CITY OF LAKE JACKSON DEVELOPMENT MANUAL

Current as of August 21, 2023

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SECTION 1 INTRODUCTION

1.01 Intent of Manual.

Since its incorporation in March of 1944, the City of Lake Jackson has built a worthy reputation as a master planned community best known for its exemplary infrastructure, fiscal conservatism, high quality of life, and beauty. Now a city with approximately 25,000 residents, Lake Jackson reaffirms its reputation and long-standing development policies by providing this documented and comprehensive source for development policy and practice.

1.02 Purpose.

The purpose of the Development Manual is to establish procedures and requirements for the submittal and review of the subdivision and development of land in Lake Jackson and its extra-territorial jurisdiction (ETJ). These procedures shall be followed by all applicants involved in submittal of plats, site plans and landscape plans.

1.03 Authority.

a. The Development Manual has been adopted by the City Council under the authority found in Ch. 212 of the Texas Local Government Code. All definitions in the Ch. 212 are incorporated as if set forth herein.

b. In this Development Manual, when the term "City" is used for the purposes of submissions or approvals, it means the City Manager or his/her designee.

1.04 Master Plan.

The City's Master Plan is a guide for future development, redevelopment, and community enhancement efforts for a 20-year period. All plats and site plans must conform to the Master Plan.

1.05 Zoning.

Lake Jackson is divided into nineteen (19) zoning districts. Ch. 110 Zoning of the City's Code of Ordinances contains details for each zone. Before a building permit can be issued or a plat or site plan approved, the property must be properly zoned. The rezoning process takes approximately 5 weeks. The development and zoning processes may take place simultaneously. However, final approval of a plat or site plan cannot take place until the proper zoning has been approved.

1.06 Building Codes.

All building codes adopted by the City are contained in Ch. 14 Buildings of the City of Lake Jackson Code of Ordinances. The City also has ordinances that regulate signs, streets and sidewalks, and standards to avoid flooding

1.07 City Ordinances.

The City uses Municipal Code Corporation for ordinance codification services. The link is https://library.municode.com/tx/lake_jackson/codes/code_of_ordinances.

1.08 Approved Product Lists

All products and materials must conform to the Approved Products Lists found in Sections 10 through 13 unless an alternate product is specifically approved by the City.

1.09 **Design and Construction Standards**

For all design and construction standards, contact the City's Engineering Department.

SECTION 2 SUBDIVISION DEVELOPMENT PROCESS

2.01 **Pre-development Review**. The City strongly recommends that developers request a pre-development review. During the review, the developer will meet with the city manager, planning staff, the city engineer, the public works director, and the fire marshal. Staff will explain the development process, review the zoning of the property, and review the concept site plan or any other documents the developer wishes to have reviewed.

2.02 **Filing Procedures**. All procedures for filing plats and site plans are in Ch. 90 Subdivisions.

2.03 **Benchmarks**

a. A permanent benchmark shall be set in each subdivision section or at a spacing of one mile, whichever is greater. The benchmark shall have an elevation based on the most recent North American Terrestrial Reference Frame (NATRF).

b. The benchmark elevation and location shall be certified by a registered public surveyor according to the Texas Society of Professional Surveyors Association Standard and Specifications Category 8, TSA Third Order Vertical Control Survey.

c. All benchmark locations shall be provided with ties to existing monuments including coordinates using Texas Plane Coordinate System, Central Zone.

d. Benchmarks shall consist of a brass disc set in concrete. The concrete footing for the benchmark shall be eight inches (8”) in diameter and three feet (3') deep. Concrete shall be reinforced with two number four (2 - #4) rebars.

e. The construction plans shall clearly identify the location of the benchmark and shall include a complete description, coordinates, and elevation, with adjustment date, of the benchmark.

2.04 **Street Lighting**

Street lighting facilities provided by the developer or subdivider shall meet the following minimum requirements:

a. *Residential:*

i. Lights shall be at least four thousand eight hundred (4,800) lumen brightness on an ornamental steel pole served underground.

ii. Lights shall be provided at all corners, intersections, and directional changes, and in addition at six hundred-foot intervals along straight-of-ways.

iii. Additional lights may be required.

b. *Highways (2004 and 332 and other major highways):*

i. Lights shall be at least thirty-two thousand (32,000) lumen brightness on an ornamental steel pole served underground.

ii. Lights shall be provided at all intersecting streets and shall be placed to backlight turning traffic.

iii. Additional lights may be required.

c. *Downtown:*

i. Lights shall be at least thirty-two thousand (32,000) lumen brightness on a thirty-foot tall black powder coated ornamental steel pole served underground.

ii. Double arm lights of thirty-two thousand (32,000) lumen brightness shall be provided in the center of streets when such locations are available.

iii. Additional lights may be required.

d. The installation location of streetlights will be determined and designed by the current electric transmission and distribution provider and approved by the City.

e. Private lighting systems may supplement or replace all or a portion of public street lighting if the net result provides equivalent lighting to the standard set out above. A perpetual entity, such as an incorporated homeowners' association and/or an appropriate private entity, shall notify the City of its agreement to pay for the operation, maintenance, and insurance of a private lighting system prior to installation of the system. The system shall be approved by the City.

SECTION 3 CONSTRUCTION PLANS

3.01 Required Plan Sheets.

a. Coversheet;

b. Final plat (Recorded plat shall be included in the drawings filed with the city);

c. Construction notes and legend;

d. Overall plans for proposed improvements with key drawing index (i.e., water/sewer layout, paving/drainage layout);

e. Drainage area map and hydraulic calculation to include detention/retention basin.

f. Lot grading plan;

g. Plan and profiles;

h. Specific construction details;

i. Standard Public Works construction details, or approved project engineer construction details; and

j. Storm Water Pollution Prevention Plan

k. Tree survey (only for commercial and industrial zones)

3.02 Drawing Requirements.

a. The seal, date, and original signature of the engineer responsible for preparation of the plans is required on each sheet.

b. A primary benchmark referenced to a NAVD benchmark with elevation and description is required on the title or general note sheet. Temporary benchmarks are required on each sheet for construction purposes.

c. Label each plan sheet as to street right-of-way widths, pavement widths and thickness, type of roadway materials, curbs, intersection radii, curve data, stationing, existing utilities type and location, etc.

d. Stationing must run from left to right except for short streets or lines originating from a major intersection where the full length can be shown on one sheet.

e. A north arrow is required on all sheets and should be oriented either upward or to the right. This requirement may be waived under the following conditions: a storm or sanitary sewer whose flow is from west to east or from south to north and a primary outflow ditch whose flow is from west to east or from south to north.

f. Show all lot lines, property lines, right-of-way lines, and easement lines.

g. A cover sheet shall be required for all projects involving three or more plan and profile sheets. All plan sheet numbers should be included on the cover sheet. A vicinity map should always be included to show the project location. A City of Lake Jackson approval block shall be provided for signatures by the City of Lake Jackson as follows:

Plans and Specifications comply with Standard Construction Details, but are subject to all record reviews.

_____

City Engineer

h. If a roadway exists where plans are being prepared to improve or construct new pavement or to construct a utility, this roadway should be labeled as to its existing width, type of surfacing, and base thickness, if available.

i. Plans prepared by the design and/or project engineer shall be prepared using permanent ink, photographic or other approved process and submitted to the City. Contractor as-built drawings may be submitted from field markup prints.

j. Do not place match lines in intersections.

k. Service areas shall be delineated on the cover sheet or area map.

l. All utility lines four inches (4") in diameter or larger within the right-of-way or construction easement should be shown in the profile view. All utility lines, regardless of size, should be shown in the plan view.

m. Show flow line elevations and direction of flow of all existing ditches.

n. Show natural ground profiles along the centerline of each right-of-way or easement line except as required below. When there is a difference of 0.50 feet or more from one right-of-way or easement line to the other, show dual right-of-way profiles.

o. Resolve all known conflicts of proposed utilities with existing utilities or with each other.

p. Plans shall be standard twenty-three inch by thirty-six inch (23″ x 36") Federal Aid Sheets or twenty-four inch by thirty-six inch (24" x 36") overall dimensions.

q. Details of special structures not covered by approved standard drawings, such as stream and gully crossing, special manholes, etc., should be drawn with the horizontal

r. Plans shall be drawn to accurate scale, showing proposed pavement typical cross sections and details, lines and grades, and all existing topography within the street right-of-way; and at intersections, the cross street shall be shown at sufficient distance in each direction along the cross street for designing adequate street crossings.

s. Grades should be labeled for the top of curb except at railroad crossings. Centerline grades are acceptable only for paving without curbs and gutters. Grades for gutter lines are acceptable where critical to the project scope and at connections to existing pavements.

t. Curb return elevations and grades for turnouts shall show in the profile and the gutter grade included where a railroad track is being crossed.

u. The surface elevation at the property line of all existing driveways should be shown in the profile.

v. Station all esplanade noses affected by proposed construction, both existing and proposed.

w. Station all points of curvature, points of tangency, radius returns and grade change, points of intersection in the plan view. Station all radius returns and grade change points or intersection in the profile with their respective elevations.

x. The standard scales permitted for plans and profiles of paving and utility plans are as follows:

Preferred:
1″ = 2′ Vertical;
1″ = 20′ Horizontal
Minimum:
1″ = 4′ Vertical;
1″ = 40′ Horizontal

y. The scales described above are the minimum allowable. Larger scales may be required to show details of construction.

z. Deviations to these scales can only be allowed with the specific approval of the City.

aa. In addition to the plan and profile sheets described above, each set of construction drawings shall contain paving and utility key drawings indexing specific plan and profile sheets. Key overall layouts may be drawn at a scale of one inch equals one hundred feet (1″ = 100′) or one inch equals two hundred feet (1″ = 200′).

bb. Standard Construction details, where applicable, shall be included.

cc. Construction plans shall include a legend describing standard symbols that may not be described in the plans.

3.03 **Graphic Standards.** The graphic standards may be electronically obtained through the City's engineering department.

3.04 **Trench Safety**

a. All trenching and excavations on public or private property within the city shall comply with federal occupational safety and health standards.

SECTION 4 UTILITY EASEMENTS AND RIGHT-OF-WAY

4.01 Easements

a. Easements adjoining a right-of-way for mains smaller than twelve inches (12") shall have a minimum width of five feet (5'). For mains greater than twelve inches (12") in diameter, the easement adjoining the right-of-way shall have a minimum width of ten (10') feet.

b. Water mains may be located at the center of or not closer than five (5') feet from an easement line.

c. All services for utilities shall be made available for each lot in such a manner as will avoid the necessity for disturbing the street pavement, gutter, curb, and drainage structures when connections are made.

d. *Storm drainage easements and right-of-way.* In subdivisions, the developer shall provide all necessary easements and right-of-way required for drainage facilities, including storm sewers, open and lined channels.

i. Easement width for storm sewer pipe shall not be less than twenty (20) feet or the maximum outside diameter of pipes plus sixteen (16) feet, whichever is more.

ii. Easement width for open and lined channels to a depth of eight (8) feet shall be at least twenty-four (24) feet wider than the top of channel, comprised of at least twelve (12) feet of easement on each side.

iii. Easement width for open and lined ditches deeper than eight (8) feet shall be reviewed by the City Engineer.

e. *Side slopes:*

i. Side slopes of lined channels shall not be steeper than one-foot vertical rise to one one-foot horizontal distance, with at least one entry point for equipment sloped to one-foot vertical distance to three-foot horizontal distance minimum.

ii. Side slopes of unlined channels shall not be steeper than one-foot vertical rise to three-feet horizontal distance.

f. Open Channel

i. Bottom width shall be no less than 6 feet wide.

4.02 Wet Utility Easement

a. The width of wet utility sanitary sewer easements shall be the minimum width of twenty feet (20') when split along a lot line, and fifteen feet (15') wide for easements located within a single lot. The sewer shall be located not less than seven and one half (7.5') feet from the edge

of the easement and a ten (10') feet minimum separation from building lines. Combination use with storm sewer or water line is permissible with proper separation (see below).

b. Wet Utility Easement (Sanitary Sewer) adjoining a public right-of-way may be five (5') feet wide provided the sewer is at least five (5') feet from the edge of the easement and the sewer is no deeper than ten (10') feet. Sewers at greater depth than ten (10') feet shall be within a ten (10') foot easement parallel and adjoining the right-of-way and located not closer than five (5') feet from the easement line.

c. Wet Utility Easements for force mains of all sizes shall have a minimum width easement of fifteen feet (15') for a single force main where the force main is not located adjacent to a public right-of-way. Where the force main is located in an easement adjacent to public right-of-way, the force main may be located at the center of a ten-foot (10') easement. Where the force main is located less than five feet (5') from the right-of-way line within the public right-of-way, the minimum easement width shall be five feet (5') adjacent to the right-of-way.

d. Combined storm right-of-way and sanitary sewer easements shall have minimum widths and clearances as required in this section for storm sewer right-of-way with an additional five foot (5') wet easement. The sanitary sewer main, trunk or force main shall be located such that the centerline of the pipe shall be not less than seven and one-half feet (7.5') from the edge of the easement and a ten foot (10') separation from designated buildings.

e. For combined storm right-of-way and sanitary sewer easements located adjacent to public right-of-way where the sanitary sewer is located along the outside of the easement, the center line of the sanitary sewer pipe shall be at least half the width of the easement defined in this section, but not less than seven and one-half feet (7.5') from the outside edge of the easement.

f. Where sanitary sewers or force mains are installed in easements separated from public right-of-way by other private or utility company easements, the sanitary sewer easement should be extended along or across the private utility company easement to provide access for maintenance of the sewer or force main.

