

**SUBDIVISION ORDINANCE NO. 2007-56
OF
THE CITY OF BOERNE, TEXAS
(Revised 02.11.2020)**

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ARTICLE 1. GENERAL PROVISIONS

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SECTION 01. PURPOSE

The following regulations shall control the subdivision of land within the corporate limits of the City of Boerne, Texas, and within the extraterritorial jurisdiction thereof, in order to promote the health, safety, morals, or general welfare of the municipality and the safe, orderly, and healthful development of the municipality, as established in the Boerne Master Plan, and the vision, goals, and future development policies in the plan. In implementing the Master Plan, these regulations have the following purposes:

- A. Implement the Boerne Master Plan and any other official plan, program or policy developed under the guidance of the Master Plan.
- B. Emphasize subdivision review as the initial and principle opportunity to view development projects in their context as a portion of the greater and comprehensive surroundings, and to consider the long-range implications and opportunities.
- C. Establish standards for different contexts which support and reinforce different development patterns called for in the Master Plan – specifically Downtown, Highway/Commercial Centers, Mixed Use Districts, Neighborhood Residential, Low-density Residential, Rural Residential, or special purpose districts.
- D. Promote good civic design and arrangement and improve the layout, form, and relationship between buildings, sites, lots, open spaces, and rights-of-way with context-based design solutions.
- E. Create a system to plan, design, and evaluate development applications in the appropriate context as segments of the entire community allowing for public and private investments to be coordinated across areas and over time.
- F. Prevent premature divisions of land that by its permanence may negatively impact long-term development patterns or that lack appropriate infrastructure, both of which may result in inefficient use of land and resources that would later require excessive expenditures of public funds to correct.
- G. Ensure that all development blocks and lots are served by necessary infrastructure services, including utilities, transportation, storm drainage, public safety, and community facilities, but recognize that necessary service levels may differ based on the context, character, and intensity of development.
- H. Encourage more efficient development by analyzing adjacencies and identifying on- and off-site opportunities for infrastructure, facility, or site design systems and that operate independent of lot and subdivision boundaries.

SECTION 02. TERRITORIAL LIMITS OF REGULATIONS

The territorial application of this ordinance shall include all land located within the corporate limits of the City and all land lying within the extra-territorial jurisdiction of the City, as from time to time extended, except that Articles 3 through 8 inclusive shall not apply to lands which were included in the City of Boerne's extra-territorial jurisdiction through petition as provided by Chapter 42, Section .022(b) of the Local Government Code, provided said lands are not within one mile of the boundaries of the City as such boundaries exist at the time of final plat approval.

SECTION 03. APPLICATION OF REGULATIONS

On or after the passage of this ordinance, any person, firm or corporation (subdivider) seeking approval of any plat, plan or replat of any subdivision of land within the City and its legally established extraterritorial jurisdiction shall be required to comply with the requirements of this ordinance before such approval may be granted. Any subdivision construction plans that have not been approved by the City before the passage of this ordinance shall be required to comply with the requirements of this ordinance. No transfer of land in the nature of a subdivision as defined herein shall be exempt from the provisions of this ordinance even though the instrument or document of transfer may describe land so subdivided by metes and bounds.

SECTION 04. DEFINITIONS

For the purpose of this ordinance, certain terms and words are hereby defined as follows. Terms not defined herein shall be construed in accordance with the Zoning Ordinance, other City codes and ordinances, or their customary usage and meaning. The word "shall" is mandatory and not permissive. The word "may" is permissive and not mandatory. The words "may not" and "shall not" are both prohibitive. Headings and captions are for reference purposes only and shall not be used in the interpretation of this ordinance.

Administratively Complete: A submittal that has met all of the associated submission requirements and includes the specific form and content items included in these regulations.

Alley: A minor public right-of-way intended to provide the primary means of access to abutting lots, or which is used primarily for vehicular service access to the back or sides of properties otherwise abutting on a street.

Alley, Commercial: An alley designed to access the rear or side of non-residential lots or the rear of residential lots with rear entry garages.

Alley, Residential: An alley designed to access the rear or side of residential lots.

Best Management Practices (BMPs): Low impact development design and techniques as defined and identified in the City of Boerne edition, San Antonio River Basin Low Impact Development Technical Design Guidance Manual hereby referred to as LID Manual.

Building Setback Line: The line within a property defining the minimum horizontal distance between a building and the adjacent street line or lot line.

City Manager: The City Manager and/or his/her duly authorized representative.

City of Boerne edition, San Antonio River Basin Low Impact Development Technical Design Guidance Manual: LID Manual.

Civic Open Space System: Parks and outdoor recreation areas, landscaped pedestrian paths (other than required sidewalks along streets), bicycle paths (separate from a street right-of-way), natural or landscaped stream courses, natural or artificial lakes and other water features, greenbelts, and other landscaped public or common areas which are incorporated into the design of a the community and which benefit the community at large rather than being the private domain of individual lot owners.

Clear Cutting: The indiscriminate cutting of trees and vegetation.

Clustered parking: Parking for each cottage unit that is adjacent to one another to create more open space. No more than five continuous parking spaces are allowed in a cottage development.

Common open space for cottages: An area improved for passive recreational use or gardening. Common open spaces are required to be owned and maintained through a homeowners' association. Parking areas, yard setbacks, private open space and driveways do not qualify as common open space.

Cottage: A small home within a Cottage development per Article 5, Section 31 of the City of Boerne Zoning Ordinance

Cottage Cluster: A group of four to ten Cottages, arranged around a common open space (See common open space for cottages).

Cottage Housing Development (CHD): A group of separate, small, detached dwelling units that are intended to create a small community oriented around open space that is pedestrian-friendly and minimizes the visibility of off-street parking. One or more clusters of Cottages developed under a single land development plan, or as part of another land development plan. A Cottage Housing Development must be on at least half an acre and does not have to have street frontage but must have public access to a utility easement or fire lane access.

Cottage Lot: Cottage lots that have access within 60 feet to pedestrian walkways, walkable distance to driveways, vehicular parking and open green space. The lot does not have to front a public street but must have public access to a utility easement or fire lane access.

Common Open Space: Open space that has been set aside in a Master Planned Community for use by inhabitants of the community and that is accessible to each subdivision within the Master Planned Community by pedestrian pathways.

Curvilinear Street: A street in which the centerline has a total curve length that is 50% or greater than any straight section of the street. On a curvilinear street, minimum lot width as defined in Table 5-2 shall be measured at any point on the lot.

Days: Refers to Calendar Days unless otherwise noted.

DBH: Tree diameter at breast height. Tree DBH is the outside bark diameter at 4 1/2 feet above the ground. For the purposes of determining breast height, the ground includes the dirt layer that may be present but does not include unincorporated woody debris that may rise above the ground line.

Development: Buildings, roads and other structures; construction; and excavation, dredging, grading, filling and clearing or removing vegetation associated with residential, recreational, commercial, industrial or institutional construction.

Drainageway: A route or course along which water moves or may move to drain a region.

Drainageway Protection Zone: An area that extends horizontally landward a specified distance from the center line of a route or course along which water moves or may move to drain a region. Area that contains the Protection Zones as detailed in Section 6.03.004.

Easement, Non-Access: An easement dedicated to the public prohibiting vehicular traffic on, over or across said easement.

Easement, Overhang: An interest in land granted to the City, to the public generally, and/or to a utility corporation, for installing or maintaining overhead utilities over private land. This easement does not grant the right of entry thereon with machinery and vehicles for maintenance.

Easement, Sidewalk: An interest in land granted to the public for the installation of and public use of, a sidewalk across or over private land, together with the right to enter thereon with machinery and vehicles necessary for the installation and maintenance of said sidewalk.

Easement, Utility: An interest in land granted to the City, to the public generally, and/or to a private utility corporation, for installing or maintaining utilities across, over or under private land, together with the right to enter thereon with machinery and vehicles necessary for the maintenance of said utility.

Fire Protection Plan: A set of civil plans illustrating the proposed layout of an internal vehicular circulation systems including and the number of access points, inside turning radius specifications at intersections, roadway width throughout the development, specifications of any gated entry and egress systems, cul-de-sac dimensions, proposed fire hydrant locations, and the number of proposed dwelling units.

Flood Plain: Any land area susceptible to being inundated by water from the unusual and rapid accumulation or runoff of surface waters from any source.

Floodway: The channel of a river or watercourse and portions of the adjacent floodplain as depicted in the current floodway map provided to the City of Boerne by Federal Emergency Management Agency (FEMA), or as determined by an engineering study in areas not depicted in the current floodway map.

Gross Density: The total area of the subdivision (including public improvements), divided by the total number of

residential dwelling units contained on the plat being submitted for approval.

Habitat corridor is a strip of land that aids in the movement of species between disconnected areas of their natural habitat.

Half-Street: Any portion of a street which does not meet the minimum right-of-way widths required by this ordinance or which is to be widened to full width at some later date.

Heritage Tree: A Legacy tree species that has a trunk circumference (TC) larger than 75 inches.

Impervious Surface: Includes all streets and pavement within a development, to include parking areas, buildings, pools, patios, sheds, driveways, sidewalks and other impermeable construction covering the natural land surface.

Legacy Tree: The following species of trees: Cottonwood, Sycamore, and all species of Cypress, Elm, Maple and Oak (with the exception of all varieties of red oaks), Pecan and Texas Ash.

Limited Access Streets: A street along which direct vehicular ingress and egress to and from adjacent residential property is prohibited (except as provided for in Section 3.04.005 B Lot Access), regional thoroughfares, arterial streets, primary and secondary collectors and avenues are limited access streets.

Lot: An undivided tract or parcel of land having frontage on a public street or an approved open space having direct street access, and which is, or in the future may be, offered for sale, conveyance, transfer, or improvement, which is designated as a distinct and separate tract, and which is identified by a tract number, lot number, or other symbol in a duly approved subdivision plat which has been properly filed of record.

Lot, Corner: A lot at the point of intersection of and abutting on two or more intersecting streets, the angle of intersection being not more than 135 degrees.

Lot, Double Front: Any lot, not a corner lot, with frontage on two streets which are parallel to each other or within 45 degrees of being parallel to each other.

Low Impact Development (LID): LID is an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product. Methods prescribed by the City of Boerne edition of the San Antonio River Authority (SARA) for Low Impact Development design may be incorporated into the development of a site. These methods are outlined in the City of Boerne edition of the SARA LID Technical Guidance Manual (also called LID Manual) outlining standard practice for design and implementation.

Low Impact Development Strategies: Structural stormwater BMPs and planning techniques that are intended to closely model predevelopment hydrologic conditions by reducing impervious surfaces and infiltrating, evaporating, and storing stormwater runoff using native or improved soils, vegetation, and bioengineering.

Master Planned Communities: Tracts of land 25 acres and larger which are anticipated to be developed sequentially in contiguous units.

Open space: Property designated for recreational area, private park (for use of property owners within the subdivision), play lot area, plaza area, and ornamental areas open to the general view within the subdivision. "Open space" does not include streets, alleys, utility easements, public parks or required building setbacks.

Park: Land dedicated for the purpose of providing recreational and/or open areas whether the land is public or privately held.

Planned Unit Development or PUD: A development which includes residential clustering or other innovative design features and dedicated community open space, as regulated by Article 4 of this ordinance. A PUD may include a mixture of housing types and mixed land uses planned and developed as an integrated unit, along with common area facilities owned and managed by an association of the property owners in the development.

Plat, Final: The map or plan of a subdivision that is submitted to the City staff and the Planning and Zoning Commission for final approval. After approval, the plat is recorded under provisions of Chapter 192 of the Local Government Code.

Plat, Preliminary: The first or introductory map or plan of a proposed subdivision that is submitted to the City staff and the Planning and Zoning Commission for initial approval as the basis for development of a final plat.

Private Street: A street that is gated and or is not dedicated to the public on a plat. A private street shall be maintained by an Association such as a Homeowners Association. Private streets shall provide signage that identifies them as private, i.e. different color, labeled as private. Private street ROW's shall be dedicated as utility easements so that the utilities can be installed in their usual locations and configurations.

PUD plan: The general plan or map of a planned unit development subdivision that is submitted for a recommendation by the Planning and Zoning Commission and approval by City Council as the basis for development of the preliminary and final plats of a PUD development.

Recreational space: That area in a public or private park that is set aside for recreational and social activities.

Redevelopment: Any development on previously developed land, other than rebuilding activity.

Resubdivision: The division of an existing subdivision, together with any change of lot size therein, or with the relocation of any street lines.

Slope Map: A map depicting native slopes of 15–25%, 25–35%, and over 35%. Slopes shall be calculated for each two-foot contour interval over 50 horizontal feet and shall be established.

Standard Tree: A Legacy tree species that has a trunk circumference between 37 and 75 inches.

Steep Slope: Land area where the inclination of the land's surface from the horizontal plane is fifteen percent (15%) or greater. Slope is determined from on-site topographic surveys prepared with two-foot contour interval or topography taken from controlled aerial photography at two-foot contour intervals. The percent of slope shall be calculated for each two-foot contour interval and shall be established by measurement of distance perpendicular to the contour of the slope (rise in feet per horizontal distance in feet). Man-made slopes (such as a quarry or retaining wall) constructed prior to 2013 shall not be considered steep slopes.

Steep Slope Area: That part of the lot that encompasses the steep slope.

Stream: A natural water course - A natural intermittent or perennial stream flowing in a well-defined bed or channel; one formed by the natural flow of the water, as determined by the general surfaces or conformation of the surrounding country, as distinguished from an "artificial" water course, formed by the work of man, such as a ditch or canal.

Stream Bank: The portion of the channel which tends to restrict lateral movement of water. It often has a slope less than 90° and exhibits a distinct break in slope from the stream bottom. Also, a distinct change in the substrate materials or vegetation may delineate the bank.

Street: A public right-of-way, however designated, other than an alley, which carries vehicular traffic or provides vehicular access to adjacent land, and includes all other adjacent pedestrian amenities, landscape areas or other urban design features. All streets are classified by both a Functional Classification and a Street Design Type as follows:

Functional Classifications, describing the streets role in the overall network:

Regional Thoroughfare: A limited access arterial street designed to carry a large volume of traffic from one part of the city to another, along a route generally indicated in the city's comprehensive plan.

Arterial Street: A limited access street of considerable continuity that provides direct connections to different areas within the City and surrounding areas for large volumes of vehicles. Arterial Streets in a residential district shall be limited access streets. Specific Arterial Streets are further classified into "Major" or "Minor" based upon the City's Official Thoroughfare Plan or based upon the function and characteristics in the overall transportation network according to the technical standards of this ordinance.

Collector Street: A street of moderate continuity that provides direct access between adjacent neighborhoods or districts for medium volumes of traffic. Collector Streets in a residential district shall be limited access streets. Specific Collector Streets are further classified into "Primary" or "Secondary" based upon the City's Official Thoroughfare Plan or based upon the function and characteristics in the overall transportation network according to the technical standards of this ordinance. Primary and secondary collectors are considered limited access streets.

Local Street: A street of limited continuity that provides connections within neighborhoods and districts for low volumes of traffic. Certain Local Streets are further classified as "Minor" based upon the function and characteristics in the overall transportation network according to the technical standards of this ordinance.

Access Street: A street of little continuity designed solely for access to lots or the interior of blocks, and not permitting any through traffic. Access Streets are further classified as “Residential” or “Non-residential” based upon the function and characteristics in the overall transportation network according to the technical standards of this ordinance.

Street Design Types, describing the specific cross-section design of the street at any one point along the length:

Rural: A roadway design for moderate speeds aligned with rough, informal and natural vegetation, appropriate for all rural areas.

Neighborhood: A roadway design for moderate or slow speeds and moderate pedestrian and landscape amenities to create a formal transition abutting lot frontages, appropriate for connections in and between all residential areas.

Avenue: A roadway design for slow speeds and high pedestrian amenities, appropriate as a “main street” and support streets for mixed-use or commercial centers.

Standard: A roadway design for moderate or high speeds, and designed primarily to accommodate vehicle flow

Subdivider: An individual or company (the applicant) that subdivides parcels of land into smaller lots but may also mean an individual or company that plats an individual property or parcel (development plat).

Subdivision: A division of any tract of land situated within the corporate limits, or within the extraterritorial jurisdiction of the City of Boerne, in two or more parts to lay out a subdivision of the tract, including an addition to the municipality, to lay out suburban, building, or other lots, or to lay out streets, alleys, squares, parks, or other parts of the tract intended to be dedicated to public use or for the use of purchasers or owners of lots fronting on or adjacent to the streets, alleys, squares, parks, or other parts. “Subdivision” includes a division of a tract regardless of whether it is made by using a metes and bounds description in a deed of conveyance or in a contract for a deed, by using a contract of sale or other executory contract to convey, or by using any other method. “Subdivision” includes resubdivision, but it does not include a division of land for agricultural purposes into parts greater than five acres where each part has street access and no public improvement is being dedicated.

Trunk Circumference (TC): The perimeter measurement, in inches, of a tree trunk taken at 4 ½ feet from ground level.

Trunk Main: A water main whose primary purpose is to transport water to the distribution system within a subdivision or a sewer main whose primary purpose is to transport wastewater from the collection system within a subdivision. Trunk mains are not directly connected to individual lots.

Zoning Ordinance: City of Boerne Ordinance No. 2007-64, adopted December 18,2007, or other zoning ordinance currently in effect, and all amendments thereafter adopted.

SECTION 05. GENERAL PROHIBITIONS

1.05.001 Unauthorized Subdivisions.

It shall be unlawful for any, or the agent of any landowner, to lay out, subdivide, plat or replat any land into lots, blocks and streets within the jurisdictional limits of the City without the approval of the Planning and Zoning Commission in accordance with this ordinance.

1.05.002 Permits in Unauthorized Subdivisions.

No building, repair, plumbing or electrical permit shall be issued by the City for any structure on a lot in a subdivision until the final plat of the subdivision has been approved and filed for record and the subdivision has been accepted by the City.

1.05.003 Public Services in Unauthorized Subdivisions.

The City shall not repair, maintain, install or provide any streets or public utility services in any subdivision for which a final plat has not been approved and filed for record, or in which the standards contained herein or referred to herein have not been complied with in full.

1.05.004 Utility Services in Unauthorized Subdivisions.

The City shall not sell any water, gas, electricity or sewage service within a subdivision for which a final plat has not been approved or filed for record, or in which the standards contained herein or referred to herein have not been complied with in full.

SECTION 06. PENALTY

Any person violating this ordinance, or any portion thereof shall, upon conviction, be guilty of a misdemeanor and shall be fined \$1,000.00, and each day that such violation continues, or each occurrence shall be considered a separate offense and punished accordingly.

SECTION 07. SEVERABILITY CLAUSE

If any section, subsection, sentence, clause or phrase of this ordinance is for any reason held to be unconstitutional, void or invalid, the validity of the remaining portions of this ordinance shall not be affected thereby, it being the intent of the Council in adopting this ordinance that no portion hereof, or provision or regulation contained herein shall become inoperative or fail by reason of the unconstitutionality or invalidity of any section, subsection, sentence, clause, phrase or provision of this ordinance.

ARTICLE 2. PROCEDURES

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SECTION 01. PRE-APPLICATION CONFERENCE

Before submitting a preliminary plat, the subdivider shall request a conference with the City Manager and designated City staff. At this conference, the subdivider shall present a preliminary plan for advice on the procedures, specifications and standards required by the City for the subdivision of land. Specific topics of the conference may include:

- A. General conformance with the official Master Plan of the City, and any specific area plan prepared under the guidance of that plan;
- B. Introductory discussions of applicable standards from these regulations, according to the guidance of the Master Plan;
- C. General plans for utilities and other improvements, and correspondence with any City capital improvement plans;
- D. Correspondence with existing or proposed zoning where applicable; and
- E. The type of application and submittal requirements, specifically whether the subdivider may be eligible for an abbreviated administrative review under Section 05 of this Article.

Another pre-application meeting may be deemed necessary as determined by staff.

SECTION 02. PROCEDURES FOR PRELIMINARY PLAT

2.02.001 Submission.

Following a pre-application conference, the subdivider may submit a preliminary plat to the City Manager. In order to be prepared for submission to the Planning and Zoning Commission, the subdivider shall deliver the following at least 30 calendar days prior to the date the plat is to be considered by the Commission.

The initial administratively complete submittal of either the preliminary or the final plat shall be delivered by the subdivider or representative to the Development Assistant's office. Any follow up revisions to the plats shall be delivered directly to the Planning department for review. Each department will review the plat and provide written comments. No revisions shall be submitted until both the Planning and the Public Works departments have provided comments – at that time a new submittal may be delivered to the Planning department.

- A. Five separate blue or black line 18" x 24" copies of the preliminary plat for staff review meeting the requirements of sub-section B and a pdf.
- B. Three copies of a preliminary water distribution and sanitary sewer plan bound together with the preliminary plat, including proposed pipe sizes and sewer grading (deliver to Public Works).
- C. Formal application and appropriate filing fee established by the City Council. No action shall be taken by the staff or Commission until the filing fee has been paid. The fee shall not be refunded should the subdivider fail to make formal filing of the preliminary plat as provided in sub-section 2.02.005., or should the plat be disapproved.
- D. Two copies of a Traffic Impact Analysis meeting the requirements of the City's TIA ordinance.

- E. If new streets or connections are being provided as part of the development - Two copies of a Transportation Network Plan meeting the requirements of Article 3, Section 3.02.002, and showing the specific location and street Design Type of all proposed Arterial, Collector, Local, and Access streets, lot access points, and typical and dimensioned drawings of cross-sections for each combination of Functional Classification/Design Type for all segments of the plan.
- F. Subdivisions 10 acres or larger shall include a written inventory of existing natural features reflective of the Hill Country character, which corresponds the Preliminary Plat and proposed Open Space System Plan. The inventory shall include historical or archeological areas, significant stands of mature trees and special designation of Heritage Trees, areas of habitat for endangered or threatened species of plants and animals, distinctive geological and topographical features, drainage protection zones to include the stream set back zones and important scenic view corridors or areas.
- G. An Open Space System Plan meeting the requirements of Article 3, Section 3.03, and showing the location, Open Space Types, and proposed area of all public or common open space, including a table of requirements based on the proposed development and typical service areas for each Type.
- H. For any application that will be constructed in phases/units, attach an approved master plan for the entire parcel or subdivision shall be submitted.
- I. A tree preservation plan that identifies the location and species of Legacy trees that are Standard (37 TC") or larger and identifying any trees that will be used toward potential mitigation toward tree removal. Clusters of trees may be identified in groups rather than individually.
- J. A Fire Protection Plan shall be submitted to the fire code official prior to the approval of any private or public development.
- K. If determined necessary by the Planning Director, a Slope Map as identified in the Zoning Ordinance Section 3.05.003C.
- L. Engineering report that determines the best location and type of LID that shall be incorporated into the site being developed. LID features that are identified in the LID Manual shall be incorporated into the development.

2.02.002 Form and Content of Plat.

The preliminary plat of a proposed subdivision shall be prepared by a registered public surveyor and bear his/her seal. The plat shall show or be accompanied by the following information:

- A. The plat shall be drawn to a legible scale of typically one inch to 100 feet or one inch to 50 feet. The preliminary plat shall generally include the entire tract intended to be developed at one time. When more than one sheet is necessary, an index sheet showing the entire subdivision at a scale of one inch to 400 feet shall be attached to the plat.
- B. The name of the subdivision, which shall be approved by the City Manager.
- C. The names and addresses of owners of record.
- D. A location map showing the relation of the subdivision to well-known streets in all directions.
- E. North point, with north to the top of the sheet if possible, and the bearing of record.
- F. Name and location of adjacent subdivisions, watercourses on or adjacent to the proposed subdivision, and the property lines and names of the property owners in all adjoining unsubdivided tracts.
- G. The total acreage and total number of lots in the proposed subdivision. Identify separately the total acreage of right-of-way.
- H. The location, right-of-way width, name and description of all existing or recorded streets, alleys, or other transportation features or similar reservations which are within or adjacent to the subdivision, as determined from existing records.

- I. The approximate location and right-of-way dimensions for all proposed streets, including Functional Classifications and Design Types based on the proposed Transportation Network Plan.
- J. Two-foot contour interval surveys tied to City Control Monuments or USGS Bench Marks. Where conditions exist that make the use of two-foot contours impractical, alternate intervals may be used upon approval of the City Manager.
- K. The location of the City limit lines and the outer border of the City's extraterritorial jurisdiction if either traverse the subdivision or are contiguous to a subdivision boundary.
- L. The appropriate setback note as stated in Exhibit A.
- M. A number to identify each lot and each block, the approximate width and depth of each lot, the acreage identified for each lot and a note of the approximate area of the smallest lot. In a grid system, identify the approximate perimeter of each block, and a note on the approximate perimeters of the largest and smallest blocks. If the alternative compliance for block sizes permitted by Article 3, Section 3.04 will be use, this shall be specified and the approximate areas where the street connectivity ratios may be different shall be indicated.
- N. The centerline of watercourses, streams, creeks and existing drainage structures within and adjacent to the subdivision. Pertinent drainage data and the limits of areas subject to flooding shall be shown, delineating the 25-year and the 100-year flood limits if applicable.
- O. A note as to whether any part of the subdivision is located within a drainage basin which is upstream from a City water supply lake, and if so, a map at a convenient scale showing the location of the entire subdivision in relation to the drainage basin.
- P. If the subdivision is located within a drainage basin which is upstream from a City water supply lake, calculations showing the maximum allowable area covered by impervious surfaces in the area of the subdivision.
- Q. The locations, dimensions and purposes of all recorded and proposed easements.
- R. The gross density of the subdivision.
- S. The total acreage of open space required by this ordinance.
- T. Plat note pertaining to the presence of Heritage Legacy Trees (Exhibit A)
- U. The location of Heritage Legacy Trees (that has a trunk circumference (TC) larger than 75 inches).
- V. If applicable, areas identified as steep slope with a slope of 15% or greater.
- W. After an initial plat submittal, revisions thereafter shall be identified by highlighting or clouding by hand the changes made on a companion document that is submitted with the revised plat.
- X. For commercial developments (which includes multi-family), submit a minimum of two (2) copies and a .pdf of the drainage study per the Subdivision Ordinance, Article 6, Section 02. Where facilities are site-specific and privately maintained a drainage study may be submitted with building permit construction documents for each lot.

2.02.003 Notice of Administratively Complete Application.

After initial submittal of the preliminary plat, the City staff will notify the subdivider, developer or engineer of record via email or formal letter if the submittal is administratively complete per Section 2.02.001. Any deficiencies in the submittal shall be specifically identified in the notice. If the subdivider, developer or engineer of record is notified that a submittal is incomplete, review of the plat will be delayed until the submittal is deemed complete by City staff. If the submittal is not complete or approved within one year of the initial submittal date, the plat and plans are void.

2.02.004 Staff Review and Comments.

City staff shall review an administratively complete submittal to see that it conforms with all requirements of this ordinance. City staff shall provide written comments via email or formal letter regarding the deficiencies, if any, to the subdivider, developer or engineer of record.

2.02.005 Formal Filing with the Planning and Zoning Commission.

Upon receipt of the review comments by staff and upon written notification from staff that the plat may be submitted, the subdivider may make formal filing to the Planning and Zoning Commission, including any revisions or corrections suggested by staff.

- A. The subdivider shall make formal filing for preliminary plat approval in writing to the City Manager no later than 10 calendar days prior to the Planning and Zoning Commission meeting at which the plat is to be considered.
- B. Along with the letter of request, the subdivider shall submit twenty (20) folded 18" x 24" copies of the preliminary plat, and a pdf shall be submitted to the Planning Department.

2.02.006 Planning and Zoning Commission Review.

The Planning and Zoning Commission shall review the preliminary plat at the scheduled meeting for the following criteria.

- A. It conforms to the Master Plan of the City and its current and future streets, alleys, parks, playgrounds, open space, trails and public utility facilities.
- B. It conforms with any general plans of the municipality or other public entity for extension of roads, streets, and public highways, taking into account access to and extension of sewer and water mains and the instrumentalities of public utilities.
- C. It meets all requirements and design standards of this ordinance.

Based on these criteria, the Planning and Zoning Commission shall conditionally approve or disapprove the preliminary plat within 30 days of the formal filing to the Planning and Zoning Commission. Should the preliminary plat as submitted fail to meet the conditions of this ordinance, the Commission shall disapprove the plat and note its disapproval in the minutes of the Commission meeting.

2.02.007 Effect of Approval.

Approval of the preliminary plat shall not constitute final acceptance of the final plat but is authority to proceed with the preparation of the final plat. If any major changes are required by the Commission, the Commission may require submission of another preliminary plat.

2.02.008 Expiration of Plat Approval.

Approval of the preliminary plat shall lapse one year from the date of initial approval. A conditionally approved final plat shall expire two years after the date of approval if the subdivider has not begun construction, which includes infrastructure construction.

SECTION 03. DESIGN AND CONSTRUCTION PLANS

Any time after approval of a preliminary plat, a subdivider may prepare the following, administratively complete design and construction plans and engineer's estimated cost documents, and for residential subdivisions a drainage study for review, comment or filing to the City (hereinafter referred to as the "submittal"). Three complete bound sets of the design and construction plans as identified in Section 8.01.003 and a minimum of two (2) copies of the drainage study as described in Article 6, Section 2 shall be filed with the Department of Public Works, 400 E. Blanco prior to

submittal of a final plat. Design and construction plans shall be bound with a copy of the proposed plat which will be submitted for consideration.

A subdivider shall prepare design and construction plans separate from infrastructure plans for LID features as identified in the engineering report and as provided in the LID Manual. Design and construction plans shall be bound with a copy of the proposed plat which will be submitted for consideration.

2.03.001 Notice of Administratively Complete Application.

After receipt of the submittal to the Department of Public Works, the Department of Public Works will notify the subdivider, developer or engineer of record via email or formal letter if the submittal is administratively complete per Section 2.03.003. If the submittal is incomplete, any deficiencies in the submittal shall be specifically identified in the notice. If the subdivider, developer or engineer of record is notified that a submittal is incomplete, review of the plans will be delayed until the submittal is deemed complete by the department of Public Works. If the submittal is not complete or approved within one year of the initial submittal date, the plans are void.

2.03.002 Staff Review and Comments.

The Department of Public Works shall review an administratively complete submittal to see that it conforms with all requirements of this ordinance. The Department of Public Works shall provide written comments via email or formal letter regarding the deficiencies, if any, to the subdivider, developer or engineer of record of an administratively complete submittal. Any subsequent submittal by the subdivider, developer, or engineer of record will be reviewed by the Department of Public Works and will be responded to by the City staff. Once the submittal is approved by the Department of Public Works, notice of such approval will be sent to the subdivider, developer or engineer and Department of Planning so the item may be placed on the following Planning and Zoning Commission meeting agenda.

2.03.003 Construction Plans.

Construction plans, engineer's estimated cost, drainage study and certification letters, as required in Section 8.01.003 of this ordinance are required for final plat approval.

SECTION 04. FINAL PLAT APPROVAL

2.04.001 Options.

Following approval of a preliminary plat by the Planning and Zoning Commission AND approval of design and construction plans, the subdivider may submit a final plat to the City Manager. The subdivider, developer or engineer of record may seek unconditional or conditional approval of the final plat by the Planning and Zoning Commission. If conditional approval is sought, the final plat will not be recorded until the condition of approval is satisfied.

- A. **Unconditional Approval.** At least 10 days prior to final plat approval by the Planning and Zoning Commission, the financial guarantee as described below, shall be submitted to the Department of Public Works and approved by the City Attorney. The final plat shall be recorded within 14 calendar days of unconditional approval by the Planning and Zoning Commission.
1. *Required Guarantee.* The subdivider shall submit an irrevocable letter of credit, a cash deposit, certificate of deposit, a savings assignment, or a performance bond, in an amount equal to the engineer's estimated cost of the utility and street improvements to be made in the subdivision by the subdivider, including the cost of erosion control during construction. Such bond or other shall be for the faithful performance, installation and completion of such improvements.
 2. *Adjustment of Guarantee.* As soon as possible after approval of the final plat, but prior to the start of construction, the subdivider shall provide the City Manager an executed copy of the utility and street construction contracts or a notarized statement certifying the final contracts so that the City may substantiate the engineer's estimated cost of improvements. The financial guarantee shall be adjusted to reflect the actual construction costs.
 3. *Reduction and Expiration of Guarantee.* The financial guarantee may be reduced from time to time as portions of the improvements are completed and accepted. The financial guarantee shall bear an

expiration date of one year from the date of final plat approval and shall be retained by the City Manager until all improvements have been completed and accepted by the City.

4. *Payment of Guarantee.* If all improvements have not been completed and accepted by the City 30 days prior to the expiration of the financial guarantee, the City Manager may either present the financial guarantee for immediate payment or allow for a six (6) month extension of the financial guarantee by the subdivider.
5. *Return of Guarantee.* If the plat is withdrawn prior to consideration by the Planning and Zoning Commission or the plat is denied by the Planning and Zoning Commission, the financial guarantee will be returned by the City of Boerne to the issuer within 30 days.

B. **Conditional Approval.** The final plat may be approved conditionally by the Planning and Zoning Commission if one of the following conditions are met. The condition of approval shall be stated by the Planning and Zoning Commission at plat approval.

1. The final plat will not be recorded until such time as the infrastructure is completed and accepted by the City, thereby negating the requirement for a financial guarantee or the financial guarantee for the entire cost of infrastructure is received and approved by the City Attorney. All infrastructure construction shall be inspected while in progress by the City, and upon completion must be approved by the Director of Public Works or his duly authorized representative. A memo or letter by the Director of Public Works stating that the construction is complete and conforms to the specifications and standards contained in or referred to in this ordinance must be presented to the Planning Department.

SECTION 05. PROCEDURES FOR FINAL PLAT

2.05.001 Procedures for Submission.

Following approval of a preliminary plat by the Planning and Zoning Commission AND approval of design and construction plans and the residential drainage study, the subdivider may submit a final plat to the City Manager. The final plat and accompanying data shall conform to the preliminary plat as conditionally approved by the Commission, incorporating any and all changes, modifications, alterations and corrections required by the Commission.

First administratively complete submittal of either the preliminary or the final plat shall be delivered by the subdivider or representative to the Development Assistant's office. Any follow up revisions to the plats shall be delivered directly to the Planning department for review. Each department will review the plat and provide written comments. No revisions shall be submitted until both the Planning and the Public Works departments have provided comments – at that time a new submittal may be delivered to the Planning department.

The subdivider shall provide to the Department of Planning the following a minimum of 21 calendar days prior to the Commission's consideration of the final plat:

- A. Five separate copies of the final plat for staff review meeting the requirements of sub-section 2.04.002.
- B. Formal application and appropriate filing fee established by the City Council. No action shall be taken by the staff or Commission until the filing fee has been paid. The fee shall not be refunded should the subdivider fail to make formal filing of the final plat as provided in sub-section 2.04.006., or should the plat be disapproved.
- C. Letters/memos from all necessary review agencies having jurisdiction over improvements required or desired in the subdivision, including:
 1. City of Boerne Fire Code Official;
 2. Bandera Electric Co-op and/or Pedernales Electric Co-op;
 3. Texas Department of Transportation, if any state right-of-way is involved in streets or access points;
 4. Cow Creek Ground Water Conservation District;
 5. Cable and telephone wire services;
 6. Kendall County, if located in the ETJ
 7. any other State or public agency approval with jurisdiction over improvements desired in the subdivision.

- 8. Other Utility Providers
- F. An electronic PDF file for all of the required documents submitted.
- G. Letter from the engineer of record that the LID features have been designed to adhere to the BMPs and techniques provided by the LID Manual.

2.05.002 Form and Content of Plat.

The final plat shall be 18 inches by 24 inches, and to an easily readable scale of typically one inch to 100 feet or one inch to 50 feet. Where more than one sheet is required, an index sheet of maximum size 18 by 24 inches shall be filed showing the entire subdivision, and all scales shall be uniform. The following information must be shown on or must accompany the plat:

- A. Name of the subdivision, north arrow, the name of the land owner or owners, the name of the registered surveyor and/or engineer responsible for the preparation of the plat, scale, location map, total acres in the subdivision, and the location of the subdivision in reference to an original corner of the original survey of which said land is a part.
- B. Certificate, signature and seal of the licensed surveyor who surveyed the land (see Exhibit A).
- C. Certificate, signature and seal of the engineer, except when the plat does not require engineering considerations (see Exhibit A).
- D. A certificate of ownership and dedication to the City of all streets, easements, alleys, parks, playgrounds or other dedicated public uses, signed and acknowledged before a notary public by the owners and by any holders of liens against the land (see Exhibit A).
- E. The total number of lots in the proposed subdivision. Show the number of buildable lots and open space lots separately.
- F. Certificate of approval to be signed by the Chair and the Secretary of the Commission (see Exhibit A).
- G. Certificate for recording the plat in the Kendall County Clerk's office.
- H. The names and property lines of adjoining subdivisions and the property lines and names of property owners in contiguous unsplit tracts, including deed of record information.
- I. The name and location of adjacent streets, alleys, easements, watercourses, and other required information, all lines outside of the subdivision boundaries to be dashed.
- J. The names of all proposed streets and the locations and right-of-way widths of all proposed streets and alleys.
- K. Complete curve data (delta, arc length, radius, tangent, point of curve, point of reverse curve, point of tangent, long chord with bearing) between all lot corner pins.
- L. Locations, dimensions, acreage and purposes of any easements or other rights-of-way to be dedicated to public use.
- M. Lot and block lines, numbers of all proposed blocks, lot numbers and street addresses on each proposed lot, dimensions for front, rear and side lot lines, the acreage of each lot, and the perimeter length of each block. Where the alternative compliance for block sizes permitted in Article 3, Section 04, a table demonstrating the connectivity ratio for the development, or different portions of the development shall be provided.
- N. The right-of-way lines and dimensions, Functional Classification, and Design type of all proposed streets based on the proposed Transportation Network Plan.
- O. The building setback note shown on the plat (See Exhibit A).

