



Department of Public Works

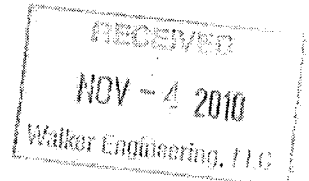
1177.00

cc: Noel

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@co.clark.nv.us

Drainage Study Approval Letter



Date: October 28, 2010
Firm: Walker Engineering
Engineer: Treasea Wolf, P.E.
Address: 5765 S. Rainbow Blvd., Suite 101, Las Vegas, NV 89118
Phone: (702) 873-5197
Fax: (702) 873-5346
E-mail: twolf@walker-eng.com

Subject: Technical Drainage Study for Chase @ Maryland and Sahara
Location: SEC Maryland Parkway and Sahara Avenue
APN: 162-11-101-001
Sec, Township, Range: S11, T21S, R61E
Flood Zone & Panel: Zone X, 2170E, Revised September 27, 2002
Application Tracking #: 10-27576



HTE10-27576

Submittals	Date Received	Date Returned	Reviewer	Miscellaneous
Technical	10/07/2010	10/28/2010	WG	

Concurrence Required: (Must be obtained prior to permit issuance)		Reason Concurrence is required
	City of Henderson	Adjacent to or Impacts Henderson
X	City of Las Vegas	Adjacent to or Impacts Las Vegas
	City of North Las Vegas	Adjacent to or Impacts North Las Vegas
	Nevada Department of Transportation	Impacts NDOT Facility
	Union Pacific Rail Road	Adjacent to or Impacts a UPRR Facility
	US Army Corp of Engineers	Impacts a USACE Facility
X	Clark County Regional Flood Control District	Adjacent to or Impacts CCRFCD MPU Facility or in a SFHA

BOARD OF COUNTY COMMISSIONERS
RORY REID, Chairman • SUSAN BRAGER, Vice-Chair
LARRY BROWN • TOM COLLINS • CHRIS GIUNCHIGLIANI • STEVE SISOLAK • LAWRENCE WEEKLY
VIRGINIA VALENTINE, P.E., County Manager

The referenced **Technical Drainage Study** has been reviewed and is accepted as complying with minimum improvement standards. As set forth in the subject drainage study, the following measures will be taken to mitigate flood hazards.

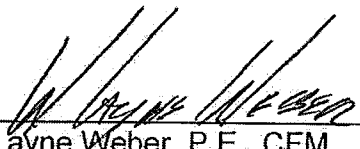
The site shall be graded with respect to drainage as shown on "Chase @ Maryland & Sahara", grading plan sheet G1, signed and sealed by Jody Walker Belsick, P.E., on October 6, 2010.

Check appropriate conditions

	Retaining/screen wall combination may be in excess of current Clark County Unified Development Code, Chapter 30.64.050.
	A FEMA Elevation Certificate, completed by a licensed surveyor, must be submitted to and approved by CCPW Development Review Plan Check prior to the issuance of Certificates of Occupancy for those structures.
X	Mylars of the grading plan must be submitted to the CCPW Development Review Plan Check for approval signatures prior to map recordation (residential) or permit issuance (commercial).
	An administrative variance to allow the finished floor elevation(s) to be set below the current Clark County criteria must be approved. The finished floor variance must be submitted to CCPW Development Review front counter after drainage study approval and prior to offsite final review.
X	The grading plan will be reviewed by the Building Office Operations Division to ensure compliance with the ADA access requirements. Revisions to the grading plan may be required if the site accessibility design does not comply with the requirements set forth in the Accessibility Chapter of the Clark County Building Code.
	The plans show work is proposed outside of the project boundary. Notarized written permission must be obtained prior to grading plan approval.
X	Right-of-way dedication must be verified.
	Any previously approved drainage easements that are not being used must be vacated.
	<i>Per Regional Flood Control District policies and Procedures manual, Section VIII. D. 13. Uniform Regulations for the Control of Drainage</i> , the Engineer of Record shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have regional flood control significance.
	Structural calculations are required. The structural calculations, plans, and details must be approved prior to "Offsite" submittal.
X	Plan revisions can be found on the red-lined plans and must be addressed.
	Prepare drainage easement documents as shown on the grading plans.

