



Department of Public Works

Development Review Division • Drainage Study Team

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DRAINAGE STUDY MINIMUM CRITERIA CHECKLIST

Project Name: _____

Engineer: _____ Company : _____

Address: _____

City: _____ State: _____ Zip: _____

E-mail: _____

Phone Number: _____ Fax Number: _____

Property Owner: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone Number: _____ Fax Number: _____

E-mail: _____

The following information is intended as a guide to the engineer for providing the minimum information required for a Technical Drainage Study submittal prior to the County performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual* (Design Manual).

This document is intended as an aid in preparing Technical Drainage Studies for Clark County. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations, and exhibits which may be necessary to properly evaluate the intended land use.

If items are not applicable for the subject site, provide N/A.

DRAINAGE STUDY MINIMUM CRITERIA CHECKLIST

I. GENERAL REQUIREMENT

Yes	No	
		Design Manual Standard Form 1 with the engineer's seal
		Design Manual Standard Form 4
		2 copies of the 24" x 36" drainage plan with the engineer's seal
		A notarized letter from adjacent property owner(s) allowing off-site grading or discharge

II. DRAINAGE PLAN INFORMATION

Yes	No	
		Sheet size: 24" x 36"
		Minimum Scale: 1" = 50'
		Project Name
		Vicinity Map
		Revision Box
		North Arrow and Bar Scale
		Professional Engineer's signature, seal, and date
		Engineer's/Consultant's address and phone number
		Elevation Datum and Benchmark
		Legend for symbols and abbreviations
		Cut/fill scarps, where applicable
		Street Names, Grades, and Widths
		Spot grades for top of curbs and street crowns at lot lines, grad breaks, and along curb returns
		Existing contours encompassing the site and 100 feet beyond with spot elevations for important, excess of 100 feet where appropriate
		Minimum finish floor elevations
		Typical street sections
		Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes
		Property lines
		Right-of-way lines and widths, existing and proposed
		Existing improvements and their elevations
		Delineation of proposed onsite drainage basins indicating area and 10-year and 100- year storm peak flows at basin concentration points
		Drainage flow direction with Q100 and V100
		Cross-sectional detail for channels, including cutoff wall locations

Yes	No	
		Existing and proposed drainage easements and widths shown with sufficient detail
		Existing and proposed drainage easements and widths shown with sufficient detail
		Location and detail of existing, proposed, and future block wall openings
		Detail of flood walls illustrating depth of flow, proposed grouting height, etc.
		Retaining wall locations
		Building and/or lot numbers
		Alignment of all existing, proposed, or future Regional Facilities adjacent to the site
		Limits of existing floodplain based on current FIRM
		For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table

III. HYDROLOGIC ANALYSIS

Yes	No	
		Appropriate soil information
		Input and output information for computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models
		Use of correct precipitation values in and outside the McCarran Airport rainfalls area
		A discussion in the text of the hydrologic analysis justifying basin boundaries and cutoffs, supporting assumptions and calculations
		A summary table of stormwater flows showing basin area, Q10 and Q100 for both individual basins and combined basin flows where applicable
		Copies of supporting technical information referenced from a previously approved study and a comment accepting these flows
		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners

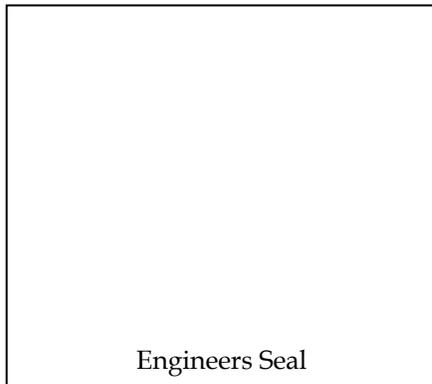
IV. HYDRAULIC ANALYSIS

Yes	No	
		Flow split calculations and supporting documentation for the method of flow split calculations used
		Normal depth street flow calculations and cross sections for all interior and perimeter streets (address dry lane criteria)
		Provide depth x velocity "D x V" products for flows in interior and exterior streets $Q_{10}(D \times V \leq 6)$ $Q_{100}(D \times V \leq 8)$
		Appropriate hydraulic calculations for block wall opening assuming a 50% vertical clogging factor (Assume the lower half of the opening is plugged)
		Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set first floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses where appropriate
		Provide necessary freeboard requirements to set the finished floor elevations
		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners

Yes	No	
		<p>A complete water surface profile analysis (HEC-2, WSPG, etc.) for channel flows and FEMA Zone A flood zones</p> <ul style="list-style-type: none"> · Field survey data · Input and output information · Plotted cross-sections based on survey with proper encroachments · A map showing the location of the cross-sections · Analysis of both sub and supercritical flow segments · A summary table and a discussion of the results in the text of the report
		Provide a 50% clogging factor in the capacity calculation for drop inlets
		Hydraulic calculations for culverts and storm drains

V. MAPS AND EXHIBITS

Yes	No	
		A Flood Insurance Rate Map (FIRM) with the site delineated
		The CCRFCD Master Plan Update Figures (F&H) with the site delineated
		A soils map with the site and the upstream sub-basins delineated
		Off-site drainage basin map for existing, interim and future conditions showing the basin boundaries, concentration points, existing topo and flows in cfs
		On-site drainage basin map for existing and proposed conditions showing the basin boundaries, concentration points, existing topo and flows in cfs
		Vicinity Map with local and major cross streets identified



Submitted By: _____

Date: _____