- P. Plat notes indicating the location of sidewalks on both sides of all streets (except where sidewalks are not required by this ordinance), and the installation of double swing gates across all utility easements.
- Q. If applicable, the boundaries of the 100-year flood plain and floodway.
- R. Subdivisions in an area having special flood hazards shall show on the plat:
 - 1. A flood zone for that area which is subject to inundation by the 100-year flood.
 - 2. The surface elevation of the 100-year flood at intervals of every 500 lineal feet. This must be based on a certified engineering survey taking into consideration the full development of the watershed.
- S. Minimum slab elevations shown on each lot that fall within the 100-year flood plain.
- T. If applicable, the limits of any water supply protection zone and plat notes to implement the zone requirements.
- U. If applicable, plat notes restricting the percentage of the area of each lot which may be covered by impervious surfaces.
- V. If applicable, Stream setback zones 1 and 2.
- W. The location of Heritage Legacy Trees (that has a trunk circumference (TC) larger than 75 inches) with the plat note pertaining to the presence of Heritage Legacy Trees.
- Y. Two corners with state plane coordinates and reference to the horizontal and vertical datum used for surveying.
- Z. Other appropriate plat notes (see Exhibit A).
- AA. Appropriate easement notes (see Exhibit A).

2.05.003 Notice of Administratively Complete Application.

After the submittal of the final plat, the City staff will notify the subdivider, developer or engineer of record via email or formal letter if the submittal is administratively complete per Section 2.05.001. Any deficiencies in the submittal shall be specifically identified in the notice. If the subdivider, developer or engineer of record is notified that a submittal is incomplete, review of the plat will be delayed until the submittal is deemed complete by City staff. If the submittal is not complete or approved within one year of the initial submittal date, the submitted plat and plans are void.

2.05.004 Formal Filing with the Planning and Zoning Commission.

Upon receipt of the review comments by staff and upon written notification from staff that the plat may be submitted the subdivider may make formal filing to the Planning and Zoning Commission, or after completion and acceptance of the submittal including any revisions or corrections suggested by staff. The formal filing shall contain the following:

- A. Twenty (20) folded copies of the final plat.
- B. At least three (3) original signed and sealed Mylars of the final plat for recording, provide an original, notarized affidavit showing the taxes have been paid, including copies of the paid tax statement from the Kendall County Appraisal District. If the plat is conditional, staff will request these documents from the subdivider at time of recordation.
- C. If a plat is unconditional, provide a check for recording fees in the amount as determined by Kendall County. If a plat is conditional, the subdivision shall provide the check for recording fees when they provide the affidavit.
- D. Two copies of the digital file of the final plat in a format specified by the City Manager, and one copy of the final plat in .pdf format.

2.05.005 Planning and Zoning Commission Review.

The Planning and Zoning Commission shall review the final plat at the scheduled meeting for the following criteria.

- A. It conforms to the approved preliminary plat, including any conditions, further studies or other requirements that were stated in the approval.
- B. It conforms to the Master Plan of the City and its current and future streets, alleys, parks, playgrounds and public utility facilities.
- C. It conforms with any general plans of the municipality or other public entity for extension of roads, streets, and public highways, taking into account access to and extension of sewer, water, reclaimed water, gas and electric mains and the instrumentalities of public utilities.
- D. It meets all requirements and design standards of this ordinance.
- E. The construction plans and specifications meet all city standards.

Based on these criteria, the Planning and Zoning Commission shall approve or disapprove the final plat within 30 days of the official filing to the Planning and Zoning Commission. Should the final plat as submitted fail to meet the conditions of this ordinance, the Commission shall disapprove the plat and note its disapproval in the minutes of the Commission meeting.

2.05.006 Effect of Approval.

The subdivider shall not proceed with infrastructure improvements subject to the provisions of Article 8 of this ordinance until the final plat is either conditionally or unconditionally approved. No building permits may be issued, and no infrastructure improvements shall be considered accepted by the City except as provided in Article 8 as applicable.

2.05.007 Filing for Record.

The City shall file the approved final plat for record and provide the subdivider with one reproducible recorded tracing of the final plat within 14 calendar days of unconditional approval by the Planning and Zoning Commission or upon satisfaction of the conditional approval as identified by the Planning and Zoning Commission.

SECTION 06. PROCEDURES FOR ADMINISTRATIVE PLAT

2.06.001 Eligibility.

A plat that meets the following criteria may be determined to be an administrative plat and is eligible for an abbreviated administrative review as an alternative to the procedures in Sections 2.02, 2.03, and 2.04:

- A. *Minor Plats.* Minor Plats that meet all of the following requirements
 1. It involves four (4) or fewer lots fronting on an existing public street.
 2. Any subdivision improvements required by these regulations are routine in design and in conformance with all other plans and specifications of the City.
 3. The proposed lot sizes and lot configurations will comply with this ordinance and the zoning ordinance, or if not subject to zoning are in conformance with the Master Plan.
 4. The subdivision does not necessitate widening of streets or the extension of any municipal utilities, other than the installation of service lines to the individual lots, because either existing mains of adequate capacity are accessible, or the subdivision is suitable for on-site water supply and wastewater disposal.
- B. *Amending Plats.* Amending Plats necessary for one or more of the purposes identified in Section 212.016 of the Texas Local Government Code.

2.06.002 Submission.

- A. Minor Plats:
 - a. The Minor plat submittal shall be provided on five paper copies 18 inches by 24 inches, at an easily readable scale of typically one inch to 100 feet or one inch to 50 feet. Where more than one sheet is required, an index sheet of maximum size 18 by 24 inches shall be filed showing the entire subdivision, and all scales shall be uniform.
 - b. The subdivider shall submit a plat with all combined submittal requirements and like form and content found in Section 2.02 and Section 2.05. Some items may be deemed unnecessary by Staff and may be omitted upon direction of Staff.

- B. Amending Plats:
 - a. The Amending plat submittal shall be provided on five paper copies 18 inches by 24 inches, at an easily readable scale of typically one inch to 100 feet or one inch to 50 feet.
 - b. The lots being amended shall demonstrate before and after amended lot dimensions.

2.06.003 Procedures.

The application for an administrative plat shall be submitted after a pre-application conference.

- A. First administratively complete submittal of the Administrative plat shall be delivered by the subdivider or representative to the Development Assistant's office. City staff will notify the subdivider, developer or engineer of record via email or formal letter if the submittal is administratively complete per Section 2.06.001. Any deficiencies in the submittal shall be specifically identified in the notice. If the subdivider, developer or engineer of record is notified that a submittal is incomplete, review of the plat will be delayed until the submittal is deemed complete by City staff. If the submittal is not complete or approved within one year of the initial submittal date, the submitted plat and plans are void.

- B. Any follow up revisions to the plat shall be delivered directly to the Planning department for review. Each department will review the plat and provide written comments. No revisions shall be submitted until both the Planning and the Public Works departments have provided comments – at that time a new submittal (five – 18" x 24" paper copies) may be delivered to the Planning department.

- C. After an initial plat submittal, revisions thereafter shall be identified by highlighting or clouding by hand the changes made on the plat.

- D. Within 21 calendar days after the date of application, an administrative plat shall be returned to the subdivider with written comments. If changes are requested by staff, the application shall not be considered officially filed with the City until such changes are made, and the application re-submitted to the City.

- E. Upon completion of plat review by City staff and corrections by the subdivider, the applicant shall submit the items listed below within 14 calendar days after receiving staff comments:
 - 1. Three original, signed Mylars of the plat;
 - 2. Original tax certificates and affidavit stating that no taxes are delinquent against the property; and
 - 3. The appropriate filing fees for final plats as specified by the City Council.If the items listed above are not submitted within 14 calendar working days after receipt of staff comments, the administrative plat application will be considered null and void.

- F. The City Manager or designee may approve an administrative plat provided it meets the eligibility criteria in sub-section A. and all requirements of this ordinance. The City Manager or designee may elect to forward the application to the Planning and Zoning Commission at any time in the review process. The City Manager or designee's decision on the administrative plat, or inaction by the City Manager or designee may be appealed to the Planning and Zoning Commission for action within thirty (30) days after the date of application and shall be considered in the same manner and procedures as preliminary plat.

2.06.003 Effect of Approval.

Following the approval of an administrative plat, the subdivider may proceed with construction of infrastructure improvements subject to the provisions of Article 8 of this ordinance when applicable. No building permits may be issued and no infrastructure improvements shall be considered accepted by the City except as provided in Article 8 as applicable.

2.06.004 Filing for Record.

The City shall file the approved administrative plat for record and provide the subdivider with one reproducible recorded tracing of the administrative plat within 14 calendar days of approval.

2.06.005 Notice of Administratively Complete Application.

After submittal of the Administrative plat, the City staff shall notify the subdivider, developer or engineer of record via email or formal letter if the submittal is administratively complete per Section 2.06.001. Any deficiencies in the submittal shall be specifically identified in the notice. If the subdivider, developer or engineer of record is notified that a submittal is incomplete, review of the plat may be delayed until the submittal is deemed complete by City staff. If the submittal is not complete or approved within one year of the initial submittal date, the plat and plans are void.

2.06.006 Formal Filing with the Planning and Zoning Commission.

Upon receipt of the review comments by staff and upon written notification from staff that the plat may be submitted for signature and recordation, the subdivider may make formal filing to the Planning Director.

SECTION 07. VARIANCES

2.07.001 Commission Power to Grant Variances.

The Planning and Zoning Commission may grant a variance from the requirements of this ordinance when, in the Commission's judgment, the application of a subdivision standard to a particular property or project meets the required findings in this section.

2.07.002 Findings Required for Variances.

A variance to the standards in the subdivision ordinance may be granted where the Planning and Zoning Commission finds that the following conditions exist:

- A. Each subdivision standard for which a variance is requested shall be specifically identified on the preliminary plat application.
- B. An inappropriate design may result from strict compliance with these regulations due to unusual topographic or other physical conditions of the land or surrounding area, and these conditions are not typical to other lands in the area.
- C. The condition is beyond the control of the subdivider and shall not be due to the convenience or needs of a specific application or development proposal.
- D. The requested variance is the minimum deviation from the required standard necessary to allow a more appropriate design.
- E. The requested variance shall not alter, negate or negatively impact the ability to meet any specific standard contained in the City of Boerne Zoning Ordinance.
- F. The plat shall propose alternative design solutions or standards to the required standards for which a variance is requested, or alternatively demonstrate that the required standard is inapplicable to the specific site, so that the proposed plat equally or better meets all of the following:
 - 1. The goals and policies of the Master Plan;
 - 2. The purposes of these regulations; and
 - 3. The intent of the standards.

- G. The variance shall not have an adverse effect on existing adjacent landowners, potential future landowners in and adjacent to the subdivision, existing or potential development within any area of impact of the proposed subdivision.
- H. The variance shall not negatively impact efficient development of the land and surrounding areas based on sound planning principles and the goals and policies of the Master Plan.
- I. The variance shall not adversely impact the general health, safety and welfare of the public.

2.07.003 Conditions.

In granting approval of a subdivision with a variance, the Planning Commission may prescribe conditions to secure the objectives and interest of the City, and to enforce the purpose and intent of these regulations. In granting a variance, the Commission shall prescribe only conditions that it deems necessary to or desirable in the public interest.

2.07.004 Procedures for Variances.

The subdivider shall submit to the City Manager a written application for each variance which is requested, 14 calendar days prior to the meeting at which the variance is to be considered, along with the appropriate filing fee established by City Council. The Planning and Zoning Commission shall not consider any action on the variance request until this fee has been paid. The findings of the Commission, together with the specific facts upon which such findings are based, shall be incorporated into the minutes of the Commission meeting at which the variance is granted.

SECTION 08. RE-PLATTING

Re-platting of any property previously subdivided or otherwise subject to an approved plat shall be conducted in accordance with the procedures of sections 212.014 and 212.015 of the Texas Local Government Code, and otherwise according to all other standards and procedures of this Ordinance.

ARTICLE 3. PLANNING AND COMMUNITY DESIGN STANDARDS

SECTION 01.	PLANNING CONTEXT
SECTION 02.	TRANSPORTATION NETWORK AND STREET DESIGNS
SECTION 03.	OPEN SPACE SYSTEMS
SECTION 04.	BLOCKS AND LOTS
SECTION 05.	PUBLIC AND COMMUNITY FACILITIES
SECTION 06.	LOW IMPACT DEVELOPMENT FACILITIES

SECTION 01. PLANNING CONTEXT

3.01.001 General Intent.

It is the General Intent of this Article to:

- A. Emphasize an integrated planning and design approach towards investment in the core community design elements of subdivisions and achieve both immediate and long-range needs that support the growth and character of the community.
- B. Place all proposed subdivisions of land in a context that relates to its surrounding areas and to the region.
- C. Enable street design solutions appropriate to the context, unique character, and anticipated land uses of each proposed division of land.
- D. Recognize open space systems, whether public, common, or private, as a determinant of community character, and create a related system of different open space types to be applied in appropriate contexts.
- E. Integrate natural systems into the design of common or public open spaces to allow open space to serve multiple aesthetic, recreational, and ecological functions.
- F. Create development patterns that are coordinated and efficiently accommodate immediate and planned uses, but that are also more resilient to change and pressures from future growth and development.
- G. To facilitate the planning and development of public and community facilities in a timely manner in association with future development of the City and its surroundings.

3.01.002 Planning and Design Elements.

The Planning and Community Design standards require that all subdivisions be considered in a comprehensive manner, integrating different core community design elements within the same subdivision and linking the same core community design elements across many adjacent subdivisions. This Article establishes initial planning and design standards for the following core community design elements that are necessary to develop complete and integrated communities:

- A. *Transportation Networks and Street Designs:* The network and design of streets to support the proposed division of land, including the relationship to existing and planned streets on adjacent property.
- B. *Open Space Systems:* A system of various types of open spaces that determine the community character and meet aesthetic, recreational, and ecological needs for the proposed division of land.
- C. *Blocks and Lots:* The arrangement of the land division within the network of streets and system of open spaces, into an orderly pattern with necessary access and services (to include fire apparatus access).

- D. *Public and Community Facilities:* Areas of land that support development by meeting broad public and community needs, and which may be identified and anticipated in other public or community plans.

3.01.003 Context and Development Patterns.

Based upon the Boerne Master Plan, these regulations recognize the following distinct planning contexts or “development patterns.” Each development pattern may be the basis for differing planning and design solutions with respect to the core community design elements of subdivisions. Each proposed land division must identify a development pattern under which it shall be evaluated. The Future Land Use / Development Plan Concept Map in the Boerne Master Plan should be used as a guide to the application of the appropriate development patterns and interpretation of the standards in these regulations.

- A. Downtown Center
- B. Highway / Commercial Center
- C. Mixed Use District
- D. Neighborhood Center
- E. Neighborhood Residential
- F. Low-Density Residential
- G. Rural Residential
- H. Special Districts

Each development Pattern is further described and characterized in the Master Plan.

SECTION 02. TRANSPORTATION NETWORK AND STREET DESIGNS.

3.02.001 Specific Intent.

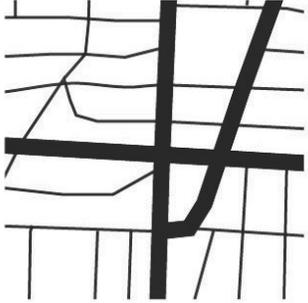
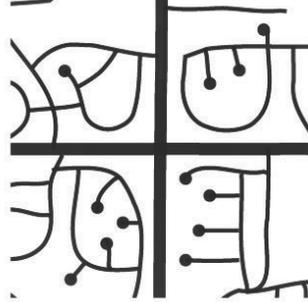
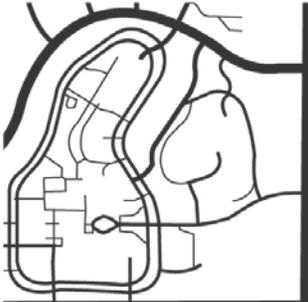
The Specific Intent of this Section is to:

- A. Prioritize planning street networks and the design of street types as an important and substantial civic asset that establishes permanent patterns and the character of the public realm of the City.
- B. Provide for efficient and safe movement and access along all public ways through a variety of modes of transportation, including automobiles, bicycles, pedestrians, and potentially transit.
- C. Complement regional transportation systems with local networks that support multiple and alternative routes for daily trips, do not overly burden any single roadway, and include logical connections to existing, planned, or potential future streets.
- D. Plan street networks that allow the design of streets to transition along their length to best support anticipated and adjacent land uses and development patterns.
- E. Develop balanced street designs for regional and local routes that accommodate all potential users of the street and rights-of-way, so that the interests of a single mode of transportation do not unnecessarily compromise other modes of transportation.

3.02.002 Transportation Network Plan.

All applications shall include a *Transportation Network Plan*. Applications featuring small parcels shall relate any proposed streets and access points to the surrounding existing transportation network according to these standards.

- A. **Network Types.** The *Transportation Network Plan* shall demonstrate how the application incorporates into the Boerne Master Plan, the Major Thoroughfare Plan, any specific sub-area transportation plan, and the existing adjacent transportation network by specifying one of the network types identified in Table 3-1.

TABLE 3-1: TRANSPORTATION NETWORK TYPES			
NETWORK TYPE	DESCRIPTION	CONTEXT / DEVELOPMENT PATTERN*	EXAMPLE Scale = roughly ¼ section (1320' x 1320')
GRID / MODIFIED GRID NETWORK	A highly connected network with a more formal and organized block structure, supporting a more compact and walkable development pattern. Modifications of the grid are permitted to provide radial streets that angle across the grid and create and terminate at focal points or important community destinations; to provide off-sets, shifts, or T-intersections with local streets that preserve connectivity but discourage through traffic; and to allow interruptions or irregularities in the grid to preserve valuable topographic or natural features.	Downtown Center; Highway/Commercial Center; Mixed Use District; Neighborhood Center; Neighborhood Residential; and Low-Density Residential	
CURVILINEAR NETWORK	A moderately connected network with an informal and loose block structure that accommodates irregularly spaced local streets within an Arterial street grid, supporting a predominantly low-density development pattern.	Low-Density Residential	
ORGANIC NETWORK	A strategically connected network that follows the topography and natural features of the land and features meandering low-volume/low-speed streets, supporting a low-density and rural development pattern.	Rural Residential; Low-Density Residential; and where a Rural Cluster Subdivision is applied.	
SPECIAL DISTRICT NETWORK	The special district network is based on a plan that is created to support one specific plan for building arrangements and uses, such as a campus or office park. The network primarily considers vehicle traffic flow within the district and primary access and through traffic is focused on regional thoroughfares and arterial streets. Provisions for non-automobile transportation may need to deviate from the street network in order to provide more meaningful and practical connections.	Highway/Commercial Centers; and Special Districts	

- B. **Transitional Network.** A *Transportation Network Plan* shall designate all existing and planned streets by both a *Functional Classification* and a *Street Design Type* (e.g. Minor Arterial / Avenue signifies a segment of an arterial street with the “Avenue” design type). The *Transportation Network Plan* shall employ a “transitional” approach to street design, whereby the physical design of the street at any one cross-section (*Street Design Type*) may vary at different segments of the same street to best support the existing or planned land uses fronting on that segment, while the function of the street (*Functional Classification*) is based on the consistent role of the street in the entire network, including areas beyond the development site.
- C. **Functional Classification.** The *Functional Classification* of a street refers to the general function in the overall transportation system and does not necessarily dictate the cross-section design on any one segment of the street. *Functional Classification* addresses primarily the continuity of the street and the traffic capacity that it is designed for when considered in context of the entire transportation system. Design speeds may vary along any particular segment of a single *Functional Classification*, depending on the *Design Type* that is most appropriate for that section of the street. Table 3-2 indicates the *Functional Classifications* of streets and the general applicability of each classification within the *Transportation Network Plan*.

TABLE 3-2: FUNCTIONAL CLASSIFICATION APPLICABILITY		
	INTENT AND CHARACTERISTICS	APPLICABILITY*
REGIONAL THOROUGHFARE	A street of regional continuity that provides access to and from the City for high volumes of traffic over long distances.	Located only on the City's initiative through its official Thoroughfare Plan, or according to TxDOT under the guidance of the Thoroughfare Plan. <i>Volume Range</i> (vehicles/day): > 54,000
ARTERIAL **	A street of considerable continuity that provides direct connections to different areas within the City and surrounding areas for large volumes of vehicles. Arterial streets are characterized by few interruptions, except at major community destinations, topographical obstacles, or important natural features.	Arterial streets shall be located every ½ to 1 mile apart, except in rural development patterns; and as may be specified in the City's official Thoroughfare Plan. <i>Volume Range</i> (vehicles/day): <i>Major Arterial:</i> < 54,000 <i>Minor Arterial:</i> < 20,000
COLLECTOR	A street of moderate continuity that provides direct access between adjacent neighborhoods or districts for medium volumes of traffic. Collector streets are occasionally interrupted or diverted by neighborhood destinations or natural barriers.	Collector streets shall be located every ¼ to ½ mile apart, except in rural development patterns; and as may be specified in the City's official Thoroughfare Plan. <i>Volume Range</i> (vehicles/day): <i>Primary Collector:</i> 3,000 to 10,000 <i>Secondary Collector:</i> 500 to 3,000
LOCAL	A street of limited continuity that provides connections within neighborhoods and districts for low volumes of traffic. Local streets are interrupted frequently by intersections with higher order street classifications or by interruptions or off-sets in the street grid (i.e. “T”-intersections). Local streets should still maintain high connectivity to the transportation network, but should be designed to discourage through traffic.	Local streets shall be located to meet the Block and Lot standards in Section 4. Generally Local streets are located every 250' to 1000' apart, except in rural development patterns. <i>Volume Range</i> (vehicles/day): <i>Local:</i> < 2,000 <i>Local:</i> < 1,000
ACCESS	A street of little continuity designed solely for access to lots or the interior of blocks, and not permitting any through traffic. Access streets within blocks or parcels allow: <ul style="list-style-type: none"> • More discrete service areas for non-residential lots; • More continuous streetscapes, uninterrupted by vehicle access points to multiple individual lots; and • Access to lots in difficult topography, where a connected street is not possible. 	Access streets shall be located as needed to serve vehicle needs and the design goals of specific blocks and lots. <i>Volume Range</i> (vehicles/day): <i>Residential:</i> < 250 <i>Non-residential:</i> < 1,000

* This Applicability is for general planning purposes. A *Transportation Network Plan* may propose alternate applicability, provided the intent of this section is equally or better met by the modifications.

** An Arterial Classification shall be a "Major Thoroughfare on the City's Thoroughfare Plan existing at the time of adoption of these regulations, until that plan is updated to use the Functional Classifications specified in this table, and the Design Types in Section D.

D. **Street Design Type.** Street Design Type refers to the specific design characteristics of the street or "cross-section" at any one point. Many different Street Design Types may be applied over the course of a street with a single Functional Classification to allow streets to transition and best support adjacent or planned land uses and development patterns. The Street Design Types vary to address the array of elements that make streets complete: (1) the finished street width and allocation of this width to travel lanes, parking, or alternative modes of travel; (2) the landscape area and the pedestrian area; (3) the necessity for clear utility zones in association with the street network, and block and lot layout; (4) the ability for fire apparatus to access sites; and (5) the building orientation on adjacent sites. Proper arrangement of these elements is necessary to balance and best meet the needs of all users of the right-of-way while supporting immediately adjacent property. Table 3-3 indicates the *Street Design Types* of streets and the general applicability of each classification within the *Transportation Network Plan*.

Table 3-3: Design Type		
	INTENT AND CHARACTERISTICS	APPLICABILITY
RURAL	<p>A medium or low capacity roadway design for moderate speeds aligned with rough, informal and natural vegetation. Appropriate for all rural areas.</p> <p><i>Finished Street:</i> Narrow lanes with an informal or curb-less street edge. <i>Parkway:</i> Informal, rough, and natural vegetation buffers. <i>Pedestrian Area:</i> Typically not required, although an informal path or multi-purpose trail may be necessary on streets with a priority connection to surrounding areas. <i>Building Orientation:</i> Very large setbacks or dense vegetative screens buffer buildings from the roadway preserve an open rustic character on the roadway.</p>	<p>The Rural street Design Type may be applied in Rural Residential and Low-Density Residential Development Patterns, or in Rural Cluster subdivisions.</p>
NEIGHBORHOOD	<p>A medium or low capacity roadway design for moderate or slow speeds and moderate pedestrian and landscape amenities that create a formal transition abutting lot frontages. Appropriate for connections in and between all residential areas.</p> <p><i>Finished Street:</i> Narrow to medium lanes with slow traffic speeds, or includes occasional or designated on-street parking to buffer pedestrians and adjacent uses from traffic flow. <i>Parkway:</i> Used to buffer sidewalks from the street and may contain more formal planting (i.e. street trees) although landscape plans that best promote the character of each unique neighborhood are encouraged. <i>Pedestrian Area:</i> Minimum 5' sidewalk on both sides; wider in higher density neighborhoods or on important or higher Functional Classifications of Neighborhood Streets. <i>Building Orientation:</i> Medium to small front lawns, terraces and courtyards to create a slight sense of enclosure along the streetscape. Larger setbacks may be characteristic on Arterial / Neighborhood Parkways.</p>	<p>The Neighborhood Street Design Type may be used for any street supporting residential uses. On any high-volume street that goes through a neighborhood, a Parkway element should be added to the cross-section so that Residential uses may still front on the street with minimal impact from traffic.</p>
AVENUE	<p>A high or medium capacity roadway design for slow speeds and high pedestrian amenities, appropriate as a "main street" and support streets for mixed-use or commercial centers.</p> <p><i>Finished Street:</i> Narrow to medium-width lanes with slow traffic speeds and on-street parking opportunities are maximized. <i>Parkway:</i> Formal ornamental landscaping and expanded pedestrian amenity area. <i>Pedestrian Area:</i> Wide sidewalks on both sides. Expanded sidewalks may accommodate activities related to adjacent businesses. <i>Building Orientation:</i> Street-front buildings or formal open spaces about the sidewalks to create a tight enclosure on the streetscape.</p>	<p>The Avenue Street Design Type may be used in any Center or District where a pedestrian character is desired and a highly connected Grid or Modified Grid network is used.</p>
STANDARD	<p>A high, medium or low capacity roadway design for moderate or high speeds, and designed primarily to accommodate vehicle flow. Landscape and pedestrian amenities are fit in as right-of-way widths permit or dependant on the needs of the specific context. Standard street designs are appropriate for areas where vehicle flow is the priority, and adjacent land uses do not rely on any specific relationship to the street. The Local Residential, Secondary Collector, Primary Collector, Minor Arterial, and Major Arterial cross sections in Table 3-4 are all "Standard" Street Design Types.</p>	<p>The Standard Street Design Type should be used where other Street Design Types are not appropriate due to right-of-way constraints, traffic priorities, or vehicle access needs of adjacent land uses.</p>

	<p><i>Finished Street:</i> Wider lanes and typically no on-street parking <i>Parkway:</i> Informal landscape, typically larger and required to buffer impacts of street. <i>Pedestrian Area:</i> Moderate to non-existent sidewalks <i>Building Orientation:</i> Large setbacks with little or no orientation to the street</p>	
FIRE APPARATUS ACCESSROAD	A public street that provides fire apparatus access from a fire station to a facility, building or portion thereof.	Access for fire apparatus must be considered for all developments.

* The Applicability is for general planning purposes. A *Transportation Network Plan* may propose alternate applicability, provided the specific intent of this Section is equally or better met by the modifications.

- E. **External Connections.** All new streets shall align with any existing or proposed streets on adjacent property, and shall continue and extend arterial, collector, and local streets within the proposed subdivision externally to the parcel boundary as follows:
1. New Arterial and Collector streets shall be provided at the intervals identified in the Applicability section of Table 3-2 or as depicted in the City of Boerne Thoroughfare Plan. All Arterial and Collector streets shall be connected and extended to the boundary of the site.
 2. Local street connections shall be provided and extended to the boundary of the site in any subdivision that contains more than 30 residential lots in a manner that all blocks and parcels in the subdivision meet the block standards in Article 3, Section 3.04. The City may require local streets to stub to the property edge where future development or re-subdivision of adjacent property is anticipated. Where there are more than 30 residential lots a second street or separate and approved fire apparatus access road shall be provided.
 3. In addition to all of the above requirements, all Commercial development shall have at least one connection to an existing external Arterial or Collector street in the surrounding transportation network, or to a newly proposed Arterial or Collector street connected to the external network. All Residential development shall have at least one connection to an existing external Arterial or Collector street in the surrounding transportation network, or to a newly proposed Arterial or Collector street connected to the external network. Additional connections similar to the one described above shall be required for each additional set of 50 lots if said connections are practicable, considering the existing and or proposed collector network.
 4. Trail systems that provide connectivity within the subdivision and connectivity to adjacent subdivision are required in all developments.
 5. A fence constructed of solid masonry or other material approved by the Planning and Zoning Commission shall be a minimum of 6 feet in height and shall be constructed at the perimeter of a residential area along a Collector or Arterial street classifications.
- F. **Traffic Impact Analysis.** The Transportation Network Plan shall take into consideration the results of any Traffic Impact Analysis required by the City's TIA ordinance. Impacts that can be mitigated by efficient design of the transportation network and public streets of the proposed subdivision shall prioritized over off-site mitigation of traffic impacts from the proposed subdivision.

3.02.003 Street Cross-section Standards.

All streets in a Transportation Network Plan shall meet one of the following Functional Classification / Design Type combinations and cross section design standards in Table 3-4. The appropriate application of each particular design type shall be based upon the planned land uses immediately abutting the street, the overall function of the Transportation Network Plan, the Major Thoroughfare Plan, and any Traffic Impact Analysis required by the City's TIA ordinance, all subject to the review and approval of the City Manager. The cross-section of a street shall be determined based on both functional classification and anticipated traffic volume on the roadway. Developers shall submit a traffic analysis that quantifies build out level traffic conditions on proposed roadways, to justify proposed cross-section based on volume ranges contained in Table 3-4 and a capacity analysis. Cross sections with deviations from these standards may be approved by the Planning Commission and Council, subject to the recommendation of the City Manager, and based upon the General and Specific Intent statements of this Article, the context of the proposed subdivision, and sound transportation planning principles.

TABLE 3-4: STREET CROSS-SECTION STANDARDS
 Specific measurements are identified in the table below to give the developer direction in preliminary planning. Proper design of any portion of a street may require modification depending on the context. The cross-sections below shall be interpreted by City staff for each subdivision following the pre-application conference.

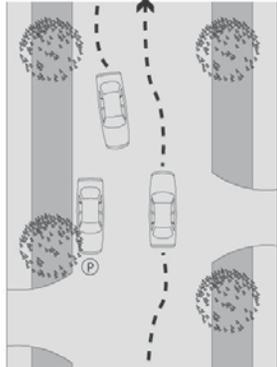
FUNCTIONAL CLASS	ACCESS		LOCAL					COLLECTOR							ARTERIAL							
	Residential (Alley)	Commercial (Alley)	Rural [1]	Neighborhood [2]		Residential	Avenue [3]	Rural [1]		Neighborhood [2]		Avenue [3]		Secondary	Primary	Parkway / Neighborhood [2]	Avenue[3]		Minor	Major[8]		
				Lot widths < 65 ft	Lot widths 65 ft and greater																	
Expected Daily Traffic (vehicles per day)	< 250	< 1,000	< 1,000	< 1,000	> 1,000	< 2,500	< 3,000	< 10,000	> 10,000	< 3,000	> 3,000	< 10,000	> 10,000	< 3,000	< 10,000	> 10,000	< 20,000	< 54,000	> 54,000	< 20,000	< 54,000	> 54,000
Desired Vehicle Speeds	< 10 mph	< 10 mph	25 – 30 mph	25 - 30 mph	25 - 30 mph	25 – 30 mph	< 25 mph	30 – 35 mph	30 – 35 mph	30 – 35 mph	30 – 35 mph	< 25 mph	> 25 mph	30 – 35 mph	35 – 40 mph	35 – 40 mph	35 – 40 mph	< 25 mph	> 25 mph	40 – 45 mph	45 + mph	45 + mph
Right-of-way Width [4]	20'	26'	56'	60'	54'	60'	66'	62'	84'	56'	62'	70'	108'	74'	72'	94'	100'	92'	112'	104'	108'	132'
Traffic Lanes [5]	1 yield	2	2	2	1 yield	2	2	2	4	2	2	2	4	2	2	4	4	2	4	4	4	6
Lane Width [5]	14' yield lane	10'	10'	10'	14'	10'	10'	11'	11'	11'	11'	10'	10'	11'	11'	11'	11'	10'	10'	12'	12'	12'
On-street Parking Type	--	--	--	Both sides	Both sides	Both sides	Both sides	--	--	One side	Two sides	Both sides	Both sides	Both sides,	--	--	--	Both sides	Both sides	--	--	--
On-street Parking Width	--	--	--	8' parallel	8' parallel	8' parallel	8' parallel	--	--	8' parallel	7' parallel	8' parallel	17' angled	8' parallel	--	--	--	17' angled	17' angled	--	--	--
Median (min. width / min. uninterrupted length) [7]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14' / 330'	14' / 330'	20' / 330'	--	--	16' / 660'	20' / 660'	20' / 660'
TOTAL Paved Width (including median)	20'	26'	28'	36'	30'	36'	36'	30'	52'	30'	36'	36'	74'	48'	46'	68'	64'	54' (2-ln)	74' (4-ln)	74'	78'	102'
Sidewalk width / Both sides[6]	--	--	--	5'	5'	5'	8'	--	--	5'	5'	10'	10'	5'	5'	5'	8'	12'	12'	5'	5'	5'
Parkway [6]	--	--	--	7'	7'	7'	7'	--	--	8'	8'	7'	7'	8'	8'	8'	10'	7'	7'	10'	10'	10'
Borrow Ditch	--	--	14'	--	--	--	--	16'	16'	--	--	--	--	--	--	--	--	--	--	--	--	--
Shoulder width	--	--	4'	--	--	--	--	4'	4'	--	--	--	--	--	--	--	--	--	--	--	--	--
*Bike Lanes	--	--	--	--	--	--	--	--	--	--	--	--	--	5'	5'	5'	--	--	--	5'	5'	5'
Landscape / Utility Easement [6]	--	--	--	10'	10'	10'	N/A	--	--	10'	10'	N/A	N/A	10'	10'	10'	10'	--	--	10'	5'	10'
*Bike Lanes	See Bike Facility standards 3.02.003.B																					
Driveway Access	See Lot Access standards in Article 3, Section 3.04.004 of the subdivision regulations and any applicable lot access and design standards of the Boerne Zoning Ordinance.																					

Table 3-4 Notes

- [1] The Rural street design type is a special type permitted only for Local or Collector streets in Rural Cluster subdivisions according to Article 4, Section 02, or in the Rural Residential or Low-Density Residential Development Patterns of the Boerne Master Plan.
- [2] The Neighborhood street design type is a special type permitted only for residential uses platted with a Grid / Modified Grid or Curvilinear Transportation Network Plan per section 3.02.002 of these regulations. It may be applied to the Local or Collector street classifications, or to an Arterial street classification as a "Parkway", according to this table.
- [3] The Avenue street design type is a special type permitted only for non-residential uses platted with a Grid / Modified Grid Transportation Network Plan per section 3.02.002, and supporting the Neighborhood, Mixed Use or Commercial Development Patterns in the Boerne Master Plan. It can be applied to Local, Collector or Arterial street classifications, but shall be applied only along those blocks where a pedestrian atmosphere is anticipated and where street designs can transition to slower desired speeds.
- [4] Where greater right-of-way widths are designed to provide a greater civic amenity in the right-of-way, this area in addition to the minimum may be counted towards the Civic Open Space requirement of the proposed subdivision per Section 3.02.003.D.
- [5] The Yield Lane shall be limited in application according to Section 3.02.003.A.
- [6] Sidewalks and Parkways shall be designed and located based on context according to Section 3.02.003.C. Additional landscape / utility easements may be necessary to allow appropriate urban design and still meet the pedestrian and utility accessibility standards. If a trail that provides direct access from each lot is provided the Planning and Zoning Commission may waive the requirement to have sidewalks on both sides of the street. A 12' concrete (or like material) multi-use trail shall be provided in lieu of a 5' sidewalk/bike lane on some collectors/arterials as determined by the Planning Director.
- [7] The requirements for medians may be waived by the directors of Public Works and Planning if deemed unnecessary.
- [8] Right-of-Way classified by TxDOT as an Interstate Highway (IH-10) shall be constructed per TxDOT standards.

A. **Limitation on Yield Lanes.** Yield lanes are narrower lanes that accommodate two-way traffic, although at certain sections of the street it may only allow one un-obstructed moving lane. This is most common on streets that allow on-street parking where the presence of parked cars is not continuous on the length of the street or not present at all times of the day. Yield lanes are only appropriate on Access streets or on Local streets supporting only residential uses. Use of these types of lanes shall be limited to the standards in Table 3-5:

TABLE 3-5: LIMITATIONS ON YIELD LANES		
DWELLING UNITS [1]	LENGTH LIMITATION [2]	QUEUING REQUIREMENTS [3]
< 20	800'	No specific queuing area required
20 TO 30	660'	Queuing areas at least every 150 feet
> 30	440'	Queuing area at least every 200 feet



- [1] Dwelling units refers to the total number of dwelling units that have frontage on the particular section of street between two intersecting streets. Any accessory dwelling units permitted are not counted in this number.
- [2] Length specifies maximum distance between intersections with other through streets, measured from the centerlines of the intersecting streets.
- [3] "Queuing areas" may be any area in the finished street design that allow for the pull-out and stopping of at least one vehicle to allow for on-coming vehicles to pass. Examples include driveway curbs-cuts that prohibit parking in the on-street parking lane or other similar designs that prohibit parking, or effectively widen the street to allow 2 cars to pass at all times.

