

[Print](#)

Tucson, AZ Unified Development Code

TECHNICAL STANDARDS MANUAL



Supplement to the Unified Development Code

Adopted — October 9, 2012

Effective — January 2, 2013

SECTION 1: GENERAL PROVISIONS

- 1-01.1.0 Establishment
- 1-01.2.0 Purpose
- 1-01.3.0 Maintenance and Publication
- 1-01.4.0 Enforcement
- 1-01.5.0 Procedure to Establish or Amend the Technical Standards Manual
- 1-01.6.0 Technical Standards Modification Requests

SECTION 2: EXCAVATING & [GRADING](#)

SECTION 3: FLEXIBLE LOT DEVELOPMENT - MAXIMUM DENSITY OPTION

SECTION 4: HYDROLOGY

- 4-01.0.0 Commercial [Water Harvesting](#)
- 4-02.0.0 Floodplain, WASH and ERZ Standard
- 4-03.0.0 [Stormwater](#) Detention/Retention Manual*
- 4-04.0.0 City of Tucson Standards Manual for Drainage Design and Floodplain Management in Tucson, Arizona*

SECTION 5: LANDSCAPING AND SCREENING STANDARDS

- 5-01.0.0 Landscaping and Screening
- 5-02.0.0 Landscape Plant Materials
- 5-03.0.0 Protected Native Plant List

**SECTION 6: MEDICAL MARIJUANA DISPENSARY AND DISPENSARY
OFF- [SITE](#) CULTIVATION USES -
REQUIRED SETBACK FROM CERTAIN PARKS**

SECTION 7: PEDESTRIAN ACCESS**SECTION 8: SOLID WASTE AND RECYCLE DISPOSAL, COLLECTION, AND STORAGE****SECTION 9: SPECIAL DEVELOPMENT DISTRICTS**

- 9-01.0.0 Hillside Development Zone
- 9-02.0.0 Historic Preservation Zone
- 9-03.0.0 Sound Attenuation within the Airport Environs Zone

SECTION 10: TRANSPORTATION

- 10-01.0.0 Street Technical Standard
- 10-02.0.0 Pavement Cut Criteria

SECTION 11: UTILITIES

- 11-01.0.0 Abandonment of Easements

SECTION 12: DEFINITIONS

* Due to the size of this manual, it is unable to be accommodated within the Technical Standards Manual. The manual is, therefore, printed and bound as an individual booklet and is available as a separate purchase item from the City of Tucson Engineering Division. For your information, the Table of Contents is included.

SECTION 1: GENERAL PROVISIONS

SECTION 1-01.0.0: GENERAL PROVISIONS

Section

- 1-01.1.0 Establishment
- 1-01.2.0 Purpose
- 1-01.3.0 Maintenance and Publication
- 1-01.4.0 Enforcement
- 1-01.5.0 Procedure to Amend the Technical Standards Manual

1-01.6.0 Technical Standard Modification Requests

1-01.1.0 ESTABLISHMENT

The City of Tucson Technical Standards Manual (“Technical Manual”) is established as Administrative Directive 1.02-9, under the City of Tucson Administrative Directives. The Technical Standards Manual is a supplemental document to the City of Tucson Unified Development Code.

1-01.2.0 PURPOSE

The purpose of the Technical Standards Manual is to establish standards for the following:

- 1.1 Excavating and [grading](#);
- 1.2 Flexible Lot Development - Maximum Density Option;
- 1.3 Hydrology;
- 1.4 Landscaping;
- 1.5 Medical Marijuana - Parks Requiring Setbacks;
- 1.6 Pedestrian Access;
- 1.7 Solid Waste and Recycle Disposal, Collection, and Storage;
- 1.8 Special Development Districts (e.g. Hillside Development Zone, Historic Preservation Zone, Rio Nuevo District, etc.);
- 1.9 Transportation; and,
- 1.10 Utilities.

1-01.3.0 MAINTENANCE AND PUBLICATION

The Planning and Planning and Development Services Department (PDSD) is responsible for maintaining and publishing the Administrative Manual. The Administrative Manual is available as a public record in the City Clerk’s Office, the PDSD, and the agency responsible for their initiation and/or review. The Administrative Manual is also available on the PDSD website.

1-01.4.0 ENFORCEMENT

The department and/or agency responsible for the adopted Administrative Manual section are responsible for its implementation.

1-01.5.0 PROCEDURE TO AMEND THE TECHNICAL STANDARDS MANUAL

5.1 Purpose

The purpose of this section is to establish the procedure for amending the Technical Standards Manual.

5.2 Initiation

Only the Mayor and Council, City Manager, or the Director of any city department or non-city agency involved in development review may initiate amendments to the Technical Standards Manual.

5.3 Review

The review procedure is as follows:

A. Proposed amendments are submitted to the Planning and Planning and Development Services Department (PDSD) Director for review and are coordinated by the PDSD; and,

B. The PDSD Director will transmit for review the proposed amendment to the City Development Review Committee (CDRC), and/or any other city department or non-city agency involved in the review of development applications. Additionally, the PDSD Director will notify interested and affected parties of the proposed amendment and make the proposed amendment available for their review and comment.

5.4 CDRC Recommendation

The CDRC shall make a recommendation to the PDSD Director on the proposed amendment. The CDRC may use the comments received from the interested and affected properties when developing their recommendation.

5.5 PDSD Director Recommendation

The PDSD Director shall make a recommendation on the proposed amendment. In making a recommendation, the Director may revise the proposal based on comments from interested and affected parties, the CDRC, and other review agencies. The Director may also forward the revised proposal to the CDRC for further review and recommendation. When applicable, the PDSD Director shall transmit the recommendation to the director of the initiating department for [approval](#) and signature.

5.6 City Manager Decision

A. The City Manager may approve, deny, remand the proposed amendment to the PDSD Director for further review, or forward the proposed amendment to the Mayor and Council for consideration and action.

B. Except when the proposed amendment is forwarded to the Mayor and Council for consideration and action, the City Manager's decision is final and the amendment becomes effective upon the signature of the City Manager. When the proposed amendment is approved through adoption of an ordinance by the Mayor and Council, the effective date of the ordinance applies.

5.7 Notice of Decision

The PDSD Director shall notify the CDRC, affected governmental and non-governmental agencies, and interested and affected properties of the decision on the proposed amendment.

1-01.6.0 TECHNICAL STANDARD MODIFICATION REQUESTS

6.1 General

A. Upon a request from an applicant, the Planning and Planning and Development Services Department (PDSD) Director may allow modifications and exceptions to the application submittal requirements and technical standards in accordance with the procedure and findings provided below.

B. The process of modifying the Technical Standards is known as the Technical Standards Modification Request (TSMR).

C. Each Technical Standard indicates the intent of each requirement and standards relating to health, life, and safety.

The provisions of the Technical Standards are not intended to prevent the use of any material or method of construction not specifically prescribed by the Technical Standards. The PDSO Director may approve alternate materials and/or methods of construction provided that the proposed alternate meets the intent of the prescribed Technical Standard and addresses any health, life, and safety considerations.

D. Requirements of the Unified Development Code restated in the Technical Standard Manual may not be modified by this process.

6.2 Application and Fees Required

A. Applicants must submit a Technical Standards Modification Request application, which are available at the PDSO office, along with seven copies of the plan which clearly indicates the area(s) of the project affected by the request to the PDSO Department. Additionally, the applicant is responsible for supplying whatever information is necessary to demonstrate that there are practical difficulties resulting from the strict application of the Technical Standard.

B. Except for modification requests to the application submittal requirements, fees are required in accordance with Section 4-01.0.0 of the Administrative Manual. Fees are not required for modification requests to the application submittal requirements.

6.3 Review

A. Modification Requests to the Application Submittal Requirements

Modification to the application submittal requirements contained in the Technical Standards Manual are processed in accordance with the Section 2-01.0.0, *Permitted Modifications to the Application Submittal Requirements*, of the Administrative Manual.

B. Modification Requests to the Technical Standards

The PDSO will confer with the director or designee of the department charged with enforcement of the applicable technical standard(s). The PDSO Director may ask the City Development Review Committee for input on the TSMR.

6.4 Decision

A. The PDSO Director shall decide whether to approve or deny a TSMR. Approvals must be based upon a finding provided below. The PDSO Director may place conditions upon [approval](#) of a TSMR necessary to effectuate the purpose of the Technical Standard.

B. A decision on a TSMR must be made within five working days from the application date.

C. The PDSO Director shall notify in writing of the decision on the TSMR to the applicant, all CDRC members, and any party requesting a copy.

D. The PDSO shall maintain a permanent record of TSMRs.

6.5 Findings

The PDSO Director may approve a TSMR based upon the following findings:

A. When applicable, the TSMR complies with any additional modification provisions required by the affected technical standard;

B. There are practical difficulties which prevent the strict application of the Technical Standards;

C. The modification is in conformity with the intent and purpose of the Technical Standard and such modification addresses health, life, and safety considerations; and,

D. The strict application of the Technical Standard fails to accomplish the intent of the Technical Standard due to such reasons as existing conditions, the character of the area, or existing [site](#) or location constraints, etc.

6.6 Effect of TSMR [Approval](#) or Denial

Each modification request and the decision on the request are [site](#) and development specific. The [approval](#) or denial of a TSMR in one case shall not be a precedent for the granting/denying of a modification request in another case.

6.7 Appeal of Decision

Appeals to TSMR decisions are heard by the Zoning Examiner. The appeal shall be processed by the PDSD as follows:

A. [Submittal](#)

The appeal is submitted in writing to the PDSD within 14 days of the issuance of the decision being appealed. An appeal may be submitted by the applicant and/or representative or by any member of the CDRC affected by the TSMR. The filing of an appeal stays all proceedings.

B. [Notice](#)

Mailed notice is sent to the applicant and/or representative and to any CDRC member affected by the TSMR. The mailed notice shall provide: the name of the applicant and/or representative and the mailing address; the assigned title and file number of the TSMR; the modification request, including the reasons for the request; the date, time, and location the appeal will be considered by the Zoning Examiner; and the address and telephone number of PDSD.

C. [Zoning Examiner Hearing](#)

The appeal is considered by the Zoning Examiner in an administrative hearing within 30 days of the filing of the appeal but no earlier than 15 days after the mailed notice is sent. During the review of the appeal, the Examiner considers testimony presented by those entities/persons noticed of the appeal or determined to be affected by the TSMR. The Zoning Examiner may continue the hearing for a period of not longer than 30 days.

D. [Appeal of Zoning Examiner's Decision](#)

The Examiner's decision may be appealed by a party of record within 14 days of the date of decision. The filing of an appeal stays all proceedings.

E. [Issuance of Permits/Approvals](#)

Permits or development approvals dependent on the modification shall not be issued until the 14- day appeal period has expired.

SECTION 2: EXCAVATING AND GRADING

SECTION 2-01.0.0: EXCAVATING AND [GRADING](#)

Section

2-01.1.0 General

2-01.2.0 Permits Required

2-01.3.0 Hazards

2-01.4.0 [Grading](#) Permit Requirements

2-01.5.0 [Grading](#) Fees

2-01.6.0 Bonds

2-01.7.0 Cuts

2-01.8.0 [Fills](#)

2-01.9.0 Setbacks

2-01.10.0 Drainage and Terracing

2-01.11.0 [Erosion](#) Control

2-01.12.0 [Grading](#) Inspection

2-01.13.0 Completion of Work

2-01.1.0 GENERAL

1.1 Purpose

The purpose of this standard is to safeguard life, limb, property and the public welfare by regulating [grading](#) on private property.

1.2 Scope

This appendix sets forth rules and regulations to control [excavation](#), [grading](#) and earthwork construction, including [fills](#) and embankments; establishes the administrative procedure for issuance of permits; and provides for [approval](#) of plans and inspection of [grading](#) construction.

2-01.2.0 PERMITS REQUIRED

2.1 Permits

- A. Except as specified in Section 2-01.2.2, *Exceptions*, no person shall do any [grading](#) without first having obtained a [grading](#) permit from the Planning and Development Services Department (PDSD).
- B. No person shall do any [grubbing](#) on any [site](#) or portion thereof without first having obtained a [grading](#) permit from PDSD. No [grubbing](#) shall occur on any land except where [grading](#) has been approved.
- C. [Grading](#) permits may be issued for single or multiple building [sites](#), not to exceed 35 acres per permit.
- D. The [grubbing](#)/[grading](#) and construction of a [site](#) shall be continuous until the [grubbing](#)/[grading](#) and construction on that building [site](#) are completed.

2.2 Exceptions

A [grading](#) permit is not required for the following:

- A. When approved by PDSD, [grading](#) in an isolated, self-contained area if there is no danger to private or public property;

- B. An [excavation](#) below finished [grade](#) for basements and footings of a building, retaining wall or other structure authorized by a valid building permit. This shall not exempt any [fill](#) made with the material from such [excavation](#) or exempt any [excavation](#) having an unsupported height greater than five feet (1,524 mm) after the completion of such structure;
- C. Cemetery graves;
- D. Refuse disposal [sites](#) controlled by other regulations;
- E. [Excavations](#) for wells or tunnels or utilities;
- F. Mining quarrying, [excavation](#), processing stockpiling of rock, sand, gravel, aggregate or clay where established and provided for by law, provided such operations do not affect the lateral support or increase the stresses in or pressure upon any adjacent or contiguous property, "except as such activities are regulated by code or other regulations of this jurisdiction";
- G. Exploratory [excavations](#) under the direction of soil engineers or engineering geologists;
- H. An [excavation](#) which (1) is less than two feet (610 mm) in depth, or (2) which does not create a cut [slope](#) greater than five feet (1,524 mm) in height and steeper than one unit vertical in one and one-half units horizontal (66.7% [slope](#)); and,
- I. A [fill](#) less than one foot (305 mm) in depth and placed on natural terrain with a [slope](#) flatter than one unit vertical in five units horizontal (20% [slope](#)), or less than three feet (914 mm) in depth, not intended to support structures, which does not exceed 50 cubic yards (38.3 m³) on any one lot and does not obstruct a drainage course.

NOTE: Exemption from the permit requirements of this chapter shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this chapter or any other laws or ordinances of this jurisdiction.

2.3 Reseeding

- A. For any [site](#) one acre or greater or portion thereof which has been wholly or partially grubbed or wholly or partially graded, construction shall commence and shall be continuous within 60 days after [grubbing](#). Should construction or [grading](#) not commence or be continuous within the required 60-day period, the [site](#) shall be native seeded or dust abatement applied within 30 days following the expiration of the required 60-day period. When approved by the Director of Planning and Development Services Department (PDSD), a time extension may be granted for conditions beyond the control of the permitted for items such as flooding or the discovery of historic artifacts.
- B. Any [site](#) which has been graded or grubbed without a permit shall in addition to other penalties provided by law be revegetated to its preexisting condition.
- C. The provisions of paragraphs A and B do not apply to [infrastructure](#) where the proposed [infrastructure](#) does not exceed 20 acres in land coverage.

2-01.3.0 HAZARDS

Whenever the Director of PDSD determines that any existing [excavation](#) or embankment or [fill](#) on private property has become a hazard to life and limb, or endangers property, or adversely affects the safety, use or stability of a public way or drainage canal, the owner of the property upon which the [excavation](#) or [fill](#) is located, or other person or agent in control of said property, upon receipt of notice in writing from the building official, shall within the period specified therein repair or eliminated such [excavation](#) or embankment so as to eliminate the hazard and be in conformance with the requirements of this code.

2-01.4.0 GRADING PERMIT REQUIREMENTS

4.1 Permits Required

Except as provided in Section 2-01.2.0, *Exceptions*, no person shall do any [grading](#) without first obtaining a [grading](#) permit from PDSD. A separate permit shall be obtained for each [site](#), and may cover both [excavations](#) and [fills](#).

A. [Application](#)

The provisions of the Uniform Administrative Code Section 302.1 (UAC) are applicable to [grading](#) and in addition the application shall state the estimated quantities of work involved.

B. [Grading Designation](#)

[Grading](#) in excess of 5,000 cubic yards (3,825 m³) shall be performed in accordance with the approved [grading](#) plan prepared by a civil engineer, and shall be designated as “engineered [grading](#)”. [Grading](#) involving less than 5,000 cubic yards (3,825 m³) shall be designated “regulated [grading](#)” unless the permittee chooses to have the [grading](#) performed as engineered [grading](#), or the Director determines that special conditions or unusual hazards exist, in which case [grading](#) shall conform to the engineered [grading](#).

C. [Engineered Grading Requirements](#)

Application for [grading](#) permit shall be accompanied by two sets of plans and specifications, and supporting data consisting of a soils engineering report and engineering geology report. The plans and specifications shall be prepared and signed by an individual licensed by the state to prepare such plan or specifications when required by PDSD. Specifications shall contain information covering construction and material requirements. Plans shall be drawn to scale upon substantial paper or cloth and shall be of sufficient clarity to indicate the nature and extent of the work proposed and show in detail that they will conform to the provisions of this code and all relevant laws, ordinances, rules and regulations. The first sheet of each set of plans shall give location of the work, the name and address of the owner and the person by whom they were prepared.

The plans shall include the following information:

1. General vicinity of the proposed [site](#).
2. Property limits and accurate contours of existing ground and details of terrain and area drainage.
3. Limiting dimensions, elevations or finish contours to be achieved by the [grading](#), and proposed drainage channels and related construction.
4. Detailed plans of all surface and subsurface drainage devices, walls, cribbing, dams and other protective devices to be constructed with, or as a part of, the proposed work together with a map showing the drainage area and the estimated runoff of the area served by any drains.
5. Location of any building or structures on the property where the work is to be performed and the location of any building or structures on land of adjacent owners which are within 15 feet (4,572 mm) of the property or which may be affected by the proposed [grading](#) operations.
6. Recommendations included in the soils engineering report and the engineering geology report shall be incorporated in the [grading](#) plans or specifications. When approved by PDSD, specific recommendations contained in the soils engineering report and the engineering geology report, which are applicable to [grading](#), may be included by reference.
7. The dates of the soils engineering and engineering geology reports together with the names, addresses and phone numbers of the firms or individuals who prepared the reports.

D. [Soils Engineering Report](#)

The soils engineering report required by the International Building Code Section 1802.6 (IBC) shall include data

regarding the nature, distribution and strength of existing soils, conclusions and recommendations for [grading](#) procedures and design criteria for corrective measures, including buttress [fills](#), when necessary, and opinion on adequacy for the intended use of [sites](#) to be developed by the proposed [grading](#) as affected by soils engineering factors, including the stability of [slopes](#).

E. [Engineering Geology Report](#)

The engineering geology report required by the IBC Section 1802.6 shall include adequate description of the geology of the [site](#), conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and opinion on the adequacy for the intended use of [sites](#) to be developed by the proposed [grading](#), as affected by geologic factors.

F. [Regular Grading Requirements](#)

Each application for a [grading](#) permit shall be accompanied by a plan in sufficient clarity to indicate the nature and extent of the work.

The plans shall give the location of the work, the name of the owner and the name of the person who prepared the plan. The plan shall include the following information:

- a. General vicinity of the proposed [site](#);
- b. Limiting dimensions and depth of cut and [fill](#); and,
- c. Location of any buildings or structures where work is to be performed, and the location of any buildings or structures within 15 feet (4,572 mm) of the proposed [grading](#).

G. [Issuance](#)

The provisions of UAC 303 are applicable to [grading](#) permits. PDSD may require that [grading](#) operations and project designs to be modified if delays occur which incur weather-generated problems not considered at the time the permit was issued. PDSD may require testing by the [soils engineer](#). When PDSD has cause to believe that geologic factors may be involved, the [grading](#) will be required to conform to engineered [grading](#).

2-01.5.0 [GRADING FEES](#)

5.1 [General](#)

Fees shall be assessed in accordance with the provisions of this section or shall be as set forth in the fee schedule adopted by the jurisdiction. "For [excavation](#) and [fill](#) on the same building [site](#), the fee shall be based on the volume of [excavation](#) or [fill](#), whichever is greater."

5.2 [Plan Review Fees](#)

When a plan or other data are required to be submitted, a plan review fee shall be paid at the time of submitting plans and specifications for review. Said plan review fee shall be as set forth in Section 4-01.0.0, *Development Review Fee Schedule*, of the Administrative Manual. Separate plan review fees shall apply to retaining walls or major drainage structures as required structures as requires elsewhere in this code. For [excavation](#) or [fill](#), whichever is greater.

5.3 [Grading Permit Fees](#)

A fee for each [grading](#) permit shall be paid to PDSD as set forth in Section 4-04.1.5, *Grading Plan Review and Permit Fees*, of the Administrative Manual. Separate permits and fees shall apply to retaining walls or major drainage structures as required elsewhere in the Technical Standards. There shall be no separate charge for standard [terrace](#) drains and similar facilities.

2-01.6.0 BONDS

The Director of PDSD may require bonds in such form and amounts as may be deemed necessary to assure that the work, if not completed in accordance with the approved plans and specifications, will be corrected to eliminate hazardous conditions. In lieu of a surety bond the applicant may file a cash bond or instrument of credit with PDSD in an amount equal to that which would be required in the surety bond.

2-01.7.0 CUTS

7.1 General

Unless otherwise recommended in the approved soils engineering or geology report, cuts shall conform to the provisions of this section. In the absence of an approved soils engineering report, these provisions may be waived for minor cuts not intended to support structures.

7.2 Slope

The [slope](#) of cut surfaces shall be no steeper than is safe for the intended use and shall be no steeper than one unit vertical in two units horizontal (50% [slope](#)) unless the permittee furnishes a soils engineering or an engineering geology report, or both, stating that the [site](#) has been investigated and giving an opinion that a cut at a steeper [slope](#) will be stable and not create a hazard to public or private property.

2-01.8.0 FILLS

8.1 General Requirements Criteria for [Fill](#)

This criteria applies to all non-residential developments, and all residential developments with lots that are less than 24,000 square feet, that are adjacent to an existing residential development or residentially zoned property (excepting multifamily developments greater than single story), or unsubdivided non-commercial property. This criteria does not apply to phase boundaries within a master planned development or to individual lots within the interior of a residential development, or to small swales and drainage rills.

A. Placement of [fill](#) in excess of two feet [or a finished floor elevation (FFE) in excess of two feet plus the slab thickness] above [existing grade](#) at any location in the outer 100 feet of the developing [site](#) (less any intervening non-developable property outside of the [site](#)) shall require:

1. Written justification based on engineering/technical reasons;
2. Written permission of the Director of the PDSD;
3. Notification of the property owner(s) adjacent to the [fill site](#) (with copies to the Council Office and the Director of PDSD) prior to the [approval](#) of a [grading](#) plan. Said notification shall include reference to this ordinance, the justification presented as the basis for the excess [fill](#), the [approval](#) letter from PDSD, and the name, address, and phone number of the owner/developer and the engineer of record. This notification shall occur early in the development process; and,
4. Preparation of a mitigation plan (i.e. additional setbacks, terracing, enhanced buffering/landscaping, etc.) acceptable to a simple majority of the notified property owners. The acceptability of the mitigation plan by the notified property owner(s) must be documented and made a part of the approved [grading](#) plan and permit. If the owner/developer and the notified property owner(s) cannot reach consensus on a mitigation plan within 15 working days of receipt of the property owners, the Director of PDSD shall review the issues and information and then render a final decision. Monitoring of [grading](#) activities shall be the responsibility of the engineer of record and certification of FFE's shall be done by a registered land surveyor hired by the permittee. Regulation, inspection, control of work, and enforcement of the above criteria shall be the responsibility of the Director of PDSD as stated in DS 2-01.13.

8.2 Preparation of Ground

Fill slopes shall not be constructed on natural slopes steeper than one unit vertical in two units horizontal (50% slope). The ground surface shall be prepared to receive fill by removing vegetation, non-complying fill, topsoil and other unsuitable materials scarifying to provide a bond with the new fill and, where slopes are steeper than one unit vertical in five units horizontal (20% slope) and the height is greater than five feet (1,524 mm), by benching into sound bedrock or other competent material as determined by the soils engineer. The bench under the toe of a fill on a slope steeper than one unit vertical in five units horizontal (20% slope) shall be at least ten feet (3,048 mm) wide. The area beyond the toe of fill shall be sloped for sheet overflow or a paved drain shall be provided. When fill is to be placed over a cut, the bench under the toe of fill shall be at least ten feet (3,048 mm) wide but the cut shall be made before placing the fill and acceptance by the soils engineer or engineering geologist or both as a suitable foundation for fill.

8.3 Fill Material

Detrimental amounts of organic material shall not be permitted in fills. Except as permitted by PDSD, no rock or similar irreducible material with a maximum dimension greater than 12 inches (305 mm) shall be buried or placed in fills.

Exception: PDSD may permit placement of larger rock when the soils engineer properly devises a method of placement, and continuously inspects its placement and approves the fill stability. The following conditions shall also apply:

- A. Prior to issuance of the grading permit, potential rock disposal areas shall be delineated on the grading plan.
- B. Rock sizes greater than 12 inches (305 mm) in maximum dimension shall be ten feet (3,048 mm) or more below grade, measured vertically.
- C. Rocks shall be placed as to assure filling of all voids with well-graded soil.

8.4 Compaction

All fills shall be compacted to a minimum of 90% of maximum density.

8.5 Slope

The slopes of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes shall be no steeper than one unit vertical in two units horizontal (50% slope).

2-01.9.0 SETBACKS

9.1 General

Cut and fill slopes shall be set back from site boundaries in accordance with this section. Setback dimensions shall be horizontal distances measured perpendicular to the site boundary.

9.2 Top of Cut Slope

The top of cut slopes shall not be made nearer to a site boundary line than one fifth of the vertical height of cut with a minimum of two feet (610 mm) and a maximum of ten feet (3,048 mm). The setback may need to be increased for any required interceptor drains.

9.3 Toe of Fill Slope

The toe of fill slope shall be made not nearer to the site boundary line than one half of the height of the slope with a minimum of two feet (610 mm) and a maximum of 20 feet (6,096 mm). Where a fill slope is to be located near the site boundary and the adjacent off- site property is developed, special precautions shall be incorporated in the work as PDSD

deems necessary to protect the adjoining property from damage as a result of such [grading](#). These precautions may include but are not limited to:

- A. Additional setbacks;
- B. Provisions for retaining or slough walls;
- C. Mechanical or chemical treatment of the [fill slope](#) surface to minimize [erosion](#); and,
- D. Provisions for the control of surface waters.

9.4 Modification of [Slope Location](#)

The PDSD may approve alternate setbacks. The PDSD may require an investigation and recommendation by a qualified engineer or engineering geologist to demonstrate that the intent of this section has been satisfied.

2-01.10.0 DRAINAGE AND TERRACING

10.1 General

Unless otherwise indicated on the approved [grading](#) plan, drainage facilities and terracing shall conform to the provisions of this section for cut or [fill slopes](#) steeper than one unit vertical in three units horizontal (33.3% [slope](#)). "All drainage structures are to be constructed as designed and shall conform to plans approved by the jurisdiction, and in no case shall the drainage be altered as to how the water enters the property from the adjacent parcel or exits the construction [site](#) without written [approval](#) from the design engineer and government agencies."

10.2 Terrace

Terraces at least six feet (1,829 mm) in width shall be established at not more than 30-foot (9,144 mm) vertical intervals on all cut or [fill slopes](#) to control surface drainage and debris except that where only one [terrace](#) is required, it shall be at midheight. For cut or [fill slopes](#) greater than 60 feet (18,288 mm) and up to 120 feet (3,6576 mm) in vertical height, one [terrace](#) at approximately mid-height shall be 12 feet (3,658 mm) in width. [Terrace](#) widths and spacing for cut and [fill slopes](#) greater than 120 feet (3,6576 mm) in height shall be designed by the civil engineer and approved by PDSD. Suitable access shall be provided to permit proper cleaning and maintenance. Swales or ditches on terraces shall have a minimum gradient of 5% and must be paved with reinforced concrete not less than three inches (76 mm) in thickness or an approved equal paving. They shall have a minimum depth at the deepest point of one foot (305 mm) and a minimum paved width of five feet (1,524 mm). A single run of swale or ditch shall not collect runoff from a tributary area exceeding 13,500 square feet (1,254.2 m²) (projected) without discharging into a down drain.

10.3 Subsurface Drainage

Cut and [fill slopes](#) shall be provided with subsurface drainage as necessary for stability.

10.4 Disposal

All drainage facilities shall be designed to carry waters to the nearest practicable drainage way approved by the PDSD or other appropriate jurisdiction as a safe place to deposit such waters. [Erosion](#) of ground in the area of discharge shall be prevented by installation of non-erosive downdrains or other devices. Building pads shall have a drainage gradient of 2% toward approved drainage facilities, unless waived by the Director of PDSD.

EXCEPTION: The gradient from the building pad may be 1% if all of the following conditions exist throughout the permit area.

1. No proposed [fills](#) are greater than ten feet (3,048 mm) in maximum depth.

2. No proposed finish cut or [fill slope](#) faces have a vertical height in excess of ten feet (3,048 mm).
3. No existing [slope](#) faces, which have a [slope](#) face steeper than one unit vertical in ten units horizontal (10% [slope](#)), have a vertical height in excess of ten feet (3,048 mm).

10.5 Interceptor Drains

Paved interceptor drains shall be installed along the top of all cut [slopes](#) where the tributary drainage area above [slopes](#) toward the cut and has a drainage path greater than 40 feet (12,192 mm) measured horizontally. Interceptor drains shall be paved with a minimum of three inches (76 mm) of concrete or gunite and reinforced. They shall have a minimum depth of 12 inches (305 mm) and a minimum paved width of 30 inches (762 mm) measured horizontally across the drain. The [slope](#) of drain shall be approved by the Director of PDSD.

2-01.11.0 EROSION CONTROL

11.1 Slopes

The faces of cut and [fill slopes](#) shall be prepared and maintained to control against [erosion](#). This control may consist of effective planting. The protection for the [slopes](#) shall be installed as soon as practicable and prior to calling for final [approval](#). Where cut [slopes](#) are not subject to [erosion](#) due to the [erosion](#)-resistant character of the materials, such protection may be omitted.

11.2 Other Devices

Where necessary, check dams, cribbing, riprap or other devices or methods shall be employed to control [erosion](#) and provide safety.

2-01.12.0 GRADING INSPECTION

12.1 General

[Grading](#) operations for which a permit is required shall be subject to inspection by PDSD. [Professional inspection](#) of [grading](#) operations shall be provided by the civil engineer, [soils engineer](#) and the engineering geologist retained to provide such services for engineered [grading](#) and as required by the Director PDSD for regular [grading](#).

12.2 Civil Engineer

The civil engineer shall provide [professional inspection](#) within such engineer's area of technical specialty, which shall consist of observation and review as to the establishment of line, [grade](#) and surface drainage of the development area. If revised plans are required during the course of the work, they shall be prepared by the civil engineer.

12.3 Soils Engineer

The [soils engineer](#) shall provide [professional inspection](#) within such engineer's area of technical specialty, which shall include observation during [grading](#) and testing for required [compaction](#). The [soils engineer](#) shall provide sufficient observation during the preparation of the natural ground and placement and [compaction](#) of the [fill](#) to verify that such work is being performed in accordance with the conditions of the approved plan and the appropriate requirements of this chapter. Revised recommendations relating to conditions differing from the approved soils engineering and engineering geology reports shall be submitted to the permittee, the Director of PDSD and the civil engineer.

12.4 Engineering Geologist

The engineering geologist shall provide [professional inspection](#) within such engineer's area of technical specialty, which

shall include [professional inspection](#) of the bedrock [excavation](#) to determine if conditions encountered are in conformance with the approved report. Revised recommendations relating to conditions differing from the approved engineering geology report shall be submitted to the [soils engineer](#).

12.5 Permittee

The permittee shall be responsible for the work to be performed in accordance with the approved plans and specifications and in conformance with the provisions of this code, and the permittee shall engage consultants, if required, to provide [professional inspections](#) on a timely basis. The permittee shall act as a coordinator between the consultants, the contractor and the Director. In the event of changed conditions, the permittee shall be responsible for informing the Director of PDSD of such change and shall provide revised plans for [approval](#).

12.6 Planning and Development Services Department

The PDSD shall inspect the project at the various stages of work requiring [approval](#) to determine that adequate control is being exercised by the professional consultants.

12.7 Notification of Non-Compliance

If, in the course of fulfilling their respective duties under this chapter, the civil engineer, the [soils engineer](#), or the engineering geologist finds that the work is not being done in conformance with this chapter or the approved [grading](#) plans, the discrepancies shall be reported immediately in writing to the permittee and to the Director of PDSD.

12.8 Transfer of Responsibility

If the civil engineer, the [soils engineer](#), or the engineering geologist of record is changed during [grading](#), the work shall be stopped until the replacement has agreed in writing to accept their responsibility within the area of technical competence for [approval](#) upon completion of the work. It shall be the duty of the permittee to notify the Director of PDSD in writing of such change prior to the recommencement of such [grading](#).

2-01.13.0 COMPLETION OF WORK

13.1 Final Reports

Upon completion of the rough [grading](#) work and at the final completion of the work, the following reports and drawings and supplements thereto are required for engineered [grading](#) or when [professional inspection](#) is performed for regular [grading](#), as applicable:

A. An as-built [grading](#) plan prepared by a civil engineer showing original ground surface elevations, [as-graded](#) ground surface elevations, lot drainage patterns, and the locations and elevations of surface drainage of facilities and of the outlets of subsurface drains is required. As-constructed locations, elevations and details of subsurface drains shall be shown as reported by the [soils engineer](#). Civil engineers shall state that to the best of their knowledge the work within their area of responsibility was done in accordance with the final approved [grading](#) plan.

B. A report prepared by a [soils engineer](#) including locations and elevations of field density tests, summaries of field and laboratory tests, other substantiating data, and comments on any changes made during [grading](#) and their effect on the recommendations made in the approved soils engineering investigations report is required. Soils engineers shall submit a statement that, to the best of their knowledge, the work within their area of responsibilities is in accordance with the approved soils engineering report and applicable provisions of this chapter.

C. A report prepared by an engineering geologist including a final description of the geology of the [site](#) and any new information disclosed during the [grading](#) and the effect of same on recommendations incorporated in the approved [grading](#) plan is required. Engineering geologists shall submit a statement that, to the best of their knowledge, the work within their area of responsibility is in accordance with the approved engineering geologist report and applicable provisions

of this chapter.

D. The Engineer of Record shall submit in a form prescribed by the Director of PDSD a statement of conformance to said as-built plan and the specifications.

13.2 Notifications of Completion

The permittee shall notify the PDSD when the [grading](#) operation is ready for final inspection. Final [approval](#) shall not be given until all work, including installation of all drainage facilities and their protective devices, and all [erosion](#)-control measures have been completed in accordance with the final approved [grading](#) plan, and the required reports have been submitted.

SECTION 3: FLEXIBLE LOT DEVELOPMENT (FLD) - MAXIMUM DENSITY OPTION STANDARDS

SECTION 3-01.0.0: FLEXIBLE LOT DEVELOPMENT (FLD) - MAXIMUM DENSITY OPTION STANDARDS

Section

- 3-01.1.0 General
- 3-01.2.0 Historic Preservation Requirements
- 3-01.3.0 Green Building Requirements

3-01.1.0 GENERAL

The following technical standards apply to applicants proposing Flexible Lot Development projects utilizing a Historic Preservation or Green Building Maximum Density Option.

3-01.2.0 HISTORIC PRESERVATION REQUIREMENTS

UDC Section 8.7.3.C.3.b(3) allows an FLD to be developed with a density increase if the project includes preservation of a historical [site](#), structure, or landmark or if the project leads to preservation or scientific study and documentation of a historical [site](#), structure, or landmark. To qualify for the Maximum Density Option, an archaeological study is required to determine the potential for designation as a prehistoric or historic [site](#) or structure.

In the study, the following steps must be completed for each individual [site](#) within the project, unless determined unnecessary as outlined within this criterion. The information contained in these steps will include: the extent of such [sites](#) or structures; the extent of data collection on each [site](#); and the potential for preservation of each [site](#), including methods or plans for such preservation. This criterion is considered satisfied upon [approval](#) by the city of a report, completed by a qualified archaeologist, which provides evaluation of all steps.

The steps in an archaeological study are as follows:

Step 1. A preliminary study to determine the presence of prehistoric or historic [sites](#). This is accomplished by a thorough walk-through survey of the project [site](#) prior to any disturbance. The result of this step is an evaluation of the potential for prehistoric or historic [sites](#) within the project [site](#), according to Step 2.

Step 2. A testing of possible [sites](#) identified during the preliminary and [grading](#) studies. This is usually accomplished by a more detailed survey, with collection of surface artifacts; digging of test pits in possible [sites](#); or trenching to determine the depth of a [site](#), the approximate number of features in the [site](#), and more specific identification of the extent of the [site](#). The result of this step is a more detailed evaluation of [site](#) potential in terms of area extent, possible age, complexity (such as multiple occupations), and number of features (such as the number of pit houses, extramural features, storage houses, or ball courts in Hohokam villages).

Step 3. [Excavation](#) of [site](#) features to retrieve maximum data about the [site](#). [Excavation](#) is done within the context of a scientific research design or plan and prior to destruction of the [site](#) for development. The research design or plan specifies questions to be answered by the excavating, lists methods of getting answers (including the percent of the [site](#) to be excavated), and gives special techniques to be used (such as radio carbon dating, pollen analysis, dendrochronology, etc.). The result of this step is a report on the [excavation](#), an analysis of the material collected, and a synthesis of results into scientific literature or prehistoric reconstruction.

If a [site](#) or structure is identified by the archaeological study as being of significant magnitude and meeting the eligibility criteria for the National Register of Historic Places, it is to be preserved. Preservation may be pursued in a number of ways, such as, but not limited to: incorporation into the project design as common area; dedication as a conservation easement to the appropriate governmental or nonprofit agency; offer of sale, at appraised value, to the appropriate governmental agency; or dedication at nominal cost to the appropriate governmental agency. Such dedicated property may be used to calculate densities.

3-01.3.0 GREEN BUILDING REQUIREMENTS

UDC Section 8.7.3.C.3.b(8) allows an FLD to use the Maximum Density Option if the project is designed and located to comply with the requirements listed below. The requirements are grouped into three categories: [infrastructure](#), siting, and design. These three categories list a total of 31 criteria. Projects meeting a minimum of 20 criteria of the 31 comply with the requirements of this provision.

The Green Building Maximum Density Option requirements may not be modified through the Technical Standard Modification Request process. A request to deviate or waive a Green Building Maximum Density Option requirement must be submitted to the Board of Adjustment for [approval](#).

3.1 [Infrastructure](#)

- A. The project boundary is within one-fourth mile of an existing bus line.
- B. The project is located in a low water-lift zone (below an elevation of 2,700 feet).
- C. The project qualifies as urban infill, e.g., there is an existing R-1 subdivision or more intense development within one-fourth mile of the project boundaries on all sides.
- D. The project is located within 1,000 feet of existing water, electric, and natural gas distribution lines of sufficient capacity to serve the project.
- E. The project is a mixed commercial and residential use, either designed as a consolidated project or by its relation to adjacent commercial projects.
- F. The project is located within one mile of the University of Arizona or the Downtown District.
- G. The project is located within 2,000 feet of:
 1. An existing neighborhood shopping center;
 2. Property for which a final or conditional ordinance has been adopted rezoning the property for such use; or,

3. Property for which a building permit has been issued, and is still current, for the construction of such use.
- H. The project is located within 4,000 feet of:
1. An existing regional shopping center;
 2. Property for which a final or conditional ordinance has been adopted rezoning the property for such use; or,
 3. Property for which a building permit has been issued, and is still current, for the construction of such use.
- I. The project is located within 3,500 feet of an existing or reserved neighborhood park, regional park, or other public recreational or community facility.
- J. The project is located within 1,000 feet of a school which meets all the requirements of the compulsory education laws of the State of Arizona.
- K. The project boundary is 30% or more contiguous to an existing R-1 subdivision or more intense development.
- L. The project is located within 3,000 feet of a major employment center.
- M. The project is located within one-half mile of a public bikeway, bike lane, or bike path and incorporates pathways which connects to these.

3.2 Siting

- A. Buildings are designed with windows oriented to provide at least five hours of solar access on December 21 between the hours of 9:00 a.m. and 4:00 p.m.
- B. Buildings are designed to provide complete shade to all windows on June 21. On new construction, shading devices which require manual operation to accomplish the shading do not qualify as building design that provides shade.
- C. Building design and deciduous landscaping at maturity are integrated into the project to provide shade to 80% of the east and west facing walls on June 21. On new construction, landscaping alone does not satisfy this criterion.
- D. Paved areas, such as sidewalks and parking areas, are shaded with deciduous shade trees or architectural shading elements, such as trellises, roofs, etc. Principal sidewalks are those which provide access from parking to each unit and from each unit to all common areas. Shade trees in a parking area are to be within a protected landscaped area with a minimum width of five feet and at a ratio of two trees for every 3,000 square feet of parking area.
- E. Eighty percent of all buildings are located and constructed to provide at least five hours of solar access to three-fourths the height of the south wall on December 21. This requirement must take into account walls and vegetation which could block solar access.
- F. Eighty percent of the buildings within the project are positioned with the longer axis, if any, oriented within 22 degrees of a true east/west direction.

3.3 Design

- A. At least 80% of the dwelling units are constructed with common walls.
- B. All buildings are earth sheltered, partially protected by earth berms, or built into an existing hillside or [slope](#).
- C. All buildings are constructed with insulation at foundations and floor slabs at [grade](#).
- D. All building envelopes have an overall average thermal resistance value (R value) of 24 or greater.
- E. Buildings have windows that can be opened and which are oriented between 20 and 70 degrees of prevailing

diurnal wind patterns to provide natural through ventilation. The windows are to be double glazed and spaced at least three feet apart.

- F. Individual units feature a minimum area of glass, to be less than 10% of the exterior wall area.
- G. At least 80% of the residential buildings do not have windows on the east facade.
- H. At least 80% of the residential buildings do not have windows on the west facade.
- I. The residential buildings include overhangs on the south facade to provide shading during the summer months.
- J. At least 80% of the units in the project have screened porches.
- K. At least 80% of the dwelling units are designed to provide a private unroofed outdoor space for sleeping, such as a rooftop deck or sun porch.
- L. At least 80% of all buildings are constructed with light-colored roofs and walls.

SECTION 4: HYDROLOGY

SECTION 4-01.0.0: COMMERCIAL RAINWATER HARVESTING

Section

- 4-01.1.0 General
- 4-01.2.0 Design Considerations and Technical Requirements
- 4-01.3.0 [Rainwater](#) Harvesting Plan
- 4-01.4.0 Landscape and Irrigation Requirements
- 4-01.5.0 Maintenance
- 4-01.6.0 Compliance
- 4-01.7.0 Enforcement

Exhibits

4-01.1.0 GENERAL

1.1 Introduction

Harvesting [rainwater](#) is a useful strategy for providing supplemental irrigation water to commercial landscapes, making more efficient use of the desert's most limited resource – water. The City of Tucson Mayor and Council adopted the Commercial [Rainwater](#) Harvesting Ordinance on October 14, 2008 to increase the use of harvested [rainwater](#) at commercial [sites](#) in Tucson and to decrease use of potable and reclaimed water supplies. The ordinance takes effect June 1, 2010.

1.2 Purpose

This Technical Standard has been prepared to facilitate effective use of available [rainwater](#) resources for landscape

irrigation in [commercial development](#) as a means of reducing dependency on potable and reclaimed water sources. It clarifies requirements for compliance with Ordinance No. 10597, the Commercial [Rainwater](#) Harvesting Ordinance (ordinance), including the key requirement of meeting 50% of landscape water demand using harvested water. This standard provides:

- A. Design considerations and technical requirements for passive and [active water harvesting](#) systems;
- B. Requirements and guidelines for the preparation and implementation of [Rainwater](#) Harvesting Plans;
- C. Requirements for landscape and irrigation at [water harvesting sites](#);
- D. Recommended maintenance steps;
- E. Elements required for compliance with the ordinance;
- F. Enforcement provisions;
- G. Water budget assumptions and calculations (Exhibit A); and,
- H. Annual reporting form (Exhibit B).

1.3 Applicability

This standard applies to all [commercial development](#) plans submitted after June 1, 2010.

4-01.2.0 DESIGN CONSIDERATIONS AND TECHNICAL REQUIREMENTS

Two primary strategies for harvesting water are commonly used in the southwest US to support landscape water needs. [Passive water harvesting](#) is accomplished by infiltrating [stormwater](#) runoff directly into [Water Harvesting Infiltration Areas](#). [Active water harvesting](#) stores harvested water in [containment systems](#) located above or below ground so the stored water is available for later beneficial use. The commercial facility may determine the strategy or strategies most appropriate for their [site](#). Design considerations and technical requirements for passive and [active water harvesting](#) systems are described in the sections below.

2.1 [Passive Water Harvesting](#)

[Passive water harvesting](#) consists of the collection of [stormwater](#) directly in [Water Harvesting Infiltration Areas](#) without the temporary storage of water in [containment systems](#). [Passive water harvesting](#) functions through gravity-flow of [stormwater](#). It requires no tanks, piping, metering, pumps or other [infrastructure](#) associated with [containment systems](#). However, in [passive water harvesting](#), [infrastructure](#) components may be needed to route overflow water, pass water under roads or parking lots, or for other purposes conducive to the effective functioning of the passive systems.

A. [Passive Water Harvesting](#) Design Considerations

An array of techniques and designs are available to accomplish [passive water harvesting](#). Whatever techniques or designs are used, the items listed below should be considered to create safe, efficient and effective [passive water harvesting](#) systems.

1. Use [Water Harvesting Infiltration Areas](#), where feasible, to offset the size of a retention/detention basin that may be needed at a [site](#). Consult Appendix C of the City of Tucson [Water Harvesting](#) Guidance Manual for information on the allowed offset.
2. The area and depth of [Water Harvesting Infiltration Areas](#) should be determined according to the anticipated volume of harvested water that will enter these areas and the infiltration characteristics of the underlying soil.
3. Plants with similar water demands should be placed in the same areas within [Water Harvesting Infiltration](#)

Areas.

4. Soils within [Water Harvesting Infiltration Areas](#) should be modified as needed to counteract the effects of mechanical [compaction](#) and/or poor soil infiltration conditions in order to ensure appropriate water infiltration.
5. The edge of [Water Harvesting Infiltration Areas](#) should be set back from building foundations or other structures to allow for positive drainage of water. Consult a soils professional where necessary.
6. Planting areas that harvest water should be recessed below the [grade](#) of adjacent hardscapes. Hardscape surfaces should be sloped toward adjacent recessed planting areas.
7. Pedestrian circulation should be designed to discourage cutting across recessed planting areas to avoid soil [compaction](#), [erosion](#), and damage to plants and to minimize the risk of injury to pedestrians.
8. Maximum reveal at the edge of public sidewalks and pedestrian circulation paths should be two inches or less to minimize the risk of injury to pedestrians. A minimum 12-inch wide shoulder with a maximum 2% cross- [slope](#) away from a public sidewalk or pedestrian circulation path should be provided where possible.
9. [Water Harvesting Infiltration Areas](#) should be stabilized for dust control purposes. Techniques could include spreading one-half inch or larger rock, hydroseeding with native seed mixes, or using other stabilizing techniques and materials. Fine-grained particles that could block water infiltration by clogging soil pores should be washed from materials prior to placement. Avoid the use of fine- [grade](#) decomposed granite within or directly adjacent to [Water Harvesting Infiltration Areas](#) due to the potential for shed silts and clays to reduce water infiltration.
10. Organic mulch is appropriate for reducing evaporation, controlling dust and increasing soil quality in [Water Harvesting Infiltration Areas](#) in those locations where the vegetation, water collection, [erosion](#) conditions, and [slope](#) characteristics are amenable to its use.

B. [Passive Water Harvesting Technical Requirements](#)

The following technical requirements apply to all [passive water harvesting](#) systems.

1. [Water Harvesting Infiltration Areas](#) shall be designed so that water infiltrates into soil within 24 hours.
2. [Water Harvesting Infiltration Areas](#) shall be designed to minimize ponding in areas that may create a nuisance for pedestrians. Ponding is not allowed on or over public sidewalks or required pedestrian circulation paths.
3. Materials for [erosion](#) control shall be specified where they are necessary due to [erosion](#) potential. The ground surface treatment of spillways and other areas that convey water flows shall be able to withstand scouring.

2.2 [Active Water Harvesting](#)

[Active water harvesting](#) stores harvested water in [containment systems](#) located above or below ground so the stored water is available for later beneficial use. [Active water harvesting](#) systems include the tanks, piping, metering, pumps and other [infrastructure](#) elements needed to store and transmit water to a beneficial use. [Active water harvesting](#) systems might be gravity-flow based or use pumps depending on the size and needs of the [site](#).

A. [Active Water Harvesting Design Considerations](#)

An array of techniques and designs are available to accomplish [active water harvesting](#). Whatever techniques or designs are used, the items listed below should be considered to create safe, efficient and effective [active water harvesting](#) systems.

1. Tanks may be constructed of metal, plastic, masonry, reinforced concrete, fiberglass, or other suitable PDSO-approved material designed to store water.
2. The dimensions of tanks may be determined by the applicant based on [site](#)-specific design needs.

3. Above-ground tank construction material or coating should be opaque to prevent sunlight from inducing algae growth. Any portion of a subsurface tank that is exposed to sunlight should be opaque to prevent sunlight from inducing algae growth.

4. A “first flush device” is intended to prevent the dust, grit, leaves and other materials that may accumulate on a roof from being washed into a [water harvesting](#) tank. This is accomplished by deflecting the first flush of [stormwater](#) from entering the tank inlet line. The installation of first flush devices is strongly recommended.

5. Inlet piping may convey water overhead from a roof to a tank, or in a U-shaped configuration that conveys water to a lower entry point on the tank. The U-shaped configuration should be designed to hold standing water, and must be pressure rated and sealed to prevent leaks.

6. Designs that involve water falling freely through the air before entering a tank may be allowed provided the design minimizes the entry of light and mosquitoes into the tank.

B. [Active Water Harvesting Technical Requirements](#)

The following technical requirements apply to all [active water harvesting](#) systems:

1. Materials must be installed per manufacturer’s specifications.
2. Tanks shall have a base or foundation that meets manufacturer’s specifications. If no specifications are provided by the manufacturer, the base shall be designed by an engineer.
3. Locations of [containment systems](#) shall be in accordance with applicable codes.
4. Consult the International Building Code for applicable regulations.
5. Sub-surface storage tanks shall be constructed of materials designed for holding water underground. Below-ground tanks must be designed and installed under the guidance of a civil or structural engineer and/or tanks must be installed per manufacturer’s specifications regarding bedding, setting the tank, strapping or other anchoring device, load bearing characteristics and backfill requirements.
6. If debris screening is used for inlets to tanks, screening must be configured in such a way that an unmaintained screen cannot block inlet pipes to a tank. Obstructed screens can prevent [water harvesting](#) and back water up on the roof creating unsafe weight load conditions on the roof.
7. There must be a structured overflow device installed with the tank to automatically allow excess infill water to exit the tank safely.
8. An overflow mechanism, separate from that provided inside the tank, shall be provided to ensure that water cannot back up on a roof. Roof overflow drains shall not be connected to tanks.
9. Outlets for overflow pipes shall be positioned so as not to compromise the foundations of buildings or other structures.
10. Tanks and covers shall be constructed of materials appropriate for use for storing water.
11. Tanks must have an inspection port of sufficient size to conduct any necessary visual inspection, maintenance, cleaning, repair, and other tasks as described in the manufacturer’s specifications.
12. If a manhole is provided with the intent of allowing human access into a tank, it must meet any applicable size and safety requirements.
13. A means should be provided to enable particulate materials that accumulate in the bottom of tanks to be cleaned out or flushed out if needed.

14. [Containment systems](#) shall be designed, maintained and operated to prevent mosquito harboring and/or breeding.
15. A reduced-pressure backflow-preventer assembly is required when connecting irrigation from an [active water harvesting](#) system to a potable water irrigation system in order to protect the public water system and/or building water system.
16. Hose bibs connected to an [active water harvesting](#) system shall be keyed and shall be posted "NON-POTABLE, DO NOT DRINK."

4-01.3.0 RAINWATER HARVESTING PLAN

A [Rainwater](#) Harvesting Plan shall be submitted with all applications for [commercial developments](#) at which landscaping is required. The [Rainwater](#) Harvesting Plan shall consist of two elements: a [Site](#) Water Budget and a [Water Harvesting](#) Implementation Plan. Preparation of the [Rainwater](#) Harvesting Plan elements requires coordination between project managers, [site](#) engineers and landscape architects from the inception of the project. The two elements of the [Rainwater](#) Harvesting Plan shall illustrate how [water harvesting](#) will meet 50% of annual landscape water demand, as required by the ordinance.

3.1 [Site Water Budget](#)

The [Site](#) Water Budget shall detail the landscape water demand and the harvested water supply needed to meet 50% of landscape demand. The [Site](#) Water Budget and the [Water Harvesting](#) Implementation Plan shall be consistent with one another.

A water budget format is shown in Exhibit A, along with the background data and assumptions used to develop it. This water budget format is available to applicants as an Excel spreadsheet at http://www.tucsonaz.gov/PDSD/What_s_New/what_s_new.html. Applicants may use this water budget format to enter [site](#)-specific data to develop their [Site](#) Water Budget. Alternatively, applicants may develop their own [Site](#) Water Budget format. Whichever format is used, the submitted [Site](#) Water Budget shall incorporate and provide the information below.

A. [Water Demand](#)

Applicants shall use plant water demand categories and data provided in Exhibit A unless alternative assumptions are provided and satisfactorily justified.

B. [Water Supply](#)

Applicants shall use the effective monthly rainfall assumptions shown in Exhibit A unless alternative assumptions are provided and satisfactorily justified.

C. [Output](#)

Output of the [Site](#) Water Budget shall include calculations showing how 50% of landscape water demand as an average across the [site](#) will be met using harvested [rainwater](#), and shall include assumptions and supporting calculations as necessary to document these outputs. Output of the [Site](#) Water Budget shall include total water demand and [rainwater](#) supply calculations for each [Water Harvesting](#) Infiltration Area at the [site](#).

3.2 [Water Harvesting Implementation Plan](#)

The [Water Harvesting](#) Implementation Plan (Implementation Plan) shall consist of a separate sheet with a plan view layout of the [site](#). The format and design of the Implementation Plan shall be consistent with the base plan, be it a Development Package (DS 2-01), Plat (DS 2-03), [Site](#) Plan (DS 2-04), Development Plan (DS 2-05), or their successor documents, as applicable. The Implementation Plan shall include all details necessary and appropriate to convey the

technical concept of the [water harvesting](#) system design and to facilitate proper installation and maintenance of the [water harvesting](#) system in compliance with the ordinance and this standard.

Submittal of the Implementation Plan shall be made concurrently with the Development Plan and Landscape Plan. Revision of the Implementation Plan may be required in conjunction with preparation of the [Grading](#) Plan in order to coordinate the construction details and specifications.

A. General Information

The following general information will be provided on the Implementation Plan.

1. The case number located in the lower right corner of the plan;
2. The means by which monthly rainfall data will be obtained and recorded;
3. The means by which monthly irrigation data will be obtained and recorded;
4. Soil pretreatment techniques, locations and schematics;
5. Maintenance notes; and,
6. Monitoring and Annual Reporting Requirements.

B. Tabulated Data

The Implementation Plan shall include a table detailing information for each identified [Water Harvesting](#) Infiltration Area (WHIA) at the [site](#), and for the [site](#) as a whole, as described below.

1. General WHIA information:
 - a) WHIA identifier;
 - b) Spatial size (square feet) of WHIA;
 - c) Average depth (feet) of WHIA;
 - d) Capacity (gallons) of WHIA; and,
 - e) Type and general location where any sensors that control the irrigation system will be placed.
2. Plant canopy information:
 - a) [Plant canopy area](#) (square feet) that is served by each WHIA, consisting of the sum of understory, midstory and overstory plant canopies at 60% of the mature plant sizes;
 - b) Plant water demand category; and,
 - c) Total annual plant water demand (gallons).
3. Information about passive and/or [active water harvesting](#) systems serving each WHIA:
 - a) For the Subwatershed passively serving each WHIA:
 - i. Subwatershed identifier;
 - ii. Spatial size (square feet) of the subwatershed;
 - iii. Material the subwatershed is made of or covered with; and,

- iv. Percent of annual plant water demand provided by this subwatershed to the WHIA.
- b) For the [containment system](#) actively serving each WHIA:
- i. Tank identifier;
 - ii. Tank capacity (gallons);
 - iii. Tank location; and,
 - iv. Percent of annual plant water demand provided by this tank to the WHIA.
- c) Any additional information needed to document how 50% of irrigation demand will be met using harvested water.
- d) Data tabulated for the entire [site](#):
- i. Percent of annual landscape water demand met using harvested water; and,
 - ii. [Water harvesting](#) capacity that will offset standard retention/detention basin size, if applicable.
- e) Additional plan information may be requested or required by the Planning and Development Services Department (PDSD) Director to evaluate [rainwater](#)-harvesting Implementation Plan

C. Mapped Data

The Implementation Plan shall graphically show the following information drawn from tabulated data.

1. For the WHIA:
 - a) Indicate the boundary of each WHIA and show its identifier;
 - b) Use arrows to show water flow directions within WHIA, including flow direction at inlets and outlets; and,
 - c) Show location where any sensors that control the irrigation system will be placed.
2. Indicate the boundary of the [plant canopy area](#) to be served by each WHIA;
3. Information about Passive and/or [Active Water Harvesting](#) Systems serving each WHIA:
 - a) Passively supplied water:
 - i. Indicate the Subwatershed Area serving each WHIA and show its identifier;
 - ii. Use arrows to indicate the flow path water will take from source to WHIA;
 - iii. Indicate spot elevations for the bottoms of [water harvesting](#) structures, at spillways, and to define other grades as needed; and,
 - iv. Indicate the location of all surface or subsurface infiltration structures, pipelines, spillways, French drains, scuppers, curb cuts and other [infrastructure](#) elements needed to convey, store or overflow passively supplied water, or to control [erosion](#).
 - b) Actively supplied water:
 - i. Show tank and show its identifier;
 - ii. Label tank as delivering water by gravity flow or pump;

- iii. Use arrows to indicate flow path water will take from source to WHIA; and,
- iv. Show additional piping, pump and other [infrastructure](#) needed to store, overflow, and convey water to WHIA.

D. Additional Information

Additional notes shall be provided on the Implementation Plan to ensure current and subsequent [site](#) owners and operators are informed of the inspection and maintenance required in Section 4-01.6.0, *Compliance*.

4-01.4.0 LANDSCAPE AND IRRIGATION REQUIREMENTS

4.1 Landscape Requirements

A. Soil pretreatment

Due to construction [site compaction](#), the soils in planting areas might need to be pretreated to ensure adequate infiltration of harvested water. Soil Pretreatment techniques, locations and schematics should be provided on the Implementation Plan.

B. Plant selection and placement

Plants selected for use within discreet [Water Harvesting Infiltration Areas](#) should have compatible water needs. Drought tolerant plants native to Tucson are adapted to the seasonal rainfall patterns present in the Sonoran Desert and present an advantage over low-water-use plants from other climates. Plants should be positioned to account for the level of expected inundation. They may be placed on the bottoms or sides of recessed areas or the tops of adjacent soil where their roots can grow toward adjacent moist soil. Other placement considerations should include sun exposure, maintenance requirements, shape, form, and aesthetics.

C. Mulch placement

Mulch shall be positioned away from the base of plant trunks to avoid excessive moisture there.

4.2 Irrigation Requirements

A. Irrigation Control

Irrigation systems shall be fitted with irrigation controllers and shall be capable of monitoring and responding to plant water needs through the use of soil moisture gauges, tensiometers, weather stations, and/or [evapotranspiration](#) data. The irrigation technology chosen should be capable of preventing the irrigation system from running if sufficient soil moisture is present to support the vegetation. All systems shall include rain shut-off devices. Instruments shall be correctly placed to ensure plants are kept healthy using a combination of harvested and non-harvested water and to ensure the stated water-saving goal of the ordinance is met.

B. Irrigation Timers

Irrigation timers, where used, shall be used in conjunction with other irrigation controls to ensure compliance with the provisions of this technical standard.

C. Water-Use Calculations

Irrigation Plans must include calculations for estimated water use based on assumptions about plant water demand and canopy size used in the [Site](#) Water Budget.

D. Drip System Efficiency

Drip irrigation systems shall meet and maintain a minimum 80% emission uniformity.

4-01.5.0 MAINTENANCE

5.1 Maintenance Requirements

All Passive and [Active Water Harvesting](#) System components, [Water Harvesting Infiltration Areas](#), and other [site](#) improvements necessary for the [water harvesting](#) system to function properly, should be regularly inspected and maintained. The following maintenance requirements should be addressed on the Implementation Plan.

A. All systems.

Periodically inspect and clean gutters, leaf screens, and filters. Inspect systems following heavy rains to check for leaks and/or overflow problems. Periodically inspect and maintain [Water Harvesting Infiltration Areas](#) to ensure proper infiltration, overflow, and prevention of [erosion](#), if occurring. Repair and correct problems.

B. Passive Systems.

In addition to requirements for all systems, to ensure proper functioning of [Passive Water Harvesting](#) Systems, periodically inspect and maintain Subwatershed surfaces and [infrastructure](#) associated with the system such as French drains, spillways, scuppers, and other elements. Repair and correct problems as needed.

C. Active Systems.

In addition to requirements for all systems, to ensure proper functioning of [Active Water Harvesting](#) Systems periodically inspect tanks, access hatches and associated locks, overflow devices, pipes, pipe joints and connectors, pumps, vents, controllers, and other associated [infrastructure](#). Empty first flush devices as needed after rainfalls to ensure correct operation in the next rainfall. Inspect systems following heavy rains to check for leaks and/or overflow problems. Determine whether sludge should be removed from tanks. Repair and correct problems as needed.

D. Irrigation systems.

Irrigation systems and associated controllers, soil moisture sensors, tensiometers, weather stations, and any other associated instruments shall be properly maintained and replaced as needed to ensure the potable and reclaimed water-saving goal of the ordinance is met.

4-01.6.0 COMPLIANCE

6.1 Monitoring

Monitoring of water use and related information at the [site](#) shall be the responsibility of the property owner. Monitoring is required to verify compliance with the approved [Water Harvesting](#) Implementation Plan. Monitoring data shall be compiled, along with other necessary information, into an annual report to be submitted to the city by January 30 of each year. The [site](#) conditions described below shall be monitored.

A. Monthly Water Use

Monthly water use for landscape irrigation shall be monitored.

1. Monitoring of monthly potable water use for irrigation of landscape plants is required at [sites](#) subject to the ordinance. [Sites](#) shall monitor water use with a Tucson Water Irrigation Service Meter, an equivalent meter from another water provider, or a private sub-meter that meets Accuracy Standards for Private Sub-meters.

2. Monitoring of monthly water use for irrigation of landscape plants is required at [sites](#) served by private wells or

reclaimed water. [Sites](#) shall monitor water use with a private submeter that meets Accuracy Standards for Private Submeters.

B. Monthly Rainfall

Monthly rainfall shall be monitored using an on- [site](#) rain gauge, or a monthly rainfall estimate shall be developed using data from the closest available rain gauge recorded at www.rainlog.org.

6.2 Annual Reporting

An Annual Report shall be submitted to the Tucson Water Conservation Office by January 30 of each year, on a form provided by that Office (Exhibit B). Each Annual Report shall, at a minimum, contain the following information for the previous calendar year:

- A. Name and contact information for [site](#) and owner;
- B. Name, title and contact information for person who prepares the annual report;
- C. Source of rainfall data (on- [site](#) gauge or www.rainlog.org);
- D. Sources of metered irrigation water other than harvested [rainwater](#) used at the [site](#);
- E. Monthly and total annual readings of the following: rainfall, projected landscape water demand shown in the approved [Rainwater](#) Harvesting Plan, actual metered water use, difference between these amounts;
- F. Explanation for any exceedence of annual metered irrigation water use projected in the approved [Rainwater](#) Harvesting Plan;
- G. Changes to the landscape or irrigation system in the reporting year; and,
- H. Other information as deemed necessary.

4-01.7.0 ENFORCEMENT

The steps described below are required to ensure the [site](#) is constructed according to the requirements of the approved Implementation Plan.

7.1 Inspections

- A. All [site](#)-scale [grading](#) related to [water harvesting](#) Subwatersheds and [Water Harvesting Infiltration Areas](#) must be inspected and accepted by PDSO prior to application of any surface treatment (e.g., concrete, asphalt, rock, etc.) to verify that [slopes](#), recessed areas, overflows, and other design elements have been properly graded.
- B. All landscape-scale [grading](#) in [Water Harvesting Infiltration Areas](#) where planting will be conducted must be inspected and accepted by PDSO prior to plant installation and application of organic mulch or rock to verify they have been properly graded.
- C. PDSO will inspect the [site](#) for compliance with the provisions of the [Rainwater](#) Harvesting Plan prior to issuance of a final certificate of occupancy.

7.2 Audits and Reporting

A. Landscape Irrigation Audit

In the event the [site](#) fails to meet the percent [water harvesting](#) in a reporting year required in the approved [Rainwater](#) Harvesting Plan, Tucson Water may request that additional information or documentation be submitted to assist in

determining the cause of the violation. A [site](#) visit and a landscape irrigation audit may be required to verify the [Rainwater Harvesting Plan](#) is being adhered to and all components are properly functioning.

B. [Non-Compliance](#)

[Sites](#) determined to be in non-compliance may be required to submit monitoring reports monthly and may be required to provide Owner's annual certification of continued maintenance and proper operation of [water harvesting](#) systems and the irrigation system and associated controls.

7.3 [Drought Contingency](#)

The 50% landscape budget provision shall not apply in any calendar year in which the annual precipitation has fallen below nine inches at the [site](#), as reported in the [site](#)'s annual report.

EXHIBITS

Exhibit A [Site](#) Water Budget Assumptions and Calculations

Exhibit B Annual Report Form for Commercial [Water Harvesting Sites](#)

EXHIBIT A. [SITE WATER BUDGET ASSUMPTIONS AND CALCULATIONS](#)

Designing [water harvesting](#) systems at a commercial [site](#) requires coordination between [site](#) developers, [site](#) engineers and landscape architects from the inception of the [site](#) design process. The information below is provided to inform [site](#) designers and engineers of the assumptions and methods the city recommends for use in designing and engineering water harvesting for a commercial [site](#). This approach can be used both in preparation of the two components of the [Rainwater Harvesting Plan](#): the [Site](#) Water Budget and the Water Harvesting Implementation Plan.

Preparing a [Site](#) Water Budget that meets the requirements of Commercial [Rainwater](#) Harvesting Ordinance and Technical Standard 4-01 requires projecting yearly plant water demand for the [site](#) landscape then determining how much harvested water supply is needed to meet at least 50% of this demand. [Sites](#) may choose to use [passive water harvesting](#) (earthworks), [active water harvesting](#) (tanks), or a combination of both methods to accomplish this goal. Because most [sites](#) will be able to accomplish the 50% goals with [passive water harvesting](#) alone, the [site](#) design calculations provided at the end of this exhibit focus on data for [passive water harvesting](#) sites. An example [Site](#) Water Budget is shown in Table A-1. This example is provided to serve as a model for [sites](#) undertaking [water-harvesting](#) design. An excel spreadsheet of this water budget is available from http://www.tucsonaz.gov/PDSD/What_s_New/what_s_new.html for use by [site](#) designers in preparing their [Site](#) Water Budget. This information in turn should be used to prepare the [Water Harvesting](#) Implementation Plan. Calculations

1.0 [WATER DEMAND ASSUMPTIONS](#)

Multiple techniques can be used to determine how much water is needed to support plants at a [site](#). For purposes of complying with city requirements, the methods and assumptions described below are recommended.

1.1 [Reference Evapotranspiration](#)

To determine how much water plants need, a measurement of how much water plants consume through [evapotranspiration](#) is needed. [Evapotranspiration](#) is the transfer of water from land surface to the atmosphere through the combination of evaporation and plant transpiration. In the Reference [Evapotranspiration](#) Method (ET_o Method), water use by plants is estimated for a high-water-use grass cover crop (such as alfalfa) for which [evapotranspiration](#) can be directly measured. Monthly Reference ET_o values for a high-water-use grass crop in Tucson have been tabulated in Table A-2.

Table A-2. Reference [Evapotranspiration](#) (ET_o) for Tucson

MONTHLY REFERENCE EVAPOTRANSPIRATION (Inches)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.0	3.72	6.0	8.04	9.96	10.56	9.36	7.92	7.20	5.76	3.60	2.64

Table A-1. [Site Water Budget Format](#)

Line	DESCRIPTIONS OF WATER BUDGET COMPONENT	SOURCES FOR EACH WATER HARVESTING INFILTRATION AREAS (WHIAs)	EXAMPLE WHIA
	PLANT WATER DEMAND		
1	Individual WHIA identifier	APPLICANT PROVIDES	WHIA - 1
2	Plant water demand category for this WHIA	APPLICANT PROVIDE USING ADWR PLANT LIST	low
3	Plant canopy area (square feet) for this WHIA. Add the canopies of understory, midstory and overstory plant areas to get total canopy for each WHIA. Assume 60% of mature plant size	APPLICANT PROVIDE. CAN BE BASED ON LANDSCAPE PLAN OR PLANT LIST	1250
4	Plant water demand per year (vertical feet of water per year per square foot of canopy) for this WHIA	APPLICANT USES APPROPRIATE NUMBER BASED ON PLANT WATER DEMAND CATEGORY FOR THIS WHIA	1.7
5	<u>CALCULATE</u> : Annual plant water demand for this WHIA based on plant canopy area (gallons)	= line 3 times line 4 times 7.48 gallons/cubic foot of water	15,895
6	OVERALL WATER HARVESTING SUPPLY		
7	WHIA area (square feet)	APPLICANT PROVIDE	1000
8	WHIA average depth (feet)	APPLICANT PROVIDES	0.5
9	<u>CALCULATE</u> : WHIA capacity (gallons)	line 7 times line 8 times 7.48 gallons/cubic foot of water	3,740
10	If Passive water harvesting is used:		
11	Subwatershed identifier	APPLICANT	S-1
12	Ratio of subwatershed area to plant canopy area needed to meet plant water demand in this WHIA in July	APPLICANT USES APPROPRIATE NUMBER BASED ON PLANT WATER DEMAND CATEGORY	3.85

	through March (use March plant water demand as the indicator month) (no units)	FOR EACH WHIA	
13	<u>CALCULATE</u> : Total catchment area ideally needed to meet plant water demand in March (square feet)	= line 3 x line 12	4,813
14	Actual total catchment area designed for this WHIA including the WHIA area itself (square feet)	APPLICANT PROVIDE	1500
15	<u>CALCULATE</u> : Actual catchment ratio for this WHIA	= line 14 divided by line 3	1.20
16	<u>CALCULATE</u> : Actual percent of plant water demand that will be met for this WHIA	= 64% times line 15 divided by line 12	20%
17	If Active water harvesting is used:		
18	Tank identifier	APPLICANT PROVIDES	T-1
19	above or below ground?	APPLICANT PROVIDES	above
20	tank height (feet)	APPLICANT PROVIDES	8
21	tank diameter (feet)	APPLICANT PROVIDES	6
22	tank capacity (gallons)	APPLICANT PROVIDES	1619
23	tank location	APPLICANT PROVIDES	East corner
24	<u>CALCULATE</u> : Percent of plant water demand for this WHIA met by this tank	(Assume tank will be filled and emptied 4 times per year). Total water provided = 4 times line 22 divided by line 5	41%
25	<u>CALCULATE</u> : Percent of plant water demand for this WHIA met using harvested rainwater from passive systems and active systems (as applicable)	= line 16 + line 24	61%
26	TOTAL SITE INFORMATION		
27	Percent to total site annual landscape demand met using harvested water	Prorate percent of water harvesting supply based on area of each WHIA	61%
28	Water harvesting capacity offsetting retention basin size capacity	APPLICANT PROVIDES	

1.2 Plant Coefficients

Four categories of plant types are typically used in Tucson. These categories are established based on their water use characteristics (Table A-3). Plant coefficients are an estimate of the water needed by each plant type expressed as a fraction of the water needed for the reference high-water-use grass crop. Plant types and corresponding plant coefficients are shown in Table A-3.