4.03 **Storm Sewer Pipe Right-of-Way**

a. For storm sewer pipe up to eight foot (8') in diameter or width, the minimum width shall be twenty feet (20') with the storm sewer typically centered in an exclusive right-of-way, except as specifically approved by the City.

b. For storm sewers greater than eight feet (8’) in diameter or width, the minimum width of an exclusive right-of-way shall be twenty-five feet (25').

c. For all right-of-way specified in this section, a minimum of five feet (5') must be maintained from the right-of-way line to the outside edge of the storm sewer.

d. Where approvals are granted for a special use or combination right-of-way/easement located along side lot, the minimum width shall be twenty-five feet (25'). The total width shall meet or exceed all other easement/right-of-way requirements.

e. For specifically approved storm sewers located adjacent to public right-of-way, the minimum wet utility easement width shall be ten feet (10'). The right-of-way width shall meet or exceed all other easement requirements.

f. For all right-of-way specified in this section a minimum of five feet (5') must be maintained from the right-of-way line to the outside edge of the storm sewer.

g. Where approvals are granted for a special use or combination right-of-way/easement located along side lot, the minimum width shall be twenty-five feet (25'). The total width shall meet or exceed all other easement/right-of-way requirements.

h. For specifically approved storm sewers located adjacent to public right-of-way, the minimum wet utility easement width shall be ten feet (10'). The right-of-way width shall meet or exceed all other easement requirements.

4.04 Dry Utility Locations

a. For the utility locations for back lot easements, contact the City's Engineering Department.

4.05 Wet Utility Locations

a. All water mains shall be located within a public right-of-way or within dedicated wet utility easements. The location of water mains within a street public right-of-way is described in Section 5.

b. Water mains shall not be located in combination easements without the specific approval of the City.

4.06 Sanitary Sewer Locations

a. Sanitary sewers are usually located within a public right-of-way or under special approved conditions in easements adjoining the right-of-way. Sanitary sewers shall be located within the public street right-of-way in accordance with Section 6. Sanitary sewers may be located

in wet utility easement or combination easements provided the easement widths comply with Section 4.01.

b. Sanitary sewers shall not be located inside lot easements without the specific approval of the City.

c. Sanitary sewers shall be located within the right-of-way between the property line and the back of curb on the opposite side of the right-of-way from the water main and in accordance with Section 4.01.

4.07 Storm Sewers

a. Storm sewers shall be located in the public right-of-way in accordance with Section 7.03.

b. All storm sewer lines shall be located within public street right-of-way or approved drainage right-of-way.

4.08 Private Facility Locations

a. Installation of private facilities, including utilities in public road right-of-way and their adjoining easements shall be approved by the City. Private facilities shall be defined but not limited to the following:

i. Driveways
ii. Sidewalks
iii. Mailboxes
iv. Irrigation Systems
v. Private Storm Drain Piping
vi. Landscape Features (trees, plantings, berms, walls, fences, borders, etc.)

b. Private facilities shall not conflict with other facilities in the right-of-way. All structures within the public right-of-way shall be approved by the City and shall be located so as to not interfere with existing or proposed public facilities to the extent possible.

c. Landscaping features within the public right-of-way or in adjoining utility easements do not affect traffic visibility. (Any removal and replacement cost of these due to maintenance of utility lines or visibility remedies shall be made at the owner's expense.

d. Paved Parking Facilities within approved public utility easements shall be designed and constructed with breakout joints to allow for controlled removal and replacement due to

maintenance work of utility lines. Any costs to remove and replace improvements shall be made at the owner's expense.

4.09 Utility Crossings

a. Highway Crossings - All State and County Roads

i. State Highway crossings shall be constructed in conformance with the requirements of the Texas Department of Transportation.

b. County road crossings shall be constructed in accordance with the requirements of Brazoria County.

4.10 Street Crossings

a. Conduits and sewers that do not carry liquid under pressure may be bored and jacked into place without an encasement pipe.

b. Crossings under existing concrete streets, other than major thoroughfares, shall be constructed by boring and jacking. Approved conduit may be jacked into place using equipment designed for that purpose. Water may be used to facilitate the boring operations. Jetting the pipe main into place will not be permitted. When conditions exist that warrant open cut across an existing street, the City shall specifically approve the crossing.

c. All open cut installations under existing or proposed streets shall be backfilled as shown in the Standard Construction Details. Cement stabilized sand backfill shall meet the requirements of Section 6.02(c).

d. All street crossings shall be constructed in accordance with construction plans approved by the City. All street crossings shall be inspected by the City.

4.11 Railroad and Pipeline Crossings

All construction within the railroad or pipeline right-of-way shall conform to minimum requirements set out in the agreement with the owner of the right- of-way.

4.12 Ditch and Stream Crossings

a. Crossing under a stream or ditch is preferred. The top of the pipe shall be designed to provide a minimum clearance of at least four feet (4') below the ultimate flow line and sides of the ditch and with sufficient bottom length to exceed the ultimate future ditch sections.

b. Where existing or proposed bridges have sufficient space and structural capacity for installing water mains or conduits, such installation will be permitted upon specific approval of the engineer design and construction plans. In all cases, the water main or conduit shall be above the bottom chord of the bridge and above the 100-year water surface elevation. All conduits attached to a bridge shall be constructed using designed pipe type and materials and shall extend a minimum of ten feet (10') beyond the bridge abutment bent or to the right-of-way line, whichever is greater. All conduit attached to a bridge shall be maintained by the owner of the conduit or will be subject to removal.

c. All stream or ditch crossings shall be constructed of conduit approved by the City from right-of-way to right-of-way.

SECTION 5 WATER SYSTEM DESIGN REQUIREMENTS

5.01 Definitions

a. **Type A** Development includes all properties and right-of-way within and adjoining residential zones excluding multi-family, or through PURZ development within the City limits and extraterritorial jurisdiction.

b. **Type B** Development includes all properties and right-of-way within and adjoining multi-family zones, business and office zoning districts, or commercial and industrial development within the City limits and extraterritorial jurisdiction.

5.02 In General

a. Construction and sizing of all water mains and appurtenances shall meet or exceed the requirements of the TCEQ Rules and Regulations for Public Water Systems (30 TAC 290).

b. The Public Water System shall not extend beyond the water meter. All design and construction to the meter shall conform to these standards. All private construction beyond the meter shall conform to the requirements in Ch. 14 Buildings of the Lake Jackson Code of Ordinances.

5.03 Water Main Sizing and Materials

a. Water mains in **Type A** Developments shall have a minimum size as follows:

i. Two-inch (2") mains may serve a maximum of five (5) domestic, residential service connections. Two-inch (2") mains shall be looped at cul-de-sacs. All two-inch (2") mains shall be specifically approved by the City.

ii. Six-inch (6") mains shall be a maximum of one thousand five hundred feet (1,500') long when supported on both ends by eight-inch (8") mains or larger, and shall have no more than two (2) intermediate fire hydrants. Temporary dead end six-inch (6") mains shall not be more than six hundred feet (600') in length, shall terminate at a fire hydrant, and shall be specifically approved by the City.

iii. Eight-inch (8") mains are required for mains over one thousand five hundred feet (1,500') long, or when a maximum three (3) fire hydrants are required. Eight-inch (8") mains shall not be dead end, except as provided in this section.

iv. Twelve-inch (12") and larger mains will be required at locations established by the City and in conformance with the pertinent Master Plan.

v. Temporary 2-inch blow-off valves must be specifically approved by the City.

b. Water mains in **Type B** Developments shall have a minimum sizing as follows:

i. Minimum size of mains shall be eight-inch (8"). Maximum length of an eight-inch main (8") or hydrant lead shall be three hundred fifty feet (350'). A temporary dead-end main shall be terminated with a fire hydrant and shall be specifically approved by the City.

ii. Twelve inch (12") and larger mains will be required at locations established by the City and in conformance to the pertinent Master Plan.

iii. Six-inch (6") fire hydrant leads shall not exceed two hundred feet (200') in length.

c. Fire loops will be required where more than two (2) fire hydrants will be installed in lead or main.

d. The length of a dead-end water main shall be measured from the intersection with a multiple feed (looped) main to the end of the main.

e. Water mains shall be constructed using the following materials:

i. Poly Vinyl Chloride (PVC) Pressure Pipe, six-inch (6") through twelve-inch (12"), shall conform to the requirements of ANSI/AWWA C900, current revision, Class 150 DR 14. Pipe shall be designed and constructed in conformance with the minimum requirements of the "Manual of Water Supply Practices", AWWA Manual No. M23. Two-inch (2") pipe shall be polyethylene SDR 9 CTS tubing.

ii. Ductile-Iron Pipe shall conform to the requirements of "Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids", AWWA C151, (ANSI A21.5l), current revision. Pipe thickness shall be the minimum specified in C151. Under special conditions, the City may require thickness design for appurtenances.

iii. Steel Water Pipe, six-inch (6") and larger shall conform to the requirements of "Standard for Steel Water Pipe Six Inches and Larger", AWWA C200. Steel pipe, minimum wall thickness shall conform to the thickness shown in Standard Construction Details.

f. Other pipe materials may be used for construction of water mains, when specifically approved by the City.

g. Bedding and backfill shall conform to Standard Construction Details.

h. Alternate materials which are identified in the Approved Products List may be used with specific approval from the City.

i. Water mains and appurtenances are not allowed in the following sizes: three inch (3"), four inch (4"), ten inch (10"), and fourteen inch (14") unless specifically approved by the City.

5.04 **Water Main Locations**

a. Water mains shall be designed and located to conform with the regulations of the TCEQ Rules and Regulations for Public Water Systems.

b. Right-of-Way. The recommended location for water mains shall be a minimum distance of five feet (5') from the right-of-way line to the outside edge of the water line. Water mains shall be placed along a uniform alignment. At all locations where a water main changes alignment, the location of the water main shall be clearly shown on the construction plans. When necessary, the water main may be deflected at a fire hydrant location to accommodate proper installation of the fire hydrant.

c. Easements for new construction, any water main, except at a fire hydrant, located less than five feet (5') from the road right-of-way line and within the right-of-way shall have a water line easement adjoining the right-of-way. Water line easements adjoining a right-of-way for mains smaller than twelve inches (12") shall have a minimum width of five feet (5'). For mains greater than twelve inches (12") in diameter, the easement adjoining the right-of-way shall have a minimum width of ten feet (10').

d. Along streets with open ditch drainage, water mains shall be located subject to City approval.

5.05 **Clearance of Water Lines from Other Utilities**

a. When a water main is placed parallel to another utility line at or near the same grade, it shall have a minimum of four feet (4') of horizontal separation. When the other utility is a sanitary sewer, a minimum of nine feet (9') of separation must be provided. If a minimum of nine feet (9') cannot be maintained, the sanitary sewer must be constructed of pressure type pipe with water-tight joints as used in water main construction and the clearances must be as defined in this section or as specifically approved by the City. When a water main crosses a utility other than sanitary sewer, a minimum of six inches (6") of clearance must be maintained, and the water main shall have one joint of pipe centered on the other utility.

b. For water mains crossing an existing or proposed sanitary sewer or force main, the following clearances shall be provided for protection from contamination. The minimum clearances will be approved only when justified and when necessitated by field conditions. The latest edition of Rules and Regulations for Public Water Systems, TCEQ, shall be followed for minimum criteria and instructions for water line crossings.

c. When water mains and sanitary sewers are installed, they shall be installed no closer to each other than nine feet (9') in all directions and parallel lines must be installed in separate trenches. Where the nine-foot (9') separation distance cannot be achieved, the following procedures shall be used:

i. Where a sanitary sewer parallels the water main, the sanitary sewer shall be constructed of polyethylene or PVC pipe meeting AWWA specifications, having a minimum working pressure rating of one hundred fifty pounds per square inch (150 psi) or greater, and equipped with pressure type joints. The water main and sanitary sewer shall be separated by a minimum vertical distance of two feet (2'), and a minimum horizontal distance of four feet (4'), measured between the nearest outside diameters of the pipes, and the water main shall be located above the sewer.

ii. Where a sanitary sewer crosses the water main, and that portion of the sewer within nine feet (9') of the water is constructed as described in this section, the water line may be placed no closer than six inches (6") from the sewer. The separation distance must be measured between the nearest outside pipe diameters. The water line shall be located at a higher elevation than the sewer, wherever possible, and the joints of the new pipe must be no closer than nine (9') feet from the existing line.

d. Where water lines are installed in areas which have existing sanitary sewers, every effort should be made to maintain nine feet (9') of separation between the outside pipe diameters of the two lines. Where this separation cannot be achieved because of local conditions, which must be fully documented in any planning material submitted, the following spaces shall be observed.

i. Where a new water line is to cross or be installed in parallel with an existing sanitary sewer, and the sewer is constructed as described in this section, the separation distances specified in those rules shall apply as though the sewer were new.

ii. Where a new water line is to be installed in parallel with an existing clay, truss, or concrete gravity sewer showing no evidence of leakage and the water line is installed above the sewer a minimum of two feet (2') vertically and four feet (4') horizontally, the sanitary sewer need not be disturbed. Should excavation for the water line produce evidence that the sewer is leaking, then the sewer must be repaired.

iii. Where a new water main is to cross an existing clay, truss, or concrete gravity sewer showing no evidence of leakage, the sewer need not be disturbed if the water line is to be installed at least twenty-four inches (24") above the existing sewer. The joints of the water line should not be closer than nine (9') feet centered over the sewer crossing, to provide maximum protection against contamination.

iv. Existing clay, truss, or concrete sewer pipe which shows no evidence of leakage and because of physical limitations must remain at a higher elevation than a proposed intersecting water line or closer than two feet (2'), may remain undisturbed if the water line is inserted in a joint of pressure type encasement pipe at least two (2) nominal sizes larger than the water line. The encasement pipe should be a minimum of eighteen feet (18') length and centered on the sewer crossing and both ends sealed with cement grout. In lieu of this procedure, that portion of the sewer within nine feet (9') of the water line may be replaced with polyethylene or PVC pipe meeting AWWA specifications with watertight joints as described in this section and the water line and sewer pipe shall be separated by a minimum vertical distance of two feet (2') and a minimum horizontal distance of four feet (4'), measured between the nearest outside diameters of the pipes.

e. Unless sanitary sewer manholes and the connecting sewer can be made completely watertight and tested for no leakage, they must be installed to provide a minimum of nine feet (9') of horizontal clearance from an existing or proposed water line. Encasement of the water line in a carrier pipe as described in this section may be approved in special cases if the plans meet TCEQ standards.