B. **Bicycle Facility Standards.** Bicycle facilities shall be added to any street designated as a Secondary Collector or larger street or in an official transportation plan or trail plan of the City as a bicycle route, and should be added at any other location where bicycle transportation is likely. The Bicycle Facility Standards in Table 3-6 shall be used in amending the typical Street Cross-sections in Table 3-4, and added to the minimum right-of-way width.

TABLE 3-6: BICYCLE FACILITIES		
FACILITY TYPE	DIMENSION	APPLICABILITY
DEDICATED BICYCLE LANE	5' to 6' minimum, each lane and located immediately adjacent to outermost vehicle lanes and included in the Total Paved Width	Required on identified bike routes with vehicle speeds above 35 mph, unless Off-street Multi-use Trail provided
SHARED BICYCLE LANE	4' added to outer most vehicle lane, but no more than 14' total lane width	Acceptable on identified bike routes with speeds below 35 mph
COMBINED VEHICLE/ BICYCLE LANE	No designated area, as bicycles and vehicles share the same space with low vehicle speeds	Acceptable on any portion of the street with design speeds of 25 mph or less; often associated with streets with yield lanes or where angled parking is allowed.
OFF-STREET MULTI-USE TRAIL	10' to 12' minimum, located adjacent to roadway in the Parkway	Preferred on identified bicycle routes with vehicle speeds above 35 mph or where on-street facilities are not appropriate or are impractical. Particularly where Greenways (Article 3, Section 03) are located along the roadway.

C. **Utility Clear Zones, Parkway and Pedestrian Facilities.** The pedestrian facilities and parkway of the right-of-way shall be designed to best balance the need for clear utility access and maintenance, for direct pedestrian connections, and for enhanced civic design of the right-of-way. The following are the minimum standards to effectively balance these needs. An additional landscape or utility easement may be necessary on the edge of the right-of-way to allow the most appropriate urban design while meeting these needs.

1. **Utility Clear Zones.** Utilities may be located in the right-of-way or within easements if designed consistent with Table 3-7. Easement locations in alleys or utility corridors out of the right-of-way may also be acceptable to allow appropriate urban design and application of the Cross-section standards in Table 3-4. However, to allow proper maintenance and function of utilities, the following standards shall apply to Utility Clear Zones, whether in the right-of-way, easement, or in alleys and utility corridors.

TABLE 3-7: TREES AND UTILITY CLEAR ZONES				
TREE TYPE	DISTANCE FROM OVERHEAD LINES (< 600 VOLTS)	DISTANCE FROM OVERHEAD LINES (> 600 VOLTS)	DISTANCE FROM UTILITY POLE OR STREET LIGHT	DISTANCE FROM UNDERGROUND LINES (ALL UTILITIES)
SMALL / ORNAMENTAL	No limit	No limit	10 feet	5 feet
MEDIUM / ORNAMENTAL OR SHADE	7 feet	20 feet	20 feet	5 feet
LARGE / SHADE	7 feet	30 feet	30 feet	7 feet

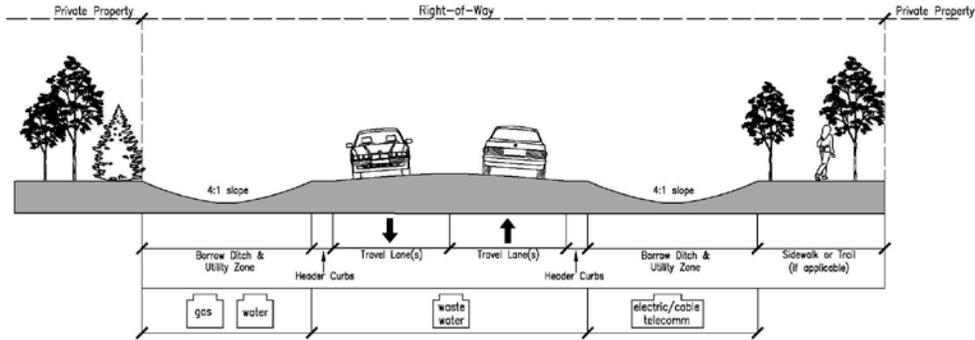
* Distance measured in lateral feet from the center of the line to the center of the tree. Large/Shade Trees are species that reach over 50' total height at maturity; Medium/ Ornamental or Shade Trees are species that reach between 20' and 50' total height at maturity; Small/Ornamental trees are species that reach under 20' total height at maturity.

2. **Pedestrian Facilities.** Pedestrian facilities required by Table 3-4 shall always be separated from moving traffic lanes of the roadway by a landscape buffer and only located immediately adjacent to the finished street as an expanded pedestrian amenity area where on-street parking will likely be present.
 - a. In all cases where sidewalks are provided, they shall be at least 5 feet wide to permit two persons to walk side-by-side comfortably.
 - b. If direct access to a trail from each lot is provided the Planning and Zoning Commission may waive the requirement to have sidewalks on both sides of the street.
 - c. On any block face below 3.5 dwelling units per acre, sidewalks on only one side may be acceptable, provided the Planning Commission determine that the street is not important to the overall pedestrian network.

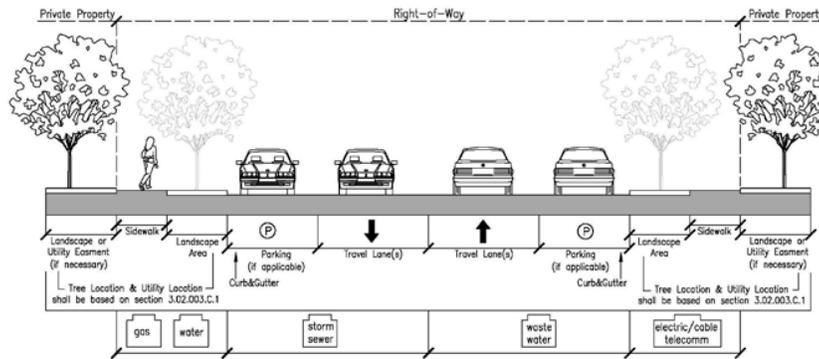
- d. On any block face that includes a Green Way and 10' to 12' multi-purpose trail, sidewalks are not required.
3. *Parkway.* The Parkway shall be designed to buffer pedestrians from moving traffic lanes. All planting in the should be coordinated with Utility Clear Zone guidelines in Section 3.02.003.C.1, and any planting in this area may be counted towards a landscape requirement of the zoning regulations. Species should be based on guidance from the Texas Forest Service, Urban Forestry Program, or other similar guidance on species appropriate to South-Central Texas, and the following standards
- a. In cases where large shade street trees are planted between the street edge and the sidewalk, the parkway shall be at least 6' wide (7' to 8' preferred) to avoid the root zone disturbing or heaving the sidewalk when trees reach maturity.
 - b. In cases where medium or small trees are planted between the street edge and the sidewalk, the parkway should be at least 5' wide (6' to 8' preferred) to avoid the root zone disturbing or heaving the sidewalk when trees reach maturity.
 - c. In all cases where a parkway is provided between the street edge and the sidewalk, low shrubs and/or perennial ground cover shall be planted.
 - d. In cases where on-street parking is provided and will serve as a buffer between pedestrians and moving vehicles at most times of the day, the parkway may be designed as an extension of the sidewalk to provide transitional pedestrian amenity area. Ornamental or small street trees may be planted in tree-wells within an expanded pedestrian amenity area. Tree wells shall be large enough to ensure sufficient soil areas for the survival of the tree species and shall generally have at least 30 square feet of impervious area, or otherwise include constructed soil volumes for the roots to access. Tree wells should be spaced at regular intervals, typically every 25' to 60'. The under canopy of all trees should be sufficient to allow a clear view of all store-fronts along the street.
 - e. Parkways on Rural street design types, or any other streets where no sidewalks may be required, should have expanded parkways with more informal, rough, low-maintenance and natural vegetation. These areas may need to incorporate trails or multi-use bicycle/pedestrian facilities in some cases and planting may occur in or along borrow ditches provided all drainage functions may be retained with no additional maintenance.

Typical Street Cross-Sections

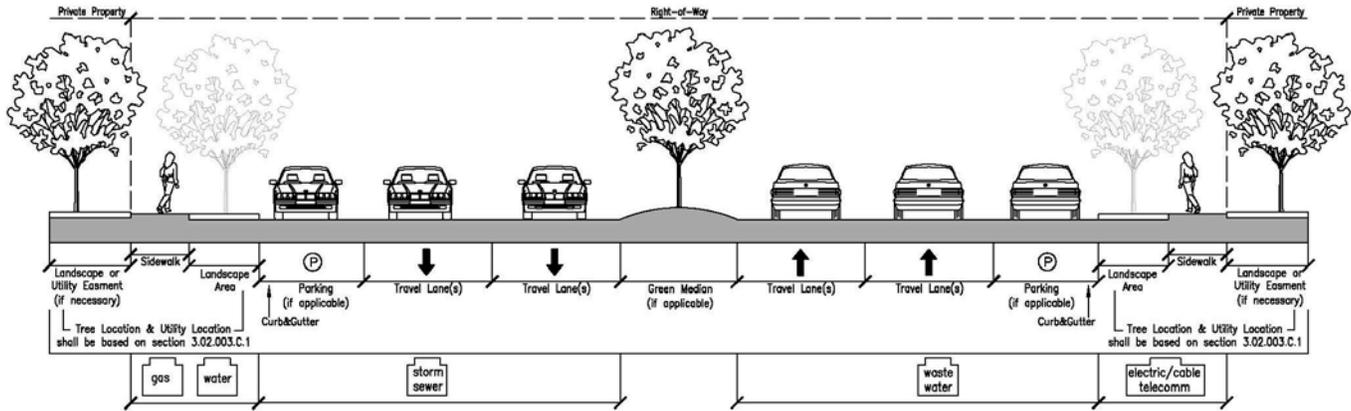
* See Table3-4 and Notes for actual dimensions and assembly of cross-section elements



Local & Collector Streets (Rural)

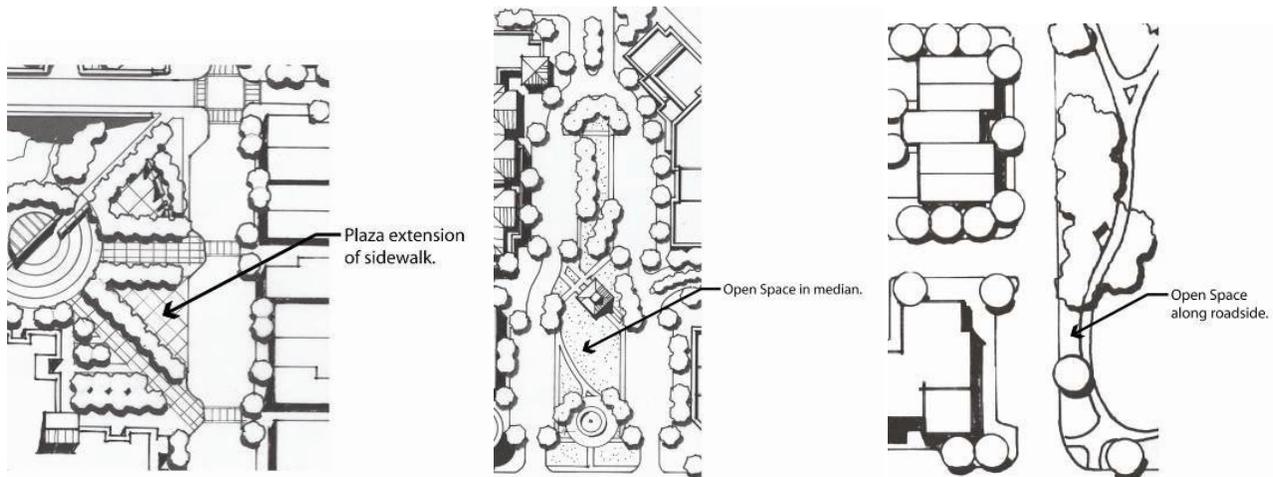


Local & Collector Streets (Non Rural)



Arterial Streets (Non Rural)

- D. **Civic Open Space Credit.** Where the Parkway and pedestrian facilities in the right-of-way in excess of the standards in this Table 3-4, and where these areas are designed to create a greater civic amenity by meeting the Open Space Standards in Article 3, Section 3.03 for Greenways, Courtyards or Plazas, the areas in excess of the minimum right-of-way standards may contribute to the Civic Open Space requirement of the proposed subdivision.

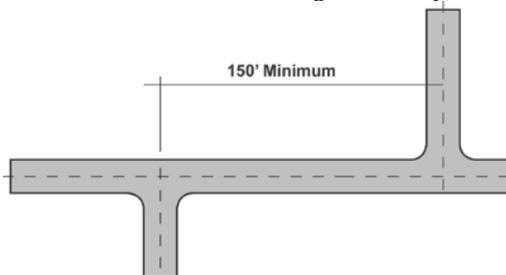


3.02.004 Intersection Design.

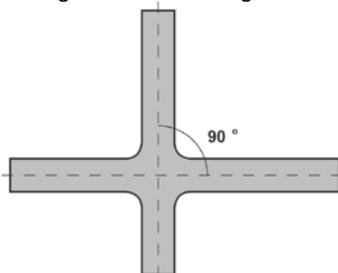
Intersections shall be designed to balance safe and direct connections for vehicles and pedestrians.

A. **Alignment.**

1. Intersections shall be either aligned directly, or off-set at least 150'.



2. Except for the intersection of two or more Local streets, only intersections of two streets shall be permitted. All intersections shall be as near to 90-degree angles as practical, and shall always be between 80 degrees and 100 degrees.

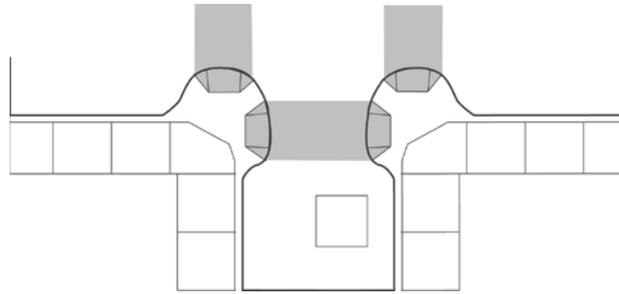


- B. **Curb Radii.** In order to minimize crossing distances for pedestrians and limit high-speed vehicle turning movements, curb radii shall be limited to the greatest extent possible considering the appropriate balance of pedestrian and vehicle needs. In general, curb radii at intersections shall be as specified in Table 3-8:

TABLE 3-8 : INTERSECTION CURB RADII	
INTERSECTION TYPE	RADII*
LOCAL/LOCAL	25'
LOCAL/COLLECTOR	25'
LOCAL/ARTERIAL	25'
COLLECTOR/COLLECTOR	35'
COLLECTOR/ARTERIAL	35'
ARTERIAL/ARTERIAL	35'

* The required turning radii of a fire apparatus access road shall be 35 feet inside. Where this requirement may be impractical or prohibitive, it may be waived by the fire code official. In such cases, areas where slower vehicle speeds are desired or high pedestrian traffic is expected, the Planning and Zoning Commission and Council may allow smaller turning radii. In areas where large vehicles will make frequent turning movements, the Planning and Zoning Commission and Council may require greater turning radii. The Planning Commission and Council requirement shall be based on the advice of the Public Works Department and upon consideration of all design solutions that effectively balance the interests of all users of the street. Actual centerline turning movements of typical vehicles, lane locations, intersection angles, or other geometric configurations of the specific intersection may be justifications for larger or smaller requirements.

- C. **Pedestrian Crossings.** Intersections of pedestrian facilities with public streets shall have crossings meeting the following standards.
1. Curb ramps meeting TDLR accessibility standards shall provide a direct, non-diverted approach from the sidewalk along the block, into the pedestrian crossing area.
 2. Pedestrian crossings of a Collector street classification or higher shall have a crosswalk differentiated from the finished street surface by any combination of textured or colored paving, decorative pavers, paint, or other alternative material subject to approval by the City Manager.
 3. The Planning and Zoning Commission or Council may require cross walks at mid-block locations for any block face that exceeds 600 feet.
 4. Where pedestrian facilities cross multi-lane streets in high-pedestrian areas, the Planning and Zoning Commission or Council may require curb extensions at the intersection to shorten pedestrian crossings and define on-street parking areas, or center pedestrian refuge islands where applicable.



- D. **Sight Distances.** Proper lines of sight shall be maintained at all intersections. Traffic on lower classification streets shall stop or yield at intersections with equal or higher classification streets. The proper line of sight shall be an unobstructed view from the stopping point to all points three feet above the centerline of the intersected street for a distance based on that streets design speed. Table 3-9 provides the clear distances.

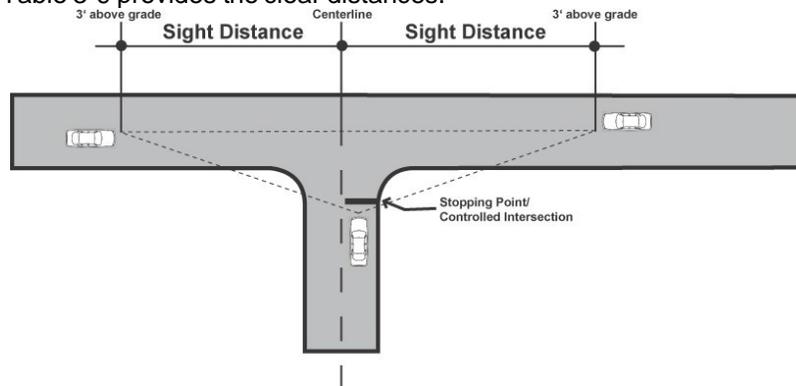


TABLE 3-9: INTERSECTION SIGHT DISTANCES	
DESIGN SPEED OF INTERSECTING STREET (MPH)	INTERSECTION SIGHT DISTANCE (MEASURED IN FEET ALONG THE CENTERLINE OF INTERSECTING STREET)
20	125
25	150
30	200
35	225
40	275
45	325

* Source: American Association of State Highway and Transportation Officials, A Policy of Geometric Design of Highways and Streets (AASHTO 1990)

SECTION 03. OPEN SPACE SYSTEMS.

3.03.001 Specific Intent.

It is the specific intent of this Section to:

- A. Value the design, function, appropriate application, and perceptual impact of different types of open space, rather than solely the quantity of space.
- B. Recognize open space, whether public, common, or private, as an important element of the civic infrastructure of the City and the primary determinant of the Hill Country character.
- C. Consider the context and multiple functions that open spaces can serve to support development.
- D. Develop a greater perceived impact from open space by coordinating the design and location of open spaces among adjacent sites and within a coordinated system and develop a community-wide Civic Open Space System.

- E. Create meaningful connections between people and open space and increase citizens' access to a wider variety of quality open spaces to meet recreation and social needs of the community.
- F. Provide connectivity of trail systems within subdivisions and between developments.
- G. Relate constructed elements on streets, blocks, and lots, to the open space and create focal points for the community, neighborhood, district, or development site where these systems intersect.
- H. Integrate natural systems into the design of common or public open spaces to allow open space to serve multiple aesthetic, recreational, and ecological functions and areas for incorporation of LID features.

3.03.002 Required Open Space.

Minimum required open space shall be provided according to Table 3-10. This space shall be in addition to any setback, landscape requirements, or other site design requirements of any individual lot or site required by the zoning ordinance. No land shall be reserved by the applicant or included in the plat as open space unless the land is of sufficient size and shape and topographically suitable to be of some practical use or service as part of a complete Civic Open Space System to support the development, as determined by the City. The City shall use the description, recommended size, and applicability guidance in Table 3-11: Open Space Design Types and Standards to make this determination. Required open space may be in private, common, or public ownership unless otherwise specified in these regulations.

- A. **Amount.** The amount of open space required shall be based upon the development pattern indicated in the Boerne Master Plan, and as specified in Table 3-10.

TABLE 3-10: REQUIRED OPEN SPACE	
CONTEXT/DEVELOPMENT PATTERN*	AMOUNT
RURAL RESIDENTIAL	One acre of recreation space per 200 lots in addition to drainageway protection zones otherwise no requirement; EXCEPT that Rural Cluster subdivisions shall meet the open space requirements of Article 4.
LOW-DENSITY RESIDENTIAL AND NEIGHBORHOOD RESIDENTIAL	20% of the gross area of the development parcel, of the 20% open space at least one acre of land per 200 lots or portion thereof shall be set aside and developed to minimum standards outlined in this section for recreation areas. The overall dedication of open space shall not fall below 12.5% of the gross area of the development parcel due to credits given towards open space. EXCEPT that Rural Cluster subdivisions shall meet the open space requirements of Article 4.
COMMERCIAL DISTRICTS, CENTERS AND MIXED-USE DISTRICTS	250 square feet per dwelling unit; AND 5% of all building footprints and areas of impervious surface dedicated to vehicle access and parking. [*NOTE: any parking lot design, buffer and landscape requirements are in addition to this Civic Open Space System requirement.]

* Per Boerne Master Plan

- B. **Required Open Space.** Those areas identified in the City of Boerne drainage protection zone as well as those areas identified in Section 2.02.001.F shall be part of the required Open Space.
- C. **Eligibility Exclusions.** In calculating the area of open space, the following shall be excluded from the open space:
 - 1. Any required rights-of-way, except where civic amenities are provided in the right-of-way in addition to those specified in the typical street cross-sections of Section 3.02. Elements of the right-of-way where a civic amenity may be increased and counted towards Civic Open Space. For example, where a street is platted with a *Neighborhood Parkway Design Type*, and a 30-foot median is used instead of the minimum 12-feet, the additional area may count towards the open space requirement and the right-of-way designated adjacent to collectors streets on which trails are constructed shall also count towards the open space requirement.

2. Utility easements required by Section 3.04.005, and Articles 5, 6, and 7, except where they are primarily designed as one of the open space types specified in Table 3-11, and the utilities are located underground and the easement acknowledges the primary design and use of the area as part of the Civic Open Space System.
 3. Land lying in the floodway or flood plain may only be included if it is left in a natural state subject to the standards for Natural Areas in Table 3-11, and shall only count towards a maximum of 50% of the open space requirements of Table 3-10.
- D. **Storm water system facilities as open space.** Storm water system facilities as required by Article 6 may be considered as an open space system with approval from the Planning and Zoning Commission if they meet the following criteria:
1. Areas for natural drainage systems used for storm water facilities - may be included as Natural Areas, Greenways, Drainageway protection zone, Parks or Greens which meet the Design Type and Standards in Table 3- 11.
 2. Areas for detention – if they are designed and engineered as a permanent aesthetic and recreation amenity within one of the other open space types, and the permanent surface water areas do not exceed 25% of the open space area.
 3. Areas for retention – no more than 50% of the areas for retention designed and engineered to serve some other primary purpose may be considered as one of the open space types specified in this section and only if the frequency and duration of standing water does not restrict the areas primary use on a regular basis.
- E. **Exceptions.** The following are exceptions to the open space requirement in Table 3-10.
1. *Small Infill Residential Subdivision.* Any residential subdivision in the City Limits at the date of adoption of this ordinance, and which is less than 10 acres shall be exempt from the open space requirements of Table 3-10.
 2. *Cottage developments:* Any cottage development shall provide open space as required by the Zoning Ordinance, Article 5, Section 31.
 3. *Medium Infill Residential Subdivision* less than 20 acres shall be required to provide a minimum of 12% open space.
 4. *Existing Public Open Space Credit:* Any application within the service areas specified in Table 3-11 of any existing public opens space may receive a credit for this open space provided the City determines that it is of a sufficient capacity and design standard to serve the additional proposed development.
 5. *Existing Shared Common Open Space Credit:* Any application within the service areas specified in Table 3-11 of any existing common open space may receive a credit for this open space provided documentation is shown granting legal access to the open space and the open space has excess capacity according to the open space requirements in Table 3-10, considering all existing development with legal access to the common open space.
- F. Recreational Parkland dedication requirement methodology
1. Demographics from the 2010 Census

Population	10,471
Number of people per household	2.47
# living units per 1000 pop	405
 2. **Current Parkland**
 These numbers are from the recently adopted Parks Master plan (the area measurement s are from aerial photographs of our community parks where there is a mixture of open space and recreational space).

3. Community Park

The City of Boerne community park system is comprised of a total of 367 acres (Northrup, City Lake, City Park, and the skate park area on Adler). Of that area approximately 96 acres is recreational space and 271 acres is open space.

Dedication calculation:

- a. Calculation acres per thousand population $96 \text{ acres} / 10.5 = 9.1 \text{ ac per } 1000 \text{ population}$.
- b. Calculation acres per household $9.1 \text{ acres} / 405 \text{ household} = 0.0224 \text{ ac per household}$.

4. Neighborhood Park

The neighborhood park system is comprised of Optimist, Roeder, Adler Road Park, Veterans, River Rd, Old #9, Main Plaza for a total of 21.2 acres.

Dedication calculation:

- a. Calculation acres per thousand population $21.2 \text{ acres} / 10.5 = 2.02 \text{ ac per } 1000$.
- b. Calculation acres per household $2.02 \text{ acres} / 405 \text{ households} = 0.005 \text{ ac per household}$.

G. Fee in lieu of Community Park land Dedication

- a. The subdivider shall provide proof of the land cost for the tract being developed by providing proof of purchase cost (if the property was purchased within the last 12 months) or the subdivider shall provide a current appraisal. At the city's discretion a separate appraisal may be provided for verification. The value per acre of land shall be multiplied by the number of acres that are required to be dedicated for community park space within the development based on Section 3.03.002 E above. The dollar value shall be divided by the total number of lots that are contained in the plat under consideration. This will determine the fee per lot to be paid in lieu of the dedication of community park space within the subdivision. The fee shall be paid with the submission of the final plat and the approval of the final plat is contingent on the receipt of said payment.
- b. If the property under consideration for final plat has been identified by the City of Boerne as an area in need of a community park (based on the City of Boerne's current Future Land Use/Development Concept Map), rather than the fee described above, the subdivider shall dedicate to the City (for use as a community park) the amount of land that is required based on Section 3.03.002 E. The City of Boerne shall reserve the right to purchase additional land (price calculation identified in subsection 3.03.002Ga) from the subdivider as necessary to meet the City's requirements for a community park.
- c. The lot owners in the development where said community park is located shall not be subject to the community park fee.
- d. The developer in both instances shall receive a credit towards the open space requirement of 20%.

3.03.003 Design Types and Standards.

In meeting the requirements for Civic Open Space System, open space shall be designed and located based upon the standards and guidance in Table 3-11:

TABLE 3-11: OPEN SPACE DESIGN TYPES AND STANDARDS			
	DESCRIPTION	RECOMMENDED SIZE	APPLICABILITY
NATURAL AREA	An undeveloped area that contains significant natural features or habitat worthy of preservation, and which provide environmental, aesthetic, and recreational benefits. Features such as large stands of trees, water elements, or prominent topography characterize Natural Areas. It contains little or no constructed improvements or maintained landscape other than trails to access the Natural Area.	The size of a Natural Area should be based on the site characteristics and potential continuity of similar natural features in the area, along with the potential to connect to adjacent natural areas.	<ul style="list-style-type: none"> ▪ Rural Residential areas ▪ Low-Density Residential areas ▪ Any Rural Cluster subdivisions ▪ Any other area of natural amenity with regional significance. <p>Service Area: N/A, dependent on area of natural features</p>
GREENWAY AND STREAM CORRIDORS	An undeveloped area of continuous linear natural features, often following a stream, floodplain, or road corridor. A	Greenways and Drainageway Protection Zone	<ul style="list-style-type: none"> ▪ Rural areas ▪ Low-Density Residential

TABLE 3-11: OPEN SPACE DESIGN TYPES AND STANDARDS			
	DESCRIPTION	RECOMMENDED SIZE	APPLICABILITY
	Greenway or drainageway protection zone should be usable for recreation and non-motorized transportation through pedestrian multi-use trails. It includes few constructed improvements except for those to enhance travel or recreational use.	Greenways and drainageway protection zones should be at least 1 linear mile if possible but sized and located based on opportunity to provide greater significant connectivity throughout a development and to areas beyond the development area. Greenways and drainageway protection zones should be at least 20 feet wide at all locations, and wider where natural features warrant. Trail design and visibility standards are located at 3.03.004D	<ul style="list-style-type: none"> ▪ Neighborhood Residential ▪ Alternative (off-street) transportation routes between, schools, parks, neighborhoods and centers. ▪ Along major streets in the network as expanded ROW; ▪ Used to preserve linear natural features in more densely developed Neighborhoods and Centers. <p>Service Area: N/A, dependent on linear features and streams.</p>
PARK	A Park may be comprised of natural landscape although portions shall be designed and constructed for structured recreation purposes as well as gathering areas for the community which they serve.	Mini Park: 0.5-2 acres, Neighborhood Park: 2-10 acres within Master planned communities Community Parks: 20 acres or more where designated on the Land Use Plan	<ul style="list-style-type: none"> ▪ Low-density Residential ▪ Neighborhood Residential ▪ Centers ▪ Special districts <p>Service Area: Mini Park: ¼ mile Neighborhood Parks: ½ -1 mi. Community Parks: 1 mile or greater</p>
GREEN	An open space for unstructured recreation or aesthetic landscaping. A Green is bordered by public rights-of-way on at least 3 sides. Front building facades and/or formal edge landscaped elements define any boundaries of the Green not bordered by public rights-of-way. Generally, there are few constructed elements except for small gathering places created as a focal point for the Green.	½ acre to 3 acres	<ul style="list-style-type: none"> ▪ Neighborhood Residential ▪ Centers ▪ Special districts <p>Service Area: within two blocks and no more than 1000 feet.</p>
PLAZA	An open space for civic purposes and formal gathering. A Plaza is bordered by public rights-of-way on at least 2 sides. Building facades define any boundaries of a Plaza not bordered by public rights of way. A Plaza is largely comprised of constructed of materials to withstand heavy pedestrian traffic and gathering, but contains intermittent lawns, landscape beds, or trees in a formal ornamental pattern.	500 square feet to ¼ acre	<ul style="list-style-type: none"> ▪ Centers ▪ Special districts <p>Service Area: within the same block or immediately adjacent block and no more than 600 feet.</p>

<p>COURTYARD</p>	<p>A small open space accessible to the public streets but generally serving one or a few surrounding buildings. Courtyards are primarily bordered by building facades, but have at least one side fully or partially boarded by a public right-of-way. A Courtyard contains a balance of formal landscape features and constructed materials to withstand heavy pedestrian traffic and gathering.</p>	<p>400 square feet to 5000 square feet</p>	<ul style="list-style-type: none"> ▪ Neighborhood Residential ▪ Centers ▪ Special Districts <p>Service Area: within the same block and no more than 300 feet.</p>
<p>POCKET PARK / GATEWAY</p>	<p>A small open space with pedestrian access used for aesthetic landscaping, small informal gathering and recreation, A Pocket Park / Gateway includes identifying architectural or public art features to establish a sense of entry or arrival. Pocket Parks / Gateways are often designed within or in close association of the right-of-way to emphasize transitions along a corridor, at entrances to a neighborhood or district, or to create a focal point on a block.</p>	<p>400 square feet to 3000 square feet</p>	<ul style="list-style-type: none"> ▪ Low-density Residential ▪ Neighborhood Residential ▪ Centers ▪ Special Districts <p>Service Area: within the same block and no more than 300 feet.</p>

3.03.004 Location, Connectivity and Design Criteria.

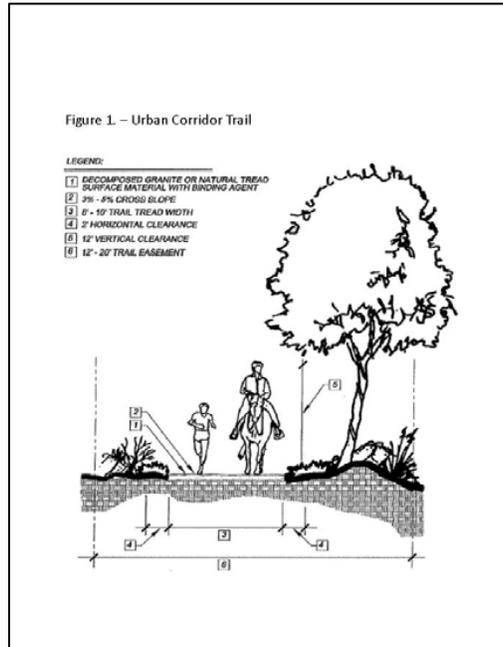
The following location criteria shall be used in determining the most appropriate locations and characteristics of land to be designated as required open space within subdivisions of land.

- A. Priority should be given to areas that provide the most visible impact.
 - 1. Formal open space (Greens, Plazas, Courtyards, and Pocket Parks/Gateways) should be located at prominent focal points within a subdivision or development site and included in or designed as an effective extension of the public rights-of-way, or other common areas. These formal space locations should take into consideration the overall urban design theme for the area, considering where planned future transportation systems, block patterns, and key building and site entrances will be located for the site and for adjacent areas.
 - 2. Natural open space (Natural Areas) should be located where they naturally occur i.e. along prominent ridges, valleys and view corridors, drainage way protections zones, etc. and that have the greatest potential for future expansion and connectivity to land areas with similar physical features and ecological characteristics on adjacent sites.
 - 3. Parks within a residential subdivision should be located in areas that will provide the most access to the citizens of the community. Mini parks should be spread evenly throughout the subdivision while neighborhood parks should be centrally located.
- B. Open space should be located to provide the greatest connectivity of open space systems with the use of greenways, drainageway protection zone with adjacent and future development sites.
- C. Connectivity requirements: All open spaces as well as adjacent subdivisions shall be connected either directly or provisions shall be provided for the future connection of these areas. The connection may be through drainageway protection zones if present, rural trails or trails associated with collector or higher classified streets or through the residential neighborhood sidewalk systems or a combination of all of the above. In cases where corridors are not present or identified and no collector streets are present alternative connectivity concepts shall be considered.

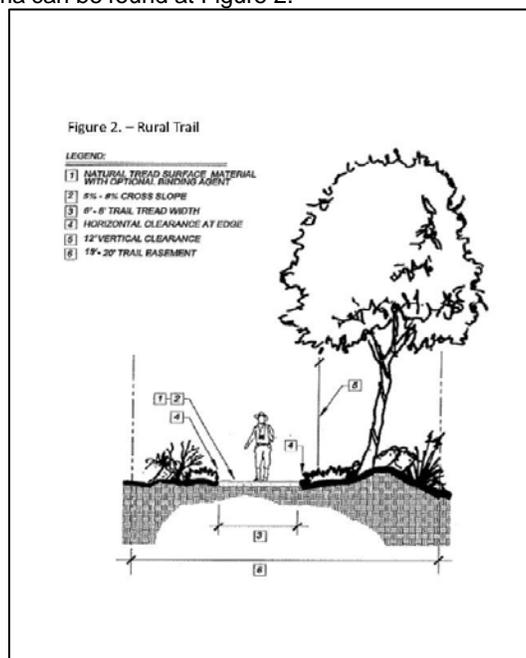
When and where it is feasible, drainageway protection zone should be connected to each other with habitat corridors which should be 20 to 30 feet wide, such corridors can also contain a rural or primitive trail.

D. Trail Classification, Design and Visibility standards

1. Urban Corridor Trail: shall be incorporated along one side of collector streets and higher classified streets (with the exception of Avenues) with an additional 20 feet of trail right-of-way. Sidewalks shall not be required on the same side of the street as the trail. The area of the right-of-way used for trails in this instance shall be counted towards the open space requirement. Design criteria can be found at Figure 1.

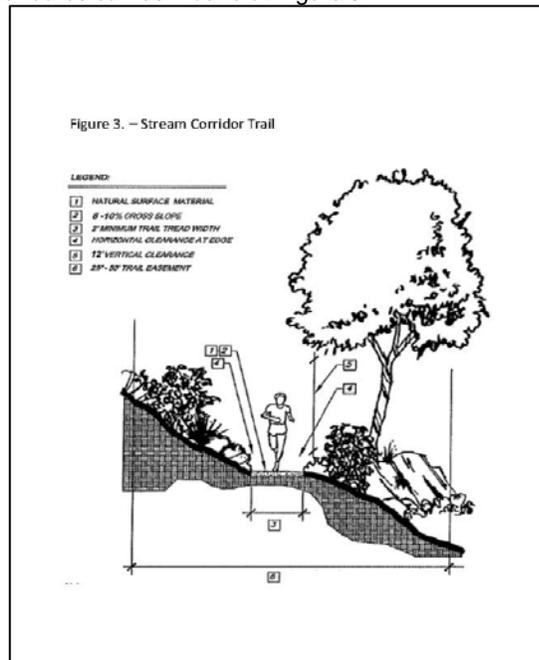


2. Rural Trail: are incorporated into Master Planned Communities to connect neighborhoods and open spaces as well as smaller developments to provide for connectivity to adjacent developments and open spaces. Design criteria can be found at Figure 2.



ARTICLE 3. PLANNING AND COMMUNITY DESIGN STANDARDS

3. Drainageway Protection Zone/Primitive Trail: may be constructed to a rural trail standard or a primitive trail standard. These trails shall be constructed in drainageway protection zone 2 and should connect to more formal trail systems within the development or to contiguous drainageway protection zone trails. Primitive trails standards can be found at Figure 3.



4. Lots adjacent to rural trails or a drainageway protection zone trail shall have open fencing, if the lot is fenced.

3.03.005 Recreational Park Development Criteria - Private and Public

The developer shall be responsible for certain minimum utilities as listed below at a location acceptable to the Director of Public Works or designee. The Director of Public Works or designee will be required to approve such location in writing.

- a. All neighborhood parks shall have:
 1. A two (2) inch water service shall be located 12 feet behind the curb.
 2. A six (6) inch sewer stub 10 feet behind the curb.
 3. Electrical service to the park
 4. Ready access to at least two hundred (200) feet of street frontage. Preferably the land will be located at the intersection of two internal subdivision streets providing at least 200 feet of frontage on each corner side. If the park is in excess of 2 acres a minimum of eight onsite parking spaces shall be included on the site.
- b. Mini Parks shall have: A two (2) inch water service located 12 feet behind the curb.

