

**CHAPTER 16.28
DESIGN STANDARDS AND REQUIREMENTS**

16.28.005 GENERAL DESIGN PRINCIPLES

The quality of design of the City is dependent on the design quality of the individual subdivisions that compose it. Good community design requires the coordination of the efforts of each subdivider and developer of land within the community. Therefore, the design of each subdivision shall be prepared in accordance with the design principles, concepts and standards in the Comprehensive Plan, and in accordance with the following provisions:

A. PHYSICAL CONDITIONS

The arrangement of lots and blocks and the street system should be designed to make the most advantageous use of topography and natural physical features. Trees and native vegetation should be preserved. The system of streets and sidewalks, and the layout and arrangement of blocks and lots should be designed to take advantage of the natural and scenic qualities of the area. Land which the City finds to be unsuitable for subdivision or development due to flooding, improper drainage, adverse earth formation, utility or pipeline easements or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the subdivision or its surroundings, shall not be developed unless adequate methods are formulated by the developer and approved by the Planning and Zoning Commission that will solve the problems created by the unsuitable land conditions.

B. The following general design requirements are intended to facilitate that the proposed subdivision is coordinated with its immediate neighbors with respect to land use, street connections, utilities, drainage facilities, and the possible dedication of parks and open spaces:

1. **Conformity with Comprehensive Plan:** The subdivision shall conform to the Comprehensive Plan of the City and elements thereof.
2. **Provision for Future Subdivision:** If a tract is subdivided into parcels larger than ordinary building lots, such lots shall be so arranged as to permit the logical location and opening of future streets and possible resubdivision of lots with provision for adequate utility easements and connections.
3. **Reserve Strips Prohibited:** There shall be no reserve strips controlling access to land dedicated or intended to be dedicated to public use.
4. **Access to Lots:** Each lot shall abut on a dedicated public street or an approved private street.
5. **Public Improvements:** All public improvements shall be designed and constructed in a manner to meet or exceed the Standard Specifications for Public Works Construction as identified in 16.20.035 or the City's Design Standards and Criteria for Streets, Drainage and other Public Improvements as promulgated by the City Manager.
6. The subdivision plat shall provide for the logical extension of abutting and proposed utilities and drainage easements and improvements in order to provide for system continuity and to promote future development of adjacent areas.
7. **Access to Subdivision:** Each subdivision having more than 20 lots shall be designed to have at least two points of access.

C. Planned Development Districts

In order to promote the health and general welfare of the community and to preserve and make available open space, the Planning and Zoning Commission may grant a subdivider the right to vary the residential density within a tract being developed which has been zoned "PD" Planned Development, or which has a "PD" suffix to its regular zoning district designation under the Zoning Ordinance of the City of Benbrook (Ordinance 808 as amended). Any deviation from the density and lot area requirements, without approval of a variance as provided in Section 17.16.060 of the Benbrook Municipal Code, shall be subject to the following conditions:

1. The overall density shall not exceed that of the zone in which the land occurs. The minimum lot area shall not be less than sixty-six percent (66%) of the minimum normally required in the zoning district in which the land occurs.
2. An overall plan of the entire tract shall be provided showing roads, lot lines, lot areas, easements, encumbrances and other relevant data and shall be submitted in accordance with the Subdivision Regulations with the locations of individual houses, structures, areas of shrubs, and/or trees to be retained, location of trees of fifteen inch diameter (15" dbh) or more, existing contours and proposed grading, drainage and landscaping shown as well.

16.28.010 PRESERVATION OF TREES AND NATIVE VEGETATION

- A. Policy: Landscape shall be preserved in its natural state to the greatest extent feasible. Structures, driveways, and parking areas shall be designed and located to fit harmoniously with the natural environment and to minimize the necessity for removing trees, native vegetation, and soil, or the addition of fill. Site clearing shall not be permitted beyond what is necessary to provide locations for structures, driveways, parking, or small yard areas not visible from the street.
- B. The Developer is reminded that the Zoning Ordinance requires landscaping and bufferyards and that sufficient space on each lot should be provided to accommodate these requirements.
- C. Tree Survey Required: The Developer shall prepare and submit a drawing showing the location and species of each tree with a trunk greater than six inches in diameter measured at a point four-and-one-half feet (4½') above the ground. In areas of dense vegetation that are proposed to be undisturbed, an outline of the vegetation may be shown. The tree survey shall be submitted along with the Preliminary Plat application.
- D. The Developer shall leave undisturbed native vegetation to the maximum extent feasible. In addition, each tree removed with a trunk greater than or equal to six inches (6") in diameter measured at a point four-and-one-half feet (4½') above the ground must be replaced with comparable mature species with an equal number of caliper inches in appropriate locations to compensate for the loss of such trees. A plan for replacing trees that must be removed shall be submitted with the Preliminary Plat application.
- E. To preserve the required mandatory areas of natural vegetation landscape from inadvertent damage during construction, a physical barrier shall be erected around the perimeter of these inviolate areas. The barriers will be in place and approved by the City Inspector before any site clearance can commence. The barrier may consist of a temporary chain link fence, wooden stake (snow) fence, plastic safety fence or other devices as approved by the City Inspector. Minimum height of all types of barriers is four feet (4'). Barriers shall remain in place until the final building and landscape site

inspections are satisfactorily completed for the issuance of the certificate of occupancy. Only after this time can the barriers be removed.

16.28.015 LAND UNSUITABLE FOR SUBDIVISION

Any land that is subject to a 100-year flood in its natural state shall not be developed.

16.28.020 EASEMENTS

A. General Policy

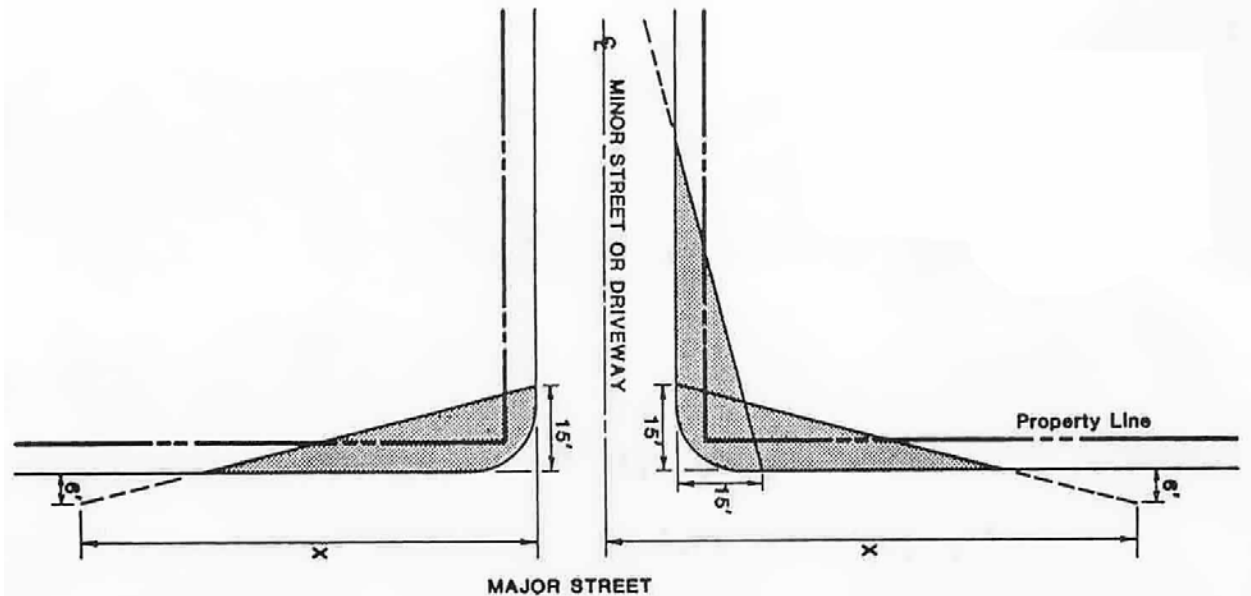
1. Easements should normally be provided along the front, rear or side lot lines.
2. Utility easements shall be a minimum of ten feet (10') in width, unless otherwise specified in this Ordinance or approved by the City Planner.
3. A ten-foot (10') utility easement shall be required adjacent to street rights-of-way to accommodate the location of underground and overhead utilities according to standardized locations promulgated by the City Manager and the Tarrant County Utility Coordinating Council.
4. Easements can be required by the City to be highly restrictive. In such cases the City will draw the easement instrument to be executed by the subdivider prior to approval of the Plat.
5. When the City finds that easements in areas adjoining a proposed subdivision are necessary to provide adequate drainage or to provide utilities, the subdivider shall obtain such easement.
6. Drainage easements shall generally be located along the existing drainage way and should be of sufficient width for the designed improvements to be installed and enough extra width for maintenance equipment to be able to work.
7. All drainage easements shall be so designed to allow maintenance equipment to enter the easement and be able to perform the necessary work.
8. Employees of the City of Benbrook and its agents shall have the authority to enter premises at any time for the purpose of inspecting, repairing or constructing improvements or premises within any easement.

B. UTILITY EASEMENTS

1. Any franchised or authorized public utility, including the City of Benbrook, shall have the right to move and keep moved all or part of any building, fences, trees, shrubs, other growths or improvements which in any way endanger or interfere with the construction, maintenance, or efficiency of its respective systems in any of the easements shown on the plat; and any public utility, including the City of Benbrook, shall have the right at all times of ingress and egress to and from and upon said easements for the purpose of construction, reconstruction, inspection, patrolling, maintaining and adding to or removing all or part of its respective systems without the necessity at any time, of procuring the permission of anyone.
2. All easements which will be used for water and/or sewer facilities, or which may potentially be used in the future for water and/or sewer facilities shall be a minimum of fifteen feet (15') in width. Easements may be greater or lesser than fifteen feet (15') in width as required by the Benbrook Water Authority.

C. PUBLIC OPEN SPACE RESTRICTION

1. A triangular Public Open Space Easement (P.O.S.E.) is required on corner lots at the intersection of two streets (including alleys and private streets.) The triangles shall be described as starting at a point 15 feet (15') behind the curb line on the intersecting street and extending along the street a distance of 10 feet (10') for every mile per hour of posted speed (10'/mph) to a point six feet (6') inside of the curb line (see Figure below.) Two triangles are required on each leg of the intersection.