5.06 **Depth of Cover**

a. Minimum depth of cover for water mains shall be as follows:

i. Twelve-inch (12") and smaller mains shall have a minimum cover of four feet (4') from the top of curb. For open ditch roadway sections, twelve inch (12") and smaller mains shall be installed at least three feet (3') below the ultimate flowline of ditch or four feet (4') below natural ground at the pipeline. Bury depths greater than six feet (6) from any surface shall be approved by the City only under special conditions and circumstances.

ii. Sixteen inch (16") and larger mains shall have a minimum cover of five feet (5'). For open ditch roadway sections, sixteen inch (16") and larger mains shall be installed at least three feet (3') below the flowline of ditch or five feet (5') below natural ground at the pipeline. Bury depths greater than six feet (6') from any surface shall be approved by the City only under special conditions and circumstances.

b. Changes in grade to clear other utilities or underground features may be made by deflecting pipe joints to the maximum manufacturers allowable deflection. The standard depth of cover maintained on the water main and the grade change shall be made by gradual deflection. If gradual deflection is not possible, then the preferred alternative is bending (flex pipes). The installation of fittings shall be the remedy of last resort.

5.07 **Valves**

a. All water system valves shall conform with AWWA standards and shall be designed as follows:

i. Two inch (2") through twelve inch (12") valves shall be resilient seated gate valves, AWWA C509, counter-clockwise opening with mechanical joints. Valves shall have a complete coating on all iron parts in the valve interior to eliminate corrosion.

ii. Sixteen inch (16") and larger valves may be butterfly valves, AWWA C504, with complete interior coating to avoid corrosion of all iron parts, as approved by the City. All butterfly valves shall be installed in a vault of adequate size and construction, as approved by the City.

iii. Cast iron valve boxes are required on all gate valves less than or equal to sixteen inch (16") as noted below. Valve vaults are required on all valves larger than sixteen inches (16").

iv. Valves shall be approved by the City and shall be listed on the Approved Products List.

b. Spacing - valves shall be set at maximum distances along the main as follows:

i. Six inch (6") through and including twelve inch (12") mains - one thousand five hundred feet (1,500').

ii. Sixteen inch (16") and larger mains - two thousand two hundred feet (2,200').

iii. All main intersections shall have a number of valves equal to the number of mains at the intersection.

c. Location - valves shall be located as follows:

i. All mains shall be valved within the street right-of-way. Valve boxes shall not be placed on the ultimate street pavement, except as specifically approved by the City.

ii. Valves are normally located on the projection of intersecting street right-of-way lines or at the curb return adjoining a paved street across the main. Tapping sleeves and valves are excluded from this requirement.

iii. All fire hydrants shall be isolated from the service main with a valve located in the fire hydrant lead.

Intermediate valves shall not be located on the projection of intersecting street right-of-way lines; they may be located at side lot line projections, or five feet (5') from fire hydrants.

iv. Valves shall be placed at the end of all mains that are to be extended in the future, and the main extended a minimum of feet (10') past the valve.

5.08 **Fire Hydrants**

a. Refer to Standard Construction Details for fire hydrant configuration and installation.

b. Spacing - fire hydrants shall be spaced along all mains six inches (6") and larger to provide as follows:

i. Type A Development - Five hundred foot (500'), and radial coverage to all points.

ii. Type B Development - Three hundred foot (300'), and radial coverage to all points.

iii. Fire hydrants should be set at street intersections and at return of cul-de-sacs where spacing requirements are met.

c. **Location** - fire hydrants shall be located as follows:

i. Fire hydrants shall be located 18 inches behind the back of curb or projected future curb and be set as near as possible to the point of curvature (PC) of the intersection curb radius as shown on Standard Construction Details.

ii. On all State Highways, fire hydrants or flushing valves shall be located within three feet (3') of the right-of-way. On open ditch roadways, hydrant locations shall be set by the City.

iii. Fire hydrants to be located between intersections should be set at the nearest side lot line, however, this location may be adjusted either way to avoid driveways or other obstructions.

iv. All fire hydrants shall be located in protected, but easily accessible, areas behind the pavement. Within Type B Development, hydrants shall be located within accessible fire lanes around structures.

d. **Depth of Bury** – the bury line on the fire hydrant shall be installed at the ground line at each location or at the finished ground after pavement construction is completed. The depth of bury for fire hydrants shall be shown on the construction plans. Minimum cover for fire hydrant leads shall be four feet (4').

e. Fire hydrants shall not be installed within nine feet (9') of a sanitary sewer system under any conditions.

f. The body of fire hydrants will be painted as specified in Standard Construction Details.

5.09 Fittings and Appurtenances

a. Fittings up to and including twelve inches (12") shall be Ductile-Iron Compact Fittings, AWWA Cl53/A21.53.84, conforming to the minimum requirements of "Grey-Iron and Ductile-Iron Fittings, Twelve Inch (12") through Forty-Eight Inch (48"), for Water and Other Liquids", AWWA C110 (ANSI 21.10), current revision.

b. All fittings shall be identified and described on the construction plans.

c. Fittings are not permitted in fire hydrant leads.

d. All water main fittings shall have mechanical joints with either MEGALUG® type restraints or AquaGrip® restraints.

e. Concrete thrust blocking shall be required on all bends, tees, plugs and combinations. Refer to Standard Construction Details for specifications. The use of restrained joint systems for ductile iron pipe application (boltless type) may be used in lieu of full thrust blocking where field conditions prevent the complete block to be installed. Even with restrained joint systems, some concrete blocking is required.

5.10 **Water Services**

Water service in Type A Development:

a. Water service fittings and appurtenances from the main to the curb stop shall be installed using approved materials from the Approved Products List.

b. Water meters shall be five-eighth inch by three-quarter-inch (5/8" x 3/4") to two-inch (2") displacement type, magnetic drive, cold water meters. Meters will be installed by the City at the time of building construction on the lot.

c. Meter boxes shall be located along the side lot line. Location of meters on open ditch streets and highways shall be specifically approved by the City.

d. City maintenance of water lines shall end at the water meter. The water meter box shall be maintained by the City.

Water Service in Type B Developments:

a. All apartments in a private street development shall have one or two master meters sized adequately to serve the entire development. Exceptions to this policy may be specifically approved by the City based on need. If the master meters are more than 2 inches, the City must approve the installation plans.

b. All meters-will be maintained by the City.

c. Meters three inch (3") or larger shall be installed in vaults.

d. City maintenance of water lines will end at the water meter vault. The property owner shall maintain the vaults.

5.11 **Overall System Layout**

a. Layout and size of all water mains shall be consistent with the overall layout and phasing plan of the City's water system. Layout of the overall system and of all water mains within the City's extraterritorial jurisdiction shall be approved by the City. The overall water system shall be designed to maintain adequate pressure throughout the system.

b. The layout of the water mains should provide maximum circulation of water to prevent future problems of odor, taste, or color due to stagnant water by the following:

i. Provide a source of fresh water at each end or at multiple points in a subdivision. Provide adequate circulation and place valves and fire hydrants, so that flushing of all mains will be simplified.

ii. Dead-ends should be avoided. Temporary dead-ends should be isolated with a line valve, be as short as possible, and be equipped with a fire hydrant at the end of the main as required in Section 5.03.

iii. In unavoidable permanent dead-end situations, reduce the size of pipes successively. Carry a six-inch (6") pipe to the last fire hydrant. Provide a standard two-inch (2") looped circle at cul-de-sacs.

iv. Where a water main is stubbed out for future extensions, place a valve to isolate the dead-end and provide no customer services from the dead-end until it is extended. Provide a standard two-inch (2") blow off at the end of the main.

5.12 **Construction Features**

In conjunction with the design, the design engineer shall determine the extent of, and fully detail the plans, including all special construction features required to complete the project in a manner of safety, convenience, and economics.

a. *Bore and Jack*. Bore and jack sections shall be clearly shown on plans by location and footage. The following criteria is generally used as a basis for setting bore and jack sections:

i. Public Streets - All public streets are to be bored and jacked regardless of surface, unless specifically directed otherwise by the City, and jack length shall be computed as roadway width at proposed bore plus up to one foot (1') to either side of sidewalk if included or plus one (1') foot to either side if not.

ii. Driveways - Whenever it is cost effective, concrete driveways in good condition shall be bored and jacked. Bore and jack length shall be computed as driveway width at bore plus one foot (1') to either side. Where driveways cross culvert pipe sections along open ditch streets and the proposed water main is in close proximity and parallel to the culvert pipe, the length of bore shall be the same as the length of culvert pipe.

iii. Sidewalks - When the water line crosses under a sidewalk four feet (4') or more in width and in good condition, the sidewalk shall either be bored and jacked or the sidewalk shall be removed and replaced to the City of Lake Jackson criteria, whichever is cost effective. Bore and jack length shall be at least the width of the sidewalk.

iv. Trees - When saving trees and shrubs in a previously developed area, all trees six inches (6") and larger in diameter within three feet (3') of the center line of the water main must be noted on the plans. The water main should be bored and jacked a total of ten feet (10’) centered from the trunk of any tree larger than six inches (6") in diameter.

b. *Open Cuts*. Where open cuts are required in street paving, plans shall call for steel plate covers to be installed and maintained over the cut during periods when the contractor is not actively engaged in work at the site. Streets that are open cut shall be full "saw cut" or removed to the nearest joint or existing crack at the city’s option.

c. Work sites in existing developed areas shall be restored to approximate original conditions after construction to include removal and replacement of all sidewalks, driveway within the right-of-way as required, along with a 16" strip sodding along the nearest paved edge.

d. Proper barricading and signage, conforming to the Texas Manual of Uniform Traffic Control Devices, must be followed on all projects. Adequate signage for vehicular and pedestrian traffic will be installed.

SECTION 6 SANITARY SEWER DESIGN REQUIREMENTS

6.01 **In General**

a. Sanitary sewers within the City shall allow for orderly expansion of the system and shall conform with the **pertinent master plan**.

b. Sewers shall be sized based on the minimum requirements set out in Section 6.02 and sewer system design criteria construction detail notes.

c. All sewers shall conform to the minimum requirements of TCEQ Wastewater System Design, 30 TAC 217.

d. Sewers shall be separated from water lines by a minimum of nine feet (9'). Where the minimum separation is not maintained, refer to Section 5.05 for allowable clearances. For sewers crossing utilities other than water, a minimum of six inches (6”) of clearance must be maintained.

e. The public sanitary sewer, as maintained by the City, is defined as sewer pipe mains, which serve more than one sewer connection, which are located in public easements or street right-of-way, and that are installed in accordance with these standards.

f. Design shall conform to the Standard Construction Details.

g. All sanitary sewer system designs except privately owned systems shall be accompanied by a detailed Engineering Report prior to approval by the City.

6.02 **Sewer Design and Materials**

a. Minimum design criteria for determining the size of sewer shall be as follows:

i. Wastewater flows shall be based on the current utility master plan for the area. The average day flow for the design of sanitary sewers shall be based on a minimum set by the plan in gallons per day per single family connection for residential areas. Commercial, industrial, and office areas shall be designed for an average day flow that can be anticipated from the contributing area. Allowance of 4% of average dry weather flow for inflow and 30% for infiltration shall be included in the total design flow determination.

ii. The peak design flow for sewers shall be four (4) times the average day flow of the fully developed service area. Inflow/infiltration allowance without peak factor consideration shall be added to total peak factored design flow.

iii. Minimum size public sewer pipe shall be six inch (6").

iv. Minimum size sewer service lead shall be at least six inch (6") and shall not serve more than two (2) residential services.

v. Minimum commercial sewer service lead shall be at least six inch (6") pipe or larger and shall not serve more than one (1) commercial connection.

vi. Sewers will be constructed of materials specified in the City of Lake Jackson Approved Product List.

vii. Bedding and backfill materials shall conform to the Standard Construction Details.

6.03 **Location of Sanitary Sewers**

a. Street Right-of-Way. Sanitary sewers with a maximum depth of ten feet (10'), measured from finished grade, shall be placed within the right-of-way at least five feet (5') from the right-of-way line, except as provided herein. All sewers that are deeper than ten feet (10') shall have an additional wet utility easement parallel and adjoining the right-of-way where required in accordance with Section 4.

b. Easements. Sanitary sewers and force mains placed in easements shall conform to the requirements of Section 4.

