

DS #:

4846-1

APN:

138.03-701-021

PROJECT:

Tenaya Senior Apartments - Update #2

SUBMITTAL:

LHW

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		July 26, 2018
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:	
	Tenaya Senior Apartments – Update #2	
Cross Streets:	NEQ of Alexander Road & Tenaya Way	
File Number:	F:\Depot\DSMemos\DS4846G.ZNAE.doc	
Parcel Number:	138-03-701-021	
Zoning Action:	SDR-66312	
FEMA Flood Zone	YES	X NO
Proposed Storm Drain	YES	X NO
COPIES TO:		
		Impulse Civil Engineering
		Ovation Development
		Bart Anderson, P.E., DevCo
		CCRFGD

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	11/9/2016 & 11/22/2016	12/21/2016	Not Approved	\$400.00	464843: \$400
2 nd Submittal	1/19/2017	2/8/2017 & 3/2/2017	Not Approved	\$400.00	472395: \$400
3 rd Submittal	3/13/2017	3/27/2017	Not Approved	\$400.00	478115: \$400
4 th Submittal	5/16/2017	5/31/2017	Conditional Approval	\$400.00	485279: \$400
CCRFGD	6/14/2017	6/28/2017	Concurrence Recv'd	N/C	N/C
5 th Submittal	11/28/2017	12/5/2017	Approved	N/C	N/C
6 th Submittal	7/16/2018	7/26/2018	See Comments Below	\$100.00	497287: \$100
			TOTAL FEES (LDDRS):	\$1,700.00	----

REMARKS:

6th Submittal: Update #2 to provide protective concrete at the footing of an existing wall

5th Submittal, Update #1 to shift Building and parking for access easements. CLOMR-F # 17-09-2202C was received from FEMA 9/14/2017. This site development is located within a FEMA SPECIAL FLOOD HAZARD AREA, Zone AE. Permits can now be issued based the CLOMR-F.

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

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END OF REMARKS

Ays/pbj

T/R/S: T20S/R60E/03

AREA L-03

TRANSACTION REPORT

JUL/26/2018/THU 01:27 PM

FAX (TX)

#	DATE	START T.	RECEIVER	COM. TIME	PAGE	TYPE/NOTE	FILE
001	JUL/26	01:26PM	7024788535	0:00:40	2	MEMORY OK	SG3 1789

CITY OF LAS VEGAS			DATE:	
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UPDATE #2 TO THE
TECHNICAL DRAINAGE STUDY
FOR
TENAYA SENIOR APARTMENTS
DS-4846

W.O. #OV1629

July 16, 2018

Prepared for:

OVATION DEVELOPMENT
6021 S. Fort Apache Road, Suite 100
Las Vegas, Nevada 89148
Phone: (702) 990-2350

Prepared by:

Impulse

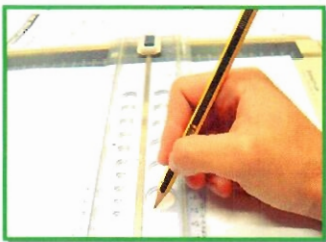
Civil Engineering & Planning

7485 West Azure Avenue, Suite 226
Las Vegas, NV 89130
Phone: 702-815-0720 · Fax: 702-478-8535



7/16/18

$$I = \int F \cdot dt$$



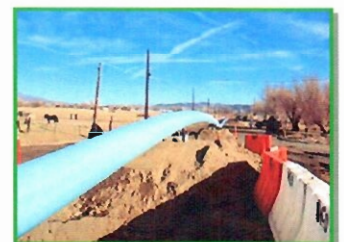
Civil Engineering



Land Planning



Flood Control



Utilities

July 13, 2018

City of Las Vegas
Public Works – Flood Control
731 South 4th Street
Las Vegas, Nevada 89101

**Re: Tenaya Senior Apartments
Update #2**

This project has structures that are within a Federal Emergency Management Agency (FEMA) Special Flood Hazard Area Zone AE as depicted in the Flood Insurance Rate Maps (FIRMs) 32003C2135F and 32003C2155F which are effective November 16, 2011. The effective base flood elevation (BFE) is established at 2323. The minimum design finished floor elevation has been established at 2326 which is three (3) feet above the effective BFE which exceeds FEMA and City of Las Vegas requirements. Copies of the effective FIRMs are included for reference. Copies of the technical drainage study for this project are on file at the City of Las Vegas under Drainage Study #4846. The drainage study and the establishment of the finished floor elevations are in accordance with the 2012 International Building Code and Southern Nevada Amendments.

