SUPPLEMENT TO UPDATE TO TECHNICAL DRAINAGE STUDY

FOR

Durango & Grand Montecito

Multi-family Residential

BNN-21-001

DS5570A

City of Las Vegas

March 2023

Prepared for:

Larry Tindall
LTRD Corporation/GreeneTindall Design Group
3047 East Warm Springs Road, Suite 500
Las Vegas, NV 89120
(702) 597-5597
larry@ltrdcorp.com

TANEY ENGINEERING
CIVIL ENGINEERING & LAND SURVEYING
6030 S. Jones Blvd
Las Vegas, NV 89118
P (702) 362-8844
F (702) 362-5233

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Durango & Grand Montecito Date: Mar 29, 2023

Location of Development: a) Descriptive (Cross Streets) North/South: Grand Montecito

East/West: Durango

b) Section: 29 Township: 19S Range: 60E

c) APN : 125-29-512-015

Name of Owner: Centennial Hills Mob Owners LLC

Telephone No.: 847-656-5136 Fax No.: E-Mail Address: ileibold@bannerreg.com

Address: 10120 West Flamingo Road Suite 4-124

Contact Person-Name: Janelle Klein, P.E. **Telephone No.:** (702) 362-8844

* **E-Mail Address:** JanelleK@taneycorp.com **Fax No.:** (702) 362-5233

Firm: Taney Engineering

Address: 6030 S. Jones, Suite 100, Las Vegas NV. 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: 8.8+/- acres Being Developed/Disturbed: 8.8+/- 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: 4.25+/- acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: DS-3941
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: The site will discharge to Grand Montecito Parkway.
8. Briefly describe your proposed schedule for the subject project: A.S.A.P

PROFESSIONAL ENGINEER - STATE OF NEVADA
JANELLE L KLEIN
EXP. 6-30-23
CIVIL
No. 17313

Engineer's Seal 3/29/23

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

DS5570A

Local Entity File No.

REFERENCE:

STANDARD FORM 1

TANEY ENGINEERING
6030 S. JONES BLVD. LAS VEGAS, NV 89118
PHONE: (702) 362-8844 | FAX: (702) 362-5233
TANEYCORP.COM

Job No. BNN-21-001

Date: March 29, 2023

JURISDICTION:
Albert Sung, P.E.
Flood Control
City of Las Vegas Public Works
495 South Main Street
Las Vegas, NV 89101

UPDATE #1 to the Technical Drainage Study for Durango & Grand Montecito

Dear Mr. Sung:

Taney Engineering is pleased to submit the Technical Drainage Study Update for **Durango & Grand Montecito**. This update addresses changes to the project site plan.

The grading shown on the current plan set is generally consistent with the plans approved in the initial drainage study. All finished floors have been adjusted: the residential buildings finished floors were raised and the Clubhouse finished floor was lowered. The North wing, West wing, South wing, and Clubhouse are still adequately protected with the revisions in this update. The freeboard calculated above twice the depth of flow in the following table represents a hydraulic summary showing that the buildings are adequately elevated per requirements.

UPDATE SUMMARY								
Bldg.	Basin Cross Section	Old FF Elev.	New FF Elev.	Slope (%)	FL Depth	Velocity	DV	Free-board
North Wing-W	Section C	84.50	87.00	0.64	0.4	2.93	1.17	1.85
North Wing-E	Section C	84.50	85.00	0.64	0.4	2.93	1.17	1.44
Clubhouse-N	Section G	84.50	82.66	0.50	0.3	2.47	0.74	0.44
Clubhouse-S	Section H	84.50	82.66	0.50	0.4	2.82	1.13	0.09
South Wing-W	Section B	84.50	87.00	0.50	0.6	2.97	1.78	1.44
South Wing-E	Section B	84.50	85.00	0.50	0.6	2.97	1.78	1.48
West Wing	Section C	84.50	87.00	0.64	0.4	2.97	1.17	1.37
Note: Courtyards North and South of the Clubhouse are affected by different flows and depths of flow, hence Clubhouse-N assesses the north side of the Clubhouse and Clubhouse-S assesses the south side.								

If there are any question or you need any additional information, please do not hesitate to contact our office.