2. These open space easements will remain in effect unless vacated by ordinance adopted by the City Council of Benbrook.

D. DRAINAGE EASEMENTS

Where a subdivision is traversed by a watercourse, drainage way, natural channel or stream, there shall be provided an easement or right-of-way conforming substantially to the limit of such watercourse, plus additional width to accommodate future needs as determined by the Comprehensive Plan and the City Manager. Natural waterways and channels should be used wherever practical to carry run-off. Any modification to an existing waterway and channel requires approval by the City Engineer and City Manager.

1. Storm drainage easements of fifteen feet (15') minimum width shall be provided for existing and proposed enclosed drainage systems. Easements shall be centered on the systems. Larger easements, where necessary, shall be provided as directed by the City Engineer.
2. Storm drainage easements along existing or proposed open channels shall provide sufficient width for the required channel and such additional width as may be required for 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 necessary slopes along the bank.

3. Where topography or other conditions are such as to make impractical the inclusion of drainage facilities within road rights-of-way, perpetual unobstructed easements for such drainage facilities shall be provided across property outside the road right-of-way lines and with satisfactory access to the road. Easements shall be indicated on the plat. Drainage easements shall be carried from the road to a natural watercourse or to other drainage facilities.
4. When a proposed drainage system will carry water across private land outside the subdivision, appropriate drainage rights must be secured and indicated on the plat or other instrument as approved by the City Attorney. In the case of clear public interest, the City may participate in easement acquisition by power of condemnation.
5. The applicant shall dedicate an appropriate drainage easement either in fee or by drainage easement or by conservation easement of land on both sides of existing watercourses to a distance to be determined by the City Engineer.
6. Easements for storm drainage facilities shall be provided at locations containing proposed or existing drainage ways.
7. Storm drainage easements shall be provided for emergency overflow drainageways 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 of a capacity required by the City of Benbrook.
8. The width of the easements shall be substantiated by a drainage study and drainage calculations or other criteria submitted to and approved by the City Engineer.
9. Floodplain Easements

Floodplain easements shall be provided along natural drainageways and lakes or reservoirs. Floodplain easements shall encompass all areas beneath the water surface elevation resulting from a storm whose design frequency is 100 years, plus such additional width as may be required to provide ingress and egress to allow maintenance of the banks and for the protection of adjacent property, as determined and required by the City Engineer.
10. Detention area easements shall be provided that completely encompass the pond and associated improvements. Detention ponds shall be maintained by the property owner or homeowner's association, unless otherwise approved by the City.

E. Access Easements

1. Emergency access easements and fire lanes will be provided where required by the Fire Marshal or the Planning and Zoning Commission and shall be a minimum of twenty feet (20') in width, have a minimum height clearance of fourteen feet (14'), and have a minimum inside turning radius of twenty-five feet (25'). Any emergency access and fire lane easement more than one hundred (100) feet in length shall either connect at each end to a dedicated public street or be provided with a cul-de-sac having a minimum diameter of eighty (80) feet with an additional distance of ten (10) feet on all sides clear of permanent structures. These easements shall be paved to Design Standards and Specifications recommended by the City Engineer.

2. Cross access easements shall be required from one commercial lot to the adjacent commercial lot to allow circulation without entering the public street.

16.28.025 STREETS

A. General

1. **Street Layout:** The arrangement, classification, character, extent, width, grade and location of all streets shall conform to the Thoroughfare Plan and the official street construction standards and shall be designed in accordance with the following provisions: Adequate streets shall be provided by the subdivider and the arrangement, character, extent, width, grade and location of each shall conform to the Comprehensive Plan of the City and shall be considered in their relation to existing and planned streets, to topographical conditions, to public safety and convenience, and in their appropriate relationship to the proposed uses of land to be served by such streets. The street layout shall be devised for the most advantageous development of the entire neighborhood.
2. **Relation to Adjoining Street System:** Where necessary to the neighborhood pattern, existing streets in adjoining areas shall be continued, and shall generally be as wide as such existing streets in alignment therewith.
3. **Projection of Streets:** Where adjoining areas are not subdivided, the arrangement of streets in the subdivision shall make provision for the proper projection of streets into such un-subdivided areas.
4. **Boundary Streets:** When land proposed to be subdivided is partially or totally bounded on one or more sides by a street or thoroughfare having a right-of-way width of less than that specified in this Section, additional right-of-way shall be dedicated to provide one-half of the ultimate right-of-way width. A half street along adjoining property that has not been subdivided may be shown on the general development plan of an entire subdivision, but no lots fronting upon such half street shall be included in the subdivisions that are approved. Half streets shall be prohibited, except where essential to the reasonable development of the subdivision in conformity with the other requirements of these regulations, and where the Commission finds it will be practicable to require the dedication of the other half when the adjoining land is subdivided. The other half of the street shall be platted within the adjacent tract at the time it is platted. When land proposed to be subdivided is partially or totally bounded on one or more sides by a street way or thoroughfare having a width of less than that specified in this Section, such land shall be laid out so as to provide street widths specified herein.
5. **Streets on Comprehensive Plan:** Where a subdivision embraces a street as shown on the Comprehensive Plan of the City, such street shall be platted in the location and of the width indicated by the Comprehensive Plan.
6. **Design of Local Streets:** Local streets shall be laid out so as to serve only local traffic and to discourage their use by through traffic. Local streets in residential subdivisions shall be designed in a curvilinear manner, except when:
 - a) In the determination of the Planning and Zoning Commission, the shape or topography of the subdivision, or existing pattern of the adjacent street would make the provision of such curvilinear streets impractical; or,

- b) The subdivision is part of and conforms to an unexpired Preliminary Plat approved prior to the adoption of this Ordinance and the Design Standards and Criteria.

- 7. Adequate Access: To insure adequate access, there should be at least two (2) planned points of ingress and egress to each subdivision with more than 20 lots.

- 8. Access to Collectors and Arterials:
 - a) Residential Access: Individual lot access to arterials and collectors for subdivisions zoned A, B, BR, C, or CR shall be prohibited. Lot access to minor collectors shall be prohibited unless specifically approved by the City. The design should provide a minimum number of access points to collector streets.

 - b) Where a residential subdivision borders on or contains an existing or proposed arterial, the Planning and Zoning Commission shall require that access to such streets be limited where possible by:
 - a) the subdivision of lots so as to back onto the arterial and front onto a parallel local street with no access from the arterial;

 - b) providing a series of cul-de-sac, U-shaped local streets, or short loops entered from and designed generally at right angles to a parallel street, with the rear lot lines of their terminal lots backing into the arterial;

 - c) lots to side onto the arterial with a non-access restriction on the arterial side;

 - d) reverse frontage with screening and containing a non-access restriction along the rear property line; or

 - e) other treatment as may be necessary or required for adequate protection of adjoining properties, and as approved, by the Commission after taking into consideration the proposed method of off-street parking and maneuvering which will prevent the necessity of backing into the arterial.

 - Subdivisions serving areas in a single-family residential zoning district that abuts on or contains an existing or proposed arterial or collector street should be designed so that direct vehicular access from any lot to such street is prohibited. The design should provide a minimum number of access points to collector streets.

- 9. Arterial Intersections: Wherever possible, arterials should be intersected only by collector streets or other arterials, rather than local streets. No off-sets at the intersection of two (2) collector streets and/or arterials shall be permitted. There shall be a minimum of six hundred feet (600') between intersections of arterials and/or collector streets.

- 10. Relation to Lots: All streets should be planned so that all resulting lots shall be sufficient size and shape to conform to applicable zoning regulations. Streets should be platted to allow two (2) tiers of lots between streets when possible.

11. Street Right-of-Way: The subdivider shall be required to dedicate appropriate right-of-way for all streets required within or abutting said subdivision in accordance with the adopted Thoroughfare Plan and Tables 16.1 and 16.2.
12. Visibility Triangles: Visibility triangles in the form of Public Open Space Easements (P.O.S.E.) shall be provided at the intersection of all public streets and the intersection of all public streets and alleys and/or private streets as required in Paragraph 16.28.020.C above. The easement shall prohibit any obstruction within the easement from a height of twenty-four inches (24") to a height of eleven feet (11') above the top of the adjacent curb. Utility poles and guy wires may be located in the P.O.S.E. Other ground mounted electrical and communication equipment and switch gear may be located within the P.O.S.E. when the location is coordinated with the City Planner.
13. Street Names: Names of new streets shall not duplicate or cause confusion with the names of existing streets, unless the new streets are a continuation of, or in alignment with existing streets, in which case names of existing streets shall be used. Streets shall be named to provide continuity with existing streets. All streets shall be named and the name approved before the Final Plat is submitted. Final approval of street names shall be by the City Planner.
14. The reservation in private ownership of strips of land at the end of proposed or existing streets and intended solely or primarily for the purpose of controlling access to property not included in the subdivision shall be prohibited.
15. Each subdivision shall have a street connectivity index of at least 1.4, unless otherwise approved by the Planning and Zoning Commission.

B. Street Costs and City Participation

The owner or developer shall be responsible and pay all costs for the design and construction of streets within the proposed development. The developer shall build these streets in accordance with City standards.

C. Traffic Impact Analysis Required

Three (3) copies of a Traffic Impact Analysis (TIA) shall be required for any development that will generate more than one hundred (100) trips per peak hour using data from the most recent edition of Trip Generation published by the Institute of Transportation Engineers. In general, this includes any development with more than 100 dwelling units or shopping area with more than 20,000 square feet of floor area. Traffic Impact Analysis studies shall be prepared by a qualified traffic engineer using generally accepted techniques. The study shall include, as a minimum:

1. analysis of existing traffic levels (some data is available from the City),
2. trip generation and distribution of proposed development,
3. capacity analysis and Level of Service on affected roadways,
4. identification of traffic impacts, needs and deficiencies, and
5. recommendations for site access and off-site improvements.

As a general policy, the City of Benbrook has adopted the Level-of-Service C as the minimum acceptable congestion level for Benbrook roadways. Review and approval of the Traffic Impact Analysis and any required improvements shall be made by the City Engineer.

D. Design Requirements

Design requirements are summarized in Tables 16.1 and 16.2. All streets shall have curb and gutter for drainage control. Curb, gutter and paving requirements for streets, unless otherwise specified, shall follow the Standard Specifications for Public Work Construction (latest edition) of the North Central Texas Council of Governments.

1. Pavement Widths

Streets shall be designed to the width required by the Thoroughfare Plan, Tables 16.1 and 16.2 or as may be specified by the Planning and Zoning Commission. All pavement widths shall be measured from the face of one curb to the face of the opposite curb. Wider pavement widths shall be provided when required by the Planning and Zoning Commission to handle increased or unusual traffic conditions.

