DS #: 4839

APN: 162-04-813-044 thru -050

PROJECT: Lucky Dragon Casino - Temporary Parking

SUBMITTAL: 1st Submittal

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: November 18, 2016
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: **Lucky Dragon Casino – Temporary Parking**			**COPIES TO:** Horrocks Engineers
Cross Streets:	SEQ of Fairfield Avenue and Cincinnati Avenue			Oxford Technology, Inc.
File Number:	F:\Depot\DSMemos\DS4839A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-813-044 thru -050			
Zoning Action:	SDR-66780			
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	10/31/2016	11/18/2016	See Comments Below	$400.00	463770 : $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

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:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

1. The overall parking lot improvements area is larger than 1 acre. Per ***Section 1500*** of the *Clark County Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual*, the subject improvements must provide for Low Impact Development (LID) measures. Please review and address the issue in the next submittal.

2. Regarding best management practices, fine, close-growing, water resistant grasses in the proposed landscape swale areas are preferred. Clearly identify as such on all pertinent plans. Provide a note on all grading plans: Property Owner is responsible to maintain the best management practices such as but not limited to the removal of accumulated sediment and debris and care of the vegetation.

3. Provide additional cross-sections along Fairfield Avenue and Cincinnati Avenue.

4. Provide FEMA FIRM information on the grading plan.

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: T21S/R61E/04
AREA R-04

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Casino - Temporary Parking Date: 10-31-16

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Ave

East/West: Cincinnati Ave

b) Section: 4 Township: 21S Range: 61E

c) APN : 162-04-813-044,045,046,047,048,049,050

Name of Owner: Oxford Technology, Inc.

Telephone No.: 2672591899 Fax No.: E-Mail Address: dave@luckydragonlv.com

Address: 5010 S VALLEY VIEW BLVD #B1 LV, NV 89118

Contact Person-Name: Larry Bitton **Telephone No.:** 702.883.1300

*** E-Mail Address:** larryb@horrocks.com **Fax No.:**

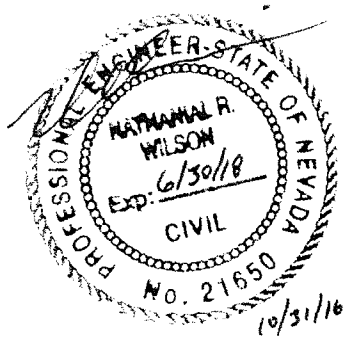
Firm: Horrocks Engineers

Address: 1349 Galleria Pkwy, #110 Henderson, NV 89014

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		Temporary Parking Lot

1. Total Owned Land Area: At Site: 1.1 ac Being Developed/Disturbed: 1.1 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.): commercial
5. Approximate upstream land area which drains to the subject site: 7.4 ac
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 site sits immediately west of previously evaluated sites (Allure Condos #3760 & Lucky Dragon DS#4825)
8. Briefly describe your proposed schedule for the subject project: The schedule is ASAP since the Lucky Dragon is scheduled to open Nov 18th and this overflow parking is needed immediately. A prompt review is respectfully requested.



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

Updated 05/01/2008

East/West: [illegible]

b) Section: 4 Township: 21S Range: 61E

c) APN : 162-04-813-044,045,046,047,048,049,050

Name of Owner: Oxford Technology, Inc.

Telephone No.: 2672591899 Fax No.: E-Mail Address: dave@luckydragonlv.com

Address: 5010 S VALLEY VIEW BLVD #B1 LV, NV 89118

Contact Person-Name: Larry Bitton **Telephone No.:** 702.883.1300

*** E-Mail Address:** larryb@horrocks.com **Fax No.:**

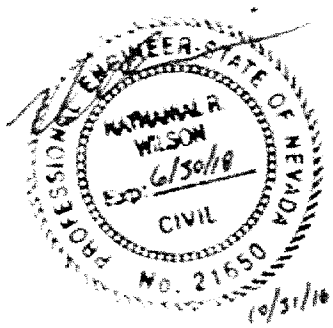
Firm: Horrocks Engineers

Address: 1349 Galleria Pkwy, #110 Henderson, NV 89014

Type of Land Development/Land Disturbance Process:

	Rezoning		Subdivision Map		Clearing and Grading Only
	Parcel Map		Planned Unit Development	x	Other (Please specify below) Temporary Parking Lot
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Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

To: Mr. Albert Sung
Flood Control
City of Las Vegas Dept. of Public Works
333 N. Rancho Rd.

HORROCKS ENGINEERS

From: Larry Bitton

Date: 10-31-16

TRANSMITTAL

Subject: **Technical Drainage Study Update Letter**
Lucky Dragon Temporary Parking Lot (SDR 66780 PRJ #66791)

The following items are:
- ☐ Requested
- ☒ Enclosed
- ☐ Sent Separately via US Mail

☒ Report	☐ Specifications	☐ Cost Estimate	☐ Progress Est.
☐ Test Result	☐ Calculations	☐ Check Print	Other

No. of Copies	Description
2	Technical Drainage Study Update Letter - Lucky Dragon Casino
2	Lucky Dragon Casino Temp Parking Plan
1	$400 Check to City of Las Vegas for review fee

General Remarks:
Provided for review and approval in accordance with SDR 6780 Conditions of Approval. Letter format allowed as previously agreed.

Please contact Larry Bitton (702) 883-1300 with any questions.

HORROCKS
ENGINEERS

Oct 27, 2016

Mr. Albert Sung
Public Works - Flood Control Division
City of Las Vegas
333 N. Rancho
Las Vegas, NV 89106

RE: Drainage Study Update for Lucky Dragon Temp Parking
APN's 162-04-813-044 through 050
SDR-66780 [PRJ 66791]

Dear Mr. Sung,

Pursuant to the requirements of the Administrative Site Development Plan Review Approval dated October 4, 2016 for a temporary parking lot at the northwest corner of Cincinnati Avenue and Fairfield Avenue, Horrocks Engineers hereby submits this Drainage Study Update to the Technical Drainage Study for the Lucky Dragon (DS #4825) for your review and approval. In accordance with our meeting October 20, 2016 since this is a temporary parking lot with no structures or public improvements and because historical flow patterns remain essentially unchanged, this update is provided in a simplified letter format.

PROJECT DESCRIPTION

The Lucky Dragon has leased a 1.1 acre parcel of undeveloped property located at the northwest corner of Cincinnati Ave and Fairfield Ave for purposes of a temporary parking lot. The property comprises APN's 162-04-813-044 through 050. It is zoned C-2 (General Commercial). A Site Development Plan was submitted and administratively reviewed and approved on October 18, 2016 (see attached approval letter). The approval is valid for three years from the date of approval. The temporary parking lot will conform to the Centennial Downtown Development Guidelines. No habitable structures or permanent improvements (other than fencing) are proposed with the lot development. The temporary parking lot will be paved and, with the exception of the paved entry point onto Cincinnati, it is fully contained on private property; no public street improvements are proposed.

EXISTING DRAINAGE CONDITIONS

The temporary parking lot site exists as an exposed dirt lot that was formerly occupied by residential homes. The homes were demolished several years ago leaving the property in an unsightly blighted

condition. Stormwater runoff upstream of the site is conveyed around the site within Cincinnati Ave on the south, Cleveland Ave on the north and Fairfield Ave on the east. Flows from the west are conveyed around the site by a paved public alley.

Offsite flows were evaluated as part of the Technical Drainage Study for Lucky Dragon (DS #4825 by GC Wallace) and the Technical Drainage Study for Allure Condominiums (DS#3760 by JHR Assoc. Ltd). The site is in FEMA Zone X per Map No. 32003C2170 F. The applicable exhibits from these studies accompany this update. Horrocks Engineers accepts the conclusions of those approved drainage studies. Offsite flows in Cleveland are generated from a sub-basin that is similar in composition and size to Basins OFF1 & OFF2 referenced in the Allure Condominium study. Therefore Horrocks Engineers conservatively concludes that the offsite flows contributing to Cleveland Ave adjacent to the site are proportional in quantity for purposes of this update. See Table 1 Existing Offsite Flows below.

Basin	Acreage	Q_{100} / Q_{10}	Reference (See Exhibit 1)
OFF1	3.8 acres	9 cfs / 4 cfs	JHR Assoc DS #3760
OFF2	2.5 acres	6 cfs / 3 cfs	JHR Assoc DS #3760
LDU-OFF1	3.6 acres	9 cfs / 4 cfs	Horrocks Engineers proportional estimate based on flows from JHR study
LDU-OFF2	3.8 acres	9 cfs / 4 cfs	Horrocks Engineers proportional estimate based on flows from JHR study

TABLE 1 – EXISTING OFFSITE FLOWS

Existing flows from the immediate west discharge to Cleveland Avenue. These westerly flows are conveyed in an existing paved alley with inverted crown (valley gutter) sloping east then north - ultimately discharging into Cleveland Ave at the northwest corner of the temp parking lot site. Reference attached Exhibit 1 Offsite Drainage for existing flow conditions and estimated flow rates.

PROPOSED DRAINAGE CONDITIONS

The temporary parking lot has been designed to be similar to the existing flow pattern in which all flows contribute to Fairfield Avenue. The parking lot will accept any flow that overtops the existing paved alleyway by draining through the perimeter fence. Onsite flows will sheet drain from west to east. The parking lot improvements will include a 5-ft wide gravel buffer (within the private property) along the three public street frontages. The buffer strip will be covered with a layer of gravel mulch. A majority of the runoff from the parking lot is directed into the gravel strip in order to satisfy the water quality

concerns associated with parking fields as outlined in the Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual Section 1502. Runoff will then sheet flow off the site into the public street similar to historic conditions. There is no existing or planned sidewalk along the adjacent streets. Reference accompanying Exhibit 2 Onsite Drainage for developed flow conditions and drainage patterns.

CONCLUSIONS

1. The parking lot will be constructed in conformance to the approved site development plan.
2. The proposed improvements will convey runoff generated by offsite and onsite development away from the project site.
3. The project will generally maintain the historical flow pattern of the property.
4. Runoff from the project will not adversely impact adjacent or downstream properties.
5. Since the site will be paved, the likelihood of sediment accumulation and associated street maintenance obligations in Cincinnati, Cleveland, and Fairfield Avenues will be reduced as compared to the historical condition.
6. There are no finished floor elevations applicable for the project

On behalf of Lucky Dragon LP, we respectfully request your approval of this update so the permitting process can be initiated.

Please don't hesitate to contact me with any questions.

Sincerely

Horrocks Engineers

Larry Bitton
Land Development Mgr.

Horrocks Engineers

Nate Wilson, PE

Accompaniments

LEGEND / ABBREVIATIONS

→	CHANNEL FLOW DIRECTION
→	RUNOFF FLOW DIRECTION
●—	BASIN DISCHARGE POINT
OFF1	BASIN IDENTIFIER
Q100	100-YEAR EVENT FLOW QUANTITY
Q25	25-YEAR EVENT FLOW QUANTITY
Q10	10-YEAR EVENT FLOW QUANTITY
CFS	CUBIC FEET PER SECOND

NOTES:

THE GENERAL TOPOGRAPHY OR FALL OF THE PROJECT SITE IS APPROXIMATELY 0.8% FROM THE WEST TO THE EAST.

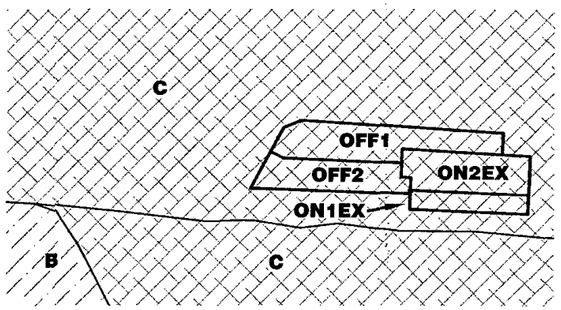
**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH
1"=300'

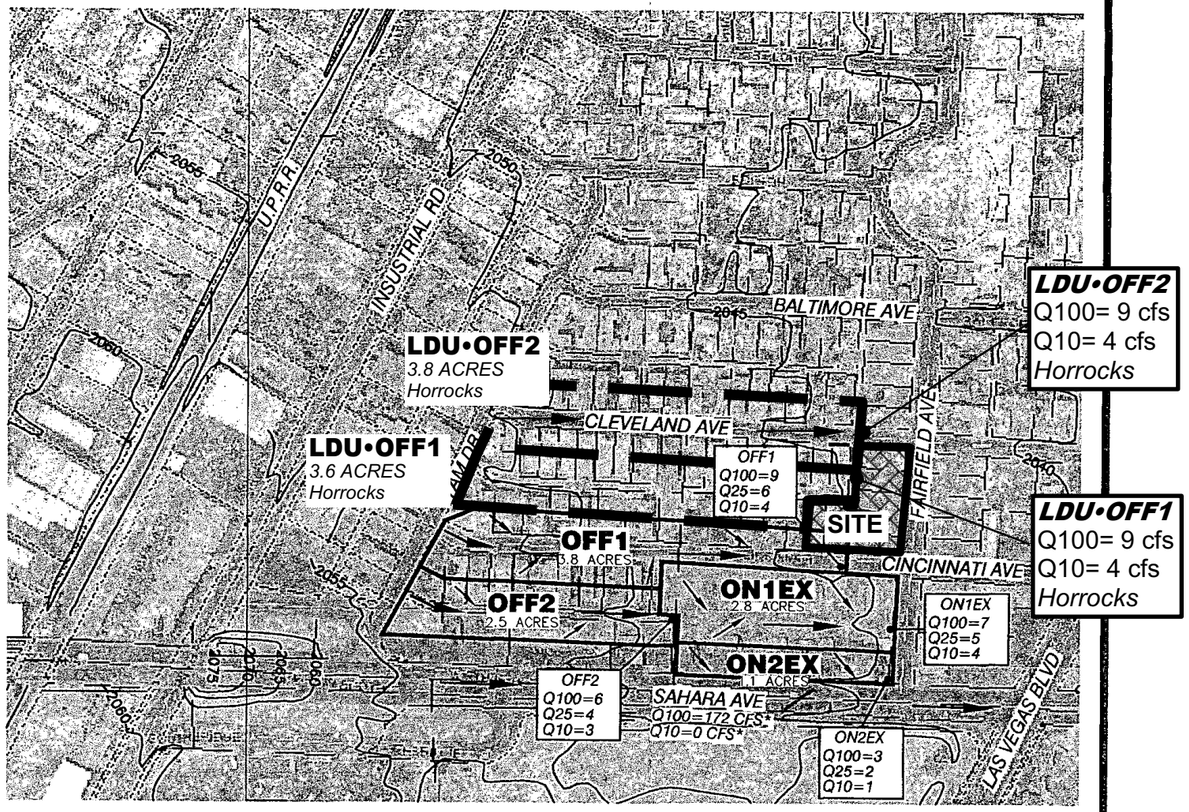
GRAPHIC SCALE

300 0 150 300 600

(IN FEET)
1 inch = 300 FT



SOIL GROUP CLASSIFICATION
SCALE 1"=100'



SOURCE: CLARK COUNTY GEOGRAPHICAL INFORMATION SYSTEMS (GIS): IMAGE AS OF FALL 2004 CONTOURS AS OF 1996

THE PROJECT SITE IS LOCATED WITHIN REGIONAL DRAINAGE BASIN CH51 OF THE CENTRAL WATERSHED. THE SOIL CLASSIFICATION IS TYPE C, WHICH IS INDICATIVE OF MODERATELY HIGH RUNOFF POTENTIAL.

JHR Associates, Ltd.
4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	02/05	**BY:**	JGR
PROJECT #:	124-04-555	**SCALE:**	1"=300'

DESCRIPTION:

OFFSITE DRAINAGE BASIN MAP
EXISTING CONDITION
ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: **6**

1 OF 1

OFFSITE DRAINAGE EXHIBIT FROM ALLURE CONDOMINIUMS DS#3760 - MODIFIED BY HORROCKS ENGINEERS TO SHOW TEMP LUCKY DRAGON TEMP PARKING LOT AND ASSOCIATED OFFSITE BASINS **LDU-OFF1 & LDU-OFF2**

HORROCKS ENGINEERS
1349GalleriaDrive
Suite110
Henderson,NV89014
(702)966-4063

LUCKYDRAGONCASINO
TEMPORARY EMPLOYEE PARKING PLAN
APNS: 162-04-813-044 THRU 050
CLVSDR-66870 [PRJ-66791]

EXHIBIT 1
OFFSITE DRAINAGE

LAS VEGAS CITY COUNCIL

GOODMAN
STEVEN G. ROSS
MAYOR PRO-TEM
LOIS TARKANIAN
RICKI Y. BARLOW
STAVROS S. ANTHONY
BOB COFFIN
FRANK A. HOSMER
CITY MANAGER

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
333 N. RANCHO DRIVE, 3RD FLOOR
LAS VEGAS, NEVADA 89106
VOICE 702.229.6301
FAX 702.474.0352
TTY 7-1
www.lasvegasnevada.gov

October 4, 2016

Oxford Technology Inc
5010 S. Valley View Blvd.
Las Vegas, Nevada 89118

RE: SDR-66870 [PRJ-66971] – *ADMINISTRATIVE SITE DEVELOPMENT PLAN REVIEW*
ADMINISTRATIVE CYCLE – OCTOBER 2016

Dear Applicant

Your request for a Minor Site Development Plan Review FOR A TEMPORARY PARKING LOT at the northwest corner of Cincinnati Avenue and Fairfield Avenue (APNs: 162-04-813-044 through 050), C-2 (General Commercial) Zone, Ward 3 (Goffin) [PRJ-66791], has been considered administratively by the Department of Planning staff.

The Department of Planning has, administratively ***APPROVED*** your request subject to the following:

Planning

1. This approval shall be void three years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.
2. All development shall be in conformance with the site plan date stamped 09/27/16, except as amended by conditions herein.
3. All necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.
4. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.
5. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

6. An update to the previously approved Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to submittal of any construction drawings or the issuance of any building or grading permits, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage study update.
7. Submit an Encroachment Agreement for landscaping and private improvements in the Cincinnati Avenue, Fairfield Avenue, and Cleveland Avenue public rights-of-way, if any, prior to the issuance of permits for these improvements. The applicant must carry an insurance policy for the term of the Encroachment Agreement and add the City of Las Vegas as an additionally insured entity on this insurance policy. If requested by the City, the applicant shall remove property encroaching in the public right-of-way at the applicant's expense pursuant to the terms of the City's Encroachment Agreement. The installation and maintenance of all private improvements in the public right of way shall be the responsibility of the applicant and any successors in interest to the property and assigns pursuant to the terms of the Encroachment Agreement. Coordinate all requirements for the Encroachment Agreement with the Land Development Section of the Department of Building and Safety (702-229-4836).
8. Meet with the Flood Control Section of the Department of Public Works for assistance with establishing finished floor elevations and drainage paths for this site prior to submittal of construction plans, the issuance of any building or grading permits or the submittal of a map for this site, whichever may occur first. Provide and improve all drainage ways as recommended.

This action by the Department of Planning staff on October 18, 2016 is final unless a written appeal is filed with the Director of the Department of Planning within ten days of the date of this letter.

Sincerely,

Peter Lowenstein, AICP
Planning Section Manager
Current Planning

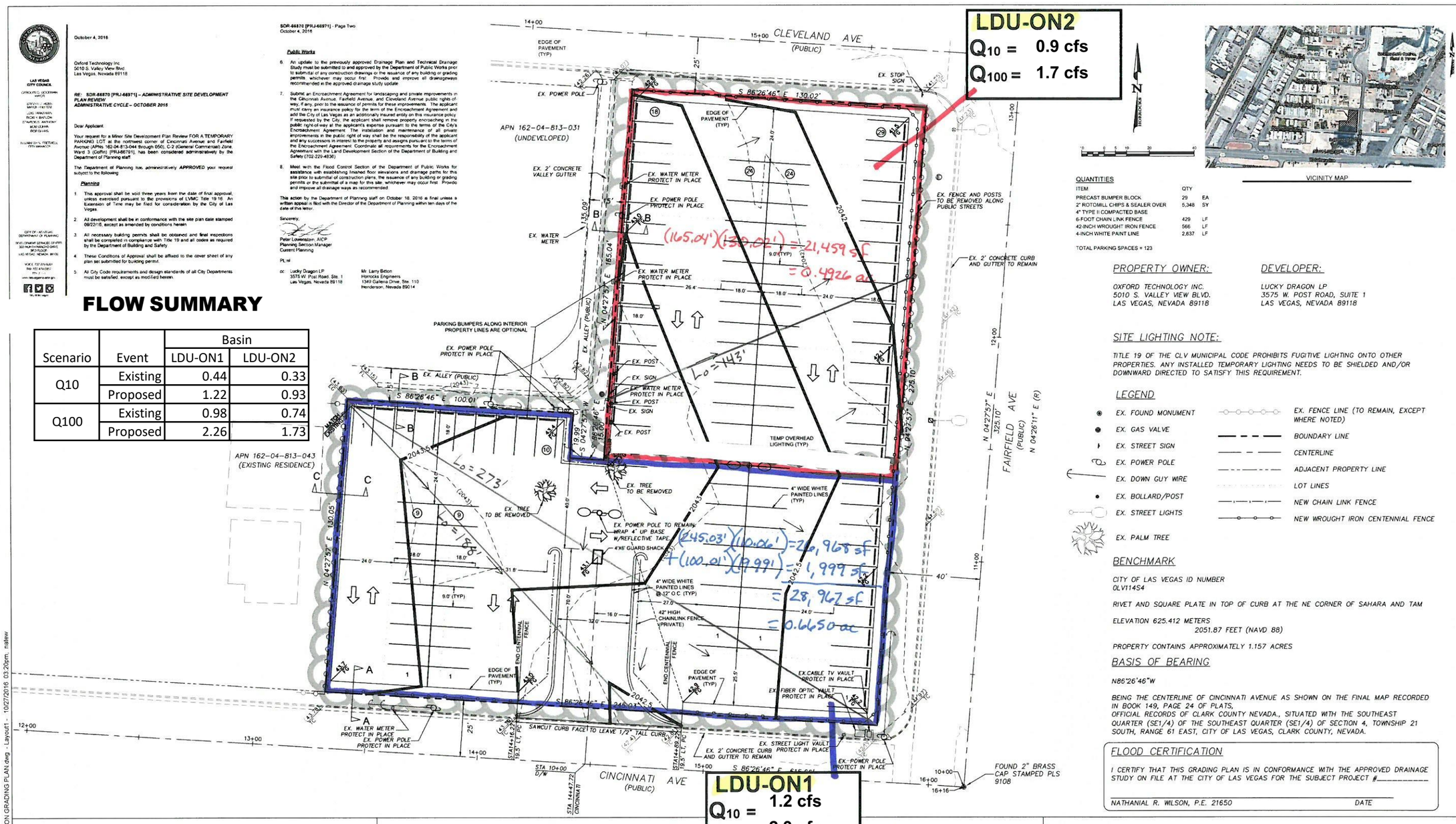
Pl.ml

cc: Lucky Dragon LP
3575 W. Post Road, Ste. 1
Las Vegas, Nevada 89118

Mr. Larry Betton
Horrocks Engineers
1349 Galleria Drive, Ste. 110
Henderson, Nevada 89014

FLOW SUMMARY

Scenario	Event	Basin	
		LDU-ON1	LDU-ON2
Q10	Existing	0.44	0.33
	Proposed	1.22	0.93
Q100	Existing	0.98	0.74
	Proposed	2.26	1.73



VICINITY MAP

QUANTITIES

ITEM	QTY	
PRECAST BUMPER BLOCK	29	EA
2" ROTOMILL CHIPS & SEALER OVER 4" TYPE II COMPACTED BASE	5,348	SY
6-FOOT CHAIN LINK FENCE	429	LF
42-INCH WROUGHT IRON FENCE	566	LF
4-INCH WHITE PAINT LINE	2,637	LF

TOTAL PARKING SPACES = 123

PROPERTY OWNER:

OXFORD TECHNOLOGY INC.
5010 S. VALLEY VIEW BLVD.
LAS VEGAS, NEVADA 89118

DEVELOPER:

LUCKY DRAGON LP
3575 W. POST ROAD, SUITE 1
LAS VEGAS, NEVADA 89118

SITE LIGHTING NOTE:

TITLE 19 OF THE CLV MUNICIPAL CODE PROHIBITS FUGITIVE LIGHTING ONTO OTHER PROPERTIES. ANY INSTALLED TEMPORARY LIGHTING NEEDS TO BE SHIELDED AND/OR DOWNWARD DIRECTED TO SATISFY THIS REQUIREMENT.

LEGEND

- EX. FOUND MONUMENT
- EX. GAS VALVE
- EX. STREET SIGN
- EX. POWER POLE
- EX. DOWN GUY WIRE
- EX. BOLLARD/POST
- EX. STREET LIGHTS
- EX. PALM TREE
- EX. FENCE LINE (TO REMAIN, EXCEPT WHERE NOTED)
- BOUNDARY LINE
- CENTERLINE
- ADJACENT PROPERTY LINE
- LOT LINES
- NEW CHAIN LINK FENCE
- NEW WROUGHT IRON CENTENNIAL FENCE

BENCHMARK

CITY OF LAS VEGAS ID NUMBER
0LV114S4

RIVET AND SQUARE PLATE IN TOP OF CURB AT THE NE CORNER OF SAHARA AND TAM

ELEVATION 625.412 METERS
2051.87 FEET (NAVD 88)

PROPERTY CONTAINS APPROXIMATELY 1.157 ACRES

BASIS OF BEARING

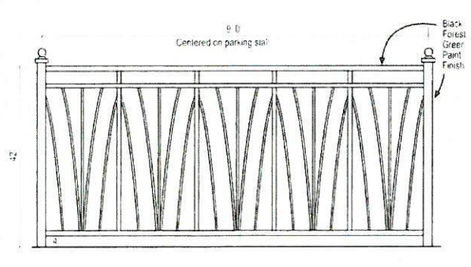
N86°26'46"W

BEING THE CENTERLINE OF CINCINNATI AVENUE AS SHOWN ON THE FINAL MAP RECORDED IN BOOK 149, PAGE 24 OF PLATS, OFFICIAL RECORDS OF CLARK COUNTY NEVADA., SITUATED WITH THE SOUTHEAST QUARTER (SE1/4) OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

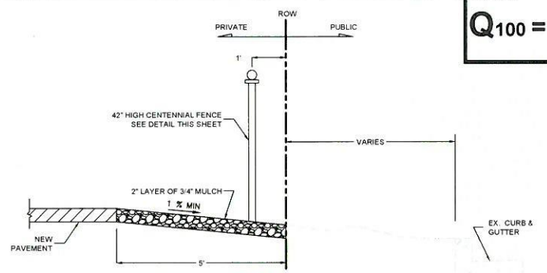
FLOOD CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT #_____

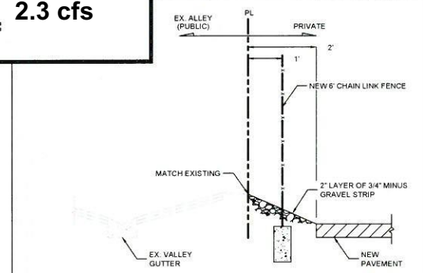
NATHANIAL R. WILSON, P.E. 21650 DATE



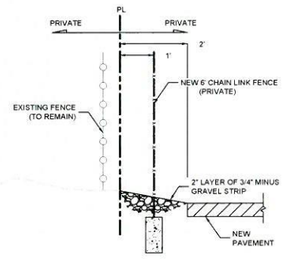
DOWNTOWN CENTENNIAL PLAN FENCE DETAIL
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

DESIGNED	DATE
NW	10/27/16
DRAWN	DATE
NW	10/27/16
CHECKED	DATE
LB	10/27/16

REV	DATE	BY	DESCRIPTION
			REVISIONS

HORROCKS ENGINEERS
1349 Galleria Drive
Suite 110
Henderson, NV 89014
(702) 966-4063

LUCKY DRAGON CASINO

TEMPORARY EMPLOYEE PARKING PLAN
APNS: 162-04-813-044 THRU 050
CLV/SDR-66870 [PRJ-66791]

EXHIBIT 2
ONSITE DRAINAGE

H:\2016\L_Lucky Dragon Parking\DWGS\Working\2016.10.27_LUCKY DRAGON GRADING PLAN.dwg - Layout1 - 10/27/2016 03:20pm, nallew

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
MAYOR

STEVEN D. ROSS
MAYOR PRO TEM

LOIS TARKANIAN
RICKI Y. BARLOW
STAVROS S. ANTHONY
BOB COFFIN
BOB BEERS

ELIZABETH N. FRETWELL
CITY MANAGER

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING

DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89106

VOICE 702.229.6301
FAX 702.474.0352
TTY 7-1-1
www.lasvegasnevada.gov

/city of las vegas

October 4, 2016

Oxford Technology Inc.
5010 S. Valley View Blvd.
Las Vegas, Nevada 89118

RE:* SDR-66870 [PRJ-66971] – *ADMINISTRATIVE SITE DEVELOPMENT PLAN REVIEW
ADMINISTRATIVE CYCLE – OCTOBER 2016

Dear Applicant:

Your request for a Minor Site Development Plan Review FOR A TEMPORARY PARKING LOT at the northwest corner of Cincinnati Avenue and Fairfield Avenue (APNs 162-04-813-044 through 050), C-2 (General Commercial) Zone, Ward 3 (Coffin) [PRJ-66791], has been considered administratively by the Department of Planning staff.

The Department of Planning has administratively ***APPROVED*** your request subject to the following:

Planning

1. This approval shall be void three years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.

2. All development shall be in conformance with the site plan date stamped 09/22/16, except as amended by conditions herein.

3. All necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.

4. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.

5. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

6. An update to the previously approved Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to submittal of any construction drawings or the issuance of any building or grading permits, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage study update.

7. Submit an Encroachment Agreement for landscaping and private improvements in the Cincinnati Avenue, Fairfield Avenue, and Cleveland Avenue public rights-of-way, if any, prior to the issuance of permits for these improvements. The applicant must carry an insurance policy for the term of the Encroachment Agreement and add the City of Las Vegas as an additionally insured entity on this insurance policy. If requested by the City, the applicant shall remove property encroaching in the public right-of-way at the applicant's expense pursuant to the terms of the City's Encroachment Agreement. The installation and maintenance of all private improvements in the public right of way shall be the responsibility of the applicant and any successors in interest to the property and assigns pursuant to the terms of the Encroachment Agreement. Coordinate all requirements for the Encroachment Agreement with the Land Development Section of the Department of Building and Safety (702-229-4836).

8. Meet with the Flood Control Section of the Department of Public Works for assistance with establishing finished floor elevations and drainage paths for this site prior to submittal of construction plans, the issuance of any building or grading permits or the submittal of a map for this site, whichever may occur first. Provide and improve all drainage ways as recommended.

This action by the Department of Planning staff on October 18, 2016 is final unless a written appeal is filed with the Director of the Department of Planning within ten days of the date of this letter.

Sincerely,



Peter Lowenstein, AICP
Planning Section Manager
Current Planning

PL:nl

cc: Lucky Dragon LP
3575 W. Post Road, Ste. 1
Las Vegas, Nevada 89118

Mr. Larry Bitton
Horrocks Engineers
1349 Galleria Drive, Ste. 110
Henderson, Nevada 89014

ATTACHMENT 1
ALLURE CONDOS TDS
(partial)

DS # 3760

DS INDEX:

APN: 162-04-812-001 & 027

PROJECT: Allure Condominiums

SUBMITTAL 1st Submittal

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: March 18, 2005
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Technical Drainage Study for: **Allure Condominiums**			**COPIES TO:** JHR Associates
Cross Streets:	NWC Sahara Av. & Fairfield Av. (W of LVBl)			SP Sahara Development.
File Number:	F:\Depot\DSMEMOS\DS3760A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-812-001 & 027			CCDDS
Zoning Action:	SDR-4534, VAC-5902, SUP-4540			CCRFCD
FEMA Flood Zone	YES	NO	**X**	NDOT
Proposed Storm Drain	YES	NO	**X**	B&H

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	3/4/2005	3/18/2005	See Comments Below	$400.00	17484: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

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.
X	must have Clark County Department of Development Services concurrence

1. **This drainage study is acceptable in concept**, however, the 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.

2. The project is also adjacent to the jurisdiction of Clark County to the south of Sahara Avenue. *Clark County Department of Development Services* must be obtained prior to the final approval of the drainage study.

3. The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right-of-way. The engineer must contact NDOT for encroachment permit for the proposed project.

4. This project is shown as being developed in two Phases. A technical drainage study update is required for Phase 2.

5. Show the limits of the alley replacement. The alley reconstruction must be included as part of the Phase 1 improvements.

6. On Sheets G1 & G2: Indicate the building footprint. Provide the existing plan number for the storm drain within Sahara Ave. Extend the flood protection berm along Sahara Avenue to the center point of the Phase 2 building or provide a solid grouted 8" CMU stem wall a minimum of three cells above the back of walk. Show the roof drain discharge locations and connect to the streets using sidewalk underdrains. Review and revise the plan accordingly.

7. Landscape areas are not allowed to drain over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the street. Revise all pertinent details accordingly.

8. Sheet C11, Detail C: Indicate the minimum ramp elevation on the cross section and provide the minimum slope of the landscape area.

9. Sheet C11, Detail D: Provide the retaining wall height and provide railing as needed.

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

B&H/PBJ

T/R/S: T21S/R61E/04

AREA R-04

GENERAL LOCATION AND DEVELOPMENT DESCRIPTION

The parcel is identified as parcel numbers 162-04-812-001 and 162-04-811-027 on the Assessor's Parcel Map. The property is located on the northwest corner of the intersection of Sahara and Fairfield Avenues. The project site is located within the Southeast Quarter (SE ¼) of Section 4, Township 21 South, Range 61 East, M.D.M., Clark County, Nevada. Refer to **FIGURE 1 (Area Map)** and **FIGURE 3 (APN Map)** contained in the appendix of this report. It is proposed to construct one 40-story condominium tower and ground floor buildings and parking structure at this point in time, and to construct a second tower of the same size at a later date as shown on the **GRADING PLAN** contained in a pocket of this report. The construction will include access drives from the Sahara and Fairfield right of ways, as well as from Cincinnati Ave, which borders the site to the north, as shown. Approximately three-quarters of the site will be developed at this point in time. For the purpose of this study, the site will be considered fully developed.

DESCRIPTION OF PROPERTY

The project site is bounded by Cincinnati Ave to the north, Sahara Ave. to the south, Fairfield Ave. to the east and commercial and high density residential property to the west. Cincinnati Ave. will serve as the ultimate drainage outlet for onsite storm runoff. This hydrology study will serve to establish a minimum recommended finished floor elevation for all buildings in accordance with local and regional criteria.

The project site lies within regional drainage basin sub-area CH51 of the Central Watershed, and its characteristic soil type classification is "C", which is indicative of moderately high runoff potential. Refer to **FIGURE 5** and **5A (Hydrologic Subareas, Land Use & Soils)** as obtained from the 2002 Clark

County Regional Flood Control District (CCRFCD) Master Plan Update (MPU), contained in the appendix. The general topography or fall of the project site is 0.8% from the west to the east.

DRAINAGE BASIN DESCRIPTION

OFFSITE

Two offsite basins that impact the project site have been delineated and labeled as OFF1 and OFF2, with overall contributing areas of approximately 3.8 and 2.5 acres, respectively. Refer to **FIGURE 6** and **FIGURE 7 (Offsite Drainage Basin Maps – Existing and Developed Conditions)** for the existing and developed contained in the appendix. Both basins' soil classification is type "C," which is indicative of moderately high runoff potential, and are labeled as being high density residential areas (refer to **FIGURE 5** and **FIGURE 5A (Hydrologic Subareas, Land Use & Soils)**). An RCN value of 91 is used for both offsite basins per Table 602A contained in the appendix. Runoff from OFF1 is conveyed east in the Cincinnati right of way along the north border of the project site. OFF2 conveys storm runoff from the west via a 20 foot alleyway in an easterly direction, then north through a 20' alleyway that borders the west property line of the project site, ultimately discharging into the Cincinnati right of way at the northwest property corner where, for the purpose of this study, the flow from OFF2 is combined with that of OFF1.

Industrial Road, a major arterial running north/south two blocks west of the project site, was determined not to impact the site in the evaluation of offsite runoff. Industrial Rd. drains from the south to the north. Flows on the east side of the street are diverted east to Las Vegas Blvd. at Circus Circus Drive via a right-hand turn lane. Runoff originating on Industrial Rd. north of Circus Circus Dr. is diverted east onto South Bridge where a portion of the flow is intercepted by a drop inlet located on the south side of the street.

The remaining flow continues east to the Sahara right of way. Flows on the west side of the street continue north where a portion of the flow is intercepted by an existing drop inlet under the Sahara overpass. The overtopping flow will continue northerly on the west side of Industrial Road and not impact the project site.

OFFSITE BASIN DATA SUMMARY TABLE

Basin ID	Area	Soil Group	RCN	Comments
OFF1	3.8 acres	C*	91	Developed
OFF2	2.5 acres	C*	91	Developed

The Hydrologic Soil Group used in the analysis is taken from **FIGURES 5 and **5A** contained in the appendix **(Figures H-17 and H-16 Clark County Master Plan Update 2002)**. The basin and soil type boundaries are shown graphically on **FIGURES 6** and **7 (Offsite Drainage Basin Maps - Existing and Developed Conditions)**, respectively, contained in the appendix.*

ONSITE

The 3.89 acre project site is considered two basins (ON1EX and ON2EX) for the present condition with the outlet of ON1EX indicated as the middle of the east property line and the outlet of ON2EX indicated as the southeast corner of the project site as shown on **FIGURE 6 (Offsite Drainage Basin Map – Existing Condition)**. As per Table 602, which is contained in the appendix, an RCN value of 94 is used for the calculation of runoff for both basins in the existing condition. The RCN value is based on commercial and business use in an urban district, which is reflective of the site's use prior to demolition activities.

For the developed condition, two onsite basins are used. ON1D consists of primarily landscaped areas on the frontage of Sahara Ave., and includes the main entrance from the Sahara right of way. This basin will follow the historical drainage patterns of ON1EX and drain south to Sahara Ave. ON2D is

composed of approximately 82% of the remaining acreage, and includes all buildings and structures. The two 40-story towers and garage structure will utilize a roof drain system that will ultimately discharge north to the Cincinnati right of way.

An RCN value of 98, considered a conservative measure is used for both basins in the developed condition. The onsite basin data is summarized in the following table:

ONSITE BASIN DATA SUMMARY TABLE

Basin ID	Area	Soil Group	RCN	Comments
ON1EX	2.8 acres	C*	94	Site present
ON2EX	1.1 acres	C*	94	Site present
ON1D	0.69 acres	C*	98	Residential
ON2D	3.20 acres	C*	98	Residential

The Hydrologic Soil Group used in the analysis is taken from **FIGURES 5 and **5A** contained in the appendix **(Figures H-17 and H-16 Clark County Master Plan Update 2002)**. The basin and soil type boundaries are shown graphically on **FIGURES 6** and **7 (Offsite Drainage Basin Map - Existing and Developed Conditions)**, respectively, contained in the appendix.*

MASTER PLANNING INFORMATION

The project site is not included within a master planned development. A proposed Regional Flood Control category A facility with ID BHSA 0289 (14' x 12' RCB) borders the project site to the south along Sahara Ave.. Refer to **FIGURES 4** and **4A (Flood Control Facilities)** contained in the appendix.

FLOODPLAIN INFORMATION

The proposed project site lies within a FEMA Zone "X," which is defined as an area being outside the 500-year floodplain. This flood designation is based on FIRM Map No. 32003C2170E with an effective date of September 27, 2002. Refer to **FIGURE 2 (FEMA Map)** contained in the appendix.

PREVIOUS DRAINAGE STUDIES

The site has not been evaluated in any previous studies. A portion of the Central Neighborhood Flood Control Master Plan, furnished by City of Las Vegas Flood Control was used in the preparation of this report. Figures E-16 and F-16 are used to determine the flow in Sahara Avenue impacting the project site. These figures are included in the Reference Appendix of the study.

PROPOSED DRAINAGE FACILITIES

It is proposed to convey offsite flows in the developed condition in the streets adjacent to the project site. Capacity calculations were performed using the FlowMaster program and are summarized in the FACILITY DESIGN CALCULATIONS section of this report.

COMPLIANCE WITH REGULATIONS AND ADOPTED PLANS

The site as designed is in compliance with current local applicable regulations.

NEVADA DEPTARTMENT OF TRANSPORTATION (NDOT) COMPLIANCE

The HEC-1 calculated flow for the 25-year event for onsite basin ON2EX is 2 cfs that discharges to the Sahara right of way. Basin ON1D in the developed condition will drain to the Sahara right of way with a calculated peak flow of 2 cfs. The runoff from the landscaped areas south of the proposed building will not create an adverse impact to the Sahara (NDOT) right of way.

HYDROLOGIC ANALYSIS

The hydrologic analysis was performed using the HEC-1 computer program and the basin delineation as shown on **FIGURES 6 and 7 (Offsite Drainage Basin Map – Existing and Developed Conditions)** and the **DRAINAGE PLAN** included with this report. The parameters used are described as follows:

- **Precipitation**
  The total rainfall used in the analysis is the McCarran Airport rainfall data. Refer to **Figure 513** contained in the appendix. A rainfall total of 1.58, 2.05 and 2.77 inches for the Q_{10}, Q_{25} and Q_{100} six-hour storm event, respectively, is used in accordance with **Table 505**, which is contained in the appendix. The six-hour storm distribution for the Q_{10}, Q_{25} and Q_{100} storm events are based on an SDN 3 storm distribution for areas less than 8 square miles. Refer to **Table 503**. No Depth Area Reduction factors were used in the HEC-1 analysis.

- **Hydrologic soil group**
  The general hydrologic soil groups for the offsite basins are soil type "**C**" as shown on **Figures 5 and 5A (H-16 & 17: Hydrologic Subareas)** of the 2002 CCRFC MPU. A soil classification type "**C**" is representative of moderately high runoff potential.

- **Runoff Coefficient Number (RCN)**
  The RCN value used in the HEC-1 analysis for the basin are summarized on **Standard Form 4**. The RCN values are taken from **Table 602** which is contained in the appendix.

- **Travel Time / T_{LAG}**

  Lag time is the elapsed time from the centroid of rainfall excess to the centroid of direct runoff. It is a measure of the watershed's response time and is a coherent property to basin length, slope and the basin's roughness characteristics. An iterative process of velocity and T_{LAG} determined the travel time velocities. The ultimate velocities used in the analysis are calculated with Flowmaster and are contained in the appendix. A minimum time of concentration value of 5 minutes, T_{LAG} = 0.05, is applied as necessary in accordance with **Section 602** of the CCRFCD Hydrologic Criteria and Drainage Design Manual. Refer to main conveyance velocity calculations for the appropriate basin areas contained in the appendix.

A summary of the calculated runoff from the drainage basins for both the present and developed conditions are provided on the **DRAINAGE PLAN** and are summarized as follows:

BASIN FLOW SUMMARY			
Basin ID	**Q_{10}**	**Q_{25}**	**Q_{100}**
OFF1	4 cfs	6 cfs	9 cfs
OFF2	3 cfs	4 cfs	6 cfs
ON1EX	4 cfs	5 cfs	7 cfs
ON2EX	1 cfs	2 cfs	3 cfs
ON1D	1 cfs	2 cfs	3 cfs
ON2D	6 cfs	8 cfs	11 cfs

FACILITY DESIGN CALCULATIONS

The flow data used for the adjacent right of way of Sahara Ave. is referenced from the City of Las Vegas Central Neighborhood Flood Control Master Plan, which indicates flow quantities of 0 cfs and 172 cfs for the 10 and 100-year events, respectively. Flow for the 10-year event is zero, as all storm runoff in the Sahara right of way is maintained in existing drainage facilities. FlowMaster sections were modeled at three locations to check for adequate

elevation above the depth of flow in the Sahara right of way. These are labeled as **SECTIONS D1**, **D2** and **D3** on the **DRAINAGE PLAN**.

A FlowMaster section was used to determine the flow capacity in Cincinnati Avenue north of the project site and is indicated on the **DRAINAGE PLAN** as **D4**. For the 10 and 100-year events calculated flows are 13 and 26 cfs respectively. These values include those flows generated by both offsite basins OFF1 and OFF2, as well as the developed onsite basin ON2D, and are summarized in the following table:

10 YEAR FLOW				
Street	**Q**	**V**	**D**	**V*D**
Sahara Ave.	0 cfs*	0 fps	0 ft	0
Cincinnati Ave.	13 cfs	2.25 fps	0.51 ft	1.15
100 YEAR FLOW				
Sahara Ave.	172 cfs*	4.30 fps*	1.19 ft*	5.12*
Cincinnati Ave.	26 cfs	2.56 fps	0.61 ft	1.56

Q value referenced from the City of Las Vegas Central Neighborhood Flood Control Master Plan contained in the reference appendix. V and D calculations are based on Section D1 as shown on the **DRAINAGE PLAN, which represents worst case water surface elevation in Sahara Ave..*

Flow in the Fairfield right of way east of the project site is negligible, as a proposed high point south of the access drive prevents runoff from entering Fairfield Avenue.

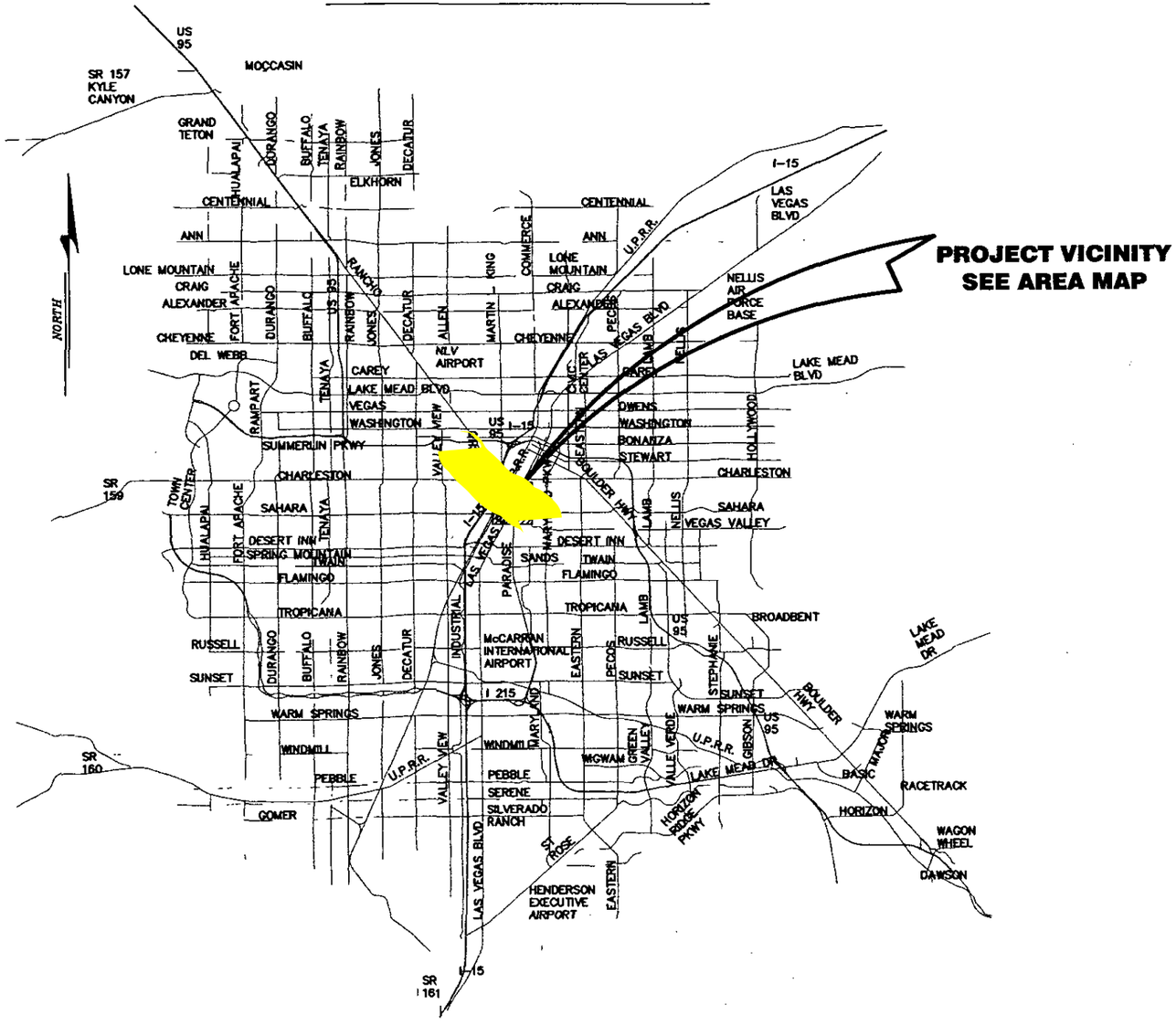
The west side of the site is adjacent to an existing 20.0 foot public alley that currently conveys drainage for Basin OFF2 north to the Cincinnati right of

way. It is not proposed with this submittal to improve the areas at the northwest corner of the site with the exception of the construction of the proposed driveway on Cincinnati Avenue as shown on the Grading Plan. The planned driveway will not impact the current drainage patterns in the area. It is intended that this study be updated for the construction of tower 2 in the future and drainage improvements to the alley system will be proposed. Because of the existing 20.0 foot public alley, it is not anticipated that a drainage easement for Basin OFF2 will be required in the future.

