

**Addendum to Technical Drainage
Study Update #2
For
Centennial Toyota
(aka: Prestige Chrysler / Dodge /
Ram / Jeep)**

JOB# 221203

December 2022

Prepared for:

Howard A. Keyes Trust
24025 Park Sorrento, Suite 460
Calabasas, CA 91302

Prepared By:

LOCHSA ENGINEERING
6345 South Jones Boulevard, Suite 100
Las Vegas, Nevada 89118
(702) 365-9312

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Update #2 to Centennial Toyota (Prestige CDRJ) Date: December 20, 2022

Location of Development: a) Descriptive (Cross Streets) North/South: Centennial Center Blvd.

East/West: Grand Montecito Parkway

b) Section: 28 Township: 19 South Range: 60 East

c) APN: 125-28-110-004

Name of Owner: Howard A Keyes Trust

Telephone No.: N/A Fax No.: _____ E-Mail Address: _____

Address: 24025 Park Sorrento, Suite 460 Calabasas, CA 91302

Contact Person-Name: Chris Blake, EI Telephone No.: (702) 365-9312

* E-Mail Address: chris.blake@lochsa.com Fax No.: (702) 365-9317

Firm: Lochsa Engineering

Address: 6345 South Jones Boulevard, Suite 100, Las Vegas, Nevada 89118

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☐	Subdivision Map	☐	Clearing and Grading Only
☐	Parcel Map	☐	Planned Unit Development	☐	Other (Please specify below)
☐	Large Parcel Map	☒	Building Permit		

1. Total Owned Land Area: At Site: 8.30+/- Acres Being Developed/Disturbed: 3.41+/- 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.): Building extension and addition (along the wash bays)

5. Approximate upstream land area which drains to the subject site: N/A

6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: TDS for Centennial Toyota with addendum (DS #2886) and TDS Update #1 (DS #4965)

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Some Flow gets to Centennial Center Blvd North and the remaining flow traverses southeasterly following its historic path on the Site

8. Briefly describe your proposed schedule for the subject project: ASAP



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

COMMENT LETTER

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: December 14, 2022
TO: Land Development Services Department of Public Works		FROM: Caitlyn Alcantara, P.E.  Engineering Associate Department of Public Works
SUBJECT:	Drainage Study for:	COPIES TO:
	Centennial Toyota	Keyes Motors, Inc.
Cross Streets:	SEC of Centennial Pkwy. and Janell St.	Lochsa Engineering
File Number:	F:\Depot\DSMEMOS\DS2886C.doc	Bart Anderson, P.E., DevCo
Parcel Number:	125-28-110-004	
Zoning Action:		
FEMA Flood Zone	YES	No X
Proposed Storm Drain	YES	No X

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	4/19/2001	5/1/2001	Not Acceptable	\$250	\$250
2 nd Submittal	6/8/2001	6/20/2001	Conditionally Accepted	\$250	\$250
3 rd Submittal	8/10/2001	8/13/2001	See Comments Below	N/C	N/C
4 th Submittal	11/29/2022	12/14/2022	See Comments Below	\$100	5060579: \$100
			TOTAL FEES (LDDRS):	\$600.00	----

REMARKS:

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public Works Department concurrence.

1. The overall parking lot improvement area is larger than 1 acre. Per **Section 1500** of the Clark County Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual, the subject improvements must provide for Low Impact Development (LID) measures. Review and address the issue in the next submittal.
2. In several locations, flow is being directed to an A-curb. Either change the A-curb to L-curb or provide an alternative to guide the flow away from the curb.
3. Provide a section showing the project site from the western boundary to the eastern boundary, including the existing properties on either end of the project site.
4. Provide existing grades including grading tags 100-feet past any proposed improvements.
5. Explain the purpose of the valley gutter between the proposed building expansion and proposed carwash. The valley gutter between the concrete area and the eastern boundary is valid as it is on asphalt and is channelized by the valley gutter. However the valley gutter between the buildings seems redundant as it connects the concrete of the valley gutter to the concrete of the area.
6. The proposed southern valley gutter does not convey any flow on the east end. If you follow the flowline, on the west end it is channelized and as you go east the flow spills out of the valley gutter traveling south to a new flowline on the border of the proposed improvements.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429.

END OF REMARKS
CAA

T/R/S: T19S/R60E/28
AREA G-28

December 21, 2022

Caitlyn Alcantara, P.E.
Engineering Associate,
City of Las Vegas Department of Public Works,
495 S. Main Street,
Las Vegas, NV 89101

Subject: Addendum to Technical Drainage Study for Centennial Toyota
CLV No. DS2886C
(Lochsa Engineering Project No. 221203)

Dear Caitlyn,

Lochsa Engineering is in receipt of the comment letter, dated: November 14, 2022, for the above referenced project. In response to your comments, the following responses are being offered:

1. The overall parking lot improvement area is larger than 1 acre. Per **Section 1500** of the Clark County Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual, the subject improvements must provide for Low Impact Development (LID) measures. Review and address the issue in the next submittal.

Response 1: Noted. We have provided an 80ft long BMP swale and 40ft BMP swale at the SEC of the improvements to treat a minimum of 75% of the parking lot improvements. We have provided 4" riprap in the BMP swales. See provided calculations.

2. In several locations, flow is being directed to an A-curb. Either change the A-curb to L-curb or provide an alternative to guide the flow away from the curb.

Response 2: Noted. We have revised the areas where flow is directed to a curb to be 'L' curb. See revised Plans.

3. Provide a section showing the project site from the western boundary to the eastern boundary, including the existing properties on either end of the project site.