3.03.006 Park and Trail Development Credits

Where a minimum of two (2) acres of park and recreational area is provided in a proposed residential subdivision and such area is to be public or privately owned and maintained by the future residents of the subdivision, credit may be given to the developer, not to exceed 50% of the total open space acreage requirements. If the City finds that it is in the public interest to give credit, all the following standards shall be met:

1. The proposed recreational space is reasonably adaptable for use for park purposes, taking into consideration such factors as size, shape, topography, geology, access and location;

ARTICLE 3. PLANNING AND COMMUNITY DESIGN STANDARDS

2. The use is restricted for park and recreation purposes by recorded covenant, which runs with the land in favor of future owners of the property and which cannot be defeated or eliminated without the written consent of the City or its successors;
3. The park and recreation space for which credit is given is a minimum of two (2) acres and provides a minimum of four (4) of the local park elements listed below, or a combination of such and other recreational improvements that will meet the specific recreation park needs of the future residents of the area (credits can be doubled if an improvement is identified in the City of Boerne's Parks Master Plan as a priority need and recommended by the Parks and Recreation Director).

0 – 100 Units – minimum of 1 elements p/ 1 ½ acre park
 101 – 200 Units – minimum of 2 elements p 1 ½ acre park
 Over 200 Units – minimum of 4 elements p/1 ½ acre park

Criteria List Credit Acres:

<u>Park Improvements</u>	<u>Credits</u>
Children play apparatus are depending on size	0.25 to 0.5 ac
Family picnic area tables (with BBQ grill)	0.25 to 0.5 ac
Pavilion	0.5 ac
Recreation Community gardening	0.25 ac
Turf playfield	0.5 ac
Basketball court	0.5 ac
Onsite parking (8 spaces)	0.5 ac
Rest Room	0.5 ac

Trail Credits – Trails do not have to be located with a park in order to receive credit; however, they have to provide connectivity and shall be part of an overall trail system.

Trails –
 paved and constructed to meet ADA
 (not to include sidewalks) per ½ mile 0.5 ac
 Primitive Rural or drainageway protection zone trails per ½ mile 0.25ac

Credits requested pursuant to this ordinance will only be given for amenities that meet the minimum design and construction standards approved by the City of Boerne's Parks and Recreation Department.

3.03.007 Ownership and Management.

Required open space shall provide specific designation on the final plat, including the ownership and management disposition. Options for ownership and management of preserved area include:

- A. Dedication to the City or other public entity subject to acceptance by and at the sole discretion of the City or other public entity.
- B. Creation of or dedication to a non-profit entity capable of carrying out the ownership and management.
- C. Creation of a Homeowners and/or Leaseholders Association capable of carrying out the ownership and management.
- D. Private ownership provided the open space is platted as part of a defined lot in the subdivision and includes covenants and other restrictions that will maintain the area as private open space.

3.03.008 Park Land Dedication to the Public Acceptance Criteria:

- A. Land dedicated for open space or recreational area shall be a minimum of 5 acres, dimensions, topography, and general character as is reasonably required by the City. Recreational needs for which land is dedicated may include but not be limited to multipurpose trails, open space buffer areas, active recreation for team or individual sports, playground, picnic area, and similar uses. This dedication shall be reviewed and considered for approval by the Planning and Zoning Commission.

- B. Rare, unique, endangered, historic or other significant natural areas will be given a high priority for dedication pursuant to this ordinance. Areas that provide an opportunity for linkages between parks or that preserve the natural character of the surrounding environment may be required by the City to be included in the park land dedication. These features shall be reviewed and considered for approval by the Planning and Zoning Commission.
- C. The City shall not accept recreational land dedication pursuant to this ordinance if it is subject to one or more of the following disqualifications unless individually and expressly approved by the Planning and Zoning Commission:
 - 1. Land within floodplain and floodway designated areas, unless such land dedication contains an open area as part of the total park land dedication property that is topographically suitable for the installation of the park amenities as defined in Exhibit C for neighborhood parks.
 - 2. Park land dedication sites which do not have ready access to at least two hundred (200) feet of street frontage. Preferable land will provide a 200 foot by 200 foot corner site at the intersection of two internal subdivision streets.
 - 3. Park land dedication sites abutted by private properties on more than two-thirds of the total boundary dimension of such site.
 - 4. Areas encumbered by overhead utility lines or easements of any type which might limit the opportunity for park and recreation development.
- D. The location of park land may be required at the edge of a subdivision so that additional land may be added at such time as adjacent land is subdivided or acquired for public use. Otherwise a central location is preferred.
- E. The City will not accept park land dedication sites encumbered by hazardous materials or dump sites.
- F. Any disturbed park land shall be restored, and the soil stabilized by vegetative cover by the developer.
- G. The dedicated park land shall not exceed a 5 percent grade on more than 50% of the land.
- H. If a developer proposes to dedicate land for park development purposes pursuant to the terms, conditions and requirements of this ordinance, he or she shall permit an onsite inspection of the property for the purposes of determining site suitability and identification of any visual hazards or impediments to park development and use. If the property owner has any form of environmental assessment on the tract, a copy of that assessment shall be provided. The developer may be asked to initiate specific environmental studies or assessments if the visual inspection of the site gives rise to the belief that an environmental problem may exist on the site. The City may require the employment of those consultants necessary to evaluate any environmental issues relating to the site. If an environmental hazard is identified on the site, the developer must remove the hazard prior to its acceptance into the park and recreation system of the City.

SECTION 04. BLOCKS AND LOTS.

3.04.001 Specific Intent.

It is the Specific Intent of this Section is to:

- A. To plan streets that support and result in an orderly system of blocks and lots, with logical connections to existing, planned and potential future streets.
- B. To ensure that all blocks, lots, and other land areas have adequate access to streets, pedestrian facilities, open space systems, and utilities necessary to support the proposed and anticipated future development.
- C. To create development patterns capable of stimulating more options for modes of travel, by ensuring that all lots and development sites are placed in an interconnected network of streets and blocks.
- D. To ensure that all lots front on streets with appropriate Design Types that support the anticipated uses and site designs and create appropriate transitions between public areas and private spaces.

- E. To ensure that vehicle access to lots is provided with appropriate attention to the impact on public streetscapes, and in particular the pedestrian facilities along streetscapes, and that all alternative vehicular lot access strategies are appropriately explored in association with planning the street network.

3.04.002 Block Sizes and Arrangement.

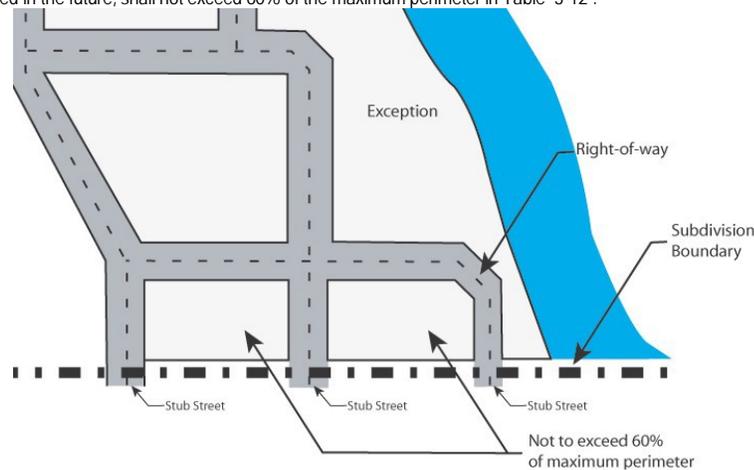
All applications shall propose an orderly system of blocks that result from the proposed *Transportation Network Plan* in Section 3.02.002

- A. **Block Sizes.** The block size standards are specified in Table 3-12, and shall be based upon the development pattern identified in the Boerne Master Plan.

TABLE 3-12: STREET CONNECTIVITY / BLOCK SIZES	
CONTEXT/DEVELOPMENT PATTERN*	BLOCK PERIMETER**
DOWNTOWN AND MIXED-USE DISTRICTS	1,600 feet maximum perimeter; 500 feet maximum on any one block face; 250 feet minimum on any one block face
HIGHWAY/COMMERCIAL CENTER	2,000 feet maximum; 600 feet maximum on any one block face; 300 feet minimum on any one block face
NEIGHBORHOOD RESIDENTIAL	2,200 feet maximum; 800 feet maximum on any one block face; 250 feet minimum on any one block face
LOW-DENSITY RESIDENTIAL	2,600 feet maximum; 1000 feet maximum on any one block face; 300 feet minimum on any one block face; Except no requirement if subdivided according the Rural Cluster Subdivision Standards in Article 4.
RURAL RESIDENTIAL	No requirement but see Article 4. for Rural Cluster Subdivision Standards
SPECIAL DISTRICTS	No requirement; block sizes may be based on an overall development plan provided it supports the <i>Transportation Network Plan</i> for this property and adjacent properties.

* Per Boerne Master Plan

** Standards are based on the perimeter formed by the centerline of the public rights-of-way forming the block. Blocks on the perimeter of the property being subdivided which are formed by the streets, any stub streets, and the subdivision boundary with property that may be subdivided in the future, shall not exceed 60% of the maximum perimeter in Table 3-12.



Exceptions to or Alternative Compliance permitted in sub-sections C. and D. may be used in place of the Standards in Table 3-12 when establishing a Transportation Network Plan. Use of the exceptions or alternative compliance should result in an overall plan that equally or better meets the General Intent of this Article, and the Specific Intent of each Section in this Article.

- B. **Arrangement.** Blocks shall be numbered consecutively within the subdivision and/or sections of an overall plat and arranged as follows:
1. All blocks shall be designed to provide two tiers of lots with each fronting on public streets.
 2. Double-frontage lots or single-tier blocks with lots backing to any street shall be prohibited, except where blocks back to portions of the Civic Open Space system in Article 3, Section 3.03.
 3. Blocks may be irregular in shape if necessary, serve important urban design goals, transportation planning goals, or address topographic and natural features, provided they still meet the general street network and connectivity standards.
 4. Whenever feasible, each lot should face the front of a similar lot across the street. Transitions between distinct lot types and land uses should occur at the rear of lots internal to the block rather than across the frontage and public streetscape.
- C. **Exceptions.** The following exceptions to the Block Size standards in Table 3-12 may be granted by the Planning and Zoning Commission or Council, after consideration of the recommendations of the Planning Department.
1. **Natural Features.** Blocks or parcels abutting or containing important natural features or topographical constraints may be larger provided the proposed street layout preserves important natural features in accordance with the Open Space System standards in Article 3, Section 3.03.
 2. **Rural Parcels.** A tract divided into rural lots substantially larger than called for under these regulations may be larger but shall be arranged to permit:
 - a. the opening of future streets in compliance with these regulations; and
 - b. a logical pattern of re-subdivision with minimal future disruption to buildings and structures that are proposed to be built under the original subdivision.
 The Planning and Zoning Commission or Planning Department may restrict building locations and site elements to permit future re-subdivision in compliance with these regulations and require a sketch plan of re-subdivision demonstrating potential future division in compliance with all regulations to be submitted with the preliminary plat.
 3. **Oversized Parcels.** Where oversized parcels are platted for the Special Districts, internal access streets and drive aisles may be required by operation of applicable zoning and site design standards to mimic the design and connectivity of the public streetscape.
- D. **Alternative Compliance.** Parcels proposed for subdivision that are larger than 30 acres may propose an Average Perimeter Block Size as a means of alternative compliance for Block Size standards in Table 3-12. In calculating the average, all parcels and blocks shall be used, including blocks formed by edges along open spaces and connections to the perimeter of the subdivision.

TABLE 3-13: ALTERNATIVE COMPLIANCE / AVERAGE PERIMETER BLOCK SIZE	
DOWNTOWN AND MIXED USE DISTRICT	1,400'
HIGHWAY/COMMERCIAL CENTERS	1,600'
RESIDENTIAL NEIGHBORHOOD	1,800'
LOW-DENSITY RESIDENTIAL	2,200'

- E. **Cul-de-sac and Disconnected Street Limitations.** In any case where a disconnected street may be permitted by the standards, exceptions, or alternative compliance of these regulations, they shall be further limited by the following standards and design requirements:
1. Permanent:
 - a. Residential – In the interior of a subdivision, Local streets ending in cul-de-sacs may be platted where the Planning and Zoning Commission deems appropriate. Where the land being subdivided adjoins property not being subdivided, Local streets ending in cul-de-sacs may be platted provided the streets are carried to the boundaries of the subdivision. Streets

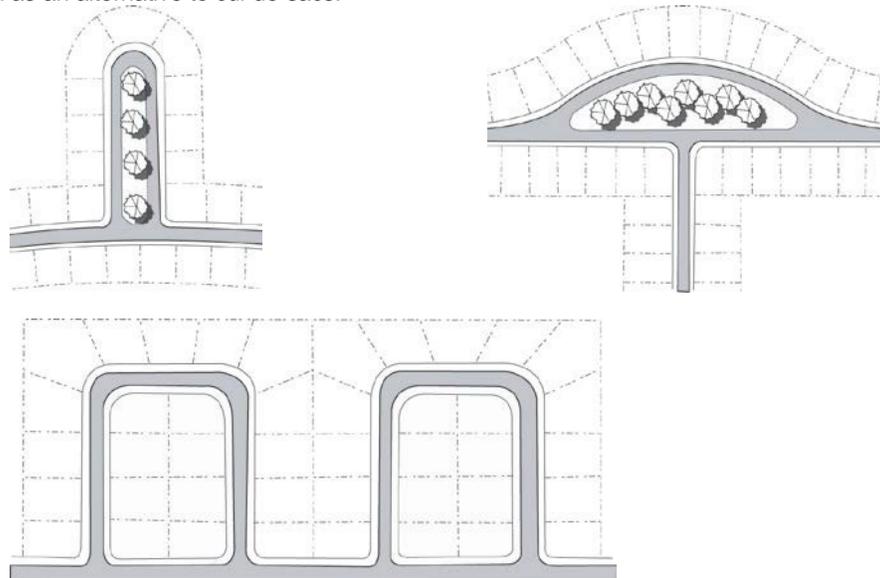
permanently ending in cul-de-sacs may not be longer than 600 feet. The closed end of the cul-de-sac in residential areas where the lots are 65 feet or wider shall provide a paved turnaround at least 80 feet in diameter on a street right-of-way of at least 104 feet in diameter and in residential areas where lots are less than 65 feet in width the closed end of the cul-de-sac shall provide a paved turnaround at least 100 feet in diameter on a street right-of-way of at least 120 feet in diameter.

- b. Commercial – In the interior of a subdivision, Local streets ending in cul-de-sacs may be platted where the Planning and Zoning Commission deems appropriate. Where the land being subdivided adjoins property not being subdivided, Local streets ending in cul-de-sacs may be platted provided the streets are carried to the boundaries of the subdivision. Streets permanently ending in cul-de-sacs may not be longer than 600 feet and shall be provided at the closed end with a paved turnaround at least 96 feet in diameter on a street right-of-way of at least 120 feet in diameter.

2. Temporary:

- a. A temporary turn-around must be built at the end of a street more than 400 feet long that will be extended in the future. The following note shall be placed on the plat: “cross-hatched area in a temporary easement for turn-around purposed until the street is extended to the (direction) on a recorded plat.”

3. Street designs such as “loop streets” or “closes” with a minimum turning radius of 30 feet are preferred as an alternative to cul-de-sacs.



- 5. The Planning and Zoning Commission or Council may require alternative connections for bicycle or pedestrians at the end of disconnected streets to best meet the Specific Intent of this section, such as pathways at the ends of cul-de-sacs.

3.04.003 Lot Size and Arrangement.

- A. **Minimum Lot Size – City Limits.** All lots in a subdivision within the corporate limits of the City shall meet the minimum standards of the Zoning Ordinance for the zoning district applicable to the land being subdivided. [See Article 5 of Boerne Zoning Ordinance for lot standards of various zoning districts.]
- B. **Minimum Lot Size – Extraterritorial Jurisdiction (ETJ).** Properties that are not provided water and wastewater service by a public utility must follow the Cow Creek Groundwater Conservation District rules.
- C. **Exceptions – Extraterritorial Jurisdiction.** The following are exceptions to the minimum lot standards in the Extraterritorial Jurisdiction:

1. Applications where the land division requires no public improvements and where each proposed parcel has access to existing roads shall have a minimum lot size of 5 acres, provided lots, buildings, and improvements are arranged in a manner that would allow the efficient and coordinated opening of streets should the property be re-subdivided in the futures.
2. Applications for Rural Cluster Subdivisions shall meet the lot requirements of Article 4, Section 4.02. Rural Cluster Subdivisions, and be supported by a Transportation Network Plan, Civic Open Space System, and Block and Lot standards required by that section.
3. Applications pursued under a development agreement for municipal services shall have lot requirements according to a development plan. The development plan shall use lot standards for the most similar zoning district from the City's zoning ordinance. Plan Developments shall have Transportation Network Plan, Civic Open Space System standards, and Block and Lot standards required by this Article and which meet the Boerne Master Plan goals for Centers and Residential Neighborhoods.

D. Lot lines.

1. *Frontage:* All lots shall have a frontage on a public right-of-way. Cottage developments may provide frontage on a shared access/utility easement provided at either the front or rear of the lot line.
2. *Side Lot Lines:* All side lot lines shall be at right angles to the right-of-way line. On curved rights-of-way or streets, side lot lines shall be radial to that line.
3. *Rear Lines:* Rear lot lines shall be established at a depth sufficient to permit two-tiers of lots on each block. Double frontage lots or lots that back up to streets shall not be permitted. Lots backing to public rights-of-way shall only be permitted if separated by open space meeting the Civic Open Space System standards in Article 3, Section 3.03.
4. *Orientation:* All lots shall have a general orientation of width to depth between 1:3 and 2:1, with a width that is relatively consistent dimension throughout the lot. "Piano key" and "flag lots" shall not be permitted, unless warranted by an unusual shape of the land or the ownership of property.
5. *Building/Setback Lines:* All lots shall have the required building lines specified by the zoning district and street network type applicable to the property. For un-zoned parcels outside of corporate limits of the City but within the City's extraterritorial jurisdiction, building setback lines shall meet the minimum requirements which would be applicable in the least intensive zoning district and street network type which would permit the proposed land use if the subdivision were located inside the City's corporate limits, or the building setback lines of a development plan approved in association with a development agreement for municipal services.

3.04.004 Lot Access.

- A. **Access Width.** Lot access width shall be limited based upon the lot width at the lot frontages subject to the standards in Table 3-15.

TABLE 3-15: LOT ACCESS WIDTH	
Lot Frontage Width	Maximum Access Width
< 50' RESIDENTIAL	9'
50' TO 64' RESIDENTIAL	9'
65 – 120' RESIDENTIAL	18'
> 120' RESIDENTIAL	15% of lot width
NON-RESIDENTIAL	25% of lot width for a single lot, but the cumulative width of access points along a single block face may never be more than 15% of the entire block face.

Maximum width shall be measured along the right-of-way at the lot frontage or at any crossing of pedestrian facilities in the right-of-way and may allow additional apron approach within the right-of-way to the street edge to permit adequate turning movements. Where maximum access widths limit or prohibit individual lot access points, shared access easements, or rear and mid-block Access Streets or easements shall be used. [See Residential Design Standards / Lot Access in Article 3, Section 06.007 of the Boerne Zoning Ordinance for related lot access types and design standards within the lots.]

- B. **Minimum Separation.** Lot access points shall be separated from other access points along a single block face and from the street edge of intersections streets by the dimensions in Table 3-16. ("access separation" / "separation from intersecting street").

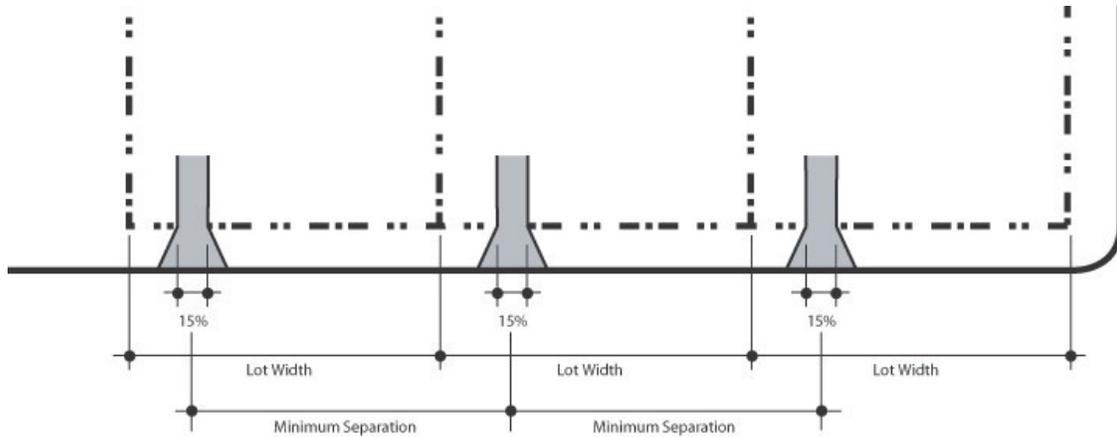


TABLE 3-16 : MINIMUM ACCESS SEPARATION**

FUNCTIONAL CLASSIFICATION	ACCESS TYPE	
	RESIDENTIAL*	NON-RESIDENTIAL
MAJOR ARTERIAL	None	None
MINOR ARTERIAL	None	None
PRIMARY COLLECTOR	None, except as provided in Note 3 below	300' / 300'
SECONDARY COLLECTOR	None, except as provided in Note 3 below	200' / 200'
LOCAL	45' / 60'	100' / 100'
NEIGHBORHOOD LOCAL	45' / 60'	75' / 75'
ACCESS	None / 30'	None / 75'

* Minimum separation of residential lot access points may be averaged along a single block face.

** Separation between access points is measured from centerlines; separation from intersecting streets is measured from the center line of the access and the street edge of the intersecting street.

1. Where applicable, driveways shall be aligned directly across from other driveways or street intersections on the opposite side of the street.
2. Where minimum separation distances limit individual lot access points, shared access easements, or rear and mid-block Access Streets or easements shall be used.
3. Where due to pre-existing lot and/or street configurations application of these standards would lead to ineffective and inefficient lot access, or for residential access to primary and secondary collectors to which the City Manager may grant exceptions to the access requirements of Table 3-16 provided:
 - a. The street design and transportation network will not be adversely affected by the exception, and the proposed access is generally consistent with the Specific Intent of this Section;
 - b. The proposed access is designed to provide the least possible impact on the public streetscape and transportation network; and
 - c. The proposed access has been reviewed recommended by the Public Works Director and Planning and Community Development Director.

C. **Pedestrian Crossings.** Where vehicular lot access crosses pedestrian facilities, including any mid-block Access Streets or easements, the continuation of the pedestrian connection shall be maintained at the same grade and with the same material as other parts of the sidewalk. Where high-speed or frequent vehicle access is expected the Planning and Zoning Commission may allow vehicle lot access at street grade, provided design details for pedestrian crossings at intersections in Section 3.03.007.C shall be used.



3.04.005 Easements.

- A. **Dedication Required.** Where necessary to adequately serve a subdivision with public infrastructure, the subdivider shall dedicate or grant easements for poles, wires, conduits, drainage channels, storm sewers, sanitary sewers, water lines, gas lines, and other infrastructure. Easements parallel and adjacent to streets shall be at least 10 feet wide on each side of Local and Collector streets. On Arterial streets these easements shall be 10' on one side (gas and water) and 20' on the other side (electric/cable/telephone) (See Section 3.02.003.C.). Where easements are not parallel and adjacent to streets, the minimum width shall be 15'. Where an easement contains multiple utilities or special circumstances require, the City Manager may require wider easements.
- B. **Location of Easements.** The easements required under this Section shall be continuous for the entire length of the block. These easements shall parallel as closely as possible the street line frontage of the block. Easements may not straddle but may cross property lines, and they may cross lots other than along lot boundary lines, if in the opinion of the Planning and Zoning Commission such locations are needed. Utilities may be located in the right-of-way or in alleys, subject to the appropriate streetscape design standards in Section 3.02.003.C.
- C. **Gates Required in Fences.** All fences crossing an easement shall have double swing gates to allow ready access to the easement and provide a minimum open width of 12 feet.
- D. **Easements Part of Lot Area.** The easements required under this Section shall be considered a part of the lot area for purposes of the minimum lot size requirements of this ordinance and the Zoning Ordinance.
- E. **Overhang Easements.** Where overhead electric utilities are located in easements along common property lines, an overhead easement at least six feet wide may be required by the City Manager on the opposing side of the 15-foot easement strip. In all alleys, overhang easements at least six feet wide must be provided on each side of the alley for electric and telephone lines.
- F. **Additional Easements.** Additional easement areas shall be provided to include all public infrastructure appurtenances.

SECTION 05. PUBLIC AND COMMUNITY FACILITIES

3.05.001 Specific Intent.

It is the Specific Intent of this Section to:

- A. Anticipate and evaluate the incremental and long-term impact of development on broader public and community facility needs.
- B. Identify opportunities to integrate plans for public and community facilities into the planning and design of proposed land divisions.

- C. Consider the location of public and community facilities with initial planning considerations for streets, open spaces, blocks, and lots, so that needed facilities are located conveniently in neighborhoods and districts and serve as focal points for the community.
- D. Provide the opportunity to negotiate a fair and equitable price for land needed to develop public or community facilities, or alternatively to provide an incentive for landowners to dedicate land for needed facilities where the lack of facilities may otherwise constrain potential future development.
- E. Ensure that the most appropriate locations of public and community facilities are identified and considered prior to the premature commitment of these areas to conflicting development patterns.

3.05.002 Dedication of Public Sites.

The Planning and Zoning Commission or Council may request the dedication of land to the City or other government entity with jurisdiction over public and community facilities, for parks, playgrounds, open space, public safety facilities, cultural facilities, or school sites wherever parcels proposed for division include locations identified for such facilities in an official master plan for the jurisdiction. The Planning and Zoning Commission or council shall require that such dedication be in conformance with the Master Plan, or any similar official plan for parks, recreation, public safety, community, or education facilities.

3.05.003 Reservation of Land.

Where the land area shown on such plan for such public sites is not dedicated and serves an impact beyond that caused by the proposed development, the Planning and Zoning Commission or Council may require that the land be reserved for a period of one year to permit such land to be acquired by the appropriate public body.

3.05.004 Credits.

Any land dedicated to the public entity for future public or community facilities for the purposes identified in sub-section 3.05.002 may be directly credited towards the applicants open space requirements of Article 3, Section 3.03. In order to receive credit, the site must be acceptable to the public entity.

Section 06. Low Impact Development Facilities

3.06.001 Specific Intent.

It is the specific intent of this Section to:

- A. Value the design, function, appropriate application of LID features and BMPs either incorporated into areas of open space or constructed separately
- B. Design features in accordance with the LID Manual to reduce stormwater runoff volume and flow rate to pre-development conditions.
- C. For new development and redevelopment, a portion of the annual stormwater runoff volume shall be adequately treated prior to discharge from the site. This performance standard is presumed to be met if the stormwater quality management system is sized to treat the water quality treatment volume from the impervious and disturbed portions of the site. The water quality treatment volume is defined as:
 - a. For new development, the runoff volume resulting from the first 1.66" of rainfall.
 - b. For redevelopment, the runoff volume resulting from the first 1.35" of rainfall.
- D. Adequate treatment of the water quality volume shall be defined as removal of 60% of the bacteria load and 80% of the calculated TSS particles.
- E. Consider the context and multiple functions that open spaces can serve to support development.
- F. Provide criteria for LID construction documents and engineering reports that meet the intent of the LID Manual.
- G. Manage stormwater runoff both at the source and at the surface using plans and soil to slow, filter, cleanse and infiltrate runoff.

3.06.002 Obligations of Subdivider.

The subdivider shall install at his/her own cost and expense all of the improvements required by this ordinance. It shall be the subdividers responsibility to ensure that all improvements are constructed in accordance with this ordinance and the LID Manual BMPs. The subdivider shall comply with all other provisions of this ordinance prior to acceptance of the subdivision by the City.

3.06.003 Engineer Responsible.

The subdivider shall retain the services of a licensed professional engineer, licensed in the State of Texas, whose seal shall be placed on each sheet of the construction plans, and who shall be responsible for the design and supervision of all LID features constructed for the subdivision.

3.06.004 Construction Plans.

The construction plans for LID features shall be submitted as provided in Article 2 and shall meet the following requirements.

- A. All design professionals shall be required to sign letters to accompany their documents stating that the “The attached documents comply with the requirements of the City of Boerne Subdivision Ordinance”.
- B. All design professionals shall include in their plans, the statement “Construction of all facilities to be shall be performed per the requirements of the City of Boerne LID Manual.
- C. Three complete bound sets of construction plans separate from the infrastructure plans, specifications and contract documents shall be filed with the City Manager after approval of a preliminary plat. These plans shall meet the BMPs and techniques as identified in the LID Manual.

3.06.005 Waiver to LID Requirements.

- A. Waiver of LID requirements in certain circumstances.

The Planning and Zoning Commission, after considering a report from City staff, may waive the LID requirements after considering the engineering report for the development. The report should be able to demonstrate that incorporating LID features would cause hardship, is ineffective or provides insignificant benefit or produces a negative impact onsite or to adjacent property or right-of-way.

ARTICLE 4. MASTER PLANNED DEVELOPMENTS/SUBDIVISIONS

SECTION 01.	MASTER PLANNED COMMUNITIES
SECTION 02.	PLANNED UNIT DEVELOPMENT
SECTION 03.	RURAL CLUSTER SUBDIVISIONS
SECTION 04.	COTTAGE HOUSING COMMUNITIES

SECTION 01. MASTER PLANNED COMMUNITIES

4.01.001 Specific Intent.

It is the Specific Intent of this section to provide a limited plan for review by staff and the Planning and Zoning Commission to locate, proposed development units, lot sizes, density, street layouts, and proposed open and recreational spaces. The Master Planned Community (MPC) plan shall be presented to and approved by vote of the Planning and Zoning Commission prior to the submission of any of the subdivision units contained in the plan.

4.01.002 Form and Content of Plan:

The MPC plan shall show the following:

- A. A location map showing the relation of the subdivision to well-known streets in all directions.
- B. North point, with north to the top of the sheet if possible.
- C. Name and location of adjacent subdivisions, watercourses on or adjacent to the proposed subdivision, and the property lines of adjoining tracts.
- D. The total acreage and number of lots in total and in each unit in the proposed MPC.
- E. The location, right-of-way width, name and description of all existing or recorded streets, alleys, or other transportation features or similar reservations which are within or adjacent to the subdivision, as determined from existing records.
- F. The location and right-of-way dimensions for all proposed streets, including Functional Classifications and Design Types based on the proposed Transportation Network Plan.
- G. Identify the proposed units within the plan with a description of lot sizes in each unit.
- H. The centerline of drainageway protection zones.
- I. The gross density of the subdivision.
- J. The approximate acreage and location of proposed open space, recreational space, trails, neighborhood parks, mini parks and drainageway protection zones identified for each category.
- K. Signature lines for the Chairman and Secretary of the Planning and Zoning Commission.

4.01.003 Procedures.

The subdivider shall provide to the Department of Planning 2 - 18" x 24" folded paper copies and a pdf of the plan for staff review a minimum of 21 calendar days prior to the Planning and Zoning Commission's meeting. Once staff has reviewed and made comments, the subdivider shall provide 12 - 18" x 24" folded paper copies and a pdf of the revised plans for submittal to the Planning and Zoning Commission 10 calendar days prior to the Planning and Zoning Commission meeting.

4.01.004 Effect of Approval.

Approval of the MPC shall not constitute final acceptance of a preliminary or final plat. If major modifications to an approved MPC, i.e. changes in the total number of lots by more than 10%, modifications to open, recreational space or drainageway protection zones that staff judges to be significant or right-of-way alignment modifications as identified in the MPC, it may be cause to require that a new MPC be submitted and approved by the Planning and Zoning Commission as well as the denial of the preliminary or final plat. The approved plan shall be filed with the City of Boerne.

SECTION 02. PLANNED UNIT DEVELOPMENTS

4.02.001 Additional Requirements for Preliminary Subdivision Plat.

In addition to the requirements for a preliminary subdivision plat which apply to a conventional subdivision, the preliminary plat of a planned unit development must contain or be accompanied by the following.

- A. Clear delineation of the areas which are to be reserved for off-street parking and loading, and the ratios of parking spaces to square feet of floor area for each lot to be developed in a non-residential use, and a clear delineation of the areas which are to be reserved for residential off-street parking and the number of parking spaces to be provided for each dwelling unit.
- B. The location, type and height of all proposed fences, screening walls, and other screening devices intended to buffer one land use from another or to buffer the PUD subdivision from adjacent properties.
- C. The location and character of all improvements to be made in community open space areas, including a general landscape plan for each area.
- D. A draft of the legal instrument establishing the community association, as required by the City of Boerne Zoning Ordinance, Article 5 Zoning Use Regulations, Section 18. Planned Unit Development, Subsection 5. Common Areas and Community Association.
- E. A draft multi-year budget for the community association, as required by the City of Boerne Zoning Ordinance, Article 5 Zoning Use Regulations, Section 18. Planned Unit Development, Subsection 5. Common Areas and Community Association.

4.02.002 Additional Requirements for Final Subdivision Plat.

In addition to the requirements for a final subdivision plat which apply to a conventional subdivision, the final plat of a planned unit development subdivision must contain or be accompanied by the following.

- A. Clear delineation of the areas which are to be reserved for off-street parking and loading, and the ratios of parking spaces to square feet of floor area for each lot to be developed in a non-residential use, and a clear delineation of the areas which are to be reserved for residential off-street parking and the number of parking spaces to be provided for each dwelling unit.
- B. The location, type and height of all proposed fences, screening walls, and other screening devices intended to buffer one land use from another or to buffer the PUD subdivision from adjacent properties.
- C. The location and character of all improvements to be made in community open space areas, including a general landscape plan for each area.
- D. A legal instrument establishing the community association, approved by the City Attorney, as required by the City of Boerne Zoning Ordinance, Article 5 Zoning Use Regulations, Section 18. Planned Unit Development, Subsection 005. Common Areas and Community Association.
- E. A multi-year budget for the community association, approved by the City Manager, as required the City of Boerne Zoning Ordinance, Article 5 Zoning Use Regulations, Section 18. Planned Unit Development, Subsection 005. Common Areas and Community Association.

- F. A bond or other financial guarantee of the full funding of the community association's reserve fund for repairs and maintenance of the common areas and facilities, as required by the City of Boerne Zoning Ordinance, Article 5 Zoning Use Regulations, Section 18. Planned Unit Development, Subsection 005. Common Areas and Community Association.
- G. A maintenance agreement between the community association and the City for repair and maintenance of the common areas and facilities which are to be dedicated as community open space, as required by the City of Boerne Zoning Ordinance, Article 5 Zoning Use Regulations, Section 18. Planned Unit Development, Subsection 005. Common Areas and Community Association.

SECTION 03. RURAL CLUSTER SUBDIVISIONS.

4.03.001 Specific Intent.

It is the Specific Intent of this section to:

- A. Provide context-based design standards particularly appropriate to preserving the rural character of the Hill Country, appropriate to this specific development pattern, in addition to the Planning and Community Design standards for all subdivisions in Article 3.
- B. Preserve in perpetuity unique or sensitive natural resources such as groundwater, floodplains, wetlands, streams, steep slopes, woodlands, wildlife habitat or important historic and archaeological sites.
- C. Permit clustering of houses and structures on less environmentally sensitive areas of a site, and to reduce the amount of infrastructure, including paved surfaces and utility easements, necessary for residential development.
- D. Reduce erosion and sedimentation by minimizing land disturbance and removal of vegetation in residential development.
- E. Promote interconnected greenways and corridors throughout the community and with adjacent jurisdictions.
- F. To conserve scenic views and reduce perceived density by maximizing contiguous open areas and clustering houses in more compact settlement areas.

4.03.002 Applicability.

A Rural Cluster Subdivision is an alternative to a conventional residential subdivision. These standards apply in addition to or more specifically than the Planning and Community Design Standards in Article 3 to better preserve rural character. It is applicable to Low-density Residential or Rural Residential areas designated in the Boerne Master Plan. In order to ensure the minimum acceptable contiguous area and maximum impact of conserved open space, the Rural Cluster Subdivision standards shall only apply to the minimum parcel size of 25 acres, except parcels that preserve a minimum of 3 acres as Conservation Area and that are the extension of an existing Rural Cluster subdivision are permitted subject to all other standards in this section.

4.03.003 Transportation Network and Street Designs.

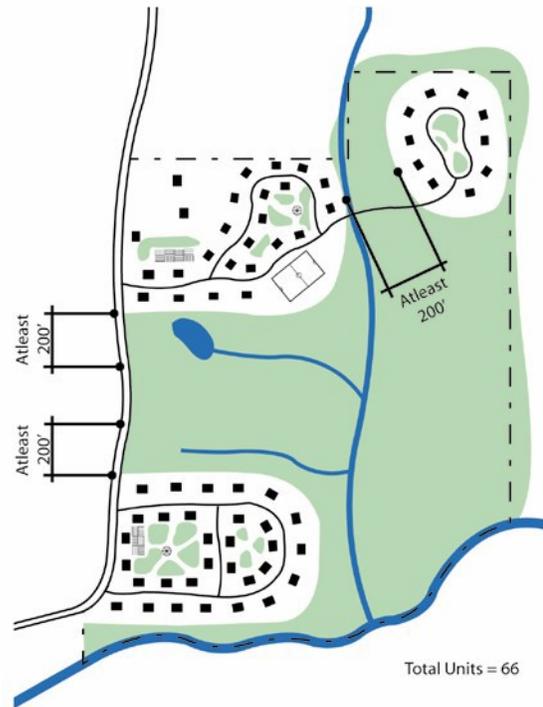
A Rural Cluster subdivision shall use the Organic Network specified in Article 3, Section 3.02, except that developed portions of the residential cluster may use a modified grid to more effectively and efficiently serve the housing cluster. The streets and lot layouts shall be designed and located in a manner that maintains and preserves the natural topography, involves the least practical amount of grading, shortens road lengths and lot frontages, and minimizes any other disturbances of land and natural features. All streets shall use the Rural Design Type specified in Article 3, Section 3.02.

