

CHAPTER 2 PLAN REQUIREMENTS

2.1 SCOPE

This section details the requirements for the preparation of plans, provides information on permit requirements and the plat/plan review process. Also included are the requirements for plans for stormwater facilities and best management practices with the protection of these systems from construction site runoff related discharges.

2.2 PERMIT APPLICATIONS

The purposes of the stormwater and land disturbance permits are: to protect City assets such as roads, bridges and storm drains; give the City the opportunity to oversee the work for proper installation; insure protection of environmentally sensitive areas; and prevent discharge of pollutants to our waterways. When applying for a permit, please provide completed applications for all applicable permits including the Land Disturbance Permit, Stormwater Discharge Permit, Building Permit and Right-of-Way permit when submitting construction plans for approval. Prior to issuance of any City permits, the City must also receive copies of all other jurisdictional approvals (COE, Floodplain, MoDOT, DNR, etc) and copies of executed off-site easements.

2.2.1 Stormwater Discharge Permit

Per the Stormwater Management Ordinance, no stormwater facilities or permanent stormwater BMPs shall be constructed or altered without obtaining a Stormwater Discharge Permit. This permit may only be obtained after approval of all grading and stormwater management plans, including an operation and maintenance plan for the development. The stormwater discharge permit is considered ongoing and will not include an expiration date. Construction of facilities under a stormwater discharge permit should be completed within two years.

2.2.2 Land Disturbance Permit

Per the Stormwater Management Ordinance, any development that disturbs greater than one acre will require a City land disturbance permit in addition to the Land Disturbance Permit required by the Missouri Department of Natural Resources. This includes projects that are part of a greater plan or sale that will cumulatively disturb greater than one acre.

2.2.2.1 Permit Application: The permit application should be submitted with the Stormwater Management Construction plans and must include a copy of the Stormwater Pollution Prevention Plan (SWPPP). Any development near an environmentally sensitive area, as defined in the Stormwater Management Ordinance, that disturbs greater than one acre, must also obtain a land disturbance permit.

Grading only: If the developer would like to begin clearing and rough grading, the following plans must be approved by City of Mexico Public Works:

- Rough Grading Plan
- Erosion and Sediment Control Plan
- Stormwater Pollution Prevention Plan (SWPPP)

Upon approval of these plans, the contractor shall install erosion and sediment controls and then arrange a meeting at the site with the City inspection staff prior to the issuance of the permit.

2.2.2.2 Permit Expiration: The land disturbance permit duration and expiration will be dependant on the proposed construction schedule. Generally the permit will expire if work is not completed within two years and may be renewed through written request.

2.3 DEVELOPMENT REVIEW PROCESS

The plans submitted to the City should include all information necessary to review the design, build and inspect the construction of the storm drainage systems and related appurtenances. The plans and calculations must be prepared and certified by a Registered Professional Engineer, licensed in the State of Missouri, and submitted to the City Engineer for review by all City departments.

The flow chart for the Subdivision Review Process at the end of this chapter displays the process for submittal and review of subdivision plats and development plans. The flow chart for Site Plan Review Process at the end of this chapter displays the process for submittal and review of site plans that do not require rezoning

2.4 CONCEPT REVIEW

Time is available for developers to meet with city staff and other interested agencies to discuss and review multiple layout possibilities for developments. The concept review is not mandatory and allows for open discussion on a wide array of potential issues that might be faced as the layout comes together. Minimal information is required and can be submitted in faxable form prior to this meeting. Please bring two full size copies to the meeting. Please call 573-581-2100 one week in advance to schedule your review with the City Engineer.

2.5 PRE-APPLICATION MEETING

Early planning for new development will include attendance at a Pre-Application Meeting at the Public Works Department. This meeting is mandatory and critical for the preparation of an acceptable stormwater management plan.

The Pre-Application Meeting will assist the developer and their engineer in identifying major storm water issues related to maximizing water quality protection, while minimizing flooding, project costs, stormwater facility conflicts and construction difficulties. With early discussions of concerns, the plan is less likely to experience delays in the review process. This is also the time that innovative ideas may be discussed and preliminary approval for design variances can be provided so that the developer and their Engineer can proceed with some assurance of approval.

