved.
  - (2) That the work shall be done according to the specifications contained herein.
  - (3) That the operation will not unreasonably interfere with vehicular and pedestrian traffic, the demand and necessity for parking spaces, and the means of ingress to and egress from the property affected and adjacent properties.
  - (4) That the health, safety, and welfare of the public will not be unreasonably impaired.
- (B) Any permit issued shall expire three (3) months from the date of issue and may be renewed upon application.

(Code 1965, §18-29; Ord. No. 1790, 3-15-71; Code 1991, §98.64; Ord. No. 4100, §2 (Ex. A), 6-16-98)

### **171.12 Inspection Of Work; Replacement Of Rejected Work**

- (A) The city official shall make all necessary inspections before, during and after the construction of all sidewalks, curbing and guttering to insure the work is being done in accordance with the plans and specifications. In the event any or part of any work is not done in a satisfactory manner or not in conformity with the plans and specifications, the city official shall notify the contractor and owner in writing of his/her nonacceptance of the work. All such rejected work shall be removed and replaced within 30 days of this notification.
- (B) Advance notification must be given the city official for inspections under this section.

(Code 1965, §18-30; Ord. No. 1790, 3-15-71; Code 1991, §98.65; Ord. No. 4100, §2 (Ex. A), 6-16-98)

### **171.13 Property Owner To Construct Sidewalk Or Contribute Cost Of Sidewalk**

(A) *Requirement.* The owner of any property abutting a public street or highway for which a sidewalk is required by the city's Master Street Plan shall construct a sidewalk in accordance with this chapter, along said street or highway upon the receipt of notice issued at the time a building or parking lot permit is issued.

- (1) The property owner shall construct the sidewalk in accordance with the specifications provided in the Minimum Street Standards.
- (2) The property owner may request a waiver to §171.13(A)(1) requiring sidewalk construction. The City Engineer shall review the following factors to determine whether or not to grant a waiver:
  - (a) Pedestrian traffic generators such as parks and schools in the area.
  - (b) The existence of a sidewalk network in the area.
  - (c) The density of current and future development in the area.
  - (d) The amount of pedestrian traffic likely to be generated by the proposed development.
  - (e) Whether the terrain is such that a sidewalk is physically practical and feasible, and the extent to which trees, ground cover and natural areas would be adversely impacted by the construction of the sidewalk.
  - (f) The overall need for a sidewalk to be constructed on the lot.
- (3) If the City Engineer grants the waiver to construct a sidewalk, the owner shall have an option to construct the sidewalk, or to contribute money in lieu of construction as set forth below:
  - (a) The amount of money in lieu of construction to be dedicated shall be determined based upon the rough proportionality of the impact of the development upon the sidewalk infrastructure needs near the development including consideration of the persons served by the development

TITLE XV UNIFIED DEVELOPMENT CODE

and approximate pedestrian trip generation rates of the development.

- (b) To facilitate administration of this ordinance for certain recurrent types of development, the City Council has determined that the city will accept, as the roughly proportionate impact, the amount shown below:

- (i) Single family house           \$630.00
- (ii) Duplex                           \$720.00

- (c) Unless the developer presents evidence that the number of persons served by the development and the pedestrian trip generation rates of the development justify a reduced contribution in lieu of the construction of sidewalks, all industrial, commercial, and multi-family developments shall make a cash contribution in lieu of the construction of the sidewalk at a rate of three dollars (\$3.00) per square foot of the sidewalk that normally would have been required. The amount per square foot and amounts for a single family house and a duplex shall be reviewed by the City Council at least every five (5) years.

- (d) Contribution in lieu of construction of sidewalks shall be paid or construction of the sidewalks shall be completed before receiving final plat approval, or issuance of a certificate of occupancy.

- (e) Contributions must be expended within one (1) year to build a sidewalk close enough to serve the project being constructed.

- (f) If the owner voluntarily consents in writing, the contributions may be used to construct sidewalk projects where most needed as determined by the City Engineer.

- (4) An owner/builder may appeal the City Engineer's refusal to grant a waiver or the administrator's determination of the amount of contribution in lieu of construction to the Planning Commission pursuant to §155.06(D).

- (B) *Application of provisions.* The provisions of this section shall only apply to the following property:

- (1) *New structure.* On which a new structure is being built;

- (2) *Existing residential structure.* On which an existing residential structure is being modified so as to increase the number of dwelling units located therein or to change the use of the nonresidential use.

- (3) *Parking lot/garage.* On which a parking lot, or parking garage having a minimum capacity of five (5) automobiles is constructed.

- (4) *Building Additions.* Additions of 2,500 square feet or larger.

- (5) *Conditional use.* Any development which requires conditional use approval.

(Code 1965, §18-31; Ord. No. 2653, 8-5-80; Ord. No. 2780, 11-17-81; Ord. No. 2917, 5-3-83; Ord. No. 3113, 9-3-85; Code 1991, §98.66; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. No. 4311, 5-1-01; Ord. No. 4387, 4-16-02)

**171.14 Sidewalk, Driveway And Trail Specifications**

- (A) *Sidewalks.*

- (1) *Grades; establishment of property lines.* All sidewalks, access ramps, and driveway approaches shall be constructed in grades as approved by the City Engineer. It shall be the responsibility of the owner to establish property lines by competent survey at his/her own expense.

- (2) *Minimum width of sidewalks.* The minimum width of sidewalks shall follow the guidelines of the Master Street Plan, of the Comprehensive Land Use Plan. In all cases, the effective width of the sidewalk shall be a minimum of 4 feet. Effective sidewalk width is the actual sidewalk width, less:

- (a) A shy distance of 2 feet where vertical barriers (walls, fences, signs, etc) greater than 3.5 feet in height are adjacent to the sidewalk and extend more than 4 feet in length parallel to the sidewalk.
- (b) A shy distance of 1.5 feet for curb adjacent to the sidewalk
- (c) A shy distance of 1 foot for all other fixed obstacles.

The greatest of the above distances shall apply for each side of the walk.

- (3) *Sidewalk distances from the curb.* The sidewalk setback distance from the curb shall follow the guidelines of the Master Street Plan, or be as specified in the final plat unless otherwise approved by the City Engineer.

(4) *ADA guidelines.* Sidewalks within rights of way shall conform to ADA guidelines.

(5) *Sidewalk elevation.* The back of sidewalk elevation shall be such that the slope from the back of sidewalk to the top of curb is 2%, unless otherwise approved by the City Engineer. This elevation shall be continuous through the driveway approach.

(6) *Inspection.* All sidewalks and curb cuts made for driveway approaches require an inspection prior to the concrete placement.

(B) *Access ramps.*

(1) *ADA requirements.* Access ramps shall conform to ADA requirements, including detectable warning devices such as truncated domes.

(2) *Sidewalk intersections.* Access ramps shall be installed at all sidewalk intersections with the street.

(3) *Raised crosswalk.* The raised or built-up access ramp shall not be installed on public streets without the approval of the City engineer.

(4) *Minimum width.* The minimum width of a curb ramp shall be Forty-eight (48) inches.

(5) *Slope.* The slope of the ramp shall not be greater than slopes specified in the Minimum Street Standards.

(D) *Multi-use Trails.*

(1) *Minimum width of multi-use trails.* The minimum width of trails shall follow the trail cross-section guidelines of the Active Transportation Plan.

(2) *ADA guidelines.* Trails shall conform to ADA guidelines, to the extent possible.

(3) *Bollards.* Bollards are required at trail intersections with streets.

(4) *Trail signage.* Trail signage shall comply with the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities.

(5) *Street Crosswalks.* Trails that intersect and cross public streets shall have a red colored concrete crosswalk with two foot wide white thermoplastic stripes on each side, a patterned thermoplastic overly for the full crossing area, or other approved treatment

to clearly mark the trail crossing. For major streets, this crosswalk may be raised 2.5 inches above pavement surface.

(6) *Striping.* Center line stripe and a diamond pattern stripe around the bollards shall be installed. Striping shall conform to the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities. Additional striping may be required for increased safety in accordance with MUTCD standards

(Code 1965, §18-28; Ord. No. 1790, 3-15-71; Ord. No. 2629, 5-6-80; Ord. No. 3117, 9-3-85; Code 1991, §98.67; Ord. No. 4005, §1, 11-19-96; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. 4919, 9-05-06; Ord. 5044, 8-07-07; Ord. 5270, 9-1-09; Ord.5333, 7-6-10)

### 171.15 Excavations

(A) *Permit required.* It shall be unlawful for any person to make any excavation in any street, alley, sidewalk, road, highway, or other public way in the city without first obtaining a permit to do so from the Mayor, or his/her duly authorized representative. Such permit shall be granted only after written application has been filed and the deposit or bond required by §158.02 has been filed. The fee for each permit shall be paid in advance. Provided, however, that utility companies franchised by the city may be billed monthly for all permits granted during the previous month.

(B) *Lights and guards.* Every person making an excavation as provided for in this chapter shall place and maintain lights and guards around the same for the protection of the public. Such lights and guards shall be subject to the approval of the Mayor.

(C) *Repairs of public property; return of cash deposit.*

(1) *Cost.* Each person making an excavation under this chapter shall repair the street or other public way at his own expense, and under the direction and supervision of the City Engineer or designee.

(2) *Standards.* Repair of the street or other public way shall be made in accordance with the requirements of the Minimum Street Standards.

(3) *Notice.* The permittee shall notify the City Engineer, prior to beginning such repair, of the time and manner of repair and obtain the approval of the City Engineer prior to beginning of such repair.

(4) *Return of deposit.* When the repairs required by this section are completed and

## TITLE XV UNIFIED DEVELOPMENT CODE

approved, the return of any sum deposited under §171.14 above will be made to the permittee. In the event the permittee shall fail, refuse, or neglect to make such repairs, the city may repair the street and deduct the cost therefrom from the amount on deposit with the city and the balance of the deposit, if any, shall be paid to the permittee.

### (D) *Street closings for excavations.*

(1) *Prohibited without approval.* It shall be unlawful for any person to cause a street to be closed due to the making of an excavation without the prior written approval of the City. In granting such approval, the City shall impose time limits and such other reasonable conditions as are necessary to minimize any inconvenience or danger to the public.

(2) *Exception.* This section shall not apply to emergency repairs.

(Code 1965, §18-40, 18-42, 18-44; Ord. No. 1829, 10-18-71; Ord. No. 2806, 4-20-82; Code 1991, §98.80, 98.82, 98.83, 98.84; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**Cross reference(s)**--Penalty, §98.99; Enforcement, Ch. 153; Bonds and Guarantees, Ch. 158; Fees, Ch. 159.

## 171.16 Street Improvement Districts

(A) *Petition to form street improvement district.* Any person desiring to initiate the formation of a street improvement district shall file with the City Clerk a petition requesting the organization of a street improvement district and signed by persons claiming to be a majority in value, as shown by the last county assessment, of the owners of real property in the proposed district. Forms of this petition shall be available to any person at the office of the City Clerk, and the City Engineer shall assist in the preparation of said petition by providing a legal description of the property to be included in the proposed district. Such petition may limit the cost of the improvement to either a fixed sum or to a percentage of the assessed value of the real property in the proposed district.

(B) *Notice of public hearing.* When persons claiming to be a majority in value, as shown by the last county assessment of the owners of real property in a proposed street improvement district file with the City Clerk a petition for the organization of such an improvement district, it shall be the duty of the City Clerk to give notice that such petition will be heard at a meeting of the City Council to be held more than 15 days after the filing of such petition. Such notice shall be published once a week for two (2) weeks, the last insertion to be not less than seven (7) days before the date fixed for the hearing. The Mayor, if he sees fit, may

call a special meeting of the City Council for the purpose of hearing such petition, such called meeting to be held not less than 15 days after the date of the call and the notice of the hearing thereat to be published for the time and in the manner above stated.

### (C) *Hearing on petition; ordinance establishing district.*

(1) At the time named in said notice, the City Council shall meet and hear all owners of real property within the proposed district who desire to be heard on the question of whether a majority in assessed value of property owners has signed the petition, and shall make a finding of whether the petition is signed by a majority in assessed value of such property owners. The finding of the governing body shall be expressed in an ordinance. If it finds that a majority has signed the petition, it shall then be its duty by the same ordinance to establish the district. The ordinance shall designate the boundaries of the district and shall also give the district a name descriptive of the nature of the proposed improvement and a number to prevent it from being confused with similar districts.

(2) The ordinance shall be published within 30 days after its adoption for one insertion in some newspaper published in the city and the findings of the governing body shall be conclusive unless attached by a suit in the Chancery Court brought within 30 days after such publication.

(D) *Appointment of Board of Improvement.* In the ordinance creating the district, the City Council shall appoint three (3) owners of real property therein as commissioners, who shall compose a Board of Improvement for the district. Such Board of Improvement shall have control of the construction of the improvements in the district.

(E) *Plans for improvement.* Immediately after their qualification, the Board of Improvement shall form plans for the improvement as prayed in the petition, and shall procure estimates of the costs thereof. For this purpose, the board may employ such engineers and other agents as may be needful, and may provide for their compensation which, with all other necessary expenditures, shall be taken as a part of the cost of the improvement. If for any cause the improvement shall not be made, said cost shall be raised and paid by an ad valorem tax upon the real property in the district as assessed for state and county purposes, which shall be levied by the City Council on the application of any person interested, and shall be paid to the Board of

Fayetteville Code of Ordinances

Improvement, to be distributed amongst the creditors of the district.

conform thereto if any change has been made therein by said City Council.

(F) *Appointment of Board of Assessment.* As soon as the Board of Improvement shall have formed said plan, and shall have ascertained the cost of the improvement, it shall report the same to the City Council who shall appoint three electors of the city, who shall constitute a Board of Assessment of the benefits to be received by each lot or block, or other subdivision of land within said district, by reason of said proposed improvement.

(K) *Assessments payable in annual installments.* It shall be provided by ordinance that the local assessment of benefits shall be paid in successive annual installments so that the tax levied in any one (1) year shall not exceed 25% of the assessed benefits accruing to real property.

(G) *Assessment of benefits.* The Board of Assessment shall at once proceed to inscribe in a book to be used for the purpose of description of each of said lots, blocks, or parcels of land and shall assess the value of the benefit to accrue to each of said lots, blocks, or parcels of land by reason of such improvement, which assessment of said benefits they shall enter upon said book opposite the description thereof; and they shall then subscribe said assessment and deposit it in the office of the City Clerk, where it shall be kept and preserved as a public record. Provided, said assessment may be annually readjusted according to additional improvements placed upon the lands, when a succession of collections is necessary to pay for the improvements.

(L) *Publication of ordinance.* Within 30 days after the passage of the ordinance mentioned in subsection (C) above, the City Clerk shall publish a copy of it in some newspaper published and having a bona fide circulation in the city for one time. Within 30 days after such publication the district, or any property owner may bring suit in Chancery Court for the purpose of correcting or invalidating such assessment; but if such suit is not brought within the time, all objections to the creation of the district for the validity of the assessment shall be forever barred and precluded.

(H) *Notice of filing of assessment.* Immediately on the filing of said assessments, the City Clerk shall insert in some newspaper published in the city, the following notice:

(M) *Copy of assessment delivered to collector.* Within 40 days after the passage of the ordinance mentioned in (C) above, unless the time be extended by the City Council, the City Clerk shall deliver to the County Collector a certified copy of said assessment of benefits containing a description of said blocks, lots, and parcels of land in said district, and the amount assessed on each, duly extended against each lot, block, or parcel of land, and a certified copy of the ordinance fixing the percentum to be collected each year. At the same time the City Clerk delivers to the County Collector a certified copy of the assessment of benefits, and the certified copy of the ordinance fixing the percentum to be collected, he/she shall deliver like said copies to the County Clerk.

"The assessment of Street Improvement District No. \_\_\_\_\_, was filed in my office on the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, and the same is now subject to inspection.

\_\_\_\_\_  
Clerk of the City of Fayetteville, Arkansas."

(I) *Appeal of assessments to City Council.* Anyone whose real estate is embraced in said assessment may at any time within 10 days from the giving of said notice, file with the City Clerk in writing his/her notice of appeal from the action of said Board of Assessment in making said assessment of his/her property, which appeal shall be heard and disposed of at the next regular meeting of the City Council, and on such appeal the matter shall be heard de novo on such evidence as may be adduced on either side.

(N) *Annual financial report required.* The commissioners of each street improvement district shall file an annual financial report with the City Clerk on or before the first day of March of each year, covering the financial affairs of their respective districts for the preceding year. Such financial statements shall be certified and filed as herein provided by the chief financial officer of each such improvement district.

(Code 1965, §§18.18, 18.19--18.22, 18-22.1--18-22.9; Ord. No. 2051, 9-17-74; Code 1991, §98.30, §98.43; Ord. No. 4100, §2 (Ex. A), 6-16-98)

(J) *Finding of City Council.* The City Council shall enter on its minutes the results of its finding on any such appeal, and shall cause a copy of its finding to be certified to said Board of Assessment, which shall make its assessment

**171.17-171.99 Reserved**

**TITLE XV UNIFIED DEVELOPMENT CODE  
CHAPTER 171: STREETS AND SIDEWALKS**

171.01 MISCELLANEOUS PROVISIONS .....	<b>3</b>	
171.02 INTERSECTIONS .....	<a href="#"><u>44433</u></a>	
171.03 RESERVED .....	<a href="#"><u>55434</u></a>	
171.04 CROSSWALKS TO BE ACCESSIBLE TO PHYSICALLY DISABLED .....	<a href="#"><u>55434</u></a>	
171.05 PROCEDURE FOR CLOSING UTILITY EASEMENTS AND STREET RIGHTS-OF-WAY .....	<a href="#"><u>554</u></a>	
171.06 OCCUPATION OF STREETS AND HIGHWAYS BY PUBLIC UTILITIES.....	<a href="#"><u>55544</u></a>	
171.07 MAINTENANCE AND CONSTRUCTION POLICIES.....	<a href="#"><u>77646</u></a>	
171.08 ORDER OF CITY COUNCIL OR PERMIT REQUIRED .....	<a href="#"><u>77756</u></a>	
171.09 APPLICATION FOR PERMIT.....	<a href="#"><u>77756</u></a>	
171.10 STANDARDS FOR ISSUANCE OF PERMIT; EXPIRATION AND REMOVAL .....	<a href="#"><u>77756</u></a>	
171.11 INSPECTION OF WORK; REPLACEMENT OF REJECTED WORK .....	<a href="#"><u>88757</u></a>	
171.12 PROPERTY OWNER TO CONSTRUCT SIDEWALK OR CONTRIBUTE COST OF SIDEWALK.....	<a href="#"><u>88767</u></a>	
171.13 SIDEWALK, DRIVEWAY AND TRAIL SPECIFICATIONS.....	<a href="#"><u>99978</u></a>	
171.14 EXCAVATIONS .....	<a href="#"><u>121212811</u></a>	
171.15 STREET IMPROVEMENT DISTRICTS .....	<a href="#"><u>131313912</u></a>	
171.16-171.99 RESERVED .....	<a href="#"><u>1515141014</u></a>	



## CHAPTER 171: STREETS AND SIDEWALKS

### 171.01 Purpose

It is the purpose of this chapter to preserve and protect the health, safety, and general welfare of citizens by providing regulations for design and construction of public streets and sidewalks; thereby providing safe, convenient, cost effective transportation systems that are accessible to all users and modes of transportation.

### 171.02~~1~~ GeneralMiscellaneous Provisions

~~(A)~~

(A) Minimum Street Standards.

(1) Adoption and enforcement of Minimum Street Standards. The City Council adopts the Minimum Street Standards as recommended by the City Engineer and attached to the enacting ordinance. All technical procedures and design standards contained within the Minimum Street Standards shall be enforceable as part of the Unified Development Code through enforcement procedures of Chapter 153 as well as § 150.12 Penalty.

(2) Variances to Minimum Street Standards. When the City Engineer determines that application of the technical procedures or design standards within the Minimum Street Standards would cause undue hardship or unnecessary practical problems for a particular street or sidewalk project, the City Engineer may vary such Minimum Street Standards and may condition such variances by requiring other standards to safeguard the purposes of this chapter and the Minimum Street Standards.

Rules and regulations governing street improvements. The City Council hereby adopts by reference the Minimum Street Standards of the City of Fayetteville, and as may be amended from time to time by the City Engineer. All technical procedures and design standards contained therein shall have the same force and effect as if printed word for word in this chapter. The City Engineer is hereby authorized to prepare such rules and regulations in connection with the standardization of the design, construction, and maintenance of street and alley paving, including driveways, sidewalks, storm sewers, culverts and bridges, material, and construction methods, including approval of all such work, and for other matters and things in connection with the construction and maintenance of such work, which lie within the jurisdiction of the city, as to him/her shall deem proper, necessary, or expedient. Upon the preparation of such rules

~~and regulations, they shall be submitted to the City Council and upon approval by the City Council, either by motion or resolution, such rules and regulations shall govern the design, construction and maintenance of street improvements as stated in this section. Such rules and regulations, when approved by the City Council, shall have the same force and effect as law and violations thereof shall be punished as provided in Chapter 153.~~

~~(B) Designation as streets or avenues. All thoroughfares now or hereafter platted, which run in an east and west direction through the corporate limits of the city, shall be designated as "street," and all thoroughfares now or hereafter platted, which run in a north and south direction through the corporate limits of the city, shall be designated as "avenues." This section shall not be construed so as to prohibit the use of such descriptive names as "boulevard," "road," "way," "trail," and the like which might be used indiscriminately as a designation of the thoroughfare, and this section shall in no way be deemed applicable to any alleys or alleyways.~~

~~(C) Retaining walls near sidewalk or right-of-way.~~

~~(1) Permit Definition. It shall be unlawful for any person to construct any portion of a retaining wall more than 3.5 feet in height, including footings or other reinforcements, within two (2) feet of the inside of any sidewalk in the city or, if there is no sidewalk, within two (2) feet of the platted line of the city right-of-way, without first obtaining a permit to do so from the Mayor, or other official designated by the Mayor. For purposes of this section, retaining walls are defined as vertical or near vertical walls at least 2.5 feet in height, that require a footing or other structural reinforcement for structural stability.~~

~~(2) Established line City Engineer Approval. The City Engineer may approve retaining walls within rights of way where necessary to protect adjacent property, minimize right of way widths, protect sensitive environmental areas, or for other reasons that further the purpose of this chapter.~~

~~(3) Requirements. Retaining walls constructed within rights of way shall:~~

~~(a) Be constructed such that footings or other structural reinforcement do not conflict with existing or future storm drainage or utility installations.~~

Fayetteville Code of Ordinances

- (b) Be of sufficient distance from sidewalks or trails so as to not impede or encroach on the minimum effective width.
- (c) Have adequate safety railings or other precautions to prevent falls.
- (d) Meet any other requirements of the City Engineer to protect the public interest.
- ~~(a) In all cases where a permit is required under the terms of this section, the City Engineer shall establish the line upon which the retaining wall is to be built.~~

(D) Gated streets not allowed in most residential subdivisions.

No residential subdivision or apartment complex shall be constructed with a gate across a street without prior express approval by resolution of the City Council that finds that security considerations favoring a gate outweigh aesthetic considerations and the city's policies in favor of connectivity, openness and neighborliness.

(E) *Taxi Stands.* Taxi stand shall mean such portion or portions of the public street or highway designated by the City Council of the City of Fayetteville as a place in which taxis may stand or park.

(1) No unattended parking allowed. A taxi must remain attended by its driver and ready for service while located within a taxi stand.

(2) City Council Establishment of Taxi Stands:

(a) The City Council may establish taxi stands on portions of public streets or facilities or private areas if permitted by the owner.

(b) The establishment, enlargement, or removal of a taxi stand shall be by City Council Resolution after a public hearing. Adjoining property owners within the block of the street or abutting the parking lot in which the taxi stand is proposed shall be notified by mail by the Planning Division and a planning notification sign shall be placed near the taxi stand location two weeks before the public hearing at City Council.

(Ord. No. 845, 5-6-40; Ord. No. 1026, 6-23-52; Ord. No. 1262, 5-8-61; Code 1965, §18-1, 18-2, 18-7; Ord. No. 2623, 4-15-80; Code 1991, §98.01, 98.02, 98.06; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. No. 4579, 06-01-04; Ord. 4946, 11-21-06)

**Cross reference(s)**--Enforcement, Ch. 153.

**171.032 Intersections**

(A) Streets shall be planned and designed to provide a safe system for present and prospective traffic and shall be approved by the City Engineer.

(B) Proposed streets shall be planned in such a manner as to provide safe access to proposed lots.

~~(C) Design standards:~~

	Ordinary	Hilly
--	----------	-------

TITLE XV UNIFIED DEVELOPMENT CODE

Approach	25 mph	20 mph
Sight distance	90 feet	70 feet
Grades within 100 ft.	Flat	4%
Minimum angle	75°	75°

Minimum Curb Radius		
Minor streets	30 feet	30 feet
Collector streets	50 feet	50 feet

Minimum Jog		
Minor streets	150 feet	150 feet
Collector streets	200 feet	200 feet

(Code 1965, App. C., Art. IV, §E; Ord. No. 2196, 2-17-76; Code 1991, §159.50; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.043 Reserved**

(Code 1965, App. C., Art. IV, §J; Ord. No. 2935, 8-2-83; Ord. No. 3302, 10-20-87; Code 1991, §159.55; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. 5296, 12-15-09)

**171.054 Crosswalks To Be Accessible To Physically Disabled**

~~At all pedestrian crosswalks on collector and arterial streets, in commercial zones, and on those streets financed by federal funds throughout the city, Adequate and reasonable access for the safe and convenient movement of physically handicapped persons, including those in wheelchairs, across curbs constructed or replaced on or after the effective date of this section shall be provided.~~

(Code 1965, §18-14; Ord. No. 2267, 8-17-76; Code 1991, §98.12; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.065 Procedure For Closing Public Utility Easements And Street Rights-Of-Way**

The procedure for closing of streets and alleys shall hereafter be as follows:

~~(A) Information to City Planning Division~~ City Clerk. Petitioners shall present to the City Planning Division City Clerk in duplicate the following information before processing shall begin:

- (1) ~~Petition/plat~~ Petition to ~~close and~~ vacate public easement or right-of-way street or alley, including a certified or photostatic copy of the plat on record in the Circuit Clerk's office.
- (2) Documentation of Ownership ~~Abstractor's certificate~~. Abstractor's certificate of ownership or other acceptable documentation of ownership of the area to be

vacated and properties adjacent to the vacated area.

(3) *Utilities comments*. Comments from owners or agents, of all utility companies concerning ~~streets or alleys public easements or rights of way~~ to be ~~closed~~ vacated and its relationship to existing or planned utilities, with recommendations, as to what action should be taken.

(B) *Information to Zoning and Development Administrator/Planning Commission*. One copy of the above shall be presented by the City Clerk Planning Division to the Zoning and Development Administrator/Planning Commission ~~who shall submit same for review and recommendation of the Planning Commission.~~

(C) *Recommendation to City Council*. The recommendation of the Planning Commission shall be forwarded to the City Council.

(D) *Record with Circuit Clerk*. If an ordinance is adopted ~~closing or~~ vacating the street or alley public easement or right of way, it shall be published and reported in the Circuit Clerk's office.

(E) *Exception*. The vacation request need not be presented to the Planning Commission before being submitted to the City Council if the City Council finds the following by a vote of at least two-thirds of its membership and the Mayor:

- (1) The ~~street, alley, public easement~~ or right-of-way to be vacated has not been constructed or has not been used by the public for at least five years or the easement does not contain any utilities within the area to be vacated; and
- (2) Special circumstances exist which require prompt consideration of the vacation request and justify the bypass of the Planning Commission.

(Code 1965, §18-15; Ord. No. 1685, 7-7-69; Ord. No. 1898, 1-16-73; Code 1991, §98.13; Ord. No. 3925, §1, 10-3-95; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. 5127, 4-01-08)

**Cross reference(s)**--Notifications and Public Hearings, Ch. 157, Fees, Ch. 159.

**171.076 Occupation Of Streets And Highways By Public Utilities**

Any public utility, as defined by state law, which occupies the streets, highways or other public places of the city under a franchise granted by the city or the state shall occupy said streets, highways or other public places in accordance with the requirements of

the Minimum Street Standards and subject to the following terms and conditions:

(A) *Written approval.* A public utility shall not erect or place any facility more than seven (7) feet inside the right-of-way line for any street without the prior written approval of the Mayor/City Engineer, who shall grant such approval only if he determines that the facility will not impair or obstruct present or future vehicular and pedestrian traffic.

(B) *Relocation.* Whenever public utility facilities which are located within a public right-of-way must be relocated in order not to impair or obstruct vehicular or pedestrian traffic on any new or existing street, highway, road, or sidewalk, the public utility shall be required to relocate its facilities within a reasonable time from receipt of written notice from the Mayor/City, and shall bear its own relocation costs; provided, where any project is funded with federal or state funds and said funds are received by the city for the purpose of reimbursing utility relocation expenses, the utility shall receive such reimbursement. This division shall not be construed as requiring a utility to relocate its facilities within or from a private easement without payment of just compensation.

~~(C) *Policies.* The following policies approved by Arkansas State Highway Commission, Minute Order 70-300 shall apply to the accommodation and adjustment of utilities on street and alley right-of-ways within the city:~~

~~(1) *General criteria:*~~

~~(a) *Underground utility construction.* Underground utility construction shall conform to all applicable codes, standards, and specifications.~~

~~(b) *Depth.* The depth of bury for new or replacement utility installations shall be established by the utility on the basis of engineering and safety factors for the area; and in keeping with the degree of hazard or protection required for the line involved; provided, however, that the normal minimum depth of bury on all cross lines shall be 2 ½ feet below the low points of roadway cross section, or 3 ½ feet below the bottom of surfacing (top of subgrade), whichever gives the greater depth; and the normal minimum depth of bury on all parallel (longitudinal) lines shall be two (2) feet.~~

~~(c) *Aboveground appurtenances.* Pedestals or other aboveground utility appurtenances shall be located at or near the right-of-way line well outside of the street maintenance operation area.~~

~~(d) *City Engineer approval.* All proposed locations and utility designs shall be reviewed and subject to approval by the City Engineer to ensure that the proposed construction will not cause avoidable interference with existing or planned street facilities, or with street operation or maintenance. The procedure for submitting plans and information to the City Engineer for approval shall be developed and agreed upon by each utility and the City Engineer.~~

~~(e) *Expansion of underground utilities.* On both cased and uncased installations, particularly on crossings installed in advance of new street construction, consideration should be given by the utility for placing a spare conduit or duct to accommodate known or planned expansion of underground lines.~~

~~(f) *Underground installations.* The controls for pipelines as apply to encasements, conduits, appurtenances, installations, trenched and untrenched construction, and adjustments shall be followed, as applicable, on underground installation of electric power and communication lines.~~

~~(2) *Location and alignment:*~~

~~(a) *Crossings.* Crossings should be located as near normal to the street alignment as practical.~~

~~(b) *Underground crossings.* Conditions which are generally unsuitable or undesirable for underground crossings should be avoided. These include locations such as deep cuts; near footings of bridges retaining walls; across intersections at grade or ramp terminals; at cross drains where flow of water, drift, or stream bedload may be obstructed; within basins of an underpass drained by a pump; land in wet or rocky terrain where it would be difficult to attain minimum bury.~~

~~(3) *Cased and uncased construction:*~~

~~(a) *Without protective conduit.* Where acceptable to both the utility and the City Engineer on minor streets, underground crossings may be installed without protective conduit or duct. Normally, such installations should be limited to open-trenched construction or to small bores for pipe, wire or cable facilities where soil conditions permit installation by boring a hole about the same diameter as the pipe or cable and pushing the pipe or pulling the cable through.~~

~~(b) *Encased in protective conduit.* Where crossings of underground lines are encased in protective conduit or duct, the encasement shall extend a suitable distance (minimum where practical equal to the depth of bury) beyond the slope or ditch~~

~~lines. On curbed sections, it should extend outside the outer curbs or sidewalk. Where appropriate, the encasement shall extend to the access control lines, to the outside of frontage roads, or to an indicated line that allows for future widening of the street.~~

~~(c) Other. Consideration should be given to encasement or other suitable protection for any pipe, wire or cable facilities with less than minimum bury, near the footings of bridges or other street structures, or near other locations where there may be hazard.~~

~~(D)(C)(4)~~ **Street design.** When plans for street improvement and development are formulated, utility line locations should be recognized and the street designed so as to minimize conflict with existing utilities.

(Code 1965, §18-17.1; Ord. No. 2850, 8-17-82; Ord. No. 2926, 6-7-83; Ord. No. 3245, 3-3-87; Code 1991, §98.14; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.087 Maintenance And Construction Policies**

The city's policies concerning and regarding the maintenance and construction of streets, curbs, gutters, and sidewalks shall be as follows:

(A) *Maintenance.* The city shall maintain roadways in the city which have been accepted by the city as city streets, or which have come under the jurisdiction of the city by or through annexation.

(B) *Priorities.* The following factors shall be considered in establishing priorities for roadway resurfacing and rebuilding:

(1) *Function.* The function of the street, that is, the streets which carry or are expected to carry heavy amounts of traffic shall have priority over lesser streets.

(2) *Condition.* The condition of the pavement, in general, roadways which are more deteriorated shall have priority over those streets of lesser deterioration. However those streets of lesser deterioration may have priority when it is determined that the benefits of resurfacing the roadways of lesser deterioration may be greater.

(C) *Sidewalks.*

(1) *Repair/replacement.* Existing city sidewalks shall be repaired and replaced by the city, as needed.

(2) *Priorities.* In establishing priorities for sidewalk repair or replacement, the factors to

be considered shall include, but not be limited to the following:

- (a) The conditions of the sidewalk;
- (b) The expected level of pedestrian traffic; and,
- (c) The use of the sidewalk by school children.

(Code 1965, 18-47; Ord. No. 1725, 1-8-70; Ord. No. 2647, 7-15-80; Ord. No. 2655, 8-5-80; Ord. No. 2724, 5-19-81; Code 1991, §98.15; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**Cross reference(s)**--Sidewalks, §158.06.

**171.098 Order Of City Council Or Permit Required**

No person shall begin to construct, reconstruct, repair, alter or grade any sidewalk, curb, curb-cut, driveway or street on the public streets, unless the same has been properly ordered by the City Council, or plans for such have been approved by the city as site improvements for a subdivision, or a permit has been issued by the city's official charged with the administration of this chapter.

(Code 1965, §18-25; Ord. No. 1790, 3-15-71; Code No. 1991, §98.61; Ord. No. 4100, §2 (Ex.), 6-16-98)

**Cross reference(s)**--Penalty, §98.99; Sidewalks, §158.06.

**171.1009 Application For Permit**

An applicant for a permit hereunder shall file with the city official an application showing:

- (A) Name and address of the owner, or agent in charge, of the property abutting the proposed work area;
- (B) Name and address of the party doing the work;
- (C) Location of the work area;
- (D) A plan or clear description of the work to be done;
- (E) Such other information as the city official shall find reasonably necessary to the determination of whether a permit should be issued hereunder.

(Code 1965, §18-26; Ord. No. 1790, 3-15-71; Code 1991, §98.62; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.110 Standards For Issuance Of Permit, Expiration And Removal**

(A) The city official shall issue a permit hereunder when he/she finds:

- (1) That the plans have been approved.

- (2) That the work shall be done according to the specifications contained herein.
- (3) That the operation will not unreasonably interfere with vehicular and pedestrian traffic, the demand and necessity for parking spaces, and the means of ingress to and egress from the property affected and adjacent properties.
- (4) That the health, safety, and welfare of the public will not be unreasonably impaired.

(B) Any permit issued shall expire three (3) months from the date of issue and may be renewed upon application.

(Code 1965, §18-29; Ord. No. 1790, 3-15-71; Code 1991, §98.64; Ord. No. 4100, §2 (Ex. A), 6-16-98)

### **171.1214 Inspection Of Work; Replacement Of Rejected Work**

- (A) The city official shall make all necessary inspections before, during and after the construction of all sidewalks, curbing and guttering to insure the work is being done in accordance with the plans and specifications. In the event any or part of any work is not done in a satisfactory manner or not in conformity with the plans and specifications, the city official shall notify the contractor and owner in writing of his/her nonacceptance of the work. All such rejected work shall be removed and replaced within 30 days of this notification.
- (B) Advance notification must be given the city official for inspections under this section.

(Code 1965, §18-30; Ord. No. 1790, 3-15-71; Code 1991, §98.65; Ord. No. 4100, §2 (Ex. A), 6-16-98)

### **171.132 Property Owner To Construct Sidewalk Or Contribute Cost Of Sidewalk**

(A) *Requirement.* The owner of any property abutting a public street or highway for which a sidewalk is required by the city's Master Street Plan, shall construct a sidewalk in accordance with ~~§171.13 of this code~~this chapter, along said street or highway upon the receipt of notice issued at the time a building or parking lot permit is issued.

- (1) The property owner shall construct the sidewalk in accordance with ~~§171.13. Sidewalk and driveway specifications~~the specifications provided in the Minimum Street Standards.-

(2) The property owner may request a waiver to §171.13~~2~~(A)(1) requiring sidewalk construction. The ~~sidewalk administrator~~City Engineer shall review the following factors to determine whether or not to grant a waiver:

- (a) Pedestrian traffic generators such as parks and schools in the area.
- (b) The existence of a sidewalk network in the area.
- (c) The density of current and future development in the area.
- (d) The amount of pedestrian traffic likely to be generated by the proposed development.
- (e) Whether the terrain is such that a sidewalk is physically practical and feasible, and the extent to which trees, ground cover and natural areas would be adversely impacted by the construction of the sidewalk.
- (f) The overall need for a sidewalk to be constructed on the lot.

(3) If the ~~Sidewalk Administrator~~City Engineer grants the waiver to construct a sidewalk, the owner shall have an option to construct the sidewalk, or to contribute money in lieu of construction as set forth below:

- (a) The amount of money in lieu of construction to be dedicated shall be determined based upon the rough proportionality of the impact of the development upon the sidewalk infrastructure needs near the development including consideration of the persons served by the development and approximate pedestrian trip generation rates of the development.

(b) To facilitate administration of this ordinance for certain recurrent types of development, the City Council has determined that the city will accept, as the roughly proportionate impact, the amount shown below:

- (i) Single family house           \$630.00
- (ii) Duplex                           \$720.00

(c) Unless the developer presents evidence that the number of persons served by the development and the pedestrian trip generation rates of the development justify a reduced contribution in lieu of the construction of sidewalks, all

industrial, commercial, and multi-family developments shall make a cash contribution in lieu of the construction of the sidewalk at a rate of three dollars (\$3.00) per square foot of the sidewalk that normally would have been required. The amount per square foot and amounts for a single family house and a duplex shall be reviewed by the City Council at least every five (5) years.

- (d) Contribution in lieu of construction of sidewalks shall be paid or construction of the sidewalks shall be completed before receiving final plat approval, or issuance of a certificate of occupancy.
- (e) Contributions must be expended within one (1) year to build a sidewalk close enough to serve the project being constructed.
- (f) If the owner voluntarily consents in writing, the contributions may be used to construct sidewalk projects where most needed as determined by the ~~sidewalk administrator~~City Engineer.
- (4) An owner/builder may appeal the ~~sidewalk administrator's~~City Engineer's refusal to grant a waiver or the administrator's determination of the amount of contribution in lieu of construction to the Planning Commission pursuant to §155.06(D).
- (B) *Application of provisions.* The provisions of this section shall only apply to the following property:
- (1) *New structure.* On which a new structure is being built;
- (2) *Existing residential structure.* On which an existing residential structure is being modified so as to increase the number of dwelling units located therein or to change the use of the nonresidential use.
- (3) *Parking lot/garage.* On which a parking lot, or parking garage having a minimum capacity of five (5) automobiles is constructed, ~~and/or improved or altered.~~
- (4) *Building Additions.* Additions of 2,500 square feet or larger.
- (5) *Conditional use.* Any development which requires conditional use approval.

(Code 1965, §18-31; Ord. No. 2653, 8-5-80; Ord. No. 2780, 11-17-81; Ord. No. 2917, 5-3-83; Ord. No. 3113, 9-3-85; Code 1991, §98.66; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. No. 4311, 5-1-01; Ord. No. 4387, 4-16-02)

## 171.143 Sidewalk, Driveway And Trail Specifications

### (A) Sidewalks.

- (1) *Grades; establishment of property lines.* All sidewalks, access ramps, and driveway approaches shall be constructed in grades as approved by the City Engineer. It shall be the responsibility of the owner to establish property lines by competent survey at his/her own expense.
- (2) *Minimum width of sidewalks.* The minimum width of sidewalks shall follow the guidelines of the Master Street Plan, of the Comprehensive Land Use Plan. In all cases, the effective width of the sidewalk shall be a minimum of 4 feet. Effective sidewalk width is the actual sidewalk width, less:
- (a) —A shy distance of 2 feet where vertical barriers (walls, fences, signs, etc) greater than 3.5 feet in height are adjacent to the sidewalk and extend more than 4 feet in length parallel to the sidewalk.
- (b) A shy distance of 1.5 feet for curb adjacent to the sidewalk
- (c) A shy distance of 1 foot ~~is required~~ for all other fixed obstacles.  
The greatest of the above distances shall apply for each side of the walk.
- (3) *Sidewalk distances from the curb.* The sidewalk setback distance from the curb shall follow the guidelines of the Master Street Plan, ~~of the Comprehensive Land Use Plan or be as specified in the final plat unless otherwise approved by the City Engineer.~~
- ~~(4) *Minimum distance between sidewalk and slopes.* There shall be a minimum of one (1) foot between the sidewalk and the beginning of a slope as shown on the typical section detail.~~
- ~~(5) *Cement-concrete requirements.* All sidewalks, access ramps, and concrete driveway approaches shall be constructed of a portland cement concrete mixture that includes at least 5.5 bags of cement per cubic yard and contains 4 to 7 percent air entrainment and that will produce a concrete of a compressive strength of 3,500 pounds per square inch after 28 days set under standard laboratory methods.~~
- ~~(6) *Minimum thickness of sidewalks and driveway approaches.*~~

Fayetteville Code of Ordinances

- ~~(a) Sidewalks.~~ The minimum thickness of sidewalks shall be four (4) inches. Any fill materials required for residential or commercial sidewalks shall consist of approved compacted material.
- ~~(b) Residential driveway approaches.~~ The minimum thickness of residential driveway approaches shall be six (6) inches with four inches of compacted base material or six inch by six inch 10-gauge reinforcing steel mesh.
- ~~(c) Commercial driveway approaches.~~ The minimum thickness of commercial driveway approaches shall be six (6) inches with six (6) inches of compacted base material or six inch by six inch 10-gauge reinforcing steel mesh.
- ~~(47) ADA guidelines.~~ Sidewalks within rights of way shall conform to ADA guidelines.
- ~~(8) Continuous through driveway approach.~~ Sidewalks shall be continuous through driveways with an expansion joint at the edge of the sidewalk opposite the street.
- ~~(9) Edge adjacent to street.~~ The sidewalk edge adjacent to the street shall have at least one (1) inch deep grooved joint mark (cannot be a saw cut, however it can be a cold joint) to clearly define the sidewalk through the driveway and approach.
- ~~(150) Sidewalk elevation.~~ The back of sidewalk elevation shall be such that the slope from the back of sidewalk to the top of curb is 2%, unless otherwise approved by the City Engineer. This elevation shall be continuous through the driveway approach.
- ~~(11) Cross Slope.~~ Sidewalk cross slopes shall be a minimum of one (1) percent and a maximum of two (2) percent. Sidewalks that are to be constructed adjacent to the curb shall be so located at their intersection with the driveway approach the ADA requirement of the two (2) percent maximum cross slope is met.
- ~~(12) Joint material.~~ Wood shall not be acceptable in sidewalks for expansion joints. The joint material shall be asphalt impregnated fiberboard meeting the requirements of AASHTO M213, or other joint material meeting the requirements of the latest version of the Arkansas State Highway and Transportation Department Standard Specifications.
- ~~(13) Expansion joint.~~ Full depth expansion joints (four inches) shall be provided at intervals not greater than 50 feet, and where sidewalks abut drainage structures, retaining walls, building faces, and all other fixed objects. One-quarter depth (one inch) weakened plane joints, or saw cut joints, shall be placed in sidewalk at regular intervals not greater than the width of the sidewalk. Maximum joint spacing shall not be greater than two times the thickness of the sidewalk. Saw joints shall be filled with self leveling sealant such as Sonneborn SL1 or equivalent.
- ~~(614) Inspection.~~ All sidewalks and curb cuts made for driveway approaches require an inspection prior to the concrete placement.
- ~~(15) Materials.~~ The material used for sidewalk construction shall be Portland cement concrete having a broom finish. The use of other materials must have the approval of the Sidewalk/ADA Administrator or the City Engineer.
- ~~(16) Edges.~~ All sidewalks shall have one-half (1/2) inch rolled edges.
- ~~(17) Removal/replacement.~~ Removal and replacement of broken sidewalks require vertical saw-cuts on both ends of the sidewalk being replaced.
- ~~(18) Curing compound.~~ All sidewalks and driveway approaches require the application of a concrete curing compound or the concrete is to be kept moist for seven (7) days.
- ~~(B) Driveway approaches.~~
- ~~(1) Curb removal.~~ Curb, if existing, shall be removed for full width of the drive approach.
- ~~(2) Vertical curb cut.~~ Vertical curb cutting along the flow line of the gutter is allowed.
- ~~(3) No vertical curb cut.~~ If no vertical curb cut is made, complete curb and gutter removal is required.
- ~~(4) Concrete removal.~~ All concrete to be removed shall be saw cut.
- ~~(5) Driveway approach.~~ The area remaining between the sidewalk and the flow-line of the gutter, called the approach to the driveway, shall slope up to the elevation of the sidewalk.

TITLE XV UNIFIED DEVELOPMENT CODE

~~(6) Broken edges of saw-cuts. Broken edges of saw-cuts caused by demolition require a new saw-cut.~~

~~(CB)~~ Access ramps.

(1) *ADA requirements.* Access ramps shall conform to ADA requirements, including detectable warning devices such as truncated domes.

(2) *Sidewalk intersections.* Access ramps shall be installed at all sidewalk intersections with the street.

(3) *Raised crosswalk.* The raised or built-up access ramp shall not be installed on public streets without the approval of the City engineer.

(4) *Minimum width.* The minimum width of a curb ramp shall be Forty-eight (48) inches. ~~Sixty (60) inches is recommended, exclusive of flared sides.~~

(5) *Slope.* The slope of the ramp shall not be greater than 8.33% (1:12).

~~(6) Slope of flared sides. The slope of the flared sides shall not be greater than 10% (1:10).~~

~~(7) Broom finish. Access ramps shall have a broom finish.~~

(D) Multi-use Trails.

(1) *Minimum width of multi-use trails.* The minimum width of trails shall be 12 feet and shall follow the trail cross-section guidelines of the Master Active Transportation Plan.

~~(2) Trail materials. Selection of trail surface materials depends upon site conditions. Generally, trails shall be constructed of asphalt except where they are located in floodprone areas or adjacent to vehicular traffic. Final determination of trail construction materials shall be made by the Trail Coordinator.~~

~~(a) Asphalt. Trails shall be constructed of asphalt in areas where the trail is located above floodprone areas and away from vehicular traffic. (Refer to detail in the Master Transportation Plan.)~~

~~(b) Concrete. Trails shall be constructed of concrete when located in or near floodprone areas, vehicular road crossings and access ramps. (Refer to detail in the Master Transportation Plan.)~~

~~(3) Grades. All trails shall be constructed with a 2% maximum cross slope in the same direction as the existing grade unless otherwise designated. Longitudinal grade shall not exceed 5%. Longitudinal grade may be varied by the Trails Coordinator for sites with difficult topography. In such cases the AASHTO longitudinal grade requirement for bicycles shall apply.~~

~~(4) Asphalt trail requirements. Asphalt trails shall be constructed of asphalt concrete hot mix surface course. Type III surface course meeting the requirements of AHTD Specifications, 1996 Edition, shall be used unless otherwise approved. Asphalt trail sections shall be constructed to the following standards:~~

~~(a) Surface. Asphalt trail sections shall have a 3 inch thick surface.~~

~~(b) Base Course. Base course for asphalt trails shall consist of a 6 inch thickness of Class 7 aggregate compacted to 95% M.P.D.~~

~~(c) Subgrade. The top 24 inches of subgrade shall meet the requirements of City of Fayetteville Minimum Street Standards. Existing material not meeting these requirements shall be removed and replaced with approved select fill and compacted to 95% Standard Proctor Density (S.P.D.) Specific site conditions may require the addition of 4 inch shot rock or other material in order to create a solid base.~~

~~(5) Concrete trail requirements. All concrete portions of trails shall be constructed of a portland cement concrete mixture with a compressive strength of 3500 p.s.i. with 4 to 7 percent air entrainment. Concrete trail sections shall be constructed to the following standards:~~

~~(a) Surface. Concrete trail portions shall have a 4 inch fiber reinforced concrete surface with a medium broom finish.~~

~~(b) Base Course. Base course for concrete trails shall consist of a 4 inch thickness of class 7 aggregate compacted to 95% M.P.D.~~

~~(c) Subgrade. Subgrade for concrete trails shall meet the requirements of asphalt trail subgrade.~~

~~(d) Expansion joints. Full depth expansion joints (four inches) shall be provided at intervals not greater than 50 feet, unless slipform paving methods are used. If slipform paving~~

~~methods are used, expansion joints shall be placed at the end of each day's placement, or as directed. Expansion joints shall also be placed when concrete abuts existing structures.~~

~~(e) Contraction Joints. One quarter depth weakened plane joints, or saw cut joints, shall be placed in sidewalk at regular intervals matching the trail width, but not greater than 12 feet apart.~~

~~(f) Joint Sealant. All expansion joints and saw joints shall be sealed with joint sealant meeting the requirements of ASTM C920, Type S. A self-leveling sealant shall be used for horizontal surfaces. A non-sag sealant shall be used for vertical or nearly vertical surfaces.~~

~~(26) ADA guidelines. Trails shall conform to ADA guidelines, to the extent possible.~~

~~(7) Trail shoulders. A two foot shoulder adjacent to the trail shall be graded smooth and should not exceed 2% cross-slope in the same direction as the trail. The Trail Coordinator shall determine the appropriateness and maintenance requirements of plants and grasses adjacent to trails.~~

~~(8) Tie back slopes. The ground beyond the shoulder shall meet the existing grade with a maximum slope of 3:1.~~

~~(39) Bollards. Bollards are required at trail intersections with streets. The Trail Coordinator will provide a bollard detail with standard requirements to the developer prior to construction.~~

~~(410) Trail signage. Trail signage shall comply with the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities. The Trails Coordinator will provide a signage detail with standard requirements to the developer prior to construction.~~

~~(511) Street Crosswalks. Trails that intersect and cross public streets shall have a red colored concrete crosswalk with two foot wide white thermoplastic stripes on each side, a patterned thermoplastic overly for the full crossing area, or other approved treatment to clearly mark the trail crossing. For major streets, this crosswalk may be raised 2.5 inches above pavement surface. For newly paved lower traveled roads, a red thermoplastic brick pattern may be applied. The Trails Coordinator will provide a~~

~~crosswalk detail with standard requirements to the developer prior to construction.~~

~~(612) Striping. Center line stripe and a diamond pattern stripe around the bollards shall be installed. Striping shall conform to the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities. Additional striping may be required for increased safety in accordance with MUTCD standards. Trails Coordinator will provide a striping detail to the developer prior to construction.~~

~~(13) Variances. The City of Fayetteville Trails Coordinator may vary the requirements of this section so long as the variance is within the allowances set forth in the Manual on Uniform Traffic Control Devices (MUTCD) or the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities.~~

(Code 1965, §18-28; Ord. No. 1790, 3-15-71; Ord. No. 2629, 5-6-80; Ord. No. 3117, 9-3-85; Code 1991, §98.67; Ord. No. 4005, §1, 11-19-96; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. 4919, 9-05-06; Ord. 5044, 8-07-07; Ord. 5270, 9-1-09; Ord.5333, 7-6-10)

## 171.154 Excavations

(A) *Permit required.* It shall be unlawful for any person to make any excavation in any street, alley, sidewalk, road, highway, or other public way in the city without first obtaining a permit to do so from the Mayor, or his/her duly authorized representative. Such permit shall be granted only after written application has been filed and the deposit or bond required by §158.02 has been filed. The fee for each permit shall be paid in advance. Provided, however, that utility companies franchised by the city ~~shall may~~ be billed monthly for all permits granted during the previous month.

(B) *Lights and guards.* Every person making an excavation as provided for in this chapter shall place and maintain lights and guards around the same for the protection of the public. Such lights and guards shall be subject to the approval of the Mayor.

(C) *Repairs of public property; return of cash deposit.*

(1) *Cost.* Each person making an excavation under this chapter shall repair the street or other public way at his own expense, and under the direction and supervision of the ~~Mayor~~City Engineer or designee.