4.03.004 Blocks and Lots

- A. *Block Sizes and Arrangement.* There are no maximum block sizes, except that no housing cluster shall contain more than 20 lots or dwelling units without being separated from other housing clusters by at least 200 feet of Conservation Areas meeting the standards in sub-section 4.02.005 However, there shall be at least one connection to an external arterial or collector street, or a newly proposed arterial or collector street for each 50 dwelling units.



Conventional Subdivision



Rural Cluster Subdivision

- B. **Lot Size and Arrangement.** There shall be no minimum lot size for Rural Cluster Subdivisions. Rural Cluster Subdivisions shall be allowed to vary the lot sizes on the developed parcel in order to fit the same number of units on the developed parcel as would have been allowed on the original parcel under the conventional subdivision standards, or the zoning for the parcel where applicable. The development yield of a parcel shall be based on a housing density determination in sub-section 4.02.004.C

Lots shall be configured so that buildable portions of each lot are located in the area that causes the least disturbance during construction activity. In addition to the required Natural Areas in sub-section 4.02.005., the largest amount of area possible on each lot shall be kept in or restored to its natural vegetative state.

- C. **Lot Yield Determination.** The maximum number of lots is determined by dividing the area of the tract of land by the minimum lot size specified in the underlying zoning or according to the Planning and Community Design Standards in Article 3 in un-zoned areas. In making this calculation, the following shall not be included in the total area of the parcel:
1. land necessary for right-of-way according to an estimated Transportation Network Plan
 2. slopes over 25% of at least 5000 square feet contiguous area;
 3. the 100-year floodplain;
 4. bodies of open water over 5000 square feet contiguous area; and
 5. wetlands that meet the definition of the Army Corps of Engineers pursuant to the Clean Water Act.

- D. **Minimum Conservation Area.** The Rural Cluster Subdivision requires that at least 30% of the site be preserved according to the standards in sub-section 4.02.005. The lots permitted by sub-section 4.02.004.C. may then be arranged in any manner that best meets the intent and standards of this Section. Open spaces such as right-of-way, landscape areas, or active recreation areas developed as amenities for the neighborhood shall not count towards the Conservation Area requirements of this Section.

- E. **Lot Yield Bonus.** Rural Cluster Subdivisions shall be allowed additional lots beyond the lot yield of the original parcel based upon the percent of the original parcel that is preserved from development according to Table 4-1:

TABLE 4-1: LOT YIELD BONUS				
AMOUNT OF CONSERVATION AREA	61% PLUS	60-51%	50-41 %	40-30%
LOT YIELD BONUS *	70%	40%	25%	0%

* Per-cent more Lots permitted beyond the Lot Yield determination in sub-section 4.02.004.C.

Regardless of the number of lots permitted by this section, all developments proposing a Rural Cluster subdivision in the City of Boerne ETJ shall meet any applicable minimum well spacing requirements of the Cow Creek Underground Water District, and if necessary, the TECQ standards for onsite sewage disposal systems.

4.03.005 Open Space System.

A. *Natural Area Criteria.* All Rural Cluster Subdivisions shall have a minimum of 30% of the parcel as Natural Areas, meeting following criteria:

1. All portions of the Natural Area shall have significant natural features or habitats worthy of preservation for environmental, aesthetic and recreation benefits. Areas of the development site that best meet these criteria shall be preserved from development and take priority in determining the best layout for the site.
2. No more than 50% of the Conservation Area shall be land that is undevelopable due to natural features or other physical impracticalities, such as water bodies, steep grades, or wetlands, or due to other local, state, or federal laws or regulations.
3. The Natural Area shall be contiguous, based upon consistent and substantial linkages of natural systems, including links to areas on adjacent sites. While a Rural Cluster Subdivision may involve more than one preserved area, no single contiguous Natural Area shall be less than 5 acres or 15% of the site, whichever is greater.
4. Thin bands of preserved areas shall be avoided to prevent erosion or degradation of the Natural Area through extensive "edge conditions." Areas less than 100-feet wide shall be excluded from the Natural Area calculations.
5. All lots shall be within 500 feet of the Natural Area as measured by the most direct pedestrian connection or shall directly abut the Natural Area.
6. The Natural Area should be usable and accessible by residents, however trails or other accessories shall be designed and located to avoid fragmenting Natural Areas and to cause the least possible impact on Natural Areas.
7. The Natural Area may be designated for assignment and management by a common ownership association of current and future lot owners or dedicated to the County subject to the County acceptance in its sole discretion. The County may approve the assignment of the preserved area to another public or non-profit entity in its sole discretion.

B. *Natural Area Guidelines.* The following are considered priorities for Natural Areas and should be included within the Natural Area if present on the site, unless the Applicant demonstrates that this provision would constitute an unusual hardship and be counter to the Intent and Standards of this Section:

1. The 100-year floodplain;
2. Riparian zones of at least 100 feet wide along all perennial and intermittent streams;
3. Slopes above 25% of at least 5000 square feet contiguous area;
4. Wetlands that meet the definition used by the Army Corps of Engineers pursuant to the Clean Water Act;
5. Populations of endangered or threatened species, or habitat for such species;
6. Historic or archaeological sites that are either protected or worthy of protection according to applicable guidelines;
7. Other significant natural features and scenic view sheds such as ridge lines, valleys, peaks and rock outcroppings or other notable topographic features, particularly those that can be seen from public roads.
8. Existing healthy, native forests of at least one-acre contiguous area;
9. Any habitat areas containing healthy specimen or heritage trees.

C. *Legal Restrictions.*

1. *Permanent Conservation.* Designation, dedication of other legal restrictions on future development of the Natural Area in perpetuity shall be filed with the plat for any proposed Rural Cluster Subdivision.
2. *Management Plan.* A detailed ownership and management plan for the Natural Area shall be filed with the plat for any proposed Rural Cluster Subdivision. The plan shall:
 - a. identify the owner, entity responsible for maintenance, and long-term funding strategies such as homeowners' fees or assessments.
 - b. demonstrate the financial feasibility of the ownership and maintenance program.
 - c. Specify guidelines for how the maintenance of the Conservation Area, and any facilities eligible for location in the Conservation Area will occur.
 - d. Include cost estimates for maintenance, including staffing, operation, or insurance costs, if any.
 - e. Identify a board and procedures for oversight of and enforcement of the Management Plan
3. *Ownership and Management.* Options for ownership and management of preserved area include:
 - a. Dedication to the City or other public entity subject to acceptance by and at the sole discretion of the City or other public entity.
 - b. Creation of or dedication to a non-profit entity capable of carrying out the ownership and management plan.
 - c. Creation of a Homeowners and/or Leaseholders Association capable of carrying out the ownership and management plan.
 - d. Establishment of an endowment where the principal generates sufficient annual interest to cover the yearly costs of ownership and maintenance of the preserved area.
 - e. Dedication to a private or not-for-profit entity such as a land trust or similar conservation-oriented organization with the legal authority and financial capacity to accept such dedications.
 - f. Dedication of a conservation easement on the Conservation Area to any of the above entities with a right of enforcement in favor of the City of Boerne stated in the easement.

Any management organization shall be bona fide and in perpetual existence and the conveyance instrument shall contain an appropriate provision for retransfer in the event the organization becomes unable to carry out its function.
4. *Right of Enforcement.* In the event the party responsible for maintenance of the Natural Area fails to maintain all or any portion in reasonable order and condition according to the Management Plan, the City of Boerne may assume responsibility for its maintenance and may enter the premises and take corrective action, including provision of extended maintenance. The cost of such maintenance may be charged to the Management Entity, or the individual property owners according to their pro-rata share based on the Management Plan. Costs may include administrative costs in taking such actions as well as penalties as provided under these regulations. Such costs shall become a lien on all subdivision properties.
5. *City Review.* The legal restrictions and ownership and management plan shall be subject to review and approval by the City Attorney.

Section 04. Cottage Housing Communities

4.04.001 Additional Requirements for Preliminary Subdivision Plat.

In addition to the requirements for a preliminary subdivision plat which apply to a conventional subdivision, the preliminary plat of a cottage housing community must contain or be accompanied by the following.

- A. Clear delineation of the areas which are to be reserved for parking, and open space.
- B. The location, type and height of all proposed fences, screening walls intended to buffer the subdivision from neighboring properties and any onsite fencing.
- C. The location and character of all improvements to be made in community open space areas.
- D. A draft of the legal instrument establishing the community association.

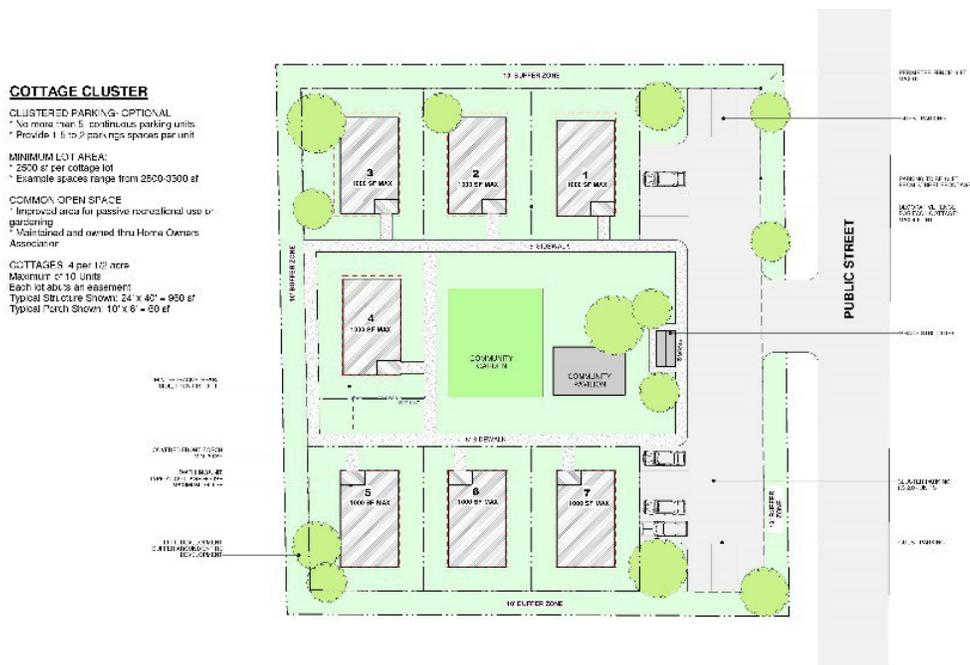
4.02.002 Additional Requirements for Final Subdivision Plat.

In addition to the requirements for a final subdivision plat which apply to a conventional subdivision, the final plat of a cottage housing community must contain or be accompanied by the following.

- A. Clear delineation of the areas which are to be reserved for parking, and open space.
- B. The location, type and height of all proposed fences, screening walls intended to buffer the subdivision from neighboring properties and any onsite fencing.
- C. The location and character of all improvements to be made in community open space areas.
- D. A final recorded legal instrument establishing the community association.

4.04.003 Blocks and Lots.

- A. *Block Sizes and Arrangement.* There are no maximum block sizes, except that no housing cluster shall contain dwelling units without being separated from other housing clusters by at least 1,000 feet. However, there shall be at least one connection to an external street, or a newly proposed street.
- B. *Cottage Lots.* Cottage lots may provide frontage on a shared access/utility easement provided at either the front or rear of the lot line.



- C. *Lot Size and Arrangement.* There shall be a 1/2 acre overall minimum lot size for Cottage Subdivisions. Cottage Subdivisions shall be allowed to vary the lot sizes on the developed parcel in order to fit the same number of units on the developed parcel. Lots shall be configured so that buildable portions of each lot are located in the area that causes the least disturbance during construction activity.
- D. *Lot Yield Bonus.* An extra cottage in each cottage cluster will be permitted if low impact development techniques are approved by the City Manager or City Manager's designee used in the development such as directing roof drains and parking lot runoff to landscape beds, green or living roofs, rain catchment, and/or rain barrels. If the LID is approved, then open space for the development as a whole may not be diminished by more than 5%.

E. Regardless of the number of lots permitted by this section, if approved by the applicable governing bodies, all developments proposing a Cottage subdivision in the City of Boerne ETJ shall meet any applicable minimum well spacing requirements of the Cow Creek Underground Water District, and if necessary, the Texas Commission on Environmental Quality standards for onsite sewage disposal systems.

F. *Impact Fee:* The impact fee for cottage lots can be found in the Impact Fee Ordinance.

4.03.004 Open Space System.

A. Common Open Space for Cottages: All cottage units in a development shall be within 60 feet walking distance measured from the nearest entrance of the cottage along the shortest safe walking route to the nearest point of the common open space. Each cottage lot shall abut a common open space, making the common open space the focal point.

1. Parking areas, fenced yard setbacks, private open space, alleys, and driveways do not qualify as common open space.
2. Community buildings, parking areas and common open space shall be owned and maintained commonly by the Cottage Housing Development residents, through a homeowners' association, or a similar mechanism.
3. There shall be at least a 10' perimeter around the entire development to adjacent residential properties to provide a buffer.
4. At least 20% of the property's overall parcel should be used as open space. This includes the common open space.

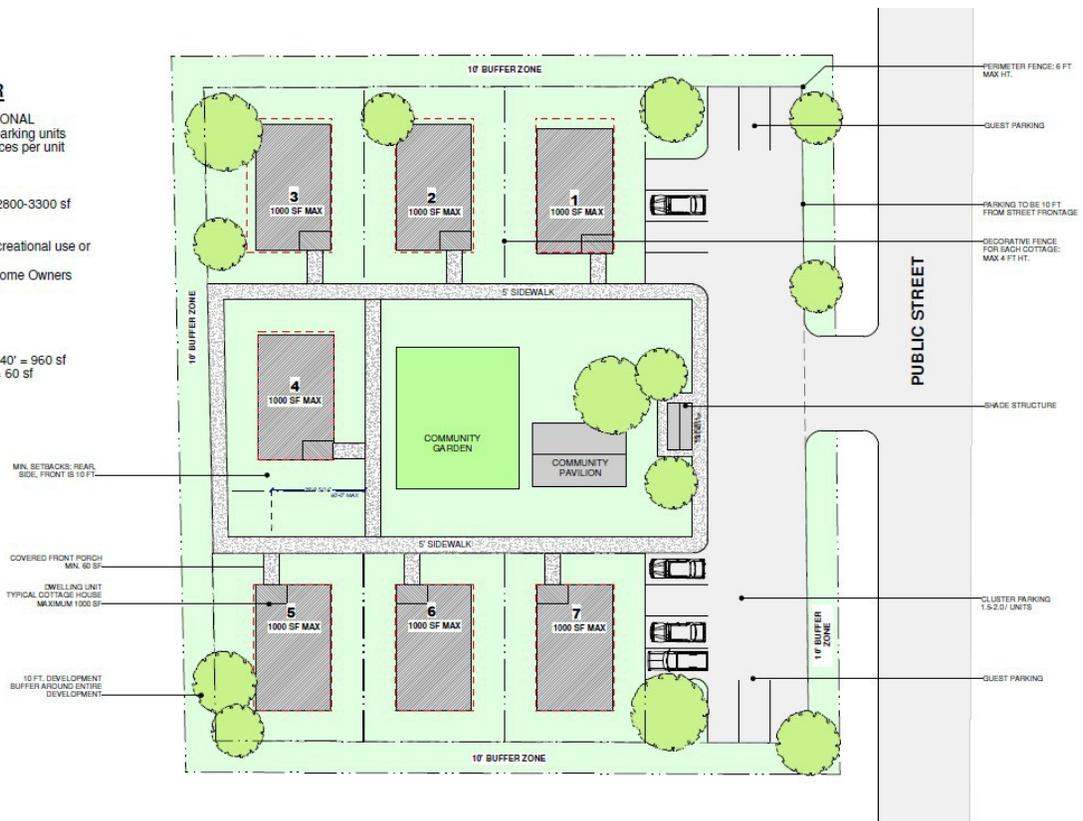
COTTAGE CLUSTER

CLUSTERED PARKING- OPTIONAL
 * No more than 5 continuous parking units
 * Provide 1.5 to 2 parkings spaces per unit

MINIMUM LOT AREA:
 * 2500 sf per cottage lot
 * Example spaces range from 2800-3300 sf

COMMON OPEN SPACE
 * Improved area for passive recreational use or gardening
 * Maintained and owned thru Home Owners Association

COTTAGES: 4 per 1/2 acre
 Maximum of 10 Units
 Each lot abuts an easement
 Typical Structure Shown: 24' x 40' = 960 sf
 Typical Porch Shown: 10' x 6' = 60 sf



ARTICLE 5. STREET SPECIFICATIONS AND CONSTRUCTION STANDARDS

Section 01.	General Layout and Alignment of Streets
Section 02.	Required Street Improvements
Section 03.	Street Geometry Standards
Section 04.	Minimum Pavement Design Standards
Section 05.	Standards for Alternative Paving Design
Section 06.	Curbs
Section 07.	Sidewalks – Timing
Section 08.	Driveways
Section 09.	Traffic Control Signs and Street Signs
Section 10.	Street Lighting
Section 11.	Private Streets

SECTION 01. GENERAL LAYOUT AND ALIGNMENT OF STREETS

Adequate streets shall be provided by the subdivider, and the arrangement, character, extent, width, grade and location of each shall be as specified in Article 3, Planning and Community Design Standards.

Private streets are restricted as identified in Section 11 of this ordinance.

SECTION 02. REQUIRED STREET IMPROVEMENTS

5.02.001 General Specifications

In the City limits or in the extraterritorial jurisdiction (ETJ) of the City of Boerne, the subdivider/developer shall, at his/her sole cost and expense, provide all necessary street grading, pavement, curbing, gutters, sidewalks, bike lanes and storm sewer drains required to service the subdivision as identified by the City of Boerne Thoroughfare Plan, including the perimeter streets contiguous to the subdivision. All street improvements shall meet the Typical street cross-sections specified in Article 3, Planning and Community Design Standards unless an exception has been approved by the Planning and Zoning Commission and City Council.

5.02.002 Street Improvement - Timing

Streets improvements as set forth in Table 3-4: Street Cross-Section Standards of this ordinance, shall be made at such time as subdivision or development occurs. If a street improvement is required to be made to an existing street, arterial, collector or street identified in the Thoroughfare Plan, the improvement shall be made to the entire length of the development that is contiguous to that street.

SECTION 03. STREET GEOMETRY STANDARDS

5.03.001 General Requirements.

The design of all streets in a subdivision shall conform to the standards of street geometry in the following table. TABLE 5-1. STREET GEOMETRY STANDARDS				
Street Functional Classification	Pavement Crown or Cross Slope	Minimum Grade	Maximum Grade	Centerline Minimum Horizontal Curve Radius
Regional Thoroughfare	Min. 2%	0.5%	6%	1,200'
Arterial	Min. 6" or 2%	0.5%	6%	600'
Collector	6" or 2%	0.5%	8%	400'
Local	5" Or 2%	0.5%	10%	150'
Local – Neighborhood (L-NH) or Local – Rural (L-RR)	4"	0.5%	10%	100'
Residential Alley	7"	0.5%	10%	50'
Commercial Alley	7"	0.5%	10%	50'

5.03.002 Exceptions to Minimum Radius Requirement.

Exceptions to the minimum centerline horizontal radius requirement in this Section may be granted only by the City Council upon appeal from the Planning and Zoning Commission at preliminary plat approval.

5.03.003 Reverse Curves.

Reverse curves shall be separated by a minimum tangent of 100 feet, except that the Planning and Zoning Commission may waive this requirement for Local streets where the Commission finds that an exception is justified by the topography of the site and by the sight distance, right-of-way width, setbacks and other features of the subdivision design.

5.03.004 Vertical Curvature.

A gradual transition from one roadway grade to another shall be accomplished by means of a vertical parallel curve connecting two intersecting tangents. The minimum length of vertical curve shall be computed from the following formula and table:

$$L = KA$$

Where: L = the length of vertical curve in feet

K = a constant related to sight distance and geometry of a parabolic curve (see Table 5-2)

A = the algebraic difference in grades in percent.

Street Classification	"K"	"K"
	Crest Curves	Sag Curves
Regional Thoroughfare	70	60
Arterial	70	60
Collector	55	55

SECTION 04. STANDARDS FOR PAVEMENT DESIGNS

Pavements shall be designed using site specific soil and geologic design considerations to assure reasonable durability and economy of maintenance. Proper documentation of the engineering and design techniques, and performance and maintenance data must be shown. Approval of these designs shall be subject to the review of the City Manager.

SECTION 05. MINIMUM PAVEMENT DESIGN STANDARDS

The pavement of all streets and alleys shall meet the minimum specifications in the following table.

TABLE 5-3: MINIMUM PAVEMENT DESIGN STANDARDS (OVER COMPACTED SUBGRADE)			
Street Classification	Asphaltic Concrete (in.)	Crushed Limestone (in.); or	Asphalt Stabilized Base (in.)
Regional Thoroughfare	3.5 in.	12	10
Arterial	3 in.	12	10
Collector	2 in.	10	8
Local	1.5 in.	8	6
Residential Alley	1.5 in.	8	6
Commercial Alley	3 in.	12	10
Bikeway / Path	Bikeway/paths shall be, six (6) inches of cement stabilized crushed limestone base (2,500 – 3,000 psi), 1 ½ inches of asphaltic concrete over 6" crushed limestone base, or 4" of concrete over 2" crushed limestone base.		

5.05.001 Soils Investigation.

The subdivider shall, at his/her own expense, cause to be made a soils investigation by a qualified and independent geotechnical engineer licensed to practice in the State of Texas. The field investigation shall include test borings within the rights-of-way of all proposed streets. The number and locations of such borings shall be subject to the approval of the City Manager. Atterberg limits and moisture contents shall be determined for all significant boring samples. The method used for these determinations shall be the same as that used by the Texas Department of Transportation using their latest Manual of Testing Procedures, 100-E Series test methods. The results of the soils investigation shall be presented to the subdivider and to the City Manager in written report form. Included as a part of the report shall be a graphical or tabular presentation of the boring data giving Atterberg limits and moisture contents, a soil description of the layers of different soils encountered in the profile of the hole, their limits in relation to a fixed surface datum, and such other information as needed to complete the soils investigation for pavement design purposes. Minimum depth of soil profile boring holes shall be 10 feet unless solid rock formations are encountered sooner.

5.05.002 Pavement Design Loads.

Pavement design shall be based on the Texas Department of Transportation tri-axial design standards in the following table.

TABLE 5-4: MINIMUM PAVEMENT LOAD STANDARDS						
Street Classification	Total Equity 18 Kip Single Axle Load Applications	Average Ten Heavy Wheel Loads Daily	Load Frequency Design Factor	Minimum ACP Thickness	Minimum Flex Crushed Limestone Base; or	Minimum ASB
Regional Thoroughfare	500,000	10,500	1.05	3.5	12	10
Arterial	300,000	10,000	1.00	3	12	10
Collector	300,000	10,000	1.00	2	10	8
Local	60,000	6,000	0.80	1.5	8	6

A written report containing pavement design data and recommendations based on the soils investigation shall be prepared at the subdivider's expense by a qualified geotechnical engineer licensed to practice in the State of Texas, and shall be presented to the subdivider and to the City Manager. The report shall state the load criteria and the soil classifications used. When approved by the City Manager, the geotechnical engineer preparing the report may use the tri-axial classification soils data given in Texas Department of Transportation report number 3-05-71-035, entitled "Tri-axial Classification of the Surface Soils of Texas, as Grouped by Soil Conservation Service Series."

When using the tri-axial data, the report shall so state. The pavement design shall be subject to the approval of the City Manager and shall be shown on the street construction plans as approved. Where the plasticity index of the sub grade soil on which the street is to be built is in excess of 20, the pavement design shall include sub grade stabilization unless approved otherwise by the City Manager.

When sub grade soils are stabilized the minimum depth of stabilization shall be six inches unless otherwise approved by the City Manager. In the stabilization of swelling clay soils, the stabilizer used shall be hydrated lime. The lime shall be applied to the sub grade soil in slurry form unless otherwise approved by the City Manager. Base material and the stabilized layer, if used, shall extend at least 18 inches behind of the back of the curb.

SECTION 06. CURBS

All streets shall have concrete curbs extending seven and one-half inches above the pavement surface and shall be reinforced with 1- #4 continuous longitudinal reinforcing bar (minimum) centered in the curb section. The minimum total curb height shall be 9 inches. Compacted backfill shall be placed on all of the rights-of-way behind curbs to a minimum elevation equal to the top of the curb. Normal curb exposure shall be required where utility easements intersect streets. Continuously reinforced flush curbs (minimum total depth of 9 inches) may be provided at driveway areas. Flush curbs are required on streets using the Rural Design Type in Article 3.

SECTION 07. SIDEWALKS - TIMING

Sidewalks, the width set forth in Table 3-4: Street Cross-Section Standards of this ordinance, shall be installed in the appropriate location adjacent to all properties fronting a street at such time as that lot is developed in the City limits or in the ETJ of the City of Boerne. This includes all lots/tracts or parcels that front any portion of IH-10 right-of-way. Locations of sidewalks within State right-of-way shall be as directed by TxDOT and a sidewalk permit must be approved by TxDOT, prior to construction within State right-of-way. Sidewalks, or trails in lieu of sidewalks that are on a main thoroughfare and do not front on a lot shall be constructed with the street improvements in order to provide safety and connectivity within the development.

Construction of the sidewalks on each street is not necessary until construction begins on the first building on that street. However, to avoid undue costs and damage to sidewalks, the subdivider, developer or builder may construct the sidewalk on each lot as it is developed. In no case will a Certificate of Occupancy be issued for a building until the required sidewalks have been constructed. In areas, sites, or other portions of streets where no building will be constructed and sidewalks are required by these regulations, the sidewalks shall be constructed with other required street infrastructure. Sidewalks, including portions within any driveway aprons, shall meet City and TDLR standards.

SECTION 08. DRIVEWAYS

Driveway aprons in the public right-of-way shall be constructed of concrete and according to City and TDLR design standards.

SECTION 09. TRAFFIC CONTROL SIGNS AND STREET SIGNS

All traffic control signs shall be provided and installed by the subdivider and shall conform with the 2006 Texas Manual on Uniform Traffic Control Devices. All street signs shall be provided and installed by the subdivider and meet the City's standard specifications and sign patterns.

SECTION 10. STREET LIGHTING

Street lighting according to the city design standards shall be provided by the subdivider at all intersections, street alignment changes greater than 45 degrees, and at the end of any cul-de-sac or other disconnected street permitted by Article 3.

SECTION 11. PRIVATE STREETS

5.11.001 Private Streets.

Private streets are allowed in certain subdivisions only under the terms set forth in this Section, and pursuant to any other ordinances or guidelines for private street developments as may be adopted for use by the City. All private streets shall be designed and constructed in accordance with this ordinance and applicable Standard Construction Details for publicly dedicated streets. The term Private Street shall be inclusive of alleys, if such are provided within the subdivision.

5.11.002 Subdivision Eligibility Criteria.

Private streets shall be permitted only within a subdivision satisfying each of the following criteria:

- A. The subdivision shall have a sufficient number of lots and value to demonstrate through an approved economic analysis the viability of private maintenance by the development served;
- B. The streets to be restricted to private use are not intended for regional or local through traffic circulation (see Subsection 5.11.003 below);
- C. The subdivision shall have restricted access as delineated in subsection (5.11.009) below;
- D. The subdivision is located adjacent to an existing or approved public street that can be reasonably connected, even though the street connection may require the construction of a bridge or culvert;
- E. The subdivision shall have at least two (2) points of vehicular access connected via improved roadways to the City's thoroughfare and street system by one or more approach roads;
- F. A mandatory property owners (homeowners) association, which includes every owner of a lot within the private street development, shall be formed and shall be responsible for maintenance of the private streets and alleys (see Subsection 5.11.005 below); and
- G. The subdivision conforms to any other special guidelines for private street developments as may be approved separately by the City Council.

5.11.003 Certain Streets Excluded.

Roads or streets that are shown on the City's Thoroughfare Plan, such as highways, major or minor thoroughfares or arterials, or collectors, shall not be used, maintained or constructed as private streets, and a private street subdivision

shall not cross or interfere with an existing or future collector or arterial street. Also, the Planning and Zoning Commission may deny the creation of any private street if, in their sole determination, the private street would negatively affect traffic circulation on public streets, or if it would impair access to the subject or adjacent property; impair access to or from public facilities including schools or parks; or if it would cause possible delays in the response time of emergency vehicles.

5.11.004 Parks, Greenbelts and Wildlife Preserves Excluded.

A private street subdivision shall not cross, interfere or hinder public access to an existing or future public pedestrian pathway, hike and bike trail, greenbelt, park or wildlife preserve as shown on the City of Boerne's Parks and Open Space Master Plan or as already dedicated for public use.

5.11.005 Property Owners' or Homeowners' Association Required.

Subdivisions developed with private streets shall have a mandatory property owners' or homeowners' association (the "Association") which must include all property, and lots served by the private streets and be in accordance with requirements of Section 5.011.015 of this Ordinance. The Association documents shall be reviewed and approved by the City Manager and the City Attorney to ensure that they conform to these and other applicable City rules and regulations prior to final plat approval. The Association documents shall be filed of record at Kendall County prior to final plat acceptance in order to ensure that there is an entity in place for long-term maintenance of private streets and all related appurtenances. The Association may not be dissolved without the prior written consent of the City Council. No portion of the Association documents pertaining to the maintenance of private streets and alleys, and assessments therefore, may be amended without the prior written consent of the City Council.

- A. The Association shall own and be responsible for the maintenance of private streets and appurtenances and the City shall not be required to pay for or assist with any portion of the construction or maintenance of such private streets.
- B. The Association shall provide for the payment of dues and assessments required to maintain the private streets.
- C. Out of such dues and assessments, the Association must establish a reserve fund for the maintenance of private streets and other improvements such as common greenbelts, security station structures and equipment, and other significant Association infrastructure.
 - (i) This reserve fund shall not be commingled with any other Association fund.
 - (ii) The balance of the fund shall be equal to the total replacement cost of the private streets and other improvements divided by the average life expectancy of those improvements times the age of the improvements. The life expectancy for a subdivision with private streets shall be a minimum of twenty (20) years.
 - (iii) The Association shall have an annual review performed by a certified public accounting firm verifying the amount in the reserve fund. A copy of the review shall be provided to City.
 - (iv) If the private streets are converted to public streets, the reserve fund shall become the property of the City.
- D. The Association documents shall provide that should the Association fail to carry out its duties as specified in these regulations, the City or its lawful agents shall have the right and ability, after due notice to the Association, to perform the responsibilities of the Association if the Association fails to do so in compliance with any of the provisions of these regulations or of any applicable City Codes, regulations or agreements with the City and to assess the Association or the individual lot owners for all costs incurred by the City in performing said responsibilities if the Association fails to do so, and the City shall further have any and all liens and lien rights granted to the Association to enforce the assessments required by the declaration and/or to avail itself of any other enforcement actions available to the City pursuant to state or City codes and regulations.
- E. Pursuant to Section 542.008 of the Transportation Code, the Association documents shall provide that all traffic rules and regulations enforced and applied by the City on all public streets, alleys and rights-of-way governing the operation and movement of vehicles are extended to all private streets, alleys and rights-of-way within the subdivision. All such streets, roads, alleys, and rights-of-way are governed and controlled by all traffic laws set forth in state law and City ordinance.

5.11.006 Private Street Lots.

Private streets must be constructed within a separate lot owned by the Association. Private streets must conform to the City's standards for public street rights-of-way. An easement covering the street lot shall be granted to the City and its employees providing unrestricted access to and use of the private streets and private street lot in pursuit of their official duties, private Street ROW's or lot shall be dedicated as utility easements so that the utilities can be installed in their usual locations and configurations. This right shall also extend to all utility providers operating within the City and to other necessary governmental service providers, such as the U.S. Postal Service. The easement shall also permit the City to remove any vehicle or obstacle within the private street lot that may impair emergency access. The easement shall also allow emergency vehicle access to the lot and enforcement of all laws and ordinances therein. The City will not assist in enforcing deed restrictions.

5.11.007 Infrastructure and Utilities.

Any public water, reclaimed water, gas, sewer and drainage facilities, street lights, and traffic control devices, such as traffic signs, placed within the private street lot shall be designed and constructed to City standards, and shall be accepted by and dedicated to the City prior to filing the record plat for the subdivision. All private traffic control devices and regulatory signs shall conform to the Texas Manual of Uniform Traffic Control Devices, as may be amended, and to City standards. Should it be necessary that the City erect and place such traffic control signs, signals and devices as may be necessary or appropriate in the application and extension of traffic rules and regulations to the subdivision, all costs of erection, placement, replacement, maintenance and/or removal shall be borne by the Association such sum shall include but not be limited to the acquisition of property for sign placement. The metering for utilities such as water, reclaimed water, gas and electricity shall be located on the individual lots to be served, not grouped together in a centralized location(s), such as "gang-box" style metering stations, which shall not be permitted.

5.11.008 Plans and Inspections.

Development applications for subdivisions with private streets must include the same plans and engineering information required for public streets and utilities. City requirements pertaining to inspection and approval of improvements shall apply. The City may periodically inspect private streets and may require any repairs necessary to ensure efficient emergency access and to protect the public health, safety, convenience and welfare.

5.11.009 Restricted Access.

The entrances to all private streets shall be clearly marked with a sign, placed in a prominent and visible location, stating that the streets within the subdivision are private, and that they are not maintained by the City. Guard houses, access control gates, and cross arms, if used, shall be constructed per Subsection (i) herein below. All restricted access entrances must be manned twenty-four (24) hours every day, or they must provide a reliable, alternative means of ensuring City and emergency access to the subdivision for emergency access, the Fire Chief shall approve of all alternative means of access, by the City and other utility or public service providers, such as postal carriers and utility companies, with appropriate identification. The method to be used to ensure City and emergency access into the subdivision shall be approved by all applicable emergency services providers prior to engineering release for construction of the development. If the Association fails to maintain reliable access as required herein, the City may enter the subdivision and remove any gate or device which is a barrier to access at the sole expense of the Association. The Association documents shall contain provisions in conformity with this Section which may not be amended without the written consent of the City Council.

5.11.010 Access Restricted Entrance Design Standards.

Any private street (and any other type of controlled access entrance street) which has an access control gate or cross arm must have a minimum uninterrupted pavement width of twenty-seven feet (27) at the location of the gate or access control device, both ingress point and egress point, regardless of the type of device used. A site plan showing the design and location of all proposed access restricted entrances shall be submitted for review by the City Public Works Director, or designee, along with the engineering plans for the subdivision, and must be approved by the Planning and Zoning along with approval of the preliminary plat.

- A. **Access Standards.** If an overhead, or lift-up, barrier is used, it must rise to a minimum of fourteen feet (14) in height above the road surface, and this clearance height shall be extended for a minimum distance of fifty feet (50) in front of and behind the location of the device. All gates and cross arms must be of a breakaway design. A minimum vehicle stacking distance of one hundred feet (100) shall be provided from the right-of-way line of the public road from which the private street subdivision is accessed to the first vehicle stopping point, which point is usually an access request keypad, a telephone, and/or a guard's window. Adequate distance shall be provided between the access request point(s) and the entry barrier, or gate, to accommodate a vehicle turnaround as described below.

- B. **Turnaround Requirement.** A paved turnaround space must be located in front of (i.e., prior to passage through) any restricted access entrance barrier, between the access request device and the barrier or gate, to allow vehicles that are denied access to safely exit onto public streets without having to back up, particularly into the public street upon which the entrance is located. The design and geometry of such turnaround shall be of sufficient pavement width and having such inside turning radius that it will accommodate smooth, single-motion U-turn movements by the types of service and utility trucks that typically visit or make deliveries to neighborhoods that are similar to the proposed private street development including by way of reference and not limitation utility service vehicles, postal or UPS delivery trucks, and two- to three-axle flatbed or box-type trucks used by contractors and moving companies. The City Public Work's Director, or designee, may require submission of additional drawings, plans or exhibits demonstrating that the proposed turnaround will work properly, and that vehicle turnaround movements will not compromise public safety on the entry and/or exit roadway or on the adjacent public street(s).
- C. Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be *approved* by the *fire code official*. Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.

5.11.011 Petition to Convert to Public Streets.

The Association documents shall allow the Association to petition the City to accept private streets and any associated property as public streets and rights-of-way upon written notice to all Association members and upon the favorable vote of a majority of the membership. However, in no event shall the City be obligated to accept said streets as public streets. Should the City elect to accept the streets as public streets, then the City has the right to inspect the private streets and to assess the lot owners for the expense of needed repairs concurrent with the City's acceptance of the streets. The City shall be the sole judge of whether repairs are needed. Upon acceptance of the private streets as public streets the City may also require, at the Association's or the lot owners' expense, the removal of any guard houses, access control devices, landscaping or other aesthetic amenities located within the street lot or within any other roadway common area that are not consistent with a public street development. The Association documents shall provide for the City's right to such removal and assessment. Those portions of the Association documents pertaining to the subject matter contained in this Section shall not be amended without the written consent of the City Council. However, the Association documents must be modified and re-filed to remove requirements specific to private street subdivisions at such time as the City accepts the private streets as public streets.