If you have any questions, please call me at (702) 815-0720.

Sincerely,
IMPULSE CIVIL ENGINEERING



Peter J. Laas, P.E.
Principal
CC: Jan Goyer, Ovation Development

$$I = \int F \cdot dt$$

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Tenaya Senior Apartments Date: 7/13/2018

Location of Development: a) Descriptive (Cross Streets) North/South: Tenaya Way
East/West: Craig Road

b) Section: 3 Township: 20 Range: 60

c) APN: 138-03-701-021

Name of Owner: Ovation Development

Telephone No.: (702) 990-2325 Fax No.: (702) 990-2391 E-Mail Address: Jang@ovationdev.com

Address: 6021 S. Fort Apache Road, Suite 100, Las Vegas NV 89148

Contact Person-Name: Peter Laas Telephone No.: 702-815-0720

* E-Mail Address: PLaas@ImpulseCivil.net Fax No.: 702-478-8535

Firm: Impulse Civil Engineering

Address: 7485 West Azure Drive, Suite 226 Las Vegas, NV 89130

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: 7.49 AC+- Being Developed/Disturbed: 7.49 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

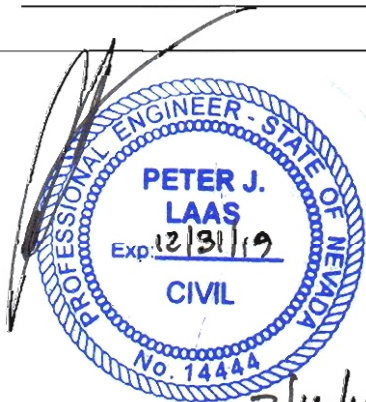
4. Proposed type of development (Residential, Commercial, Etc.): Multifamily Residential

5. Approximate upstream land area which drains to the subject site: _____

6. Has the site drainage been evaluated in the past? ☐ YES ☒ NO If yes, please identify documentation: _____

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: _____
The southeast corner of the property

8. Briefly describe your proposed schedule for the subject project: Construction 3/1/2018



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.

CLV DS-4846 / CCRFCD 17-9833

Local Entity File No.

Revision

Date

REFERENCE:

$$I = \int F \cdot dt$$

STANDARD FORM 1

The purpose of this study is to update the drainage study for Tenaya Senior Apartments (CLV#4846C). This study was approved May 31, 2017, received Clark County Regional Flood Control District (RFCD#17-9833) concurrence on June 14, 2017, and received a Conditional Letter of Map Revision (Case No. 17-09-2202C) from the Federal Emergency Management Agency on September 14, 2017. Approval letters for each may be found at the rear of this update.

This update is required because during the construction of the channel along the south property line, the existing wall footing extends into the project site by roughly 2-feet (worst case) after the channel had been excavated and the base course installed. The height of this footing varies with about an average of 6-inches above the ultimate finished surface of the channel at the west end to below the channel at the east end.



The exposed footing is not a structural concern however, the velocity in the channel could degrade sub-grade and expose more of the footing which could lead to ultimate failure. In order to protect the footing from storm flows, we are proposing to cover the exposed portion with 3-inches of concrete. Detail J is included in Appendix A and shows the proposed revision to the plans along with appropriate calculations.

As a precaution, we added vertical rebar at 24" O.C. to provide some additional support for the face of this concrete. Please recall that the Mayfield studies to the west showed that this flow is reduced to 66 cfs with the construction of the Gowan North Buffalo Branch facility. The approved FIS flow in the channel is 175 cfs which does not consider the Gowan North Buffalo Branch facility. Since this is the accepted flow rate, this is the design flow.

The following is a summary of the approved and the proposed revised hydraulic characteristics for the channel:

Approved Channel Characteristics:

$$Q_{100} = 175 \text{ cfs}$$

$$V_{100} = 8.70 \text{ fps}$$

$$D_{100} = 1.55 \text{ ft}$$

$$Fb_{100} = 1.45 \text{ ft}$$

Proposed Revised Channel Characteristics:

$$Q_{100} = 175 \text{ cfs}$$

$$V_{100} = 8.66 \text{ fps}$$

$$D_{100} = 1.63 \text{ ft}$$

$$Fb_{100} = 1.37 \text{ ft}$$

The proposed revision maintains adequate freeboard and does not negatively impact the proposed project or adjacent properties.