The first major design consideration is the identification of the natural features of the property. Specifically, these include the existing topography, predominate soils and drainage area boundaries, which will dictate the types of BMPs, width of buffers and the location and configuration of stormwater facilities and water quality controls. The existing buffers and natural drainage ways should play a significant role in determining the location and configuration of streets and lots. Consideration of a site's natural topography and the proximity of sensitive features is critical to the design of proper stormwater management. A development that preserves existing drainage patterns and terrain may be able to reduce front end construction costs and long term maintenance.

Additional requirements for land development in environmentally sensitive areas should be identified early in the design process. If there is a watershed plan, those recommendations should be addressed early in the planning stage, to prevent future land-use conflicts.

2.5.1 Pre-Application Meeting Requirements

Call the City Engineer's office two weeks in advance to schedule a pre-application meeting. One electronic copy (pdf) and 2 print copies should be submitted to the City Engineer one week prior to the review date. This plan will be reviewed according to the following criteria and as referenced in the checklist located in Appendix B.

2.5.1.1 General Information: The plan should provide the following general information: legal description of the site, address or Parcel number (available on GIS website), aerial vicinity map showing the surrounding streets and landmarks, photo scale, north arrow, tract boundaries, adjacent municipal boundaries, project narrative describing the purpose of the project, and any expected variances from standards (ie street widths, curb and gutter, sidewalks).

2.5.1.2 Design Considerations: Provide staff with a map of the area with existing topography, using 2-foot contours or best available data; soil information, including information on the predominate soils, and the current infiltration and/or permeability for those soils (NRCS soil survey for Audrain County); the location of natural streams with arrows showing direction of water flow; the delineation of stream buffers and flood plain limits; the location of any sensitive resource areas such as karst features,

wetlands, impaired waterbodies or outstanding resource areas (topography, Appendix C); and the existing stormwater outfalls.

2.5.1.3 Infrastructure/Facilities: Provide a sketch depicting the location of existing roads and utilities, proposed lot lines and/or building locations, and the proposed placement of roadways, parking lots, etc.

2.5.1.4 Potential Stormwater BMPs: The Engineer may want to be prepared to discuss the types of stormwater quality and quantity BMPs expected on the site. Low impact development concepts that utilize dispersed microdetention are encouraged and often can be more cost-effective in handling runoff. Often these concepts do not “fit” into traditional stormwater management, zoning and subdivision regulations. It is intended for this pre-application meeting to serve as a forum to discuss the potential design and code variances and gain preliminary staff approval.

2.5.1.5 Meeting Notes: Meeting notes will be kept by City staff so that all discussions and decisions will be documented. The notes will be distributed to all attendees.

2.6 PRELIMINARY PLAT/PLAN REVIEW

After the Pre-Application Meeting, the developer or their engineer should obtain a copy of the Preliminary Plat Checklist (in Appendix B) to begin preparation of acceptable stormwater plans, calculations and plat layout. This information is also available from the City website. Preliminary plats are not required for Site Plans that do not involve subdivision issues. Site plans that require a change in zoning will go to the Planning and Zoning Commission for approval of the zoning changes.

After the Preliminary Plat has been approved, the developer must submit final public improvement plans including all stormwater related plans and associated calculations and documentation. Plans must be completed in accordance with this manual following the checklists and formats provided.

2.6.1 Plan Requirements

2.6.1.1 Existing Site Features

The plan submittal must include the existing topography (minimum 2-foot contours or best available) and the location of natural features, including wooded areas, ponds, lakes and, wetlands, and Karst topography; floodplain as shown on the current Flood Insurance Rate Map (FIRM) and inclusion of the riparian buffers, per the stream buffer ordinance.

Identify the existing utility placement and utility easements in the the proposed subdivision or development site, adjacent to the subdivision, and the offsite areas that affect the project site. This information should include the existing waterlines, fire hydrants, gas lines, solid waste disposal areas, community assets, property lines, building lines, buildings and/or structures, and on-site wastewater systems or other wastewater treatment facilities, as applicable.