5.11.012 Hold Harmless.

The subdivision final and recorded plat shall contain language whereby the property (or home) owners' association, as owner of the private streets and appurtenances, agrees to release, indemnify, defend and hold harmless the City, any other governmental entity, and any public utility for damages to the private streets that may be occasioned by the reasonable use of the private streets by same, and for damages and injury (including death) arising from the condition of the private streets, out of any use of access gates or cross arms, or out of any use of the subdivision by the City or governmental or utility entity (such plat language is available from the City).

5.11.013 Required Disclosures.

The Association documents shall address, but shall not be limited to, the following five paragraphs:

- A. The Association documents must indicate that the streets within the development are private, owned and maintained by the Association and that the City has no obligation to maintain or reconstruct the private streets.
- B. The Association documents shall include a statement indicating that the City may, but is not obligated to, inspect private streets, and require repairs necessary to ensure that the same are maintained to City standards.
- C. The Association may not be dissolved without the prior written consent of the City.
- D. That the Association and the lot owners agree to release, indemnify, defend and hold harmless the City, its officers, agents licensees, servants, contractors and/or employees ("Indemnitees"), from and against any and all claims or suits for property damage or loss and/or personal injury of whatever kind or character arising out of or in connection with, directly or indirectly: (a) the

reasonable use of the private streets, emergency access, utility easements, entrance gate or structures by the Indemnitees; (b) the condition of the private streets, private entrance gates or structures, private walls and fences, private pedestrian access, private storm drainage systems and emergency access; or (c) any use of the addition by the Indemnitees for any purpose stated hereinabove, whether or not caused, in whole or in part, by the alleged negligence of the Indemnitees. The Association shall be responsible for carrying liability insurance to meet the requirements of this paragraph.

- E. The Association documents shall provide that all traffic rules and regulations enforced and applied by the City on all public streets, alleys and rights-of-way governing the operation and movement of vehicles are extended to all private streets, alleys and rights-of-way within the subdivision. All such streets, roads, alleys, and rights-of-way are governed and controlled by all traffic laws set forth in state law and City ordinance.

5.11.014 Property Owner's or Homeowners' Associations (the "Association").

- A. Applicability. An incorporated nonprofit Association must be created when a subdivision contains private streets, or any other improvements not intended to be dedicated to the City of Boerne for public use. Such private streets, recreation facility, landscaped entry features or any other private amenity shall hereafter be referred to collectively as "Common Areas". The Association shall also be responsible for the maintenance of all landscaping, buffering, screening, irrigation and associated improvements adjacent to residential subdivisions along public thoroughfares.
- B. An Association agreement consistent with State and other appropriate laws must be submitted to and approved by the City Manager and made a part of the final plat documents. The restrictive covenants -- Covenants, Conditions and Restrictions ("CCRs") -- and the Association documents including articles of incorporation and by-laws shall be submitted to the City for review and approval along with the preliminary plat application, and shall be filed at Kendall County prior to final plat acceptance in order to ensure that there is an entity in place for long-term maintenance of these Common Areas. The Association's CCRs shall provide for continuous maintenance and control of the Common Areas by a responsible body, in perpetuity, for the benefit of the homeowners. Such maintenance and control shall be performed without using public funds. In the approval of the above documents, the City shall determine that the proper legal position is ensured and that the proposed Association will function properly both during and after the time in which the developer is active in the subdivision.
- C. The Association agreement must include provisions that allow, but do not require, the City to take over the maintenance of the Common Areas, including private streets, using Association funds if such action becomes necessary due to request of the Association, nonperformance or inaction by the Association and/or if the Association becomes defunct. The following provisions shall also be included in the Association Agreement which would control in the event the City is asked to take over the maintenance of the Common Areas by the Association:
 - 1. Grant the City all the rights of the Association to either file a lien on property within the subdivision or assess property owners within the subdivision for the costs of maintaining, repairing, replacing or making safe any Common Areas;
 - 2. In the sole discretion of the City, convey to the City ownership of all or part of the Common Areas either before or after exercising the City's rights under (a) herein above; and
 - 3. Authorize the City, upon taking ownership of the Common Areas to remove any improvements or amenities from the Common Areas and sell any buildable land area as residential lots to recoup the City's expenses for maintenance or demolition of the improvements. Any money that remains after the City has recovered all of its expenses, including any necessary and reasonable legal expenses, shall be retained for future maintenance or upgrading of the Common Areas (if any remain), screening walls, or other improvements within the subdivision. These provisions are not intended to allow the City to profit in any way from taking over the Association's responsibilities or funds; they are only intended to allow the City to recoup its actual incurred expenses.
- D. Membership. The Association shall be an incorporated nonprofit organization operating under recorded land agreements through which:
 - 1. Each lot owner within the described land area is automatically a mandatory member of the Association and such membership shall run with the title to each lot; and
 - 2. Each lot is automatically subject to a charge for a proportionate share of the expenses for the Association's activities, such as maintenance and upkeep of Common Areas. That is, membership in the Association is not voluntary and its primary source of operating funds is a periodic assessment levied against each parcel of land within the development under recorded covenants

which shall be incorporated into each deed and which shall run with the land to bind each and every owner of it and which are enforceable as a lien against the land.

- E. Association Contact Information. The Association shall provide and maintain an address and telephone contact with the City Secretary's office of the City of Boerne.
- F. Legal Requirements. In order to assure the establishment of a proper Association, including its financing, and the rights and responsibilities of the property or home owners in relation to the use, management and ownership of Common Areas, the subdivision plat, dedication documents, covenants, and other recorded legal agreements must:
1. Legally create an automatic membership, non-profit Association;
 2. Save the title to the Common Area properties for the benefit of the Association and express a definite undertaking by the developer to convey the Common Areas to the Association;
 3. Tie the covenants and use provisions to the plat so that collection of fees and denying use is legally supportable;
 4. Appropriately limit the uses of the Common Areas;
 5. Give each lot owner the right to the use and enjoyment of the Common Areas;
 6. Place responsibility for operation and maintenance of private streets and the Common Areas in the Association in perpetuity;
 7. Place an Association charge on each lot in a manner which will both assure sufficient Association funds, and which will provide adequate safeguards for the lot owners against undesirable high charges;
 8. Establish each lot owner's obligation to pay assessments for the maintenance and operation of the Common Areas which shall be set aside in a reserve fund subject to the following restrictions:
 - i. This reserve funds shall not be commingled with any other Association fund;
 - ii. The balance of the fund shall be equal to the total replacement cost of the improvements divided by the average life expectancy of such Common Areas times the age of the improvements. The life expectancy for a subdivision with private streets shall be a minimum of twenty (20) years;
 - iii. The Association shall have an annual review performed by a certified public accounting firm verifying that the amount in the reserve fund complies with the requirements herein and copy of the review shall be provided to City; and
 - iv. If the private streets and Common Areas are converted to the public, the reserve fund shall become the property of the City.
 9. Give each lot owner voting rights in the Association; and
 10. Identify land area within the Association's jurisdiction including but not limited to the following:
 - i. Property to be transferred to public agencies;
 - ii. The individual residential lots;
 - iii. The Common Areas to be transferred by the developer to the Association; and
 - iv. Other parcels.
- G. Government Access. Any governmental authority or agency, including, but not limited to, the City and the County, their agents, and employees, shall have the right of immediate access to the Common Areas at all times if necessary, for the preservation of public health, safety and welfare.
- H. Traffic Enforcement. The Association, its members and the City of Boerne agree that all traffic rules and regulations enforced and applied by the City on all public streets, alleys and rights-of-way governing the operation and movement of vehicles are hereby extended to all streets, alleys and rights-of-way within the subdivision. All such streets, roads, alleys, and rights-of-way shall henceforth be governed and controlled by all traffic laws set forth in state law and City ordinance.
- a. The City may erect, place, replace, maintain and/or remove such traffic control signs, signals and devices that may be necessary or appropriate in the application and extension of traffic rules and regulations to the subdivision. If the City is so required, all costs of erection, placement, replacement, maintenance and removal shall be reimbursed by the Association to the City within thirty (30) days of such invoice. This reimbursement requirement shall include, but not be limited, to the acquisition of property for sign placement.
- I. Failure to Maintain. Should the Association fail to maintain part or all of the Common Areas to City specifications for an unreasonable time, not to exceed ninety (90) days after written request to do so, then the City shall have the same right, power and authority to enforce the Association's rules and to levy assessments necessary to maintain the private streets and Common Areas. The City, in its sole discretion, may elect to exercise the rights and powers of the Association, or to take any action required and levy any assessment that the Association might have taken, either in the name of the Association or otherwise, to

cover the cost of maintenance (or the possible demolition, if such becomes necessary to preserve public safety or to ease maintenance burden) of any Common Areas. It is in the City's sole discretion as to whether to take such action. Any expenses incurred by the City in taking this action shall be borne by the Association and the City shall be repaid for such expenses incurred.

1. The City is not responsible for enforcing protective covenants or deed restrictions.
- J. Protective Covenants. Protective covenants shall be developed which, among other things, shall make the Association responsible for:
1. The maintenance and operation of all Common Areas;
 2. The enforcement of all other covenants;
 3. The administration of architectural controls (optional); and
 4. Certain specified exterior maintenance of exterior improvements of individual properties (optional).
- K. The City may require the Association to provide ongoing reporting of budgetary actions, financial reports, and collection activity on homeowners' assessments. Should the funding of the Common Areas maintenance not support the level of maintenance required by applicable ordinance, the City may require additional security for the provision of such maintenance.
- L. The Association may not be dissolved without the prior written consent of the City Council.
- M. No portion of the Association documents pertaining to the maintenance of private streets and alleys or other Common Areas, and assessments therefore, may be amended without the written consent of the City Council.
- N. The Association and its members agree to release, indemnify, defend and hold harmless the City, its officers, agents licensees, servants, contractors and/or employees ("Indemnitees"), from and against any and all claims or suits for property damage or loss and/or personal injury of whatever kind or character arising out of or in connection with, directly or indirectly: (a) the reasonable use of the private streets, emergency access, utility easements, entrance gate or structures by the Indemnitees; (b) the condition of the private streets, private entrance gates or structures, private walls and fences, private pedestrian access, private storm drainage systems and emergency access; or (c) any use of the addition by the Indemnitees for any purpose stated hereinabove, whether or not caused, in whole or in part, by the alleged negligence of the Indemnitees. The Association shall be responsible for carrying liability insurance to meet the requirements of this paragraph.
- O. All conflicting ordinances of the City are hereby repealed and all other provisions not in conflict with the provisions of this ordinance shall remain in full force and effect.
- P. Should any article, paragraph, subdivision, clause or provision of this ordinance, or the ordinances of the City, as hereby amended, be adjudged or held invalid or unconstitutional for any reason, such judgment or holding shall not affect the validity of this ordinance as a whole or any part or provision hereof other than the part so declared to be invalid or unconstitutional.

ARTICLE 6. DRAINAGE AND FLOOD HAZARDS

SECTION 01.	GENERAL REQUIREMENTS
SECTION 02.	REQUIRED DRAINAGE STUDY
SECTION 03.	DRAINAGE EASEMENTS
SECTION 04.	DRAINAGE SYSTEM DESIGN STANDARDS
SECTION 05.	FLOOD HAZARDS
SECTION 06.	PROTECTION OF SURFACE WATER SUPPLIES

SECTION 01. GENERAL REQUIREMENTS

6.01.001 Specific Intent.

It is the Specific Intent of this Section to:

- A. Preserve and protect sensitive natural areas that serve an ecological function in minimizing flood damage.
- B. Create a priority for maintaining natural drainage systems wherever possible and emphasize the design and arrangement of storm water facilities as community amenities, appropriate to the planning context.
- C. Minimize the amount of impervious surfaces directly connected to storm water systems, and reduce the amount of flow, speed of flow and level of contaminants entering both natural and manmade storm water systems.
- D. Allow flexibility in site designs and cooperation among adjacent development sites, to allow the most efficient development of sites and encourage individual designs that support a more regional or watershed-based storm water solutions.
- E. Integrate high-performance flood protection and storm water systems into the open space system.
- F. Encourage creative design solutions that allow areas to perform multiple functions in terms of storm water management, flood protection, open space and recreation, landscape and urban design, or other site development support functions.

6.01.002 Facilities Required.

The subdivider shall provide an adequate storm drainage system to protect each individual lot throughout the subdivision from flooding. These drainage facilities may consist of a combination of natural features, swales, watercourse improvements, bridges and culverts, enclosed storm sewers and other man-made improvements to carry off stormwater within the subdivision. The drainage system shall use detention ponds, retention ponds and siltation ponds, individually or in concert, to control runoff and to protect upstream, downstream and adjacent properties from any increase in flooding originating from the subdivision. The system shall be integrated with the overall drainage system of the city, and the design of the system must be approved by the City Manager in accordance with the requirements of this ordinance.

6.01.003 Stormwater Management.

Stormwater management facilities shall be provided prior to site construction or clearing, where design is required at the time of platting.

- A. Stormwater management shall be designed and constructed to prevent adverse conditions from arising on property adjoining, upstream and downstream of the subdivision site. Adverse conditions include increases in peak stormwater flows, water surface elevations and flow velocity. The applicant shall provide a drainage report that shows mitigation of the impacts of development or redevelopment on the existing downstream drainage system. Mitigation may include detention, retention, infiltration, channel improvements, and other means acceptable to the City Manager. Stormwater Management facilities shall be designed to reduce post-development or redevelopment peak flow rates of discharge to pre-development rates for the 2, 5, 10, 25, 50 and 100-year storm events at all points of discharge. The drainage report shall also include an evaluation of immediately upstream, downstream and adjacent property conditions to confirm no adverse impact.

B. Exemptions of Stormwater Management requirements.

The following types of development are exempt from the requirements as set forth in Section 6.01.002, Facilities Required if the following criteria is met:

1. Residential lots, whether created by metes and bounds or plat, meeting the criteria in a. or b. below:
 - a. The lot is larger than 3 acres and the total impervious cover on the lot, excluding the right of way, is less than 15 percent or,
 - b. The lot is less than 3 acres and the total impervious cover on the lot, excluding the right of way, is less than 20 percent.

Or;

2. An individual lot (commercial or residential - one lot) whether created by metes and bounds or by plat if the owner/applicant is adding 100 square feet or less of new impervious cover and will direct the runoff from any new impervious cover into a vegetated area outside of the right-of-way but within the same lot using methods described in the LID Manual or as provided by the City of Boerne for residential lots.

6.01.004 Construction Sequencing and Erosion Controls.

The final construction plans required by Article 8 shall be accompanied by a comprehensive and detailed report and plan for the control of erosion and sedimentation. The report shall include a construction sequencing plan which details the proposed placement, maintenance and removal of temporary erosion controls, the slope stabilization techniques which are to be employed and the restoration measures, including vegetative types, which are to be employed as part of the process of subdivision development. The plan shall list and show the location of temporary erosion controls, show the physical details of the controls, and include a construction sequencing list which will govern the timing of the use of various controls in relation to distinct steps in subdivision construction.

6.01.005 Land Clearing Restrictions.

No clear-cutting or rough-cutting of land shall be permitted unless approved by a construction sequencing and erosion control plan provided in subsection 6.01.004, except for the limited clearing and rough-cutting which is necessary for soil testing and surveying as required by this ordinance. No other clearing or rough cutting shall be permitted except as necessary for construction of temporary erosion and sedimentation controls until these controls are in place and approved by the City Manager. Areas to be cleared for temporary storage of spoil or construction equipment, or for the permanent disposal of fill material or spoils, shall be shown on preliminary plat. The natural vegetation within any water supply protection zone which is required by Section 6 B of this Article shall not be disturbed except for purposes consistent with the ultimate use of the land in that zone.

6.01.006 Enforcement of Erosion Controls and Clearing Restrictions.

If a subdivider does not comply fully with an approved erosion control and construction sequencing plan, or violates the restrictions on land clearance in the preceding subsection, the City Manager shall notify the subdivider in writing that the City may correct the violation and revegetate the disturbed area at the subdivider's expense unless, within 30 days after the date of the notice, the subdivider complies, corrects the violation, provides the required erosion and sedimentation controls and provides continuing maintenance thereof acceptable to the City Manager.

SECTION 02. REQUIRED DRAINAGE STUDY

6.02.001 Drainage Study Contents.

The subdivider shall submit a drainage study with the final construction plans for residential subdivisions, and wherever stormwater flow management facilities shall be regional and dedicated to the public. The required drainage studies in commercial subdivisions where facilities are site-specific and privately maintained may be submitted with building permit construction documents for each lot. The drainage study shall provide the following information, for both existing and fully developed conditions, for the entire watershed drainage area upstream of the lowest point(s) in the subdivision.

General

- A. Project Location depicted on a 7.5-minute series U.S.G.S. or aerial map.
 - 1. Include land plan and limit of downstream drainage assessment
- B. Digital Flood Insurance Rate Map (DFIRM) with site superimposed.
- C. Onsite Drainage Area Map (to scale) including the following:
 - 1. Time of Concentration flow paths
 - 2. Overall drainage areas for the site and indicate area for each
 - 3. Points of discharge to directly correlate with discharge summary tables
 - 4. Land use type data
 - 5. Land plan, when applicable
 - 6. Two-foot contour intervals
- D. Provide Overall Drainage Area Map (to scale) including the following, when applicable:
 - 1. Time of Concentration flow paths
 - 2. Overall drainage areas for the site and indicate area for each
 - 3. Points of discharge to directly correlate with discharge summary tables
 - 4. Approximate location of downstream drainage assessment limit
 - 5. Land use type data
 - 6. Land plan, when applicable
 - 7. Two-foot contour intervals
- E. Provide Soil Type Map (to scale) for the project site, when applicable.
 - 1. Include project area, land plan, and drainage areas
- F. Grading Plan (Also required in construction plans).
 - 1. Lots grading properly, including lot grading type (A, B, C)
 - 2. All storm drain, channel and/or pond facilities
 - 3. All proposed drainage easements, including width of easement
- G. Hydraulic Work Map including the following, when applicable
 - 1. Land plan
 - 2. Proposed drainage systems including storm drains, channels, and ponds
 - 3. Cross sections associated with supporting models
 - 4. Points of discharge/flow change locations
 - 5. Appropriate flood plain limits
 - 6. Approximate location of downstream drainage assessment limit
 - 7. Two-foot contour intervals

Hydrology

- A. Detailed Time of concentration/Lag Time calculations.
- B. Surface runoff coefficient calculations.
 - 1. Soil Type Map to be included when SCS curve number (CN) calculations provided
- C. Percent Impervious Cover detailed calculations.
- D. Peak flow summary table including:
 - 1. All storm events defined in Section 6.01.003
 - 2. Associated rainfall intensity factors, when applicable
- E. Detailed calculations for hydrologic routing as stated in 6.04.002, when applicable.
- F. Table comparing peak flows for specified conditions and storm events

Hydraulics

- A. 25- and 100-year flow quantities with the 25- and 100-year flood plain limits for the existing and fully developed watershed shown on the preliminary plat.
- B. Preliminary street grades and directional flow paths sufficient to determine high points, low point, and intended drainage patterns.
 - 1. Provide typical street section
 - 2. Provide summary of street capacities with supporting calculations for minimum and maximum grades along all streets proposed
- C. Proposed locations of inlets, storm drains, channels, and culvert along with supporting calculations.
- D. All proposed drainage easements, including width of easement and configuration of channel.
- E. Calculations to determine the volume of proposed detention/retention/sedimentation ponds.
 - a. Verify if pond qualifies as a Texas Commission of Environmental Quality (TCEQ) pond
- F. Summary of discharges and velocities at all major outlets, outfall, and at the downstream drainage assessment limit.
 - a. Specify proposed energy dissipation type and provide detailed calculations and supporting references

The above information shall be supplemented with narrative text describing the watershed and the subdivision, including their general soil conditions, downstream channel conditions, all weather access. In general, all deviations from the Boerne Subdivision Ordinance shall be included in the narrative with justification for deviation. The study shall be prepared by a professional engineer registered in the State of Texas. The drainage study shall be submitted

along with the administratively complete design and construction plans per Section 2.03 prior to submittal of the final plat. The City Manager shall review the submission, verify that all ordinance requirements have been met, and forward his/her recommendations to the Planning and Zoning Commission.

6.02.002 Downstream Drainage Assessment.

A downstream drainage assessment shall extend from the outfall of the subdivision to a point downstream, determined by one of two methods:

- *Zone of Influence* – Point downstream where the discharge from a proposed development no longer has a significant impact upon the receiving stream or storm drainage system
- *Adequate Outfall* – Location of acceptable outfall that does not create adverse flooding or erosion conditions downstream

These methods recognize the fact that a structural control providing detention has a “zone of influence” downstream where its effectiveness can be felt. Beyond this zone of influence the storm water effects of a structural control become relatively small and insignificant compared to the runoff from the total drainage area at that point. Based on studies and master planning results for a large number of sites, a general rule of thumb is that the zone of influence can be considered to be the point where the drainage area controlled by the detention or storage facility comprises 10% of the total drainage area. This is known as the *10% Rule*. As an example, if a structural control drains 10 acres, the zone of influence ends at the point where the total drainage area is 100 acres or greater.

The downstream assessment shall include the following steps:

1. Determine the outfall location of the site and the pre- and post-development site conditions.
2. Using a topographic map, determine a preliminary lower limit of the zone of influence using the 10% Rule.
3. Using a hydrologic model determine the pre-development peak flows and velocities at each junction beginning at the development outfall and ending at the next junction beyond the preliminary lower limit of the zone of influence (10% point). Model undeveloped off-site areas as “fully built-out” for both the pre- and post-development analyses. Use the City of Boerne Master Plan to determine future land uses for the model. Evaluate discharges and velocities for the 2- year, 5-year, 10-year, 25-year, 50-year and 100-year storms. Use storm durations equal to 24- hours.
4. Change the land use on the subdivision site to post-development conditions and rerun the model.
5. Compare the pre- and post-development peak discharges and velocities at the downstream end of the model. If the post-developed flows are higher than the pre-developed flows for the same frequency event, or the post-developed velocities are higher than the allowable velocity of the downstream receiving system, extend the model downstream. Repeat steps 3 and 4 until the post-development flows are less than the pre-developed flows, and the post-developed velocities are below the allowable velocity. Allowable velocities are given in Table 6-6 of this article.
6. Add proposed storm water management facilities to the model designed so that the model shows that adverse effects are mitigated. Adverse effects can be shown to be mitigated if flooding is not increased off site, velocities do not exceed the greater of Table 6-6 allowable maximum velocities or pre-development velocities, and that the peak flow at the downstream limit of the zone of influence is not increased.

SECTION 03. DRAINAGE EASEMENTS

6.03.001 General Requirements.

Natural waterways and channels should be used wherever practical to carry runoff. Any modifications to existing waterways and channels must be approved by the City Manager. Where a subdivision is traversed by a watercourse, drainageway, natural channel or stream, an easement or right-of-way shall be provided conforming substantially to the 100-year floodway or channel limits of such watercourse, plus additional width to accommodate future needs.

6.03.002 Enclosed Systems.

Storm drainage easements shall be provided for existing and proposed enclosed drainage systems. Easements shall be centered on the systems. The easement width shall be based on the following formula:

$$W = 5' + 2H + D$$

W is the width of the easement
 H is the depth of soil cover over the pipe or box structure
 D is the diameter or width of pipe or box structure

6.03.003 Open Channels.

Storm drainage easements along proposed or existing open channels shall provide sufficient width for the required channel and such additional width as may be required to provide ingress and egress of maintenance equipment; to provide clearance from fences and space for utility poles; to allow maintenance of the channel bank; and to provide adequate slopes necessary along the bank.

The minimum easement width shall be the width of the channel plus 15 feet on one side (20 feet with utilities) and 2 feet on the opposite side unless approved by the City manager. The channel top width is determined by the locations where the channel side slopes intersect with adjacent grade with cross slopes less than 10 percent.

6.03.004 Overflow Drainage.

Storm drainage easements shall be provided for emergency overflow drainage ways of sufficient width to contain within the easement storm water resulting from a 100-year frequency storm less the amount of storm water carried in an enclosed system.

6.03.005 Drainageway Protection Zone.

The Drainageway Protection Zone is an area that extends horizontally landward a specified distance from the center line of a route or course along which water moves or may move to drain a region.

1. Protection Zone 1 is approximately the width of the riparian zone and is measured from the drainageway center line.
 - a. Protection Zone 1 is intended to protect or allow restoration the physical and ecological integrity of natural stream corridors.
 - b. Vegetation must remain undisturbed to the maximum practical extent in this zone to assure proper functioning of this zone. Limited access to a permanent water course is allowed in private or publicly dedicated recreational areas.
2. Protection Zone 2 is the outer protection zone and is measured from the outer edge of Protection Zone 1 and extend horizontally the remaining distance of the Total Protection Width.
 - a. The outer zone is intended to prevent encroachment into the riparian zone, and to provide distance between development activity and the riparian zone.

Drainage Area (Acres)	Protection Zone 1	Protection Zone 2	Total Protection Width (each side)
≥25 acres and less than 128 acres	35'	20'	55'
≥128 acres and less than 320 acres	55'	30'	85'
≥320 acres and less than 640 acres	70'	50'	120'
≥640 acres	100'	50'	150'

3. Restrictions in Drainageway Protection Zones.

Drainageway protection zones shall remain reasonably free of all construction activity. Protection zone 1 may allow those street crossings as identified in 6.06.004. Protection zone 2 shall remain free of all construction activity, development and alterations accept as allowed in 6.06.003.

SECTION 04. DRAINAGE SYSTEM DESIGN STANDARDS

6.04.001 General Requirements.

Drainage facilities shall be provided and constructed as specified by the City Manager in accordance with the City Drainage Design Standards and Construction Specifications.

6.04.002 Method of Computing Runoff.

The method of computing runoff shall be the Rational Method for watersheds of 200 acres or less in area and with time of concentration of 60 minutes or less. For watersheds with an area greater than 200 acres or time of concentration greater than 60 minutes, a computer model acceptable to the City Manager or a hydrograph method as shown in the Texas Department of Transportation (TXDOT) Hydraulic Design Manual (HDM) shall be prepared. Also, when designing detention facilities or determining downstream impacts, a similar approach shall be used. In all cases, normal antecedent conditions shall be assumed unless otherwise determined by the City Manager.

- A. *Rational Method.* The following parameters shall be used for runoff calculations by the Rational Method.
1. The Rational Method shall use the following formula:

$$Q = CC_f IA$$

Where:

- Q = The flow at the discharge of the watershed, cubic feet per second (cfs).
- C = The runoff coefficient, dimensionless, from Table 6-1 or Table 6-2
- C_f = Runoff coefficient adjustment factor from Table 6-3.
- I = Rainfall intensity, inches per hour, from Figure 6-1.
- A = Watershed area, acres.

2. Runoff coefficients may be calculated based on specific land use established by the Zoning Districts according to Table 6-1 below, or
3. A composite runoff coefficient based on the percentages of different types of surfaces in the drainage area according to Table 6-2 below.
4. Runoff coefficients given in Table 6-1 and Table 6-2 are valid for storms up to and including the 10-year storm. Use the adjustment factor in Table 6-3 for other storm frequencies.

TABLE 6-1: RATIONAL METHOD RUNOFF COEFFICIENTS BY ZONING DISTRICT				
Zoning District	Average Impervious Cover (%)	Slope		
		Up to 2%	Over 2% & Up to 7%	Over 7%
RA Single Family Residential-Agricultural	10	0.31	0.40	0.44
RMA Single Family Residential-Manor Lots	25	0.40	0.47	0.51
RE Single Family Residential – Estate	30	0.42	0.49	0.53
RE1 Low Density Single Family Residential	35	0.45	0.52	0.55
R1 Medium Density Single Family Residential	40	0.48	0.54	0.57
RN1 Neighborhood Residential	45	0.51	0.57	0.59
R2 Moderate Density Residential	50	0.54	0.59	0.62
R3 High Density Residential	60	0.60	0.64	0.66
R-4 Multi-family Residential	65	0.63	0.66	0.68
RMO Modular Residential	55	0.57	0.61	0.64
O Office	70	0.66	0.69	0.70
B1 High Density Residential & Neighborhood Commercial	80	0.71	0.73	0.74

ARTICLE 6. DRAINAGE AND FLOOD HAZARDS

MU1 Mixed Use District	75	0.69	0.71	0.72
B2 Highway Commercial	85	0.74	0.76	0.77
B2R Highway Commercial (Restricted)	80	0.71	0.73	0.74
MU2 Mixed Use District	75	0.69	0.71	0.72
B3 Central Business	92	0.78	0.79	0.80
RC River Corridor	90	0.77	0.78	0.79
I Industrial	95	0.80	0.81	0.81
MHC Manufactured Home Community	55	0.57	0.61	0.64

Note: Average expected impervious cover is indicated, if impervious cover of development will differ because of overlay zoning or other conditions, alternative factors may be used when justified to the satisfaction of the City Manager in the drainage report.

TABLE 6-2: RATIONAL METHOD RUNOFF COEFFICIENTS FOR COMPOSITE ANALYSIS	
Character of Surface	C
Developed Areas	
Asphaltic	0.81
Concrete or Roof	0.83
Planted – Poor Condition (grass cover on less than 50% of the area)	
Less than 2% Slope	0.37
2 – 7% Slope	0.43
More than 7% Slope	0.45
Planted – Fair Condition (grass cover on 50% to 75% of the area)	
Less than 2% Slope	0.30
2 – 7% Slope	0.38
More than 7% Slope	0.42
Planted – Good Condition (grass cover on more than 75% of the area)	
Less than 2% Slope	0.25
2 – 7% Slope	0.35
More than 7% Slope	0.40
Undeveloped Areas	
Cultivated Land	
Less than 2% Slope	0.36
2 – 7% Slope	0.41
More than 7% Slope	0.44
Pasture or Range Land	
Less than 2% Slope	0.30
2 – 7% Slope	0.38
More than 7% Slope	0.42
Forest or Wooded Land	
Less than 2% Slope	0.28
2 – 7% Slope	0.36
More than 7% Slope	0.41

TABLE 6-3: RUNOFF COEFFICIENT ADJUSTMENT FACTORS FOR RATIONAL METHOD	
Storm Frequency (years)	C _f
25	1.1
50	1.2
100	1.25

Note: Use C_f = 1 for 10-year form frequency or less.

5. Rainfall intensity shall be calculated as function of the time of concentration. The time of concentration shall be calculated based on its component parts and summed to determine the total time of concentration. Flow shall be assumed to begin as sheet flow, develop into shallow concentrated flow until the flow enters a drainage system where it becomes pipe flow or channel

ARTICLE 6. DRAINAGE AND FLOOD HAZARDS

flow. Sheet flow shall not exceed a length of 300 feet. Shallow concentrated flow shall be the total between the end of the sheet flow and the beginning of a drainage system. The following equations may be used to calculate travel time for sheet flow and shallow concentrated flow, respectively:

$$T_{Sheet} = \frac{Ln}{42S^{0.5}}$$
$$T_{Shallow} = \frac{Ln}{60S^{0.5}}$$

Where:

T_{Sheet} = Sheet flow travel time, minutes.

$T_{Shallow}$ = Shallow concentrated flow travel time, minutes

L = Flow length, feet, maximum 300 feet for sheet flow.
 N = Manning's roughness coefficient from Table 6-4.
 S = Slope of ground, ft/ft.

Where hydraulic calculations can be performed to calculate the velocity in the drainage system, the calculated velocity shall be used to determine the time of concentration in the drainage system. In other cases, use Manning's equation with the roughness coefficients given below to calculate the velocity in the drainage system.

TABLE 6-4: MANNING'S ROUGHNESS COEFFICIENTS FOR SHEET FLOW AND SHALLOW CONCENTRATED FLOW	
Manning's "n"	Condition
0.016	Concrete (rough or smoothed finish)
0.02	Asphalt
0.1	0-50% vegetated ground cover, remaining bare soil or rock outcrops, minimum brush or tree cover
0.2	50-90% vegetated ground cover, remaining bare soil or rock outcrops, minimum- medium brush or tree cover
0.3	100% vegetated ground cover, medium- dense grasses (lawns, grassy fields etc.) medium brush or tree cover
0.6	100% vegetated ground cover with areas of heavy vegetation (parks, green- belts, riparian areas etc.) dense under- growth with medium to heavy tree growth

Use the total calculated time of concentration as the duration to determine the critical rainfall intensity from Figure 6-1. Use a minimum time of concentration of 5 minutes.

**Boerne Rainfall Intensity-Duration-Frequency Curves
(Durations: 5-60 minutes)**

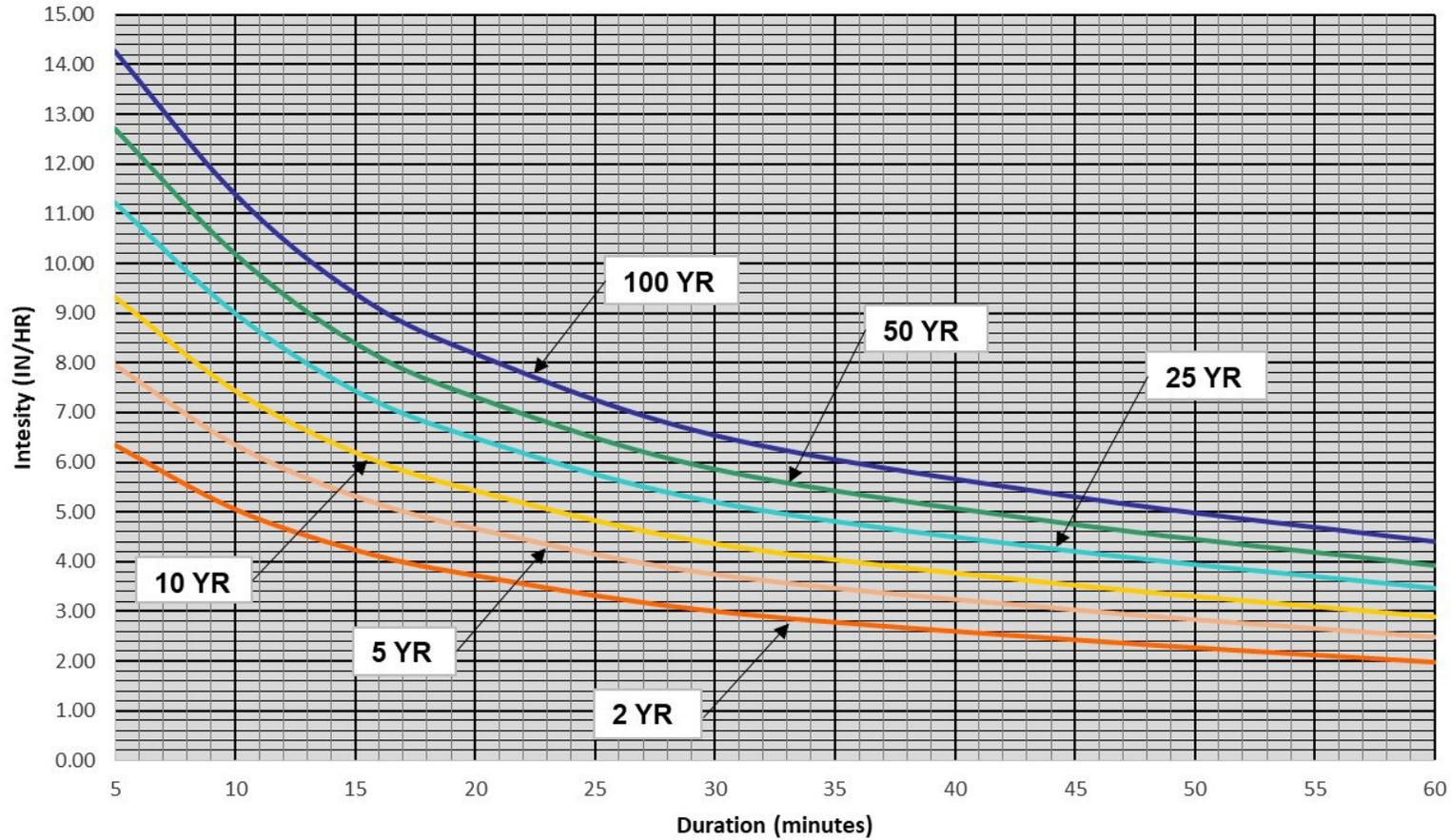


Figure 6-1 – Boerne Rainfall IDF Curves (Duration 5-60 Minutes)

B. *Computer Models.* Computer models shall be prepared using the HEC-HMS software developed by the US Army Corps of Engineers Hydrologic Engineering Center. Parameters for the model shall be determined as described herein. Rainfall and runoff relationships shall be based on the methodology and parameters provided in TR-55 Urban Hydrology for Small Watersheds (TR-55) published by the Natural Resource Conservation Service (NRCS) except as modified herein. All published Hydrology and Hydraulic models shall be used if available (FEMA, San Antonio River Authority).

- i. Runoff: The TR-55 methodology shall be used for runoff calculations in HEC-HMS. Curve numbers shall be determined from the values given in TR-55 or pre-approved references by the City Manager. In addition, impervious cover values shall be estimated from aerial photos for existing conditions. For post-development conditions, the maximum anticipated impervious cover shall be used with the appropriate curve number for the development. An assumption that the initial abstraction is equal to 0.2 times the maximum soil retention per TR-55 shall be used unless calibration data is available to justify other figures to the satisfaction of the City Manager.
- ii. Rainfall: Values from Table 6-5 shall be used to calculate the rainfall depth-duration-frequency relationships for the model. Rainfall distribution shall be based on the Type II distribution per TR-55.

TABLE 6-5: BOERNE RAINFALL DEPTHS FOR VARIOUS DURATIONS AND FREQUENCIES.