The County's review is solely based on the information submitted by the Engineer of Record. The County's review is strictly limited to compliance with minimum County Codes and Standards. The Engineer of Record is responsible for researching and addressing situations that may require designs above and beyond the minimum codes for issues of public safety and impacts to upstream, downstream and adjacent properties. The County assumes no liability for information data, designs or conclusions of the Engineer of Record.

By


W. Layne Weber, P.E., CFM
Principal Engineer
Clark County Public Works
Development Review

cc: Sahara Towne Square

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: CHASE @ MARYLAND & SAHARA Date: DECEMBER 20, 2010
Location of Development: a) Descriptive (Cross Streets) North/South: MARYLAND PARKWAY
East/West: SAHARA AVENUE
b) Section: 11 Township: 21 S Range: 61 E
c) APN : 162-11-101-001

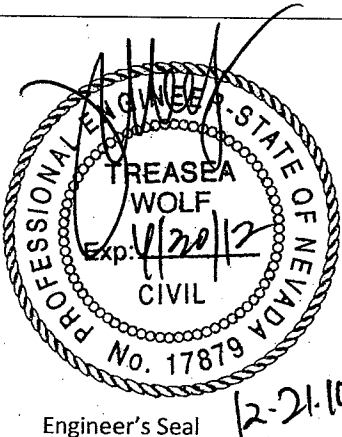
Name of Owner: SAHARA TOWNE SQUARE LLC
Telephone No.: _____ Fax No.: _____ E-Mail Address: _____
Address: 3275 S. JONES BLVD., SUITE 105 LAS VEGAS, NV 89146

Contact Person-Name: TREASEA WOLF, P.E., LEED AP Telephone No.: 702.873.5197
* E-Mail Address: twolf@walker-eng.com Fax No.: 702.873.5346
Firm: WALKER ENGINEERING, LLC
Address: 5765 S. RAINBOW BLVD., SUITE 101 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: 1.52 ACRES Being Developed/Disturbed: 0.56 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.): COMMERCIAL
5. Approximate upstream land area which drains to the subject site: 496 ACRES
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: TECHNICAL DS FOR SAHARA TOWNE SQUARE
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site:
HALF OF SITE DISCHARGES NORTH INTO SAHARA AVENUE AND HALF SITE DISCHARGES SOUTH INTO KAREN AVENUE
8. Briefly describe your proposed schedule for the subject project: ASAP



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
	SUPP #1	DECEMBER 20, 2010
Local Entity File No. _____		

REFERENCE:

STANDARD FORM 1



December 20, 2010
WE Job No. 1177.00

Mr. Derek Ridenoure
Nevada Department of Transportation
Hydraulics Section
1263 S. Stewart Street
Carson City, Nevada 89712

**RE: Supplement #1 to Technical Drainage Study for JP Morgan Chase:
Chase @ Maryland & Sahara
(HTE: 10-27576)**

Dear Mr. Ridenoure,

This Supplement is being submitted in response to your comments dated December 7, 2010. A copy of the comment email is included in **Appendix A**. These comments have been reviewed and are addressed as follows:

Comment 1: According to North Section B on sheet G1 and the top of curb elevations provided, it looks like the proposed curb along Sahara Avenue will be raised. This curb, roughly 3.5'-4.5' from NDOT Right-of-Way, will constrict the flow path in Sahara and in doing so may raise the water surface elevation over Sahara Avenue, increasing the hazard to the traveling public. Please address.

Response: Please note that the street section for Sahara is existing and the development of this project will not be affecting the existing off-site improvements. The on-sites adjacent to Sahara will be removed and replaced with new improvements. Only the landscaping adjacent to the NDOT Right-of-Way will be raised.

5765 South Rainbow Blvd.
Suite 101
Las Vegas, Nevada, 89118
Phone: 702.873.5197
Fax: 702.873.5346
www.walker-eng.com

The FlowMaster section for *SECTION 1-SAHARA 100-YR* that was included in the original study was a section of the existing street section with the proposed landscape adjacent to the existing sidewalk scarping up to the new proposed on-site improvements. I've included the section in **Appendix B** for reference.

To demonstrate that the raising of the landscaping at the back of existing sidewalk does not raise the water surface elevation in Sahara nor does it cause any increase in hazard to the traveling public, an additional FlowMaster section was analyzed with the existing landscape elevations adjacent to the existing sidewalk on Sahara adjacent to the project site. It is the same section as *SECTION 1-SAHARA 100-YR* only the landscaping adjacent to the existing street section is the current existing condition. This section is called *SECTION 1-SAHARA 100-YR (EX. COND ADJ. TO RM)* and is included in **Appendix B** for review.

