



Engineering and Development Division Plan Set Requirements

The following information applies to all permit plan sets that will be reviewed by the Public Works and Engineering Department (PWE), including the site civil work for building permit applications. This document was originally issued on October 25, 2022 and the latest update was on November 13, 2024.

To apply for a permit from PWE, please go to our [Citizen Self Service \(CSS\)](#) portal and fill out the appropriate engineering permit application and submit the plans. This application can be found under Permits or Plans on the CSS web page. Once the application is complete, please submit the completed application, the sealed plan set, and any other required documentation.

In addition, a traffic impact analysis (TIA) may be required if the proposed development or redevelopment generates 50 or more new peak hour trip (PHT), the Engineer of Record should meet with the City to determine the requirement for a Traffic Impact Analysis.

If you are making a resubmission, please provide a comment response letter to show how each engineering staff comment shown on the plans is being addressed in the revised submittal. The comment response letter and all supporting documents (LONO, approval, etc.) can be attached to civil plan set as a single pdf file. If the required information is not included in the resubmission it will be returned, without review, for correction.

If you are making a resubmission for a building permit, please be sure to follow their department's submission requirements.

In order to be deemed administratively complete, each set of plans shall include the following sheets (if applicable), in order. If the submission is not deemed to be administratively complete, it will be returned to the applicant, without review, for correction.

For engineering applications and permits, please feel free to email the engineering email at engineering@baytown.org for any help. For building permits, please contact Building Department at building@baytown.org for assistance.

1. Project cover sheet.
2. Plat.
3. Topographic survey.
4. Construction notes.
5. Overall plan layouts for sanitary sewer collection.
6. Overall plan layouts for water distribution.
7. Overall plan layouts for storm sewer collection.

ENGINEERING AND DEVELOPMENT DIVISION PLAN SET REQUIREMENTS

8. Overall plan layouts for paving and signage.
9. Grading plan.
10. Drainage area map.
11. Storm sewer calculations.
12. Plan and profile sheet(s).
13. Detention pond design and calculations.
14. Stormwater pollution plan and details.
15. Traffic control plan(s).
16. Project specific details.
17. City of Baytown current standard details in individual sheets.

Individual sheet requirements:

1. Cover sheet, must have:
 - a. Project information.
 - b. Vicinity map.
 - c. Engineer seal.
 - d. Firm registration information.
 - e. Submission month and year.
 - f. Initial submission or revision number.
 - g. Floodplain information.
 - h. Add permit expiration note: "If construction has not begun within 180 days after issuance, these approved plans are void."
 - i. Index of sheets with sheets numbered consecutively using whole numbers beginning with the cover sheet as Sheet 1 (no sub-number sheet as such C1.1 or C1A, etc.).
 - j. Add following notes:
 - The City of Baytown Public Works and Engineering (PWE) is not part of 811. PWE will mark existing utilities BUT the contractor is responsible for locating and field verifying all utilities and be responsible to repair or replace any damages to COB assets or utilities conflict. Contractor should contact PWE at 281-420-5300, 72 hours before any construction, boring, or utility connection.
 - Drainage facilities are to be owned, operated, and maintained by the owners and not the City of Baytown.
 - No proposed development shall impede the natural flow of surface runoff from adjacent lands, nor cause flooding on adjacent properties.

ENGINEERING AND DEVELOPMENT DIVISION PLAN SET REQUIREMENTS

- Contractor shall contact Public Works and Engineering – engineeringinspections@baytown.org. for engineering inspection a minimum of 72 hours prior to any construction in public right-of-way, driveway approach, sidewalk, detention, and utility connection (water, sanitary sewer, and storm drainage).
 - As built plans for any improvements within the ROW or public easement that has any infrastructure will need to be provided to the City. This will be a requirement as part of the final inspection approval. The plans will need to have all relevant information.
2. Plat
 - a. Either the approved preliminary or the recorded plat that is in effect.
 - b. This sheet is required for all projects that are not solely within the ROW.
 3. Topographic survey: must be signed and sealed by a registered R.P.L.S licensed to practice in Texas.
 4. Construction notes: for water distribution, wastewater collection systems, stormwater drainage, paving, and sidewalk shall be designed in accordance with the city standards and Chapter 109 of the City of Baytown Code of Ordinances. (For floodplain notes and requirements, ensure to comply with Chapter 110 of the City of Baytown Code of Ordinances.)
 5. Overall plan layouts for sanitary sewer collection.
 6. Overall plan layouts for water distribution.
 7. Overall plan layouts for storm sewer collection.
 8. Overall plan layouts for paving and signage.
 9. Grading plan.
 10. Drainage area map.
 11. Storm sewer calculations for 5-year and 100-year events per Chapter 109 requirements. See last page for COB stormwater calculation template. Storm water restrictor for outfall pipe from the detention shall be restricted to 5-year storm event.
 12. Plan and profile sheets. Plan and profile drawing must be provided for all infrastructure (water, sanitary sewer, storm system, etc.) work within the ROW. All relevant information must be included.
 13. Detention pond design and calculations. (Ensure to meet Chapter 109 requirements.)

