

ORDINANCE NO. 019327

**AN ORDINANCE AMENDING VARIOUS SECTIONS OF TITLE 19 (SUBDIVISION AND DEVELOPMENT PLATS), TO ADOPT THE EL PASO STREET DESIGN MANUAL, TO UPDATE REFERENCES TO THE DESIGN STANDARDS FOR CONSTRUCTION TO THE STREET DESIGN MANUAL, AND TO UPDATE STANDARDS OF CONSTRUCTION FOR STREETS. THE PENALTY IS AS PROVIDED IN CHAPTER 19.42 OF THE EL PASO CITY CODE.**

**WHEREAS**, the City wishes to adopt the El Paso Street Design Manual to provide requirements for the design and construction of streets;

**WHEREAS**, the El Paso Street Design Manual is aimed at planning and producing context sensitive, functional and sustainable streets for everyone; and

**WHEREAS**, the Design Standards for Construction will be included as a chapter in the El Paso Street Design Manual.

**NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF EL PASO:**

**SECTION 1.** The City Council adopts the El Paso Street Design Manual attached to this ordinance as Attachment "A". The Street Design Manual, as attached to this ordinance, amends the Designs Standards for Construction previously adopted by City Council and incorporates the Design Standards for Construction into the El Paso Street Design Manual as a chapter within the El Paso Street Design Manual. Title 19 (Subdivision and Development Plats) is amended to add an Appendix 113 – Street Design Manual as shown in Attachment "A" of this ordinance.

**SECTION 2.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.01 (Provisions Applicable to all Platting Procedures), Section 19.01.010 (Authority, purpose and applicability), subsection (D) (Subdivision plat and development plat rules) is amended to read as follows:

D. Subdivision plat and development plat rules. The provisions of this title, the standards governing water and wastewater facilities applicable to plats, and the technical standards contained in the City of El Paso Street Design Manual (SDM), as developed by the city manager or designee and adopted by ordinance by the city council and as may be amended from time to time, constitute the subdivision and development rules of the City of El Paso, which apply to applications for plat approval inside city limits and within the city's extraterritorial jurisdiction. The SDM shall be maintained by and be available in the planning division of the planning and inspections department. Other ordinances of the city may also apply to land development and must be complied with.

**SECTION 3.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.02 (Land Studies), Section 19.02.030 (Decision) is amended to read as follows:

19.02.030 - Decision.

- A. The City Plan Commission shall decide whether to approve, approve with conditions, or deny the land study application.
- B. Prior to the decision, the City Plan Commission shall be provided with a full copy of the land study and all related documents that are needed to make a decision as to compliance with this title.
- C. Where the City Plan Commission conditionally approves or disapproves a land study application, the City Plan Commission shall provide the applicant a written statement of the conditions for the conditional approval or reasons for disapproval that clearly articulates each specific condition for the conditional approval or reason for disapproval. Each condition or reason specified in the written statement must:
  - 1. Be directly related to the requirements in Title 19 and specifications contained in the City of El Paso Street Design Manual (SDM); and
  - 2. Include a citation to the law, including a statute or municipal ordinance, that is the basis for the conditional approval or disapproval; and
  - 3. May not be arbitrary.
- D. After the conditional approval or disapproval of the land study, the applicant may resubmit the land study along with a written response that clearly articulates how each condition for conditional approval or each reason for disapproval has been remedied.
- E. The City Plan Commission shall determine whether to approve or disapprove the applicant's previously conditionally approved or disapproved land study within fifteen days of receipt of resubmission and written response.
- F. It shall be the responsibility of the subdivider to ensure that the land study satisfies all the requirements of the city code, the SDM and any other regulatory requirement.

**SECTION 4.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.02 (Land Studies), Section 19.02.040 (Criteria for approval) is amended to read as follows:

19.02.040 - Criteria for approval.

- A. Factors. The following criteria shall be used to determine whether an application for a land study shall be approved, approved with conditions, or denied:
  - 1. The land study is consistent with all zoning requirements for the property, and any approved development agreement;
  - 2. The proposed provision and configuration of arterial and collector roads, water, wastewater, drainage and park and open space facilities are adequate to serve each phase of the subdivision and generally meet the standards of this title, the SDM and any other applicable standards or requirements of the city;
  - 3. The schedule of development assures that the proposed development will progress to completion within the schedule proposed;

**ORDINANCE NO.** 019327



4. The proposed land study conforms to the district and is consistent with the incorporated concept plan, if any;
  5. The location, size and sequence of the phases of development proposed assures orderly development of the land subject to the plat;
  6. Where the proposed development is located in whole or in part in the extraterritorial jurisdiction of the city in El Paso County, the proposed land study meets any County of El Paso standards; and
  7. The land study is consistent with the adopted comprehensive plan, except where application of the plan conflicts with state law.
- B. Conditions. In addition to any other conditions required to conform the land study to the standards of this title, the city plan commission may condition approval on exclusion of land from the land study or adjustments in the proposed sequence or timing in the proposed phases of the development.

**SECTION 5.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.03 (Preliminary Plats), Section 19.03.020 (Application and procedures), Subsection (D) is amended to read as follows:

- D. Preliminary engineering information in accordance with the SDM checklists meeting the submission requirements must also be submitted with the preliminary plat application.

**SECTION 6.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.03 (Preliminary Plats), Section 19.03.030 (Decision) is amended to read as follows:

**19.03.030 - Decision.**

- A. Review and Determination. The City Plan Commission shall review all preliminary plat applications, findings of the staff, findings of the city manager, or designee regarding compliance with staff recommendations, and any other information available. From all such information, the commission shall determine whether the preliminary plat as shown on the application meets the standards of this title.
- B. Approval or Denial. The City Plan Commission shall decide whether to approve, approve with conditions, or deny the preliminary plat application within thirty days from determination that the application is complete in accordance with Section 19.37.020. The action of the commission shall be entered in the minutes of the commission and the applicant shall be notified of the results.
1. All changes or conditions required by the City Plan Commission as part of the preliminary plat approval shall be made a part of the record and any final plat or final subdivision improvement plans shall meet those required changes or conditions.
  2. On a preliminary plat with significant changes, the City Plan Commission may at the time a preliminary plat is approved subject to conditions, require a revised preliminary plat to be resubmitted.
  3. Where the City Plan Commission conditionally approves or disapproves a preliminary plat application, the City Plan Commission shall provide the applicant a written



statement of the conditions for the conditional approval or reasons for disapproval that clearly articulates each specific condition for the conditional approval or reason for disapproval. Each condition or reason specified in the written statement must:

- a. Be directly related to the requirements in Title 19 and specifications contained in the City of El Paso Street Design Manual (SDM); and
  - b. Include a citation to the law, including a statute or municipal ordinance, that is the basis for the conditional approval or disapproval; and
  - c. May not be arbitrary.
4. After the conditional approval or disapproval of the preliminary plat application, the applicant may resubmit the preliminary plat along with a written response that clearly articulates how each condition for conditional approval or each reason for disapproval has been remedied.
  5. The City Plan Commission shall determine whether to approve or disapprove the applicant's previously conditionally approved or disapproved preliminary plat within fifteen days of receipt of resubmission and written response.
  6. It shall be the responsibility of the subdivider to ensure that the preliminary plat satisfies all the requirements of the city code, the SDM and any other regulatory requirement.

**SECTION 7.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.03 (Preliminary Plats), Section 19.03.040 (Criteria for approval), subsection (G) is amended to read as follows:

- G. The preliminary plat conforms to the design requirements and construction standards as set forth in the City of El Paso Street Design Manual (SDM);

**SECTION 8.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.04 (Final Plat), Section 19.04.030 (Decision), subsection (B) is amended to read as follows:

- B. Approval or Denial. The City Plan Commission shall decide whether to approve, approve with conditions, or deny the final plat application. Upon approval of the final plat, the applicant shall correct and submit final plat copies to the city manager or designee so that required signatures can be obtained and recording completed. The reasons for any action taken by the commission, whether a final plat is approved, denied, or approved with conditions, shall be entered in the minutes of the commission.
  1. All changes or conditions required by the City Plan Commission as part of the final plat approval shall be made a part of the record.
  2. On a final plat with significant changes, the City Plan Commission may at the time a final plat is approved subject to conditions, require a revised final plat to be resubmitted.
  3. Where the City Plan Commission conditionally approves or disapproves a final plat application, the City Plan Commission shall provide the applicant a written statement of the conditions for the conditional approval or reasons for disapproval that clearly

**ORDINANCE NO.**

**019327**

21-1007-2795.001 | 1164349

Title 19 Amendment – Street Design Manual

RTA



articulates each specific condition for the conditional approval or reason for disapproval. Each condition or reason specified in the written statement must:

- a. Be directly related to the requirements in Title 19 and specifications contained in the City of El Paso Street Design Manual (SDM); and
  - b. Include a citation to the law, including a statute or municipal ordinance, that is the basis for the conditional approval or disapproval; and
  - c. May not be arbitrary.
4. After the conditional approval or disapproval of the final plat application, the applicant may resubmit the final plat along with a written response that clearly articulates how each condition for conditional approval or each reason for disapproval has been remedied.
  5. The City Plan Commission shall determine whether to approve or disapprove the applicant's previously conditionally approved or disapproved final plat within fifteen days of receipt of resubmission and written response.
  6. It shall be the responsibility of the subdivider to ensure that the final plat satisfies all the requirements of the city code, the SDM and any other regulatory requirement.

**SECTION 9.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.04 (Final Plat), Section 19.04.040 (Criteria for approval), subsection (B), subsubsection (7) is amended to read as follows:

7. The plat conforms to design requirements and construction standards as set forth in the City of El Paso Street Design Manual (SDM); and

**SECTION 10.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.04 (Final Plat), Section 19.04.070 (Plat recordation), subsection (C) and subsection (D), are amended to read as follows:

- C. Submittal of record plat where improvements have been installed. Where public improvements have been installed and approved for acceptance by the city prior to recording of the plat, the property owner, developer or contractor shall submit a maintenance bond in accordance with Chapter 19.08 of this article from each contractor, one sealed set of "as built" plans in accordance with the SDM or record drawings (submitted as mylars), and an electronic copy of all plans (in a format as determined by the city manager or designee), together with a letter stating the contractors' compliance with Chapter 19.08 of this article, and bearing sealed certification by an engineer that all public improvements have been constructed in compliance with all city construction standards. The property owner also shall submit copies of the approved final plat, revised to reflect the "as built" plans or record drawings, in the format and number as required by the city manager or designee.
- D. Submittal of record plat where improvements have not been installed. Where public improvements have yet to be completed in connection with an approved final plat, the

**ORDINANCE NO. 019327**

21-1007-2795.001 | 1164349  
Title 19 Amendment – Street Design Manual  
RTA

property owner shall submit in the format and number as set forth in the SDM, the approved final plat, revised to reflect any changes required by the city plan commission.

**SECTION 11.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.08 (Construction Plans and Management), Section 19.08.010 (Subdivision improvement plans) is amended to read as follows:

19.08.010 - Subdivision improvement plans.

- A. Purpose. The purpose of subdivision improvement plans is to assure that public improvements required to be installed in order to serve a subdivision or a development are constructed in accordance with all standards of this title.
- B. Application contents. When required by this title either prior to or at the time of submission of an application for final plat approval by the City Plan Commission or by staff where administrative approval is authorized, the number of sets of subdivision improvement plans required by the SDM shall be submitted to the city manager or designee for review for code compliance. All applications shall be submitted on a form supplied by the planning official with the required information as stated on the application form. The subdivision improvement plans shall be submitted for the entire area covered by the subdivision application, and shall comply with all provisions of this title and the SDM. The final subdivision improvement plans including paving and stormwater engineering shall be submitted in one package and be approved or approved with conditions prior to the final plat recordation in accordance with this title. The subdivider shall provide and the subdivision improvement plans shall contain all applicable improvements required by this title and the SDM, including but not limited to the following details:
  1. Grading and slope stabilization as regulated by Chapter 18.44;
  2. Drainage facilities;
  3. Water and wastewater plans, except water and wastewater plans in developments to be served by EPWU, which shall comply with subsection C below;
  4. Streets and other rights-of-way (including sidewalks); on subdivisions within the city limits, sidewalks may be deferred until building permits are requested for a residential lot, except sidewalks at the rear of double frontage lots must be installed, inspected, approved and accepted by the city prior to building permits being issued;
  5. Bikeway and transit improvements (where applicable);
  6. Survey monuments;
  7. Street lights;
  8. Traffic control signs and traffic signalization; traffic calming devices (where applicable);
  9. Landscaping; on subdivisions within the city limits, landscape (street trees) may be deferred until building permits are requested for a residential lot, except landscape at the rear of double frontage lots must be installed, inspected, approved and accepted by the city prior to building permits being issued;

**ORDINANCE NO. 019327**



10. Curb ramps; on subdivisions within the city limits, curb ramps may be deferred until building permits are requested for a residential lot, except curb ramps at the rear of double frontage lots must be installed, inspected, approved and accepted by the city prior to building permits being issued;
11. Street pavement markings;
12. Parkland and open space; and
13. Provisions for arroyo protection.

It is the developer and his engineer's responsibility to put the plans together into one package and follow-up on their review. Incomplete plans shall be returned to the applicant.

- C. The subdivider shall provide complete EPWU approved water and wastewater design plans on or before the final plat is submitted to the CPC. The subdivider shall have the option of using one of two processes for completion of the plans:
  1. EPWU prepares complete water and wastewater plans meeting EPWU requirements and standards.
  2. The subdivider's engineer prepares water and wastewater plans meeting TCEQ and EPWU requirements and submitting those plans to EPWU for approval. Upon approval by EPWU the water and wastewater plans shall be provided to the city. The EPWU shall have fifteen business days to accept the plans or reject the plans with comments for corrections. Failure to act within this timeframe shall permit the subdivider to proceed in accordance with Section 19.08.010(E)(3). This option to the subdivider shall not apply if any off-site extension or capital improvement infrastructure, master plan land studies, or any on-site oversized facilities to serve any areas adjacent to the subdivision are required.
  3. Plans will not be approved and the plat will not be recorded until water and wastewater designs meet TCEQ and EPWU/PSB design standards.
- D. Phasing plan. Where phasing is proposed for the construction and installation of the required subdivision improvements, approval of a phasing plan shall be required, provided, that all of the subdivision improvements are completed within the time period specified herein. The city manager or designee may approve, disapprove or conditionally approve the phasing proposed if the proposed phasing will provide for the orderly development of the subdivision with adequate access to all improvements. No phasing plan shall be approved unless each phase has a complete drainage system, or security for all improvements that are not completed in the initial phase is provided in accordance with the methods and amount in Section 19.08.040 A.1., 2., or 3. No temporary drainage structures will be allowed. If the property contains an arroyo or flow path that requires improvements, security in accordance with the methods and amounts stated in Section 19.08.040 shall be provided regardless of the phasing, unless the improvements to the arroyo or flow path are completed in the initial phase. Where the city manager or designee disapproves a phasing plan, the subdivider may appeal the decision to the City Plan Commission upon a written request submitted to the city manager or designee. Whether or not the city manager or designee approves phasing at the time of the construction plan submission, a subdivider may request phasing and submit a phasing plan at any time prior to the expiration of the time period for completion of the subdivision improvements, or any authorized extension. A phasing plan submitted and

**ORDINANCE NO. 019327**



approved by the city manager or designee after the approval of the construction plan submission, shall be considered an authorized amendment to the subdivision improvement plans and such approved phasing plan shall be attached to and incorporated as part of the approved subdivision improvement plans.

E. Responsible Official and Decision.

1. The city manager, or designee, shall be the responsible official for approval of subdivision improvement plans.
2. For subdivision improvement plans submitted following approval of a preliminary plat, the city manager, or designee shall provide the applicant or applicant's representative a determination of completeness as specified in Section 19.37.020.
3. The city manager, or designee shall decide whether to approve, approve with conditions, or deny the subdivision improvement plan application within thirty days from determination that the application is complete in accordance with Section 19.37.020.
4. Failure of the city manager or designee or EPWU, when applicable, to approve, approve with conditions, or deny the subdivision improvement plan application within the prescribed thirty days from the date that the submission is accepted for completeness, shall permit the subdivider to proceed with the construction of the subdivision improvements pursuant to the plans submitted; except that a subdivider may authorize in advance, or during the review, an extension to the prescribed time period for additional review by the city manager or designee or EPWU, when applicable. The request for a time extension may be for a period not to exceed thirty days and shall be provided in writing by a subdivider prior to the expiration of the prescribed review period. It shall be the responsibility of the subdivider to ensure that the subdivision improvement plans meet or exceed all the requirements of the City Code, EPWU requirements and any other regulatory requirements.
5. Distribution and Review. Once the subdivision improvement plans are approved, the property owner shall provide additional sets of the approved plans to the city, as specified by the city manager, or designee, for use during construction. A full set of the city approved and stamped subdivision improvement plans must be available for inspection on the job site at all times.

F. Notification. The city manager, or designee, shall notify the applicant in accordance with Section 19.38.040 that the subdivision improvement plans are approved for construction. The city manager or designee shall also forward a written certification to all affected departments and agencies advising of the approval of the subdivision improvement plans. The certification shall identify the subdivision name, legal description, and acreage for which the approval was granted.

G. Revised Plan Submission. In cases of conditional approval or disapproval of the subdivision improvement plan application, the process is as follows:

1. The city manager or designee shall provide the applicant a written statement of the conditions for the conditional approval or reasons for disapproval that clearly articulates each specific condition. Each condition or reason specified in the written statement must;

**ORDINANCE NO.** \_\_\_\_\_

21-1007-2795.001 | 1164349

Title 19 Amendment – Street Design Manual

RTA

**019327**



- a. Be directly related to the requirements in Title 19 and specifications contained in the City of El Paso Street Design Manual (SDM); and
    - b. Include a citation to the law, including a statute or municipal ordinance, that is the basis for the conditional approval or disapproval; and
    - c. May not be arbitrary.
  2. If the conditions of approval or disapproval of the plans require revision(s) to the subdivision improvement plans, one set shall be marked with objections noted (on the plans themselves) and returned to the applicant for correction.
  3. The applicant's engineer shall then correct the plans as requested and resubmit the appropriate number of sets required by the SDM of subdivision improvement plans to the city manager or designee for decision. The resubmission or the plans shall be accompanied by a written response that clearly articulates how each condition for conditional approval or each reason for disapproval has been remedied.
  4. The city manager or designee shall determine whether to approve or disapprove the applicant's previously conditionally approved or disapproved subdivision improvement plans within fifteen days of receipt of resubmitted plans and written response. Failure of the city manager or designee to approve or disapprove within the prescribed period, shall permit the subdivider to proceed with the construction of the subdivision improvement plans pursuant to the plans submitted. It shall be the responsibility of the design engineer to certify and ensure that the subdivision improvement plans satisfy all the requirements of the city code, the SDM and any other regulatory requirement.
  5. A copy of any subdivision improvement plans submitted within the extraterritorial jurisdiction, after approval by the city manager or designee, shall be forwarded to the county road and bridge administrator.
  6. Additional copies may be requested by the city manager or designee for informational purposes and review by other agencies.
  7. The city will not require non-engineering related significant changes in the final subdivision improvement plans or final plat approval that contradict the preliminary plat approval, reserving the right to address life safety or other significant issues that should have been addressed in the preliminary plat.
- H. Criteria for Approval. The city manager, or designee, shall render a decision on the subdivision improvement plans in accordance with the following criteria:
1. The plans are consistent with the approved preliminary plat, and the proposed final plat;
  2. The plans conform to the development standards, and standards for adequate public facilities contained in this title; and
  3. The plans conform to the specifications contained in the City of El Paso Street Design Manual (SDM).
- I. Approval Required. Approval of subdivision improvement plans authorizes the property owner to install public improvements in rights-of-way and/or easements offered for



dedication or previously dedicated to the public under an approved preliminary or final plat for which site preparation and other required permits have been approved.

- J. Acceptance Required. Acceptance of the subdivision improvements shall authorize the recording plat submission pursuant to this title. Where the city manager or designee has authorized public improvements to be deferred, the final plat may be approved, recorded and foundation or building permits may be issued, in accordance with Section 19.08.040.
- K. If the city is unable to comply with the time requirements specified in this chapter due to unforeseeable causes beyond the control and without the fault or negligence of the city, including, but not restricted to, acts of God, or of the public enemy, fires, floods, epidemics, quarantine restrictions, strikes, orders of any kind of the government of the United States or the State of Texas, operation of law, disturbances, explosions and severe weather, such time restrictions shall be suspended until such time that the inability to perform due to the unforeseeable cause no longer exists.

**SECTION 12.** Title 19 (Subdivision and Development Plats), Article 1. (Platting Procedures), Chapter 19.08 (Construction Plans and Management), Section 19.08.050 (Inspection and acceptance of public improvements), Subsection (A) (Entry and Inspections), subsection (1) is amended to read as follows:

- 1. The city manager, or designee shall inspect the construction of improvements while in progress as well as upon completion. Construction shall be in accordance with the approved subdivision improvement plans. The city manager or designee shall have the right to enter upon the subdivision site for the purpose of conducting inspections. The city manager or designee shall provide for the inspection of required subdivision improvements during construction to insure general conformity with plans and specifications as approved. If the city manager or designee finds, upon inspection, that any of the required subdivision improvements have not been constructed in accordance with the subdivision improvement plans, this title or the SDM, then the subdivider shall be responsible for making the necessary changes to insure compliance. Any significant change in design required during construction shall be made by the subdivider's engineer, and shall be subject to prior approval by the city manager or designee. If the city manager, or designee finds upon inspection that any of the required public improvements have not been constructed in accordance with the approved subdivision improvement plans, the property owner shall be responsible for completing and/or correcting the public improvements.

**SECTION 13.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.09 (General Requirements), Section 19.09.030 (Conformance to plans), is amended to read as follows:

19.09.030 - Conformance to plans.

- A. Conformance. Proposed capital improvements serving new development shall conform to and be properly related to the public facilities elements of the city's adopted comprehensive plan, other adopted master plans for public facilities and services including parks and open

**ORDINANCE NO.** 019327



space, bikeway and transit, and applicable capital improvements plans, and shall meet the service levels specified in such plans.

- B. Thoroughfare Plan (Map) Amendments. No final plat shall be approved for any subdivision within the city or its extraterritorial jurisdiction until the applicant has made adequate provision for thoroughfares as shown on the thoroughfare plan (Map) as approved by the city. The thoroughfare plan is a guide for the roadway connections and types that will be needed in the future. Subject to city manager, or designee approval, as long as the connection is made, whether or not it is close to the exact alignment shown on the thoroughfare plan, no thoroughfare plan amendment should be necessary. The design and construction of the proposed thoroughfare shall be in conformance with the city's master plans for thoroughfares and with the City of El Paso Street Design Manual (SDM), and shall be subject to approval by the city manager or designee. If a different roadway type is found to be adequate or if the connection is not proposed to be made, then the thoroughfare plan shall be amended, upon provision of a traffic impact analysis of the proposed amendment in accordance with Chapter 19.18.
- C. Water and Wastewater Plans. No final plat shall be approved for any subdivision within the city or its extraterritorial jurisdiction until the applicant has made adequate provision for a water system and a sanitary wastewater system of sufficient capacity to adequately provide service to all tracts and lots within the area to be subdivided. The design and construction of the water system and of the sanitary wastewater system to serve the subdivision shall be in conformance with the El Paso Water Utilities master plans and construction standards for water and wastewater facilities and with the rules and regulations of the Public Service Board/El Paso Water Utilities and with the City of El Paso Street Design Manual (SDM), and shall be subject to approval by the utility manager. Subdivisions either in the ETJ or recently annexed and that are not served by the EPWU but by other systems shall either meet the same EPWU requirements or the requirements of the other utility provider but also be subject to approval by the city manager or designee.

**SECTION 14.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.11 (Extraterritorial Jurisdiction (ETJ) Standards), Section 19.11.010 (General Provisions), subsection (A) is amended to read as follows:

- A. Owners of property within the extraterritorial jurisdiction who propose a subdivision of land shall be subject to the provisions of this chapter. The regulations contained within Chapter 19.01 and including the Street Design Manual (SDM), shall be applicable except as modified by this chapter.

**SECTION 15.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.11 (Extraterritorial Jurisdiction (ETJ) Standards), Section 19.11.020 (Water and wastewater service), subsection (C), subsubsection (1) is amended to read as follows:

1. Final engineering report. The final plat shall be accompanied by an engineering report regarding the availability and methodology of providing wastewater treatment service prepared, meeting the requirements of the SDM, and bearing the signed and dated seal of a professional engineer registered in the State of Texas.



**SECTION 16.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.12 (Water), Section 19.12.020 (El Paso Water Utilities System), is amended to read as follows:

19.12.020 - The El Paso Water Utilities System.

- A. Installation of Water Facilities. Where water is to be provided through the EPWU system, the developer shall install adequate water facilities, including fire hydrants, in accordance with the current rules and regulations for public water systems of the TCEQ, the rules and regulations of the El Paso Water Utilities/Public Service Board (EPWU/PSB) and the firefighting standards of the Texas Board of Insurance, and the standards and specifications of the city and EPWU.
- B. Facilities for Health and Safety Emergencies; Alternative Water Sources. All water facilities connected to the EPWU water system shall be capable of providing water for health and emergency purposes, including fire protection. Water supply facilities shall be in accordance with city and EPWU. The design and construction of water system improvements and alternative water sources shall also comply with the following standards:
  - 1. Design and construction of a water source on the site shall be in accordance with applicable regulations of the TCEQ.
  - 2. Design and construction of water service from the EPWU shall be in accordance with the standards in the city's SDM and of EPWU.
  - 3. Design and construction of a fire protection and suppression system shall be in accordance with the standards of the SDM, the EPWU, the city's adopted fire code, Chapter 9.52 of the code and be approved by the city manager, or designee, utility manager and fire department.

**SECTION 17.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.14 (Utilities Generally), Section 19.14.005 (General Provisions), Subsection (B), subsection (1) is amended to read as follows:

- 1. The placement and separation of the various utilities within an easement or right-of-way shall conform to the Development Standards for Construction contained in the SDM. The placement and separation of water and wastewater utilities shall also conform to the requirements of the Texas Commission on Environmental Quality (TCEQ).

**SECTION 18.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.14 (Utilities Generally), Section 19.14.020 (Utility location policies), is amended to read as follows:

19.14.020 - Utility location policies.

- A. Placement. It is in the city's best interest to coordinate and regulate the placement of utilities within public rights-of-way or public or private easements. Such regulations and coordination shall be managed under the general standards of this chapter.

**ORDINANCE NO.** \_\_\_\_\_

**019327**

21-1007-2795.001 | 1164349

Title 19 Amendment – Street Design Manual

RTA



B. Standards.

1. Public street rights-of-way shall be the preferred location for all utility extensions to the extent reasonably possible.
2. In order to accommodate the multiple public and franchise utilities within the public street right-of-way, there shall be a minimum amount of unpaved right-of-way outside of and in addition to the right-of-way covered by street paving, sidewalk and curb-and-gutter in accordance with the SDM street cross sections and requirements. This unpaved area may be between the curb and sidewalk or on the outside of the sidewalk. The minimum roadway cross sections in Chapter 19.15 have been designed with a minimum area behind the curb, and sufficient right-of-way to meet this requirement in accordance with the SDM shall be dedicated to accommodate over-width sidewalks, bikeways, or any surface improvement.
3. Easements on private property may be used in the following instances and under conditions specified therein:
  - a. For pedestal, transformer and utility hut pads;
  - b. Where special developments (i.e., cluster subdivisions and planned development districts) occur;
  - c. Where public or private streets are platted lacking sufficient parkway to install required and franchise utilities and, even then, such easements as needed shall be provided adjacent and parallel to the street;
  - d. Where on-site ponding is proposed and the parkway is proposed to be removed to accommodate the on-site ponding, then the utilities must be located in an adjacent easement;
  - e. Where unusual circumstances prevent use of the public right-of-way or private street; and
  - f. Easements shall be a minimum of ten feet on private property, or as specified by the utility provider utilizing the easement.
4. Prior to the pavement installation, the subdivider shall obtain a written release from each utility provider indicating that required utility installation is complete. Subdividers shall provide such release to the city.
5. A joint trench for electric and communication utilities shall be provided, in accordance with the SDM. Separate trenching for electric and communication utilities will be allowed only:
  - a. In the mountain development area, in accordance with Chapter 19.24;
  - b. For individual street crossings;
  - c. For service drops;
  - d. Where existing service feeds or sources are coming from demonstrably different directions;
  - e. In replats where existing utilities are in separate trenches.

ORDINANCE NO. 019327



6. Conduit, to accommodate electric, telephone and cable television service lines at street crossings extending from closures on one side of the street, shall be provided. Utilities shall meet the locational criteria, if any, contained in the SDM.

**SECTION 19.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.010 (Adequacy of streets and thoroughfares), is amended to read as follows:

19.15.010 - Adequacy of streets and thoroughfares.

- A. Responsibility for Adequacy of Streets and Thoroughfares. The property owner shall assure that the subdivision is served by adequate streets and thoroughfares, and shall be responsible for the costs of rights-of-way and street improvements, in accordance with the following policies and standards, and subject to the city's cost participation policies on oversized facilities. Additional right-of-way may be required at some street intersections to accommodate utilities, sidewalks, traffic control devices and/or sight distances.
- B. General Adequacy Policy. Every subdivision shall be served by improved streets and thoroughfares adequate to accommodate the vehicular, bicycle and pedestrian traffic to be generated by the development. Adequacy as it relates to public improvements including roadways is attained by complying with the requirements and standards of this title, the SDM and all related city ordinances. Proposed streets shall provide a safe, convenient and functional system for traffic circulation; shall be related to the city's thoroughfare plan, road classification system, comprehensive plan and any amendments thereto; and shall be appropriate for the particular traffic characteristics of each development.
- C. Road Network. New subdivisions shall be supported by a road network having adequate capacity, ingress/egress, safe and efficient traffic circulation and roadway network connectivity. The adequacy of the road network for developments that meet the requirements of Section 19.18.010(B), traffic impact studies (TIA), shall be demonstrated by preparation and submission, prior to or along with land study or the preliminary plat application, of a traffic impact analysis prepared in accordance with Chapter 19.18 (Traffic Impact Analysis). The study shall address accommodating traffic generated by the development, land to be developed in common ownership and other developed property.
  1. In the event the property to be developed is intended as a phase in a larger development project, or constitutes a portion of the land to be ultimately developed, the city manager, or designee may require a demonstration of adequacy pursuant to this article for additional phases or portions of the property as a condition of approval for the proposed preliminary plat.
- D. Major and minor arterials, collectors and other thoroughfares appearing on the city's adopted bike plan shall have bicycle facilities installed in accordance with the Street Design Manual. For major and minor arterials, collectors and other thoroughfares not appearing on the city's adopted bike plan, bicycle facilities may be constructed on one side or both sides of the street.



- E. Traffic Calming. Traffic calming may be provided by the developer or may be required in accordance with the adopted Neighborhood Management Policy and in accordance with the SDM by the city manager or designee.

**SECTION 20.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.020 (Subdivider responsibility), Subsection (B), subsection 3 is amended to read as follows:

3. Alleys. Where provided, alleys shall be installed and improved in accordance with all standards required by this title and the SDM. Alleys shall be provided by and at the expense of the subdivider.

**SECTION 21.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.050 (General Requirements), is amended to read as follows:

19.15.050 - General requirements.

- A. Approach Roads and Access shall comply with the SDM.
- B. Roadway Network Connectivity shall comply with the SDM.
- C. Off-Site Improvements shall comply with the SDM.
- D. Street right-of-way dedication shall comply with the SDM.
- E. Street Construction shall comply with the SDM.
- F. Intersection Improvements and Traffic Control Devices shall comply with the SDM.
- G. Private Streets shall comply the SDM.
- H. Access Management. Roadway access management standards and requirements related to TXDOT roadways and city roadways shall be in accordance with the SDM.
- I. Exceptions to these requirements shall comply with the SDM. The Street design manual allows for flexibility in street design in cases where the proposed subdivision is constrained by topographic features, existing development, or other impassable features, as determined by the city manager or designee.

**SECTION 22.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.060 (Street Standards), is amended to read as follows:

19.15.060 - Street standards.

- A. SDM Standards Met. In addition to the requirements of the City of El Paso Street Design Manual (SDM), the requirements of the street standards in this chapter shall be met.

**ORDINANCE NO.** 019327



B. Projections and Related Requirements. Where adjoining un-subdivided areas exist, the subdivision street arrangement shall make provision for projection of streets into such areas. Dead-end streets shall otherwise be prohibited, except where projections into un-subdivided land are necessary or where turnarounds are provided in accordance with the SDM. Private streets shall not be allowed to project beyond the subdivision boundary, and therefore shall not be allowed to dead-end at the subdivision boundary.

C. Transitions of Right-of-Way Width shall comply with Street Design Manual.

D. Lots accessing arterial streets shall comply with Street Design Manual.

E. Right-of-way Widths. Street right-of-way widths shall be as shown in the SDM

F. Construction of Streets. All streets shall be constructed in accordance with paving widths and specifications as set forth in the SDM of the City of El Paso at the time at which any required application is officially submitted and deemed a complete application, in accordance with the vesting provisions of this title.

1. Intersections of major and minor arterials shall be constructed with concrete in accordance with the SDM, unless a specific exception is granted by the CPC and upon the affirmative recommendation of the city engineer or other designee of the city manager.

2. All other streets may be constructed with asphalt in accordance with the SDM.

G. Street Grades and Horizontal Curves. Minimum and maximum street grades and horizontal curves will conform to standards set forth in the SDM and the American Association of State Highway and Transportation Officials (AASHTO).

H. Street Signs. Street signs shall be installed by the developer at all intersections within and abutting the subdivision. These signs shall be of a type approved by the city, and shall be installed according to city standards and in conformance with the Texas Manual on Uniform Traffic Control Devices.

I. Streetlights. Streetlights shall be installed in accordance with the SDM.

J. Screening Along Roadways. Screening requirements for roadways shall be in accordance with the zoning districts and requirements outlined in the zoning ordinance.

K. Pedestrian Connectivity. Pedestrian connectivity and access shall be provided between subdivisions, schools (where access is allowed by the school district), cul-de-sac (i.e., bulb-to-bulb access) and park and open space areas. In cases where a subdivision is constructed in a location that is adjacent to another subdivision, pedestrian access shall be provided such that adjacent development can connect to such access at a later date, when development occurs. Gated subdivisions, subdivisions with severe topography problems or subdivisions where such connectivity may interfere with Arroyo or sensitive environmental protection may be exempt from this requirement upon approval by the city plan commission.

L. Conformance with the Comprehensive Plan. Streets and the layout of streets shall be consistent with the adopted comprehensive plan, and specifically the adopted Major Thoroughfare Plan.

M. Reserve Strips. Reserve strips controlling access to streets shall be prohibited except where their control is required by the city and approved by the city plan commission.

**ORDINANCE NO.** 019327



**SECTION 23.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.070 (Intersections, half-streets), is amended to read as follows:

19.15.070 - Intersections, half-streets

- A. Street intersections and half streets shall comply with the SDM.

**SECTION 24.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.080 (Street Length), is amended to read as follows:

19.15.080 - Street length

- A. The length of any block or street segment shall comply with the SDM.

**SECTION 25.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.090 (Cul-de-sac streets), is amended to read as follows:

19.15.090 - Cul-de-sac streets

- A. Cul-de-sac streets shall comply with the SDM.

**SECTION 26.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.100 (Dead-end streets), is amended to read as follows:

19.15.100 – Dead-end streets

- A. Dead-end streets shall comply with the SDM.

**SECTION 27.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.110 (Street width and design), is amended to read as follows:

19.15.110 - Street width and design

- A. Pavement widths and designs of right of way shall comply with the City of El Paso Street Design Manual.



**SECTION 28.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.120 (Street off sets), is amended to read as follows:

19.15.120 - Street offsets

- A. Street offsets shall comply with the SDM.

**SECTION 29.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.130 (Curbs and gutters), is amended to read as follows:

19.15.130 - Curbs and gutters.

Curbs and Gutters. Curbs and gutters shall be installed according to the provisions of this chapter and to the SDM. Combination curb and gutter improvements shall be provided to mark the edge of pavement and carry off surface water, as set forth below:

- A. Beside Freeways. The subdivider shall be required to install curbs along the outside lanes in rights-of-way designated for freeways, as per the TXDOT approval or construction plans.
- B. Beside Arterial and Collector Streets. The subdivider shall install curbs on both sides of all arterial and collector streets within the subdivision, and on one side of all such streets at the subdivision boundary.
- C. Beside Local Streets. The subdivider shall install curbs on both sides of all local streets within the subdivision and at subdivision boundaries, except for existing boundary streets, in which case curb and gutter installation shall be required on the subdivision side only.
- D. At Street Intersections. The minimum curvature of curbs at street intersections shall be as prescribed in the SDM and shall maintain proper stopping sight distance as determined by the latest edition of AASHTO's "A policy on Geometric Design of Highways and Streets."

**SECTION 30.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.140 (Street names and addresses), is amended to read as follows:

19.15.140 - Street names and addresses

- A. Street names and addresses shall comply with the SDM.

**SECTION 31.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.15 (Roadways), Section 19.15.160 (Alleys), is amended to read as follows:



19.15.160 – Alleys

- A. Alleys shall comply with the SDM.

**SECTION 32.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.16 (Streetlighting) is amended to read as follows:

Chapter 19.16 - STREETLIGHTING

19.16.010 – Streetlighting

- A. Streetlighting shall comply with SDM Chapter 7.

19.16.020 - Custom lighting.

- A. The subdivider may elect to provide custom lighting in lieu of the required standard streetlighting, subject to the approval of such lighting by the city manager or designee. Custom lighting shall be furnished and installed to meet the approved standards of Title 18 of this City Code and the SDM.
- B. Where custom lighting is approved within the street right-of-way, the city or county shall be liable for the costs of electrical energy of the custom lighting provided that the following conditions are met:
1. A separate rate can be charged to the city by the electric utility for the custom lighting proposed; and
  2. The total rate charged to the city is equal to or less than the rate for electrical energy for standard streetlighting.
- C. If a subdivider elects to provide and install custom lighting, a public improvement district (or other such private entity) shall be created which will be perpetually liable for all costs associated with the maintenance of the lighting fixtures. Where the city is not liable for the costs of electrical energy from the custom lighting as provided in this subsection, the public improvement district shall also be liable for the electrical energy costs of the custom lighting.
- D. An agreement between the city and the public improvement district shall be required which makes adequate provision to indemnify and hold the city harmless from any claims which may arise from the custom lighting, whether within or outside of the public right-of-way. The agreement shall provide that the city may require that any or all of the installed custom lights be removed, at the public improvement district expense, when a finding is made by the city council or county commissioners' court based on a recommendation of the city engineer or other designee of the city manager or county engineer that the custom lighting creates a nuisance or is unsafe. Upon such a finding, standard streetlighting pursuant to this chapter shall be required to be furnished and installed to replace the custom lighting.
- E. The city shall reserve the right to review and approve all such provisions of the agreement. The agreement shall accompany the subdivision improvement plan



submission. Restrictive covenants which include the provisions for continuous lighting and perpetual maintenance of the custom streetlights shall be recorded by the subdivider concurrently with the subdivision.

- F. Where custom lighting is provided, the subdivider or public improvement district shall notify the electric utility before any work is commenced at any streetlight location.
- G. Custom streetlighting placed within the public right-of-way shall meet the lumen level required in the DSC and provide roadway coverage meeting or exceeding that provided by standard streetlighting. Lighting outside the right-of-way shall meet the lumen level and coverage requirements of the DSC.

**SECTION 33.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.17 (Driveways) is amended to read as follows:

#### Chapter 19.17 - DRIVEWAYS

##### 19.17.010 – Driveways

- A. Driveways shall comply with the SDM.

**SECTION 34.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.19 (Stormwater Management Requirements), Section 19.19.010 (General provisions), Subsection A, subsection 3 is amended to read as follows:

- 3. Establish minimum post-development stormwater management standards and design criteria to be adopted via a Drainage Design Manual (DDM) as part of the Street Design Manual (SDM);

**SECTION 35.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.20 (Parks and Open Space), Section 19.20.010 (Policy Plan and Purpose) is amended to read as follows:

##### 19.20.010 - Policy plan and purpose.

- A. Purpose. This chapter is adopted to provide recreational areas as a function of subdivision development in the City of El Paso. This article is enacted in accordance with the home rule powers of the City of El Paso granted under the Texas Constitution, and the statutes of the State of Texas, including, but not by way of limitation, V.T.C.A. Local Government Code, Chapter 212. It is declared by the city council that recreation areas in the form of neighborhood parks, community parks that serve several neighborhoods, linear parks, trails, and open space areas are necessary and in the public welfare, and that the only adequate procedure to provide for same is by integrating such a requirement into the procedure for planning and developing property or subdivisions in the city, whether such development consists of new construction on vacant land or the addition of new construction or redevelopment on existing developed lands.



- B. Neighborhood parks, community parks, linear parks, trails and open space areas referred to in this chapter are those parks providing for a variety of outdoor recreational opportunities and within convenient distances from the majority of the residences to be served thereby. The primary cost of those parks should be borne by the ultimate property owners who, by reason of their proximity to such parks, shall be the primary beneficiaries of such facilities.
- C. The requirements for parkland are based in part on the standards, needs and objectives set forth in the El Paso Parks and Recreation Master Plan, routinely amended and adopted by the city council, a copy of which shall be retained in the office of the director of parks and recreation and which shall be incorporated by reference herein for all purposes. Therefore, the requirements in this code and any requirements in the SDM are adopted to effect the purposes stated above and shall apply to any development within the City of El Paso, except as noted therein

**SECTION 36.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.20 (Parks and Open Space), Section 19.20.030 (Parkland calculation), subsection B, is amended to read as follows:

- B. Types of parkland that may be dedicated. The following park configurations of land may be proposed by the subdivider to meet the dedication requirements of this chapter. The lands to be dedicated and the type of dedication to be provided shall be based on the affirmative recommendation of the director of parks and recreation and the approval of the city plan commission.

If the parks director does not provide an affirmative recommendation, the developer may appeal the parks director's decision. The parks director shall provide to the developer, in writing, the reasons for the denial. The appeal will require the developer to file with the planning director an appeal within fifteen business days from receiving the parks director's decision. The appeal shall be accompanied by the following:

- (a) A thirty-day waiver of the thirty-day statutory requirement for approval of the subdivision plat.
- (b) The reasons for the appeal. Upon receipt of the appeal, the planning director shall place the appeal on the next available city plan commission meeting. The city plan commission may overturn the parks director's decision by a super majority, which shall be three fourths of the city plan commission present and voting. In determining whether to overturn the parks director's decision, the city plan commission shall consider any evidence presented by the developer and parks director. In no instance can the city plan commission modify or vary any City Code requirements.

An alternative type of dedication may be recommended by the director of parks and recreation, based on the specific nature of the subject property. Any dedication that is proposed shall meet the requirements of Section 19.20.050, Standards, except as noted in this chapter.

- 1. Neighborhood parks. Lands for parks that serve a neighborhood shall be of the quantity determined by the density of the residential subdivision submitted pursuant to Section



19.20.030. The developer may satisfy Section 19.20.030 by providing multiple park sites that comply with Section 19.20.050, for a residential subdivision application.

2. Dual park-pond. Parks and drainage retention or detention ponds may be placed side by side or combined to provide for larger and more efficient park and open space lands for neighborhoods.

Conceptual cross-sections for park-pond areas are included in the subdivision standards. These conceptual drawings are intended to serve as a guideline to the designer, and modifications that meet or exceed the intent of this chapter are encouraged. All park-pond designs shall be approved by the director of parks and recreation and the city engineer or city floodplain administrator.

- a. Park-ponds requirements. For purposes of this subsection, the ponding area proposed for use as a park-pond shall require an affirmative approval for park usage by the director of the parks and recreation department, subject to the provisions below being met. Where acceptable, the pond portion of the park may count towards the required parkland dedication amount at ratio of one acre of park-pond for every one acre of required parkland dedication, subject to the following requirements being met.
  - i. To be considered as a park-pond, the proposed facility must be located no further than one-half mile from all residences that it is intended to serve. The street frontage for the park-pond shall be continuous along one complete side of the park or thirty-five percent of the park perimeter whichever is greater.
  - ii. Flat perimeter areas on the rim of the ponding basin shall be provided. These shall be a minimum of ten feet in width from the edge of the pond slope to the nearest property line to allow for a trail, landscaping and pond maintenance requirements. If abutting a seven-foot sidewalk or trail the flat perimeter area shall be a minimum of five feet. Wider and variable width areas are preferred to create a more parklike appearance.
  - iii. A park-pond shall have a flat contiguous park area adjacent to the detention/retention basin that is not subject to periodic inundation (ten-year storm frequency). This area shall be a minimum of one-half acre in size or larger, including the area of the one closest adjacent perimeter flat zone. This area shall meet the minimum improvements requirements set forth in Section 19.20.050 B. as may be found to be warranted and applicable to a park-pond by the director of parks and recreation. For park-ponds where the pond portion is over two and one-half acres in size, the size of the upper area shall be at least twenty percent of the area of the pond. This area shall be shaped to accommodate the placement of permanent park structures such as play features, multi-purpose courts and shade pavilions.
  - iv. Side slopes in park-ponds shall not exceed a maximum three to one horizontal to vertical slope. Flatter side slopes are recommended.
  - v. If a two tier park-pond is designed, then the lower tier flat area shall not be less than twenty percent of the upper tier flat area.



- vi. The maximum depth of the pond portion of a park-pond shall not exceed ten feet for a two tier park-pond and six feet for a one tier park-pond.
  - vii. Perimeter areas around the pond shall be planted to create an attractive buffer zone around the park-pond. Plant materials and required irrigation system(s) must be installed and operational at the time the city accepts the facility. All irrigation and planting shall meet the park facilities standards referenced in Section 19.20.050.
  - viii. Signs shall be provided to inform the public of the dual park-pond purpose and to notify them of the potential safety hazard from stormwater detention/retention.
  - ix. Percolation tests at the bottom of the park-pond basin shall be performed according to ASTM 5126. Stormwater shall percolate within seventy-two hours or as may be approved by the city engineer or other designee of the city manager.
  - x. A fully accessible route that meets Americans with Disabilities Act (ADA) standards to the lower park area in the basin of the pond shall be provided.
  - xi. Grading, irrigation and turf in accordance with Section 19.20.050 B.3.d.
  - xii. Credit may be provided for that portion of the park-pond that exceeds the amount of parkland required to be deeded to the city pursuant to this title if the credit to be derived is within the same park zone and upon the affirmative recommendation of the director of parks and recreation.
  - b. Other ponds not serving as park ponds. Shall meet minimum placement, setback and landscaping requirements as established by the City of El Paso Stormwater Drainage Manual.
3. Linear park corridors and trail development. Trail corridors may be dedicated and constructed by the subdivider, and may serve as credit against required parkland, subject to the following conditions being met:
- a. Where adjacent to private property lines on either side of the corridor, the trail corridor shall be a minimum of thirty feet in width;
  - b. Where the trail corridor is adjacent to a permanently preserved corridor such as a drainage channel or natural open space, the additional trail corridor width may be reduced to fifteen feet. A minimum of ten feet from the nearest edge of the trail adjacent to a private property line shall be maintained except where separated from such private property by a wall;
  - c. If the trail corridor is located adjacent to a street right-of-way, the trial corridor shall be a minimum of fifteen feet in width as measured from the adjacent back of curb. The additional portion of the corridor that is outside of the street right-of-way and that is a minimum of five feet in width shall be credited as lands meeting the parkland dedication requirements of Section 19.20.030.
  - d. Trails shall be a minimum of eight feet in width. Narrower trails will not count as credit towards parkland requirements. Trail surface material shall follow the



requirements of the City of El Paso Park Development Standards. The City of El Paso may elect to contribute to the cost of the trail if a width wider than eight feet is deemed appropriate for that specific location;

- e. Public access points to the corridor shall be provided at regular intervals. The linear areas adjacent to the corridor shall have open space, street ROW, or other opportunities for immediate and safe ingress/egress along at least seventy-five percent of the corridor length on one side or the other;
  - f. A zone that is a minimum of five feet wide along each side of the trail shall be improved with a natural non-irrigated landscape treatment, following guidelines contained in the parks facility standards referenced in Section 19.20.050.
  - g. Trails may be built on power line or other utility corridors, but in cases with corridor lands whose ownership is not fully transferable to the City of El Paso, only the lands under built trails and those improved areas meeting the requirements of this subsection will count towards the parkland dedication requirements of this chapter. In such cases, the easement holder or right-of-way owner must provide legal acceptance allowing the trail to be built with free public access provided in perpetuity;
  - h. Trail standards in this title and in the SDM may be modified by the city plan commission based upon the recommendation of the director of parks and recreation;
  - i. Trail corridor lighting shall not be required where earthen trails are provided nor where corridors are located in public right-of-way and street lighting is provided. Otherwise lighting may be required by the director of parks and recreation or designee in accordance with the parks facilities standards, the SDM and the provisions of the Dark Skies section of Title 18.
4. Open space lands and arroyos - types of land that are noted as areas that should be preserved in the El Paso Open Space Master Plan, such as natural Arroyos, may be used to meet the land dedication requirements of this chapter:
- a. For purposes of this subsection, the area open space to be used in applying the reduction shall be the acreage that is deemed acceptable for preservation by the director of the parks and recreation department and approved by the city plan commission;
  - b. Open space lands will not be required to meet the minimum development standards of Section 19.20.050.
  - c. One acre of open space dedication will count as one-half of an acre of required parkland dedication;
  - d. Other open space lands, such as Arroyos, that exceed the parkland requirements of this chapter, may be accepted by the City of El Paso. The City of El Paso will assume maintenance of these areas.

019327

**ORDINANCE NO.** \_\_\_\_\_

21-1007-2795.001 | 1164349

Title 19 Amendment – Street Design Manual

RTA



**SECTION 37.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.20 (Parks and Open Space), Section 19.20.050 (Standards for deeded parkland), is amended to read as follows:

19.20.050 - Standards for deeded parkland.

A. General characteristics. Parkland deeded to the city as provided in this chapter shall meet the standards set forth below and in the SDM:

1. The parkland shall be placed in a location near the center of the subdivision or subdivisions that it serves, with the expressed goal that the park is no further than one-quarter mile measured by walking distance from any residence within the subdivision that it serves;
2. Where the subdivision is an initial phase of multiple phases, the park may be located so that it is accessible to the future phases, provided that the park meets the requirements of Subsection A.1. above;
3. Parklands submitted for dedication shall be located so that users are not required to cross arterial roads to access the park site from within the subdivision, and shall not abut an arterial except in the following circumstances:
  - a. Parks over twelve acres may abut an arterial on one side; or
  - b. The arterial has no more than four lanes and has on-street parking; or
  - c. Parks permitted in Section B.4.a (Alternate Park Type Table).
4. If the park is one acre or larger, the entire boundary of the parkland shall abut either a public or private street, dedicated open space or arroyo. Parks of less than one acre shall abut a public or private street, dedicated open space or arroyo on at least two sides. Buildings on lots that have frontage on streets that abut the park shall face the park. Residential lots may abut parkland provided that the subdivider incorporates the following standards:
  - a. Pedestrian connectivity between the parkland and adjacent lots is provided,
  - b. That a front build-to line, in accordance with the zoning ordinance, is delineated on the plat so that residential structures face the park, and
  - c. The park site shall share at least one boundary line with a public or private street;
5. The parkland should, when possible, be located adjacent to school sites, ponding areas, or public open space to facilitate shared facilities;
6. When parkland is deeded to the city as required by this title, the area of the park shall be calculated from the nearest property line or street right-of-way line, and not from the existing or proposed curb line of an adjacent street, unless park features are incorporated into the parkway, subject to an affirmative recommendation by the director of parks and recreation and approval by the city plan commission. Sidewalks and signs shall not count as park features that allow the inclusion of the parkway area as part of the park area calculation; and



7. Where possible, and as approved by the director of the parks and recreation department, parkland shall be designed and located within a subdivision to allow for an extension or connection to a public park or other public recreational facility within an abutting subdivision.
- B. Minimum improvements for lands to be dedicated as parklands. Parkland deeded to the city shall meet the following minimum improvements described by this subsection.
1. The subdivider shall indicate the proposed parkland improvement(s) within the subdivision improvement plans as required in Section 19.08.010.
  2. Construction of the required minimum parkland improvement(s) shall be in accordance with the approved subdivision improvement plans, and shall be completely installed and constructed by the subdivider within the time period specified for construction of subdivision improvements in this title.
  3. An improved park shall, at a minimum, include the following:
    - a. Paving frontage, curbing, and gutter for all street frontages abutting the outside perimeter of the parkland;
    - b. Utility (water, sanitary sewer and electricity) extensions to the perimeter of the park at a location indicated by the director of parks and recreation and that are consistent with published EPWU rules;
    - c. An accessible route shall be installed per the Texas Accessibility Standards (TAS) on all street frontages abutting the outside perimeter of the parkland of a minimum width and construction to provide accessibility to individuals with disabilities as provided by the Texas Accessibility Standards (TAS). The sidewalk alignment and width shall be approved by the director of parks and recreation;
    - d. Grading, automatic irrigation and turf within the parkland boundaries shall be installed prior to the acceptance of the proposed parkland submittal. The design and installation shall be approved by the director of the parks and recreation department. The city plan commission may, upon an affirmative recommendation from the director of the parks and recreation department, allow parkland to remain undisturbed in its natural state;
    - e. One age appropriate play structure unit entirely covered by a metal shade canopy, for either ages two—five years or ages five—twelve years, with a minimum 50-foot by 50-foot user zone, from an approved park department list of acceptable alternatives, including an appropriate safety surface that meets industry requirements. If a play structure already exists within a dedicated park within one-fourth mile, other comparable amenities entirely covered by a metal shade canopy of comparable size may be provided such as basketball courts, outdoor exercise stations, splash pads, or picnic tables.
    - f. A minimum of two accessible shaded picnic tables, or four benches or a combination of benches and tables, per acre on concrete pads;
    - g. A minimum of one trash can per acre on a concrete pad;



- h. Pedestrian-oriented perimeter lighting along adjacent public and private street rights-of-way and one light at the playground or focal point of the park;
- i. Where open space lands to be left in an undisturbed state are accepted as required parklands, grading, automatic irrigation and turf establishment requirements shall be waived;
- j. Standards.
  - i. Facilities and improvements provided by a subdivider on lands dedicated as parkland shall be designed and installed to meet the minimum standards of this chapter, the SDM and the parks and recreation department as established in the parks facilities standards, a copy of which is maintained by the director of the parks and recreation department. The parks facilities standards shall be approved by the city plan commission and the city council. The parks facilities standards may be changed from time to time, but each change shall be approved by the city plan commission and the city council.
  - ii. Facilities and improvements of a park developed for and owned by the city, regardless of whether the project is developed through City of El Paso Engineering and Capital Construction or the project is developer-generated, shall be designed and installed to meet the minimum standards of the following, or as otherwise approved by the director of the parks and recreation department, in accordance with related federal, national, state, or local codes, including but not limited to the following:
    - 1. International Play Equipment Manufacturer's Association (IPEMA);
    - 2. Consumer Product Safety Commission (CPSC) Handbook for Public Safety;
    - 3. American Society for Testing and Materials (ASTM);
    - 4. Accessibility Standards for Play Areas through the ADA Accessibility Guidelines (ADAAG);
    - 5. Illuminating Engineering Society of North America (IESNA RP-6-01);
    - 6. Sports Turf Management Association (STMA); and
    - 7. American Society for Testing and Materials (ASTM F08).
  - k. Street trees shall be provided in the parkway abutting the park at twenty-foot intervals. If the park does not abut street ROW on all sides, in addition to the street trees, shade trees shall be provided at a minimum of ten trees per one-fourth acre.
- 4. The subdivider may use one or more of the designs in the approved alternate park type table (a) and shall receive full credit towards parkland dedication requirements (unless otherwise stated in the table), provided all requirements listed in the table are met. In developments larger than thirty acres, at least two different park types are required.

**Alternate Park Type Table:**

Park Type	Tot. Lot	Pocket Park	Green	Plaza	Square
Size	< ¼ acre	¼—½ acre	½—8 acres	¼—2 acres	½—5 acres
Location	Residential/Commercial/ Mixed Use	Residential/Commercial/ Mixed Use	Low-Medium Density Residential	Commercial/ Mixed Use/High Density Residential @ Intersection of roads on the City's MTP with street frontage on 4 sides; abutting buildings must face the plaza.	Mixed Use/High Density Residential @ Intersection of roads on the City's MTP with street frontage on 4 sides; abutting buildings must face the square.
Requirements	B.3.a-k;	B.3.a-k; except that e. (play structure) is required in a residential area; but any of the following may be substituted in a commercial or mixed-use area: basketball court, outdoor exercise stations or gazebo with a combined structured shade area at least 900 sf & 4 picnic tables or benches or a combination.	B.3.a-k; except that the following may be substituted with approval of Parks Director for e. (play structure) when a play structure within a dedicated park already exists within ¼ mile of the green: basketball	B.3.a-d, f- k; primarily hardscape surface; a focal point must be provided (such as a fountain or water feature or gazebo with a combined structured shade area at least 900 sf & 4 picnic tables or benches or a combinatio	B.3.a-d, f- k; a focal point must be provided (such as a fountain, water feature, splash pad, outdoor exercise stations or gazebo with a combined structured shade area at least 900 sf & 4 picnic tables, benches or a



			courts, outdoor exercise stations, splash pad, gazebo with a combined structured shade area at least 900 sf & 4 picnic tables or benches or a combination, trails, amphitheaters.	n).	combination).
Optional	N/A	Up to 10% of the dedicated acreage may be landscaped with shrubs, screenings or crushed rock.	Up to 10% of the dedicated acreage may be landscaped with shrubs, screenings or crushed rock.	Up to 10% of the dedicated acreage may be landscaped with shrubs, screenings or crushed rock.	Up to 10% of the dedicated acreage may be landscaped with shrubs, screenings or crushed rock.
Conditional	N/A	N/A	10-30% of the dedicated acreage may be open space left in an undisturbed state depending on topography, wildlife habitat, or	N/A	N/A

			aesthetic value; up to 50% credit for open space subject to approval of Parks Director.		
--	--	--	---	--	--

5. The subdivider shall be required to submit development construction plans that conform to this title, the SDM and the parks and recreation department design, construction and specification standards. The parks and recreation department will review the construction documents for compliance with city park construction requirements. The developer must agree to standard city construction inspections of the park improvements.
- C. Exceptions. For purposes of this chapter, off-site dedications accepted pursuant to Section 19.20.080 shall not be required to satisfy the requirements of subsection (B)(3) of this section at the time of acceptance of the deed by the city. The city shall require the approval of a development agreement as a condition of acceptance of an off-site dedication, requiring such improvements within two years of the recording of the first subdivision plat within the development by the property owner who deeded the parkland, or a subsequent purchaser.

**SECTION 38.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.21 (Sidewalks), Section 19.21.020 (General requirements), is amended to read as follows:

19.21.020 - General requirements.

General Requirements. The following general requirements and the requirements contained in the street design manual (SDM) apply to the provision of all sidewalks throughout the city and ETJ.

- A. Standards Not Otherwise Specified. Where facility standards and requirements are not otherwise specified within this chapter, the design of pedestrian facilities shall follow the City's Code, Title 13.04, the Street Design Manual (SDM) and other city Sidewalk Design Standards and applicable state and federal laws and regulations.
- B. Maintenance. All sidewalks, sidewalk amenities, and landscaping in the right-of-way shall be maintained by the adjoining property owner unless otherwise specifically provided for by public policy.
- C. Location and Width of Sidewalks. Unless noted otherwise:
  1. Sidewalks shall have a minimum clear path width of a minimum of five feet on local streets in all zoning districts primarily intended for single-family residential

**ORDINANCE NO. 019327**



development when located adjacent to the property line. Sidewalks located next to the curb along local streets shall be a minimum five feet in width. Sidewalks along arterials shall have a minimum of five feet in width;

2. Sidewalks shall have a minimum clear path width of a minimum of five feet in all other locations;
  3. Sidewalks in areas determined to be high pedestrian traffic areas or pedestrian-oriented developments by the CPC may be required to be wider than the minimum widths listed herein by the CPC;
  4. Sidewalks shall be located in existing areas to match the width and location of existing walks of the block in which they are located. Vacant blocks shall comply with the sidewalk requirements of this title;
  5. Sidewalks shall not be located next to the curb on collectors or arterial streets except when an exception is approved by the CPC or designee at the time of subdivision plat approval. Such exception shall be in accordance with Chapter 19.48 and due to actual physical or topographic constraints. Sidewalks on TXDOT facilities shall be as approved by TXDOT;
  6. Sidewalks may be required to improve connectivity between subdivisions, to schools, parks, bus stops and retail areas by the CPC at the time of plat approval;
  7. The CPC may approve alternative sidewalk design and locations at the time of plat approval including meandering or curvilinear sidewalks provided such design and location meets the intent of this title.
- D. **Timing of Improvements.** The timing of sidewalk construction shall be as required by this chapter and Title 13.04, unless a developer agreement between the property owner and the city provides for alternative timing for construction or security has been provided in accordance with this title.
- E. **Internal Pedestrian Circulation.** In addition to sidewalks within the right-of-way, internal pedestrian circulation shall be provided in new development or redevelopment serving any nonresidential and at any governmental facility, school, church, or other place of public assembly. Sidewalks shall be installed to connect all buildings to one another and to parking areas and to connect the development to the public street system. All such sidewalks shall be protected from encroachment by parked vehicles.
- F. **Curb ramps** shall be provided within a street right-of-way wherever an accessible route for pedestrians (sidewalk or pedestrian way) is required. The design and construction of curb ramps shall be in accordance with the SDM and shall comply with the Texas Accessibility Standards.
- G. **Compliance with SDM.** Sidewalks shall be constructed in compliance with the standards in the City of El Paso SDM and Chapter 13.04.

**SECTION 39.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.21 (Sidewalks), Section 19.21.050 (Waivers and deviations), is amended to read as follows:



19.21.050 - Waivers and deviations.

- A. Waivers. A complete waiver of the requirement for sidewalks should be rare and allowed only where there are extreme factors. The waiver shall be approved by the city plan commission at the time of plat approval upon a favorable recommendation of the city manager, or designee and shall be documented with supporting data that indicates the basis for the decision.
- B. Deviations. Deviations from these requirements and the SDM and other city Sidewalk Design Standards may be allowed by the city manager or designee as part of site plan review when necessary due to the physical circumstance of the street or when necessary to accomplish adopted development goals of the city.
  - 1. The specific nature and justification for any deviation must be documented and authorized in writing by the city manager or designee.
  - 2. Deviations should be minimal and consist primarily of changes to required width of clear path or alignment within the right-of-way.
  - 3. Deviations shall not allow a minimum clear path width of less than three feet.

**SECTION 40.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.23 (Easements, Block and Lot Design and Improvement Standards), Section 19.23.040 (Lots-Determination and regulation of size), Subsection (H), subsection (1) is amended to read as follows:

- 1. Single-family or duplex double frontage lots shall be prohibit, except where they may be essential to provide separation of single-family or duplex residential development from arterial streets, or to overcome a specific disadvantage or hardship imposed by topography or other factors. Such double frontage lots allowed within the city limits shall provide hardscape improvements to the parkway as set forth in the SDM, to be maintained by the city

**SECTION 41.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.23 (Easements, Block and Lot Design and Improvement Standards), Section 19.23.050 (Monuments and Markers) is amended to read as follows:

19.23.050 - Monuments and markers.

- A. Requirements. The location of all monuments shall be in accordance with the SDM and is subject to approval by the city manager or designee.

**SECTION 42.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.26 (Alternative Subdivision/Smart Code Designs), Section 19.26.040 (Alternative subdivision improvement design), is amended to read as follows:

19.26.040 - Alternative subdivision improvement design.

**ORDINANCE NO.** \_\_\_\_\_

019327



- A. Intent. This chapter contains the regulations for the alternative subdivision improvement design procedure. These regulations are supplemented and qualified by additional general regulations appearing elsewhere in this title, which are incorporated as part of this chapter by reference. It is in the intent of the alternative subdivision improvement design procedure to allow one or more alternative improvement designs to those required in this title and the SDM to be utilized in a comprehensive manner throughout a proposed development, provided the improvements meet the intent and have the same or higher level of service or adequacy of the original required improvement. It is not the intent of the alternative subdivision improvement design procedure to allow an inferior improvement to the original one required by this title for the purpose of reducing costs.
- B. Application. An application for the alternative subdivision improvement design procedure shall be submitted at the time of preliminary plat application, along with a subdivision improvement plan showing the proposed changes. Subdivision improvement plans in accordance with this title with the proposed alternative subdivision improvement design clearly designated shall be provided in order for the designated staff to make an evaluation of the proposal. Engineering or other studies should be provided to establish that the proposal meets the intent of this title and provides the same level or greater of protection, service or adequacy of the original requirement. The alternative subdivision improvement design will be reviewed under the provisions outlined in Chapter 19.03, Preliminary Plats, of Section 19.08.010, subdivision improvement plans, as amended, as well as provisions outlined in this chapter. All applications shall be submitted on a form supplied by the planning official with the required information as stated on the application form and meeting the administrative submission requirements available in the office of the planning official.
- C. Based on Engineering. Decisions regarding the design of various physical improvements in a subdivision should be based on engineering or other studies. Thus, while this code provides standards for design, the regulations are not a substitute for sound engineering judgment. Therefore, a licensed engineer may submit alternative designs to be reviewed and considered by the city manager or designee.
- D. Relationship to Standards in Chapter 19.15, Roadways. If the proposed alternative design is approved by the city manager or designee, then the applicable provisions of Chapter 19.15 shall be deemed to have been met. If the proposed alternative design standards are not approved by the city manager or designee, then the standards contained within Chapter 19.15 shall apply.
- E. Relationship to All Other Improvement Standards. If the proposed alternative subdivision improvement design is determined to meet or exceed the standard for such improvement contained in this title and the SDM and approved by the CPC upon recommendation of city manager or designee, then the applicable provisions of this title shall be deemed to have been met. If the proposed alternative design standards are determined not to be the equivalent of the standard contained in this title and not approved by the city manager or designee, then the standards contained within this chapter shall apply.

**SECTION 43.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.26 (Alternative Subdivision/Smart Code Designs), Section 19.26.050 (Form based/smart code subdivisions), is amended to read as follows:

**ORDINANCE NO.** 019327



19.26.050 - Form based/smart code subdivisions.

- A. Standards. In cases where the applicant for subdivision approval is currently zoned in a smart code district as set forth in Title 21 of the city code, the applicant must comply with the standards set forth in Section 19.26.050, the Street Design Manual (SDM) of Title 19 and the standards set forth in Title 21, smart code. Where the standards conflict, the standards set forth in the smart code provisions prevail. Applicants whose property is zoned in a smart code district are required to utilize the following standards contained in Title 21, Smart Code, Tables:

Table 3A — Vehicular Lane Dimensions; 3B — Vehicular Lane and Parking Assemblies

Table 4A — Public Frontages - General

Table 4C — Thoroughfare Assemblies

Table 17 — Turning Radius

Table 13 — Civic Spaces

- B. Applicability of Form Based and Smart Code Provision.

1. Subdivision with Smart Code Zoning In Place: In cases where the applicant for subdivision approval is currently zoned in a smart code district as set forth in Title 21 of the city code, then where such provisions conflict with provisions contained in Section 19.26.050 and the Street Design Manual, the smart code provisions shall prevail, otherwise, the standards set forth in section 19.26.050 and the Street Design Manual shall apply.
2. Properties Seeking Zoning Approval: In unplatted properties in which the applicant is seeking zoning approval for districts set forth in the form based/smart code section of Title 21 of the city code, and is proposing to use form based code/smart code standards in their plat and subdivision improvement drawings, then the applicant shall utilize the form based code/smart code standards set forth in Title 21, Smart Code, Section 19.26.010, and the Street Design Manual (SDM).

**SECTION 44.** Title 19 (Subdivision and Development Plats), Article 2. (Subdivision Standards), Chapter 19.26 (Alternative Subdivision/Smart Code Designs), Section 19.26.060 (Approval), is amended to read as follows:

19.26.060 - Approval.

- A. Infill Development. The city plan commission, as part of the preliminary plat approval, may approve, approve with conditions or deny the proposed infill development, provided it meets all the requirements in this chapter. Since the applicant is assured of approval of a preliminary plat that meets the requirements of this title, the CPC is not obligated to approve an infill development. It is the applicant's obligation to document to the CPC that the infill development meets the intent of this chapter and is a better quality development than would

**ORDINANCE NO.** \_\_\_\_\_

**019327**

21-1007-2795.001 | 1164349

Title 19 Amendment – Street Design Manual

RTA



otherwise be developed. Replats of existing lots shall meet the requirements of Texas State Statute. If the proposed infill development plat is approved, or approved with conditions by the city plan commission, upon recommendation by the manager or designee, then the applicable provisions of this title shall be deemed to have been met. If the proposed infill development is not approved by the city plan commission, then the standards contained within this title shall apply.

**B. Alternative Subdivision Improvement Design.**

1. Alternative subdivision improvement designs that either alter the road standards and applicable provisions in Chapter 19.15 or the various other physical improvement standards contained in this title or in the SDM, may be approved by the CPC upon recommendation of the city manager or designee as part of the preliminary and/or final plat approval, if the CPC and the city manager or designee agree with the engineering studies provided as part of the submission showing that the proposal meets the intent of the ordinance codified in this title and provides the same level or greater of protection, service or adequacy of the original requirement.
2. Since there are already acceptable standards for subdivision improvements and the applicant is assured of approval of a preliminary plat that meets the requirements of this title, the CPC is not obligated to approve an alternative subdivision improvement design. It is the applicant's obligation to document to the CPC that the alternative subdivision improvement design meets the intent of this chapter and is a better quality development than would otherwise be developed.
3. The city plan commission may approve alternative subdivision improvement designs as part of a land study if the land study contains sufficient detail and information, to include any necessary engineering studies, showing that the proposal meets the intent of this title and provides the same level or greater of protection, service or adequacy of the original requirement.
4. If the proposed alternative subdivision improvement design is approved, or approved with conditions by the city plan commission, upon recommendation by the manager or designee, then the applicable provisions of this title shall be deemed to have been met. If the proposed alternative subdivision improvement design is not approved by the city plan commission, then the standards contained within this title shall apply.

**C. Form Based or Smart Code Subdivisions.** The city plan commission, as part of the preliminary plat approval, may approve, approve with conditions or deny the proposed form based or smart code subdivision. If the form based or smart codes subdivision meets the requirements of El Paso code of ordinances for form based or smart codes, this title and the Street Design Manual, then the CPC shall approve the plat.

**D. Misrepresentation of facts of any kind shall result in the denial or revocation of the approval or conditional approval of the preliminary plat and/or final plat.**

**SECTION 45.** Title 19 (Subdivision and Development Plats), Article 4. (Specific application and processing requirements), Chapter 19.37 (Application processing), Section 19.37.060 (Application contents), Subsection A is amended to read as follows:

**ORDINANCE NO.** 019327



- A. Application Forms Generally. The city is authorized to prepare application forms that include information requirements, checklists, drawing sizes, applicant contact information, and any other relevant information, which shall be available in the SDM.

**SECTION 46.** Title 19 (Subdivision and Development Plats), Article 5. (Relief Procedures), Chapter 19.45 (Appeals), Section 19.45.010 (Appeals, purpose, applicability and effect), Subsection A is amended to read as follows:

- A. Purpose. The purpose of an appeal is to contest most administrative any decision on an application based upon alleged misapplication of the criteria for approval of the application. An appeal shall not be used as a means of amending, varying or otherwise altering the standards of this title or the SDM that apply to the application.

**SECTION 47.** Title 19 (Subdivision and Development Plats), Article 6. (Definitions), Chapter 19.50 (Definitions), Section 19.50.030 (Definitions), defined term "city standards" is amended to read as follows:

"City standards" means all of the city's technical standards and specifications that apply to development, together with all tables, drawings, and other attachments. All city standards described or referred to in this title are adopted by reference and are a part of this title in the same way as if they were set out at length herein. See also the City of El Paso Street Design Manual (SDM).

**SECTION 48.** Title 19 (Subdivision and Development Plats), Article 6. (Definitions), Chapter 19.50 (Definitions), Section 19.50.030 (Definitions), defined term "Design standards for construction , E; Paso (DSC)" is amended to read as follows:

"Design standards for construction, El Paso (DSC)" means the detailed specifications, procedures and standards approved administratively for the purpose of regulating the design and construction of specified improvements. The DSC also includes checklists and application forms for approvals required by this title. The El Paso Design Standards for Construction are incorporated by reference to this title and are found in the Street Design Manual adopted as Appendix 113 to title 19 of the El Paso City Code.

**SECTION 49.** Title 19 (Subdivision and Development Plats), Article 6. (Definitions), Chapter 19.50 (Definitions), Section 19.50.030 (Definitions), defined term "Detention pond" is amended to read as follows:

Pond, detention. "Detention pond" means a man-made or natural reservoir, either public or private, designed to restrict the flow of stormwater to a prescribed maximum rate through a controlled release by gravity, and to concurrently detain the excess waters that accumulate behind the control structure. Further defined within the City of El Paso Street Design Manual (SDM).



**SECTION 50.** Title 19 (Subdivision and Development Plats), Article 6. (Definitions), Chapter 19.50 (Definitions), Section 19.50.030 (Definitions), defined term "Retention pond" is amended to read as follows:

Pond, retention. "Retention pond" means a man-made or natural reservoir, either public or private, designed to completely retain a specified amount of stormwater runoff without gravity release. Further defined within the City of El Paso Street Design Manual (SDM).

**SECTION 51.** Title 19 (Subdivision and Development Plats), Article 6. (Definitions), Chapter 19.50 (Definitions), Section 19.50.030 (Definitions), defined term "Stormwater" is amended to read as follows:

"Stormwater" means the surface drainage runoff or flow created from any form of precipitation accumulation including rain, snow, sleet and/or hail that exceeds the interception by vegetation and infiltration into the soil. The following definitions are applicable to the management of stormwater and apply to any stormwater requirement contained in this title, in chapter 19.19, stormwater or in the SDM. All other definitions shall be in accordance with article 6.

1. Applicant: A person submitting a post-development stormwater management application and plan for approval.
2. Channel: A natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.
3. Drainage design manual (DDS): The detailed specifications, procedures and standards approved by resolution of the city council for the purpose of regulating the design and construction of specified stormwater and drainage improvements.
4. Flooding: A general and temporary condition of partial or complete inundation of normally dry land areas from:
  - a. The overflow of inland or tidal waters;
  - b. The unusual and rapid accumulation or runoff of surface waters from any source.
5. Floodplain manager: The Texas licensed professional engineer designated by the city manager as the responsible official and initial decision-maker to administer and implement the provisions of chapter 18.60 of this Code and other appropriate sections of 44 CFR (National Flood Insurance Program regulations) pertaining to floodplain management.
6. Inspection and maintenance agreement: A written agreement providing for the long-term inspection and maintenance of storm water management facilities and practices on a site or with respect to a land development project, which when properly recorded in the deed records constitutes a restriction to a site or other land involved in a land development project.
7. Non-point source pollution: A form of water pollution that does not originate from a discrete point such as a sewage treatment plant or industrial discharge, but involves the transport of pollutants such as sediment, fertilizers, pesticides, heavy metals, oil, grease, bacteria, organic materials and other contaminants from land to surface water and

**ORDINANCE NO.**

**019327**

21-1007-2795.001 | 1164349

Title 19 Amendment – Street Design Manual

RTA



groundwater via mechanisms such as precipitation, stormwater runoff, and leaching. Non-point source pollution is a by-product of land use practices such as agricultural, mining, construction, subsurface disposal and urban runoff sources.

8. Nonstructural stormwater management practice or nonstructural practice: Any natural or planted vegetation or other nonstructural component of the stormwater management plan that provides for or enhances stormwater quantity and/or quality control or other stormwater management benefits, and includes, but is not limited to, riparian buffers, open and greenspace areas, overland flow filtration areas, natural depressions, and vegetated channels.
9. Post-development: The time period, or the conditions that may reasonably be expected or anticipated to exist, after completion of the land development activity on a site as the context may require.
10. Pre-development: The time period, or the conditions that exist, on a site prior to the commencement of a land development project and at the time that plans for the land development of a site are approved by the plan approving authority. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the existing conditions at the time prior to the first item being approved or permitted shall establish pre-development conditions.
11. Redevelopment: A land development project on a previously developed site, but excludes ordinary maintenance activities, remodeling of existing buildings, resurfacing of paved areas, and exterior changes or improvements which do not materially increase or concentrate stormwater runoff, or cause additional non-point source pollution.
12. Runoff: Stormwater runoff.
13. Site: The parcel of land being developed, or the portion thereof on which the land development project is located.
14. Stormwater management: The collection, conveyance, storage, treatment and disposal of stormwater runoff in a manner intended to prevent increased flood damage, stream bank channel erosion, habitat degradation and water quality degradation, and to enhance and promote the public health, safety and general welfare.
15. Stormwater administrator: The person designated by the city manager to be the responsible official and initial decision maker for applications pertaining to drainage plans and other drainage decisions as may be required in Title 18, Building and Construction and Section 19.19, Storm Water Management Requirements.
16. Stormwater management facility: Any infrastructure that controls or conveys stormwater runoff.
17. Stormwater management measure: Any stormwater management facility or nonstructural stormwater practice.
18. Stormwater management plan: A document describing how existing runoff characteristics will be affected by a land development project and containing measures for complying with the provisions of this title.



19. Stormwater management system: The entire set of structural and nonstructural stormwater management facilities and practices that are used to capture, convey and control the quantity and quality of the stormwater runoff from a site.
20. Stormwater runoff: The flow of surface water resulting from precipitation.
21. Structural stormwater control: A structural stormwater management facility or device that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release or the velocity of flow of such runoff.

**SECTION 52.** Title 19 (Subdivision and Development Plats), Article 6. (Definitions), Chapter 19.50 (Definitions), Section 19.50.030 (Definitions), is amended to add a new definition for the term "Street Design Manual (SDM)" as follows:

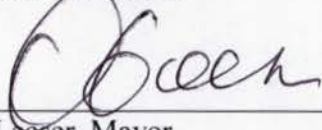
"Street Design Manual" and/or "(SDM)" means Appendix 113 of Title 19 of the El Paso City Code. The Street Design Manual is the detailed specifications, procedures and standards approved for the purpose of regulating the design and construction of specified improvements.

**SECTION 53.** Except as expressly herein amended, Title 19 (Subdivision and Development Plats) of the El Paso City Code shall remain in full force and effect.


ADOPTED this 26<sup>th</sup> day of April, 2022.




CITY OF EL PASO:

  
Oscar Leeser, Mayor

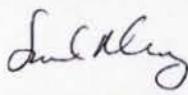
ATTEST:

  
Laura D. Prine  
City Clerk

APPROVED AS TO FORM:

  
Russell T. Abeln  
Assistant City Attorney

APPROVED AS TO CONTENT:

  
Samuel Rodriguez, P.E.  
City Engineer

A stylized, light blue map of El Paso, Texas, serves as the background for the top half of the cover. It shows a dense network of streets and highways, with the city's grid pattern clearly visible.

# **CITY OF** **EL PASO**

2022

## **Street Design Manual**

*April 12, 2022*





# ACKNOWLEDGMENTS



## Contributors

### MAYOR

Oscar Leeser

### CITY COUNCIL

District 1 - Peter Svarzbein

District 2 - Aleksandra Anello

District 3 - Cassandra Hernandez

District 4 - Joe Molinar

District 5 - Isabel Salcido

District 6 - Claudia Lizette Rodriguez

District 7 - Henry Rivera

District 8 - Cissy Lizarraga

### CONTRIBUTING DEPARTMENTS & STAFF

City Manager - Tommy Gonzalez

City Engineer - Sam Rodriguez, P.E.

Assistant Director for CID Planning -  
Alex Hoffman, AICP, CNU-A

Capital Planning Project Manager - Joaquin  
Rodriguez, CNU-A

Capital Planning Project Manager - Jeff Howell

GIS Administrator - Santiago Vallejo-Gutierrez

Police Department

Fire Department

Parks and Recreation

Planning and Inspections

Streets and Maintenance

Libraries

Environmental Services Department

Sun Metro

## Consultants

Stantec Consulting Services, Inc.  
[www.stantec.com](http://www.stantec.com)





# Table of Contents

## Chapter 1

<b>How to Use This Document .....</b>	<b>1</b>
1.1 INTRODUCTION.....	1
1.2 STREET DESIGN PROCESS.....	2
1.2.1 DESIGN PROCESS: SITE PLANS AND SUBDIVISIONS.....	3
1.2.2 DESIGN PROCESS: PUBLIC PROJECTS.....	4

## Chapter 2

<b>Design Principles and Community Context .....</b>	<b>9</b>
2.1 WHY FOCUS ON STREET DESIGN?.....	9
2.2 PURPOSE OF THE DOCUMENT.....	9
2.3 LOCAL PLANS/DOCUMENTS .....	10
2.3.1 PLAN EL PASO & MAJOR THOROUGHFARE PLAN 2013.....	10
2.3.2 EL PASO EASTSIDE MASTER PLAN & EL PASO THOROUGHFARE PLAN 2019 UPDATE.....	10
2.3.3 EL PASO BICYCLE PLAN 2016.....	11
2.3.4 CNU/ITE MANUAL: DESIGNING WALKABLE URBAN THOROUGHFARES 2017.....	11
2.3.5 NACTO URBAN STREET DESIGN GUIDE AND BIKEWAY DESIGN GUIDE.....	11
2.3.6 FEDERAL, STATE AND NATIONAL PUBLICATIONS .....	11
2.4 THE COMPLETE STREETS APPROACH.....	12
2.5 FUNCTIONAL CLASSIFICATION AND COMMUNITY CONTEXT .....	12
2.5.1 MAJOR ARTERIALS.....	14
2.5.2 MINOR ARTERIALS.....	14
2.5.3 COLLECTOR STREETS .....	14
2.5.4 LOCAL STREETS .....	14
2.5.5 PLAN EL PASO: COMPACT URBAN .....	15
2.5.6 PLAN EL PASO: DRIVABLE SUBURBAN.....	15
2.5.7 PLAN EL PASO: RURAL AND OPEN SPACE.....	15
2.5.8 CONFORMING TO THE MAJOR THOROUGHFARE PLAN .....	16
2.5.9 CONFORMANCE WITH THE COMPREHENSIVE PLAN .....	16
2.5.10 TXDOT ROADWAYS .....	16

## Chapter 3

<b>The El Paso Street Design Toolbox .....</b>	<b>19</b>
3.1 THE DESIGN TOOLBOX KIT OF PARTS.....	19
3.2 STREET DESIGN ZONES .....	20
3.2.1 FRONTAGE ZONE.....	20
3.2.2 PEDESTRIAN THROUGH ZONE.....	20
3.2.3 STREET FURNISHINGS/BUFFER ZONE.....	22
3.2.4 CURBSIDE ZONE .....	22

3.2.5 TRAVELWAY ZONE .....	23
3.2.6 MEDIAN ZONE.....	23
3.3 DESIGN CRITERIA FOR THOROUGHFARE ZONES .....	23
3.4 GENERAL BICYCLE FACILITY TYPES .....	26
3.5 MID-BLOCK CROSSWALKS.....	28
3.6 ARID CLIMATE DESIGN CONSIDERATIONS.....	30
3.7 SMART MOBILITY .....	31
3.7.1 SMART MOBILITY .....	31
3.7.2 ACCESSIBILITY .....	31
3.7.3 AUTOMATED .....	31
3.7.4 CONNECTED .....	31
3.7.5 ELECTRIC .....	31
3.7.6 SHARED .....	31

## Chapter 4

<b>Thoroughfare and Street Standards.....</b>	<b>35</b>
4.1 APPLICABILITY.....	35
4.2 SUMMARY TABLE OF TYPICAL SECTIONS.....	35
4.3 MAJOR ARTERIALS.....	38
4.3.1 MAJOR ARTERIAL - COMPACT URBAN .....	38
4.3.2 MAJOR ARTERIAL - DRIVABLE SUBURBAN .....	40
4.3.3 MAJOR ARTERIAL - RURAL .....	44
4.4 MINOR ARTERIALS .....	46
4.4.1 MINOR ARTERIAL - COMPACT URBAN.....	46
4.4.2 MINOR ARTERIAL - DRIVABLE SUBURBAN.....	48
4.4.3 MINOR ARTERIAL - RURAL .....	50
4.5 COLLECTORS .....	52
4.5.1 COLLECTOR - COMPACT URBAN.....	52
4.5.2 COLLECTOR - DRIVABLE SUBURBAN.....	54
4.5.3 COLLECTOR - RURAL.....	58
4.6 LOCAL STREETS.....	60
4.6.1 LOCAL - COMPACT URBAN .....	60
4.6.2 LOCAL - DRIVABLE SUBURBAN.....	62
4.6.3 LOCAL - RURAL .....	66
4.7 BICYCLE FACILITIES.....	68
4.7.1 BICYCLE FACILITIES - GENERALLY .....	68
4.7.2 DEDICATION REQUIRED .....	68
4.7.3 CONTINUITY OF EXISTING FACILITIES.....	68



# Table of Contents

4.7.4 BICYCLE BOULEVARDS .....	68
4.7.5 BIKE ROUTE - SIGNED & MARKED AND SIGNED SHARED .....	70
4.7.6 CONVENTIONAL BIKE LANES .....	71
4.7.7 BUFFERED BIKE LANES .....	73
4.7.8 CYCLE TRACKS.....	75
4.7.9 SHARED USE PATHS.....	77
4.7.10 INTERSECTION TREATMENTS.....	77
4.8 ALLEYS .....	80
4.8.1 ALLEYS - ALL AREA TYPES.....	80
4.8.2 ALLEYS REQUIRED.....	80
4.8.3 EXISTING SUBDIVISIONS WITH ALLEYS .....	80
4.8.4 ALLEY GENERAL REQUIREMENTS.....	80
4.9 SIDEWALKS .....	83
4.9.1 PURPOSE .....	83
4.9.2 APPLICABILITY .....	83
4.9.3 EXCEPTIONS.....	83
4.9.4 GENERAL REQUIREMENTS.....	84
4.9.5 SIDEWALK REQUIREMENTS FOR NEW STREETS.....	85
4.9.6 SIDEWALK REQUIREMENTS FOR EXISTING STREETS.....	86
4.10 CURBS AND GUTTERS .....	87
4.10.1 BESIDE FREEWAYS.....	87
4.10.2 BESIDE ARTERIAL AND COLLECTOR STREETS.....	87
4.10.3 BESIDE LOCAL STREETS .....	87
4.10.4 AT STREET INTERSECTIONS .....	87
4.11 GENERAL DESIGN STANDARDS .....	87
4.11.1 DSC STANDARDS TO BE MET.....	87
4.11.2 INTERSECTION IMPROVEMENTS AND TRAFFIC CONTROL DEVICES .....	87
4.11.3 OFF-SITE IMPROVEMENTS.....	88
4.11.4 STREET NAMES AND ADDRESSES .....	88
4.11.5 STREET RIGHT-OF-WAY DEDICATION.....	90
4.11.6 TRANSITIONS OF RIGHT-OF-WAY WIDTH.....	90
4.11.7 EXTENSIONS OF EXISTING STREETS .....	90
4.11.8 INTERSECTIONS .....	90
4.11.9 STREET OFFSETS .....	91
4.11.10 HALF-STREETS.....	91
4.11.11 PRIVATE STREETS .....	92
4.11.12 CUL-DE-SAC STREETS .....	95

4.11.13 STREET STUBS/FUTURE CONNECTIONS.....	95
--	----

## Chapter 5

### Design Exceptions and Modifications..... 99

5.1 APPLICABILITY AND VESTED .....	99
------------------------------------	----

5.2 GUIDANCE ON FLEXIBILITY IN STREET DESIGN.....	99
---	----

5.3 DESIGN PRIORITIZATION FOR MODIFICATION OF TYPICAL SECTIONS.....	100
---	-----

## Chapter 6

### Access and Connectivity..... 105

6.1 ROADWAY NETWORK CONNECTIVITY .....	105
--	-----

6.1.1 APPROACH ROADS AND ACCESS.....	105
--------------------------------------	-----

6.1.2 STREET SPACING GUIDELINES .....	106
---------------------------------------	-----

6.1.3 LENGTH OF A BLOCK OR STREET SEGMENT.....	106
--	-----

6.1.4 MAXIMUM LENGTH OF A CUL-DE-SAC STREET .....	107
---	-----

6.2 DRIVEWAYS AND ACCESS MANAGEMENT .....	108
---	-----

6.2.1 DRIVEWAY APPROACHES AND RELATED REQUIREMENTS.....	108
---	-----

6.2.2 ACCESS MANAGEMENT .....	108
-------------------------------	-----

6.2.3 SHARED DRIVEWAYS AND CROSS-ACCESS DRIVES .....	108
--	-----

6.2.4 MEDIAN OPENINGS .....	109
-----------------------------	-----

6.2.5 LOTS ACCESSING ARTERIAL STREETS.....	109
--	-----

## Chapter 7

### Street Lighting ..... 115

7.1 PURPOSE AND APPLICABILITY.....	115
------------------------------------	-----

7.2 CONTEXTUAL STREET LIGHTING .....	115
--------------------------------------	-----

7.2.1 LIGHTING PLANNING & DESIGN .....	115
--	-----

7.2.2 LIGHTING DESIGN PROCESS.....	117
------------------------------------	-----

7.2.3 PRE DESIGN.....	118
-----------------------	-----

7.3 STANDARDS.....	119
--------------------	-----

7.3.1 HIGHWAY LIGHTING VS. STREET LIGHTING .....	119
--	-----

7.3.2 RESIDENTIAL STREET LIGHTING .....	119
---	-----

7.3.4 INTERSECTIONS, ROUNDABOUTS AND CROSSWALKS.....	122
--	-----

7.3.5 MINIMUM LIGHTING REQUIREMENTS.....	127
--	-----

7.4 EASEMENTS .....	127
---------------------	-----

7.5 EXCEPTIONS.....	127
---------------------	-----

7.6 EXPENSES PRIOR TO ACCEPTANCE .....	127
--	-----

7.7 ILLUMINATION PLAN.....	128
----------------------------	-----

7.8 AS-BUILT ILLUMINATION PLAN .....	128
--------------------------------------	-----



# Table of Contents

7.9 CUSTOM LIGHTING.....	128
<b>Chapter 8</b>	
<b>Traffic Calming &amp; Vision Zero .....</b>	<b>133</b>
8.1 TRAFFIC CALMING.....	133
8.2 VISION ZERO (RESERVED) .....	133
<b>Chapter 9</b>	
<b>Design Standards for Construction .....</b>	<b>137</b>
<b>Chapter 10</b>	
<b>Definitions.....</b>	<b>141</b>
<b>Appendix A</b>	
<b>Interim Design Standards for Construction.....</b>	<b>147</b>









# How to Use This Document

1







## Chapter 1

# How to Use This Document

### 1.1 INTRODUCTION

The City of El Paso (COEP) Street Design Manual is structured in twelve chapters aimed at planning and producing context-sensitive, functional and sustainable streets for everyone. It should be noted that the information in this document is not intended to supersede or conflict with the specific standards and requirements from the City of El Paso's subdivision regulations and other development regulations documents, but rather provide all information in a single document so that the same approach used in City- and public agency-led street designs may be combined with the private development process.

A brief overview of the content of each chapter is presented below:

#### **Chapter 1: How to Use this Document**

This chapter outlines the step-by-step process for both private and public projects. The process diagrams provide information regarding the goals of each step, and directs the reader to specific sections of this document for more information on each step.

#### **Chapter 2: Design Principles and Community Context**

This chapter presents a broad discussion of the purpose of the document and its scope, a brief description of the various existing policy documents used as a reference, and outlines the philosophy of the Complete Streets Approach that forms the base of this document's standards and guidelines.

#### **Chapter 3: The El Paso Street Design Toolbox**

This chapter presents the core guiding principles and details for street design, including street design zones, bicycle facility types, and Smart Mobility notes.

#### **Chapter 4: Thoroughfare and Street Standards**

This chapter provides revised functional classifications and definitions of streets and thoroughfares, accompanied by design criteria and cross-sections for each type. Chapter 4 is intended to consolidate street standards from various planning and regulatory documents of the City of El Paso (e.g., Plan El Paso, Major Thoroughfare Plan, Title 19).



## **Chapter 5: Design Exceptions and Modifications**

The roadway cross-sections in the preceding chapter are intended as templates only; the heart of context-sensitive street design is the ability to customize execution to fit local conditions. This chapter describes acceptable modifications to the idealized cross-sections based on local context, available right-of-way, street type and other factors.

## **Chapter 6: Access and Connectivity**

This Chapter discusses the guidelines and minimum requirements to be used for access points from the El Paso roadway network into properties adjoining such thoroughfares and streets.

## **Chapter 7: Street Lighting**

This Chapter provides high-level guidance regarding the goals and standards of roadway and thoroughfare lighting, including Dark Sky requirements. It directs the creation of an Illumination Plan, and discusses easements and funding.

## **Chapters 8-9: Reserved/Interim**

This document is intended as a living document, to be updated to reflect evolving local context, and to integrate future additional policy efforts. At this time, Chapters 8 - 9 are reserved for future expansion of the document, and are designated for the following topics:

- Chapter 8: Traffic Calming
- Chapter 9: Design Standards for Construction

## **Chapters 10: Definitions**

This chapter provides explanation of the

terminology and acronyms used throughout the document.

## **1.2 STREET DESIGN PROCESS**

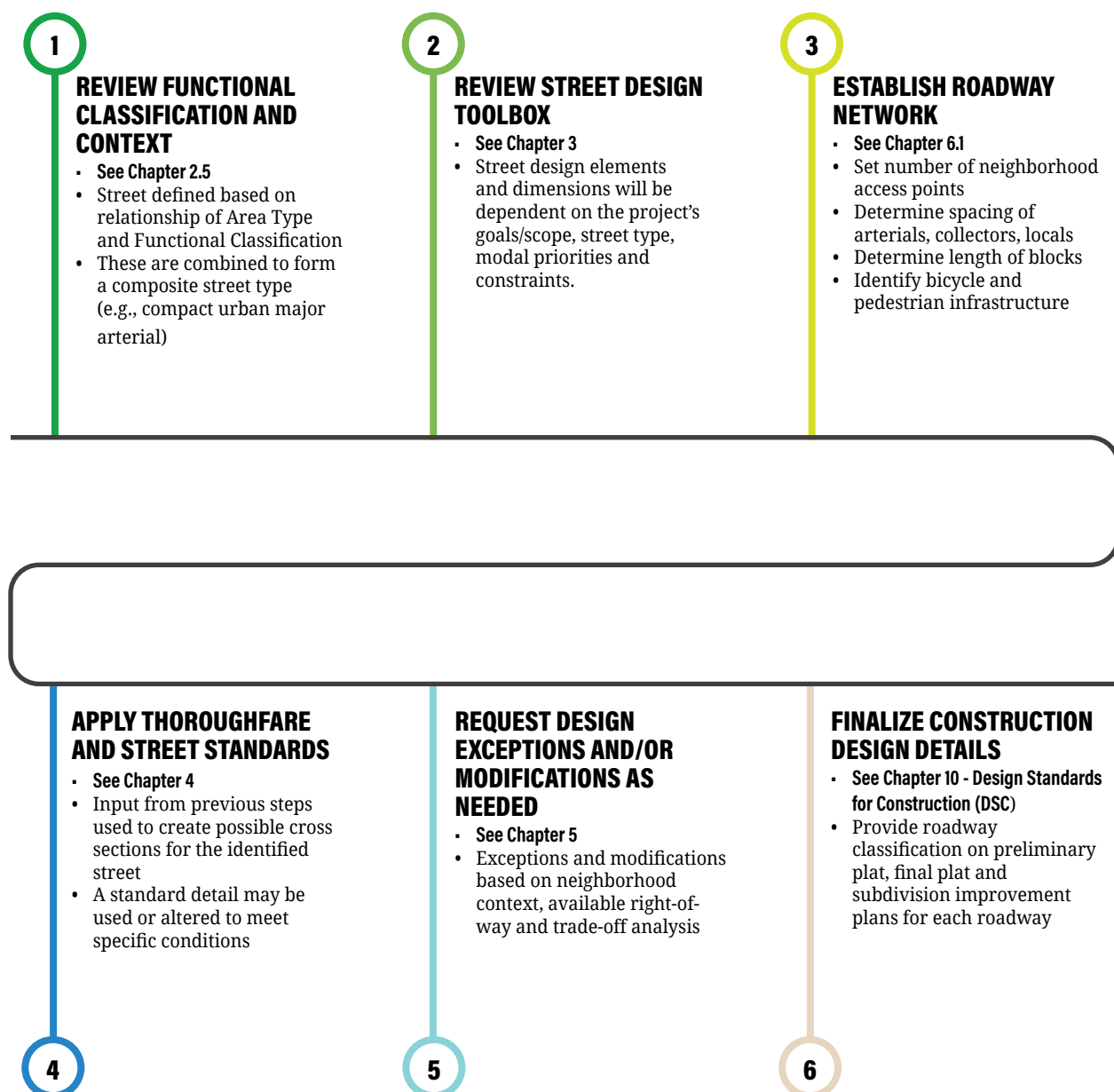
This document's approach highlights the need for context-sensitive design strategies to best capture the role of each street within the broader transportation network. However, it also takes into consideration the existing limitations and challenges which arise from space constraints on existing or future streets. For this reason, the manual is designed to allow flexibility, especially when travel modes or street users other than automobiles have a special need or priority.

Designing streets should follow the process outlined in subsections 1.2.1 and 1.2.2.

Although the document is intended to be used in redesigns of existing streets as well as designs of new streets, new streets are obviously less constrained (in space as well as in the current community expectations), and will likely involve fewer tradeoffs or compromises described through this Chapter.

## 1.2.1 DESIGN PROCESS: SITE PLANS AND SUBDIVISIONS

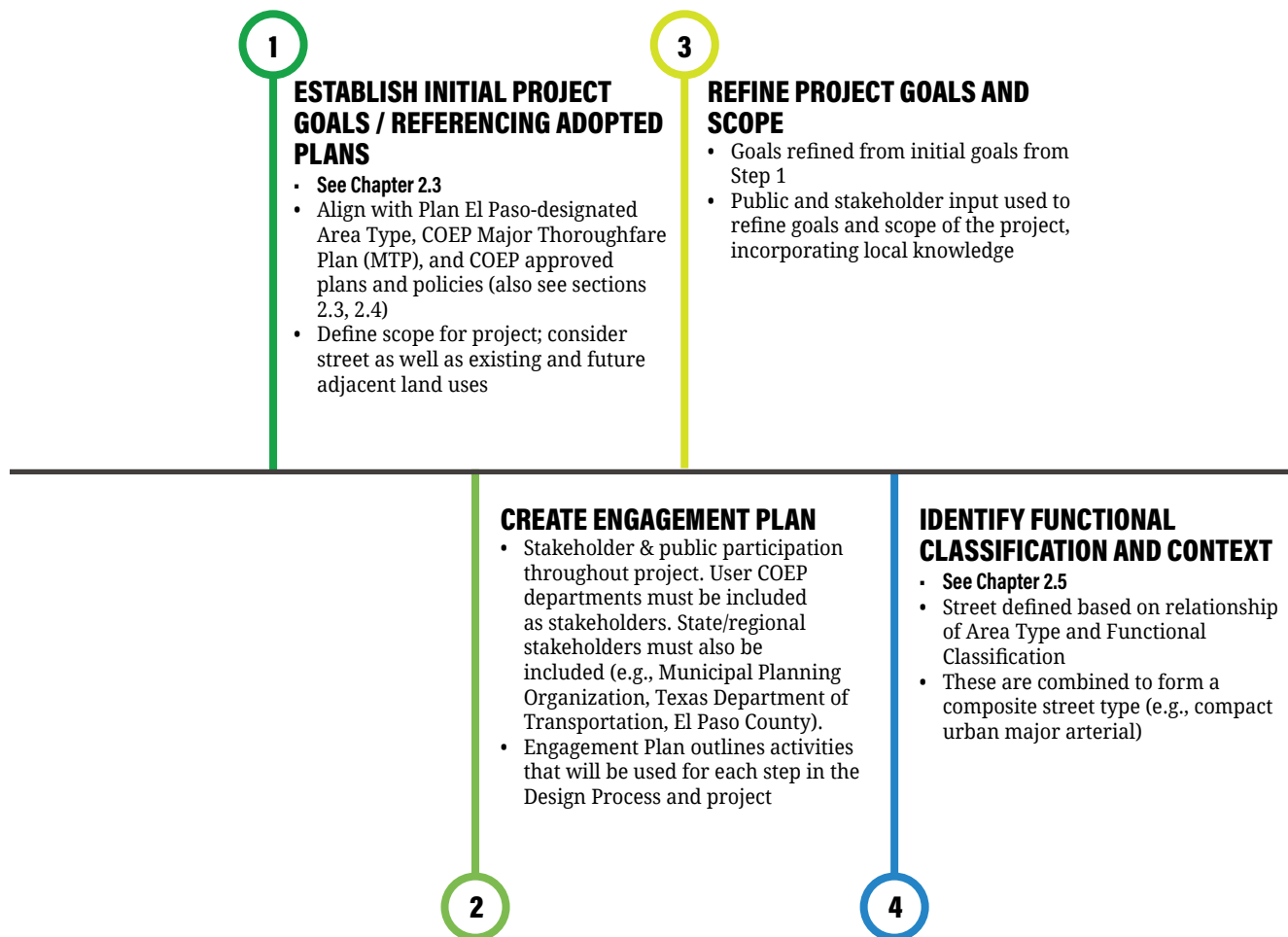
The following procedures shall apply for all site plan and subdivisions of land in accordance with Title 19, Subdivisions and Title 20, Zoning.





## 1.2.2 DESIGN PROCESS: PUBLIC PROJECTS

The following procedures apply for all projects undertaken by the City for the improvement of existing streets and the construction of new streets.



5

**IDENTIFY MODAL PRIORITIES**

- Modal priorities (e.g., walking, cycling, transit, driving, and delivering goods/services are identified; generally walking and cycling should be prioritized based on Plan El Paso goals
- Where required, emergency access must be accommodated regardless of the modal priorities of a corridor

7

**MAKE TRADE-OFFS**

- See Chapter 4
- Prioritize competing demands for street space with limited right-of-way
- City Manager or designee will approve trade-offs
- Considerations include modal priority, network considerations and evaluation of street design elements as compared to goals and values established in previous steps

9

**FINALIZE CONSTRUCTION DESIGN DETAILS**

- See El Paso Design Standards for Construction (DSC)

**EVALUATE DESIGN OPTIONS**

- See Chapter 3
- Street design elements and dimensions will be dependent on the project's goals/scope, street type, modal priorities

6

**CONFIRM RECOMMENDED DESIGN**

- Modal priorities (e.g., walking, cycling, transit, driving, and delivering goods/services are identified; generally walking and cycling should be prioritized based on Plan El Paso goals
- Where required, emergency access must be accommodated regardless of the modal priorities of a corridor

8



**This page intentionally left blank**

# 2

## Design Principles and Community Context







## Chapter 2

# Design Principles and Community Context

### 2.1 WHY FOCUS ON STREET DESIGN?

Public streets are the most prevalent public space in our cities. They should also be the most equitable, right? Citizens pay taxes toward the construction, maintenance and improvement of public streets, but historically, streets have been designed almost exclusively for motor vehicles. This imbalance in favor of automobiles has created inequities for other user groups; fortunately, street design is evolving to provide more attention to the usage, interests, and safety of other modes, like walking and cycling. It is also becoming more flexible and context sensitive. City streets are high cost infrastructure investments. They should be designed and built to accommodate all users equitably while also considering existing and future land use and community context. The City of El Paso is setting the stage to be a leader in treating streets as high-quality public spaces, not just a way to get from here to there.

### 2.2 PURPOSE OF THE DOCUMENT

The El Paso Street Design Manual is a specialized document aimed at providing appropriate requirements and guiding standards on the planning, design and construction of safe, adequate and sustainable streets and thoroughfares for every user. This

Street Design Manual consolidates the various design standards from Titles 19, 20 and 21 as well as the Design Standards for Construction Manual (DSC). It constitutes a single point of reference through which the City unites best practices in design guidance and technical knowledge with the purpose of creating efficient streets that can also be great public spaces for the City. It is intended to encourage a broader and context-based approach to street design that seeks to include the different users' needs with a focus on safety, comfort, efficiency, and sustainability. The Street Design Manual presents the different design components, minimum standards and guidance necessary to prepare construction documents for the City of El Paso, which also include the prior classifications of streets and their zones presented in the proposed Major Thoroughfare Plan Update (MTP) of 2019.

This manual also presents the Geometric Design Standards to be applied to the various street types, which includes design criteria for pavement structures. Geometric Design Standards are set in place to ensure the construction of safe, comfortable and efficient streets and thoroughfares that provide appropriate conditions for the transit of all of its users (pedestrian, motor vehicle, and bicycle traffic). By incorporating context-specific design, these standards enhance the



public realm and allow for flexibility in case of future changes. The need for retrofitting existing streets is also addressed.

The El Paso Street Design Manual is created as a living document acknowledging that future changes in best practices and their specific applications need to allow for regular updates.

## 2.3 LOCAL PLANS/DOCUMENTS

The policy documents used and referenced for the creation of the El Paso Street Design Manual are listed below:

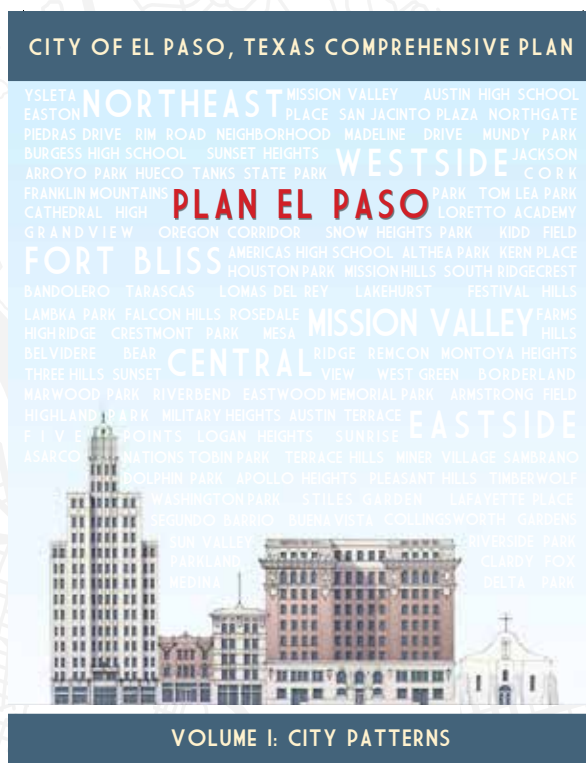
### 2.3.1 PLAN EL PASO & MAJOR THOROUGHFARE PLAN 2013

The 1999 Plan for El Paso included a thoroughfare plan in its Map Atlas, labeled as “Proposed Thoroughfare System.” The map was modified 30 times between 1999 and 2012 through comprehensive plan amendments. The current version has been maintained as a computer-based map on the City’s Geographic Information System (GIS). The then-current MTP map was readopted into Plan El Paso in March 2012. This draft update was effective on an interim basis until the Thoroughfare Plan was finalized and adopted in 2013.

This draft plan introduced a context-sensitive approach to street design decision-making—setting thoroughfare street designs according to a set of land use area types (compact urban, drivable suburban, and rural). It recognized the different needs of particular streets as they travel through various contexts of the city—especially related to sidewalks and the use of streetside space behind curbs.

### 2.3.2 EL PASO EASTSIDE MASTER PLAN & EL PASO THOROUGHFARE PLAN 2019 UPDATE

[The Eastside Master Plan](#) identifies existing deficiencies in City services and infrastructure in this fast growing desert city. The Eastside Growth Management Plan addresses the absence of sufficient public amenities in the areas of parks, libraries, public safety services, senior centers, recreation centers and pools. Overall connectivity between neighborhoods and services through multi-modal pathways is addressed in the companion thoroughfare plan recommendations. The 2019 Major Thoroughfare Plan Update keeps the original system of combining land use context with street design parameters, but it harmonizes a series of different classification types into a single system.



*Plan El Paso* (<https://www.elpasotexas.gov/planning-and-inspections/plan-el-paso/>)

### 2.3.3 EL PASO BICYCLE PLAN 2016

The [bike plan adopted in 2016](#) gave the City of El Paso a road map to create a comprehensive network of cycling infrastructure over a ten year horizon. Preferred routes were identified as part of an interconnected network. The plan also includes construction guidance for new facility types such as bicycle boulevards, bike lanes, buffered bike lanes, and one-way or two-way cycle tracks. At the time of adoption, the city had approximately 140 miles of bike facilities with an additional 900-1,100 miles planned for the future.

### 2.3.4 CNU/ITE MANUAL: DESIGNING WALKABLE URBAN THOROUGHFARES 2017

The City of El Paso officially adopted the CNU/ITE guidebook as part of its Complete Streets policy. The manual illustrates the creation of walkable mixed use streets by utilizing best practices in both design and implementation.

### 2.3.5 NACTO URBAN STREET DESIGN GUIDE AND BIKEWAY DESIGN GUIDE

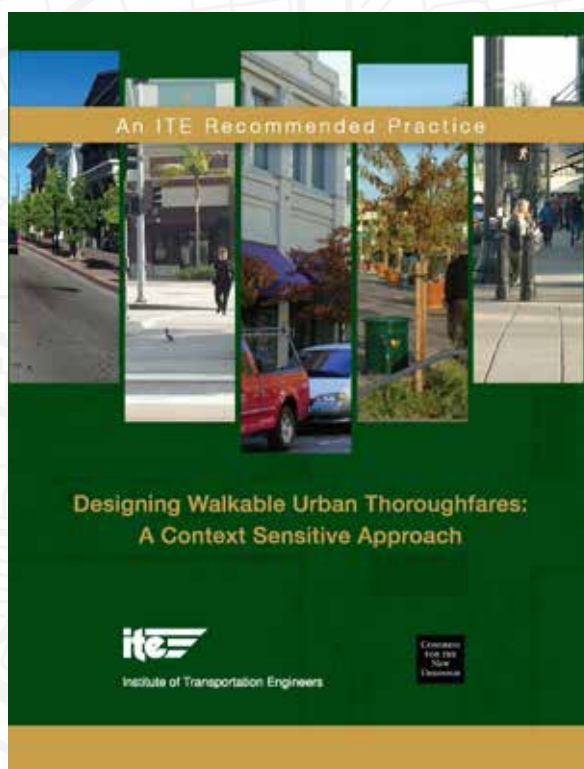
The City of El Paso officially passed a resolution in 2014 adopting several guides published by the National Association of City Transportation Officials (NACTO) including the [“Urban Street Design Guide,”](#) the [“Transit Street Design Guide,”](#) the [“Urban Street Stormwater Guide”](#) and the [“Urban Bikeway Design Guide”](#) as the official design guidelines for capital improvement projects and other city funded street and roadway improvement projects within the City of El Paso.

### 2.3.6 FEDERAL, STATE AND NATIONAL PUBLICATIONS

This document is also informed by the following publications on best practices:



*City of El Paso Bike Plan*



*ITE/CNU Designing Walkable Urban Thoroughfares*



- [MUTCD](#) (Manual on Traffic Control Devices for Streets & Highways)
- [TXMUTCD](#) (Texas Manual on Uniform Traffic Control Devices)
- [FHWA](#) (U.S. Dept. of Transportation)
- [AASHTO](#) (American Association of State Highway and Transportation Officials)
- [NCHRP](#) (National Cooperative Highway Research Program)

## 2.4 THE COMPLETE STREETS APPROACH

Streets in the City of El Paso have traditionally been designed following the principles of roadway functional classification, a concept developed to guide street and road design around primary functions of roads in a larger system. This was developed as a way of standardizing the expansion of America's highway network during a time of rapid growth in automobile use, and has generally worked well to serve vehicular movement. However, when the needs of other modes of travel are considered—especially in the limited space of cities and towns—it quickly becomes apparent that a more nuanced approach is needed.

In March, 2012, the City adopted a document called [“Complete Streets Policy Plan El Paso”](#) with the specific goal of “becoming the least car-dependent city in the Southwest through meaningful travel options and land-use patterns that support walkability, livability, and sustainability.” Several challenges arise when designing a street as a multi-modal facility including competing demands and limited space. This manual seeks to address these challenges by presenting a context-sensitive design philosophy that steers away from vehicle-focused roadway standards and

provides a new direction for the planning, design, and construction of quality streets for all users.

This street design guidance in this document is intended to modernize the City's transportation system over time to balance safety, comfort, and efficient movement for all users. To achieve this, certain trade-offs and evaluations will need to be made, depending on context and priorities. Some streets prioritize certain modes over others, based on their primary use, function, and surrounding land uses. A more detailed explanation of how to assess these prioritizations is presented in Table 4.1 (Design Guidance Criteria for Typical Sections: by Functional Classification and Area Type) presented in Chapter 3 El Paso Street Design Toolbox, of this manual.

## 2.5 FUNCTIONAL CLASSIFICATION AND COMMUNITY CONTEXT

Conventional transportation engineering has broadly adopted the Federal Highway Administration's functional classification system defining the role of a roadway within the broader transportation network. Over time, this system has become closely tied to design standards and policies, used by many state and even local transportation agencies, that emphasize elements such as design speeds, lane widths, and the spacing of intersections and access points to adjoining land. However, on its own the Functional Classification system does not consider community context, adjacent land uses, or— notably— the needs of non-motoring users of a road.

In this case, El Paso's current transportation network (implemented post-World War II) utilizes a three-type thoroughfare classification, as defined in [A Policy on the](#)

**Table 2.1 - Comparison of Functional Classifications and Application of Area Types**

Plan El Paso Area Types Compact Urban   Drivable Suburban Rural   Open Space	2020 Street Design Manual	TXDOT Roadway Inventory	Capital Improvement Plan	El Paso Smart Code	2013 Thoroughfare Plan Update
	Expressway	Interstate	No Equivalent Classification	Highway	Expressway
		Other Freeway & Expressway			
	Major Arterial	Other Principal Arterial	Major Arterial	No Equivalent Classification	Principal Arterial
	Minor Arterial	Minor Arterial	Minor Arterial	Boulevard	Minor Arterial
	Collector	Major Collector	Non-Residential Collector	Avenue	Collector
		Minor Collector	Multi-Family and Commercial/ Industrial Collector		
			Residential Collector		
	Local	Local	No Equivalent Classification	Road	Local
				Street	
				Drive	
				Commercial Street	

Geometric Design of Highways and Streets (“Green Book” by AASHTO, 2011): (a) Arterial Streets; (b) Collector Streets; and (c) Local Streets. These three main distinct categories classify thoroughfares and streets based on movement/direction, distribution/collection, and access. Given the adoption of Plan El Paso, which orients the city toward a more walkable, bikable and transit focused evolution, the use of the CNU-ITE design manual and NACTO design guides to provide flexibility in street design are appropriate.

However, more recent practices in street and thoroughfare design have embraced a more holistic approach that emphasizes support for other modes of transportation. Further, considerations toward scale, traffic volume, service areas, and creating important and strategically located access points from certain types of roadways have proven to be beneficial for the majority of users and the surrounding communities they serve. As Plan El Paso defined a community vision for a high-quality built environment and a balanced transportation system, the conventional functional classification system

is not adequate as a de facto design policy to address the more complex and nuanced transportation needs for El Paso’s streets and roads.

In response, the El Paso Street Design Manual presents a revised version of the Functional Classification System that brings together the objectives of Plan El Paso with a context-sensitive approach towards Street and Thoroughfare Design. This manual offers a measured balance between the Functional Classification System requirements with considerations for context-appropriate street type. Section 3.1 expands on the design and planning guidelines that reflect such a balance.

Based on this approach, the manual presents a more detailed breakdown of the broader three-type thoroughfare classifications typically considered within the Functional Classification System, based on previous uses and applications presented in the MTP. A more detailed description of each of the Street Types used in this manual is offered in the sub-sections that follow.



## 2.5.1 MAJOR ARTERIALS

Major Arterials facilitate trips between one point of the city to another by linking lower classification streets to Freeways. Designed for long trips, high traffic volumes and speeds, they are located in areas where major centers of activity attract greater numbers of traffic connections. They should carry a high percentage of travel while efficiently making use of space needed for total system mileage.

Major Arterials are laid out to create a network of interconnected roadways that, through the use of strategies such as Geometric Design and traffic control measures, enhance efficient movement of motorists. Further, this street type addresses safety considerations by setting access restrictions to adjoining properties while protecting the through traffic carrying capacity of a roadway.

## 2.5.2 MINOR ARTERIALS

Supplementing a Major Arterials network, Minor Arterials interconnect to serve the flow of traffic within a smaller geographic area of influence and to provide continuous paths to intermediate destinations. Trips made on Minor Arterials tend to be moderate in length although still carrying significant through traffic, and sometimes, act as alternate routes. Because of their characteristics, Minor Arterials are in the position to effectively ensure greater land access to adjoining properties. Ultimately, this street type represents a key element to adequately provide route and spacing continuity within the Major Arterials Network.

## 2.5.3 COLLECTOR STREETS

Providing continuous paths to arterial roadway networks, Collector Streets allow for connections between local neighborhood

streets and the Major and Minor Arterials System needed to allow users to reach their ultimate destinations. They are intended to collect traffic from local streets and channel it into the wider arterial system of the city, while allowing for greater land access due to their medium traffic volumes and speeds. Collector Streets are critical to the effective operation of their communities and provide unique access quality to the wider circulation needs of the transportation roadways network.

## 2.5.4 LOCAL STREETS

Supporting access to all destinations not on the Arterials/Collector network, Local Streets traditionally manage neighborhood-level transportation needs. They serve a smaller scale of traffic volumes and constitute the lowest level of mobility within the system. The main role of Local Streets is to allow for direct access to adjoining land and properties, possible through the increased safety aspect of establishing lower speeds, while also linking its traffic to Arterial and Collector roadways.

This Street Design Manual continues to expand on these categories in Sections 4.2-4.8 providing illustrated and detailed cross section information for each street type. Although many roads do not fully match the descriptions and definitions presented here, a road should be categorized according to the type that it most closely matches. Additionally, this approach is aimed at offering future design flexibility as the variety of physical and social conditions in a city environment continue to change and evolve.

While the conventional functional classification system and its balance of regional and local mobility is still a

fundamental foundation for this Street Design Manual's street types, the Manual outlines additional considerations to reflect the variety of physical and social contexts that each type will traverse.

### 2.5.5 PLAN EL PASO: COMPACT URBAN

[Plan El Paso](#) designates the Compact Urban area type as a place where multi-modal transportation and street network design become a priority. In this case, character and function are emphasized over traffic capacity, and the main focus becomes to get “people moving” through the provision of smaller blocks and pedestrian-scale amenities. Compact Urban represents an area type that had been previously part of the Drivable Suburban designation.

In the Compact Urban area type, there is an established grid of streets, and because motor-vehicle users have choices, guidelines are not needed to restrict access to adjoining land along certain arterial roadways to maintain an efficient traffic flow. [Plan El Paso](#) has designated three main neighborhood types as Compact Urban, based on the layout of the Future Land Use Map (See page 1.30 of [Plan El Paso](#)):

- A. **Existing Walkable Neighborhoods.** These types of existing neighborhoods tend to allow for a greater number and quality of pedestrian-oriented facilities, typically arising from El Paso's original development pattern laid out in eras when walking and/or taking transit were the norm. Because of their physical characteristics, these areas are well-suited for continued evolution through a mix of land uses and transportation options. As laid out in the Future Land Use Map, these types of neighborhoods have been designated as G-1 “Downtown” and G-2

“Traditional Neighborhood”.

- B. **Planned Walkable Communities.**

These types of areas correspond to large tracts of developable land owned by the City of El Paso that are being master planned for potential urban expansion using Smart Growth principles. Planned Walkable Communities are envisioned to be served with pedestrian-oriented streets that allow for safe and comfortable walking paths/sidewalks. As presented in the Future Land Use Map, land for Planned Walkable Communities corresponds to areas designated as O-7 “Urban Expansion”, with one tract adjoining the El Paso International Airport, and two others located on opposite sides of the Franklin Mountains.

- C. **Future Redevelopment and Infill**

**Neighborhoods.** These areas correspond to land near Rapid Transit System (RTS) stops and Sun Metro transfer stations with a strong potential for infill development and redevelopment (See page 4.34 of [Plan El Paso](#)).

### 2.5.6 PLAN EL PASO: DRIVABLE SUBURBAN

Characterized by maintaining a predominately motor-vehicle oriented development pattern, Drivable Suburban areas in El Paso represent an often-continuous network of arterials along with a fewer numbers of collectors. In these areas, the network provides alternate travel paths for motor vehicles to alleviate some of the traffic congestion that occurs during peak hours. Physical features of thoroughfares in Drivable Suburban areas include sidewalks and, when feasible, separated, protected or buffered bike lanes.

### 2.5.7 PLAN EL PASO: RURAL AND OPEN SPACE



As defined in the Federal-Aid Highway Law, Rural Areas comprise everything outside the boundaries of Urban Areas (designated as such by the Census Bureau). These two classifications of areas (Urban and Rural) present fundamentally different characteristics, however Federal Guidelines allow for the adjustment of this boundary for transportation purposes.