(2) *Standards.* Repair of the street or other public way shall be made in accordance with

TITLE XV UNIFIED DEVELOPMENT CODE

~~the requirements of the Minimum Street Standards to the following standards:~~

~~(a) Backfill. All excavations shall be back filled with SB 2 material applied in eight (8) inch lifts.~~

~~(b) Lift. Each lift shall be individually compacted.~~

~~(c) Asphaltic surface streets. In the case of asphaltic surface streets, six inches (6") of Portland concrete shall be placed an allowed to cure. The concrete shall have a layer of prime coat applied and followed by a minimum of three inches (3") of hot-mixed, hot-land asphaltic concrete placed to an elevation matching the existing finished grade.~~

~~(d) Portland concrete surface streets. In the case of Portland concrete streets, all excavations shall be resurfaced with nine inches (9") of Portland concrete. Joint sealer shall be placed in the area between the repaired surface and the original surface.~~

~~(e) Asphaltic sealed streets/unpaved streets. Asphaltic sealed streets or unpaved streets shall be resurfaced with a surface similar to that which existed before excavation.~~

(3) *Notice.* The permittee shall notify the ~~Mayor~~City Engineer, prior to beginning such repair, of the time and manner of repair and obtain the approval of the ~~Mayor~~City Engineer prior to beginning of such repair ~~and afford the Mayor the opportunity of being present during the progress of such repair until completed.~~

(4) *Return of deposit.* When the repairs required by this section are completed, ~~and approved, and paid for, the Mayor shall authorize~~ the return of any sum deposited under §171.14 above ~~will be made to the permittee.~~ In the event the ~~permittee~~holders shall fail, refuse, or neglect to make such repairs, the city may repair the street and deduct the cost therefrom from the amount on deposit with the city and the balance of the deposit, if any, shall be paid to the ~~permittee~~holder.

(D) *Street closings for excavations* ~~in excess of 24 hours.~~

(1) *Prohibited without approval* ~~of Mayor.~~ It shall be unlawful for any person to cause a street to be closed ~~for more than 24 hours~~ due to the making of an excavation without the prior written approval of the ~~Mayor~~City. In

granting such approval, the ~~Mayor~~City shall impose time limits and such other reasonable conditions as are necessary to minimize any inconvenience or danger to the public.

(2) *Exception.* This section shall not apply to emergency repairs.

(Code 1965, §18-40, 18-42, 18-44; Ord. No. 1829, 10-18-71; Ord. No. 2806, 4-20-82; Code 1991, §98.80, 98.82, 98.83, 98.84; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**Cross reference(s)**--Penalty, §98.99; Enforcement, Ch. 153; Bonds and Guarantees, Ch. 158; Fees, Ch. 159.

### 171.165 Street Improvement Districts

(A) *Petition to form street improvement district.* Any person desiring to initiate the formation of a street improvement district shall file with the City Clerk a petition requesting the organization of a street improvement district and signed by persons claiming to be a majority in value, as shown by the last county assessment, of the owners of real property in the proposed district. Forms of this petition shall be available to any person at the office of the City Clerk, and the City Engineer shall assist in the preparation of said petition by providing a legal description of the property to be included in the proposed district. Such petition may limit the cost of the improvement to either a fixed sum or to a percentage of the assessed value of the real property in the proposed district.

(B) *Notice of public hearing.* When persons claiming to be a majority in value, as shown by the last county assessment of the owners of real property in a proposed street improvement district file with the City Clerk a petition for the organization of such an improvement district, it shall be the duty of the City Clerk to give notice that such petition will be heard at a meeting of the City Council to be held more than 15 days after the filing of such petition. Such notice shall be published once a week for two (2) weeks, the last insertion to be not less than seven (7) days before the date fixed for the hearing. The Mayor, if he sees fit, may call a special meeting of the City Council for the purpose of hearing such petition, such called meeting to be held not less than 15 days after the date of the call and the notice of the hearing thereat to be published for the time and in the manner above stated.

(C) *Hearing on petition; ordinance establishing district.*

(1) At the time named in said notice, the City Council shall meet and hear all owners of real property within the proposed district who desire to be heard on the question of whether a majority in assessed value of

Fayetteville Code of Ordinances

- property owners has signed the petition, and shall make a finding of whether the petition is signed by a majority in assessed value of such property owners. The finding of the governing body shall be expressed in an ordinance. If it finds that a majority has signed the petition, it shall then be its duty by the same ordinance to establish the district. The ordinance shall designate the boundaries of the district and shall also give the district a name descriptive of the nature of the proposed improvement and a number to prevent it from being confused with similar districts.
- (2) The ordinance shall be published within 30 days after its adoption for one insertion in some newspaper published in the city and the findings of the governing body shall be conclusive unless attached by a suit in the Chancery Court brought within 30 days after such publication.
- (D) *Appointment of Board of Improvement.* In the ordinance creating the district, the City Council shall appoint three (3) owners of real property therein as commissioners, who shall compose a Board of Improvement for the district. Such Board of Improvement shall have control of the construction of the improvements in the district.
- (E) *Plans for improvement.* Immediately after their qualification, the Board of Improvement shall form plans for the improvement as prayed in the petition, and shall procure estimates of the costs thereof. For this purpose, the board may employ such engineers and other agents as may be needful, and may provide for their compensation which, with all other necessary expenditures, shall be taken as a part of the cost of the improvement. If for any cause the improvement shall not be made, said cost shall be raised and paid by an ad valorem tax upon the real property in the district as assessed for state and county purposes, which shall be levied by the City Council on the application of any person interested, and shall be paid to the Board of Improvement, to be distributed amongst the creditors of the district.
- (F) *Appointment of Board of Assessment.* As soon as the Board of Improvement shall have formed said plan, and shall have ascertained the cost of the improvement, it shall report the same to the City Council who shall appoint three electors of the city, who shall constitute a Board of Assessment of the benefits to be received by each lot or block, or other subdivision of land within said district, by reason of said proposed improvement.
- (G) *Assessment of benefits.* The Board of Assessment shall at once proceed to inscribe in a book to be used for the purpose of description of each of said lots, blocks, or parcels of land and shall assess the value of the benefit to accrue to each of said lots, blocks, or parcels of land by reason of such improvement, which assessment of said benefits they shall enter upon said book opposite the description thereof; and they shall then subscribe said assessment and deposit it in the office of the City Clerk, where it shall be kept and preserved as a public record. Provided, said assessment may be annually readjusted according to additional improvements placed upon the lands, when a succession of collections is necessary to pay for the improvements.
- (H) *Notice of filing of assessment.* Immediately on the filing of said assessments, the City Clerk shall insert in some newspaper published in the city, the following notice:
- "The assessment of Street Improvement District No. \_\_\_\_\_, was filed in my office on the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, and the same is now subject to inspection.
- \_\_\_\_\_  
Clerk of the City of Fayetteville, Arkansas."
- (I) *Appeal of assessments to City Council.* Anyone whose real estate is embraced in said assessment may at any time within 10 days from the giving of said notice, file with the City Clerk in writing his/her notice of appeal from the action of said Board of Assessment in making said assessment of his/her property, which appeal shall be heard and disposed of at the next regular meeting of the City Council, and on such appeal the matter shall be heard de novo on such evidence as may be adduced on either side.
- (J) *Finding of City Council.* The City Council shall enter on its minutes the results of its finding on any such appeal, and shall cause a copy of its finding to be certified to said Board of Assessment, which shall make its assessment conform thereto if any change has been made therein by said City Council.
- (K) *Assessments payable in annual installments.* It shall be provided by ordinance that the local assessment of benefits shall be paid in successive annual installments so that the tax levied in any one (1) year shall not exceed 25% of the assessed benefits accruing to real property.
- (L) *Publication of ordinance.* Within 30 days after the passage of the ordinance mentioned in subsection (C) above, the City Clerk shall publish a copy of it in some newspaper published and

TITLE XV UNIFIED DEVELOPMENT CODE

having a bona fide circulation in the city for one time. Within 30 days after such publication the district, or any property owner may bring suit in Chancery Court for the purpose of correcting or invalidating such assessment; but if such suit is not brought within the time, all objections to the creation of the district for the validity of the assessment shall be forever barred and precluded.

(M) *Copy of assessment delivered to collector.* Within 40 days after the passage of the ordinance mentioned in (C) above, unless the time be extended by the City Council, the City Clerk shall deliver to the County Collector a certified copy of said assessment of benefits containing a description of said blocks, lots, and parcels of land in said district, and the amount assessed on each, duly extended against each lot, block, or parcel of land, and a certified copy of the ordinance fixing the percentum to be collected each year. At the same time the City Clerk delivers to the County Collector a certified copy of the assessment of benefits, and the certified copy of the ordinance fixing the percentum to be collected, he/she shall deliver like said copies to the County Clerk.

(N) *Annual financial report required.* The commissioners of each street improvement district shall file an annual financial report with the City Clerk on or before the first day of March of each year, covering the financial affairs of their respective districts for the preceding year. Such financial statements shall be certified and filed as herein provided by the chief financial officer of each such improvement district.

(Code 1965, §§18.18, 18.19--18.22, 18-22.1--18-22.9; Ord. No. 2051, 9-17-74; Code 1991, §98.30, §98.43; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**171.167-171.99 Reserved**



**STAFF MEMO**

**TO** Fayetteville Planning Commission  
**T** Chris Brown, City Engineer  
**OM** Matt Casey, Engineering Design Manager

**MEETING DATE** ~~June 22, 2015~~ July 13, 2015

**SUBJECT** **UPDATES TO THE MINIMUM STREET STANDARDS AND CODE AMENDMENT CHAPTER 171 STREETS AND SIDEWAYS**

**RECOMMENDATION**

Staff recommends forwarding the Minimum Street Standards and code amendments to the City Council with a recommendation for approval.

**BACKGROUND**

City staff has prepared the final draft of the guidance document for design and construction of streets, sidewalks and trails. This document will replace a 1996 version of the Minimum Street Standards, and will serve as a technical supplement to the City’s Unified Development Code. In addition, the associated revisions to Chapter 171 Streets and Sidewalks are attached,

**DISCUSSION**

The revisions proposed to Chapter 171 are summarized below:

- 171.01 A purpose statement was added to the chapter.
- 171.02 Adoption of the Minimum Street Standards added.
- 171.02 Language for retaining wall locations adjacent to the ROW was clarified.
- 171.06 Procedure for Vacations was changed to reflect the current submittal procedure.
- 171.07 Removed technical criteria for utilities within the ROW and referenced the Minimum Street Standards.
- 171.13 Changed language from Sidewalk Administrator to City Engineer.
- 171.14 Removed technical criteria for sidewalk, driveway and trail construction and referenced the Minimum Street Standards.
- 171.15 Removed technical criteria for excavations in the ROW and updated the permitting procedure.

**NET STATE IMPACT**

None

**ATTACHMENTS**

Unified Development Code Revisions:  
Chapter 171 Streets and Sidewalks  
Minimum Street Standards

**TITIE    NIIE    EEOPMENT COE  
CAPTE 11 STETS AN SIE AS**

- 111 MISCEANEOUS PROVISIONS
- 112 INTERSECTIONS
- 113 ESE
- 114 CROSS AAS TO E ACCESSI E TO P SICA SA E
- 115 PROCE E O COSIN TIT EASEMENTS AN ST EET I TS-O A
- 116 OCCUPATION O ST EETS AN I AS P IC TITITIES
- 117 MAINTENANCE AN CONST CTION POLICIES
- 118 O E O CIT CONC O PE MIT E I E
- 119 APPLICATION O PE MIT
- 1110 STAND AS O ISS ANCE O PE MIT E PIATION AN EMO A
- 1111 INSPECTION O O OEP ACEMENT O E ECTE O
- 1112 PROPE T O NE TO CONST CT SIE AS O CONT I TE COST O  
SIE AS
- 1113 SIE AS I E A AN T AI SPECIFICATIONS
- 1114 ECAATIONS
- 1115 ST EET IMP O EMENT I ST ICTS
- 1116-1117 ESE



## CHAPTER 11 STREETS AND SIDEWALKS

### 11.1 Purpose

It is the purpose of this chapter to preserve and protect the health, safety, and general welfare of citizens by providing regulations for design and construction of public streets and sidewalks; thereby providing safe, convenient, cost effective transportation systems that are accessible to all users and modes of transportation.

### 11.2 Street and Sidewalk Standards

(A) *Rules and regulations governing street improvements.* The City Council hereby adopts by reference the Minimum Street Standards of the City of Fayetteville, and as may be amended from time to time by the City Engineer. All technical procedures and design standards contained therein shall have the same force and effect as if printed word for word in this chapter. Such rules and regulations shall have the same force and effect as law and violations thereof shall be punished as provided in Chapter 153.

(B) *Designation as streets or avenues.* All thoroughfares now or hereafter platted, which run in an east and west direction through the corporate limits of the city, shall be designated as "street," and all thoroughfares now or hereafter platted, which run in a north and south direction through the corporate limits of the city, shall be designated as "avenues." This section shall not be construed so as to prohibit the use of such descriptive names as "boulevard," "road," "way," "trail," and the like which might be used indiscriminately as a designation of the thoroughfare, and this section shall in no way be deemed applicable to any alleys or alleyways.

(C) *Retaining walls near sidewalk or right-of-way.*

(1) *Definition.* For purposes of this section, retaining walls are defined as vertical or near vertical walls at least 2.5 feet in height, that require a footing or other structural reinforcement for structural stability.

(2) *City Engineer Approval.* The City Engineer may approve retaining walls within rights of way where necessary to protect adjacent property, minimize right of way widths, protect sensitive environmental areas, or for other reasons that further the purpose of this chapter.

(3) *Requirements.* Retaining walls constructed within rights of way shall:

(a) Be constructed such that footings or other structural reinforcement do not conflict with

existing or future storm drainage or utility installations.

- (b) Be of sufficient distance from sidewalks or trails so as to not impede or encroach on the minimum effective width.
- (c) Have adequate safety railings or other precautions to prevent falls.
- (d) Meet any other requirements of the City Engineer to protect the public interest.

(D) Gated streets not allowed in most residential subdivisions.

No residential subdivision or apartment complex shall be constructed with a gate across a street without prior express approval by resolution of the City Council that finds that security considerations favoring a gate outweigh aesthetic considerations and the city's policies in favor of connectivity, openness and neighborliness.

(E) *Taxi Stands.* Taxi stand shall mean such portion or portions of the public street or highway designated by the City Council of the City of Fayetteville as a place in which taxis may stand or park.

(1) No unattended parking allowed. A taxi must remain attended by its driver and ready for service while located within a taxi stand.

(2) City Council Establishment of Taxi Stands:

(a) The City Council may establish taxi stands on portions of public streets or facilities or private areas if permitted by the owner.

(b) The establishment, enlargement, or removal of a taxi stand shall be by City Council Resolution after a public hearing. Adjoining property owners within the block of the street or abutting the parking lot in which the taxi stand is proposed shall be notified by mail by the Planning Division and a planning notification sign shall be placed near the taxi stand location two weeks before the public hearing at City Council.

(Ord. No. 845, 5-6-40; Ord. No. 1026, 6-23-52; Ord. No. 1262, 5-8-61; Code 1965, §18-1, 18-2, 18-7; Ord. No. 2623, 4-15-80; Code 1991, §98.01, 98.02, 98.06; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. No. 4579, 06-01-04; Ord. 4946, 11-21-06)

Code Enforcement, Ch. 153.

### 11.3 Sidewalk Standards



TITLE XV UNIFIED DEVELOPMENT CODE

funds and said funds are received by the city for the purpose of reimbursing utility relocation expenses, the utility shall receive such reimbursement. This division shall not be construed as requiring a utility to relocate its facilities within or from a private easement without payment of just compensation.

(C) *City Engineer approval.* All proposed locations and utility designs shall be reviewed and subject to approval by the City Engineer to ensure that the proposed construction will not cause avoidable interference with existing or planned street facilities, or with street operation or maintenance. The procedure for submitting plans and information to the City Engineer for approval shall be developed and agreed upon by each utility and the City Engineer.

(D) *Street design.* When plans for street improvement and development are formulated, utility line locations should be recognized and the street designed so as to minimize conflict with existing utilities.

(Code 1965, §18-17.1; Ord. No. 2850, 8-17-82; Ord. No. 2926, 6-7-83; Ord. No. 3245, 3-3-87; Code 1991, §98.14; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**111111 Maintenance and Construction Permits**

The city's policies concerning and regarding the maintenance and construction of streets, curbs, gutters, and sidewalks shall be as follows:

(A) *Maintenance.* The city shall maintain roadways in the city which have been accepted by the city as city streets, or which have come under the jurisdiction of the city by or through annexation.

(B) *Priorities.* The following factors shall be considered in establishing priorities for roadway resurfacing and rebuilding:

(1) *Function.* The function of the street, that is, the streets which carry or are expected to carry heavy amounts of traffic shall have priority over lesser streets.

(2) *Condition.* The condition of the pavement, in general, roadways which are more deteriorated shall have priority over those streets of lesser deterioration. However those streets of lesser deterioration may have priority when it is determined that the benefits of resurfacing the roadways of lesser deterioration may be greater.

(C) *Sidewalks.*

(1) *Repair/replacement.* Existing city sidewalks shall be repaired and replaced by the city, as needed.

(2) *Priorities.* In establishing priorities for sidewalk repair or replacement, the factors to be considered shall include, but not be limited to the following:

(a) The conditions of the sidewalk;

(b) The expected level of pedestrian traffic; and,

(c) The use of the sidewalk by school children.

(Code 1965, 18-47; Ord. No. 1725, 1-8-70; Ord. No. 2647, 7-15-80; Ord. No. 2655, 8-5-80; Ord. No. 2724, 5-19-81; Code 1991, §98.15; Ord. No. 4100, §2 (Ex. A), 6-16-98)

Cr 111111 Sidewalks, §158.06.

**111111 Ordinance Construction or Permit**

No person shall begin to construct, reconstruct, repair, alter or grade any sidewalk, curb, curb-cut, driveway or street on the public streets, unless the same has been properly ordered by the City Council, or plans for such have been approved by the city as site improvements for a subdivision, or a permit has been issued by the city's official charged with the administration of this chapter.

(Code 1965, §18-25; Ord. No. 1790, 3-15-71; Code No. 1991, §98.61; Ord. No. 4100, §2 (Ex.), 6-16-98)

Cr 111111 Penalty, §98.99; Sidewalks, §158.06.

**111111 Application for Permit**

An applicant for a permit hereunder shall file with the city official an application showing:

(A) Name and address of the owner, or agent in charge, of the property abutting the proposed work area;

(B) Name and address of the party doing the work;

(C) Location of the work area;

(D) A plan or clear description of the work to be done;

(E) Such other information as the city official shall find reasonably necessary to the determination of whether a permit should be issued hereunder.

(Code 1965, §18-26; Ord. No. 1790, 3-15-71; Code 1991, §98.62; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**1-11.11 Sidewalk Permits**

(A) The city official shall issue a permit hereunder when he/she finds:

- (1) That the plans have been approved.
- (2) That the work shall be done according to the specifications contained herein.
- (3) That the operation will not unreasonably interfere with vehicular and pedestrian traffic, the demand and necessity for parking spaces, and the means of ingress to and egress from the property affected and adjacent properties.
- (4) That the health, safety, and welfare of the public will not be unreasonably impaired.

(B) Any permit issued shall expire three (3) months from the date of issue and may be renewed upon application.

(Code 1965, §18-29; Ord. No. 1790, 3-15-71; Code 1991, §98.64; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**1-11.12 Inspection and Rejection**

(A) The city official shall make all necessary inspections before, during and after the construction of all sidewalks, curbing and guttering to insure the work is being done in accordance with the plans and specifications. In the event any or part of any work is not done in a satisfactory manner or not in conformity with the plans and specifications, the city official shall notify the contractor and owner in writing of his/her nonacceptance of the work. All such rejected work shall be removed and replaced within 30 days of this notification.

(B) Advance notification must be given the city official for inspections under this section.

(Code 1965, §18-30; Ord. No. 1790, 3-15-71; Code 1991, §98.65; Ord. No. 4100, §2 (Ex. A), 6-16-98)

**1-11.13 Sidewalk Construction Requirements**

(A) *Requirement.* The owner of any property abutting a public street or highway for which a sidewalk is required by the city's Master Street Plan shall construct a sidewalk in accordance with this chapter, along said street or highway upon the receipt of notice issued at the time a building or parking lot permit is issued.

(1) The property owner shall construct the sidewalk in accordance with the specifications provided in the Minimum Street Standards.

(2) The property owner may request a waiver to §171.13(A)(1) requiring sidewalk construction. The City Engineer shall review the following factors to determine whether or not to grant a waiver:

- (a) Pedestrian traffic generators such as parks and schools in the area.
- (b) The existence of a sidewalk network in the area.
- (c) The density of current and future development in the area.
- (d) The amount of pedestrian traffic likely to be generated by the proposed development.

(e) Whether the terrain is such that a sidewalk is physically practical and feasible, and the extent to which trees, ground cover and natural areas would be adversely impacted by the construction of the sidewalk.

(f) The overall need for a sidewalk to be constructed on the lot.

(3) If the City Engineer grants the waiver to construct a sidewalk, the owner shall have an option to construct the sidewalk, or to contribute money in lieu of construction as set forth below:

(a) The amount of money in lieu of construction to be dedicated shall be determined based upon the rough proportionality of the impact of the development upon the sidewalk infrastructure needs near the development including consideration of the persons served by the development and approximate pedestrian trip generation rates of the development.

(b) To facilitate administration of this ordinance for certain recurrent types of development, the City Council has determined that the city will accept, as the roughly proportionate impact, the amount shown below:

- (i) Single family house           \$630.00
- (ii) Duplex                           \$720.00

TITLE XV UNIFIED DEVELOPMENT CODE

(c) Unless the developer presents evidence that the number of persons served by the development and the pedestrian trip generation rates of the development justify a reduced contribution in lieu of the construction of sidewalks, all industrial, commercial, and multi-family developments shall make a cash contribution in lieu of the construction of the sidewalk at a rate of three dollars (\$3.00) per square foot of the sidewalk that normally would have been required. The amount per square foot and amounts for a single family house and a duplex shall be reviewed by the City Council at least every five (5) years.

(d) Contribution in lieu of construction of sidewalks shall be paid or construction of the sidewalks shall be completed before receiving final plat approval, or issuance of a certificate of occupancy.

(e) Contributions must be expended within one (1) year to build a sidewalk close enough to serve the project being constructed.

(f) If the owner voluntarily consents in writing, the contributions may be used to construct sidewalk projects where most needed as determined by the City Engineer.

(4) An owner/builder may appeal the City Engineer's refusal to grant a waiver or the administrator's determination of the amount of contribution in lieu of construction to the Planning Commission pursuant to §155.06(D).

(B) *Application of provisions.* The provisions of this section shall only apply to the following property:

(1) *New structure.* On which a new structure is being built;

(2) *Existing residential structure.* On which an existing residential structure is being modified so as to increase the number of dwelling units located therein or to change the use of the nonresidential use.

(3) *Parking lot/garage.* On which a parking lot, or parking garage having a minimum capacity of five (5) automobiles is constructed.

(4) *Building Additions.* Additions of 2,500 square feet or larger.

(5) *Conditional use.* Any development which requires conditional use approval.

(Code 1965, §18-31; Ord. No. 2653, 8-5-80; Ord. No. 2780, 11-17-81; Ord. No. 2917, 5-3-83; Ord. No. 3113, 9-3-85; Code 1991, §98.66; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. No. 4311, 5-1-01; Ord. No. 4387, 4-16-02)

**111 Sidr Ad Tr**  
**S**

(A) *Sidewalks.*

(1) *Grades; establishment of property lines.* All sidewalks, access ramps, and driveway approaches shall be constructed in grades as approved by the City Engineer. It shall be the responsibility of the owner to establish property lines by competent survey at his/her own expense.

(2) *Minimum width of sidewalks.* The minimum width of sidewalks shall follow the guidelines of the Master Street Plan, of the Comprehensive Land Use Plan. In all cases, the effective width of the sidewalk shall be a minimum of 4 feet. Effective sidewalk width is the actual sidewalk width, less:

(a) A shy distance of 2 feet where vertical barriers (walls, fences, signs, etc) greater than 3.5 feet in height are adjacent to the sidewalk and extend more than 4 feet in length parallel to the sidewalk.

(b) A shy distance of 1.5 feet for curb adjacent to the sidewalk

(c) A shy distance of 1 foot for all other fixed obstacles.

The greatest of the above distances shall apply for each side of the walk.

(3) *Sidewalk distances from the curb.* The sidewalk setback distance from the curb shall follow the guidelines of the Master Street Plan, or be as specified in the final plat unless otherwise approved by the City Engineer.

(4) *ADA guidelines.* Sidewalks within rights of way shall conform to ADA guidelines.

(5) *Sidewalk elevation.* The back of sidewalk elevation shall be such that the slope from the back of sidewalk to the top of curb is 2%, unless otherwise approved by the City Engineer. This elevation shall be continuous through the driveway approach.

Fayetteville Code of Ordinances

(6) *Inspection.* All sidewalks and curb cuts made for driveway approaches require an inspection prior to the concrete placement.

(Code 1965, §18-28; Ord. No. 1790, 3-15-71; Ord. No. 2629, 5-6-80; Ord. No. 3117, 9-3-85; Code 1991, §98.67; Ord. No. 4005, §1, 11-19-96; Ord. No. 4100, §2 (Ex. A), 6-16-98; Ord. 4919, 9-05-06; Ord. 5044, 8-07-07; Ord. 5270, 9-1-09; Ord.5333, 7-6-10)

(B) *Access ramps.*

- (1) *ADA requirements.* Access ramps shall conform to ADA requirements, including detectable warning devices such as truncated domes.
- (2) *Sidewalk intersections.* Access ramps shall be installed at all sidewalk intersections with the street.
- (3) *Raised crosswalk.* The raised or built-up access ramp shall not be installed on public streets without the approval of the City engineer.
- (4) *Minimum width.* The minimum width of a curb ramp shall be Forty-eight (48) inches.
- (5) *Slope.* The slope of the ramp shall not be greater than slopes specified in the Minimum Street Standards.

1011 E

(A) *Permit required.* It shall be unlawful for any person to make any excavation in any street, alley, sidewalk, road, highway, or other public way in the city without first obtaining a permit to do so from the Mayor, or his/her duly authorized representative. Such permit shall be granted only after written application has been filed and the deposit or bond required by §158.02 has been filed. The fee for each permit shall be paid in advance. Provided, however, that utility companies franchised by the city may be billed monthly for all permits granted during the previous month.

(D) *Multi-use Trails.*

- (1) *Minimum width of multi-use trails.* The minimum width of trails shall follow the trail cross-section guidelines of the Active Transportation Plan.
- (2) *ADA guidelines.* Trails shall conform to ADA guidelines, to the extent possible.
- (3) *Bollards.* Bollards are required at trail intersections with streets.
- (4) *Trail signage.* Trail signage shall comply with the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities.
- (5) *Street Crosswalks.* Trails that intersect and cross public streets shall have a red colored concrete crosswalk with two foot wide white thermoplastic stripes on each side, a patterned thermoplastic overly for the full crossing area, or other approved treatment to clearly mark the trail crossing. For major streets, this crosswalk may be raised 2.5 inches above pavement surface.
- (6) *Striping.* Center line stripe and a diamond pattern stripe around the bollards shall be installed. Striping shall conform to the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities. Additional striping may be required for increased safety in accordance with MUTCD standards

(B) *Lights and guards.* Every person making an excavation as provided for in this chapter shall place and maintain lights and guards around the same for the protection of the public. Such lights and guards shall be subject to the approval of the Mayor.

(C) *Repairs of public property; return of cash deposit.*

- (1) *Cost.* Each person making an excavation under this chapter shall repair the street or other public way at his own expense, and under the direction and supervision of the City Engineer or designee.
- (2) *Standards.* Repair of the street or other public way shall be made in accordance with the requirements of the Minimum Street Standards.
- (3) *Notice.* The permittee shall notify the City Engineer, prior to beginning such repair, of the time and manner of repair and obtain the approval of the City Engineer prior to beginning of such repair.
- (4) *Return of deposit.* When the repairs required by this section are completed and approved, the return of any sum deposited under §171.14 above will be made to the permittee. In the event the permittee shall fail, refuse, or neglect to make such repairs, the city may repair the street and deduct the cost therefrom from the amount on deposit with the city and the balance of the deposit, if any, shall be paid to the permittee.

(D) *Street closings for excavations.*

(1) *Prohibited without approval.* It shall be unlawful for any person to cause a street to

TITLE XV UNIFIED DEVELOPMENT CODE

be closed due to the making of an excavation without the prior written approval of the City. In granting such approval, the City shall impose time limits and such other reasonable conditions as are necessary to minimize any inconvenience or danger to the public.

(2) *Exception.* This section shall not apply to emergency repairs.

(Code 1965, §18-40, 18-42, 18-44; Ord. No. 1829, 10-18-71; Ord. No. 2806, 4-20-82; Code 1991, §98.80, 98.82, 98.83, 98.84; Ord. No. 4100, §2 (Ex. A), 6-16-98)

Crimes and Offenses-Penalty, §98.99; Enforcement, Ch. 153; Bonds and Guarantees, Ch. 158; Fees, Ch. 159.

**1111 Streets and Highways**

(A) *Petition to form street improvement district.* Any person desiring to initiate the formation of a street improvement district shall file with the City Clerk a petition requesting the organization of a street improvement district and signed by persons claiming to be a majority in value, as shown by the last county assessment, of the owners of real property in the proposed district. Forms of this petition shall be available to any person at the office of the City Clerk, and the City Engineer shall assist in the preparation of said petition by providing a legal description of the property to be included in the proposed district. Such petition may limit the cost of the improvement to either a fixed sum or to a percentage of the assessed value of the real property in the proposed district.

(B) *Notice of public hearing.* When persons claiming to be a majority in value, as shown by the last county assessment of the owners of real property in a proposed street improvement district file with the City Clerk a petition for the organization of such an improvement district, it shall be the duty of the City Clerk to give notice that such petition will be heard at a meeting of the City Council to be held more than 15 days after the filing of such petition. Such notice shall be published once a week for two (2) weeks, the last insertion to be not less than seven (7) days before the date fixed for the hearing. The Mayor, if he sees fit, may call a special meeting of the City Council for the purpose of hearing such petition, such called meeting to be held not less than 15 days after the date of the call and the notice of the hearing thereat to be published for the time and in the manner above stated.

(C) *Hearing on petition; ordinance establishing district.*

(1) At the time named in said notice, the City Council shall meet and hear all owners of real property within the proposed district who

desire to be heard on the question of whether a majority in assessed value of property owners has signed the petition, and shall make a finding of whether the petition is signed by a majority in assessed value of such property owners. The finding of the governing body shall be expressed in an ordinance. If it finds that a majority has signed the petition, it shall then be its duty by the same ordinance to establish the district. The ordinance shall designate the boundaries of the district and shall also give the district a name descriptive of the nature of the proposed improvement and a number to prevent it from being confused with similar districts.

(2) The ordinance shall be published within 30 days after its adoption for one insertion in some newspaper published in the city and the findings of the governing body shall be conclusive unless attached by a suit in the Chancery Court brought within 30 days after such publication.

(D) *Appointment of Board of Improvement.* In the ordinance creating the district, the City Council shall appoint three (3) owners of real property therein as commissioners, who shall compose a Board of Improvement for the district. Such Board of Improvement shall have control of the construction of the improvements in the district.

(E) *Plans for improvement.* Immediately after their qualification, the Board of Improvement shall form plans for the improvement as prayed in the petition, and shall procure estimates of the costs thereof. For this purpose, the board may employ such engineers and other agents as may be needful, and may provide for their compensation which, with all other necessary expenditures, shall be taken as a part of the cost of the improvement. If for any cause the improvement shall not be made, said cost shall be raised and paid by an ad valorem tax upon the real property in the district as assessed for state and county purposes, which shall be levied by the City Council on the application of any person interested, and shall be paid to the Board of Improvement, to be distributed amongst the creditors of the district.

(F) *Appointment of Board of Assessment.* As soon as the Board of Improvement shall have formed said plan, and shall have ascertained the cost of the improvement, it shall report the same to the City Council who shall appoint three electors of the city, who shall constitute a Board of Assessment of the benefits to be received by each lot or block, or other subdivision of land within said district, by reason of said proposed improvement.



CITY OF  
Fayetteville  
ARKANSAS

Minimum Street Standards

May 2015



## TABLE OF CONTENTS

### GENERAL INFORMATION

- Chapter 1. General Provisions
- Chapter 2. Submittal and Review Procedures
- Chapter 3. Construction Plans Submittal Requirements

### DESIGN

- Chapter 4. Street Design And Technical Criteria
- Chapter 5. Intersections
- Chapter 6. Pavement Structure and Materials
- Chapter 7. Traffic Control Devices
- Chapter 8. Pedestrian Facilities Design & Technical Criteria
- Chapter 9. On Street Bicycle Facilities Design & Technical Criteria
- Chapter 10. Neighborhood Traffic Safety

### CONSTRUCTION

- Chapter 11. Street Inspection and Testing Procedures
- Chapter 12. Acceptance/Warranty Procedures and Record Drawings



## CHAPTER 1 GENERAL PROVISIONS

### TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.1	AUTHORITY OF THIS DOCUMENT	
1.2	INTENT AND PROVISIONS	
1.2.1	Ordinance Standard	
	A. Minimum Standards	3
	B. Objectives	3
1.3	RESOURCE STANDARDS	
	A. List of Resource Standards for Reference	4
1.4	AUTHORITY OF THE CITY ENGINEER	
1.5	ENFORCEMENT RESPONSIBILITY	
1.6	AMENDMENTS AND DEVIATIONS TO STANDARDS	
1.7	DEFINITIONS OF TERMS AND ABBREVIATIONS	
1.8	INTERPRETATION OF STANDARDS	12
1.8.1	Standard	12
1.8.2	Priority and Construction Provisions	12
1.9	VAIANCES AND APPEALS	12
1.9.1	Criteria	12
1.9.2	Appeals	1
1.10	OSCEOE	1
1.11	TITLE COORDINATION	1

#### LIST OF TABLES

*This Chapter Does Not Contain Tables*

#### LIST OF FIGURES

*This Chapter Does Not Contain Figures*





## CHAPTER 1 GENERAL PROVISIONS

### 1.1 AUTHORITY OF THIS DOCUMENT

This document adopted by Resolution No. \_\_\_\_\_ of the City of Fayetteville, provides technical procedures and design standards to support Chapter 171: Streets and Sidewalks and other applicable Chapters of the Title XV Unified Development Code (UDC).

### 1.2 INTENT AND PROVISIONS

These Standards shall be required for all development projects within the jurisdiction of the City of Fayetteville. The City’s review and approval of any plans, reports, or drawings or the City’s inspection and approval of any improvements constructed by the Developer in accordance with these Standards, does not constitute a representation, warranty, or guarantee by the City that such improvements are free from defects or will operate adequately for the purpose intended. These Standards shall also be used as a guidance document for projects to be constructed by the City, including construction by City crews.

The chapters and appendices that make up these standards pertain to planning, design, approval, construction, inspection, testing, and documentation of street improvements. The intent of this manual is to establish the minimum acceptable standards.

These Standards are a supplement to the City of Fayetteville Code of Ordinances Title XV Unified Development Code and other Ordinances. Where conflict between these Standards and City Code exists, the Code shall govern.

### 1.2.1 OBJECTIVES AND STANDARDS

#### A. Minimum Standards

These Standards shall be the minimum standards necessary for design and construction of all street improvements required for development projects within the jurisdiction of the City of Fayetteville. Special situations as determined by the City may require different facilities and/or standards. For items not covered by these Standards, the City may require the use of resource standards in Section 1.3 below.

#### B. Objectives

It is the objective of these Minimum Street Standards to address the following:





9. Federal Highway Administration, Roundabouts: An Informational Guide.
10. American Association of State Highway and Transportation Officials, Guide for the Development of Bicycle Facilities.
11. Standard Specifications for Transportations Materials and Methods of Sampling and Testing and AASHTO Provisional Standards.
12. City of Fayetteville standard drawings, details and specifications when available.
13. National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide

**1.11 AUTHORITY OF THE CITY ENGINEER**

The City Engineer shall have the authority on behalf of the City to determine that all design and construction is completed to a level that is equal to or exceeds the requirements set forth in these Minimum Street Standards.

**1.12 ENFORCEMENT RESPONSIBILITY**

It shall be the duty of the City Engineer acting on behalf of the City of Fayetteville to enforce the provisions of these Minimum Street Standards.

**1.13 AMENDMENTS AND REVISIONS TO STANDARDS**

These Standards may be periodically amended as necessary to provide additional clarity or to reflect changes in policy or in construction or engineering practice.

Technical revisions shall consist of such additions, revisions, and corrections to these Standards as may, in the judgment of the City Engineer, be necessary to better conform to good engineering and/or construction standards and practice. The City Engineer shall approve only those proposed technical revisions that are consistent with all existing policies relevant to the revision and are consistent with existing law. Technical revisions shall become effective when approved, in writing, by the City Engineer.

**1.14 DEFINITIONS OF TERMS AND ABBREVIATIONS**

When the following words, phrases, or abbreviations appear in these Standards, they shall have the following definition and meaning. Where conflict between these Standards and Chapter 151:Definitions in the Unified Development Code exists, the Code shall govern.



- AASHTO** – American Association of State Highway and Transportation Officials.
- ABC** – Aggregate Base Course.
- Access Management** – The concept of a public agency controlling the location of access points in order to achieve the dual purposes of providing access to individual land uses and limiting access on higher order streets in order to facilitate the smooth flow of traffic with a limited amount of impedance.
- ACI** – American Concrete Institute.
- ADH** – Arkansas Department of Health
- AHTD** – Arkansas State Highway and Transportation Department
- AISC** – American Institute of Steel Construction.
- Alley** – A minor public way dedicated to public use for utility easements and vehicle access to the back or the side of properties abutting a street.
- ANSI** – American National Standards Institute.
- Applicant** – The person or designated agent providing pertinent information for preparation of permit, etc. This is often the Developer.
- Approach Taper** – A taper from the point where all approaching traffic must shift laterally, to the point of the beginning bay taper.
- APWA** – American Public Works Association.
- Arterials** – A street or road of considerable continuity which serves or is intended to serve as the principal traffic way between separated areas or districts which is the main means of access to the primary street system or expressways.
- ASA** – American Standards Association.
- ASTM** – American Society for Testing and Materials.
- ATSSA** – American Traffic Safety Services Association.
- Attached Sidewalk** – Sidewalk that is adjoining the curb.
- Bay Taper** – A taper from the edge of the adjacent through traffic lane to the beginning of the full width of the turn lane storage.
- Bicycle Facilities** – A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking facilities, mapping of all bikeways, and shared roadways not specifically designated for bicycle use.
- Bicycle Lane (Bike Lane)** – The portion of the shoulder or roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.
- Bridge** – Any structure conveying a roadway or path over a body of water or other feature. Bridges shall be designed to carry a varying combination of loading, including vehicular, bicycle, and/or pedestrian traffic.
- Calendar Day** – Each and every day shown on the calendar, beginning and ending at midnight.
- Chicanes** – Offset curb extensions which change the path of vehicular travel from straight to curvilinear.



**City** – The City of Fayetteville, Arkansas

**CMP** – Corrugated Metal Pipe.

**Code** – The latest official adopted ordinances, policies, codes, and/or regulations of the City of Fayetteville.

**Collector** – A street which in addition to serving abutting properties, intercepts minor streets, connects with community facilities and carries neighborhood traffic to the major arterial street system.

**Construction Costs** – Generally, the cost of all right-of-way, earthwork, paving, drainage, structures, signing and striping, traffic control, curb and gutter, sidewalk, and utility work necessary to complete the required improvements.

**Consultant Engineer** – An Arkansas licensed professional engineer working on behalf of the Developer.

**Continuity** – The continuous length of a roadway segment that is uninterrupted by 90 degree turns or controlled intersections.

**Contract Documents** – The executed contract agreement, approved plans, and technical specifications, prepared by an Arkansas licensed professional engineer, for constructing a facility.

**Contractor** – The person, firm, or organization to whom a construction contract is awarded by the Developer or City. Agents, employees, workers, or designers employed by the Contractor are also bound by the terms of the contract or permit.

**Corner Sight Distance** – The distance necessary for the driver of a motor vehicle stopped at a stop sign on a Minor Street or driveway to see approaching vehicles, pedestrians, and bicyclists along the intersecting major street and have sufficient space to make any allowed move to cross the Major Street or merge with traffic on the Major Street without causing vehicles, pedestrians, or bicyclists traveling at or near the design speed on the major street to slow down. The controlling distance for design is the longest distance, generally the distance necessary to merge with traffic.

**Cross Slope** – Slope of the pavement surface, excluding gutter, measured perpendicular to the street centerline.

**Days** – Intended as calendar days and not working days unless stipulated as working days.

**Deceleration Lane** – A right-turn lane or left turn lane lengthened to provide for safe reduction of travel speed.

**Departure Taper** – A left-turn bay from the point where through traffic beyond the intersection begins a lateral shift to the left to the point where the through lane is adjacent and parallel to the centerline.

**Design Speed** – The speed determined for design which takes into account the physical features of a street influencing vehicle operation; the maximum safe speed maintainable on a specified section of street when conditions permit design features to govern. Design speed is normally 5 to 10 mph higher than the posted speed limit to provide a factor of safety and allow for other conditions or uses of the street that may affect vehicle operation.



**Designer** – The person or company responsible for the creation and submission of contract documents or construction plans for the purpose of one-time construction of a facility. This person shall be an Arkansas licensed professional engineer.

**Developer** – Any person(s), parties, partnerships, or corporations, private or public, engaging in activities described as development.

**Development** – Shall include, but shall not be limited to, the construction of a new improvement, the construction of an addition to an existing improvement, or a parceling which results in the need for access and utilities.

**Driveway** – A private access from a public or private roadway.

**Driveway Approach** – The portion of the driveway lying in the public right-of-way or public access easement between the street gutter lip or roadway of a public street and the right-of-way or public access easement line, for the full width of the access, including both apron and side slopes.

**Engineer of Record** - The person or company responsible for the creation and submission of contract documents or construction plans for the purpose of one-time construction of a facility. This person shall be an Arkansas licensed professional engineer.

**FEMA** – Federal Emergency Management Agency.

**Fence** – An artificially constructed barrier of wood, masonry, stone, wire, metal, or other manufactured material, or combination of materials, erected to enclose, partition, beautify, mark, or screen areas of real property.

**FHWA** – Federal Highway Administration, Department of Transportation.

**Final Acceptance** – The written notification from the City, after the City Engineer finds the Warranty Period to be satisfactorily completed, that all public improvements are free of defects and the City releases the Developer from future maintenance obligations.

**FIRM** – Flood Insurance Rate Map.

**Franchise Agreement** – An agreement between the City and certain private utility companies, specifying terms and conditions for use of the City’s public rights-of-way or other public lands.

**Frontage** – The property line or lines of a lot which coincide with a right-of-way or other public open space.

**Greenspace** – Area of right-of-way between the face of the curb and the sidewalk.

**HMA** – Hot Mix Asphalt

**HHOD** – Hillside Hilltop Overlay District

**Improvements** – All public or private improvements within City rights-of-way or easements.

**Initial Acceptance** – This is the City’s document and process, by which the City initially accepts for ownership, maintenance, and warranty the public improvements identified in the approved plans for a specific project.

**Inspector** – An authorized representative of the Design Engineer, assigned to make inspections to assure work is completed in compliance with plans, standards and specifications.



**Intersection Nose** – The radius or distance from the end of the storage bay to the near edge of the cross-route exit lane for the left-turning vehicle. For left-turn bays the cross-route exit reference is normally the centerline of an unchannelized 2-way street or the far edge of the median in a channelized street.

**Intersection Sight Distance** – Refer to Corner Sight Distance.

**“Issued for Construction” Plans** – Design plans that conform to these Standards and are signed and stamped by the Designer, ready for distribution to the Contractor for construction.

**ITE** – Institute of Transportation Engineers.

**Landscaping** – The area within the boundaries of a given lot which consists of planting materials, including but not limited to trees, shrubs, ground covers, grass, flowers, decorative rock, bark, mulch, and other similar materials.

**Knuckle** – A bulb or semi-circular extension of a curb on the outside edge of a street or at an “L” turn to provide more street frontage for adjacent lots.

**Lane Width** – The width of a travel lane measured from the centerline of the lane striping to the centerline of the parallel lane stripe, the face of curb, or to the lip of gutter, whichever is applicable.

**Lift** – The maximum specified thickness of material that may be placed at one time.

**Lip** – Defines the outermost edge of the gutter pan.

**Local Streets** – All street facilities that are not in one of the higher systems. Their primary purpose is to provide direct access to abutting lands and connections to the higher classification streets.

**Mini-Roundabout** – Elevated circular islands placed in the center of a street intersection to reduce vehicular travel speeds by requiring the motorist to travel in a counter clockwise direction around the circular island.

**MSP** - Master Street Plan

**MUTCD** – Manual on Uniform Traffic Control Devices.

**Neckdowns** – A narrowing of the roadway for traffic calming at intersections or mid-block.

**Neighborhood** – A residential or commercial area defined by ordinance, resolution or common understanding.

**Opinion of Cost (Cost Estimate)** – Unit costs, based on those approved by the City and assigned to materials and related quantities.

**Ordinance** – A law established by the City Council.

**OSHA** – Occupational Safety and Health Administration.

**P.C.** – Point of curvature.

**P.C.R.** – Point of curb return.

**Pedestrian Walkway** – A public facility for pedestrian traffic either within the right-of-way of the vehicular traffic roadway or within a public easement (e.g., public tunnels).

**Permittee** – The holder of a valid permit issued in accordance with these Standards or other City related process.



**Phasing Plan** – A plan that defines improvements to be completed in specified parts over a defined sequence.

**P.I.** – Point of intersection.

**Plans** – Construction plans signed by the City depicting public improvements to be constructed for the project.

**Pre-Construction Meeting** – A meeting between the Designer and assigned agents and the City to review proposed work necessary to construct the project, **prior** to proceeding with the work. A meeting may be required for each project, at the City's discretion.

**Professional Engineer (P.E.)** – An Arkansas licensed professional engineer.

**Professional Land Surveyor (P.L.S.)** – An Arkansas licensed land surveyor.

**Project** – The public or private improvement(s) designated in the approved plans, which are to be constructed in conformance with these Standards. The term “Project” includes any and all public or private improvement projects whether development projects, private utility projects, or capital improvement projects.

**Project Supervisor** – The person appointed by the Developer or Contractor for management and control of the work on the project as performed by the Contractor and Subcontractors.

**Proposed Roadway Improvements** – Those roadway improvements deemed necessary due to the impact of the project development.

**P.T.** – Point of tangency.

**Public Improvements** – Those public-type facilities to include: pavement, curb and gutter, sidewalk, pedestrian/bike paths, storm drain facilities with related appurtenances, culverts, channels, bridges, water distribution or transmission facilities with related appurtenances, sanitary sewer collection facilities with related appurtenances, water and waste water treatment facilities, pavement markings, signage and striping, traffic signals and related appurtenances, erosion control and right-of-way grading, or earth excavation processes integral to construction of other public improvements listed herein.

**Punch list, Initial or Final** – A written list of work items, compiled by the Inspector, which do not conform to these Standards, the plans or other associated City Codes that govern the project.

**Raised Crosswalk** – A roadway crossing that slightly elevates the pedestrian crossing surface above the general roadway surface. A raised crosswalk is a traffic calming device.

**Record Drawings** – (Also As-Built Plans) Original design drawings updated by a Professional Engineer depicting all modifications from the design that occurred during construction.

**Report** – A bound document, the contents of which may contain certain necessary analyses, surveys, tests, exhibits, and other pertinent data supporting the subject matter.

**Right-of-way** – (Also ROW or “public right-of-way.”) The land opened, reserved or dedicated for streets, sidewalks, drainage or other public purposes.

**Roadway** – The portion of the highway, arterial, collector, or local street, including shoulders, intended for vehicle and/or bicycle use.



**Roundabout** – A circular street intersection used as a traffic control device in lieu of a multi-way stop or a traffic signal.

**Shall** – A mandatory condition.

**Shared Roadway** – Any roadway upon which a bicycle lane is not designated and which may be legally used by bicyclists regardless of whether such facility is specifically designated as a bikeway.

**Should** – An advisory condition, recommended, but not required.

**Sidewalks** – Paved or otherwise improved area for pedestrian use.

**Specifications** – Construction specifications and standards adopted by the City.

**Speed Tables** - Elevated areas placed in the street roadway with the intent to slow vehicular traffic. The geometrics of the speed table determine how fast it can be navigated.

**Stop Work Order (S.W.O.)** – A written instruction/notice from the City, revoking the Developer’s and/or Contractor’s rights to continue work on the project due to nonconformance with these Standards.

**Stopping Sight Distance** – The distance required by the driver of a vehicle traveling at the design speed to bring the vehicle to a stop after an object on the road becomes visible. This distance is measured from the driver’s eye, 3.5 feet above the pavement to the top of an object 2 feet high on the pavement anywhere on the roadway.

**Storage Length** – The distance from the end of the bay taper to the nearest flow line extension of the intersecting street.

**Street** – A strip of land intended primarily as a means of vehicular and pedestrian travel which may also be used to provide space for sewers, public utilities, trees and sidewalks.

**Streetscape** – Pedestrian and landscape improvements in the right-of-way, generally occurring between the curb and the right-of-way line. Streetscape generally includes sidewalks, street trees, pedestrian lighting, fencing, furnishings, and landscaped areas, including medians and irrigation.

**Structure** – Anything constructed or erected with a fixed location below, upon, or above grade, including without limitation foundations, traffic signals, fences, retaining walls, buildings, inlets, vaults, poles, bridges, and major drainage facilities.

**Subcontractor** – A person, other than the Contractor, supplying labor and materials, or labor only, for the Project, and working for the Contractor or the City.

**Substantial Completion** – Major completion of all Work for the Project, prior to certain inspection(s) or the creation of Punch lists.

**Target Speed** – The desired operating speed of a roadway.

**TIS** - Transportation Impact Study.

**Trail** – Any path used by pedestrians or bicyclists within a public right-of-way or easement. This would include concrete, gravel, or natural surfaces.

**U.D.C.** –Unified Development Code

**USGS** – United States Geological Survey.



**Variance** – A grant of relief to a person from the requirements of these Standards. A variance, therefore, permits construction in a manner otherwise prohibited by these Standards.

**Warranty Period** – The period of time that the Developer or Contractor is responsible for material and workmanship defects in the public improvements, until written notification by the City of final acceptance of the public improvements.

**Work** – All construction activity, including materials, labor, supervision, and use of tools and equipment necessary to complete the Project in full compliance with these Standards, or approved Plans.

**1.01 INTERPRETATION OF STANDARDS**

In the interpretation and application of the provisions of these Minimum Street Standards, the following principles apply:

**1.01.1 Standard**

These Standards are a supplement to the City of Fayetteville Code of Ordinances Title XV Unified Development Code and other Ordinances. Where conflict between these Standards and City Code exists, the Code shall govern.

**1.01.2 Prior Adopted Construction Plans**

These Minimum Street Standards shall not modify or alter any street construction plans that have been filed with and accepted by the City prior to the effective date of the ordinance or resolution adopting these Standards. This exception shall be subject to the conditions and limitations under which said plans were accepted by the City Engineer.

**1.02 VARIANCES AND APPEALS**

**1.02.1 Review**

Any design that does not conform to these Standards must be approved by the City Engineer. Variances from these Standards will be considered administratively on a case-by-case basis following a written request for a variance prepared by a Professional Engineer and submitted to the City Engineer. If the developer, contractor, or utility responsible to the City for public improvements desires to design and construct such improvements in variance to criteria in these standards, such variance(s) shall be identified in a written attachment to the initial submittal of construction plans to the City Engineer. The design submitted for review shall show the variance.

To assist with their plan preparation, designers may submit variance requests, along with sufficient documentation to support the variance, prior to formal submittal of construction plans for informal advisory consideration. Such advisory consideration shall not be binding on the City Engineer, but may help to guide the requestor in the preparation of plans.

The variance request(s) shall include the following:

- a. Identifying Issue. Identification of the standard to be waived or varied and why the standard is unfeasible or is not in the public interest.
- b. Proposed Alternate Design. Identification of the proposed alternative design or construction criteria.
- c. Comparing to Standards. A thorough description of the variance request including impact on capital and maintenance requirements, costs, and how the new design compares to the standard.
- d. Justification. The Professional Engineer must determine and state that the variance will not be detrimental to the public health, safety and welfare, will not reduce design life of the improvement nor cause the City additional maintenance costs. The proposed plan (as varied) must advance the public purpose of the standard sought to be varied equally well or better than would compliance with such standard.
- e. Approval or Denial of Variance. Based upon review of the plans and additional information submitted, and an analysis of the criteria set forth in this subsection the City Engineer may approve or deny the variance request.