Response to Comments:

1. **The new finished floor elevations of the buildings listed in the "Update Summary" table do not match exactly with the grading plans. For example: On the grading plan, North Wing have two separate elevations: 2487.00 and 2485.00 while the summary table shows one only. Same situation for South Wing.**

   Grading plans finished floors and update letter finish floors now match exactly.

2. **Clubhouse-N and Clubhouse-S listed in the summary table cannot be found anywhere in the grading plans. Clubhouse is the only related building found. Address and resolve in the next submittal.**

   There is only one Clubhouse. Note: Courtyards North and South of the Clubhouse are affected by different flows and depths of flow, hence Clubhouse-N assesses the north side of the Clubhouse and Clubhouse-S assesses the south side. Both sides are protected per city of Las Vegas requirements.

3. **The Update letter stated that the finished floor elevations have all been raised. Indeed, Clubhouse-N and Clubhouse-S are both lowered as demonstrated in the summary table.**

   Update summary paragraph was revised to acknowledge the residential buildings finished floors were raised and the Clubhouse finished floor was lowered.

4. **Provide a set of the originally approved grading plans in the next submittal so that the reviewer can compare the exact changes between the old and new set of plans.**

   Original set of grading plans are to be provided with this submittal.

5. **City of Las Vegas does not allow HDPE pipe in public right-of-ways or public drainage easements. Note that City of Las Vegas only allows the use of HDPE storm drain pipes for privately owned and privately maintained storm drain systems which serve and are located exclusively on private properties. Any proposed HDPE storm drain pipes must also meet all design criteria established by the Clark County Regional Flood Control District and must be installed per Clark County Regional Transportation Commission Uniform Standard Drawings and Specifications.**

   Acknowledged. All onsite storm drains are private and will be installed per Clark County Regional Flood Control District criteria.

Sincerely,
TANEY ENGINEERING

ShaTobe Hal

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: March 28, 2023
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: **Durango & Grand Montecito Multi-Family Residential - Update**		**COPIES TO:** Taney Engineering
Cross Streets:	North side of the intersection of Grand Montecito Parkway & Durango Drive		LTRD Corporation / Green Tindall Design Group
File Number:	F:\Depot\DSMemos\DS5570D.doc		Bart Anderson, P.E., DevCo
Parcel Number:	125-29-512-015		
Zoning Action:	21-0764-SDR1; 21-0764-SUP1; 21-0764-SUP2; 21-0764-VAR1 & 21-0764-MOD1		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES	NO **X**	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	5/18/2022	6/6/2022	Not Approved	$400.00	4791956: $400
2nd Submittal	6/23/2022	7/12/2022	Not Approved	$400.00	4839420: $400
3rd Submittal	8/3/2022	8/18/2022	Approved	$400.00	4896780: $400
4th Submittal	3/14/2023	3/28/2023	See Comments Below	$100.00	5186120: $100
			TOTAL FEES (LDDRS):	**$1,300.00**	**----**

REMARKS:

4th Submittal: Update to revise the finished floor elevation of the onsite buildings

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 new finished floor elevations of the buildings listed in the "Update Summary" table do not match exactly with the grading plans. For example: On the grading plan, **North Wing** have two separate elevations: 2487.00 and 2485.00 while the summary table shows one only.

   Same situation for **South Wing**.

2. **Clubhouse-N and Clubhouse-S** listed in the summary table cannot be found anywhere in the grading plans. **Clubhouse** is the only related building found. Address and resolve in the next submittal.

3. The Update letter stated that the finished floor elevations have all been raised. Indeed, **Clubhouse-N** and **Clubhouse-S** are both lowered as demonstrated in the summary table.

4. Provide a set of the originally approved grading plans in the next submittal so that the reviewer can compare the exact changes between the old and new set of plans.

5. *City of Las Vegas* does not allow HDPE pipe in public right-of-ways or public drainage easements. Note that *City of Las Vegas* only allows the use of HDPE storm drain pipes for privately owned and privately maintained storm drain systems which serve and are located exclusively on private properties. Any proposed HDPE storm drain pipes must also meet all design criteria established by the *Clark County Regional Flood Control District* and must be installed per *Clark County Regional Transportation Commission Uniform Standard Drawings and Specifications*.