Although the Urban/Rural distinction is a key component of thoroughfare design, designations based on the Census Bureau remain quite broad and group vastly diverse types of land development that do not differentiate among the physical contexts of those areas. To improve on the conventional Urban/Rural distinction, Plan El Paso bases its designations on desired conditions projected for the future. These enhancements include:

- The Rural Area boundary is based on Plan El Paso's Future Land Use Map, instead of the U.S. Census.
- Urban Areas are subdivided as described earlier.
- The Open Space Area represents a newly conceived type to group lands that will not be developed.

### **2.5.8 CONFORMING TO THE MAJOR THOROUGHFARE PLAN**

The City's adopted thoroughfare plan shall be used to determine the minimum type of roadway, the general location of the roadway, and the areas that the roadway is intended to connect to as part of the platting process. For streets that are not shown on the city's thoroughfare plan, such as local residential streets, the arrangement of such streets within a subdivision shall:

- A. Conform to any plan for the neighborhood approved or adopted by the city to meet a

particular situation where topographical or other conditions make continuance or conformity to existing streets impractical;

- B. Provide for future access, such as by stubbing streets for future extension, to adjacent vacant or commercial areas which will likely not have incompatible land uses; and
- C. Not conflict in any way with existing or proposed driveway openings (including those on the other side of an existing or planned median-divided arterial, in which case new streets shall align with such driveway openings such that median openings can be shared).

### **2.5.9 CONFORMANCE WITH THE COMPREHENSIVE PLAN**

Streets, contexts and the layout of streets shall be consistent with the adopted comprehensive plan and its relevant contexts, and specifically the current Major Thoroughfare Plan.

### **2.5.10 TXDOT ROADWAYS**

Roadways owned by TXDOT shall be subject to TXDOT standards and regulations.

3

# The El Paso Street Design Toolbox







## Chapter 3

# The El Paso Street Design Toolbox

### 3.1 THE DESIGN TOOLBOX KIT OF PARTS

This section pertains to the design of new streets and/or the re-design of existing streets. It summarizes essential characteristics of the updated roadway classification system, establishing basic principles based on the street cross-sections previously presented in the Major Thoroughfare Plan (MTP). Guidance is generally defined ‘from centerline to edge’ with regard to a typical cross-section layout. Specific design criteria are presented in detail in Tables 3.1 and 4.1, and rely on the following basic principles (which should be understood as minimum standards when defined as such):

- A. **Lane Widths.** May range from 9 to 18 feet depending on their intended use, per the DSC. However, where certain conditions call for lanes to accommodate high-capacity transit, wider dimensions need to be considered. Therefore, cross-sections presented will typically propose 10-foot widths for inner lanes, and 11-foot widths for outer lanes, parking adjacent, or rural area lanes. Also see, [NACTO guidance](#).



*Context sensitive lane widths that discourage speeding*



*Arterial sidewalks suitable for multiple uses*



*Planting strips that provide separation from moving cars and encourage shade tree vitality*



- B. **Bicycle Facilities.** Refer to the [El Paso Bike Plan](#) and [NACTO standards](#) for proposed bicycle network and facilities. A 3-foot wide buffer from the travelway is recommended for buffered bike lanes or cycle tracks.
- C. **Planting Zone.** A minimum of 5 feet width shall be used for Planting Zones, including planter parkways, strips, or tree wells.
- D. **Arterial Pedestrian Zone.** A minimum of 12-foot widths should be used for the Pedestrian Zone along Arterial roadways to allow for space that may need to be re-purposed or substituted for other uses, such as sidepaths.
- E. **Collector Sidewalks.** A minimum of 6-foot widths for sidewalks along Collector roadways will be used.

## 3.2 STREET DESIGN ZONES

Street Zones represent an important aspect of Street Design that regulate and outline the distinct uses contained within the right-of-way. In El Paso, although not all streets will contain all zones, they are still one of the most extensively used civic spaces in the community. For this, the broader purpose of this section is to provide the appropriate and context-sensitive design criteria to be used in Street and Thoroughfare creation.

The Street Zones illustrated and defined below include guidelines to design portions of the street containing components such as vehicle travel lanes and sectors allocated to other uses such as pedestrian areas or the placement of public utilities\*.

\* Utilities may be found in all street zones and are subject to local utility requirements, per City of El Paso Code and technical criteria manuals. For mobility purposes, utility location is preferred in the pedestrian zone.

Typically, a street is comprised of six different zones, each one with specific functions and unique design considerations that also interact in several ways. Also see, [NACTO guidelines](#).

### 3.2.1 FRONTAGE ZONE

The Frontage Zone comprises the frontage area immediately adjacent to the building face, wall, or fence that marks the property line. Elements such as stoops, bay windows, planters, water fountains, or ground level commercial amenities could be used in the Frontage Zone to enhance the street environment provided that pedestrian and Americans with Disabilities Act (ADA) accessibility are maintained.

### 3.2.2 PEDESTRIAN THROUGH ZONE

The Pedestrian Through Zone comprises the portion of the street that primarily accommodates pedestrian access. Uses generally include walking, business, and social activities, and they could extend from the face of the building or property edge to the face of the curb. The portion of the Pedestrian Through Zone specifically reserved for pedestrian travel is the Sidewalk Clear Zone.

Sidewalk design considerations need to meet the ADA Accessibility Guidelines (ADAAG). To accomplish this, sidewalks should be well-lit, free of any physical obstructions for pedestrian movement, and should use consistent materials from block to block along the street. Other considerations critical for accessibility and safety include surface design, dimensions, and slopes.

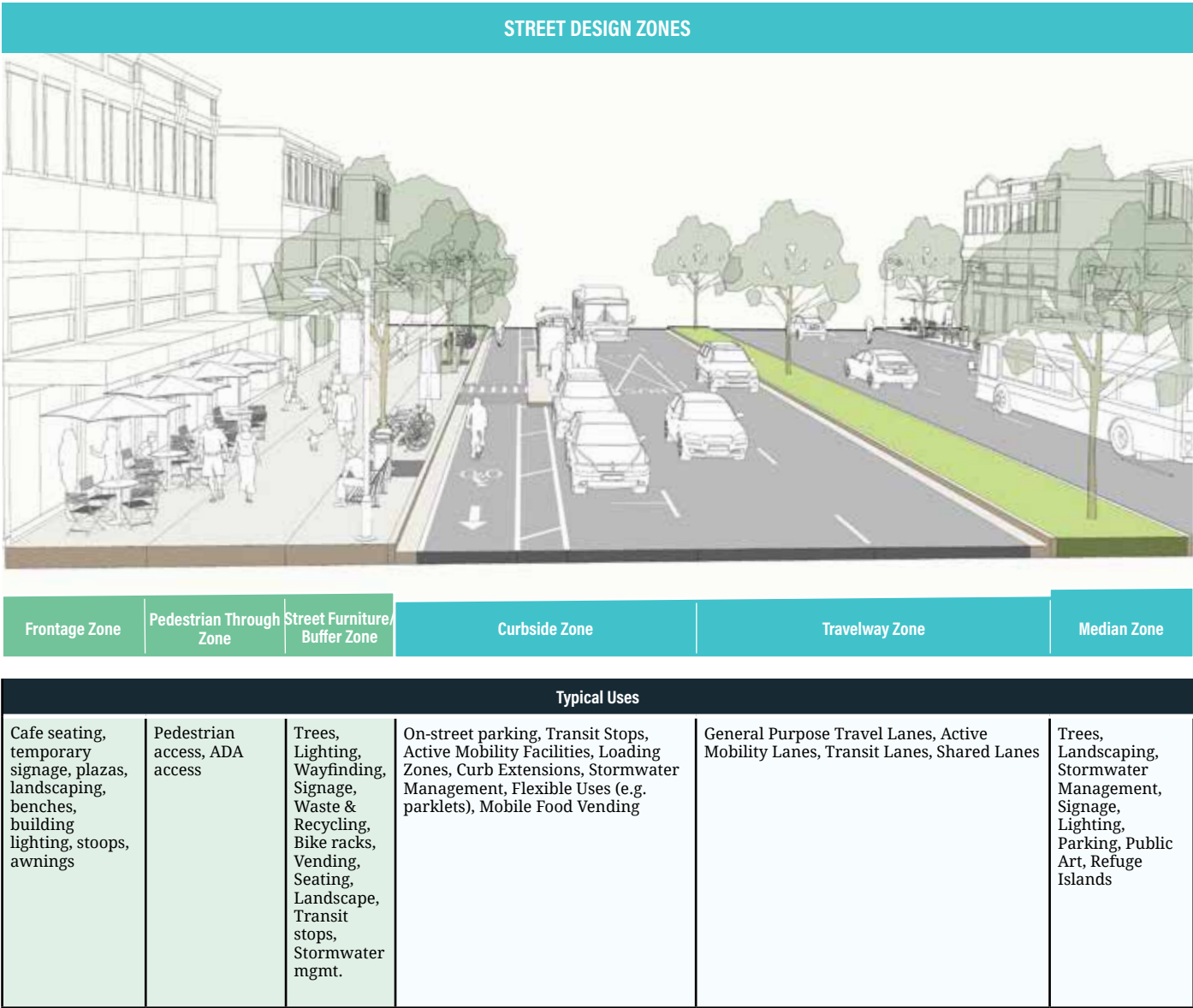


Figure 3.1: Street design zones



Throughout this document, the minimum Sidewalk Clear Zone is established at 5 ft wide in all areas and 6 ft wide when within ½ mile of a transit facility. The placement of utility poles, signal boxes, street furniture, and vegetation should not encroach into the Sidewalk Clear Zone.

### 3.2.3 STREET FURNISHINGS/BUFFER ZONE

The Street Furnishings/Buffer Zone comprises the area between the curb and the Pedestrian Through Zone, placed there to provide physical distance and protection from moving vehicle traffic. It provides space for the placement and organization of street lights, street trees and landscaping, transit stops (to include bus stops/shelters), street furniture, bicycle racks, newspaper boxes, signage, parking meters, as well as above and below ground utilities.

As the point of transfer between pedestrians and the various transportation vehicles (transit, bicycle and private automobiles), the Street Furnishings/Buffer Zone provides the area needed to create space between the curb and the various vertical elements on the streets. When adjacent curbside parking is present, this area allows for proper clearance to allow car doors to open and motor vehicle drivers to access the sidewalk. It also includes space for driveway aprons to ramp down from the sidewalk grade to the street, needed to maintain a level sidewalk.

In the case of Stormwater Management considerations, features such as rain gardens or bioswales could be placed here to collect rainwater and reduce impervious surface area.

### 3.2.4 CURBSIDE ZONE

Accessory elements included in public curbsides reflect the wide variety of uses possible for the city's streets. Some examples include curb extensions, sidewalk extensions, waste and recycling removal, bicycle parking, temporary installations, storm drains, and/or parklets with public seating. The placement and organization of these elements need to pay careful attention to paths of movement and required sight lines.

The flexible use of the Curbside Zone serves to enhance the overall pedestrian experience and vibrancy of the street while maintaining safety and making efficient, equitable use of streets. Elements like curb bump-outs and curb extensions, serve to calm traffic and enhance pedestrian safety by visually and physically narrowing the street, extending the sidewalk, reducing pedestrian crossing distance, and increasing pedestrian visibility.

The Curbside Zone also accommodates parking areas adjacent to the curb where it is permissible within the public right-of-way for drivers to leave their vehicles. Parking areas designated as on-street parking serve multiple functions such as increasing street activity, meeting the parking needs of adjacent land uses, protecting pedestrians from moving traffic, and making pedestrian crossing safer through traffic calming.

On-street parking in the Curbside Zone may be parallel, perpendicular, angled, or back-in diagonal; and when appropriate, is beneficial to most street types and contexts. Additionally, it can be designated or managed to provide curbside access for persons with disabilities, in which case it should be located near major destinations such as commercial areas and civic buildings.

Parking in the Curbside Zone can also provide

some congestion relief in high traffic areas, by converting to a travel lane during peak hours. This is achieved through management by allowing parking throughout the day, except during peak morning and evening hours. Alternative uses allowed in the Curbside Zone, such as bike corrals, can encourage other modes of mobility while reducing vehicle emissions and fuel consumption. Parking in the Curbside Zone is notably not an essential component of all streets, as it may not be appropriate or necessary in certain contexts.

### 3.2.5 TRAVELWAY ZONE

The Travelway Zone is the portion of the street reserved for vehicular travel of all varieties, including transit, bicycle and other motorized vehicles. Consideration of speed and width are important when designing Travelways in various contexts.

For example, increased lane widths can encourage higher travel speeds, which may not be appropriate in pedestrian-oriented and compact contexts. Lower speeds are favorable for accommodating curbside parking maneuvers and responding to restricted sight distances encountered in compact urban places. Travelways should not be used for loading or parking. Typically, the acceptable lane width on Travelways varies depending on the street type, the context and the average daily traffic.

### 3.2.6 MEDIAN ZONE

Medians are a preferred means of access management, with space to allow turn lanes. They provide opportunities for stormwater management, green infrastructure, public art and landscaping. Medians can also accommodate pedestrian refuge islands to enhance pedestrian crossing safety. Occasionally, in pedestrian-oriented contexts and on streets with low travel speeds, medians can also provide curbside parking and seating areas. They can be depressed as a drainage swale to accommodate drainage and stormwater management.

## 3.3 DESIGN CRITERIA FOR THOROUGHFARE ZONES

Tables 3.1 and 3.2 on the following pages identify design criteria for Major and Minor Arterials, Collectors, Locals, and Alleys. Adjustments to number of lanes will be made based on a Traffic Impact Assessment (TIA).



Table 3.1 Additional Design Criteria for Thoroughfare Corridors

	Major Arterial	Minor Arterial
TYPICAL THOROUGHFARE CHARACTERISTICS		
Network Function	Straight paths to distant destinations; connects to freeways	Continuous paths to intermediate destinations; alternate routes for longer trips
Direct Route	Yes	Yes, but may include minor deflections
Network Spacing Guidance	Should be spaced generally 1 mile apart outside of Compact Urban areas, where historical growth patterns may mean these are closer together.	Midway between principal arterials, although exact spacing (such as directly at the midpoint) may be determined by particular network characteristics
Driveway and Access Spacing	Curb cuts should be discouraged by land development regulations, no more than one driveway per 660 feet in urban conditions and 1320 feet in suburban and rural conditions	Curb cuts should be replaced by cross-parcel access requirements in land development regulations; no more than one driveway per 500 feet or one per block face, whichever is less
DESIGN CRITERIA FOR NEW & RECONFIGURED THOROUGHFARES		
Number of Travel Lanes and Base ROW Width		
Compact Urban	4 lanes under 35,000 ADT <sup>3</sup> ; 6 lanes over 35,000 ADT <sup>3</sup> Base 110 ft ROW; constraints may reduce this	4 lanes under 35,000 ADT <sup>3</sup> ; 6 lanes over 35,000 ADT <sup>3</sup> Base 92 ft ROW; constraints may reduce this
Drivable Suburban	4 lanes / 92 ft ROW under 30,000 ADT <sup>3</sup> 6 lanes / 112 ft ROW at or over 30,000 ADT <sup>3</sup>	2 lanes / 70 ft ROW under 18,000 ADT <sup>3</sup> 4 lanes / 90 ft ROW at or over 18,000 ADT <sup>3</sup>
Rural	4 lanes / 108 ft ROW at or over 15,000 ADT <sup>3</sup>	2 lanes / 80 ft ROW
Bicycle Facilities <sup>1</sup> (preferred design to be used on El Paso Bike Plan-designated thoroughfares)		
Compact Urban	Refer to <a href="#">El Paso Bike Plan</a> “Recommended Bikeway Network” for preferred facility type	
Drivable Suburban		
Rural		
Mid-Block Crossings <sup>4</sup>		
Compact Urban	Allowed on blocks longer than 800 feet	Allowed on blocks longer than 600 feet
Drivable Suburban	Allowed between signalized intersections more than 1000 feet apart	Allowed between signalized intersections more than 1000 feet apart
Rural	Not allowed except at special locations (recreational areas, etc.)	Not allowed except at special locations (recreational areas, etc.)
On-street Parking (for curbside not designated for bus stops, loading, and other specialized uses)		
Compact Urban	In commercial districts	Commercial districts
Drivable Suburban	No	No
Rural	No	No
Maximum Curb Radius (without curb extensions)		
Compact Urban	15 feet	15 feet
Drivable Suburban	25 feet	25 feet
Rural	25 feet	25 feet
Recommended Street Tree Spacing		
Compact Urban	30 feet on center	30 feet on center
Drivable Suburban	30 feet on center	30 feet on center
Rural	35 feet on center	35 feet on center

Note 1 - Bike facilities shall not be limited, instead they shall conform to the [El Paso Bike Plan](#) and [NACTO Design Guides](#).

Note 2 - Adjustments to number of travel lanes will be made based on a Traffic Impact Assessment (TIA).

Note 3 - Adapted from [Florida DOT's Generalized Level of Service Tables](#).

Note 4 - The City Traffic Engineer will have final approval authority over mid block crossings.

	Collector	Local
TYPICAL THOROUGHFARE CHARACTERISTICS		
Network Function	Continuous paths to arterial network; allows local trips to avoid the arterial network	Provides access to all parcels not on the arterial / collector network
Direct Route	Yes, but may include deflections & minor jogs	Not critical; but are highly interconnected in Compact Urban areas
Network Spacing Guidance	A minimum of one collector should be placed between two arterials whether minor or major; should generally not exceed one-half mile	As needed to provide access to all parcels
Driveway and Access Spacing	Depending on area type and specific land use context, driveways may be required frequently but should be discouraged through subdivision design features such as alleys and side-street entrances	Frequent spacing, though land development regulations should allow no more than one driveway per land parcel and should favor local streets over higher classifications
DESIGN CRITERIA FOR NEW & RECONFIGURED THOROUGHFARES		
Number of Travel Lanes and Base ROW Width		
Compact Urban	2 lanes / 74 ft ROW	2 lanes / 62 ft ROW in non-residential land use areas 2 lanes / 60 ft ROW in residential land use areas
Drivable Suburban	2 lanes / 71 ft ROW in non-residential land use areas 2 lanes / 58 ft ROW in residential land use areas	2 lanes / 60 ft ROW in non-residential land use areas 2 lanes / 48 ft ROW in residential land use areas
Rural	2 lanes / 70 ft ROW	2 lanes / 60 ft ROW
Bicycle Facilities (preferred design to be used on El Paso Bike Plan-designated thoroughfares)		
Compact Urban	Refer to <a href="#">El Paso Bike Plan</a> “Recommended Bikeway Network” for preferred facility type	
Drivable Suburban		
Rural		
Mid-Block Crossings		
Compact Urban	Allowed on blocks longer than 800 feet	Allowed on blocks longer than 500 feet
Drivable Suburban	Allowed when distance between protected pedestrian crossings is more than 1000 feet	Allowed when distance between traffic control devices that would stop vehicles for a pedestrian crossing is more than 800 feet
Rural	Not allowed except at special locations (recreational areas, etc.)	Not allowed
On-street Parking (for curbside not designated for bus stops, loading, and other specialized uses)		
Compact Urban	Required in commercial districts	Allowed but not required
Drivable Suburban	Required in commercial districts	Allowed but not required
Rural	No	No
Maximum Curb Radius (without curb extensions)		
Compact Urban	15 feet	15 feet
Drivable Suburban	20 feet	15 feet
Rural	20 feet	15 feet
Recommended Street Tree Spacing		
Compact Urban	30 feet on center	30 feet on center
Drivable Suburban	30 feet on center	30 feet on center
Rural	35 feet on center	30 feet on center



### 3.4 GENERAL BICYCLE FACILITY TYPES

The NACTO Urban Bikeway Design Guide and El Paso Bike Plan recommends a variety of facility types to be applied to various street types. The specific bicycle facility types are illustrated below.

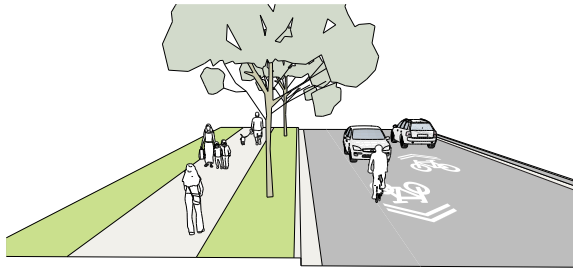
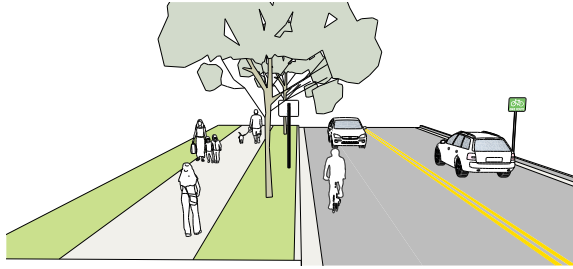
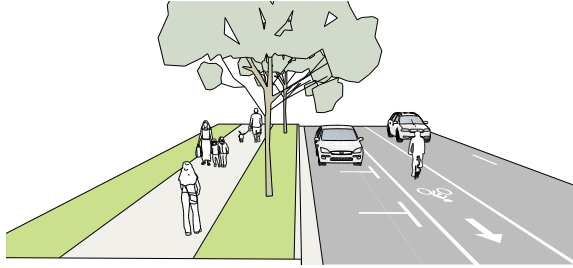
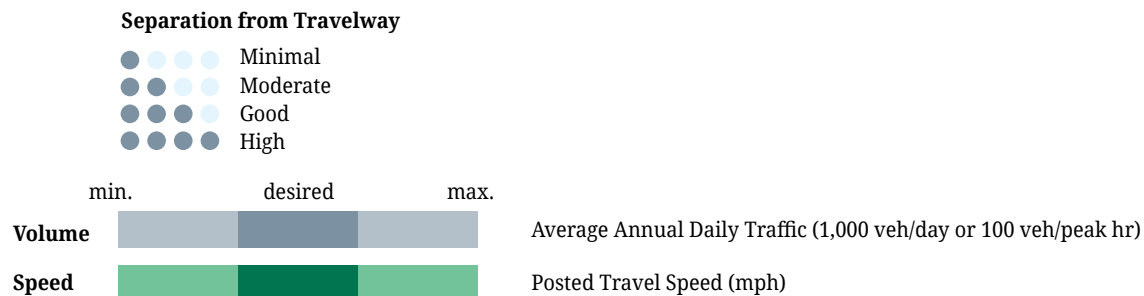
BICYCLE FACILITY CONTEXTUAL GUIDANCE				
Typical Arrangement of the Facility	Facility Type	Street Class	Speed, Volume & Separation	Additional Factors
	<b>Bicycle Boulevard</b>  Comfortable and attractive bicycling environment without utilizing physical separation; Includes traffic calming.	Local	<b>Volume</b> 0-2k 2k-3k <b>Speed</b> 15-20 20-25 <b>Separation</b> ● ● ● ●	Emergency Route
	<b>Bike Route</b>  A travel lane shared by bicyclists and motorists, indicated by signage.	Local	<b>Volume</b> 0-2k 2k-8k 8k-10k <b>Speed</b> 15-25 25-30 <b>Separation</b> ● ● ● ●	Higher Traffic Volumes, Space for Traffic Calming, Space for Bike Lanes, Critical Network Link
	<b>Bike Lane</b>  Exclusive space for bicyclists through the use of pavement markings and signage.	Collector	<b>Volume</b> 3k-4k 4k-15k 15k-20k <b>Speed</b> 15-20 20-30 30-40 <b>Separation</b> ● ● ● ●	High Turnover Parking, Front-in Diagonal Parking, Insufficient Road Space, High Traffic Volumes, Multiple Travel Lanes

Figure 3.2: Bicycle facility contextual guidance



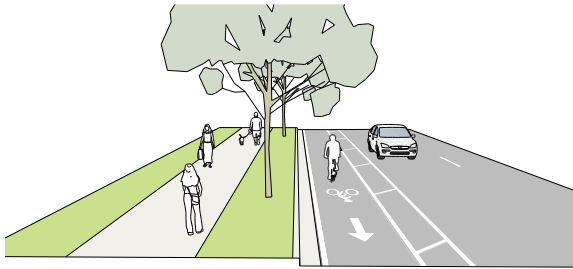
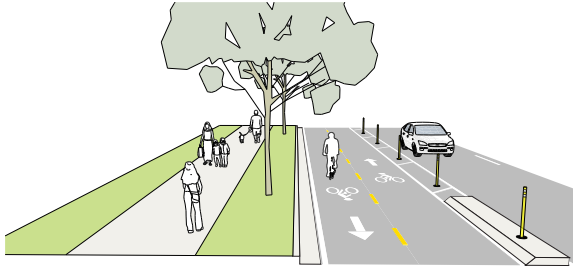
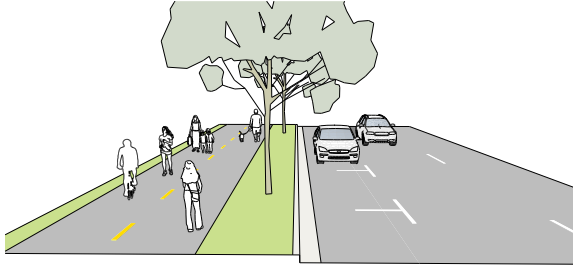
BICYCLE FACILITY CONTEXTUAL GUIDANCE				
Typical Arrangement of the Facility	Facility Type	Street Class	Speed, Volume & Separation	Additional Factors
	<b>Buffered Bike Lane</b> Traditional bike lane separated from vehicle travel lanes or parking lanes by an adjacent buffer area.	<b>Minor Arterial</b>	<p><b>Volume</b></p> <p>3k-4k 4k-25k 25k-30k</p> <p><b>Speed</b></p> <p>20-25 25-40 40-45</p> <p><b>Separation</b></p> <p>● ● ● ●</p>	Insufficient Road Space, Illegal Parking/Loading, Sidewalk Riding, Space for Cycle Track
	<b>Cycle Track</b> Physically separated bikeway. Could be one or two way and physically protected.	<b>Minor Arterial</b>	<p><b>Volume</b></p> <p>3k-9k 9k-25k 25k-32k</p> <p><b>Speed</b></p> <p>25-30 30-50 50-55</p> <p><b>Separation</b></p> <p>● ● ● ●</p>	Frequent Driveways, Frequent Intersections, Park or linear corridor with space for shared use path
	<b>Shared Use Path</b> Completely separated from roadway, typically shared with pedestrians.	<b>Major Arterial</b>	<p><b>Volume</b></p> <p>3k-6k 6k-32k</p> <p><b>Speed</b></p> <p>35-45 45-60 60+</p> <p><b>Separation</b></p> <p>● ● ● ●</p>	Frequent Driveways, Frequent Intersections, High Pedestrian Volume

Figure 3.2: Bicycle facility contextual guidance (continued)

(Sources: El Paso Bike Plan, 2016. FHWA. Separated Bike Lane Planning and Design Guide. 2015. AASHTO. Guide for the Development of Bicycle Facilities. 2012. FHWA. Manual on Uniform Traffic Control Devices. 2009. NACTO. Urban Bikeway Design Guide. 2012. NCHRP Report 766: Recommended Bicycle Lane Widths for Various Roadway Characteristics. 2014)

## 3.5 MID-BLOCK CROSSWALKS

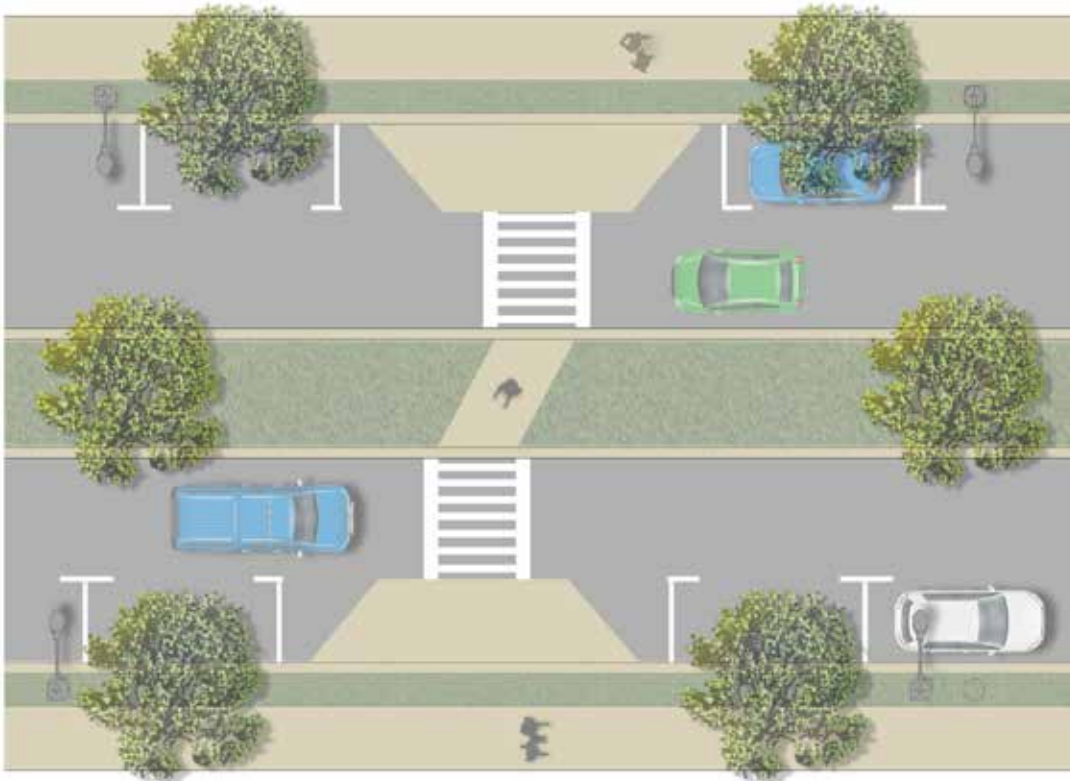
**Table 3.3 Recommended Practice for Midblock Crossings**

GENERAL
The decision to locate a midblock crosswalk will be based on numerous factors. Generally, however, consider providing a marked midblock crossing when protected intersection crossings are spaced greater than 400 feet so that crosswalks are located no greater than 200 to 300 feet apart in areas where a relatively high demand of foot traffic is existing or anticipated, and meet the criteria below.
Midblock crossings may be considered when there is significant pedestrian demand to cross a street between intersections, such as connecting to major generators or transit stops.
Midblock crosswalks should be located at least 100 feet from the nearest side street or driveway so that drivers turning onto the major street have a chance to notice pedestrians and properly yield to pedestrians who are crossing the street.
CRITERIA
Streets with an average daily traffic volume (ADT) of 12,000 vehicles per day or less
Multilane streets carrying less than 15,000 ADT if a raised pedestrian refuge island or median is provided
Operating speeds less than 40 mph
A minimum pedestrian crossing volume of 25 pedestrians per hour for at least four hours of a typical day.
Adequate sight distance is available for pedestrians and motorists.
RECOMMENDATIONS
Conform to Public Rights-of-Way Accessibility Guidelines (PROWAG) for the disabled and visually impaired. Conform to COEP TAS, TDLR, ADA rules.
Unsignalized midblock crosswalks should not be provided on streets where traffic volumes do not have gaps in the traffic stream long enough for a pedestrian to walk to the other side or to a median refuge. At locations with inadequate gaps that also meet Manual on Uniform Traffic Control Devices (MUTCD) signalization warrants, consider a signalized midblock crossing.
Consider a signalized midblock crosswalk (including locator tone and audio pedestrian signal output as well as visual pedestrian countdown signal heads) where pedestrians must wait more than an average of 60 seconds for an appropriate gap in the traffic stream. When average wait times exceed 60 seconds, pedestrians tend to become impatient and cross during inadequate gaps in traffic. If this initial threshold is met, check pedestrian signal warrants in the MUTCD.
Provide overhead safety lighting on the approach sides of both ends of midblock crosswalks.
Provide wheelchair ramps or at-grade channels at midblock crosswalks with curbs and medians.
Provide raised median pedestrian refuge at midblock crossings where the total crossing width is greater than 60 feet, and on any unsignalized multi-lane thoroughfare crossing.
Use high-visibility (ladder-style) crosswalk markings to increase visibility longitudinally.
Provide advance stop or yield lines to reduce multiple-threat crashes.
Provide advance crosswalk warning signs for vehicle traffic.
Provide curb extensions at midblock crosswalks with illumination and signing to increase pedestrian and driver visibility.
“Z” crossing configurations should be used for midblock crossings with medians wherever possible (see Figure 2.5). Provide an at-grade channel in median at a 45-degree angle toward advancing traffic to encourage pedestrians to look for oncoming traffic.
OTHER CONSIDERATIONS
A strategy to calm traffic speeds in advance of and at a midblock crossing is to raise the pavement to meet the sidewalk elevation by use of gentle ramps (see Figure 2.6). Consider use of overhead flashing beacons.

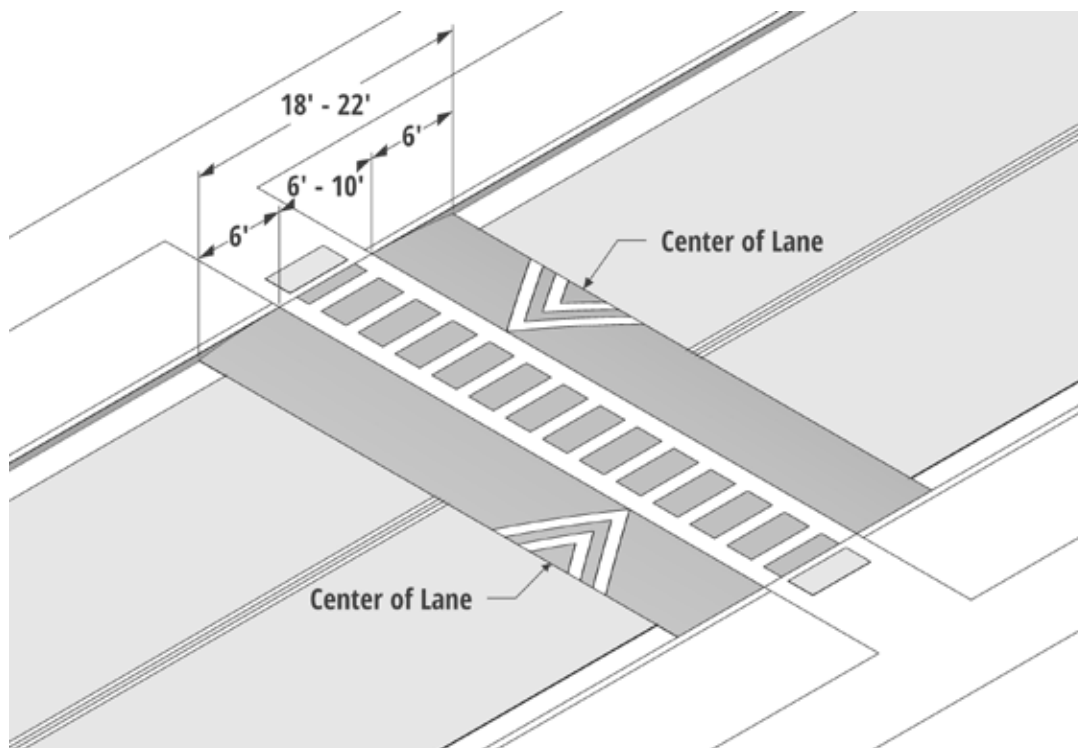
**Sources:**

Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, ITE/CNU, 2017  
 Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations, FHWA, 2005  
 Manual on Uniform Traffic Control Devices, FHWA, 2014 Edition  
 Guide for the Planning, Design and Operation of Pedestrian Facilities, AASHTO, 2004  
[Guide for the Development of Bicycle Facilities, AASHTO, 2012](#)





**Figure 3.3 - Midblock crossings with a “Z” configuration force pedestrians crossing the median or raised pedestrian refuge island to look toward oncoming traffic. Avoid street trees that interfere with visibility. Source: Stantec, ITE**



**Figure 3.4 - The raised roadway crosswalk concept combines midblock crosswalks with traffic calming devices. Source: Stantec, ITE**

### 3.6 ARID CLIMATE DESIGN CONSIDERATIONS

El Paso is a southwestern city characterized for its low-humidity hot summers and its cool dry winters. During the summer months (July to September), the city experiences most of its heavy rainfall—averaging about 9.7 inches per year—and thunderstorms, some severe enough to produce flash flooding. These natural climate considerations form part of a context-sensitive design strategy aimed at creating comfortable urban environments year-round. In the case of El Paso, the need to design streets for this specific climate is apparent.

Considerations for El Paso's climate should be integral to the design process for both public and private projects\*. Some street design characteristics to consider are as follows:

- 1 Provide relief from hot temperatures in the pedestrian environment with design elements such as street trees, umbrella-covered tables, and cooling mist systems.

- 2 Require building facades to implement generous awnings for shading of the sidewalk area.
- 3 Must include water harvesting design treatments as per NACTO standards latest editions
- 4 Utilize textured hardscape elements to enliven and bring color to the streetscape.
- 5 Apply stormwater management strategies to handle flash flooding through a continuous shared soil system for street trees that absorbs and filters intense rainfalls efficiently and enhances street tree health. See [Urban Street Stormwater Guide](#), NACTO, 2017 for additional guidance.
- 6 Flexible use of the street can allow opportunities to provide shade and seating areas to enhance comfort for pedestrians.
- 7 [NACTO Transit Street Design Guide](#)

\* Applicable to Downtown and Compact Urban Areas

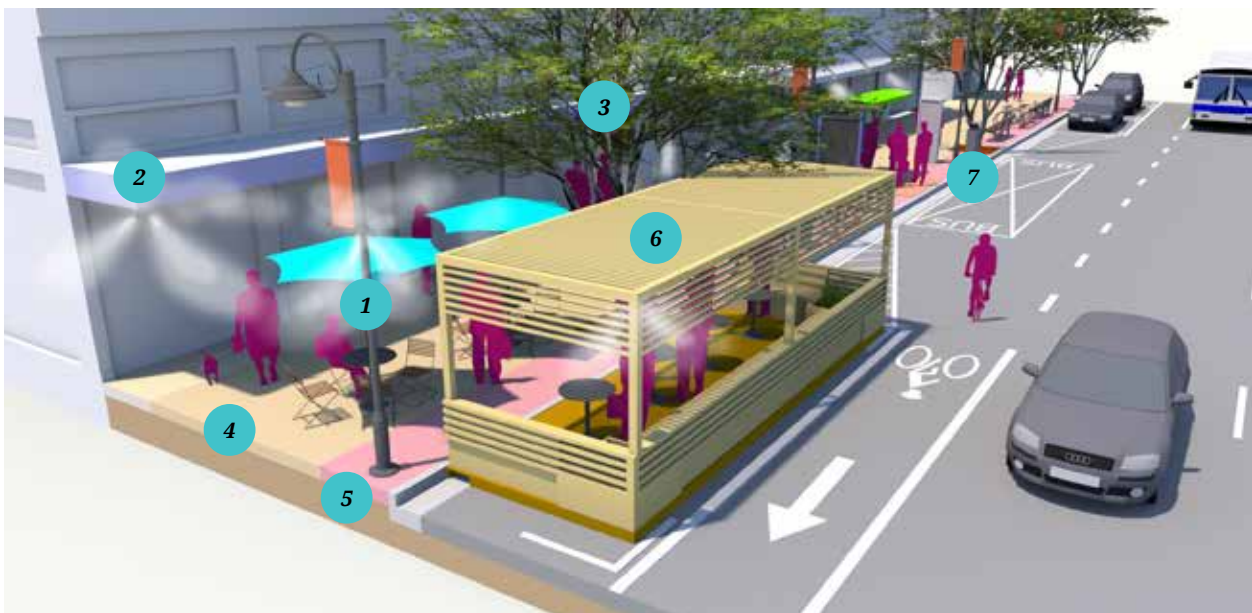


Figure 3.5: Illustration depicting design considerations for El Paso's arid climate

## 3.7 SMART MOBILITY

### 3.7.1 SMART MOBILITY

Smart mobility is a rapidly growing broader transportation focus that can transform communities. It includes more commonly known mobility technologies like autonomous and electric vehicles. More specifically, Smart mobility can be divided into five categories, accessible, automated, connected, electric, and shared (A2CES) systems. Communities—including El Paso—can take advantage of these rapidly evolving technologies to enhance the community’s resiliency, equity, environmental sustainability, and economy.

### 3.7.2 ACCESSIBILITY

Accessibility refers to a mobility system’s effectiveness in serving people of different abilities including disabled persons, senior citizens, children, or even parents with strollers. Accessibility features can be built into all manner of vehicle systems and services from mobile applications to on-board human-machine interfaces to wheelchair ramps. The principles of accessibility seek to promote equity, flexibility, simplicity, and ease of use.

### 3.7.3 AUTOMATED

Automated vehicles are those that operate independently of the world around them and do not need a driver. Such vehicles depend on a sophisticated set of sensors and computing to construct a digital map of the world around them in real time and move accordingly. Trials and pilots of automated vehicles have been occurring around the world for a number of years with millions of miles of successfully logged trips.

### 3.7.4 CONNECTED

Vehicles can now be connected to a wide variety of things, other vehicles, surrounding infrastructure and many other potential devices. This connectivity is made possible through a series of devices like sensors, servers and 5G networks, which increasingly allows for mobility and service enhancements. Connections provide additional information to the vehicle such as the location of potential accidents ahead, ride hailing by a passenger, and location/availability of parking spaces or charging stations. At its most basic level, today’s mapping applications on smart phones are examples of how information is communicated through a connected system that pools information from other drivers to improve the experience for everyone.

### 3.7.5 ELECTRIC

The electric car has long been a technology that transportation planners have embraced as a means to reduce the negative impacts of air and noise pollution produced by the internal combustion engine. Recently, electric vehicles have become more desirable as advances in battery storage have drastically increased the vehicle’s travel range. Still, the availability and location of charging stations remains a limiting factor in the widespread use of electric vehicles.

### 3.7.6 SHARED

Shared mobility has historically taken the form of public transit – buses and trains. The great recession gave rise to a sharing economy that leveraged the power of social networking and mapping to rent out and “share” a variety of assets including available car seats (e.g., Uber/Lyft). The sharing



network has extended to other mobility services including shared bicycles and electric scooters. Manufacturers and service providers are taking this concept further and have been developing new shared vehicle technologies known as micro-transit or automated shuttles to provide short distance connectivity – typically less than 3 miles in length – in business districts, office and college campuses, and in high tourist areas.

Smart mobility has great potential to positively transform communities and enhance the efficiency, safety and equity of community mobility. But, like all technologies, the success will depend on the core principles with which it is applied. These rapidly emerging mobility technologies deserve consideration as El Paso and its street network grow and streets are planned, designed and redesigned over time.



*Figure 3.6: Conceptual rendering of a connected intersection where the vehicles, can communicate with the infrastructure as well as with other devices in the area*

# 4

## Thoroughfare and Street Standards







## Chapter 4

# Thoroughfare and Street Standards

### 4.1 APPLICABILITY

This Chapter of the El Paso Street Design Manual presents, in coordination with partner agencies, an updated set of typical cross-sections based on requirements and considerations contained in the Major Thoroughfare Plan (MTP), the revised Functional Classifications of Streets, and the new area types of Plan El Paso. The proposed set of cross-sections presents a new way of approaching thoroughfares in El Paso, and is aimed at creating a single reference resource for street design, planning, and construction. These sections also take into account other things happening around the city such as capital projects, development-related infrastructure, and right-of-way contributions—all key elements to the continuous urban and economic growth of the City of El Paso.

### 4.2 SUMMARY TABLE OF TYPICAL SECTIONS

This chapter contains descriptions of priorities and spatial preferences and minimums for roadway type. Table 4.1 on the next pages provides a high level of summary of this information, followed by more detailed information and sections for each type.

**Table 4.1 Design Guidance Criteria for Typical Sections: by Functional Classification and Area Type**

		<b>Major Arterial (92-112 ft typ. ROW)</b> Detailed design guidance begins on <a href="#">Page 38</a>						<b>Minor Arterial (70-92 ft typ. ROW)</b> Detailed design guidance begins on <a href="#">Page 46</a>					
		Travelway			Parking Zone	Accessory/ Amenity Zones	Pedestrian Zone	Travelway			Parking Zone	Accessory/ Amenity Zones	Pedestrian Zone
		Typical Lanes/ Widths <sup>5</sup>	Medians/ Access	EBBP Bike Facilities Focus	On-Street Parking	Streetscape Focus <sup>1</sup>	Min. Sidewalk Width <sup>2</sup>	Typical Lanes/ Widths	Medians/ Access	EBBP Bike Facilities Focus	On-Street Parking Priority	Streetscape Focus	Min. Sidewalk Width
Compact Urban	G-1	4-6 lanes, 10-11 ft	N/A	CT/ BBL/BL	Allowed	Planter/ Hardscape	8 ft	4-6 lanes, 10-11 ft	N/A	CT/BBL/ BL	Allowed	Planter/ Hardscape	8 ft
	G-2	4-6 lanes, 10-11 ft	Medians	CT/ BBL/BL	Allowed	Planter/ Hardscape	8 ft	4-6 lanes, 10-11 ft	Medians	CT/BBL/ BL	Allowed	Planter/ Hardscape	8 ft
	O-7	4-6 lanes, 10-11 ft	Medians	CT/ BBL/BL	Cond	Planter/ Hardscape	8 ft	4-6 lanes, 10-11 ft	Medians	CT/BBL/ BL	Cond	Planter/ Hardscape	8 ft
Drivable Suburban	G-3	4-6 lanes, 10-12 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Planter Strip	12 ft SUP, 6 ft SW	2-4 lanes, 10-11 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Planter Strip	6 ft
	G-4	4-6 lanes, 10-12 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Planter Strip	12 ft SUP, 6 ft SW	2-4 lanes, 10-11 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Planter Strip	6 ft
	G-5 <sup>3</sup>	4-6 lanes, 10-12 ft	Medians	SUP/ BBL/BL	Cond	Planter Strip	6 ft	2-4 lanes, 10-12 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Planter Strip	6 ft
	G-7	4-6 lanes, 11-12 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Sidewalk	6 ft	2-4 lanes, 10-12 ft	Medians or TWLTL	SUP/ BBL/BL	Allowed	Sidewalk	6 ft
	G-8 <sup>3</sup>	4-6 lanes, 11-12 ft	Medians	SUP/ BBL/BL	Cond	Sidewalk	6 ft	2-4 lanes, 10-12 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Sidewalk	6 ft
	G-9 <sup>3</sup>	4-6 lanes, 11-12 ft	Medians	SUP/ BBL/BL	Cond	Sidewalk	6 ft	2-4 lanes, 10-12 ft	Medians or TWLTL	SUP/ BBL/BL	Cond	Sidewalk	6 ft
Rural	G-6	2-4 lanes, 11-12 ft	Medians	SUP/ BL	Not Allowed	Sidewalk	5 ft	2-4 lanes, 11-12 ft	N/A	SUP/BL	Not Allowed	Sidewalk	6 ft
	O-3	2-4 lanes, 12 ft	Medians	BL/BB	Not Allowed	None	N/A	2-4 lanes, 12 ft	N/A	SUP/BL	Not Allowed	None	5 ft
	O-4	2-4 lanes, 12 ft	Medians	BL/BB	Not Allowed	None	N/A	2-4 lanes, 12 ft	N/A	SUP/BL	Not Allowed	None	5 ft
	O-5	2-4 lanes, 12 ft	Medians	BL/BB	Not Allowed	None	N/A	2-4 lanes, 12 ft	N/A	SUP/BL	Not Allowed	None	5 ft
	O-6	2 lanes, 11-12 ft	Medians	BL/BB	Not Allowed	None	N/A	2 lanes, 11-12 ft	N/A	SUP/BL	Not Allowed	None	5 ft

**EXPLANATION OF PARKING TERMS**

**Allowed<sup>4</sup>** On-street parking is permitted on this thoroughfare type in the area type. Specific guidance in Chapter 9 provides detail on how it can be accommodated, especially in constrained rights-of-way

**Conditional (Cond)** On-street parking may be permitted subject to additional criteria.

**Not Allowed** On-street parking is not allowed.

**Not Applicable (NA)**

Note 1: In areas where 8 ft is the min. sidewalk width, 6 ft may be accepted in constrained areas as approved by the City Manager or designee. Pedestrian Clear Zone, not inclusive of Planter Strip.

Note 2: A minimum of 12-foot widths should be used for the Pedestrian Zone along Arterial roadways to allow for space that may need to be re-purposed or substituted for other uses, such as shared use paths.

Note 3: Areas of the County designated as G-5, G-8 and G-9 are not within the COEP's regulatory jurisdiction at the time of writing.

Note 4: On-street parking near a bus stop and adjacent to a transit lane will need to comply with existing Sun Metro standards.

Note 5: Adjustments to number of lanes will be made based on a Traffic Impact Assessment (TIA).

		<b>Collector (58-88 ft typ. ROW)</b> Detailed design guidance begins on <a href="#">Page 52</a>						<b>Local (48-62 ft typ. ROW)</b> Detailed design guidance begins on <a href="#">Page 60</a>					
		Travelway			Parking Zone	Accessory/ Amenity Zones	Pedestrian Zone	Travelway			Parking Zone	Accessory/ Amenity Zones	Pedestrian Zone
		Typical Lanes/ Widths	Medians/ Access	EPBP Bike Facilities Focus	On-Street Parking	Streetscape Focus	Min. Sidewalk Width	Typical Lanes/ Widths	Medians/ Access	EPBP Bike Facilities Focus	On-Street Parking	Streetscape Focus	Min. Sidewalk Width
Compact Urban	G-1	2-4 lanes, 10-11 ft	N/A	CT/BBL/ BL	Allowed	Planter/ Hardscape	8 ft	2 lanes, 10-11 ft	N/A	BL/BB	Allowed	Planter/ Hardscape	6 ft
	G-2	2-4 lanes, 10-11 ft	Medians or TWLTL	CT/BBL/ BL	Allowed	Planter/ Hardscape	8 ft	2 lanes, 10-11 ft	Turn lanes	BL/BB	Allowed	Planter/ Hardscape	6 ft
	O-7	2-4 lanes, 10-11 ft	Medians or TWLTL	CT/BBL/ BL	Allowed	Planter/ Hardscape	8 ft	2 lanes, 10-11 ft	Turn lanes	BL/BB	Allowed	Planter/ Hardscape	6 ft
Drivable Suburban	G-3	2-4 lanes, 10-11 ft	Medians or TWLTL	CT/BBL/ BL	Allowed	Planter Strip	6 ft	2 lanes, 10-11 ft	N/A	BL/BB	Allowed	Planter Strip	5 ft
	G-4	2-4 lanes, 10-11 ft	Medians or TWLTL	CT/BBL/ BL	Allowed	Planter Strip	6 ft	2 lanes, 10-11 ft	N/A	BL/BB	Allowed	Planter Strip	5 ft
	G-5	2-4 lanes, 10-11 ft	Medians or TWLTL	SUP/BL	Allowed	Planter Strip	6 ft	2 lanes, 10-11 ft	N/A	BL/BB	Allowed	Planter Strip	5 ft
	G-7	2-4 lanes, 10-11 ft	Medians or TWLTL	SUP/BL	Allowed	Planter Strip	6 ft	2 lanes, 10-11 ft	N/A	BL/BB	Allowed	Sidewalk	5 ft
	G-8	2-4 lanes, 11-12 ft	Medians or TWLTL	SUP/BL	Cond	Sidewalk	6 ft	2 lanes, 10-11 ft	N/A	BL/BB	Cond	Sidewalk	5 ft
	G-9	2-4 lanes, 12 ft	Medians or TWLTL	SUP/BL	Cond	Sidewalk	6 ft	2 lanes, 10-11 ft	N/A	BL/BB	Not Allowed	Sidewalk	5 ft
Rural	G-6	2 lanes, 11-12 ft	N/A	BL, SB	Not Allowed	SUP or Sidewalk	6 ft	2 lanes, 10-11 ft	N/A	N/A	Allowed	SUP or Sidewalk	5 ft
	O-3, O-4, O-5, O-6	2 lanes, 11-12 ft	N/A	SB	Not Allowed	None	N/A	2 lanes, 10-11 ft	N/A	N/A	Not Allowed	None	5 ft
<b>Alley (20-28 ft typ. ROW)</b> Detailed design guidance begins on <a href="#">Page 68</a>													
All Area Types								1-2 lanes, 12-14 ft	N/A	N/A	Not Allowed	None	None

### EXPLANATION OF BICYCLE FACILITY TERMS (core designations from the El Paso Bike Plan)

<b>CT</b>	Cycle Track
<b>BBL</b>	Buffered Bike Lane (may also be designed as “protected bike lane” with physical barriers in the buffer area)
<b>BL</b>	Bike Lane
<b>SB</b>	Shoulder Bikeway

<b>SUP</b>	Shared Use Path: Minimum 10-foot, two-way shared bicycle and pedestrian facility separated from main traveled way
<b>BB</b>	Bicycle Boulevard
<b>SSR</b>	Signed Shared Roadway
<b>MSSR</b>	Marked and Signed Shared Roadway

### EXPLANATION OF OTHER TERMS

**TWLTL** Two-way Left Turn Lane



## 4.3 MAJOR ARTERIALS

### 4.3.1 MAJOR ARTERIAL - COMPACT URBAN

The Compact Urban sections should have the slowest design speed (compared to the suburban and rural sections) to provide a better balance between pedestrians, vehicles, and bicyclists in walkable urban areas. Four travel lanes are provided in the basic section, with an option to add two additional lanes if warranted by traffic demand. Medians may be allowed based on local access and driveway patterns, and interior travel lanes are narrowed to 10 feet. Any bicycle facilities

recommended in the El Paso Bike Plan shall be pursued, although in constrained rights-of-way design trade-offs approved by the City Manager or designee may allow for reduced facility dimensions. These streets will require flexibility in designing for the arterial function, as they are located in land use contexts not compatible with high-speed travel.

Although vehicle lanes (and their widths) remain high-priority design factors, they should not come at the expense of pedestrian safety or other concerns central to downtowns and traditional neighborhoods.

#### BASIC DESIGN FACTORS

##### MAJOR ARTERIAL COMPACT URBAN AREA TYPE

BASE ROW: 110 FEET

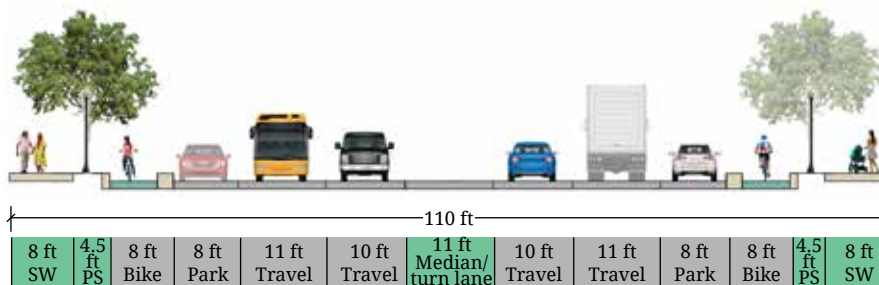
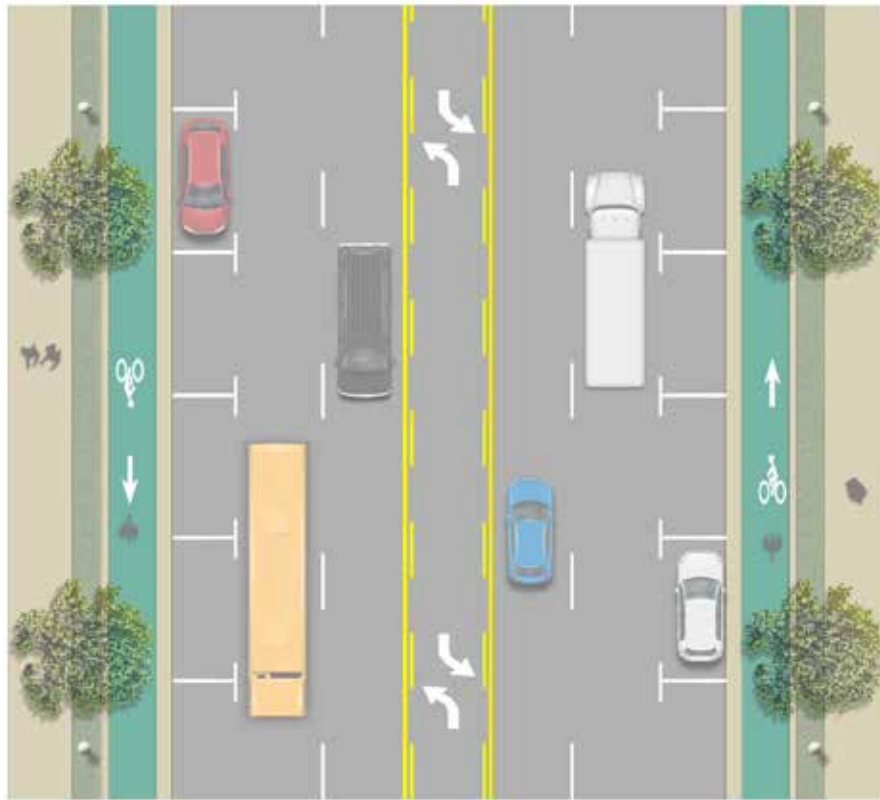
Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/ Widths	Medians/Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-1 Downtown</b>	4-6 lanes depending on volumes and bicycle facilities or parking needs. 10 ft inner lanes and 11 ft outer lanes (for transit vehicles)	Medians (except in G-1) preferred. Curb cuts should be restricted.	Allowed, should be retained when possible. Other lower-class roadway types may be more suitable	Planter strip, which may be substituted for hardscape treatment. The separation from sidewalk to travel lanes is important for pedestrian safety in these areas	Cycle Track or Buffered Bike Lane should always be used on designated routes. Constrained areas, buffer may be reduced or eliminated	8 ft
<b>G-2 Traditional Neighborhood</b>						8 ft
<b>O-6 Potential Annexation &amp; O-7 Urban Expansion</b>	2-4 lanes, 10 ft-11 ft lanes	Medians	Depends on context. May be used in commercial areas		When planning for new routes, plan space for protected facilities	8 ft

The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
<b>Traffic Volume Threshold for Added Lanes</b>	35,000 vehicles per day existing or projected volume (based on major development) to expand from four to six lanes
<b>Mid-Block Crossings and Other Pedestrian Enhancements</b>	Mid-block crossings should not be needed along major arterials with a regular block spacing typical of (or desired for) Compact Urban area types. They may be allowed when block lengths (or the spacing between otherwise protected pedestrian crossings) exceeds 800 feet.
<b>Curbside Management Concerns</b>	On-street parking is generally allowed, though should be used with care, especially on any six-lane arterials or cases of right-of-way constraint. Curbside freight loading/unloading and rideshare/taxi pickup and drop-off should not be designated.
<b>Transit Vehicle Design and Needs</b>	Transit routes may designate stops in curbside lanes. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.

### MAJOR ARTERIAL COMPACT URBAN AREA TYPE 110 FT TOTAL ROW



Medians (except in G-1) are preferred means of access management, with space to allow turn lanes.

Travel lanes are the main priority of arterials, though in Compact Urban area types 10 ft inner lanes may be used. 11 ft outer lanes should be designated on priority transit corridors. **Inside travel lane dimensions exclude gutter, which is included in median dimensions.**

Parking is critical to include in commercial areas. For trade-offs, the number of lanes may be reconsidered, as major arterials in Compact Urban areas should not be carrying the bulk of regional traffic volumes.

Bicycle facilities shall be provided when designated in the El Paso Bike Plan, with protected facilities preferred. Dimensions are inclusive of gutter.

Planter strips or hardscape areas allow street trees and critical separation of pedestrians and moving traffic in Compact Urban area types, especially when parking or bike facilities are not included.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in Compact Urban area types.

### 4.3.2 MAJOR ARTERIAL - DRIVABLE SUBURBAN

The Drivable Suburban section is similar to the existing permitted section. Four travel lanes are provided in the basic section, with an option to add two additional lanes if warranted by traffic demand. The vehicular lanes are 10 or 11 ft in width, and medians are a preferred approach to access management.

Because bicycle facilities as recommended in the El Paso Bike Plan are not as crucial to Compact Urban Major Arterials, they should be given a higher priority in Drivable Suburban area types as they may be critically important routes for completing a bicycle network.

#### BASIC DESIGN FACTORS

##### MAJOR ARTERIAL DRIVABLE SUBURBAN AREA TYPE

BASE ROW: 112 FEET (6 LANE) / 92 FEET (4 LANE)

Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/ Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-3 Post-War</b>	4-6 lanes depending on volumes, 10 ft-12 ft lanes. 10 ft lanes typ. for inner lanes; 12 ft lanes (incl. gutter) typ. for outer lanes on priority transit corridors and truck routes	Medians preferred; TWLTL may be used	Conditional depends on land use context. This is preferred for commercial locations with smaller parcel patterns	Planter strips, which may be substituted with hardscape materials for special treatments such as bus stops	BBL, BL or SUP are appropriate to use, though in these area types any designated corridors should emphasize pedestrian and cyclist safety	12 ft SUP, 6 ft SW
<b>G-4 Suburban</b>						12 ft SUP, 6 ft SW
<b>G-5 Independent City</b>	4-6 lanes, 10 ft-12 ft	Medians		Planter strip ideal to provide	SUP/BBL/BL	6 ft
<b>G-7 Industrial</b>	4-6 lanes, 11 ft-12 ft	Medians or TWLTL	Low priority; may not be feasible due to other design factors	Sidewalks critical to preserve, other streetscape may be lesser priority	SUP/BBL/BL	6 ft
<b>G-8 Fort Bliss Mixed Use</b>	4-6 lanes, 11 ft-12 ft	Medians	Conditional, depending on land use context	Sidewalk	SUP/BBL/BL	6 ft
<b>G-9 Fort Bliss Military</b>	4-6 lanes, 11 ft-12 ft	Medians		Sidewalk	SUP/BBL/BL	6 ft

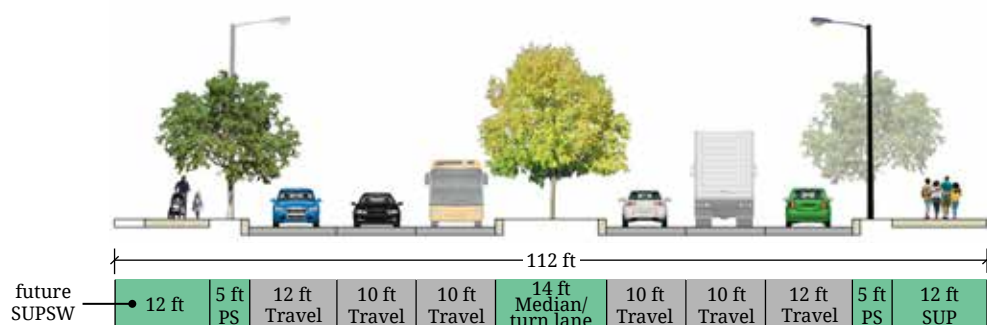
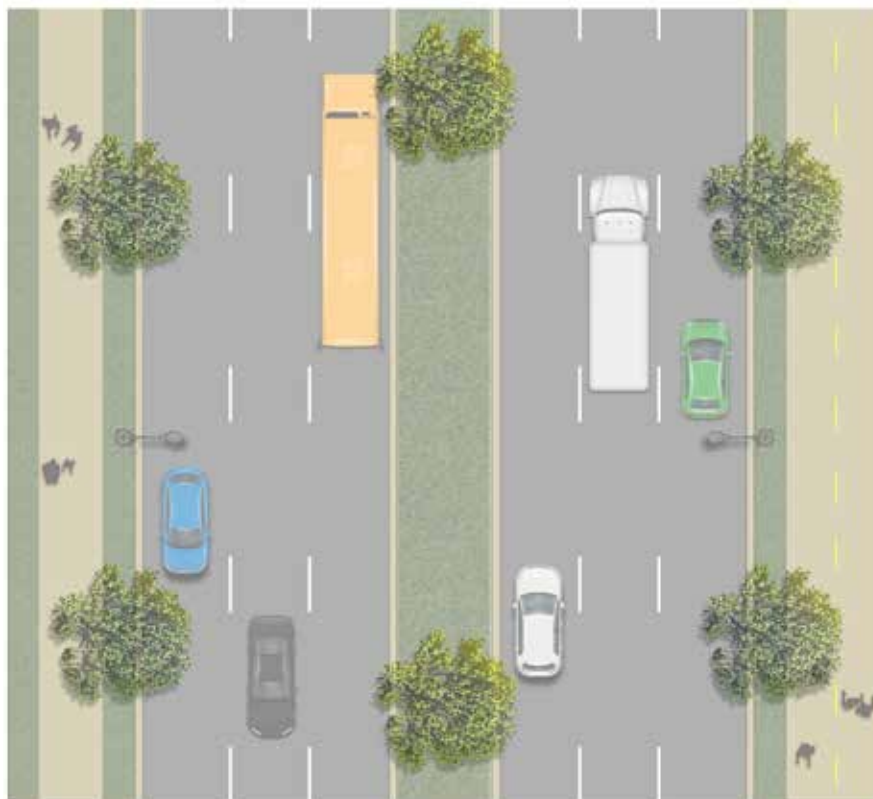
The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
<b>Traffic Volume Threshold for Added Lanes</b>	30,000 vehicles per day existing or projected volume (based on major development) to expand from four to six lanes, due to a greater amount of expected mid-block turn activity.
<b>Mid-Block Crossings and Other Pedestrian Enhancements</b>	Mid-block crossings are allowed between signalized intersections more than 1,000 feet apart.
<b>Curbside Management Concerns</b>	On-street parking should be focused on commercial or multi-family areas only. Freight and passenger pickup/drop-off should not be designated.
<b>Transit Vehicle Design and Needs</b>	Transit routes may designate stops in curbside lanes. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.



### MAJOR ARTERIAL DRIVABLE SUBURBAN AREA TYPE 112 FT TOTAL ROW



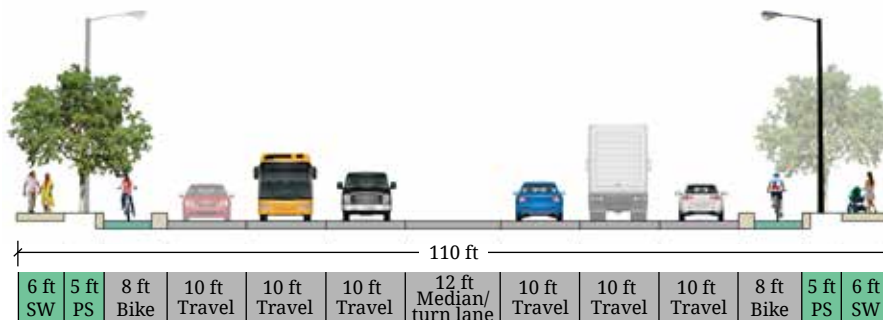
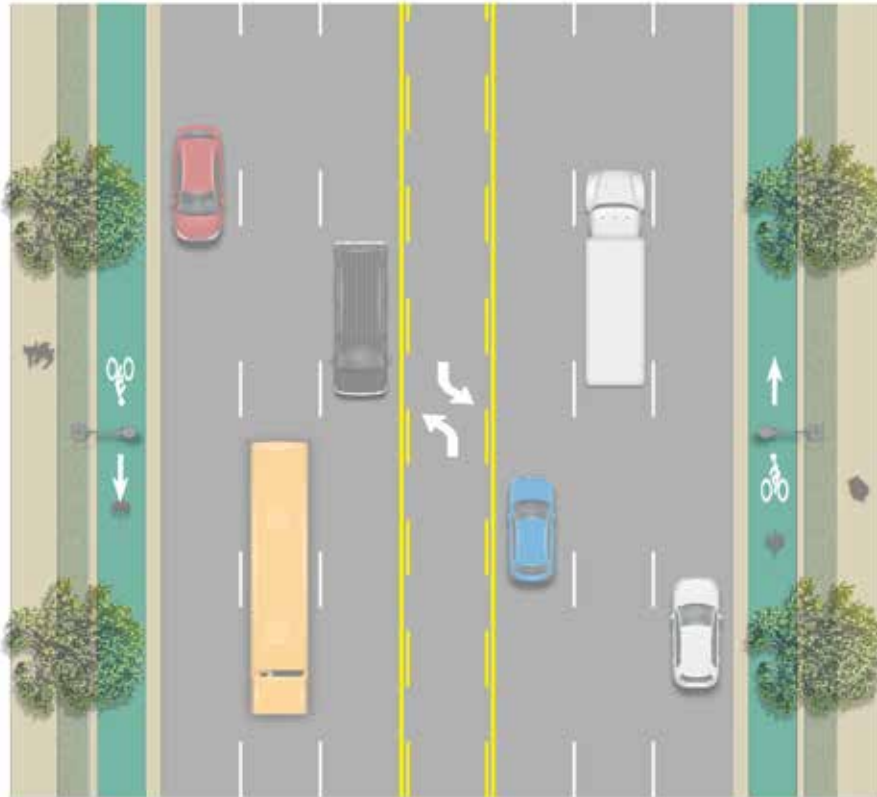
Median widths may be reduced to 11 ft in constrained conditions.

When existing or projected traffic volumes warrant added lanes, strive to keep overall lane widths tailored to context conditions of Compact Urban area types, designing for travel speeds appropriate to these areas. Outside travel lane dimensions are inclusive of the gutter.

Planter strips or hardscape areas are all the more critical in roadways wider than four lanes, as constrained conditions may mean that parking or bicycle facilities are not added.

12 ft should be maintained on corridors planned for a shared use path (SUP) in the El Paso Bike Plan and/or to allow for future shared use path implementation. If no SUP is planned, wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in Drivable Suburban Area Types.

### MAJOR ARTERIAL DRIVABLE SUBURBAN AREA TYPE 110 FT TOTAL ROW



Medians are a preferred means of access management, with space to allow turn lanes. Two-way left turn lanes may be used in existing conditions with frequent driveway spacing or where access management is difficult to implement.

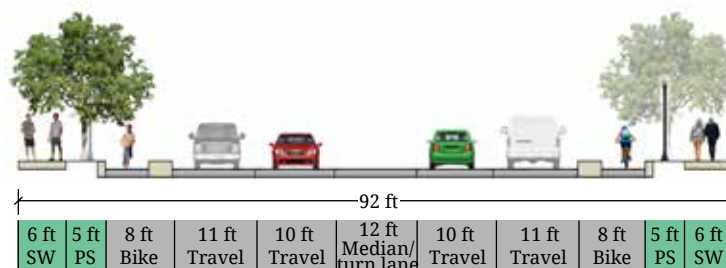
Number of travel lanes should be determined by traffic volumes (or projected volumes from new major developments).

Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. Bike lane dimensions are inclusive of the gutter, but the gutter is not considered a rideable surface.

Planter strips or hardscape areas allow street trees and critical separation of pedestrians and moving traffic.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in Drivable Suburban area types.

### MAJOR ARTERIAL DRIVABLE SUBURBAN AREA TYPE 92 FT TOTAL ROW



Wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in Drivable Suburban area types.

Medians are a preferred means of access management, with space to allow turn lanes. Two-way left turn lanes may be used in existing conditions with frequent driveway spacing or where access management is difficult to implement.

Number of travel lanes should be determined by traffic volumes (or projected volumes from new major developments). 11 ft outer lanes are preferred on major transit and truck route corridors.

Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. This may be substituted for on-street parking in space constrained areas and in industrial land use contexts where curbside parking is a low priority. Bike lane dimensions are inclusive of the gutter.

Planter strips or hardscape areas allow street trees and critical separation of pedestrians and moving traffic in Drivable Suburban area types, especially when parking or bike facilities are not included.



### 4.3.3 MAJOR ARTERIAL - RURAL

The Rural section provides two lanes, with an option to add two additional lanes if warranted by traffic demand. A wide swale provides separation between pedestrians, bicyclists, equestrians, and moving vehicles. Trees in swales are typically clustered organically.

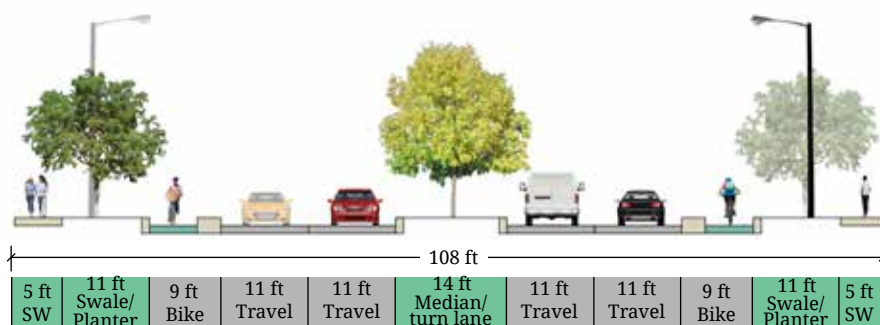
#### BASIC DESIGN FACTORS

#### MAJOR ARTERIAL RURAL AREA TYPE

BASE ROW: 108 FEET

Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/ Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-6 Rural Settlement</b>	2-4 lanes, depending on traffic volumes. 11 ft lanes preferred, though 12 ft lanes may be used for particular needs such as truck routes	Medians	Not allowed	Sidewalk is critical, though separation from roadway is also desirable	Shared use path or Bike Lane, depending on overall driveway spacing and access patterns	5 ft sidewalk is critical to preserve in these areas
<b>O-3 Agriculture</b>	2-4 lanes, 12 ft lane widths	Medians	Not allowed	None	Shared use path or Shoulder Bikeway	Not applicable
<b>O-4 Military Reserve</b>	2-4 lanes, 12 ft lane widths	Medians	Not allowed	None	Bike Lanes or Bicycle Boulevard.	Not applicable
<b>O-5 Remote</b>	2-4 lanes, 12 ft lane widths	Medians	Not allowed	None	Bike Lanes or Bicycle Boulevard.	Not applicable
<b>O-6 Potential Annexation</b>	2-4 lanes, 12 ft lane widths	Medians	Not allowed	None	Bike Lanes or Bicycle Boulevard.	Not applicable

### MAJOR ARTERIAL RURAL AREA TYPE 108 FT TOTAL ROW



Medians should be standard in rural sections, as access management principles should apply to new development.

Number of travel lanes should be determined by traffic volumes (or projected volumes from new major developments). 110 ft section shown here is a four-lane section. **Inside travel lane dimensions exclude gutter, which is included in median dimensions.**

Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. Bicycle lane dimensions include the gutter, but the gutter is not considered a rideable surface.

ROW accommodates swale drainage until future curb and gutter is constructed.

5 ft sidewalk is a high priority in Rural Settlement areas only; it is not required in other Plan El Paso area designations.

## 4.4 MINOR ARTERIALS

### 4.4.1 MINOR ARTERIAL - COMPACT URBAN

In the Compact Urban context, the denser street network allows minor arterials to have only two travel lanes. Vehicular lanes are reduced to 10 ft in width and sharrow markings are provided to slow the vehicular design speeds and provide a better balance between all modes of travel (vehicle, pedestrian, and bike). On-street parking produces further traffic calming, and provides a buffer between pedestrians and moving

vehicles. The street gutter pan should be located within the prescribed parking lane dimension.

Parallel parking should be allowed up to within 25 ft of the curb radius return at intersections. Where left turn lanes are needed, additional parking may be eliminated closest to intersections to provide needed width. Curb extensions at intersections are not recommended, as these can interfere with turning movements of emergency service and similar-sized vehicles.

*Note: One travel lane each direction should be increased to 11 ft in width on transit streets.*

#### BASIC DESIGN FACTORS

##### MINOR ARTERIAL COMPACT URBAN AREA TYPE

BASE ROW: 92 FEET

Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/ Widths	Medians/Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-1 Downtown</b>	4-6 lanes depending on volumes. 10 ft inner lanes and 11 ft outer lanes (for transit vehicles)	Medians (except G-1) preferred. Curb cuts should be restricted.	On-street parking is highly important in commercial land use contexts	Planter strip, which may be substituted for hardscape treatment. The separation from sidewalk to travel lanes is important for pedestrian safety in these areas	CT or BBL should always be used on designated routes. In right-of-way constraints, buffer may be reduced or eliminated	8 ft minimum critical
<b>G-2 Traditional Neighborhood</b>						8 ft
<b>O-7 Urban Expansion</b>	4-6 lanes, 10 ft-11 ft lanes		Conditional		When planning for new routes, plan space for protected facilities	8 ft

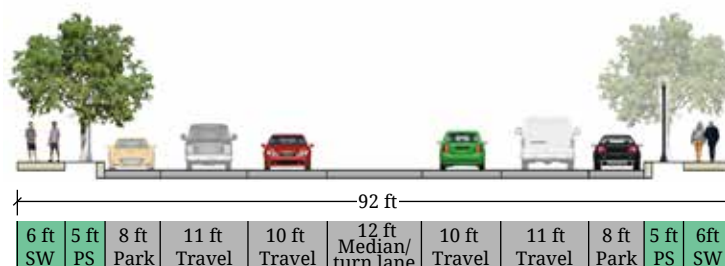
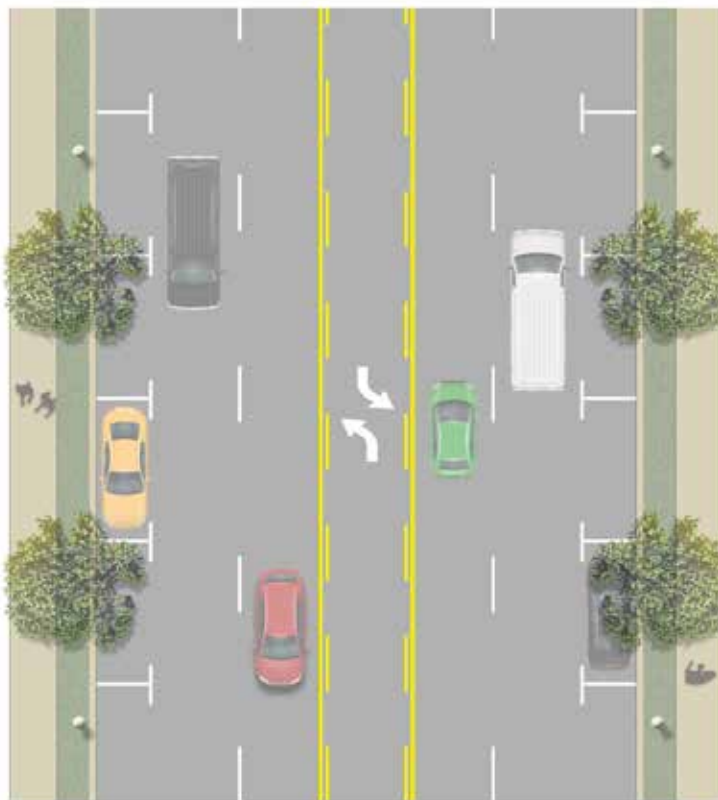
The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
<b>Traffic Volume Threshold for Added Lanes</b>	35,000 vehicles per day existing or projected volume (based on major development) to expand from four to six lanes.
<b>Mid-Block Crossings<sup>1</sup> and Other Pedestrian Enhancements</b>	Mid-block crossings may be allowed when block lengths (or the spacing between otherwise protected pedestrian crossings) exceeds 600 feet.
<b>Curbside Management Concerns</b>	On-street parking should be focused on commercial or multi-family areas only. Freight and passenger pickup/drop-off may be designated.
<b>Transit Vehicle Design and Needs</b>	Transit routes may designate stops in curbside lanes. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.



### MINOR ARTERIAL COMPACT URBAN AREA TYPE 92 FT TOTAL ROW



Wider sidewalks are desirable, but in trade-offs and constrained situations, 6ft minimum is critical to preserve in Drivable Suburban area types.

Medians (except in G-1) are a preferred means of access management, with space to allow turn lanes. Two-way left turn lanes may be used in existing conditions with frequent driveway spacing or where access management is difficult to implement.

Number of travel lanes should be determined by traffic volumes (or projected volumes from new major developments). 11ft outer lanes are preferred on major transit and truck route corridors.

Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. This may be substituted for on-street parking in space constrained areas and in industrial land use contexts where curbside parking is a low priority. Parking and bike lane dimensions are inclusive of the gutter.

Planter strips or hardscape areas allow street trees and critical separation of pedestrians and moving traffic in Drivable Suburban area types, especially when parking or bike facilities are not included.

#### 4.4.2 MINOR ARTERIAL - DRIVABLE SUBURBAN

The Suburban section is the most similar to the existing permitted minor arterial section. Two travel lanes are provided in the basic section, with an option to add two additional lanes if warranted by traffic demand. The vehicular lanes are 11 ft width in this auto-

dominant environment. The pedestrian realm is widened to enhance walking and biking opportunities. The tree-lined parkway provides separation between pedestrians, bicyclists, and moving vehicles.

##### BASIC DESIGN FACTORS

##### MINOR ARTERIAL DRIVABLE SUBURBAN AREA TYPE

BASE ROW: 90 FEET (4 LANE) / 70 FEET (2 LANE)

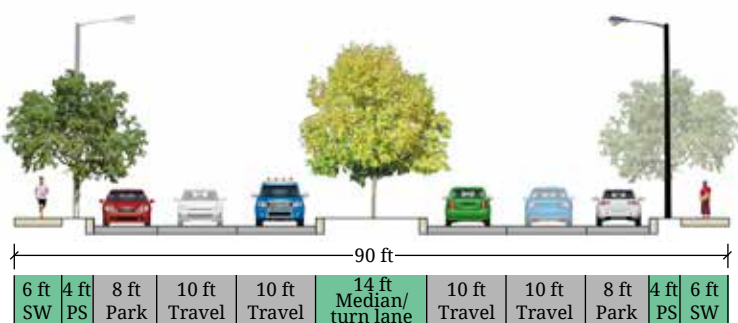
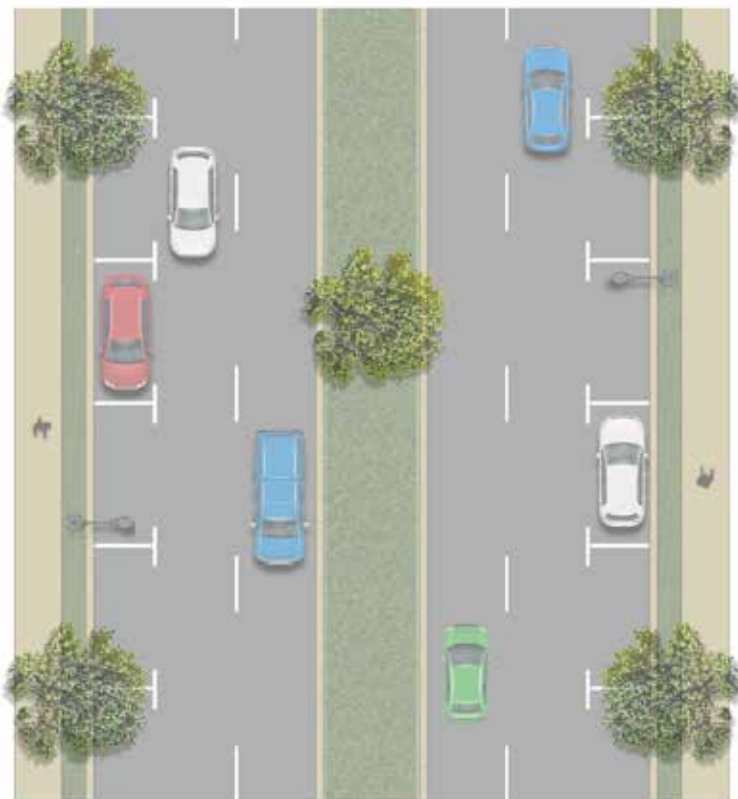
Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/ Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
G-3 Post-War	2-4 lanes depending on volumes, 10-11 ft lanes. 10 ft lanes typ. for inner lanes; 11 ft lanes typ. for outer lanes on priority transit corridors and truck routes	Medians are preferred, though two-way left turn lanes may be used	Conditional depends on land use context. This is preferred for commercial locations with smaller parcel patterns	Planter strips, which may be substituted with hardscape materials for special treatments such as bus stops	BBL, BL, or a SUP appropriate, though in these area types any designated corridors should emphasize pedestrian and cyclist safety	6 ft
G-4 Suburban						6 ft
G-5 Independent City	2-4 lanes, 10 ft-12 ft	Medians	Conditional	Planter strip	SUP/BBL/BL	6 ft
G-7 Industrial	2-4 lanes, 10 ft-12 ft	Medians or TWLTL	Low priority; may not be feasible due to other design factors	Sidewalks critical to preserve, though other streetscape is a lesser priority	SUP/BBL/BL	6 ft
G-8 Fort Bliss Mixed Use	2-4 lanes, 10 ft-12 ft	Medians	Conditional	Sidewalk	SUP/BBL/BL	6 ft
G-9 Fort Bliss Military	2-4 lanes, 10 ft-12 ft	Medians	Conditional	Sidewalk	SUP/BBL/BL	6 ft

The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
Traffic Volume Threshold for Added Lanes	18,000 vehicles per day existing or projected volume (based on major development) to expand from two to four lanes.
Mid-Block Crossings and Other Pedestrian Enhancements	Mid-block crossings may be allowed when block lengths (or the spacing between otherwise protected pedestrian crossings) exceeds 1,000 feet.
Curbside Management Concerns	On-street parking should be focused on commercial or multi-family areas only. Freight and passenger pickup/drop-off should not be designated.
Transit Vehicle Design and Needs	Transit routes may designate stops in curbside lanes. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.

### MINOR ARTERIAL DRIVABLE SUBURBAN AREA TYPE 90 FT TOTAL ROW



Medians are preferred means of access management, with space to allow turn lanes.

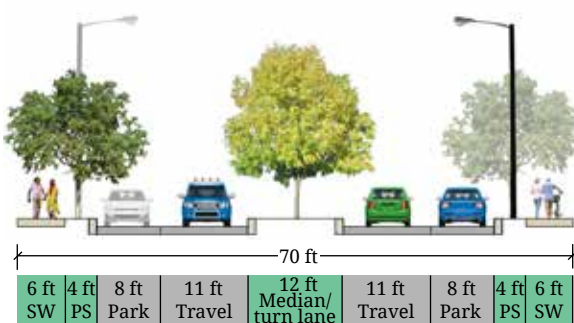
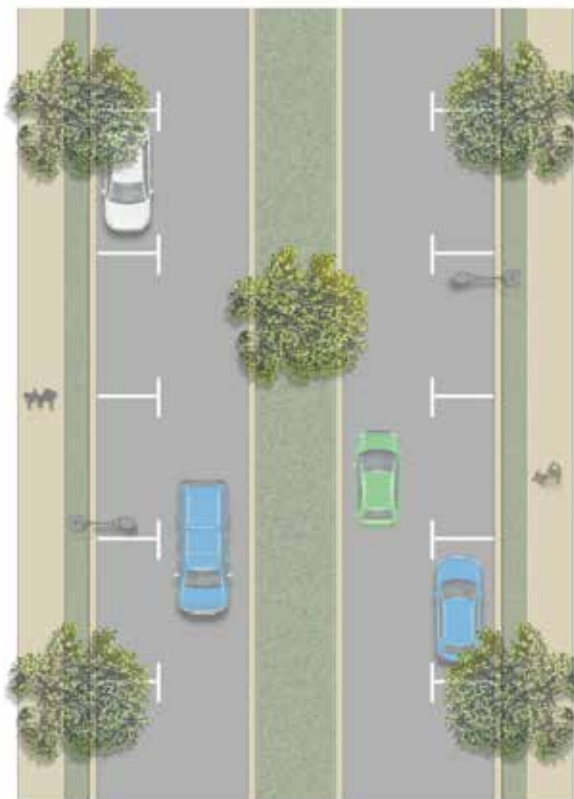
Travel lanes are the main priority of arterials, though in Drivable Suburban area types 10 ft inner lanes may be used. 11 ft outer lanes should be designated on priority transit corridors. **Inside travel lane dimensions exclude gutter, which is included in median dimensions.**

Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. This may be substituted for on-street parking, though in space constraints these are less of a priority than ensuring the arterial function of the street and pedestrian safety.

Planter strips or hardscape areas allow street trees and critical separation of pedestrians and moving traffic in Compact Urban area types, especially when parking or bike facilities are not included.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in Drivable Suburban area types.

### MINOR ARTERIAL DRIVABLE SUBURBAN AREA TYPE 70 FT TOTAL ROW



Medians preferred, with space to allow turn lanes.

Travel lanes are the main priority of arterials, though in Drivable Suburban area types 10 ft inner lanes may be used. 11 ft outer lanes should be designated on priority transit corridors. **Inside travel lane dimensions exclude gutter, which is included in median dimensions.**

Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. This may be substituted for on-street parking with no bike plan designation.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in Drivable Suburban area types.



### 4.4.3 MINOR ARTERIAL - RURAL

The Rural section provides two lanes, with an option to add two additional lanes if warranted by traffic demand. A wide swale provides separation between pedestrians, bicyclists, equestrians, and moving vehicles. Trees in swales are typically clustered organically.

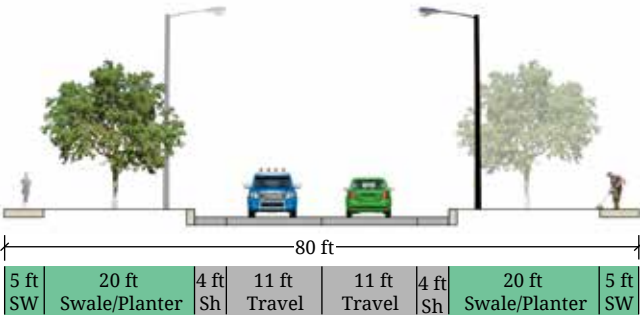
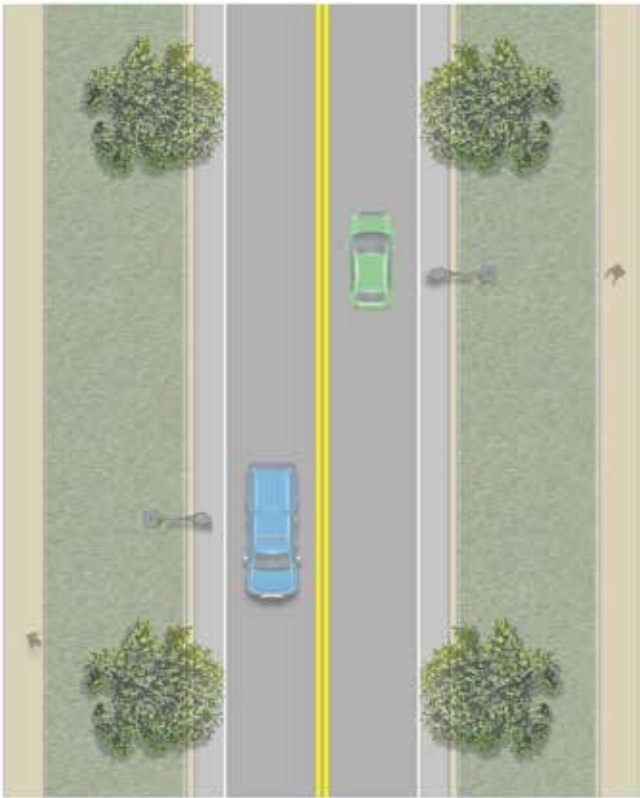
#### BASIC DESIGN FACTORS

##### MINOR ARTERIAL RURAL AREA TYPE

BASE ROW: 80 FEET

Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/ Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-6 Rural Settlement</b>	2-4 lanes, depending on traffic volumes. 11 ft lanes preferred, though 12 ft lanes may be used for particular needs such as truck routes	Medians	Not allowed	Sidewalk	Shared use path or Bike Lane, depending on overall driveway spacing and access patterns	5 ft sidewalk is critical to preserve in these areas
<b>O-3 Agriculture</b>	2-4 lanes, 12 ft lane widths	Medians	Not allowed	None	Shared use path or Bike Lanes	Not applicable
<b>O-4 Military Reserve</b>	2-4 lanes, 12 ft lane widths	Medians	Not allowed	None	Shared use path or Bike Lanes	Not applicable
<b>O-5 Remote</b>	2-4 lanes, 12 ft lane widths	Medians	Not allowed	None	Shared use path or Bike Lanes	Not applicable
<b>O-6 Potential Annexation</b>	2-4 lanes, 11-12 ft lane widths	Medians	Not allowed	None	Shared use path or Bike Lanes	Not applicable

MINOR ARTERIAL RURAL AREA TYPE  
80 FT TOTAL ROW



- Number of travel lanes should be determined by traffic volumes (or projected volumes from new major development). 80 ft ROW accommodates a 4-lane section should expansion be warranted.
- If designated in bike plan, shoulders should be substituted for bike facilities, or space in swale dedicated to off-street/off-road facilities (such as sidepaths).
- ROW accommodates swale drainage until future curb and gutter is constructed.
- 5 ft Sidewalk is a high priority in Rural Settlement areas only; it is not required in other Plan El Paso area designations.

## 4.5 COLLECTORS

### 4.5.1 COLLECTOR - COMPACT URBAN

In the Compact Urban context, Collectors may generally have narrower lanes, although these may still function as preferred routes for transit and should consider that when designing streets. Medians remain a preferred means of access management, as

they are with arterials, though these may be substituted with turn lanes as needed, including two-way left turn lanes on longer blocks.

#### BASIC DESIGN FACTORS

##### COLLECTOR COMPACT URBAN AREA TYPE

BASE ROW: 74 FEET

Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/ Widths	Medians/Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-1 Downtown</b>	2-4 lanes depending on volumes, 10 ft inner lanes and 11 ft outer lanes (for transit vehicles)	Medians preferred for driving roadways. Two-way left turn lanes may be provided in areas with frequent existing driveways	Allowed	Planter strip, which may be substituted for hardscape treatment. The separation from sidewalk to travel lanes is important for pedestrian safety in these areas	Cycle Track or Buffered Bike Lane should always be used on designated routes. In right-of-way constraints, buffer may be reduced or eliminated	8 ft minimum is critical to meet
<b>G-2 Traditional Neighborhood</b>						8 ft
<b>&amp; O-7 Urban Expansion</b>	2-4 lanes, 10 ft-11 ft lanes		Allowed		When planning for new routes, plan space for protected facilities	8 ft

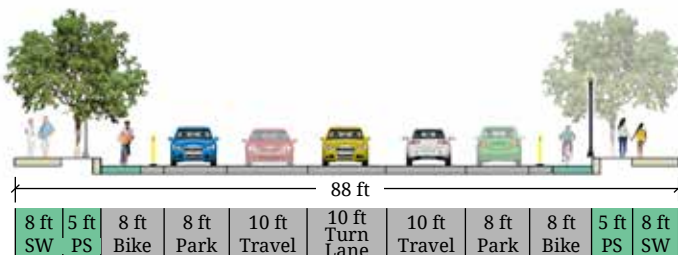
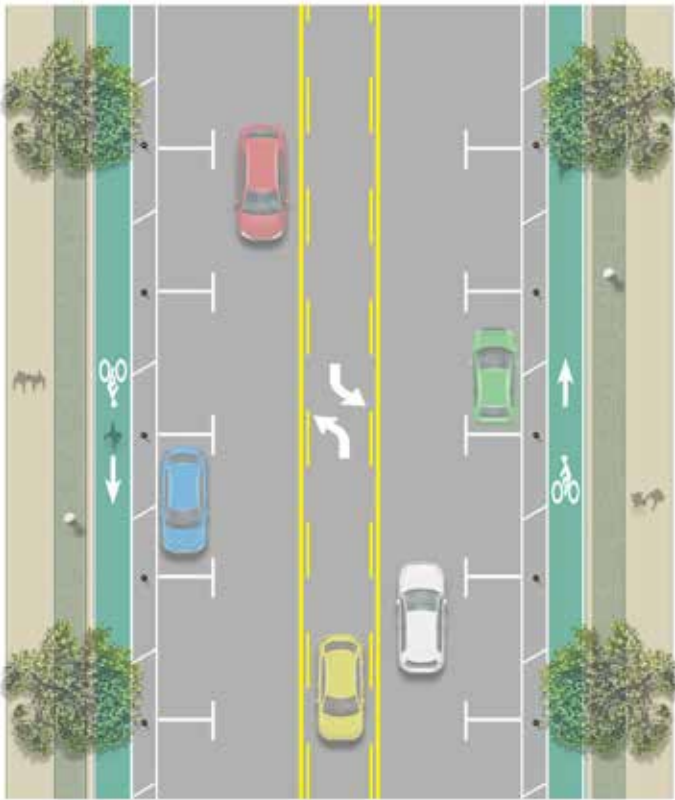
The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
<b>Traffic Volume Threshold for Added Lanes</b>	18,000 vehicles per day existing or projected volume (based on major development) to expand from four to six lanes.
<b>Mid-Block Crossings<sup>1</sup> and Other Pedestrian Enhancements</b>	Mid-block crossings may be allowed when block lengths (or the spacing between otherwise protected pedestrian crossings) exceeds 800 feet.
<b>Curbside Management Concerns</b>	On-street parking should be focused on commercial or multi-family areas, though is generally allowed. Freight and passenger loading areas may be designated.
<b>Transit Vehicle Design and Needs</b>	Transit routes may designate stops in curbside lanes. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.



### COLLECTOR COMPACT URBAN AREA TYPE 88 FT TOTAL ROW



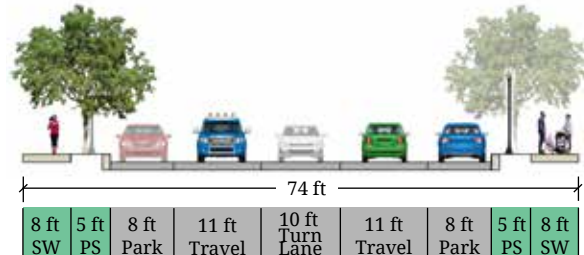
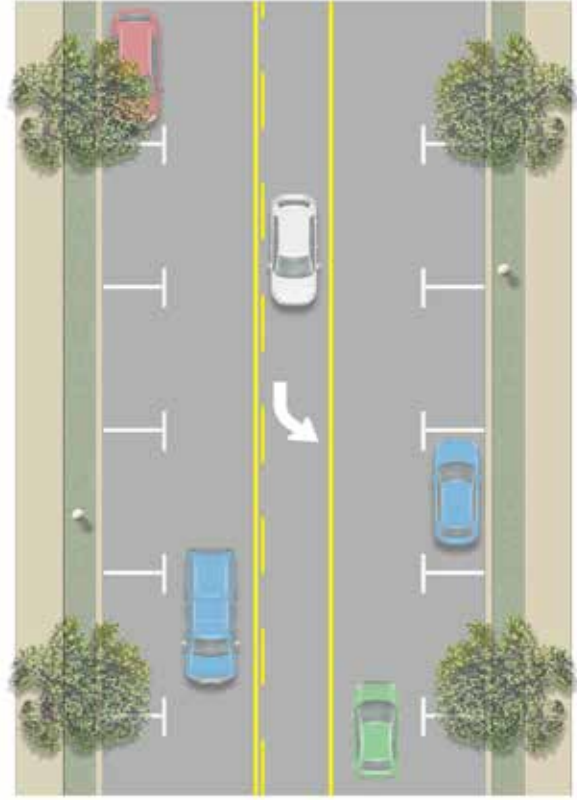
Turn lanes at intersections or along streets as needed.

Travel lanes are the main priority of arterials, though in Compact Urban area types 10 ft inner lanes may be used. 11 ft outer lanes should be designated on priority transit corridors.

Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. This may be substituted for on-street parking with no bike plan designated, or as space allows with other needs, both may be used. Bike lane dimensions include the gutter, but the gutter is not considered a rideable surface..

Wider sidewalks are desirable, but in trade-offs and constrained situations, 8 ft minimum is critical to preserve in Compact Urban area types.

### COLLECTOR COMPACT URBAN AREA TYPE 74 FT TOTAL ROW



Turn lanes at intersections or along street as needed.

Travel lanes are the main priority of arterials, though in Compact Urban area types 10 ft inner lanes may be used. 11 ft outer lanes should be designated on priority transit corridors.

Parking lane dimensions include the gutter. Depending on priorities, context and available right-of-way, bicycle facilities may be included in the Curbside Zone. Where designated in the El Paso Bike Plan, bicycle facilities should be included, with protected facilities preferred.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 8 ft minimum is critical to preserve in Compact Urban area types.

## 4.5.2 COLLECTOR - DRIVABLE SUBURBAN

The Suburban section is the most similar to the existing permitted sections. The vehicular lanes are 11 feet wide in this auto-dominant environment. The pedestrian realm is widened to enhance walking and

biking opportunities. The tree-lined parkway provides separation between pedestrians, bicyclists, and moving vehicles.

**Note:** Travel lanes may be increased to 12-14 feet in width in industrial zones.

### BASIC DESIGN FACTORS

#### COLLECTOR DRIVABLE SUBURBAN AREA TYPE

BASE ROW: 71 FEET (NON-RESIDENTIAL) / 58 FEET (RESIDENTIAL) / 62 FEET (INDUSTRIAL)

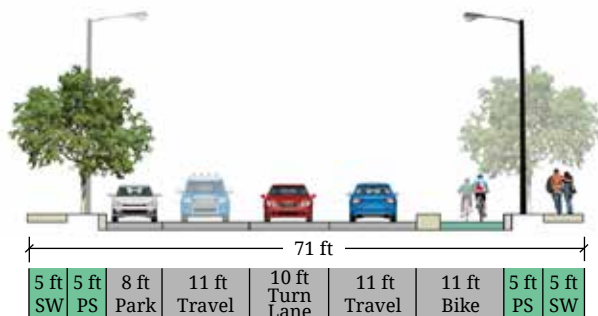
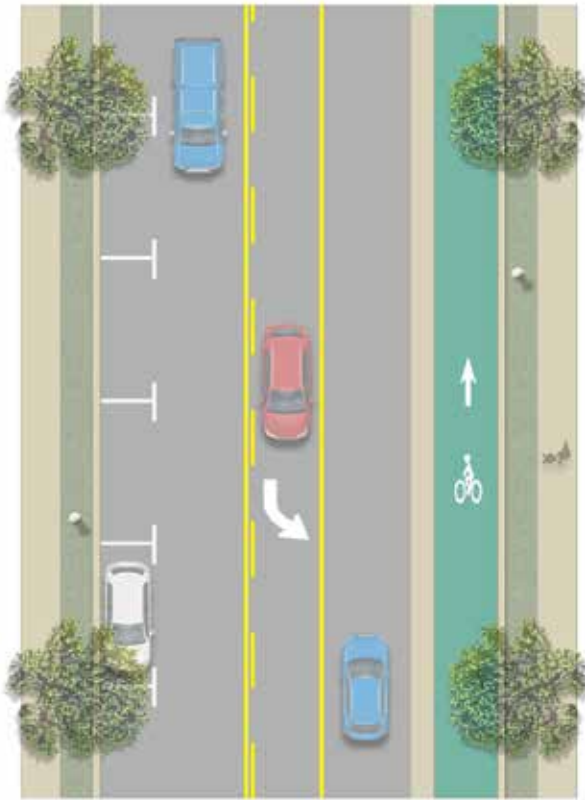
Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-3 Post-War</b>	2-4 lanes depending on volumes, 10-11 foot lanes. 11 foot lanes typ. in areas with transit, on-street parking or where bicycle facilities are designated. Protected facilities do not fit in constrained right-of-way	Medians or TWLTL with two travel lanes	Allowed, and preferred in commercial and residential areas without on-site parking or driveway access	Planter strips, which may be substituted with hardscape materials for special treatments such as bus stops	El Paso Bike Plan designations should be followed as collectors are a key network component to balance safety with connectivity of routes. Protected facilities preferred, but bicycle lanes may be used.	5 ft
<b>G-4 Suburban</b>						5 ft
<b>G-5 Independent City</b>	2-4 lanes, depending on traffic volumes. 10-11 foot lane widths may be used	Medians or TWLTL	Allowed	Planter strip	Bike Lanes or Sidepaths	5 ft
<b>G-7 Industrial</b>	2-4 lanes, depending on traffic volumes. 10-11 foot lane widths may be used	Medians or TWLTL	Allowed	Sidewalks critical to preserve; other streetscape is a lesser priority	Bike Lanes or Sidepaths	5 ft
<b>G-8 Fort Bliss Mixed Use</b>	2-4 lanes, depending on traffic volumes. 10-11 foot lane widths may be used	Medians or TWLTL	Conditional, based on land use context	Sidewalk	Bike Lanes or Sidepaths	5 ft
<b>G-9 Fort Bliss Military</b>		Medians or TWLTL	Not allowed	Sidewalk	Bike Lanes or Sidepaths	5 ft

The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
<b>Traffic Volume Threshold for Added Lanes</b>	Two lanes for volumes less than or equal to 18,000 vehicles per day; Four lanes for volumes greater than 18,000 vehicles per day; Collectors in Drivable Suburban area types should not need to be expanded beyond four lanes.
<b>Mid-Block Crossings<sup>1</sup> and Other Pedestrian Enhancements</b>	Mid-block crossings may be allowed when block lengths (or the spacing between otherwise protected pedestrian crossings) exceeds 1,000 feet.
<b>Curbside Management Concerns</b>	On-street parking should be focused on commercial or multi-family areas, though is generally allowed. Freight and passenger loading may happen freely without a need for designated areas.
<b>Transit Vehicle Design and Needs</b>	Transit routes may designate stops in curbside lanes. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.

### NON-RESIDENTIAL COLLECTOR DRIVABLE SUBURBAN AREA TYPE 71 FT TOTAL ROW



Bike lane dimensions include the gutter. One way cycle track shown.

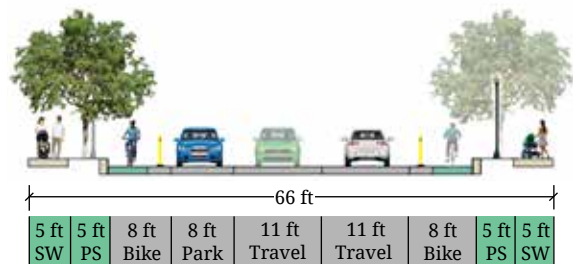
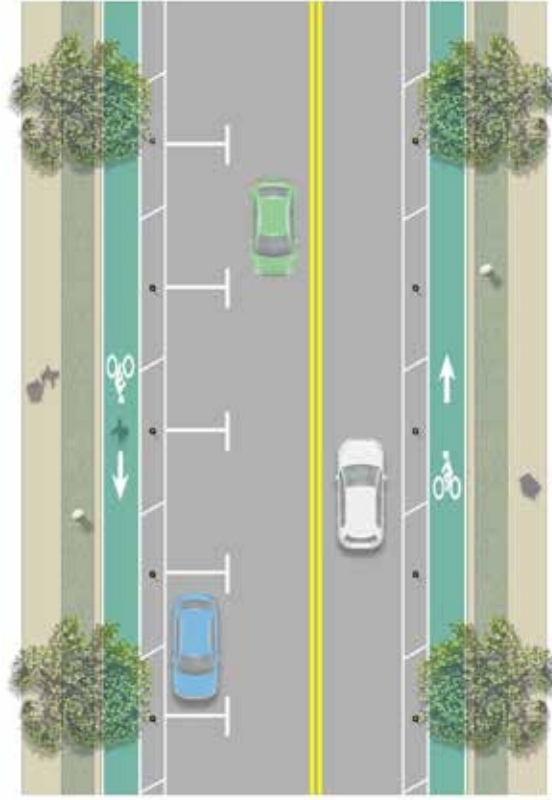
Turn lanes at intersections or along street as needed.

11 foot travel lanes recommended adjacent to narrow on-street parking spaces; may reduce to 10 foot in constrained conditions.

Parking lane dimensions include the gutter. Bicycle facilities should be included when designated in the El Paso Bike Plan, with protected facilities preferred. As shown in this cross-section illustration, both parking and bikes are accommodated on separate sides of the street using a two-way cycle track.

Wider sidewalks are preferred, but in trade-offs and constrained situations, 5 foot minimum is critical to preserve in Drivable Suburban area types.

### RESIDENTIAL COLLECTOR DRIVABLE SUBURBAN AREA TYPE 66 FT TOTAL ROW



Bike lane dimensions include the gutter.

11 foot travel lanes recommended adjacent to narrow on-street parking spaces; may reduce to 10 foot in constrained conditions.

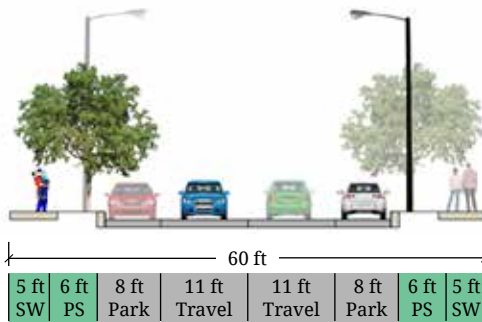
On-street parking may be important in neighborhood contexts where properties directly access arterials. This should be balanced with land development regulations and the permission of driveway curb cuts to ensure adequate curbside for allowing on-street parking. Parking lane dimensions include the gutter.

Streets with lower speeds and volumes, bike lanes or bicycle boulevards may be used as recommended in the El Paso Bike Plan.

Wider sidewalks are preferred, but in trade-offs and constrained situations, 5 foot minimum is critical to preserve in Drivable Suburban area types.



**RESIDENTIAL COLLECTOR DRIVABLE SUBURBAN AREA TYPE**  
60 FT TOTAL ROW

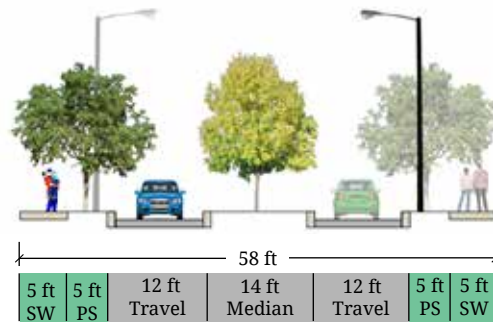


Travel lane widths may be reduced though care should be taken adjacent to parking and other auxiliary uses such that they protrude from their design dimensions.

On-street parking is an important component of commercial land use contexts, though less of a priority in Drivable Suburban area types than in Compact Urban areas types. It may be substituted for bicycle facilities as recommended in the El Paso Bike Plan. Parking lane dimension includes the gutter.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 5 ft minimum is critical to preserve in non-residential areas of Drivable Suburban area types.

**RESIDENTIAL COLLECTOR DRIVABLE SUBURBAN AREA TYPE**  
58 FT TOTAL ROW



Medians are preferred means of access management, with space to allow turn lanes. Dimensions include gutter on both sides.

Travel lane dimensions include outside gutter; median gutters are included in median dimensions.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 5 ft minimum is critical to preserve in non-residential areas of Drivable Suburban area types.

# INDUSTRIAL COLLECTOR DRIVABLE SUBURBAN AREA TYPE 62 FT TOTAL ROW



62 ft							
5 ft	5 ft	7 ft	14 ft	14 ft	7 ft	5 ft	5 ft
SW	PS	Bike	Travel	Travel	Bike	PS	SW

Bike lane dimensions include the gutter.

14 foot travel lanes accommodate industrial vehicles and prevent damage to buffer areas adjacent to bike lanes/cycle tracks or vehicular trespass into unprotected bike lanes.

Bike facilities should be used to complete the bike network as recommended in the El Paso Bike Plan.

Wider sidewalks are preferred, but in trade-offs and constrained situations, 5 ft minimum is critical to preserve in Drivable Suburban area types.

### 4.5.3 COLLECTOR - RURAL

The vehicular lanes are 11-12 feet wide in this auto-dominant rural environment. Paved shoulders are 6 feet wide to accommodate bicycle mobility as necessary per the El Paso Bike Plan. The pedestrian realm is available in two configurations: one 12 ft shared use path on one side of the street accommodating all pedestrian movement and other appropriate modes, or; 6 ft sidewalks on either side of the street. On-street bicycle facilities are

accommodated by either shoulder bikeways or bike lanes. Streets are curbless and stormwater is managed by drainage swales.

#### BASIC DESIGN FACTORS

#### COLLECTOR RURAL AREA TYPE

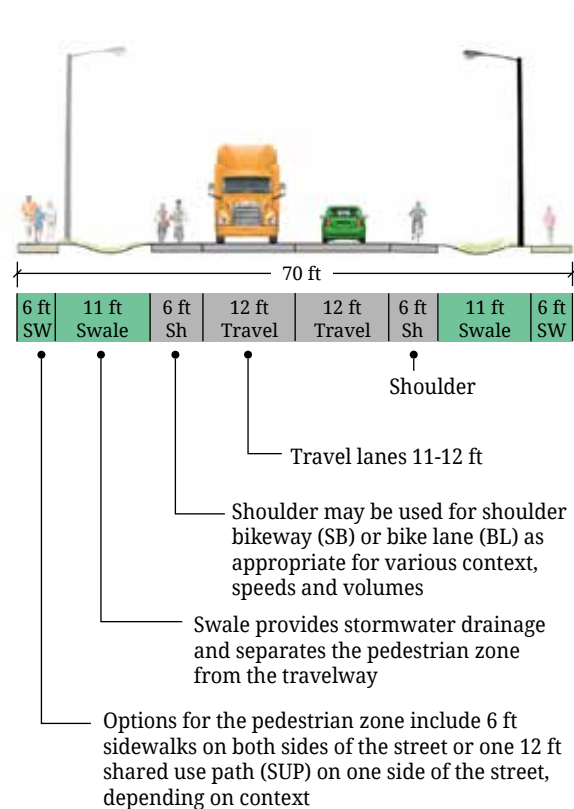
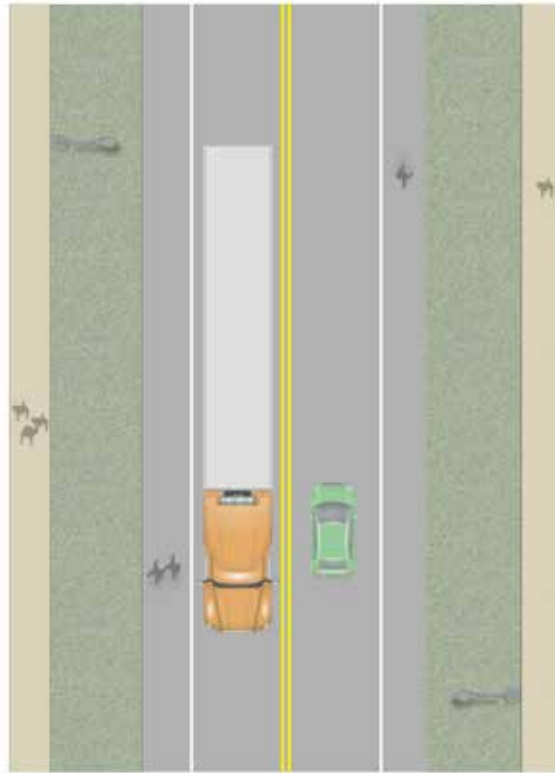
BASE ROW: 70 FEET

Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/ Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-6, Rural Settlement</b>	2 lanes, 11-12 ft	N/A	Not Allowed	SUP or Sidewalk	BL, SB	6 ft
<b>Open Space Sectors O-3, O-4, O-5, O-6</b>	2 lanes, 11-12 ft	N/A	Not Allowed	None	SB	N/A

The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.



### COLLECTOR RURAL AREA TYPE 70 FT TOTAL ROW



## 4.6 LOCAL STREETS

### 4.6.1 LOCAL - COMPACT URBAN

In the Compact Urban context, vehicular lanes are reduced to ten feet in width and sharrow markings are provided to slow the vehicular design speeds and provide a better balance between all modes of travel (vehicle, pedestrian, and bike). Nine foot wide travel lanes may be permitted within blocks 400 feet long or less and on streets without on-street parking so long as a 20 foot cleared travelway is maintained for fire access.

On-street parking produces further traffic calming, and provides a buffer between pedestrians and moving vehicles. The street gutter pan should be located within the prescribed parking lane dimension. Parallel parking should be allowed up to within 25 ft of the curb radius return at intersections. Where left turn lanes are needed, additional parking may be eliminated closest to intersections to provide needed width.

#### BASIC DESIGN FACTORS

##### LOCAL COMPACT URBAN AREA TYPE

BASE ROW: 62 FEET (NON-RESIDENTIAL) / 60 FEET (RESIDENTIAL)

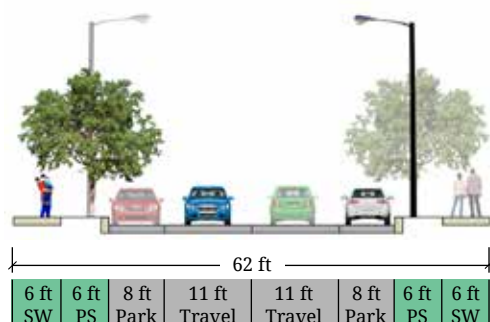
Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/ Widths	Medians/Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-1 Downtown</b>	2 lanes; 10 or 11 feet depending on land use context. Commercial and mixed-use streets may use 11 ft lane widths	Medians and other dividers not applicable, though land development regulations should limit curb cuts	Allowed. Parking is important in commercial land use contexts and should be prioritized	Planter strip, which may be substituted for hardscape treatment. The separation from sidewalk to travel lanes is important for pedestrian safety in these areas	Bicycle lane or bicycle boulevard	6 ft minimum is critical to meet.
<b>G-2 Traditional Neighborhood</b>						6 ft
<b>O-7 Urban Expansion</b>	2-4 lanes, 10-11 ft lanes		Allowed			6 ft

The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
<b>Mid-Block Crossings<sup>1</sup> and Other Pedestrian Enhancements</b>	Mid-block crossings may be allowed when block lengths (or the spacing between otherwise protected pedestrian crossings) exceeds 500 feet.
<b>Curbside Management Concerns</b>	On-street parking allowed, and freight and passenger loading areas may be designated. In areas where on-street parking is not regulated, freight and passenger loading may occur freely.
<b>Transit Vehicle Design and Needs</b>	Transit routes are less likely to follow local streets, but in the event of the preferred transit alignment that would utilize particular local streets, adequate curbside areas should be provided for passenger waiting and loading. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.

### NON-RESIDENTIAL LOCAL COMPACT URBAN AREA TYPE 62 FT TOTAL ROW

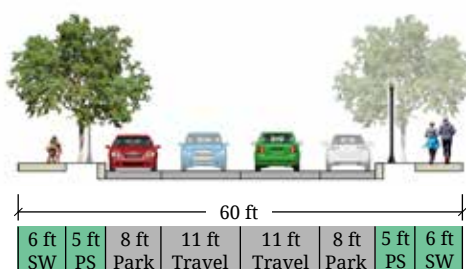


Travel lane widths may be reduced though care should be taken adjacent to parking and other auxiliary uses that may operate such that they protrude from their design dimensions.

On-street parking is a critical component of commercial land uses contexts, especially on local streets. This should be regarded as a general curbside auxiliary use in these areas, which can also support freight deliveries, passenger pickup and drop-off, and other uses such as dockless bicycle stations. Parking lane dimension includes the gutter. Bike lanes may replace parking lanes depending on priority.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in non-residential areas of Compact Urban area types.

### RESIDENTIAL LOCAL COMPACT URBAN AREA TYPE 60 FT TOTAL ROW



Travel lane widths may be reduced to 9 feet depending on context, though care should be taken adjacent to parking and other auxiliary uses that may operate such that they protrude from their design dimensions.

Residential areas of Compact Urban area types tend to rely on street parking more than in suburban neighborhoods and it is important to keep this as a part of designs. However, in constrained conditions, it may be limited to a single side, or drive lanes narrowed as per current DSC street sections. Parking lane dimension includes gutter. Bike lanes may replace parking lanes depending on priority.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 6 ft minimum is critical to preserve in non-residential areas of Compact Urban area types.



## 4.6.2 LOCAL - DRIVABLE SUBURBAN

The Suburban section is the most similar to the existing permitted sections. Bicyclists and vehicles may share the travel lanes in the local street setting.

The tree-lined parkway provides separation between pedestrians, bicyclists, and moving vehicles.