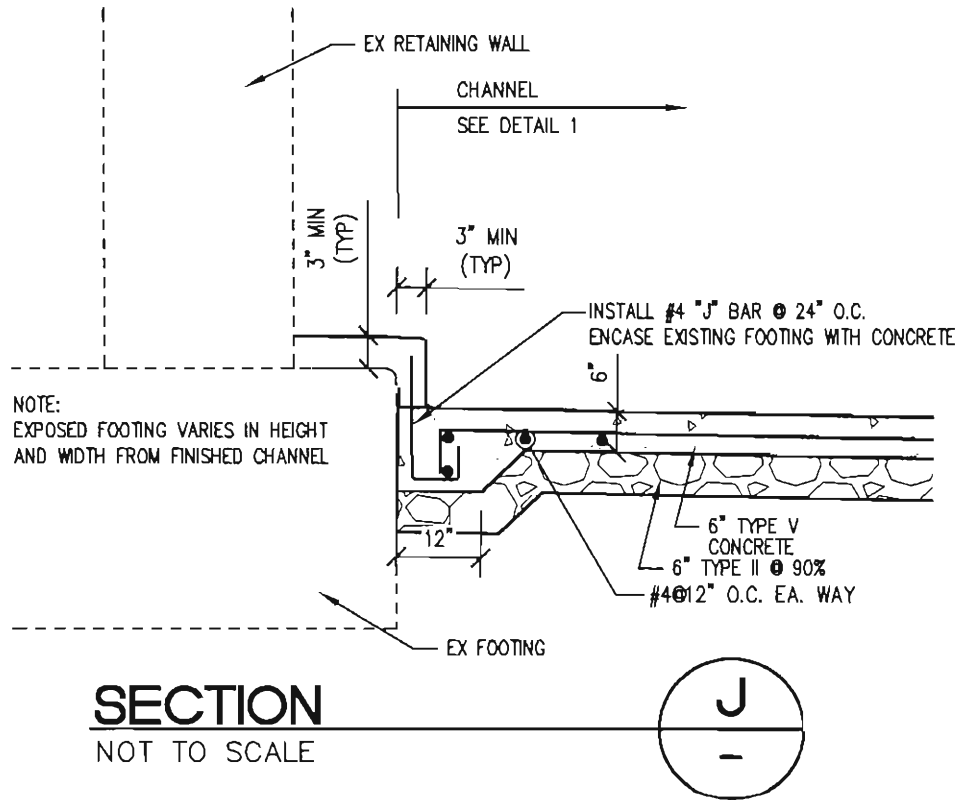
APPENDIX A



Supplemental Information

$$I = \int F \cdot dt$$


TENAYA SENIOR APARTMENTS



7/13/18

Impulse

Civil Engineering & Planning

PLANNERS • CIVIL ENGINEERS

7485 WEST AZURE DRIVE, SUITE 226 • LAS VEGAS, NEVADA 89130 • (702) 815-0720

$$I = \int F \cdot dt$$

Approved Design 100-year
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\channel.fm2
Worksheet	tenaya 1
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.013
Channel Slope	0.004300 ft/ft
Bottom Width	13.00 ft
Discharge	175.00 cfs

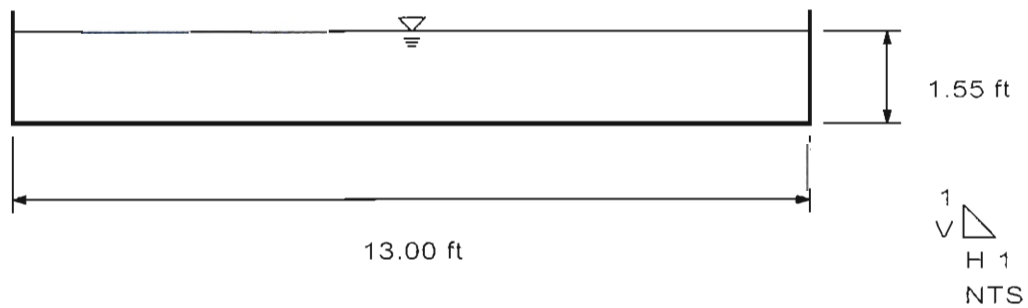
Results		
Depth	1.55	ft
Flow Area	20.12	ft ²
Wetted Perimeter	16.10	ft
Top Width	13.00	ft
Critical Depth	1.78	ft
Critical Slope	0.002806	ft/ft
Velocity	8.70	ft/s
Velocity Head	1.18	ft
Specific Energy	2.72	ft
Froude Number	1.23	
Flow is supercritical.		