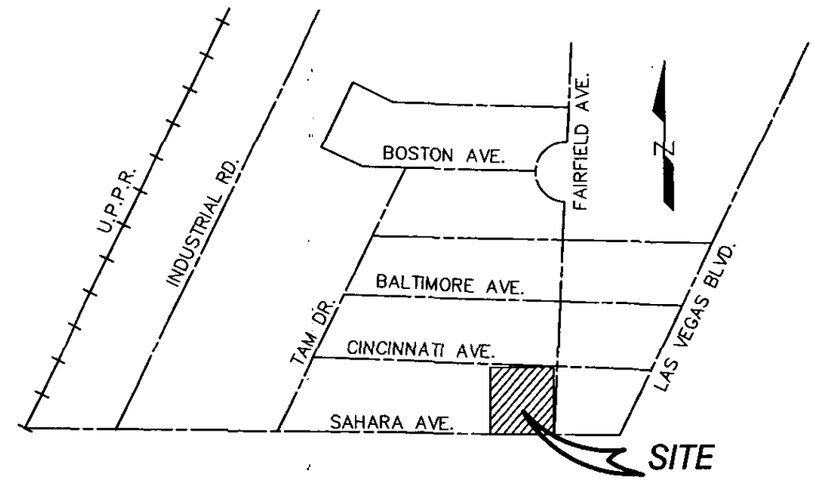
CONCLUSIONS

The finish floor elevation of 2047.00 is adequate to protect the buildings from the calculated 100-year storm flows. The project does not require any variances or deviations from accepted standards or design criteria.

VICINITY MAP
CITY OF LAS VEGAS, NEVADA



PROJECT VICINITY
SEE AREA MAP



AREA MAP

N.T.S.

THIS PROJECT IS LOCATED IN TOWNSHIP 21 SOUTH, RANGE 61 EAST, SECTION 04.

APNS 162-04-812-001 AND 162-04-811-027

JHR Associates, Ltd.
4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	**02/05**	**BY:**	**JGR**
PROJECT #:	**124-04-555**	**SCALE:**	**N/A**

DESCRIPTION:

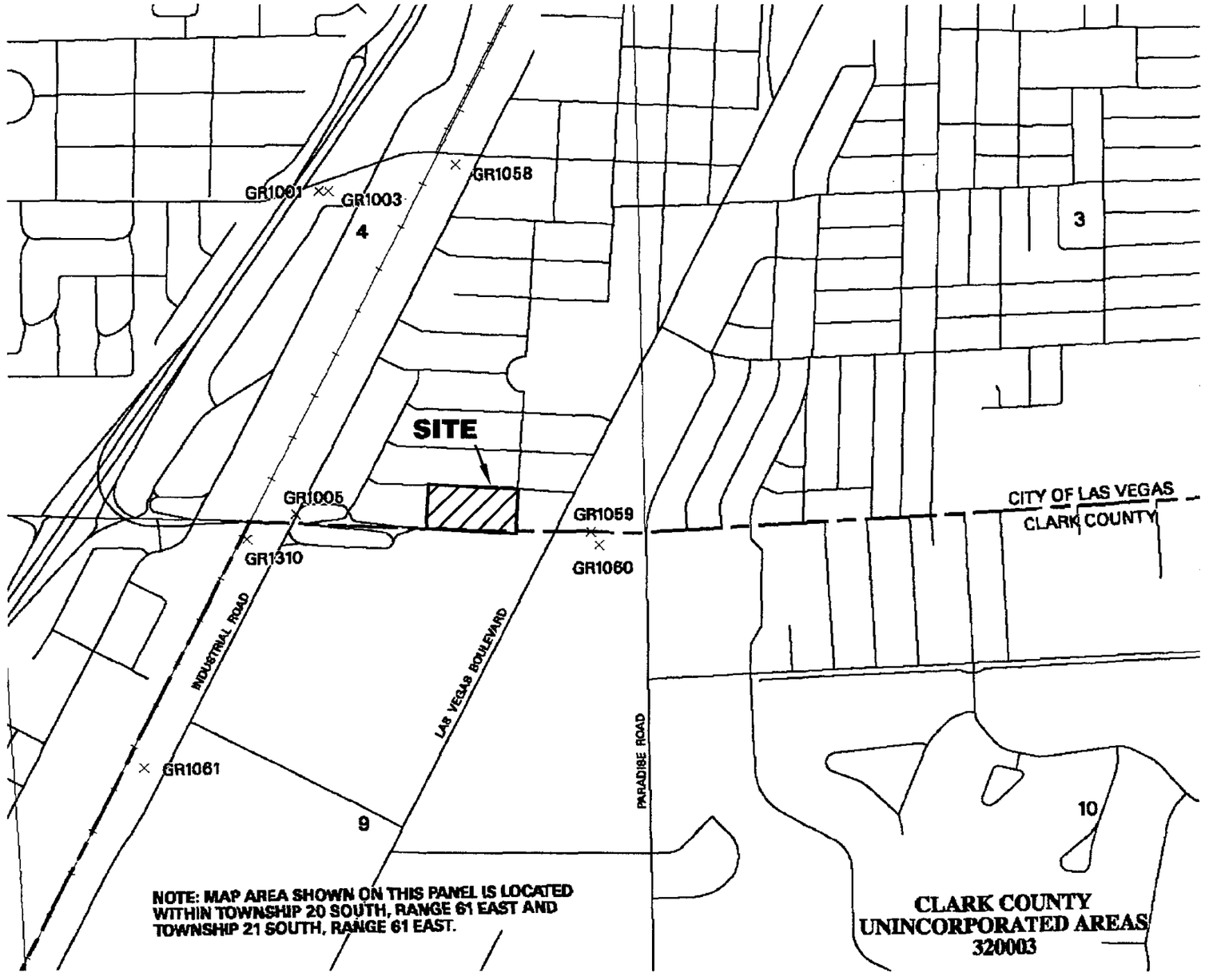
AREA MAP
ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: **1**

1 OF 1

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MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2170 E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 2170 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2170	E
NORTH LAS VEGAS, CITY OF	320007	2170	E
LAS VEGAS, CITY OF	320276	2170	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
32003C2170 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

THE PROJECT SITE LIES WITHIN A FEMA DESIGNATED ZONE X, WHICH IS DEFINED AS AN AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOODPLAIN.

JHR Associates, Ltd.
4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	02/05	**BY:**	JGR
PROJECT #:	124-04-555	**SCALE:**	1"=1000'

DESCRIPTION:

FEMA MAP

ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: 2

1 OF 1

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NOTES

This map is for assessment use only and does NOT represent a survey.

No liability is assumed for the accuracy of the data deliniated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

SCALE IN FEET

0 50 100 200 400 600 800

MAP LEGEND

AVERAGE QA VALUE 35

ASSESSOR'S PARCELS - CLARK CO., NV.

M. W. Schofield, Assessor

PARCEL BOUNDARY	001 1.00	PARCEL NUMBER ACREAGE
SUBD BOUNDARY	202	PARCEL SUB/SEQ NUMBER
ROAD EASEMENT	PB 25-45	PLAT RECORDING NUMBER
PM/LD BOUNDARY	5	BLOCK NUMBER
NON-PARCEL LOT LINE	5	LOT NUMBER
MATCH LINE / LEADER LINE	GL5	GOV. LOT NUMBER
001 ROAD ID NUMBER		

BOOK T21S R61E

	R60E	R61E	R62E
T20S	138	139	140
T21S	163	162	161
T22S	176	177	178

SEC. 04

	6	5	4	3	2	1
	7	8	9	10	11	12
	18	17	16	15	14	13
	19	20	21	22	23	24
	30	29	28	27	26	25
	31	32	33	34	35	36

MAP S 2 SE 4

8	4	8	4
5	1	5	1
6	2	6	2
7	3	7	3
8	4	8	4
5	1	5	1

Scale:1"=200' Rev:10/03/00

162-04-8

CLARK COUNTY NEVADA

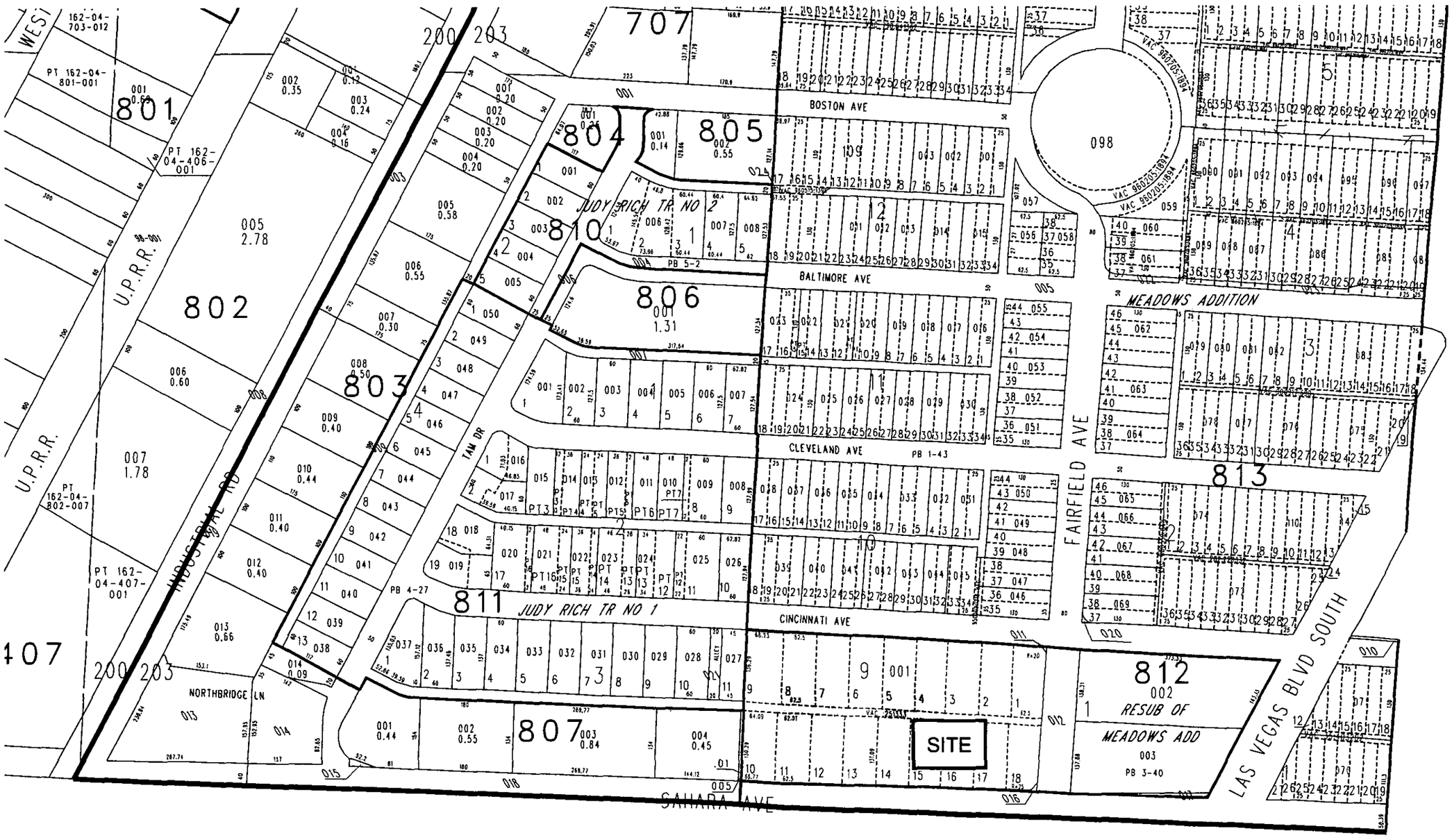
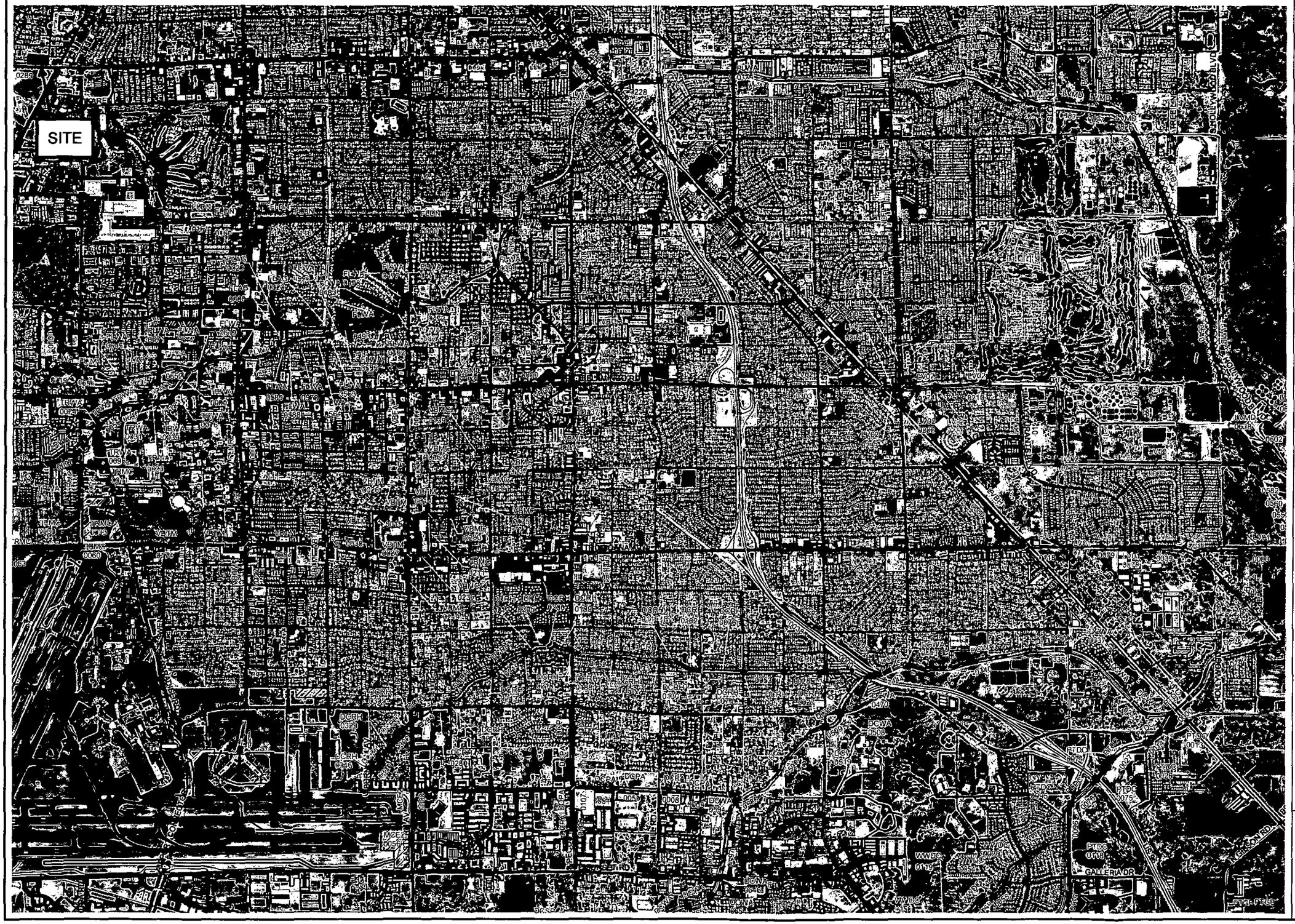


FIGURE 3



REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDAT

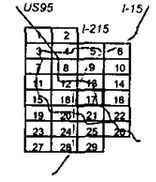
LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Unlined Channel
- Dike
- Natural Wash
- ID-Mile Separator

N
W E
S

0 1,000 2,000 3,000 4,000 5,0
Feet

SCALE: 1 inch = 3000 feet

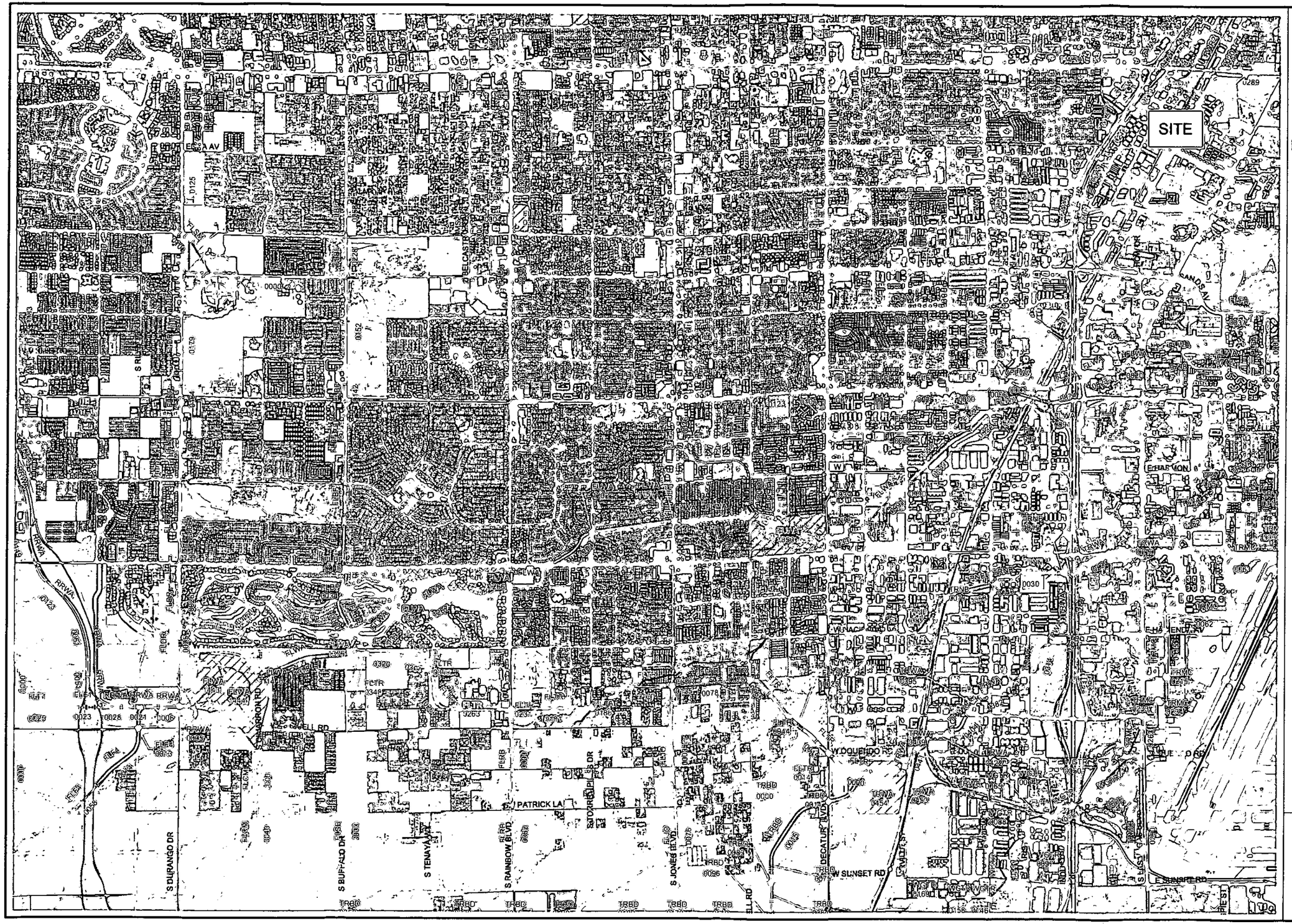


FLOOD CONTROL FACILITIES
FIGURE F-17

PBS&J

C.C. WALLACE, INC.

FIGURE 4



REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDAT

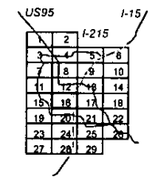
LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Unlined Channel
- XXXX Dike
- Natural Wash
- ID-Mile Separator

N
W E
S

0 1,000 2,000 3,000 4,000 5,0
Feet

SCALE: 1 inch = 3000 feet



FLOOD CONTROL FACILITIES
FIGURE F-16

PBS&J

C.C. WALLACE, INC.

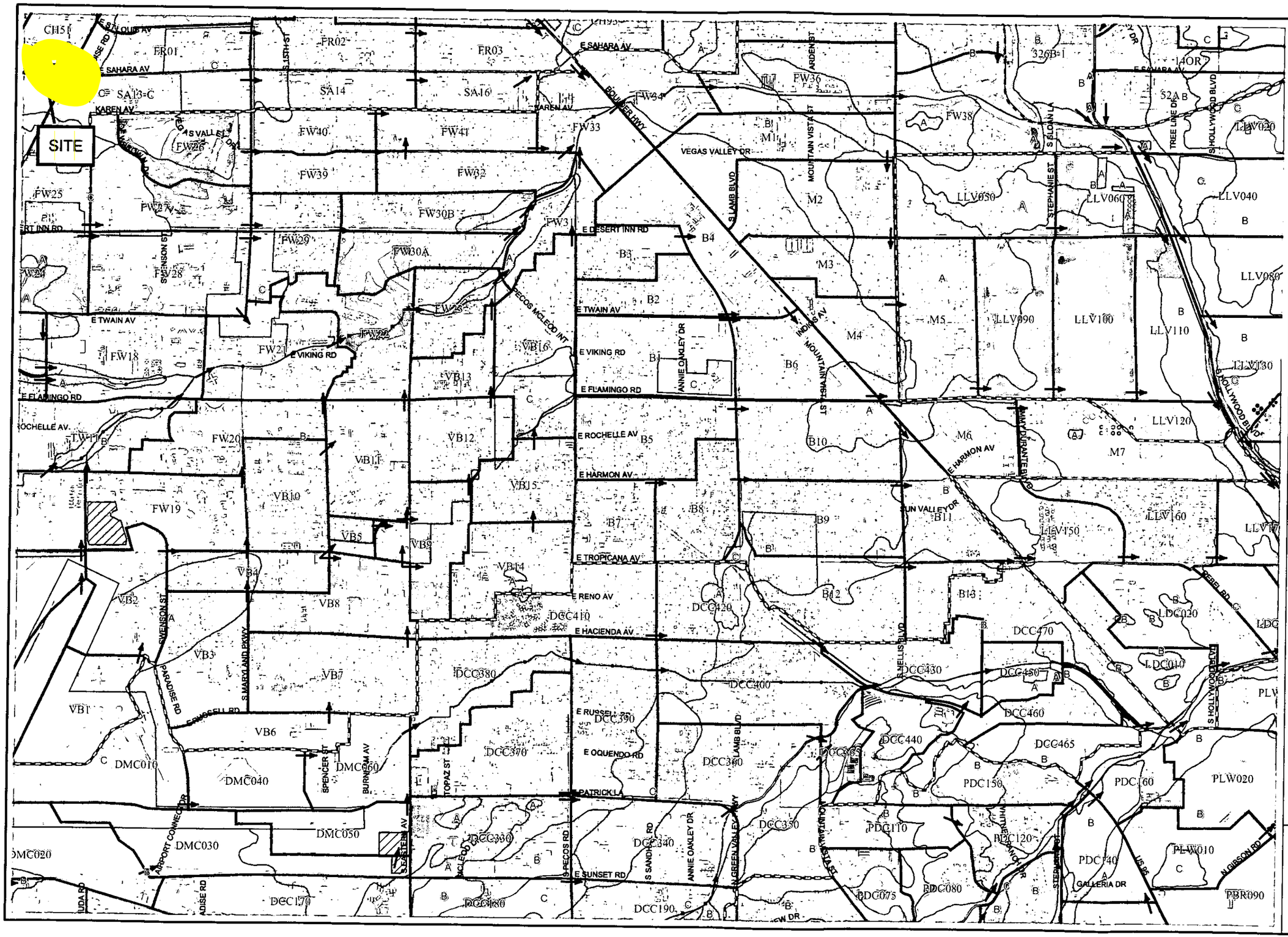
FIGURE 4A

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)
BDMO		**BLUE DIAMOND CHANNEL MOHAWK**						
0000	E	Conc Chnl 10'W 6'D 0:1 SS	570	343	CTBD20BS	FLAM3SC	0.73	0.70
BHSA		**BOULDER HIGHWAY SAHARA AVENUE**						
0289	P1	14' X 12' RCB	2300	3462	CSA11	SW3SC	7.76	0.87
0331	P1	12' X 12' RCB	2000	3152	CSA10-2	SW3SC	7.36	1.00
FLBF		**FLAMINGO WASH - BUFFALO**						
0000	E	Gabion Chnl 35'W 9.5'D 3:1 SS	1850	1375	CLF16	FLAM3SC	3.48	0.40
0034	E	2: 12' X 8' RCBC	40	1183	CLF15	FLAM3SC	2.96	0.70
0036	E	Gabion Chnl 30'W 5'D 1:1 SS	550	1183	CLF15	FLAM3SC	2.96	0.50
0044	E	2: 12' X 8' RCBC @ Spanish Gate	40	1183	CLF15	FLAM3SC	2.96	0.40
0045	E	Conc Chnl 10'W 7'D 2:1 SS	40	1183	CLF15	FLAM3SC	2.96	0.50
0046	E	2: 15' X 8' RCBC @ Tropicana	150	1183	CLF15	FLAM3SC	2.96	0.80
0047	E	Conc Chnl 10'W 7'D 2:1 SS	1650	1183	CLF15	FLAM3SC	2.96	0.40
0107	E	2: 10' X 6' RCB	990	1001	CLF14	FLAM3SC	2.69	0.25
0125	E	2: 9' X 7' RCB	2720	895	CLF13	FLAM3SC	2.43	0.32
0142	E	12' X 6' RCB	550	670	CLF12	FLAM3SC	1.91	0.32
0152	E	10' X 7' RCB	3460	670	CLF12	FLAM3SC	1.91	0.32
0228	E	96" RCP	1330	539	CLF9	FLAM3SC	0.93	1.00
0252	E	9' X 6' RCB	170	539	CLF9	FLAM3SC	0.93	1.00
0258	E	96" RCP	1140	539	CLF9	FLAM3SC	0.93	0.50
0278	E	90" RCP	2640	495	LF8	FLAM3SC	0.50	0.50
0328	E	54" RCP	660					0.30
FLCM		**FLAMINGO-CIMMARON BRANCH**						
0000	P1	78" RCP	2110	391	UFS27	FLAM3SC	0.38	1.50
0040	P1	72" RCP	2690	391	UFS27	FLAM3SC	0.38	1.50
FLDI		**DESERT INN DRAIN**						
0000	E	9' X 6' RCB	190	1208	CLF4	FLAM3SC	1.38	2.71
0004	E	96" RCP	2670	1208	CLF4	FLAM3SC	1.38	1.00
0050	E	90" RCP	1390	931	CLF3	FLAM3SC	0.94	1.65
0075	E	84" RCP	1010	931	CLF3	FLAM3SC	0.94	1.87
0095	E	96" RCP	200	931	CLF3	FLAM3SC	0.94	1.87
0100	E	72" RCP	190	329	LF1	FLAM3SC	0.37	1.86
FLDR		**DURANGO COLLECTOR**						
0000	E	12' X 10' RCB	1630	999	CUFS26	FLAM3SC	1.94	0.57
0025	E	14' X 6' RCB	110	999	CUFS26	FLAM3SC	1.94	0.45
0026	E	12' X 8' RCB	2570	999	CUFS26	FLAM3SC	1.94	0.52
0064	E	12' X 6' RCB	2610	930	CUFS25	FLAM3SC	1.73	0.60
0114	E	10' X 7' RCB	2780	706	CUFS24	FLAM3SC	1.28	0.33
0164	E	10' X 7' RCB	360	437	CUFS23	FLAM3SC	0.77	1.52
0169	E	84" RCP	510	437	CUFS23	FLAM3SC	0.77	1.10
0179	E	60" RCP	1810	174	UFS22	FLAM3SC	0.25	1.21
FLDY		**FLAMINGO WASH - DARBY STORM DRAIN**						
0000	E	84" RCP	100	549	CLF24	FLAM3SC	0.76	0.25
0002	E	10' X 3' RCB	50	549	CLF24	FLAM3SC	0.76	0.25
0004	E	60" RCP	680	549	CLF24	FLAM3SC	0.76	2.80
0013	E	78" RCP	560	549	CLF24	FLAM3SC	0.76	1.79
FLF1		**F1 CHANNEL**						
0000	E	Conc Chnl 13'W 13'D 0:1 SS	650	5844	CUFSSCW	FLAM3SC	7.87	2.40
0015	E	13' X 12' RCB	170	5844	CUFSSCW	FLAM3SC	7.87	0.61
0018	E	Conc Chnl 13'W 12' D	80	5844	CUFSSCW	FLAM3SC	7.87	0.61
0020	E	13' X 12' RCB	190	5844	CUFSSCW	FLAM3SC	7.87	0.61
0022	E	Conc Chnl 13'W 12' D	100	5844	CUFSSCW	FLAM3SC	7.87	4.35
0023	E	13' X 12' RCB	160	5844	CUFSSCW	FLAM3SC	7.87	4.35
0025	P2	Conc Chnl 20'W 8.5'D 2:1 SS	2180	5844	CUFSSCW	FLAM3SC	7.87	2.01
0066	P2	Conc Chnl 20'W 8'D 2:1 SS	5350	5303	CF1F2	FLAM3SC	7.10	2.01
FLF4		**F4 CHANNEL**						
0000	E	Conc Chnl 19.5'W 23'D 2:1 SS	730	5636	CUFS19S	FLAM3SC	6.82	5.00
0013	E	19.5' X 13.5' RCB	140	5636	CUFS19S	FLAM3SC	6.82	0.60
0014	E	Conc Chnl 10'W 10'D 2:1 SS	2340	5636	CUFS19S	FLAM3SC	6.82	0.90
0050	E	28' X 12' RCB	420	5330	CUFS18	FLAM3SC	6.47	0.94
0058	E	20' X 12' RCB	250	5330	CUFS18	FLAM3SC	6.47	0.94
0091	P1	Conc Chnl 20'W 8.5'D 2:1 SS	640	5330	CUFS18	FLAM3SC	6.47	1.28
0101	P1	Conc Chnl 20'W 8.5'D 2:1 SS	2280	4095	CUFS13	FLAM3SC	4.45	1.28
0155	P1	Conc Chnl 20'W 7.0'D 2:1 SS	10550	3846	CUFS12	FLAM3SC	4.07	1.90
FLFA		**FLAMINGO - FASHION**						
0000	E	12' X 5' RCB	2050	729	CFW17N	FLAM3SC	0.72	0.28
0037	E	8' X 5' RCB	3060	527	FW14	FLAM3SC	0.44	0.45
FLFL		**FLAMINGO WASH - FLAMINGO STORM DRAIN**						
0000	E	54" RCP	1370	683	CFW4	FLAM3SC	0.68	1.70
0026	E	57" RCP	1370	683	CFW4	FLAM3SC	0.68	1.14
0051	E	51" RCP	1390	377	FW3	FLAM3SC	0.37	0.96
0077	E	42" RCP	1160					1.68
0101	E	45" RCP	1250					3.54
0123	E	39" RCP	790					0.83
0139	E	33" RCP	430					0.83
0147	E	27" RCP	1260					1.19
FLHA		**FLAMINGO HACIENDA**						
0000	P1	Conc Chnl 10'W 6.5'D 0:1 SS	2010	774	CUFSSBN	FLAM3SC	0.65	1.00
FLJO		**FLAMINGO DIVERSION-JONES BRANCH**						
0000	E	12' X 6' RCB	3310	1179	CTD11S	FLAM3SC	1.46	1.00
0076	E	96" RCP	2640	699	CTD9	FLAM3SC	0.79	1.00
FLLA		**FLAMINGO WASH - LATERAL DRAIN (FLAMINGO/RAINBOW)**						
0000	E	Conc Chnl 20'W 6'D 0:1 SS	4200	1191	CLF32	FLAM3SC	2.48	0.75
0076	E	114" RCP	1490	1048	CLF31	FLAM3SC	2.25	0.89
0104	E	114" RCP	5340	824	CLF29	FLAM3SC	1.36	0.89
0203	E	96" RCP	1350	664	CLF28	FLAM3SC	1.07	0.40
0227	E	93" RCP	1360	664	CLF28	FLAM3SC	1.07	0.40
0254	E	90" RCP	2730	431	CLF27	FLAM3SC	0.56	0.40
0305	E	1,556 cfs Spillway		1556	CLF25	FLAM3SC	0.97	
0306	E	30" RCP with 18" Orifice Outlet	160	29	DIDB	FLAM3SC	0.97	0.43

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)
FLLA		**FLAMINGO WASH - LATERAL DRAIN (FLAMINGO/RAINBOW) – continued**						
0308	E	62 ac-ft Desert Inn Detention Basin		734	CLF25	FLAM3SC	0.97	
0322	E	81" RCP	1370					0.50
0345	E	81" RCP	1340					0.50
0369	E	72" RCP	670					0.50
0379	E	66" RCP	1320					0.50
FLMN		**FLAMINGO WASH - MONTESSOURI NORTH**						
0000	E	78" RCP	1340					0.50
0025	E	72" RCP	1330					0.50
0050	E	66" RCP	500					0.50
0060	E	54" RCP	800					0.50
0075	E	48" RCP	30					0.50
FLMS		**FLAMINGO WASH - MONTESSOURI SOUTH**						
0000	E	54" RCP	630					0.52
FLOQ		**FLAMINGO OQUENDO**						
0000	P1	Conc Chnl 12'W 7.5'D 0:1 SS	3160	926	CUFS15W	FLAM3SC	0.99	0.50
FLRB		**FLAMINGO DIVERSION-RAINBOW BRANCH**						
0000	P1	Conc Chnl 12'W 5.0'D 2:1 SS	3300	1086	CTD6	FLAM3SC	1.29	1.00
0062	P1	96" RCP	2660	671	CTD5	FLAM3SC	1.00	1.00
FLRO		**FLAMINGO WASH - ROCHELLE**						
0000	E	48" RCP	4350	295	FW1	FLAM3SC	0.29	1.30
FLSB		**FLAMINGO DIVERSION-SOUTH BUFFALO BRANCH**						
0000	P1	9' X 6' RCB	7800	865	CTD3S	FLAM3SC	1.01	1.20
FLSM		**SPRING MOUNTAIN DRAIN**						
0000	E	60" RCP	4590	113	CLF10W	FLAM3	2.84	2.50
0083	E	36" RCP	570	85	LAKEDB	FLAM3SC	2.62	1.90
0086	E	36" RCP Outlet	90	85	LAKEDB	FLAM3SC	2.62	
0087	E	143 ac-ft Lakes Detention Basin		1955	CLF7	FLAM3SC	2.62	
0100	E	12' X 8' RCB	310	1955	CLF7	FLAM3SC	2.62	1.25
0125	E	96" RCP	3040	748	CLF6N	FLAM3SC	0.87	0.80
0180	E	90" RCP	2350	523	LF5	FLAM3SC	0.49	0.50
FLTR		**FLAMINGO-TROPICANA DIVERSION CHANNEL**						
0000	E	Conc Chnl 26'W 19.5'D 0:1 SS	1480	3478	CTD13	FLAM3SC	4.86	0.11
0014	E	26' X 18' RCBC	250	3478	CTD13	FLAM3SC	4.86	0.11
0015	E	Conc Chnl 26'W 18'D 0:1 SS	460	3214	CTD13N	FLAM3SC	4.44	0.11
0020	E	Conc Chnl 13'W 18'D 2:1 SS	610	3214	CTD13N	FLAM3SC	4.44	0.11
0025	E	Conc Chnl 26'W 16.5'D 0:1 SS	500	3214	CTD13N	FLAM3SC	4.44	0.11
0044	E	26' X 16.5' RCBC	160	3214	CTD13N	FLAM3SC	4.44	0.11
0046	E	Conc Chnl 13'W 16.5'D 2:1 SS	920	3214	CTD13N	FLAM3SC	4.44	0.11
0065	E	Conc Chnl 19.5'W 18'D 0:1SS	740	3214	CTD13N	FLAM3SC	4.44	0.11
0076	E	19.5' X 18' RCBC	120	3098	CTD11	FLAM3SC	4.07	0.11
0078	E	Conc Chnl 13'W 11.5'D 2:1 SS	2410	3098	CTD11	FLAM3SC	4.07	1.25
0125	E	19.5' X 16.5' RCBC	150	3098	CTD11	FLAM3SC	4.07	1.25
0127	P2	Conc Chnl 19.5'W 11.5'D 0:1 SS	2770	2085	CTD7	FLAM3SC	2.61	1.25
0180	P2	19.5 X 15' RCBC	120	2085	CTD7	FLAM3SC	2.61	0.96
0181	P1	Conc Chnl 13'W 11.5'D 2:1 SS	2530	2085	CTD7	FLAM3SC	2.61	0.96
0231	P2	19.5' X 8' RCBC	160	2085	CTD7	FLAM3SC	2.61	0.70
0233	P2	Conc Chnl 19.5'W 8'D 0:1 SS	1550	1071	CTD7W	FLAM3SC	1.32	0.70
0263	P2	19.5' X 10' RCBC	100	1071	CTD7W	FLAM3SC	1.32	0.70
0264	P2	Conc Chnl 19.5'W 8'D 0:1 SS	1870	1071	CTD7W	FLAM3SC	1.32	0.70
0300	P2	19.5' X 8' RCBC	120	1071	CTD7W	FLAM3SC	1.32	0.70
0301	P2	Conc Chnl 19.5'W 10'D 0:1 SS	940	1071	CTD7W	FLAM3SC	1.32	0.70
0320	P2	Conc Chnl 13'W 10'D 2:1 SS	1080	1071	CTD7W	FLAM3SC	1.32	0.70
0340	P2	10' X 8' RCBC	120	865	CTD3	FLAM3SC	1.02	0.70
0341	P2	Conc Chnl 33'W 10'D 0:1 SS	480	865	CTD3	FLAM3SC	1.02	0.70
FLVV		**FLAMINGO - VALLEY VIEW**						
0000	E	60" RCP	1490	870	CFW5	FLAM3SC	1.20	0.67
0001	P0	Add Parallel 102" RCP	1490	870	CFW5	FLAM3SC	1.20	0.67
0028	E	48" RCP	3310	229	FW5	FLAM3SC	0.52	0.50
0090	E	48" RCP	4180	229	FW5	FLAM3SC	0.52	1.06
FLWA		**FLAMINGO WASH**						
0719	E	2: 15' X 10' RCB @ Paradise	1440	3587	CFW17	FLAM3SC	4.48	0.53
0748	E	Conc Chnl 30'W 10'D 0:1 SS	1220	2732	CFW17W	FLAM3SC	3.53	0.64
0768	E	Conc Chnl 50'W 6'D 4:1 SS	150	2732	CFW17W	FLAM3SC	3.53	0.64
0772	E	4: 8' X 6' RCBC @ Koval	90	2732	CFW17W	FLAM3SC	3.53	2.30
0773	E	2: 11' X 7' RCB	1530	2732	CFW17W	FLAM3SC	3.53	0.91
0798	E	Free Span Bridge 90'W 8'D	680	2732	CFW17W	FLAM3SC	3.53	0.40
0810	E	4: 10' X 10' RCB	640	2732	CFW17W	FLAM3SC	3.53	0.38
0820	E	8: 10' X 8' RCBC @ Las Vegas Blvd	100	2732	CFW17W	FLAM3SC	3.53	0.38
0823	E	2: 16' X 10' RCB	2610	2631	CFW13	FLAM3SC	3.37	0.83
0874	E	6: 10' X 8' RCBC	560	1804	CFW11	FLAM3SC	2.31	0.82
0884	E	Gabion Chnl 100'W 3.5'D 3:1 SS	320	1804	CFW11	FLAM3SC	2.31	0.60
0891	E	7 Span Bridge 84'W 5.5'D @ UPRR	90	1804	CFW11	FLAM3SC	2.31	1.30
0892	E	Earth Chnl 60'W 10'D 3:1 SS	140	1804	CFW11	FLAM3SC	2.31	0.84
0892	P1	Gabion Chnl 30'W 7'D 2:1 SS	140	1804	CFW11	FLAM3SC	2.31	0.84
0895	E	Earth Chnl 60'W 10'D 3:1 SS	560	970	CFW11S	FLAM3SC	0.98	0.84
0895	P1	Gabion Chnl 30'W 5'D 2:1 SS	560	970	CFW11S	FLAM3SC	0.98	0.84
0901	E	4: 12' X 10' RCBC @ Flamingo/Industrial Connector	180	970	CFW11S	FLAM3SC	0.98	0.60
0902	E	Earth/Conc Chnl 30'W 15'D 1:1 SS	1000	970	CFW11S	FLAM3SC	0.98	0.72
0902	P1	Conc Chnl 30'W 4'D 1:1 SS	1000	970	CFW11S	FLAM3SC	0.98	0.72
0923	E	3: 20' X 5' Arch Culverts @ Valley	80	970	CFW11S	FLAM3SC	0.98	1.10
0924	E	Earth Chnl 60'W 14'D 1:1 SS	800	970	CFW11S	FLAM3SC	0.98	1.00
0924	P1	Gabion Chnl 30'W 5'D 2:1 SS	800	970	CFW11S	FLAM3SC	0.98	1.00
0940	E	Earth Chnl 60'W 14'D 1:1 SS	2700	908	LWFLDB	FLAM4SC	8.94	1.00
0940	P1	Gabion Chnl 30'W 5'D 2:1 SS	2700	908	LWFLDB	FLAM4SC	8.94	1.00
0990	E	7: 12' X 5' RCBC @ Arville	130	906	LWFLDB	FLAM4SC	8.94	1.50
0991	E	3: 10' X 8' RCB Orleans Box	1970	908	LWFLDB	FLAM4SC	8.94	1.00
1025	E	7: 10' X 5' RCBC @ Cameron	100	908	LWFLDB	FLAM4SC	8.94	1.10
1026	E	2: 24' X 9' Concrete Arch	450	908	LWFLDB	FLAM4SC	8.94	0.43
1033	E	3: 12' X 10' Concrete Arch	680	908	LWFLDB	FLAM4SC	8.94	0.43

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)
FLWA		**FLAMINGO WASH – continued**						
1039	E	3: 12' X 10' RCBC @ Decatur	90	908	LWFLDB	FLAM4SC	8.94	1.60
1048	P1	28,950 cfs PMF Spillway		28950	CLF33	FLAM4SC	8.94	
1049	P1	2: 72" RCP Outlet	90	908	LWFLDB	FLAM4SC	8.94	
1050	P1	156.4 ac-ft Lower Flamingo Detention Basin		2895	CLF33	FLAM4SC	8.94	
1111	E	Rip Rap Chnl 40'W 5'D 2:1 SS	2470	1816	CLF20A	FLAM3SC	5.23	1.35
1149	E	Conc Chnl 50'W 6'D 2:1 SS	150	1771	CLF20	FLAM3SC	5.05	1.00
1151	E	4: 10' X 8' RCBC @ Jones	100	1771	CLF20	FLAM3SC	5.05	1.70
1152	E	Earth Chnl 50'W 8'D 3:1 SS	2600	1816	CLF20A	FLAM3SC	5.23	0.44
1152	P1	Gabion Chnl 50'W 6'D 2:1 SS	2600	1816	CLF20A	FLAM3SC	5.23	0.44
1202	E	4: 10' X 8' RCBC @ Torrey Pines	90	1771	CLF20	FLAM3SC	5.05	1.00
1203	E	Earth/Conc Chnl 40'W 10'D 2:1 SS	1640	1771	CLF20	FLAM3SC	5.05	1.38
1203	P0	Conc Chnl 40'W 4'D 2:1 SS	1640	1771	CLF20	FLAM3SC	5.05	1.40
1236	E	4 Span Bridge 80'W 6'D @ Tropicana	180	1645	CLF19	FLAM3SC	4.54	1.20
1237	E	Gabion Chnl 40'W 10'D 2:1 SS	1650	1645	CLF19	FLAM3SC	4.54	0.91
1266	E	3 Span Bridge 120'W 15'D 3:1SS @ Rainbow	130	1645	CLF19	FLAM3SC	4.54	1.20
1267	E	Gabion Chnl 40'W 5'D 1:1 SS	3770	1645	CLF19	FLAM3SC	4.54	0.90
1334	E	2 Span Bridge 90'W 8.4'D @ Spanish Trail	30	1404	CLF17	FLAM3SC	3.75	0.90
1335	E	Gabion Chnl 40'W 5'D 1:1 SS	1720	1404	CLF17	FLAM3SC	3.75	1.50
1367	E	Rip Rap Chnl 4'D 8'W 2:1 SS	380	260	UPFLDB	FLAM5SC	30.38	1.50
1376	P1	13' X 6' RCBC	80	865	CTD3	FLAM3SC	1.02	1.00
1378	E	Rip Rap Chnl 8'W 4'D 2:1 SS	3000	260	UPFLDB	FLAM5SC	30.38	1.50
1439	E	66,000 cfs PMF Spillway		66000	CUFS28	FLAM5SC	30.38	
1440	E	2: 60" RCP Outlet	200	260	UPFLDB	FLAM5SC	30.38	
1443	E	1,100 ac-ft Flamingo Detention Basin		11180	CUFS28	FLAM5SC	30.38	
1444	P3	Upgrade to 1,340 ac-ft Flamingo Detention Basin		11180	CUFS28	FLAM5SC	30.38	
FW15		**FREEWAY CHANNEL FROM DESERT INN TO EXPRESSWAY**						
0125	E	2: 10' X 8' RCB	1379	2156	COK11-C	SW3SC	7.78	0.80
0150	E	2: 10' X 8' RCB	1067	1450	DCCSA08	SW3SC	6.88	0.80
0175	E	2: 10' X 8' RCB	985	1450	DCCSA08	SW3SC	6.88	0.75
0214	P1	2: 12' X 10' RCB	1500	3946	CED10-C	SW3SC	6.28	0.73
0242	P1	2: 12' X 9' RCB	1500	3835	CCPS08	SW3SC	6.06	0.93
0271	P1	2: 12' X 8' RCB	1700	2574	CRCP506	SW3SC	4.20	0.59
0301	P1	Conc Chnl 12'W 4'D 2:1 SS	1300	435	CCE3FD-C	SW3SC	0.54	0.42
FWP5		**PALMYRA / SIRIUS DRAIN**						
0000	P1	12' X 9' RCB	3000	2399	CCPS06	SW3SC	3.67	1.50
0057	P1	2: 84" RCP	5280	1112	CPS06	SW3SC	1.57	1.28
0157	P1	2: 66" RCP	5100	530	CPS03	SW3SC	0.61	1.15
FWR2		**FREEWAY CHANNEL - RAILROAD CHANNEL**						
0000	E	5' X 5' RCBC	310					1.60
0010	E	Conc Chnl 8'W 4'D 2:1 SS	50					0.95
0020	E	Earth Chnl 8'W 4'D 2:1 SS	600					0.95
FWSA		**FREEWAY CHANNEL - SAHARA**						
0000	P1	7' X 6' RCB	5700	593	CSA08	SW3SC	0.60	1.49
FWUP		**FREEWAY CHANNEL BYPASS FACILITY**						
0059	E	6' X 5' RCB	2680	221	CH50	SW3SC	0.48	0.56
0100	E	6' X 5' RCB	1400	221	CH50	SW3SC	0.20	0.56
FWVV		**VALLEY VIEW DRAIN**						
0000	P1	12' X 11' RCB	1320	1495	CCE3FA	SW3SC	2.67	0.30
0025	P1	10' X 10' RCB	1320	1013	CR4C	SW3SC	1.74	0.30
0050	P1	7' X 6' RCB	9000	716	DFW5	SW3SC	1.34	1.50
MECH		**EXTENSION OF MEADOWS / CHARLESTON COLLECTION SYSTEM**						
0324	E	180 ac-ft Oakey Detention Basin		1503	OAKEYIN	SW3SC	1.82	
0338	E	10' X 8' RCB	2118	1072	C3A-OAKC	SW3SC	1.31	2.00
0378	E	10' X 8' RCB	475	1072	C3A-OAKC	SW3SC	1.31	2.00
0387	E	66" RCP	325	284	3-HOLM-C	SW3SC	0.28	3.08
0400	E	10' X 6' RCB	1853	850	C3-ELP-C	SW3SC	0.96	1.43
0405	E	66" RCP	1244	284	3A-OAK-C	SW3SC	1.31	1.00
MEOK		**OAKEY/I-15 STORM DRAIN**						
0159	P1	8' X 6' RCB	3900	733	CCSA05	SW3SC	0.67	1.25
0233	P1	10' X 9' RCB	1300	553	CSA05	SW3SC	0.50	0.15
RRFA		**RED ROCK- FORT APACHE COLLECTOR**						
0000	E	14' X 8' RCB	460	639	CUFR23	FLAM3SC	1.07	0.54
0009	P1	16' X 6' RCB	2450	639	CUFR23	FLAM3SC	1.07	0.54
0055	P1	90" RCP	3020	639	CUFR23	FLAM3SC	1.07	1.00
0083	P1	78" RCP	2730	498	CUFR22	FLAM3SC	0.77	1.33
RRNA		**RED ROCK-NAPLES BRANCH**						
0000	P3	12' X 12' RCB	510	3310	CUFR20W	FLAM3SC	3.31	2.14
0007	P3	Conc Chnl 16'W 8'D 0:1 SS	800	3310	CUFR20W	FLAM3SC	3.31	1.50
RRWA		**RED ROCK CHANNEL**						
0000	E	Conc Chnl 28'W 14'D 0:1 SS	270	11567	CUFS21	FLAM5SC	27.58	3.10
0005	E	28' X 14' RCB	150	11567	CUFS21	FLAM5SC	27.58	3.10
0006	E	Conc Chnl 28'W 14'D 0:1 SS	600	11567	CUFS21	FLAM5SC	27.58	3.10
0017	E	Conc Chnl 48'W 17.5'D 0:1 SS	460	11567	CUFS21	FLAM5SC	27.58	1.00
0021	E	Conc Chnl 26'W 13'D 0:1 SS	300	8224	CUFS5C	FLAM5SC	20.05	1.90
0028	E	Conc Chnl 37.5'W 13'D 0:1 SS	430	8224	CUFS5C	FLAM5SC	20.05	1.90
0041	E	Conc Chnl 23'W 13'D 0:1 SS	790	7507	CURF24	FLAM4SC	11.69	1.10
0051	E	23' X 13' RCB	850	7507	CURF24	FLAM4SC	11.69	1.10
0061	E	Conc Chnl 23'W 13'D 0:1 SS	2850	7507	CURF24	FLAM4SC	11.69	0.99
0123	E	23' X 13' RCB	740	7507	CURF24	FLAM4SC	11.69	0.70
0137	E	Conc Chnl 23'W 13'D 0:1 SS	540	7507	CURF24	FLAM4SC	11.69	0.70
0149	E	23' X 13' RCB	930	7507	CURF24	FLAM4SC	11.69	0.70
0165	E	Conc Chnl 23'W 11'D 0:1 SS	950	6971	CURF20	FLAM4SC	10.32	1.40
0205	E	Conc Chnl 23'W 10'D 0:1 SS	880	5564	CUFR14	FLAM3SC	7.00	1.70
0214	E	23' X 10' RCB	750	5564	CUFR14	FLAM3SC	7.00	1.70
0228	E	Conc Chnl 23'W 11'D 0:1 SS	1710	5564	CUFR14	FLAM3SC	7.00	1.70

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)
TRBD		**BLUE DIAMOND CHANNEL**						
0000	E	Conc Chnl 10'W 10'D 2:1 SS	1700	4353	CTD15	FLAM4SC	9.49	0.70
0014	E	23' X 10' RCB	130	4353	CTD15	FLAM4SC	9.49	0.70
0015	E	Conc Chnl 10'W 10'D 2:1 SS	3070	4353	CTD15	FLAM4SC	9.49	0.90
0075	E	Conc Chnl 19.5'W 12'D 0:1 SS	400	4233	CTD14	FLAM4SC	9.24	0.48
0083	E	2: 14' X 11' RCBC	120	4233	CTD14	FLAM4SC	9.24	0.48
0084	E	Conc Chnl 19.5'W 12'D 0:1 SS	550	4233	CTD14	FLAM4SC	9.24	0.48
0096	E	Conc Chnl 28'W 9'D 0:1 SS	760	4176	CTBD15*	FLAM3SC	6.47	1.00
TRMC		**TROPICANA WASH - MCCARRAN AIRPORT**						
0062	P0	Add 1: 14' X 9' RCB	7100	1968	CMC9	FLAM3SC	2.94	0.30
0063	E	2: 8' X 6' RCB	7100	1968	CMC9	FLAM3SC	2.94	0.30
0195	E	Conc Chnl 12'W 5'D 1.5:1 SS	1350	1968	CMC9	FLAM3SC	2.94	0.60
0195	P0	Conc Chnl 12'W 7.5'D 1.5:1 SS	1350	1968



REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDAT

LEGEND

- Ultimate Development Boundary
- Watershed Boundary
- ID — Subarea Boundary
- Flow Arrows

Flood Control Facilities

- Existing Facilities
- Proposed Facilities

Type — Hydrologic Soil Groups

- A Low Runoff Potential
- B Moderately Low Runoff Potential
- C Moderately High Runoff Potential
- D High Runoff Potential

Typical Land Use

1. Undeveloped Land, Open Deser
2. Parks, Golf Courses
3. Rural
4. Low Density Residential
5. Medium Density Residential
6. High Density Residential
7. Public Facility, Multi Family
8. Commercial, Office, Retail, Casi
9. Light Industrial
10. Heavy Industrial
11. Schools
12. Lakes

N / W / E / S

0 1,000 2,000 3,000 4,000 5,00
Feet

SCALE: 1 inch = 3000 feet

US95 I-15 I-215

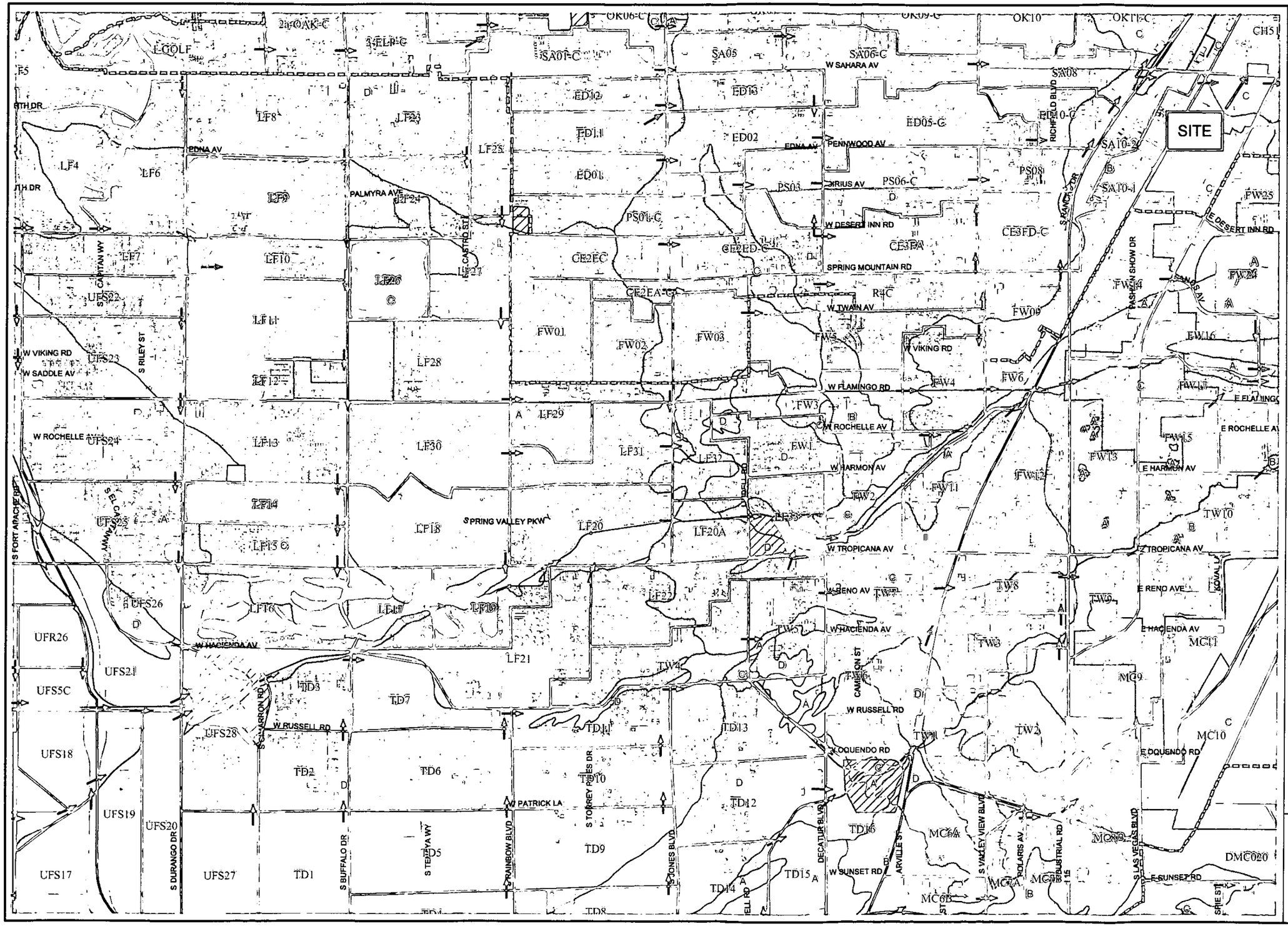
HYDROLOGIC SUBAREAS, LAND USE & SOILS

FIGURE H-17

PBS&J

C.C. WALLACE, INC.