*Note: Travel lanes may be increased to 12 ft width in industrial zones.*

### BASIC DESIGN FACTORS

#### LOCAL DRIVEABLE SUBURBAN AREA TYPE

BASE ROW: 60 FEET (NON-RESIDENTIAL)/ 48 FEET (RESIDENTIAL)

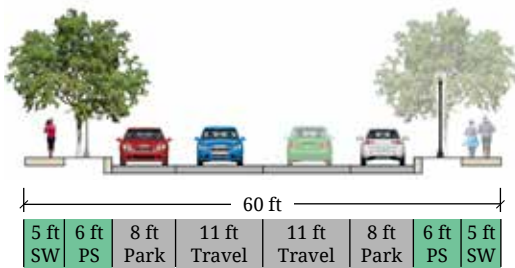
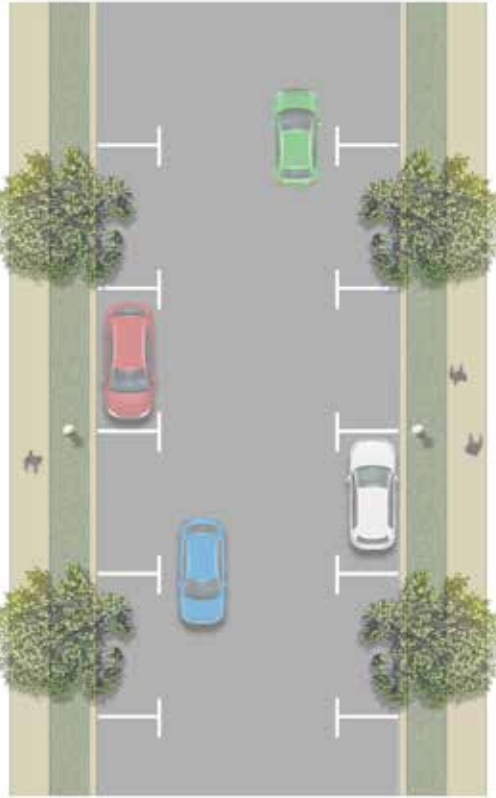
Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/Access	On-Street Parking Priority	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-3 Post-War</b>	2 lanes; 9 to 11 feet depending on land use context. Commercial and mixed-use streets may use 11 ft lane widths	Not Applicable	Allowed, and preferred in commercial and residential areas without on-site parking or driveway access	Planter strip, which may be substituted with hardscape materials for special treatments such as bus stops	El Paso Bike Plan designations shall be followed, though bicycle lanes or bicycle boulevards area appropriate if other design factors control speeds	5 ft
<b>G-4 Suburban</b>		Not Applicable				5 ft
<b>G-5 Independent City</b>	2 lanes; 9 to 11 feet depending on land use context. Commercial and mixed-use streets may use 11 ft lane widths	Not Applicable	Allowed		Bike Lanes or Bicycle Boulevard	5 ft
<b>G-7 Industrial</b>	2 lanes. May use lane widths of up to 14 ft	Not Applicable	Allowed		Bike Lanes or Bicycle Boulevard	5 ft
<b>G-8 Fort Bliss Mixed Use</b>	2-4 lanes, depending on traffic volumes. 9 to 11 ft lane widths may be used	Not Applicable	Conditional, based on land use context	Sidewalk	Bike Lanes or Bicycle Boulevard	5 ft
<b>G-9 Fort Bliss Military</b>		Not Applicable	Not Allowed	Sidewalk	Bike Lanes or Bicycle Boulevard	5 ft

The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

Other Thoroughfare Design Factors	
<b>Mid-Block Crossings<sup>1</sup></b>	Mid-block crossings may be allowed when block lengths (or the spacing between otherwise protected pedestrian crossings) exceeds 500 feet.
<b>Curbside Management Concerns</b>	On-street parking allowed, and freight and passenger loading areas may be designated. In areas where on-street parking is not regulated freight and passenger loading may occur freely.
<b>Transit Vehicle Design and Needs</b>	Transit routes are less likely to follow local streets, but in the event of preferred transit alignments that would utilize particular local streets, adequate curbside areas should be provided for passenger waiting and loading. Generally, 62 feet and 95 feet of curbside length should be reserved at stops for standard transit bus and Brio transit bus vehicle needs respectively.

Note 1: Mid-block crossings shall be determined by engineering studies/judgment not just define spacing, provided sources and defined regular block spacing.

### NON-RESIDENTIAL LOCAL DRIVABLE SUBURBAN AREA TYPE 60 FT TOTAL ROW

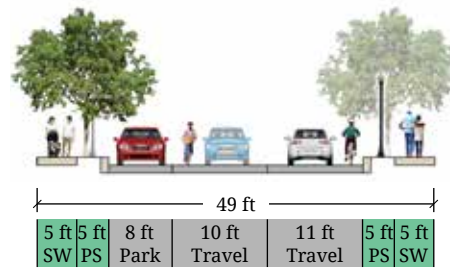
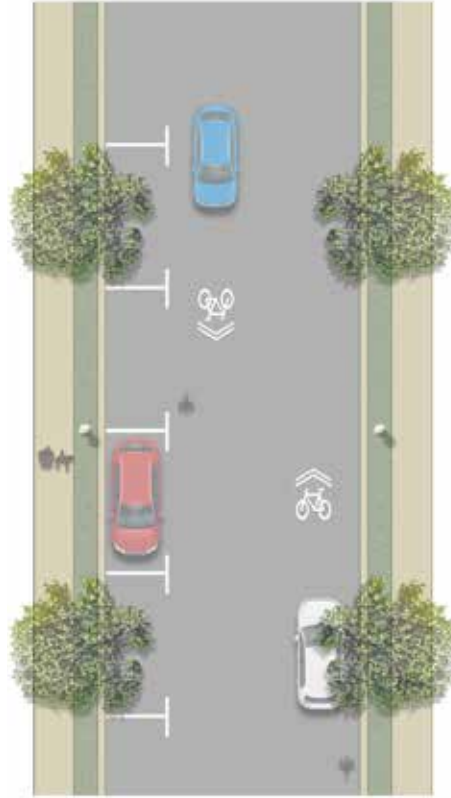


Travel lane widths may be reduced though care should be taken adjacent to parking and other auxiliary uses that may operate such that they protrude from their design dimensions.

On-street parking is an important component of commercial land use contexts, though less of a priority in Drivable Suburban area types than in Compact Urban area types. It may be substituted for bicycle facilities as recommended in the El Paso Bike Plan. Parking lane dimension includes the gutter.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 5 ft minimum is critical to preserve in non-residential areas of Drivable Suburban area types.

### RESIDENTIAL LOCAL DRIVABLE SUBURBAN AREA TYPE 49 FT TOTAL ROW



Travel lane widths should generally remain narrow to control speeds on these streets, though treatments such as bicycle boulevards may use wider lanes to allow flexibility for cyclists navigating on-street parking and allowing vehicles to pass cyclists safely. Travel lane dimension includes the gutter. Lane widths may be reduced to 9 feet depending on context.

On-street parking is allowed in Drivable Suburban area types but may be less likely to serve a critical need based on land use patterns and driveways. Parking lane dimension includes the gutter.

Wider sidewalks are desirable, but in trade-offs and constrained situations, 5 ft minimum is critical to preserve in non-residential areas of Drivable Suburban area types.

**RESIDENTIAL LOCAL DRIVABLE SUBURBAN AREA TYPE - NO PARKING**  
48 FT TOTAL ROW



48 ft					
5 ft	8 ft	11 ft	11 ft	8 ft	5 ft
SW	PS	Travel	Travel	PS	SW

Travel lane widths should remain narrow along neighborhood streets to encourage slow moving traffic. Travel lane dimension includes the gutter. Lane widths may be reduced to 9 feet, depending on context.

A more generous 8 foot planting strip may be more appropriate in Drivable Suburban area types. 6 foot is minimum for health of trees.

Minimum sidewalk width is 5 feet



**This page intentionally left blank**

### 4.6.3 LOCAL - RURAL

The vehicular lanes are 10-11 feet wide in this auto-dominant rural environment. The pedestrian realm is available in two configurations: one 10 ft shared use path on one side of the street accommodating all pedestrian movement and other appropriate modes, or; 5 foot sidewalks on either side of the street. Streets are curbless and stormwater is managed by drainage swales.

#### BASIC DESIGN FACTORS

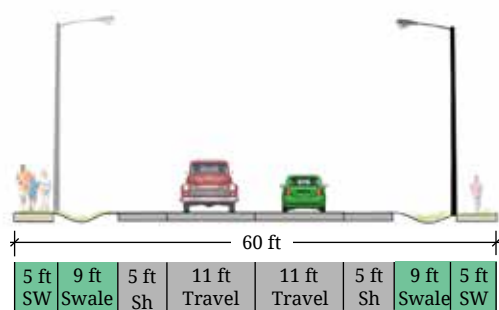
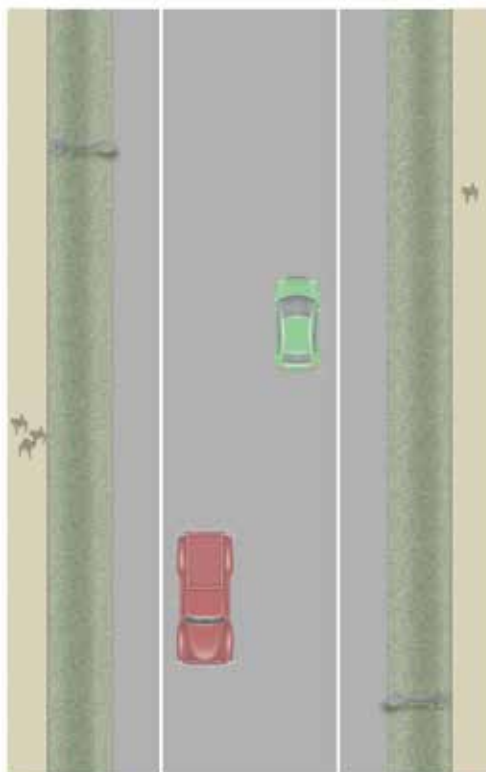
##### LOCAL RURAL AREA TYPE

BASE ROW: 60 FEET

Thoroughfare Cross-Section Design Factors and Priorities						
	Typical Lanes/Widths	Medians/ Access	On-Street Parking	Streetscape Elements	El Paso Bike Plan Bike Facilities	Min. Sidewalk Width
<b>G-6, Rural Settlement</b>	2 lanes, 10-11 ft	N/A	Allowed	SUP or Sidewalk	N/A	5 ft
<b>Open Space Sectors O-3, O-4, O-5, O-6</b>	2 lanes, 10-11 ft	N/A	Not Allowed	None	N/A	N/A

The above design factors and priorities may be applied in O-6 Potential Annexation as necessary with future annexations.

### LOCAL RURAL AREA TYPE 60 FT TOTAL ROW



Shoulder

Travel lanes 11-12 ft

Shoulder may be used for shoulder bikeway (SB) or bike lane (BL) as appropriate for various context, speeds and volumes

Swale provides stormwater drainage and separates the pedestrian zone from the travelway

Options for the pedestrian zone include 5 ft sidewalks on both sides of the street or one 10 ft shared use path (SUP) on one side of the street, depending on context



## 4.7 BICYCLE FACILITIES

### 4.7.1 BICYCLE FACILITIES - GENERALLY

Bicycle facilities are required in accordance with the adopted City of El Paso Bike Plan. The design standards presented herein follow the technical and dimensional standards of the NACTO Urban Bikeway Design Guide.

The type of facilities required are specified in the El Paso Bike Plan Appendix B: Bike Network Atlas. For developments and thoroughfares not specified in the adopted bike plan facilities shall be provided in accordance with the contextual guidance in Chapter 3 of this manual.

### 4.7.2 DEDICATION REQUIRED

Additional right-of-way dedication shall be made to accommodate required bicycle facilities. The additional width is calculated from the design requirements in this section and added to the typical right-of-way widths for all thoroughfare classifications when required.

### 4.7.3 CONTINUITY OF EXISTING FACILITIES

For new developments, bicycle facilities on thoroughfares adjacent to existing developments shall maintain continuity of the existing adjacent facilities. Deviation from these standards is permitted if connection to an existing bicycle facility is proposed and the new bicycle facility meets or exceeds the design standard of the existing facility.

### 4.7.4 BICYCLE BOULEVARDS

Bicycle boulevards streets with low motorized traffic volumes and speeds, designated and designed to give bicycle and pedestrian travel priority. Bicycle boulevards use signs, pavement markings, and traffic-calming measures to discourage through trips by motor vehicles, while accommodating local access. These facilities provide people of all ages and abilities with comfortable and attractive places to walk and ride a bicycle. Intersection crossing treatments (particularly at arterial crossings) are used to create safer, more comfortable, and convenient bicycle- and pedestrian-optimized streets. People riding bicycles should feel comfortable bicycling two abreast or “conversation riding” while traveling on a neighborhood greenway.



**FIGURE 4.7.4 BICYCLE BOULEVARD DESIGN STANDARDS ILLUSTRATED**

Figure 4.7.4 illustrates some of the required design standards for Bicycle Boulevards. The numbered call-outs on the image correspond to the required design standards of section 4.7.4 of this document.

Bicycle Boulevards shall meet the following design standards:

1. Bicycle wayfinding signage and pavement markings shall be included on bicycle boulevards. Pavement markings and identification/wayfinding signs provide a strong visual identity for the street and designate the corridor as a bicycle route.
2. Where the bicycle boulevard turns or jogs onto another street, signs and/or markings shall be provided to indicate how users can remain on the route.
3. Center line stripes (if present) shall be removed or not repainted, except for short sections on intersection approaches that have a stop line or traffic circle. Drivers have an easier time passing bicyclists on roads that do not have centerline stripes. If vehicles cannot easily pass each other using the full width of the street, it is likely that there is too much traffic for the street to be a successful bicycle boulevard.
4. Pavement markings shall be large enough to be visible to all road users; 112 inches by 40 inches (the standard size of a shared lane marking) is the minimum recommended size.
5. Decision and turn signs shall include destinations with arrows and distance and/or bicycling times. Bicycling time should assume a typical speed of 10 mph.
6. Advanced crossing warning signs such as MUTCD sign W11-1 (bicycle crossing; may be supplemented with AHEAD plaque) should be placed on intersecting streets with more than 5,000 vpd. A non-standard sign using the coloration and style of other bicycle boulevard signs may be used with an arrow showing bi-directional cross traffic.
7. On narrow local streets where it can be difficult for cars traveling in opposite directions to pass, pavement markings shall be applied in closer intervals near the center of the travel lane, as determined by the City Traffic Engineer.
8. Signs may differ from those outlined in the MUTCD to highlight or brand the bicycle boulevard network. If used, signs



Image credit: NACTO (National Association of City Transportation Officials), [nacto@nacto.org](mailto:nacto@nacto.org)

shall be consistent in content, design, and intent; colors reserved by the MUTCD Section 1A.12 for regulatory and warning road signs (red, yellow, orange, etc.) are not recommended. Green, blue and purple are commonly used.

9. Confirmation signs may include destinations and distance and/or bicycling times.
10. To minimize sign clutter, a bicycle symbol may be placed on a standard street name sign, along with distinctive coloration.
11. Either shared lane markings or non-standard markings may be used along bicycle boulevards.
12. On particularly narrow streets (approximately 25 feet wide with parking), shared lane marking stencils may be placed either in the center of the lane facing each other, or with the bicycle marking in the center of the roadway and two sets of chevrons offset 1 foot in each direction or travel.
13. For wayfinding purposes, the orientation of the chevron marking at offset intersections may be adjusted to direct bicyclists along discontinuous routes. Alternately, an arrow may be used with the chevrons to indicate the direction of the turn.
14. On-street parking spaces may be delineated with paint or other materials to clearly indicate where a vehicle should be parked and to discourage motorists from parking their vehicles too far into the adjacent travel lane.

#### **4.7.5 BIKE ROUTE - SIGNED & MARKED AND SIGNED SHARED**

On shared streets, bicyclists and motor vehicles use the same roadway space. Signed shared roadways use guide signs and warning signs to provide wayfinding information to people riding bicycles and to alert people driving motor vehicles to be aware and respectful of other road users. Signed shared roadways are often installed on streets that have considerable constraints prohibiting a more substantial bikeway type, but are essential for addressing a gap in the bikeway network or serving as the final leg of a bicycle route on a low-volume, low-speed roadway. The shared lane marking is a pavement marking with a variety of uses to support a complete bikeway network; it is not a facility type and should not be considered a substitute for bike lanes, cycle tracks, or other separation treatments where these types of facilities are otherwise warranted or space permits.

A marked and signed shared roadway builds on the basic signed shared roadway described above by incorporating shared lane markings (sharrows). Sharrows are road markings used to indicate a shared lane environment for bicycles and automobiles. Sharrows remind drivers of bicycle traffic on the street and recommend proper bicyclist positioning within the travel lane.

Bike routes shall meet the following design standards:

1. The Shared Lane Marking in use within the United States is the bike-and-chevron “sharrow,” illustrated in MUTCD figure 9C-9.
2. Shared Lane Markings shall not be used on shoulders, in designated bicycle lanes, or to designate bicycle detection at signalized intersections. (MUTCD 9C.07 03)



3. Frequent, visible placement of markings is essential. The number of markings along a street should correspond to the difficulty bicyclists experience taking the proper travel path or position. SLMs used to bridge discontinuous bicycle facilities or along busier streets should be placed more frequently (50 to 100 feet) than along low traffic bicycle routes (up to 250 feet or more). SLMs used along low volume routes can be staggered by direction to provide markings closer together.
4. Lateral placement is critical to encourage riders to avoid the “door zone” and to encourage safe passing behavior. MUTCD guidance recommends minimum placement when a parking lane is present at 11 feet from the curb face.
5. If on-street vehicle parking is not present, SLMs should be placed far enough from the curb to direct bicyclists away from gutters, seams, and other obstacles. On streets with posted 25 mph speeds or slower, preferred placement is in the center of the travel lane to minimize wear and encourage bicyclists to occupy the full travel lane. MUTCD guidance recommends minimum placement with no parking at 4 feet from the curb face.
6. On streets with posted 25 mph speeds or slower, preferred placement is in the center of the travel lane to minimize wear and encourage bicyclists to occupy the full travel lane.
7. On streets with posted 35 mph speeds or faster and motor vehicle volumes higher than 3,000 vpd shared lane markings are not a preferred treatment. On these streets other bikeway types are preferred.

For wayfinding purposes the orientation of the chevron marking may be adjusted to direct bicyclists along discontinuous routes.

8. Color may be used to enhance the visibility of the shared lane marking and to further encourage desired lane positioning.
9. Dotted line markings may accompany the shared lane marking to further encourage desired lane positioning.

#### 4.7.6 CONVENTIONAL BIKE LANES

Bicycle lanes designate an exclusive space for bicyclists with pavement markings and signage. The bicycle lane is located adjacent to motor vehicle travel lanes and bicyclists ride in the same direction as motor vehicle traffic. Bicycle lanes are typically on the right side of the street (on a two-way street), between the adjacent travel lane and curb, road edge or parking lane.

Conventional Bike Lanes shall meet the following design standards:

1. The desirable dimensions should be used unless other street elements (e.g., travel lanes, medians, median offsets) have been reduced to their minimum dimensions.
2. The desirable bike lane width adjacent to a curbface is 6 feet. The minimum rideable surface adjacent to a street edge or longitudinal joint is 3 feet.
3. When placed adjacent to a parking lane, the desired reach from the curb face to the edge of the bike lane (including the parking lane, bike lane, and optional buffer between them) is 14.5 feet; the absolute minimum reach is 12 feet. A bike lane next to a parking lane shall be at

least 5 feet wide, unless there is a marked buffer between them. Wherever possible, minimize parking lane width in favor of increased bike lane width.

4. The minimum bike lane width adjacent

to a guardrail or other physical barrier is 2 feet wider than otherwise in order to provide a minimum shy distance from the barrier.

5. Bicycle lane word and/or symbol and arrow markings (MUTCD Figure 9C-3)



Image credit: NACTO (National Association of City Transportation Officials)

#### FIGURE 4.7.6 CONVENTIONAL BIKE LANE DESIGN STANDARDS ILLUSTRATED

Figure 4.7.6 illustrates some of the required design standards for conventional bike lanes. The numbered call-outs on the image correspond to the required design standards of section 4.7.6 of this document.

shall be used to define the bike lane and designate that portion of the street for preferential use by bicyclists.

6. Bike lane word, symbol, and/or arrow markings (MUTCD Figure 9C-3) shall be placed outside of the motor vehicle tread path at intersections, driveways, and merging areas in order to minimize wear from the motor vehicle path.
7. A solid 6" white lane line marking shall be used to separate motor vehicle travel lanes from the bike lane.
8. A through bike lane shall not be positioned to the right of a right turn only lane or to the left of a left turn only lane (MUTCD 9C.04). A bike lane may be positioned to the right of a right turn only lane if split-phase signal timing is used.
9. When placed adjacent to parking, a solid white line marking of 4 inch width shall be used between the parking lane and the bike lane to minimize encroachment of parked cars into the bike lane.
10. Gutter seams, drainage inlets, and utility covers should be flush with the ground and oriented to prevent conflicts with bicycle tires.
11. If sufficient space exists, separation should be provided between bike lane striping and parking boundary markings to reduce door zone conflicts. Providing a wide parking lane may offer similar benefits.
12. If sufficient space exists and increased separation from motor vehicle travel is desired, a travel side buffer should be used.
13. Lane striping should be dashed through

high traffic merging areas.

#### 4.7.7 BUFFERED BIKE LANES

Buffered bicycle lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. A buffered bicycle lane could potentially be converted to a cycle track.

Buffered Bike Lanes shall meet the following design standards:

1. Bicycle lane word and/or symbol and arrow markings (MUTCD Figure 9C-3) shall be used to define the bike lane and designate that portion of the street for preferential use by bicyclists.
2. The buffer shall be marked with 2 solid white lines. White lines on both edges of the buffer space indicate lanes where crossing is discouraged, though not prohibited. For clarity, consider dashing the buffer boundary where cars are expected to cross at driveways.
3. Buffers shall be at least 18 inches wide and located on both the travel side and parking side of the bike lane. The buffer area shall have interior diagonal cross hatching or chevron markings if 3 feet in width or wider.
4. If used, interior diagonal cross hatching should consist of 4" lines angled at 30 to 45 degrees and striped at intervals of 10 to 40 feet. Increased striping frequency may increase motorist compliance.
5. The combined width of the buffer(s) and bike lane should be considered "bike lane width" with respect to guidance given in other documents that don't recognize the existence of buffers. Where buffers



### FIGURE 4.7.7 BUFFERED BIKE LANE DESIGN STANDARDS ILLUSTRATED

Figure 4.7.7 illustrates some of the required design standards for buffered bike lanes. The numbered call-outs on the image correspond to the required design standards of section 4.7.7 of this document.

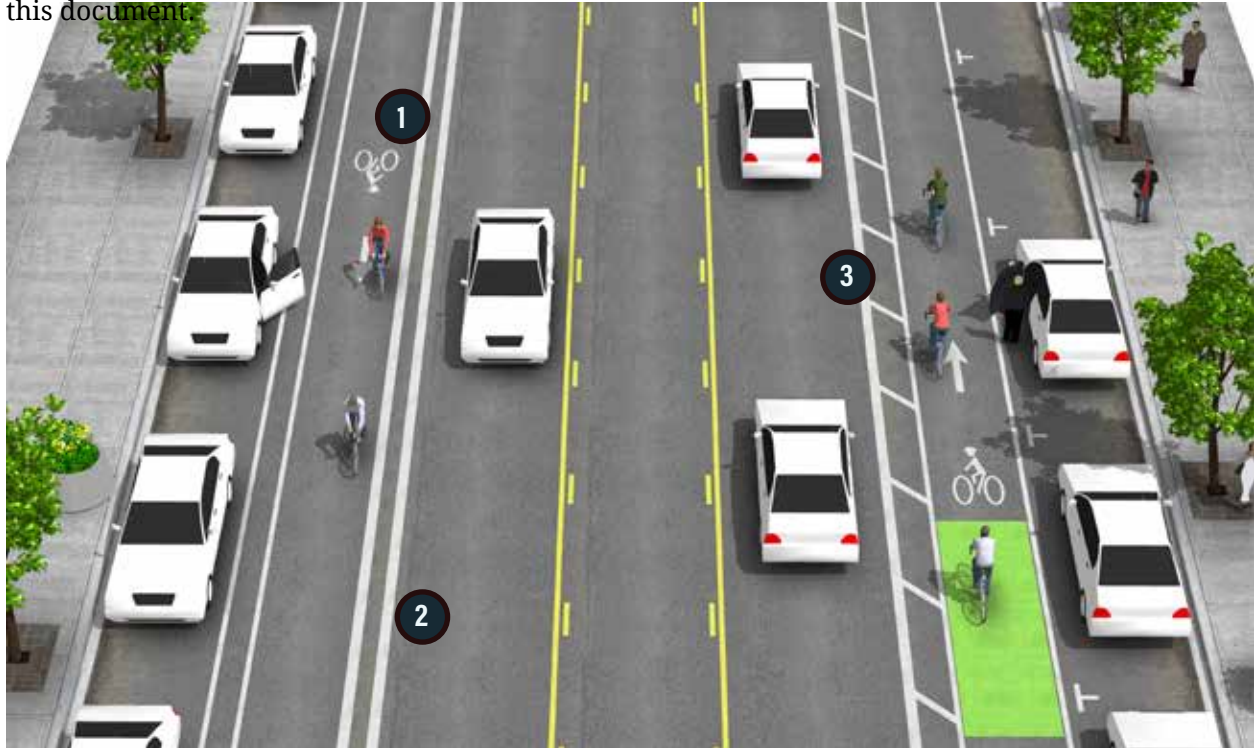


Image credit: NACTO (National Association of City Transportation Officials)

are used, bike lanes can be narrower because the shy distance function is assumed by the buffer. For example, a 3 foot buffer and 4 foot bike lane next to a curb can be considered a 7 foot bike lane. For travel side buffered lanes next to on street parking, a 5 foot minimum width is recommended to encourage bicyclists to ride outside of the door zone.

6. The desired bicycle travel area width is 7 feet when parking is permitted, the City Traffic Engineer may approve a narrower bicycle travel area width when insufficient right-of-way exists.
7. On intersection approaches with right turn only lanes, the bike lane shall be transitioned to a through bike lane to the left of the right turn only lane, or a

combined bike lane/turn lane should be used if available road space does not permit a dedicated bike lane.

8. On intersection approaches with no dedicated right turn only lane the buffer markings should transition to a conventional dashed line. Consider the use of a bike box at these locations.
9. Like a conventional bike lane, a wide (6 inch) solid white line may be used to mark the edge adjacent to a motor vehicle travel lane. For a parking side buffer, parking T's or a solid line are acceptable to mark between a parking lane and the buffer.
10. For travel lane buffer configurations, separation may also be required, at the discretion of the city traffic engineer,

between bike lane striping and the parking boundary to reduce door zone conflicts. This creates a type of parking-side buffer.

11. Color shall be used at the beginning of each block to discourage motorists from entering the buffered lane.

#### 4.7.8 CYCLE TRACKS

Of all on-street bicycle facilities, protected bike lanes, also referred to as cycle tracks, offer the most protection and separation from adjacent motor vehicle traffic. Protected bike lanes are physically separated from motor vehicle traffic and typically provide bicycle travel in the same direction as motor vehicle traffic. They may be at street level, or distinct from the sidewalk, as a raised cycle track. In situations where on-street parking is allowed, protected bike lanes are located adjacent to the curb and sidewalk, with on-street parking repositioned to buffer people on bicycles from moving vehicles.

A two-way cycle track is an on-street bicycle facility that allows bicycle movement in both

directions on one side of the street. A two-way cycle track may be configured as a street level cycle track with a parking lane or other barrier or as a raised cycle track to provide vertical separation from the adjacent motor vehicle lane. Two-way cycle tracks must provide clear and understandable bicycle movements at intersections and driveways.

Cycle tracks shall meet the following design standards:

1. Bicycle lane word, symbol, and/or arrow markings (MUTCD Figure 9C-3) shall be placed at the beginning of a cycle track and at periodic intervals along the facility to define the bike lane direction and designate that portion of the street for preferential use by bicyclists.
2. If configured on a one-way street, a “ONE WAY” sign (MUTCD R6-1, R6-2) with “EXCEPT BIKES” plaque shall be posted along the facility and at intersecting streets, alleys, and driveways informing motorists to expect two-way traffic.
3. A “DO NOT ENTER” sign (MUTCD R5-1)



Image credit: NACTO (National Association of City Transportation Officials)

#### FIGURE 4.7.8 CYCLE TRACK DESIGN STANDARDS ILLUSTRATED

Figure 4.7.8 illustrates some of the required design standards for cycle tracks. The numbered callouts on the image correspond to the required design standards of section 4.7.8 of this document.

- with “EXCEPT BIKES” plaque shall be posted along the facility to only permit use by bicycles.
4. Intersection traffic controls along the street (e.g., stop signs and traffic signals) shall also be installed and oriented toward bicyclists traveling in the contra-flow direction.
  5. The desirable two-way cycle track width is 12 feet. Minimum width in constrained locations is 8 feet.
  6. When protected by a parking lane, 3 feet is the desired width for a parking buffer to allow for passenger loading and to prevent dooring collisions.
  7. In the absence of a raised median or curb, the desired width of the painted buffer is 3 feet. The buffer space shall include bollards, armadillos, planters, signs or other forms of physical protection as approved by the city’s traffic engineer.
  8. A dashed yellow line shall be used to separate two-way bicycle traffic and to help distinguish the cycle track from any adjacent pedestrian area.
  9. If the cycle track is parking protected, parking shall be prohibited near the intersection to improve visibility. The desirable no-parking area is 30 feet from each side of the crossing.
  10. For motor vehicles attempting to cross the cycle track from the side street or driveway, street and sidewalk furnishings and/or other features shall accommodate a sight triangle of 20 feet to the cycle track from minor street crossings, and 10 feet from driveway crossing.
  11. Color, yield lines, and “Yield to Bikes” signage shall be used to identify the conflict area and make it clear that the cycle track has priority over entering and exiting traffic.
  12. Tubular markers or armadillos/concrete

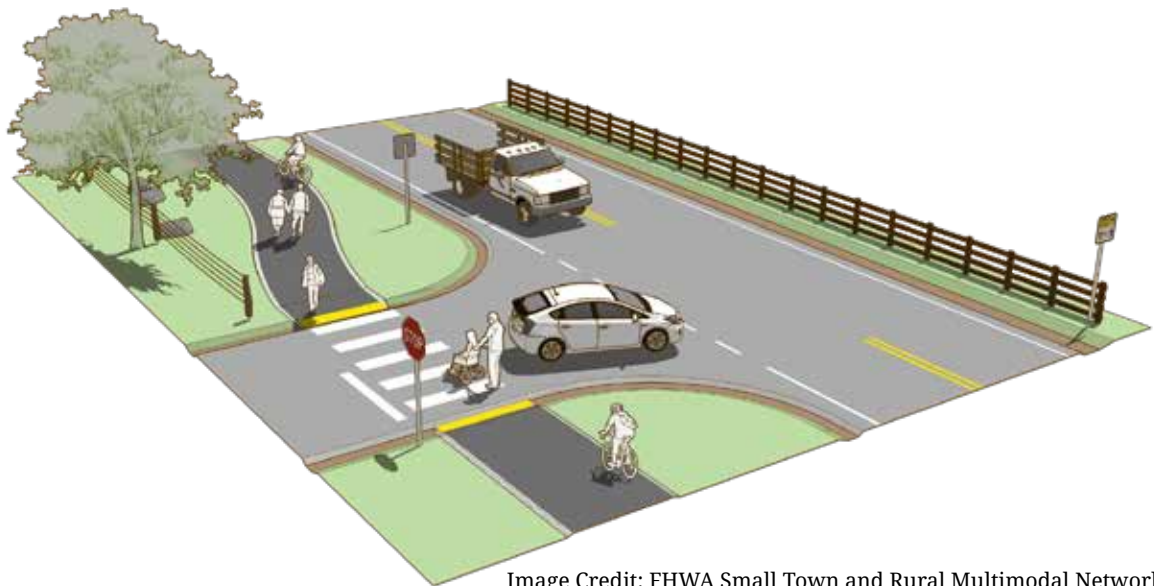


Image Credit: FHWA Small Town and Rural Multimodal Networks

#### FIGURE 4.7.9 SHARED USE PATH DESIGN STANDARDS ILLUSTRATED

Figure 4.7.9 illustrates some of the required design standards for shared use paths. The numbered call-outs on the image correspond to the required design standards of section 4.7.9 of this document.



buttons shall be used to protect the cycle track from the adjacent travel lane. The color of the tubular markers shall be the same color as the pavement marking they supplement.

#### 4.7.9 SHARED USE PATHS

A shared-use path, also called a multi-use trail, or hike and bike path allows for two-way, off-street bicycle use and may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Because of their separation from motor vehicle traffic, shared-use paths appeal to the widest variety of user types, from families with children to adult recreational riders to everyday commuters. When these linear shared-use paths lead to popular destinations or connect to the on-street bikeway network, their utility expands greatly, offering a comfortable, low-stress bicycling environment for people to use for everyday trips.

Shared Use Paths shall meet the following design standards:

1. The desired paved width of a shared use path is 10 feet, the minimum width is 8 feet. The desired dimensions shall be used unless other street elements (e.g., travel lanes, medians, median offsets) have been reduced to their minimum dimensions at the discretion of the city traffic engineer.
2. Shared use paths shall be separated from the roadway by a minimum 5 feet planted buffer or as otherwise required in Chapter 4 of this document. Separation of less than 5 feet is permitted when a physical barrier is proposed.
3. Due to the fact that nearly all shared use paths are used by pedestrians, they fall under the accessibility requirements of the Americans with Disabilities Act (ADA). Refer to the U.S. Access Board website ([www.access-board.gov](http://www.access-board.gov)) for up-to-date information regarding the accessibility provisions for shared use paths and other pedestrian facilities covered by the Americans with Disabilities Act and the Architectural Barriers Act.
4. In addition to the standards herein, designers shall justify proposed shared use paths with guidance from the AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012.

#### 4.7.10 INTERSECTION TREATMENTS

For bicyclists traveling in a conventional bike lane the approach to an intersection with vehicular turn lanes can present a significant challenge. For this reason it is vital that bicyclists are provided with an opportunity to correctly position themselves to avoid conflicts with turning vehicles. This treatment specifically covers the application of a through bicycle lane at the intersection.

Through bicycle lanes at intersections shall meet the following standards:

1. The desired width of a dotted bike transition lane and through bike lane is 6 feet with a minimum width of 4 feet.
2. Bicycle lane word and/or symbol and arrow markings (MUTCD Figure 9C-3) shall be used to define the bike lane and designate that portion of the street for preferential use by bicyclists.
3. The through bike lane shall be placed to the left of the right-turn only lane.
4. Dotted lines signifying the merge area shall begin a minimum of 50 feet before the intersection (MUTCD). Dotted lines should begin 100 feet before the intersection if along a high speed/volume

roadway.

5. Dotted lane line transition areas to through bike lanes shall not be used on streets with double right turn lanes. Double right turn lanes are extremely difficult for bicyclists to negotiate. Shared lane markings may be used in the center of the inside turn lane to designate the preferred path of through bicycle travel.
6. Accompanying signage shall include R3-7R “Right Lane Must Turn Right” and R4-4 “Begin Right Turn Yield to Bikes” (MUTCD).
7. Dotted white lines should be 6 inches wide and 2 feet long with a 2- to 6-foot gap between dashes (MUTCD).
8. Through bike lanes should be provided at any intersection approach where a right turn only auxiliary lane is created (also known as a right turn add lane). It is desirable for bicyclists to travel straight through the merging area to reinforce right-of-way.
9. Dotted lane line transition areas to through bike lanes should not be provided at any intersection approach where a through travel lane transitions into a right turn only lane (also known as a right turn drop or trap lane). In such instances designers shall utilize an exclusive bicycle signal phase with the bike lane remaining to the right, or not delineating the merging area connecting to the through bicycle lane. Shared lane markings may be used to provide additional guidance.
10. At intersections with high right turning vehicle volumes, high bicyclist volumes, or along priority bicycle corridors, treatments beyond dotted white lines such as coloring and increased signing should be provided.
11. Terminating the bike lane in advance of

the intersection is not acceptable.

12. For intersections that lack the physical width to install a bicycle pocket, a combined bike/turn lane should be used.
13. Vehicle turn lane width shall not be reduced to less than 9 feet.
14. Bicycle warning signs or a “Share the Road” sign shall be used in advance of the merge/transition area.

A combined bike lane/turn lane places a suggested bike lane within the inside portion of a dedicated motor vehicle turn lane. Shared lane markings or conventional bicycle stencils with a dashed line can delineate the space for bicyclists and motorists within the shared lane or indicate the intended path for through bicyclists. This treatment includes signage advising motorists and bicyclists of proper positioning within the lane.

When configured on a cycle track corridor, the combined lane is commonly called a mixing zone, and is intended to minimize conflicts with turning vehicles at intersections as an alternative to an exclusive bike signal phase.

Combined bicycle lane turn lanes shall meet the following standards:

1. Shared lane markings shall be used to clarify bicyclist positioning within the combined lane. A dotted 4 inch line and bicycle lane marking shall be used to clarify bicyclist positioning within the combined lane without excluding cars from the suggested bicycle area.
2. Within the combined lane, the bicycle area width shall be 4 feet minimum.
3. Width of combined lane shall be 9 feet minimum, 13 feet maximum. A full bicycle through lane can be accommodated if the vehicle right turn

only lane can be made 14 feet or wider.

Further intersection treatments consistent with NACTO guidance may be required at the discretion of the city traffic engineer.



## 4.8 ALLEYS

### 4.8.1 ALLEYS - ALL AREA TYPES

Alleys are assets in certain zoning districts and they can supplement the overall street network by providing rear access to various land uses. By providing rear access to a development, curb cuts and driveways along the frontage conditions can be minimized and pedestrian safety can be enhanced. Alleys provide necessary circulation and can accommodate services like utilities, trash pick-up and stormwater drainage.

### 4.8.2 ALLEYS REQUIRED

The dedication of alleys shall be optional in all subdivisions, except where alleys must be dedicated as direct continuations or extensions of alleys existing in adjacent subdivisions or as otherwise indicated in this chapter. Such continuations shall be extended in the same alignment as evident from adjacent lots in the existing subdivision, except where an existing alley is less than sixteen feet wide. In that case, additional land shall be dedicated so as to form an alley at least sixteen feet wide.

For new development, alleys shall be required for all residential lots fronting major or minor arterials. Where off-street access is desired, alleys shall be provided.

### 4.8.3 EXISTING SUBDIVISIONS WITH ALLEYS

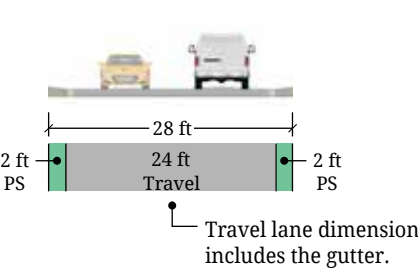
Where lots are subdivided or resubdivided adjacent to or within subdivisions already having alleys, the alley must be improved only to the same extent as may be evident from the existing alley. Where lots are subdivided as continuations of existing subdivisions already having alleys, alleys in the new subdivision shall be improved only to the same standards as those existing alleys, all the way to the first street intersection. Thereafter, if alleys are required or desired, they should conform to standards for alley dedication and improvement set forth in subsection 4.8.4 below.

### 4.8.4 ALLEY GENERAL REQUIREMENTS

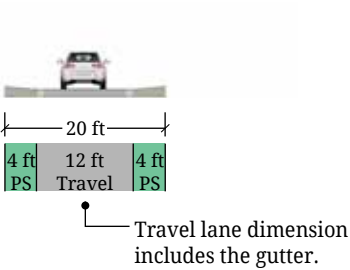
1. Alleys shall be as nearly parallel to the street frontage as reasonably possible.
2. Alley intersections with streets shall be as close to right angles (ninety degrees) as practical.
3. Where two alleys intersect or turn at an angle, a corner clip of not less than ten feet from the normal intersection of the property line shall be provided along each property line.
4. If alleys are not straight within each block or do not connect on a straight

Alley Design Factors		
	Alley in Commercial and Multifamily Districts (including townhomes and patio homes)	Alleys in Residential Districts
Minimum ROW Width	28 feet	20 feet
Minimum Paved Width	24 feet	12 feet

**COMMERCIAL/MULTIFAMILY ALLEY**  
28 FT TOTAL ROW



**RESIDENTIAL ALLEY**  
20 FT TOTAL ROW



course with alleys on adjoining blocks, an easement shall be provided for the placement of guy wires on lot division lines necessary to support overhead utility poles set on curving or deviating alley rights-of-way.

5. Alleys should not be platted to intersect any arterial streets.
6. Dead-end alleys shall not be permitted unless a permanent or temporary turnaround is provided. The following standards shall apply:
  - a. In subdivisions subject to Sub-section 4.8.3 above, turnarounds shall be provided with a minimum radius of thirty-five feet;
  - b. In all other subdivisions, turnarounds shall be provided with a minimum radius of thirty-two feet;
  - c. In instances where dead-end alleys will clearly be permanent, turnarounds shall be surfaced in accordance with the cross-sections on the preceding page, as applicable;
  - d. In instances where dead-end alleys are of a temporary nature, turnarounds shall be improved with a minimum six-inch-base of crushed limestone.
7. Layout and arrangement of alleys shall be designed to avoid the creation of short cuts for traffic and to discourage use by traffic other than that generated by activity within property abutting the alley.
8. Cross intersections of alleys shall not be permitted.
9. Alleys forming the boundary of a subdivision, and adjacent to unplatted property, shall be dedicated and improved the same as if situated in the interior of a subdivision.



## 4.9 SIDEWALKS

### 4.9.1 PURPOSE

Sidewalks are required as a part of subdivision plat approval as outlined within this manual and in the City Code Title 13, Chapter 04 to help the City of El Paso achieve the following:

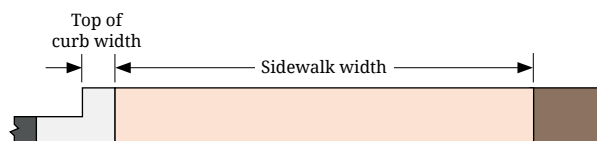
1. Promote the mobility, health, safety, and welfare of residents, property owners, and visitors to the City of El Paso and to implement objectives and strategies of the El Paso Comprehensive Plan;
2. Improve the safety of walking by providing separation from motorized transportation and improving travel surfaces for pedestrians;
3. Improve public welfare by providing an alternate means of access to transportation and social interaction, especially for children, other citizens without personal vehicles, or those with disabilities;
4. Facilitate walking as a means of physical activity recognized as an important provider of health benefits;
5. Establish minimum criteria for the development of sidewalks as a part of the pedestrian element of the transportation system within the city and its extraterritorial jurisdiction (ETJ).

### 4.9.2 APPLICABILITY

These requirements shall apply to all development within the city and its ETJ.

### 4.9.3 EXCEPTIONS

The City Plan Commission may approve an exception to the requirement for sidewalks on individual streets or within subdivisions:



*Figure 4.1: Sidewalk width (Cross section view)*

1. In existing single-family residential neighborhoods where sidewalks are not present and have not historically been provided or comply;
2. On local streets within an approved subdivision where all the lots provide a minimum one-half acre lot area and the adjoining properties have no sidewalks;
3. On mountain residential and divided mountain residential streets within an approved mountain development subdivision;
4. On local streets within an approved planned unit development where pedestrian access is provided within the approved subdivision through an alternative sidewalk design not installed within the street right-of-way; provided, however, that an easement may be required by the City Manager or designee to provide for the installation of traffic signage and signalization, utility services, neighborhood delivery and collection box units, or other similar facilities;
5. On local streets within an approved subdivision which meet all of the following criteria as determined by the City Plan Commission:
  - a. A characteristic of the neighborhood is that no sidewalks have been required to date,

- b. The subdivision adjoins or lies within a neighborhood in which buildings or structures have been constructed on at least fifty percent of the lots within the neighborhood, and
  - c. The type of subdivision and intensity of land use is compatible with the character of the neighborhood;
6. On streets within neighborhoods that meet the criteria in Title 20 (Zoning) for infill development, where a street construction project, whether local, state or federal, has been awarded and the project includes construction of the sidewalks; and
  7. In areas with severe topography or other natural constraints that will constrain proper implementation of this title.

#### 4.9.4 GENERAL REQUIREMENTS

- A. **Standards Not Otherwise Specified.** Where facility standards and requirements are not otherwise specified within this manual, the design of pedestrian facilities shall follow the City's Ordinance Title 13.04, the DSC, and other city Sidewalk Design Standards and applicable state and federal laws and regulations.
- B. **Maintenance.** All sidewalks, sidewalk amenities, and landscaping in the right-of-way shall be maintained by the adjoining property owner unless otherwise specifically provided for by public policy.
- C. **Location and Width of Sidewalks.** Unless noted otherwise:
  1. Sidewalks shall have a minimum clear path width of five feet on local streets in all zoning districts primarily intended for single-family residential development when located adjacent to the property line. Sidewalks are

preferred abutting the property line, not directly adjacent to the curb. Sidewalks located next to the curb along local streets shall be a minimum five feet in width. Sidewalks along arterials shall have a minimum width of five feet. The top of curb width shall not be included in the sidewalk width;

2. Sidewalks shall have a minimum clear path width of five feet in all other locations;
3. Sidewalks in areas determined to be high pedestrian traffic areas or pedestrian-oriented developments by the CPC may be required to be wider than the minimum widths listed herein by the CPC;
4. Sidewalks shall be located in existing areas to match the width and location of existing walks of the block in which they are located. Vacant blocks shall comply with the sidewalk requirements of this title;
5. Sidewalks shall not be located next to the curb on collectors or arterial streets except when an exception is approved by the CPC or designee at the time of subdivision plat approval. Such exception shall be due to actual physical or topographic constraints. Sidewalks on TXDOT facilities shall be as approved by TXDOT;
6. Sidewalks may be required to improve connectivity between subdivisions, to schools, parks, bus stops and retail areas by the CPC at the time of plat approval;
7. The CPC may approve alternative sidewalk design and locations at the time of plat approval including

meandering or curvilinear sidewalks provided such design and location meets the intent of this title.

- D. **Timing of Improvements.** The timing of sidewalk construction shall be as required by this manual and Chapter 13.04 of the City Ordinance, unless a developer agreement between the property owner and the city provides for alternative timing for construction or security has been provided in accordance with this title.
- E. **Internal Pedestrian Circulation.** In addition to sidewalks within the right-of-way, internal pedestrian circulation shall be provided in new development or redevelopment serving any nonresidential and at any governmental facility, school, church, or other place of public assembly. Sidewalks shall be installed to connect all buildings to one another and to parking areas and to connect the development to the public street system. All such sidewalks in the city's right-of-way shall be protected from encroachment by parked vehicles.
- F. **Curb Ramps.** Curb ramps shall be provided within a street right-of-way wherever an accessible route for pedestrians (sidewalk or pedestrian way) is required. The design and construction of curb ramps shall be in accordance with the DSC and shall comply with the Texas Accessibility Standards. DSC standards must be modified to increase the number of options, place of installation and at signalized intersections. ADA TXDOT standards must be considered for state and local streets
- G. **Compliance with DSC.** Sidewalks shall

be constructed in compliance with the standards in the City of El Paso DSC and Chapter 13.04 of the City Code.

#### 4.9.5 SIDEWALK REQUIREMENTS FOR NEW STREETS

- A. **Sides of the street.** Sidewalks shall be required on both sides of all new streets except in accordance with Chapter 13.04 of the City Code.
- B. **Timing of Improvements.** Sidewalks, landscape and curb ramps shall be provided by the developer at the time of road construction on all new freeway frontage roads unless disallowed by TXDOT, arterial streets, or collector streets, except on individual lots fronting on or siding up to such street. The developer may choose to provide security in accordance with this chapter and to delegate the requirement to construct such sidewalks, landscape and curb ramps



*A safe and predictable sidewalk system is an essential public infrastructure investment*



to the purchaser of a lot or the purchaser's builder as a part of the building permit for a period of three years from the date of acceptance of the adjacent street. However, at the end of the three-year time period, the developer shall make arrangements to complete the missing sidewalks, landscape and curb ramps or in lieu of such arrangements, the city may utilize the security to complete the sidewalks, landscape and curb ramps. As sidewalks, landscape and curb ramps are completed during the three year period, the developer may request the partial release of security for the completed portions in accordance with this title.

- C. **Financial Guarantee.** A developer of a new subdivision may contribute the projected cost of the sidewalk construction into an escrow fund or through other form of financial guarantee to delay the time of construction of the sidewalk according to procedures within this manual and Chapter 13.04 of the City Ordinance.

#### 4.9.6 SIDEWALK REQUIREMENTS FOR EXISTING STREETS

- A. **Sides of the Street.** Sidewalks shall be required on both sides of existing collector streets, arterial streets, and the external sides of the frontage roads of freeways.
- B. **Location.** Sidewalks shall be required along block faces of existing local streets where redevelopment is occurring in any of the following categories or combinations of categories:
1. The central business district designated by the El Paso comprehensive plan;
  2. Designated pedestrian routes in a

neighborhood plan, corridor plan, or other small area plan adopted by the City of El Paso;

3. Locations that would connect existing or otherwise required sidewalks by closing gaps of less than two hundred and fifty feet;
  4. Locations in which an adjacent property has a public sidewalk along the same block face;
  5. Street frontages in all developments except the following:
    - a. Developments intended primarily for single-family residential purposes and where sidewalks are not present,
    - b. Along local and collector streets in developments intended primarily for warehousing, manufacturing, and industrial uses,
    - c. Developments intended to preserve agricultural activities and open space.
- C. **Required with Street Improvement.** Any land development or subdivision that triggers a requirement for any street improvements along an existing collector street, arterial street, or freeway frontage road shall include sidewalk improvements. The sidewalks shall be provided concurrently by the developer with other street improvements except as otherwise provided in this manual and Chapter 13.04 of the City's Ordinance
- D. **Site Plan.** No new or amended site plan shall be approved for development on any property in a location wherein sidewalks are required unless applicable provisions for required sidewalks are included in the site plan.
- E. **Permits.** A certificate of occupancy, or

any other type of final approval for a residential development that does not require a certificate of occupancy, may not be issued until required sidewalks are installed or brought up to applicable standards when there is development activity requiring:

1. A permit for new construction of a structure other than an accessory structure,
2. A permit for a major addition to a structure other than an accessory structure, or
3. A permit for major alterations or repairs to a structure other than an accessory structure.

F. **Removal Requires Replacement.** An existing sidewalk may not be removed unless a replacement sidewalk is constructed to standards current at the time of removal.

## 4.10 CURBS AND GUTTERS

Curbs and gutters shall be installed according to the provisions of this chapter and to the DSC. Combination curb and gutter improvements shall be provided to mark the edge of pavement and carry off surface water, as set forth below:

### 4.10.1 BESIDE FREEWAYS

The subdivider shall be required to install curbs along the outside lanes in rights-of-way designated for freeways, as per the TXDOT approval or construction plans.

### 4.10.2 BESIDE ARTERIAL AND COLLECTOR STREETS

The subdivider shall install curbs on both sides of all arterial and collector streets within the subdivision, and on one side of all such streets at the subdivision boundary.

### 4.10.3 BESIDE LOCAL STREETS

The subdivider shall install curbs on both sides of all local streets within the subdivision and at subdivision boundaries, except for existing boundary streets, in which case curb and gutter installation shall be required on the subdivision side only.

### 4.10.4 AT STREET INTERSECTIONS

The minimum curb radii at street intersections shall be as prescribed in the DSC and shall maintain proper stopping sight distance as determined by the latest edition of AASHTO's "A policy on Geometric Design of Highways and Streets."

## 4.11 GENERAL DESIGN STANDARDS

### 4.11.1 DSC STANDARDS TO BE MET

In addition to the requirements of the City of El Paso Design Standards for Construction (DSC), the requirements of the street standards in this section shall be met.

All streets and thoroughfares shall be constructed and paved to city standards and within rights-of-way as required by the thoroughfare plan and this article, and in accordance with the DSC and other city standards, as may be from time to time amended or adopted. Traffic signal design shall be as per TMUTCD latest edition. Construction and/or dedication of facilities that exceed the standards herein is discouraged unless the excess facilities serve a functional purpose that aligns with the standards herein.

### 4.11.2 INTERSECTION IMPROVEMENTS AND TRAFFIC CONTROL DEVICES

Intersections shall be designed and improved in accordance with the DSC and MUTCD. Any additional improvements and/or traffic control devices shall be required only as

a result of the findings of a traffic impact analysis when required per the City Code of Ordinances.

#### 4.11.3 OFF-SITE IMPROVEMENTS

Where traffic impact analysis demonstrates the need for the facilities or upon the affirmative recommendation of the City Manager or designee, the property owner shall make their proportional share of improvements to off-site collector and arterial streets and intersections necessary to mitigate traffic impacts generated by the development or in conjunction with related developments including but not limited to vehicular, bicycle and pedestrian improvements. The city may participate in the costs of additional/oversize improvements with the property owner as set out herein, and subject to the city's cost participation policies on additional/oversized improvements.

#### 4.11.4 STREET NAMES AND ADDRESSES

##### Street Names

A. **Requirement.** New streets in a subdivision shall be named in a way that will provide continuity of street names and prevent conflict or confusion with existing street names in the city, in the city's extraterritorial jurisdiction or in a neighboring jurisdiction, subject to the approval of the City Manager, or designee for subdivisions located within the corporate limits, or by the county engineer within the extraterritorial jurisdiction. Subdivisions submitted as a preliminary plat shall indicate proposed street names for streets within the subdivision. The City Manager, or designee or county engineer may review, coordinate with the fire department and 911 and accept, in accordance with

these standards, any street name that is proposed. The City Manager, or designee or county engineer, when requested by the subdivider, may originate street name(s) as needed. Approved street names shall be shown on the final plat of the subdivision.

B. **Standards.** Preliminary street names shall be shown on the preliminary plat and final street names shall be approved with the final plat and shown on the recorded plat. Street names shall not conflict with or duplicate any existing street name within the City or County of El Paso. Conflict may be based on the following:

1. Close pronunciation to another street name;
2. Street name is too difficult to pronounce;
3. Street names with undesirable meanings or connotations; and
4. Street names with language translation problems.
5. New streets which are extensions of, or obviously in alignment with, existing streets shall bear the name of the existing street.
6. Cul-de-sac streets having six or more lots fronting on them, or that have more than one hundred fifty feet or more in length measured from the center line of the intersecting street to the center of the turnaround, shall have street names assigned to them. All other cul-de-sac, inlets, turning heels or eyebrows shall carry the street name, suffix and house numbering sequence of the main street.



7. Street names shall be in accordance with the DSC.
8. Street names shall not begin with initials.
9. Street names shall contain suffixes according to the standards listed in Table 4.2 and below except that streets within the extraterritorial jurisdiction shall be provided a street name suffix of “road” except where otherwise approved by the county engineer:
  - (i) Boulevards built in accordance with ordinance may be designated as “Boulevard” regardless of orientation;
  - (ii) Frontage roads within a freeway right-of-way shall be assigned the suffix of “Gateway.”
10. Streets with curves, doglegs or offsets up to ninety degrees with fewer than six lots fronting on them and no intersecting streets shall maintain the same name and addressing as the street at each end.
11. Renaming of existing streets shall also be in accordance with this chapter and all other applicable city ordinances.

### Street Addresses

- A. **Requirement.** Street addresses shall be assigned, after consulting with the fire department and 911 reviews, by the city for subdivisions located within the corporate limits, or by the county engineer if within the extraterritorial jurisdiction, as part of the preliminary plat submittal. Street addresses shall be shown on the final recorded plat of the subdivision, including residential, commercial and industrial lot addresses.

Table 4.2 Street Names		
General Direction of Street	Street Length 1,000ft or More	Street Length Less than 1,000ft
North and south	Street	Place
East and west	Avenue	Court
Diagonal	Drive	Way
Curving	Drive	Lane or Circle

Blocks to be divided into lots in the future by replatting shall show the address range on the recorded plat.

### B. Standards.

1. Addresses on the north side of streets which are subdivided in a generally east-west direction shall have odd numbers assigned.
2. Addresses on the south side of the street shall have even numbers assigned.
3. Addresses on the west side of the street which are subdivided in a generally north-south direction shall have odd numbers assigned.
4. Addresses on the east side of the street shall have even numbers assigned.
5. Addresses shall be assigned numerically in intervals of four, except where otherwise approved by the planning official or county engineer.
6. Cul-de-sac having less than six lots fronting on them, or less than one hundred fifty feet in length measured from the centerline of the intersecting street to the center of the turnaround,

shall be assigned the same house numbering sequence as the main street.

7. A property not requiring a subdivision shall have frontage on a dedicated public or private street before an official street address may be assigned to it.
8. Assignment of addresses to corner lots within single-family residential subdivisions shall be determined by the location of the main entrance to the building; except that assignment of addresses to lots with nonresidential uses and having more than one street frontage shall be determined by the location of the main entrance to the building, unless otherwise requested by the property owner and approved by the director.
9. Addresses shall not be assigned to landlocked or illegally subdivided properties.
10. As adjacent territory is annexed into the city, the existing street names and addresses in the newly annexed areas shall be reviewed by the director and modified as necessary to eliminate duplication of street names already existing within the city, and to ensure that all addresses follow the numbering sequence existing in the city.

#### **4.11.5 STREET RIGHT-OF-WAY DEDICATION**

The property owner shall provide all rights-of-way required for existing or future streets, and for all required street improvements, including perimeter streets and approach roads, as shown in the thoroughfare plan

and as required by the Design Standards for Construction (DSC) or by other valid development plans approved by the city, subject to the rough proportionality provisions of this design manual. There shall be sufficient right-of-way such that sidewalks and related pedestrian activity is not impeded by the location of utilities, including solid waste pick-up, fire hydrants, and utility poles. If such right-of-way is not sufficient, then the developer and/or the respective utility shall be responsible for obtaining additional easements or right-of-way.

#### **4.11.6 TRANSITIONS OF RIGHT-OF-WAY WIDTH**

Wherever the right-of-way width of a residential, local, collector or arterial street must transition to a greater or lesser width, the transition shall not occur within an intersection but within the street right-of-way so that the right-of-way shall be the same on both sides of the street intersection. The minimum taper length of the right-of-way transition taper shall be 100 feet.

#### **4.11.7 EXTENSIONS OF EXISTING STREETS**

New streets which extend existing streets shall bear the names of the existing streets, and shall be dedicated at equal or greater right-of-way widths than the existing streets for an appropriate transition length, if applicable, unless a lesser street is justified by a TIA.

#### **4.11.8 INTERSECTIONS**

Street intersections shall be situated at an angle of ninety degrees, plus or minus fifteen degrees except where the intersection utilizes knuckles, turning heels or eyebrows in accordance with the DSC. Such intersections shall maintain proper intersection visibility as determined by the latest edition of AASHTO's

“A policy on Geometric Design of Highways and Streets.” The major access driveway to large multifamily, commercial and industrial developments shall also meet the requirements of this chapter.

#### 4.11.9 STREET OFFSETS

- A. **Minimum Offset Distances.** No combination of two streets intersecting a third shall have their centerlines offset any less than the distance specified in Table 6.1 unless a traffic impact analysis recommends a greater distance to preserve safe and efficient traffic operations. The City Manager or designee may grant an exception where infill, topographic or other physical features render the required offset unnecessary or impractical.
- B. **Configuration Shall Reduce Minimal Offsets.** Intersecting streets onto an existing or future divided roadway must be configured in accordance with Section 6.2, such that the centerline offset will accommodate the appropriate median opening and left-turn lanes (with required transition and stacking distances) on each divided roadway, and shall be aligned with any existing or proposed streets or driveways on the opposite side of the divided roadway (in order to share the median opening). Median openings and offsets should be analyzed in the traffic impact analysis, and a determination made if developments sharing a median opening may cause additional traffic conflicts, where an exception to sharing a median opening may be made.

#### 4.11.10 HALF-STREETS

Construction of half-streets shall be prohibited, except when essential to the

reasonable development of the subdivision in conforming with the other requirements of this code and the thoroughfare plan, and where the CPC makes a determination at the time of preliminary plat approval that

**Table 4.3 Minimum Offset Distances**

Types of Streets Intersecting at Offset <sup>1</sup>	Types of Street Intersected	Minimum Offset Distances <sup>2,3</sup>	
		Intersection Type A	Intersection Type B
Local/Local	Local	125 ft	125 ft
Local/Local	Collector	125 ft	125 ft
Local/Local	Arterial <sup>4</sup>	125 ft	300 ft
Local/Collector	Collector	125 ft	300 ft
Local/Collector	Arterial	125 ft	300 ft
Local/Arterial w/o median or median break	Arterial	200 ft	400 ft
Collector/Collector	Collector	250 ft	400 ft
Collector/Collector	Arterial	300 ft	400 ft
Collector/Arterial	Arterial	300 ft	400 ft

Note 1: For the purposes of this table freeways shall be considered as arterial streets with no median breaks unless an interchange is provided.

Note 2: Measured from closest property line to closest property line, as shown in the DSC. If one intersection is signalized, the minimum spacing to the next unsignalized intersection shall be 600' or as dictated by TIA.

Note 3: Existing and future signalized intersections shall be at least 2,650 feet apart in order to match the desired spacing in the thoroughfare plan and shall be required to have left turn storage in both directions. The City Manager or designee may approve a reduction to the required signal spacing to meet a specific need. The city traffic engineer may also require lining up of intersections for future or existing signalization or median breaks, as required in Sub-Section 3.8.2. Signal spacing in central business districts may be reduced upon approval of the traffic engineering division. Signals shall be spaced at least 2,650 feet or more from frontage roads.

Note 4: Local streets intersecting with an arterial with no median break shall not be required to be offset.



there is no immediate benefit to be gained by constructing the full street section since no access from the street will be needed by the subdivision in question. The CPC may also find that it would be more practical, or cost effective, to delay construction of the other half or some portion thereof of a street until when the adjoining property is developed.

#### 4.11.11 PRIVATE STREETS

- A. **Permitted Only as Local Street.** Private streets shall require approval as an exception at the time of preliminary plat approval by the City Plan Commission in accordance with this title. No streets or thoroughfares shown on the adopted thoroughfare plan may be a nonpublic street. Construction and development of private streets shall meet the standards for right-of-way width and improvement as set forth in this chapter as applied to public streets.
- B. **Classification.** At the time a private street is proposed, it shall be classified as either a local or sub-collector street, as described herein and made to conform in all respects with right-of-way paving, curb and gutter, construction, and design requirements as applicable to a public street.
- C. **Subdivision Boundary Streets.** New subdivision boundary streets shall not be private.
- D. **Private Streets, General.** In order to be considered for an exception to allow the construction of private streets, the developer shall meet the requirements set out in this section.
  1. **Construction.** All private streets shall be designed, constructed, and maintained to meet city standards. The construction and improvement plans shall be reviewed by the city

in the same manner as construction and improvement plans for public infrastructure. The city shall not participate in any portion of the cost of constructing a private street.

2. **Inspection During Construction.** All private streets shall be subject to inspections by city staff in the same manner, at the same intervals, as public streets, including the payment of applicable inspection fees. A construction schedule shall be submitted with the construction and improvement plans in order to assist in scheduling the inspections. Failure to pass an inspection and meet city construction standards shall require re-inspection, and re-construction, as necessary. No certificates of occupancy shall be released for structures along a private street until all inspections shall have been completed satisfactorily.
3. **Traffic Control Devices.** All private traffic control devices and regulatory signs shall conform to the “Texas Manual of Uniform Traffic Control Devices”, as amended, and to city standards.
4. **Restricted Access.** The subdivision homeowners association shall clearly mark entrances to all private streets with a sign, in accordance with the DSC, placed in a prominent and visible location, indicating that the streets within the subdivision are private, and not maintained nor regularly patrolled by the city. All restricted access entrances shall be manned twenty-four (24) hours every day, or they shall provide a reliable, alternative means of ensuring access into the subdivision by the City, by

emergency service providers, and by other utility or public service providers, such as postal carriers and utility companies, with appropriate identification. The method used to ensure city and emergency access into the subdivision shall be approved by the city's fire department and by any other applicable emergency service providers during the final platting process. Gates on private streets shall provide a traffic queue analysis and provide adequate on-street storage in advance of the gate. If the homeowners association fails to maintain reliable access as required by city codes, the city may enter the private street subdivision and remove any gate or device which is a barrier to access, and bill the expense to the association. If the bill is not paid, the city may file a lien for the expense against any property owned by the association.

5. **Waiver of Services.** Certain city services may not be provided for private street subdivisions, including but not limited to street maintenance, routine law enforcement patrols, enforcement of traffic and parking regulations, preparation of accident reports, and payment of costs for street lighting. A note as to waiver of services may be required on the face of the plat.
6. **Street Lighting.** Street lighting as required by this title shall be entirely at the expense of the developer and subsequent property owners. Decorative poles or alternative spacing may be approved by the City Manager or designee, following a recommendation by the CPC, who shall make such recommendation

based on the lighting type, the lumens necessary to effectuate safe traffic and pedestrian travel, and a finding that the proposed lighting plan provides as well or better for the health, safety and welfare of the future residents of the private street subdivisions.

7. **Maintenance.** The developer shall provide for the establishment of a homeowners or property owners association, in covenants, conditions, and restrictions (CCRs), to assume the obligation of perpetual maintenance of private streets and other improvements held privately, including a mandatory assessment for such private streets and improvements to be placed on all property owners within the subdivision, allowance for city staff to inspect the streets to assure they are being maintained to city standards, hold harmless provisions as required in subsection 9, and providing for notice to the city attorney and City Manager of any amendments to these relevant sections. The city shall be a necessary party for the amendment of any portions of the CCRs dealing with these requirements. The proposed CCRs shall be submitted for review by the city attorney at the time of filing the preliminary plat. The city attorney shall review the CCRs to ensure that the requirements of this section are met, and shall submit recommended changes to the developer, who shall incorporate such changes. Absence of city attorney approval of the CCRs shall require the denial of the exception for private streets.
8. **Petition to Convert to Public Streets.** A property owners association may petition the city to accept private

streets and any associated property as public streets and right-of-way upon written notice to all association members, and the favorable vote of a majority of the membership, or as required in the CCRs. A dedication instrument shall also be submitted, and shall be reviewed and the final form approved by the city attorney prior to submission of this request to city council. The city shall not be required to accept any private streets for public dedication and maintenance. The staff shall review the request and make a recommendation to CPC, who shall forward a recommendation to city council. City council shall make their decision based on the public health, safety and welfare considerations of the streets. As a condition of accepting the dedication and maintenance of

private streets, the city may impose a requirement for repairs and improvements at private expense prior to acceptance, enter into an agreement for an assessment or pro-rata sharing of costs for repairs or improvements prior to acceptance, or other legal or equitable options to ensure that the streets being accepted are not a liability to the city. The city shall be the sole judge of the nature and extent of repairs or improvements needed. The city may also require, at the sole expense of the association's or property owner's expense, the removal of any guard houses, access control devices, landscaping or other amenities located within the streets or common areas prior to city acceptance.

9. **Hold Harmless.** The property

**Table 4.4 Width for Cul-de-sac Streets and Turnarounds for Certain Activities**

Activity Served	Paving Width <sup>1</sup>	Right-of-Way Width	Additional Requirements
<b>Cul-de-sac Streets</b>			
Less than 12 dwellings	32 ft	52 ft	300 ft maximum length
1-25 dwellings	36 ft	56 ft	600 ft maximum length-Single-family, duplex only <sup>2</sup>
Nonresidential Zoning Districts (except as otherwise specified)	36 ft	54 ft	300 ft maximum length
Heavy Commercial District and Industrial Districts	40 ft	62 ft	300 ft maximum length
<b>Cul-de-sac Turnarounds</b>			
Residential and Nonresidential Zoning Districts (except as otherwise specified)	90 ft diameter	110 ft diameter or 100 ft with 10 ft utility and sidewalk easement <sup>3</sup>	Shall be a minimum of 10 ft of ROW or ROW/Easement Combination behind curb <sup>4</sup>
Heavy Commercial District and Industrial Districts	100 ft diameter	120 ft diameter	N/A

Note 1: Measured from the front of adjoining curbs.

Note 2: Cul-de-sacs (dead end streets) serving triplex, quadruplex and higher density multifamily uses shall be discouraged. Exceptions may be granted by the CPC where no alternative exists and meeting the Heavy Commercial Standard or in infill development situations.

Note 3: 7 foot to provide room for fire hydrants and other utilities, streetlights and traffic/no parking signs, and still meet ADA compliance.

Note 4: or in accordance with the DSC.



owners association, as owner of the private streets and appurtenances, shall release, indemnify, defend and hold harmless the city, any other governmental entity, and any public utility entity for damages to the private streets that may be occasioned by the reasonable use of the private streets by same, and for damages and injury (including death) arising from the condition of the private streets, out of any use of access gates or cross arms, or out of any use of the subdivision by the city or governmental or utility entity.

#### 4.11.12 CUL-DE-SAC STREETS

Cul-de-sac streets are discouraged for use in subdivision design. Except where projecting into adjacent unsubdivided areas, any street having only one vehicular access to another street shall be terminated by a permanent turnaround. Standards for both the turnaround and its street approach are set forth within this section. Exceptions to these standards shall be discouraged due to firefighting and solid waste collection requirements. Any turnaround, either temporary or permanent, that does not meet these requirements shall be permanently signed for no parking or marked as a fire lane in accordance with the DSC.

- A. **Width for Cul-de-sac Streets for Certain Activities.** That portion of any street extending from an intersection to a turnaround shall be improved and rights-of-way platted with the minimal dimensions provided in Table 4.3.
- B. **Turnaround for Cul-de-sac Streets for Certain Activities.** The turnaround portion of any cul-de-sac shall be improved, and rights-of-way platted, as prescribed in Table 4.3.

#### 4.11.13 STREET STUBS/FUTURE CONNECTIONS

Except when recommended by the City Manager or designee, no public dead-end streets will be approved unless they are provided to connect with existing streets (including stubbed-out streets) or future platted streets on adjacent land.

- A. **Lots on Future Connections.** No more than one lot (per side) can front onto the street stub/future connection unless a temporary turnaround bulb (with the appropriate temporary street easement) is provided at the end.
- B. **Maximum length and turnaround.** A street stub/future connection shall not exceed the maximum allowed length of a normal cul-de-sac, and the temporary turnaround bulb must be constructed like a cul-de-sac, as provided in Section 4.11.12 above.
- C. **Temporary Street stubs.** A note shall be placed on the final plat clearly labeling any temporary street stubs (if any) that will at some point be extended into the adjacent property. Any required temporary turnaround easements shall be shown on the final plat along with their appropriate recording information, if they are off-site or established by separate instrument.

**This page intentionally left blank**

# 5

## **Design Exceptions and Modifications**







## Chapter 5

# Design Exceptions and Modifications

### 5.1 APPLICABILITY AND VESTED

The City Plan Commission may grant exceptions to these requirements in cases where the proposed subdivision is constrained by topographic features of at least 20% grade, existing single family neighborhood development, or other impassable features, as determined by the City Manager or designee.

### 5.2 GUIDANCE ON FLEXIBILITY IN STREET DESIGN

This Street Design Manual emphasizes the concept of tradeoffs and priorities in street design to ensure that the general intent of a design can be met even if right-of-way constraints or other limiting context factors might not make all preferred parts of a design possible. These tradeoffs should occur explicitly throughout the process and be guided by design values that actively respond to their context. Generally, trade-off considerations include modal priority, determination of appropriate street design elements, and evaluations on the level of impact that regular weather conditions will have on normal street and thoroughfare operations.

#### GENERAL PRIORITIES FOR DECISION-MAKING

- Connect to existing bicycle facilities on the corridor or adjacent corridors and/or provide bicycle connections proposed in the El Paso Bike Plan
- Widen and/or connect sidewalks to those existing on the corridor or adjacent corridors where possible
- Provide additional amenities where possible (e.g., landscaping, lighting)

Additionally, to ensure consistency along a corridor, network level operations should also be considered. Trade-offs are typically required in constrained situations and should be made strategically to avoid any unintended adverse impacts on adjacent streets when determining how to fit multiple modes into a roadway.

There are many combinations of factors related to the design of a street including, but not limited to; constraints on the right-of-way, particular access needs, accommodating space for parking, streetscaping, as well as other additional curbside uses. The El Paso Street Design Manual focuses on providing a general set of Cross-Sections that include more detail on the decision factors that would finalize a design for a certain corridor. This becomes especially important for achieving certain designs on existing street

while ensuring an overall consistency in the Functional Classification as they transition into newer areas of the City.

Depending on existing amenities, existing context, project type, and priority these trade-off considerations could include the following<sup>1</sup>:

- Removal or reduction of medians
- Inclusion of streetscape elements (such as planter strips, hardscape, or sidewalks)
- Removal of the parking lane on one or both sides of the street to make space for the inclusion of dedicated lanes for other modes of transportation (such as bicycle lanes)
- Removal or reduction of the Amenity Zone (in exceptional circumstances)
- A “Road Diet,” or the removal or reduction of motor vehicle lanes

Where constraints prevent the accommodation of a certain mode on a street that is recommended within the Design Criteria values, the broader network should be reviewed. In some instances, such modes may be accommodated on a parallel street, for example.

Since the El Paso Street Design Manual is intended to be used as a guide for the implementation of a broad range of thoroughfares—including both existing constrained rights-of-way and new rights-

of-way dedicated with development—it is important to understand how trade-off considerations should be made. To explain the process through which trade-offs and design decisions should be made, Table 3.2 summarizes general guidelines according to each functional classification and street type.

Section 3.1 (and specifically Tables 3.1 and 4.1) provides an overall summary of recommended guidance for each combination of functional classification and area types. More specific trade-off priority level details are included on each cross-section diagram, presented in Sections 4.2-4.8, with the aim of providing direction on where trade-offs need to be made for certain conditions.

### 5.3 DESIGN PRIORITIZATION FOR MODIFICATION OF TYPICAL SECTIONS

Table 5.1 below, identifies allowable modifications to typical sections based on roadway type, location and sector. Adjustments to number of travel lanes will be made based on a TIA.

Note 1: Existing landscaping and or illumination shall be taken into consideration before removal.

**Table 5.1 General Design Flexibility Guidance for Thoroughfare Corridors**

		Major Arterial		Minor Arterial	Collector	Local
KIT-OF-PARTS APPROACH TO THE CROSS SECTIONS						
Compact Urban	G-1, G-2, O-7	Basic Cross Section <sup>1</sup>	4-6 lanes without median, with parking, sidewalk, and parkway with trees	Two lanes without median or four lanes with median, with parking, sidewalk, and parkway with trees	Two lanes without median, with parking, sidewalk, and parkway with trees	Two lanes, with curb, parking, sidewalk, and parkway with trees
		Is it designated in the Bike Plan?	Volumes of 6,000 vehicles per day (VPD) or greater and posted speed of 25 MPH or greater, consider cycle track or shared use path Volumes less than 6,000 vehicles per day (VPD) and posted speed of less than 25 MPH, consider buffered bike lanes, bike lanes or bicycle boulevard		Add Cycle Track, buffered bike lanes, bike lanes or bike boulevards	Add bike lanes or a bike boulevard treatment
		Special context factors?	Substitute parkway/ tree well with hardscape		Substitute parkway/ tree well with decorative features	
Drivable Suburban	G-3, G-4, G-5, G-7, G-8, G-9	Basic Cross Section <sup>1</sup>	Four lanes with median, with sidewalks and parkway with trees	Two lanes without median or four lanes with median, with sidewalks and parkway with trees	Two lanes without median, with sidewalk and parkway with trees	Two lanes, with curb, sidewalk, and wider parkway with trees
		Is it designated in the Bike Plan?	Volumes of 6,000 vehicles per day (VPD) or greater and posted speed of 25 MPH or greater, consider cycle track or shared use path Volumes less than 6,000 vehicles per day (VPD) and posted speed of less than 25 MPH, consider buffered bike lanes, bike lanes or bicycle boulevard			
		Special context factors?	Add median (continuous or at major intersections only)			
Rural	G-6, O-3, O-4, O-5, O-6	Basic Cross Section <sup>1</sup>	Two lanes without median or 4 lanes with median, with shared use path and equestrian trail and swales	Two lanes without median, with shared use path and equestrian trail and swales		Two lanes without curbs, with equestrian trail (optional) and swales
		Is it designated in the Bike Plan?	Buffered bike lanes or shared use path			
		Special context factors?	In Rural Settlement area types, add sidewalks			

Note 1: Adjustments to number of travel lanes will be made based on a TIA.

**GROWTH SECTORS**

G-1 Downtown  
G-2 Traditional N'hood  
G-3 Post-War  
G-4 Suburban  
G-5 Independent City  
G-6 Rural Settlement  
G-7 Industrial  
G-8 Fort Bliss Mixed Use  
G-9 For Bliss Military

**OPEN SPACE SECTORS**

O-1 Preserve  
O-2 Natural  
O-3 Agriculture  
O-4 Military Reserve  
O-5 Remote  
O-6 Potential Annexation  
O-7 Urban Expansion

*Plan El Paso Future Land Use Base Sectors*

**This page intentionally left blank**



# 9

## **Access and Connectivity**





## Chapter 6

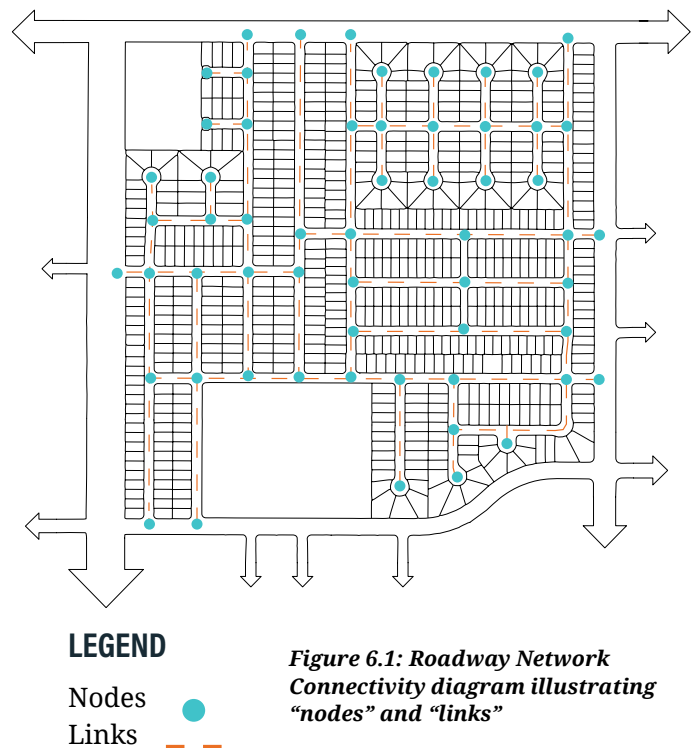
# Access and Connectivity

### 6.1 ROADWAY NETWORK CONNECTIVITY

#### 6.1.1 APPROACH ROADS AND ACCESS

All subdivisions with a single point of access must have no roadway, or link, that exceeds three hundred feet or sixty dwelling units from the access point or an average daily traffic (ADT) of greater than one thousand two hundred. All other subdivisions must have at least two points of vehicular access, and must be connected with improved roadways to the city's improved thoroughfare and street system by two or more approach roads of the dimensions and standards hereinafter set forth. An access road that is divided with twenty feet in each direction to the intersection of two streets shall be considered two means of access.

- A. Requirements for dedication of right-of-way and improvement of approach roads, signalization, median breaks, additional lanes and other traffic mitigation or safety improvements may be increased depending upon the size or density of the proposed development, or if the need is demonstrated by traffic impact analysis (TIA).
- B. An exception for a subdivision may be allowed by the City Plan Commission



*Figure 6.1: Roadway Network Connectivity diagram illustrating "nodes" and "links"*

(CPC) provided a second emergency access that is controlled in a manner acceptable to the fire marshal shall be provided.

- C. Each nonresidential lot shall have a minimum frontage on a dedicated public street as required by the applicable zoning, unless other provisions have been authorized through a commercial unit development with cross access easements to the property. The City Plan Commission may approve alternative solutions provided the intent of providing adequate emergency access for public safety vehicles is met.
- D. Adequate lighting of access points shall be coordinated with the Streets and Maintenance Department and provided by the subdivider.

### 6.1.2 STREET SPACING GUIDELINES

The basic form of the thoroughfare system is shaped by the spacing and alignment of arterial thoroughfares. The system of arterials should be continuous and networked in a general rectilinear form. In urban areas, arterial spacing may need to be one-half mile or less. In denser urban centers and core areas, arterials may need to be spaced at one-quarter mile or less.

In more conventional suburban areas that are intended to remain so, arterial spacing of up to one mile may suffice if facilities of up to six lanes are acceptable to the community. The arterial thoroughfares should be supplemented by thoroughfares spaced at most one-half-mile apart. Such areas typically are interspersed with areas of mixed-use and walkable activity, such as commercial districts and activity centers. These centers require more frequent and connected networks of local streets.

Closer spacing of thoroughfares (one-quarter

mile for collectors) may be needed depending on pedestrian activity levels, desired block patterns and continuity. Natural features, preserved lands, or active agriculture may break up the pattern.

Local streets should be configured in a fine-grained, multimodal network internal to the neighborhood, with many connections to the system of thoroughfares. Where streets cannot be fully networked, they should be supplemented by pedestrian and/ or bike-pedestrian facilities to provide the desired connectivity.

Pedestrian facilities should be spaced so block lengths in less dense areas (suburban or general urban) do not exceed 600 feet (preferably 200 to 400 feet) and relatively direct routes are available. In the densest urban areas (urban centers and urban cores), block length should not exceed 400 feet (preferably 200 to 300 feet) to support higher densities and pedestrian activity.

All proposed developments must have a connectivity index of 1.4 or greater. The connectivity index shall be calculated by dividing the total number of links (streets including stub-out streets) by the total number of nodes (intersections, culs-de-sac, no-outlets, dead-ends).

The city plan commission may grant exceptions to these requirements only upon a finding that the development is constrained by topographic features, existing development or other impassible features. The grant of the exception requires the affirmative vote of at least three fourths of all members of the city plan commission.

### 6.1.3 LENGTH OF A BLOCK OR STREET SEGMENT

The maximum length of any block or street segment (including a looped street) shall be



one thousand six hundred feet along arterial streets, except that where lots are designed under Sub-section 6.2.5, blocks may not exceed eight hundred feet. Block faces shall not exceed one thousand feet along other streets and the full perimeter of a block shall not exceed two thousand four hundred feet except when Section 5.2 specifies otherwise or where topographic features or parcels of one-half acre or larger would justify an exception from this requirement. Cul-de-sac streets shall adhere to Sub-Section 6.1.4 or other requirements herein. Measurements shall be as measured along the centerline of the street from the centerline or center point of one intersection to the centerline or center point of the next intersection. For the purposes of measurement, either a full four-way intersection or a “T” three-way intersection shall be considered an intersection. Traffic calming may be provided by the developer or may be required in accordance with the adopted Neighborhood Traffic Management Policy and in accordance with the DSC by the City Manager or designee.

The length of a block or street segment may exceed the maximum length stated above under the following conditions:

1. Blocks containing retention or detention ponds, and
2. Blocks containing parks.

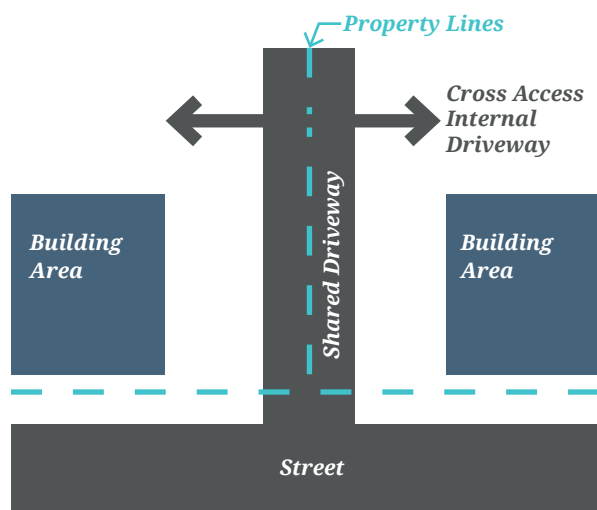
#### **6.1.4 MAXIMUM LENGTH OF A CUL-DE-SAC STREET**

- A. Cul-de-sacs should be discouraged in subdivision design.
- B. No cul-de-sac served by one access point in any single-family, multiple-family, industrial, or commercial subdivision shall exceed six hundred feet in length or the length as shown in Table 4.3, whichever is less.
- C. No cul-de-sac in any single-family subdivision district shall be designed to serve more than twenty-five single-family dwelling units, unless an exception is granted by the CPC to the maximum length, in which case the maximum number of dwelling units shall be increased in the same percentage as the maximum length has been increased.
- D. For purposes of this paragraph, cul-de-sac length shall be measured along the centerline of the cul-de-sac from a point beginning at the intersection of the cul-de-sac street with the centerline of the street from which it extends to the center of the turnaround at the end of such cul-de-sac. (Also see Sub-section 4.11.12 for cul-de-sac requirements.) For the purposes of measurement, either a full four-way intersection or a “T” three-way intersection shall be considered an intersection.
- E. An exception may be granted by the City Plan Commission to develop a parcel:
  1. With topographic problems;
  2. With Arroyos or environmental areas requiring protection surrounding such parcel;
  3. That is effectively landlocked with no other alternative than a cul-de-sac exceeding six hundred feet;
  4. Is in a proposed subdivision that has such a unique configuration that the only way to serve the area in question is with a cul-de-sac exceeding six hundred feet. Such exception shall not be granted if the length of the cul-de-sac can be reduced by connection to an adjacent and/or parallel street. The desire to gain additional lots from the cul-de-sac exception by itself is not

reason enough to grant such exception to the maximum length;

5. Additional modifications may be required by the City Plan Commission upon recommendation by the fire marshal's office including intermediate turnarounds (eyebrows) to accommodate emergency vehicles being provided at a maximum distance of six hundred feet;
6. Building construction within the area of the cul-de-sac beyond the six hundred feet distance shall be fire sprinklered and a note shall be added to the recording plat and the subdivision improvement plans indicating that buildings are required to be sprinklered within the subdivision, and which lot numbers have such requirement.

## 6.2 DRIVEWAYS AND ACCESS MANAGEMENT



**Figure 6.2 Shared Access Driveway & Cross Access Internal Driveway**

### 6.2.1 DRIVEWAY APPROACHES AND RELATED REQUIREMENTS

Driveway approaches, curbs, gutters, pavements and appurtenances on public property and other facilities to provide access to abutting properties in the city and ETJ in connection with platting or building construction shall be constructed, provided, altered or repaired in accordance with the City of El Paso Design Standards for Construction (DSC) and as prescribed by the standards outlined within this title.

### 6.2.2 ACCESS MANAGEMENT

Roadway access management standards and requirements related to TXDOT roadways and city roadways shall be in accordance with this ordinance, the DSC, all other city and TXDOT regulations, and as determined by the traffic impact analysis.

### 6.2.3 SHARED DRIVEWAYS AND CROSS-ACCESS DRIVES

A. **Type II Driveway Approaches and Shared Driveways.** Shared access driveways in relation to Type II driveways are encouraged and may be required by the City Manager, or designee in order to ensure public safety access by providing mutual/common access to a median opening, to minimize the number of driveway cuts on streets, thereby maintaining street mobility, and to facilitate traffic flow between adjacent lots. (See Figure 6.2)

1. **Arterial Street.** A shared mutual access easement(s) for a driveway(s) may be required between adjacent lots fronting on an arterial street, as designated on the thoroughfare plan (as the street exists or is planned to be improved in the future).

2. **Location and Dimension.** The location and dimensions of such easement(s) shall be determined by the City Manager or designee.
3. **Easement on Plats.** Such easements shall be noted on the preliminary plat and final plat with the language specified as part of the city's application requirements.

**B. Type II Driveway Approaches and Cross Access Internal Driveways.** Cross access easements for internal driveways are encouraged and may be required as part of the preliminary and final plat approval by the City Manager, or designee in order to minimize the number of driveway cuts on streets, thereby maintaining street mobility, and to facilitate traffic flow between adjacent lots.

1. **May Be Required.** A cross access easement(s) for an internal driveway(s) may be required between adjacent lots. Such easement shall be required between adjacent properties within the same plat, phases of plats or ownership when the following conditions exist:
  - a. On arterial frontages between adjacent parking lots;
  - b. Between lots when one or more do not have direct access to the thoroughfare;
  - c. When accessing shared driveways;
  - d. On arterial lots in close proximity to intersections where individual lot driveways do not align with median breaks, thereby giving each lot access to a median break.

- C. **Location and Dimension.** The location and dimensions of such easement(s) shall be determined by the City Manager or designee.
- D. **Easement on Plats.** Such easements shall be noted on the preliminary plat and final plat with the language specified as part of the city's application requirements.

#### 6.2.4 MEDIAN OPENINGS

Common access to median openings from driveways should be discouraged due to increase of potential conflict points and collisions.

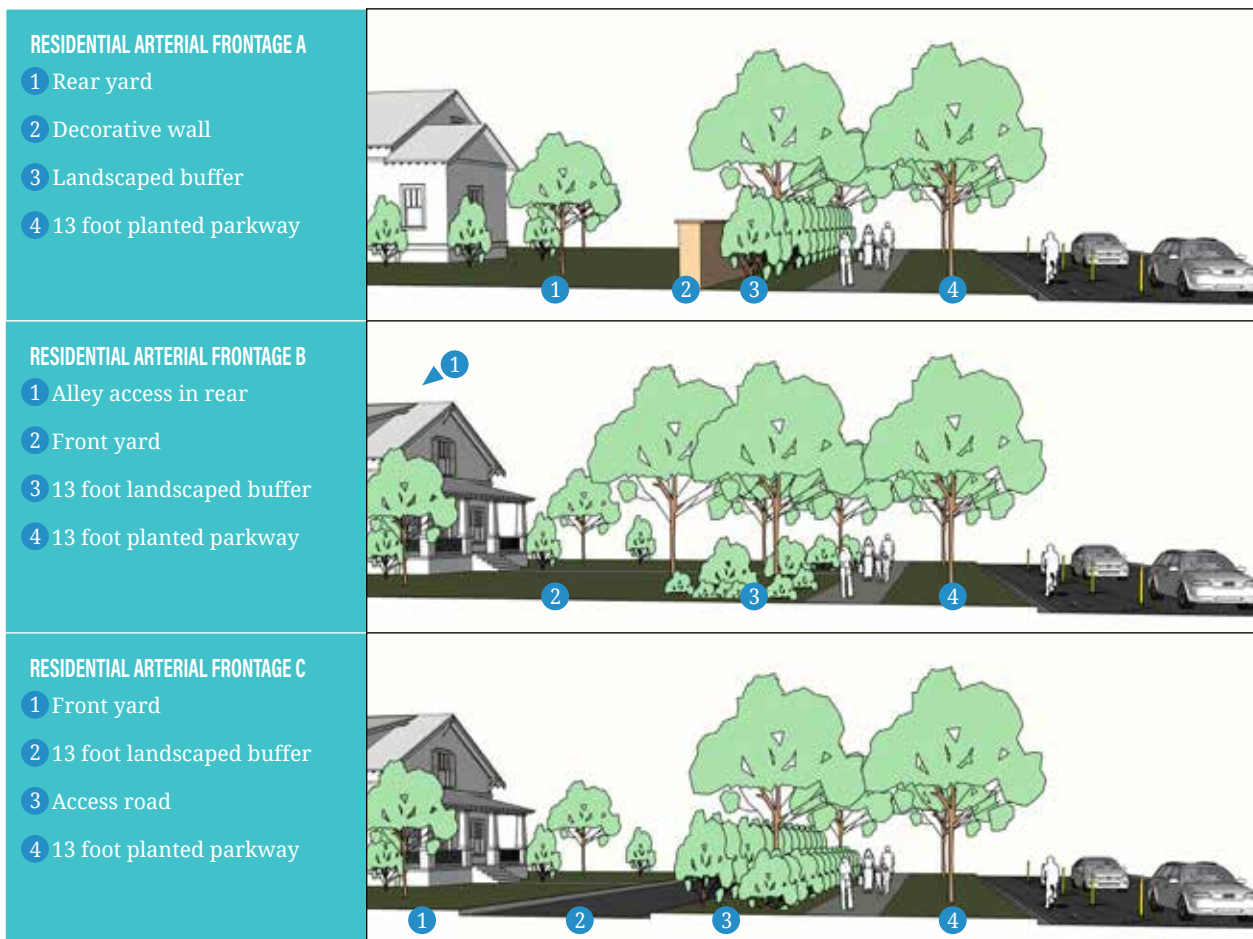
#### 6.2.5 LOTS ACCESSING ARTERIAL STREETS

Where a subdivision abuts or contains an existing or proposed arterial street, the City Manager, or designee may require that single-family lots shall not directly access an existing or proposed arterial and no residential lot frontage, other than the side of the lot with no access, shall be allowed on arterial streets, except where the proposed subdivision meets one or more of the following criteria:

- A. **Adjoining Property Frontage.** Where residential lot frontage is provided from an arterial street on an adjoining property, and the City Plan Commission determines that a public benefit would result from permitting the proposed development to be similarly designed.
- B. **Physical Limitations.** Where the only street frontage which may be provided to the residential lots is from an arterial street due to the shape, topography or other physical condition of the property.
- C. **Design Requirements.** Where residential lot frontage is proposed on an arterial street, the block face and lot(s) facing the arterial shall meet the following

requirements:

- a. Lots shall be accessed from an alley at the rear of the property.
- b. Lots shall not have driveway access to the arterial.
- c. The development shall provide street trees placed at thirty feet on center along the entire block face where lots face the arterial.
- d. The arterial shall provide for on street parking.
- e. The sidewalk width along the entire face of the block with lots facing the arterial shall be a minimum of six feet.
- f. The parkway along the entire face of the block with lots facing the arterial shall be a minimum of thirteen feet.



**Figure 6.3 Design Visualizations for lots fronting an arterial roadway.** Decorative walls will comply with Title 20 - Zoning and are shown to illustrate recommended treatments for residential lots fronting arterial roadways.







# Street Lighting

7







## Chapter 7

# Street Lighting

### 7.1 PURPOSE AND APPLICABILITY

The subdivider shall furnish and install streetlights along all public and private streets, whether within the corporate limits or within the extraterritorial jurisdiction. Such streetlights shall comply with the requirements of this title, the City of El Paso lighting ordinance found in Title 18, the City's Building and Construction Standards and with the requirements of the DSC. The standards shall apply in determining the number of streetlights required, and are based on approved standards of the American National Standards Institute and the Illuminating Engineering Society of North America, a copy of which is maintained by the city.

### 7.2 CONTEXTUAL STREET LIGHTING

Lighting can and should vary between various contexts. Lighting of rural roadways may be desired, but the need is much less than in Compact Urban areas. Lighting of rural areas is not well justified except in certain areas including intersections, railroad grade crossings, bridges and tunnels, sharp curves and where roadside interferences are present.

Compact Urban and Drivable Suburban roadway lighting is necessary to enhance

safety. General fixed-source roadway lighting is mounted on a support pole at least 30 feet above the roadway surface. Pedestrian-scale lighting is fixed-source lighting mounted at a lower height than other roadway lighting, generally only 15 feet above grade. It is essential for illuminating sidewalks, crosswalks, bike lanes and other multi-modal facilities. Pedestrian-scale lighting should be used in any contexts where relatively high volumes of pedestrian activity are anticipated such as transit stops, educational and medical institutions and mixed use or commercial areas.

#### 7.2.1 LIGHTING PLANNING & DESIGN

All projects that involves a roadway is to be evaluated for lighting requirements. This includes:

1. Land development, including new roadways
2. Upgrades to existing roadways with geometric modifications
3. Upgrades to existing roadways without geometric modifications
4. Retrofits to an existing roadway lighting system

The design of a roadway lighting system

needs to take into consideration various factors including:

- Safety – the primary objective of roadway lighting is to enhance road user safety by providing road users with improved nighttime visibility of roadway conditions and potential hazards.

Light poles, transformers and cabinets present potential hazards to errant vehicles. Therefore, take careful consideration of installation locations. In addition, location is crucial for maintenance crews to be able to conduct activities in a safe, economical and effective manner.

Evaluate Clear zones. The clear zone is the preferred location for installing elements associated with the lighting system whenever it is possible. The width of the clear zone is dependent on the traffic speed, traffic volumes, road geometry, and alignment. For more information regarding clear zones, refer to the AASHTO Roadside Design Guide.

- Cost – A proposed design shall include Estimates for Capital costs, Operating costs and Life Cycle costs. Operating cost calculations should include maintenance and energy costs.
- Optimization of Lighting – In general, design a roadway section requiring lighting to use the least amount of lighting infrastructure possible to provide the recommended amount of light for roadway user safety. Evaluate photometric reports of various products and select luminaires with optics most suitable for a given application. Optimize the design and use the fewest number of luminaires and poles, reducing both

capital and life cycle costs.

The use of few poles also improves the roadway aesthetics, reduces visual clutter, and enhances safety by reducing the possibility of collisions with poles by errant vehicles.

- Aesthetics – Roadway aesthetics are most heavily influenced by the pole height and layout. In areas with high pedestrian volumes such as downtown and entertainment districts, the use of shorter poles, for a more pedestrian – scale appearance, is recommended.
- Environmental Consideration – some street locations pose special environmental concerns related directly to lighting. Designers should consider how to mitigate the negative effects of roadway lighting when designing for these special situations. This includes:
  1. Vehicle-wildlife conflict areas. Give consideration to light areas past the roadway edge. This will assist roadway users in identifying wildlife entering the roadway or adjacent areas and may aid road users in avoiding collisions with animals. The use of approved taller poles with a longer setback from the roadway will facilitate a wider lighted area.
  2. Obtrusive light impacts – Design the lighting system so it minimizes obtrusive light impacts particularly in urban areas and address dark sky compliance, light trespass, sky glow, and offsite glare.
- Site conditions – The lighting designer should work with the landscape designer to find the best locations for trees and bushes with respect to the luminaires.

In all cases, the lighting should take precedence over the installation and maintenance of trees and bushes.

- Collision data and investigations – The designer should use this information to improve lighting to recommended levels within areas that have a history of collisions involving vehicles and pedestrians.

### 7.2.2 LIGHTING DESIGN PROCESS

**Visual Task.** Designers should completely understand the visual task in a given setting. The designer often thinks only in terms of the driving task. Take into account seeing pedestrians, dropping off passengers, viewing elements within the streetscape, reading signs, and other driving tasks related to urban areas. Other users include pedestrians and bicyclists, which also require adequate lighting for their tasks.

**Design Considerations:**

1. Impact of headlights. Generally, roads designed for speeds of 30mph or less do not require additional illumination, vehicle headlights are sufficient.
2. “Because it is dark” is not a reason for installing street lighting. Carefully evaluate the reason and purpose the requirement for installing street lighting
3. Location Considerations:
  - Pole locations should be compatible with driveway entrances, property lines and windows of residential dwellings and be aware how pole location affects the adjacent properties not just the site.
  - Pole locations should be coordinated with physical obstructions such as trees, distribution transformers,

utility enclosures and other utility infrastructure. Avoid installing street lighting on El Paso Electric poles as much as possible.

- Installation of Street lighting fixtures on poles/structures not owned by the City of El Paso is not permitted. The only exceptions are poles owned by El Paso Electric, and only if there are no other options available for installing a fixture. The El Paso Electric Co. and Streets and Maintenance Department must approve this installation prior to design approval.
  - No portion of the street lighting system shall be installed on private property.
  - Always check clearance to overhead power lines.
  - Coordinate with The El Paso Electric Co. at the pre-design phase to determine service availability and location of power drops.
  - Additional lighting may be needed for streets near playgrounds, green spaces, or school zones.
4. Equipment considerations
    - Dark sky compliance now asks for fixtures with light spectrum Color Coordinated Temperature (CCT) of 3000K or less. Color rendering Index (CRI) of fixtures should be no less than 70%
    - In keeping with environmental concerns the up-light rating in B-U-G rating system shall be zero (0).
    - Decorative street lights are not considered street lighting. Decorative lighting is designed for improving

aesthetics and not roadway safety.

5. Safety and security - lighting may not ensure security, but the presence of lighting may provide a sense of security.
6. Other recommended considerations
  - All streets shall be illuminated as per their classification as determined by the proper warrants. See table below.
  - The B-U-G rating for a particular street's luminaires, shall not serve to compromise the design criteria as determined by the street design classification and pedestrian classification.
  - Environmental Lighting Zones shall have no influence in the selection of the proper street classification.
  - No off-road lighting shall be considered in determining a street classification, nor shall any off-road lighting contribution be used to achieve the minimum lighting requirements of a classification.
  - Street lighting design shall be restricted as much as possible to the roadway area. However, it may be desirable to extend the lighting to adjacent areas such as sidewalks.
  - Off-road lighting installations shall take into consideration any adjacent streets so as not to create any safety issues for drivers.
  - Metal street light poles placed within streets with a posted speed limit greater than 30mph require a breakaway device.
  - Luminaire and pole Location should

be such as not to obstruct sidewalks or to provide enough clearance for placement of a sidewalk where none exists.

### 7.2.3 PRE DESIGN

The designer is expected to evaluate and understand the roadway geometrics and utility locations both overhead and underground prior to beginning the design.

The design must be coordinated and integrated with all civil design elements.

The designer is expected to be familiar with the City of El Paso light ordinances and National Electric Code requirements.

The designer is expected to investigate the site conditions. This includes proper assessment of the condition of existing equipment. Google maps investigations are not proper site condition investigations.

Lighting systems near railroad tracks have specific track-clearance requirements which are covered at the end of this chapter. Coordination with the proper railroad authority may be necessary and any approvals by them secured during this phase of the design.

Coordination with El Paso Electric Company is required at this stage to determine power service requirements, location of power drops and if any transformers or equipment needs to be installed or ordered. In addition, any conflicts with distribution and transmission lines and clearance distances owned by The El Paso Electric Company are to be cleared by them.

Environmental issues of concern are offsite glare, light trespass, and sky glow. Also, be aware of community concerns.



Take into consideration maintenance and operations into the design. Materials used should be corrosion resistant and durable. It is critical that luminaires be safely accessible with minimal disruption to traffic. Consult with the Streets and Maintenance Department's Street Lights section during this phase.

Poles can be a potential hazard to errant motor vehicles. Clear zones and pole placement issues should be known and addressed.

Historical traffic data. Consult with the Streets and Maintenance Traffic section for historical information regarding hazardous locations and problematic locations with recorded collision statistics. Problematic areas should be identified and solutions discussed.

Historical Districts. Consult with the City of El Paso Historical district for any limitations or restrictions to the design of the lighting system.

## 7.3 STANDARDS

The classifications in Table 7.1, Table 7.2 and Table 7.3 shall be used for purposes of this chapter.

### 7.3.1 HIGHWAY LIGHTING VS. STREET LIGHTING

The intent of this chapter is to provide guidance in planning and designing street lighting. To assist with this a definition for both highway lighting and street lighting are given.

Highway lighting refers to lighting that is provided for freeways, expressways, limited access roadways, and roads on which pedestrians, cyclists, and parked vehicles are generally not present. The primary purpose

of highway lighting are to help the motorist remain on the highway and help with the detection of obstacles within and beyond the range of the vehicle's headlights.

Street lighting refers to lighting that is provided for major (arterial), collector, and local roads, where pedestrians and cyclists are generally present during hours of darkness. The primary purpose of street lighting are to help the motorist identify obstacles, provide adequate visibility of pedestrians and cyclists, and assist in visual search tasks, both on and adjacent to the street.

### 7.3.2 RESIDENTIAL STREET LIGHTING

Designers should always maintain the recommended light levels for residential streets as for any other roadway. General objectives that can be achieved in a residential street lighting installation include:

1. pedestrian and driver safety
2. crime reduction
3. comfortable use of residential neighborhood streets after dark
4. obtrusive light control
5. minimized power usage
6. community and neighborhood ambience

#### Location Consideration

1. Pole locations should be compatible with driveway entrances, property lines, and windows of residential dwellings.
2. Pole locations should be coordinated with physical obstructions such as trees, distribution transformers, utility enclosures and other utility infrastructure. Minimize the number

**TABLE 7.1 - CLASSIFICATIONS AND DEFINITIONS FOR ILLUMINATION DESIGN (MAY DIFFER IN OTHER DOCUMENTS, ZONING CODES, BUILDING CODES, AND AGENCIES)**

STREET CLASSIFICATION	DESCRIPTION
Major Street	Principal network for through-traffic flow. Connect areas of principal traffic generation and important rural roadways entering and leaving the city. Primary and secondary arterials and thoroughfares.
Collector Street	Road servicing traffic between major and local streets. Used mainly for traffic movements within residential, commercial and industrial areas. Used for truck or bus movements.
Local Street	Direct access to residential, commercial, industrial or other abutting property.
Alley	A narrow public way within a block, generally used for vehicular access to the rear of an abutting property.
Isolated Traffic Area	Where an increased potential exists for collisions between vehicle, between vehicles and pedestrians, and/or between vehicles and fixed objects. Examples include intersections, crosswalks, and merge areas.
Median	Portion of a divided roadway physically separating the traveled ways for traffic in opposite directions

**TABLE 7.2 - PEDESTRIAN ACTIVITY CLASSIFICATIONS FOR LIGHTING DESIGN**

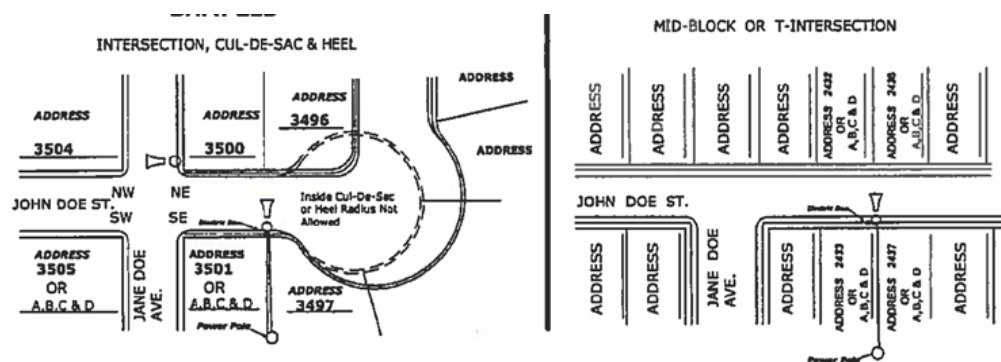
PEDESTRIAN ACTIVITY AREAS	DESCRIPTION	DESIGN CONSIDERATION
High	Commercial areas with high nighttime pedestrian activity.	The use of both horizontal and vertical illuminances is recommended for design
Medium	Community facilities such as libraries and recreation centers.	Pedestrian safety and providing guidance to primary travel ways are key elements in the design.
Low	Direct access to residential, commercial, industrial or other abutting property.	Allow both driver and pedestrian to visually orient in the environment, detect obstacles, identify other pedestrians, read street signs and recognize landmarks.

**TABLE 7.3 - PAVEMENT CLASSIFICATIONS FOR LIGHTING DESIGN**

Pavements can be grouped into a limited number of standard road surfaces (Class) having specific reflectance ( $Q_0$ ) characteristics. Calculations where pavement luminance or Small Target Visibility (STV) are used, reflectance values may be taken from Table

CLASS	$Q_0$	DESCRIPTION	MODE OF REFLECTANCE
R1	0.10	Portland cement concrete road surface Asphalt road surface with a minimum of 12% aggregate composed of artificial brightener (e.g. Synopal) aggregates. (E.g. labradorite, quartzite)	Mostly Diffuse
R2	0.07	Asphalt road surface with an aggregate composed of a minimum 60% gravel (size >1 cm) Asphalt road surface with with 10 to 15 percent artificial brightener in aggregate mix. (Atypical for North America)	Mixed (diffuse and specular)
R3	0.07	Asphalt road surface (regular and carpet seal) with dark aggregates (e.g. trap rock, blast furnace slag); rough texture after some months of use. (typical highway)	Slightly Specular
R4	0.08	Asphalt road surface with very smooth texture	Mostly Specular

- of poles to pole clutter and improve aesthetics.
3. Luminaire orientation on curves shall be oriented at 90 degrees perpendicular to the tangent of the curve. Street light poles placed on the outside of a curve and center medians have a greater tendency of being struck by a vehicle. Consider this as to the placement of the street light. From an errant vehicle perspective, it is preferred that the luminaire and pole be placed on the inside curve rather than the outside curve and on the parkway (left and right sides of the road) instead of the center medians.
  4. All luminaires for street lighting shall be full cut off and dark sky compliant. Up lighting rating (U) shall be zero (0).
  5. Keep light trespass to a maximum of 0.05fc at the property line in residential areas and 0.1fc in commercial districts whenever possible. This restriction however, should not compromise the minimum requirements for safely illuminating for a roadway.
  6. Fixtures with a B-U-G ratings of no more than 1-0-2 shall be used in residential street lighting.
  7. BUG ratings - Residential streetlights with design speed of 30mph or less and low pedestrian traffic. should have an Up Light (U) rating of 0 and a Glare (G) rating no greater than 2. The BUG rating however, shall not compromise the design criteria as determined by the street design classification and Pedestrian classification.
  8. Keep back lighting to a minimum to allow illumination of the sidewalk but close the 0.5 fc at the property line.
  9. Arterial lighting should meet the requirements of the street Design Classification and Pedestrian Classification.
  10. Environmental Lighting Zones shall have no influence in the selection of the proper Street Classification.
  11. Place streetlights perpendicular to the street. At intersections, the light shall illuminate as shown in Fig. 7.1. Place streetlights beginning of a cul-de-sac or heel.
  12. Place streetlights as close to between property lines as shown in Fig 7.1 below.
  13. For street lighting, the recommended



**FIGURE 7.1 LIGHTING REQUIREMENTS FOR RESIDENTIAL STREET LIGHTING**

**TABLE 7.4 - ILLUMINATION REQUIREMENTS**

Street Classification	Pedestrian Activity Classification*	Average Luminance $L_{avg}$ (cd/m <sup>2</sup> )	Average Uniformity Ratio $L_{avg}/L_{min}$	Maximum Uniformity Ratio $L_{max}/L_{min}$	Maximum Veiling Luminance Ratio $L_{v,max}/L_{avg}$
Major	High	1.2	3.0	5.0	0.3
	Medium	0.9	3.0	5.0	0.3
	Low	0.6	3.5	6.0	0.3
Collector	High	0.8	3.0	5.0	0.4
	Medium	0.6	3.5	6.0	0.4
	Low	0.4	4.0	8.0	0.4
Local	High	0.6	6.0	10.0	0.4
	Medium	0.5	6.0	10.0	0.4
	Low	0.3	6.0	10.0	0.4

Table Notes:

\* Pedestrian Activity Classifications are defined in Section 11.3.3.

$L_{avg}$ : Maintained average pavement luminance

$L_{min}$ : Minimum pavement luminance

$L_{v,max}$ : Maximum veiling luminance

method of calculation is luminance. For cul-de-sacs the recommended method of calculation is illuminance. For minimum luminance requirements use table 7-4

- ii. Collector (C) roadway: 1,500 to 3,500 vehicles ADT
- iii. Local (L) roadway: 100 to 1,500 vehicles ADT

### 7.3.4 INTERSECTIONS, ROUNDABOUTS AND CROSSWALKS

The following definitions shall be used for purposes of this chapter:

1. Intersection – The general area where two or more roadways cross at the same level. Also called a grade intersection
2. Isolated intersection – a lighted area in which two or more non-continuously lighted roadways join or cross at the same level.
3. Crosswalk – any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by lines on the surface, which may be supplemented by contrasting pavement texture, style, or color.
4. Intersection Classifications: Each intersecting street or roadway may be classified as one for the following based on the average daily traffic (ADT):
  - i. Major (M) roadway: Over 3,500 vehicles ADT,

Note: these street classifications apply only to Table 7.5 for determining intersection lighting levels.

5. Full Intersection Lighting – Used for continuous lighting situations. If an intersecting roadway is illuminated above the recommended value, then the intersection illuminance value should be proportionately increased. The corresponding uniformity ratio should meet the highest roadway classification.
6. Light poles should be positioned in advance of the crosswalk to improve visibility in the crosswalk by providing improved vertical illuminance and positive contrast.
7. Partial Intersection Lighting (Isolated Intersections) – a lighting system that is put in place to provide lighting at points of potential conflict. Not continuous lighting.
8. Delineation (beacon) lighting – Lighting that marks an intersection location for approaching traffic, lights vehicles on a cross street, or lights a median crossing.



**TABLE 7.5 - ILLUMINANCE CRITERIA FOR FULL INTERSECTION LIGHTING (lux/fc)**

Illuminance for Intersections				
Functional Classification	Pedestrian Activity Level Classification			$E_{avg}/E_{min}$
	High	Medium	Low	
Major/Major	34/3.2	26/2.4	18/1.7	3.0
Major/Collector	29/2.7	22/2.0	15/1.4	3.0
Major/Local	26/2.4	20/1.9	13/1.2	3.0
Collector/Collector	24/2.2	18/1.7	12/1.1	4.0
Collector/Local	21/2.0	16/1.5	10/0.9	4.0
Local/Local	18/1.7	14/1.3	8/0.7	6.0

**TABLE 7.6 - ILLUMINANCE CRITERIA FOR PARTIAL (ISOLATED) INTERSECTION LIGHTING (lux/fc)**

Road Classification	Pavement Classification			Uniformity Ratio $E_{avg}/E_{min}$
	R1 lux/fc	R2 & R3 lux/fc	R4 lux/fc	
Major	6/0.6	9/0.8	8/0.7	3.0
Collector	4/0.4	6/0.6	5/0.5	4.0
Local	3/0.3	4/0.4	4/0.4	6.0

### Design Considerations

Design considerations are typical for all roadway-related lighting designs.

1. Safety – Consider the placement of poles, transformer, cabinets and establish clear zones as described in AASHTO documents. Evaluate possible glare situations.
2. Site Conditions – Investigate site conditions to establish the context in which the lighting design will be completed. Take into account land use, traffic and pedestrian activity levels, intersection and roadway geometry and classification and potential hazards.

### Design Criteria

Establish the design criteria prior to starting the lighting design:

- Light levels and uniformity requirements
- Pavement classifications
- Full, partial, or delineation lighting
- Local policies and ordinances

### Design Elements

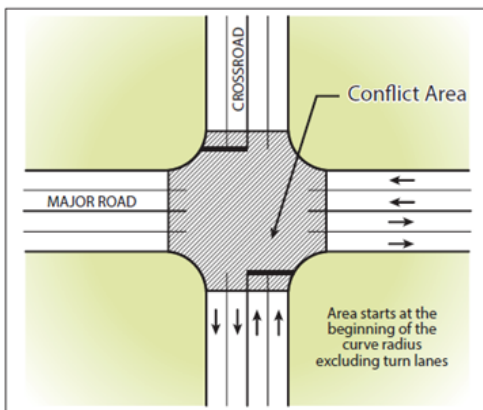
Consider variable design elements such as pole placement, light source type, fixture height, arm length, offsets, wattage, light output and distribution. Luminaire wattage and mounting heights may need to vary from those on the approach roads to meet the required levels of illumination and uniformity ratios for the intersection.

### Intersections

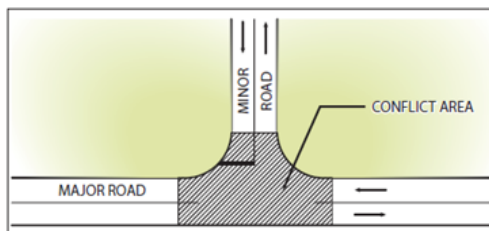
Lighting design parameters for grade intersections depend on whether continuous or non-continuous lighting exists. In areas with continuous lighting, design with full intersection lighting. For non-continuous lighting areas design as Partial intersection lighting (Isolated Intersections).

Tables 7.5 and 7.6 are the minimum recommended values for Full Intersection Lighting.

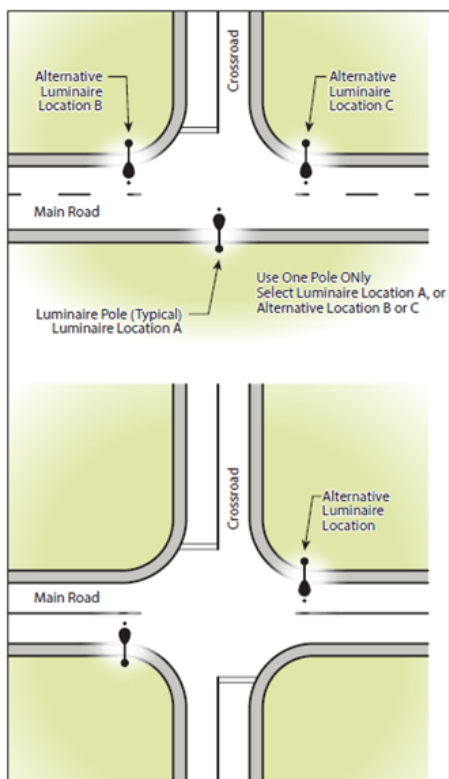
Figures 7.2 and 7.3 illustrate the conflict areas that should be illuminated. Use for both Full & Partial Intersection Lighting.



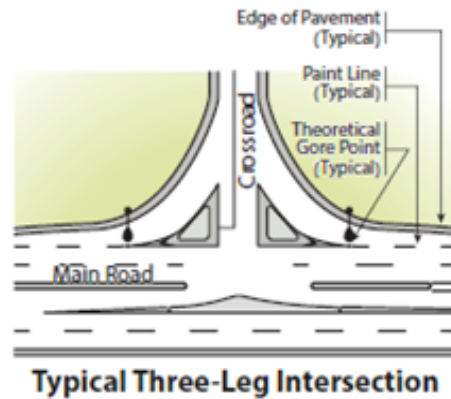
**FIGURE 7.2 CONFLICT AREA, FOUR-WAY INTERSECTION**



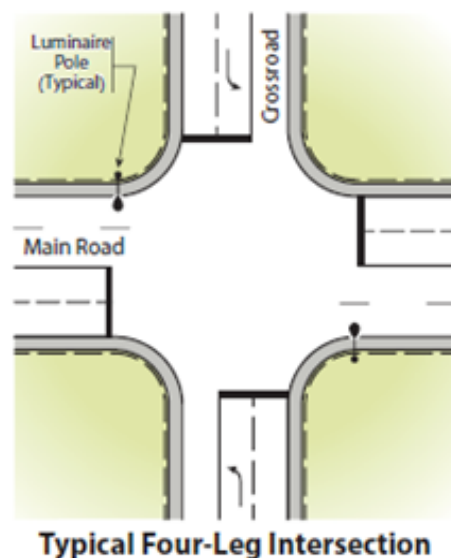
**FIGURE 7.3 CONFLICT AREA, T-INTERSECTION**



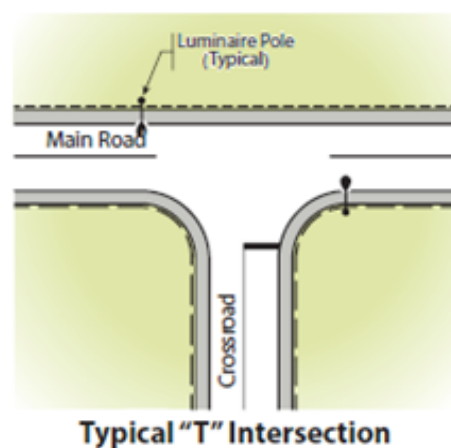
**FIGURE 7.4 TYPICAL POLE LAYOUTS FOR DELINEATION LIGHTING**



**Typical Three-Leg Intersection**



**Typical Four-Leg Intersection**



**Typical "T" Intersection**

**FIGURE 7.5 TYPICAL POLE PLACEMENT FOR PARTIAL INTERSECTION LIGHTING**

Intersection Delineation (Beacon Lighting) shall consist of a single luminaire installed simply for marking the presence of an intersection. Low light output luminaires and low mounting heights should be used in order to reduce glare.

For roads with four or fewer lanes, it is recommended that a single HID luminaire source of 150W or less (LED equivalent) mounted on 30ft. height or lower.

For roads with more than four lanes, it is recommended a 250W or less HID luminaire source or LED equivalent) mounted on a 30 to 45 ft. pole. Luminaires should be oriented toward the road with the highest traffic volume.

### Roundabouts

The lighting of roundabouts serves two primary purposes

1. It makes the roundabout visible from a distance, improving the roundabout's perception to approaching users.
2. It makes key conflict areas more visible, thus improving user's perception of the layout of the intersection and their

perception of one another as they use the roundabout.

The lighting should mark a break in the linear path of the approaching roads by emphasizing the circular aspect of the roundabout and thus improve the users understanding of its operation and their task ahead.

### Light Recommendations for Roundabouts

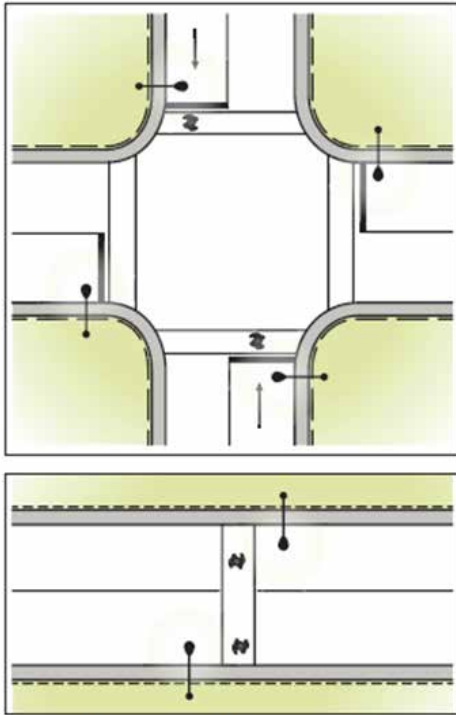
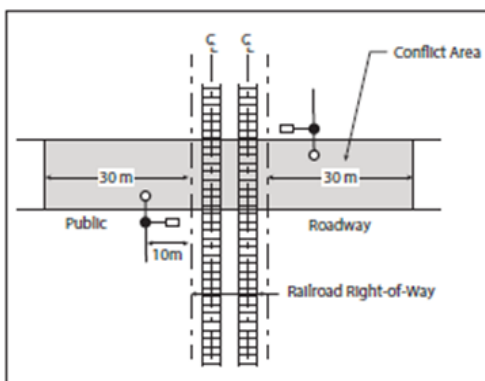
Use a combination of horizontal and vertical illuminance (when crosswalks are present) to determine proper lighting levels. Refer to Table 7.7 for minimum illumination requirements and uniformity ratios.

