

Appendix A: Development Submittal Checklists

Drainage Memo Checklist

Project Name:

Date:

Cover Letter		Included	N/A
	Date		
	Name of Engineer designing the site		
	Statement of compliance with the requirements of the FCSCM		
Project Description			
	Existing Conditions		
	Proposed land uses and/or project summary		
	Description and quantification of impervious surfaces or changes		
Other			
	Other specific items that may be identified by the design engineer or Stormwater staff		

ODP Drainage Report Checklist

Project Name:

Date:

General Location & Existing Site Info		Included	N/A
	Section, Township, Range		
	Vicinity Map		
	Roadways within and adjacent to site		
	Master Drainage Basin that site is located within		
	Existing stormwater drainage facilities and drainage patterns		
	Existing irrigation facilities		
	Existing ground cover and/or vegetation type		
Master Drainage Basin Info			
	Reference/discussion regarding pertinent master drainage basin		
	Any master planning improvements in the vicinity?		
	General basin characteristics		
	Existing and planned land uses within the master drainage basin		
	Irrigation facilities that influence or are influenced by the local drainage		
Floodplain Information			
	Existing floodplain and floodway info		
	Other planning studies such as flood hazard delineation reports and FIRMs		
Project Description			
	Proposed land uses and/or project summary		
	Site acreage		
	Names of surrounding developments		
Proposed Drainage Facilities			
	Proposed drainage patterns		
	Location and approximate size of detention storage and outlet design		
	Area to be serviced by the drainage improvements		
	LID system considerations/options		
	Potential impacts on the project site from offsite basins under existing and fully developed basin conditions pursuant to zoning and land use plans		
	Conveyance of minor and major stormwater systems to an existing stormwater conveyance		
	Specific details and special design points, if necessary		
References			
	Referenced criteria, master plans, technical info		
Appendices			
	drainage calculations based on ODP site plan		
	detention pond volume calculations based on ODP site plan		

ODP Drawing Checklist

Project Name:			
Date:			
Existing Drainage Info		Included	N/A
	Identification of drainage flows entering/leaving site; general drainage patterns		
	Major drainage basin boundaries		
	Any offsite drainage feature influencing development		
Existing Watercourses			
	All watercourses, rivers, wetlands, creeks, irrigation ditches or laterals located on or within 150' of the property		
Imagery and Topography			
	Include existing topo contours and/or aerial image background, if available		
Floodplain Information			
	All 100-year floodplain and floodway boundaries, cross-sections and BFE's		
	FEMA-regulated floodplains - BFE's must be reported in NAVD 1988 and NGVD 1929		
	City-regulated floodplains - BFE's shown in NAVD 1988		
Proposed Drainage Facilities			
	Proposed drainage flow directions (arrows)		
	Proposed contours, if available		
	Proposed drainage facilities (general locations) including detention ponds, water quality ponds, LID systems, storm sewers, street network, culverts, channels/swales		
Legend			
	Define map symbology		

PDP and FP Drainage Report Checklist

Project Name:

Date:	Included	N/A
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Cover Letter

	Include name of project, date, name of design engineer		
	Statement of compliance with the manual		
FP	Final copies required to be stamped and signed by Colorado licensed PE		

General Location & Existing Site Info

	Section, Township, Range		
	Vicinity Map		
	Roadways within and adjacent to site		
	Names of surrounding developments		
	Master Drainage Basin where site is located		
	Existing stormwater drainage facilities and drainage patterns		
	Existing irrigation facilities (if applicable)		
	Existing land uses		
	Existing ground cover and/or vegetation type		
	Existing soils info		

Master Drainage Basin Info

	Reference/discussion regarding pertinent Master Drainage Basin and any improvements planned for the area		
	General basin characteristics		
	Existing and planned land uses within the Master Drainage Basin		
	Irrigation facilities that influence or are influenced by the local drainage (if applicable)		

Floodplain Information

	Refer to Floodplain Checklists for requirements		
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Project Description

	Proposed land uses and/or project summary		
	Site acreage		

Proposed Drainage Facilities

	Discussion of proposed drainage plan, specific details that may include drainage issues at specific design points		
	Conveyance of minor and major stormwater systems to an existing stormwater conveyance		
	Detention basin and outlet design; summary table for each detention basin		
	WQCV design		
	LID systems and design		
	Maintenance access to the drainage facilities		
	Easements/tracts for drainage purposes		

Drainage Design Criteria

	Reference to any previous drainage studies for the area		
	Four-Step process outlined and discussed		
	Using CoFC rainfall data for 2-yr and 100-yr recurrence intervals		
	Using proper design storm recurrences (2-yr and 100-yr)		
	Runoff calculation method		
	Detention calculation method		
FP	Street Capacity discussion		
FP	Inlet Capacity discussion		

PDP and FP Drainage Report Checklist

Project Name:

Date:		Included	N/A
FP	Pipe network models discussion		
FP	Swale or channel sizing/capacity discussion		
FP	Emergency spillway sizing discussion		
Variance Requests			
	Included variance request form		
Erosion Control			
	Statement of compliance with all erosion control materials that are to be provided with final plans		
FP	Separate Erosion Control Report and Plans submitted		
Conclusion			
	Statement of compliance with manual, master drainage plans, floodplain regs, other state/federal regs		
	Summary conclusion of drainage concept and effectiveness of design		
References			
	Referenced criteria, master plans, technical info		
Appendices			
	Hydrologic calculations: historic and developed runoff		
	Detention basin volume calculations		
	SDI data spreadsheet (meets detention drain time criteria)		
	SWMM models (if applicable)		
	LID exhibit and calculations		
	Floodplain maps		
	Soil survey information		
FP	Street capacity		
FP	Inlet sizing and capacity		
FP	Storm pipe network models		
FP	Erosion protection (i.e. riprap calculations)		
FP	Swale or channel sizing		
FP	Outlet structure design		
FP	Spillway design		
	Drainage map		