Table A-3. Plant Coefficients for use in Tucson

PLANT TYPE	PLANT COEFFICIENT
Very low water use	0.13 times monthly Reference ETo
Low water use	0.26 times monthly Reference ETo
Moderate water use	0.45 times monthly Reference ETo
High water use	0.65 times monthly Reference ETo

1.3 Plant Water Demand

Plant water demand is the water needed over a given period of time to support a landscape. The first step in determining plant water demand is to calculate the inches of water needed per year for each square foot of plant canopy (as seen from a bird's eye view). This is calculated by multiplying Tucson's monthly reference ETo by the plant coefficient for each plant type to be used at a [site](#) (Table A-4). Add monthly amounts to get the total annual plant demand per square foot of canopy (Table A-4).

Table A-4. Plant water demand per square foot of plant canopy for Tucson

PLANT TYPE	MONTHLY PLANT WATER DEMAND (Inches)												ANNUAL DEMAND (Inches)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Very low water use	0.39	0.48	0.78	1.05	1.29	1.37	1.22	1.03	0.94	0.75	0.47	0.34	10.11
Low water use	0.78	0.97	1.56	2.09	2.59	2.75	2.43	2.06	1.87	1.50	0.94	0.69	20.22
Moderate water use	1.35	1.67	2.70	3.62	4.48	4.75	4.21	3.56	3.24	2.59	1.62	1.19	34.99
High water use	1.95	2.42	3.90	5.23	6.47	6.86	6.08	5.15	4.68	3.74	2.34	1.72	50.54

To calculate various plant water demands for large planted areas, the inches of water needed per square foot of one type of plant canopy is multiplied by the total canopy area for that plant type to get plant water demand. Plant Water Demand should be calculated for each individual [Water Harvesting Infiltration Areas](#). These can then be added together to get total plant water demand for the [site](#).

1.4 Alternative Calculations

Applicants wishing to use alternative values and methods from those described above may do so. Along with the

alternative calculations, they should provide justification for deviation from the assumptions and methods recommended above.

2.0 RAINWATER SUPPLY ASSUMPTIONS

2.1 Factors Affecting Rainfall

Rainfall in the Sonoran Desert is highly variable. Between 1993 and 2008, Tucson's annual rainfall ranged from 7.62 inches to 14.99 inches and averaged 12.17 inches per year. Tucson [sites](#) experience localized differences in rainfall primarily due to widely spaced summer monsoon storms. Winter rains tend to cover larger areas with more even distribution of rainfall. The amount of water that can be harvested also depends on how much rain falls each time it rains. Very light rains might not create sufficient runoff to reach waterharvesting basins, while runoff from heavy rains might overflow basins.

2.2 Effective Average Annual Rainfall

To comply with the city's Commercial [Rainwater](#) Harvesting Ordinance, average rainfall for Tucson should be adjusted to a lower effective average rainfall. Two adjustments should be made: reduce average rainfall by 25% to address localized variability and reduce average rainfall by an additional 25% to remove very light and very heavy rainfall events from monthly rainfall. Tucson's average rainfall and the calculation of effective average rainfall are shown in Table A-5 month-by-month and totaled for the year.

Table A-5. Effective average rainfall for Tucson for use in [Site](#) Water Budget calculations

RAINFALL ASSUMPTIONS	MONTHLY AVERAGE RAINFALL (Inches)												ANNUAL TOTAL (inches)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Average rainfall	0.99	0.88	0.81	0.28	0.24	0.24	2.07	2.3	1.45	1.21	0.67	1.03	12.17
Effective Average Rainfall	0.50	0.44	0.41	0.14	0.12	0.12	1.04	1.15	0.73	0.61	0.34	0.52	6.09

2.3 Alternative Calculations

Applicants wishing to use alternative values and methods from those described above may do so. Along with the alternative calculations, they should provide justification for deviation from the assumptions and methods recommended above.

3.0 DETERMINING [WATER HARVESTING CATCHMENT NEEDS FOR PASSIVE WATER HARVESTING](#)

3.1 Definition of [Catchment Area](#) and [Catchment Ratio](#)

Because most commercial [sites](#) should be able to accomplish the ordinance's 50% [water harvesting](#) goal using [passive water harvesting](#) strategies alone, the following information focuses on data for [passive water harvesting sites](#).

[Passive water harvesting sites](#) typically consist of an array of [Water Harvesting Infiltration Areas](#), each served by a [catchment area](#) that provides harvested water to support the plants within it. To meet the city ordinance requirements, the [site](#) needs to be designed so that 50% of annual plant water demand is met with harvested [rainwater](#) as an average across the [site](#). If the 50% goal cannot be met at some [Water Harvesting Infiltration Areas](#) due to [site](#) conditions, then other [Water Harvesting Infiltration Areas](#) should be designed to exceed the 50% goal in order to achieve 50% overall.

[Catchment areas](#) are locations at a [site](#) from which water is harvested for beneficial use. These locations include areas

where rain falls directly into earthen basins and infiltrates into the ground (these are known as [Water Harvesting Infiltration Areas](#). [Catchment areas](#) also include locations where rain falls on rooftops, sidewalks, parking lots, driveways and other hard surfaces then flows toward [Water Harvesting Infiltration Areas](#) where the water infiltrates into the soil.

The [catchment ratio](#) for any given [Water Harvesting Infiltration Area](#) is the ratio between the [water harvesting catchment area](#) serving it and the canopy area of the plants located within it. As one example, runoff from 100 square feet of sloped parking lot and soil drains to a [Water Harvesting Infiltration Area](#) that is planted with trees that have a canopy area of 20 square feet (as seen from a bird's eye view). The [catchment ratio](#) for this example is 100 to 20, which can be simplified as five to one.

3.2 Calculation of [Catchment Areas](#)

In Tucson, different types of plants need different amounts of water each month because rainfall and temperature vary from month-to-month (Table A-4). Table A-6 shows the [catchment area](#) needed to provide harvested water for each square foot of [plant canopy area](#) for different plant types in different months. The data on Table A-6 was calculated using the following equation for each month and each plant type:

$$\text{Catchment area needed} = \frac{\text{Monthly water demand per square foot of plant type}}{\text{Effective monthly rainfall}}$$

Effective monthly rainfall

Table A-6 . [Catchment area](#) needed to meet monthly plant water demand in Tucson

PLANT TYPE	SQUARE FEET OF CATCHMENT AREA NEEDED TO MEET WATER DEMAND FOR EACH SQUARE FOOT OF CANOPY AREA											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Very low water use	0.8	1.0	1.8	7.1	10.3	10.9	1.1	0.9	1.2	1.2	1.3	0.6
Low water use	1.5	2.1	3.7	14.2	20.6	21.8	2.2	1.7	2.5	2.4	2.7	1.3
Moderate water use	2.6	3.6	6.3	24.6	35.6	37.7	3.9	3.0	4.3	4.1	4.6	2.2
High water use	3.8	5.2	9.2	35.6	51.4	54.5	5.6	4.3	6.1	5.9	6.7	3.2

3.3 Calculation of [Catchment Ratios](#)

In Tucson, plants need around 37% of their annual water supply in the hot dry months of April, May and June. The remainder of their annual water supply, about 63%, is needed in July through March. Figure A-1 illustrates the relationship between plant water demand and effective rainfall supply in Tucson. In April, May and June there is a large gap between plant water demand and effective rainfall supply. There is a smaller, but still substantial gap between demand and supply in March. The rest of the year, [rainwater](#) supply lags behind demand, but not as much as in March through June.

By designing a [site](#) that has [catchment areas](#) sized to fully meet March plant water demand, the harvested water supply would typically exceed plant water demand in July through February (Figure A-2). This design strategy provides a cushion in meeting the 50% goal for the [site](#) and is recommended by the city as a general approach.

Based on Table A-6, a landscape composed of low water use plant types would need a [catchment ratio](#) of 3.7 to 1 to meet March water demand. This means that for each square foot of [plant canopy area](#) (as seen from a bird's eye view), 3.7 square feet of [catchment area](#) is needed to collect [rainwater](#) from. This area includes the dirt [Water Harvesting Infiltration Area](#) the plants are located in, and any parking lot, roof-top, or other hard surface around the plant that drains

to that area.

It is best to locate plants of the same type in a [Water Harvesting](#) Infiltration Area, though [sites](#) may have different plant types in other [Water Harvesting Infiltration Areas](#). Table A-6 can be used to determine appropriate [catchment ratios](#) for the plant types used in Tucson.

Figure A-1. Monthly Low-Water-Use Plant Demand vs Adjusted Rainfall, Tucson, Arizona

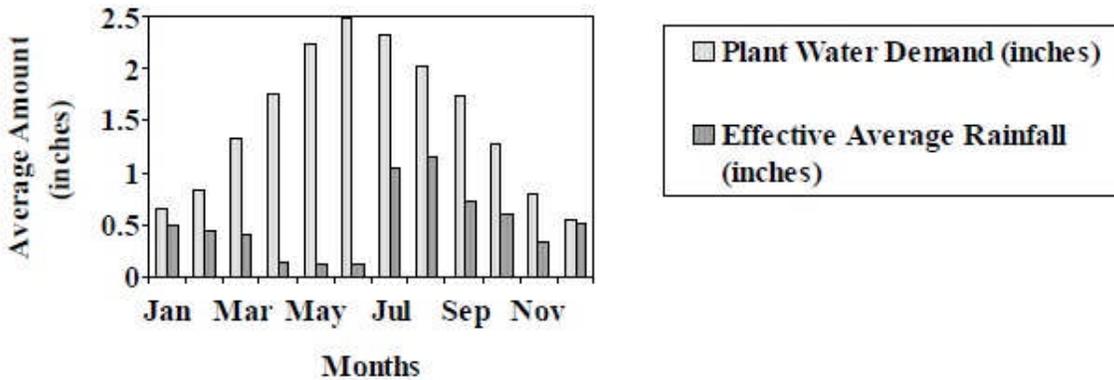
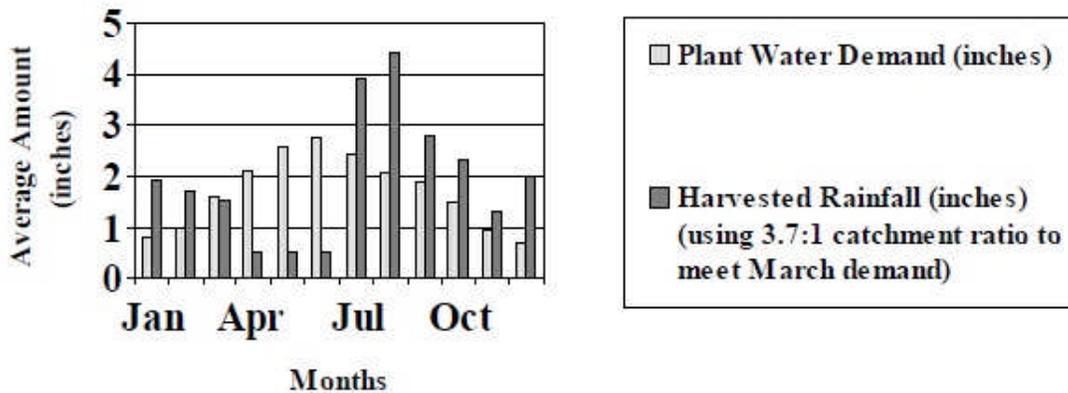


Figure A-2. Monthly Low-Water-Use Plant Demand vs Harvested rainfall, Tucson, Arizona



ATTACHMENT B. ANNUAL REPORT FORM FOR COMMERCIAL [WATER HARVESTING SITES](#)

Annual Water Use Report	
Reporting period (month/day/year): from _____ to _____	

Project Name	
Project Address	
Owner name	
Report Preparer name	Preparer title
Preparer address	
Preparer email	Preparer phone
Source of rain data (check all that apply): <input type="checkbox"/> on site raingage <input type="checkbox"/> www.rainlog.org station: note the closest cross streets _____	
Source of metered irrigation water (check all that apply): <input type="checkbox"/> Tucson Water, acct # _____ <input type="checkbox"/> water from another water utility <input type="checkbox"/> well water <input type="checkbox"/> reclaimed water	

MONTHS	RAINFALL (inches)	IRRIGATION WATER USE		
		Projected landscape water demand shown in the Rainwater Harvesting Plan (gallons)	Actual metered use (gallons)	Difference (gallons)
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				

November				
December				
ANNUAL TOTAL				
Explanation for any exceedence of annual irrigation water use projected in the approved Rainwater Harvesting Plan :				
Changes to the landscape or irrigation system in the reporting year:				
AREA BELOW FOR STAFF USE ONLY				
Drought conditions exist at the site :				
Compliance with Rainwater Harvesting Plan :				
Audit required/date/outcome				

SECTION 4-02.0.0: FLOODPLAIN, WASH AND ERZ STANDARDS

Section

- 4-02.1.0 General
- 4-02.2.0 Development Standards
- 4-02.3.0 Application Requirements and Review
- 4-02.4.0 Modifications

4-02.1.0 GENERAL

1.1 Purpose

This standard has been established for the purpose of informing applicants of the preparation, submittal, and review procedures for development within areas that have environmentally valuable habitat in conformance with Article 1, Division 1, *Floodplain and Erosion Hazard Area Regulations*, Chapter 26, Tucson Code; Article VIII, *Watercourse Amenities, Safety and Habitat (WASH)*, Chapter 29, Tucson Code; and Section 5.7, *Environmental Resource Zone (ERZ)*, Unified Development Code (UDC), Chapter 23, all of the Tucson Code; so that proper and adequate information is presented in a consistent manner, thereby providing the basis for an efficient and timely review.

This standard is further to insure that the adopted policies of the Mayor and Council and adopted recommendations of the city’s [Stormwater](#) Advisory Committee are accurately reflected in the implementation of existing regulations.

The areas subject to regulation under this technical standard include the floodplain and floodway fringe areas as defined in Section 26-2, and the adjacent banks and associated riparian habitat as provided in Section 26-5.2(3) and (4), which are established as the “regulated areas”. If there is no encroachment within these regulated areas, the documentation requirements, development restrictions and mitigation requirements do not apply.

Where the regulated areas are based upon maps prepared for the TSMS Phase II [Stormwater](#) Master Plan, the Critical and Sensitive Wildlife Habitat Map, or similar maps prepared by Pima County, there is a presumption that riparian habitat that should be preserved has been documented on the property. Any development must therefore comply with this standard to establish the precise location of riparian habitat. It is, however, the actual documentation of the location of the habitat pursuant to this standard that will determine where the development may occur, not the maps.

If there is encroachment into the regulated areas, the standard requires that the riparian habitat be identified and delineated as the “protected riparian area”. This will include the submittal of an Environmental Resource Report that will document (1) the areas that contain riparian and wildlife habitat that is to be preserved and (2) those areas without such habitat. Development is permitted within the regulated areas that are outside the protected riparian areas. Development within the protected riparian area is limited as set forth in this standard.

It is the intent of this standard that the protected riparian area incorporate the Critical Riparian Habitat in ERZ watercourses, the Resource Areas in WASH watercourses, and riparian habitat within the undesignated regulatory floodplains so that there is a single process for review with consistent criteria for application.

This standard does not waive any applicable city regulations or codes.

1.2 Application and Exceptions

This standard applies to all applications accepted for review after November 7, 2006. Exceptions to this applicability include:

- A. This standard does not apply to single family residential lots with dwellings constructed in accordance with the building permits issued before November 7, 2006.
- B. This standard does not apply in a manner that conflicts with a rezoning or special exception approved by the Mayor and Council after November 7, 2001.
- C. This standard may apply to an exempt application at the request of the applicant.

4-02.2.0 DEVELOPMENT STANDARDS

2.1 Plan Requirements

The information required as part of a submittal under this standard will be shown graphically or provided as notes on a plan, as appropriate. The required information is in addition to the plan or plat requirements of the applicable process, such as, but not limited to, a plat, a development plan, a [site](#) plan, or a plot plan.

2.2 Regulated Areas Subject to Review

The regulated areas are listed below:

A. ERZ Watercourses

The regulated area for ERZ watercourses includes the 100-year floodplain for all watercourses. ERZ watercourses include:

1. Watercourses zoned as ERZ;
2. Watercourses that have been designated for preservation in the Tucson [Stormwater](#) Management Study and are delineated as proposed for ERZ designation or as under review for ERZ designation shall be considered as ERZ watercourses; or
3. The designated, proposed and under review watercourses are shown on the Hydrologic Data and Wash

Information maps on the Tucson Department of Transportation internet web site.

B. WASH Watercourses

The regulated area for WASH watercourses includes channel and banks of a watercourse and the area within 50 feet of the top of the bank, or where there is no defined bank, 50 feet from the ten-year flood boundary. WASH watercourses include:

1. Watercourses designated by name in the Watercourse Amenities, Safety and Habitat regulations in Article VIII of Chapter 29.
2. Watercourses that have been designated for preservation in the Tucson [Stormwater](#) Management Study and delineated as proposed for WASH designation or as under review for WASH designation shall be considered as WASH designated watercourses.
3. The designated, proposed and under review watercourses are shown on the Hydrologic Data and Wash Information maps on the Tucson Department of Transportation internet web site.
4. The regulated area for watercourses under this technical standard 4-02.2.2.B.2 and 3 above shall not extend beyond the 100-year floodplain.

C. Regulatory Floodplain Watercourses

Within floodplains that are not designated as an ERZ or WASH watercourses in accordance with Sections 4-02.2.2.A or B above, the regulated area is the area within the 100-year floodplain for watercourses with flows of 100 cfs or more including, by not limited to, those areas which contain any of the following:

1. Hydroriparian, Mesoriparian, or Xeroriparian Types A, B or C habitats as delineated by Pima County as part of Article X of the Pima County Floodplain and [Erosion](#) Hazard Ordinance.
2. Hydroriparian, Mesoriparian, or Xeroriparian High or Xeroriparian Intermediate Habitats as delineated in the TSMS Phase II [Stormwater](#) Master Plan.
3. Xeroriparian Low Habitats as delineated in the TSMS Phase II [Stormwater](#) Master Plan or Type D habitat as delineated by Pima County for connectivity between higher habitat classes, if low-volume, high-value habitats are present, including tabosa swales or similar habitats.
4. Unclassified or undocumented riparian habitat of equivalent value to the above criteria.

2.3 Protected Riparian Area (PRA)

The protected riparian area is the area that has riparian habitat that is to be preserved. Except for watercourses designated by ordinance as subject to ERZ and WASH regulations, the protected riparian area shall not exceed the 100-year floodplain. protected riparian areas include areas that provide habitat structure, wildlife food and shelter, and that also aid in supporting wildlife connectivity, [erosion](#) control and help to improve [stormwater](#) quality. Riparian habitat may include the vegetative resources, mapped areas and wildlife habitat and corridors listed below where such habitat is riparian in nature and function.

A. Vegetative Resources

Vegetative Resources are groups of three or more individual plants in close proximity to each other representing any of the plant species (and any combination of associated vegetative structure) listed below.

1. Mesoriparian plant species, including Arizona walnut, Fremont cottonwood, Goodding (black) willow, Arizona sycamore, Arizona ash.
2. Over-story vegetation consisting of closely spaced, perennial, woody (e.g., mesquite, foothill palo verde,

Mexican palo verde, ironwood, netleaf hackberry), that are generally six feet or more in total height, and where the distance between canopy margins of individuals of the predominant over-story plant species is less than two times the height of the tallest individuals.

3. Understory vegetation consisting of closely spaced, perennial woody plants (e.g., catclaw and whitethorn acacia) that are generally six feet in total height, or less, and where the distance between canopy margins of individuals of the predominant understory plant species is generally less than two times the height of the tallest individuals, excluding nearly pure stands of understory vegetation consisting of the following perennial woody plants: burrow bush, creosote bush, desert broom, or triangle-leaf bursage.

4. Combinations of overstory and understory vegetation that together constitute valuable habitat, and tobasa swales.

B. Mapped Areas shown on the Critical and Sensitive Wildlife Habitat Maps which contain:

1. Major segments of desert riparian habitat extending from public preserves;
2. Major segments of desert riparian habitat not extending directly from a public preserve but containing a high density and diversity of plant and animal species;
3. Deciduous riparian woodlands;
4. Mesquite bosques; and,
5. Lakes, ponds, or wetlands.

C. Wildlife includes, but is not limited to, the wildlife and areas identified in the public draft or final City of Tucson Habitat Conservation Plan applicable to the regulated area.

2.4 Identification of Regulated Areas and Protected Riparian Areas

All tentative plats, [site](#) plans, plot plans or other plans providing for [approval](#) of development within property that includes any regulated area as defined in Section 4-02.2.2.A, *ERZ Watercourses*, shall identify and delineate the regulated areas and the protected riparian area on the property and shall comply with this standard. The boundary of the regulated area and the protected riparian area should be clearly depicted on applicable submittal documents.

2.5 Development Restrictions

The intent of this Technical standard is to preserve natural and existing drainage and 100% of the habitat areas within the protected riparian areas. To accomplish this, the regulations provide for two options: (1) no encroachment into the regulated area or (2) if encroachment is proposed into the regulated area, submittal of an environmental resource report in conformance with this section, and, if encroachment is proposed into the protected riparian areas, development in conformance with development restrictions and mitigation requirements in this section.

A. No Encroachment in Regulated Areas

For projects where there will be no encroachment within the regulated areas, development is not restricted by this section except as provided herein and except that the regulated areas shall be identified on the [site](#) plan, plat or development plan in a surveyable manner. This plan, or a separate plan, shall also indicate the proposed location of the temporary fencing which is required to protect the protected riparian areas during construction. The conditions for development with no encroachment are as follows:

1. *ERZ Watercourses*. Applications within the ERZ watercourses described in Section 4-02.2.2.A, *ERZ Watercourses*, above that propose a project with no encroachment into the regulated area are required to indicate the 100-year floodplain on the plans submitted through the applicable process, accompanied by a floodplain report verifying the floodplain limits.

2. *WASH Watercourses.* Applications for WASH watercourses as described in Section 4-02.2.2.B, *WASH Watercourses*, above that propose a project with no encroachment into the regulated area, are required to indicate the top of bank or ten-year flood boundary and the 50-foot study area beyond those lines on the plans submitted through the applicable process, accompanied by a floodplain report verifying the floodplain limits.

3. *Regulatory Floodplain Watercourses.* Applications within the regulatory floodplain watercourses described in Section 4-02.2.2.C, *Regulatory Floodplain Watercourses*, above that propose a project with no encroachment into the regulated area are required to indicate the 100-year floodplain on the plans submitted through the applicable process, accompanied by a floodplain report verifying the floodplain limits.

4. *Floodplain Restoration.* Revegetation, restoration or enhancement under this subsection shall not constitute "encroachment" under applicable codes. A Floodplain Restoration Plan must be prepared and approved in conformance with this subsection in order to undertake floodplain revegetation, restoration or enhancement. For areas within the regulated areas that are to remain as open space after development, revegetation and restoration of the open spaces areas is encouraged, but not required, to enhance the riparian resources within the regulated area as follows:

a. Voluntary revegetation, restoration or enhancement should create or restore the riparian habitat through the planting of native trees, shrubs, and understory species and the distribution of seed mix native to the [site](#) or a comparable reference [site](#) to the extent possible. Additional native species may be used in the restoration effort if they are typical of intact riparian habitat in areas similar to the [site](#).

b. Revegetation, restoration or enhancement efforts should include native plant material salvaged from the [site](#) or preserved in place.

c. Development and revegetation, restoration or enhancement efforts shall conform to the city's policies regarding [water harvesting](#).

B. Encroachment in Regulated Areas

If the project proposes encroachment within the regulated areas, it shall conform to the following.

1. *Environmental Resource Report.* Applicants are required to submit an Environmental Resource Report as defined in Section 11.4.6 of the UDC. The supporting material for preparation of the Environmental Resource Report is based on information from the Hydrologic Data and Wash Information maps on the Tucson Department of Transportation internet web site: The Critical and Sensitive Wildlife Habitat Map and Report, the Mayor and Council Interim Watercourse Improvement Policy and subsequent adopted policies, the Tucson [Stormwater](#) Management Study, the following Basin Management Plans: 1) West Branch, Santa Cruz; 2) Houghton East; 3) Este Wash; and 4) Arroyo Chico. the Tucson [Stormwater](#) Management Study, Phase II and field observation. An application may request that an element listed below be waived or that the report address only a specified area where a full report is not applicable to the proposed encroachment. DSD may grant such waivers where the elements or full report are not required by code. The Environmental Resource Report must include:

a. A table of contents, indicating all information by page or map number;

b. The location of the 100-year floodplain on, adjacent to, and a minimum of 200 feet upstream and downstream of the proposed development;

c. Soil conditions in and adjacent to the watercourse, and the [erosion](#) potential;

d. Existing rights-of-way or easement dedication along the wash for a distance of 500 feet upstream and downstream of the proposed development;

e. The existing and proposed ownership of any drainageway facilities on or adjacent to the [site](#) and identification of the persons responsible for the maintenance of such facilities;

f. Previous hydraulic/hydrology studies or maps prepared for the watershed and relevant floodplain studies, delineations, LOMR applications and approvals affecting the project [site](#);

- g. Groundwater recharge potential at this location;
- h. Sediment transport characteristics along the watercourse centered on this location;
- i. Existing and proposed utilities to and across the [site](#);
- j. Any other elements that may be characteristic of the watercourses on or adjacent to the [site](#);
- k. A map indicating the boundaries of the proposed development and its relationship to any watercourses designated on the Hydrologic Data and Wash Information maps on the Tucson Department of Transportation internet web site;
- l. An aerial photograph no more than two years old, with flight date, north arrow, project [site](#) boundaries, floodplain delineation, protected riparian area and a scale no smaller than one inch equals 200 feet. DSD staff may request an aerial photograph with topographic information;
- m. Ground level photographs from points identified on submitted plans that document the protected riparian area and any areas within the protected riparian area to be disturbed;
- n. Any applicable Basin Management Plan, which recommends that watercourses remain in a natural state, shall be referenced in the Report;
- o. A map identifying the type, location and extent of all riparian resources and plant associations, including but not limited to, hydri-riparian habitat, meso-riparian habitat, xero-riparian habitat, tobosa grass habitat, mesquite bosques, individual cacti and trees with a caliper of four inches or greater, and all saguaros, regardless of size. The identification of riparian habitat shall cover the entire [site](#) and is not limited to the regulated areas;
- p. Delineation of the proposed protected riparian area and a statement of the total area of the [site](#), the total area of the protected riparian area, the area within the regulated area, and the total of any areas proposed to be disturbed within the protected riparian areas;
- q. Delineation of the riparian resources and any proposed open space linkages or facilities recommended by parks, recreation, open space, and trails plan, for a distance of 500 feet or one-half times the length of the watercourses on the property, whichever is greater, both upstream and downstream from the property. This shall be based on information that is available from aerial photographs, the Hydrologic Data and Wash Information maps on the Tucson Department of Transportation internet web site and other public sources;
- r. A Plant Inventory and aerial photographs of individual woody plants and cacti rooted within the encroachment area. Both living and dead plants and cacti should be inventoried. The Plant Inventory List shall include an identification number, genus and species, and size of all plants having basal trunk diameters greater than two inches. All plants inventoried are to be shown on an aerial photograph at a minimum scale of one inch equals 60 feet;
- s. A delineation, map and assessment on an aerial photograph of habitat types noted on the Critical and Sensitive Wildlife Habitat Map;
- t. A written or mapped assessment of significant densities of wildlife by species;
- u. A description of the impact of the encroachment on riparian resources within the property and on the adjacent property as identified in subsection q above;
- v. A written statement from the regional office of the Arizona Game and Fish Department regarding any impacts to fish and wildlife;
- w. A draft Mitigation Plan in conformance with subsection 3 below if development is proposed within the protected riparian areas; and,
- x. Other landscaping requirements established in Chapter 23 of the Tucson Code.

2. *Development Restrictions.* All development within the protected riparian area shall be reviewed to insure that there is no unnecessary disturbance of the riparian resources. Development that is outside of the protected riparian area but within the regulated area is not subject to this subsection. Necessary development shall include only the crossing of riparian habitats with roadways, bikeways, paved walkways and utilities as listed below where there is no viable alternate crossing available and the crossing is necessary for the reasonable development of the property. A written explanation as to why the development is necessary shall be submitted with the appropriate plans. Development that is permitted as necessary is subject to the following conditions:

- a. Roadway, bike path, and paved walkway improvements and utility encroachments will cross the riparian habitat areas, not to run parallel to the protected riparian areas;
- b. Encroachments that cross the protected riparian area shall be located and constructed to minimize disturbance of the habitat and wildlife movement;
- c. All utilities in protected riparian area areas will be located underground; utilities will be placed either in proposed or existing public right of way along roadway, bike path, or paved walkway improvements or within approved easements.
- d. Any roadway, bike path, or paved walkway improvement must be constructed in such a manner as to provide means for safe and accessible passage for wildlife.
- e. Concrete, rock veneer and soil cement bank treatment for the culvert and associated drainage may be permitted within the public right of way upon [approval](#) of the City Manager.
- f. For WASH watercourses, concrete, rock veneer and soil cement bank treatment for the culvert that is outside of the proposed or existing public right of way shall be permitted only with the [approval](#) of the Mayor and Council. For all other watercourses, concrete, rock veneer and soil cement should not be used where there is any practicable alternative.
- g. Where a roadway, paved walkway, or bike path improvement or utility encroachment occurs within the protected riparian area, mitigation in conformance with Section 4-02.2.5.B.3, *Mitigation Plans*, shall be provided.
- h. Temporary Fencing Required. No [grubbing](#), [grading](#), or construction will occur on a project [site](#) which includes areas designated as protected riparian area to be retained in a natural state until those designated areas are temporarily fenced. The temporary fencing shall remain in place during all phases of construction that could affect the protected riparian area.

3. *Mitigation Plan.* Where any development, except planting solely for revegetation, restoration or enhancement with an approved Floodplain Restoration Plan, encroaches within the protected riparian areas, mitigation will be required. A mitigation report shall be submitted with the Environmental Resource Report demonstrating that the proposed mitigation is in conformance with this subsection and applicable codes.

a. Mitigation Plans shall address the following:

1. Revegetation should recreate the lost functions and values of the riparian habitat through the planting of native trees, shrubs, understory plants and seed mix native to the [site](#) which will result in comparable habitat that is equal to the predisturbance habitat in area, plant density, diversity, and volume on the net [site](#). Revegetation should be conducted over a sufficient area to accomplish the following mitigation ratios while accomplishing the specified plant density, diversity and volume of the impacted area.
 - i. Trees with basal trunk diameters ranging from two to four inches and shrubs should be replaced at a two to one ratio.
 - ii. Trees with basal trunk diameters larger than four inches should be replaced at a three to one ratio.
 - iii. Cacti, except cholla or prickly pear, should be replaced at a two to one ratio.
 - iv. Cottonwood, willow, walnut, sycamore, arizona ash, ironwood and canyon hackberry (*Celtis reticulata*)

should not be removed. If removal is unavoidable and no other practicable alternative exists, then these plants shall be replaced by large, boxed trees at a three to one ratio and provided with at least three years of supplemental irrigation and care to ensure healthy establishment. Replacement trees shall be in 36-inch boxes and shall be at least eight to ten feet tall and at least two and one-half inches in diameter, measured three feet above the ground.

2. Mitigation can be designed to provide native riparian habitat that is appropriate for the location and soil conditions, even where that may be enhanced beyond the predisturbance habitat in terms of native habitat area, plant density, diversity and volume on the net [site](#).

3. Revegetation should include native plant material salvaged from the [site](#).

4. Development and revegetation shall conform to the city's policies regarding [water harvesting](#).

b. Mitigation Plans shall include:

1. A development plan/ [site](#) plan, including landscape plans, indicating proposed development; floodplain encroachment locations; location of mitigation areas; techniques used for mitigating impacts to, or preservation of, natural areas; specifications for restoration and revegetation of disturbed areas; and general compliance with the applicable standards;

2. Landscape plans that document compliance with the mitigation plan requirements. A summary of mitigation and preservation requirements shall be included on the plans; and,

3. A description of the maintenance program that provides for revegetated/restored or enhanced areas. The program shall include irrigation to establish native plants, provide for regular inspection, removal of invasive species, and native plant replacement as necessary to successfully establish the mitigation habitat. All mitigation plantings and related improvements shall be maintained for at least three years following installation.

2.6 Ownership of PRA

Ownership of the protected riparian area shall be provided in one or more of the methods set forth below to insure continued preservation of the area. Forms of ownership of protected riparian areas include:

A. protected riparian area Areas for proposed subdivisions may be either publicly owned, owned by a common association, or owned by a non-profit association which provides for conservation management.

B. Privately owned individual residential lots of 24,000 square feet or less may include protected riparian area where (i) there is a conservation easement prohibiting private development within the protected riparian areas, (ii) no more than 10% of the total area of the protected riparian area is included within individual private lots and (iii) no walls or fences are constructed within the protected riparian areas. The common ownership and the location of any portion of the protected riparian area within individual lots and applicable legal restrictions shall be included in a note on the final plat or development plan.

C. Privately owned individual residential lots that are greater than 24,000 square feet may include protected riparian area where (i) the protected riparian area is delineated on the plat providing a surveyed description of the location within each lot, and (ii) there is a note on the plat requiring that each purchaser of a lot shall sign a disclosure form acknowledging the prohibition upon development in the protected riparian area and (iii) no walls or fences are constructed within the protected riparian areas.

D. Where the protected riparian area is on property that remains under the ownership of a single person or entity following the development, the protected riparian area shall be protected through a conservation or public easement or other legal restriction upon further development.

2.7 Compliance with other Code Provisions

All development within regulated areas must comply with all other applicable code provisions, including obtaining

floodplain use permits where necessary. Washes zoned as ERZ washes or named in the WASH regulations are reviewed in accordance with Section 3.3.3, *PDSD Director [Approval](#) Procedure*.

4-02.3.0 APPLICATION REQUIREMENTS AND REVIEW

3.1 Application

Applications for review of projects affected by this technical standard shall be submitted to the CDRC Section at PDSD. Review staff will evaluate submitted information for completeness and shall accept or reject the application within five days of the date of submittal. The applicant will be notified if the application is found to be incomplete.

3.2 Submittal Requirements

Copies of all required plans, documents, and reports are to be submitted to the CDRC staff at PDSD, who will coordinate the hydrologic and resource reviews with the appropriate staff. Plans are to be folded to an eight and one-half inch by 11-inch size.

3.3 Review

Plans are reviewed for compliance with this standard in accordance with Section 3.3.3, *PDSD Director [Approval](#) Procedure*.

3.4 [Stormwater](#) Advisory Committee (SAC) Review

Development which encroaches within the protected riparian areas, except for development limited to revegetation or restoration in accordance with an approved Floodplain Restoration Plan, shall be reviewed by the [Stormwater](#) Advisory Committee (SAC) as follows:

A. All watercourses subject to adopted ERZ or WASH regulations are reviewed by SAC as part of Section 3.3.3, *PDSD Director [Approval](#) Procedure*.

B. All watercourses designated to be treated consistent with the ERZ or WASH regulations under this technical standard and regulatory floodplain watercourses may be reviewed by SAC upon either the request of the applicant or upon the determination by the PDSD Director that such review is appropriate.

C. Review by SAC shall focus upon whether the application correctly defines, delineates and describes the protected riparian area and complies with Section 4-02.2.5.B.2 and 3, *Development Restrictions and Mitigation Plan*, respectively.

4-02.4.0 MODIFICATIONS

4.1 A minor encroachment modification may be requested for necessary development in addition to the roadway, bike path, paved trail and utility improvements as provided in Technical Standard 4-02.2.5.B.2 above. A minor encroachment under this subsection shall be approved if the loss of riparian resources does not impair the function of the habitat and the mitigation provides riparian resources of greater value if the request is granted. A modification under this subsection shall not exceed 5% of the total area of the protected riparian area on the [site](#). The mitigation shall be provided on a three to one ratio of new habitat for disturbed habitat. The mitigation shall be within the protected riparian area or an area that directly connects with the protected riparian areas. The mitigation shall be integrated with, and function as a part of, the protected riparian areas. The requirements for the Environmental Resource Report may be modified by PDSD staff as may be appropriate to document a minor encroachment under this subsection.

4.2 Technical Standard Modification Requests are processed in accordance with Section 1-01.6.0.

4.3 Either the applicant or the PDSD Director can refer a Technical Standard Modification Request to this standard to the

[Stormwater](#) Advisory Committee or the [Stormwater](#) Technical Advisory Committee for recommendation.

SECTION 4-03.0.0: STORMWATER DETENTION/RETENTION MANUAL

Due to the size and nature of this manual, it is unable to be accommodated within the Technical Standards Manual. The manual is, therefore, printed and bound as an individual booklet and is available as a separate purchase item from the Pima County Transportation and Flood Control District.

For your information, the Table of Contents is included.

TABLE OF CONTENTS

I.	Introduction	Page
1.1	Goals and Objectives	1
1.2	Applicability	1
1.3	Detention/Retention Concepts	2
1.4	Policies	5
1.5	Glossary of Terms	9
1.6	List of Symbols	12
II.	Detention/Retention Requirements	
2.1	Balanced and Critical Basins	13
2.2	Threshold Retention	13
2.3	Location Within Watershed	14
2.4	Retention Feasibility Map	20
2.5	Depth to Groundwater Map	22
III.	Design Procedures and Criteria	
3.1	Hydrology	25
3.1.1	Precipitation	25
3.1.2	Peaks and Volumes	25
3.1.3	Inflow Hydrographs	26
3.2	Retention	32
3.2.1	Required Storage Volume	32
3.2.2	Method of Disposal	32
3.3	Detention	33
3.3.1	Estimating Detention Storage Volume	33

- 3.3.2 Outflow Hydrograph Determination (Reservoir Routing) 37
- 3.3.3 Principal Outlet Structures 45
- 3.3.4 Embankments 48
- 3.4 Sedimentation Impacts 50
 - 3.4.1 Estimating Sediment Delivery 50
 - 3.4.2 Methods for Control of Sedimentation 51
- 3.5 Criteria for Special Detention/Retention Methods 53
 - 3.5.1 Surface Storage 53
 - 3.5.2 Parking Lot Storage 55
 - 3.5.3 Rooftop Storage 55
 - 3.5.4 Underground Storage 55
 - 3.5.5 Subsurface Disposal 55
- 3.6 Basin Design Requirements 58
 - 3.6.1 Basin Side- [Slopes](#) and Depths 58
 - 3.6.2 Security Barriers 59
 - 3.6.3 Multiple Basins 60

IV. Multiple-Use Concepts and Aesthetic Design Guidelines

- 4.1 Basin Siting 61
 - 4.1.1 Project Scale [Sites](#) 61
 - 4.1.2 Individual Parcels 62
 - 4.1.3 Regional Facilities 64
 - 4.1.4 Roadside Basins 64
- 4.2 Multiple Use Concepts 65
 - 4.2.1 Project Amenity 65
 - 4.2.2 Active Recreation 65
 - 4.2.3 Passive Recreation 67
 - 4.2.4 Urban Open Space 69
 - 4.2.5 Preservation of Native Plant Communities 70
 - 4.2.6 [Water Harvesting](#) for Recharge and Re-use 71
 - 4.2.7 Wildlife Habitat 72

4.3	Technical Requirements and Guidelines	74
4.3.1	Basin Configuration	74
4.3.2	Basin Landscaping	85
4.3.3	Erosion Control	96
4.3.4	Landscape Irrigation	97
V. Report Submittal and Review Requirements		
5.1	Submittal Procedure	99
5.2	Stormwater Detention/Retention Report Requirements	99
VI.	Bibliography	103

LIST OF FIGURES

Figure 1.1:	Open Space and Common Areas	3
Figure 1.2:	Pedestrian Plazas and Courtyards	3
Figure 1.3:	Roadway Embankment Storage	4
Figure 1.4:	Parking Lot Detention	4
Figure 1.5:	Regional Detention Basins	5
Figure 2.1:	Definition Sketch for Example 2.1	19
Figure 2.2:	Retention Feasibility Map for Eastern Pima County	21
Figure 2.3:	Depth to Groundwater, Tucson Basin and Avra Valley	23
Figure 3.1:	Example Watershed for Method B	30
Figure 3.2:	Hydrograph Determination by Method B	31
Figure 3.3:	Graphical Representation of Inflow/Outflow Hydrographs for Type I, II, III, & IV Basins	36
Figure 3.4:	Working Curve	43
Figure 3.5:	Inflow/Outflow Hydrograph for Q100	46
Figure 3.6:	Typical Multi-Frequency Outlet Structures	47
Figure 3.7:	Sediment-Trap Concept	52
Figure 3.8:	Conceptual Cross-Section for Engineered Basin Floor	56
Figure 3.9:	Typical Dry-Well Installation	57

LIST OF TABLES

Table 3.1:	Rainfall Depths of Various Return-Period Events	25
Table 3.2:	Hydrograph Rise Times for TC < 60 Minutes	28

Table 3.3:	Ratios for Generation of Pima County Synthetic Flood Hydrograph	29
Table 3.4:	Runoff Coefficients	33
Table 3.5:	Synthetic Inflow Hydrograph for Example 3.1	39
Table 3.6:	Stage-Storage Relationship for Example 3.1	40
Table 3.7:	Stage-Discharge Relationship for Example 3.1	41
Table 3.8:	Storage-Discharge Relationship for Example 3.1	41
Table 3.9:	Working Table for Example 3.1	42
Table 3.10:	Routing Table for Example 3.1	44

SECTION 4-04.0.0: CITY OF TUCSON STANDARDS MANUAL FOR DRAINAGE DESIGN AND FLOODPLAIN MANAGEMENT IN TUCSON, ARIZONA

Due to the size and nature of this manual, it is unable to be accommodated within the Technical Standards Manual. The manual is, therefore, printed and bound as an individual booklet and is available as a separate purchase item from the City of Tucson Engineering Division.

For your information, the Table of Contents is included.

TABLE OF CONTENTS

Page

LIST OF FIGURES	xi
LIST OF TABLES	xv
GLOSSARY	xvii
LIST OF SYMBOLS	xxvii
CHAPTER I. INTRODUCTION	
1.1 Objectives	1.01
1.2 Applicability	1.02
1.3 General Policies	1.02
1.4 Implementation	1.05
1.4.1 Subdivision Assurances	1.05
1.4.2 Private Improvement Agreement	1.05
1.4.3 Public Improvement District	1.06
1.4.4 Private Drainage Improvements	1.06
1.5 Maintenance of Drainage Improvements	1.06

1.5.1 Maintenance of Drainageways 1.07

1.5.2 Maintenance of Detention/Retention Basins 1.08

CHAPTER II. POLICIES, PROCEDURES, AND FORMATS FOR DRAINAGE REPORTS, HYDROLOGY REPORTS, AND DRAINAGE STATEMENTS

2.1 Introduction 2.01

2.1.1 Drainage Report 2.01

2.1.2 Hydrology Report 2.01

2.1.3 Drainage Statement 2.01

2.2 Conditions Requiring Report or Data Submittal 2.02

2.2.1 Rezoning Applications 2.02

2.2.2 Subdivision Plats and Development Plans 2.02

2.2.3 Application for a Building Permit or a [Grading](#) Plan 2.03

2.2.4 Condominium Conversions 2.03

2.2.5 Floodplain Use Permits 2.04

2.2.6 Request for Map Revision 2.04

2.3 Report Content and Format 2.05

2.3.1 Drainage Reports and Hydrology Reports 2.05

2.3.1.1 Cover Sheet 2.05

2.3.1.2 Introduction 2.06

2.3.1.3 Hydrology 2.07

2.3.1.4 Floodplain Analyses and Results 2.09

2.3.1.5 Hydraulic Improvements and Hydraulic Structures 2.11

2.3.1.6 Detention Basins and/or Retention Basins 2.12

2.3.1.7 Summary and Conclusions 2.14

2.3.1.8 References 2.15

2.3.1.9 Appendices 2.15

2.3.2 Drainage Statement 2.15

2.4 Quality of Submittals 2.15

CHAPTER III. PLANNING

3.1 Drainage Sub-System 3.01

- 3.2 Drainage Master Planning 3.01
- 3.3 Balanced and Critical Basins 3.02
- 3.4 Flood Plains and Floodways 3.03
- 3.5 Transportation 3.04

CHAPTER IV. CITY OF TUCSON METHOD FOR ESTIMATING FLOOD PEAKS AND FLOOD HYDROGRAPHS

- 4.1 Purpose 4.01
- 4.2 Flood Peak Estimator Procedure 4.01
 - 4.2.1 Step-by-Step Procedure for Estimating Flood Peaks 4.01
- 4.3 Selection of Basin Factors (n_b 's) 4.08
 - 4.3.1 Procedure for Determination of Weighted Basin Factors (n_{bw} 's) 4.09
 - 4.3.2 Guidelines for Determination of Dispersed-Flow Watersheds and Underfit Channels 4.12
- 4.4 Calculating Times of Concentration for Frequent Floods 4.14
- 4.5 Development of a Flood Hydrograph 4.15

CHAPTER V. FLOODPLAIN DELINEATION

- 5.1 Purpose 5.01
- 5.2 Policies 5.01
- 5.3 Analytical Procedures for Evaluating Floodplain Widths and Depths in Channels with Uniform Hydraulic Roughness 5.02
 - 5.3.1 Normal Flow Depth 5.02
 - 5.3.2 Backwater Flow Depth 5.03
- 5.4 Analytical Procedures for Evaluating Floodplain Widths and Depths in Channels with Composite Hydraulic Roughness 5.03
 - 5.4.1 Composite Channels 5.03
 - 5.4.2 Manning Roughness Coefficients 5.04
- 5.5 City of Tucson Requirements for Evaluating Flood Plains and Floodways Subject to Agency Review 5.05
 - 5.5.1 Floodplain Delineations 5.05
 - 5.5.2 Floodway Delineations 5.07
- 5.6 Administrative Procedures for Revising Effective Flood Insurance Rate Maps 5.08
 - 5.6.1 Federal Flood Insurance Rate Maps 5.08
 - 5.6.2 Map Amendments and Revisions 5.08

CHAPTER VI. [EROSION](#) AND SEDIMENTATION

- 6.1 Introduction 6.01
 - 6.2 Purpose 6.01
 - 6.3 Fluvial Geomorphology 6.01
 - 6.3.1 Channel Morphology 6.02
 - 6.3.1.1 Hydraulic Geometry of Alluvial Channels 6.02
 - 6.3.1.2 Influence of Sediment Load 6.02
 - 6.4 Sediment-Transport Theory 6.03
 - 6.5 Sediment Routing 6.04
 - 6.5.1 Simplified Sediment Modeling 6.04
 - 6.5.2 Quasi-Dynamic Sediment Modeling 6.06
 - 6.5.3 Dynamic Mathematical Modeling 6.07
 - 6.6 Depth of Scour 6.07
 - 6.6.1 General Scour 6.08
 - 6.6.2 Anti-Dune Trough Depth 6.09
 - 6.6.3 Low-Flow Thalweg 6.09
 - 6.6.4 Bend Scour 6.11
 - 6.6.5 Local Scour 6.13
 - 6.6.6 Scour Below Channel Drops 6.18
 - 6.7 Scour-Hole Geometry at Culvert Outlets 6.20
 - 6.8 Design of Sediment Basins 6.28
 - 6.9 Equilibrium [Slopes](#) within Constructed Channels 6.31
 - 6.10 Spacing and Depth of [Grade](#)-Control Structures 6.34
- CHAPTER VII. [EROSION](#)-HAZARD/BUILDING SETBACK CRITERIA
- 7.1 Introduction 7.01
 - 7.2 Purpose 7.01
 - 7.3 Applicability 7.01
 - 7.4 Policies 7.02
 - 7.5 [Erosion](#) Resistance of Unlined Channels 7.02
 - 7.5.1 Allowable-Velocity Approach 7.02
 - 7.5.2 Tractive-Stress Approach 7.04

- 7.5.3 Tractive-Power Approach 7.15
- 7.5.4 Effect of Vegetation upon Channel Stability 7.18
- 7.6 Setbacks 7.18
 - 7.6.1 Equations to Compute Setbacks 7.18
 - 7.6.2 Sediment Supply Rates/Transport Capacity 7.21
 - 7.6.3 Bank Sloughing/ [Slope](#) Stability 7.22
 - 7.6.4 Detailed Sediment-Transport Analysis 7.23
 - 7.6.5 Drainage Swales, Roads, and P.A.A.L.s 7.23

CHAPTER VIII. OPEN-CHANNEL DESIGN

- 8.1 Purpose 8.01
- 8.2 Introduction 8.01
- 8.3 Requirements for Natural Channels 8.01
- 8.4 Floodplain Encroachments 8.02
- 8.5 Constructed Channels 8.03
 - 8.5.1 Channel Geometry 8.03
 - 8.5.1.1 Side- [Slopes](#) 8.04
 - 8.5.1.2 Width 8.04
 - 8.5.1.3 Depth 8.05
 - 8.5.1.4 Freeboard 8.07
 - 8.5.2 Safety Considerations 8.08
 - 8.5.3 Right-of-Way 8.08
 - 8.5.4 Bank-Protection [Key](#)-Ins and Minor Side Drainage 8.09
 - 8.5.5 Bank-Protection Toe-Downs 8.11
 - 8.5.6 Low-Flow and Compound Channels 8.11
 - 8.5.6.1 Low-Flow Channels 8.11
 - 8.5.6.2 Compound Channels 8.11
 - 8.5.7 Upstream and Downstream Controls 8.12
 - 8.5.8 Channel [Slope](#) 8.14
 - 8.5.9 Hydraulic Jump 8.14
 - 8.5.9.1 Height of a Hydraulic Jump 8.15

- 8.5.9.2 Length of a Hydraulic Jump 8.16
- 8.5.9.3 Surface Profile of a Hydraulic Jump 8.16
- 8.5.9.4 Location of a Hydraulic Jump 8.16
- 8.5.9.5 Undular Hydraulic Jumps 8.16
- 8.5.10 Flow in a Curved Channel 8.22
 - 8.5.10.1 Superelevation 8.22
 - 8.5.10.2 Easement Curves 8.25
 - 8.5.10.3 Banking 8.25
 - 8.5.10.4 Limiting Curvature 8.26
- 8.5.11 Transitions 8.26
 - 8.5.11.1 Entrance Transitions 8.26
 - 8.5.11.2 Exit Transitions 8.31
 - 8.5.11.3 Internal Channel Transitions 8.31
- 8.5.12 Channel Confluences 8.33
 - 8.5.12.1 General Design Guidelines 8.33
 - 8.5.12.2 Momentum Equation 8.35
 - 8.5.12.3 Design Procedure: Supercritical Flow 8.40
- 8.5.13 Collector Channels 8.43
 - 8.5.13.1 Cross Section and [Slope](#) 8.43
 - 8.5.13.2 Depth 8.43
 - 8.5.13.3 [Erosion](#) Protection 8.44
 - 8.5.13.4 Sediment 8.46
 - 8.5.13.5 Additional Design Considerations 8.46

CHAPTER IX. CHANNEL STABILIZATION AND HYDRAULIC STRUCTURES

- 9.1 Introduction 9.01
- 9.2 Purpose 9.01
- 9.3 Stabilization Methods 9.01
 - 9.3.1 Soil Cement 9.02
 - 9.3.2 Concrete or Shotcrete 9.02
 - 9.3.3 Rock Riprap 9.02

- 9.3.3.1 Riprap Sizing 9.02
 - 9.3.3.2 Riprap Gradation, Blanket Thickness, and Stone Shape 9.04
 - 9.3.3.3 Riprap Filters 9.05
 - 9.3.4 Gabion Baskets and Mattresses 9.05
 - 9.3.5 Articulated Revetment Units 9.05
 - 9.3.6 Other Forms of Channel Stabilization 9.06
 - 9.4 Energy Dissipators 9.06
 - 9.4.1 Culvert Outlets 9.06
 - 9.4.2 Channel Outlets 9.06
 - 9.4.3 Channel Drops 9.06
 - 9.4.4 Seepage Forces 9.07
 - 9.5 Bridges 9.08
 - 9.5.1 Hydraulic Analysis 9.09
 - 9.5.2 Scour 9.09
 - 9.5.3 Freeboard 9.09
 - 9.6 Structure Aesthetics 9.09
- CHAPTER X. STORM DRAINS
- 10.1 Purpose 10.01
 - 10.2 Introduction 10.01
 - 10.3 Policies 10.01
 - 10.4 Design Discharge and Hydrology 10.02
 - 10.5 Street and Gutter Flow 10.03
 - 10.6 Pavement Inlets 10.08
 - 10.6.1 Capacity of a [Grade](#) Inlet in a Sag 10.10
 - 10.6.2 Capacity of a Curb Inlet in a Sag 10.11
 - 10.6.3 Capacity of a Combination Inlet in a Sag 10.12
 - 10.6.4 Capacity of a Slotted Inlet in a Sag 10.12
 - 10.6.5 Capacity of a Grate Inlet on a Continuous [Grade](#) 10.14
 - 10.6.6 Capacity of a Curb Inlet on a Continuous [Grade](#) 10.17
 - 10.6.7 Capacity of a Combination Inlet on a Continuous [Grade](#) 10.22

- 10.6.8 Capacity of a Slotted Inlet on a Continuous [Grade](#) 10.22
- 10.6.9 Clogging 10.24
- 10.7 Inlet Design Procedure 10.25
- 10.8 Storm-Drain Calculations 10.26
 - 10.8.1 Normal-Depth Calculations 10.28
 - 10.8.2 Pressure-Flow Calculations: Computation of Hydraulic [Grade](#) Line 10.28
 - 10.8.3 Friction Losses 10.30
 - 10.8.4 Minor Losses 10.30
 - 10.8.5 Bend Losses 10.30
 - 10.8.6 Junction Losses 10.32
 - 10.8.7 Transition Losses 10.34
 - 10.8.8 Manhole Losses 10.35
 - 10.8.9 Entrance and Outlet Losses 10.35
- 10.9 Storm-Drain Design Procedure 10.37
 - 10.9.1 Preliminary Design 10.37
 - 10.9.2 Final Pipe Sizing: Hydraulic [Grade](#)-Line Calculations 10.40
- 10.10 Suggested Design Practices 10.41
- 10.11 Check List for Design Submittals 10.43

CHAPTER XI. CULVERTS

- 11.1 Purpose 11.01
- 11.2 Design Criteria and Policies 11.01
- 11.3 Procedure for Culvert Design 11.01
 - 11.3.1 Step-by-Step Procedure for Sizing Culverts 11.02
- 11.4 Guidelines for Culvert Design 11.12
 - 11.4.1 Hydraulics of Culverts and Dip Sections 11.12
 - 11.4.2 Culvert Inlets and Outlets 11.15
 - 11.4.2.1 Inlets 11.15
 - 11.4.2.2 Outlets 11.15
 - 11.4.3 Debris Grates 11.16
 - 11.4.4 Sedimentation and [Erosion](#) 11.16

11.4.4.1 Inlet Recommendations 11.16

11.4.4.2 Outlet Recommendations 11.16

11.5 Culvert vs. Bridge Crossings 11.17

11.6 At- [Grade](#) (Dip) Crossings 11.18

CHAPTER XII. STREET AND PARKING LOT DRAINAGE

12.1 Purpose 12.01

12.2 Street Drainage Design Criteria 12.01

12.2.1 Local, Collector, and Arterial Streets 12.01

12.2.2 Collector and Arterial Streets 12.02

12.3 P.A.A.L. Drainage Design Criteria 12.02

12.4 Alley Drainage Design Criteria 12.03

12.5 Flow-Through Openings in Perimeter Walls 12.03

12.6 Computation of Flow Splits at Intersections 12.05

CHAPTER XIII. FLOODPROOFING

13.1 Purpose 13.01

13.2 Policies 13.01

13.3 When to Floodproof 13.02

13.4 Types of Floodproofing 13.07

13.5 Engineering Aspects 13.10

13.5.1 Flooding Characteristics 13.10

13.5.2 Floodproofing Methods 13.10

13.5.2.1 Sealants 13.10

13.5.2.2 Closures 13.11

13.5.2.3 Floodwalls and Levees 13.11

13.5.2.4 Protection of Utilities 13.13

13.5.2.5 Elevation 13.13

CHAPTER XIV. DETENTION/RETENTION BASINS

14.1 Purpose 14.01

14.2 Design Policies 14.01

14.3 Inspection and Maintenance Policies 14.03

14.4 Fees in Lieu of Detention/Retention Requirements 14.04

14.5 [Stormwater](#)-Infiltration Systems 14.04

REFERENCES AND SELECTED BIBLIOGRAPHIES R.01

INDEX I.01

APPENDIX

EVALUATION OF ALTERNATIVE FLOOD-CONTROL AND [EROSION](#)-CONTROL TECHNIQUES FOR WATERCOURSES IN TUCSON, ARIZONA

SECTION 5: LANDSCAPING

SECTION 5-01.0.0: LANDSCAPING AND SCREENING

Section

- 5-01.1.0 Purpose
- 5-01.2.0 Oasis Locational Standards
- 5-01.3.0 Landscaping in Vehicular Use Areas
- 5-01.4.0 Landscape Borders
- 5-01.5.0 Plant Size, Location, and Spacing
- 5-01.6.0 Crime Prevention and Safety Guidelines
- 5-01.7.0 Standards for Trees in Sight Visibility Triangles
- 5-01.8.0 Screening Safety Standards
- 5-01.9.0 Maintenance
- 5-01.10.0 Figures

5-01.1.0 PURPOSE

The purpose of this section is to supplement the landscaping and screening standards provided in the Section 7.6 of the Unified Development Code.

5-01.2.0 OASIS LOCATIONAL STANDARDS

- 2.1 Minimizing evaporation potential by choosing locations sheltered from wind and heat; and,
- 2.2 Incorporating [water harvesting](#) system and storm water runoff design with oasis areas.

5-01.3.0 LANDSCAPING IN VEHICULAR USE AREAS

3.1 Planter Area

- A. The measurement must always be within the planter area and may not include any material that defines the outer edge of the unpaved area.
- B. The unpaved area may be covered with a permeable material or with grillwork, but air and moisture must be able to penetrate the soil.
- C. Inert or vegetative ground cover must be used in planter areas not otherwise occupied by trees, shrubs, or grillwork.

3.2 Shading of Paved Areas

Canopy trees planted within and adjacent to vehicular use areas should be planted in a manner that at maturity they afford the greatest amount of shade to the paved areas.

3.3 Vehicle Overhangs

- A. Parking spaces may be designed so that the front of a vehicle overhangs into planter areas that are within a vehicular use area but cannot overhang into the street landscape border.
- B. When planted within the vehicular use area, trees must be located at the edge and between vehicle spaces, such as the common corner of four perpendicular spaces that face each other (see Figure 5-B, Vehicle Use Area). The minimum required vehicle overhang is three feet with the following exception. When the tree is located at the common corner of four perpendicular parking spaces that face each other, the minimum required overhang is two and one-half feet (2'-6"). The vehicle overhang is measured from the front of the wheel stop to the centerline of the tree.
- C. Only trees with single trunks may be planted within these planters because trees with multiple trunks need wider areas of growth and may interfere with the parked vehicles.

5-01.4.0 LANDSCAPE BORDERS

4.1 Landscaping on Adjacent Sites

Existing drought tolerant vegetation on adjacent [sites](#) must be considered in design to prevent abrupt changes in plant types and to maintain a visual continuity along street frontages.

4.2 Structural Overhangs

Covered parking canopies or other structural canopies, such as those used in service stations, may not overhang into street landscape borders in order to avoid conflicts between the structures and crowns of trees.

4.3 Streetscape Landscape Border - Maximum Width

In situations where the street landscape border is wider than the minimum ten foot standard, the landscape border width needs to be determined for the purposes of calculating the 50% vegetative coverage standard. The width is that area between the required screen and the property line, unless there is permitted encroachment into the right-of-way as per this section.

5-01.5.0 PLANT SIZE, LOCATION, AND SPACING

Required plant characteristics, sizes, and standards for various landscape applications are as provided below.

5.1 Size of Vegetation

When vegetation is used to satisfy a screen standard, the size of the plant material specified must be a minimum of five gallon container size and be of a type that will maintain an opaque screen year round.

5.2 Screen Planting

A. Screen planting may be aligned, clustered, or unevenly spaced to provide interest, as long as the plants provide a continuous and opaque screen, at maturity.

B. When vegetation is proposed for screening purposes, an appropriate width of planter area must be provided in addition to the width of the landscape border. The required width of the screen is based on the growth pattern of the plant material chosen. For example, if Nerium oleander is specified, the minimum width that will have to be available is six feet, as that plant grows as wide as it does high. (See Figure 5-C, Plant Size, Location, and Spacing)

C. Vegetation used to meet the screening standards is not included in the ground cover calculation as provided in Section 5-01.5.3, *Calculation of Plant Growth Coverage*.

5.3 Calculation of Plant Growth Coverage

A. For the calculation of plant growth coverage, two years' growth is used as a base for shrubs and ground covers. Ten years' growth is used for trees.

B. If the standard is for a certain size area of landscaping or for a purpose such as dust control, the plant materials used must be installed with the appropriate spacing and cover more than 50% of the area with vegetation. Applicant must indicate "on center" (o.c.) planting standards for all ground cover.

5.4 Size of Trees

Trees that are located in areas of required landscaping must be a minimum of 15-gallon container size. Palms must have a minimum trunk height of five feet from soil line to the bottom of the crown.

5.5 Protection of Sidewalks

Trees planted near sidewalks or curbs must be planted at a sufficient distance from the structural improvement to prevent pavement upheaval or soil settling. Where the distance is not available or where the design places the trees closer to the improvement, suitable barriers to the root system to mitigate pavement upheaval or soil settling must be installed with the landscaping. If the trees are in the public right-of-way, the root barriers must be approved by the City Engineer or designee.

5.6 Shrubs Not Used as Screen

Shrubs in areas of required landscaping other than for opaque screening must be a minimum of one gallon container size, with 20% of the required number to be five gallon container size or larger.

5.7 Size of Ground Cover

Ground cover in areas of required landscaping must be a minimum of one gallon container size or in flats if the watering techniques allow.

5.8 Refuse Dumpsters and Loading Spaces

Trees must be planted an appropriate distance from refuse dumpster locations and loading spaces so that the tree canopy, at maturity, does not obstruct service.

5.9 High Pollen-Producing Plants

Use of high pollen-producing plants must be kept to a minimum on the [site](#). These plant materials, when used, should not be concentrated in any one location. Pima County health ordinances regulating the use, maintenance, and sale of specific plant species, such as bermuda grass, mulberry trees, and olive trees, shall also apply in the City of Tucson.

5.10 Winter Planting Schedule

Landscape designs for developments that are projected for construction and occupancy during the winter months shall avoid using frost-sensitive vegetative ground cover. If it cannot be avoided, planting schedules must be discussed with the PDSO to establish conditions of occupancy.

5.11 Conflicts with Utilities and Solar Access

Trees and shrubs must be selected and located so that, at maturity, they do not interfere with existing on- [site](#) or off- [site](#) utility service lines or utility easements or with solar access, as defined in Section 11.4.20 of the Unified Development Code, to an adjacent property (see Figure 5-D, Conflicts with Utilities and Solar Access).

5-01.6.0 CRIME PREVENTION AND SAFETY GUIDELINES

Vehicular and pedestrian safety factors from the following list must be incorporated into all landscape designs:

- 6.1** The positioning, location, and type of plant material, screening, and other landscape elements should allow for natural surveillance of the outdoor spaces from within buildings, from outdoor locations on- [site](#), and from adjacent buildings, [sites](#), and rights-of-way.
- 6.2** Landscaping and screening should complement efforts to define public, semipublic, and private spaces.
- 6.3** Entrances to and exits from buildings or open spaces around buildings, including pedestrian walkways, should be open and in view of the surrounding neighboring or adjacent [sites](#) in order to reduce opportunities for crime.
- 6.4** Curbs, sidewalks, and landscaped trails should be used to define public, semipublic, and private areas.
- 6.5** Property owner/occupant areas of influence should be defined through the use of design elements, such as walls, fences, changes in level or [grade](#), lights, color, or change in paving texture.
- 6.6** To allow maximum visibility and surveillance of the development, screening should be used that is no higher than required by this section unless high enough to create an effective barrier to entry.
- 6.7** In areas adjacent to doors and windows, applicants should select plant material of such height to retain visibility of building openings from the street or from other development (e.g., less than 30 inches or with a greater than six foot space between the ground and the canopy).
- 6.8** Shrubs and ground cover located within four feet of the edge of a walkway may not exceed 30 inches in height, except where other standards call for a greater height. An effort should be made to avoid a design requiring a greater height. Trees located less than 12 feet from the edge of a walkway must be trimmed to a minimum six foot canopy height. (See Figure 5-E, Pedestrian Safety Zone.)
- 6.9** Use of barrier plants (see Figure 5-F, Security Plant Materials) in areas adjacent to walkways is recommended with consideration for pedestrian safety in compliance with Section 5-01.8.0, *Screening Safety Standards*.
- 6.10** Unless adjacent to a pedestrian path, barrier plants must be planted below and extending at least 12 inches beyond each side of windows. Plant materials in this area may be no higher than the sill height of the window.

5-01.7.0 STANDARDS FOR TREES IN SIGHT VISIBILITY TRIANGLES

Trees may be planted in sight visibility triangles provided that:

- 7.1 The trunk caliper, at maturity, does not exceed 12 inches in diameter;
- 7.2 The lowest branch of any tree is at least six feet above the [grade](#) of the street or driveway, whichever is the determining factor in the sight visibility triangle; and
- 7.3 Trees are not planted in a line that could result in a solid wall effect when viewed at an angle.

5-01.8.0 SCREENING SAFETY STANDARDS

- 8.1 Vegetation, such as those with spines, thorns, or needles, that may present hazards to pedestrians, bicycles, or vehicles must be planted a safe distance from the outer branch tips to the edge of a walkway, bike lane or path, roadway, or parking area access lane (PAAL). The growing characteristics of the vegetation must be taken into consideration when determining this distance (see Figure 5-I, Safety Standards).
- 8.2 Shrubs or ground cover planted adjacent to a walkway, driveway, bicycle path, or street must be placed with the plant center at a distance equal to or greater than one-half the normal width of the plant, at maturity.
- 8.3 Shrubs or ground cover that spreads must be kept pruned to prevent encroachment upon walkways, bicycle paths, driveways, or streets.
- 8.4 Trees with the potential for overhanging a walkway, driveway, bicycle path, parking space, or street must be of a type that, at maturity, provides a canopy with an understory height clearance of eight feet for walkways and bicycle paths, 12 feet for driveways and streets, and 15 feet for loading spaces. The height clearance shall be maintained by pruning during the tree's active growth period or when necessary.
- 8.5 In addition to the sight visibility triangle, no planted area may create a hazard by obstructing a driver's view of oncoming pedestrians, bicyclists, or vehicles.

5-01.9.0 MAINTENANCE

9.1 Plant Materials

- A. Any plant material in areas of required landscaping that does not survive must be replaced with an equivalent size and species within 30 days.
- B. Plant material must be pruned as necessary to control size but not to disrupt the natural growth pattern or characteristic form of the plant except as necessary to achieve height clearance for visibility and pedestrian passage or to achieve a continuous opaque hedge if required.
- C. Clipping and pruning of the plant material are required to allow maximum shading while preserving surveillance opportunities and preventing obstructive overhang into walks, curb areas, drives, and line of sight triangles as required by the Unified Development Code.
- D. All dead or removed plant material must be replaced with plant material acceptable under the standards of the xeriscape landscaping standards. Replacement material must be a minimum 15-gallon size for trees and five gallon size for shrubs.
- E. Regular landscape maintenance shall ensure water efficiency and include, but not be limited to, pruning, mulching, weeding, litter removal, aerating and dethatching turf areas, and fertilizing nonnative plant materials, as necessary.

9.2 Inert Materials

- A. Exterior improvements, such as benches, walls, or ramadas, must be of durable materials appropriate to the desert climate. Material with integral coloring or stucco is preferred for seating fixtures and other permanent improvements.
- B. Inert materials used in the landscaping areas must be of a nature to withstand the extremes of the desert climate and minimize heat gain or reflected heat.
- C. The inert materials must be replaced as needed due to displacement or [erosion](#).

9.3 Planting Areas

- A. Inert materials must be used in inaccessible, narrow, or hard to maintain sections of the planting areas.
- B. Landscaped areas must be kept free of trash, weeds, debris, and dead plant material and must be maintained in a clean and neat fashion.
- C. Use of river rock is discouraged adjacent to building windows.

9.4 Landscape Removal

- A. Substantial modifications, as determined by the PDSD Director, and/or removal of plant materials or other landscape elements shall require review and [approval](#) of a revised landscape plan by PDSD.
- B. The removal or destruction of landscape material that has been installed according to an approved landscape plan and not replaced constitutes a violation of the UDC.
- C. Minor modifications of the landscaping occurring as a result of routine maintenance, necessary replacement of elements because of damage or disease, or other causes is not subject to review by PDSD.

9.5 Screening and Wall Maintenance

- A. Paint and stucco must be renewed on the surfaces of fences and walls as needed.
- B. Wooden slats in chain link fences must be replaced as needed to retain the opacity of the screen.
- C. Any screening device that has deteriorated to the point where it does not serve as a screen must be replaced by the property owner. Vegetation used to meet the screening standards may not be replaced with new vegetation after two years past the installation. Replacement must be with another option for screening, such as a fence or a wall, in order to achieve an immediate screen. This standard does not apply to the occasional replacement of single plants within a vegetative screen.

9.6 Irrigation System Maintenance

- A. Irrigation systems must be maintained and replaced as necessary to continue to conserve water. Detection and repair of leaky or broken pipes, valves, and fittings and malfunctioning and/or misaligned heads, emitters, and bubblers must be part of a regular maintenance program for the [site](#).
- B. Automatic irrigation controllers are recommended to be reset a minimum of four times a year (spring, summer, fall, and winter) to adjust for plant water requirements that vary according to the season.
- C. Whenever possible, repair of irrigation equipment must be done with the originally specified materials or their equivalent.

