



DRAINAGE DESIGN CRITERIA

Rainfall Frequency	25-Years
Minimum Time of Concentration	10 Minutes
Starting Water Surface Elevation	1.5-ft (msl-mean tide) (Design Standards) 1.6-ft (msl) in City Study
Manning's Roughness	0.013 (RCP)
Runoff Coefficients	0.30 - Undeveloped Areas 0.55 - Minimum Developed Areas 0.75 - Lots less than 7,000 SF or areas where there are extensive paved areas
Minimum Storm Sewer Size	18-inch
Storm Sewer Material	- Reinforced Concrete with rubber joints, alternates must be approved by City Engineer - Use of CMP is prohibited

1. Subsurface site drainage is required for sites larger than 15,000 square feet or having a frontage wider than 150-ft. Tracts 15,000 square feet and/or no deeper than 150-ft. can drain directly to the City system without an internal drainage system, as long as none of the drainage is directed to adjacent property owners. Subdividing tracts to meet this minimum size will not be permitted.
2. All new developments must drain north to Galveston Bay or connect to an existing drainage system that drains to the north side of the island. Drainage to the Seawall, or beach areas is prohibited.
3. Where existing drainage crosses the site, the developer shall be required to provide an adequate drainage easement to allow for the conveyance of existing and future flows across the site. The developer shall in no way interfere with the existing or future drainage of upstream property unless alternate drainage facilities are provided at the expense of the developer.
4. Minimum developed run-off rates:
 - A. Commercial - 6 cfs/acre
 - B. Residential – 4.5 cfs/acre
 - C. Undeveloped – 2.4 cfs/acre
5. Any development draining to a TxDOT facility must get TxDOT approval prior to City approval. TxDOT shall be notified prior to construction activities for inspection purposes.
6. Driveway culverts or other cross-drainage facilities within the City right-of-way must be sized based on upstream drainage areas and expected level of development. The City currently specifies the required driveway culvert sizes if not submitted by a registered engineer. Minimum culvert size is 18-inch in areas unserved by a curb and gutter storm sewer system.
7. Maximum distance to an inlet is 1,000 ft.

8. Construction plans shall include a site drainage plan with drainage calculations showing:
 - a. Total area of site to be drained
 - b. Area drained to each inlet
 - c. All buildings, regardless of occupancy, shall provide acceptable forms of roof drainage with gutters, downspouts and roof drains
 - d. Buildings discharging roof water for sites smaller than 15,000 square feet or having a frontage less than 150-ft may provide internal drainage piping to storm sewer in lieu of swale and/or curb. If grass lined ditches are provided, roof water outfall location shall be protected from erosion with concrete or riprap pads. Subdivision swales shall have headwalls with RCP pipe to roadside ditch or inlet.
 - e. The use of corrugated metal pipe is prohibited for internal site drainage and for use in the City Right of Way.
 - f. Where curbs and gutters, sidewalks, driveways or other facilities are constructed on roads with existing roadside ditches, applicant shall install drainage pipe adjacent to property which includes drainage culverts to allow proper drainage.
 - g. Separate ROW construction permits are required for driveway culverts
 - h. Contours or an adequate number of spot elevations to indicate area drained to each inlet
 - i. Top elevations and flow lines at each inlet
 - j. Flowline elevation at outlet (and ditch flowline elevation, if appropriate. Ditch side slopes shall be minimum 4Horizontal:1vertical for grass lined swales)
 - k. Slope of each drain line
 - l. Sufficient contours or spot elevations (existing and proposed) onsite and around perimeter of site and vicinity to indicate extent of any filling or excavation. Cut of fill over 6" requires a retaining wall and over 12" requires an engineering design
 - m. Applicant shall provide computations to support sizes and grades shown. Velocity in ditches and pipes shall be adequate to prevent silting of pipes and ditches
 - n. When connecting a drain line into a storm pipe or driveway culvert, an approved junction box, manhole or grate inlet shall be constructed
9. Minimum proposed roadway crown elevation is 8.2-ft. unless given written approval of a lower elevation by the City Engineer. (This elevation is the approximate 25-yr tidal elevation for Galveston Bay)
10. New buildings shall be not less than 1-ft. above the centerline elevation of the street, or 1-ft. above the highest elevation within 6-ft. of the building site or 2-ft above the base flood elevation whichever is higher.
11. For developments over 5-acres, minimum first floor elevations based on FEMA information for homes east of 103rd Street shall be 12-ft, and west of 103rd Street shall be 13-ft.
12. Minimum gradient of streets and gutters is 0.15%
13. Drainage easements and utility easements shall be shown for all drainage and utility configurations including service lines serving 2 properties and swales adjacent to properties
14. For grass/concrete swale ditches a copy can be obtained from City Engineer's office and other standard details are available upon request. Standard Construction Specifications can be found here: <http://www.galvestontx.gov/504/Standard-Construction-Specifications>