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UPDATE #3 TO THE TECHNICAL DRAINAGE STUDY FOR

SUMMERLIN VILLAGE 27 PARCEL E CUSTOM LOTS MASS GRADING ADDENDUM #1

62027-201A

August 2024

8/28/24

Prepared for:
The Howard Hughes Company, LLC
1700 S Pavilion Center Dive, STE 250
Las Vegas, NV 89135
Phone: (702) 791-4300

Prepared by GCW, Inc.

1555 South Rainbow Blvd
Las Vegas, NV 89146

P: 702.804.2000
F: 702.804.2298

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HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin Village 27 Parcel E Custom Lots Mass Grading Date: August 2024

Location of Development: a) Descriptive (Cross Streets) North/South: Park Drift Trail

East/West: Sunset Run Drive

b) Section: 15, 21 Township: 20S Range: 59E

c) APN : 137-16-811-001; 137-15-310-002

Name of Owner: Owner:The Howard Hughes Company

Telephone No.: (702) 791-4300 Fax No.: N/A E-Mail Address: April.Chapman@howardhughes.com

Address: 1700 S Pavilion Center Drive, Suite 250; Las Vegas, Nevada 89135

Contact Person-Name: Lee Gong, PhD, PE, CFM **Telephone No.:** (702) 804-2000

* **E-Mail Address:** LGong@gcwengineering.com **Fax No.:** (702) 804-2299

Firm: GCW, Inc.

Address: 1555 South Rainbow Boulevard, Las Vegas, Nevada 89146

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 344.12 acres Being Developed/Disturbed: +/- 49.9 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.): Mass Grading
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: Summerlin West Village 27 & 31 Master Conseptual Drainage Study for Tributary Area to Reverance (V26 Detetnion Basin. Atkins 2021
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Northeast towards Existing Channel.
8. Briefly describe your proposed schedule for the subject project: ASAP

8/28/24
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

62027-201A

August 27, 2024

Albert Y. Sung, P.E.
City of Las Vegas, Public Works
495 S. Main Street
Las Vegas, NV 89101

Re: **Update #3 to the Technical Drainage Study for Summerlin Village 27 Parcel E Custom Lots Mass Grading Addendum #1**

Dear Mr. Sung,

This letter is to certify that all documents provided on electronic submittal (CD) match the hardcopy version of the study.

Respectfully submitted,

Lee Gong, PhD, P.E., CFM
Project Engineer

8/28/24

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Las Vegas, Nevada 89146
O 702.804.2000
F 702.804.2299
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62027-201A

August 28, 2024

Re: Response to City of Las Vegas Comments on the Update #3 to the Technical Drainage Study for Summerlin Village 27 Parcel E - Custom Lots Mass Grading

This report addresses the City of Las Vegas (CLV) review comments dated August 22, 2024, regarding the project in its entirety. Below are individual responses to each comment included in the review letter.

Comment 1:

The project proposes to mass grade Parcel E with numbers of temporary swales and berms at various locations of the parcel. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (berms or channels) and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. Once the drainage study is conditionally approved, the engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to City's Land Development Section (229-6371) to begin the agreement and bond process.

In order for the maintenance bond to be released in the future, a drainage update / letter will be required to justify that the offsite berms / channels are no longer necessary and can be removed.

Response:

Noted.

Comment 2:

Per the “Summerlin V27 Debris Basin” study, the debris basin outflow at the northeast side of Parcel E is 2,270 cfs. However, Hydraulic Sections 4 and 10 in Figure 7 only registered a 100-year flow of 947 cfs. Address and resolve in the next submittal. Verify that the newly graded area adjacent to the wash will not be inundated.

Response:

Note that the Debris Basin was designed using flows from the Parcel M & E Channel. The V27 Parcel E Mass Grading study assumes that neither the Parcel M & E Channel nor the Debris Basin are currently in place. Consequently, the upstream watershed is considered in its existing condition, with offsite flows referenced from the Summerlin West 27 & 31 MCDS. Therefore, the flow rate used is appropriate for this interim condition, ensuring that the graded area adjacent to the wash will not be inundated, as demonstrated in this update. Additionally, the Debris Basin was already addressed in the recently approved TDS for V27 Parcel E Custom Lot Improvements (final design) (DS5681), which analyzes the project site improvements with the Parcel M & E Channel and Debris Basin in place. Email Coordination with CLV has been provided in the Appendix.

Please contact me via email at LGong@gcwengineering.com if you have any questions or require additional information.

Respectfully,

GCW, INC.

Lee Gong, PhD, P.E, CFM
Flood Control Division

APPENDIX

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: August 22, 2024
TO: **Land Development Services** Department of Building & Safety			**FROM:** Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:		**COPIES TO:**
Summerlin Village 27 Parcel E - Custom Lots Mass Grading – Update #3			GCW, Inc.
Cross Streets:	NWQ of Park Drift Trail & Sunset Run Drive		The Howard Hughes Company
File Number:	F:\Depot\DSMemos\DS5677G.doc		Bart Anderson, P.E.; DevCo
Parcel Number:	137-21-501-003; 137-15-401-003		CCRFCD
Zoning Action:	23-0176-TMP1; 23-0176-MOD1		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	5/16/2023	6/14/2023	Not Approved	$400.00	5276022: $400
2nd Submittal	7/11/2023	7/25/2023	Not Approved	$400.00	5350274: $400
3rd Submittal	8/9/2023	8/16/2023	Conditional Approval	$400.00	5391377: $400
CCRFCD	9/21/2023	9/26/2023	Concurrence Received	N/C	N/C
4th Submittal	9/20/2023	10/3/2023	Approved	$100.00	5443744: $100
5th Submittal	12/4/2023	12/14/2023	Approved	$100.00	5546358: $100
6th Submittal	8/6/2024	8/22/2024	See Comments Below	$100.00	5877733: $100
			TOTAL FEES (LDDRS):	**$1,500.00**	**----**

REMARKS:

6th Submittal: Update #3 for Grading Revision at the northeast corner of Parcel E

5th Submittal: Update #2 to revise mass grading in order to better balance the cut/fill of the site

4th Submittal: Update #1 to remove a bypass lane at the parcel entrance of the development

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 project proposes to mass grade **Parcel E** with numbers of temporary swales and berms at various locations of the parcel. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (berms or channels) and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. Once the drainage study is conditionally approved, the engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to *City's Land Development Section* (229-6371) to begin the agreement and bond process.

In order for the maintenance bond to be released in the future, a drainage update / letter will be required to justify that the offsite berms / channels are no longer necessary and can be removed.

2. Per the "*Summerlin V27 Debris Basin*" study, the debris basin outflow at the northeast side of Parcel E is 2,270 cfs. However, *Hydraulic Sections 4* and *10* in Figure 7 only registered a 100-year flow of 947 cfs. Address and resolve in the next submittal. Verify that the newly graded area adjacent to the wash will not be inundated.

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.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Update and accepted by the *City of Las Vegas Flood Control Section*. Additionally, final approval of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

***** The City of Las Vegas Flood Control is standardizing the file naming of drainage studies and plans during the digitizing process. When saving the project files in the CD or thumb drive, please follow the system below:**

If drainage study only contains one combined file, use the following naming convention in Document Title:

1st Submittal DS and Plans (for first and original submittal);

2nd Submittal DS and Plans (for second submittal (addendum #1)) etc.

If drainage study contains multiple files, use the following naming convention in Document Title:

1st Submittal DS (for the report of the drainage study)

1st Submittal Plan 1 (could be the drainage condition maps)

1st Submittal Plan 2 (could be the improvement plans) etc.

END OF REMARKS
HDR/AYS

T/R/S: T20S/R59E/21
AREA K-21

COMMENT #2

From: Albert Sung <YSung@LasVegasNevada.GOV>
Sent: Tuesday, August 27, 2024 2:17 PM
To: Lee Gong <LGong@gcwengineering.com>
Subject: RE: V27 E Mass

Ok, put the explanation in the addendum. Thanks, Lee.

From: Lee Gong <LGong@gcwengineering.com>
Sent: Tuesday, August 27, 2024 8:27 AM
To: Albert Sung <YSung@LasVegasNevada.GOV>
Subject: RE: V27 E Mass

Good Morning Albert,

Have you had a chance to review the following email I sent you last week for V27 Parcel E (DS5677G)? Please let me know if you need any additional information.

Thanks.

Lee Gong, PhD, PE, CFM
GCW, Inc. | Direct: 702 804 2134
Sending us a large file? **Use the** GCW File Transfer Site

From: Lee Gong
Sent: Thursday, August 22, 2024 5:12 PM
To: 'Albert Sung' <YSung@LasVegasNevada.GOV>
Subject: RE: V27 E Mass

Hi Albert,

The attached comment letter for the Summerlin Village 27 Parcel E Custom Lots Mass Grading (DS5677G) project has been received. We have a question regarding Comment #2.

Comment #2

Per the "Summerlin V27 Debris Basin" study, the debris basin outflow at the northeast side of Parcel E is 2,270 cfs. However, Hydraulic Sections 4 and 10 in Figure 7 only registered a 100-year flow of 947 cfs. Address and resolve in the next submittal. Verify that the newly graded area adjacent to the wash will not be inundated.

Response:

Note that the Debris Basin was designed using flows from the Parcel M & E Channel, as shown in the attached excerpt. The V27 Parcel E Mass Grading study assumes that neither the Parcel M & E Channel nor the Debris Basin is currently in place. Consequently, the upstream watershed is considered in its existing condition, with offsite flows referenced from the Summerlin West 27 & 31 MCDS. Therefore, the flow rate used is appropriate for this interim condition, ensuring that the graded area adjacent to the wash will not be inundated, as demonstrated in this update. Additionally, the Debris Basin was already addressed in the recently approved TDS for V27 Parcel E Custom Lot Improvements (final design) (DS5681), which analyzes the project site improvements with the Parcel M & E Channel and Debris Basin in place.

Please let us know if this is acceptable and let me know if you have any additional questions.

Thanks.

Lee Gong, PhD, PE, CFM
GCW, Inc. | Direct: 702 804 2134
Sending us a large file? **Use the** GCW File Transfer Site

From: Albert Sung <YSung@LasVegasNevada.GOV>
Sent: Thursday, August 22, 2024 3:35 PM
To: Lee Gong <LGong@gcwengineering.com>
Subject: V27 E Mass

Here you go, Lee.

Albert Y. Sung, P.E.
Project Engineer
Public Works Dept. / Flood Control
(702) 229-2001
495 S. Main Street
Las Vegas, NV 89101

lasvegasnevada.gov

3.4. Hydrology Results

3.4.1. HEC-1 Results

The HEC-1 results for the 100-year 6-hr event in the developed condition are provided in **Appendix B**. A summary of the developed condition flows are also shown in the local and project hydrology overview maps in **Figure 3-1** and **Figure 3-2**.

4. Hydraulics Analysis

4.1. General

Hydraulics analyses of the debris basin, outlet storm drain, and of the interim stilling basin outfall riprap-pad were performed. The goal was to evaluate the performance of the debris basin, flows within the storm drain outlet and to investigate the need for, and extent of, riprap protection in the interim outfall stilling basin.

4.2. Proposed Design

The debris basin accepts flows from 2 main channels. There is a natural channel to the west that transports the flows from Subbasins OFF1-4 and OFF 1-5. A 4:1 concrete embankment is the inlet for these flows. The second channel is the Parcel E boundary drainage channel (GCW), that is transporting flows from the Village 31 Detention Basin, and several other onsite and offsite subbasins. The steep transitions the inlet channels to a 0.05% slope will act to dissipate the inflow energy and settle much of the debris. Additionally, an earthen berm is to be located around the outlet structure to further dissipate the inflows and facilitate the settling of sediment. More detailed design and hydraulic analysis of the inflow structures will be provided at the 90% design level.

The interior face of the basin is comprised of a 14.5 ft. concrete wall with one step. The first wall is 9.7 ft. tall with a second 5 ft. wall on top.

The Outlet Structure consists of four parallel 12’ x 6’ RCBs. In the interim condition these RCB’s daylight a few hundred feet downstream of the basin and discharge onto an outlet riprap pad. In the ultimate condition these RCBs will continue to an energy dissipator, and the flow will outlet into a natural channel at the Summerlin West property line and back into the RRNCA. Based on the interim outlet analysis, it was determined that a total length of 80 feet of 12-inch riprap is recommended, downstream of the outfall RCBs. A trash rack will also be designed and analyzed at the 90% level.

4.3. Hydraulic Analysis Methodology and Results

The outlet RCB facility was analyzed in HY-8 to ensure the inlet control depth did not exceed the height of the 14.5 ft. embankment face. The inlet control depth at the 100-yr design flow of 2,403 cfs was calculated in HY-8 to be 7.18 ft., providing over 7 ft. of freeboard. The HY-8 report can be seen in **Appendix C**. A stage-storage-discharge curve was also created and input into HEC-1 to gage the performance of the debris basin and outlet facilities. The primary HEC-1 model provided in this TDS does not include the Village 27 Debris Basin storage card, in effort to provide more conservative estimates of down stream flows (under the assumption that the debris basin does not provide and attenuation of flows). This alternative HEC-1 model can be found in **Appendix C**.

The hydraulics for the debris basin outfall and riprap stilling basin were modeled using WSPG-W for the outfall and a spreadsheet utilizing the methods described in the Hydrologic Criteria and Drainage Design Manual (HCDDM), for the outlet riprap pad. The model outputs and calculation files are included in **Appendix C**.