If the City Engineer approves the variance request, the plans will continue to be reviewed and approved within the typical review process.

If the City Engineer denies the variance request, the developer shall subsequently submit revised plans in compliance with these Standards. The City Engineer shall provide a written response outlining the basis for all approvals or denials of variance requests.

**112 A**

If a variance request is denied by the City Engineer, the Developer may appeal the decision as outlined in Chapter 155, Appeals of the Unified Development Code.

**11 O S C E E**

Normal working day hours are 7:00 a.m. to 5:00 p.m., Monday through Friday excluding City Holidays. No work requiring Public Works Inspector observation may be conducted outside of these normal working hours without prior approval.



Contractors shall follow the guidelines of Chapter 96, Noise Control, of the City of Fayetteville Code of Ordinances. Noise from construction activities shall be limited to no later than 11:00 p.m. every day and no earlier than 7:00 a.m. on all days except Sundays when the time is extended to 9:00 a.m.

### **111 UTIL COORDINATION**

The Developer shall coordinate construction with affected private utility companies and notify said utilities in accordance with their notification prior to interruption of service or operation. Prior to construction, the Developer shall be responsible to make special arrangements with private utilities for any relocation necessary within the approved project and to coordinate such relocation activities with adjacent affected property owners. The Developer shall be responsible to notify said utilities of any damage to utility systems caused during construction.

All private utility installation within the City of Fayetteville Right of Way shall follow all requirements of Section 171.06, Occupation of Streets and Highways by Public Utilities of the City of Fayetteville Unified Development Code and the AHTD Utility Accommodation Policy.



**CHAPTER 2 SUBMITTAL AND REVIEW PROCEDURES**  
**TABLE OF CONTENTS**

Section	Title	Page
21	GENERAL	
211	General Submittal and Review Procedures	
212	Additional Submittal and Review Procedures	
	A. Designer's Signature.....	3
	B. Additional Requirements.....	3
	C. Final Authorization.....	3
	D. Construction Traffic Control Plans.....	3
	E. Storm Water Pollution Prevention Plans (SWPPP).....	3
22	SUBMITTAL AND CONTENT	
221	Plan and Section Construction Plans	
222	Section and Detail Construction Plans	
223	Plan and Section Construction Plans	
224	Plan and Section Construction Plans	
225	Plan and Section Construction Plans	
226	Plan and Section Construction Plans	
227	Plan and Section Construction Plans	
228	Plan and Section Construction Plans	
229	Plan and Section Construction Plans	
2210	Plan and Section Construction Plans	
2211	Plan and Section Construction Plans	
2212	Plan and Section Construction Plans	
2213	Plan and Section Construction Plans	
2214	Plan and Section Construction Plans	
2215	Plan and Section Construction Plans	
2216	Plan and Section Construction Plans	
2217	Plan and Section Construction Plans	
2218	Plan and Section Construction Plans	
2219	Plan and Section Construction Plans	
2220	Plan and Section Construction Plans	
2221	Plan and Section Construction Plans	
2222	Plan and Section Construction Plans	
2223	Plan and Section Construction Plans	
2224	Plan and Section Construction Plans	
2225	Plan and Section Construction Plans	
2226	Plan and Section Construction Plans	
2227	Plan and Section Construction Plans	
2228	Plan and Section Construction Plans	
2229	Plan and Section Construction Plans	
2230	Plan and Section Construction Plans	
2231	Plan and Section Construction Plans	
2232	Plan and Section Construction Plans	
2233	Plan and Section Construction Plans	
2234	Plan and Section Construction Plans	
2235	Plan and Section Construction Plans	
2236	Plan and Section Construction Plans	
2237	Plan and Section Construction Plans	
2238	Plan and Section Construction Plans	
2239	Plan and Section Construction Plans	
2240	Plan and Section Construction Plans	
2241	Plan and Section Construction Plans	
2242	Plan and Section Construction Plans	
2243	Plan and Section Construction Plans	
2244	Plan and Section Construction Plans	
2245	Plan and Section Construction Plans	
2246	Plan and Section Construction Plans	
2247	Plan and Section Construction Plans	
2248	Plan and Section Construction Plans	
2249	Plan and Section Construction Plans	
2250	Plan and Section Construction Plans	
2251	Plan and Section Construction Plans	
2252	Plan and Section Construction Plans	
2253	Plan and Section Construction Plans	
2254	Plan and Section Construction Plans	
2255	Plan and Section Construction Plans	
2256	Plan and Section Construction Plans	
2257	Plan and Section Construction Plans	
2258	Plan and Section Construction Plans	
2259	Plan and Section Construction Plans	
2260	Plan and Section Construction Plans	
2261	Plan and Section Construction Plans	
2262	Plan and Section Construction Plans	
2263	Plan and Section Construction Plans	
2264	Plan and Section Construction Plans	
2265	Plan and Section Construction Plans	
2266	Plan and Section Construction Plans	
2267	Plan and Section Construction Plans	
2268	Plan and Section Construction Plans	
2269	Plan and Section Construction Plans	
2270	Plan and Section Construction Plans	
2271	Plan and Section Construction Plans	
2272	Plan and Section Construction Plans	
2273	Plan and Section Construction Plans	
2274	Plan and Section Construction Plans	
2275	Plan and Section Construction Plans	
2276	Plan and Section Construction Plans	
2277	Plan and Section Construction Plans	
2278	Plan and Section Construction Plans	
2279	Plan and Section Construction Plans	
2280	Plan and Section Construction Plans	
2281	Plan and Section Construction Plans	
2282	Plan and Section Construction Plans	
2283	Plan and Section Construction Plans	
2284	Plan and Section Construction Plans	
2285	Plan and Section Construction Plans	
2286	Plan and Section Construction Plans	
2287	Plan and Section Construction Plans	
2288	Plan and Section Construction Plans	
2289	Plan and Section Construction Plans	
2290	Plan and Section Construction Plans	
2291	Plan and Section Construction Plans	
2292	Plan and Section Construction Plans	
2293	Plan and Section Construction Plans	
2294	Plan and Section Construction Plans	
2295	Plan and Section Construction Plans	
2296	Plan and Section Construction Plans	
2297	Plan and Section Construction Plans	
2298	Plan and Section Construction Plans	
2299	Plan and Section Construction Plans	
2300	Plan and Section Construction Plans	

**LIST OF TABLES**

*This Chapter Does Not Contain Tables*

**LIST OF FIGURES**

*This Chapter Does Not Contain Figures*



## CHAPTER 2 SUBMITTAL AND REVIEW PROCEDURES

### 21 GENERAL

#### 211 Submittal and Review Procedures

This chapter gives criteria and procedures for submitting engineering drawings as required by these Minimum Street Standards. All other requirements for planning and related submittals can be found in the City of Fayetteville Unified Development Code.

#### 212 Approval Criteria

##### A. Designer's Signature

All documents, including plans and other submittals noted below, shall be prepared, stamped, signed, and dated by a Professional Engineer registered in the State of Arkansas.

##### B. Additional Requirements

The Designer should be aware that whenever unusual or serious problems are anticipated or encountered for a proposed construction project, additional information and analysis beyond the minimum requirements of these specifications and criteria will be required.

##### C. Final Authorization

No plans are considered final and ready for construction until signed and stamped by the Designer and signed by the City Engineer or designee. Refer to **Chapter 3, Construction Plan Submittal Requirements**.

##### D. Construction Traffic Control Plans

Plans for traffic control during construction for the development project must be accepted by the City prior to any issuance of grading permits for Collector and Arterial streets and on lower classification streets when deemed necessary by the City Engineer.

##### E. Storm Water Pollution Prevention Plans (SWPPP)

A Storm Water Pollution Prevention plan for the construction of the development project must be accepted by the City and the Arkansas Department of Environmental Quality (ADEQ), when required, prior to issuance of the grading permit.



**22 SUBMITTALS AND CONTENT**

**22.1 Plans and Construction Plan Submittal Requirements**

Refer to **Chapter 3, Construction Plan Submittal Requirements**, for further description and requirements.

**22.2 Soils Investigation Report**

Refer to **Chapter 6, Pavement Design and Report**, for the content and requirements for the soils report.

**22.3 Pavement Design Report**

Refer to **Chapter 6, Pavement Design and Report**, for the content and requirements for the pavement design report.

**22.4 Traffic Arterial Treatment Construction Plans**

The plans shall be designed in accordance with MUTCD, Section VI.

**22.5 Street Cross Sections**

Typical and unique street cross sections shall be submitted for each street, including the proposed width, treatment of curbs and gutters, sidewalk systems, and bikeway systems where deviations are proposed from these Standards.

**22.6 Drainage Report**

The Developer is required to submit a drainage report in compliance with the City of Fayetteville Drainage Criteria Manual.

**22.7 Opinion of Costs**

As a separate attachment to the Plans, an Opinion of Costs for all Public Improvements will be required. The items shall be identified by unit price and total cost for each item for each type of Project.

**22.8 Record Drawings**

Record Drawings shall follow the requirements set forth in **Chapter 12, Acceptance Procedures and Record Drawings/Warranty**, and be signed, stamped, and dated by the Professional Engineer. The Record Drawings shall be prepared utilizing the original plans. They must show any deviations from the approved plans. Record Drawings must be signed and stamped with the Professional Engineer’s statement that the changes have not changed the intent of the approved plans.



**200 SUBMITTAL PROCEDURES**

**2001 Submittal Procedures**

The submittal shall be complete with all necessary information included for review of the project. The material shall include, but shall not be limited to the Plans, Traffic Impact Study (where required), soils report, pavement design, utility plans, erosion control plans, SWPPP, tree preservation plans where required, and the Drainage Report.

The review and approval process for Construction Plans shall comply with the following criteria:

- A The Plans shall be submitted digitally in PDF format.
- B All Construction Plans shall be submitted directly to the City's Engineering Division.
- C Upon completion of the Engineering Division review, the Design Engineer will be notified that comments are available. These comments can be given to the Design Engineer by e-mail, ftp, cd, or portable data storage device.
- D After the Design Engineer has addressed all review comments, the Consultant Engineer shall re-submit in pdf format as stated above and include a typed written response to each of the City's comments or questions either on the plans or in a separate correspondence.
- E The submittal process may be repeated until such time as the City deems the plans to meet the City standards. At that time, the Design Engineer will be contacted by the City with a request to submit the final plans both in digital pdf format and four (4) hard copies as described in Chapter 3 of these standards.
- F Upon subsequent review and approval by the City the plans will be stamped and signed by the City's review engineer. The Design Engineer (or Developer) will be contacted to pick up the approved plans.

**2002 Construction Permit**

- A. A Grading and Drainage Permit must be issued before construction can begin. In order to obtain a Grading and Drainage Permit, the following is required:
  - 1. Approved Construction Plans and Drainage Report.
  - 2. Material submittals must be submitted with the City standard checklist through the Engineer of Record and approved prior to the preconstruction conferent.



3. The Design Engineer shall schedule a pre-construction conference with the City's Review Engineer, the City's Public Works Inspector, and the contractor.
  4. The Storm Water Pollution Prevention Plan and NOI, if required, shall be submitted in PDF form to the City.
  5. The erosion control measures and tree preservation fencing shall be installed.
  6. An Erosion Control performance bond shall be submitted for projects over 5 acres.
  7. A Public Infrastructure performance bond shall be submitted when required.
  8. Signed easements or written permission from owner for off-site work.
- B. Additional permits may be required by State and/or Federal agencies. All permits required shall be obtained prior to construction. These permits may include, but are not limited to AHD, ADEQ, US Army COE, and AHTD.



**CHAPTER 3 CONSTRUCTION PLANS SUBMITTAL REQUIREMENTS**

**TABLE OF CONTENTS**

Section	Title	Page
1	GENERAL	
1.1	PROJECT SUBMITTALS	
1.2	PROJECT INFORMATION	
1.1	PROJECT SUBMITTALS	
2	GENERAL INFORMATION	
2.1	PROJECT SUBMITTALS	
2.2	PROJECT INFORMATION	
	A. Required Information	4
2.3	PROJECT SUBMITTALS	
2.4	PROJECT SUBMITTALS	
2.5	PROJECT SUBMITTALS	
	A. General	4
	B. Bar Scale and Other Options	5
	C. Signing and Striping	5
	D. Key Map	5
	E. Vicinity Map	5
2.6	PROJECT SUBMITTALS	
2.7	PROJECT SUBMITTALS	
2.8	PROJECT SUBMITTALS	
2.9	PROJECT SUBMITTALS	
2.10	PROJECT SUBMITTALS	
	<b>3. STREET TITLE NAMES AND SPECIFIC REQUIREMENTS</b>	
3.1	CONSTRUCTION NOTES	
	A. General Construction Notes	6
	B. Vicinity Map	6
	C. Engineer/Owner Contacts	6
	D. Index	6
	E. Indemnification Statement	6
	F. Project Title	6
	G. Legend of Symbols	6
3.2	PROJECT SUBMITTALS	
	A. Street Plan View	7
	B. Street Profile	8



C. Typical Street Section(s).....9  
 D. Cross-Sections .....9  
 E. Key Map..... 10  
 Streets and Intersections .....1  
 Traffic Signs and Markings .....1  
 A. Area Map ..... 10  
 B. Road Segment Pages..... 10  
 C. Signing Plan ..... 10  
 D. Striping Plan ..... 11  
 E. Traffic Control Plan ..... 11

**LIST OF TABLES**

*This Chapter Does Not Contain Tables*

**LIST OF FIGURES**

*This Chapter Does Not Contain Figures*



## CHAPTER 3 – CONSTRUCTION PLAN SUBMITTAL REQUIREMENTS

### 1 GENERAL

#### 1.1 Plans

The submittal shall be complete with all necessary information included for review of the project. The material shall include, but shall not be limited to the Plans, Traffic Impact Study (where required), soils report, pavement design, utility plans, erosion control plans, SWPPP, tree preservation plans where required, and the Drainage Report.

#### 1.2 Horizontal and Vertical Datum

The horizontal datum shall be NAD83, Arkansas State Plane, North Zone. The units shall be U.S. Survey Foot.

The vertical datum shall be North American Vertical Datum of 1988 (NAVD88).

At least two horizontal control monuments shall be shown on each sheet. At least one benchmark shall be shown on each sheet. A horizontal and vertical tie to at least one City of Fayetteville GPS monument shall be made and the results provided to the City Surveyor.

#### 1.3 Expiration of Plans

Public improvement construction plans shall be valid for a period of one year from the date of approval by the City Engineer unless construction has begun and continual progress is made towards completion of the improvements. Refer to section 166.20 of the Unified Development Code for time limits and the process for time extensions.

### 2 GENERAL NOTES AND REQUIREMENTS

The following information is provided for the Developer when determining Plan format and design requirements required by the City. This information should be considered the minimum information to be provided.

#### 2.1 Sheet Size

All sheets in the construction plan set shall be either 22 inches x 34 inches or 11 inches x 17 inches..



**2.2 Title Block**

A title block is required on every sheet submitted for review and acceptance. The title block shall be located in the extreme lower right hand corner, the right side margin, or along the bottom edge of the sheet. Provide an area 2" x 4" on each sheet for the City to place a stamp of approval.

**A. Required Information**

The following information shall appear in title block on each sheet:

1. The subdivision or Development name and project number (if applicable).
2. The type of improvement (Grading, Site Plan, Utility Plan).
3. Designer's Name, address, including zip code, telephone number, e-mail address, professional seal, company name and date.
4. Sheet number (consecutive, beginning with the cover sheet).
5. Revision block.

**2.3 Incomplete Plans**

Incomplete plan submittals or plans that do not have a sufficient level of detail will not be reviewed. The Applicant shall be notified if the submitted plans are incomplete. Partial plans may be submitted when appropriate. This may be allowed on a case by case basis and must be authorized by the review engineer prior to submittal.

**2.4 Designer's Signature, Stamp and Date**

All sheets shall include the Designer's signature, stamp and date and shall be stamped and signed in accordance with the rules and regulations established by the Arkansas State Board of Licensure for Professional Engineers and Professional Surveyors.

**2.5 Scales**

**A. General**

All scales listed below shall be based on a standard 22"x34" full scale drawing.

All Plan and profile sheets:

1. Horizontal. 1 inch = 10, 20, 30, 40, or 50 feet.
2. Vertical. 1 inch = 5 or 10 feet.
3. Overall Plan. 1 inch = 100 feet.
4. Cross Sections. Vertical exaggeration ratio shall be a maximum of 5:1. 1:1 is preferred.



**B. Bar Scale and Other Options**

Show bar scale. Other scales may be used upon City approval.

**C. Signing and Striping**

All signing and striping plans require a scale of 1 inch = 30 feet minimum.

**D. Key Map**

1 inch = 500 - 1,000 feet

**E. Vicinity Map**

1 inch = 1,000- 1,500 feet

**2.0000**

All sheets shall have dates shown in the Title Block for both Plan preparations and subsequent revisions. An electronic date shall appear on all electronic files to be submitted. Final approved construction plans shall start the date sequence again.

**2.0001 North Arrow**

All design sheets shall have a north arrow oriented toward the top or right side of applicable sheets.

**2.0002 Existing Facilities**

Each sheet shall show all existing facilities in a ghosted or alternate line weight or type.

**2.0003 Legend**

Each plan sheet shall include a legend that identifies the symbols pertaining to the sheet unless an overall legend is provided for the entire plan set.

**2.0004 Key Map**

For plan sets that include 3 or more plan and profile sheets, each Plan and profile sheet shall provide a key map showing the location of the street being detailed.

**3.0000 SHEET TITLE NAMES AND SPECIFIC ELEMENTS**

This section outlines the minimum required information to be included on specific sheets of the Plan set. The following sheets are listed in the order they should appear in the Plan set. Some sections of the Plan set may have more than one sheet, but should be labeled alike.



**1 Construction**

All sets of construction drawings shall include a cover sheet with the following information provided:

**A. General Construction Notes**

General Notes may be shown on this sheet or as a separate sheet.

**B. Vicinity Map**

1. Information to Include. The vicinity map shall show the location and name of all Arterial roadways within one mile of the proposed construction, and all other roadways within 1/2 mile of the proposed construction. The project area shall be indicated by shading.
2. Size. Minimum size of vicinity map shall be 10 inches x 10 inches and to a scale of 1 inch = 1,000 – 1,500 feet.

**C. Engineer/Owner Contacts**

The name, address, e-mail address and phone number of the Developer (owner) and Design Engineer shall be listed on the cover sheet.

**D. Index**

Each cover sheet shall include an index of all sheets within the Plan set.

**E. Indemnification Statement**

The indemnification statement shall be shown on the cover sheet. Annotate the following on Cover Sheet only:

*These plans have been reviewed by the City for concept only. The review does not imply responsibility by the reviewing department, the City Engineer, or the City for accuracy and correctness of the calculations. Furthermore, the review does not imply that quantities of items on the plans are the final quantities required. The review shall not be construed for any reason as acceptance of financial responsibility by the City for additional quantities of items shown that may be required during the construction phase.*

**F. Project Title**

The project title shall be clearly shown.

**G. Legend of Symbols**

Provide City of Fayetteville standard symbols for all appurtenances related to each type of facility. The standard legend may be expanded as necessary to fit specific projects

**2 Road Standards PPP**

These Plan sheets shall be drawn at a legible scale (1"=10' to 1"=50') which will clearly convey design and construction intent. All erosion control devices (temporary and long term) shall be included, as well as revegetation methods with specific notes. Plan must show grades of all drainage facilities. All grading plans shall meet the requirements as described in Chapter 169 of the Unified Development Code. The SWPPP shall meet all ADEQ requirements.

**3 Street Standards**

The Plans shall include Plan and Profile views for each street (private or public) proposed in the development. Cross-section sheets are required for all roadways. All plans shall be produced at a scale that is completely legible for review and for construction. In addition to the requirements set forth elsewhere in these Minimum Street Standards, the following information shall be shown on all Roadway plans submitted for review and approval:

**A. Street Plan View**

The plan view shall include, but not be limited to, the following:

1. Existing and proposed Property and/or right-of-way lines, easements, and adjacent property owners names and addresses. Type and dimension of easement or tract is to be clearly labeled. Dimensions of Property and right-of-way lines are to be marked.
2. Survey lines and stationing lines shall normally be based on centerline of travel lanes; other profiles may be included but shall be referenced to centerline stationing. Stationing in cul-de-sacs shall be on the centerline to the center of the bulb with flowlines dimensioned within the bulb. Survey lines and stationing lines shall deviate from centerline of street to parallel the roadway for situations where two sides of a divided roadway are not parallel.
3. Stationing shall read in ascending order in the direction of the north arrow or to the right.
4. Roadways and Roadway names.
5. Existing utilities and structures (shown as phantom lines), including, but not limited to:
  - a. Storm sewer and appurtenances.
  - b. Ditches or swales.
  - c. Bridges or culverts.
  - d. Fence lines and gates.
  - e. Water lines and appurtenances.
  - f. Sewer lines and appurtenances.
  - g. Curbs and gutters.



- h. Pavement limits.
  - i. Telephone lines and appurtenances.
  - j. Electric lines, poles and appurtenances.
  - k. CATV lines and appurtenances.
  - l. Gas lines and appurtenances, etc.
  - m. Signs.
  - n. Guardrails.
  - o. Houses or other buildings.
  - p. Trees.
  - q. Driveways.
6. Critical elevation (flowline, invert of pipe, etc.) of all existing and proposed utility or drainage structures.
  7. Storm drainage flow direction arrows, particularly at intersections and all high and low points.
  8. Match lines, stations and consecutive sheet numbers, beginning with cover sheet.
  9. Station and elevation of all horizontal curves including PI, PC's, PT's, etc.; high or low point and VPI/PVI of all vertical curves; existing and proposed, centerline bearings, distances, and complete curve data.
  10. Curb return radii, existing and proposed. Stations and elevations of all curb returns at the gutter line; mid-point elevations and additional locations as necessary, flowline-flowline intersection elevations, corresponding centerline spot elevations and percent of grade from the P.C.R. to flowline-flowline intersections of all crosspans.
  11. Centerline stations of all intersecting roadways.
  12. Survey tie lines to section corners or quarter corners, consistent with that shown on the plat.
  13. Intersections. Any roadway intersections shall include construction and lane details for the new construction and existing facilities for a minimum of 150 feet beyond the limits of construction.
  14. Basis of plan view and profile elevations shall be the same, i.e., flowline and flowline, top of curb and bottom of curb, etc.
  15. Cul-de-sacs. High point and grades shown with percent arrows at critical points (cross-slope and flow line).
  16. Location of all proposed and existing sidewalk and/or trails.
  17. Soil Boring Locations and CBR test locations (when available).
  18. Location of all existing or proposed retaining walls.

## B. Street Profile

Profiles shall include, but not be limited to, the following:

1. All streets shall be designed to show profile of center line.



2. Original ground (dashed) and design grade (heavy, solid). Both grades are to be plainly labeled for all centerline profiles.
3. Existing and design elevations shall be provided for the centerline.
4. Elevation and location of all utilities and storm sewer in the immediate vicinity of the construction shall be shown on the profile. Separate left and right profiles may be required for clarification when there are multiple utility or storm sewer lines.
5. Station and elevation of all vertical grade breaks.
6. Distance and grade between VPI's.
7. Vertical curves, when necessary, with VPI, VPC, and VPT, high or low point (if applicable) stations and elevations. All vertical curves shall be labeled with length of curve (L) and  $K=L/A$  where A is the algebraic difference in slopes, in percent.
8. Profiles for curb returns when requested.
9. Specify limits of typical sections and transitions.
10. Separate drainage profiles are required for off-site storm drainage.

### C. Typical Street Section(s)

A typical street section shall be included in the Plans and shall show the following:

1. Pavement section type, width and thickness
2. Cross slope and crown
3. Location of profile grade (crown, center line, curb line)
4. Curbs and/or ditches/swales
5. Existing and proposed grades
6. Right of way width
7. Sidewalks and/or trails, where required
8. Landscaping, if required
9. Stationing limits for the typical section
10. Street name and classification
11. Parking, where required

### D. Cross-Sections

Roadway Cross-Sections. Roadway cross-sections shall be provided at intervals deemed necessary by the City to effectively evaluate connection with the existing facilities, (typically every 50 feet horizontally, at intersections, transition points, driveways, storm sewer structures, etc...).

The cross-sections shall include the following:

1. Profile centerline including proposed and existing spot elevations,
2. Roadway width.
3. Right-of-way width.
4. Pavement cross slope.



5. Pavement thickness.
6. Curbs and/or ditches/swales.
7. Proposed and existing drainage and utilities in the right of way (size, material, elevation and location).
8. Street name.

**E. Key Map**

1. Clearly depict each sheet’s relative position compared to the overall project. The Roadway or area that the design pertains to will be shaded.
2. Minimum scale is 1 inch = 500 feet, showing the location and name of all roadways within and adjacent to the proposed construction and all future roadways. Scale should be indicated. The key map should be oriented consistent with detail in the sheet, i.e., same north.

**Standard**

All pertinent details related to street improvements shall be shown on a detail sheet (or sheets) for the Project. Standard City of Fayetteville Detail Sheets shall be included, along with standard AHTD detail sheets where work is planned with AHTD right of way.

**Temporary Signage and Pavement Markings**

All permanent and temporary traffic signing and pavement markings shall be shown on the signing and striping plan, with the existing and proposed street system used as the base layout. Locations of signs and pavement markings shall be indicated by station/offset, or other specific dimensions indicating exact locations. This sheet shall also contain any construction or application notes, (e.g., application temperatures, surface cleaning methods to be used prior to application, etc.).

**A. Area Map**

Separate signage and striping plans are to consist of an overall area map noting all specific use areas, such as schools, parks, recreation centers, library, commercial, industrial, fire zones, no-parking and designated parking.

**B. Road Segment Pages**

The pages following the area map are to be broken down into road segments, for notation of signage and striping details.

**C. Signing Plan**

The permanent signing plan should:

1. Show the general longitudinal location of each sign (horizontal offset and station).



2. Specify the sign legend and sign type (from MUTCD).
3. Specify the sign size.
4. Detail post and base dimensions and installation plan (showing sleeves, depth below surface, and materials used, according to City standards).
5. Specify the blank gauge of the sign.
6. Note the reflectorization provided.

#### **D. Striping Plan**

The striping plan must show:

1. Color and type.
2. Lane widths, taper lengths, storage lengths, etc.
3. Striping/skip interval.
4. Typical treatments for acceleration/deceleration lanes, turning lanes, and crosswalks.
5. Type of material (thermoplastic).
6. Station and offset or dimensions to all angle points, symbol locations, and line terminations.
7. Pedestrian crossings.

#### **E. Traffic Control Plan**

All temporary traffic control signage and striping for lane closures and detours shall be shown. Controls must be designed to meet all MUTCD standards.





**CHAPTER 4 STREET DESIGN AND TECHNICAL CRITERIA**

**TABLE OF CONTENTS**

S	T	P
4.1	GENERAL	
4.2	STREET ADJUSTMENTS	
4.2.1	Proposed	
4.2.2	Major Proposed Arterial Collector Street	
4.2.2.1	Street	
	A. Neighborhood Traffic Safety and Traffic Calming	3
	STREET CLASSIFICATIONS	
	GENERAL DESIGN ELEMENTS	
4.1	Alignment	
	A. Horizontal Alignment	5
	B. Vertical Alignment	6
	C. Sight Distance	7
4.2	Cross Slope	
	A. Minimum Cross Slope	8
	B. Maximum Allowable Cross Slope	9
	C. Cross Slope for Street Modifications	9
	D. Cross Slope for Cul-de-Sacs	9
	Superelevation	
	A. Where Superelevation Is Permitted	9
	B. Run-Out	9
	Shoulder	
	Curb and Gutter	
	MEANS	1
4.1	Travel	1
4.2	Right-of-Way	1
	Non-Connective	1
	Travel	1
	Other	1
	NON-CONNECTIVE STREET ALIGNMENTS	11
4.1	Cul-de-Sac	11
	A. Permitted Locations	11
	B. Minimum Radius	11
4.2	Other	11
	A. Permitted Locations	11
	B. Permitted Lengths	11
	Dead-End Street	11



- A. Temporary Dead-End Streets ..... 11
- B. Temporary Turnarounds ..... 11
- C. Temporary Turnaround Easements ..... 11
- 4.02 **SEWERAGE SYSTEMS** ..... 12
- 4.02.1 **Stormwater** ..... 12
- 4.02.2 **Sanitary Sewer** ..... 12
- A. Controlling Groundwater ..... 12
- B. Protecting Right-of-way Improvements ..... 12
- C. Design Criteria ..... 12
- 4.03 **Stormwater Management** ..... 12
- 4.03.1 **Stormwater Management** ..... 13
- A. Basic Requirements ..... 13
- B. Dimensions and Depth ..... 13
- C. Minimum Grade ..... 13
- 4.04 **Intersections** ..... 13
- 4.04.1 **Stormwater Management** ..... 13
- 4.04.2 **Centerline Arc Lengths** ..... 13
- 4.04.3 **Stopping Sight Distance** ..... 13
- A. Roadside Ditches ..... 13
- B. Driveway Culverts ..... 14

**LIST OF TABLES**

- Table 4-1 Technical Design Criteria ..... 4-4
- Table 4-2 Centerline Arc Lengths ..... 4-5
- Table 4-3 Stopping Sight Distance ..... 4-7

**LIST OF FIGURES**

*Figures are Located at the End of the Chapter*

- Figure 4-1 Intersection Sight Distance (Sight Triangle) – No On-street Parking
- Figure 4-1a Intersection Sight Distance (Sight Triangle) – With On-street Parking
- Figure 4-2 Knuckle Detail
- Figure 4-3 Cul-De-Sac Detail
- Figure 4-4 Street Stubout
- Figure 4-5 Temporary Turnaround
- Figure 4-6 Street Intersection Approach



## CHAPTER 166 STREET DESIGN AND TECHNICAL CRITERIA

### 1 GENERAL

This chapter defines layout criteria and other design criteria that shall be followed for locating and designing all streets.

### 2 STREET LOCATION REQUIREMENTS

The locations of Arterial and Collector streets shall be in accordance with the current Master Street Plan. Other streets shall be located in accordance with all other applicable street layout requirements.

#### 2.1 Proposed Extensions

All streets shall have a logical relationship to the existing topography and to the location of existing or platted streets within adjacent properties. Certain streets within the project may need to be extended to the project boundary to provide for the future extension of the street through adjacent properties.

#### 2.2 Master Planned Arterial and Collector Streets

The Master Street Plan shows the approximate locations of all Arterial streets and some Collector streets for the City and its Planning Area. The Master Street Plan shall be used for establishing approximate locations of these streets. The City Engineer shall hold approval authority for specific alignments for all Arterial and Collector streets.

#### 2.3 Local Streets

Layout of new Local streets not covered by the Master Street Plan shall meet the needs of the specific development and satisfy all other specific requirements of this chapter and the access management requirements of Chapter 166 of the Unified Development Code. The City retains the authority for approval of the overall street layout.

### A. Neighborhood Traffic Safety and Traffic Calming

A major component in street layout is neighborhood traffic safety. This is an essential transportation issue in the City of Fayetteville. Traffic calming is the implementation of physical and perceptual techniques intended to slow or divert traffic on existing or planned roadways. It is often a reactive approach to minimize high speeds and volumes of vehicular traffic. Significant efforts in traffic calming have been put forward on existing roadways and in the development of new roadways to limit traffic speeds and traffic volumes in



neighborhoods and to provide for safer travel for all modes of transportation including pedestrian, bicycle, and vehicular.

**STREET CLASSIFICATIONS**

Street cross sections shall meet the classifications as shown in the current City of Fayetteville Master Street Plan.

**DESIGN ELEMENTS**

All streets shall be designed in accordance with design speeds specified for each street classification in **Table 4-1**. Where ranges are specified, the design speed shall be determined by the City Engineer.

**Table 4-1**  
**Street Classification Criteria**

Street Type	Arterial		Collector	Local	Alley
	Principal	Minor			
Other Street					
Standard	25-35	25-35	25-35	15-25	15
Transfer Standard	25-35	25-35	25-35	15-25	15
Standard Street	Street Type				
Arterial					
Major Collector			15		
Major Street-Express					
Major Transfer	15	15	15		
Collector					
Arterial					
Major Collector	Order			15	15
Collector				12	15
Major Collector					
Major Street	Criteria			25	15
Street	Street				25
Intersecting					
Major Street	Street Type				
Intersecting	15 and 15				
Transfer Street					
Transfer Street					
Transfer Street					
Transfer Street					



1 A

Horizontal and vertical street alignments should conform to existing land layout plus the following criteria:

**A. Horizontal Alignment**

On Arterial and Collector roadways, curve radii and tangents shall be as large as possible using the minimums only where necessary. All changes in direction shall be made using standard curves. Traffic calming measures may be required for relatively straight sections of local streets that encourage excessive speeds.

1. Horizontal Curve Radii. The minimum allowable centerline radii for horizontal curves shall be as designated in **Table 4-1**. For low speed, low volume subdivision streets with 90 degree turns, it may be appropriate to have a curve radius less than the minimum shown. These will be evaluated on a case by case basis and may be approved by the City Engineer. For these curves, a Knuckle design may be used to provide additional lot frontage around the curve (See Figure 4-2). Reverse and compound curves should be used only when a single radius curve will not work. For driver safety, compound curves shall have a ratio no greater than 1.5 where the value of the larger radius is divided by the smaller radius.
2. Minimum Tangent Length
  - a. Intersection. Whenever a minor street intersects a street of higher classification, a tangent length (measured from the nearest gutter flowline of the intersected street to the point of curvature in the intersecting street) shall be provided for a safe sight distance and safe traffic operation. The minimum required tangent lengths indicated in **Table 4-1** apply to the minor leg(s) only. The angle of departure shall not exceed 10 degrees for the length of tangent.
  - b. Reverse Curves. The tangent between reverse curves shall be no less than the length shown in **Table 4-1**. If the curve radii are at least 50% greater than the radii required by the design speed, the tangent sections may not be required depending on grades and topography. If the curves are superelevated, the superelevation transition lengths will determine the minimum length of tangent between reverse curves.
3. Consistent Radii. All curves along a local street segment shall be designed with radii that are approximately equal to provide consistency and minimize unexpected difficult or quick maneuvers for the driver.
4. Curves with Small Deflection Angles (10° or less). To reduce the appearance of kinks in the street, minimum lengths of curve shall be designed with minimum arc lengths as shown in **Table 4-2**.



**T** **C** **Ar** **- 2**

S	M
C	C
Ar	Ar
Arterial	400
Collector	300
Local	200

5. Horizontal Curves on Vertical Curves. For driver safety, horizontal curves shall not begin near the top of a crest vertical curve nor near the bottom of a sag vertical curve.
6. Coefficient of Friction. The coefficient of friction shall conform to the recommendations in Chapter 3 of the **AASHTO “Green Book.”**
7. Joining Existing Improvements. Connection with existing streets shall be made to match the existing alignment of the existing improvements, in accordance with horizontal alignment criteria.
8. Lane Transitions. The lengths for the transition in the lane width or for the addition or reduction of the number of travel lanes shall be designed in accordance with AASHTO standards.

**B. Vertical Alignment**

1. Maximum and Minimum Grades for Streets. The maximum and minimum grades for specific street classifications are shown in **Table 4-1**. The centerline grade in the bulb of a cul-de-sac shall not exceed 3 percent (See **Figure 4-3**).
2. Minimum Flowline Grades. Minimum flowline grades for gutters shall be 0.50 percent, except the bulb of cul-de-sacs where the minimum shall be 1.0 percent (See **Figure 4-3**).
3. Requirements for Using Vertical Curves. Vertical curves are required for grade changes that exceed 1.0 percent. Both centerlines and the curb and gutter flowlines shall be designed with vertical curves to meet AASHTO requirements. A series of grade breaks may be used in lieu of a specified vertical curve as long as the series of breaks meet the vertical curve criteria in these Standards for the design speed. K-values for design shall conform to **Table 4-1**. In sag curves on flow line, the minimum grade requirement of 0.50 percent shall override the slope within the vertical curve.



4. Joining Existing Improvements. Connection with existing streets shall be made to match the existing grade of the existing streets, in accordance with vertical alignment criteria. (Grade breaks shall not exceed allowable.)
5. Vertical Clearance. Vertical clearance above a roadway is a minimum of 16.5 feet. Clearance may be higher in AHTD right of way. AHTD requirements will govern.
6. Intersection Approach Grades. Intersection approach grades are discussed in **Chapter 5, Intersections**.
7. Off-Site Continuance of Grade and Ground Lines. To assure that future street improvements will meet these Standards the future grade and ground lines of all streets, except cul-de-sacs, shall be continued for 100 feet beyond the proposed construction.
8. Master Residential Lot Grading Plan. Consideration should be given to the earthwork associated with the individual lot grading for finished floor elevations, driveway slopes, etc...

### C. Sight Distance

Sight distance is the distance necessary for a vehicle operator to perform expected functions and be able to do so without causing a hazard for the driver or other vehicle operators for the specific design speed of the street. In no case shall the distance be less than the stopping sight distance. This includes visibility at intersections and higher volume driveways as well as around curves and roadside encroachments.

1. Stopping Sight Distance for Vertical Crest Curves. Stopping sight distance is calculated assuming the following:  
 Object height is 2 feet above road surface and viewer's height is 3.5 feet above road surface.
2. Stopping Sight Distance on Horizontal Curves. Where an object off the pavement restricts sight distance, the minimum radius of curvature is determined by the stopping sight distance. In no case shall the stopping sight distance be less than as specified in **Table 4-3**. The sight distance design procedure shall assume a 6-foot high obstruction (as measured from actual finished grade) exists at all property lines except in the sight distance easements that may be required to preserve the needed sight distance.

Stopping sight distance on horizontal curves is based upon lateral clearance from the inner edge of pavement to sight obstruction, for various radii of inner edge of pavement and design speeds. The position of the driver's eye and the object sighted shall be assumed to be 6 ft. from the inner edge of pavement, with the sight distance being measured along this arc. Minimum stopping sight distances are given in **Table 4-3**.



**T**  
**S S**

S d	S S
<b>2</b>	<b>12</b>
<b>2</b>	<b>1</b>
<b>2</b>	<b>2</b>

(For Intersection Sight- Distance, see 4-1)

3. **Corner Sight Distance.** The corner sight distance provides for vehicles to enter traffic and accelerate to the average running speed. Corner sight distance shall be measured as shown in **Figure 4-1**.
4. **Intersection Sight Distance Triangles.** All sight-distance triangles must be shown on the street plan/profile plans. All sight distances must be within the public right-of-way or a sight distance easement. The easement shall be dedicated to the City and be kept free of sight obstructions.
5. **Sight Obstructions.** Any object within the sight distance easement more than 30 inches above the flow line elevation of the adjacent street shall constitute a sight obstruction, and shall be removed or lowered. Such objects include but are not limited to berms, buildings, parked vehicles on private property, cut slopes, hedges, trees, bushes, utility cabinets or tall crops. Mailbox clusters must be installed a minimum of 2 feet from back of curb and not cause any sight obstruction. The City may limit parking to protect visibility. The sight distance shall be measured to the centerline of the closest through-lane in both directions. In no case shall any permanent object encroach into the line-of-sight of any part of the sight distance triangle.

**2 Cr S**

Cross slope on a pavement is provided to drain water from the street surface. The design of cross slope shall consider driver comfort and safety.

**A. Minimum Cross Slope**

A minimum cross slope on all streets shall be 2.0 percent. Minimum cross slope on reconstruction or overlays of existing roadways is 1.5 percent.



**B. Maximum Allowable Cross Slope**

Maximum allowable cross slope on all new construction shall be 3 percent. Maximum allowable cross slope on any reconstruction or overlays of existing roadways shall be 4 percent.

**C. Cross Slope for Street Modifications**

When widening an existing street or adding turn lanes to an existing street, the resulting cross slope of the widened portion shall be within the limits stated above and the new cross slope shall be no less than the existing cross slope. However, if the cross slope of the existing street exceeds the Standards then new curb and gutter shall be designed such that the existing pavement, when overlaid, will result in a straight line cross slope grade that meets these Standards. Alternatively, the existing pavement may be removed and reprofiled to comply with these Standards.

**D. Cross Slope for Cul-de-Sacs**

Refer to **Figure 4-6** for cul-de-sac bulb cross slopes.

**Superelevation and Curb Return**

The purpose of superelevating a roadway is to maintain the riding comfort on smaller than standard curves. Superelevation may only be used when other means of design will not work and is subject to review and approval by the City Engineer. The following criteria shall be followed:

**A. Where Superelevation Is Permitted**

Superelevation may be allowed for curves on Arterial and Collector streets in order to reduce the minimum centerline radius. In no case shall superelevation exceed 4.0 percent cross slope. Superelevation shall not be used to reduce minimum radii on Local Streets.

**B. Run-Out**

When superelevation is used, the minimum run-out used entering and exiting the superelevated portion shall be 100 feet.

**Design Speed**

Each roadway classification has a specific design speed. See **Table 4-1**.

**Curb Return Radii**

The required curb return radii are defined in **Table 5-1**, unless otherwise approved or required by the City Engineer.



MEDIANS

1 Turn and Access

The design of medians shall include the evaluation for needed turn lanes and accesses. For the minimum requirements of turn lanes, refer to **Chapter 5, Intersections**.

2 Landscaped

Landscaped medians shall be provided with drainage facilities to handle sprinkler runoff and nuisance flows. Sprinklers shall be designed to prevent spray onto the pavement surface. A properly designed under drain system shall be required.

3 Nose

Vehicle tracking templates shall be used to determine the position of the median nose so that vehicles do not track onto the median. The minimum radius for nose curbs shall be 2 feet to back of curb. A Single Unit (SU) truck template should be used for the design vehicle.

4 Transition

The ends of medians shall transition into turn lanes with a minimum radius of 100 feet. A change of directions must be accomplished with the use of radii. Angle points shall not be allowed. See **Figure 5-10**.

5 Obstructions

No permanent structures, including light poles, fire hydrants, etc., shall be placed within 5 feet of the travel lane or in any location that would obstruct sight distance except for structures as approved in these Standards. If a median streetlight is placed within 5 feet of the travel lane, the light must be a breakaway model.

## 4.1 NON-CONNECTIVE STREET ALIGNMENTS

### 4.1.1 CUL-DE-SACS

#### A. Permitted Locations.

Cul-de-sacs shall be used only where necessary. Cul-de-sacs are permitted only on Local Streets in conformance with **Chapter 166 of the U.D.C.**

#### B. Minimum Radius

The cul-de-sac shall have a minimum radius of 50', or as required by the fire code.

### 4.1.2 KNUCKLES

#### A. Permitted Locations

Knuckles may be permitted only on Local Streets that intersect Local Streets.

#### B. Permitted Lengths

Knuckles shall have a maximum radius as indicated in **Figure 4-2**.

### 4.1.3 TEMPORARY DEAD-END STREETS

#### A. Temporary Dead-End Streets

Temporary dead-end streets will be permitted only on streets that have no direct access from adjoining property. Additionally, a temporary dead-end street shall be planned to extend into neighboring property during a later development phase or project. The road must be fully constructed to the property line. Refer to **Figure 4-4**.

#### B. Temporary Turnarounds

At locations where a temporary dead-end street exceeds 150 feet in length, a temporary turnaround shall be constructed. Refer to **Figure 4-5** for two layout options.

#### C. Temporary Turnaround Easements

All temporary turnarounds shall be constructed within an access Easement or street ROW. The Easement may be vacated by the City when the Easement is no longer necessary.



4.1.1 **RAINAGE SYSTEMS**

4.1.1.1 **Drainage**

Drainage system design shall be in accordance with current City of Fayetteville Drainage Criteria Manual.

4.1.1.2 **Underdrains**

**A. Controlling Groundwater**

Under drains used for the purpose of controlling groundwater on private property may be constructed within public right-of-way. The system shall be private and must be maintained by viable private parties.

**B. Protecting Right-of-way Improvements**

Under drains constructed for the purpose of protecting public right-of-way improvements may be installed only if other means are not possible. The City shall own and maintain these systems.

**C. Design Criteria**

All Under drains covered by these Standards shall be designed to meet the following criteria:

1. **Positive Outfall:** Demonstrate that under drain has positive outfall for gravity drainage.
2. **Groundwater Barriers:** The system shall be designed such that clay cutoff walls are provided at boundaries of the development to preclude hydraulic communication with offsite utility trenches either upstream or downstream.
3. **Filter Fabric:** The under drain trench shall be lined with a filter fabric specifically selected in consideration of on-site soil conditions in order to minimize the invasion of fine soil particles into the bedding gravel.

4.1.1.3 **Sidewalk Underdrains**

Storm water from concentrated points of discharge shall not be allowed to flow over sidewalks, but shall drain to the roadway by use of a sidewalk underdrain or other methods approved by the City Engineer.

A sidewalk underdrain shall not be located within a curb ramp, curb cut, or driveway. Sidewalk underdrains shall only be allowed in special situations, on a case-by-case basis, as determined by the City Engineer. Sidewalk underdrain sections shall be constructed in accordance with **Figure 4-7**.

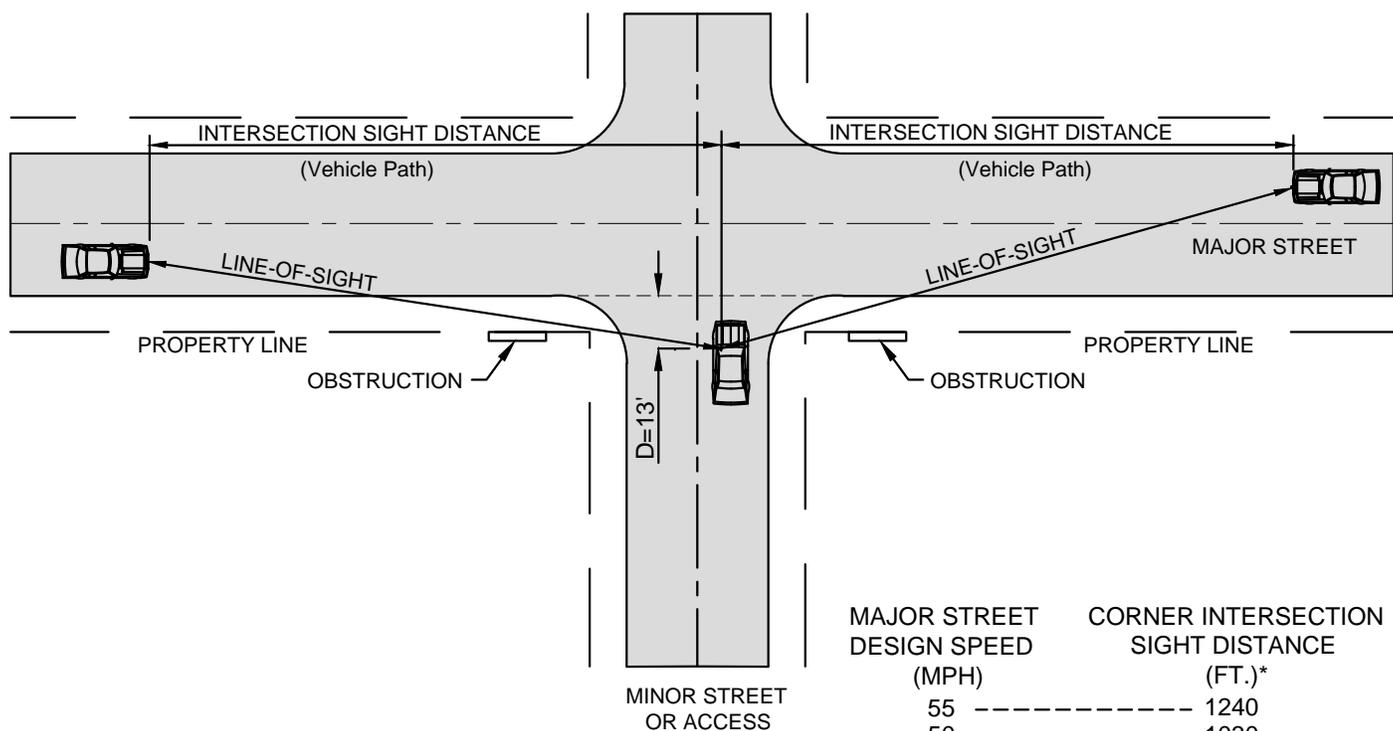




## **B. Driveway Culverts**

The slope and capacity of any roadside ditches shall be maintained in any areas that driveways cross the ditch. Each site is required to provide a pipe culvert a minimum of eighteen (18) inches in diameter, calculated to meet capacity and strength. The pipe shall be designed to have no less than twelve (12) inches of cover over the pipe. At each end of the culvert, there shall be a headwall or a flared end section installed. If a HDPE or CMP flared end section is used, a min. 6" wide concrete band shall be constructed around the exposed edges of the flared end section.



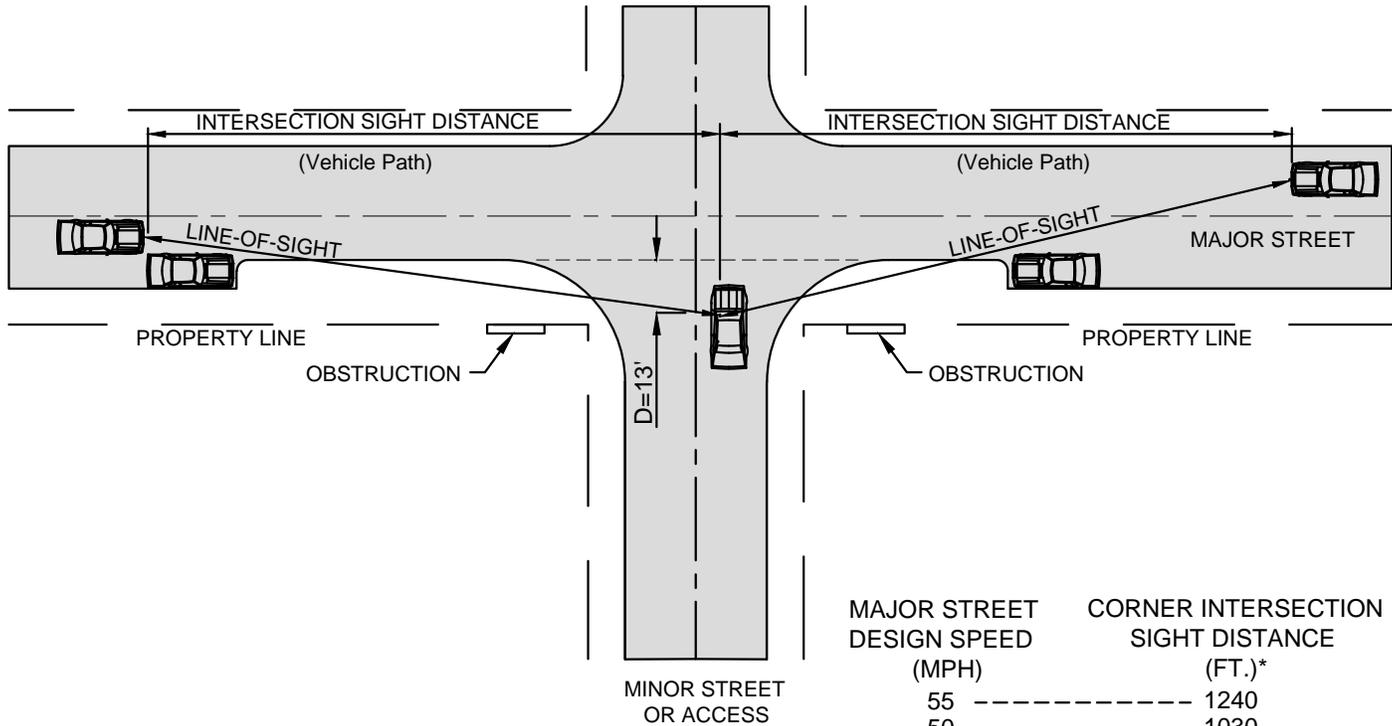


MAJOR STREET DESIGN SPEED (MPH)	CORNER INTERSECTION SIGHT DISTANCE (FT.)*
55	1240
50	1030
45	830
40	660
35	520
30	310
25	260
20	210
15	210

\*NOTE: Line of Sight must be within R.O.W. or sight distance easement

1. Corner sight distance measured from a point on the minor road at 13 feet back from the edge of the travel lane (flowline) and measured from a height of eye at 3.50 feet on the minor road to a height of object at 3.5 feet on the major road.
2. At Local-Local street intersections only, the "D" distance shall be ten feet (10') and the sight distance shall be measured to the centerline of the street.
3. For private driveway access to a public street, use 10 feet back from flowline (or shoulder for gravel roads).
4. These values apply to passenger cars on 2-lane roads only. Intersections and access serving trucks or on multi-lane roadways requires separate analysis.
5. Adjustments may be required on a skewed intersection.
6. For local/local street intersection, the minimum sight distance allowed is the stopping sight distance. See Table 4-3.

