

Drainage Ordinance

**City of
Rollingwood**

**September
2016**

Drainage and Water Quality Ordinance

PREFACE

The rules and design criteria contained herein shall be known as the City of Rollingwood Drainage Ordinance. The purpose of this ordinance is to establish standard principles and practices for the design and construction of drainage improvements within the City of Rollingwood, Texas. The design requirements are intended for use only as engineering guides in the solution of drainage problems and proper conveyance and disposal of stormwater. Responsibility for actual design remains primarily with the design engineer. Users of this ordinance should be knowledgeable and experienced in the theory and application of drainage engineering principles.

Storm drainage facilities shall be designed and constructed in compliance with the City of Austin (COA) - Drainage Criteria Manual (DCM) (Supplement 9 – 2014) Sections 2-8. No amendments made to the COA-DCM by the COA shall become effective with Rollingwood standards unless adopted by the Rollingwood City Council.

SPECIFIC DESIGN CRITERIA

The design engineer shall prepare construction drawings in conformation to City requirements and accepted engineering practices. If the specifics of a project identify any conflicts between Rollingwood's and COA's design criteria, the more stringent policy shall prevail.

Methods of design other than those indicated herein may be considered in those cases where experience indicates they are appropriate. However, any variations from practices established herein must have the expressed written approval of the City Council.

This ordinance represents the application of accepted principles of surface drainage engineering and is complementary to basic information obtainable from standard references on hydrology, hydraulics and water resources. It is presented in a format that assists in the logical development of solutions to the problems of storm drainage.

EXECUTIVE SUMMARY

CITY OF ROLLINGWOOD REQUIREMENTS FOR DRAINAGE:

The intent of the City's drainage policy for stormwater management is to implement design principles and practices that control runoff from all development, during and after construction, such that no development will result in additional adverse flooding impacts. Any development that causes an increase in stormwater runoff requires mitigation by providing drainage analysis and a drainage plan performed by a Professional Engineer licensed in the State of Texas. The City's drainage policy shall govern the planning and design of drainage facilities within the Corporate Limits of the City. Definitions, criteria, procedures and data in this ordinance have been developed to support this policy.

For developments requiring drainage facilities, construction plans and all associated documents shall be provided to the City and shall conform to the requirements described within the Drainage Ordinance and the City's Drainage Criteria Manual. Drainage facilities located on private property shall be maintained by the property owner. Developments that include drainage improvements require an Operations and Maintenance (O&M) plan and schedule for routine inspection and maintenance of the drainage facilities to ensure proper functionality. The owner is responsible for complying with the O&M requirements.

TCEQ REQUIREMENTS FOR WATER QUALITY:

The City of Rollingwood is located within the Edwards Aquifer Recharge Zone. The Texas Commission on Environmental Quality (TCEQ) regulates activities having potential for polluting surface streams which recharge the Edwards Aquifer to protect existing and potential beneficial uses of groundwater in the Edwards Aquifer. TCEQ rules and regulations are found in the Texas Administrative Code – Chapter 213 Edwards Aquifer – Subchapter B. The City does not establish water quality design criteria within this ordinance. Any construction activity that requires TCEQ regulation shall conform to TCEQ chapter 213 requirements and required mitigative measures shall be presented to the City to demonstrate conformance. The City's drainage requirements are separate from TCEQ requirements and water quality BMP's provided per TCEQ requirements are to be separated from drainage facilities provided for the City's drainage requirements unless approved by the City Engineer.

Definitions:

BMP means Best Management Practices and is a term used to describe a type of water pollution control method and/or stormwater runoff control. The method may be temporary (for construction period) or permanent and may be structural or non-structural.

Construction activity means the disturbance of soils associated with clearing, grading, grubbing, demolition or excavating activities or other construction activities.

Conveyance refers to streams, channels, drainage ways, floodplains, storm drainage systems, watercourse, waterways and other means to convey runoff.