Response 3: Noted. A section showing the project site from the western boundary to the eastern boundary, including the existing properties on either end of the project site has been provided. See revised Detail Sheet.

4. Provide existing grades including grading tags 100-feet past any proposed improvements.

Response 4: Noted. Existing grades (contours) including grading tags 100-feet past all proposed improvements have been provided. See revised Plans.

5. Explain the purpose of the valley gutter between the proposed building expansion and proposed carwash. The valley gutter between the concrete area and the eastern boundary is valid as it is on asphalt and is channelized by the valley gutter. However the valley gutter between the buildings seems redundant as it connects the concrete of the valley gutter to the concrete of the area.

Response 5: Noted. The valley gutter was not needed as this area is entirely concrete already. A concrete swale will remain without the valley gutter where flow is conveyed east. See revised Plans.

6. The proposed southern valley gutter does not convey any flow on the east end. If you follow the flowline, on the west end it is channelized and as you go east the flow spills out of the valley gutter traveling south to a new flowline on the border of the proposed improvements.

Response 6: Noted. This has been revised to keep the southern valley gutter channelized for the flows north of the valley gutter. That way this portion of the parking lot improvement flow from the west can get treated in the proposed BMP swale at the SEC of the improvements.

The flows south of the valley gutter sheet flow in a southeasterly direction and a majority of these flows will discharge to the south proposed BMP swale. Please note that we have provided swales and improved the situation the best we can even with Site restrictions of the Site already being constructed.

If you have any questions or further comments, please contact our office at your convenience.

Sincerely,

Lochsa Engineering



Chris Blake, EI



12/22/22

COMMENT #1

BMP Swale Capacity Worksheet for Triangular Channel

Project Description	
Worksheet	BMP Swale Capacity
Flow Element	Triangular Channel
Method	Manning's Form
Solve For	Discharge

Input Data	
Mannings Coeff	0.033
Slope	0.010000 ft/ft
Depth	0.75 ft
Left Side Slope	4.00 H : V
Right Side Slope	4.00 H : V

Results	
Discharge	5.16 cfs
Flow Area	2.2 ft ²
Wetted Perim	6.18 ft
Top Width	6.00 ft
Critical Depth	0.64 ft
Critical Slope	0.024215 ft/ft
Velocity	2.29 ft/s
Velocity Head	0.08 ft
Specific Energy	0.83 ft
Froude Number	0.66
Flow Type	Subcritical

4" riprap (see MANNING'S CALC Next sheet)

6' WIDE, 4:1 SS

Capacity (> 2yr Flow)

2yr Flow = .5 cfs/Acre

BMP swale treats 1.80 ac

$$1.80 \text{ ac} \times \frac{.5 \text{ cfs}}{\text{Acre}} = \underline{\underline{.90 \text{ cfs}}} < 5.16 \text{ cfs capacity}$$

✓

BMP Swale Capacity

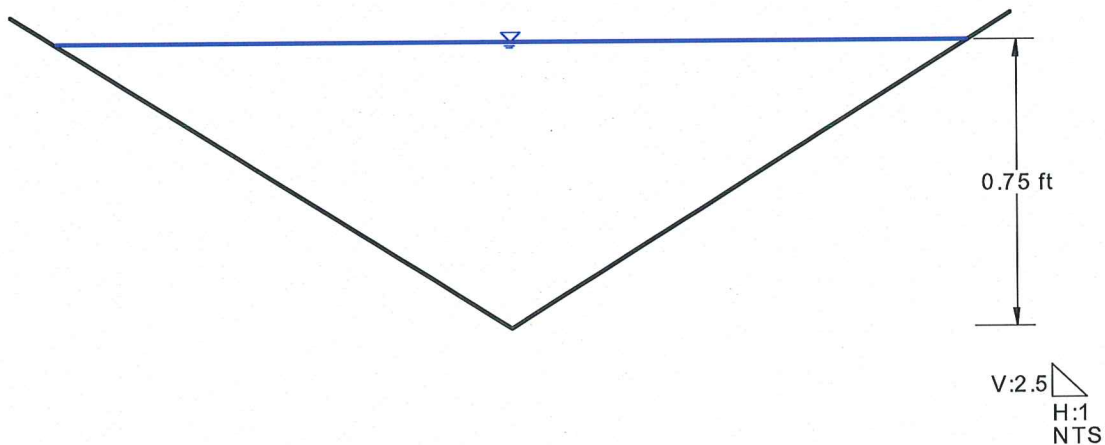
Cross Section for Triangular Channel

Project Description

Worksheet	BMP Swale Ca
Flow Element	Triangular Char
Method	Manning's Form
Solve For	Discharge

Section Data

Mannings Coeffic	0.033
Slope	010000 ft/ft
Depth	0.75 ft
Left Side Slope	4.00 H : V
Right Side Slope	4.00 H : V
Discharge	5.16 cfs



Manning's Calculation

CENTENNIAL TOYOTA - PRESTIGE

Date: DECEMBER, 2022

Lochsa Job No. 221203

Calculated By: Chris Blake

From Section 705.4.4 of Hydrologic Criteria and Drainage Design Manual (HCDDM)
Equation 732:

$$n = 0.0395(D50)^{1/6}$$

n = Manning's coefficient

D50 = Mean stone size in ft, rock size for which 50% (by weight) of the riprap is smaller

Solve for n: D50= 4.0 inches

$$n = 0.0395(D50)^{1/6}$$

D50= 0.333 ft

n = 0.033

<<<< Manning's n-value for 4-inch Loose Riprap

(
For the
BMP SWALE