Show the existing and proposed streets including the location and width of street right-of-ways, street plan lines as shown by the Major Thoroughfare plan, the existing alleys, roads and bridges, and any existing railroads and railroad right of ways. Also indicate the location of any existing culverts, drain pipes, storm drains and watercourses.

2.6.1.2 Proposed site features

All of the proposed lot lines (with consecutively numbered lots) and building lines must be shown on the plan. Provide the proposed traffic control and street plans with cross sections including features such as alleys, bridges and other features. Identify the proposed placement of gas lines, water lines, fire hydrants, utility easements and right of way and wastewater treatment facilities or sewage lines.

Identify the proposed placement of common land or land for special uses or features including:

- stated intent for ownership or dedication
- responsible party for supervision and maintenance
- preliminary landscaping plan

2.6.1.3 Stormwater Management

Provide a conceptual layout of the stormwater management facilities and BMPs, The stream reach should be identified with any proposed channel modifications, including the placement and type of outfall (primary, tributary, edge of buffer). The facilities and BMPs identified should have adequate surface area to convey, capture and treat the stormwater runoff. Include drainage area information, preliminary runoff calculations, maintenance access routes and proposed easement locations.

Limited Stream Assessment: If the proposed project will be entering the stream or buffer area, a limited stream assessment is required. Additional details can be found in Chapter 5. The following information will be needed for the the review:

- Predeveloped conditions and flow rates
- Photographs
- Stream analysis and inventory

- Longitudinal profile
- Identification of bed and bank materials

General Layout: Provide the plans for the existing and proposed stormwater system layout, including the existing culverts, drain pipes, storm drains and watercourses and the proposed system. The stream reach should be identified with all proposed channel modifications, including the placement and type of outfall. (primary, tributary, edge of buffer). The practices identified should have adequate surface area to capture and treat the stormwater runoff as laid out in Chapter 6. Include the calculations, drainage area, and maintenance access routes with easement locations.

Narrative: Please provide a description of the stormwater practices that will be implemented on the site. This description should include an indication of the pollutants of concern during construction and after build out (ie. high rates of fertilizer if building a golf course). The stormwater best management practices should treat those expected pollutants. The narrative should also include the following: non-structural practices such as scheduling or vegetative buffers; structural practices including detention or retention basins; and any individual lot practices such as site fingerprinting and rain gardens.

The narrative should also include a general discussion of the Erosion and Sediment Control plan identifying both temporary and permanent Best Management Practices that may be used for construction site runoff control.

2.6.2 Variance Requests

Whenever possible, variances from requirements should be submitted with the /plan. This may include those variances necessary to provide better stormwater management such as smaller street widths, reduced sidewalks, removal of curb and gutters, reduction in parking spaces, etc.

If the variance is from a regulatory (code) requirement, submit the variance request letter with information as outlined in the appropriate section of the City of Mexico Code of Ordinances. If the variance is from a design standard or methodology, the Engineer should provide the supporting documentation to justify the requested deviation in a letter to the Director of Public Works.

2.7 CONSTRUCTION PLAN REVIEW

Typically, final construction plans are submitted after the Planning and Zoning and City Council approves the preliminary plat/plan, but prior to submittal of the final plat. This is to ensure consistency between the infrastructure plans and the final plat.

2.7.1 Construction Plan Requirements

Final plans for all infrastructure construction must be submitted to the City Engineer for review prior to construction. Please provide an electronic copy (pdf) and two (2) print copies of the construction plans. The following plans need to be included as applicable: roadway, stormwater management, sanitary sewer, water supply, grading, erosion and sediment control. Each set shall have a title sheet, a general layout sheet, plan and profile sheets as applicable, cross section sheets as applicable and details (standard and special).