Critical Root Zone means an imaginary circle on the ground that corresponds with the dripline of the tree equal in feet to twice the number of inches of the tree's trunk diameter. For example, a tree with a 15 inch trunk diameter would be represented by a 30 foot concentric circle centered on the tree trunk location.

Discharge means any addition or introduction of stormwater, pollutants, sediment, or any other substance whatsoever into the municipal separate storm sewer system (MS4) or conveyances.

Design Engineer means the engineer responsible for performing engineering design for construction plans or engineering studies.

Detention Pond means a low lying area that is designed to temporarily hold a set amount of water while slowly releasing the water at a controlled rate.

Drainage Facility means any structure, installation, or activity from which purpose serves to convey or control stormwater runoff.

EPA means the United States Environmental Protection Agency and any federal department, agency, regional office, or commission under the authority and authorized official of the EPA.

EAPP means Edwards Aquifer Protection Plan, regulated by the TCEQ, and is an outline of best management practices that will be implemented and maintained – both during and after construction activities – to prevent contaminants found in stormwater reaching the Edwards Aquifer. The EAPP may include: a water pollution abatement plan, organized sewage collection system plan, underground storage tank facility plan, aboveground storage tank facility plan, contributing zone plan, or a modification, exception, or extension request granted by the TCEQ executive director.

Hazardous Substance means pollutants or contaminants in terms of their negative impact on people and the environment and include any material, substance, waste or combination thereof, because of its quantity, concentration or physical, chemical or

infectious characteristic, may cause or significantly contribute to an increase in serious illness or pose a substantial or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of or otherwise managed. Hazardous substances are as described in the Code of Federal Regulations - 40 CFR 261 and extremely hazardous substances are as described in 40 CFR 355 – Emergency Planning and notification.

HEC-HMS means Hydrologic Engineering Centers Hydrologic Modeling System designed by the US Army Corps of Engineers to simulate the complete hydrologic processes of dendritic watershed systems.

HEC-RAS means Hydrologic Engineering Centers River Analysis System designed by the US Army Corps of Engineers to perform one-dimensional steady flow, unsteady flow, sediment transport/mobile bed computations, and water temperature modeling.

Impervious Cover (IC) means impermeable, constructed, or installed coverage of natural ground surfaces and includes only the footprint on a horizontal plane (vertical walls are not included).

Regulated Activity means (per TCEQ) any construction-related activity or post construction activity on the recharge zone of the Edwards Aquifer having the potential for polluting the Edwards Aquifer and hydrologically connected surface streams. Activities include: construction of buildings, utility station, utility lines, roads, highways, or railroads; clearing, excavation, or other disturbances of topography, geologic, or existing recharge characteristic of a site; any installation of aboveground or underground storage tanks, or any other activity that may pose a potential for contaminating the Edwards Aquifer and hydrologically connected surface streams.

Release means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the MS4 or conveyances.

Site means the land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

Stormwater Runoff means precipitation from rain events that flows over land or impervious surfaces and does not percolate into the ground.

SWPPP means Storm Water Pollution Prevention Plan. It is a site-specific, written document that Identifies potential sources of stormwater pollution at the construction site, describes practices to reduce pollutants in stormwater discharges from the construction site, and identifies procedures the operator will implement to comply with the terms and conditions of a construction general permit.

TCEQ means Texas Commission on Environmental Quality or any duly authorized official of said agency.

TPDES means Texas Pollutant Discharge Elimination System and is a program delegated to the State of Texas by EPA pursuant to 33 USC 1342(b).

Trash/Garbage/Debris means any solid waste consisting of combustible materials such as paper, rags, cartons, furniture, synthetic materials, yard clippings, twigs, or noncombustible materials such as sediment, dirt, rock, gravel, sand, glass, and any metal waste.

WPAP means Water Pollution Abatement Plan and is a plan that outlines the best management practices that will be implemented in order to protect water quality when a regulated activity is conducted in the Edwards Aquifer recharge zone.