5-01.10.0 FIGURES

- Figure 5-A: Vehicle Use Area
- Figure 5-B: Vehicle Use Area
- Figure 5-C: Plant Size, Location, and Spacing
- Figure 5-D: Conflicts with Utilities and Solar Access
- Figure 5-E: Pedestrian Safety Zone
- Figure 5-F: Security Plant Materials
- Figure 5-G: Screening Standards
- Figure 5-H: Screening Standards - Variation for Walls
- Figure 5-I: Safety Standards

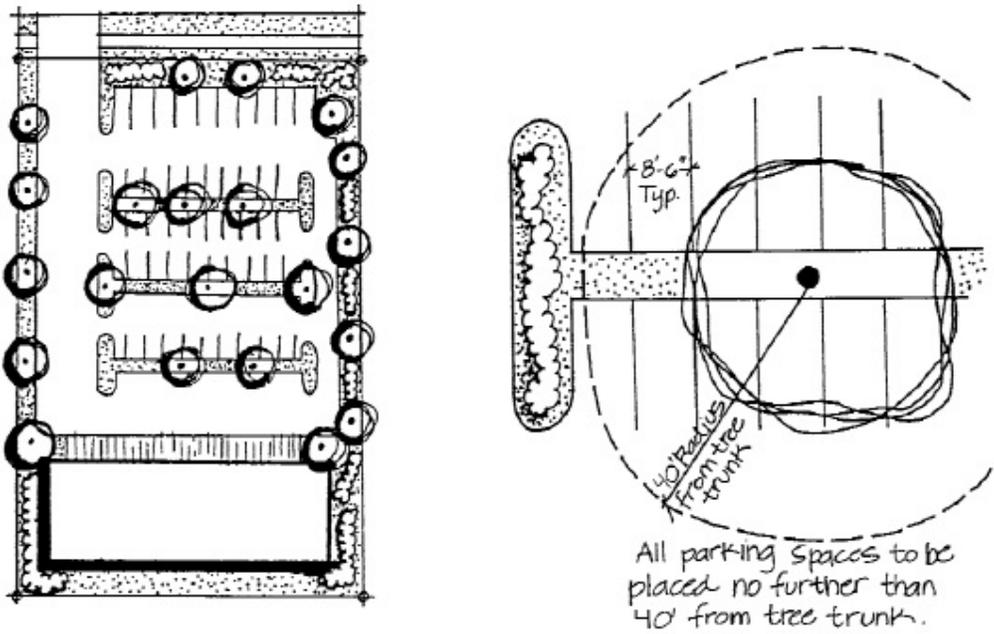
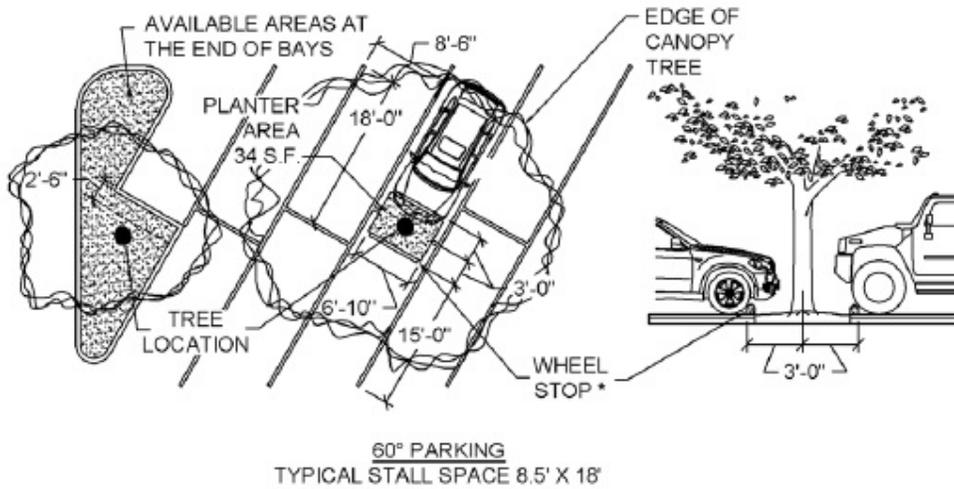
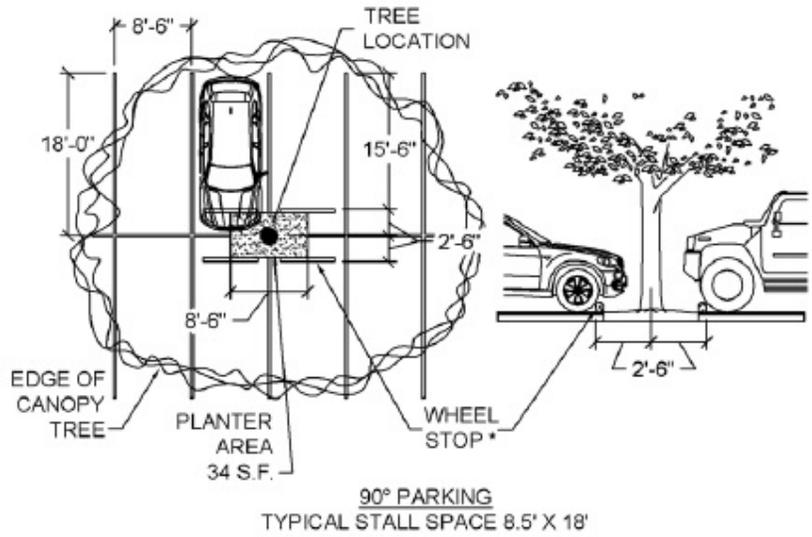


Figure 5-A: Vehicle Use Area



* WHEEL STOP LOCATION AS SHOWN ON THIS PAGE FOR TREE LOCATIONS ONLY

Figure 5-B: Vehicle Use Area

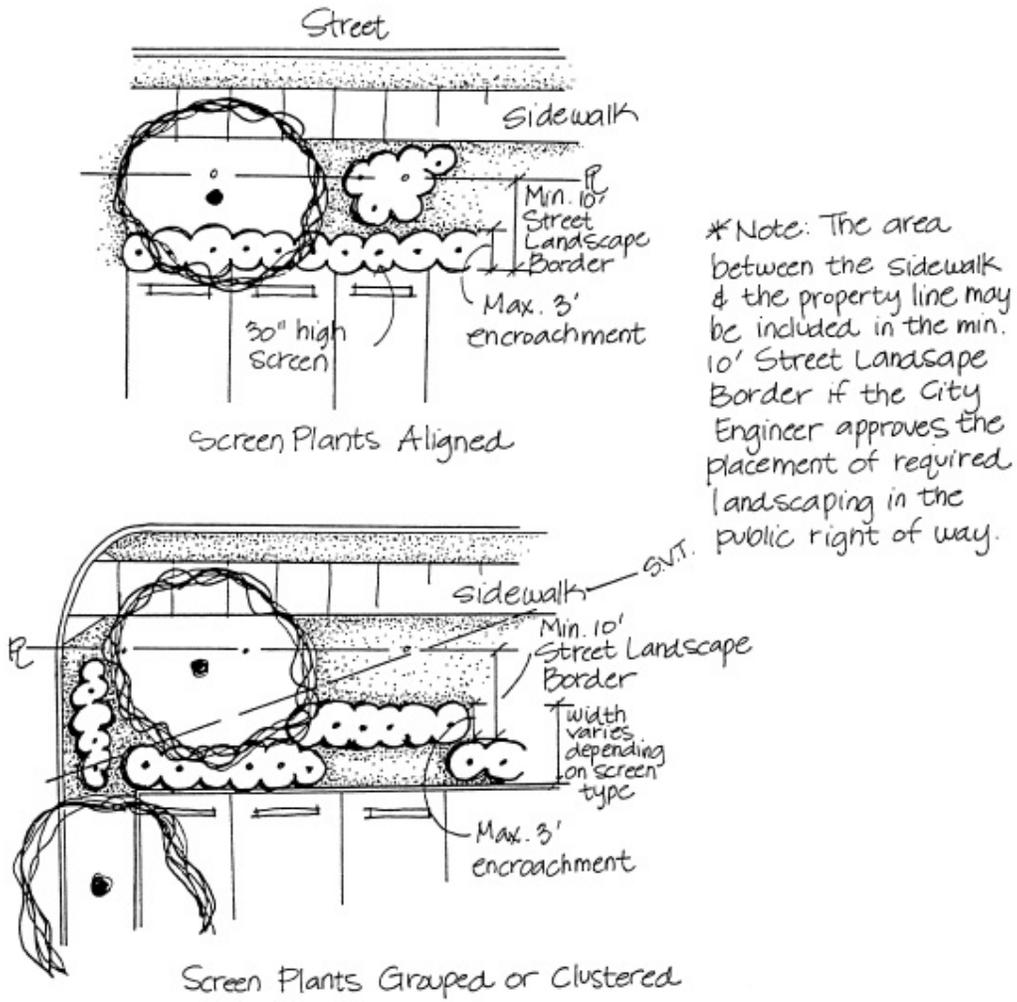
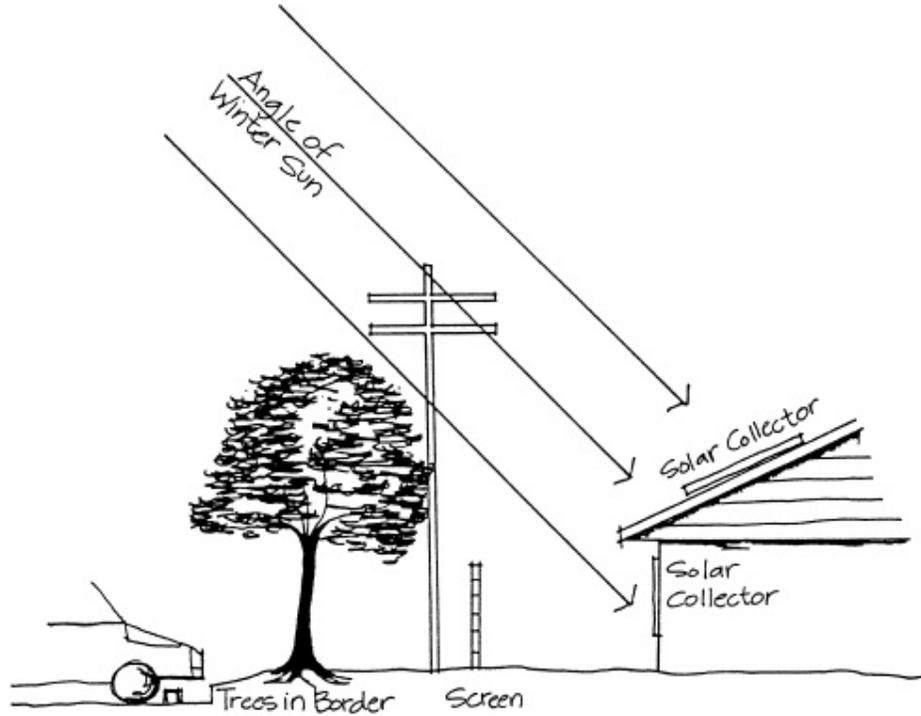


Figure 5-C: Plant Size, Location, and Spacing



Adjust the locations of trees in the border to allow access to existing solar collectors and prevent conflicts with utility wires or easements.

Figure 5-D: Plant Size, Location, and Spacing

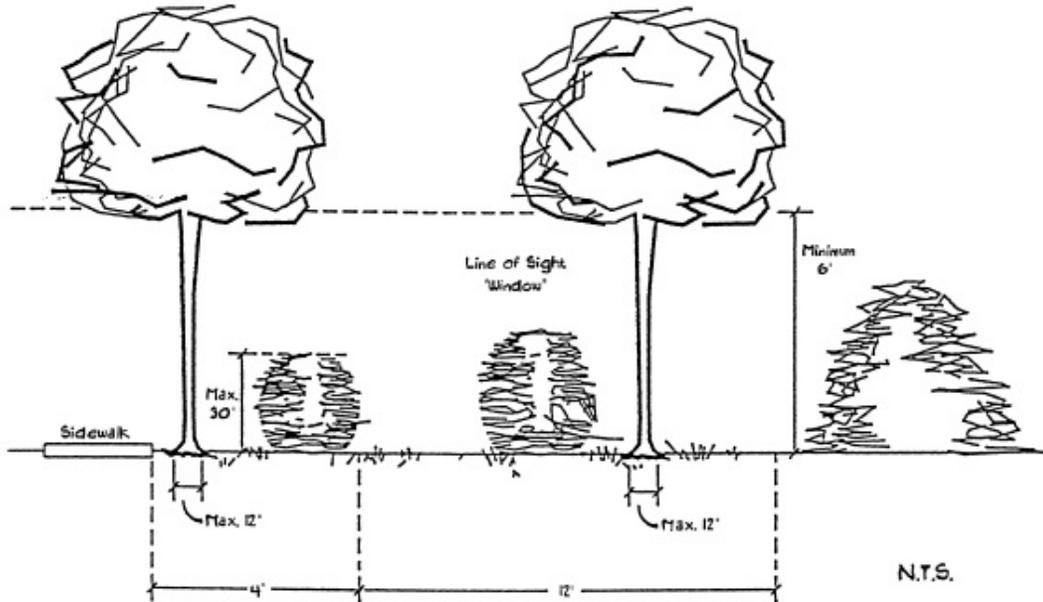


Figure 5-E: Pedestrian Safety Zone

Security Plant Materials													
Botanical	Common	Evergreen	Deciduous	Barrier	Hedge	Thorns	Stickers	Dense	Height	Tree	Shrub	Ground	Perennial

Name	Name								at Maturity			Cover	
Acacia species			•	•		•	•		Varies	•	•		
Agave - many species		•		•		•			Varies				•
Aloe barbadensis	Aloe Vera	•		•			•		2'				•
Aloe saponaria	African Aloe	•		•			•		12"				•
Araucaria bidwillii	Bunya-Bunya Tree	•		•			•		80'	•			
Asparagus falcatus	Sickle Thorn Asparagus	•					•		12"			•	•
Atriplex lentiformis	Saltbush	•		•			•	•	8'		•		
Bambusa - many species	Bamboo	•			•			•	10'-15'				•
Bougainvillea 'Barbara Karst'			•	•					8'-10'		•		
Bougainvillea - Bush Var.	Bush Bougainvillea		•		•				3'-4'		•		
Caesalpinia pulcherrima	Red Bird of Paradise		•	•			•		6'	•	•		
Carissa grandiflora	Natal Plum - Many Var.	•		•			•	•	2'-6'		•		
Celtis pallida	Spiny Hackberry		•	•			•	•	8'-10'	•	•		
Chamaerops humilis	Med. Fan Palm	•		•	•			•	6'-10'				•
Cortaderia selloana	Pampas Grass	•		•				•	10'				•
Cotoneaster pannosus	Silverleaf Cotoneaster	•			•				6'-10'		•		
Dasyllirion wheeleri	Sotol	•		•			•		5'				•
Euphorbia mili	Crown of Thorns	•		•			•		7'-8'				•
Feijoa sellowiana	Pineapple Guava	•			•			•	6'-15'		•		
Ferocactus	Barrel Cactus	•					•		2'				•

species													
Fouquieria splendens	Ocotillo	•		•		•			12'				•
Ilex cornuta 'Burfordii'	Burford's Holly	•		•	•		•		6'		•		
Jasminum mesnyi	Primrose Jasmine	•			•			•	6'-8'		•		
Juniperus species	Juniper	•			•		•	•	Varies		•		
Leucophyllum frutescens	Texas Ranger	•			•			•	6'-8'		•		
Ligustrum UDCidum	Privet	•			•			•	10'-30'	•	•		
Mahonia aquifolium	Oregon Grape	•			•		•	•	6'		•		
Nerium oleander	Oleander	•			•			•	10'-15'		•		
Opuntia species	Prickly Pear; Cholla	•		•			•		Varies				•
Photinia fraseri	Photinia	•			•				10'		•		
Pithecellobium flexicaule	Texas Ebony		•	•		•			20'	•	•		
Punica granatum	Pomegranate		•	•					12'-20'	•	•		
Pyracantha 'Rosedale'	Firethorn	•		•		•			8'-10'		•		
Pyracantha 'Santa Cruz'	Firethorn	•		•		•			2'-3'		•		
Rosa	Rose		•	•		•			Varies		•		•
Rosa banksiae	Lady Bank's Rose	•		•		•		•	Varies		•		
Tamarix aphylla	Tamarisk	•			•			•	10'-30'	•	•		
Vauquelinia californica	Arizona Rosewood	•			•			•	8'		•		
Viburnum suspensum	Viburnum	•			•				6'-8'		•		
Xylosma congestum	Xylosma	•			•			•	8'-15'	•	•		

Yucca aloifolia	Spanish Bayonet	•		•		•		5'-7'				•
Yucca brevifolia	Joshua Tree	•		•		•		15'				•
Yucca whipplei	Our Lord's Candle	•		•		•		2'-4'				•

Figure 5-F: Security Plant Materials

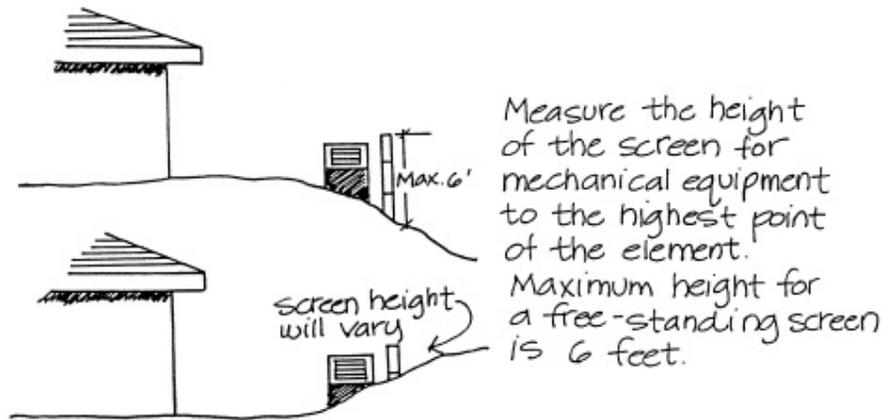
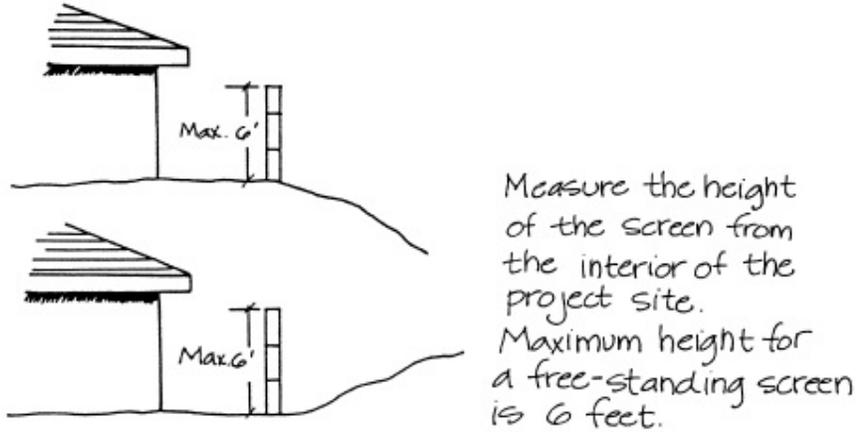


Figure 5-G: Screening Standards

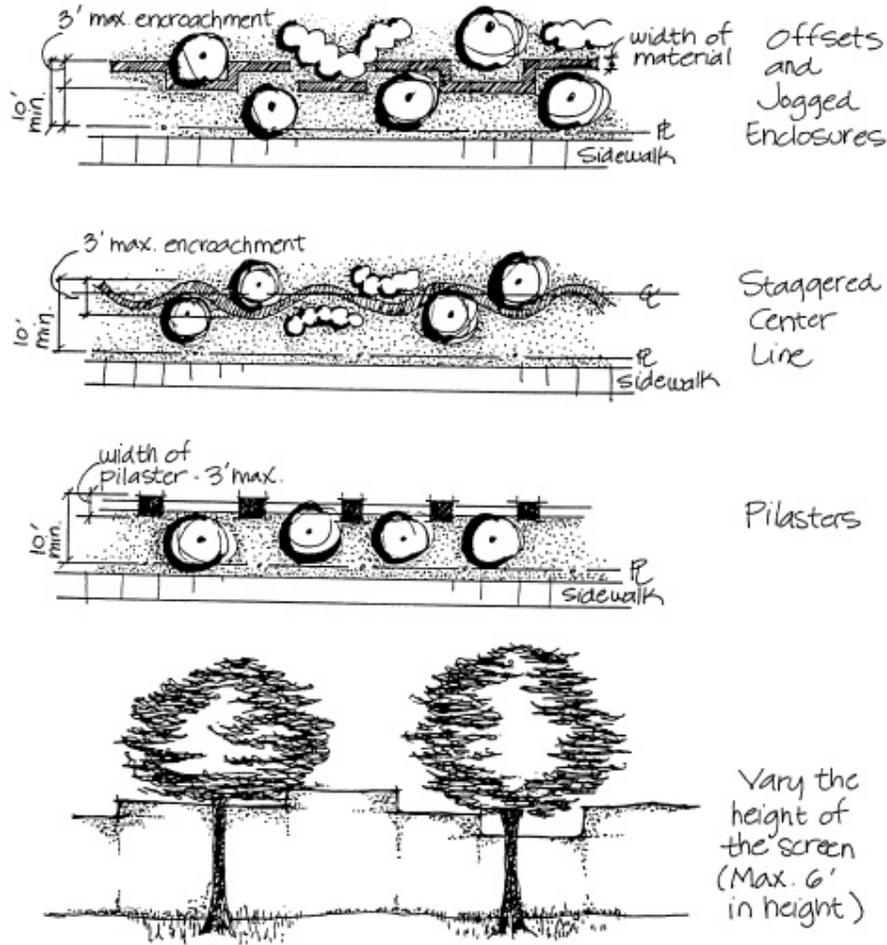


Figure 5-H: Screening Standards - Variations for Walls

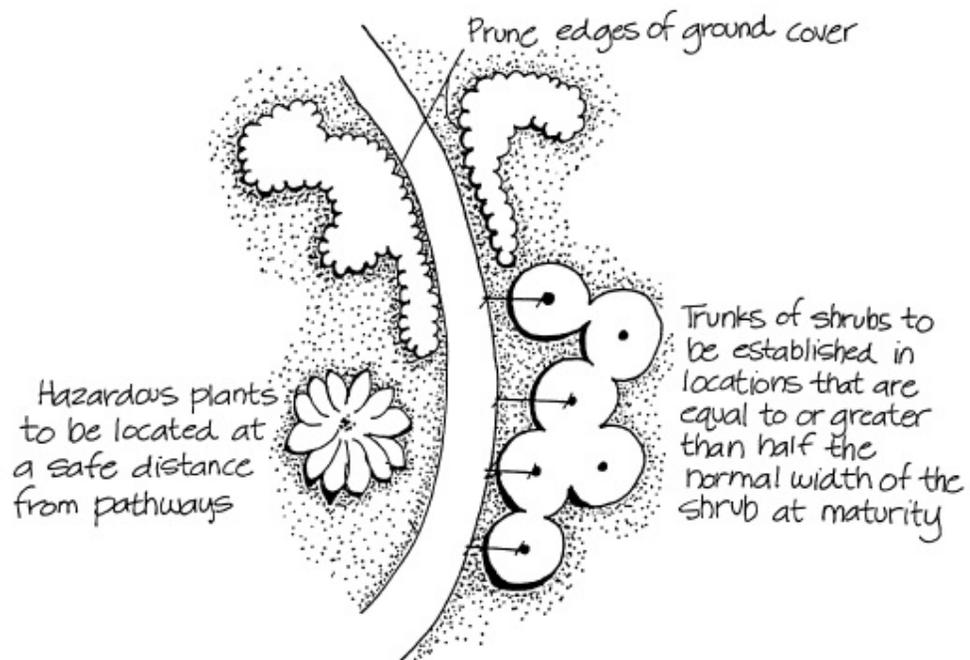


Figure 5-I: Safety Standards**SECTION 5-02.0.0: LANDSCAPE PLANT MATERIALS**

Section

- 5-02.1.0 Purpose
- 5-02.2.0 Applicability
- 5-02.3.0 Types of Plant Material
- 5-02.4.0 Seeding Programs
- 5-02.5.0 Plant/Seed Lists
- 5-02.6.0 Exhibit

5-02.1.0 PURPOSE

This standard has been prepared for the purpose of establishing plant and seed lists for use with various City of Tucson regulations that either require or regulate landscaping.

5-02.2.0 APPLICABILITY

This standard applies on development projects, including repair and [infrastructure](#) installation, when city regulations mandate the use of drought tolerant or native plant and seed material.

5-02.3.0 TYPES OF PLANT MATERIAL

Most projects, with some exceptions, are required to be landscaped with either native vegetation or drought tolerant vegetation. The following subsections describe how vegetation is selected to comply with those requirements. For information on any exceptions, refer to the individual ordinance requiring or regulating the landscaping.

3.1 Native Vegetation

There are regulations in the UDC, such as the Scenic Corridor Zone (SCZ) and the Environmental Resource Zone (ERZ), where native vegetation is required to be retained or where the property is required to be revegetated with native plant material. In these two zones or in any other city regulation listing a requirement for native vegetation or revegetation, the requirement is to be complied with as discussed below.

Native vegetation is defined as vegetation indigenous to the [site](#). Native vegetation, however, varies greatly in different areas of the Tucson basin due to changes in topographical elevation, soils, and availability of moisture. Due to this variation of native plant material, a general native plant list applicable to an individual [site](#) within the region cannot be defined.

Therefore, when native vegetation is required on a project, the landscape plans submitted for review must include a comprehensive list of native vegetation that exists on the [site](#) and in the immediate areas surrounding the [site](#). Selection of plant material for use on the project will be from that comprehensive list.

3.2 Native Seeds

The type of native vegetation varies greatly within the Tucson basin. To determine which seeds to use on a project when

native seeds are required, a comprehensive list of native plants must be submitted.

A base set of native seed species is contained in Exhibit I of this standard. This base set is not inclusive of all native plant material. Seeds from that list may be chosen for use on a project requiring native seeds, if the plant is found on the comprehensive native plant list assembled for the property.

If the project does not require native seeds but the landscape design calls for the use of seeds native to the [site](#) or region, a comprehensive list in accordance with Section 5-02.3.1, may be submitted for determination as to whether or not they are native. As an alternative (on projects not requiring native seeds), seed selection may be made from Exhibit I, *Native Seeds*. If the proposed seed is not on the comprehensive list, Exhibit I, nor the Arizona Department of Water Resources (ADWR) Low Water Use/Drought Tolerant Plant List for the Tucson Active Management Area, it may be used if:

- A. The seed species is drought tolerant and a seed supplier certification of drought tolerancy is submitted;
- B. The city can certify through a third party the seed species' drought tolerancy;
- C. The proposed seed species is not for landscaping public right-of-way, unless it is to comply with SCZ or ERZ requirements; and,
- D. The seed species has not been considered by the Arizona Department of Water Resources (ADWR) and rejected.

3.3 Drought Tolerant Vegetation

When drought tolerant vegetation is required by a city regulation, such as Section 7.6, *Landscaping and Screening Regulations*, of the UDC, plant selection is from the ADWR Low Water Use/Drought Tolerant Plant List.

3.4 Drought Tolerant Seeds

Various city landscaping regulations allow the use of seeds within landscape areas. For example, the landscaping and screening regulations allow the use of seeds as a ground cover in lieu of decomposed granite (DG) in such areas as under canopy trees. However, seeds cannot be used to comply with the 50% vegetative coverage area requirements of the street landscape border.

In situations where the use of seeds is permitted, selection of seed material will be from plants on the ADWR Low Water Use/Drought Tolerant Plant List. Also, if the area that is to be reseeded is not within the public right-of-way, seed selection may be in accordance with Section 5-02.3.2, *Native Seeds*.

All plant material used within the public right-of-way is to be from the ADWR Low Water Use/Drought Tolerant Plant List regardless of whether it is plant or seed material. The only exceptions to this are in the application of native vegetation requirements of the SCZ and the ERZ sections of the UDC or in compliance with native seeding requirements of the Uniform Building Code [grading](#) ordinance.

5-02.4.0 SEEDING PROGRAMS

In projects where seeding is required or is being utilized to meet a landscaping requirement, the items to address, in addition to seed selection, are irrigation requirements, [site](#) preparation, and establishment guarantee. [Site](#)-specific situations will be addressed on a case-by-case basis. General guidelines are provided in this standard; however, alternatives may be proposed to the staff reviewing the landscape plans.

4.1 [Site Preparation](#)

In order to attain the maximum benefit from the seeded materials, it is necessary to till the soil prior to seeding. The method and use of fertilizers, seeding, mulching, tackifiers, etc., will vary per [site](#)-specific situations. The applicant is expected to do whatever is necessary to prepare the [site](#) to guarantee plant establishment to the satisfaction of the city.

4.2 Irrigation

The [sites](#) that will require revegetation will vary considerably. Some [sites](#) with little [slope](#) and with soil textures and structures conducive to capturing rainfall or capable of being modified to capture rainfall can be revegetated on rainfall alone. Some [sites](#) may require short-term irrigation to achieve plant establishment. The applicant will not be required by the city to irrigate but will, however, be responsible for successful establishment of vegetation using the appropriate seeding/irrigation method.

4.3 Plant Establishment Guarantee

A stand of vegetation shall be considered established when:

A minimum of one perennial seeded species per square foot has rooted, developed true leaves, and is in a state of continual positive growth, and the interspace area between perennial species has a minimum of one annual or perennial plant in any stage of development or growth other than seed.

5-02.5.0 PLANT/SEED LISTS

5.1 Origin of Plant/Seed Lists

A. Exhibit I, *Native Seed List*, was derived from the Low Water Use/Drought Tolerant Plant List as known native vegetation. The list is not inclusive of all native vegetation. For alternative selections, refer to Section 5-02.3.2, *Native Seeds*.

The seed list is established as a guide on how to mix the various types of seeds to provide a varying mix of native plant growth on the [site](#) giving it a more natural appearance. The pounds per acre listing is a guide for use by the designer to achieve a minimum growth pattern to the seeded area. Specific rates are based on the seeds that are used in the mix. The seed mix is to be certified by the seed supplier as to the growth coverage projected.

B. The ADWR Low Water Use/Drought Tolerant Plant List is prepared for use within the Tucson Active Management Area (TAMA) by the ADWR.

5.2 Modification of Plant Selection

In order to use plants not listed in ADWR Low Water Use/Drought Tolerant Plant List, the plants are to be approved through the following process.

A. Any person seeking to add or delete a plant or plants from the low water use plant list may submit an application for modification of the list at any time to the Director of the ADWR. The application is made on a form prescribed and furnished by the Director of the ADWR.

B. The ADWR Director reviews each request for modification of the low water use plant list. The Director may request additional information from the applicant and may seek information from other sources as may be necessary to determine whether the list should be modified.

C. If the addition of a plant to the low water use plant list is approved, the ADWR Director will place the plant on a supplemental list as an addendum to the low water use plant list. The supplemental list shall be available upon request from the ADWR.

D. If the ADWR Director approves the deletion of a plant from the Low Water Use/Drought Tolerant Plant List, the deletion from the list will be issued with the annual modified review plant list.

E. The ADWR Director conducts an annual review of the low water use plant list and issues a modified plant list. As a result of the review, the Director may add or delete plants from the list.

5.3 Updates of Plant Lists

The plant and seed lists will be updated as necessary to provide the most current plant list based on Section 5-02.5.2.E.

5-02.6.0 EXHIBIT

Exhibit I - Native Seed List

EXHIBIT I: NATIVE SEED LIST

<u>SPECIES</u>		
<u>Botanical Name</u>	Common Name	PLS* Rate lbs/acre
Aristida purpurea (P, W)	Purple Three-Awn	2.0
Plantago insularis (A, C)	Indian Wheat	3.0
Senna covesii (P, W)	Desert Senna	2.0
Sphaeralcea ambigua (P, C/W)	Desert Globe-Mallow	1.0
Sporobolus cryptandrus (P, W)	Sand Dropseed	1.0
<u>Plus</u> choose a minimum of three (3) species from the following six:		
Acacia constricta (P, W)	Whitethorn Acacia, Mescat	2.0
Ambrosia (Franseria) deltoidea (P, C)	Triangle-Leaf Bursage	4.0
Atriplex canescens (P, C)	Four-Wing Saltbush	3.0
Encelia farinosa (P, C/W)	Brittlebush	1.5
Haplopappus (Ericameria) laricifolius (P, C/W)	Turpentine Bush	1.0
Larrea tridentata (divaricata) (P, W)	Creosote Bush, Greasewood	6.0
Optional recommended species:		
Acacia greggii (P, W)	Cat's Claw Acacia	2.0-3.0
Atriplex lentiformis (P, C)	Quail Bush	1.0-2.0
Atriplex polycarpa (P, C)	Desert Saltbush	1.0-3.0
Baileya multiradiata (P, C/W)	Desert Marigold	1.0-2.0

Bouteloua curtipendula (P, W)	Sideoats Grama	2.0
Parkinsonia floridum (P, W)	Blue Palo Verde	2.0-3.0
Parkinsonia microphyllum (P, W)	Littleleaf or Foothill Palo Verde	2.0-3.0
Eragrostis intermedia (P, W)	Plains Lovegrass	1.0
Eschscholtzia mexicana (A, C)	Mexican Gold Poppy	1.0-3.0
Leptochloa dubia (P, W)	Green Sprangle-Top	1.0
Phacelia campanularia (A, C)	Desert Canterbury Bells	1.0-2.0
Prosopis velutina (P, W)	Velvet Mesquite	1.0-2.0
Psilostrophe cooperi (P, C/W)	Paper Flower	1.0-2.0
Setaria macrostachya (P, W)	Plains Bristle Grass	2.0
*PLS = Pure Live Seed		
KEY: A = Annual; P = Perennial; C = Germinates and thrives in the cool season; W = Germinates and thrives in the warm season; C/W = Germinates and thrives in cool/warm seasons.		
NOTE: The cool season in Tucson runs September through March, and the warm season is from March through October. There is an overlap of seasons.		

SECTION 5-03.0.0: PROTECTED NATIVE PLANT LIST

Section

5-03.1.0 Purpose

5-03.2.0 Protected Native Plant List

5-03.1.0 PURPOSE

This standard has been prepared for the purpose of establishing the protected native plant list for use with various City of Tucson regulations, in particular Section 7.7, *Native Plant Preservation*, of the UDC, that either require or regulate native plants.

5-03.2.0 PROTECTED NATIVE PLANT LIST

ALL CACTI

Common Name	Latin Name
Compass Barrel	Ferocactus acanthodes
Crested or Fan-top Saguaro	Carnegiea gigantea 'Crested'
Desert Night-blooming Cereus	Peniocereus greggi
Fishhook Barrel	Ferocactus wislizenii
Needle-spined Pineapple Cactus	Echinomastus erectocentrus var. erectocentrus
*Pima Pineapple Cactus	*Coryphantha scheeri var. robustipina
Saguaro	Carnegiea gigantea

TREES OF A MINIMUM SIZE OF FOUR-INCH CALIPER

Common Name	Latin Name
Arizona Ash	Fraxinus velutina var. velutina or Fraxinus pennsylvanica spp. velutina
Arizona Black Walnut	Juglans major
Arizona Sycamore	Platanus racemosa Nutt. var. wrightii
Blue Palo Verde	Cercidium floridum
Catclaw Acacia	Acacia greggii var. arizonica
Desert Elderberry	Sambucus mexicana
Desert Hackberry	Celtis pallida
Desert Willow	Chilopsis linearis
Foothills Palo Verde	Cercidium microphyllum
Fremont Cottonwood	Populus fremontii sp. fremontii
Goodding Willow	Salix gooddingii
Ironwood	Olneya tesota
Net Leaf Hackberry	Celtis reticulata
Screwbean Mesquite	Prosopis pubescens
Western Soapberry	Sapindus saponaria var. drummondii

Whitethorn Acacia	Acacia constricta
Velvet Mesquite	Prosopis velutina

* Denotes plants listed as Endangered or Threatened under the Federal Endangered Species Act (ESA) as of March 24, 1997. Any plants designated by the ESA, as amended, shall be subject to the Section 7.7.3, *Applicability* (of the Native Plant Preservation ordinance), of the UDC.

SHRUBS OF A MINIMUM SIZE OF THREE FEET IN HEIGHT	
Common Name	Latin Name
Catclaw Acacia	Acacia greggii var. arizonica
Desert Hackberry	Celtis pallida
Desert Willow	Chilopsis linearis
Greythorn	Zizyphus obtusifolia var. canescens
Kearney Condalia	Condalia warnockii var. kearneyana
Whitethorn Acacia	Acacia constricta
SUCCULENTS OF A MINIMUM SIZE OF TWO FEET IN HEIGHT	
Common Name	Latin Name
Ocotillo	Fouquieria splendens
Soaptree Yucca	Yucca elata

SECTION 6: MEDICAL MARIJUANA DISPENSARY AND DISPENSARY OFF-SITE CULTIVATION USES - REQUIRED SETBACK FROM CERTAIN PARKS

SECTION 6-01.0.0: MEDICAL MARIJUANA DISPENSARY AND DISPENSARY OFF-SITE CULTIVATION USES - REQUIRED SETBACK FROM CERTAIN PARKS

In accordance with Sections 4.9.10.E.1.k and 4.9.10.E.2.f of the Unified Development Code, *Medical Marijuana Dispensary* and *Medical Marijuana Dispensary Off-Site Cultivation Location Uses*, are required to be setback a minimum of 1,000 feet from the following public parks (Note: the table is organized into the following categories: Parks - General; School Ground Parks; and, Natural Resources and Other Parks):

Name	Address
Parks - General	
Alvernon Park	3900 E. 3rd St.

20/30 Park	5300 E. 7th St.
Abraham Lincoln Park	8280 E. Escalante Rd.
Balboa Heights Park	2526 N. Castro Av.
Brandi Fenton Memorial Park	3482 E. River Road
Bravo Park	4595 S. Mountain Av.
Case Park	9851 E. Kenyon Dr.
Catalina Park	900 N. 4th Av.
Cherokee Avenue Park	900 N. Cherokee Av.
Cherry Avenue Park	5085 S. Cherry Av.
Children's Memorial Park	4851 N. 15th Place
Christopher Columbus Park	4600 N. Silverbell Rd.
Conner Park	2200 E. Glenn St.
Country Club Annex Park	3300 E. Aviation Hy.
David G. Herrera and Ramon Quiroz Park	600 W. St. Mary's Rd.
De Anza Park	1000 N. Stone Av.
Desert Aire Park	600 S. Beverly Bl.
Desert Shadows Park	Greenway Dr. & Ponderosa Pl.
Eastmoor Park	2500 E. Aviation Hy.
El Presidio Plaza Park	160 W. Alameda St.
El Pueblo Park	101 W. Irvington Rd.
El Tiradito Wishing Shrine	400 S. Main Av.
Escalante Park	6900 E. Nicaragua Dr.
Estevan Park	1000 N. Main Av.
Fort Lowell Park	2900 N. Craycroft Rd.
Francisco Elias Esquer Park	1331 N. 4th Av.
Freedom Park	5000 E. 29th St.

Garden of Gethsemane	602 W. Congress St.
Gene C. Reid Park	900 S. Randolph Wy
Golf Links Sports Complex	2400 S. Craycroft Rd.
Greasewood Park	1075 N. Greasewood Rd.
Groves Park	7400 E. Juniper Dr.
Harold Bell Wright Park	Corinth & Shepherd Hills Dr.
Harriet Johnson Park	6100 E. 25th St.
Himmel Park	1000 N. Tucson Bl.
Hoffman Park	4800 E. Cecelia St.
Houghton Park	5600 S. Houghton Rd.
Iron Horse Park	75 N. 1st Av.
Jacinto Park	2600 N. 15th Av.
Jacobs Park	3300 N. Fairview Av.
James Thomas Park	3200 S. Forgeus Av.
Jardin de Cesar Chavez Park	E. 18th St. & 6th Av.
Jesse Owens Park	400 S. Sarnoff Dr.
Joaquin Murrieta Park	1400 N. Silverbell Rd.
John F. Kennedy Park	Ajo Way & Mission Rd.
Juhan Park	1770 W. Copper St.
La Madera Park	2700 E. La Madera Dr.
Lakeside (Charles Ford) Park	8300 E. Stella Rd.
Limberlost Family Park	4255 N. 4th Av.
Linden Park	300 S. Desert Av.
Mansfield Park	2000 N. 4th Av.
Manuel Herrera Jr. Park	5901 S. Fiesta Av.

Manuel Valenzuela Alvarez Park	1945 N. Calle Central
Mariposa Park	310 E. Aviation Dr.
McCormick Park	2950 N. Columbus Bl.
Menlo Park	300 N. Grande Av.
Mesa Village Park	5700 E. 18th St.
Michael Perry Park	8700 E. Arbor St.
Military Plaza Park	221 S. 6th Av.
Miracle Mile Manor Park	850 W. Grant Rd.
Mirasol Park	1100 E. Silverlake Rd.
Mission Manor Park	6100 S. 12th Av.
Mitchell Park	1100 E. Mitchell St.
Morris K. Udall Park	7290 E. Tanque Verde Rd.
North Central Park	3861 N. Cactus Bl.
Oaktree Park	5433 S. Oaktree Dr.
Ormsby Park	24th St. & Verdugo Av.
Palo Verde Park	425 S. Mann Av.
Parkview Park	3700 E. 24th St.
Pinecrest Park	4800 E. Fairmount St.
Pueblo Gardens Park	2500 E. 36th St.
Purple Heart Park	10050 E. Rita Rd.
Riverview Park	1600 N. Yavapai St.
Rodeo Grounds	4825 S. 6th Av.
Rodeo Wash Park	Michigan & 9th Av.
Rolling Hills Park	8900 E. 29th St.
Rudy Garcia Park	5001 S. Nogales Hy
San Augustine Park	119 W. Broadway Bl

San Juan Park	1665 S. La Cholla Bl
Santa Cruz River Park	West of Interstate 10
Santa Rita Park	401 E. 22nd St.
Santa Rosa Park	1085 S. 10th Av.
Sears Park	5900 E. 14th St.
Seminole Park	600 N. Seminole Av.
Sentinel Peak Park	1000 S. Sentinel Peak Rd.
Silverlake Park	1575 E. 36th St.
Stefan Gollob Park	401 S. Prudence Rd.
Street Scene Park	39th St. & Euclid Av.
Sunnyside Park	5811 S. Del Moral Bl.
Sunset Park	255 W. Alameda St.
Swan Park	1700 S. Swan Rd.
Swanway Park	4800 E. 1st St.
Tahoe Park	2000 E. Edison St.
Tierra del Sol Park	6700 E. Calle Marta
Toumey Park	4500 E. Eastland St.
Valle Alegre Park	13031 E. Redington Rd.
Veinte de Agosto Park	Broadway Bl. & Church Av.
Verdugo Park	19th St. & Verdugo Av.
Villa Serena Park	5900 E. Calle Serena
Vista del Prado Park	6900 E. Stella Rd.
Vista del Pueblo Park	1800 W. San Marcos Bl.
Vista del Rio Park	7575 E. Desert Arbor St.
Wilshire Heights Park	5500 E. 14th St.
School Ground Parks	

Amphi Neighborhood Park	510 E. Navajo Rd.
Amphitheater High School	125 W. Yavapai Rd.
Amphitheater Middle School	315 E. Prince Rd.
Blenman Elementary School	1695 N. Country Club Rd.
Booth-Fickett Middle School	7240 E. Calle Arturo
Catalina High School	3645 E. Pima St.
Cholla High School	2001 W. 22nd St.
Desert Vista District Park	6091 W. Calle Santa Cruz
Doolen Middle School	2400 N. Country Club Rd.
Dunbar School Park	325 W. 2nd St.
E.C. Nash Elementary School	515 W. Kelso St.
Flowing Wells High School	3725 N. Flowing Wells Rd.
Hudlow Elementary School	502 N. Caribe Av.
Jefferson Park Elementary School	1701 E. Seneca St.
John B. Wright Elementary School	4311 E. Linden St.
Keeling Desert Park	245 E. Glenn St.
Magee Middle School	8300 E. Speedway Bl.
Manzo Elementary School	1301 W. Ontario St.
Palo Verde High School	1302 S. Avenida Vega
Pima Community College (West)	2202 W. Anklam Rd.
Richey Elementary School	2209 N. 15th Av.
Rincon High School	422 N. Arcadia Av.
Rollin Gridley Middle School	350 S. Harrison Rd.
Sahuaro High School	545 N. Camino Seco
Santa Rita High School	3951 S. Pantano Rd.
Sunnyside High School	1725 E. Bilby Rd.

Townsend Middle School	2120 N. Beverly Bl.
Utterback Middle School	3233 S. Pinal Vista
Wakefield Middle School	101 W. 44th St.
Natural Resources and Other Parks	
Miramonte Natural Resources Park	701 N. Richey Bl.
Rio Vista Natural Resources Park	3974 N. Tucson Bl.
Rodeo Wash Park II	621 W. Columbia St.
San Gabriel Park	4056 E. Montecito St.
Sixth Avenue Commemorative Pet Park	2075 N. 6th Av.

SECTION 7: PEDESTRIAN ACCESS

SECTION 7-01.0.0: PEDESTRIAN ACCESS

Section

- 7-01.1.0 Purpose
- 7-01.2.0 Applicability
- 7-01.3.0 Pedestrian Circulation Path Required
- 7-01.4.0 Location and Design Standards
- 7-01.9.0 Figures

7-01.1.0 PURPOSE

The purpose of this Section is to require reasonable improvements for pedestrian facilities to and within places of public accommodation, to transportation systems, and to housing; increase public safety by lessening the conflict between vehicular and pedestrian activities; aid in improving air quality in the City of Tucson by providing for one pedestrian mode of alternate travel; and provide design standards for pedestrian circulation paths.

7-01.2.0 APPLICABILITY

The provisions apply to the following:

- A. All new uses of land or structures;
- B. All existing uses of land or structures legally existing as of September 24, 1990, which are expanded in lot

coverage, floor area, number of parking spaces, or seating capacity, as follows:

1. If the expansion is less than 25%, these provisions apply only to the proposed expansion. The remainder of the use or structure is governed by the provision in force at the time of initial [approval](#) for the use or structure.
 2. If the expansion is 25% or more, these provisions apply to the existing use or structure, as well as the expansion.
 3. All expansions which occur after the adoption of this ordinance are cumulated in determining the 25% expansion. After the use of the land or structure is brought into conformance with the provisions of this Section, additional changes to the existing use of the land or structure will commence cumulating over time as of the date the existing use of the land or structure is brought into conformance.
 4. Nothing contained in this Section affects existing property or the right to its continued use for the purpose legally used at the time these regulations become effective, nor do these regulations affect any reasonable repairs to, or alterations of, buildings or property used for such existing purposes or require compliance by existing structures or facilities where not otherwise required by A.R.S. Title 34.
- C. Other regulations enforceable by the city.

7-01.3.0 PEDESTRIAN CIRCULATION PATH REQUIRED

3.1 Pedestrian circulation paths located within any street, whether public or private, are regulated by Section 10-01.0.0, *Street Technical Standard*. (See Figure 7-A for a typical cross-section.)

3.2 Pedestrian circulation paths designed for barrier-free accessibility for the physically disabled and located within any development are regulated by the Uniform Building Code.

3.3 Within all development, a continuous pedestrian circulation path is required as follows:

A. This path must connect all public access areas of the development and the pedestrian circulation path located in any adjacent streets.

B. The areas within the development which must be connected include, but are not limited to, all buildings, all bicycle and vehicle parking areas, all recreation areas, all dumpster areas, and all other common use areas.

Exceptions:

1. Areas within the development which are not required to be connected to the pedestrian circulation path are those which will be used only for maintenance or for nonpublic truck use, such as truck loading spaces.
 2. Portions of certain Land Use Classes which by their nature will not be used for public pedestrian access, such as industrial uses, commercial storage uses, wholesale uses, contractor yards, or similar uses, are not required to have sidewalks constructed in conformance with this standard, provided adequate pedestrian refuge areas are provided.
- C. Within this pedestrian circulation path, an accessible route is also required in compliance with the city's adopted Building Codes.

7-01.4.0 LOCATION AND DESIGN STANDARDS

4.1 Location Standards

Sidewalks must meet the following locational requirements:

A. At least one sidewalk is required to a project from each street on which the project has frontage, unless there is no vehicular access from a street because of a physical barrier, such as a drainageway or an unbroken security barrier (e.g., a

wall or fence). The sidewalk should be located to minimize any conflict with vehicular access to the project;

B. A sidewalk is required adjacent and parallel to any access lane or PAAL on the side where buildings are located (See Figure 1);

C. A sidewalk is required adjacent to any parking space accessed by a PAAL where the space is located on the same side of the PAAL as any building and no other parking spaces or PAALs intervene (See Figure 2);

D. Sidewalks must connect all areas of the development and must also connect to the pedestrian circulation path located along any adjacent street;

E. Sidewalks shall be flood free for all storm discharges of up to and including a ten-year frequency flood event. Drainage flowing across all pedestrian circulation paths shall be conveyed under the path for up to and including the ten-year frequency flood events, except at street intersections, pedestrian crossings, and PAAL pedestrian crossings;

F. Sidewalks or pedestrian refuge areas cannot be located between any motor vehicle parking space and the PAAL providing access to that space;

G. Sidewalks or crosswalks cannot cross any type of stacking areas for drive-through lanes; and,

H. In Land Use Classes where the public does not have access to certain portions of the [site](#), a four-foot wide pedestrian refuge area must be maintained between any enclosed structure and a PAAL (See Figure 6).

4.2 Physical Separation from Travel Lane Standards

A. Sidewalks associated with PAALs must be physically separated from any vehicular travel lane by means of curbing, [grade](#) separation (minimum six inches), barriers, railings, or other means, except at designated crosswalks;

B. When bollards or architectural features are used to provide physical separation, the maximum separation between the barriers is five feet clear (See Figure 5); and,

C. Barriers must be permanently affixed to the sidewalk by pinning, set in foundations, etc. or when the use of architectural features is proposed such as planters, the containers must be of sufficient weight and size to prevent the removal of such features.

4.3 Sidewalk Specifications

A. Width

All sidewalks must be a minimum of four feet wide and installed to avoid any obstruction which decreases the minimum width to less than four feet (See Figure 3);

B. Vertical Clearance

All sidewalks must have a minimum unobstructed vertical clearance of 84 inches (See Figure 4);

C. Composition

Sidewalks must be constructed of:

1. Portland cement concrete, four inches thick, with a smooth or broom-finish;
2. Brick Pavers set in a bed of cement;
3. Resin Pavement Mixture that complies or is equivalent to ASTM D 4123;
4. Any surfaces equivalent in smoothness, hardness, and durability;

5. Asphalt or asphaltic concrete may be used only for jogging paths, nature trails which are part of an accessible route, and pedestrian refuge areas which are not required to be connected to the pedestrian circulation path, as listed in Section 7-01.3.3.B; or,

6. Compacted decomposed granite or similar material cannot be used for construction of a required sidewalk system that is part of the required accessible route or pedestrian circulation path.

D. Slope

Slopes shall comply with the accessibility requirements in accordance with the city's adopted Building Code.

E. Drainage

At any point where a ten-year frequency flood discharge is proposed to cross a sidewalk or pedestrian access, the sidewalk/access shall be designed and constructed to convey up to and including the ten-year frequency flood flows under the sidewalk/access.

7-01.9.0 FIGURES

Figure 1: Sidewalk Location - One Site of Access Lane or PAAL

Figure 2: Sidewalk Location - Adjacent to Parking

Figure 3: Sidewalk Obstruction Clearance

Figure 4: Sidewalk Height Clearance

Figure 5: Physical Separation from a Travel Lane

Figure 6: Pedestrian Refuge Area

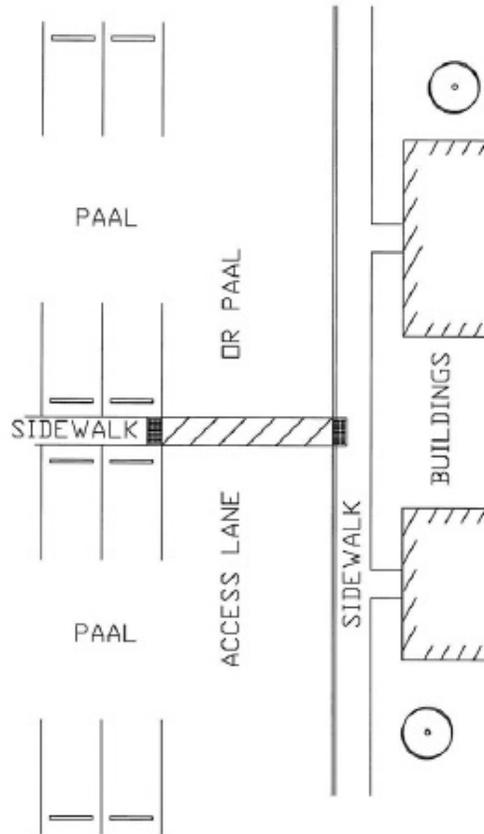


Figure 1: Sidewalk Location - One Side of Access lane or PAAL

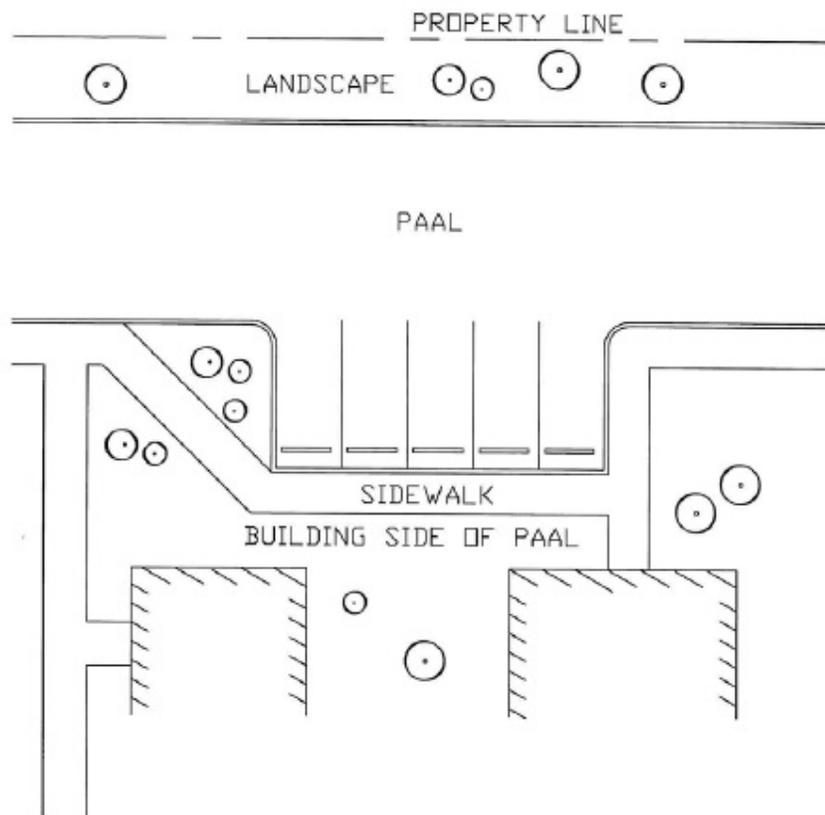


Figure 2: Sidewalk Location Adjacent to Parking

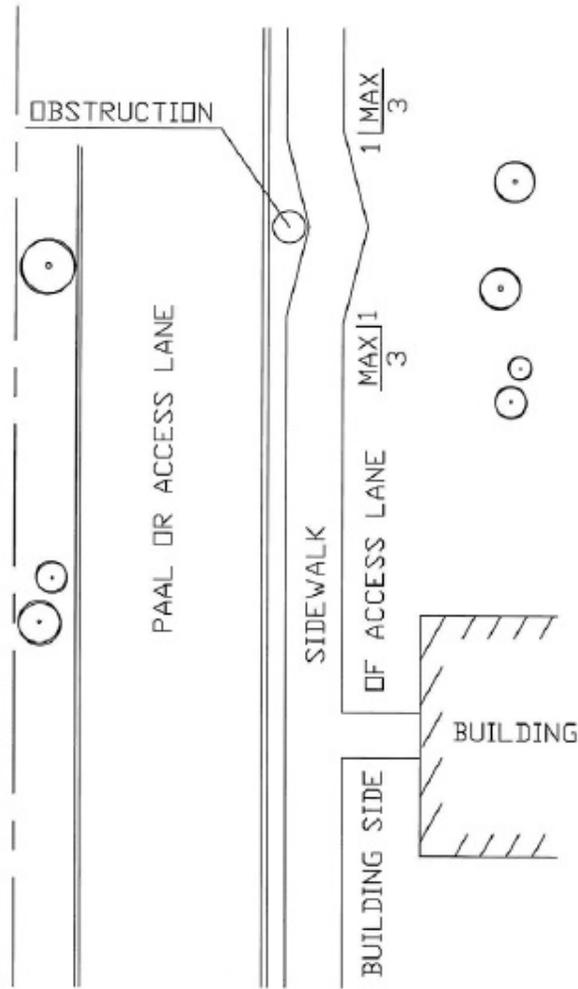


Figure 3: Sidewalk Obstruction Clearance

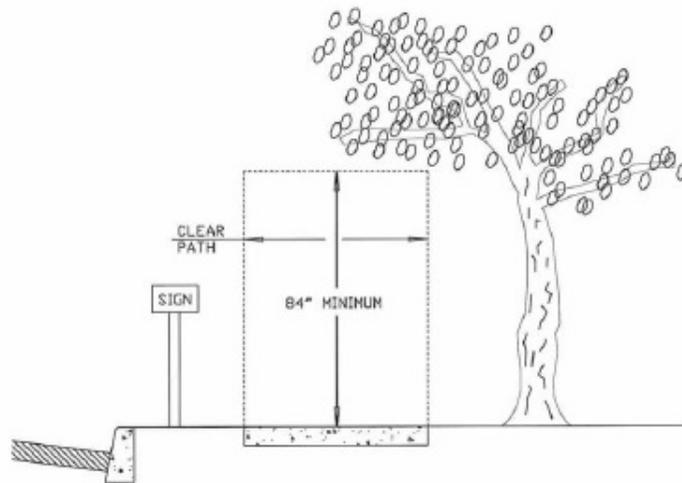


Figure 4: Sidewalk Height Clearance

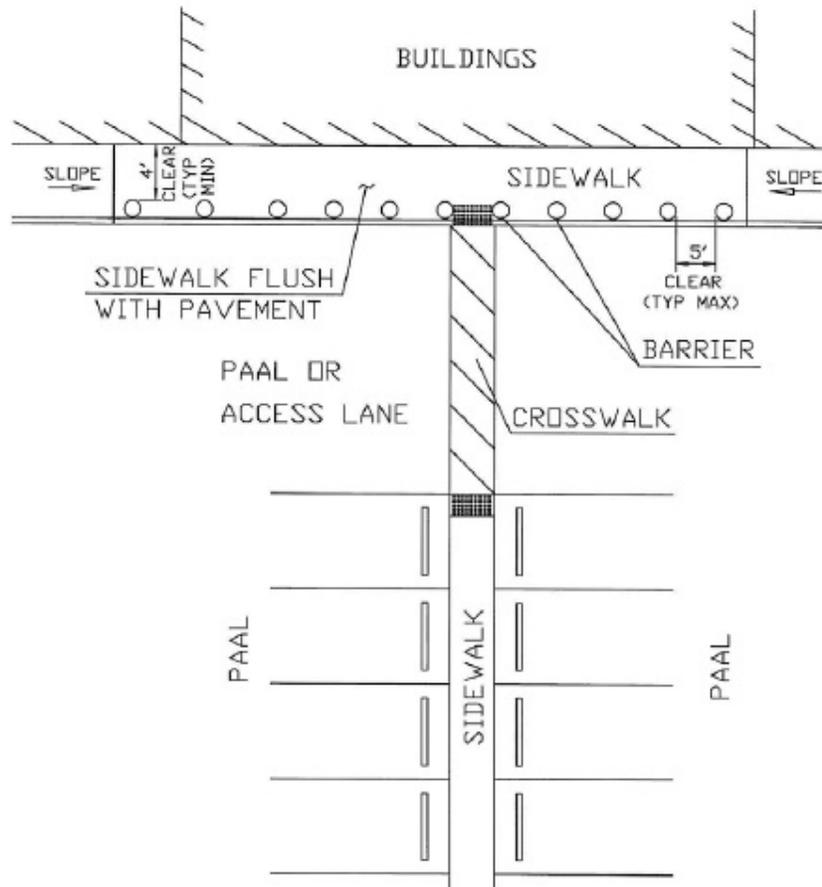


Figure 5: Physical Separation from Travel Lane

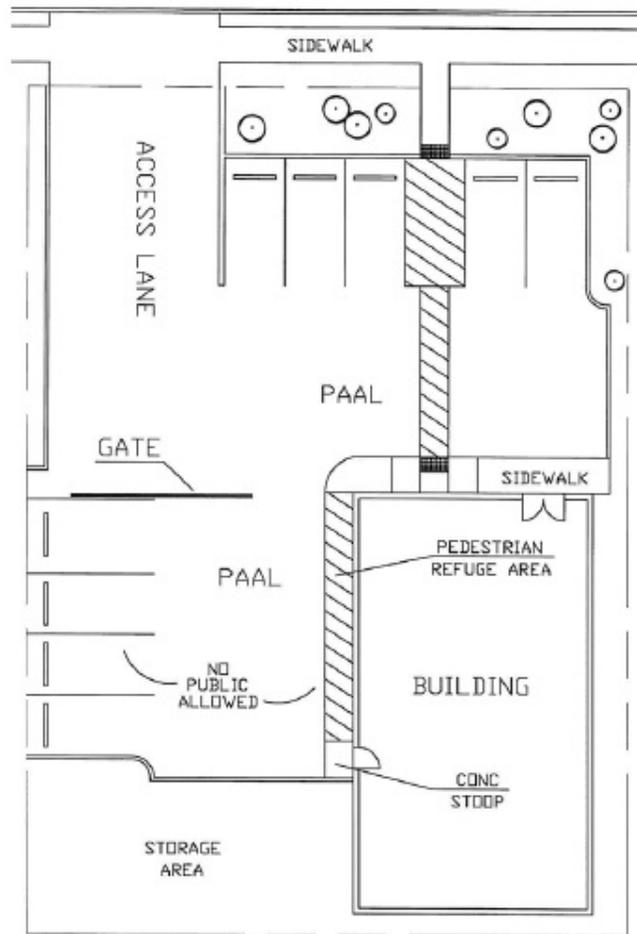


Figure 6: Pedestrian Refuge Area

SECTION 8: SOLID WASTE AND RECYCLE DISPOSAL, COLLECTION, AND STORAGE

SECTION 8.01.0.0: SOLID WASTE COLLECTION AND RECYCLE DISPOSAL, COLLECTION, AND STORAGE

Section

- 8-01.1.0 Purpose
- 8-01.2.0 Definitions
- 8-01.3.0 Applicability
- 8-01.4.0 All Development
- 8-01.5.0 Multi-family, Commercial, and Industrial Development
- 8-01.6.0 Single-family Residential Development
- 8-01.7.0 Special Services

8-01.8.0 Waste Stream Calculation Guidelines

8-01.9.0 Figures

8-01.1.0 PURPOSE

The following Standards have been established for solid waste and recycle materials collection, storage, and disposal. The standards shall serve as guidelines for safe and efficient solid waste and recycling service.

To enhance the City of Tucson appearance, by implementing standards for the collection and storage of solid waste and recycle containers.

Establish dimensional requirements for container enclosures, accessibility and maneuvering space for collection vehicles.

To promote the recycling of materials generated by the city residential, commercial, and industrial communities.

8-01.2.0 DEFINITIONS

Definitions for words used in this standard are found below, in the Tucson City Code (TCC) Chapter 15, in the Technical Standards Glossary, or in Article 11 of the Unified Development Code (UDC).

APC, Automated Plastic Containers

ASL, Automated Side Loading service vehicle

PAAL, Parking Area Access Lane

CC&R, Covenants, Conditions, and Restrictions

ES, Environmental Services

8-01.3.0 APPLICABILITY

These Standards apply to all new construction within the city including the expansion of existing [sites](#) as specified by Section 3.4.3.E, *Expansions*, of the UDC.

8-01.4.0 ALL DEVELOPMENT

- A. Details from this standard shall be shown on the plan graphically and by written notes.
- B. A note specifying the anticipated method of collection and frequency based on the calculated tonnage from Table 1 for the intended use.
- C. All solid waste and recycle metal containers storage areas shall be screened from public view, and from adjacent developments.
- D. APCs shall be allowed for solid waste and recycle collection for volumes not greater than 190 gallons per week, 95 gallons for solid waste and 95 gallons for recycle. Metal container service will be required when the waste stream calculation exceeds 190 gallons per week.
- E. Solid waste and recycle container enclosures built into property walls must comply with horizontal and vertical clearances as stated in this technical standard.

F. Properties without sufficient space for on- [site](#) collection and storage of solid waste and recycle containers shall be evaluated for service on a case by case basis. Examples of enclosures for metal containers are shown in the Exhibits and Figures of Section 8-01.9.0, *List of Exhibits and Figures*.

G. Use of APCs for multi-family, commercial, or industrial development requires prior [approval](#) from ES.

H. Each residential development as defined in Tucson Code Chapter 15, *Environmental Services Department*, require on- [site](#) solid waste and recycle collection services, must contact ES to establish services.

I. Off-street parking may be reduced for existing development when solid waste and recycle enclosures are provided per Section 7.4.5.E.8, *Reduction Based on Providing Trash and Recycling Enclosures*.

8-01.5.0 MULTI-FAMILY, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT

5.1 General

A. New projects and the remodeling of existing [sites](#) (including mobile home parks) consisting of six to 24 units shall provide centralized on- [site](#) solid waste and recycle collection service access within the tract. Utilization of individual containers (APCs) for six or more new dwelling units requires [approval](#) by ES on a case by case evaluation.

B. All containers require enclosures with gates. Containers shall be stored in their enclosure when not being serviced and containers must be leak proof.

C. The locations of walls, fences, hedges, or landscaped buffer areas that are designed to reduce noise and enhance the aesthetics at the point of the solid waste and recycle materials collection shall be shown on the plan.

D. Where a development is intending to provide centralized storage and collection to serve multiple buildings, tenants, or businesses, a general note must be included within the plan stating "A single property owner, property management company, or home owners association (HOA), will be responsible for the management and maintenance of the solid waste collection services and storage area(s) for all development/business occupants.

5.2 Enclosure Specifications

A. Enclosure walls shall be masonry or other materials based upon [approval](#) by the Environmental Services Department and constructed as shown in Figure 2.

B. Vertical steel pipes (bollards) are required within the enclosure as wall protection. The inside edge of the bollard shall be a minimum of one foot inside the inside surface of the rear and side walls of the enclosure to prevent the container from damaging the walls of the enclosure (See Figure 3A & 3B).

C. The enclosure shall have a minimum ten-foot by ten-foot unobstructed interior space per container within the bollards (See Figure 3A & 3B).

D. Enclosures are to have gates with latches to prevent unauthorized access and to visually screen the container. Gates are to be mounted to a post fastened and secured on the front face of the enclosure wall(s).

E. Enclosure gates shall be painted to match or compliment the enclosure walls.

F. Enclosure and gates must have a minimum unobstructed opening of 12 feet (See Figure 3A & 3B). The gates must be securable in both the closed and open positions.

G. A concrete service apron shall be constructed six inches thick with a minimum of 2% [slope](#) away from the enclosure. To prevent storm water from collecting in front of the enclosure gates (See Figures 3A & 3B).

H. The enclosure shall have a concrete slab six inches thick, and the concrete shall have a design strength of 2,500 psi with No. 4 rebar reinforcement at 12-inch on centers both ways.

I. Stationary compactor units shall be screened from adjacent properties and public right-of-way. Enclosure shall allow space to include recycle containers.

J. Stationary roll-off compactor unit shall be placed on a pad of sufficient width to provide a two-foot clear area on each side of the unit. The overall length of the pad must be five feet greater than the combined length of the compactor, receiving container, and recycle container. The lengths of the receiving containers will vary depending on the container's capacity.

5.3 Access and Maneuvering Standards

A. Service access shall be from within the development.

B. A minimum safe access and operational area of 14 feet by 40 feet, with a minimum vertical clearance of 25 feet, shall be provided in front of each enclosure.

C. An adequate and safe ingress/egress is required for the collection vehicle in each new project. On-[site](#) turnarounds for service vehicles are shown in Figure 6 and 7.

D. Metal container locations shall be placed so that the collection vehicle does not have to back into the public right-of-way or into moving traffic.

E. Maneuvering requirements - the minimum turning radiuses required for collection vehicle to service metal containers shall be 36 feet for the inside rear wheels radius and 50 feet for the outside front bumper as illustrated on Figure 7. At any structure or vehicle parking space there must be a minimum of three feet of clearance between the collection vehicle and the maneuvering/turning radius.

F. The maximum back-up distance for the collection vehicle shall be 80 feet measured from the front of the collection vehicle.

G. When the width and depth of the property to be developed is insufficient to provide service access from within the development, the enclosures may be located such that service access is from the adjacent public right-of-way with a 45 or 30-degree angle of approach that allows service by the vehicle without the collection vehicle pulling completely off the public right-of-way. (Note: Off street service is not permitted from arterial or collector streets (See Figure 1 & 4.)

H. Service vehicle will approach in-line with the enclosure; ten feet of space must be provided in front of the enclosure for a vehicle to maneuver in order to service the containers. (See Figure 3A & 3B.)

5.4 Location Standards

A. Containers shall not be stored on any public right-of-way, bike lane, sidewalk or other public access.

B. Containers and enclosures shall not obstruct traffic line-of-sight visibility.

C. Containers and enclosures shall not obstruct or block drainage.

5.5 Operational Standards

The property owner shall be responsible for keeping the collection and storage areas free from obstructions, vegetation, any liquids spilled within storage enclosures.

8-01.6.0 SINGLE-FAMILY RESIDENTIAL DEVELOPMENT

6.1 General

A. Curbside service in dedicated right-of-way or a PAAL using APCs and the ASL system is preferred for Single

Family and Duplex Developments.

B. Three hundred-gallon APC solid waste service is based on three residences per container. Service availability subject to ES [approval](#).

6.2 Access and Maneuvering Standards

A. The collection point shall be unobstructed by any other improvements such as mailboxes, light poles, fire hydrants, fencing, street signs, or landscaping.

B. Alley access requires [approval](#) by ES. Alley shall have a minimum 20-foot wide cross section, maintained with a 12-foot wide clear travel lane.

C. A 25-foot minimum height clearance, free of any overhead obstructions (wires, branches, etc.), will be provided above the collection area. (The alley travel lane must have a minimum of 15-foot overhead clearance.)

6.3 Location Standards for APCs, 95 gallons or less

A. The standard collection point will be behind the curb in front of the premises in accordance with the Technical Standards contained herein.

B. Where sidewalks exist, APCs are to be placed in the buffer area between the curb and sidewalk. Placement shall be so as to not obstruct sidewalk traffic or bike lanes. There should be no obstruction within three feet of an APC set out for collection. (Common obstructions are cars, mailboxes, and light poles.)

C. For residential collection that cannot be directly placed for collection in front of the residence, specific instructions on how and where the solid waste and recycle APCs will be collected will be included in the subdivision's plat.