FIGURE 5


SITE
W SAHARA AV
W DESERT INN RD
SPRING MOUNTAIN RD
W TWAIN AV
W VIKING RD
W FLAMINGO RD
W ROCHELLE AV
W HARMON AV
SPRING VALLEY PKWY
W TROPICANA AV
W RENO AV
W HACIENDA AV
W RUSSELL RD
E DESERT INN RD
E TROPICANA AV
E RENO AVE
E HACIENDA AV
E DQUENDO RD
E SUNSET RD
PENNWOOD AV
PALMYRA AVE
W SADDLE AV
W PATRICK LA
S FORT APACHE RD
S DURANGO DR
S BUFFALO DR
S RAINBOW BLVD
S JONES BLVD
DECATUR BLVD
S VALLEY VIEW BLVD
S LAS VEGAS BLVD
S RIVERSIDE DR
S TORREY PINES DR
S CAMERON ST
S RIFLE ST
S RIFLE ST
S RILEY ST
S CANTAN WY
S CASTRO ST
S TENAYA WY
S EL CAMINO WY
S SANDY LN DR
S HUALAPAI WAY
S TASMAN SHOW DR
S VALLEY VIEW BLVD
S INDUSTRIAL RD
S POLARIS AV
S ARVILLE ST
S CAMERON ST
S TORREY PINES DR
S RAINBOW BLVD
S JONES BLVD
S DECATUR BLVD
S BUFFALO DR
S DURANGO DR
S RILEY ST
S CASTRO ST
S CANTAN WY
S EL CAMINO WY
S FORT APACHE RD
S RIFLE ST
S RIFLE ST
S CAMERON ST
S TORREY PINES DR
S RAINBOW BLVD
S JONES BLVD
S DECATUR BLVD
S VALLEY VIEW BLVD
S LAS VEGAS BLVD
S INDUSTRIAL RD
S POLARIS AV
S ARVILLE ST
S TASMAN SHOW DR
S SANDY LN DR
S HUALAPAI WAY
S TENAYA WY
S CASTRO ST
S CANTAN WY
S EL CAMINO WY
S RILEY ST

LEGEND / ABBREVIATIONS

——→	CHANNEL FLOW DIRECTION
——→	RUNOFF FLOW DIRECTION
●——	BASIN DISCHARGE POINT
OFF1	BASIN IDENTIFIER
Q100	100–YEAR EVENT FLOW QUANTITY
Q25	25–YEAR EVENT FLOW QUANTITY
Q10	10–YEAR EVENT FLOW QUANTITY
CFS	CUBIC FEET PER SECOND

NOTES:

THE GENERAL TOPOGRAPHY OR FALL OF THE PROJECT SITE IS APPROXIMATELY 0.8% FROM THE WEST TO THE EAST.

**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH

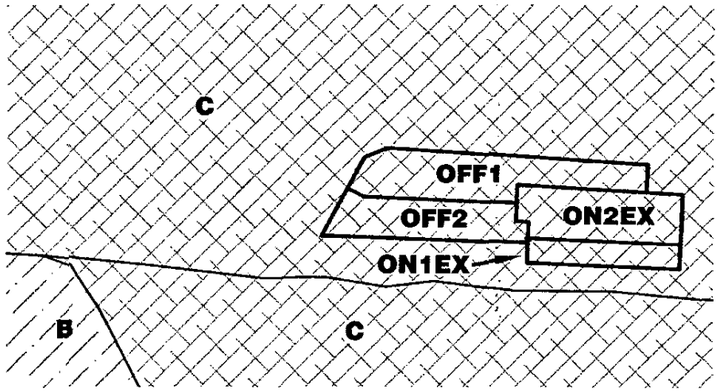
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GRAPHIC SCALE

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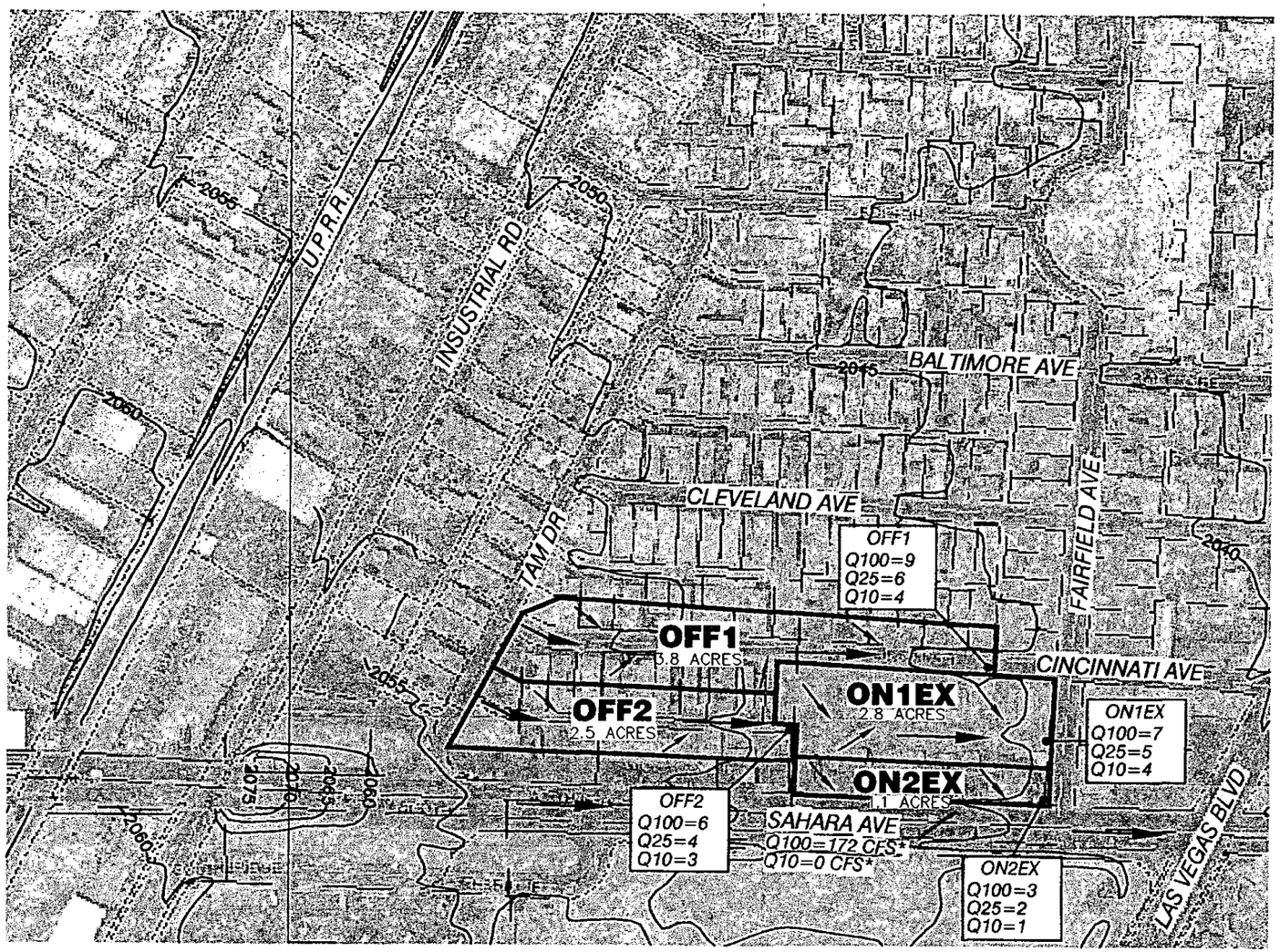
(IN FEET)

1 inch = 300 FT



SOIL GROUP CLASSIFICATION

SCALE 1"=100'



SOURCE: CLARK COUNTY GEOGRAPHICAL INFORMATION SYSTEMS (GIS): IMAGE AS OF FALL 2004 CONTOURS AS OF 1996

THE PROJECT SITE IS LOCATED WITHIN REGIONAL DRAINAGE BASIN CH51 OF THE CENTRAL WATERSHED. THE SOIL CLASSIFICATION IS TYPE C, WHICH IS INDICATIVE OF MODERATELY HIGH RUNOFF POTENTIAL.

JHR Associates, Ltd.

4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876–2341 FAX: (702) 876–8395

DATE:	02/05	**BY:**	JGR
PROJECT #:	124-04-555	**SCALE:**	1"=300'

DESCRIPTION:

OFFSITE DRAINAGE BASIN MAP

EXISTING CONDITION

ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: 6

1 OF 1

I:\Temp-14\SAHACOND\Flood\SC-BASEX.dwg Tue Mar 01 11:05:35 2005

LEGEND / ABBREVIATIONS

⟶	CHANNEL FLOW DIRECTION
→	RUNOFF FLOW DIRECTION
●—	BASIN DISCHARGE POINT
ON1D	BASIN IDENTIFIER
Q100	100-YEAR EVENT FLOW QUANTITY
Q25	25-YEAR EVENT FLOW QUANTITY
Q10	10-YEAR EVENT FLOW QUANTITY
CFS	CUBIC FEET PER SECOND

NOTES:

THE GENERAL TOPOGRAPHY OR FALL OF THE PROJECT SITE IS APPROXIMATELY 0.8% FROM THE WEST TO THE EAST.

**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH

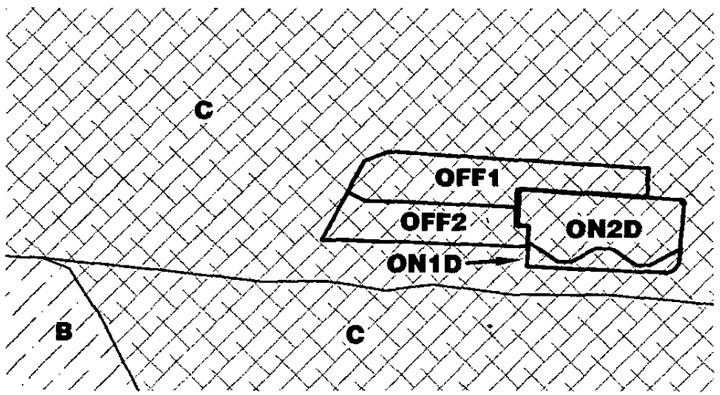
1"=300'

GRAPHIC SCALE

300 0 150 300 600

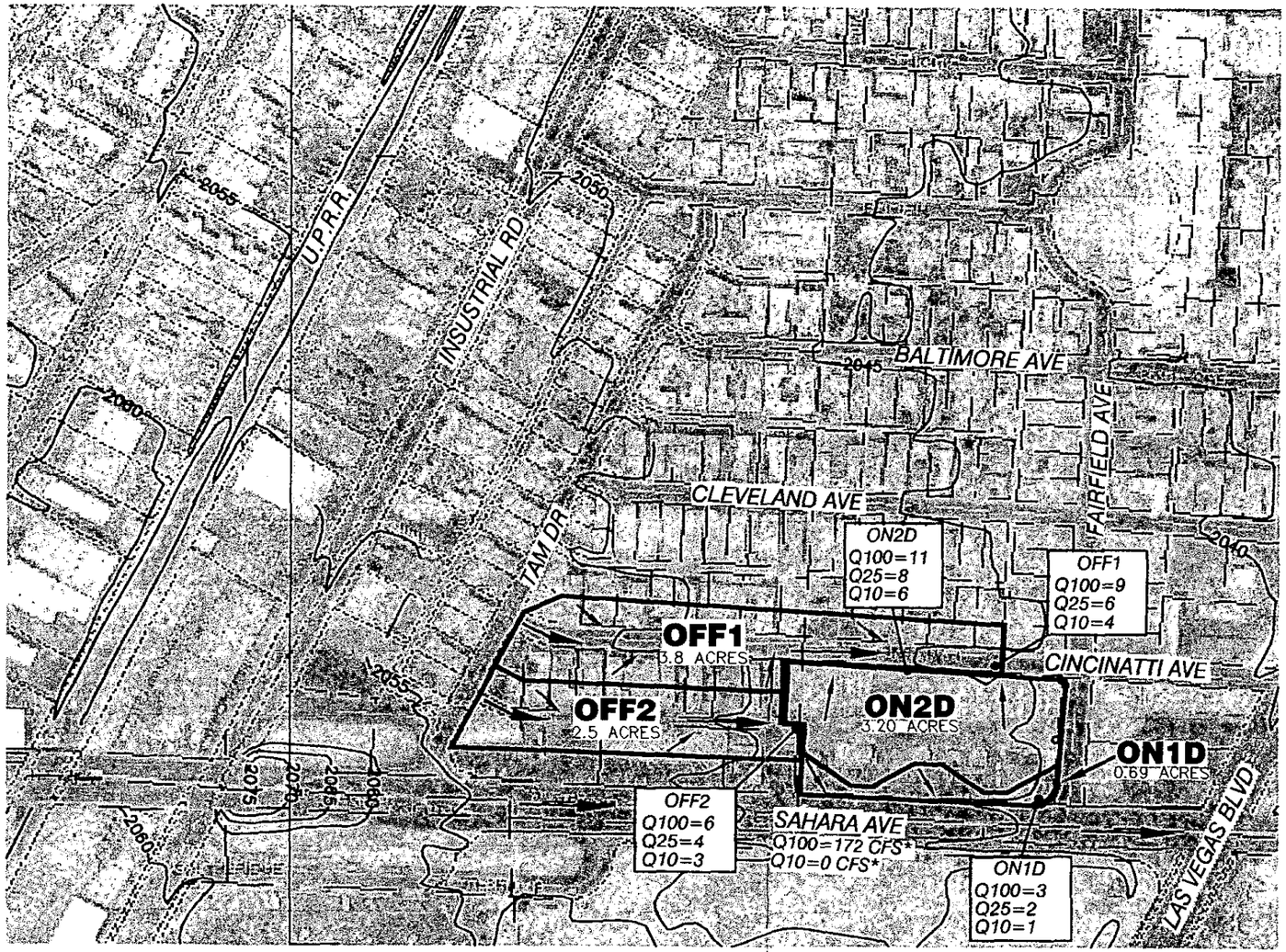
(IN FEET)

1 inch = 300 FT



SOIL GROUP CLASSIFICATION

SCALE 1"=100'



SOURCE: CLARK COUNTY GEOGRAPHICAL INFORMATION SYSTEMS (GIS): IMAGE AS OF FALL 2004 CONTOURS AS OF 1996

THE PROJECT SITE IS LOCATED WITHIN REGIONAL DRAINAGE BASIN CH51 OF THE CENTRAL WATERSHED. THE SOIL CLASSIFICATION IS TYPE C, WHICH IS INDICATIVE OF MODERATELY HIGH RUNOFF POTENTIAL.

JHR Associates, Ltd.

4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	**02/05**	**BY:**	**JGR**
PROJECT #:	**124-04-555**	**SCALE:**	**1"=300'**

DESCRIPTION:

OFFSITE DRAINAGE BASIN MAP

DEVELOPED CONDITION

ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: **7**

1 OF 1

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ATTACHMENT 2
LUCKY DRAGON TDS UPDATE
(PARTIAL) - reference

DS #: 4825

APN: 162.04.807.004 & 162-04.814.002

PROJECT: Lucky Dragon

SUBMITTAL: 1st Submittal

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: September 6, 2016
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: **Lucky Dragon – Update by a different engineer**			**COPIES TO:** Lochsa Engineering
Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue			Grand Canyon Development
File Number:	F:\Depot\DSMemos\DS4825A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-807-004 & 162-04-814-002			CCRFCD
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891			NDOT
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	9/1/2016	9/6/2016	See Comments Below	$400.00	457214: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

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. Provide a profile for the proposed extension of the 18"-lateral. The profile shall verify whether enough cover is provided for the storm drain.

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, 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.

END OF REMARKS

ays

T/R/S: T21S/R61E/04
AREA R-04

Update to the Technical Drainage Study for Lucky Dragon

August 2016

Prepared for:

Terry Barnes
Grand Canyon Development
6841 S. Eastern Avenue, Suite 103
Las Vegas, Nevada 89119
(702) 492-5335

Prepared by:

Lochsa Engineering
6345 South Jones Boulevard, Suite 100
Las Vegas, Nevada 89118
(702) 365-9312

Lochsa Job No. 151059

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Date: August 25, 2016

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Avenue

East/West: Sahara Avenue

b) Section: 4 Township: 21 South Range: 61 East

c) APN : 162-04-816-001

Name of Owner: Terry Barnes - Grand Canyon Development

Telephone No.: (702) 492-5335 Fax No.: (702) 877-4700 E-Mail Address:

Address: 6841 S. Eastern Avenue, Suite 103, Las Vegas, Nevada 89119

Contact Person-Name: Mark Hedge, PE **Telephone No.:** (702) 365-9312

* **E-Mail Address:** chris.blake@lochsa.com **Fax No.:** (702) 365-9317

Firm: Lochsa Engineering

Address: 6345 South Jones Boulevard, Suite 100, Las Vegas, Nevada 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: 2.28 +/- Acres Being Developed/Disturbed: 2.28 +/- 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 (Casino/Hotel)
5. Approximate upstream land area which drains to the subject site: 6.3 +/- Acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Allure Condominiums (DS 3760)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Cincinnati Avenue and Sahara 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.**

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name:	Lucky Dragon	Map ID:	
Firm Name:	Lochsa Engineering	Engineer:	Mark Hedge, PE
Address:	6345 South Jones Boulevard Suite 100		
City:	Las Vegas	State: Nevada	Zip: 89118
Phone Number:	(702) 365-9312	Fax Number:	(702) 365-9317
Property Owner:	Grand Canyon Development		
Address:	6841 S. Eastern Avenue, Suite 103		
City:	Las Vegas	State: NV	Zip: 89119

Reviewed By:	Date Received:	Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

This document is intended as an aid in preparing Technical Drainage Studies. Each study is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT

Yes	No	
✓		Design Manual **Standard Form 1** with the engineer's seal and signature.
✓		Design Manual **Standard Form 4.**
✓		2 copies of the 24" x 36" Drainage Plan
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

REFERENCE:	**STANDARD FORM 2**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS

Yes	No	
✓	____	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
✓	____	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.
✓	____	Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.
✓	____	On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs.
✓	____	Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

Yes	No	
✓	____	Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
✓	____	Minimum scale: 1" = 60'.
✓	____	Project name.
✓	____	Vicinity Map with local and major cross streets.
✓	____	Revision box.
✓	____	North arrow and bar scale.
✓	____	Engineer's/consultant's address and phone number.
✓	____	Elevation datum and benchmark.
✓	____	Legend for symbols and abbreviations.
✓	____	Cut/fill scarps, where applicable.
✓	____	Street names, grades, widths.
✓	____	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.

REFERENCE:	**STANDARD FORM 2**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
✓		Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
✓		Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
	N/A	Proposed typical street sections.
	N/A	Streets with off-set crowns.
✓		Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
✓		Property lines.
✓		Right-of-way lines with widths, existing and proposed.
✓		Existing improvements and their elevations.
✓		Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
✓		Concentration points and drainage flow directions with Q_{100} and V_{100} and D_{100} in streets.
✓		Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
✓		Location and cross-section of street capacity calculations.
	N/A	Cross-sectional detail for channels, including cutoff wall locations.
✓		Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
✓		Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
	N/A	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
	N/A	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
____	N/A	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
✓	____	Building and/or lot numbers.
____	N/A	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
____	N/A	Limits of existing floodplain based on current FIRM of best available information; limits of proposed floodplains based on best available information.
____	N/A	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table.
✓	____	Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
✓	____	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.

IV. HYDROLOGIC ANALYSIS

Yes	No	
✓	____	Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
✓	____	Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
✓	____	Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
✓	____	Use of correct precipitation values in and around the McCarran Airport rainfall area.
✓	____	A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
✓	____	A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.
✓	____	Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
✓	____	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
____	N/A	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
✓	____	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. Q_{100} d x v $\leq$ 8. Q_{10} d x v $\leq$ 6 and 12 foot dry lane for rights-of-way $\geq$ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
✓	____	A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
____	N/A	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged).
✓	____	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
✓	____	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow of depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height of flow depth, which ever is greater.
____	N/A	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones.

- Field survey data
- Input and output information
- Plotted cross-sections based on survey with proper encroachments.
- A map showing the locations of the cross-sections.
- Analysis of both sub and super-critical flow segments.
- A summary table and a discussion of the results in the text of the report.

Provide a 50 percent clogging factor in the capacity calculation for drop inlets.

____	N/A	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
✓	____	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

The following checklist is intended as a supplemental guide for the engineer preparing a Technical Drainage Study submittal to the City of Las Vegas. This supplement focuses on requirements specific to the City of Las Vegas. The requirements presented are in addition to the Clark County Regional Flood Control District (CCRFCD) Manual Standard Form 2. The listed items are the minimum information required prior to the City performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the CCRFCD Hydrologic Criteria and Drainage Design Manual (Design Manual).

An appointment must be made to preview this checklist in conjunction with CCRFCD Standard Form 2 prior to the City accepting a new drainage study for review. The engineer must contact the Flood Control Section at (702) 229-6541 to schedule a submittal appointment.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT		
Yes	No	
	✓	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
	✓	Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
✓		An electronic copy of the complete submittal is required to be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output device replicating your submittal. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats. If figures are in color, they must be scanned in color and saved as a separate file. _____ by initial here, the engineer on record acknowledges that the electronic copy is an identical replicate of the original hard copy submitted to the City of Las Vegas.

II. GRADING PLAN INFORMATION		
Yes	No	
✓		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
✓		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
✓		Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet* around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)

II. GRADING PLAN INFORMATION		
Yes	No	
	✓	Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
	✓	All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
✓		Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
	✓	Back of lot elevations and lot drainage pattern for all lots including common lots.
	✓	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
✓		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
	✓	This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
✓		Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
✓		Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
	✓	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
	✓	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
✓		Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
	✓	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	✓	Lots with "B and C Type Drainage" that drain from one lot to another through a drainage easement shall be required to install an underground nuisance drainage system or a 2-foot valley gutter. 16" x 24" minimum block wall openings are required for both options.
	✓	Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36". Inlets must be sized to match the pipe size provided.

- Contact the Flood Control Section regarding the drainage study review fee. These fees are payable at the time of submittal.
- The Drainage Study must be conditionally approved prior to submitting improvement plans to the Civil and Planning Development of the Department of Building and Safety for review.

This document is intended as an **aid** in preparing Technical Drainage Studies for the City of Las Vegas. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all-inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

T 702-365-9312 | F 702-365-9317
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Las Vegas, NV 89118

Lochsa engineering

September 1, 2016

Mr. Albert Sung, P.E.
City of Las Vegas Public Works
Flood Control Division
333 North Rancho Drive
Las Vegas, NV 89106

Subject: **Update to Technical Drainage Study for Lucky Dragon**
Previous DS4659
Lochsa Job # 151059

Dear Mr. Sung,

This letter is intended as an Update to the approved "Technical Drainage Study for Lucky Dragon", hereinafter will be referred to as the 'Original Study'. The Original Study was prepared by G.C. Wallace Companies, and was approved by the City of Las Vegas on May 22, 2014 (DS4659). The proposed development within the Original Study included a hotel and a casino on the undeveloped land to the west of the existing Allure Condominium Complex. The proposed development also includes a drive aisle, associated surface parking, curb and gutter. The site is located near the northwest corner of Las Vegas Blvd. and Sahara Avenue intersection. The improvements are currently under construction per the approved study and approved plans. A Minor revision for the storm drain in Sahara Avenue is being proposed to the site plan to better accommodate the use of the existing storm drain and proposed NDOT type 3 DI. The revision is limited to eliminating the 18" RCP storm drain that runs along the frontage of the site in the north portion of the Sahara Avenue Right-of-Way (NDOT) from west to east (approximately 190 feet) and also relocating the proposed NDOT Type 3 DI located just west of the driveway entrance. Instead, we are proposing to extend a portion of the 18" RCP lateral to the north curb line of the proposed 12-foot right turn lane. With this revision, we are proposing to eliminate the proposed manhole and instead extend the lateral north to a NDOT Type 3 drop inlet (our revised location) to connect and extend the existing 18" RCP into. The previously approved grading plan has been revised to accommodate these site plan revisions. This Update is being submitted to address this revision to the approved grading plan.

The previously approved design by GC Wallace added a proposed Manhole where an existing NDOT Type 3 Drop inlet existed, and then chased an 18" RCP storm drain to the west along Sahara Avenue where they have relocated the NDOT Type 3 DI just west of the proposed driveway entrance. During construction of the site, they found out the proposed Manhole did not have the minimum cover required over the pipe as was shown on the approved plans. Therefore the manhole could not be constructed at this location.

Lochsa Engineering is doing an Update for the 18" RCP storm drain. We are proposing to eliminate the relocation of the NDOT Type 3 DI to the west (by GC Wallace) and the 18" RCP that runs to the west. Instead, we are eliminating the proposed Manhole (by GC Wallace) and extending the 18" lateral (concrete-cased) to the north where the north half of Sahara Avenue is extended to include a 12-foot right turn lane. We have maintained the existing 18" RCP lateral slope (0.80%) to the north to the proposed curb of the right turn lane where we are proposing a NDOT Type 3 DI. We have revised the longitudinal slope of the right turn lane (west of proposed NDOT Type 3 DI) to 0.40%, to help provide cover over the pipe at the revised location of the NDOT Type 3 DI. We have included the necessary revised plans for clarity. Please note that we have achieved 1ft of cover over the crown of the pipe (worst case). If you add the thickness of the pipe (3-inches), the cover to the top of pipe is 9-inches (worst case).

Please note that the proposed NDOT type 3 drop inlet at this location has the same capacity as the previously approved proposed NDOT Type 3 drop inlet west of the project driveway. Therefore, no NDOT right-of-way, downstream facilities or properties will be impacted. Please note that the 10-year flow in Sahara Avenue ROW is 0cfs, as all storm runoff in the ROW is maintained in existing drainage facilities.

As shown in the included copies of the approved and revised grading plan (Sheet C-6), proposed revisions do not impact the previously approved drainage pattern. As shown in the previously approved Figure 6 (FIG-6) for the "Drainage Basin Map, Proposed Conditions", the project site was delineated into two basins ON1(3/6cfs, 2.00acres) and ON2(1/2cfs, 0.50acres). As described in the Original Study, runoff from ON1 travels northerly to Cincinnati Avenue and combines with referenced offsite basins **OFF1 (3.80ac.- 4/9cfs) and **OFF2 (2.50ac.- 2/6cfs) at Concentration Point 1 (CP1- 9/19cfs). The runoff from onsite basin ON2 is conveyed south to Sahara Avenue through the proposed driveway entrance. The hydrology and drainage patterns all remain the same. Also, the grading plan was not revised for this Update. Therefore, we have not provided a revised drainage exhibit. The previously approved exhibit illustrates the correct delineated onsite basins as they remain unchanged from the Original Study. Review of the offsite watershed impacting the site, Sahara Avenue and Cincinnati Avenue also indicates that offsite flows will remain as determined in the Original Study.

As described in the Original Study, the project site is located approximately 800ft west of the intersection of Las Vegas Blvd. and Sahara Ave. within the City of Las Vegas jurisdiction, Nevada. West Cincinnati Ave. borders the site from the north and is a fully developed 50ft right-of-way. Sahara Ave. borders the site from the south and is a fully developed 120ft right-of-way. The western boundary of the site is surrounded by a commercial site (APN 162-04-807-003) and a Condo subdivision. The remainder eastern boundary of the site is surrounded by the Allure Condominiums with Assessor's Parcel Number (APN) 162-04-815-000. The site is specifically located within a portion of the Southern Half (S 1/2) of the Southeast Quarter (SE 1/4) of Section 04, Township 21 South, Range 61 East, of the M.D.M., in the City of Las Vegas, Nevada. The project site is also identified with APN 162-04-816-001. Please refer to the copy of the Assessor's Parcel Map and the vicinity map (Figure 1) for the subject site as referenced from the Original Study.

The "*2008 Las Vegas Valley Flood Control Master Plan Update*", as prepared by Post Buckley Schuh and Jernigan, Inc. (PBS&J), in association with Louis Berger Group and Parsons Brinckerhoff, for the Clark County Regional Flood Control District (CCRFCD) illustrates the existing and proposed master-planned facilities. The CCRFCD facility exhibits and inventory tables were updated in 2013. As shown in Figure F-31 of the 2013 MPU, the future CCRFCD facility runs along the south side of Sahara Avenue adjacent to our site. The storm drain is identified as a 14'x12' RCB (labeled as BHSA 0289), with a design flow of 3,566cfs and a 0.87% slope.

The project site is covered by Flood Insurance Rate Map (FIRM) for Clark County, Nevada, and incorporated areas, community panel number: 32003C2170F, effective date: November 16, 2011. Review of Panel 2170 indicates that the site is entirely located within Zone "X" (unshaded), described by FEMA as: "*Areas determined to be outside the 0.2% annual chance floodplain*". Please refer to the attached referenced Figure 2 from the Original Study for the location of the site on a portion of the above referenced FIRM.

The subject drainage study update is specifically provided as a support document for the aforementioned revisions to the Lucky Dragon. This update is in conformance with the approved "Technical Drainage Study for Lucky Dragon", (DS4659). The drainage design associated with the proposed revisions is based on generally accepted engineering practices and is in compliance with the CCRFCD's "*Hydrologic Criteria and Drainage Design Manual*" and 2008 MPU. The proposed revisions do not impact the previously approved drainage pattern. Please refer to the attached grading plan and details for further clarification of the proposed revisions.

If you have any questions or comments, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
LOCHSA ENGINEERING

Mark Hedge, P.E.
Principal

REVISED FIGURE F-31 FROM 2013 MPU

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 31
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin

- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

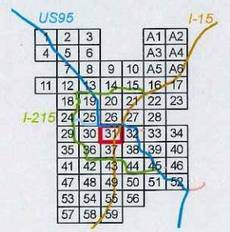
PROJECT SITE

N

0 500 1,000 2,000 3,000
Feet

Scale: 1 inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)



ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BHSA		BOULDER HIGHWAY SAHARA AVENUE						
0175	P1	14' X 14' RCB	6000	3837	CSA13	SW3	7.93	0.67
0289	P1	14' X 12' RCB	2300	3566	CSA11	SW3	7.55	0.67
0331	P1	14' X 11' RCB	2000	3232	CSA10-1	SW3	7.15	1.00
CHRA		WEST CHARLESTON DRAINS - RANCHO						
0000	E	6' X 5' RCB	310	286	CAL95	SW3	0.62	1.92
0006	E	5' X 5' RCB	420	286	CAL95	SW3	0.62	1.00
0014	E	5' X 4' RCB	600	286	CAL95	SW3	0.62	1.50
FLBN		FLAMINGO - BOULDER HIGHWAY NORTH						
0281	P1	10' X 7' RCB	1300	1259	CCH56	SW3	1.64	1.33
0312	P1	7' X 4' RCB	1800	555	CCH52	SW3	0.55	4.20
0342	P1	7' X 4' RCB	2500	555	CCH52	SW3	0.55	4.20
FLFA		FLAMINGO - FASHION						
0000	E	12' X 5' RCB	2050	747	CFW17N	FLAM3A	0.72	0.28
0037	E	8' X 5' RCB	3060	526	FW14	FLAM3A	0.44	0.45
FW15		FREEWAY CHANNEL FROM DESERT INN TO EXPRESSWAY						
0000	E	3: 12' X 10' RCB	2170	3728	CAL93	SW4	10.63	0.17
0010	E	3: 12' X 10' RCB	677	3403	CAL96	SW4	10.10	0.17
0038	E	3: 12' X 10' RCB	1945	3344	CCCH22	SW4	9.92	0.17
0050	E	3: 12' X 10' RCB	870	2613	CCH50	SW4	8.54	0.17
0089	E	3: 12' X 10' RCB	980	2448	CCWAL2	SW4	8.28	0.17
0100	E	3: 12' X 9' RCB	1575	2295	COK11C	SW3	7.83	0.17
0125	E	2: 10' X 8' RCB	1350	1450	DCCSA08	SW3	6.67	0.80
0150	E	2: 10' X 8' RCB	1067	1450	DCCSA08	SW3	6.67	0.80
0175	E	2: 10' X 8' RCB	985	1450	DCCSA08	SW3	6.67	0.75
0214	P1	2: 12' X 10' RCB	1610	4104	CED10-C	SW3	6.25	0.73
0242	P1	2: 12' X 9' RCB	1500	3968	CCPS08	SW3	6.03	0.93
0271	P1	2: 12' X 10' RCB	1520	3674	CPS08	SW3	5.59	0.59
0301	P1	Conc Chnl 12'W 4'D 2:1 SS	1300	433	CCE3FD-C	SW3	0.54	0.42
FWCH		WEST CHARLESTON DRAIN						
0000	E	10' X 7' RCB	1710	1008	CCH22	SW3	1.38	0.74
0020	E	10' X 7' RCB	840	783	CCCH18-C	SW3	1.15	0.40
0036	E	9' X 7' RCB	425	783	CCCH18-C	SW3	1.15	0.40
0044	E	9' X 7' RCB	145	538	CCH18-C	SW3	0.53	0.40
0047	E	7' X 5' RCB	710	538	CCH18-C	SW3	0.53	2.05
0060	E	5' X 4' RCB	400	538	CCH18-C	SW3	0.53	0.40
FWOK		OAKEY DRAIN						
0000	E	10' X 8' RCB	1350	928	1COK11C	SW3	1.16	0.62
0020	E	10' X 8' RCB	1025	928	1COK11C	SW3	1.16	0.60
0040	E	8' X 8' RCB	960	721	COK10	SW3	0.85	1.00
0060	E	5' X 5' RCB	970	453	COK09-C	SW3	0.55	1.50
0076	E	6' X 6' RCB	1175	453	COK09-C	SW3	0.55	9.40
0100	E	6' X 6' RCB	980	453	COK09-C	SW3	0.55	1.98
FWPS		PALMYRA / SIRIUS DRAIN						
0000	P1	12' X 11' RCB	3000	3240	CCPS06	SW3	4.88	1.50
0057	P1	10' X 10' RCB	5220	1941	CPS06	SW3	2.78	1.28
0157	P1	2: 66" RCP	5100	521	CPS03	SW3	0.60	1.15
FWR2		FREEWAY CHANNEL - RAILROAD CHANNEL						
0000	E	5' X 5' RCB	377					1.60
0020	E	Earth Chnl 10'W 4'D 2:1 SS	650					0.50
FWRR		FREEWAY CHANNEL BYPASS FACILITY RR BRANCH						
0000	E	48" RCP	70					1.22
0010	E	Conc Chnl 4'W 4'D 0:1 SS	220					1.22
FWSA		FREEWAY CHANNEL - SAHARA						
0000	P1	7' X 5' RCB	5700	486	CSA08	SW3	0.42	1.49
FWSH		SHADOW LANE DRAIN						
0000	E	7' X 4' RCB	950	253	CH22-C	SW3	0.23	0.20

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
FWUP		FREEWAY CHANNEL BYPASS FACILITY						
0000	E	10' X 9' RCB	350	242	CH50	SW3	0.26	0.37
0010	E	10' X 8' RCB	804	242	CH50	SW3	0.26	0.37
0059	E	10' X 6' RCB	2680	242	CH50	SW3	0.26	0.40
0100	E	8' X 4' RCB	1440	242	CH50	SW3	0.26	0.47
FWVV		VALLEY VIEW DRAIN						
0000	P1	12' X 11' RCB	1320	1475	CCE3FA	SW3	2.67	0.30
0025	P1	10' X 10' RCB	2665	1006	CR4C1	SW3	1.74	0.30
0050	P1	8' X 6' RCB	7785	712	DFW5	SW3	1.34	1.50
FWWL		FREEWAY CHANNEL-WALDMAN AVENUE						
0000	E	6' X 6' RCB	1000	418	CWAL2	SW3	0.45	0.20
LCCH		LAS VEGAS CREEK CHANNEL						
0000	E	2: 12' X 7' RCB	730	2894	CLC20-C	MEADOWS4	9.68	1.28
0013	E	2: 12' X 6' RCB	2035	2894	CLC20-C	MEADOWS4	9.68	0.82
0051	E	2:14' X 7' RCB	3113	2894	CLC20-C	MEADOWS4	9.68	0.60
0110	E	Transition Structure	220	2798	CCLC16-C	MEADOWS4	9.51	
0114	E	2: 14' X 7' RCB	670	2329	CRMEDET	MEADOWS4	8.25	0.80
0127	E	Transition Structure	110	2329	CRMEDET	MEADOWS4	8.25	
0129	E	2: 14' X 7' RCB	1130	2329	CRMEDET	MEADOWS4	8.25	0.50
0150	E	2: 13' X 7' RCB	200	2329	CRMEDET	MEADOWS4	8.25	0.95
0154	E	Transition Structure	190	2329	CRMEDET	MEADOWS4	8.25	
0157	E	2: 12' X 6' RCB	1650	1631	CCLC14-C	SW3	2.99	1.06
0230	E	12' X 6' RCB	2140	1381	CLC14-C	SW3	2.54	1.74
0270	E	12' X 6' RCB	1705	774	CCWA02-C	SW3	1.84	0.54
0302	E	8' X 6' RCB	3940	774	CCWA02-C	SW3	1.84	2.49
0377	E	10' X 7' RCB	1226	774	CCWA02-C	SW3	1.84	0.74
0400	E	Transition Structure	110	437	CWA02-C	SW3	1.47	0.49
0402	E	8' X 6' RCB @ Jones	535	437	CWA02-C	SW3	1.47	0.49
0412	E	60" RCP	1370	437	CWA02-C	SW3	1.47	1.08
0438	E	60" RCP	1090	162	CLC01-C	SW3	1.20	1.60
0458	E	60" RCP	1060	162	CLC01-C	SW3	1.20	1.60
0478	E	60" RCP	1110	162	CLC01-C	SW3	1.20	0.55
LCDE		LAS VEGAS CREEK - DECATUR						
0000	E	6' X 5' RCB	1800	404	LC11-C	SW3	0.38	1.26
0034	E	72" RCP	700	404	LC11-C	SW3	0.38	0.50
LCJO		LAS VEGAS CREEK - JONES						
0000	E	6' X 6' RCB	380	358	AL01B-C	SW3	0.37	0.50
0007	E	6' X 5' RCB	675	358	AL01B-C	SW3	0.37	0.62
LCME		LAS VEGAS CREEK - MEADOWS						
0000	E	14' X 8' RCB	895	1423	MEADOWDB	SW3SC	5.67	0.72
0016	E	Stilling Basin	140	1423	MEADOWDB	SW3SC	5.67	0.21
0017	E	3,300 cfs Spillway (Replace w/ LCME0018)		3300	MEADOWIN	SW3SC	5.67	
0018	P1	Modify Spillway, raise height by 1' (Replaces LCME0017)		3300	MEADOWIN	SW3SC	5.67	
0019	E	1: 11' X 5' RCB and 1: 11.5' X 5' RCB	110	1423	MEADOWDB	SW3SC	5.67	0.81
0020	E	213 ac-ft Meadows Detention Basin		4713	MEADOWIN	SW3SC	5.67	
0021	P1	Upgrade to 235 ac-ft Meadows Detention Basin		4713	MEADOWIN	SW3SC	5.67	
0026	E	Energy Dissipator	110	4713	MEADOWIN	SW3SC	5.67	2.94
0028	E	Conc Chnl 42'W 9'D 0:1 SS	922	4713	MEADOWIN	SW3SC	5.67	0.40
0040	E	Conc Chnl 40'W 10'D 0:1 SS	525	4593	CAL90-C	SW3SC	5.44	0.40
0070	E	Conc Chnl 40'W 8.5'D 0:1 SS	255	4593	CAL90-C	SW3SC	5.44	0.40
0076	E	Free Span Bridge 18'W 8'D @ Alta	100	4441	CCAL16	SW3SC	5.27	1.89
0077	E	Conc Chnl 18'W 8'D 1:1 SS	618	4441	CCAL16	SW3SC	5.27	1.89
0085	E	10' X 6' RCBC @ Valley View	275	1661	1CAL16	SW3	2.09	1.89
LCRA		LAS VEGAS CREEK - RANCHO						
0000	E	12' X 8' RCB	380	783	CLC16-C	SW3	1.71	0.60
0004	E	12' X 6' RCB	2367	783	CLC16-C	SW3	1.71	0.77
LVOE		OWENS AVENUE - EAST						
0345	P1	13' X 11' RCB	1685	2369	DLVOE	SW5	22.79	0.60

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
LVWH		WASHINGTON AVENUE CHANNEL						
0431	E	3: 14.33' X 10' RCB	665	2870	DCLC21	SW5	22.79	0.15
0446	E	Junction Structure	69	2870	DCLC21	SW5	22.79	0.15
0447	E	3: 14.33' X 10' RCB	1955	4978	CCAL93	SW5	22.19	0.15
0484	E	Confluence Structure	455	4978	CCAL93	SW5	22.19	0.15
MEAL		MEADOWS ALTA						
0000	E	Conc Chnl 8'W 11'D 1:1 SS	700	1207	CAL13-3	SW3	1.48	1.58
0012	E	12' X 6' RCBC @ Red Sky	160	1161	CAL10-C	SW3	1.42	3.03
0013	E	Conc Chnl 8'W 11'D 1:1 SS	320	1161	CAL10-C	SW3	1.42	3.03
0015	E	72" RCP	2500	1126	CAL11-C	SW3	1.38	1.94
0060	E	60" RCP	905	792	CBR3	SW3	1.08	1.00
0100	E	72" RCP	1160	792	CBR3	SW3	1.08	1.00
0120	E	60" RCP	3500	733	CAL05-C	SW3	1.01	1.00
0130	E	6' X 4' RCB	1150	186	AL04-C	SW3	0.18	0.40
0150	E	60" RCP	285	499	CCUS	SW3	0.74	1.40
0160	E	36" RCP	2600	331	CUS	SW3	0.56	1.25
0209	E	48" RCP	2500	150	DCR2	SW3	0.41	1.70
MECH		EXTENSION OF MEADOWS / CHARLESTON						
0059	E	36" RCP	1310					0.25
0084	E	30" RCP	2960					1.26
0108	E	30" RCP	8550	32	OAKEYOT	SW3	1.88	1.43
0310	E	24" RCP	1000	32	OAKEYOT	SW3	1.88	1.43
0323	E	15" RCP Outlet	200	32	OAKEYDB	SW3	1.88	
0324	E	201 ac-ft Oakey Detention Basin		1652	OAKEYIN	SW3	1.88	
0334	E	11' X 6' RCB	200	573	C5-OAK-C	SW3	0.56	0.50
0337	E	9' X 6' RCB	520	573	C5-OAK-C	SW3	0.56	0.50
0338	E	10' X 8' RCB	2060	1131	C3A-OAKC	SW3	1.32	1.62
0351	E	90" RCP	1350	573	C5-OAK-C	SW3	0.56	0.50
MECN		MEADOWS - CHARLESTON						
0000	P1	9' X 8' RCB	1570	1105	CCH10	SW3	1.00	1.09
0061	P1	8' X 7' RCB	3300	1105	CCH10	SW3	1.00	1.82
0123	P1	8' X 6' RCB	5200	821	CCH09-C	SW3	0.72	1.64
0223	P1	6' X 5' RCB	2700	422	CCH05-C	SW3	0.34	2.04
MEOK		OAKEY MEADOWS STORMDRAIN						
0000	E	19' X 7' RCB	900	2718	COK13	SW3SC	2.94	0.91
0017	E	19' X 8' RCB	1550	2718	COK13	SW3SC	2.94	0.80
0048	E	18' X 9' RCB	1700	2718	COK13	SW3SC	2.94	0.50
0070	E	7' X 6' RCB	1320	226	CH14B	SW3	0.22	0.44
0079	E	18' X 8' RCB	630	2450	COK12	SW3SC	2.62	0.50
0091	E	18' X 8' RCB	850	2450	COK12	SW3SC	2.62	0.50
0110	E	12' X 8' RCB	2304	1491	COK08	SW3	1.58	0.77
0150	P3	12' X 8' RCB	642	1491	COK08	SW3	1.58	0.77
0166	P3	12' X 9' RCB	1350	1491	COK08	SW3	1.58	0.45
0191	P3	12' X 7' RCB	660	957	COK07	SW3	0.93	0.71
0204	P3	12' X 6' RCB	655	957	COK07	SW3	0.93	0.71
0217	P3	12' X 5' RCB	1276	556	CSA06	SW3	0.52	0.44
MEPA		MEADOWS PARALLEL						
0000	E	10' X 6' RCB	1370	259	CCH14A	SW3	0.25	0.50
0022	E	6' X 5' RCB	200	259	CCH14A	SW3	0.25	1.45
0025	E	78" RCP	470	259	CCH14A	SW3	0.25	1.16
PSDE		PALMYRA / SIRIUS DRAIN - DECATUR LATERAL						
0000	P1	12' X 8' RCB	1330	1018	CED02	SW3	1.21	0.38
0025	P1	10' X 8' RCB	1320	598	CED13	SW3	0.65	0.25
WAGC		WASHINGTON AVENUE CHANNEL - GRAND CENTRAL						
0000	E	2: 12' X 4' RCB	700	557	LC21	SW3	0.60	0.20
0014	E	1: 12' X 4' RCB and 1: 11' X 4' RCB	2440	557	LC21	SW3	0.60	0.20
0060	E	12' X 4' RCB	455	557	LC21	SW3	0.60	0.20

** The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.*

*** As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.*

^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e., HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

REGIONAL FLOOD CONTROL DISTRICT

2013 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F - 31

LEGEND

ID (Facility Identifier) AABB
Parent Stream Name
Stream Name
River Mile 0000
Distance Above Confluence with Parent Stream (Miles)
Miles in Hundredths

Existing Facility.....E
Proposed or Modified Facility.....P
Contingency Level
Category B.....P0
Master Plan.....P1
Preliminary Design.....P2
Design.....P3

Bottom Width.....W
Depth.....D
Side Slope, H:V.....SS

Construction Features

Cast in Place Concrete Pipe.....CIPCP
Corrugated Metal Arch Pipe Culvert.....CMAP
Corrugated Metal Pipe Culvert.....CMPC
High Density Polyethylene.....HDPE
Horizontal Elliptical Reinforced Concrete Pipe.....HERCP
Reinforced Concrete Arch Pipe.....RCAP
Reinforced Concrete Arch Culvert.....RCAC
Reinforced Concrete Box.....RCB
Reinforced Concrete Box Culvert.....RCBC
Reinforced Concrete Pipe.....RCP
Reinforced Concrete Pipe Culvert.....RCPC
Storm Sewer Pipe.....SSP

FIGURES

APN MAP

FIRM

NOTES

This map is for assessment use only and does NOT represent a survey.