Water Quality means a standard, as set by TCEQ 31 Tex. Admin. Code Ch. 307, created to maintain the quality of water in the state consistent with public health and enjoyment, propagation and protection of terrestrial and aquatic life. Water Quality is also regulated by Ch. 213 Edwards Aquifer, created to regulate activities having the potential for polluting the Edwards Aquifer and hydrologically connected surface streams in order to protect existing and potential uses of groundwater and maintain Texas Surface Water Quality Standards.

Water Quality Facility means permanent BMP's that are designed for water quality control for total suspended solids (TSS) reduction. Typically BMP's include basins for capturing the first flush of stormwater runoff from upgradient drainage areas.

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Drainage Ordinance

SECTION 1 - DRAINAGE POLICY

1-1. GENERAL

This ordinance represents the application of accepted principles of storm water drainage engineering and is a working supplement to basic information obtainable from standard drainage handbooks and other publications on drainage. The policy statements of this section provide the underlying principles by which all drainage facilities shall be designed. The application of the policy is facilitated by the technical criteria contained or referenced in the remainder of the ordinance.

1-2. CITY OF ROLLINGWOOD DRAINAGE POLICY

A. Stormwater Runoff Control:

The intent of the City's drainage policy for stormwater management is to implement design principles and practices that control runoff from all development, during and after construction, such that no development will result in additional adverse flooding impacts.

B. Water Quality:

The city of Rollingwood is located within the Edwards Aquifer Recharge Zone. The Texas Commission on Environmental Quality (TCEQ) regulates activities having potential for polluting surface streams which recharge the Edwards Aquifer to protect existing and potential beneficial uses of groundwater in the Edwards Aquifer. TCEQ rules and regulations are found in the Texas Administrative Code – Chapter 213 Edwards Aquifer – Subchapter B. The City does not establish water quality design criteria within this ordinance. Any construction activity that requires TCEQ regulation shall conform to TCEQ chapter 213 requirements and required mitigative measures shall be presented to the City to demonstrate conformance.

1.2.1. APPLICATION

The City's drainage policy shall govern the planning and design of drainage facilities within the Corporate Limits of the City. Definitions, criteria, procedures and data in this ordinance have been developed to support this policy. If any condition requiring some additional measure of protection is identified during design or construction, the engineer shall make provisions within the design.

1.2.2. GENERAL

A. The developer shall be responsible for the conveyance of all storm water

drainage flowing through or originating from the subject property.

- B. If development includes any of the following, a drainage analysis shall be required by a professional engineer licensed in the state of Texas:
1. Increase of impervious cover (see definition). If development includes a net increase of impervious cover less than 250 square feet, a drainage plan may be prepared by other than a professional engineer.
 2. Change in topography that redirects and/or increases stormwater runoff to neighboring properties.
 3. Change in roofline that redirects stormwater runoff to neighboring properties.
 4. Any site improvements that cause an increase in stormwater runoff at any point along the property boundary.

The required drainage analysis shall include a hydrologic analysis, computations, and design of drainage facilities, provided in accordance with City of Austin (COA) - Drainage Criteria Manual (DCM) (Supplement 9 – 2014) Sections 2-8. HEC-HMS with SCS curve number loss method and SCS unit hydrograph transform method shall be used for hydrologic modeling.

- C. All drainage facilities shall be designed to control storm water runoff peak flow rates for 2, 10, 25, and 100 year frequency storms such that peak flows are not increased for each storm event. To the extent possible, pre-development flow patterns along the property boundary shall be maintained to the greatest degree possible.
- D. Exceptions for stormwater detention requirements may be granted for properties that are adjacent to Eanes Creek or as determined by the City Engineer for a specific instance related solely to beneficial storm water runoff flows due to specific topographical site conditions. TCEQ Chapter 213 requirements and the City's soil erosion and sedimentation standards still apply for these sites.
- E. Proposed drainage improvements for a site development shall be installed prior to any construction. If the contractor is unable to install the permanent drainage facilities prior to construction, temporary drainage facilities are allowed with the approval of the City Engineer and shall be designed with the same storm water drainage control criteria as the permanent drainage facility.
- F. Drainage and water quality facilities located on private property shall be maintained by the property owner. For all developments that include drainage improvements, the City will provide an Operations and Maintenance (O&M) plan and schedule for routine inspection and maintenance of the drainage facilities to ensure proper functionality. The owner is responsible for complying with the O&M requirements.

