Chapter 4
Submittals

Contents

Tables

1.0 Introduction

This chapter describes the drainage submittal, review and approval process for development and redevelopment projects in Woodland Park, including requirements for stormwater-related submittals such as drainage reports and construction drawings for stormwater management facilities. The Applicant must prepare the required submittals in compliance with previously approved governing documents and the criteria in this Manual. The requirements presented in this chapter are the minimum necessary and will be used to evaluate the adequacy of submittals. Depending on site-specific conditions, additional studies and submittals may be necessary.

Plans for addressing stormwater management issues for each phase of a project may include a Preliminary Drainage Report and/or a Final Drainage Report. In some cases, a Drainage Letter Report may be sufficient. Requirements for each of these documents are described in the remainder of this chapter. Title 1, Policies and Procedures, of the *City of Woodland Park Engineering Specifications* (2011) provides detailed information on procedures and required submittals for subdivisions and other developments in Woodland Park.

2.0 Overview of Submittal Requirements

All reports shall be prepared in the appropriate format and properly bound. The drawings, figures, and tables shall be bound with the report or included in a pocket attached to the report. The reports shall contain appropriate analyses and information as described herein, prepared under the supervision of and certified by a Professional Engineer licensed in Colorado. The Applicant must also provide an electronic copy of all submittal materials in PDF format when hard copy submittals are delivered to the City.

2.1 Preliminary Drainage Report (PDR)

A Preliminary Drainage Report (PDR) shall accompany Preliminary Plat submittals. The purpose of the PDR is to identify a conceptual plan and identify specific solutions for on-site and off-site existing and future conditions resulting from the development of the proposed project. The PDR should address any existing drainage and/or water quality problems associated with the project site and proposed measures to address existing problems and accommodate the planned development without adversely affecting neighboring properties.

The proposed improvements must be consistent with any previously approved master plans and the *City of Woodland Park Engineering Specifications* (2011). Analysis of drainage basin hydrology and hydraulics shall be based on the best available site information and land use plans. Specific improvements, including open channels, storm sewers, grading, site stabilization, catch basins, culverts and other improvements, will be located and sized to meet requirements of the minor and major drainage systems. Drainage easements and tracts necessary to access and maintain the proposed improvements must be identified.

A typical PDR consists of a narrative portion and appendices with supporting calculations and other pertinent information. The narrative should lead the reader logically through the entire analysis and design process and provide a clear picture of stormwater management issues. The narrative portion shall provide detailed discussion regarding the general location and description of the site, off-site and on-site drainage basins and subbasins, drainage design criteria, stormwater management facility design, and conclusions. Discussion of methodology, assumptions, input, and a summary of results shall be provided in the narrative for all hydrologic or hydraulic modeling efforts. Peak flow rates, storage volumes, critical water surface elevations, and stormwater management facility sizes shall also be summarized and

discussed in the report narrative. The appendices must provide the appropriate backup information and calculations, but the reader should not have to review information contained in the appendices to have a clear and thorough understanding of the project and the stormwater management analysis and facility designs.

The guidelines for a typical PDR are summarized in Table 4-1, which can be used as a checklist for completeness for PDR submittals.

If it is determined during the development review process that the project is of sufficient size or complexity, a PDR may be required in advance of the final drainage report. This may also be done at the developer's request. Two copies of the PDR shall be submitted. The drainage report shall be a stand-alone document. When references are made or assumptions are based on previously approved submitted reports, the drainage report must include the appropriate excerpts, pages, tables, and maps containing the referenced information.

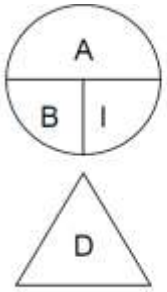
Table 4-1.Guidelines for a Preliminary Drainage Report (PDR)

	Cover Sheet	Project Name, Owner/Developer/Applicant and Address, Engineer, Submittal Date/Revision Date(s)
	Letter of Transmittal	Must include Professional Engineer's Stamp/Certification
	Certification Statement	The report shall contain a certification page with the following statement: "This report and plan for the preliminary drainage design of (Name of Development) was prepared by me (or under my direct supervision) in accordance with the provisions of City of Woodland Park Drainage Design and Technical Criteria and was designed to comply with the provisions thereof. I understand that City of Woodland Park does not and will not assume liability for drainage facilities designed by others." SIGNATURE: _____ Registered Professional Engineer State of Colorado No. _____ (Affix Seal)
	Report Contents	I. General Location and Description A. Location a. City and county, and local streets within and adjacent to the subdivision b. Township, range, section, ¼ section c. Major drainageways and existing facilities d. Names of surrounding platted developments B. Description of property a. General project description, including proposed land use b. Area in acres c. Ground cover (type of trees, shrubs, vegetation) d. General topography e. General soil conditions, hydrologic soil group f. Major drainageways and drainage facilities II. Drainage Basins and Subbasins A. Major basin descriptions a. Reference should be made to major drainageways planning studies; such as drainage basin planning studies, flood hazard delineation reports, and flood insurance studies or maps, if available 1. A floodplain statement shall be provided indicating whether any