PDP and FP Drawing Checklist

Project Name:

Date:

Included

N/A

General Plan Requirements

	Title block		
	Name of project and/or subdivision		
	Legend with symbols, abbreviations, etc.		
	Vicinity map or Key map		
	Typical drawing scales: 1" = 20', 30', 40' or 50'		
	North Arrow on all sheets		
	Date of preparation		
	City signature block		
	Ditch company signature block (if applicable)		
FP	On final plans: Stamp and signature of Colorado licensed Professional Civil Engineer in accordance with Colorado State Statutes and Board Rules		

Existing Conditions and/or Demolition Plan (if applicable)

	Existing prominent features (waterways, irrigation ditches, vegetation, etc)		
	Existing site information (building footprints, parking lots, roadways, street names)		
	Existing boundary lines of the property, including: right of way lines, lot lines and existing easements		
	Existing utilities locations		
	Existing topography (contours should extend 50' outside of property boundary or show relationship to adjacent properties)		
	Demolition information shown and called out on this plan		

Overall Grading Plan

	Existing prominent features (waterways, ponds, major utilities, irrigation ditches, vegetation lines, trees, natural habitat buffer zones, etc)		
	Existing and proposed site plan information (building footprints, parking lots, roadways, street names)		
	Existing and proposed boundary lines of the subdivision or project, right of way lines, lot lines, easements		
	Existing utilities locations where drainage design affects the existing utility		
	Existing and proposed contours (contours should extend 50' outside of property boundary or show relationship to adjacent properties)		
	Easements: Proposed drainage easements shown for public storm lines, detention ponds, outfall pipes from ponds, volume-based LID systems		
	LID: Type of LID and location of LID systems clearly shown and called out on this plan.		
	verify subgrade material depths meet FCU minimum requirements		
	max run-on ratio for bioswales 10:1; max run-on ratio for pavers 3:1		
	for pavers: include impervious membrane adjacent to buildings		
	underdrain included in the design and shown in the plans; min underdrain size is 4"		
	inflow forebay or level spreader included for rain gardens and sand filters		
	review landscape plan for appropriate plantings in raingardens, bioswales, sand filters		
	no trees in raingardens		
FP	Erosion control around perimeter of raingardens or other LID's - Note on grading plans: Please refer to the erosion control plan sheets and report for temporary control measures and construction sequencing that shall be used in order to prevent loading of this LID drainage facility with sediment during construction.		

PDP and FP Drawing Checklist

Project Name:

Date:		Included	N/A
	Underdrains: horizontal locations are shown and make sense relative to the surface or subsurface grading		
	cleanouts at bends and tees		
FP	invert elevations shown at junctions		
	minimum pipe size is 4"		
	Stormwater outfall identified on the plans		
	Proposed flow arrows and slope labels		
	Proposed spot elevations		
	Proposed storm sewers, culverts, manholes, cross-pans, other		
	Detention Basins: max slope in detention basins 4:1		
	pipe outlets (FES's) and outlet structures tucked into embankments and not sticking out		
	review landscape plan for appropriate plantings in detention basins		
	no trees in swale centerlines		
	FG at least 6" below FF elevation (varies depending on site plans)		
	max slope away from buildings 3:1		
Detailed Grading Plan			
FP	individual lot grading details: FF's, MO's, lot line swales, front and back lot grades, grade breaks		
FP	typical lot grading details		
Overall Utility Plan			
	ROW lines, property lines and easements with dimensions shown		
	Curb and gutter, cross-pans, sidewalks (attached or detached) and medians shown		
	Water, Wastewater and Storm Sewer: show the existing and proposed system layouts including sizes of all mains; a minimum horizontal separation of 10' shall be maintained between all utility mains		
	Dry Utilities: Existing and proposed gas, electric, telephone, cable, etc.		
	Proposed private subdrains (if applicable)		
	Existing irrigation ditches shown		
	Match lines with corresponding sheet numbers referenced		
	Phasing lines (if applicable)		
Storm Sewer Plan and Profile Sheets			
FP	size, type and class of all portions of storm sewer with lengths measured from manhole centers		
FP	manhole type, diameters		
FP	longitudinal stationing		
FP	matchlines with stationing and sheet numbers		
FP	phase lines (if necessary)		
FP	existing ground and proposed ground shown in profile		
FP	Manhole rim and inflow/outflow invert elevations		
FP	include 100-yr HGL's in the profile		
FP	include all wet utility crossings and dry utility crossings in the profile		
FP	identify each segment of each storm sewer as "private" or "public"		
FP	A minimum vertical clearance of 18" shall be maintained when crossing all other utilities.		

PDP and FP Drawing Checklist

Project Name:

Date:

Included

N/A

Construction Detail Sheets

FP	Applicable FCU standard storm sewer details		
FP	Applicable FCU standard LID details		
FP	Other stormwater details such as: emergency spillway, concrete pan, soft pan, others?		
FP	Details of special connections, crossings or construction specific to this project		
FP	Any modified details are clearly labeled or distinguished from the standard details		

Site and Landscape Plans

	No trees shall be planted within 10' of storm sewer mains		
	No shrubs shall be planted within 4' of storm sewer mains		
	Verify that the note listing these minimum separation distances is included on the landscape plan.		

Plat

	All existing easements shown		
	All proposed drainage easements shown		