6.04 **Design Requirements**

a. Sewers shall be designed to meet or exceed the pipe manufacturer's recommendations for depth and constructed of materials in the Approved Products List.

b. Minimum depth of cover of a sewer shall be three feet (3') below finished grade or top of curb, whichever is lower.

c. Sewer bedding will be required with approved granular material. Bedding shall be compacted to ninety-five percent (95%) Standard Proctor Density to six inches (6") over pipe for sewer, prior to backfilling the trench. In water bearing sand, washed gravel or other approved granular material will be required. Geotechnical fabric wrap will be required for water bearing soil as shown in Standard Construction Details. When water bearing sands are encountered, the City of Lake Jackson shall be notified immediately. Dewatering operations may become necessary to allow for the placement and procedure as outlined.

d. To determine unacceptable deflections, a final ring deflection test shall be performed using a mandrel prior to acceptance of all installed sewer pipe. The mandrel will pass through the pipe if actual deflection is less than specified limit when pulled by hand from the upstream end of the pipe to the downstream end. Testing, means, methods and deflections in sewer pipe shall be performed according to TCEQ, "Design Criteria for Domestic Wastewater Systems", 30 TAC 217.

e. Hydraulic Requirements.

i. Design velocity in a new gravity sewer flowing full shall be a minimum of two feet (2') per second. Where sewers are anticipated to flow less than one-half full, consideration should be given to increasing the slope of sewer to provide two feet (2') per second velocity in the pipe for the anticipated flowrate.

ii. Minimum acceptable slopes in new sewer main and leads shall be:

Size of Pipe (Inches)	Fall in Feet Per 100 Feet of Sewer
4	0.7
6	0.5
8	0.33
10	0.25
12	0.20
15	0.15
18	0.11
21	0.09
24	0.08

iii. Sewers are to be designed so that the crowns of the pipes are matched at manholes. The upstream sewer may be designed so that the flowline of the upstream sewer is higher than the flowline of the downstream sewer.

iv. Alignment. Sewers should be laid in a straight alignment, and in close agreement to designated locations as required in Sections 4 and 5, with the use of additional manholes as needed.

6.05 **Appurtenances**

a. Manholes.

i. Manholes shall be placed at points of changes in alignment, grade, or size of sewers, at the intersection of sewers and at the end of all sewers in lieu of cleanouts.

ii. Manholes should be spaced at a maximum distance of three hundred feet (300') apart.

iii. Sewers laid in easements shall have a manhole in each street crossing.

iv. Manholes should be located to eliminate the inflow of storm water into the sanitary sewer. The top of manhole rims shall be a minimum of six inches (6") above finished grade with a manhole insert and a maximum throat length of twenty-four inches (24"). Sealed manholes are required when installed below the Base Flood Elevation or when in a paved area.

vi. Manholes and manhole covers shall be constructed in accordance with Standard Construction Details.

vii. Steps in manholes will not be permitted.

viii. All manhole adjustments shall be made with precast concrete rings.

ix. All manholes shall be tested in accordance with the regulations of the TCEQ, "Design Criteria for Domestic Wastewater Systems", 30 TAC 217.58.

x.

b. Stacks shall be constructed for connections to sewers that are more than eight feet (8') below finished grade. Stacks shall be provided during the initial construction of the sewer.

c. Lift stations shall be designed in conformance with the TCEQ, "Design Criteria for Domestic Wastewater Systems". 30 TAC 217.59, et seq. Lift stations should be considered only when a gravity system cannot be achieved. The Design Engineer shall provide design requirements and pertinent data along with a preliminary O & M Manual as part of the engineering report, with construction plans for review. A preliminary design meeting with the City is recommended. Lift stations shall be designed as follows:

i. Pumps shall be sized to operate at optimum efficiency.

ii. Operation and maintenance should be considered in the design of the station and the location of the station.

iii. Wet well working volume should be sized to allow for the recommended minimum pump on cycle time of six (6) minutes for each pump and a fifteen to twenty (15 to 20) minute storage capacity.

iv. Controls and equipment shall be approved by the City. Pumps shall be in the approved product list of the City of Lake Jackson. Pump controls shall be manufactured by E. G. Controls or Mercer Control, or equal.

v. Emergency operations should be considered. Provide fittings and a blind flange that will be readily accessible for emergency bypass pumping.

vi. No collection line system will be considered for storage capacity in the wet well design and pump level operations.

6.06 **Service Connections**

a. Sewer service leads shall be located within a public right-of-way and extend to within three feet (3') of the property line in new installations and up to the property line in reconstruction installation.

b. Single-Family Residential Lots.

i. All service connections shall be installed at the time of construction of the sewer. All sewer service leads shall be located within a public right-of-way.

ii. Service connections should be installed at a manhole, when possible, and made with a flexible connector approved by the City.

c. Multi-Family Residential, Commercial, and Office Development

i. Service connections six inches (6") and larger shall be made at a manhole. All service connections should be installed at the time of construction of the sewer.

ii. Service connections at manholes shall be made with approved flexible connectors.

d. Service Connections at Manholes

i. Service connections at a manhole should be made when possible. When a service connection stub-out is not provided, an opening shall be neatly cut out of the manhole at the required elevation. A prefabricated "Inserta Tee" connection shall be inserted in the wall and the service connection made to it.

ii. Service connection at existing brick shall be grouted in place using non-shrink grout Fosroc Preco-Patch, or equal. For equals, refer to the listed on the Approved Products List. When a hole for a service connection in a brick manhole exceeds eighteen inches (18"), the manhole shall be rebuilt above the disturbed area.

iii. Service connections at existing fiberglass manholes shall be as indicated by this section.

e. Adequate markings on site and accurate as-built locations shall be provided, so that the service connection stub-out can be recovered at the time that the connection to the service is made. Magnetic locators provided by the City shall be installed according to Standard Construction Details.

f. All connections to the public sewer system shall be approved by the City prior to construction. Actual connections to the public sewer system shall be inspected by a representative of the City within the City Limits or extraterritorial jurisdiction.

g. Service connections that are installed after initial construction of a sewer shall be constructed using a PVC saddle with gasket and stainless steel straps and screws as approved by the City.

6.07 **Unsewered Building Sites**

Sanitary sewer shall be extended to all building sites prior to building development. Septic systems are not allowed.

SECTION 7 DRAINAGE DESIGN REQUIREMENTS

7.01 In general

a. All drainage plans, and drainage construction shall meet or exceed the requirements of the City, the applicable drainage district, and all other entities having jurisdiction. Refer to Outfall Channel/Ditch Maintenance Jurisdiction Map, Exhibit A.

b. Public storm sewers are defined as sewers and appurtenances that provide drainage for a public right-of-way, or private tract, and are located in the public right-of-way. Private storm sewers provide internal drainage for private tract. Private storm sewer connections to public storm sewer pipes shall occur at a manhole or at the back of an inlet as approved by the City. All private storm sewers shall be constructed in conformance with these standards.

c. All construction shall conform with Standard Construction Details.

d. All drainage design shall meet or exceed the requirements of the latest Brazoria County Drainage Criteria Manual, and the requirements of the City. Where a conflict arises, the City's criteria and regulations will take precedence.

7.02 Storm Sewer Materials

a. **Reinforced Concrete Pipe:** Concrete pipe shall be manufactured in conformance with the requirements of ASTM C 76-20, Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe, current revision. Reinforced concrete pipe shall be Class III or stronger. The design engineer shall provide for increased pipe strength when conditions of the proposed installation exceed the allowable load for Class III pipe. All concrete pipe constructed in water bearing soil or thirty-six inches (36") in diameter or larger, shall have rubber gasket joints meeting the requirements of ANSI/ASTM C443, "Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets", current revision. Concrete pipe with a diameter of less than thirty-six inches (36") may be installed using pipe with tongue and groove type joint and approved joint filler. When specifically approved by the City, reinforced concrete arch and elliptical pipe conforming to ASTM C506 and C507, respectively, current revision, may be installed in lieu of circular pipe. Reinforced concrete box culverts shall meet the minimum requirements of ASTM C789, Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers, current revision. Pipe joints for arch and elliptical pipe and box culverts shall be sealed. Refer to the Approved Products List.

b. Storm sewer outfalls shall have slope protection to prevent erosion. Slope protection may be constructed of slope paving or other approved method in Standard Construction Details. Standard slope paving shall be four-inch (4") thick pavement with four and one half (4.5)

sack concrete and three-eights-inch (3/8") steel rebar on twenty-four inch (24") centers, each way. Refer to Standard Construction Details for alternate slope protection measures.

c. Alternate Pipe (Polyethylene, PVC, other). Alternate materials and methods are identified in Standard Construction Details and may be used with specific approval from the City.

7.03 Location of Storm Sewer

a. Public storm sewers shall be located within a public street right-of-way or a storm sewer right-of-way that is dedicated to the public.

b. Recommended alignment within a public street right-of-way.

i. For all storm sewers located in a public street right-of-way, there shall be a minimum distance spacing of two feet (2') between the back of the curb and the outside edge of the storm sewer.

ii. Alternate locations for a storm sewer will be permitted by the City under special circumstances and conditions.

c. Recommended alignment within an exclusive storm sewer right-of-way.

i. Storm sewers shall be placed in a right-of-way that conforms to the requirements of Section 6.

ii. Storm sewers within right-of-way shall be placed no closer than five feet (5') measured from the outside edge of the pipe to the edge of a right-of-way, except when adjoining another easement or public right-of-way where the distance may be reduced to two feet (2'). The storm sewer shall be placed in the center of the right-of-way. When the storm sewer right-of-way may be reduced to a minimum of ten feet (10'), the storm sewer may be aligned closer to the right-of-way line, as long as required clearances are met, with specific approval of the City.

7.04 Construction Plan Requirements

a. A drainage area map shall be included in the construction plans. The drainage area map shall include:

i. Drainage areas, including areas draining from off-site onto or adjoining the project.

ii. Design storm runoff 10 or 100 year return period, as determined by the City.

iii. Flow per inlet.

iv. Route of overland flow including the overflow to a drainage way sized to accommodate the 100-year flow, when available.

v. Elevations for the 10-year and 100-year storms in the outfall channel.

vi. Maximum 100-year ponding elevation.

vii. Detention/Retention Basin System for 100-year flow control where required, where no 100-year outfall is available.

b. A detailed summary drainage hydraulic tabulation shall be submitted with the construction plans.

c. The hydraulic gradient for the design storm drainage shall be shown on the construction drawings based on the tail water elevation of the larger of a 10 or 25-year flood or capacity flow in the outfall channel. Calculations for the elevation of the hydraulic gradient shall be provided with the design storm drainage calculations.

7.05 **Design Requirements**

a. Minimum size public storm sewer for main and inlet lead shall be fifteen inch (15") diameter.

b. Storm sewers shall be bedded as shown in Standard Construction Details.

c. Pipe Requirements.

i. Reinforced concrete pipe, as described in Section 7 shall meet or exceed the following minimum requirements:

Pipe Class	Maximum Cover (Ft.)
III	15'

ii. High density polyethylene shall have a minimum thickness as follows:

Pipe Thickness (Inches)	Outside Diameter (Inches)	Wall Thickness (Inches)
15	17.5	.040
18	21.5	.050
24	27.9	.060
30	35.7	.060
36	42.1	.070

d. Storm sewers shall have a minimum clearance of six inches (6") from all other utilities. The clearance shall be measured from the outside wall of the pipe.

e. Design storm runoff shall be calculated in accordance with the latest "Drainage Criteria Manual for Brazoria County, Texas". Where a conflict arises, the City's criteria and regulation shall govern.

f. Hydraulic Requirements.

i. Storm sewers shall be designed to have a minimum velocity of two feet per second (2 fps) or a maximum six feet (6') per second, when flowing full.

ii. Inlet capacity for the design storm shall be computed using a six inch (6") maximum water surface elevation inlet. Design capacity for a Type "C" inlet with a six inch (6") standard curb shall be a minimum four (4) cubic feet per second. Type "E" and area inlet shall be also computed using a max. six inches (6") max hydraulic head and the number of inlet openings or grate openings sized for the design flow.

iii. Design storm flow in a street shall not exceed the capacity of the street, for the water surface equal to the top of inlet, and shall not exceed the inlet capacity.

iv. The maximum allowable ponding level for a minor or collector street is the lowest of the following:

1. One foot (1') above natural ground;
2. One foot (1') above top of curb;
3. One foot (1') below the lowest slab elevation for a 100-year storm event.

v. The storm sewer system must convey flows from a 100-year storm event without ponding water in the street at levels that exceed the maximum allowable level. In addition, for a major thoroughfare, the minimum top of curb elevation shall be at or above the 100-year flood plain elevation. Drainage calculations, along with water surface or hydraulic grade line profiles shall be submitted to the City for approval.

vi. All bridges must be a minimum of twelve inches (12”) above the 100-year water surface elevation with a minimum free board of twelve inches (12") to the span beam.

g. Storm sewers less than forty-two inches (42") in diameter shall be constructed on a straight horizontal and vertical alignment between manholes. Storm sewers greater than or equal to forty-two inches (42") in diameter may be laid along a curve using manufactured bends of less than or equal to 11-14 degrees. Camera inspection may be required on storm sewers constructed along a curve.

7.06 **Appurtenances**

a. Manhole/Junction Box.

i. Manhole/junction boxes shall be placed at all changes in alignment (except sewers laid along a curve), grade and size of storm sewers; and at the intersection of two or more storm sewers.

ii. Maximum spacing between manholes shall be six hundred feet (600').

iii. Manhole covers shall be cast iron, traffic bearing, with a type ring and cover.

b. Inlets.

i. Curb inlets shall be spaced and sized to intercept the calculated runoff for the design storm. The water surface elevation at the inlet shall be less than or equal to the top of curb for the design storm flow.

ii. Maximum travel distance of water in the street to a curb inlet shall be three hundred feet (300') on a major thoroughfare and in a commercial area. The maximum travel distance of water in the street permitted in a single-family residential area shall be six hundred feet (600').

iii. Curb inlets should be located on the intersecting side street at an intersection with major thoroughfare. Locations on the major thoroughfare at intersections shall be specifically approved by the City.

iv. Grated inlets will be permitted in an open ditch with the approval of the City.

v. Backslope swale interceptors may be placed only in drainage district maintained drainage ways when approved by the Drainage District in accordance with their requirements.

vi. Curb inlets shall have covers in accordance with Standard Construction Details.

vii. Backfill around inlets shall consists of 1.5 sacks per cubic yard of cement stabilized sand.

