

City of Waco

Stormwater Management Regulations

1.0 Applicability:

These regulations apply to all development within the limits of the City of Waco as well as to any subdivisions within the extra territorial jurisdiction of the City of Waco. Any request for a variance from these regulations must be justified by sound Engineering practice. Other than those variances identified in these regulations as being at the discretion of the City Engineer, variances may only be granted as provided in the Subdivision Ordinance of the City of Waco or Chapter 28 – Zoning, of the Code of Ordinances of the City of Waco, as applicable.

1.1 Definitions:

100 year Floodplain Area inundated by the flood having a one percent chance of being exceeded in any one year (Base Flood). (Also known as Regulatory Flood Plain)

Adverse Impact: Any impact which causes any of the following:

- Any increased inundation, of any building structure, roadway, or improvement.
- Any increase in erosion and/or sedimentation.
- Any increase in the upstream or downstream floodplane level.
- Any increase in the upstream or downstream floodplain boundaries.

Floodplane Elevation The calculated elevation of floodwaters caused by the flood of a particular frequency.

Drainage System System made up of pipes, ditches, streets and other structures designed to contain and transport surface water generated by a storm event.

Treatment Removal/partial removal of pollutants from stormwater.

Watercourse a natural or manmade channel, ditch, or swale where water flows either continuously or during rainfall events

1.2 Adverse Impact

No preliminary or final plat or development plan or permit shall be approved that will cause an adverse drainage impact on any other property, based on the 2 yr, 10

yr, 25 yr and 100 yr floods. Potential damage must be assessed downstream from the site until the site drainage area comprises 10% or less of the total drainage area.

1.3 Design Storm Frequency

All streets, curb and gutter, roadside ditches, inlets, and storm drains shall be designed to intercept and convey the peak discharge from a 5 year frequency storm. Inundation of streets will be allowed subject to the requirements of the appropriate section of the Storm Drainage Design Manual.

In addition to the above, the drainage system shall be designed to convey the peak flow generated from the 100-year frequency storm within dedicated rights-of-way or easements.

Culverts shall be designed on the storm frequency shown in the appropriate section of the Storm Drainage Design Manual.

1.4 Stormwater Detention

Predeveloped peak flows from the site generated from the 2-year, 10-year, and 100-year storm frequencies shall not be increased. For developments of two acres or more, the peak flows from the 2-year, 10-year, and 100-year storms shall be detained in on-site stormwater detention basins with release rates equal to, or less than the flows generated from the site for the 2, 10, and 100-year storm events when the site was in its pre developed state.

Development sites within a watershed where a regional detention facility exists or is planned shall be eligible to participate in that regional facility. Fees for participation shall be assessed based on the area of the development compared to the total area of the watershed.

The City Engineer shall have the authority to waive the requirement for on-site detention, provided that at least one of the following conditions is met:

1. The development is eligible, and commits to financially participate in an approved Regional Stormwater Management Program. Under this provision, the applicant shall demonstrate that the peak, post-developed runoff generated from the 100-year storm can be conveyed downstream to the Regional Facility and not impact adversely any downstream properties
2. The development is near Lake Waco, Lake Brazos, the North Bosque River, the Middle Bosque River, the South Bosque River, or the Brazos River, and lies immediately adjacent to a drainage system that has sufficient capacity to convey the site's post-developed peak discharge from the 100-year storm event without creating an adverse impact (as previously defined) on any other properties. The discharge in the system shall be determined by using the 100-year storm event with the post-

developed site and the remainder of the watershed in its existing state at the time of development (first come - first served).

3. It can be demonstrated, by Engineering calculations, that there will be no adverse impact on other properties if detention is not provided.
4. The development is single family residential, involves no street construction and consists of no more than two single family residential structures.

All stormwater detention facilities (on-site and regional) shall be designed to enhance stormwater quality in addition to reducing peak flows. All detention facilities shall be dual purpose for detention and treatment and shall, at a minimum, be designed to retain the first one half inch per impervious acre of run off permanently and allow it to percolate into the soil. If the soil conditions are such that the runoff will not percolate into the soil within 24 hours then other methods, based on accepted Best Management Practices, must be utilized.

In earthen detention/retention facilities and in open channels, the preferred ground cover is grass. The following varieties are acceptable:

Full Sun

Buffalo Grass
Texas Bluegrass
Curly-Mesquite
Blue Grama
Seep Muhly

Partial Shade

Texas Bluegrass
Sideoates Grama
Eastern Gamagrass
Little Bluestem
Green Sprangletop

Regional and on-site detention facilities and a 5 ft strip around the perimeter for access shall be contained within dedicated rights-of-way or easement. All weather access drives from a public street must be provided and contained within dedicated right-of-way or an easement.

