

Engineering Plans Checklist for Engineering Report

Chapter 126, Section 126-167

This checklist is required for all subdivisions except minor plats, minor replats, amending plats, and lot line adjustment/consolidations. You must submit two sets of plans, Engineering Application, the Engineering Plans Checklist if applicable, and a digital copy of the submittal.

Project Number: PL_____ (assigned at time of preliminary plat application for department review)

Date Submitted: _____

Name of Subdivision: _____

Development Location: _____

Total Subdivision Acreage: _____ **Number of Lots:** _____

- Completion and return of "Applicable Development Ordinance & Codes" form.
- Plans Sealed by a Registered Professional Engineer licensed to practice in Texas
- Letter from the City authorizing connection to the City's infrastructure (Utility availability letter)
- Impact Fees Paid Paid at time of permitting
- Tap fees paid? Not applicable
- Copy of preliminary approval of the subdivision plat by the Planning & Zoning Commission

Approval from Required Government Agencies (Copy of approvals required)

- Harris County Permit Dept. (ETJ Only-not in City limits) (West of Cedar Bayou)
- Harris County Flood Control (for connection to HCFCD Units)
- Chambers County, if applicable (East of Cedar Bayou)
- TCEQ/USEPA (ETJ, Septic, private wells, etc...)
- TXDOT (Driveway, Drainage and/or Utility Permits)
- Corps of Engineers (Connecting to Navigable Waters, Wetlands, etc...)
- Texas Railroad Commission (railroad crossings, abandoned wells)
- Subsidence District (Public wells or private wells for public use)

Master or Phasing Plan:

- Overall map of total property showing tracts, blocks, reserves, street and parking layout, setbacks, etc.
- Proposed traffic circulation and phasing for fire protection.
- Overall drainage overlay, or plan view, with existing topographic contours (show adjacent property to ensure adjacent property will not be impacted), areas to be filled, if any, drainage areas outlined, major drainage ways, etc. (Indicate proposed staging of

drainage construction if developed in sections or phases; indicate Bench Mark Datum & Location).

- Wastewater overlay or plan view (Clearly label all manholes, gravity lines, force mains, etc.). Provide phasing plan of wastewater line if developed in sections or phases.
- Water main overlay or plan view (Indicate location of fire hydrants, valves, taps locations, etc.). Provide phasing plan of water line if developed in phases.
- Location of geological fault lines in plan view or in a geological report from a registered professional engineer, if any exist.
- Final plans shall be prepared using permanent ink on Mylar. Sheet size shall be 24"x36" overall dimensions.
- Registered Professional Land Surveyor's certification of original boundary and topography data (Preferably not more than 18 months old)
- Any area to be filled shown with approximate proposed elevations (with cut sections if applicable). Any area where existing and/or proposed sheet flow enters or leaves the property shall be clearly shown.
- Location map showing orientation of development in relation to adjacent areas of principal streets
- Location and width of existing and proposed streets and/or access drives within the development and immediately adjacent to it, and the proposed type of street construction (where required, a traffic impact analysis shall be submitted)
- Alignment of proposed streets or drives with existing city streets (90 degree intersection required by Ordinance)
- Proposed name of commercial establishment/project, if applicable
- Traverse lines along streams and easements shown adjacent to high bank of streams and waterways

General Requirements:

- Proposed grading and drainage plan: indicate top of curbs, flowlines, high points, offsite drainage & outfall improvements (if applicable), top of grates, etc.; provide drainage calculations on drawings; drainage shall comply with the intent of the master drainage plan
- Statement on drawing: "The development has been designed to not impede, impound or block the natural flow of water across adjacent and contiguous properties."
- Provide plan and profile sheets on all public lines or at locations where lines cross public property; on roadway profiles label top of curbs, flowlines, centerline of street, street & utility line grades, etc.
- The name, location, width, and purpose of all existing and proposed easements (city will not accept any side or rear lot water, sewer or drainage easements; city will not accept any joint use easements, ex. drainage/utility)

- Private Drainage Easement
- Private Detention Pond and Appurtenances
- Private Utility Easement
- Fire Lane (either on plat or separate fire lane easement)

- Location of proposed and existing fire hydrants. An approved fire hydrant must be installed within 300 feet for commercial or 500 feet for residential of the furthest extremity of the proposed building, if none exist within that area.
- Proposed Utility Plan (Indicate existing and proposed utilities adjacent to the tract up to a distance of 200 feet; sizes of existing utilities, and the location of proposed junctions with the existing system)
- Indicate front, side and rear lot setbacks, building lines, etc.
- Include North arrow, scale, and date (month, day, year) on all sheets (except detail sheets)
- Name of development, streets, water courses, pipelines, easements to a distance of 200 feet beyond property boundary lines; include Harris County Flood Control District Units Numbers, if applicable
- Indicate adjacent property ownerships as required by law
- One-foot elevation contours on both existing and planned facilities based upon latest monument elevation available related to City datum and to FIRM datum (consult with city surveyor for datum). Provide spot elevations on flat sites in addition to contour lines. Topography shall extend a minimum of 25' beyond property lines onto adjacent properties.
- Proposed design plan conforms to the City's Thoroughfare Plan. The Thoroughfare Plan was a subsection of the Baytown 2025 Comprehensive Plan and has been adopted by Council (Consult Planning and Development Services Department for adopted plan).
- Indicate additional land in the area adjacent to the subdivision in which the owner/developer has a legal interest
- Location of proposed streetlights, guy wires, poles and type of construction
- Flood Plain and Floodway boundary, if applicable
- Copy of CLOMR or LOMR documents submitted to FEMA, if applicable
- On completion of the project, the engineer shall furnish the city with a complete set of "as-built" mylar drawings and an AutoCAD DXF file of the civil site and infrastructure improvements of the project on a CD, DVD or USB flash drive. Submittal shall be tied to the City's GPS monument system.
- Statement on face of plat that property does or does not lie within the defined 100-year flood plain and floodway (location of 100-year plain boundary contour and FEMA flood zone indicated on face of plat when said contour and/or zone divides development area; indicate floodways, if applicable).
- Affidavit that all existing or proposed pipelines which cross property have been satisfactorily provided for to the requirements of said pipeline operator(s), and that said

pipeline operator agrees to all pipeline crossings by proposed streets and other development features. Provide a copy of the letter of authorization from all pipeline companies being crossed by public streets, drainage or utility lines.

- Utility Company affidavits of review or transmittal letters (provide copies)
- Show and distinguish between existing and proposed buildings, outdoor storage, outdoor display locations, signage design and location
- Building plans shall not be submitted to the Permit Counter until Development Review Committee has received civil drawings.

Streets (Sec. 126-641 and Sec. 122-91)

- Minimum grade of 0.25%
- Crown Slope not less than 1/8" per foot
- Gutter grades above design water surface elevation of ditches at 100 year level and storm sewers at 5 year level
- Grade changes with an algebraic difference of one percent or more shall be connected with a vertical curve
- Streets may not have duplicate or near duplicate names (i.e. St., Rd., Ave., etc.) as other existing public or private streets within the City's jurisdiction
- Maximum side slope on roadside ditches 3:1. Maximum depth 5' measured from crown of finished pavement. The full width shall be in the right-of-way or public drainage easement.

Minimum width back-to-back of curb (Sec. 126-641):

	Type of Street	Pavement Width (ft)	Right-of-way Width (ft)
<input type="checkbox"/>	Arterial	61	100
<input type="checkbox"/>	Collector	40	60
<input type="checkbox"/>	Local	28	50
<input type="checkbox"/>	Fire lane easement	24	(Sec. 126-385)

Large lots (>1acre) (Sec. 126-419)

<input type="checkbox"/>	Asphalt	22 w/4' shoulder	60
<input type="checkbox"/>	Concrete	22*	60

* Note: Shoulder not required. Extend stabilized subgrade one foot beyond edge of pavement.

Curves (Sec. 126-509):

- Arterial streets = min. centerline radius of 2,000 feet
- Reverse curves separated min. of 100 feet
- Local = min. centerline radius of 300 feet; waiver may reduce to 150 feet
- Collector street = min. centerline radius of 800 feet
- Fire lane easement = min. center line radius of 35 feet (Sec. 126-385)

Intersections (Sec. 126-510):

- Right angle or 90 degrees.
- Approved acute angles must have min. 25 ft radii at corner.

Cul-de-sac (Sec. 126-511):

- Min. right-of-way radius = 50 ft for single-family w/curb & gutter; 60 ft without curb & gutter
- Min. right-of-way radius = 60 ft for other uses w/curb & gutter; 70 ft without curb & gutter
- No island or planters permitted
- Max length of dead-end with paved turnaround = 800 ft
- Temporary turnarounds must be installed if over 400 ft. Base of turnaround shall be 6-inch stabilized soil with asphaltic topping.

Block length (Sec. 126-513):

- Residential = 1,200 ft from each intersection
- Major thoroughfare = 1,500 ft from each intersection

Pavement:

Concrete

- Shall conform with City Standards (TxDOT's Item 360).
- Shall conform to the following pavement design table:

Class	Thickness	Longitudinal Steel #4 bars	Transverse Steel #4 bars
Local	6"	20.5"	36"
Collector	7"	18"	36"
Collector in LI or HI Zoning District*	8"	16"	30"
Minor Arterial	8"	16"	30"
Principal Arterial	Specialized Design	Specialized Design	Specialized Design
Major Thoroughfare	Specialized Design	Specialized Design	Specialized Design

- 1" expansion joint at ends of radius returns, existing inlets, and 80-ft intervals

Subgrade:

- Minimum 6-inch depth for concrete and 8" for asphalt compacted to 95% Standard Proctor Density
- If PI exceeds 19, then subgrade shall be lime stabilized per geotech report and approved by the City.

Curb and gutter (Sec. 122-91)

- Cast-in-place barrier or mountable curb (see standard detail)
- Monolithic Curb & Gutter: 6-inch curb and 14-3/4" height with 7" gutter and 18" width (see standard detail)
- Dowels shall be #4 and spaced at intervals to match reinforcement steel spacing (see pavement design table above)

Public Sidewalks (Sec. 122-91 and Sec. 126-433)

- Minimum 4-inch thickness
- 1/2" expansion joint at 20-foot intervals
- #3 on 18" o.c.
- Minimum width 5 feet
- Curb ramps per ADA and TAS
- Locate at property line or as directed by the city inspector

Sanitary Sewer (Sec 126-710)

Gravity Line Minimum Standards

- Material: Minimum PVC SDR26 with integral bell
- Mains: minimum 8-inch
- Service: minimum 6-inch for commercial minimum 4-inch for commercial (provide Cleanout @ right-of-way/property line on all service lines)
- Fittings conforming to ASTM D-3034 and 1784
- Trenching and backfill per standard drawings (install metallic tape)
- Sanitary sewer lines beneath roadways other than residential streets shall be cased. Bolt-on or snap-on manufactured pipe casing spacers shall be used.
- Sanitary sewer line shall be extended across front of property and end in a manhole
- Sewer service lines will connect at an existing manhole or developer will be responsible for installing a new manhole on city sewer main (commercial only)
- Sanitary sewer service lines shall enter a public right-of-way perpendicular with the property line
- Pressure test and vacuum test per TCEQ requirement

Manholes

- Spacing not to exceed 400 feet
- Precast cast-in-place reinforced concrete manholes per ASTM C-478 with Xypex or approved coating
- Rings and covers 32" diameter, cast iron, min. of two ¾" holes in cover. Bolt down lids shall be provided if requested by Utility Department; stainless steel inserts shall be provided if requested by Public Works.
- Vacuum test

Force Mains

- Minimum PVC, class 150, SDR-26, per ASTM D-2241 with integral bell minimum 160 psi
- Polyethylene, based on outside diameter per ASTM F714
- Force mains beneath roadways other than residential streets, shall be cased. Bolt-on or snap-on manufactured pipe casing spacers shall be used.
- Abrupt vertical changes in force main elevation, which would typically require fittings, require a full welded steel pipe section, coated inside and out, and approved by Utility Department.

Lift Stations per TCEQ Chapter 317 (Subject to Utility Department Approval)

- Commercial lift stations shall remain private.
- Provide Site Plan indicating overall site size, wet well location, electrical panel location, paved areas, service drop location, location of fence, etc...
- Lift Station shall have automatic controls with alternating pumps and high level audible and visual alarms.
- Wet well shall be no less than 6 feet in diameter.
- Provide air relief valves as required.
- All check valves shall be swing check type.
- Minimum of two pumps – pumps shall be self-priming Gorman Rupp T series; pumps approved by Utility Department; each pump shall have a gate or plug valve located on the discharge after the check valve
- Motor shall be 3-phase 240/480 volt power and have self-priming pumps
- All force mains headers shall have a fitting and valve to allow connection with a portable pump; valve shall be same size as force main

- Control voltage: 120 volts or less
- Site shall have a security light with photocell
- Potable water on site (wash down)
- Paved Access road and site
- Hot Dipped Galvanized chain link Security fence with screening
- Odor control (if requested by Utility Department)
- Auto dialing alarm
- Developer to submit test results in writing
 - Hydrostatic Test (Force Main)
 - Low Air Pressure Test (Gravity)
 - Deflection Test (Gravity)
 - Vacuum Test (Manholes)

Water (Sec 126-711)

Water Line Standards:

- Approved by AWWA
 - Water lines 16" or larger
 - PVC, DR18, AWWA C-905
 - Prestressed concrete pressure pipe, steel cylinder type, AWWA C-301
 - Reinforced concrete pressure pipe, steel cylinder type, AWWA C-300
 - Reinforced concrete pressure pipe, pretension, AWWA C-303
 - Steel water pipe, AWWA CD-200 with protective coating
 - PVC, Class 150, AWWA C-900
 - Cast iron fittings per ASA A-21.10 and ASA A-21.11
 - All water lines beneath existing roadways shall be bored and cased. Bolt-on manufactured pipe casing spacers shall be used.
 - Abrupt vertical changes in water line elevation, which would typically require fittings, require a full welded steel pipe and shall be approved by Utility Department.
 - Water meters shall be placed at property line. City will only maintain up to property line, City's side of the meter.
 - Water line shall be extended across the entire frontage of property and shall be valved off for future extension (except in Industrial District)

Valves:

- Resilient seat gate valves per AWWA C-509 (preferred), C-500 (required)
- Opens to the left
- With adjustable valve box and cover
- At water line intersections, the number of valves will be one less than the number of radiating lines.