8-01.7.0 SPECIAL SERVICES

In developments where proposed solid waste and recycle disposal service is not specified in these Standards (i.e., developments for the elderly or disabled), prior [approval](#) must be obtained from ES.

8-01.8.0 WASTE STREAM CALCULATION GUIDELINES

A. Determine the square footage and uses for the proposed development. A separate calculation for each area that has a different use should be performed.

Calculation: Select the use that best describes the proposed usage, from Table 1 below. Then multiply the Floor Area (sq. ft) by the Annual Tons Generated for the usage selected.

Sample Calculation for Food Retail:

[Area in sq. ft. 3,000] x [Annual Waste Generated 0.0057 tons/sq. ft.] =

17 Annual Tons Generated for specified usage.

Sample Calculation for an Office or Professional Services:

[Area in sq. ft. 2,000] x [Annual Waste Generated 0.0013 tons/sq. ft.] =

2.6 Annual Tons Generated for specified usage

Table 1: Annual Waste Generated Based On Proposed Usage

1. Office, Professional Services or Small Retail Use	0.0013 tons/sq. ft.
2. Industrial Use	0.0016 tons/sq. ft.
3. Food Retail, Multi-Family, Large Commercial	0.0057 tons/sq. ft.
4. Public Facility and Large Retail	0.00105 tons/sq. ft.
5. School and Institution	0.00105 tons/sq. ft.
6. Warehouses	0.00155 tons/sq. ft.
(Table 1, Data is obtained from Fairfax County Virginia Solid Waste Stream Calculation Reference)	

Estimated conversion factors for solid waste 3.0 lbs/gal. and 600 lbs/ cu.yd.

B. Determine the size and collection frequency required for the Annual Tons Generated for specified usage:

Sample Calculation for Food Retail Above: 17 Annual Tons Generated

$$[17 \text{ tons/year}] / [52 \text{ weeks /year}] = 0.329 \text{ tons /wk.}$$

$$[0.329 \text{ tons/week}] \times [2000 \text{ lbs/ton}] = 658 \text{ lbs/wk.}$$

Size of container, $[658 \text{ lbs /wk}] / [3.0 \text{ lbs/gal}] = 219 \text{ gal/wk}$, this volume is greater than an APC of 95 gal/wk. Therefore, a metal container must be selected.

$$\text{Selecting a 2 cubic yard container/wk} = [2 \text{ cu.yd./wk}] \times [202 \text{ gal/cu.yd}] = 404 \text{ al/wk.}$$

Therefore, 404 gal/wk will be adequate service for a Food Retail business of 3000 sq. ft. The 2 cubic yard metal container/wk is adequate.

Sample Calculation for an Office or Professional Services Above: 2.6 Annual Tons Generated

$$[2.6 \text{ tons/years}] / [52 \text{ weeks / years}] = 0.052 \text{ tons / week}$$

$$[0.052 \text{ tons/week}] \times [2000 \text{ lbs/ton}] = 100 \text{ lbs/wk}$$

Size of container, $[100 \text{ lbs /wk}] / [3.0 \text{ lbs/gal}] = 33.33 \text{ gal/wk}$, this volume is less than an APC of 95 gal/wk.

Therefore, a 95 gal/wk APC container will be adequate for specified usage.

8-01.9.0 LIST OF EXHIBITS AND FIGURES

Figure 1: 45 Degree Enclosure 'Option' Off Residential Streets

Figure 2: Structural Design for Enclosure Walls

Figure 3A: Double Metal Container Enclosure (2 to 8 cubic yards)

Figure 3B: Single Metal Container Enclosure (2 to 8 cubic yards)

Figure 4: 30 & 45 Degree Enclosures off Alleys

Figure 5: 30 & 45 Degree Enclosures off PAAL's

Figure 6: Turnaround for Service Vehicles

Figure 7: Turning Radii/Turnaround for Service Vehicles

Figure 8: Specifications for 90 Gallon APCs

Figure 9: Specifications for 300 Gallon APCs

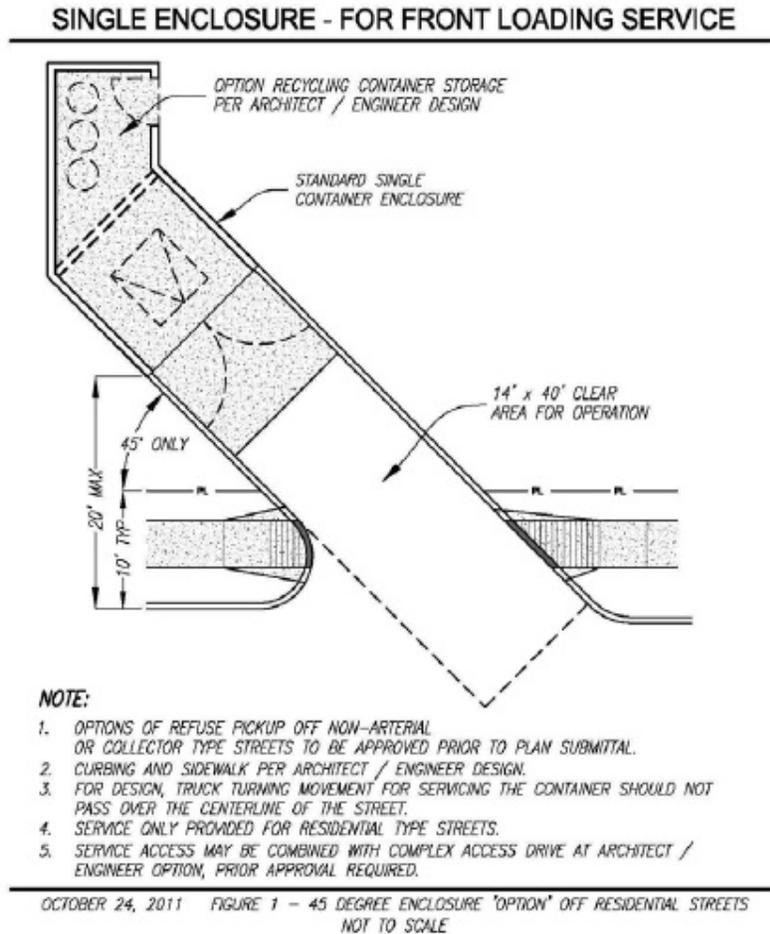
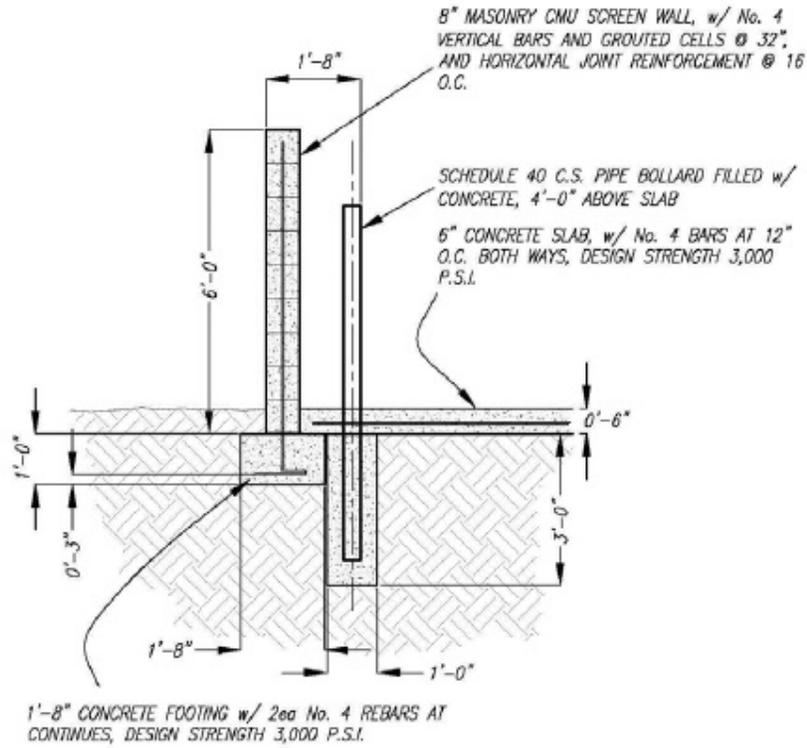


Figure 1: 45 Degree Enclosure 'Option' Off Residential Streets

STRUCTURAL DESIGN FOR WALL ENCLOSURE (2 to 8 CUBIC YARDS)

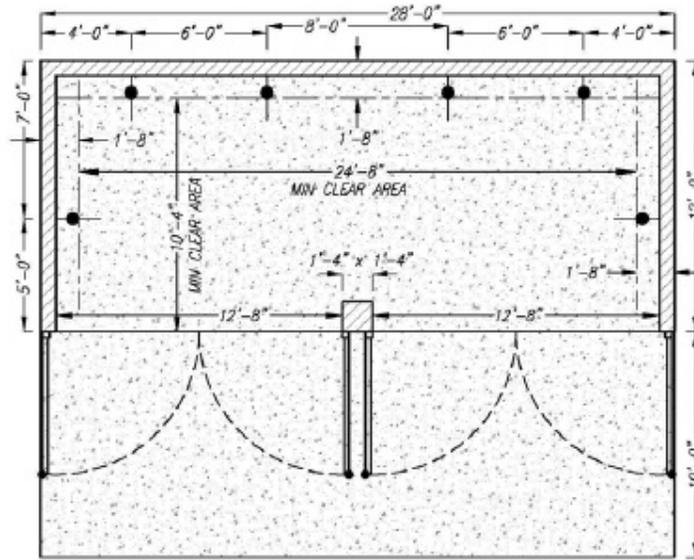


OCTOBER 24, 2011 FIGURE 2 - STRUCTURAL DESIGN FOR ENCLOSURE WALL (2 to 8 CUBIC YARDS) NOT TO SCALE

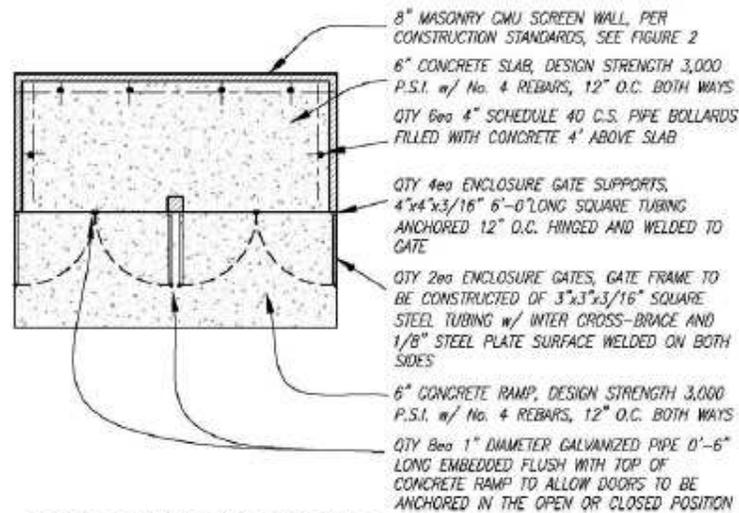
Figure 2: Structural Design for Enclosure Walls

DOUBLE CONTAINER ENCLOSURE (2 to 8 CUBIC YARDS)

**FIGURE 3A - PAGE 1 of 2 - DIMENSION PLAN
SEE PAGE 2 OF 2 FOR GENERAL NOTES**



OCTOBER 24, 2011 FIGURE 3A - DOUBLE METAL CONTAINER ENCLOSURE (2 to 8 CUBIC YARDS)
SCALE: 1" = 5'

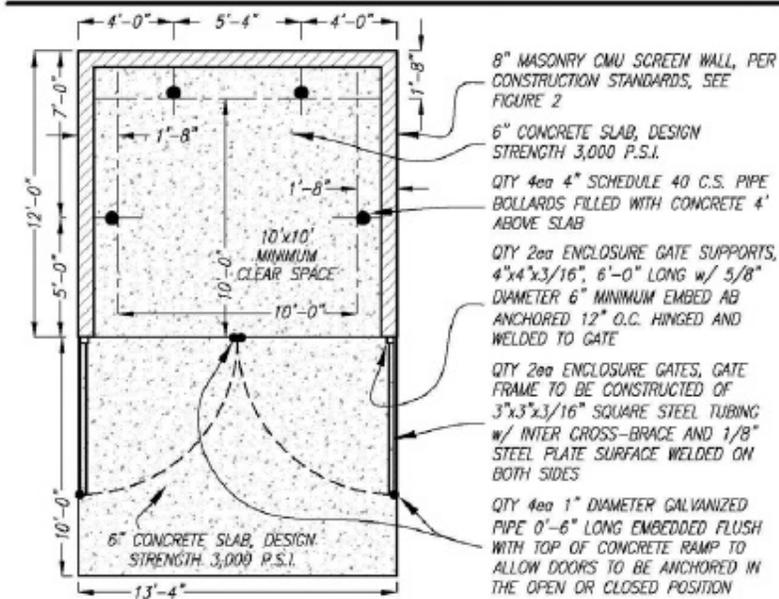
DOUBLE CONTAINER ENCLOSURE (2 to 8 CUBIC YARDS)**FIGURE 3A - PAGE 2 of 2 - GENERAL NOTES
SEE PAGE 1 OF 2 FOR DIMENSION PLAN****DOUBLE CONTAINER ENCLOSURE NOTES**

1. CONCRETE RAMP TO BE A MINIMUM OF 24' x 13' AND SHALL SLOPE 2% AWAY FROM ENCLOSURE.
2. CONCRETE SLAB FOR ENCLOSURE SHALL SLOPE AT 1% TO GATE OPENING.
3. THE INSIDE CLEAR WIDTH AND LENGTH SHALL NOT BE LESS THAN 10- FEET FOR EACH CONTAINER.
4. WHEN NECESSARY FOR PERSONNEL ACCESS, A 3-FOOT WIDE DOORWAY AND STEEL DOOR FRAME MAY BE PLACED AS REQUIRED BY THE APPROVED CONSTRUCTION PLAN.
5. IN FRONT OF ENCLOSURE AND/OR EACH CONTAINER A 14-FOOT BY 40-FOOT CLEAR AREA SHALL BE REQUIRED AND MUST SLOPE AWAY FROM THE ENCLOSURE AT 2%.
6. ALL RESIDENTIAL ESTABLISHMENTS MUST COMPLY WITH THE CITY OF TUCSON DEVELOPMENT STANDARDS, CHAPTER 15.

OCTOBER 24, 2011 FIGURE 3A - DOUBLE METAL CONTAINER ENCLOSURE (2 to 8 CUBIC YARDS)
SCALE: 1" = 10'

Figure 3A: Double Metal Container Enclosure (2 to 8 cubic yards)

SINGLE CONTAINER ENCLOSURE (2 to 8 CUBIC YARDS)



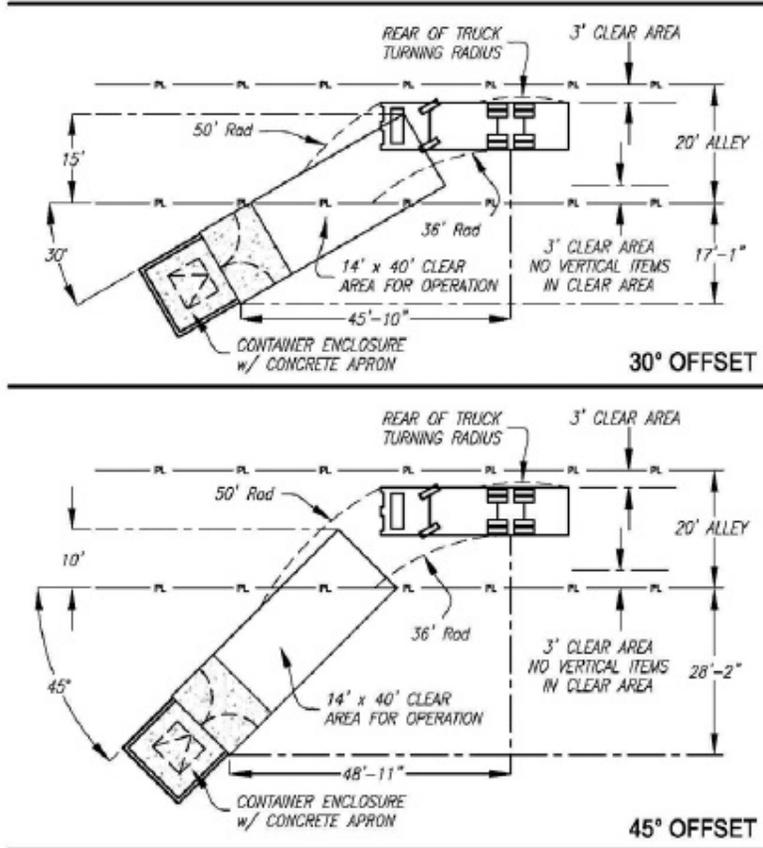
SINGLE CONTAINER ENCLOSURE NOTES

1. CONCRETE RAMP TO BE A MINIMUM OF 24' X 13' AND SHALL SLOPE 2% AWAY FROM ENCLOSURE.
2. CONCRETE SLAB FOR ENCLOSURE SHALL SLOPE AT 1% TO GATE OPENING.
3. THE INSIDE CLEAR WIDTH AND LENGTH SHALL NOT BE LESS THAN 10- FEET.
4. FOR CONSTRUCTION OF MULTIPLE CONTAINER ENCLOSURES, THE CLEAR WIDTH OF 10- FEET IS REQUIRED FOR EACH CONTAINER.
5. WHEN NECESSARY FOR PERSONNEL ACCESS, A 3-FOOT WIDE DOORWAY AND STEEL DOOR FRAME MAY BE PLACED AS REQUIRED BY THE APPROVED CONSTRUCTION PLAN.
6. IN FRONT OF ENCLOSURE A 14-FOOT BY 40-FOOT CLEAR AREA SHALL BE REQUIRED AND MUST SLOPE AWAY FROM THE ENCLOSURE AT 2%.
7. ALL RESIDENTIAL ESTABLISHMENTS MUST COMPLY WITH THE CITY OF TUCSON DEVELOPMENT STANDARDS, CHAPTER 15.

OCTOBER 24, 2011 FIGURE 3B - SINGLE METAL CONTAINER ENCLOSURE (2 to 8 CUBIC YARDS)
SCALE: 1" = 5'

Figure 3B: Single Metal Container Enclosure (2 to 8 cubic yards)

30 & 45 DEGREE ENCLOSURES OFF ALLEYS



OCTOBER 24, 2011 FIGURE 4 - 30 & 45 DEGREE ENCLOSURES OFF ALLEYS
SCALE: 1" = 20'

Figure 4: 30 & 45 Degree Enclosures off Alleys

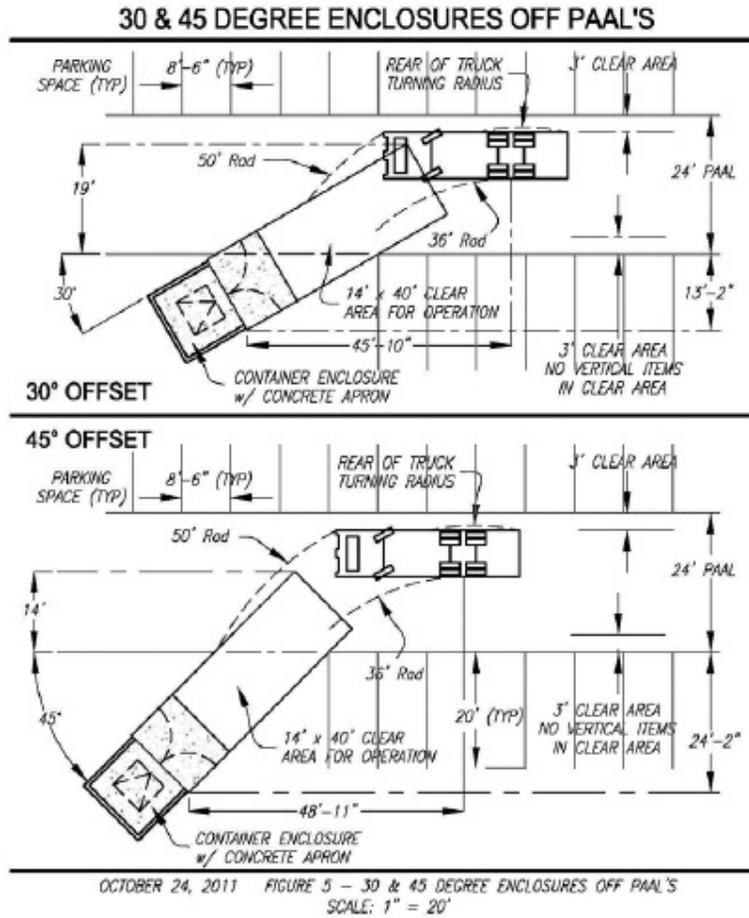
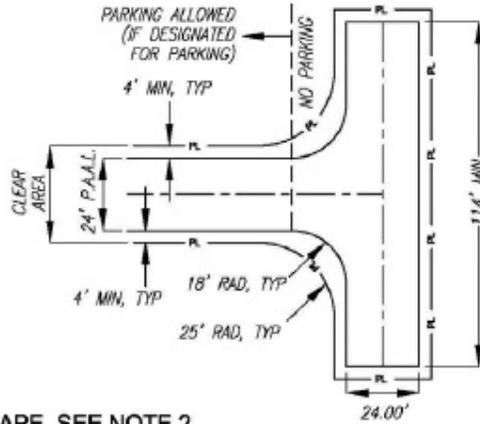


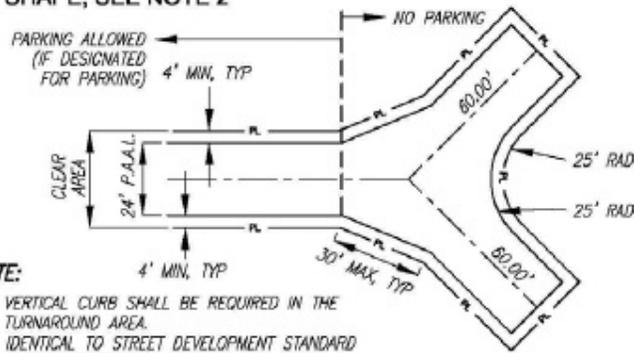
Figure 5: 30 & 45 Degree Enclosures off PAAL's

TURNAROUND FOR SERVICE VEHICLES



"T" SHAPE, SEE NOTE 2

"Y" SHAPE, SEE NOTE 2



NOTE:

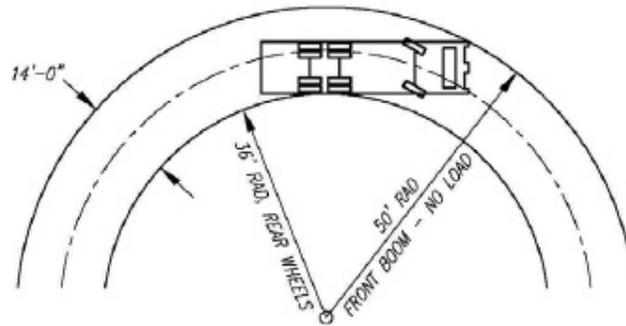
1. VERTICAL CURB SHALL BE REQUIRED IN THE TURNAROUND AREA.
2. IDENTICAL TO STREET DEVELOPMENT STANDARD 3.01.0, FIGURE 23.

OCTOBER 24, 2011 FIGURE 6 - TURN AROUND FOR SERVICE VEHICLES
SCALE: 1" = 40'

Figure 6: Turnaround for Service Vehicles

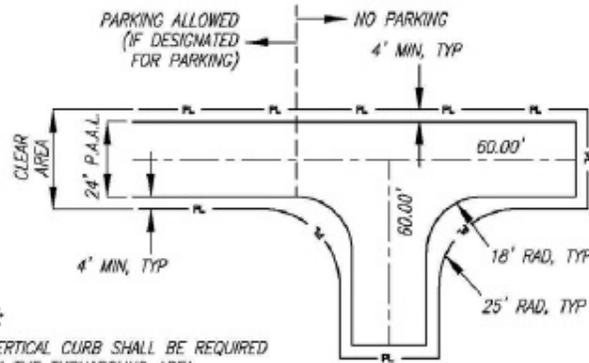
TURNING RADII / TURNAROUND FOR SERVICE VEHICLES

SCALE: 1" = 20'



INDUSTRY STANDARD TURNING RADII FOR SERVICE VEHICLES

ON-SITE TURNAROUND - "L" SHAPE



NOTE:

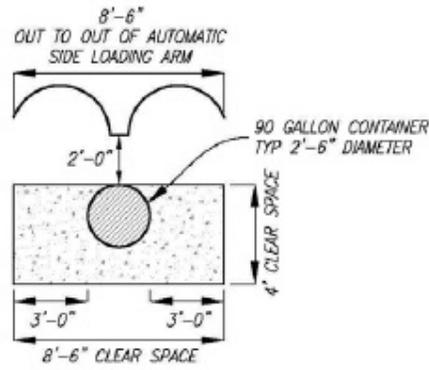
- 1. VERTICAL CURB SHALL BE REQUIRED IN THE TURNAROUND AREA.

SCALE: 1" = 40'

OCTOBER 24, 2011 FIGURE 7 - TURNING RADII / TURNAROUND FOR SERVICE VEHICLES

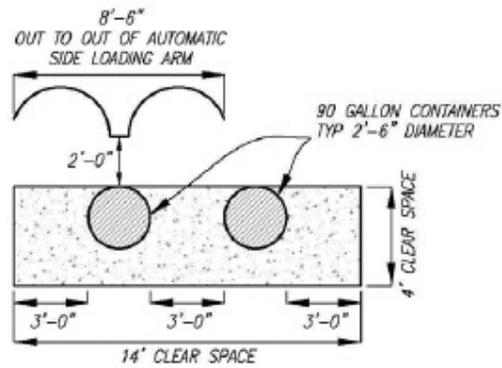
Figure 7: Turning Radii/Turnaround for Service Vehicles

90 GALLON APC (AUTOMATED PLASTIC CONTAINER)



SINGLE CONTAINER

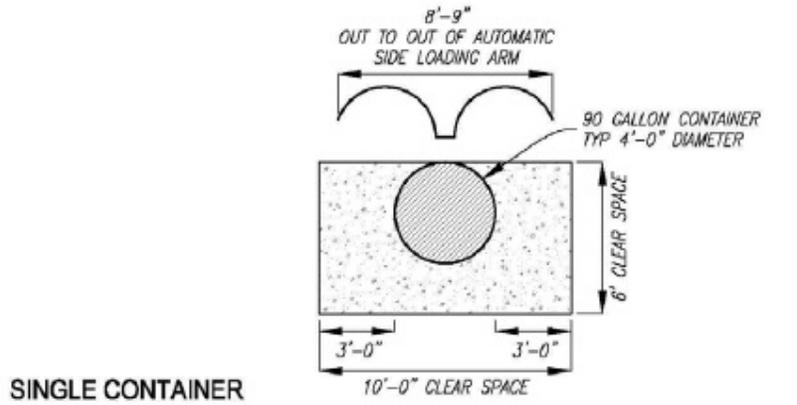
DOUBLE CONTAINER



OCTOBER 24, 2011 FIGURE B - 90 GALLON APC (AUTOMATED PLASTIC CONTAINER)
SCALE: 1" = 5'

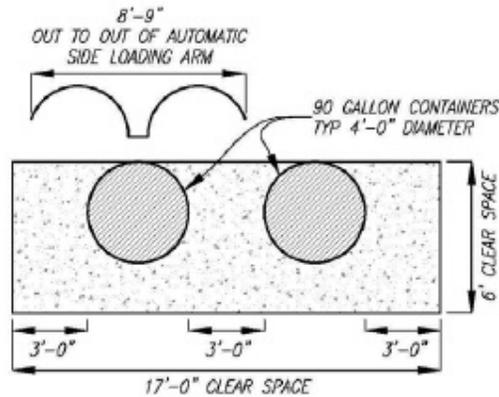
Figure 8: Specifications for 90 Gallon APCs

300 GALLON APC (AUTOMATED PLASTIC CONTAINER)



SINGLE CONTAINER

DOUBLE CONTAINER



OCTOBER 24, 2011 FIGURE 9 - 300 GALLON APC (AUTOMATED PLASTIC CONTAINER)
SCALE: 1" = 5'

Figure 9: Specifications for 300 Gallon APCs

SECTION 9: SPECIAL DEVELOPMENT DISTRICTS

SECTION 9-01.0.0: HILLSIDE DEVELOPMENT

Section

- 9-01.1.0 General
- 9-01.2.0 Plan Format and Content Requirements
- 9-01.3.0 [Slope](#) Analysis Standard

9-01.1.0 GENERAL

This standard has been established to provide a listing of criteria for analysis and development of property affected by Section 5.2, *Hillside Development Zone (HDZ)*, of the Unified Development Code (UDC), and to inform applicants of the preparation, submittal, and review requirements for HDZ projects so that proper and adequate information is presented in a consistent manner, thereby providing the basis for an efficient and timely review. It is intended that this Technical Manual

provide support and clarification to the HDZ provisions of Section 5.2, *Hillside Development Zone*, of the UDC. This standard does not waive any applicable city regulations or codes.

9-01.2.0 PLAN FORMAT AND CONTENT REQUIREMENTS

2.1 Hillside Development Zone Plan Requirement

The information required as part of the HDZ submittal will be shown graphically or provided by notes on a plan. The HDZ requirements are in addition to the plan requirements of the applicable process, such as, but not limited to, a plat, a development plan, a [site](#) plan, or a plot plan. The information may be provided as part of the drawing required through the applicable process or as a separate drawing. The plan may comprise several sheets showing various elements of required data.

2.2 Submittal Requirements

The plan which includes the HDZ information is to be provided with the initial submittal under the applicable process, such as, but not limited to, a plat, development plan, [site](#) plan, or plot plan.

If the HDZ information is provided as a separate drawing, submit three copies.

2.3 Review

HDZ compliance applications are reviewed by the Zoning Review Section and the Engineering Section at the Planning and Planning and Development Services Department (PDSD).

2.4 Format

If the HDZ information is provided as a separate drawing, the format, sheet size, scale, margins, lettering, and similar requirements are the same as those for the applicable process, i.e., tentative plat, [site](#) plan, or plot plan.

2.5 Content

The following information is to be provided for all projects affected by the HDZ.

A. [Grading](#) information, including proposed [grading](#) area, amount of [grading](#) by square feet and percentage of lot area, proposed contours, and locations of all areas of cut and [fill](#).

B. Topographic information of the existing terrain, prior to any [grading](#), [grubbing](#), clearing, [excavation](#), or modification, with contour intervals.

C. The location, size, color, and textural treatment of all retaining walls, riprapped [slopes](#), or other constructed means of [slope](#) stabilization must be shown on one of the plans submitted.

D. The following [slope](#) analysis information must be provided on the plan. For specific information on calculations of [slope](#), refer to Section 9-01.4.0, [Slope](#) Analysis Standard.

1. The average natural cross [slope](#) (ACS) analysis must be submitted with the plat or plan, and the ACS must be listed in the general notes on the plat or plan.

2. If the standards of Section 5.2.5, *Development Standards*, of the UDC require an analysis of sloped areas, those areas of 15% or greater [slope](#) must be shown on a topographic map.

E. A note must be added to the plan or plat listing those lots which are subject to HDZ [grading](#) requirements.

F. All protected peaks and ridges must be shown and labeled, and the 300-foot setback area must be delineated.

9-01.3.0 SLOPE ANALYSIS STANDARD

3.1 Average Natural Cross Slope Analysis

The Average Natural Cross Slope (ACS) of a site is determined in the following manner.

A. The site is depicted on a topographic map of the existing terrain, prior to any grading, grubbing, clearing, excavation, or modification, utilizing a scale no smaller than one inch equals 100 feet, with the following contour intervals.

1. For parcels less than five acres, a contour interval of two feet;
2. For parcels five acres and greater, a contour interval of ten feet.

B. The length of each contour line contained within the site boundaries on the map is measured by means of a mechanical device such as a map wheel or digitizer. This actual length is converted to scale length in feet. For example, at a scale of one inch equals 40 feet, a contour line with an actual map length of six and one-half inches represents a line 260 feet long ($6.5 \times 40 = 260$).

C. The sum of the lengths (L) of all contour lines is multiplied by the contour interval (I) in feet.

D. The result is multiplied by the factor .0023, which converts the square footage of the scale map to acres.

E. This result is then divided by the area (A) of the site in acres.

F. This result is multiplied by a linear adjustment factor which equals the number of contour lines less one line (N - 1), divided by the number of contour lines (N).

G. This process is mathematically represented by the formula:

$$\text{ACS} = \frac{(I)(L)(.0023)}{(A)} \times \frac{(N - 1)}{(N)}$$

H. The answer is the percentage of the ACS for the site.

3.2 Sloped Area Analysis

The slope of any topography is determined by the following method.

A. The site or lot is depicted on a map with a scale and contour interval conforming to Sections 2-03.2.3.F or 2-05.2.3.E.

B. A slope gauge is prepared at the same scale as the map to be analyzed, as follows.

1. On a straight edge of a piece of stiff paper, such as an index card or other straight-edged material, a straight line representing 100 linear feet is marked parallel to the edge.

2. This line is divided into 15 equal divisions, with the 16 marks between the divisions being numbered. Marks zero and 15 will fall at each end of the scale 100 foot line. These marks represent the distance between one-foot contour intervals at a 15% slope for the scale used.

C. The contours on the map are compared to the slope gauge by placing the gauge perpendicular to the contour lines. When the contour lines are equal to or are closer together than the corresponding interval marks on the gauge, a slope of 15% or greater is indicated.

D. All slopes of 15% or greater are then outlined and so indicated on the map. Submittal of slope information is required to allow the Engineering Review Section at the Planning and Planning and Development Services Department

(PDS) to review, comment upon, and make recommendations concerning the appropriateness of the location of the [grading](#). **Exception.** Any sloped area no greater than 15 feet in any horizontal direction and no greater than seven and one-half feet vertically may be excluded from compliance with this section. Adjacent exempted areas are not cumulative.

SECTION 9-02.0.0: HISTORIC PRESERVATION ZONE

Section

- 9-02.1.0 General
- 9-02.2.0 Review and [Approval](#) Procedures
- 9-02.3.0 Development Criteria
- 9-02.4.0 Supplemental Review Criteria
- 9-02.5.0 Signs
- 9-02.6.0 Parking
- 9-02.7.0 Specific Historic Preservation Zone Guidelines
- 9-02.8.0 Historic Preservation Zones, [Sites](#), and Structures

9-02.1.0 GENERAL

1.1 Purpose

This standard has been established for the purpose of informing applicants of preparation, submittal, and review requirements for projects within City Historic Preservation Zones (HPZs). An owner of property within the HPZ has an opportunity to work with the HPZ Advisory Board, comprised of district residents and design professionals, the Tucson-Pima County Historical Commission, and Planning staff to assure that the proposed development protects both historic resources and property values.

The review procedures and development criteria summarized in this standard should assist the applicant in meeting these twin goals successfully and expeditiously. The Standard lists general development criteria applicable within all designated HPZs, along with specific district guidelines that apply within a particular HPZ. Illustrations are included to clarify particular design concepts and further aid the applicant in meeting HPZ review requirements.

The applicant should refer to the list of Historic Landmarks and Contributing and Noncontributing Properties within each HPZ published as Technical Standard 9-02.8.0 (Structures List) and available in the Planning and Development Services Department (PDS). This list, and associated maps of the HPZs, identify and categorize all principal and accessory buildings and structures within HPZs as combinations of Contributing, Noncontributing, Historic, and Nonhistoric, or as an Intrusion (Contributing Properties may contain both historic and nonhistoric buildings and structures; Noncontributing Properties and Intrusions do not contain any designated historic buildings or structures).

The applicant's first step in the review process is to locate the subject property on the list and carefully read those sections of this technical standard that apply to that category of property. In the case of new construction on vacant land, the applicant should review the Structures List to identify Contributing Properties within the subject property's development zone. Other recommended early steps in the process include a pre-application meeting with Planning staff and preliminary discussions with the appropriate advisory board. This standard does not waive any applicable city regulations or codes. Plans approved through the HPZ review process must also meet applicable zoning and building code requirements.

1.2 Applicability

This standard applies to all development and improvements within the Historic Preservation Zone (HPZ), which is a zoning overlay identified with the prefix “H” on City of Tucson Zoning Maps, with the exception of the San Xavier Environs Historic Preservation Zone within which specific development regulations apply as listed in Section 2.8.8.13 of the Tucson Unified Development Code (UDC).

1.3 Definitions

Definitions for words and terms used in this standard are found in Section 12, *Definitions*, of this Manual and in Article 11 of the UDC. Selected terms relating to design elements and criteria are further defined and clarified graphically within this technical standard. National standards and guidelines for historic preservation distinguish between buildings (constructions created principally to shelter human activities) and structures (constructions for purposes other than human shelter). In this Section, these terms are generally used interchangeably, but are sometimes distinguished when referring to principal or secondary buildings and accessory structures.

9-02.2.0 REVIEW AND APPROVAL PROCEDURES

2.1 Development Review Required

Review and [approval](#) of all properties, buildings, signs, and structures within an HPZ is required for all development and improvements, including new construction or improvements that do not require building permits in accordance with the procedures established in Section 5.8.5, *Development Review Required*, of the UDC.

2.2 Demolition Review Required

A review in accordance with Section 5.8.7, *Demolition Review Required*, of the UDC is required when a demolition or relocation of all or part of a structure, [site](#), sign, or Historic Landmark is proposed.

9-02.3.0 DEVELOPMENT CRITERIA

3.1 General

The character of a HPZ depends to a great extent on the integrity of its buildings and streetscapes. Development patterns, design relationships, landscape designs, and architectural styles and details together create the historic fabrics of these districts. Key development criteria relating to heights, setbacks, proportions, roof types, surface textures, [site](#) utilizations, projections and recessions, details, building forms, and rhythms have been identified to guide future development within each HPZ. Proposed improvements will be reviewed for compliance with these criteria to ensure that projects in historic districts preserve the historical and architectural character of the neighborhood. Although new construction does not require a specific architectural style, it must be compatible with the overall design context of the neighborhood and streetscapes.

All treatments of historic buildings and structures must apply the Secretary of Interior’s Standards for the Treatment of Historic Properties (1995, and as amended). There are different local standards for different types of historic resources. Generally, alterations to a Historic Landmark must conform to the intrinsic and unique character of the building or structure. Changes to a historic building or structure must reflect the architectural style and character of the existing building/structure. Alterations to a nonhistoric building or structure and new construction must be compatible with historic buildings and structures on Contributing Properties located within the development zone of the subject property.

The design context within the development zone is particularly important as a guide for streetscape improvements, siting and setbacks, and building massing. Changes to architectural detailing are evaluated based on comparisons within the development zone of similar buildings. Principal buildings are compared with other principal buildings that reflect a similar historical period and style. Alterations to a historic building or structure located on a Contributing Property must be true to the style of the original construction or, in the case of new construction, to a characteristic historical style and period within the development zone.

3.2 Height

Height is measured as the vertical distance between the highest part of a building/structure and the finished [grade](#) at the midpoint of the front facade of the principal building, excluding chimneys, mechanical equipment, church spires, belfries, towers, and other miscellaneous additions and exceptions as provided in the Code.

As shown in Figure 5: Height Compatibility, compatibility of building heights is addressed by comparing principal building proposed heights, in both new construction and alterations, with existing principal building heights within the development zone. Proposed accessory structure heights are compared with existing accessory structure heights.

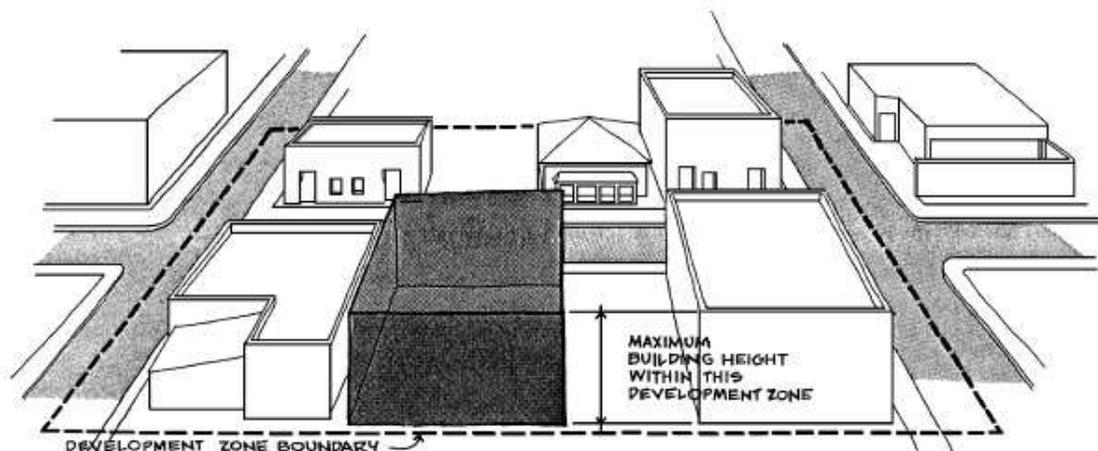


Figure 5: Height Compatibility

Building height compatibility can be accomplished by comparing similar types and styles of buildings. For example, a new Territorial style house should not be built to the height of its Victorian neighbor. The mass, volume, and scale of the Territorial building is quite different from that created by a hipped roof bungalow or more steeply pitched Victorian. A Territorial house built up to the allowable height of a pitched roof Victorian would look massive and out of scale.

3.3 Setbacks

The prevailing setback is the most frequently occurring distance between buildings and the street and interior property boundaries in the development zone of the subject property. Maintaining the prevailing setback protects the historic and visual character of the street. The figures which follow give several examples of prevailing setbacks in the Tucson metropolitan area.

As shown in Figure 6, row houses on this block of El Presidio HPZ are built in the Spanish-Mexican vernacular tradition with no side or front setbacks. Their front elevations (facades) are all located on their front property lines. The effect of this zero lot line could be achieved without actually locating the building on the property line.

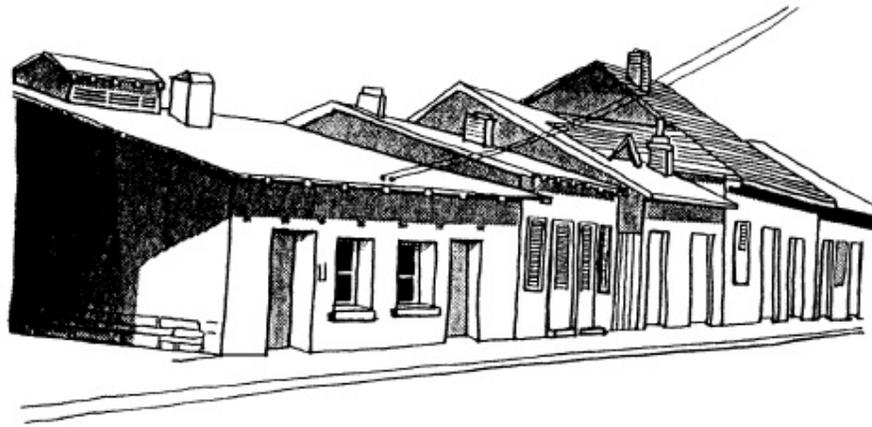


Figure 6: Sonoran Row Houses

In cases where a front building setback is provided, a high wall or fence may be located on the property line to allow the building itself to be set farther back. This design solution would reinforce the continuous and cohesive sense of enclosure along the street while providing for the unique needs of the property owner. Zero lot line design does not eliminate other Code requirements, such as fire walls and on- [site](#) drainage.

Figure 7: Comparison of Prevailing Setbacks shows the contrast in front and side setbacks between blocks.

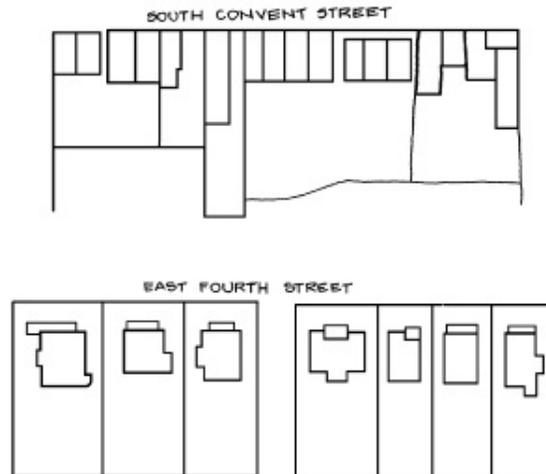


Figure 7: Comparison of Prevailing Setbacks

In the area represented in Figure 8, the setbacks from interior property lines do not follow a regular pattern. In this example low density development has been incremental and informal and has resulted in the preservation of valuable native vegetation. In this case, determining the prevailing setbacks entails an evaluation of both the character of [site](#) design in the entire development zone and close scrutiny of setbacks of adjacent properties.



Figure 8: Irregular Setbacks, Fort Lowell Historic Preservation Zone (HPZ)



Figure 9: Anglo-American [Site](#) Design illustrates front setbacks and a typical streetscape. A uniform setback from the street reflects [site](#) planning practices common in subdivisions built after the arrival of the Southern Pacific Railroad in Tucson. The uniform front setback is a primary factor in giving the street its character. The goal in both new construction and renovation is to maintain the prevailing front yard setbacks.

Figure 9: Anglo-American [Site](#) Design

The effect of disrupting the prevailing front setback is shown in the schematic in Figure 10. In this example, the effect of discontinuity of the streetscape would be the same whether the offending structure is a room addition, a carport, or a screen or security wall built on the front property line. In each of these instances, the prevailing setback would be compromised.

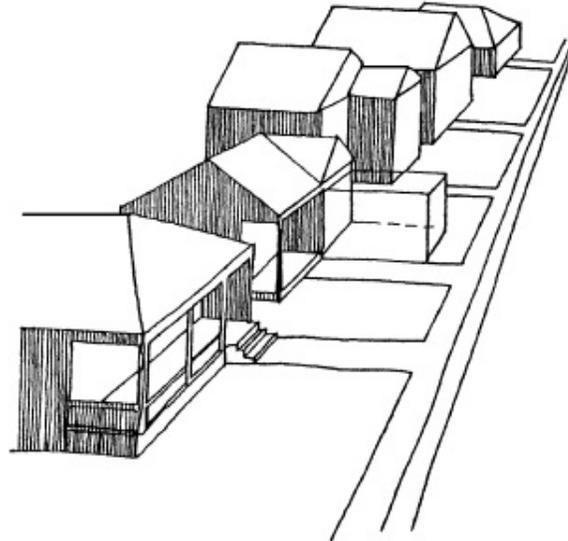


Figure 10: Incompatible Front Setback

3.4 Proportion

Proportion, as used in the HPZs, means the relationship between the width and height of a building’s front facade, windows, and doors. Maintaining similar building proportions preserves the sense of visual continuity of the street and neighborhood. The buildings shown in Figure 11 illustrate horizontal massing. They are about twice as wide as they are high--a proportion of two to one. This proportion holds true for many of the buildings in the El Presidio and Barrio Historico HPZs built in the Sonoran vernacular tradition. These buildings generally have horizontal massing with width predominating over height. When most of the buildings in a development zone have similar proportions, whatever they may be, construction of a new building with very different proportions would be destructive of the character of the zone.

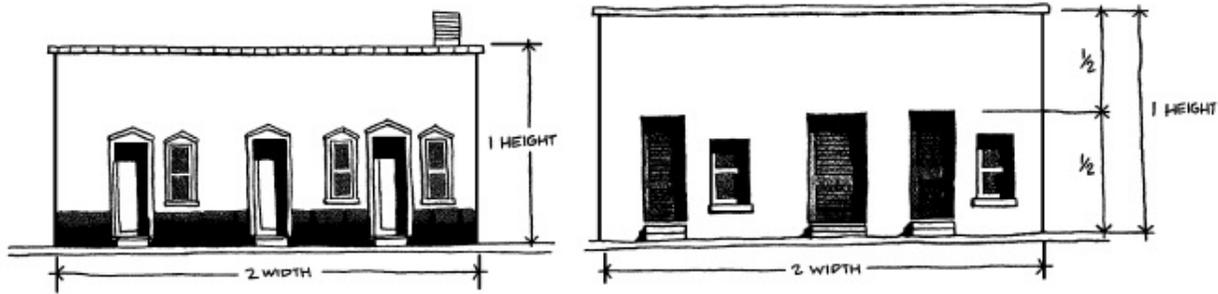


Figure 11: Horizontal Massing

Figure 12 shows a series of buildings that generally have the same proportions, with a two to one width-to-height ratio. The second building from the right, with a three to four width-to-height ratio, represents a new structure which does not relate well to the others because of its markedly different proportions.

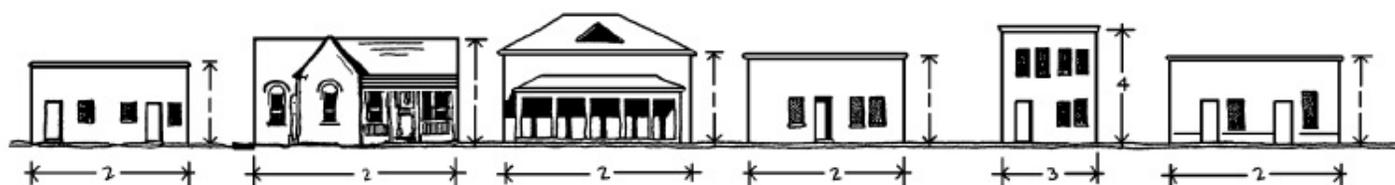


Figure 12: Proportion in Series

3.5 Roof Types and Rooftop Equipment

The relationship of a new or altered building to the historic buildings and structures in the development zone will be strengthened by repeating a roof type that is prevalent within the zone. If the predominant roof type is hipped or gabled, typical of California bungalow or Victorian styles, a new home constructed with a flat roof characteristic of the Sonoran Territorial style would be a visual disruption of the rooflines and may result in conflicts in height, mass, and materials between established residences and the new construction. Figure 13 provides examples of common roof types in different HPZs in Tucson.

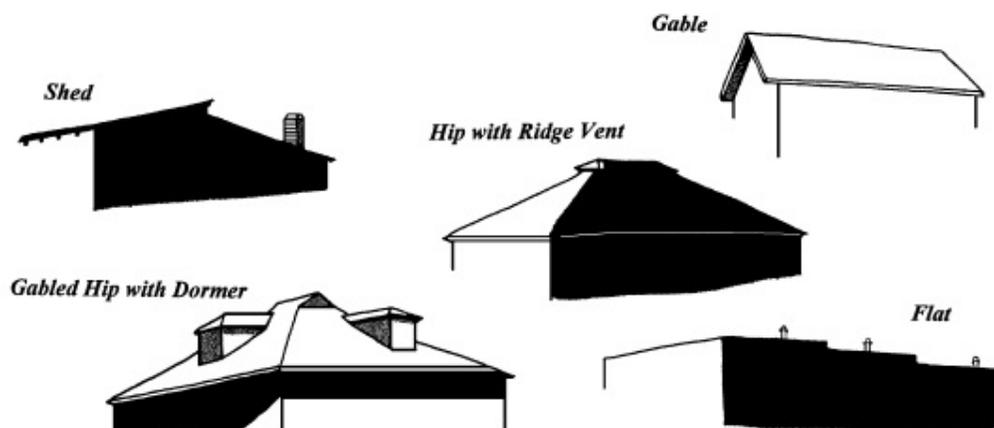


Figure 13: Common Roof Types in Tucson's Historic Districts

Solar panels, other energy-conserving or -generating devices, and [water harvesting](#) systems should be architecturally integrated into the design when installed on an existing historic building or structure, and should be installed in a way that minimizes visibility, does not damage the building/structure or remove historic roof features, and can be easily removed.

Newly installed equipment on principal buildings and on secondary buildings and structures should be placed in locations that minimize visual impacts. Rooftop panels and other types of units should not be mounted on street-facing roof elevations. For sloped roofs, panels should be installed flat against the roof to maintain the existing roof profile, and any visible mounting hardware should be painted to match the roofing materials as closely as possible. Panels and other types of units appropriate for flat roofs should be installed so they are hidden by parapet walls. If none of the secondary roof elevations are an appropriate orientation for efficient operation, then solar panels and other types of units should be ground mounted or placed on a nonhistoric accessory structure in a way that minimizes visual impacts.

Other architectural features and mechanical equipment atypical of the historical period or style, such as skylights, coolers, heating units, and satellite dishes, should be located on the building, structure, or property on non-street-facing elevations and in locations that minimize visual impacts. The following guidelines are recommended for the type, placement, and screening of these features.

- A. Skylights should be flat, non-bubble type installations located on the rear of the structure or behind gables or dormers so that they are not visible from the front public right-of-way.
- B. Mechanical devices such as coolers and heating units should be hidden whenever possible, e.g., ground placement on the interior portion of the property, or placement on a roof [slope](#) facing the interior of the property. If they cannot be hidden, then they should be placed in locations that minimize visual impacts.
- C. Satellite dishes should be placed on non-street-facing elevations and in locations that minimize visual impacts.
- D. Wind turbines should be of a height and scale compatible with the historic building, and installed in an appropriate location on the [site](#) or on a non-historic structure or addition so as to minimize the visual impact on the historic character of the building, the [site](#), and the development zone.
- E. Gutters, downspouts, and other roof drainage features being added to a structure should blend into the architecture and avoid interrupting the lines and details of architectural features, and should provide proper drainage to avoid water damage to the building. Cisterns used to collect rainfall from a roof should be located at non-street facing elevations, and should not block views of architectural features. The placement of cisterns within properties is additionally regulated by Sections 6.4.5, *Perimeter Yards*, and 6.6, *Accessory Uses and Structures*, of the UDC detailing the requirements for accessory structures. Historic gutters, scuppers, drainpipes (canals), and downspouts should be repaired when possible, and not covered; when historic roof drainage features cannot be repaired, they should be replaced using like materials, shapes, and placements.

3.6 Surface Texture

Building materials and surface treatments found in Tucson's HPZs can vary from district to district. An application for renovation or new construction must be compatible with the architectural context found in the particular development zone to ensure that materials and textures of new development are appropriate to neighborhood character. Surface treatments commonly used in the particular development zone should guide future improvements. Adobe and stucco may characterize an entire historic district, such as Fort Lowell, while the types of materials and surface treatments in other districts may vary considerably. Brick, stone masonry, lava rock, and wood are common materials in districts with eclectic architectural styles.

When stucco (plaster) is being replaced on the entire exterior of a Contributing historic building or structure, a lime or mud stucco should be used; cement based stucco should not be used. When stucco is being repaired, the same material should be used. On Contributing historic buildings and structures, stucco applications with expansion joints and modern textures are not allowed. Buildings and structures that were stuccoed historically should not have their stucco sheathings entirely or partially removed without being replaced with new stucco. Certain materials, such as exposed concrete block, and certain surface treatments, such as painting over rock or painting over unpainted brick or masonry, are not allowed.

3.7 Site Utilization

[Site](#) utilization is defined as the distance between the sides of buildings. However, the concept of [site](#) utilization also relates to front and rear setbacks. The space between buildings is an important factor that contributes to the character of an entire group of buildings. Figure 14 shows a block in the University area. The generous side yards visually separate each house from the next. Figure 15 depicts a block in an older part of the city where the spacing between buildings is either very narrow or nonexistent. Any new construction should observe the same or compatible spacing within the development zone.

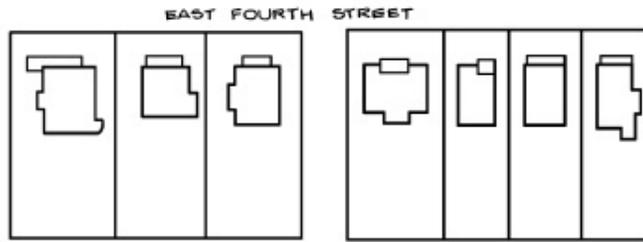


Figure 14: University Area

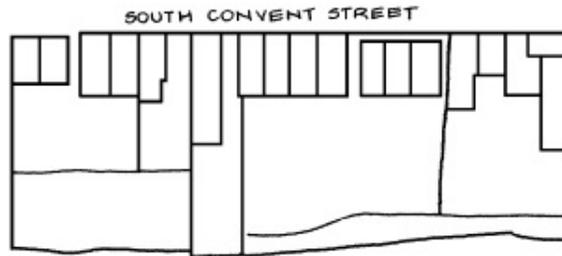


Figure 15: Barrio Historico

Principal buildings in most HPZs are street-oriented with entrances from at least one street. Any new construction or renovation should maintain the relationship to the street that is appropriate to the architectural and [site](#) design context of the development zone. Any changes to the front of the building should maintain the street facade of existing buildings and the prevalent street orientation of front entrances in the development zone.

3.8 Projections and Recessions

Projections and recessions, such as porches, steps, awnings, overhangs, entrances, windows, and doors, provide the continuity, rhythm, and spatial quality of the streetscape. They also help define the architectural and historic character of the buildings as seen from the street. Sonoran-style buildings usually had no projections beyond the facade. Transformed Sonoran buildings, such as the Verdugo House shown in Figure 16, added front steps, an understated front projection.



Figure 16: Verdugo House

As the influence of the Anglo immigrants to Tucson increased, front porches began to appear on residential buildings. In some cases, the grafting of one architectural tradition onto another resulted in an eclectic mixture of styles and treatments, as is shown in Figure 17.

Front porches help to link the structure with the street. In addition to supporting street character, porches protect windows and doors from solar damage and consequently affect maintenance and long-term property values.

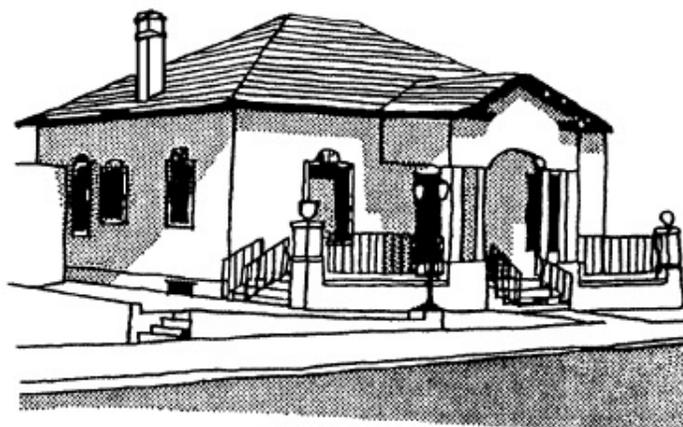


Figure 17: New Porch Addition

The design of any new construction or repair in a HPZ must take into account the presence or absence of such projections and recessions, in order to assure that the development reflects-but does not directly mimic-the design of surrounding buildings in the development zone and is compatible with other buildings in the particular HPZ.

3.9 Details

Repetition of architectural details is another way of achieving a harmonious relationship between new and old buildings and structures. Architectural details frequently define the historical period(s) and style. Examples of character-defining details include wall design, parapet treatment, roof trim, eaves and verge treatment, and door and window openings. These details must be compatible with the existing historical periods and styles. However, compatibility does not mean exact duplication of architectural details. When replacing features that were previously replaced with inappropriate materials after the historical period(s) of the building or structure, the replacements should be of the same materials and types as the originals.

Of the details listed above, windows are particularly important in defining historical and architectural character. With this in mind, repair or alterations to windows must be accomplished with a degree of sensitivity to the types of existing windows on the building. Window location, size, shape, function, and materials should be retained and in the case of new construction, the window type and historical style most common within the development zone will determine the type of window used in the new structure. Historic windows should be repaired, rather than replaced, whenever possible. When replacing historic windows, the replacements should be of the same materials, types, and designs (e.g., number and dimensions of lights, and widths and profiles of mullions and muntins) as the original windows. Aluminum, clad, vinyl, and fiberglass materials are not allowed. Sliding, flush-mounted, and simulated divided lights are not allowed. Lintels, molding, and sills should be added to replacements and new windows as appropriate.

Figure 18 identifies traditional window components.

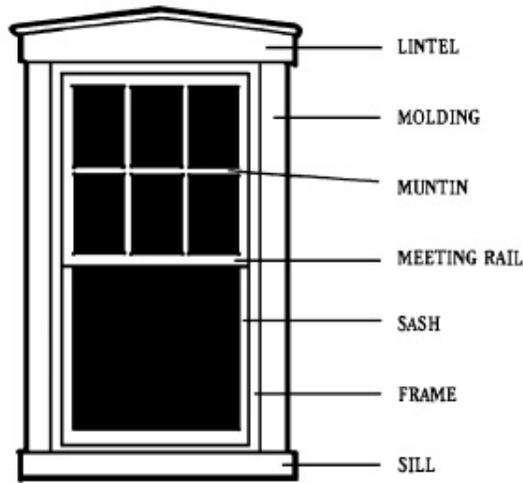
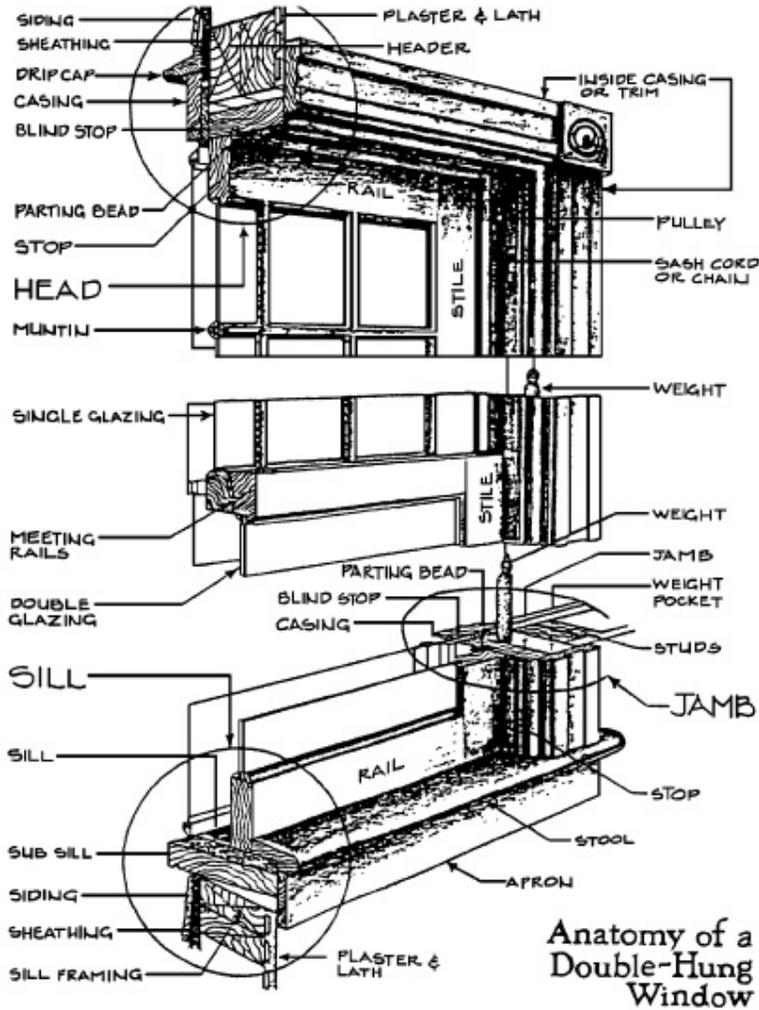


Figure 18: Window Components



Anatomy of a Double-Hung Window

Figure 19: Anatomy of a Double-Hung Window

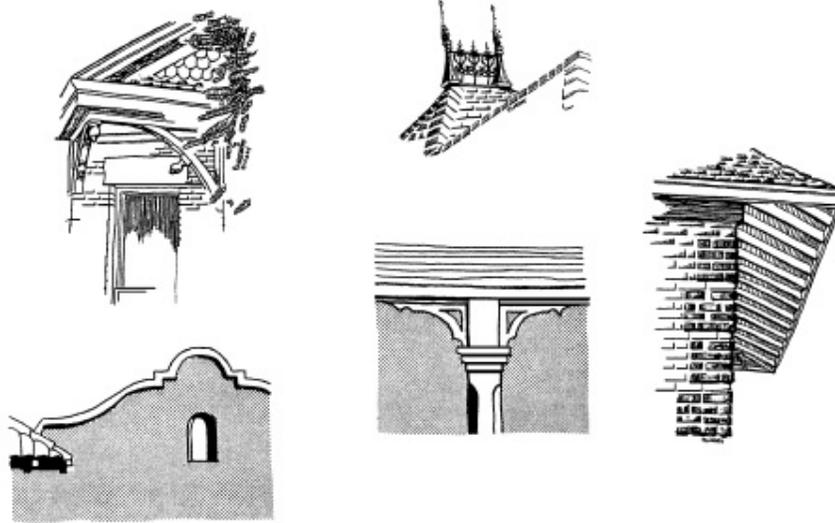


Figure 20: Details Found in Tucson's Historic Preservation Zones

3.10 Building Form

Maintaining the character of a neighborhood through size, mass, and scale of the buildings and structures reinforces the sense of conformity and compatibility essential to development in HPZs. Conversely, new construction or alterations that do not conform to the overall character of the neighborhood can erode the historical and architectural character. The schematic in Figure 21 shows buildings with similar heights, proportions, and massings.

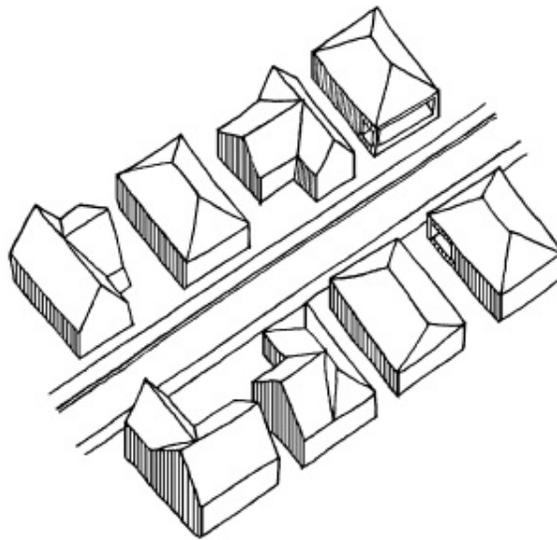


Figure 21: Continuity in Size, Mass, and Scale

3.11 Rhythm

Rhythm means an ordered, alternating, recurring pattern of solids to voids in building facades along the street. The recurrent alternation of walls to windows and doors (solids to voids) along the front facade of a building establishes a pattern which can be perceived when observing the building from a distance. Figure 22 shows wall to window and door patterns common in Sonoran row houses.

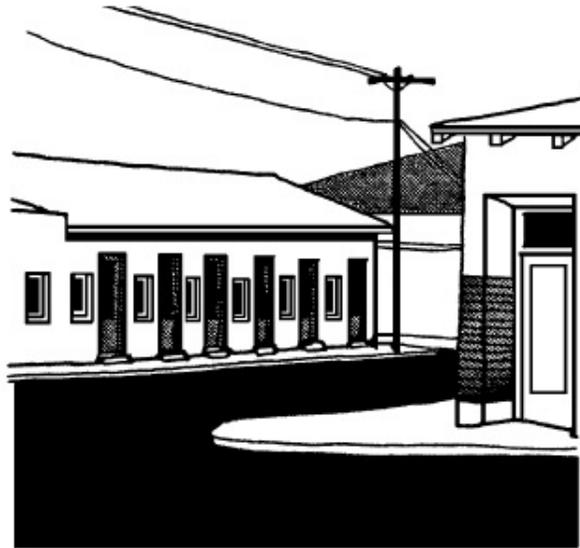


Figure 22: Rhythm of Solids to Voids in Sonoran Row Houses

When constructing a new building or addition, a similar rhythmic pattern should be incorporated to achieve a relationship between the existing historic building and the new construction. The rhythm of recurrent building masses helps define the quality of the streetscape. Street rhythm can be accomplished by the central siting of a structure and the regular width of side yards. With row houses, having no side yards, the rhythm is established through the alternation of walls to windows and doors.



Figure 23: Street Rhythm

3.12 Accessibility Features

Features added to increase accessibility for persons with lessened mobility, such as ramps and lifts, should be designed and installed in ways that do not damage the building or remove historic features, do not negatively impact the historic character of the building, and can be removed. Handrails should be of simple design and compatible with the building character. The Building Code includes regulations on accessibility features for compliance with the Americans with Disabilities Act of 1990, as amended.

9-02.4.0 SUPPLEMENTAL REVIEW CRITERIA

In addition to the key design criteria listed above, the following factors affecting the appearance, harmony, and unique

characteristics of a HPZ have been identified in the UDC and may be considered in the review process.

4.1 Color

Although a property owner does not need [approval](#) to paint a house in a HPZ, color may be reviewed as part of a required HPZ review. In this case, the color of walls, trim, roof, and other details of a building or structure, including fences and privacy walls, will be evaluated according to how well the choice of colors reflects the architectural style of the subject structure and the historical period of properties within the development zone.

4.2 Landscaping

Landscaping and hardscape elements, such as walkways, driveways, and [site](#) furnishings, may be reviewed as part of a required HPZ review. The general guide for the selection and placement of plants is the existing character of landscaping within the HPZ. Individual district guidelines may include specific recommendations on plant materials. The PDSD Director has the authority to waive or amend landscaping and screening requirements in order to assure that the type and placement of plant materials is compatible with the character of the subject property and the development zone.

4.3 Enclosures

Fences, privacy walls, or other physical features used to enclose open space or provide privacy must be compatible with the architectural style of the subject structure and the historic character of the development zone. The height of a new privacy wall or fence cannot obstruct the public view of buildings and structures from the street, except where it is used to simulate zero-lot-line construction to meet compatibility criteria; new solid walls or fences at the front of a property should not be taller than four feet as measured from the street-side [grade](#), but may be up to six feet tall on the sides and rear of a property. Privacy wall and fence materials must be appropriate to the historic context of the structure and the neighborhood. Although recommended materials for enclosures vary from district to district, adobe, stone, stuccoed masonry, wood picket, and wrought iron are acceptable. Chain link, unpainted redwood, and unstuccoed concrete block are not acceptable materials.

4.4 Utilities

Whenever possible, utilities should be located underground or where they are not visible from public rights-of-way.

9-02.5.0 SIGNS

5.1 General

The appearance, color, size, location, method of attachment, materials, and design of signs within a HPZ must be compatible with the historic characteristics of the structures located within the appropriate development zone. Signs allowed in the underlying zoning are regulated by Chapter 3 of the Tucson Code and may be further limited by the HPZ ordinance.

5.2 Historic Landmark Signs (HLS)

Article III and Article XIII include the regulations for the preservation and designation of historic iconic signs in the City of Tucson. Permitting requirements, fees, inspections and the initial designation of a sign as a Historic Landmark Sign are provided in Section 3-25 of the Sign Code. Section 3-149 of the Sign Code provides information for the designation of signs within a voluntary registry of HLS maintained by the City of Tucson Sign Section at PDSD. Section 3-149 also provides the regulations for restoration and relocation of registered HLS signs.

9-02.6.0 PARKING

6.1 Parking is required in accordance with Section 7.4 of the UDC. All Code required improvements, including surfacing, wheel stops, curbing, striping and screening are applicable within HPZs.

6.2 Parking requirements applicable in the El Presidio Historic Preservation Zone are provided in Section 2.8.8.6.N of the HPZ ordinance.

6.3 The location and number of on- [site](#) parking spaces can have negative effects on the unique architectural design and historic features of a [site](#) and can affect the character of the streetscape in an HPZ. Generally, on- [site](#) parking should be located at the rear of all development and in a location that cannot be seen from public rights-of-way.