**SIGHT DISTANCE AT INTERSECTIONS**  
(Unsignalized)

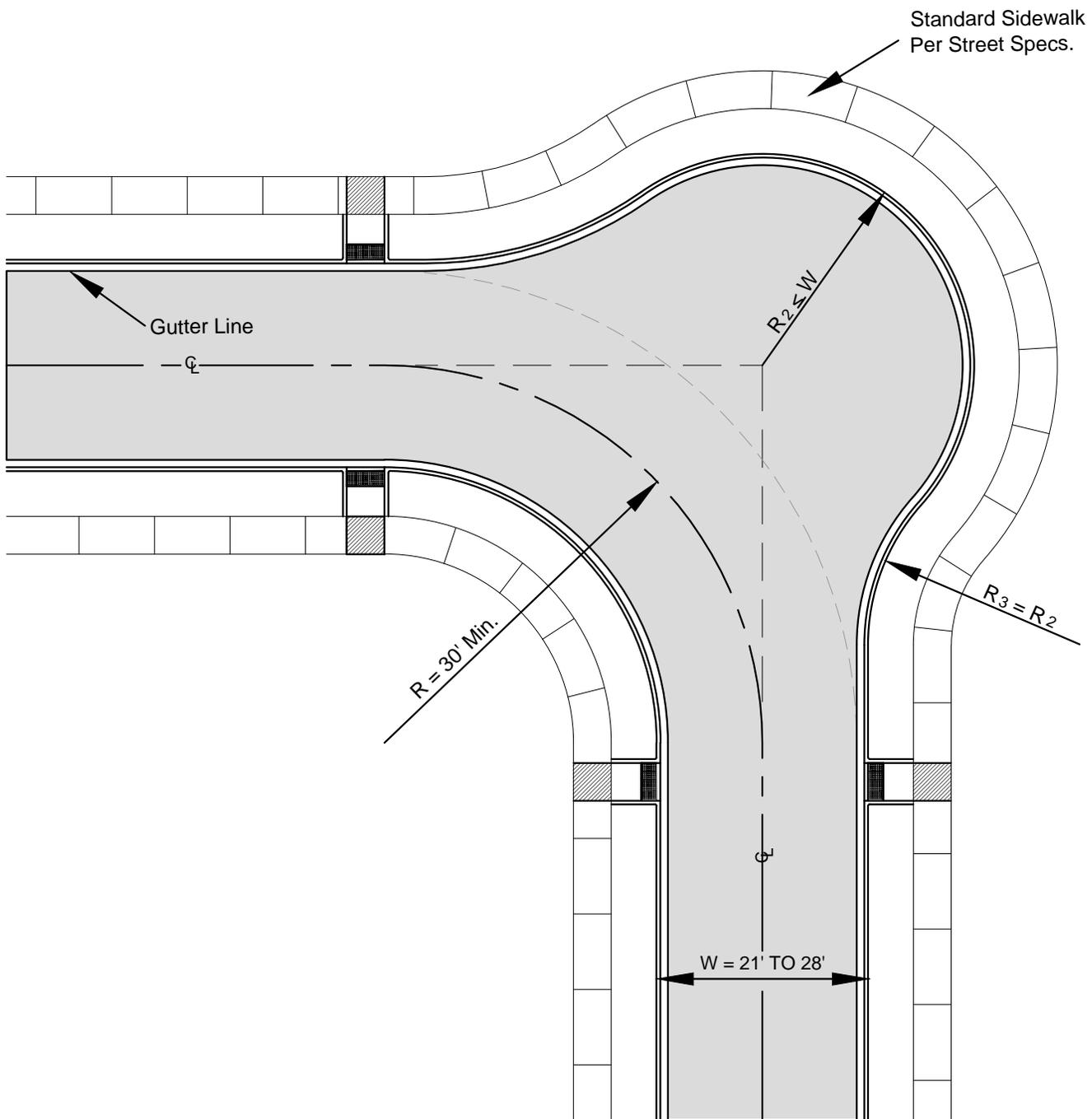


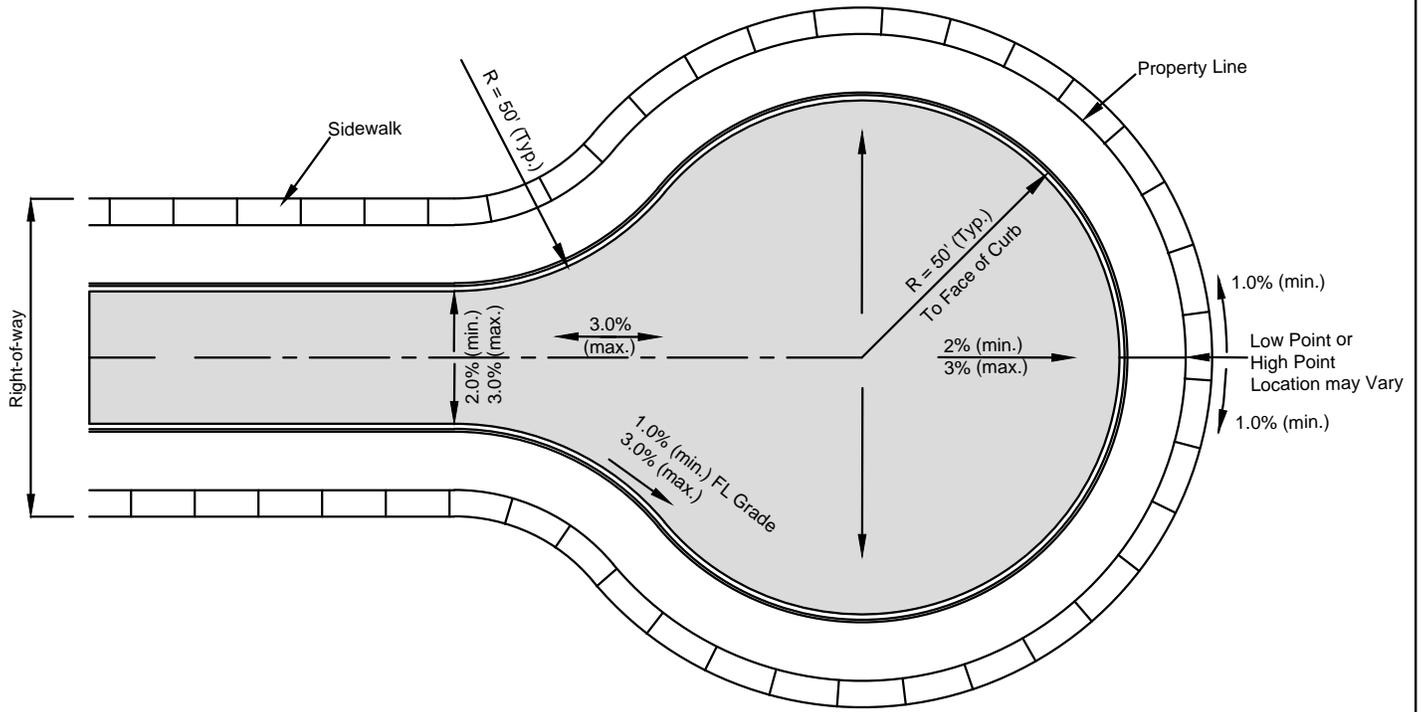
MAJOR STREET DESIGN SPEED (MPH)	CORNER INTERSECTION SIGHT DISTANCE (FT.)*
55	1240
50	1030
45	830
40	660
35	520
30	310
25	260
20	210
15	210

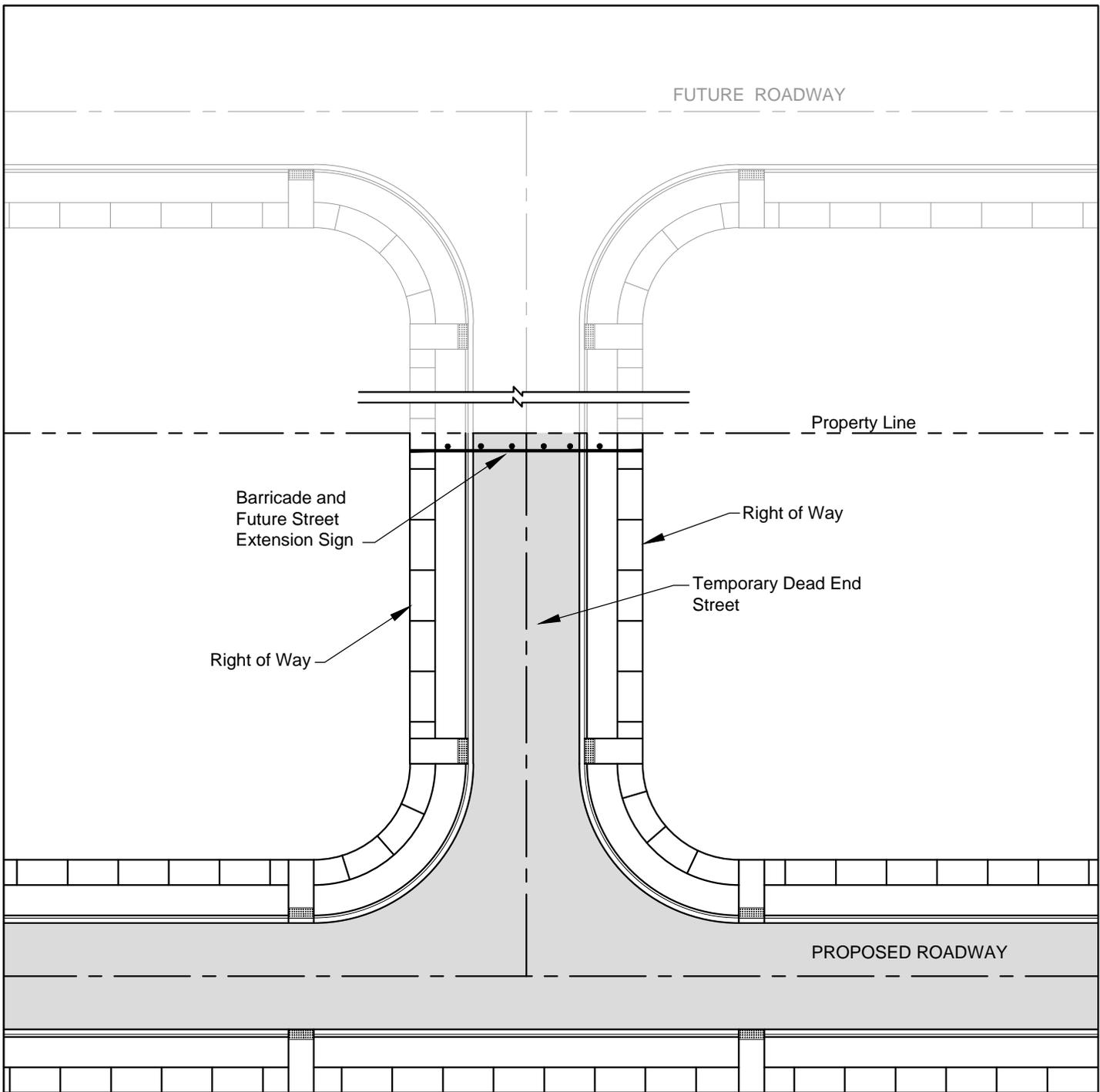
NOTE: Line of Sight must be within R.O.W. or sight distance easement

1. Corner sight distance measured from a point on the minor road at 13 feet back from the edge of the travel lane (flowline) and measured from a height of eye at 3.50 feet on the minor road to a height of object at 3.5 feet on the major road.
2. At Local-Local street intersections only, the "D" distance shall be ten feet (10') and the sight distance shall be measured to the centerline of the street.
3. For private driveway access to a public street, use 10 feet back from flowline (or shoulder for gravel roads).
4. These values apply to passenger cars on 2-lane roads only. Intersections and access serving trucks or on multi-lane roadways requires separate analysis.
5. Adjustments may be required on a skewed intersection.
6. For local/local street intersection, the minimum sight distance allowed is the stopping sight distance. See Table 4-3.

**SIGHT DISTANCE AT INTERSECTIONS**  
(Unsignalized)

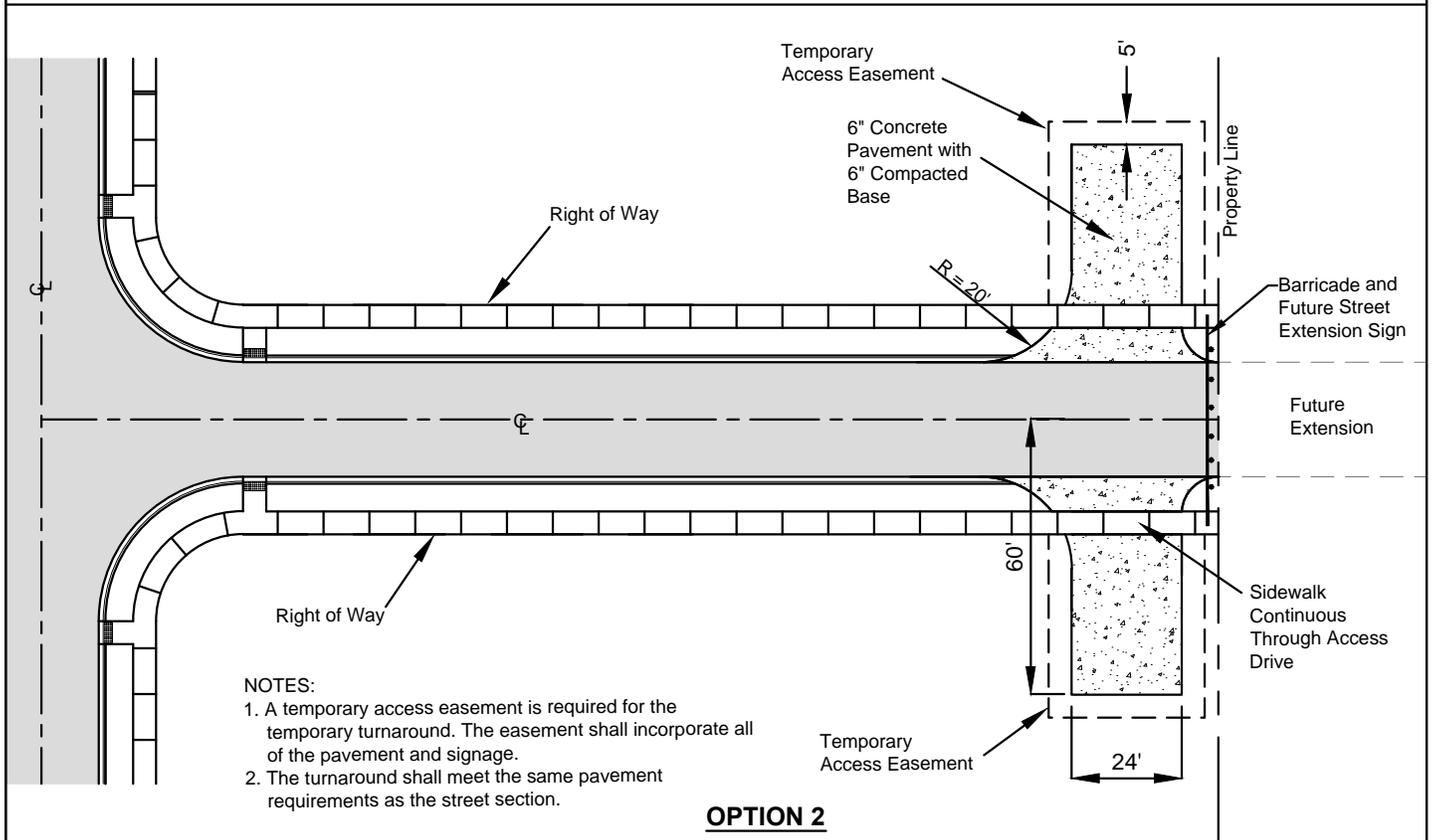
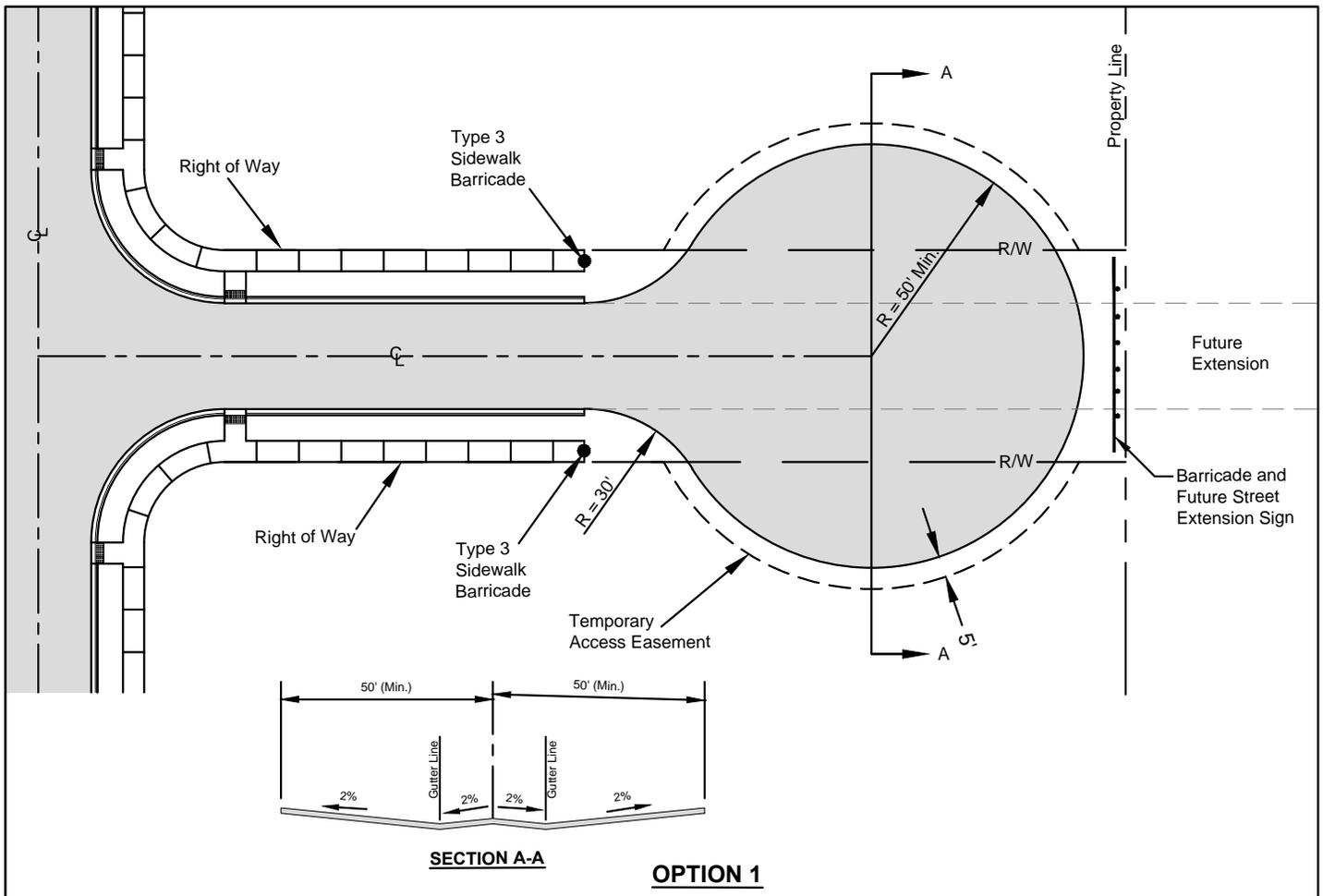


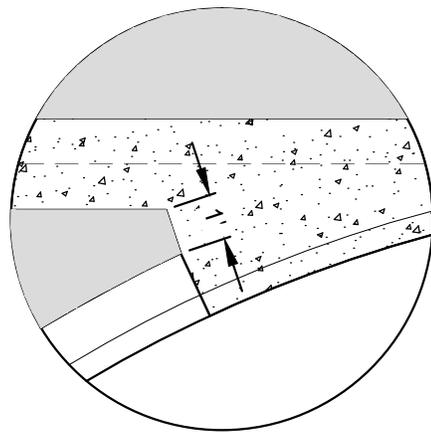
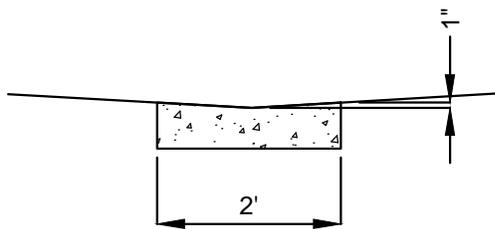
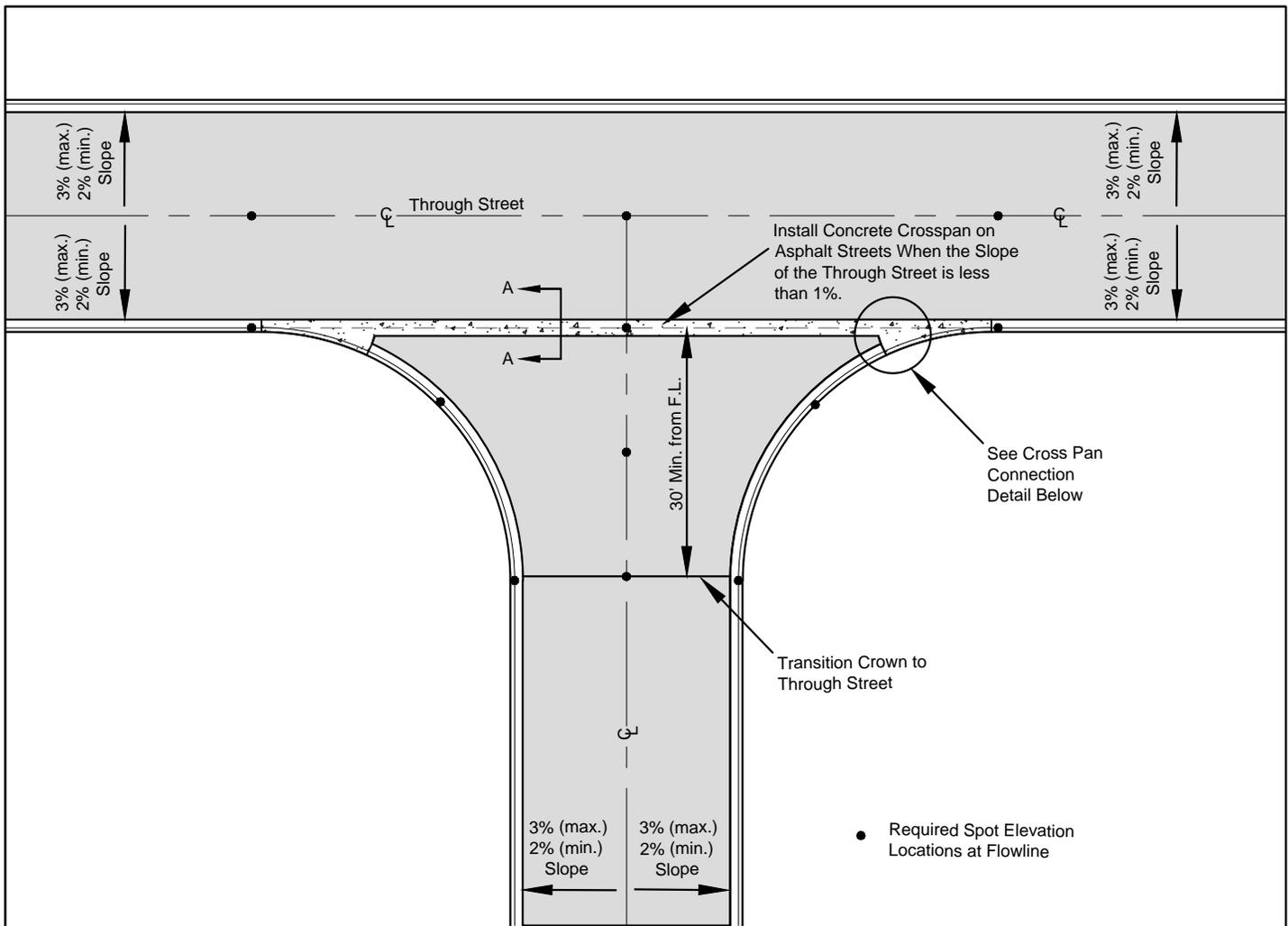




Notes:

1. The temporary dead end is limited to 150' in length.
2. A turnaround is not required.







**C H A P T E R 5 I N T E R S E C T I O N S**

**T A B L E O F C O N T E N T S**

S E C T I O N	T I T L E	P A G E
5	<b>GENERAL</b>	
5.1	<b>GENERAL</b>	
5.1.1	<b>General Provisions and Code References</b>	
5.2	<b>INTERSECTION DESIGN CRITERIA</b>	
5.2.1	<b>General</b>	
5.2.2	<b>Access</b>	
5.2.3	<b>Access to Intersections</b>	
5.2.4	<b>Right Turn Access</b>	
	A. Horizontal.....	4
	B. Vertical.....	4
5.2.5	<b>Emergency Turn</b>	
5.2.6	<b>Emergency Turn</b>	
	A. Warrants for Right Turn Lanes.....	4
	B. Design Criteria.....	5
	C. Pedestrian Refuge.....	5
5.2.7	<b>Truck</b>	
	A. DL-23 (Delivery Truck).....	5
	B. SU-30 (Single Unit Truck).....	5
	C. CITY-BUS (City Transit Bus).....	5
	D. WB-40 (Intermediate Semitrailer).....	6
	E. WB-67 (Interstate Semitrailer).....	6
	F. Other Vehicles.....	6
5.2.8	<b>Curve</b>	
	A. Curb Return Radii.....	6
	B. Curb Return Grades.....	7
5.2.9	<b>Turn Island</b>	
	A. Corner Islands Separating Right Turns.....	7
	B. Median Islands Separating Opposing Traffic.....	7
	C. Splitter Islands on Roundabouts.....	8
5.2.10	<b>Turn Signal and Signal</b>	
5.2.11	<b>Access</b>	
5.2.12	<b>Access</b>	
	A. Requirements.....	8
5.2.13	<b>Intersections</b>	
	A. Minimum Requirements.....	8
	B. Landscaping and Hardscaping.....	9
5.2.14	<b>Pedestrian</b>	



21 **CONTENTS**

1 **SECTION 5.01**

2 **SECTION 5.02**

3 **SECTION 5.03**

4 **SECTION 5.04**

5 **SECTION 5.05**

6 **SECTION 5.06**

7 **SECTION 5.07**

8 **SECTION 5.08**

9 **SECTION 5.09**

10 **SECTION 5.10**

11 **SECTION 5.11**

12 **SECTION 5.12**

**LIST OF TABLES**

*This Chapter Does Not Contain Tables*

**LIST OF FIGURES**

*Figures are Located at End of Chapter*

- Figure 5-1 Intersection Grades
- Figure 5-2 Exclusive Left Turn
- Figure 5-3 Guidelines for Design of Left Turn Lanes
- Figure 5-4 Guidelines for Design Tapers for Left Turn Lanes
- Figure 5-5 Traffic Vol. Guidelines for Design Right Turn Lanes
- Figure 5-6 Exclusive Right Turn
- Figure 5-7 Guidelines for Design of Right Turn Lanes
- Figure 5-8 Pedestrian Refuge Island/Right Turn Lane
- Figure 5-9 Right Turn Lane to a Continuous Lane with Pedestrian Refuge
- Figure 5-10 Turn Lane Design Criteria
- Figure 5-11 Splitter Island for Mini Roundabouts
- Figure 5-12 Typical Roundabout



## CHAPTER 5 INTERSECTIONS

### 5.1 GENERAL

Intersections shall be designed to provide for the safety of motorists, pedestrians, and bicyclists. This chapter is based on criteria from the ITE Traffic Engineering Handbook, ITE Designing Walkable Urban Thoroughfares and AASHTO's A Policy on Geometric Design of Highways and Streets.

#### 5.1.1 Purpose and Considerations

By their nature, intersections are conflict locations. Vehicles, pedestrians, and bicycles all cross paths. Each crossing is a conflict point. The basic design of intersections includes the following objectives:

- A. Minimize conflicts between modes of transportation
- B. Accommodate all modes with appropriate levels of service for motorists, pedestrians, bicyclists, and transit given the recommended speed, volume and expected mix of traffic.
- C. Avoid elimination of any travel modes due to intersection design. Intersection widening for additional turn lanes to relieve traffic congestion should be balanced against impacts to pedestrians, bicyclists and transit.
- D. Provide good driver and non-driver visibility through proper sight distance triangles and geometric features that increase visibility.
- E. Minimize pedestrian exposure to moving traffic.
- F. Avoid extreme intersection angles and break up complex intersections with pedestrian refuge islands. Keep intersections easily and fully comprehensible for all users. Strive for simplicity in intersection design.
- G. Ensure intersections are fully accessible to the physically disabled.

### 5.2 INTERSECTION DESIGN CRITERIA

#### 5.2.1 Intersection Location

For intersection location criteria, refer to **Section 166.08 (Street Design and Access Management Standards)** of the U.D.C., and the current Master Street plan.

#### 5.2.2 Alignment

All lanes shall be in alignment through each intersection, with a maximum of a 2-foot shift in a hardship situation only, subject to approval by the City Engineer.





**B. Design Criteria**

Right turn lanes shall be designed to accomplish the following functions:

1. Provide a means of safe deceleration outside the high speed through lane.
2. Provide a separate storage area for right turns to assist in the optimization of traffic signal phasing.
3. Provide a means of separating right turn movements at stop controlled intersections. The design elements, as shown in **Figure 5-6**, are the approach taper, bay taper, lengths of lanes, width of lanes, and departure taper. For approach taper lengths, see **Figure 5-7**.

**C. Pedestrian Refuge**

Where Pedestrian refuge is required, it shall be designed in accordance with **Figure 5-8**. If a right turn lane turns into an exclusive lane that continues, use **Figure 5-9**

□2□ □□□□□ □□□□□□

As a minimum, intersections shall be designed to accommodate the following design vehicles for the specified turns. The minimum allowable intersection turning radii are as follows.

**A. DL-23 (Delivery Truck)**

All DL-23 vehicles must be able to turn easily from one street to the next and remain in the correct lane for each roadway. This is required for all roadways.

**B. SU-30 (Single Unit Truck)**

All SU-30 vehicles must be able to turn easily from one street to the next and remain in the correct lane for each roadway. For low traffic Local/Local intersections, the SU-30 may use more than one traffic lane to complete the turn without tracking onto the curb at corners. For all other roadways this vehicle must be able to complete turns without entering into opposing lanes.

**C. CITY-BUS (City Transit Bus)**

All CITY-BUS vehicles may use more than one traffic lane to complete the turn when turning from the correct lane without tracking onto the curb at corners. This shall apply to all streets. When the intersection is on a regular or planned transit route where the turning movement could conflict with a stopped vehicle at the intersection, then the intersection must be designed to allow the bus to turn easily from one street to the next without entering opposing lanes of either roadway.



**D. WB-40 (Intermediate Semitrailer)**

All WB-40 vehicles may use more than one traffic lane to complete the turn without tracking onto the curb at corners. In addition, the vehicle must make the turn in one forward maneuver not encroaching into opposing traffic lanes unless the intersection has been designed to allow for safe encroachment. This requirement shall apply to all Arterial/Arterial, Arterial/Collector, Arterial/Local and Collector/Collector. For all other intersections (including mini-roundabouts), the vehicles may use the entire paved surface of the street to negotiate the turn. The vehicle may have to back up to complete the turn.

**E. WB-67 (Interstate Semitrailer).**

All modern roundabouts and arterial intersections containing raised medians and channelizing islands shall be designed to accommodate a WB-67 vehicle.

**F. Other Vehicles.**

For special circumstances other design vehicles may be required by the City Engineer.

**2 Curb Return Radii**

**A. Curb Return Radii**

The corner radii at intersections shall be set so that the selected design vehicles can pass through the intersection in an appropriate manner. The design vehicle types and use of lanes shall be per Section 5.2.7. Intersections shall be designed to minimize curb radii while still accommodating the largest applicable design vehicle. The following should be considered when possible in order to minimize the curb return radii:

1. Bike lanes, on-street parking, and other facilities should be included to create an effective corner radius which accommodates the design vehicle. When on-street parking is used to establish an effective turning radius, the effective radius shall be delineated within the parking lane by an approved striping pattern, raised curb, or other approved traffic control device.
2. Traffic control devices should be arranged as to allow safe encroachment of infrequent vehicles into approaching lanes of traffic.
3. Compound radii should be used to minimize the crossing distance for pedestrians.
4. The outside vehicular lane should be widened through the intersection to increase the effective turning radius.



A variance from the above requirements and 5.2.7 may be approved by the City Engineer where:

1. High pedestrian volumes are present or reasonably anticipated.
2. Volumes of turning vehicles are low.
3. The design vehicle constitutes a very low proportion of the turning vehicles.
4. Occasional encroachment of the design vehicle beyond that provided in Section 5.2.7 is acceptable.
5. Occasional encroachment of turning school bus, moving van, or oversized delivery truck into an opposing lane is not acceptable.
6. Larger vehicles than those listed in 5.2.7 are expected to be frequent users of the street.

For curb returns on a State Highway, every effort shall be made to minimize curb radii through negotiation with AHTD while acknowledging AHTD’s curb radii requirements

supersede these Standards.

**B. Curb Return Grades**

The minimum allowable grade for flowlines around curb returns shall be no less than 0.5 percent. One percent (1%) minimum slope is recommended.

**2 Traffic Islands**

The following is a list of different types of traffic islands:

**A. Corner Islands Separating Right Turns**

Standard corner islands may be used in Arterial/Arterial intersections to channelize traffic where required to provide pedestrian refuge or where required by the City Engineer. The corner islands shall be designed as raised islands in accordance with **Figures 5-8** or **5-9** for a right turn lane continuing to an exclusive lane or for a right turn lane stop condition, respectively. The striping shall be in accordance with the requirements of **Chapter 7, Traffic Control Devices**.

**B. Median Islands Separating Opposing Traffic**

Median islands are required at all Arterial/Arterial intersections. The length of the island shall include the appropriate approach taper, bay taper and length of lane required by these Standards, or supported by another approved resource standard. The design shall be in accordance with **Figure 5-10** and as follows:

1. No Obstruction. Medians must not obstruct the minimum left turn radius for the design vehicle(s).



2. Drainage. Landscaped medians shall include drainage facilities to handle sprinkler run-off and nuisance flows. When low maintenance landscaping is used in conjunction with trickle irrigation, drainage requirements may be waived and outfall curb and gutter should be used.
3. A pedestrian refuge area shall be provided at all pedestrian crossings.

**C. Splitter Islands on Roundabouts**

In modern roundabout designs, raised splitter islands shall be designed in accordance with Federal Highway Administration Roundabouts to direct traffic and provide pedestrian refuge.

**211 Traffic Signs and Signals**

See Chapter 7, Traffic Control Devices.

**2111 Accessible Pedestrian Signals**

See Chapter 8, Pedestrian Facilities Design and Technical Criteria.

**212 Intersections**

**A. Requirements**

All intersection rights-of-way shall be dedicated as shown in the current **Master Street Plan** to provide adequate right-of-way to include greenspace, sidewalks, and access ramps around the radii. Additional right-of-way may be required at intersections to provide space for additional left or right turn lanes without reducing the widths of standard required facilities.

**2121 Intersection Sight Triangles**

Street intersections shall be designed so that adequate sight distance is provided along all streets. The required sight distance shall be determined by the design speed and grades of the street and the acceleration rate of an average vehicle as prescribed below.

**A. Minimum Requirements**

All designs must provide minimum safe stopping sight distance in accordance with **Chapter 4, Street Design and Technical Criteria**, and **AASHTO**. In addition, for all streets that intersect with Arterial and Collector streets, the sight distance must be large enough to allow a vehicle to enter the street and accelerate to the average running speed without interfering with the traffic flow on the Arterial or Collector street.



**B. Landscaping and Hardscaping**

No landscaping or hardscaping higher than 30 inches above the flow line of the gutter shall be permitted within a corner cut that will block the line of sight for pedestrian visibility.

**211 Pedestrian Crosswalks**

See **Chapter 7, Traffic Control Devices**, concerning crosswalk requirements and **Chapter 8, Pedestrian Facilities Design and Technical Criteria**.

**211 Drainage**

See **Chapter 4, Street Design and Technical Criteria**, concerning drainage.

**5.10.1 ROUNDABOUTS**

Roundabouts shall be specially designed to the specific need on high traffic volume streets and used to improve traffic flow. Refer to **Federal Highway Administration, Roundabouts: An Informational Guide** for typical layout. Also refer to **Figure 5-11 and 5-12** for typical roundabout layout features. The following are certain minimum requirements:

**5.10.1.1 Arterial and Collector Roundabouts**

Arterial and Collector Roundabouts shall be designed to accommodate WB-67 trucks. The design vehicle is to be accommodated by maintaining a 2-foot separation between the truck and the curb face. A truck apron shall be provided around the circulatory island. The WB-67 vehicle may use the truck apron for left turn movements and may use the truck apron for right-turn movements if necessary.

**5.10.1.2 Design Speed**

The design speed for a single-lane roundabout shall be 20-25 mph. The design speed for a multi-lane roundabout shall be 25 to 30 mph.

**5.10.1.3 Roundabout Layout**

The roundabout layout shall be determined by the Design Engineer and approved by the City Engineer.

**5.10.1.4 Circulatory Roadway Width**

The circulatory roadway width shall be a minimum of 1.0 to 1.2 times the width of the widest entering roadway. This width may include the truck apron when approved by the City Engineer.



**5.10.1 Truck Apron**

1. The width of the truck apron shall be a minimum of 8-feet to allow for emergency or maintenance vehicles. The truck apron shall be constructed of a material different in appearance from the adjacent pavement to provide visual contrast. Final truck apron design shall be based on truck turning analysis plus a two-foot buffer. The designer shall provide a jointing pattern plan to control shrinkage cracking.
2. The truck apron shall have a 4% to 6% Cross Slope to allow utility and maintenance vehicles access and discourage any pedestrian use.
3. Curb for the truck aprons shall be a 6-inch mountable curb with a 1:1 slope face. No expansion material shall be specified between the back of curb and the truck apron.
4. Truck apron pavement thickness shall be developed with the Final Pavement Design and may required subgrade stabilization if swelling soils exist.

**5.10.2 Pedestrian Access at Roundabouts**

1. Bicycle traffic shall be assisted / encouraged to leave the roadway prior to the roundabout by construction of bicycle exit and re-entrance ramps.

**5.10.3 Pedestrian Crossing at Roundabouts**

1. The pedestrian crossing through the splitter island shall be set back 25-feet from the yield line at the nose of the splitter island pending sight triangle analysis. The pedestrian crossing and ramps shall meet the ADA requirements for accessible pathways.
2. A 7 to 8-foot wide of pedestrian refuge opening shall be provided in the splitter island.
3. The pedestrian crossing shall cross both the entry and exit roads along a single tangent roughly perpendicular to the centerline of the splitter island as shown on **Figure 5-11**.
4. Pedestrian ramps shall be lined up directly with the crosswalk A two-foot wide truncated dome surface shall be located perpendicular to the pedestrian crossing at each location where pedestrians are designated to enter the traffic way including the splitter island refuge.
5. The pedestrian ramps and splitter island pedestrian refuge shall be contained by six-inch vertical curbs to give direction at the crossing as shown on **Figure 5-11**.



**5.11.1 Roundabout Drainage**

1. All drainage within the roundabout shall drain away from the center island at a slope of 2% min. (1% min. for concrete). A crowned circulatory roadway shall be designed for all multi-lane roundabouts unless a variance is granted by the City Engineer.
2. No pavement swales or drainage crosspans shall be allowed to take storm drainage away from center island or across roundabout entry or exit alignments. Drainage directed to the roundabout from adjacent legs must be intercepted by storm drain inlets to minimize encroachment into the circulatory roadway.

**5.11.2 Roundabout Approval**

Roundabouts may be allowed on any roadway as approved by the City Engineer. Design engineers are encouraged to evaluate the appropriateness of roundabouts for intersections within proposed developments.

**5.11.3 Roundabout Design Software**

The roundabout design shall be completed with the aid of computer software. Acceptable products include the latest versions of Auto Turn, ARCADY, RODEL or other software as approved by the City Engineer. VISSIM or other simulation software may be used for public presentation. The City Engineer is authorized to require the use of a specific software package when warranted by the needs of a specific intersection. The Design Engineer shall have specific knowledge of how to control the software and be able to demonstrate that understanding to the City Engineer.

**5.11.4 Roundabout Right-of-Way**

The City will require additional right-of-way to be dedicated by the Developer to accommodate the roundabout.

**5.11.5 Roundabout Raised Splitter Islands**

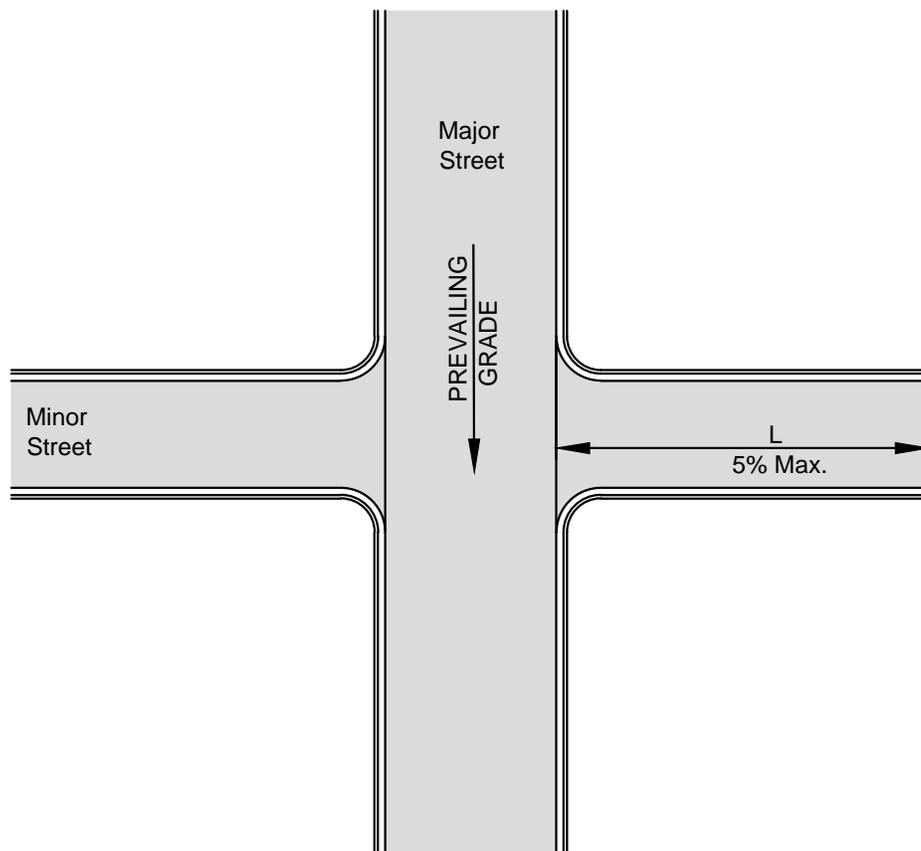
Raised splitter islands shall be required on all approaches. Where the approach leg has a central turning lane or median, the splitter island shall be extended to connect to the median or a sufficient distance from the pedestrian refuge to provide confinement of the entering and exit movements and control of the fastest paths (125-feet is suggested). The vertical face of the raised splitter island shall be set back approximately 3-feet from the approach edge of a median nose and 1 to 1.5-feet at the trailing edge (down traffic).



□□□1□ S□□□□□

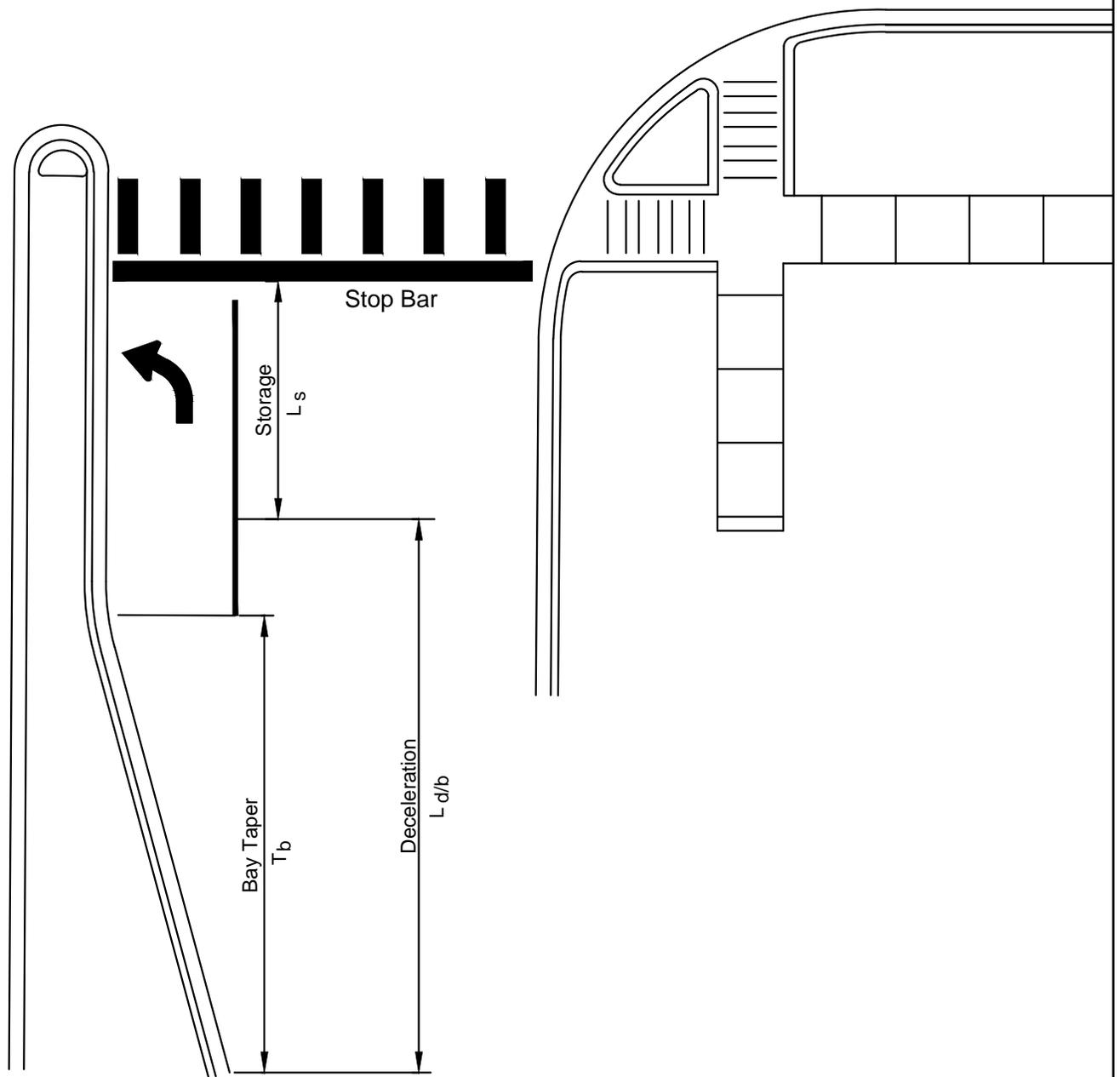
The signage shall be in accordance with **Chapter 7, Traffic Control Devices.**





INTERSECTION GRADE CONTROL LENGTHS (L)

MINOR LEG	LOCAL	COLLECTOR	ARTERIAL
Local	95 ft	100 ft	125 ft
Collector	100 ft	120 ft	200 ft
Arterial	125 ft	200 ft	200 ft



NOTES:

1. Refer to **Figures 5-3, and 5-4** for design requirements.
2. Provide a  $50\pm$  arc length at angle points for a smooth curve.

**Deceleration**

**L<sub>d/b</sub>** -- Length of Taper and Lane for Deceleration and Braking (ft.)

**Functional Basis:** To provide sufficient length for a vehicle to decelerate and brake entirely outside the through traffic lanes.

**Desirable Design:** Deceleration in gear for 3 seconds (occurs over bay taper) followed by comfortable braking to a stopped position. .

Design Values For L<sub>d/b</sub>

S-- Speed (mph)	Total	Length Lane (ft)	Bay Taper
30	235	115	(120)
40	315	155	(160)
50	435	235	(200)
60	530	290	(240)

**Storage**

**L<sub>s</sub>** -- Length of Lane for Storage (Full Width Lane) (ft.)

**Functional Basis:** To provide sufficient length for a reasonable number of vehicles to queue within the lane without affecting other lanes.

**Desirable Design:** Based on twice the mean arrival rate (per cycle for signals, per 2-minute period for stop control) during the peak hour of traffic.

**Minimum Design:** Based on mean arrival rate, with minimum storage for one vehicle.

L<sub>s</sub> for Stop Control

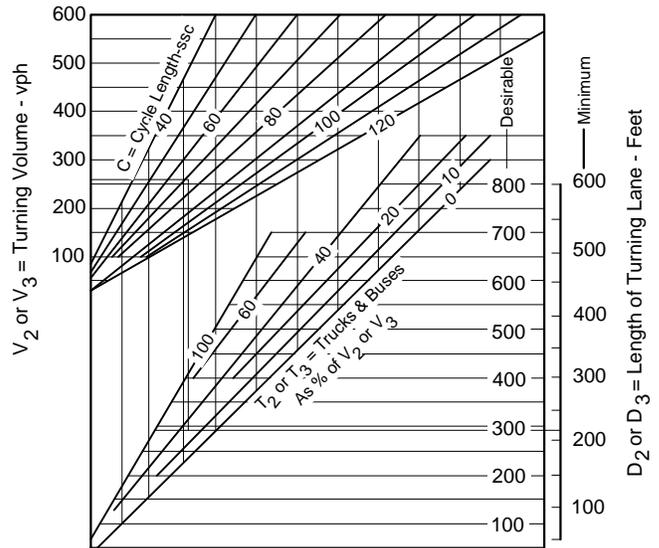
DHV (vph)	L <sub>s</sub> (ft)
≤60	50-75
61-120	100
121-180	150
>180	200 or more

**Minimum Design:** Braking begins at 2/3 full lane width, with minimum 50-foot storage. For low speeds only, the following values apply:

Design Values For L<sub>d/b</sub>

S-- Speed (mph)	Total	Length Lane (ft)	Bay Taper
30	230	50	(180)
35	250	70	(180)
40	280	100	(180)
45	320	140	(180)

L<sub>s</sub> for Traffic Signal Control



**T<sub>a</sub> -- Approach Taper Design (ft) (Redirect Taper)**

Functional Basis: To provide a smooth lateral transition for all vehicles approaching the intersection.

Form of Alignment: Tangent

Low Speed Design: (<45) Provide a fully shadowed lane.

$$T_a = \frac{WS^2}{60}$$

W = Width of Offset (ft)  
S = Speed (mph)

Typical Values for T<sub>a</sub>\*

S-- Speed (mph)	W -- Width of Offset (ft)		
	11	11.5	12
25	115	120	125
30	165	170	180
35	225	235	245
40	295	305	320

\*Rounded to nearest 5 ft.

High Speed Design: (≥45) Provide a fully shadowed lane. Design as follows:

$$T_a = WS$$

W = Width of Offset (ft)  
S = Speed (mph)

S-- Speed (mph)	W -- Width of Offset (ft)		
	11	11.5	12
45	495	520	540
50	550	575	600

\*Rounded to nearest 5 ft.

**T<sub>b</sub> = Bay Taper Design**

Functional Basis: To direct left-turning vehicles into the turn lane.

Form of Alignment: Tangent; or reverse curves with 1/3 of the total length comprised of a central tangent.

