



## CHECKLIST FOR PRELIMINARY DRAINAGE REPORT

City of Greenwood Village  
6060 S Quebec Street  
Greenwood Village, CO 80111  
(303) 486-5783

Project/Permit No. \_\_\_\_\_ Address: \_\_\_\_\_  
Review Dates: \_\_\_\_\_

### I. COVER SHEET

Yes	No	N/A	Report Requirements
			A. Name of Project
			B. Address/Location of Property/Project
			C. Owner/Developer Certification
			D. Engineer Certification
			E. Submittal Date and Revision Dates as Applicable

### II. PROJECT DESCRIPTION

Yes	No	N/A	Report Requirements
			A. General Project Description, Proposed Land Use
			B. Summarize the Construction Activities

### III. GENERAL LOCATION AND DESCRIPTION OF PROPERTY

Yes	No	N/A	Report Requirements
			A. Property Location
			1. Township, Range, Section and ¼ Section
			2. Roadways, highways and trails adjacent to the proposed development, or within the area served by the proposed drainage improvements
			3. Access to the property
			4. Names of surrounding or adjacent developments including land use or zoning information
			B. Site Description of Property
			1. Area in acres
			2. Existing impervious area and comparison to 1998 impervious area
			3. Ground cover and vegetation
			4. Site topography and slopes
			5. Existing drainage facilities on or near the site
			6. Irrigation canals or ditches
			7. Summarize NRCS Soils Classification, add report to appendix
			8. Significant geologic features
			9. Wetlands on site and or near the property
			10. Groundwater investigations, groundcover recharge or high groundwater areas



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			11. Drainage patterns that influence the site including:
			a. Historical drainage patterns
			b. Existing drainage patterns
			c. Offsite drainage flowing onto the project
			d. Drainage system downstream of the project
			12. Floodplains delineated by UDFCD FHAD Studies or on FEMA FIRM Maps

### IV. PREVIOUS DRAINAGE REPORTS

Yes	No	N/A	Report Requirements
			A. Major Drainage Basins
			1. Reference all drainageway planning or flood hazard area delineation studies that affect the project such as UDFCD FHAD Studies, Outfall System Planning Studies
			2. Discuss the effects of these studies on the proposed project, including existing conditions, need for improvements and impact on proposed development.
			B. Project Drainage
			1. Reference previous site-specific drainage studies
			2. Discuss impact of previous studies impact on the project and offsite runoff flowing to the project

### V. DESIGN CRITERIA

Yes	No	N/A	Report Requirements
			A. List applicable criteria and optional provisions selected when applicable including GVDCM and or USDCM. Discuss tables, figures, charts, details that will be used
			B. Hydrology
			1. Runoff calculations method(s)
			2. Design storm recurrence intervals
			3. Design rainfall
			4. Flood attenuation/Storage calculation method(s)
			5. Flood attenuation/Release rate calculation method(s)
			C. Hydraulics
			1. Methods used to determine conveyance facility capabilities
			2. Hydraulic grade line calculation method and discussion of loss of coefficients
			3. Methods used to calculate water surface profiles
			4. Allowable street capacity
			D. Water Quality Enhancement
			1. Discuss proposed BMPs
			2. Identify design procedures and WQCV



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			3. Discuss proposed source controls for site activities
			E. Groundwater Investigation
			1. Discuss groundwater investigations and results
			2. Identify potential groundwater issues and remediation measures

### VI. DRAINAGE DESIGN

Yes	No	N/A	Report Requirements
			A. Proposed Drainage Plan
			1. Tier Classification Assessment in accordance with Table 1-1 of the Greenwood Village Drainage Criteria Manual
			2. Square feet of increased or decrease impervious area for the project area of disturbance
			3. Area of disturbance
			4. Wetland requirements
			5. Floodplain requirements
			6. Water quality requirements outside and/or inside the Cherry Creek Reservoir Basin
			7. Discuss the application of the Four Step Process (Section 15.3.1 of the DCM)
			8. Discuss the approach to stormwater quality management including; runoff reduction, onsite treatment, regional/sub-regional treatment (Section 15.3.2 of the DCM)
			9. Discuss the base design standards selected for the project (Section 15.3.3 of the DCM)
			B. Discuss conveyance concepts
			1. Proposed drainage paths and patterns
			2. Tributary basins and areas, peak flow rate at design points
			3. Street capacities
			4. Storm sewer layout, including inlet and pipe locations and sizes
			5. Storm sewer outfall locations and design, including method of energy dissipation
			6. Discuss how runoff is conveyed from all outfalls to the nearest major drainageway, including the flow path, and capacity downstream of the outfall to the nearest major drainageway
			7. Open channel and swale design, peak flow rates at design points, dimensions, alignment, stabilization and grade control improvements, low flow and trickle channel capacities, water surface elevations, etc.
			8. Downstream facilities impacted by project and offsite facility for the conveyance of minor and major flows to the major drainageway



