



**Update to the  
Technical Drainage Study  
for**

***AREA 15 DISTRICT 2***

**Date Prepared:**  
January 2024

**Prepared for:**  
Fisher Brothers Las Vegas, LLC  
299 Park Avenue, 42<sup>nd</sup> Floor  
New York, NY 10171  
212.940.6262

**Prepared by:**  
Kimley-Horn and Associates, Inc.  
6671 Las Vegas Boulevard South, Suite 320  
Las Vegas, NV 89119  
702.862.3600

**Kimley»»Horn**

# HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

## DRAINAGE STUDY INFORMATION FORM

Name of Development: Area 15 District 2 Date: January 2024

Location of Development: a) Descriptive (Cross Streets) North/South: Rigel Avenue & Rancho Drive

East/West: Meade Avenue & Sirius Avenue

b) Section: 8 Township: 21 South Range: 61 East

c) APN : 162-08-702-001, 162-08-702-002, 162-08-303-034, 162-08-799-003, 162-08-799-009, and 162-08-799-009

Name of Owner: Fisher Brothers Las Vegas, LLC

Telephone No.: 212.940.6262 Fax No.: n/a E-Mail Address: pbrohn@fisherbrothers.com

Address: 299 Park Avenue, 42nd Floor; New York, NY 10171

Contact Person-Name: Rachael R. Dennis, P.E. Telephone No.: 702.734.5666

\* E-Mail Address: Rachael.Dennis@kimley-horn.com Fax No.: \_\_\_\_\_

Firm: Kimley-Horn

Address: 6671 Las Vegas Boulevard South, #320, Las Vegas NV 89119

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 checked="" type="checkbox"/> Other (Please specify below)
<input type="checkbox"/> Large Parcel Map	<input checked="" type="checkbox"/> Building Permit	<input type="checkbox"/> Grading Permit

1. Total Owned Land Area: At Site: +/- 11.06 ac Being Developed/Disturbed: +/- 11.06 ac

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.): Parking Garage, Commercial

5. Approximate upstream land area which drains to the subject site: +/- 4.38 sq. mi.

6. Has the site drainage been evaluated in the past?  YES  NO If yes, please identify documentation: Area 15 TDS (DS-4921); Area 15 Event Pkg Lot TDS (DS-5288); Area 15 - Phase 2 TDS (DS-5313); Area 15 - Dist 2 TDS (DS-5627)

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Surface runoff into Rancho Drive, Rigel Avenue, & Meade Avenue

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

Engineer's Seal 1/25/24

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

# REGIONAL FLOOD CONTROL DISTRICT



**Steven C. Parrish, P.E.**  
General Manager/Chief  
Engineer

**BOARD OF DIRECTORS**

**Commissioner  
Justin Jones**  
Chair  
Clark County

**Councilman  
Isaac Barron**  
Vice-Chair  
City of North Las Vegas

**Mayor  
Carolyn Goodman**  
City of Las Vegas

**Mayor  
Joe Hardy**  
City of Boulder City

**Mayor Pro Tem  
Brian Knudsen**  
City of Las Vegas

**Commissioner  
Tick Segerblom**  
Clark County

**Councilman  
Dan Shaw**  
City of Henderson

**Councilman  
Paul Wanlass**  
City of Mesquite

April 26, 2023

Mr. Oh Sang Kwon, P.E.  
City of Las Vegas Department of Public Works  
495 S Main Street, 5th Floor  
Las Vegas, NV 89101

**DISTRICT CONCURRENCE: AREA 15 DISTRICT 2  
(DS5627C) (RFCD No. 23-14333)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated November 23, 2022, Addendum No. 1 dated January 17, 2023, and Addendum No. 2 dated February 22, 2023, for above-mentioned project as submitted by KIMLEY-HORN. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated March 20, 2023.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage*.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by KIMLEY-HORN may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