7.07 **Residential Lots**

a. All residential lots shall drain to a public right-of-way directly adjoining the lot. Drainage from a residential lot to a public right-of-way at the rear or side of a lot may be permitted provided the drainage system has been properly designed to accept the flow. Drainage from a residential lot to an adjoining private property shall require a public right-of-way for drainage purposes. Drainage to a private or public easement shall be allowed under pre-existing conditions and shall require specific approval by the City. Drainage to a private or public easement shall be noted on the recorded subdivision plat. Drainage to a Drainage District drainage easement shall be approved by the Drainage District having jurisdiction (Velasco or Angleton).

b. A lot grading master plan showing proposed finished grades, flow pattern and contour will be included in the construction plans. A site-specific lot grading plan may be prepared prior to building development of lot in those cases where a variance to the building slab elevation or lot grading pattern is sought.

7.08 **Flood Plain Management**

All development shall conform to Ch. 46 Floods in the Lake Jackson Code of Ordinance and the National Flood Insurance Program.

SECTION 8 PAVING DESIGN REQUIREMENTS

8.01 In General

a. All paving plans and construction shall be approved by the City for all streets within the City.

b. All new public street pavement shall be four thousand two hundred (4200) psi compressive strength concrete with curb and gutter. Existing asphalt surface pavements may be resurfaced and reconstructed as approved by the City.

c. Street type and classification should conform to all applicable planning tools, such as the subdivision ordinance (Ch. 90) and the applicable master plan. Other considerations for design should include street function, street capacity, service levels, traffic safety, pedestrian safety, and utility location. These additional considerations may affect the minimum requirements set forth herein.

d. Design shall conform to Pavement Design Guidelines and Standard Construction Details.

8.02 Roadway Types.

a. P6D - Principal Arterial, six (6) lanes, divided may be used for major thoroughfare streets.

b. P4D - Principal Arterial, four (4) lanes, divided shall be used for major thoroughfare streets.

c. P4DWP - Major Parkway, four (4) lanes, divided shall be used for major thoroughfare streets.

d. P4DIC - Major Industrial/Commercial, four (4) lanes divided shall be used for major thoroughfare/industrial/commercial.

e. M4U - Minor Arterial, four (4) lanes, undivided shall be use for minor thoroughfare commercial or industrial streets.

f. C2UWP - Minor Parkway, two (2) lanes, undivided with parkway shall be used for minor collector single family residential streets or local multi-family residential.

g. C4U - Major Collector, four (4) lanes, undivided shall be used for major collector multi-family, commercial, or industrial streets and secondary streets.

h. C2U - Minor Collector, two (2) lanes, undivided shall be used for minor collector single family residential streets or local multi-family residential, commercial, or industrial streets and secondary streets.

i. L2U - Residential, two (2) lanes, undivided shall be used for local single family residential streets.

8.03 **Roadway Widths**

Also refer to Ch. 86 Streets, Sidewalks, and Other Public Places

a. Minor streets shall have a minimum right-of-way of sixty (60) feet and twenty-seven (27) feet of paving.

b. Collector streets shall have a minimum right-of-way width of seventy (70) feet and a minimum paving width of thirty-six (36) feet.

c. Arterial streets shall have a minimum right-of-way width of one hundred (100) feet and a minimum paving width of forty-eight (48) feet.

d. Greater width right-of-way and paving may be required by the city council upon the recommendation of the traffic commission and planning commission or the city staff.

e. Future arterial streets will be designated on the traffic plan in their approximate location. The exact location of future arterials will be set when the area is platted.

f. Future collector and minor streets shall be designated by the planning commission and approved by the city council on a case by case basis.

8.04 **Geometric Street Design Standards**

a. Minimum geometric street design standards for number of lanes, lane widths, right-of-way widths, median widths, and parkway widths shall conform to the Design Standards of the City's Engineering Department.

b. The design speeds shall conform to Design Standards of the City's Engineering Department.. The design speed does not necessarily indicate the posted speed.

c. The maximum grade refers to the vertical slope of the street and shall conform to Design Standards of the City's Engineering Department..

d. Vertical curves shall be designed when algebraic difference in grades exceeds one percent (1%). Elevation shall be shown on the construction plans at ten foot (10') intervals through vertical curves. The gradient for tangents to vertical curves at railroad crossings shall be a maximum of four percent (4%). All crest vertical curves shall be determined by sign distance requirements for the design speed. The minimum design speed on any vertical curve shall be based on the street classification.

e. Intersections and curves shall be evaluated for adequate sight distances.

i. Minimum sight distances shall conform to Design Standards of the City's Engineering Department..

f. Horizontal curvature is defined as the centerline radius of the street right-of-way.

i. Horizontal curvature shall conform to Design Standards of the City's Engineering Department..

ii. All roadway types defined as thoroughfares in Section 8.02 shall be designed to the speed criteria set by the Planning and Zoning Commission as recommended by the Traffic Commission and regulated by the City Council. All other roadways shall be designed to thirty (30) mph speed unless otherwise granted variance by the same bodies above.

iii. The centerline curvature of all roadways shall be dictated by the speed design requirements as set in Section 8.04 and shall meet the minimum radius set forth in Design Standards of the City's Engineering Department unless granted site specific speed variance and regulation compatible with the curvature by the planning and zoning commission and the traffic commission.

iv. The superelevation of curvature in the roadways shall be as follows:

Roadway Type	**Radius**	**Superelevation**
Thoroughfare	<2000 ft.	Per AASHTO Guidelines <0.04
Collector/Local	All	None

v. Right angle centerline deflection may be used on local streets. The minimum centerline curvature shall be fifty feet (50') and the angle of deflection shall be ninety degrees (90°) plus or minus ten degrees (10°).

g. Each street shall be evaluated for adequate clearances from obstructions. Such obstructions could include retaining walls, abutments or bridge columns, signposts, large trees, or head walls. Refer to Design Standards of the City's Engineering Department for minimum vertical and horizontal clearance requirements.

h. Intersections.

i. Curb radii, measured from the back of curb, shall be twenty-five (25) feet minimum on local residential streets and thirty feet (30') desirable to twenty five (25') absolute minimum on residential major thoroughfares. The desirable curb radii shall be forty five feet (45') to forty feet (40') absolute minimum, depending on an evaluation of vehicular types and volumes in commercial or industrial areas. Minimums should be increased at skewed intersections.

ii. Streets and traffic lanes shall be properly aligned across an intersection. Proposed streets shall be aligned with existing streets.

iii. When turnouts are provided at an existing street, the ultimate cross section is required to the end of curb return. Pavement transition is required to adjust the pavement width to the existing cross section.

iv. Intersections should be designed as a high point in the drainage system, when possible.

v. Streets intersecting major thoroughfares shall maintain a minimum of three hundred feet (300') of separation. Separation is defined as the distance from pavement face of curb to face of curb. Streets intersecting collector streets shall maintain a minimum of two hundred and fifty feet (250') of separation. Local streets shall maintain a minimum separation of two hundred and forty feet (240'). Collector and local street separation may be reduced with specific approval from the City.

vi. Offset intersections are not permitted on any arterial if the offset distance (or clearance between streets) is less than three hundred feet (300'). The minimal allowable offset shall be two hundred and fifty feet (250') on collector streets and eighty feet (80') on local streets.

vii. Lane drop tapers shall extend a minimum of one hundred feet (100') beyond the intersection or more according to the speed of the roadway and in conformance to Design Standards of the City's Engineering Department.

viii. Except where existing conditions will not permit, all streets, major and minor, shall intersect at a ninety-degree (90°) angle. Variations of plus or minus ten degrees (10°) on secondary and local streets and five degrees (5°) on arterials may be allowed with specific approval from the City.

i. Design Standards of the City's Engineering Department contain the desired minimums pavement width transitions. Minimum transition lengths shall meet or exceed requirements of the Texas Manual of Uniform Traffic Control Devices.

j. Design Standards of the City's Engineering Department contain the desired minimums for left turn lanes. Variance to these lengths may be justified by a traffic analysis. Left turn additions to existing roadways may be permitted when specifically approved by the City.

k. Design Standards of the City's Engineering Department contain the desired minimums for median openings. On major thoroughfares, when areas adjoining the right-of-way are not planned for immediate development, esplanade openings may be spaced one thousand feet (1000') apart when specifically approved by the City.

l. Cul-de-sac Pavement.

i. Single Family Residential - pavement radius measured to the back of curb shall be fifty (50) feet.

ii. Multi-Family Residential, Commercial, and Industrial pavement radius measured to the back of curb shall be fifty feet (50').

iii. Right-of-way radius shall be clear of permanent obstructions. Medians on modified cul-de-sacs may be considered with specific approval from the City when the request is accompanied by verification that the modification can accommodate an SU-30 turning path.

iv. The distance from the back of curb of a cul-de-sac to the right-of-way line shall be a minimum of ten feet (10').

v. Curb radii at the transition to the cul-de-sac shall have a minimum radius of twenty-five feet (25') in single family residential areas and thirty-five feet (35') in other areas, measured at the back of curb.

vi. The length of a cul-de-sac is defined as the distance from the centerline of the intersecting pavement to the center of the cul-de-sac bulb measured along the centerline of the street right-of-way. Maximum length of cul-de-sac streets for residential subdivision shall be one thousand feet (1,000') or serve a maximum of twenty-four (24) residential lots, whichever is less. Maximum length of cul-de-sac streets for commercial or industrial developments shall be six hundred feet (600'). A traffic analysis may be required in commercial or industrial areas to determine high traffic volumes that may be generated from the development, thereby reducing the maximum length of cul-de-sac allowed.

m. Guidelines for permitting on-street parking are given in Design Standards of the City's Engineering Department.

8.05 **Pavement Structure**

a. Local residential streets shall have a minimum thickness of eight (8) inches with number four (#4) rebar spaced at twenty-four inches (24") measured center to center of the rebar.

b. Residential collector streets and all streets in multi-family residential, commercial, or industrial areas shall have a minimum thickness of eight (8) inches with number four (#4) rebar spaced at twenty-four inches (24") measured center to center of the rebar.

c. Major thoroughfares shall have a minimum thickness of eight (8) inches with number four (#4) rebar spaced at eighteen inches (18") measured center to center of the rebar.

d. Any variances to the pavement structure minimum for each roadway type shall be designed based on soil data from the site and based on the anticipated traffic volume, loading and service life of the proposed pavement structure. The design engineer is responsible to ensure that the pavement structure is designed to withstand the anticipated loads that are expected on the roadway. The design shall be submitted to the City for approval.

e. Hot-mix asphaltic concrete pavement for existing asphalt streets_only shall be designed for each individual project based on a geotechnical analysis prepared by a registered engineer. Minimum requirements shall include two inches (2") of surface course, six inches (6") of base, and six inches (6") of lime stabilized subgrade.

f. Subgrade shall be stabilized with a minimum seven percent (7%) lime by weight, six inches (6") thick and compacted to ninety-five percent (95%) Standard Proctor Density. Alternative subgrade stabilization may be substituted when specific recommendations are made by the geotechnical engineer for the project and when specifically approved by the City.

g. Exposed horizontal dowels on existing construction joint or drilled/epoxied bars in saw cut joints are required to create a minimum twelve inch (12") overlap of reinforced steel when making a connection of a proposed street to an existing concrete street or drive. When the existing concrete street has no exposed steel, dowels should be number five (#5) bars, eighteen inches (18") long, and spaced in accordance with this section.

h. Dead-end streets or ends of concrete slabs designed to be extended in the future shall have paving headers and fifteen inches (15") of reinforcing steel exposed beyond the pavement, and protectively wrapped with moisture-proof materials or paving headers and dowel type expansion joint for future pavement ties.

i. Pavement extensions shall connect to the existing pavement with a pavement undercut and a minimum steel overlap of twelve inches (12"). Refer to Standard Construction Details.

j. All concrete to be removed shall be removed either to an existing joint or a sawed joint. Sawed joints shall be full cut, extending through the pavement structure allowing for a complete disassociation.

k. Materials:

i. Concrete -- five and a half (5-1/2) sacks cement per cubic yard concrete; four thousand two hundred (4200) psi compressive strength, modulus of rupture strength at twenty-eight (28) days. High early strength concrete when approved shall consist of a seven (7) sack mix design with plasticizer or a city approved custom mix batch design specially formulated to the planned field operations.

ii. Reinforcing steel -- Grade 40, ASTM A615, current.

iii. All materials and workmanship shall conform to the TXDOT Standard Specifications for Construction and Maintenance of Highways, Street, and Bridges.

iv. All special, non-standard materials, such as stamped concrete or concrete pavers, and special signage, which are installed by the developer, shall be specifically approved by the City, and shall be maintained by the developer or his assigns. Any maintenance of non-standard items by the City will be done using standard materials and methods.

v. A concrete mix design of cement plus fly-ash may be substituted in lieu of the standard concrete batch design in a case by case basis as specifically approved by the City. The fly-ash shall conform to the requirements of TXDOT Standard Specifications No. 265 and shall

not exceed 25% by absolute volume of the specified cement content. The modulus of rupture and/or compressive strengths and development period minimums of the standard concrete mix batch shall remain in effect and be verified by a mix design prepared and tested by a Geotechnical Lab and submitted for review and approval by the City prior to paving operations.