Desirable Design: For fully shadowed left turn lane.

$$T_b = \frac{W_1S}{3}$$

W<sub>1</sub> = Width of Lane  
S = Speed (mph)

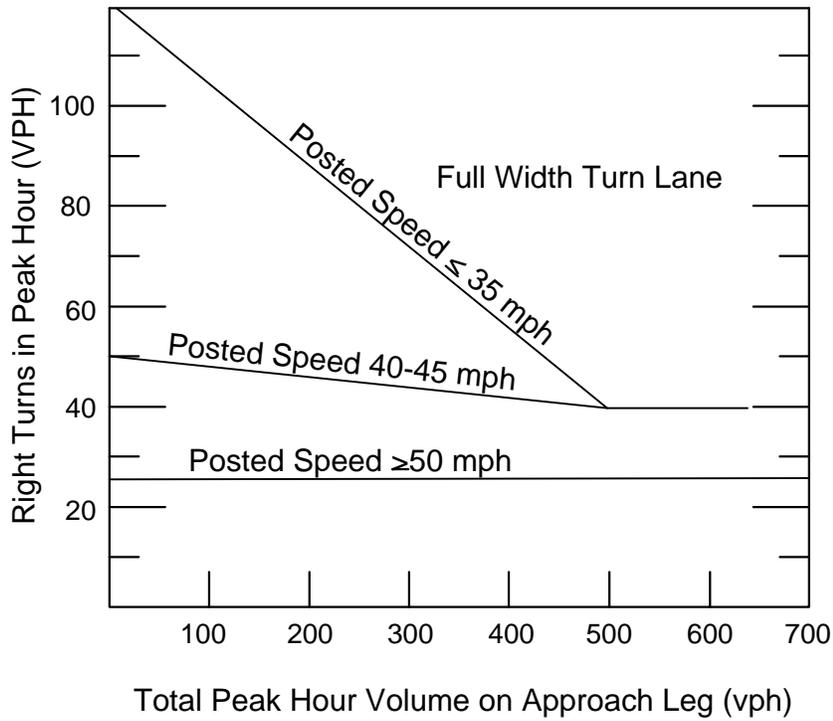
Typical Values for T<sub>b</sub>\*

S-- Speed (mph)	W <sub>1</sub> -- Width of Lane (ft.)	
	11	12
30	110	120
40	145	160
50	185	200

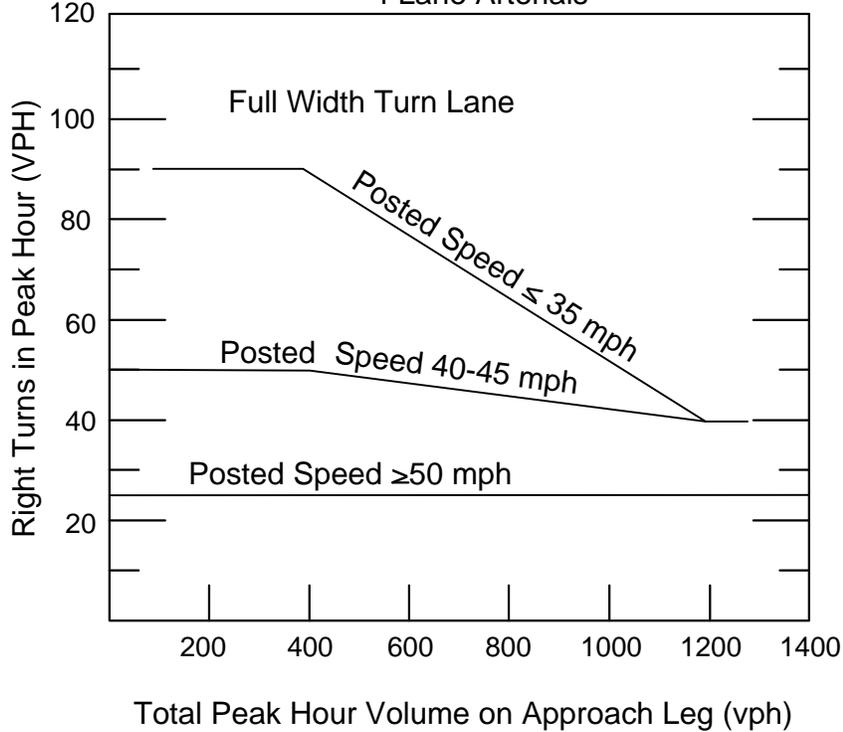
\*Rounded to nearest 5 ft.

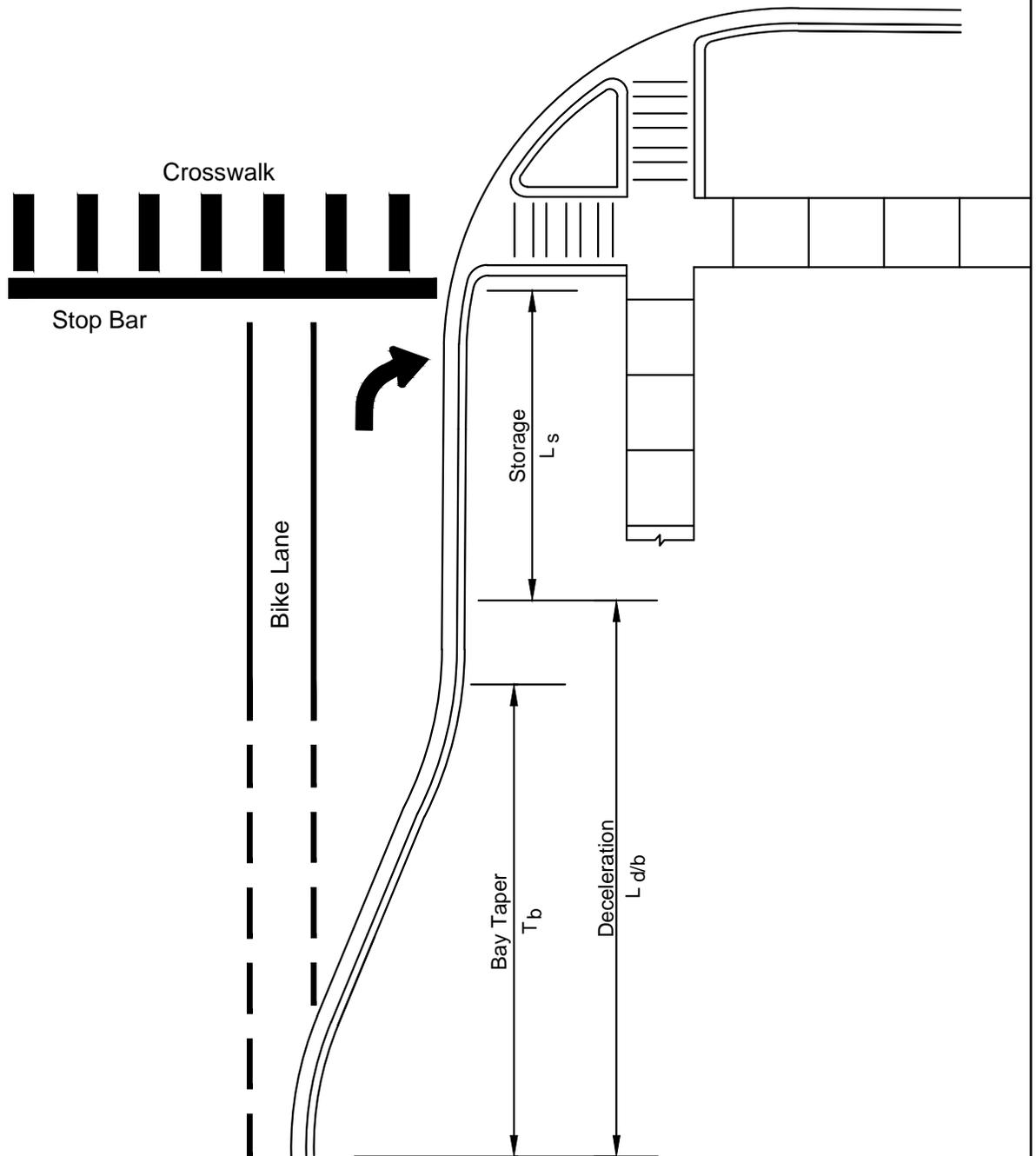
Minimum Design: Taper ratios of 8:1 can be used for tangent bay tapers in constrained locations.

### 2-Lane Collectors or Arterials



### 4 Lane Arterials





**NOTES:**

1. Refer to **Figures 5-7** for design requirements.
2. Provide a  $50\pm$  arc length at angle points for a smooth curve.

L<sub>d/b</sub> -- Length of Taper and Lane for Deceleration and Braking (ft.)

Functional Basis: To provide sufficient length for a vehicle to decelerate and brake entirely outside the through traffic lanes.

Desirable Design: Deceleration in gear for 3 seconds (occurs over bay taper) followed by comfortable braking to a stopped position.

T<sub>b</sub> = Bay Taper Design

Functional Basis: To direct left-turning vehicles into the turn lane.

Form of Alignment: Tangent; or reverse curves with 1/3 of the total length comprised of a central tangent.

Desirable Design: For fully shadowed left turn lane.

Design Values For L<sub>d/b</sub>

Highway Design Speed, V (mph)	Stop Conditions*	Design Speed of Corner Radius (mph)			
		15	20	25	30
30	235	185	160	140	-
35	275	240	213	188	93
40	315	295	265	235	185
45	375	350	325	295	250
50	435	405	385	355	315

$$T_b = \frac{W_1 S}{3}$$

W<sub>1</sub> = Width of Lane  
S = Speed (mph)

Typical Values for T<sub>b</sub>\*

S -- Speed (mph)	W <sub>1</sub> -- Width of Lane (ft.)	
	11	12
30	110	120
40	145	160
50	185	200

\* Approximate for right turn lanes in approaches to stop signs and traffic signals.

$$\text{Bay Taper Length} = \frac{WS}{3}$$

$$T_b = \frac{W_1 S}{3}$$

\*Rounded to nearest 5 ft.

Minimum Design: Taper ratios of 8:1 can be used for tangent bay tapers in constrained locations.

L<sub>s</sub> -- Length of Lane for Storage (Full Width Lane) (ft.)

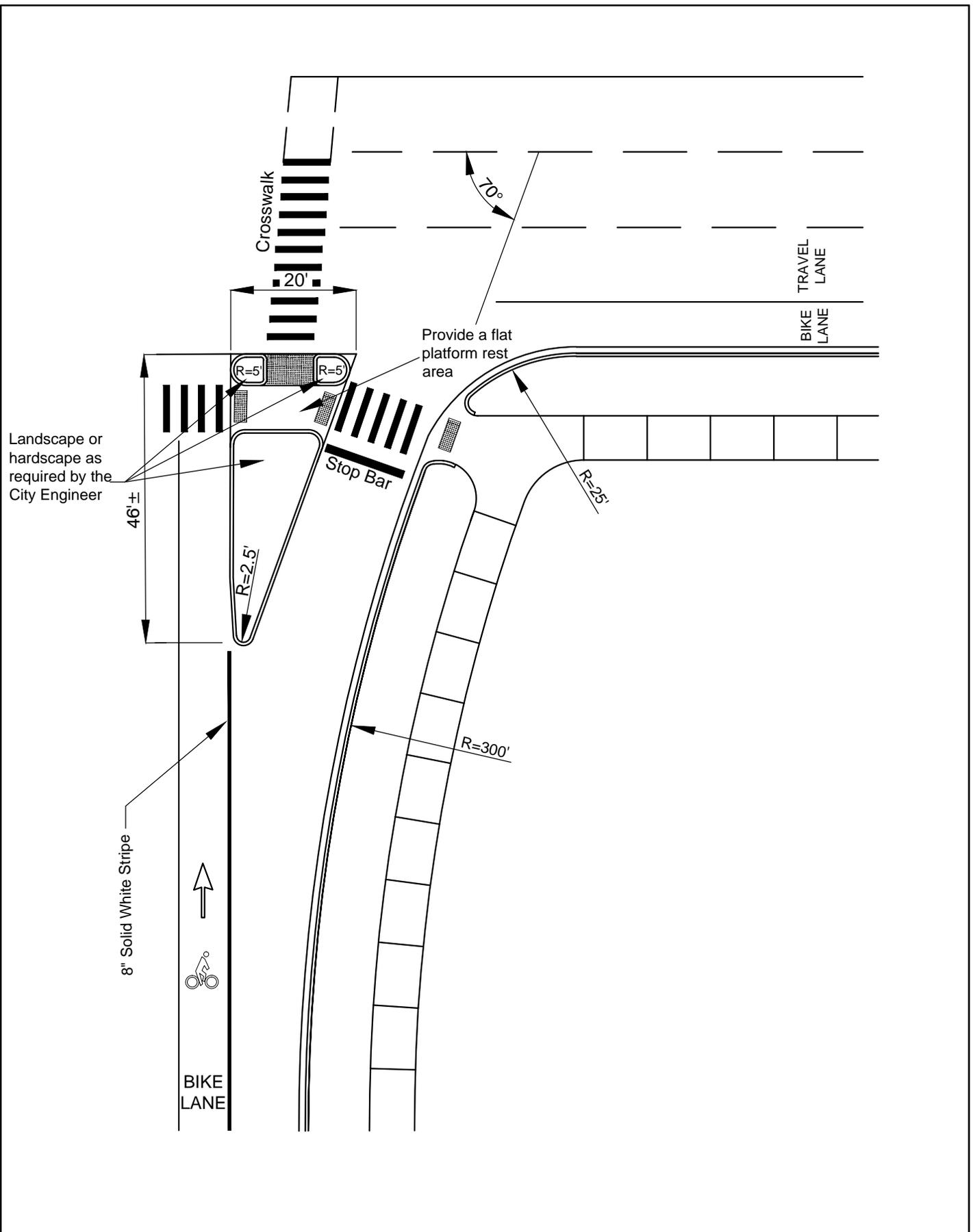
Functional Basis: To provide sufficient length for a reasonable number of vehicles to queue within the lane without affecting other lanes.

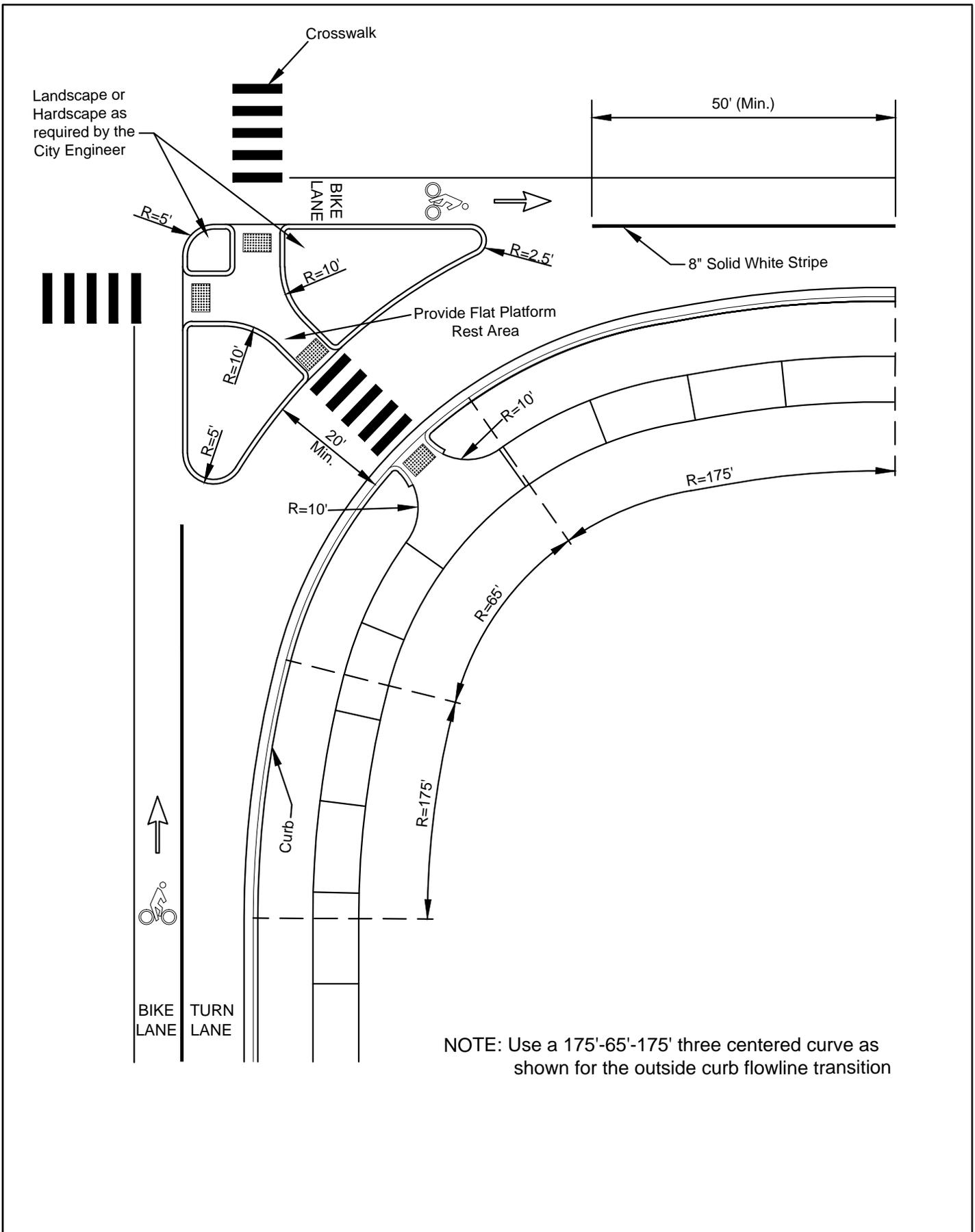
Desirable Design: Based on twice the mean arrival rate (per cycle for signals, per 2-minute period for stop control) during the peak hour of traffic.

Minimum Design: Based on mean arrival rate, with minimum storage for one vehicle.

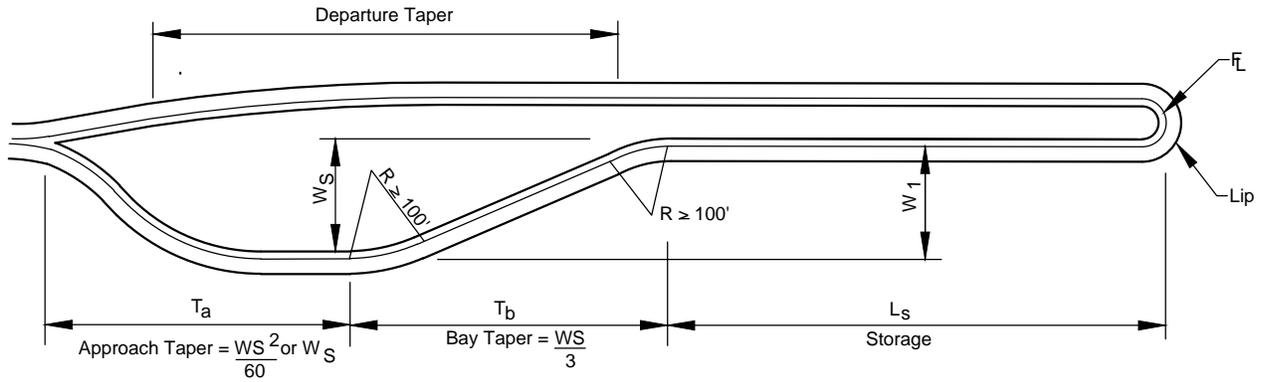
L<sub>s</sub> for Stop Control

DHV (vph)	L <sub>s</sub> (ft)
≤60	50-75
61-120	100
121-180	150
>180	200 or more



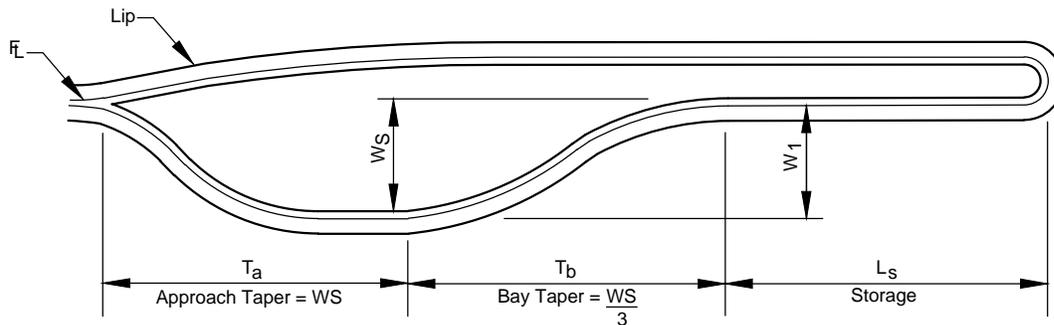


NOTE: Use a 175'-65'-175' three centered curve as shown for the outside curb flowline transition



Left Turn Lane with Full Shadow

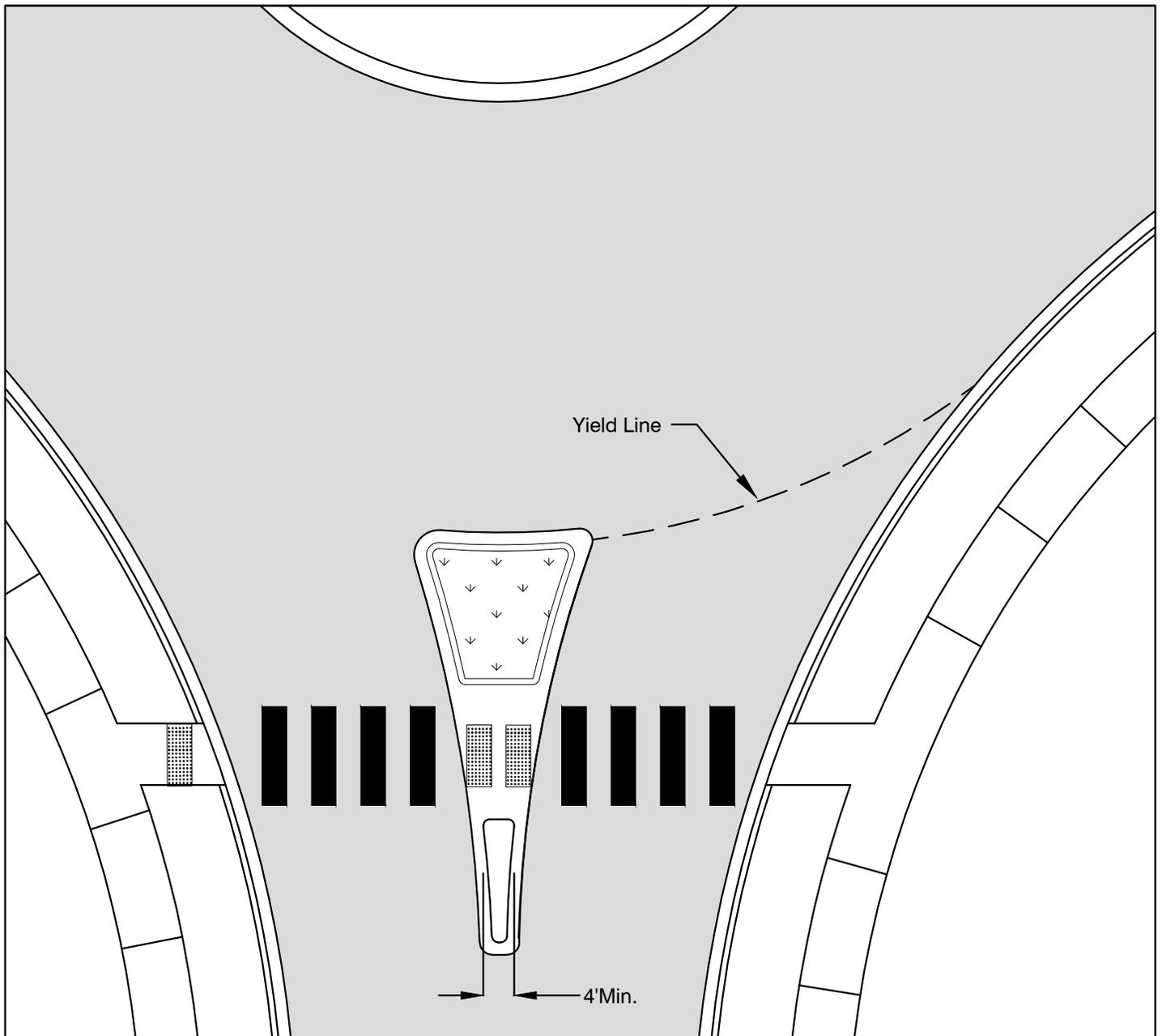
High Speed ( $\geq 45$  MPH)



Left Turn Lane with Partial Shadow

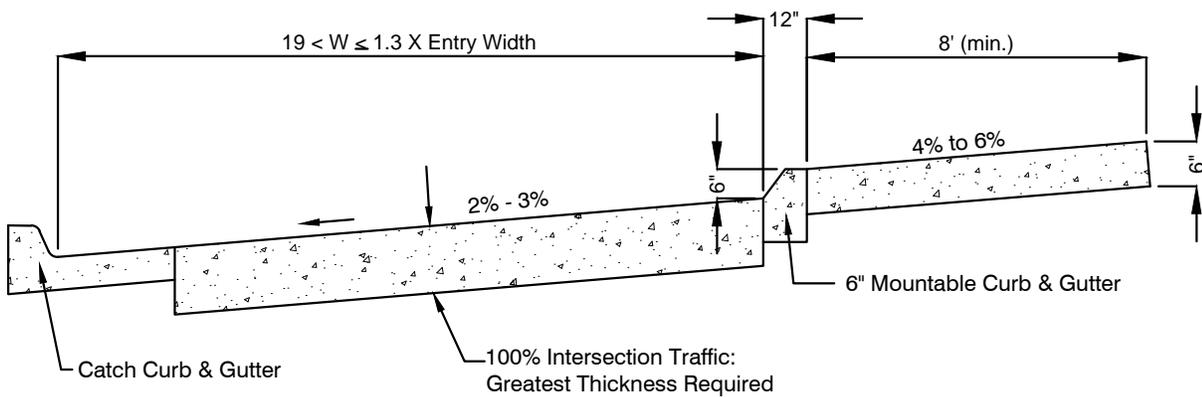
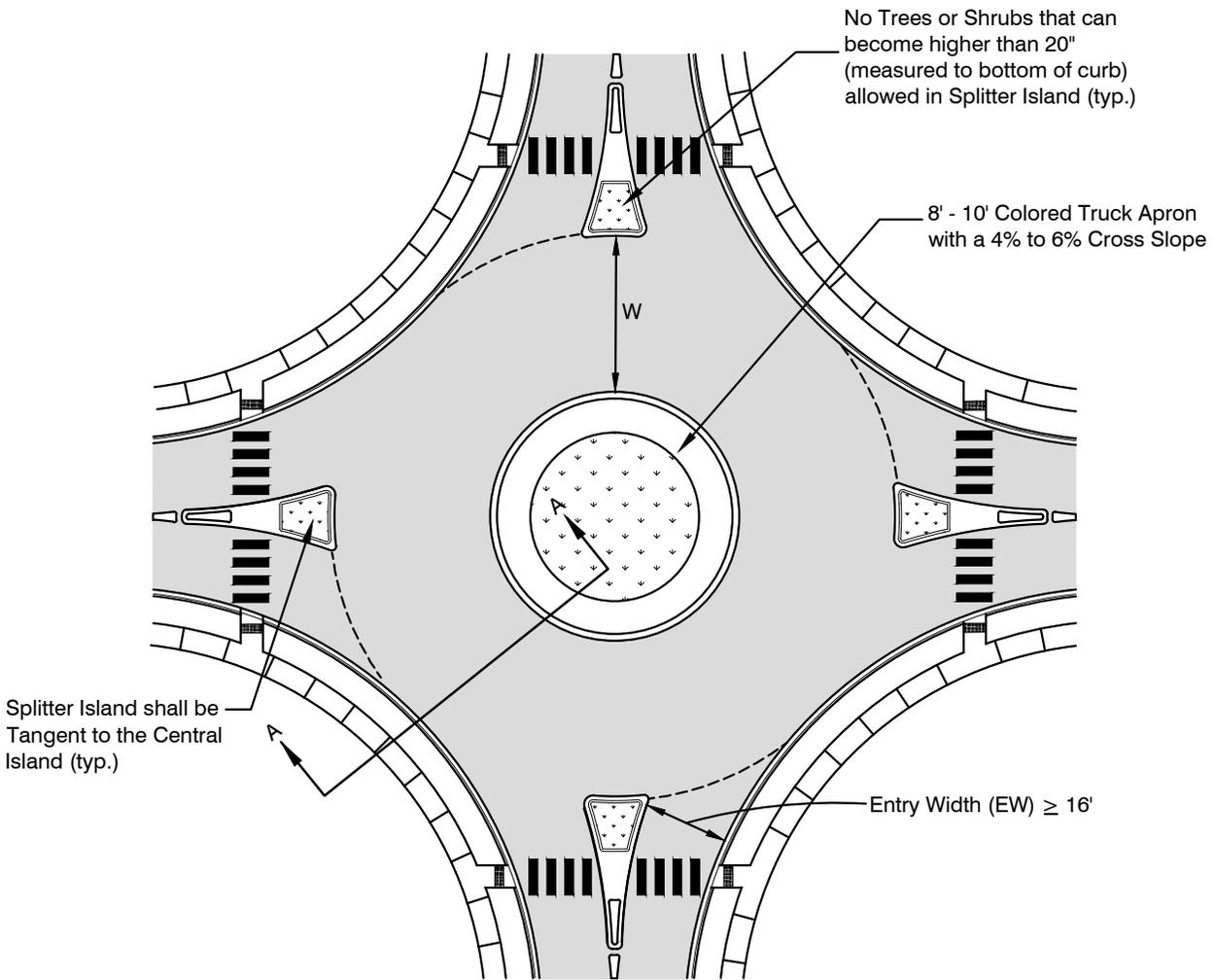
TAPER RATIOS				
TAPER TYPE	DESIGN SPEED			
	35	40	45	50
Bay	12:1	13.3:1	15:1	16.7:1
Approach	20:1	27:1	45:1	50:1
Depart	NA	NA	NA	NA
Combined	20:1	27:1	45:1	50:1

NOTE: Refer to **Figure 5-4** for Design Requirements.



Notes:

1. Each Splitter Island shall have a minimum width equal to the street classification sidewalk width.
2. The specific design shall determine minimum radii and island lengths.
3. Raised crosswalk may be required.
4. Designer shall provide design to drain water out of pedestrian refuge.



**SECTION A - A**

# CHAPTER 6 PAVEMENT STRUCTURE AND MATERIALS

## TABLE OF CONTENTS

SECTION	PAGE
6.1 GENERAL	
6.1.1 Earthwork	
6.1.2 AASHTO	
6.1.3 Standard	
6.1.4	
6.1.5	
6.1.6	
6.1.7	
6.1.8	
6.1.9	
6.1.10	
6.1.11	
6.1.12	
6.1.13	
6.1.14	
6.1.15	
6.1.16	
6.1.17	
6.1.18	
6.1.19	
6.1.20	
6.1.21	
6.1.22	
6.1.23	
6.1.24	
6.1.25	
6.1.26	
6.1.27	
6.1.28	
6.1.29	
6.1.30	
6.1.31	
6.1.32	
6.1.33	
6.1.34	
6.1.35	
6.1.36	
6.1.37	
6.1.38	
6.1.39	
6.1.40	
6.1.41	
6.1.42	
6.1.43	
6.1.44	
6.1.45	
6.1.46	
6.1.47	
6.1.48	
6.1.49	
6.1.50	
6.1.51	
6.1.52	
6.1.53	
6.1.54	
6.1.55	
6.1.56	
6.1.57	
6.1.58	
6.1.59	
6.1.60	
6.1.61	
6.1.62	
6.1.63	
6.1.64	
6.1.65	
6.1.66	
6.1.67	
6.1.68	
6.1.69	
6.1.70	
6.1.71	
6.1.72	
6.1.73	
6.1.74	
6.1.75	
6.1.76	
6.1.77	
6.1.78	
6.1.79	
6.1.80	
6.1.81	
6.1.82	
6.1.83	
6.1.84	
6.1.85	
6.1.86	
6.1.87	
6.1.88	
6.1.89	
6.1.90	
6.1.91	
6.1.92	
6.1.93	
6.1.94	
6.1.95	
6.1.96	
6.1.97	
6.1.98	
6.1.99	
6.1.100	
6.1.101	
6.1.102	
6.1.103	
6.1.104	
6.1.105	
6.1.106	
6.1.107	
6.1.108	
6.1.109	
6.1.110	
6.1.111	
6.1.112	
6.1.113	
6.1.114	
6.1.115	
6.1.116	
6.1.117	
6.1.118	
6.1.119	
6.1.120	
6.1.121	
6.1.122	
6.1.123	
6.1.124	
6.1.125	
6.1.126	
6.1.127	
6.1.128	
6.1.129	
6.1.130	
6.1.131	
6.1.132	
6.1.133	
6.1.134	
6.1.135	
6.1.136	
6.1.137	
6.1.138	
6.1.139	
6.1.140	
6.1.141	
6.1.142	
6.1.143	
6.1.144	
6.1.145	
6.1.146	
6.1.147	
6.1.148	
6.1.149	
6.1.150	
6.1.151	
6.1.152	
6.1.153	
6.1.154	
6.1.155	
6.1.156	
6.1.157	
6.1.158	
6.1.159	
6.1.160	
6.1.161	
6.1.162	
6.1.163	
6.1.164	
6.1.165	
6.1.166	
6.1.167	
6.1.168	
6.1.169	
6.1.170	
6.1.171	
6.1.172	
6.1.173	
6.1.174	
6.1.175	
6.1.176	
6.1.177	
6.1.178	
6.1.179	
6.1.180	
6.1.181	
6.1.182	
6.1.183	
6.1.184	
6.1.185	
6.1.186	
6.1.187	
6.1.188	
6.1.189	
6.1.190	
6.1.191	
6.1.192	
6.1.193	
6.1.194	
6.1.195	
6.1.196	
6.1.197	
6.1.198	
6.1.199	
6.1.200	
6.1.201	
6.1.202	
6.1.203	
6.1.204	
6.1.205	
6.1.206	
6.1.207	
6.1.208	
6.1.209	
6.1.210	
6.1.211	
6.1.212	
6.1.213	
6.1.214	
6.1.215	
6.1.216	
6.1.217	
6.1.218	
6.1.219	
6.1.220	
6.1.221	
6.1.222	
6.1.223	
6.1.224	
6.1.225	
6.1.226	
6.1.227	
6.1.228	
6.1.229	
6.1.230	
6.1.231	
6.1.232	
6.1.233	
6.1.234	
6.1.235	
6.1.236	
6.1.237	
6.1.238	
6.1.239	
6.1.240	
6.1.241	
6.1.242	
6.1.243	
6.1.244	
6.1.245	
6.1.246	
6.1.247	
6.1.248	
6.1.249	
6.1.250	
6.1.251	
6.1.252	
6.1.253	
6.1.254	
6.1.255	
6.1.256	
6.1.257	
6.1.258	
6.1.259	
6.1.260	
6.1.261	
6.1.262	
6.1.263	
6.1.264	
6.1.265	
6.1.266	
6.1.267	
6.1.268	
6.1.269	
6.1.270	
6.1.271	
6.1.272	
6.1.273	
6.1.274	
6.1.275	
6.1.276	
6.1.277	
6.1.278	
6.1.279	
6.1.280	
6.1.281	
6.1.282	
6.1.283	
6.1.284	
6.1.285	
6.1.286	
6.1.287	
6.1.288	
6.1.289	
6.1.290	
6.1.291	
6.1.292	
6.1.293	
6.1.294	
6.1.295	
6.1.296	
6.1.297	
6.1.298	
6.1.299	
6.1.300	
6.1.301	
6.1.302	
6.1.303	
6.1.304	
6.1.305	
6.1.306	
6.1.307	
6.1.308	
6.1.309	
6.1.310	
6.1.311	
6.1.312	
6.1.313	
6.1.314	
6.1.315	
6.1.316	
6.1.317	
6.1.318	
6.1.319	
6.1.320	
6.1.321	
6.1.322	
6.1.323	
6.1.324	
6.1.325	
6.1.326	
6.1.327	
6.1.328	
6.1.329	
6.1.330	
6.1.331	
6.1.332	
6.1.333	
6.1.334	
6.1.335	
6.1.336	
6.1.337	
6.1.338	
6.1.339	
6.1.340	
6.1.341	
6.1.342	
6.1.343	
6.1.344	
6.1.345	
6.1.346	
6.1.347	
6.1.348	
6.1.349	
6.1.350	
6.1.351	
6.1.352	
6.1.353	
6.1.354	
6.1.355	
6.1.356	
6.1.357	
6.1.358	
6.1.359	
6.1.360	
6.1.361	
6.1.362	
6.1.363	
6.1.364	
6.1.365	
6.1.366	
6.1.367	
6.1.368	
6.1.369	
6.1.370	
6.1.371	
6.1.372	
6.1.373	
6.1.374	
6.1.375	
6.1.376	
6.1.377	
6.1.378	
6.1.379	
6.1.380	
6.1.381	
6.1.382	
6.1.383	
6.1.384	
6.1.385	
6.1.386	
6.1.387	
6.1.388	
6.1.389	
6.1.390	
6.1.391	
6.1.392	
6.1.393	
6.1.394	
6.1.395	
6.1.396	
6.1.397	
6.1.398	
6.1.399	
6.1.400	
6.1.401	
6.1.402	
6.1.403	
6.1.404	
6.1.405	
6.1.406	
6.1.407	
6.1.408	
6.1.409	
6.1.410	
6.1.411	
6.1.412	
6.1.413	
6.1.414	
6.1.415	
6.1.416	
6.1.417	
6.1.418	
6.1.419	
6.1.420	
6.1.421	
6.1.422	
6.1.423	
6.1.424	
6.1.425	
6.1.426	
6.1.427	
6.1.428	
6.1.429	
6.1.430	
6.1.431	
6.1.432	
6.1.433	
6.1.434	
6.1.435	
6.1.436	
6.1.437	
6.1.438	
6.1.439	
6.1.440	
6.1.441	
6.1.442	
6.1.443	
6.1.444	
6.1.445	
6.1.446	
6.1.447	
6.1.448	
6.1.449	
6.1.450	
6.1.451	
6.1.452	
6.1.453	
6.1.454	
6.1.455	
6.1.456	
6.1.457	
6.1.458	
6.1.459	
6.1.460	
6.1.461	
6.1.462	
6.1.463	
6.1.464	
6.1.465	
6.1.466	
6.1.467	
6.1.468	
6.1.469	
6.1.470	
6.1.471	
6.1.472	
6.1.473	
6.1.474	
6.1.475	
6.1.476	
6.1.477	
6.1.478	
6.1.479	
6.1.480	
6.1.481	
6.1.482	
6.1.483	
6.1.484	
6.1.485	
6.1.486	
6.1.487	
6.1.488	

B. Asphalt Concrete Hot Mix.....9

C. Concrete Requirements ..... 10

**S** **C** **d** **r** ..... **1**

A. Staged Construction ..... 10

B. Full Depth Sections ..... 11

C. Rehabilitating Existing Asphalt Streets..... 11

D. Special Requirements ..... 11

**PA** **EMENT** **ESI** **N** **EPO** **T** ..... **11**

**1** **r** **d** **I** **r** **P** **r** ..... **11**

A. List of Required Information ..... 11

**LIST OF TABLES**

Table 6-1 Pavement Strength Coefficients.....6-7

Table 6-2 Pavement Design Criteria.....6-9

Table 6-3 Asphalt Requirements.....6-10

**LIST OF FIGURES**

*This chapter does not contain figures.*



## CHAPTER 6 PAVEMENT STRUCTURE AND MATERIALS

### 6.1 GENERAL

The purpose of this chapter is to present the Pavement Design Criteria required for use on streets in the City of Fayetteville. These criteria shall be used in conjunction with **Chapter 4, Street Design and Technical Criteria**. The Final Pavement Design Report shall include all testing in accordance with **Table 6-1**.

#### 6.1.1 Existing Streets

For existing streets the City Engineer may require an evaluation of the existing pavement and base structure to determine if an overlay is feasible, or if reconstruction is necessary.

Any damage done to existing City streets during construction shall be repaired and/or replaced at the contractor's expense. All repair work shall meet the requirements of this document.

#### 6.1.2 AASHTO

The design criteria and procedures presented follow **American Association of State Highway and Transportation Officials (AASHTO)** Guide for the Design of Pavement Structures.

#### 6.1.3 Standard Paved Streets

Streets are to be constructed of asphaltic concrete pavement or Portland cement concrete pavement, base course material, and subbase material (where required), and placed on compacted, unyielding subgrade.

The use of treated subgrade, treated base, and/or full depth asphalt pavement may be acceptable when designed and submitted by the designer, and approved by the City Engineer in accordance with these standards.

On streets with grades steeper than 10%, concrete pavement may be required. The final determination will be made by the City Engineer.

The pavement section requirements for alley construction, whether private or public, shall be the same as for a public roadway. Alternative pavement materials proposals will require approval from the City Engineer.





among lanes and shall be evenly spaced. The City Engineer may require more frequent testing.

Samples shall be taken to a minimum depth of 5 feet below the proposed subgrade elevation.

**2.2.1.1**

All fill material placed in the right-of-way shall be tested and approved by the City prior to its use on the project. The material shall meet minimum requirements. Sampling shall be at the beginning of the project, and after every 5,000 cubic yards of material is placed.

**2.2.1.2**

All sampling and testing of soils shall be performed under the direct supervision of a Professional Engineer who must sign and stamp the report.

**2.2.2**

**2.2.2.1**

To simplify subgrade support testing, soil samples may be combined to form soil groups consistent with the **AASHTO** classification, group index, and location for the area investigated. Groupings shall not mix samples with different **AASHTO** classifications.

Appropriate tests, to include gradation, Atterberg limits, maximum compaction testing, and California Bearing Ratio tests, shall be accomplished in order to determine the suitability of soils for use as subgrade material within the roadway.

“Subgrade” shall be defined as material within 2 feet of the first paving layer (base or asphalt). Roadway limits shall extend to 1 foot behind the back of curb, or edge of pavement when no curb is present.

**2.2.2.2**

Soils shall be classified visually and tested to determine the properties. Soils shall be classified according to the **AASHTO** Classification system.

**2.2.2.3**

Maximum density of soils proposed for use as subgrade material shall be determined by **AASHTO T-99** (Standard Proctor Test), using Note 7. A new moisture/density test shall



be completed for every 5,000 cubic yards of material imported, or when field testing results indicate a change in material. This includes instances when field testing results yield percentages of compaction relative to maximum of 105% or greater.

**C**

CBR testing in accordance with ASTM D 1883-94 shall be completed on all soils proposed for use as subgrade material. CBR testing shall be performed at the dry density corresponding to 95% of the maximum dry density of the material being tested, and at 2% above optimum moisture content.

The 3-point method of CBR testing shall be performed on in-situ soils classified as A-1 or A-2, and on all soils proposed for use as borrow material for subgrade.

**S**

If groundwater is encountered or predicted to be encountered within 5 feet of the original or proposed ground surface, a subsurface water investigation report shall be submitted for approval by the City Engineer. This report is required to ensure mitigation of high groundwater effects upon public improvements within the right-of-way. This information may be a separate report or may be included in the geotechnical report.

**S**

The top 24 inches of subgrade must be of material meeting the following specifications unless a formal design is approved:

- A. Material classified by the AASHTO Soil Classification System as A-1, A-2, or A-3, having a maximum of 35 percent of the material passing the number 200 sieve, and having a CBR equal to or greater than 8.
- B. Material not meeting the above requirements for AASHTO Classification and gradation, but having a CBR equal to or greater than 8 and a Liquid Limit and Plasticity Index of less than or equal to 40 and 15, respectively.
- C. Material not meeting the above requirements for Liquid Limit and Plasticity Index may be used if chemically modified by the use of lime, fly ash, or cement. The type and amount of treatment shall be determined by a material testing lab and approved by the City. The chemically modified soil must meet all requirements of Section A above.
- D. Material not meeting the CBR requirements of Section A above, but meeting the requirements for Liquid and Plasticity limits may be used provided a formal pavement design based on the actual CBR value of the soil is provided. For this case, CBR values shall be a minimum of 4. Use of lower CBR values may be allowed



where specialized pavement designs using geogrids or other technologies are proposed.

**6.02.03 Embankment and Curb**

Material for curb backfill, under sidewalks, on backslopes, or in other areas within the right-of-way may be any material that is free from sod, stumps, roots, or other perishable or deleterious material that it be capable of forming a stable embankment when compacted. Areas outside the roadway shall be compacted to minimum of 90% Standard Proctor density unless otherwise specified.

**6.02.04 PAVEMENT DESIGN CRITERIA**

**6.02.04.1 Flexible Pavement**

Flexible pavements are those pavements that have sufficiently low bending resistance to maintain continuous contact with the underlying structure, yet have sufficient stability to support a given traffic loading condition. Commonly known as asphaltic concrete pavement.

Refer to **Table 6-1** below for structural number coefficients for the pavement design.

**Table 6-1 Pavement Structure Coefficients**

Pavement Structure Coefficient	Structural Number Coefficient	Thickness
ACHM Surface Course	0.44	*2" Min. Course
ACHM Binder Course	0.44	*3" Min. Course
ACHM Base Course	0.36	R 90+ *4.5" Min. Course
Aggregate Base Course (Class 7)	0.14	R>72 6" Min. Course
Cement Treated Subgrade	0.23	7 day, 650–1000 psi
Fly Ash Treated Subgrade	0.10	7 day, 150 psi @ 70°±
Lime Treated Subgrade	0.14	7 day, 160 psi, PI <6
Kiln Dust Treated Subgrade	0.10	7 day, 150 psi, PI <6

\* Maximum lift is only limited by compaction requirements.

**2 Portland Cement Concrete**

**A. General**

Rigid pavements are those that possess a high bending resistance and distribute loads over a large area of foundation soil. Commonly known as Portland Cement Concrete Pavement.

**B. Joint Design**

The construction plans for rigid pavement areas shall include a joint pattern layout for each street, alley and intersection. All joints and joint filling in rigid pavement shall be designed and detailed in accordance with the current AASHTO standards.

**Equivalent Single Axle Loads**

**A. Equivalent Single Axle Loads (ESAL)**

Equivalent Single Axle Loads (ESAL) units are based on 18 kip (80 kN) axle loading on each design lane. All data and design procedures in this section use ESAL units for pavement loading repetitions. Maximum ESAL criteria for local residential and collector streets are given in **Table 6-2**. Where existing or projected traffic is such that maximum ESAL's are exceeded, a formal design will be required, at the discretion of the City Engineer. ESAL calculations are required for arterial streets.

Directional distribution of ESAL's may be 50% unless the Traffic Study indicates otherwise. Lane distribution factors shall be 80% for two lanes of travel in each direction.

In the absence of truck traffic distribution data, 5% trucks shall be used, distributed across truck types in accordance with Federal Highway Administration guidance for urban arterial streets. The City Engineer may require a higher percentage of trucks to be included in the calculations when existing or projected truck traffic is expected to exceed 5%.

**B. Design Serviceability**

The Serviceability Index to be used for all City Roadways dedicated for public use is given in **Table 6-2**.

**C. Minimum Pavement Section**

**Table 6-2** provides the minimum acceptable pavement sections and Structural Numbers for each roadway classification based on a minimum CBR of the subgrade material of 8, and on the maximum number of ESAL's as specified. For lower CBR values and higher ESAL's, pavement design calculations shall be provided. In



specifying layer thickness, the designer shall consider how the pavement section will be physically constructed, including minimum asphalt layer thicknesses.

**D. Portland Cement Concrete Working Stress ( $f^t$ )**

The working stress ( $f^t$ ) to be used in the design shall be 75 percent of that provided by third-point beam loading, which shall have a minimum laboratory 28-day strength of 600 psi based on actual tests of materials to be used.

**E. Arterial and Collector Level Intersections**

The pavement thickness design for arterial and collector level intersections shall be the combined 20-year design for both directions for the shared use areas. A separate design analysis is required.

**TABLE 2-2 Pavement Structure Criteria**

CLASSIFICATION	Traffic Volume (ESAL'S)	Structural Strength (PSI)				Subgrade Strength (%)	Minimum Asphalt Surface Layer, inches	Minimum Asphalt Concrete Surface Layer, inches	Minimum Portland Cement Concrete Surface Layer, inches	Minimum Concrete Surface Layer, inches	Minimum Structural Number
		$p_o$ Init.	$p_t$ Final	$\Delta$ PSI Diff.							
<b>LOCAL</b>	50,000	4.5	2.0	2.5	80	3.0	8.0	5.5	6.0	2.42	
<b>COLLECTOR</b>	500,000	4.5	2.0	2.5	85	5.0	6	7	Design	3.04	
<b>ARTERIAL</b>											
Through	Design	4.5	2.5	2.0	95	Design	Design	Design	Design	Design	
Collector	Design	4.5	2.5	2.0	95	Design	Design	Design	Design	Design	

A pavement design may be required as requested by the City Engineer.

**TABLE 2-3 Pavement Material Criteria**

**A. Aggregate Base Material**

Materials for aggregate base courses shall meet the requirements of Section 303.02 of the AHTD Standard Specifications Edition of 2014.

**B. Asphalt Concrete Hot Mix**

Materials for Asphalt Concrete Hot Mix base, binder, and surface courses shall meet the requirements of the 2014 AHTD Standard Specifications referenced in the



following. NO MARSHALL MIXES ARE ALLOWED UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE CITY ENGINEER.

Asphalt mix designs shall meet the requirements of Section 404.01(b), and Tables 405-1, 406-1, 407-1, and 407-2 of Sections 405, 406, and 407, with additional requirements as follows:

**Table 6-3 Asphalt Requirements**

ESAL'S	N <sub>Initial</sub>	N <sub>Design</sub>	N <sub>Max</sub>	Aggregate Gradation	Surface Course
<300k	6	50	115	64-22	9.5
300k-3 Million	7	75	160	70-22	9.5/12.5
>3 Million	8	100	205	76-22	12.5

3/8" (9.5) mm surface course shall be used on all residential and local streets. 1/2" (12.5 mm) surface course shall be used on arterial streets. Collector streets may use either type of surface mix.

Lift thicknesses shall be a minimum of 3 times the maximum nominal aggregate size. Maximum lift thicknesses will be limited by capability of compaction equipment to achieve minimum compaction requirements, but will not be allowed to exceed 6 times the maximum nominal aggregate size.

**C. Concrete Requirements**

Materials for Portland Cement Concrete Pavement shall meet the requirements of the latest edition of the AHTD Standard Specifications. Concrete for paving shall be Class B concrete with a minimum 28-day compressive strength of 4,000 psi and shall have air entrainment of 4 to 7 percent.

**Staged Construction**

**A. Staged Construction**

This is an alternative for the Developer to provide a minimum thickness pavement during construction, and after repairs, construct the final lift of asphalt, providing for a new finished pavement surface.

(HMA) may be submitted for approval with a minimum wearing course thickness of 2.0 inches. If the full pavement section is not to be placed immediately, a pavement



design for staged construction may be required by the City Engineer. The staged construction design must include asphalt thickness for each proposed stage. Calculations, traffic numbers, and construction truck traffic numbers supporting the staged design must also be submitted. For staged construction, accommodations must be provided for the paved surface to drain with no water left standing on the pavement.

**B. Full Depth Sections**

Full depth asphalt pavement sections will be considered on a case by case basis where depth of bedrock, drainage, and soil conditions are compatible with full-depth asphalt. When permitted by the City Engineer, full depth asphalt pavements shall consist of one or more layers of black base or binder course topped with one or more layers of surface course.

**C. Rehabilitating Existing Asphalt Streets**

Prior to overlaying existing asphalt, the City Engineer may accept nondestructive testing to determine the amount of overlay necessary to bring the street to current standards. All “pot-holes,” utility trench settlement, cracking, and any similar imperfections shall be repaired to the City Engineer’s satisfaction prior to overlaying.

**D. Special Requirements**

The City Engineer may require full depth asphalt, Portland cement concrete or chemically treated base or subgrade in locations where traffic, utilities, type of construction, subsurface drainage, or time of construction would make asphalt on aggregate base impractical.

**PAVEMENT DESIGN REPORT**

The pavement design report shall be prepared by or under the supervision of and signed and stamped by a Professional Engineer registered in the State of Arkansas. The report shall make a recommendation for a typical pavement structural section based on known site soil conditions and a valid traffic impact study, when required. The report shall be submitted in pdf format.