### Crosswalks at Intersections

A minimum vertical illuminance level of 20 lx measured at 5 ft. from the road surface is recommended to allow drivers to detect pedestrians in midblock crosswalks at adequate stopping distances under rural conditions. Higher levels might be required if glare from opposing vehicles is a possibility or when the crosswalk is located in areas with high ambient light levels or at a lighted intersection. For areas with a medium

**TABLE 7.7 - MINIMUM PAVEMENT ILLUMINANCE FOR ROUNDABOUTS BASED ON PEDESTRIAN ACTIVITY CLASSIFICATION.**

Illuminance for Roundabouts (lux/ft)				
Functional Classification	Pedestrian Activity Classification			$E_{avg}/E_{min}$
	High	Medium	Low	
Major/Major	34/3.2	26/2.4	18/1.7	3:1
Major/Collector	29/2.7	22/2.0	15/1.4	3:1
Major/Local	26/2.4	20/1.9	13/1.2	3:1
Collector/Collector	24/2.2	18/1.7	12/1.1	4:1
Collector/Local	21/2.0	16/1.5	10/0.9	4:1
Local/Local	18/1.7	14/1.3	8/0.7	6:1

**FIGURE 7.6 CROSSWALK POLE PLACEMENT****FIGURE 7.6 CROSSWALK POLE PLACEMENT**

pedestrian conflict, the minimum should be 30 lx. 40 lx for high pedestrian conflict locations.

Figure 7.6 shows the proper placement for lighting at crosswalks.

### At-Grade Railway Crossings

#### Design Considerations

The intent of railroad grade crossing lighting is to light the conflict area of the crossing. The conflict area is defined as the complete road cross section, including the shoulders, to a distance of 30 meters in front of the crossing in both directions.

#### Design Issues

Coordinate all designs with the proper railroad authority at all stages of the design. The electric company should also be involved at this stage.

Consider clear zones and the use of breakaway systems at railroad crossings.

#### Lighting Recommendations

Maintain an average of at least 10 lux on the vertical plane of the train cars for each track, the plane of measurement to be located along the centerline of each track for each roadway approach. Use Luminaires with low intensity at high angles to minimize glare.

#### Lighting Calculations

Use Horizontal illuminance calculations for the approach road as for partial intersection lighting. Use vertical illuminance for the train cars with the light meter pointing in the direction of the approaching road user. Glare calculations are not required.



### 7.3.5 MINIMUM LIGHTING REQUIREMENTS

Streetlights shall be installed in accordance with the requirements of this chapter and the DSC by the developer:

- C. At all intersections as close to the corner as possible;
- D. At the beginning of turnarounds of cul-de-sac exceeding three hundred feet in length, unless located by the City Manager or designee at different intervals or at corners to provide better coverage. In no case, however, shall the number of lights provided by the developer exceed the number in subsection (6) below;
- E. Shall have no greater distance than three hundred feet between them within or abutting the subdivision, unless located by the City Manager or designee at different intervals or at corners to provide better coverage. In no case, however, shall the number of lights provided by the developer exceed the number in subsection (6) below;
- F. “Dark sky” compliant streetlights shall be installed in accordance with the DSC;
- G. Streetlights shall be placed at approximately equal intervals between intersections and shall be subject to the approval of the City Manager or designee;
- H. The number of streetlights that are the responsibility of the developer shall be calculated as the total linear footage between street intersections divided by the required spacing of three hundred feet for local and collector streets and as required by the illumination plan for arterial streets. Fractions of streetlights shall be rounded to the next whole number when the fractional amount is equal to or exceeds 0.50. Fractional amounts less than 0.50 shall not require

an additional streetlight.

### 7.4 EASEMENTS

Where required, electrical service easements for overhead or underground electrical services shall be provided as a part of the subdivision approval. The service connections and streetlight poles shall be installed by the subdivider.

### 7.5 EXCEPTIONS

Exceptions or reductions to the streetlight spacing requirements for local streets in residentially zoned exclusive single family neighborhoods may be authorized by the City Plan Commission at the request of the developer at the time of plat approval:

- A. Where streetlights are not present or have reduced coverage and have not historically complied;
- B. On local streets within an approved subdivision where all the lots have a minimum one-half acre lot area and the adjoining properties have reduced streetlighting;
- C. On mountain residential and divided mountain residential streets within an approved mountain development subdivision; or
- D. Streetlighting shall be provided at all intersections regardless of other exceptions or reductions that may be granted.

### 7.6 EXPENSES PRIOR TO ACCEPTANCE

The subdivider shall be responsible for the maintenance and associated cost of electrical energy of the streetlights until such lights are accepted by the city or the City of El Paso shall accept the streetlights for maintenance and

electrical energy costs at the time it accepts the streets and other public improvements within the subdivision for maintenance.

## 7.7 ILLUMINATION PLAN

An illumination plan for all streets within the subdivision, as part of the requirements of this chapter, shall be filed, together with the subdivision improvement plans, and based on approved standards of the American National Standards Institute and the Illuminating Engineering Society of North America, a copy of which is maintained by the city. The plan shall show the proposed location of the streetlights. The illumination plan shall be subject to the approval of the city engineer or other designee of the City Manager within the corporate limits, and of the county engineer within the extraterritorial jurisdiction.

At minimum, the street illumination plan shall include:

1. A plan-view drawing showing all proposed, existing and future road geometrics (curbs and gutters, sidewalks, crosswalks) and utilities. Overlay pole locations, conduit and wiring, and the service location on the plan. Include legend and notes specific to the design.
2. Pole elevation drawings, including pole and foundation details. If standard drawings are available, a reference to the standards may mitigate the need to detail these items.
3. Schematic and/or one-line diagram of service, lighting controls, and branch lighting circuits. If standard drawings are available, a reference to the standards may mitigate the need to detail these items.
4. Drawings signed and sealed by a

Professional Engineer licensed in the State of Texas.

5. Photometric drawings, although not part of a plan set, will be required for review during the design process. Show light levels as contours for easy of reading. Do not terminate the contours at the property lines. Include table(s) showing the recommended lighting values and the design values. (ex. Avg. fc and uniformity ratios).
6. Superimpose the Traffic plan on the street light plan. Show crosswalks, traffic intersections, midpoint crosswalks, signs etc. If there is landscaping involved, a separate landscape plan superimposed on the street light plan showing the size and shape of mature trees shall be included to determine any conflicts with illumination and street light fixtures.
7. Provide cost estimates for the project with the final drawings.

## 7.8 AS-BUILT ILLUMINATION PLAN

Prior to the acceptance of the streetlights for maintenance by the city or county, an amended illumination plan showing the final location of the streetlights installed by the subdivider shall be submitted to the city engineer or other designee of the City Manager or county engineer.

## 7.9 CUSTOM LIGHTING

- A. The subdivider may elect to provide custom lighting in lieu of the required standard streetlighting, subject to the approval of such lighting by the City Manager or designee. Custom lighting shall be furnished and installed to meet the approved standards of Title 18, the City's Building and Construction

Standards.

- B. Where custom lighting is approved within the street right-of-way, the city or county shall be liable for the costs of electrical energy of the custom lighting provided that the following conditions are met:
  - 1. A separate rate can be charged to the city by the electric utility for the custom lighting proposed; and
  - 2. The total rate charged to the city is equal to or less than the rate for electrical energy for standard streetlighting in the same configuration.
- C. If a subdivider elects to provide and install custom lighting, a public improvement district (or other such private entity) shall be created which will be perpetually liable for all costs associated with the maintenance of the lighting fixtures. Where the city is not liable for the costs of electrical energy from the custom lighting as provided in this subsection, the public improvement district shall also be liable for the electrical energy costs of the custom lighting.
- D. An agreement between the city and the public improvement district shall be required which makes adequate provision to indemnify and hold the city harmless from any claims which may arise from the custom lighting, whether within or outside of the public right-of-way. The agreement shall provide that the city may require that any or all of the installed custom lights be removed, at the public improvement district expense, when a finding is made by the city council or county commissioners' court based on a recommendation of the city engineer or other designee of the City Manager or county engineer that the custom lighting creates a nuisance or is unsafe. Upon such a finding, standard streetlighting pursuant to this chapter shall be required to be furnished and installed to replace the custom lighting.
- E. The city shall reserve the right to review and approve all such provisions of the agreement. The agreement shall accompany the subdivision improvement plan submission. Restrictive covenants which include the provisions for continuous lighting and perpetual maintenance of the custom streetlights shall be recorded by the subdivider concurrently with the subdivision.
- F. Where custom lighting is provided, the subdivider or public improvement district shall notify the electric utility before any work is commenced at any streetlight location.
- G. Custom streetlighting placed within the public right-of-way shall meet the lumen level required in the DSC and provide roadway coverage meeting or exceeding that provided by standard streetlighting. Lighting outside the right-of-way shall meet the lumen level and coverage requirements of the DSC.





8

# Traffic Calming





## Chapter 8

# Traffic Calming & Vision Zero

### 8.1 TRAFFIC CALMING

Traffic calming should be considered in street design, especially in residential areas, near parks and other public facilities. Traffic calming standards are detailed in the DSC.

Traffic Calming must be considered by a developer where the roadway facility exceeds the street length standards and treatments from traffic calming devices described in the amended NTMP.

### 8.2 VISION ZERO (RESERVED)

Chapter reserved for future information.

**This page intentionally left blank**



The image shows a rolled-up architectural drawing, possibly a site plan or key plan, resting on a larger, partially unrolled drawing. The rolled-up drawing is labeled "MAIN PERS KEY PLAN" and features a curved boundary with various dimensions and annotations. The background drawing includes sections labeled "SECTION A-A" and "SECTION B-B", and features a grid system with dimensions like "12.00" and "12.00".



## Chapter 9

# Design Standards for Construction

### 9.1

Chapter reserved for future information.  
Interim design standards that reflect the  
requirements of this manual are provided in  
appendix A.





# Definitions

10





## Chapter 10

# Definitions

“Avenue (AV)” means a Thoroughfare of high vehicular capacity and low to moderate speed, acting as a short distance connector between urban centers, and usually equipped with a landscaped median.

“Bicycle Boulevard (BB)” means a street with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle Boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets. (Source: NACTO)

“Bicycle lane (BL)” means a dedicated lane for cycling within a moderate-speed vehicular Thoroughfare, demarcated by striping.

“Bicycle route (BR)” means a Thoroughfare suitable for the shared use of bicycles and automobiles moving at low speeds.

“Bicycle trail (BT)” means a bicycle way running independently of a vehicular Thoroughfare.

“Boulevard (BV)” means a Thoroughfare designed for high vehicular capacity and moderate speed, traversing an urbanized area. Boulevards are usually equipped with slip roads buffering sidewalks and buildings.

“Buffered Bicycle Lane” means conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. (Source: NACTO)

“Curb” means the edge of the vehicular pavement that may be raised or flush to a swale. It usually incorporates the drainage system.

“Design speed” means the velocity at which a Thoroughfare tends to be driven without the constraints of signage or enforcement. There are four ranges of speed: very low: (below 20 MPH); low: (20 to 25 MPH); moderate: (25 to 35 MPH); high: (above thirty-five MPH). Lane width is determined by desired design speed.

“Drive” means a Thoroughfare along the boundary between an urbanized and a natural condition, usually along a waterfront, park or promontory. One side has the urban character of a Thoroughfare, with sidewalk and building, while the other has the qualities of a road or parkway, with naturalistic planting and rural details.

“Road (RD)” means a local, rural and suburban Thoroughfare of low-to-moderate vehicular speed and capacity. This type is allocated to the more rural Transect Zones (T1-T3).

“Effective turning radius” means the measurement of the inside turning radius taking parked cars into account.

“Highway” means a rural and suburban Thoroughfare of high vehicular speed and capacity. This type is allocated to the more rural Transect Zones (T-1, T-2, and T-3).

“One-Way protected cycle track” means bikeways that are at street level and use a variety of methods for physical protection from passing traffic.

“Passage (PS)” means a pedestrian connector, open or roofed, that passes between buildings to provide shortcuts through long blocks and connect rear parking areas to Frontages.

“Path (PT)” means a pedestrian way traversing a park or rural area, with landscape matching the contiguous Open Space, ideally connecting directly with the urban sidewalk network.

“Protected bicycle lane” (See “One-way protected cycle track”)

“Raised median” means a raised barrier in the center of the roadway separating opposing lanes of traffic, through which a crosswalk passes.

“Raised pedestrian refuge island” (See “Raised median”)

“Rear alley (RA)” means a vehicular way located to the rear of lots providing access to service areas, parking, and outbuildings and containing utility easements.

“Rear lane (RL)” means a vehicular way located to the rear of lots providing access to service areas, parking, and outbuildings and containing utility easements.

“Shared use path” means a minimum 10-foot wide, two-way shared bicycle and pedestrian facility separated from the main traveled way

“Sidepath” (See “Shared use path”)

“Slip road” means an outer vehicular lane or lanes of a Thoroughfare, designed for slow speeds while inner lanes carry higher speed traffic, and separated from them by a planted median.

Street (ST): a local urban Thoroughfare of low speed and capacity.

“Special district (SD)” means an area that, by its intrinsic function, disposition, or configuration, cannot or should not conform to one or more of the normative community types or Transect Zones specified by the SmartCode.

Thoroughfare at an intersection, measured at the inside edge of the vehicular tracking. The smaller the turning radius, the smaller the pedestrian crossing distance and the more slowly the vehicle is forced to make the turn.

“Turning radius” means the curved edge of a Thoroughfare at an intersection, measured at the inside edge of the vehicular tracking. The smaller the turning radius, the smaller the pedestrian crossing distance and the more slowly the vehicle is forced to make the turn.

“Yield street” means characterizing a Thoroughfare that has two-way traffic but only one effective travel lane because of parted cars, necessitating slow movement and driver negotiation.







# A

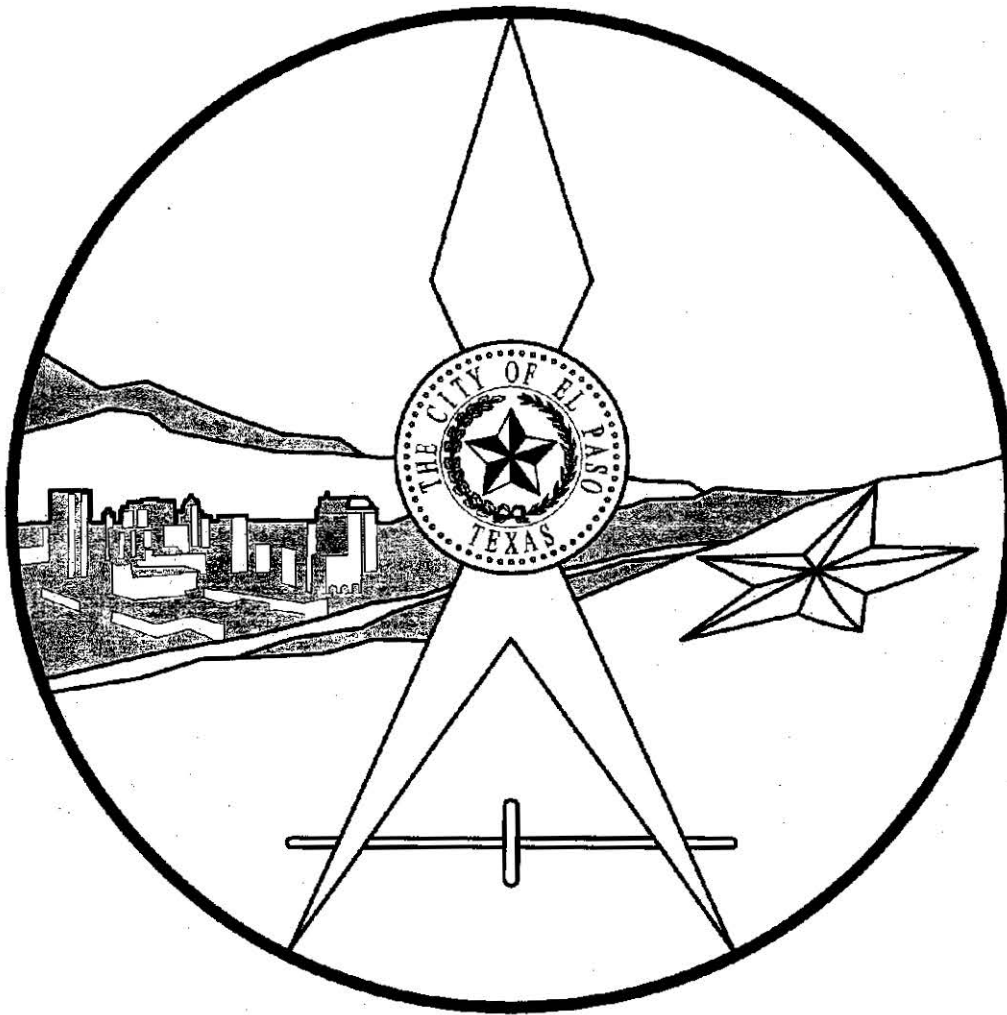
## Appendix A - Interim DSC





## Appendix A

# Interim Design Standards for Construction



TITLE 19 - SUBDIVISION ORDINANCE

# DESIGN STANDARDS FOR CONSTRUCTION

JUNE 3, 2008

## DESIGN STANDARDS FOR CONSTRUCTION

<b>SECTION 1</b>	SUBDIVISION IMPROVEMENT PLAN PREPARATION GUIDELINES
<b>SECTION 2</b>	DRAINAGE AND DRAINAGE STRUCTURES
<b>SECTION 3</b>	STREETS
<b>SECTION 4</b>	FENCING
<b>SECTION 5</b>	EARTH RETENTION AND EROSION CONTROL
<b>SECTION 6</b>	SIDEWALKS, DRIVEWAYS AND CURB RAMPS
<b>SECTION 7</b>	SIGNAGE AND SIGNALIZATION
<b>SECTION 8</b>	STREET LIGHTING
<b>SECTION 9</b>	TYPICAL LOT LAYOUT
<b>SECTION 10</b>	TRAFFIC CALMING STANDARDS
<b>APPENDIX</b>	APPLICATION FORMS AND CHECKLISTS

# SECTION 1



## SECTION 1

SUBDIVISION IMPROVEMENT PLAN  
PREPARATION GUIDELINES

<u>TITLE</u>	<u>PAGE</u>
PLAN STANDARDS.....	1-1
TITLE SHEET.....	1-2
GRADING PLAN.....	1-3A thru 1-3B
DRAINAGE PLAN.....	1-4A thru 1-4E
DRAINAGE COMPUTATION TABLES.....	1-5
STREET PLAN & PROFILE.....	1-6A thru 1-6B
STORM SEWER PLAN & PROFILE.....	1-7A thru 1-7D
DETAIL SHEET.....	1-8
CONSTRUCTION PHASING PLAN.....	1-9

[BACK TO SECTION INDEX PAGE](#)



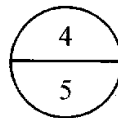
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 1  
TABLE OF  
CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

## PLAN STANDARDS

- A. LETTERS AND NUMBERS SHALL BE VERTICAL OR SLANTED CAPITAL. THE MINIMUM SIZE SHALL BE 1/16-INCH - GUIDELINES ARE REQUIRED FOR FREEHAND.
- B. REFERENCE CROSS-SECTION SYMBOLS SHALL BE AS SHOWN



- 1. TOP NUMBER: SECTIONAL DETAIL NUMBER
- 2. BOTTOM NUMBER: SHEET DETAIL NUMBER

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PLAN  
STANDARDS  
1-1

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

## TITLE SHEET

- A. LOCATION PLANS - SCALE ONE (1) INCH = SIX HUNDRED (600) FEET
- B. TITLE SHALL COMPLY WITH THE CITY'S ENGINEERING DEPARTMENT'S STANDARD TITLE SHEET
- C. VICINITY MAP - N. T. S.
- D. INDEX OF DRAWINGS
  - 1. TITLE SHEET
  - 2. FINAL APPROVED PLAT FOR REFERENCE ONLY (IF APPLICABLE)
  - 3. GRADING PLAN
  - 4. DRAINAGE PLAN
  - 5. STREET PLAN & PROFILES
  - 6. CROSS-SECTIONS
  - 7. DETAILS
  - 8. ILLUMINATION PLAN; INCLUDING STREET SIGNAGE & NDCBU LOCATIONS
  - 9. LANDSCAPE & IRRIGATION PLAN
  - 10. STORMWATER POLLUTION PREVENTION PLANS AND ASSOCIATED SPECIFICATIONS
- E. DESIGN FIRM NAME

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TITLE  
SHEET  
1-2

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

### GRADING PLAN

- A. NORTH ARROW UP OR LEFT TO RIGHT, A SCALE OF ONE (1) INCH = ONE HUNDRED (100) FEET
- B. GRADING PLAN SHALL BE REFERENCED TO THE PRELIMINARY PLAT VERTICAL CONTROL. VERTICAL CONTROL TO NORTH AMERICAN VERTICAL DATUM (NAVD) 1988.
- C. BOUNDARIES OF SUBDIVISION OR SITE
- D. CONTOUR LINES OF THE PROPOSED SUBDIVISION, AND TWO HUNDRED (200) FEET OUTSIDE AND ABUTTING THE SUBDIVISION UNLESS THE AREA IS MODIFIED BY THE CITY ENGINEER, HAVING THE FOLLOWING INTERVALS:
  - 1. ONE FOOT (1') CONTOUR INTERVALS FOR GROUND SLOPES BETWEEN LEVEL AND THREE (3) PERCENT;
  - 2. TWO FOOT (2') CONTOUR INTERVALS FOR GROUND SLOPES MORE THAN THREE (3) PERCENT AND UP TO AND INCLUSIVE OF ELEVEN (11) PERCENT;
  - 3. FIVE FOOT (5') CONTOUR INTERVALS FOR GROUND SLOPES OVER ELEVEN (11) PERCENT;
  - 4. DASHED LINES FOR EXISTING CONTOUR LINES;
  - 5. SOLID (BOLD) LINES FOR PROPOSED CONTOUR LINES; AND
  - 6. INDEX CONTOURS AT FIVE (5) FEET INTERVALS.
- E. LOCATE ALL EXISTING STRUCTURES WITHIN AND ONE HUNDRED (100) FEET OUTSIDE OF THE SUBDIVISION UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
- F. TYPICAL GRADING PLAN FOR LOT SHALL SHOW DIRECTION OF RUNOFF OR ON-SITE PONDING.
- G. FINISHED FLOOR AND FINISHED GROUND ELEVATION FOR ALL LOTS.

[GO TO PAGE 2 OF 2](#)

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

GRADING PLAN

1-3A

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC/I.R.



- H. TOP OF CURB, HEADER CURB AND DRIVEWAY ELEVATIONS.
- I. SLOPE STABILIZATION PLAN, WHERE REQUIRED BY CITY ENGINEER.
- J. EROSION CONTROL PLAN
- K. CONCENTRATED STORM RUNOFF OVER UNPROTECTED AREAS, INCLUDING SLOPES SHALL NOT BE PERMITTED
- L. CROSS SECTIONS AS REQUESTED BY CITY ENGINEER
- M. REQUIRED RETAINING WALLS (LOCATION ONLY, UNLESS TO BE BUILT BY SUBDIVIDER)  
  
 DESIGN OF RETAINING WALLS FOUR (4) FEET OR HIGHER SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER
- N. PLANS SHALL SHOW FLOOD ZONE AREAS AS PER CURRENT FLOOD INSURANCE RATE MAPS (FIRM) OR LETTER OF MAP REVISION (IF APPLICABLE), REFERENCE PANEL NUMBER AND DATE
- O. FINISHED FLOOR ELEVATIONS SHALL COMPLY WITH DRIVEWAY ORDINANCE AND/OR FEMA REGULATIONS.

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

GRADING PLAN

1-3B

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC / J. R.

### DRAINAGE PLAN

(REFER TO DRAINAGE DESIGN MANUAL FOR DRAINAGE  
CRITERIA, DESIGN METHODS AND METHODOLOGIES)

- A. SCALE ONE (1) INCH = ONE HUNDRED (100) FEET - NORTH ARROW
- B. DRAINAGE PLANS SHALL CONFORM TO THE APPROVED MASTER DRAINAGE PLAN, IF APPLICABLE
- C. SHOW BOUNDARIES OF SUBDIVISION AND CONTRIBUTING DRAINAGE AREAS
- D. IDENTIFY LIMITS OF CONTRIBUTING WATERSHED AREAS WITHIN SUBDIVISION AND OUTSIDE THE SUBDIVISION
- E. CALCULATION TABLE TO INCLUDE TIMES OF CONCENTRATION ( $T_c$ ), INTENSITIES (I), COEFFICIENT VALUES (C) AND EXPECTED RUNOFFS OF ALL WATERSHED AREAS - EXPECTED RUNOFF QUANTITIES, CARRYING CAPACITIES, AND RUNOFF VELOCITIES FOR DRAINAGE STRUCTURES SHALL BE SHOWN ON PLANS FOR 25, 50 AND 100 YEAR EVENTS.
- F. SHOW LOCATION AND SIZES OF ALL PROPOSED AND EXISTING DROP INLETS, PIPES, CULVERTS, CHANNELS, BASINS, AND OTHER DRAINAGE STRUCTURES
- G. SHOW EXISTING AND PROPOSED DRAINAGE FLOW PATTERNS
- H. SHOW HIGH AND LOW POINTS OF STREET WITH FLOW PATTERNS

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DRAINAGE PLAN

1-4A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

## DRAINAGE PLAN (continued)

- I. STORAGE FACILITIES (DAMS, PONDS, ETC.) INDICATING:
1. MAXIMUM CAPACITY
  2. EXPECTED RUNOFF
  3. BOTTOM ELEVATION
  4. HIGH WATER SURFACE
  5. FREE BOARD
  6. SPILLWAY AND OUTLET STRUCTURE
    - (A) MAXIMUM CAPACITY
    - (B) DESIGN OUTFLOWS
  7. SEDIMENT AND EMERGENCY VOLUMES
  8. APPROVAL FROM TEXAS WATER BOARD AND U.S. ARMY CORPS OF ENGINEERS FOR DAMS, WHEN APPLICABLE
  9. SOIL TESTS TO DETERMINE SPECIAL STABILIZED SLOPES
  10. PERCOLATION RATE TESTS TO BE PERFORMED AT PROPOSED POND INVERT (RETENTION BASINS ONLY). TO BE PERFORMED WHEN THE WATER TABLE (ELEVATION) IS AT ITS HIGHEST.
  11. EXISTING WATER TABLE ELEVATION DURING OFF-PEAK PERIOD AND HIGH WATER TABLE ELEVATION, IF APPLICABLE.

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DRAINAGE PLAN

1-4B

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>OEC/J. R.</u>

## DRAINAGE PLAN (continued)

### J. ON LOTS WITH ON-SITE PONDING THE FOLLOWING INFORMATION SHALL BE SUBMITTED

1. PRELIMINARY SOILS TEST, FINAL PERCOLATION RATE TEST, SOILS TESTS, AND WATER TABLE ELEVATION INFORMATION TO BE SUBMITTED PRIOR TO STREET ACCEPTANCE AND/OR BUILDING PERMITS. PERCOLATION TESTS TO BE PERFORMED AT THE INVERT WHERE STORMWATER WILL BE RETAINED AND WHEN THE WATER TABLE IS AT ITS HIGHEST.
2. TYPICAL LOT CROSS SECTION DETAIL SHOWING ON-SITE PONDING STORAGE CAPACITY
3. PERMANENT ELEVATION MARKER DETAIL (REFER TO PLATE 2-7)
4. DRAINAGE COMPUTATIONS BASED ON 100-YEAR STORM
5. MINIMUM OF 2.0% CROSS SLOPE ON STREET
6. LOTS AND/OR MEDIANS SHALL ALSO ACCOMMODATE ALL STREET RUNOFF
7. FIFTY (50) PERCENT OF THE RESIDENTIAL LOT AREA SHALL REMAIN WITHOUT STRUCTURES OR OTHER IMPERMEABLE SURFACES
8. ADDITIONAL EMERGENCY AND SILT/DEBRIS CAPACITY NOT REQUIRED FOR RESIDENTIAL ON-SITE PONDING LOTS

### K. STREET DESIGN REQUIREMENTS

#### 1. GENERAL STANDARDS

- (A) MAXIMUM STANDARD CURB HEIGHT - 6 INCHES UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER
- (B) CROWN ON STREET TO BE FROM ZERO (0) TO THREE (3) PERCENT SLOPE

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

### DRAINAGE PLAN

1-4C

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



## DRAINAGE PLAN (continued)

(C) INVERT STREET CROSS SECTION ALLOWED WITH APPROVAL BY CITY ENGINEER

(D) NO PONDING (UNDRAINED LOW POINTS) TO BE ALLOWED ON STREETS TO PREVENT PAVEMENT DETERIORATION

### 2. STANDARDS FOR 25-YEAR STORM

(A) MAXIMUM FLOW DEPTH IN ANY STREET: FIVE (5) INCHES OR CURB HEIGHT, WHICHEVER IS LESS

(B) MINOR ARTERIALS; ONE HALF (1/2) OF ONE (1) LANE WIDTH TO REMAIN FREE OF WATER IN EACH DIRECTION

(C) MAJOR ARTERIALS AND SUPER ARTERIALS; ONE (1) FULL LANE WIDTH ON EACH SIDE OF RAISED MEDIAN TO REMAIN FREE OF WATER

(D) AT ROAD BENDS AND INTERSECTIONS, MAXIMUM FLOW DEPTH IN STREETS TO BE FIVE (5) INCHES

(E) PRODUCT NUMBER (DEPTH X AVERAGE VELOCITY) TO BE A MAXIMUM OF 6.5 FT<sup>2</sup>/S UNLESS APPROVED BY THE CITY ENGINEER

(F) ANY HYDRAULIC JUMPS (EG. SAG VERTICAL CURVES OR CHANGES IN SLOPE) TO BE CONTAINED WITHIN CURB HEIGHTS WITH APPROPRIATE FREE BOARD

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DRAINAGE PLAN

1-4D

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

**DRAINAGE PLAN**

(continued)

(G) THE HYDRAULIC GRADE LINE FOR THE DRAINAGE STRUCTURE(S) DISCHARGING INTO A 100-YEAR RETENTION OR DETENTION BASIN SHALL BE BASED ON THE 100-YEAR WATER SURFACE ELEVATION (WSEL) WHICH EXCLUDES THE SILT/DEBRIS AND 25% EMERGENCY CAPACITY VOLUMES AND:

(i.) THE 25-YEAR WSEL SHALL NOT EXCEED THE TOP OF CURB ELEVATION

(ii.) IF THE 100-YEAR WSEL EXCEEDS THE TOP OF CURB ELEVATION, THE ENGINEER SHALL ALSO CONSIDER THE EFFECT ON MANHOLES.

3. STANDARDS FOR 100-YEAR STORM

(A) PRODUCT NUMBER (DEPTH X AVERAGE VELOCITY) TO BE A MAXIMUM OF 8 FT<sup>2</sup>/S UNLESS APPROVED BY THE CITY ENGINEER

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DRAINAGE PLAN

1-4E

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

## DRAINAGE COMPUTATION TABLES

DETENTION OR RETENTION BASINS							
BASIN NO.	REQUIRED CAPACITY (AC.FT)	AVAILABLE CAPACITY (AC.FT)	PEAK INFLOW (CFS)	OUTLET TOWER FLOW (CFS)	HIGH WATER SURFACE ELEVATION (FT)	BOTTOM ELEVATION	FREE BOARD (FT)

WATERSHED AREAS					
DRAINAGE AREA NO.	DRAINAGE AREA (AC)	DESIGN STORM INTENSITY	TIME OF CONCENTRATION	RUNOFF COEFF. (C)	Q (CFS)

DROP INLETS			
DROP INLET NO	REQ. FLOW CAPACITY Q REQ (CFS)	AVAIL. FLOW CAPACITY Q AVAIL.(CFS)	FLOW BYPASS

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DRAINAGE  
COMPUTATION TABLES  
1-5

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

## STREET PLAN AND PROFILE

### A. PLAN

1. STREET NAMES
2. VERTICAL CONTROL TO NORTH AMERICAN VERTICAL DATUM (NAVD) 1988 AND SHOWN ON EVERY SHEET
3. SCALE ONE (1) INCH = THIRTY (30) FEET MAXIMUM HORIZONTAL VERTICAL SCALE OF ONE (1) INCH = FIVE (5) FEET FOR SLOPES OF ZERO (0) PERCENT TO THREE (3) PERCENT AND ONE (1) INCH = TEN (10) FEET FOR SLOPES GREATER THAN THREE (3) PERCENT
4. EXISTING STRUCTURES AND TOPOGRAPHIC FEATURES
5. SURVEY CONTROL LINE
6. RIGHT-OF-WAY LINES, CURB LINES AND CENTERLINES
7. RIGHT-OF-WAY AND ROADWAY WIDTHS
8. CURB RETURN DATA
9. CENTERLINES AND CURB DATA
10. STATIONING ALONG CENTERLINE
11. STATION AT SPECIAL POINTS (PC, PT, PRC, CB, RET, CL INTERSECTIONS, LC, ETC.)
12. TOP OF CURB ELEVATION AT SPECIAL POINTS (PC, PT, PRC, CB, RET)
13. PROPOSED AND EXISTING DRAINAGE STRUCTURES
14. DIRECTION OF FLOW AND HIGH AND LOW POINTS
15. FIFTY (50) FOOT (MINIMUM) TRANSITIONS FROM CROWN - FLAT - INVERT
16. LIMITS OF CONSTRUCTION
17. LOCATION OF GUARDRAIL AND DEAD END SIGNS
18. MATCH STATIONS FOR FOLLOWING PAGE
19. SHOW ALL EXISTING STRUCTURES AND IMPROVEMENTS ONE HUNDRED (100) FEET PAST THE LIMITS OF CONSTRUCTION UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER
20. SIDEWALK LOCATIONS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET  
PLAN & PROFILE

1-6A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.



## STREET PLAN AND PROFILE

(continued)

### B. PROFILE

1. EXISTING AND PROPOSED PROFILES AT CURB LINES
2. PROPOSED PERCENT GRADE FOR ALL PROFILES
3. MINIMUM OF FIVE TENTHS (0.5) PERCENT GRADE AND A MAXIMUM OF ELEVEN (11) PERCENT GRADE; EXCEPT THAT UP TO FIFTEEN (15) PERCENT GRADE IN THE MOUNTAIN DEVELOPMENT AREA MAY BE PERMITTED WITH APPROVAL OF FIRE DEPARTMENT AND CITY ENGINEER
4. VERTICAL CURVE INFORMATION. THE ENTIRE LENGTH OF VERTICAL CURVE SHALL BE SHOWN ON SAME SHEET
5. EXISTING AND PROPOSED ELEVATIONS AT EVERY FIFTY (50) FEET AND SPECIAL STATIONS
6. STREET PROFILE SHALL EXTEND ONE HUNDRED (100) FEET BEYOND LIMITS OF CONSTRUCTION UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER
7. EXISTING AND PROPOSED DRAINAGE STRUCTURES AS THEY RELATE TO PROFILES
8. PROPOSED STREET PROFILE SHALL MATCH EXISTING STREET PROFILE FOR A SMOOTH TRANSITION
9. OPPOSITE CURB ELEVATIONS SHALL MATCH AT EACH STATION, EXCEPT IN A SUPERELEVATED ROADWAY OR AS APPROVED BY CITY ENGINEER
10. STREET CROWN SHALL NOT EXCEED THREE (3) PERCENT

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET  
PLAN & PROFILE

1-6B

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

## STORM SEWER PLAN AND PROFILE

### A. STORM SEWER PLAN

1. PROPOSED RIGHT-OF-WAY LINE AND WIDTHS
2. LIMITS OF CONSTRUCTION AND MATCH-LINE STATIONING
3. NORTH ARROW AND SCALE
4. NAME OF STREET
5. SURVEY CONTROL LINE
6. STORM SEWER ALIGNMENT TIED TO SURVEY CONTROL LINE
7. BEARINGS (DIRECTION AND HORIZONTAL CURVE DATA)
8. STATIONING
9. SIZE, TYPE, AND CLASSIFICATION OF PIPE
10. MANHOLES - JUNCTION BOXES (CAST-IN-PLACE OR PRE-CAST)
  - (A) STATIONING AND A MAXIMUM OF FIVE HUNDRED (500) FEET ON CENTER - MANHOLE REQUIRED AT CHANGE OF DIRECTION
  - (B) TOP OF COVER ELEVATION
  - (C) INVERT ELEVATION
  - (D) TYPE, SIZE, AND NUMBER OF MANHOLE

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STORM SEWER  
PLAN & PROFILE

1-7A

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

**STORM SEWER PLAN AND PROFILE**

(continued)

## 11. DROP INLETS

(A) STATIONING

(B) TOP OF GRATE AND TOP OF CURB/NOSE AT GRATE ELEVATION

(C) INVERT ELEVATION

(D) TYPE, NUMBER OF GRATES, AND DROP INLET NUMBER (TWO (2) GRATE MINIMUM)

(E) STORMWATER DISCHARGE - EXPECTED AND CAPACITY

## 12. DROP INLET PIPE (LATERALS)

(A) SIZE AND TYPE OF PIPE

(B) TYPE OF CONNECTOR

(C) STORMWATER DISCHARGE - EXPECTED, CAPACITY, AND VELOCITY(IES)

## 13. SHOW EXISTING DRAINAGE STRUCTURES IN DASHED LINE AND INDICATE SIZE AND TYPE OF STRUCTURE

## B. STORM SEWER PROFILE

1. STATIONING ALONG CENTERLINE OF STREET AT EVERY 100 FEET

2. TYPE AND SIZE OF EXISTING DRAINAGE STRUCTURES

3. EXISTING GROUND PROFILE AND PROPOSED TOP OF PAVEMENT

4. PROPOSED STORM SEWER PROFILE WITH PERCENT SLOPE

5. TYPE AND SIZE OF PIPE

6. HYDRAULIC GRADIENT LINE PROFILE WITH ELEVATION SHOWN AT EVERY MANHOLE AND/OR DROP INLETS

[BACK TO TITLE INDEX PAGE](#)

TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
 FOR CONSTRUCTION**

STORM SEWER  
 PLAN & PROFILE

1-7B

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC/J.R.

## STORM SEWER PLAN AND PROFILE

(continued)

7. MANHOLE
  - (A) SIZE, TYPE, AND MANHOLE NUMBER
  - (B) TOP INVERT ELEVATION
  - (C) CENTERLINE STATIONING
  - (D) INVERT OF CONNECTOR LATERAL - SIZE AND TYPE OF PIPE
8. DROP INLETS
  - (A) TYPE, NUMBER OF GRATES AND DROP INLET NUMBER (TWO (2) GRATE MINIMUM)
  - (B) TOP OF GRATE AND INVERT ELEVATIONS
  - (C) CENTERLINE STATIONING
  - (D) STORMWATER DISCHARGE - EXPECTED AND CAPACITY
9. CONNECTOR PIPES (INLETS LATERALS)
  - (A) TYPE AND SIZE OF PIPE
  - (B) INVERT AT MAIN STORM SEWER
  - (C) CENTERLINE STATIONING
  - (D) STORMWATER DISCHARGE - EXPECTED, CAPACITY, AND VELOCITY(IES)

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STORM SEWER  
PLAN & PROFILE

1-7C

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC/J.R.



**STORM SEWER PLAN AND PROFILE**

(continued)

## 10. EXISTING SANITARY SEWER

## (A) SANITARY SEWER LINE

- (i.) PROFILE OF SANITARY SEWER
- (ii.) TOP MANHOLE AND INVERT ELEVATIONS
- (iii.) TYPE AND SIZE OF PIPE
- (iv.) PERCENT GRADE
- (v.) DETAIL INFORMATION OF SANITARY SEWER CONFLICTS

[BACK TO TITLE INDEX PAGE](#)


TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
 FOR CONSTRUCTION**

STORM SEWER  
 PLAN & PROFILE

1-7D

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC / I. R.

## DETAIL SHEET

WHERE APPLICABLE, THE FOLLOWING SHALL BE PROVIDED:

- A. DROP INLET(S)
- B. MANHOLE(S) AND JUNCTION BOX(ES)
- C. SURVEY MONUMENTS
- D. STORM SEWER TRENCH CROSS-SECTION
- E. PIPE CONCRETE COLLAR(S)
- F. ROCKWALL FENCING
- G. GUARD RAIL(S), BARRICADE(S), AND SIGNAGE
- H. BOX CULVERTS
- I. RETAINING WALL(S) (LOCATION ONLY, UNLESS TO BE BUILT BY SUBDIVIDER)
- J. FOOTING(S)
- K. CHANNEL CONCRETE LINING(S) - CROSS SECTIONS
- L. SPILLWAYS
- M. SEWER PIPE(S) - THRUST BLOCK(S)
- N. SEEPAGE LINE(S) DETAILS
- O. STORM SEWER OUTLET STRUCTURE(S)
- P. BASIN(S) PLAN AND CROSS SECTIONS
- Q. CONFLICTS WITH EXISTING IRRIGATION FACILITIES OR UTILITIES

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DETAIL SHEET

1-8

Approved By <u>R. A. SHUBERT</u> Date <u>JUNE 03, 2008</u>	Checked By <u>H. M. E.</u> Drawn By <u>QBC / J. R.</u>
---	---

## CONSTRUCTION PHASING PLAN

WHERE APPLICABLE:

- A. SHOW ENTIRE LIMITS OF PROJECT
- B. INDICATE LIMITS OF INDIVIDUAL CONSTRUCTION PHASE BY STATIONS
- C. TEMPORARY DRAINAGE PHASING PLAN

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CONSTRUCTION  
PHASING PLAN

1-9

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

## SECTION 2



## SECTION 2

### DRAINAGE AND DRAINAGE STRUCTURES

<u>TITLE</u>	<u>PAGE</u>
RETENTION BASIN DESIGN .....	2-1
RETENTION BASIN DESIGN REQUIREMENTS .....	2-2A thru 2-2B
RETENTION BASIN DESIGN (DRAWING) .....	2-3
DETENTION BASIN DESIGN .....	2-4
DETENTION BASIN DESIGN REQUIREMENTS .....	2-5
DETENTION BASIN (DRAWING) .....	2-6
PERMANENT ELEVATION MARKER (FOR ON-SITE PONDING) .....	2-7
POND DEPTH GAUGE .....	2-8
LEFT BLANK FOR FUTURE USE .....	2-9
LEFT BLANK FOR FUTURE USE .....	2-10
LEFT BLANK FOR FUTURE USE .....	2-11
LEFT BLANK-FOR FUTURE USE .....	2-12
LEFT BLANK-FOR FUTURE USE .....	2-13
LEFT BLANK-FOR FUTURE USE .....	2-14
LEFT BLANK-FOR FUTURE USE .....	2-15
MANHOLE RING .....	2-16
MANHOLE COVER .....	2-17
GRATED MANHOLE COVER .....	2-18
PENETRATION APRON .....	2-19
48" DIAMETER STANDARD CONICAL MANHOLE .....	2-20
48" DIAMETER PRE-CAST MANHOLE .....	2-21
72" DIAMETER PRE-CAST MANHOLE .....	2-22
72" DIAMETER CAST-IN-PLACE MANHOLE .....	2-23
72" CONCRETE MANHOLE COVER .....	2-24
CONCRETE PIPE COLLAR .....	2-25

[BACK TO SECTION INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 2  
TABLE OF  
CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>OEC / J. R.</u>

## SECTION 2

### DRAINAGE AND DRAINAGE STRUCTURES

(continued)

<u>TITLE</u>	<u>PAGE</u>
CONNECTION AT PRE-CAST JUNCTION BOXES	
OR EXISTING MANHOLES .....	2-26
PRE-FABRICATED REINFORCED CONCRETE PIPE WYE .....	2-27
STANDARD MANHOLE SPECIFICATIONS .....	2-28
GRATE AND FRAME FOR DROP INLET .....	2-29
DROP INLET TYPE I .....	2-30
DROP INLET TYPE II .....	2-31
DROP INLET TYPE III .....	2-32
OFF-STREET STORM INLET DETAIL .....	2-33
FLUME DESIGN .....	2-34
CONCRETE FLUME WITHIN DRAINAGE RIGHT-OF-WAY .....	2-35A
TYPICAL CONCRETE DRAINAGE FLUMES .....	2-35B
SMALL WALL OPENING FOR DRAINAGE .....	2-35C
FLUME DESIGN SECTION .....	2-36
CONCRETE CHANNEL TYPE I .....	2-37
CONCRETE CHANNEL TYPE I END WALL DETAIL .....	2-38
CHANNEL LINING AT PIPE DISCHARGE .....	2-39
CONCRETE JOINTS .....	2-40
WATERSTOP DETAIL .....	2-41
DEBRIS TRAP/SAFETY GRATE .....	2-42
NO TRESPASSING WARNING SIGN .....	2-43
CURB OPENING FOR DRAINAGE .....	2-44
MODIFIED SIDEWALK DETAILS "A" & "B" .....	2-45

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 2  
TABLE OF  
CONTENTS

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

## RETENTION BASIN DESIGN

DEFINITION: A MANMADE OR NATURAL RESERVOIR, EITHER PUBLIC OR PRIVATE, DESIGNED TO COMPLETELY RETAIN A SPECIFIED AMOUNT OF STORM WATER RUNOFF WITHOUT GRAVITY RELEASE.

DESIGN CRITERIA: THE DESIGN STORM FOR RETENTION BASINS IS 4" OF RAINFALL IN THREE HOURS OVER AN AREA OF 200 ACRES OR LESS (FOR AREAS OVER 200 ACRES SEE 2-9)

TOTAL RUNOFF FORMULA:  $QT = ARC/12$

QT = TOTAL RUNOFF IN ACRE-FEET

A = 100% OF CONTRIBUTING WATERSHED AREA IN ACRES

R = RAINFALL IN INCHES

C = RUNOFF FACTOR INCHES (SEE NO. 2-10)

STORAGE CAPACITY: A RETENTION BASIN MUST HAVE STORAGE CAPACITY AS FOLLOWS:

1. 100% OF THE DESIGN STORM

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

RETENTION BASIN  
DESIGN  
2-1

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

### RETENTION BASIN DESIGN REQUIREMENTS

1. SIDE SLOPES SHALL NOT EXCEED FOLLOWING MAXIMUMS, UNLESS SATISFACTORY GEOTECHNICAL REPORT IS SUBMITTED:

- A. IN COHESIVE SOIL: THREE HORIZONTAL TO ONE VERTICAL (3:1)
- B. IN NON-COHESIVE SOIL: THREE HORIZONTAL TO ONE VERTICAL (3:1)

NOTE: SOILS HAVING A PLASTICITY INDEX (PI) OF 8 OR ABOVE ARE CONSIDERED COHESIVE.

2. AN EROSION CONTROL PLAN IS REQUIRED FOR NON-COHESIVE SOILS.
3. RETENTION BASINS WITH SIDE SLOPES GREATER THAN 12% SHALL BE ENCLOSED WITH A SIX (6) FOOT HIGH CHAINLINK FENCE, EXCEPT THAT THE CHAINLINK FENCE MAY BE SUBSTITUTED WITH MASONRY OR ROCKWALL, WROUGHT IRON FENCING OR A COMBINATION THEREOF. THE HEIGHT SHALL BE MEASURED FROM THE GROUND INSIDE OR OUTSIDE THE WALL WHICHEVER IS THE HIGHER
4. BORING TESTS SHALL BE TO A DEPTH OF FIVE (5) FEET BELOW THE PROPOSED BASIN INVERT. THE BOTTOM OF THE BASIN SHALL BE A MINIMUM OF 24 INCHES ABOVE THE HIGH WATER TABLE. PERCOLATION TESTS IN THE VALLEY AREAS, SHALL BE PERFORMED ACCORDING TO ASTM-5126 DURING PEAK IRRIGATION SEASON BETWEEN AUGUST AND SEPTEMBER. STORM WATER, WITHIN THE BASIN, SHALL PERCOLATE WITHIN 72 HOURS. A GEOTECHNICAL INVESTIGATION, PERFORMED BY A LICENSED PROFESSIONAL GEOTECHNICAL ENGINEER, SHALL BE SUBMITTED PRIOR TO FINAL APPROVAL OF THE DEVELOPMENT PLANS. THE REPORT SHALL CONTAIN, AT A MINIMUM, SUBSURFACE SOIL PROFILE(S) AND PERCOLATION TEST RESULTS.
5. PROVIDE ONE (1), 18 FT MINIMUM WIDE DOUBLE GATE, ACCESSIBLE FROM PUBLIC RIGHT-OF-WAY AND ALIGNED WITH THE ACCESS RAMP. THE GATE SHALL BE CHAINLINK FENCE, EXCEPT THAT THE GATE SHALL BE WROUGHT IRON WHERE A MASONRY OR ROCKWALL IS SUBSTITUTED FOR A CHAINLINK FENCE.
6. PROVIDE AN ACCESS RAMP MEETING THE FOLLOWING CRITERIA:

MAXIMUM SLOPE: 15%

MINIMUM WIDTH: 15 FT

RAMP MATERIAL: MINIMUM PI OF 8, WITH NO LOOSE MATERIAL

COMPACTION: MINIMUM 90% PER ASTM D-1557

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

RETENTION BASIN  
DESIGN REQ.  
2-2A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

**RETENTION BASIN DESIGN REQUIREMENTS**

(continued)

7. RETENTION BASINS WITH DEPTHS OF 10 FEET OR MORE SHALL HAVE MAINTENANCE ROADS WITH A MINIMUM WIDTH OF 15 FEET. RETENTION BASINS WITH DEPTHS OF LESS THAN 10 FEET SHALL HAVE A FIVE (5) FOOT BENCH TERRACE ADJACENT TO THE PROPERTY LINE.
8. THE DESIGN WATER DEPTH IN RETENTION BASINS SHALL NOT EXCEED TWENTY (20) FEET, EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER WHEN BENCHING, SHALLOWER SLOPES OR OTHER MEASURES ARE PROVIDED.
9. THE ALLOWABLE CLEARANCE AT THE BOTTOM OF THE BASIN SHALL BE 25 FEET IN DIAMETER, MINIMUM.
10. IF AN ACCESS ROAD IS REQUIRED, A MINIMUM WIDTH OF TWENTY (20) FEET FOR THE ACCESS ROAD SHALL BE PROVIDED FROM THE STREET R.O.W. TO THE TOP OF THE BASIN.

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

RETENTION BASIN  
 DESIGN REQ.  
 2-2B

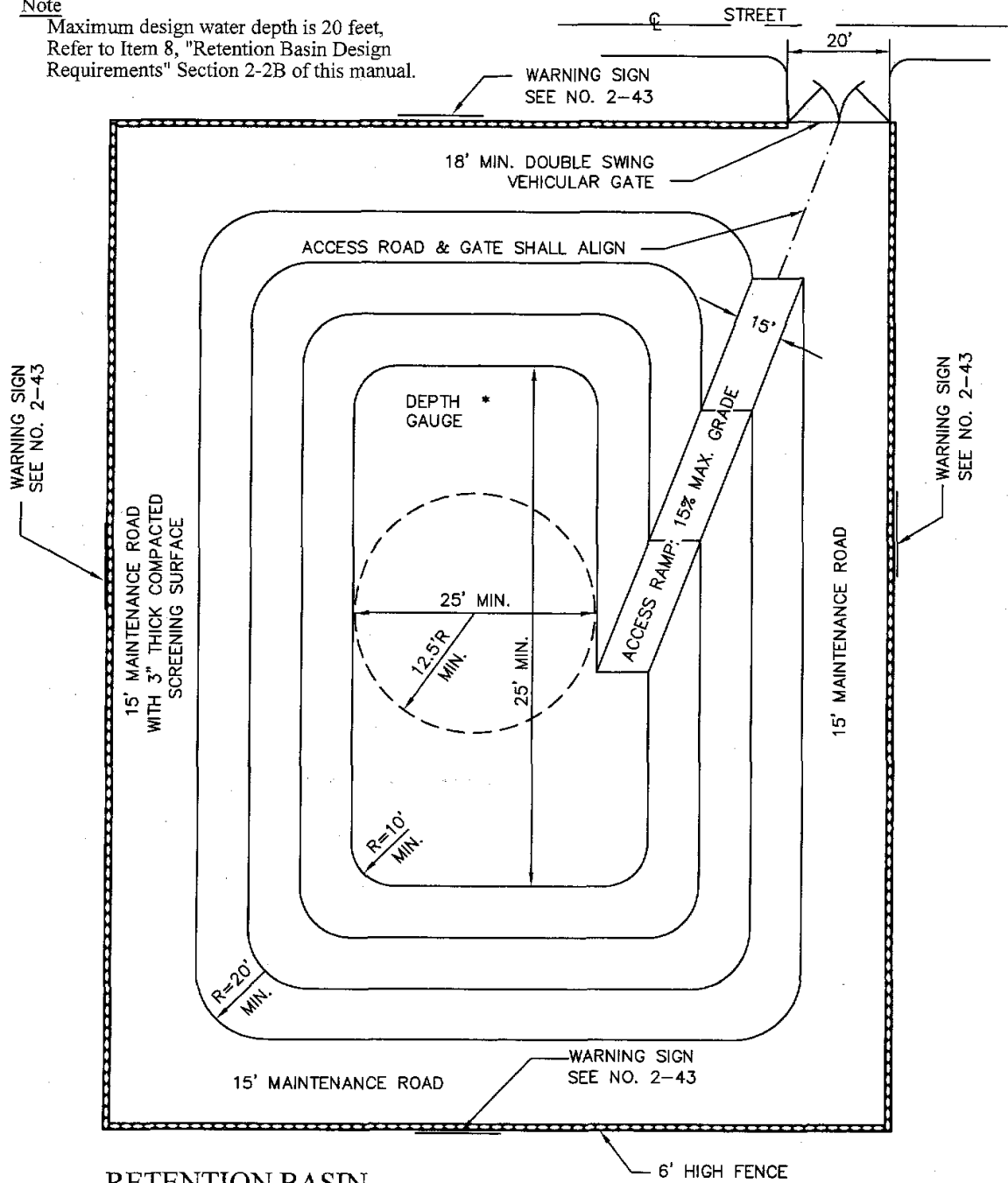
Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC / J. R.



BACK TO TITLE INDEX PAGE

Note  
Maximum design water depth is 20 feet,  
Refer to Item 8, "Retention Basin Design  
Requirements" Section 2-2B of this manual.



RETENTION BASIN



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

RETENTION BASIN  
DESIGN (DRAWING)  
2-3

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

## DETENTION BASIN DESIGN

**DEFINITION:** A DETENTION BASIN IS A MANMADE OR NATURAL RESERVOIR, EITHER PUBLIC OR PRIVATE, DESIGNED TO RESTRICT THE FLOW OF STORMWATER TO A PRESCRIBED MAXIMUM RATE THROUGH A CONTROLLED RELEASE BY GRAVITY, AND TO CONCURRENTLY DETAIN THE EXCESS WATERS THAT ACCUMULATE BEHIND THE CONTROL STRUCTURE.

**DESIGN CRITERIA:** THE DESIGN STORM WILL BE A 4" RAINFALL IN THREE (3) HOURS OVER AN AREA OF 200 ACRES OR LESS. (FOR AREAS LARGER THAN 200 ACRES, SEE NO. 2-9, EXAMPLE INCLUDED).

**TOTAL RUNOFF FORMULA:**  $QT = ARC/12$

$QT$  = TOTAL RUNOFF IN ACRE-FEET  
 $A$  = 100% OF CONTRIBUTING WATERSHED AREA IN ACRES  
 $R$  = RAINFALL IN INCHES  
 $C$  = RUNOFF FACTOR (SEE CoEP "DRAINAGE DESIGN MANUAL")

THE DETENTION BASIN WILL BE DESIGNED UTILIZING GOOD ENGINEERING PRACTICES AND ACCEPTED METHODS (HEC-1) WHEREBY 100% OF THE RUNOFF VOLUME IS TO BE PROPERLY MANAGED THROUGH THE USE OF CHANNELS AND BASINS.

A GEOTECHNICAL INVESTIGATION, PERFORMED BY A LICENSED PROFESSIONAL GEOTECHNICAL ENGINEER, SHALL BE SUBMITTED PRIOR TO FINAL APPROVAL OF DEVELOPMENT PLANS. THE REPORT SHALL CONTAIN, AT A MINIMUM, SUBSURFACE SOIL PROFILE(S) AND PERCOLATION TEST RESULTS.

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

DETENTION BASIN  
 DESIGN  
 2-4

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>OEC/J.R.</u>

### DETENTION BASIN DESIGN REQUIREMENTS

1. EARTH LEVEE DESIGN: THE DESIGN OF EARTH LEVEES SHALL BE IN ACCORDANCE WITH BOTH ACCEPTED ENGINEERING PRACTICE AND FEMA (FEDERAL EMERGENCY MANAGEMENT AGENCY) GUIDELINES AND SHALL INCLUDE A SEEPAGE ANALYSIS.
2. SPILLWAY: AN EMERGENCY CONCRETE SPILLWAY SHALL BE PROVIDED WITH A CAPACITY EQUAL TO THE PEAK DISCHARGE OF THE DESIGN STORM. (SEE 2-6,2-9,2-10,2-11) DEPTH OF FLOW OVER THE CREST OF THE SPILLWAY SHALL BE NO MORE THAN ONE (1) FOOT.
3. SIDE SLOPES SHALL NOT EXCEED FOLLOWING MAXIMUMS, UNLESS OTHERWISE RECOMMENDED BY A LICENSED PROFESSIONAL GEOTECHNICAL ENGINEER:
  - A. IN COHESIVE SOIL, THREE (3) HORIZONTAL TO ONE (1) VERTICAL (3:1).
  - B. IN NON-COHESIVE SOIL, THREE (3) HORIZONTAL TO ONE (1) VERTICAL (3:1).
4. PROVIDE AN ACCESS RAMP MEETING THE FOLLOWING CRITERIA:
 

MAXIMUM SLOPE: 15%

MINIMUM WIDTH: 15 FT

RAMP MATERIAL: MINIMUM PI OF 8, WITH NO LOOSE MATERIAL

COMPACTION: MINIMUM 90% PER ASTM D-1557
5. FOR MAINTENANCE PURPOSES, ONE (1) 18-FOOT WIDE DOUBLE SWING GATE ACCESSIBLE FROM PUBLIC RIGHT-OF-WAY SHALL BE PROVIDED.
6. DETENTION BASINS WITH DEPTHS OF 10 FEET OR MORE SHALL HAVE MAINTENANCE ROADS WITH A MINIMUM WIDTH OF 15 FEET AND A MAXIMUM SLOPE OF 15%. DETENTION BASINS WITH DEPTHS OF LESS THAN 10 FEET SHALL HAVE A FIVE (5) FOOT BENCH TERRACE ADJACENT TO THE PROPERTY LINE.
7. DETENTION BASINS SHALL BE ENCLOSED WITH A 6-FOOT CHAINLINK FENCE, EXCEPT THAT THE CHAINLINK FENCE MAY BE SUBSTITUTED WITH MASONRY OR ROCK WALL, WROUGHT IRON FENCING OR A COMBINATION THEREOF. THE HEIGHT SHALL BE MEASURED FROM THE GROUND INSIDE OR OUTSIDE THE WALL, WHICHEVER IS THE HIGHER.
8. THE DESIGN WATER DEPTH IN DETENTION BASINS SHALL NOT EXCEED TWENTY (20) FEET, EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER WHEN BENCHING, SHALLOWER SLOPES OR OTHER MEASURES ARE PROVIDED.
9. THE MINIMUM ALLOWABLE CLEARANCE AT THE BOTTOM OF BASIN SHALL BE 25 FEET IN DIAMETER.
10. THE OUTLET SHALL EMPTY THE BASIN WITHIN 72 HOURS FROM THE END OF DESIGN INTENSITY STORM.

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE

ENGINEERING DEPARTMENT

DESIGN STANDARDS  
FOR CONSTRUCTION

DETENTION BASIN  
DESIGN REQ.  
2-5

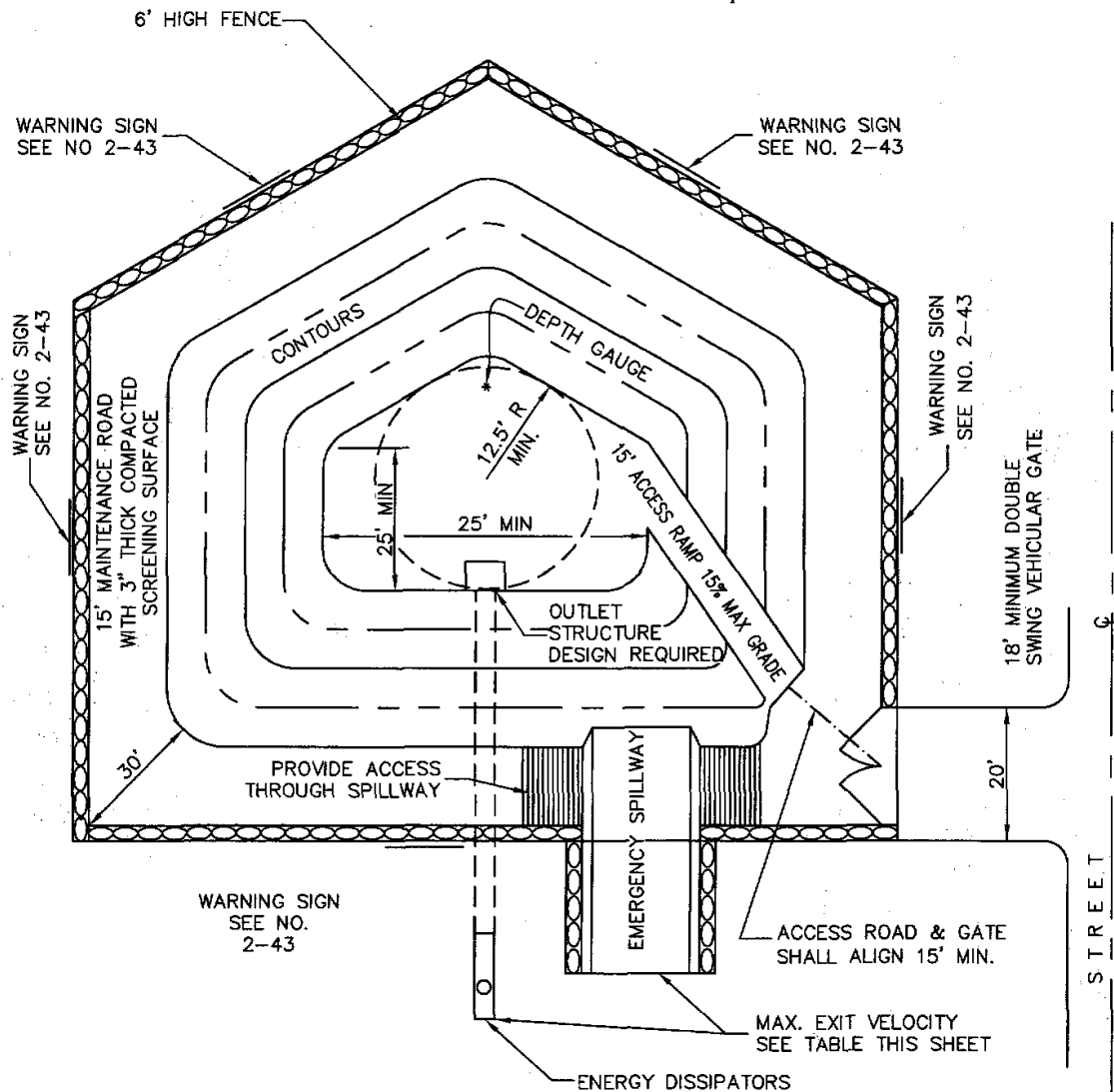
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE

Note

Maximum design water depth is 20 feet,  
Refer to Item 9, "Detention Basin Design  
Requirements" Section 2-5 of this manual.



DETENTION BASIN

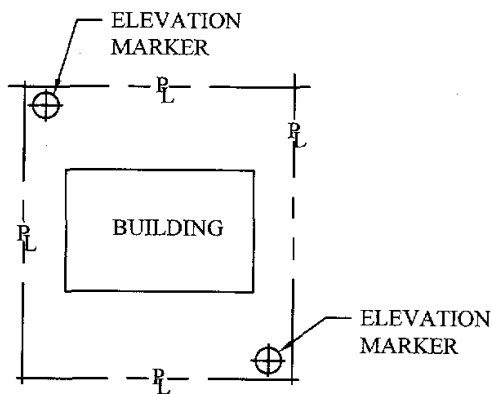
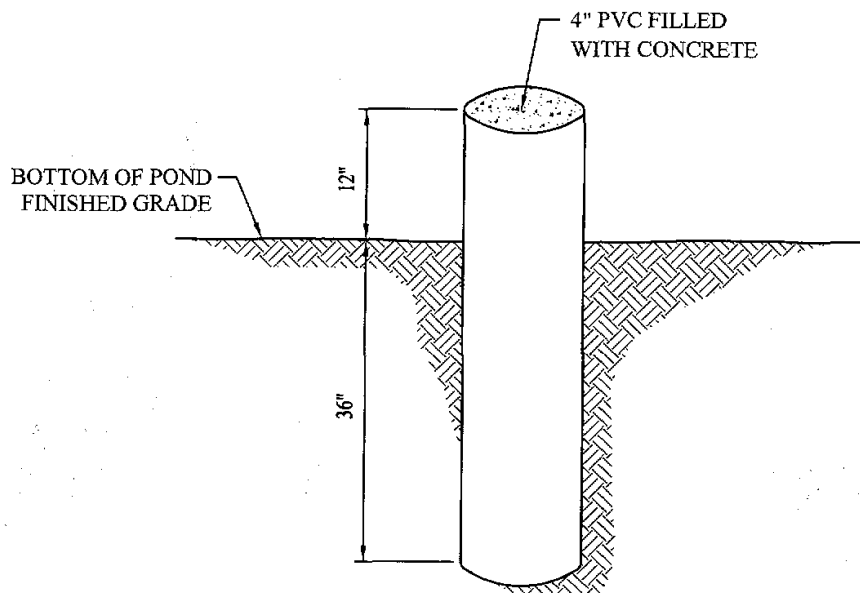
MAX. VELOCITY @ DISCHARGE POINTS
5 fps FOR UNPROTECTED GROUND
8 fps FOR OTHER GROUND COVER MATERIALS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DETENTION BASIN  
DESIGN (DRAWING)  
2-6

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>



MARKERS TO BE PLACED  
AT CORNER OF FRONT  
AND BACK YARDS.

PERMANENT ELEVATION MARKER  
FOR ON SITE PONDING N.T.S.

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PERMANENT ELEVATION  
MARKER FOR ON-SITE  
PONDING

2-7

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

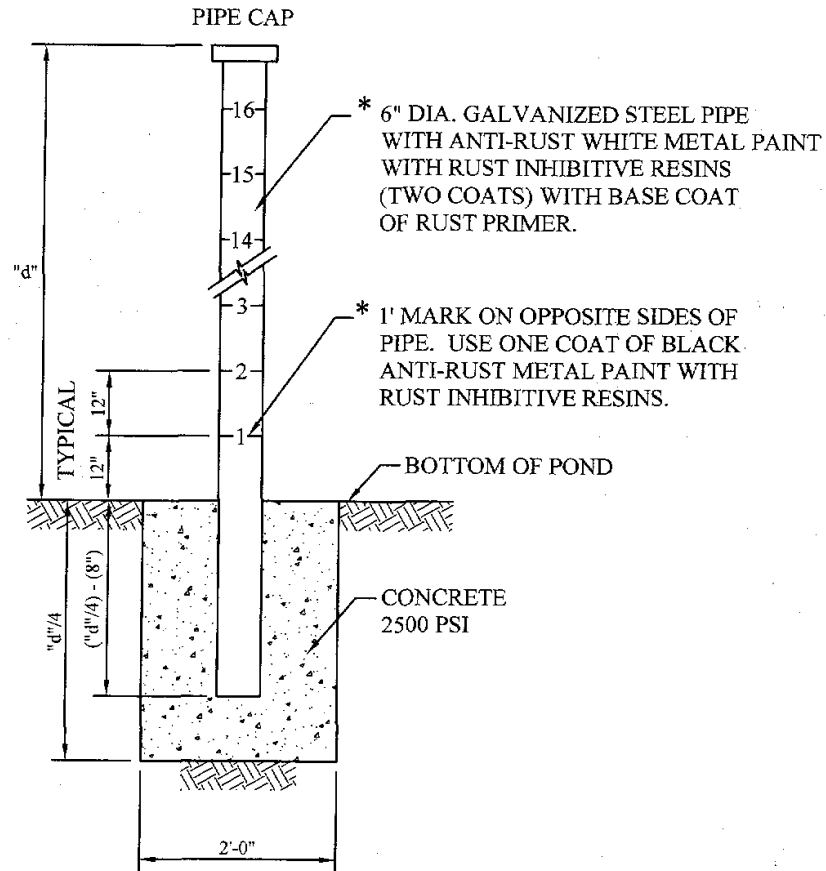
Checked By H. M. E.  
Drawn By QEC/J.R.



BACK TO TITLE INDEX PAGE

NOTE

ALTERNATES WILL BE ALLOWED WITH THE PRIOR REVIEW AND APPROVAL OF THE CITY ENGINEER.



## POND DEPTH GAUGE

SCALE: 1/2"=1'-0"

NOTES:

- \* 1. CONSULT WITH PAINT MANUFACTURER FOR PRODUCTS THAT CAN SUSTAIN LONG PERIODS OF MOISTURE.
- 2. "d" = depth



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

POND DEPTH GAUGE

2-8

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.

INTENTIONALLY LEFT BLANK FOR FUTURE USE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BLANK  
2-9

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC / I. R.

INTENTIONALLY LEFT BLANK FOR FUTURE USE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BLANK  
2-10

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H.M.E.  
Drawn By OEC/J.R.

INTENTIONALLY LEFT BLANK FOR FUTURE USE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BLANK  
2-11

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC / J. R.

INTENTIONALLY LEFT BLANK FOR FUTURE USE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BLANK  
2-12

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QBC/J. R.</u>



INTENTIONALLY LEFT BLANK FOR FUTURE USE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BLANK  
2-13

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / I. R.

INTENTIONALLY LEFT BLANK FOR FUTURE USE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BLANK  
2-14

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

INTENTIONALLY LEFT BLANK FOR FUTURE USE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

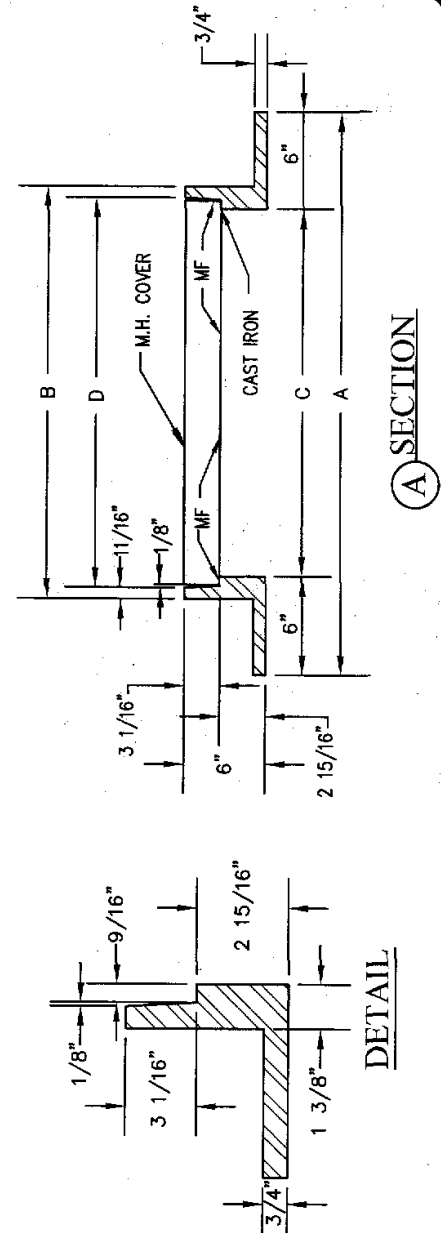
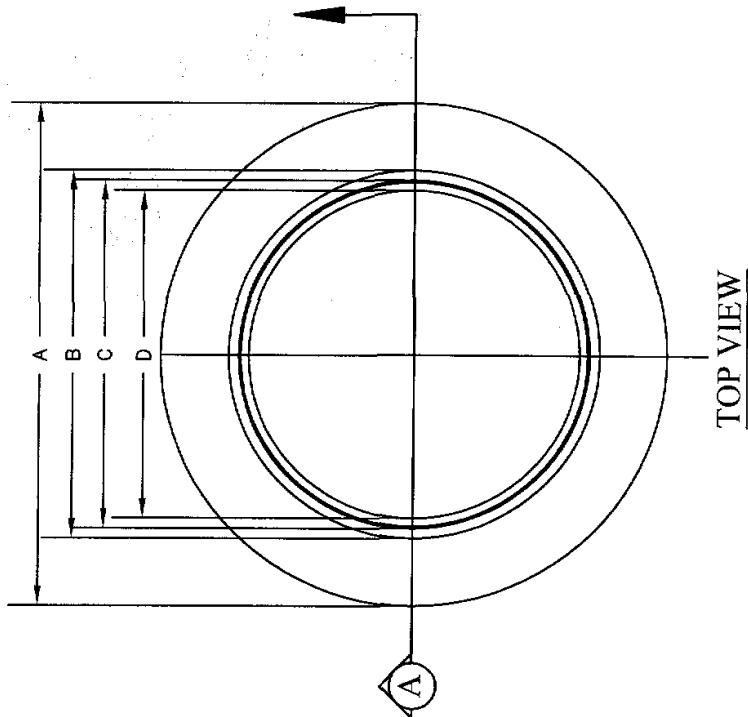
BLANK  
2-15

Approved By R. A. SHUBERT	Checked By H. M. E.
Date JUNE 03, 2008	Drawn By OEC / J. R.

BACK TO TITLE INDEX PAGE

- NOTE:
1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
  2. CASTING TO BE SMOOTH AND VOID OF AIR HOLES.

MANHOLE RING	48" MANHOLE	72" MANHOLE
WEIGHT	165 LBS.	225 LBS.
A	2'-10 1/2"	3'-6"
B	2'-1 1/4"	2'-8 3/4"
C	1'-10 1/2"	2'-6"
D	1'-11 7/8"	2'-7 3/8"



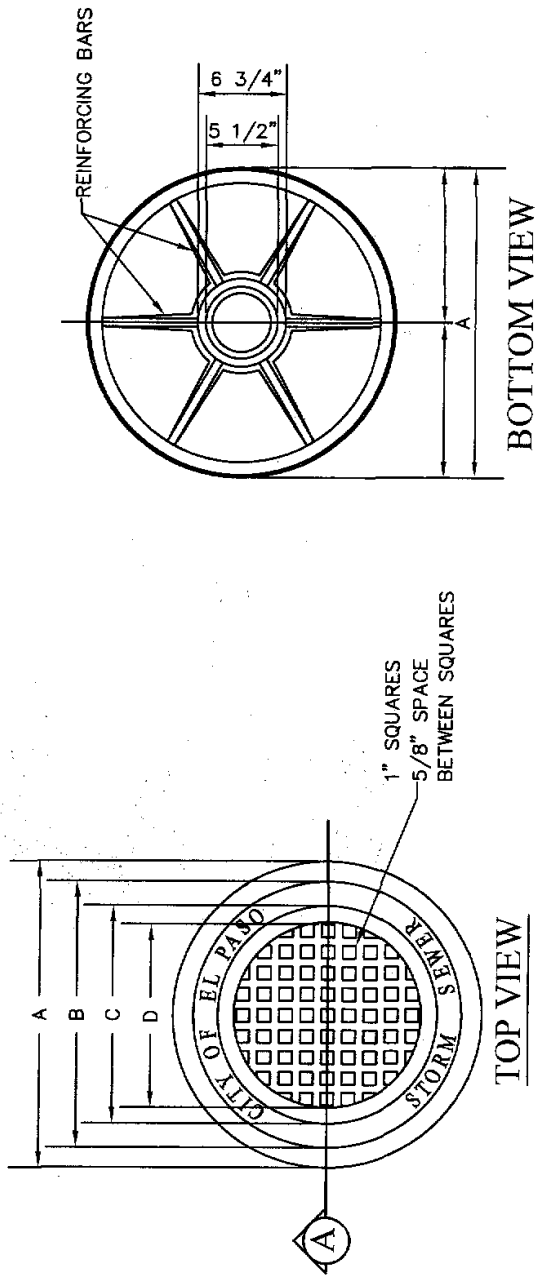
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MANHOLE RING  
2-16

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC/I. R.

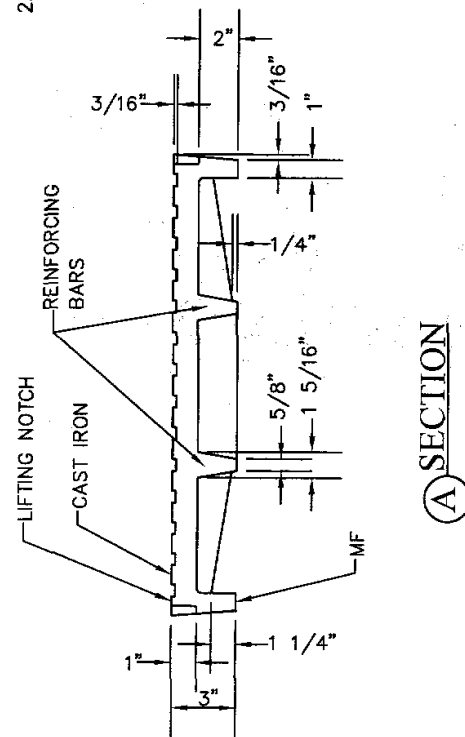
BACK TO TITLE INDEX PAGE



GENERAL NOTES:

1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH AND VOID OF AIR HOLES.

MANHOLE COVER WEIGHT	48" MANHOLE	72" MANHOLE
A	1'-11 3/4"	2'-7 1/4"
B	1'-8 5/8"	2'-4 1/8"
C	1'-4 7/8"	2'-3/8"
D	1'-2 3/8"	1'-9 7/8"
E	11 7/8"	1'-3 5/8"



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MANHOLE COVER  
2-17

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.





BACK TO TITLE INDEX PAGE

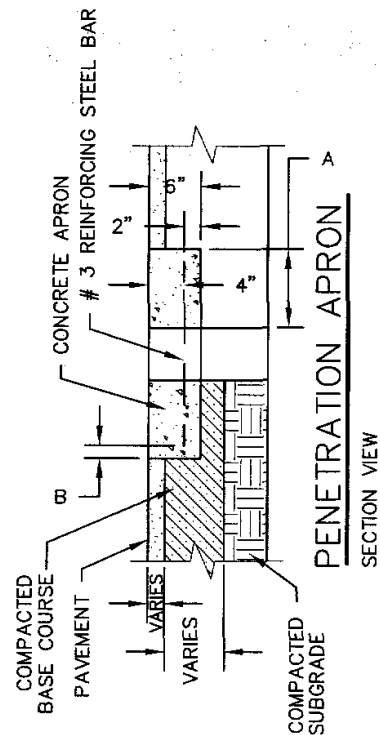
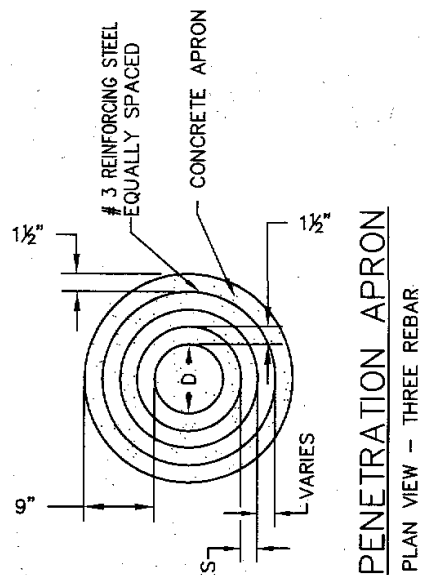
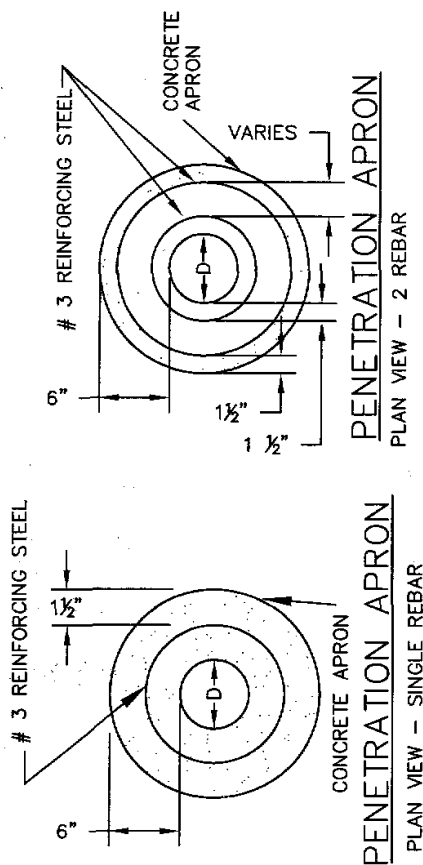
CONCRETE APRON FOR CIRCULAR PENETRATIONS IN ASPHALT PAVEMENTS				
"D" DIAMETER OF PENETRATION (INCHES)	"A" CONCRETE HORIZONTAL DIMENSION FROM PENETRATION (INCHES)	NUMBER OF NO. 3 REINFORCING STEEL BARS (INCHES)	"B" MINIMUM CLEARANCE FROM EDGE OF CONCRETE APRON TO CENTER OF NEAREST REBAR (INCHES)	"C" MINIMUM CLEARANCE FROM PENETRATION EDGE TO CENTER OF NEAREST REBAR (INCHES)
0 TO 6.01	6	1	1 1/2	1 1/2
6.01 TO 18.01	8	2	1 1/2	1 1/2
18.01 AND OVER	12	3	1 1/2	1 1/2

**CONSTRUCTION NOTES:**

1. ANY DISTURBED SUBGRADE UNDER THE CONCRETE APRON SHALL BE COMPACTED TO 95% DENSITY  $\pm$  3% OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D-1557.
2. ANY DISTURBED COARSE UNDER THE CONCRETE APRON SHALL BE COMPACTED TO 100% DENSITY  $\pm$  2% OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D-1557.
3. PROVIDE A MINIMUM OF 1 1/2" OF CONCRETE COVER FOR ALL REINFORCEMENT STEEL.
4. REINFORCING SHALL MEET ASTM C-478 AND TRAFFIC LOADING (HS-20).
5. NO. 3 REINFORCING STEEL HOOPS SHALL BE SPACED EQUALLY.

**GENERAL NOTES:**

1. THE PENETRATION APRON SHOULD BE CAST IN-PLACE CONCRETE. (MINIMUM 28 DAY COMPRESSIVE STRENGTH 4000 PSI. HIGH EARLY CONCRETE IS REQUIRED)
2. TOPS OF PENETRATION APRON SHALL BE FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE UNLESS OTHERWISE SPECIFIED BY THE CITY ENGINEER.



TITLE 19 - SUBDIVISION ORDINANCE

ENGINEERING DEPARTMENT

DESIGN STANDARDS  
FOR CONSTRUCTION

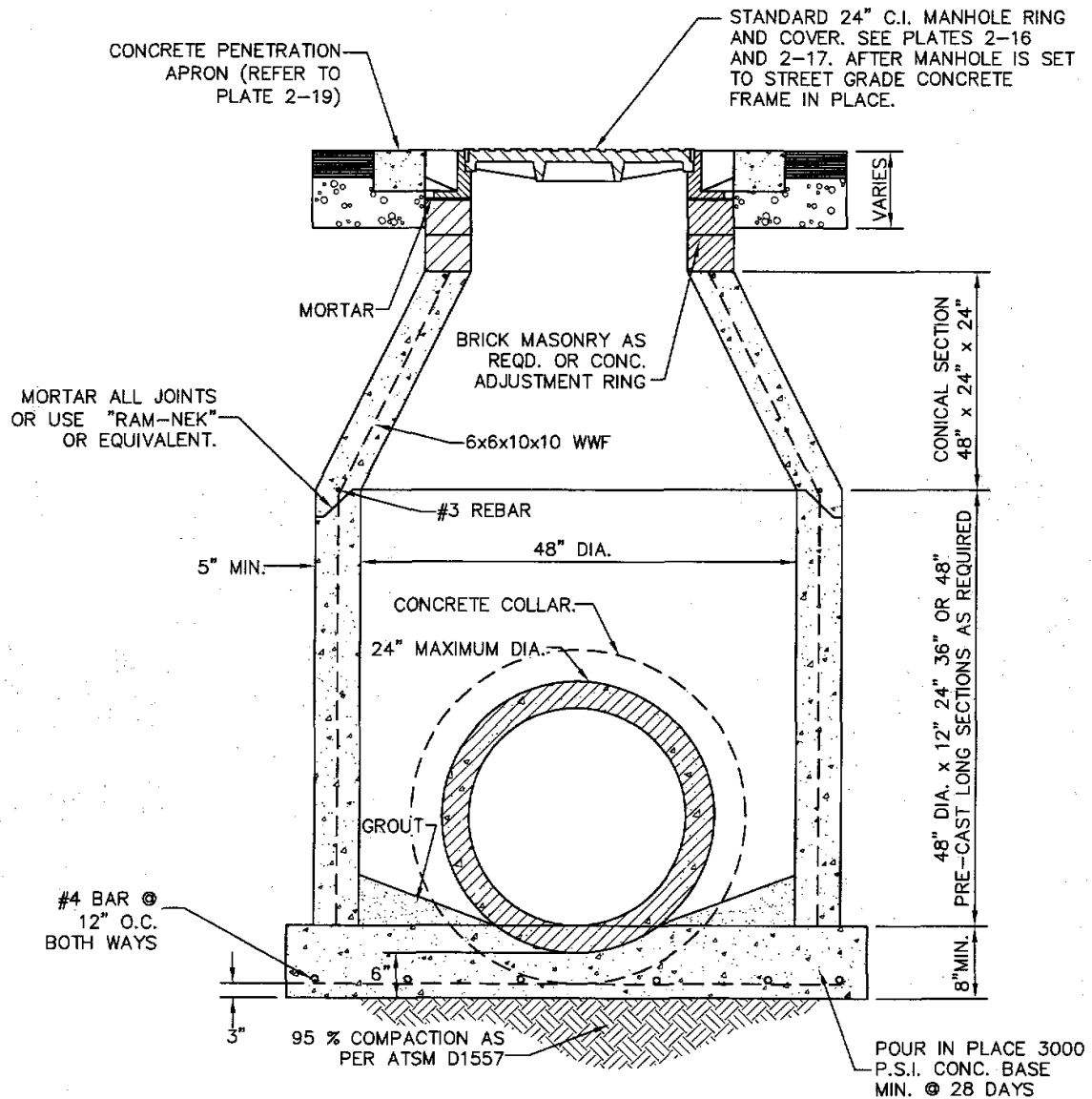
PENETRATION  
APRON

2-19

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



48" DIAMETER STANDARD MANHOLE  
NTS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

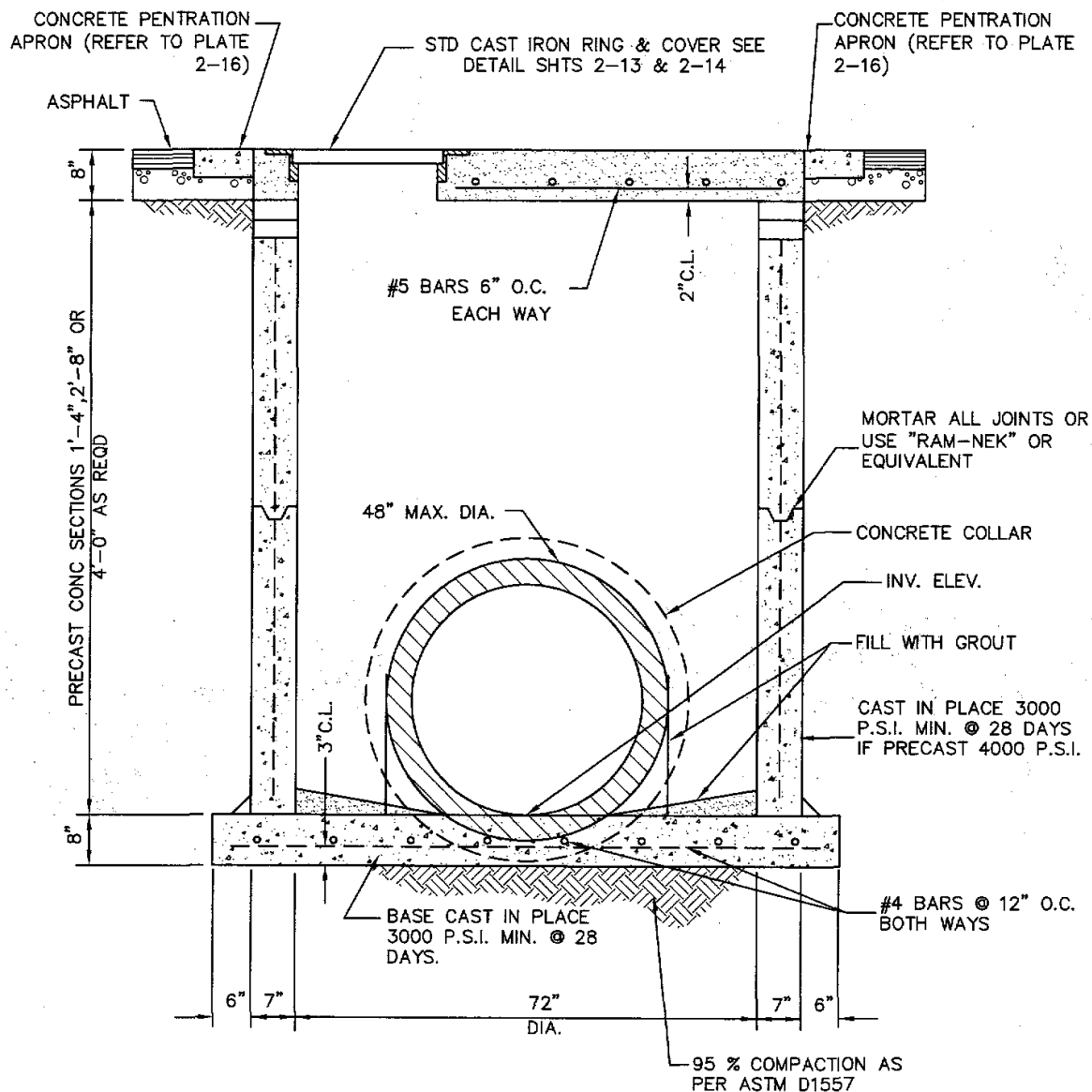
48" DIAMETER  
STANDARD  
CONICAL MANHOLE  
2-20

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC/J.R.



BACK TO TITLE INDEX PAGE



72" DIAMETER PRECAST MANHOLE SECTIONS  
NTS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

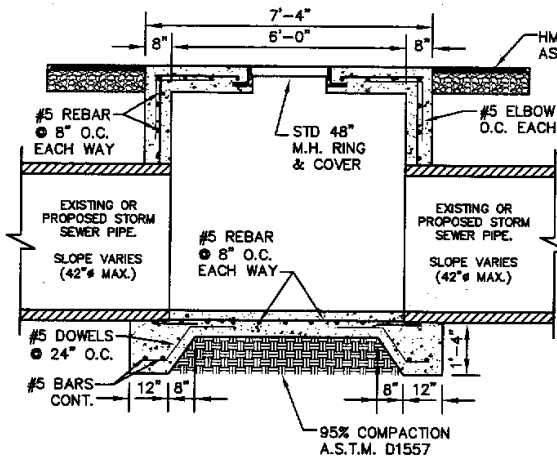
72" DIAMETER PRECAST  
MANHOLES  
2-22

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

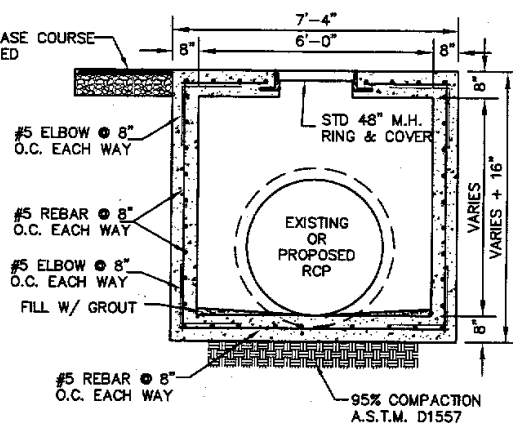
Checked By H. M. E.  
Drawn By OEC / J. R.



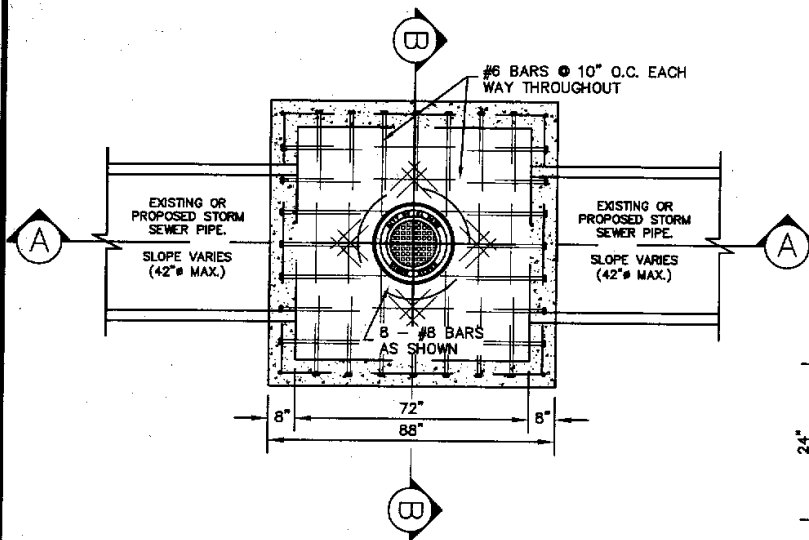
BACK TO TITLE INDEX PAGE



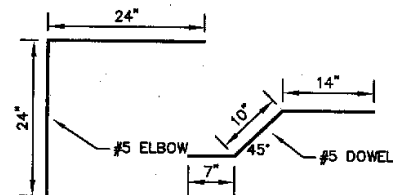
SECTION A-A



SECTION B-B



72" DIAMETER CAST-IN PLACE  
STANDARD MANHOLE



BENDING DETAIL



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

72" DIAMETER  
CAST-IN-PLACE  
MANHOLE  
2-23

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

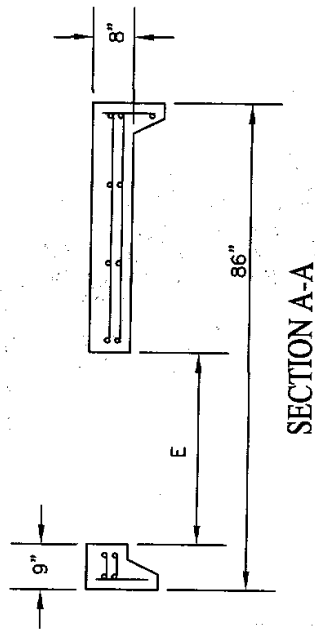
Checked By H. M. E.  
Drawn By QEC / J. R.

GENERAL NOTES:

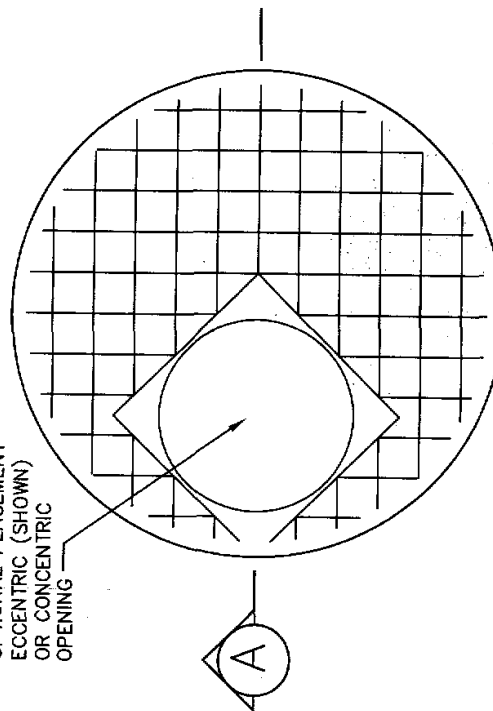
1. ALL JOINTS TO BE TONGUE AND GROOVE AND SEALED WITH RAM-NEK OR EQUAL.
2. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.

CONSTRUCTION KEY NOTES:

- A. 4000 P.S.I. CONCRETE 28 DAYS.
- B. KEYLOCK ADDS 8" TO VERTICAL HEIGHT.
- C. RING & COVER OR SPECIAL LIDS TO MEET REQUIREMENTS. MAY BE CAST IN PLACE.
- D. REINFORCING SHALL MEET A.S.T.M. C478-87 AND TRAFFIC LOADING (HS-20).
- E. SIZE TO ACCOMMODATE TYPE 72" DIAMETER MANHOLE RING.



OPTIONAL PLACEMENT  
ECCENTRIC (SHOWN)  
OR CONCENTRIC  
OPENING



MANHOLE COVER FOR TYPE 72" MANHOLE

[BACK TO TITLE INDEX PAGE](#)

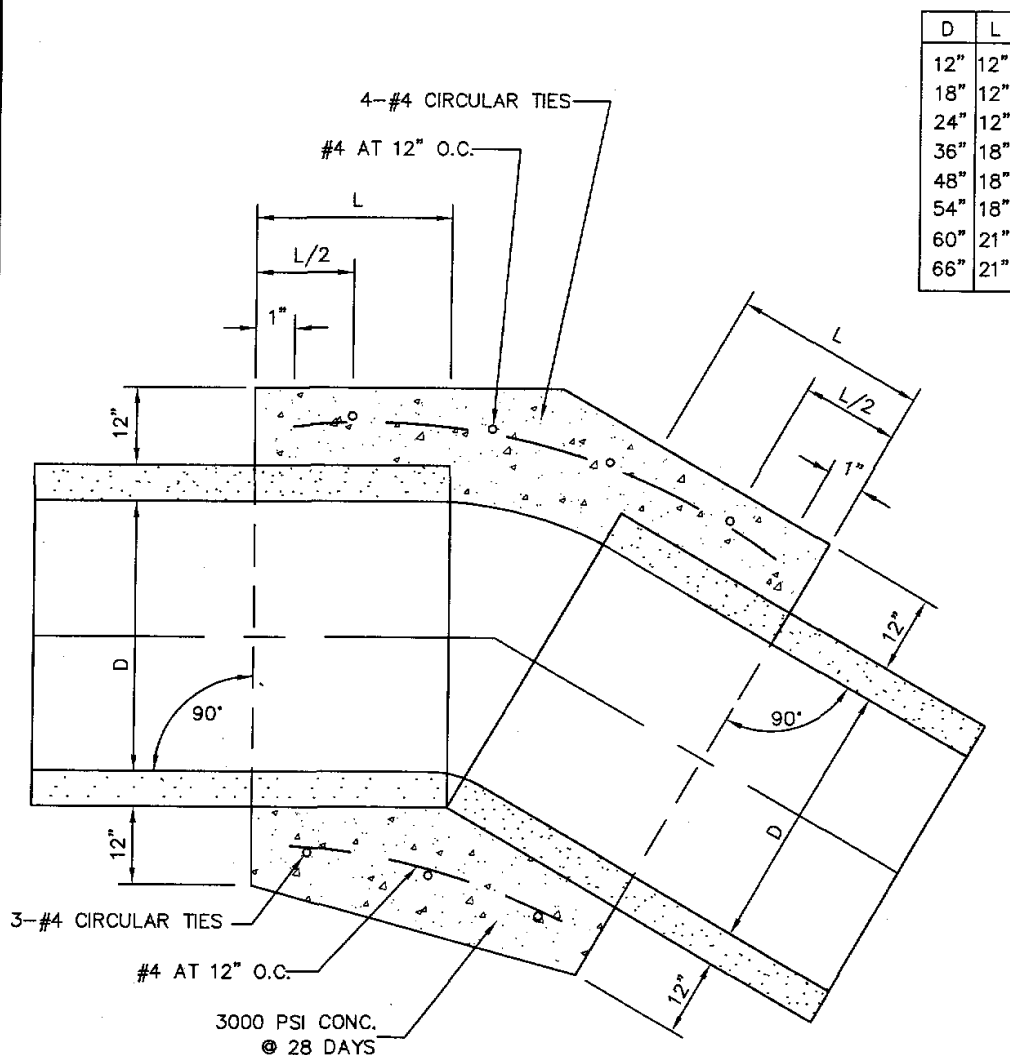


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CONCRETE MANHOLE  
COVER FOR TYPE 72"  
MANHOLE  
2-24

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.



### CONCRETE PIPE COLLAR

1. A CONCRETE COLLAR IS REQUIRED WHERE PIPES CHANGE IN HORIZONTAL OR VERTICAL ALIGNMENT.
2. FOR PIPES 24" OR LESS IN DIAMETER REINFORCE WITH W.W.M.

[BACK TO TITLE INDEX PAGE](#)

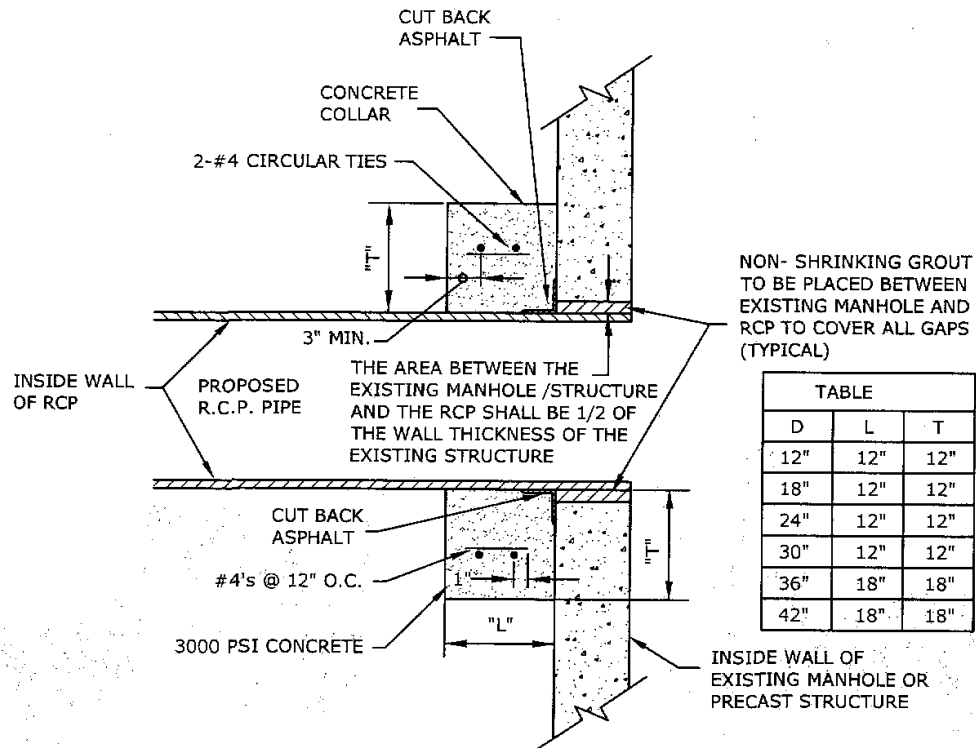


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CONCRETE PIPE  
COLLAR  
2-25

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



### CONNECTION AT PRECAST JUNCTION BOXES OR EXISTING MANHOLES

SCALE: N.T.S.

[BACK TO TITLE INDEX PAGE](#)

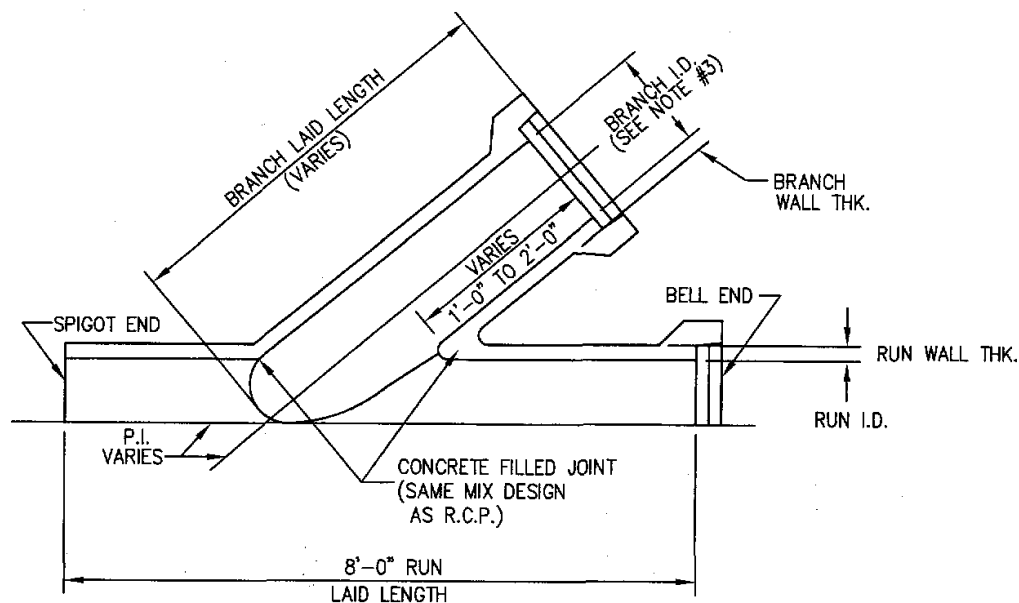


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CONNECTION AT PRECAST  
JUNCTION BOXES OR  
EXISTING MANHOLES  
2-26

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.



REINFORCED CONCRETE PIPE – WYE 18" THRU 96" DIA.

### PLAN VIEW SECTION

N.T.S.

#### NOTES:

- 1) THIS DRAWING IS NOT INTENDED TO SHOW REINFORCEMENT DESIGN EITHER AS TO PLACEMENT OR STEEL AREA. ACTUAL PROJECT SPECIFICATIONS WILL GOVERN.
- 2) STEEL AREA IN WYE CONNECTION EXCEEDS THAT REQUIRED IN ADJACENT PIPE.
- 3) FOR 18" DIA. TO 30" DIA. MAINLINE R.C.P. THE DIA. OF THE WYE NEEDS TO BE 6" SMALLER THAN THE MAINLINE DIA. FOR 36" DIA. TO 96" DIA. MAINLINE R.C.P. THE DIA. OF THE WYE NEEDS TO BE 12" SMALLER THAN THE MAINLINE DIA.

[BACK TO TITLE INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PRE-FABRICATED  
REINFORCED CONCRETE  
PIPE WYE  
2-27

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC / J. R.



### STANDARD MANHOLE SPECIFICATIONS

1. THE PRECAST MANHOLE RISER AND CONICAL SECTIONS SHALL CONFORM TO ASTM SPECIFICATIONS C-478.
2. THE PRECAST CONCRETE SHALL ATTAIN A MINIMUM ALLOWABLE COMPRESSIVE STRENGTH OF 4000 PSI @ 28 DAYS.
3. THE CONCRETE BASE SHALL ATTAIN A MINIMUM ALLOWABLE COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS.
4. MASONRY SHALL BE COMMON BRICK WITH ASTM TYPE 'S' MORTAR ATTAINING A MINIMUM COMPRESSIVE STRENGTH OF 1800 P.S.I. AT 28 DAYS.
5. INCLUDE DETAIL FOR CONNECTION AT PRECAST JUNCTION BOXES OR EXISTING MANHOLES (IF APPLICABLE) , REFER TO PLATE 2-26.
6. MANHOLE COVER SHALL BE SET FLUSH WITH FINISHED PAVEMENT.
7. SUBGRADE FOR MANHOLES SHALL BE COMPACTED TO A MINIMUM OF 95% IN ACCORDANCE WITH ASTM D1557.

[BACK TO TITLE INDEX PAGE](#)



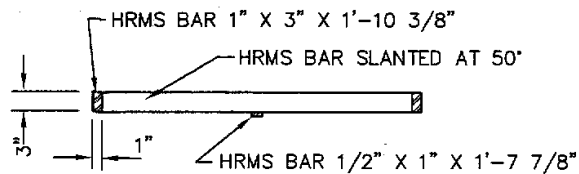
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STANDARD MANHOLE  
SPECIFICATIONS  
2-28

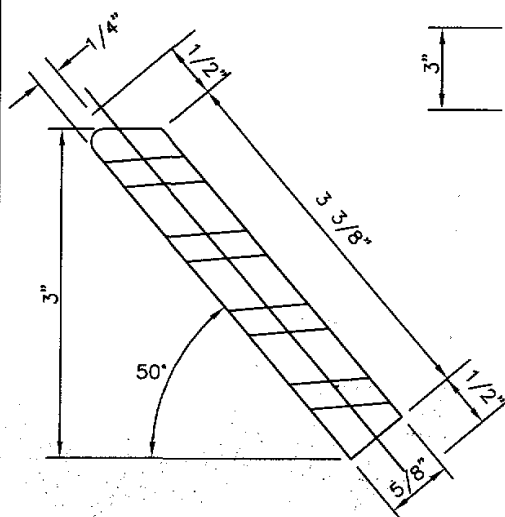
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

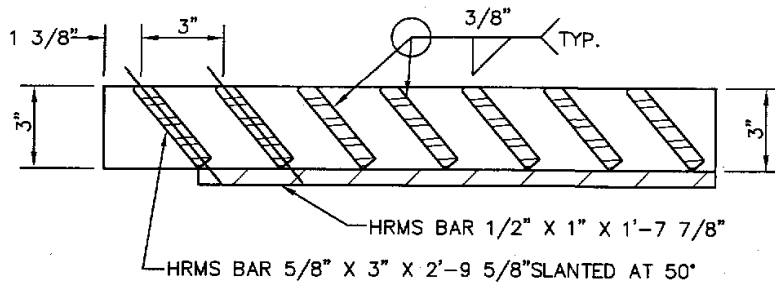
BACK TO TITLE INDEX PAGE



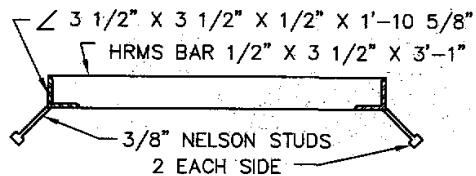
C GRATE SECTION



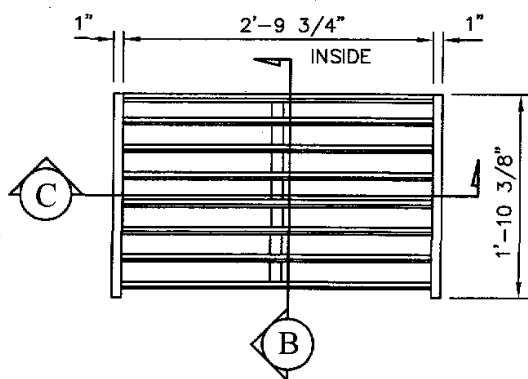
SLANTED BAR DETAIL



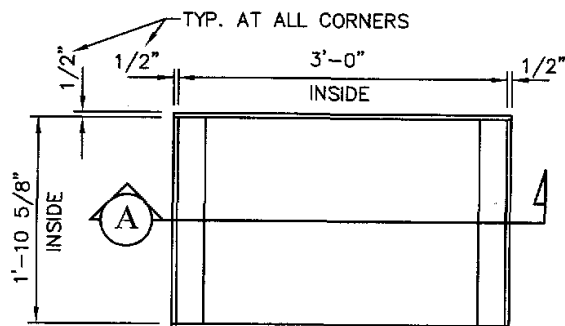
B GRATE SECTION



A FRAME SECTION



GRATE



FRAME



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

GRATE AND FRAME  
FOR DROP INLET  
2-29

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

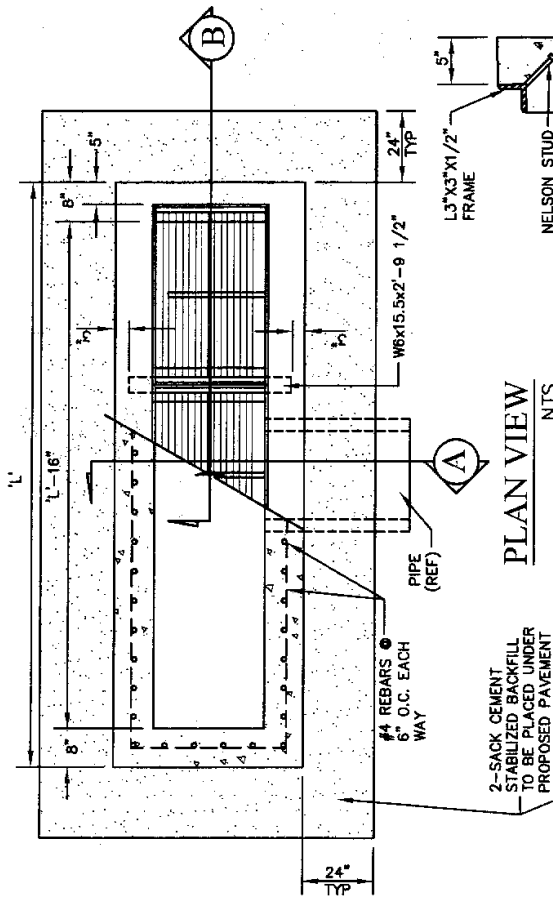
Checked By H. M. E.  
Drawn By QEC / J. R.



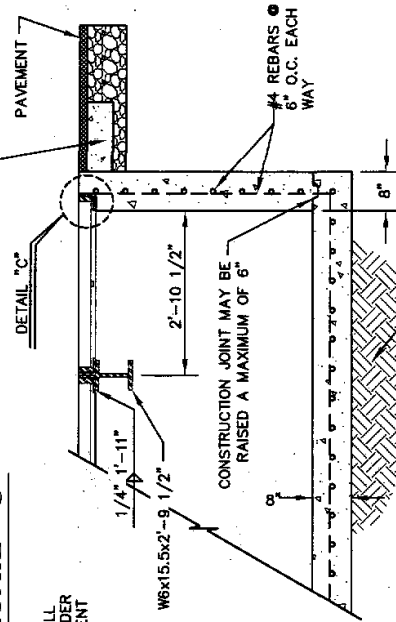
BACK TO TITLE INDEX PAGE

NUMBER OF GRATES	'L'
2	7'-1"
3	10'-2"
4	13'-3"
5	16'-4"

- NOTES
1. H = 20" MAXIMUM
  2. CONCRETE TO BE 3000 psi MIN CORE TEST @ 28 DAYS.
  3. GRATE TO BE PERPENDICULAR TO TRAFFIC.

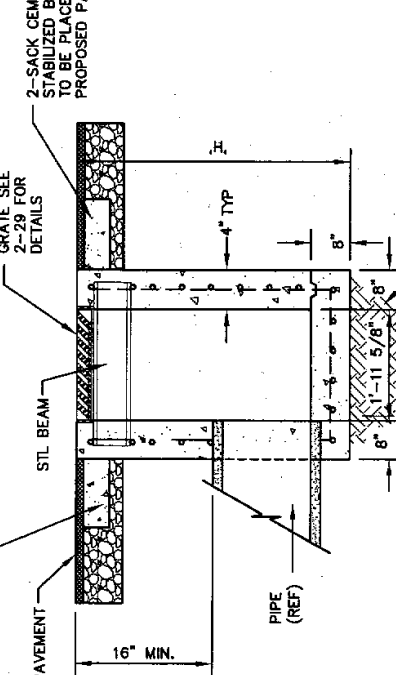


DETAIL "C"



SECTION B NTS

SUBGRADE TO BE COMPACTED TO 95% AS PER ASTM D1557



SUBGRADE TO BE COMPACTED TO 95% AS PER ASTM D1557



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DROP INLET  
TYPE II  
2-31

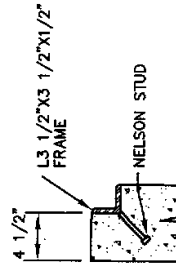
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

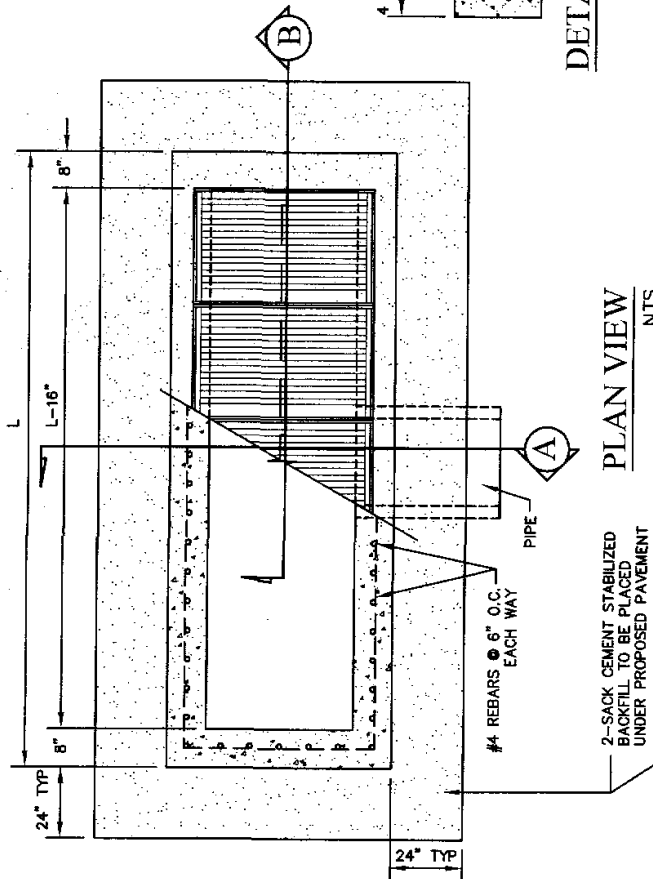
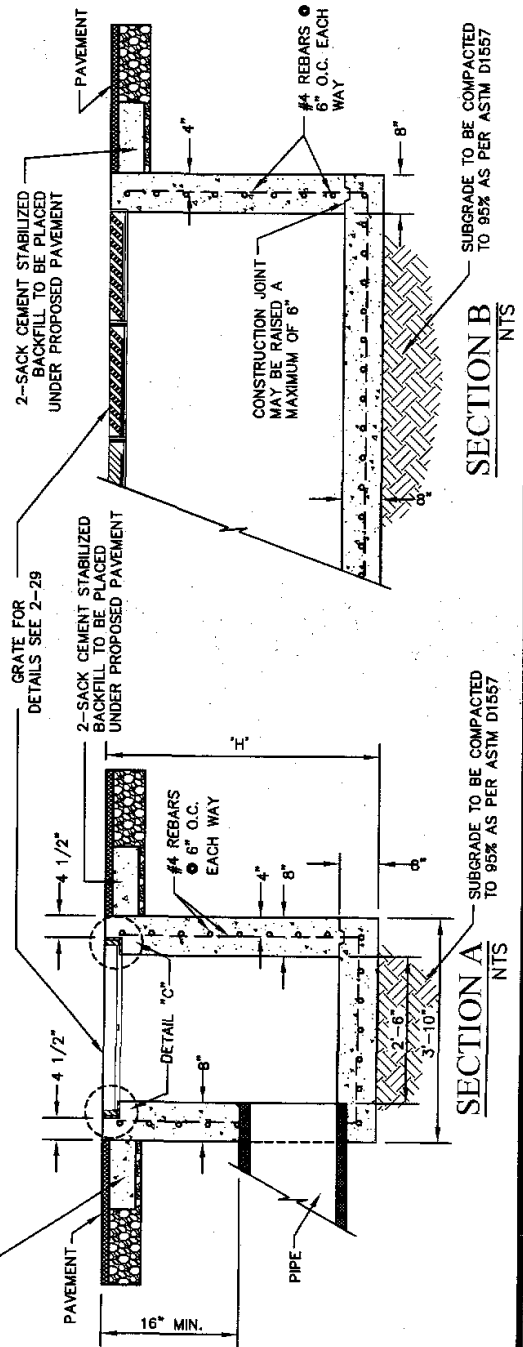
BACK TO TITLE INDEX PAGE

NUMBER OF GRATES	'L'
2	5'-1 1/8"
3	7'-0 1/8"
4	8'-9 7/8"
5	10'-8"

- NOTES
1. H = 20' MAXIMUM
  2. CONCRETE TO BE 3000 psi MIN CORE TEST @ 28 DAYS.
  3. GRATE TO BE PERPENDICULAR TO TRAFFIC.