Duration (Minutes)	Frequency					
	2-year (Inches)	5-year (Inches)	10-year (Inches)	25-year (Inches)	50-year (Inches)	100-year (Inches)
5	0.53	0.66	0.78	0.94	1.06	1.19
10	0.84	1.06	1.24	1.86	1.70	1.90
15	1.06	1.33	1.81	2.16	2.44	2.35
20	1.24	1.56	1.81	2.16	2.44	2.73
30	1.50	1.87	2.18	2.60	2.93	3.27
45	1.82	2.27	2.65	3.16	3.56	3.98
60	1.97	2.47	2.89	3.47	3.92	4.40
120	2.43	3.09	3.69	4.56	5.28	6.06
180	2.70	3.48	4.23	5.28	6.21	7.23
240	2.91	3.79	4.60	5.85	6.94	8.15
360	3.16	4.14	5.09	6.53	7.79	9.22
720	3.63	4.81	5.95	7.71	9.24	11.00
1440	4.14	5.53	6.88	8.95	10.80	12.80

- iii. Unit hydrograph development shall be based on the Snyder-Clark Synthetic Unit Hydrograph. The following equations and parameters shall be used unless a more precise calibration is provided and approved by the City Manager.

Use the following to compute the duration of the Unit Hydrograph:

Use the following to compute the duration of the Unit Hydrograph:

$$t_r = \frac{t_p}{5.5}$$

Where:

t_r = Unit hydrograph duration (hours).

t_p = basin lag time (hours).

Use the following to compute the basin lag time developed by the Tulsa District Corps of Engineers and used by the San Antonio River Authority in the hydraulic modeling of the Cibolo Creek Watershed:

$$t_{lag} = C_t \left(\frac{L \cdot L_{ca}}{\sqrt{S}} \right)^{0.39}$$

Where:

- t_p = basin lag time (hours).
- L = Length of longest flow path in the watershed (miles).
- L_{ca} = Length to the centroid along the longest flow path (miles).
- C_t = Coefficient, based upon level of watershed development in the watershed.
- S = average slope of the longest flow path (ft. /ft.)

The C_t coefficient is defined based on the percentage of development within the watershed by:

$$C_t = 1.4224e^{-0.0088x}$$

Where:

x = is the percentage of development (in percent form)

The peak discharge of the unit hydrograph shall be calculated by:

$$q_p = 380t_{lag}^{-0.92}$$

$$C_p = \frac{q_p t_{lag}}{640} \text{ or } C_p = 0.594t_{lag}^{0.08}$$

Where:

q_p = peak discharge of the unit hydrograph (cfs).

C_p = Snyder's peaking coefficient.

A = watershed size (sq. mi.).

t_p = basin lag time (hours).

TABLE 6-6: SNYDER'S PEAKING COEFFICIENT		
Watershed Type	Average Watershed Slope	C_p
Flat	$S \leq 0.5\%$	0.55
Moderate	$0.5\% \leq S \leq 1.5\%$	0.61
Rolling	$1.5\% < S \leq 3.0\%$	0.71
Steep	$S > 3.0\%$	0.80

- iv. Modified Puls methodology shall be used when detailed hydraulic models are available, but Muskingum-Cunge may be used for all other methods.
- 6. For watersheds greater than 10 square miles, the effects of storm centering must be taken into account. Consult with city staff prior to completing the model (TXDOT HDM Chapter 4 Section 13).
- 7. Watershed delineation for hydrologic models must include at a minimum the subareas delineated in the City of Boerne Watershed Map. In addition, subareas shall be added to the model to effectively isolate the subject development.

6.04.003 Hydraulic Calculations.

Hydraulic calculations shall be based on industry standard methods and as described herein. The purpose of hydraulic calculations shall be to determine the depth, velocity, and width of flow in drainage systems. Small systems may be designed based on normal depth calculations using Manning's equation. Large systems must be modeled using acceptable computer software. Closed systems must include calculations for inlet capacity, pipe capacity, hydraulic grade line and energy grade line. Flow depths and hydraulic grade lines shall be plotted on construction plans.

- A. *Open Systems.* Open systems include channels, swales, detention ponds and other open forms of drainage conveyance and/or storage.
 - i. Small systems: Small systems have a maximum normal depth of 3.0 feet and serve a watershed smaller than 100 acres. Normal depth calculations shall be used for design based on the Manning's equation:

$$V = \frac{1.486}{N} R^{2/3} S_f^{1/2}$$

Where:

V = average flow velocity in feet per second.

N = Manning's roughness coefficient.

R = hydraulic radius = $\frac{A}{WP}$ in feet.

S_f = Friction slope in feet per foot, assumed equal to channel slope.

A = flow area in square feet.

WP = wetted perimeter in feet.

The average flow velocity and flow area are related to the discharge flow rate as follows:

$$Q = VA$$

Where Q = discharge flow rate in cubic feet per second.

- ii. Large systems: Large systems either have a normal depth greater than 3.0 feet or serve a watershed of 100 acres or more. These systems require that a backwater model be prepared to show the depth of flow and velocity in the system. Natural channels shall be modeled using HEC-RAS computer software developed by the US Army Corps of Engineers Hydrologic Engineering Center. Other channels may also be modeled using HEC-RAS. Uniform cross-section channels may be modeled using the standard step procedure in hand calculations or other software programs acceptable to the City Manager. Both

methods shall make use of the Manning's equation for channel friction losses. For natural channels, Manning's n values should be estimated using experienced judgment and information presented in publications such as the *Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains*, FHWA-TS-84-204, 1984, FHWA HEC-15, 1988, or Chow, 1959. Some of these values are given in Table 6-8 below. Use the values in Table 6-6 below for artificial channels.

TABLE 6-7: ROUGHNESS COEFFICIENTS (MANNING'S N) FOR NATURAL CHANNELS		
Channel Description	Manning's n	
MINOR NATURAL STREAMS		
Fairly regular section		
1. Some grass and weeds; little or no brush	0.030	
2. Dense growth of weeds, depth of flow materially greater than weed height	0.035	
3. Some weeds, light brush on banks	0.035	
4. Some weeds, heavy brush on banks	0.050	
5. Some weeds, dense willows on banks	0.060	
For trees within channels with branches submerged at high stage, increase above values by	0.010	
Irregular section with pools, slight channel meander, increase above values by	0.010	
Floodplain – Pasture		
1. Short grass	0.030	
2. Tall grass	0.035	
Floodplain – Cultivated Areas		

TABLE 6-7: ROUGHNESS COEFFICIENTS (MANNING’S n) FOR NATURAL CHANNELS		
Channel Description	Manning’s n	
1. No crop	0.030	
2. Mature row crops	0.035	
3. Mature field crops	0.040	
Floodplain – Uncleared		
1. Heavy weeds scattered brush	0.050	
2. Wooded	0.120	
MAJOR NATURAL STREAMS Roughness coefficient is usually less than for minor streams of similar description on account of less effective resistance offered by irregular banks or vegetation on banks. Values of “n” for larger streams of mostly regular sections, with no boulders or brush	Range from 0.028 to 0.060	
UNLINED VEGETATED CHANNELS		
Clays (Bermuda Grass)	0.035	
Sandy and Silty Soils (Bermuda Grass)	0.035	
UNLINED NON-VEGETATED CHANNELS		
Sandy Soils	0.030	
Silts	0.030	
Sandy Silts	0.030	
Clays	0.030	
Coarse Gravels	0.030	
Shale	0.030	
Rock	0.025	

TABLE 6-7 MANNING’S ROUGHNESS COEFFICIENTS (n) FOR ARTIFICIAL CHANNELS				
		Depth Ranges		
Category	Lining Type	0-0.5 ft	0.5-2.0 ft	>2.0 ft
Rigid	Concrete	0.015	0.013	0.013
	Grouted Riprap	0.040	0.030	0.028
	Stone Masonry	0.042	0.032	0.030
	Soil Cement	0.025	0.022	0.020
	Asphalt	0.018	0.016	0.016
Unlined	Bare Soil	0.023	0.020	0.020
	Rock Cut	0.045	0.035	0.025
Temporary*	Woven Paper Net	0.016	0.015	0.015
	Jute Net	0.028	0.022	0.019
	Fiberglass Roving	0.028	0.022	0.019
	Straw with Net	0.065	0.033	0.025
	Curled Wood Mat	0.066	0.035	0.028
	Synthetic Mat	0.036	0.025	0.021
Vegetated lining	Sod lining	0.035	0.035	0.030
		0.030	0.030	0.028
Gravel Riprap	1-inch D ₅₀	0.044	0.033	0.030
	2-inch D ₅₀	0.066	0.041	0.034
Rock Riprap	6-inch D ₅₀	0.104	0.069	0.035
	12-inch D ₅₀	-	0.078	0.040
Note: Values listed are representative values for the respective depth ranges. Manning’s roughness coefficients, n, vary with the flow depth. *Some “temporary” linings become permanent when buried.				

Source: HEC-15, 1988.

- iii. **Detention and Retention Ponds:** Detention ponds shall be analyzed using commercially available software approved by the City Manager or HEC-HMS. Inflow hydrographs developed in accordance with Section B, above shall be used with the design depth-volume-discharge rating curve for the pond to determine the outflow hydrograph. An outflow hydrograph shall be plotted for each of the design storms. The pond may use a combination of culverts, weirs and spillways to control the outflow from the pond. Culverts used as outflow structures must be designed for inlet control. The pond embankment shall include one foot of freeboard above the 100-year maximum depth and embankment shall have a 4’ minimum top width for maintenance purposed. A spillway shall be provided to prevent breach of the pond embankment.

B. Closed Systems. Closed systems include underground storm sewers, culverts and any drainage system with the potential for being surcharged. Refer to the Hydraulic Manual published by Texas Department of Transportation, Bridge Division for design procedures, equations, parameters, and other information for design of closed drainage systems except as modified herein. Software programs acceptable to the City Manager that use procedures and equations derived from the Hydraulic Manual may be used. Spreadsheets and other non-commercial software calculations must show each step and be adequately documented for approval by the City Manager.

- i. Storm sewer systems shall be designed for gravity flow with no surcharge with flows from the 5-year storm. The Hydraulics shall then be checked for the 100-year storm by plotting the hydraulic grade line and energy grade line for the system. The final system design shall not allow the energy grade line to be higher than the ground and shall maintain the hydraulic grade line below ground by at least one foot at all locations within the storm sewer system. Refer to the Hydraulic Manual for inlet capacities, entrance loss calculations and other factors required to calculate and plot the energy and hydraulic grade lines.
- ii. Culverts shall be designed in accordance with the procedures and factors in the Hydraulic Manual. Variances from this procedure shall be approved by the City Manager.

6.04.004 Use of streets as Drainage Facilities.

Streets may be used to carry storm water to dedicated drainage facilities. However, streets may not be used as a continuation of or discharge for other drainage facilities such as ponds, channels, or sub-surface facilities without approval of the City Manager. The maximum spread of storm water in street gutters must provide for the requirements of Table 6-9 below. The depth of flow in streets shall be measured at its deepest point, at the curb in the gutter. Inlets shall be provided to minimize the flow of storm water in streets and alleys. Streets carrying storm water shall have a minimum cross slope of 2% at all times except at transitions from crowned sections to superelevated sections. In transition, the longitudinal slope shall be a minimum of 0.70% whenever the cross slope is less than 2% and the requirements of Table 6-9 must be met. Inlets should be provided on both sides of crowned streets to remove storm water. Thoroughfares, arterials, and collectors shall not allow storm drainage to cross traffic lanes unless approved by the City Manager.

TABLE 6-9: STORM WATER CARRYING CAPACITY OF STREETS BY FUNCTIONAL CLASSIFICATION		
Functional Classification	5-Year Criteria	100-Year Criteria
Regional Thoroughfare	Two 12' lanes dry	Maximum 6 IN depth
Arterial (Undivided)	Two 11' lanes dry	Maximum 6 IN depth
Arterial (Divided)	One 11' lane dry each direction	Maximum 6 IN depth
Collector	One 12' lane dry	Contained within ROW
Local (Non-residential)	One 10' lane dry	Contained within ROW
Local (Residential)	Max 6 IN depth	Contained within ROW
Access	Curb full	Contained within ROW

6.04.005 Storm Sewers.

Where storm sewers are provided, they shall be designed in accordance with the above criteria in Section 6.04.003.B and the structures provided shall be designed and constructed in accordance with design criteria and assumptions used in the design. A final design report shall provide the calculations and show that the structures and facilities included in the construction plans will function as the calculations describe. Calculations of hydraulic grade shall be shown in the report and the line plotted on the profiles included in the construction plans.

6.04.006 Capacity of Open Drainage Channels.

The design of all open drainage channels shall be based on a 100-year storm frequency and must be approved by the City Manager. All open drainage channels shall be designed with at least the minimum freeboard specified in Table 6-10 below.

TABLE 6-10: MINIMUM DRAINAGE CHANNEL FREEBOARD	
Design Depth of Flow	Required Freeboard
Less than 5 feet	0.5 foot
5 – 10 feet	10% of design depth
More than 10 feet	1.0 foot

Add extra freeboard whenever design conditions such as channel bends or turns require it.

6.04.007 Lining of Open Drainage Channels

Use Table 6-11 below to determine the channel lining used for scour protection and erosion control. The maximum calculated velocity shall be used for design. The only approved linings are shown in Table 6-11, no other channel linings are approved unless specifically approved by the City Manager.

TABLE 6-11: VELOCITY CONTROL REQUIREMENTS	
Maximum velocity	Type of Channel Lining Required
Less than 3 feet per second	Vegetated earth or sod lined
3 – 5 feet per second	Sod lined
More than 5 feet per second	Concrete lined

6.04.008 Design of Concrete Lined Channels.

All concrete lined channels shall be designed according to the following standards, and their design must be approved by the City Manager.

- A. From the top of the concrete lining to the top of the ditch, the side slope shall not be steeper than three horizontal to one vertical, nor shall the slope be less than 12 horizontal to one vertical.
- B. For normal conditions, the concrete lining shall be a minimum of four inches thick and reinforced with No. 3 round bars placed not more than 18 inches on centers in both directions. Where the surface, the nature of the ground, height and steepness of slope, or other factors become critical, the design shall be in accordance with the latest structural standards and codes.
- C. Maximum side slopes of concrete rip-rap shall be one to one, unless actual soils test data submitted by a soils engineer shows that a steeper special design is allowable. A minimum of 200 pounds per square foot surcharge shall be used.
- D. Vertical walls shall not exceed a depth of two feet unless the channel is properly fenced or enclosed.
- E. Where conditions warrant, the design of alternative composite sections is encouraged.

6.04.009 Design of Sod-Lined and Earth Channels.

All sod-lined and earth channels shall be designed according to the following standards, and their design must be approved by the City Manager.

- A. The side slope shall not be steeper than three horizontal to one vertical.

SECTION 05. FLOOD HAZARDS

6.05.001 General Policy.

All subdivisions shall conform to the "Flood Disaster Protection Act of 1973," Public Law 93-234, and the latest revisions thereof. The Flood Damage Prevention Ordinance as amended and policies as dictated by the Federal Emergency Management Agency shall be adhered to.

6.05.002 Flood Plain Designations and General Restrictions.

Local Floodplains shall be designated as the area inundated by the 100-year flood for all watersheds draining 25 acres or more that do not have a regulatory floodplain and are defined as a drainageway per this ordinance (Article 1, Section 04). Local floodplains are further defined by a minimum 1-foot flow depth to exclude shallow concentrated or sheet flows from being identified as elevated risk zones per FEMA guidelines. Base flood elevation data shall be generated for all local floodplains and submitted to the City of Boerne for review with any proposed development. Development is prohibited within the local floodplain, except where allowed by subsection 6.06.003. Redevelopment within the local floodplain may be allowed according to the provisions in the subdivision code.

6.05.003 General Requirements in Flood Plains.

The limits of the 100-year FEMA or 100-year local floodplain and the limits of the floodway shall be shown on the preliminary and final plats as applicable. The minimum building slab elevation for lots in or that about the 100-year floodplain shall be based on the following table.

Basis of Study	Minimum building slab elevation
Atlas 14 Rainfall	1 foot above 100-year floodplain Base Flood Elevation
Rainfall other than Atlas 14	2 feet above the 100-year floodplain Base Flood Elevation

6.05.004 Flood Hazards to Water and Wastewater Systems.

New or replacement water supply systems and/or wastewater systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters. On-site waste disposal systems shall be located so as to avoid impairment of them or contamination from them during flooding.

6.05.005 Review of Proposed Subdivision Flood Hazards.

Proposed subdivisions shall be reviewed to assure that:

- A. All such proposals are consistent with the need to minimize flood damage;
- B. All public utilities and facilities, such as sewer, gas, electrical, and water systems are located, elevated, and constructed to minimize or eliminate flood damage; and
- C. Adequate drainage is provided so as to reduce exposure to flood hazards.

6.05.006 Access to Subdivisions.

The Planning and Zoning Commission shall not permit new "island" subdivisions, lots or streets that would be surrounded by the flood waters of the 100-year flood, unless:

- A. The area is accessible to high ground by a street elevated above the 100-year flood level; or
- B. The evidence presented shows that the surface area and elevation of the "island" is sufficient to sustain the residents safely during a 100-year flood.

SECTION 06. PROTECTION OF SURFACE WATER SUPPLIES

6.06.001 Statement of Purpose.

The City Council hereby finds and declares that the City's dependence on surface water supplies which are impacted by urban development poses a potentially serious risk to public health, safety and welfare from possible degradation or contamination of these water supplies. Therefore, the following regulations are enacted in order to prevent pollution of the public water supply and to ensure the preservation of clean and safe drinking water, while still allowing reasonable development, use and enjoyment of private property. These objectives are to be achieved by emphasizing passive measures to prevent both point and non-point source pollution, supplemented by the use of structural controls where necessary.

6.06.002 Water Supply Protection Zones.

Water Supply Protection Zones within the area draining into a lake which is used or intended to be used by the City as a surface reservoir for drinking water shall be defined as the Drainageway Protection Zones established under 6.03.004. On all sides around the shores at normal pool of any lake which is used or intended to be used by the City as a surface water reservoir, the buffer zone shall be a minimum of 200 feet.

6.06.003 Restrictions in Water Supply Protection Zones.

The water supply protection zone shall remain free of all construction activity, development and alterations except for the following:

- A. Street crossings as provided by subsection 6.06.004 below;
- B. Utilities as provided by subsection 6.06.005 below;
- C. Fences that do not obstruct the flow of water;
- D. Public and private parks and similar open spaces, in which development is limited to trails and facilities (other than stables and corrals for animals) for hiking, jogging, non-motorized biking, and nature walks; and
- E. Water quality or flood control systems with minimum disruption to the natural surface and natural vegetation.

6.06.004 Street Crossings in Water Supply Protection Zones.

Neighborhood Local streets shall not cross a water supply protection zone. Regional thoroughfares and all types of arterial and collector streets may cross a water supply protection zone only at right angles or as near as practicable to right angles in the judgment of the City Manager. All crossings should use the *Rural Design Type* specified in Article 3. All streets in the zone shall be designed and constructed with sedimentation and filtration basins sufficient to capture and treat the first one-half inch of rainfall runoff from the roadway. In addition, all regional thoroughfares in the zone shall be designed and constructed with hazardous material traps that will capture, contain and isolate a hazardous material spill in the street right-of-way. These hazardous material traps shall have a minimum volume of 10,000 gallons and they shall contain a self-draining outlet and an emergency cut-off to contain any spilled materials. No bridge structure shall discharge directly from the roadway surface into the zone. All bridges shall be designed to transport stormwater off the bridge structure and into a sedimentation pond or filtration basin, or to provide equivalent water quality protection in the judgment of the City Manager.

6.06.005 Utilities in Water Supply Protection Zones.

All underground utilities, other than sewer mains, shall be located outside the water supply protection zone, except for necessary crossings. Underground utilities crossing the zone shall utilize shared trenches wherever practical in the judgment of the City Manager. Before submitting an application for preliminary plat approval, the subdivider shall consult with the City Manager to evaluate possible alternatives for the location and design of sewer mains in the zone.

6.06.006 Impervious Cover in Zone Drainage Areas.

In order to reduce the potential pollutant and contaminant load which may ultimately be carried by drainage into the City water supply, the maximum percentage of the area which may be covered by impervious surfaces within any subdivision in any drainage basin above a City water supply reservoir shall be limited according to the following table. The limits of a drainage basin shall be determined according to USGS maps and confirmed in the final plat by a survey of the proposed subdivision site. The "percent impervious cover" shall be calculated as the total area of all impervious surfaces within the perimeter of a subdivision, divided by the total area within the perimeter of the subdivision. In a subdivision which is to be developed in more than one land use, the impervious surfaces in streets and alleys shall be counted and assigned as divided equally between the lot areas on both sides of the street or alley according to the frontage of the lot areas in each contrasting land use. A request for a variance from the provisions of this subsection must be accompanied by clear and convincing evidence, at a minimum consisting of engineering documents submitted under the seal of a registered engineer, that the proposed impervious cover in excess of that allowed by this subsection will not cause any degradation in the quality of the runoff originating on the site and draining toward the City water supply lake.

TABLE 6-12: MAXIMUM IMPERVIOUS COVER IN WATER SUPPLY DRAINAGE AREAS	
Context – Development Pattern	Maximum Percent Impervious Cover
Rural Residential	10%
Low-Density Residential	30%
Neighborhood Residential	50%
Centers and Special Districts	65%

See Boerne Zoning Ordinance, Article 4, Section 05.006. for site design techniques to reduce the effective impervious surface.

6.06.007 Stormwater Treatment in Zone Drainage Areas.

All stormwater management facilities in drainage basins upstream of a City water supply reservoir shall be designed as Low Impact Development Facilities to treat 95 percent of the annual stormwater runoff volume as defined in Section 3.06.001 C. The water quality volume in Zone Drainage Areas is defined as the runoff resulting from the first 2.35" of rainfall. Any subsequent runoff in excess of the design capacity of the basins shall bypass the basins and remain segregated from the contained runoff waters including those waters in a detention basin if required. Input to and release from the drainage facilities required by this subsection for water quality protection shall be designed according to the requirements in Section 3.06.001 and utilize vegetated swales and/or overland flow dispersion measures where possible before release into the reservoir or a contributing stream.

ARTICLE 7. WATER AND SEWERS

- SECTION 01. GENERAL REQUIREMENTS FOR WATER SYSTEMS
 - SECTION 02. WATER SYSTEM DESIGN STANDARDS
 - SECTION 03. WATER MAINS
 - SECTION 04. FIRE HYDRANTS
 - SECTION 05. SANITARY SEWERS
 - SECTION 06. SEPTIC SYSTEM
 - SECTION 07. WASTEWATER SYSTEM DESIGN STANDARDS
-

SECTION 01. GENERAL REQUIREMENTS FOR WATER SYSTEMS

7.01.001 Service Required.

Each lot within a new subdivision within the corporate limits of the City shall be provided with domestic water service from the City of Boerne Water System. Each lot within a subdivision outside the corporate limits of the City, but within the limits of the City's extraterritorial jurisdiction, shall be provided with domestic water service from a community water system meeting the design requirements of the Texas Commission on Environmental Quality (TCEQ) or may be served by an individual private well that is permitted and approved by Cow Creek Groundwater District. The water distribution system required under this section shall include all pumping station production facilities, elevated storage tanks, fire hydrants and other appurtenances required to adequately serve the area being subdivided.

The water system improvements required under this section shall include the extension of existing water mains (including the installation of new fire hydrants) across the entire length (frontage) of all newly established lots adjacent to a public right of way and/or to the perimeter of the subdivision for future extension into undeveloped areas, or for connections to the systems in adjoining developed areas.

7.01.002 Obligations of Subdivider.

Within the perimeter of the subdivision, the subdivider shall install, at his/her own cost and expense, all necessary lift stations, booster pumps, mains and appurtenances, including, but not limited to, valves, manholes and fire hydrants. The subdivider shall provide all water lines necessary to properly serve each lot of the subdivision and to ensure that existing and/or new water facilities can supply the required demand for domestic use and for fire protection at the desired pressure. The subdivider shall install all mains and shall extend the service to all lots terminating thereon with a curb stop and meter box. The subdivider shall submit a certificate to the City Manager certifying that the system has been designed in accordance with the requirements of the State Health Department, rules of the Texas Insurance Commission and this ordinance.

SECTION 02. WATER SYSTEM DESIGN STANDARDS

7.02.001

All water production and distribution facilities shall be designed and sized to meet the minimum design standards in the following table.

TABLE 7-1: WATER SYSTEM MINIMUM DESIGN STANDARDS	
Demand Assumptions	
Population Equivalent	2.7 persons per residential unit
Average Daily Demand	160 gallons per capita per day
Peak Daily Demand	2 times average daily demand (= 320 gallons per capita per day)
Peak Hour Flow Rate	3.5 x average hourly rate (= 560 gallons per capita per day)
Supply Requirements	
Service Capacity	Peak Daily Demand
High Service Pumps	Peak Hour Demand plus fire flow
Storage Requirements	
Ground Storage	One day of storage (160 gallons per capita)
Elevated Storage	Top 20' = 40 gallons per capita Top 40' = 4 hours of maximum fire flow + average demand

SECTION 03. WATER MAINS

7.03.001 General Specifications.

Piping for water mains and connections shall be in accordance with the City of Boerne Standard Specifications for Public Works Construction.

7.03.002 Minimum Diameter.

Water mains smaller than eight inches shall not be permitted, except that water mains less than 600 feet long and located solely in residential areas may be six inches in diameter. No more than one fire hydrant shall be installed on any 6-inch water main.

7.03.003 Maximum Length.

In all areas, water mains shall be the shorter of either 3,000 feet or that length which would by fluid friction render the main incapable of producing flows and pressures set out in this ordinance for the type of area to be served.

7.03.004 Looping Requirements.

In all areas, water mains shall be looped between water mains whose inside diameter is eight inches or larger, except dead end mains in cul-de-sacs up to 600 ft. shall be allowed.

7.03.005 Location.

All water mains shall be located in dedicated streets or fire lanes, or in the community open space in a planned unit development or cottage development. On streets with curbs and sidewalks, all water mains shall be located in the public right-of-way between the curb and the sidewalk.

7.03.006 Minimum Flow Requirements.

Water mains in principal mercantile and industrial areas shall be sized so that the minimum fire flow from any single fire hydrant shall be not less than 3,000 gallons per minute with 20 psig residual pressure. Water mains in light mercantile areas shall be sized so that the minimum fire flows from any single fire hydrant shall be not less than 1,500 gallons per minute with 20 psig residual pressure. Water mains in residential areas shall be sized so that the

minimum fire flow at any single fire hydrant shall not be less than 750 gallons per minute with 20 psig residual pressure and a domestic use of 2 gpm for every lot in the subdivision.

7.03.007 Valve Locations.

The distribution system shall be equipped with a sufficient number of valves and the valves shall be so located that no case of accident, breakage or repair to the water distribution system mains will necessitate shutting from service a length of water main greater than either one side of a single block or a maximum of 500 feet. A minimum of 2 valves are required at all tees and 3 valves at all crosses.

7.03.008 Service Lines.

The minimum sizes of service lines that shall be used are as required in the following table.

TABLE 7-2: MINIMUM WATER SERVICE LINE SIZES	
Number of Dwelling Units	Service Line Size (inches)
1	3/4
2	1
3 - 4	1 1/2
5 - 10	2
11 - 50	4
51 - 80	6
More than 80	8

SECTION 04. FIRE HYDRANTS

7.04.001 General Requirements.

All fire hydrants shall have a six-foot clear horizontal radius of 360 degrees around the fire hydrant free from obstructions. All fire hydrants shall be located on street corners or side property lines so as to be readily accessible at all times. All fire hydrants shall be equipped with at least a 6-inch valve located on the hydrant lead and the valve and hydrant shall be mechanically anchored to the main.

7.04.002 Maximum Spacing.

Every building in the City limits shall be within 500 feet of a standard City fire hydrant. In mercantile and industrial areas, hydrants shall be located so that there will be at least one hydrant every 300 feet average as measured along dedicated streets. In light mercantile areas containing apartment houses, hydrants shall be located in dedicated streets or fire lanes behind curbs and be spaced not more than 300 feet hose lay from any building within the district, each distance to be measured down any standard fire hose laid from the fire hydrant to the building. In residential areas, hydrants shall be located so that there will be a fire hydrant every 500 feet average distance as measured along dedicated streets, including dedicated easements and fire lanes in mobile home parks and travel trailer parks.

SECTION 05. SANITARY SEWERS

7.05.001 General Requirements.

Every subdivision shall be provided with a sewage disposal system meeting the design requirements of the Texas Commission on Environmental Quality and approved by the City Manager. Sanitary sewers shall be connected to serve each lot in the subdivision unless the Planning and Zoning Commission determines that such connection would require an unreasonable expenditure of funds when compared with other methods of sewage disposal or unless the subdivision meets the requirements of Section 6 of this Article. Where connection to the sewer system is not to be made immediately, plans shall be prepared for installation of a sewage collection system to serve each lot, and those

parts of such system which will lie in the portion of streets intended for vehicular traffic shall be installed before the street is paved. The sewage collection and disposal systems required under this section shall include all lift stations, force mains, treatment facilities and appurtenances required to adequately serve the area being subdivided.

The sewage collection and disposal systems improvements required under this section shall include the extension of sanitary sewer mains to the boundaries of the subdivision as required to provide for the future extension of the systems into adjoining undeveloped areas or for connection to the systems in adjoining developed areas. No variance shall be granted to this section without the provision of permanent utility easements and temporary construction easements for the future extension of said improvements. The easement widths and location shall be determined by the City.

7.05.002 Obligations of Subdivider.

The subdivider shall install all sanitary sewer mains and lines to serve each lot. If the public sewer system is not within 1,200 feet of the subdivision, those portions of the system which lie under paved areas shall be installed and capped off and temporary waste treatment shall be provided in accordance with the requirements of state health officials. The subdivider shall submit a certificate to the City Manager certifying that the sewer system has been approved by the Texas Commission on Environmental Quality.

SECTION 06. ON-SITE SEWAGE FACILITIES

7.06.001 General Requirements.

When specifically authorized by the Planning and Zoning Commission, on-site sewage facilities in the city limits may be utilized for wastewater disposal. All lots in the subdivision which utilize private wells and on-site sewage facilities shall obtain approval from and adhere to the regulations provided by Cow Creek Groundwater District and TCEQ (Texas Commission on Environmental Quality). Lots in subdivisions being served with water provided by a public or other community water system may utilize individual on-site sewage facilities provided all lots within the subdivision have a minimum area of 45,000 square feet unless the water system is providing water from a source that is outside the jurisdiction of the Cow Creek Underground water District then the standards set forth in Section 3.04.003.B shall be followed. On-site sewage facilities shall be installed on each lot concurrent with any development thereon and the design of such system and the method of installation shall conform in all respects to the requirements of the Kendall County Office of Development Management.

SECTION 07. WASTEWATER SYSTEM DESIGN STANDARDS

7.07.001 General Design Standards.

All wastewater collection system improvements shall be designed and sized to meet the minimum design standards in the following table.

TABLE 7-3: WASTEWATER SYSTEM MINIMUM DESIGN STANDARDS	
Demand Assumptions	
Population Equivalent	3 persons per residential unit
Average Daily Flow	100 gallons per capita per day
Peak Daily Flow	3.25 times average daily flow
Infiltration Factor	500 gallons per gross acre per day
Average Capacity Requirements	
Single Family Residential	300 gallons per lot per day
Multi-Family Residential	7,500 gallons per acre per day
Commercial	1,500 gallons per acre per day

All sewers shall be sized to accommodate the maximum peak flow plus infiltration flows which will render the pipe flowing no greater than three-fourths full. Minimum slope shall be according to current Texas Commission on Environmental Quality rules and regulations and sewerage design standards.

7.07.002 Sewer Location.

All sewer mains are to be located in the right-of-way as designated by the City Manager. Separation distances between sewer mains or laterals and potable waterlines shall be in accordance with regulations of the Texas Commission on Environmental Quality.

7.07.003 Materials.

Materials shall be in accordance with the City of Boerne Standard Specifications for Public Works Construction.

7.07.004 Trenching.

Sewers shall be constructed according to City standard specifications as to trenching, bedding, backfill and compaction.

7.07.005 Minimum Diameter of Mains.

Eight-inch diameter pipe shall be the minimum acceptable for sewer mains and lines, except that a sewer main less than 600 feet long may be six inches in diameter if located on a cul-de-sac or an existing dead end street within a residential subdivision.

7.07.006 Manholes.

Manholes shall be spaced not more than 400 feet apart and shall be constructed in accordance with City standard specifications.

7.07.007 Lift Stations and Force Mains.

Lift station capacity shall be no less than 100 gallons per minute per pump. Lift station force mains shall be designed and sized to produce a complete exchange of wastewater every other cycle of the pumps. Force mains and fittings shall be epoxy lined ductile iron, Polyethylene or PVC pipe, pressure class 150, minimum. The pipe shall have either mechanical joints or rubber gasket joints as approved by the City Manager. The minimum force main size shall be four inches. Lift stations shall be enclosed, for noise and odor control, in a building that matches the general architecture of the subdivision.

7.07.008 Minimum Diameter of Service Lines.

Service lines serving individual lots shall be no smaller than 6 inches in diameter.

ARTICLE 8. UTILITY EXTENSIONS AND GENERAL SUBDIVISION IMPROVEMENTS

SECTION 01.	GENERAL REQUIREMENTS
SECTION 02.	SURVEY REQUIREMENTS
SECTION 03.	COSTS OF UTILITY EXTENSIONS
SECTION 04.	COSTS DISTRIBUTIONS FOR OVERSIZED FACILITIES
SECTION 05.	MINIMUM SIZE FOR OVER-SIZING CALCULATIONS
SECTION 06.	WATER AND SEWER MAIN REIMBURSEMENTS

SECTION 01. GENERAL REQUIREMENTS

8.01.001 Obligations of Subdivider.

The subdivider shall install at his/her own cost and expense all of the improvements required by this ordinance. It shall be the subdividers responsibility to ensure that all improvements are constructed in accordance with this ordinance, City of Boerne Standard Specifications for Public Construction, the approved final design plans and all applicable regulatory rules and regulations. The subdivider shall comply with all other provisions of this ordinance prior to acceptance of the subdivision by the City.

8.01.002 Engineer Responsible.

The subdivider shall retain the services of a licensed professional engineer, licensed in the State of Texas, whose seal shall be placed on each sheet of the construction plans, and who shall be responsible for the design and supervision of all public infrastructure improvements constructed for the subdivision.

8.01.003 Construction Plans.

The construction plans and drainage study shall be submitted as provided in Article 2 and shall meet the following requirements.

- A. All design professionals shall be required to sign letters to accompany their documents stating that the "The attached documents comply with the requirements of the City of Boerne Subdivision Ordinance".
- B. All design professionals shall include in their plans, the statement "Construction of all facilities to be dedicated to the public shall be performed per the requirements of the City of Boerne Standard Specifications for Public Works Construction, latest edition".
- C. Three complete bound sets of construction plans, specifications and contract documents shall be filed with the City Manager after approval of a preliminary plat. These plans and specifications shall include the following, all in compliance with the specifications and Design Standards of this ordinance:
 1. Street plans, showing roadway cross sections and longitudinal slope for drainage, a full description of the proposed pavement or other street improvement, and its grade and slope.
 2. Drainage system plans, sanitary sewer system plans, water system plans, electric plans, natural gas plans, and the overall utility layout. showing the dimensions and specifications of the improvements to be installed, including proposed position on the ground, specifications of materials and construction, profile maps showing both ground surface and flow line, and other pertinent information of similar nature.
 3. A final erosion control and construction phasing plan as specified in Article 6, Section 01.003.
 4. A copy of the associated plat shall be attached to each set of plans.
- D. A detailed cost estimate for the construction of all subdivision improvements prepared by the designers of the improvements.
- E. A minimum of two (2) copies of the drainage study as described in Article 6, Section 2.

8.01.004 Installation of Utilities Before Paving.

Unless the subdivider shall have received prior written permission to the contrary from the City Manager, all utilities must be installed prior to the paving of a street or alley or portion thereof.

8.01.005 Inspection of Improvements.

The City Manager shall from time to time inspect the construction of all utility facilities, drainage infrastructure, and streets in the subdivision during the course of construction to see that they comply with the standards governing them. In this regard, free access to the subdivision shall be accorded the City Manager by the subdivider and the subdivider's agents and employees.

8.01.006 Final Plans and Acceptance.

Prior to final acceptance by the City of completed improvements for maintenance, the subdivider shall file with the City Manager or the Kendall County Commissioners Court, whichever is appropriate, the following:

- A. Either a two-year warranty bond conditioned that the improvements are free from defects in materials and workmanship, or an irrevocable letter of credit, cash deposit, certificate of deposit, or savings assignment, committing funds for the correction and repair of any defects in materials or workmanship. The amount of the financial guarantee shall be in the amount of 10 percent of the final contract price for the improvements.
- B. Two (2) sets of reproducible tracings of complete record drawings, dated, signed and certified by the engineer in charge, shall be filed with the City for each improvement, showing all features as actually installed, including materials, size, location, depth of elevation, numbers, end of lines, connections, wyes, valves, storm sewer drains, inlets, and any other pertinent items.
- C. One (1) electronic file of each plan set in sub-section 8.01.006.B. in AutoCAD.
- D. Two certified copies of all improvement costs, itemized as follows:
 - 1. Streets, alleys, curbs, sidewalks and drainage features.
 - 2. Water mains, valves, hydrants and services.
 - 3. Sewer mains, lift stations, force mains, manholes and services.
 - 4. Reclaimed water mains, valves, and services.
 - 5. Electric distribution and services (excluding transformers) not constructed by the City.
 - 6. Natural gas mains, valves and services not constructed by the City.
- E. Letter of certification, signed and sealed by the subdividers engineer certifying that the improvements have been constructed and tested in accordance with all applicable Texas Administrative Codes and this ordinance, the final design plans, and City of Boerne Specifications for Public Works.
- F. Prior to acceptance of the subdivision improvements, the subdivider shall provide the City with either 1.) A release of lien from all subcontractors and contractors verifying that all contractors have been paid and that no liens will be filed on the subdivision or 2.) A form of an Affidavit as to Debts and Liens signed by the owner. No acceptance shall be given until all verification is made.
- G. One (1) copy each of the completion notices submitted to the TCEQ executive director in accordance with TCEQ 30 TAC 217.14 and 30 TAC 290.39.