- G. For any activity that causes a drainage feature or facility to fail to perform to the standard required of the feature or facility in a permit for improvement of the affected property, the owner shall obtain a special permit from the City of Rollingwood for such activity that is separate from any other permit. The purpose of the permit is to establish that the owners of the property shall:
 - 1. Install or provide drainage facilities in accordance with the Rollingwood Drainage Ordinance as conditioned by the City engineer to achieve the affected standard of performance or any new applicable standard of performance, and
 - 2. Operate and maintain the new or alternative drainage facilities in accordance with an O&M plan issued by the City.
- H. If a drainage facility shows signs of potential failure, authorized inspectors shall have the right of entry on the land or premises for the purpose of inspection of required maintenance. Owners will be notified 24 hours prior to inspection. In the case of an emergency, an inspector may access the site without notice. If the facilities are damaged and/or failing, the property owner shall be responsible for restoration of the facilities within 30 days of notice. If the maintenance is not accomplished, the city may coordinate the necessary restoration and assess the property owner for costs, or authorize injunction, mandamus, abatement, or any other action available in law or equity to prevent, enjoin, abate, correct or remove such unlawful structure, use or activity.
- I. All development within the city of Rollingwood's jurisdiction shall comply with TCEQ Edwards Aquifer Recharge Zone - Chapter 213 Rules. Owner or developer shall provide the city of Rollingwood with evidence of communication to TCEQ indicating if an Edwards Aquifer Protection Plan (EAPP) is required. If mitigated measures are taken to comply with TCEQ Chapter 213 Rules, the owner or developer is responsible for providing the City of Rollingwood with water quality plans. The City's drainage requirements are separate from TCEQ requirements and water quality BMP's provided per TCEQ requirements are to be separated from drainage facilities provided for the City's drainage requirements unless approved by City Engineer.

1.2.3. DRAINAGE EASEMENTS

- A. All easements across private property shall contain the necessary language to permit the required unobstructed water flow, require maintenance of vegetation by the property owner(s), and permit the necessary access by city officials for inspection.
- B. All easements, one-hundred year flood boundaries, and buffer zones shall be clearly shown on drainage and site plans.

1.2.4. STORMWATER DRAINAGE CHANNELS

- A. Channels should be designed for the 25 year storm with provisions for the 100 year storm event to be contained within the property right-of-way.
- B. New channels shall be designed with dense grasses and materials that would provide adequate soil erosion control based on quantity of flow and design velocities. Channels shall be designed, at a minimum, with the following criteria:
 - 1. Side slopes of channels shall not exceed four 4:1 (four (4) horizontal to one (1) vertical) unless slope stabilization for steeper areas are approved by the City Engineer.
 - 2. For grass lined channels, the maximum permissible velocity for the one hundred 100 year storm event is six (6) feet per second.
 - 3. All constructed and altered drainage channels, sediment ponds, and detention ponds shall be stabilized with vegetation, and if necessary, synthetic erosion control matting, immediately after final grading.
- C. Permanent erosion control measures shall be required for all proposed channels as needed to prevent loosening of earth and migration of soils from designated drainage channels. Methods to prevent soil erosion may include, maintained vegetation, mulch blankets, energy dissipaters (check dams, filter socks, etc.), geogrid or geotextile reinforcement (mats/blankets). Grass lined channels are preferred. If the project site conditions create difficulty for the design of grass lined swales, then swales with concrete, mortared rocks, rock rip-rap or other materials are acceptable upon the approval of the City Engineer.
- D. Natural drainage channels shall be preserved whenever possible. Modification of an existing channel is only allowed if approved by the City Engineer. The design engineer should check the requirements of Section 404 of the Clean Water Act, and if required a permit should be obtained from the U.S. Army Corps of Engineers by the design engineer.