Cross Section

Cross Section for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\channel.fm2
Worksheet	tenaya 1
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.004300 ft/ft
Depth	1.55 ft
Bottom Width	13.00 ft
Discharge	175.00 cfs



Existing Footing - Proposed Fix 100-year
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\channel.fm2
Worksheet	tenaya2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope		0.004300 ft/ft		
Elevation range: 0.00 ft to 3.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	3.00	0.00	13.00	0.013
0.00	0.50			
2.00	0.50			
2.00	0.00			
13.00	0.00			
13.00	3.00			
Discharge	175.00	cfs		

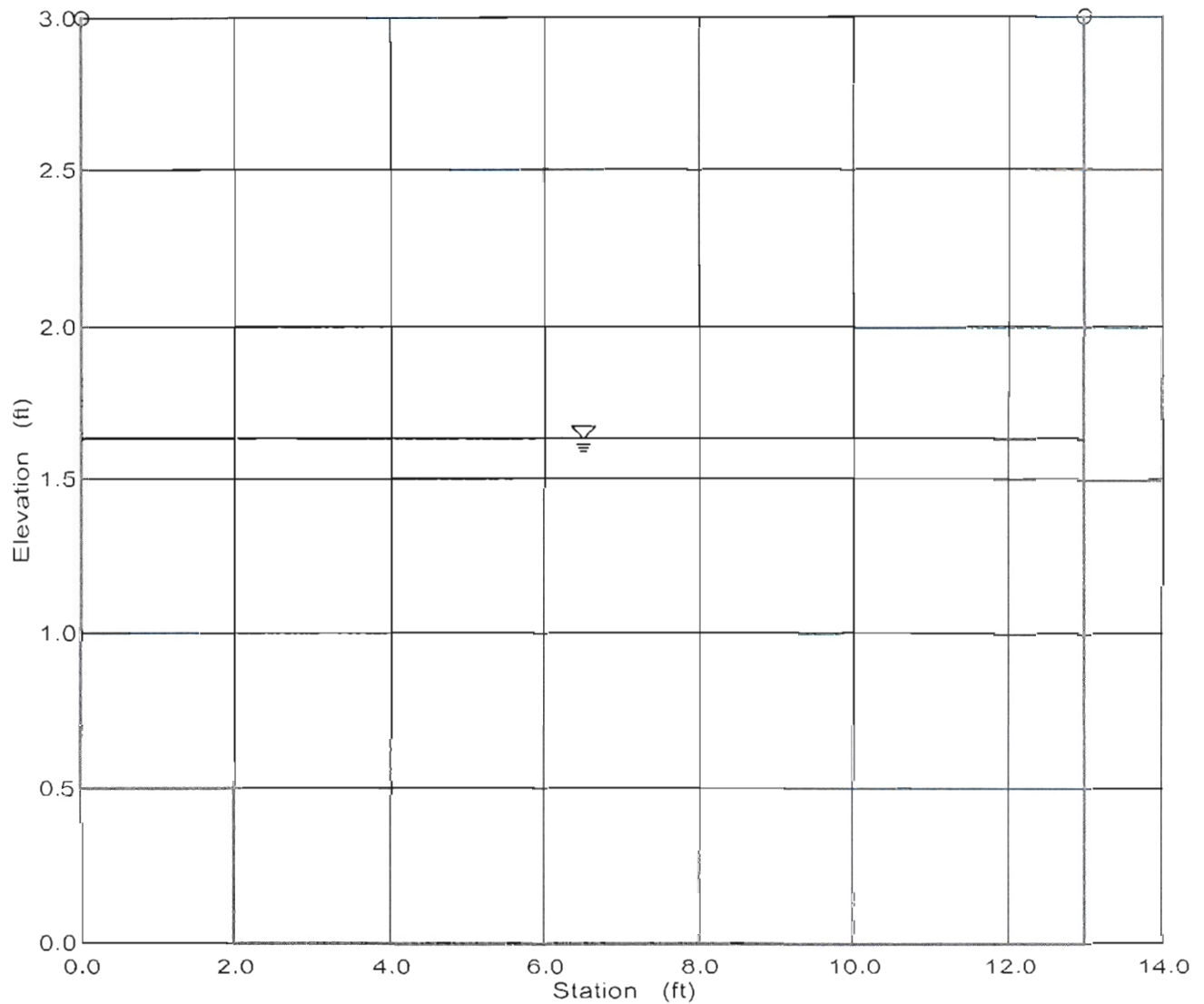
Results		
Wtd. Mannings Coefficient	0.013	
Water Surface Elevation	1.63	ft
Flow Area	20.20	ft ²
Wetted Perimeter	16.26	ft
Top Width	13.00	ft
Height	1.63	ft
Critical Depth	1.86	ft
Critical Slope	0.002841	ft/ft
Velocity	8.66	ft/s
Velocity Head	1.17	ft
Specific Energy	2.80	ft
Froude Number	1.22	
Flow is supercritical.		