**TABLE 16.1 CITY OF BENBROOK, TEXAS
SUMMARY OF STANDARDS
FOR PRIMARY AND SECONDARY MAJOR ARTERIALS**

	PRIMARY ARTERIALS		SECONDARY ARTERIALS	
	PD6 DIVIDED	PU6 UNDIVIDED	M4D DIVIDED	M4U UNDIVIDED
1. Pavement Width (feet) (Face to face)	2-36	72	2-24	48
2. Minimum Pavement Section ¹				
a. Stabilized Subgrade (inches)	6	6	6	6
b. Concrete pavement (ins)	8	8	7	7
3. Number of Traffic Lanes	6	6	4	4
4. Lane widths (feet)	12	12	12	12
5. Right-of-way width (feet)	120	110	90	80
6. Vehicle Capacity Policy (Vehicles/hr:vehicles/day)	2700/ 30,000	2100/ 23,000	1400/ 16,000	1266/ 12,600
7. Design speed (mph)	45	40	40	40
8. Minimum grade (%)	0.5	0.5	0.5	0.5
9. Maximum grade (%)	7	7	7	7
10. Minimum Centerline Radius (feet)	750	750	500	500
11. Stopping Sight Distance (feet)	275	275	275	250
12. Minimum Median Width (feet)	16	n/a	14	n/a
13. Minimum Spacing Median Opening (feet)	400	n/a	400	n/a
14. Minimum Radius for curb returns at Intersection (feet)	35	35	20	20
15. Reverse curve Separation Minimum (feet)	100	100	100	100

Notes: 1. A pavement design shall be provided to determine if a section greater than the minimum is required.

**TABLE 16.2 - CITY OF BENBROOK, TEXAS
SUMMARY OF DESIGN STANDARDS
FOR COLLECTOR AND RESIDENTIAL STREETS**

	COLLECTOR STREETS	LOCAL STREETS		
		ONE-FAMILY RESIDENTIAL	ONE-FAMILY RESIDENTIAL (RURAL SECTION) ³	COMMERCIAL, INDUSTRIAL, AND MULTIFAMILY
1. Pavement Width (feet) (Face to face)	36	30(26 ¹)	20	40
2. Minimum Pavement Section ²				
a. Stabilized subgrade (in)	6	6	6	6
b. Concrete Pavement (in)	7	6	6	7
3. Number of Traffic Lanes	4	2	2	2
4. Lane widths (feet)	10	13	10	12
5. Right-of-way width (feet)	60	50	60	60
6. Vehicle Capacity Policy (Vehicles/hr:vehicles/day)	790/ 7,100	400/ 5,250	400/ 5,250	400/ 5,250
7. Design speed (mph)	35	30	30	30
8. Minimum grade (%)	0.5	0.5	0.5	0.5
9. Maximum grade (%)	7	--	--	--
10. Minimum Centerline Radius (feet)	300	--	--	--
11. Stopping Sight Distance (feet)	250	200	200	200
12. Minimum Median Width (feet)	n/a	n/a	n/a	--
13. Minimum Spacing Median Opening (feet)	n/a	n/a	n/a	--
14. Minimum Radius for curb returns at Intersection (feet)	30	20	20	20
15. Reverse curve Separation Minimum (feet)	75	--	--	--

- Notes: 1. May be used for subdivisions with lot widths 80 feet or larger.
2. The City Engineer may require a pavement design.
3. Rural design may be used on lots zoned SD, RE, or A with lot areas exceeding 11,000 SF and lot widths exceeding 80 feet. Grass-lined swales shall be designed and approved by the City Engineer.

2. Street Section

The City of Benbrook's minimum street section for a local residential street shall be not less than six inches (6") of lime stabilized subgrade and six inches (6") of reinforced concrete, with a minimum crown of five inches (5"). The minimum section for collector and arterial streets is six inches (6") of lime or cement-stabilized subgrade and seven inches (7") reinforced concrete with concrete curb and gutter. As a part of the soils test for determining lime or cement content, a pavement design shall be provided for arterials. The design shall be in accordance with AASHTO Guidelines and shall be based upon a 20-year design life. Commercial and industrial-use roadways shall have a minimum section of six inches (6") of lime or cement stabilized subgrade and seven inches (7") of concrete with concrete curb and gutter. A pavement design shall be provided for commercial and industrial use roadways. A parabolic crown shall be provided in accordance with the City's standard details. Any concrete for street sections shall have a minimum compressive strength of 3600 pounds per square inch (psi) (5-½ sack). The City Engineer may require more stringent design requirements in locations of unusual soil or traffic conditions. When required, twenty-four inch (24") monolithic concrete curb and gutter shall be provided in accordance with the City's standard details. In all cases, the developer's engineer shall conduct geotechnical tests which may dictate an increase in the pavement section. Any deviations from the typical sections shall require the approval of the City Engineer.

The developer's engineer shall provide soil tests to determine by recommendation of a reputable soil testing laboratory the degree of lime stabilization of the subgrade is needed in conjunction with the reinforced concrete pavement. The recommendations shall address the percentage (%) of lime to be applied. As a part of the soils test for determining lime or cement content, a pavement design shall be provided for arterials, industrial and commercial streets. The design shall be in accordance with AASHTO Guidelines and shall be based upon a 20-year design life. A pavement design shall be provided for commercial and industrial use roadways. A parabolic crown shall be provided in accordance with the City's standard details. The distance between expansion joints shall not exceed 600 feet.

All materials furnished for the paving of streets and all construction methods shall fully conform to the appropriate sections of the Standard Specifications for Public Works Construction (NCTCOG).

Curb and gutter shall be constructed as detailed and specified in the Standard Specifications for Construction.

3. Street Alignment: A curved street pattern that follows the topography is preferred to a grid pattern imposed upon the land. This provides use of the streets for drainage purposes, a more interesting pattern of development, and slows traffic driving through residential neighborhoods. Streets should traverse the topography in the following manner:
- a) Cross streams and drainage ways at a right angle; this minimizes bridge and culvert costs.
 - b) Streets on sloping terrain should gradually cross hills rather than directly up and down.

- c) Cul-de-sacs and loop streets should curve with the flow of the topography to best handle drainage.
 - d) Where possible, drainage should be away from the cul-de-sac or loop street.
 - e) Property boundaries should not serve as the primary basis for street layout, with other property features (topography, soils, vegetation, etc.) serving as the overall guide.
4. Intersections: Intersections shall be designed to as near right angles as possible and in no case shall vary from ninety degrees by more than 5 degrees without specific authorization by the Planning and Zoning Commission. Curb returns at intersections shall be in accordance with Tables 16.1 and 16.2. If the intersection angle between any two streets varies by more than 5 degrees from a right angle, the minimum curb return shall be determined and approved by the City Engineer.

Wherever possible, street jogs with center line off-sets of less than one hundred fifty feet (150') for local streets shall be avoided. No street jogs or off-sets are permitted for collector or arterial streets.

Intersections should have only two streets intersecting at right angles. This provides the safest type of intersection. Other types of intersection include:

- a) "T" Intersection - These are useful for discouraging through traffic and should be used more than 150 feet away from any other intersection.
- b) "Y" Intersection - These occur when three streets intersect at a common point. "Y" intersections shall not be permitted.

Visibility triangles shall be provided at all street intersections, either as dedicated right-of-way or as a Public Open Space Easement. The minimum triangle shall be that provided in Section 16.28.020.C, though additional open space easement may be required when necessary to achieve the necessary sight distances. The City shall utilize the sight distance requirements established by the Institute of Transportation Engineers' Guidelines for Urban Major Street Design (1990) in making its determinations. Recommended sight distances are as follows:

Arterial streets with median	500 feet
Arterial streets without median	800 feet
Collector streets	300 feet
Minor streets	200 feet

5. Dead-End Streets, Cul-de-sacs and Loop Streets

Dead-end Streets: Dead-end streets shall be prohibited except as short stubs to permit future expansion. Such short stubs longer than one hundred thirty feet (130') in length shall be provided with an approved turnaround having a minimum radius of fifty feet (50'). Temporary dead-end street shall have provisions for future extension of the street and utilities and, if the temporary cul-de-sac is utilized, a reversionary right to the land abutting the turn-around for excess right-of-way shall be provided.

Cul-de-sacs: A street ending permanently in a cul-de-sac should not be longer than six hundred (600) feet and shall be provided at the closed end with a turn-

around having an outside roadway diameter of at least eighty (80) feet, and a street property line diameter of at least one hundred (100) feet. On extra wide lots, cul-de-sacs may be longer if approved by the Planning and Zoning Commission.

When the Planning and Zoning Commission determines that there is a reasonable expectation that a dead-end street will be extended within two (2) years, construction of a temporary cul-de-sac may be approved. The Planning and Zoning Commission may waive temporary cul-de-sac requirements for dead-end streets when the street is less than two hundred (200) feet in length. The portion of the temporary cul-de-sac which will serve as an extension of the street shall be constructed in accordance with the City standards and that additional portion of the temporary cul-de-sac shall be in accordance with the City standards for a permanent cul-de-sac. "Adequate, all-weather turnaround" is defined as a turnaround that is of sufficient size to accommodate fire and sanitation vehicles and is of a construction quality comparable to standard road cross sections.

Cul-de-sacs and loop streets should drain to other streets, if possible.

6. One-Way Streets: Unless otherwise approved by the City Planner, one-way streets are prohibited in the City.
7. Minimum and Maximum Grades: Street and alley grades should conform to the natural terrain where possible and shall conform to the requirements in Table 16.1 and 16.2.
8. Horizontal Curves: Minimum and maximum horizontal curves shall be in accordance with Tables 16.1 and 16.2. These requirements may be made more stringent by the City Engineer if deemed necessary to provide minimum stopping distance, sight distance, design speeds, and other safety requirements consistent with good engineering practices.
9. Design Speeds: Unless otherwise approved by the City Council, design speeds shall be in conformance with Table 16.1 and 16.2.
10. Curbs and Gutters: Curbs shall be installed by the developer on both sides of all interior and perimeter streets. The City has adopted the seven-inch (7") high curb as the standard for all streets. In limited places where monolithic curb is not provided after approval by the City, the gutter shall be eighteen inches (18") wide. Alternative curb designs shall be approved by the City Engineer for rural section local streets.