No liability is assumed for the accuracy of the data deliniated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL

0 100 200 400 600 800

MAP LEGEND

PARCEL BOUNDARY
SUB BOUNDARY
PM/LD BOUNDARY
ROAD EASEMENT
MATCH / LEADER LINE
HISTORIC LOT LINE
HISTORIC SUB BOUNDARY
HISTORIC PM/LD BOUNDARY
SECTION LINE

CONDOMINIUM UNIT
AIR SPACE PCL
RIGHT OF WAY PCL
SUB-SURFACE PCL

001 ROAD PARCEL NUMBER
001 PARCEL NUMER
1.00 ACREAGE
202 PARCEL SUB/SEQ NUMBER
PB 24-45 PLAT RECORDING NUMBER
5 BLOCK NUMBER
5 LOT NUMBER
GLS GOV. LOT NUMBER

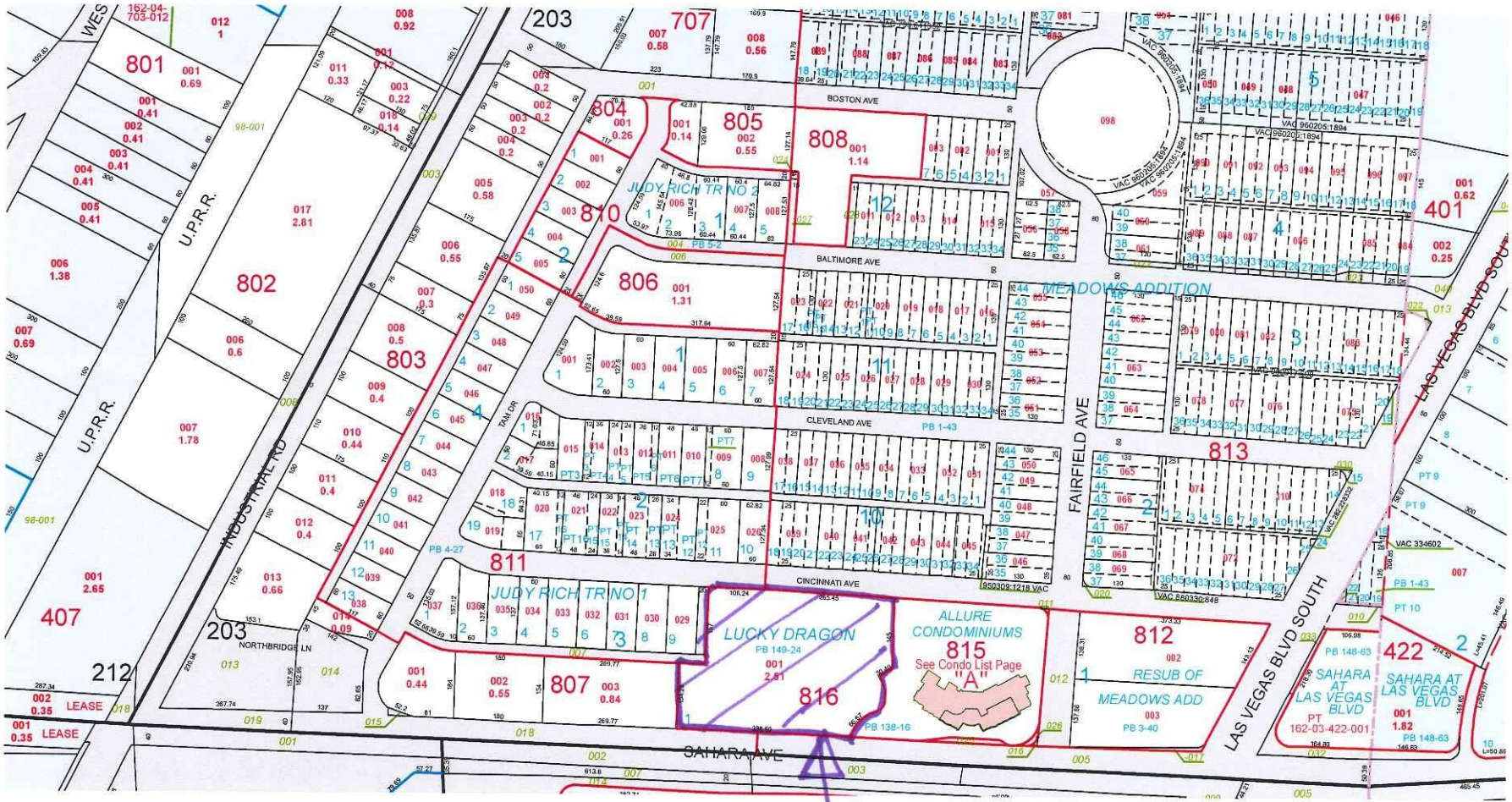
ASSESSOR'S PARCELS - CLARK CO., NV.
Michele W. Shafe - Assessor

BOOK T21S R61E | SEC. 4 | MAP S 2 SE 4 | 162-04-8

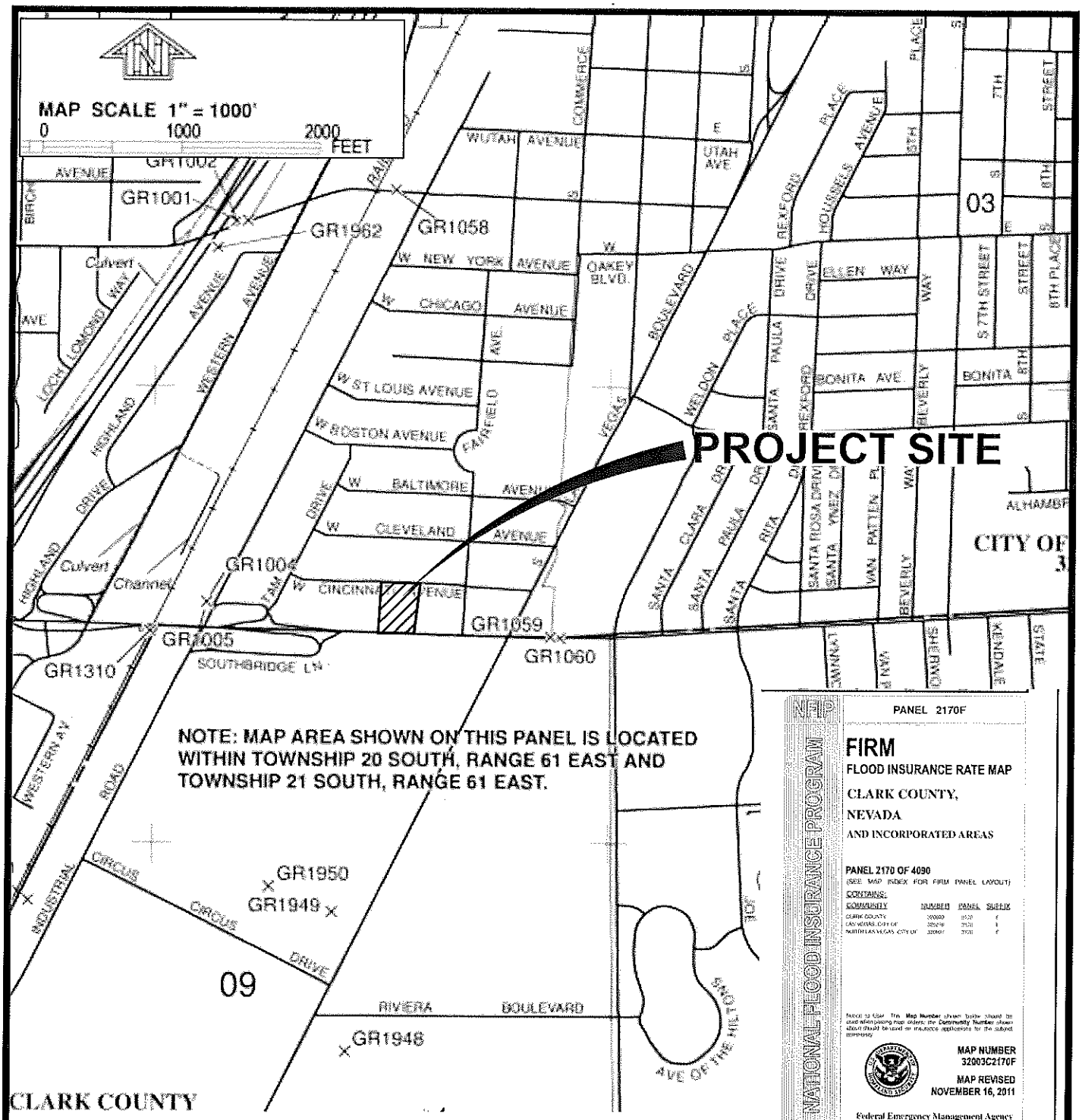
138	139	140
163	162	161

Scale: 1" = 200' Rev: 4/28/2015

CLARK COUNTY ASSESSOR NEVADA



TAX DIST 212,203



DRAWN BY: CB	SCALE: 1" = 1000'	FLOOD INSURANCE RATE MAP (FIGURE 2)	PROJECT No.: 151059
CHECKED BY: CB	DATE: 08-24-16		SHEET No. 2

Lochsa engineering
6345 South Jones Blvd. Suite 100
Las Vegas, NV 89118
Phone (702) 365-9312 - Fax (702) 365-9317

LUCKY DRAGON

SHEET 1 OF 1

EXCERPTS FROM THE

"TDS FOR THE LUCKY DRAGON"

(DS 4659)

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 14, 2014
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: **Lucky Dragon**			**COPIES TO:** G.C. Wallace Companies
Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue			Lucky Dragon LP
File Number:	F:\Depot\DSMemos\DS4659B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-807-004 & 162-04-814-002			CCRFCD
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891			CCPW
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/10/2014	3/24/2014	Not Approved	$400.00	350152: $400
2nd Submittal	4/10/2014	4/14/2014	See Comments Below	$400.00	353390: $400
			TOTAL FEES (LDDRS):	**$800.00**	----

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.
X	is conditionally approved subject to Clark County Public Works Department concurrence.

1. **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.
2. This project is also adjacent to the jurisdiction of *Clark County* to the south of *Sahara Avenue*. *Clark County Public Works Department*'s concurrence must be obtained prior to the final approval of the drainage study.
3. The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right of way (*Sahara*). The engineer must contact NDOT for encroachment permit for the proposed development.

REGIONAL FLOOD CONTROL DISTRICT

Rec'd: 5/13/14
DS 4659
R-04
N/C

Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

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Clark County

Debra March
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City of Las Vegas

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City of Las Vegas

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City of Boulder City

Mayor Mark Wier
City of Mesquite

May 1, 2014

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

DISTRICT CONCURRENCE: LUCKY DRAGON HOTEL & CASINO
(DS 4659B) (RFCD No. 14-9307)

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated February 26, 2014, Addendum No. 1 dated April 9, 2014, for above-mentioned project as submitted by G.C. WALLACE COMPANIES. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas dated April 14, 2014.

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

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 G.C. WALLACE COMPANIES 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.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

BY: _____
Abigail Mayrena, P.E., CFM
Senior Engineer

AM:eb

c: Jerry E. Pruitt, P.E., G.C. Wallace Companies

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2014\L-14-9307.doc

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 685-0000 • FAX: (702) 685-0001
Website: http://www.regionalflood.org

TECHNICAL DRAINAGE STUDY
FOR
LUCKY DRAGON

398-A436C

March 2014

Prepared For:

Lucky Dragon LP
3575 West Post Road
Las Vegas, Nevada 89118
Phone: (702) 897-5625

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Date: 04/09/2014

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Ave

East/West: Sahara Avenue

b) Section: 4 Township: 21 Range: 61 East

c) APN : 162-04-807-004

162-04-814-002

Name of Owner: Lucky Dragon LP - David S Jacoby

Telephone No.: (702) 897-5625 Fax No.: E-Mail Address: jacobyd@ggamllc.com

Address: 3575 West Post Road, Las Vegas, NV 89118

Contact Person-Name: Jerry E. Pruitt **Telephone No.:** (702) 804-2000

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

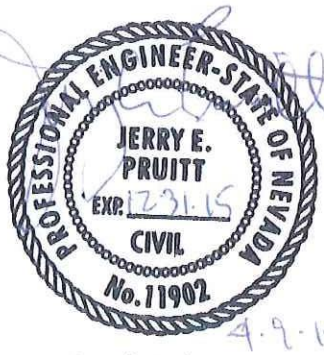
Firm: G.C. Wallace Inc.

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	X	Building Permit		

1. Total Owned Land Area: At Site: +/- 2.28 acres Being Developed/Disturbed: +/-2.28 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: +/- 6.3 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Allure Condominiums
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Cincinnati Avenue and Sahara Avenue
8. Briefly describe your proposed schedule for the subject project: ASAP



4.9.14

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.

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

I. INTRODUCTION

Lucky Dragon LP is proposing to develop a hotel and casino on the undeveloped land to the west of the existing Allure Condominium Complex. The project area lies within the approximately 2.5 acres parcels APN 162-04-807-004, 162-04-811-028, 162-04-814-002, and 162-04-899-021. This study addresses the development of the proposed hotel and casino. Design flow rates and drainage patterns for the site were previously established in the Allure Condominiums Hydrology Study (Reference 1, hereinafter referred to as the Allure Study).

The purpose of this report is to accompany the grading plans, to provide detailed hydrologic and hydraulic analyses for the site, and to determine adequate protection for the project from offsite and onsite flows. The following tasks were performed in the preparation of this report:

- Identify previous drainage studies for the project site and surrounding areas.
- Identify the FEMA floodplain designation for the project site.
- Identify existing and proposed regional drainage facilities adjacent to the site.
- Estimate runoff generated for the peak 10-year, 25-year, and 100-year return period storms for existing and proposed conditions.
- Recommend drainage facilities to protect the project from storm runoff.

II. LOCATION AND DESCRIPTION

The project site is located in Section 4, Township 21 South, Range 61 East, M.D.M., in City of Las Vegas, Clark County, Nevada. Please refer to Figures 1 and 2 for the vicinity and location of the project site. The site is presently undeveloped and is bordered by Cincinnati Avenue to the north, Allure Condominium development to the east, high density residential and commercial property to the west, and Sahara Avenue to the south. For this study, the proposed onsite improvements include a hotel and casino, streets, parking, curb and gutter, etc.

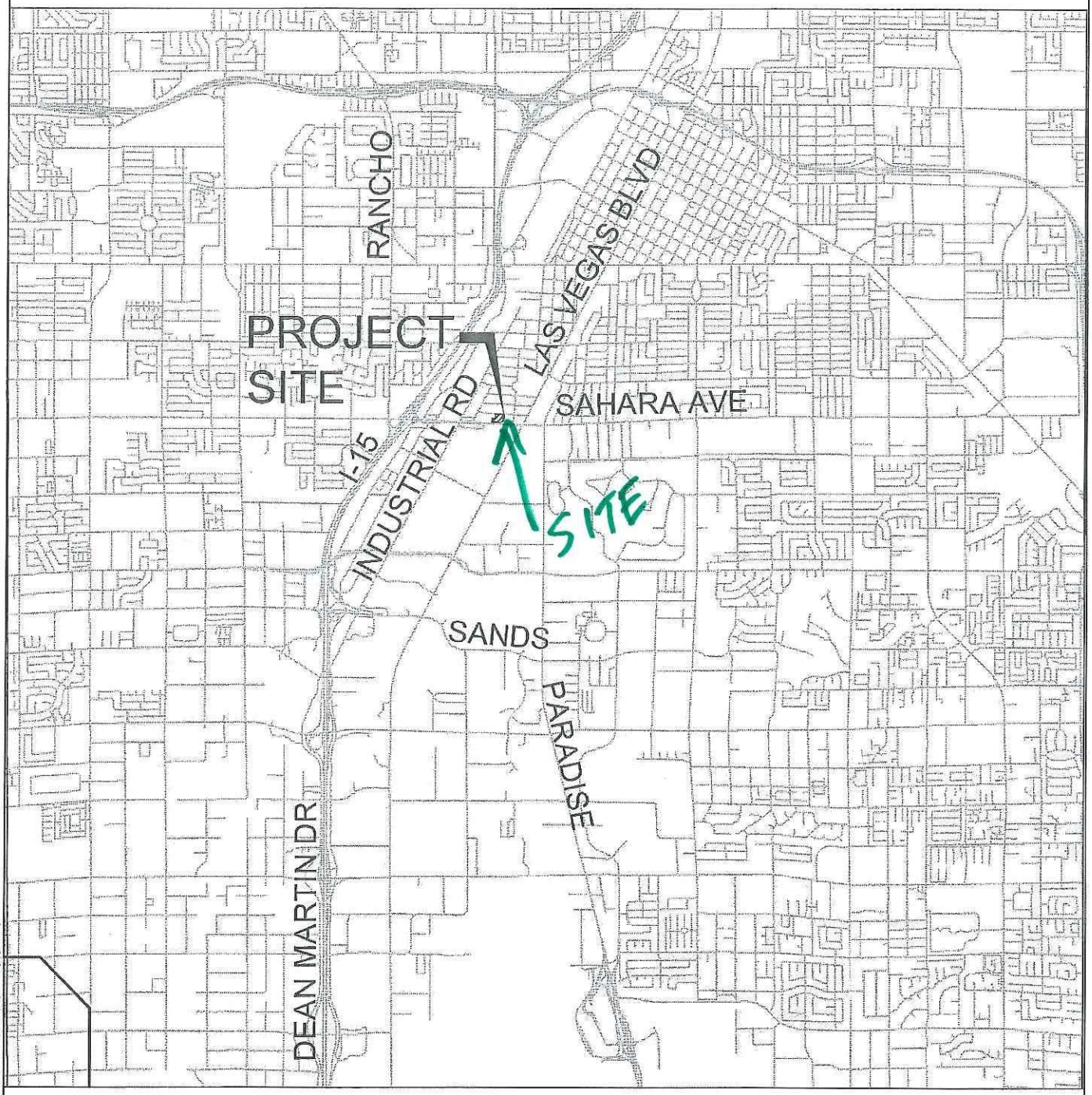
III. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD ANALYSIS

Based on the FEMA Flood Insurance Rate Map (FIRM) Community Panel 32003C 2170F, dated November 16, 2011, this project is not currently located in a FEMA

designated Special Flood Hazard Area (SFHA). Figure 3 shows the site denoted on a portion of the aforementioned FIRM.

IV. CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (CCRFCD) FACILITIES

Figure 4 is reproduced from Figure F-31 of the CCRFCD 2013 Las Vegas Valley Master Plan Update (Reference 3, hereinafter referred to as the 2013 MPU). This figure depicts the project site in relation to existing and proposed CCRFCD Facilities. As shown on the figure, the project is adjacent to the proposed CCRFCD Facility identified as BHSA 0289 (14-foot wide by 12-foot high reinforced concrete box). Flows generated onsite will be discharged either to the north to the existing Cincinnati Avenue right-of-way or to the south to the existing Sahara Avenue right-of-way which ultimately drains to the Flamingo Wash east of the site.



GRAPHIC SCALE

5000 0 2500 5000

(IN FEET)

1 inch = 5000 ft.

NORTH

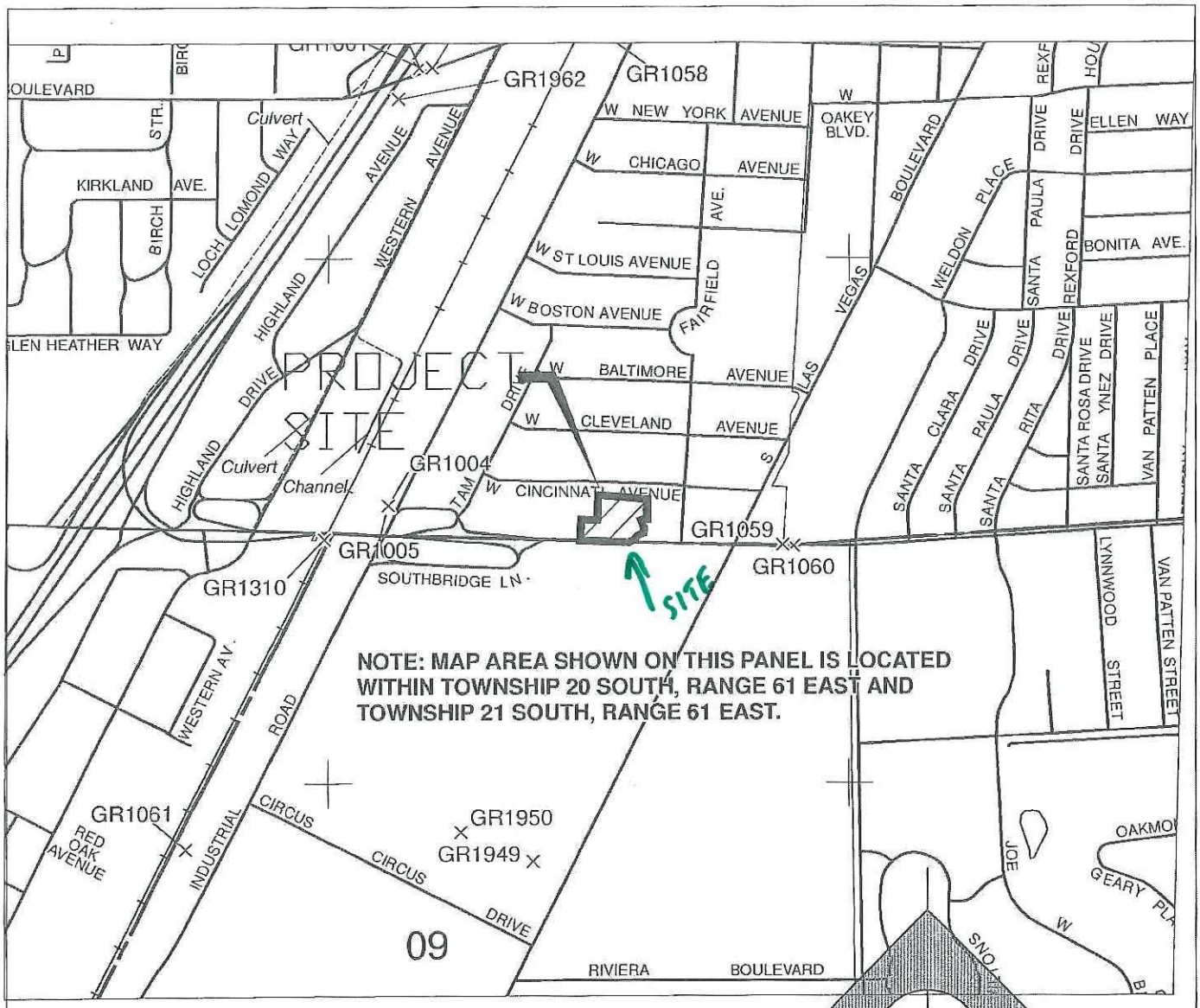
LUCKY DRAGON

FIGURE 1

VICINITY MAP

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
6655 S. CIMARRON ROAD · LAS VEGAS, NV 89113
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

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PANEL 2170F

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2170 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2170	F
LAS VEGAS, CITY OF	320276	2170	F
NORTH LAS VEGAS, CITY OF	320007	2170	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 32003C2170F

MAP REVISED NOVEMBER 16, 2011

Federal Emergency Management Agency

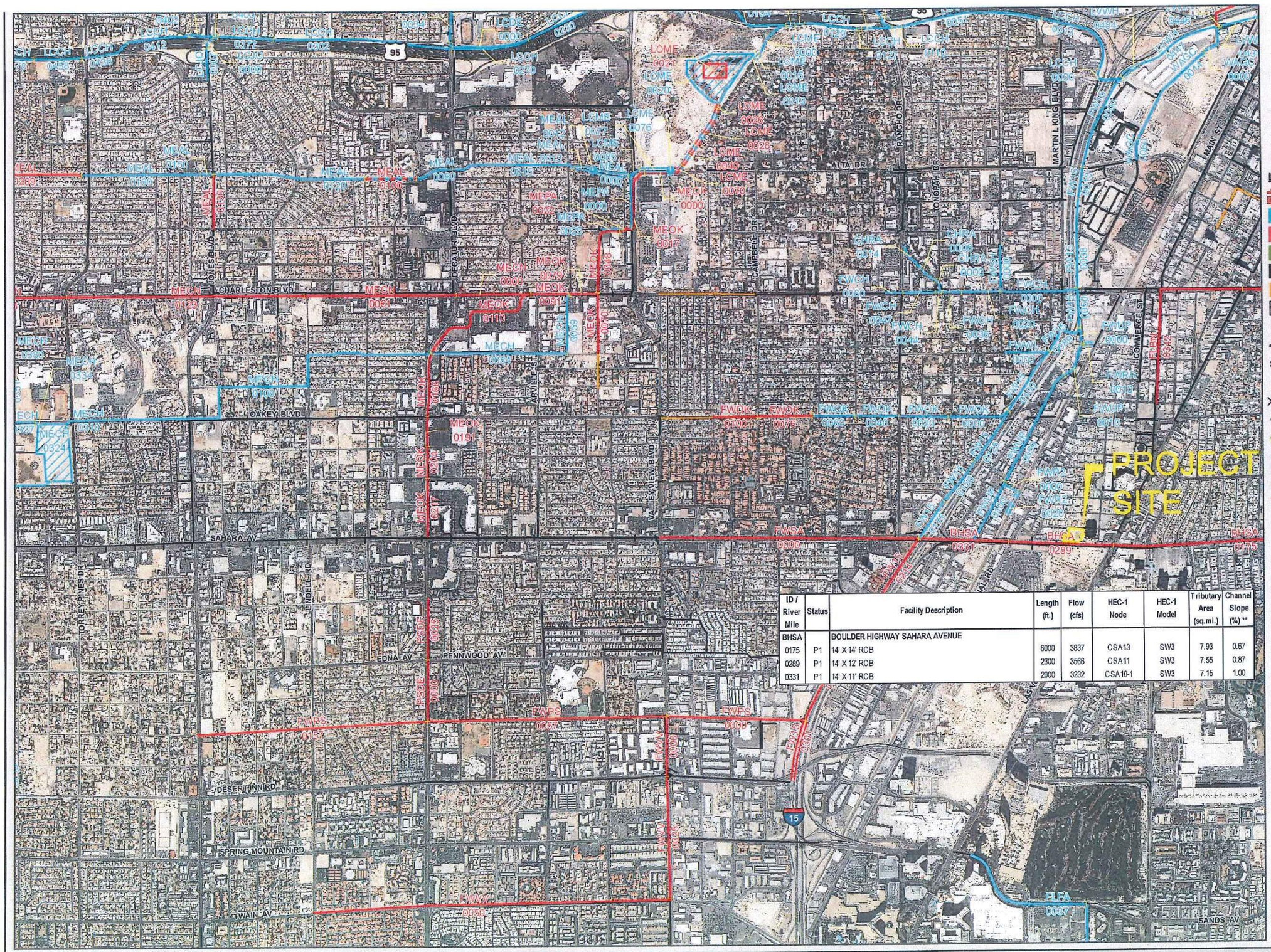
LUCKY DRAGON

FIGURE 3

F.I.R.M.

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

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ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BHSA		BOULDER HIGHWAY SAHARA AVENUE						
0175	P1	14' X 14' RCB	6000	3837	CSA13	SW3	7.93	0.67
0289	P1	14' X 12' RCB	2300	3566	CSA11	SW3	7.55	0.87
0331	P1	14' X 11' RCB	2000	3232	CSA10-1	SW3	7.15	1.00

REGIONAL FLOOD CONTROL DISTRICT

2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-31
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

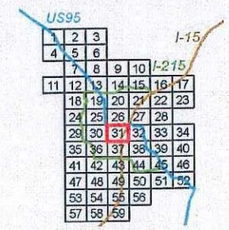
Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

FIGURE 4

N

0 500 1,000 2,000 3,000
Feet
Scale: 1 inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)



PBS|J
PB

V. HYDROLOGY

The methodology presented in this study is in compliance with the *CCRFCD Hydrologic Criteria and Drainage Design Manual* (Reference 4, hereinafter referred to as the Manual).

Model Description - The drainage basins were modeled using the SCS Unit Hydrograph method within the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package (Reference 5). Since the drainage area for each watershed within the project is less than 8 square miles, an SDN 3 design storm was selected for use in the HEC-1 computer model.

Precipitation – The project site and tributary drainage areas lie within the McCarran Rainfall Area as identified in the Manual Figure 513. The adjusted point precipitation values for the drainage subbasins are 2.77 inches, 2.05 inches, and 1.58 inches for the 100, 25, and 10-year storm events, respectively in accordance with the Manual Table 505.

Curve Numbers (CN) – The soils information for the project watershed was referenced from the *Allure Study* (Reference 6). Figure H-31 of the 2013 MPU depicts the project site in relation hydrologic soil groups (HSG). The figure shows that the project area and the offsite subbasins are classified as HSG Type "C."

The land uses or land covers used for the onsite basins consist of "Newly Graded" for undeveloped areas, the offsite basins consist of "Apartments/Condos" for developed areas, and onsite basins consist of "Commercial" for developed areas.

CN values were determined from appropriate columns of Table 602 of the Manual. CN values are 91 for the undeveloped areas, 91 for the offsite developed areas, and 94 for the onsite developed areas.

Drainage Areas and Flow Patterns - The subbasins and flow patterns used for the hydrologic modeling were determined from elevations established for the project site in a master grading digital file. Aerial topography with 1-foot contour intervals has been used for subbasin delineations.

Lag Time - The lag time (TLAG) is described as the time between the center of mass of rainfall and the time of peak discharge from a basin. Lag time can be related to time of concentration (Tc) by the following relationship: TLAG = 0.6 (Tc). The time of concentration (Tc) is defined as the time required for runoff to flow from the most hydraulically distant area of the basin to the outlet of the basin or a design point. The procedure for calculating Tc is outlined in Section 602 of the Manual. Lag time calculations for the drainage subbasins have been included in Appendix A on Standard Form 4. Referenced lag time calculations for the offsite subbasins have been included in Appendix C.

VI. EXISTING CONDITIONS

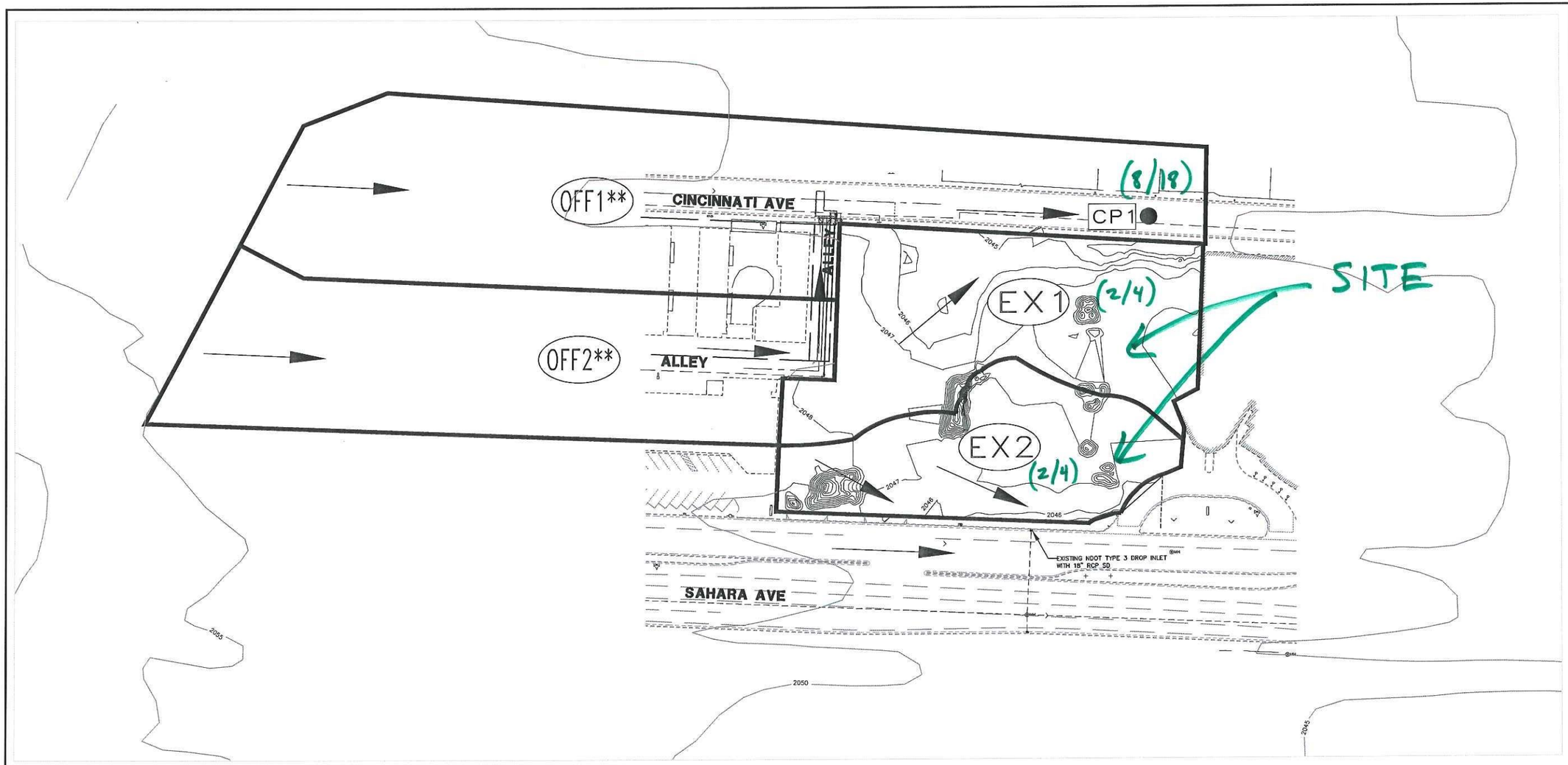
Existing conditions for the project site consists of the site undeveloped with developed offsite subbasins. Offsite subbasins from the Allure Study have been referenced and discharge a total of 15 cfs toward the western boundary of the project site. Pertinent reference material has been included in Appendix C. Offsite flows impacting the project site and flows generated onsite will be conveyed northerly and southerly to Cincinnati Avenue and Sahara Avenue, respectively.

The project-specific existing conditions hydrology consists of two onsite subbasins (Subbasins EX1 and EX2) and two offsite subbasins (Subbasins OFF1 and OFF2). Figure 5, Existing Conditions Drainage Map, depicts the subbasins and drainage patterns used in the existing conditions hydrologic analysis for this project and are generally consistent with the subbasins and drainage patterns of the approved Allure Study. Hydrologic calculations have been included in Appendix A. Table 1 summarizes the HEC-1 results for existing conditions. Referenced hydrologic calculations and information have been included in Appendix C.

TABLE 1 EXISTING CONDITIONS HEC-1 MODEL SUMMARY			
SB OR GP[1]	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	3
EX1	1.50	4	2
CP1	-	18	8
EX2	1.00	4	2

[1]See Figure 5

**Referenced from the Technical Drainage Study for Allure Condominiums



EXISTING CONDITIONS HEC-1 MODEL SUMMARY			
SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	3
EX1	1.50	4	2
CP1	-	18	8
EX2	1.00	4	2

**Referenced from the Technical Drainage Study for Allure Condominiums

NORTH

GRAPHIC SCALE
50 0 25 50
(IN FEET)
1 inch = 50 ft.

LEGEND
- EX1 — DRAINAGE SUBBASIN
- CP1 — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION

% COMPLETE

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE

PROJECT NO.
398-A436
DESIGN:
DRAWN:
CHECK:
PLOT DATE:03-07-14
PLOT TIME:18:37:27

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM
LAS VEGAS

F:\Projects\300\398-A436\Division\Civil\Figures\Fig5 - Existing Conditions.dgn
Joanne Ayson

LUCKY DRAGON LP

LUCKY DRAGON CASINO

EXISTING CONDITIONS DRAINAGE MAP

DRAWING
FIG-5
SHT OF SHTS

HTE: 00-00000

VII. PROPOSED CONDITIONS

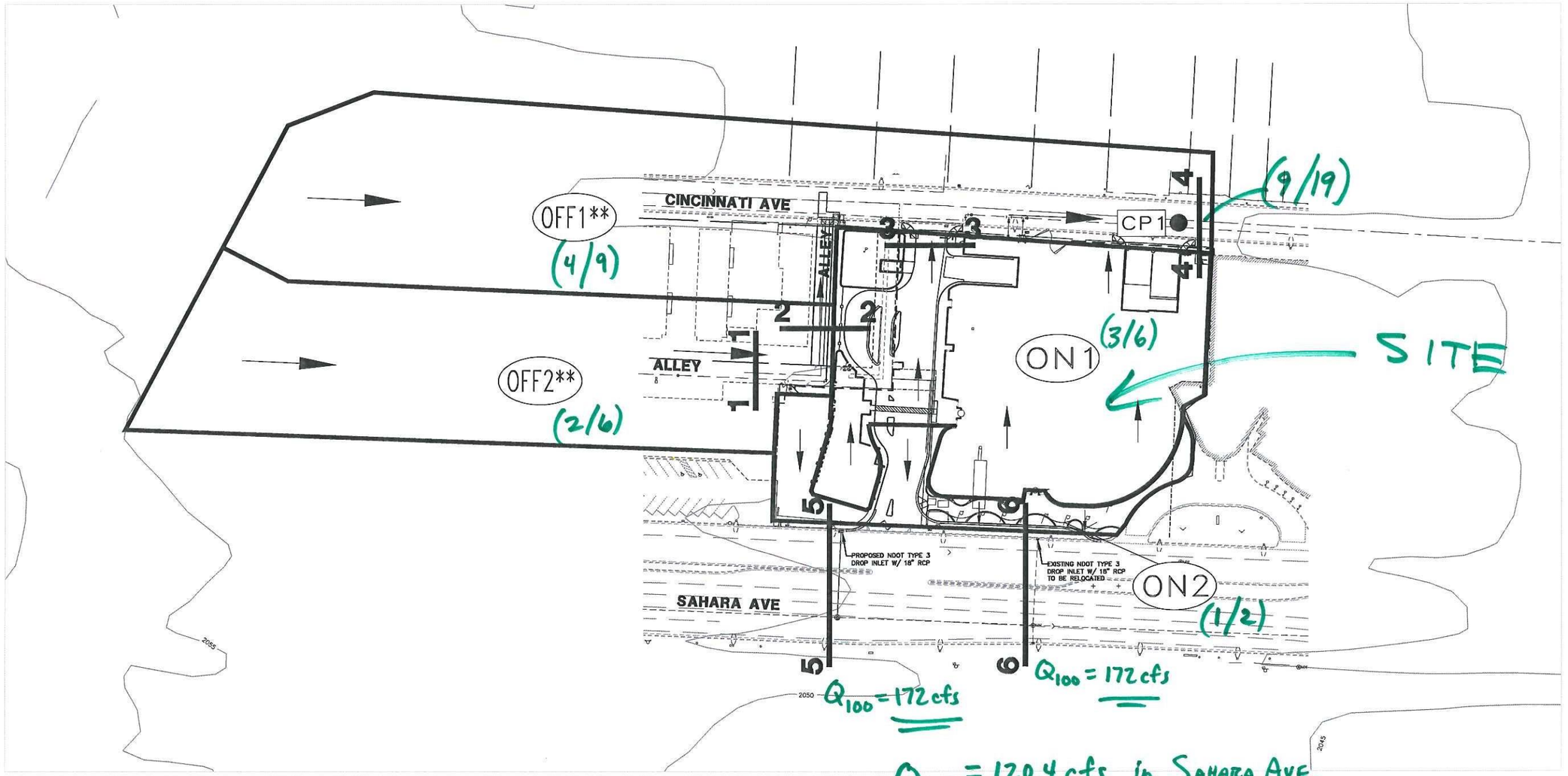
The proposed improvements consist of a hotel, casino, and parking garage. The interior street improvements include pavement, curb and gutter. Figure 6, Proposed Conditions Drainage Map, depicts the subbasins and drainage patterns used in the proposed conditions hydrologic analysis for this project and are generally consistent with the subbasins and drainage patterns of the approved Allure Study. Hydrologic calculations have been included in Appendix A. Table 2 summarizes the HEC-1 results for proposed conditions. Referenced hydrologic calculations and information have been included in Appendix C. Since the upstream watershed is fully developed, the ultimate conditions are the same as the proposed conditions.

TABLE 2
PROPOSED CONDITIONS HEC-1 MODEL SUMMARY

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	2
ON1	2.00	6	3
CP1	-	19	9
ON2	0.50	2	1

**Referenced from the Technical Drainage Study for Allure Condominiums

The north half of Sahara Avenue will be extended to include a proposed 12-foot right turn lane. Due to the roadway improvements, the existing NDOT Type 3 drop inlet at this location will be removed and the existing 18-inch reinforced concrete pipe (RCP) attached to the drop inlet will be plugged. The NDOT Type 3 drop inlet will be relocated upstream just west of the project driveway and connected to a proposed 18-inch RCP. The proposed 18-inch RCP will convey flow from the roadway to the existing 42-inch RCP storm drain. The proposed improvements are depicted in Figure 6.



NORTH

GRAPHIC SCALE

50 0 25 50

(IN FEET)

1 inch = 50 ft.

LEGEND

- EX1 — DRAINAGE SUBBASIN
- CP1 — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- 1 1 — CROSS SECTION

PROPOSED CONDITIONS HEC-1 MODEL SUMMARY

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	2
ON1	2.00	6	3
CP1	-	19	9
ON2	0.50	2	1

**Referenced from the Technical Drainage Study for Allure Condominiums

100-YEAR STREET FLOW CHARACTERISTICS PROPOSED CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 1-1	1.05	6	0.21	2.54	0.53
Section 2-2	1.05	6	0.21	2.54	0.53
Section 3-3	1.15	6	0.35	2.69	0.94
Section 4-4	0.50	19	0.54	2.32	1.25
Section 5-5	0.90	172	1.11	4.64	5.15
Section 6-6	0.40	172	1.06	3.41	3.61

25-YEAR STREET FLOW CHARACTERISTICS PROPOSED/EXISTING CONDITIONS

Location	Slope (%)	Q_{25} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 5-5 (Existing)	0.90	120.4	1.00	4.29	4.29
Section 6-6 (Existing)	0.79	120.4	0.93	4.04	3.76
Section 6-6 (Proposed)	0.40 (min)	120.4	0.94	3.10	2.91

% COMPLETE

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE

PROJECT NO. 398-A436

DESIGN:
DRAWN:
CHECK:

PLOT DATE: 03-07-14
PLOT TIME: 18:34:27

F:\Projects\2001\398-A436\Division\Civil\Figures\Fig6 - Proposed Conditions.dwg
Joanna Ayson

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

LAS VEGAS

LUCKY DRAGON LP

LUCKY DRAGON CASINO

PROPOSED CONDITIONS DRAINAGE MAP

DRAWING
FIG-6
SHT OF SHTS

HTE: 00-00000

LDP

In general, the drainage patterns for the proposed conditions subbasins are consistent with existing conditions. Subbasins OFF1 and OFF2 will generate total flowrates of 9 cfs and 6 cfs, respectively, during the 100-year storm event. The offsite flows will be conveyed north toward Cincinnati Avenue via a 20-foot alley with a 4-foot wide concrete gutter. The offsite runoff will then continue towards the east end of the street and combine with runoff from onsite Subbasin ON1 for a total of 19 cfs at Concentration Point 1. The onsite Subbasin ON2 will generate 2 cfs of flow and will be conveyed south towards Sahara Avenue. The flow will continue east along Sahara Avenue and combines with the 172 cfs of street flow referenced from the Allure Study. Pertinent reference material has been included in Appendix C.

VIII. STREET HYDRAULICS

The resulting street flow data based on the flows generated during the 100-year and 25-year storm events are presented in Tables 3 and 4, respectively. Figure 6 shows the locations of the cross sections corresponding to the calculations included in Tables 3 and 4. Hydraulic calculations have been included in Appendix B. The flowrates and normal depth sections for Cincinnati Avenue and Sahara Avenue have been referenced and/or revised from the Allure Study. Pertinent reference material has been included in Appendix C.

TABLE 3
100-YEAR STREET FLOW CHARACTERISTICS
PROPOSED CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 1-1	1.05	6	0.21	2.54	0.53
Section 2-2	1.05	6	0.21	2.54	0.53
Section 3-3	1.15	6	0.35	2.69	0.94
Section 4-4	0.50	19	0.54	2.32	1.25
Section 5-5	0.90	172	1.11	4.64	5.15
Section 6-6	0.40	172	1.06	3.41	3.61

TABLE 4
25-YEAR STREET FLOW CHARACTERISTICS
PROPOSED/EXISTING CONDITIONS

Location	Slope (%)	Q_{25} (cfs)*	Depth (ft)	Velocity (ft/s)	D*V
Section 5-5 (Existing)	0.90	120.4	1.00	4.29	4.29
Section 6-6 (Existing)	0.79	120.4	0.93	4.04	3.76
Section 6-6 (Proposed)	0.40 (min)	120.4	0.94	3.10	2.91

*25-year storm flow calculated from ratio in Pima County Hydrology Manual (Reference 5)

Cross Section 1-1 and 2-2 are located on 20-foot alleys west of the project site and convey a flow of 6 cfs. The alleys on these cross sections direct offsite flows toward Cincinnati Avenue.

Cross Section 3-3 is located near the entrance to the parking garage and conveys a flow of 6 cfs towards Cincinnati Avenue.

Cross Section 4-4 is located in Cincinnati Avenue, northwest of the project site, and conveys a flow of 19 cfs. Flows generated at Concentration Point 1 will be conveyed east within Cincinnati Avenue.

Cross Section 5-5 is on Sahara Avenue adjacent to the relocated NDOT Type 3 drop inlet. The cross section remains the same during existing and proposed conditions. The proposed NDOT Type 3 drop inlet at this location has the same capacity as the existing inlet that will be removed, and therefore no NDOT right-of-way, downstream facilities or properties will be impacted.