DETAIL "C"

PLAN VIEW  
NTSSECTION A  
NTSSECTION B  
NTS

TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DROP INLET TYPE III  
2-32

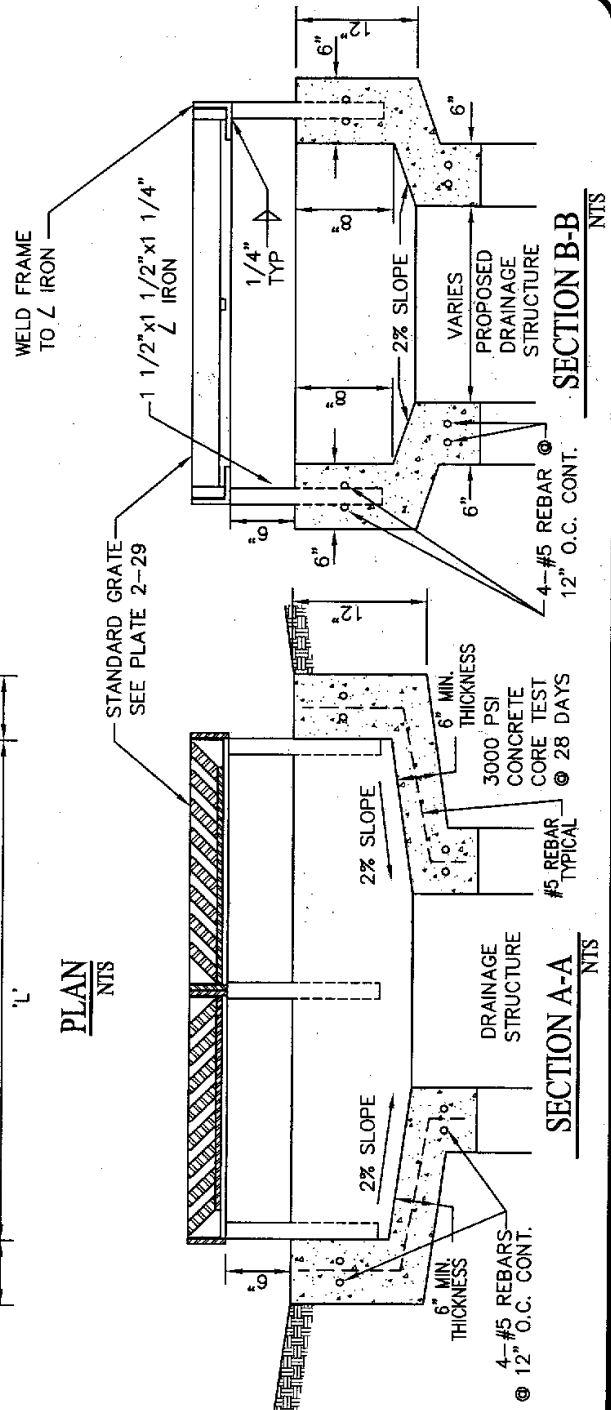
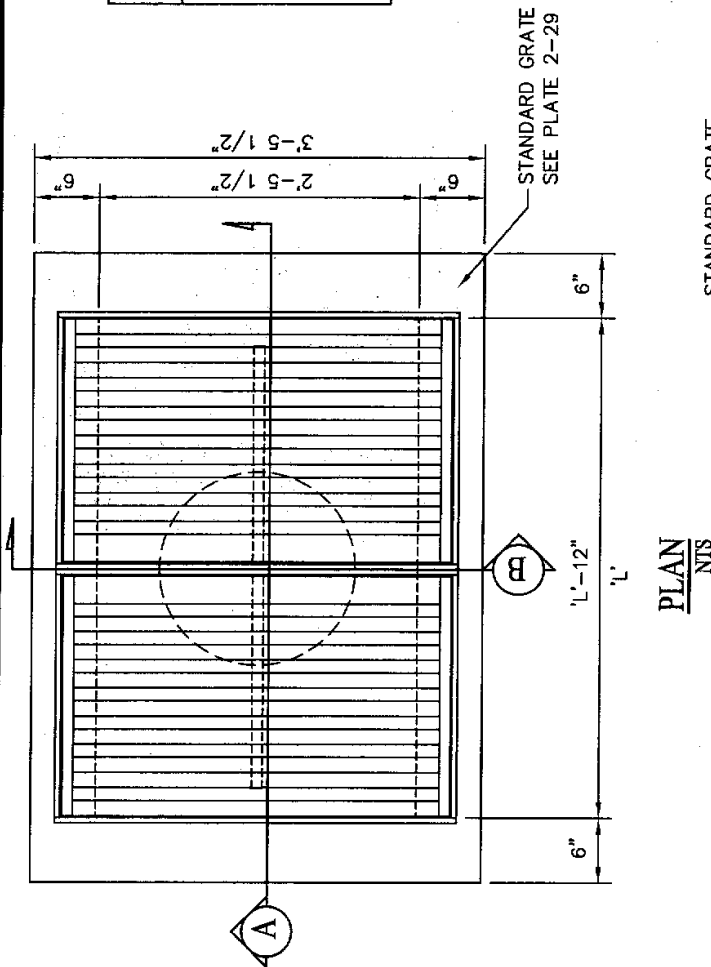
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC/J.R.



BACK TO TITLE INDEX PAGE

NUMBER OF GRATES	'L'
1	2'-11 5/8"
2	5'- 3/4"
3	6'-10 3/4"
4	8'-9 1/2"
5	10'-8"



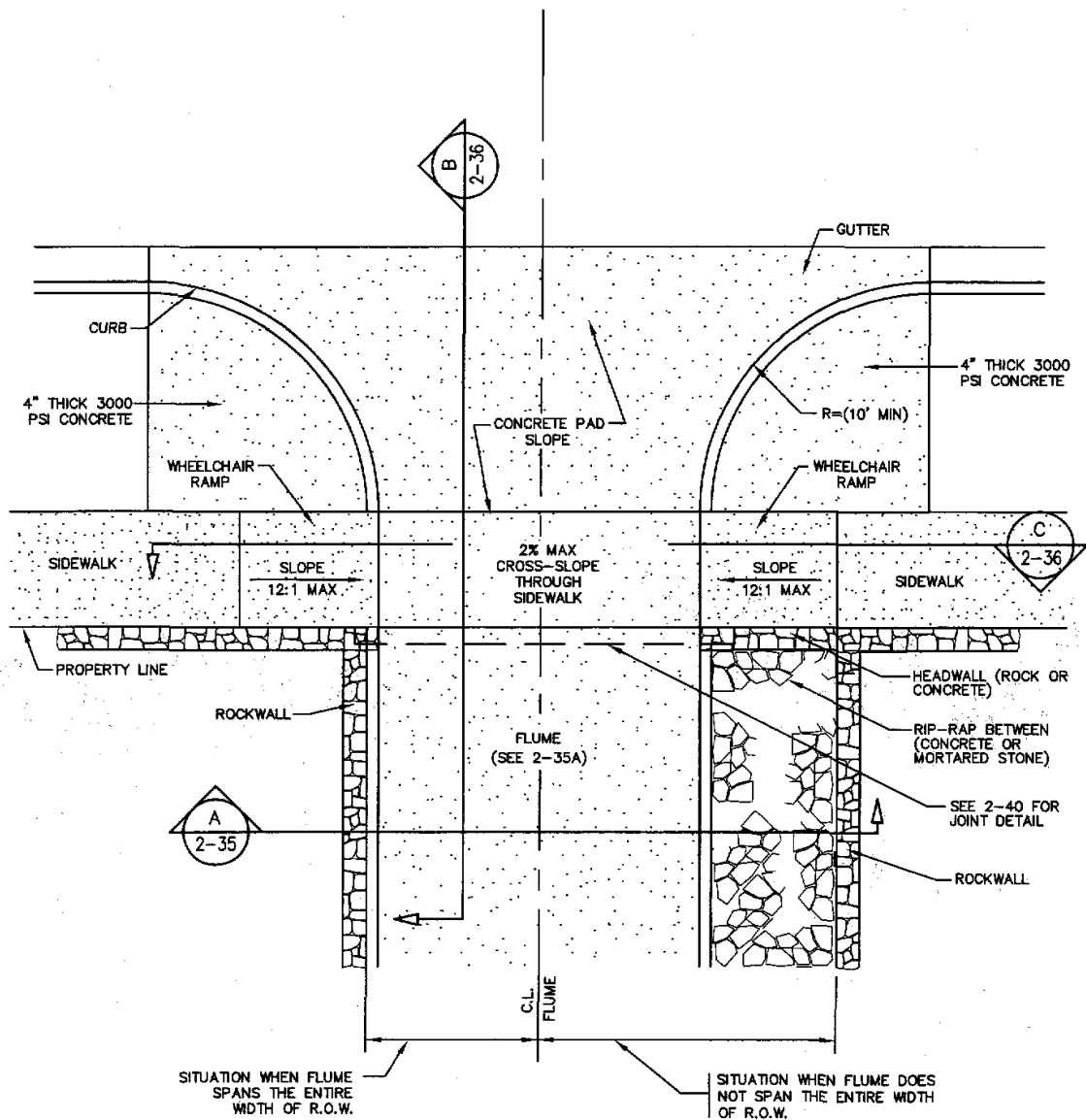
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

OFF- STREET STORM  
INLET DETAIL  
2-33

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



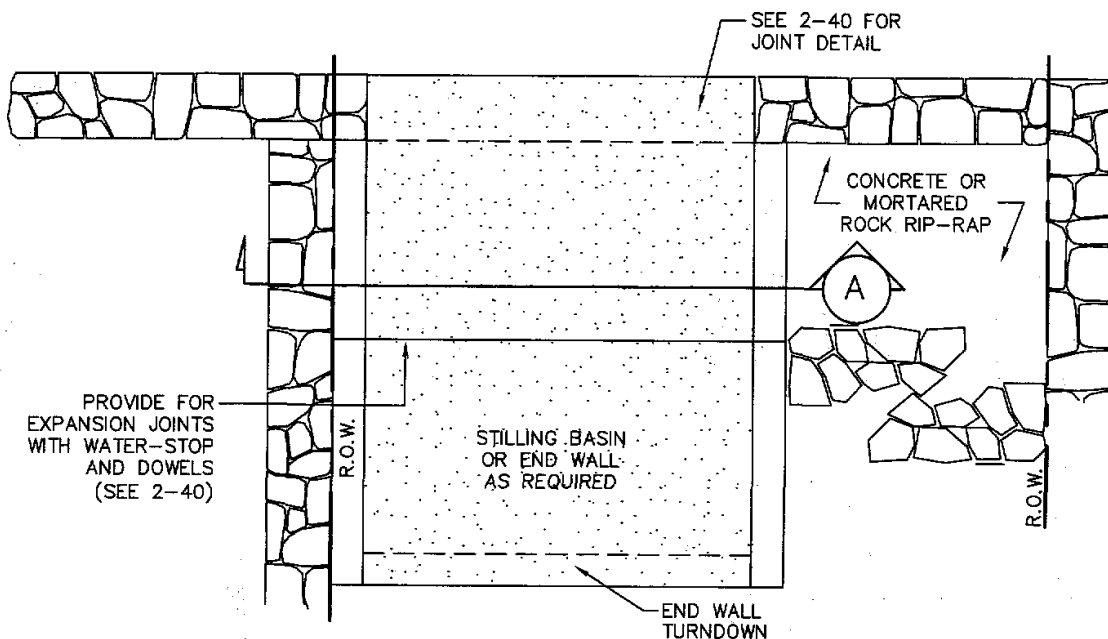
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

FLUME DESIGN  
2-34

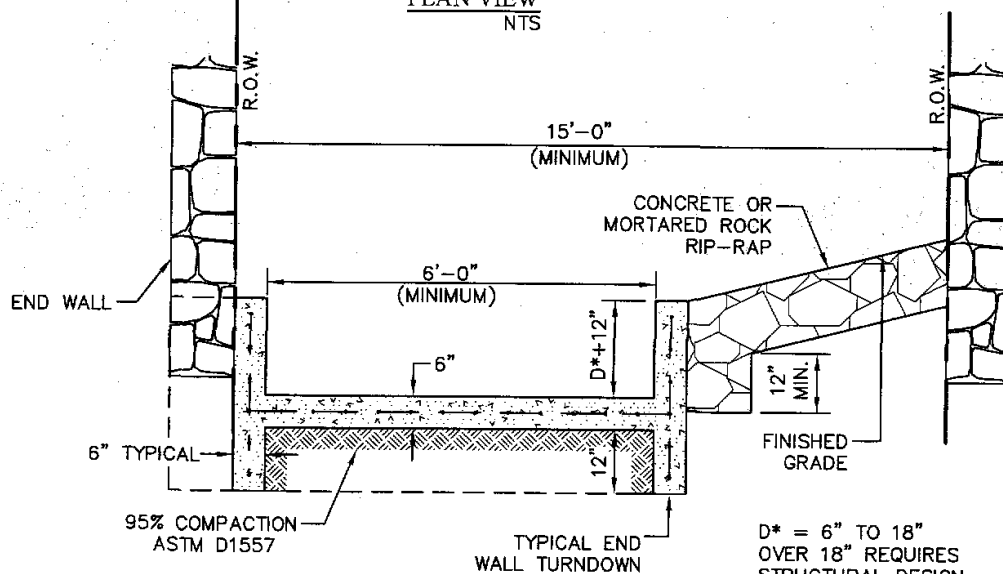
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC/J.R.

BACK TO TITLE INDEX PAGE



PLAN VIEW  
NTS



SECTION - A  
NTS



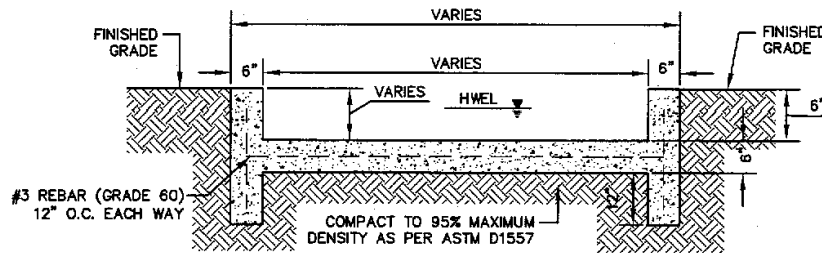
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CONCRETE FLUME  
WITHIN DRAINAGE  
R.O.W.  
2-35A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

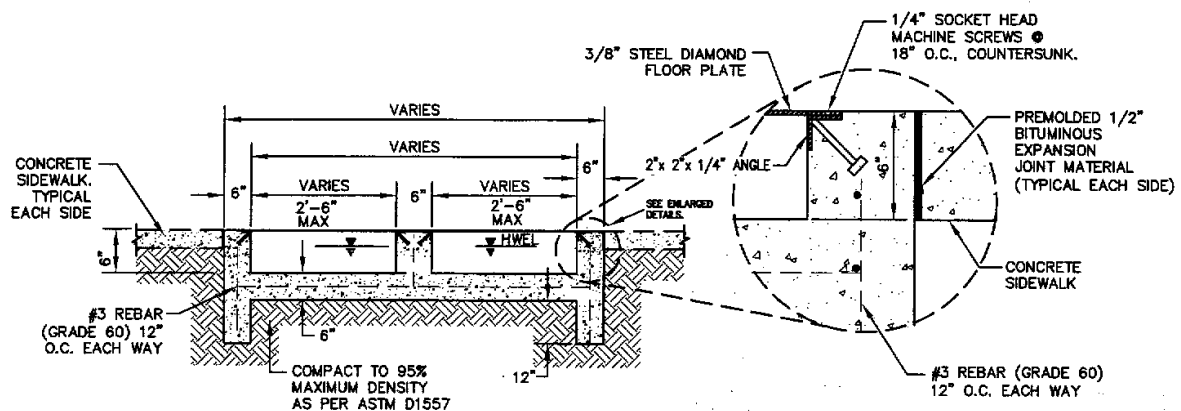
Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE

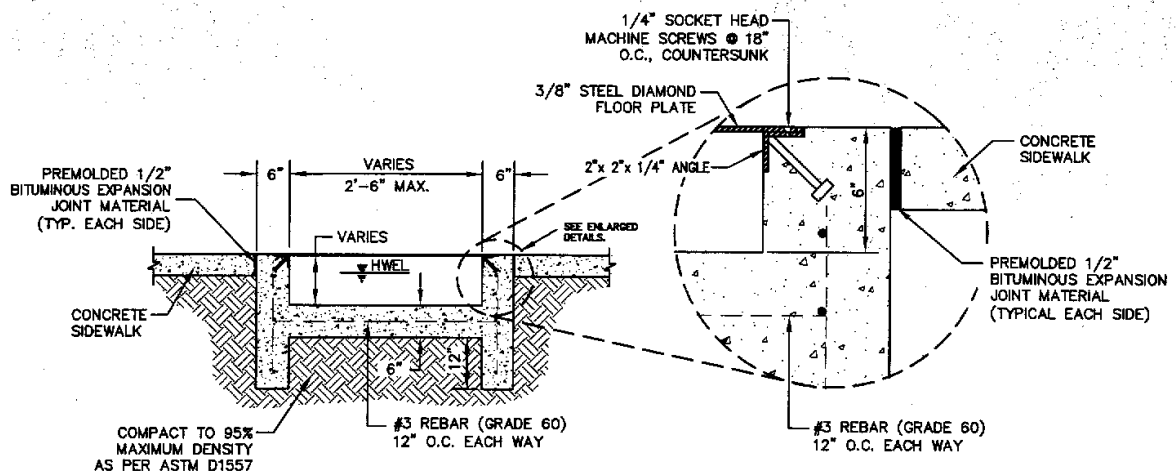
**NOTES:**

1. ALL CONCRETE SHALL BE 3000 PSI COMPRESSIVE STRENGTH @ 28 DAYS.
2. STEEL DIAMOND FLOOR PLATE TO HAVE A MINIMUM OF TWO COATS OF RED OXIDE PRIMER.
3. PLATE COLOR AS SPECIFIED.

CONCRETE FLUME SECTION WITHOUT PLATE



MULTIPLE CONCRETE FLUMES WITH STEEL PLATE COVER



CONCRETE FLUME WITH STEEL PLATE COVER



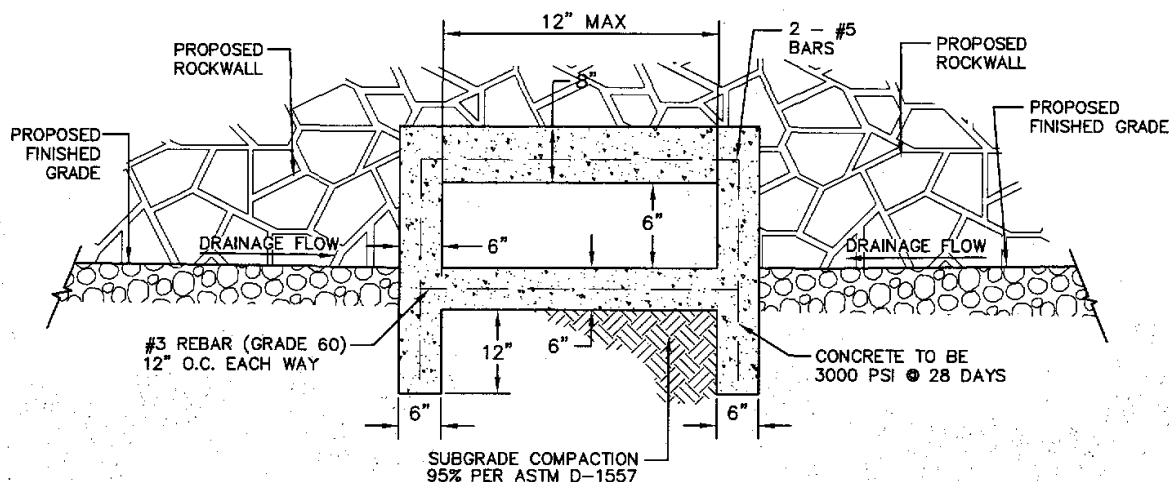
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TYPICAL CONCRETE  
DRAINAGE FLUMES  
2-35B

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



NOTE: FOR OPENINGS WIDER THAN 12",  
DESIGN ENGINEER SHALL SUBMIT  
STRUCTURAL DESIGN CALCULATIONS TO  
BE SUBMITTED AND APPROVED BY THE  
CITY ENGINEER. WIDER OPENINGS SHALL  
INCLUDE INTERMEDIATE VERTICAL  
CONCRETE SUPPORTS AND SAFETY  
PIPE/GRATING WHERE APPROPRIATE.

### SMALL WALL OPENING FOR DRAINAGE

SCALE: NTS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

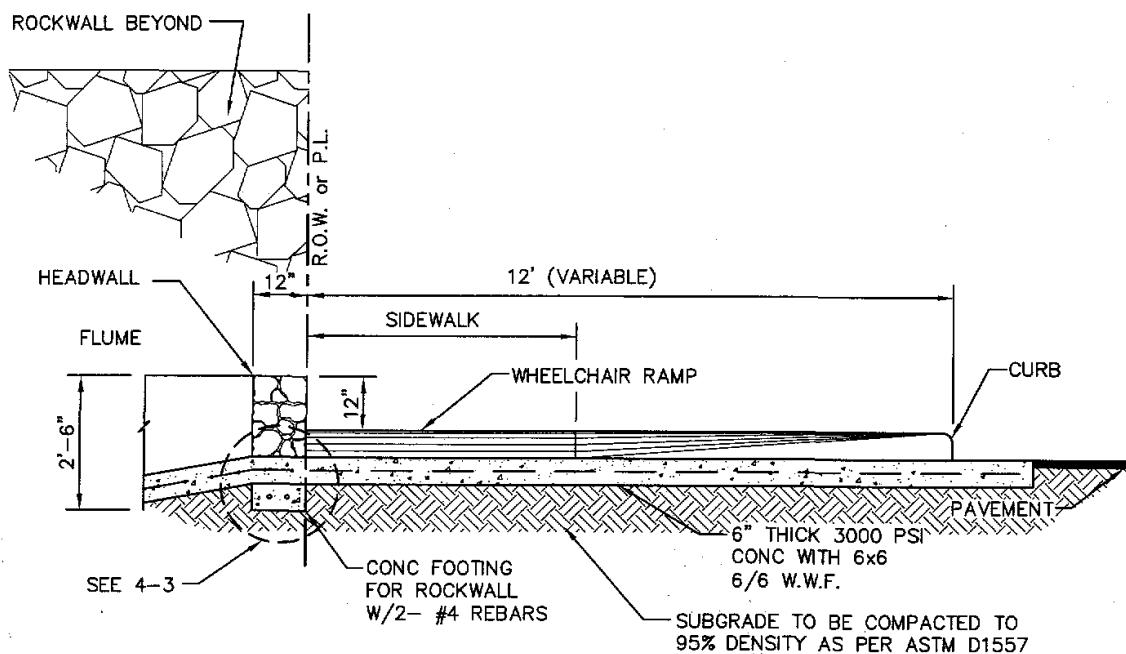
SMALL WALL OPENING  
FOR DRAINAGE  
2-35C

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

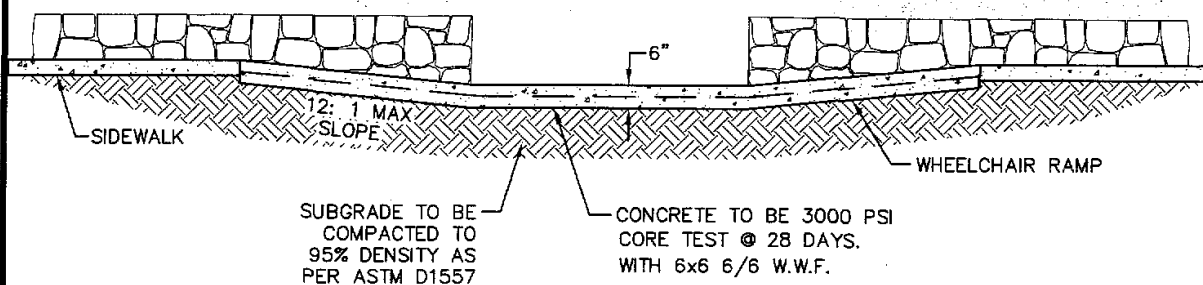
Checked By H. M. E.  
Drawn By QEC / J. R.



BACK TO TITLE INDEX PAGE



SECTION - B  
NTS



SECTION - C  
NTS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

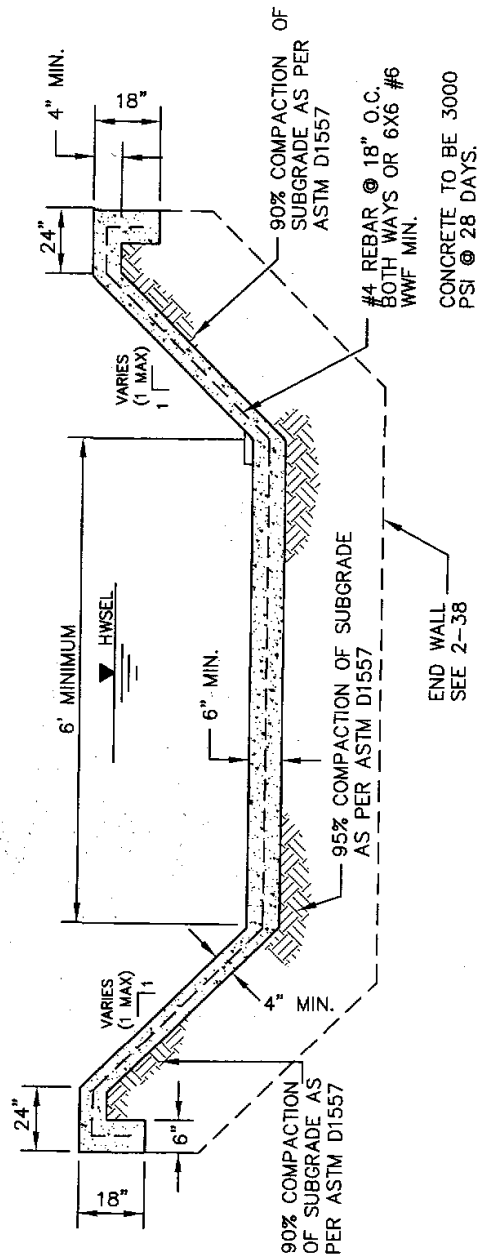
FLUME DESIGN  
SECTION

2-36

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE



- NOTE:
1. TYPE I SPECIFIED WHEN TOP OF CHANNEL IS EVEN WITH GROUND.
  2. CHANNEL SECTIONS SHALL BE POURED MONOLITHICALLY FROM TOP OF SLOPE TO TOP OF SLOPE
  3. SEE DRAINAGE DESIGN MANUAL, JUNE 2008 (SEC. 8.2.5) FOR REQUIRED FREEBOARD FOR SUBCRITICAL OR SUPERCRITICAL FLOWS.

ALTERNATE WING WALL DETAIL

CONCRETE CHANNEL TYPE I



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

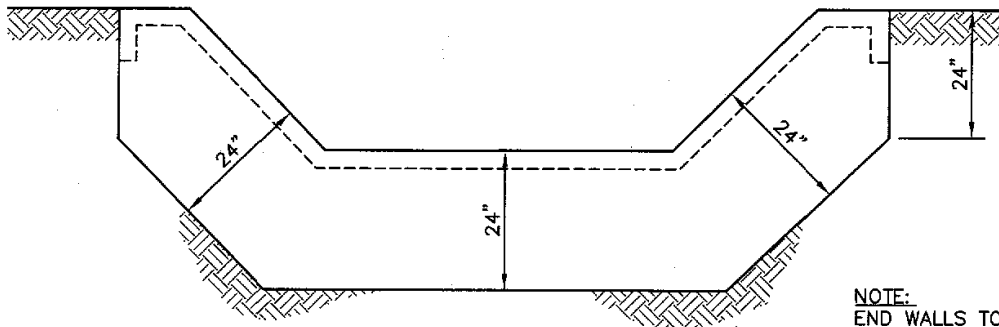
CONCRETE CHANNEL  
TYPE I

2-37

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

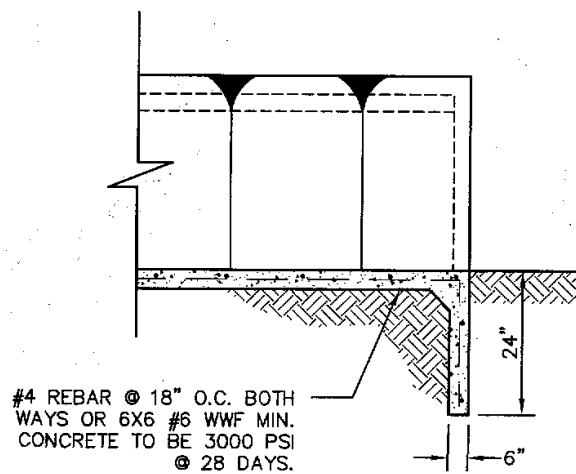
Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



NOTE:  
END WALLS TO BE PLACED  
AT BEGINNING AND END OF  
CONCRETE CHANNELS.

END WALL  
ELEVATION



END WALL  
SECTIONAL VIEW



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

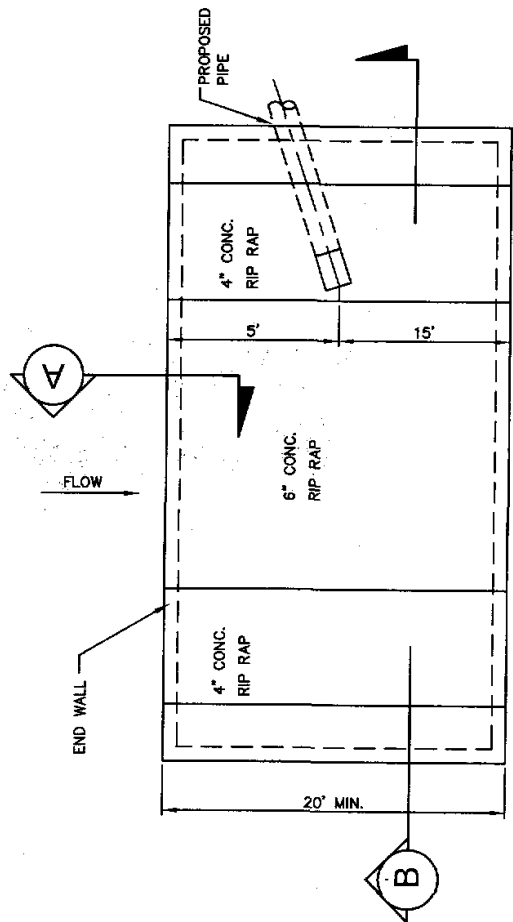
CONCRETE CHANNEL  
TYPE I  
END WALL DETAIL  
2-38

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

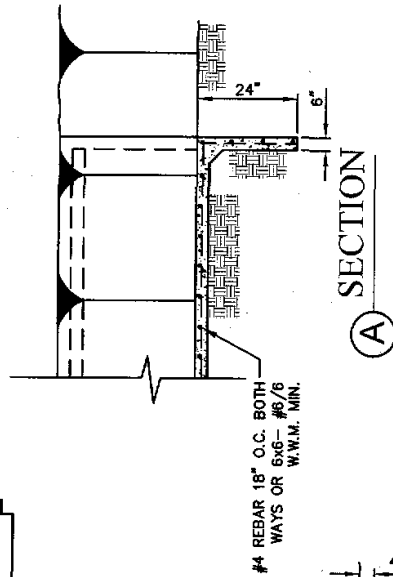
Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE

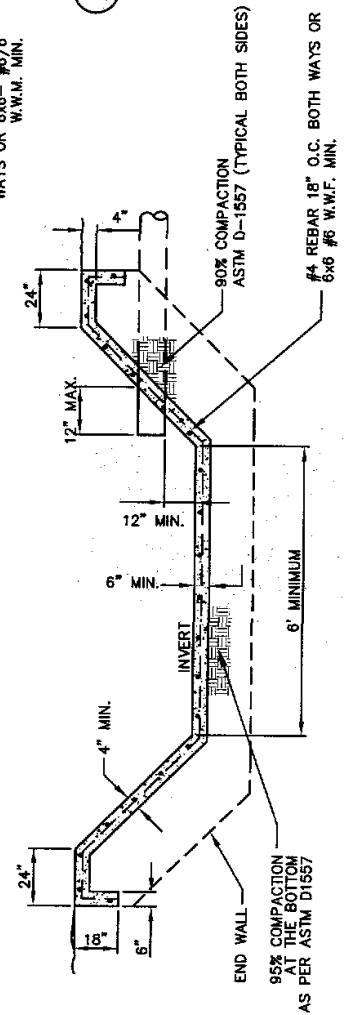
- NOTES:
1. CONCRETE LINING INVERT MUST MATCH MAINTENANCE GRADE AND WIDTH OF CHANNEL.
  2. CONCRETE LINING SHALL BE PLACED 5' UPSTREAM AND 15' DOWNSTREAM OF LINE OF DISCHARGE PIPE (48" MAXIMUM).
  3. ALL CONCRETE TO BE 3000 PSI @ 28 DAYS.
  4. CHANNEL SECTIONS SHALL BE POURED MONOLITHICALLY FROM TOP OF SLOPE TO TOP OF SLOPE



PLAN VIEW



SECTION A



SECTION B



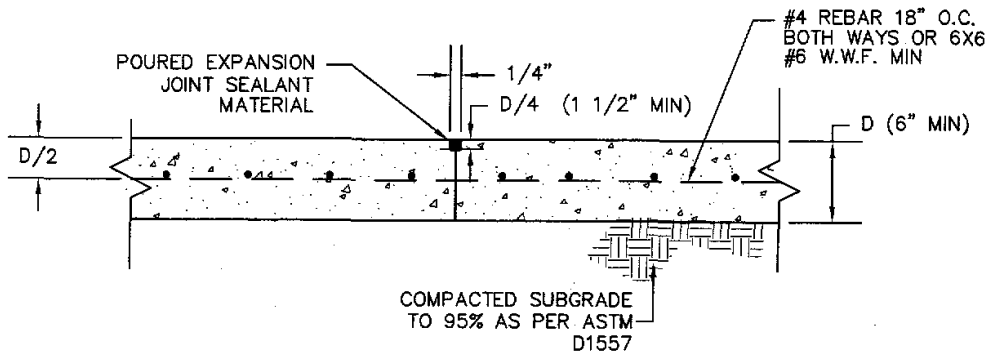
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CHANNEL LINING AT  
PIPE DISCHARGE

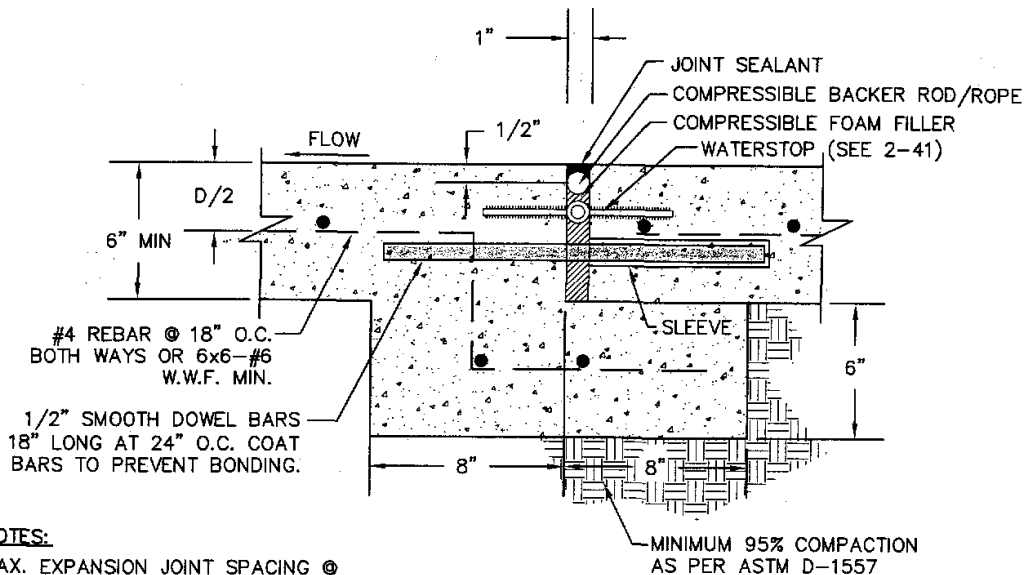
2-39

Approved By <b>R. A. SHUBERT</b>	Checked By <b>H. M. E.</b>
Date <b>JUNE 03, 2008</b>	Drawn By <b>QEC / J. R.</b>

[BACK TO TITLE INDEX PAGE](#)



CONTRACTION JOINT AT 25' O.C.



## EXPANSION JOINT



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

## CONCRETE JOINTS

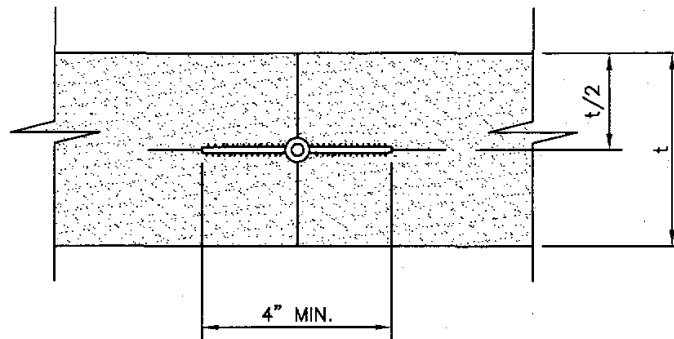
2-40

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.



BACK TO TITLE INDEX PAGE



### WATERSTOP DETAIL

**NOTE:**

WATERSTOP SHALL BE GREENSTREAK PVC MATERIAL, SPECIFICATIONS GRADE, 6" X 1/8" AND SERRATED WITH CENTERBULB OR APPROVED SUBSTITUTION BY CITY ENGINEER.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

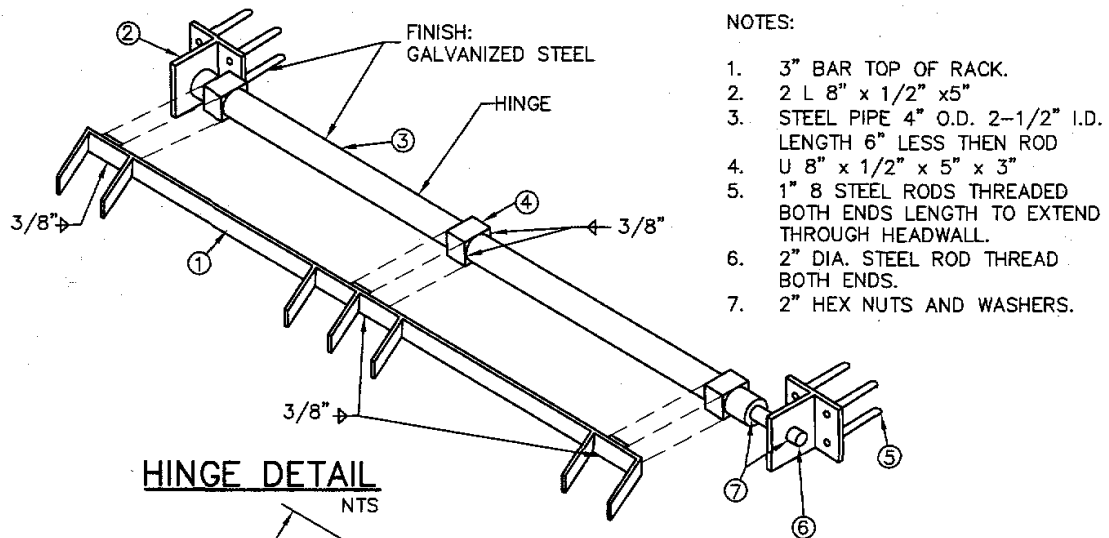
WATERSTOP DETAIL

2-41

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

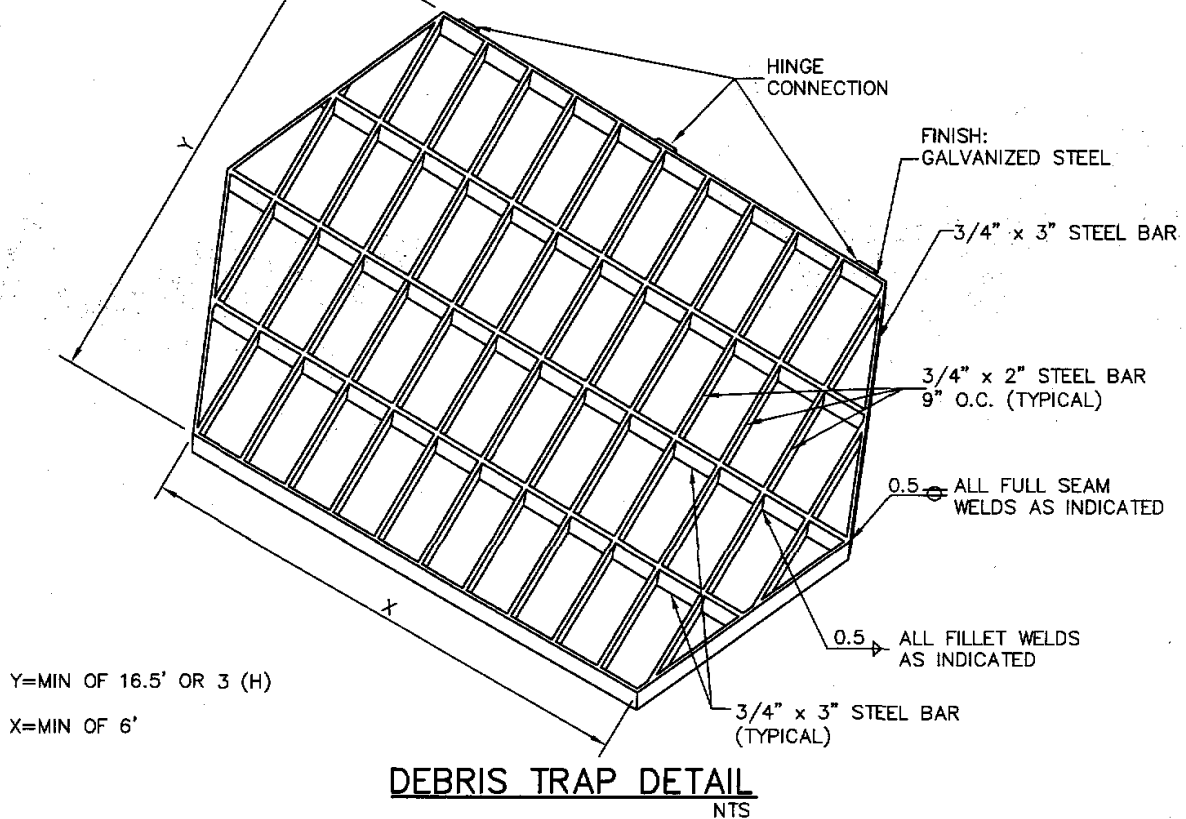
Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



NOTES:

1. 3" BAR TOP OF RACK.
2. 2 L 8" x 1/2" x 5"
3. STEEL PIPE 4" O.D. 2-1/2" I.D. LENGTH 6" LESS THEN ROD
4. U 8" x 1/2" x 5" x 3"
5. 1" 8 STEEL RODS THREADED BOTH ENDS LENGTH TO EXTEND THROUGH HEADWALL.
6. 2" DIA. STEEL ROD THREAD BOTH ENDS.
7. 2" HEX NUTS AND WASHERS.



TITLE 19 - SUBDIVISION ORDINANCE

ENGINEERING DEPARTMENT

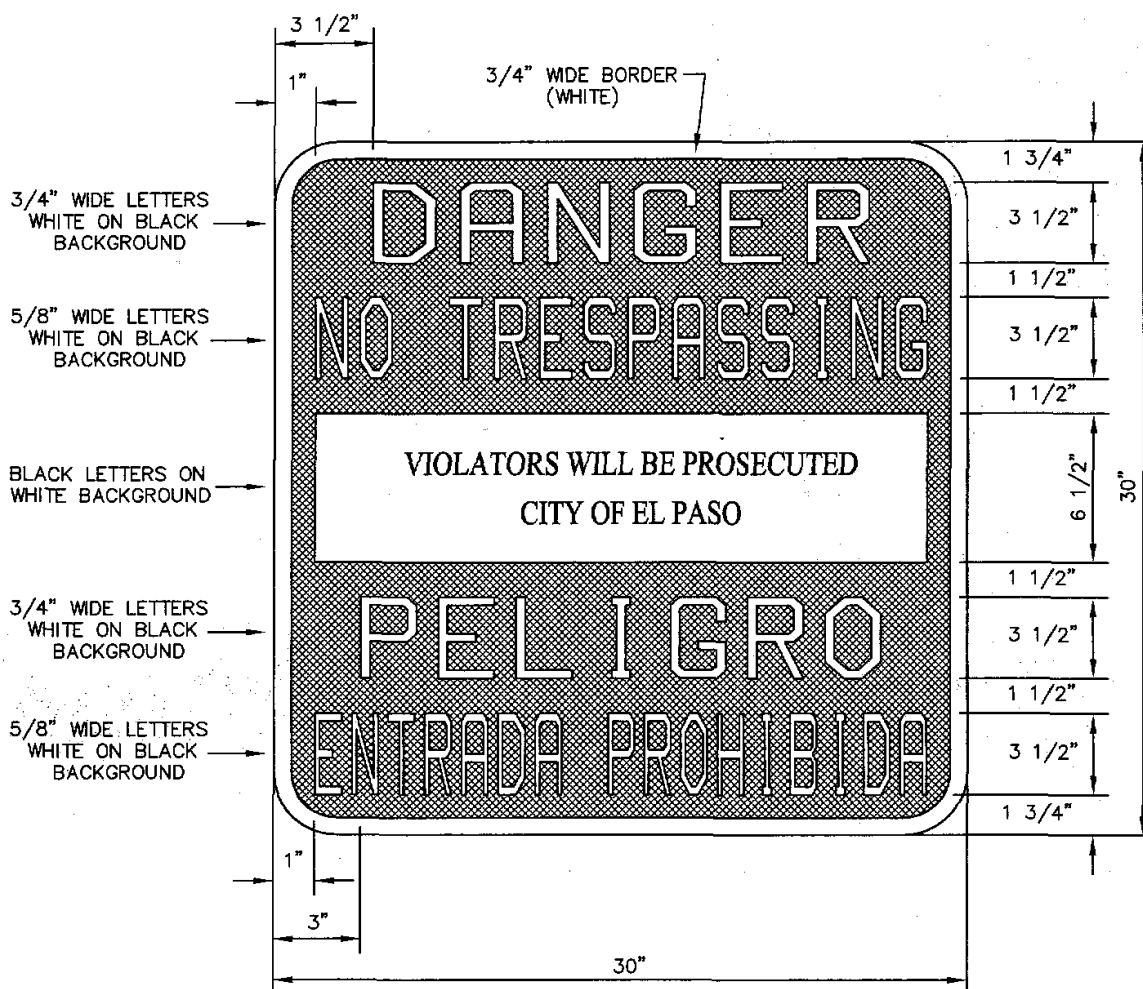
DESIGN STANDARDS  
FOR CONSTRUCTION

DEBRIS TRAP/SAFETY  
GRATE  
2-42

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



NO TRESPASSING WARNING SIGN



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

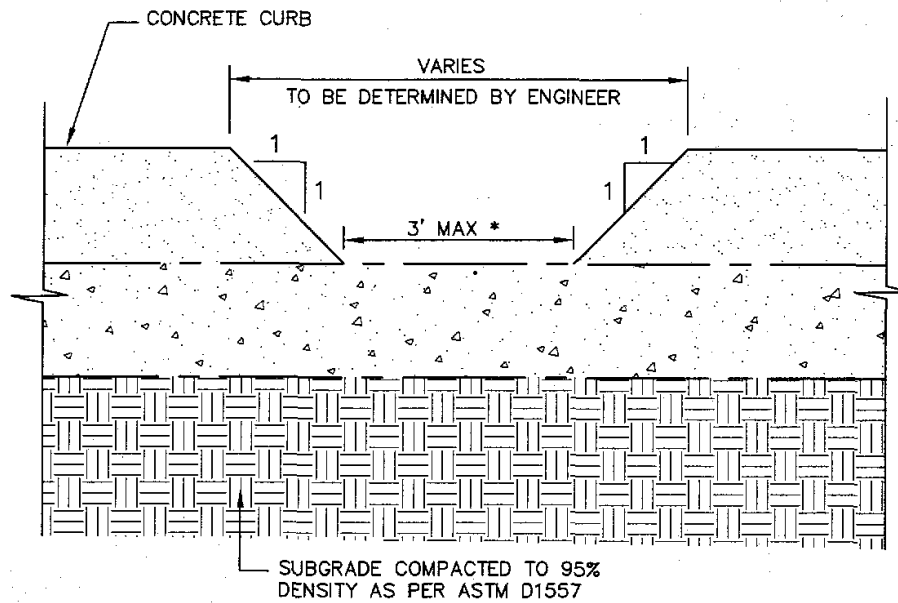
NO TRESPASSING  
WARNING SIGN

2-43

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / I. R.

BACK TO TITLE INDEX PAGE



### CURB OPENING FOR DRAINAGE

SCALE: N.T.S.

\* NOTE: 3' MAX UNLESS APPROVAL IS GRANTED BY THE CITY ENGINEER FOR A LARGER OPENING. IF PERMISSION IS GRANTED FOR A WIDER OPENING PROTECTIVE MEASURES SUCH AS PIPE BOLLARDS OR GUARDRAIL SHALL BE USED.



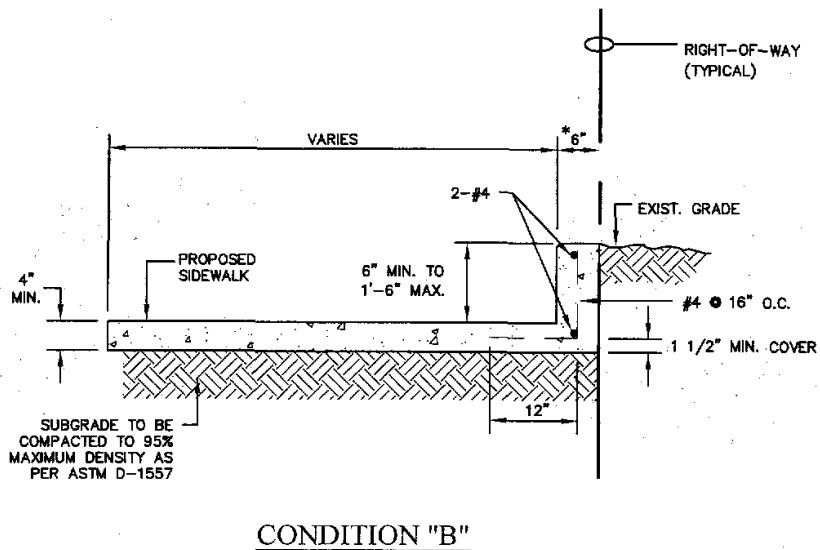
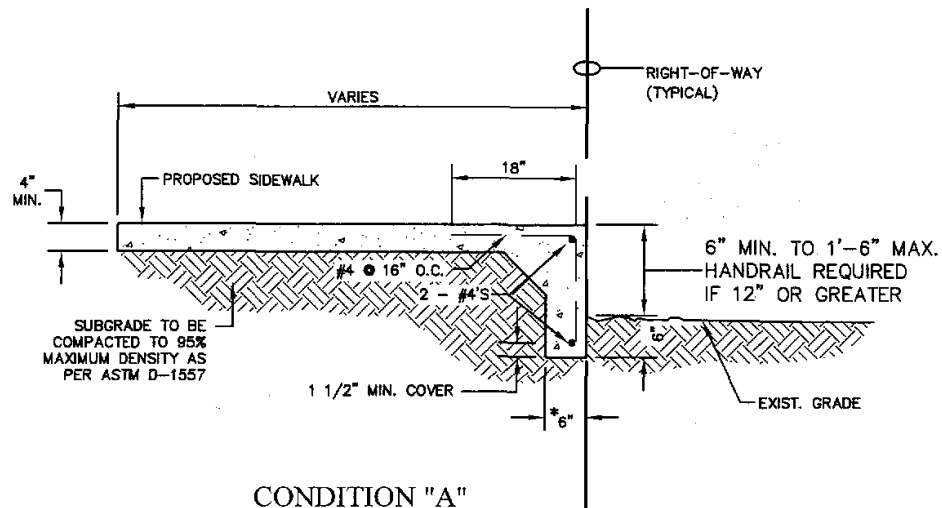
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CURB OPENING  
FOR DRAINAGE  
2-44

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



\*NOTE: THICKNESS SHALL BE 8" FOR SECTIONS WITH HANDRAIL.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MODIFIED SIDEWALK  
DETAILS "A" & "B"

2-45

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



## SECTION 3

BACK TO SECTION INDEX PAGE

### SECTION 3

#### STREETS

TITLE	PAGE
<del>STREET CROSS SECTIONS.....</del>	<del>3-1 thru 3-9</del>
LOCAL STREETS.....	3-10
ALLEY CROSS-SECTIONS AND DETAILS.....	3-11
ALLEY CROSS-SECTIONS.....	3-11A
ALLEY DETAILS.....	3-12
FLUSH MEDIAN w/HEADER & RAISED MEDIAN DESIGN.....	3-13
TERMINUS OF STREET.....	3-14
MOUNTAIN RESIDENTIAL STREET.....	3-15
CUL-DE-SAC.....	3-16
"T" CUL-DE-SAC.....	3-17
"Y" CUL-DE-SAC.....	3-18
STUB STREET.....	3-19
CONCRETE BUS PAD (PROPOSED PAVEMENT).....	3-20
CONCRETE BUS PAD (EXISTING PAVEMENT).....	3-21
PAVEMENT THICKNESS DESIGN PROCEDURE.....	3-22A thru 3-24
PAVEMENT THICKNESS DESIGN CHART.....	3-25 thru 3-26
PAVEMENT THICKNESS DESIGN CHART (HEAVY).....	3-27
PAVEMENT THICKNESS DESIGN.....	3-28 thru 3-29B
MEDIAN OPENING SIGHT DISTANCE (2-STOP CROSSING).....	3-30
MEDIAN OPENING SIGHT DISTANCE (1-STOP CROSSING).....	3-31
MEDIAN OPENING SPACING.....	3-32
CENTERLINE STRIPING WITH BIKE LANES.....	3-33
CENTERLINE STRIPING WITHOUT BIKE LANES.....	3-34
MEDIAN STRIPING WITH BIKE LANES.....	3-35
MEDIAN STRIPING WITHOUT BIKE LANES.....	3-36
ACCELERATION AND DECELERATION LANES.....	3-37
MINIMUM RADII AT INTERSECTION APPROACH.....	3-38



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 3  
TABLE OF  
CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO SECTION INDEX PAGE

### SECTION 3

#### STREETS

(continued)

TITLE	PAGE
INTERSECTION DESIGN REQUIREMENTS.....	3-39
GEOMETRIC DESIGN OF ROADWAYS.....	3-40
INTERSECTION DESIGN.....	3-41
INTERSECTION OFFSET.....	3-41A
CLUSTER PARKING.....	3-42
STREET PAVING CUT.....	3-43
STREET PAVING CUT (CONDUIT).....	3-44
STREET PAVING CUT FOR FLEXIBLE PIPE.....	3-45
GUARD POST DETAIL.....	3-46
GUARD RAIL.....	3-47
TERMINUS METAL BEAM GUARD FENCE.....	3-48
PROPOSED CITY MONUMENT LOCATIONS.....	3-49
PLANE SURVEYS AND GEODETIC CONTROL.....	3-50
SURVEYS AND MONUMENTS.....	3-51
CITY SURVEY MONUMENT.....	3-52
SINGLE EYEBROW CUL-DE-SAC.....	3-53
DUAL EYEBROW CUL-DE-SAC.....	3-54
TURNING HEEL CURVE.....	3-55
PROPOSED 70 DEGREE ANGLE (MIN.) TURNING HEEL.....	3-56
PROPOSED 90 DEGREE ANGLE TURNING HEEL.....	3-57
PROPOSED 110 DEGREE ANGLE (MAX.) TURNING HEEL.....	3-58

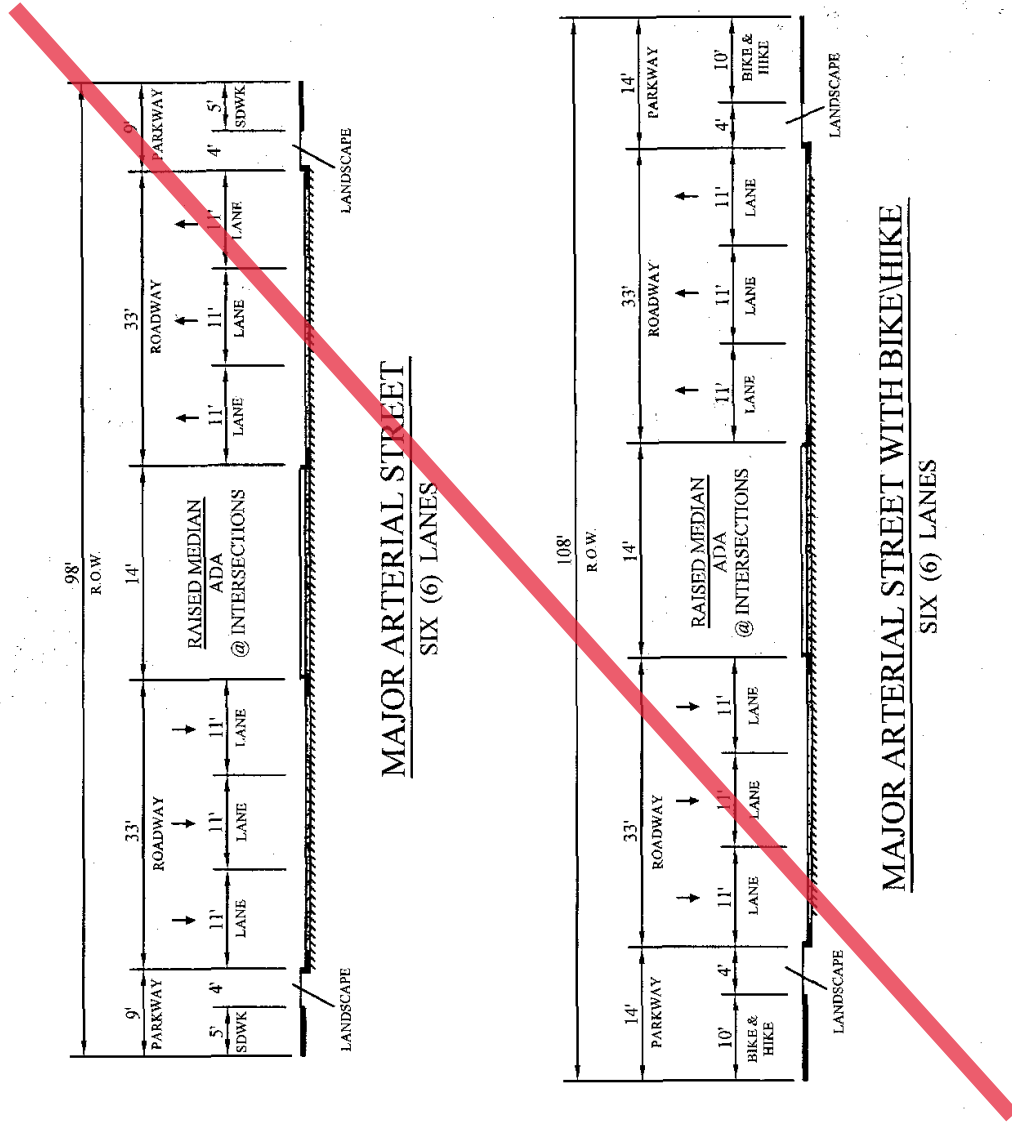


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 3  
TABLE OF  
CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE



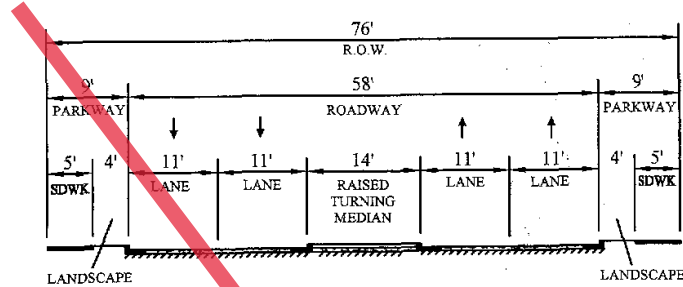
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET CROSS-SECTIONS

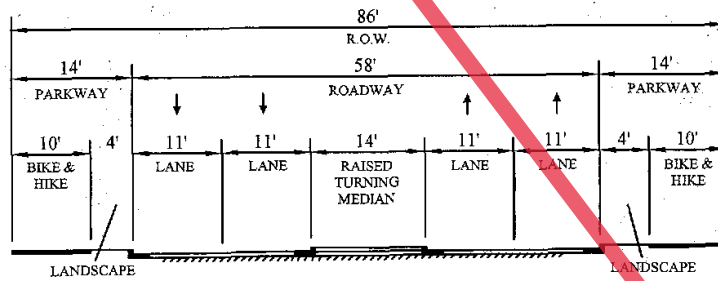
3-1

Approved By R. A. SHUBERT  
Date JUNE 03, 2008  
Checked By H. M. E.  
Drawn By QBC/J.R.

BACK TO TITLE INDEX PAGE



MINOR ARTERIAL STREET  
FOUR (4) LANES



MINOR ARTERIAL STREET WITH BIKE/HIKE  
FOUR (4) LANES



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET CROSS-SECTIONS

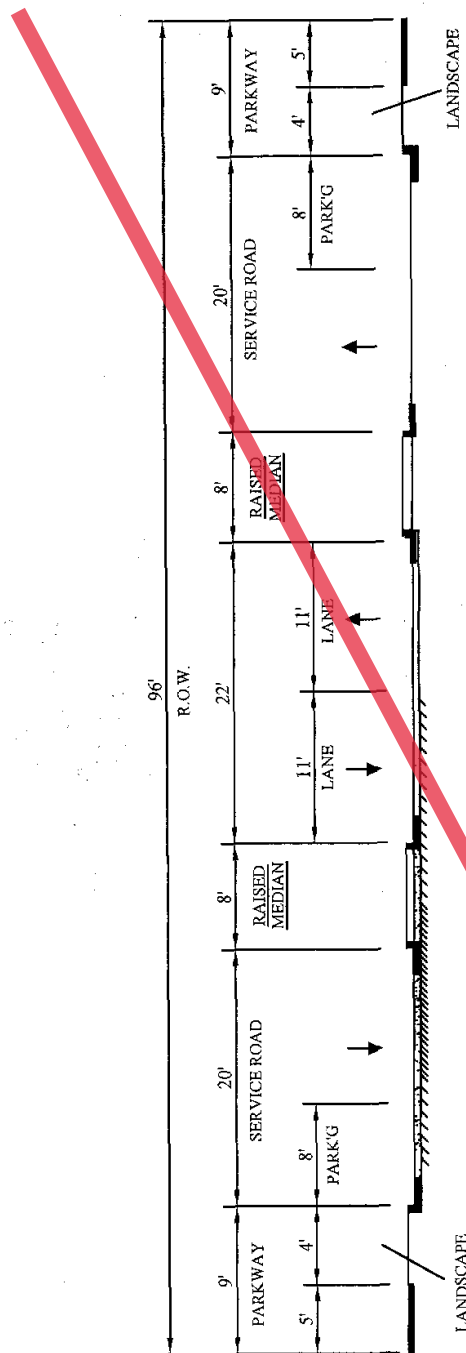
3-2

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



BACK TO TITLE INDEX PAGE



## BOULEVARD

CAN BE DESIGNED TO PROVIDE FOR ANGLE PARKING



TITLE 19 - SUBDIVISION ORDINANCE

### ENGINEERING DEPARTMENT

### DESIGN STANDARDS FOR CONSTRUCTION

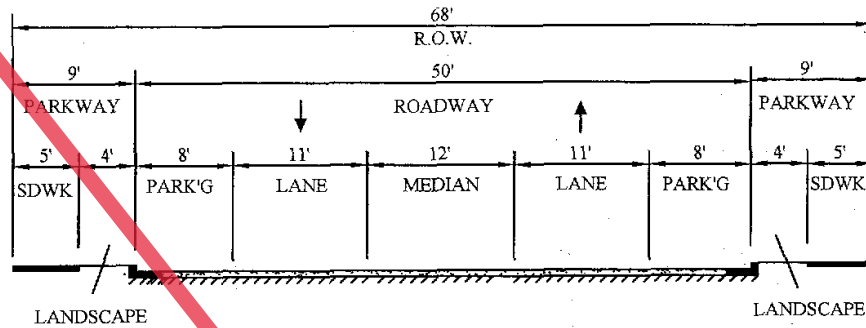
#### STREET CROSS- SECTIONS

3-3

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

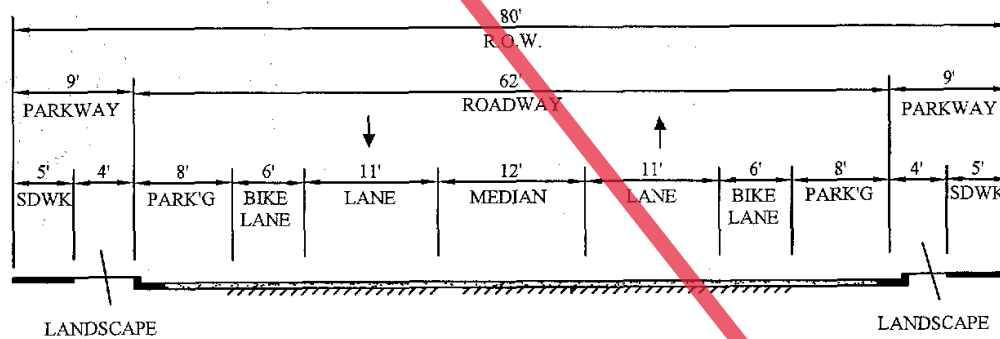
Checked By H. M. E.  
Drawn By QBC/J.R.

BACK TO TITLE INDEX PAGE



### NON-RESIDENTIAL COLLECTOR

CAN BE DESIGNED TO PROVIDE FOR ANGLE PARKING  
MEDIAN MAY BE RAISED



### NON-RESIDENTIAL COLLECTOR WITH BIKE LANES

CAN BE DESIGNED TO PROVIDE FOR ANGLE PARKING  
MEDIAN MAY BE RAISED



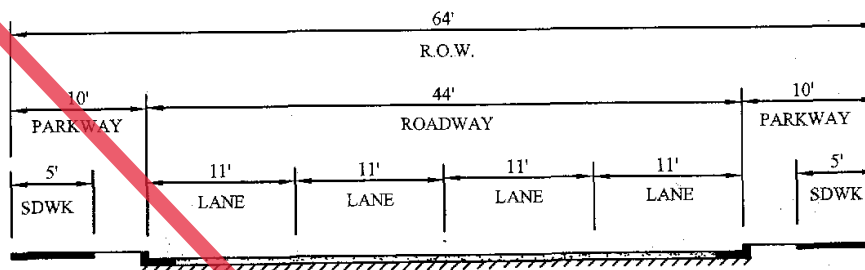
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET CROSS-SECTIONS

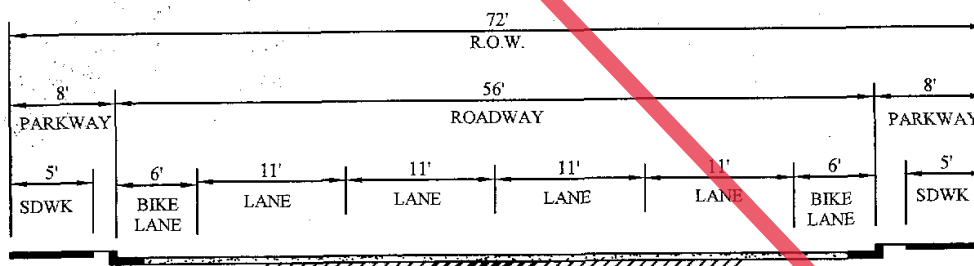
3-4

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QBC/I. R.

BACK TO TITLE INDEX PAGE



NON-RESIDENTIAL 4 LANE COLLECTOR



NON-RESIDENTIAL 4 LANE COLLECTOR  
WITH BIKE LANES



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

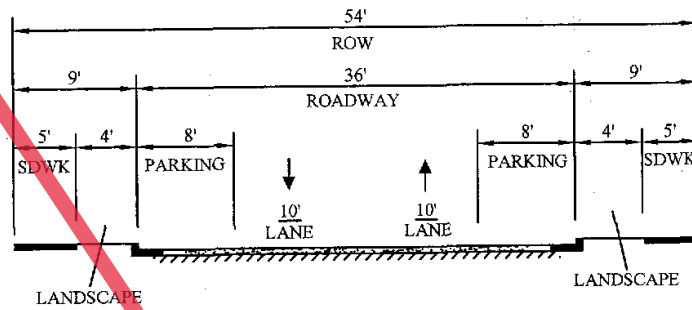
STREET CROSS-SECTIONS

3-5

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

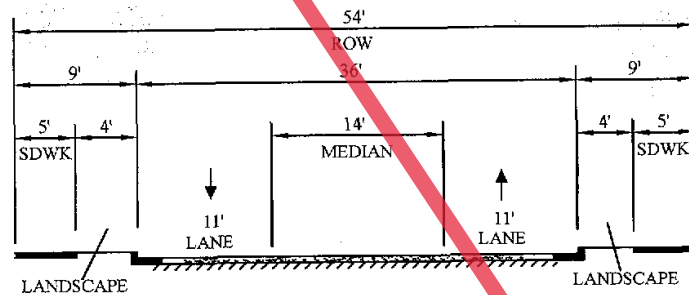
Checked By H. M. E.  
Drawn By QEC / J. R.

[BACK TO TITLE INDEX PAGE](#)



## RESIDENTIAL COLLECTOR

CAN BE DESIGNED TO PROVIDE FOR ANGLE PARKING



## RESIDENTIAL COLLECTOR STREET SECTION

TWO (2) LANES

CAN BE DESIGNED TO PROVIDE FOR ANGLE PARKING



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

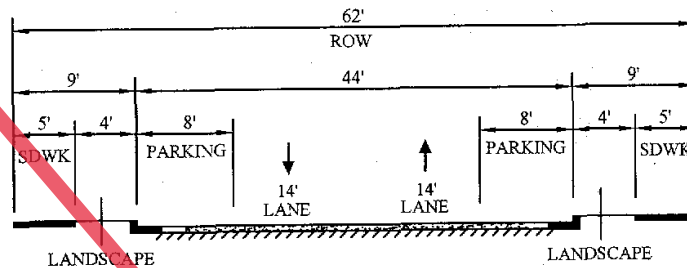
STREET CROSS-SECTIONS

3-6

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

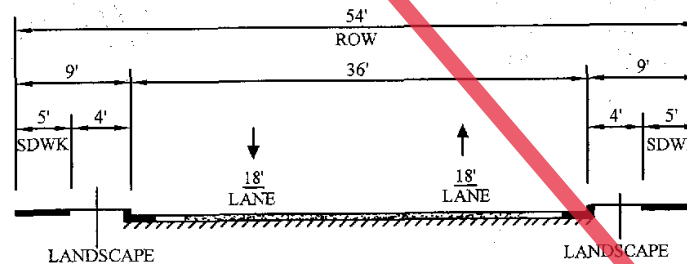
Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



## MULTI-FAMILY & COMMERCIAL/INDUSTRIAL LOCAL STREET 1

CAN BE DESIGNED TO PROVIDE FOR ANGLE PARKING



## MULTI-FAMILY & COMMERCIAL/INDUSTRIAL LOCAL STREET 2

CAN BE DESIGNED TO PROVIDE FOR ANGLE PARKING



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET CROSS-SECTIONS

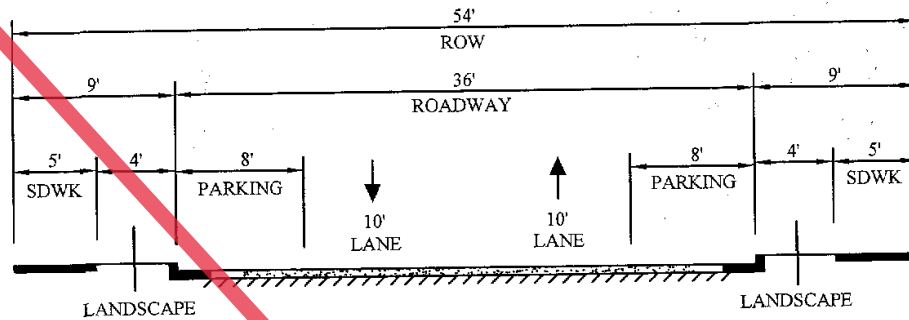
3-7

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

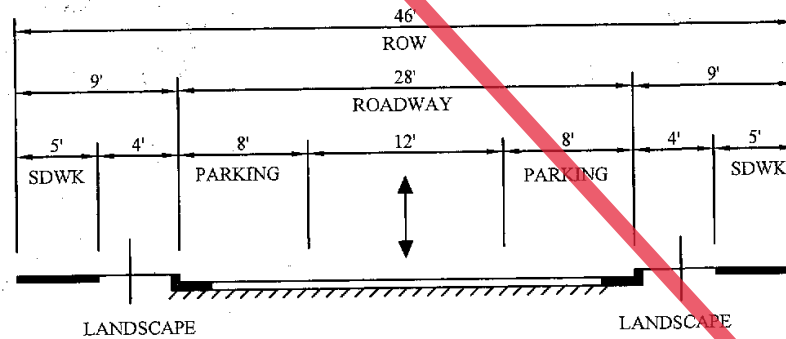


BACK TO TITLE INDEX PAGE



### 36' LOCAL RESIDENTIAL 1

NOTE: CROSS SECTIONS ARE MINIMUM, STANDARD REQUIREMENTS



### 28' LOCAL RESIDENTIAL 2

NOTE: CROSS SECTIONS ARE MINIMUM, STANDARD REQUIREMENTS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

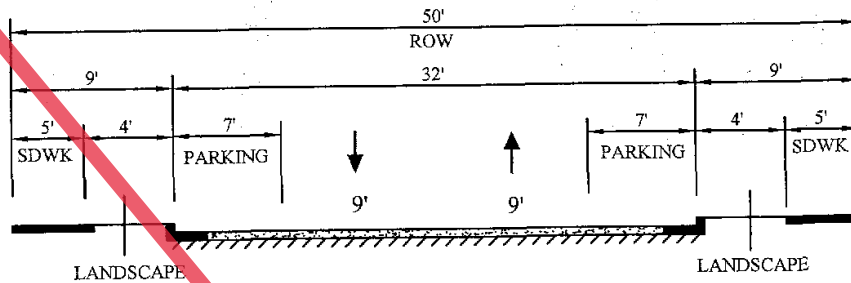
STREET CROSS -SECTIONS

3-8

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

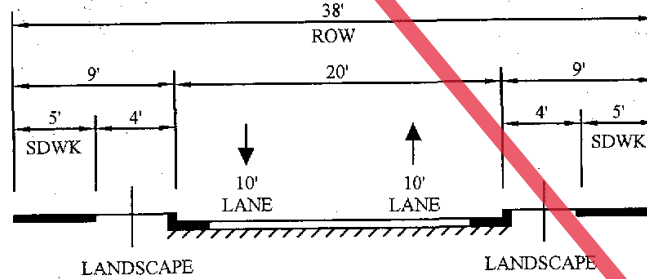
Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



### 32' LOCAL RESIDENTIAL 3

NOTE: CROSS SECTIONS ARE MINIMUM, STANDARD REQUIREMENTS



### 20' RESIDENTIAL LANE NO PARKING



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

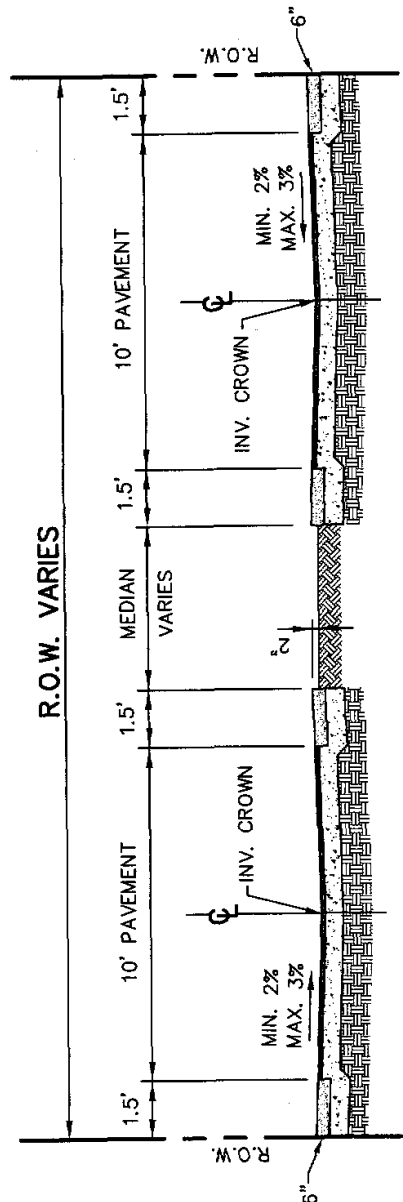
STREET CROSS-SECTIONS

3-9

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC/I.R.

**[BACK TO TITLE INDEX PAGE](#)**



## DIVIDED MOUNTAIN RESIDENTIAL STREET

**NOTES:**

1. WITHIN A DIVIDED RESIDENTIAL STREET, THE MEDIAN MAY BE DESIGNED TO PERMIT A SWALE FOR DRAINAGE PURPOSES.
2. HEADER CURBING AS A MINIMUM SHALL BE REQUIRED, HOWEVER, STANDARD CURBING SHALL BE ALLOWED.
3. STREET CROSS-SECTION TO BE INVERTED CROWN.
4. GRADES IN EXCESS OF 11% MUST BE APPROVED BY THE CITY ENGINEER AND FIRE DEPARTMENT, BUT IN NO CASE SHALL GRADES EXCEED 15%.
5. GRADES AT INTERSECTION IN EXCESS OF 3% SHALL HAVE THE APPROVAL OF THE CITY ENGINEER.
6. MINIMUM MEDIAN WIDTH - FOUR (4') FEET.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

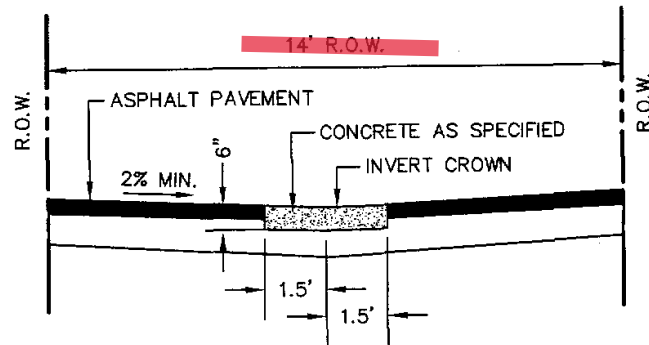
## LOCAL STREETS

3-10

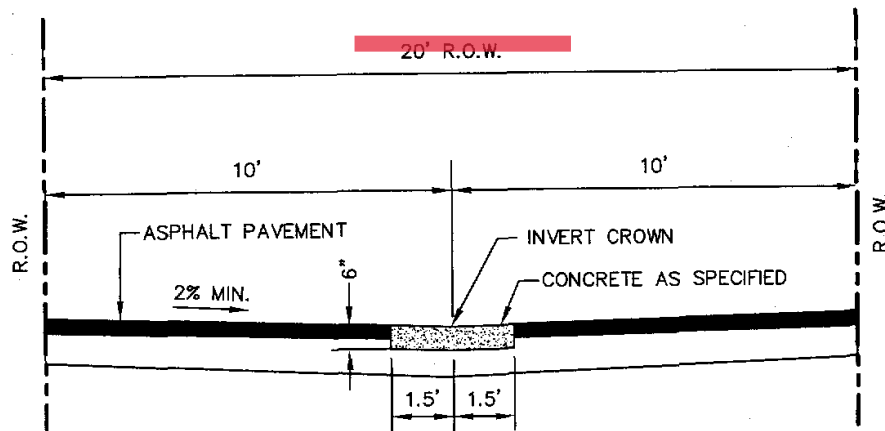
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



**ALLEY**  
**ONE (1) WAY LANE**



**ALLEY**  
**TWO (2) LANES**

**NOTES:**

1. ONE (1)-THREE FOOT CONCRETE VALLEY GUTTER LOCATED AT THE CENTERLINE OF THE RIGHT-OF-WAY WHEN THE LONGITUDINAL SLOPE OF THE ALLEY IS LESS THAN ONE (1) PERCENT, AND DRAINAGE IS TO BE CARRIED WITHIN THE ALLEY.
2. NO CONCRETE VALLEY GUTTER REQUIRED WHEN LONGITUDINAL SLOPE OF THE ALLEY IS EQUAL OR GREATER THAN ONE (1) PERCENT.



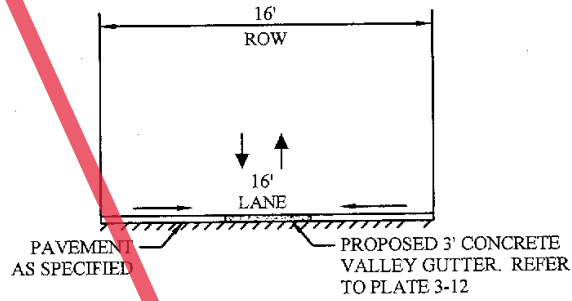
TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

ALLEY CROSS-SECTIONS  
AND DETAILS

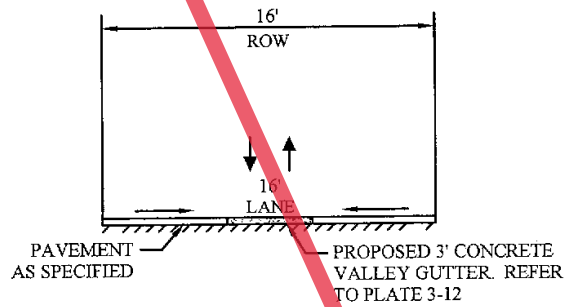
3-11

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J.R.</u>

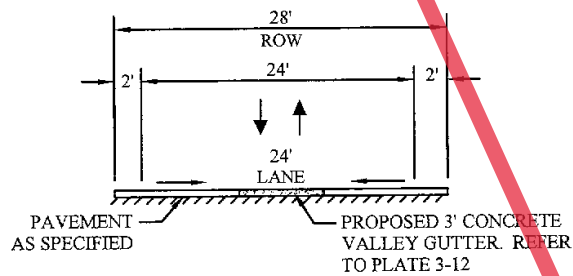
BACK TO TITLE INDEX PAGE



### 16' ALLEY NO PARKING



### 16' ALLEY SINGLE FAMILY RESIDENTIAL



### 28' ALLEY COMMERCIAL/INDUSTRIAL/MULTI-FAMILY



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

ALLEY CROSS-SECTIONS

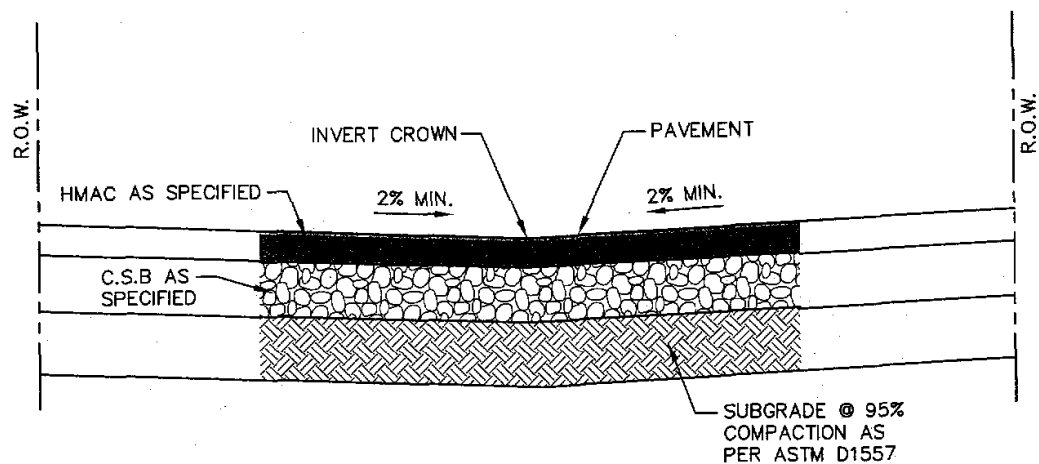
3-11A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

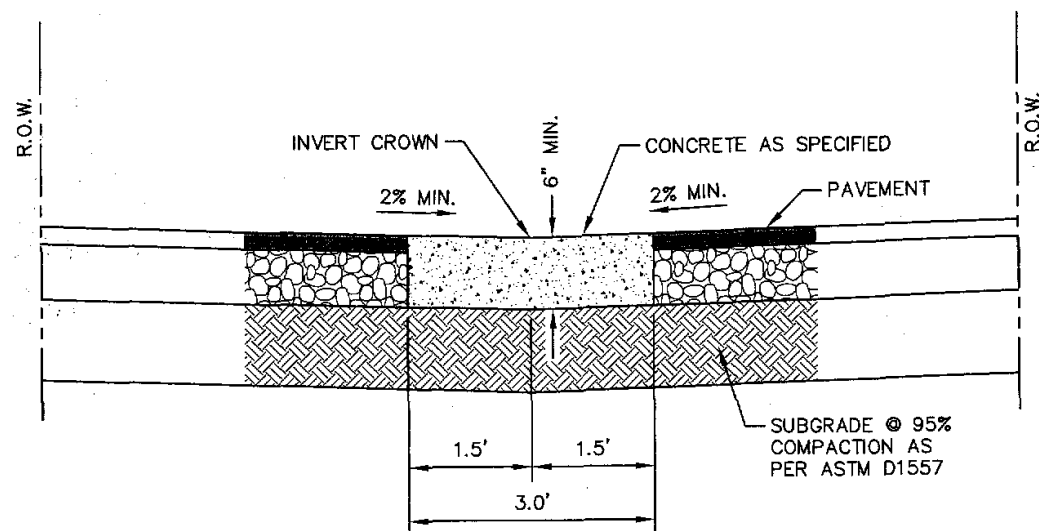
Checked By H. M. E.  
Drawn By QEC/J.R.



BACK TO TITLE INDEX PAGE



## ALLEY PAVEMENT



## VALLEY GUTTER

NOTES:

COMPRESSIVE STRENGTH OF CONCRETE SHALL BE  $F_C = 3000$  P.S.I. MINIMUM



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

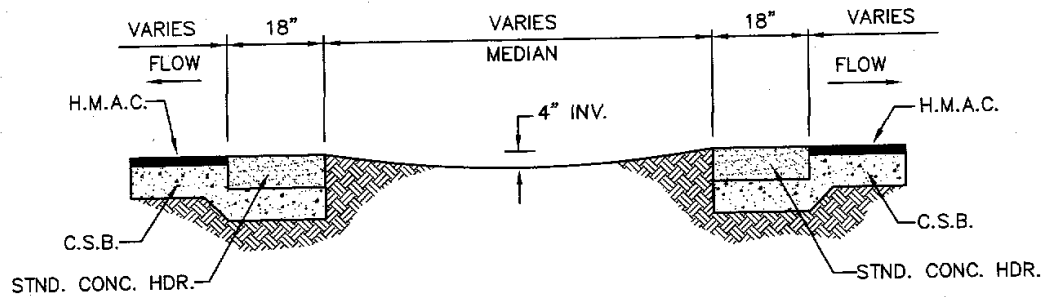
ALLEY DETAILS

3-12

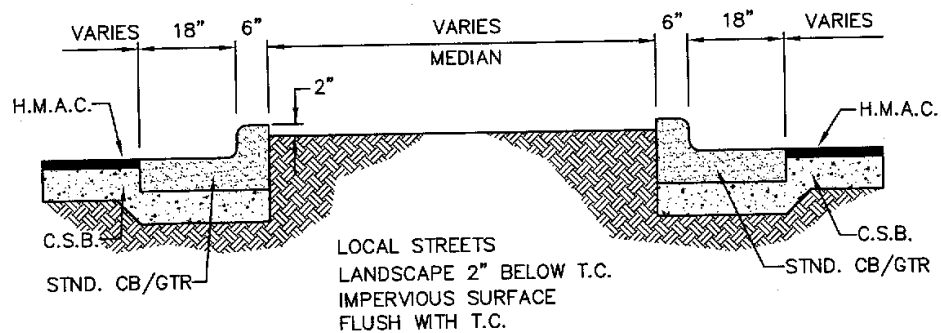
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



FLUSH MEDIAN WITH HEADER DESIGN



RAISED MEDIAN DESIGN

**NOTE:**

THE MEDIAN MAY BE DESIGNED TO PERMIT A SWALE FOR DRAINAGE PURPOSES.



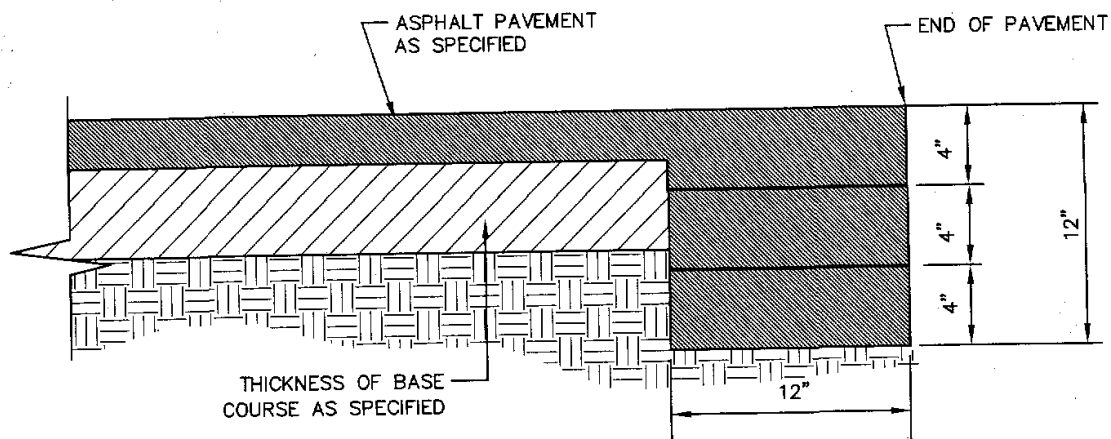
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

FLUSH MEDIAN W/HEADER  
& RAISED MEDIAN DESIGN

3-13

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE



### TERMINUS OF STREET

**NOTE:**

TERMINUS MUST BE CONSTRUCTED IN 4" LIFTS. FINAL LIFT MUST BE PLACED WITH FINAL PAVEMENT COURSE. COMPACTION REQUIREMENTS SHALL BE 98% MINIMUM AS PER ASTM D1557 OR AS RECOMMENDED BY THE PROJECT GEOTECHNICAL ENGINEER.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

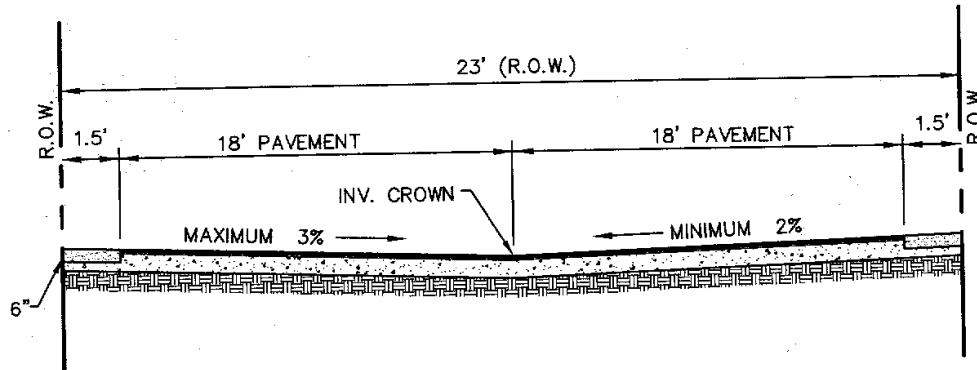
TERMINUS OF STREET

3-14

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC/J. R.

BACK TO TITLE INDEX PAGE



MOUNTAIN RESIDENTIAL STREET  
TWO (2) LANES ONLY ON (M.D.A.)

1. 18" x 6" HEADER CURB.
2. MINIMUM 23 FOOT RIGHT-OF-WAY.
3. STREET CROSS-SECTION TO BE INVERTED CROWN. (REFER TO NOTE No. 7).
4. GRADES IN EXCESS OF 11% MUST BE APPROVED BY THE CITY ENGINEER AND FIRE DEPARTMENT, BUT IN NO CASE SHALL GRADES EXCEED 18%.
5. GRADES AT INTERSECTIONS IN EXCESS OF 3% SHALL HAVE THE APPROVAL OF THE CITY ENGINEER.
6. HEADER CURBING AS A MINIMUM SHALL BE REQUIRED, HOWEVER, STANDARD CURBING SHALL BE PERMITTED.
7. A CROWNED SECTION CAN BE USED IN LIEU OF AN INVERTED CROWN WITH THE APPROVAL OF THE CITY ENGINEER.



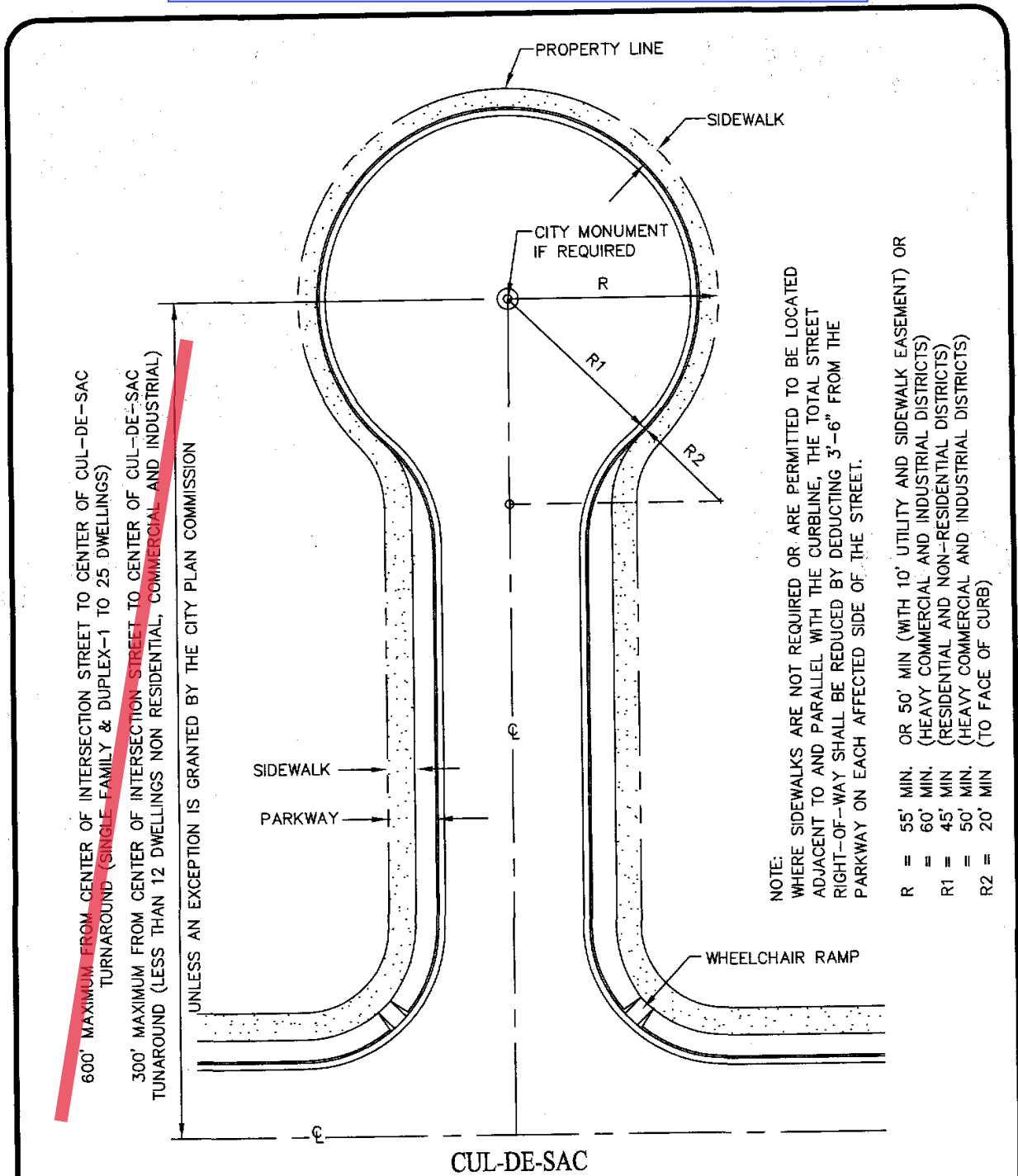
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MOUNTAIN  
RESIDENTIAL STREET  
3-15

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC / J. R.

BACK TO TITLE INDEX PAGE



TITLE 19 - SUBDIVISION ORDINANCE

ENGINEERING DEPARTMENT

DESIGN STANDARDS  
FOR CONSTRUCTION

CUL-DE-SAC

3-16

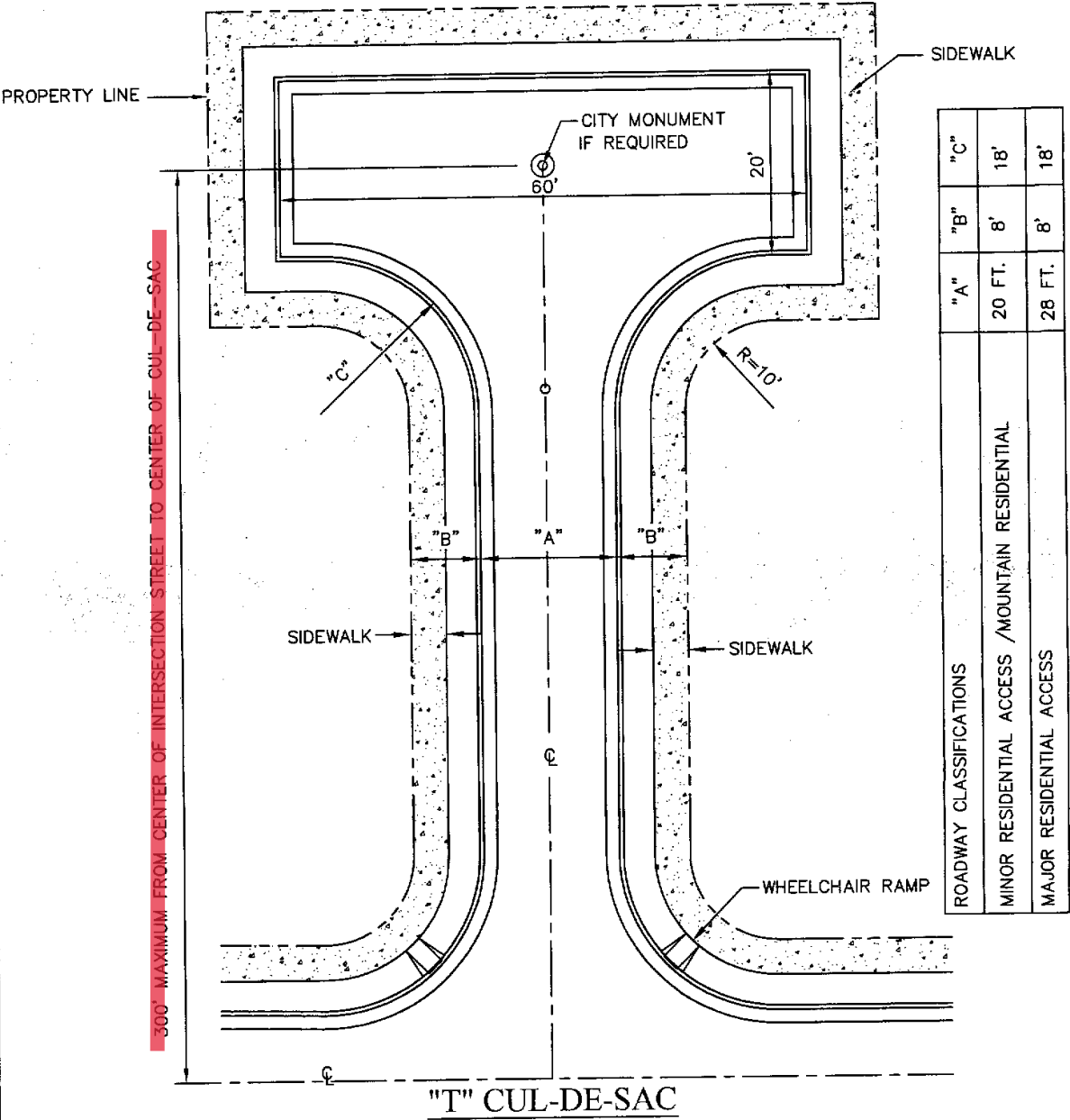
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.



BACK TO TITLE INDEX PAGE

NOTE:  
WHERE SIDEWALKS ARE NOT REQUIRED OR ARE PERMITTED TO BE LOCATED ADJACENT TO AND PARALLEL WITH THE CURBLINE, THE TOTAL STREET RIGHT-OF-WAY SHALL BE REDUCED BY DEDUCTING 3'-6" FROM THE PARKWAY ON EACH AFFECTED SIDE OF THE STREET.

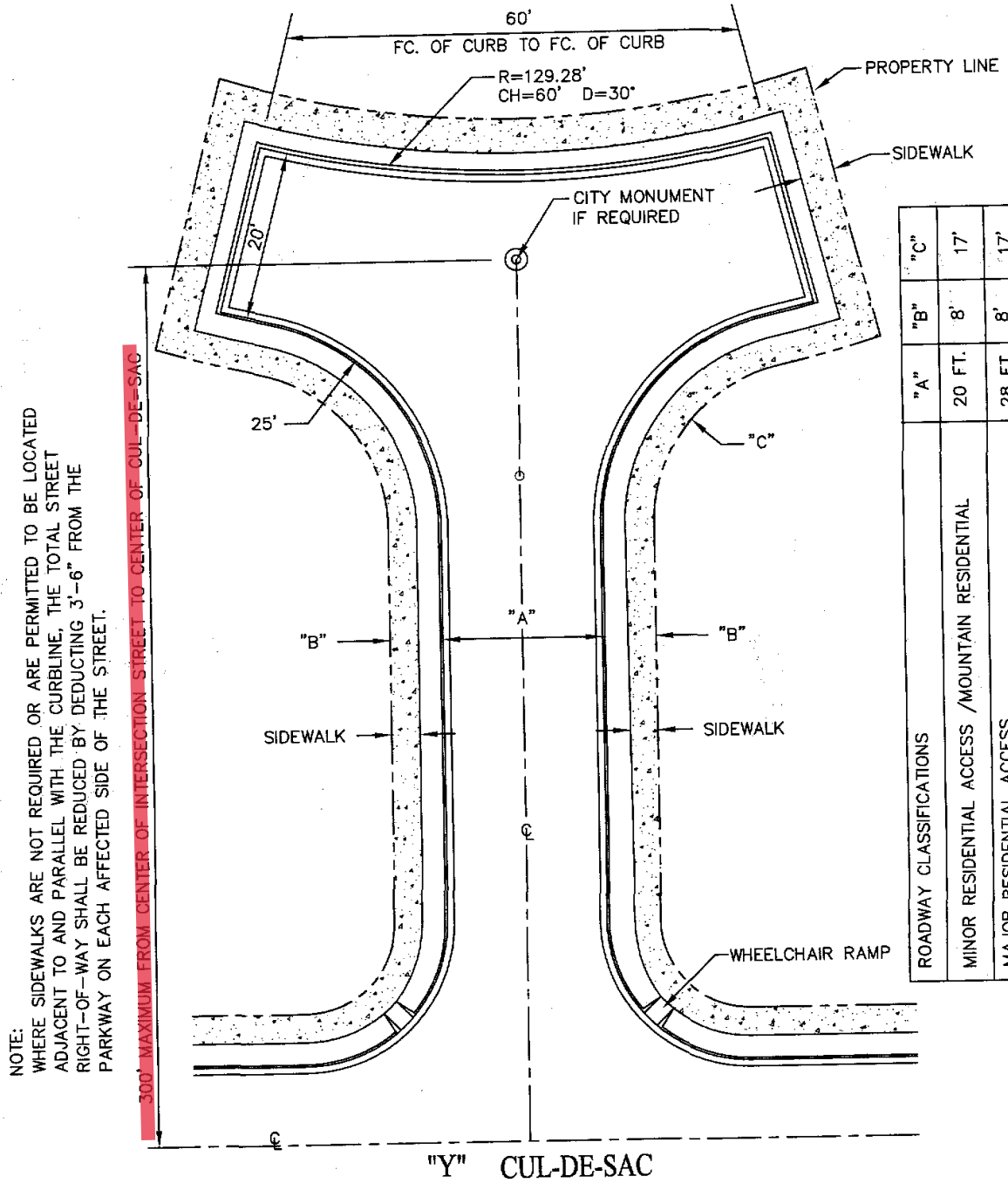


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

"T" CUL-DE-SAC  
3-17

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



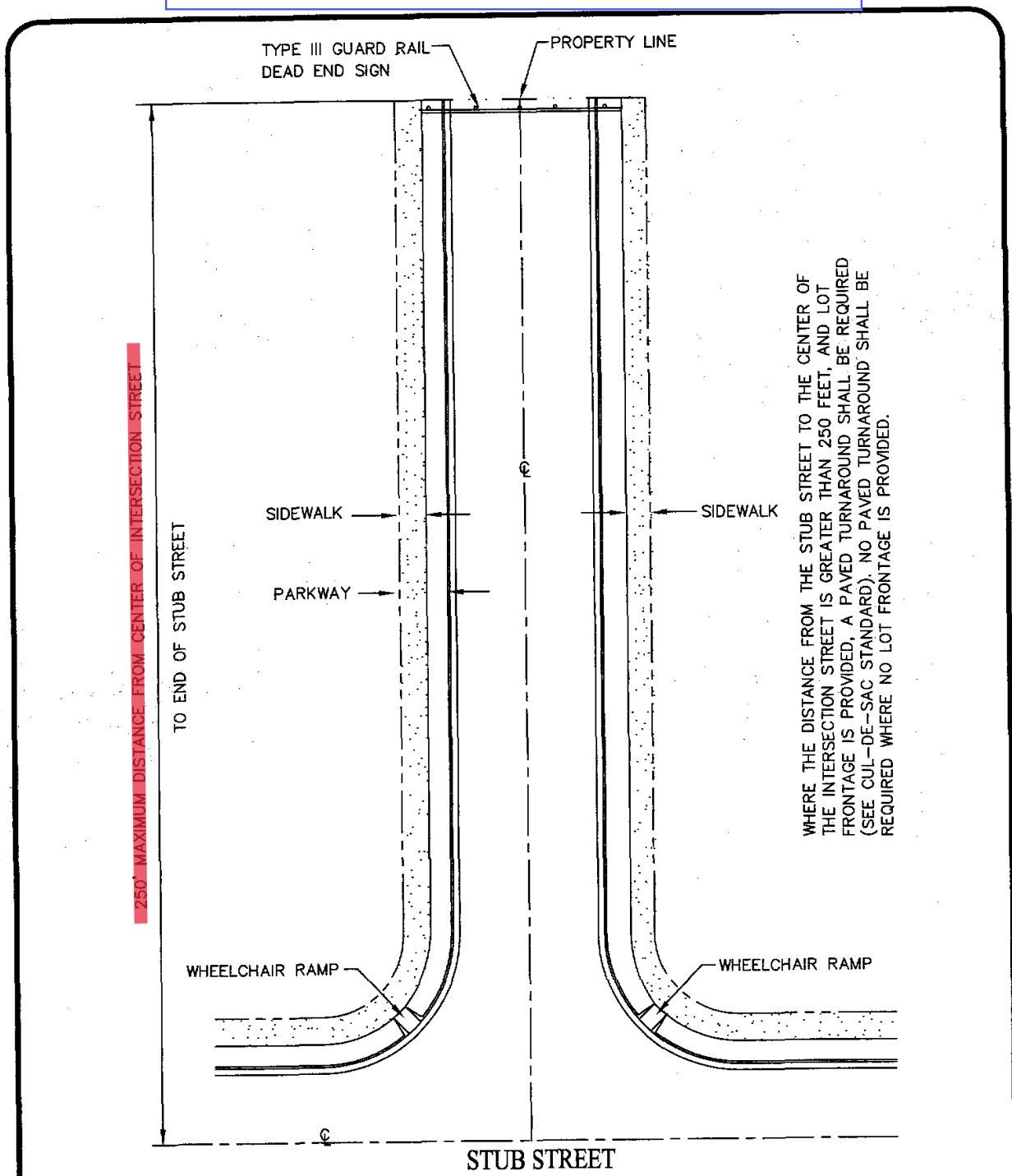
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

"Y" CUL-DE-SAC

3-18

Approved By R. A. SHUBERT  
Date JUNE 03, 2008  
Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



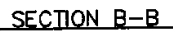
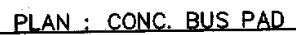
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STUB STREET

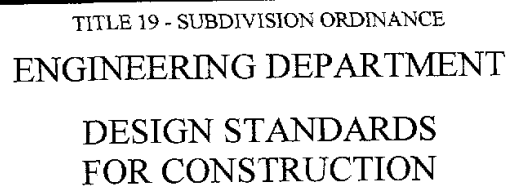
3-19

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



WHERE NEW BUS STOP PADS ARE CONSTRUCTED AT BUS STOPS, BAY OR OTHER AREAS WHERE A LIFT OR RAMP IS TO BE DEPLOYED, THEY SHALL HAVE A FIRM, STABLE SURFACE; A MIN. CLEAR LENGTH OF 96 INCHES (MEASURED FROM THE CURB OR VEHICLE ROADWAY EDGE) AND A MIN. CLEAR WIDTH OF 80 INCHES (MEASURED PARALLEL TO THE VEHICLE ROADWAY) TO THE MAXIMUM EXTENT ALLOWED BY LEGAL OR SITE CONSTRAINTS; AND SHALL BE CONNECTED TO STREETS, SIDEWALK OR PEDESTRIAN PATHS BY AN ACCESSIBLE ROUTE COMPLYING WITH TAS. THE SLOPE OF THE PAD PARALLEL TO THE ROADWAY SHALL, TO THE EXTENT PRACTICABLE, BE THE SAME AS THE ROADWAY. FOR WATER DRAINAGE A MAXIMUM SLOPE OF 1:50 (2%) PERPENDICULAR TO THE ROADWAY IS ALLOWED.



Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>





**BACK TO TITLE INDEX PAGE**

### PAVEMENT THICKNESS DESIGN PROCEDURE

THE FOLLOWING PROCEDURES WILL BE USED FOR ALL CITY OF EL PASO STREET PAVING PROJECTS, INCLUDING THOSE CONTRACTED BY THE CITY AND THOSE CONTRACTED BY THE DEVELOPER WITHIN A DISTANCE OF 5 MILES OUTSIDE THE CITY LIMITS. THE SOIL STUDY ANALYSIS REPORT FOR ALL PROJECTS SHALL INCLUDE THE FOLLOWING:

1. ESTABLISH CLASSIFICATION OF SUBGRADE SOILS.
  - A. DRILL SOIL BORINGS WITH STANDARD PENETRATION TESTS (SURFACE AND 2-1/2 FOOT INTERVALS) TO 6.5 FT BELOW PAVING SUBGRADE AT LOCATIONS DETERMINED BY THE CITY ENGINEER OR AT INTERVALS NOT TO EXCEED 800 FT. WITH A MINIMUM OF 2 SOIL BORINGS PER PROJECT.
  - B. OBSERVE AND LOG SAMPLES TO IDENTIFY SOILS IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.
  - C. OBSERVE AND REPORT FREE GROUNDWATER CONDITIONS.
2. ESTABLISH INDEX PROPERTIES OF SUBGRADE.
  - A. MAKE TESTS TO DETERMINE ATTERBERG LIMITS AND PERCENT OF SOIL PASSING 200-MESH SIEVE FOR EACH MAJOR SOIL TYPE.
  - B. DETERMINE GRAIN SIZE CURVES FOR COARSE GRAINED SOILS BY SIEVE ANALYSIS.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PAVEMENT  
THICKNESS DESIGN  
PROCEDURE  
3-22A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.

**BACK TO TITLE INDEX PAGE**

**PAVEMENT THICKNESS DESIGN PROCEDURE**  
(continued)

3. ESTABLISH IN-PLACE CONDITIONS AND STRENGTH OF SUBGRADE.
  - A. DETERMINE MOISTURE CONTENTS AND UNIT DRY WEIGHTS OF UNDISTURBED AND/OR RELATIVELY UNDISTURBED SAMPLES OF SOILS.
  - B. DETERMINE STRENGTH OF COHESIVE SOILS BY UNCONFINED COMPRESSION TESTS ON SELECTED UNDISTURBED SHELBY TUBE SAMPLES.
4. OBTAIN STRENGTH OF SUBGRADE SOILS.
  - A. USE THE CALIFORNIA BEARING RATION (CBR). CBR VALUES SHALL BE OBTAINED BY TEST METHODS OUTLINED IN EITHER ASHTO T193 OR ASTM D1883.
5. DETERMINE THICKNESS OF BASE MATERIALS AND PAVEMENT IN ACCORDANCE WITH AASHTO INTERIM GUIDE FOR DESIGN OF PAVEMENT STRUCTURES 1972, CHAPTER III, REVISED 1981; PUBLISHED BY: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 444 N. CAPITAL STREET, N.W. SUITE 225, WASHINGTON, D.C. 20001.
  - A. THE NECESSARY DESIGN DATA FOR HOT MIXED ASPHALTIC CONCRETE PAVEMENTS MUST BE OBTAINED AND USED AS FOLLOWS:
    1. TERMINAL SERVICEABILITY INDEX (PT) MUST BE 2.0.
    2. EQUIVALENT 18-KIP SINGLE-AXLE LOADS (EAL) MUST BE OBTAINED FROM TABLE 1, STREET DESIGN CRITERIA, DESIGN STANDARD SHEET NO. 3-25. THE DEPARTMENT OF ENGINEERING SHALL DETERMINE APPLICABLE STREET CLASSIFICATION.



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

PAVEMENT  
THICKNESS DESIGN  
PROCEDURE  
3-22B

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

### PAVEMENT THICKNESS DESIGN PROCEDURE (continued)

3. SOIL SUPPORT VALUE (S) MUST BE DETERMINED FROM FIGURE 1 ATTACHED. SOIL STRENGTH VALUES MUST BE AS OBTAINED FROM CBR TESTS.
4. REGIONAL FACTOR (R) MUST BE 0.5.
5. STRUCTURAL NUMBER (SN) MUST BE DETERMINED FROM THE NOMOGRAPH, FIGURE 2. ATTACHED.
6. LAYER COEFFICIENT ( $A_1$ ,  $A_2$ ,  $A_3$ ) MUST BE ESTABLISHED FROM TABLE 2. (ATTACHED).
7. USE THE FOLLOWING EQUATION TO DETERMINE THE MOST EFFICIENT PAVEMENT STRUCTURE.

$$SN = A_1 D_1 + A_2 D_2 + A_3 D_3$$

WHERE

- $D_1$  = THICKNESS OF SURFACE COURSE
- $D_2$  = THICKNESS OF BASE COURSE
- $D_3$  = THICKNESS OF SUBBASE COURSE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PAVEMENT THICKNESS  
DESIGN PROCEDURE  
3-22C

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

**BACK TO TITLE INDEX PAGE**

**PAVEMENT THICKNESS DESIGN PROCEDURE**  
(continued)

**DEFINITIONS:**

CALIFORNIA BEARING RATION (CBR) - THIS IS A MEASURE OF THE STRENGTH OF A SOIL AS DETERMINED BY FORCING A 3 SQUARE INCH PLUNGER INTO A CYLINDER OF THE SOIL. CBR VALUES MAY RANGE FROM 1-100.

TERMINAL SERVICEABILITY INDEX (PT) - THE SERVICEABILITY OF A PAVEMENT IS DEFINED AS THE ABILITY TO SERVE HIGH-SPEED, HIGH VOLUME AUTOMOBILE AND TRUCK TRAFFIC AND IS MEASURED BY USE OF AN INDEX. THE PT IS THE LOWEST INDEX THAT WILL BE TOLERATED BEFORE RESURFACING OR RECONSTRUCTION BECOMES NECESSARY. FOR EL PASO, THE PT MUST BE 2.0.

EQUIVALENT 18-KIP SINGLE AXLE LOADS (EAL) - TO ASSESS TRAFFIC LOADS, THE VARYING AXLE LOADS OF DIFFERENT VEHICLES ARE CONVERTED TO A COMMON UNIT. IN THIS PROCEDURE THE 18 KIP SINGLE AXLE LOAD IS USED.

SOIL SUPPORT VALUE (S) - AN INDEX NUMBER WHICH EXPRESSES THE ABILITY OF A SOIL OR AGGREGATE MIXTURE TO SUPPORT TRAFFIC LOADS THROUGH A FLEXIBLE PAVEMENT STRUCTURE.

REGIONAL FACTOR (R) - A NUMERICAL FACTOR THAT IS USED TO ADJUST THE STRUCTURAL NUMBER FOR CLIMATIC AND ENVIRONMENTAL CONDITIONS. FOR EL PASO, THE (R) MUST BE 0.5.

STRUCTURAL NUMBER (SN) - AN INDEX NUMBER DERIVED FROM AN ANALYSIS OF TRAFFIC, SUBGRADE SOIL CONDITIONS, AND REGIONAL FACTOR WHICH MAY BE CONVERTED TO THICKNESS OF FLEXIBLE PAVEMENT LAYERS THROUGH THE USE OF SUITABLE LAYER COEFFICIENTS RELATED TO THE TYPE OF MATERIAL BEING USED IN EACH LAYER OF THE PAVEMENT STRUCTURE.

LAYER COEFFICIENTS - A NUMBER WHICH RELATES SN AND THICKNESS.

A<sub>1</sub> REPRESENTS THE SURFACE COURSE.  
A<sub>2</sub> REPRESENTS THE BASE COURSE.  
A<sub>3</sub> REPRESENTS THE SUBBASE COURSE.



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

PAVEMENT  
THICKNESS DESIGN  
PROCEDURE  
3-23

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / I. R.

BACK TO TITLE INDEX PAGE

**PAVEMENT THICKNESS DESIGN PROCEDURE**  
(continued)

EXAMPLE:

DESIGN A PAVEMENT STRUCTURE FOR A 36' ROADWAY WITH CBR = 12,  
85% COMPACTED SUBGRADE, ASTM D1557.

A.  $P_i = 2.0$

B. CITY ENGINEER DETERMINES THIS STREET IS A RESIDENTIAL  
COLLECTOR ACCORDING TO TABLE 1. THEREFORE,  $EAL = 269,000$

C. FROM FIGURE 1, WITH CBR = 12,  $S = 6.35$

D.  $R = 0.5$

E. FROM FIGURE 2,  $SN = 1.70$

F. FROM TABLE 2,  $a_1 = 0.44$ ,  $a_2 = 0.14$ ,  $a_3 = 0.11$

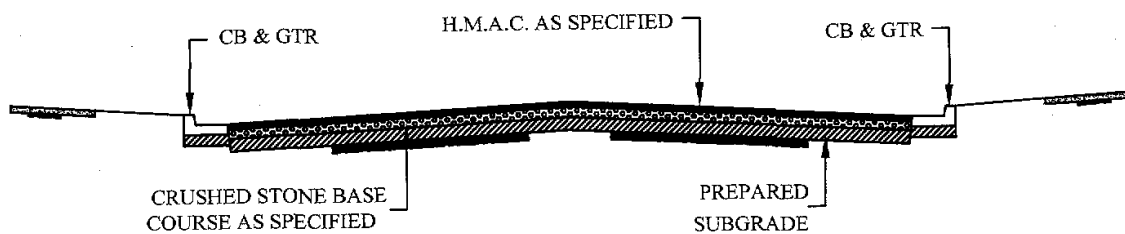
G. USE  $D_1 = 2"$ ,  $D_3 = 6$  IN EQU -1 AND SOLVE FOR  $D_2$

$$1.70 = (0.44)(2) + (0.14)D_2 + (0.11)(6)$$

$$D_2 = 1.14"$$

EXAMPLE:

MINIMUM "D" FOR RESIDENTIAL SUBCOLLECTOR ACCESS STREET IS 4 1/2".  
THIS PAVEMENT STRUCTURE WOULD CONSIST OF 2" H.M.A.C., 4 1/2" C.S.B.  
AND 6" COMPACTED SUB-BASE



TYPICAL ROAD SECTION



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

PAVEMENT  
THICKNESS DESIGN  
PROCEDURE  
3-24

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / I. R.