In the existing conditions before this proposed project, the depth of flow in Sahara is **1.52'**. The depth of flow after the development of this project and landscape scarping is **1.51'**. **The entire street is inundated with water in existing conditions in the 100-year storm event and the development of this project site does not increase flows to the NDOT Right-of-Way nor does it adversely affect the existing conditions.**

The plans have not been revised for this supplement and therefore, new copies are not included. Please refer to the original study for the plans. Please do not hesitate to contact me if you should have any questions or need additional information.

Sincerely,
WALKER ENGINEERING, LLC



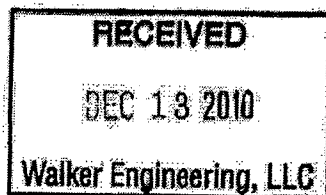
Treasea Wolf, P.E., LEED AP
Project Manager



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

1263 S. Stewart Street
Carson City, Nevada 89712

JIM GIBBONS
Governor



SUSAN MARTINOVICH, P.E., Director

In Reply Refer to:

December 7, 2010

C019

JP MORGAN CHASE
1125 17TH STREET, FLOOR 2
DENVER, CO 80202

TECHNICAL DRAINAGE STUDY
CHASE @ MARYLAND & SAHARA
CLARK COUNTY

Dear JP Morgan Chase:

The Nevada Department of Transportation (NDOT) Hydraulics Section has received and reviewed the following document(s) for the above-referenced project.

Document:	Dated:
Technical Drainage Study for JP Morgan Chase: Chase @ Maryland & Sahara	10/25/2010

The drainage design information presented in the reviewed document(s):

	is acceptable in concept. Final Hydraulic Section approval will be based on review of final design documents submitted with the NDOT Right-Of-Way Occupancy Permit application that must be submitted for this project.
	is acceptable in concept. Final Hydraulic Section approval will be based on review of final design documents submitted with the NDOT Right-Of-Way Occupancy Permit application that must be submitted for this project. The following comments should be addressed with the permit application:
X	must be supplemented or modified to satisfy the following comment(s) before preliminary Hydraulic Section approval can be granted:

1. According to North Section B on sheet G1 and the top of curb elevations provided, it looks like the proposed curb along Sahara Avenue will be raised. This curb, roughly 3.5'-4.5' from NDOT Right-Of-Way, will constrict the flow path in Sahara, and in doing so may raise the water surface elevation over Sahara Avenue, increasing the hazard to the traveling public. Please address.

All submittals regarding this project must be forwarded through (or copied to) the local NDOT District permitting office. All pertinent drainage design

documents (including those previously submitted for preliminary review) must be submitted to the local NDOT District permitting office with the Right-Of-Way Occupancy Permit Application. All plans and reports must be signed and stamped by a Nevada registered civil engineer.

No liability is assumed by the Department in performing this review. Verification and acceptance of all background information, design data and conclusions is the responsibility of the consulting engineer.

If we do not receive the information requested above from your office by 1/7/2010, this Technical Drainage Study will be returned to the appropriate district office without further action.

Please call me at (775) 888-7747 should you have any questions.

Sincerely,

Derek Ridenoure
Senior Hydraulic Engineer

dr
c: Rudy Lucero, District I Engineer
Bill Bowman, HQ Permit Coordinator
Treasea Wolf, Walker Engineering, LLC

Worksheet for SECTION 1-SAHARA 100-YR

Project Description

Friction Method

Manning Formula

Solve For

Normal Depth

EX. STREET SECTION W/
PROP. HS SCARP.

Input Data

Channel Slope

0.01270 ft/ft

Discharge

701.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
--------------	----------------

$$d * V = 1.57 * 7.75 = 11.70$$

0+00.00	100.93
0+06.85	98.81
0+12.85	98.80
0+13.35	98.80
0+13.35	98.11
0+14.85	98.30
0+60.71	99.43
0+62.21	99.26
0+62.21	99.76
0+62.71	99.76
0+66.87	100.11
0+67.37	100.11
0+67.37	99.61
0+68.87	99.76
1+38.87	98.36
1+40.37	98.19
1+40.37	98.69
1+40.87	98.69
1+46.87	98.81
1+46.87	104.81

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 100.93)	(0+06.85, 98.81)	0.030