Cross Section 6-6 is located in the north half of Sahara Avenue, just east of the project driveway. In proposed conditions, a 12-foot right turn lane is added to the north half of Sahara Avenue with a longitudinal street slope of 0.40%. Due to the aforementioned improvements, the 25-year depth of flow at this location increases from 0.93 ft during existing conditions to 0.94 ft during proposed conditions. Although a majority of the street section at this location has a longitudinal street slope of 0.79% during proposed conditions, a slope of 0.40% is used in the hydraulic calculations which is conservative. Therefore, the proposed conditions will not adversely impact Sahara Avenue.

Review of the Allure Study shows Sahara Avenue with a total flow rate of 172 cfs. The proposed flowrate of 2 cfs discharging into the road by the onsite Subbasin ON2 is less than the 3 cfs discharging into the road in the referenced Allure Study, and therefore

does not pose any negative impacts on the downstream facilities or properties. Additionally, the 2 cfs of flow discharging into Sahara Avenue in proposed conditions is less than the 4 cfs discharging into the road in existing conditions. Pertinent reference materials have been included in Appendix C.

The street criteria within the project are met during both the 10- and 100-year storm events as illustrated by the largest 100-year peak flow within the project of 172 cfs on Sahara Avenue. The maximum velocity (V) times depth (D) in the project is 5.15 with a corresponding depth of 1.11 feet and velocity of 4.64 feet per second. At the minimum longitudinal street slope on Sahara Avenue of 0.40%, the associated D is 1.06 feet and the V is 3.41 feet per second, resulting in V times D of 3.61 during the 100-year event.

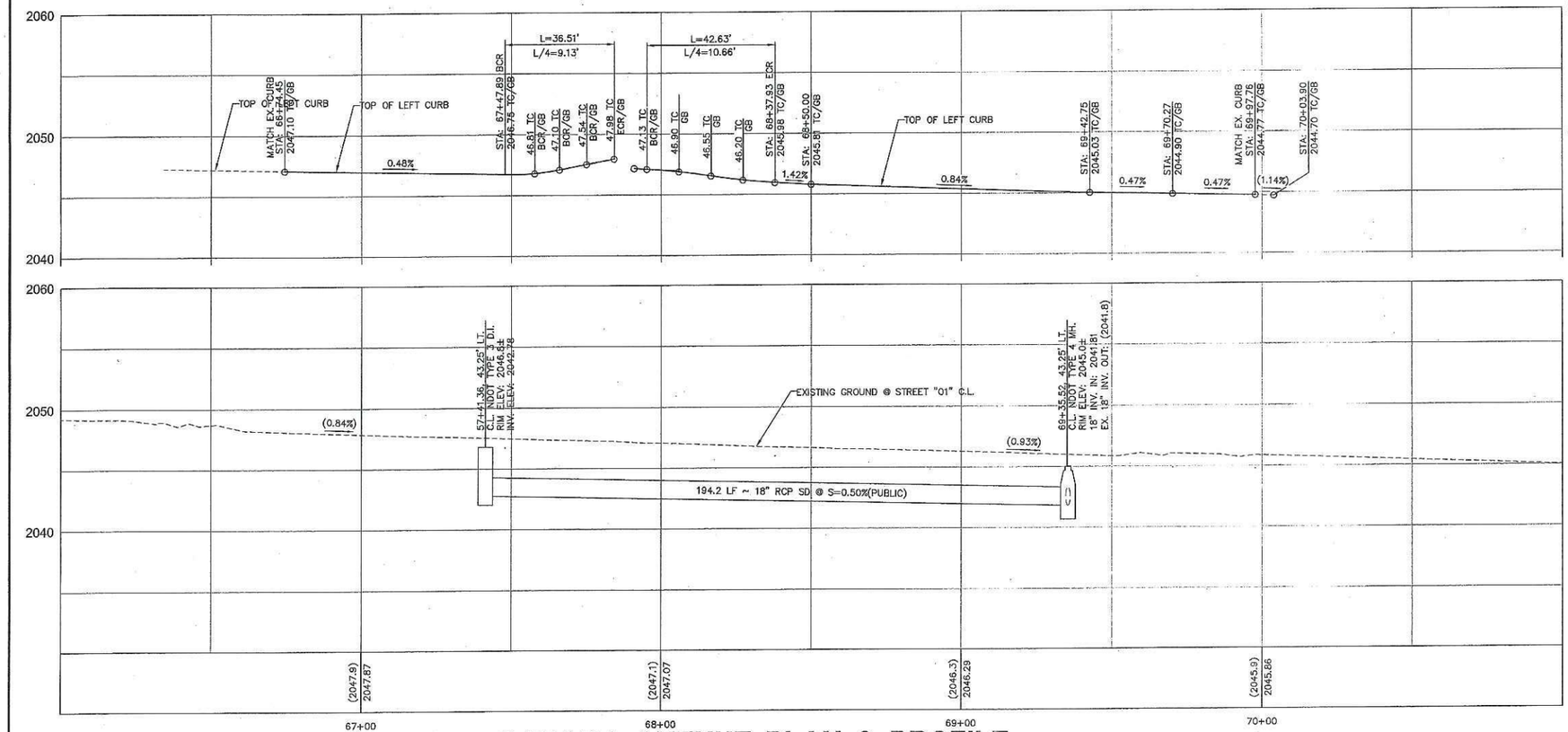
The Manual criteria for a major roadway requires a 12-foot wide dry lane in addition to a dry center turn lane in each direction for streets with a right of way (ROW) greater than 80 feet during a 10-year storm event. The 10-year flow in the Sahara Avenue ROW is zero, as all storm runoff in the ROW is maintained in existing drainage facilities. Therefore, the calculated 10-year depth for Sahara Avenue is 0 feet to provide for 19-foot dry lane which includes 7 feet of the center turn lane, and the 10-year maximum street flow depth of will be met.

A separate HEC-1 model for the 25-year storm event is included in Appendix A. The 25-year Sahara Avenue storm flow was determined using the Pima County Hydrology Manual (Reference 5). Based on the depths presented in Table 4, the NDOT criteria under existing conditions is not met as there is storm flow in the travel lane. Thus, the NDOT criteria under proposed conditions will not be met either. However, the proposed development will not worsen the roadway's existing conditions.

IX. FLOOD PROTECTION FACILITIES

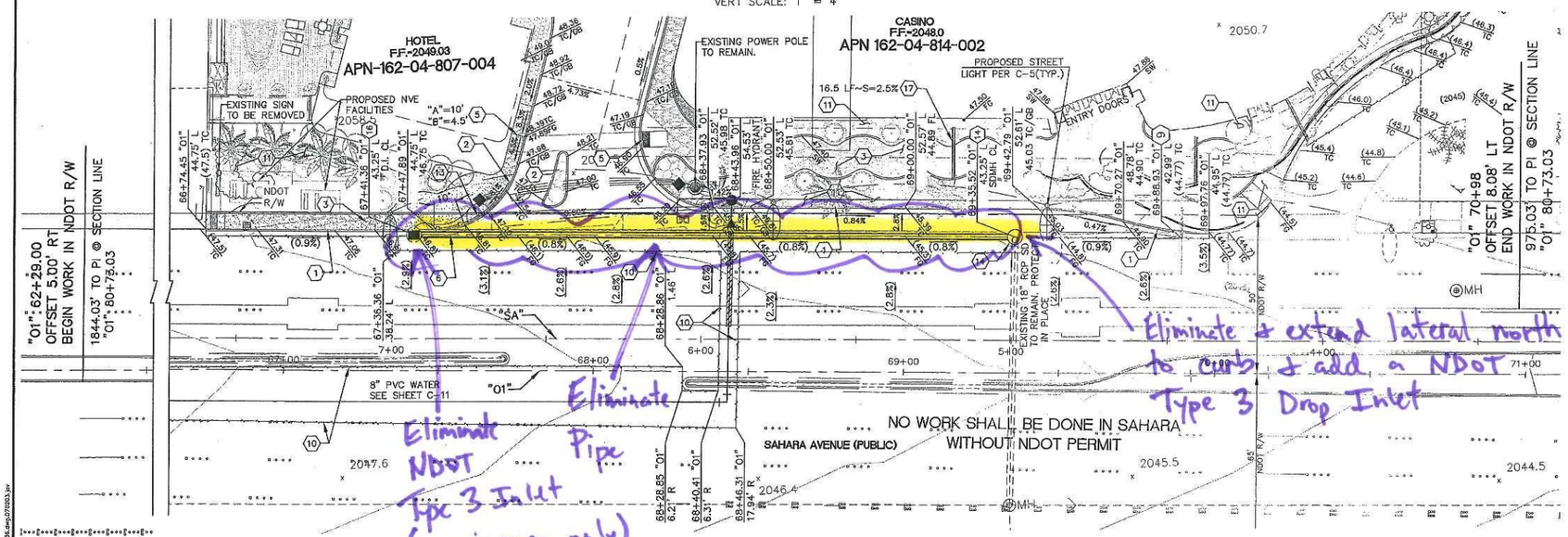
Finished Floor Elevations

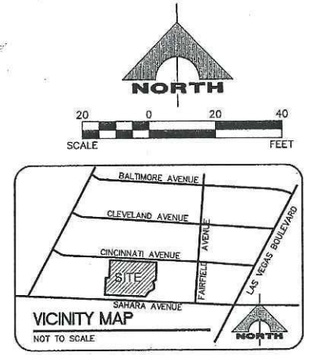
The proposed finish floor elevations of the mechanical room, hotel, and casino/parking garage are 2047.90, 2048.68, and 2047.88, respectively. All finished floor elevations are greater than two times the depth of flow above the flow line elevations in the adjacent streets and alleys.



SAHARA AVENUE PLAN & PROFILE

HORIZ SCALE: 1" = 20'
VERT SCALE: 1" = 4'





VICINITY MAP
NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT OLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234) (SEE ARCHITECTURAL PLANS PER SURFACE SECTION)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. CONSTRUCT 6" TO 0" CURB DETAIL PER DETAIL "B" SHEET C8.
7. CONSTRUCT SIDEWALK UNDERDRAIN (USDCCA NO. 236)
8. CONSTRUCT ASPHALT PAVEMENT (3" A/C OVER 8" TYPE II COMPACTED TO 95%)
9. REMOVE EXISTING 6"X3" SIDEWALK UNDERDRAIN.
10. SAWCUT REMOVE AND REPLACE EXISTING PAVEMENT PER NDOT.
11. CONSTRUCT PLANTER, PER ARCHITECTURAL PLANS.
12. SEE ARCH PLANS FOR SIDEWALK RAMPS
13. INSTALL HAND RAIL PER DEAIL A SHEET C8.
14. REMOVE EXISTING NDOT TYPE 3 INLET IN IT'S ENTIRETY. REPLACE WITH NDOT TYPE 4 MANHOLE PER DWG. R-4.3.2
15. NOT USED.
16. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421
17. INSTALL 3"X6" RECTANGULAR TUBING SIDEWALK UNDER DRAIN PER DETAIL "C" SHT. C-8.

Call before you Dig
Avoid cutting underground utility lines. It's easy.
Call 811
OR 1-800-227-2600

FAST
Call before you UnderGround.
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES IT'S COSTLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 (Pending this Approval) 10/24/14 DATE

ENGINEER - STATE OF NEVADA - ROY D. CLARK - No. 8354 - PROFESSIONAL ENGINEER - DATE: 10/24/14

DESCRIPTION	DATE	REV	DATE	AGEN. APP	DATE	CITY APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 10-28-14
PLOT TIME: 14:01:41

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
3335 S. RAINBOW BLVD · LAS VEGAS, NV 89146
T: 702.804.8000 · F: 702.804.8299 · GCWALLACE.COM

LAS VEGAS

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Rudy Lopez

LUCKY DRAGON LP

LUCKY DRAGON CASINO
SAHARA AVENUE IMPROVEMENTS

SAHARA AVENUE
PLAN + PROFILE

DRAWING
C-9
9 OF 12 SHTS

To: Mr. Albert Sung
Flood Control
City of Las Vegas Dept. of Public Works
333 N. Rancho Rd.

HORROCKS ENGINEERS

From: Larry Bitton

Date: 10-31-16

TRANSMITTAL

Subject: **Technical Drainage Study Update Letter**
Lucky Dragon Temporary Parking Lot (SDR 66780 PRJ #66791)

The following items are:
- ☐ Requested
- ☒ Enclosed
- ☐ Sent Separately via US Mail

☒ Report	☐ Specifications	☐ Cost Estimate	☐ Progress Est.
☐ Test Result	☐ Calculations	☐ Check Print	Other

No. of Copies	Description
2	Technical Drainage Study Update Letter - Lucky Dragon Casino
2	Lucky Dragon Casino Temp Parking Plan
1	$400 Check to City of Las Vegas for review fee

General Remarks:
Provided for review and approval in accordance with SDR 6780 Conditions of Approval. Letter format allowed as previously agreed.

Please contact Larry Bitton (702) 883-1300 with any questions.

1349 Galleria Pkwy, Suite 110 Henderson, NV 89014 -- ph. (702) 966-4063

DS #: 4659

APN: 162-04-807-004 & 162-04-814-002

PROJECT: NWC of Sahara Blvd. & Fairfield Avenue

SUBMITTAL: 1st

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: March 24, 2014
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: **Lucky Dragon**			**COPIES TO:** G.C. Wallace Companies
Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue			Lucky Dragon LP
File Number:	F:\Depot\DSMemos\DS4659A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-807-004 & 162-04-814-002			CCRFCD
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891			CCPW
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/10/2014	3/24/2014	See Comments Below	$400.00	350152: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

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:
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 site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

2. This project is also adjacent to the jurisdiction of *Clark County* to the south of *Sahara Avenue*. *Clark County Public Works Department*'s concurrence must be obtained prior to the final approval of the drainage study.

3. The project proposes to construct facilities and/or increase flows within Nevada Department of Transportation (NDOT) right of way (*Sahara*). The engineer must contact NDOT for encroachment permit for the proposed development.

4. The finish floor elevation of the *Casino* and the *Hotel* buildings must be set at a minimum of twice-the-depth of water surface in the street (Sahara) corresponding to the high side of each building. Raise the proposed finish floor elevation of the *Casino* to F.F. = 2048.00 while the *Hotel* to F.F. = 2049.03.

5. There are no distinct property lines of the development to be found on the grading plan. Revise the grading plan in the next submittal to include the property limits especially at the east and the west boundaries on the plan.

6. It appears that portion of a shaded structure encroaches into the footprint of the proposed *Casino* building at the east side. It is recommended to provide a *Demolition Plan* in the next submittal to clarify how the proposed structures match the existing features in the vicinity of the building.

   Provide grading information at least 100' beyond the proposed project limits adjacent to the east and to the west.

7. A proposed high point "47.05 FG" at the west entrance of the *Casino* has about one inch of freeboard only versus the 100-year water surface in *Sahara Avenue*. Raise the high point elevation as much as possible in the next submittal.

8. There are two identical finish grade elevations "47.42 SW" in the meandering sidewalk outside the south entrance of the *Casino* building. It appears that the sidewalks between these two points are not draining anywhere. Review and revise accordingly.

9. Label the finish floor elevations of all existing buildings adjacent to the subject development on the grading plan.

10. Label an existing storm drain system in *Sahara Avenue* with *City of Las Vegas* recorded document number in the next submittal.

11. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per a newly adopted USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).

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: T21S/R61E/04
AREA R-04

****
*** FAX TX REPORT ***
****

TRANSMISSION OK

JOB NO.	3279
DESTINATION ADDRESS	8042299
PSWD/SUBADDRESS	
DESTINATION ID	
ST. TIME	03/25 17:15
USAGE T	00' 39
PGS.	2
RESULT	OK

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**				**DATE:** **March 24, 2014**
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: **Lucky Dragon**			**COPIES TO:** G.C. Wallace Companies
Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue			Lucky Dragon LP
File Number:	F:\Depot\DSMemos\DS4659A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-807-004 & 162-04-814-002			CCRFCD
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891			CCPW
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/10/2014	3/24/2014	See Comments Below	$400.00	350152: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

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:
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 site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

2. This project is also adjacent to the jurisdiction of *Clark County* to the south of *Sahara Avenue*. *Clark County Public Works Department*'s concurrence must be obtained prior to the final approval of the drainage study.

LETTER OF TRANSMITTAL

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

G. C. WALLACE, INC.
G. C. WALLACE OF CALIFORNIA, INC.
G. C. WALLACE HOLDINGS, INC.

Writer's Contact Information:

804-2000

Project No.: 398-A436
Date: March 10, 2014

To: **City of Las Vegas**
City of Las Vegas - Land Development Services
Department of Public Works
333 N. Rancho Drive
Las Vegas, NV 89106

Attention: Albert Sung, PE

Subject: **Technical Drainage Study for Lucky Dragon Hotel & Casino**

Sent Via: Hand Delivery

Items being sent:

One (1) Copy of the subject TDS
One (1) Copy of Standard Form 1 (bound with TDS)
One (1) Copy of Improvement Plans
CD of the subject TDS
Check (#1025) for $400

These items are submitted:

- ☐ At your request
- ☒ For your approval
- ☐ For your review and comments
- ☐ For your action
- ☐ For your files
- ☐ For your information

Acknowledgment of receipt:

☒ **Required**

Received by: _____
Date: _____
Time: _____

Remarks:

For review and approval.

Cordially,

G. C. WALLACE, INC.

Jerry E. Pruitt, PE
Flood Control Division
jep

Copies to: Ryan Belsick, GCW
Roy Clark, GCW

DAVID JACOBY 407-5683
ED VANCE 946-8196

January 11, 2012

Mr. Andrew Fonfa
Sahara Investments, LLC
Lucky Dragon, LP
9710 West Tropicana Avenue, Suite #120
Las Vegas, Nevada 89147

RE: GPA-43887 - GENERAL PLAN AMENDMENT RELATED TO ZON-43888, SUP-43889, VAC-43891 AND SDR-43890 PLANNING COMMISSION MEETING OF JANUARY 10, 2012

Dear Mr. Fonfa:

Your request for a General Plan Amendment FROM: MXU (MIXED USE) TO: C (COMMERCIAL) on 0.20 acres at 305 West Cincinnati Avenue (APN 162-04-811-028), Ward 3 (Coffin), was considered by the Planning Commission on January 10, 2012.

The Planning Commission voted to recommend ***APPROVAL*** of your request.

This item will be considered by the City Council on ***February 15, 2012***, at 1:00 P.M. in the Council Chambers of City Hall, 400 Stewart Avenue, Las Vegas, Nevada. ***The Council requires that you or your representative be present at this meeting.*** If you or your representative chooses not to attend, the City Council may act in your absence without your input.

Sincerely,

Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Andrew Fonfa
Lucky Dragon, LP
3575 West Post Road, Suite #1
Las Vegas, Nevada 89118

Mr. Greg Borgel
Moreno & Associates
300 South Fourth Street, Suite #1700
Las Vegas, Nevada 89101

LAS VEGAS CITY COUNCIL

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ELIZABETH N. FRETWELL
CITY MANAGER

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
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333 NORTH RANCHO DRIVE
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BOB COFFIN

ELIZABETH N. FRETWELL
CITY MANAGER

January 11, 2012

Mr. Andrew Fonfa
Sahara Investments, LLC
Lucky Dragon, LP
9710 West Tropicana Avenue, Suite #120
Las Vegas, Nevada 89147

RE: ZON-43888 - REZONING RELATED TO GPA-43887, SUP-43889, VAC-43891 AND SDR-43890
PLANNING COMMISSION MEETING OF JANUARY 10, 2012

Dear Mr. Fonfa:

Your request for a Rezoning FROM: R-4 (HIGH DENSITY RESIDENTIAL) TO: C-2 (GENERAL COMMERCIAL) on 0.20 acres at 305 West Cincinnati Avenue (APN 162-04-811-028), Ward 3 (Coffin), was considered by the Planning Commission on January 10, 2012.

The Planning Commission voted to recommend ***APPROVAL*** of your request.

This item will be considered by the City Council on ***February 15, 2012***, at 1:00 P.M. in the Council Chambers of City Hall, 400 Stewart Avenue, Las Vegas, Nevada. ***The Council requires that you or your representative be present at this meeting.*** If you or your representative chooses not to attend, the City Council may act in your absence without your input.

Sincerely,

Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Andrew Fonfa
Lucky Dragon, LP
3575 West Post Road, Suite #1
Las Vegas, Nevada 89118

Mr. Greg Borgel
Moreno & Associates
300 South Fourth Street, Suite #1700
Las Vegas, Nevada 89101

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ELIZABETH N. FRETWELL
CITY MANAGER

January 11, 2012

Mr. Andrew Fonfa
Sahara Investments, LLC
Lucky Dragon, LP
9710 West Tropicana Avenue, Suite #120
Las Vegas, Nevada 89147

RE: SUP-43889 - SPECIAL USE PERMIT RELATED TO GPA-43887, ZON-43888, VAC-43891 AND SDR-43890
PLANNING COMMISSION MEETING OF JANUARY 10, 2012

Dear Mr. Fonfa:

Your request for a Special Use Permit FOR A GAMING ESTABLISHMENT, NON-RESTRICTED on the north side of Sahara Avenue, approximately 410 feet west of Fairfield Avenue (APNs 162-04-811-028, 162-04-807-004 and 005, 162-04-814-002), Ward 3 (Coffin), was considered by the Planning Commission on January 10, 2012.

The Planning Commission voted to recommend ***APPROVAL*** of your request, subject to the following:

Planning

1. Conformance to all Minimum Requirements under LVMC Title 19.12 for a Gaming Establishment, Non-Restrictive use.

2. Approval of General Plan Amendment (GPA-43887) and Rezoning (ZON-43888), and conformance to the Conditions of Approval for Vacation (VAC-43891) and Site Development Plan Review (SDR-43890) shall be required.

3. This approval shall be void two years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.

4. Prior to occupancy, all necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.

5. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.

CITY OF LAS VEGAS
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6. All City Code requirements and design standards of all City departments must be satisfied, except as modified herein.

This item will be considered by the City Council on ***February 15, 2012***, at 1:00 P.M. in the Council Chambers of City Hall, 400 Stewart Avenue, Las Vegas, Nevada. ***The Council requires that you or your representative be present at this meeting.*** If you or your representative chooses not to attend, the City Council may act in your absence without your input.

Sincerely,

Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Andrew Fonfa
Lucky Dragon, LP
3575 West Post Road, Suite #1
Las Vegas, Nevada 89118

Mr. Greg Borgel
Moreno & Associates
300 South Fourth Street, Suite #1700
Las Vegas, Nevada 89101

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CITY MANAGER

January 11, 2012

Mr. Andrew Fonfa
Sahara Investments, LLC
Lucky Dragon, LP
9710 West Tropicana Avenue, Suite #120
Las Vegas, Nevada 89147

RE: VAC-43891 - VACATION RELATED TO GPA-43887, ZON-43888, SUP-43889 AND SDR-43890
PLANNING COMMISSION MEETING OF JANUARY 10, 2012

Dear Mr. Fonfa:

Your Petition to Vacate A PORTION OF AN EXISTING ALLEY SOUTH OF CINCINNATI AVENUE AND EAST OF TAM DRIVE, Ward 3 (Coffin), was considered by the Planning Commission on January 10, 2012.

The Planning Commission voted to recommend ***APPROVAL*** of your request, subject to the following:

1. The limits of this Petition of Vacation shall be defined as the eastern north/south leg of the public alley located south of Cincinnati Avenue, east of Tam Drive.

2. The dedication of the new 20-foot wide north/south leg of the alley shall record prior to or concurrently with the recordation of the Order of Vacation. The final layout of the area dedicated shall accommodate minimum turning radii for a SU-30 design vehicle.

3. Submit a sewer relocation plan acceptable to the Sanitary Sewer Planning section of the Department of Public Works prior to the recordation of the Order of Vacation. This vacation shall not record until civil improvement plans are approved by the City of Las Vegas and a temporary sewer easement is submitted overlying the vacation limits. The temporary easement shall remain on file until the relocated sewer is accepted for use by the City of Las Vegas or may be recorded if sewer relocation is not completed within one year of civil improvement plan approval. Alternatively, this vacation may be written to record in phases, reserving a public sewer easement that may be vacated as a subsequent phase after the relocated sewer is accepted for use by the City of Las Vegas.

4. A Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the recordation of the Order of Vacation for this application. Appropriate drainage easements shall be reserved if recommended by the approved Drainage Plan/Study. The drainage study required by SDR-43890 may be used to satisfy this requirement provided that it addresses the area to be vacated.

5. All existing public improvements, if any, adjacent to and in conflict with this vacation application are to be modified, as necessary, at the applicant's expense prior to the recordation of the Order of Vacation.

CITY OF LAS VEGAS
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6. The Order of Vacation shall not be recorded until all of the conditions of approval have been met provided, however, that conditions requiring modification of public improvements may be fulfilled for purposes of recordation by providing sufficient security for the performance thereof in accordance with the Subdivision Ordinance of the City of Las Vegas. City Staff is empowered to modify this application if necessary because of technical concerns or because of other related review actions as long as current City right-of-way requirements are still complied with and the intent of the vacation application is not changed. If applicable, a five foot wide easement for public streetlight and fire hydrant purposes shall be retained on all vacation actions abutting public street corridors that will remain dedicated and available for public use. Also, if applicable and where needed, public easement corridors and sight visibility or other easements that would/should cross any right-of-way or easement being vacated must be retained.

7. Reservation of easements for the facilities of the various utility companies together with reasonable ingress thereto and egress there from shall be provided if required.

8. If the Order of Vacation is not recorded within one (1) year after approval by the City of Las Vegas or an Extension of Time is not granted by the Planning Director, then approval will terminate and a new petition must be submitted.

9. All development shall be in conformance with code requirements and design standards of all City Departments.

This item will be considered by the City Council on ***February 15, 2012***, at 1:00 P.M. in the Council Chambers of City Hall, 400 Stewart Avenue, Las Vegas, Nevada. ***The Council requires that you or your representative be present at this meeting.*** If you or your representative chooses not to attend, the City Council may act in your absence without your input.

Sincerely,

Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Andrew Fonfa
Lucky Dragon, LP
3575 West Post Road, Suite #1
Las Vegas, Nevada 89118

Mr. Greg Borgel
Moreno & Associates
300 South Fourth Street, Suite #1700
Las Vegas, Nevada 89101

LAS VEGAS CITY COUNCIL

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ELIZABETH N. FRETWELL
CITY MANAGER

January 11, 2012

Mr. Andrew Fonfa
Sahara Investments, LLC
Lucky Dragon, LP
9710 West Tropicana Avenue, Suite #120
Las Vegas, Nevada 89147

RE: SDR-43890 – SITE DEVELOPMENT PLAN REVIEW RELATED TO GPA-43887, ZON-43888, SUP-43889 AND VAC-43891
PLANNING COMMISSION MEETING OF JANUARY 10, 2012

Dear Mr. Fonfa:

Your request for a Site Development Plan Review FOR A 240,199 SQUARE-FOOT, 201-UNIT, 10-STORY HOTEL/CASINO WITH A 446-SPACE PARKING GARAGE AND WAIVERS OF THE DOWNTOWN CENTENNIAL PLAN STANDARDS FOR STREETSCAPE, SERVICE AREA/LOADING DOCK, UTILITY LOCATION, PERIMETER WALL HEIGHT AND WALL TREATMENT AT THE STREET LEVEL REQUIREMENTS on 2.63 acres along the north side of Sahara Avenue, approximately 410 feet west of Fairfield Avenue (APNs 162-04-811-028, 162-04-807-004 and 005, 162-04-814-002), Ward 3 (Coffin), was considered by the Planning Commission on January 10, 2012.

The Planning Commission voted to recommend ***APPROVAL*** of your request, subject to the following:

Planning

1. Approval of General Plan Amendment (GPA-43887) and Rezoning (ZON-43888), and conformance to the Conditions of Approval for Vacation (VAC-43891) shall be required, if approved.

2. This approval shall be void two years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.

3. All development shall be in conformance with the landscape plan and building elevations, date stamped 11/16/11 and site plan date stamped 12/12/11, except as amended by conditions herein.

4. The applicant shall coordinate with the City Surveyor and other city staff to determine the most appropriate mapping action necessary to consolidate the existing lots. The mapping action shall be completed and recorded prior to the issuance of any building permits.

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DEPARTMENT OF PLANNING
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5. A Waiver from the Downtown Centennial Plan is hereby approved, to allow no first story façade to align along the front property line where 70% alignment is required along Sahara Avenue.

6. A Waiver from the Downtown Centennial Plan is hereby approved, to allow a meandering eight to ten foot wide sidewalk and no amenity zone along the back of curb along Sahara Avenue and a five foot wide sidewalk and zero to five-foot amenity zone along Cincinnati Avenue, where a 10 foot wide sidewalk and five-foot amenity zone are required.

7. A Waiver from the Downtown Centennial Plan is hereby approved, to allow loading docks to front onto the Cincinnati right-of-way to allow maneuvering of service vehicles in the public right-of-way where such is not permitted.

8. A Waiver from the Downtown Centennial Plan is hereby approved, to allow utility vaults to be above ground where utility vaults are required to be underground.

9. A Waiver from the Downtown Centennial Plan is hereby approved, to allow 14 foot solid block walls with paint and no contrasting materials where eight foot tall walls with 20% contrasting material are required.

10. A Waiver from the Downtown Centennial Plan is hereby approved, to allow extended, blank, expressionless walls on the west and portions of the east, north and south elevations where relief in elevations is required.

11. An Exception from the Downtown Centennial Plan is hereby approved, to allow no 36-inch box shade trees where required along Sahara Avenue.

12. Any changes based upon right-of-way, traffic or drainage studies or street improvements required by the city or public utilities shall not reduce the widths of perimeter landscape buffers, height of walls or quantities of plant materials from that on submitted landscape plans date stamped 11/16/11. Any changes based upon subsequently submitted studies must be accommodated elsewhere on the site.

13. Prior to occupancy, all necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.

14. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.

15. A technical landscape plan, signed and sealed by a Registered Architect, Landscape Architect, Residential Designer or Civil Engineer, must be submitted prior to or at the same time application is made for a building permit. A permanent underground sprinkler system is required, and shall be permanently maintained in a satisfactory manner; the landscape plan shall include irrigation specifications. Installed landscaping shall not impede visibility of any traffic control device.

16. A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.

17. A Comprehensive Construction Staging Plan shall be submitted to the Department of Planning Department for review and approval prior to the issuance of any building permits. The Construction Staging Plan shall include the following information: Design and location of construction trailer(s); design and location of construction fencing; all proposed temporary construction signage; location of materials staging area; and the location and design of parking for all construction workers.

18. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

19. A Petition of Vacation, such as VAC-43891, shall record and a new alley acceptable to the City Traffic Engineer shall be dedicated prior to the approval of construction drawings or the issuance of building permits that propose construction in the existing alley, whichever may occur first.

20. Construct the proposed alley per Uniform Standard Drawing #214.S1 concurrent with development of this site. The new alley shall not be permitted to have any encroachments less than 20-feet above the paved surface in order to facilitate public sewer maintenance.

21. In accordance with code requirements of Title 13.16 and 13.56, remove all substandard improvements and replace with new improvements meeting Downtown Centennial Standards except as amended herein concurrent with development of this site. All existing paving damaged or removed by this development shall be restored at its original location and to its original width concurrent with development of this site.

22. Provide a sewer relocation plan to the Sanitary Sewer Planning section of the Department of Public Works for the sewer located within the alley to be vacated prior to the submittal of any construction drawings for this site. Additionally, this site shall connect to the public sewer line in Sahara Avenue.

23. Grant Pedestrian Access Easements for all public sidewalks not located within the public right-of-way.

24. Contact the City Engineer's Office at 229-6272 to coordinate the development of this project with the "Project Clear Skies" project and any other public improvement projects adjacent to this site. Comply with the recommendations of the City Engineer.

25. The design of the proposed acceleration/ deceleration lanes, driveways, and proposed median modifications on Sahara Avenue shall all meet the approval of both the City of Las Vegas Traffic Engineer and the Nevada Department of Transportation.

26. Landscape and maintain all unimproved rights-of-way adjacent to this site. All landscaping and private improvements installed with this project shall be situated and maintained so as to not create sight visibility obstructions for vehicular traffic at all development access drives and abutting street intersections.

27. As appropriate, submit an Encroachment Agreement to the City of Las Vegas and/or obtain an Occupancy Permit from the Nevada Department of Transportation for all landscaping and private improvements in the Cincinnati Avenue and Sahara Avenue public rights-of-way adjacent to this site prior to the issuance of any building permits. The applicant must carry an insurance policy for the term of the Encroachment Agreement and add the City of Las Vegas as an additionally insured entity on this insurance policy. If requested by the City, the applicant shall remove property encroaching in the public right-of-way at the applicant's expense pursuant to the terms of the City's Encroachment Agreement. The installation and maintenance of all private improvements in the public right-of-way shall be the responsibility of the adjacent property owner(s) and shall be transferred with the sale of the property for the entire term of the Encroachment Agreement.

28. A Traffic Impact Analysis must be submitted to and approved by the Department of Public Works prior to the issuance of any building or grading permits or the submittal of any construction drawings for this site. Comply with the recommendations of the approved Traffic Impact Analysis prior to occupancy of the site. The Traffic Impact Analysis shall also include a section addressing Standard Drawings #234.1 #234.2 and #234.3 to determine additional right-of-way requirements for bus turnouts adjacent to this site, if any; dedicate all areas recommended by the approved Traffic Impact Analysis. All additional rights-of-way required by Standard Drawing #201.1 for exclusive right turn lanes and dual left turn lanes shall be dedicated prior to or concurrent with the commencement of on-site development activities unless specifically noted as not required in the approved Traffic Impact Analysis. Phased compliance will be allowed if recommended by the approved Traffic Impact Analysis. No recommendation of the approved Traffic Impact Analysis, nor compliance therewith, shall be deemed to modify or eliminate any condition of approval imposed by the Planning Commission or the City Council on the development of this site.

29. A Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the issuance of any building or grading permits or submittal of any construction drawings, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage plan/study. The developer of this site shall be responsible to construct such neighborhood or local drainage facility improvements as are recommended by the City of Las Vegas Neighborhood Drainage Studies and approved Drainage Plan/Study concurrent with development of this site.

This item will be considered by the City Council on ***February 15, 2012***, at 1:00 P.M. in the Council Chambers of City Hall, 400 Stewart Avenue, Las Vegas, Nevada. ***The Council requires that you or your representative be present at this meeting.*** If you or your representative chooses not to attend, the City Council may act in your absence without your input.

Sincerely,

Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Andrew Fonfa
Lucky Dragon, LP
3575 West Post Road, Suite #1
Las Vegas, Nevada 89118

Mr. Greg Borgel
Moreno & Associates
300 South Fourth Street, Suite #1700
Las Vegas, Nevada 89101

TECHNICAL DRAINAGE STUDY
FOR
LUCKY DRAGON

398-A436C

March 2014

Prepared For:

Lucky Dragon LP
3575 West Post Road
Las Vegas, Nevada 89118
Phone: (702) 897-5625

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Date: 02/26/2014

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Ave

East/West: Sahara Avenue

b) Section: 4 Township: 21 Range: 61 East

c) APN : 162-04-807-004

162-04-814-002

Name of Owner: David S Jacoby - Lucky Dragon LP

Telephone No.: (702) 897-5625 Fax No.: E-Mail Address: jacobyd@ggamllc.com

Address: 3575 West Post Road, Las Vegas, NV 89118

Contact Person-Name: Jerry E. Pruitt **Telephone No.:** (702) 804-2000

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

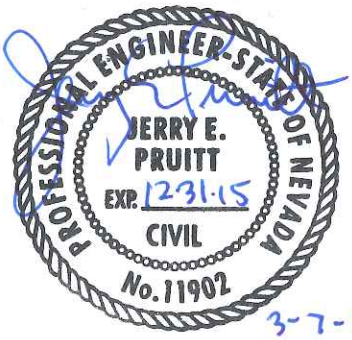
Firm: G.C. Wallace Inc.

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	X	Building Permit		

1. Total Owned Land Area: At Site: +/- 2.28 acres Being Developed/Disturbed: +/-2.28 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: +/- 6.3 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Allure Condominiums
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Cincinnati Avenue and Sahara Avenue
8. Briefly describe your proposed schedule for the subject project: ASAP



3-7-14

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

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Technical Drainage Study for Lucky Dragon	Map ID:	
Firm Name: G.C. Wallace, Inc.	Engineer: Jerry E. Pruitt	
Address: 1555 South Rainbow Boulevard		
City: Las Vegas	State: NV	Zip: 89146-2903
Phone Number: (702)804-2011	Fax Number: (702)804-2299	
Property Owner: Lucky Dragon LP		
Address: 3575 West Post Road		
City: Las Vegas	State: NV	Zip: 89118
Reviewed By:	Date Received:	Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

This document is intended as an aid in preparing Technical Drainage Studies. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT

Yes	No	
X		Design Manual **Standard Form 1** with the engineer's seal and signature.
X		Design Manual **Standard Form 4**.
X		2 copies of the 24" x 36" Drainage Plan.
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

II. MAPS AND EXHIBITS

Yes	No	
X		A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
X		A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

Yes	No	
X		Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.
X		On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs.
X		Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

Yes	No	
X		Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
X		Minimum scale: 1" = 60'.
X		Project name.
X		Vicinity Map with local and major cross streets.
X		Revision box.
X		North arrow and bar scale.
X		Engineer's/consultant's address and phone number.
X		Elevation datum and benchmark.
X		Legend for symbols and abbreviations.
X		Cut/fill scarps, where applicable.
X		Street names, grades, widths.
X		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.
X		Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
X		Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
X		Proposed typical street sections.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
_____	N/A	Streets with off-set crowns.
X	_____	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
X	_____	Property lines.
X	_____	Right-of-way lines and widths, existing and proposed.
X	_____	Existing improvements and their elevations.
X	_____	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
X	_____	Concentration points and drainage flow direction with Q100 and V100 and D100 in streets.
X	_____	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
X	_____	Location and cross-section of street capacity calculations.
X	_____	Cross-sectional detail for channels, including cutoff wall locations.
X	_____	Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
_____	N/A	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
_____	N/A	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
X	_____	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.
X	_____	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
X	_____	Building and/or lot numbers.
X	_____	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
_____	N/A	Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
_____	N/A	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
X	_____	Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q100 flows.
X	_____	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
_____	N/A	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required).

IV. HYDROLOGIC ANALYSIS

Yes	No	
X	_____	Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
X	_____	Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
X	_____	Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
X	_____	Use of correct precipitation values in and around the McCarran Airport rainfall area.
X	_____	A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
X	_____	A summary table of stormwater flows showing basin area, Q10 and Q100 for both individual basins and combined basin flows, where applicable.
X	_____	Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
X	_____	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.
_____	N/A	Calculation for impervious area for parking lots and LIDs (if required).

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
_____	N/A	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
X	_____	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q100 and Q10 flows representing the worst case for interior and all perimeter streets. Q100 d x v < 8. Q10 d x v < 6 and 12 foot dry lane for rights-of-way > 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
X	_____	A summary table of interior and exterior street capacity calculations showing the street name, Q100 flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
_____	N/A	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
_____	N/A	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
X	_____	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q100 weir height or flow depth, whichever is greater.
_____	N/A	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
_____	N/A	Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
_____	N/A	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
X	_____	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.
_____	N/A	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE:	STANDARD FORM 2

TECHNICAL DRAINAGE STUDY
FOR
LUCKY DRAGON

398-A436C

March 2014

Prepared For:

Lucky Dragon LP
3575 West Post Road
Las Vegas, Nevada 89118
Phone: (702) 897-5625

Prepared By:

G. C. Wallace, Inc.
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299

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I. INTRODUCTION

Lucky Dragon LP is proposing to develop a hotel and casino on the undeveloped land to the west of the existing Allure Condominium Complex. The project area lies within the approximately 2.5 acres parcels APN 162-04-807-004, 162-04-811-028, 162-04-814-002, and 162-04-899-021. This study addresses the development of the proposed hotel and casino. Design flow rates and drainage patterns for the site were previously established in the Allure Condominiums Hydrology Study (Reference 1, hereinafter referred to as the Allure Study).

The purpose of this report is to accompany the grading plans, to provide detailed hydrologic and hydraulic analyses for the site, and to determine adequate protection for the project from offsite and onsite flows. The following tasks were performed in the preparation of this report:

- Identify previous drainage studies for the project site and surrounding areas.
- Identify the FEMA floodplain designation for the project site.
- Identify existing and proposed regional drainage facilities adjacent to the site.
- Estimate runoff generated for the peak 10-year, 25-year, and 100-year return period storms for existing and proposed conditions.
- Recommend drainage facilities to protect the project from storm runoff.

II. LOCATION AND DESCRIPTION

The project site is located in Section 4, Township 21 South, Range 61 East, M.D.M., in City of Las Vegas, Clark County, Nevada. Please refer to Figures 1 and 2 for the vicinity and location of the project site. The site is presently undeveloped and is bordered by Cincinnati Avenue to the north, Allure Condominium development to the east, high density residential and commercial property to the west, and Sahara Avenue to the south. For this study, the proposed onsite improvements include a hotel and casino, streets, parking, curb and gutter, etc.

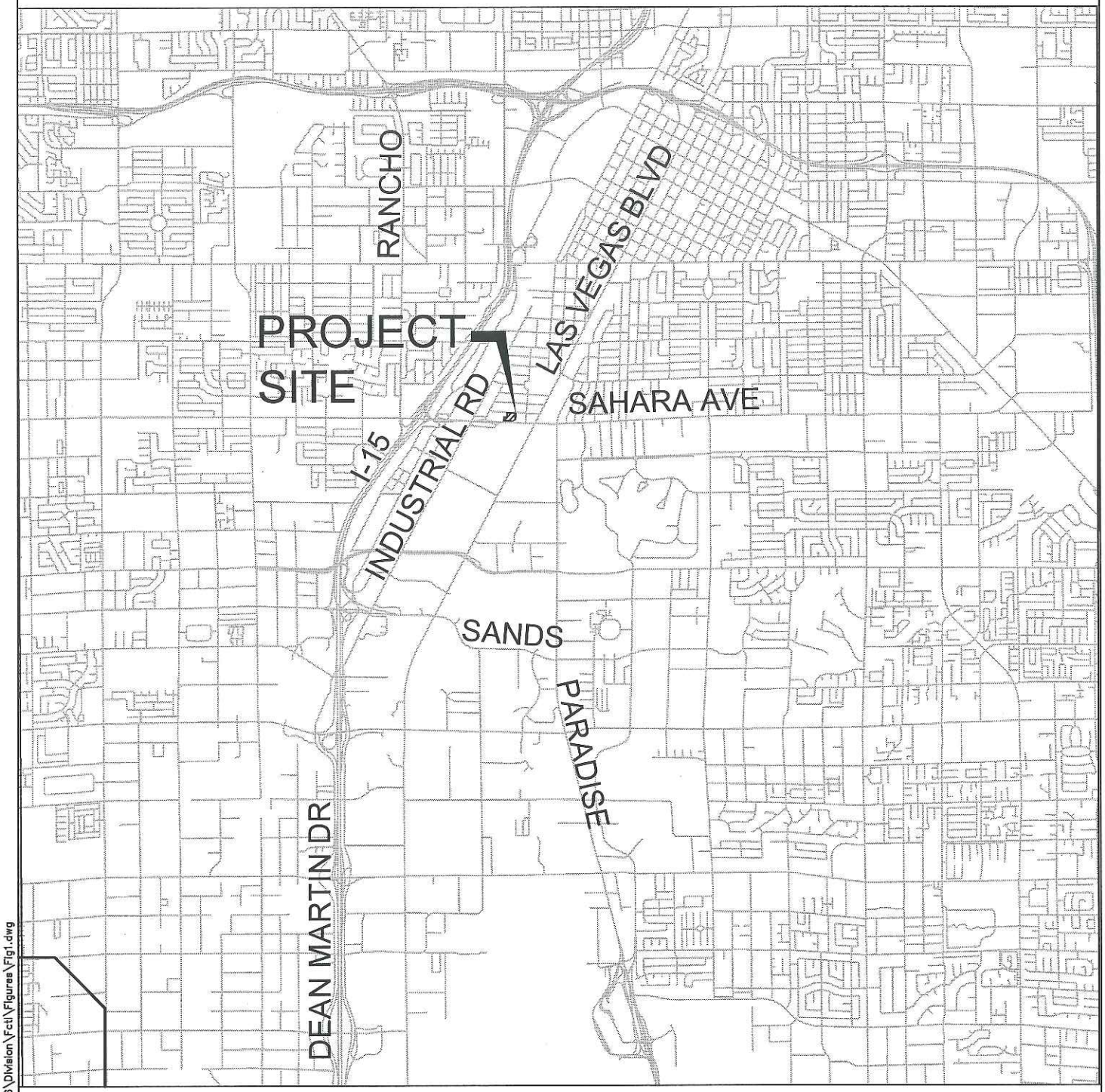
III. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD ANALYSIS

Based on the FEMA Flood Insurance Rate Map (FIRM) Community Panel 32003C 2170F, dated November 16, 2011, this project is not currently located in a FEMA

designated Special Flood Hazard Area (SFHA). Figure 3 shows the site denoted on a portion of the aforementioned FIRM.

IV. CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (CCRFCD) FACILITIES

Figure 4 is reproduced from Figure F-31 of the CCRFCD 2013 Las Vegas Valley Master Plan Update (Reference 3, hereinafter referred to as the 2013 MPU). This figure depicts the project site in relation to existing and proposed CCRFCD Facilities. As shown on the figure, the project is adjacent to the proposed CCRFCD Facility identified as BHSA 0289 (14-foot wide by 12-foot high reinforced concrete box). Flows generated onsite will be discharged either to the north to the existing Cincinnati Avenue right-of-way or to the south to the existing Sahara Avenue right-of-way which ultimately drains to the Flamingo Wash east of the site.



GRAPHIC SCALE

5000 0 2500 5000

(IN FEET)

1 inch = 5000 ft.

NORTH

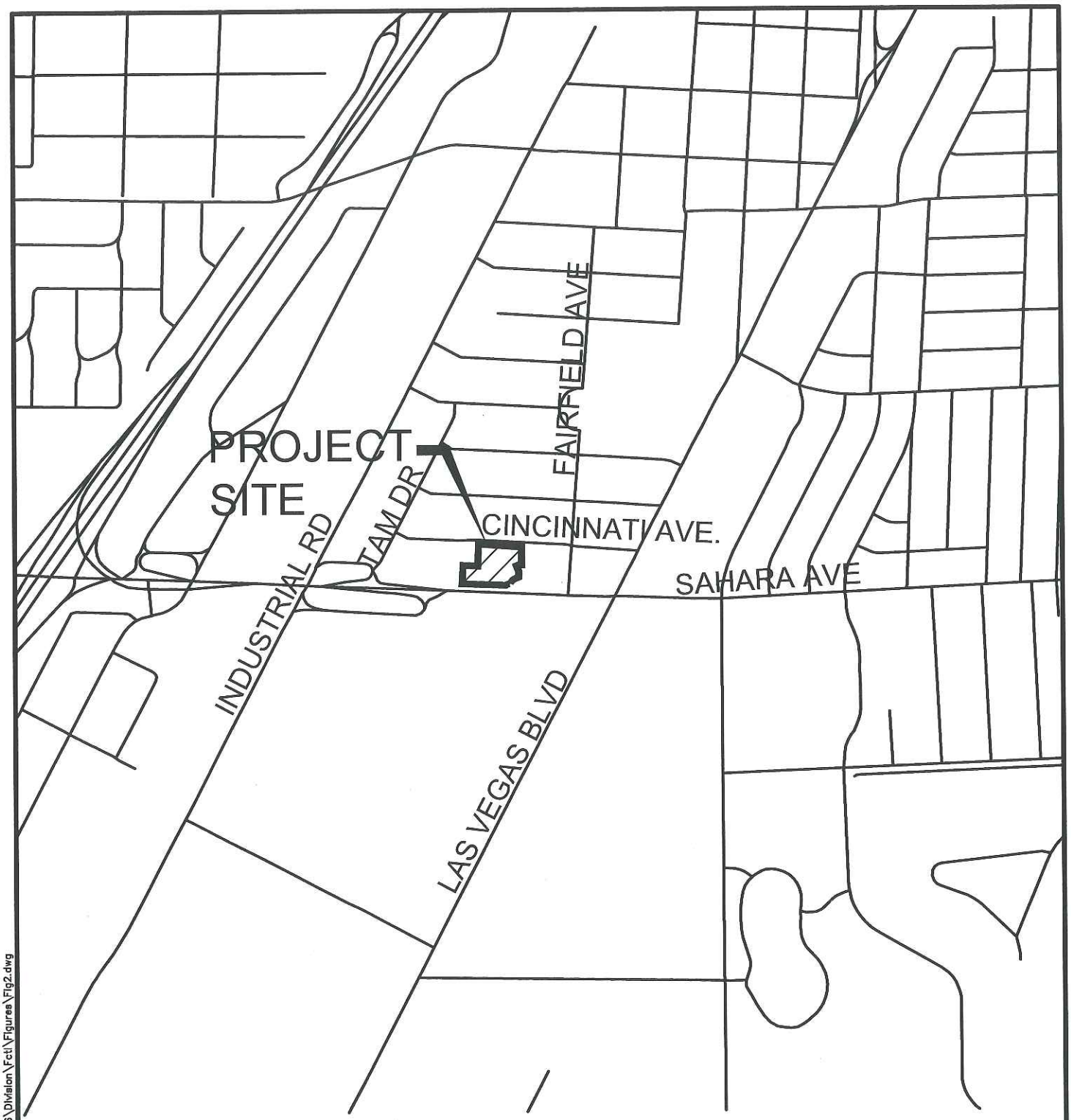
LUCKY DRAGON

FIGURE 1

VICINITY MAP

G. C. WALLACE COMPANIES
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GRAPHIC SCALE

1000 0 500 1000

(IN FEET)

1 inch = 1000 ft.