2.7.1.1 Title Sheet

The title sheet should include the following information:

- Name of project.
- Index to sheets.
- A location map adequately showing the project location in relation to major streets, with north arrow. Map shall be oriented with north arrow up.
- A signature block for City approval. See standard approval block at the end of this chapter.
- Name, address and telephone number of the consulting engineer and owner/developer.
- A legend of symbols shall be shown that apply to all sheets.
- List containing name and telephone number of each utility company and state One-Call system.
- Engineer's seal, signed and dated

2.7.1.2 General Layout Sheet

A general layout sheet is useful in showing the overall plan view. It may be necessary to reduce the scale so that the entire project can fit on a standard plan sheet. If this is done, all information shown must be detailed in subsequent plan sheets. This sheet may be combined with the title sheet where feasible. The General Layout Sheet should include the following information:

- General Notes: Minor construction notes shall appear on the proper plans and profile sheets.
- North arrow and bar scale. North arrow should be oriented up or to the right.
- Surveyed or aerial base map detail indicating existing man-made or natural topographical features, such as buildings, fences, trees, channels, ponds, streams, existing utilities, etc..
- Subdivision information including, but not limited to Rights-of-Way, Property and lot lines, existing and proposed easements, subdivision nomenclature, street names and other pertinent information impacting the project.

- Identification and location of all existing and proposed drainage features.
- Elevation and location of all applicable benchmarks indicating the datum. A minimum of two (2) benchmarks are required for each project.
- Survey control line or base line with adequate ties to land survey or property lines.
- Locations of any test borings if taken.
- Existing and finish grade contours at intervals of 2.0 feet or less in elevation; or equivalent detail indicating existing and finish grades and slopes.
- The lowest elevation for the top of foundation for each lot. This elevation typically represents the elevation of the top of the foundation however, in cases where a full basement or crawlspace is constructed the elevation will represent the lowest opening through the foundation into the basement or crawlspace. This elevation will need to be high enough to protect the structure from flooding.
- Addresses of homes abutting the projects, and current homeowner names associated with properties impacted by the project.
- Revisions noted.

2.7.1.3 Plan and Profile Sheets

Plan and profile sheets should be provided for proposed streets, sanitary sewers, waterlines, and stormwater conveyance facilities. It is preferred that the plan view be above and directly correlated to the profile view. Plan and profile sheet should contain the following information:

- North arrow and bar scale.
- Stationing ascending from the left side of the page to the right side.
- Elevations of gravity flow systems (ie. sanitary or storm sewers) should ascend from the left side of the page to the right side (lowest elevations furthest left for each segment).
- Existing man-made and natural topographic features, such as buildings, fences, trees, channels, ponds, streams, all existing and proposed utilities, etc..
- Identification and location of each storm drainage segment and existing utilities affecting construction.
- Length, size, type and slope of each line or channel segment.
- Right-of-Way, property, easement lines and street names.
- The 100 year (1% annual chance) floodplain.
- Applicable stream buffers.
- Location of test borings representing depth of drilled hole and refusal elevation if applicable.

- Invert elevations in and out and top elevations of each structure shall be shown. At least two elevations shall be shown for inlet tops matching sloped grades.
- Each utility line crossing the alignment shall be properly located and identified as to type, size and material. This information shall be to the best information available and provided through records, field prospecting and/or excavation.
- All stations (maximum of 400' between structures) of manholes, junction boxes, inlets and other significant structures.
- The profile shall show existing grade above the centerline as a dashed line, proposed finish grades or established street grades by solid lines. Each line shall be properly identified. The proposed sewer shall be shown as solid lines properly showing the inside top and bottom of pipe.
- The overflow path of the 100 year storm event.
- All structures shall be shown and labeled with appropriate drawing references.
- Revisions noted.

2.7.1.4 Cross-Section Sheets

Cross-sections shall be drawn for all streets and open channels. Sections shall be drawn at all structures, intersecting drainage systems, grade breaks and change in section. Additional sections may be required by City to adequately convey design. Cross-sections shall also provide for overflow drainage paths that are designated to convey overland flows in excess of underground system capacity. The following shall be indicated on each section:

- Existing and proposed grades.
- Elevation of proposed flow-lines.
- Cut and fill end areas if required for bid quantities.
- Grading limits.

2.7.1.5 Drainage Area Map and Table

The drainage map shall have the following.