8.06 **Driveways**

a. Single family residential driveways shall be a minimum of ten feet (10') wide at the right-of- way line and the maximum width as set out in Ch. 86 Streets, Sidewalks, and Other Public Places.

b. Non-residential driveways shall have a minimum of twenty-four feet (24') travel way width and be spaced with a minimum of twenty feet (20') separation. Commercial driveways on major thoroughfares shall follow TXDOT standards.

c. Non-residential driveways on major thoroughfares. shall be separated from intersecting streets a distance as determined and permitted by the controlling Jurisdictional Agency. Non-residential driveways on major thoroughfares (non-highway), collector or local streets are to be placed no closer than seventy and one half (70 ½') feet from the curb (radius point) of any intersecting street. Distances shall be measured from the edge of driveway.

d. Commercial tracts with ninety-five feet (95') or less or frontage on a public street shall have no more than one (1) driveway. Commercial tracts with between three hundred twenty feet (320') and ninety-six feet (96') of frontage on a public street shall have no more than two (2) driveways. Commercial tracts containing between six hundred feet (600') and three hundred twenty-one feet (321') of frontage on a public street shall have no more than three (3) driveways. Commercial tracts with over six hundred feet (600') of frontage on a public street shall have driveways specially designed and specifically approved by the City.

e. Non-residential driveway connections to the public street shall be approved and inspected by the City.

f. Driveways within right-of-way or parkways shall be installed according to the Standard Construction Details.

g. Driveways shall be evaluated with respect to landscaping and structures for adequate sight distances.

8.07 **Grading and Layout Requirements**

a. Minimum gradient on gutter shall be 0.25 percent. For special conditions where the gutter must be placed at a flatter grade, the minimum grade may be as approved by the City.

b. Inlet spacing is defined by Section 7.06.

c. Maximum cut measured from finished grade at the right-of-way line to top of curb shall be 1.75 feet, unless otherwise approved by the City. The recommended maximum slope for driveways shall be one and three-quarters of an inch (1-3/4") per foot. Driveway slope at sidewalk continuation shall conform to ADA cross slope requirements of one-quarter inch (1/4") per foot.

d. Minimum grade around intersection turnouts of fifteen foot (15') minimum radius shall be one half percent (.5%) for new and one-quarter percent (0.25%) for reconstruction unless otherwise approved by the City. Grade for larger radius shall be determined on an individual basis.

e. All residential streets shall have a four inch (4") laydown concrete curb and commercial, business and multi-family shall have six inch (6") high concrete curb as shown in Standard Construction Details. Other curb types as contained in the standard details may be designed based on the application used.

f. Minimum slope for the gutter of a cul-de-sac or of the long radius shall be four tenths percent (.4%) unless otherwise approved by the City.

g. The amount of cross slope over the standard street pavement section should be shown on the plans. The usual cross slope is three-eights inch (3/8") per foot from the curb line to quarter point, and one-fourth inch (1/4") per foot from quarter point to centerline, and one-eighth inch (1/8") to three sixteenths inch (3/l6") per foot for left turn lanes. Cross slope elevation may be calculated using the elliptical crown formula for a four inch (4") crown.

h. Top of curb elevations and top of curb/inlet shall be shown on the construction plans. Gutter elevations shall be indicated where connecting to existing surfaces are proposed. Profile grades should indicate reference line used, usually the top of curb or other if clearly indicated.

i. Gutter elevations are required for vertical curves where a railroad track is being crossed.

j. Where railroad crossings are not at right angles to the pavement slab, vertical curves should be calculated for each curb line and should be posted at ten foot (10') intervals in the profile.

k. The lowest street gutter flow line elevation at storm sewer inlets shall be at or above the hydraulic grade line (HGL) derived from a hydraulic analysis on a ten-year downstream tailwater elevation.

l. For non-flood hazard zone development, the centerline of streets shall be built to an elevation of twenty-four (24) inches below the ground elevation or the expected lowest adjacent

building ground floor elevations, or above the lowest street gutter flow line elevation at storm sewer inlets, whichever is greater.

m. For flood hazard zone development, the centerline of streets shall be built to an elevation that equals the BFE, or twenty-four (24) inches below the expected lowest adjacent building ground floor elevations, or above the lowest street gutter flow line elevation at storm sewer inlets, whichever is greater.

n. Street centerlines and gutter flowlines at storm sewer inlets shall be built at elevations adhering to the requirements set forth in this development manual.

8.08 **Traffic Control Devices**

a. Standard barricades shall be permanently installed at the end of all dead-end streets not terminating in a cul-de-sac and at all temporary turnouts. Barricades shall meet requirements of the Texas Manual of Uniform Traffic Control Devices for Type III barricades.

b. Developers shall install traffic control devices as warranted by a traffic study.

8.09 **Sidewalks**

a. Sidewalks of four feet (4') in width are required on each side of all public residential streets. Sidewalks of six (6) feet in width are required on each side of a commercial street. Construction of a sidewalk along a single family residential local street may be deferred until a lot is improved. Where the sidewalk is part of a designated bike path plan, the width shall be as set by the plan.

b. Sidewalk wheelchair ramps meeting the latest ADA criteria shall be required at all intersections, driveways, and median crossovers.

c. All sidewalks are to be constructed in accordance with Standard Construction Details.

d. Sidewalks shall be typically located four feet (4') offset from the street curb in new development. Variations to this offset may be allowed in existing street reconstruction or in commercial business districts with specific approval from the City.

e. Hike and bike paths shall consist of a minimum ten feet (10') in width in corridors designated by the Parks and Recreation Board and\or contained in the latest official Hike and Bike Master Plan. All hike and bike pavement shall be constructed in accordance with the City’s sidewalk and wheelchair ramp Standard Construction Details.

8.10 **Alleys**

a. Only privately owned and maintained alleys are allowed in the city. Service alleys in commercial and industrial districts and driveway alleys in residential areas are private alleys and lie entirely within private property.

b. Pavement design requirements for private alleys shall be the responsibility of the private owners, but consideration to the following are recommendations for fire lane and waste haul lane operations:

i. Alleys for commercial and industrial districts shall have a minimum thickness of eight (8) inches with number four (#4) rebar spaced at eighteen inches (18") measured center to center of the rebar.

ii. Residential services alleys shall have a minimum thickness of eight (8) inches with number four (#4) rebar spaced at eighteen inches (18") measured center to center of the rebar.

iii. Residential alleys shall have a minimum thickness of six inches (6") with number four (#4) rebar spaced at twenty-four inches (24") measured center to center of the rebar.

iv. Alleys without curb shall be constructed as a "V" section with cross slopes of three-eights inch (3/8") per foot. Alleys with curb shall be crowned with cross slope of three-eights inch (3/8") per foot.

8.11 **Fire Lanes**

a. Fire lanes shall be created on all multi-family and non-residential tracts. All fire lanes must have access to public roadways and shall be located so that no exterior portion of the building is greater than one hundred and fifty feet (150') from either a fire lane or a public street right-of-way.

b. Fire lanes shall be either twenty feet (20’) ide for non-aerial apparatus or a minimum twenty-six feet (26’) wide for aerial fire apparatus access with a minimum inside turning radius of twenty-six feet (26’).

c. Fire lane pavement design requirements shall be the responsibility of the private owner. The pavement shall be able to withstand a fire apparatus weighing up to 86,000 pounds.

d. Fire lanes shall be designed to drain in compliance with the site development requirements.

e. All fire apparatus roads shall comply with appendix D of the most current adopted edition of the International Fire Code.

SECTION 9 SITE DEVELOPMENT REQUIREMENTS

9.01 **In general**

a. Site developments plans shall include any project that affects public water, wastewater, storm drainage, or paving facilities. Site developments of two (2) acres or larger shall be approved by the Planning and Zoning Commission.

b. All site developments shall conform to the requirements of these standards and applicable rules and regulations of the City.

c. Site development plans for projects of less than two (2) acres may be submitted to the Building Permits Department, with the construction plans, for issuance of a building permit prior to construction. The landscape plan shall accompany the submittal as a separate document or may be included in the site development plan if all pertinent landscape information is included.

d. The City will only accept site improvements for operation and maintenance purposes if the improvements serve more than one party, are located within the public right-of-way or easements, and meet the design standards set forth in this development manual.

e. A traffic impact study may be required for any development proposal expected to generate traffic volumes that will significantly impact the capacity and/or safety of the street system.

9.03 **Building Slab Elevation**

a. *Non-Residential and Apartment Sites.* Each application for a building permit shall be accompanied by a Lot/Site Grading Plan prepared by and certified to by a Registered Professional Engineer, and showing the following:

i. The proposed finished grading of the building site to properly convey rainfall runoff away from the structure and adjoining area via overland flow to the appropriate storm sewer inlet or outfall channel.

ii. A minimum ground floor elevation 12 inches above the highest grade adjacent to the structure, or at least 12 inches above the 100 year flood elevation (if any) shown on the current Flood Insurance Rate Map, whichever requirement is the higher elevation.

iii. Each building shall undergo a slab elevation certification prepared by a registered professional engineer or land surveyor at the following stages.

1. Prior to foundation inspection a form elevation certification is to be required.

2. Prior to application for certificate of building occupancy, an "As Built" lot/site grading plan with the plan on file will be required.

b. *Residential Sites.* For all residential lots, the minimum ground floor elevation shall be 24 inches above the center of the street at the mid-point of the lot frontage and with typical and usual rear to front lot grading or as otherwise indicated in Master Lot Grading Plan. Variance may be obtained by providing the required documentation as prescribed for Non-Residential and Apartment Sites.

9.05 **Sanitary Sewer Service**

Sanitary sewer service leads are normally installed during construction of the public sanitary sewer. When a sanitary sewer service lead is to be installed for a site development, refer to requirements set out in Section 7 of these Standards. All lots, tracts, or reserves shall be connected directly to a public sanitary sewer by a single lead, except as specifically approved by the City. The City shall be contacted for all sanitary sewer connections for commercial projects within the City and its extraterritorial jurisdiction.

9.06 **Site Drainage Requirements**

a. All commercial, industrial, office, recreational, and multi-family tracts shall have an internal drainage system. The internal drainage system shall collect all site runoff beyond one hundred feet (100') from the right-of-way line into a storm sewer system that shall connect to the public drainage facilities in the area, except with specific approval. The one hundred foot (100') area adjacent to the right-of-way may sheet flow to the roadway drainage system if the roadway system is designed to accommodate the additional sheet flow from development as included in the drainage analysis plan of the site area in effect or as certified by a revised engineering hydraulic analysis.

b. The internal site storm sewer shall be connected to a public storm sewer at a storm manhole/junction box or at an inlet adjoining the site. The site drainage outfall shall be connected to the nearest existing drainage system with adequate capacity to serve the drainage area. Where extension of the existing drainage system is required, all costs for extension shall be the responsibility of the development.

c. All internal site storm sewer extended into a public right-of-way or easement shall be with properly designed diameter pipe with a minimum of fifteen inches (15") in diameter. Only one connection will be allowed into the back of a curb inlet. Storm sewer pipe material shall be in accordance with requirements set out in Section 7.02.

d. All internal facilities shall be designed by a registered professional engineer and shall be sized to drain the site in accordance with these Standards.

e. Drainage calculations shall be submitted with all site development plans. Other supporting data may be required by the City.

f. When the site drains directly or indirectly into a Velasco/Angleton District drainage facility and/or into a highway right-of-way, the appropriate governmental entity shall approve the site development connection to public facilities.

9.07 **Driveways**

a. Single family residential driveways shall be a minimum of ten feet (10') wide at the right-of- way line and the maximum width as set out in Ch. 86 Streets, Sidewalks, and Other Public Places.

b. Non-residential driveways shall have a minimum of twenty-four feet (24') travel way width and be spaced with a minimum of twenty feet (20') separation. Commercial driveways on major thoroughfares shall follow TXDOT standards.

c. Non-residential driveways on major thoroughfares shall be separated from intersecting streets a distance as determined and permitted by the controlling Jurisdictional Agency. Non-residential driveways on major thoroughfares (non-highway), collector or local streets are to be placed no closer than seventy and one half (70 ½') feet from the curb (radius point) of any intersecting street. Distances shall be measured from the edge of driveway.

d. Commercial tracts with ninety-five feet (95') or less or frontage on a public street shall have no more than one (1) driveway. Commercial tracts with between three hundred twenty feet (320') and ninety-six feet (96') of frontage on a public street shall have no more than two (2) driveways. Commercial tracts containing between six hundred feet (600') and three hundred twenty-one feet (321') of frontage on a public street shall have no more than three (3) driveways. Commercial tracts with over six hundred feet (600') of frontage on a public street shall have driveways specially designed and specifically approved by the City.

e. Non-residential driveway connections to the public street shall be approved and inspected by the City.

f. Driveways within right-of-way or parkways shall be installed according to the Standard Construction Details.

g. Driveways shall be evaluated with respect to landscaping and structures for adequate sight distances.

9.09 **Landscaping**

a. All landscaping site plans for proposed developments shall be prepared in compliance with Ch. 90 of the Code of Ordinances. Site landscape plans shall contain the following: (See Appendix 1001, Development Checklist.)

i. Tabulation summary of required and proposed area square footage comparison to include total site area proposed, enclosed building areas and other pertinent area detail.

ii. Landscape area layout with dimensioned outline.

iii. Tree, shrub, and planting location and type layout.

iv. Proposed schedule list of proposed specimen material by name, quantity, and size.

v. Tabulation summary of required and proposed tree schedule to include credits and diameter size.

b. Site landscaping plans for developments two (2) acres or larger shall be prepared in a separate plan and include a Planning and Zoning Commission signature block. The submittal and approval procedure shall be in accordance with requirements set out in Ch. 90 Subdivisions.

c. Site landscaping plans for developments less than two (2) acres may be incorporated with the site plan and do not require a signature block. The submittal and approval procedure shall be in accordance with requirements set out in Ch. 90 Subdivisions.