1.2.5. STORMWATER DETENTION

- A. Permanent stormwater detention designed for post-construction, along with any other drainage facilities in combination, shall be designed such that post-development peak flows do not exceed pre-development peak flows along the perimeter of the subject property for 2, 10, 25, and 100 year storm events. Drainage calculation methods shall be based on the COA DCM (Supplement 9 – 2014) Sections 2-8. Stormwater detention facilities shall be designed and sealed by a Texas licensed professional engineer.

- B. The permanent stormwater detention pond or an equivalent temporary detention pond, as approved by the City Engineer, shall be provided for the construction phase and rough cut prior to rough grading a site.
- C. All computations for all drainage related design shall be submitted with the plans for review.
- D. Side slopes of detention pond earth berms shall not be steeper than 3:1 (three (3) horizontal to one (1) vertical) unless approved by the City Engineer.
- E. Aesthetic enhancement is required for exposed concrete of drainage facilities that are visible from adjacent roadways and neighboring properties. All concrete shall be stained and/or stamped concrete or veneered with rock, brick, steel, tile or other material or method as approved by the City Engineer. If indisputable evidence is provided that demonstrates that drainage facilities will not be visible from adjacent properties or roadways, due to significant differences in elevation, screening may not be required. If topography is claimed in lieu of screening, the developer shall provide a contour map to scale with sections at appropriate intervals that clearly illustrates the topographic differences.
- F. Detention facilities shall be located at minimum 10 foot setback from all property lines unless approved by the City Engineer. The setback requirement shall be measured from the edge of any portion of the facility such as top of embankment, end of concrete apron/rock rip rap or top of structural wall.

SECTION 2 - SEDIMENT AND SOIL EROSION CONTROL

2-1. GENERAL

No rough cutting or site clearing shall be permitted without an approved temporary and permanent sediment and soil erosion control plan (BMP's) as part of the building permit process. No permanent certificate of occupancy shall be issued before all approved BMP's have been installed and established as necessary to effectively control sediment and soil erosion.

The developer shall provide a combination of measures, structural and non-structural, management and planning techniques to control erosion and sedimentation for the construction period and for post-development conditions.

2-2. SOIL EROSION CONTROL PLAN REQUIREMENTS

The sedimentation and soil erosion control plan shall include the following:

- A. general/sequence of construction
- B. location of all soil erosion and sedimentation controls
- C. Standard details for soil erosion and sedimentation controls
- D. Standard soil erosion and sedimentation control notes

SECTION 3 - WATER QUALITY BMP PLAN

3-1. GENERAL

The Edwards Aquifer Rules (30 TAC Chapter 213) regulate activities having the potential for polluting the Edwards Aquifer and associated surface waters. The goals of the rules are the protection of existing and potential uses of groundwater and the maintenance of Texas Surface Water Quality Standards. The activities addressed are those that pose a threat to water quality. The city of Rollingwood is located within the Edwards Aquifer Recharge Zone and all development must comply with the Chapter 213 Rules.

Per Chapter 213 rules, construction within the Edwards Aquifer Recharge Zone may require a protection plan to be reviewed and approved by TCEQ. A protection plan may not be required based on the size of property and amount of impervious cover (Refer to current Chapter 213 rules to determine). The developer is responsible for communicating with TCEQ and adhering to all applicable rules. The developer shall provide Rollingwood with proof of communication to TCEQ.

3-2. WATER QUALITY BMP PLAN REQUIREMENTS

General requirements for Water Quality BMP's:

- A. Water Quality BMP's, as required by TCEQ, shall be designed and installed to capture the first stormwater flush and to filter sediment and pollutants including captured off-site runoff unless bypassed or diverted.
- B. Water quality facilities shall be located at a minimum 10 foot setback from all property lines.
- C. Water quality facilities shall be operated and maintained per TCEQ Chapter 213 requirements.
- D. Stormwater detention facilities are to be separated from designated water quality control facilities but may be allowed if approved by the City Engineer.
- E. Aesthetic enhancement is required for exposed water quality facilities that are visible from adjacent roadways and neighboring properties. All facilities shall be stained and/or stamped concrete or veneered with rock, brick, steel, tile or other material or method as approved by the City Engineer. If indisputable evidence is provided that demonstrates that water quality facilities will not be visible from adjacent properties or roadways, due to significant differences in elevation, screening may not be required. If topography is claimed in lieu of screening, the developer shall provide a contour map to scale with sections at appropriate intervals that clearly illustrates the topographic differences.