- North arrow and scale. North should be oriented up or to the right.
- Drainage area boundaries for all watersheds including sub-watersheds of analysis including pass through waters, inlet drainage areas, culvert drainage areas and other points of interest.
- Drainage system nomenclature matching that on the “designed” systems shown in the plans.

The drainage area map shall be supported by a drainage table tabulating the physical properties of the drainage sub-basins, as well as the hydrologic and hydraulic properties of the design. This may include:

- Incremental drainage area
- Runoff coefficient for sub-basin
- Existing and future ground cover
- Receiving structure (ie. “Inlet A-1”, “Culvert C-2”, Flume #1)
- Watershed slope
- Time of Concentration
- Design storm return frequency
- Rainfall intensity

2.7.1.6 Standard and Special Detail Sheets

Detail sheets shall be included to show all details of appurtenances, materials and construction. Details shall conform to the requirements of the City and are to be drawn clearly and neatly with proper identifications, dimensions materials and other information necessary to guide desired construction. City standard structures are assumed where applicable.

2.7.1.7 Traffic Control Plans

Traffic control plans shall conform to design and principals contained the most recent copy of Manual of Uniform Traffic Control Devices (MUTCD).

2.7.1.8 Erosion and Sediment Control/Grading Site Plan(s):

Erosion and sediment control and grading plan sheets should contain the following information:

- General Information – Include information such as title block, scale, and legend on the site plan.
- Location Map – Include a small map locating the site and adjacent watersheds in the surrounding area. Include any landmarks which might assist in locating the site.
- North arrow and Scale.
- Limits of Clearing and Grading – Show areas that are to be cleared and graded.
- Identification of any Environmentally Sensitive Features – Show and identify sinkholes, losing streams, springs, caves, or any other significant sensitive site features.
- Existing Contours – Show existing contours of the site.
- Existing Vegetation – Show existing tree lines, grassed areas, or unique vegetation and any protection of these assets.

- Stream Buffers – Show buffer areas to be preserved or enhanced.
- Existing Drainage Patterns – Show the dividing lines and the direction of flow for different drainage areas. Include the acreage of each drainage area.
- Critical Areas – Indicate all steep slopes, channels, wetlands, underground springs, and environmentally sensitive areas.
- Proposed Contours – Show the proposed contours of the site.
- Site Development – Show all improvements such as buildings, parking lots, access roads, and utility construction.
- Location of Best Management Practices (BMPs) – Show the locations and types of erosion and sediment controls and stormwater management practices used on the site.
- Location of Topsoil Stockpile – Indicate the location of all soil stockpiles on the site.
- Detail Drawings – Explain and Illustrate with detail drawings any structural practices used which are not referenced in this manual.
- Construction Access – Show the access on which construction traffic will be entering and exiting the construction site.
- Staging Area – Indicate the area on which the construction equipment and materials will be stored. Show any proposed construction fuel storage and refueling areas.
- Inspection and Maintenance – Provide notes indicated the required frequency of inspections and maintenance of erosion and sediment control structures.

2.7.1.9 Stormwater Pollution Prevention Plan (Narrative):

Stormwater Pollution Prevention Plans (SWPPPs) should contain the following information:

- Project Location – Provide location and site map with site boundaries clearly indicated.
- Project Description – Briefly describe the nature and purpose of the land disturbing activity and the number of acres to be disturbed.
- Topographic Map - Label streams and indicate direction of flow; show outfall locations.
- Phased Development – Briefly describe the location, nature, and size of each phase of development. Include a list of contractors for each aspect or phase of construction.
- Project Schedule/Dates – List starting dates of initial land disturbing activities and the expected date of completion of final stabilization for each phase.
- Existing Site Conditions – Describe the existing topography, vegetation, and drainage. Require the preservation of vegetation where practical.