**1. REQUIRED INFORMATION FOR PAVEMENT DESIGN REPORT**

**A. List of Required Information**

1. Project Name.
2. Owner Name and Contact Information.



3. Vicinity map to locate the investigated area.
4. Scaled drawings showing the location of final borings.
5. Plat with street names.
6. Scaled drawings showing the estimated extent of subgrade soil types and ESAL for each street classification.
7. Pavement design alternatives for each street classification.
8. Tabular listing of sample designation, sample depth, Group Number, liquid limit, plasticity index, percent passing the No. 200 sieve, **AASHTO** Classification, Group Index and soil description.
9. Swell/consolidation tests.
10. Borrow source identification.
11. Design calculations for all phases of soil report.
12. Design coefficient used for asphalt, base course, etc. Refer to **Table 6-1**.
13. Mix design test results as discussed in **Chapter 11, Street Inspection and Testing Procedures**, where chemical stabilization has been approved.
14. A discussion of potential subgrade soil problems including, but not limited to:
  - a. Heave or settlement prone soils.
  - b. Frost susceptible soils.
  - c. Ground water.
  - d. Drainage considerations (surface and subsurface).
  - e. Cold weather construction (if appropriate).
  - f. Soluble sulfates in subgrade.
  - g. Other factors or properties that could affect the design or performance of the pavement system.
15. Recommendations to alleviate or mitigate the impact of problems discussed in Item 14 above.
16. Professional Engineer Stamp



**CHAPTER 7 TRAFFIC CONTROL DEVICES**

**TABLE OF CONTENTS**

SECTION	TITLE	PAGE
7	<b>GENERAL</b>	
7.1	<b>INSTALLATION</b>	
7.2	<b>DESIGN REQUIREMENTS</b>	
7.2.1	<b>TRAFFIC SIGNALS</b>	
	A. Design Requirements .....	3
	<b>TRAFFIC SIGNS</b>	
7.1	<b>GENERAL</b>	
	A. Type and Location of Signs .....	4
	B. Design, Installation, and Maintenance .....	4
	C. New Roadway .....	4
	D. Other Standards .....	5
	E. Sign Posts, Supports, and Mountings .....	5
	F. Sign Reflectivity .....	5
	G. Backing Plates .....	5
7.2	<b>TRAFFIC SIGNALS</b>	
	A. Street Name Sign .....	5
	<b>TRAFFIC CONTROL SIGNS</b>	
	A. Design and Size .....	6
	B. Regulatory .....	6
	C. Warning .....	7
	<b>TRAFFIC CONTROL MARKINGS</b>	
7.1	<b>GENERAL</b>	
	A. Type and Location of Striping and Markings .....	8
	B. Design, Installation, and Maintenance .....	8
	C. New Roadway .....	8
7.2	<b>PREFORMED THERMOPLASTIC PAVEMENT MARKING SPECIFICATIONS</b>	
	A. General .....	8
	B. Preformed Thermoplastic Pavement Marking Specifications .....	8
	C. Crosswalks .....	9
	D. Stop Bars .....	9
	E. Symbols .....	9
	F. Roundabouts .....	9
	<b>TRAFFIC CONTROL DEVICES</b>	
	A. General .....	9



B. Broken Line.....9

C. Dotted Line ..... 10

D. Turn Bay Line ..... 10

E. Centerline ..... 10

F. Parking Stalls and Angle Parking..... 10

G. Bikeway ..... 10

**TABLE OF CONTENTS**.....1

A. Specifications..... 10

B. Time Duration Limit..... 10

C. Extensions ..... 10

**LIST OF TABLES**

*This Chapter Does Not Contain Tables*

**LIST OF FIGURES**

*Figures are Located at the End of the Chapter*

- Figure 7-1 Crosswalk and Stop Bar
- Figure 7-2 Turn Arrow Marking
- Figure 7-3 “Only” Marking
- Figure 7-4 Broken Line Striping
- Figure 7-5 Solid Line Striping
- Figure 7-6 Center Turn Lane Striping
- Figure 7-7 Raised Pavement Markers
- Figure 7-8 Future Street Extension Sign



## CHAPTER 7 TRAFFIC CONTROL DEVICES

### 7 GENERAL

This chapter describes general signal, signing, and striping design requirements for use in the City of Fayetteville. All design and construction of signals, signing, and striping shall be in conformance with this chapter and the latest revision of the **MUTCD**. The traffic signal and signage plans shall be included in the construction plan submittal.

#### 7.1 Installation of Traffic Signals and Signage

The cost of the installation of traffic signals, street signage and pavement markings is the responsibility of the developer when required with a proposed development. The work and materials necessary for the installation shall be included as part of the street improvements.

### 7 DESIGN REQUIREMENTS

#### 7.1 Traffic Signal Controller Requirements

The design of traffic signals shall be performed by a qualified Traffic Engineer approved by the City. The design will follow the latest edition of “Standard Specifications for Highway Construction,” published by **AHTD**.

##### A. Design Requirements

1. All mast arm/signal poles, luminaire arms, extensions, foundations, pull boxes and conduit shall meet AHTD Standards and details.
2. Street light luminaire shall be LED or a 250 Watt HPS streetlight fixture with cut off design.
3. Controller and cabinet shall be Peek equipment.
4. Radio shall be Ip addressable or compatible with closed loop system.
5. Tomar fire preemption system complete with detectors, wiring, and card in the cabinet is required.
6. Attachment height for mast arms to signal pole shall be at 20 feet.
7. Video detection with wiring and detector cards for detection counting traffic on all approach lanes shall be used per Traffic Superintendent approval.
8. Black, 12”-12”-12” polycarbonate signal head tunnel visors with 5” black back plates shall be mounted using astrobrackets over the center of each lane. Side of pole mounted 12”-12”-12” are for the far side right, which



will cover any dedicated right turn lanes. Use of far side left 12”-12”-12” or 12”-12”-12”-12” heads with tunnel visors are determined on an intersection by intersection basis but will be used in most cases on State Highways or Arterials with significant large truck traffic. Section heads shall not be doghouse style.

9. Black 16-inch LED pedestrian heads (hand/man) countdown with visors and a clamshell/banding mounting system are required with ADA pedestrian buttons for all standard pedestrian movements. Crate style protection shall be provided for all pedestrian heads.
10. Two 3-inch conduits (Schedule 40 PVC minimum) will be used for wiring between the signal bases and the cabinet.
11. Pedestrian buttons shall be the Pelro SE-2000-08-P33 type with audio alert, LED light, and sign housing/back plate.
12. The City of Fayetteville operates its own communications network for the traffic management system, and as such, any new traffic signal installation shall include the design and expansion of that communications network from an approved existing access point to the new signal. The design and expansion of the communications network shall be per the traffic operations specifications current at that time.

## TRAFFIC SIGNALS

### 1. GENERAL

#### A. Type and Location of Signs

The Traffic Superintendent shall make the final determination regarding the type and location of signage controls within the city right-of-way. These controls shall include traffic control signs, street name signs, delineators, and permanent barricades. AHTD requirements shall apply for all signage within AHTD right-of-way.

#### B. Design, Installation, and Maintenance

Because the City will maintain the permanent traffic control devices on public rights-of-way, all traffic control devices shall be fabricated and installed in accordance with this chapter and the latest revision of the **MUTCD**.

#### C. New Roadway

Permanent signage, unless otherwise approved by the Traffic Superintendent, shall be completely in place before any new roadway is opened to the public.



**D. Other Standards**

These Standards are to be used in conjunction with other applicable City Regulations.

**E. Sign Posts, Supports, and Mountings**

1. Sign Post. The post shall be 12' 2#/ft green U-channel post. If the sign area is greater than 6 sf, then the post must be 3#/ft.
2. Sign Bolts. Signs shall be mounted to the post with a minimum of two 5/16" hex bolts with metal washers and nylon washer (against sign face) at the top of sign.

**F. Sign Reflectivity**

All traffic control signs must be fabricated with reflective materials. All reflective materials to be a minimum of high intensity material or greater per **ASTM TYPE III**. All signs or traffic control devices must have a 7-year materials warranty.

**G. Backing Plates**

Aluminum blanks of .080 gauge are standard, except for signs larger than 36 x 36 inches, which shall be .100 or .125 gauge aluminum.

□□□2 | □□r□□□□□□□□

**A. Street Name Sign**

1. General. All street name signs must conform to these standards. If the intersection has a traffic signal, street name signs will be designated as part of the signal.
2. Minor Intersection. Nine-inch plates shall be used at all minor intersections; lengths will vary to fit street names.
3. Major Intersection. Nine-inch plates shall be used at all major intersections, which include the intersections with Collector and Arterial Roadways.
4. Sign Assembly. There shall be one plate for each road, with a minimum of two plates per street sign assembly. Typical installation shall include two street name signs, one for each direction. For signs with lengths of 18" – 30" use .125 gage blank thickness; for signs 36" – 48" us .125 gage blank thickness.
5. Sign Face.
  - a. Letter Size - 6"; Height of Sign Blank – 9".
  - b. Color. Letters and numbers are to be white on a green background face. The colors shall not fade when exposed to an accelerated test of



- ultraviolet light equivalent to 5 years of outdoor exposure. No silk screened signs are permitted.
- c. Border. There shall be a .625” white border on post mounted street name signs.
- d. The street names shall be a combination of upper and lower case with the suffix (St., Ave., Ln....) being in 3.5” upper and lower case.
- 6. Street Name. Street names designations should be obtained from the approved plat.

**B. Stop Signs**

- 1. Location of all stop signs shall be determined and discussed in the TIS, when required.
- 2. Stop signs will be placed in accordance with the TIS, approved construction plans, and the **MUTCD**. Stop signs shall be placed at point of curvature (PC) behind attached sidewalk and before the access ramp.

**Traffic Control Standards**

**A. Design and Size**

Sign specifications and diagrams are detailed in the latest revision of the Federal “Standard Highway Signs,” latest version. This publication is available from the U.S. Department of Transportation, Federal Highway Administration. Acceptable sign sizes are listed in the standard column of the table printed with each diagram. Expressway and construction signs shall be a minimum 36 inches.

**B. Regulatory**

- 1. Reflectivity. All regulatory signs, except parking, shall be **ASTM TYPE III** grade reflectivity or greater. This includes the red series and black on white signs.
- 2. Sheeting Material. All signs shall be fabricated with sheeting material, including letters.
- 3. Stop Sign. Stop signs shall be a minimum of 30 inches and **ASTM TYPE III** sheeting or greater.
- 4. Yield Sign. For minor intersections only, a 36”x36”x36” yield sign may be used in lieu of a stop sign, at the discretion of the City according to **MUTCD**.
- 5. Parking/No Parking Sign. Designated parking and “no parking” zones shall be signed in accordance with **MUTCD**. No silk screened signs are permitted.



**C. Warning**

1. Reflectivity Requirements. All pedestrian crossing, school crossing, and W16-7P signs shall be made with diamond grade fluorescent yellow/green sheeting.
2. “Future Street Extension” Sign and Barricades.  
Dead End. All dead-end streets shall have a Type III barricade with appropriate advance warning sign(s). Type III Barricades shall have a “Future Road Extension” sign mounted on the barricade. See **Figure 7-8**.
4. Crosswalk Sign. Crosswalks shall be signed where adjacent to a school and on an established school pedestrian route per Traffic Superintendent approval. There are usually a minimum of 4 signs per crosswalk. The color and installation shall be completed according to **MUTCD**. The color shall be fluorescent yellow green. The diamond shaped sign shall have a minimum height and width of 36 inches.

□□□□ □□□□**d**□□□□□□

Signage in advance of the circulating roadway shall be required. Use “Yield At Roundabout” (W3-2a, 30 x 30 inches; R1-2, 36 x 36 inches), “Roundabout Advisory Sign” (RB-1, 24 x 24 inches) and “Reduced Speed Ahead” (R2-5a, 24” x 30”) signs. The “Yield” sign (R1-2, 36 x 36 inches) shall be located at each entry to the circulatory roadway. An “arrow” sign, designating direction of travel in circulatory roadway, shall be located within the central island. Refer to **MUTCD**. Specifications for traffic control signs, listed in **MUTCD** , shall apply to these signs.

□□□□ **T**□□ □□**r**□**r**□ **C**□□□□**r**□□□□□□ **S**□□□□□□

All temporary construction signage shall be placed according to **MUTCD** standards. All temporary signage is subject to review and approval by the City. Temporary street lane closures shall be coordinated with the City, emergency services and transportation providers. Detour plans shall be submitted for review when detours are required.

**PAVEMENT MARKING AND STRIPING**

**1. STRIPING**

**A. Type and Location of Striping and Markings**

Per MUTCD Section 3 B.01: Centerline markings shall be placed on arterials and collectors 20 feet or more in width and having an ADT of 6000 vpd or greater.

The Traffic Superintendent shall make the final determination in regards to the type and location of pavement striping and marking within the right-of-way during the review of the project signing and striping plans.

**B. Design, Installation, and Maintenance**

The City maintains the permanent pavement striping and marking on public rights-of-way after completion of the warranty period. All such devices shall be specified and installed in accordance with these Standards; all designs shall be in accordance with these Standards and the latest revision of the MUTCD.

**C. New Roadway**

Permanent striping and marking, unless otherwise approved by the City Engineer, shall be completely in place before any new Roadway is opened to the public.

**2. PREFORMED THERMOPLASTIC MARKING SPECIFICATIONS AND ARRANGEMENTS**

**A. General**

Preformed thermoplastic shall be used on all pavement markings such as arrows, “onlys,” crosswalks, railroad crossings, school crossings, stopbars, and bike symbols.

**B. Preformed Thermoplastic Pavement Marking Specifications**

The prefabricated markings described shall be 125 mils in thickness unless otherwise specified and consist of white or yellow pigmented plastic film with imbedded reflective glass spheres, uniformly distributed throughout their entire cross-sectional area. It shall be possible to affix the markings to bituminous or Portland cement concrete pavements by either a pressure sensitive precoated adhesive or a liquid contact cement and shall have a black contrasting border 4” wide. Prefabricated legends and symbols shall conform to the applicable shapes and sizes as outlined in the MUTCD.



**C. Crosswalks**

1. General. Crosswalks shall be used at all signalized intersections, approved crossings, school routes, adjacent to schools, and as otherwise directed.
2. Standard Crosswalk. White 10-foot long x 12-inch wide bars with 48” spacing shall be used for all crosswalks.

**D. Stop Bars**

All stop bars shall be white and a minimum of 12 inches wide. Stop bars are required at signalized locations where the speed limit is 35 mph or higher and other locations specified by the City Engineer.

**E. Symbols**

Preformed thermoplastic pavement marking standard material shall be a minimum of 125 mils thick unless otherwise approved. This material shall be used for all arrows, “only,” bike symbols, bike diamonds, sharrows, railroad crossing symbols, etc.

**F. Roundabouts**

1. Yield Line. The roundabout shall require a yield line at the point of entry into the circulatory roadway unless otherwise approved by the City Engineer.
2. Crosswalk. Generally, crosswalks do not need special markings on each approach leg at a roundabout.
3. Lane use arrows shall be fish-hook type with circle.

□□□□□ **S r** □□□□□

**A. General**

1. Typical striping widths for lane lines are 4 inches, unless otherwise noted. Double yellow centerline must have a 4-inch minimum gap between stripes.
2. Preformed thermoplastic shall be used on all striping. Thermoplastic as specified in 7.4.2 shall be used.
3. All striping on sealcoats shall require a layout line. Prior to striping, tabs are required for sealcoats (prior to the sealcoat process). All other conditions require spot taping at an interval of 25 ft or closer.

**B. Broken Line**

All broken lines shall be 4-inch wide using a 40 foot cycle (10’ long with 30’ gap).



**C. Dotted Line**

All dotted lines shall be 4-inch wide using a 6 foot cycle (2’ long with 4’ gap).

**D. Turn Bay Line**

All turn bay lines shall be created with a minimum 4-inch wide line. However, if a turn bay occurs on a horizontal curve, the bay taper from the start of the double wide 4” may be marked with short 4-inch wide dotted lines (2’ long with 4’ gap).

**E. Centerline**

All centerline striping shall be double yellow, each a minimum of 4 inches wide, with an 8-inch minimum gap between the two.

**F. Parking Stalls and Angle Parking**

All striping for parking shall be white and 4 inches wide. All edge lines of parking areas shall also be white and a minimum of 4 inches wide.

**G. Bikeway**

A 4-inch minimum wide white stripe shall be used for Bike Lanes.

□□□□ **T** □□ □□r□r□ **S** r□□□□□

All temporary striping shall conform to “Standard Specifications for Highway Construction,” published by **AHTD**, the latest revision except as herein amended. When approved, temporary striping shall be required prior to the opening of a Roadway for travel where pavement and/or permanent striping cannot be completed due to weather and/or time constraints or for staged construction.

**A. Specifications**

Temporary striping shall be the same color and width as for permanent striping. Temporary striping shall consist of tabs, 4 x 4-inch (min.) tape, or paint depending on the pavement surface, spaced at 25-foot intervals.

**B. Time Duration Limit**

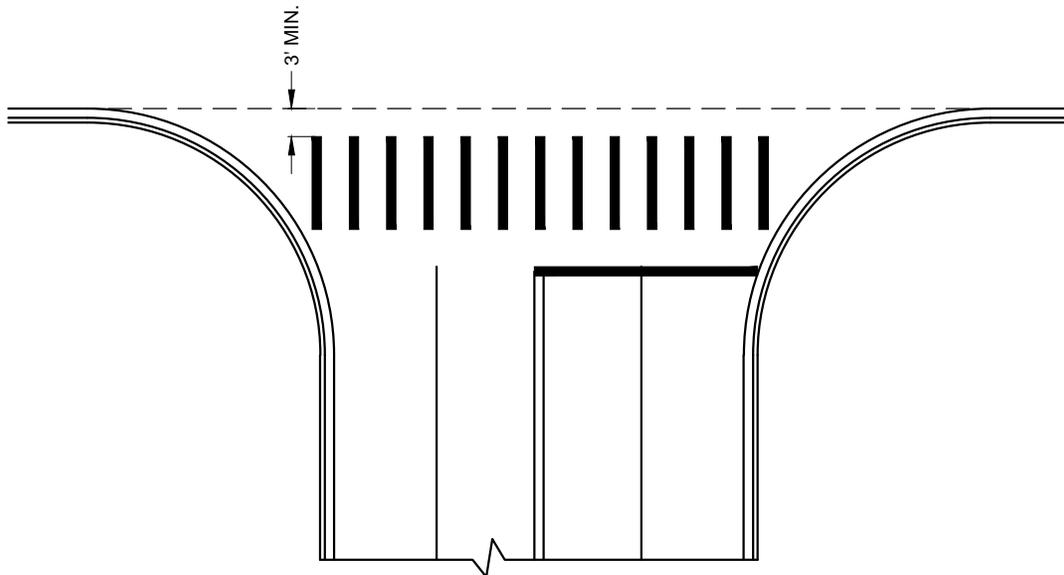
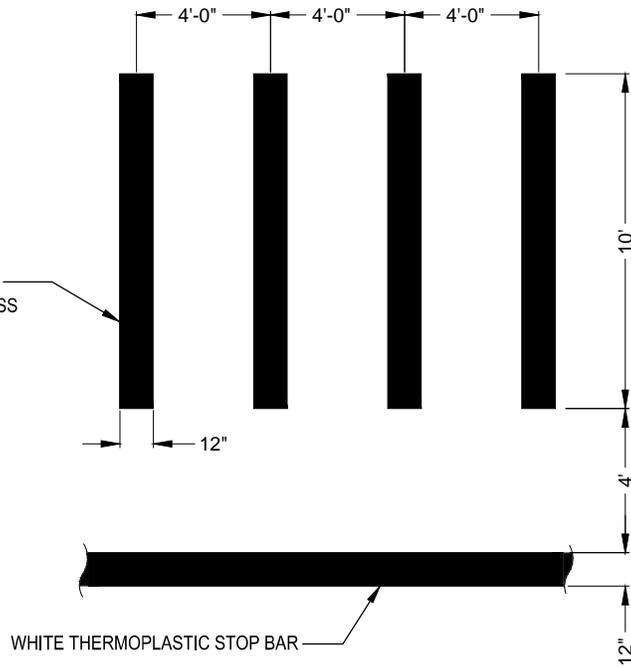
Temporary striping is permitted for no more than 7 days unless for staged construction or otherwise approved.

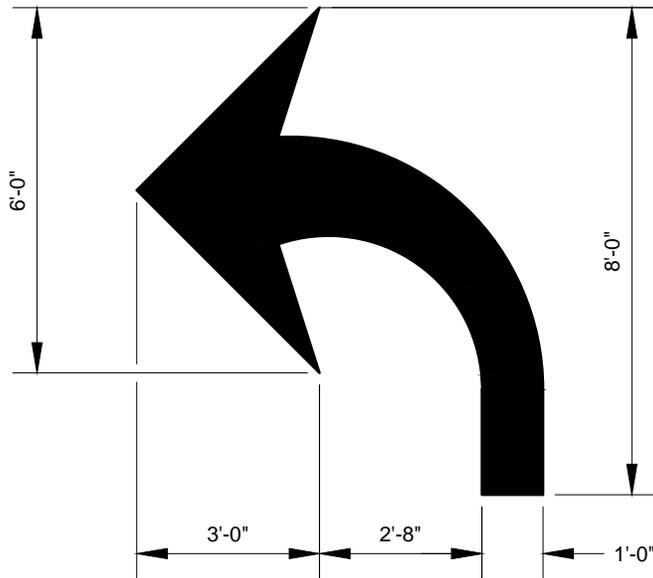
**C. Extensions**

Extensions must be requested in writing if weather does not allow installation of permanent striping.

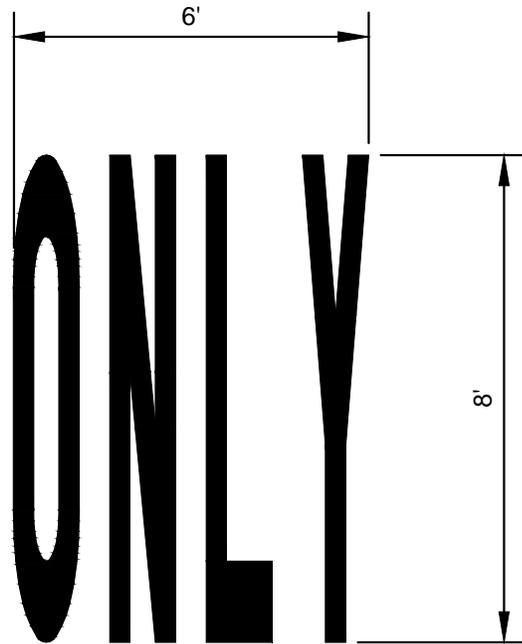


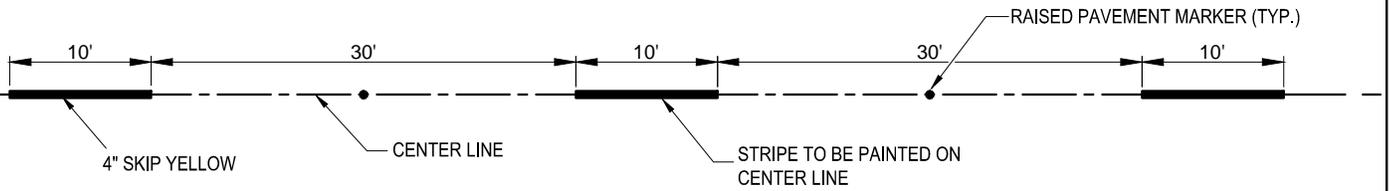
CONTINUOUS WHITE THERMOPLASTIC MARKING, SPACING AS SHOWN, ACCESS RAMP TO ACCESS RAMP



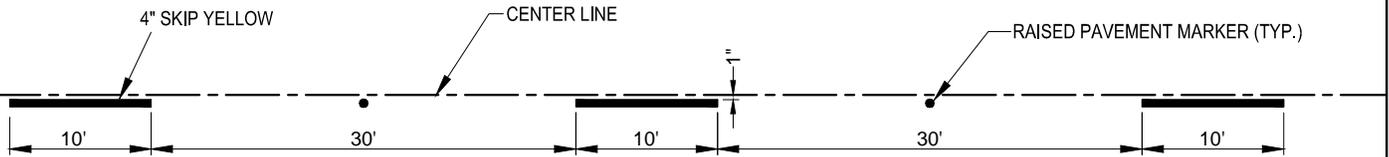


NOTE: ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC MATERIAL

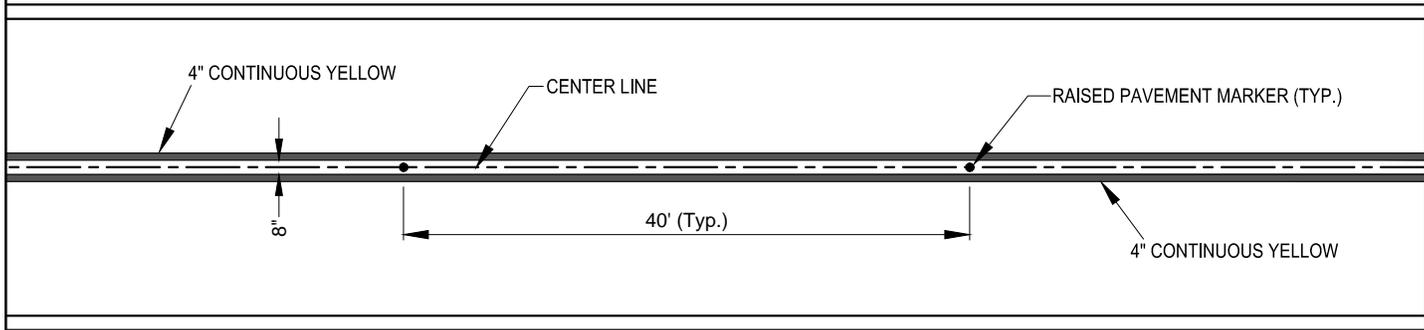


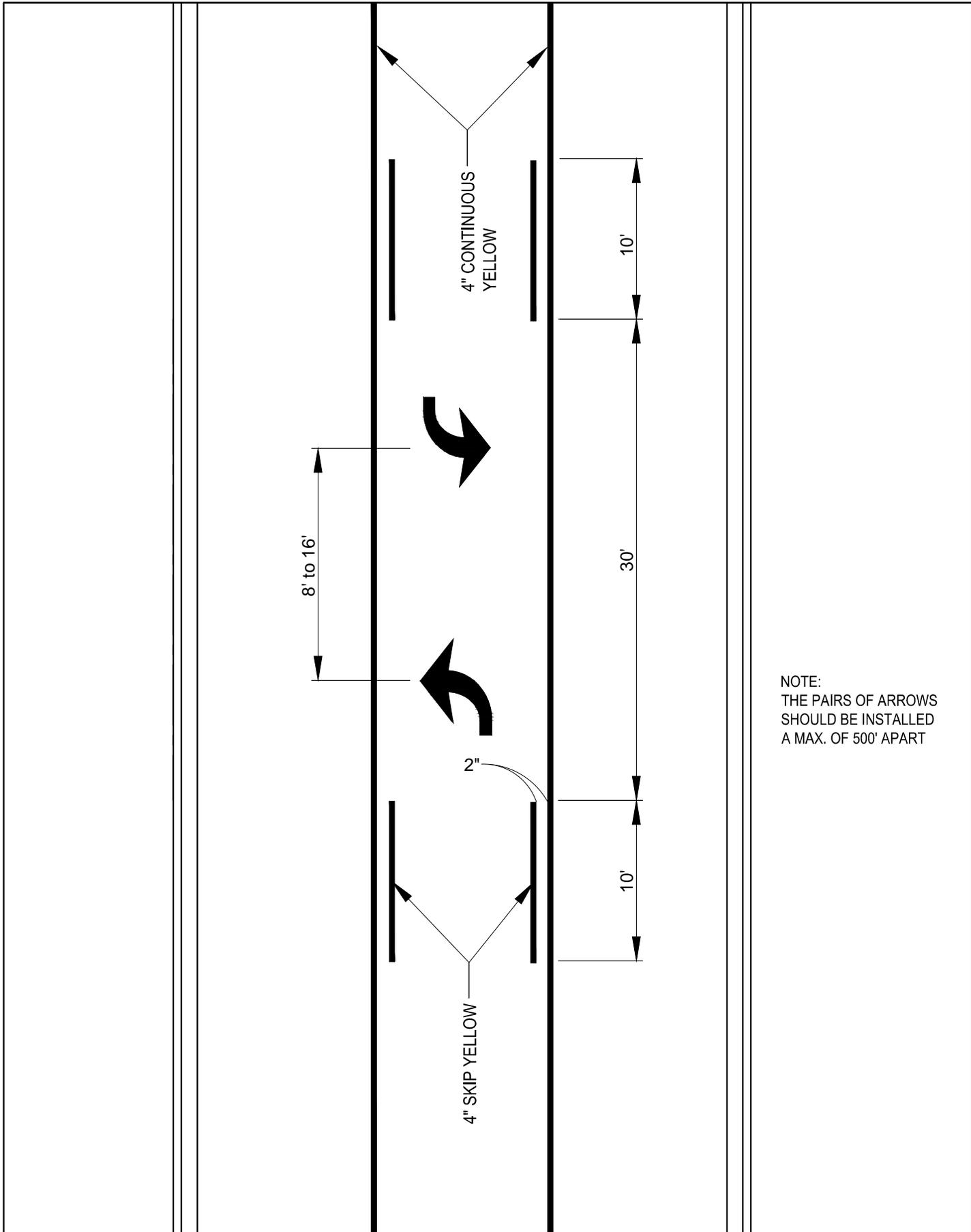


ASPHALT PAVEMENT



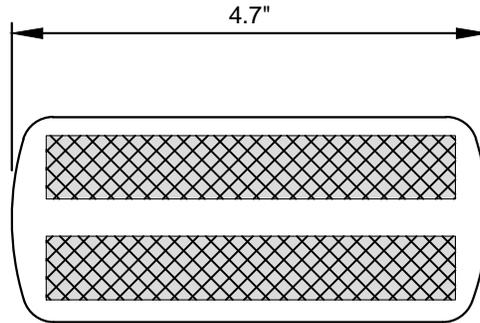
CONCRETE PAVEMENT



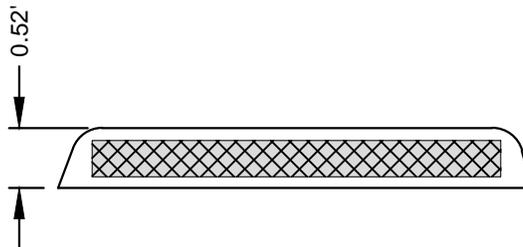
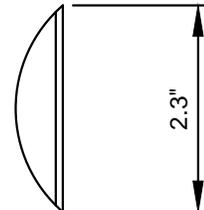
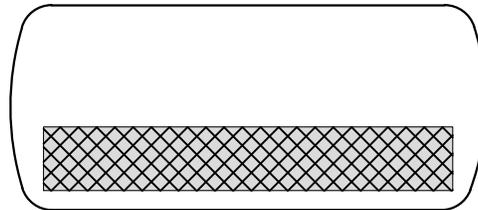


NOTE:  
THE PAIRS OF ARROWS  
SHOULD BE INSTALLED  
A MAX. OF 500' APART

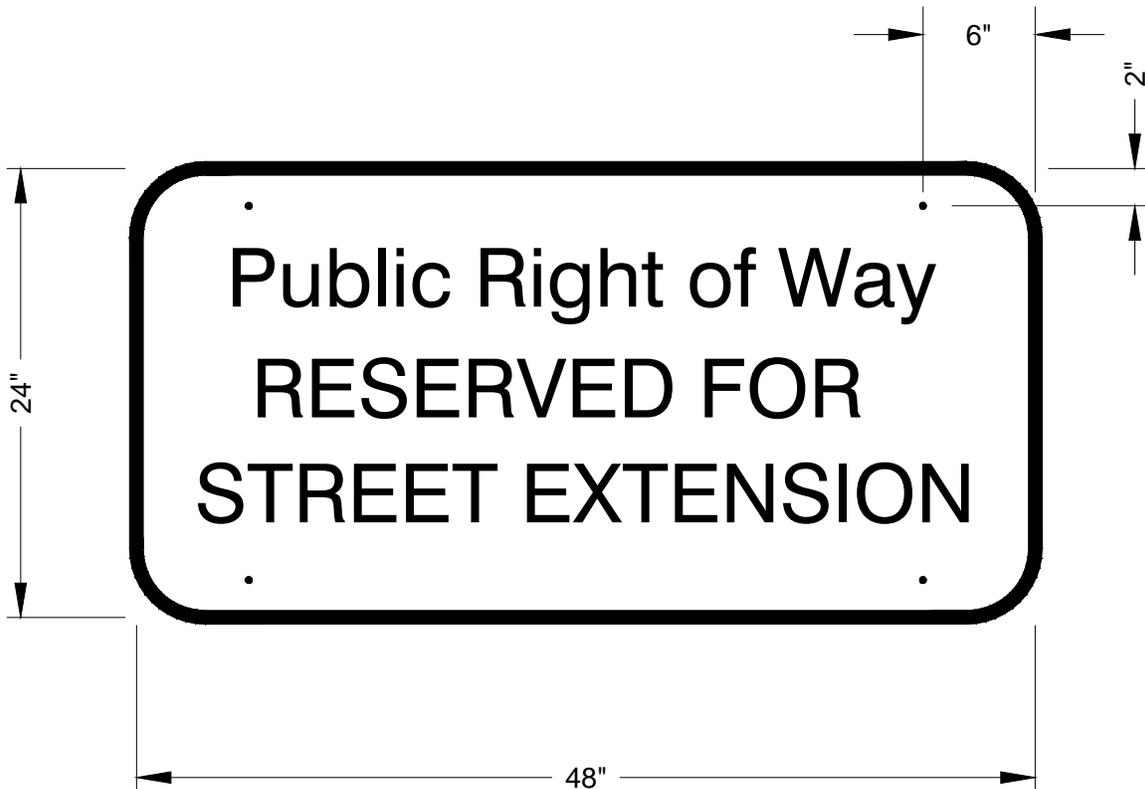
TYPE II  
RED/CLEAR OR  
YELLOW/YELLOW



TYPE I  
CLEAR OR  
YELLOW



NOTE:  
THE RED LENS OF THE TYPE II  
R.P.M. SHALL FACE THE INCORRECT  
TRAFFIC MOVEMENT



1. SIGN SHALL HAVE ASTM TYPE III GRADE REFLECTIVITY.
2. SIGN SHALL BE WHITE WITH BLACK LETTERING.
3. INCLUDE FOUR 3/8" DIAMETER HOLES FOR MOUNTING.
4. SIGN SHALL BE MOUNTED ON A TYPE III BARRICADE.

**CHAPTER 8 PEDESTRIAN FACILITIES DESIGN AND TECHNICAL CRITERIA**

**TABLE OF CONTENTS**

Section	Title	Page
1	<b>GENERAL</b>	
1.1	Order of Construction	
1.2	Adaptability	
1	Order of Construction	
1	Sidewalk and Driveway Closures	
1	Driveway Closures	
1	Driveway Arched	
1	Driveway	
2	<b>SIDEWALKS</b>	
2.1	Driveway Closures	
	A. Width.....	4
	B. Shy Distance.....	4
	C. Minimum Distance to Slope.....	4
	D. Concrete Requirements.....	5
	E. Concrete Thickness.....	5
	F. Sidewalk Crossings of Driveways and Alleys.....	5
	G. Sidewalk Elevation.....	5
	H. Slope.....	5
	I. Joints.....	5
	J. Finish.....	6
	K. Curing Compound.....	6
	L. Existing Sidewalks.....	6
	M. Storm Water Runoff at Curb Cuts.....	7
	<b>ACCESS AMPS</b>	
1	Order of Construction	
	A. Locations.....	7
	B. Width.....	7
	C. Slope.....	7
	D. Flared Sides.....	7
	E. Finish.....	7
	F. Curing Compound.....	8
	G. Detectable Warnings.....	8
	<b>MATERIALS</b>	
1	Order of Construction	



A. Width.....8  
 B. Materials .....8  
 C. Grades.....8  
 D. Asphalt Trail Requirements (By approval of the Trail Coordinator Only)9  
 E. Concrete Trail Requirements .....9  
 F. Trail Shoulders .....10  
 G. Tie Back Slopes .....10  
 H. Trail Signage .....10  
 I. Street Crosswalks .....10  
 J. Striping .....10  
 K. Location Criteria.....11  
 L. Overhead Clearance .....11  
 M. Drainage Design .....11  
 2 S d .....11  
 S I E A N E A I N S C A S E S .....11  
 P E S T I A N C O S S I N S .....11  
 P E S T I A N E A E A S .....11

**LIST OF TABLES**

*This Chapter Does Not Contain Tables*

**LIST OF FIGURES**

*This Chapter Does Not Contain Figures*



## CHAPTER 8 PEDESTRIAN FACILITIES DESIGN AND TECHNICAL CRITERIA

### 8.1 GENERAL

This chapter sets forth the minimum criteria to be used in the design of all sidewalks, access ramps, and other pedestrian facilities within the right-of-way, or other public easements.

#### 8.1.1 Reference Documents

Within this chapter, AASHTO's A Policy on Geometric Design of Highways and Streets, as published by the American Association of State Highway and Transportation Officials, and the ITE Designing Walkable Urban Thoroughfares were used as a reference.

#### 8.1.2 ADA Requirements

All pedestrian facilities shall be designed in accordance with American Disabilities Act (ADA) regulations and the requirements of these Standards. Any variances from these requirements shall be in accordance with ADA requirements and shall be approved by the City Engineer prior to construction.

#### 8.1.3 Obstructions

Manholes, utility poles or other appurtenances or obstructions, should not be located in sidewalks or trails unless specifically approved by the City Engineer. A minimum ADA accessible path of 3 feet in width should be provided that is free of such obstruction when feasible.

#### 8.1.4 Sidewalk Underdrains and Curb Cuts

Sidewalk underdrains shall not interfere with the pedestrian's use of the sidewalk. Underdrains shall not be located within an access ramp, curb cut, or driveway.

#### 8.1.5 Pedestrian Crosswalks

All crosswalks shall be marked in accordance with **Chapter 7, Traffic Control Devices**. Crosswalks will be required at all signalized intersections, school areas, and high pedestrian areas as designated by the City Engineer.

**1.1. Pedestrian Refuges on Arterials**

For Arterials with raised medians and on splitter islands for roundabouts, a pedestrian refuge area shall be created in the median to increase pedestrian safety. See **Figure 5-8 and Figure 5-9**.

**1.2. Safety Railings on Drops**

Safety railings will be required on any drop adjacent to a sidewalk/trail greater than 30" that has a slope of 1:1 or greater.

**2. SIDEWALKS**

**2.1. Sidewalks and Curb**

**A. Width**

Minimum sidewalk widths for the various street classifications shall be as specified in the City of Fayetteville Master Street Plan. The City Engineer may require additional width for activity areas and routes leading to and from these areas. The final sidewalk width shall be determined through additional study of higher pedestrian traffic areas.

When a sidewalk is located adjacent to the back of curb where on street parking is allowed, the sidewalk shall be widened by 1.5' to accommodate the car doors opening onto the sidewalk area.

**B. Shy Distance**

A shy distance of 2 feet is required where vertical barriers (walls, fences, signs, etc) greater than 3.5 feet in height are adjacent to the sidewalk and extend more than 4 feet in length parallel to the sidewalk. A shy distance of 1.5' is required from the back of curb. A shy distance of 1 foot is required for all other fixed obstacles. Shy distances shall be added to the minimum widths of sidewalks specified in the Master Street Plan or required by the City Engineer to determine the final sidewalk width.

**C. Minimum Distance to Slope**

There shall be a minimum of 1 foot between the sidewalk and the beginning of a slope.



**D. Concrete Requirements**

All sidewalks, access ramps and driveway approaches shall be constructed of a Portland Cement concrete mixture that includes at least 5.5 bags of cement per cubic yard and contains 4 to 7 percent air entrainment and that will produce a concrete of a compressive strength of 3,500 psi after 28 days set under standard laboratory methods.

**E. Concrete Thickness**

All sidewalks not within driveways shall be a minimum of 4 inches thick concrete. All sidewalks within a driveway shall be a minimum of 6 inches thick.

**F. Sidewalk Crossings of Driveways and Alleys**

Sidewalks shall be continuous through driveways and alleys. Sidewalks shall have an expansion joint at the edge of sidewalk opposite the street. The sidewalk edge adjacent to the street shall have at least 1 inch deep grooved joint mark (cannot be a saw cut) to clearly define the sidewalk through the driveway or alley.

**G. Sidewalk Elevation**

The back of sidewalk elevation shall be such that the slope from the back of sidewalk to the top of curb is 2% unless otherwise approved by the City Engineer.

**H. Slope**

1. *Cross Slope.* Sidewalk cross slopes shall be a minimum of 1 percent and a maximum of 2%. The cross slope shall be towards the street unless otherwise approved.
2. *Longitudinal Slope.* Longitudinal slope of sidewalks shall be consistent with the adjacent street slopes.
3. *ADA Requirements for Steeper Slopes.* Sidewalks with greater than 5 percent longitudinal slope or those not adjacent to a street, shall be constructed to meet ADA requirements by use of ramps and landings, construction of switchbacks, or other acceptable means.

**I. Joints**

1. *Material.* Expansion joint material shall be asphalt impregnated fiberboard meeting the requirements of AASHTO M213, or other joint material meeting the requirements of the latest edition of the AHTD standard specifications.

2. *Location.* Full depth expansion joints shall be provided where sidewalks abut drainage structures, retaining walls, building faces, and all other fixed objects. Expansion joint material shall be provided at each cold joint. One-quarter depth (1 inch) weakened plane joints, or saw-cut joints shall be placed in sidewalks at regular intervals not greater than the width of the sidewalk.
3. *Saw Joints.* Saw joints shall be filled with self leveling sealant such as Sonneborn SL1 or equivalent meeting the requirements of ASTM C 920, Type S.
3. *Joint Sealant.* All expansion joints and saw joints shall be sealed with joint sealant meeting the requirements of ASTM C 920, Type S. A self leveling sealant shall be used for horizontal surfaces. A non-sag sealant shall be used for vertical or nearly vertical surfaces.

**J. Finish**

All sidewalks shall have a broom finish.

**K. Curing Compound**

All sidewalks require the application of a concrete curing compound or the concrete is to be kept moist for seven (7) days.

**L. Existing Sidewalks**

When redevelopment is proposed on properties with existing sidewalks, the plans shall show the location of all existing and proposed sidewalk improvements. In accordance with Chapter 166.04 of the UDC, each development will be subject to review of the overall impact to the sidewalks to evaluate the extent of the sidewalk replacement.

Widening of the existing sidewalks to meet current sidewalk width standards is not allowed.

Removal and replacement of the existing sidewalks is required for all:

- a. Segments of the sidewalk, including ramps, that do not meet all applicable ADA standards, including cross slope and running slope.
- b. Segments that have cracked and/or settled to the extent that they are out of ADA compliance. This is defined as more than ¼ inch of vertical displacement or cracks or joints more than ½ inch wide.
- c. Segments that display surface spalling or other distress such that a trip hazard (more than ¼ inch vertical displacement) is created.
- d. Segments of sidewalk damaged during construction to the extent that any of the items above apply.



**M. Storm Water Runoff at Curb Cuts**

Drainage shall meet the requirements specified in **Chapter 4**, in the section/subsection titled **Drainage Systems/Sidewalk Culvert (Chases)**.

**ACCESS RAMP**

**1. ACCESS RAMP**

Access ramps shall be installed at all sides of all intersections and at certain mid-block locations for all new construction or reconstruction of curb and sidewalk. Access ramps shall meet ADA requirements to the maximum extent feasible.

**A. Locations**

Intersections. Two access ramps shall be included at all intersection corners. On T-intersections, corresponding access ramp are required opposite the intersecting street. Access ramps shall not be placed in designated parking areas nor in or across from driveways. Ramps shall be located to avoid conflicts with the storm drain inlet depressions.

**B. Width**

The minimum width of an access ramp shall be 48 inches excluding the flared sides.

**C. Slope**

The slope of the ramp shall not be greater than 8.33% (1:12) for all new developments.

In existing developed rights-of-way, it may be necessary to install a steeper ramp to provide access to street crossings. In an alteration, slopes as steep as 1:10 (10%) are permitted for the distance of a 6-inch rise if it is not technically feasible to provide a ramp at 1:12 (8.33%). For a 3-inch rise, the maximum slope may be as steep as 1:8 (12.5%) where necessary.

**D. Flared Sides**

The slope of the flared sides shall not be greater than 10% (1:10).

**E. Finish**

Access ramps shall have a broom finish.

**F. Curing Compound**

All access ramps require the application of a concrete curing compound or the concrete is to be kept moist for seven (7) days.

**G. Detectable Warnings**

Detectable warning devices (truncated domes) meeting ADA requirements shall be installed on all access ramps.

**11.03.01 MULTISECTORS**

**11.03.01.01 Trail Construction**

**A. Width**

The minimum width of trails shall be 12 feet and shall follow the trail cross-section guidelines of the Master Transportation Plan.

**B. Materials**

Selection of trail surface materials depends upon site conditions. Final determination of trail construction materials shall be made by the Trail Coordinator.

1. *Concrete.* Trails shall be constructed of concrete when located in or near floodprone areas, vehicular road crossings, access ramps and within street right of way.
2. *Asphalt.* Trails may be constructed of asphalt in areas where the trail is located above floodprone areas and away from vehicular traffic and street right of way.

**C. Grades**

All trails shall be constructed with a 2% maximum cross slope in the same direction as the existing grade unless otherwise designated to allow drainage to sheet flow across the trail. Trails adjacent to streets shall have 2% maximum cross slope towards the street. Longitudinal grade shall not exceed 5%. Longitudinal grade may be varied by the Trails Coordinator for sites with difficult topography. In such cases, the AASHTO longitudinal grade requirement for bicycles shall apply.



**D. Asphalt Trail Requirements (By approval of the Trail Coordinator Only)**

Asphalt trails shall be constructed of asphalt concrete hot mix surface course. Type III surface course meeting the requirements of AHTD Specifications. Asphalt trail sections shall be constructed to the following standards:

1. *Surface.* Asphalt trail sections shall have a minimum 3 inch thick surface.
2. *Base Course.* Base course for asphalt trails shall consist of a minimum 6 inch thickness of Class 7 aggregate compacted to 95% M.P.D.
3. *Subgrade.* The top 24 inches of subgrade shall meet the requirements of **Chapter 6**, Section 6.3.5 for street construction. Existing material not meeting these requirements shall be removed and replaced with approved select fill and compacted to 95% Standard Proctor Density (S.P.D.). Specific site conditions may require the additional undercut, placement of stone backfill or other methods in order to create a solid base.

**E. Concrete Trail Requirements**

All concrete portions of trails shall be constructed of a portland cement concrete mixture with a compressive strength of 3500 p.s.i. and with 4 to 7 percent air entrainment. Concrete trail sections shall be constructed to the following standards:

1. *Surface.* Concrete trail portions shall have a minimum 4 inch thick concrete surface reinforce with fibers or welded wire fabric with a medium broom finish.
2. *Base Course.* Base course for concrete trails shall consist of a 4 inch minimum thickness of class 7 aggregate compacted to 95% M.P.D.
3. *Subgrade.* The top 24 inches of subgrade shall meet the requirements of **Chapter 6**, Section 6.3.5 for street construction. Existing material not meeting these requirements shall be removed and replaced with approved select fill and compacted to 95% Standard Proctor Density (S.P.D.). Specific site conditions may require the additional undercut, placement of stone backfill or other methods in order to create a solid base. This requirement does not apply where trails are constructed within the right of way adjacent to a street.
4. *Expansion joints.* Full depth expansion joints shall be provided where trails abut drainage structures, retaining walls, building faces, and all other fixed objects. Expansion joint material shall be provided at each cold



joint. Expansion joint material shall be asphalt impregnated fiberboard meeting the requirements of AASHTO M213, or other joint material meeting the requirements of the latest edition of the AHTD standard specifications.

5. *Contraction Joints.* One inch depth weakened plane joints, or saw-cut joints, shall be placed in trail at regular intervals matching the trail width, but not greater than 12 feet apart.
6. *Joint Sealant.* All expansion joints and saw joints shall be sealed with joint sealant such as Sonneborn SL! meeting the requirements of ASTM C 920, Type S. A self leveling sealant shall be used for horizontal surfaces. A non-sag sealant shall be used for vertical or nearly vertical surfaces.

#### **F. Trail Shoulders**

A two foot shoulder adjacent to the trail shall be graded smooth and should not exceed 2% cross-slope in the same direction as the trail. The Trail Coordinator shall determine the appropriateness and maintenance requirements of plants and grasses adjacent to trails.

#### **G. Tie Back Slopes**

The ground beyond the shoulder shall meet the existing grade with a maximum slope of 3:1. A swale may be required on the uphill side of the trail to direct stormwater runoff to a storm sewer system or culvert crossing. These may be required where runoff is concentrated onto the trail.

#### **H. Trail Signage**

Trail signage shall comply with the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities.

#### **I. Street Crosswalks**

Trails that intersect and cross public streets shall have a red concrete crosswalk with two foot wide white thermoplastic stripes on each side. Where appropriate, this crosswalk may be raised 2.5 inches above pavement surface. The concrete shall be colored with integral color mix (Soloman Dry Pigment 417 Apple Red with 4% loading) or with thermoplastic (Decomark Herringbone Patter, Brick Red).

#### **J. Striping**

Striping shall conform to the Manual on Uniform Traffic Control Devices, Part 9 – Traffic Controls for Bicycle Facilities. Additional striping may be required for increased safety.



**K. Location Criteria**

Multi-use trail locations shall be based on safety, circulation, and access considerations.

**L. Overhead Clearance**

All multi-use trails shall have a minimum of 10 feet clear vertical distance above the path.

**M. Drainage Design**

All culvert crossings shall be designed to carry the 10-year storm event.

**2. Speed**

For paved surfaces a minimum design speed of 20 mph shall be used. Where grades exceed 4 percent, a design speed of 30 mph shall be used.

**SIDEWALK UNDERDRAIN CASES**

Sidewalk underdrains shall not interfere with the pedestrian’s use of the sidewalk. Underdrains shall not be located within an access ramp, curb cut, or driveway.

**PEDESTRIAN CROSSINGS**

All crosswalks shall be marked in accordance with **Chapter 7, Traffic Control Devices**. Crosswalk markings will be required at all signalized intersections, school areas, and high pedestrian areas as designated by the City Engineer.

**PEDESTRIAN REFUGE AREAS**

For Arterials with raised medians and on splitter islands for roundabouts, a pedestrian refuge area shall be created in the median to increase pedestrian safety. See **Figure 5-8 and Figure 5-9**.





**CHAPTER 9 – ON-STREET BICYCLE FACILITIES DESIGN AND TECHNICAL CRITERIA**

**TABLE OF CONTENTS**

SECTION	TITLE	PAGE
1	GENERAL	
1.1	Introduction	
1.2	Major Provisions	
1	Other	
2	ON-STREET BICYCLE LANES DESIGN ELEMENTS	
2.1	On-Street	
2.2	Shared Street	
2	Other	

**LIST OF TABLES**

*This Chapter Does Not Contain Tables*

**LIST OF FIGURES**

*This Chapter Does Not Contain Figures*





## CHAPTER 9 ON-STREET BICYCLE FACILITIES DESIGN AND TECHNICAL CRITERIA

### 9 GENERAL

This chapter sets forth the minimum criteria to be used in the design of all bike lanes, bike paths, or other bicycles facilities within the City’s rights-of-way.

#### 9.1 REFERENCES

In this chapter, the AASHTO “Guide for the Development of Bicycle Facilities” as published by the American Association of State Highway and Transportation Officials, the National Association of City Transportation Officials Urban Bikeway Design Guide and the Manual on Uniform Traffic Control Devices were used as references.

#### 9.2 City of Active Transportation Plan

This subsection was developed based on the **City of Active Transportation Plan (ATP)**. All projects shall optimize bicycle travel within the city by providing bicycle facilities in all new developments in accordance with this plan.

#### 9.3 Obstructions

Manholes, utility poles or other appurtenances or obstructions, should not be located in bike lanes or bike paths.

### 10 ON-STREET BIKE LANES DESIGN REQUIREMENTS

#### 10.1 On-Street Bicycle Routes

Specific streets are designated in the **City of Fayetteville Alternative Transportation and Trails Master Plan** as on-street bicycle routes. Streets designated as on-street bicycle routes shall be designed with additional width for bike lanes in accordance with the master street plan.

#### 10.2 Standard Cross Sections

The bike lane shall be designed with widths shown in standard street classification sections. Bicycle lanes on one-way streets shall be on the right side of the street,



unless otherwise specified by the City Engineer. Bike lane width shall not be less than 5 feet measured from the face of curb or edge of pavement if no curb exists.

**2. Sign and Striping**

All designated bike lanes shall be signed and striped, as required by MUTCD and as required in **Chapter 7, Traffic Control Devices**.

**2. Intersections**

At the intersections where a separate right turn lane exists and is striped, the bicycle lane shall transition and be placed between the through lane and the right turn lane. The bike lane width shall remain the same as the approaching bike lane. See **Figures 5-8 and 5-9 in Chapter 5, Intersections**.