Detention/Retention facilities must operate by gravity; no pumping will be allowed.

Dams/Berms for detention facilities must be designed by a licensed professional engineer with specifications for construction materials.

1.5 Floodplain Management

The intent of these regulations is to leave watercourses in a natural condition. While this is the intent, the developer may, upon approval of the City Engineer, change the location of existing channels and thus the location of the floodplain subject to the requirements of Section 1.7 of these regulations.

All development must comply with Chapter 11 “Flood Prevention and Protection” of the Code of Ordinances of the City of Waco, Texas.

Fences will not be allowed inside floodplains.

If development is planned within a floodplain the developer must mitigate any adverse impact on any other property and redelineate the floodplain based on the mitigation implemented.

The ultimate floodplain delineation shall be based on the watershed contributing to the design point assuming upstream properties provide adequate detention.

All floodplains shall be computed utilizing the computer software and methodologies outlined in the Storm Drainage Design Manual.

1.6 Survey Control

Delineation of drainage areas may be based on City of Waco aerial topographic maps. Cross sections for determining depth and width of flow in channels must be based on field surveys (on the ground) U.S.G.S. Quadrangle Maps will not be allowed.

All field surveys shall be related to FEMA approved vertical datum and Horizontal State Plane Coordinates (SPC).

1.7 Open Channels

As stated in Section 1.5, the intent of these regulations is to leave watercourses in their natural state. If the developer desires to alter the natural drainage channel, developer must justify the request to the satisfaction of the City Engineer. If alteration is approved by the City, the channel should follow the existing course as much as possible.

Channelization of watercourses shall be in accordance with all state and federal laws.

In detention/retention facilities and open channels, the preferred ground cover is grass. The following varieties are acceptable:

Full Sun

Buffalo Grass
Texas Bluegrass
Curly-Mesquite
Blue Grama
Seep Muhly

Partial Shade

Texas Bluegrass
Sideoates Grama
Eastern Gamagrass
Little Bluestem
Green Sprangletop

Channels must be designed so there is no adverse impact on the upstream, downstream, or adjacent properties. (See Section 1.2).

The maximum side slope on earthen drainage channels will be six horizontal to one vertical (6:1).

Open channels shall be designed to convey the peak discharge from the storm event shown in the appropriate section of the Storm Drainage Design Manual with one foot of freeboard. This peak discharge will be based upon watershed contributing to the point of consideration assuming upstream properties provide adequate detention.

Open channels shall be designed and constructed in accordance with the City of Waco Storm Drainage Design Manual so as to promote stormwater quality by limiting erosion and sedimentation. The use of concrete channel lining shall be prohibited (not including drop structures and pilot channels). The City Engineer is authorized to accept, or mandate, concrete channel lining in severe conditions on a case-by-case basis.

Open channels and detention facilities shall be wholly contained within dedicated rights-of-way or easements with an additional 5' easement on each side for access. A driveway access must be provided from a public street and must be contained within dedicated right-of-way or an easement.

1.8 Grading Plan

All development plans must include an overall site grading plan showing existing and proposed contours for the entire development. The plan must also include finish floor elevations for all proposed structures. Final building plans must conform to the overall plan.

1.9 Drainage Systems

Storm drains must be extended to connect to the nearest existing receiving facility such as another storm drain, roadside ditch, or natural stream. If the receiving facility is a storm drain or roadside ditch, designed to meet the design criteria in place at the time that facility was constructed, there will be no requirement to upgrade that facility to meet new standards unless the new development itself causes the receiving facility to be undersized.

1.10 Maintenance

The City will maintain drainage facilities that serve more than one property. The property owner will maintain drainage facilities that serve one property.

Mowing will not require a permit; however no excavation may be performed nor fill placed in an easement or floodplain without a permit.

The City will perform major maintenance (e.g. dam maintenance, dredging) on detention facilities. The City will maintain drainage facilities, including mowing, within dedicated parks.

No maintenance may be performed within an identified wetlands prior to obtaining a permit from the US Army Corps of Engineers.

1.11 Dam Safety Act

Any berm that is over 25 feet high and impounds more than 15 acre feet OR is over 6 feet high and impounds over 50 acre feet is subject to the dam safety act and will require a permit from the Texas Commission on Environmental Quality.

1.12 Redevelopment

Any area that has been previously developed and is being resubdivided or redeveloped must meet the requirements of these regulations to the extent practicable. The City Engineer will review redevelopment on a case by case basis and determine the extent to which compliance with these regulations will be required.