The subgrade for curb and gutter typically shall consist of six inches (6") of lime or cement-stabilized base material. In cases where lime stabilization is not feasible, six inches (6") of mechanically compacted crushed stone or six inches (6") of 2-sack concrete ("2:27") may be used as base material. The stabilized base must extend six inches (6") beyond the curb and gutter.

The curb and gutter shall be constructed monolithically in accordance with the City's standard details and Standard Specifications. Concrete shall be 5-sack, 3600 psi design with two #3 steel bars placed longitudinally with the curb and gutter. Joints shall be scribed in the curb and gutter at distances no greater than 12 feet and expansion joints placed at each radius or linear distances of 250 feet or less. Any pavement damaged during curb and gutter installation must be restored to meet City specifications.

All improvements shall be subject to inspection and approval of the City Inspector. All work shall be subject to tests as prescribed by the City Inspector, with the cost of such tests borne by the Developer or his contractor. If a test fails to meet specifications, the contractor shall bear the expense of removing the faulty section delineated by the City Inspector, reconstructing the section, and performing any subsequent tests required by the City Inspector.

Wheelchair ramps shall be provided at all street intersections, unless otherwise approved in writing by the City Engineer. Wheelchair ramps shall also be provided at driveway curb returns where the location of the curb return intersects the sidewalk and results in a barrier to handicapped access. Wheelchair ramps shall be provided in commercial and industrial parking lots that are required to provide handicapped parking spaces. All wheelchair ramps shall be constructed in accordance with the City's standard details and in compliance with ADA requirements.

11. Driveways and Median Openings

Driveways: The location of driveway ingress or egress from any lot onto a collector or arterial shall be approved by the City Inspector. Driveways shall provide a minimum of eighteen feet (18') between the property line and any garage door, gate, or other obstruction to provide for safe parking or stack space off of the public right-of-way. The location and size of all driveways serving multi-family residential, commercial and industrial properties shall be subject to the approval of the City Inspector. The City Manager shall promulgate design standards for such facilities.

a) Residential driveway access to arterial streets: Residential driveway access to arterial streets should not be permitted except for major multiple-family "cluster" developments.

b) Number of direct access driveways (curb cuts):

Each land owner is entitled to access to the City street and thoroughfare system; however, it is City policy to limit the number of driveways entering streets and thoroughfares to protect public safety and maintain traffic efficiency. Therefore, each landowner is entitled to only one driveway for each lot or parcel. Additional drive approaches shall be approved only when it has been determined that the additional driveway is necessary for adequate traffic circulation and that street efficiency and safety are preserved. Circle drives on one-family lots fronting on local streets will be generally permitted when the City Inspector determines that traffic safety is not hindered.

No driveway shall be located within two hundred feet (200') of the intersection of an arterial with an arterial, one hundred twenty five feet (125') of the intersection of an arterial and a collector, or seventy-five feet (75') of a street intersection of a collector and local or within fifty feet (50') of a local and local street unless no other point of access can be provided. Likewise, driveways shall be located a minimum of seventy-five feet (75') from any median opening unless the median opening directly serves the driveways. Deviations from these standards shall be allowed only upon approval of the City Planner. Except for residential driveways on local streets, driveways should be located directly opposite

each other to minimize the potential points of conflict. The use of common driveways for adjacent property shall be encouraged.

Driveways entering onto access roads of controlled access highways shall be prohibited for a distance of one hundred feet (100') before the intersection of roadway surfaces on exit ramps to a point three hundred feet (300') after the intersection of the travel-ways. Driveways are prohibited for a distance of one hundred feet (100') before the intersection of travel-ways on any entry ramp to a point one hundred feet (100') beyond the intersection of roadway surfaces and otherwise meet or exceed all other requirements of the Texas Department of Transportation.

Whenever the use of any driveway approach is abandoned and not used for ingress and egress to the abutting property, it shall be the duty of the abutting property owner to restore the curb to the standards of the City.

c) Minimum Spacing between Driveways

- | | | |
|-----|--|--|
| (1) | <u>Street Classification</u>

Primary Arterials (P6D)
Secondary Arterials(M4U)
Collector (RC)
Local (residential) | <u>Separation of Curb Cuts</u>

One per 300 feet of frontage
One per 200 feet of frontage
One per 100 feet of frontage
10-foot separation unless joint access |
|-----|--|--|
- (2) It is the policy of the City to discourage driveway cuts onto the major arterials of the City. Driveway cuts onto the City's major streets will be allowed only when:
- i) There is no other feasible alternative; or
 - ii) Traffic engineering studies clearly show a need.
- (3) Additional driveways other than permitted in the table above will be allowed under the following conditions:
- i) If the daily volume using one driveway would exceed five thousand (5,000) vehicles (both directions).
 - ii) If the on-site, peak-hour traffic volume exceeds five hundred (500) vehicles per hour (both directions).
 - iii) A competent professional traffic analysis shows that traffic conditions warrant more driveways. Part of this study must include data indicating volumes compared to above standards and must show how alternative arrangements, joint access, etc., will not work.
- (4) Right-turn deceleration lanes and associated additional right-of-way shall be provided when the peak hour right-turn movements exceed 40 per hour. Deceleration lanes shall be at least 100 feet long with a 100-foot transition.

- d) Sight Distance, Onsite Maneuvering and Parking Lot Design: Adequate site distance and on-site maneuvering should be available from every driveway. Any movement for which adequate sight distance is not available or any parking lot design that does not provide adequate on-site maneuvering should not be permitted., For example, if parking is within twenty-five (25) feet of the driveway for commercial or multifamily developments under three (3) acres or within fifty (50) feet of the driveway for commercial or multifamily development over three (3) acres, either the parking should be rearranged or joint access should be considered or access to another street should be sought. Adequate driveway throat length shall be provided to reduce congestion.
- e) Median Openings: If and when medians are constructed on any arterial street, spacing between median openings should be at least four hundred (400) feet. The spacing may be reduced if a competent traffic study shows that a lesser spacing will still safely and efficiently accommodate left-turn movements to existing and projected future development in the immediate vicinity.
- f) Width of Driveway Approaches:

(1) Residential: Residential driveways to serve single car garages, carports, and/or storage areas shall be not less than ten (10) feet nor more than twenty (20) feet in width, measured at the property line. Residential driveways to serve two car garages, carports, and/or storage areas shall be not less than eleven (11) feet, not more than twenty-four (24) feet in width, measured at the property line. When residential driveways are required to serve three or more car garages, carports, and/or storage areas, the size and location of the driveway(s) shall be subject to the approval of the City Engineer, after an adequate engineering analysis of the parking, maneuvering and access requirements. A driveway should not begin less than five (5) feet from the point of tangency of the corner radius of an intersection.

Driveways shall provide a minimum of eighteen feet (18') between the property line and any garage door, gate, or other obstruction to provide for safe parking or stack space off of the public right-of-way.

The radius of all driveway returns shall be a minimum of five (5) feet. Residential driveways shall not be constructed closer than ten (10) feet apart. If permitted, low density residential driveways entering onto collector or arterial streets shall have a minimum curb return radius of ten feet (10').

Joint driveway approaches may be approved provided a letter of agreement signed by all adjoining property owners is delivered to the City Inspector or designee.

(2) Commercial, Industrial and Multifamily residential: The location of ingress and egress for all commercial, industrial and multifamily residential driveways shall be subject to the approval of the City Inspector. Driveways should not exceed sixty-five percent (65%) of the property frontage. Driveways shall have a minimum width of 12 feet for a one-way drive and 24 feet for a two-way drive. The maximum width shall not exceed thirty feet (30') unless otherwise approved by the City Inspector.

The minimum radius of a commercial, industrial or multifamily residential driveway shall be ten feet, but twenty feet may be required in most locations.

12. Private Streets, Gated Communities and Common Area Regulations

a) Intent and Purpose

It is the intent of these private street and common area regulations to:

- (1) Allow private street developments to occur within the City of Benbrook on a limited and restrictive basis;
- (2) Provide for private street developments as one type of residential development alternative to allow the City of Benbrook to expand housing types as compared to other Metroplex cities;

There shall be no required minimum or maximum acreage size and/or number of lots within private street developments. However, minimums and maximums will be evaluated on a case-by-case basis by the Planning and Zoning Commission.

The location of each private street development will be subject to the approval of the Planning and Zoning Commission on a case by case basis, based upon, among other matters, the criteria described in this Chapter. An applicant who meets the stated criteria will not be entitled to the Private Street subdivision as a matter of right, but shall only obtain approval for the Private Street subdivision at the sole discretion of the Planning and Zoning Commission, after review by City Staff.

b) Compliance with Other Laws

In order to qualify for consideration of private streets, the applicant must satisfy the criteria of the City of Benbrook Comprehensive Zoning Ordinance, as amended; the City of Benbrook Subdivision Ordinance as amended; and any other applicable codes and ordinances, as may be, from time to time amended.

Denial of approval of any private street development by the Planning and Zoning Commission shall be final and shall not be reviewable by the Benbrook City Council or Zoning Board of Adjustment.

c) Guidelines for Development

The following guidelines are to be satisfied as part of the review and approval process for all private street developments:

- (1) The area must be within the corporate limits of the City of Benbrook, or within the Benbrook Extraterritorial Jurisdiction.
- (2) The area shall be a proposed residential development, and shall be zoned solely as a residential zoning district (that is, a zoning district the stated purpose of which is to provide for primarily residential uses), except in the case of a Planned Development

(PD) zoning district, in which case the area must be designated solely for residential use.

- (3) Only the following zoning districts shall allow consideration of private street developments:

RE - Residential Estate District
A - One Family District
B - One Family District
BR - One Family Reduced District
CR - Multiple Family Restricted District
C - Multiple Family District
D - Multiple Family District
PD - Planned Development District

- (4) The area may not impede a current or future development of a thoroughfare.

- (5) The area may not disrupt an existing or proposed City of Benbrook public pedestrian pathway, hike and bike trail or park.

d) General Requirements

- (1) The private street system must comply with design standards in the Benbrook Subdivision Ordinance. All rules and regulations in the Subdivision Ordinance to "public right-of-way" shall apply to private street lots, including right-of-way and street width and paving requirements, sidewalk and street lighting requirements. The Commission will entertain proposals for creative quality alternative streetscape developments that achieve the goals of adequate vehicle and pedestrian access.
- (2) The private street system shall provide perpetual access for police and other emergency vehicles, public and private utility maintenance and service personnel, solid waste collection services, the U.S. Postal Service, and government employees in pursuit of their official duties.
- (3) The type of gate or controlled access mechanism is subject to the approval by the City of Benbrook's Fire Marshall, and any corrective action shall be the responsibility of the property owners association. The City of Benbrook shall bear no responsibility or liability in connection with the removal or destruction of any gate or other controlled access mechanism while engaged in an emergency action.

e) Specific Requirements

- (1) Each private street development plat shall contain the following wording on the face of the plat. "The streets have not been dedicated to the public, for public access nor have they been accepted by the City of Benbrook as public improvements, and the streets and roadways shall be maintained by the property owners association within the subdivision, except that the streets and roadways shall always be open to emergency vehicles, public and private utility maintenance and service personnel,

solid waste collection services, the U.S. Postal Service, and governmental employees in pursuit of their official duties".