Worksheet for SECTION 1-SAHARA 100-YR

Input Data

Start Station	Ending Station	Roughness Coefficient
(0+06.85, 98.81)	(0+14.85, 98.30)	0.013
(0+14.85, 98.30)	(0+60.71, 99.43)	0.017
(0+60.71, 99.43)	(0+68.87, 99.76)	0.013
(0+68.87, 99.76)	(1+38.87, 98.36)	0.017
(1+38.87, 98.36)	(1+46.87, 104.81)	0.013

Results

Normal Depth	1.51	ft
Elevation Range	98.11 to 104.81 ft	
Flow Area	90.41	ft ²
Wetted Perimeter	131.37	ft
Top Width	128.83	ft
Normal Depth	1.51	ft
Critical Depth	1.79	ft
Critical Slope	0.00438	ft/ft
Velocity	7.75	ft/s
Velocity Head	0.93	ft
Specific Energy	2.44	ft
Froude Number	1.63	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.51	ft
Critical Depth	1.79	ft
Channel Slope	0.01270	ft/ft
Critical Slope	0.00438	ft/ft

Cross Section for SECTION 1-SAHARA 100-YR

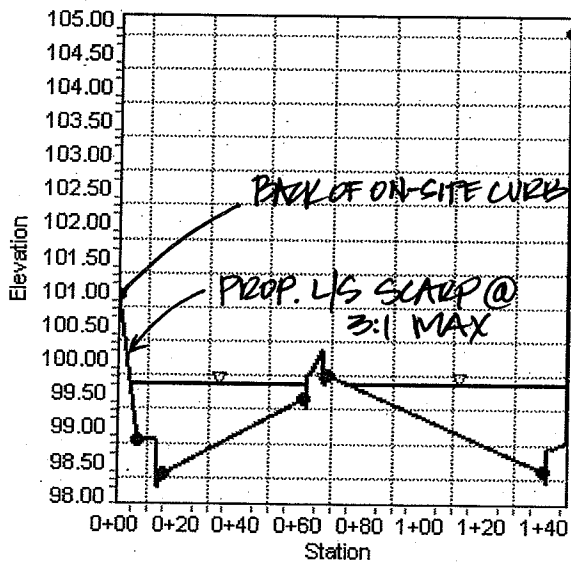
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope	0.01270	ft/ft
Normal Depth	1.51	ft
Discharge	701.00	ft ³ /s

Cross Section Image



depth of flow = 1.51'

Worksheet for SECTION 1-SAHARA 100-YR (EX. COND. ADJ. TO R/W)

Project Description

Friction Method

Manning Formula

Solve For

Normal Depth

Input Data

Channel Slope

0.01270 ft/ft

Discharge

701.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
-0+05.15	99.75
0+06.85	98.81
0+12.85	98.80
0+13.35	98.80
0+13.35	98.11
0+14.85	98.30
0+60.71	99.43
0+62.21	99.26
0+62.21	99.76
0+62.71	99.76
0+66.87	100.11
0+67.37	100.11
0+67.37	99.61
0+68.87	99.76
1+38.87	98.36
1+40.37	98.19
1+40.37	98.69
1+40.87	98.69
1+46.87	98.81
1+46.87	104.81

$$d * V = 1.52 * 7.29 = 11.08 > 8$$

EX. CONDITION
W/ EX. L/S COND.
ADJ. TO R/W

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(-0+05.15, 99.75)	(0+06.85, 98.81)	0.030

Worksheet for SECTION 1-SAHARA 100-YR (EX. COND. ADJ. TO RIW)

Input Data

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+06.85, 98.81)	(0+14.85, 98.30)	0.013
(0+14.85, 98.30)	(0+60.71, 99.43)	0.017
(0+60.71, 99.43)	(0+68.87, 99.76)	0.013
(0+68.87, 99.76)	(1+38.87, 98.36)	0.017
(1+38.87, 98.36)	(1+46.87, 104.81)	0.013

Results

Normal Depth	1.52	ft
Elevation Range	98.11 to 104.81 ft	
Flow Area	96.10	ft ²
Wetted Perimeter	140.40	ft
Top Width	137.89	ft
Normal Depth	1.52	ft
Critical Depth	1.77	ft
Critical Slope	0.00497	ft/ft
Velocity	7.29	ft/s
Velocity Head	0.83	ft
Specific Energy	2.35	ft
Froude Number	1.54	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.52	ft
Critical Depth	1.77	ft
Channel Slope	0.01270	ft/ft
Critical Slope	0.00497	ft/ft