6.4 Screening of parking areas with non-traditional materials may be required to be compatible with and protect the character of the HPZ.

9-02.7.0 SPECIFIC HISTORIC PRESERVATION ZONE GUIDELINES

7.1 General

In addition to facilitating compliance with development criteria required by the Historic Preservation Zone and described in Section 9-02.3.0 of this standard, related guidelines are used by individual HPZ Advisory Boards to evaluate proposed projects within those HPZs. Because each of the HPZs is unique, individual district guidelines have been created by each HPZ Advisory Board and are used as tools for making recommendations to the Historical Commission Plans Review Subcommittee.

Buildings and structures designated as Contributing in an HPZ and listed in Technical Standard 9-02.8.0 (*Structures List*) should have minimal changes made, with alterations compatible with the existing architectural style and character. For buildings and structures designated as a Noncontributing, renovation may offer an opportunity to restore the historic character with alterations that are compatible with Contributing buildings and structures within the development zone. Applicants considering new construction on a vacant parcel in a HPZ, should be familiar with the overall character of the HPZ, particularly with [site](#) design and architectural features within the development zone. This will ensure that new construction projects are compatible with, and contribute to, the character of the HPZ. The following list is a guide when considering exterior renovation or construction:

- A. Exterior alterations and changes are minimal;
- B. Alterations are compatible with the structure's original design;
- C. New construction is compatible with surrounding properties, in terms of materials and architectural style and character;
- D. Alterations or renovations visible from the street are minimal;
- E. Alterations or changes to original roof form, building materials, and details are minimal;
- F. All construction materials are appropriate to the building and to the neighborhood;
- G. The size, shape, and materials of window and door openings are maintained; and,
- H. Any historical and distinctive architectural details are to remain.

Information provided in this section will aid the applicant in successfully and expeditiously meeting Code requirements, as interpreted and applied at the Historic Preservation Zone level.

7.2 Armory Park

A. Background. Armory Park became the city's first Historic Preservation Zone in 1974 encompassing approximately a 30-block area bounded by Stone Avenue on the west, Third and Jacobus Avenues on the east, Twelfth Street on the north, and Nineteenth Street on the south. District boundaries are shown on the map below. The 1995 survey of the District lists approximately 450 buildings or structures as Contributing Historic Properties. (See Technical Standard 9-02.8.0.) In

addition to City Historic Preservation Zone status, the neighborhood is a National Register Historic District that was designated in 1976.

The present Armory Park Historic Preservation Zone was surveyed as part of the original 1872 town plan. The arrival of the railroad in 1880 had the greatest impact on the development of the area until approximately 1920. Armory Park grew from the original Military Plaza to a progressive neighborhood of prominent railroad men, affluent businessmen, and working class residents. The majority of structures in Armory Park were residences for Southern Pacific Railroad workers and their families. In addition to the residential core of the neighborhood, the Armory Park Historic Preservation Zone includes a mix of public uses, including the former Carnegie Library, Safford Junior High School, the Temple of Music and Art, and Armory Park with the adjacent Senior Center.



B. Architectural Character - Armory Park developed into a stable, cohesive neighborhood of multiple and single family detached houses encompassing a mixture of architectural styles. The vast majority of structures in the district were built speculatively in tract fashion, having similar architectural character and detail. The railroad afforded wealthy Tucsonans the ability to add Victorian detailing and soon a variety of each architectural style and tradition began to appear in the neighborhood. Several of these architectural styles were intermixed and the result is often referred to as “American Victorian”. Houses reflecting this eclectic style are constructed of brick and have complex roofs and intricate wood detailing. In addition to design influences introduced from the East and Midwest, the 1915 Panama–California Exposition at San Diego provided architectural models that were copied within the Armory Park area, including the Mission Style, California Bungalow, and Spanish Colonial Revival. Safford School is the best example of the latter style. The school displays plastered walls, an ornamented and elaborate entry, flanked columns, and portales. Bungalow-style homes were built from mass produced model plans to provide simple, single-story bungalows with gable roofs, articulated wood rafters, and heavy masonry porch piers. Houses that typify earlier Spanish-Mexican traditions can be found throughout Armory Park as well.

C. Streetscape - The character of the streetscape of Armory Park reflects the influence of the post-railroad era and Anglo [site](#) planning concepts. Rather than contiguous structures built on street property lines, typical of the Sonoran or Spanish-Mexican vernacular tradition, [site](#) utilization in the Anglo manner located the structure in the center of the lot, with spacious front, side, and rear landscaped yards. The neighborhood’s character is further defined by ornamental lamp standards, street trees, and lushly landscaped yards.

D. **Specific District Guidelines.** In addition to the development criteria described above, the following review criteria provide additional guidance to applicants considering renovations or additions within the district boundaries.

1. **Additions.** Additions to buildings, including rooms, porches, stairs and access ramps, should be constructed at the rear of the property.
2. **Windows and Doors.** Any replacement doors and windows shall be of the same materials, types, and designs. Flush doors, sliding glass doors, aluminum windows, doors, or screen frames are inappropriate materials for renovation or new construction. Security bars are discouraged, however if used, should be of a simple design, follow the lines of the window and should be mounted inside the window opening, rather than on the surface of the building.
3. **Masonry.** Exposed concrete block is not an acceptable substitute for brick or adobe. If concrete block is used for the construction of an addition, it must be stuccoed. Color may be added to the stucco or it may be painted an appropriate color.
4. **Chimneys.** Original chimneys must be left in place and maintained, even if unused. If repairs are necessary, the original material, color, shape, and brick pattern must be matched as closely as possible.
5. **Roofing.** Rolled roofing, white or light roofing shingles are discouraged on roof surfaces visible from the street.
6. **Porches.** Original porches should be maintained and as much of the original material and ornamentation as possible should be retained if repair is necessary. Front porches should not be enclosed as rooms. If a porch has been enclosed, the enclosure should be removed and the porch restored. Wrought iron columns or steel pipe columns are not acceptable building materials for new or restored porches.
7. **Architectural Details.** Historical architectural details should be retained; even the simplest details contribute to the overall character of the building. If replacement of architectural details is necessary, original detailing on the structure should be researched and architectural details visible on other houses in the development zone can be duplicated using size, placement, and quantity as a guide.
8. **Mechanical Equipment.** Mechanical equipment, including but not limited to swamp coolers, air conditioners, water heaters, wind turbines, roof vents, furnaces, electrical equipment, solar panels, catwalks, emergency or utility access, maintenance safety equipment, satellite dishes, disks and antennas, and skylights should be placed in locations that minimize visual impacts. Cisterns should be placed at non-street-facing elevations and should not block views of architectural features.
9. **Fences and Privacy Walls.** Fences and privacy walls should be compatible with the style, material, and age of the existing structure. The height of a front fence or privacy wall should be four feet or lower to allow an unobstructed view of the buildings and structures from the public right-of-way. Inappropriate fence and privacy wall materials include: ocotillo ribs, stockade fencing, post and rail, tubular steel or wrought iron without spear tips, unstuccoed concrete block, unpainted wood, rough cedar, and corrugated metal. Extra attention should be paid to the fence or privacy wall along the street side of the property and the side yards extending from the front facade of the building.
10. **Landscaping.** Landscaping should be in keeping with the historic period of the neighborhood. Plantings should reflect the architectural style of the structure, and all vegetation should provide an unobstructed view of the building.

7.3 Barrio Historico

A. Background.

The Barrio Historico Historic Preservation Zone is an approximately 20-block area located between Cushing Street on the north, Eighteenth Street on the south, the Southern Pacific Railroad on the west, and Stone Avenue on the east. District boundaries are shown on the map below. The area was designated as a Historic Preservation Zone by the City of Tucson in 1975. A 1995 survey of the District lists El Tiradito Wishing Shrine as a city historic landmark and approximately 225 buildings or structures as contributing historic properties. (See Technical Standard 9-02.8.0.) In addition to City Historic Preservation Zone status, the neighborhood is included in two National Register Districts: Barrio Libre, created in 1978, and Barrio El Hoyo, created in 2008, and comprises portions of four distinct neighborhoods (barrios): El Hoyo, El Membrillo,

Santa Rosa, and Barrio Viejo.



The National Register District barrios were first settled in the mid to late 1800s by residents who began building homes and businesses beyond the original Presidio walls, and around the Plaza de la Mesilla. The real growth occurred during the Territorial Period, and development accelerated with the arrival of the Southern Pacific Railroad in 1880. While the barrios were primarily working-class Mexican neighborhoods, the residents enjoyed a surprising diversity of ethnic backgrounds, including Chinese, African-American, Anglo, and Native American.

As the Arizona Territory grew with the influx of Anglo soldiers, ranchers, businessmen, and craftsmen, the barrios grew as well but managed to remain relatively unchanged in their cultural and architectural heritage. In the late 1960s, urban renewal programs led to the demolition of nearly half of the barrios. Arising in their place were the Tucson Convention Center associated parking lots, the La Placita commercial area, and the city, county, and Federal buildings. Tucson's preservation movement was in large part a response to the unfortunate impacts of urban renewal programs and threats to these historic neighborhoods from proposed major transportation plans.

B. Architectural Character and Streetscape.

The Barrio Historico Historic Preservation Zone retains the distinctive architectural and cultural traditions of the past due to the majority of the development being comprised of small one-story adobe and brick residences and commercial buildings. Sonoran and Transformed Sonoran are the most characteristic architectural styles, although the Spanish Colonial Revival, Victorian, and Craftsman Bungalow styles are represented as well. The Sonoran style, part of the Spanish-Mexican vernacular tradition, is characterized by thick-walled adobe buildings set on the street property line; flat roofs with high parapet walls, stuccoed or left exposed; round wood beams (vigas); saguaro-rib roof decks; and projecting drainpipes (canales), which penetrate the parapet wall at roof level. The buildings generally have horizontal massing, with width predominating over height. Exterior doors are usually placed flush with the inside wall creating a deeply recessed entry when viewed from the street. Windows are installed flush with the outside wall, creating a shelf or window seat for interior rooms. Floor plans vary, having either a central hall (zaguan) or a series of rooms parallel or perpendicular to the street. Transformed Sonoran buildings are similar to this earlier vernacular style, with the addition of a sloping gable or pyramidal roof.

The streetscape of Barrio Historico reflects Spanish and Mexican [site](#) planning concepts and earlier Islamic planning principles. Residential open spaces consisted of interior courtyards designed both to accommodate social customs and environmental factors with narrow streets shadowed by thick-walled buildings set close to the street. A typical street in Barrio Historico, lined with Sonoran row houses that hug the street, reflects these design influences. This street character contrasts sharply with the look and feel of neighborhoods developed after the arrival of the railroad and Anglo design influences from the East and Midwest. These later styles located the structure in the center of the lot, with front, side, and rear landscaped yards.

C. Specific Historic Preservation Zone Guidelines for Barrio Historico.

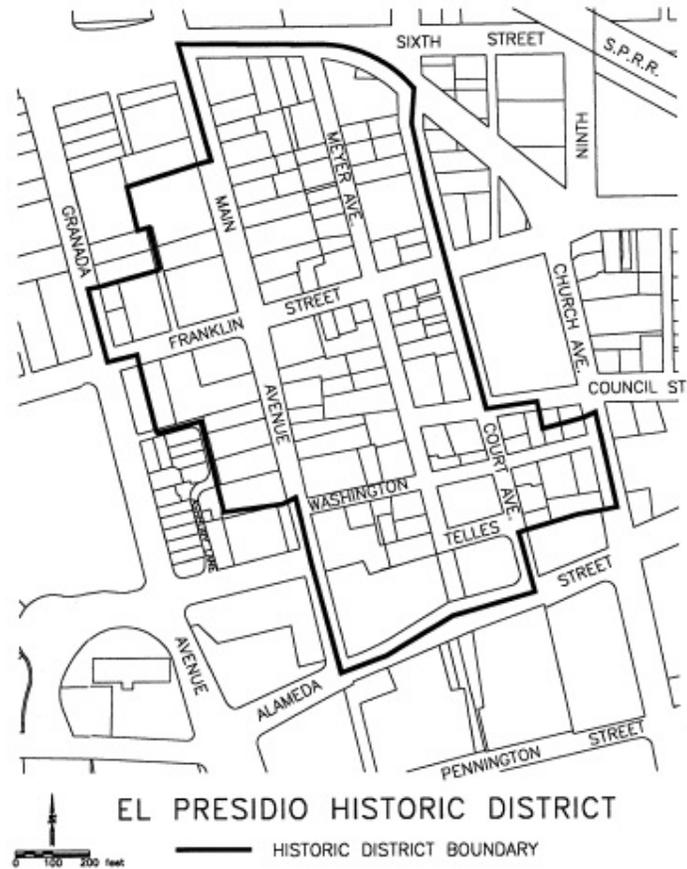
In addition to the development criteria listed above, the following HPZ criteria provide additional guidance to applicants contemplating renovation or new construction.

1. **Alterations of Existing Buildings.** Windows, doors, and porches, should remain open with original sizes and shapes maintained.
2. **Roof Forms and Elements.** Roof forms and elements vary within the HPZ. New construction should be constructed to reflect the roof form immediately adjacent to the new building or the prominent roof forms within the development zone.
3. **Porches.** Existing porches should retain all original detail and ornamentation. Existing porches should not be enclosed. Porches that have been enclosed and made into a room as part of a previous remodel should be taken back to their original condition as an open porch.
4. **Exterior Wall Materials.** When repairing or replacing adobe block, brick, stucco or stone, the same or similar materials should be used and should match as closely as possible the color, texture, and composition of the original walls. Unacceptable materials include exposed or painted concrete block or slump block as a substitute for brick or adobe. When stucco (plaster) is being replaced on the entire exterior of a Contributing historic building or structure, a lime or mud stucco should be used; cement based stucco should not be used. When stucco is being repaired, the same material should be used. On Contributing historic buildings and structures, stucco applications with expansion joints and modern textures are not allowed. Buildings and structures that were stuccoed historically should not have their stucco sheathings entirely or partially removed without being replaced with new stucco.
5. **Doors and Windows.** New and/or replacement doors and windows should conform to the original size, style, and materials of the structure (e.g., single glazed, double-hung wood windows and solid wood panel doors). Flush mounted doors and sliding glass doors are not appropriate, nor are aluminum windows, doors, or screen frames.
6. **Site Elements.** New privacy walls and fences should be compatible with the architectural style and age of the house. Appropriate materials include: stuccoed masonry, adobe, stone, cast iron, and wood picket. Unacceptable materials include: chain link, unpainted redwood, rough cedar, post and rail. Unstuccoed concrete block as privacy wall or fence facing the street side(s) of a property are not permitted. If a new carport will be constructed on the [site](#), the carport and driveway should be located at the side or rear of the property whenever possible. Mailboxes should be compatible with the style of the building and surrounding neighborhood.
7. **Landscaping.** Landscaping should respect the historic period of the neighborhood, as well as the architectural style of the structure, and should not obstruct the public view of the building.

7.4 El Presidio Historic Preservation Zone (HPZ)

A. Background.

The El Presidio HPZ, an approximately 12-block area located immediately north of the downtown governmental center, is linked both physically and historically to the center of life in Tucson. The area was designated a HPZ by the City of Tucson in 1975 and a National Register District in 1976. District boundaries are shown on the map below.



B. Architectural Character and Streetscape

Although a relatively small and homogeneous neighborhood in many respects, the El Presidio HPZ reflects a diversity of architectural styles. Sonoran, Transformed Sonoran, Spanish Colonial Revival, Victorian, Prairie, and Bungalow styles are all represented. The Sonoran style, part of the Spanish-Mexican vernacular tradition, is characterized by thick-walled adobe buildings set on the street property line; flat roofs with high parapet walls, stuccoed or left exposed; round wood beams (vigas); saguaro-rib roof decks; and projecting drainpipes (canales), which penetrate the parapet wall at roof level. The buildings generally have horizontal massing, with width predominating over height. Exterior doors are usually placed flush with the inside wall creating a deeply recessed entry when viewed from the street. Windows are installed flush with the outside wall, creating a shelf or window seat for interior spaces. Floor plans vary using a central hall (zaguan) or have a series of rooms parallel or perpendicular to the street. Transformed Sonoran buildings are similar to this earlier vernacular style, with the addition of a sloping gable or pyramidal roof.

Other architectural and [site](#) design features in the District arrived after the Southern Pacific Railroad in 1880. Some architectural styles, such as the Queen Anne, Victorian, Tudor Revival, and Prairie styles, were introduced from the East and Midwest. Many of these styles were intermixed, and the result is often referred to as Anglo-American Victorian. Victorian houses reflecting this eclectic style are generally constructed of brick and have complex roofs and intricate wood detailing. The El Presidio HPZ also has several examples of Spanish Colonial and Mission Revival structures. The streetscape of El Presidio reflects both Spanish-Mexican [site](#) planning concepts and later Anglo design influences. Streets such as Meyer and Court illustrate the Sonoran tradition with row houses built to the front property line. Open spaces were generally interior courtyard spaces. In contrast to this tradition, many of the houses along Main Avenue show Anglo [site](#) planning concepts. Houses such as the Hereford House and the Franklin House were built in architectural styles popular in the East and Midwest. These Prairie and Victorian adaptations were set back from the street and surrounded by trees and lush vegetation in front, side, and rear yards.

C. Specific Historic Preservation Zone Guidelines for El Presidio

In addition to the development criteria listed above, the following HPZ criteria provide additional guidance to applicants

contemplating renovation or new construction.

1. **Development Zone.** In the El Presidio HPZ, there are many instances where different building styles are located side by side or across from each other within the same development zone. Because of the heterogeneous nature of this HPZ, the design context within the development zone will be evaluated as part of HPZ review, particularly for proposed renovations. Plans submitted with proposed alterations that are not compatible with the character, period(s), or style of the subject property, even though examples of similar alterations are found within the development zone will not be approved by the Advisory Board. Renovations must be consistent with the style and period(s) of the subject building, despite the existence of other styles within the development zone. The applicant should avoid grafting on stylistic details from neighboring buildings of a different timeframe or architectural style.

2. District Review Categories.

Level One: Basic zoning regulations and design criteria in the UDC

Level One design criteria focus on [site](#) planning and overall [site](#) design issues addressed in the UDC and discussed in detail in this technical standard. (See Sections 9-02.3 through Section 9-02.6.) The submittal will be evaluated using these design elements. Any submittal that conflicts with UDC provisions applicable to these overall [site](#) design issues will not be recommended for [approval](#). (References in parentheses are to subsections of this technical standard.)

1. Building spacing (see [Site Utilization](#), Section 9-02.3.7);
2. Lot coverage (see [Site Utilization](#), Section 9-02.3.7);
3. Yard limits (see [Site Utilization](#), Section 9-02.3.7);
4. Setbacks (see [Setbacks](#), Section 9-02.3.3);
5. Density of use (see [Setbacks](#), Section 9-02.3.3);
6. Bulk (see [Building Form](#), Section 9-02.3.10);
7. Height (see [Height](#), Section 9-02.3.2); and,
8. Signage (see [Signs](#), Section 9-02.5.0).

Level Two: Specific Elements in the HPZ's Design Vocabulary

Level Two design criteria focus on elements of building style and detailing to determine whether the proposed design is appropriate with respect to the following:

1. Simplicity (see [Details](#), Section 9-02.3.9);
2. Elements of composition (see [Projections and Recessions](#), Section 9-02.3.8);
3. Symmetrical or asymmetrical appearance (see [Building Form](#), Section 9-02.3.10, and [Rhythm](#), Section 9-02.3.11);
4. Basic shape or form (see [Building Form](#), Section 9-02.3.10);
5. Roof form (including skylights) and pitch (see [Roof Types](#), Section 9-02.3.5);
6. Door and window patterns (see [Rhythm](#), Section 9-02.3.11, and [Details](#), Section 9-02.3.9);
7. Characteristic local forms (stoops, porches, etc.) (see [Projections and Recessions](#), Section 9-02.3.8);
8. Expression of detailing (see [Details](#), Section 9-02.3.9). Details must reflect the style and period of the structure despite the existence of non-approved details in the development zone;

9. Materials (see *Surface Texture*, Section 9-02.3.6);
10. Surface texture (see *Surface Texture*, Section 9-02.3.6). Textures must reflect the style and period of the structure despite the existence of non-approved textures in the development zone;
11. Colors (see *Color*, Section 9-02.4.1). Colors must reflect the style and period of the structure despite the existence of non-approved colors in the development zone;
12. Gutters and down spouts (see *Details*, Section 9-02.3.9);
13. Peripheral walls and/or fencing (see *Enclosures*, Section 9-02.4.3);
14. Lighting fixtures (see *Details*, Section 9-02.3.9);
15. Landscape and hardscape (see *Landscaping*, Section 9-02.4.2). Landscaping will be reviewed for appropriateness of massing and plant materials on a case-by-case basis; and,
16. Mechanical Equipment (HVAC, satellite dishes, solar panels) (see *Utilities*, Section 9-02.4.4).

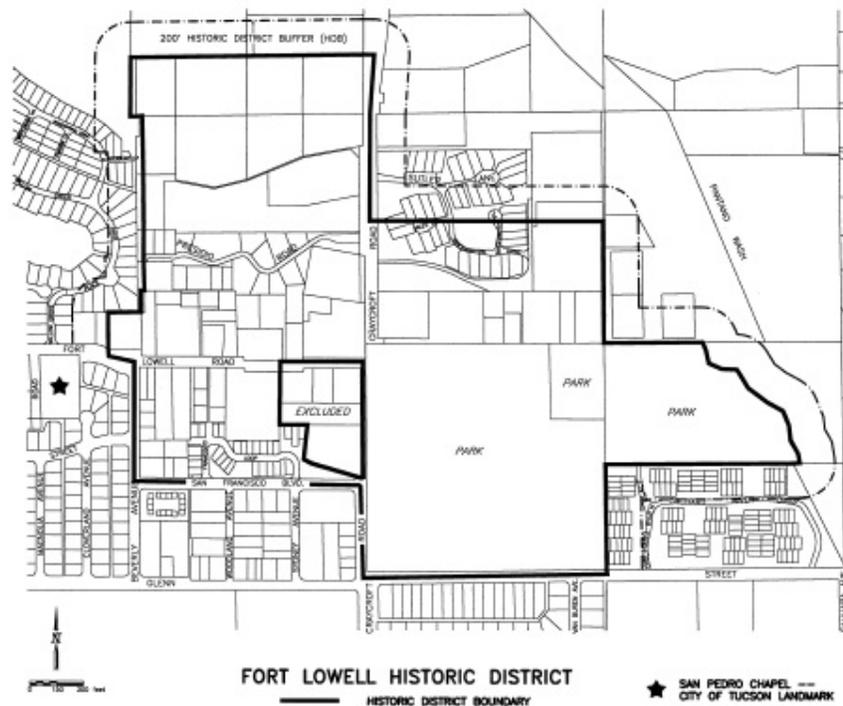
Level Three: Environmental Relationships

Level Three design criteria focus on the overall relationship of the proposed design to [site](#) surroundings and character. The proposed design will be evaluated to determine whether it is appropriate with respect to the following:

1. Scale (see *Building Form*, Section 9-02.3.10);
2. Rhythm of the block space (see *Rhythm*, Section 9-02.3.11);
3. Orientation (see [Site Utilization](#), Section 9-02.3.7);
4. Proportion (see *Proportion*, Section 9-02.3.4);
5. Ground cover and plantings (see *Landscaping*, Section 9-02.4.2);
6. Parking Requirements (see *Parking*, Section 9-02.6.0); and,
7. General character of the neighborhood (see *General*, Section 9-02.3.1).

7.5 Fort Lowell Historic Preservation Zone (HPZ)

A. **Background.** The Fort Lowell Historic Preservation Zone, an area of approximately 150 acres, is located southwest of the confluence of the Tanque Verde, Pantano, and Rillito Washes. The map below shows HPZ boundaries.



A 1995 survey of the HPZ lists approximately 30 Contributing Historic Properties. In addition, nearly 70 recently constructed residences in the La Sonrisa, San Miguel, and Bosque Ranch developments are designated as Contributing Non-historic Properties. (See Technical Standard 9-02.8.0.) The area north of Fort Lowell Road was designated by the Pima County Board of Supervisors as a County Historic District in 1976. In 1978, in order to preserve the historical Fort remains, Hohokam [sites](#), and several biological communities, the area including and surrounding Fort Lowell Park was designated the "Fort Lowell Multiple Resource Area" and listed on the National Register of Historic Places. In 1981, the Mayor and Council designated the area south of Fort Lowell Road as the City Fort Lowell Historic Preservation Zone. Eleven years later, the city annexed the area between Fort Lowell Road and the Rillito and Pantano washes; the County and City Historic Preservation Zones were combined into one City Fort Lowell Historic Preservation Zone. San Pedro Chapel, located west of the HPZ boundary, was built by the people of the Village of El Fuerte in Mission Revival style and dedicated in 1932. It was designated as the first City Historic Landmark in 1982. In 1993, it was placed on the State and National Registers of Historic Places. The Fort Lowell neighborhood is a unique area in metropolitan Tucson, reflecting a wide range of historic, scenic, rural, and natural resources.

The first documented remains of settlement show a large community of Hohokam people, who lived and farmed in the area from about 300 to 1250 A.D. In 1873, the military began to build Fort Lowell. During the Fort days, a number of adobe homes were built to the east of Swan Road--on the road from the Fort to Tucson and are still in use. Just west of the Fort, the sutler's store, or the post trader's store, was built by John B. "Pie" Allen, an important historical figure in Tucson and the Arizona Territory. This structure was restored and is in use as a home today. Fort Lowell was the base of operations during the U.S. Army campaigns against the Apaches. The Fort was abandoned in 1891 and shortly thereafter, Sonoran and Chihuahuan farming and ranching families came north from Mexico to the rich bottomlands of the Rillito and Pantano washes. They adapted the deserted Fort buildings to their own use and as time passed, they acquired land and built homes. Moving west of the Fort, the Village of El Fuerte was established. At about the same time, Mormons established dairy farms and maintained the several irrigation ditches which had probably been built before the Fort by nearby farmers and ranchers. Originally from Utah and Colorado, as well as from the colonies in Chihuahua, these Mormons established the community of Binghampton, near Fort Lowell Road and Dodge Boulevard.

Because later growth was incremental and low density, the cultural landscape generally developed in harmony with the opportunities and limits of the area's natural resources. Increased development in recent years and a rapidly dropping water table have placed the remaining groves of mesquites at risk. Development criteria included within the HPZ ordinance, review guidelines developed by the Historic Zone Advisory Board, and policies established for the greater Fort Lowell area (in the Old Fort Lowell Neighborhood Plan) together help to maintain the historic, cultural, and natural resources of the area.

B. Architectural Character and Streetscape.

Houses in the Fort Lowell Historic Preservation Zone reflect a simple vernacular style with design roots in the Sonoran tradition. Distinct styles include Sonoran Military, Sonoran Ranch, Santa Fe-Sonoran Ranch, and Bungalow Vernacular. Structures are single story, of adobe or other masonry construction, with parapet flat roofs, although gabled roofs also occur in bungalow adaptations. Buildings have horizontal massing, with width predominating over height. Solid walls predominate over voids, such as windows and door openings. Exterior doors are usually placed flush with the inside wall creating a deeply recessed entry when viewed from the exterior or the street. Windows are installed flush with the outside wall, creating a shelf or window seat for the interior rooms. The area's rural and historic low density residential land uses resulted in random [site](#) utilization, irregular street setbacks, and organic rather than planned growth. This informal and incremental growth pattern is complemented by informality in landscaping design and plant materials. Generally, native plants are favored since they help maintain habitat values and complement vernacular house styles. Together architectural styles, [site](#) design, and landscaping reinforce the interdependent relationship that exists between the natural and cultural environments in the HPZ.

C. Specific Historic Preservation Zone Guidelines for the Fort Lowell Historic Preservation Zone.

In addition to the development criteria listed above, the following HPZ criteria provide additional guidance to applicants contemplating renovations or new construction. For a more detailed explanation, see the District's Guidelines available from the Fort Lowell Historic Advisory Board.

1. **Setbacks.** Historically, there has been great variety in front setbacks, rather than strict adherence to a prevailing setback. Projects will be evaluated for conformance to the general character or pattern of front and interior setbacks within the development zone.

2. **Site Utilization.** The informal, semi-rural, low-density quality of [site](#) design should be continued throughout the HPZ for new construction.

3. **Proportion.** Buildings are greater in length than in height and roof lines are irregular.

4. **Pattern/Rhythm.** Solid walls predominate over voids. Openings should be a minimum of two feet from building corners. Symmetry is not architecturally characteristic in the Fort Lowell HPZ.

5. **Roof Types.** Flat roofs with parapets are characteristic. Sloping porch roofs may be shingled or metal sheeting. Mission tile is not a compatible material.

6. **Texture.** Building walls can be lime or mud stucco (plaster) with smooth or sand finish or exposed sun-dried adobe. When stucco is being replaced on the entire exterior of a Contributing historic building or structure, a lime or mud stucco should be used; cement based stucco should not be used. When stucco is being repaired, the same material should be used. On Contributing historic buildings and structures, stucco application with expansion joints and modern textures are not allowed. Buildings and structures that were stuccoed historically should not have their stucco sheathings entirely or partially removed without being replaced with new stucco.

7. **Color.** Soft earth tones of light to middle value predominate in the area. However, dark colors and stark primaries should be avoided. Blue window trim is common.

Property owners do not need [approval](#) for painting or repainting a structure. However, since color is important to the character of the Fort Lowell HPZ, the Advisory Board recommends that all repainting projects, regardless of size and scope, adhere to the color guidelines as stated above.

8. **Landscaping.** Landscaping should be informal native desert plant materials. As much of the original vegetation as possible should be retained. [Stormwater](#) runoff is best retained and detained on [site](#) for passive irrigation use.

9. **Architectural Detail.** Frame-and-panel or plank wooden doors are most common in the area and French doors are acceptable even though not historic. French doors may be installed if they are not visible from streets or adjacent properties. Double-hung or casement wood frame windows are most historically correct. Painted steel casement windows with divided lights are acceptable with the vertical dimension greater than the horizontal. Arched openings over the main

entrance may be appropriate, although rows of arches characteristic of Spanish Colonial or Mediterranean architecture are not. Exposed wooden lintels over window and door openings are encouraged.

7.6 San Xavier Environs

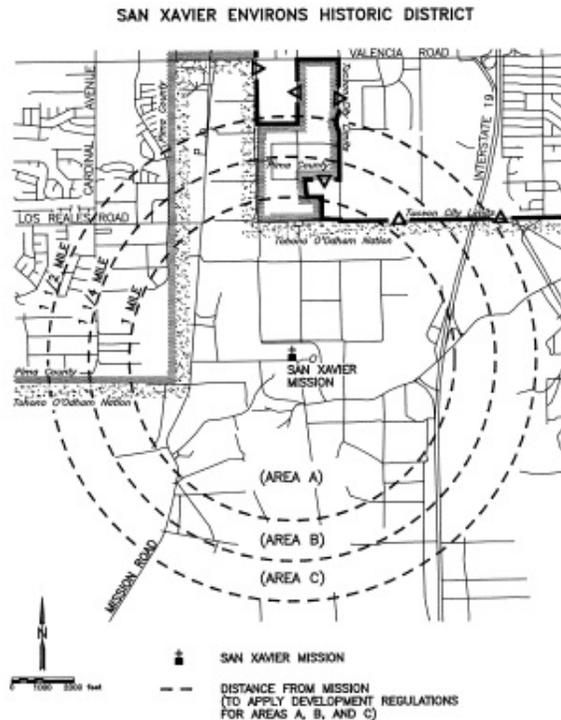
A. Background.

The San Xavier Environs Historic Preservation Zone applies to an area extending one and one-half miles from San Xavier Mission (see map below).

This HPZ was established in 1972 by Pima County in order to conserve heritage values by designating an “area of influence” from the Mission, the county’s most recognized historic landmark. When areas included in the county-designated San Xavier Environs Historic Zone were annexed by the City of Tucson in 1994, Pima County Code provisions were adopted by the Mayor and Council to provide comparable protection within the San Xavier “area of influence” for properties between Valencia Road and Los Reales Road.

B. Specific Development Regulations.

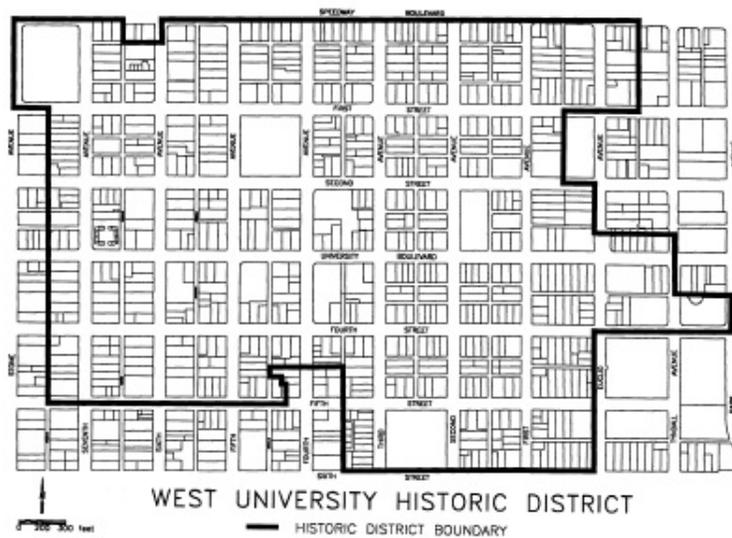
Specific regulations of the City San Xavier Environs Historic Preservation Zone apply to those areas within the city limits that lie within a one and one-half mile radius from the Mission. Other provisions of the Historic Preservation Zone ordinance do not apply within the San Xavier Environs Historic Preservation Zone. The San Xavier Environs HPZ is divided into three sub-areas as shown on the map. Each of these areas has maximum residential densities (two residences per 36,000 square feet in Area A; four residences per 36,000 square feet in Area B; and six residences per 36,000 square feet in Area C with development standards that address lighting, screening, and height restrictions. An applicant with property within the San Xavier Environs HPZ should refer to the UDC (Section 2.8.8.13) for more detailed information.



7.7 West University Historic Preservation Zone (HPZ)

A. Background.

The West University HPZ is an approximately 60-block area located between the University of Arizona and downtown. District boundaries are shown on the map below.



The area was designated a HPZ by the City of Tucson in 1984. Prior to local designation, the District was listed on the National Register of Historic Places. The 1995 survey of the District lists more than 600 buildings or structures as Contributing Historic Properties. (See Technical Standard 9-02.8.0.)

B. Architectural Character and Streetscape.

The West University Historic Preservation Zone retains the residential scale pedestrian environment of an early 1900s community in the heart of metropolitan Tucson. While predominantly residentially developed, two commercial areas, on Fourth Avenue and University Boulevard, are located within the West University Historic Preservation Zone boundaries.

Although there are some Sonoran Transitional buildings in the West University neighborhood, reflecting Tucson's Spanish colonial and Mexican heritage, the majority of architectural and [site](#) design features in the HPZ arrived after the Southern Pacific Railroad in 1880. Some architectural styles, such as the Queen Anne, Victorian, and Neo-Classical Revival styles, were introduced from the Midwest and East Coast. Instead of being introduced to Tucson with their characteristics intact, several of these imported styles were intermixed, and the result is often referred to as Anglo-American Victorian. Victorian houses reflecting this eclectic style are generally constructed of brick and have complex roofs and intricate wood detailing. Other styles, such as Mission Revival, Spanish Colonial Revival, Western Stick Style, and the California Bungalow, arrived from the West Coast. The latter is the most characteristic style in the HPZ, and even this style was transformed over time to include variety in materials and detailing.

The West University HPZ includes bungalows that are quite small, two rooms wide and two or three rooms deep, and have a broad gable roof. Stuccoed brick is the most common material with wood structural members along the roof eaves and an exposed porch with tapered columns of stucco or stone. In spite of this rich diversity of design influences and styles, the buildings in the HPZ share homogeneity of scale and density - a collective character that contributes to the neighborhood's unique sense of place.

The relationship of houses to streets and alleys was also defined by imported design influences. In contrast to Sonoran row houses which lack front setbacks, houses in the West University neighborhood have uniform, albeit modest, setbacks copied from early 20th century City Beautiful style suburbs popular in the Midwest and East. In addition, nearly all the houses in the neighborhood, regardless of architectural style, include a clearly indicated front entry and front porch. Symmetrically placed front walks, sidewalks, a clearly defined planting strip between the sidewalk and street, and many mature trees collectively contribute to the area's pedestrian-friendly street character.

C. Specific District Guidelines.

In addition to development criteria described in this technical standard, the West University Historic Zone Advisory Board has prepared design guidelines applicable within the HPZ. The applicant should contact the Chair of the Advisory Board for a current copy of these specific HPZ guidelines.

9-02.8.0 HISTORIC PRESERVATION ZONES, SITES, AND STRUCTURES

8.1 General

A. Purpose. To establish a centralized list of neighborhoods, districts, [sites](#), and structures that have been designated as HISTORIC LANDMARK, CONTRIBUTING-HISTORIC, CONTRIBUTING-NONHISTORIC, NONCONTRIBUTING, and INTRUSION. The list also includes structures in the Downtown Heritage Incentive District which are either designated on the National Register of Historic Places or have the potential for designation. These lists are for the purpose of convenient accessibility, public awareness, and effective enforcement of city regulations on historic preservation.

B. Applicability. Listed within this standard are the districts, [sites](#), and structures designated as HISTORIC LANDMARK, CONTRIBUTING-HISTORIC, CONTRIBUTING NON-HISTORIC, NONCONTRIBUTING, and INTRUSION under the applicability of Chapter 23 of the Tucson Code or any city regulation that was in effect prior to the adoption of Section 2.8.8 of the UDC.

8.2 Historic Preservation Zones

Listed below are all the districts within the Historic Preservation Zone that have been designated by the Mayor and Council. As part of the list, all pertinent information relative to the District, such as historic structures, [sites](#), adoption information, boundaries, and permitted uses, will be included for proper implementation and enforcement.

8.3 Armory Park Historic District

A. Established: December 23, 1974, by Ordinance No. 4300.

Amended: November 14, 1983, by Ordinance No. 5902.

Amended: June 12, 1995, by Ordinance No. 8520.

Amended: July 10, 1995, by Ordinance No. 8544.

B. Boundaries and Location: The boundaries and location of the Armory Park Historic District are as designated on Map 2-1.

C. List of **HISTORIC LANDMARK, CONTRIBUTING-HISTORIC (CH), CONTRIBUTING-NONHISTORIC (CN), NONCONTRIBUTING (NHNC), and INTRUSION (I)**.

TAX PARCEL NUMBER	ADDRESS	STRUCTURE OR SITE STATUS
<u>BLOCK 99, CITY OF TUCSON</u>		
117-06-222 0	346 E. 12th St.	CH
117-06-223 0	340 E. 12th St.	CH
117-06-224 0	334-336 E. 12th St.	CH
117-06-225 0	328 E. 12th St.	CH
117-06-226 0		Vacant
117-06-227 0	316 E. 12th St.	CH
117-06-228 0	203 S. 4th Ave.	CH

117-06-229 0	211 S. 4th Ave.	CH
117-06-230 0		Vacant
117-06-231 0	218-226 S. 3rd Ave.	CH
117-06-232 0	219 S. 4th Ave.	CH
117-06-233 0	227 S. 4th Ave.	CH
117-06-234 0	244 & 266 S. Railroad Ave.	CH
117-06-235 0	228 S. 3rd Ave.	CH
117-06-236 0	230 S. 3rd Ave.	CH
117-06-237 0	236 S. 3rd Ave.	CH
	270 S. Railroad Ave.	CH
117-06-238 0	345 E. 13th St.	CH
117-06-239 0		Vacant
117-06-240 0	237 S. 4th Ave.	CH
117-06-241 0	245 S. 4th Ave.	CH
<u>BLOCK 100, CITY OF TUCSON</u>		
117-06-242 0	238-248 E. 12th St.	CH
117-06-243 0	214-216 E. 12th St.	CH
117-06-244 0		Vacant
117-06-248 0	211-219 S. 5th Ave.	CH
117-06-249 0		Parking Lot
117-06-250 0	225 S. Herbert Ave.	CH
117-06-251 0	218 S. 4th Ave.	CH
117-06-252 0	220 S. 4th Ave.	CH
117-06-253 0	227 S. Herbert Ave.	CH
117-06-254 0	229 S. Herbert Ave.	CH
117-06-256 0	225-227 S. 5th Ave.	CH

117-06-257 0	230 S. Herbert Ave.	CH
117-06-258 0	231-237 S. 5th Ave.	CH
117-06-259 0	231 S. Herbert Ave.	CH
117-06-260 0	228 S. 4th Ave.	CH
117-06-261 0	238 S. 4th Ave.	CH
117-06-262 0	246 S. 4th Ave.	CH
117-06-263 0	221-223 E. 13th St.	CH
117-06-264 0	219 E. 13th St.	CH
117-06-265 0	245 S. 5th Ave.	CH
<u>BLOCK 101, CITY OF TUCSON</u>		
117-06-267 0	300 S. 5th Ave./200 E. 13th St.	CH/NHNC
<u>BLOCK 102, CITY OF TUCSON</u>		
117-06-268 0	306 S. 3rd Ave.	CH
117-06-269 0	340 E. 13th St.	CH
117-06-270 A	330 E. 13th St.	CH
117-06-271 0	318 E. 13th St.	CH
117-06-273 A	312 S. 3rd Ave.	CH
117-06-274 A	331-337 S. Railroad Ave.	CN
117-06-274 B	322-328 S. 3rd Ave.	NHNC
117-06-275 0	319 S. 4th Ave.	CH
	319 S. Railroad Ave.	CH
117-06-276 0	329 S. 4th Ave.	CH
117-06-277 0	330 S. 3rd Ave.	CH
117-06-278 0	340 S. 3rd Ave.	CH
117-06-279 0	337 S. 4th Ave.	CH
117-06-280 0	345 S. 4th Ave.	NHNC

117-06-281 0	344 S. 3rd Ave.	CH
<u>BLOCK 107, CITY OF TUCSON</u>		
117-07-001 0	348 E. 14th St.	CH
117-07-002 0	340 E. 14th St.	CH
117-07-003 0	332 E. 14th St.	CH
117-07-004 0	330 E. 14th St.	CH
117-07-005 0	405 S. 4th Ave. 405-1/2 S. 4th Ave.	CH CH
117-07-006 0	417 S. 4th Ave.	CH
117-07-007 0	414 S. 3rd Ave.	CH
117-07-008 0	416-418 & 420-422 S. 3rd Ave. 417 S. Railroad Ave.	CH CH
117-07-009 0		Vacant
117-07-010 0	427 S. 4th Ave. 429-431 S. Railroad Ave.	CH CH
117-07-011 0	428 S. 3rd Ave.	CH
117-07-012 0	438 S. 3rd Ave.	CH
117-07-013 0	333 E. 15th St. 443 S. Railroad Ave.	CN CH
117-07-014 0	445 S. 4th Ave.	CH
117-07-015 0	446 S. 3rd Ave.	CH
<u>BLOCK 108, CITY OF TUCSON</u>		
117-07-017 0	406 S. 4th Ave.	CH
117-07-018 0	222 E. 14th St.	CH
117-07-019 0	220 E. 14th St.	CH
117-07-020 0	417 S. 5th Ave.	CH

117-07-021 0	414 S. 4th Ave.	CH
117-07-022 0	420 S. 4th Ave.	CH
117-07-023 0	419-421 S. 5th Ave.	CH
117-07-024 0	423 S. 5th Ave 423 S. Herbert Ave.	CH CH
117-07-024 0	423 S. 5th Ave. 423 S. Herbert Ave.	CH CH
117-07-025 0	429 S. 5th Ave. 429-1/2 S. 5th Ave.	CH CH
117-07-026 0		Vacant
117-07-027 0		Vacant
117-07-028 0	441 S. 4th Ave. 225 E. 15th St.	CH CH
117-07-029 0	437-441 S. 5th Ave.	CH
117-07-030 0	219 E. 15th St.	CH
117-07-031 0	445 S. 5th Ave.	CH
<u>BLOCK 109, CITY OF TUCSON</u>		
117-07-032 0	404-408 S. 5th Ave.	CH
117-07-033 0	138-140 E. 14th St.	CH
117-07-034 0	136 E. 14th St.	CH
117-07-035 0	126 E. 14th St.	CH
117-07-036 0	415-435 S. 6th Ave.	CH/CN
117-07-038 0	422 S. 5th Ave.	CH
117-07-041 0	422 S. Arizona Ave.	CH
117-07-042 0	424 S. Arizona Ave.	CH
117-07-043 0	424-426 S. 5th Ave. 425 S. Arizona Ave.	CH CH

117-07-044 A	438 S. Arizona Ave.	CH
117-07-044 B	436 S. 5th Ave.	CH
117-07-047 0	115 E. 15th St.	CH
117-07-048 0	125-129 E. 15th St.	CH
117-07-049 0	460 S. 5th Ave.	CN
<u>BLOCK 110, CITY OF TUCSON</u>		
117-07-050 0	502-506 S. 5th Ave.	CH
117-07-051 A	120 E. 15th St.	CH
117-07-052 A	505 S. 6th Ave.	CH
117-07-053 A	509 S. 6th Ave.	CH
117-07-054 0	508-512 S. 5th Ave.	CH
117-07-055 0	516 S. 5th Ave.	CH
117-07-056 0	522 S. 5th Ave.	CH
117-07-057 0	515 S. 6th Ave.	CH
117-07-058 0	521 S. 6th Ave.	CH
117-07-059 0	525 S. 6th Ave.	CH
117-07-060 0	530 S. 5th Ave.	CH
	530 S. Arizona Ave.	CH
117-07-061 0	534 S. 5th Ave.	CH
117-07-062 0	527-533 S. 6th Ave.	CH/NHNC
117-07-063 0	541 S. 6th Ave.	CH
117-07-064 0	115 E. 16th St.	CH
117-07-065 0	117-119 E. 16th St.	CH
117-07-066 0	543 S. 6th Ave.	CH
117-07-067 0	125 E. 16th St.	CH

117-07-068 0	544 S. 5th Ave.	CH
<u>BLOCK 111, CITY OF TUCSON</u>		
117-07-069 0	502 S. 4th Ave.	CH
117-07-070 0	226 E. 15th St.	CH
117-07-071 A	220-222 E. 15th St.	CH
117-07-071 B	501 S. 5th Ave.	CN
117-07-072 0	515-517 S. 5th Ave.	CH
117-07-073 0	518-520 S. Herbert Ave.	CH
117-07-074 0	522 S. Herbert Ave.	CH
117-07-075 0	524 S. Herbert Ave.	CH
117-07-076 A	512 S. 4th Ave.	CH
117-07-076 B	509 S. Herbert Ave.	CH
117-07-077 0	516 S. 4th Ave.	CH
	525-527 S. Herbert Ave.	CH
117-07-078 0	520 S. 4th Ave.	CH
	529 S. Herbert Ave.	CH
117-07-079 0	526 S. Herbert Ave.	CH
117-07-080 0	530 S. Herbert Ave.	CH
117-07-081 0	521 S. 5th Ave.	CH
117-07-083 0	529 S. 5th Ave.	CH
117-07-084 0	530-532 S. 4th Ave.	CH
117-07-085 0	542-544 S. 4th Ave.	CH
117-07-086 0	535 S. 5th Ave.	CH
117-07-087 0	537 S. 5th Ave.	CH
117-07-088 0	545 S. 5th Ave.	CN
	209 E. 16th St.	CH

117-07-089 0	546 S. 4th Ave.	CH
<u>BLOCK 112, CITY OF TUCSON</u>		
117-07-090 0	350 E. 15th St.	CN
117-07-091 0	330 E. 15th St. 505 S. 4th Ave.	CN CH
117-07-092 0	509-513 S. 4th Ave.	CH
117-07-093 A	512 S. 3rd Ave.	CN
117-07-095 A	521 S. 4th Ave.	CH
117-07-095 B		Vacant
117-07-096 0	523-527 S. 4th Ave. 526 S. Railroad Ave.	CH CH
117-07-097 A	528 S. 3rd Ave.	CH
117-07-097 B	529 S. Railroad Ave.	CH
117-07-098 0	536 S. 3rd Ave.	CH
117-07-099 0	546 S. 3rd Ave. 333-335 & 337-339 E. 16th St.	CH CH
117-07-100 0	537 S. 4th Ave.	CH
117-07-101 0	545 S. 4th Ave.	CH
<u>BLOCK 116, CITY OF TUCSON</u>		
117-07-103 0		Vacant
117-07-104 0		Vacant
117-07-105 0	424 E. 16th St.	CH
117-07-107 0	416 E. 16th St. 620 S. Bean Ave.	CH CH
117-07-108 0	412 E. 16th St.	CH
117-07-109 0	408 E. 16th St.	CH

117-07-110 0	617 S. 3rd Ave.	CH
117-07-111 0	619 S. 3rd Ave.	CH
117-07-112 0	621 S. 3rd Ave.	CH
117-07-113 0	622 S. Bean Ave.	CH
117-07-114 0	628 S. 2nd Ave.	CH
117-07-115 0	627 S. 3rd Ave.	CH
117-07-116 0	632 S. 2nd Ave.	CH
117-07-117 0	640 S. 2nd Ave.	CH
117-07-118 0	417-419 E. 17th St.	CH
117-07-119 0	415 E. 17th St.	CH
117-07-120 0	641 S. 3rd Ave.	CH
117-07-121 0	645 S. 3rd Ave.	CH
117-07-122 0	425 E. 17th St.	CH/NHNC
117-07-123 0	648 S. 2nd Ave.	CH
<u>BLOCK 117, CITY OF TUCSON</u>		
117-07-124 B	604 S. 3rd Ave.	CH
117-07-125 B	336 E. 16th St.	CH
117-07-126 0	334 E. 16th St.	CH
117-07-127 0	330 E. 16th St.	CH/NHNC
117-07-128 0	601-603 S. 4th Ave.	CH
117-07-129 0	605-607 S. 4th Ave.	CH
117-07-130 0	619 S. 4th Ave.	CH
117-07-131 A	606 S. Railroad Ave.	CH
117-07-132 0	614 S. 3rd Ave.	CH
117-07-133 0	620 S. 3rd Ave.	CH
117-07-134 0	622 S. Railroad Ave.	CH

117-07-135 A	621-623 S. 4th Ave.	CH
117-07-136 0	627-629 S. 4th Ave.	CH
	630 S. Railroad Ave.	CH
117-07-137 0	630 S. 3rd Ave.	CH
117-07-138 0	636-638 S. 3rd Ave.	CH
117-07-139 0	639 & 641-643 S. Railroad Ave.	CH
117-07-140 0	637 S. 4th Ave.	CH
	636 S. Railroad Ave.	CH
117-07-141 0	647 S. 4th Ave.	CH
117-07-142 0	646 S. 3rd Ave.	CH
<u>BLOCK 118, CITY OF TUCSON</u>		
117-07-143 0	600 S. 4th Ave.	CH
117-07-144 0	230 E. 16th St.	CH
117-07-145 0	601 & 607 S. 5th Ave.	CH
	607-1/2 S. 5th Ave.	CH
	606 S. Herbert Ave.	CH
117-07-146 0	611 S. 5th Ave.	CH/CN
117-07-147 0	610 S. 4th Ave.	NHNC
117-07-148 0	620 S. 4th Ave.	CH/CN
117-07-149 0	619 S. 5th Ave.	CH
117-07-150 0	625 S. 5th Ave.	CH
117-07-151 0	629 S. 5th Ave.	CH
	627 S. Herbert Ave.	CH
117-07-152 0	630 S. 4th Ave.	CH
117-07-153 0	640 S. 4th Ave.	CH
117-07-154 0	233 E. 17th St.	CH

117-07-155 0	227 E. 17th St.	CH
117-07-156 0	631 S. 5th Ave.	CH
	636 S. Herbert Ave.	CH
117-07-157 A	643 S. 5th Ave.	CH
117-07-157 B	647 S. 5th Ave.	CH
117-07-158 0	215 E. 17th St.	CH
117-07-159 0	217 E. 17th St.	CH
117-07-160 0	650 S. 4th Ave.	CH
<u>BLOCK 119, CITY OF TUCSON</u>		
117-07-161 0	600 S. 5th Ave.	CH
117-07-162 0	120 E. 16th St.	CH
117-07-163 0	112-114 E. 16th St.	CH
117-07-164 0	603-605 S. 6th Ave.	CH
117-07-165 0	611 S. 6th Ave.	CH
117-07-166 0	612 S. 5th Ave.	CH
117-07-167 0	618 S. 5th Ave.	CH
117-07-168 0	620 S. 5th Ave.	CH
117-07-169 0	619 S. 6th Ave.	CN
	621 S. 6th Ave.	CH
	627 S. 6th Ave.	NHCH
117-07-170 0	617 S. 6th Ave.	NHNC
117-07-171 0	629 S. 6th Ave.	CH
117-07-172 0	632 S. 5th Ave.	CH/NHNC
117-07-173 0	634 S. 5th Ave.	CH
117-07-174 0	631-639 S. 6th Ave.	CH
	631 S. Arizona Ave.	CH

117-07-175 0	647 S. 6th Ave.	CH
117-07-176 0	106 E. 17th St.	CH
117-07-177 0	644 S. 5th Ave.	CH
<u>BLOCK 122, CITY OF TUCSON</u>		
117-07-210 A	148 E. 17th St.	CH
117-07-211 C	140 E. 17th St.	CH
117-07-212 0	132 E. 17th St.	CN
117-07-213 0	105 E. 17th St.	CH
117-07-214 0	705 S. 6th Ave.	CH
	102 E. 17th St.	CH
117-07-215 0	707-709 S. 6th Ave.	CH
117-07-216 A	711 S. 6th Ave.	CN
117-07-218 0	720 S. 5th Ave.	I
117-07-222 0	725 S. 6th Ave.	NHNC
117-07-224 0	738 S. 5th Ave.	CH
117-07-225 0	735 S. 6th Ave.	CH
117-07-226 0	747 S. 6th Ave.	CH
117-07-227 0	742-744 S. 5th Ave.	CH
<u>BLOCK 123, STARR'S RESUB, CITY OF TUCSON</u>		
117-07-285 0		Vacant
117-07-286 0		Vacant
117-07-287 0		Vacant
117-07-288 0	218 E. 17th St.	CH
117-07-289 0	216 E. 17th St.	CH
117-07-290 0	212 E. 17th St.	CH
117-07-291 0	701-703 S. 5th Ave.	CH

117-07-292 0	715-717 S. 5th Ave.	CH
117-07-293 0	723 S. 5th Ave.	CH
117-07-294 0	724-728 S. Herbert Ave.	CH
117-07-295 0	730-734 S. Herbert Ave.	CH
117-07-296 0	725-729 S. 5th Ave.	CH
117-07-297 A		Vacant
117-07-297 B	748 S. 4th Ave.	CN
117-07-298 A	731 S. 5th Ave.	CN
117-07-298 B	736 S. Herbert Ave.	CN
117-07-299 0	733 S. 5th Ave.	CH
	740-742 S. Herbert Ave.	CH
117-07-300 0		Vacant
117-07-301 0	749 S. 5th Ave.	CH
117-07-302 0	215 E. 18th St.	CH
117-07-303 0	731-735 S. Herbert Ave.	NHNC
117-07-304 0	722 S. 4th Ave.	CH
117-07-305 0		Vacant
<u>BLOCK 124, CITY OF TUCSON</u>		
117-07-228 0	702 S. 3rd Ave.	CH
117-07-229 0	326 E. 17th St.	CH
117-07-230 0	320 E. 17th St.	CH/CN
117-07-231 0	300-310-316 E. 17th St.	CH
117-07-232 0		Easement
117-07-233 0	714 S. 3rd Ave.	CH
117-07-234 0	720 S. 3rd Ave.	CH
117-07-235 0		Easement

117-07-236 0	719 S. 4th Ave.	CH
117-07-237 0	727-729 S. 4th Ave.	CH
117-07-238 0	731 S. 4th Ave.	CH
117-07-239 0	731-733 S. Railroad Ave.	CH
117-07-240 0	728 S. 3rd Ave.	CH
117-07-241 0	732 S. 3rd Ave.	CH
117-07-242 0	736 S. 3rd Ave.	CH
117-07-243 0	742 S. 3rd Ave.	CH
117-07-244 0	741 S. 4th Ave.	CH
117-07-245 0	749 S. 4th Ave.	CH
117-07-246 0	321 E. 18th St.	CH
117-07-247 0	331 E. 18th St.	CH
117-07-248 0	337 E. 18th St.	CH
	744 S. 3rd Ave.	CH
<u>BLOCK 125, CITY OF TUCSON</u>		
117-07-249 0	704 S. 2nd Ave.	CH
117-07-250 0	428 E. 17th St.	CH
117-07-251 0	426 E. 17th St.	CH
117-07-252 A	701 S. 3rd Ave.	CH
	404 E. 17th St.	CH
117-07-252 B	420-422 E. 17th St.	CH
117-07-253 A	707-709 S. 3rd Ave.	CH
117-07-254 0		Vacant
117-07-255 0	706 S. 2nd Ave.	CH
117-07-256 0	710 S. 2nd Ave.	CH
117-07-257 0	707-709 S. Bean Ave.	CH

117-07-258 A	715 S. 3rd Ave.	CH
117-07-258 B		Vacant
117-07-259 0	720 S. 2nd Ave.	CH
117-07-260 0	730-732 S. 2nd Ave.	CN
	728 S. Bean Ave.	CN
117-07-261 0	727-729 S. 3rd Ave.	CH
117-07-262 0	733 S. 3rd Ave.	CH
117-07-263 0	741 S. 3rd Ave.	CH
	419 E. 18th St.	CH
	419-1/2 E. 18th St.	CH
117-07-264 0	435 E. 18th St.	I
117-07-267 0		Vacant
117-07-268 0	415 E. 18th St.	CH
<u>BLOCK 126, CITY OF TUCSON</u>		
117-07-271 0		Vacant
117-07-272 0	516 E. 17th St.	CH
117-07-274 A	502 E. 17th St.	CH
117-07-275 0	707 S. 2nd Ave.	CH
117-07-276 0	717 S. 2nd Ave.	CH
117-07-277 0	721 S. 2nd Ave.	CH
117-07-279 0	731 S. Jacobus Ave.	CH
117-07-281 0	729 S. 2nd Ave.	CH
117-07-282 0	739 S. 2nd Ave.	CH
117-07-283 0	739 (Rear) S. 2nd Ave.	CH
117-07-284 0	749 S. 2nd Ave.	CH
<u>BLOCK 127, CITY OF TUCSON</u>		

117-08-002 0	520 E. 18th St.	CH
117-08-003 0	516 E. 18th St.	CH
117-08-004 0	510 E. 18th St.	CH
117-08-005 0	502 E. 18th St.	CH
117-08-006 0	821 S. 2nd Ave.	CH
117-08-007 0	823 S. 2nd Ave.	CH
117-08-009 0	826 S. Jacobus Ave.	CH
117-08-010 0	825 S. 2nd Ave.	CH
117-08-011 0	831 S. 2nd Ave.	CH
	831 S. Jacobus Ave.	CH
117-08-012 0	519 E. 19th St.	CH
117-08-014 0	849 S. 2nd Ave.	CH
<u>BLOCK 128, CITY OF TUCSON</u>		
117-08-016 0	802 S. 2nd Ave.	CH
117-08-017 A	430 E. 18th St.	CH
	430-1/2 E. 18th St.	CH
117-08-017 B	426-428 E. 18th St.	CH
117-08-018 0	420 E. 18th St.	CH
117-08-020 A	801 S. 3rd Ave.	CH
117-08-021 A	806 S. Bean Ave.	CH
117-08-021 C	807 S. 3rd Ave.	CH
117-08-022 0	815 S. Bean Ave.	CH
117-08-023 0	814 S. 2nd Ave.	CH
117-08-024 0	820 S. 2nd Ave.	CH
117-08-025 0	811 S. 3rd Ave.	CH
117-08-026 0	815 S. 3rd Ave.	CH

117-08-027 0	817 S. 3rd Ave.	CH/CN
117-08-028 0	826 S. 2nd Ave.	CH
117-08-029 0	838 S. 2nd Ave.	CH
117-08-030 0	821-825 S. 3rd Ave.	CH
117-08-031 0	837 S. 3rd Ave.	CH
117-08-032 0	419 E. 19th St.	CH
117-08-033 0	427 E. 19th St.	CH
117-08-034 0	846-848 S. 2nd Ave.	CH
<u>BLOCK 129, CITY OF TUCSON</u>		
117-08-035 0	346 E. 18th St.	CH
117-08-036 0	342 E. 18th St.	CH
117-08-037 0	330 E. 18th St.	NHNC
117-08-038 0	320-322 E. 18th St.	CH
117-08-039 0	803-807 S. 4th Ave.	CH
117-08-040 0	811 S. 4th Ave.	CH
117-08-041 A	814 S. 3rd Ave.	CH
117-08-041 B	814 S. Railroad Ave.	CH
117-08-042 0	820 S. 3rd Ave.	CH
117-08-043 0	820 S. Railroad Ave.	CH
117-08-044 0	821 S. 4th Ave.	CH
117-08-045 0	825 S. 4th Ave.	CH
117-08-046 0	822 S. 3rd Ave.	CH
117-08-047 0	826 S. 3rd Ave.	CH
117-08-048 0	825 S. Railroad Ave.	CH
117-08-049 A	837 S. Railroad Ave.	CH

117-08-051 0	847-849 S. 4th Ave.	CN
117-08-052 0	365 E. 19th St.	CH
117-08-053 0	830 S. 3rd Ave.	CH
<u>BLOCK 130, CITY OF TUCSON</u>		
117-08-054 0	802 S. 4th Ave.	CH
117-08-055 0	808 S. 4th Ave.	CH
117-08-056 0	222 E. 18th St.	CH
117-08-057 0	803 S. 5th Ave.	CH
117-08-058 0	813 S. 5th Ave.	CH
117-08-059 0	806 S. Herbert Ave.	CH
117-08-060 0	810 S. Herbert Ave.	CH
117-08-061 0	810 S. 4th Ave.	CH
117-08-062 0	812-814 S. 4th Ave.	CH
117-08-063 D	822 S. 4th Ave.	CH
117-08-064 0	812 S. Herbert Ave.	CH
117-08-065 0	819 S. 5th Ave.	CH
117-08-066 0	819-1/2 S. 5th Ave.	CH
117-08-067 A	818 S. Herbert Ave.	CH
117-08-068 0	827 S. Herbert Ave.	CH
117-08-069 0	824 S. 4th Ave.	CH
117-08-070 A	840 S. 4th Ave.	CH
117-08-071 0	840 S. Herbert Ave.	CH
117-08-072 A	821 S. 5th Ave.	CH
117-08-073 0	847 S. 5th Ave.	CH
117-08-074 0	215 E. 19th St.	CH
117-08-075 A	848 S. 4th Ave.	CH

117-08-075 B	848 S. 4th Ave.	CN
<u>BLOCK 131, CITY OF TUCSON</u>		
117-08-076 0		Vacant
117-08-081 0	812 S. 5th Ave.	CH
117-08-082 0	822 S. 5th Ave.	CH
117-08-083 0	818-820 S. Arizona Ave.	CH
117-08-087 0	827 S. Arizona Ave.	CH
117-08-088 0	828 S. 5th Ave.	CH
117-08-089 0	844 S. 5th Ave.	CH
117-08-092 0	850 S. 5th Ave.	CN
<u>BLOCK 226, CITY OF TUCSON</u>		
117-13-174 0	204-214 S. Scott Ave.	CH
<u>BLOCK 231, CITY OF TUCSON</u>		
117-14-072 A	260 S. Scott Ave.	NHNC
117-14-073 B	31-33 & 35 E. McCormick St.	CH
117-14-078 A	330 S. Scott Ave.	CH
117-14-080 A	336-340 S. Scott Ave.	CH
117-14-083 0	344 S. Scott Ave.	CH
117-14-084 0	346 S. Scott Ave.	CH
<u>BLOCK 232, CITY OF TUCSON</u>		
117-14-085 0	408 S. 6th Ave.	CH
117-14-086 0	40 E. 14th St.	CH
117-14-090 0	410 S. 6th Ave.	CH
117-14-091 0	35 E. 15th St.	CH
117-14-092 0	35 E. 15th St.	CH
117-14-094 0	385 S. Stone Ave.	CH

117-14-095 0	35 E. 15th St.	CH
117-14-096 0	35 E. 15th St.	CH
117-14-097 0	25 E. 15th St.	CH
117-14-098 0	23 E. 15th St.	CH
117-14-100 0	19 E. 15th St.	CH
117-14-101 0	417-419 S. Stone Ave.	CH
<u>BLOCK 238, CITY OF TUCSON</u>		
117-14-200 0	502 S. 6th Ave.	CH
117-14-201 0	28 E. 15th St.	CH
117-14-202 0	24 E. 15th St.	CH
117-14-203 0	16 E. 15th St.	CH
117-14-204 0	443 S. Stone Ave.	CH
117-14-205 B	447 S. Stone Ave.	CH
117-14-207 0	512 S. Russell Ave.	CH
117-14-208 A	516 S. Russell Ave.	CH
117-14-209 0	512-514 S. 6th Ave.	CH
	511 S. Russell Ave.	CN
117-14-210 0	522 S. 6th Ave.	CH
117-14-211 0	521-523 S. Russell Ave.	CH
117-14-213 0	475 S. Stone Ave.	CH
	522 S. Russell Ave.	CH
117-14-215 0	526-528 S. 6th Ave.	CH
117-14-216 A	538 S. 6th Ave.	CN
	535 S. Russell Ave.	CN
117-14-220 0	545 S. Russell Ave.	CH
117-14-221 0	544 S. 6th Ave.	CH

<u>BLOCK 258, CITY OF TUCSON</u>		
117-17-032 0	71 E. 13th St.	CH
117-17-033 0	36-39 E. 13th St.	CH
117-17-034 0	273 S. Scott Ave.	CH
117-17-035 0	277 S. Scott Ave.	CH
117-17-036 0	314 S. 6th Ave.	NHNC
	316 S. 6th Ave.	CH
117-17-037 0	324 S. 6th Ave.	CH
117-17-038 0	281-283 S. Scott Ave.	CH
117-17-039 0	285 S. Scott Ave.	CH
117-17-040 0	287 S. Scott Ave.	CH
	287-1/2 S. Scott Ave.	CH
117-17-041 0	334 S. 6th Ave.	CH
117-17-042 0	344 S. 6th Ave.	CH
117-17-043 0	346-348 S. 6th Ave.	CH
	81-83 E. 14th St.	CH
117-17-044 0	343 S. Scott Ave.	CH
<u>BLOCK 259, CITY OF TUCSON</u>		
117-17-045 0	200 E. 13th St.	NHNC
117-17-046 0		I
117-17-047 0		I
117-17-048 0	307 S. 6th Ave.	CH
117-17-049 0	315 S. 6th Ave.	CN
117-17-050 0	321 S. 6th Ave.	CH
	320 S. Arizona Ave.	CH
117-17-052 0	333 S. 6th Ave.	I

117-17-054 0	337 S. 6th Ave.	CH
117-17-055 0	345-347 S. 6th Ave.	CH
117-17-056 0	115 E. 14th St.	CH
117-17-057 0	117 E. 14th St.	CH
<u>BLOCK 260, CITY OF TUCSON</u>		
117-17-058 0	220 S. 6th Ave.	CH/NHNC
	220 S. 6th Ave.	CH
<u>BLOCK 261, CITY OF TUCSON</u>		
117-07-059 0	200 (Block) S. 5th Ave.	CH
117-07-060 0	220 S. 5th Ave.	CN

8.4 Barrio Historico Historic District

A. Established: April 28, 1975, by Ordinance No. 4307.

Amended: August 7, 1995, by Ordinance No. 8555.

Amended: November 27, 1995, by Ordinance No. 8611.

B. Boundaries and Location: The boundaries and location of the Barrio Historico Historic District are as designated on Map 2-2.

C. List of **HISTORIC LANDMARK, CONTRIBUTING-HISTORIC (CH), CONTRIBUTING-NONHISTORIC (CN), NONCONTRIBUTING (NHNC), and INTRUSION (I)**.