**CHAPTER 10 NEIGHBORHOOD TRAFFIC SAFETY**

**TABLE OF CONTENTS**

Section	Title	Page
101	GENERAL	
1011	Intermodal	
102	TRAFFIC SAFETY PROGRAMS	
1021	Speed	
1022	Motorist Speed	
102	Intermodal Construction	
102	Pedestrian Safety	
100	TRAFFIC CAMMIN DESIGN CRITERIA	
1001	Intermodal - O	
	A. Appropriate Locations	6
	B. Typical Uses	6
	C. Signing and Markings	6
	D. Other Considerations	7
	E. Advantages	7
	F. Disadvantages	7
1002	Construction	
	A. Appropriate Locations	7
	B. Typical Uses	7
	C. Signing and Markings	7
	D. Advantages	7
	E. Disadvantages	7
1000	Construction	
	A. Appropriate Locations	8
	B. Typical Uses	8
	C. Signing and Markings	8
	D. Advantages	8
	E. Disadvantages	8
1000	Other	
	A. Appropriate Locations	8
	B. Typical Uses	8
	C. Signing and Markings	8
	D. Advantages	9
	E. Disadvantages	9
1000	Construction	
	A. Appropriate Locations	9
	B. Typical Uses	9



	C. Signing and Markings .....	9
	D. Other Considerations.....	9
	E. Advantages.....	9
	F. Disadvantages .....	9
<b>1</b>	<b>C</b> .....	<b>1</b>
	A. Appropriate Locations .....	10
	B. Typical Uses .....	10
	C. Signing and Markings .....	10
	D. Other Considerations.....	10
	E. Advantages.....	10
	F. Disadvantages .....	10
<b>1</b>	<b>T</b> - <b>S</b> <b>P</b> .....	<b>11</b>
	A. Appropriate Locations .....	11
	B. Typical Uses .....	11
	C. Signing and Markings .....	11
	D. Other Considerations.....	11
	E. Advantages.....	11
	F. Disadvantages .....	11
<b>1</b>	<b>Tr</b> <b>Cr</b> .....	<b>12</b>
	A. Appropriate Locations .....	12
	B. Typical Uses .....	12
	C. Signing and Markings .....	12
	D. Other Considerations.....	12
	E. Advantages.....	12
	F. Disadvantages .....	12
<b>1</b>	<b>T</b> <b>r</b> <b>d</b> <b>Cr</b> .....	<b>1</b>
	A. Appropriate Locations .....	13
	B. Typical Uses .....	13
	C. Advantages.....	13
	D. Disadvantages .....	13
<b>1</b>	<b>S</b> <b>d</b> <b>T</b> .....	<b>1</b>
	A. Appropriate Locations .....	13
	B. Typical Uses .....	13
	C. Signing and Markings .....	14
	D. Other Considerations.....	14
	E. Advantages.....	14
	F. Disadvantages .....	14
<b>1</b>	<b>11</b> <b>d</b> <b>Cr</b> .....	<b>1</b>
	A. Appropriate Locations .....	14
	B. Typical Uses .....	14
	C. Signing and Markings .....	14
	D. Other Considerations.....	15



E. Advantages..... 15

F. Disadvantages ..... 15

**10-12 Island**..... 15

A. Appropriate Locations..... 15

B. Typical Uses ..... 15

C. Signing and Markings..... 15

D. Other Considerations..... 15

E. Advantages..... 16

F. Disadvantages ..... 16

**10-12 O-Square**..... 16

A. Appropriate Locations..... 16

B. Typical Uses ..... 16

C. Advantages..... 16

D. Disadvantages..... 16

**LIST OF TABLES**

*This Chapter Does Not Contain Tables*

**LIST OF FIGURES**

*Figures are Located at End of Chapter*

- Figure 10-1 Intersection Bulb-Out
- Figure 10-2 Center Island Narrowing
- Figure 10-3 Gateway Treatment
- Figure 10-4 Oval Median
- Figure 10-5 Choker
- Figure 10-6 Chicane
- Figure 10-7 Two-Lane Slow Point
- Figure 10-8 Traffic Circle
- Figure 10-9 Speed Table
- Figure 10-10 Elongated Speed Table
- Figure 10-11 Raised Crosswalk
- Figure 10-12 Raised Intersection



## CHAPTER 10 NEIGHBORHOOD TRAFFIC SAFETY

### 101 GENERAL

This chapter presents acceptable methods of neighborhood traffic calming that are determined by the City to be necessary for existing Local streets. This chapter also provides for specific design criteria for a number of traffic calming methods.

#### 1011 Intended Use

The necessity or desire for traffic safety and calming stems from the perception that local streets, particularly in residential areas, do not always function as intended. These roadways should be low traffic volume roadways used for direct access to residences on the street. They are also intended as a multi-modal system that is shared by vehicular, bicycle, and pedestrian traffic in a manner that minimally impacts residents in these areas.

### 102 TRAFFIC SAFETY PROBLEMS

The presence of too many vehicles traveling at high speeds through a neighborhood diminishes that neighborhood's quality of life. Traffic calming measures are intended to minimize these issues and return the quality of life to the neighborhood. Care must be taken by the designer so that the installation of traffic calming devices does not create unintended hazards that delay emergency response or jeopardize the safety of bicyclists, pedestrians or motorists.

#### 1021 Speeding

Speeding may occur on roadways that allow the driver to feel safe while exceeding the posted speed limit. Factors that contribute to this perception include long, unbroken lines of sight, steep roadway grades, wide roadways, low density developments, low pedestrian activity, and large building setbacks. In addition, speeding may occur when the street functions as a higher classification street than originally intended.

#### 1022 Measuring Speed Standard

The standard method of measuring speed on any street is the determination of the 85<sup>th</sup> percentile speed. The 85<sup>th</sup> percentile speed is the speed at which or below which 85 percent of the vehicles travel. If the 85<sup>th</sup> percentile speed is at or below the posted speed limit, then speeding is not considered a problem. However, if the 85<sup>th</sup> percentile speed is over the posted speed limit by 5 miles per hour or greater,



either the posted speed limit may be inappropriate or a speeding problem may exist.

### 102 Intrusion Cut-Through Traffic

Intrusion is increased volume or excessive non-local traffic along a neighborhood street. This cut-through traffic is caused by drivers who use a local street to go through a neighborhood and save time on their trip. These streets, which are less impeded than others, will often invite cut-through traffic. Routes that are perceived to be time-saving will attract more traffic. This increased cut-through traffic can cause local streets to function more like a collector.

### 102 Pedestrian Safety

Pedestrian safety negatively impacted by speeding vehicles, cut-through traffic, or a combination of these problems. The high concern areas are in the vicinity of neighborhood schools and parks or mid-block pedestrian crossings, particularly on streets with on-street parking. These areas require special consideration for the mobility and safety of the pedestrian.

## 100 Traffic Calming Design Criteria

### 1001 Intersection-Only

Bulb-outs are areas of expanded curbing, at intersections, that narrow the overall street width and protect on street parking. See **Figure 10-1**.

#### A. Appropriate Locations

1. Appropriate for local streets.
2. Works well in downtown areas.
3. Primarily used at intersections.

#### B. Typical Uses

1. Reduce the crossing distance for pedestrians.
2. Improve the line of sight for pedestrians.
3. Make pedestrians more visible to oncoming traffic.
4. Slow traffic by funneling it through a narrower street opening.

#### C. Signing and Markings

Bulb-outs can be used with the standard intersection signage.



**D. Other Considerations**

Impact on roadway drainage must be addressed. Drainage may be provided by devices such as inlets, concrete channels, valley gutters, etc...

**E. Advantages**

1. Improve pedestrian safety.
2. Reduce vehicle speeds.
3. May slow right-turning vehicles.
4. Prevent parking close to intersections.
5. Can improve neighborhood appearance with landscaping.

**F. Disadvantages**

1. Can result in loss of on-street parking space.
2. May make it difficult to accommodate bicycle lanes.
3. Challenging drainage patterns.
4. Landscaping maintenance.

**10-2 Center Island Narrowing**

Center Island Narrowing are areas of curbed or painted islands located before an intersection or mid-block along the centerline of a street. See **Figure 10-2**.

**A. Appropriate Locations**

1. Appropriate for local streets.

**B. Typical Uses**

Slow traffic by narrowing the roadway with a median and to increase pedestrian safety by providing a refuge halfway across the street, so that only one direction of traffic need be crossed at a time.

**C. Signing and Markings**

Reflectors and street lighting are recommended to improve visibility.

**D. Advantages**

1. Improve pedestrian safety.
2. Reduce vehicle speeds.
3. Can improve neighborhood appearance with landscaping.

**E. Disadvantages**

1. Can result in loss of on-street parking space.
2. May make it difficult to accommodate bicycle lanes.
3. Landscaping maintenance.
4. May restrict access.



**10-3 Gateway Treatments**

Gateway Treatments are short medians at the entrance to a residential street. See **Figure 10-3**.

**A. Appropriate Locations**

1. Appropriate for local streets.

**B. Typical Uses**

Slow traffic as they turn into the street and to limit the exit to a single lane.

**C. Signing and Markings**

Reflectors and street lighting are recommended to improve visibility.

**D. Advantages**

1. Reduce vehicle entry speeds.
2. Prevents drivers from forming a second lane.
3. Can improve neighborhood appearance with landscaping.
4. Does not restrict access for residents.
5. Improve pedestrian safety.

**E. Disadvantages**

1. Can result in loss of on-street parking space.
2. May make it difficult to accommodate bicycle lanes.
3. Landscaping maintenance.

**10-4 Oval Medians**

Oval Medians are curbed oval shaped medians located mid-block See **Figure 10-4**.

**A. Appropriate Locations**

1. Appropriate for local streets.
2. Appropriate on streets having volumes less than 3,500 vehicles per day.

**B. Typical Uses**

Slow traffic by narrowing the roadway with a median.

**C. Signing and Markings**

Reflectors and street lighting are recommended to improve visibility.



**D. Advantages**

1. Reduce vehicle speeds.
2. Can improve neighborhood appearance with landscaping.
3. Does not restrict access for residents.

**E. Disadvantages**

1. Can result in loss of on-street parking space.
2. May make it difficult to accommodate bicycle lanes.
3. Landscaping maintenance.

**10-10-10 C-10-10-10**

Chokers are areas of curbing, typically mid-block, that narrow the overall street width. See **Figure 10-5**.

**A. Appropriate Locations**

1. Appropriate for local streets.
2. Appropriate on streets having volumes less than 3,500 vehicles per day.

**B. Typical Uses**

Slow traffic by funneling it through a narrower street opening.

**C. Signing and Markings**

The “Road Narrows” Sign (W5-1) with an appropriate “Advisory Speed” Sign (W13-1) should be used at least 150 feet in advance of the choker. Reflectors and street lighting are also recommended to improve visibility.

**D. Other Considerations**

Impact on roadway drainage must be addressed. Drainage may be provided by devices such as inlets, concrete channels, valley gutters, etc...

**E. Advantages**

1. Improve pedestrian safety.
2. Reduce vehicle speeds.
3. Can improve neighborhood appearance with landscaping.

**F. Disadvantages**

1. Can result in loss of on-street parking space.
2. May make it difficult to accommodate bicycle lanes.
3. Challenging drainage patterns.
4. Landscaping maintenance.



**1** ■■■■ **C** ■■■■■■

A chicane is a series of three curb bulb-outs staggered on alternating sides of the street, at a mid-block location, which forces vehicles to negotiate the narrowed roadway in a snake-like fashion. See **Figure 10-6**.

**A. Appropriate Locations**

1. Appropriate on local streets having volumes less than 3,500 vehicles per day.
2. Appropriate on two-lane, two-way streets or on one-lane, one-way streets.

**B. Typical Uses**

1. Slows vehicles by forcing motorists to weave through the bulb-outs.

**C. Signing and Markings**

1. The “Road Narrows Sign” (W5-1) with an appropriate “Advisory Speed Sign” (W13-1) should be used at least 150 feet in advance of the chicane. Object Markers (OM-3R, OM-3L), may be installed within the Chicanes if necessary. Reflectors, street lighting and landscaping are also recommended to improve visibility.

**D. Other Considerations**

1. Traffic volumes should be balanced in each direction. Chicanes lose effectiveness when volumes are significantly unbalanced.
2. Chicanes may not be appropriate in areas with high truck traffic.
3. Avoid locations where grades exceed 8 percent.
4. Placement of chicanes will depend on site conditions and driveway locations.

**E. Advantages**

1. Reduce vehicle speeds.
2. Reduce traffic volume.
3. May reduce collisions.
4. Traffic noise may be reduced due to lower speeds and volume.
5. Can improve neighborhood appearance with landscaping.

**F. Disadvantages**

1. Can result in loss of on-street parking space.
2. With two-lane chicanes, motorists may cross the centerline to maintain a straight line of travel.
3. Landscaping maintenance.



**10-10 Two-Lane Slow Point**

A Two-Lane Slow Point is a pair two islands with an angled median in between, at a mid-block location, which forces vehicles to negotiate the narrowed roadway in a snake-like fashion. See **Figure 10-7**.

**A. Appropriate Locations**

1. Appropriate on local streets having volumes less than 3,500 vehicles per day.
2. Appropriate on two-lane, two-way streets or on one-lane, one-way streets.

**B. Typical Uses**

1. Slows vehicles by forcing motorists to weave through the Slow Point.

**C. Signing and Markings**

1. The “Road Narrows Sign” (W5-1) with an appropriate “Advisory Speed Sign” (W13-1) should be used at least 150 feet in advance of the Slow Point. Object Markers (OM-3R, OM-3L), may be installed within the Slow Point if necessary. Reflectors, street lighting and landscaping are also recommended to improve visibility.

**D. Other Considerations**

1. Traffic volumes should be balanced in each direction. Slow Points lose effectiveness when volumes are significantly unbalanced.
2. Slow Points may not be appropriate in areas with high truck traffic.
3. Avoid locations where grades exceed 8 percent.
4. Placement of Slow Points will depend on site conditions and driveway locations.

**E. Advantages**

1. Reduce vehicle speeds.
2. Reduce traffic volume.
3. May reduce collisions.
4. Traffic noise may be reduced due to lower speeds and volume.
5. Can improve neighborhood appearance with landscaping.

**F. Disadvantages**

1. Can result in loss of on-street parking space.
2. Landscaping maintenance.



## 10-10 Traffic Circles

Traffic circles are raised islands located in the center of an unsignalized intersection. All traffic must negotiate the circle and circulate in a counterclockwise direction. See **Figure 10-8**.

### A. Appropriate Locations

1. Appropriate on local streets having volumes less than 3,500 vehicles per day.
2. Appropriate on streets without high pedestrian or left-turning volumes.

### B. Typical Uses

1. Slows vehicles due to the horizontal deflection.

### C. Signing and Markings

1. The use of the “Advance Traffic Circle Warning Sign” (W6-4) with an appropriate “Advisory Speed Sign” (W13-1) is recommended in advance of the first traffic circle encountered on each street.

### D. Other Considerations

1. Depending on the intersection configuration, the shape of the traffic circle may not actually be round.
2. Turning analysis should be completed to ensure that the design vehicle can negotiate the circle. A mountable concrete apron may be used to accommodate emergency service vehicles, trucks and buses.
3. Traffic circles may require additional street lighting.

### E. Advantages

1. Reduce vehicle speeds.
2. Reduces the number of potential conflict points at an intersection.
3. May reduce collisions.
5. Can improve neighborhood appearance with landscaping.
6. Creates a visual obstruction that deters through traffic.

### F. Disadvantages

1. May make it difficult for emergency vehicles, buses, and trucks to turn left.
2. May require removal of some on-street parking. The prohibition of parking for 30 feet from the intersection is recommended.
3. Landscaping maintenance.
4. Additional right of way may be necessary.



## 10000 Textured Crosswalk

Textured crosswalks are the use of pavers, imprinted concrete/asphalt, or other materials to demarcate crosswalks and alert motorists that they are entering a pedestrian-friendly area.

### A. Appropriate Locations

1. Appropriate on all street classifications where high pedestrian volume exists.
2. May be used on streets posted up to 45 mph.

### B. Typical Uses

1. Often used in combination with raised crosswalks, raised intersections or bulb-outs.

### C. Advantages

1. Improved street appearance.
2. Alerts motorist to the possible presence of pedestrians.

### D. Disadvantages

1. Virtually no effect on traffic speeds or volumes.
2. Extra noise may be produced from vehicles passing over the textured surface.
3. Heavily textured surface may present a traction problem for bicyclists, wheelchairs or disabled persons.

## 10001 Speed Table

A speed table is a raised surface on the roadway that is typically 3” in height and 12 to 22 feet in length. See **Figure 10-9 and 10-10**.

### A. Appropriate Locations

1. Appropriate on local streets having volumes less than 3,500 vehicles per day with posted speeds of 30 mph or less.
2. Primarily used in mid-block locations.

### B. Typical Uses

1. Within typical residential travel speeds, speed tables encourage motorists to slow to a safe speed at or below the speed limit.



**C. Signing and Markings**

1. The Speed Table Warning Sign (W16-1) is recommended to be installed 100 feet in advance of speed tables, at the table, or in both locations. For a series of tables, the sign may be used at the first table in the series,
2. The pavement markings as shown in Figures 10-4 and 10-5 shall be used for all speed tables.

**D. Other Considerations**

1. Speed tables should be placed 250 to 600 feet apart.
2. Typically, speed tables should not be placed within 150 feet of an intersection.
3. Speed tables should not be used on curves.
4. Speed tables should not be used on streets with a grade of 8% or greater.
5. Speed tables should not be used on streets without curbing.

**E. Advantages**

1. Reduce vehicle speeds.
2. Relatively inexpensive to install and maintain.

**F. Disadvantages**

1. Drainage must be accommodated.
2. Should be avoided on emergency routes.
3. Rutting and pavement damage in retro-fit situations.

**10-11 Raised Crosswalks**

Raised crosswalks are marked and elevated pedestrian areas that are an extension of the sidewalk at intersections or mid-block locations. Raised crosswalks are typically 3 to 6 inches above street level. See **Figure 10-11**.

**A. Appropriate Locations**

1. Appropriate on local streets having volumes less than 3,500 vehicles per day with posted speeds of 30 mph or less.

**B. Typical Uses**

1. Reduce vehicle speeds.
2. Improve visibility of pedestrians.

**C. Signing and Markings**

1. The “Raised Pedestrian Crossing Warning Sign” (W11A-3) is recommended to be installed with each raised pedestrian crossing.



**D. Other Considerations**

1. Most appropriately used at areas with significant pedestrian crossings.
2. Most effective when combined with textured crosswalks and bulb-outs.
3. Drainage inlets should be installed on the uphill side of the raised crosswalk.
4. All ADA requirements must be met.

**E. Advantages**

1. Reduce vehicle speeds.
2. Improves visibility of pedestrians.

**F. Disadvantages**

1. Drainage must be accommodated.
2. May slow emergency vehicles.

**10-12 Raised Intersections**

Raised Intersections are intersections, including crosswalks, which are raised 3 to 6 inches above street level. See **Figure 10-12**.

**A. Appropriate Locations**

1. Commonly found in commercial areas and business districts with high pedestrian activity.
2. They are appropriate on local and collector streets.
3. They are appropriate on streets with volumes up to 10,000 ADT.

**B. Typical Uses**

1. Reduce vehicle speeds on all approaches.
2. Decrease conflicts between vehicles and pedestrians by better demarcating crossing areas and elevating pedestrians above the street.

**C. Signing and Markings**

1. Advance warning signs should be posted. The “Raised Pedestrian Crossing” sign (W11A-3) is recommended.

**D. Other Considerations**

1. If raised intersections are the same height as the surrounding curb, a slight lip or other tactile measure should be used as a warning to the visually impaired.
2. Textured pavement treatments and curb extensions are often used in conjunction with raised intersections.



**E. Advantages**

1. Improves visibility of pedestrians.
2. Visual enhancement.
3. Reduction in vehicle speeds.

**F. Disadvantages**

1. Expensive to construct.
2. May slow emergency vehicles.
3. May disrupt drainage.

**10-12 On-Street Parking**

On-street parking creates the appearance of a narrower roadway. The proximity of parked vehicles and opening doors tends to slows traffic.

**A. Appropriate Locations**

1. Commonly found in commercial areas and business districts, but may be used on any street of adequate width.

**B. Typical Uses**

1. Reduce vehicle speeds.
2. Provide additional parking spaces for businesses and residents.

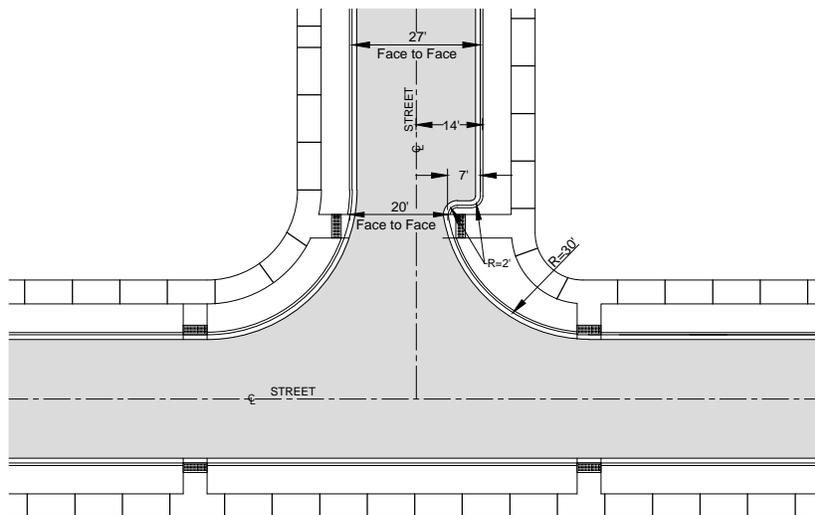
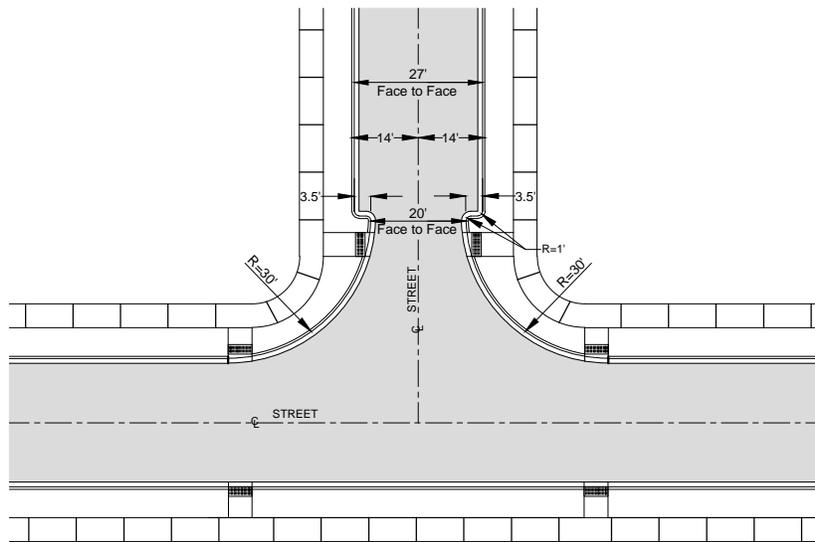
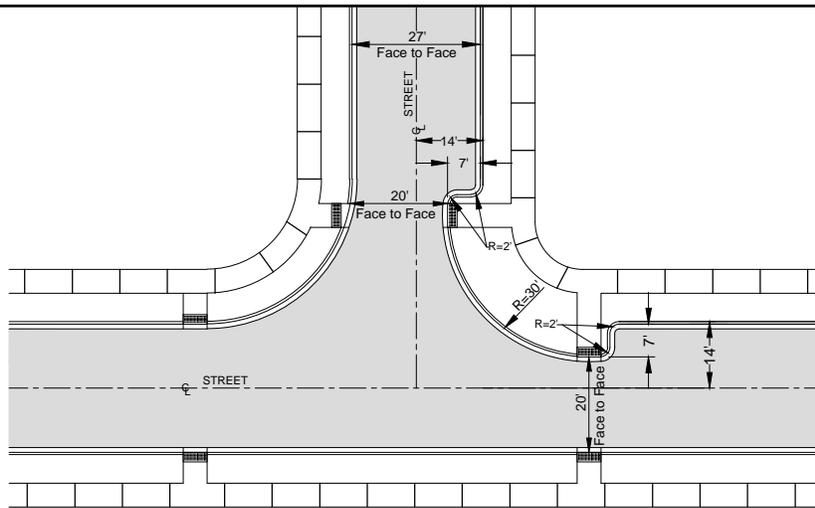
**C. Advantages**

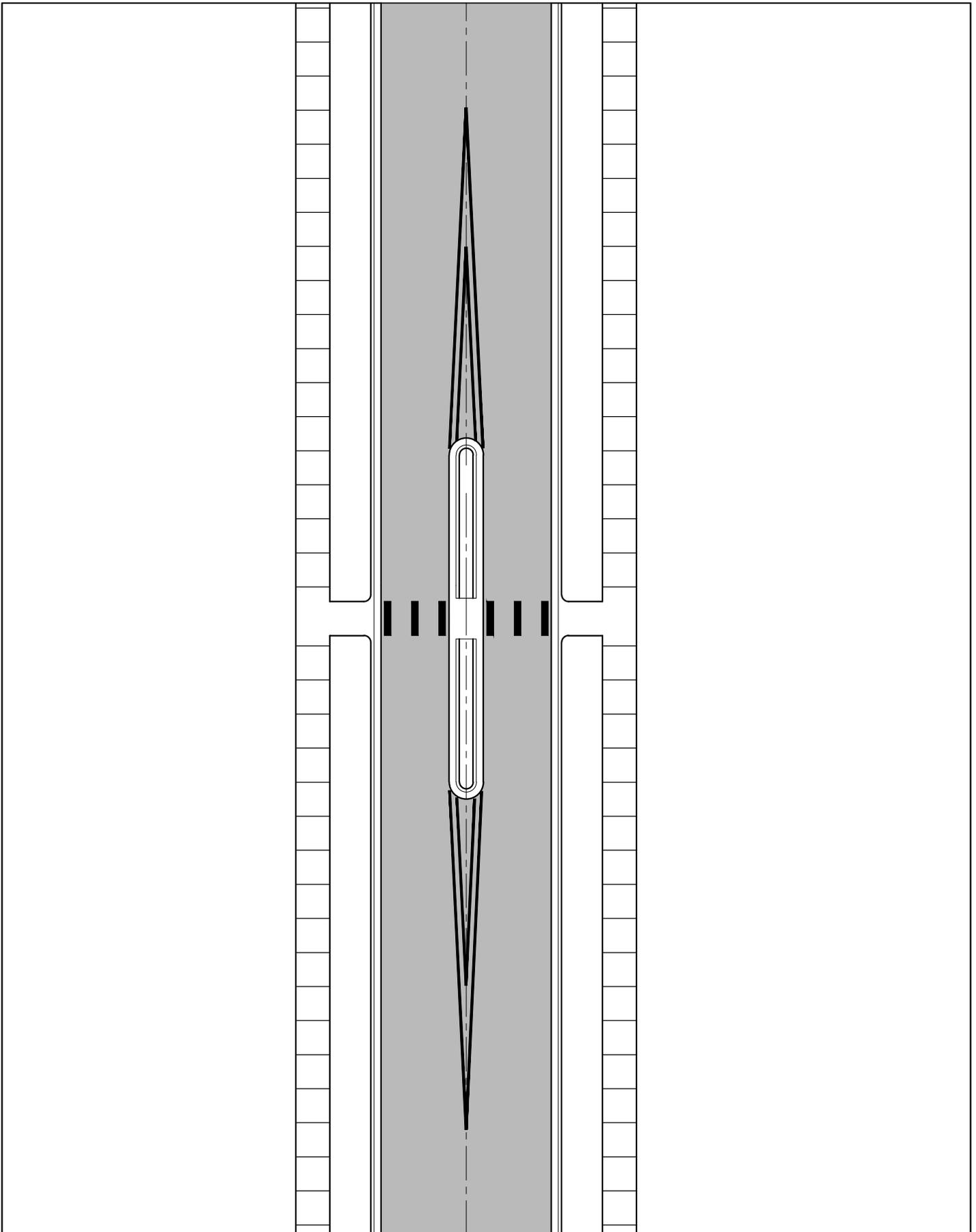
1. Creates a buffer between pedestrians and moving vehicles.
2. Reduction in vehicle speeds.

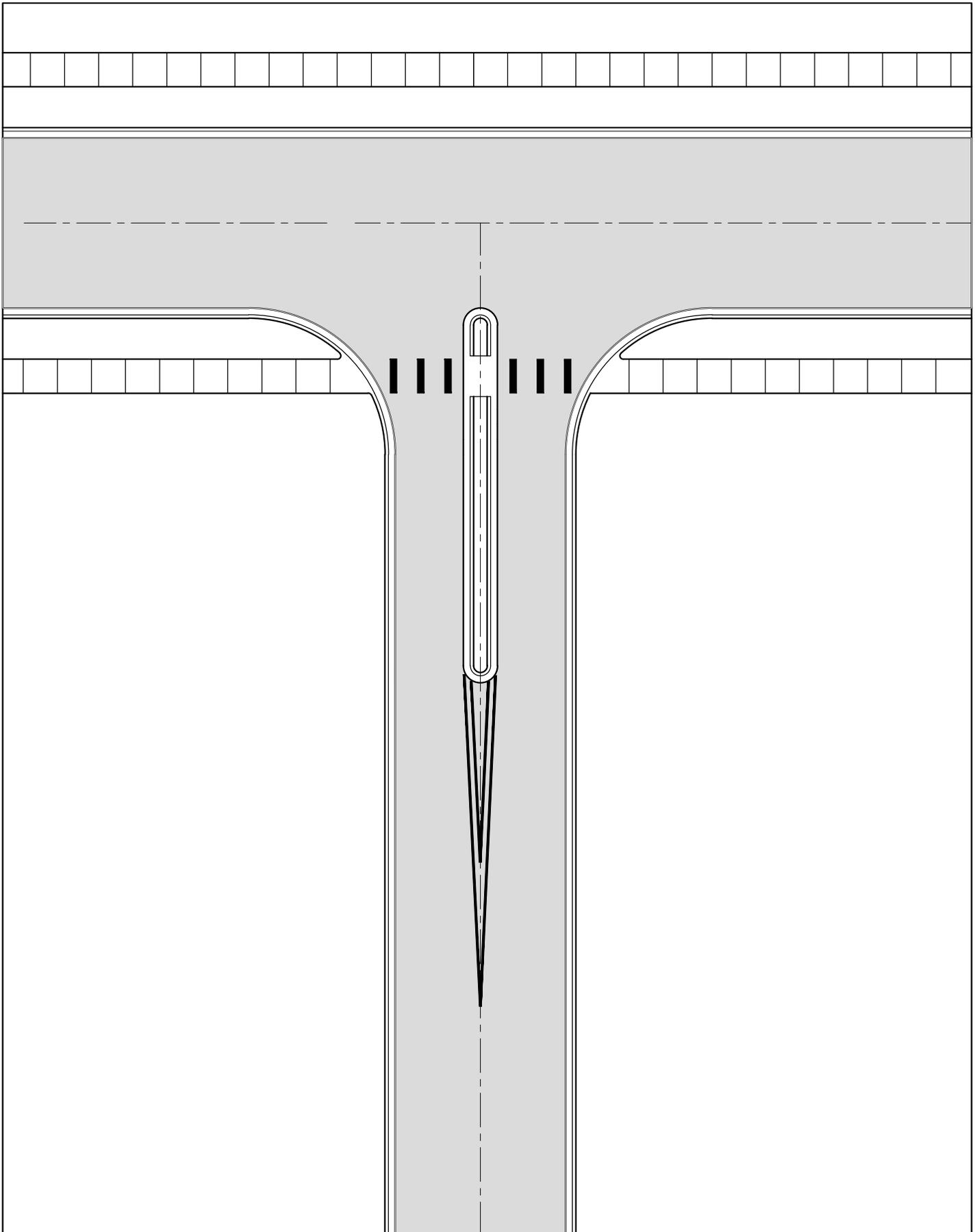
**D. Disadvantages**

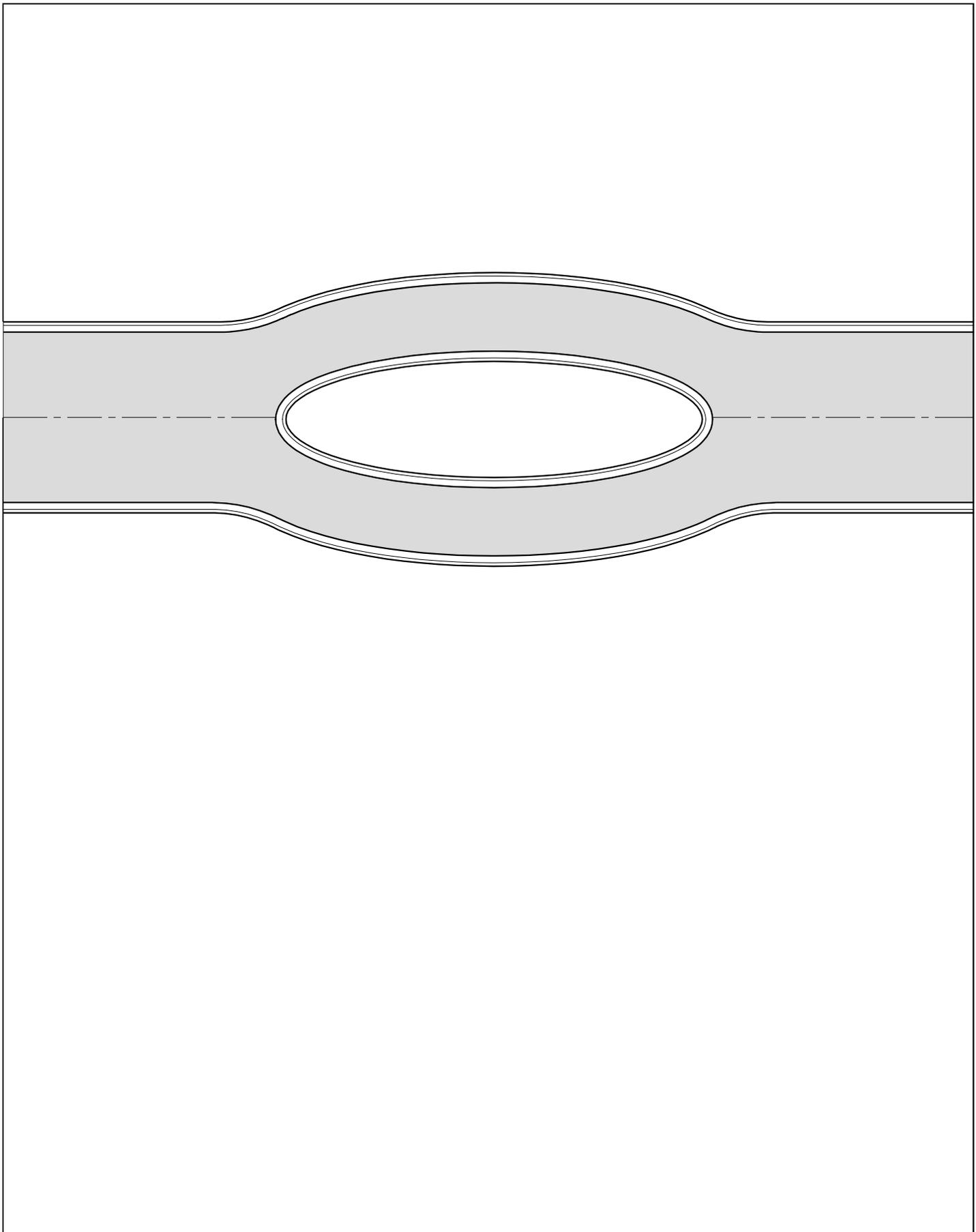
1. ROW Impacts
2. Disruption of traffic flow while motorist is parking.
3. May disrupt drainage.

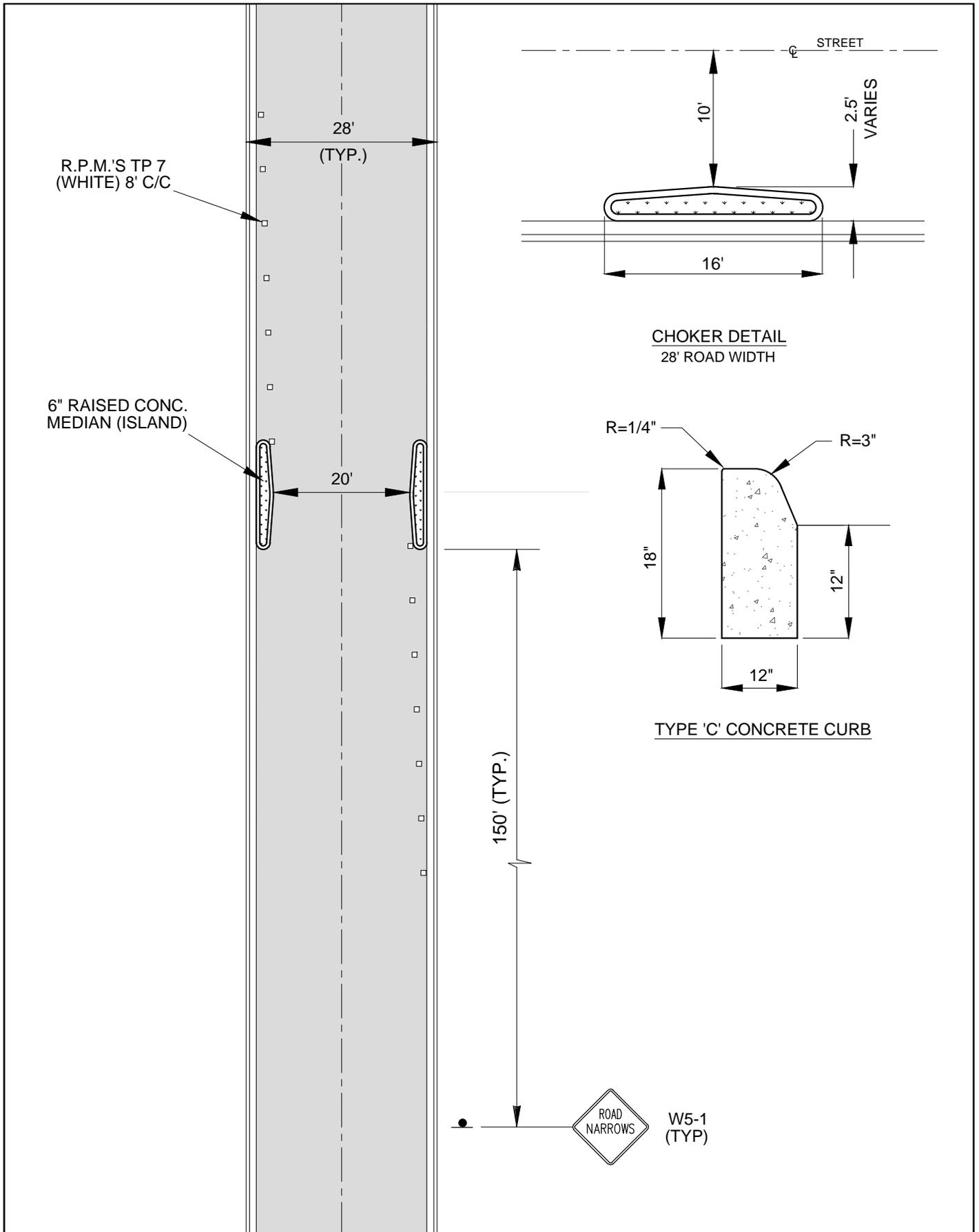


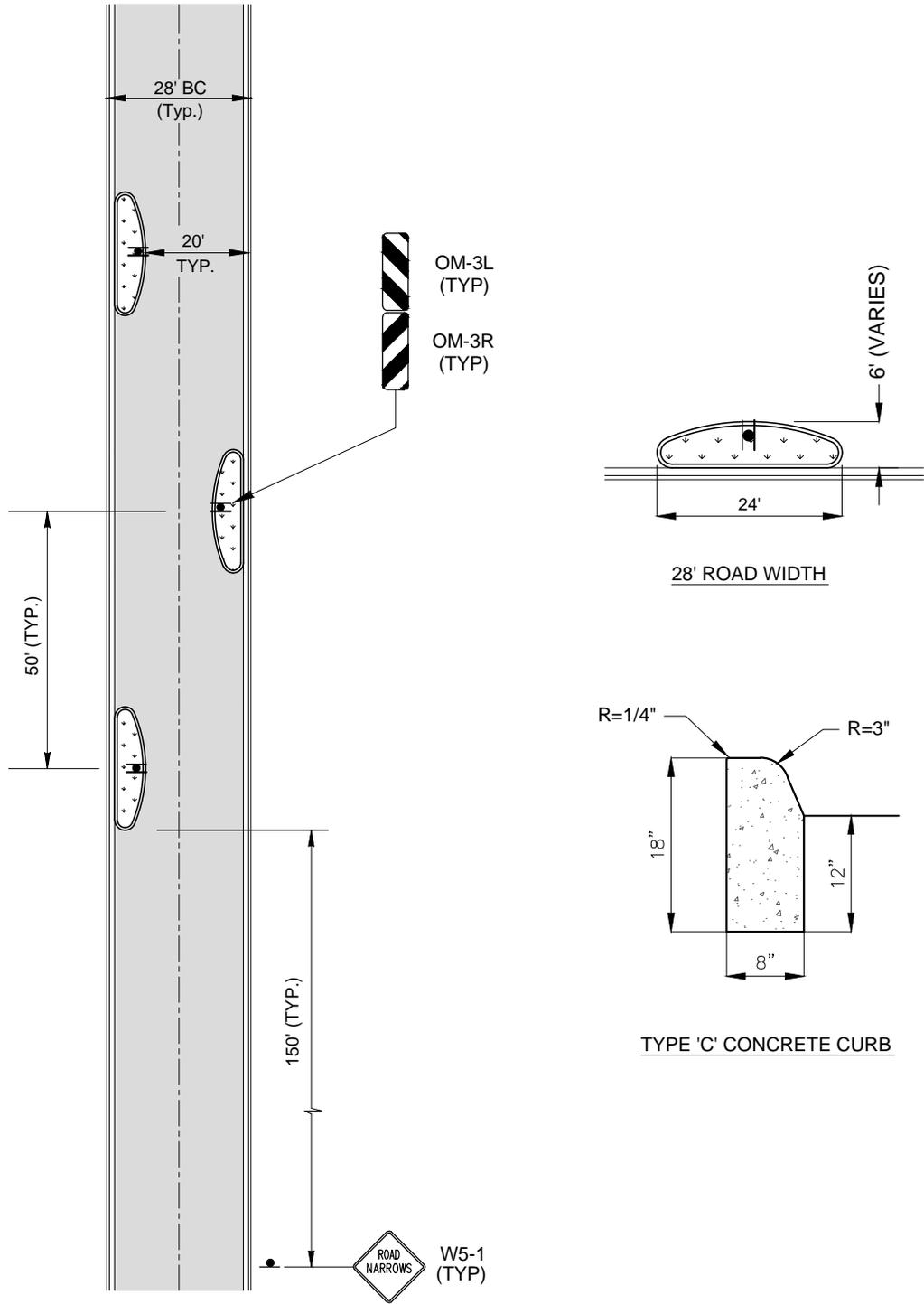


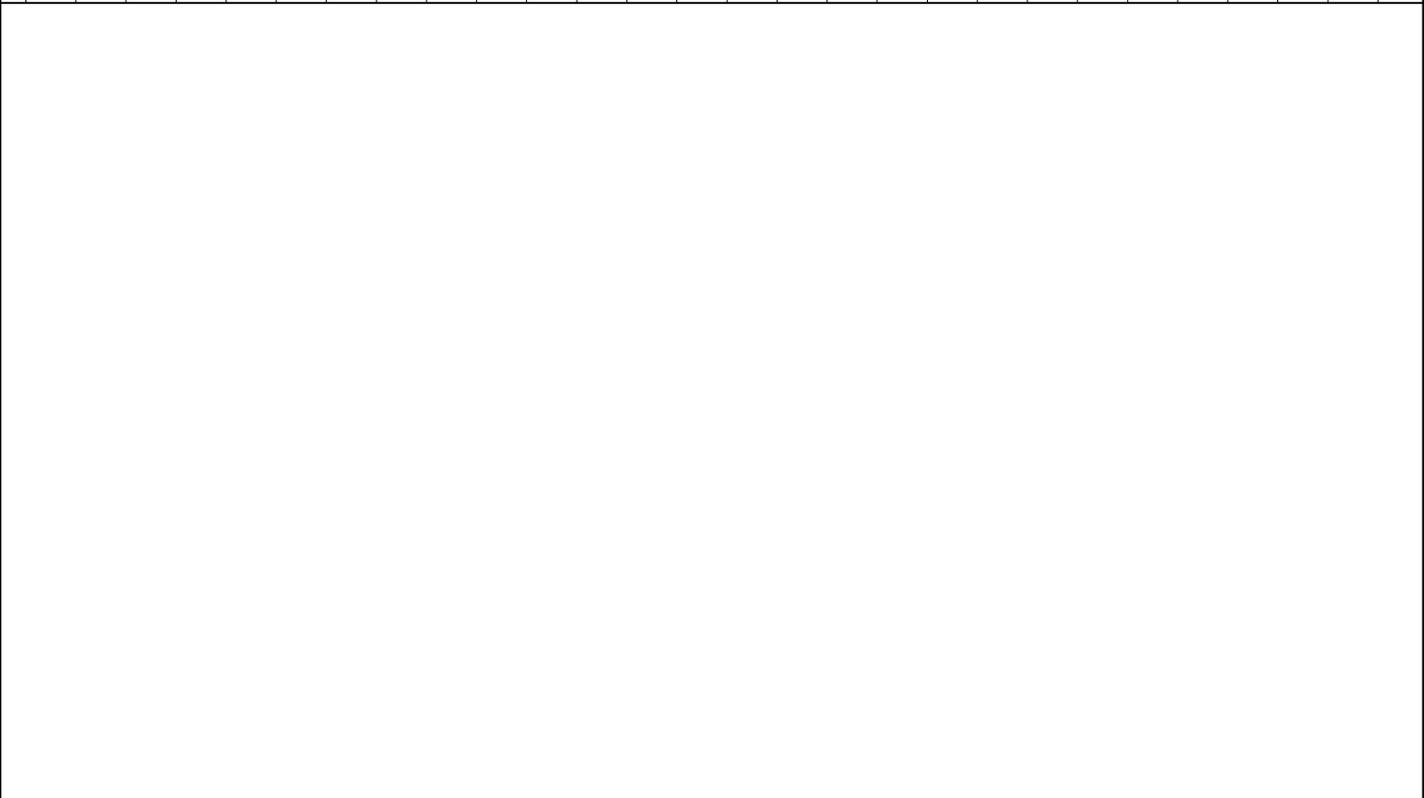
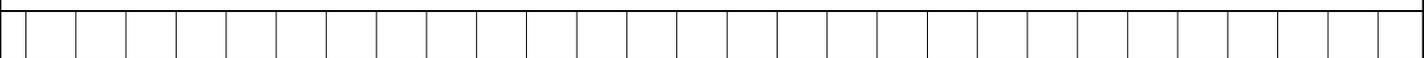
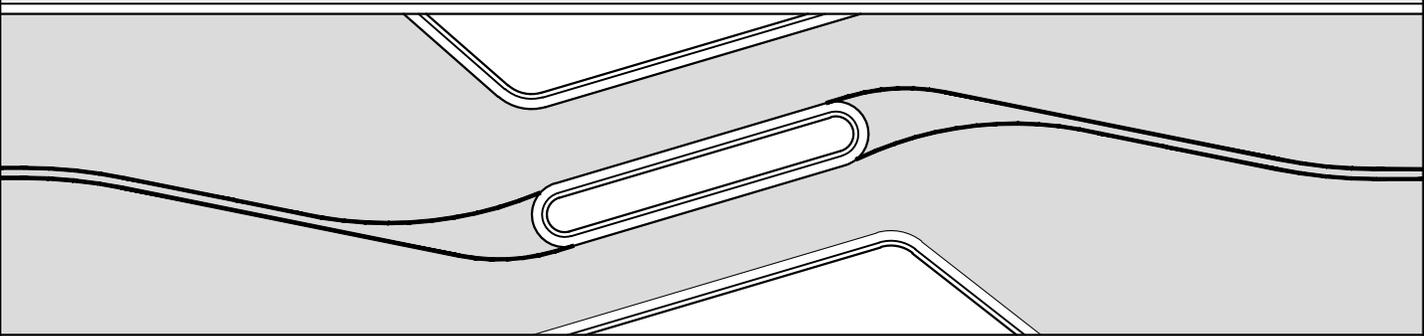
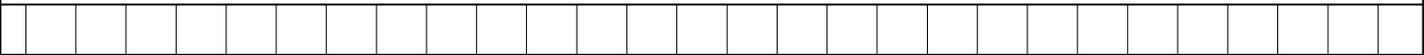


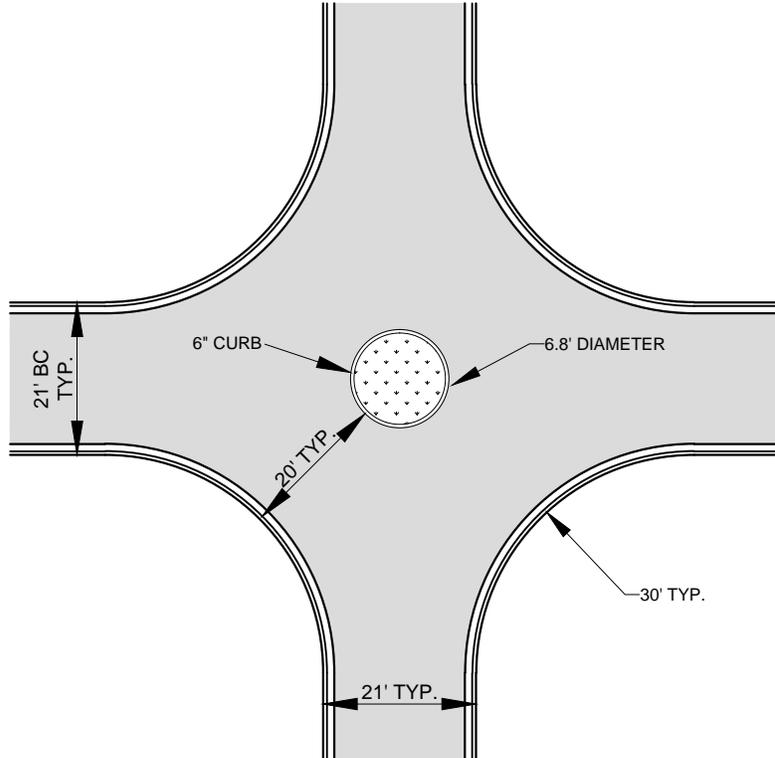
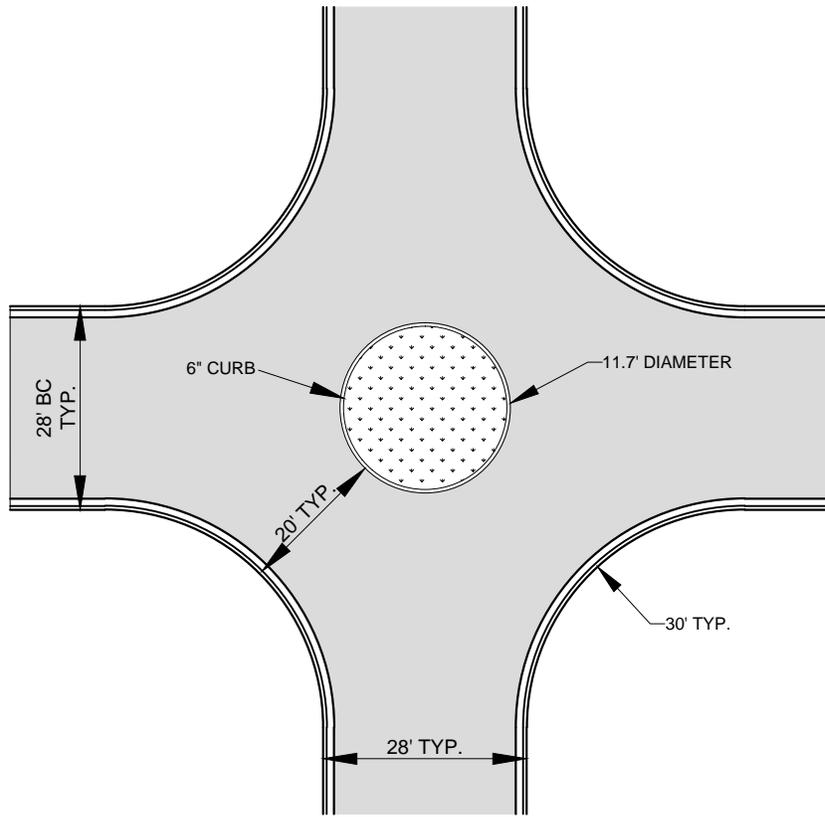


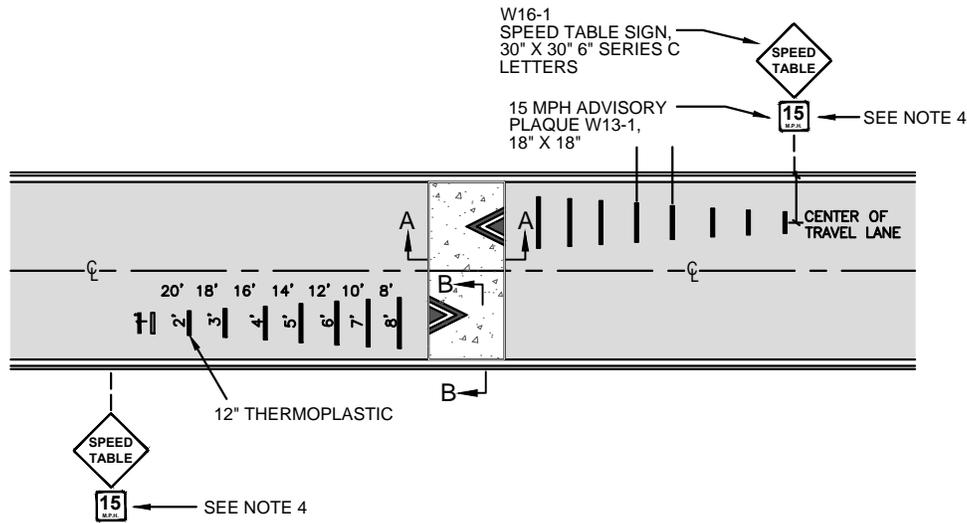






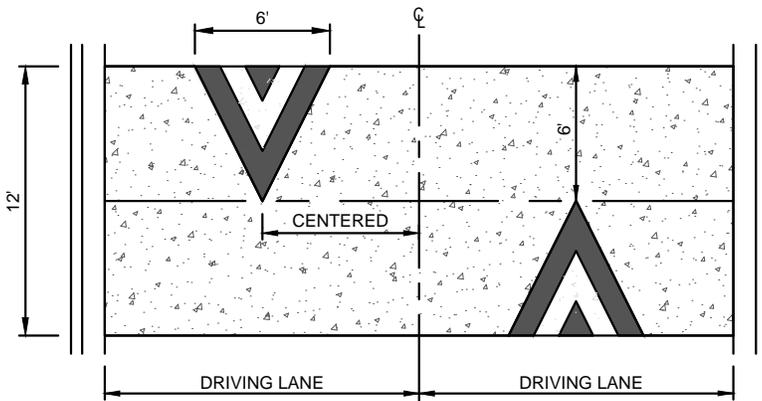




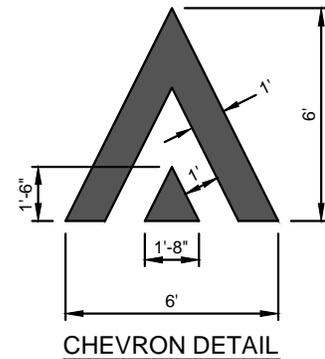


**SPEED TABLE MARKING AND SIGNING**

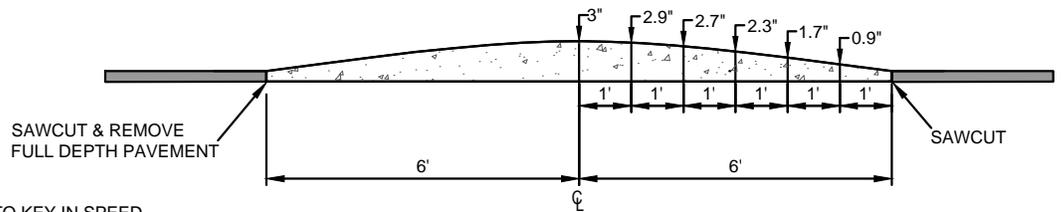
Not to Scale



**MARKING DETAIL**



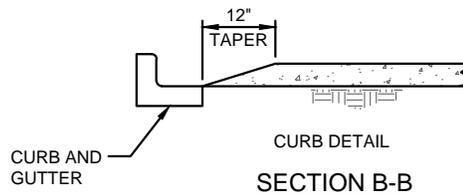
**CHEVRON DETAIL**



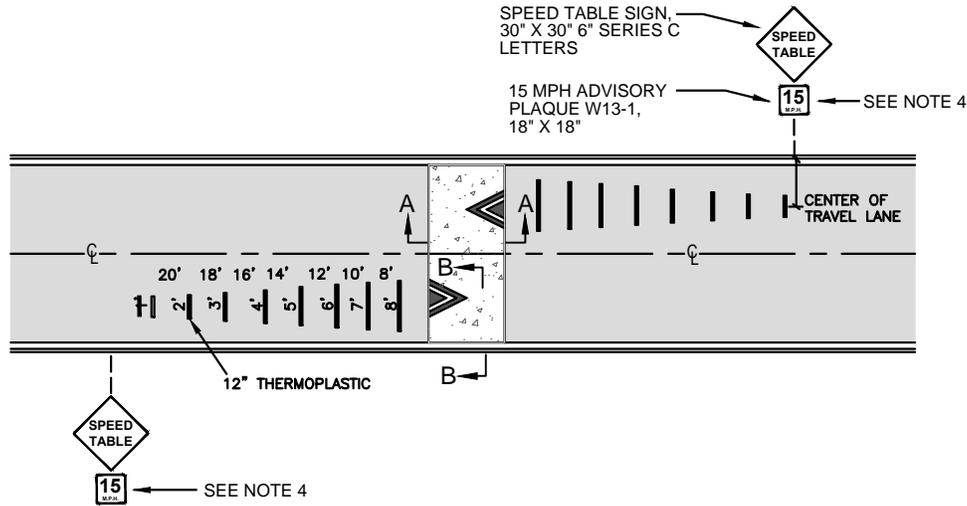
**SECTION A-A**

**NOTES:**

1. SAWCUT OR FEATHER GRIND TO KEY IN SPEED TABLE. SEE SECTION A-A.
2. SIGN LOCATIONS SHALL BE VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.
3. SPEED TABLE CHEVRON MARKING SHALL BE WHITE THERMOPLASTIC, HEAT FUSED PREFORMED, 125 MIL., OR EQUAL APPROVED BY THE ENGINEER.
4. FOR A SERIES OF SPEED TABLES, USE THE ADVISORY SPEED PLAQUE AT ONLY THE FIRST SPEED TABLE IN EACH DIRECTION OF TRAVEL.
5. SPEED TABLES SHALL BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE 3500 PSI MIN.