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, conditional acceptance 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.

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
AYS

T/R/S: T19S/R60E/29
AREA G-29

Worksheet for G

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.500 %
Discharge	3.44 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	85.00
0+15.00	81.41
0+40.00	82.66

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 85.00)	(0+15.00, 81.41)	0.013
(0+15.00, 81.41)	(0+40.00, 82.66)	0.013

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.3 ft
Roughness Coefficient	0.013
Elevation	81.75 ft
Elevation Range	81.410 to 85.000 ft
Flow Area	1.4 ft²
Wetted Perimeter	8.259 ft
Hydraulic Radius	0.2 ft
Top Width	8.21 ft
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Critical Slope	0.445 %
Velocity	2.47 ft/s
Velocity Head	0.09 ft
Specific Energy	0.43 ft
Froude Number	1.056
Flow Type	Supercritical

Worksheet for G

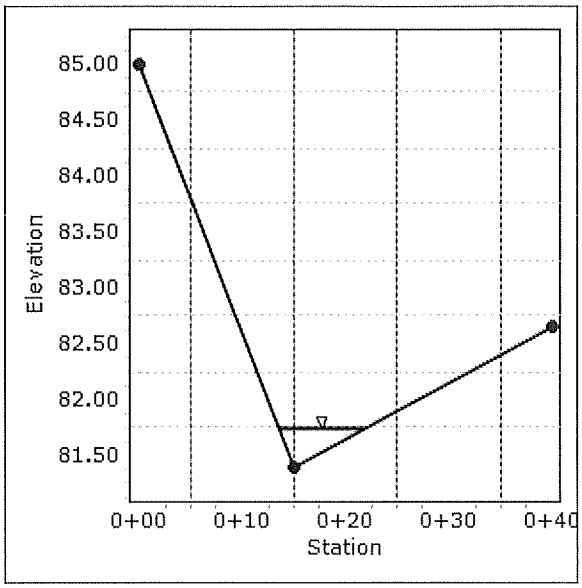
GVF Input Data	
Downstream Depth	0.0 ft
Length	0.000 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Channel Slope	0.500 %
Critical Slope	0.445 %

Cross Section for G

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.500 %
Normal Depth	0.3 ft
Discharge	3.44 cfs



Worksheet for H

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.500 %
Discharge	5.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	82.60
0+10.00	82.00
0+30.00	85.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 82.60)	(0+10.00, 82.00)	0.013
(0+10.00, 82.00)	(0+30.00, 85.00)	0.013

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Roughness Coefficient	0.013
Elevation	82.41 ft
Elevation Range	82.000 to 85.000 ft
Flow Area	2.0 ft²
Wetted Perimeter	9.676 ft
Hydraulic Radius	0.2 ft
Top Width	9.63 ft
Normal Depth	0.4 ft
Critical Depth	0.4 ft
Critical Slope	0.414 %
Velocity	2.82 ft/s
Velocity Head	0.12 ft
Specific Energy	0.54 ft
Froude Number	1.093
Flow Type	Supercritical

Worksheet for H

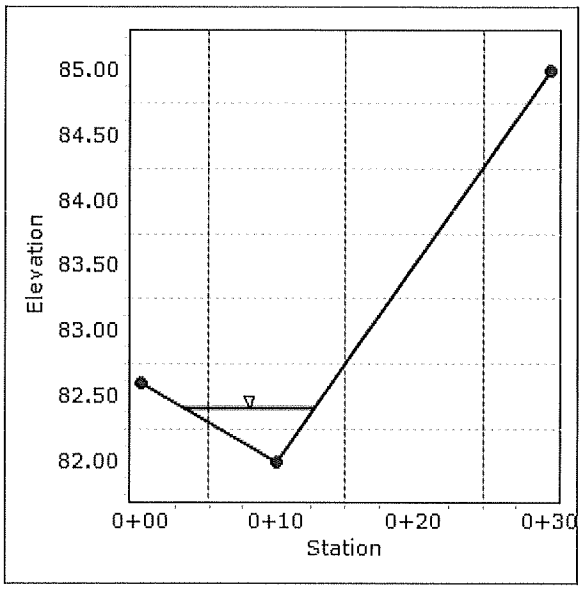
GVF Input Data	
Downstream Depth	0.0 ft
Length	0.000 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.4 ft
Channel Slope	0.500 %
Critical Slope	0.414 %