Cross Section

Cross Section for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\channel.fm2
Worksheet	tenaya2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.013
Channel Slope	0.004300 ft/ft
Water Surface Elevation	1.63 ft
Discharge	175.00 cfs



$$I = \int F \cdot dt$$

Fr > 1 Super-critical Freeboard = $1.0 + (0.025 \text{ vd}^{0.75})$
Fr < 1 Sub-critical Freeboard = $0.5 + \text{V}^2/2g$
Super-elevation = $\text{V}^2\text{T}_w/g$

HEC-RAS Plan: Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Flow Depth (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Top Width (ft)	Froude # Channel	V ² /2g (ft)	Required Freeboard (ft)	Super- elevation* (ft)	Freeboard Elevation (ft)
Approved		175	2320	2321.55	1.55	2321.78	2322.73	0.002806	8.7	13	1.2	1.18	1.25		
Proposed Revised		175	2320	2321.63	1.63	2321.86	2322.8	0.002841	8.66	13	1.2	1.17	1.25		2322.80

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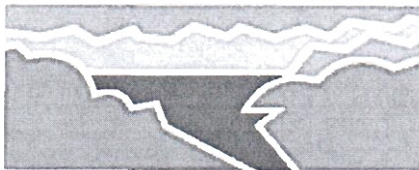
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Ays/pbj

T/R/S: T20S/R60E/03

AREA L-03

REGIONAL FLOOD CONTROL DISTRICT



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

BOARD OF DIRECTORS

Lawrence L. Brown, III
Chairman
Clark County

Debra March
Vice-Chairman
City of Henderson

David Ballweg
City of Mesquite

Chris Glunchiglian
Clark County

Mayor Carolyn Goodman
City of Las Vegas

Mayor John J. Lee
City of North Las Vegas

Dr. Lois Tarkanian
City of Las Vegas

Mayor Rodney Woodbury
City of Boulder City

June 14, 2017

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

**DISTRICT CONCURRENCE: TENAYA SENIOR APARTMENTS
(DS # 4846C) (RFCN No. 17-9833)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated November 7, 2016, Addendum No. 1 dated January 7, 2017, Addendum No. 2 dated March 7, 2017, and Addendum No. 3 dated May 10, 2017 for above-mentioned project as submitted by IMPULSE CIVIL ENGINEERING. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated May 31, 2017.

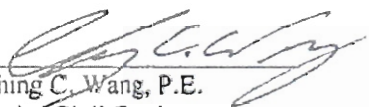
District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works.

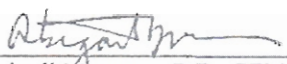
District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage*. As noted in study, site resides in a Special Flood Hazard Area (SFHA) designated as "Zone AE" per the effective Flood Insurance Rate Map (FIRM). Therefore, consultant should be advised that this acceptance does not serve to amend the FIRM or remove the SFHA.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by IMPULSE CIVIL ENGINEERING 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, P.E.
Senior Civil Engineer


Abigail Mayrena, P.E., CFM
Principal Civil Engineer

AM:ad

c: Peter J. Laas, P.E., Impulse Civil Engineering

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Federal Emergency Management Agency