- (2) All private street developments will be approved concurrent with the Final Plat. The Planning and Zoning Commission shall consider the private street development after review and recommendation by the City staff.
- (3) Easements: Private street developments shall provide the following easements:
 - i) "public utility, drainage and storm sewer" easements containing private streets and public utilities;
 - ii) additional public utility assessments required by public agencies;
 - iii) pre-existing easements unaffected by the platting process; and
 - iv) such private service easements, including but not limited to, utilities, fire lanes, street lighting, government vehicle access, mail collection and delivery access, and utility meter reading, access, as may be necessary or deemed mutually convenient by the applicant and the City.
- (4) Access: To insure adequate access to each subdivision, there should be at least two (2) points of ingress and egress, except for approved cul-de-sacs. The second entry may be designated for emergency access only.
- (5) Private Access Amenity Plan: For each private street development, a private access amenity plan shall be submitted to the City Planner for review and approval in consultation with Public Safety and other City departments. At a minimum, the private access amenity plan shall include a scale drawing showing the plan and profile of all walls, gates, entry areas, landscaping, architectural features, and signs, etc. This will provide opportunity to review proposed controlled access mechanisms, access points, landscaping, screening walls, or similar buffering barriers, and other related private street components.
- (6) The City Staff may request rendered perspectives and elevations of proposed structures, including description of proposed building materials, roof pitches, signage, and showing relationships to adjacent structures and such other items as the City staff might reasonable request (said renderings of elevation of proposed structures does not refer to residential structures, but rather to other structures that are components of the private street development).
- (7) The City staff may require additional data to amplify and clarify the private access amenity plan; such information may include, but not be limited to, fencing, access controllers, entrance areas, barriers, perimeter walls, and exterior landscaping.

- (8) No credit will be allowed for the development of private parks, not open to the public, except as may be provided in Section 16.04.045 of this Ordinance.
- (9) Except as may otherwise be provided in a PD-zoning approval, building lines shall be provided in accordance with the Zoning Ordinance from the edge of the private street lot.

f) Conversion of Public Streets to Private Streets

For existing subdivisions with public streets and rights-of-way to become private, the following procedures shall apply:

- (1) The permit application must contain the signatures of all the owners of the lots that would be part of the proposed private street subdivision.
- (2) The street right-of-way must be purchased from the City in accordance with Chapter 272 of the Texas Local Government Code. The Planning & Zoning Commission shall first review the application and forward a recommendation to the City Council. If the recommendation is favorable and the City Council concurs, the City Council shall order an appraisal of the street rights-of-way in the affected subdivision. The cost of such appraisal shall be borne by the applicants, and the appraisers conclusion of value shall be final.
- (3) Once the conversion takes place, all of the other provisions of this Ordinance shall be applicable to the private street subdivision.

g) Relationship to the City of Benbrook Comprehensive Plan

The following components shall be elevated when reviewing potential private street developments. This evaluation will aid in logical implementation of the current City of Benbrook Comprehensive Plan and the following components may be hereafter amended.

- (1) Future Land Use Plan: Development impact on land uses, their configuration and function shall be examined as part of each request for a private street development.
- (2) The Master Park Plan: The proposed private street development shall be evaluated to assess impact of private streets on access, including ingress and egress, and continuity of the hike/bike/jogging/open space linkage system within the community, as well as the functioning of other Park Plan and trail system plan elements of the Comprehensive Plan.
- (3) Thoroughfare Plan: The proposed private street development shall be evaluated to assess its impact on the efficiency, convenience, and safe functioning and implementation of the Thoroughfare Plan element of the Comprehensive Plan.

- h) Public Improvement Districts and Property Owners Associations
- (1) Public Improvement District Required: Developers proposing subdivisions with private streets shall petition the City Council for the creation of a public improvement district to maintain the private streets as provided in Chapter 372 of the Local Government Code. If the proposed development is adjacent to an existing public improvement district, the developer shall petition to be added to the preexisting district.
 - (2) Property Owners Association: In lieu of the public improvement district and upon approval of the Planning and Zoning Commission, subdivisions with private streets and/or common areas and facilities may have an approved property owners association. The property owners association shall require membership by all property owners within the subdivision, and have provisions to assess and/or place liens on owners for nonpayment of street and common area maintenance dues. The Property Owners Association shall own and be responsible for the maintenance of private streets, appurtenances and common areas and facilities. The Property Owners Association shall provide for the payments of dues and assessments required to maintain the private streets and common areas. The Property Owners Association covenants and bylaws shall be approved by the City staff and City Attorney. The approved document must be filed for record contemporaneously with the filing of the Final Plat in the County records department.
 - (3) Street and Common Area Maintenance Reserve Fund: The Property Owners Association covenants and bylaws shall establish a Street Maintenance Reserve Fund for the maintenance, repair and reconstruction of private streets, access controlled structures and equipment and common areas and facilities. This Reserve Fund shall not be co-mingled with any other Property Owners Association funds. Each property owner shall be assessed annually to be placed in the Street and Common Area Maintenance Reserve Fund. After five years of existence, the accumulated balance of the fund shall not be less than five dollars (\$5.00) per front foot of each lot. The formula for calculating the reserve fund may be reviewed and amended as needed upon approval by the City. The property owners association shall provide the City an audited statement of the fund's balance, upon request.
 - (4) The Property Owners Association's covenants shall contain provisions that allow the City of Benbrook to assume the duty of performing the maintenance obligations should the property owners association dissolve or in any way fail or refuse to maintain its obligations. The covenants shall further provide that the City of Benbrook may use the outstanding balance in the Street and Common Area Maintenance Reserve Fund for maintenance or in the alternative, levy an assessment upon each lot on a pro rata basis for the cost of such maintenance.

- (5) Membership Requirements: Every lot owner within the development shall be a member of the property owners association.
- (6) The Property Owners Association documents shall indicate that the streets within the development are private, owned and maintained by the property owners association and that the City of Benbrook has no obligation to maintain or reconstruct the private streets or common areas and facilities. The covenants shall include the following provision.

"The property owners association shall be responsible for contacting the City of Benbrook Inspection Department every two (2) years, or as needed, from time of construction to schedule an inspection by city staff and/or their designee of the private streets or private roadways and common areas and facilities."

- (7) The Property Owners Association covenants and bylaws shall include language, approved by the City Attorney, whereby the association agrees to fully indemnify, hold harmless and defend the City, its officers, agents, and employees, from any and all claims, lawsuits, judgments, costs or causes of action of any nature whatsoever, whether real or asserted, brought for or on account of any injuries or damages to persons or property including death, resulting from or in any way connected with the construction, maintenance or operation of the private streets and common areas and facilities.

i) Conversion of Private Streets to Public Streets

- (1) Voluntary Conversion: The City of Benbrook may, but is not obligated to, accept private streets for public access and maintenance. The procedure must conform to all of the following provisions:
 - i) The Property Owners Association must submit a petition signed by one-hundred percent (100%) of its members.
 - ii) All of the streets and roadways must be in a condition that are acceptable to the City of Benbrook.
 - iii) All access controllers and other structures not consistent with a public street development must be removed.
 - iv) If any maintenance of the streets and roadways is required, the City of Benbrook may use the outstanding balance in the reserve fund for such maintenance. Any remaining balance in the fund shall be returned to the lot owners at the time the private street and/or roadway is converted back to a public street on a fair and equitable basis to be determined by the City Council.
 - v) Each lot owner shall execute an instrument of dedication for filing of record, the form of which shall be approved by the City Attorney's office.

j) Design Standards

The design and construction of the infrastructure within a private street subdivision shall conform to the same rules, regulations, standards, and specifications established for public subdivisions. The City Manager or his/her designee is hereby authorized to promulgate rules, regulations, standards, and specifications for the design and construction of improvements unique to a private street subdivision. The same shall be filed with the City Secretary at least thirty (30) days before they shall become effective. An amendment may be made from time to time, provided that the amendment is filed with the City Secretary at least thirty (30) days before it becomes effect. No such rules, regulations, standards or specifications shall conflict with this or any other ordinance of the City of Benbrook.

(1) Structures:

- i) Project perimeter fences at project entry access points, entry monuments, and access controllers, may be erected within the public utility, drainage and storm sewer easement(s), provided they do not impede the installation, maintenance, repair, or replacement of public utilities and storm sewers within the easement.
- ii) Where access controllers are a part of a larger, multipurpose structure, only that portion of the structure which functions as access controllers may encroach the building line adjacent to the private street.

k) Street lights on private streets

The developer shall submit a street lighting plan for review and comment by the City Staff. Street lighting shall generally conform to the standards in Section 16.28.045, though alternate poles and luminaries may be used that achieve the same level of illumination. It shall be the responsibility of the Property Owners Association to pay for the cost of operating the street lights on private streets.

13. Alleys

- a) Widths and Paving: Any alleys installed in commercial or industrial areas shall be not less than thirty feet (30') in right-of-way width and pavement. Alleys in residential areas are prohibited, unless specially approved by the Planning and Zoning Commission. All alley paving shall be constructed in accordance with City standards. Alleys shall be approximately parallel to the frontage of the street and shall be less than one thousand six hundred feet (1,600') in length unless specifically approved by the Planning and Zoning Commission.
- b) Intersecting Alleys or Utility Easements: Where two (2) alleys or utility easements intersect or turn at a right angle, a cut-off of not less than ten feet (10') from the normal intersection of the property or easement line shall be provided along each property or easement line.
- c) Dead-end Alleys: Dead-end alleys shall not be permitted.