TAX PARCEL NUMBER	ADDRESS	STRUCTURE OR SITE STATUS
<u>BLOCK 120, CITY OF TUCSON</u>		
117-07-181 0	127 W. 17th St.	CH
117-07-182 0	129 W. 17th St.	CH
117-07-183 0	135 W. 17th St.	CH
117-07-184 0	141 W. 17th St.	CH
117-07-185 0		Vacant
117-07-186 0	567 S. 8th Ave.	CH
117-07-187 0		Vacant

117-07-188 0	708 S. Rubio Ave.	CH
<u>BLOCK 221, CITY OF TUCSON</u>		
117-13-072 0	357 W. Simpson St.	CH
117-13-095 B	354-356 S. Main Ave.	CH
117-13-097 0		Parking Lot
117-13-098 0	418 S. Main Ave. (El Tiradito Wishing Shrine)	LANDMARK
117-13-099 0	420 S. Main Ave.	CH
117-13-100 0	424 S. Main Ave.	CN
<u>BLOCK 228, CITY OF TUCSON</u>		
117-14-014 A	201-203 W. Cushing St. 310 S. Meyer Ave.	NHNC CN
117-14-015 0	384-388 S. Meyer Ave.	CH
117-14-017 0		Vacant
117-14-019 0	207-211 W. Simpson St.	CH
117-14-020 0	319 W. Simpson St.	CH
117-14-022 0	373-381 S. Main Ave.	CH
117-14-023 0	361 S. Main Ave.	CH
117-14-024 0	351 S. Main Ave.	CH
<u>BLOCK 233, CITY OF TUCSON</u>		
117-14-102 0		Parking Lot
117-14-103 0	340 S. Stone Ave.	NHNC
117-14-104 0	376 S. Stone Ave.	CH/CN
117-14-105 0	38-40 W. Cushing St.	CH
117-14-106 0		Parking Lot
117-14-107 0	58 W. Cushing St.	CH
117-14-108 C	62-70 W. Cushing St.	CH

117-14-109 0	78 W. Cushing St.	CH
117-14-110 0	287-297 S. Convent Ave.	CH
117-14-111 0	305-307 S. Convent Ave.	CH
117-14-112 0	317 S. Convent Ave.	CH
117-14-113 0		Parking Lot
117-14-114 0	69-91 W. Simpson St.	CH
117-14-116 0	63-65 W. Simpson St.	CH
117-14-117 0	53 W. Simpson St.	CH
117-14-118 0	43 W. Simpson St.	CH/CN
117-14-119 0	25 W. Simpson St.	CH
117-14-120 0	388 S. Stone Ave.	CH
117-14-121 0	396 S. Stone Ave.	CH
<u>BLOCK 234, CITY OF TUCSON</u>		
117-14-122 0	292-296 S. Convent Ave.	CH
117-14-125 0	310-314 S. Convent Ave.	CH
117-14-126 0	102 W. Cushing St.	CH
117-14-127 0		Parking Lot
117-14-128 0	316-318 S. Convent Ave. 130 W. Cushing St.	CH/CN CN
117-14-129 0		Parking Lot
117-14-130 0		Parking Lot
117-14-131 0	198 W. Cushing St.	CH
117-14-132 0	363 S. Meyer Ave.	CH
117-14-134 0	371-379 S. Meyer Ave.	CH/CN
117-14-135 0		Vacant
117-14-136 0	135-139 & 141-147 W. Simpson St.	CH

117-14-137 0	330-332 S. Convent Ave.	CH/CN
117-14-138 A	334-340 S. Convent Ave.	CN
117-14-141 0	101 W. Simpson St.	CH
<u>BLOCK 235, CITY OF TUCSON</u>		
117-14-142 0		Vacant
117-14-143 0		Vacant
117-14-144 0		Vacant
117-14-145 0		Vacant
117-14-146 0	196 W. Simpson St.	CH
117-14-147 0		Parking Lot
117-14-148 0		Parking Lot
117-14-149 0		Parking Lot
117-14-150 0	453 S. Main Ave.	CH
117-14-151 0	485 S. Main Ave.	CH
117-14-152 0	235 W. Kennedy St.	CH
117-14-153 0	221 W. Kennedy St.	CH
117-14-154 0		Vacant
117-14-155 0		Vacant
<u>BLOCK 236, CITY OF TUCSON</u>		
117-14-156 0	116 W. Simpson St.	CH
	364-370 S. Convent Ave.	CH
117-14-157 0	382 S. Convent Ave.	CH
117-14-158 0	136 W. Simpson St.	CH
117-14-159 0	150 W. Simpson St.	CH
117-14-160 0	415 S. Meyer Ave.	CH

117-14-161 0	417 S. Meyer Ave.	CN
117-14-162 A		Vacant
117-14-163 A	447-449 S. Meyer Ave.	CH
117-14-164 0		Vacant
117-14-165 0	155-157 W. Kennedy St.	CH
117-14-166 0	149 W. Kennedy St.	CH
117-14-167 A	396 S. Convent Ave.	CH/CN
117-14-167 C	394 S. Convent Ave.	CN
117-14-167 D	392 S. Convent Ave.	CN
117-14-169 0	145 W. Kennedy St.	CH
117-14-172 C	408 S. Convent Ave.	CH/CN
117-14-172 D	136 W. Kennedy St.	CN
117-14-174 0	418 S. Convent Ave.	CH
<u>BLOCK 237, CITY OF TUCSON</u>		
117-14-176 0	350 S. Stone Ave.	CH
117-14-177 0	454 S. Stone Ave.	NHNC
117-14-178 0	24-28 W. Simpson St.	CH
117-14-179 0	38 W. Simpson St.	CH
117-14-180 0	46 W. Simpson St.	CH
117-14-181 0	54-64 W. Simpson St.	CH
117-14-183 0	92 W. Simpson St.	CH
117-14-184 0	355 S. Convent Ave.	CH
117-14-185 0	371 S. Convent Ave.	CN
117-14-186 0	387-391 S. Convent Ave.	CH
117-14-187 A	391-395 S. Convent Ave.	CH
117-14-189 A	413 S. Convent Ave.	CN

117-14-191 A	89 W. Kennedy St.	NHNC
117-14-192 0		Vacant
117-14-193 0	61 W. Kennedy St.	CH
117-14-194 0		Vacant
117-14-195 0	59 W. Kennedy St.	CH
117-14-196 0	53 W. Kennedy St.	CH
117-14-197 0	49 W. Kennedy St.	CH
117-14-198 A	21-31 W. Kennedy St.	CH
117-14-199 A	482 S. Stone Ave.	CH
<u>BLOCK 240, CITY OF TUCSON</u>		
117-14-237 0	504 S. Stone Ave.	CH
117-14-239 0	34-38 W. Kennedy St.	CH
117-14-240 0	42 W. Kennedy St.	CH
117-14-241 0	46-48 W. Kennedy St.	CH
117-14-242 0		Vacant
117-14-243 0	56 W. Kennedy St.	CH
117-14-245 0	60 W. Kennedy St.	CH
117-14-246 0	74 W. Kennedy St.	CH
117-14-247 0	78 W. Kennedy St.	CH/CN
117-14-248 A	86-92 W. Kennedy St.	CH
117-14-249 0	441-447 S. Convent Ave.	CN
117-14-250 A	501 S. Convent Ave.	CN
117-14-251 0	459 S. Convent Ave.	CH
117-14-252 A	463 S. Convent Ave.	CH
117-14-252 B	467 S. Convent Ave.	CH
117-14-253 0	469-471 S. Convent Ave.	CH

117-14-254 0	473-481 S. Convent Ave.	CH
117-14-255 0		Vacant
117-14-256 0		Vacant
117-14-264 0	499 S. Convent Ave.	CH
117-14-265 0	483 S. Convent Ave.	CH/CN
117-14-266 0	517 S. Convent Ave.	CH
117-14-267 0		Vacant
117-14-268 0		Vacant
117-14-269 0	519 S. Convent Ave.	CH
117-14-271 0	531 S. Convent Ave.	CH
117-14-273 0	116 W. 17th St.	CH
117-14-274 0	128 & 136 W. 17th St.	CH
117-14-275 0	503 S. Convent Ave.	CH
117-14-276 0	507 S. Convent Ave.	CH
117-14-277 0	44 W. 17th St.	CH/NHNC
<u>BLOCK 241, CITY OF TUCSON</u>		
117-14-283 0	436 S. Convent Ave.	CH
117-14-285 0	140 W. Kennedy St.	CH
117-14-286 0	150 W. Kennedy St.	CH
117-14-287 0	168 W. Kennedy St.	CH
	487 S. Meyer Ave.	CH
117-14-288 0	499 S. Meyer Ave.	CH
117-14-289 0	505 S. Meyer Ave.	CH
117-14-290 0		Vacant
117-14-291 0	509-511 S. Meyer Ave.	CH

117-14-292 0	525 S. Meyer Ave.	CH
117-14-294 0	529 S. Meyer Ave.	CH
117-14-295 B	482-484 S. Convent Ave.	CH
117-14-296 0	492-494 S. Convent Ave.	CH
117-14-297 0	496 S. Convent Ave.	CH
117-14-298 B	500-502 S. Convent Ave.	CH
117-14-299 A	504-506 S. Convent Ave.	CH
117-14-300 0	551-557 S. Meyer Ave.	CH
117-14-301 0	555 S. Meyer Ave.	CH
117-14-303 0	541-545 S. Meyer Ave.	CH
117-14-307 B	180 W. 17th St.	CN
117-14-308 A	510 S. Convent Ave.	CH
117-14-309 0		Vacant
<u>BLOCK 242, CITY OF TUCSON</u>		
117-14-312 0	486-498 S. Meyer Ave.	CH
117-14-313 0		Vacant
117-14-314 0	517 & 529 S. Main Ave.	CH
117-14-315 0	531 S. Main Ave.	CH
117-14-318 0	537 S. Main Ave.	CH
117-14-319 0	541 S. Main Ave.	CH
117-14-320 0	579 S. Main Ave.	CH
117-14-321 0		Vacant
117-14-322 0		Vacant
117-14-325 0	589 S. Main Ave.	CN
	580 S. Ninth Ave.	CN

117-14-326 0		Vacant
117-14-327 C	623 S. Main Ave.	CH
117-14-329 0	600 S. Meyer Ave.	CH
117-14-331 0	526 S. Ninth Ave.	CH
117-14-333 0	530 S. Ninth Ave.	CH
117-14-334 0		Vacant
117-14-336 0		Vacant
117-14-337 0	661 S. Main Ave.	CH
117-14-338 0	534 S. Ninth Ave.	CH
117-14-339 0		Vacant
117-14-340 0		Vacant
117-14-341 0		Vacant
117-14-342 0	554 S. Meyer Ave.	CH
117-14-343 0		Vacant
117-14-344 0	524 S. Meyer Ave.	CH
117-14-346 0	508-522 S. Meyer Ave.	CH
117-14-347 0		Vacant
117-14-349 0		Vacant
117-14-425 0		Vacant
117-14-426 0	671 S. Ninth Ave.	CN
117-14-427 0	651 S. Ninth Ave.	CN
117-14-428 0	631 S. Ninth Ave.	CN
117-14-429 0	601 S. Ninth Ave.	CN
117-14-430 0	590 S. Ninth Ave.	CN
117-14-431 0		Vacant
117-14-432 0	570 S. Ninth Ave.	CH

117-14-433 0	560 S. Ninth Ave.	CN
117-14-434 0		Common Area
<u>BLOCK 243, CITY OF TUCSON</u>		
117-14-350 0	440 S. Main Ave.	CH
117-14-351 0	448 S. Main Ave.	CH
117-14-352 0	530 S. Main Ave.	CN
117-14-353 0	562-564 S. Main Ave.	CH
117-14-354 B	570 S. Main Ave.	CH
117-14-384 0		Vacant
117-14-385 0		Vacant
117-14-386 0	582 S. Main Ave.	CH
	582 1&2 S. Main Ave.	CH
117-14-389 0	580 S. Main Ave.	CH
117-14-390 0		Vacant
117-14-391 0	420 1&2 W. 17th St.	CN
117-14-395 0	460 W. 17th St.	CH
<u>BLOCK 245, CITY OF TUCSON</u>		
117-14-358 0	630 S. Main Ave.	CH
117-14-359 0	664 S. Main Ave.	CH
117-14-360 0	668 S. Main Ave.	CH
117-14-361 0		Vacant
117-14-362 0	372 W. 18th St.	CH
117-14-363 0	419 W. 18th St.	CH
117-14-364 0	416 W. 18th St.	CH
117-14-365 E	418 W. 18th St.	CH

117-14-367 0	438 W. 18th St.	CH
117-14-369 A	733 S. Osborne Ave.	CH
117-14-370 0		Vacant
117-14-371 0		Vacant
117-14-372 0		Vacant
117-14-373 0	704 S. Osborne Ave.	CH/CN
117-14-374 0	449 W. 17th St.	CH
117-14-375 0	505 W. 17th St.	CH
117-14-376 0	706 S. Osborne Ave.	CN
117-14-377 0	708 S. Osborne Ave.	CH
117-14-378 0	715 S. 11th Ave.	CH
117-14-379 0	719 S. 11th Ave.	CH
117-14-380 0	730 S. Osborne Ave.	CH
117-14-381 0	732 S. Osborne Ave.	CH
117-14-382 0	734 S. Osborne Ave.	CH
117-14-383 A	508 W. 18th St.	CH
<u>BLOCK 246, CITY OF TUCSON</u>		
117-14-396 0	614 S. Meyer Ave.	CH
117-14-397 0		Vacant
117-14-398 0		Vacant
117-14-399 0	684 S. Meyer Ave.	CH
<u>BLOCK 247, CITY OF TUCSON</u>		
117-14-400 0	677-685 S. Meyer Ave.	CH
117-14-401 0	669 S. Meyer Ave.	CH
117-14-402 0		Vacant

117-14-403 0		Vacant
117-14-404 0	641 S. Meyer Ave.	CH
117-14-405 0	633 S. Meyer Ave.	CH
117-14-406 0	601-611 S. Meyer Ave.	CH
117-14-407 0	209-217 S. 8th Ave. 562 S. 8th Ave.	CH CH
117-14-410 0		Vacant
117-14-413 0	600-610 S. 8th Ave.	CH
117-14-414 0		Vacant
<u>BLOCK 7, SOUTHWESTERN ADDITION</u>		
117-18-054 0		Vacant
117-18-055 0		Vacant
117-18-056 0	403 S. El Paso Ave	CH
117-18-057 0	437 S. El Paso Ave.	CH
117-18-058 0		Vacant
117-18-060 A	340 W. Simpson St.	CH
117-18-061 0		Vacant
117-18-062 0	421 S. El Paso Ave.	CN
117-18-063 0	350 W. Simpson St.	CH/NHNC
<u>BLOCK 8, SOUTHWESTERN ADDITION</u>		
117-18-064 0	546 W. Simpson St.	CH
117-18-065 0	440 W. Simpson St.	CH
117-18-066 0	438 W. Simpson St.	CH
117-18-067 0	426 W. Simpson St.	CH
117-18-068 0	430 W. Simpson St.	CH
117-18-069 0	416 W. Simpson St.	CH/CN

117-18-070 0	410 W. Simpson St.	CH
117-18-071 0	402 W. Simpson St.	CH
<u>BLOCK 1, BALL PARK SUBDIVISION</u>		
117-18-079 0	448 W. Rosales St.	CH
117-18-080 0		Vacant
117-18-081 0		Vacant
117-18-082 0	428 W. Rosales St.	CH
117-18-083 0		Vacant
117-18-084 0	412 W. Rosales St.	CH
117-18-085 0	410 W. Rosales St.	CH
117-18-086 0	400 W. Rosales St.	CH
<u>BLOCK 2, BALL PARK SUBDIVISION</u>		
117-18-087 0	442 S. El Paso Ave.	CH
117-18-088 0	409 W. Rosales St.	CH
117-18-089 0	411 W. Rosales St.	CH
117-18-090 0	427 W. Rosales St.	CH
117-18-091 0	429 W. Rosales St.	CH
117-18-092 0	431 W. Rosales St.	NHNC
117-18-093 0	433 W. Rosales St.	CH
117-18-094 0		Vacant
117-18-095 0		Vacant
<u>BLOCK 1, ELYSIAN GROVE</u>		
117-19-001 0	400 W. Simpson St.	CH
117-19-003 0	408 W. Simpson St.	CH
117-19-005 0	420 S. Samaniego Ave.	CH

117-19-006 0	428 S. Samaniego Ave.	CH
117-19-007 0		Vacant
117-19-008 0	521 S. Elias Ave.	CN
117-19-009 0		Vacant
117-19-010 0		Vacant
117-19-011 0	423 S. Elias Ave.	NHNC
117-19-012 0	427 S. Elias Ave.	CN
117-19-013 0	550 S. Samaniego Ave.	CH
117-19-014 0	552 S. Samaniego Ave.	CN
117-19-015 0	431 S. Elias Ave.	CN
117-19-017 0		Vacant
117-19-020 A	441 S. Elias Ave.	CN
117-19-021 0	445 S. Elias Ave.	CH
117-19-022 0	560 S. Samaniego Ave.	CN
117-19-023 0	570 S. Samaniego Ave.	CN
117-19-025 0	449 S. Elias Ave.	CH
<u>BLOCK 2, ELYSIAN GROVE</u>		
117-19-026 0	445 W. Simpson St.	CH/I
117-19-027 0	455 W. Simpson St.	CH
117-19-028 0	505 S. Otero Ave.	CN
117-19-029 0	412 S. Elias Ave.	CN
117-19-030 0	416 S. Elias Ave.	CH
117-19-031 0	511 S. Otero Ave.	CN
117-19-032 0		Vacant
117-19-033 0	436 S. Elias Ave.	CH
117-19-034 0		Vacant

117-19-035 0	431 S. Otero Ave.	CN
117-19-036 0	455 S. Otero Ave.	CN
117-19-037 0	432 S. Elias Ave.	CH
117-19-038 0	434 S. Elias Ave.	CH
117-19-039 0	435 S. Otero Ave.	CN
117-19-040 0	439 S. Otero Ave.	CN
117-19-042 0	438 S. Elias Ave.	CH
117-19-043 0	445 S. Otero Ave.	CN
117-19-046 0	446 S. Elias Ave.	CH
117-19-047 0	529 S. Otero Ave.	CH
<u>BLOCK 3, ELYSIAN GROVE</u>		
117-19-048 0		Vacant
117-19-049 0		Vacant
117-19-050 0		Vacant
117-19-051 0		Vacant
117-19-052 0	426 S. Otero Ave.	CH/CN
117-19-054 0	438 S. Otero Ave.	CH
117-19-056 0	452 S. Otero Ave.	CH
117-19-057 0	456 S. Otero Ave.	CH
117-19-058 0	460 S. Otero Ave.	CN
<u>BLOCK 4, ELYSIAN GROVE</u>		
117-19-061 0		Vacant
117-19-062 0	502 W. 17th St.	CH
117-19-063 0	506 W. 17th St.	CH
117-19-064 0	407 W. Carrillo St.	CH

117-19-065 0	415 W. Carrillo St.	CN
117-19-066 0	514A W. 17th St.	CH
117-19-067 0	514B W. 17th St.	CH
117-19-068 0	503 W. Carrillo St.	CH
117-19-069 0	525 W. Carrillo St.	CH
117-19-070 0	516 W. 17th St.	CH
117-19-071 0	516 W. 17th St.	CH
117-19-072 0		Vacant
117-19-073 0	521 W. Carrillo St.	CH/CN
117-19-074 0	518 W. 17th St.	CH
117-19-075 0	520 W. 17th St.	CH
117-19-076 0	531 W. Carrillo St.	CN
117-19-077 0	535 W. Carrillo St.	CH
117-19-078 0	534 W. 17th St.	CH
117-19-079 0	524 W. 17th St.	CH
117-19-080 0	537 W. Carrillo St.	CH
117-19-081 0	545 W. Carrillo St.	CN
117-19-082 0	538 W. 17th St.	CH

8.5 El Presidio Historic District

A. Established: February 24, 1975, by Ordinance No. 4328.

Amended: October 3, 1983, by Ordinance No. 5880.

Amended: June 12, 1995, by Ordinance No. 8520.

Amended: July 10, 1995, by Ordinance No. 8544.

Amended: August 7, 1995, by Ordinance No. 8555.

B. Boundaries and Location: The boundaries and location of the El Presidio Historic District are as designated on Map 2-3.

C. List of **HISTORIC LANDMARK, CONTRIBUTING-HISTORIC (CH), CONTRIBUTING-NONHISTORIC (CN), NONCONTRIBUTING (NHNC), and INTRUSION (I)**.

TAX PARCEL NUMBER	ADDRESS	STRUCTURE OR SITE STATUS
116-19-044 A	402 N. Main Ave.	CH
<u>BLOCK 6, GOLDSCHMIDT'S ADDITION</u>		
116-19-050 0	378 N. Main Ave.	CH
116-19-051 0	340 N. Main Ave.	CH
116-19-052 0	325 W. Franklin St.	CH
116-19-053 A	329 W. Franklin St.	CH
116-19-053 B	329 N. Granada Ave.	CN
<u>BLOCK 11, GOLDSCHMIDT'S ADDITION</u>		
116-19-067 C	300 N. Main Ave.	CH
116-19-067 B	330 W. Franklin St.	I
116-19-068 0	343 W. Franklin St.	CH
116-19-070 0	262 N. Main Ave.	CH/NHNC
116-19-072 0	252 N. Main Ave.	CH
116-19-074 0	233 N. Main Ave.	CH
<u>BLOCK 172, CITY OF TUCSON</u>		
117-10-003 0	433 N. Main Ave.	CH
117-10-004 0	427 N. Main Ave.	CH
117-10-005 0	309 W. Sixth St.	CH
117-10-006 0	307 W. Sixth St.	CH
117-10-007 0		Vacant
117-10-008 A	423-425 N. Main Ave.	CH
117-10-009 A	417-419 N. Main Ave.	CH
117-10-010 A	385 N. Main Ave.	CH
117-10-013 0	347 N. Main Ave.	CH
117-10-014 0	333-335 N. Main Ave.	CH

117-10-015 0	317-319 N. Main Ave.	CH
117-10-016 0	239-241 W. Franklin St.	CH
117-10-017 0	345-347 N. Meyer Ave.	CH
117-10-018 0	211-219 W. Franklin St.	CH
117-10-019 0	349-361 N. Meyer Ave.	CH
117-10-020 D		Easement
117-10-020 E	365 N. Meyer Ave.	CH
117-10-020 F	369 N. Meyer Ave.	CH
117-10-022 A	373 N. Meyer Ave.	CH
117-10-023 A	385-387 N. Meyer Ave.	CH
117-10-024 B		Easement
117-10-025 0		Vacant
117-10-026 0	405 N. Court Ave.	CN
117-10-027 0	403 N. Court Ave.	CH
117-10-028 0	402 N. Meyer Ave.	CH
117-10-029 0	382-384 N. Meyer Ave.	CH
117-10-030 0	381 N. Court Ave.	NHNC
117-10-031 0	378-380 N. Meyer Ave.	CH
117-10-033 A	351-359 N. Court Ave.	CH
117-10-034 0	222-224 W. Franklin St.	CN
	326-340 N. Meyer Ave.	CH
117-10-035 0	337 N. Court Ave.	CH
117-10-036 0	333 N. Court Ave.	CH
117-10-138 0	405-411 N. Meyer Ave.	CH/CN
117-10-150 0		Vacant

117-10-151 0	360 N. Main Ave.	CN
117-10-152 0	350 N. Main Ave.	CN
<u>BLOCK 176, CITY OF TUCSON</u>		
117-10-092 0	317 N. Court Ave.	CH
117-10-093 A	186-192 W. Franklin St.	CH
117-10-094 A	196-198 W. Franklin St.	CH
117-10-095 0		Vacant
117-10-096 0	311 N. Court Ave.	CH
117-10-097 0	299 N. Court Ave.	CH
117-10-098 0	297 N. Court Ave.	CH
117-10-099 0	290 N. Meyer Ave.	CH
117-10-100 0		Vacant
117-10-101 0	250 N. Meyer Ave.	NHNC
117-10-102 0	141 W. Council/261 N. Court	CH
<u>BLOCK 177, CITY OF TUCSON</u>		
117-10-103 0	212 W. Franklin St.	CH
117-10-104 0	216 W. Franklin St.	CH
117-10-105 0	220 W. Franklin St.	CH
117-10-106 0	285-295 N. Meyer Ave.	CH
117-10-107 0	259 N. Meyer Ave.	CN
117-10-108 A	259 N. Meyer Ave.	CN
117-10-108 C	259 N. Meyer Ave.	CN
117-10-109 0	259 N. Meyer Ave.	CN
117-10-110 0	239 N. Meyer Ave.	CH
117-10-111 0	107 W. Washington St.	NHNC
117-10-112 0	115-117 W. Washington St.	CH

117-10-113 0	221-223 N. Main Ave.	CH
	135-137 W. Washington St.	CH
117-10-114 0	235-237 N. Main Ave.	CH
117-10-115 0	245 N. Main Ave.	CH
117-10-116 0	253-255 N. Main Ave.	CH
117-10-118 B	273 N. Main Ave.	CH
117-10-119 A	297 N. Main Ave.	CH/CN
<u>BLOCK 178, CITY OF TUCSON</u>		
117-10-121 0	233-239 N. Court Ave.	CH
117-10-123 0	230-234 N. Meyer Ave.	CH
117-10-124 0	220 N. Meyer Ave.	CH
	77 W. Washington St.	CH
117-10-125 0	215 N. Court Ave.	NHNC
<u>BLOCK 179, CITY OF TUCSON</u>		
117-10-130 0		Vacant
117-10-131 0	15 W. Washington St.	CH
117-10-133 A	135 W. Council St.	CN
117-10-135 0	222 N. Court Ave.	CH
117-10-136 0	240 N. Court /134 W. Council	CH
<u>BLOCK 181, CITY OF TUCSON</u>		
117-11-014 0		Vacant
117-11-015 0		Vacant
117-11-016 0		Vacant
117-11-018 0	182 N. Court Ave.	CH
117-11-019 0	192-196 N. Court Ave.	CH
117-11-020 0	198-200 N. Court Ave.	CH

	38 W. Washington St.	CH
<u>BLOCK 182, CITY OF TUCSON</u>		
117-11-021 0	201 N. Court Ave.	CN
	186 N. Meyer Ave.	CH
<u>BLOCK 183, CITY OF TUCSON</u>		
117-11-024 0	195-199 N. Meyer	CH
117-11-025 0	100-108 W. Washington	CH
117-11-026 0		Vacant
117-11-027 0	150 N. Main Ave.	CH
117-11-034 0	171-177 N. Court Ave.	CH
117-11-039 0		Vacant
117-11-040 0		Vacant
117-20-003 0	120 N. Main Ave.	CH
117-20-001 0	166 W. Alameda	NHNC
	166 W. Alameda	CH
<u>BLOCK 185, CITY OF TUCSON</u>		
116-19-042 0	216 N. Main Ave.	CH

8.6 Fort Lowell Historic District

A. Established: May 11, 1981, by Ordinance No. 5364.

Amended: January 11, 1982, by Ordinance No. 5495.

Amended: September 8, 1992, (as the result of annexation) by Ordinance No. 7902.

Amended: June 12, 1995, by Ordinance No. 8520.

B. Boundaries and Location: The boundaries and location of the Fort Lowell Historic Preservation Zone are as designated on Map 2-4.

C. List of **HISTORIC LANDMARK, CONTRIBUTING-HISTORIC (CH), CONTRIBUTING-NONHISTORIC (CN), NONCONTRIBUTING (NHNC), and INTRUSION (I)**.

TAX PARCEL NUMBER	ADDRESS	STRUCTURE OR SITE STATUS

<u>FORT LOWELL RD./BEVERLY AVE.</u>		
109-26-011 A		Vacant
110-09-001 O	5302 E. Fort Lowell Rd.	CH/CN/I
110-09-003 D		Easement
110-09-003 F		Mesquite Bosque/The Swale
110-09-006 G		Vacant
110-09-006 L	5479 E. Ft. Lowell Rd.	CH
110-09-006 K	5495 E. Ft. Lowell Rd.	CN
110-09-006 R		Undeveloped
110-09-006 Q	3111 N. Craycroft Rd.	NHNC
110-09-006 D		Vacant
110-09-008 O	5309 E. Ft. Lowell Rd.	CH
110-09-009 E	5333 E. Ft. Lowell Rd.	CH
110-09-009 F	El Callejon	
110-09-010 A	5329 E. Ft. Lowell Rd.	CH/CN
110-09-011 O	5343 E. Ft. Lowell Rd.	CH
110-09-012 B	5335 E. Ft. Lowell Rd.	NHNC
110-09-013 O	5345 E. Ft. Lowell Rd.	CN
110-09-014 O	5341 E. Ft. Lowell Rd.	CH
110-09-015 O	5347 E. Ft. Lowell Rd.	CH
110-09-016 O	5351 E. Ft. Lowell Rd.	CH
110-09-017 B	5339 E. Ft. Lowell Rd.	CN
110-09-017 D		Vacant
110-09-018 A	5349 E. Ft. Lowell Rd.	CH
110-09-018 B	5353 E. Ft. Lowell Rd.	CN
110-09-019 K	5433 E. Ft. Lowell Rd.	CN

110-09-019 D	5425 E. Ft. Lowell Rd.	CH
110-09-019 J		Vacant
110-09-019 N		Vacant
110-09-019 M	5329 E. Ft. Lowell Rd.	NHNC
110-09-020 0	3031 N. Craycroft Rd.	CH
110-09-021 0	5230 E. Ft. Lowell Rd.	CH
110-09-037 0		Vacant
110-09-039 0	5354 E. Ft. Lowell Rd.	CH
110-09-040 0	5352 E. Ft. Lowell Rd.	CH
110-09-042 0	5344 E. Ft. Lowell Rd.	CH/CN
110-09-043 0	5349 E. Ft. Lowell Rd.	CH
110-09-044 0	5346 E. Ft. Lowell Rd.	CN
110-09-047 0	5328 E. Ft. Lowell Rd.	CN
110-09-048 0	5320 E. Ft. Lowell Rd.	CH/CN
110-09-049 B	2928 N. Beverly Ave.	CH
110-09-049 C	2930 N. Beverly Ave.	CH
110-09-049 D	2932 N. Beverly Ave.	CH
110-09-049 E	2932 N. Beverly Ave.	I
110-09-049 F		Vacant
110-09-050 0	2920 N. Beverly Ave.	CH
110-09-055 0		Vacant
110-09-057 A	5303 E. San Francisco Blvd.	CN
110-09-056 A	5313 E. San Francisco Blvd.	CN
110-09-058 0	2902 N. Beverly Ave.	CH/CN
<u>LA SONRISA TOWNHOMES</u>		

110-09-390 0		Common Area
110-09-362 0	5428 E. Francisco Loop	CN
110-09-363 0	5424 E. Francisco Loop	CN
110-09-364 A	5420 E. Francisco Loop	CN
110-09-365 0	5416 E. Francisco Loop	CN
110-09-366 0	5412 E. Francisco Loop	CN
110-09-367 0	5408 E. Francisco Loop	CN
110-09-368 0	5346 E. Francisco Loop	CN
110-09-369 0	5344 E. Francisco Loop	CN
110-09-370 0	5342 E. Francisco Loop	CN
110-09-371 0	5340 E. Francisco Loop	CN
110-09-372 0	5351 E. Francisco Loop	CN
110-09-373 0		Vacant
110-09-374 A		Vacant
110-09-375 A	5363 E. Francisco Loop	CN
110-09-376 0	5371 E. Francisco Loop	CN
110-09-377 0	5375 E. Francisco Loop	CN
110-09-378 0	5383 E. Francisco Loop	CN
110-09-379 0	5387 E. Francisco Loop	CN
110-09-380 0	5395 E. Francisco Loop	CN
110-09-381 0	5399 E. Francisco Loop	CN
110-09-382 0	5403 E. Francisco Loop	CN
110-09-383 0	5407 E. Francisco Loop	CN
110-09-384 0	5411 E. Francisco Loop	CN
110-09-385 0	5415 E. Francisco Loop	CN
110-09-386 0	5419 E. Francisco Loop	CN

110-09-387 0	5427 E. Francisco Loop	CN
110-09-388 0	5431 E. Francisco Loop	CN
110-09-389 0	5435 E. Francisco Loop	CN
<u>BOSQUE RANCH</u>		
110-09-344 0		Common Area
110-09-345 0		Common Area
110-09-327 0	5301 E. Presidio Dr.	CN
110-09-328 0	5315 E. Presidio Dr.	CN
110-09-329 0	5329 E. Presidio Dr.	CN
110-09-330 0	5343 E. Presidio Dr.	CN
110-09-332 A	5375 E. Presidio Dr.	CN
110-09-331 0	Schantz Pool & Spa	
110-09-334 0		Vacant
110-09-335 0	5415 E. Presidio Dr.	CN
110-09-336 0	5433 E. Presidio Dr.	CN
110-09-337 0	5441 E. Presidio Dr.	CN
110-09-339 C	5440 E. Presidio Dr.	CN
110-09-339 B	5432 E. Presidio Dr.	CN
110-09-340 0	5424 E. Presidio Dr.	CN
110-09-341 0	5416 E. Presidio Dr.	CN
110-09-342 A	5408 E. Presidio Dr.	CN
<u>FORT LOWELL PARK</u>		
110-14-009 C		Vacant
110-14-010 0	5669 E. Ft. Lowell Rd.	NHNC
110-14-011 G	5621 E. Ft. Lowell Rd.	CN
110-14-011 H	5611 E. Ft. Lowell Rd.	CN

110-14-011 J	5651 E. Ft. Lowell Rd.	CN
110-14-011 K		Vacant
110-14-011 L	5601 E. Ft. Lowell Rd.	CN
110-14-011 M		Vacant
110-14-012 C		Vacant
110-14-013 B	5531 E. Ft. Lowell Rd.	CH
110-14-014 O		Vacant
110-14-015 A	Fort Lowell Park	CH
110-14-016 B	Fort Lowell Park	CH
<u>SAN MIGUEL TOWNHOMES</u>		
110-14-242 O	5565 E. Binghampton Dr.	CH
110-14-222 O	5521 E. Miles Circle	CN
110-14-223 O	5520 E. Miles Circle	CN
110-14-224 O	5530 E. Miles Circle	CN
110-14-225 O	5540 E. Miles Circle	CN
110-14-226 O	5550 E. Miles Circle	CN
110-14-227 O	5560 E. Miles Circle	CN
110-14-228 O	5570 E. Miles Circle	CN
110-14-229 O	5580 E. Miles Circle	CN
110-14-230 O	5590 E. Binghampton Dr.	CN
110-14-231 O	5600 E. Binghampton Dr.	CN
110-14-232 O	5610 E. Binghampton Dr.	CN
110-14-233 A	5620 E. Binghampton Dr.	CN
110-14-234 A	5630 E. Binghampton Dr.	CN
110-14-235 O	3070 N. Binghampton Pl.	CN
110-14-236 O	3080 N. Binghampton Pl.	CN

110-14-237 0	3090 N. Binghamton Pl.	CN
--------------	------------------------	----

8.7 West University Historic District

A. Established: January 3, 1984, by Ordinance No. 5920.

Amended: July 10, 1995, by Ordinance No. 8544.

Amended: August 7, 1995, by Ordinance No. 8555.

Amended: November 27, 1995, by Ordinance No. 8611.

Amended: November 18, 1996, by Ordinance No. 8775.

B. Boundaries and Location: The boundaries and location of the West University Historic Preservation Zone are as designated on Map 2-5.

C. List of **HISTORIC LANDMARK, CONTRIBUTING-HISTORIC (CH), CONTRIBUTING-NONHISTORIC (CN), NONCONTRIBUTING (NHNC), and INTRUSION (I)**.

TAX PARCEL NUMBER	ADDRESS	STRUCTURE OR SITE STATUS
<u>BLOCK 1, CITY OF TUCSON</u>		
117-02-001 0	648 E. Speedway Blvd.	CH
117-02-002 0	642 E. Speedway Blvd.	CH
117-02-003 0	644 E. Speedway Blvd.	CH
117-02-004 0	632 E. Speedway Blvd.	CH
117-02-005 0	630 E. Speedway Blvd.	CH
117-02-006 0	616 E. Speedway Blvd.	CH
117-02-007 0	612 E. Speedway Blvd.	CH
117-02-009 0	1048 N. 2nd Ave.	CH
	1049 N. Jacobus Ave	CH
117-02-010 0	1043 N. 1st Ave.	CH
	1043-1/2 N. 1st Ave.	CH
117-02-012 0	1023 N. 1st Ave.	CH
117-02-013 0	1046 N. 2nd Ave.	CH
117-02-014 0	1044 N. 2nd Ave.	CH

117-02-015 0	1027 N. 1st Ave.	CH
117-02-016 A	1017 N. 1st Ave.	CH
117-02-016 B	1018 N. Jacobus Ave.	CH
117-02-017 0	1019 N. Jacobus Ave.	CH
117-02-018 0	1038 N. 2nd Ave.	CH
117-02-019 0	1040 N. 2nd Ave.	CH
117-02-020 0	601 E. 1st St.	CH
117-02-021 0	615 E. 1st St.	CH
117-02-022 0	627 E. 1st St.	CH
117-02-023 0	629 E. 1st St.	CH
	1014-1016 N. Jacobus Ave.	CH
117-02-024 0	645 E. 1st St.	CH
<u>BLOCK 2, CITY OF TUCSON</u>		
117-02-027 0	1049 N. 2nd Ave.	CH
117-02-028 0	540-544 E. Speedway Blvd.	CH
117-02-029 0	530 E. Speedway Blvd.	CH
117-02-030 0	522 E. Speedway Blvd.	CH
117-02-031 0	518 E. Speedway Blvd.	CH
117-02-032 0	512-514 E. Speedway Blvd.	CH
117-02-033 0	504 E. Speedway Blvd.	CH
117-02-034 0	1044 N. 3rd Ave.	CH
117-02-035 0	1043 N. Bean Ave.	CH
117-02-036 0	1043-1045 N. 2nd Ave.	NHNC
	1048 N. Bean Ave.	CH
117-02-037 0	1033 N. 2nd Ave.	CH
117-02-038 0	1042 N. 3rd Ave.	CH

117-02-039 0	1024-1028 N. 3rd Ave.	CH
117-02-040 0	1025 N. 2nd Ave.	CH
117-02-041 B	1021 N. 2nd Ave. 1023 N. 2nd Ave.	NHNC CH
117-02-042 0	1019 N. Bean Ave.	NHNC
117-02-043 0	1022 N. 3rd Ave.	CH
117-02-044 0	501 E. 1st St.	NHNC
117-02-045 0	515 E. 1st St.	CH
117-02-046 0	519 E. 1st St.	CH
117-02-047 0	529 E. 1st St.	CH
117-02-048 0	537-539 E. 1st St.	CH
117-02-049 0	547-549 E. 1st St.	CH
<u>BLOCK 3, CITY OF TUCSON</u>		
117-02-050 0		Vacant
117-02-051 0	436 E. Speedway Blvd.	CH
117-02-052 0	432 E. Speedway Blvd.	CH
117-02-053 0	420 E. Speedway Blvd.	CH
117-02-054 0	410 E. Speedway Blvd.	CH
117-02-055 0		Vacant
117-02-056 0		Vacant
117-02-057 0	1044 N. 4th Ave.	CH
117-02-058 0	1038 N. 4th Ave.	CH
117-02-059 0	1045 N. 3rd Ave.	CH/NHNC
117-02-060 0	1042 N. Hoff Ave.	CH
117-02-061 0	1037 N. 3rd Ave.	CH
117-02-062 0	1032 N. 4th Ave.	CH

117-02-063 0	1030 N. 4th Ave.	CH
117-02-064 0	1031-1035 N. 3rd Ave.	CH
117-02-065 0	1021 N. 3rd Ave.	CH
117-02-067 0	1002-1004 N. 4th Ave.	NHNC
117-02-068 0	425 E. 1st St.	CH
117-02-069 0	437 E. 1st St.	CH
117-02-070 0	439 E. 1st St.	CH
<u>BLOCK 4, CITY OF TUCSON</u>		
117-02-073 0	346 E. Speedway Blvd.	CH
	346-1/2 E. Speedway Blvd.	CH
117-02-074 0	338 E. Speedway Blvd.	CH
117-02-076 0	320 E. Speedway Blvd.	CH
117-02-077 0	318 E. Speedway Blvd.	CH
117-02-078 0	316 E. Speedway Blvd.	CH
117-02-075 0		Vacant
117-02-079 0	1042 N. 5th Ave.	CH
117-02-080 0	1045 N. 4th Ave.	CH
117-02-081 0	1041 N. 4th Ave.	CH
117-02-082 0	1033 N. 4th Ave.	CH
117-02-083 01	1026 N. 5th Ave.	CH
	1025 N. Herbert Ave.	CH
117-02-084 0	1010 N. 5th Ave.	NHNC
17-02-085 A	1025 N. 4th Ave.	CH
117-02-086 A	1011-1019 N. 4th Ave.	NHNC
117-02-088 0	309 E. 1st St.	CH
117-02-090 0	315 E. 1st St.	CH

117-02-091 0	317 E. 1st St.	CH
117-02-092 0	341 E. 1st St.	CH
<u>BLOCK 5, CITY OF TUCSON</u>		
117-02-094 C	220 E. Speedway Blvd.	CH
117-02-097 A		Vacant
117-02-099 B	202 E. Speedway Blvd.	NHNC
117-02-100 A		Parking Lot
117-02-101 0	1045 N. 5th Ave.	CH
117-02-102 0	1035 N. 5th Ave.	CH
117-02-103 0		Parking Lot
117-02-104 B	1010-1030 N. 6th Ave.	NHNC
117-02-105 0	1029 N. 5th Ave.	CH
117-02-106 0	1015 N. 5th Ave.	CH
117-02-108 0	1006 N. 6th Ave.	CH
117-02-109 0	1007 N. 5th Ave.	CH
117-02-110 0	1003 N. 5th Ave.	CH/CN
117-02-111 0	225-227 E. 1st St.	CH
117-02-112 0	1004 N. 6th Ave.	CH
<u>BLOCK 6, CITY OF TUCSON</u>		
117-02-116 0	118-120 E. Speedway Blvd.	NHNC
117-02-117 0	110 E. Speedway Blvd.	CH
117-02-118 0	102 E. Speedway Blvd.	NHNC
117-02-119 0	1040-1044 N. 7th Ave.	NHNC
117-02-120 A	1039 N. 6th Ave.	CH
117-02-121 0	1034 N. 7th Ave.	CH
117-02-122 0	1018 N. 7th Ave.	CH

117-02-124 0	1007 N. 6th Ave.	CH
117-02-125 0	1014 N. 7th Ave.	CH
117-02-126 0	1010 N. 7th Ave.	CH
117-02-127 0	105 E. 1st St.	CH
117-02-128 0	115 E. 1st St.	CH
117-02-129 0	119 E. 1st St.	CH
117-02-130 0	127-129 E. 1st St.	CH
117-02-131 0	1005 N. 6th Ave.	CH
117-02-132 0	1001 N. 6th Ave.	CH
117-02-412 0	1011-1017 N. 6th Ave.	CH/NHNC
<u>BLOCK 7, CITY OF TUCSON</u>		
117-02-133 A	De Anza Park	CH
<u>BLOCK 16, CITY OF TUCSON</u>		
117-02-195 0	48 E. 1st St.	CH
117-02-196 0	30-32 E. 1st St.	CH
117-02-197 0	939 N. 7th Ave.	CH
117-02-200 0	935 N. 7th Ave.	CH
117-02-201 0	925-933 N. 7th Ave.	I
117-02-204 0	921 N. 7th Ave.	CH
117-02-205 0	917 N. 7th Ave.	CH
117-02-206 0	911 N. 7th Ave.	CH
117-02-207 B	909 N. 7th Ave.	CH
117-02-208 0	29 E. 2nd St.	CH
117-02-211 A	901 N. 7th Ave.	CH
<u>BLOCK 17, CITY OF TUCSON</u>		
117-02-212 0	947-949 N. 6th Ave.	CH

117-02-213 0	941 N. 6th Ave.	CH
117-02-214 0	118 E. 1st St.	CH
117-02-215 0	112 E. 1st St.	CH
117-02-216 0	102 E. 1st St.	CH
117-02-217 0	936 N. 7th Ave.	CH
117-02-218 0	930 N. 7th Ave.	NHNC
117-02-219 0	937-939 N. 6th Ave.	CH
117-02-220 0	935 N. 6th Ave.	CH
117-02-221 0	933 N. 6th Ave.	CH/CN
117-02-223 0	103 E. 2nd St.	CH
117-02-224 0	105-113 E. 2nd St.	I
117-02-225 0	121 E. 2nd St.	CH
117-02-226 0	127 E. 2nd St.	CH
117-02-227 0	911 N. 6th Ave.	CH
117-02-228 0	901 N. 6th Ave.	CH
<u>BLOCK 18, CITY OF TUCSON</u>		
117-02-229 B	945 N. 5th Ave.	CH
117-02-230 0	950 N. 6th Ave.	CH/CN
117-02-231 0	932-944 N. 6th Ave.	NHNC
117-02-232 0	937 N. 5th Ave.	CH
117-02-233 0	931 N. 5th Ave.	CH
117-02-234 0	924 N. 6th Ave.	CH
117-02-235 0	920 N. 6th Ave.	CH
117-02-236 0	919 N. 5th Ave.	CH
117-02-237 0	907 N. 5th Ave.	CH
117-02-238 0	219 E. 2nd St.	CH

117-02-239 0	211 E. 2nd St.	CH
117-02-240 0	203 E. 2nd St.	CH
117-02-241 0	903 N. 5th Ave.	CH
<u>BLOCK 19, CITY OF TUCSON</u>		
117-02-242 0	Catalina/Northside Park	CH
<u>BLOCK 20, CITY OF TUCSON</u>		
117-02-243 0	446 E. 1st St.	CH
117-02-244 0	438-444 E. 1st St.	NHNC
117-02-245 0	434 E. 1st St.	CH
117-02-246 0	424 E. 1st St.	CH
117-02-247 0	944 N. 4th Ave.	CH
117-02-248 0	940 N. 4th Ave.	CH
117-02-252 0	929 N. 3rd Ave.	CH
117-02-253 0	929 N. Hoff Ave.	CH
117-02-254 0	925 N. 3rd Ave.	CH
117-02-255 0	915-917 N. Hoff Ave.	CH
117-02-258 0	922 N. Hoff Ave.	CH
117-02-259 0	917 N. 3rd Ave.	CH
117-02-260 0	907 N. 3rd Ave.	CH
117-02-261 0	425 E. 2nd St.	CH
117-02-262 0	415 E. 2nd St.	CH
117-02-263 0	407 E. 2nd St.	CH
117-02-265 0	910 N. 4th Ave.	CH
117-02-266 0	904 N. 4th Ave.	CH
117-02-268 0	901 N. 3rd Ave.	CH
<u>BLOCK 21, CITY OF TUCSON</u>		

117-02-269 0	939 N. 2nd Ave.	CH
117-02-271 0	532 E. 1st St.	CH
117-02-272 0	530 E. 1st St.	CH
117-02-273 0	518 E. 1st St.	CH
117-02-274 A	512-514 E. 1st St.	CH
117-02-275 A	502 E. 1st St.	CH
117-02-276 0	924-926 N. 3rd Ave	CH
117-02-277 0	927 N. 2nd Ave.	CH
	927-1/2 N. 2nd Ave.	CH
117-02-278 0	921-923 N. 2nd Ave.	CH
117-02-279 0	920 N. 3rd Ave.	CH
117-02-280 0	503 E. 2nd St.	CH
117-02-281 0	509 E. 2nd St.	CH
117-02-282 0	515 E. 2nd St.	CH
117-02-283 0	521 E. 2nd St.	CH
117-02-284 0	525-529 E. 2nd St.	CH
117-02-285 0	543-545 E. 2nd St.	CH
117-02-286 0	911 N. 2nd Ave.	CH
117-02-287 0	909 N. 2nd Ave.	CH
	547-549 E. 2nd St.	CH
<u>BLOCK 22, CITY OF TUCSON</u>		
117-02-288 0	642 E. 1st St.	CH
117-02-289 0	638 E. 1st St.	CH
117-02-290 0	630 E. 1st St.	CH
117-02-291 0	620 E. 1st St.	CH

117-02-292 0	612 E. 1st St.	CH
117-02-293 0	604 E. 1st St.	CH/CN
117-02-295 0	927 N. 1st Ave.	CH
117-02-296 0	921 N. 1st Ave.	CH
117-02-297 0	928 N. 2nd Ave.	CH
117-02-298 0	914-918 N. 2nd Ave.	CH
	601-605 E. 2nd St.	CH
117-02-299 0	615 E. 2nd St.	CH
117-02-300 0	623 E. 2nd St.	CH
117-02-301 0	901 N. 1st St.	I
<u>BLOCK 23, CITY OF TUCSON</u>		
117-03-001 0	646 E. 2nd St.	CH
	845 N. 1st Ave.	CH
117-03-002 0	837 N. 1st Ave.	CH
117-03-003 0	642 E. 2nd St.	CH
117-03-004 0	636-638 E. 2nd St.	CH
117-03-005 0	630 E. 2nd St.	CH
117-03-010 0	819 N. 1st Ave.	I
117-03-015 0		Vacant
117-03-016 0		Vacant
117-03-017 0	645 E. University Blvd.	CH
<u>BLOCK 24, CITY OF TUCSON</u>		
117-03-018 0	550 E. 2nd St.	CH
	847-849 N. 2nd Ave.	CH
117-03-019 0	534-538 E. 2nd St.	CH
117-03-020 0	528 E. 2nd St.	CH
117-03-021 0	522 E. 2nd St.	CH

117-03-022 0	512 E. 2nd St.	CH
117-03-023 0	502 E. 2nd St.	CH
117-03-024 0	832 N. 3rd Ave.	CH
117-03-025 0	827 N. Bean Ave.	CH
117-03-026 0	833 N. 2nd Ave.	CH
	830 N. Bean Ave.	CH
117-03-027 0	825 N. 2nd Ave.	CH
	822 N. Bean Ave.	CH
117-03-028 0	820 N. 3rd Ave.	CH
117-03-029 0	503 E. University Blvd.	CH
117-03-030 0	509 E. University Blvd.	CH
117-03-031 0	521 E. University Blvd.	CH
117-03-032 0	535 E. University Blvd.	CH
117-03-033 0	541 E. University Blvd.	CH
117-03-034 0	545 E. University Blvd.	CH
<u>BLOCK 25, CITY OF TUCSON</u>		
117-03-035 0	448 E. 2nd St.	CH
117-03-036 0	438 E. 2nd St.	CH
117-03-037 0	434 E. 2nd St.	CH
117-03-038 A	415 E. University Blvd.	I
117-03-042 0	827-829 N. 3rd Ave.	CH
117-03-048 0	435-437 E. University Blvd.	CH
117-03-049 0	439-441 E. University Blvd.	CH
117-03-050 0	445 E. University Blvd.	CH
117-03-374 0	800 N. 4th Ave.	NHNC
<u>BLOCK 26, CITY OF TUCSON</u>		

117-03-051 0	845 N. 4th Ave.	CH
117-03-052 0	314 E. 2nd St.	CH
117-03-053 0	312 E. 2nd St.	CH
117-03-055 0	826 N. 5th Ave.	CH
117-03-057 0	827 N. 4th Ave.	CH
117-03-058 0	305 E. University Blvd.	CH
117-03-059 0	307 E. University Blvd.	CH
117-03-060 0	819 N. 4th Ave.	CH
117-03-061 0	329 E. University Blvd.	CH
117-03-062 0	339 E. University Blvd.	CH
117-03-063 0	345 E. University Blvd.	CH
	345-1/2 E. University Blvd.	NHNC
<u>BLOCK 27, CITY OF TUCSON</u>		
117-03-064 0	248 E. 2nd St.	CH
117-03-065 0	236 E. 2nd St.	CH
117-03-066 0	224 E. 2nd St.	CH
117-03-067 0	200-210 E. 2nd St.	CH
117-03-068 0	836 N. 6th Ave.	CH
117-03-069 B	829 N. 5th Ave.	CH
117-03-070 0	825-827 N. 5th Ave.	CH
117-03-071 0	828 N. 6th Ave.	CH
117-03-072 0	820 N. 6th Ave.	CH
117-03-073 0	811-819 N. 5th Ave.	CH
	245 E. University Blvd.	CH
117-03-074 0	239-243 E. University Blvd.	CH
117-03-075 0	237 E. University Blvd.	CH

117-03-076 0	215 E. University Blvd.	CH
117-03-077 0	207 E. University Blvd.	CH
117-03-078 0	205 E. University Blvd.	CH
<u>BLOCK 28, CITY OF TUCSON</u>		
117-03-079 0	835 N. 6th Ave.	I
117-03-080 0	122 E. 2nd St.	CH
	122-1/2 E. 2nd St.	CH
117-03-081 0	116 E. 2nd St.	CH
	116-1/2 E. 2nd St.	CH
117-03-082 0	110 E. 2nd St.	CH
117-03-083 0	104 E. 2nd St.	CH
117-03-084 C	830 N. 7th Ave.	CH
117-03-088 0	826 N. 7th Ave.	CH
117-03-090 0		Vacant
117-03-091 0	145 E. University Blvd.	CH
117-03-387 0	101 E. University Blvd.	NHNC
<u>BLOCK 29, CITY OF TUCSON</u>		
117-03-093 0	837 N. 7th Ave.	CH
117-03-094 0	833 N. 7th Ave.	CH
117-03-095 0	829 N. 7th Ave.	CH
117-03-096 0	26-28 E. 2nd St.	CH
117-03-102 0	823-827 N. 7th Ave.	CH
117-03-109 A	25 E. University Blvd.	CH
117-03-110 0	27 E. University Blvd.	CH
117-03-111 0	35 E. University Blvd.	CH
<u>BLOCK 38, CITY OF TUCSON</u>		

117-03-255 0		Vacant
117-03-260 0	737-741 N. 7th Ave.	CH
117-03-264 0	717 N. 7th Ave.	CH
117-03-265 0		Vacant
117-03-268 0	25-27 E. 4th St.	CH
117-03-269 0	29 E. 4th St.	CH
<u>BLOCK 39, CITY OF TUCSON</u>		
117-03-271 0	144 E. University Blvd.	CH
117-03-272 0	128 E. University Blvd.	CH
117-03-273 0	130 E. University Blvd.	CH
117-03-274 0	110-116 E. University Blvd.	CH
117-03-275 0	102 E. University Blvd.	CH
117-03-276 0	737 N. 6th Ave.	CH
117-03-277 0	729 N. 6th Ave.	CH
117-03-278 0	728 N. 7th Ave.	CH
117-03-279 0	720 N. 7th Ave.	CH
117-03-281 0	711 N. 6th Ave.	NHNC
117-03-282 0	712 N. 7th Ave.	CH
117-03-283 0	123 E. 4th St.	NHNC
117-03-284 A	705 N. 6th Ave.	CH
117-03-284 B	131-133 E. 4th St.	CH
<u>BLOCK 40, CITY OF TUCSON</u>		
117-03-285 0	246-248 E. University Blvd.	CH
	741 N. 5th Ave.	CH
117-03-286 0	240-244 E. University Blvd.	CH
117-03-287 0	228-232 E. University Blvd.	CH

	731 N. Arizona Ave.	CH
	731-1/2 N. Arizona Ave.	CH
117-03-288 0	226 E. University Blvd.	CH
117-03-289 0	202-212 E. University Blvd. 720 N. 6th Ave.	CH CN
117-03-291 0	725-727 N. 5th Ave. 728 & 730-731 N. Arizona Ave.	CH CH
117-03-295 0	723 N. 5th Ave.	CH
117-03-296 0		Vacant
117-03-297 0	237 E. 4th St.	CH
117-03-298 0	710 N. 6th Ave.	CH
117-03-299 0	245 E. 4th St.	CH
117-03-300 0	225 E. 4th St.	CH
117-03-302 0	702 N. 6th Ave.	CH
<u>BLOCK 41, CITY OF TUCSON</u>		
117-03-304 0	733-745 N. 4th Ave.	NHNC
117-03-305 A	330 E. University Blvd.	CH
117-03-305 B		Parking Lot
117-03-306 0	300 E. University Blvd.	CH
117-03-309 0		Parking Lot
117-03-310 0	311 E. 4th St.	CH
117-03-312 0		Parking Lot
117-03-313 0	347 E. 4th St.	CH
117-03-314 0	335 E. 4th St.	CH
117-03-315 0	327 E. 4th St.	CH
117-03-316 0	319 E. 4th St.	CH

117-03-317 0	301 E. 4th St.	CH
<u>BLOCK 42, CITY OF TUCSON</u>		
117-03-318 0	444 E. University Blvd.	CH
117-03-319 0	400 E. University Blvd.	CH
117-03-321 0	740 N. 4th Ave.	CH
117-03-324 A	721 N. 3rd Ave.	CH
117-03-325 0	445 E. 4th St.	CH
117-03-326 0		Vacant
117-03-327 0		Vacant
117-03-328 0	411-413 E. 4th St.	CH
<u>BLOCK 43, CITY OF TUCSON</u>		
117-03-331 0	548 E. University Blvd.	CH
117-03-332 0	536 E. University Blvd.	CH
117-03-333 0	532 E. University Blvd.	CH
117-03-334 0	528 E. University Blvd.	CH
117-03-335 0	518 E. University Blvd.	CH
117-03-336 0	516 E. University Blvd.	CH
117-03-337 0	512 E. University Blvd.	CH
117-03-338 0	502 E. University Blvd.	CH/NHNC
117-03-339 0	728 N. 3rd Ave.	CH
117-03-340 0	728 N. Bean Ave.	CH
117-03-341 0	727 N. 2nd Ave.	CH
	727 N. Bean Ave.	CH
117-03-342 0	721-725 N. 2nd Ave.	CH
117-03-343 0	722 N. 3rd Ave.	CH
117-03-346 0	519 E. 4th St.	CH

117-03-347 0	529 E. 4th St.	CH
117-03-348 0	533 E. 4th St.	CH
117-03-349 0	539 E. 4th St.	CH
117-03-350 0	547 E. 4th St. 701 N. 2nd Ave.	CH CH
<u>BLOCK 44, CITY OF TUCSON</u>		
117-03-351 0		Vacant
117-03-352 0	638 E. University Blvd.	CH
117-03-353 0	632 E. University Blvd.	CH
117-03-354 0	620 E. University Blvd.	CH
117-03-355 0	616 E. University Blvd.	CH
117-03-356 0	610 E. University Blvd.	CH
117-03-357 0	604 E. University Blvd.	CH
117-03-358 0	730-732 N. 2nd Ave.	CH
117-03-359 0	726 N. Jacobus Ave.	CH
117-03-361 A		Vacant
117-03-362 0		Vacant
117-03-363 0	724 N. 2nd Ave.	CH
117-03-364 0	605 E. 4th St.	CH
117-03-365 0	611 E. 4th St.	CH
117-03-366 0	617 E. 4th St.	CH
117-03-367 0	623 E. 4th St.	CH
117-03-368 0	629 E. 4th St.	CH
117-03-369 0	635 E. 4th St.	CH
117-03-370 0	641 E. 4th St.	CH
117-03-371 0	645 E. 4th St.	CH

BLOCK 45, CITY OF TUCSON

117-04-001 0	644 E. 4th St.	CH
	644 Rear E. 4th St.	CH
	628 E. 4th St.	CH
117-04-003 0	632 E. 4th St.	CH
117-04-004 0	626 E. 4th St.	CH
117-04-005 0	620 E. 4th St.	CH
117-04-006 0	614 E. 4th St.	CH
117-04-007 0	608 E. 4th St.	CH
117-04-008 0	602 E. 4th St.	CH
117-04-009 0	600-632 N. 2nd Ave.	CH
117-04-010 0	642 N. Jacobus Ave.	CH
117-04-011 0	633 N. 1st Ave.	CH
117-04-012 0	621 N. 1st Ave.	CH
117-04-013 0	632 N. Jacobus Ave.	CH
117-04-014 0	610 N. 2nd Ave.	CH
117-04-015 0	607 E. 5th St.	CH
117-04-016 0	611 E. 5th St.	CH
117-04-017 0	615 E. 5th St.	CH
117-04-018 0	619 E. 5th St.	CH
117-04-019 0	629 E. 5th St.	CH
117-04-020 0	637 E. 5th St.	CH
117-04-021 0	649 E. 5th St.	CH

BLOCK 46, CITY OF TUCSON

117-04-022 0	528 E. 4th St.	CH
117-04-023 0	526 E. 4th St.	CH

117-04-024 0	524 E. 4th St.	CH
117-04-025 0	522 E. 4th St.	CH
117-04-026 0	520 E. 4th St.	CH
117-04-027 0	510 E. 4th St.	CH
117-04-028 0	502 E. 4th St.	CH
117-04-029 0	624-628 N. 3rd Ave.	CH
117-04-030 0	633 N. 2nd Ave.	CH
117-04-031 0	631 N. 2nd Ave.	CH
117-04-032 0	620 N. 3rd Ave.	CH
117-04-033 0	614 N. 3rd Ave.	CH
117-04-034 0	501-503 E. 5th St.	CH
117-04-035 0	505 E. 5th St.	CH
117-04-036 0	513 E. 5th St. 601-605 N. Bean Ave.	NHNC NHNC
117-04-037 0	527 E. 5th St.	CH
117-04-038 0	531 E. 5th St.	CH
117-04-039 0	547 E. 5th St.	CH
<u>BLOCK 47, CITY OF TUCSON</u>		
117-04-040 0	635 N. 3rd Ave.	CH
117-04-041 0	432 E. 4th St.	CH
117-04-042 0	426-428 E. 4th St.	CH
117-04-043 0	420 E. 4th St.	CH
117-04-044 0	412 E. 4th St.	CH
117-04-045 0	402 E. 4th St.	CH
117-04-046 0	636 N. 4th Ave.	CH
117-04-047 0	634 N. 4th Ave.	CH

117-04-048 0	623 N. 3rd Ave.	CH
117-04-049 0	630 N. 4th Ave.	CH
117-04-050 0	628 N. 4th Ave.	CH/NHNC
117-04-053 0	621 N. 3rd Ave.	CH
117-04-054 0	615 N. 3rd Ave.	CH
117-04-055 0	609 N. 3rd Ave.	CH
117-04-056 0	425-427 E. 5th St.	CH
117-04-059 0	603 N. 3rd Ave.	CH
<u>BLOCK 48, CITY OF TUCSON</u>		CH
117-04-060 0	342 E. 4th St.	CH
117-04-061 0	332 E. 4th St.	CH
117-04-062 0	326 E. 4th St.	CH
117-04-063 0	320 E. 4th St.	CH
117-04-064 0	312 E. 4th St.	CH
117-04-066 0	643 N. 4th Ave.	CH
117-04-067 0	628-630 & 632 N. Herbert Ave.	CH
117-04-068 0	628 N. 5th Ave.	CH
117-04-069 0	624 N. 5th Ave.	CH
117-04-070 0	620 N. 5th Ave.	CH
117-04-074 0	331 E. 5th St.	CH
117-04-075 0	317-321 E. 5th St.	CH
117-04-077 0	307 E. 5th St.	CH
117-04-078 A	614 N. 5th Ave.	CH
<u>BLOCK 49, CITY OF TUCSON</u>		
117-04-079 0	242 E. 4th St.	CH
117-04-080 0	234 E. 4th St.	CH

117-04-081 0		Parking Lot
117-04-082 0	222 E. 4th St.	CH
117-04-083 0	650 N. 6th Ave.	NHNC
117-04-084 0	626 N. 6th Ave.	CH/I
117-04-086 0		Parking Lot
117-04-087 0		Parking Lot
117-04-089 0	620 N. 6th Ave.	CH
117-04-090 0		Parking Lot
117-04-091 0	247 E. 5th St.	CH
117-04-092 0		Parking Lot
117-04-093 0		Parking Lot
117-04-094 0		Parking Lot
117-04-095 0	604 N. 6th Ave.	CH
<u>BLOCK 50, CITY OF TUCSON</u>		
117-04-099 0		Vacant
117-04-100 0	632 N. 7th Ave.	NHNC
117-04-102 0		Parking Lot
117-04-103 0	637 N. 6th Ave.	CH/NHNC
117-04-105 0	624 N. 7th Ave.	CH
117-04-106 0	622 N. 7th Ave.	CH
117-04-107 0	620 N. 7th Ave.	CH
117-04-108 0	621 N. 6th Ave.	CH
117-04-110 0	612 N. 7th Ave.	NHNC
117-04-111 0	602 N. 7th Ave.	CH
117-04-112 0		Vacant
117-04-113 0	123-125 E. 5th St.	CH

BLOCK 51, CITY OF TUCSON

117-04-115 0	667 N. 7th Ave.	NHNC
117-04-120 0	629 N. 7th Ave.	CH
117-04-125 0	627 N. 7th Ave.	CH
117-04-126 0	621 N. 7th Ave.	CH
117-04-127 0	605 & 615-617 N. 7th Ave.	CH
	75 E. 5th St.	CH

BLOCK 62, CITY OF TUCSON

117-04-294 0	547 N. 3rd Ave.	CH
117-04-295 0	599 N. 3rd Ave.	CH
117-04-296 A	428 E. 5th St.	CH
117-04-297 A	422-424 E. 5th St.	CH
117-04-302 0	538 N. Hoff Ave.	CH
117-04-303 0	591 N. 3rd Ave.	CH
117-04-304 0	535 N. 3rd Ave.	CH
117-04-305 0	534 N. Hoff Ave.	CH
117-04-306 0	521 N. 3rd Ave.	CH
117-04-307 0	517 N. 3rd Ave.	CH
117-04-308 0	528 N. Hoff Ave.	CH
117-04-313 0	526 N. Hoff Ave.	NHNC
117-04-314 0	513 N. 3rd Ave.	CH
117-04-315 0	511-509 N. 3rd Ave.	CH
117-04-316 0	507 N. 3rd Ave.	CH
117-04-317 0	429 E. 6th St.	NHNC
117-04-321 0	503 N. 3rd Ave.	CH

BLOCK 63, CITY OF TUCSON

117-04-322 0	506 E. 6th St.	CH
<u>BLOCK 64, CITY OF TUCSON</u>		
117-04-323 0	646 E. 5th St.	CH
117-04-324 0	640-642 E. 5th St.	CH
117-04-325 0	628 E. 5th St.	CH
117-04-326 0	616 E. 5th St.	CH
117-04-328 0	604 E. 5th St.	CH
117-04-329 0	523 N. Jacobus Ave.	CH
	523-1/2 N. Jacobus Ave.	CH
117-04-330 0	525 N. 1st Ave.	CH
117-04-331 0	521 N. 1st Ave.	CH
117-04-332 0	528-530 N. 2nd Ave.	NHNC
117-04-333 0	522 N. 2nd Ave.	NHNC
117-04-334 0	519 N. Jacobus Ave.	CH
117-04-335 0	517 N. 1st Ave.	CH
117-04-336 0	643 E. 6th St.	CH
117-04-337 0	623 E. 6th St.	CH
117-04-338 0	621 E. 6th St.	CH
117-04-339 0	619 E. 6th St.	CH
117-04-340 0	617 E. 6th St.	CH
117-04-341 0		Vacant
117-04-342 0	514 N. 2nd Ave.	CH
117-04-343 0	601-603 E. 6th St.	CH
<u>BLOCK 29, FELDMAN'S AMENDED</u>		
115-04-503 0	818 E. Speedway Blvd.	CH
	818-1/2 E. Speedway Blvd.	CH

115-04-504 0	814 E. Speedway Blvd.	CH
115-04-505 0	812 E. Speedway Blvd.	CH
	812-1/2 E. Speedway Blvd.	CH
115-04-506 0	1052 N. Euclid Ave.	CH
115-04-507 0		Vacant
115-04-508 0	1044-1046 N. Euclid Ave.	NHNC
	1036, 1038, & 1040-1042 N. Euclid Ave.	CH
115-04-512 0	1030 N. Euclid Ave.	CH
115-04-515 0		1024 N. Euclid Ave.
115-04-516 0	1018-1020 N. Euclid Ave.	CH
	803 & 811 E. 1st St.	CH
115-04-519 0	819-821 E. 1st St.	CH
<u>BLOCK 30, FELDMAN'S AMENDED</u>		
115-04-525 0	750 E. Speedway Blvd.	CH
115-04-526 0		Vacant
115-04-527 0	710 E. Speedway Blvd.	CH
115-04-528 0		Parking Lot
115-04-529 0		Parking Lot
115-04-530 0		Parking Lot
115-04-531 0	1046 N. 1st Ave.	CH
115-04-532 0	1039 N. Euclid Ave.	CN
115-04-533 0		Parking Lot
115-04-534 0	1036 N. 1st Ave.	CH
115-04-535 0	1030 N. 1st Ave.	CH
115-04-536 0	1029 N. Euclid Ave.	CH
115-04-537 0	1025 N. Euclid Ave.	CH

115-04-538 0	1024-1028 N. 1st Ave.	NHNC
115-04-539 0	1018-1020 N. 1st Ave.	CH
115-04-540 0	701 E. 1st St.	CH
115-04-541 0	707 E. 1st St.	CH
115-04-542 0	715-717 E. 1st St.	CH
115-04-543 0	723 E. 1st St.	CH
115-04-546 0	741-743 E. 1st St.	CH
115-04-548 0	745 E. 1st St.	CH
<u>BLOCK 31, FELDMAN'S AMENDED</u>		
115-04-554 0	724 E. 1st St.	CH
115-04-555 0	920 N. 1st Ave.	NHNC
115-04-556 0		Vacant
115-04-557 0	708-712 E. 1st St.	CH
115-04-558 0	700 E. 1st St.	CH
115-04-567 0	906 N. 1st Ave.	CH/NHNC
115-04-569 A	722 E. 2nd St.	CH
115-04-568 A	830 N. 1st Ave.	CH
115-04-570 A		Parking Lot
115-04-571 A	830 N. 1st Ave.	CH
115-04-572 A	830 N. 1st Ave.	CH
115-04-573 A		Parking Lot
115-04-574 0	819 N. Euclid Ave.	CH
115-04-576 A	820 N. 1st Ave.	NHNC
<u>BLOCK 2, BUELL'S ADDITION</u>		
124-05-007 A		University Main Gate
124-05-009 0		University Main Gate

124-05-010 B		University Main Gate
124-05-011 B		University Main Gate
124-05-012 0		University Main Gate
124-05-013 A		University Main Gate
124-05-014 A	834 E. University Blvd.	NHNC
<u>BLOCK 3, BUELL'S ADDITION</u>		
124-05-016 A	701-707 E. University Blvd.	CH
124-05-018 0	715 E. University Blvd.	CH
124-05-019 0	721 E. University Blvd.	CH
<u>BLOCK 4, BUELL'S ADDITION</u>		
124-05-024 0	704 N. 1st Ave.	CH
124-05-025 0	728 N. 1st Ave.	CH
124-05-026 0	730 N. 1st Ave.	CH
124-05-027 0	715 E. 4th St.	CH
124-05-028 0	721 E. 4th St.	CH
124-05-029 0	725-729 E. 4th St.	CH
124-05-030 0	731 E. 4th St.	CH
124-05-031 0	701 N. Euclid Ave.	CH
124-05-032 0	703 N. Euclid Ave.	CH
124-05-033 0	705 N. Euclid Ave.	CH
124-05-034 0	707 N. Euclid Ave.	CH
124-05-035 0	727-729, 731-733, & 735-737 N. Euclid Ave. 744-746 E. University Blvd.	CH CH
124-05-036 0	742 E. University Blvd.	CH
124-05-037 0	732-738 E. University Blvd.	CH
124-05-038 0	728-730 E. University Blvd.	CH

124-05-040 0	720 E. University Blvd.	CH
124-05-041 0	708 E. University Blvd.	CH
124-05-042 0	704 E. University Blvd.	CH
<u>BLOCK 5, BUELL'S ADDITION</u>		
124-05-043 0	714-718 N. Euclid Ave.	CH
124-05-044 0		Vacant
124-05-045 0	801-803 E. 4th St.	CH
124-05-046 0	805-811 E. 4th St.	CH
124-05-047 0	813-819 E. 4th St.	CH
124-05-048 0		Parking Lot
124-05-049 0	876 E. University Blvd.	CH
124-05-050 0	874 E. University Blvd.	CH
124-05-051 A	870 E. University Blvd.	CH
124-05-052 0	800 & 820 E. University Blvd.	CH
<u>BLOCK 9, BUELL'S ADDITION</u>		
124-05-084 0	632 N. 1st Ave.	CH
124-05-085 0	701-703 E. 5th St.	CH
124-05-086 0	709 E. 5th St.	CH
124-05-087 0	711-713 E. 5th St.	CH
124-05-088 0	715-717 E. 5th St.	CH
124-05-089 0	725 E. 5th St.	CH
124-05-090 0	733 E. 5th St.	CH
124-05-091 0	739 E. 5th St.	CH
124-05-092 0	615 N. Euclid Ave.	CH
124-05-093 0	745 E. 5th St.	CH

124-05-094 0	627 N. Euclid Ave.	CH
124-05-095 0	633 N. Euclid Ave.	CH
124-05-096 0	748 E. 4th St.	CH
124-05-097 0	746 E. 4th St.	CH
124-05-099 0	722 E. 4th St.	CH
124-05-100 0	734 E. 4th St.	CH
124-05-101 0	728 E. 4th St.	CH
124-05-102 0	712 E. 4th St.	CH
124-05-103 0	634 N. 1st Ave.	CH
124-05-104 0	710 E. 4th St.	CH
124-05-105 0	704 E. 4th St.	CH
124-05-106 0	636-638 N. 1st Ave.	CH
<u>BLOCK 10, BUELL'S ADDITION</u>		
124-05-107 0	516 N. 1st Ave.	CH
124-05-108 0	701 E. 6th St.	CH
124-05-109 0	711 E. 6th St.	CH
	711-1/2 E. 6th St.	CH
	711 Rear E. 6th St.	NHNC
124-05-110 0	717 E. 6th St.	CH
124-05-111 0	721-725 E. 6th St.	CH
124-05-112 0	727 E. 6th St.	CH
124-05-113 0	731 E. 6th St.	CH
124-05-116 0	746 E. 5th St.	NHNC
124-05-117 0	726 E. 5th St.	CH
124-05-118 0	728 E. 5th St.	CH
124-05-119 0	714-716 E. 5th St.	CH

124-05-120 0	528-530 N. 1st Ave.	CH
124-05-121 0	532 N. 1st Ave.	CH
124-05-122 0	710 E. 5th St.	CH
124-05-123 0	702-704 E. 5th St.	CH
124-05-124 0	538 N. 1st Ave.	CH

8.8 Downtown Heritage Incentive District

A. Established: August 5, 1991, by Ordinance No. 7674.

B. Boundaries and Location. The boundary of the District coincides with the Downtown Redevelopment District (see map in Article 11 of the UDC).