		portion of the development is in a designated floodplain as delineated on the current FEMA mapping b. Major basin drainage characteristics c. Identification of all nearby irrigation facilities and other obstructions which could influence or be influenced by the local drainage B. Sub-basin description a. Discussion of historic drainage patterns of the property in question b. Discussion of off-site drainage flow patterns and their impact on the development III. Drainage Design Criteria A. Development criteria reference a. Reference all criteria, master plans, and technical information used for report preparation and design; any deviation from such material must be discussed and justified b. Discussion of previous drainage studies (i.e., PDR, DBPSs, master plan, flood insurance studies) for the site in question that influence or are influenced by the drainage design and how the studies affect drainage design for the site B. Hydrologic criteria a. Identify design rainfall b. Identify runoff calculation method c. Identify design storm recurrence intervals d. Identify detention discharge and storage calculation method IV. Drainage Facility Design A. General concept a. Drainage concept and typical drainage patterns b. Discussion of compliance with off-site runoff considerations c. Discussion of anticipated and proposed drainage patterns d. Discussion of the content of tables, chart, figures, plates or drawings presented in the report B. Specific details a. Presentation of existing and proposed hydrologic conditions including approximate flow rates entering and exiting the project site with all necessary calculations

		b. Existing stormwater conveyance and storage facilities c. Proposed stormwater conveyances, including storm drain pipes, inlets, and open channels d. Detention/water quality facility volumes, water surface elevations, release rates, and outfalls e. Discussion of the drainage impact of site constraints such as streets, utilities, existing and proposed structures f. Relationship to both upstream and downstream properties and impact of the project on these properties; include discussion of off-site drainage flow patterns g. Maintenance responsibility, access and aspects of the preliminary design h. Compliance with other local, state and federal requirements, if any i. Water quality measures implemented to treat stormwater, including Water Quality Capture Volume(WQCV) or Excess Urban Runoff Volume (EURV) j. Structural and non-structural best management practices (BMPs) that will be part of the stormwater management design C. Conclusions a. Compliance with Standards b. Justification for any requested waiver(s) c. Effectiveness of drainage design to control damage from storm runoff d. Influence of proposed development on upstream and downstream properties e. Water quality treatment D. References E. Appendices

Table 4-2 Summarizes PDR drawing requirements. The following symbols should be used to define basins and design points:



A = Basin Designation

B = Area in Acres

I = % imperviousness

D = Design Point Designation

A summary runoff table should be included on the PDR plan sheets that lists design points, identifies contributing drainage basins to each design point, quantifies contributing drainage areas and provides 5- and 100-year design peak flow rates.

A detention basin summary table should be included on the PDR plan sheets that provide storage volumes (WQCV/EURV and/or detention volumes) and water surface elevations and release rates corresponding to storage volumes and release rates. A rating curve showing stage-storage-discharge relationships for detention and/or water quality features shall be provided on PDR plan sheets for storage facilities designed to impound more than 1 acre-foot of runoff.

Table 4-2. Preliminary Drainage Plan Drawing Requirements

Preliminary Drainage Plan Contents	
	24” x 35” in size at a scale of 1” = 20’ to 1’ = 200’
	Vicinity map at a scale no smaller than 1’ = 2000’
	Title Block, Including name of project, address, engineering firm, P.E. stamp.
	Legend, north arrow, scale, date of preparation and benchmark.
	Boundaries of entire development of project.
	Existing (dashed or screened) and proposed (solid) contours with 2-foot maximum interval, extending a minimum of 100 feet beyond property lines. In terrain greater than 10% slope, 10 foot intervals are allowed.
	Proposed development site plan/improvements.
	All existing and proposed drainage facilities (e.g. detention facilities, storm sewers, swales, riprap, outlet structures, irrigation ditches, culverts, cross pans).
	Major basin and sub basin boundaries, including off-site basins.
	Floodplain boundary based on the most current information.

2.2 Guidelines for a Final Drainage Report (FDR)

The Final Drainage Report (FDR) serves to finalize the planned improvements identified the Preliminary Drainage Report and to present the design details for the proposed improvements. The FDR must also identify changes to the preliminary design concepts that were incorporated due to review comments.

The analyses included in the FDR provide the background for the design that is incorporated into construction plans for the proposed project and shall include calculations that support the location and sizing of all drainage features required to properly convey on-site and off-site surface runoff, including grading, streets profiles, pond grading and outlet designs, street sections, storm sewer and channel profiles and water quality features, etc.