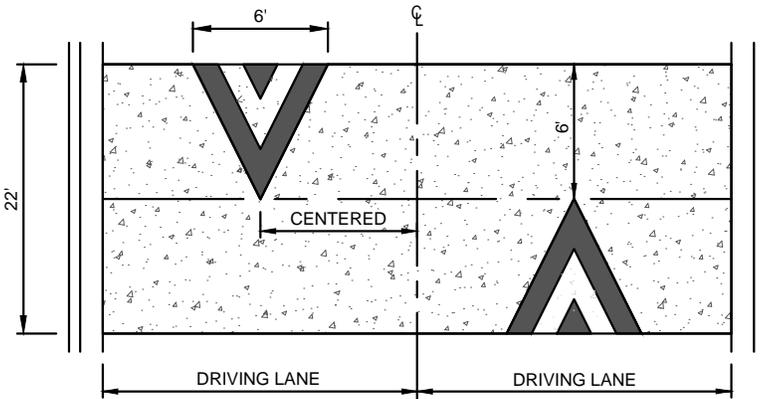


**SECTION B-B**

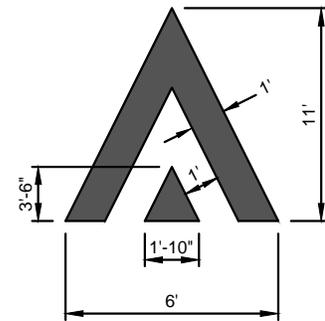


**SPEED TABLE MARKING AND SIGNING**

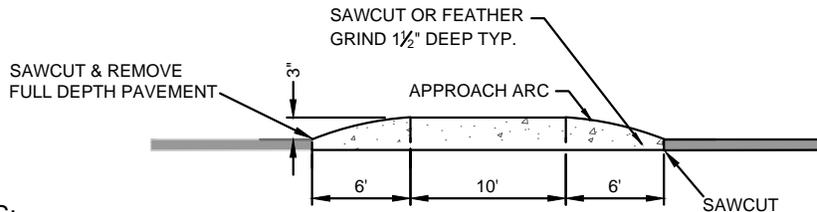
Not to Scale



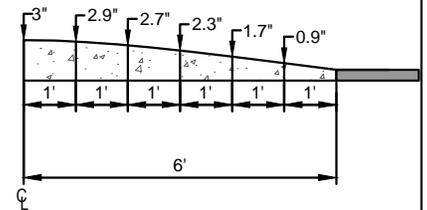
**MARKING DETAIL**



**CHEVRON DETAIL**



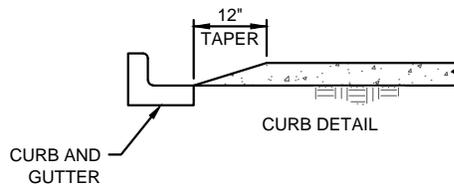
**SECTION A-A**



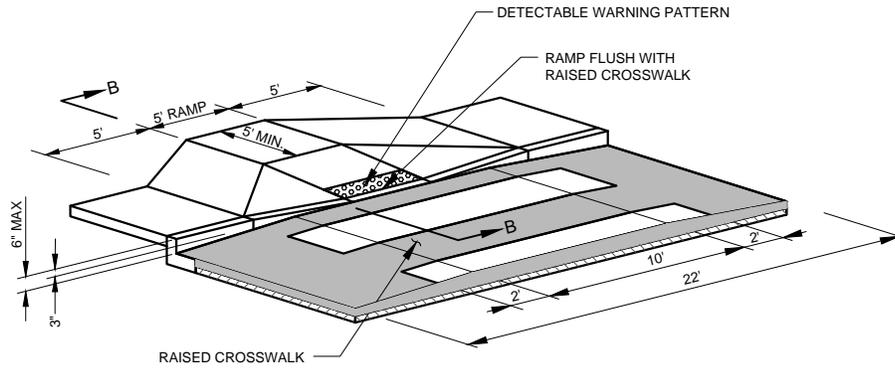
**APPROACH ARC DETAIL**

**NOTES:**

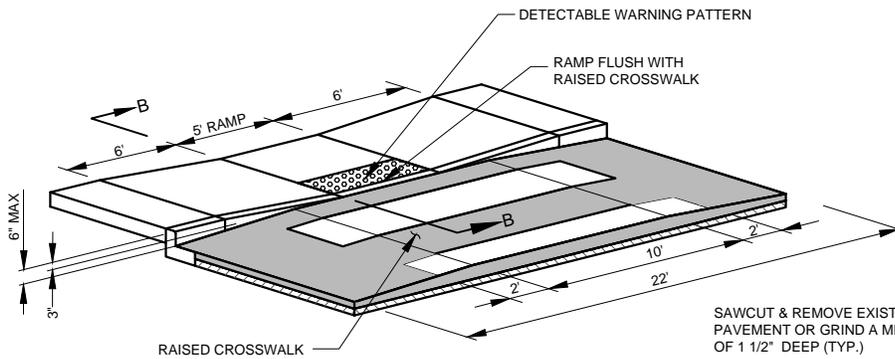
1. SAWCUT OR FEATHER GRIND TO KEY IN SPEED TABLE. SEE SECTION A-A.
2. SIGN LOCATIONS SHALL BE VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.
3. SPEED TABLE CHEVRON MARKING SHALL BE WHITE THERMOPLASTIC, HEAT FUSED PREFORMED, 125 MIL., OR EQUAL APPROVED BY THE ENGINEER.
4. FOR A SERIES OF SPEED TABLES, USE THE ADVISORY SPEED PLAQUE AT ONLY THE FIRST SPEED TABLE IN EACH DIRECTION OF TRAVEL.
5. SPEED TABLE TO BE INSTALLED USING CITY PROVIDED TEMPLATE, 48 HOURS NOTICE REQUIRED.
6. SPEED TABLES SHALL BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE 3500 PSI MIN.



**SECTION B-B**

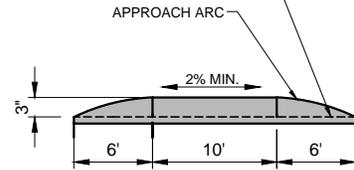


**MODIFIED SIDEWALK RAMP TYPE 1**

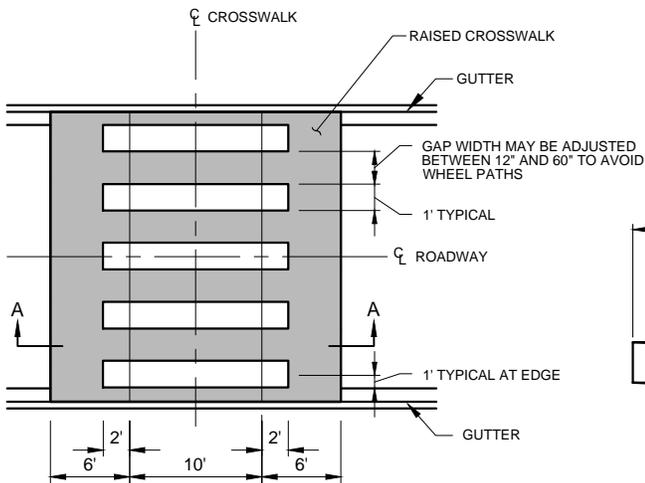


**MODIFIED SIDEWALK RAMP TYPE 2**

SAWCUT & REMOVE EXIST. PAVEMENT OR GRIND A MIN. OF 1 1/2" DEEP (TYP.)

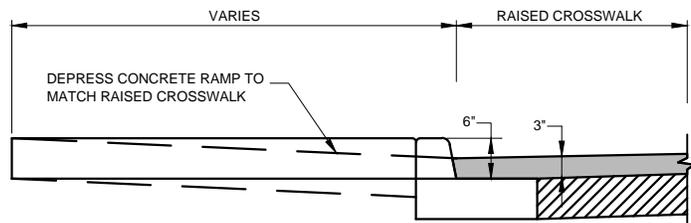


**SECTION A-A**

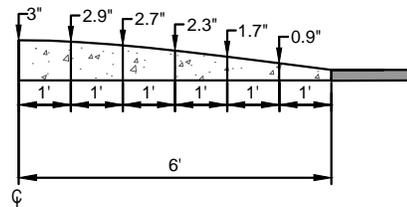


**MARKING DETAIL**

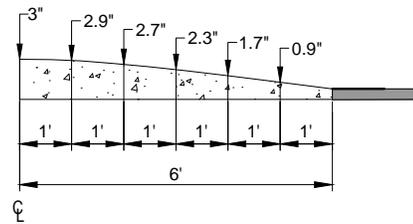
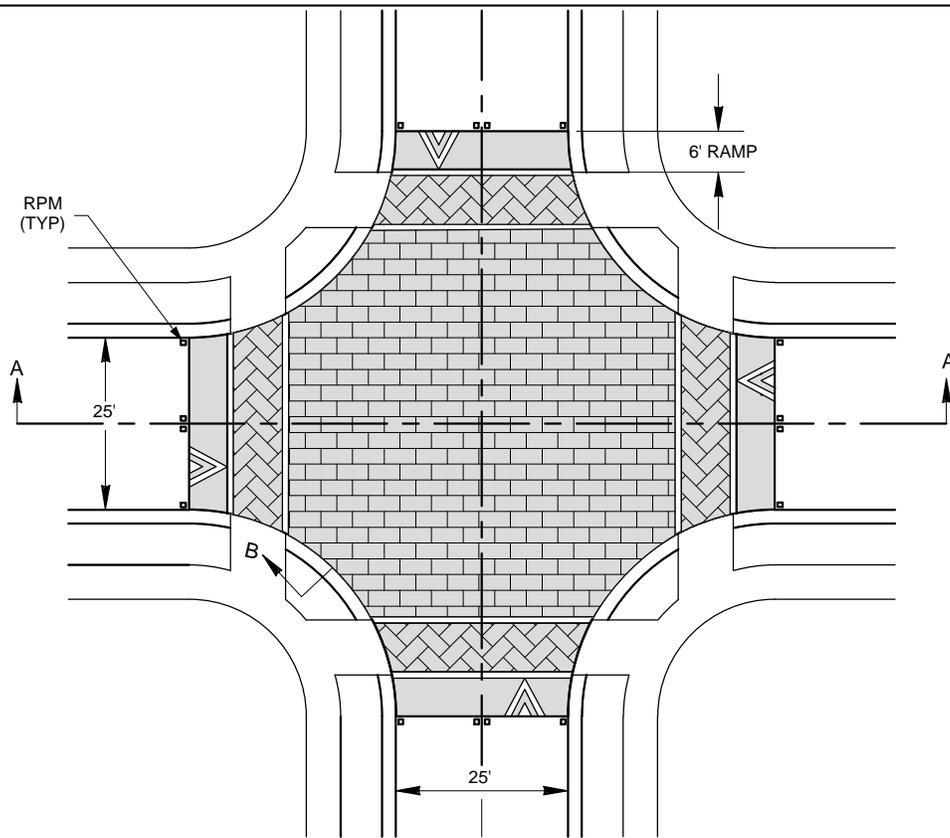
NOTE: LOCATION SHOULD TAKE INTO CONSIDERATION PROXIMITY TO DRAINAGE STRUCTURES, SINCE THE FLOW IN THE GUTTER WILL BE OBSTRUCTED BY THE CROSSWALK. ADDITIONAL INLETS MAY NEED TO BE CONSTRUCTED TO PREVENT PONDING.



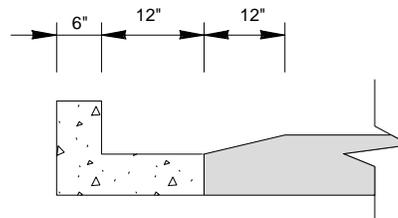
**SECTION B-B**



**APPROACH ARC DETAIL**



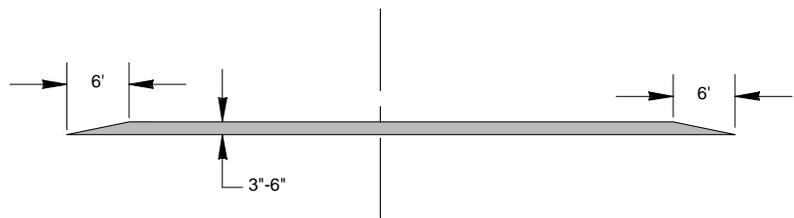
**APPROACH ARC DETAIL**



**SECT. B-B**

**NOTES:**

1. MINIMUM 1% SLOPE REQUIRED IN ALL AREAS FOR DRAINAGE.
2. A 30" X 30" YELLOW WARNING SIGN "RAISED PEDESTRIAN CROSSING" (W11A-3) MAY BE REQUIRED ON ALL APPROACHES NOT CONTROLLED BY A STOP SIGN.
3. INTERSECTION HUMPS MAY BE CONSTRUCTED USING ASPHALT OR CONCRETE, PER CITY ENGINEER.
4. CONSTRUCT INTERSECTION HUMPS USING 4000 PSI HIGH/EARLY CONCRETE REINFORCED WITH 6 X 6 - W2.9 X W2.9 WELDED WIRE FABRIC.
5. CONCRETE WILL BE COLORED AND TOP STAMPED WITH TEXTURE PER CITY ENGINEER.
6. CONSTRUCT INTERSECTION HUMPS USING ASPHALTIC CONCRETE IN ACCORDANCE WITH SECTION 402 OF THE A.H.T.D SPECIFICATIONS, CURRENT EDITION.
7. APPLY PAVEMENT MARKINGS USING WHITE THERMOPLASTIC, 125 MIL., IN THICKNESS IN ACCORDANCE WITH A.H.T.D. STANDARD SPECIFICATIONS, CURRENT EDITION.
8. APPLY RAISED PAVEMENT MARKERS, TP 11 (YELLOW/YELLOW) (CENTERLINE) AND TP 13 (CLEAR/RED) (EDGE OF PAVEMENT), USING HEATED BITUMINOUS ADHESIVE IN ACCORDANCE WITH A.H.T.D. SPECIFICATIONS, CURRENT EDITION.



**SECT. A-A**

**CHAPTER 11 STREET INSPECTION AND TESTING PROCEDURES**

**TABLE OF CONTENTS**

S	T	P
<b>111</b>	<b>ROADWAY ASSISTANCE</b>	
	A. City Observation .....	3
	B. Inspection .....	3
	C. Testing.....	3
	D. Pavement Design Report.....	4
	E. Mix Designs.....	4
	F. Test Reports .....	4
<b>112</b>	<b>PAVEMENT</b>	
<b>1121</b>	<b>SOFT</b>	
	A. Existing Material.....	5
	B. Moisture and Density Requirements .....	5
	C. Final Proof-Rolling .....	5
	D. Testing Frequency.....	5
	E. Finished Subgrade .....	5
<b>1122</b>	<b>CURB</b>	
	A. Materials.....	6
	B. Moisture and Density Requirements .....	6
	C. Thickness.....	6
	D. Testing Frequency.....	6
	E. Finished Grade.....	6
<b>112</b>	<b>MAINTENANCE</b>	
	A. Materials.....	6
	B. HMA Testing.....	6
	C. Density Requirements .....	7
	D. Thickness .....	7
	E. Surface Tolerance.....	7
<b>112</b>	<b>PREPARED CONCRETE ROADWAY</b>	
	A. Materials.....	8
	B. Concrete Testing .....	8
	C. Concrete Roadway Inspection.....	8
<b>11</b>	<b>STRUCTURAL CONCRETE</b>	<b>11</b>
<b>111</b>	<b>CURB</b>	<b>11</b>
	Materials .....	11
<b>112</b>	<b>CURB</b>	<b>11</b>



A. Structural and Inspection Requirements ..... 11

B. Foundation Testing and Inspection Requirements ..... 11

C. Inspection of Forms and False Work ..... 11

D. Inspection of Reinforcing Steel..... 11

E. Concrete Testing and Inspections..... 12

F. Testing Frequency and Related Inspections ..... 13

G. Placement (Inspection)..... 13

**11-1 NON-STRUCTURAL CONCRETE** ..... 11

**11-1 Concrete Standards** ..... 11

A. Materials..... 13

B. General Specifications..... 14

**11-2 Concrete Test and Field Inspection** ..... 11

A. Concrete Tests..... 15

B. Testing Frequency and Related Inspections..... 15

C. Placement (Inspection)..... 16

**11- MISCELLANEOUS** ..... 11

**11-1 Traffic Signs and Standards** ..... 11

A. Installation/Application..... 16

**LIST OF TABLES**

Table 11-1 Materials Testing.....10

Table 11-2 Concrete Mix Designs.....10

**LIST OF FIGURES**

*This Chapter Contains No Figures*



## CHAPTER 11 STREET INSPECTION AND TESTING PROCEDURES

### 111 ASSISTANCE

#### A. City Observation

A City Public Works Inspector will observe key steps of the construction process to insure compliance with these standards and the approved plans and specifications. Inspections will include but not be limited to: grading, erosion control, storm sewer installation, structures, non-structural concrete, sub-grade, base course, pavement and traffic control devices.

#### B. Inspection

The engineer of record shall provide inspection services for all work on the approved construction plans. The inspector shall keep a daily log of all construction activities and testing for the project. The logs shall be submitted to the City in pdf format on a weekly basis, unless otherwise approved.

The inspector will be responsible for coordinating the required testing to make sure that the contractor, testing lab and City representatives are present.

All inspection personnel shall be qualified to read and interpret the plans and specifications and to observe the construction and testing procedures to ensure compliance.

The costs of all inspections and oversight of the construction process shall be paid for by the Developer.

#### C. Testing

During the construction process testing from an independent laboratory is required on all infrastructure installation including soils, concrete, asphalt, and other applicable tests. All testing laboratories engaged in testing for projects shall be pre-qualified by the City Engineer.

These Standards state the minimum requirements for materials sampling, testing, and inspection. All tests shall be made and certified by an approved independent testing laboratory. All costs required and pertaining to testing, the work performed, and materials supplied to verify compliance with these Standards shall be the responsibility of the Developer.

The use of the testing laboratory's services does not relieve the Developer of the responsibility to furnish the required materials and to perform the required construction in full compliance with these Standards. Passing test results do not constitute acceptance of the work or materials represented by the test. The Developer is responsible for quality control of their work.



In various sections of these Standards, specific testing or other data is required by the City to insure that the intent of these Standards is fulfilled. The costs of such tests or other specific data where required by these Standards or on the approved plans shall be borne by the Developer. When evidence indicates that the work performed may not comply with these standards or the approved plan, the City Engineer may require additional tests or data beyond that required in these Standards or on the approved plans. The costs of such tests shall be borne by the Developer. Should such tests or additional data show a failure to meet these Standards or the approved plans, the Developer shall be responsible for all costs associated with repair or replacement of said failure.

**D. Pavement Design Report**

The pavement design report required in these Standards shall be submitted for review a minimum of 10 working days prior to any paving. Refer to **Chapter 6, Pavement Structure and Materials**.

**E. Mix Designs**

Pavement mix designs meeting the requirements of these Standards shall be furnished to the City Engineer a minimum of 10 working days prior to intended use of the mix. The mix design shall be reviewed and accepted by the City Engineer prior to use. If a mix design not accepted by the City is used, the City may require removal of all improvements placed with the unaccepted material.

**F. Test Reports**

Test reports submitted to the City shall include all tests performed on the project. All test reports shall show the location where the test was performed or at which work or batch is represented by the test. Test reports shall include all information specified in the **AASHTO**, **ASTM**, or local test procedure used. Prior to acceptance of each phase of a project, all final reports shall be submitted to the City indicating compliance with these specifications.

**1102 PAVEMENT**

**110201 Subgrade**

The subgrade will be evaluated by the City Public Works Inspector prior to the placement of the next course. Any necessary reworking, compaction, or replacement will be required prior to continuation. The approval is valid only to a time when weather conditions may have changed the condition of the subgrade.



Changes in weather such as freezing or precipitation, which may cause changes in the subgrade, will require re-approval of the subgrade.

**A. Existing Material**

Unsuitable material will be excavated to a depth as directed by the City Engineer or the geotechnical engineer, disposed of, and replaced with fill material meeting the requirements of **Chapter 6, Pavement Structure and Materials**.

If the existing material is acceptable for use as subgrade material, or modified to be suitable, the subgrade will be scarified to a depth of 8 inches and recompacted to conform to the requirements of this chapter.

**B. Moisture and Density Requirements**

All lifts in embankment areas shall be compacted to not less than 95% of the maximum density. The moisture content of the material shall be within 2% of optimum moisture content before compaction.

Maximum density will be determined using AASHTO T-99 (Standard Proctor). In-place field density measurements shall be determined using AASHTO T-191, T-233 or T-310.

Density requirements do not apply to portions of embankments constructed of materials such as rock that cannot be tested by approved testing methods.

**C. Final Proof-Rolling**

Final proof rolling of subgrade shall be required prior to taking density tests. Proof rolling shall be done with a fully loaded tandem-axle dump truck.

**D. Testing Frequency**

Density tests shall be taken every 300 feet for each lane or portion thereof. For streets less than 300 feet in length, a minimum of one test shall be taken for each lane. The Public Works Inspector shall determine the location of the tests.

**E. Finished Subgrade**

The subgrade shall be shaped for its full width to the required grade and cross section. The finished subgrade shall not vary at any point by more than 1/2" from the design elevation.

**11.2.2**     **C**

The base course material shall be placed on a completed and approved subgrade or existing base that conforms to the grade and cross section shown on the plans. Base course shall not be placed on frozen subgrade.

**A. Materials**

Materials for aggregate base courses shall meet the requirements of Section 303 of the **AHTD Standard Specifications (2014 Edition)** for Class 7.

**B. Moisture and Density Requirements**

All lifts in embankment areas shall be compacted at substantially optimum moisture content to not less than 98% of the maximum density.

Maximum density will be determined using AASHTO T-180 (Modified Proctor). In-place field density measurements shall be determined using AASHTO T-310.

**C. Thickness**

The compacted base course shall be tested for thickness in the same general location of the density testing. The finished base course shall not vary at any point by more than 1/4” from the design thickness.

**D. Testing Frequency**

Density tests shall be taken every 300 feet for each lane or portion thereof. For streets less than 300 feet in length, a minimum of one test shall be taken for each lane. The Public Works Inspector shall determine the location of the tests.

**E. Finished Grade**

The base course shall be shaped for its full width to the required grade and cross section. The finished base course shall not vary at any point by more than 1/2” from the design elevation.

**112 M A MA**

**A. Materials**

Materials for Hot Mix Asphalt Concrete base, binder and surface courses shall meet the requirements of the **AHTD Standard Specifications (2014 Edition)** as referenced in Section 6.4.4 of these standards. No “Marshall Mixes” are allowed within City right of way unless specifically authorized in writing by the City Engineer.

**B. HMA Testing**

All testing shall be done in accordance with AASHTO or ASTM as designated throughout this chapter.

Testing results for Asphalt Binder Content, VMA and Air Voids shall be provided by the contractor upon request by the City Engineer.



The pavement shall be cored at 500 foot intervals for each lane, or fraction thereof, in each lane. The core locations shall be chosen so as to accurately represent the quality of the asphalt placed in a particular area.

**C. Density Requirements**

Minimum asphalt density shall be 92% of the maximum theoretical density. No density of less than 90% shall be accepted. The asphalt where densities are less than 92% and greater than 90% shall be left in place and a penalty of 2% of the in-place construction cost of the deficient asphalt shall be paid to the City for each .10% deviation from the required density up to a maximum of 40 %. Where densities are less than 90%, the paving shall be removed and replaced.

When a deficient density is obtained, two additional cores shall be taken within 10' either side of the deficient core location. If the density of both of these cores is 92% or higher, then no additional cores are necessary and no penalty will be applied. If insufficient density is reported with the new cores, then additional cores shall be taken every 50 feet until the limits of the deficient asphalt have been established.

The asphalt density used for the purpose of computing the penalty shall be the average density over the deficient area. Only the deficient densities (from 90-92%) shall be used to calculate the average.

**D. Thickness**

Thickness measurements shall be taken for each core sample. The thickness measurement shall be averaged for each run of paving. A run shall be considered a portion of paving constructed in one day on one section of street. Multiple streets paved in one day will result in multiple runs.

Should any deviation be found, additional cores may be taken to define the horizontal limits of the deviation. When measurement of the core is not deficient by more than 1/4 inch from the design thickness, the pavement thickness will be considered to be within acceptable tolerance. When such measurement is deficient more than 1/4 inch from the design thickness, two additional cores at intervals not less than 50 ft will be taken and used to determine the average thickness for that area. When the average thickness of cores is deficient by more than 1/4 inch the City Engineer may require that the area be removed and replaced.

Maximum thickness used for averaging purposes shall be the specified thickness plus 1/2 inch.

**E. Surface Tolerance**

The finished surface of the pavement, when tested with a 10-foot straight edge parallel to the centerline or perpendicular across joints, will show variations as



measured from the testing face of the straight edge to the surface of the pavement, which shall not exceed 1/8 inch on surface course and 3/16 inch on binder course. Areas that do not meet the required surface accuracy shall be clearly marked and if the City Engineer requires repair, the contractor shall repair the pavement.

## 112 Portland Concrete Pavement

### A. Materials

Materials for Portland Cement Concrete Pavement shall meet the requirements of the latest edition of the **AHTD Standard Specifications**.

### B. Concrete Testing

All testing shall be done in accordance with AASHTO or ASTM as designated throughout this chapter.

### C. Concrete Roadway Inspection

#### 1. Tolerances.

- a. Where the constructed surface varies from the design cross slope by more than 1/2 inch in 10 feet, the pavement shall be removed and replaced. This technique may not apply in areas with less than 2% cross slope.
- b. Areas showing high spots greater than 1/4 inch as measured with a 10-foot straight edge, but less than 1/2 inch, may be diamond ground to within the specification of 1/4 inch.
- c. Thickness Tolerance. The thickness of the pavement shall be determined by average caliper measurement of cores tested. A minimum of 1 core per 500 LF will be taken at random. Should any deviation be found, additional cores may be taken to define the horizontal limits of the deviation. When measurement of the core is not deficient by more than 1/4 inch from the design thickness, the pavement thickness will be considered to be within acceptable tolerance. When such measurement is deficient more than 1/4 inch and not more than 1 inch from the design thickness, two additional cores at intervals not less than 50 ft will be taken and used to determine the average thickness for that area. When the thickness of pavement is deficient by more than 1/4 inch the City Engineer may require that the area be removed and replaced.



2. Specifications.

- a. All panels with cracks wider than 1/8 inch shall be repaired by total removal of the panel and replacement as required by the criteria herein.
- b. All panel cracks 1/8 inch and narrower may be routed and sealed at the discretion of the City Engineer.
- c. There shall be no more than one structural crack per panel. Panels with more than one structural crack shall be repaired by total panel removal and replacement.
- d. All sections removed shall have edges parallel to adjacent panel joints.
- e. All saw cuts for removal of slabs shall be full depth cuts.
- f. No panel shall be allowed that has a crack meeting an adjacent panel at an angle more acute than 45 degrees to a finished edge or control joint.
- g. All corner cracks to a panel shall be removed and replaced.
- h. Any vertical differential movement across a crack greater than 3/16 inch shall be repaired by either partial or total panel removal and replacement.
- i. All panels with faulted joints resulting from settlement and/or pumping of the edges shall be repaired by removal and replacement.
- j. All manholes, water valves, range boxes, etc., shall be flush to 1/4 inch below the final surface roadway grade.
- k. When an entire panel is removed, the panel shall be secured to the surrounding panels with 18" long 1/2" diameter smooth dowel bars placed at 12" centers.



**T 11-1**  
**M T**

Standard	AASHTO	ASTM	Requirement
Standard	T	2	Per Section E
Standard	M1	2 2 2 2	
Standard	T T1		
Standard	T1 T1	1	
Standard	T1 T2 T1	2 2 1	1 or 1 M 1 or
<b>M A</b>			
Standard	T1		
Standard	--	2	As required C
Standard	T1	2 2	1 or 1 M 1 or
<b>C</b>			
Standard	T1	C1 2	
Standard	T2	C1	
Standard	T2	C1	
Standard			1 or 1 M 1 or 1 or 1 C
Standard	T11	C1	Section 11-2
Standard	T1 2	C2 1	
Standard	T22	C	
Standard	T2	C 2	As required C
Standard	T2	C 2	
<b>A C</b>			
Standard	T2	C1	1 Per Section
Standard			
Standard	T1	1	
Standard	T		1 or 1 M 1 or
Standard			

**T 11-2**  
**C M**

Requirement	C A	C
2-C S		
Per C		
M C		
S 1-	1-	1-
Air E	-	-
M A C	2	2



## 11 STRENGTH AND CONCRETE

This section delineates the testing, inspection, and related documentation requirements for all structures, including retaining walls, cast-in-place box culverts, and other concrete structures specified within.

### 11.1 Concrete Structures

#### Materials

Class A or B concrete shall be used in drop inlets, junction boxes and others as specified.

Class B concrete shall be used in box culverts, bridges, retaining walls and other structures as specified.

### 11.2 Concrete Test and Inspection

#### A. Structural and Inspection Requirements

The structural design Engineer or his representative, familiar with assumptions inherent in the structure design, shall inspect the construction in sufficient detail to confirm that the construction meets the requirements of the plans and specifications.

#### B. Foundation Testing and Inspection Requirements

Unstable foundation material shall be removed to a depth approved by the City Engineer below the finish grade elevation and be replaced with a material and construction procedure as approved by the City.

#### C. Inspection of Forms and False Work

1. The forms shall be clean of all dirt, mortar, and all foreign material. Forms that will later be removed shall be thoroughly coated with an approved form oil.
2. The forms shall be mortar tight and of a quality (in addition to the bracing) to withstand the pressures from deposited concrete.
3. Unless otherwise specified, forms for exposed surfaces shall be constructed with triangular fillets 3/4 inch at all exterior corners.

#### D. Inspection of Reinforcing Steel

1. Material Grade and Size. The material grade and size shall be as specified by the Designer on the certified construction plans.



2. Tying.

a. The intersections of all bars shall be tied in accordance with the following requirements: Slab bars shall be tied at every intersection around the periphery and at spacing according to bar sizes. Unless bar spacing is less than 12” in which case every other intersection shall be tied. However, in no case shall less than 30% of the intersections be tied.

b. Wall bars should be tied sufficiently to prevent shifting, at least 3 times in any bar length at every third or fourth intersection and at spaces according to bar sizes, staggered:

- #5 and smaller - 3'0"
- #6 to #9 - 4'0" to 5'0"
- #10 to #11 - 6'0" to 8'0"

Upper and lower mats shall be tied or otherwise fastened at 4 foot maximum spacing in each direction. Minimum splice length shall be 24 bar diameters.

- 1) All reinforcing steel shall be supported with steel chair or precast mortar.
- 2) Reinforcing steel shall be clean and free of all foreign material before concrete is placed.
- 3) All clearances shall be in compliance with approved plans and specifications.

**E. Concrete Testing and Inspections**

1. Materials Specifications. The class of concrete used shall be in accordance with **Table 11-2**. Concrete that does not meet strength in 28 days is subject to removal.

2. Concrete Tests.

- a. All testing shall be done in accordance with **AASHTO** or **ASTM** as designated in **Table 11-1**.
- b. Maximum time allowed between sampling and casting cylinders shall not exceed 15 minutes. Cylinders shall be transported to the laboratory within 24 hours of casting but after the concrete has hardened, (see **AASHTO T23** or **ASTM C-31**).
- c. The slump test shall be performed in accordance with **AASHTO T119**. The air test shall be performed in accordance with **AASHTO T196** or



**T121.** Slump and air test measurements shall be taken with each cylinder series.

- d. If compressive strength of cylinders does not meet the specified values, the Design Engineer shall recommend and the City Engineer shall approve the necessary mitigation measures needed.

**F. Testing Frequency and Related Inspections**

1. Testing frequency shall be in accordance with **Table 11-1**.
2. At least 4 compressive strength cylinders shall be taken from the same concrete delivery truck to provide design compliance testing at the laboratory. Two of the four specimens will be tested at 28 days for acceptance and 1 shall be tested at 7 days for information. The fourth cylinder shall only be necessary if the 28-day fails. Additional cylinders may be required, as directed by the City Engineer.

**G. Placement (Inspection)**

1. Concrete placement shall be done in a manner such that the concrete is not segregated or altered before placing. It shall not be allowed to free fall more than 5 feet. Concrete shall be placed in lifts not to exceed 18 inches.
2. A sufficient number of vibrators shall be used to properly consolidate the concrete as required.
3. Weepholes and drainage systems should be installed in the structure at the locations noted on the plans or specifications.
4. Construction joints and expansion joints shall be constructed in conformance with approved plans and specifications.

**11 NON-STRUCTURAL CLASS A CONCRETE**

Non-structural concrete includes curb, gutter, sidewalks, driveways, crosspans and ADA ramps.

**11-1 CURB AND SIDEWALKS**

**A. Materials**

Class A concrete shall be used in curb and gutter, sidewalks driveways, crosspans, ADA ramps and miscellaneous concrete items as specified. See **Table 11-2**.

## B. General Specifications

1. Humps and Depressions. Any localized humps and/or depressions greater than 1/4 inch (as measured with a 10-foot straight edge) will require removal and replacement of the work in question.
2. Water Ponding. No ponding of water shall greater than 1/4 inch be allowed.
3. Flowline Depth. Curb and gutter flowline depth shall not vary from adopted standards by more than  $\pm$  1/4 inch, measured vertically from the top of curb to the gutter invert.
4. Cross Slope in Pedestrian Walks. Pedestrian walks shall have a maximum of 2.0 percent cross slope.
5. Joint Spacing. Contraction and construction joints shall be placed at a maximum spacing of 10 feet in curb and gutter, crossspans, trickle channels, etc. Refer to Chapter 8 for Sidewalk and Trail joint spacing.
6. Heave or Settlement of Sidewalk. Heave or settlement of sidewalk, relative to separate curb pour, greater than 1/4" shall be cause for corrective action.
7. Utility Placement. No utility facilities shall be placed in curb and gutter, sidewalk, crossspan, ADA ramp etc., unless specifically called out on the approved construction plans. This includes meter boxes, manholes, power poles, fire hydrants, water valves, etc.
8. Concrete Cracks.
  - a. At the time of final acceptance, the repair of all cracks will be completed.
  - b. Any section of concrete with longitudinal cracks or with cracks greater than 1/16" in width will require complete removal and replacement of that section between joints.
  - c. Repair action for hairline cracks may be waived at the discretion of the City Engineer. For the purpose of this section, a hairline crack is one that is reasonably immeasurable and without separation as determined by the City Engineer.
9. Concrete Chips and Gouges.
 

Chips and gouges in the concrete will be evaluated on an individual basis. If determined by the City to be unacceptable, then the section shall be removed and replaced.
10. Other Imperfections in Concrete Surface. Stress cracking, pop-outs, spalling, rain damage, graffiti, and other surface defects will remain discretionary and will usually require removal and replacement.



11. Final Grade.

- a. A light broom finish shall be required.
- b. All concrete work shall have the proper finished grade.
- c. No abrupt changes in grade shall be allowed, i.e., curb returns from new to existing, driveway entrances, etc.

**11-2 Concrete Tests and Inspection**

**A. Concrete Tests**

1. Concrete Tests.

- a. All testing shall be done in accordance with **AASHTO** or **ASTM** as designated in **Table 11-1**.
- b. Maximum time allowed between sampling and casting cylinders shall not exceed 15 minutes. Cylinders shall be transported to the laboratory within 24 hours of casting but after the concrete has hardened, (see **AASHTO T23** or **ASTM C-31**).
- c. The slump test shall be performed in accordance with **AASHTO T119**. The air test shall be performed in accordance with **AASHTO T196** or **T121**. Slump and air test measurements shall be taken with each cylinder series.
- d. If compressive strength of cylinders does not meet the specified values, the Design Engineer shall recommend and the City Engineer shall approve the necessary mitigation measures needed.

2. Grade Verification of Gutter Flowline.

After completion of curb and gutter, including curb returns and crosspans, and prior to installation of asphalt, the new installation must be flow-tested with water in the presence of the Public Works Inspector to confirm that there are no areas that hold water. The City Engineer will confirm the results and accept or reject the work. The work will not be accepted if it holds water more than 1/4 inch deep or for a distance greater than 5 feet. Unacceptable work must be removed and replaced.

**B. Testing Frequency and Related Inspections**

- 1. Testing frequency shall be in accordance with **Table 11-1**.
- 2. At least 4 compressive strength cylinders shall be taken from the same concrete delivery truck to provide design compliance testing at the laboratory. Two of the four specimens will be tested at 28 days for acceptance and 1 shall be tested at 7 days for information. The fourth



cylinder shall only be necessary if the 28-day fails. Additional cylinders may be required, as directed by the City Engineer.

**C. Placement (Inspection)**

1. Concrete placement shall be done in a manner such that the concrete is not segregated or altered before placing. It shall not be allowed to free fall more than 5 feet. Concrete shall be placed in lifts not to exceed 18 inches.
2. A sufficient number of vibrators shall be used to properly consolidate the concrete as required.
3. Construction joints and expansion joints shall be constructed in conformance with approved plans and specifications.

**11 MISCELLANEOUS**

**11.1 Traffic Signs and Standards**

**A. Installation/Application**

The City Engineer shall verify that traffic control devices are installed or applied at appropriate locations as shown on the approved signing and striping plans.

All striping layouts will be reviewed by the City Engineer prior to any installation of paint or markings. The City requires a 48-hour notice before any application for inspection or approval.



A. Street .....8  
 B. Drainage .....9  
 C. Utilities .....9  
 D. Other.....9

12 2 Mr C .....1  
 12 S P .....1  
 12 r S .....1

**LIST OF TABLES**

*This Chapter Does Not Include Tables*

**LIST OF FIGURES**

*This Chapter Does Not Include Figures*



## CHAPTER 12 ACCEPTANCE AND MAINTENANCE PROCEDURES AND RECORD DRAWINGS

### 12.1 GENERAL

This chapter defines the requirements for approval and acceptance of the Public Improvements installed within the rights-of-way and easements. This chapter also covers warranty and record plan (as-builts) requirements.

#### 12.1.1 Contractor Process

The Developer shall be required to meet the following process prior to the acceptance of the public improvements and maintenance:

##### A. Completion of Work

Completion of all Public Improvements required in the approved Construction Plans & Specifications in accordance with these Standards.

##### B. Notification

Developer notifies the Public Works Inspector and the Engineer of Record of the Project Completion.

##### C. Inspection – By Engineer of Record

The Engineer of Record shall perform a site inspection to determine if the project is substantially complete and ready for a joint inspection as described below. The Engineer of Record shall generate a deficiency list (punch list) and all items on the list shall be corrected before scheduling a joint inspection. The City Engineer may deem some punch list items as incidental and allow the scheduling of the joint inspection.

##### C. Joint Inspection

A joint inspection will be performed with City representatives, the Engineer of Record, and the contractor. The public improvements will be inspected for compliance to the plans, standards and specifications. The Engineer of Record shall develop a final punchlist.

##### D. Correction of Deficiencies

The Contractor or Developer shall correct deficiencies. As-built survey may identify additional deficiencies, which shall be addressed as stated below.



**E. Submittal of Record Plans**

The Engineer of Record shall submit signed and sealed Record Plans (As-builts) in accordance with the description in **Section 12.5**. One hard copy, one electronic copy in PDF format and one electronic copy in .dwg format shall be submitted to the City Engineer’s office. A review copy in PDF format will be required for review purposes prior to the final submittal.

**F. Initial Acceptance**

After the Contractor has corrected the deficiencies identified on the punch list and the Engineer of Record has inspected the site, the City may be contacted by the Engineer of Record to inspect the corrections. Upon satisfactory completion of the punch list items and submittal of the public improvement construction costs, warranty guarantee, inspection reports, material testing reports, engineer certifications, final as-built drainage report, as-built plans, and any other project requirements per the approval letter, initial acceptance shall be granted.

**G. Start of Warranty Period**

Upon written initial acceptance by the City, the warranty period shall commence.

**H. Warranty Inspection**

No more than forty-five days prior to the completion of the warranty period, the City Engineer may inspect all public improvements for defects in workmanship or materials. A deficiency list shall be developed and provided to the Developer. Normal wear and tear shall not be considered a deficiency.

**I. Written Notification of Release**

Once the Developer/Contractor has satisfactorily completed any necessary repairs or replacements at the end of the warranty period, a written notification from the City shall release the Developer of all future repairs for the Public Improvements and the Warranty Guarantee shall be released to the original provider.

**12.2 INITIAL ACCEPTANCE**

**12.2.1** After the Contractor has completed the punchlist, the Engineer of Record shall inspect and notify the Public Works Inspector that the work has been complete. The Public Works Inspector shall recommend granting or denial of initial

After the Contractor has completed the punchlist, the Engineer of Record shall inspect and notify the Public Works Inspector that the work has been complete. The Public Works Inspector shall recommend granting or denial of initial



acceptance based on re-inspection for compliance with the joint inspection punch list.

If new deficiencies are found, either in quality or extent of construction, the Developer/Contractor shall be notified in writing of these deficiencies. These deficiencies shall be also be corrected, and additional inspections shall be performed until the work is acceptable.

**12.2.2 Initial Acceptance**

The City Engineer shall issue written notice either granting or withholding Initial Acceptance within ten working days of the acceptance re-inspection. The Initial Acceptance letter shall specify the date on which the Developer is eligible to request Final Acceptance.

**12.2.3 Record Plans**

Prior to issuance of the Initial Acceptance, Record Plans shall be completed, stamped, and signed by the Engineer of Record and submitted to the City Engineer. The Record Plans shall be submitted in paper and electronic form (as specified by the City Engineer). Refer to **Section 12.5** for Record Drawing requirements.

**12.2.4 Warranty Guarantee**

Prior to issuance of the Initial Acceptance, a Warranty Guarantee in the amount of 25% of all Public Improvements associated with the project shall be submitted to the City. The following items shall be included on the Guarantee:

- Identify guarantee as for MAINTENANCE.
- Name of project.
- Project description & location (address, subdivision, if applicable).
- Description of items guaranteed & total construction cost of public infrastructure.
- Name the City of Fayetteville as Obligee or Dual Obligee.
- Contact information for the provider of guarantee – (who purchased the guarantee).



**12.01.01 FINAL ACCEPTANCE**

**12.01.01 Final Inspection and Acceptance**

Within 45 days of the end of the Warranty Period, the Developer shall request a final inspection and acceptance, in writing, to the City Engineer.

**12.01.02 Preparation for Inspection**

The Developer is responsible for sweeping and cleaning public improvements for inspection. If the Developer does not provide a clean site, including having curb flowlines clear of debris and dirt, then the inspection may be postponed until the site is sufficiently clean.

**12.01.03 Inspection and Punchlist**

The City Engineer shall inspect all Public Improvements related to the Project. If applicable, a written final punchlist shall be compiled listing any necessary repair or replacement of materials or workmanship. The punchlist shall be sent to the Developer and Contractor.

**12.01.04 City Maintenance Crews Caused Damage**

If the Developer can demonstrate that the City maintenance crews caused damage to certain improvements, the Developer will not be held responsible for the replacement.

**12.01.05 Repair or Replacement**

If repair or replacement of Public Improvements is required, the Developer/Contractor shall complete repair or replacement within thirty calendar days of receipt of the final punchlist, unless otherwise agreed upon. Upon completion, the Developer/Contractor shall contact the City Engineer for a re-inspection.

**12.01.06 Release of Responsibility**

Once all repairs or replacements are satisfactorily completed, the Developer/Contractor shall receive written notice from the City that all Public Improvements are complete and the City releases the Developer/Contractor from responsibility for all future maintenance and repairs for the Public Improvements on this project.

**12.0000** **0.000000** **0000** **0.000000** **0000** **0.000000** **0000** **0.000000**

Upon the satisfactory completion of the final punchlist the City will release the Warranty guarantee.

**12.0000** **0.000000** **0000** **0.000000** **0000** **0.000000** **0000** **0.000000**

If the Developer has not completed the warranty repairs in the time frame specified, the City may choose to affect the necessary repairs. The City will either invoice the Developer for all costs for the related work plus a \$500.00 administrative fee or it will collect from the guarantee.

**12.000** **0.000000** **0000** **0.000000** **0000** **0.000000** **0000** **0.000000**

**12.0001** **0.000000** **0000** **0.000000** **0000** **0.000000** **0000** **0.000000**

The Construction Plans shall be updated with all design changes that occurred after plan approval. The final installation of all public infrastructure shall be surveyed prior to submittal of record drawings. The Professional surveyor shall provide stamped drawings specifically identifying the limits of as-built survey performed. Field changes not previously approved by City Engineer, discovered during the as-built process are at the Contractor’s risk and may not be accepted.

**A. Street**

Street Record Drawings shall identify the actual pavement type and grade or mix type used; if the subgrade was treated or additional undercut: location of any under drains added; and document all changes to widths and lengths for streets, sidewalks, and curbs.

- At 100 ft interval or as necessary to reflect actual placement of roadway, the back of curb shall be located in reference to the existing/or proposed right-of-way.
  - Deviations more than 6 inches shall be identified on the plans and included in a transmittal letter to the City Engineer.
  - Additional Right of Way or Reconstruction may be required.
- At grade breaks, no more than 500 ft intervals, profile and cross slope verification will be performed and shown on plans.
  - Deviations more than 0.5% profile or cross slope shall be identified on the plans and included in a transmittal letter to the City Engineer.
  - Geometric K values no longer meeting city criteria shall be evaluated.
  - Additional Calculations or Reconstruction may be required.



- Record drawings shall identify all signage and striping locations as actually placed in the project.

**B. Drainage**

Record storm drainage drawings shall document the location, size, rim elevation and invert elevation of all pipes (including pipe class), inlets, riprap, headwalls, detention pond volumes, swale cross-sections and all other storm drainage infrastructure shown on the construction plans, including those improvements located in areas outside of the public right-of-way, if appropriate. Record drawings shall also show all pipe and/or drainage way/swale grade percentages.

- More than 2 ft deviation of design alignment shall require new easement dedication or adjustment of the storm drain.
- More than 0.1 ft deviation of design elevation shall require revisions in the drainage report. Any field changes, that no longer meets drainage design criteria, shall be removed and replaced.
- Any field changes, that creates an adverse slope, shall be removed and replaced to original design.
- Change in specified material shall require revisions to the drainage report.

**C. Utilities**

Water and Sanitary Sewer Record drawings shall document the location, size, invert elevations and rim elevation of all pipes and manholes, location of all valves, changes in direction, encasements, meters, services, hydrants, etc.

- Professional surveyor shall provide stamp drawings specifically identifying the limits of as-built survey performed.
- More than 2 ft deviation of design alignment shall require new easement dedication or adjustment of the utility drain.
- See Water & Sewer Specifications for additional criteria.

**D. Other**

Record drawings shall verify other information as specifically requested by the City Engineer or outlined in the project’s conditional approval letter.

**12.2 Minor Changes**

Minor changes are not required to be included on the Record Plans. Minor changes include incorrect references and grade changes less than 0.1 foot.