STEVEN C. PARRISH, P.E.  
General Manager/Chief Engineer

BY: *Ching C. Wang*  
Ching C. Wang (Apr 27, 2023 06:27 PDT)  
Ching C. Wang, P.E.  
Principal Civil Engineer

CCW:rm

c: RACHAEL R. DENNIS, KIMLEY-HORN

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2023\L-23-14333.docx

<b>CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM</b>		<b>DATE:</b> April 26, 2023
<b>TO:</b> Land Development Services Department of Building & Safety		<b>FROM:</b> Neil Wacaser, P.E. <i>NW</i> Engineering Associate Department of Public Works
<b>SUBJECT:</b>	Drainage Study for:	<b>COPIES TO:</b>
Area 15 District 2		Kimley-Horn & Associates, Inc.
<b>Cross Streets:</b>	SWC of Rancho Drive & Meade Avenue	Fisher Brothers Las Vegas, LLC
<b>File Number:</b>	F:\Depot\DSMemos\DS5627D.doc	Bart Anderson, P.E., DevCo.
<b>Parcel Number:</b>	162-08-702-001, 162-08-702-002, 162-08-303-034, 162-08-799-003, 162-08-799-009	CCRFCD
<b>Zoning Action:</b>	22-0425-TMP1	
<b>FEMA Flood Zone</b>	YES	NO <b>X</b>
<b>Proposed Storm Drain</b>	YES	NO <b>X</b>

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 <sup>st</sup> Submittal	11/23/2022	12/08/2022	Not Approved	\$400.00	5048051: \$400
2 <sup>nd</sup> Submittal	1/17/2023	2/6/2023	Not Approved	\$400.00	5111599: \$400
3 <sup>rd</sup> Submittal	2/22/2023 (Paid on 2/27/2023)	3/16/2023	See Comments Below	\$400.00	5161732: \$400
	4/27/2023		RTC Concurrence received	n/a	
<b>TOTAL FEES (LDDRS):</b>				<b>\$1,200.00</b>	----

**REMARKS:**

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

<b>X</b>	is approved subject to conformance to all City standards and the following conditions: 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.

- This drainage study is acceptable in concept;** however, *City of Las Vegas* will not formally accept the study until the *Clark County Regional Flood Control District (CCRFCD)* has issued a letter of concurrence. The engineer should contact the CCRFCD to confirm that they have begun their review.

Please note that effective March 15, 2019, the CCRFCD adopted new requirements for drainage study concurrence submittal. Follow the link below for specific guidance.

<http://gustfront.ccrfcd.org/LandDev/LandDev.aspx>

- Repeat Comment: Sheet C03.04:** There is a pond being created at the northeast wall of the trash enclosure. Review and revise accordingly.

The response has not resolved the local sump issue. Particularly, there are two elevations at "4.20TC" along the north wall of the trash enclosure area which are lower than the vicinity area, ie, creating a local sump condition.

3. Provide a note on all grading plans (Standard Note No. 6): Post-Construction BMPs (PCBMPs) / Control Measures noted on the Grading Plans are mandatory permanent regulatory stormwater pollution controls. These PCBMPs must be installed per the approved plans and must be permanently maintained.

**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**  
HDR/CAA/AYS/NW

T/R/S: T21S/R61E/08  
AREA R-08



January 25, 2024

Mr. Albert Sung, P.E.  
City of Las Vegas Flood Control  
333 Rancho Drive  
Las Vegas, NV 89106

**RE: *Update to the Technical Drainage Study for Area 15 District 2***

Dear Mr. Sung,

Attached is one (1) copy of the *Update to the Technical Drainage Study for Area 15 District 2* for your review. This letter certifies that all items provided on the electronic submittal (CD) match the paper version bound into the study.

With Kimley-Horn, you should expect more and will experience better. Please contact me at (702) 734-5666 or [rachael.dennis@kimley-horn.com](mailto:rachael.dennis@kimley-horn.com) should you have any questions or concerns.

Sincerely,

A handwritten signature in black ink that reads "Rachael R. Dennis".