- d) Commercial and Industrial Alleys: Alleys shall be provided in commercial and industrial districts where other definite and assured provisions are not made for service access, such as off street loading, unloading, parking and fire fighting access consistent with and adequate for the uses proposed. Alleys in commercial and industrial areas shall have a minimum right-of-way and pavement width of thirty feet (30') and a minimum pavement thickness of seven inches (7") of reinforced concrete pavement or eight inches (8") of HMA over six inches (6") of lime or cement stabilized subgrade. A pavement design shall be provided by the developer for commercial and industrial alleys. The minimum inside radius of any curve shall not be less than twenty feet (20').
- e) Residential Areas: Alleys are not permitted.
- f) Turnouts: Alley turnouts shall be paved to the property line and shall be at least twelve (12) feet wide at that point. The paving radius where an alley intersects an arterial shall be twenty (20) feet, and shall be ten (10) feet at intersections with all other streets.
- g) Alleys should intersect streets at right angles or radially to curved streets.
- h) In cases where two alleys intersect or turn a sharp angle, lot corners shall be platted so that a triangular area of 25 feet by 25 feet or greater, is dedicated as part of the alley for the purpose of providing a minimum radius of 30 feet to the inside edge of the alley paving.
- i) Alley paving should have a minimum grade of 0.4 percent (%) and a maximum grade of 10.0 percent (%.)

14. Traffic Control and Street Signs

The developer shall provide all street identification signs and attachment hardware for streets within the subdivision. The street identification signs shall be constructed in accordance with the requirements in the Design Standards and Criteria. The Developer shall provide poles and any necessary traffic control signs (such as stop signs) as directed by the City Engineer.

15. Sidewalks, Hike and Bike Trails and Parkways

Unless otherwise approved by the Planning and Zoning Commission, sidewalks shall be installed as follows:

- a) On the subdivision side of all arterials and collector streets adjacent to the subdivision.
- b) On both sides of all internal arterial, collector, and local streets of a subdivision.
- c) Such additional sidewalks as the subdivider may desire.
- d) Sidewalks shall be placed in the right-of-way and shall be a minimum of five feet (5') in width, but must be at least six foot (6') in width if placed at the back of the curb.

- e) Swept corner or other approved handicapped access curb ramps shall be provided at all intersections and crosswalks.

Sidewalks shall be constructed of concrete in accordance with the City Standard Specifications and in accordance with the City Standard Design Details. Sidewalks shall have a minimum pavement thickness of four inches (4") of reinforced concrete with a minimum compressive strength of 3,000 pounds per square inch. Sidewalks shall have a minimum cross slope of 0.015 foot per foot for drainage.

Parkways shall be graded with a slope not less than 0.015 foot per foot. Except as otherwise provided by City Ordinance or policy, no other structures or trees and shrubs shall be placed in the parkway. Landscaping plans for the parkways must be approved by the Benbrook Parks and Recreation Board.

Any subdivision that contains or adjoins a route for a bike trail as shown in the current Comprehensive Plan shall provide sufficient right-of-way and construct the portion of the bike trail that lies within or adjacent to the subdivision. The bike trail pavement shall be at least ten feet (10') in width made of concrete to AASHTO design standards. Right-of-way dedication for this purpose may be used as a credit toward parkland dedication requirements in Section 16.04.045.

Sidewalks shall be installed at the time of subdivision construction for all commercial, industrial, and multifamily subdivisions. In single-family residential subdivisions, sidewalks for each lot may be installed by the home builder at the time of home construction during the first four (4) years after acceptance of the subdivision. At the time of Final Plat submittal, the developer shall submit a cash or performance bond (or other approved financial assurance instrument) to construct 20 percent of the required sidewalks. At the end of the four-year period, the developer shall construct the remaining sidewalks in the subdivision, or the City shall exercise the bond and construct them. The City shall refund any funds not required for sidewalk construction at the end of the four-year period.

16. Parking lots

The required number of parking and loading spaces shall be provided in accordance with the City's Zoning Ordinance. Parking shall be designed to facilitate efficient traffic movement with a minimum conflict. All parking maneuvers shall be accomplished off of public right-of-way. Off street parking layouts shall afford the driver the ability to accomplish all maneuvers to enter or exit the parking spaces on private property. Adequate stack space shall be required for entrances into parking lots to prevent congestion backing onto the arterial.

Off-street parking areas shall be maintained by the Owner.

Except for projects in the MU-Mixed Use zoning district, no new "head-in" parking is permitted, except for one and two-family residential lots. Existing head-in parking may be required to be eliminated when the City Engineer determines that prevailing traffic conditions require the elimination of existing head-in parking that makes use of public rights-of-way to correct a serious traffic hazard.

Nothing in this section shall require the changing of existing driveways and/or parking except under one or more of the following conditions:

- a) during widening and/or reconstruction of streets, the driveways will be brought into conformity with the present standards and head-in parking will be eliminated; or
- b) during new building construction or major additions and remodeling of existing buildings all driveways and parking requirements will be brought into conformity with the present standards and head-in parking will be eliminated.

Parking lots should be designed with a minimum pavement thickness of five inches (5") of 5-sack concrete with a minimum compressive strength of 3,000 pound per square inch reinforced with #3 bars on 24-inch centers in both directions over fill sand, lime or cement stabilized subgrade or equivalent. Alternative porous pavements (such as concrete pavers, grass pavers, or gravel pavers) may be considered on a case-by-case basis.

17. Fire Lanes

Fire lanes shall be constructed in accordance with the requirements for fire apparatus access roads in the International Fire Code as adopted by the City of Benbrook, unless otherwise specified herein. The location requirements for fire lanes shall be established by the City Fire Marshall. No certificate of occupancy shall be issued until the required fire lanes are constructed, inspected and approved.

Fire lanes shall have a minimum width of twenty feet (20') and shall have a minimum vertical clearance of fourteen feet (14'). The minimum inside turning radius shall be twenty-five feet (25') and the minimum outside turning radius shall be forty-five feet (45'). All dead end fire lanes exceeding one hundred feet (100') in length shall have a turn-around with minimum radius of fifty feet (50'). Fire lanes shall not have a grade exceeding ten percent (10%). Fire lanes shall be clearly marked as a fire lane and parking prohibited. Markings must be maintained at all times.

Fire lanes shall be constructed of an all-weather pavement designed and maintained to support a twelve thousand five hundred pound (12,500 lb.) wheel loading. Unless otherwise approved by the City Engineer, such pavement shall consist of five-inch (5") thick concrete pavement in light traffic areas and six-inch (6") thick concrete pavement in areas expected to receive heavy truck traffic, such as service drives. In both cases, pavement shall a minimum of 5-½ sack concrete with a minimum compressive strength of 3,600 pounds per inch reinforced with #3 bars on 24-inch centers in both directions. In both cases, concrete shall be poured over stabilized subgrade. The developer or contractor shall submit a pavement design for the fire lanes prior to construction and the construction must be inspected. The contractor shall provide test results verifying the strength of the concrete, at the direction of the City Inspector.

18. Medians

Medians shall not be constructed in dedicated public right-of-way unless specifically required by and/or approved by the Planning and Zoning Commission. Medians approved for aesthetic purposes shall be maintained by, and at the expense of, the dedicator in accordance with specific contractual arrangements with the City. Medians required for traffic control shall be designed for minimum maintenance.

16.28.030 BLOCKS AND LOTS

A. BLOCKS

1. The length of a block shall be considered to be the distance from property corner to property corner measured along the property line of the block face of greatest dimension, or on which the greatest number of lots face. The width of a block shall be considered to be the distance from property corner to property corner measured along the property line of the block face of least dimension, or on which the fewest number of lots face. The length, width and shapes of blocks shall be determined with due regard to provision of adequate building sites suitable to the special needs of the type of use contemplates, zoning requirements as to lot sizes and dimensions, and needs for convenient access, circulation, control and safety of street traffic.
2. Block lengths shall not exceed one thousand six hundred feet (1,600'), nor be less than five hundred feet (500').
3. When the length of any block exceeds one thousand two hundred feet (1,200'), the subdivider or developer shall be required to dedicate a portion of property to the City which will divide the block width-wise, so as to allow utilities, drainage, or other accommodations in the best interest of the immediate and adjacent properties. The exact width of such dedication shall be determined by the Commission.
4. Where long blocks in the vicinity of a school, park or shopping center are platted, the Commission may require a public walkway near the middle of long blocks or opposite a street that terminates between the streets at the ends of the block. If required, the walkway shall be not less than four (4) feet in width, and shall have a concrete walk of a minimum width of four (4) feet through the block from sidewalk to sidewalk, or curb to curb, or if no street, to the property line adjacent to school, park or shopping center.

B. LOTS

1. The lot arrangement and design shall be such that all lots will provide satisfactory and desirable building sites, properly related to topography and the character of surrounding development.
2. All side lines of lots shall be at approximately right angles to straight street lines and radial to curved street lines except where a variation to this rule will provide a better street and lot layout. Rear lot lines should be straight and avoid acute angles with side yard lines. Odd-shaped lots should be avoided. Where utility easements are to be located along rear lot lines, these lines should be as straight as possible for long lengths.
3. No lot shall have less area of width at the building line than is required by the zoning regulations that apply to the area in which it is located.
4. Lots shall be consistent with zoning regulations. When the specific proposed use of a lot or tract depends upon future action by the City Council or other properly designated authority, lot lines shall also be shown on the Preliminary Plat appropriate to a use that does not require such action. Proposed uses shall be shown on the Preliminary Plat.

5. Generally lots should be deeper than they are wide. It is recommended to have the depth twice the width. The important consideration is to assure that the lots are neither too deep nor too shallow to allow for good placement of a dwelling unit on a lot.
6. Corner lots shall be wider than interior lots so that dwellings can be placed further from the street. Corner lots shall be 10 to 20 percent wider than interior lots. Lots facing onto heavy traffic streets shall be avoided. This can be accomplished by providing deeper lots with the houses backing onto the heavy traffic street. Other methods include,
 - a) providing an access street parallel to the major street,
 - b) cul-de-sac if the property has sufficient depth, or
 - c) provide a loop street, if the property has sufficient depth and width.
7. Surface drainage must be diverted away from house sites to a public right-of-way or dedicated drainage easement. Sufficient slope must exist on the lot to enable drainage to runoff from the building site across sidewalks, and onto the street. Swales may be needed to provide drainage from backyards.
8. Building Lines: Front and second front building lines shall be shown on all lots in the subdivision. The building lines shall be listed in accordance with the minimum applicable to the zoning district. Building lines on plats may exceed the minimum required by the Zoning Ordinance.
9. Orientation to Creeks and Streams: Any lots that are contiguous to the major stream channels (Mary's Creek, Clear Fork-Trinity River, Timber Creek, or Walnut Creek) shall be oriented so that their front shall face the creek across a public street.
10. Orientation to public parks: No more than fifty percent (50 %) of the boundary of a public park may be contiguous to the rear lot line of residential lots. All other residential lots must face the public park across a public street.