Cross Section for H

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.500 %
Normal Depth	0.4 ft
Discharge	5.60 cfs



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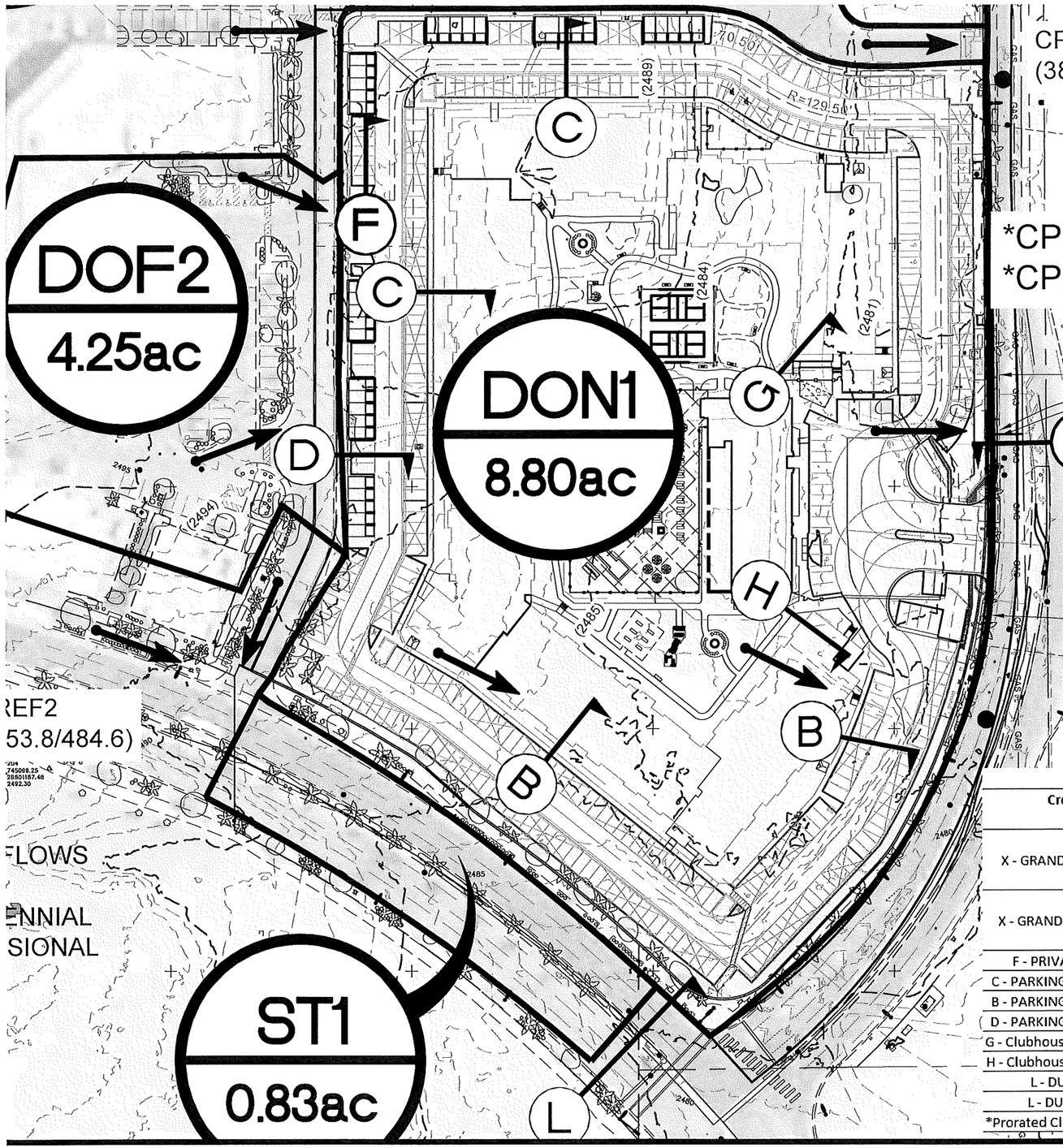
EST. 2000