SECTION 10 APPROVED PRODUCTS LIST: WATER*

10.01 **Fire Hydrants (Flushing Valves)**
(Pumper Nozzle 4.5", Hose Nozzle 2.5", valve body 5.25") National Standard Thread
a. Mueller – Model: Centurion

10.02 **Valves (AWWA Approved Resilient Wedge Type) (Push On) (Open Left)**
a. Mueller

Brass Gate Valves (3/4"to 2")
C.I. Gate Valve with Epoxy (2")
a. Hammond
b. Watts
c. Crane
d. Matco

10.03 **P.V.C. Pipe (AWWA C-900)**
a. J-M Pipe
b. CertainTeed
c. Napco
d. ETI
e. Various manufacturers with C-900 5 yr. Production History
f.

10.04 **Ductile Iron Pipe (AWWA Cl51, C5S0 and C600)**
a. U.S. Pipe
b. American
c. Clow

10.05 **Ductile Iron Pipe Coatings (AWWA C104 (ANSI A21.4))**
a. Various Manufacturers

10.06 **Fittings (D.I.P., AWWA C153/A21.53.84, AWWA Cl10 (ANSI 21.10)) (PUSH ON)**
a. U.S. Pipe
b. American
c. Tyler Pipe/Fittings

10.07 **Steel Pipe Casing (AWWA C200)**
a. Various Manufacturers

*Materials and manufactured items that the City will maintain must be approved by the City prior to installation. Items not appearing on this list or designated as "various manufacturers" shall not be used without prior approval.

10.08 **Curb Stop – Bronze, Ball Valve, 360º Rotation, Locking Wing (CCx Comp)**

a. Ford
b. Meuller

10.09 **Corporation Stop – Bronze, (CCx Comp) (≤1") or FIPT Tap (≥1")**

a. Ford – Model: F100
b. Meuller

10.10 **Service Saddle – Double Strap, Bronze or Brass with CC Tap (≤1") or FIPT Tap (≥1")**

a. Ford
b. Mueller
c. Smith Blair

10.11 **Service Saddle – Single Strap, Stainless Steel, Epoxy Coated Saddle**

a. Romac
b. Smith-Blair

10.12 **Water Meters (AWWA Approved) (City Furnished)**

a. Sensus (old Rockwell)

10.13 **Service Tubing (CTS Heavy Wall)**

a. ADS Drainage

10.14 **Tapping Sleeve (stainless steel) & Tapping Valve**

a. Mueller (Sleeve & Valve)
b. Smith Blair (Sleeve)
c. Romac (Sleeve)
d. JCM (Sleeve)
e. American Flow Control

10.15 **Repair Clamps (Stainless Steel)**

a. Romac
b. Smith Blair

10.16 **Cast Iron Body Couplings (Stainless Steel Bolts)**

a. Smith Blair

10.17 **Air Release Valve**

a. APCO
b. Watts
c. Wilkins
d. Ari

10.18 **Meter Boxes**

a. Concrete –OCastle or Approved Equal
b. Cast Iron –East Jordan

10.19 **Polyethylene Encasement Tubing, 8 mil min (ANSI/AWWA C105)**

a. Various Manufacturers

10.20 **Ductile Iron Body Coupling M.J. (Stainless Steel Bolts)**

a. U.S.
b. American
c. Smith-Blair
d. Tyler

Section 11 APPROVED PRODUCTS LIST: SANITARY SEWER

11.01 **Gravity Flow Pipes**

a. P.V.C. ≤ 12 inch -- SDR 26, ASTM 3034, flow line ≤ 12 feet depth
b. P.V.C. > 12 inch -- DR 25, C905, flowline ≤ 12 feet depth
c. P.V.C., flow line ≥ 12 feet, DR 18, C905
d. P.V.C., SDR 21, flow line ≤ 12 feet ASTM D2241 with gasketed joints
e. PVC Service Leads ≤ 6 inch -- Sch. 40
f. Ductile Iron Pipe, Class 51 cement lined, C600
g. PVC Profile Wall > 21" - PSO46
h. Polyethylene > 21" - Profile Wall
i. C Fiberglass > 18" -- SN46

11.02 **Force Main**

a. Ductile Iron Pipe Class 51 Cement lined w/40 mil polyliner
b. P.V.C., DR 18, C900

11.03 **Coating for Manholes (40 Mils. Minimum Thickness)**

a. Sewpercoat

11.04 **Lift Station Submersible Pumps (By Special Approval)**

a. Flygt 3” or less

11.05 **Lift Station Controls Panels**

a. Prime Controls
b. Mercer Controls

11.06 **Non-Shrink Grout**

a. Sika

11.07 **Manhole Covers and Rings**

a. Vulcan
b. Neenah
c. Western Works

11.08 **Engineering Fabrics**

a. Various Manufacturers

11.09 **Manhole Inserts (No Flow/In Protectors)**

a. Contractor Specialties and Supply Company

11.10 **Sewer Fittings**

a. Napco
b. Harco

11.11 **Pipe Connectors/Flexible Couplings**

a. Fernco
b. Inserta Tee

11.12 **Manholes – Concrete Prefab (Bottoms Only)**

a. Moore-Tex
b. Ocastle
c. NC Pipe

11.13 **Manholes – Fiberglass (Risers Only) (Heavy Wall – ½" thick)**

a. Owings-Corning
b. Various Manufacturers

11.14 **Sewer Pipe – Trenchless Liners**

a. CIPP – Insituform
b. Polyethylene Liner - Driscopipe
c. PVC Fold & Form – NU Pipe
d. CC Fiberglass -- Hobas

11.15 **Lift Station Pumps**

a. Goman-Rump T
b. Flygt 3000

SECTION 12 APPROVED PRODUCTS LIST: STORM SEWER

12.01 **Engineering Fabrics**

a. Various Manufacturers

12.02 **Manhole Covers, Rings and Inlet Grates**

a. Sipma
b. Star Pipe
c. East Jordan

12.03 **Reinforced Concrete Pipe (ASTM C76, ANSI/ASTM C443, ASTM C506, ASTM C507)**

a. Various Manufacturers (CL III)

12.04 **Concrete Box Culverts (ASTM C789) (ASTM C850)**

a. Various Manufacturers

12.05 **Corrugated Polyethylene and Fittings (AASHTO M294, ASTM D3350)**

a. ADS N-12 D < 12" > 24"
b. Rancor HI-Q D < 12" > 24"
c. ADS "Prolink" D >12"--24"
d. Rancor "SurLoc" D > 12" -- 24"

12.06 **Slope Erosion Liners**

a. Gabions -- Bekaert, Maccaferri
b. Grout Fabric Blankets -- Fabriform, Armor Form
c. Confinement Mat -- Geoweb
d. Vegetation Blanket -- Excelsior, Curley -- Enka Prods.
e. Drainage Blanket -- ENKA Products

12.07 **Corrugated Metal Pipe (Not Approved in Velasco Drainage District Outfall)**

SECTION 13 APPROVED PRODUCTS LIST: STREETS

13.01 **Raised Pavement Markers (Class A, B, C & D)**
- a. Apex Universal

13.02 **Type Y and Type W Traffic Buttons (Ceramic only)**
- a. Apex Universal

13.03 **Raised Pavement Marker Adhesive (Two Part Epoxy)**
- a. Various Manufacturers

13.04 **Thermoplastic Pavement Markings (125 mils thick)**
- a. Flint Trading Inc. – Premark LKF Road marking Material

13.05 **Prefabricated Pavement Markings (125 mils thick)**
- a. Flint Trading Inc. – Premark LKF Road marking Material

13.06 **Thermoplastic Adhesive**
- a. Ashland Chemicals – Pliobond 10

13.07 **Crack and Joint Sealant**
- a. Elastometric-type, Hot-pour Joint Sealant conforming to TxDot Item 433 and TxDot Departmental Material Specification D-9-6310
- b. Sika – 2 part polymeric self leveling

13.08 **Paints**
- a. Only water based conforming to TxDot specifications are approved for use (various manufacturers).

13.09 **Road Marker Posts**
- a. Carsonite #CRM-375

13.10 **Replaceable Delineator Post w/Base (Epoxy or 8" Bundy Adhesive)**
- a. Repo Tm Model

13.11 **Concrete Curing Membranes**
- a. Liquid membrane-forming Curing Compound conforming to TxDot Item 526 and TxDot Departmental Material Specification D-9-8120 (various manufacturers)

13.12 **Geotextile Fabric**
- a. Paving – "Petromat" (Philipps 66)
  "RoadGlas" (Owings-Corning)

b. Stabilization – Trevira (Hoechst)
-- Mirafi (Celanese)
-- Supac (Phillips 66)

APPENDIX 1001 DEVELOPMENT CHECKLIST

CITY OF LAKE JACKSON
ADMINISTRATIVE REVIEW & COMPLETENESS CHECKLIST
PLANNING & ZONING COMMISSION

PLATTING
ZONING
SITE PLAN DEVELOPMENT
SUBDIVISION DEVELOPMENT

NAME OF SUBDIVISION OR TRACT DESCRIPTION:

_____

TYPE OF REQUEST: ☐ AMENDMENT ☐ PLAT ☐ REPLAT ☐ VACATE
☐ SITE/LANDSCAPE PLAN DEVELOPMENT
☐ SUBDIVISION DEVELOPMENT ☐ ZONING

CLASS OF DEVELOPMENT: ☐ NON-RESIDENTIAL ☐ RESIDENTIAL

TYPE OF DEVELOPMENT: ☐ COMMERCIAL/BUSINESS ☐ INDUSTRIAL
☐ INSTITUTIONAL ☐ MULTI FAMILY
☐ SINGLE FAMILY ☐ PURZ ☐ PUD

SIZE OF DEVELOPMENT (ACRES): _____

NUMBER OF LOTS, TRACTS, UNITS, ETC: _____

OWNER OR OPTIONEE: _____

DEVELOPER'S ENGINEER: _____

DEVELOPER'S CONTACT NAME, ADDRESS, TELEPHONE & EMAIL:

_____

_____

_____

_____

_____

_____

ADMINISTRATIVE REVIEW DEVELOPMENT CHECKLIST SUMMARY

Development of any property lying within the City or the extraterritorial jurisdiction of the City requires steps that may include all or part of the following procedures: (re)zoning, platting, subdivision development and site plan development. The procedures are contained in Ch. 90 Subdivisions.

The following is a checklist of items necessary to be included in a request for any of the above steps to be considered for approval by the Planning and Zoning Commission. City staff will determine if any of the listed items do not apply.

Request for the specific development procedure should be made when the following actions to property are being considered: zoning, platting, subdivision development, and site development.

Some procedures may require a public hearing(s) as required by State Law.

Plats, subdivision plans and site plans (preliminary and/or final) will be submitted to the City prior to the official meeting with the Planning and Zoning Commission.- Plats and plans to be submitted typically shall follow the following format:

	Plat	Site Development Plan	Site/Landscape Plan
Scale	1:100 or larger	1:100 or larger	1:100 or larger
Size	24-inch x 36-inch	24-inch x 36-inch	24-inch x 36-inch
Print	PDF/Bond (PDF 300 dpi)	PDF/Bond (PDF 300 dpi)	PDF/Bond (PDF 300 dpi)
Copies	1 PDF & 2 Bond	1 PDF & 2 Bond	1 PDF & 2 Bond

STAFF PROCEDURE REVIEW

Predevelopment Meeting Required: ☐ Yes ☐ No ☐ Opt

Existing Zoning: ☐ E1 ☐ R1 ☐ R2 ☐ R-2A ☐ R3 ☐ R4 ☐ B1 ☐ B1A ☐ B2 ☐ B3 ☐ C1 ☐ C2 ☐ PURZ _____ ☐ PUD _____ ☐ MH1 ☐ M1 ☐ M2 ☐ T1

Zoning Request: _____

Platting Request: ☐ Amendment ☐ Not Required ☐ Plat ☐ Replat

Public Hearing Required: ☐ Yes ☐ No

Public Hearing Request: ☐ Replat ☐ (Re) Zoning ☐ Not Required

Planning & Zoning Action Required:

Zoning	☐ Not Required	☐ Administrative Review	☐ Final Review
Platting	☐ Not Required	☐ Administrative Review	☐ Final Review
Site Development	☐ Not Required	☐ Administrative Review	☐ Final Review
Landscape Development	☐ Not Required	☐ Administrative Review	☐ Final Review
Subdivision Plan	☐ Not Required	☐ Administrative Review	☐ Final Review

Development Procedure Timeline (Tentative)	**Administrative**	**Final**
Call for Public Hearing	Date: _____	
Public Hearing	Date: _____	

(Re) Zoning 1st Meeting Date: _____
(Re) Zoning 2nd Meeting Date: _____
(Re) Zoning Council Approval Date: _____
Plat File Date: _____
Replat File Date: _____
Plat Amendment File Date: _____
Site / Landscape Plan File Date: _____
Site / Landscape Amendment File Date: _____
Subdivision Plan Date: _____

Pre-Development Meeting

Prospectus Provided: ☐ Yes ☐ No ☐ Not Required / Previous
Development Manual Provided: ☐ Yes ☐ No ☐ Not Required / Previous

Discussion Items:

Utilities:

Water Availability: _____

Special Encumbrances Remarks

(Master Plan Required): _____

(Oversize): _____

(Fire Loop): _____

(Other): _____

Sewer Availability: _____

Special Encumbrances Remarks

(Master Plan Required): _____

(Oversize): _____

(Lift Station): _____

(Other): _____

Utilities (continued):