NORTH

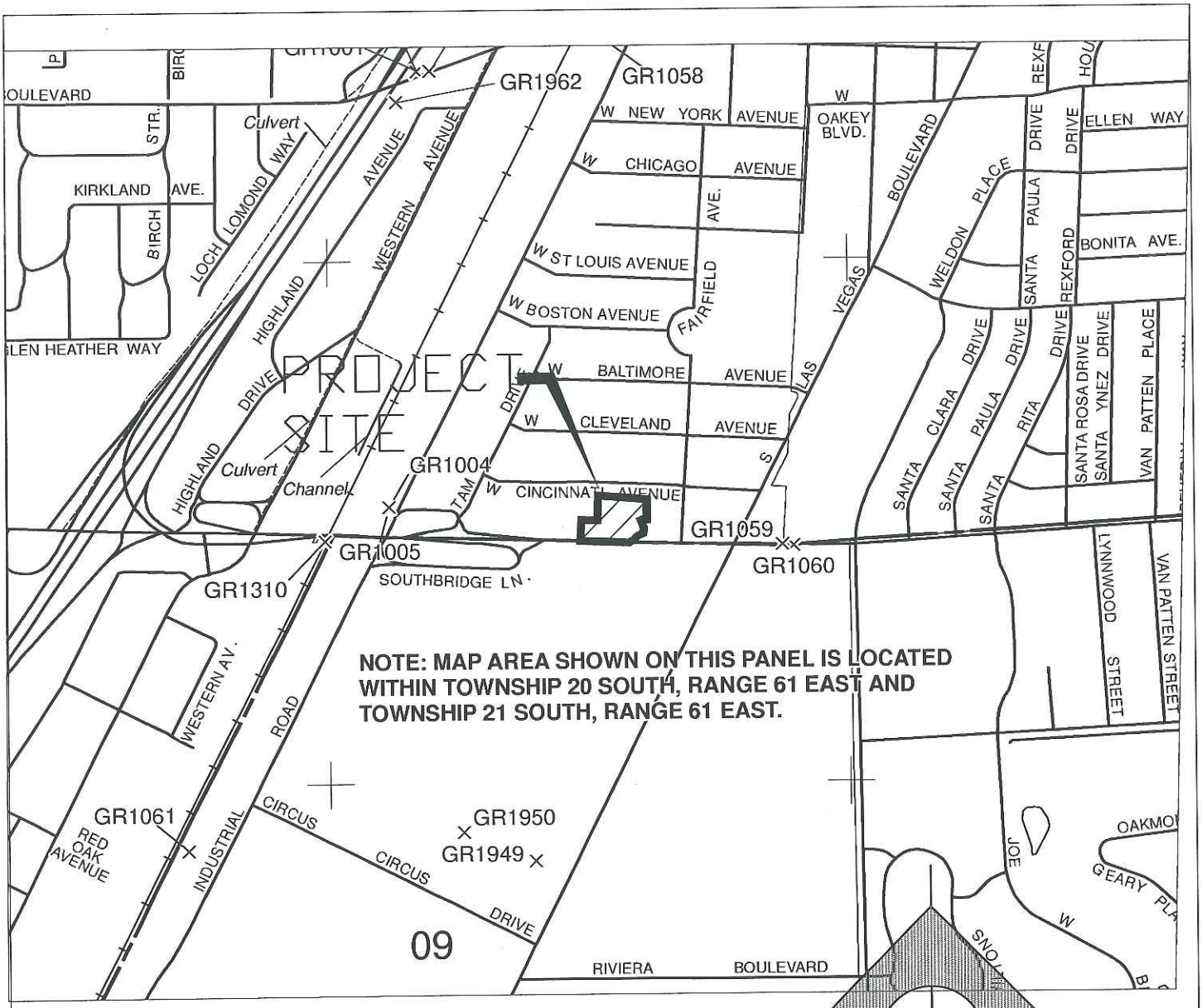
LUCKY DRAGON

FIGURE 2

LOCATION MAP

G. C. WALLACE COMPANIES
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NORTH

GRAPHIC SCALE

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(IN FEET)

1 inch = 1000 ft.

PANEL 2170F

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2170 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2170	F
LAS VEGAS, CITY OF	325276	2170	F
NORTH LAS VEGAS, CITY OF	320007	2170	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 32003C2170F

MAP REVISED NOVEMBER 16, 2011

Federal Emergency Management Agency

LUCKY DRAGON

FIGURE 3

F.I.R.M.

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REGIONAL FLOOD CONTROL DISTRICT

2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-31
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

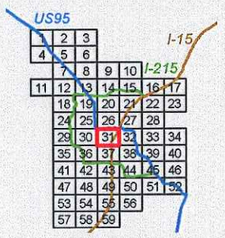
PROJECT SITE

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BHSA		BOULDER HIGHWAY SAHARA AVENUE						
0175	P1	14' X 14' RCB	6000	3837	CSA13	SW3	7.93	0.67
0289	P1	14' X 12' RCB	2300	3566	CSA11	SW3	7.55	0.87
0331	P1	14' X 11' RCB	2000	3232	CSA10-1	SW3	7.15	1.00

FIGURE 4

N

0 500 1,000 2,000 3,000
Feet
Scale: 1 inch = 2,000 feet
Refer to Figure G-2 for Aerial Source(s)



PBS&J
PB

V. HYDROLOGY

The methodology presented in this study is in compliance with the *CCRFCD Hydrologic Criteria and Drainage Design Manual* (Reference 4, hereinafter referred to as the Manual).

Model Description - The drainage basins were modeled using the SCS Unit Hydrograph method within the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package (Reference 5). Since the drainage area for each watershed within the project is less than 8 square miles, an SDN 3 design storm was selected for use in the HEC-1 computer model.

Precipitation – The project site and tributary drainage areas lie within the McCarran Rainfall Area as identified in the Manual Figure 513. The adjusted point precipitation values for the drainage subbasins are 2.77 inches, 2.05 inches, and 1.58 inches for the 100, 25, and 10-year storm events, respectively in accordance with the Manual Table 505.

Curve Numbers (CN) – The soils information for the project watershed was referenced from the *Allure Study* (Reference 6). Figure H-31 of the 2013 MPU depicts the project site in relation hydrologic soil groups (HSG). The figure shows that the project area and the offsite subbasins are classified as HSG Type "C."

The land uses or land covers used for the onsite basins consist of "Newly Graded" for undeveloped areas, the offsite basins consist of "Apartments/Condos" for developed areas, and onsite basins consist of "Commercial" for developed areas.

CN values were determined from appropriate columns of Table 602 of the Manual. CN values are 91 for the undeveloped areas, 91 for the offsite developed areas, and 94 for the onsite developed areas.

Drainage Areas and Flow Patterns - The subbasins and flow patterns used for the hydrologic modeling were determined from elevations established for the project site in a master grading digital file. Aerial topography with 1-foot contour intervals has been used for subbasin delineations.

Lag Time - The lag time (TLAG) is described as the time between the center of mass of rainfall and the time of peak discharge from a basin. Lag time can be related to time of concentration (Tc) by the following relationship: TLAG = 0.6 (Tc). The time of concentration (Tc) is defined as the time required for runoff to flow from the most hydraulically distant area of the basin to the outlet of the basin or a design point. The procedure for calculating Tc is outlined in Section 602 of the Manual. Lag time calculations for the drainage subbasins have been included in Appendix A on Standard Form 4. Referenced lag time calculations for the offsite subbasins have been included in Appendix C.

VI. EXISTING CONDITIONS

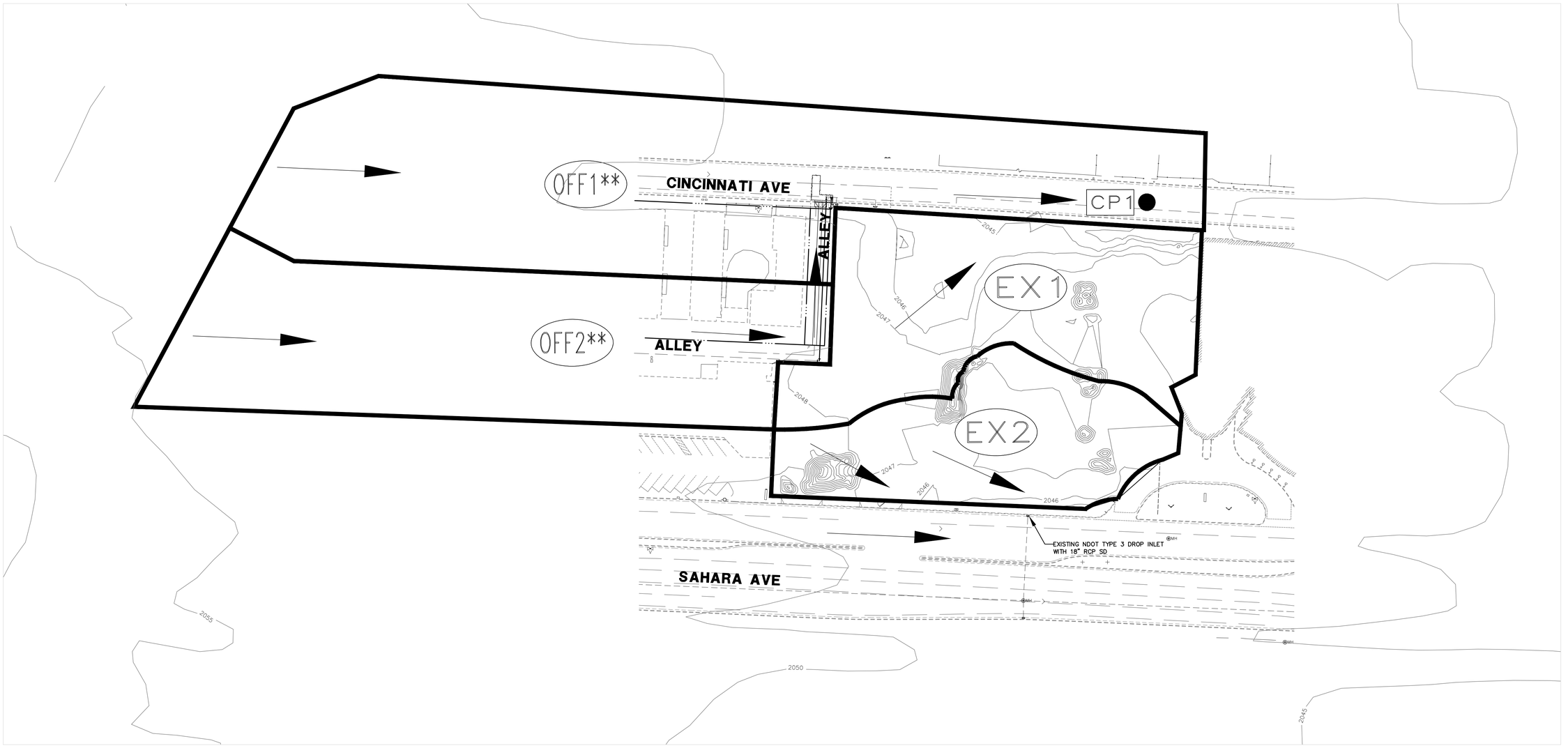
Existing conditions for the project site consists of the site undeveloped with developed offsite subbasins. Offsite subbasins from the Allure Study have been referenced and discharge a total of 15 cfs toward the western boundary of the project site. Pertinent reference material has been included in Appendix C. Offsite flows impacting the project site and flows generated onsite will be conveyed northerly and southerly to Cincinnati Avenue and Sahara Avenue, respectively.

The project-specific existing conditions hydrology consists of two onsite subbasins (Subbasins EX1 and EX2) and two offsite subbasins (Subbasins OFF1 and OFF2). Figure 5, Existing Conditions Drainage Map, depicts the subbasins and drainage patterns used in the existing conditions hydrologic analysis for this project and are generally consistent with the subbasins and drainage patterns of the approved Allure Study. Hydrologic calculations have been included in Appendix A. Table 1 summarizes the HEC-1 results for existing conditions. Referenced hydrologic calculations and information have been included in Appendix C.

TABLE 1 EXISTING CONDITIONS HEC-1 MODEL SUMMARY			
SB OR CP_1	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	3
EX1	1.50	4	2
CP1	-	18	8
EX2	1.00	4	2

[1]See Figure 5

**Referenced from the Technical Drainage Study for Allure Condominiums



EXISTING CONDITIONS HEC-1 MODEL SUMMARY			
SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	3
EX1	1.50	4	2
CP1	-	18	8
EX2	1.00	4	2

**Referenced from the Technical Drainage Study for Allure Condominiums

NORTH

GRAPHIC SCALE

50 0 25 50

(IN FEET)

1 inch = 50 ft.

LEGEND

- EX1 — DRAINAGE SUBBASIN
- CP1 — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION

% COMPLETE

DATE:

REV	DATE	DESCRIPTION	DATE	AGEN. APP	DATE	GCW APP

PROJECT NO. 398-A436

DESIGN:

DRAWN:

CHECK:

PLOT DATE: 03-07-14

PLOT TIME: 18:37:27

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LAS VEGAS

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Joanna Ayson

LUCKY DRAGON LP

LUCKY DRAGON CASINO

EXISTING CONDITIONS DRAINAGE MAP

DRAWING FIG-5

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VII. PROPOSED CONDITIONS

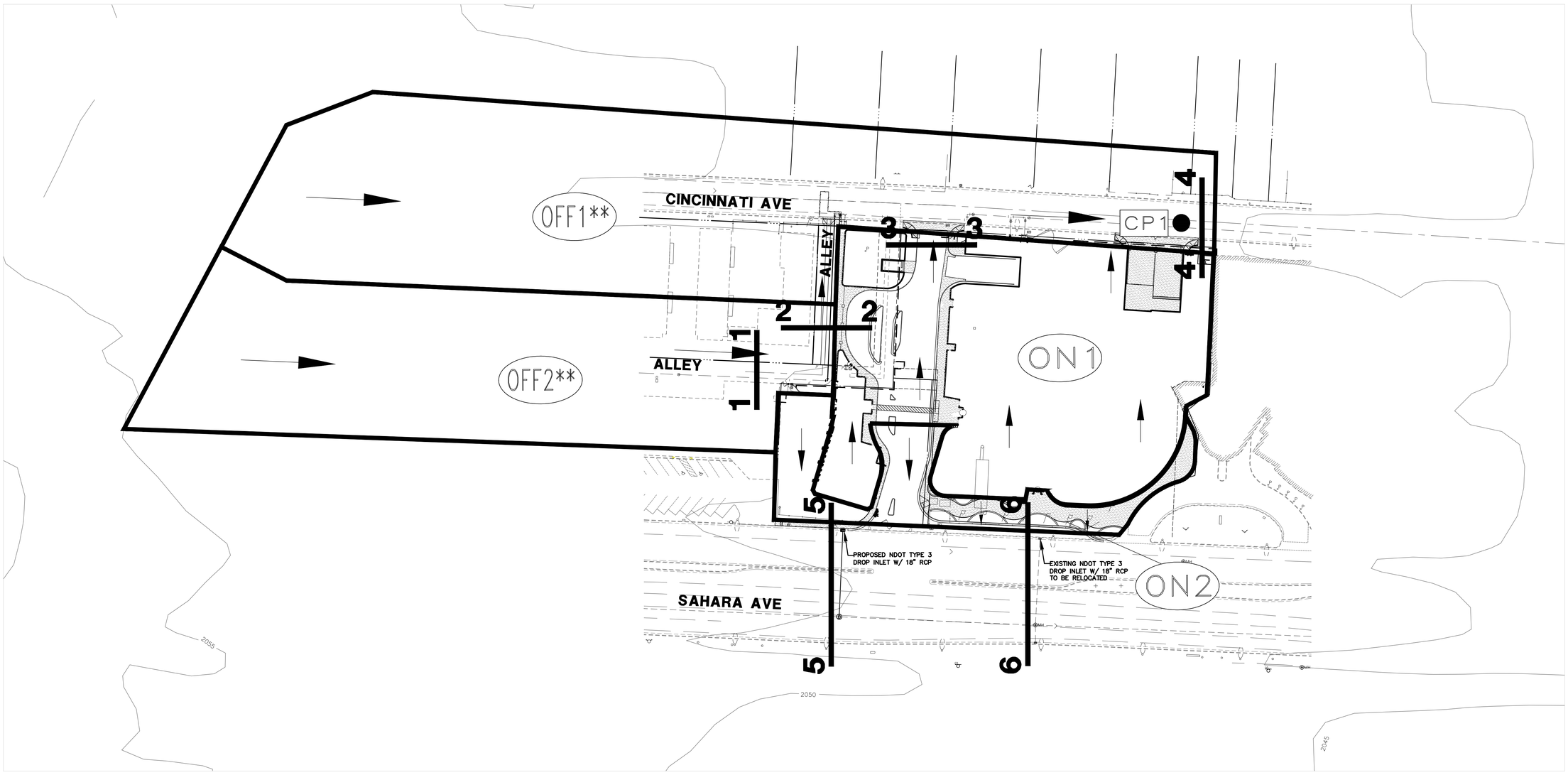
The proposed improvements consist of a hotel, casino, and parking garage. The interior street improvements include pavement, curb and gutter. Figure 6, Proposed Conditions Drainage Map, depicts the subbasins and drainage patterns used in the proposed conditions hydrologic analysis for this project and are generally consistent with the subbasins and drainage patterns of the approved Allure Study. Hydrologic calculations have been included in Appendix A. Table 2 summarizes the HEC-1 results for proposed conditions. Referenced hydrologic calculations and information have been included in Appendix C. Since the upstream watershed is fully developed, the ultimate conditions are the same as the proposed conditions.

TABLE 2
PROPOSED CONDITIONS HEC-1 MODEL SUMMARY

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	2
ON1	2.00	6	3
CP1	-	19	9
ON2	0.50	2	1

**Referenced from the Technical Drainage Study for Allure Condominiums

The north half of Sahara Avenue will be extended to include a proposed 12-foot right turn lane. Due to the roadway improvements, the existing NDOT Type 3 drop inlet at this location will be removed and the existing 18-inch reinforced concrete pipe (RCP) attached to the drop inlet will be plugged. The NDOT Type 3 drop inlet will be relocated upstream just west of the project driveway and connected to a proposed 18-inch RCP. The proposed 18-inch RCP will convey flow from the roadway to the existing 42-inch RCP storm drain. The proposed improvements are depicted in Figure 6.



NORTH

GRAPHIC SCALE

50 0 25 50

(IN FEET)

1 inch = 50 ft.

LEGEND

- EX1 — DRAINAGE SUBBASIN
- CP1 — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- 1 — 1 — CROSS SECTION

PROPOSED CONDITIONS HEC-1 MODEL SUMMARY

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	2
ON1	2.00	6	3
CP1	-	19	9
ON2	0.50	2	1

**Referenced from the Technical Drainage Study for Allure Condominiums

100-YEAR STREET FLOW CHARACTERISTICS PROPOSED CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 1-1	1.05	6	0.21	2.54	0.53
Section 2-2	1.05	6	0.21	2.54	0.53
Section 3-3	1.15	6	0.35	2.69	0.94
Section 4-4	0.50	19	0.54	2.32	1.25
Section 5-5	0.90	172	1.11	4.64	5.15
Section 6-6	0.40	172	1.06	3.41	3.61

25-YEAR STREET FLOW CHARACTERISTICS PROPOSED/EXISTING CONDITIONS

Location	Slope (%)	Q_{25} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 5-5 (Existing)	0.90	120.4	1.00	4.29	4.29
Section 6-6 (Existing)	0.79	120.4	0.93	4.04	3.76
Section 6-6 (Proposed)	0.40 (min)	120.4	0.94	3.10	2.91

% COMPLETE

DATE:

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 398-A436

DESIGN:
DRAWN:
CHECK:

PLOT DATE:03-07-14
PLOT TIME:18:34:27

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LAS VEGAS

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Joanna Ayson

LUCKY DRAGON LP

LUCKY DRAGON CASINO

PROPOSED CONDITIONS DRAINAGE MAP

DRAWING FIG-6

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In general, the drainage patterns for the proposed conditions subbasins are consistent with existing conditions. Subbasins OFF1 and OFF2 will generate total flowrates of 9 cfs and 6 cfs, respectively, during the 100-year storm event. The offsite flows will be conveyed north toward Cincinnati Avenue via a 20-foot alley with a 4-foot wide concrete gutter. The offsite runoff will then continue towards the east end of the street and combine with runoff from onsite Subbasin ON1 for a total of 19 cfs at Concentration Point 1. The onsite Subbasin ON2 will generate 2 cfs of flow and will be conveyed south towards Sahara Avenue. The flow will continue east along Sahara Avenue and combines with the 172 cfs of street flow referenced from the Allure Study. Pertinent reference material has been included in Appendix C.

VIII. STREET HYDRAULICS

The resulting street flow data based on the flows generated during the 100-year and 25-year storm events are presented in Tables 3 and 4, respectively. Figure 6 shows the locations of the cross sections corresponding to the calculations included in Tables 3 and 4. Hydraulic calculations have been included in Appendix B. The flowrates and normal depth sections for Cincinnati Avenue and Sahara Avenue have been referenced and/or revised from the Allure Study. Pertinent reference material has been included in Appendix C.

TABLE 3
100-YEAR STREET FLOW CHARACTERISTICS
PROPOSED CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 1-1	1.05	6	0.21	2.54	0.53
Section 2-2	1.05	6	0.21	2.54	0.53
Section 3-3	1.15	6	0.35	2.69	0.94
Section 4-4	0.50	19	0.54	2.32	1.25
Section 5-5	0.90	172	1.11	4.64	5.15
Section 6-6	0.40	172	1.06	3.41	3.61

TABLE 4
25-YEAR STREET FLOW CHARACTERISTICS
PROPOSED/EXISTING CONDITIONS

Location	Slope (%)	Q_{25} (cfs)*	Depth (ft)	Velocity (ft/s)	D*V
Section 5-5 (Existing)	0.90	120.4	1.00	4.29	4.29
Section 6-6 (Existing)	0.79	120.4	0.93	4.04	3.76
Section 6-6 (Proposed)	0.40 (min)	120.4	0.94	3.10	2.91

*25-year storm flow calculated from ratio in Pima County Hydrology Manual (Reference 5)

Cross Section 1-1 and 2-2 are located on 20-foot alleys west of the project site and convey a flow of 6 cfs. The alleys on these cross sections direct offsite flows toward Cincinnati Avenue.

Cross Section 3-3 is located near the entrance to the parking garage and conveys a flow of 6 cfs towards Cincinnati Avenue.

Cross Section 4-4 is located in Cincinnati Avenue, northwest of the project site, and conveys a flow of 19 cfs. Flows generated at Concentration Point 1 will be conveyed east within Cincinnati Avenue.

Cross Section 5-5 is on Sahara Avenue adjacent to the relocated NDOT Type 3 drop inlet. The cross section remains the same during existing and proposed conditions. The proposed NDOT Type 3 drop inlet at this location has the same capacity as the existing inlet that will be removed, and therefore no NDOT right-of-way, downstream facilities or properties will be impacted.

Cross Section 6-6 is located in the north half of Sahara Avenue, just east of the project driveway. In proposed conditions, a 12-foot right turn lane is added to the north half of Sahara Avenue with a longitudinal street slope of 0.40%. Due to the aforementioned improvements, the 25-year depth of flow at this location increases from 0.93 ft during existing conditions to 0.94 ft during proposed conditions. Although a majority of the street section at this location has a longitudinal street slope of 0.79% during proposed conditions, a slope of 0.40% is used in the hydraulic calculations which is conservative. Therefore, the proposed conditions will not adversely impact Sahara Avenue.

Review of the Allure Study shows Sahara Avenue with a total flow rate of 172 cfs. The proposed flowrate of 2 cfs discharging into the road by the onsite Subbasin ON2 is less than the 3 cfs discharging into the road in the referenced Allure Study, and therefore

does not pose any negative impacts on the downstream facilities or properties. Additionally, the 2 cfs of flow discharging into Sahara Avenue in proposed conditions is less than the 4 cfs discharging into the road in existing conditions. Pertinent reference materials have been included in Appendix C.

The street criteria within the project are met during both the 10- and 100-year storm events as illustrated by the largest 100-year peak flow within the project of 172 cfs on Sahara Avenue. The maximum velocity (V) times depth (D) in the project is 5.15 with a corresponding depth of 1.11 feet and velocity of 4.64 feet per second. At the minimum longitudinal street slope on Sahara Avenue of 0.40%, the associated D is 1.06 feet and the V is 3.41 feet per second, resulting in V times D of 3.61 during the 100-year event.

The Manual criteria for a major roadway requires a 12-foot wide dry lane in addition to a dry center turn lane in each direction for streets with a right of way (ROW) greater than 80 feet during a 10-year storm event. The 10-year flow in the Sahara Avenue ROW is zero, as all storm runoff in the ROW is maintained in existing drainage facilities. Therefore, the calculated 10-year depth for Sahara Avenue is 0 feet to provide for 19-foot dry lane which includes 7 feet of the center turn lane, and the 10-year maximum street flow depth of will be met.

A separate HEC-1 model for the 25-year storm event is included in Appendix A. The 25-year Sahara Avenue storm flow was determined using the Pima County Hydrology Manual (Reference 5). Based on the depths presented in Table 4, the NDOT criteria under existing conditions is not met as there is storm flow in the travel lane. Thus, the NDOT criteria under proposed conditions will not be met either. However, the proposed development will not worsen the roadway's existing conditions.

IX. FLOOD PROTECTION FACILITIES

Finished Floor Elevations

The proposed finish floor elevations of the mechanical room, hotel, and casino/parking garage are 2047.90, 2048.68, and 2047.88, respectively. All finished floor elevations are greater than two times the depth of flow above the flow line elevations in the adjacent streets and alleys.

Entrances to the project site provide more than 6-inches of freeboard above the adjacent water surface elevations. Therefore, offsite flows will not enter the proposed development.

X. CONCLUSIONS AND RECOMMENDATIONS

1. Methodology used in this report is in compliance with Clark County Regional Flood Control District (CCRFCD), City of Las Vegas, and Nevada Department of Transportation (NDOT) criteria.

2. The project is not currently located in a FEMA-designated Special Flood Hazard Area.

3. The site is adjacent to a proposed CCRFCD Facility; therefore, CCRFCD concurrence is required.

4. The finished floor elevations are adequate to protect the buildings from the calculated 100-year storm flows.

5. The proposed drainage patterns in this report are generally consistent with existing drainage patterns and approved adjacent drainage studies.

6. Runoff generated from, or conveyed by, the project will not adversely impact any downstream properties or facilities.

7. Proposed improvements will convey storm flows generated by offsite and onsite development away from the site.

XI. REFERENCES

1. JHR Associates, Ltd., *Allure Condominiums Hydrology Study*, March 2005.

2. CCRFCD, *CCRFCD 2013 Las Vegas Valley Master Plan Update*, 2013

3. *Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual,* updated August 1999.

4. U. S. Army Corps of Engineers, *HEC-1 Flood Hydrograph Package*, June 1998.

5. Pima County Department of Transportation & Flood Control District, *Hydrology Manual for Engineering Design and Flood Plain Management within Pima County, Arizona,* September 1979.

TECHNICAL DRAINAGE STUDY FOR
THE LUCKY DRAGON CASINO
APPENDIX LAYOUT

Appendix A. Hydrologic Calculations and Information

1. Table 513 from the CCRFCD Manual
2. Table 503 from the CCRFCD Manual
3. Table 505 from the CCRFCD Manual
4. Table 602 – 1 of 4 from the CCRFCD Manual
5. Soil Report
6. Ratio of 25- to 100-Year Peak Flow from Pima County Manual
7. Existing Conditions Standard Form 4
8. Existing Conditions HEC-1 Model
9. Existing Conditions 25-year storm HEC-1 Model
10. Proposed Conditions Standard Form 4
11. Proposed Conditions HEC-1 Model
12. Proposed Conditions 25-year storm HEC-1 Model

Appendix B. Hydraulic Calculations

1. Cross Section Normal Depth Calculations

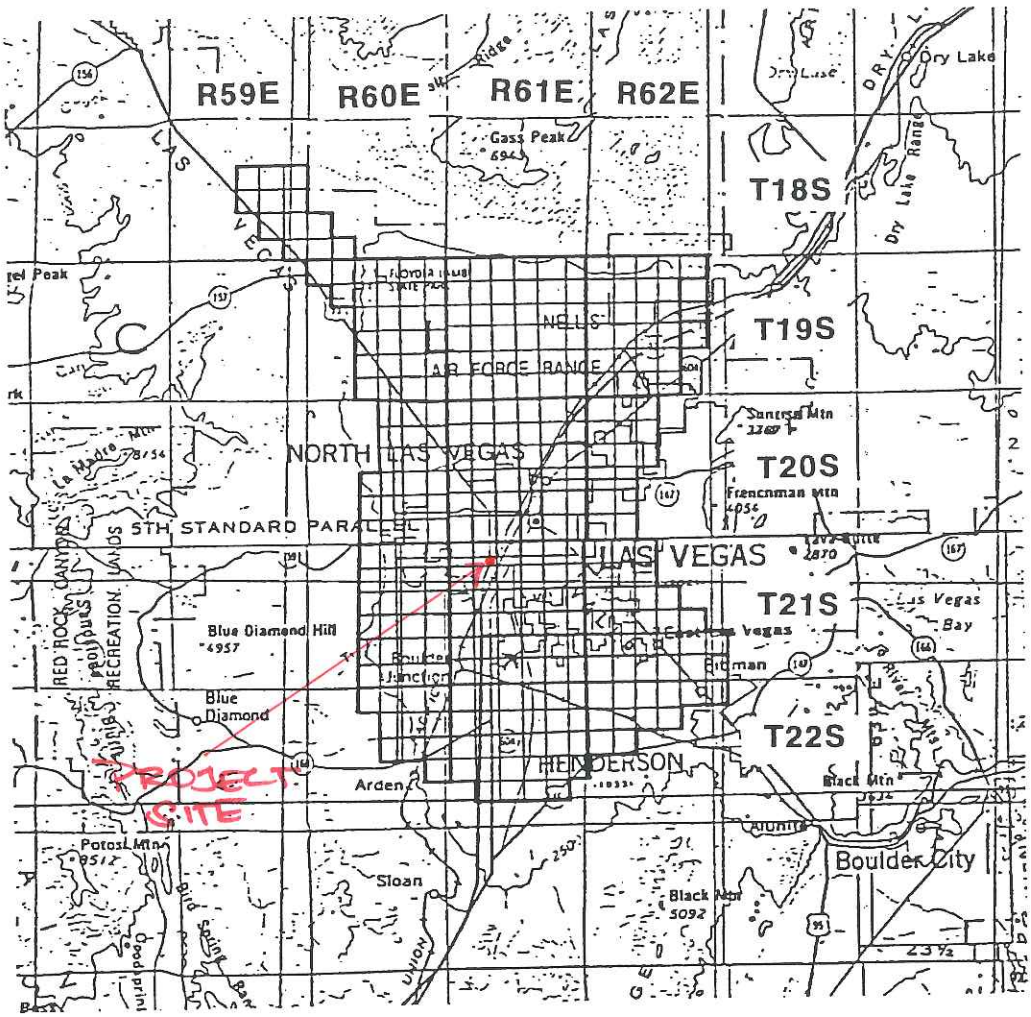
Appendix C. Referenced Materials

1. Technical Drainage Study for Allure Condominiums
    a) City of Las Vegas Approval Letter
    b) Clark County Concurrence Letter
    c) Approved Drainage Plan
    d) Existing Condition Offsite Drainage Basin Map
    e) Developed Condition Offsite Drainage Basin Map
    f) Standard Form 4
    g) HEC-1 Model

APPENDIX A

Hydrologic Calculations and Information

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP	RANGE	SECTIONS	TOWNSHIP	RANGE	SECTIONS
18 South	59 East	13-15,22-26,36	20 South	62 East	4-9,16-20,29-32
18 South	60 East	30-32	21 South	60 East	1-4,9-16,21-28,33-36
19 South	60 East	1-6,8-16,21-28,33-36	21 South	61 East	ALL SECTIONS
19 South	61 East	ALL SECTIONS	21 South	62 East	4-9,15-23, 25-36
19 South	62 East	2-11,14-23,27-34	22 South	60 East	1-4,10-15,24
20 South	60 East	1-3,10-15,21-28,33-36	22 South	61 East	1-24,26-29
20 South	61 East	ALL SECTIONS	22 South	62 East	1-10,17-18

Notes:
1. Refer to Table 505 and Figure 516 Depth-Duration- Frequency values in the McCarran Airport Rainfall Area.
2. Refer to Table 506 and Figure 517 for Time-Intensity-Frequency values on the McCarran Airport Rainfall Area.

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

SIX-HOUR STORM DISTRIBUTIONS

Storm Time (In Minutes)	Percent of Total Storm Depth SDN3	SDN4	SDN5
0	0.0	0.0	0.0
5	2.0	2.0	2.0
10	5.7	5.8	5.9
15	7.0	7.5	8.0
20	8.7	9.9	11.0
25	10.8	12.6	14.4
30	12.4	13.7	15.0
35	13.0	14.5	16.0
40	13.0	14.9	16.8
45	13.0	15.1	17.1
50	13.0	15.5	18.0
55	13.0	15.6	18.2
60	13.0	15.9	18.7
65	13.3	16.2	19.0
70	14.0	16.9	19.7
75	14.2	17.2	20.2
80	14.8	17.9	21.0
85	15.8	18.9	22.0
90	17.2	20.1	23.0
95	18.1	21.1	24.1
100	19.0	22.0	25.0
105	19.7	22.8	25.9
110	19.9	23.2	26.5
115	20.0	24.0	28.0
120	20.1	24.6	29.0
125	20.4	25.2	30.0
130	21.4	26.0	30.5
135	22.9	26.9	30.9
140	24.1	27.6	31.0
145	24.9	28.3	31.7
150	25.1	28.6	32.1
155	25.6	29.2	32.7
160	27.0	30.2	33.3
165	27.8	31.2	34.6
170	28.1	32.1	36.1
175	28.3	33.2	38.1
180	29.5	35.2	40.8
185	32.2	37.6	43.0
190	35.2	41.5	47.7
195	40.9	46.2	51.4
200	49.9	53.0	56.1
205	59.0	61.0	63.0
210	71.0	71.0	71.0
215	74.4	73.2	72.0
220	78.1	75.6	73.1
225	81.2	78.2	75.2
230	81.9	79.9	77.9
235	83.5	81.3	79.0
240	85.1	82.3	79.5
245	85.6	83.0	80.4
250	86.0	83.5	81.0
255	86.8	84.4	82.0
260	87.6	85.1	82.6
265	88.8	86.4	84.0
270	91.0	88.5	85.9
275	92.6	90.8	88.9
280	93.7	92.4	91.0
285	95.0	94.4	93.8
290	97.0	96.8	96.6
295	97.6	97.3	97.0
300	98.2	97.8	97.4
305	98.5	98.2	97.9
310	98.7	98.4	98.1
315	98.9	98.6	98.3
320	99.0	98.8	98.5
325	99.3	99.1	98.9
330	99.3	99.2	99.0
335	99.4	99.3	99.2
340	99.5	99.4	99.3
345	99.8	99.7	99.6
350	99.8	99.8	99.7
355	99.9	99.9	99.9
360	100.0	100.0	100.0

Notes:
1. For drainage areas less than 8 square miles in size, use SDN 3.
2. For drainage areas greater than or equal to 8 square miles and less than 12 square miles in size, use SDN 4.
3. For drainage areas greater than or equal to 12 square miles, use SDN 5.
4. A graphical representation of these values is presented on **Figure 515.**

Revision	Date

REFERENCE:

TABLE 503

DEPTH-DURATION-FREQUENCY VALUES FOR McCARRAN AIRPORT RAINFALL AREA

(IN INCHES)

	RECURRENCE INTERVAL					
TIME	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5 min.	0.15	0.27	0.35	0.46	0.54	0.63
10 min.	0.25	0.44	0.57	0.74	0.89	1.02
15 min.	0.33	0.57	0.74	0.97	1.15	1.32
30 min.	0.44	0.78	1.01	1.31	1.55	1.79
1 hour	0.52	0.89	1.15	1.50	1.78	2.06
2 hour	0.59	1.01	1.30	1.70	2.01	2.30
3 hour	0.64	1.08	1.39	1.82	2.15	2.48
6 hour	0.72	1.22	1.58	2.05	2.41	2.77
24 hour (TR-55)	1.20	1.60	1.80	2.40	2.70	2.96

NOTE: 1. Refer to Figure 513 for a description and drawing of the area included in the McCarran Airport Rainfall Area.

2. The 24 hour values presented above are for use with TR-55 only.

3. Table 501 adjustments not required.

Revision	Date

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					

See Table 602A

Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system. Impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 603.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using Figure 603 based on the impervious area percentage (CN #98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using Figure 603 based on the degree of development impervious area percentage) and the CN's for the newly graded pervious areas.

Revision	Date

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

Average Lot Size or Usage[1]	Percent Impervious[2]	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Apartments/Condos	72	81	88	91	93
Townhouses/6,000 sq ft lots or less[3]	69	80	87	90	92
7,000 sq ft lots	63	76	84	89	91
8,000 sq ft lots	58	73	82	88	90
10,000 sq ft lots	38	61	75	83	87
14,000 sq ft lots	30	57	72	81	86
20,000 sq ft lots	25	54	70	80	85
40,000 sq ft lots	20	51	68	79	84
80,000 sq ft lots	12	46	65	77	82

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.

2 Actual percent impervious value should be compared to selected land use type.

3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

Revision	Date

REFERENCE:

TABLE 602A

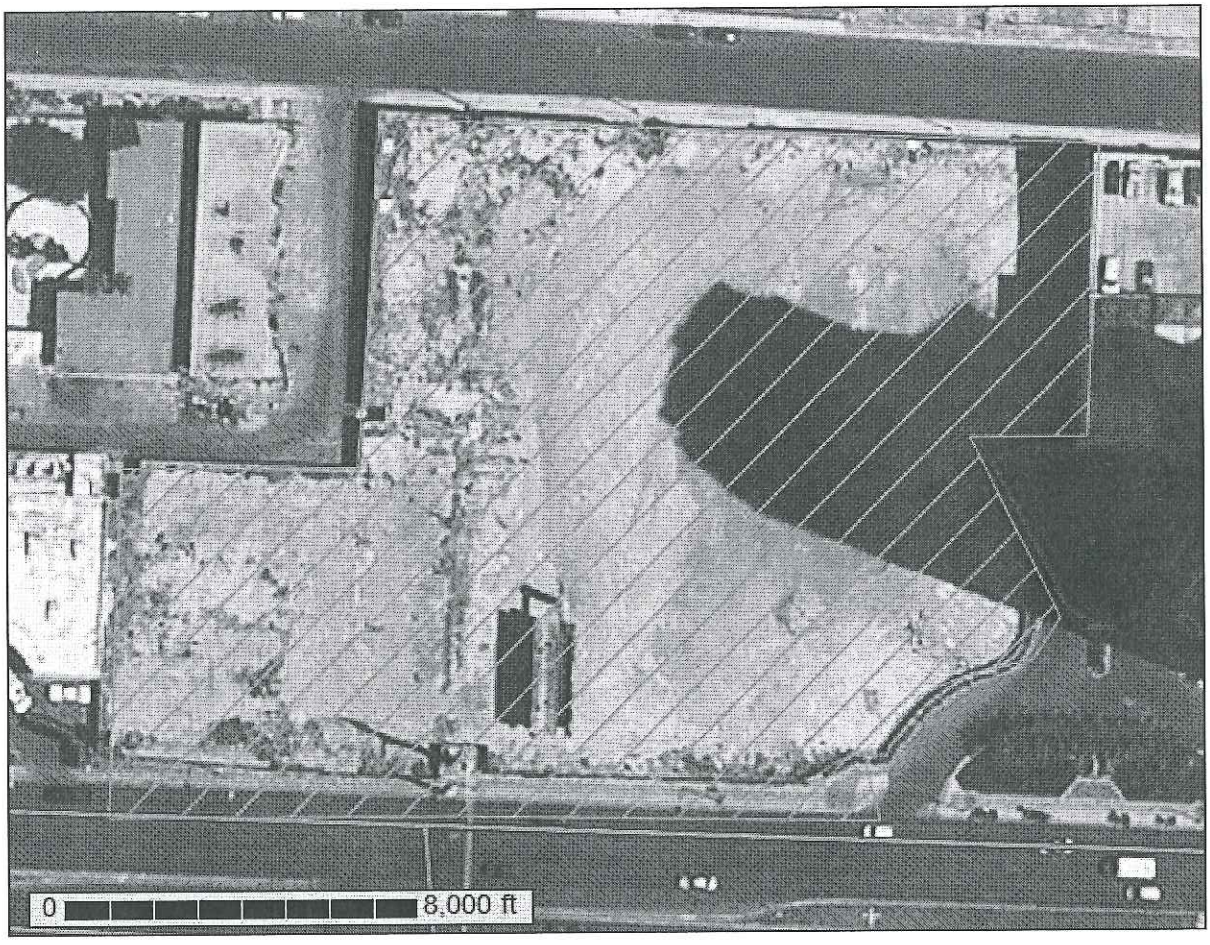
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

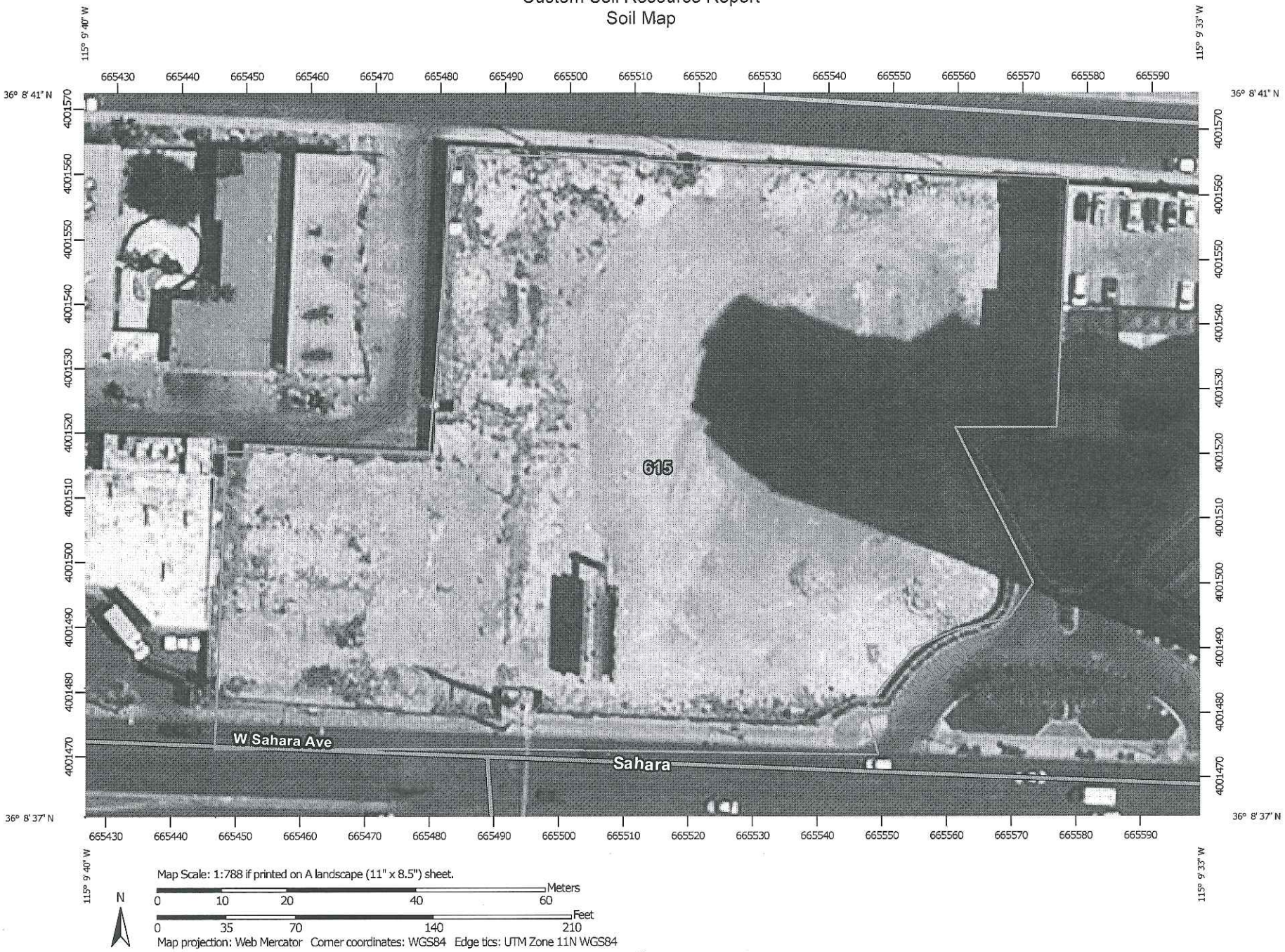
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Las Vegas Valley Area, Nevada, Part of Clark County



February 7, 2014

Custom Soil Resource Report
Soil Map



Map Scale: 1:788 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 9, Dec 14, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2011—Oct 17, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Las Vegas Valley Area, Nevada, Part of Clark County (NV788)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
615	Urban land	2.3	100.0%
Totals for Area of Interest		**2.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Las Vegas Valley Area, Nevada, Part of Clark County

615—Urban land

Map Unit Composition

Urban land: 100 percent

Description of Urban Land

Setting

Landform: Valleys
Down-slope shape: Convex
Across-slope shape: Convex

Properties and qualities

Frequency of flooding: Rare

APPROXIMATE RATIOS OF LESSER MAGNITUDE FLOODS TO THE 100-YEAR FLOOD

In an attempt to both simplify and reduce the computational procedures and time involved in estimating peak discharge values for floods of lesser magnitude than the 100-year flood, the following procedure may be employed if the user so desires:

First, the predicted value for the peak discharge of the 100-year flood which would occur upon the watershed under investigation should be determined using the procedures as outlined within this Manual.

Next, peak discharge values for floods of lesser magnitude than the 100-year flood may be calculated approximately by multiplying the previously determined 100-year flood value for the watershed under investigation by the factors shown within the table below:

WATERSHED DEVELOPMENT	RECURRENCE INTERVAL			
	2-Yr.	10-Yr.	25-Yr.	50-Yr.
Rural	0.10	0.35	0.55	0.75
Suburban	0.15	0.40	0.60	0.80
Moderately Urban	0.20	0.45	0.65	0.85
Highly Urban	0.25	0.50	0.70	0.85

Q_{100} ON SAHARA = 172 cfs

→ $Q_{25} = 172 \times 0.70 = 120.4$ cfs

Where

Rural = Watersheds which will remain in a natural condition (undeveloped), or where the anticipated future development will be negligible.

Suburban = Watersheds which contain two (2) houses per acre, or less, with drainage improvements being relatively few or nonexistent.

Moderately Urban = Watersheds which contain from two (2) to five (5) houses per acre (detached), with moderate to extensive drainage improvements present.

Highly Urban = Watersheds which contain more than five (5) houses per acre (including multiple dwellings, commercial and industrial development), with extensive drainage improvements present.

It is to be noted that the above factors are only applicable under typically "average" watershed conditions upon generally homogeneous drainage basins. For atypical or nonhomogeneous watersheds, all flood peaks, whatever their recurrence intervals, should be determined in a complete and detailed manner as outlined within this Manual; otherwise, serious errors might easily arise as a consequence of choosing expediency over good engineering judgement.