BACK TO TITLE INDEX PAGE

### PAVEMENT THICKNESS DESIGN CHART

STREET CLASSIFICATION	AVERAGE DAILY TRAFFIC	ROADWAY WIDTH (FT.)	ROW WIDTH (FT.)	MINIMUM PAVEMENT THICKNESS (IN.) ** <u>HMAC</u>
<u>E.A.L.</u>	<u>CSB</u> (20 YRS)			<u>SUBGRADE</u>
ALLEY	200	14 OR 20	14 OR 20	1-1/2 4-1/2 6
	45,000			
TWENTY FOOT (20') RESIDENTIAL LANE - NO PARKING	200 45,000	20	40	1-1/2 6 8
THIRTY-TWO FOOT (32') RESIDENTIAL LANE - NO PARKING	500 45,000	32	50	1-1/2 6 8
THIRTY-SIX FOOT (36') RESIDENTIAL 1 LANE	3,000 269,000	36	56	1-1/2 6 8
TWENTY-EIGHT FOOT (28') RESIDENTIAL 2 LANE	3,000 269,000	28	46	1-1/2 6 8
RESIDENTIAL COLLECTOR - WITH PARKING	3,000 269,000	36	54	1-1/2 6 8
RESIDENTIAL COLLECTOR WITH MEDIAN	3,000 269,000	36	54	1-1/2 6 8
MOUNTAIN RESIDENTIAL	500 * 45,000	20	23	1-1/2 4-1/2 6
DIVIDED MOUNTAIN RESIDENTIAL	500 * 45,000	20	VARIES	1-1/2 4-1/2 6
MULTI-FAMILY/ COMMERCIAL/ INDUSTRIAL LOCAL STREET 1	6,000 * 630,000	44	64	2 8 10



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PAVEMENT THICKNESS  
DESIGN CHART  
3-25

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE

### PAVEMENT THICKNESS DESIGN CHART

(continued)

STREET CLASSIFICATION	AVERAGE DAILY TRAFFIC	ROADWAY WIDTH (FT.)	ROW WIDTH (FT.)	MINIMUM PAVEMENT THICKNESS (IN.) ** <u>HMAC</u> <u>CSB</u> <u>SUBGRADE</u>
	<b>E.A.L. (20 YRS)</b>			
MULTI-FAMILY/ COMMERCIAL/ INDUSTRIAL LOCAL STREET 2	6,000 * 630,000	36	56	2 8 10
NON- RESIDENTIAL COLLECTOR	6,000 * 630,000	50	70	2 8 10
NON-RESIDENTIAL COLLECTOR WITH BIKE LANES	6,000 * 630,000	62	82	2-1/2 8 10
BOULEVARD	14,000 * 1,300,000	44	120	2-1/2 10 12
MINOR ARTERIAL	14,000 * 1,500,000	58	78	2-1/2 8 10
MINOR ARTERIAL W/BIKE LANES	14,000 * 1,500,000	58	88	2-1/2 8 10
MAJOR ARTERIAL	26,000 * 3,100,000	66	110	2-1/2 10 12
MAJOR ARTERIAL W/BIKE LANES	26,000 * 3,100,000	66	120	2-1/2 10 12

\* ADT FOR PURPOSES OF ESTIMATING AXLE LOADS ONLY

\*\* IF THE RESULTS FOR "CBR" VALUES ARE HIGHER THAN THE MINIMUM PAVEMENT THICKNESS, THE HIGHER VALUES SHALL BE USED.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PAVEMENT THICKNESS  
DESIGN CHART

3-26

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

PAVEMENT THICKNESS DESIGN PROCEDURE				
STREET CLASSIFICATION	AVER. DAILY TRAFFIC E. A. L. (20 YRS.)	ROADWAY WIDTH (FT.)	R. O. W. WIDTH (FT.)	MINIMUM PAVEMENT THICKNESS (IN.) ** <u>HMAC</u> <u>CSB</u> <u>SUBGRADE</u>
COLLECTOR ARTERIAL**	7,000* 1,800,000	90	98	2 1/2 8 10
MINOR ARTERIAL**	14,000* 2,200,000	98	120	2 1/2 10 12
MAJOR ARTERIAL**	28,000* 4,600,000	98	136	2 1/2 10 12
COLLECTOR ARTERIAL** W/ BIKE LANES	7,000* 1,800,000	98	136	2 1/2 8 10
MINOR ARTERIAL** W/ BIKE LANES	14,000* 2,200,00	98	136	2 1/2 10 12
MAJOR ARTERIAL** W/ BIKE LANES	28,000* 4,600,000	98	136	2 1/2 10 12

\*ADT FOR PURPOSES OF ESTIMATING AXLE LOADS ONLY.

\*\*MINIMUM PAVEMENT THICKNESS FOR ARTERIAL STREETS, WITHIN HEAVY COMMERCIAL AND INDUSTRIAL DEVELOPMENTS (PROPERTIES ZONED C-4, M-1, M-2, M-3 AND P.I.) SHALL BE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.



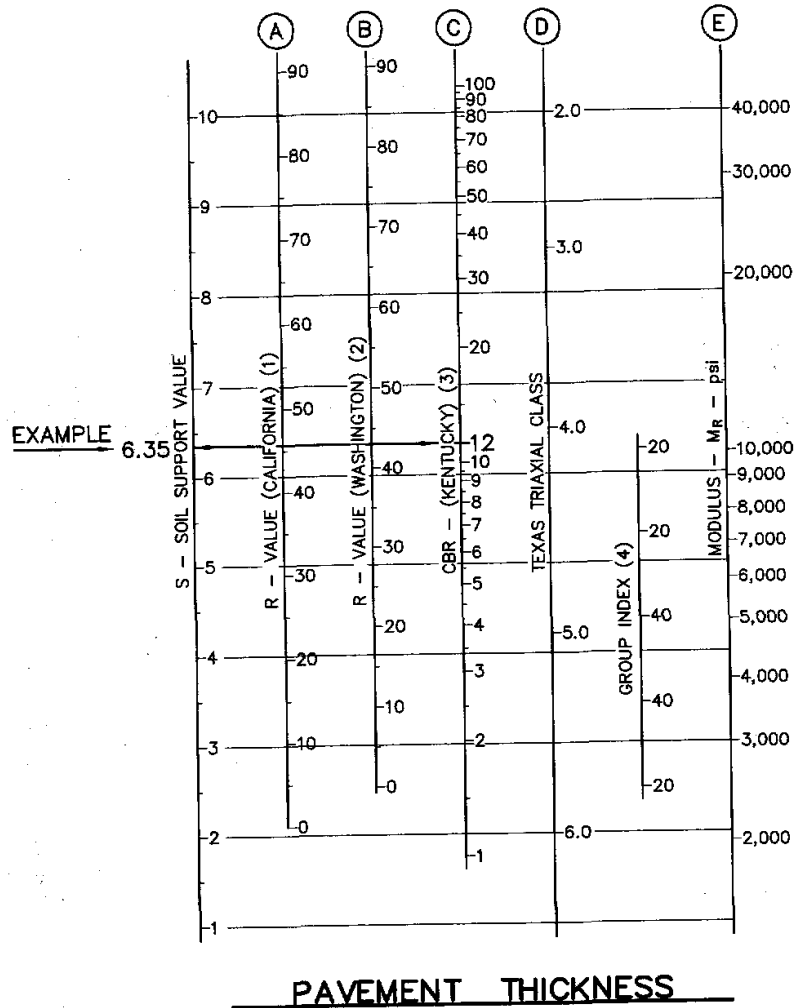
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PAVEMENT THICKNESS  
DESIGN CHART  
(HEAVY)  
3-27

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



- (1) THE CORRELATION IS WITH THE DESIGN CURVES USED BY CALIFORNIA; AASHTO DESIGNATIONS T-173-60, AND EXUDATION PRESSURE IS 240 psi. SEE HVEEM, F.M., AND CARMANY, R.M., "THE FACTORS UNDERLYING THE RATIONAL DESIGN OF PAVEMENTS." PROC. HRB, VOL. 28 (1948) PP. 10-136.
- (2) THE CORRELATION IS WITH THE DESIGN CURVES USED BY WASHINGTON DEPT. OF HIGHWAYS; EXUDATION PRESSURE IS 300 psi. SEE "FLEXIBLE PAVEMENT DESIGN CORRELATION STUDY." HRB BULL. 133 (1956).
- (3) THE CORRELATION IS WITH THE CBR DESIGN CURVES BY KENTUCKY. SEE DRAKE, W.B., AND HAVENS, J.H., "RE-EVALUATION OF KENTUCKY FLEXIBLE PAVEMENT DESIGN CRITERION." HRB BULL. 233 (1959) PP. 33-56. THE FOLLOWING CONDITIONS APPLY TO THE LABORATORY-MODIFIED CBR: SPECIMEN IS TO BE MOLDED AT OR NEAR THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY AASHTO T-99; DYNAMIC COMPACTION IS TO BE USED WITH A HAMMER WEIGHT OF 10 LB. DROPPED FROM A HEIGHT OF 18 IN.; SPECIMEN IS TO BE COMPACTED IN FIVE EQUAL LAYERS WITH EACH LAYER RECEIVING 10 BLOWS; SPECIMEN IS TO BE SOAKED FOR 4 DAYS.
- (4) THIS SCALE HAS BEEN DEVELOPED BY COMPARISON BETWEEN THE CALIFORNIA R-VALUE AND THE GROUP INDEX DETERMINED BY THE PROCEDURE IN PROC. HRB VOL. 25 (1945) PP. 376-392.

FIGURE 1



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

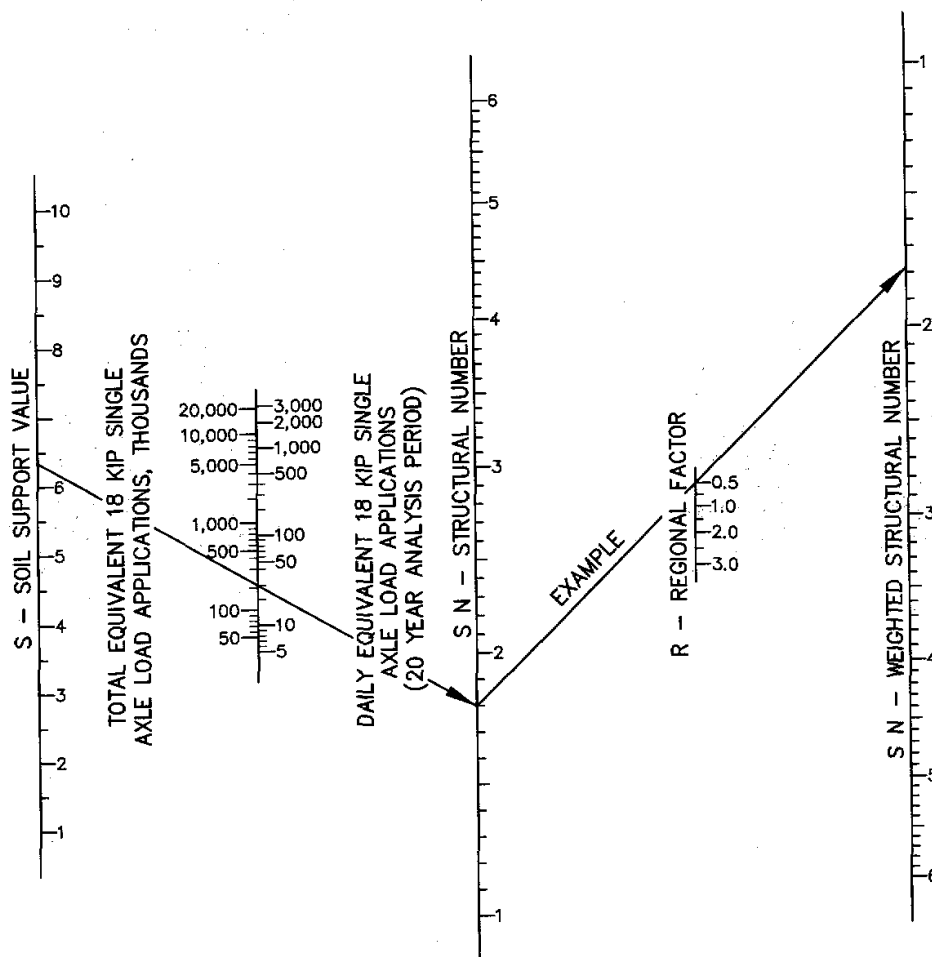
PAVEMENT THICKNESS  
DESIGN

3-28

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / I. R.

BACK TO TITLE INDEX PAGE



STRUCTURAL NUMBER FOR  $P_t = 20$   
FIGURE 2



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PAVEMENT THICKNESS  
DESIGN

3-29A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.



BACK TO TITLE INDEX PAGE

PAVEMENT COMPONENT	COEFFICIENT <sup>(3)</sup>
<u>SURFACE COURSE</u>	
ROADMIX (LOW STABILITY)	0.20
PLANTMIX (HIGH STABILITY)	0.44* ← EXAMPLE
SAND ASPHALT	0.40
<u>BASE COURSE</u>	
SANDY GRAVEL	0.07 <sup>2</sup> ← EXAMPLE
CRUSHED STONE	0.14
CEMENT-TREATED (NO SOIL - CEMENT)	
COMPRESSIVE STRENGTH @ 7 DAYS	
650 PSI OR MORE (4.48 MPA)	0.23 <sup>2</sup>
400 TO 650 PSI (2.76 TO 4.48 MPA)	0.20
400 PSI OR LESS (2.76 MPA)	0.15
BITUMINOUS - TREATED	
COARSE - GRADED	0.34 <sup>2</sup>
SAND ASPHALT	0.30
LIME - TREATED	0.15 - 0.30
<u>SUBBASE COURSE</u>	
SANDY GRAVEL	0.11* ← EXAMPLE
SAND OR SANDY-CLAY	0.15 - 0.10

LAYER COEFFICIENTS  
TABLE 2

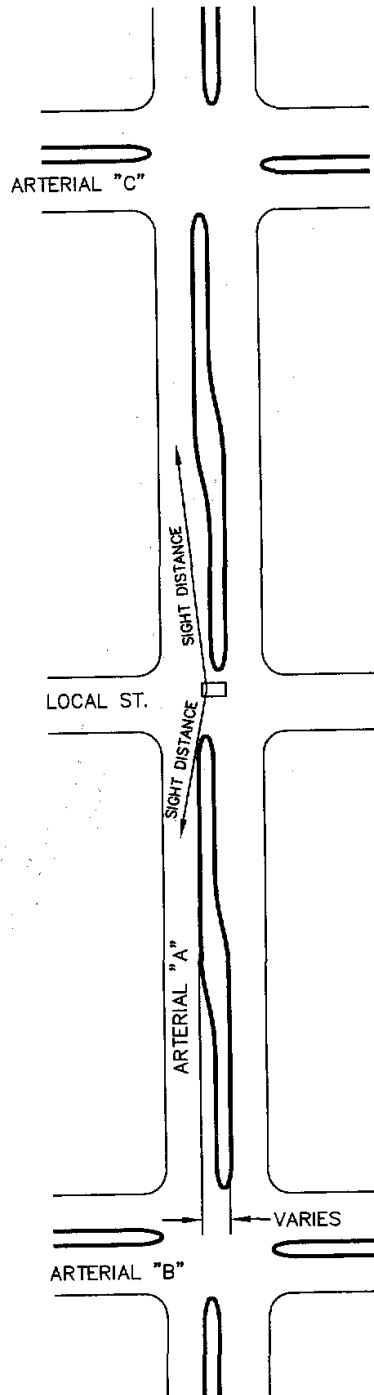


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PAVEMENT  
THICKNESS DESIGN  
3-29B

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE



### MEDIAN OPENING SIGHT DISTANCE

NOTE: (2-STOP CROSSING)

MINIMUM SIGHT DISTANCE REQUIRED AT MEDIAN OPENINGS WHERE THE CROSSROAD IS CONTROLLED BY STOP SIGNS SHALL BE AS SHOWN BELOW; OTHER APPLICATIONS SHALL COMPLY WITH AASHTO REQUIREMENTS.

MEDIAN GREATER THAN OR EQUAL TO 20 FEET (2-STOP CROSSING)

ARTERIAL DESIGN SPEED	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH
2 LANES (20'-24')	390	455	520	585	650
3 LANES (32'-36')	435	505	580	650	725
4 LANES (40'-48')	450	525	600	675	750

VERTICAL SIGHT DISTANCE SHALL BE MEASURED FROM A DRIVER'S EYE LEVEL (3.5 FEET) TO THE TOP OF AN ONCOMING CAR (4.5 FEET).  
NO MEDIAN OPENING SHALL BE LOCATED WHERE THE GRADE BETWEEN THE LANES ON OPPOSITE SIDES OF THE MEDIAN EXCEEDS 11%.



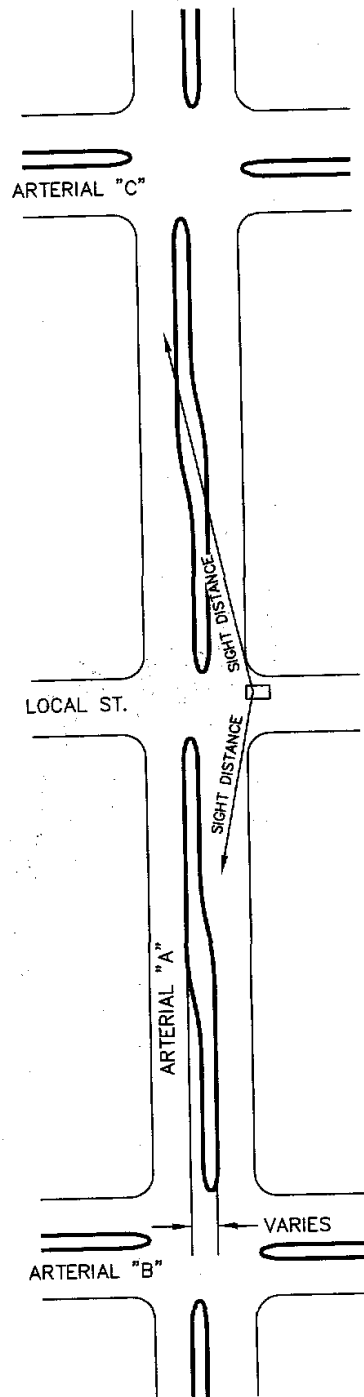
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MEDIAN OPENING SIGHT  
DISTANCE  
(2-STOP CROSSING)  
3-30

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



### MEDIAN OPENING SIGHT DISTANCE

#### (1-STOP CROSSING)

NOTE:  
MINIMUM SIGHT DISTANCE REQUIRED AT MEDIAN OPENINGS WHERE THE CROSSROAD IS CONTROLLED BY STOP SIGNS SHALL BE AS SHOWN BELOW; OTHER APPLICATIONS SHALL COMPLY WITH AASHTO REQUIREMENTS.

#### MEDIAN LESS THAN 20 FEET (1-STOP CROSSING)

ARTERIAL DESIGN SPEED	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH
4 LANES (40'-48')	485	565	645	730	810
6 LANES (64'-72')	530	620	705	795	880

VERTICAL SIGHT DISTANCE SHALL BE MEASURED FROM A DRIVER'S EYE LEVEL (3.5 FEET) TO THE TOP OF AN ONCOMING CAR (4.5 FEET).  
NO MEDIAN OPENING SHALL BE LOCATED WHERE THE GRADE BETWEEN THE LANES ON OPPOSITE SIDES OF THE MEDIAN EXCEEDS 11%. OTHER APPLICATIONS FOR SIGHT DISTANCE DESIGN SHALL BE PERMITTED, PROVIDED THEY MEET AASHTO GUIDELINES.



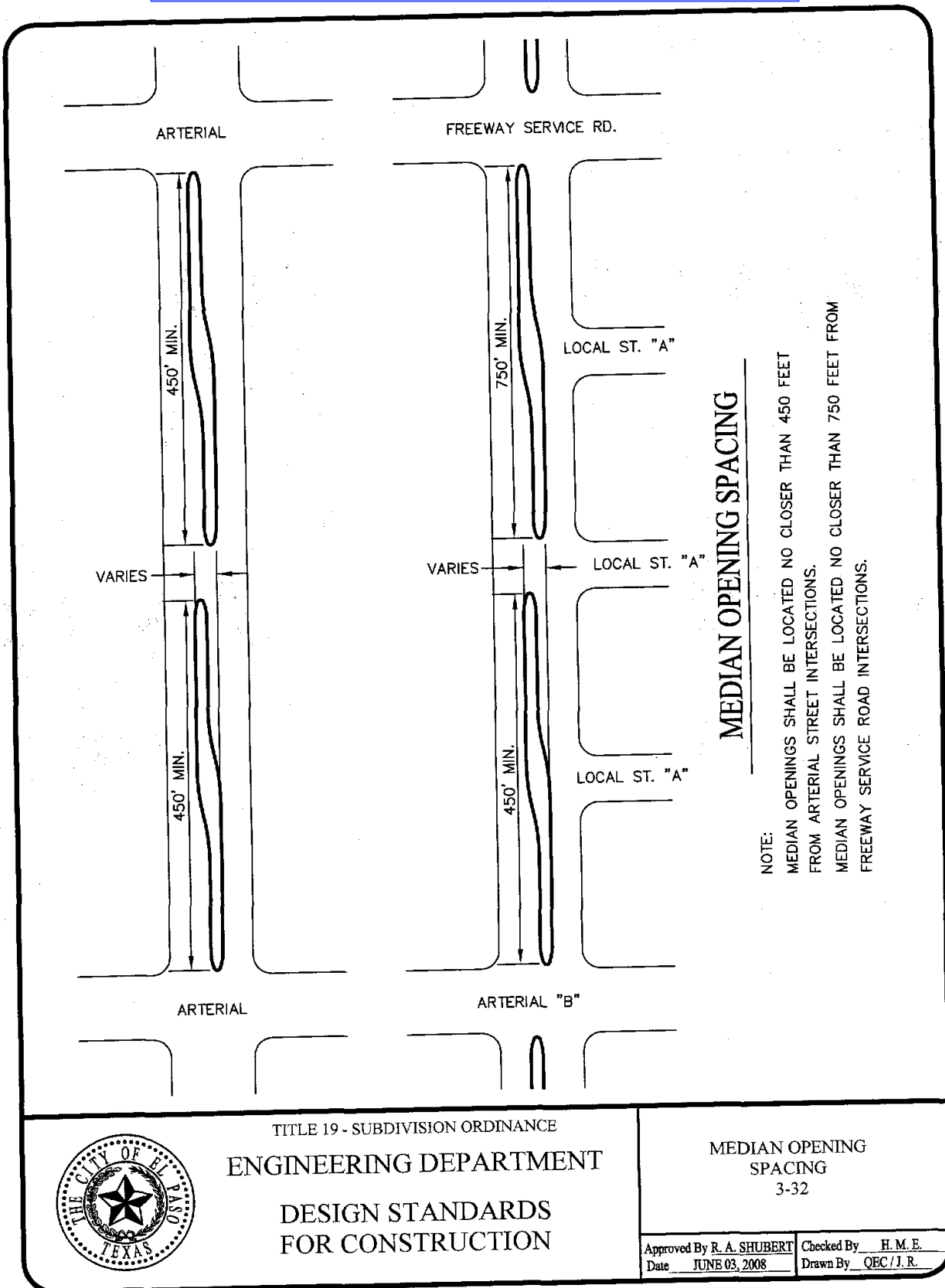
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MEDIAN OPENING SIGHT  
DISTANCE  
(1-STOP CROSSING)  
3-31

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

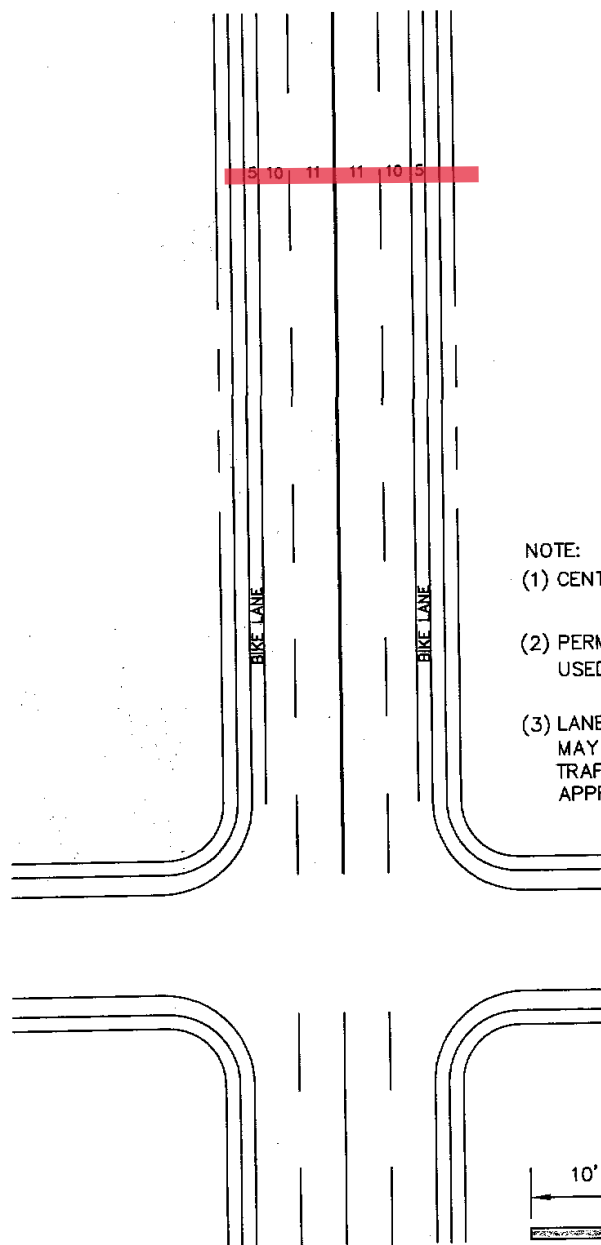
Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



BACK TO TITLE INDEX PAGE

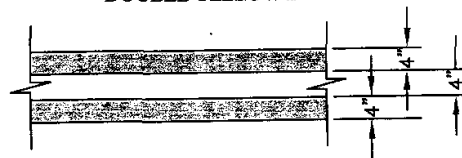
# CENTERLINE STRIPING WITH BIKE LANES



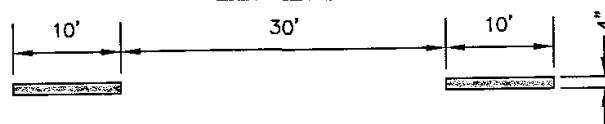
## NOTE:

- (1) CENTER LINE STRIPING FOR COLLECTOR ARTERIAL.
- (2) PERMANENT PAVEMENT MARKING MATERIALS TO BE USED AS PER CITY SPECIFICATIONS.
- (3) LANE MARKINGS TO BE FURNISHED AND INSTALLED MAY INCLUDE PERMANENT THERMO-PLASTIC MARKINGS, TRAFFIC BUTTONS OR OTHER STRIPING MATERIALS APPROVED BY THE CITY ENGINEER.

## DOUBLE YELLOW LINE



## LANE LINES



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CENTERLINE STRIPING  
WITH BIKE LANES  
3-33

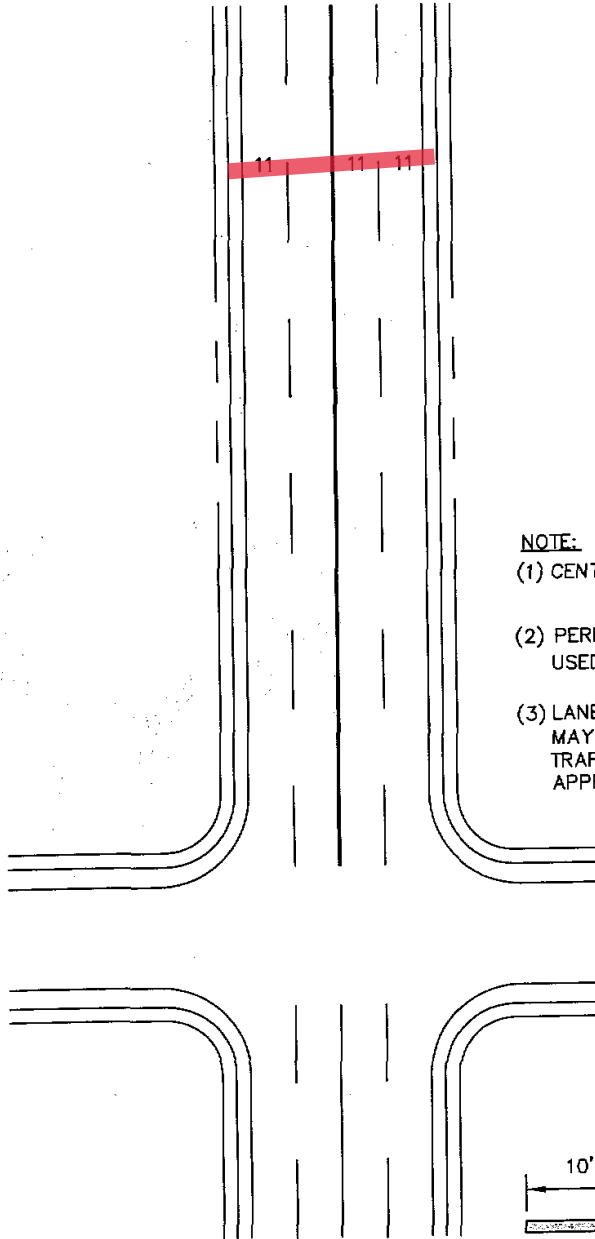
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC/J. R.



BACK TO TITLE INDEX PAGE

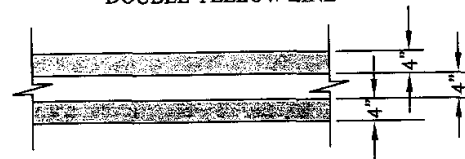
## CENTERLINE STRIPING WITHOUT BIKE LANES



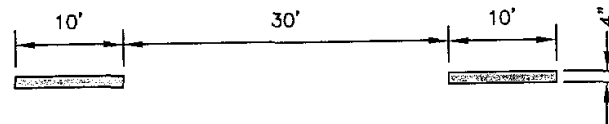
### NOTE:

- (1) CENTER LINE STRIPING FOR COLLECTOR ARTERIAL.
- (2) PERMANENT PAVEMENT MARKING MATERIALS TO BE USED AS PER CITY SPECIFICATIONS.
- (3) LANE MARKINGS TO BE FURNISHED AND INSTALLED MAY INCLUDE PERMANENT THERMO-PLASTIC MARKINGS, TRAFFIC BUTTONS OR OTHER STRIPING MATERIALS APPROVED BY THE CITY ENGINEER.

### DOUBLE YELLOW LINE



### LANE LINES



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

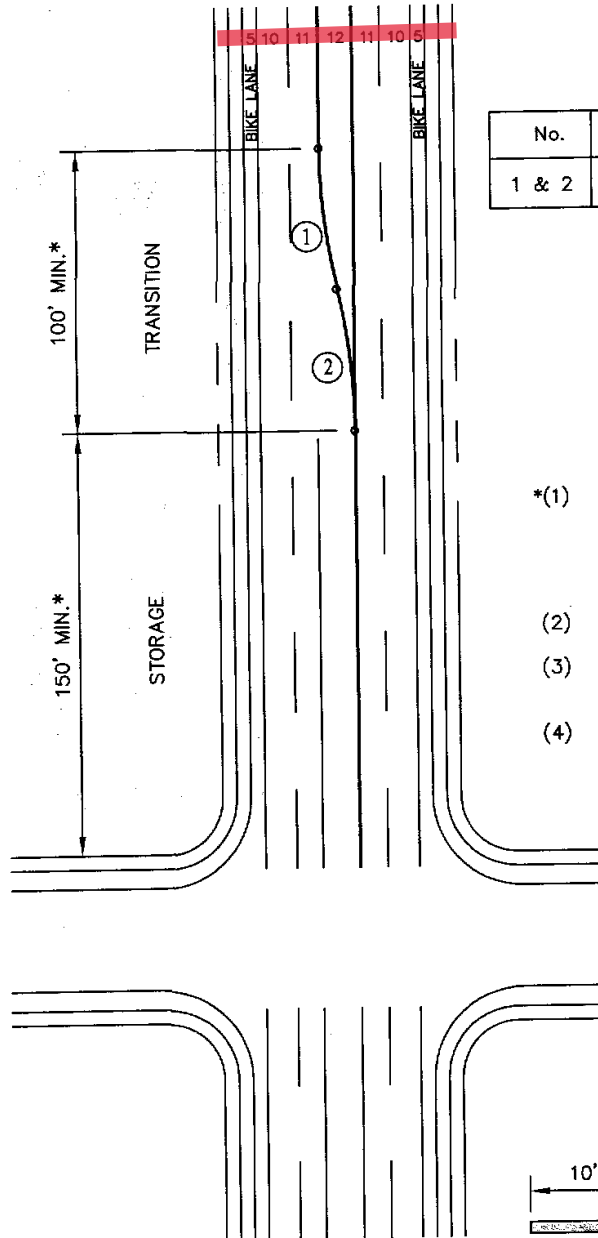
CENTERLINE STRIPING  
WITHOUT BIKE LANES  
3-34

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE

## MEDIAN STRIPING WITH BIKE LANES



TYPICAL CURVE DATA

No.	$\Delta$	R	L	T	CH
1 & 2	13°41'08"	211.34'	50.48'	25.36'	50.36'

$$T = R \tan \frac{\Delta}{2}$$

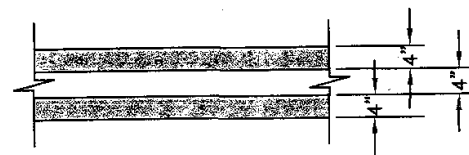
$$C = 2R \sin \frac{\Delta}{2} = 2T \cos \frac{\Delta}{2}$$

$$L = \frac{\Delta R \pi}{2}$$

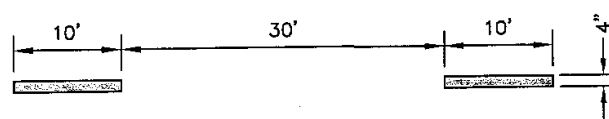
NOTE:

- \*(1) LENGTH OF R, STORAGE, AND TRANSITION TO BE INCREASED BASED UPON TRAFFIC DENSITY, ROAD DESIGN, SPEED, AND PRESENCE OR ABSENCE OF TRAFFIC SIGNALS.
- (2) MEDIAN STRIPING FOR MINOR ARTERIAL.
- (3) PERMANENT PAVEMENT MARKING MATERIALS TO BE USED AS PER CITY SPECIFICATIONS.
- (4) LANE MARKINGS TO BE FURNISHED AND INSTALLED MAY INCLUDE PERMANENT THERMO-PLASTIC MARKINGS, TRAFFIC BUTTONS OR OTHER STRIPING MATERIALS APPROVED BY THE CITY ENGINEER.

DOUBLE YELLOW LINE



LANE LINES



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

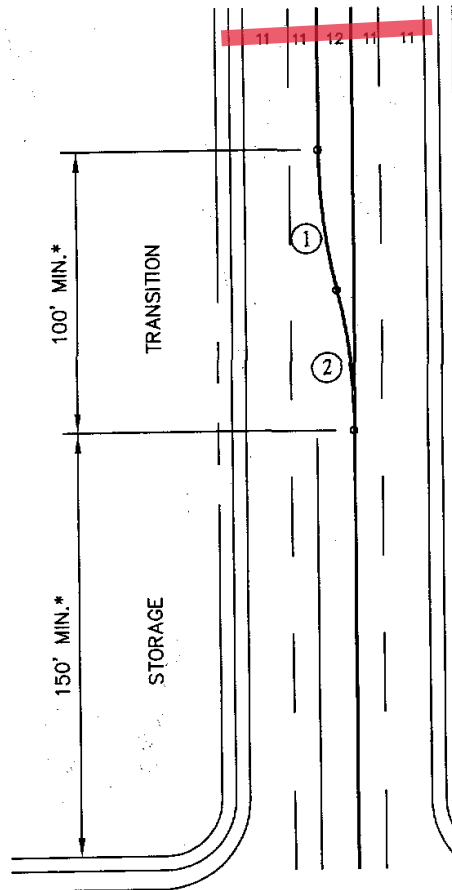
MEDIAN STRIPING WITH  
BIKE LANES

3-35

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

## MEDIAN STRIPING WITHOUT BIKE LANES



TYPICAL CURVE DATA

No.	$\Delta$	R	L	T	CH
1 & 2	13°41'08"	211.34'	50.48'	25.36'	50.36'

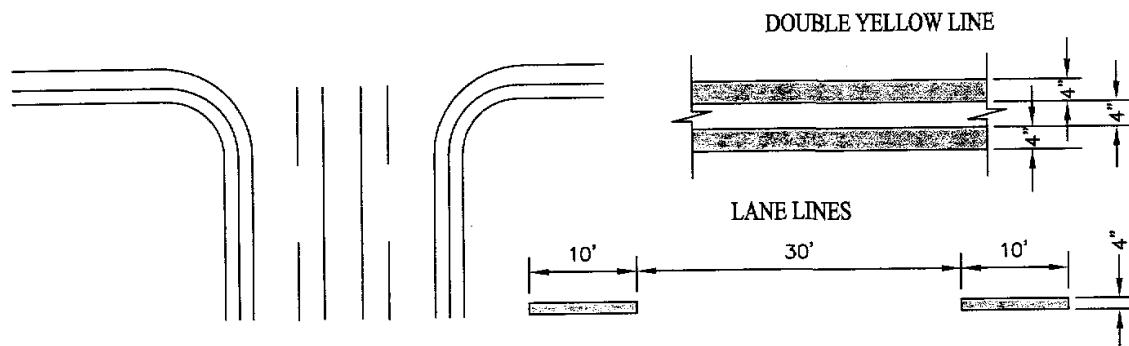
$$T = R \tan \frac{\Delta}{2}$$

$$C = 2R \sin \frac{\Delta}{2} = 2T \cos \frac{\Delta}{2}$$

$$L = \frac{\Delta R \pi}{2}$$

NOTE:

- \*(1) LENGTH OF R, STORAGE, AND TRANSITION TO BE INCREASED BASED UPON TRAFFIC DENSITY, ROAD DESIGN, SPEED, AND PRESENCE OR ABSENCE OF TRAFFIC SIGNALS.
- (2) MEDIAN STRIPING FOR MINOR ARTERIAL.
- (3) PERMANENT PAVEMENT MARKING MATERIALS TO BE USED AS PER CITY SPECIFICATIONS.
- (4) LANE MARKINGS TO BE FURNISHED AND INSTALLED MAY INCLUDE PERMANENT THERMO-PLASTIC MARKINGS, TRAFFIC BUTTONS OR OTHER STRIPING MATERIALS APPROVED BY THE CITY ENGINEER.



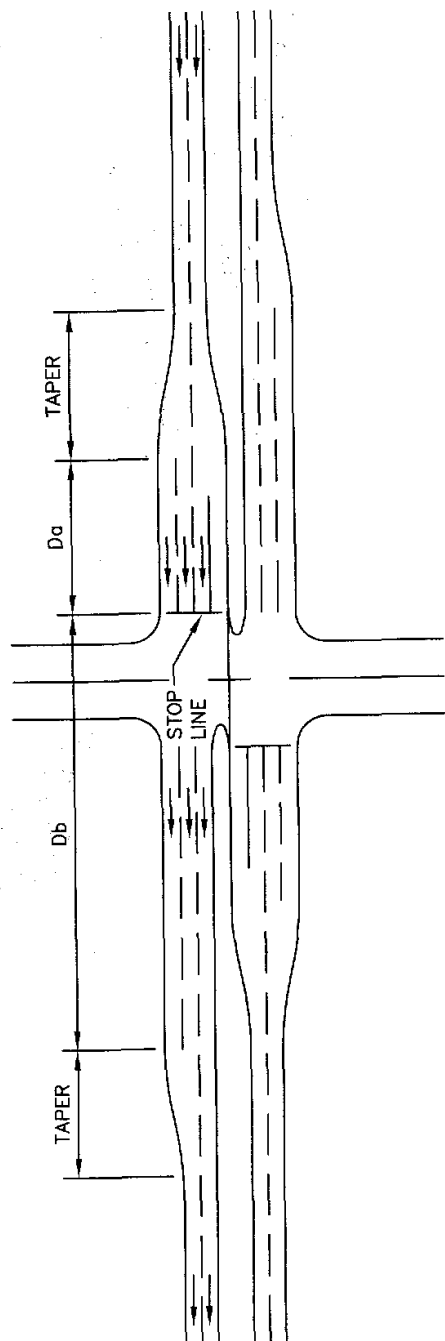
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MEDIAN STRIPING  
WITHOUT BIKE LANES

3-36

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE



LENGTH OF WIDENING IN ADVANCE OF INTERSECTION

LENGTH REQUIRED FOR DECELERATION		
DESIGN SPEED (MPH)	Da (FEET)	TAPER (FEET)
40	150	175
45	175	200
50	200	225

LENGTH OF WIDENING BEYOND INTERSECTION

LENGTH REQUIRED FOR ACCELERATION		
DESIGN SPEED (MPH)	Db (FEET)	TAPER (FEET)
40	200	200
45	375	225
50	525	250

LENGTH REQUIREMENTS FOR ACCELERATION AND DECELERATION TURNING LANE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

ACCELERATION AND  
DECELERATION LANES

3-37

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

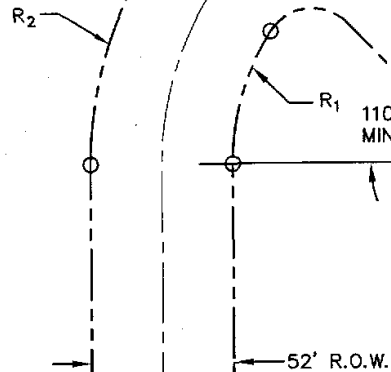
Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

RECOMMENDED RADII

$R_1$  = NO LESS THAN 40'

$R_2$  = NO LESS THAN 92'



NOTES:

1. IF LESS THAN 110', THEN TURNING HEEL IS NEEDED.
2.  $R_1$  AND  $R_2$  ARE BASED ON DESIGN SPEED AS PER AASHTO DESIGN GUIDELINES.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MINIMUM RADII AT  
INTERSECTION APPROACH

3-38

Approved By R. A. SHUBERT	Checked By H. M. E.
Date JUNE 03, 2008	Drawn By QEC/J.R.



[BACK TO TITLE INDEX PAGE](#)

## INTERSECTION DESIGN

1. STREETS SHALL BE LAID OUT SO AS TO INTERSECT AS NEARLY AS POSSIBLE AT RIGHT ANGLES. NO INTERSECTION SHALL BE LESS THAN AN INCLUDED ANGLE OF SEVENTY DEGREES AND NO MORE THAN ONE HUNDRED TEN DEGREES.
2. THE RIGHT-OF-WAY LINE AT STREET INTERSECTIONS SHALL HAVE A MINIMUM RADIUS OF TWENTY (20) FEET.
3. WHERE PARALLEL STREETS INTERSECT ANOTHER STREET, THE CENTERLINE OF THOSE STREETS SHALL BE OFFSET A MINIMUM OF ONE HUNDRED TWENTY (120) FEET. THIS OFFSET SHALL NOT APPLY TO MINOR ARTERIAL STREETS INTERSECTING A HIGHER ORDER ARTERIAL, IF A RAISED MEDIAN IS PROVIDED AND NO MEDIAN OPENING IS ALIGNED WITH OR RAISED BETWEEN THE OFFSET STREETS. FUTURE MEDIAN OPENINGS SHALL NOT BE PERMITTED WHERE TWO (2) MINOR ARTERIAL STREETS OFFSET AND INTERSECT A MAJOR ARTERIAL STREET AT A DISTANCE OF LESS THAN ONE HUNDRED TWENTY (120) FEET; PROVIDED, HOWEVER MEDIAN OPENINGS MAY BE ALLOWED FOR ONEWAY TRAFFIC CIRCULATION SUBJECT TO THE APPROVAL OF THE DIRECTOR OF TRAFFIC AND TRANSPORTATION DEPT.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

INTERSECTION  
DESIGN  
REQUIREMENTS  
3-39

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE

## GEOMETRIC DESIGN OF ROADWAYS

DESIGN SPEED (m.p.h.)	HORIZONTAL ALIGNMENT MINIMUM CURVE RADIUS (ft)	VERTICAL ALIGNMENT RATE OF VERTICAL CURVATURE (K-VALUE)		INTERSECTION SIGHT DISTANCE MINIMUM SIGHT DISTANCE (ft)
		CREST	SAG	
15	180	20	30	125
25	(INFORMATION TO BE INCORPORATED AT A LATER DATE)			
30	300	30	40	325
35	475	50	50	400
40	675	80	70	500
45	1,100	120	90	500
50	1,400	160	110	600



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

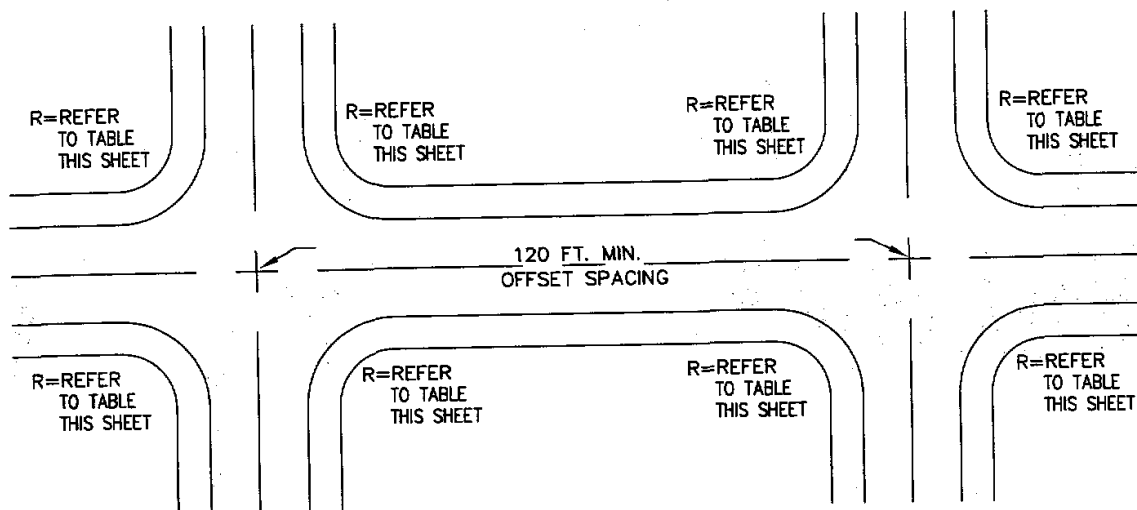
GEOMETRIC DESIGN  
OF ROADWAY

3-40

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



## INTERSECTION DESIGN

ROADWAY CLASSIFICATION	DESIGN SPEED	Minimum Curvature of Curbs at Street Intersections	
ALLEY	15	Intersection	Curb Turn Radius
(INFORMATION TO BE INCORPORATED AT A LATER DATE)	25		
MINOR RESIDENTIAL ACCESS	30	<u>Local with:</u>	
MAJOR RESIDENTIAL ACCESS	30	Local, Subcollector, or Collector	25'
RESIDENTIAL SUBCOLLECTOR	30	<u>Local with:</u>	
DIVIDED RESIDENTIAL	30	Arterial or Freeway	25'
MOUNTAIN RESIDENTIAL &		<u>Subcollector with:</u>	
DIVIDED MOUNTAIN RESIDENTIAL:		Subcollector, or Collector	20'
< 200 ADT	20	<u>Subcollector with:</u>	
> 200 ADT	25	Arterial or Freeway	25'
STUB STREET	25	<u>Collector with:</u>	
COLLECTOR ARTERIAL	35	Collector	25'
MINOR ARTERIAL	40	<u>Collector with:</u>	
MAJOR ARTERIAL	45	Arterial or Freeway	30'
SUPER ARTERIAL	50	<u>Arterial with:</u>	
		Arterial or Freeway	40'



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

### INTERSECTION DESIGN

3-41


Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

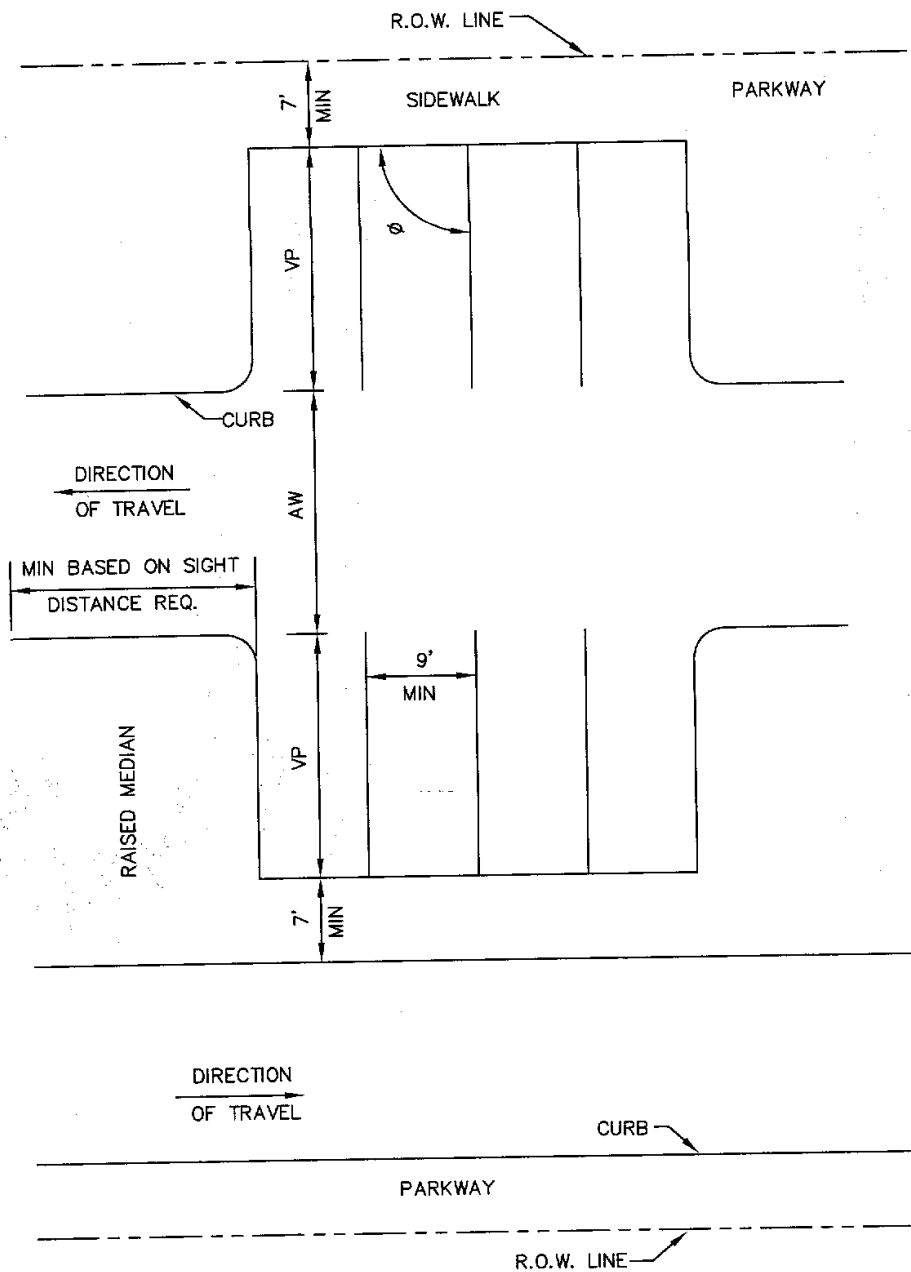
BACK TO TITLE INDEX PAGE

**INTERSECTION OFFSET**

NOTE:  
REFER TO SECTION 19.15.12 - STREET OFFSETS, TABLE 19.15-4 OF THE SUBDIVISION  
ORDINANCE FOR MINIMUM OFF-SET DISTANCES

	TITLE 19 - SUBDIVISION ORDINANCE	INTERSECTION OFFSET	
	ENGINEERING DEPARTMENT	3-41A	
	DESIGN STANDARDS FOR CONSTRUCTION	Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
		Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE



**NOTES:**

- 1) FOR TWO-WAY CIRCULATION ON A STREET, ROADWAY SHALL BE A MINIMUM OF 2 x AW WIDTH.
- 2) CLUSTER PARKING ON PARKWAY OR MEDIAN SHALL MEET MINIMUM SIGHT DISTANCE REQUIREMENTS OF INTERSECTIONS.
- 3) OTHER APPLICATIONS FOR CLUSTER PARKING SHALL BE PERMITTED UPON THE APPROVAL OF THE CITY ENGINEER BASED ON AASHTO GUIDELINES.

**CLUSTER PARKING**

ANGLE $\phi$	VEHICLE PROJECTION VP	AISLE WIDTH AW
45°	18'-0"	13'-0"
60°	19'-6"	16'-0"
75°	19'-9"	20'-0"
90°	20'-0"	20'-0"



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
FOR CONSTRUCTION**

**CLUSTER PARKING**

3-42

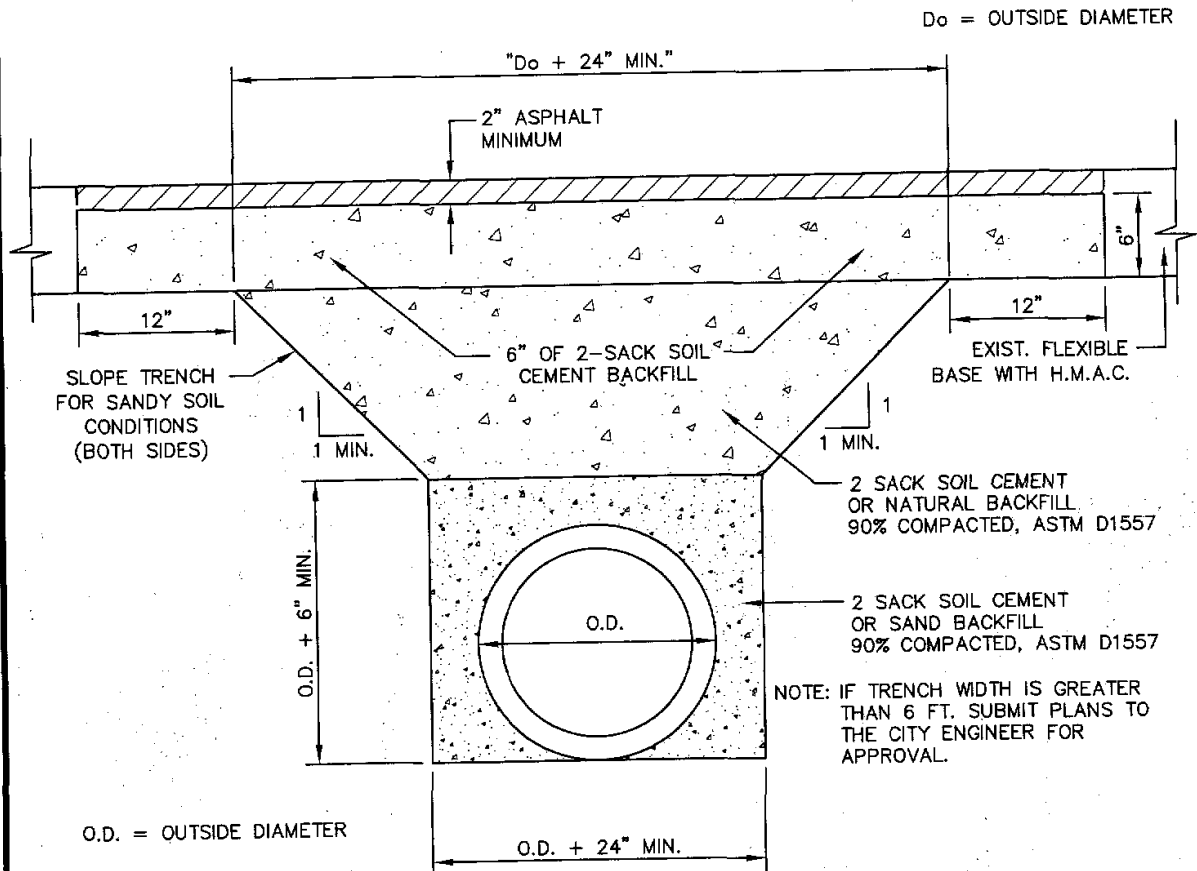
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/I.R.



BACK TO TITLE INDEX PAGE

## TRENCH BACKFILL & PAVEMENT REPLACEMENT



## TYPICAL SECTION FLEXIBLE BASE WITH H.M.A.C. SURFACE

- A. ALL ASPHALT CUTS MUST BE SAW CUT.
- B. TWO SACK SOIL CEMENT MIX MUST BE 2 SACKS OF CEMENT PER ONE CUBIC YARD OF SOIL.
- C. PLACE BACKFILL MATERIAL IN 8" MAX. LIFTS AND COMPACT AS SPECIFIED.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET PAVING CUT

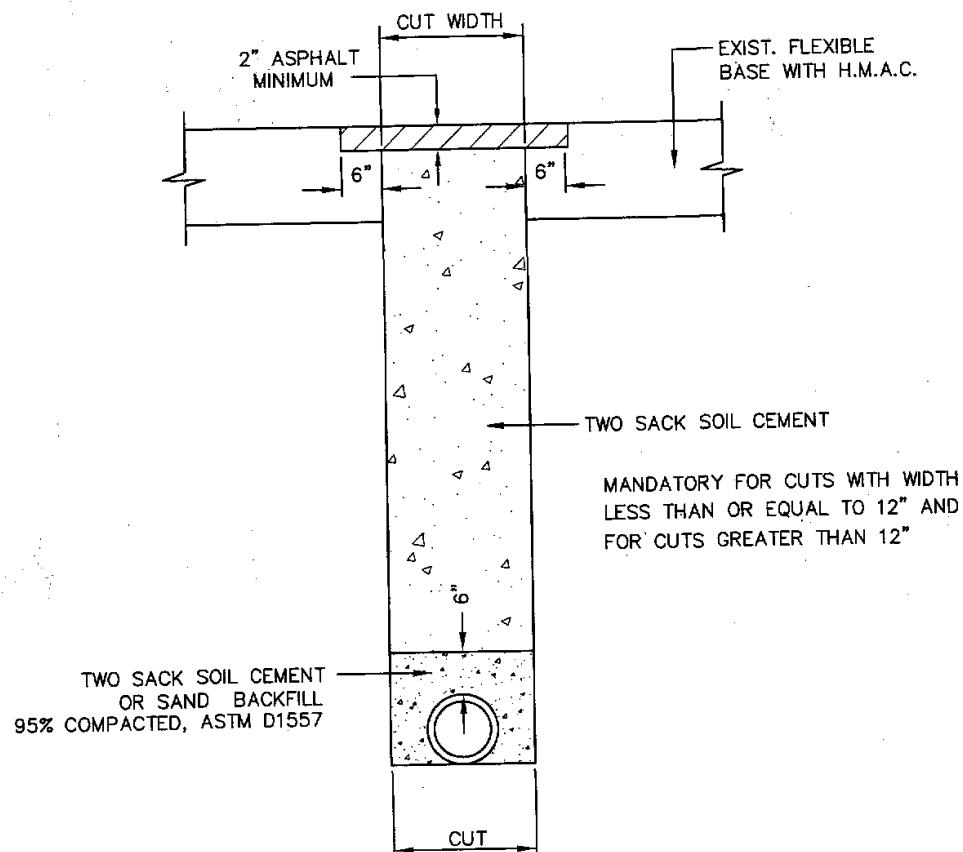
3-43

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/I.R.

BACK TO TITLE INDEX PAGE

## CONDUIT TRENCHING



### TYPICAL SECTION FLEXIBLE BASE WITH H.M.A.C. SURFACE

1. ALL ASPHALT CUTS MUST BE SAW CUT.
2. TWO SACK SOIL CEMENT MIX MUST BE  
2 SACK OF CEMENT PER ONE CUBIC YARD OF SOIL.

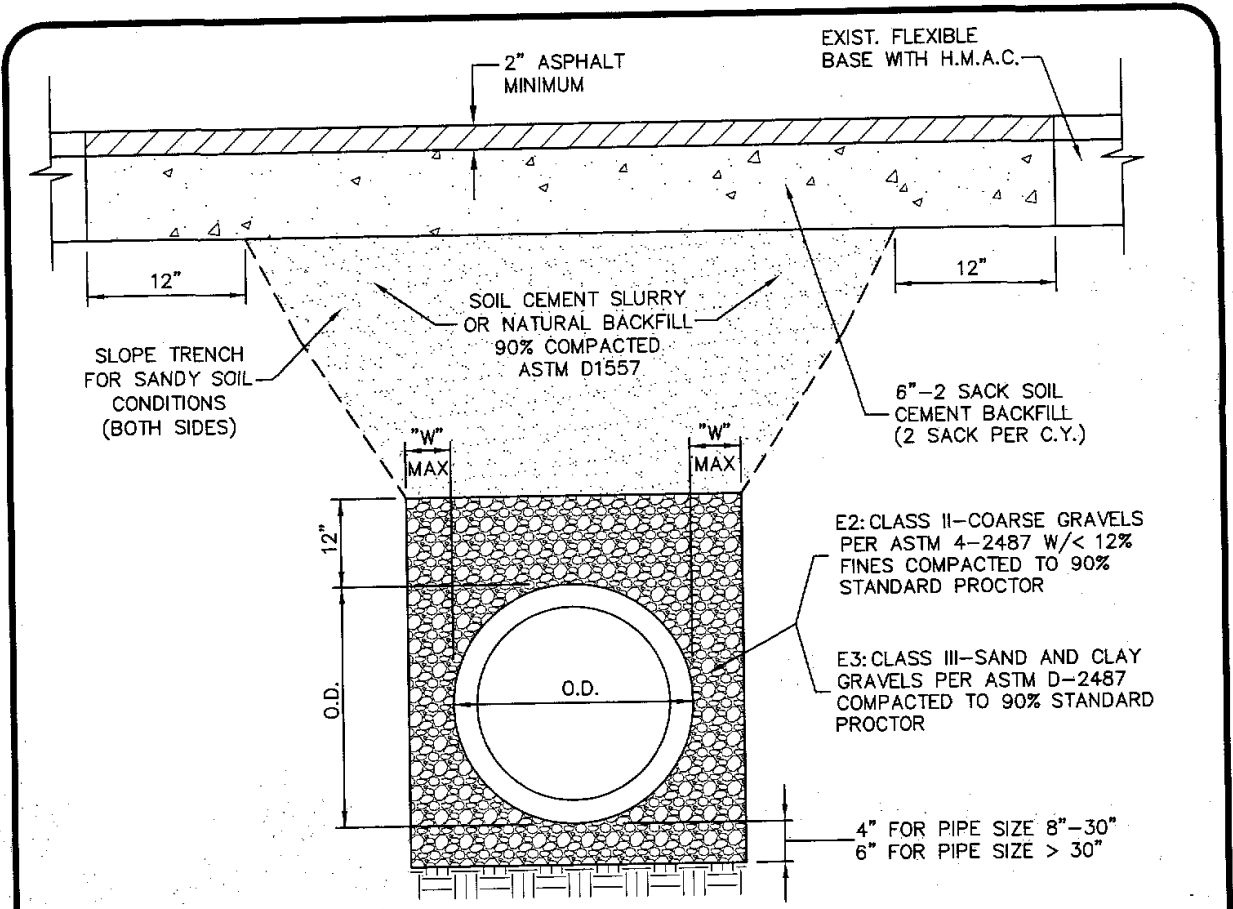


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STREET PAVING CUT  
(CONDUIT)  
3-44

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

[BACK TO TITLE INDEX PAGE](#)



## GENERAL NOTES

1. NATURAL MATERIAL MAY BE USED PROVIDED IT MEETS THE SPECIFICATIONS FOR CLASS II OR III MATERIALS.
2. EMBEDMENT CONDITIONS SHOWN FOR DRY TRENCH.

## CONSTRUCTION KEY NOTES

- A. PLACE EMBEDMENT MATERIAL IN 8" MAX. LIFTS AND COMPACT AS SPECIFIED.  
B. TRENCH DIMENSION "W" AS FOLLOWS

<u>PIPE DIAMETER</u>	<u>"W"</u>
LESS THAN 24'	9"
24' THRU 48"	12"
GREATER THAN 48"	O.D./4

## STREET PAVING CUT FOR FLEXIBLE PIPE



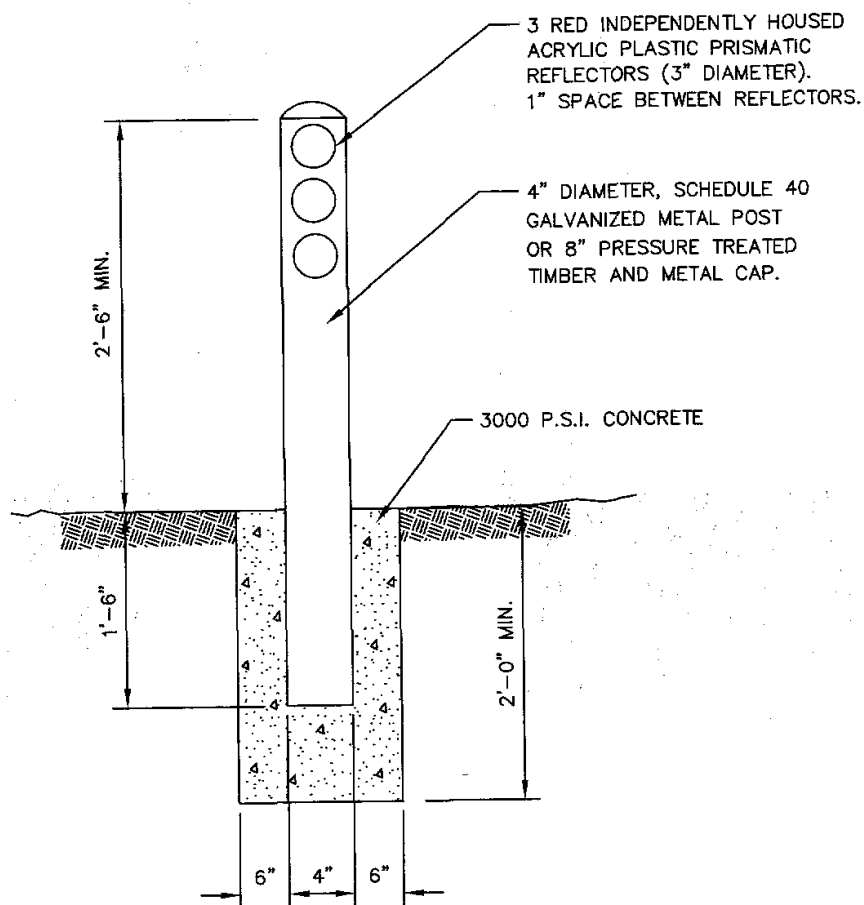
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

## STREET PAVING CUT FOR FLEXIBLE PIPE

3-45

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



METAL GUARD POST DETAIL



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

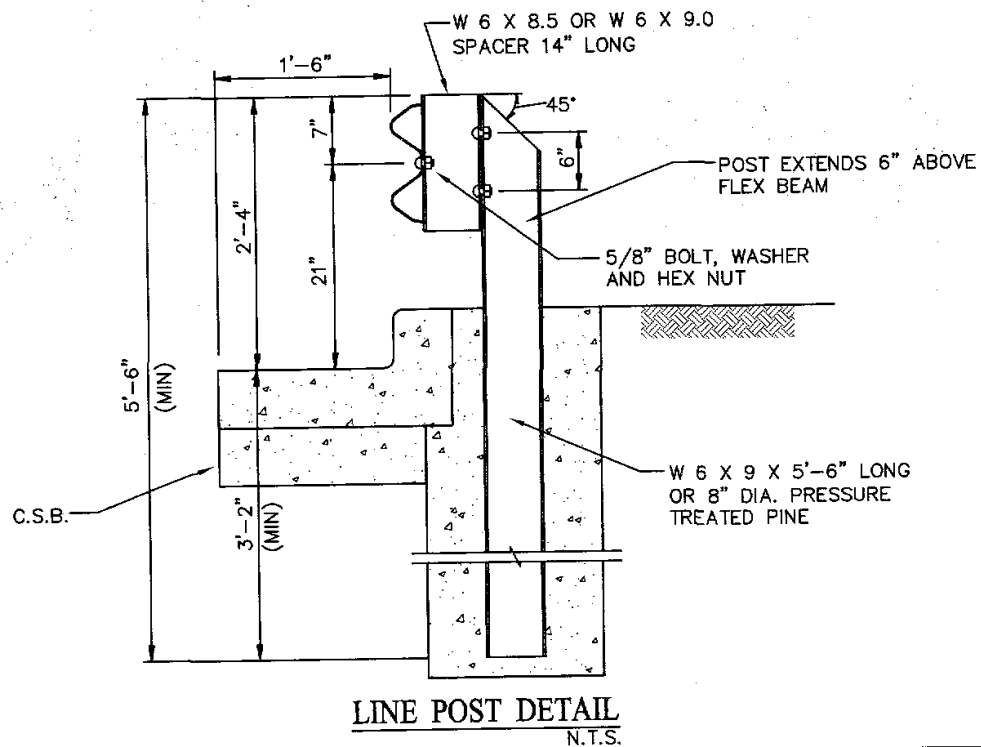
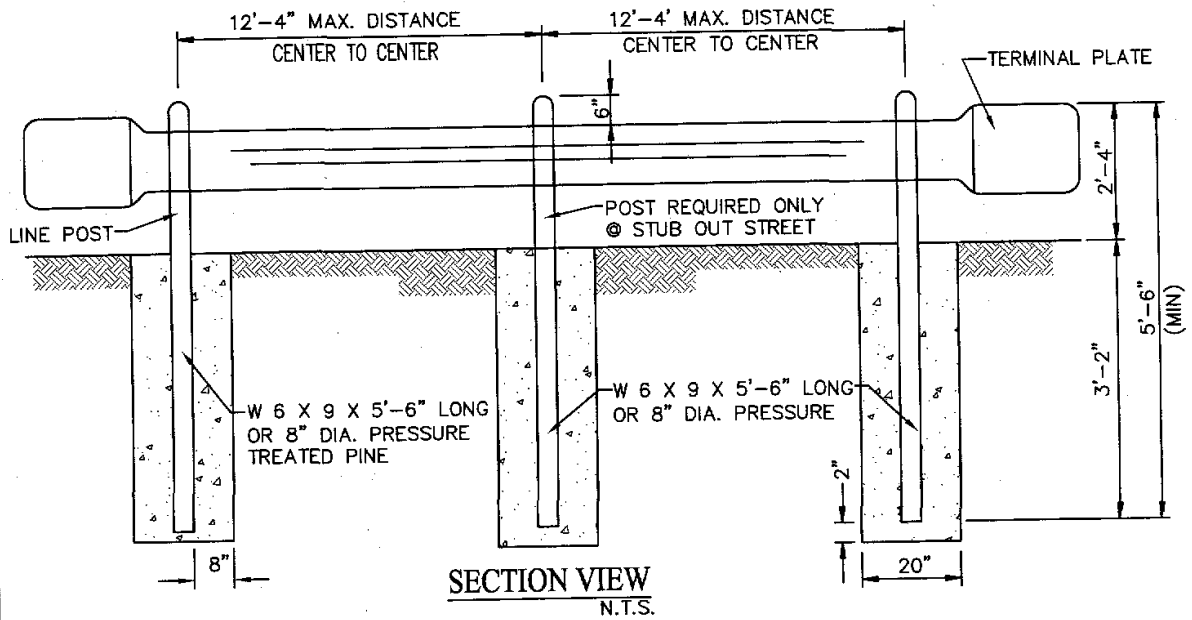
GUARD POST DETAIL

3-46

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

GUARD RAIL

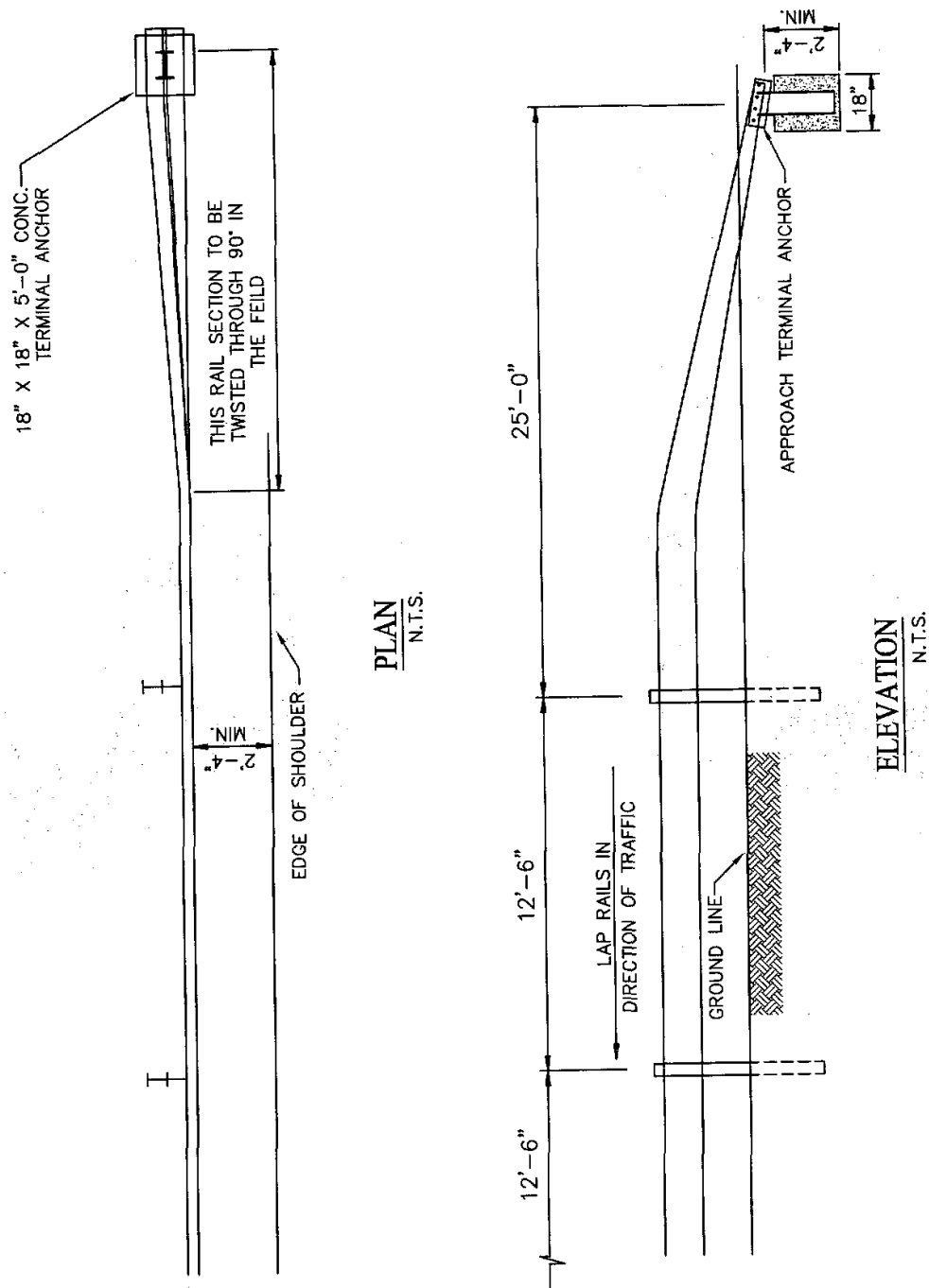
3-47

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



BACK TO TITLE INDEX PAGE



NOTE:

1. ALL STEEL FITTINGS SHALL BE GALVANIZED.
2. SEE NO. 3-44 FOR LINE POST DETAIL.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TERMINUS METAL BEAM  
GUARD FENCE

3-48

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

### PROPOSED CITY MONUMENT LOCATIONS

- A. MONUMENTS SHALL BE INSTALLED SO THAT ALL FRONT PROPERTY CORNERS OF ALL LOTS IN THE SUBDIVISION ARE WITHIN LINE OF SIGHT OF A MONUMENT, OR WITHIN SIGHT OF THE LINE BETWEEN TWO ADJACENT MONUMENTS
- B. EACH MONUMENT SHALL BE WITHIN LINE OF SIGHT OF ANOTHER MONUMENT
- C. MONUMENTS SHALL BE NO FARTHER THAN 2000 FEET APART
- D. AT LEAST ONE (1) MONUMENT SHALL BE PLACED ON EACH HORIZONTAL CURVE (PI) OF THE TANGENTS LEADING INTO THE CURVE FALLS OUTSIDE THE CURB LINE
- E. NO FEWER THAN TWO MONUMENTS SHALL BE PLACED IN ONE (1) STREET SUBDIVISIONS.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PROPOSED CITY  
MONUMENTS  
LOCATIONS  
3-49

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

**PLANE SURVEYS AND GEODETIC CONTROL  
SUBMISSION REQUIREMENTS ON  
ALL ENGINEERING AND GIS MAP DRAWINGS**

**SCOPE:**

THESE SUBMISSION REQUIREMENTS APPLY TO ALL WORK DONE IN THE CITY AND COUNTY OF EL PASO. IT IS PUT FORTH TO FACILITATE PERSONNEL TO ACCESS AND UPDATE MAP INFORMATION MORE EFFICIENTLY.

ALL FIELD WORK WHICH REQUIRES A SURVEY SHALL BE REQUIRED TO ABIDE TO THE FOLLOWING:

- BENCHMARK(S) ARE TO BE TIED TO THE PUBLISHED CITY OF EL PASO'S GEODETIC CONTROL POINTS, AND REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE (TXC SPCS), FIPS 4203. HORIZONTAL DATA WILL BE REFERENCED TO NAD83, AND ELEVATIONS TO NAVD88.
- DETAILED CAD DRAWINGS ILLUSTRATING THE SPATIAL LAYOUT OF THE OVERHEAD (PORTION OF A PARCEL MAP AND/OR UTILITY INFRASTRUCTURE) SHALL HAVE ALL BENCHMARKS REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE (TXC SPCS), FIPS 4203. HORIZONTAL DATA WILL BE REFERENCED TO NAD83, AND ELEVATIONS TO NAVD88. THIS WILL ALLOW THE ELECTRONIC DRAWING(S) TO CONFORM AND OVERLAY TO ALL EXISTING ENGINEERING COMPUTER AIDED DESIGNS, GIS LAYERS AND IMAGERY.

**DELIVERY**

1. A DIGITAL COPY(S) OF THE COMPUTER AIDED DESIGN DRAWING REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, FIPS 4203, NAD83, AND ELEVATIONS TO NAVD88; ELEVATIONS WILL BE NOTED (ANNOTATED) NEXT TO THE BENCHMARK(S) IN BOTH NAVD88 AND GROUND/SURFACE COORDINATES.
2. A HARD COPY.
3. A REPORT ON THE ELEVATIONS OF SURVEYED BENCHMARKS IN GROUND COORDINATES AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988

AN ADDITIONAL REPORT IS REQUIRED WHEN A NEW BENCHMARK IS TIED INTO THE SURVEY. THE REPORT WILL INCLUDE THE SURVEYED COORDINATES AND THE TIED COORDINATES AS THEY READ FROM THE CITY OF EL PASO'S GEODETIC CONTROL SYSTEM.



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
  
**DESIGN STANDARDS  
FOR CONSTRUCTION**

PLANE SURVEYS AND  
GEODETIC CONTROL

3-50

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

**SURVEYS AND MONUMENTS**

**TEXAS COORDINATE SYSTEM MONUMENTATION:** SUBDIVISION PLATS INTRODUCED TO THE CITY OF EL PASO SHALL BE TIED TO TEXAS STATE PLANE COORDINATE SYSTEM CONTROL ZONE, IN CONFORMANCE WITH THE REQUIREMENTS OF DIVISION X, CHAPTER X, SECTION XXX ET SEQ. OF THE PUBLIC RESOURCES CODE OF THE STATE OF TEXAS, UNLESS WAIVED IN WRITING BY THE CITY ENGINEER. COORDINATES AND BEARINGS MAY BE BASED UPON TEXAS CENTRAL STATE PLANE COORDINATE SYSTEM AND SHALL BE BASED UPON THE HORIZONTAL DATUM OF 1983 AND VERTICAL DATUM OF 1988. ALL TIES SHALL BE IDENTIFIED WITH GRID BEARINGS AND GROUND LEVEL DISTANCES, AND THE FOLLOWING NOTE SHALL APPEAR ON ALL SHEETS OF THE MAP UPON WHICH ANY PARCEL IS SHOWN:

**TEXAS STATE PLANE COORDINATE SYSTEM:** COORDINATES AND BEARINGS SHOWN HEREON ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, FIPS 4203, US SURVEY FEET (NAD 83, NAVD 88) AND TIED TO THE CITY OF EL PASO'S GEODETIC CONTROL POINT SURVEY. DISTANCES SHOWN ARE GROUND LEVEL DISTANCE. TO OBTAIN GRID DISTANCE, MULTIPLY GROUND LEVEL DISTANCE BY (COMBINATION FACTOR). THE NORTH ARROW SHALL INDICATE GRAPHICALLY THE DIVERGENCE BETWEEN GEODETIC NORTH AND GRID NORTH, AND THE THETA ( $\theta$ ) ANGLE SHALL BE SHOWN NOTING AT WHICH MONUMENT SAID ANGLE WAS COMPUTED. THE ONLY COORDINATES APPEARING ON THE FINAL MAP SHALL BE FOR THE PRIMARY GEODETIC CONTROL STATIONS.

**BOUNDARY MONUMENTS:** MONUMENTS SHALL BE SET OR REFERENCED ON THE EXTERIOR BOUNDARY OF THE SUBDIVISION AT ALL CORNERS, ANGLE POINTS, BEGINNING AND ENDS OF CURVES AND AT INTERMEDIATE POINTS NOT TO EXCEED 1,000 FEET APART. THE LOCATION OF INACCESSIBLE POINTS SHALL BE ESTABLISHED BY TIES TO THE CITY OF EL PASO'S GEODETIC CONTROL POINT SURVEY AND SHALL BE NOTED ON THE FINAL MAP OR PARCEL MAP. IF ANY OR ALL OF THE BOUNDARY MONUMENTS ARE TO BE SET AFTER FILING OF THE FINAL MAP OR PARCEL MAP WITH THE COUNTY RECORDER, THE SURVEYOR MAKING THE SURVEY SHALL FURNISH EVIDENCE ACCEPTABLE TO THE CITY ENGINEER TO SUBSTANTIATE HIS REASONS FOR DEFERRING THE SETTING OF SUCH MONUMENTS UNTIL AFTER FILING OF SUCH MAP WITH THE COUNTY RECORDER.

**INTERIOR MONUMENTS:** MONUMENTS SHALL BE SET AT ALL BLOCK, LOT OR PARCEL CORNERS AND ANGLE POINTS AND AT THE BEGINNINGS AND ENDS OF CURVES AND WITHIN STREET RIGHTS-OF-WAY. IF THE INTERIOR MONUMENTS ARE NOT SET WITHIN THE PERIOD OF TIME SPECIFIED ON THE SURVEYOR'S CERTIFICATE, THE CITY ENGINEER SHALL BY WRITTEN NOTICE FORTHWITH DIRECT THE SURVEYOR OF RECORD TO SET SUCH MONUMENTS WITHIN SIXTY (60) DAYS OF NOTICE, AND FURNISH SUCH FIELD NOTES AS WERE AGREED TO BE SET AND FURNISHED ON SAID CERTIFICATE. IF THE SURVEYOR FAILS TO COMPLY WITH SAID DIRECTIVE AFTER 60 DAYS, THE CITY ENGINEER SHALL WITHOUT FURTHER NOTICE SUBMIT A WRITTEN COMPLAINT AND REQUEST FOR DISCIPLINARY ACTION AGAINST SAID SURVEYOR TO THE TEXAS BOARD OF PROFESSIONAL LAND SURVEYING.

**MONUMENT TYPE:** ALL BOUNDARY MONUMENTS AND MONUMENTS SET WITHIN EXISTING AND PROPOSED CITY RIGHTS-OF-WAY SHALL BE STANDARD CITY MONUMENTS AND SHALL BE SET TO THE DEPTH AND IN THE MANNER PRESCRIBED IN THE SUBDIVISION STANDARDS.

**MONUMENT IDENTIFICATION MARKS:** ALL MONUMENTS SET AS REQUIRED HEREIN SHALL BE PERMANENTLY AND VISIBLY MARKED OR TAGGED WITH THE REGISTRATION OR LICENSE NUMBER OF THE SURVEYOR WHO SIGNS THE SURVEYOR'S CERTIFICATE AND UNDER WHOSE SUPERVISION THE SURVEY WAS MADE.

**REPLACEMENT OF DESTROYED MONUMENTS:** ANY MONUMENT SET AS REQUIRED HEREIN WHICH IS DISTURBED OR DESTROYED BEFORE ACCEPTANCE OF ALL IMPROVEMENTS BY THE CITY SHALL BE REPLACED BY THE SUBDIVIDER'S SURVEYOR AND NEW MONUMENT CERTIFICATION SHALL BE SUBMITTED.

**SURVEY DATA AND INFORMATION TO BE SHOWN ON FINAL MAP OR PARCEL MAP:** THE FOLLOWING SURVEY DATA AND INFORMATION SHALL BE SHOWN ON EACH FINAL MAP OR PARCEL MAP BASED UPON A FIELD SURVEY: 1) STAKES, MONUMENTS OR OTHER EVIDENCE FOUND ON THE GROUND TOGETHER WITH THEIR PRECISE POSITIONS TO DETERMINE THE BOUNDARIES OF THE SUBDIVISION; AND 2) CORNERS OF ALL ADJOINING PROPERTIES IDENTIFIED BY LOT AND BLOCK NUMBERS, SUBDIVISION NAMES, NUMBERS AND PAGE OF RECORD OR BY SECTION, TOWNSHIP AND RANGE OR OTHER PROPER DESIGNATION.



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
FOR CONSTRUCTION**

**SURVEYS AND  
MONUMENTS**

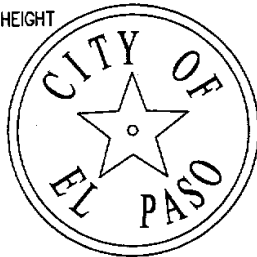
3-51

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

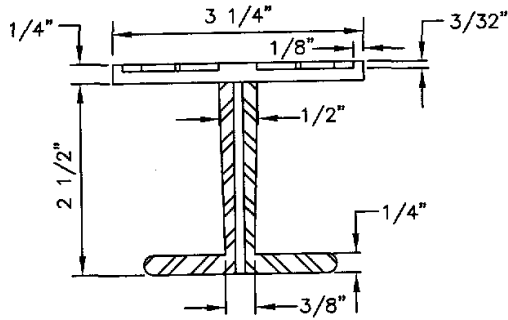
Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

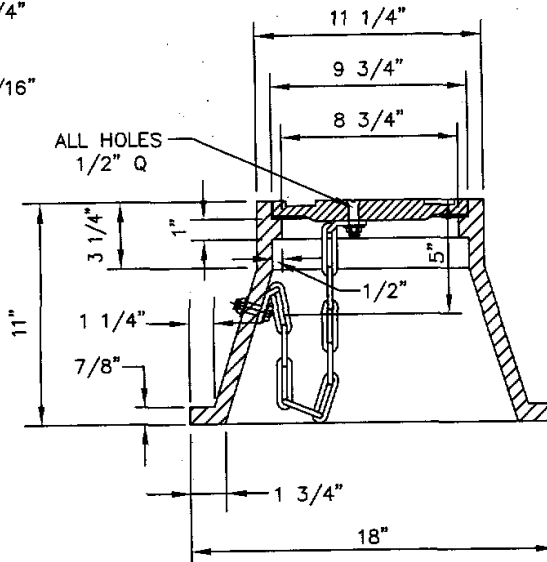
EMBOSS STAR, RING AND  
LETTERS TO HEIGHT  
OF  $\frac{3}{32}$ "



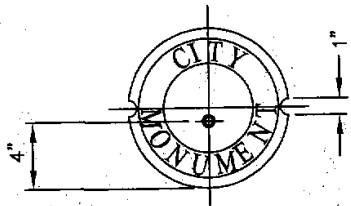
OUTSIDE RADIUS  
OF STAR =  $\frac{3}{4}$ "  
INSIDE RADIUS  
OF STAR =  $\frac{3}{16}$ "



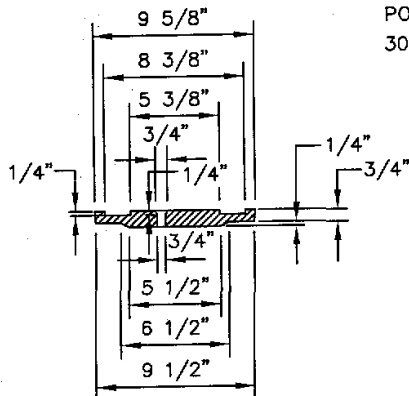
BRONZE MONUMENT CAP



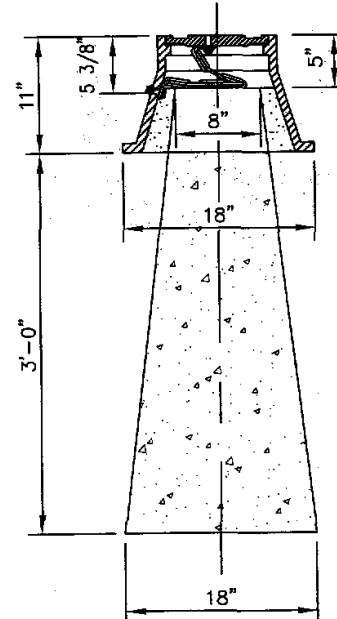
MONUMENT BOX



NO FORMS REQUIRED  
CONCRETE TO BE  
POURED IN PLACE.  
3000 P.S.I. CONCRETE.



BOX COVER



SECTION VIEW



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CITY SURVEY  
MONUMENT

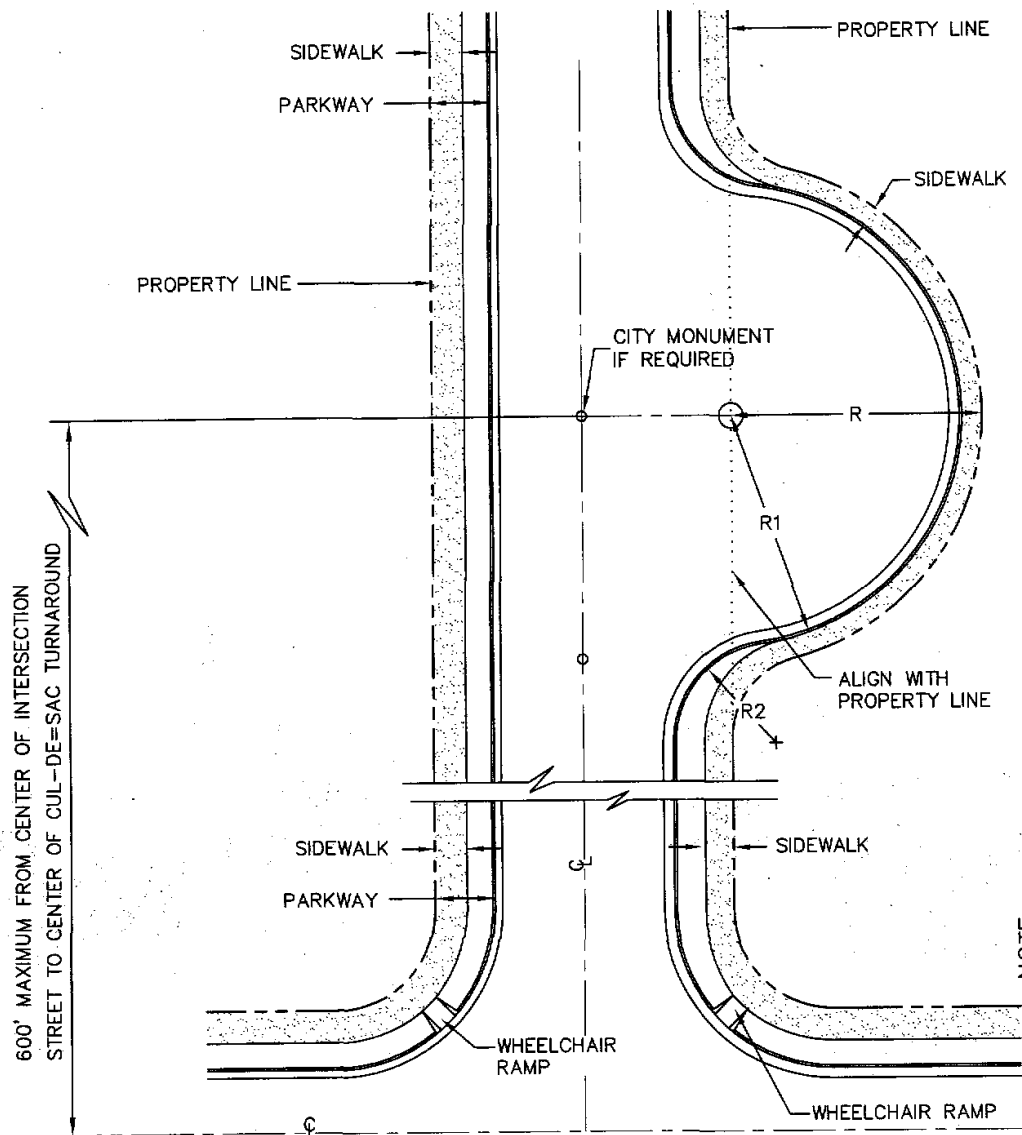
3-52

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.



BACK TO TITLE INDEX PAGE



NOTE:  
WHERE SIDEWALKS ARE NOT REQUIRED OR ARE PERMITTED TO BE LOCATED ADJACENT TO AND PARALLEL WITH THE CURB LINE, THE TOTAL STREET RIGHT-OF-WAY SHALL BE REDUCED BY DEDUCTING 3'-6" FROM THE PARKWAY ON EACH AFFECTED SIDE OF THE STREET.

	R	R1	R2
32' LOCAL	58'	54'	20'
RESIDENTIAL COLLECTOR = (36' RDWY.)	50'	46'	20'
MINOR\DIVIDED\MOUNTAIN RESIDENTIAL = (20' RDWY.)	66'	62'	20'
* DIVIDED MOUNTAIN RESIDENTIAL = (10' RDWY.)	-	-	-

\* SINGLE EYEBROW CUL-DE-SAC SHALL NOT BE PERMITTED



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

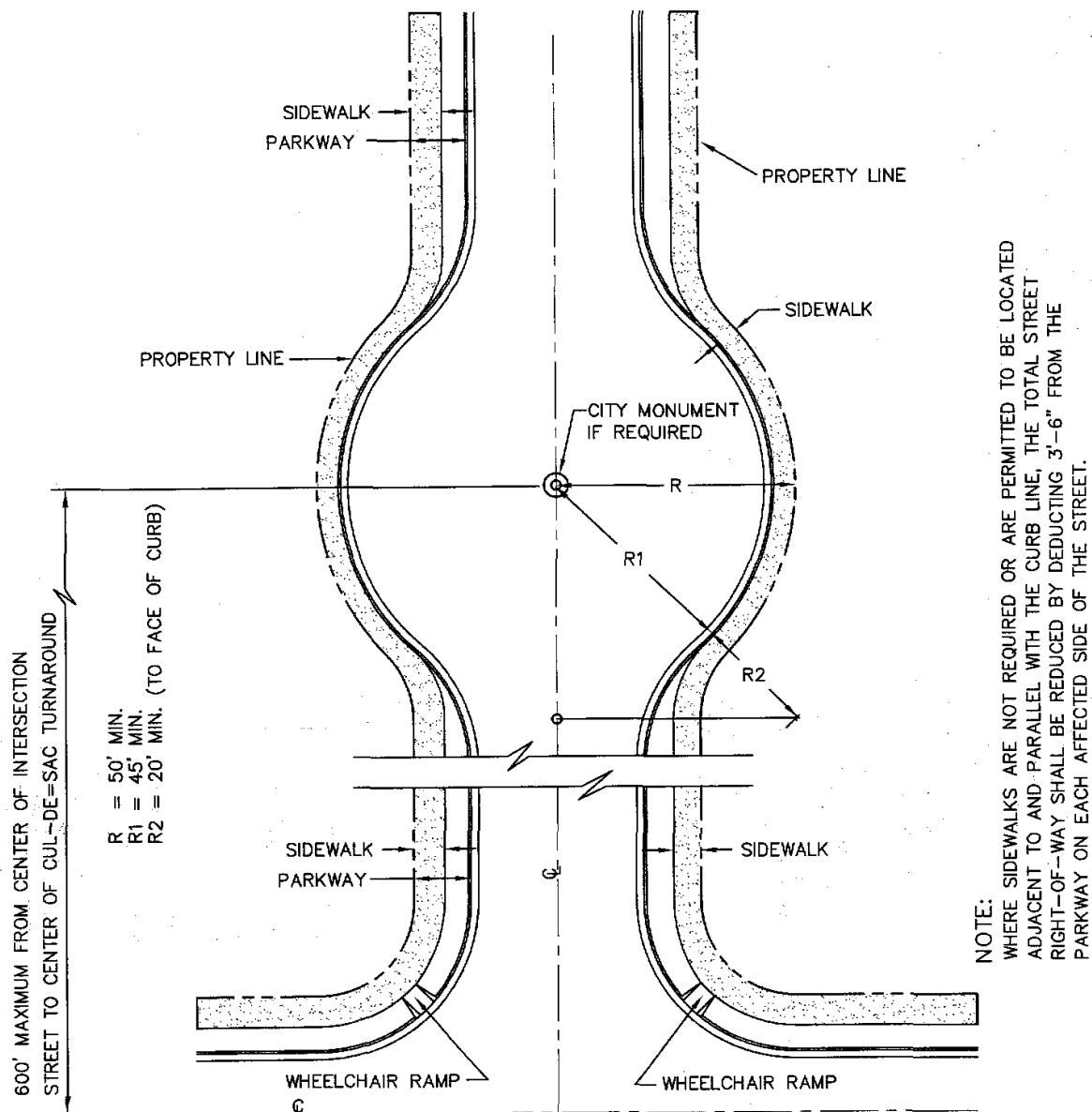
SINGLE EYEBROW  
CUL-DE-SAC

3-53

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.

BACK TO TITLE INDEX PAGE



DIVIDED MOUNTAIN RESIDENTIAL DUAL EYEBROW CUL-DE-SAC'S MAY BE PERMITTED SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

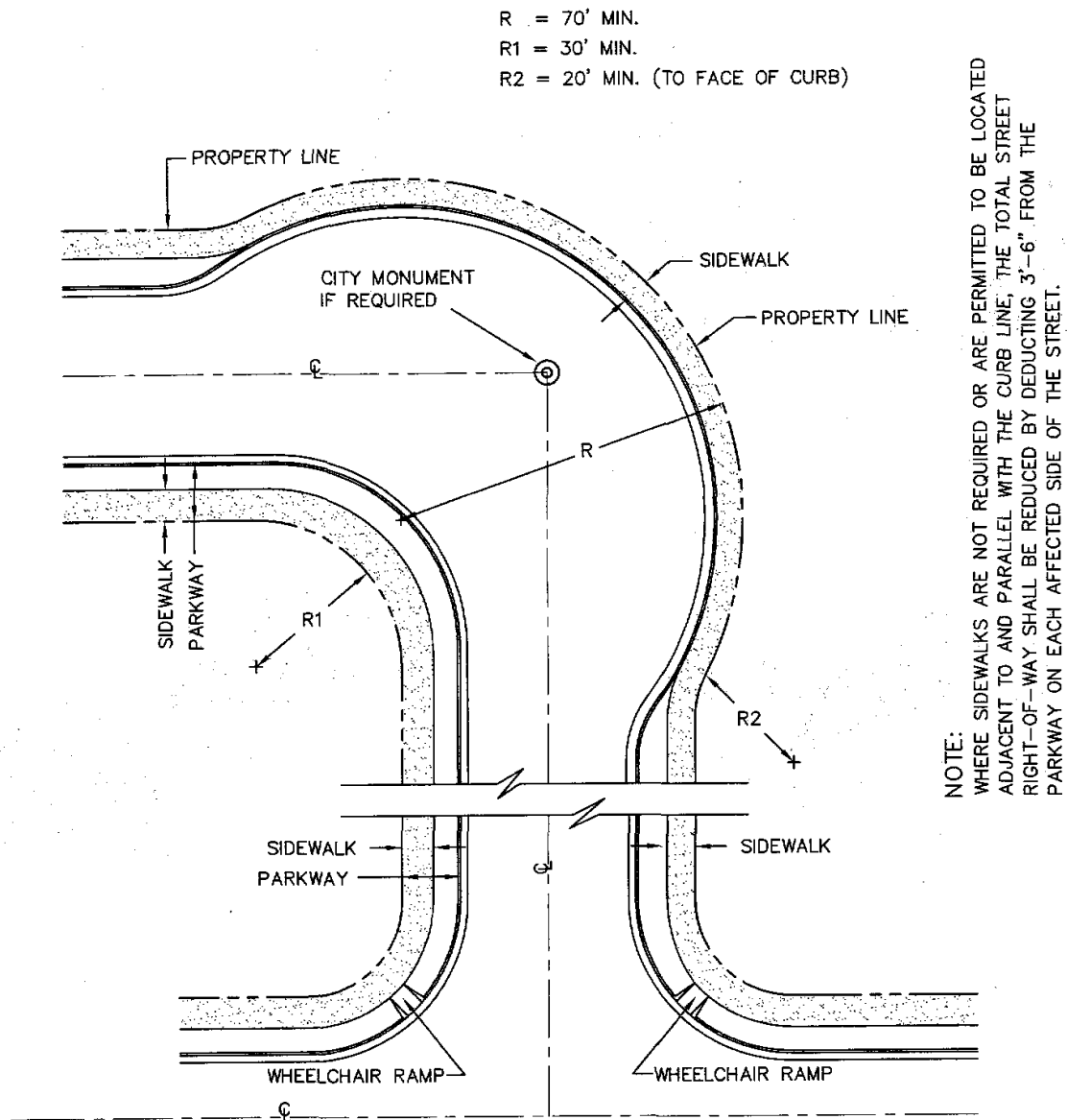
**DUAL EYEBROW**  
**CUL-DE-SAC**

3-54

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



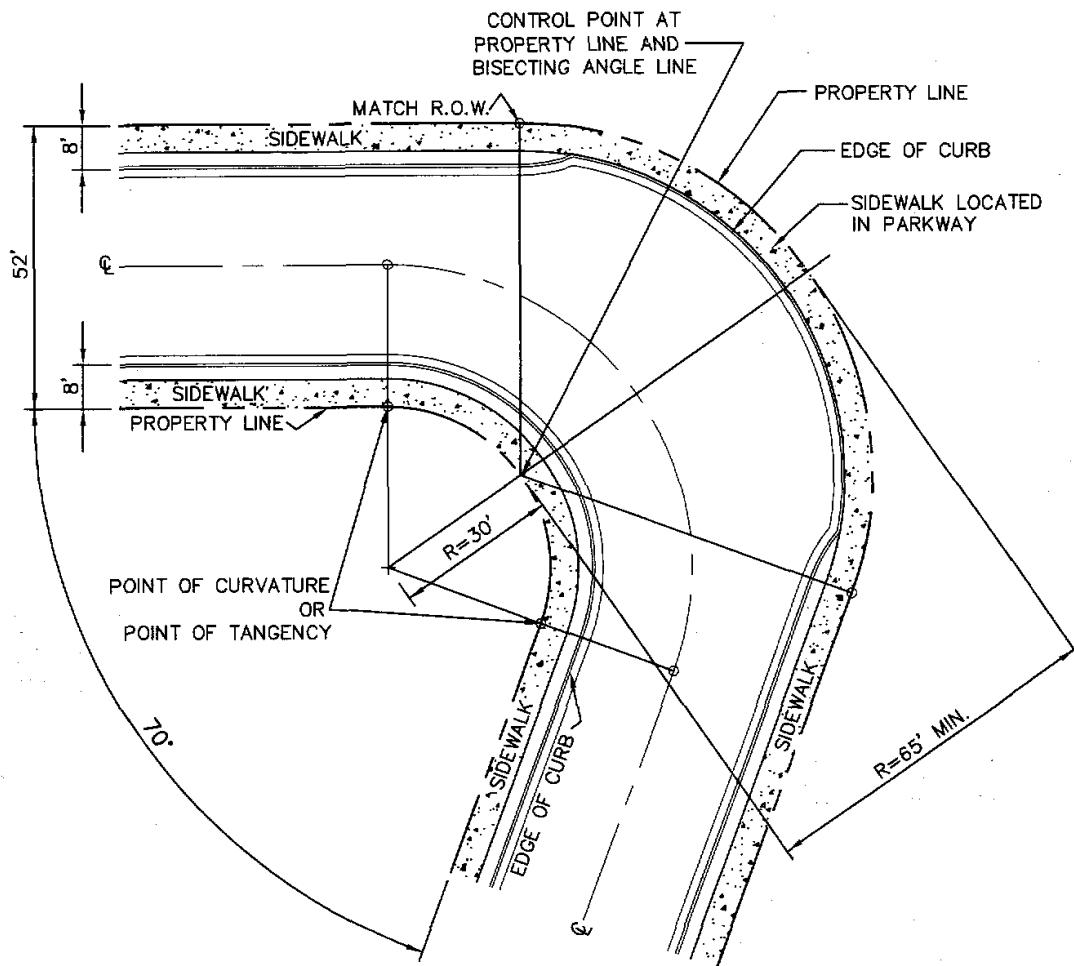
TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

TURNING HEEL CURVE

3-55

Approved By R. A. SHUBERT	Checked By H. M. E.
Date JUNE 03, 2008	Drawn By OEC/J.R.

BACK TO TITLE INDEX PAGE



PROPOSED 70 DEGREE ANGLE (MIN.) TURNING HEEL.

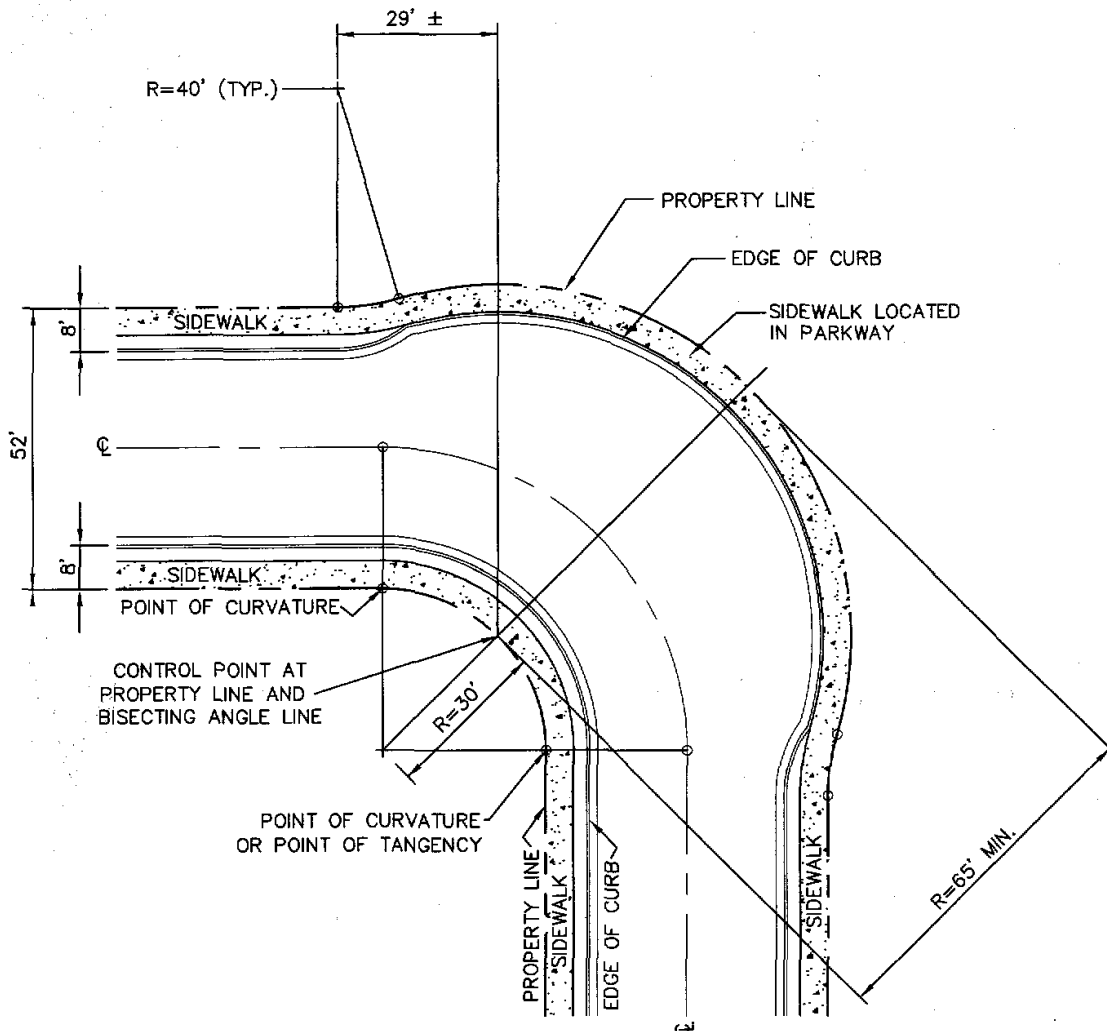


TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

PROPOSED 70 DEGREE  
 ANGLE (MIN.) TURNING HEEL  
 3-56

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE



PROPOSED 90 DEGREE ANGLE TURNING HEEL.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PROPOSED 90 DEGREE  
ANGLE TURNING HEEL

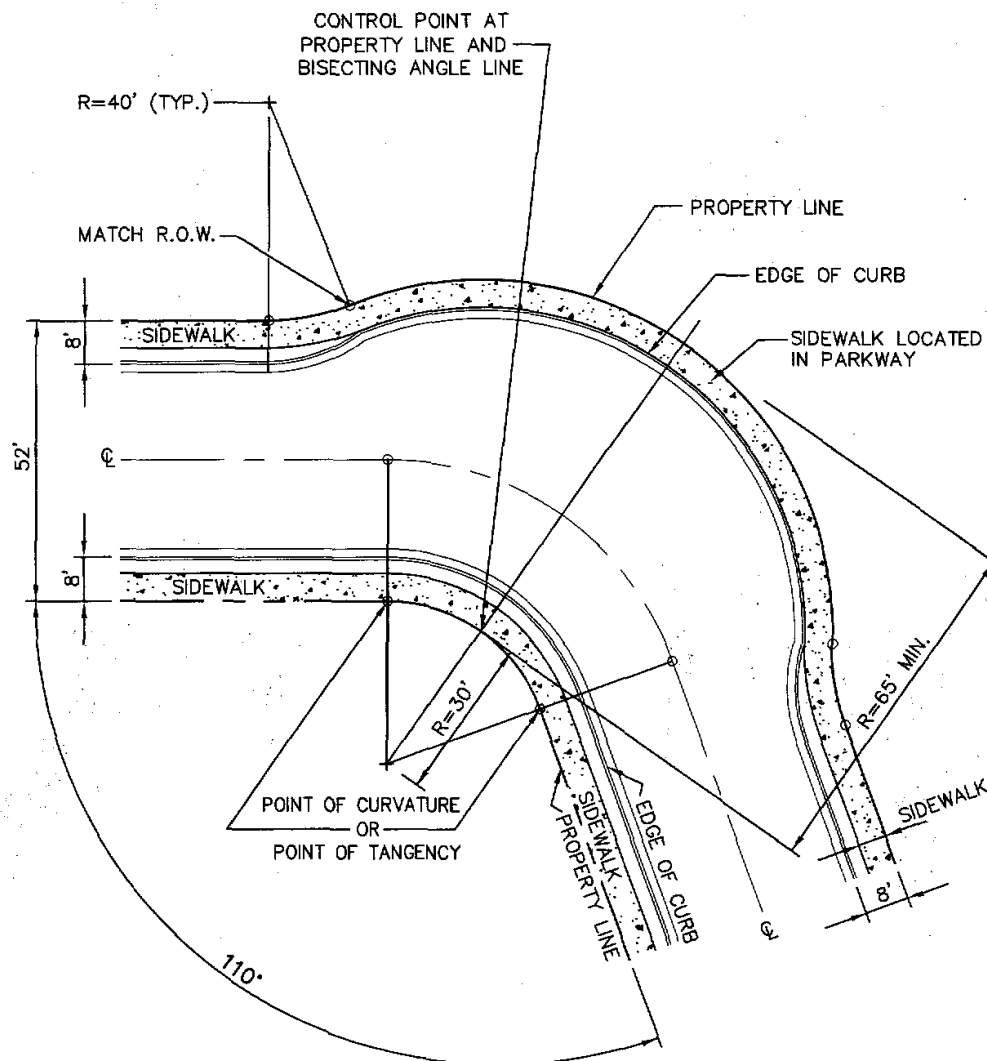
3-57

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.



BACK TO TITLE INDEX PAGE



PROPOSED 110 DEGREE ANGLE (MAX.) TURNING HEEL.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PROPOSED 110 DEGREE  
ANGLE (MAX.) TURNING  
HEEL

3-58

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

## SECTION 4

## SECTION 4

## FENCING

<u>TITLE</u>	<u>PAGE</u>
CHANLINK STANDARD DETAILS.....	4-1
CHANLINK FENCE POST.....	4-2
ROCKWALL DESIGN.....	4-3
WROUGHT IRON FENCE AND GATE DETAIL.....	4-4

[BACK TO SECTION INDEX PAGE](#)



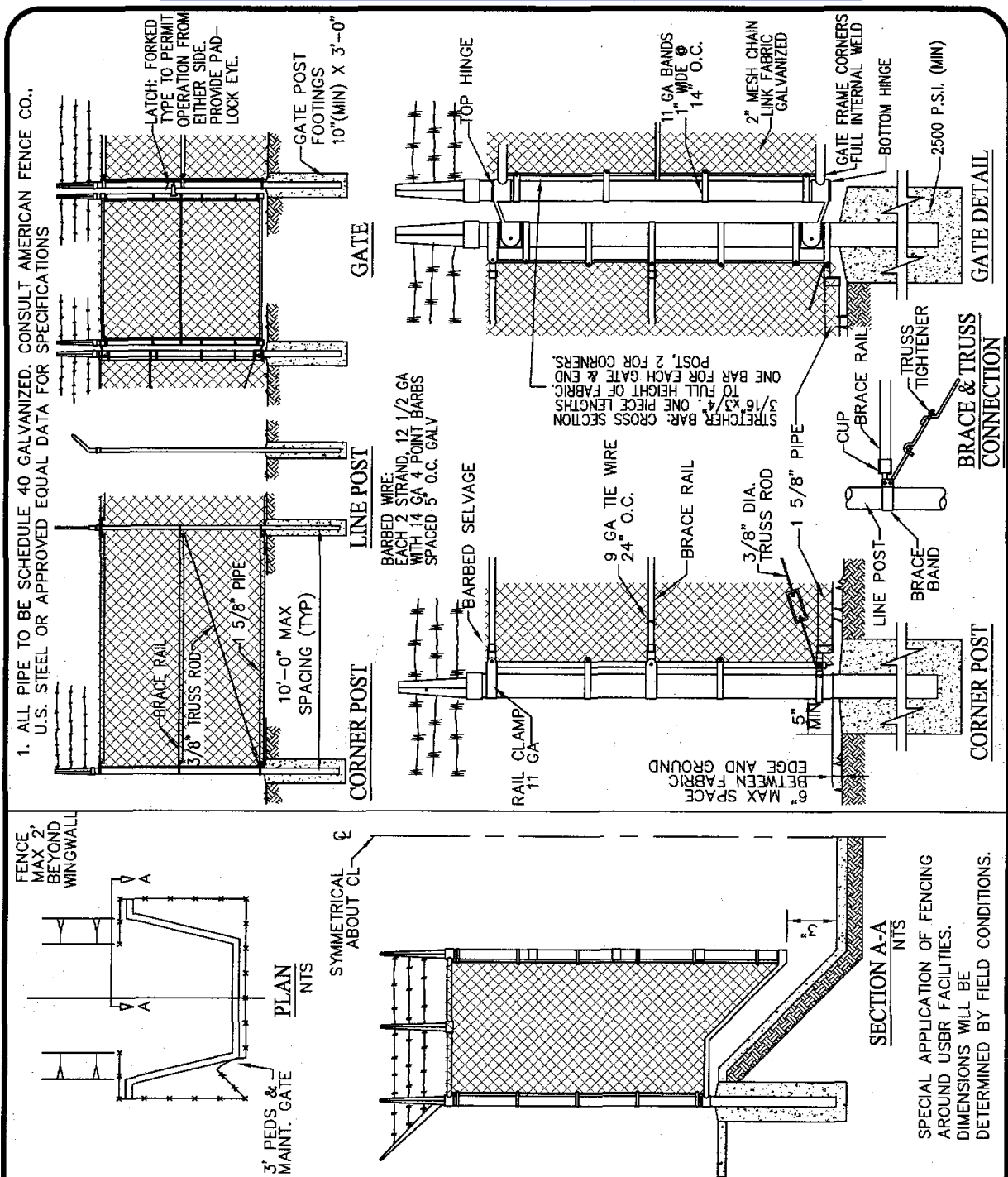
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 4  
TABLE OF  
CONTENTS

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



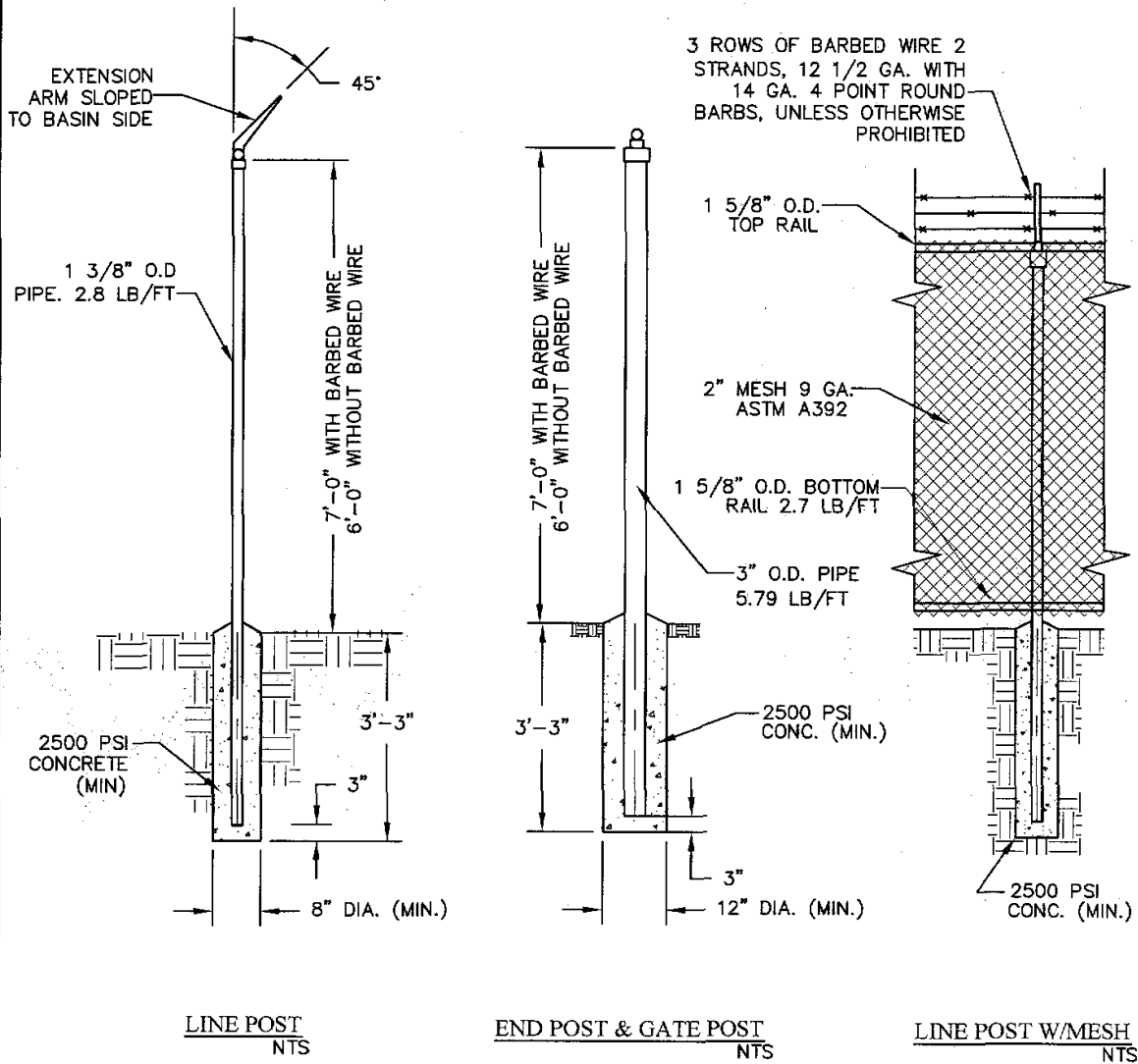
TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

CHAINLINK  
 STANDARD DETAILS  
 4-1

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



NOTE : ALL PIPE TO BE SCHEDULE 40



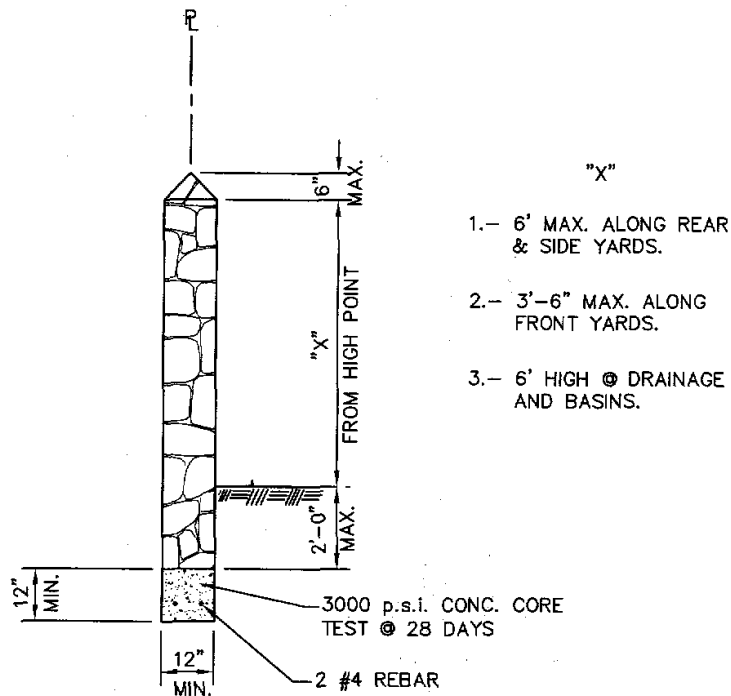
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CHAINLINK FENCE  
POSTS  
4-2

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QEC / J. R.