C. Structures Currently on the National Register of Historic Places. The following are the National Register descriptions of the downtown structures which are currently individually listed, with their dates of entry on the Register:

Structure	Address	Date of Entry on the Register	Additional Information
Old Adobe Patio (Charles O. Brown House)	40 West Broadway	June 3, 1971	This is a Mexican-style, adobe townhouse and is one of the oldest houses in Tucson. It has a flat roof, patio, and seventeen rooms. It now houses a restaurant and shops.
Fremont House	145-153 South Main Street	June 3, 1971	Constructed in 1858 (modified, 1880), this adobe, U-shaped townhouse is said to have been occupied by former Governor John C. Fremont in 1881. It has been restored and is now maintained as a museum by the Arizona Historical Society.
Pima County Courthouse	115 North Church Avenue	June 23, 1978	The three-story, Spanish Colonial Revival building has a blue tiled dome and was designed by noted Tucson architect, Roy Place.
Coronado Hotel	410 East 9th Street	November 30, 1982	Constructed on a main commercial intersection, the three-story, Spanish Colonial Revival-style hotel is historically important as a manifestation of the development of tourism (and tourist hotels) in Tucson.
United States Courthouse	55 East Broadway	February 10, 1983	Designed by the architects of the Treasury Department, the

			Neoclassical Revival building represents part of the extensive Federal building program of the late 1920s. The building is four (4) stories tall and remains one of Tucson's major public buildings. The Courthouse retains its original integrity and continues to serve its original function.
1. Fourth Avenue Underpass		September 30, 1988	
2. Sixth Avenue Underpass			
3. Stone Avenue Underpass			
4. Vehicular Bridges in AZ Thematic Nomination			

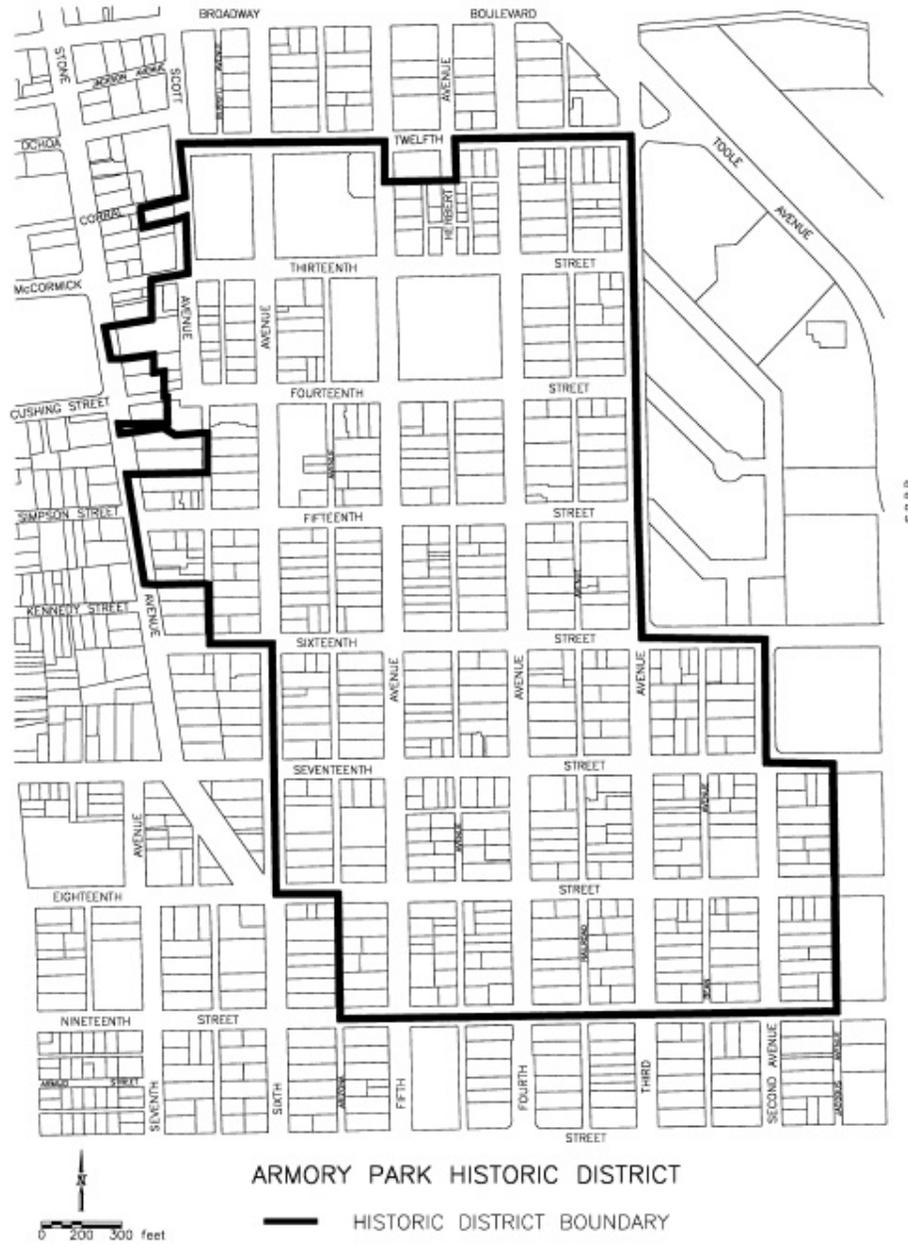
D. Structures Potentially Eligible for the National or Arizona Registers of Historic Places.

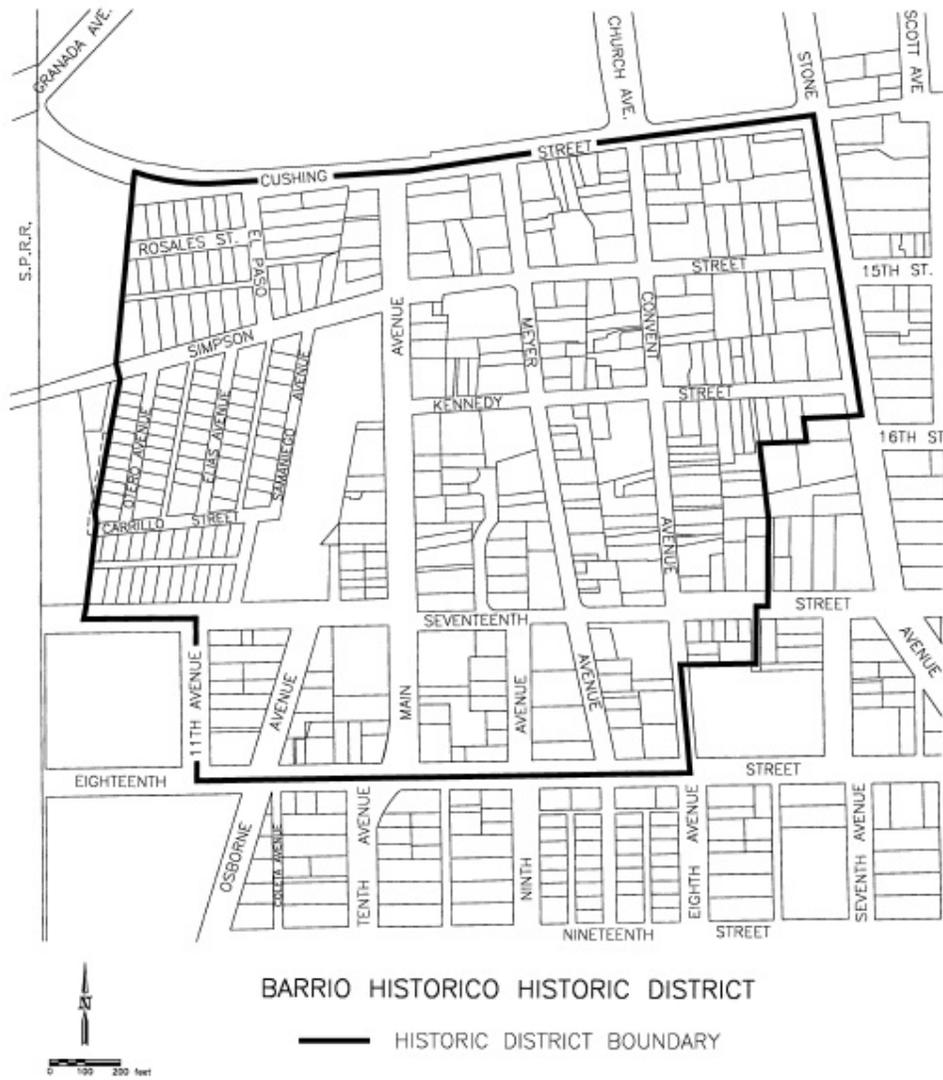
1. The 1983 Historical Survey of Downtown Tucson evaluated some 200 structures and identified 40 as potentially eligible for National Register listing. Of these, three (the underpasses) were subsequently placed on the Register, and two (the El Presidio and Catalina Hotels) were demolished. In its review of the remaining three dozen structures, the Downtown Preservation Strategy Committee's Inventory Subcommittee recommended that 20 buildings receive priority for official recognition, whether as nomination to the National Register, the Arizona Register, or designation as a local landmark. It should be noted that designation would require additional research to document the primary criteria of significance and integrity. Also, the owner's [approval](#) would be required.

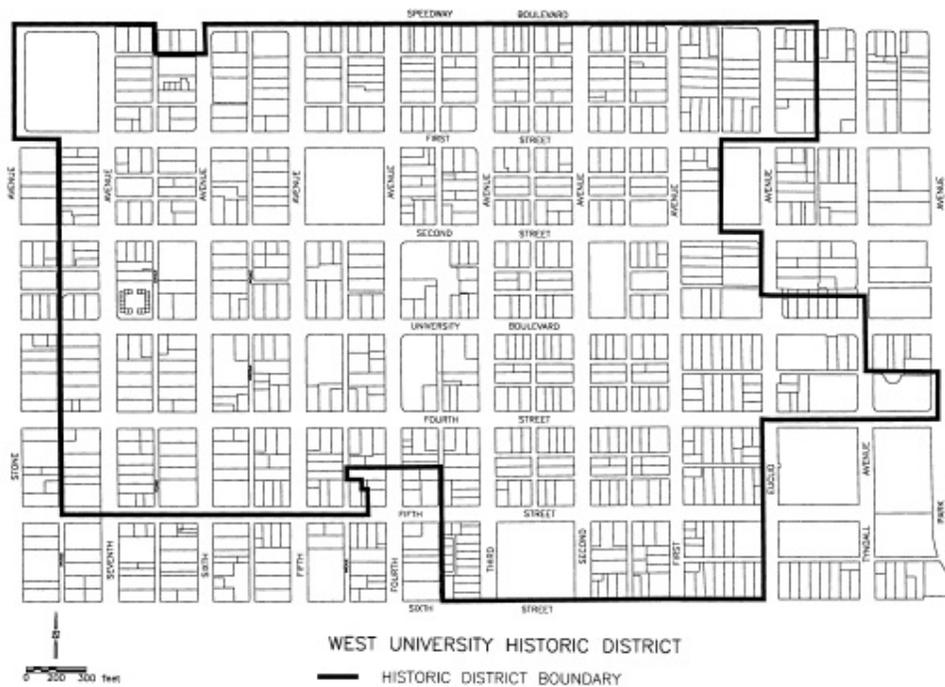
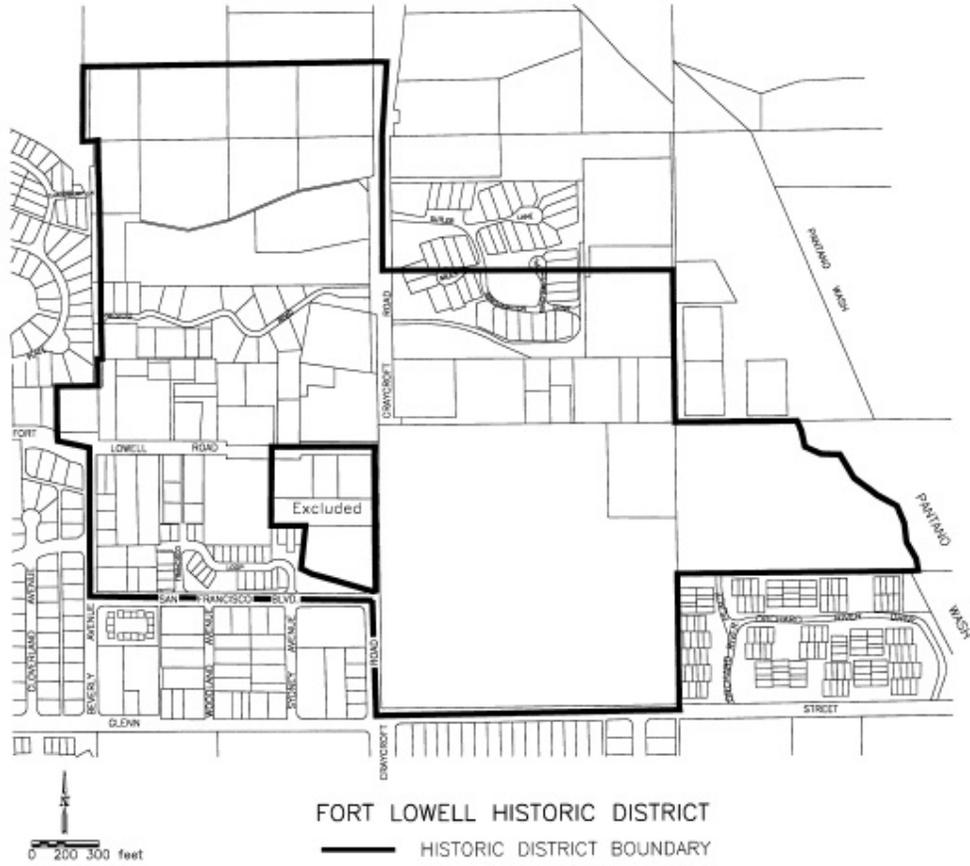
2. Structures potentially eligible for National Register, the Arizona Register, or local landmark designation are listed below, in chronological order:

Structure	Address	Date Constructed
Arizona Daily Star Building	32 North Church Avenue	1884
Willard (Pueblo) Hotel	145 South Sixth Avenue	1903
Chicago Store	130 East Congress	1905
W. A. Julian Building	117-121 East Congress	1905-07
Steinfeld Warehouse	101 West Sixth Street	1906
Tovrea Warehouse	15 East Toole Avenue	1906, 1928
Old Pueblo Club	115 South Stone Avenue	1907
Southern Pacific Railroad Station	400 North Toole Avenue	1907, 1942

Reilly Funeral Home	102 East Pennington Street	1908, 1935
El Paso and Southwestern Railroad Station	419 West Congress	1912
Arizona Hotel	31-47 North Sixth Avenue	1917
Lewis Hotel	179 East Broadway	1917, 1939
Hotel Congress	301-323 East Congress	1919
Odd Fellows Hall	135 South Sixth Avenue	1919
Rialto Theater and Apartments	300-314 East Congress	1919-21
Baffert-Leon Warehouse	1 East Toole Avenue	1928
Thomas-Davis Clinic	130 South Scott Avenue	1928
Valley National Bank	2-16 East Congress	1929
Fox Theater	27-33 West Congress	1930
First Interstate Bank Building	150 North Stone Avenue	1953







Graphics included in this technical standard are reprinted from Tucson's Historic Districts: Criteria for Preservation and Development, City of Tucson, 1972, and Tucson Preservation Primer: A Guide for the Property Owner, edited by Robert C. Giebner [A Class Project of the College of Architecture, University of Arizona], 1979.

SECTION 9-03.0.0: SOUND ATTENUATION WITHIN THE AIRPORT ENVIRONS ZONE

Section

- 9-03.1.0 Purpose
- 9-03.2.0 Compliance
- 9-03.3.0 Required Construction Methods for Noise Level Reduction of 25 dB
- 9-03.4.0 Modifications

9-03.1.0 PURPOSE

The following Standard is intended to provide construction/design requirements for reducing interior noise/sound levels for all new construction occurring within the Noise Control Districts (NCD) identified in the City of Tucson Unified Development Code for the Tucson International Airport (TIA) and Davis-Monthan (DM) Airport Environs Zone. The following Standard may be applied to construction outside the TIA and DM Airport Environs Zone as determined by the Building Official.

9-03.2.0 COMPLIANCE

Compliance with this standard shall be deemed to meet requirements for a minimum noise level reduction (NLR) of 25 decibels (dB). Alternative methods to meet the required minimum NLR may be submitted for review and [approval](#) by the Building Official or designated representative.

9-03.3.0 REQUIRED CONSTRUCTION METHODS FOR NOISE LEVEL REDUCTION OF 25 dB

3.1 Exterior Walls

- A. Exterior walls, other than as described in this section, shall have a laboratory sound transmission class (STC) rating of at least STC-30; or
- B. Masonry walls having a weight of at least 25 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered; and
- C. Stud walls shall be at least four inches in nominal depth and shall be finished on the outside with solid sheathing under an approved exterior wall finish; and
 - 1. Interior surface of the exterior walls shall be gypsum board or plaster at least one-half inch thick, installed on studs.
 - 2. Continuous composition board, plywood or gypsum board sheathing at least one-half inch thick shall cover the exterior side of the wall studs.
 - 3. Sheathing panels shall be covered on the exterior with overlapping building paper.
 - 4. Insulation material at least R-11 shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

3.2 Exterior Windows

- A. Windows, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28; or

- B. Glass shall be at least three-sixteenths thick; and
- C. All openable windows shall be weatherstripped and airtight when closed so as to conform to an air infiltration test not to exceed one-half cubic foot per minute per foot of crack length in accordance with American Society for Testing Materials (ASTM) E-283-65-T; and
- D. Glass shall be sealed in an airtight manner with a non-hardening sealant or a soft elastomer gasket or gasket tape; and
- E. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal specifications for caulking: TT-S-00227, TT-S-00230 or TT-S-00153.

3.3 Exterior Doors

- A. Doors, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-26; or
- B. All exterior side-hinged doors shall be solid-core wood or insulated hollow metal at least one and three-fourths thick and shall be fully weatherstripped; and
- C. Exterior sliding doors shall be weatherstripped with an efficient airtight gasket system with performance as specified in Section 3.2. The glass in the sliding doors shall be at least three-sixteenths inch thick; and
- D. Glass over two square feet in area, in doors shall be sealed in an airtight non-hardening sealant or in a soft elastomer gasket or glazing tape; and
- E. The perimeter of door frames shall be sealed airtight to the exterior wall construction as described in Section 9-03.3.2.D.

3.4 Roofs

- A. Combined roof and ceiling construction, other than described in this paragraph and in paragraph F, shall have a laboratory sound transmission class rating of at least STC-39; or
- B. With an attic or rafter space at least six inches deep, and with a ceiling below, the roof shall consist of one-half inch composition board, plywood or gypsum board sheathing topped by roofing as required; and
- C. Open beam roof construction shall follow the energy insulation standard method for batt insulation; and
- D. Skylights shall conform to the window standard in Section 9-03.3.3.

3.5 Ceilings

- A. Gypsum board or plaster ceilings at least one-half inch thick shall be provided where required by paragraph 3.4 B, above. Ceilings shall be substantially airtight with a minimum of penetrations; and
- B. Glass fiber, cellulose or mineral wool insulation at least R-38 shall be provided above the ceiling between joists.

3.6 Ventilation

- A. A ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors or other openings to the exterior. The inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with one-inch thick coated glass fiber, and shall be at least five feet long with one 90 degree bend; and
- B. Gravity vent openings in attics shall be as close to code minimum in number and size, as practical; and

C. Bathroom, laundry and similar exhaust ducts connecting the interior space to the outdoors, shall contain at least a five-foot length of internal sound-absorbing duct lining. Exhaust ducts than five feet in length shall be fully lined and shall also meet the provisions of Section 9-03.3.2, *Exterior Windows*. Each duct shall be provided with a bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room-opening cross-section. Duct lining shall be coated glass fiber duct liner at least one-inch thick; and

D. Fireplaces shall be provided with well fitted dampers.

9-03.4.0 MODIFICATIONS

For modification procedures, refer to the procedures outlined in Section 1-01.6.0. Emergency situations and other conditions not specifically addressed by this standard shall be judged on a case-by-case basis by the Building Official, or designated representative, without setting precedent. In addition, for all modifications requested, the Davis-Monthan Air Force Base (DMAFB) will be notified for review of all such requests within the boundaries of the DM AEZ Environs.

SECTION 10: TRANSPORTATION

SECTION 10-01.0.0: STREET TECHNICAL STANDARD

Section

- 10-01.1.0 General
- 10-01.2.0 Street Composition
- 10-01.3.0 Street Improvements
- 10-01.4.0 Construction Standards
- 10-01.5.0 Sight Visibility
- 10-01.6.0 Street Design Criteria
- 10-01.7.0 Modifications
- 10-01.8.0 Enforcement
- 10-01.9.0 List of Figures

10-01.1.0 GENERAL

1.1 Purpose

The following Street Technical Standard has been established to:

- Provide for streets of suitable location, width, and improvement to safely accommodate vehicular, pedestrian, disabled pedestrian, and bicycle traffic;
- Afford satisfactory access to police, fire fighting, ambulance, paramedic, utility, sanitation, and street maintenance equipment;

- Coordinate street improvements, both public and private, so as to compose a convenient system and avoid undue hardships to adjoining properties; and
- Provide design values and alternatives most suitable for various situations as dictated by safety and sound engineering judgment.

1.2 Scope

This standard applies to all development located within the City of Tucson.

1.3 Functional Classification

The improvement and development of streets is based on the functional classification system. The design characteristics of the street depend on the volume and type of traffic, length of street, and whether or not it is a through street.

The three functional classifications identified by the City of Tucson are local streets, collector streets, and arterial streets.

1.4 Definitions

Definitions for words used in this standard are found in Section 12, *Definitions*, or in Article 11 of the Tucson Unified Development Code (UDC).

10-01.2.0 STREET COMPOSITION

2.1 Right-of-Way Requirements

A. All rights-of-way, both public and private, will be designed to accommodate present and future street pavements, medians, curbs, walks, utility installations, drainage, landscaping, and other design considerations. All entire or partial right-of-way widths are in whole numbers, dimensioned in feet.

The following abbreviations are used in this standard to refer to right-of-way elements.

M - Median	T - Travel Lanes
TL - Turning Lanes	C - Curbs
B - Bike Lanes	P - Parking Lanes
W - Sidewalk Area	

B. The minimum required right-of-way width consists of:

Local Street	T & C & P & W
Collector Street	T & C & W & TL & B & M (if required)
Arterial Street	T & C & W & TL & B & M

C. Each arterial and collector street will be designed to Major Streets and Routes (MS&R) Plan guidelines to accommodate the projected traffic for the design year and any safety features, buffer zones, frontage roads, refuge lanes, bus lanes, or other design considerations.

D. Additional right-of-way is required by the MS&R Plan at major intersections to allow for necessary turning movements and other street uses.

E. Where considered appropriate by the Tucson Department of Transportation (TDOT), additional right-of-way may also be required for installing mass transit stops, facilities for the physically disabled, or [stormwater](#) flows and drainage structures.

2.2 Traffic Volumes

A. Residential Average Daily Traffic (ADT) can be estimated according to the following table or the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Handbook:

Type of Dwelling Unit	ADT per Unit
Single Family Dwellings	10.0
Apartment/Condominiums	7.0
Townhomes	6.0
Mobile Homes	5.0

B. Nonresidential ADT can be estimated using the *Trip Generation Manual of the Institute of Transportation Engineers*.

C. The ADT calculated for the project must be added to the ADT of the through traffic on any street adjacent to the project, to determine whether the requirements of this standard apply to the street.

2.3 Width Requirements (See Figures 1-5.)

A. Pavement and Travel Lane Widths

1. Paved roadway and travel lane widths are determined by the use of the following tables.

TABLE 1 MIDBLOCK PAVEMENT WIDTHS		
Number of Parking Lanes	Minimum Width of 2-Way Roadway Exclusive of Curbs	
	ADT 0-1,000	ADT 1,001-2,500
0	24 feet	24 feet
2	32 feet*	40 feet

*May be used only with two (2) foot wide wedge curbs.

TABLE 2 TRAVEL LANE WIDTHS		
ADT	Lane Width	Number of Lanes
0 to 1,000	10 feet	2
1,001 to 2,500	12 feet	2

Over 2,500

Designed on a case-by-case basis

2. The width of a travel lane is determined by the speed of traffic, modal split, truck traffic, ADT, and other considerations. Where the volume of truck traffic exceeds 5% of the ADT, the minimum travel lane width will be 12 feet. Where speed of traffic and modal splits effect the width of travel lanes, lane widths will be approved by TDOT.

B. When a travelway exhibits characteristics of both a parking area access lane (PAAL) and a local street, TDOT will classify the travelway according to the most dominant use.

2.4 Parking Lanes

A. A parking lane is eight feet in width and parallel with the curb, if used with a vertical curb and measured from the face of the vertical curb, or, if used with a wedge curb and measured from the back of the wedge curb. Exception: seven feet is acceptable on local roads when the ADT is less than 1,000.

B. When wedge curbs are permitted, they may be included as a part of the parking lane.

C. Parking is prohibited on arterial and collector streets, unless specifically authorized by the Mayor and Council or the TDOT.

D. Local streets must be designed with parking on both sides of the street, unless parking is provided in common areas distributed throughout the subdivision, at a ratio of one parking space per dwelling within the subdivision.

2.5 Additional Vehicular Lanes

A. Deceleration, left turn, and/or additional travel lanes may be required adjacent to driveways on collector or arterial streets. A Traffic Impact Analysis (TIA) shall be prepared for developments that generate over 100 peak hour vehicular trips to determine the need for additional vehicular lanes. The TIA must comply with the criteria established in the latest edition of the city's Transportation Access Management Guidelines.

B. Left turn lanes, with appropriate transitions, may be required on streets that exist at less than the full future width or where significant turning movements will occur. The minimum turn lane width is 11 feet, but 12 feet is recommended.

C. Pavement transitions are to be designed based upon the latest edition of the Manual on Uniform Traffic Control Devices [MUTCD] or other TDOT approved design manuals.

D. Median islands will be designed with a length consistent with the design speed of the street and have a nominal width of 20 feet but at no point be less than six feet in width unless approved by the TDOT, and not intended for pedestrian use. Median islands will provide accessible routes through or across medians and a place of refuge for pedestrians and disabled pedestrians at all pedestrian crosswalks.

2.6 Bikeways, Lanes, and Paths

A. Bikeways and bike paths separate from the paved roadway require a minimum of five feet for one-way travel and a minimum of ten feet for two-way travel.

B. Each bike lane within the paved roadway requires a minimum of five feet of additional pavement.

C. Bikeways, bike lanes, and bike paths will be designed in accordance with the Arizona Department of Transportation publication, Arizona Bicycle Facilities Planning and Design Guidelines and Mayor and Council policy.

2.7 Sidewalk Areas

A. All streets require a sidewalk area on each side of the street. A sidewalk area generally consists of a space between the curb and sidewalk, area for a sidewalk, and a ground [slope](#) area. Improvements include, but are not limited

to, wheelchair ramps, sidewalks, driveways, utilities, street furniture, landscaping, and drainage structures.

Reduction in the width of the sidewalk area or the omission of the sidewalk area (see Section 10-01.3.3.A for the criteria for the omission of sidewalk area) is not allowed, except when authorized by the City Engineer or designee under any of the following conditions:

1. If an alternative street cross-section has been previously approved;
2. In order to accommodate [existing grade](#) differentials;
3. In order to match existing sidewalks;
4. In order to accommodate drainage facilities; or,
5. In order to accommodate existing right-of-way.

B. The space between the curb and the sidewalk is reserved for placing fire hydrants, traffic signs, mailboxes, water meters, drainage structures, and other similar uses. The minimum width for this space is two feet.

The space between the curb and sidewalk may be excluded. (See Figures 1 and 2.) In such a situation, sufficient right-of-way on the property side of the sidewalk must be dedicated to accommodate the items normally found in the space.

C. When landscaping is installed in sidewalk areas which are not required to have sidewalks, a four-foot wide walk area must be kept free from trees and large bushes. If curbs exist, the walk area will be graded to provide a ground [slope](#) of 2% to the top of the curb.

D. In sidewalk areas where sidewalks are installed, owners of abutting property may place pea gravel, decomposed granite, or brick in sand in the space between the curb and sidewalk and in the ground [slope](#) areas. A no cost right-of-way permit from the City of Tucson is required for the placement of the materials.

E. Landscaping work in street right-of-way that involves irrigation systems, raised planters, trees, large shrubs, or curbing will require the abutting property owner to submit a plan to, and receive written [approval](#) and a permit (pursuant to Chapter 25, Tucson Code) from, TDOT. The landscaping will be reviewed for sight visibility safety, pedestrian safety, upheaval potential, and compatibility with existing utilities and drainage facilities.

F. Any improvements (landscaping, irrigation, etc.) installed in the sidewalk area by the owner of an abutting property will be installed and maintained at the owner's expense. If the improvements need to be removed or relocated because of construction of City of Tucson projects, removal and relocation will be at the owner's expense.

G. Maintenance of the sidewalk area in the public right-of-way is the responsibility of the owner of the abutting property when the sidewalk area is damaged or compromised by the owner of the abutting property or resident of the property.

2.8 Pedestrian Access

Barrier-free access routes shall be designed so they are traversable at all times and free of floodwater during a ten-year frequency flood event.

A. All streets require the installation of a barrier-free pedestrian circulation path, unless specifically exempted by this standard. The pedestrian circulation path consists of sidewalks, wheelchair ramps, and landings.

Where the local street system is designed so that access to schools via the local streets is indirect, a pedestrian easement is required which provides a direct route to nearby schools (see the latest edition of the Arizona Department of Transportation (ADOT) Traffic Safety for School Areas Guidelines for additional information related to school pedestrian circulation.

B. Pedestrian circulation paths located in a street will conform to the criteria in this standard.

C. Pedestrian circulation paths located within a development must meet the criteria listed in Section 7-01, *Pedestrian Access*.

10-01.3.0 STREET IMPROVEMENTS

3.1 Paving

A. All pavement sections will be designed in accordance with ambient soil conditions and projected use, using a method acceptable to the City Engineer.

1. The minimum structural section for permanent pavement on local streets is:

a. Two inches of asphaltic concrete, supported by four inches of aggregate base course, supported by subgrade compacted to 95% relative density in accordance with the Pima County and City of Tucson Standard Specifications for Public Improvements; or

b. Three and one-half inches of asphaltic concrete supported by subgrade compacted to 100% relative density in accordance with Standard Specifications for Public Improvements.

2. The minimum structural section for an interim paving improvement is two inches of asphaltic concrete on compacted subgrade. (Interim paving may be constructed on public streets when designated by the City Engineer. Such interim paving must be at least 24 feet in width. Curbing may be required.)

3. The minimum structural section for a private residential street is dust control paving.

4. The minimum structural section for a private street in an industrial development will be three inches of asphaltic concrete supported by six inches of aggregate base course.

5. The minimum structural section for temporary paving is two inches of asphaltic concrete pavement on compacted earth.

B. All asphaltic concrete will conform to Standard Specifications for Public Improvements or an approved equivalent, unless directed otherwise by the City Engineer.

3.2 Curbing

A. Curbing is required on streets in order to adequately control drainage within the street, prevent moisture from entering the subgrade, control access to abutting property, separate the roadway from the pedestrian area, and provide adequate lateral support for the pavement structure.

B. Curbing will conform to the following criteria.

1. Curbing will be vertical or wedge curbs as detailed in Standard Details for Public Improvements.

2. Vertical curbing is required on all streets:

a. With a projected ADT of 1,000 or more, and

b. When the sidewalk adjoins the back of curb.

3. Wedge curbing may be used on streets with a projected ADT of 1,000 or less, but shall not be placed against sidewalks. A buffer of two feet is required between the back of wedge curbing and the sidewalk, except when authorized by the City Engineer for areas of reduced sidewalk area.

C. At the intersections of streets with other streets or collector or arterial streets with PAALs/driveways, the curb lines will be connected with a curve having the minimum radius shown in Figure 6, measured at the face of the curb.

D. At intersections of alleys with streets having vertical curbing, curb returns with a minimum radii of 12 feet are required. If the alleys are not paved, the ends of the curb returns will be connected with a concrete header along the extension of the street right-of-way. Curb cuts may be used in place of curb returns only with the [approval](#) of the City Engineer. (See Figure 7.)

When wedge curbs are used, curb returns need not be provided at alleys unless required for drainage control.

E. All curb cuts, curb returns, and curb depressions will be located in accordance with the City of Tucson Code, Chapter 25.

F. Wheelchair ramps meeting the criteria of this standard will be provided at all curb returns.

G. When curb returns are installed at arterial intersections, conduit and pull boxes will also be installed per the currently adopted street lighting plan to allow for future lighting projects. The conduit and pull boxes will be to Standard Details for Public Improvements. TDOT will provide guidelines as to plan details.

3.3 Street Pedestrian Circulation Paths

A. Except as provided in Section 10-01.3.3.C, *Sidewalks*, as specified in Section 10-01.4.0, *Construction Standards*, are required along the entire street frontage of new development of all properties, including proposed new subdivisions and applications for building permits. The sidewalk requirements also apply to expansions in floor area, [site](#) area, or vehicular use area of 25% or more.

B. Sidewalks are required along the entire length of the street frontage of all streets, whether public or private, of the property in question.

C. Exceptions. Sidewalks are not required in the following circumstances:

1. At locations where pedestrian traffic is extremely unlikely, subject to [approval](#) of the City Development Review Committee (CDRC);

2. At locations where pedestrian traffic is heavily predominant along only one side of a street, a sidewalk is required only on that side of the street, subject to [approval](#) of the CDRC;

3. For development of parcels located in areas included in improvement districts which are under design and which include sidewalks;

4. On any residential street with an ADT of less than 140, provided the street has vertical curbs and concrete driveways providing pedestrian and disabled pedestrian access to the dwelling on each lot;

5. On any residential street with an ADT of less than 400, provided that a sidewalk is constructed in an alternative location approved by the CDRC;

6. For subdivisions proposing individual single-family residential lots, with each lot containing 16,000 square feet of area or more;

7. On streets in established areas without existing curbs;

8. For lots containing drainageways in which the flow from the 100-year storm is 100 cfs or greater, provided an alternate route for pedestrians is constructed in a location approved by the CDRC. This exception is limited to the width of the drainageway, which is measured from top-of-bank to top-of-bank;

9. For streets in established areas where adequate right-of-way does not exist and existing improvements adjacent to the right-of-way preclude granting a public pedestrian access easement for construction of pedestrian facilities on [site](#);

10. For a single-family lot where adjacent lots are developed without sidewalks, provided the lot is not part of a

subdivision that is under development or has assurances posted for such improvements.

D. Sidewalk Location. Sidewalks must meet the following locational requirements.

1. Sidewalks will be located a minimum of two feet from the back of the existing or projected wedge curb location (the standard location) and extend to the curb at all street intersections.

These sidewalks may meander, if:

a. The sidewalk is in the standard location at the extension of the property lines or matches the alignment of the abutting sidewalks; and

b. On a public street, the sidewalk is located within the right-of-way or within an acceptable pedestrian easement; and

c. The maximum lateral offset does not exceed seven and one-half feet; and

d. Lateral transitions in the sidewalk are no sharper than three longitudinal to one lateral; and

e. Irrigation is not placed between the sidewalk and the curb; and

f. The sidewalk is a minimum of five feet in width where it adjoins vertical curbing.

2. Sidewalks will extend the full length of the street frontage of the development to provide continuity of the pedestrian and disabled pedestrian circulation path.

3. Bus benches and shelters will be located adjacent to the edge of the sidewalk and will not encroach into the five-foot wide circulation path.

4. There will be a minimum of one-foot separation between the five-foot wide pedestrian circulation path portion of any sidewalk and any adjacent structure. This one-foot wide area may also consist of concrete.

5. Sidewalks must be physically separated from any vehicular travel lane by means of curbing, [grade](#) separation, barriers, railings, or other means, except at crosswalks.

E. Ramp Requirement. Curb ramps must be provided at all points where the sidewalk intersects a curb, in accordance with A.R.S. § 9-499.02. Ramps must align with each other where they cross the street.

10-01.4.0 CONSTRUCTION STANDARDS

4.1 Sidewalk Specifications

A. Width

1. Sidewalks located along a street will meet the following requirements.

a. All projects which require a new sidewalk will provide a sidewalk with a minimum width of five feet along local streets and six feet along collector and arterial streets, installed to avoid any obstruction which decreases the minimum width to less than five feet.

Additional sidewalk width is required for schools and within pedestrian oriented areas, such as the University area and the Downtown Redevelopment Area.

b. All projects which have an adjacent existing sidewalk less than four feet in width will provide a sidewalk with a minimum width of five feet by:

- 1) Increasing the width of any narrower existing sidewalk to five feet; and
- 2) Removing all obstructions (such as poles, signs, benches, bus stops, etc.) from the sidewalk to provide a minimum width of five feet; or
- 3) Constructing additional sidewalk where obstructions cannot be moved, so that a minimum five feet of sidewalk extends past the obstruction.

c. Where sidewalks are less than five feet in width, passing spaces at least five feet by five feet will be located at reasonable intervals not to exceed 200 feet. A T-intersection of two sidewalks or a level driveway apron is an acceptable passing space. A public pedestrian easement may be required for installation of the passing spaces.

B. Vertical Clearance. All sidewalks will have an unobstructed vertical clearance of 84 inches.

C. Composition. Sidewalks located within a street right-of-way, both parallel to the street and leading into a development project, will be constructed in conformance with the composition requirements of the Standard Details for Public Improvements. The Standard Details for Public Improvements may have to be modified to comply with the slope requirements of this standard. Textured concrete will have a relief less than or equal to one-eighth inch.

D. Slope.

1. Accessible Route Cross Slope

The cross slope of the sidewalk will not exceed 2%. If existing public sidewalks which intersect driveway aprons have a cross slope which exceeds 2% (where the apron slope is measured to the back of the sidewalk), one of the following will occur. A public pedestrian easement may be required for installation of pedestrian facilities.

- a. The driveway apron will be reconstructed so the sidewalk portion of the apron does not exceed 2% cross slope; or
- b. An additional four feet of sidewalk, with transitions, will be installed behind the existing apron; or
- c. Additional paving will be installed to provide a level accessible route, with transitions, in the parking area behind the sidewalk; or
- d. Where excess right-of-way exists, the sidewalk is meandered behind the driveway apron to provide an accessible route.

2. Accessible Route Running Slope

The running slope of the sidewalk will not exceed one vertical to 20 horizontal, unless the longitudinal grade of the street exceeds this maximum. Any portion of a sidewalk which exceeds this slope will conform to the requirements of this standard concerning ramp construction, unless TDOT determines that extenuating circumstances preclude conformance.

4.2 Ramp Specifications

A. Width

All ramps will have a minimum width of five feet, excluding edge protection or flared sides.

B. Rise

The maximum rise for any ramp will be 30 inches.

C. Slope

1. Accessible Route Cross Slope

The cross [slope](#) of ramps will not exceed one vertical to 50 horizontal.

2. [Accessible Route Running Slope](#)

The running [slope](#) of ramps will not exceed one vertical to 12 horizontal. This includes the [slope](#) of the underlying and adjacent topography.

Exceptions:

- a. Changes in elevation no greater than one-fourth inch may be vertical and without treatment.
- b. Changes in elevation between one-fourth inch and one-half inch will be beveled with a [slope](#) no greater than one vertical to two horizontal.

D. [Ramp Landings](#)

All ramps will have an unobstructed level landing both at the top and the bottom of the ramp, meeting the following requirements.

1. [Width](#)

The landing will be at least as wide as the ramp leading into it.

2. [Length](#)

The landing will be at least five feet long.

3. [Landing Slope](#)

A landing will be level in any direction. A street surface may be used for the landing at the bottom of the ramp if it meets all composition and [slope](#) requirements for an accessible route.

E. [Sidewalk/Ramp Intersections](#)

A sidewalk will intersect a ramp only at the top or bottom landing.

F. [Ramp Safety](#)

1. [Obstruction by Parked Vehicles](#)

Curb ramps will be located so that vehicles cannot park blocking the ramp access.

2. [Handrails](#)

Handrails will be required for any ramp other than a curb ramp with a rise greater than six inches or longer than 72 inches. The following criteria apply.

- a. Handrails will be located on both sides of the ramp.
- b. On any ramp which changes direction, the inside handrail will be continuous.
- c. The height of the top of the handrails will be between 30 inches and 34 inches from the ramp surface.
- d. If the handrails are constructed of metal, the top railing will be covered with a non-heat-conducting material.

3. [Vertical Drop-Offs](#)

If any ramp other than a curb ramp has a vertical drop off on the side, there will be a curb, wall, railing, or surface projecting above the ramp surface to prevent pedestrians and wheelchairs from slipping off the ramp. Minimum height of

any protective device will be two inches.

4. Surface

Ramps and landings will be rough finished for traction. Stamped textured concrete is not acceptable.

5. Drainage

All ramps and landings will be designed so that water does not collect on the surface of the ramp or landing.

4.3 Driveways

A. Driveway aprons will be of portland cement concrete (PCC) constructed to City of Tucson Standards, with a standard length of eight feet from the front of the curb to the back of the apron.

B. Curb returns may be used in place of standard curb cuts only when one or more of the following conditions occur.

1. The ADT of the driveway exceeds 100;

2. The points of access to a property should be limited for traffic control and other reasons;

3. Local conditions occur which involve speed, the amount of truck traffic, or the type of development and which, in the opinion of TDOT, require curb returns; or,

4. When intersections a collector or arterial street.

4.4 Street Drainage

A portion of rainfall which falls on subdivision lots eventually concentrates in either streets or drainageways. The primary function of streets is to carry the traffic. In most cases, however, drainage and traffic flow can complement each other to accomplish the most efficient use of streets. As the storm runoff amount increases adjacent to curbs, it will begin to interfere with traffic movement, at which time the flow or portions thereof must be removed from the streets into drainageways.

A. Drainage Criteria for Local, Collector, and Arterial Streets

The design criteria given in Section 12.2 of Technical Standard 10-02.0, *Standard Manual for Drainage Design and Floodplain Management in Tucson, Arizona*, shall apply to all newly constructed and substantially improved local, collector, and arterial streets. The following drainage design criteria shall apply.

1. Runoff from a ten-year storm must be contained within the curbs of the street. On arterial streets or multiple lane roadways, at least one travel lane in each direction shall be free from flooding during a ten-year flood. Otherwise, storm drains, drainage channels, or other acceptable [infrastructure](#) shall be provided to comply with all-weather access requirements.

2. Storm drain systems shall be designed such that the ten-year storm is contained in the combined street gutter and storm drain system. Whenever developments occur in areas not adequately served by existing storm drains and/or drainage channels and street drainage design criteria require installation of storm drains, the design of this drainage facility shall be as approved by the City Engineer's Office.

B. Maximum Allowable Street Flow

All streets shall be designed and constructed so that the maximum rate of storm runoff flowing in the direction of vehicular travel should not exceed 50 cfs. In no case shall the maximum rate of storm runoff flowing in the direction of vehicular travel exceed 100 cfs without proper justification and prior [approval](#) by the City Engineer's Office.

C. Drainage Conveyance Structures

Curb cuts, sidewalk scuppers, curb inlets, grate inlets, or other drainage conveyance structures shall be constructed, as appropriate, to convey the street flow to the storm drain or other drainageways.

D. Flow at At-Grade Dip Crossings

Streets required for permanent all-weather access shall be designed and constructed so that the maximum rate of storm runoff flowing across the street at a wash crossing shall not exceed one foot in depth during a 100-year flood.

E. All-Weather Access

All-weather access is a safe vehicular travel route which both conventional and emergency vehicles require for the purpose of unimpeded access. Streets required for permanent all-weather access shall be designed and constructed based on the following performance criteria.

1. At least one paved, permanent, all-weather access shall be provided to each lot over terrain which can be traversed by conventional motor vehicles in times of flooding. This standard applies to public or private streets and to a designated route connecting a street and the development or building in question.

2. Stormwater runoff flowing either across or in the direction of an all-weather access route shall not exceed one foot in depth during the 100-year flood.

3. The depth of flow in a roadway shall not exceed one foot in depth, except at drainage crossings, during the regulatory (100-year) flood peak discharge.

F. Sidewalks

At any point where the ten-year flood discharge starts to cross a sidewalk, the sidewalk shall be designed and constructed to convey the ten-year flood flow under the sidewalk. The equation or design criteria $dv^2 < 18$ may be utilized to regulate flow depths and/or flow rates exceeding the ten-year flood discharge magnitudes.

4.5 Vehicular Travel Lane Grade Criteria

A. Barring unusual circumstances of grade or drainage conditions, the following criteria apply to streets (both public and private) and alleys. Any exceptions must be obtained in writing from the City Engineer.

Maximum Longitudinal Grades	
Travelways under 600 feet in length	15%
Travelways over 600 feet in length	12%
Cul-de-sac turning areas	8%
Minimum Longitudinal Grades	
Crowned streets	0.50%
Inverted streets	0.50%

B. Vertical curves are required on local, collector, and arterial streets where the algebraic difference in grade exceeds 1%, and the minimum desirable vertical curve length is 100 feet. Vertical curves will be designed to meet minimum stopping sight distance.

C. Crowned Streets (see Figure 8). When the street is used as a ramp landing, the maximum slope of the landing area is 2%.

1. The minimum crown is 2% for streets with a longitudinal [grade](#) of 0.50% or greater.
 2. The minimum crown is 3% for streets where a longitudinal [grade](#) less than 0.50% is approved.
 3. The maximum crown is 4%.
- D. Inverted Streets (see Figure 8). When the street is used as a ramp landing, the maximum [slope](#) of the landing area is 2%.
1. The minimum cross [slope](#) for an inverted street is 2% for streets with a longitudinal [grade](#) of 0.50% or greater.
 2. The minimum cross [slope](#) for an inverted street is 3% for a street where a longitudinal [grade](#) of less than 0.50% is approved.
 3. Inverted crown [slopes](#) in excess of 3% may be used only with the City Engineer's [approval](#).
- E. Street improvements are required on streets abutting properties subject to rezoning or subdivision platting. The extent of the improvements will be based on the street classification, the amount of traffic projected, soil conditions, and drainage.
- F. All street improvement plans must comply with Standard Details for Public Improvements which outlines drafting standards for the preparation of plans.
- G. All standard details, specifications, and procedures mentioned in this standard may be obtained at the Office of the City Engineer or the City Clerk.

4.6 Utilities

- A. Utilities will be located in compliance with utility location drawings. (See Figures 9- 14.)
- B. Strip easements may be used along streets for the installation of utilities. (See Figure 15.) With the exception of minor service extensions to individual parcels, all longitudinal utility installations between service points at individual parcels will be located within street rights-of-way. Access between the street and the private property will not be denied unless unsafe conditions exist.
- C. All sanitary sewer facilities will be constructed in accordance with current Pima County Regional Wastewater Reclamation Department standards.

4.7 Assurances

When assurances for street, sewer, electric and water utilities, and drainage and flood control improvements are required in conjunction with a subdivision, they will be posted prior to final plat [approval](#) by the City Engineer or designee. Assurances are to be posted in accordance with Section 8.6.2, *Subdivision Improvements and Assurances*, of the Unified Development Code.

10-01.5.0 SIGHT VISIBILITY

5.1 Sight Visibility Triangles

Clear lines of sight will be maintained along all streets and driveways to assure the safety of motorists and pedestrians.

A. Lines of Sight

1. Lines of sight will not be obscured between 30 inches and six feet through a triangular area adjacent to a driveway, a PAAL, an alley, or a street, where such access ways intersect with another street in a T-configuration. The sight visibility triangle, or sight triangle, consists of three sides that are formed by two intersecting access ways and a line

connecting the two.

The first side, or through street side, is drawn parallel to the centerline of the street that is intersected. The second side, or stem side, is drawn parallel to the centerline of the stem street. The line which connects the first two sides, or sight line, is drawn diagonally to the through street. (See Figure 16.)

Where streets meet in a four-way intersection, each street is considered a stem, with the other street considered the through street, for purposes of determining the sight triangle. (See Figure 17.)

2. The datum for the purpose of measuring the limits of the lines of sight (i.e., 30 inches and six feet) is an imaginary plane formed by the intersection of the gutter line (or its approximation) of the through street with the at-[grade](#) centerline (or its approximation) of the stem street.

B. Sight Visibility Triangle Criteria

1. A sight triangle will be maintained on each side of a stem that intersects a two-way through street so that clear sight is provided to vehicles approaching from both the near side (to the driver's left) and the far side (to the driver's right) of the stem. Near side means approaching traffic is on the same side of the street as the stem. Far side means approaching traffic is on the opposite side of the street from the stem.

The length required for the through street side of the sight triangle is measured on the side of the stem from which traffic approaches. On one-way streets or streets with median islands (i.e., no opening), only one sight triangle is required on the side of approaching traffic; however, a 20-foot (stem) by 30-foot (curb) pedestrian visibility triangle will be maintained on the opposite side of approaching traffic. (See Figure 16.)

2. If a street is included on the MS&R Plan, both the existing and future sight visibility triangles (based on the MS&R Plan typical cross sections) should be shown. Future sight visibility triangles are to be based upon the MS&R Plan typical cross section for said street. The most restrictive sight visibility triangles will be used unless specifically exempted.

3. The through street side of a sight triangle on a horizontal curve is measured along a chord, as opposed to along the arc. (See Figure 18.)

4. The sight triangle location and dimensions may be adjusted to compensate for unusual circumstances, such as irregular topography or [grade](#) changes, cul-de-sacs, curvilinear or deflected streets, or in other situations acknowledged by the CDRC.

5.2 Sight Distances

A. The length of the stem side of the sight triangle is 20 feet, measured from a point specified below.

B. The length and location of the through street side of the sight triangle for near side/far side is determined according to the following criteria.

1. On any PAAL or on a street that generates an ADT of 140 or less and intersects a local road, no sight triangle is required. The minimum perimeter yard required in Article 6, *Dimensional Standards and Measurements*, of the UDC prevails.

2. Where the ADT is greater than 140 but less than 1,001, the through street side is considered a local street in the "Line of Sight Matrix" (Section 10-01.5.3) and is measured at the edge of the nearest adjacent travel lane.

3. Where the ADT is between 1,001 and 12,000 and the street is not designated as an arterial on the MS&R Plan, the through street side is considered a collector street in the "Line of Sight Matrix" and is measured at both the existing and projected (future) face of curb or edge of travel lane. The future face of curb is based on the typical MS&R Plan right-of-way cross section for that street.

4. Where the ADT is 12,000 or more or the street is designated as an arterial on the MS&R Plan, the through street side is considered an arterial street in the "Line of Sight Matrix" and is measured at both the existing and projected (future) face of curb or edge of travel lane.

The future face of curb or travel lane is based on the typical MS&R Plan right-of-way cross section for that street.

5. On any street designated by the MS&R Plan as requiring intersection widening, the midblock MS&R Plan cross section may be used, at the discretion of the City Engineer, for determining the future sight visibility triangles of parcels lying within or adjoining the intersection widened portion of the street right-of-way.

5.3 Line of Sight Matrix

STEM STREET SIDE	THROUGH STREET SIDE			
		Local	Collector	Arterial
DRIVE/PAAL	Near Side	185*	265	345
	Far Side	110	110	125
LOCAL	Near Side	180	260	340
	Far Side	110	110	125
COLLECTOR	Near Side	175	255	335
	Far Side	110	110	125
ARTERIAL	Near Side	165	245	325
	Far Side	110	110	125

*Length in Feet

5.4 Structural Projections or Overhangs

Structural projections or overhangs over six feet above [finish grade](#) are permitted within the required setback areas, provided that the overhang does not extend into the public right-of-way or the future right-of-way per the MS&R Plan, and the following conditions are met.

- A. On any PAAL, see Section 7.4.6.F.2, *Setbacks from Access Lanes and PAALs*, of the Unified Development Code.
- B. On any street, see Sections 6.4.5.C, *Street Perimeter Yard*, and 6.4.5.D, *Exceptions*, of the UDC.

10-01.6.0 STREET DESIGN CRITERIA

6.1 Street Layout

A. Partial local street rights-of-way are not acceptable for subdivision design. Modifications may be granted in accordance with Section 10-01.7.0. Where partial streets exist adjacent to the tract being developed (see Figure 19):

- 1. Additional property necessary to provide the full width right-of-way must be dedicated; and
- 2. Improvements must be made to the street as required by TDOT.

B. Proposed developments will provide for the continuation of existing arterial and collector street right-of-way.

- C. The local street system will be arranged to discourage through vehicular traffic through the proposed development.
- D. When residential lots front on arterials or collectors, proposed developments will provide sufficient right-of-way for local service or access streets. Other treatments to protect residential properties by separation of through and local traffic will be considered.
- E. Where residential driveways front directly on a major street, adequate area will be provided on [site](#) to accommodate a vehicular turnaround area or a circular driveway.
- F. The proposed development will provide streets that conform to all adopted neighborhood or area plans.
- G. All stub streets will be designed as collector streets for a minimum ADT of 1,000 vehicles and will provide temporary turnaround areas at the stub end.
- H. When the City of Tucson determines that vehicular access to or from a development or subdivision at a particular location should be prohibited in the public interest and for health, welfare, or safety, a one-foot wide no vehicular access easement will be dedicated to the City of Tucson. Physical barriers may be required.

6.2 Geometric Design

A. Street design will be in accordance with the following criteria, subject to the [approval](#) of the City Engineer and concurrence by the CDRC. Grades, curve criteria, sight distances, and other geometric design standards not specifically included in this standard will conform to A Policy on Geometric Design of Highways and Streets, published by the American Association of State Highway and Transportation Officials (A.A.S.H.T.O.).

Arterial street design will conform to the current edition of the A.A.S.H.T.O. manual, A Policy on Design of Urban Highways and Arterial Streets.

Minimum posted speed for public local streets will be 25 miles per hour. Private local streets may be designed for 20 miles per hour.

B. Permanent dead-end streets will be designed with an adequate turnaround at the dead end, except for dead-end streets less than 150 feet in length, if municipal services, such as fire, refuse, and postal service, can be provided without the use of the street.

Dead-end streets may exceed 600 feet in length, as measured from the centerline of the connecting street to the far end of the turnaround area, under the following conditions.

1. The ADT is less than 400;
2. The total length of the dead-end street is not to exceed 1,200 feet in length;
3. The street is approved by both the Fire Department and TDOT; and,
4. The portion of the dead-end street nearest the connecting street has a minimum of 36 feet of pavement (measured between backs of wedge curbs or between faces of vertical curbs) for a distance equal to the total length of the dead-end street less 600 feet.

C. Turnarounds may be designed as cul-de-sacs or “T” or “Y” shaped configurations in accordance with Section 10-01.6.2.C.1 and Section 10-01.6.2.C.2.

1. The cul-de-sac is preferred by the City of Tucson at all times for local street turnarounds because of its overall efficiency. (See Figures 20 and 21.)

a. In residential areas, the right-of-way turnaround radius will be a minimum of 50 feet, with a radius of 50 feet for return curves.

- b. In industrial and commercial areas, the right-of-way turnaround radius will be a minimum of 60 feet, with a radius of 60 feet for return curves.
 - c. In residential areas, the turnaround will be paved with a minimum radius of 42 feet, measured to the face of the vertical curb or to the back of the wedge curb, whichever is provided.
 - d. In industrial and commercial areas, the turnaround will be paved with a minimum radius of 52 feet, measured to the face of the vertical curb or to the back of the wedge curb, whichever is provided.
 - e. Parking will be allowed along the curb of a cul-de-sac utilizing a pavement turnaround radius of 50 feet or greater.
 - f. See Figure 22 for the standard right-of-way and curb “knuckle” design for a street right-of-way of 50 feet.
2. “T” and “Y” shaped turnarounds may be used for dead-end streets which have a projected ADT of 140 or less. (See Figure 23.) Parking will not be allowed in the turnaround area. Vertical curbing is required in the turnaround area.
 3. Street improvements may be required on dead-end streets abutting properties subject to rezoning or subdivision platting. The extent of improvements will be based on the street classification, the amount of traffic projected, the soil conditions, and the drainage.

6.3 Street Alignments

Jogs of less than 150 feet in local alignments are not acceptable. Arterial and collector streets will not have jogs in alignment. (See Figure 24.)

6.4 Intersection Alignments

A. The centerlines of intersecting streets will have an angle of intersection of 90 degrees or as close to 90 degrees as is practicable. Local streets will intersect at an angle no less than 60 degrees.

Arterial and collector streets will have an angle of intersection no less than 75 degrees. (See Figure 25.) Curvilinear streets should radially intersect.

B. Right-of-way lines at the corners of street intersections will be rounded with a curve radius of 25 feet or greater for residential districts and 40 feet for commercial or industrial districts.

6.5 Private Streets

A. Private streets are permitted only where satisfactory means of providing for their control and maintenance is demonstrated.

1. The City of Tucson will not be responsible for maintenance, liability, or enforcement of traffic control on private streets, except where specifically authorized by ordinance.

2. Erection of all traffic control and street name signs is the responsibility of the developer. Maintenance of all traffic control and street name signs is the responsibility of the property owners' association.

B. Private streets will be named according to current Pima County criteria and will be approved by Pima County Addressing.

C. An applicant petitioning the City of Tucson to accept the dedication of a private street to the public must satisfy TDOT that the street meets city standards for public streets, such as structure, right-of-way, and all other public street provisions.

D. Private streets must meet all the requirements of public streets which carry similar types and volumes of traffic, except where specific exceptions are noted in this standard.

- E. PAALs are not acceptable for dedication as public rights-of-way.

6.6 Alleys

Alleys are to be used for utility placement, provision of sanitary services, and as a secondary point of access to property.

10-01.7.0 MODIFICATIONS

A. Where, in the opinion of the CDRC, there exist extraordinary conditions of topography, land ownership, adjacent development, Historic District review, or other circumstances not provided for in this standard, the CDRC may modify this standard in such a manner appropriate to the public interest.

B. In granting a modification of this standard or requirements of these provisions, the CDRC may make such additional requirements as appear necessary, in its judgment, to secure substantially the objectives of the Standards or requirements so modified.

C. All items not specifically covered by this standard will be judged on a case-by-case basis by the CDRC without setting precedent.

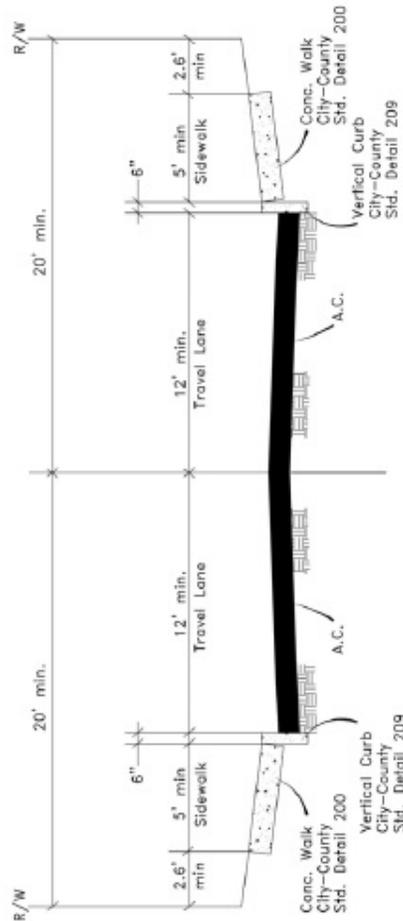
10-01.8.0 ENFORCEMENT

The Department of Transportation is responsible for enforcing the provisions of the Standard.

10-01.9.0 LIST OF FIGURES

- Figure 1 Typical Cross Section for Interior Roads - No Parking Lanes (ADT 0-1,000)
- Figure 2 Typical Cross Section - Two Parking Lanes (ADT 0-1,000)
- Figure 3 Typical Cross Section - Handicapped Accessible Drive
- Figure 4 Typical Detail - Handicapped Accessible Ramp Detail for Vertical Curb
- Figure 5 Typical Cross Section - Two Parking Lanes (ADT 1,001-2,500)
- Figure 6 Curb and Property Radii
- Figure 7 Alley/Street Intersection
- Figure 8 Crowned Streets/Inverted Streets
- Figure 9 150' Right-of-Way - Utility Location
- Figure 10 120' Right-of-Way - Utility Location
- Figure 11 100' Right-of-Way - Utility Location
- Figure 12 90' Right-of-Way - Utility Location
- Figure 13 76' Right-of-Way - Utility Location
- Figure 14 64' Right-of-Way - Utility Location
- Figure 15 Utility Strip Easement

- Figure 16 Sight Visibility Triangles
- Figure 17 Sight Visibility Triangles - 4-Way Intersection
- Figure 18 Sight Visibility Along Curve
- Figure 19 Partial Local Street
- Figure 20 Cul-de-Sac
- Figure 21 Cul-de-Sac
- Figure 22 Standard Right-of-Way and Curb Knuckle Design for 50' Right-of-Way
- Figure 23 Turnarounds
- Figure 24 Street Jogs
- Figure 25 Street Intersections



TYPICAL CROSS SECTION FOR INTERIOR ROADS*

PARKING LANES = 0

* CAN BE USED WHERE PARKING IS PROVIDED IN COMMON AREAS DISTRIBUTED EVENLY THROUGHOUT THE SUBDIVISION AT A RATIO OF ONE (1) PARKING SPACE PER DWELLING UNIT WITHIN THE SUBDIVISION

Figure 1: Typical Cross Section for Interior Roads - No Parking Lanes (ADT 0 - 1,000)

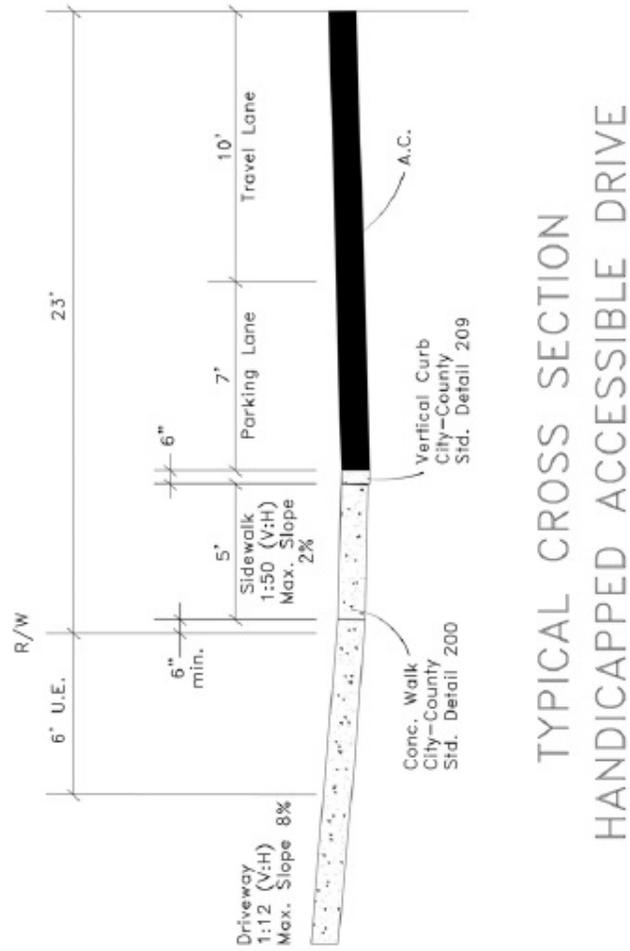
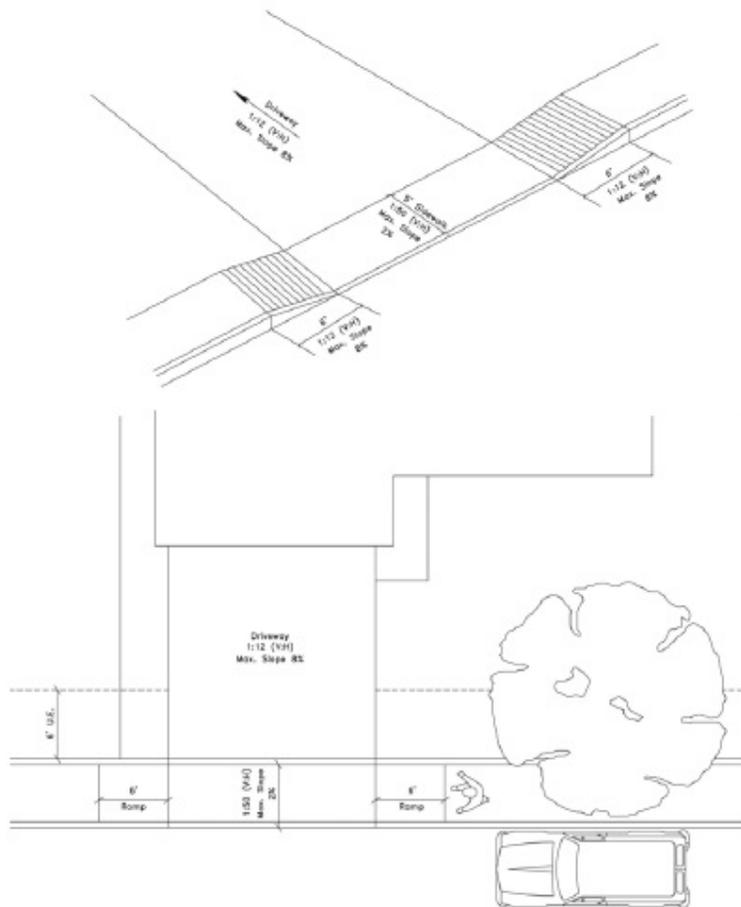


Figure 3: Typical Cross Section Handicapped Accessible Driveway



Handicapped Accessible Ramp Detail For Vertical Curb

Figure 4: Handicapped Accessible Ramp Detail for Vertical Curb

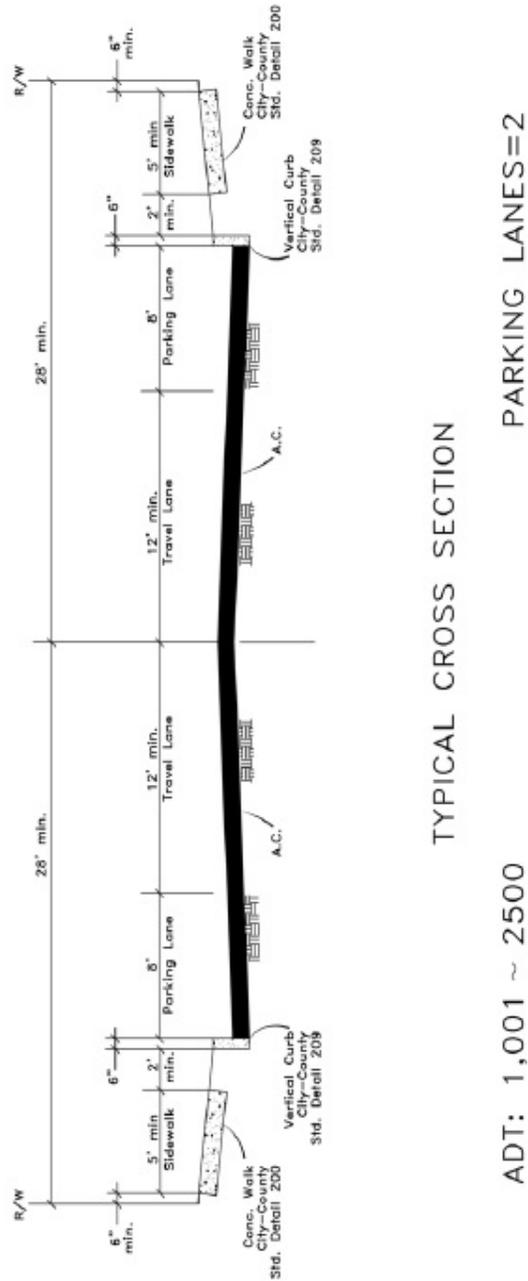


Figure 5: Typical Cross Section - Two Parking Lanes (ADT 1,000 - 2,500)

MINIMUM CURB RETURN RADIUS

	ARTERIAL STREET	COLLECTOR STREET	LOCAL STREET	P.A.A.L./ DRIVEWAY
ARTERIAL STREET	30'	25'	25'	25'
COLLECTOR STREET	25'	25'	25'	25'
LOCAL STREET	25'	25'	18'	18'
P.A.A.L./DRIVEWAY	25'	25'	18'	18'

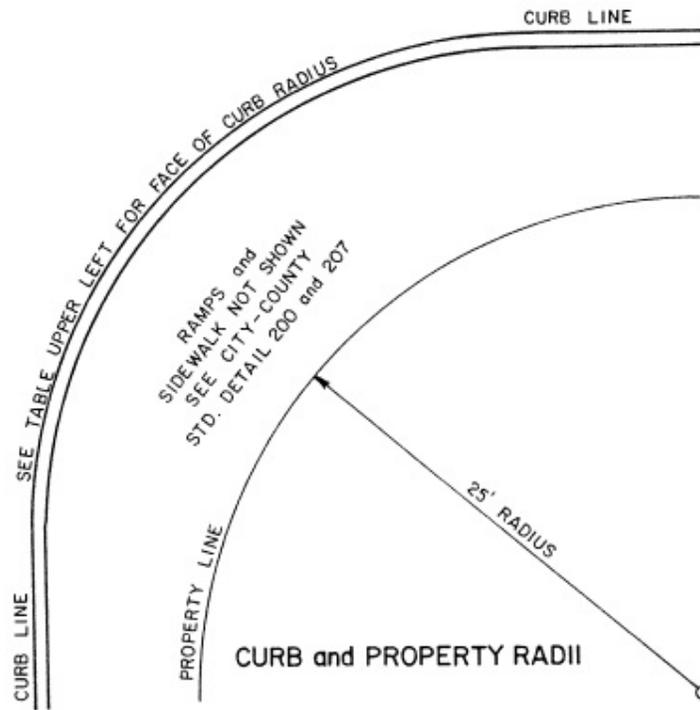
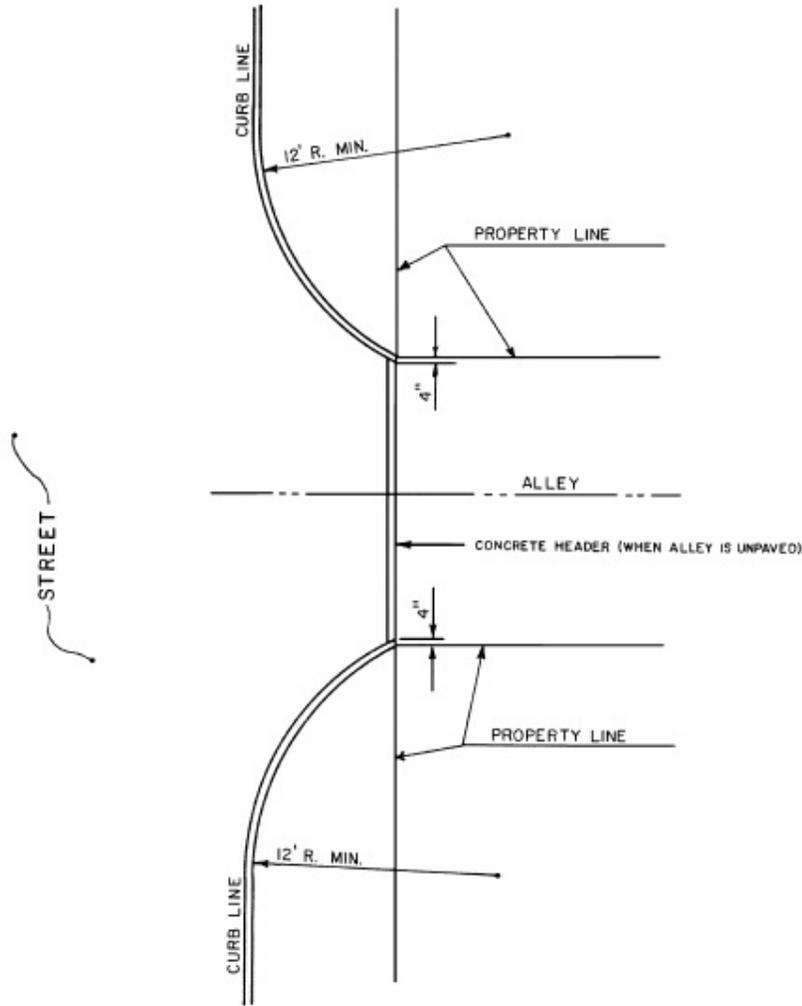


Figure 6: Curb and Property Radii

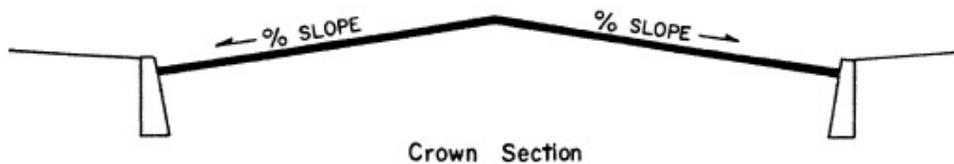


SIDEWALK AND RAMPS NOT SHOWN

ALLEY/STREET INTERSECTION

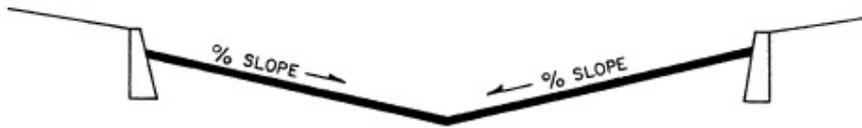
Figure 7: Alley/Street Intersection

LONGITUDINAL <u>GRADE</u>	CROWN
≥0.50%	2% MIN.
<0.50%	3% MIN.
ANY	4% MAX.