No applications shall be accepted for building permits or utility connections, and no building permits shall be issued, or utility connection made until such time as the entire subdivision is accepted by the City. Only the City Manager or the Assistant City Manager, no other designee, may approve an exception to timing of the issuance of the building permit.

SECTION 02. SURVEY REQUIREMENTS

8.02.001 Placement of Lot Markers and Street Monuments.

Monuments consisting of at least one-half inch iron pipe or at least one-half inch reinforced steel, 24 inches in length, shall be placed at all corners of the block lines, and at the point of intersection of curves and tangents of the subdivision. Lot markers shall be metal, at least 24 inches in length, placed at each corner of each lot, flush with the average ground elevation, or they may be countersunk, if necessary, to avoid being disturbed.

8.02.002 Elevation Benchmarks.

At least one benchmark for every 5 acres in a subdivision shall be permanently installed in an approved manner, at the location and the elevation as shown on the plat. Permanent benchmarks shall be five feet long, steel reinforced concrete posts, four inches in diameter, with the top no more than six inches above and no less than two inches below finished grade.

8.02.003 Lot Markers for Utility Easements.

There shall be markers placed where a lot line crosses a utility easement with the exception of those blanket utility easements placed around all lots.

SECTION 03. COSTS OF UTILITY EXTENSIONS

8.03.001 Water and Sewer Main Extensions.

The subdivider shall install water and sewer mains from their present locations to the boundaries of the subdivision at his/her own cost and expense, subject to the provisions of this ordinance.

8.03.002 Reclaimed Water Main Extensions.

The subdivider shall either (a) reimburse the City for the cost of extension of the reclaimed water distribution system from their present locations to the perimeter of the subdivision or (b), with the City Manager's approval, extend the distribution system at the subdivider's own expense.

8.03.003 Electric Distribution System and Gas Main Extensions.

The subdivider shall either (a) reimburse the City for the cost of extension of the electrical primary distribution system and/or the natural gas mains from their present locations to the perimeter of the subdivision or (b), with the City Manager's approval, extend the electric distribution system and/or gas mains at the subdivider's own expense.

8.03.004 Electric and Gas Systems within the Subdivision.

The subdivider shall reimburse the City for the cost of installation of the electrical primary distribution system and the natural gas distribution system within the perimeter of the subdivision, including the installation of required street lights and services to any required lift stations, booster pumps, and similar facilities.

The electrical primary distribution system and natural gas distribution system extensions required under this section shall include the extension of the utilities to the boundaries of the subdivision as required by the City to provide for the future extension of the systems into adjoining unsubdivided areas or for connection to the systems in adjoining developed areas.

8.03.005 Lift Stations, Booster Pumps and Related Equipment.

In the event that it is determined that installation of equipment or appurtenances such as lift stations, booster pumps, or similar facilities is necessary in the area between the existing utility mains and the perimeter of a subdivision, the City Council shall, taking all circumstances into consideration, determine who shall bear the cost of such necessary equipment and appurtenances, and in what proportion each party shall be liable.

8.03.006 Waiver of Costs for Industrial Parks and Commercial Developments.

The requirements of subsections 8.03.001 and 8.03.002 of this Section, for the subdivider to install water and sewer mains from their present locations to the perimeter of the subdivision at his/her own cost and expense, and either to reimburse the City for the cost of electrical primary distribution system extensions and natural gas main extensions from their present locations to the perimeter of the subdivision or to extend these systems at his/her own expense, may be waived by the City Council for proposed industrial parks and commercial developments. Such waiver shall be at the discretion of the Council after taking into consideration all the circumstances including, but not limited to, the following:

- A. The ratio of the potential tax revenues and utility system revenues from property within the industrial park or commercial development to the costs to the City of extending water, gas and sewer mains and electric primary distribution lines to the proposed industrial park or commercial development.
- B. The availability of funds for the extension of such mains and distribution lines.
- C. The contribution, if any, by the subdivider for the extension of the mains and distribution lines.

SECTION 04. COST DISTRIBUTION FOR OVERSIZED FACILITIES

In the event that the Planning and Zoning Commission, City Manager or his designee deems it necessary and prudent to require lift stations, booster pumps, mains, equipment, streets and/or appurtenances which are larger or whose capacities are in excess of those which are usual, customary and necessary to meet the needs and requirements of a particular subdivision, then the Planning and Zoning Commission or City Manager may recommend to the City Council and the Council may determine that the City shall pay to the subdivider the difference in cost (including construction and installation) between those lift stations, booster pumps, mains, equipment, streets and/or appurtenances which the City requires the subdivider to install, and the cost of like equipment of the size and/or capacity which would have adequately met and served the needs of the subdivision. Providing that funds are available, the City may also participate in the extra cost of bridges and/or large drainage structures on regional thoroughfares and Arterial streets shown on the Major Thoroughfare Plan.

SECTION 05. MINIMUM SIZES FOR OVER-SIZING CALCULATIONS

When calculations are made for oversizing requirements, the minimum sizes assumed to be necessary to serve the subdivision itself shall not be less than those in the following table.

TABLE 8-1: MINIMUM SIZES FOR OVERSIZING CALCULATIONS	
Water and Sewer Main	8 inches
Reclaimed Water Main	4 inches
Sewer Force Main	6 inches
Lift Station Capacity	100 gallons per minute per pump
Residential Street Width	Per TIA in Article 3, an approved Major Thoroughfare plan of the City, or programmed in a Capital Improvements Plan.
Non-Residential Street Width	Per TIA in Article 3, an approved Major Thoroughfare plan of the City, or programmed in a Capital Improvements Plan.

SECTION 06. WATER, RECLAIMED WATER AND SEWER MAIN REIMBURSEMENTS

8.06.001 Eligibility for Reimbursement.

When a subdivider must extend water, reclaimed water and/or sewer mains through previously unserved and unsubdivided areas of a drainage basin, the City may reimburse the subdivider for that proportional cost of the extension by those entities who plat property between the original subdivider's subdivision and the point of connection to existing City utilities and connect pipelines directly to that water/sewer main extension.

8.06.002 Formula for Reimbursement.

The amount of the reimbursement under this section shall be calculated as follows.

- A. Determine the total area to be served by the water and sewer main extensions, including the original subdivision. It shall be the responsibility of the subdivider to provide the City with this information, to be substantiated by City staff.
- B. Determine the cost of extension of the trunk mains minus any oversizing costs contributed by the City.
- C. Determine the trunk main unit cost per acre by dividing the total adjusted cost #2 by the total acreage #1.
- D. The unit cost per acre shall be charged to each subsequent subdivider who may connect to the trunk main, and shall be paid to the subdivider who originally installed the trunk main, or the original subdivider's heirs or assigns.
- E. Force mains or interbasin transfers which may connect to the trunk main shall not be included in the reimbursement for trunk main extension.

8.06.003 Forfeiture of Trunk Main Reimbursement.

It shall be the sole responsibility of the subdivider due reimbursement under this section to maintain his/her current address on file with the City Manager. Should a reimbursement be payable and the subdivider cannot be contacted at the address on file in the City Manager's office, the right to a reimbursement under this section shall lapse 24 months after the date of the initial attempt to contact the subdivider and the subdivider shall forfeit all claims to the reimbursement. The City may utilize all forfeited reimbursements for any purpose related to the water and sewer systems as determined by the City Council.

8.06.004 New Subdivider's Contribution for Trunk Main Extension.

When water, reclaimed water and sewer mains for a new subdivision are to be connected to trunk mains installed per the requirements of this section to prior subdivisions, the subdivider shall deliver to the City Manager, prior to final plat approval, a check for his/her portion of the trunk main based on the formula in Subsection 8.06.002. The contribution shall be based on the trunk main unit cost per acre multiplied by the number of acres in the subject subdivision. It shall be the responsibility of the subdivider to provide the City staff with evidence of the acreage involved.

ARTICLE 9. IMPERVIOUS COVER IN THE EXTRATERRITORIAL JURISDICTION (ETJ).

SECTION 01. PURPOSE

The growth in and around the City of Boerne and the associated development and construction of buildings, paved surfaces, roads and other improvements including the construction of gutters, culverts, drains and channels increases the pollution of natural waterways from urban runoff of rainwater or other non-point specific sources. This Chapter is adopted to provide environmental protection within the City's extraterritorial jurisdiction (ETJ) and protect the natural and ecological resources that are essential elements of the City's health and community character by reducing negative impacts from the following concerns:

- A. Paved surfaces, automobiles, buildings, and other improvements produce increases in air temperatures whereas plants and vegetation have the opposite effect through transpiration and the creation of shade.
- B. Impervious surfaces created by development generate greater water runoff causing problems from contamination, erosion, and flooding. Preserving and improving the natural environment and maintaining a working ecological balance are of increasing concern.
- C. Landscape elements can contribute to the processes of air purification, oxygen regeneration, water absorption, water purification, and the abatement of both noise and heat as well as the preservation of the community's aesthetic qualities.
- D. The use of such landscape elements and minimization of impervious covers serves as a benefit to the health, welfare and general well-being of the community and, therefore, the proper use of such landscape and impervious cover elements are required.

9.01.001 Authority

The provisions of this Chapter are adopted pursuant to the Texas Local Government Code Chapters 211 and 212; §26.177 of the Texas Water Code, the Texas Health and Safety Code, the rules and regulations of the Texas Commission on Environmental Quality, the United States Environmental Protection Agency and the City of Boerne Home Rule Charter

9.01.002 Applicability

All development in the City of Boerne ETJ shall comply with the impervious cover limitations set forth in this Article.

9.01.003 Compliance

Compliance with the requirements of this Article will be achieved in the City of Boerne ETJ through the Impervious Cover review and approval process during the subdivision plat review process.

SECTION 02. IMPERVIOUS COVER STANDARDS APPLIED TO DEVELOPMENT IN THE EXTRATERRITORIAL JURISDICTION (ETJ)

9.02.001 Impervious Cover Limitation

These impervious cover standards are adopted to minimize negative flooding effects from storm water runoff and to control, minimize and abate water pollution resulting from urban runoff of rainwater or other non-point specific sources, pursuant to §26.177 of the Texas Water Code. These impervious cover limitations apply to all properties in the City of Boerne's ETJ.

9.02.002 Percent Impervious Cover

"Percent impervious cover" is calculated as the area of impervious cover within a lot, tract or parcel (only the residential structure and driveway) and within the total site being developed, divided by the total area within the perimeter of such lot, tract, parcel or development. Vegetated water quality basins, vegetated swales and other vegetated conveyances for overland drainage are not calculated as impervious cover.

9.02.003 Impervious Cover Standards

1. Site Development: Overall impervious cover for a residential subdivision shall be no more than 50%.
2. Impervious Cover ratio (maximum %) for Residential Lots: The following percent of impervious cover shall apply to the following lot sizes as defined in Table 5.2 of the City of Boerne Zoning Ordinance: rural, large and manor lot - 25%, estate and low density lots - 40%, standard, neighborhood, small and duplex lots - 50%, attached lots - 80%, and multifamily dwellings - 85%.

9.02.004 Impervious Cover Credits

1. Credit for Parkland: Parkland to be dedicated shall be counted toward pervious area.
2. Arterials and major collectors within the subdivision required by the City of Boerne thoroughfare plan.

9.02.005 Waiver of Impervious Cover Limitations

1. Low Impact Site Design (up to 7%): The City Manager may give credit toward the amount of impervious cover permitted up to seven percent (7%). These credits, if not needed for impervious cover credit, may also be considered as credit toward open space that is required by this ordinance.
2. Low Impact Development options that may be considered for credit are listed below. These options shall be verified as appropriate by the City of Boerne.
 - a. dry wells or infiltration trenches to capture rooftop and driveway runoff;
 - b. rainwater harvesting;
 - c. preserving stream buffers and riparian corridors;
 - d. bio-retention facilities placed around the perimeter of parking lots;
 - e. wet ponds; and
 - f. using grassed filter strips and vegetated swales in place of traditional curb-and-gutter type drainage systems.

No combination of waivers may allow impervious cover to exceed the maximum required by the ordinance. Partial credit of the following waiver may be granted by the City Manager

3. Requirements for a Waiver of Impervious Cover Limitations:
 - a. Accepted Low Impact Development designs must be utilized, following the guidelines and standards adopted by the Texas Commission on Environmental Quality.
 - b. The applicant is responsible for providing sufficient design information for the appropriate department to examine and verify the improvement.

ARTICLE 10. RECLAIMED WATER

SECTION 01.	GENERAL REQUIREMENTS FOR RECLAIMED WATER SYSTEMS
SECTION 02.	RECLAIMED WATER SYSTEM DESIGN STANDARDS
SECTION 03.	RECLAIMED WATER SYSTEM COMPLIANCE

SECTION 01. GENERAL REQUIREMENTS FOR RECLAIMED WATER SYSTEMS

10.01.001 Service Requirements.

New subdivisions or platted properties within the corporate limits of the City or within the limits of the City's extraterritorial jurisdiction may request reclaimed water service from the City of Boerne Reclaimed Water System. In the event the City approves the request, the Subdivider shall provide reclaimed water system improvements. System improvements shall include the extension of reclaimed water mains, design and installation of distribution system within property and all required appurtenances. The City may require the extension of lines across the entire length (frontage) of all newly established lots adjacent to a public right of way and/or to the perimeter of the subdivision for future extension into undeveloped areas, or for connections to the systems in adjoining developed areas.

A reclaimed water master meter or individual service meters are required for the measurement of the quantity of reclaimed water.

10.01.002 Provision of Reclaimed Water Service.

- A. Upon the Utility Director's recommendation that the provision of Reclaimed Water is feasible, the City Manager may enter into an Agreement for the provision of Reclaimed Water to properties within the City's Reclaimed Water Service Area upon application, and in compliance with this Article and all applicable laws and regulations.
- B. Requests for Reclaimed Water Service from the City must meet all requirements provided in this Article and all minimum design, construction and operation standards for Reclaimed Water systems.
- C. The request for Reclaimed Water Service, must come from the owner or authorized agent of the property for which the service is to be provided.

10.01.003 Obligations of the City.

The City and its authorized agents, employees, or contractors are responsible for the operation, management, and control and the oversight of the Reclaimed Water System.

10.01.004 Obligations of Subdivider.

Within the proposed Reclaimed Water Service Area, the Subdivider shall install, at their own cost and expense, all necessary booster pumps, mains, valves and appurtenances to properly serve the subdivision as approved by the City.

Subdivider shall:

- A. Provide an engineering report documenting the existing and/or new reclaimed water facilities can supply the required demand at the desired pressure. Report shall include calculations for proposed system demands.
- B. Be responsible for the design and construction of new reclaimed water facilities to proposed service areas in accordance with TCEQ Design Criteria in Chapter 210 and other applicable chapters of the Texas Administrative Code, as amended;
- C. Provide construction supervision of work to assure compliance with this Article;

- D. Provide access to work during construction for inspections by the City;
- E. Train all City operations personnel on any constructed facilities;
- F. Submit a certificate to the City Manager certifying that the system has been designed in accordance with the requirements of the Texas Administrative Code and this ordinance. Certificate shall be sealed by a Professional Engineer licensed in the State of Texas.

SECTION 02 RECLAIMED WATER SYSTEM DESIGN STANDARDS

10.02.001 General Specifications.

Piping and appurtenances for reclaimed water mains and connections shall meet the minimum criteria as required by the City of Boerne, "Standard Specifications for Public Works Construction" as currently amended.

10.02.002 Sizing of Reclaimed Water Mains.

All reclaimed water production and distribution facilities shall be designed and sized to meet the minimum design standards and be based on the Subdivider's expected average and peak reclaimed water consumption as identified in the design report. All reclaimed water mains shall be installed at locations designated by the City. Computer modeling is preferred for sizing reclaimed water mains based on Subdivider's expected reclaimed water consumption; however, for reclaimed water mains less than sixteen (16) inches in diameter other engineering calculation methods may be accepted. All reclaimed water mains shall be sized to provide necessary service to the subdivision being developed and per the minimum standards indicated in Table 10-1.

TABLE 10-1: RECLAIMED WATER SYSTEM MINIMUM DESIGN STANDARDS	
Demand Assumptions	
Annual Average Irrigation Application Rate	1,987 GPD / Irrigated Acres
Peaking Factors	Summer – 1.37
	Winter – 0.66
Peak Flow Rate	Maximum Summer Irrigation Volume over 14-Hour Period

Subdivider shall specify the total irrigated areas and percent impervious cover in accordance with the land use category. Additional demands for reclaimed water shall be clearly defined in the report. The City may require oversizing of certain mains in accordance with City Ordinance Article 8.

Reclaimed water mains smaller than four (4) inches shall not be permitted.

Maximum static pressure – one-hundred (100) psi unless otherwise approved by the City. If the maximum static pressure exceeds eighty (80) psi, a PRV will be required on the property owner's side of the reclaimed water meter and should be shown on the plan view.

10.02.003 Looping Requirements.

In all areas, reclaimed water mains shall be looped between reclaimed water mains whose inside diameter is four inches or larger, except dead end mains in cul-de-sacs up to 600 ft shall be allowed.

10.02.004 Location.

All reclaimed water mains are to be located in the right-of-way as designated by the City Manager.

10.02.005 Valve Locations.

The distribution system shall be equipped with a sufficient number of valves and the valves shall be so located that no case of accident, breakage or repair to the reclaimed water distribution system mains will necessitate shutting from service a length of reclaimed water main greater than either one side of a single block or a maximum of 500 feet. A minimum of 2 valves are required at all tees and 3 valves at all crosses.

SECTION 03. RECLAIMED WATER SYSTEM COMPLIANCE

10.03.001 Proof of Compliance with the Minimum Design and Operation Standards.

The Subdivider making an application for Reclaimed Water Service shall submit the information as required by Article 8 for the construction plans, inspection, and final acceptance of the reclaimed water system improvements.

ARTICLE 11. GAS DISTRIBUTION

SECTION 01. GENERAL REQUIREMENTS FOR GAS DISTRIBUTION

SECTION 02. GAS MAIN DESIGN STANDARDS

SECTION 03. GAS SYSTEM COMPLIANCE

SECTION 01. GENERAL REQUIREMENTS FOR GAS DISTRIBUTION

11.01.001 Service Requirements.

New subdivisions or platted properties within the corporate limits of the City or within the limits of the City's extraterritorial jurisdiction may request natural gas service from the City of Boerne. In the event the City approves the request, the Subdivider shall provide gas distribution system improvements. System improvements shall include the extension of gas mains, design and installation of distribution system within property and all required appurtenances. The City may require the extension of lines across the entire length (frontage) of all newly established lots adjacent to a public right of way and/or to the perimeter of the subdivision for future extension into undeveloped areas, or for connections to the systems in adjoining developed areas.

11.01.002 Provision of Gas Service.

- A. Upon the Utility Director's recommendation that the provision of natural gas is feasible, the City Manager may approve the provisions for natural gas to properties within the City's Gas Service Area upon application, and in compliance with this Article and all applicable laws and regulations.
- B. Requests for Natural Gas Service from the City must meet all requirements provided in this Article, the International Fuel Gas Code (IFGC) latest edition, and all minimum design, construction and operation standards for the gas distribution system.
- C. The request for gas service, must come from the owner or authorized agent of the property for which the service is to be provided.

11.01.003 Obligations of the City.

The City and its authorized agents, employees, or contractors are responsible for the operation, management, and control and the oversight of the Gas Distribution System.

The City's standard gas service shall be provided to all customers at 4 ounces per square inch, except that the City may provide gas service at a nonstandard pressure only upon request from the customer and where the customer's facilities in place prior to the effective date of this ordinance are inadequate to properly operate at the City's standard service pressure.

11.01.004 Obligations of Subdivider.

Within the proposed Gas Service Area, the Subdivider shall install, at their own cost and expense, all necessary mains, valves and appurtenances to properly serve the subdivision as approved by the City.

Subdivider shall:

- A. Provide an engineering report documenting the existing and/or new gas system can supply the required demand at the desired pressure.
- B. Be responsible for the design and construction of new gas facilities and service lines to proposed service areas;
- C. Provide construction supervision of work to assure compliance with this Article;
- D. Provide access to work during construction for inspections by the City;

- E. Train all City operations personnel on any constructed facilities;
- F. Submit a certificate to the City Manager certifying that the system has been designed in accordance with the requirements of the Title 16 of the Texas Administrative Code and this ordinance. The certificate shall be sealed by a Professional Engineer licensed in the State of Texas.

SECTION 02. GAS MAIN DESIGN STANDARDS

All natural gas production and distribution facilities shall be designed and sized to meet the minimum design standards in accordance with the projected demand load provided by the Subdivider and approved by the City.

11.02.001 General Specifications.

Piping and appurtenances for gas systems and services shall meet the minimum criteria as required by the City of Boerne, "Standard Specifications for Public Works Construction" as currently amended. All materials that will become a permanent part of the gas distribution system must be approved by the City with written assurance that minimum requirements are being satisfied for the selection and qualification as established by Federal and State Regulations. All components used in the construction of a gas pipeline and related facilities must be to withstand operating pressures and temperatures without impairment.

11.02.002 Sizing of Natural Gas Mains.

All natural gas mains shall be installed in accordance with this article or as required by the City. All natural gas mains shall be sized to provide necessary service to the subdivision being developed with the minimum diameter being 1 inch.

The City's standard pipe diameters for providing gas services are 1 and 2 inches. The City shall determine the appropriate service size after consideration of service requirement information provided by the Applicant or Customer.

The maximum gas pressure provided to a Customer shall be 2 psi, unless authorized by the City.

The City may require oversizing of certain mains in accordance with City Ordinance Article 8.

11.02.003 Looping Requirements.

In all areas, natural gas mains shall be looped between natural gas mains, except dead end mains in cul-de-sacs up to 600 ft. shall be allowed.

11.02.004 Location.

All natural gas mains are to be located in the right-of-way as designated by the City Manager.

11.02.005 Valve Locations.

The distribution system shall be equipped with a sufficient number of valves and the valves shall be so located that no case of accident, breakage or repair to the gas distribution system mains will necessitate shutting from service a length of gas main greater than either one side of a single block or a maximum of 500 feet. A minimum of 2 valves are required at all tees and 3 valves at all crosses.

The City reserves the right to specify additional valves or less spacing between valves as necessary to reduce the time to shut down a section of pipeline in an emergency. Spacing determined by size of pipe, operating pressures, and local conditions.

11.02.006 Gas Service Stubs.

Stubs for future Customers may be installed when installing gas main. Stubs will be sized for anticipated usage and should terminate 1 foot inside the property line or 1 inch past electric utility easement if applicable. Service stubs may cross beneath streets and sidewalks and can be installed to serve residential lots on either side of a street. Each service shall be provided its own tap off of the distribution main.

SECTION 03. GAS SYSTEM COMPLIANCE

11.03.001 Proof of Compliance with the Minimum Design and Operation Standards.

The subdivider making an application for Gas Service shall submit the information as required by Article 8 for the construction plans, inspection, and final acceptance of the gas system improvements.

Exhibit "A" Plat Certificates and Notes

Surveyor's Certificate:

STATE OF TEXAS
COUNTY OF KENDALL

I hereby certify that this plat is true and correct and was prepared from an actual survey of the property made on the ground under my supervision.

Registered Public Surveyor

Sworn to and subscribed before me this the _____ day of _____, _____.

Notary Public in and for the
State of Texas,

Engineer's Certificate: An engineer's certificate is required in all cases except when the plat does not require engineering considerations.

STATE OF TEXAS
COUNTY OF KENDALL

I hereby certify that proper engineering consideration has been given in this plat to the matters of streets, lots and drainage layout. To the best of my knowledge this plat conforms to all requirements of the Subdivision Ordinance, except for those variances granted by the Planning and Zoning Commission of the City of Boerne.

Registered Professional Engineer

Sworn to and subscribed before me this the _____ day of _____, _____.

Notary Public in and for the
State of Texas,

Owner's Acknowledgment: If the owner authorizes an agent, the owner shall file a notarized letter to that effect.

STATE OF TEXAS
COUNTY OF KENDALL

The owner of land shown on this plat, in person or through a duly authorized agent, dedicates to the use of the public forever all streets, alleys, parks, watercourses, drains, easements and public places thereon shown for the purpose and consideration therein expressed.

Name of Owner and Address

Duly Authorized Agent

STATE OF TEXAS
COUNTY OF KENDALL

Before me, the undersigned authority on this day personally appeared (name) known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he/she executed the same for the purposes and considerations therein expressed and, in the capacity, therein stated. Given under my hand and seal of office this _____ day of _____, _____.

Notary Public
Kendall County Texas

Approval of the Planning and Zoning Commission:

This plat of (name) has been submitted to and considered by the Planning and Zoning Commission of the City of Boerne, Texas, and is hereby approved by such Commission.

Dated this _____ day of _____, _____.

By: _____
Chair

By: _____
Secretary

County Clerk's certificate of authentication as required by the applicable county.

Easement Notes

All properties designated as easements shall or may be utilized for the following purposes:

DRAINAGE EASEMENT:

Drainage, water diversion, and sanitary control, including without limitation, walls, beds, embankments, spillways, appurtenances, and other engineered devices (the "Drainage System")

Together with the right of ingress and egress over passable areas of the Grantor's adjacent land, when the delineated entrance point that abuts public right-of-way is obstructed and/or inaccessible, either in whole or in part, in order to access or leave the Easement for the purpose of constructing, reconstructing, inspecting, patrolling, operating, maintaining, repairing, and removing the Drainage System; the right to change the size of the Drainage System within the Easement; the right to relocate along the same general direction of the Drainage System; the right to create and/or dredge a stream course, refill, or dig out such stream course, establish or change stream embankments within the Easement, install storm sewer systems, culverts, water gaps, and protecting rails; the right to remove from the

Easement all trees and parts thereof, or other obstructions, which reasonably endanger or may reasonably interfere with the efficiency of the Drainage System; and the right to place temporary structures for use in constructing or repairing the Drainage System.

With respect to the Drainage System, it is expressly agreed and understood by all parties hereto, that the intention is to improve conditions of sanitation and water drainage control on the Property for the benefit of the Property, adjacent property, and the community, but the City does not guarantee or warrant that such control work will be effective, nor does the City assume any additional liability whatsoever for the effects of flood, standing water, or drainage on or to the Property, or any other property or persons that might be affected by said stream, wash, or gully in its natural state or as changed by the City.

1. The Grantor specifically reserves the right to use all or any part of the Easement for any purpose, which does not damage, destroy, injure, and/or unreasonably interfere with the Grantee's use of the Easement.
2. The Grantee shall make commercially reasonable efforts to ensure the damage to the Property is minimized and will at all times, after doing any work in connection with the Drainage System, restore the Property to the condition in which the Property was found before such work was undertaken to the extent that such restoration is reasonable in accordance with the Grantee's usual and customary practices.
3. The Grantee shall make necessary modifications and improvements to conform with the City of Boerne Drainage Policy and Plan at such a time as the said plan and policy are enacted by City Council of the City of Boerne, Texas.

UTILITY EASEMENT:

Utilities, including, without limitation, sewer, water, gas, electricity, telephone, and cable television, with all necessary and/or desirable lines, laterals and/or appurtenances thereto (the "Utilities")

Together with the right of ingress and egress over passable areas of the Grantor's, adjacent land, when the delineated entrance point that abuts public right-of-way is obstructed and/or inaccessible, either in whole or in part, in order to access or leave the Easement for the purpose of constructing, reconstructing, inspecting, patrolling, operating, maintaining, repairing, and removing the Utilities; the right to place new or additional Utilities in the Easement and to change the size of the Utilities within the Easement; the right to relocate along the same general direction of the Utilities; the right to remove from the Easement all trees and parts thereof, or other obstructions, which reasonably endanger or may reasonably interfere with the efficiency or operation of the Utilities; and the right to place temporary structures for use in constructing or repairing the Utilities.

1. The property owner retains the right to use all or any part of the Easement for any purpose which does not damage, destroy, injure, and/or unreasonably interfere with the use of the Easement. However, the easement shall be kept clear of all structures or other improvements.
2. The City shall make commercially reasonable efforts to ensure that damage to the Property is minimized and the City will at all times, after doing any work in connection with the Utilities, restore the Property to the condition in which the Property was found before such work was undertaken to the extent that such restoration is reasonable in accordance with the City's usual and customary practices.

PLAT NOTES:

SETBACK NOTES:

Setbacks in the ETJ: Lot setbacks are determined by the City of Boerne Zoning Ordinance enforced at the time of development. The use that is being constructed and the lot size shall determine which setback shall apply.

Setbacks in City Limits: Lot setbacks are determined by the City of Boerne Zoning Ordinance enforced at the time of development and are based on zoning/lot size. Unless otherwise identified, the front setback for a pie shaped lot or a lot on a curvilinear street or cul-de-sac is measured wherever the lot width meets frontage requirements for the lot category.

FENCE NOTES:

Gates Across Easement: Double swing gates with a minimum clear opening of 12 feet wide shall be installed wherever fences cross Utility and Drainage Easements.

Obstructions of Drainage: Adequate structures shall be provided to allow the unhindered passage of all storm and drainage flows wherever fences cross Drainage Easements.

LANDSCAPE NOTE:

Residential lots in excess of 12,500 square feet shall only irrigate the area that lies within 75 feet of the main residence. Turf grasses shall be limited to Zoysia, Buffalo or Bermuda grasses or other grasses approved by the City Manager or his or her designated representative. (Ord. No. 2004-20). Xeriscaping is permitted as described in the City of Boerne Zoning Ordinance, Article 3, Section 3.07.003D.

SIDEWALK NOTES:

At such time as a lot is developed, a five-foot wide [Substitute ""larger where required] reinforced concrete sidewalks shall be installed adjacent to all property lines of each lot where the lot abuts public or private street.

IMPACT FEE ASSESSMENT:

Assessment and collection of the City of Boerne Water and Wastewater Utilities' capital recovery fees shall be the amount per lot as set forth in City Ordinance No. 2xxx-xx, Section xxx. [insert current ordinance number and section]

TAX CERTIFICATE:

Tax Certificate Affidavit filed this date in Volume , Page , Kendall County Official Records.

HERITAGE LEGACY TREE:

There are ___ Heritage Legacy Trees, as defined in subsection 2.02.002, identified on this plat.

GRID STREET SETBACKS:

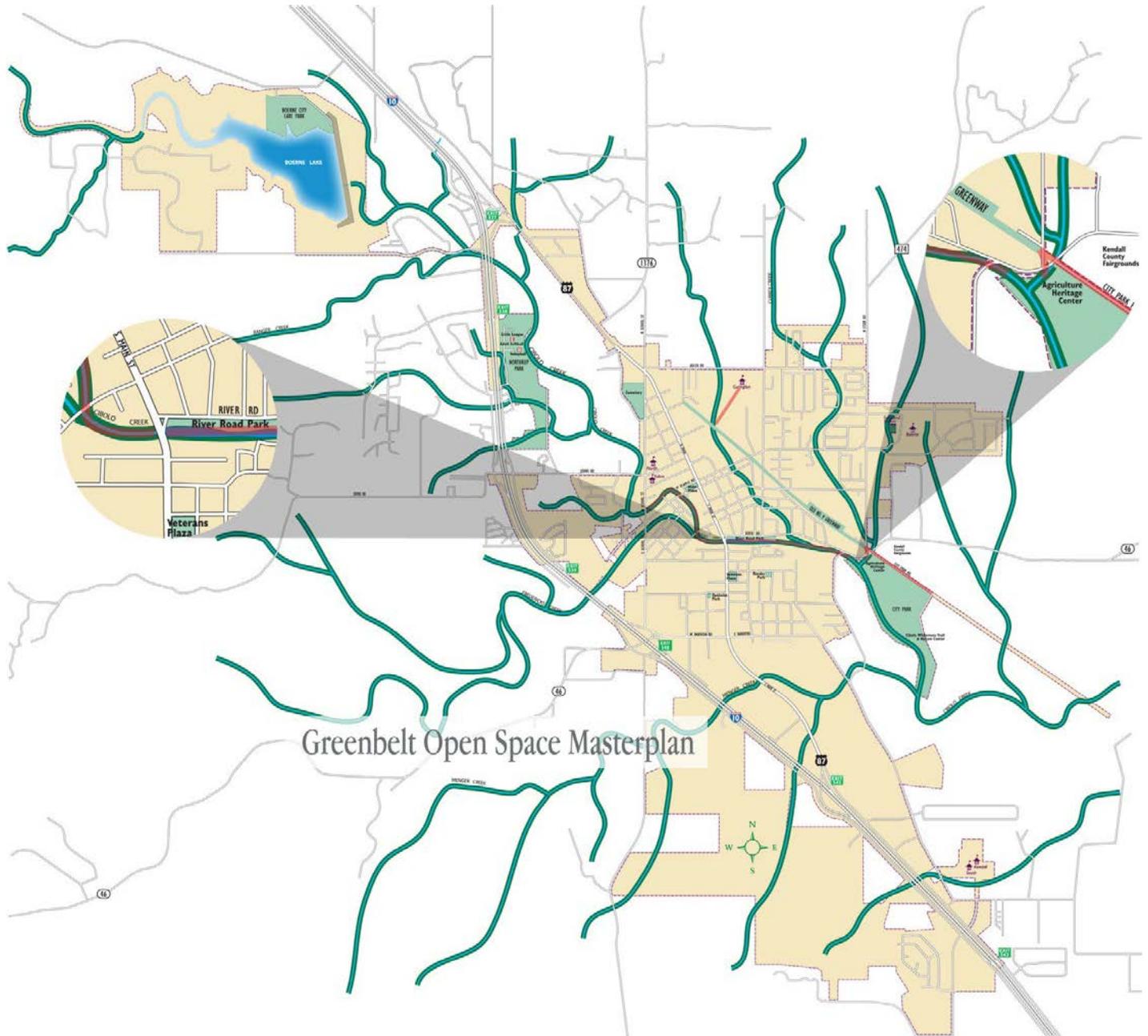
Lots on Grid Network streets have varying setbacks as defined in the zoning ordinance.

SPECIFIC NOTES FOR PLAT IN THE ETJ:

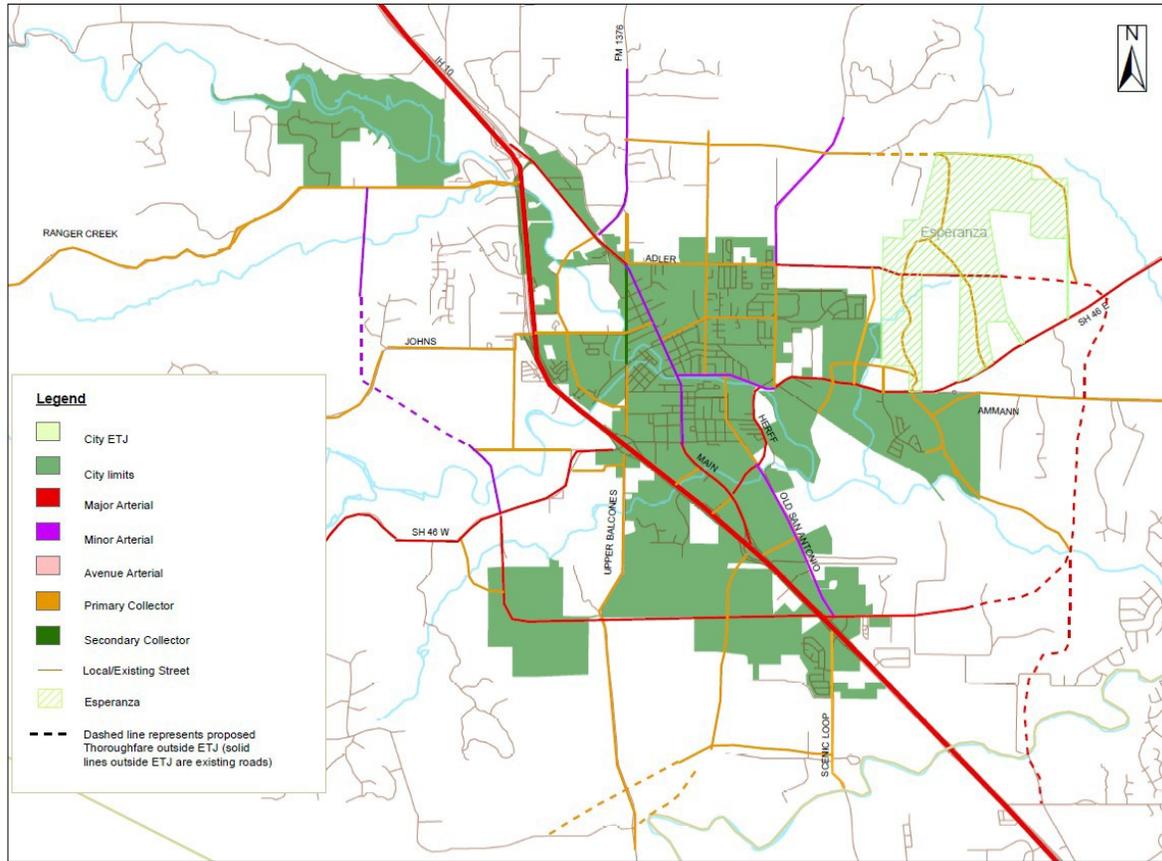
Setbacks in the ETJ: Lot setbacks are determined by the City of Boerne Zoning Ordinance enforced at the time of development. The use that is being constructed and the lot size shall determine which setback shall apply.

Fire Marshall Approval: At time of development of the lot, the owner/developer shall obtain a development permit for Kendall County; submit a site plan for the proposed development, and a letter of approval from the Kendall County Fire Marshall.

Detention shall be provided for each lot unless approved otherwise by the County. Prior to any improvements being made on the lot, Kendall County shall review and approve detention for the site.



City of Boerne Thoroughfare Plan



Adopted 9/14/10 - Revised 2/10/15