BACK TO TITLE INDEX PAGE



## ROCKWALL ADJACENT TO RESIDENTIAL LOTS

### NOTES:

1. STONE FOR ROCKWALL SHALL BE AS NEARLY UNIFORM IN SECTIONS AS IS PRACTICABLE. THE STONE SHALL BE DENSE AND RESISTANT TO AIR AND WATER.
2. MORTAR SHALL BE TYPE "S" 1800 P.S.I. AS PER ASTM C270
3. MASONRY WALLS OVER SIX (6) FEET IN HEIGHT AND THOSE USED FOR EARTH RETENTION OVER TWO (2) FEET SHALL BE DESIGNED AS STRUCTURAL WALLS.
4. WALLS ADJACENT TO PONDING AREAS OR DRAINAGE DITCHES MAY BE CONSTRUCTED OF BRICK OR CINDER BLOCK AND SHALL NOT BE LESS THAN SIX (6) FEET HIGH.
5. ROCKWALL MORTAR JOINTS SHALL NOT EXCEED TWO (2) INCHES.
6. PROVIDE ONE (1) INCH EXPANSION JOINTS AT EVERY 100 FEET.
7. ALL STONE SHALL BE THOROUGHLY SOAKED BEFORE BEING PLACED.
8. NO RIVER ROCK SHALL BE ALLOWED FOR ROCKWALLS.



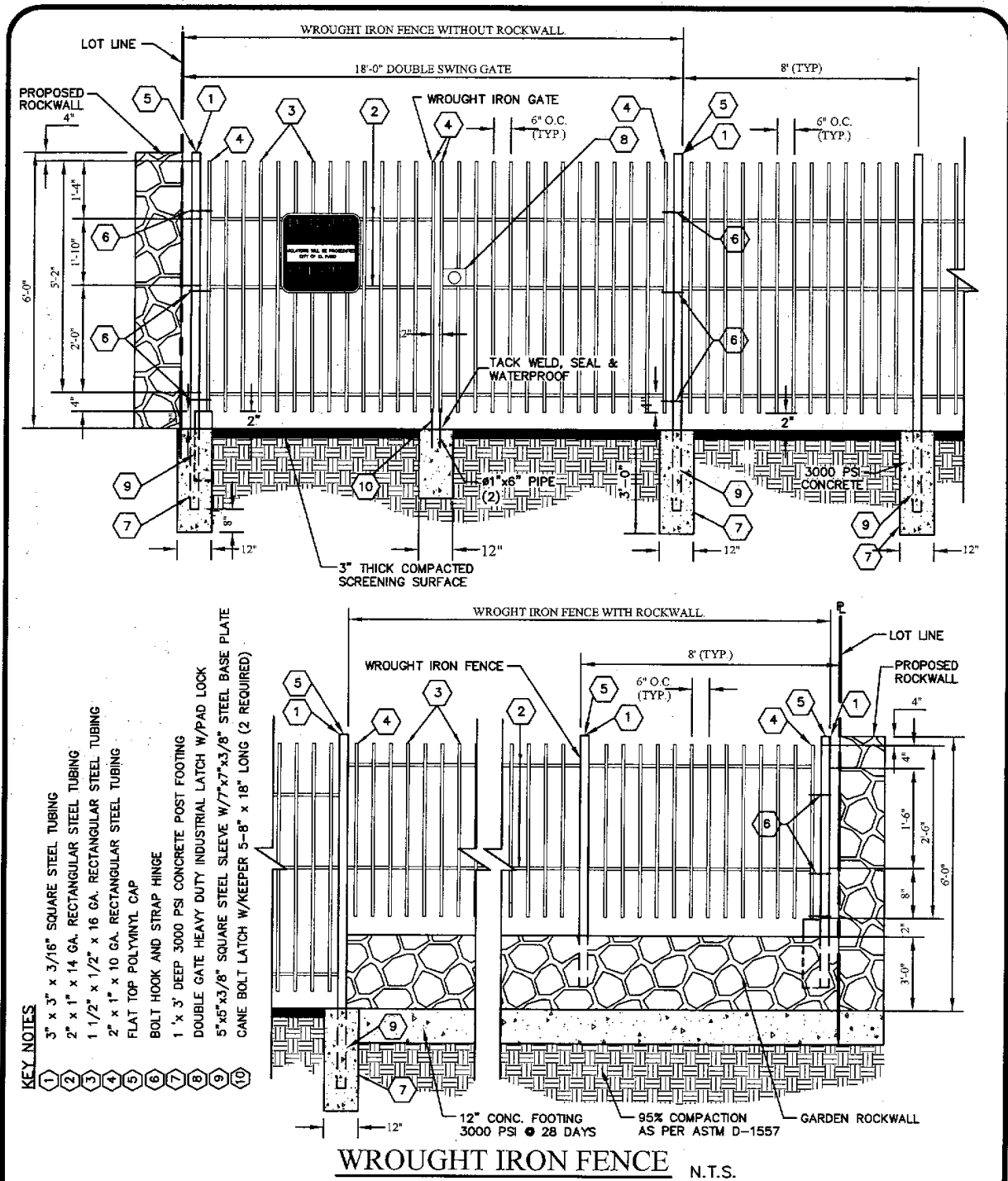
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

ROCKWALL DESIGN

4-3

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>OEC/J.R.</u>

BACK TO TITLE INDEX PAGE



TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

WROUGHT IRON  
 FENCE AND GATE  
 DETAIL  
 4-4

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC/J.R.

## SECTION 5

## SECTION 5

## EARTH RETENTION AND EROSION CONTROL

<u>TITLE</u>	<u>PAGE</u>
CONCRETE RIP RAP.....	5-1
ROCK RIP RAP.....	5-2
WIRE WRAPPED RIP RAP.....	5-3
TEMPORARY EROSION CONTROL.....	5-4

[BACK TO SECTION INDEX PAGE](#)

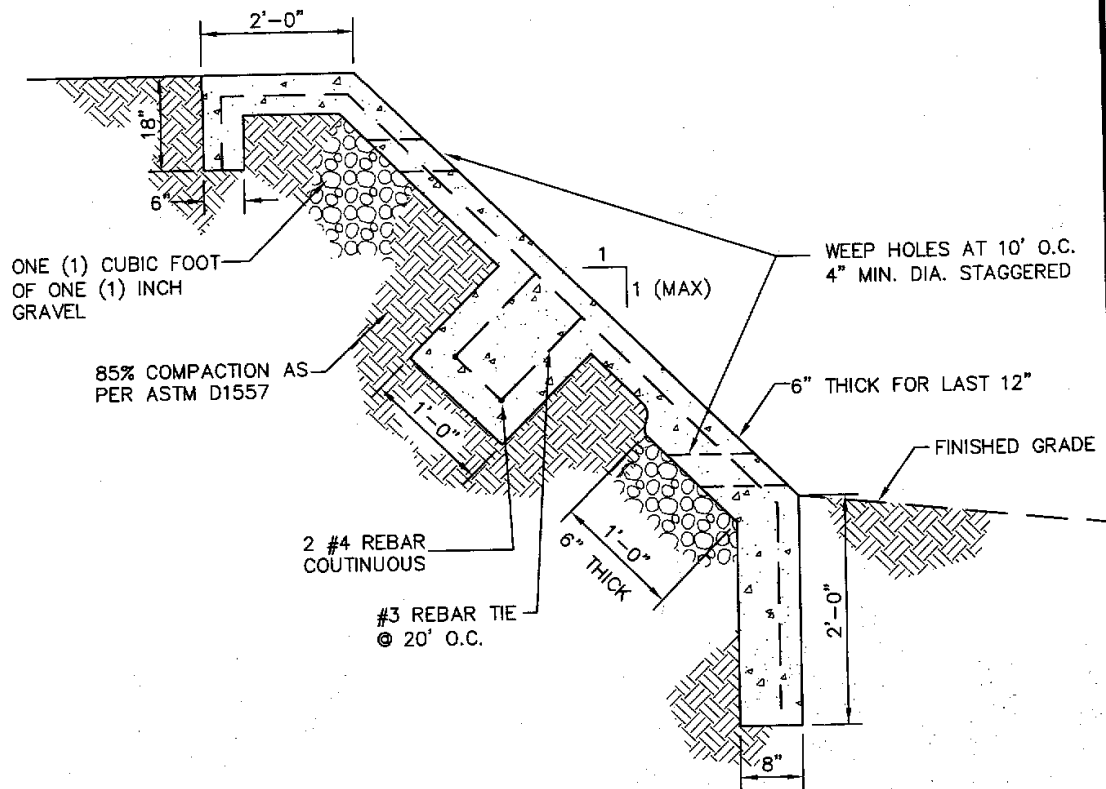


TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

SECTION 5  
 TABLE OF  
 CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE



CONCRETE RIP-RAP DETAIL  
SCALE: N.T.S.

NOTES:

1. CONCRETE RIP-RAP SHALL BE PLACED ON EMBANKMENTS OR SLOPES WHERE REQUIRED BY THE CITY ENGINEER FOR EROSION PROTECTION, EXCEPT FOR PONDING AREAS. (REFER TO SECTION 2)
2. CONCRETE RIP-RAP SHALL BE A MINIMUM OF 4" CONCRETE.
3. CONCRETE TO BE 3000 PSI WITH MIN. 6x6x#10 WWF
4. FOR SLOPES GREATER THAN 1:1 OR VERTICAL HEIGHT OF MORE THAN SIX(6) FEET, THE RIP-RAP SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.
5. PROVIDE ONE (1) INCH EXPANSION JOINT AT EVERY FIFTY (50) FEET WITH #6 DOWELS AT 18 INCHES O.C.
6. PROVIDE DUMMY JOINTS AT TEN (10) FEET O.C.



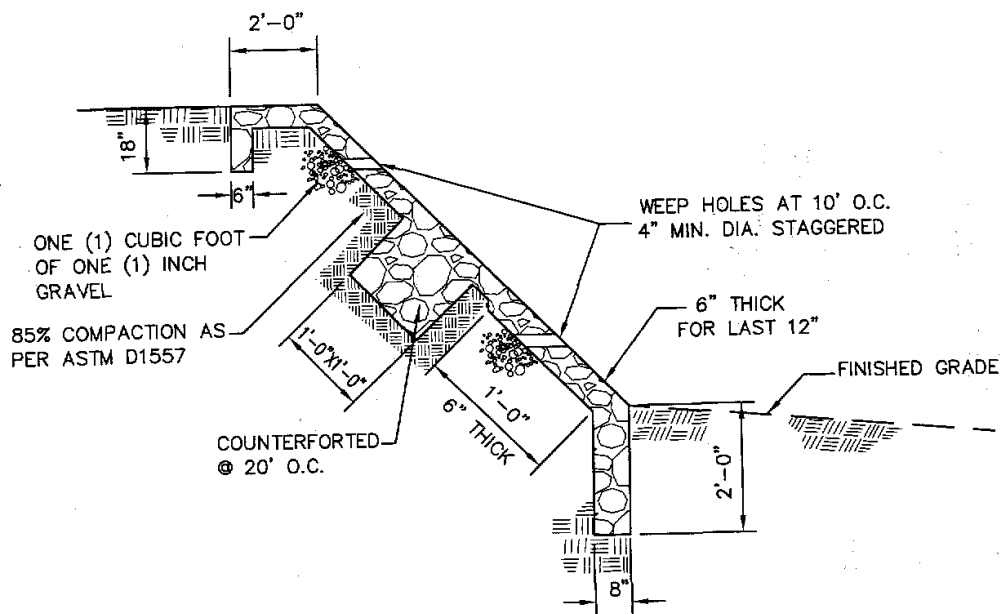
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CONCRETE  
RIP RAP  
5-1

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



### ROCK RIP-RAP DETAIL

#### NOTES:

1. ROCK RIP-RAP SHALL BE PLACED ON EMBANKMENTS OR SLOPES WHERE REQUIRED BY THE CITY ENGINEER FOR EROSION PROTECTION, EXCEPT FOR PONDING AREAS. (SEE SECTION 2)
2. ROCK RIP-RAP SHALL BE A MINIMUM OF 8" MORTARED ROCK.
3. STONE FOR ROCK RIP RAP SHALL BE AS NEARLY UNIFORM IN SECTION AS IS PRACTICABLE. STONE SHALL BE QUARRIED; FRACTURED RIVERROCK SHALL NOT BE PERMITTED.
4. MORTAR FOR ROCK RIP-RAP SHALL BE TYPE S, 1800 P.S.I. AS PER ASTM C270.
5. FOR SLOPES GREATER THAN 1:1 OR VERTICAL HEIGHT OF MORE THAN SIX (6) FEET, THE RIP RAP SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.
6. PROVIDE ONE (1) INCH EXPANSION JOINT AT EVERY FIFTY (50) FEET.
7. PROVIDE DUMMY JOINTS AT TEN (10) FEET O.C.
8. NON-MORTARED ROCK RIP RAP SHALL BE ALLOWED WHERE APPROVED BY THE CITY ENGINEER.



TITLE 19 - SUBDIVISION ORDINANCE

ENGINEERING DEPARTMENT

DESIGN STANDARDS  
FOR CONSTRUCTION

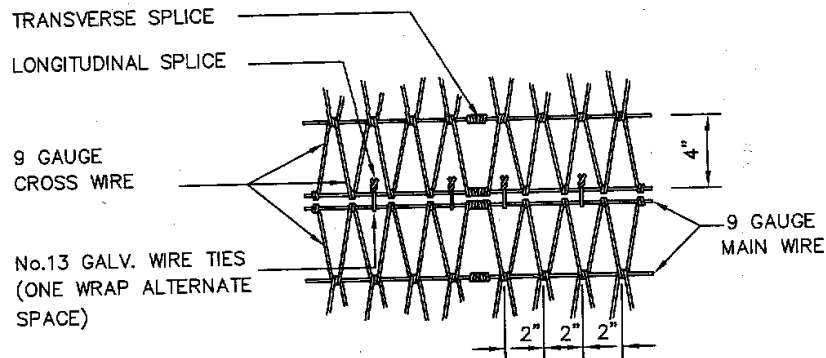
ROCK RIP RAP  
5-2

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

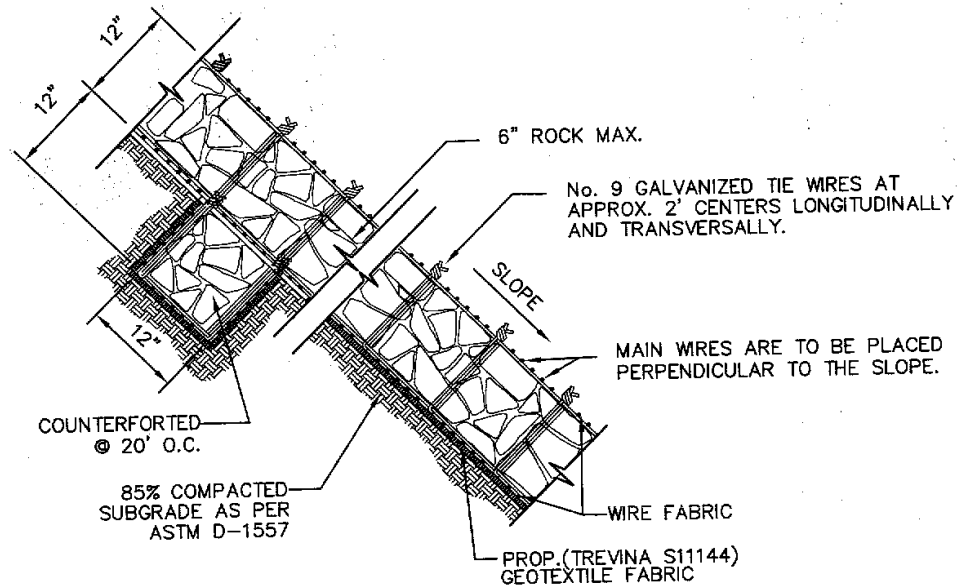
Checked By H. M. E.  
Drawn By QEC/J.R.



BACK TO TITLE INDEX PAGE



### WIRE FABRIC AND SPLICE DETAIL (FOR NON-COHESIVE SOIL) N.T.S.



### TYPICAL SECTION

### WIRE WRAPPED RIP-RAP DETAIL N.T.S.



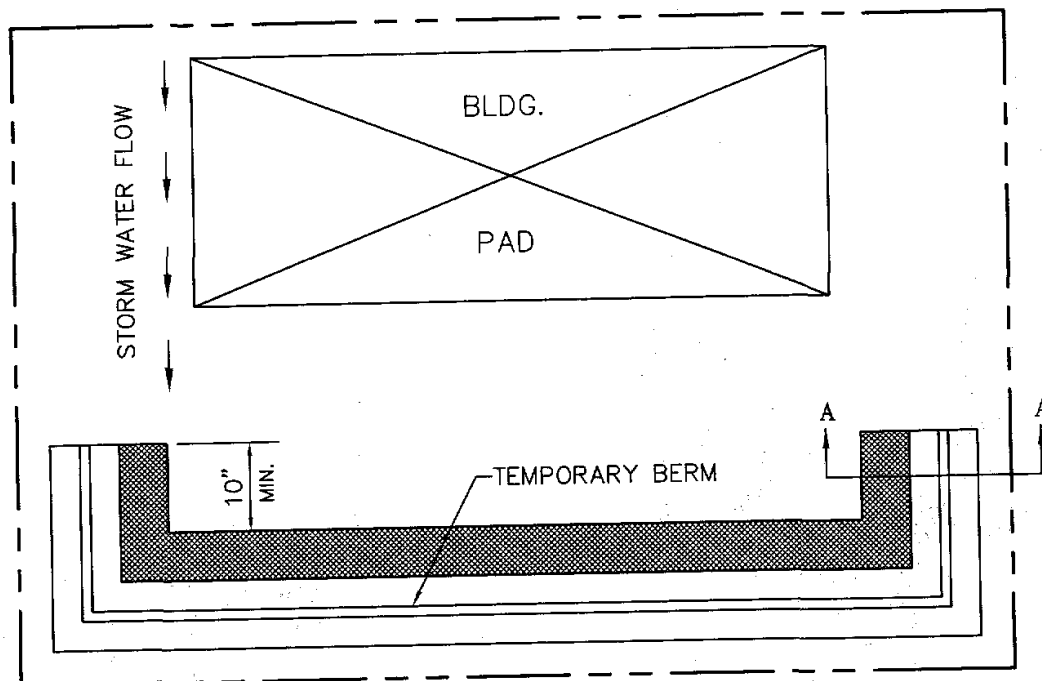
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

WIRE WRAPPED  
RIP-RAP  
5-3

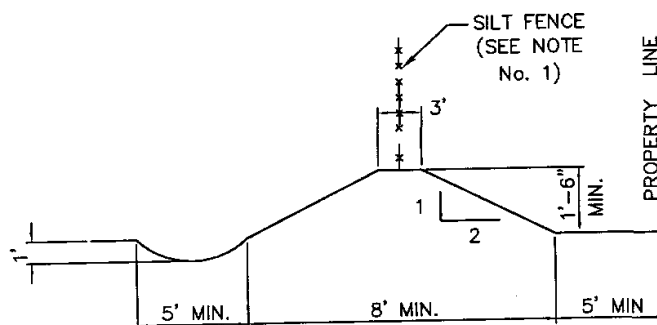
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



TYPICAL LOT LAYOUT FOR EROSION CONTROL  
N.T.S.



NOTE:  
1.- SILT FENCE SHALL BE PROVIDED PRIOR TO GRADING OF SITE  
AND IF THE SITE HAS SANDY SOIL CONDITIONS.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TEMPORARY  
EROSION CONTROL  
5-4

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J.R.</u>

## SECTION 6

BACK TO SECTION INDEX PAGE

## SECTION 6

### SIDEWALKS, DRIVEWAYS AND CURB RAMPS

TITLE	PAGE
CURB WITH SIDEWALK SECTION.....	6-1
SIDEWALK ADJACENT TO CURB SECTION.....	6-2
CURB WITH SIDEWALK SECTION.....	6-3
ROLLED CURB SECTIONS.....	6-4
ROLLED CURB SECTIONS WITH SIDEWALK AGAINST CURB.....	6-5
TYPE "A" CURB AND GUTTER.....	6-6
TYPE "B" AND "C" CURB AND GUTTER.....	6-7
TYPE "D" CURB AND GUTTER.....	6-8
TYPE "E" CURB.....	6-9
TEMPORARY CURBS TYPE "F" AND "G".....	6-10
TYPE "H" DRIVEWAY CURB.....	6-11
CONCRETE HEADER WITH SIDEWALK SECTION.....	6-12
SIDEWALK FOR ON-SITE PONDING.....	6-13
ACCESSIBLE PASSING SPACE DESIGN.....	6-14
RESIDENTIAL DRIVEWAYS.....	6-15
COMMERCIAL/INDUSTRIAL DRIVEWAYS.....	6-15A
DRIVEWAY APPROACHES.....	6-16
CONCRETE APRON FOR DRIVEWAYS/ALLEYWAYS.....	6-17
DRIVEWAY WITH ON-SITE PONDING.....	6-18
ASPHALTIC WALKWAY/JOGGING PATH.....	6-19
STRAIGHT CURB RAMP DESIGN WITH CURB RETURNS.....	6-20
DIAGONAL CURB RAMP DESIGN WITH CURB RETURNS.....	6-21



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 6  
TABLE OF  
CONTENTS

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

## SECTION 6

## SIDEWALKS, DRIVEWAYS AND CURB RAMPS

<u>TITLE</u>	<u>PAGE</u>
DIAGONAL CURB RAMP DESIGN WITH FLARED SIDES.....	6-22
STRAIGHT CURB RAMP DESIGN WITH FLARED SIDES.....	6-23
WHEEL CHAIR CURB RAMP WIDTH.....	6-24
RAMP SURFACE.....	6-25
TRANSITION RAMP WITH DETECTABLE WARNING.....	6-26
LOCATION OF DETECTABLE WARNINGS ON VARIOUS RAMPS.....	6-27
DOMESIZE AND SPACING.....	6-28
BUILT-UP CURB RAMP.....	6-29
DIAGONAL SHARED RAMP.....	6-30
CURB RAMPS AT MEDIAN ISLANDS.....	6-31
MEDIAN CURB RAMP DESIGN (ARTERIAL) .....	6-32
MEDIAN CURB RAMP DESIGN (LOCAL).....	6-33

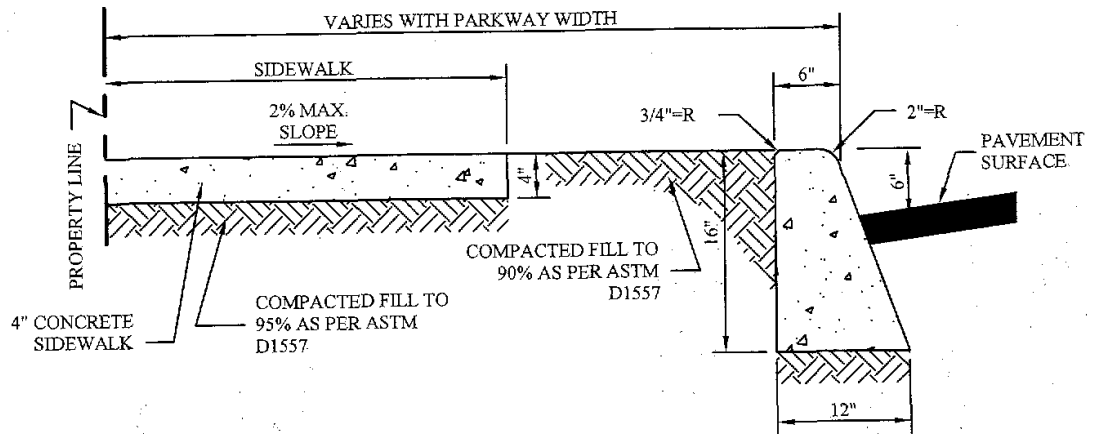


TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
 FOR CONSTRUCTION**

SECTION 6  
 TABLE OF  
 CONTENTS

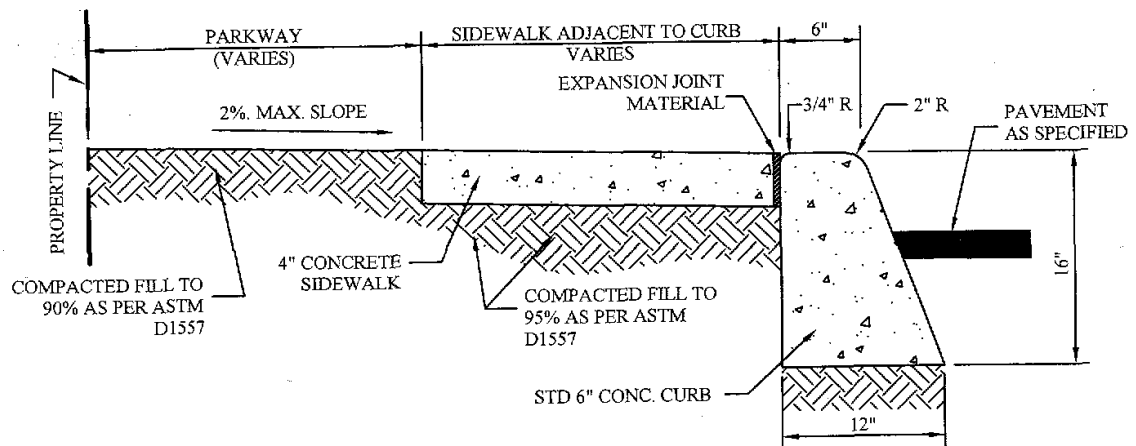
Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>OEC / J. R.</u>

BACK TO TITLE INDEX PAGE



### STANDARD CURB & SIDEWALK SECTION

- NOTES:
1. CONCRETE SHALL BE 3000 P.S.I. MIN.
  2. DUMMY JOINT REQUIRED AT 10' O.C. FOR CURB & GUTTER AND 5' O.C. FOR SIDEWALK.
  3. EXPANSION MATERIAL REQUIRED AT CURB RETURNS AND AT 20' ON CENTER FOR SIDEWALKS WITH 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL OR EQUAL.
  4. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING FOR CURBS.



### STANDARD 6" CURB WITH SIDEWALK SECTION



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

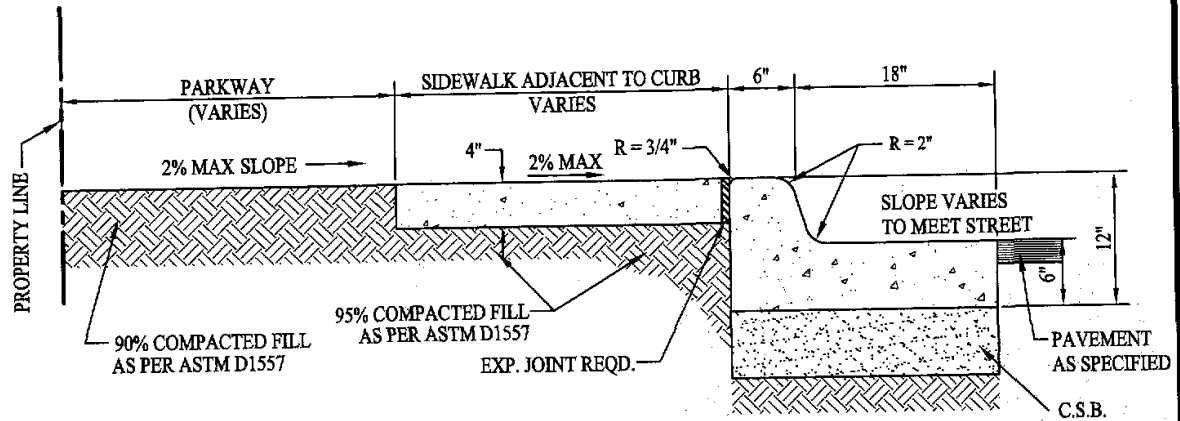
CURB WITH  
SIDEWALK SECTION

6-1

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>



BACK TO TITLE INDEX PAGE



### CURB & GUTTER WITH SIDEWALK SECTION

C.S.B.

#### NOTES:

1. CONCRETE SHALL BE 3000 P.S.I. MIN.
2. DUMMY JOINT REQUIRED AT 10' O.C. FOR CURB & GUTTER AND 5' O.C. FOR SIDEWALK.
3. EXPANSION MATERIAL REQUIRED AT CURB RETURNS, AND AT 20' ON CENTER FOR SIDEWALKS WITH 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL OR EQUAL.
4. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING FOR CURBS.



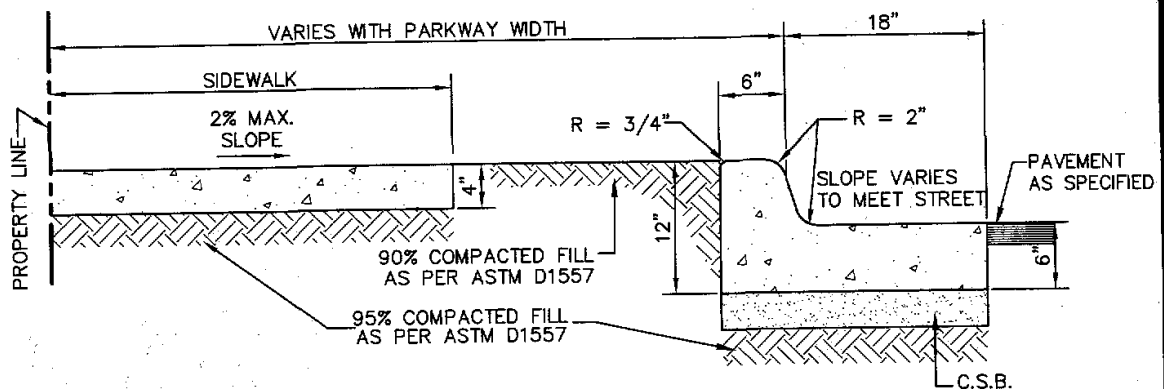
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SIDEWALK ADJACENT  
TO CURB SECTION  
6-2

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



### CURB & GUTTER WITH SIDEWALK SECTION

**NOTES:**

1. CONCRETE SHALL BE 3000 P.S.I. MIN.
2. DUMMY JOINT REQUIRED AT 10' O.C. FOR CURB & GUTTER AND 5' O.C. FOR SIDEWALK.
3. EXPANSION MATERIAL REQUIRED AT CURB RETURNS AND AT 20' ON CENTER FOR SIDEWALKS WITH 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL OR EQUAL.
4. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING FOR CURBS.



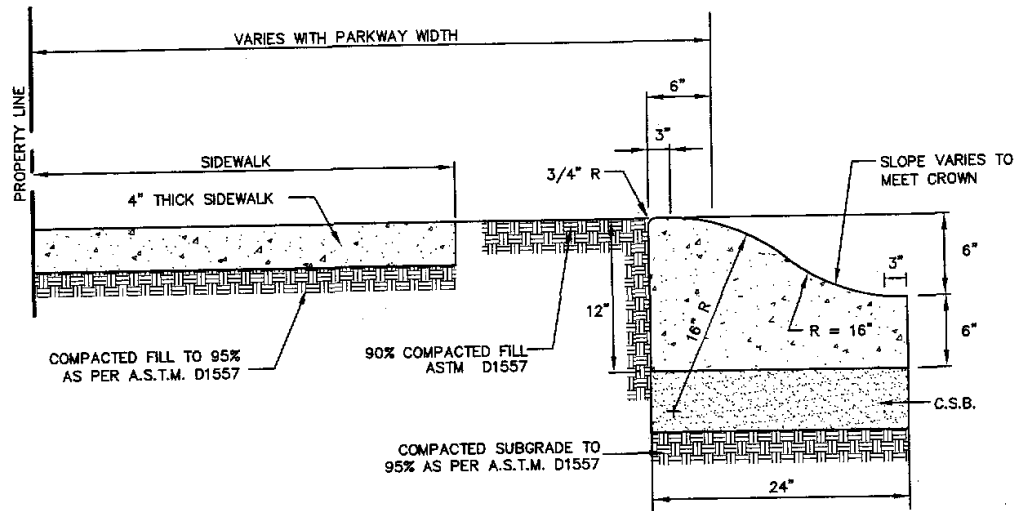
TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

**CURB WITH**  
**SIDEWALK SECTION**  
 6-3

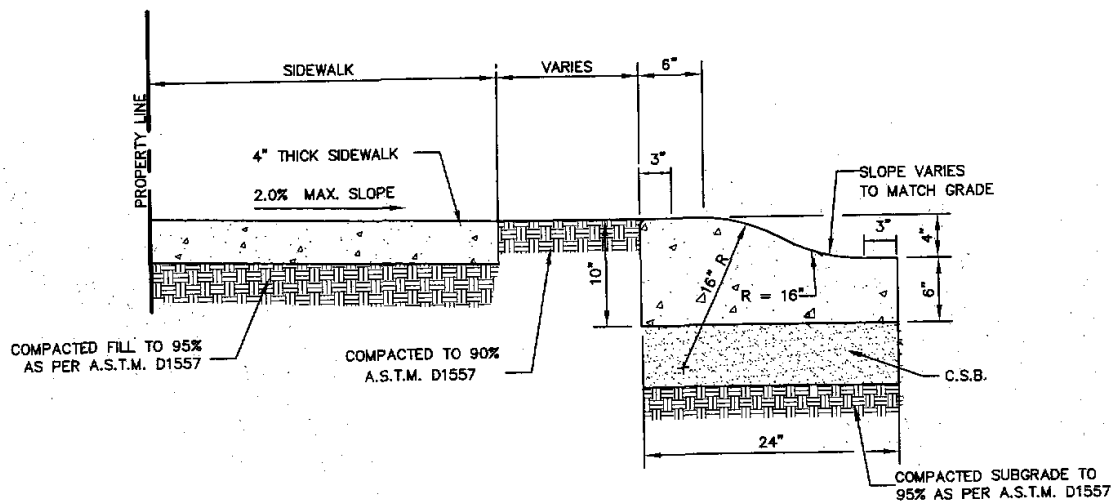
Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



6" ROLLED CURB WITH SIDEWALK SECTION



4" ROLLED CURB WITH SIDEWALK SECTION

- NOTES:
1. CONCRETE SHALL BE 3000 P.S.I. MINIMUM.
  2. DUMMY JOINT REQUIRED AT 10' O.C. FOR HEADERS AND 5' O.C. FOR SIDEWALK.
  3. EXPANSION JOINT MATERIAL REQUIRED AT CURB RETURNS, AND AT 20' O.C. FOR SIDEWALKS WITH 1/2" PRE-MOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL.
  4. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING FOR HEADERS.
  5. PROVIDE EXPANSION JOINT MATERIAL WHERE SIDEWALK MEETS CURB, AND AT ALL SIDES WHERE CONCRETE PARKWAY MEETS SIDEWALK AND CURB.



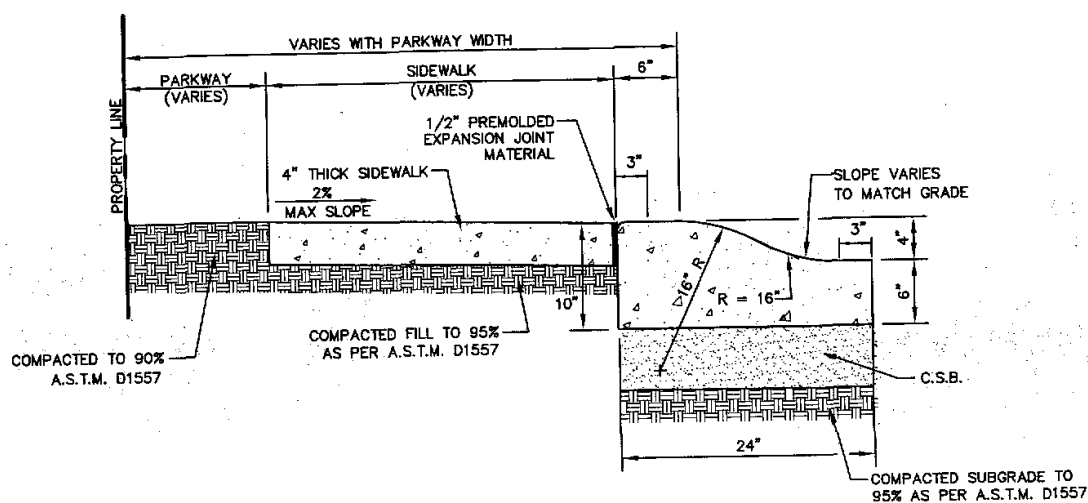
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

ROLLED CURB  
SECTIONS  
6-4

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

6" ROLLED CURB WITH SIDEWALK SECTION



4" ROLLED CURB WITH SIDEWALK SECTION

- NOTES:
1. CONCRETE SHALL BE 3000 P.S.I. MINIMUM.
  2. DUMMY JOINT REQUIRED AT 10' O.C. FOR HEADERS AND 5' O.C. FOR SIDEWALK.
  3. EXPANSION JOINT MATERIAL REQUIRED AT CURB RETURNS, AND AT 20' O.C. FOR SIDEWALKS WITH 1/2" PRE-MOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL.
  4. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING FOR HEADERS.
  5. PROVIDE EXPANSION JOINT MATERIAL WHERE SIDEWALK MEETS CURB, AND AT ALL SIDES WHERE CONCRETE PARKWAY MEETS SIDEWALK AND CURB.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

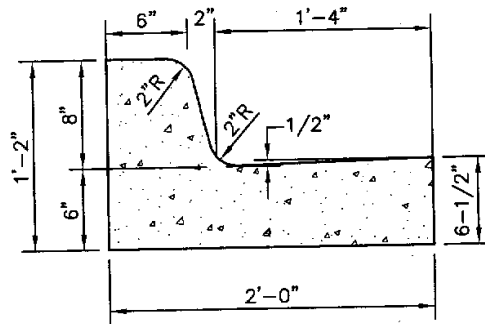
ROLLED CURB SECTIONS  
WITH SIDEWALK  
AGAINST CURB  
6-5

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>



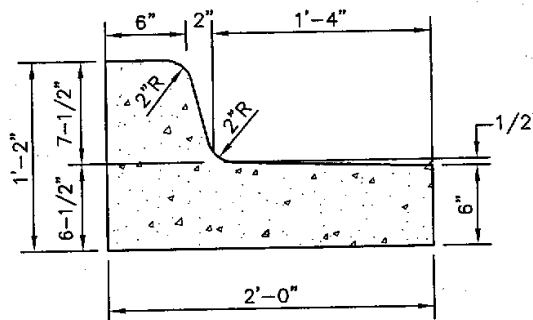
BACK TO TITLE INDEX PAGE

FOR USE ON ALL CITY STREET CLASSIFICATIONS AS A FUNCTION OF DRAINAGE AND TRAFFIC CONTROL. IT IS PERMISSIBLE TO MIX CURB HEIGHTS OF 6" & 8" WHEN APPROPRIATE FOR PROPER DRAINAGE CONVEYANCE. MINIMUM TRANSITION LENGTH OF 10' FROM 6" TO 8" CURB.  
8" CURB NOT RECOMMENDED FOR STREETS WITH ON-STREET PARKING.



**TYPE "B" 8" CURB & GUTTER**  
N.T.S.

FOR USE ON CITY STREETS WHERE THE ROADWAY IS SUPERELEVATED, I.E. THE PAVEMENT SLOPES AWAY FROM THE CURB AND DRAINAGE IS TO BE DIVERTED.



**TYPE "C" 8" MODIFIED CURB & GUTTER**  
N.T.S.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

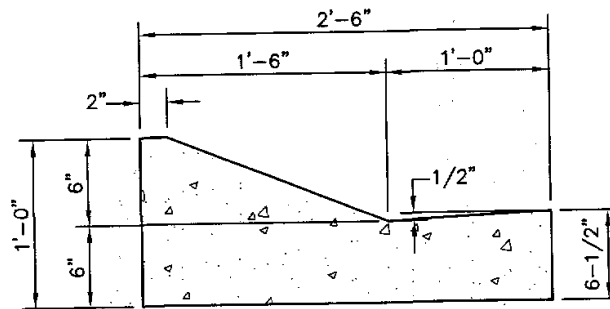
TYPE "B" AND "C" CURB  
AND GUTTER  
6-7

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



BACK TO TITLE INDEX PAGE



TYPE "D" DRIVE OVER CURB & GUTTER  
N.T.S.



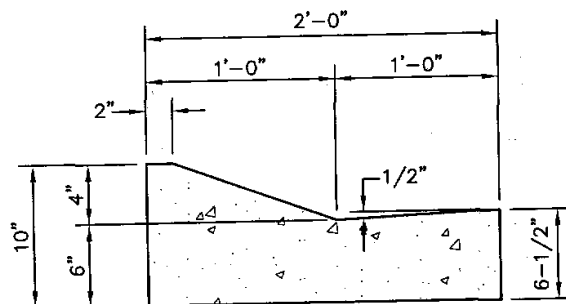
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TYPE "D" CURB AND  
GUTTER  
6-8

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



TYPE "E" DRIVE OVER CURB & GUTTER  
N.T.S.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TYPE "E" CURB

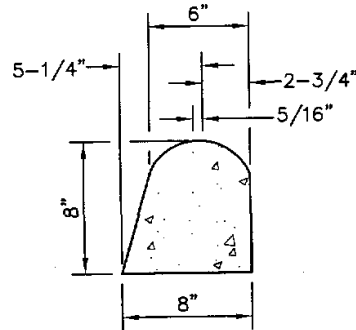
6-9

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

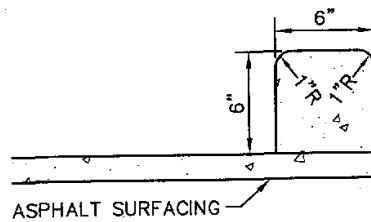
BACK TO TITLE INDEX PAGE

FOR USE ON STREETS WHERE THE ESTIMATED EXPANSION OF THE ROAD IS TO OCCUR WITHIN THE NEXT FIVE (5) YEARS.



**TYPE "F" TEMPORARY ASPHALT CURB**  
N.T.S.

FOR USE ON STREETS WHEN EXPANSION TO THE CENTER IS PLANNED IN EXCESS OF FIVE (5) YEARS. NO DRAINAGE IS TO BE CONVEYED IN OR ON THE MEDIAN. CURB IS TO BE REMOVED.



**TYPE "G" TEMPORARY EXTRUDED CONCRETE MEDIAN CURB**  
N.T.S.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

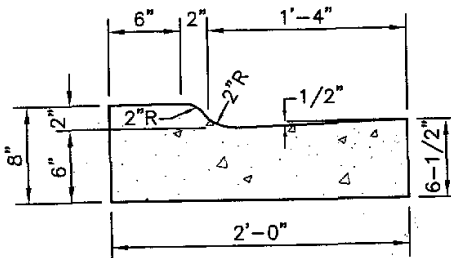
TEMPORARY CURB  
TYPES "F" AND "G"  
6-10

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QBC/J.R.

BACK TO TITLE INDEX PAGE

CAN BE USED ON DRIVEWAYS WITH  
APPROVAL BY THE CITY ENGINEER: EXCEPT  
WHERE ROLLOVER OR MOUNTABLE CURBING  
IS INSTALLED.



TYPE "H" DRIVEWAY CURB  
N.T.S.



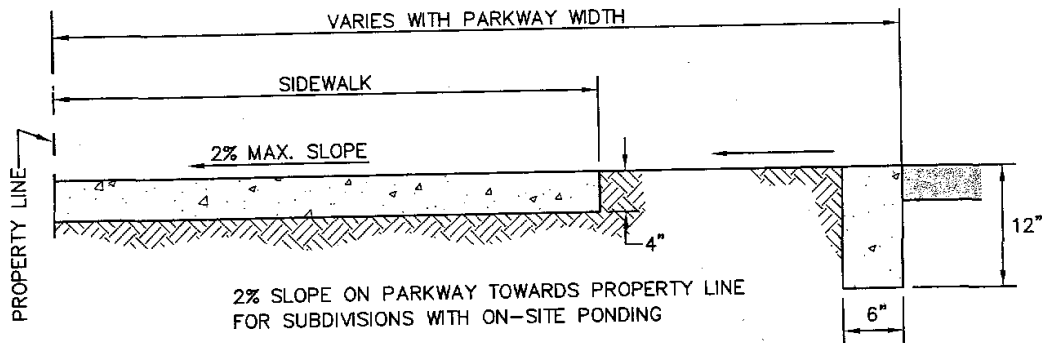
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TYPE "H"  
DRIVEWAY CURB  
6-11

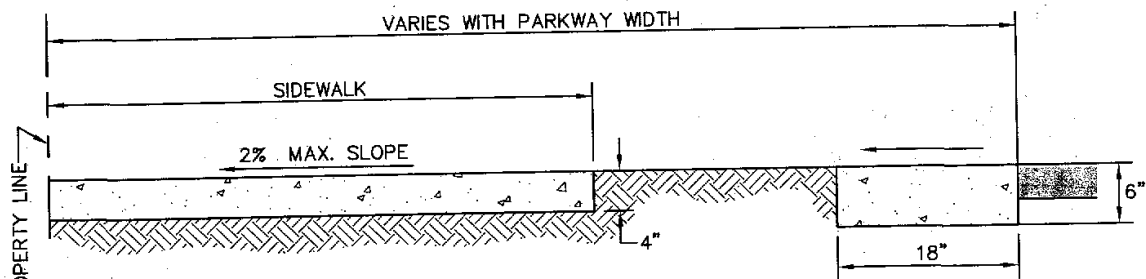
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE



### HEADER FOR EXPANSIVE SOIL



### HEADER FOR ROCKY OR MOUNTAINOUS TERRAIN

#### NOTES:

1. CONCRETE TO BE 3000 P.S.I. MIN.
2. DUMMY JOINT REQUIRED AT 10' O.C. FOR HEADERS AND 5' O.C. FOR SIDEWALKS.
3. EXPANSION MATERIAL REQUIRED AT CURB RETURNS AND AT 20" O.C. FOR SIDEWALKS WITH 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL OR EQUAL.
4. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING FOR HEADERS.
5. EXPANSION JOINTS REQUIRED FOR SIDEWALK AT 20' O.C.

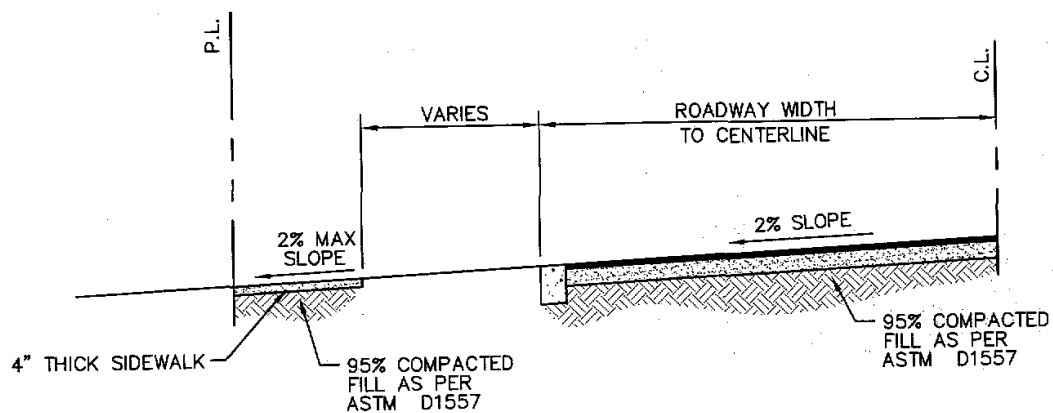


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CONCRETE HEADER WITH  
SIDEWALK SECTION  
6-12

Approved By R. A. SHUBERT	Checked By H. M. E.
Date JUNE 03, 2008	Drawn By QBC/J.R.

BACK TO TITLE INDEX PAGE



### SIDEWALK FOR ON-SITE PONDING

NOTES:

1. CONCRETE FOR HEADERS AND SIDEWALKS SHALL BE 3000 P.S.I. (MIN.).
2. DUMMY JOINT AT 5'-0" O.C., MINIMUM 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION JOINT AT 20' O.C. (SIDEWALK ONLY)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

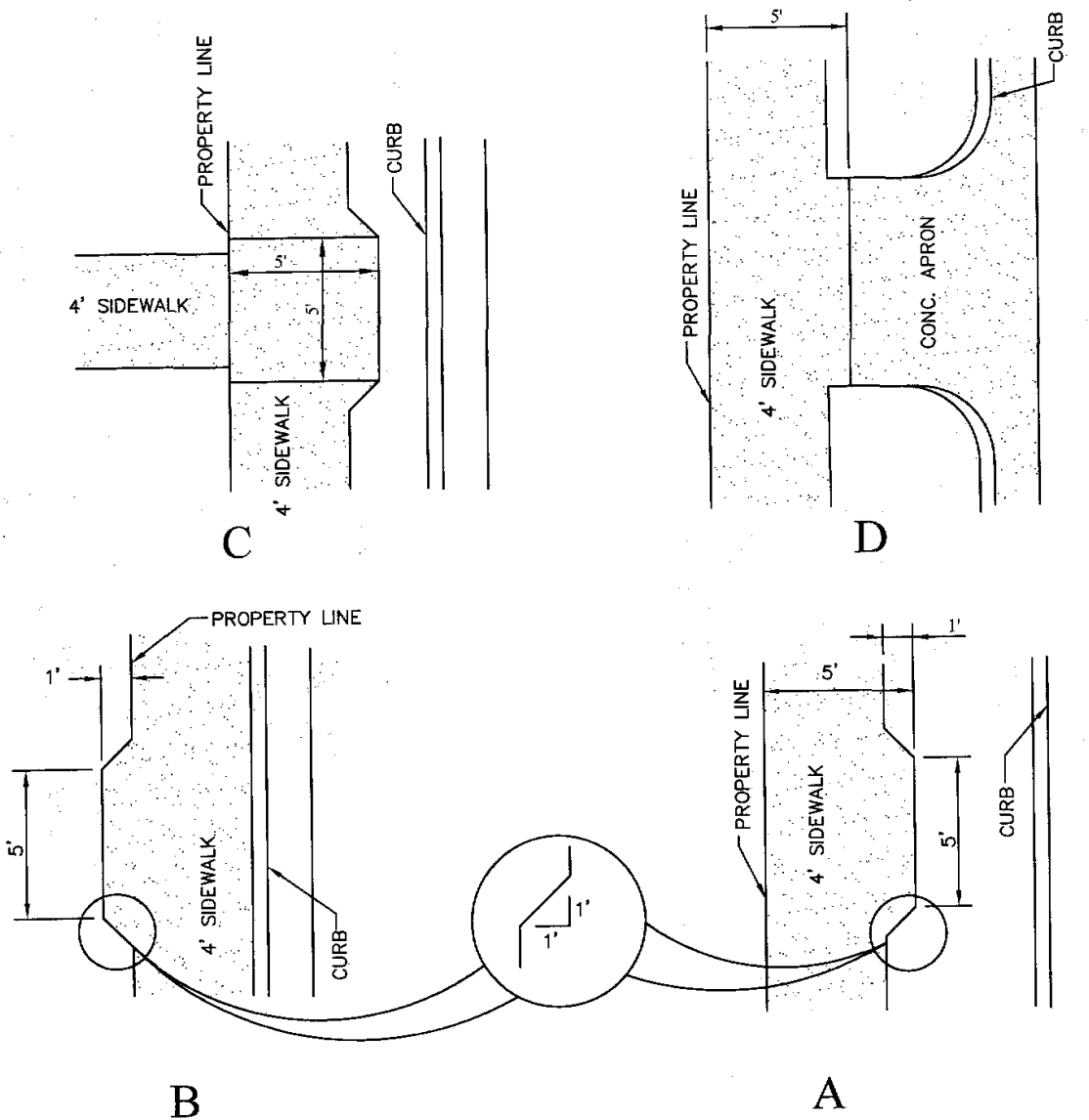
SIDEWALK FOR  
ON-SITE PONDING  
6-13

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.



BACK TO TITLE INDEX PAGE



## ACCESSIBLE PASSING SPACE DESIGN FOR 4 FT. SIDEWALKS

(SHALL BE SPACED AT EVERY 200' MAXIMUM)



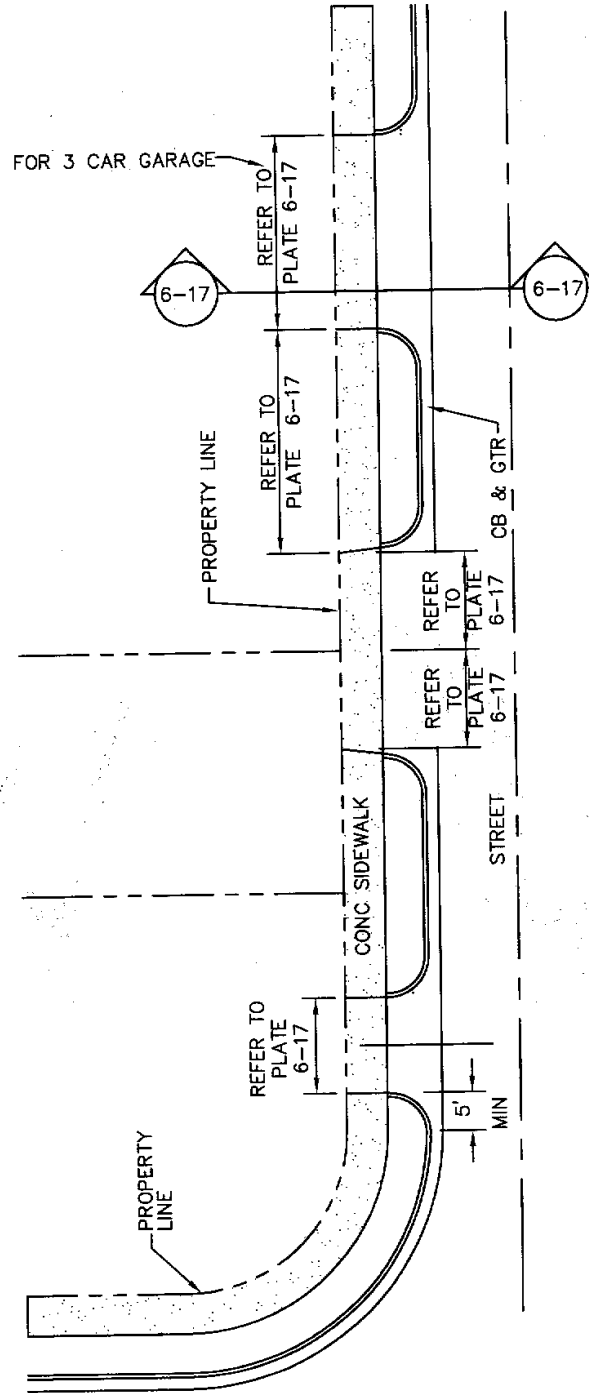
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

ACCESSIBLE PASSING  
SPACE DESIGN  
6-14

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



RESIDENTIAL DRIVEWAY  
NTS

NOTE:  
A MINIMUM PARKING SPACE LENGTH OF TWENTY (20) FEET  
SHALL BE PROVIDED MEASURED FROM THE PROPERTY LINE  
TO A GARAGE, CARPORT OR PARKING SPACE.



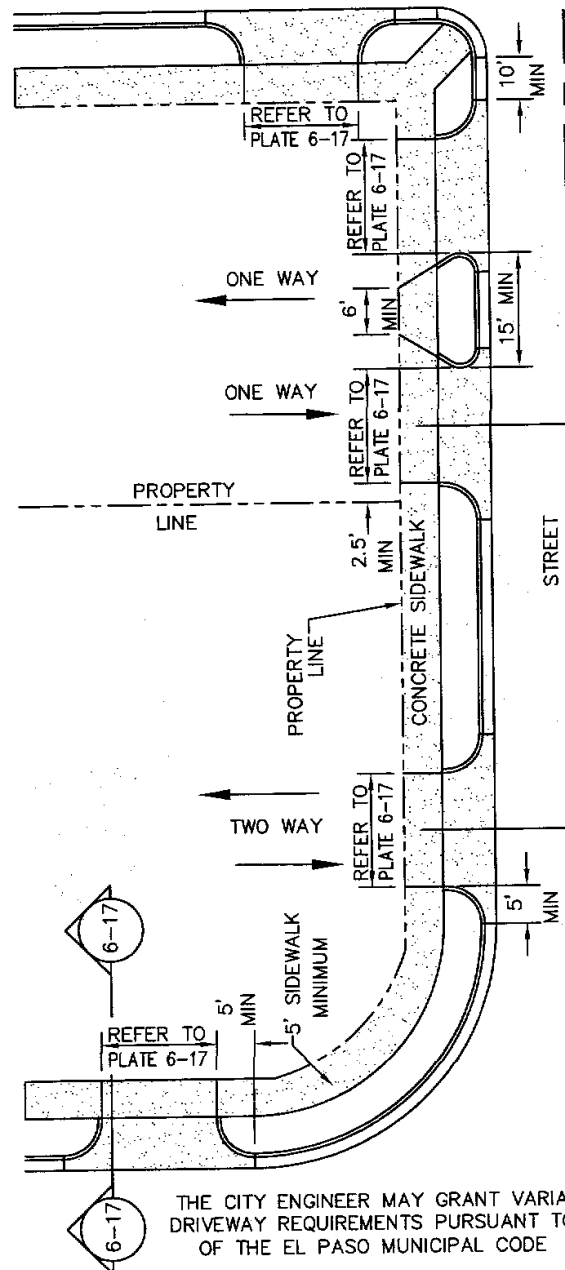
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

RESIDENTIAL  
DRIVEWAYS  
6-15

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



## COMMERCIAL/INDUSTRIAL DRIVEWAYS

NTS



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

COMMERCIAL /  
INDUSTRIAL DRIVEWAYS

6-15A

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC/J. R.

[BACK TO TITLE INDEX PAGE](#)

### Type I and Type II Two-Way Driveway Standards

Driveway	Type of Development	Curb				Minimum Edge to Edge Spacing Between Drives (ft.)
		Width (ft.)		Radius (ft.)		
		Min.	Max.	Min.	Max.	
Type I	Single-Family-60' lots	10	20	5	5	10
	Less than 60' lots, Duplex and Townhouse	15	25	10	10	20
	Multi-Resident Apartments	25	30*	10	10	20
Type II	Office, Commercial and Parking Lots	25	35	10	15	20
	Industrial	24	45	10	15	20
	Banks, Service Stations, and Convenience Stores with Gasoline Pumps	25	35**	10	15	1/3 x Frontage

\* On 50 MPH streets

\*\* Special approval required by City Engineer, or designee depending on location, traffic count, speed and angle of driveway

(TO BE MODIFIED BY THE CITY OF EL PASO TRAFFIC AND TRANSPORTATION DEPARTMENT)



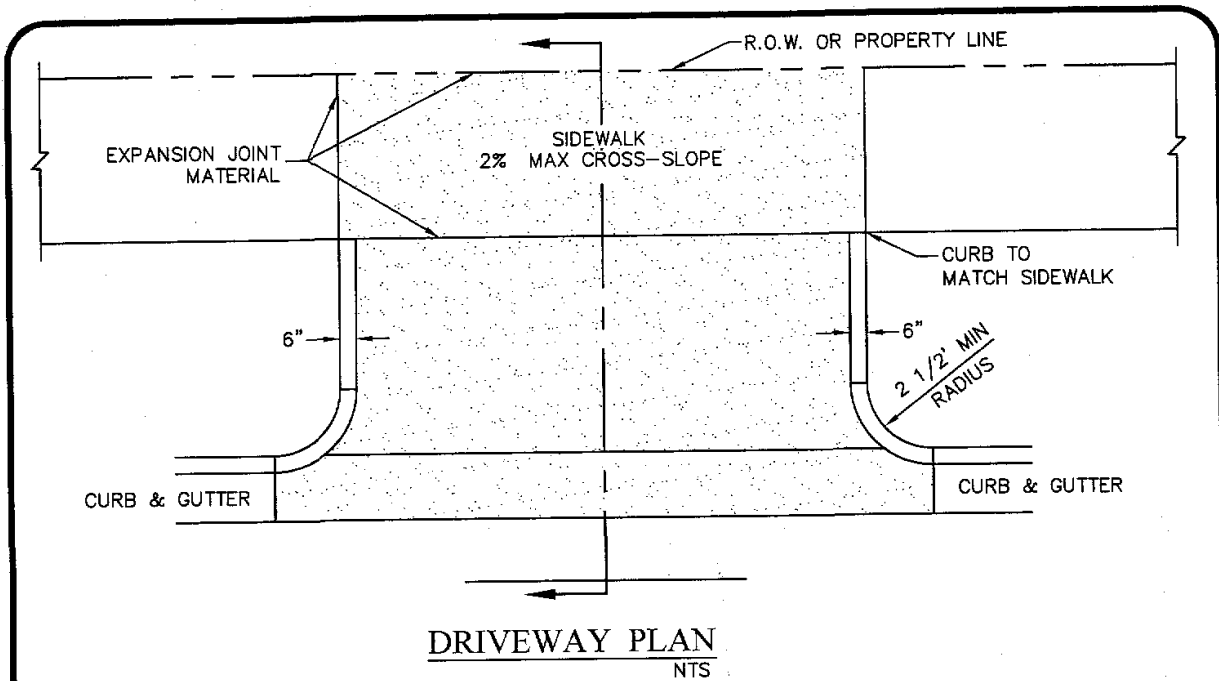
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DRIVEWAY  
APPROACHES  
6-16

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / I. R.

BACK TO TITLE INDEX PAGE



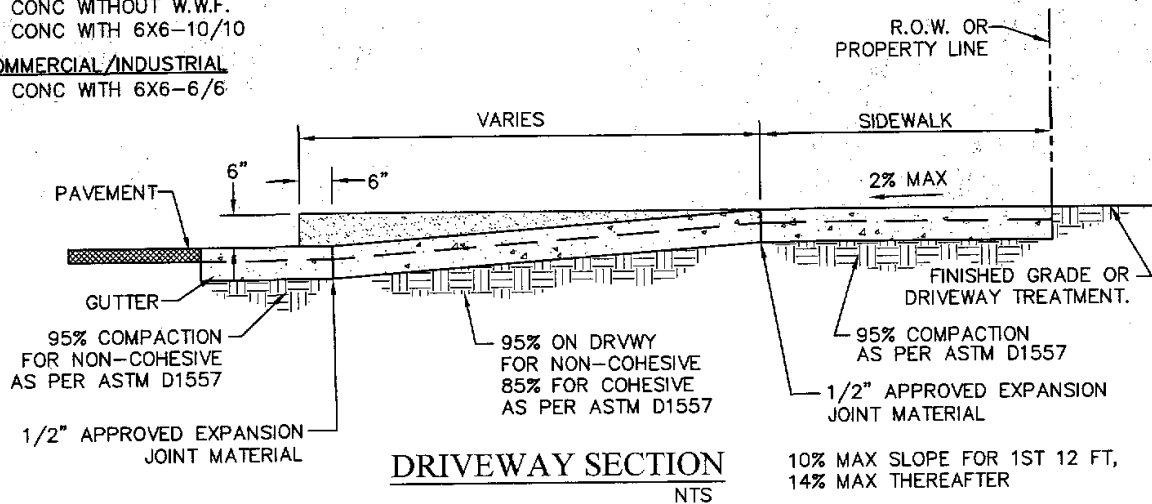
DRIVEWAY WIDTH	MIN	MAX
COMMERCIAL/INDUSTRIAL	24'	35'
RESIDENTIAL (SINGLE FAMILY 60' LOTS)	10'	20'
LESS THAN 60' LOTS, DUPLEX, AND TOWNHOMES (REFER TO PLATE 6-16)	15'	25'

**RESIDENTIAL**

6" CONC WITHOUT W.W.F.  
4" CONC WITH 6X6-10/10

**COMMERCIAL/INDUSTRIAL**

6" CONC WITH 6X6-6/6



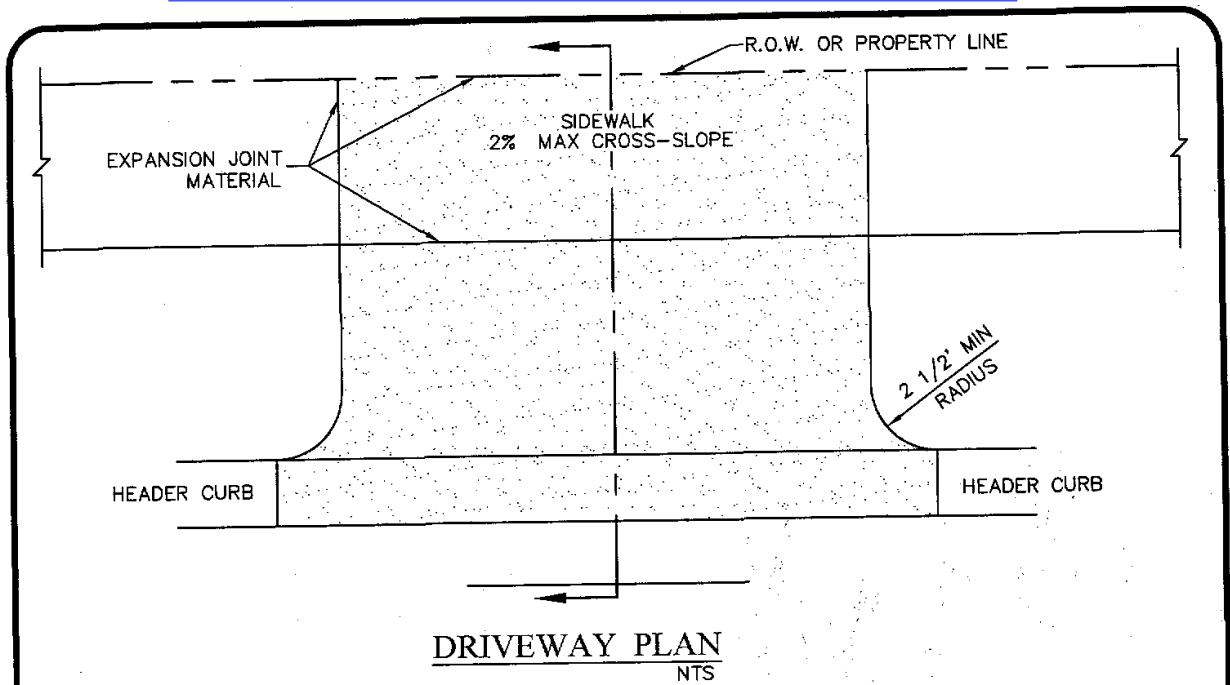
TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

CONCRETE APRON FOR  
DRIVEWAYS/ALLEYWAYS  
6-17

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE



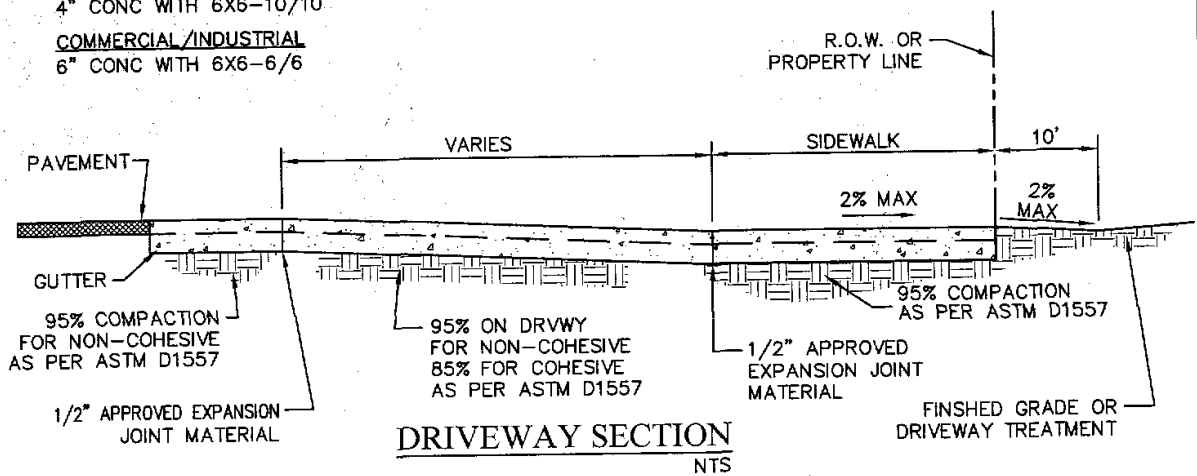
DRIVEWAY WIDTH	MIN	MAX
COMMERCIAL/INDUSTRIAL	24'	35'
RESIDENTIAL (SINGLE FAMILY 60' LOTS)	10'	20'
LESS THAN 60' LOTS, DUPLEX, AND TOWNHOMES (REFER TO PLATE 6-16)	15'	25'

**RESIDENTIAL**

6" CONC WITHOUT W.W.F.  
4" CONC WITH 6X6-10/10

**COMMERCIAL/INDUSTRIAL**

6" CONC WITH 6X6-6/6



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

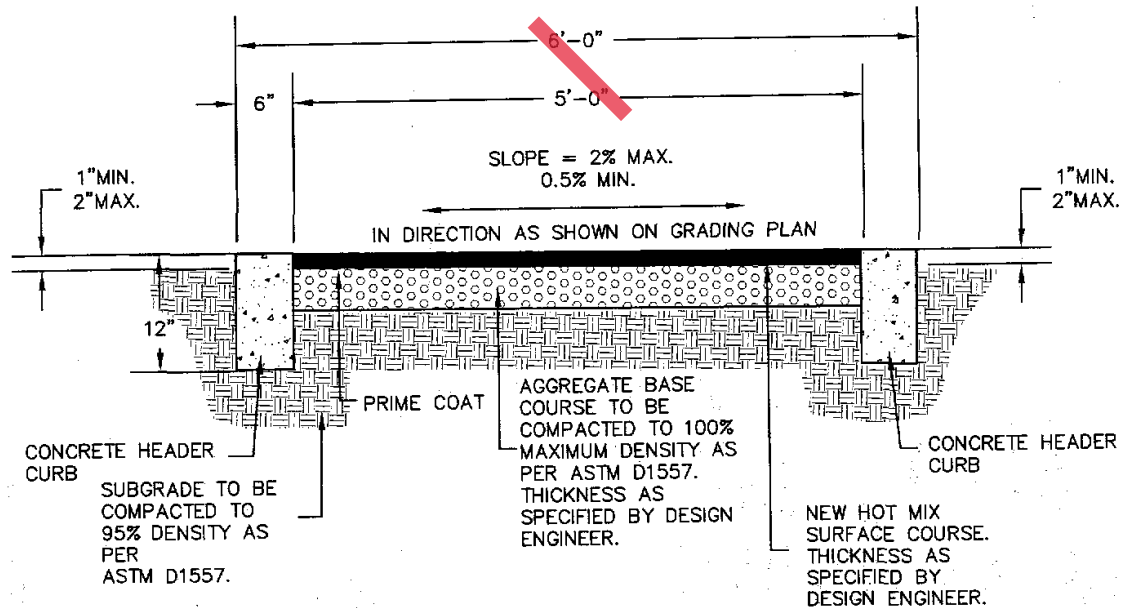
DRIVEWAY WITH  
ON-SITE PONDING  
6-18

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/I.R.



BACK TO TITLE INDEX PAGE



NOTES:

1. CONCRETE HEADER CURBS SHALL BE 3,000 P.S.I. MIN.
2. DUMMY JOINT REQUIRED AT 10' O.C.
3. 1/2" PREMOLDED BITUMINOUS EXPANSION JOINT (AASHTO M-33) IS REQUIRED FOR ALL CURB RETURNS.
4. SUBGRADE UNDER CURB MUST BE FORMED AND COMPACTED TO 95% ASTM D1557.
5. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING FOR CURBS.
6. REFER TO GRADING & DRAINAGE PLAN FOR DIRECTION OF FLOW.

## ASPHALTIC WALKWAY/JOGGING PATH

SCALE: N.T.S.



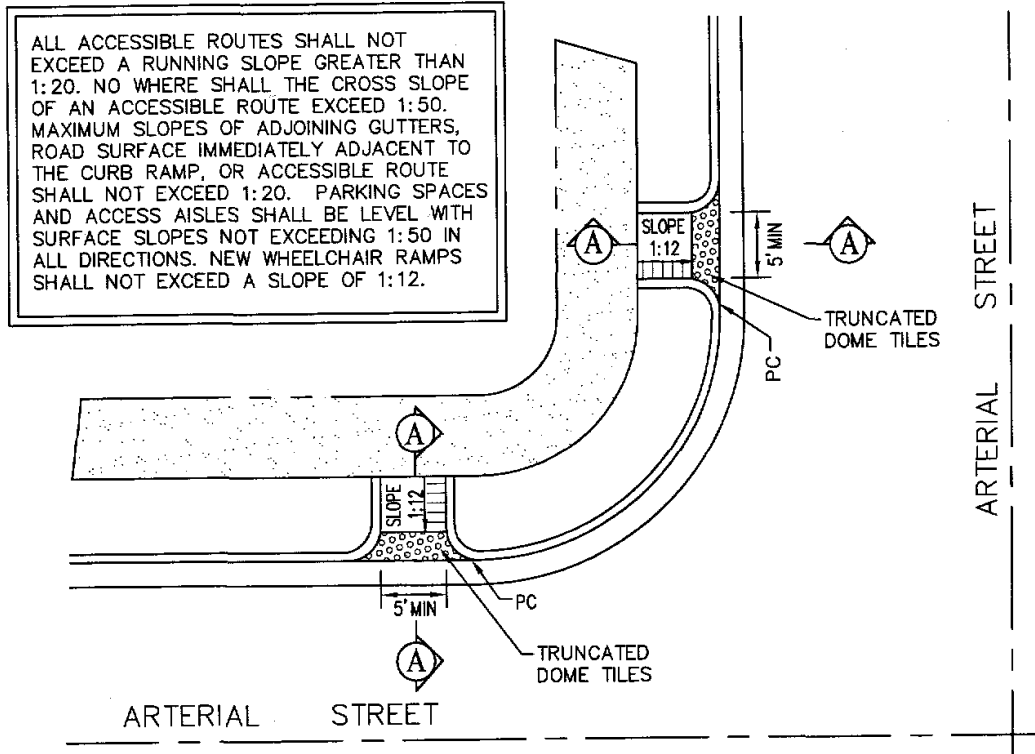
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

ASPHALTIC  
WALKWAY/JOGGING PATH  
6-19

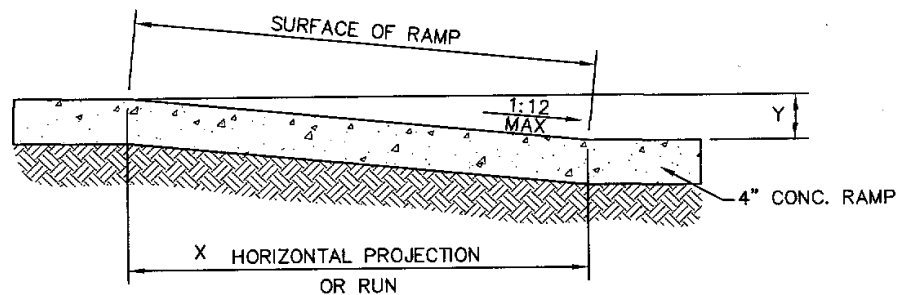
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE



## STRAIGHT CURB RAMP DESIGN WITH CURB RETURNS



### SECTION A

NOTES:

- (1) SLOPE =  $y:x$ , where  $x$  is level plane
- (2) Cross-slope shall not exceed 1:50



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

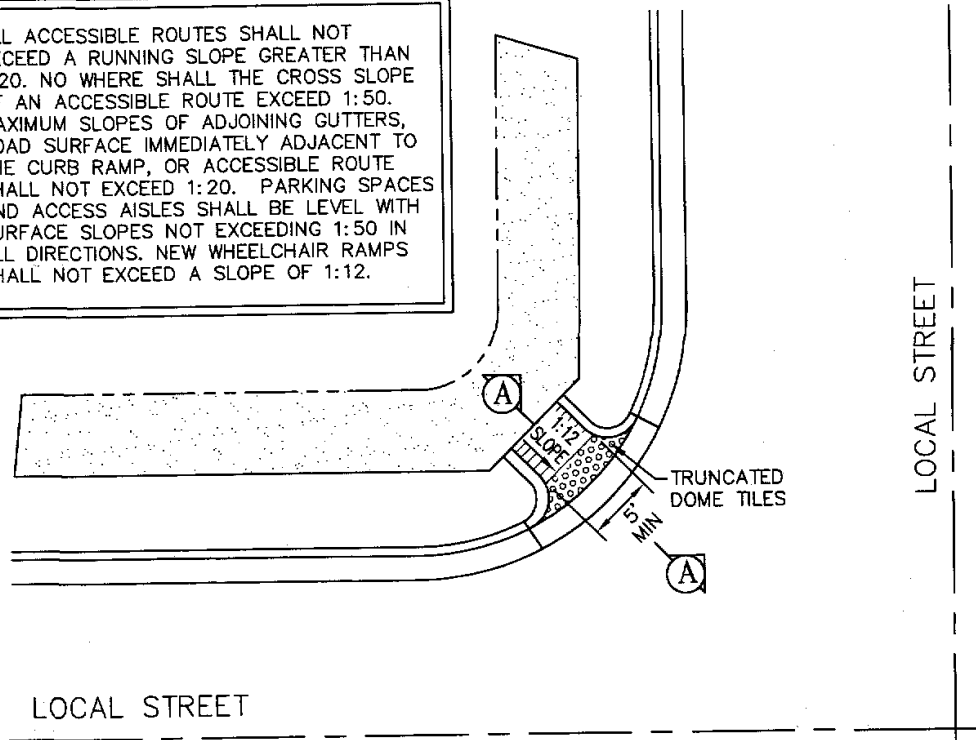
STRAIGHT CURB  
RAMP DESIGN  
W/ CURB RETURNS  
6-20

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

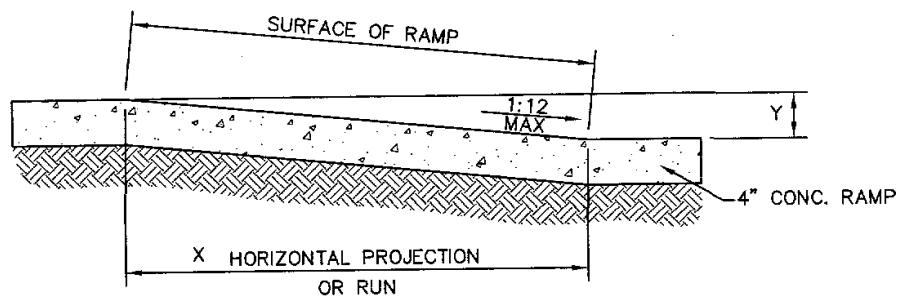
Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE

ALL ACCESSIBLE ROUTES SHALL NOT EXCEED A RUNNING SLOPE GREATER THAN 1:20. NO WHERE SHALL THE CROSS SLOPE OF AN ACCESSIBLE ROUTE EXCEED 1:50. MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20. PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 1:50 IN ALL DIRECTIONS. NEW WHEELCHAIR RAMPS SHALL NOT EXCEED A SLOPE OF 1:12.



## DIAGONAL CURB RAMP DESIGN WITH CURB RETURNS



### SECTION A

NOTES:

- (1) SLOPE =  $y:x$ , where  $x$  is level plane
- (2) Cross-slope shall not exceed 1:50



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

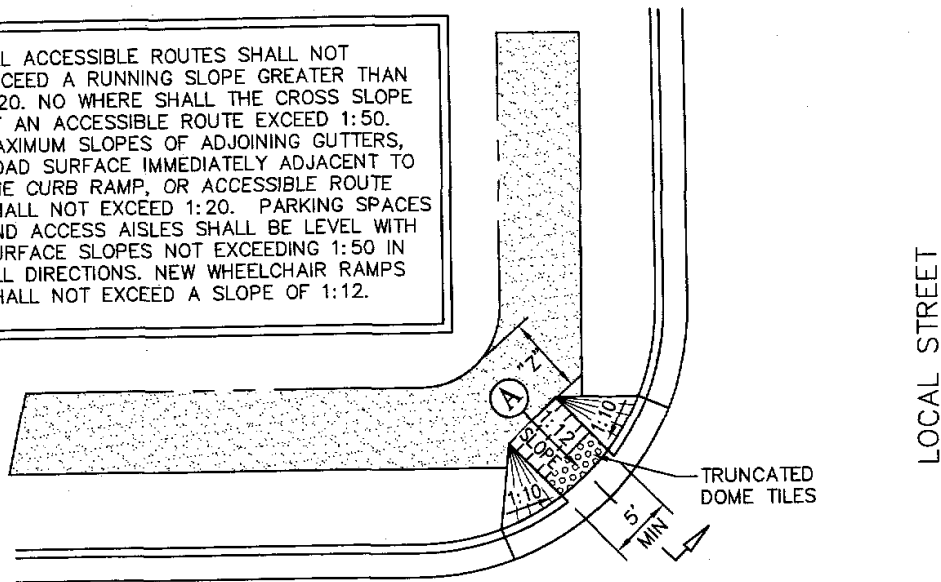
DIAGONAL CURB  
RAMP DESIGN  
W/ CURB RETURNS  
6-21

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

BACK TO TITLE INDEX PAGE

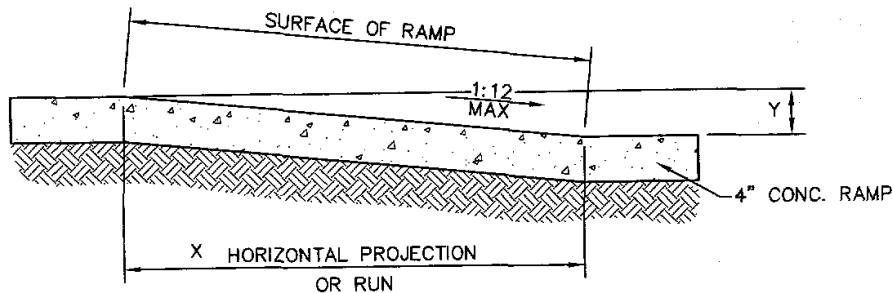
ALL ACCESSIBLE ROUTES SHALL NOT EXCEED A RUNNING SLOPE GREATER THAN 1:20. NO WHERE SHALL THE CROSS SLOPE OF AN ACCESSIBLE ROUTE EXCEED 1:50. MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20. PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 1:50 IN ALL DIRECTIONS. NEW WHEELCHAIR RAMPS SHALL NOT EXCEED A SLOPE OF 1:12.



NOTES:  
IF "Z" IS LESS THAN 48 INCHES,  
THEN THE SLOPE OF THE FLARED  
SIDE SHALL NOT EXCEED 1:12

LOCAL STREET

## DIAGONAL CURB RAMP DESIGN WITH FLARED SIDES



### SECTION A

NOTES:

- (1) SLOPE =  $y:x$ , where  $x$  is level plane
- (2) Cross-slope shall not exceed 1:50



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

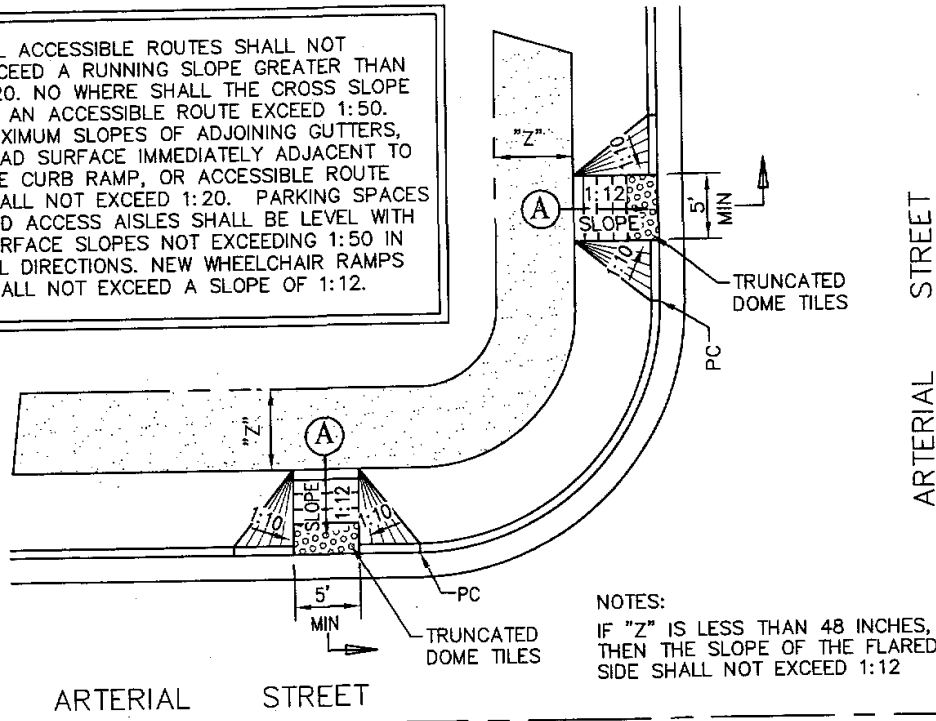
DIAGONAL CURB  
RAMP DESIGN  
W/ FLARED SIDES  
6-22

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

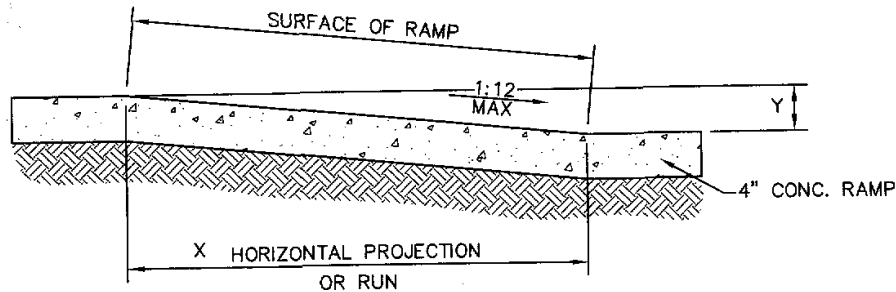
Checked By H. M. E.  
Drawn By QEC/J.R.

## BACK TO TITLE INDEX PAGE

ALL ACCESSIBLE ROUTES SHALL NOT EXCEED A RUNNING SLOPE GREATER THAN 1:20. NO WHERE SHALL THE CROSS SLOPE OF AN ACCESSIBLE ROUTE EXCEED 1:50. MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20. PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 1:50 IN ALL DIRECTIONS. NEW WHEELCHAIR RAMPS SHALL NOT EXCEED A SLOPE OF 1:12.



## STRAIGHT CURB RAMP DESIGN WITH FLARED SIDES



### SECTION A

NOTES:

- (1) SLOPE =  $y:x$ , where  $x$  is level plane
- (2) Cross-slope shall not exceed 1:50



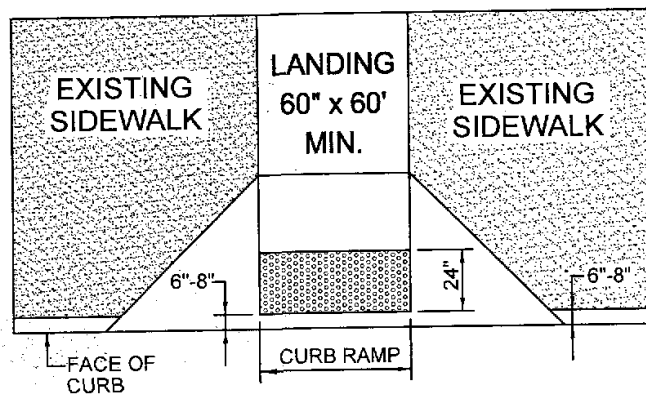
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

STRAIGHT CURB  
RAMP DESIGN  
W/ FLARED SIDES  
6-23

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE

**Width.** The minimum width of curb ramps shall be 60 inches exclusive of flared sides. In areas where space does not permit a 60 inch width, the minimum width shall be no less than 36 inches as determined by the owner (Note; Landing can not exceed 2% slope on every direction). See Figure



LANDING  
60" x 60'  
MIN.

LANDING CAN NOT  
EXCEED 2% SLOPE  
ON EVERY DIRECTION



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

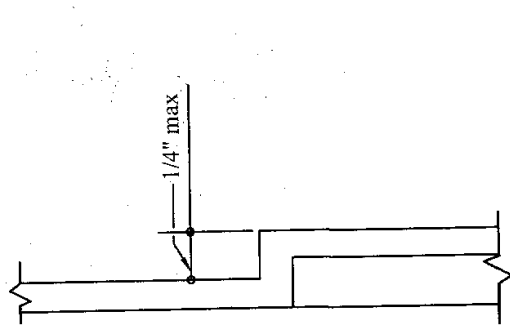
WHEEL CHAIR CURB  
RAMP WIDTH  
6-24

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

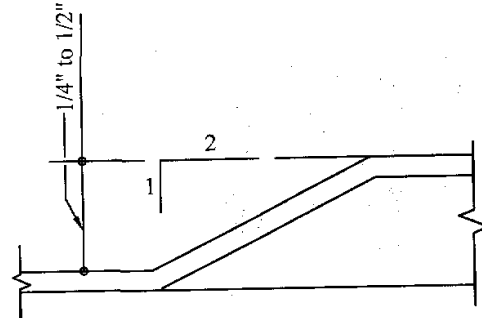
Checked By H. M. E.  
Drawn By QEC / J. R.



BACK TO TITLE INDEX PAGE



Changes in Level



Changes in Level



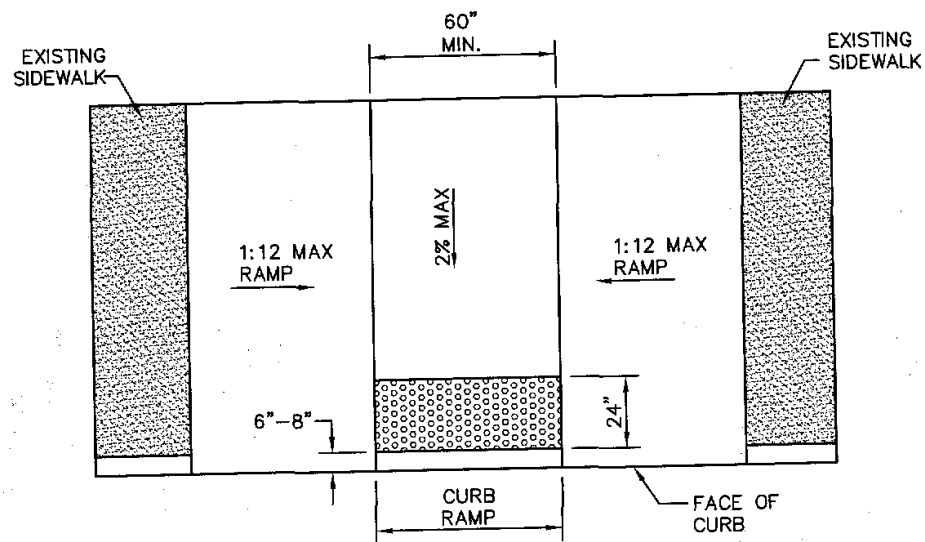
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

RAMP SURFACE  
6-25

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

**[BACK TO TITLE INDEX PAGE](#)**



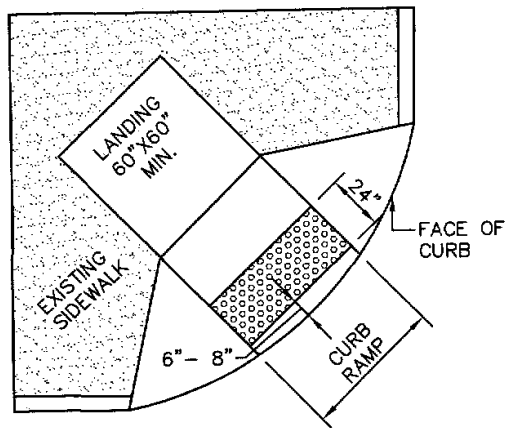
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TRANSITION RAMP  
WITH DETECTABLE  
WARNING  
6-26

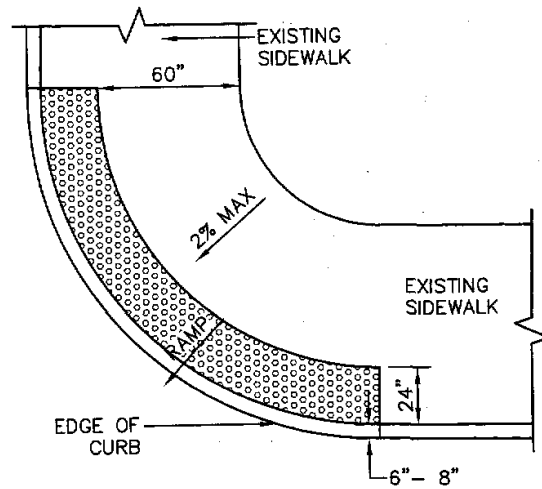
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

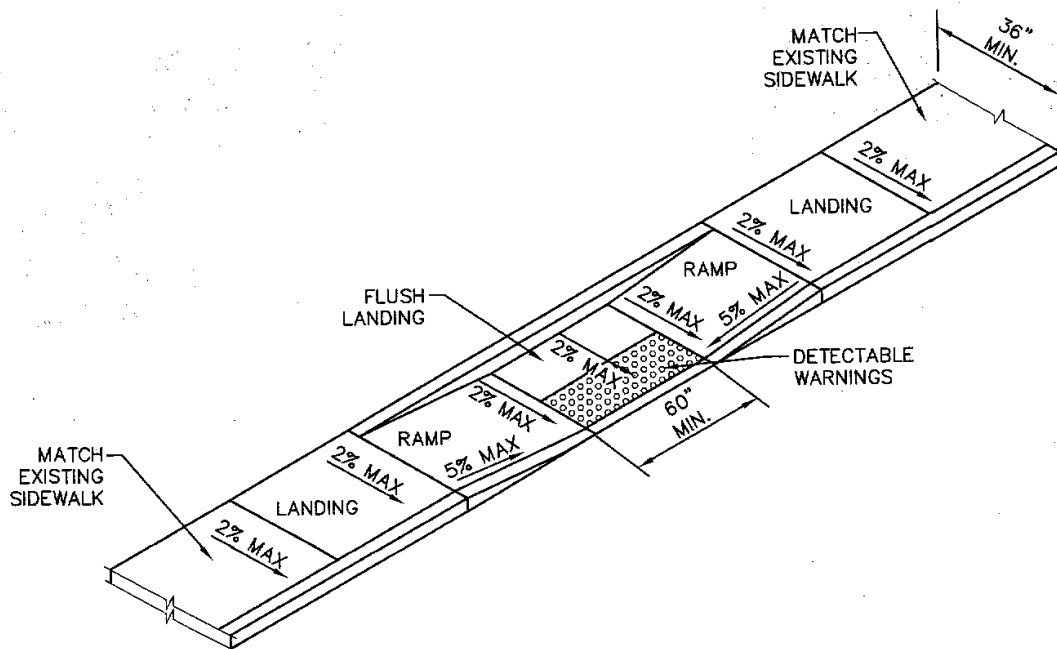
BACK TO TITLE INDEX PAGE



(SHARED CURB RAMP)



(BLENDED CURB)



(TRANSITION RAMP: ISOMETRIC VIEW OF A TRANSITION RAMP AS CURRENTLY DEFINED. THE ILLUSTRATION IS BASED ON THE OLD "PARALLEL" STYLE RAMP)



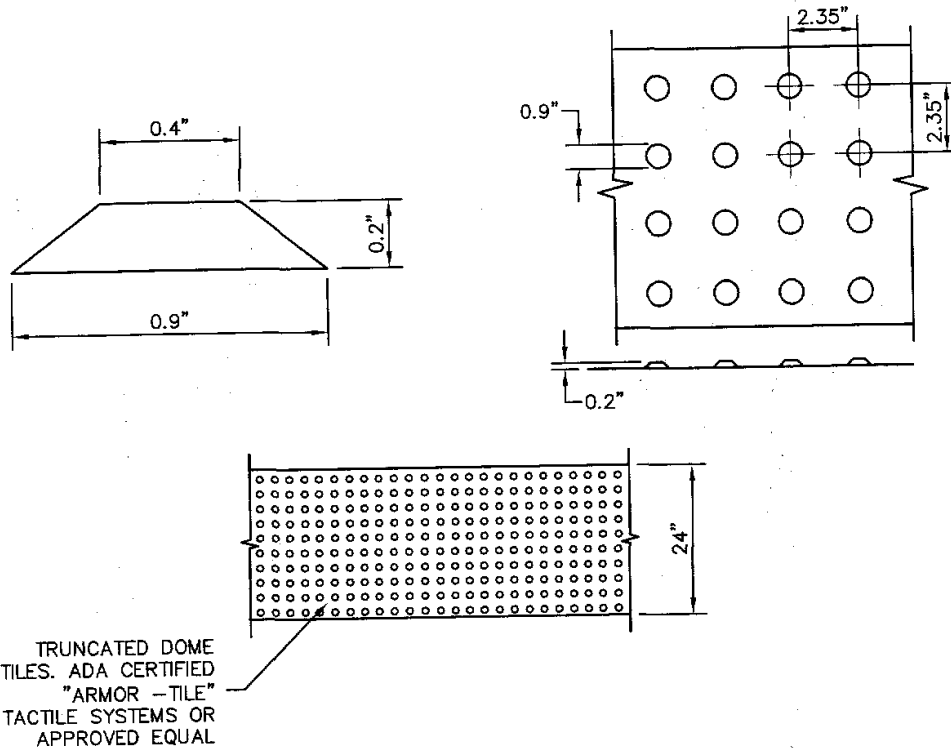
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

LOCATION OF  
DETECTABLE WARNINGS  
ON VARIOUS RAMPS  
6-27

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/I.R.

BACK TO TITLE INDEX PAGE



**DOMES SIZE AND SPACING.** TRUNCATED DOMES SHALL HAVE A DIAMETER OF NOMINAL 0.9 INCHES (23 mm) AT THE BOTTOM, A DIAMETER OF 0.4 INCH (10 mm) AT THE TOP, A HEIGHT OF NOMINAL 0.2 INCHES (5 mm), AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 INCHES (60 mm) MEASURED ALONG ONE SIDE OF A SQUARE ARRANGEMENT.

**DOMES ALIGNMENT.** DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES. DETECTABLE WARNING SURFACES SHALL EXTEND 24 INCHES (610 mm) MINIMUM IN THE DIRECTION OF TRAVEL AND THE FULL WIDTH OF THE CURB RAMP, LANDING, OR BLENDED TRANSITION.

**CONTRAST.** THERE SHALL BE A MINIMUM OF 70 PERCENT CONTRAST IN LIGHT REFLECTANCE BETWEEN THE DETECTABLE WARNING AND AN ADJOINING SURFACE, OR THE DETECTABLE WARNING SHALL BE "RED BRICK" COLOR, UNLESS OTHERWISE DIRECTED BY THE OWNER. THE MATERIAL USED TO PROVIDE VISUAL CONTRAST SHALL BE AN INTEGRAL PART OF THE DETECTABLE WARNING SURFACE. CONTRAST SHALL BE PROVIDED BY PLACING AND MIXING TINT IN THE PLASTIC CONCRETE USED FOR THE DETECTABLE WARNING SURFACE. NO PAINTING OF SURFACE SHALL BE PERMITTED.

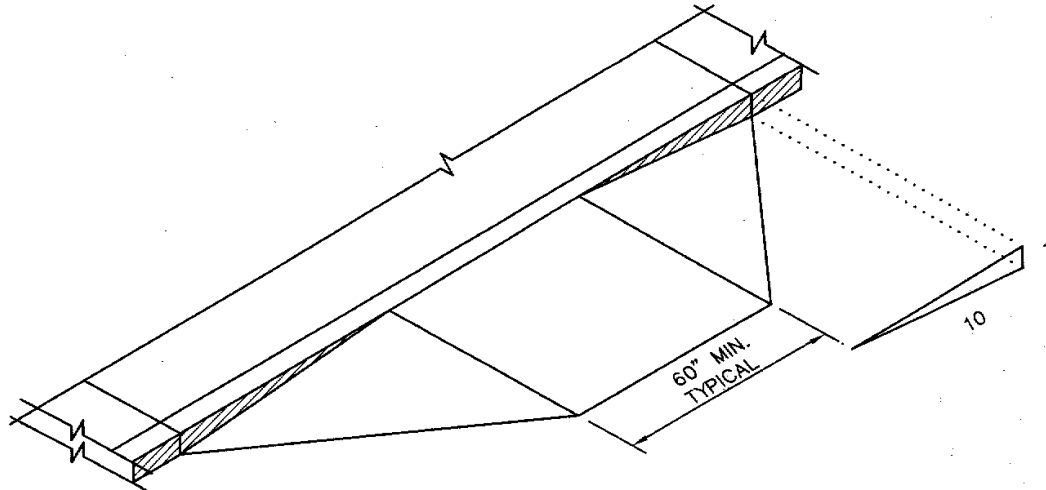


TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

DOMES SIZE AND SPACING  
6-28

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE



**SIDES OF CURB RAMPS.**

IF A CURB RAMP IS LOCATED WHERE PEDESTRIANS MUST TRAVEL ACROSS THE RAMP, OR WHERE IT IS NOT PROTECTED BY HANDRAILS OR GUARDRAILS, IT SHALL HAVE FLARED SIDES; THE MAXIMUM SLOPE OF THE FLARE SHALL BE 1:12. CURB RAMPS WITH RETURNED CURBS MAY BE USED WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP.

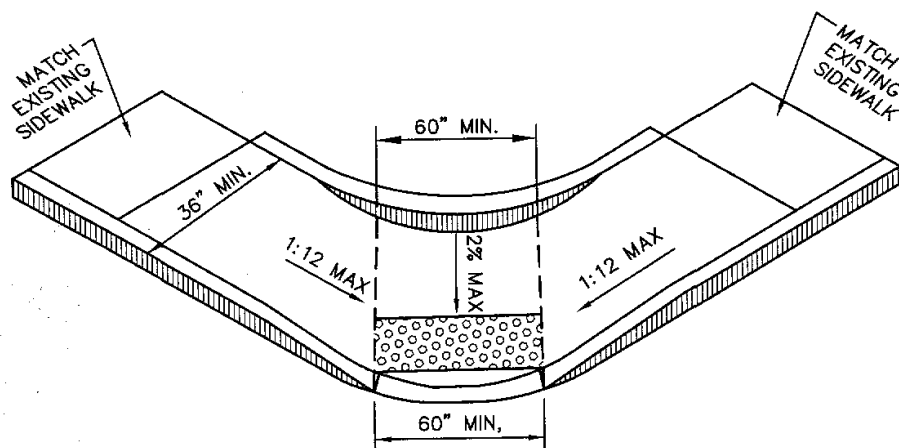


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BUILT-UP CURB RAMP  
6-29

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DIAGONAL SHARED RAMP  
6-30

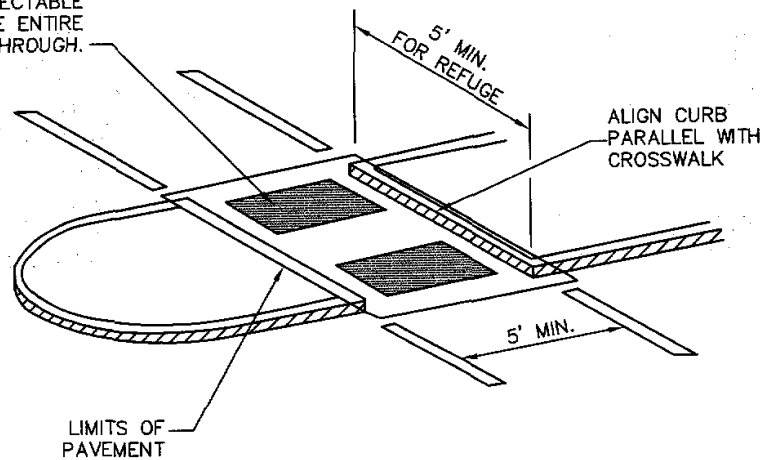
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.



BACK TO TITLE INDEX PAGE

2' STRIP IF CUT THROUGH IS  
GREATER THAN 4' IN LENGTH.  
OTHERWISE PLACE DETECTABLE  
WARNING ON THE ENTIRE  
SURFACE OF CUT THROUGH.



### CURB RAMPS AT MEDIAN ISLANDS

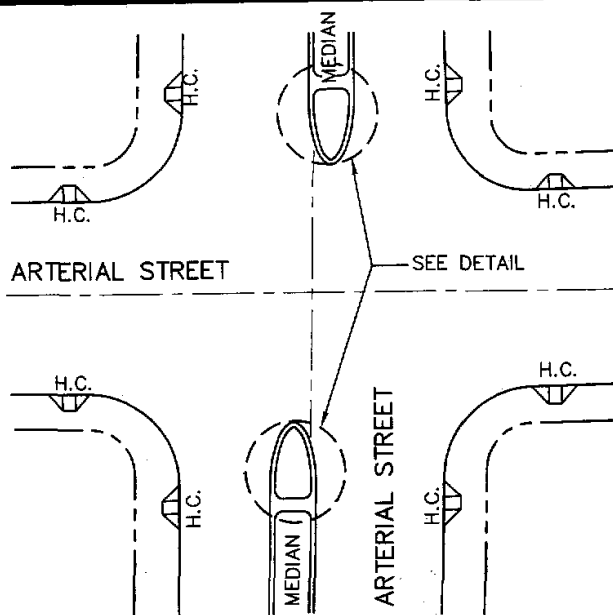


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

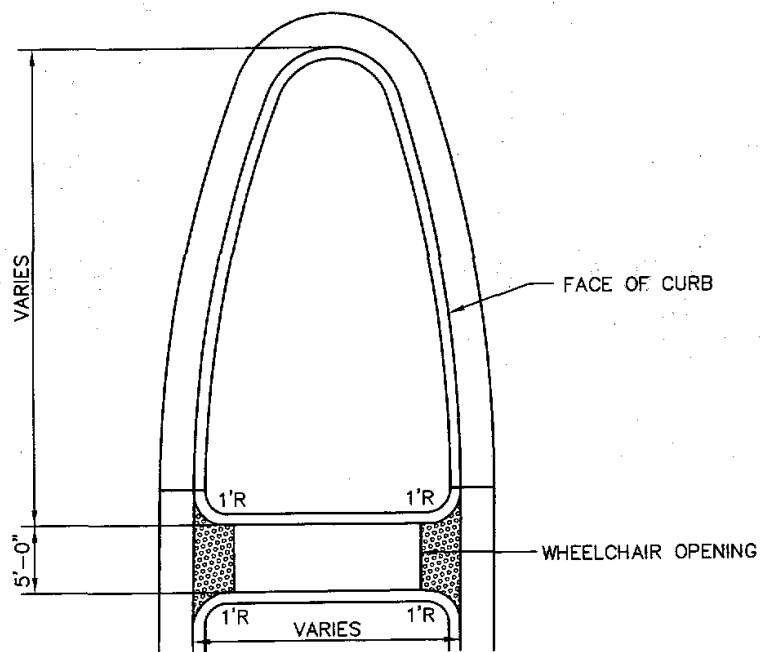
CURB RAMPS AT  
MEDIAN ISLANDS  
6-31

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE



**MEDIAN CURB RAMP DESIGN**  
ARTERIAL STREET

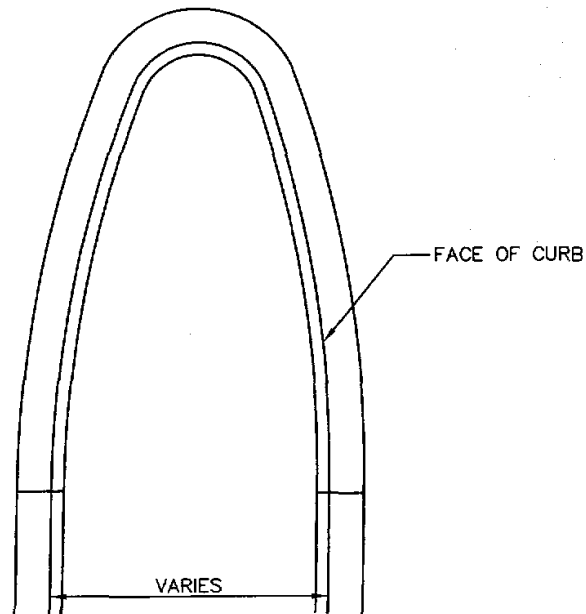
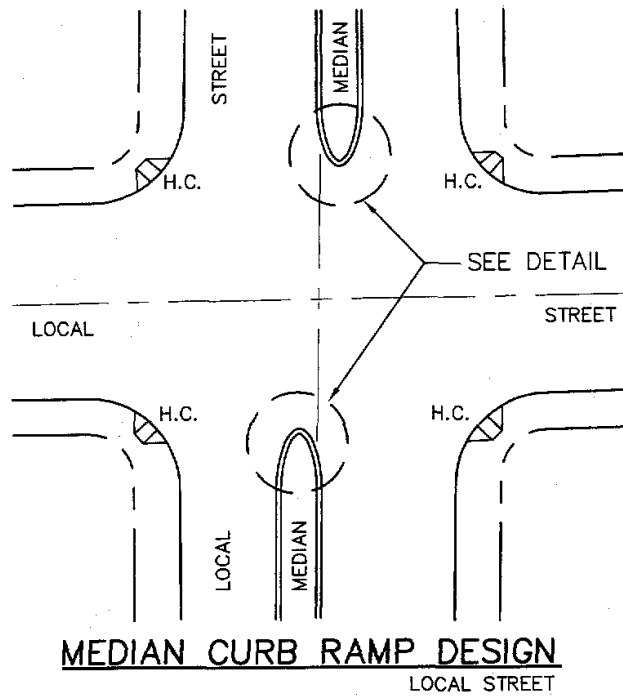


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MEDIAN CURB  
RAMP DESIGN  
(ARTERIAL)  
6-32

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MEDIAN CURB  
RAMP DESIGN  
(LOCAL)  
6-33

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

# SECTION 7

## SECTION 7

### SIGNAGE AND SIGNALIZATION

<u>TITLE</u>	<u>PAGE</u>
SPECIFICATIONS FOR ALUMINUM SIGN BLANKS.....	7-1 thru 7-2
9" STREET NAME SIGN EXTRUDED ALUMINUM SIGN BLANK.....	7-3
D.H.T. BLANK STANDARDS.....	7-4 thru 7-6
SPECIFICATIONS FOR REFLECTORIZED STREET NAME SIGNS.....	7-7 thru 7-8
9" STREET NAME SIGN.....	7-9
9" STREET NAME SIGN ASSEMBLY.....	7-10 thru 7-12
SIGN POST INSTALLATION.....	7-13
ALUMINUM SIGN CLAMP BRACKET FOR TRAFFIC CONTROL SIGNS.....	7-14
SIGN POST SPECIFICATIONS.....	7-15
BIKE LANE SIGNS AND MARKINGS.....	7-16
DEAD END SIGN.....	7-17A
GUARDRAIL SIGN ASSEMBLY AT DEAD END.....	7-17B
TYPICAL ELECTRIC RACEWAY TRENCH DETAIL.....	7-18
TRAFFIC SIGNAL CONDUIT LAYOUT (MAJOR-MAJOR).....	7-19
TRAFFIC SIGNAL CONDUIT LAYOUT (MAJOR-MINOR).....	7-20
TYPICAL TRAFFIC SIGNAL JUNCTION BOX.....	7-21
TYPICAL CUTS FOR CONDUIT PLACEMENT OF TRAFFIC SIGNALS.....	7-22
PROHIBITED PARKING SIGNAGE (FIRE LANE).....	7-23
NO PARKING FIRE LANE SIGN.....	7-24

[BACK TO SECTION INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 7  
TABLE OF  
CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

[BACK TO TITLE INDEX PAGE](#)

### SPECIFICATIONS FOR ALUMINUM SIGN BLANKS

THESE SPECIFICATIONS DESCRIBE DETAILS AND MINIMUM REQUIREMENTS FOR ALUMINUM SIGN BLANKS, TO WHICH REFLECTIVE SHEETING WILL BE APPLIED.

1. ALL MATERIALS SHALL BE NEW AND UNWEATHERED AND SHALL BE OF DOMESTIC ORIGIN, MILLED, ROLLED, AND FINISHED IN DOMESTIC MILLS.
2. SIGN BLANKS SHALL BE 0.080 GAUGE ALODIZED-TREATED ALUMINUM, 5052-H38 ALLOY, FREE OF BURRS, CORROSION, WHITE RUST, AND DIRT, SUITABLE FOR APPLICATION OF REFLECTIVE SHEETING WITHOUT FURTHER PREPERATION.
3. EDGES OF BLANKS SHALL BE CUT TRUE AND SQUARE. CORNER RADII, HOLE DIAMETERS AND HOLE LOCATIONS SHALL BE AS DESCRIBED IN THE ALUMINUM SIGN BLANK BID D.H.T. STANDARDS.
4. ALL SIGN BLANKS WILL BE TREATED AS FOLLOWS:

#### A. DEGREASING

- (1) VAPOR DEGREASING - BY TOTAL IMMERSION OF THE SIGN BLANK IN A SATURATED VAPOR OF TRICHLORETHYLENE OR PERCHLOROETHYLENE. TRADEMARK PRINTING SHALL BE REMOVED WITH LACQUER THINNER BEFORE DEGREASING.

OR

- (2) ALKALINE DEGREASING - BY TOTAL IMMERSION OF THE SIGN BLANK IN A TANK CONTAINING ALKALINE SOLUTIONS, CONTROLLED AND TITRATED TO THE SOLUTION MANUFACTURER'S SPECIFICATIONS FOR TIME, TEMPERATURE, AND CONCENTRATION. IMMERSION TIME SHALL DEPEND UPON THE AMOUNT OF SOIL PRESENT, GAUGE OF THE METAL AND SOLUTION STRENGTH. RINSE THOROUGHLY WITH RUNNING WATER.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SPECIFICATIONS FOR  
ALUMINUM SIGN BLANKS

7-1

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J.R.</u>



BACK TO TITLE INDEX PAGE

**B. ETCHING**

- (1) ACID ETCH - ETCH WELL IN 6-8% PHOSPHORIC ACID SOLUTION AT 100 DEGREES FAHRENHEIT OR PROPRIETARY ACID ETCHING SOLUTION. RINSE THOROUGHLY WITH RUNNING WATER .

OR

- (2) ALKALINE ETCH - ETCH WELL THE PRE-CLEANED ALUMINUM SURFACE IN AN ALKALINE ETCHING MATERIAL THAT IS CONTROLLED BY TITRATION. USE TIME, TEMPERATURE, AND CONCENTRATION SPECIFIED BY THE SOLUTION MANUFACTURER . RINSE THOROUGHLY. REMOVE SMUT WITH AN ACIDIC CHROMIUM COMPOUND-TYPE SOLUTION AS SPECIFIED BY THE SOLUTION MANUFACTURER AND THEN RINSE THOROUGHLY.

**C. CHROMATE CONVERSION COATING**

COAT THE ALUMINUM BLANKS ACCORDING TO THE CHROMATE CONVERSION COATING MANUFACTURER'S INSTRUCTIONS. THE COATING SHALL CONFORM TO ASTM B449, CLASS 2, AND SHALL RANGE IN COLOR FROM SILVERY IRIDESCENT TO PALE YELLOW. THE COATING WEIGHT SHALL BE 10 TO 35 MG. PER SQ. FT WITH A MEDIAN OF 25 MG. PER SQ. FT. AS THE OPTIMUM COATING WEIGHT.

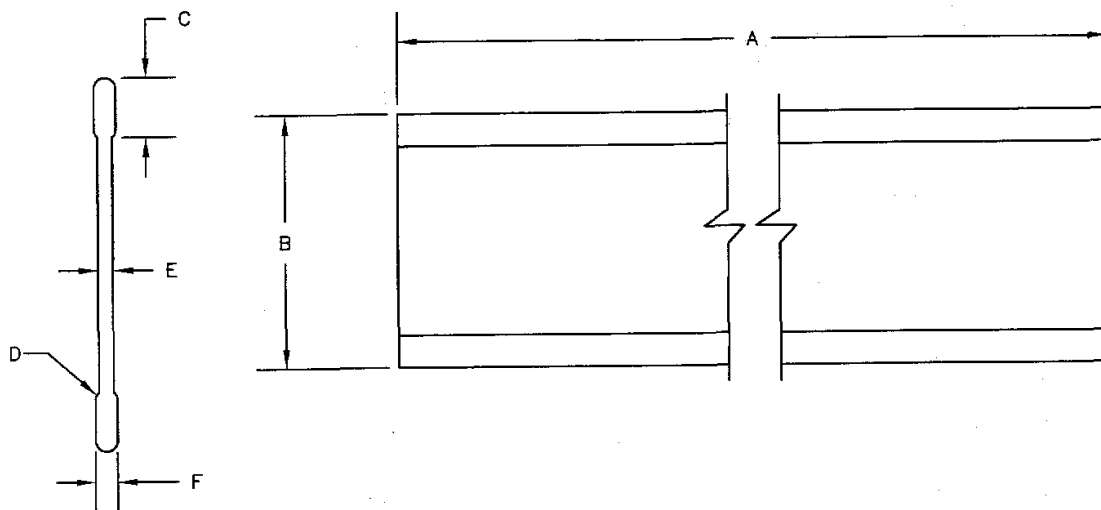


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SPECIFICATIONS FOR  
ALUMINUM SIGN BLANKS  
(continued)  
7-2

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE



**9" STREET NAME SIGN  
EXTRUDED ALUMINUM SIGN BLANK**

DIMENSIONS (INCHES)

A	B	C	D	E	F
30	9	0.800	1/4R	0.091	0.25
36	9	0.800	1/4R	0.091	0.25
42	9	0.800	1/4R	0.091	0.25
48	9	0.800	1/4R	0.091	0.25



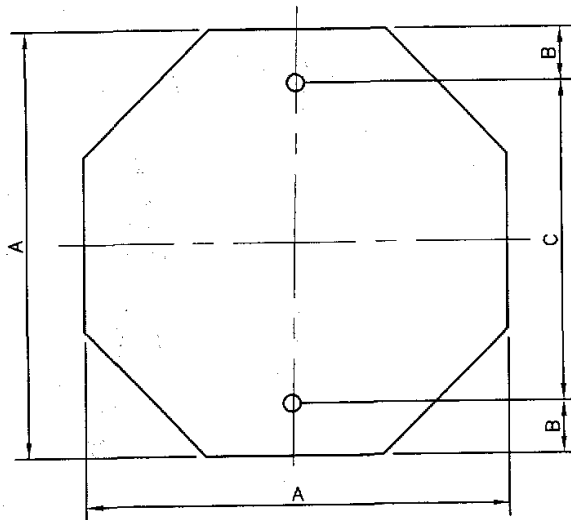
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

9" STREET NAME SIGN  
EXTRUDED ALUMINUM  
SIGN BLANK  
7-3

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.

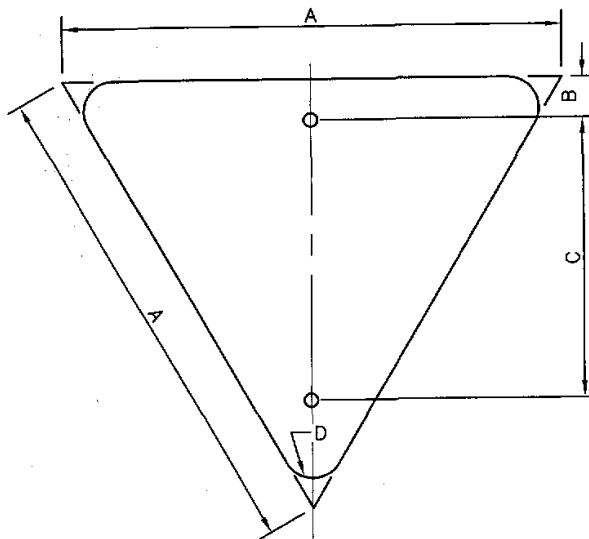
BACK TO TITLE INDEX PAGE



3/8" HOLE DIA.

A	B	C
24	3	18
30	3	24
36	3	30

**OCTAGON**  
N.T.S.



3/8" HOLE DIA.