16.28.035 DRAINAGE

A. GENERAL

1. **Conformance with Comprehensive Plan**: The developer shall provide those drainage improvements which traverse or abut the proposed subdivision, where specified in the Comprehensive Plan. All cost for such improvements shall be paid by the developer, except where the City Manager shall determine that the improvements benefit other citizens more than that of the proposed subdivision and shall determine the equitable City participation in such improvements. Such City participation, or any appeal of such requirements, shall be approved by the City Council.
2. To protect health, safety and environmental quality, it shall be the policy of the City of Benbrook that no new development will be allowed within the 100-year floodplain, as delineated by the Federal Emergency Management Agency. Undeveloped land within the floodplain may be used for agricultural purposes, be incorporated into adjacent lots outside of the floodplain, or set aside as private or public open space.
3. Development shall not increase the peak flow discharge or velocities over natural conditions, particularly on adjacent and downstream properties for the 2-year, 25-year or 100-year, 24-hour storm events. When preliminary drainage studies

indicates that peak flows or velocities will be increased, then detention basins or other techniques shall be designed to reduce flows to natural conditions.

B. Drainage Facilities: Drainage facilities shall be provided and constructed as specified by the City Engineer. Streets may be used for conveyance of surface run-off within the following standards:

1. Local streets shall have the capacity to carry a five (5) year storm-flow without topping the curbs and that the one hundred (100) year storm-flow will be contained within the right-of-way.
2. Collector Streets shall have the capacity to carry a five (5) year storm-flow without topping the curb and have at least one (1) lane of traffic open at all times. The 100-year storm flow shall be contained within the right-of-way.
3. Arterials shall have the capacity to carry a five (5) year storm-flow without topping the curb and maintain at least one (1) open lane of traffic in each direction. The 100-year storm flow shall be contained within the right-of-way.
4. The Planning and Zoning Commission shall not recommend for approval any plat of a subdivision which does not make adequate provisions for storm or floodwater runoff channels or basins. Drainage provision shall ensure the health and safety of the public and the property in times of flood.
5. Development shall not increase the peak flow discharge or velocities over natural conditions to adjacent and downstream properties, unless the discharge is into a dedicated drainage easement with channel capacity to contain the increased flow. When calculations indicate that curb capacities are exceeded at a point, no further allowance shall be made for flow beyond that point, and inlets shall be used to intercept flow at that point.
6. The applicant may be required by the Planning and Zoning Commission to carry away by pipe or open ditch any spring or surface water that exists previous to, or as a result of the subdivision. Such drainage facilities shall be located in the road right-of-way where feasible, or in the perpetual unobstructed drainage easements of appropriate width, and shall be constructed in accordance with the construction standards and specifications of the City of Benbrook.
7. Storm drainage facilities shall be designed in accordance with the iSWM Design Manual for Site Development (2006), unless otherwise specified herein. Approval of storm drain facilities necessary and construction requirements shall be the responsibility of the City Engineer. Where there is a question as to the justification of size of the facility required, the question will be resolved in favor of additional drainage capacity.
8. Coordination with the Comprehensive Plan drainage element (when applicable) is required. The developer shall provide those drainage improvements which traverse or abut the proposed subdivision, where specified in the Comprehensive Plan. All costs for such improvements shall be paid by the developer, except where the City Engineer shall determine that the improvements benefit other citizens more than that of the proposed subdivision and shall determine the equitable City participation in such improvements. Such City participation, or any appeal of such requirements, shall be approved by the City Council.
9. Drainage facilities shall be provided and constructed by the developer in accordance with the iSWM Design Manual for Site Development (2006) and the

Standard Specifications for Public Works Construction and the following basic requirements:

- a) All drainage improvements shall be designed to an acceptable outfall as approved by the City Engineer.
- b) The developer may install an approved open channel in lieu of installing pipe larger than 60 inches. This open channel shall be at the rear of residential lots and shall be adequately armored with a material approved by the City (e.g. concrete, rock gabions, etc.). In the event it is necessary to locate the drainage facility adjacent to and parallel to a street it shall be a closed conduit even though pipe sizes larger than 60 inches are required.
- c) A permanent chain link fence or other fence meeting the requirements of the City shall be constructed along the top of any channel exceeding three feet (3') in depth to enclose the area where it is adjacent to residential lots and also in other cases, where it is deemed necessary to restrict access to the channel.
- d) All drainage facilities shall be constructed on public right-of-way or easements dedicated for the purpose. Drainage easements shall be of a sufficient size to permit access for maintenance of the drainage facility. The easement shall be designed to facilitate maintenance access to the drainage channel by City crews and equipment. Additional easements shall be required at any access points and the access points shall be designed to restrict access by unauthorized personnel. An access point will typically be required at every intersection of the drainage easement with street right-of-way.
- e) When a drainage ditch or storm drain pipe, culvert or bridge is proposed, calculations shall be submitted showing basis for design.
- f) When a drainage channel, storm drain pipe, culvert or bridge is proposed, completed plans, profiles and specifications shall be submitted, showing complete construction details and detailed cost estimate.
- g) Detention/Retention ponds: Retention (maintains a permanent pool elevation) and detention (no permanent pool storage) shall be designed in accordance with the iSWM Design Manual for Site Development (2006). Retention/detention ponds shall be encompassed by an easement. The facility will remain the maintenance responsibility of the owner/developer or property owners association, unless otherwise accepted by the City. Acceptance by the City will be contingent upon the facility being a part of a dedicated park or other such property which meets with the City's approval. Preservation of major floodplains is strongly encouraged and detention/retention may be required if a proposed drainage improvement is found to create actual or potential upstream, adjacent or downstream property damage due to the creation of excessive flood velocities or heights. Refer to 16.28.035.C. for additional criteria.
- h) The owner or developer of property to be developed shall be responsible for all storm drainage flowing on his property. This responsibility includes the drainage directed to that property by ultimate development

as well as drainage naturally flowing through the property by reason of topography.

- i) The subdivider shall pay for the cost of all drainage improvements required for the development of the subdivision, including any necessary off-site channels or storm sewers and acquisition of the required easements.
- j) Where it is anticipated that additional runoff incidental to the development of the subdivision will overload an existing downstream drainage facility, whether natural or manmade, the Planning and Zoning Commission may withhold approval of the subdivision until appropriate provision has been made to accommodate the problem, and plans shall be provided which include all necessary off-site improvements including storm sewer systems, channel grading, driveway adjustments, culvert improvements, etc.
- k) In areas where downstream pipes or channels are inadequate to handle proposed increased flows, the City, as one alternative, may consider accepting cash payment in lieu of actual drainage improvements. The developer must show that the proposed pipe system to handle the flow from his development would not function properly without substantial downstream improvements. Prior to permitting any development that will significantly increase flood heights downstream or upstream, a hearing before the Planning and Zoning Commission is required with special notice to the adjacent property owners.

10. Off-Site Drainage

- a) Adequate consideration shall be given by the owner in the development of property to determine how the discharge leaving the proposed development will affect adjacent property.
- b) On lots or tracts of three (3) acres or more where storm water runoff has been collected or concentrated, it shall not be permitted to drain onto adjacent property except in existing creeks, channels or storm sewers unless proper drainage easements or notarized letters of permission from the affected property owners are provided.

C. Detention:

Runoff from sites larger than one (1) acre must not exceed pre-development levels for the two-year, 25-year and 100-year 24-hour events. Multi-phase developments will be considered as a single entity in determining the requirement for detention.

No increase or concentration of storm water may be conveyed off-site without easements and/or downstream drainage improvements. Increased storm water runoff attributable to new development must not exceed the capacity of the downstream drainage system. If no downstream drainage system exists, increased storm water runoff must not adversely affect adjoining property. In cases where the proposed runoff would exceed the capacity of downstream facilities, the developer will be required to provide detention to prevent overloading of downstream systems.

In all new developments where storm water runoff has been collected or concentrated, discharge shall be conveyed off-site by creeks, channels or storm sewer systems. Easements shall be provided by the developer to the City for off-site drainage facilities, as well as for on-site facilities. All flows shall be discharged in a non-erosive manner, and shall meet the established regulations governing storm water quality.

The developer shall pay for the cost of all drainage improvements required, including any necessary off-site channels or storm sewers and acquisition of the required easements.

If it is anticipated that additional runoff caused by the development will overload any existing downstream drainage facility, whether natural or improved, and result in hazardous conditions, approval of the improvements for the proposed subdivision may be withheld until appropriate provision has been made to accommodate the problem. If existing capacity is not available downstream and property damage could occur, the owner or developer shall provide a drainage system or detention facility to mitigate the deficiency. In any case, a letter of acknowledgement shall be obtained from the downstream property owner indicating that the downstream property owner is aware of proposed drainage improvements impacting drainage on or to said owner's property.

Permanent impoundments of water shall be constructed in such a way that negative effects on aesthetics, function, flooding, health, and safety are minimized. Such improvements shall be allowed at the discretion of the City Engineer. The Developer shall be responsible for all necessary permitting required by the Texas Commission on Environmental Quality for impounding public water. The City Engineer may require calculations and/or other documentation that no negative impact is created.

All storage facilities serving drainage areas greater than fifty (50) acres shall be designed and analyzed using reservoir routing of an inflow unit hydrograph. The software program or computational method must be approved by the City Engineer. The analysis should consist of comparing the design flows at a point or points downstream of the proposed storage site with and without storage. Design calculations shall show the effects of the detention facility in each of the 2-, 25-, and 100-year storm events. This may require the use of multi-stage control structures. The detention facility shall be designed to provide the required detention for all of the above-listed frequencies.

Detention storage facilities serving drainage areas smaller than fifty (50) acres may use the Modified Rational Method or Unit Hydrograph method for storage calculations. All calculations must be provided to the City Engineer for review and approval.

Detention facility embankments shall be designed to provide a minimum freeboard of one (1) foot above the 100-year storm water elevation. Certain impoundments are subject to State of Texas regulations.

Outlet structures shall be designed to intercept sediment and floatables from the 25-year storm. The potential for the impact of sedimentation on the detention facility should be evaluated. A means of access for maintenance of the facility shall be provided.