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

G. C. WALLACE COMPANIES
Engineers/Planners/Surveyors

The Lucky Dragon Casino
Existing Conditions

Project No: 398-A436
Date: 2-Feb-14
Calculated by: JYA

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Sq Mi	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY fps	V2 VELOCITY fps	Tt Min	TOTAL LENGTH Feet	Tc = (L/180)+10 Min	Min	Tlag = 0.6Tc/60 Hours	Remarks:
(1)		(16)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(11)	(12)	(13)	(14)	(15)	
Onsite Basins																		
EX1	D	94	0.8508	1.5	0.002	100	1.00	4.5	400	1.00	2.0	3.1	3.3	500	12.8	7.8	0.078	
EX2	D	94	0.8508	1.0	0.002	175	0.80	6.4	156	1.00	2.0	3.1	1.3	331	11.8	7.7	0.077	
Offsite Basins Referenced From Approved Study																		
OFF1**	D	91	0.8112	3.8	0.006	100	0.50	6.5	1000	0.70	1.7	2.6	8.2	1100	16.1	14.7	0.147	
OFF2**	D	91	0.8112	2.5	0.004	130	0.50	7.5	670	0.70	1.7	2.6	6.0	800	14.4	13.5	0.135	

$Tc = Ti + Tt$ $Tlag = 0.6\ Tc$

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

$K = 0.0132\ (CN) - 0.39$

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$ $V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

REFERENCE:

STANDARD FORM 4

```
1****************************************
*                                      *
*    FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*              JUN  1998               *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   05MAR14  TIME  14:55:38   *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

                       *DIAGRAM
*** FREE ***
             1         ID   ****************************************************************
             2         ID   * ............................................................ *
             3         ID   * :                                                          : *
             4         ID   * :                                                          : *
             5         ID   * :              THE LUCKY DRAGON CASINO                     : *
             6         ID   * :              EXISTING CONDITIONS                         : *
             7         ID   * :..........................................................: *
             8         ID   * :              RETURN PERIOD_ _ _ _100 & 10 -YEAR          : *
             9         ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3             : *
            10         ID   * :              PROJECT NO_ _ _ _ _ 398-A436                : *
            11         ID   * :              FILENAME_ _ _ _ _ _ EX1.H1                  : *
            12         ID   * :              DATE MODELED_ _ _ _ 02/24/2014              : *
            13         ID   * :              MODELED BY_ _ _ _ _ JYA                     : *
            14         ID   * :..........................................................: *
            15         ID   * :                                                          : *
            16         ID   * :..........................................................: *
            17         ID   ****************************************************************
            18         ID
            19         ID
            20         IT       5       0       0     300
            21         IO       5       0       0
            22         IN       5       0       0
            23         JR    PREC       1    0.57
                       *

            24         KK    OFF1
            25         KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
            26         BA  0.0059
            27         PB    2.77
            28         PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
            29         PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
            30         PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
            31         PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
            32         PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
            33         PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
            34         PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
            35         PC   .9980   .9990  1.000
            36         LS       0      91
            37         UD    .147
                       *

            38         KK    OFF2
            39         KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
            40         BA  0.0039
            41         LS       0      91
            42         UD    .135
                       *
```



```
         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

            43         KK     EX1
            44         KM  BASIN EX1
            45         BA   0.002
            46         LS       0      94
            47         UD    .078
                       *

            48         KK     CP1
            49         KM  COMBINES OFF1, OFF2, & EX1
            50         HC       3
                       *

            51         KK     EX2
            52         KM  BASIN EX2
```

```
            53           BA   0.002
            54           LS       0      94
            55           UD    .077
                         *
            56           ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
                .
                .
    38          .        OFF2
                .          .
                .          .
    43          .          .         EX1
                .          .          .
                .          .          .
    48         CP1.........................
                .
                .
    51          .         EX2

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*                JUN   1998            *
*             VERSION 4.1              *
*                                      *
*  RUN DATE   05MAR14  TIME  14:55:38  *
*                                      *
****************************************

****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*        DAVIS, CALIFORNIA 95616       *
*           (916) 756-1104             *
*                                      *
****************************************

**********************************************************************
* ................................................................ *
* :                                                              : *
* :                                                              : *
* :              THE LUCKY DRAGON CASINO                         : *
* :              EXISTING CONDITIONS                             : *
* :..............................................................: *
* :              RETURN PERIOD_ _ _ _100 & 10 -YEAR              : *
* :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3                 : *
* :              PROJECT NO_ _ _ _ _ 398-A436                    : *
* :              FILENAME_ _ _ _ _ _ EX1.H1                      : *
* :              DATE MODELED_ _ _ _ 02/24/2014                  : *
* :              MODELED BY_ _ _ _ _ JYA                         : *
* :..............................................................: *
* :                                                              : *
* :..............................................................: *
**********************************************************************

   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1   0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2   0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL      .08 HOURS
                        TOTAL TIME BASE   24.92 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA         SQUARE MILES
                 PRECIPITATION DEPTH   INCHES
                 LENGTH, ELEVATION     FEET
                 FLOW                  CUBIC FEET PER SECOND
                 STORAGE VOLUME        ACRE-FEET
                 SURFACE AREA          ACRES
                 TEMPERATURE           DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                     1.00       .57
1
                PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                              FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                          TIME TO PEAK IN HOURS


                                                                RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN           RATIO 1  RATIO 2
                                                        1.00       .57

 HYDROGRAPH AT
+                  OFF1        .01      1   FLOW           9.        4.
```

						EX.OUT
				TIME	3.58	3.58
HYDROGRAPH AT						
+	OFF2	.00	1	FLOW	6.	3.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	EX1	.00	1	FLOW	4.	2.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1	.01	1	FLOW	18.	8.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	EX2	.00	1	FLOW	4.	2.
				TIME	3.50	3.50

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   05MAR14  TIME  14:37:17   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
                    *DIAGRAM
*** FREE ***
             1      ID   ********************************************************************
             2      ID   * .............................................................. *
             3      ID   * :                                                            : *
             4      ID   * :                                                            : *
             5      ID   * :              THE LUCKY DRAGON CASINO                       : *
             6      ID   * :              25-YEAR NDOT CRITERIA (EXISTING CONDITIONS)   : *
             7      ID   * :............................................................: *
             8      ID   * :              RETURN PERIOD_ _ _ _25-YEAR                   : *
             9      ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3               : *
            10      ID   * :              PROJECT NO_ _ _ _ _ 398-A436                  : *
            11      ID   * :              FILENAME_ _ _ _ _ _ 25YEAREX.H1               : *
            12      ID   * :              DATE MODELED_ _ _ _ 03/05/2014                : *
            13      ID   * :              MODELED BY_ _ _ _ _ JYA/JEP                   : *
            14      ID   * :............................................................: *
            15      ID   * :                                                            : *
            16      ID   * :............................................................: *
            17      ID   ********************************************************************
            18      ID
            19      ID
            20      IT       5       0       0     300
            21      IO       5       0       0
            22      IN       5       0       0
            23      JR    PREC   .7401
                    *
            24      KK    OFF1
            25      KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
            26      BA  0.0059
            27      PB    2.77
            28      PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
            29      PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
            30      PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
            31      PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
            32      PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
            33      PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
            34      PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
            35      PC   .9980   .9990  1.000
            36      LS       0      91
            37      UD    .145
                    *
            38      KK    OFF2
            39      KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
            40      BA  0.0039
            41      LS       0      91
            42      UD    .179
                    *
```



```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
            43      KK     EX1
            44      KM  BASIN EX1
            45      BA   0.002
            46      LS       0      94
            47      UD    .100
                    *
            48      KK     CP1
            49      KM  COMBINES OFF1, OFF2, & ON1
            50      HC       3
                    *
            51      KK     EX2
            52      KM  BASIN EX2
```

```
            53           BA   0.002
            54           LS      0      94
            55           UD    .100
                         *
            56           ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
                .
                .
    38          .        OFF2
                .          .
                .          .
    43          .          .         EX1
                .          .          .
                .          .          .
    48         CP1.........................
                .
                .
    51          .         EX2

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*               JUN   1998             *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   05MAR14  TIME  14:37:17  *
*                                      *
****************************************

****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*        DAVIS, CALIFORNIA 95616       *
*           (916) 756-1104             *
*                                      *
****************************************

*****************************************************************
* .........................................................     *
* :                                                       :     *
* :                                                       :     *
* :              THE LUCKY DRAGON CASINO                  :     *
* :              25-YEAR NDOT CRITERIA (EXISTING CONDITIONS) :  *
* :.......................................................:     *
* :              RETURN PERIOD_ _ _ _25-YEAR              :     *
* :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3          :     *
* :              PROJECT NO_ _ _ _ _ 398-A436             :     *
* :              FILENAME_ _ _ _ _ _ 25YEAREX.H1          :     *
* :              DATE MODELED_ _ _ _ 03/05/2014           :     *
* :              MODELED BY_ _ _ _ _ JYA/JEP              :     *
* :.......................................................:     *
* :                                                       :     *
* .........................................................     *
*****************************************************************

  21 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT           HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME         0000  STARTING TIME
                         NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2    0  ENDING DATE
                     NDTIME         0055  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL      .08 HOURS
                      TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA         SQUARE MILES
               PRECIPITATION DEPTH   INCHES
               LENGTH, ELEVATION     FEET
               FLOW                  CUBIC FEET PER SECOND
               STORAGE VOLUME        ACRE-FEET
               SURFACE AREA          ACRES
               TEMPERATURE           DEGREES FAHRENHEIT

     JP           MULTI-PLAN OPTION
                      NPLAN           1  NUMBER OF PLANS

     JR           MULTI-RATIO OPTION
                  RATIOS OF PRECIPITATION
                  .74
1
            PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                              FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                          TIME TO PEAK IN HOURS


                                                          RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN           RATIO 1
                                                       .74

 HYDROGRAPH AT
+                 OFF1       .01     1   FLOW          6.
```

				TIME	3.58
HYDROGRAPH AT					
+	OFF2	.00	1	FLOW	4.
				TIME	3.58
HYDROGRAPH AT					
+	EX1	.00	1	FLOW	3.
				TIME	3.50
3 COMBINED AT					
+	CP1	.01	1	FLOW	12.
				TIME	3.58
HYDROGRAPH AT					
+	EX2	.00	1	FLOW	3.
				TIME	3.50

*** NORMAL END OF HEC-1 ***

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

G. C. WALLACE COMPANIES
Engineers/Planners/Surveyors

The Lucky Dragon Casino
Proposed Conditions

Project No: 398-A436
Date: 2-Feb-14
Calculated by: JYA

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Sq Mi	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY fps	V2 VELOCITY fps	Tt Min	TOTAL LENGTH Feet	Tc = (L/180)+10 Min	Min	Tlag = 0.6Tc/60 Hours	Remarks:
(1)		(16)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(11)	(12)	(13)	(14)	(15)	
Onsite Basins																		
ON1	D	94	0.8508	2.0	0.003	110	1.00	4.7	460	0.83	1.8	2.8	4.2	570	13.2	8.9	0.089	
ON2	D	94	0.8508	0.5	0.001	30	1.15	2.3	400	0.50	1.4	2.2	4.7	430	12.4	7.0	0.070	
Offsite Basins Referenced From Approved Study																		
OFF1**	D	91	0.8112	3.8	0.006	100	0.50	6.5	1000	0.70	1.7	2.6	8.2	1100	16.1	14.7	0.147	
OFF2**	D	91	0.8112	2.5	0.004	130	0.50	7.5	670	0.70	1.7	2.6	6.0	800	14.4	13.5	0.135	

$Tc = Ti + Tt$ $Tlag = 0.6\ Tc$

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

$K = 0.0132\ (CN) - 0.39$

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$ $V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

REFERENCE:

STANDARD FORM 4

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   25FEB14  TIME  15:40:50   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
                    *DIAGRAM
*** FREE ***
               1    ID   ********************************************************************
               2    ID   * ..................................................................... *
               3    ID   * :                                                                   : *
               4    ID   * :                                                                   : *
               5    ID   * :              THE LUCKY DRAGON CASINO                              : *
               6    ID   * :              PROPOSED CONDITIONS                                  : *
               7    ID   * :...................................................................: *
               8    ID   * :              RETURN PERIOD_ _ _ _100 & 10 -YEAR                   : *
               9    ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3                      : *
              10    ID   * :              PROJECT NO_ _ _ _ _ 398-A436                         : *
              11    ID   * :              FILENAME_ _ _ _ _ _ PRO.H1                           : *
              12    ID   * :              DATE MODELED_ _ _ _ 02/24/2014                       : *
              13    ID   * :              MODELED BY_ _ _ _ _ JYA/JEP                          : *
              14    ID   * :...................................................................: *
              15    ID   * :                                                                   : *
              16    ID   * :...................................................................: *
              17    ID   ********************************************************************
              18    ID
              19    ID
              20    IT       5       0       0     300
              21    IO       5       0       0
              22    IN       5       0       0
              23    JR    PREC       1    0.57
                    *
              24    KK    OFF1
              25    KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              26    BA  0.0059
              27    PB    2.77
              28    PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
              29    PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
              30    PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
              31    PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
              32    PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
              33    PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
              34    PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
              35    PC   .9980   .9990  1.000
              36    LS       0      91
              37    UD    .145
                    *
              38    KK    OFF2
              39    KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              40    BA  0.0039
              41    LS       0      91
              42    UD    .179
                    *
```

1 HEC-1 INPUT PAGE 2

```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
              43    KK     ON1
              44    KM  BASIN ON1
              45    BA   0.003
              46    LS       0      94
              47    UD    .089
                    *
              48    KK     CP1
              49    KM  COMBINES OFF1, OFF2, & ON1
              50    HC       3
                    *
              51    KK     ON2
              52    KM  BASIN ON2
```

```
            53          BA   0.001
            54          LS      0      94
            55          UD    .070
                        *
            56          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
                .
                .
    38          .         OFF2
                .           .
                .           .
    43          .           .          ON1
                .           .            .
                .           .            .
    48         CP1.........................
                .
                .
    51          .          ON2

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *               JUN  1998               *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   25FEB14  TIME  15:40:50   *
 *                                       *
 *****************************************

 ***************************************
 *                                     *
 *    U.S. ARMY CORPS OF ENGINEERS     *
 *    HYDROLOGIC ENGINEERING CENTER    *
 *          609 SECOND STREET          *
 *        DAVIS, CALIFORNIA 95616      *
 *             (916) 756-1104          *
 *                                     *
 ***************************************

 ********************************************************************
 * .............................................................. *
 * :                                                            : *
 * :                                                            : *
 * :              THE LUCKY DRAGON CASINO                       : *
 * :              PROPOSED CONDITIONS                           : *
 * :............................................................: *
 * :              RETURN PERIOD_ _ _ _100 & 10 -YEAR            : *
 * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3               : *
 * :              PROJECT NO_ _ _ _ _ 398-A436                  : *
 * :              FILENAME_ _ _ _ _ _ PRO.H1                    : *
 * :              DATE MODELED_ _ _ _ 02/24/2014                : *
 * :              MODELED BY_ _ _ _ _ JYA/JEP                   : *
 * :............................................................: *
 * :                                                            : *
 * .............................................................. *
 ********************************************************************

   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL      .08 HOURS
                        TOTAL TIME BASE    24.92 HOURS

           ENGLISH UNITS
                DRAINAGE AREA         SQUARE MILES
                PRECIPITATION DEPTH   INCHES
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                     1.00       .57
1
                PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                            FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                        TIME TO PEAK IN HOURS


                                                                RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN            RATIO 1  RATIO 2
                                                         1.00      .57

 HYDROGRAPH AT
+                  OFF1        .01     1   FLOW           9.        4.
```

						PRO.OUT
				TIME	3.58	3.58
HYDROGRAPH AT						
+	OFF2	.00	1	FLOW	6.	2.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON1	.00	1	FLOW	6.	3.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1	.01	1	FLOW	19.	9.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON2	.00	1	FLOW	2.	1.
				TIME	3.50	3.50

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   05MAR14  TIME  14:34:37   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
                        *DIAGRAM
*** FREE ***
             1          ID   ************************************************************
             2          ID   * ........................................................ *
             3          ID   * :                                                      : *
             4          ID   * :                                                      : *
             5          ID   * :              THE LUCKY DRAGON CASINO                 : *
             6          ID   * :              25-YEAR NDOT CRITERIA (PROPOSED CONDITIONS) : *
             7          ID   * :......................................................: *
             8          ID   * :              RETURN PERIOD_ _ _ _25-YEAR             : *
             9          ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3         : *
            10          ID   * :              PROJECT NO_ _ _ _ _ 398-A436            : *
            11          ID   * :              FILENAME_ _ _ _ _ _ 25YEAR              : *
            12          ID   * :              DATE MODELED_ _ _ _ 03/05/2014          : *
            13          ID   * :              MODELED BY_ _ _ _ _ JYA/JEP             : *
            14          ID   * :......................................................: *
            15          ID   * :                                                      : *
            16          ID   * :......................................................: *
            17          ID   ************************************************************
            18          ID
            19          ID
            20          IT       5       0       0     300
            21          IO       5       0       0
            22          IN       5       0       0
            23          JR    PREC   .7401
                        *
            24          KK    OFF1
            25          KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
            26          BA  0.0059
            27          PB    2.77
            28          PC  0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
            29          PC  .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
            30          PC  .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
            31          PC  .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
            32          PC  .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
            33          PC  .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
            34          PC  .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
            35          PC  .9980   .9990  1.000
            36          LS      0      91
            37          UD   .145
                        *
            38          KK    OFF2
            39          KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
            40          BA  0.0039
            41          LS      0      91
            42          UD   .179
                        *
```

1 HEC-1 INPUT PAGE 2

```
          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
            43          KK     ON1
            44          KM  BASIN ON1
            45          BA   0.003
            46          LS      0      94
            47          UD    .089
                        *
            48          KK     CP1
            49          KM  COMBINES OFF1, OFF2, & ON1
            50          HC      3
                        *
            51          KK     ON2
            52          KM  BASIN ON2
```

```
           53           BA   0.001
           54           LS      0      94
           55           UD    .070
                        *
           56           ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
                .
                .
    38          .        OFF2
                .          .
                .          .
    43          .          .         ON1
                .          .          .
                .          .          .
    48         CP1.........................
                .
                .
    51          .         ON2

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   05MAR14  TIME  14:34:37   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
*********************************************************************
* ................................................................. *
* :                                                               : *
* :                                                               : *
* :              THE LUCKY DRAGON CASINO                          : *
* :              25-YEAR NDOT CRITERIA (PROPOSED CONDITIONS)      : *
* :...............................................................: *
* :              RETURN PERIOD_ _ _ _25-YEAR                      : *
* :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3                  : *
* :              PROJECT NO_ _ _ _ _ 398-A436                     : *
* :              FILENAME_ _ _ _ _ _ 25YEAR                       : *
* :              DATE MODELED_ _ _ _ 03/05/2014                   : *
* :              MODELED BY_ _ _ _ _ JYA/JEP                      : *
* :...............................................................: *
* :                                                               : *
* :...............................................................: *
*********************************************************************
```

```
   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2   0  ENDING DATE
                     NDTIME       0055  ENDING TIME
                     ICENT          19  CENTURY MARK

                   COMPUTATION INTERVAL     .08 HOURS
                        TOTAL TIME BASE   24.92 HOURS

           ENGLISH UNITS
                DRAINAGE AREA         SQUARE MILES
                PRECIPITATION DEPTH   INCHES
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                      .74
1
                PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                              FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                                TIME TO PEAK IN HOURS


                                                                RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN                RATIO 1
                                                             .74

 HYDROGRAPH AT
+                  OFF1        .01      1   FLOW             6.
```

```
                                        TIME          3.58

 HYDROGRAPH AT
+                    OFF2       .00     1  FLOW          4.
                                           TIME          3.58

 HYDROGRAPH AT
+                     ON1       .00     1  FLOW          4.
                                           TIME          3.50

   3 COMBINED AT
+                     CP1       .01     1  FLOW         13.
                                           TIME          3.58

 HYDROGRAPH AT
+                     ON2       .00     1  FLOW          1.
                                           TIME          3.50


 *** NORMAL END OF HEC-1 ***
```

APPENDIX B

Hydraulic Calculations

Worksheet for Section 1-1 Alley (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01050	ft/ft
Discharge	6.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.670
0+00.0	0.170
0+08.0	0.040
0+10.0	0.000
0+12.0	0.040
0+20.0	0.170
0+20.0	0.670

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.670)	(0+08.0, 0.040)	0.017
(0+08.0, 0.040)	(0+12.0, 0.040)	0.013
(0+12.0, 0.040)	(0+20.0, 0.670)	0.017

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.21	ft
Elevation Range	0.00 to 0.67 ft	
Flow Area	2.36	ft²
Wetted Perimeter	20.08	ft

Worksheet for Section 1-1 Alley (100-Yr. Storm Event)

Results

Hydraulic Radius		0.12	ft
Top Width		20.00	ft
Normal Depth		0.21	ft
Critical Depth		0.23	ft
Critical Slope		0.00590	ft/ft
Velocity		2.54	ft/s
Velocity Head		0.10	ft
Specific Energy		0.31	ft
Froude Number		1.30	
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	0.21	ft
Critical Depth	0.23	ft
Channel Slope	0.01050	ft/ft
Critical Slope	0.00590	ft/ft

Messages

Notes

P-1

Cross Section for Section 1-1 Alley (100-Yr. Storm Event)

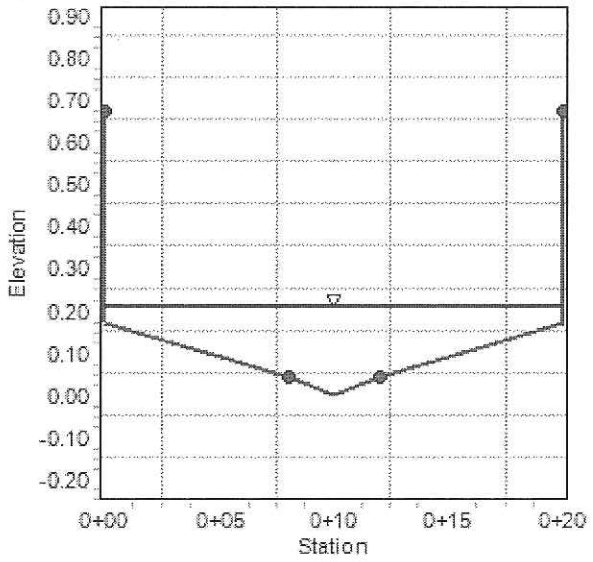
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01050	ft/ft
Normal Depth	0.21	ft
Discharge	6.00	ft³/s

Cross Section Image



Worksheet for Section 2-2 Alley (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01050	ft/ft
Discharge	6.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.670
0+00.0	0.170
0+08.0	0.040
0+10.0	0.000
0+12.0	0.040
0+20.0	0.170
0+20.0	0.670

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.670)	(0+08.0, 0.040)	0.017
(0+08.0, 0.040)	(0+12.0, 0.040)	0.013
(0+12.0, 0.040)	(0+20.0, 0.670)	0.017

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.21	ft
Elevation Range	0.00 to 0.67 ft	
Flow Area	2.36	ft²
Wetted Perimeter	20.08	ft

Worksheet for Section 2-2 Alley (100-Yr. Storm Event)

Results

Hydraulic Radius		0.12	ft
Top Width		20.00	ft
Normal Depth		0.21	ft
Critical Depth		0.23	ft
Critical Slope		0.00590	ft/ft
Velocity		2.54	ft/s
Velocity Head		0.10	ft
Specific Energy		0.31	ft
Froude Number		1.30	
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	0.21	ft
Critical Depth	0.23	ft
Channel Slope	0.01050	ft/ft
Critical Slope	0.00590	ft/ft

Messages

Notes

P-1

Cross Section for Section 2-2 Alley (100-Yr. Storm Event)

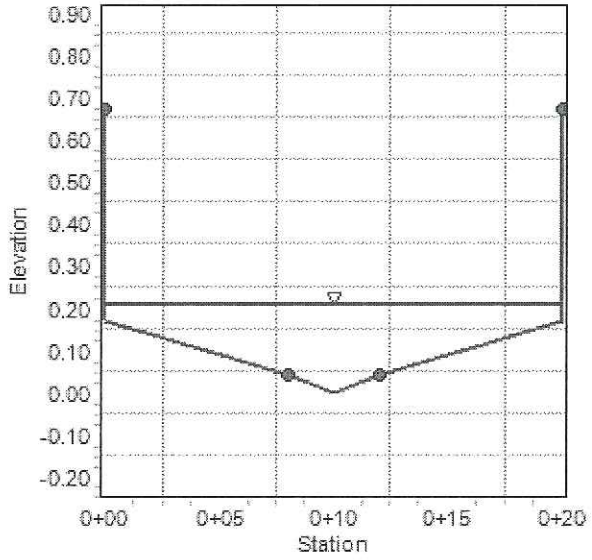
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01050	ft/ft
Normal Depth	0.21	ft
Discharge	6.00	ft³/s

Cross Section Image



Worksheet for Section 3-3 Parking Entrance (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01150	ft/ft
Discharge	6.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.600
0+05.0	0.500
0+05.5	0.500
0+05.5	0.000
0+07.0	0.130
0+07.0	0.170
0+35.5	0.428
0+35.5	0.928

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.600)	(0+35.5, 0.928)	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	0.35	ft
Elevation Range	0.00 to 0.93 ft	
Flow Area	2.23	ft²
Wetted Perimeter	21.89	ft
Hydraulic Radius	0.10	ft

Worksheet for Section 3-3 Parking Entrance (100-Yr. Storm Event)

Results

Top Width		21.50	ft
Normal Depth		0.35	ft
Critical Depth		0.39	ft
Critical Slope		0.00510	ft/ft
Velocity		2.69	ft/s
Velocity Head		0.11	ft
Specific Energy		0.46	ft
Froude Number		1.47	
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	0.35	ft
Critical Depth	0.39	ft
Channel Slope	0.01150	ft/ft
Critical Slope	0.00510	ft/ft

Cross Section for Section 3-3 Parking Entrance (100-Yr. Storm Event)

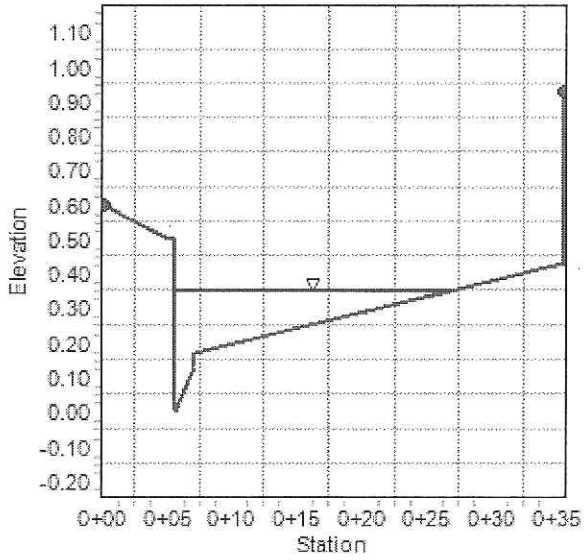
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01150	ft/ft
Normal Depth	0.35	ft
Discharge	6.00	ft³/s

Cross Section Image



Worksheet for Section 4-4 Cincinnati Ave (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	19.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.600
0+00.0	0.600
0+07.0	0.500
0+07.0	0.000
0+08.5	0.125
0+08.5	0.167
0+23.0	0.457
0+37.5	0.167
0+37.5	0.125
0+39.0	0.000
0+39.0	0.500
0+46.0	0.600
0+46.0	2.600

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.600)	(0+08.5, 0.125)	0.013
(0+08.5, 0.125)	(0+37.5, 0.167)	0.017
(0+37.5, 0.167)	(0+46.0, 2.600)	0.013

Options

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

Worksheet for Section 4-4 Cincinnati Ave (100-Yr. Storm Event)

Results

Normal Depth		0.54	ft
Elevation Range	0.00 to 2.60 ft		
Flow Area		8.21	ft²
Wetted Perimeter		38.88	ft
Hydraulic Radius		0.21	ft
Top Width		37.78	ft
Normal Depth		0.54	ft
Critical Depth		0.52	ft
Critical Slope		0.00658	ft/ft
Velocity		2.32	ft/s
Velocity Head		0.08	ft
Specific Energy		0.62	ft
Froude Number		0.88	
Flow Type	Subcritical		

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	0.54	ft
Critical Depth	0.52	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00658	ft/ft

Cross Section for Section 4-4 Cincinnati Ave (100-Yr. Storm Event)

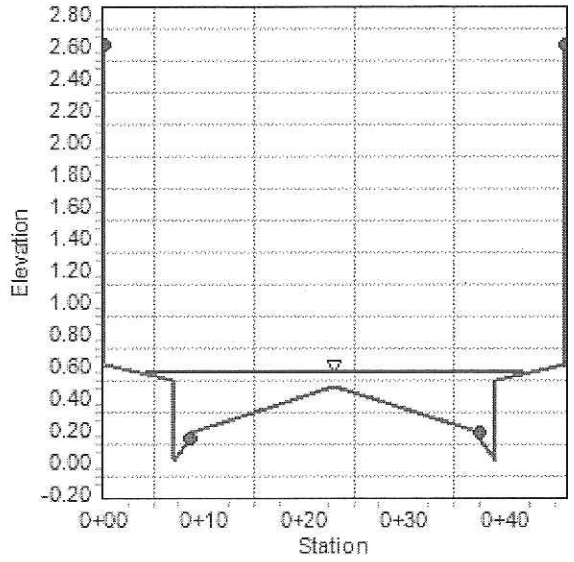
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Normal Depth	0.54	ft
Discharge	19.00	ft³/s

Cross Section Image



Worksheet for Section 5-5 Existing Sahara Ave (25-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Discharge	120.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.600
0+05.0	0.500
0+05.5	0.500
0+05.5	0.000
0+07.0	0.130
0+07.0	0.170
0+74.8	1.356
0+74.8	1.856
0+79.3	1.856
0+79.3	1.360
1+16.3	0.620
1+16.3	0.580
1+17.8	0.450
1+17.8	0.950
1+18.3	0.950
1+23.3	1.050
1+23.3	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.170)	0.013
(0+07.0, 0.170)	(1+16.3, 0.620)	0.017
(1+16.3, 0.620)	(1+23.3, 2.000)	0.013

Worksheet for Section 5-5 Proposed Sahara Ave (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Discharge	172.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.600
0+05.0	0.500
0+05.5	0.500
0+05.5	0.000
0+07.0	0.130
0+07.0	0.170
0+74.8	1.356
0+74.8	1.856
0+79.3	1.856
0+79.3	1.360
1+16.3	0.620
1+16.3	0.580
1+17.8	0.450
1+17.8	0.950
1+18.3	0.950
1+23.3	1.050
1+23.3	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.170)	0.013
(0+07.0, 0.170)	(1+16.3, 0.620)	0.017
(1+16.3, 0.620)	(1+23.3, 2.000)	0.013

Worksheet for Section 5-5 Proposed Sahara Ave (100-Yr. Storm Event)

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		1.11	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		37.06	ft²
Wetted Perimeter		93.45	ft
Hydraulic Radius		0.40	ft
Top Width		91.78	ft
Normal Depth		1.11	ft
Critical Depth		1.19	ft
Critical Slope		0.00524	ft/ft
Velocity		4.64	ft/s
Velocity Head		0.33	ft
Specific Energy		1.44	ft
Froude Number		1.29	
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	1.11	ft
Critical Depth	1.19	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00524	ft/ft

Cross Section for Section 5-5 Proposed Sahara Ave (100-Yr. Storm

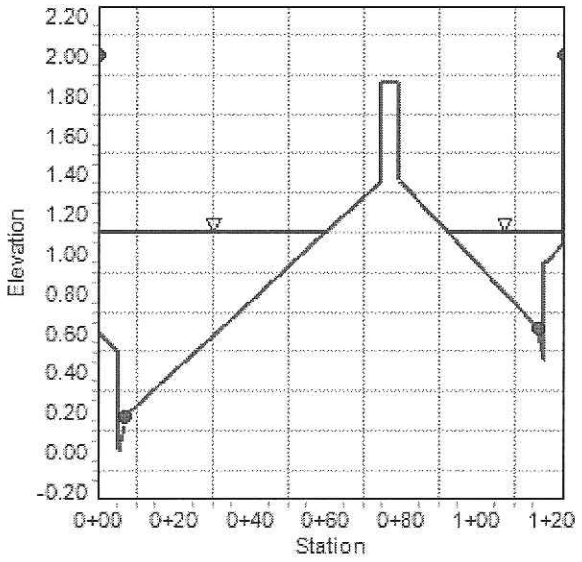
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Normal Depth	1.11	ft
Discharge	172.00	ft³/s

Cross Section Image



Worksheet for Section 5-5 Existing Sahara Ave (25-Yr. Storm Event)

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		1.00	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		28.07	ft²
Wetted Perimeter		79.55	ft
Hydraulic Radius		0.35	ft
Top Width		78.04	ft
Normal Depth		1.00	ft
Critical Depth		1.07	ft
Critical Slope		0.00552	ft/ft
Velocity		4.29	ft/s
Velocity Head		0.29	ft
Specific Energy		1.29	ft
Froude Number		1.26	
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	1.00	ft
Critical Depth	1.07	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00552	ft/ft

Cross Section for Section 5-5 Existing Sahara Ave (25-Yr. Storm Event)

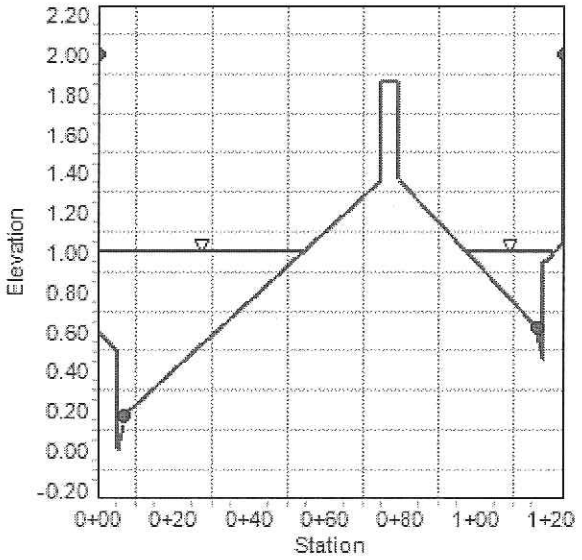
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Normal Depth	1.00	ft
Discharge	120.40	ft³/s

Cross Section Image



Worksheet for Section 6-6 Proposed Sahara Ave (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Discharge	172.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.690
0+05.0	0.590
0+05.5	0.590
0+05.5	0.090
0+07.0	0.220
0+07.0	0.260
0+19.0	0.320
0+63.5	1.210
0+63.5	1.710
0+68.2	1.710
0+68.2	1.210
1+20.2	0.170
1+20.2	0.130
1+21.7	0.000
1+21.7	0.500
1+22.2	0.500
1+27.2	0.600
1+27.2	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.260)	0.013
(0+07.0, 0.260)	(1+20.2, 0.170)	0.017

Worksheet for Section 6-6 Proposed Sahara Ave (100-Yr. Storm Event)

Input Data

Start Station	Ending Station	Roughness Coefficient
(1+20.2, 0.170)	(1+27.2, 2.000)	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		1.06	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		50.45	ft²
Wetted Perimeter		109.15	ft
Hydraulic Radius		0.46	ft
Top Width		107.22	ft
Normal Depth		1.06	ft
Critical Depth		1.01	ft
Critical Slope		0.00531	ft/ft
Velocity		3.41	ft/s
Velocity Head		0.18	ft
Specific Energy		1.24	ft
Froude Number		0.88	
Flow Type	Subcritical		

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	1.06	ft
Critical Depth	1.01	ft

Worksheet for Section 6-6 Proposed Sahara Ave (100-Yr. Storm Event)

GVF Output Data

Channel Slope	0.00400	ft/ft
Critical Slope	0.00531	ft/ft

Cross Section for Section 6-6 Proposed Sahara Ave (100-Yr. Storm

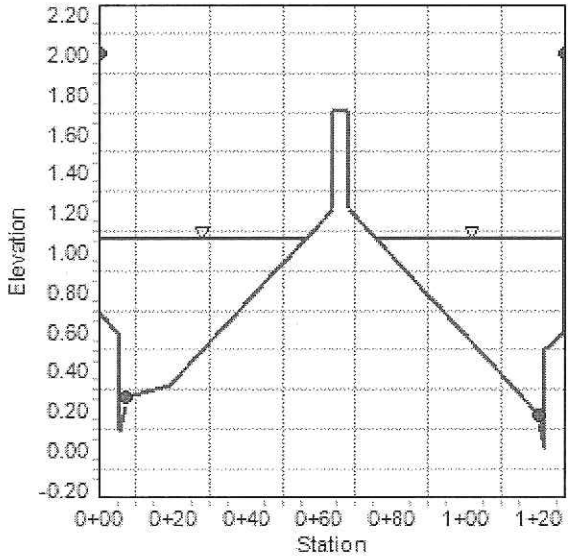
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Normal Depth	1.06	ft
Discharge	172.00	ft³/s

Cross Section Image



Worksheet for Section 6-6 Existing Sahara Ave (25-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00790	ft/ft
Discharge	120.40	ft^3/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.750
0+05.0	0.650
0+05.5	0.650
0+05.5	0.150
0+07.0	0.280
0+07.0	0.320
0+51.5	1.210
0+51.5	1.710
0+56.2	1.710
0+56.2	1.210
1+08.2	0.170
1+08.2	0.130
1+09.7	0.000
1+09.7	0.500
1+10.2	0.500
1+15.2	0.600
1+15.2	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.320)	0.013
(0+07.0, 0.320)	(1+08.2, 0.170)	0.017
(1+08.2, 0.170)	(1+15.2, 2.000)	0.013

Worksheet for Section 6-6 Existing Sahara Ave (25-Yr. Storm Event)

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		0.93	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		29.82	ft²
Wetted Perimeter		84.51	ft
Hydraulic Radius		0.35	ft
Top Width		82.89	ft
Normal Depth		0.93	ft
Critical Depth		0.98	ft
Critical Slope		0.00547	ft/ft
Velocity		4.04	ft/s
Velocity Head		0.25	ft
Specific Energy		1.19	ft
Froude Number		1.19	
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	0.93	ft
Critical Depth	0.98	ft
Channel Slope	0.00790	ft/ft
Critical Slope	0.00547	ft/ft

Cross Section for Section 6-6 Existing Sahara Ave (25-Yr. Storm Event)

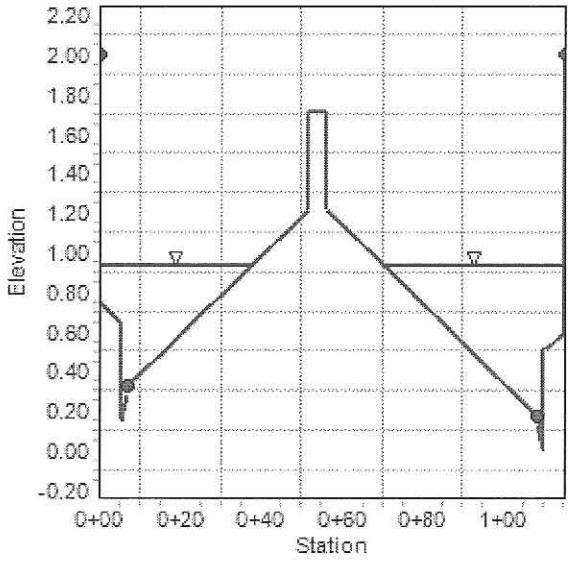
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00790	ft/ft
Normal Depth	0.93	ft
Discharge	120.40	ft^3/s

Cross Section Image



Worksheet for Section 6-6 Proposed Sahara Ave (25-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Discharge	120.40	ft^3/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.690
0+05.0	0.590
0+05.5	0.590
0+05.5	0.090
0+07.0	0.220
0+07.0	0.260
0+19.0	0.320
0+63.5	1.210
0+63.5	1.710
0+68.2	1.710
0+68.2	1.210
1+20.2	0.170
1+20.2	0.130
1+21.7	0.000
1+21.7	0.500
1+22.2	0.500
1+27.2	0.600
1+27.2	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.260)	0.013
(0+07.0, 0.260)	(1+20.2, 0.170)	0.017

Worksheet for Section 6-6 Proposed Sahara Ave (25-Yr. Storm Event)

Input Data

Start Station	Ending Station	Roughness Coefficient
(1+20.2, 0.170)	(1+27.2, 2.000)	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		0.94	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		38.87	ft²
Wetted Perimeter		97.52	ft
Hydraulic Radius		0.40	ft
Top Width		95.82	ft
Normal Depth		0.94	ft
Critical Depth		0.90	ft
Critical Slope		0.00556	ft/ft
Velocity		3.10	ft/s
Velocity Head		0.15	ft
Specific Energy		1.09	ft
Froude Number		0.86	
Flow Type	Subcritical		

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	0.94	ft
Critical Depth	0.90	ft

Worksheet for Section 6-6 Proposed Sahara Ave (25-Yr. Storm Event)

GVF Output Data

Channel Slope	0.00400	ft/ft
Critical Slope	0.00556	ft/ft

Cross Section for Section 6-6 Proposed Sahara Ave (25-Yr. Storm

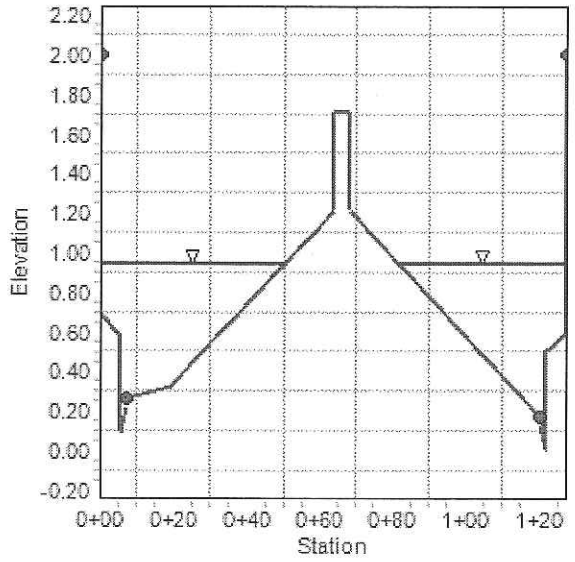
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Normal Depth	0.94	ft
Discharge	120.40	ft³/s

Cross Section Image



APPENDIX C

Reference Materials

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: March 18, 2005
TO: Land Development Services Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Technical Drainage Study for: Allure Condominiums			COPIES TO: JHR Associates
Cross Streets:	NWC Sahara Av. & Fairfield Av. (W of LVBl)			SP Sahara Development.
File Number:	F:\Depot\DSMEMOS\DS3760A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-812-001 & 027			CCDDS
Zoning Action:	SDR-4534, VAC-5902, SUP-4540			CCRFCD
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	B&H

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	3/4/2005	3/18/2005	See Comments Below	$400.00	17484: $400
			TOTAL FEES (LDDRS):	$400.00	—

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.
X	must have Clark County Department of Development Services concurrence

1. **This drainage study is acceptable in concept**; however, the 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.
2. The project is also adjacent to the jurisdiction of Clark County to the south of Sahara Avenue. *Clark County Department of Development Services* must be obtained prior to the final approval of the drainage study.
3. The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right-of-way. The engineer must contact NDOT for encroachment permit for the proposed project.
4. This project is shown as being developed in two Phases. A technical drainage study update is required for Phase 2.
5. Show the limits of the alley replacement. The alley reconstruction must be included as part of the Phase 1 improvements.
6. On Sheets G1 & G2: Indicate the building footprint. Provide the existing plan number for the storm drain within Sahara Ave. Extend the flood protection berm along Sahara Avenue to the center point of the Phase 2 building or provide a solid grouted 8" CMU stem wall a minimum of three cells above the back of walk. Show the roof drain discharge locations and connect to the streets using sidewalk underdrains. Review and revise the plan accordingly.

Post-it® Fax Note 7671	Date	# of pages ▶
To Reese Jarrell	From Albert Sung	

7. Landscape areas are not allowed to drain over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the street. Revise all pertinent details accordingly.

8. Sheet C11, Detail C: Indicate the minimum ramp elevation on the cross section and provide the minimum slope of the landscape area.

9. Sheet C11, Detail D: Provide the retaining wall height and provide railing as needed.

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
B&H/PBJ

T/R/S: T21S/R61E/04
AREA R-04

LTR

Department of Development Services
Civil Engineering Division

500 S Grand Central Pky 1st Fl • PO Box 551799 • Las Vegas NV 89155-1799
(702) 455-4600 • Fax (702) 388-2550

Phil Rosenquist, Director

June 6, 2005

05-21511
LTR

JHR Associates
4880 W. University Avenue, Suite B-2
Henderson, Nevada 89103

Re: **Technical Drainage Study Concurrence** for Allure Condominiums
Dated: March 4, 2005
Location: NWC Sahara Avenue and Fairfield Avenue
(Sec. 04, T21S, R61E)
CLV# DS3760A
HTE# 05-21511

The above-referenced project is located within the **City of Las Vegas** adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence on May 13, 2005. In addition, the County has received the City of Las Vegas acceptance letter dated March 18, 2005 for the Technical Drainage Study.

The County concurs with the acceptance of this Technical Drainage Study by the City of Las Vegas. Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas.

No liability is assumed by the County for information, data, and conclusions of the consulting engineer.

DEPARTMENT OF DEVELOPMENT SERVICES

By _____
Jeffery J. Jensen, P.E.
Senior Civil Engineer
Civil Engineering Division

cc: Development File
Albert Sung, P.E., City of Las Vegas

BOARD OF COUNTY COMMISSIONERS
RORY REID, Chairman • MYRNA WILLIAMS, Vice Chair
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THOM REILLY, County Manager

PROJECT SITE

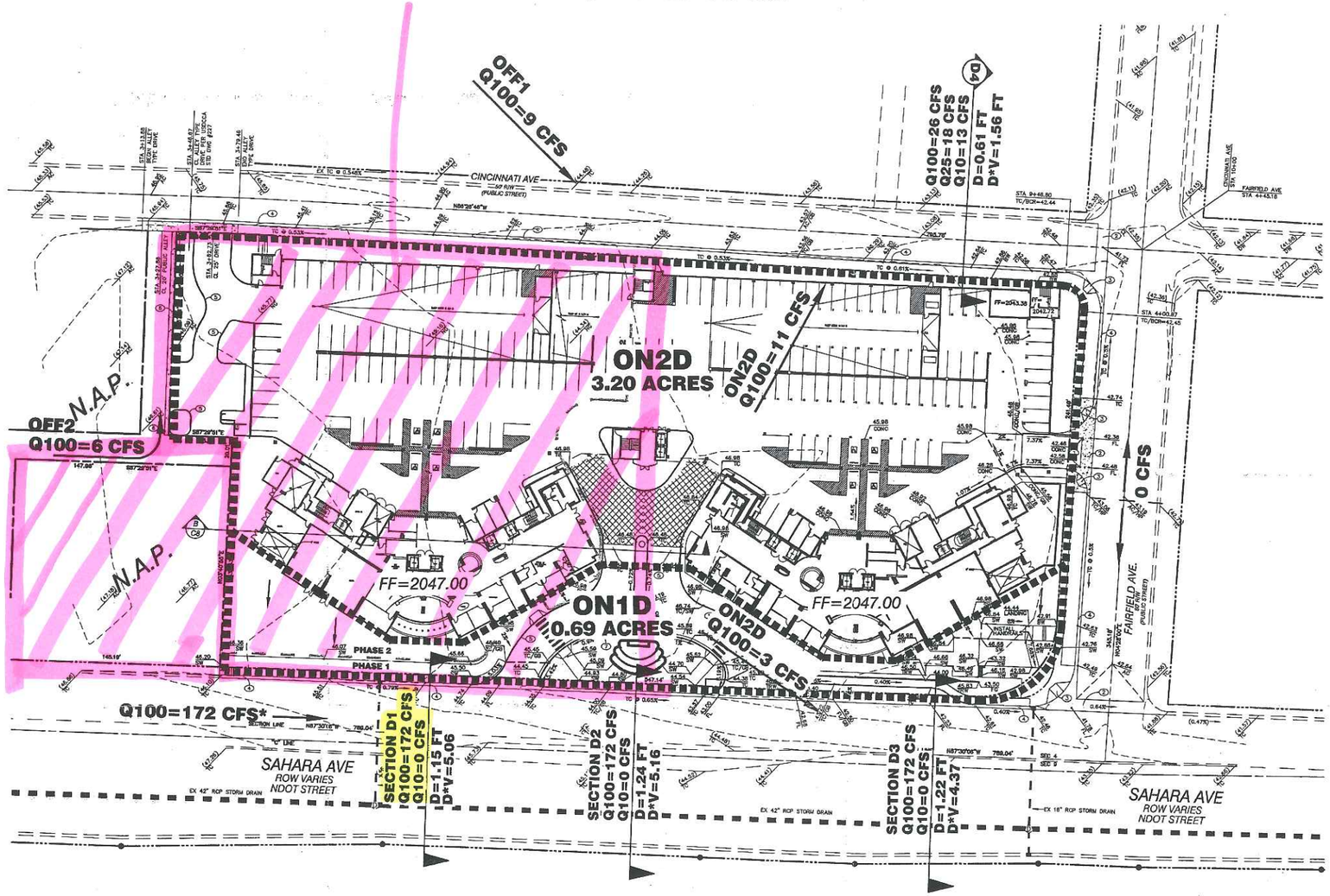
BASIN DATA

BASIN ID	AREA (AC)	SOIL GROUP	RCN	COMMENTS
ON1D	0.69 AC	C	98	DEVELOPED
ON2D	3.20 AC	C	98	DEVELOPED

FLOW DATA

BASIN ID	10-YEAR	25-YEAR	100-YEAR	COMMENTS
ON1D	1 CFS	2 CFS	3 CFS	DEVELOPED
ON2D	6 CFS	8 CFS	11 CFS	DEVELOPED

GRAPHIC SCALE
40 20 0 40 120
(IN FEET)
1 inch = 40ft.





AREA MAP
N.T.S.

LEGEND

- PROPERTY LINE
- RIGHT OF WAY
- CENTERLINE
- AC CUTLINE
- EXISTING CURB
- PROPOSED CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF PAVEMENT
- EXISTING BLOCK WALL
- PROPOSED BLOCK WALL
- 2051 — CONTOUR LINE
- OHP — OHP — EXISTING OVER HEAD POWER
- AC — ASPHALTIC CONCRETE
- BC — BACK OF CURB
- BCR — BEGINNING OF CURB RADIUS
- BW — BACK OF WALK
- CG — CURB & GUTTER
- CL — CENTERLINE
- CONC — CONCRETE
- ECR — END OF CURB RADIUS
- EP — EDGE OF PAVEMENT
- EX — EXISTING
- FG — FINISH GRADE
- FL — FLOW LINE
- GB — GRADE BREAK
- HP — HIGH POINT
- LP — LOW POINT
- NG — NATURAL GROUND
- PL — PROPERTY LINE
- STA — STATION
- SW — SIDEWALK
- TC — TOP OF CURB
- TF — TOP OF FOOTING
- TRW — TOP OF RETAINING WALL
- TW — TOP OF WALL
- EXISTING 250W STREET LIGHT
- EXISTING GUY WIRE
- EXISTING POWER POLE
- SIGHT VISIBILITY RESTRICTION ZONE (SVRZ) NOTHING OVER 24 INCHES IN HEIGHT AS MEASURED FROM TOP OF CURB ALLOWED IN SVZ EXCEPT TRAFFIC CONTROL DEVICES
- EXISTING INGRESS/EGRESS EASEMENT

BASIS OF BEARINGS

N04°28'00"E BEING THE CENTERLINE OF FAIRFIELD AVENUE, CALCULATED FROM BOOK 1, PAGE 43 OF PLATS.

BENCHMARK

CLV BM# CLV11 4SES

BEING A RIVET AND PLATE IN TOP OF CURB, 20' EAST OF N.E. RETURN SAHARA AVENUE AND LAS VEGAS BOULEVARD.

ELEV. = 621.9630 (M) 2040.56 (FT) NAVD '88

LEGAL DESCRIPTION

PARCEL 1:

LOT ELEVEN (11) IN BLOCK THREE (3) OF JUDY RICH TRACT, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 4 OF PLATS, PAGE 27, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.
EXCEPTING THEREFROM THE INTEREST IN AND TO THE WEST 20 FEET THEREOF AS CONVEYED TO THE CITY OF LAS VEGAS FOR ALLEY AND INCIDENTAL PURPOSES BY DEED RECORDED JANUARY 9, 1973 AS DOCUMENT NO. 251334.

PARCEL 2:

LOTS ONE (1) THROUGH EIGHTEEN (18) INCLUSIVE IN BLOCK NINE (9) OF MEADOWS ADDITION, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 3 OF PLATS, PAGE 40, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.
TOGETHER WITH THAT VACATED ALLEY AS DESCRIBED BY ORDER OF VACATION RECORDED JANUARY 4, 1973 AS DOCUMENT NO. 251333, OFFICIAL RECORDS.
EXCEPTING THEREFROM THOSE PORTIONS OF THE RESUBDIVISION OF PORTIONS OF BLOCKS 1 AND 9, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 3 OF PLATS, PAGE 40 AS CONVEYED TO THE CITY OF LAS VEGAS BY DEED RECORDED AUGUST 10, 1987 IN BOOK 870810 AS DOCUMENT NO. 00704, OFFICIAL RECORDS.

CONSTRUCTION NOTES

1. CONSTRUCT DRIVEWAY PER USDCCA STD DWG'S #222-A AND #225
2. CONSTRUCT CROSS GUTTER PER USDCCA STD DWG #228
3. CONSTRUCT HANDICAP RAMPS PER USDCCA STD DWG # 235
4. REMOVE AND REPLACE EXISTING 2' "L" TYPE CURB PER STD DWG #216
5. INSTALL 6" "A" TYPE CURB PER DETAIL THIS SHEET
6. INSTALL 2' CONCRETE WATERWAY PER DETAIL THIS SHEET
7. INSTALL 2' "L" TYPE CURB PER STD DWG #216

GRADING NOTES

1. ALL GRADING AND PAVING TO BE COMPLETED IN STRICT ACCORDANCE WITH KLEINFELDER SOILS REPORT PROJECT No. 49939 DATED JANUARY 14, 2005
2. PAD ELEVATION IS BASED ON FOUR (4") INCHES TYPE II OVERLAIN WITH A 10 MIL 10 MIL VISQUEEN MEMBRANE ALL UNDER CONCRETE SLAB OF 4" MINIMUM.
*** SEE SOILS REPORT FOR ALTERNATIVE ***

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you Dig.
1-800-227-2600
(48 hrs. Advance Notice Required)

AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
Call before you OVERHEAD
1-702-227-2929
NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UNDERGROUND
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

SUBMITTAL
PRINTED
MAR 22 2005
JHR ASSOC.

05-21511 TDSMAPS

CLIENT: SP SAHARA DEVELOPMENT, LLC.
20 N. WACKER DRIVE #2200 CHICAGO, ILLINOIS 60606
PHONE: (312) 424-6228 FAX: (312) 855-1719

PREPARED: Gruber Associates Ltd.
4880 W. UNIVERSITY, SUITE B-2 PH (702) 876-2341
LAS VEGAS, NEVADA 89103 FAX (702) 876-8395

SHEET: DRAINAGE PLAN
PROJECT: ALLURE CONDOMINIUMS
WEST SAHARA AVENUE
CITY OF LAS VEGAS, NEVADA

REV	DATE	BY	DESCRIPTION

DRAWN BY: JGR
DESIGNED BY:
CHECKED BY:
2-22-05
SCALE: HORIZ: 1"=40' VERT: N/A
PROJECT NO. 124-04-555

SEAL
REESE P. JARRELL
Exp. 6-30-05
CIVIL
No. 7867
PROFESSIONAL ENGINEER
STATE OF NEVADA

SHEET DR1
SHEET 1 OF 1 SHEETS

\\Terra-14\SAHADONDV\Flood\SC-DRN.dwg Fri Mar 04 12:41:39 2005

LEGEND / ABBREVIATIONS

→	CHANNEL FLOW DIRECTION
→	RUNOFF FLOW DIRECTION
•—	BASIN DISCHARGE POINT
OFF1	BASIN IDENTIFIER
Q100	100-YEAR EVENT FLOW QUANTITY
Q25	25-YEAR EVENT FLOW QUANTITY
Q10	10-YEAR EVENT FLOW QUANTITY
CFS	CUBIC FEET PER SECOND

NOTES:

THE GENERAL TOPOGRAPHY OR FALL OF THE PROJECT SITE IS APPROXIMATELY 0.8% FROM THE WEST TO THE EAST.

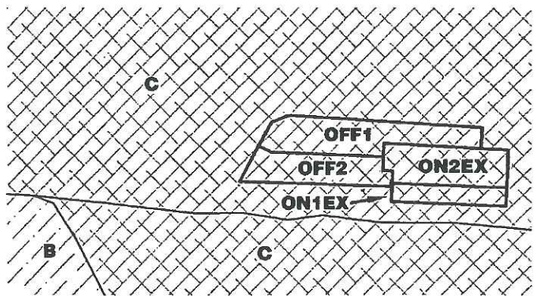
**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH
1"=300'

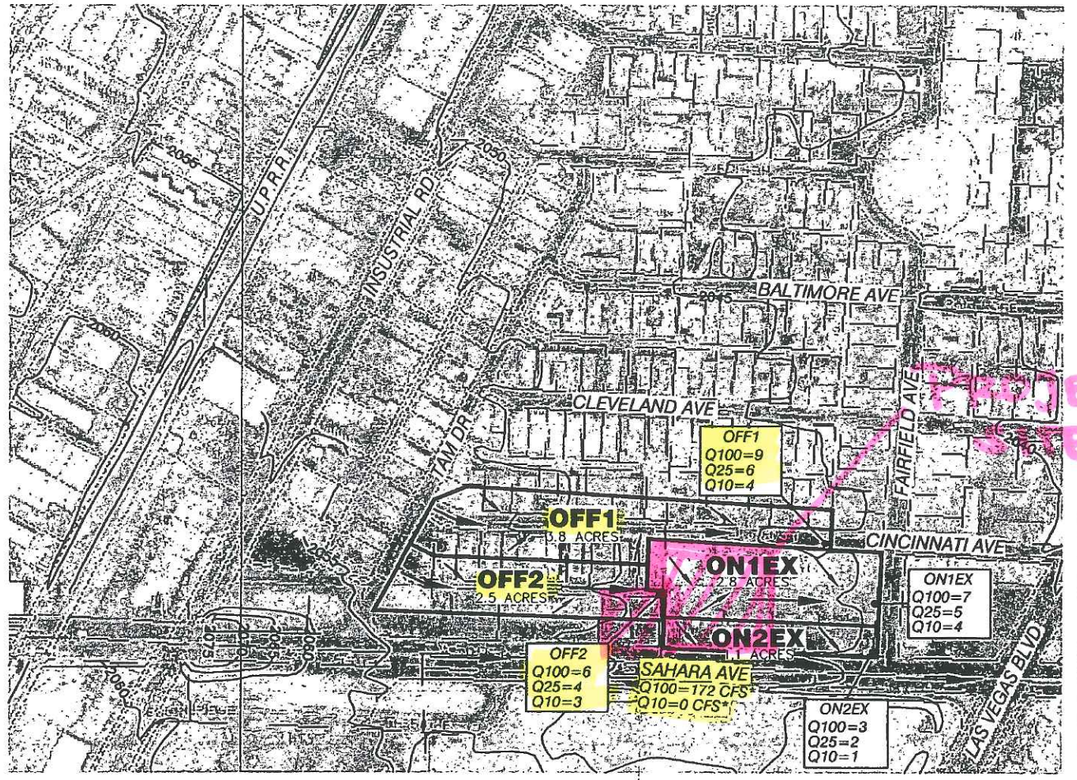
GRAPHIC SCALE

300 0 150 300 600

(IN FEET)
1 inch = 300 FT



SOIL GROUP CLASSIFICATION
SCALE 1"=100'



SOURCE: CLARK COUNTY GEOGRAPHICAL INFORMATION SYSTEMS (GIS): IMAGE AS OF FALL 2004 CONTOURS AS OF 1996

THE PROJECT SITE IS LOCATED WITHIN REGIONAL DRAINAGE BASIN CH51 OF THE CENTRAL WATERSHED. THE SOIL CLASSIFICATION IS TYPE C, WHICH IS INDICATIVE OF MODERATELY HIGH RUNOFF POTENTIAL.

JHR Associates, Ltd.
4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	02/05	BY:	JGR
PROJECT #:	124-04-555	SCALE:	1"=300'

DESCRIPTION:

OFFSITE DRAINAGE BASIN MAP
EXISTING CONDITION
ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: 6

1 OF 1

I:\Temp-14\SAHACOND\Flood\SC-BASEX.dwg Tue Mar 01 11:05:36 2005

LEGEND / ABBREVIATIONS

——►	CHANNEL FLOW DIRECTION
—→	RUNOFF FLOW DIRECTION
●—	BASIN DISCHARGE POINT
ON1D	BASIN IDENTIFIER
Q100	100-YEAR EVENT FLOW QUANTITY
Q25	25-YEAR EVENT FLOW QUANTITY
Q10	10-YEAR EVENT FLOW QUANTITY
CFS	CUBIC FEET PER SECOND

NOTES:

THE GENERAL TOPOGRAPHY OR FALL OF THE PROJECT SITE IS APPROXIMATELY 0.8% FROM THE WEST TO THE EAST.

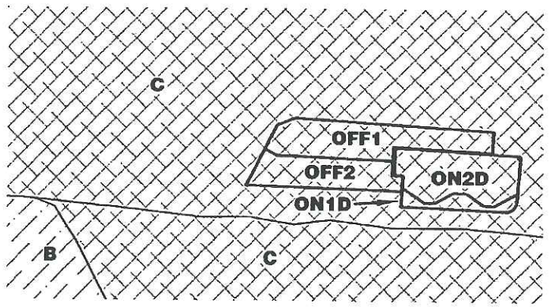
**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH
1"=300'

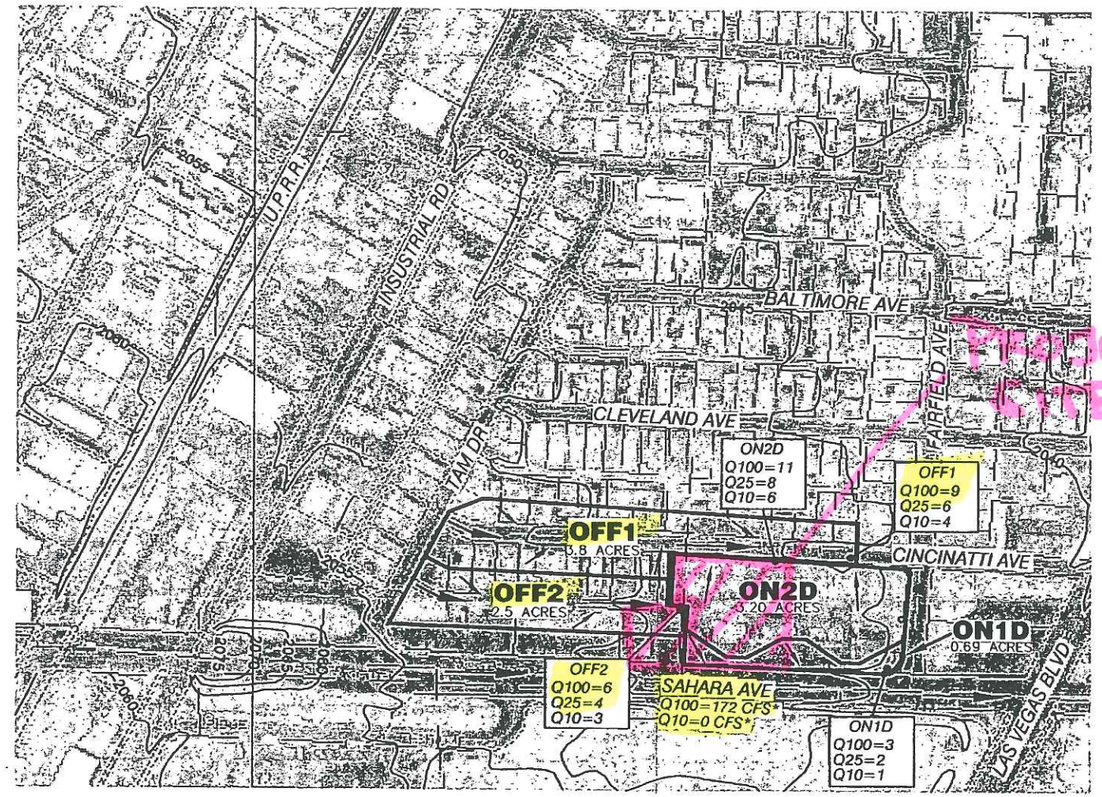
GRAPHIC SCALE

300 0 150 300 600

(IN FEET)
1 inch = 300 FT



SOIL GROUP CLASSIFICATION
SCALE 1"=100'



SOURCE: CLARK COUNTY GEOGRAPHICAL INFORMATION SYSTEMS (GIS): IMAGE AS OF FALL 2004
CONTOURS AS OF 1996

THE PROJECT SITE IS LOCATED WITHIN REGIONAL DRAINAGE BASIN CH51 OF THE CENTRAL WATERSHED. THE SOIL CLASSIFICATION IS TYPE C, WHICH IS INDICATIVE OF MODERATELY HIGH RUNOFF POTENTIAL.

JHR Associates, Ltd.
4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	02/05	**BY:**	JGR
PROJECT #:	124-04-555	**SCALE:**	1"=300'

DESCRIPTION:

OFFSITE DRAINAGE BASIN MAP

DEVELOPED CONDITION
ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: 7

1 OF 1

I:\Temp-14\SAHACOND\Flood\SC-BASDV.dwg Tue Mar 01 07:02:17 2005

STANDARD FORM 4

124-04-555 Allure Condominiums

BASIN IDENTIFIER	RCN	K	TOTAL AREA (acres)	TOTAL AREA ($miles^2$)	L (ft)	SLOPE (%)	T_t (min)	L (ft)	SLOPE (%)	V (ft/sec)	T_t (min)	TOTAL L (ft)	$T_c=T_t+T_t$ (min)	CHECK $T_c=(L/180)+10$ (min)	ACCEPTED T_c (min)	TLAG (hrs)	COMMENTS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
OFFSITE DRAINAGE BASINS - EXISTING CONDITION																	
OFF1 **	91	0.811	3.8	0.0059	100	0.5	6.55	1000	0.7	2.10	7.94	1100	14.49	N/A	14.49	0.145	Developed - apartments
OFF2 **	91	0.811	2.5	0.0039	130	0.5	7.47	670	0.7	1.07	10.44	800	17.90	N/A	17.90	0.179	Developed - apartments
ONSITE DRAINAGE BASIN - EXISTING CONDITION																	
ON1EX	94	0.851	2.80	0.0044	75	0.8	4.18	575	0.8	0.95	10.09	650	14.27	N/A	14.27	0.143	Urban - commercial
ON2EX	94	0.851	1.10	0.0017	140	0.8	5.72	620	0.8	0.76	13.60	760	19.31	N/A	19.31	0.193	Urban - commercial
		$K = 0.0132 * RCN - 0.39$					$T_t = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3}$									$TLAG = (T_c * 0.6) / 60$	
KK	LS	n/a	n/a	BA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	UD	HEC-1 CARD

STANDARD FORM 4

124-04-555 Allure Condominiums

BASIN IDENTIFIER	RCN	K	TOTAL AREA (acres)	TOTAL AREA ($miles^2$)	L (ft)	SLOPE (%)	T_l (min)	L (ft)	SLOPE (%)	V (ft/sec)	T_t (min)	TOTAL L (ft)	$T_c=T_l+T_t$ (min)	CHECK $T_c=(L/180)+10$ (min)	ACCEPTED T_c (min)	TLAG (hrs)	COMMENTS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
ONSITE DRAINAGE BASINS - DEVELOPED CONDITION																	
ON1D	98	0.904	0.69	0.0011	45	0.7	2.62	60	1.6	2.83	0.35	105	2.98	10.58	2.98	0.050	Developed residential
ON2D	98	0.904	3.20	0.0050	288	1.0	6.00	123	1.0	2.45	0.84	411	6.84	12.28	6.84	0.068	Developed residential
		$K = 0.0132 * RCN - 0.39$					$T_l = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3}$									$TLAG = (T_c * 0.6) / 60$	
KK	LS	n/a	n/a	BA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	UD	HEC-1 CARD

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE  28FEB05  TIME  14:38:51    *
*                                       *
*****************************************
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```
*********************************
*                               *
*    U.S. ARMY CORPS OF ENGINEERS
*    HYDROLOGIC ENGINEERING CENTE
*         609 SECOND STREET     *
*       DAVIS, CALIFORNIA 95616 *
*           (916) 756-1104      *
*                               *
*********************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX  XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1      ID
          *DIAGRAM
   2      ID
   3      ID   ***** ALLURE CONDOMINIUMS
   4      ID   ***** LOCATED ON THE NORTHWEST CORNER OF
   5      ID   ***** SAHARA BLVD AND FAIRFIELD AVE
   6      ID   ***** JHR PROJECT NO. 124-04-555
   7      ID   ***** FILENAME: ALLURE.DAT
   8      ID
   9      ID        ANALYSIS BY:    JHR ASSOCIATES, LTD.
  10      ID                        4880 W.UNIVERSITY, SUITE B-2
  11      ID                        LAS VEGAS, NEVADA 89103
  12      ID                        (702) 876-2341
  13      ID
  14      ID
  15      ID   100-YR STORM EVENT RATIO FOR (JR) CARD: 1.0000
  16      ID    25-YR STORM EVENT RATIO FOR (JR) CARD: 0.7401
  17      ID    10-YR STORM EVENT RATIO FOR (JR) CARD: 0.5704
  18      ID
  19      ID   THE RATIOS APPLIED FOR THE 10-YEAR AND 100-YEAR STORM EVENT
  20      ID   ARE BASED ON THE MCCARRAN PRECIPITATION RATIOS
  21      ID   THE PROJECT SITE: 100-YEAR 6 HR STORM - 2.77 INCHES
  22      ID   THE PROJECT SITE:  25-YEAR 6 HR STORM - 2.05 INCHES
  23      ID   THE PROJECT SITE:  10-YEAR 6 HR STORM - 1.58 INCHES
  24      ID
  25      IT       5       0       0       0     300
  26      IO       5       0       0       0
  27      IN       5       0       0       0
  28      JR    PREC   1.000  0.7401  0.5704

  29      KK    OFF1
  30      KM   STORM RUNOFF FROM OFFSITE BASIN OFF1
  31      BA  0.0059
  32      PB    2.77
  33      PC  0.000  0.020  0.057  0.070  0.087  0.108  0.124  0.130  0.130  0.130
  34      PC  0.130  0.130  0.130  0.133  0.140  0.142  0.148  0.158  0.172  0.181
  35      PC  0.190  0.197  0.199  0.200  0.201  0.204  0.214  0.229  0.241  0.249
  36      PC  0.251  0.256  0.270  0.278  0.281  0.283  0.295  0.322  0.352  0.409
  37      PC  0.499  0.590  0.710  0.744  0.781  0.812  0.819  0.835  0.851  0.856
  38      PC  0.860  0.868  0.876  0.888  0.910  0.926  0.937  0.950  0.970  0.976
  39      PC  0.982  0.985  0.987  0.989  0.990  0.993  0.993  0.994  0.995  0.998
  40      PC  0.998  0.999  1.000
  41      LS      0     91
  42      UD  0.145

  43      KK    OFF2
  44      KM   STORM RUNOFF FROM OFFSITE BASIN OFF2 - EXISTING CONDITION
  45      BA  0.0039
  46      LS      0     91
  47      UD  0.179
```