*CP1 = DOF1 + DOF4 + XOF5 - EX. 18' DI (15.3CFS)
*CP2 = DOF2 + DON1 - (SDDI#32 + EX. 20' INTERCEPT)

Basin Summary - Ultimate Condition

Basin	Area (acres)	Q_{10} (cfs)	Q_{100} (cfs)
DOF3	1.05	2	4
DOF4	1.7	2.7	5.4
DOF5	0.73	1.2	2.5
CP1	-	38.6	116.3
DOF1	5.97	8.9	19
DOF2	4.25	6.2	12.7
CP2	-	<1	<1
DON1	8.8	14.1	28.7
ST1	0.83	1.6	2.8

Cross Section Summary - Ultimate Condition

Cross Section	Description	Q (cfs)	Slope (%)	Depth (ft)	Velocity (ft/s)	DxV
X - GRAND MONTECITO 10YR	CP1 - (EX 18'DI+DI34+ DI33+DI35)	0.0	0.37	0.00	0.00	0.00
X - GRAND MONTECITO 100YR	CP1 - (EX 18'DI+DI34+ DI33+DI35)	0.0	0.37	0.00	0.00	0.00
F - PRIVATE DRIVE 100 YR	DOF2	12.7	3.5	0.20	4.79	0.96
C - PARKING-DRIVE AISLE 100 YR	DON1	28.7	0.64	0.40	2.93	1.17
B - PARKING-DRIVE AISLE 100 YR	DON1	28.7	0.5	0.60	2.97	1.78
D - PARKING-DRIVE AISLE 100 YR	DON1	1.0	0.64	0.10	1.11	0.11
G - Clubhouse-N Courtyard 100 YR	DON1	3.4	0.5	0.30	2.47	0.74
H - Clubhouse-S Courtyard 100 YR	DON1	5.6	0.5	0.40	2.82	1.13
L - DURANGO 10 YR	CP3	155.4	1.81	0.90	6.81	6.13
L - DURANGO 100 YR	CP3	487.4	1.81	1.40	10.11	14.15

*Prorated Clubhouse Courtyard flows were taken from the drop inlets throughout basin Don1

DRAINAGE LEGEND

XOF1 / XXX	BASIN IDENTIFICATION / BASIN AREA (ACRES)
	BASIN BOUNDARY
C1	CONCENTRATION POINT
	FLOW PATH
	PROJECT SITE
A	CROSS SECTION
XX/XXX (XX/XXX)	10-YR/100-YR FLOW (CFS) / REFERENCE FLOW (CFS)

DATE: 5.11.2022
JOBNO: BNN-21-001

ULTIMATE CONDITION

FIGURE 8

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: August 18, 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: **Durango & Grand Montecito Multi-Family Residential**		**COPIES TO:** Taney Engineering
Cross Streets:	North side of the intersection of Grand Montecito Parkway & Durango Drive		LTRD Corporation / Green Tindall Design Group
File Number:	F:\Depot\DSMemos\DS5570C.doc		Bart Anderson, P.E., DevCo
Parcel Number:	125-29-512-015		
Zoning Action:	21-0764-SDR1; 21-0764-SUP1; 21-0764-SUP2; 21-0764-VAR1 & 21-0764-MOD1		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES	NO **X**	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	5/18/2022	6/6/2022	Not Approved	$400.00	4791956: $400
2nd Submittal	6/23/2022	7/12/2022	Not Approved	$400.00	4839420: $400
3rd Submittal	8/3/2022	8/18/2022	See Comments Below	$400.00	4896780: $400
			TOTAL FEES (LDDRS):	**$1,200.00**	**----**

REMARKS:

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

X	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.

1. *City of Las Vegas* does not allow HDPE pipe in public right-of-ways or public drainage easements. Note that *City of Las Vegas* only allows the use of HDPE storm drain pipes for privately owned and privately maintained storm drain systems which serve and are located exclusively on private properties. Any proposed HDPE storm drain pipes must also meet all design criteria established by the *Clark County Regional Flood Control District* and must be installed per *Clark County Regional Transportation Commission Uniform Standard Drawings and Specifications*.