The outlet control structures for storage facilities typically include a principal outlet and an emergency overflow. The principal outlet functions to restrict the outflow and cause the runoff to use the available storage volume. The principal outlet shall be designed to accommodate the multiple frequency storms listed above while maintaining the minimum freeboard of one (1) foot. The emergency overflow shall be paved and provide positive overflow.

The outlet control structure may be drop inlets, pipes, culverts, weirs, or orifices. Checks should be made to determine if the outlet structure is controlled by weir or orifice flow. The

tailwater on the structure could significantly affect its capacity. The engineer should carefully evaluate the tailwater depth. For detention facilities in a series, the lower facility should not cause inundation of the upper outlet control structure. The calculation of the hydraulic capacity for outlet control structures is based on the type of structure used, using standard hydraulic calculations.

All Texas Commission on Environmental Quality (TCEQ) requirements for impoundments and dam safety shall apply. These requirements relate to both the size and the hazard classification of the embankment. Copies of all materials submitted to TCEQ for permitting, along with the TCEQ permits, must be submitted to the City Engineer.

16.28.040 WATER AND SANITARY SEWER

A. Water Installations:

1. **Water Supply and Distribution:** All subdivisions shall be provided with water supply and distribution systems approved by the Benbrook Water Authority. All public water systems shall be connected to the existing Benbrook Water Authority distribution system.
2. **Fire Hydrants:** Standard fire hydrants shall be installed as part of the water distribution system in accordance with specifications of the State Board of Insurance and the Benbrook Water Authority Manager. Fire hydrants shall be spaced no further than six hundred feet (600') apart along the street in a Single Family Residential subdivision and no more than three hundred feet (300') along streets in Multiple Family, Commercial or Industrial subdivisions. The spacing and location of fire hydrants is subject to approval of the City Fire Marshal.

B. Sewers:

1. All subdivisions shall be provided with an approved sewage disposal system.
2. Connection with the sanitary sewer system shall be required except where both the Benbrook Water Authority and the City Manager determine that such connection will require unreasonable expenditure when compared with other methods of sewage disposal and that alternate methods will protect public health and water quality. Where septic systems are installed, the subdivider shall conduct percolation tests under the supervision of the Tarrant County Health Department to determine the adequacy of proposed lot sizes.

C. Utility Lines under Pavement: All water, sewer, and natural gas utility lines and conduit for electrical, telephone, and cable television that pass under a street or alley shall be installed before the street or alley is paved. When it is necessary that utility lines pass under the street or alley pavement, they shall be installed to a point at least three feet (3') beyond the edge of the pavement.

D. Easements: All easements which will be used for water and/or sewer facilities, or which may potentially be used in the future for water and/or sewer facilities shall be a minimum of fifteen feet (15') in width. Easements may be greater or lesser than fifteen feet (15') in width as required by the Manager of the Benbrook Water Authority.

16.28.045 STREET LIGHTS, OTHER UTILITIES AND SCREENING DEVICES

A. Street Lights:

Street Lights shall be installed by the designated transmission and distribution utility, at the developer's expense, in accordance with the following standards:

1. Local Residential Streets:
 - a) A light shall be installed at each intersection and shall be installed mid-block at a spacing of not more than two hundred feet (200').
 - b) Lights shall be installed at the end of a cul-de-sac and at midpoints if the length of the block exceeds two hundred feet (200').
 - c) As a minimum, lamps of not less than nine thousand five hundred (9,500 lumens (100-watt high pressure sodium or equivalent) shall be installed on galvanized steel poles at a height of not less than twenty-five feet (25'). Power shall be provided by underground service or by overhead lines perpendicular to the street.
2. Collector Streets and Local Non-Residential Streets:
 - a) A light shall be installed at each intersection and shall not be installed midblock at a spacing of not more than one hundred eighty feet (180').
 - b) As a minimum, lamps of not less than twenty seven thousand (27,000 lumens (250-watt high pressure sodium or equivalent) shall be installed on galvanized steel poles at a height of not less than twenty-five feet (25'). Collector streets adjoining residential areas may provide lamps of not less than nine thousand five hundred (9,500 lumens (100-watt high pressure sodium or equivalent) upon approval of the Director of Community Development. Power shall be provided by underground service or by overhead lines perpendicular to the street.
3. Arterials:
 - a) A light shall be installed at each intersection and shall be installed midblock at a spacing of not more than one hundred sixty feet (160').
 - b) As a minimum, lamps of not less than fifty thousand (50,000 lumens (400-watt high pressure sodium or equivalent) shall be installed on galvanized steel poles at a height of not less than thirty-five feet (35'). Power shall be provided by underground service or by overhead lines perpendicular to the street.
4. Private Streets:
 - a) Street lighting shall be installed at the same intensity and spacing as would be required for a public street of similar use.
 - b) The responsibility for payment of maintenance and operation of a private street light system shall be the responsibility of the appropriate property owners association.

B. UTILITY CONSTRUCTION GENERALLY

1. Unless otherwise approved by the City Engineer, utilities shall be located in the standardized locations as provided in the City of Benbrook Design Standards and Criteria. All pressurized utility systems (water, gas, etc) shall be located behind the curb line wherever possible.
2. Utility Lines under Pavement: All water, sewer, and natural gas utility lines and conduit for electrical, telephone, and cable television that pass under a street or alley shall be installed before the street or alley is paved. When it is necessary that utility lines pass under the street or alley pavement, they shall be installed to a point at least three feet (3') beyond the edge of the pavement.

C. Underground Electrical, Telephone, and Cable Television Utilities

All telephone, cable television, and electrical utility lateral and service lines shall be placed underground throughout new subdivisions for which Final Plats are approved subsequent to the effective date of this ordinance, subject to the following conditions:

1. All electrical transmission lines, meaning those electrical lines operated at nominal voltages of sixty thousand (60,000) volts or higher, may be placed overhead.
2. Any electric distribution lines, meaning those electrical lines that emanate from substations to distribute power throughout an area, may be placed overhead. Subdivisions located within commercial corridors designated on the Comprehensive Plan of the City shall provide sufficient easement to locate feeders at the rear of lots, away from arterial frontage, wherever possible.
3. Lateral electric lines, meaning those electric lines that emanate from an electric feeder line and are used to distribute power to small areas of electric consumers, and service lines, meaning those electric lines which through a transformer connect a lateral line to a customer's service entrance, may be placed overhead only when they are located along rear property lines to provide service from the rear of the lot. Generally perpendicular overhead street crossings are permitted when connecting rear lateral lines in one block to rear lateral lines in an adjacent block.
4. Any electric distribution or transmission line crossing any Interstate Highway may be placed overhead.
5. Where electrical service is to be placed underground, electrical service for street or site lighting shall also be placed underground except for the lighting standards.
6. Temporary electrical service during construction may be provided by overhead utility lines and facilities prior to activation of the underground service. Following activation of the underground permanent service, the temporary overhead electrical service shall be removed within sixty (60) days.
7. The electrical utility company may plan and construct overhead lines on perimeters of subdivisions or property without obtaining a variance. Telephone and cable television lines may be constructed overhead where overhead electric utility lines are permitted.
8. Each of the utility companies shall be responsible for developing administrative policies and cost reimbursement procedures for the installation and extension of

their underground utilities. Nothing herein shall prohibit or restrict any utility company from recovering the difference in cost of overhead facilities and underground utilities from the owner or developer in accordance with the provisions of such utility's approved tariff. No utility company shall be required to begin construction of underground facilities unless and until the owner or developer of the subdivision has made arrangements satisfactory to the specific utility company for the payment of such underground facilities. If the Planning and Zoning Commission denies a waiver for overhead construction under Paragraph 10 below, the City Council may, by the affirmative vote of at least 3/4 of its members determine that the developer should not pay the difference in cost between overhead and underground construction by overruling the Planning and Zoning Commission and granting a waiver. The City of Benbrook shall not be responsible for any portion of such cost unless specifically authorized by the City Council.

9. All electrical, cable television and telephone support equipment (transformers, amplifiers, switching devices, etc.) necessary for underground installation shall be pad-mounted or placed underground and the difference in cost of such facilities and overhead facilities shall be paid to the installing utility company in accordance with provisions established under paragraph 8 above.
10. In special or unique circumstances, or to avoid undue hardship, the Planning and Zoning Commission may authorize waivers in conjunction with plat approval to the requirements to provide underground facilities.
11. Nothing contained herein shall be construed to require any existing overhead facilities to be placed underground or to prohibit the upgrading, reconstruction or reconductoring of any existing overhead facilities with overhead construction.
12. Nothing contained herein shall be construed to alter the intent of any utility Franchise Agreement Ordinance in effect on the effective date of this Ordinance.

D. Screening Devices:

1. Screening walls shall be provided where required by Section 27 of the Zoning Ordinance. Screening walls shall be constructed on private property and shall be maintained by the appropriate property owner.
2. Where screening walls are constructed on the perimeter of a residential subdivision, a homeowners association and common area maintenance reserve fund shall be created in accordance with Chapter 16.28.025, paragraph D.12.h of the Benbrook Municipal Code (1985) as amended.
3. Screening walls shall be a minimum of six feet (6') in height and of solid masonry construction (brick or concrete panels). Concrete panels, such as "brickcrete" must resemble brick or wood construction. No concrete masonry units (concrete blocks) will be permitted. A mow strip (which could be the foundation of the wall) shall be provided. Wooden fences shall not be allowed for exterior screening fences.
4. The foundation and wall shall be designed and sealed by a Professional Structural or Civil Engineer registered in the State of Texas for review and approval by the City. Plans shall include:
 - a) Plan view showing location, dimensions, etc.
 - b) Detail of wall and columns

- c) Profile or elevation view showing elevations of concrete mow strip and adjacent ground
- d) Foundation details and calculations, including soils data and wind load.

Walls shall be designed to allow adequate drainage, and shall include a minimum two-inch (2") tall opening along the bottom if necessary. The extent of such an opening shall be determined by specific site conditions. Walls shall also be designed with adequate sight distances at intersections and corners."

SECTION II PENALTY CLAUSE

Any person, firm or corporation who violates, disobeys, omits, neglects or refuses to comply with or who resists the enforcement of any of the provisions of this Ordinance shall be fined not more than Two Thousand Dollars (\$2,000.00) for all violations involving zoning, fire safety or public health and sanitation, including dumping of refuse, and shall be fined not more than Five Hundred Dollars (\$500.00) for all other violations of this Ordinance. Each day that a violation is permitted to exist shall constitute a separate offense.