Storm Drainage Availability: _____

Special Encumbrances Remarks
(Master Plan Required): _____

(100-Year Detaining Required): _____

(Drainage System): _____

(Other): _____

Traffic: _____

Street & Facility Access: _____

Special Encumbrances Remarks

(Master Plan Required): _____

(Arterial Street): _____

(Left Turn Lanes): _____

(Median Crossovers): _____

(Access Drives): _____

Parks/Schools: _____

Special Encumbrances Remarks

(Park Land Required): _____

(Park Land Area Required): _____

(Fee Option in Lieu): _____

(School Land Required): _____

Miscellaneous: _____

Special Encumbrances Remarks

(Sidewalks & ADA Ramps): _____

(Bridge / Culvert Crossing): _____

(Flood Berms): _____

(Other): _____

Landscape: _____

Special Encumbrances Remarks

(Ordinance Required): _____

(Other): _____

Development Procedure Fees **see section 90-36 of the Lake Jackson Code of Ordinances**

Project Name: _____

Date: _____

Action Taken:

_____

Billing Contact Name & Address:

_____

_____

ADMINISTRATIVE REVIEW CHECKLIST

	REQUIRED		COMPLETED		ACTION NEEDED
	Y	N	Y	N	
PRE-PRELIMINARY PROCESS					
Pre-Development Meeting					
Public Hearing (Zoning)					
Public Hearing (Replat)					
Zoning					
PLATTING DEVELOPMENT					
Submittal within Timeline	✕				
Bond Paper Prints Provided (2 sets / 24 x 36) and PDF (300 dpi)	✕				
Contents					
Name of Subdivision on Plat Title	✕				
Location & Vicinity Map	✕				
Name of Developer or Optionee	✕				
Boundary Lines (lengths)	✕				
Lot / Tract Dimensions (width & depth)	✕				
Building Lines & Dimensions	✕				
Block & Lot Numbers	✕				
Physical Features	✕				
Park Area & Acreage	✕				
Utility Easements (widths)	✕				
Drainage R-O-W (widths)	✕				
Street R-O-W (widths)	✕				
Adjacent Property Land Use / Legal Description	✕				
Street Names	✕				
North Arrow & Scale	✕				
Coordinate System (Tx State Plane Coordinate System in US Feet / Ref NAD83)	✕				
Benchmarks (Vertical Datum Ref NAVD88)	✕				
Owners Certificate of Dedication	✕				
Surveyors Certification	✕				
Notary Signature Certification(s)	✕				
Planning & Zoning Commission Signature Block	✕				
Drainage District Certification & Signature Block	✕				
SUBDIVISION DEVELOPMENT					

Submittal within Timeline	✕				
Bond Paper Prints Review (2 sets / 24 x 36) and PDF (300 dpi)	✕				
Content – Construction Plans					
Plat	✕				
Drainage Area Map & Hydraulic Data Analysis	✕				

ADMINISTRATIVE REVIEW CHECKLIST	**REQUIRED**	**COMPLETED**	**ACTION NEEDED**
Content – Construction Plans (continued)			
Detention Analysis & Plan	✕		
Overall Paving & Drainage Layout	✕		
Overall Water & Sewer Layout	✕		
Overall Final Grading Plan	✕		
Overall Staging Plan	✕		
Plans & Profiles	✕		
Pollution Prevention Plan	✕		
Special Construction Details	✕		
Standard Construction Details	✕		
Construction Specifications	✕		
Staff Review	✕		
SITE DEVELOPMENT			
Submittal within Timeline	✕		
Bond Paper Print Review (2 sets / 24 x 36) and PDF (300 dpi)	✕		
Content – Site Plan			
Plat	✕		
Building / Improvement Footprint	✕		
Parking & Pavement Layout	✕		
Parking Spaces Tabulation Summary	✕		
Site & Building Space Area Tabulation Summary	✕		
Planning & Zoning Commission Signature Block	✕		
Special Notes	✕		
Name of Site or Site Title	✕		
Name of Owner or Developer	✕		
Drainage & Utility Layout	✕		
Drainage Area & Hydraulic Data Analysis	✕		
Civil Construction Plans & Details	✕		
Exterior Lighting Iso-Candle Plot Plan	✕		
Landscape Plan			
Submittal within Timeline	✕		
Landscape Area Layout	✕		
Landscape Area Dimensions	✕		
Landscape Area Square Footage	✕		
Planting Type & Location Plan	✕		
Tree Type & Location Plan	✕		
Berm Location Plan	✕		

Landscape Area Tab Summary	✕				
Tree Count Tab Summary	✕				
Tree Protection Survey	✕				
Tree Credit Summary	✕				
Detail Landscape Bill of Material	✕				
Special Notes	✕				
Planning & Zoning Commission Signature Block	✕				
Name of Site or Site Title	✕				

ADMINISTRATIVE REVIEW CHECKLIST	**REQUIRED**		**COMPLETED**		**ACTION NEEDED**
	Y	**N**	**Y**	**N**	
Content – Landscape Plan (continued)					
Name of Site Owner or Developer	✕				
Special Landscape Details	✕				
Staff Review	✕				

RECOMMEND FOR COMPLETENESS REVIEW CHECKLIST: FILE ☐ YES ☐ NO

_____ _____

Date Staff Signature

CITY STAFF REVIEW COMMENTS & RECOMMENDATIONS:

_____

_____

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_____

_____Recommend for Preliminary Approval

Date _____ Chairman's Signature _____

COMPLETENESS CHECKLIST

	REQUIRED		COMPLETED		ACTION NEEDED
	Y	N	Y	N	
STAFF / DEVELOPER FINAL REVIEW					
Platting Development					
Submittal within Timeline	✕				
Bond Paper Prints Provided (2 sets / 24 x 36)	✕				
Contents					
Name of Subdivision or Plat Title	✕				
Location & Vicinity Map	✕				
Name of Developer or Optionee	✕				
Boundary Lines (lengths)	✕				
Lot / Tract Dimensions (width & depth)	✕				
Building Lines & Dimensions	✕				
Block & Lot Numbers	✕				
Physical Features	✕				
Park Area & Acreage	✕				
Utility Easements (widths)	✕				
Drainage R-O-W (widths)	✕				
Street R-O-W (widths)	✕				
Adjacent Property Land Use / Legal Description	✕				
Street Names	✕				
North Arrow & Scale	✕				
Coordinate System (Tx State Plane Coordinate System in US Feet / Reference NAD83)	✕				
Benchmarks (Vertical Datum Reference NAVD88)	✕				
Owners Certificate of Dedication	✕				
Surveyors Certification	✕				
Notary Signature Certification(s)	✕				
Planning & Zoning Commission Signature Block	✕				
Drainage District Certification & Signature Block	✕				
SUBDIVISION DEVELOPMENT					
Submittal within Timeline	✕				
Bond Paper Print Review (2 sets / 24 x 36) and PDF (300 dpi)	✕				
Content – Construction Plans					
Plat	✕				
Drainage Area Map & Hydraulic Data Analysis	✕				
Detention Analysis & Plan	✕				
Overall Paving & Drainage Layout	✕				

Overall Water & Sewer Layout	✕				
Overall Final Grading Plan	✕				
Overall Staging Plan	✕				

COMPLETENESS CHECKLIST	**REQUIRED**		**COMPLETED**		**ACTION NEEDED**
	Y	**N**	**Y**	**N**	
Content – Construction Plans (continued)					
Plans & Profiles	✕				
Pollution Prevention Plan	✕				
Special Construction Details	✕				
Standard Construction Details	✕				
Construction Specifications	✕				
Staff Review	✕				
SITE DEVELOPMENT	✕				
Submittal within Timeline	✕				
Bond Paper Print Review (2 sets / 24 x 36) and PDF (300 dpi)	✕				
Content – Site Plan					
Plat	✕				
Building / Improvement Footprint	✕				
Parking & Pavement Layout	✕				
Parking Space Tabulation Summary	✕				
Site & Building Space Area Tabulation Summary	✕				
Planning & Zoning Commission Signature Block	✕				
Special Notes	✕				
Name of Site or Site Title	✕				
Name of Owner or Developer	✕				
Drainage & Utility Layout	✕				
Drainage Area & Hydraulic Data Analysis	✕				
Civil Construction Plans & Details	✕				
Exterior Lighting Iso-Candle Plot Plan	X				
Content – Landscape Plan	✕				
Submittal within Timeline	✕				
Landscape Area Layout	✕				
Landscape Area Dimensions	✕				
Landscape Area Square Footage	✕				
Planting Type & Location Plan	✕				
Tree Type & Location Plan	✕				
Berm Location Plan	✕				
Landscape Area Tab Summary	✕				
Tree Count Tab Summary	✕				
Tree Protection Survey	✕				
Tree Credit Summary	✕				

Detail Landscape Bill of Material	✕				
Special Notes	✕				
Planning & Zoning Commission Signature Block	✕				
Name of Site or Site Title	✕				
Name of Site Owner or Developer	✕				
Special Landscaping Details	✕				

COMPLETENESS CHECKLIST	**REQUIRED**		**COMPLETED**		**ACTION NEEDED**
	Y	**N**	**Y**	**N**	
Staff Review	✕				
DOCUMENTATION SUBMITTAL					
Completed, Approved Plans & Specifications (2 each)					
Letter of Land Need – School District Board					
Letter of Service Availability (CenterPoint Gas, CenterPoint Electric, AT&T and Cable)					
Letter of Compliance Sewer Design Review - TNRCC					
Copy of Deed Restrictions (2 each)					
Tax Certificates (originals)					
Filing Plat(s) with Signatures (1 - minimum)					
Filing Site Plan(s) with Signatures (1 - minimum)					
Total Fees Paid					

CITY STAFF REVIEW COMMENTS & RECOMMENDATIONS:

_____

_____

_____

_____

_____

_____

FILE

RECOMMENDED AS ADMINISTRATIVELY COMPLETE: ☐ YES ☐ NO

_____ _____

Date Staff Signature

RECOMMENDED FOR FINAL APPROVAL:

_____ _____

Date Chairman's Signature

RECOMMENDATION BY PLANNERS TO COUNCIL FOR REZONING:

_____	_____
Date	Chairman's Signature

APPENDIX 1020 APPROVED TREE AND SHRUB LIST

LAKE JACKSON *APPROVED* TREE AND SHRUB LIST

CURRENT LIST: Trees & Shrubs That Grow Well in Brazoria County (Native plants and Exotic Species)

L=Large Tree S=Small Tree (<25ft) Su=Shrub N=Native to Brazoria County T=Texas native E=Exotic/introduced H=High M=Medium Lo=Low

	Common Name	Species Name	Size	Evergreen	Birds & BF	Wildlife	Flower	Shade Tol	Sun Tol	Fast Grow	Origin	Wind Resistance
1	American Elm	*Ulmus americana*	L		X	X			X		N	M
2	Bald Cypress	*Taxodium distichum*	L			X			X	X	N	H
3	Black Gum (Black Tupelo)	*Nyssa sylvatica*	L		X	X		X	X		N	M
4	Black Willow	*Salix nigra*	L		X	X		X	X		N	L
5	Box Elder Maple	*Acer Negundo*	L		X	X		X	X		N	M
6	Bur Oak	*Quercus macrocarpa*	L			X			X		N	M
7	Cabbage Palm	*Sabal palmetto*	L						X		T	M
8	California Fan Palm	*Washingtonium filifera*	L								E	M
9	Cedar Elm	*Ulmus crassifolia*	L		X	X			X		N	M
10	Chinese Pistache	*Pistacia chinensis*	L								E	M
11	Drummond Red Maple	*Acer rubrum v. drummondii*	L		X		X	X			N	M
12	Eastern Cottonwood	*Populus deltoides*	L		X	X	X		X	X	N	M
13	Eastern Red Cedar	*Juniperus virginiana*	L	X	X	X		X	X		N	H
14	Green Ash	*Fraxinus pennsylvanica*	L			X		X	X	X	N	M
15	Lace Bark (Chinese) Elm	*Ulmus Parvifolia*	L								E	L
16	Laurel Oak	*Quercus laurifolia*	L	X		X			X		N	L
17	Live Oak	*Quercus virginiana*	L	X		X					N	H
18	Pecan	*Carya illinoiensis*	L			X			X		N	M
19	Red Mulberry	*Morus rubra*	L		X	X		X	X	X	N	M
20	Shumard Oak	*Quercus shumardii*	L			X			X	X	N	M
21	Southern Magnolia	*Magnolia grandiflora*	L	X	X	X	X	X	X		T	H
22	Southern Red Oak	*Quercus Falcata*	L						X		T	L
23	Swamp Chestnut Oak	*Quercus prinus*	L			X					N	M
24	Sweet Bay Magnolia	*Magnolia virginiana*	L								T	H
25	Sweetgum	*Liquidambar styraciflua*	L		X	X			X	X	N	M
26	Sycamore	*Platanus occidentalis*	L		X	X			X	X	N	M
27	Texas Palm	*Sabal mexicana*	L						X		T	M
28	Texas Persimmon	*Diospyros texana*	L		X	X	X		X		T	M
29	Water Oak	*Quercus nigra*	L			X					N	L
30	Western Soap-berry	*Sapindus drummondii*	L		X	X	X	X	X	X	N	M
31	White Ash	*Fraxinus americana*	L			X		X	X		N	M
32	Willow Oak	*Quercus phellos*	L			X			X		N	M
33	Cherry-laurel (Wild Peach)	*Prumus caroliniana*	S	X	X	X	X	X	X	X	N	L