Cross Section for SECTION 1-SAHARA 100-YR (EX. COND. ADJ. TO

Project Description

Friction Method

Manning Formula

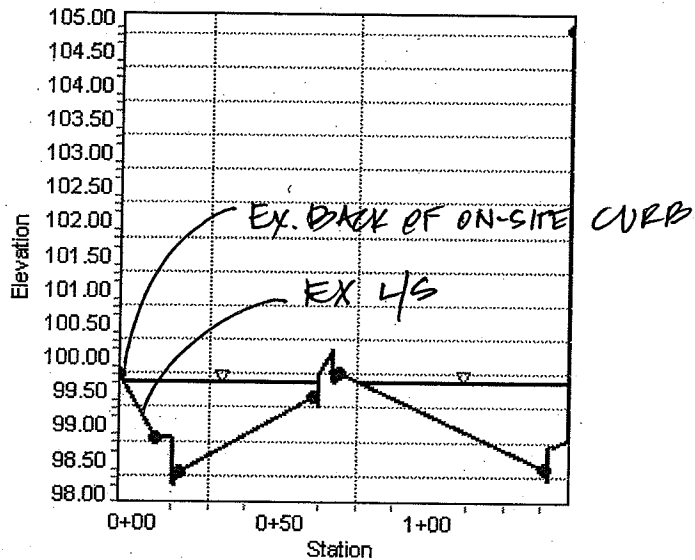
Solve For

Normal Depth

Input Data

Channel Slope	0.01270	ft/ft
Normal Depth	1.52	ft
Discharge	701.00	ft ³ /s

Cross Section Image



LETTER OF TRANSMITTAL

Date: January 6, 2011

To:

CLV

ATTN: Flood Control

731 S. 4th Street

Las Vegas, NV 89101

WE Project:

Chase @ Maryland &
Sahara

CC:

WE Project No.: 1177.00

Subject:

Drainage Study for Concurrence

We are sending you the attached documents via:

☐ Messenger, ☒ Hand Delivery, ☐ US Mail, ☐ Overnight Delivery, ☐ Pick Up
for your use as checked below:
☐ Urgent☐ As
requested☐ For review☐ For your
files☐ For your
info.☐ Returning☒ For approval ☐ Other: _____☒ Please Reply☐ No Reply Necessary

Items transmitted:

Doc Date	Copies	No. Pages	Description of Item
-	1	-	Drainage Study & Supplement #1 for Concurrence
12/31/10	-	-	Check #8098 for \$400.00

Remarks:

Attached is the Drainage Study for Concurrence. If you have any questions or need any additional information, please feel free to contact the office. Thank you!

Sent by:

Treasea Wolf, PE, LEED AP

Project Manager

Tel: 702.873.5197, Fax: 702.873.5346

Email: twolf@walker-eng.com

5765 S. Rainbow Blvd.
Suite 101

Las Vegas, NV 89118

Tel: 702.873.5197

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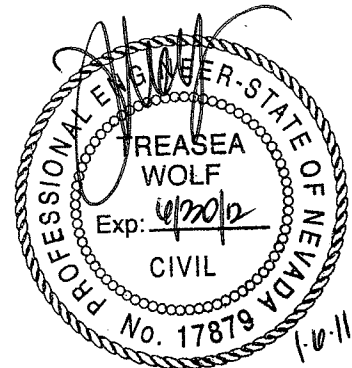
WALKER ENGINEERING, LLC

SUPPLEMENT #1 to the **TECHNICAL DRAINAGE STUDY** for

**JP MORGAN CHASE
CHASE @ MARYLAND & SAHARA
APN: 162-11-101-001**



Prepared for:
JP MORGAN CHASE
1125 17th Street, Floor 2
Denver, CO 80202
Tel: 303 244 3038
Fax: 720 745 6332



Date Prepared:
December 20, 2010

**** Duplicate Receipt ****

City of Las Vegas

Development Services Center

731 South Fourth Street

Las Vegas, NV 89101

01/06/2011 10:35 Trn 160338
Cashier 890381

PRJ Permit # DS4514 \$400.00

Subtotal \$400.00

Tax \$0.00

Total \$400.00

Received CHECK \$400.00

Check # 3098

Change \$0.00

For questions related to this receipt call

702-229-6251