14. Stormwater pollution prevention plan and details. Sheets must have the following notes:

- All subcontractors will be educated to follow stormwater pollution prevention requirements.
- Structural BMPs will be inspected and maintained at least every 14 days and after any precipitation or runoff event that causes surface erosion, sediment transport or vehicular tracking.
- Regular scraping and sweeping of streets, sidewalks and flowlines must be conducted.
- Earth materials and landscape materials such as sod, rock and mulch shall not be stockpiled, placed or stored on driveways, streets, sidewalks or in stormwater flowlines.
- Construction supplies (e.g. trusses and lumber), roll off containers, dumpsters, portable toilets, trailers, etc. shall not be stored on streets or sidewalks or other impervious surfaces. These items shall be stored on the construction site or staging areas.
- Sanitary facilities shall be located on natural ground and at least 25 feet from any storm sewer inlet or water body and shall be serviced regularly.

15. Traffic control plan. Please add the following standard notes to proposed TCP:

- All temporary traffic control devices shall conform to the Texas Manual on Uniform Traffic Control Devices (TMUTCD), current edition.
- Unless the traffic control devices are protecting an active construction site, all nonessential traffic control devices shall be removed from road visibility in order to prevent confusion for the road user.
- All existing driveways within the traffic control zone shall remain open at all times unless agreed upon by the owner of the driveway. All agreements for offsite driveway closures shall be included with the traffic control plan submittal.
- No work within the City of Baytown ROW may occur without the full implementation of the approved traffic control plan intended to protect that work.
- No work within the City of Baytown ROW that requires trenching, excavation or digging may be left unprotected when workers are not present. Contact City of Baytown Traffic Engineer for acceptable methods of work protection.
- No staging of equipment, work, materials or workers may take place on a City of Baytown roadway without appropriate traffic control in place.
- Lane closure should be kept to a minimum. Limit lane closures on major thoroughfares during peak hours.

16. Project specific details.

17. COB standard details: each detail sheet must be shown on individual sheets except driveway approach details.

Plan Sheet Requirements

Graphic requirements:

1. Plan sheets shall be either 22" x 34" (full size) or 11" x 17" (half size).
 - a. If the submission is included in a building permit application with other disciplines, the plan sheets may match the majority sheet size in the building permit application.
2. All plan submittals are to be electronic and shall be at a resolution of 300 DPI or greater.
3. All sheets shall be sealed in accordance with Texas Engineering and Land Surveying Practices Acts. Interim seals on plans are not acceptable and will be returned to applicant without review.
4. All design sheets with either elevation or coordinate information shall include the permanent reference benchmark information, including datum and adjustment.
 - a. Coordinate points shall be surface and based upon Texas South Central Zone 4204 State Plane Grid Coordinates (NAD83) and may be brought to surface by dividing the following combined scale X.XXXXXXX.
 - b. Vertical datum is to be based upon NAVD88, 2001 adjustment
5. All design sheets shall include the pertinent floodplain information.
6. All design sheets shall have the street ROW widths, pavement width and thickness, materials, curbs, return radii, curve data, stationing, and existing utilities labeled.
7. All design sheets shall have a north arrow and should be oriented either upward or to the right.
8. All design sheets are to include a graphic scale.
9. Acceptable sheet scales:
 - a. Collectors and above:
 - i. 1"=2' vertical; 1"=20' horizontal
 - b. Minor streets:
 - i. 1"=5. Vertical; 1"=50' horizontal
 - ii. 1"=4' vertical; 1"=40' horizontal
 - iii. 1"=2' vertical; 1"=20' horizontal
 - c. These are the minimum scales allowable; larger scales may be appropriate to show more detail.
 - d. Deviation from these scales is only allowable with the prior approval of the City Engineer.
 - e. Overall plan layouts may be drawn at a scale of 1"=100' or 1"=200'.
10. Overall plan layout sheets are to include keyed indexes to the corresponding P&P sheets.
11. Include the following note on all utility layout sheets:

ENGINEERING AND DEVELOPMENT DIVISION PLAN SET REQUIREMENTS

- Public Works and Engineering is not part of 811. PWE will mark existing utilities but the contractor is responsible for locating and field verifying all utilities and be responsible to repair or replace any damages to COB assets or utilities conflict. Contractor should contact PWE at 281-420-5300, 72 hours before any construction, boring or utility connection.
12. Construction plans shall include a legend describing symbols used in the plans.
 13. Provide a grading elevation at each corner of a lot.
 14. Each drainage area shall have a single inlet.
 15. Time of concentrations shall be calculated using overland flow, if the T_c is less than 10 minutes, use 10 minutes.
 - a. Overland flow for undeveloped areas shall be 0.3 ft/sec.
 - b. Overland flow for streets shall be 1.0 ft/sec.
 16. The storm sewer calculation sheet shall follow the model included with this document.
 17. Stationing shall run from left to right except for short streets.
 18. Show all lot, property, ROW, and easement lines.
 - a. All property ownership and easement information are to be shown on the construction plans with the associated recording information.
 - b. If the plat included with the plans is preliminary and not all ownership, easement, and ROW recording information is shown, the construction plans shall show this information.
 19. Do not place match lines within 100' of the near side end returns at an intersection.
 20. All utility lines four inches in diameter and larger within the ROW or an easement shall be shown in the profile view. All utility lines, regardless of size shall be shown in the plan view.
 21. Show flow line elevations and direction of flow for all ditches and culverts.
 22. Provide a perimeter swale along adjacent properties and ensure proper drainage.
 23. Show natural ground profiles along the centerline and each ROW or easement line unless the elevation difference is less than 0.5 feet. One ROW profile line is sufficient when the elevation difference is less than 0.5 feet.
 24. Grades should be labeled for the top of curb except at railroad crossings. Centerline grades are acceptable only for paving without curbs and gutters.
 25. Curb return elevations and grades for turnouts are to be shown in the profile.
 26. The surface elevation at the property line of all existing driveways should be shown in the profile.
 27. Station all median noses affected by proposed construction, both existing and proposed.
 28. Station all points of curvature, points of tangency, and points of intersection in the plan view. Station all radius returns and grade change points of intersection in the profile with their respective elevations.
 29. There shall be no new proposed manholes within the street pavement.

ENGINEERING AND DEVELOPMENT DIVISION PLAN SET REQUIREMENTS

30. Details of special structures not covered by approved standard drawings shall be drawn to scale with the horizontal and vertical scale equal to each other.
31. Only include relevant standard detail sheets. If the plans are for waterline only, do not include sanitary sewer details
32. Upon final inspection prior to final approval, the applicant shall provide the COB with a digital copy (PDF and shapefiles) of As-Built plans for work within ROW and within easements with City Utilities as per the "As-Built Plan Set Requirements" on the City's website. The following bullets provide some guidance:
 - a. All submitted electronic design files shall be properly geolocated in the Texas Coordinate System, South Central Zone, 4204 State Plane Grid Coordinates (NAD83) and may be brought to surface by dividing the following combined scale X.XXXXXXX.
 - b. All submitted electronic design files shall be properly geolocated in NAVD88, 2001 as appropriate
 - c. ESRI GIS compatible;
 - d. DGN; or
 - e. DWG (confirm the acceptable release).
 - f. If you have any questions, please contact Jarred Thibodeaux at Jarred.Thibodeaux Jarred.Thibodeaux@baytown.org and Matthew.Bailey Matthew.Bailey@baytown.org.

Table Format for Drainage Calculations along with Notes for Drainage Calculations

Frequency: -yr

Branch	Manholes / Inlets / Nodes		Local Area	Total Area	C Factor	Tc	I (-yr)	Q (-yr)	Add. Q	Total Q	Reach	Box Span / Pipe 3 Size	Pipe 2 Size	Pipe 1 Size / Box Rise	Line Type	Slope	n	Design Q	Design V	Slope Fall	Friction Loss	Flowline Elevation		Actual V	Y	HGL Slope	HGL		TP - HGL	TC/TG/TP/NG	TC-HGL	Cover
	from	to																				acre	acre				minutes	in/hr				

Drainage Calculations Notes

Please note that you will need to provide the calculations for both the 5-year and 100-year events per Chapter 109 of the City of Baytown Code of Ordinances. Start from the most upstream drainage area for the trunkline and continue downstream to the outfall. The first trunkline should have the longest reach.

For the main trunkline:

Step 1 Enter name of the most upstream inlet/node in the "FROM" column, then you enter the next inlet/node/manhole that is immediately downstream, on the same line in the "TO" column.

Step 2 Enter the acreage of the area being drained / served by the inlet in the Local Area column.

Step 3 Enter the C factor to be used for this area, or for the development. Please see Section 109-102(2)(b) of the Baytown Code of Ordinances.

Step 4 Enter the initial time of concentration for this branch. The Tc shall be calculated as described in Section 109-102(1) of the Baytown Code of Ordinances. The subsequent Tc for this branch should be calculated.

Step 5 (optional) If your system is receiving any off-site Q that is not associated with a drainage area inside your project boundary, this should be entered in the Additional Q column. This column is not commonly used.

Step 6 Enter the length of the pipe from the upstream structure to the downstream structure in the Reach column.

Step 7 Next you will enter your pipe sizes:

If you have a single circular, storm sewer pipe, enter the size, in inches, in the Pipe 1 Size / Box Rise column.

If you have dual pipes, enter their sizes, individually, in the Pipe 2 Size and Pipe 1 Size / Box Rise columns.

If you have triple pipe, enter their sizes, individually, in the Box Span / Pipe 3 Size, Pipe 2 Size, and Pipe 1 Size / Box Rise columns.

If you are using a Reinforced Concrete Box, you will need to enter the nominal width of the box in the Box Span / Pipe 3 Size column and the nominal height of the box in the Pipe 1 Size / Box Rise column.

Step 8 Specify either RCP (n=0.009), HDPE (n=0.013), or RCB (n=0.013) in the Line Type column.

Step 9 Next, you will enter the upstream and downstream flowline elevations for the pipe runs. Please note that the City of Baytown prefers for crowns to be matched.

Step 10 The upstream and downstream HGL process

If your outfall is discharging to a dry detention basin, the downstream column will need to be set to the HGL to the top of pipe

If your outfall is discharging to a wet detention basin and the outfall pipe is submerged, you will need to enter the normal pool elevation of the wet pond as your downstream outfall HGL.

If you are discharging to an existing system, see Step D.

Step 11 Enter the elevation of either the top of curb, top of grate, top of pavement, or natural grade in the TC/TG/TP/NG column.

For all subsequent branch lines:

Step A Add new rows needed for the new branch below the main trunkline.

Step B Repeat the main trunkline Steps 1 through 11 for each branch line.

Step C Add the total area from each of the branches to the local area at the junction of the branch line with the trunkline.

Step D Evaluate the tie in HGL for the branches at the junctions of the branch line with the trunkline.

-If the branch HGL is lower than the trunkline HGL and the branch Q is less than the trunkline, replace the local HGL at the junction with the trunkline HGL at the junction.

-If the branch HGL is higher than the trunkline HGL and the branch Q is less than the trunkline, do not modify either HGL.

-If the branch HGL is lower than the trunkline HGL and the branch Q is greater than the trunkline, do not modify either HGL.

-If the branch HGL is higher than the trunkline HGL and the branch Q is greater than the trunkline, replace the trunkline HGL at the junction with the branch HGL at the junction

Design Storm Event Intensities shall be as per 109-102 of the City's Ordinance.

$$I = \frac{b}{(T_c + d)^e}$$

I = Intensity (in/hr)

b = 52.32 (5-year)

b = 60.66 (100-year)

Tc = Time of Concentration

d = 7.88 (5-year)

d = 4.44 (100-year)

e = 0.69 (5-year)

e = 0.5797 (100-year)