The Final Drainage Report and Plan shall incorporate all of the information outlined in Table 4-1 for preliminary reports and plans, updated to reflect comments and revisions. The following information also shall be provided:

a. Detention storage and outlet design and details.
b. Storm drain system design, and hydraulic calculations including hydraulic grade line (HGL) and energy grade line (EGL) computations, pipe and inlet locations, types and sizes.
c. Locations of storm drain system outfalls, energy dissipation features (if required), and details.
d. Water quality features and details.

The report also must include the following certification statement signed and stamped by a registered Professional Engineer in Colorado.

> "This report and plan for the final drainage design of (Name of Development) was prepared by me (or under my direct supervision) in accordance with the provisions of City of Woodland Park Drainage Design and Technical Criteria for the owners thereof. I understand that City of Woodland Park does not and will not assume liability for drainage facilities designed by others."
>
> SIGNATURE: _____
>
> Registered Professional Engineer State of Colorado No. _____

2.3 Drainage Report for Re-subdivisions

When a portion of previously platted land is re-subdivided and the proposed division of lots is consistent with previously approved reports for the property, a modified drainage report format may be submitted with approval. In this situation a "Letter Type" drainage report rather than a complete Final Drainage Report may be proposed.

A "Letter Type" drainage report may be used only for re-subdivision or re-plat when a complete drainage report has previously been approved by the City/County Engineer and significant changes from such report are not proposed. If a complete drainage report has not been approved in the past, a full drainage report will be required.

The "Letter Type" drainage report must include the following:

1. Cover sheet or statement stating the name and purpose of the report. This shall include the date of preparation and the name of the previous subdivision.
2. Engineer's certification.
3. Body of the report shall include:
    a. General property description with acreage
    b. General existing drainage characteristics (on and off site)

   c. General proposed drainage characteristics (on and off site)
   d. Hydrologic calculations including areas, runoff coefficients, time of concentration, rainfall intensity, and runoff.
4. A site map showing the general vicinity of the project.
5. A drainage plan indicating site and adjacent property as platted with name and filing. Indicate storm runoff routing and rates if applicable.
6. Drainage fees (cash or letter of credit) shall be determined in accordance with the latest drainage ordinances/resolutions and applicable basin fees.

2.4 Stormwater Management Facility Operation and Maintenance

All projects should be planned, designed and constructed acknowledging that maintenance is essential to the effectiveness of stormwater improvements. Designs should provide adequate maintenance access and implement concepts that reduce maintenance requirements. Detention ponds, open channels, post-construction water quality BMPs, and other stormwater management facilities require proper maintenance in order to ensure that they function as designed. Each project must include an Operation and Maintenance (O&M) Manual developed in conjunction with the final design to ensure that maintenance considerations have been incorporated into project designs and to document how those provisions must be implemented. Although many common maintenance provisions apply to projects, each O&M Manual must also identify the unique features of each project that need to be addressed.

The O&M Manuals should provide guidance and standard forms for those responsible for the maintenance of stormwater management facilities. The O&M Manual must be submitted for acceptance with the construction drawings. For small projects, the O&M Manual may be a short and simple document identifying maintenance activities and methods, maintenance frequency, triggers for maintenance (scheduled and unscheduled) and documentation requirements. For larger projects, a more comprehensive O&M Manual addressing multiple facets of the drainage system (detention, channels, water quality facilities, etc.) is required.

2.5 Erosion and Stormwater Quality Control Plan/Stormwater Management Plan (SWMP)

A Stormwater Management Plan (SWMP) that addresses erosion control and stormwater quality during the construction phase and extends through final stabilization of this site is required. Volume 2 of the Colorado Springs Manual provides criteria and guidance on construction-phase (and post-construction) stormwater quality management. The SWMP shall address each phase of construction and shall be an integral part of the overall site development plans. Erosion control measures shall be sufficient to control the runoff from the design rainfall. For sites disturbing more than 1 acre (or smaller sites that are a part of a larger common plan of development) coverage under the CDPHE General Permit for Stormwater Discharges Associated with Construction Activities will be required in addition to local requirements.

2.6 Construction Plan Drainage Statements and Notes

All construction plans shall contain the following statements and notes:

1. Detailed Drainage Construction Plans and Specifications Engineer's Statement: "These detailed plans and specifications were prepared under my direction and supervision. Said detailed plans and specifications have been prepared according to the established criteria for detailed drainage plans and specifications, and said detailed plans and specifications are in conformity with the master plan of the drainage basin. Said detailed drainage plans and specifications meet the

purposes for which the particular drainage facility(s) is designed. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparation of the detailed drainage plans and specifications."

2. Required Note: "Plan review by The City of Woodland Park is provided only for general conformance with Design Criteria. The City of Woodland Park is not responsible for the accuracy and adequacy of the design, dimensions, and/or elevations which shall be confirmed at the job site. The City of Woodland Park, through the approval of this document, assumes no responsibility for completeness and/or accuracy of this document."