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, conditional acceptance 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.

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
AYS

T/R/S: T19S/R60E/29
AREA G-29

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Cross Section Summary - Ultimate Condition						
Cross Section	Description	Q (cfs)	Slope (%)	Depth (ft)	Velocity (ft/s)	DxV
X - GRAND MONTECITO 10YR	CP1	0.0	0.2	0.00	0.00	0.00
X - GRAND MONTECITO 100YR	CP1	0.19	0.2	0.10	0.69	0.07
F - PRIVATE DRIVE 100 YR	DOF2	12.7	3.5	0.20	4.79	0.96
C - PARKING-DRIVE AISLE 100 YR	DON1	28.7	0.64	0.40	2.93	1.17
B - PARKING-DRIVE AISLE 100 YR	DON1	28.7	0.5	0.60	2.97	1.78
D - PARKING-DRIVE AISLE 100 YR	DON1	1.0	0.64	0.10	1.11	0.11
L - DURANGO 10 YR	CP3	155.4	1.81	0.90	6.81	6.13
L - DURANGO 100 YR	CP3	487.4	1.81	1.40	10.11	14.15

Basin Summary - Ultimate Condition			
Basin	Area (acres)	Q_{10} (cfs)	Q_{100} (cfs)
DOF3	1.05	2	4
DOF4	1.7	2.7	5.4
DOF5	0.73	1.2	2.5
CP1	-	38.6	116.3
DOF1	5.97	8.9	19
DOF2	4.25	6.2	12.7
CP2	-	<1	<1
DON1	8.8	14.1	28.7
ST1	0.83	1.6	2.8

*CP1 = DOF1 + DOF4 + XOF5 - EX. 18' DI (15.3CFS)
*CP2 = CP1 + DOF2 + DON1 - (SDDI#34+SDDI#33+SDDI#32+EX. 20' DI BYPASSES)

Inlet Calculations				
Inlet ID	Inflow Description	Q100, infow (cfs)	Q100, intercepted (cfs)	Q100, bypass (cfs)
EX 18'SDDI	CP1	116.3	15.3	101
SDDI#34	EX 18'SDDI BYPASS	101	72.45	28.55
SDDI#33	SDDI#34 BYPASS	28.55	28.36	0.19
SDDI#32	SDDI#33 BYPASS + DOF2 + DON1	41.59	34.99	6.6
EX 20' SDDI	SDDI#32 BYPASS	6.6	6.42	0.18

DOF3 1.05ac
DOF4 1.70ac
DOF5 0.73ac
DOF1 5.97ac
DOF2 4.25ac
DON1 8.80ac
ST1 0.83ac
*REFERENCE FLOW FROM DS-756:CENTENNIAL HILLS REHABILITATION HOSPITAL
*REF1 (46.9/111.3)
*REF2 (153.8/484.6)
*REFERENCE FLOWS FROM DS-394:CENTENNIAL HILLS PROFESSIONAL CENTER
CP1 (38.6/116.3)
CP2 (<1/<1)
EX. 18' SDDI
SDDI#34-20' TYPE CM2
SDDI#33-40' TYPE CM2
DI #31-5'X6' NDOT TYPE 2
SDDI#32-20' TYPE CM2
EX. 20' TYPE CM2 SDDI
DURANGO DRIVE
(2504) (2501) (2499) (2494) (2493) (2489) (2484) (2483) (2482) (2481) (2486)

SCALE: 1" = 250'
250' 150' 0' 250'

DRAINAGE LEGEND

XOF1 / XXX	BASIN IDENTIFICATION / BASIN AREA (ACRES)
	BASIN BOUNDARY
C1	CONCENTRATION POINT
	FLOW PATH
	PROJECT SITE
A	CROSS SECTION
XX/XXX (XX/XXX)	10-YR/100-YR FLOW (CFS) / REFERENCE FLOW (CFS)

DATE: 5.11.2022
JOBNO: BNN-21-001

ULTIMATE CONDITION

FIGURE 8