Rachael R. Dennis, P.E.

A handwritten signature in black ink that appears to read "Sean Schofield".

Sean Schofield, Analyst

**Update to the  
Technical Drainage Study  
for**

***AREA 15 DISTRICT 2***

**Date Prepared:**  
January 2024

**Prepared for:**  
Fisher Brothers Las Vegas, LLC  
299 Park Avenue, 42<sup>nd</sup> Floor  
New York, NY 10171  
212.940.6262

**Prepared by:**  
Kimley-Horn and Associates, Inc.  
6671 Las Vegas Boulevard South, Suite 320  
Las Vegas, NV 89119  
702.862.3600



January 25, 2024

Mr. Albert Sung, P.E.  
City of Las Vegas Flood Control  
333 Rancho Drive  
Las Vegas, NV 89106

**RE: *Update to the Technical Drainage Study for Area 15 – Phase 2 (DS5627)***

Dear Mr. Sung,

The purpose of this letter is to serve as the **Update** to the subject project. The *Technical Drainage Study for Area 15 District 2* (hereinafter referred to as **TDS**) was approved by CLV on April 26, 2023. Pertinent reference material has been included in **Appendix C**. Pertinent reference material has been included in **Appendix C**. The **Update** included herein, is intended to supersede data contained in previous studies.

Since approval of **TDS**, the overall site layout has been revised. The proposed revisions include:

- Revised building numbers, building footprints, finished floor elevations, and onsite grading. Onsite prorates and hydraulic sections have been updated accordingly. Refer to revised hydraulic summary tables on **Figures PRO-1** and **PRO-2** in **Appendix A**. The onsite and offsite normal depth sections and flow rates have been calculated from their respective tributary subbasins. Updated onsite and offsite hydraulic calculations have been included in **Appendix B**. It should be noted that only the flowrates were revised along Rancho Drive due to the revised storm drain outlet locations. The **Finished Floor Elevation Table** in **Appendix B** identifies the proposed finished floor protection measures for all the proposed Buildings.
- Revised onsite storm drain systems to accommodate onsite grading changes and new roof drain discharge locations. Roof drains will now outlet directly into the adjacent streets limiting onsite flow depths. Revised onsite storm drain alignments, drop inlets, trench drains, and wall penetration locations have been shown on **Figure FAC-1** in **Appendix A**. Proposed onsite local storm drain ranging in size from **6-inch to 10-inch PVC** will convey flows captured by the proposed trench drains and drop inlets to outlet through the curb into the existing adjacent roadways. Copies of proposed drop inlet, trench drain, and storm drain calculations have been included in **Appendix B**.
- Added onsite swales at the northeast and southwest corners of the site to accommodate the revised onsite grading. The swales have been provided to convey onsite flows into the adjacent streets. The swale normal depth sections and flow rates have been calculated from their respective tributary subbasins. Refer to revised hydraulic summary tables on **Figures PRO-1** and **PRO-2** in **Appendix A**. Updated hydraulic normal depth calculations have been included in **Appendix B**. Block wall openings have also been provided to allow flows to discharge into the adjacent roadways. The proposed 48" x 16" block wall openings will convey the 100-year

storm flows assuming the bottom 50% is clogged. Updated block wall opening calculations have been provided in **Appendix B**.