SECTION 4 - O&M, & PERMIT REQUIREMENTS

4-1. O&M REQUIREMENTS

Proper maintenance is vital for water quality control and ensures that engineered controls will function effectively and as intended. An O&M schedule will be provided by the City based on the BMP controls designated for drainage improvements. The O&M will provide a plan for routine inspection and maintenance of the facilities to ensure proper functionality. The property owner shall inspect on a routine basis, and after heavy rainfalls, all drainage facilities including inlets, storage tank, outlets, etc. for any garbage, trash, debris, sediment, etc. and remove as necessary to ensure proper functionality.

4-2. PERMIT REQUIREMENTS

For any activity that causes a drainage feature or facility to fail to perform to the standard required of the feature or facility in a permit for improvement of the affected property, the owner shall obtain a special permit from the City of Rollingwood for such activity that is separate from any other permit. The purpose of the permit is to establish that the owners of the property shall:

- A. Install or provide drainage facilities in accordance with the Rollingwood Drainage Ordinance as conditioned by the City engineer to achieve the affected standard of performance or any new applicable standard of performance, and
- B. Operate and maintain the new or alternative drainage facilities in accordance with an O&M plan issued by the City.

SECTION 5 – SITE DISTURBANCE

5-1. SITE DISTURBANCE REQUIREMENTS FOR CUT AND FILL

The following requirements are adopted by this ordinance regarding site disturbance. Disturbance is defined by the depth of cut and height of fill.

- A. No rough cutting or site clearing shall be permitted without first obtaining a building permit.
- B. No rough cutting or site clearing shall be permitted until the construction of temporary erosion and sedimentation controls and tree protection are in place.
- C. No grade changes are allowed at any point along the property line.
- D. Grading slopes inside a 10 foot setback shall be a maximum of 4:1 (four (4) horizontal to (1) foot vertical) unless approved by City Engineer for construction of allowable drainage facility.
- E. Outside of the designated building envelope and outside of the 10 foot setback, the maximum allowable depth of cut is 8 feet.
- F. Outside of the designated building envelope and outside of the 10 foot setback, the maximum allowable height of fill is 8 feet.
- G. Outside of the 10 foot setback, vertical cut slopes should not be used unless the cut is in stable rock or adequately cemented soil.
- H. Outside of the 10 foot setback, maximum slopes for cut and fill shall be 2:1 slopes provided that adequate slope stabilization is provided as need to prevent movement of loose earth.
- I. Disturbance of earth in the 100-year floodplain is not allowed.
- J. Grade changes will not be approved that negatively impact adjacent property owners, or adjacent street flow.
- K. Slope stability shall be required for areas of cut or fill with steep slopes as needed to resist and prevent movement of loose earth. The method of stabilization shall be chosen as appropriate to the local soil conditions, steepness of slope, ability of vegetation to properly grow, and any other variable that would affect the functionality of the chosen stabilization method. Allowable stabilization methods include, geogrid or geotextile reinforcement (mats/blankets), rock rip-rap, rock rip-rap encased in concrete, retaining walls, rock gabions, slope roughening, and terracing. Refer to Rollingwood

Ordinance Sec. 14.02.124 Vision Clearance for more information on grading and retaining wall design requirements.

- L. All construction shall require contractor to take special care when grading in the vicinity of critical root zones, including root zones for off-site trees with root zones that overlap property boundaries. Any permitted construction requiring tree removal that will negatively alter drainage flows as determined by the City Engineer shall require approval by the City Engineer or specific mitigation for the area effected.

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