LONGITUDINAL <u>GRADE</u>	INVERT
---------------------------	--------

≥0.50%	2% MIN.
<0.50%	3% MIN.*
ANY	5% MAX.*



Invert Section

* INVERTED CROWN SLOPES IN EXCESS OF 3% REQUIRE CITY ENGINEER APPROVAL

Figure 8: Crowned Street/Inverted Streets

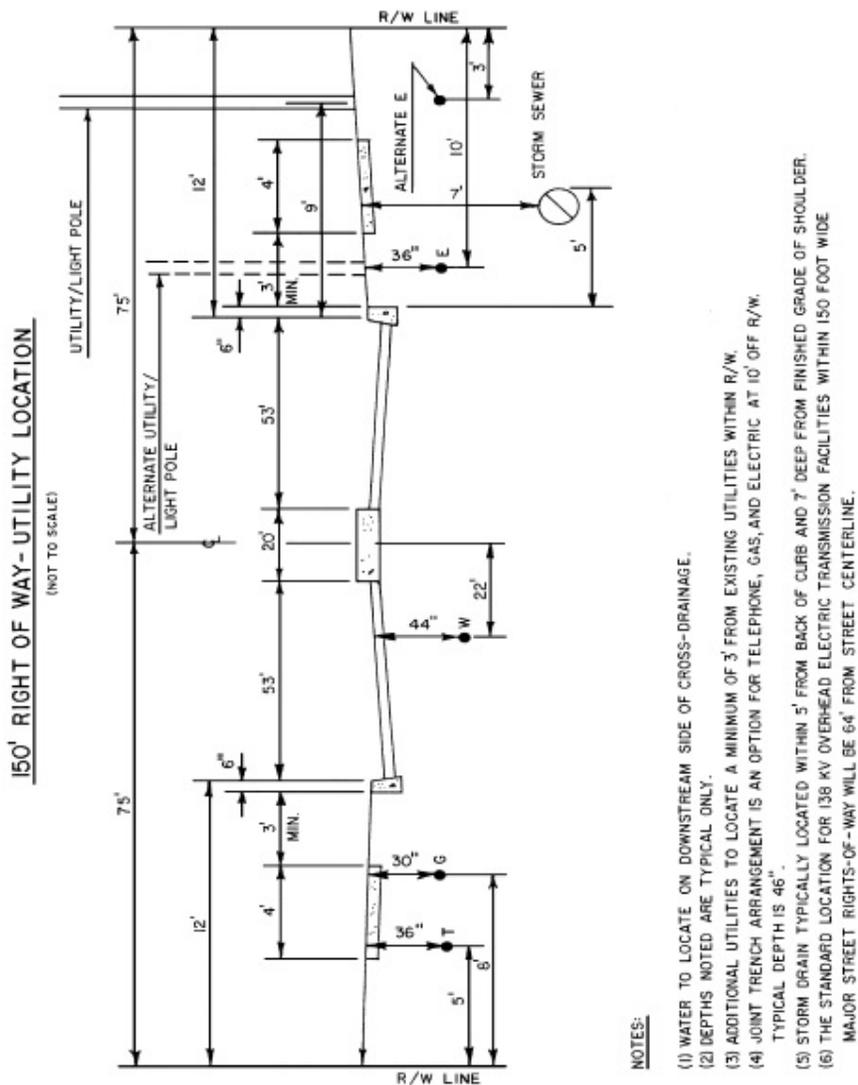
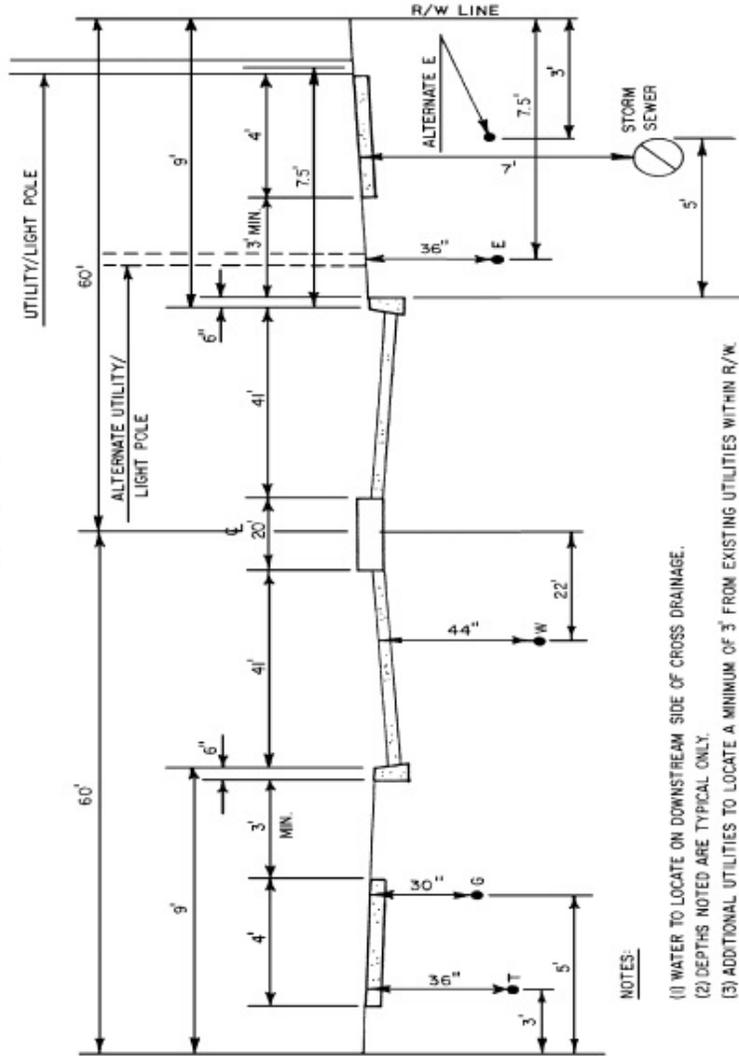


Figure 9: 150' Right-of-Way - Utility Location

120' RIGHT OF WAY - UTILITY LOCATION

(NOT TO SCALE)



NOTES:

- (1) WATER TO LOCATE ON DOWNSTREAM SIDE OF CROSS DRAINAGE.
- (2) DEPTHS NOTED ARE TYPICAL ONLY.
- (3) ADDITIONAL UTILITIES TO LOCATE A MINIMUM OF 3' FROM EXISTING UTILITIES WITHIN R/W.
- (4) JOINT TRENCH ARRANGEMENT IS OPTION FOR TELEPHONE, GAS, AND ELECTRIC AT 10' OFF R/W. TYPICAL DEPTH IS 46".
- (5) STORM DRAIN TYPICALLY LOCATED WITHIN 5' FROM BACK OF CURB AND 7' DEEP FROM FINISHED GRADE OF SHOULDER.
- (6) THE STANDARD LOCATION FOR 138 KV OVERHEAD ELECTRIC TRANSMISSION FACILITIES WITHIN 120 FOOT WIDE MAJOR STREET RIGHTS-OF-WAY WILL BE 58.5' FROM STREET CENTERLINE.

Figure 10: 120' Right-of-Way - Utility Location

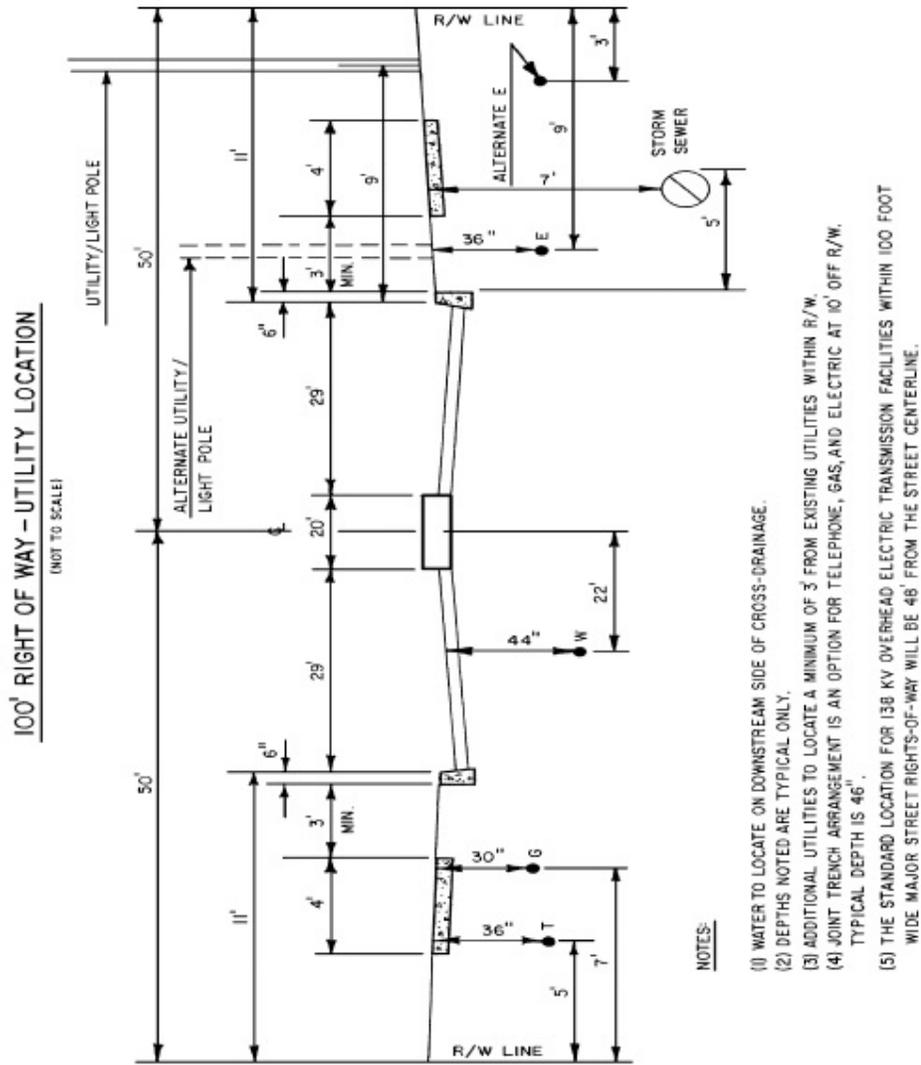


Figure 11: 100' Right-of-Way - Utility Location

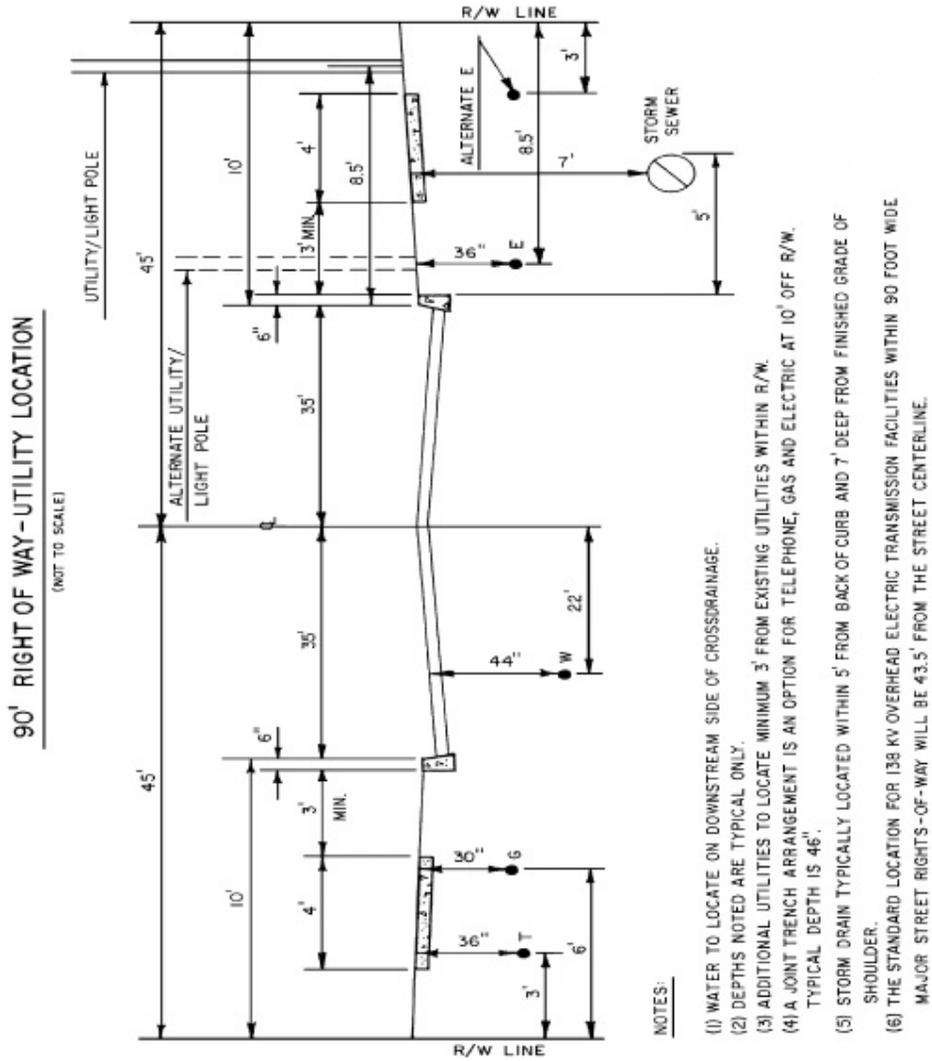
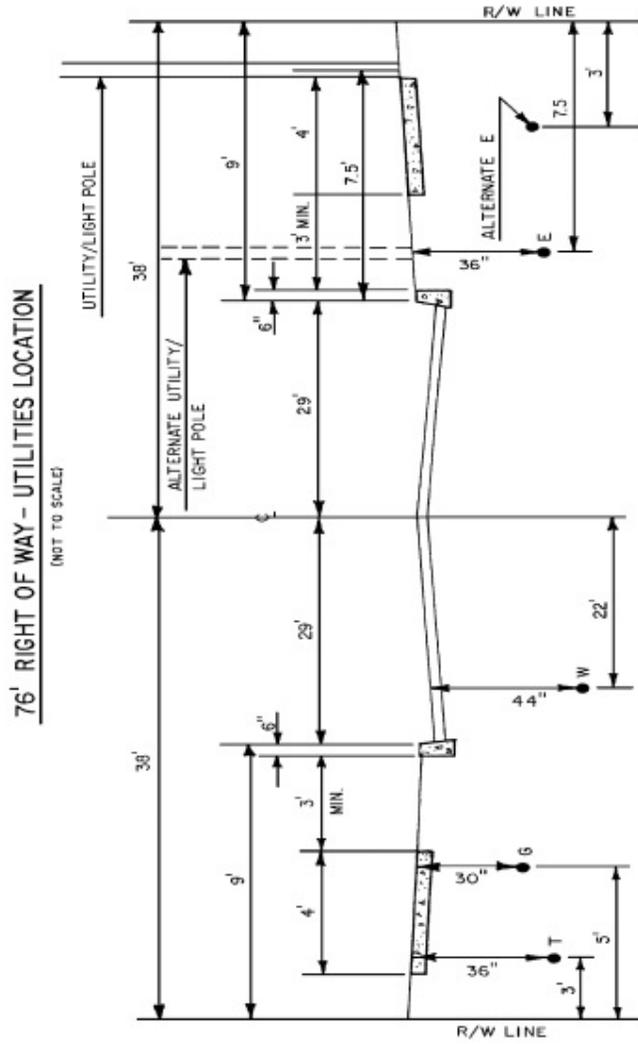


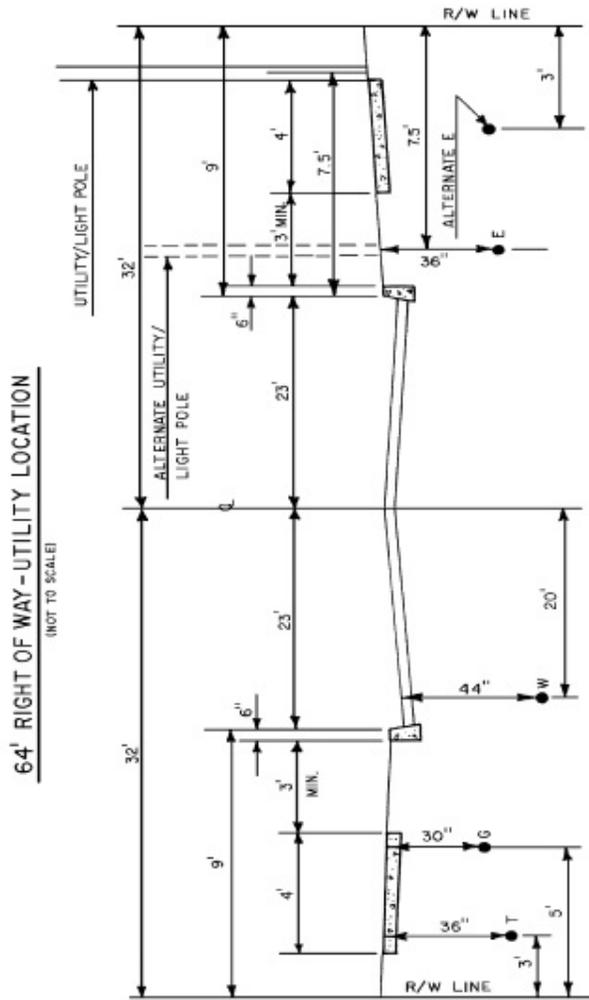
Figure 12: 90' Right-of-Way Utility Location



NOTES:

- (1) WATER TO LOCATE ON DOWNSTREAM SIDE OF CROSS-DRAINAGE.
- (2) DEPTHS NOTED ARE TYPICAL ONLY.
- (3) ADDITIONAL UTILITIES TO LOCATE A MINIMUM OF 3' FROM EXISTING UTILITIES WITHIN R/W.
- (4) JOINT TRENCH ARRANGEMENT IS OPTION FOR TELEPHONE, GAS, AND ELECTRIC AT 10' OFF R/W. TYPICAL DEPTH IS 46".
- (5) THE STANDARD LOCATION FOR 138 KV OVERHEAD ELECTRIC TRANSMISSION FACILITIES WITHIN 76 FOOT WIDE MAJOR STREET RIGHTS-OF-WAY WILL BE 36.5' FROM STREET CENTERLINE.

Figure 13: 76' Right-of-Way - Utility Location



NOTES:

- (1) WATER TO LOCATE ON DOWNSTREAM SIDE OF CROSS-DRAINAGE.
- (2) DEPTHS NOTED ARE TYPICAL ONLY.
- (3) ADDITIONAL UTILITIES TO LOCATE A MINIMUM OF 3' FROM EXISTING UTILITIES WITHIN R/W.
- (4) JOINT TRENCH ARRANGEMENT IS AN OPTION FOR TELEPHONE, GAS AND ELECTRIC AT 10' OFF R/W. TYPICAL DEPTH IS 46".
- (5) THE STANDARD LOCATION FOR 138 KV OVERHEAD ELECTRIC TRANSMISSION FACILITIES WITHIN 64 FOOT WIDE MAJOR STREET RIGHTS-OF-WAY WILL BE 30.5' FROM STREET CENTERLINE.

Figure 14: 64' Right-of-Way - Utility Location

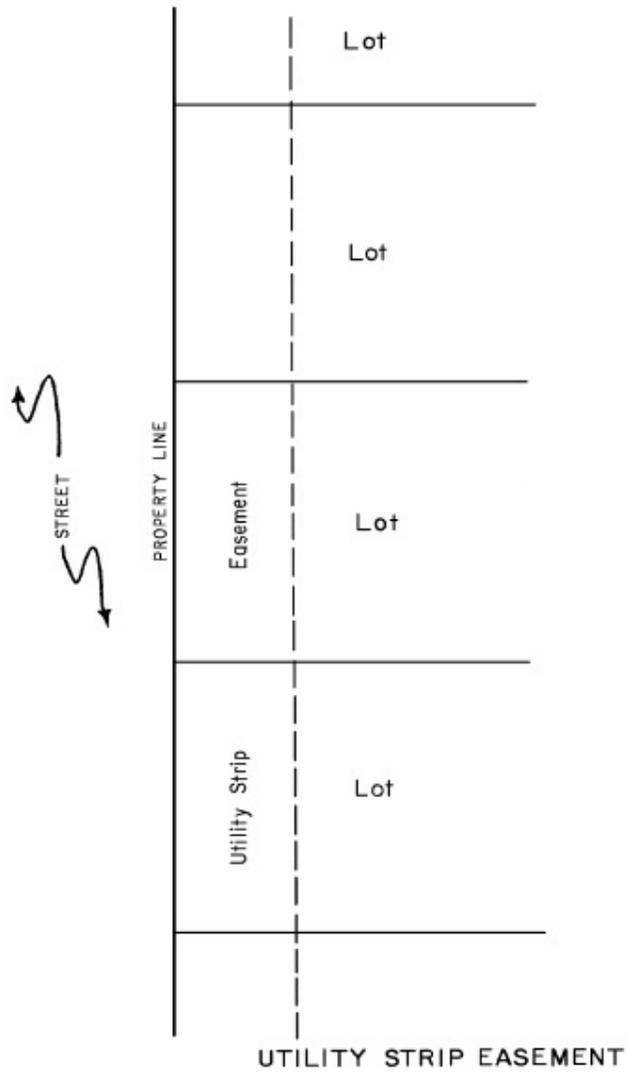


Figure 15: Utility Strip Easement

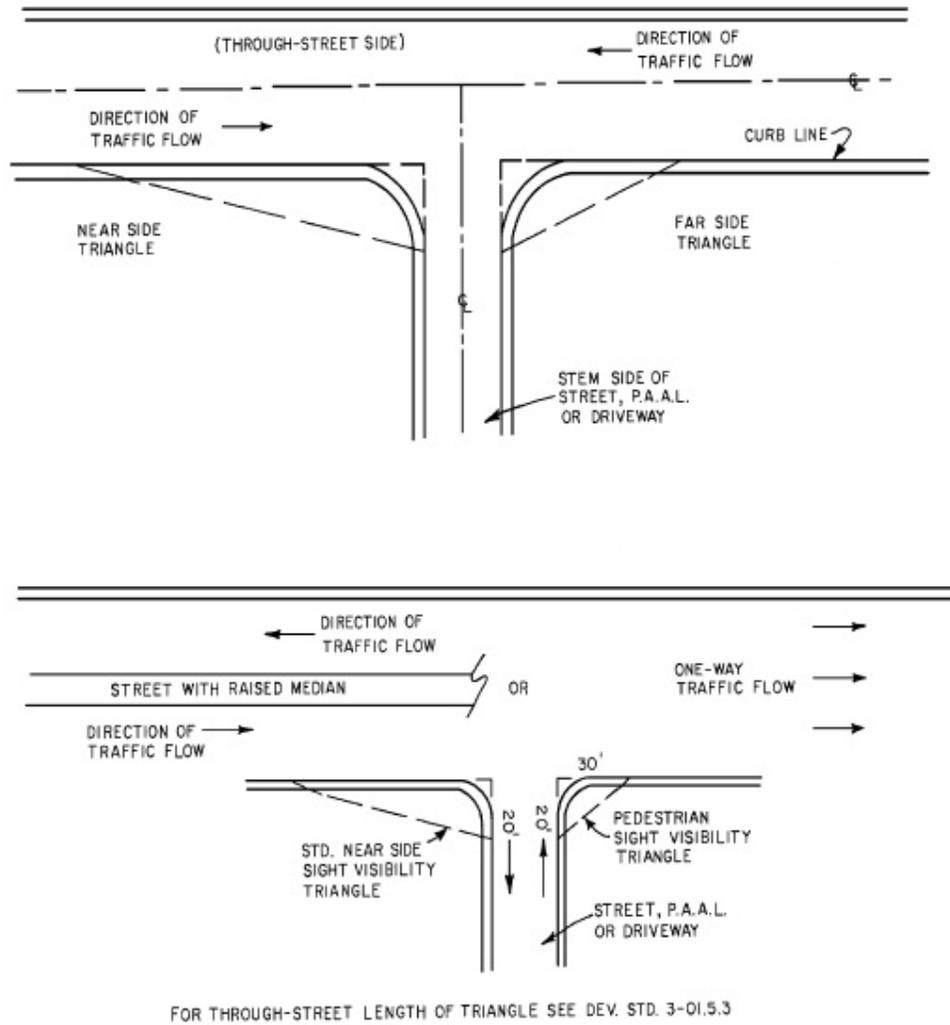


Figure 16: Sight Visibility Triangles

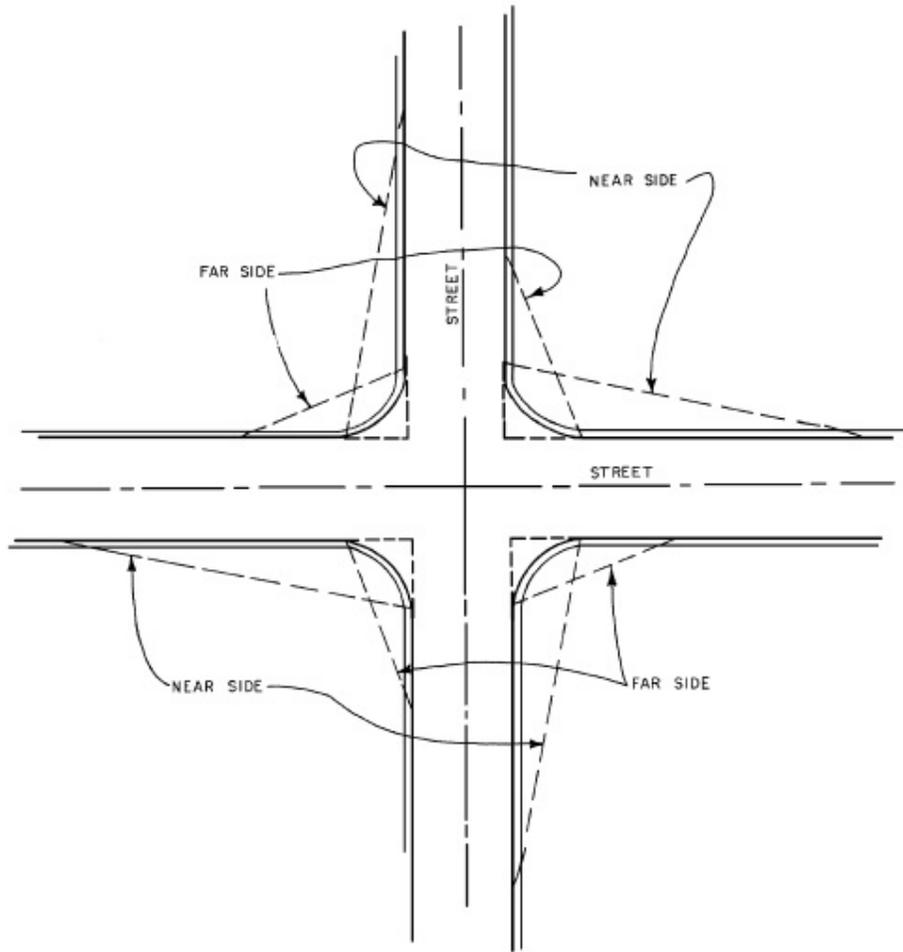


Figure 17: Sight Visibility Triangles - 4-Way Intersections

SIGHT VISIBILITY ALONG CURVE

(NOT TO SCALE)

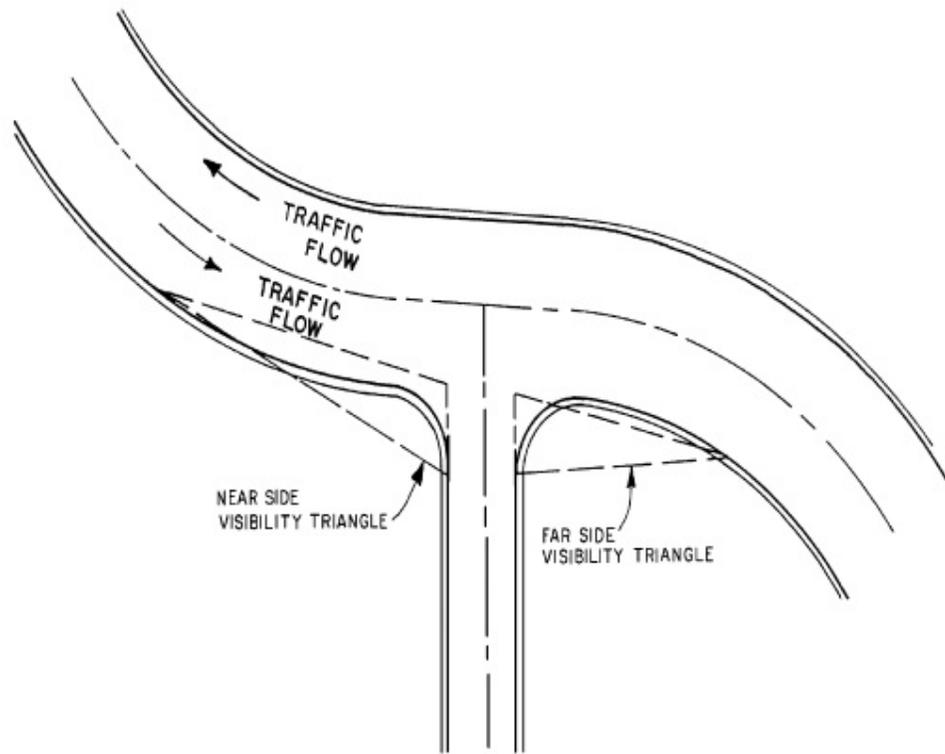
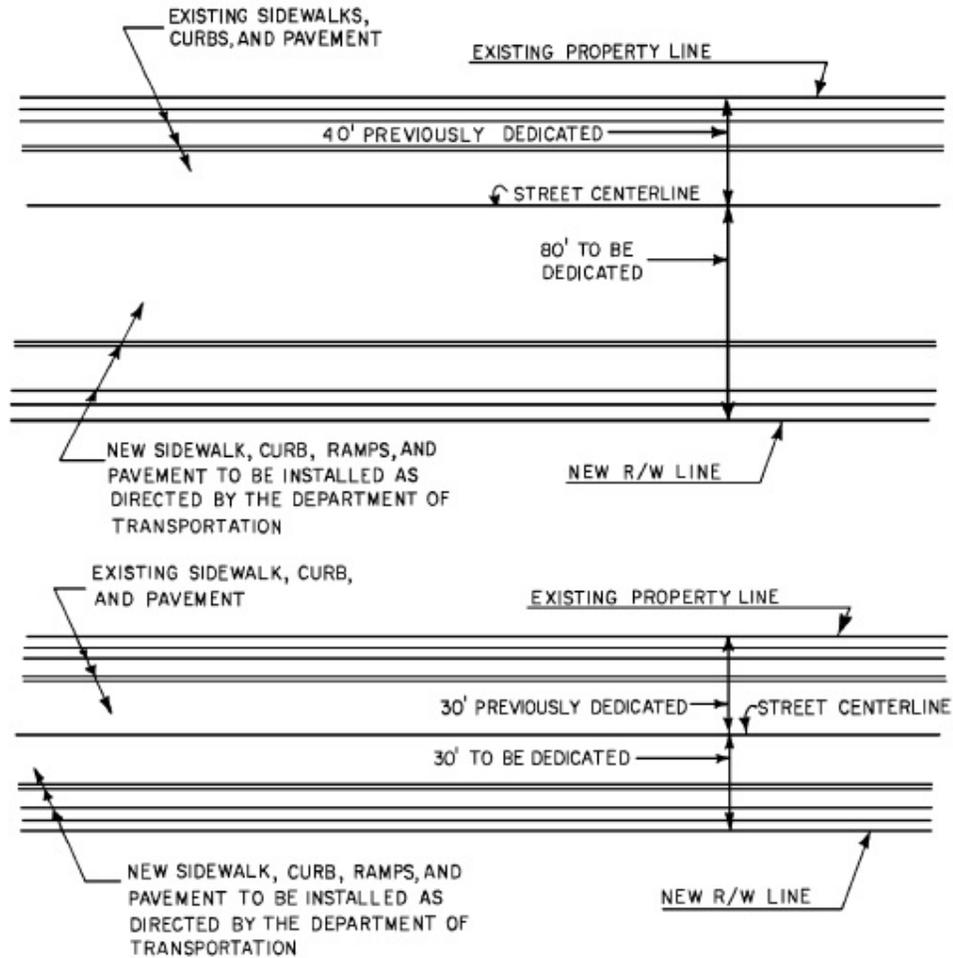


Figure 18: Sight Visibility Along Curve



PARTIAL LOCAL STREET

Figure 19: Partial Local Str

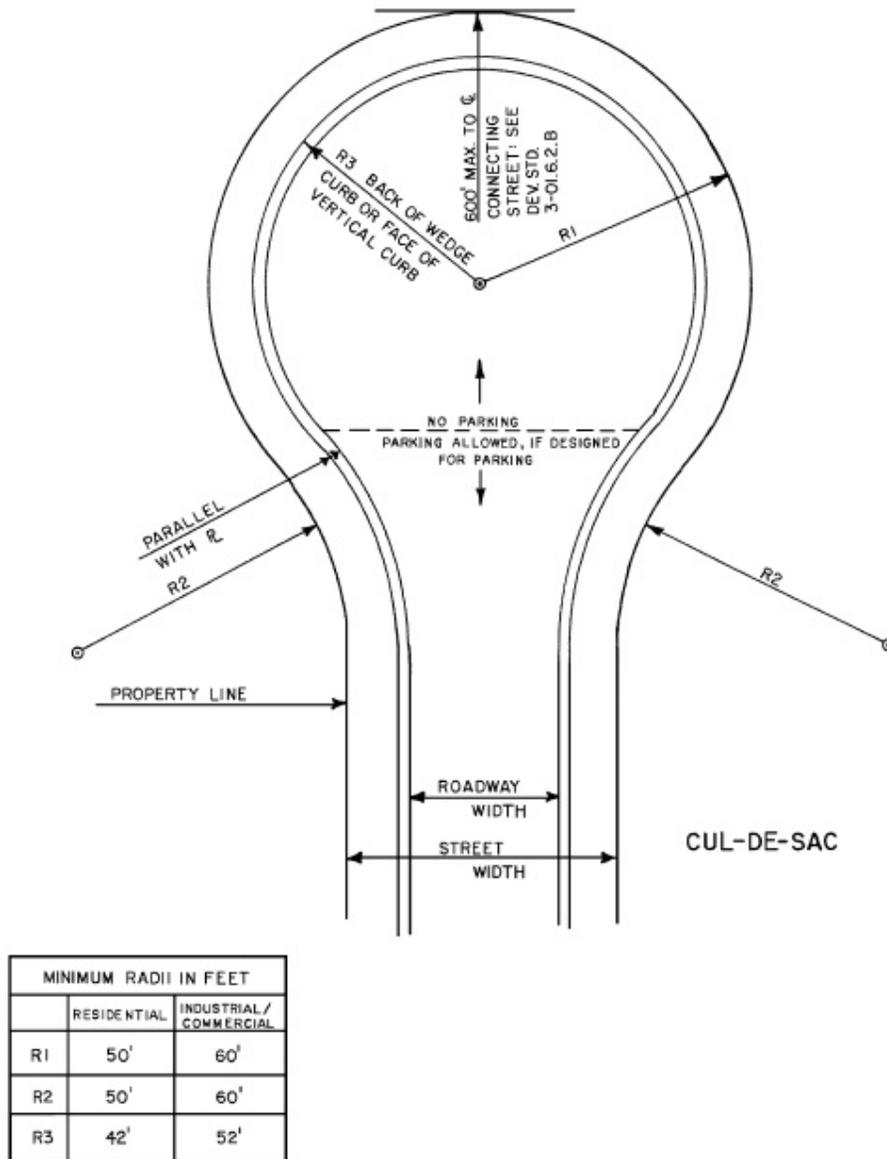


Figure 20: Cul-De-Sac

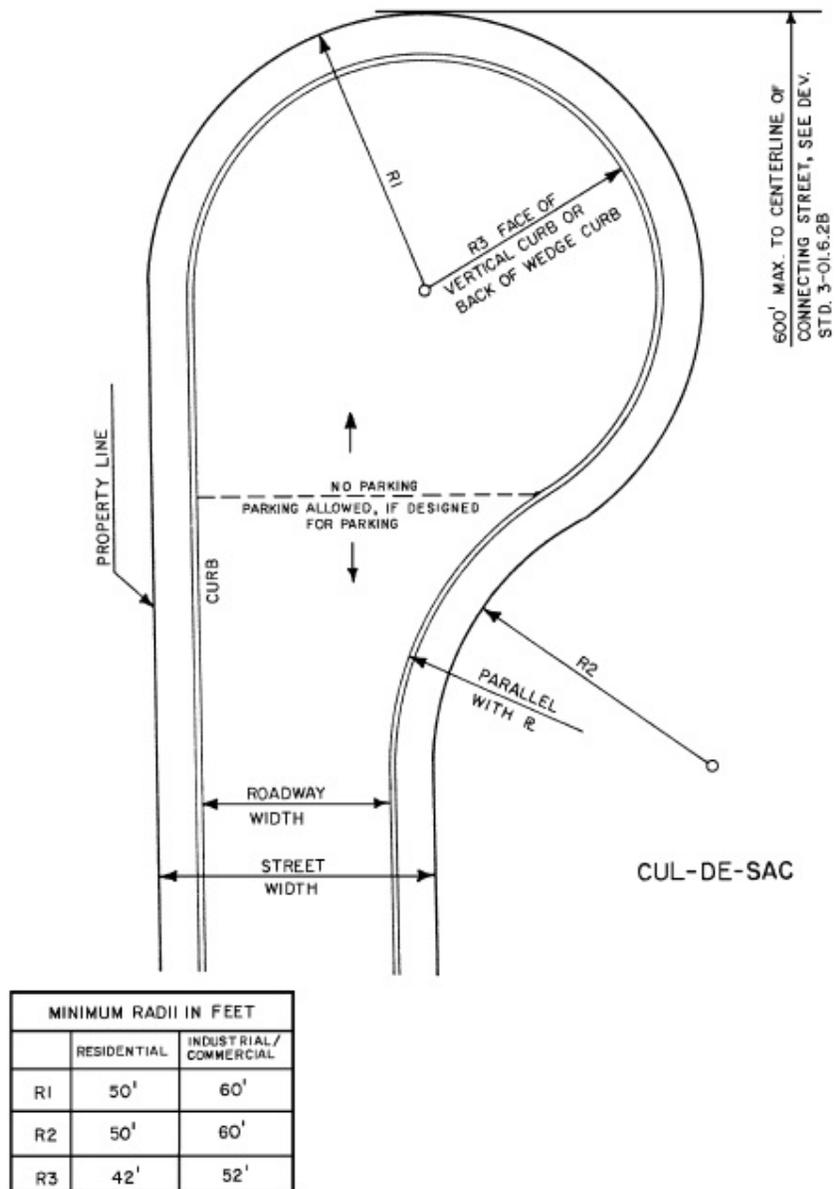


Figure 21: Cul-De-Sac

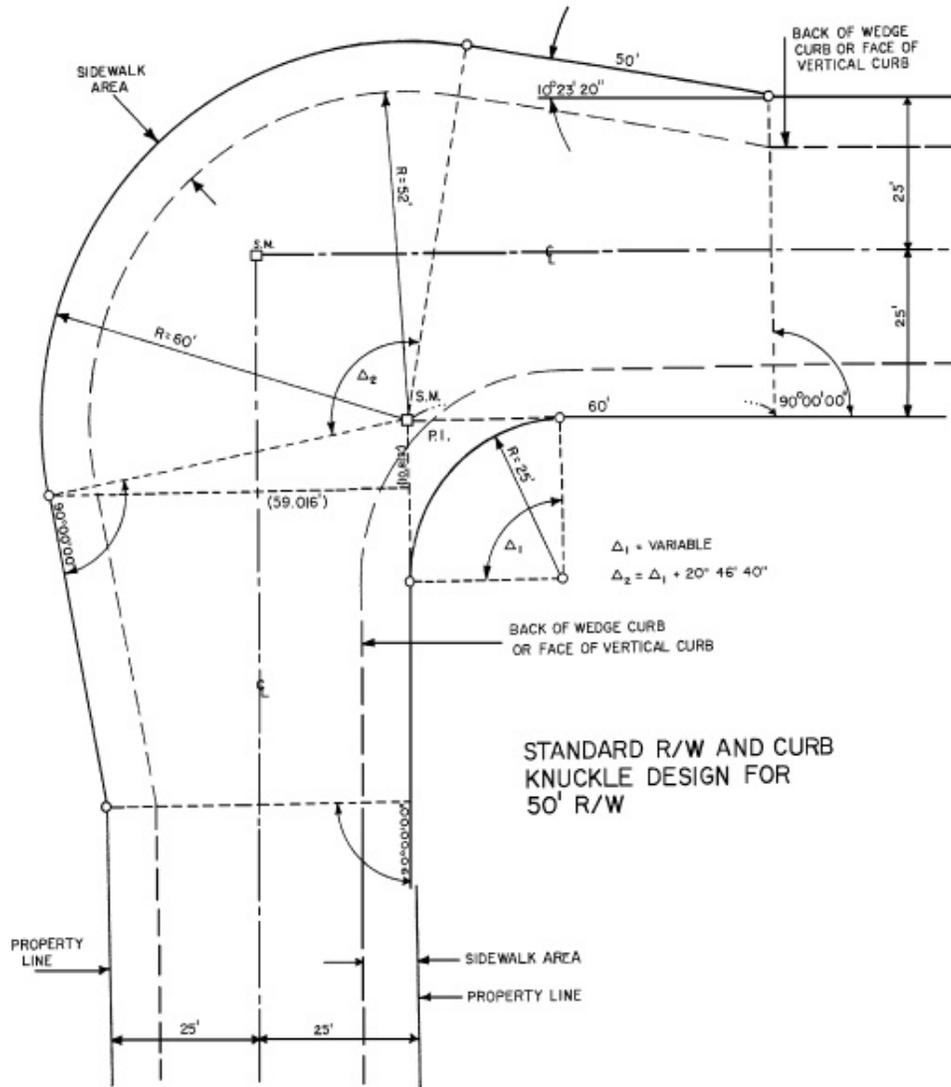
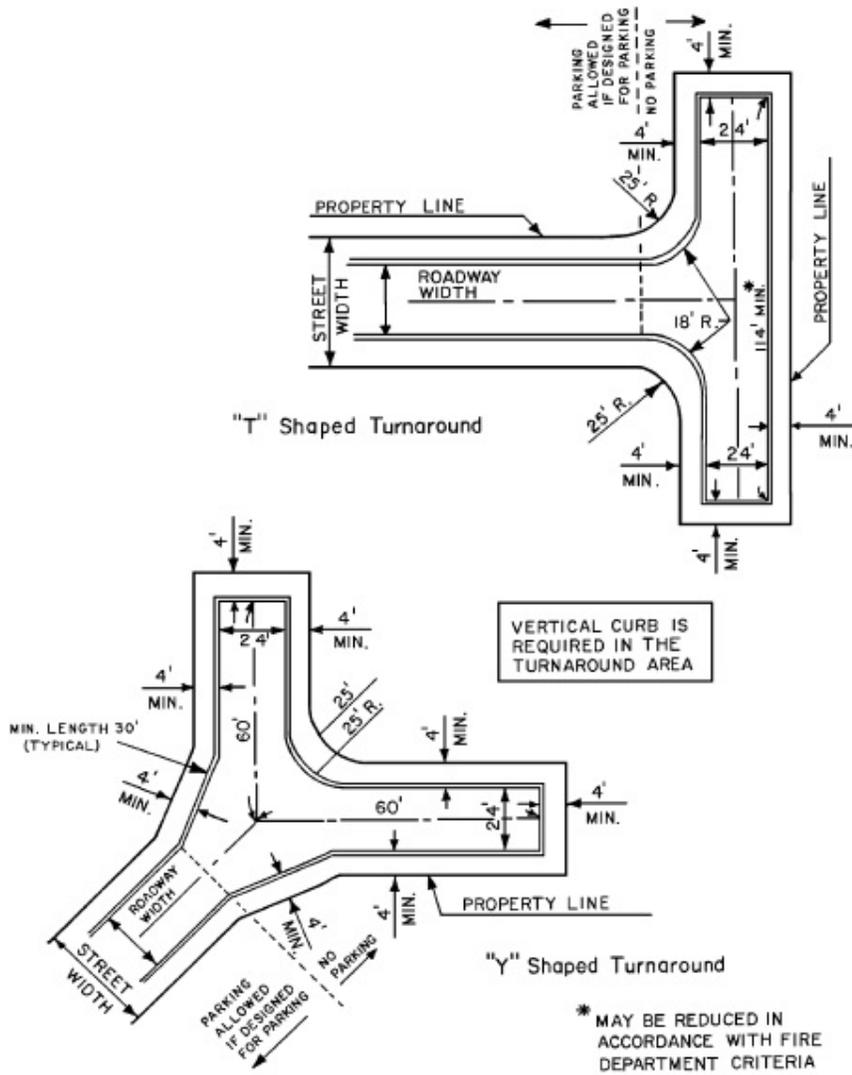


Figure 22: Standards Right-of-Way and Curb Knuckly Design for 50' Right-of-Way



TURNAROUNDS

Figure 23: Turnarounds

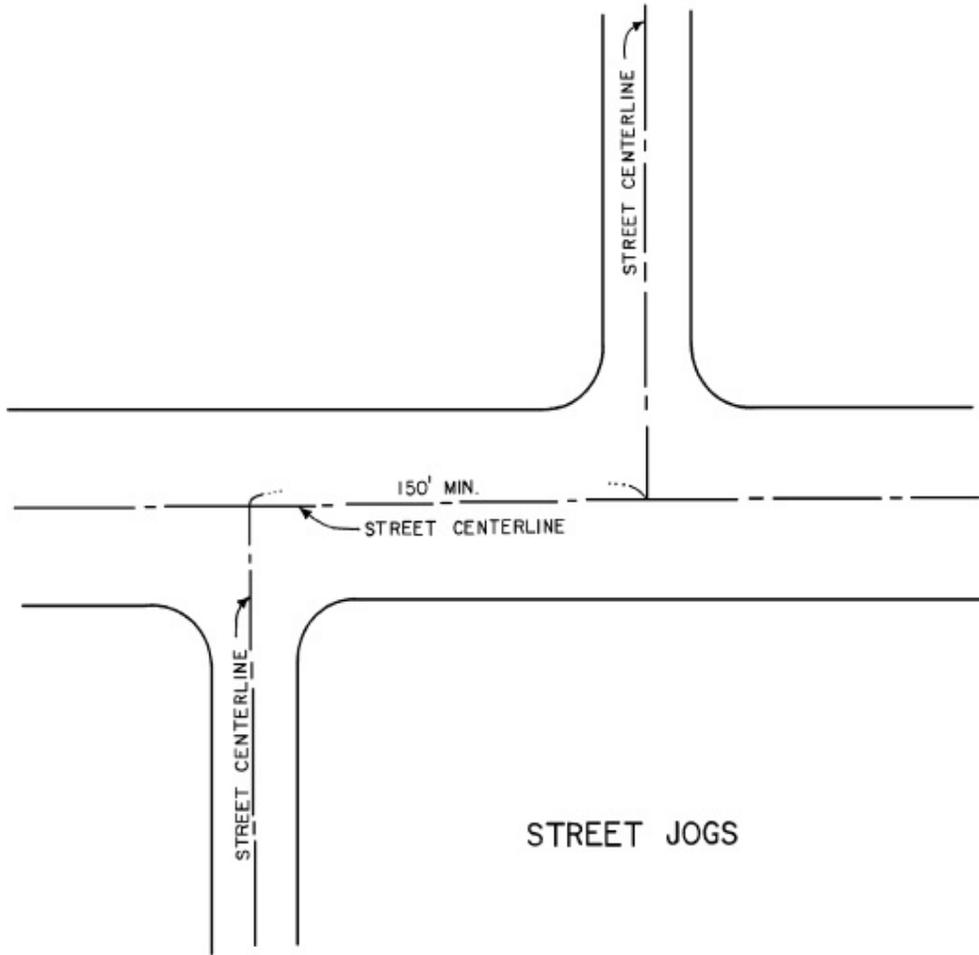


Figure 24: Street Jogs

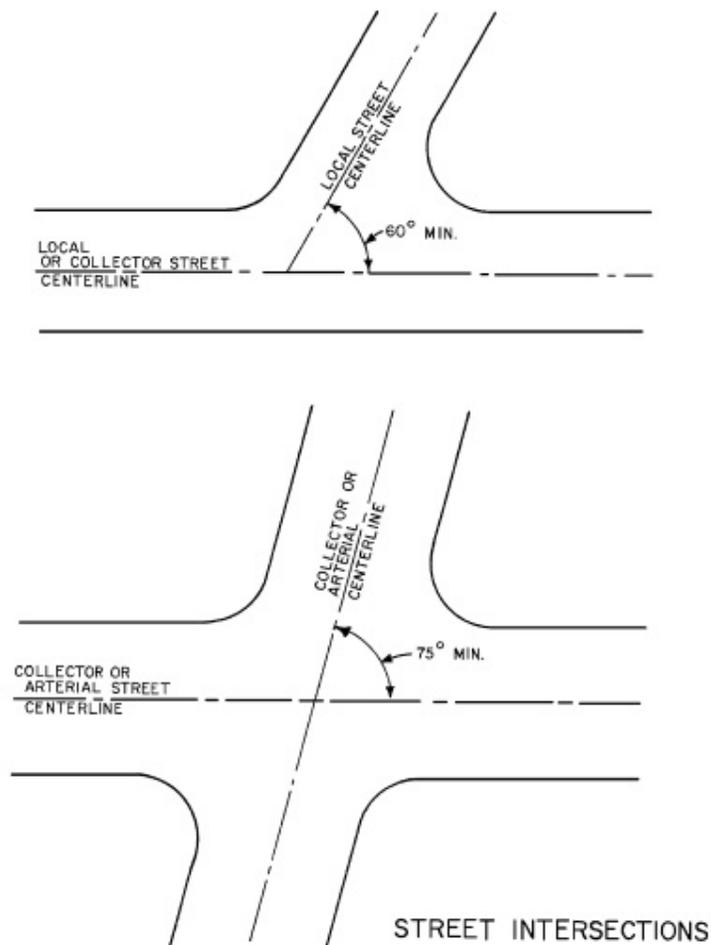


Figure 25: Street Intersections

SECTION 10-02.0.0: PAVEMENT CUT CRITERIA

Section

- 10-02.1.0 General
- 10-02.2.0 Trenching Within the Rights-of-Way of City Streets
- 10-02.3.0 Shading, Backfilling, and Patching
- 10-02.4.0 Alternatives to Pavement Cuts
- 10-02.5.0 Abatement
- 10-02.6.0 Modifications and Appeals

10-02.1.0 GENERAL

1.1 Purpose

The following Standard is intended to help provide for the continued high level of service of street pavements by establishing criteria for the cutting of pavement, trenching, trench backfilling, repairing of pavement cuts, and the limiting of pavement cuts after the installation of new pavement or overlay. The goal of this technical standard is to reduce the number of pavement cuts in city streets and to improve the quality of those pavement cuts which are found to be necessary.

1.2 Scope

This standard applies to all roadway pavement located within the public rights-of-way of the City of Tucson.

10-02.2.0 TRENCHING WITHIN THE RIGHTS-OF-WAY OF CITY STREETS

2.1 Applicability

This Technical Standard concerning trenching under present or future pavement, shading, trench backfilling, and patching in City of Tucson rights-of-way shall apply to all public and private entities seeking to trench within the City of Tucson rights-of-way. Builders, developers, utilities, etc., shall make every effort to utilize the “common trench” principle. Multiple cuts for services which can be combined into a common trench will not be approved.

2.2 Facilities

When facilities other than City of Tucson Department of Transportation facilities (storm sewers, street lighting conduit and appurtenances, traffic light conduit and appurtenances) are installed in the City of Tucson rights-of-way between curb lines, bedding and shading of the facility shall be in accordance with the parent organization’s specifications and details for bedding, installation, and shading.

2.3 Permits

Prior to [excavation](#) within the rights-of-way of the City of Tucson, a permit to excavate within the rights-of-way shall be obtained in accordance with the procedure outlined in Chapter 25 of the City of Tucson Code as adopted or as it may be amended. The City Engineer, or designated representative, may, with discretion, require the posting of a performance bond by any entity wishing to obtain an [excavation](#) permit for the purpose of trenching within the rights-of-way of the City of Tucson. The City Engineer, or designated representative, may, with discretion, issue blanket/annual permits to utilities and other entities trenching in City of Tucson rights-of-way for the purpose of installing or maintaining service connections, subject to compliance with these Standards. Failure to comply with these Standards shall be cause for revocation of blanket/annual permits.

Failure to obtain an [excavation](#) permit prior to commencement of trenching activities shall be considered a civil infraction of Chapter 25 of the Tucson Code. (See Section 10-02.2.5.D for emergency procedures.)

2.4 Traffic Control

Traffic control during trenching operations shall be in accordance with the current City of Tucson Work Zone Traffic Control Manual and Chapter 25 of the City of Tucson Code, as adopted or as it may be amended. For situations and conditions not covered in the City of Tucson Barricading and Channelization Manual or City Code, the provisions of the Manual for Uniform Traffic Control Devices shall apply. In all cases concerning traffic control, the Traffic Engineer shall be the final authority with regard to barricading, channelization, hours of work, and compliance with other Traffic Engineering procedures and regulations.

2.5 Pavement Cuts

A. The following moratorium shall generally apply to the cutting of asphaltic concrete pavement or overlay.

1. Streets Shown on the Current Major Streets and Routes (MS&R) Plan

Five years from the date of acceptance of the last installation of asphaltic concrete pavement or overlay. Chip sealcoats are not considered overlays for moratoria purposes.

2. Streets Not Shown on the Current Major Streets and Routes (MS&R) Plan

In order to reduce the number of pavement cuts on streets not shown on the current MS&R Plan, alternatives to pavement cuts shall be utilized for such streets whenever feasible (see Section 10-02.4.0, *Alternatives to Pavement Cuts*).

The City Engineer, or designated representative, shall maintain a list for protected streets ("Protected List") on which pavement cuts shall not be allowed without the specific permission of the City Engineer, or designated representative. Streets may be added to this Protected List from time to time (at least semiannually), and such lists shall be maintained and available for inspection in the office of the City Engineer.

Criteria for placing a newly paved or overlaid street on the above Protected List shall include, but not necessarily be limited to, the following:

- a. Residential collector streets.
- b. Streets with inverted cross-sections utilized for drainage.
- c. Streets in the Central Business District not shown on the current MS&R Plan.

The moratorium for streets not shown on the MS&R Plan, but included on the Protected List, shall be three years from the date of acceptance of the last installation of asphaltic/concrete pavement or overlay.

No moratorium shall exist for streets not shown or included on the Protected List or the MS&R Plan.

3. Traffic Loops

Traffic loops may be installed in new pavement where required by the Traffic Engineer. Grooves to receive traffic loop detection wire shall be sawed to a depth sufficient to allow a sealant thickness over the loop wire of not less than one inch. Sealant shall conform to the current specifications of the Traffic Engineer.

B. Where the above moratorium is in effect, boring or jacking shall be used for pavement crossing.

C. Where jacking or boring is impossible due to subsurface soil conditions or other extenuating conditions, the City Engineer, or designated representative, may, at his/her discretion, allow trenching subject to such conditions as the City Engineer, or designated representative, may establish.

D. Where emergency (dangerous to health and safety) situations exist, the express written or verbal permission of the City Engineer, or designated representative, must be obtained prior to cutting of pavement within the above restrictions. Emergencies under pavement not subject to these restrictions shall be handled in accordance with the provisions of Paragraph 4, Section 17, Chapter 25, of the City Code.

E. All final pavement cuts shall be sawed to the full depth of the asphalt prior to patching. Initial cuts for pavement removal may be made using pneumatic spades providing the spade penetrates the entire thickness of asphalt and the successive cuts form a connected straight line. Dimensions for pavement cuts shall be as called for in Section 10-02.3.3, *Patching*, and shown on Standard Detail 216.

F. The City Engineer shall maintain, in the Engineering Division, information concerning the date, by month and year, of the latest construction or overlay affecting streets covered by these restrictions.

10-02.3.0 SHADING, BACKFILLING, AND PATCHING

3.1 Shading

Shading shall extend to one foot above the top of the highest projection of the facility being installed and conform to the parent organization’s specifications.

3.2 Backfilling

Backfilling of trenches under existing or future pavement with native soil/aggregation base course/lean portland cement concrete shall be from the top of the shading to the appropriate elevation depending on the type of patch to be installed.

Backfilling shall be in accordance with City of Tucson Department of Transportation, Engineering Division’s Standard Specification for Public Improvements (typ.) 923.

When native soils (material excavated from the trench [site](#)) are used for backfill, evidence of meeting [compaction](#) requirements, in the form of test results by a recognized testing laboratory in accordance with the following schedule, may be required.

- One test per 500 feet of trench length or portion thereof, per three feet of trench depth or portion thereof. The City Engineer, or designated representative, may require these tests anywhere within the backfill prism.
- Aggregate base course used for backfill shall conform to City of Tucson Standard Specification 303, Aggregate Base Course.
- Controlled Low Strength Material No. 1 per SSPI subsection 501-2.03, Table 501-1.

3.3 Patching

A. Temporary Patching

1. Temporary patching shall be one-inch thick temporary cold-mix asphalt placed on compacted back [fill](#).
2. Temporary patches shall be replaced with permanent patches within 30 calendar days of the application of the temporary patch.
3. It shall be the responsibility of the organization installing/securing the permit for pavement cuts to maintain the temporary patch until replaced by a permanent patch.

B. Permanent Patches

1. Permanent patches shall be in accordance with Standard Detail No. 216 . Type B patches shall be used for all streets shown on the MS&R Plan and all inverted water-carrying streets. A list of inverted water-carrying streets will be maintained in the City of Tucson, Engineering Office. During trenching activities, care shall be taken to preserve the shoulder at the trench top.
2. For longitudinal trenches whose top widths exceed four feet, the roadway shall be repaved with a combination of materials having the same structural strength and surface course as the existing pavement according to the following schedule.

Trench/Width	Repaving Width
4' - 12'	One-half pavement width or one lane width, depending on trench location
Over 12'	Full pavement width

3. Patches for transverse trench shall be twice the trench width.
4. Temporary Pavement. Permanent patches on temporary pavement shall consist of the standard pavement

section for residential streets.

5. The organization shall be provide a five-year warranty on permanent patches.

3.4 Slurry Seal Coating

Seal coating shall be done in accordance with City of Tucson Department of Transportation, Engineering Division Standard Specification for Public Improvements No. 404, where applicable.

3.5 Older Asphaltic Pavement Underlaid by Concrete Bases

Type 3 patch per Standard Detail No. 216 shall be used and the underlying concrete base cut to a width shown for Type 3 patches.

3.6 Chip Sealed Alleys

Where the surface treatment of existing alleys consists of one or more applications of emulsified asphalt and chip sealcoats, the permanent patch shall be replacement in kind.

10-02.4.0 ALTERNATIVES TO PAVEMENT CUTS

All alternatives to pavement cutting shall be explored prior to the submission of an application for an [excavation](#) permit by those seeking to install/repair/connect to underground facilities located within City of Tucson rights-of-way. Applicants for [excavation](#) permits shall demonstrate, to the satisfaction of the City Engineer, or designated representative, evidence of investigation of alternatives to pavement cutting. These alternatives shall include, but are not limited to, use of unpaved or chip sealed alleys, locating trenches in parkway (behind curb) areas, unused (not water-carrying) portions of drainageways, etc.

Economics of installation shall not be the only or necessarily the overriding consideration in the selection of underground routing and location.

10-02.5.0 ABATEMENT

Abatement for violations of this standard shall consist of paving/overlaying a substantial portion of the affected roadway. The extent of the paving/overlaying shall be determined by the City Engineer, or designated representative.

10-02.6.0 MODIFICATIONS AND APPEALS

6.1 Modifications

Emergency situations and other conditions not specifically addressed by this standard shall be judged on a case-by-case basis by the City Engineer, or designated representative, without setting precedent.

6.2 Appeals

Appeals to rulings made under this standard shall be to the Director of Transportation, whose decision shall be final.

SECTION 11: UTILITIES (PRIVATE WATER COMPANIES, ELECTRIC, GAS, TELEPHONE)

SECTION 11-01.0.0: ABANDONMENT OF EASEMENTS

Section

- 11-01.1.0 General
- 11-01.2.0 Tentative Plat Content and Specifications
- 11-01.3.0 Final Plat Content and Specifications
- 11-01.4.0 Supplemental Documentation Specifications

11-01.1.0 GENERAL

1.1 Purpose

In order to process plat-related actions in a timely manner, this standard provides a simple method for abandonment of easements concurrently with the processing of a resubdivision plat.

1.2 Applicability

The provisions of this standard apply to easements, whether originally created by a subdivision plat or by separate documents, when the same area or a portion of the same area is resubdivided.

11-01.2.0 TENTATIVE PLAT CONTENT AND SPECIFICATIONS

In addition to the information required by Section 2-06.0.0, *Development Package*, of the Administrative Manual, the following information must be shown on the tentative plat of the proposed resubdivision.

- 2.1** All easements created by the original plat and/or by separate instrument, in the correct location and labeled with the width, purpose of granting, recording data of the original plat, and if applicable, the notation "to be abandoned."
- 2.2** A separate note that the easements created by the original plat (noted by name and recordation data) and/or by separate instrument (noted by recording data) will, unless otherwise labeled, be abandoned simultaneously with the recording of the resubdivision (noted by name).

11-01.3.0 FINAL PLAT CONTENT AND SPECIFICATIONS

In addition to the information required by Section 2-07.0.0, *Final Plats, Land Splits, Block Plats, Minor Subdivisions, and Condominium Plats*, of the Administrative Manual, the following information must be shown on the final plat of the proposed resubdivision:

- 3.1** All easements not to be abandoned with the width, purpose of granting, and recording data of the original subdivision plat or separate instrument shown.
- 3.2** A separate note that the interest of the City of Tucson in that portion of the easement(s) created by the original plat (noted by name and recording data) and/or by separate instrument (noted by recording data), which is included in the resubdivision, will be abandoned by the recording of this resubdivision plat, unless otherwise indicated.

11-01.4.0 SUPPLEMENTAL DOCUMENTATION SPECIFICATIONS

The interest of the City of Tucson is abandoned by recordation of the final plat. However, the interests of other entities

may also have to be abandoned prior to recording the final plat. These entities include, but are not limited to:

- Qwest Communications
- Pima County Wastewater Management
- Southwest Gas
- Tucson Electric Power Company
- Any private cablevision company
- Any private water company

4.1 The developer must obtain from each entity having a record interest in an easement, as shown by a current title report, a recordable document such as a quit-claim deed or abandonment of easement which relinquishes its interest in the easement. The request for abandonment should be made to the entity holding an easement interest shortly after the City Development Review Committee (CDRC) [approval](#) of the tentative plat. This is in order to allow adequate time for relocation of any facilities within the easement prior to abandonment and depiction of the new easement on the final plat.

4.2 The developer will record all such documents prior to or concurrently with the final plat and provide a copy of each recorded document to the Planning and Planning and Development Services Department (PDS). These documents do not need to be cross-referenced on the resubdivision plat.

4.3 The abandonment of an easement does not occur until all documents from holders of interest have been recorded or submitted for recording with the final plat of the proposed resubdivision.

SECTION 12: DEFINITIONS

SECTION 12-01.0.0: DEFINITIONS

The definitions listed hereunder shall be construed as specified in the section.

Active Water Harvesting. The collection of [stormwater](#) into [containment systems](#) for storage and later diversion to beneficial uses.

Approval. The proposed work or completed work conforms to this chapter in the opinions of the Building Official.

As Graded. The extent of the surface conditions on completion of [grading](#).

Bench. A relatively level step excavated into [earth material](#) on which [fill](#) is to be placed.

Borrow. [Earth material](#) acquired from an off- [site](#) location for use in [grading](#) on a [site](#).

Catchment Areas. Areas of a [site](#) where water is harvested, including where rain falls directly on plant canopies and pervious [Water Harvesting Infiltration Areas](#), and where rain falls on impervious rooftops, sidewalks, parking lots, driveways and other surfaces from which [stormwater](#) is directed toward [Water Harvesting Infiltration Areas](#).

Catchment Ratio. The ratio of the water harvesting [catchment area](#) to the canopy area of the plants that use water harvested from that [catchment area](#).

Commercial Development. Any new non-residential development that is intended to be used primarily for commercial activities, and is subject to the requirements of the International Building Code.

Compaction. The densification of a [fill](#) by mechanical means.

Containment Systems. Above-ground tanks, below-ground tanks, other types of above- and below-ground water-holding containers, and associated pipes and transmission equipment that enable beneficial use of harvested water.

Earth Material. Any rock, natural soil, or [fill](#) any combination thereof.

Erosion. The wearing away of the ground surface as a result of the movement of wind, water or ice.

Excavation. The mechanical removal of [earth material](#).

Fill. A deposit of [earth material](#) placed by artificial means.

Grade. The vertical location of the ground surface.

Evapotranspiration. The transfer of water from land surface to the atmosphere through the combination of evaporation and plant transpiration.

Existing Grade. The [grade](#) prior to [grading](#).

Finish Grade. The final grade of the [site](#), which conforms to the approved plan.

Grading. Any excavating or filling combination thereof.

Grubbing. The removal of any vegetation from the [existing grade](#) of the land for purposes of land development. (Inventory and boxing of native vegetation shall not constitute grubbing.)

Impervious Subwatersheds. Discrete nonporous subareas of a [site](#)--including rooftops, sidewalks, parking lots, driveways and other impervious areas--that capture [stormwater](#) and deliver it through gravity flow to discrete [containment systems](#) or [Water Harvesting Infiltration Areas](#).

Infrastructure. All structures or improvements to the land such as roads or facilities for the provision of gas, electric, water, drainage, or communications, which are necessary to support development on abutting property.

Key. A designed compacted [fill](#) placed in a trench excavated in [earth material](#) beneath the toe of a proposed [fill slope](#).

Passive Water Harvesting. The collection of [stormwater](#) directly into [Water Harvesting Infiltration Areas](#) without the temporary storage of water in a [containment system](#).

Plant Canopy Area. The area covered by plants as indicated on the landscape plans, including understory, midstory and overstory plants.

Professional Inspection. The inspection required by this code to be performed by the civil engineer, [soils engineer](#) or engineering geologist. Such inspections include that performed by person supervised by such engineers or geologists and shall be sufficient to form an opinion relating to the conduct of the work.

Rainwater. Liquid precipitation falling from the sky before it lands on a surface.

Site. Any lot or parcel of land or contiguous combination thereof, under the same ownership, where [grading](#) is performed or permitted.

Slope. An inclined ground surface the inclination of which is expressed as a ratio of horizontal distance to vertical distance.

Soils Engineer (Geotechnical Engineer). An engineer experienced and knowledgeable in the practice of soils engineering (geotechnical) engineering.

Stormwater. [Rainwater](#) that has landed on a surface.

Terrace. A relatively level step constructed in the face of a graded [slope](#) surface for drainage and maintenance purposes.

Water Harvesting. The process of intercepting [stormwater](#) and putting it to beneficial use.

Water Harvesting Infiltration Areas. Pervious areas of a [site](#) where harvested water collects and soaks into the subsurface to support landscape plants. Water Harvesting Infiltration Areas include exposed soil shaped to hold and infiltrate water, permeable soil subgrades overlain with impervious pavement that receive water via perforated pipes or other conveyance techniques, structured soil overlain with permeable paving, and other strategies that collect water and allow it to soak into the subsurface to support landscape plants.

Disclaimer:

This Code of Ordinances and/or any other documents that appear on this site may not reflect the most current legislation adopted by the Municipality. American Legal Publishing Corporation provides these documents for informational purposes only. These documents should not be relied upon as the definitive authority for local legislation. Additionally, the formatting and pagination of the posted documents varies from the formatting and pagination of the official copy. The official printed copy of a Code of Ordinances should be consulted prior to any action being taken.

For further information regarding the official version of any of this Code of Ordinances or other documents posted on this site, please contact the Municipality directly or contact American Legal Publishing toll-free at 800-445-5588.

© 2013 American Legal Publishing Corporation
techsupport@amlegal.com
1.800.445.5588.