Washington, D.C. 20472

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September 14, 2017

THE HONORABLE CAROLYN GOODMAN
MAYOR, CITY OF LAS VEGAS
495 SOUTH MAIN STREET
LAS VEGAS, NV 89101

CASE NO.: 17-09-2202C
COMMUNITY: CITY OF LAS VEGAS, CLARK
COUNTY, NEVADA
COMMUNITY NO.: 325276

DEAR MS. GOODMAN:

This is in reference to a request that the Federal Emergency Management Agency (FEMA) determine if the property described in the enclosed document is located within an identified Special Flood Hazard Area, the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), on the effective National Flood Insurance Program (NFIP) map. Using the information submitted and the effective NFIP map, our determination is shown on the attached Conditional Letter of Map Revision based on Fill (CLOMR-F) Comment Document. This comment document provides additional information regarding the effective NFIP map, the legal description of the property and our comments regarding this proposed project.

Additional documents are enclosed which provide information regarding the subject property and CLOMR-Fs. Please see the List of Enclosures below to determine which documents are enclosed. Other attachments specific to this request may be included as referenced in the Determination/Comment document. If you have any questions about this letter or any of the enclosures, please contact the FEMA Map Information eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426.

Sincerely,

A handwritten signature in black ink, appearing to read "Luis V. Rodriguez", is written over a horizontal line.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

LIST OF ENCLOSURES:

CLOMR-F-DEN COMMENT DOCUMENT

cc: Mr. Peter Laas



Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL COMMENT DOCUMENT

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CITY OF LAS VEGAS, CLARK COUNTY, NEVADA	Parcel 4, as shown on Parcel Map 01809 recorded in Official Records Book No. 20000621, File 098, Page 0037, in the Office of the Recorder, Clark County, Nevada
	COMMUNITY NO.: 325276	
AFFECTED MAP PANEL	NUMBER: 32003C2135F; 32003C2155F	
	DATE: 11/16/2011; 11/16/2011	
FLOODING SOURCE: UNNAMED-WASH ALONG US HIGHWAY 95		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 36.237245, -115.249650 SOURCE OF LAT & LONG: LOMA LOGIC DATUM: NAD 83

COMMENT TABLE REGARDING THE PROPOSED PROPERTY (PLEASE NOTE THAT THIS IS NOT A FINAL DETERMINATION. A FINAL DETERMINATION WILL BE MADE UPON RECEIPT OF AS-BUILT INFORMATION REGARDING THIS PROPERTY.)

LOT	BLOCK/SECTION	SUBDIVISION	STREET	OUTCOME WHAT WOULD NOT BE REMOVED FROM THIS SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
4	--	--	4204 North Tenaya Way	Property	AE	2322.8 feet	--	2320.1 feet

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

CONDITIONAL LOMR-F DETERMINATION

This document provides the Federal Emergency Management Agency's comment regarding a request for a Conditional Letter of Map Revision based on Fill for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the proposed property(ies) would be located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) if built as proposed. Therefore, flood insurance is required for the property described above. If fill is placed on the subject property to raise its elevation above the base flood elevation after the effective date of the first NFIP map showing the property in the SFHA, then, for the subject property to be outside of the SFHA, it must be demonstrated that the subject property is reasonably safe from flooding in accordance with Part 65.5(a)(4) of our regulations. Further guidance on determining if the subject property is reasonably safe from flooding may be found in FEMA Technical Bulletin 10-01. A copy of this bulletin can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at <http://www.fema.gov/mit/tb1001.pdf>.

This comment document is based on the flood data presently available. The enclosed documents provide additional information regarding this request and information regarding your options for obtaining a Letter of Map Revision based on Fill. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426.


Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL COMMENT DOCUMENT

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

CONDITIONAL LOMR-F DETERMINATION (This Additional Consideration applies to the preceding 1 Property.)

Comments regarding this conditional request are based on the flood data presently available. Our final determination will be made upon receipt of this Comment Document, certified as-built elevations and/or certified as-built survey. Since this request is for a Conditional Letter of Map Revision based on Fill, we will also require the applicable processing fee, and the "Community Acknowledgement" form. Please note that additional items may be required before a final as-built determination is issued.

This letter does not relieve Federal agencies of the need to comply with Executive Order 11988 on Floodplain Management in carrying out their responsibilities and providing Federally undertaken, financed, or assisted construction and improvements, or in their regulating or licensing activities.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Information eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426.


Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration