

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin Village 26 Parcel L Date: May 31, 2022

Location of Development: a) Descriptive (Cross Streets) North/South: Reverence Pkwy.

East/West: Lake Mead Blvd.

b) Section: 14 Township: 20S Range: 59E

c) APN : 137-14-715-038

Name of Owner: Owner: P N II INC ; Developer: Pulte Homes

Telephone No.: (702) 914-4836 Fax No.: (702) 914-3100 E-Mail Address: brenin.anderson@pultegroup.com

Address: 7555 S. Tenaya Way #200, Las Vegas, NV 89113

Contact Person-Name: Kevin Ramage, P.E, DBA Telephone No.: (702) 804-2000

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

Firm: GCW, Inc.

Address: 1555 S. Rainbow Blvd. Las Vegas, NV 89146

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	☐	Update#1 to TDS (DS5533C)

1. Total Owned Land Area: At Site: +/- 15.69 acres Being Developed/Disturbed: +/- 15.69 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.): Residential.

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: MDS for Summerlin Village 26 Reverence, GCW, Inc 2015.

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: The project site will discharge northeast towards a 48" RCP and into a 20'X7.5' Concrete Channel.

8. Briefly describe your proposed schedule for the subject project: The client intends to start construction as soon as practical. Any expediting of this process is appreciated.



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

764-204-023

May 31, 2022

Albert Y. Sung, P.E.
Flood Control Project Engineer
City of Las Vegas Land Development Services
Flood Control Division
495 S. Main Street
Las Vegas, Nevada 89101

Re: Update#1 the Technical Drainage Study for Summerlin Village 26 - Parcel L (DS5533C)

Dear Mr. Sung,

This letter is to certify that all documents provided in the Update#1 to the Technical Drainage Study for Summerlin Village 26 – Parcel L electronic submittal (CD) matches

100% the hardcopy version of the study.

Respectfully submitted,

Dr. Kevin Ramage, P.E., DBA
Flood Control
Project Manager



764-204-023

May 31, 2022

Albert Y. Sung, P.E.
City of Las Vegas Land Development Services
Flood Control Division
495 S. Main Street
Las Vegas, NV 89101

Re: Update #1 to the Technical Drainage Study for Summerlin Village 26 – Parcel L (DS5533C)

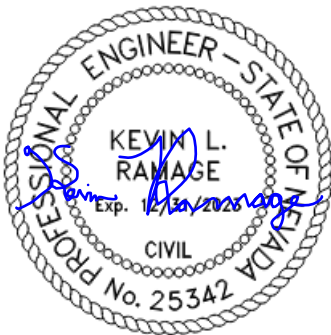
Dear Mr. Sung:

The purpose of this letter is to update the above-referenced project by addressing any changes to the project. Since the previous approval it was noticed that SDDI #6 was shown as a 7.5' MOD. TYPE "DM2" on the plans; however, the TDS depicted it as a 10.0' MOD. TYPE "DM2". Furthermore, SDDI #6 has been changed within the TDS to a 7.5' MOD. TYPE "DM2" per the plans. Thank you and please call or e-mail back at your earliest convenience if you have any questions.

Cordially,

GCW, INC.

Dr. Kevin Ramage, PE, DBA
Project Manager
Flood Control Division



APPENDIX



GCV

ENGINEERS & SURVEYORS

Drop Inlet Sizing Calculation

Project Name: Summerlin Village 26 - Parcel L
 By: KLR
 Date: 5/26/2022

Drop Inlet Sizing on a Continuous Grade

7.5" Type DM2

DI#6

Known:

Q _s = Street Flow	4.0	cfs
S _o = Longitudinal Slope	0.005	ft/ft
n= Manning's Roughness Coefficient	0.016	
V _s = Flow Velocity	1.82	fps
D= Flow Depth	0.38	ft
S _x = Street Transverse Slope	0.02	ft/ft
W= Grate Width	1.5	ft
a= Gutter Depression	5.0	in
L _g = Length of Grate	5.0	ft
L _c = Length of Curb Opening	7.5	ft
C _{fg} = Clogging Factor for Grate	50	%
C _{fc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

R _f = Frontal flow factor = $1 - 0.09 \cdot (V_s - V_o)$ if $V_s > V_o$; else $R_f = 1$	1.00
V _o = Splash over velocity = $p + q \cdot (L_g \cdot (1 - (C_{fg}/100))) - r \cdot (L_g \cdot (1 - (C_{fg}/100)))^2 + s \cdot (L_g \cdot (1 - (C_{fg}/100)))^3$	7.22 fps
E _o = Grate flow ratio = Q_w/Q_s	0.23
Q _w = Frontal flow = $A_w \cdot V_s$	0.92 cfs
Q _x = Side flow = $Q_s - Q_w$	3.08 cfs
R _s = Side flow factor = $1 / (1 + (0.15 \cdot V_s^{1.8}) / (S_x \cdot (L_g \cdot (1 - (C_{fg}/100)))^{2.3}))$	0.27
Q _{ig} = Flow intercepted = $[R_f \cdot E_o + R_s \cdot (1 - E_o)] \cdot Q_s$	1.8 cfs
†p=1.76;q=3.12;r=0.45;s=0.03 (based on Bar P 1-1/8 grate)	

Curb Opening Capacity Calculations

S _e = Equivalent cross slope = $S_x + S_w \cdot E_o$	0.086 ft/ft
S _w = Gutter cross slope = $(0.137 + a \cdot \text{feet}) / W$	0.285 ft/ft
L _t = Total interception L = $0.60 \cdot Q_s^{0.42} \cdot S_o^{0.30} \cdot (1/n \cdot S_e)^{0.6}$	11.42 ft
Q _{ic} = Flow intercepted = $(1 - (1 - (L_c \cdot (1 - (C_{fc}/100))) / L_t)^{1.8}) \cdot Q_s$	2.0 cfs

Total Inlet Calculations

Q _{ti} = Total flow intercepted = $Q_{ig} + Q_{ic}$	4 cfs
Q _{tq} = Flow bypass = $Q_s - Q_{ti}$	0 cfs
q= Interception per unit ratio = Q_{ti}/L_g	0.53 cfs/ft
E _q = Efficiency = $(Q_{ti}/Q_s) \cdot 100$	100 %

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		April 20, 2022
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 26 - Parcel L	GCW
Cross Streets:	Reverence Pkwy and Lake Mead Blvd.	PN II INC and Pulte Homes
File Number:	F:\Depot\DSMemos\DS5533C.doc	Bart Anderson, P.E., DevCo
Parcel Number:	137-14-715-038	CCRFCD
Zoning Action:	21-0615-TMP1; 21-0615-MOD1 & 21-0615-SCD1 to 21-0615-SCD3	
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES X NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	12/16/2021	1/5/2022	Not Approved	\$400.00	4575513: \$400
2 nd Submittal	3/8/2022	3/29/2022	Not Approved	\$400.00	4680454: \$400
3 rd Submittal	4/5/2022	4/20/2022	See Comments Below	\$400.00	4711380: \$400
TOTAL FEES (LDDRS):				\$1,200.00	----

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:
	must be resubmitted or supplemented including the following:
X	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>

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/AYS

T/R/S: T20S/R59E/14
AREA K-14



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

BOARD OF DIRECTORS

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May 23, 2022

Mr. Oh Sang Kwon, P.E.
City of Las Vegas Department of Public Works
333 North Rancho Drive
Las Vegas, NV 89106

**DISTRICT CONCURRENCE: SUMMERLIN VILLAGE 26 PARCEL L Reverence
MULTI-FAMILY
(DS5533C) (RFCD No. 22-14081)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Conceptual Drainage Study dated December 16, 2021, Addendum No. 1 dated March 8, 2022, and Addendum No. 2 dated April 5, 2022, for above-mentioned project as submitted by GCW, INC. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated April 20, 2022.

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 GCW, INC. 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 (May 25, 2022 10:08 PDT)

Ching C. Wang, P.E.

Principal Civil Engineer

CCW:rm

c: KEVIN RAMAGE P.E., GCW, INC.

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