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			9. Maintenance of the facilities, easements, and tracts that are required for stormwater conveyance
			10. Offsite conveyance facilities needed for the conveyance of minor and major flows to the major drainageway
			C. Flood Attenuation/Water Quality Facilities
			1. Provide pond design including release rates, storage volumes and water surface elevations for the Water Quality Capture Volume, Excess Urban Runoff Volume, 100-year, and emergency overflow conditions and spillway, outlet structure design, etc.
			2. Provide pond outfall locations and design, including method of energy dissipation
			3. Runoff conveyance from all pond outfall(s) to the nearest drainageway, including a discussion of the flow path and capacity downstream of the outfall(s)
			4. Maintenance of the pond and easements and tracts that are required
			D. Water Quality Enhancement
			1. Design of all structural water quality practices including tributary area, sizing, treatment volumes design
			2. Maintenance of the facility, easements, and tracts that are required for the water quality enhancement
			3. Source controls that are necessary to prevent the potential for illicit discharge from site activities
			E. Floodplain
			1. Source of the floodplain information and level of detailed analysis including UDFCD FHAD or FEMA FIRM, and Village Floodplain Development Regulations and Floodplain Development Permits
			2. Details of floodplain modifications, including encroachments, velocities, depths, stabilization measures, water surface elevations, etc.
			3. Floodplain modification studies, including CLOMR and LOMR requirements (separate CLOMR/LOMER studies are required and floodplain permit)
			F. Groundwater
			1. Discuss improvements to mitigate groundwater
			G. Additional Permitting Requirements
			1. Section 404 of the Clean Water Act
			2. Endangered Species Act
			3. Colorado Discharge Permit System Construction Permit
			4. Other Local, State and Federal requirement



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### VII. CONCLUSIONS

Yes	No	N/A	Report Requirements
			A. Compliance with Standards
			1. Greenwood Village
			2. UDFCD Criteria
			3. Master Plans and UDFCD Outfall Systems Planning Study
			4. Floodplain regulations
			5. Cherry Creek Basin Control Regulation No. 72
			B. Waivers
			1. Provide the drainage criteria by section number for which a waiver will be requested (Note: a request in writing justifying the waiver request with all pertinent analysis must be submitted for approval prior to approval of the Final Drainage Report)
			C. Drainage Concepts
			1. Overall effectiveness of stormwater management design to convey, store and treat stormwater

### REFERENCES

Yes	No	N/A	Report Requirements
			A. Reference all criteria, master plans, reports, or other technical information used in development of the report

### VIII. APPENDICES

Yes	No	N/A	Report Requirements
			A. Maps
			1. Vicinity Map
			2. Soil Survey Information
			3. Floodplain Map
			B. Hydrologic Calculations
			1. Land use assumptions both on and off site
			2. Runoff coefficients and time concentration
			3. Colorado Urban Hydrograph Procedure input parameters
			4. UDSWM Input parameters
			5. Peak flow rate calculations for the minor and major storms
			6. Rainfall information
			7. CUHP/UDSWM input and output
			8. Hydrograph data
			9. Connectivity diagram showing relationship/connectivity of basins, conveyance facilities, detention ponds, and design points
			10. Floodplain hydrology information



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			C. Hydraulic Computations
			1. Street, inlet storm sewer capacities
			2. Open channel or swale capacities
			3. Low flow and trickle channels
			4. Stabilization and grade control structures
			5. Water surface profiles
			6. State-storage-discharge calculations for flood attenuation and water quality
			7. Pond routing calculations
			8. Emergency spillway sizing calculations
			9. Downstream/outfall capacity to drainageway
			10. Energy dissipation for outfalls
			11. Floodplain modeling
			12. Water quality enhancement, design and sizing
			D. Referenced Information
			1. Pertinent portions of all referenced materials or drainage reports

## CHECKLIST FOR FINAL DRAINAGE PLAN

### I. OVERALL DRAINAGE PLAN

Yes	No	N/A	Report Requirements
			A. 24" x 36" in size, 22" x 34" also acceptable when half size sets will be produced
			B. Title block and legend
			C. Show boundaries of entire development or project
			D. Existing or proposed streets, roadways, or highways
			E. Show limits of all major basins, including off-site basins where feasible
			F. Drainage basin and sub basin boundaries
			G. General drainage patterns and flow paths, including those entering and leaving the site
			H. Topographic information
			I. Identify existing stormwater management facilities, upstream, downstream, or within the site, which will provide a stormwater management function for the site
			J. Overlay or figure showing layout of Detailed Drainage Plan sheets

### II. DETAILED DRAINAGE PLANS

Yes	No	N/A	Report Requirements
			A. 24" x 36" in size, 22" x 34" are acceptable sizes
			B. Title block and legend



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			C. Scale 1"=20' to 1"=100', as required to show sufficient detail
			D. Existing topographic contours with a 2' maximum contour interval. Contours must extend a minimum of 100' beyond the property line
			E. Proposed topographic contours with a 2' maximum contour interval
			F. Existing utilities and structures including irrigation ditches
			G. Existing stormwater conveyance or storage facilities
			H. All property lines and easements with type of easements noted
			I. Adjacent development or ownerships
			J. Streets and roadways with right-of-way and flow line widths, type of curb and gutter or roadway swale, slopes flow directions and cross pans
			K. Proposed stormwater management facilities, including roadway swales, open channels, drainageways, storm sewers, culverts, detention ponds, water quality enhancement structures or features, non-structural control, etc. Include all materials for size, shapes and slopes
			L. Proposed outfall points and existing or proposed facilities to convey runoff to the nearest drainageway
			M. Location of all existing and proposed 100-year floodplain boundaries, including the source of designation. Floodplain change require separate CLOMR/LOMR report
			N. Summary Runoff Table

GREENWOOD VILLAGE STAFF USE ONLY	
Reviewer Name	
Date	
Approve/Disapprove	
Yes/No	
<b>Copy of Checklist provided to Village Stormwater Manager</b>	