- Soils – Briefly describe the soils on the site giving such information as soil name, mapping unit, erodibility, permeability, depth, texture, and soil structure.
- Critical Areas – Describe the areas on the development site that have potentially serious erosion problems such as steep slopes, channels, underground spring, wetlands, and environmentally or ecologically sensitive areas.
- Temporary Erosion and Sediment Control Measures – Describe the methods that will be used to control erosion and sedimentation on the site. Provide a physical description of the BMP, site and physical conditions that must be met for the effective use of the BMP, BMP installation/construction procedures including typical drawings were applicable, operation and maintenance procedures for the BMP, where the BMP is to be located (in relation to site features), when the BMP should be installed (in relation to each phase of the land disturbance procedures to complete the project), and what site conditions must be met before removal of the BMP. This should include BMPs for the protection of adjacent roadways/storm sewers.
- Require sedimentation basins for each drainage area with 10 or more acres disturbed at one time.
- Permanent Stabilization – Briefly describe and include specifications of how the development site will be stabilized after construction is completed.
- Dewatering – Describe any anticipated dewatering methods, including the anticipated volume of water to be discharged and the anticipated maximum flow discharged from these activities. Indicate specific BMPs for the treatment of pumped water.
- Description of Non-Structural BMPs to be Utilized – Briefly describe the selected non-structural BMPs such as tree and vegetation preservation, vegetated buffer strips, mulching, sodding, temporary/final seeding, geotextiles, soil stabilizing emulsions or tackifiers, etc.
- Stormwater Runoff Considerations – Describe the strategy to control stormwater runoff. Will the development site cause an increase in peak runoff rates? Will the increase in runoff cause flooding or channel degradation downstream? How will the design prevent this?
- Calculations – Show detailed calculations for the design of temporary sediment basins, diversions, channels, etc. Include calculations for pre- and postdevelopment runoff.
- Inspection and Maintenance – Include a schedule of regular inspections and repairs of erosion and sediment control structures and forms to be used.
- Spill Prevention and Material Management Practices – Provide a plan of methods to manage materials and spills during construction.
- Additional Site Management BMPs – Describe site management BMPs such as solid and hazardous waste management, disposal of

sanitary sewage (portable toilets), storage of construction materials away from drainage courses and low areas, installation of containment berms and use of drip pans at petroleum product and liquid storage tanks/containers.

2.8 FINAL PLAT SUBMITTAL

The Final plat may be submitted to the Public Works Department after all construction plans for the public infrastructure have been approved and all public improvements have been constructed and deemed acceptable. Alternatively, the developer may escrow the cost of construction of the public improvements. The City engineer will review the Final Plat for consistency with the approved construction plans and any field changes made thereto.

2.9 MODIFICATIONS TO PLANS

Field modifications of any plan may be made by the engineer of record, however, these changes may not alter the overall direction of stormwater discharge and must not significantly alter associated calculations for sizing and location of facilities and BMPs. Changes in design will require the plans to be resubmitted.

Major changes will require a resubmittal of affected plan sheets, calculations and reports. At the Director's discretion, a complete resubmittal may be required.

2.10 General Plan Requirements

When preparing submittals for review, please follow these guidelines.

2.10.1 Sheet Sizes

Plans shall be submitted on 24 inch by 36 inch sheets. Each sheet shall contain a sheet number, including the individual sheet number and the total number of sheets, proper project identification and all revision dates.

2.10.2 Registered Professional Seals

The registered professional (Engineer, Surveyor, Geologist, etc) should seal all plans, reports and calculations per state statute.

2.10.3 Scales

Plans shall be drawn at a scale appropriate to clearly present the design and of not more than one (1) inch equals one hundred (100) feet. When necessary to provide adequate information on a general layout sheet, a smaller scale may be used. Bar Scales shall be shown on each sheet.

2.10.4 Calculation Summary

The Engineer shall submit a summary of all calculations and investigation analysis: hydraulic, hydrologic, erosion and sediment control, structural, geotechnical and others as necessary to adequately and fully explain the designs being submitted. The calculation summary shall indicate the methods used to perform the calculations and determine the final results. The Director may require additional supporting documentation when the results cannot be verified using the methods indicated in the summary.

2.10.5 Electronic Archive

Upon approval, an electronic copy of the final signed and sealed plans will be retained by the City in Adobe Acrobat Reader format (.pdf).

Figure 2.1: Standard Approval Signature Block

Approved For Construction

City Engineer/Director of Public Works Date