Fire Hydrants:

- Per AWWA 502
- Three-way with National Standard threading (one-4-1/2" and two 2-1/2")
- Located on min. 8-inch water lines
- The most remote exterior point of a residential building shall be within 500 feet of a hydrant measured along a roadway surface
- The most remote exterior point of a commercial building shall be within 300 feet of a hydrant measured along a roadway surface
- Provide gate valve between hydrant and main
- Trenching and backfill per standard drawings (install metallic tape)
- Utility Dept. will take Bac-T sample
- Developer to submit test results in writing

Acceptable Hydrant Types:

- Mueller A423
- American Darling B-84-B
- American Darling B-62-B with extension

Size:

- Minimum 8-inch commercial, 6-inch residential

Stormwater drainage (Sec 126-671)

- Site surface drainage shall be handled internally and conveyed to a public system through an approved outfall structure. Sheet flowing surface water over a curb or directly into a public street is not allowed.
- If a tract of land exceeds one acre, if all phases of a development exceed one acre, or if all adjacent property under one owner or control exceeds one acre, then participation in detention facilities designed to prevent an increase in pre-development runoff rates during the 10-year and the 100-year storm events is required.
- Ditches, if approved, shall have a min. slope of 0.10% and side slopes of <3:1
- Outfall enters 6" above grade of natural drainage channel.
- Major drainageways shall be approved in writing by the appropriate flood control district.

Design Storm Q=CIA

I = See County Flood Control District Standards

- | | <u>Frequency</u> |
|---|------------------|
| <input type="checkbox"/> Interior drainage system | 5 year |
| <input type="checkbox"/> Major drainage ditches | 25 year |
| <input type="checkbox"/> Detention pond | 100 year |
- Drainage calculation shown on plans
 - Use Manning equation for pipe design and open channel flow
 - Maximum inlet spacing 600 feet
 - Inlet throat height 5-inches

Manholes:

- Provide at junctions and change in direction
- Maximum spacing 1,000 feet
- Precast concrete manholes

Pipe

- Reinforced concrete pipe per ASTM C-76, Class III in public right-of-way
- Under roads RCP per ASTM C-76, Class IV or V
- Minimum cover 12-inches over top of pipe

Detention facilities: (Private development detention ponds are not city maintained)

- City requires that detention facilities be designed so that they are easily maintained by the owner (commercial) or a corporation, community association or other legal entity established for this purpose (residential)
- Detention facilities shall be fenced
- Wet bottom basins with 4' minimum depth and 4-foot wide safety berm above water level
- Side slopes may be steeper than 3:1 where reinforced concrete walls are used; these basins shall have 12' wide access drives to bottom for maintenance and fencing or guard rail at top perimeter.

- Earthen basin with min. 3:1 slope and min. bottom width of 10 feet (Verify 3:1 slope stability with project soils report. In some instances slope distance may need to be increased to 4:1 or 5:1).
- Trickle channel shall be 5 ft wide, 6 in. thick reinforced concrete
- Min. slope at bottom 0.2 % for concrete and 1% for all earthen areas
- Inlets, outlets, and trash racks shall be easily accessible
- Hydro mulch maintenance road ROW and detention site

Traffic circulation

- Overall site plan showing blocks, streets, drives, parking, street markings, speed limits and regulatory signs
- Documentation of traffic study or appropriate engineering on regulatory sign installation in compliance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD)
- Study of impact upon existing streets or thoroughfares that is caused by new development
- The Planning and Zoning Commission and City Council must approve any change to an existing street regulatory device. Every effort shall be taken to use existing crossing or maintaining block distances.

Comments: _____

Engineer agrees by signing below that the plans being submitted are complete and correct. Engineer further agrees by signing below that incomplete plans will be returned as having not been reviewed and administratively incomplete.

Signature of Registered Engineer: _____ Phone Number: _____ Date: _____	<i>Place Seal Below</i>
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CONTACT INFORMATION

Signature of Owner: _____

Printed Name: _____ **Date:** _____

Contact Name _____ **Relationship to project** _____

Address _____ **City/State** _____

Zip _____ **Phone Number** _____ **Fax Number** _____