

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: MountainView Hospital Tower Addition Date: 11/11/2021

Location of Development: a) Descriptive (Cross Streets) North/South: Tenaya Way

East/West: Cheyenne Avenue

b) Section: 15 Township: 20 S Range: 60 E

c) APN : 138-15-510-005

Name of Owner: Sunrise MountainView Hospital

Telephone No.: 702-255-5065 Fax No.: _____ E-Mail Address: _____

Address: 3100 N Tenaya Way, Las Vegas, NV, 89128

Contact Person-Name: Olivia Berryhill Telephone No.: 615-622-7200

* E-Mail Address: oberryhill@catalyst-dg.com Fax No.: _____

Firm: Catalyst Design Group, PC

Address: 1524 Williams Drive, Suite 201, Murfreesboro, TN 37129

Type of Land Development/Land Disturbance Process:

<input type="checkbox"/> Rezoning	<input type="checkbox"/> Subdivision Map	<input type="checkbox"/> Clearing and Grading Only
<input type="checkbox"/> Parcel Map	<input type="checkbox"/> Planned Unit Development	<input type="checkbox"/> Other (Please specify below)
<input type="checkbox"/> Large Parcel Map	<input checked="" type="checkbox"/> Building Permit	

1. Total Owned Land Area: At Site: 37.97 acres Being Developed/Disturbed: 0.26 acres

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? Yes** No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? Yes** No

4. Proposed type of development (Residential, Commercial, Etc.): Commercial

5. Approximate upstream land area which drains to the subject site: 0 acres

6. Has the site drainage been evaluated in the past? YES NO If yes, please identify documentation: September 1994 GC Wallace, Inc. Drainage Study for Sunrise MountainView Hospital and Office Building

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site:
6x3 RCB in NDOT ROW under US 95 approximately 900' south of the intersection with Cheyenne Avenue (from previous permit)

8. Briefly describe your proposed schedule for the subject project:
Construction Start: 3/01/2022



Engineer's Seal

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

***New Required Field**

****Review and concurrence of the Clark County Regional Flood Control District is required.**

	Revision	Date

Local Entity File No.		

REFERENCE: STANDARD FORM 1

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: MountainView Hospital Parking Garage		Map ID: 138-15-510-005
Firm Name: Catalyst Design Group, PC		Engineer: Olivia Berryhill
Address: 1524 Williams Drive, Suite 201		
City: Murfreesboro	State: TN	Zip: 37129
Phone Number: 615-622-7200	Fax Number:	
Property Owner: Sunrise MountainView Hospital		
Address: 3100 N. Tenaya Way		
City: Las Vegas	State: NV	Zip: 89128
Reviewed By:	Date Received:	Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity 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 (MANUAL).

This document is intended as an aid in preparing Technical Drainage Studies. 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 or exhibits which may be necessary to properly evaluate the intended land use.

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

I. GENERAL REQUIREMENT

- | | | |
|--|--------------------------------|--|
| Yes
<input checked="" type="checkbox"/> | No
<input type="checkbox"/> | Design Manual Standard Form 1 with the engineer's seal and signature. |
| <input type="checkbox"/> | N/A | Design Manual Standard Form 4 . |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 2 copies of the 24" x 36" Drainage Plan. |
| <input type="checkbox"/> | N/A | A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge. |

II. MAPS AND EXHIBITS

- | | | |
|--|--------------------------------|---|
| Yes
<input checked="" type="checkbox"/> | No
<input type="checkbox"/> | A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated. |

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

- | Yes | No | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <u>N/A</u> | Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs. |
| <u>X</u> | <input type="checkbox"/> | On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs. |
| <u>X</u> | <input type="checkbox"/> | Vicinity Map with local and major cross streets identified and a north arrow. |

III. DRAINAGE PLAN

- | Yes | No | |
|--------------------------|--------------------------|---|
| <u>X</u> | <input type="checkbox"/> | Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada. |
| <u>X</u> | <input type="checkbox"/> | Minimum scale: 1" = 60'. |
| <u>X</u> | <input type="checkbox"/> | Project name. |
| <u>X</u> | <input type="checkbox"/> | Vicinity Map with local and major cross streets. |
| <u>X</u> | <input type="checkbox"/> | Revision box. |
| <u>X</u> | <input type="checkbox"/> | North arrow and bar scale. |
| <u>X</u> | <input type="checkbox"/> | Engineer's/consultant's address and phone number. |
| <u>X</u> | <input type="checkbox"/> | Elevation datum and benchmark. |
| <u>X</u> | <input type="checkbox"/> | Legend for symbols and abbreviations. |
| <input type="checkbox"/> | <u>N/A</u> | Cut/fill scarps, where applicable. |
| <u>X</u> | <input type="checkbox"/> | Street names, grades, widths. |
| <u>X</u> | <input type="checkbox"/> | Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. |
| <u>X</u> | <input type="checkbox"/> | Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate. |
| <u>X</u> | <input type="checkbox"/> | Minimum finish floor elevations with top-of-curb elevations at upstream end of lot. |
| <input type="checkbox"/> | <u>N/A</u> | Proposed typical street sections. |

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
<u> </u>	<u>N/A</u>	Streets with off-set crowns.
<u>X</u>	<u> </u>	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
<u>X</u>	<u> </u>	Property lines.
<u>X</u>	<u> </u>	Right-of-way lines and widths, existing and proposed.
<u>X</u>	<u> </u>	Existing improvements and their elevations.
<u>X</u>	<u> </u>	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
<u> </u>	<u>N/A</u>	Concentration points and drainage flow direction with Q_{100} and V_{100} and D_{100} in streets.
<u> </u>	<u>N/A</u>	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
<u> </u>	<u>N/A</u>	Location and cross-section of street capacity calculations.
<u> </u>	<u>N/A</u>	Cross-sectional detail for channels, including cutoff wall locations.
<u>X</u>	<u> </u>	Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
<u>X</u>	<u> </u>	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
<u> </u>	<u>N/A</u>	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
<u> </u>	<u>N/A</u>	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.
<u> </u>	<u>N/A</u>	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
<u>X</u>	<u> </u>	Building and/or lot numbers.
<u> </u>	<u>N/A</u>	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
<u> </u>	<u>N/A</u>	Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

- | Yes | No | |
|--------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A 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. Finish floor elevations must be a minimum of 18 inches above BFE. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required). |

IV. HYDROLOGIC ANALYSIS

- | Yes | No | |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A Use of correct precipitation values in and around the McCarran Airport rainfall area. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Copies of supporting technical information referenced from a previously approved study and a statement accepting these results. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | N/A Calculation for impervious area for parking lots and LIDs (if required). |

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
_____	<u>N/A</u>	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
_____	<u>N/A</u>	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. $Q_{100} d \times v \leq 8$. $Q_{10} d \times v \leq 6$ and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
_____	<u>N/A</u>	A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
_____	<u>N/A</u>	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
_____	<u>N/A</u>	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
_____	<u>N/A</u>	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, whichever is greater.
_____	<u>N/A</u>	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. <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 super-critical flow segments.• A summary table and a discussion of the results in the text of the report.
_____	<u>N/A</u>	Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
_____	<u>N/A</u>	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
_____	<u>N/A</u>	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.
_____	<u>N/A</u>	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE:

STANDARD FORM 2