A	B	C	D
36	3	21	2
42	3	24	2 1/2
48	3	35	3

**EQUILATERAL TRIANGLE**  
N.T.S.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

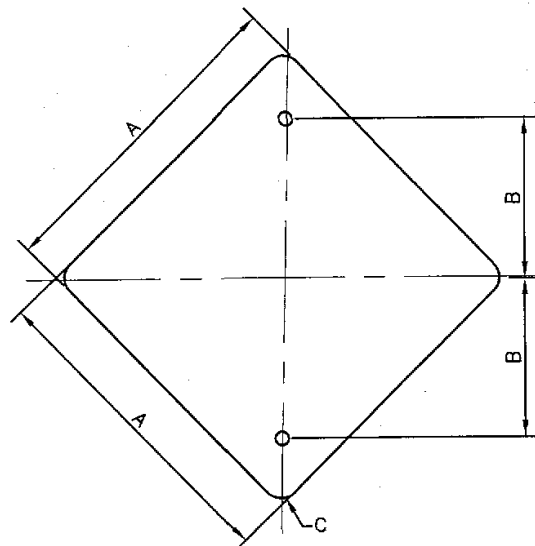
D.H.T. BLANK  
STANDARDS

7-4

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

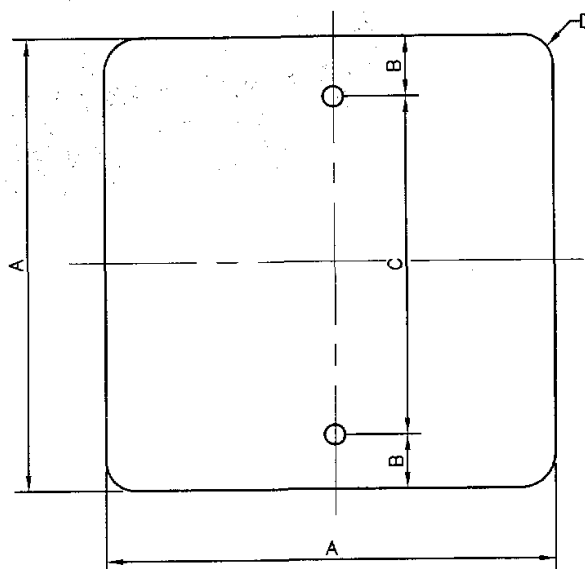
BACK TO TITLE INDEX PAGE



3/8" HOLE DIA.

A	B	C
24	12	1 1/2
30	15	1 7/8
36	18	2 1/4

**DIAMOND**  
N.T.S.



3/8" HOLE DIA.

A	B	C	D
9	1	7	—
12	3	6	1 1/2
18	3	12	1 1/2
24	3	18	1 1/2
30	3	24	1 7/8
36	3	30	2 1/4

**SQUARE**  
N.T.S.



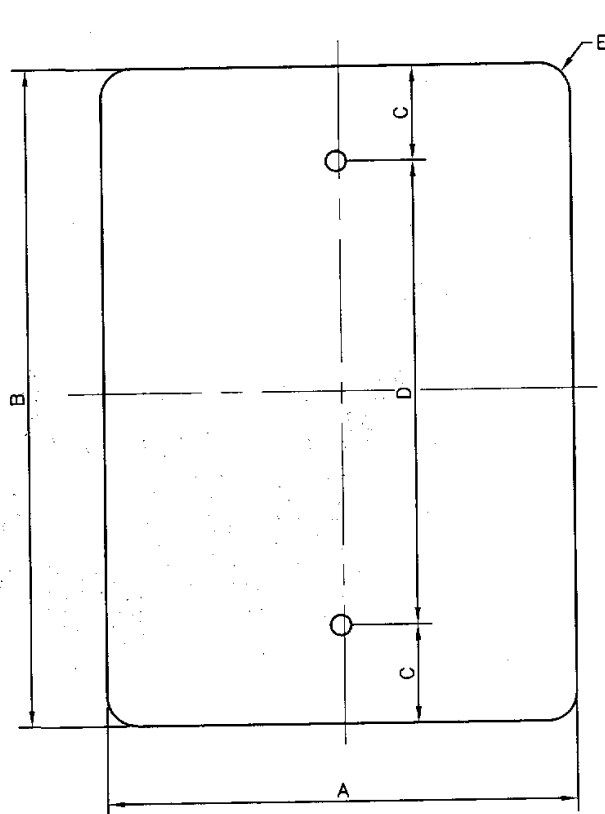
TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
FOR CONSTRUCTION**

D.H.T. BLANK  
STANDARDS  
(continued)  
7-5

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J.R.

BACK TO TITLE INDEX PAGE



3/8" HOLE DIA.

A	B	C	D	E
9	12	3	6	1 1/2
10	18	2	14	1 1/2
10	27	2	23	1 1/2
10	36	2	32	1 1/2
12	18	1-1/2	15	1 1/2
12	24	2	20	1 1/2
12	30	1-1/8	27-3/4	1 1/2
12	36	2	32	1 1/2
12	48	2	44	1 1/2
18	24	3	18	1 1/2
18	30	1-1/2	27	1 1/2
24	30	3	24	1 1/2
24	36	3	30	1 1/2
24	48	3	42	1 1/2
30	36	3	30	1 7/8
30	42	3	36	1 7/8

**VERTICAL RECTANGLE**  
N.T.S.



TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS**  
**FOR CONSTRUCTION**

D.H.T. BLANK  
STANDARDS  
(continued)  
7-6

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

[BACK TO TITLE INDEX PAGE](#)

CITY OF EL PASO  
SPECIFICATIONS FOR REFLECTORIZED  
STREET NAME SIGNS

1. COLOR OF SIGNS : THE FINISHED SIGN MUST HAVE A REFLECTORIZED GREEN BACKGROUND. THE GREEN MUST CONFORM WITH THE BUREAU OF PUBLIC ROADS HIGHWAY GREEN. THE LEGEND MUST BE REFLECTORIZED SILVER WHITE (GREEN REVERSE SCREENED BACKGROUND WITH SILVER COPY).
2. LETTER DESIGN: THE LETTERING OF ALL LEGENDS MUST BE UPPER CASE LETTERS IN ACCORDANCE WITH "STANDARD ALPHABETS FOR HIGHWAY SIGNS" PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
3. LETTER SPACING: THE CONTROL FOR THE SPACING VALUES IN TRAFFIC LAYOUT IS THE DISTANCE RECOGNIZED AS AESTHETIC SPACING BETWEEN TWO STRAIGHT LETTERS (HN). A SPACING CONTROL OF TWO TIMES THE WIDTH OF THE STROKE OF THE LETTER SERIES TO BE USED MUST BE THE AESTHETIC CONTROL (100%). TWO AND ONE-HALF TIMES (2-1/2) THIS CONTROL MUST BE USED AS THE AESTHETIC WORD SPACE BETWEEN ELEMENTS IN THE PRIMARY LEGEND.
4. LAYOUT: THE MAXIMUM NUMBER OF LETTERS TO BE ACCOMMODATED ON A GIVEN LENGTH STREET NAME FACE MUST BE DETERMINED BY THE WIDEST LETTER SERIES POSSIBLE FOR THAT LEGEND AND THE SPACING CONTROL (100%) FOR THE SERIES USED MUST BE EXPANDED OR CONDENSED UP TO 25% IN 5% INCREMENTS.
5. THE SPACING CONTROL (100%) FOR THE SERIES USED MUST BE EXPANDED OR CONDENSED UP TO 25% IN 5% INCREMENTS FOR THE END MARGIN WITH MINIMUM OF 1".
6. THE WORD SPACE MUST BE EXPANDED UP TO 25% IN 5% INCREMENTS BUT NOT CONDENSED.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SPECIFICATIONS FOR  
REFLECTORIZED  
STREET NAME SIGNS  
7-7

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J.R.



BACK TO TITLE INDEX PAGE

7. SPACE BETWEEN PRIMARY AND BLOCK NUMBER AREA MUST BE 1/2 THE AESTHETIC WORK SPACE USED IN THE PRIMARY LEGEND.
8. SUFFIX LETTER SIZE FOR ALL LENGTHS MUST BE 2" CAPITALS, "C" SERIES, EXCEPT THAT SERIES "A" OR "B" WHERE SUFFIX ABBREVIATION EXCEEDS TWO LETTERS, MAY BE USED.
9. SIZE OF LEGEND: FOR 9" STREET NAME SIGNS, THE PRIMARY LEGEND, OR STREET NAME MUST HAVE CAPITAL LETTERS SIX INCHES (6") HIGH AND ALL SECONDARY LEGENDS, INCLUDING THE SUFFIX, BLOCK NUMBERS, MUST HAVE UPPER CASE LETTERS TWO AND ONE-HALF INCHES (2 1/2") HIGH.
10. SUFFIX LETTER SIZE FOR ALL LENGTHS MUST BE 2 1/2" CAPITALS, "C" SERIES, EXCEPT THAT SERIES "A" OR "B" WHERE SUFFIX ABBREVIATION EXCEEDS TWO LETTERS, MAY BE USED.
11. POSITION OF LEGEND: EACH SIGN FACE WILL CONSIST OF THE STREET NAME, SUFFIX, AND TWO ZEROS OF THE BLOCK NUMBER. THE ADDITIONAL NUMBERS OF THE BLOCK NUMBER WILL BE APPLIED BY THE CITY OF EL PASO. THE SUFFIX WILL BE LOCATED IN THE UPPER RIGHT CORNER AND THE BLOCK NUMBER IN THE LOWER RIGHT CORNER OF THE SIGN FACE AND THE STREET NAME CENTERED IN THE REMAINING SPACE.
12. SIGN FABRICATION: THE SIGN FACE MUST BE FABRICATED BY REVERSE SCREENING GREEN TRANSPARENT COLOR OVER SILVER REFLECTIVE SHEETING. TRANSPARENT PROCESS COLORS MUST BE AS RECOMMENDED BY THE SHEETING MANUFACTURER. CUT-OUT OR APPLIED LEGENDS ARE NOT PERMITTED. SIGN FACES MUST BE COMPRISED OF ONE PIECE OR PANEL OF REFLECTIVE SHEETING.
13. TYPE OF SHEETING: ENGINEER GRADE REFLECTIVE SHEETING MUST BE USED IN THE FABRICATION OF THE STREET NAME SIGN FACES.



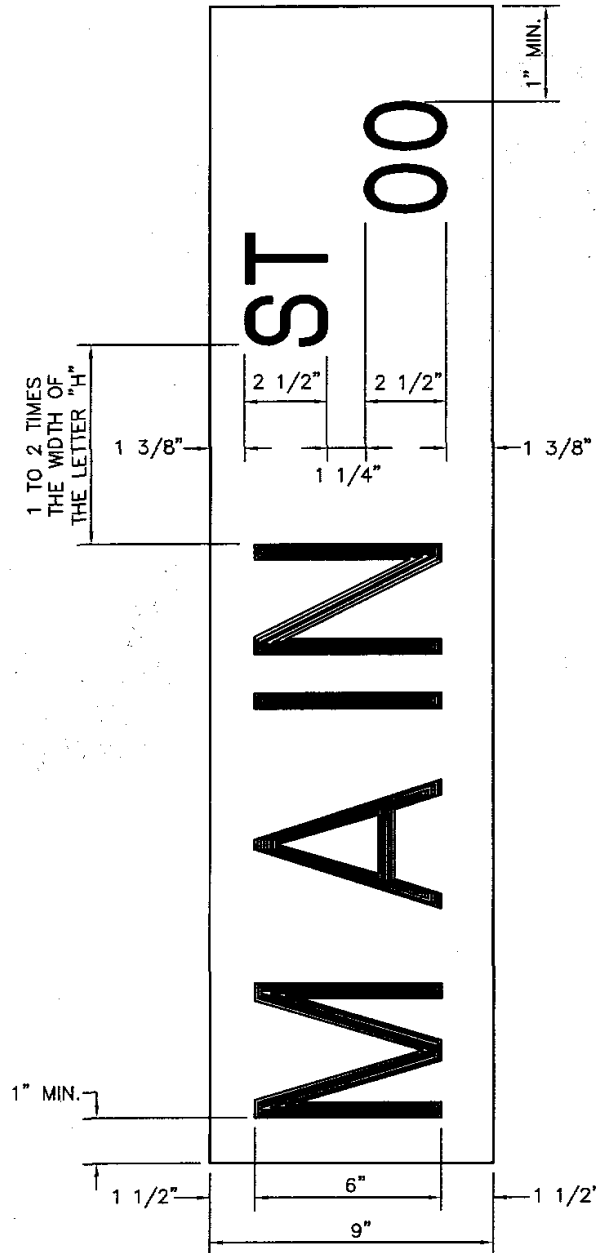
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SPECIFICATIONS FOR  
REFLECTORIZED  
STREET NAME SIGNS  
(continued)  
7-8

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE

CITY OF EL PASO  
LAYOUT FOR 9" STREET NAME SIGNS



SIGN CLASS	SIGN LENGTH	PRIMARY LETTERS SIZE & SERIES	SUFFIX & BLOCK NUMBER SIZE & SERIES
9" ARTERIAL STREETS	36"	6" C,D SERIES	3" C SERIES
	42"	6" C,D SERIES	3" C SERIES
	48"	6" A,B,C,D SERIES	3" C SERIES



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

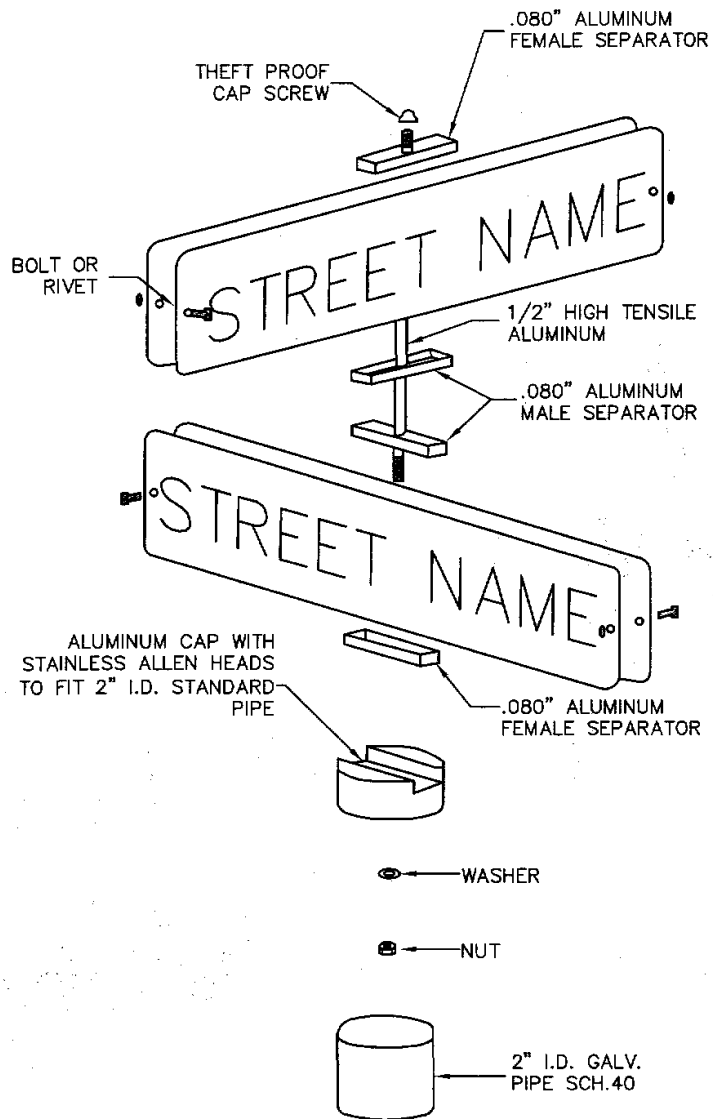
9" STREET NAME SIGN

7-9

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE



### 9" STREET NAME ASSEMBLY



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

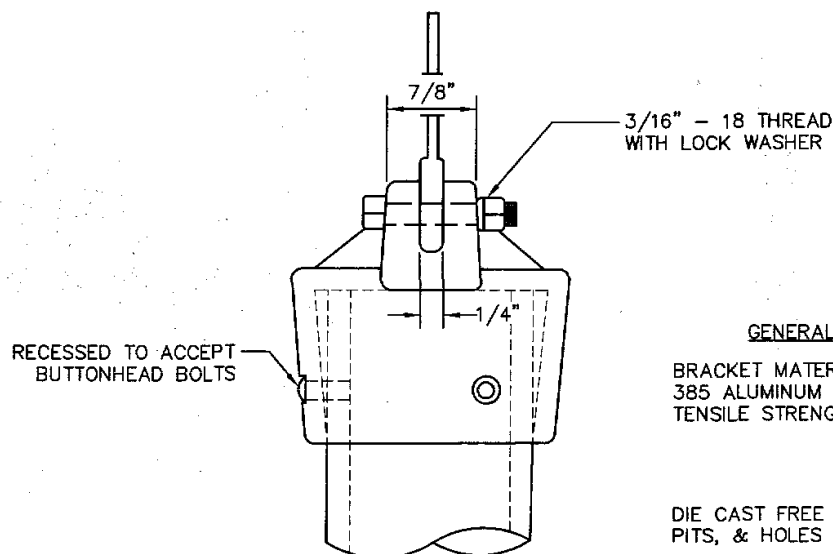
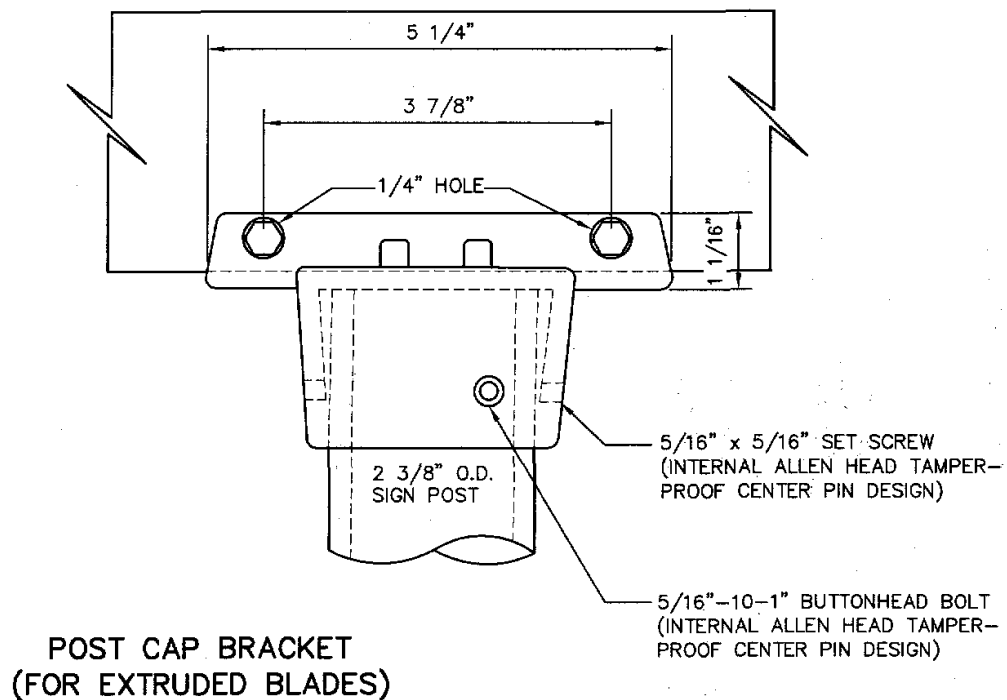
9" STREET NAME SIGN  
ASSEMBLY

7-10

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.

BACK TO TITLE INDEX PAGE



**GENERAL NOTES**

BRACKET MATERIALS TO BE  
385 ALUMINUM ALLOY  
TENSILE STRENGTH 4900 P.S.I.

DIE CAST FREE OF BURRS,  
PITS, & HOLES



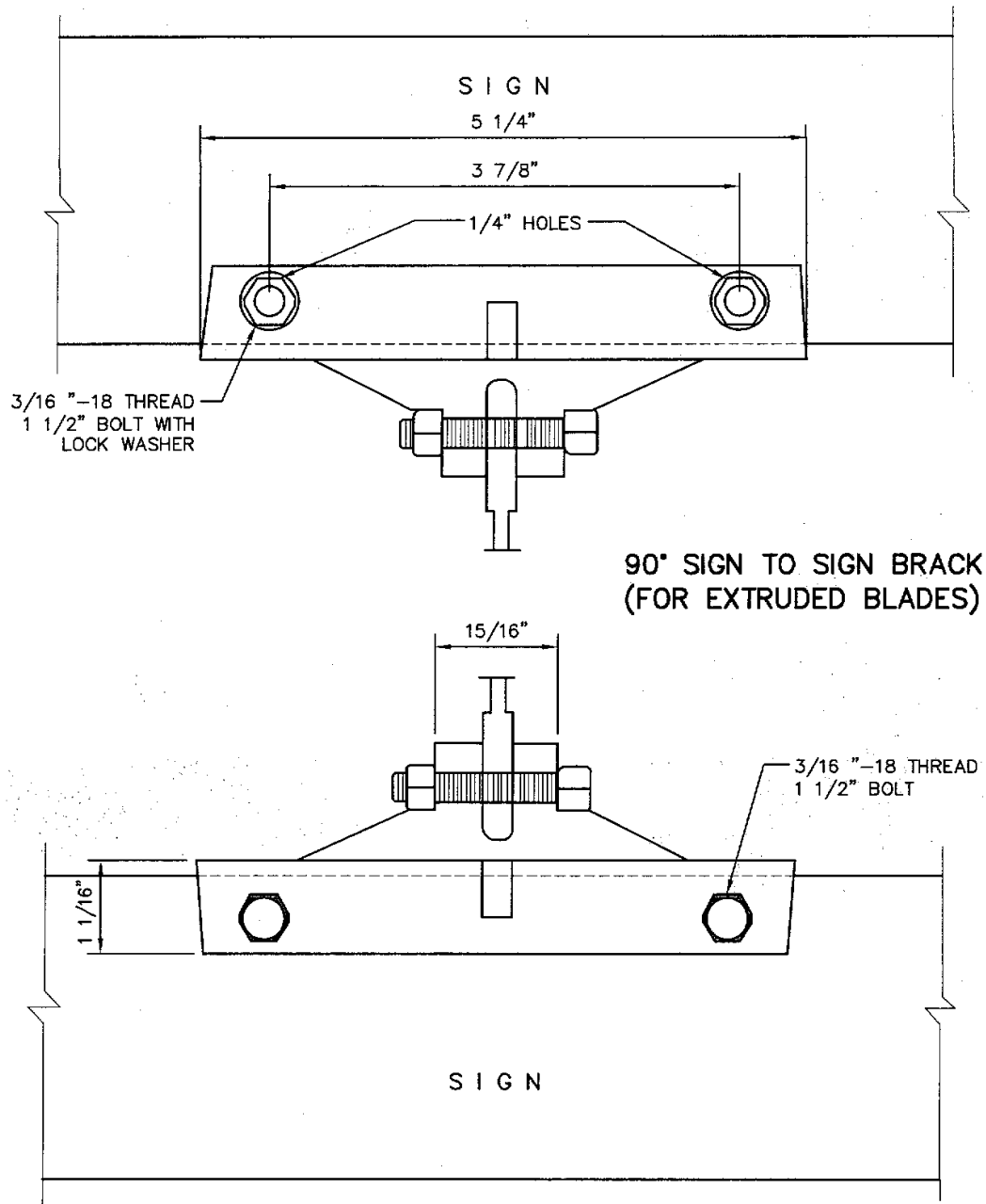
TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
FOR CONSTRUCTION**

**9" STREET NAME SIGN  
ASSEMBLY  
(continued)  
7-11**

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



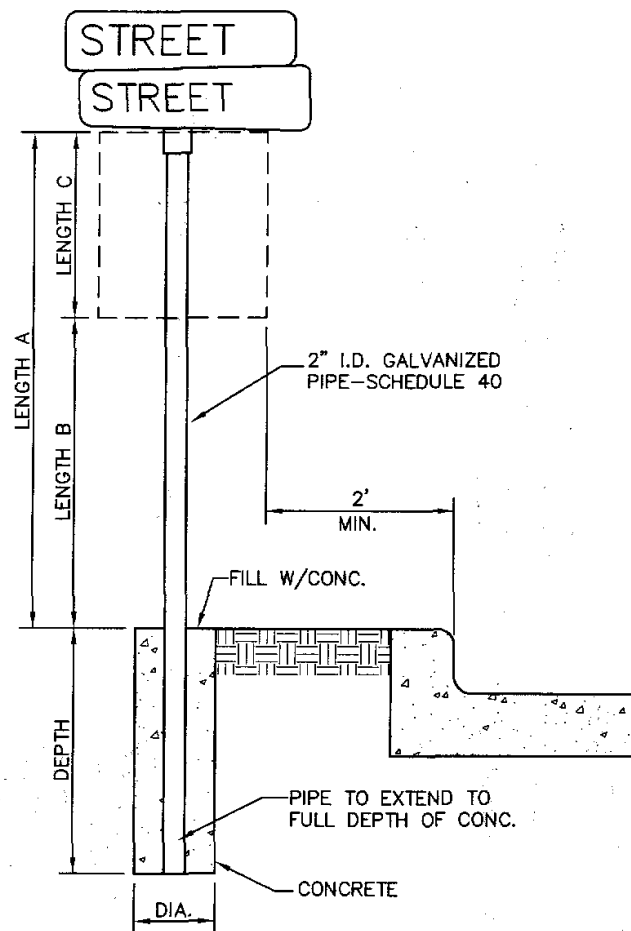
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

9" STREET NAME SIGN  
ASSEMBLY  
(continued)  
7-12

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE



DIA. = 8" MIN IN SOIL OR GRAVEL  
3" MIN. UNDER CONC SIDEWALK

### SIGN POST INSTALLATION

LENGTH A	LENGTH B	LENGTH C	DEPTH
10 FT	7 FT	LARGER THAN 24"	2 FT
9 FT	7 FT	SMALLER THAN 24"	1 1/2 FT



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SIGN POST INSTALLATION

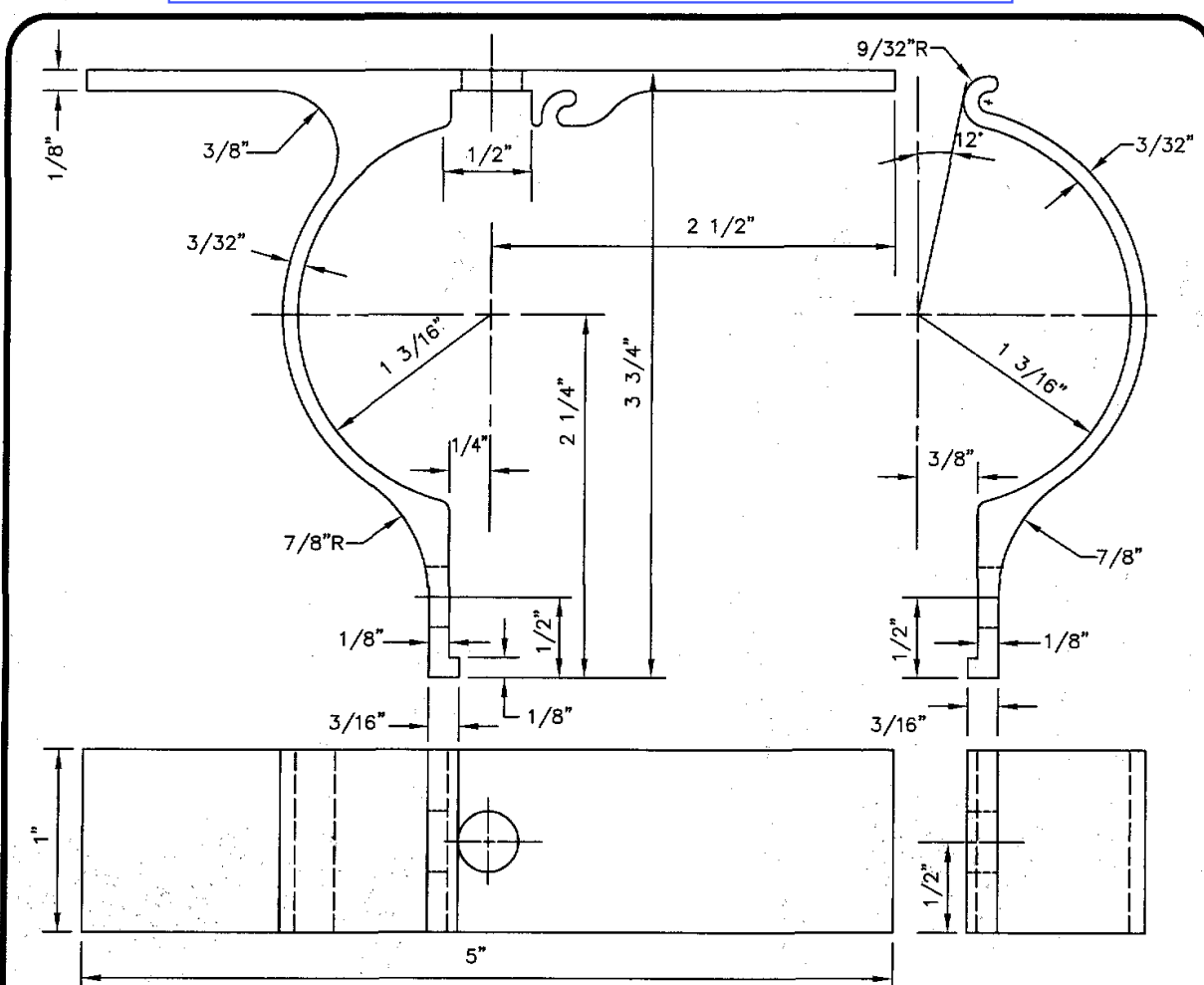
7-13

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC / J. R.



BACK TO TITLE INDEX PAGE



### ALUMINUM SIGN CLAMP BRACKET FOR TRAFFIC CONTROL SIGNS

#### NOTES:

N.T.S.

1. ALL HOLES  $3/8"$  PUNCH
2. FILLETS & ROUNDS  $1/16"=R$
3. FURNISH THE FOLLOWING HARDWARE FOR EACH BRACKET:
  - 1 -  $5/16" \times 3/4"$  BOLTS
  - 1 -  $5/16" \times 1 1/4"$  BOLT
  - 2 -  $5/16"$  NUTS & LOCK WASHERS
  - 2 - FLAT WASHERS
4. THE BRACKET IS TO BE MADE FROM HIGH STRENGTH ALUMINUM ALLOY. THE BRACKET IS TO EMPLOY AN EXTRUDED INTERLOCKING FEATURE OFFERING A RIGID MEANS OF ATTACHING A FLAT SIGN TO A STANDARD 2" (2/8" O.D.) TUBULAR POST.



TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

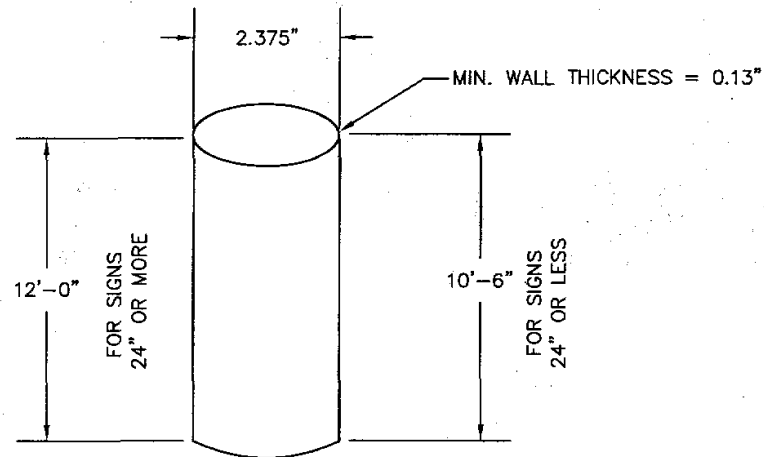
ALUMINUM SIGN CLAMP  
 BRACKET FOR TRAFFIC  
 CONTROL SIGNS  
 7-14

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QBC/I. R.

BACK TO TITLE INDEX PAGE

### SIGN POST SPECIFICATIONS



#### NOTES:

1. WELD ALONG ITS LENGTH TO FORM VIRTUALLY SEAMLESS.
2. POST SHALL BE HOT-DIPPED ZINC GALVANIZED UNIFORMLY ON THE OUTSIDE WITH A NOMINAL ZINC WEIGHT OF 1.0 OUNCE PER SQUARE FOOT.
3. THE ZINC COATING IS TO BE OVER-COATED WITH A CHROMITE CONVERSION AND ACRYLIC COATING TO PROVIDE RESISTANCE TO RUSTING AND CORROSION.
4. THE INSIDE OF THE POST SHALL BE COATED WITH AN ORGANIC MATERIAL FOR PROTECTION AGAINST RUST.
5. BOTH ENDS ARE TO BE SQUARELY CUT WITHOUT FLARE.
6. POST SHALL BE FREE OF WARPS, CORROSION, OR OTHER DEFECTS.
7. RING WELDS OR SPLICES WILL NOT BE ACCEPTABLE.
8. BENDING STRENGTH AS SPECIFIED BY AASHTO FOR SCHEDULE 40 PIPE.
9. POST SHALL BE BUNDLED WITH METAL STRAPS AND SHALL NOT EXCEED 37 POST PER BUNDLE.



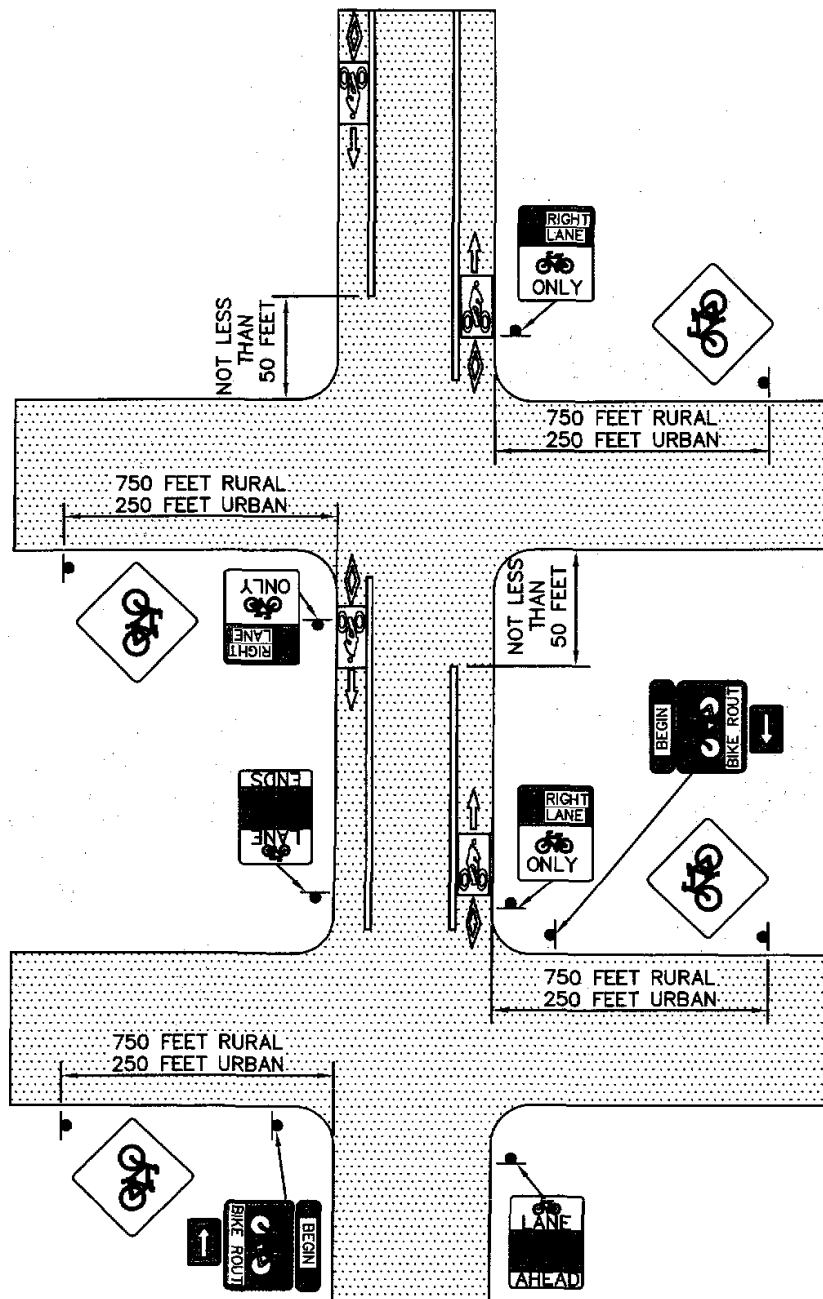
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SIGN POST  
SPECIFICATIONS  
7-15

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

**[BACK TO TITLE INDEX PAGE](#)**



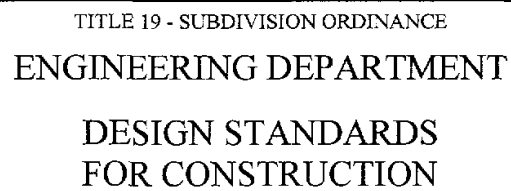
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

## BIKE LANE SIGNS AND MARKINGS

7-16

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

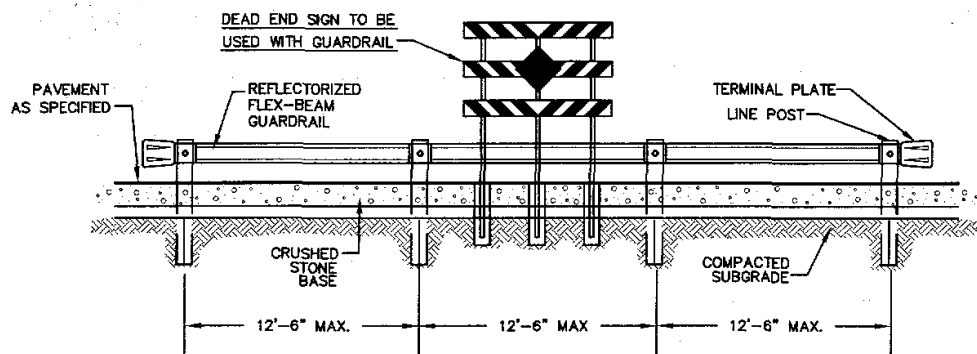
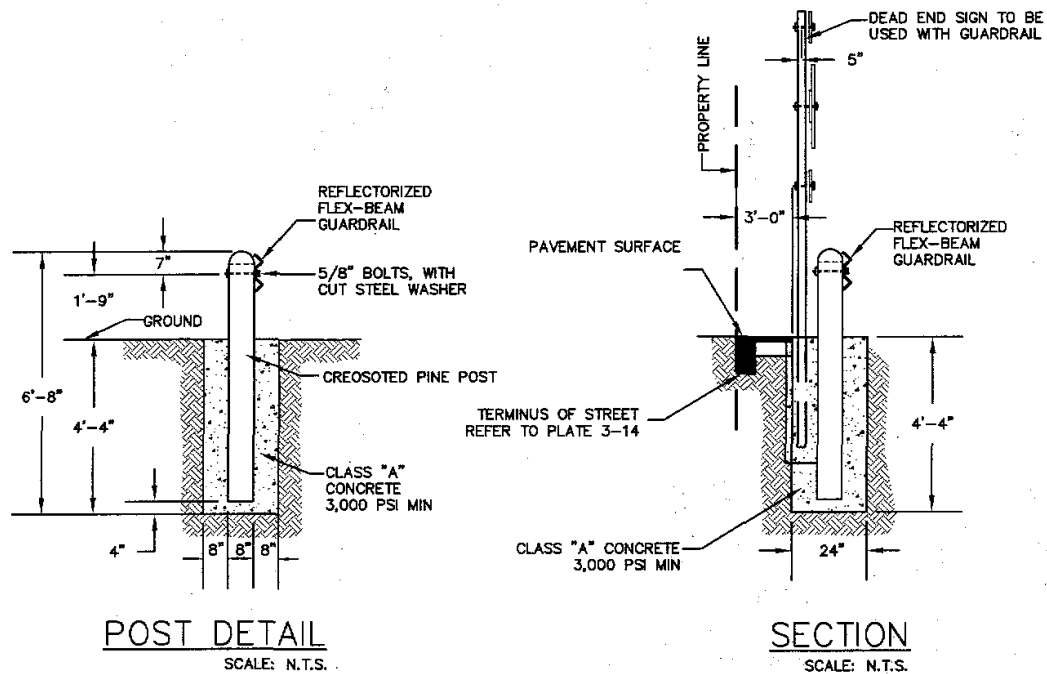
Checked By H. M. E.  
Drawn By QEC / J. R.



7-17A

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

GUARDRAIL SIGN  
ASSEMBLY AT DEAD END  
7-17B

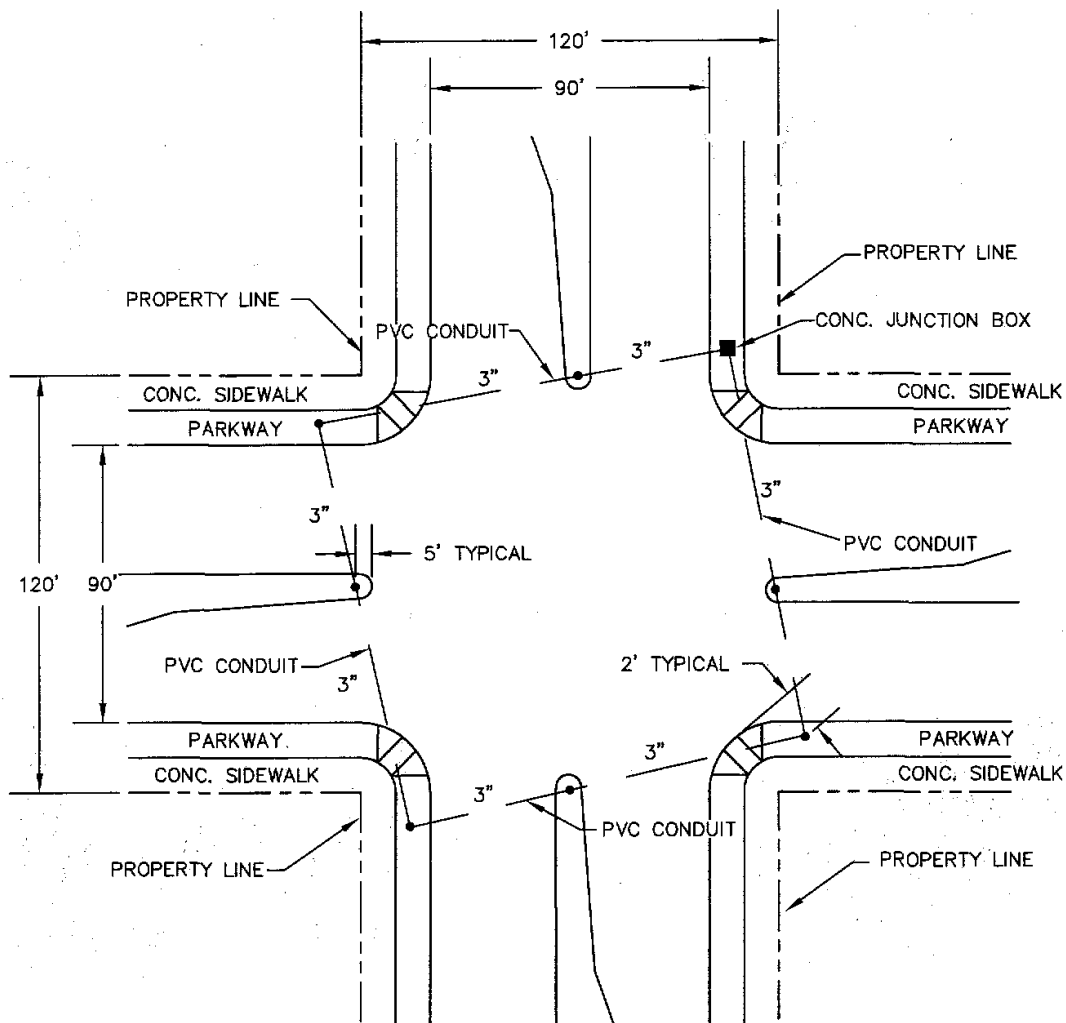
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.





BACK TO TITLE INDEX PAGE



NOTE:  
CONDUIT SHALL BE HIGH IMPACT  
P.V.C. - 3" SCHEDULE 40 AS  
PER CITY SPECIFICATIONS.

**TYPICAL INTERSECTION**  
MAJOR ARTERIAL - MAJOR ARTERIAL



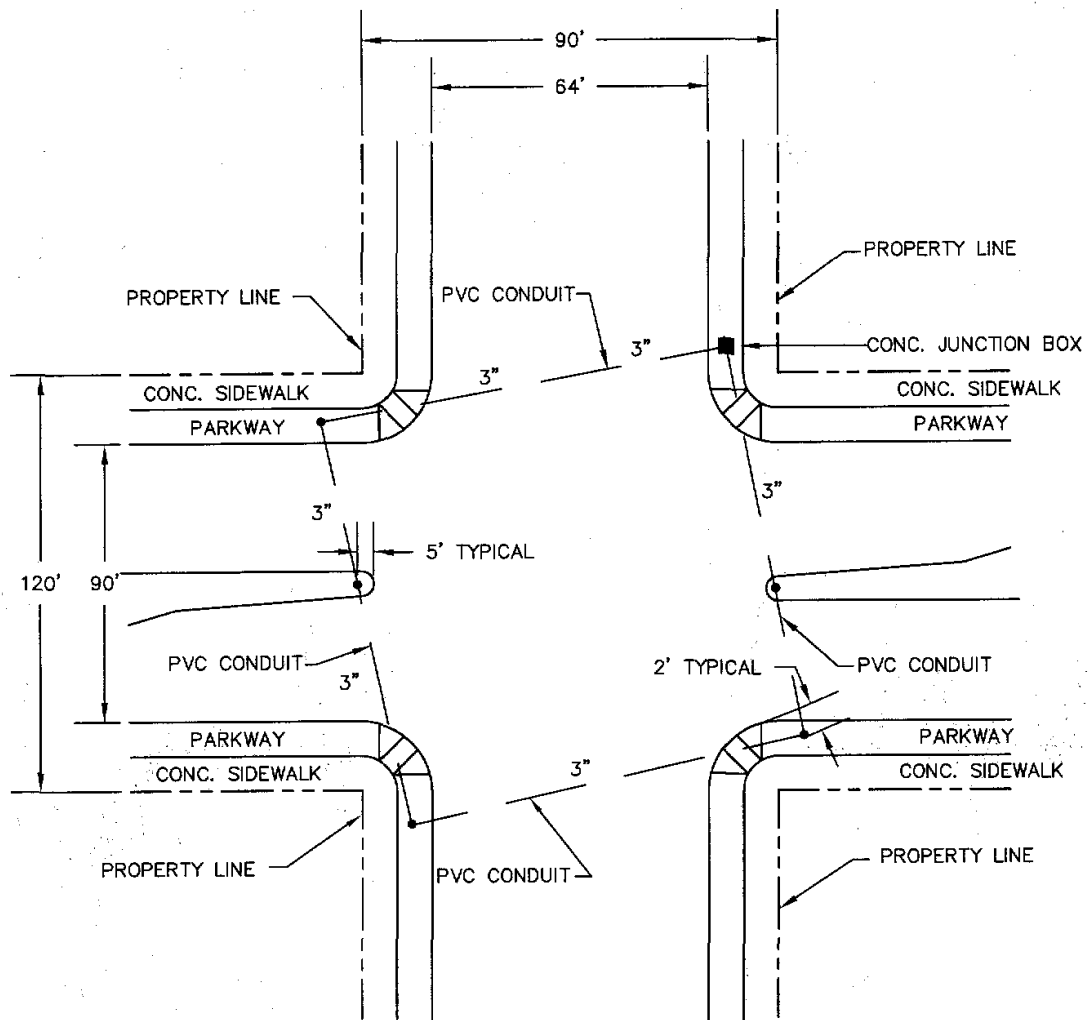
TITLE 19 - SUBDIVISION ORDINANCE  
**ENGINEERING DEPARTMENT**  
**DESIGN STANDARDS  
FOR CONSTRUCTION**

TRAFFIC SIGNAL  
CONDUIT LAYOUT  
(MAJOR-MAJOR)  
7-19

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



NOTE:  
CONDUIT SHALL BE HIGH IMPACT  
P.V.C. - 3" SCHEDULE 40 AS  
PER CITY SPECIFICATIONS.

### TYPICAL INTERSECTION

MAJOR ARTERIAL - MINOR ARTERIAL



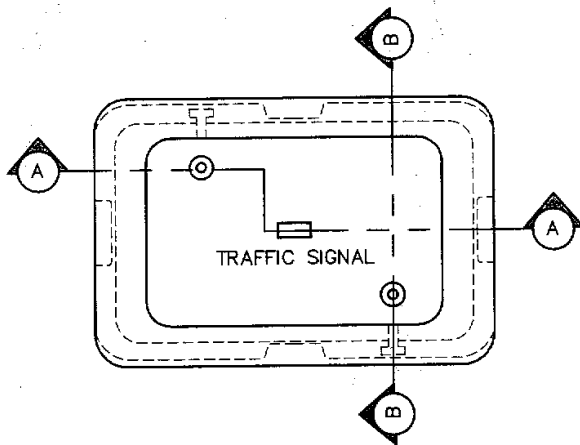
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TRAFFIC SIGNAL  
CONDUIT LAYOUT  
(MAJOR-MINOR)  
7-20

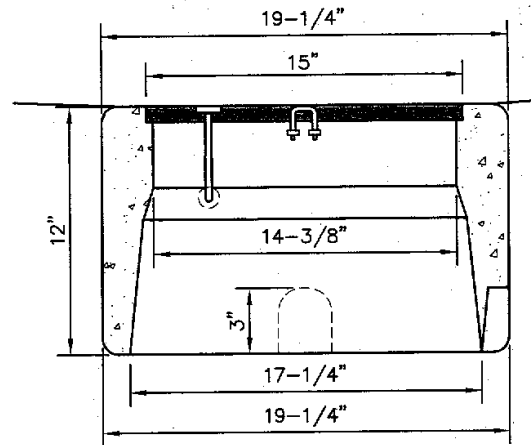
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

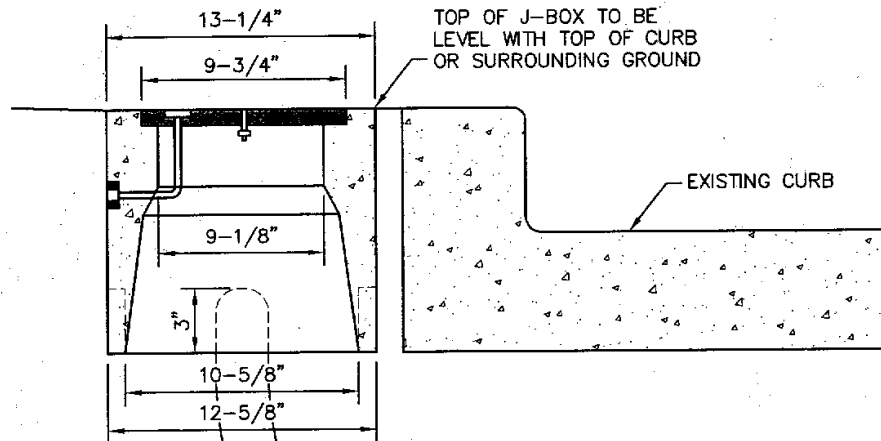
BACK TO TITLE INDEX PAGE



PLAN VIEW



SECTION A-A



SECTION B-B

NOTE:  
PROPOSED J-BOXES TO BE  
PLACED EVERY 150 FEET  
UNLESS OTHERWISE SPECIFIED  
BY ENGINEER.

PROPOSED 3" P.V.C. ELBOW W/  
90° BEND AT 18" RADIUS

### TYPICAL JUNCTION BOX



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT

DESIGN STANDARDS  
FOR CONSTRUCTION

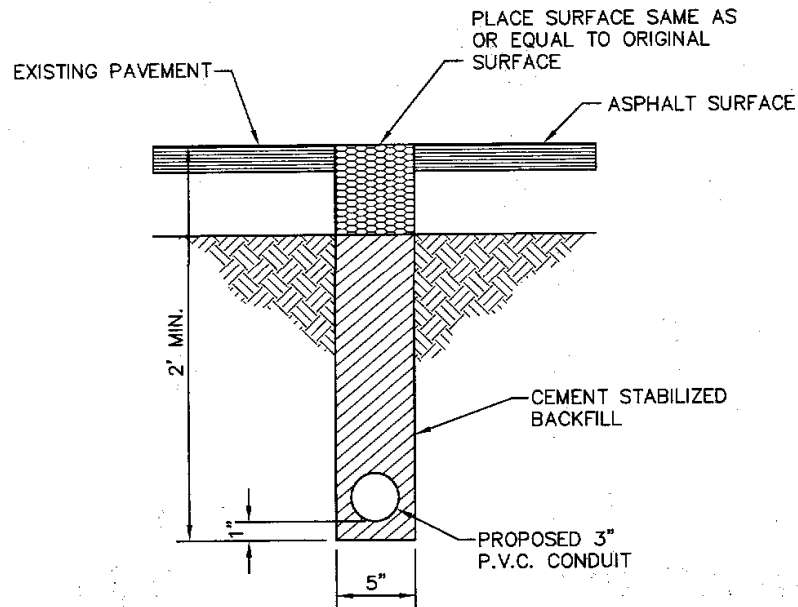
TYPICAL TRAFFIC SIGNAL  
JUNCTION BOX

7-21

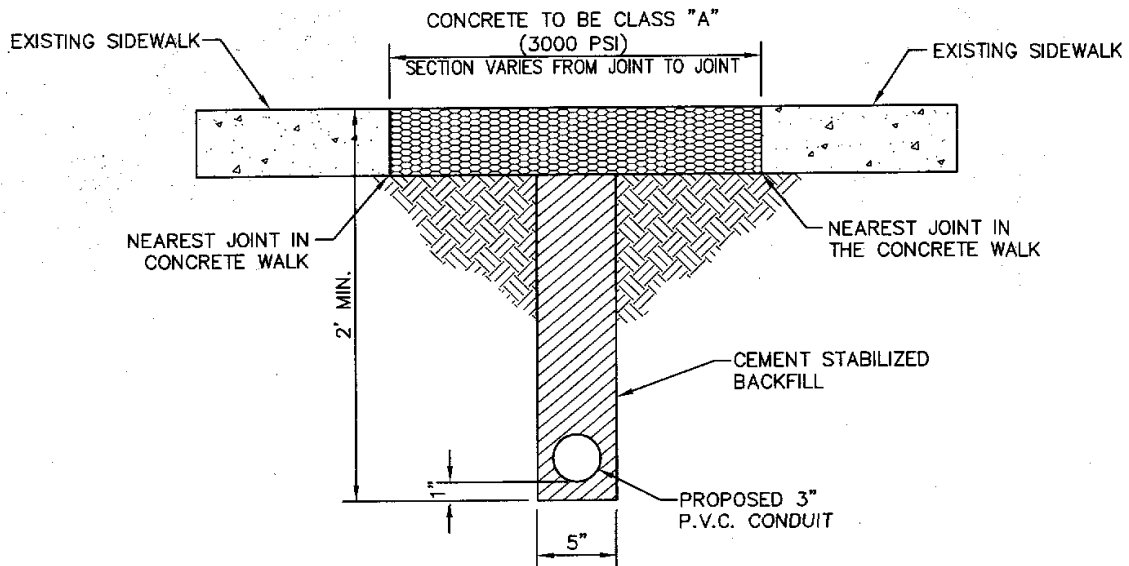
Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE



PAVEMENT CUT FOR CONDUIT PLACEMENT



SIDEWALK CUT FOR CONDUIT PLACEMENT

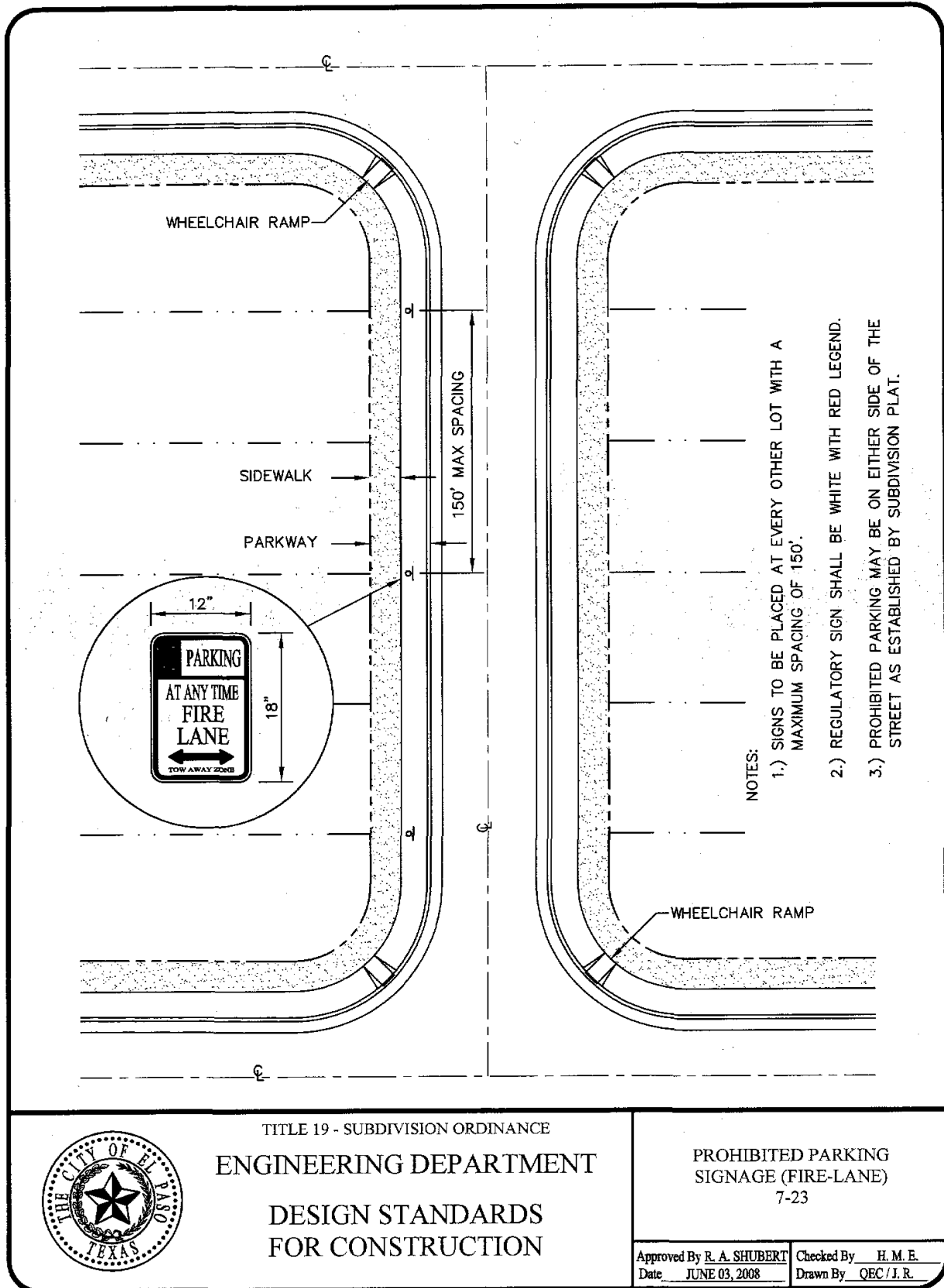


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TYPICAL CUTS FOR  
CONDUIT PLACEMENT OF  
TRAFFIC SIGNALS  
7-22

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC/J.R.</u>

BACK TO TITLE INDEX PAGE







## SECTION 8

## SECTION 8

### STREET LIGHTING

<u>TITLE</u>	<u>PAGE</u>
RESIDENTIAL STREET LIGHTING.....	8-1
RESIDENTIAL STREET LIGHT WOOD POLE.....	8-2
RESIDENTIAL STREET LIGHT WOOD POLE (connection to service enclosure).....	8-3
RESIDENTIAL STREET LIGHTING MATERIAL LIST.....	8-4
RESIDENTIAL STREET LIGHT STEEL POLE.....	8-5 thru 8-6

[BACK TO SECTION INDEX PAGE](#)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 8  
TABLE OF  
CONTENTS

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

**BACK TO TITLE INDEX PAGE**

*The Subdivider shall furnish and install street lights along all public and private streets, whether within the corporate limits or within the extraterritorial jurisdiction. Such street lights shall comply with the City of El Paso lighting ordinance found at Chapter 18.18 of the El Paso Municipal Code. The following standards shall apply in determining the number of street lights required, and are based on approved standards of the American National Standards Institute and the Illuminating Engineering Society of North America, a copy of which is maintained by the City Engineer:*

<b>Street Type</b>	<b>Required Spacing</b>	<b>Pole Type</b>	<b>Lamp Type</b>	<b>Height</b>
Local streets	At intervals of not more than three hundred feet (300')	Wood or Metal	100 watt high pressure sodium	30 feet
Collector arterials	At intervals of not more than three hundred feet (300')	Wood or Metal	100 watt high pressure sodium	30feet



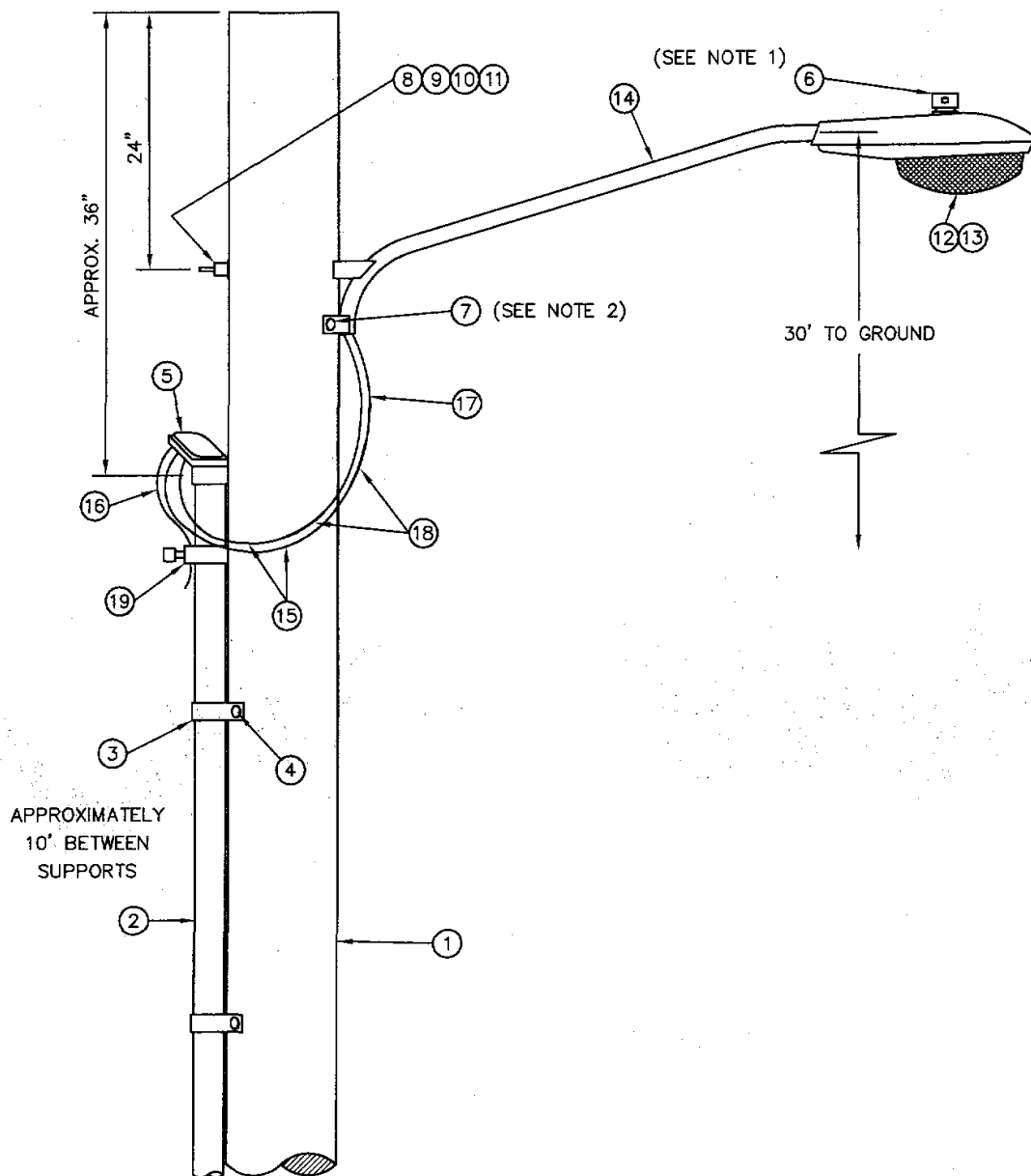
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

RESIDENTIAL STREET  
LIGHTING  
8-1

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



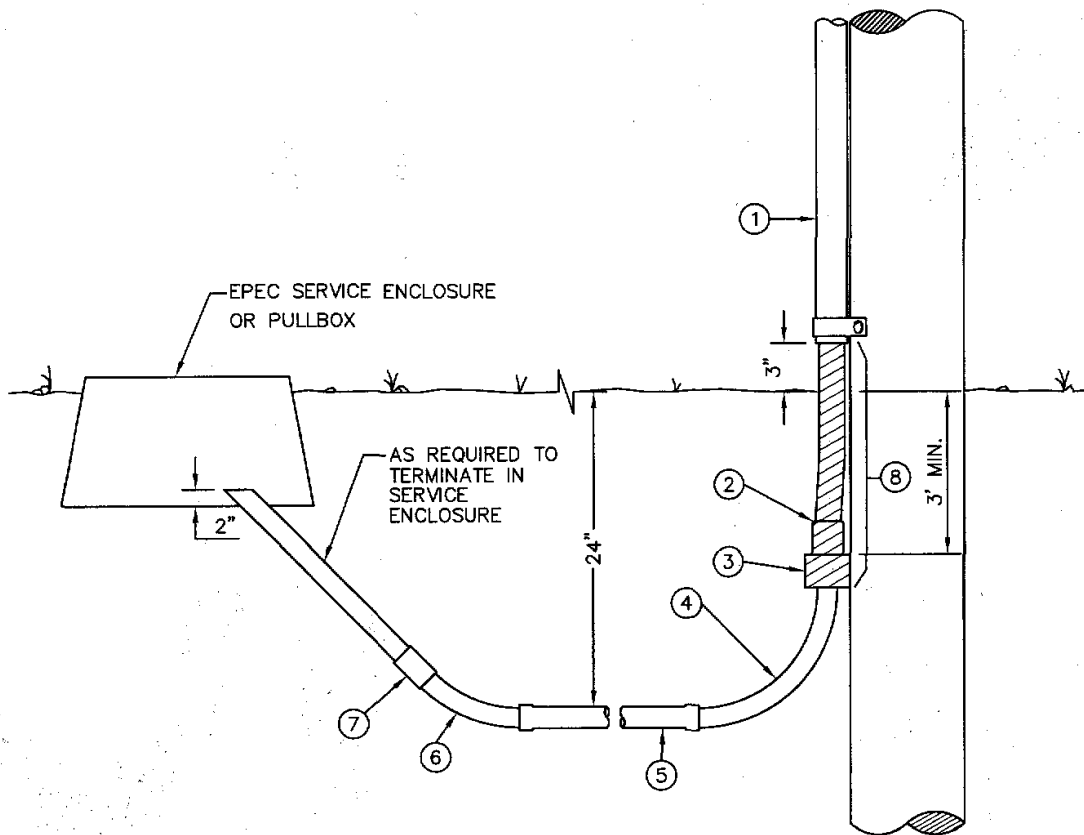
TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

RESIDENTIAL  
 STREET LIGHT WOOD POLE  
 8-2

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE



KEY NOTES:

1. 1/2" GALVANIZED RIGID CONDUIT
2. REDUCER 1" TO 1/2" BUSHING
3. 1" PVC FEMALE ADAPTER
4. 1" PVC 90° ELBOW
5. 1" PVC CONDUIT
6. 1" PVC 45° ELBOW
7. 1" PVC COUPLING
8. TAPE 1/2" RIGID CONDUIT (6")



TITLE 19 - SUBDIVISION ORDINANCE

ENGINEERING DEPARTMENT

DESIGN STANDARDS  
FOR CONSTRUCTION

RESIDENTIAL  
STREET LIGHT WOOD POLE  
(connection to service enclosure)  
8-3

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

ITEM No.	DESCRIPTION	STOCK No.	QTY.
1	POLE, 35 FT.-CLASS IV	009-035	1
2	GALVANIZED RIGID 1/2" CONDUIT	017-292	3
3	PIPE STRAP FOR 1/2' CONDUIT, 2-HOLE	017-334	7
4	LAG BOLT, 1/4" x 2"	002-330	6
5	WEATHERHEAD, 1/2" CONDUIT	017-293	1
6	PHOTOCELL, 240V-SEE NOTE 1	021-225	1
7	LAG BOLT, 1/2" x 4"	002-370	2
8	MACHINE BOLT, 5/8" x 8"	002-450	1
9	SQUARE GALV. WASHER, 2-1/4"x2"-1/4"	002-760	1
10	COIL-SPRING WASHER, 5/8"	002-786	1
11	LOCKNUT, 5/8"	002-705	1
12	LUMINAIRE, 100W H. P. S.	021-335	1
13	HPS LAMP, 100W	021-085	1
14	MAST ARM, 6' x 1-1/4"	021-200	1
15	COPPER CABLE, #12, 19 STRAND, 600 V	013-665	
16	COPPER CABLE, #12, SOLID, 600 V, GREEN	013-701	
17	CABLE, #10, 2 CONDUCTOR, 600 V, UF	013-600	8
18	SLEEVES, #12-10	005-140	2
19	GROUNDING CLAMP	021-215	1

**KEYNOTES**

1. MOUNT SO THAT CONTROL FACES NORTH.
2. ITEM 17 SHALL NOT BE SPLICED INSIDE ITEM 14.

**DESIGN NOTES**

1. INSTALLATION SHALL COMPLY WITH ALL LOCAL CODE REQUIREMENTS.
2. FOR ANY CLARIFICATION, EXCEPTIONS OR QUESTIONS REGARDING CODE INTERPRETATION, CALL EL PASO ELECTRIC CO. DISTRIBUTION DEVELOPMENT DEPARTMENT.



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
  
DESIGN STANDARDS  
FOR CONSTRUCTION

RESIDENTIAL STREET  
LIGHTING MATERIAL LIST  
8-4

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>





BACK TO TITLE INDEX PAGE

ITEM No.	DESCRIPTION	STOCK No.	QTY.
1	POLE, 35 FT.-CLASS IV		1
2	PHOTOCELL, 240V-SEE NOTE 1	021-225	1
3	LUMINAIRE, 100W H. P. S.	021-335	1
4	HPS LAMP, 100W	021-085	1
5	MAST ARM, 6' x 1-1/4"	21-200	1
6	#10 SOLID CABLE 600 V	013-600	AS REQ'D.
7	CABLE, #10, 3 CONDUCTOR, 600 V, UF	013-600	40' PLUS
8	SLEEVES, #12	05-145	AS REQ'D.
9	ROADWAY LUMINAIRE HPS 150 WATTS	21-340	1
10	BREAK-A-WAY FUSES 30 AMP.	21-250	2
11	ALUMINUM TRANSFORMER BASE	21-608	1
12	5/8' GROUND ROD CLAMP	07-561	1
13	5/8" x 10' CU BONDED GROUND ROD	08-626	1

KEYNOTES

1. MOUNT SO THAT CONTROL FACES NORTH.
2. ITEM 7 SHALL NOT BE SPLICED INSIDE ITEM 5.

DESIGN NOTES

1. INSTALLATION SHALL COMPLY WITH ALL LOCAL CODE REQUIREMENTS.
2. FOR ANY CLARIFICATION, EXCEPTIONS OR QUESTIONS REGARDING CODE INTERPRETATION, CALL EL PASO ELECTRIC CO. DISTRIBUTION DEVELOPMENT DEPARTMENT.
3. A GROUND ROD MUST BE USED,



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

RESIDENTIAL STREET  
LIGHT STEEL POLE  
(continued)  
8-6

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

## SECTION 9

## SECTION 9

### TYPICAL LOT LAYOUT

<u>TITLE</u>	<u>PAGE</u>
TYPICAL LOT LAYOUT.....	9-1

[BACK TO SECTION INDEX PAGE](#)

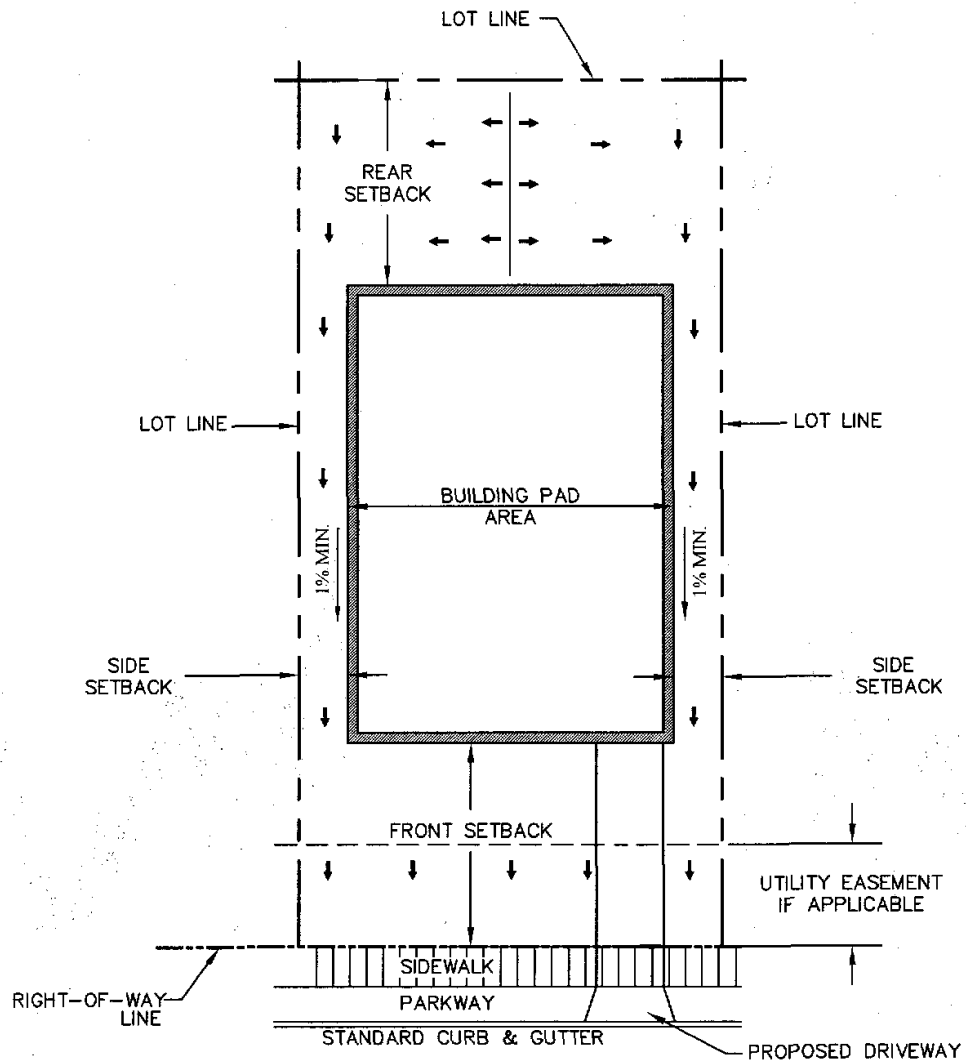


TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
  
DESIGN STANDARDS  
FOR CONSTRUCTION

SECTION 9  
TABLE OF  
CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE



### TYPICAL LOT LAYOUT

SCALE: N.T.S.

#### DRIVEWAY NOTE:

NOTE: DRIVEWAY SLOPES MUST BE 10% MAX.  
FROM GUTTER FOR FIRST 12 FT. AND  
14% MAX. THEREAFTER (BLDG. CD. 18.08.060 C)  
FOR SETBACK DIMENSIONS REFER TO ZONING ORDINANCE.



### TITLE 19 - SUBDIVISION ORDINANCE ENGINEERING DEPARTMENT DESIGN STANDARDS FOR CONSTRUCTION

### TYPICAL LOT LAYOUT 9-1

Approved By R. A. SHUBERT	Checked By H. M. E.
Date JUNE 03, 2008	Drawn By QEC / J. R.

# SECTION 10



## SECTION 10

## TRAFFIC CALMING STANDARDS

<u>TITLE</u>	<u>PAGE</u>
BULBOUT (INTERSECTION TREATMENT).....	10-1
BULBOUT (MIDBLOCK TREATMENT).....	10-2
CENTER ISLAND NARROWING.....	10-3
CHOKER.....	10-4
DIAGONAL DIVERTER.....	10-5
FORCED TURN ISLAND.....	10-6
HALF CLOSURE.....	10-7
MEDIAN BARRIER.....	10-8
PEDESTRIAN REFUGE ISLAND.....	10-9
TRAFFIC CIRCLE.....	10-10
ROUNDAABOUT.....	10-11
SPEED HUMP.....	10-12
SPEED TABLE.....	10-13

[BACK TO SECTION INDEX PAGE](#)

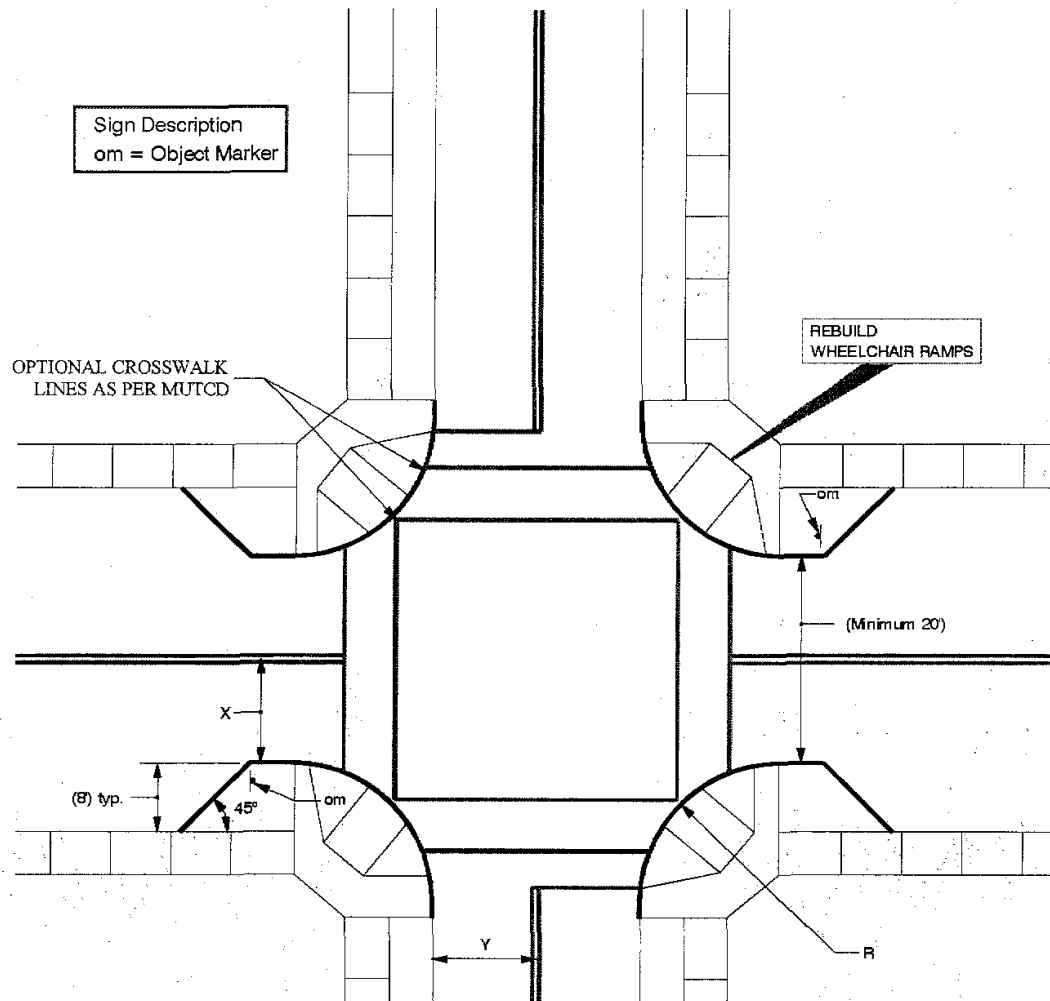

TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

SECTION 10  
 TABLE OF  
 CONTENTS

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE

## Bulbout (Intersection Treatment)



### NOTES:

1. Distance X is referenced from the center of the roadway to the lip of gutter.

For the Street Widths		Use this Curb Radius
X	Y	R
12'	12'	40'
12'	14'	32'
12'	16'	28'
14'	12'	37'
14'	14'	35'
14'	16'	24'



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

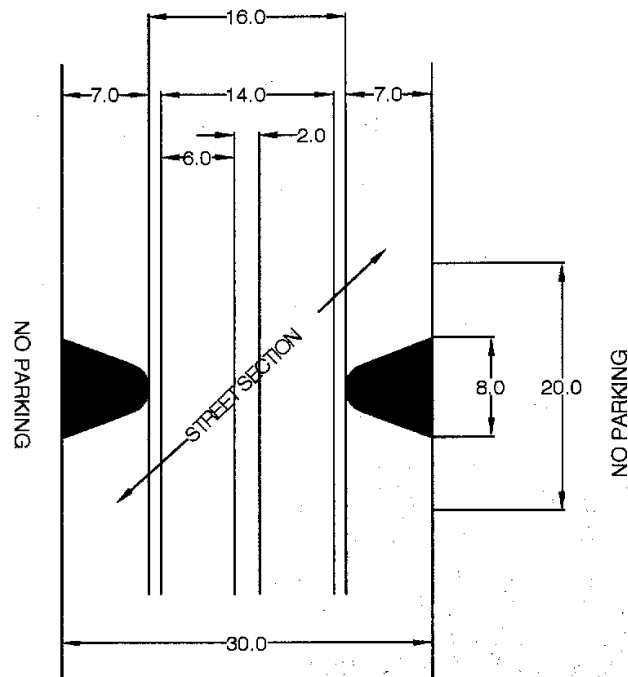
BULBOUT  
(INTERSECTION TREATMENT)  
10-1

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

**[BACK TO TITLE INDEX PAGE](#)**

## Bulbout (Midblock Treatment)



MIN. 30' WIDE STREET  
FOR WIDER STREETS  
MAKE BULB DEEPER

THE BULB-OUT DRAWING SHOWN IS FOR A 30 FOOT WIDE STREET. IF A STREET IS WIDER, THE BULB WOULD BE DEEPER; EACH BULB SHOWN IS SEVEN FEET DEEP. THE WIDTH BETWEEN BULBS SHOULD BE 16 FEET, WHICH ALLOWS FOR ONE FOOT BETWEEN BULB AND CAR, SIX FEET PER CAR AND TWO FEET BETWEEN CARS. THIS WOULD REQUIRE CARS TO SLOW DOWN SUBSTANTIALLY IN ORDER TO PASS. THE BULB WOULD RESTRICT PARKING FOR APPROXIMATELY 20 FEET (ONE CAR LENGTH FOR PARKING PURPOSES) IN ORDER FOR THE BULB TO BE VISIBLE, ALLOW WIDER VEHICLES TO PULL TO THE RIGHT AND ALLOW AN OPPOSING VEHICLE TO PASS. IT MAY BE POSSIBLE TO PLANT A TREE IN EACH BULB.



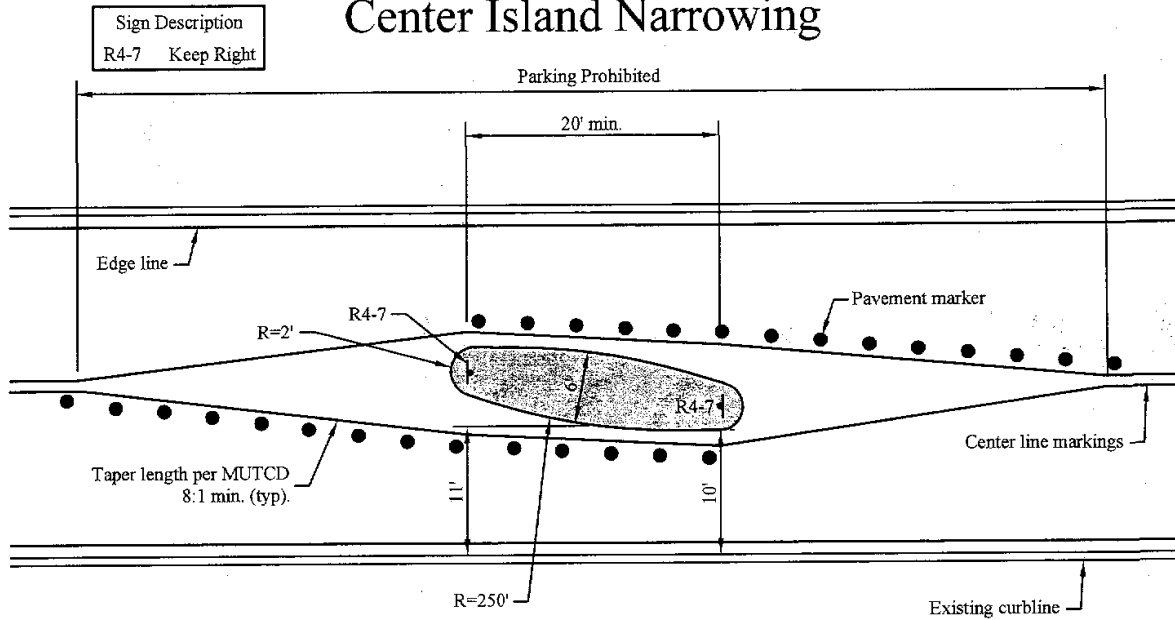
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

BULBOUT  
(MIDBLOCK TREATMENT)  
10-2

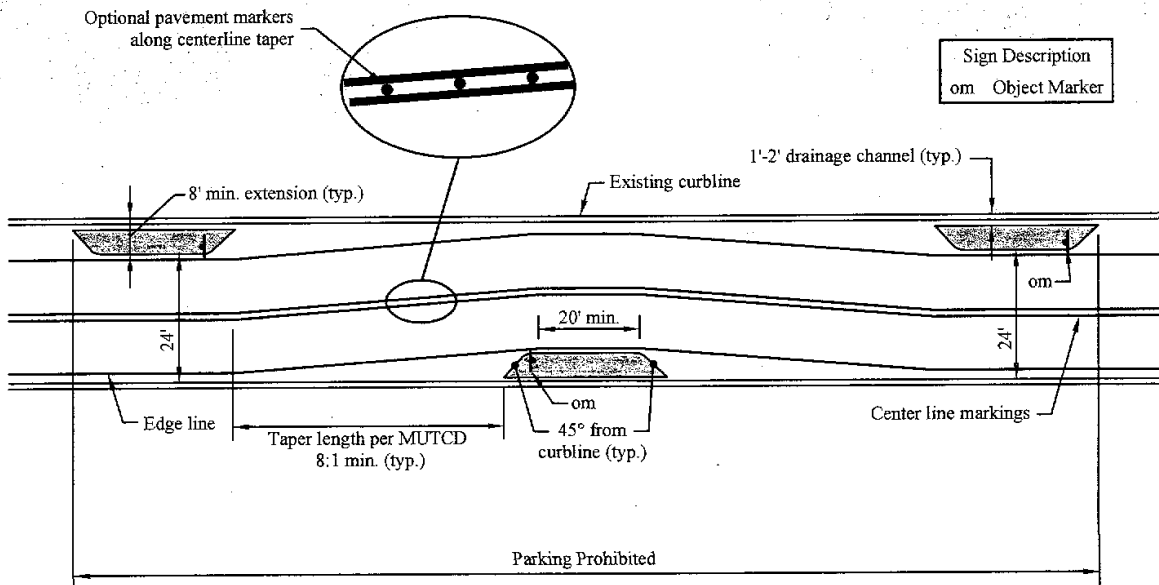
Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE

## Center Island Narrowing



## Chicane



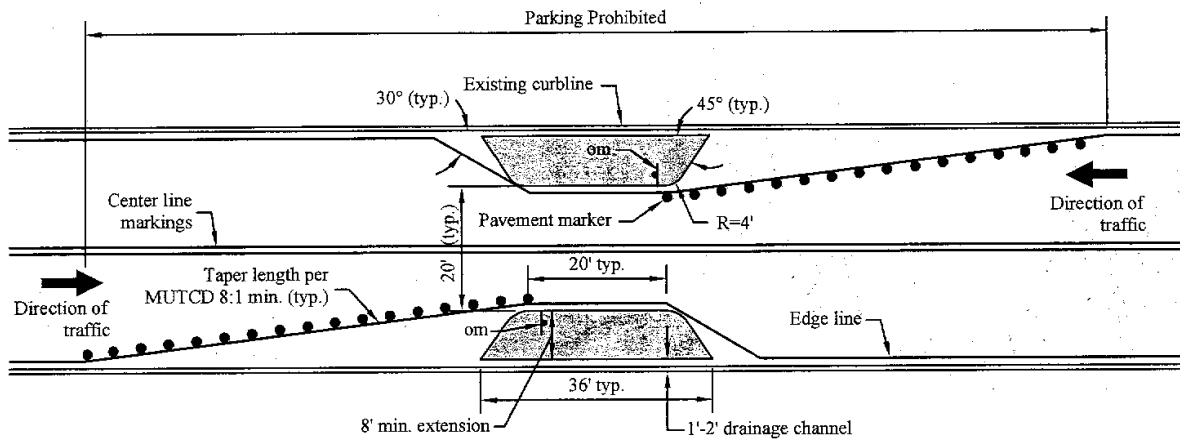
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CENTER ISLAND  
NARROWING AND CHICANE  
10-3

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QBC/J.R.

BACK TO TITLE INDEX PAGE

## CHOKER



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

CHOKER

10-4

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

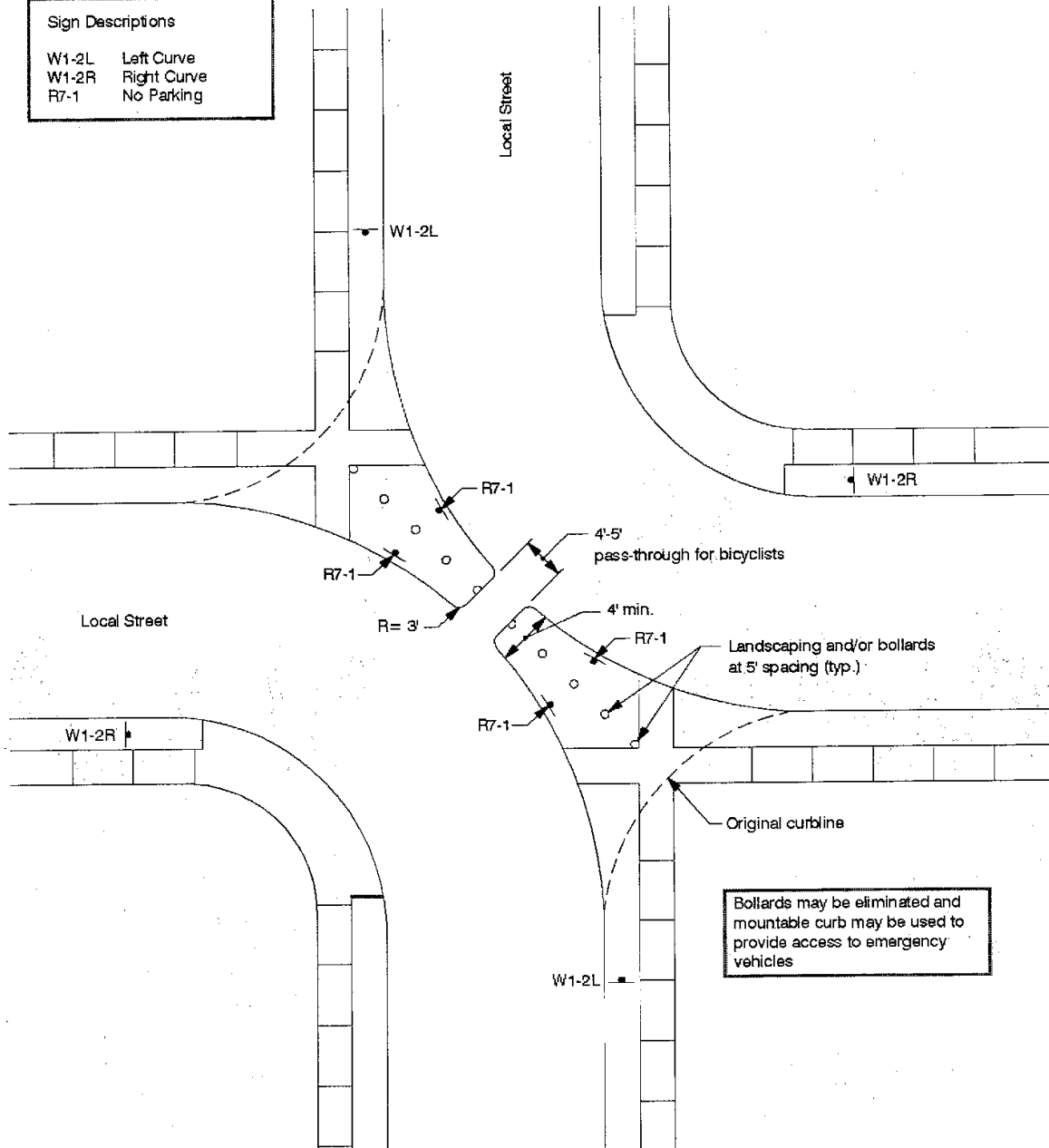
Checked By H. M. E.  
Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE

# Diagonal Diverter

## Sign Descriptions

W1-2L Left Curve  
W1-2R Right Curve  
R7-1 No Parking



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

DIAGONAL DIVERTER

10-5

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By OEC/J. R.



[BACK TO TITLE INDEX PAGE](#)

**FORCED TURN ISLAND**

Local Street

R3-8C

Optional crosswalk lines as per MUTCD

1.5'

Width varies with inner curb radius and angle of turn

om R5-1 R=3'

R=3'

R3-2

Min. island size 400 sf

R=3'

3' offset

R4-7

Stop bar set back from crosswalk 4'

R3-1b

Sign Descriptions	
R3-1b	Right Turn Only
R3-2	No Left Turn
R3-8C	Left or Right Turn
R4-7	Keep right
R5-1	Do Not Enter
om	Object Marker



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

FORCED TURN ISLAND  
10-6

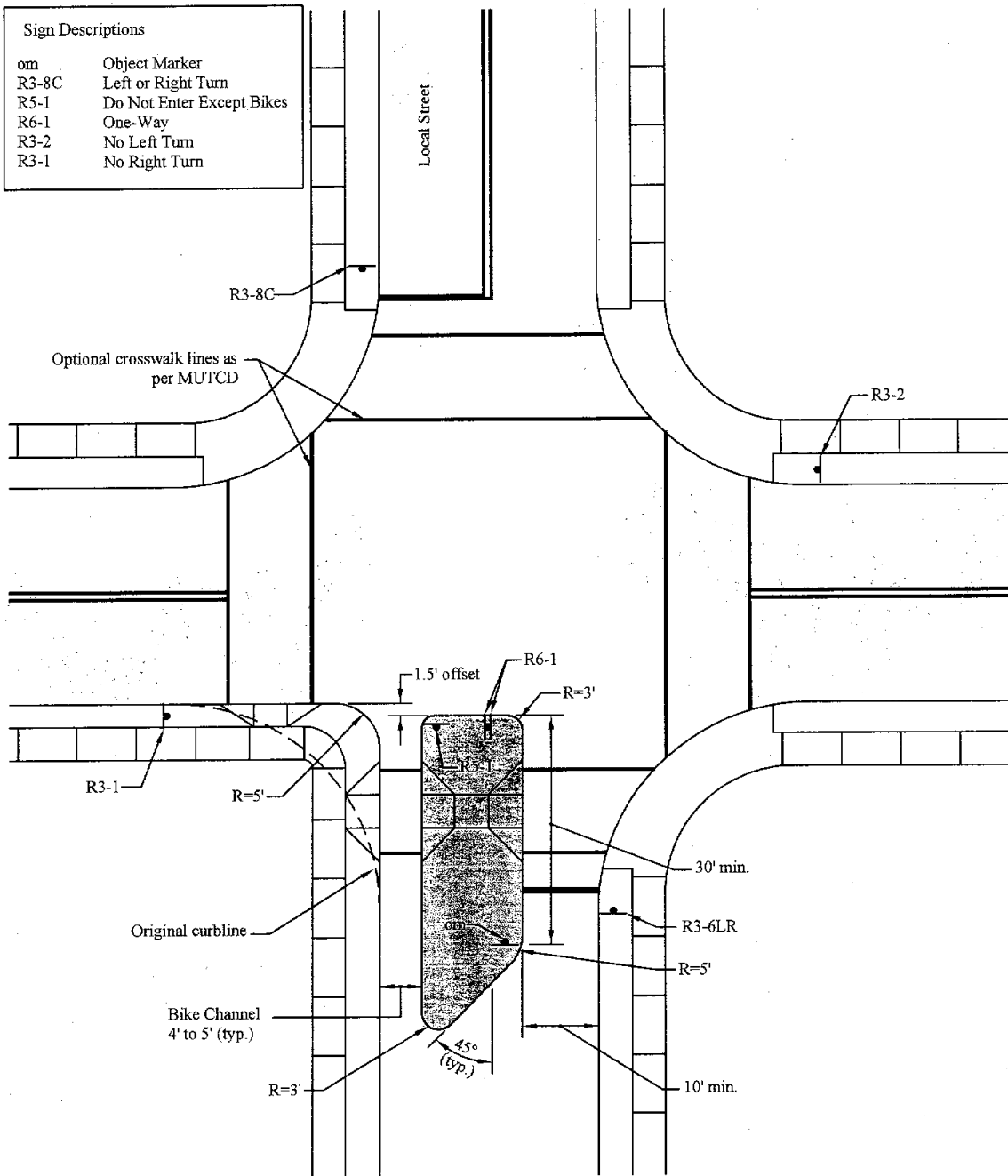
Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QEC / J. R.</u>

BACK TO TITLE INDEX PAGE

# HALF CLOSURE

## Sign Descriptions

om	Object Marker
R3-8C	Left or Right Turn
R5-1	Do Not Enter Except Bikes
R6-1	One-Way
R3-2	No Left Turn
R3-1	No Right Turn



TITLE 19 - SUBDIVISION ORDINANCE  
 ENGINEERING DEPARTMENT  
 DESIGN STANDARDS  
 FOR CONSTRUCTION

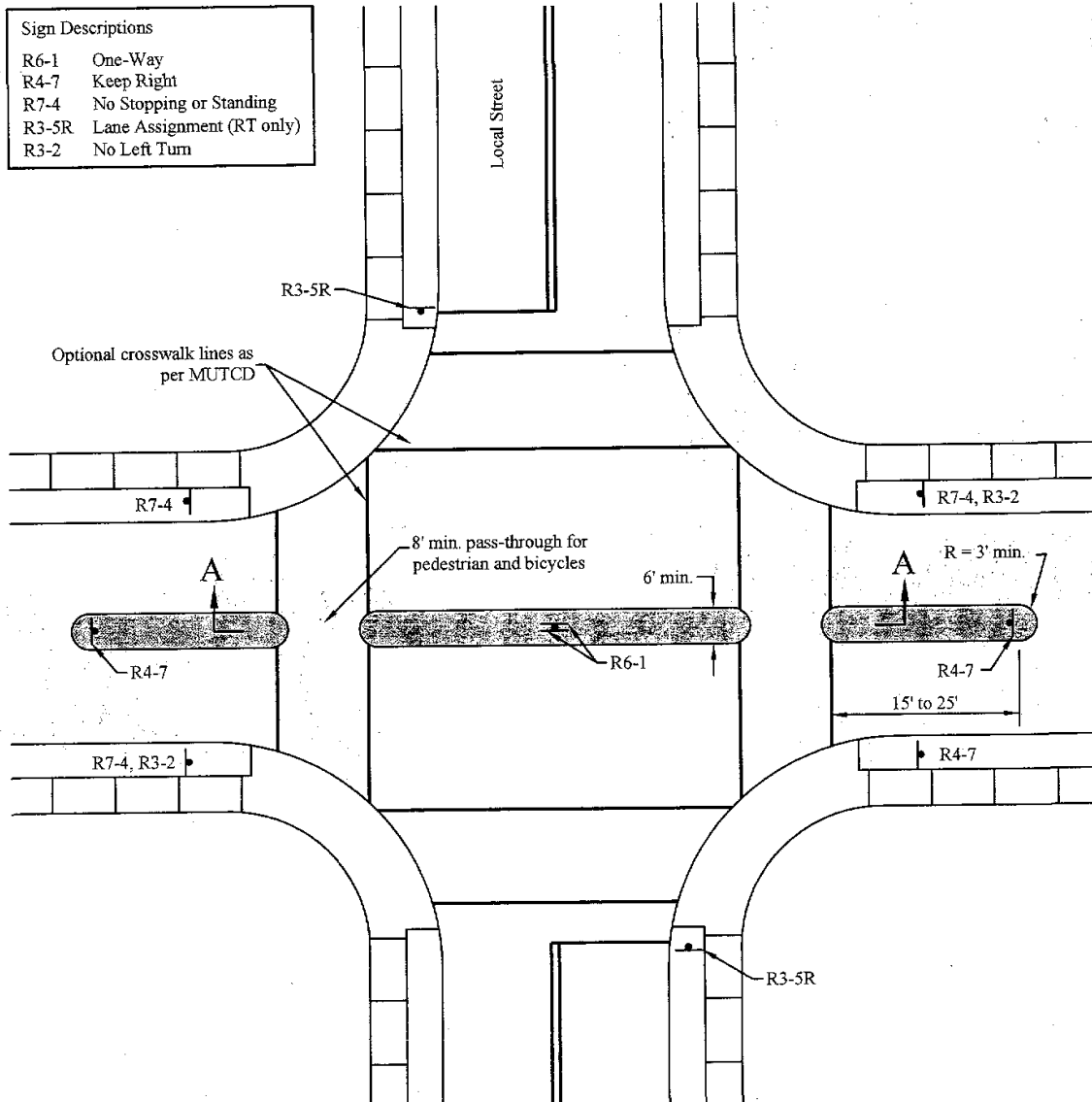
HALF CLOSURE  
 10-7

Approved By R. A. SHUBERT  
 Date JUNE 03, 2008

Checked By H. M. E.  
 Drawn By QEC / J. R.

BACK TO TITLE INDEX PAGE

## Median Barrier



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

MEDIAN BARRIER  
10-8

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

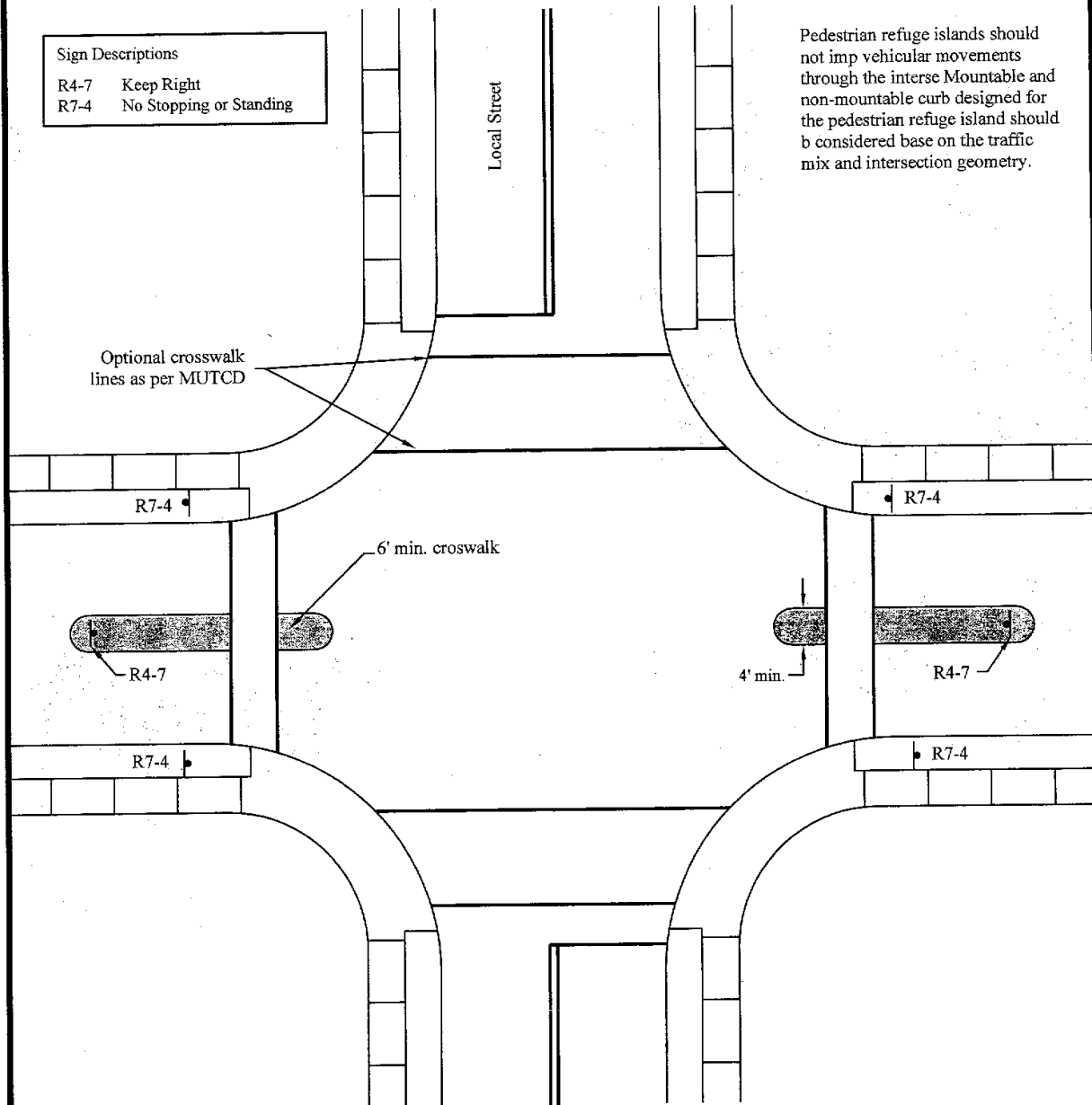
[BACK TO TITLE INDEX PAGE](#)

## Pedestrian Refuge Island

### Sign Descriptions

R4-7 Keep Right  
R7-4 No Stopping or Standing

Pedestrian refuge islands should not imp vehicular movements through the intersection. Mountable and non-mountable curb designed for the pedestrian refuge island should be considered base on the traffic mix and intersection geometry.



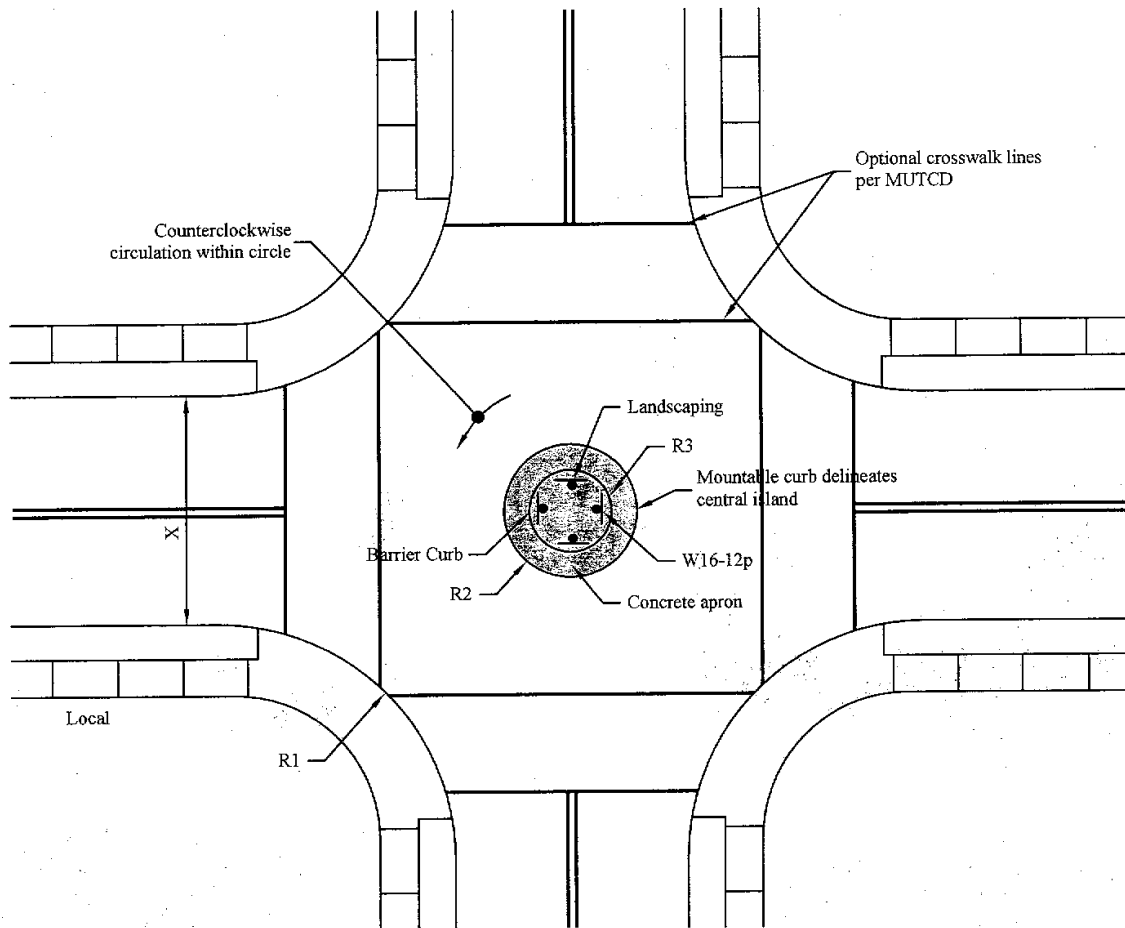
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

PEDESTRIAN REFUGE  
ISLAND  
10-9

Approved By R. A. SHUBERT Checked By H. M. E.  
Date JUNE 03, 2008 Drawn By QEC/J. R.

BACK TO TITLE INDEX PAGE

## Traffic Circle



### Sign Descriptions

W16-12p Traffic Circle

### NOTE:

1. Assumes equal street widths; For unequal street widths, use Autoturn to ensure adequate turning radii for the desired design vehicle.

For The Street Width	Use This Circle Radius		
X	R1	R2	R3
34'	20'	20'	8'
	25'	24'	8'
32'	15'	12'	7'
	20'	18'	7'
	25'	20'	7'
30'	15'	11'	6'
	20'	15'	6'
	25'	16'	6'



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

TRAFFIC CIRCLE  
10-10

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.

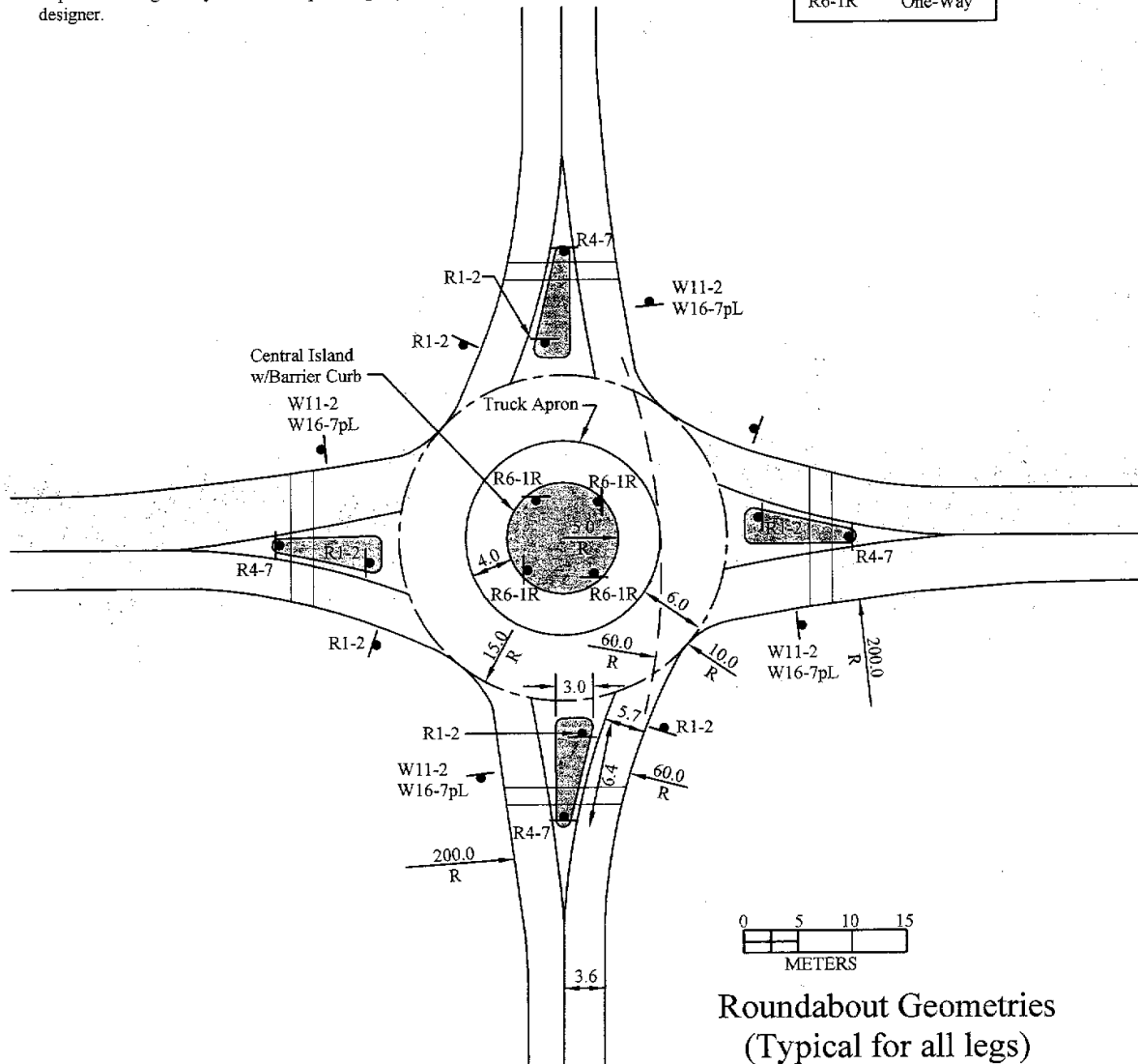
BACK TO TITLE INDEX PAGE

## ROUNABOUT

This figure illustrates the minimum roundabout configuration for a 90 degree intersection of two roadways with one lane in each direction. It is designed to accommodate a WB-15 design vehicle, or automobile traffic at a 25 mph speed. This is only an example and not a recommended design. Each intersection requires thorough analysis and a unique design by a roundabout designer.

### Sign Descriptions

R1-2	Yield
W11-2	Pedestrian
W16-7pL	Arrow
R4-7	Keep Right
R6-1R	One-Way



Roundabout Geometries  
(Typical for all legs)



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

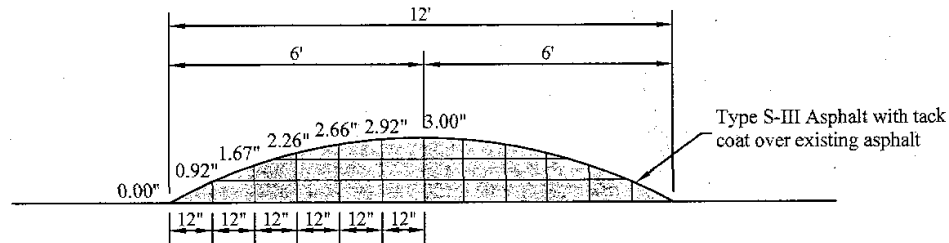
ROUNABOUT  
10-11

Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QBC/J.R.</u>

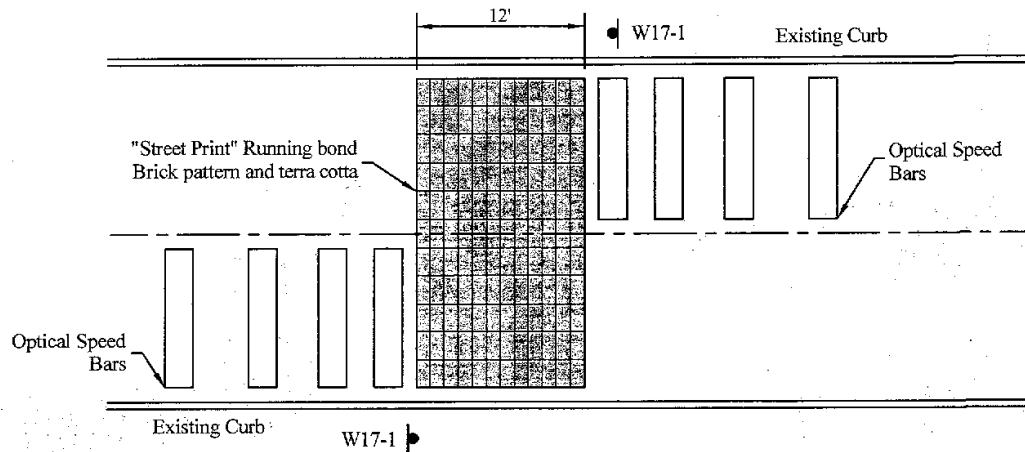


BACK TO TITLE INDEX PAGE

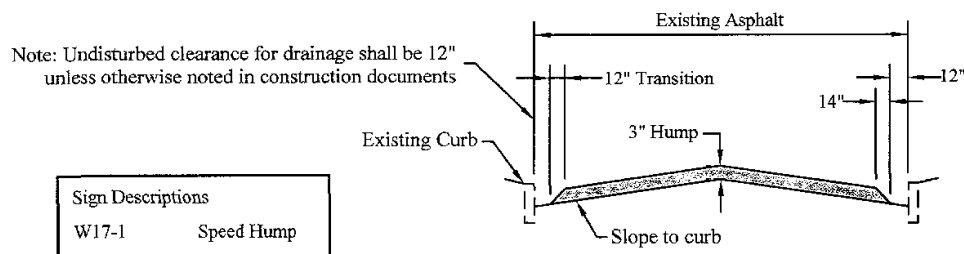
## Speed Hump



## Driving Profile



## Plan View



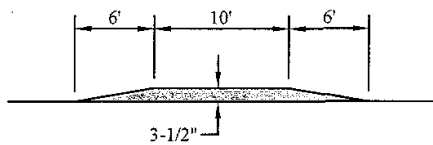
TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SPEED HUMP  
10-12

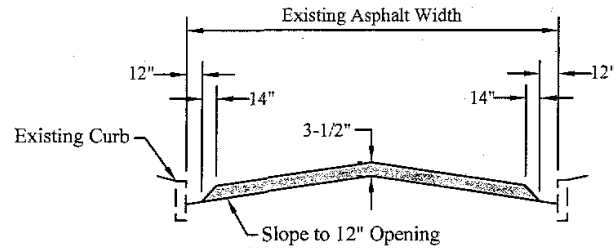
Approved By <u>R. A. SHUBERT</u>	Checked By <u>H. M. E.</u>
Date <u>JUNE 03, 2008</u>	Drawn By <u>QBC/J.R.</u>

BACK TO TITLE INDEX PAGE

# Speed Table

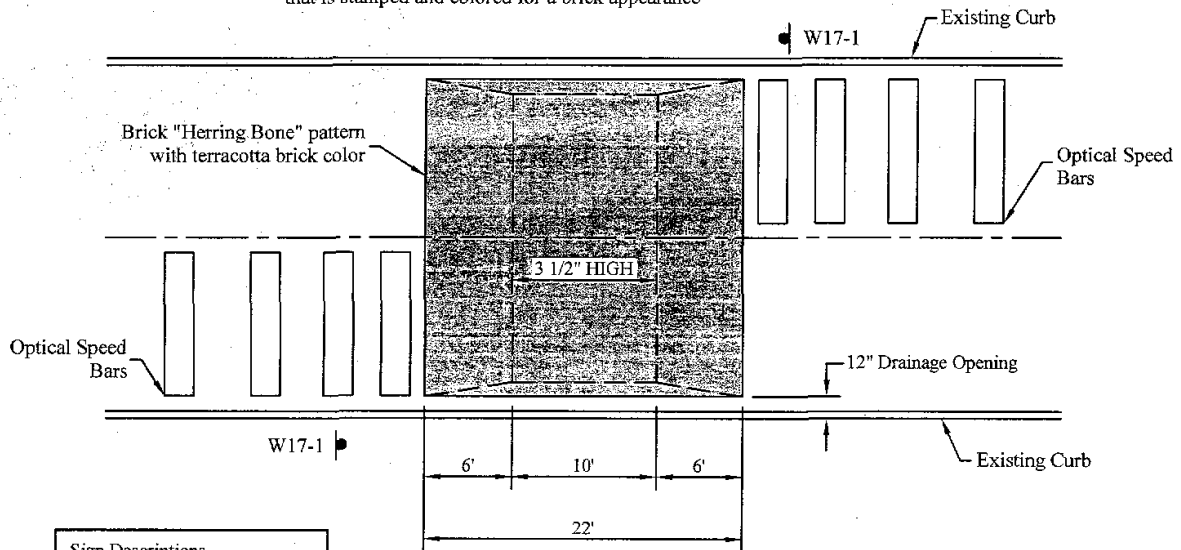


Driving Profile



Typical Section

The speed table is made with "Street Print", asphalt that is stamped and colored for a brick appearance



Plan View

Sign Descriptions  
W17-1 Speed Hump



TITLE 19 - SUBDIVISION ORDINANCE  
ENGINEERING DEPARTMENT  
DESIGN STANDARDS  
FOR CONSTRUCTION

SPEED TABLE  
10-13

Approved By R. A. SHUBERT  
Date JUNE 03, 2008

Checked By H. M. E.  
Drawn By QEC / J. R.





# Street Design Manual