- Revised grading along the pedestrian ramps east and west of Rigel Avenue. Since the landscaped areas adjacent to the parking garage and pedestrian ramp were revised, the calculated impervious areas were updated accordingly. Based on hydraulic analysis, the proposed landscaped swales will convey, contain, and treat the peak BMP discharge (QBMP) as well as facilitate the 100-year peak flow rate; these calculations are included in **Appendix C**. Refer to the revised **LID Basin Map** included in **Appendix C**. The proposed BMPs are shown on the grading plan included in **Appendix E**. An additional block wall opening will allow a portion of the flows generated onsite to discharge into Rigel Avenue.
- The proposed conditions HEC-RAS Model **Cross Section 1170** was revised to match the new grading for the pedestrian ramp near the intersection of Rigel Avenue and Sirius Avenue. As a result of the revised cross section elevations, the water surface elevation at **Cross Section 1170** increased to an elevation of **2110.98 feet** resulting in additional flows overtopping the existing lateral weir to the north in Rigel Avenue. A total flowrate of **115 cfs** (previously 78 cfs) will weir north in Rigel Avenue, turn east in Meade Avenue, and will ultimately be conveyed within Rancho Drive. Flows for Cross Sections in Rigel Avenue (**RA**) and Meade Avenue (**MA**) have been updated accordingly. Refer to the revised hydraulic summary tables on **Figures PRO-1 and PRO-2** in **Appendix A**. Although the flows increased within the adjacent roadway corridor, the proposed driveways along Rigel Avenue and Meade Avenue are humped 6-inches above the WSE in the street. Note that the existing buildings north of the project site along Meade Avenue are scheduled for demolition (by others) and will not be impacted by the proposed increased flows in Meade Avenue. A lateral weir has been added at **Cross Section 1170** to show that the proposed walls along the pedestrian ramp will prevent flows from entering the site from Sirius Avenue. Due to onsite grading constraints, trench drains have been provided directly downstream of the pedestrian ramp walls to ensure any flows adjacent to the proposed District 2 Buildings will be conveyed back into the adjacent roadways. Additionally, HEC-RAS **Cross Section 1036** was adjusted to include the additional 5-feet between the sidewalk and proposed/existing walls. Refer to the revised RAS summary tables on **Figures PRO-1 and PRO-2** in **Appendix A**. A copy of the HEC-RAS Model has been included in **Appendix B** and on the Data CD in **Appendix F**.

Refer to the **Improvement Plans in Appendix E** for the revised grading and storm drain changes. The proposed project generally maintains existing drainage patterns, the proposed buildings meet finished floor criteria, and is in general conformance with the approved **TDS**. The methodologies and calculations presented in this report are in compliance with the *CCRFCD Hydrologic Criteria and Drainage Design Manual* (Manual).

In the unlikely event the drains at the proposed low points become completely clogged, emergency overflow paths have been provided to protect the adjacent finished floors.

In general, the overall drainage patterns for the site are consistent with the previously approved referenced drainage studies and the proposed site plan does not significantly alter existing peak flows or the character of flows downstream of the development and do not pose any negative impacts on the downstream facilities and development.

With Kimley-Horn, you should expect more and will experience better. Please contact me at (702) 734-5666 or [rachael.dennis@kimley-horn.com](mailto:rachael.dennis@kimley-horn.com) should you have any questions.

Sincerely,



Rachael R. Dennis, P.E.



Sean Schofield, Analyst

## LIST OF APPENDICES

### Appendix A – Documents & Figures

- PRO-1: Overall Proposed Condition Drainage Map
- PRO-2: Onsite Proposed Condition Drainage Map
- FAC-1: Onsite Facility Map
- FAC-2: Parking Garage Facility Map

### Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Proposed Conditions Street Sections
- Normal Depth Calculations - Onsite Sections
- Normal Depth Sections – Swales
- Normal Depth Sections – Block Wall Openings
- Emergency Overflow Calculations
- Trench Drain Calculations
- Nomographs
- Full Flow Capacity Calculations
- HEC-RAS Proposed Conditions Analysis Model (SiriusAve.prj) (On Data CD)
  - Proposed Conditions Report
  - Summary Tables
  - Reach Profile
  - Cross Sections
  - Lateral Weir Summary Tables
- Finished Floor Elevation Table

### Appendix C – Parking Lot LID Calculations

- LID Parking Lot Map & Calculations

### Appendix D – Reference Material

- *Technical Drainage Study for Area 15 District 2; April 2023 (DS5762).*

### Appendix E – Improvement Plans

### Appendix F – Data CD