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 LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

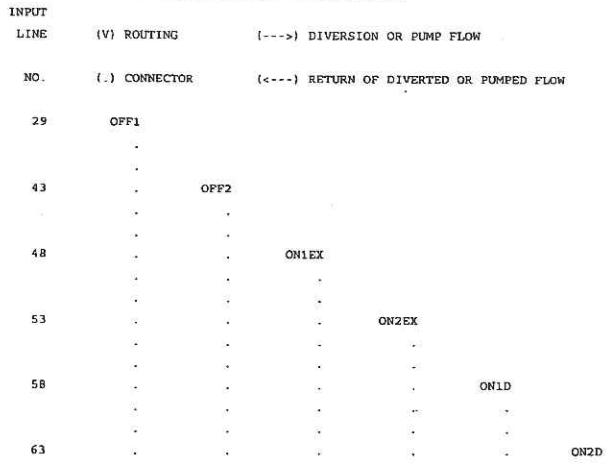
   48      KK   ON1EX
   49      KM   STORM RUNOFF FROM PROJECT ONSITE BASIN ON1EX
   50      BA  0.0044
   51      LS       0      94
   52      UD   0.143

   53      KK   ON2EX
   54      KM   STORM RUNOFF FROM PROJECT ONSITE BASIN ON2EX
   55      BA  0.0017
   56      LS       0      94
   57      UD   0.193

   58      KK    ON1D
   59      KM   STORM RUNOFF FROM ONSITE BASIN ON1D - DEVELOPED CONDITION
   60      BA  0.0011
   61      LS       0      98
   62      UD   0.050

   63      KK    ON2D
   64      KM   STORM RUNOFF FROM ONSITE BASIN ON2D - DEVELOPED CONDITION
   65      BA  0.0050
   66      LS       0      98
   67      UD   0.068
   68      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   28FEB05  TIME  14:38:51   *
*                                       *
*****************************************
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*********************************
*                               *
*    U.S. ARMY CORPS OF ENGINEERS
*    HYDROLOGIC ENGINEERING CENTE
*         609 SECOND STREET     *
*       DAVIS, CALIFORNIA 95616 *
*           (916) 756-1104      *
*                               *
*********************************
```

***** ALLURE CONDOMINIUMS
***** LOCATED ON THE NORTHWEST CORNER OF
***** SAHARA BLVD AND FAIRFIELD AVE
***** JHR PROJECT NO. 124-04-555
***** FILENAME: ALLURE.DAT

ANALYSIS BY: JHR ASSOCIATES, LTD.
4880 W.UNIVERSITY, SUITE B-2
LAS VEGAS, NEVADA 89103
(702) 876-2341

100-YR STORM EVENT RATIO FOR (JR) CARD: 1.0000
25-YR STORM EVENT RATIO FOR (JR) CARD: 0.7401
10-YR STORM EVENT RATIO FOR (JR) CARD: 0.5704

THE RATIOS APPLIED FOR THE 10-YEAR AND 100-YEAR STORM EVENT
ARE BASED ON THE MCCARRAN PRECIPITATION RATIOS
THE PROJECT SITE: 100-YEAR 6 HR STORM - 2.77 INCHES
THE PROJECT SITE: 25-YEAR 6 HR STORM - 2.05 INCHES
THE PROJECT SITE: 10-YEAR 6 HR STORM - 1.58 INCHES

26 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		101	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0820	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 8.33 HOURS

	FLOW	CUBIC FEET PER SECOND
	STORAGE VOLUME	ACRE-FEET
	SURFACE AREA	ACRES
	TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION

RATIOS OF PRECIPITATION

1.00 .74 .57

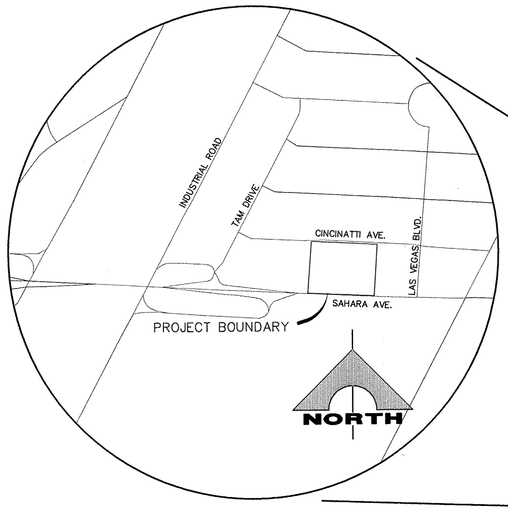
PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

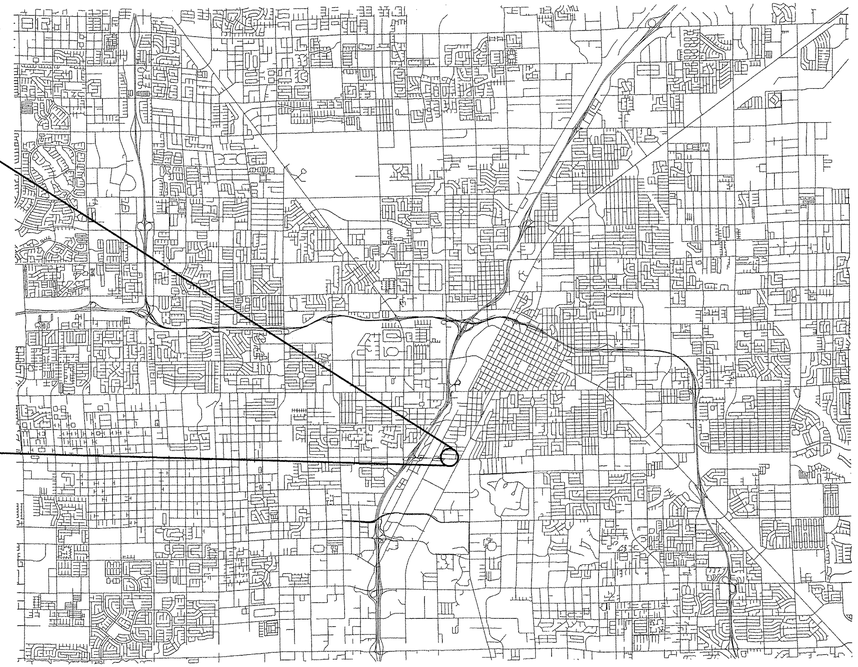
OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2	RATIO 3
					1.00	.74	.57
HYDROGRAPH AT							
+	OFF1	.01	1	FLOW	9.	6.	4.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	OFF2	.00	1	FLOW	6.	4.	3.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ON1EX	.00	1	FLOW	7.	5.	4.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ON2EX	.00	1	FLOW	3.	2.	1.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ON1D	.00	1	FLOW	3.	2.	1.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ON2D	.00	1	FLOW	11.	8.	6.
				TIME	3.50	3.50	3.50

*** NORMAL END OF HEC-1 ***

IMPROVEMENT PLANS
FOR
LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY

CITY OF LAS VEGAS
STATE OF NEVADA
APN# 162-04-814-002
305 W. CINCINATTI AVENUE





INDEX OF DRAWINGS

SHT.	NO.	SHEET TITLE
1	C-1	COVER SHEET
2	C-2	NOTES AND ABBREVIATIONS
3	C-3	GRADING PLAN
4	C-4	DETAIL SHEET

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

Call before you Dig
Avoid cutting underground utility lines! It's easy.
Call 811
OR
1-800-227-2600

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT OLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

FAST
Call before you UnderGround.
1-702-432-5300
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QUANTITIES

UTILITY/AGENCY APPROVALS

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

CENTRAL TELEPHONE COMPANY d/b/a/CENTURYLINK — DATE

THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

NV ENERGY — DATE

NEVADA POWER COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NEVADA POWER COMPANY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY – TRANSMISSION ENGINEERING — DATE

SOUTHWEST GAS CORP. — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

PROJECT NO._____ DATE: _____
SHEETS C1-C3

CLV PLANNING DEPARTMENT

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT

CHRIS KNIGHT, DIRECTOR, BUILDING & SAFETY — DATE

APPROVED FOR CONSTRUCTION

CITY OF LAS VEGAS FIRE DEPARTMENT — DATE

"APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND / OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND / OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARDS IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA".

DAVID BOWERS, PE #16736, PTOE — DATE
CITY ENGINEER
CITY OF LAS VEGAS, NEVADA

STATE OF NEVADA — ENGINEER — PROFESSIONAL — ROY D. CLARK — No. 8354 — Exp. 12/31/2014 — CIVIL — DATE: 3/10/14

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 03-10-14
PLOT TIME: 11:27:40

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LAS VEGAS
F:\Projects\300\398-A436\DWG\Production\PHASE 3\A436-c01-02.dwg
Bob Doone

LUCKY DRAGON LP
LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY
COVER SHEET

DRAWING C-1
1 OF 4 SHTS
CLV #

cov436.dwg 07/2013 jw

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" 'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

REVISED 04/15/10

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

LVVWD PROJECT # _____ - _____

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 3:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS
9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT 811 OR 1-800-227-2600.
14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.

    ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF IT'S FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

APPROVED FOR CONSTRUCTION

_____

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

PROJECT NO._____ DATE:_____







CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL	COMPACTION
A. PAVEMENT AREA SUBGRADE	0.1'±	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5'±	+0.1' TO -0.1'	SEE SOILS REPORT

    COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE. COMPACTION SHALL COMPLY WITH THE REQUIREMENTS OF THE ENGINEER.
7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, SUCH ITEM SHALL BE PROVIDED, AS DIRECTED BY THE CITY ENGINEER, AT NO EXPENSE TO THE CITY OF LAS VEGAS. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

REVISED 4/15/10

STORMWATER RUNOFF MANAGEMENT

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS.
2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC ENGINEER AND THE CITY ENGINEER.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.
4. ALL STREET LIGHTING CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE. WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO PB, IT SHALL HAVE MINIMUM OF 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TEFO PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE PLANS.
8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.
9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.
10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.
11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ANY NEW SERVICE REQUIREMENTS. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHT/S AND/OR SERVICE/S INSTALLED UNDER THIS PLAN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION. COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEFO) AT (702) 229-6331.

REVISED 04/15/10

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCED WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM; SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANIT-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT-OF-WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED 4/15/10

LEGEND

- (1) DETAIL DRAWING NUMBER
- (1/—) DRAWING NUMBER FOR DETAIL DRAWN ON SAME SHEET
- (1/7) DRAWING NUMBER FOR DETAIL WITH REFERENCE TO IT'S SHEET
- INDICATES SEWER MANHOLE IN PROFILE
- INDICATES STORM DRAIN MANHOLE IN PROFILE
- (60.5) TC — EXIST. ELEVATION
- 60.50 TC — PROPOSED ELEVATION
- (2356.1) × — EXIST. SPOT ELEVATION
- SUBDIVISION BOUNDARY
- EASEMENT LINE
- FUTURE LINE
- STREET CENTERLINE
- CONCRETE CURB & GUTTER
- EXISTING IMPROVEMENTS
- (2612) — EXISTING GROUND CONTOURS
- 34 — FINISH GROUND CONTOUR LINE
- DRAINAGE FLOW LINE
- BLOCK WALL
- EXISTING BLOCK WALL

EMBANKMENT

- TOP — PROPOSED
- BOTTOM — EXISTING

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE, WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER OR OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE 1/2" ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER USD 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER USD 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY, REPORT #, DATE) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE DETERMINED IN THE FIELD BY A CITY ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 AND CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOW LINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.
16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC., THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GO

CINCINNATI AVENUE (PUBLIC)

MECHANICAL
F.F.=2047.90

UP TO PARKING GARAGE

PARKING GARAGE
ABOVE OFFICES
F.F.=2047.88

LOADING DOCK
F.F.=2047.88

EXISTING APARTMENT BUILDING

STING PUBLIC ALLEY

FUTURE POOL AREA

HOTEL
F.F.=2048.68

CASINO
F.F.=2047.88

ENTRY DOORS
REVOLVING DOOR INTO CASINO
ENTRY DOORS

ENTRY DOORS
REVOLVING DOOR INTO CASINO
ENTRY DOORS

TOP=47.07
INV IN 18"=43.32

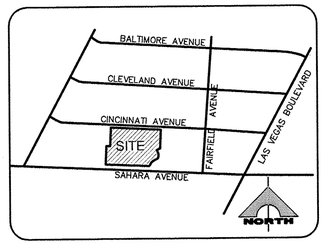
84.6 LF-18" RCP @ 1.0%

EXISTING 42" RCP
INV IN 18"=42.49
INV THRU 42"=41.26

SAHARA AVENUE (PUBLIC)

NORTH

SCALE 20 0 20 40 FEET



VICINITY MAP

NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT OLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. CONSTRUCT 3' CONCRETE VALLEY GUTTER
7. CONSTRUCT SIDEWALK UNDERDRAIN (USDCCA NO. 236)
8. CONSTRUCT ASPHALT PAVEMENT (X" A/C OVER X" TYPE II COMPACTED TO 95%)
9. ADJUST EXISTING UTILITY TO FINISHED GRADE
10. SAWCUT EXISTING PAVEMENT
11. CONSTRUCT PLANTER WALL, PER ARCHITECTURAL PLANS
12. PROVIDE TRENCH DRAIN IN DOCK AREA
13. PROVIDE 0" CURB FACE
14. PROVIDE METAL SCREEN WALL PER ARCHITECTURAL PLANS
15. PROVIDE 0" CURB FACE
16. CONSTRUCT CMU WALL PER ARCHITECTURAL PLANS
17. REMOVE EXISTING NDOT TYPE 3 INLET, PLUG EXISTING 18" PIPE IN PLACE WITH A PRECAST PLUG
18. INSTALL NDOT TYPE 4 MANHOLE PER DWG. R-4.3.2.
19. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3.

Call before you Dig
Avoid cutting underground utility lines it's costly.
Call 811
OR
1-800-227-2600

FAST
Call before you UnderGround.
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES IT'S COSTLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 — DATE 3/10/14

PROFESSIONAL ENGINEER STATE OF NEVADA ROY D. CLARK Exp. 12/31/2014 CIVIL No. 8354

DATE: 3/10/14

REV	DATE	DESCRIPTION	AGEN APP	DATE	GOV APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 03-10-14
PLOT TIME: 11:34:13

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD - LAS VEGAS, NV 89146
T: 702.804.2000 - F: 702.804.2299 - GCWALLACE.COM

LAS VEGAS

F:\Projects\300\398-A436\DWG\Production\PHASE 3\A436-cGRD.dwg
Bob Doane

LUCKY DRAGON LP

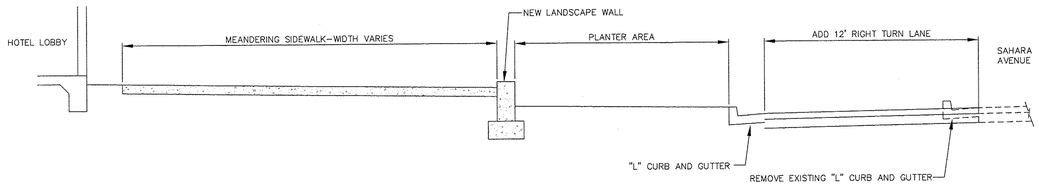
LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY

GRADING PLAN

DRAWING C-3
3 OF 4 SHTS

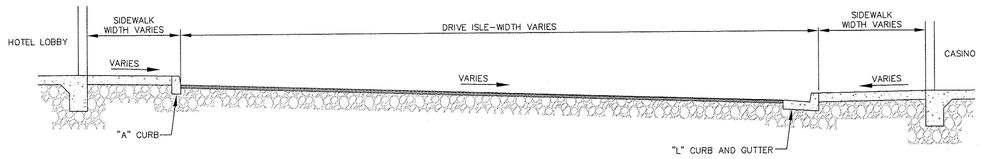
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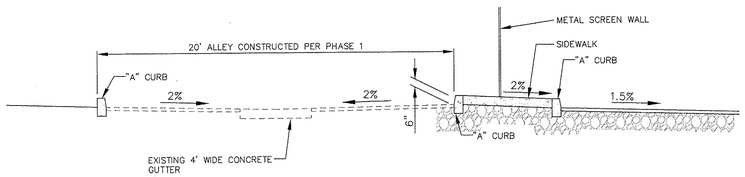
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A C-3



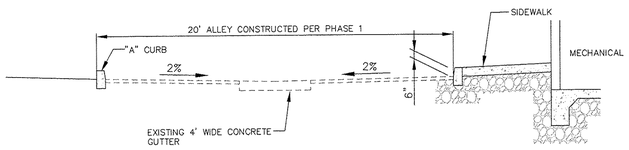
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B C-3



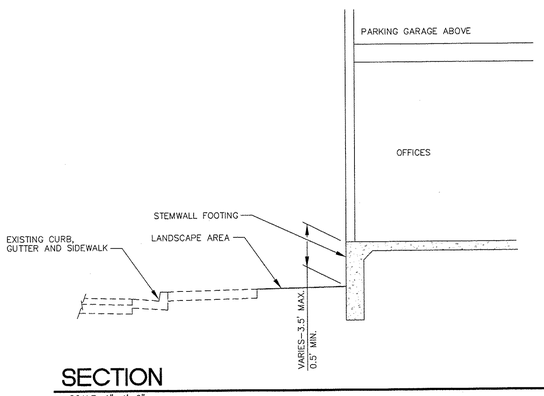
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C C-3



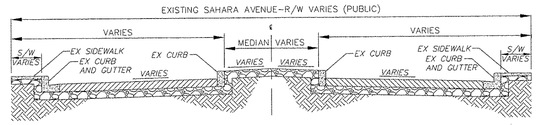
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D C-3

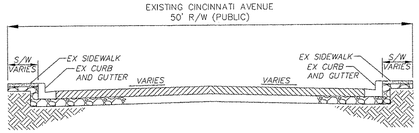


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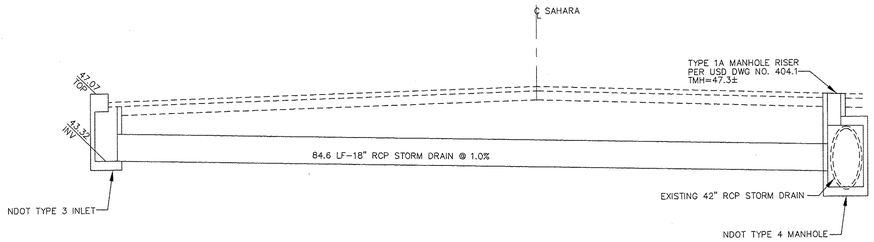
E C-3



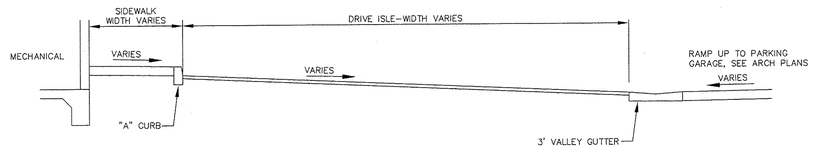
SAHARA AVENUE–NDOT STREET
NOT TO SCALE



CINCINATTI AVENUE
NOT TO SCALE

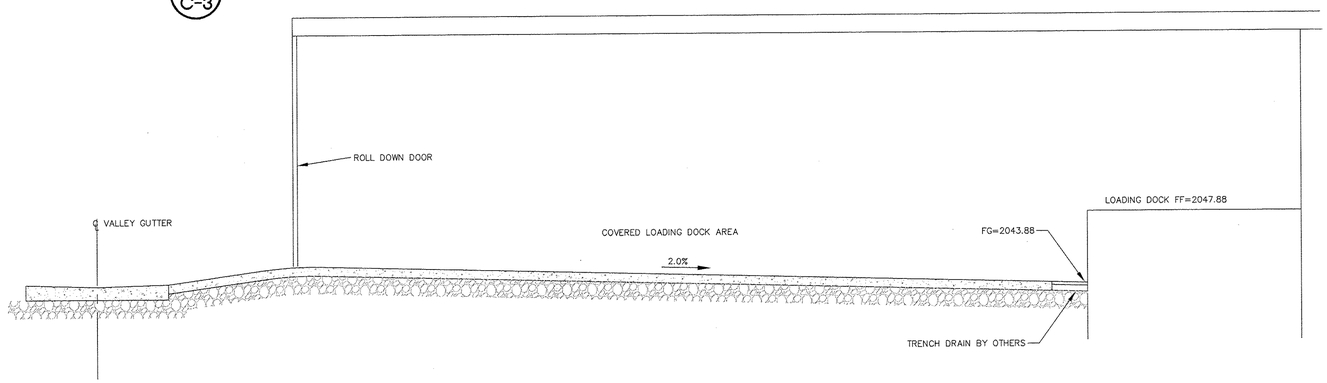


PROFILE–18" STORM DRAIN
NOT TO SCALE



SECTION
SCALE: 1"=4'-0"

F C-3



SECTION
SCALE: 1"=4'-0"

G C-3

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ENGINEER · STATE OF NEVADA · PROFESSIONAL · No. 8354 · Exp. 12/31/2014 · CIVIL
ROY D. CHAK
DATE: 3/19/14

REV	DESCRIPTION	DATE	AGEN APP	DATE	CCW APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: BD
PLOT DATE: 03-10-14
PLOT TIME: 11:34:25

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Bob Doone

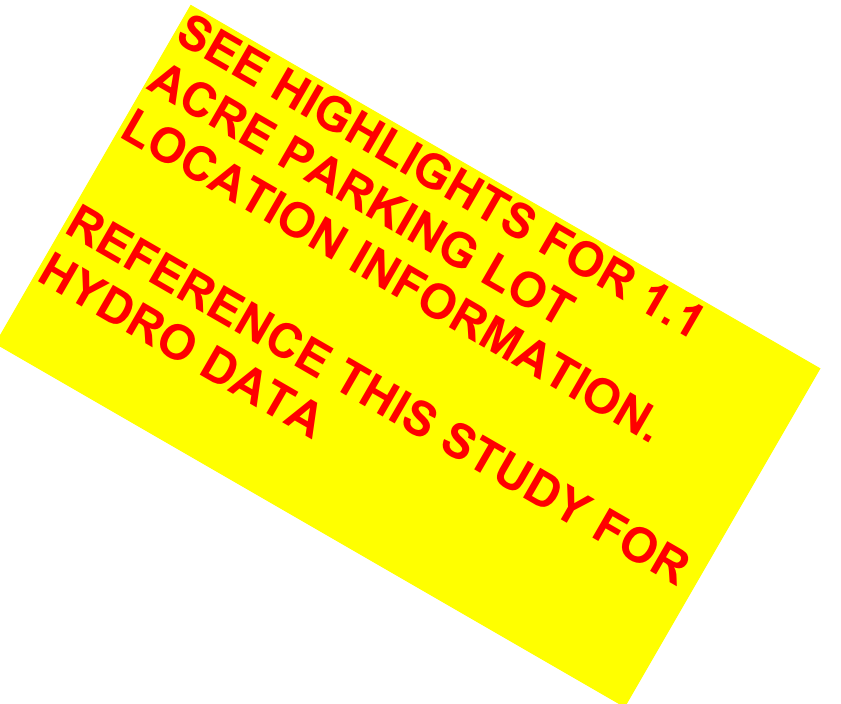
LUCKY DRAGON LP

LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY

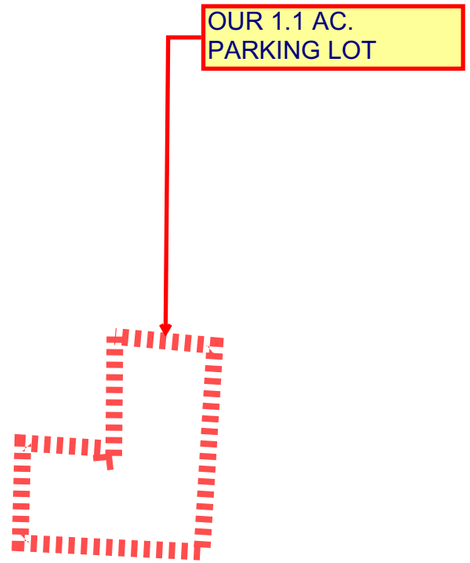
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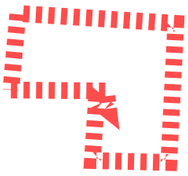
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4 OF 4 SHTS
CLV #

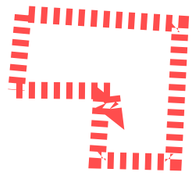
ce2436.dwg 070203.pv


SEE HIGHLIGHTS FOR 1.1
ACRE PARKING LOT
LOCATION INFORMATION.
REFERENCE THIS STUDY FOR
HYDRO DATA


OUR 1.1 AC.
PARKING LOT


OUR 1.1 AC.
PARKING LOT





DS # 3760

DS INDEX:

APN: 162-04-812-001 & 027

PROJECT: Allure Condominiums

SUBMITTAL CCDDS & CCRFCD

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: June 14, 2005
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Technical Drainage Study for: **Allure Condominiums**			**COPIES TO:** JHR Associates
Cross Streets:	NWC Sahara Av. & Fairfield Av. (W of LVBl)			SP Sahara Development.
File Number:	F:\Depot\DSMEMOS\DS3760B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-812-001 & 027			CCDDS
Zoning Action:	SDR-4534, VAC-5902, SUP-4540			CCRFCD
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	3/4/2005	3/18/2005	Conditional Approval	$400.00	17484: $400
CCDDS & CCRFCD	6/9/2005	6/14/2005	Concurrences	N/C	N/C
			TOTAL FEES (LDDRS):	**$400.00**	—

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.
	must have Clark County Department of Development Services concurrence

The following comments are repeated until they are complete:

1. *The project proposes to construct facilities and/or increase flows within Nevada Department of Transportation (NDOT) right-of-way. The engineer must contact NDOT for encroachment permit for the proposed project.*

2. *This project is shown as being developed in two Phases. A technical drainage study update is required for Phase 2.*

3. *Show the limits of the alley replacement. The alley reconstruction must be included as part of the Phase 1 improvements.*

4. *On Sheets G1 & G2: Indicate the building footprint. Provide the existing plan number for the storm drain within Sahara Ave. Extend the flood protection berm along Sahara Avenue to the center point of the Phase 2 building or provide a solid grouted 8" CMU stem wall a minimum of three cells above the back of walk. Show the roof drain discharge locations and connect to the streets using sidewalk underdrains. Review and revise the plan accordingly.*

5. *Sheet C11, Detail C: Indicate the minimum ramp elevation on the cross section and provide the minimum slope of the landscape area.*

6. *Landscape areas are not allowed to drain over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the street. Revise all pertinent details accordingly.*

7. *Sheet C11, Detail D: Provide the retaining wall height and provide railing as needed.*

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 Amendment 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 T/R/S: T21S/R61E/04
B&H/PBJ AREA R-04

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT

RECEIVED
MAY 24 2005

DS3760
R-04
N/C

Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

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City of Mesquite

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Bruce L. Woodbury
Clark County

May 12, 2005

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 S. Fourth St
Las Vegas, NV 89101

DISTRICT CONCURRENCE: ALLURE CONDOMINIUMS (DS3760) (RFCD NO. 05-6308)

Dear Mr. Fultz:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated February 21, 2005, for the above-mentioned project as submitted by JHR Associates. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Public Works dated March 18, 2005.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas 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 JHR Associates 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.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

BY: _____
Andrew R. Trelease, P.E.
Senior Civil Engineer

ART:css

c: Reese P. Jarrell, P.E., JHR Associates

File: 21-61-4.JHR

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: *http://www.ccrfcd.org*

Department of Development Services
Civil Engineering Division

500 S Grand Central Pky 1st Fl • PO Box 551799 • Las Vegas NV 89155-1799
(702) 455-4600 • Fax (702) 388-2550

Phil Rosenquist, Director

June 6, 2005

JHR Associates
4880 W. University Avenue, Suite B-2
Henderson, Nevada 89103

Re: **Technical Drainage Study Concurrence** for Allure Condominiums
Dated: March 4, 2005
Location: NWC Sahara Avenue and Fairfield Avenue
(Sec. 04, T21S, R61E)
CLV# DS3760A
HTE# 05-21511

The above-referenced project is located within the **City of Las Vegas** adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence on May 13, 2005. In addition, the County has received the City of Las Vegas acceptance letter dated March 18, 2005 for the Technical Drainage Study.

The County concurs with the acceptance of this Technical Drainage Study by the City of Las Vegas. Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas.

No liability is assumed by the County for information, data, and conclusions of the consulting engineer.

DEPARTMENT OF DEVELOPMENT SERVICES

By _____
Jeffery J. Jensen, P.E.
Senior Civil Engineer
Civil Engineering Division

cc: Development File
Albert Sung, P.E., City of Las Vegas

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THOM REILLY, County Manager

P.01

TRANSACTION REPORT

JUN-14-2005 TUE 02:53 PM

FOR: CITY OF LAS VEGAS 7023828551

SEND

DATE	START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
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TOTAL : 1M 36S PAGES: 3

Facsimile Transmission
Department of Public Works

Date: 6/14/05
Time: 2:55
Page 1 of 3

To: REESE SPERELL Of: JHR

Fax Number: /876-8395 Phone Number: /

From: ALBERT JUNG Of: CW

		FAX	PHONE
☐	**Administration**	702-382-0848	702-229-6276
☐	City Engineer Division	868-6374	229-6272
☐	Architectural Services	382-3232	229-6535
☐	Construction Services	254-4541	229-6337
☐	Engineering Design	382-3232	229-6272
☐	Pavement Management	366-0032	229-2453
☐	Special Improvement Districts	366-0032	229-2136
☐	Survey	804-8582	229-6217
☑	**Engineering Planning**	382-8551	229-6541
☑	Flood Control	382-8551	229-6541
☐	Land Development	383-9767	229-6371
☐	Right-of-Way	382-8551	229-6483

Facsimile Transmission

Department of Public Works

Date: 6 / 14 / 05

Time: 2:55

Page 1 of 3

To: REESE SPRELL Of: JHR

Fax Number: / 876-8395 Phone Number: /

From: ALBERT JUNG Of: CW

		FAX	PHONE
☐	**Administration**	702-382-0848	702-229-6276
☐	City Engineer Division	868-6374	229-6272
	☐ Architectural Services	382-3232	229-6535
	☐ Construction Services	254-4541	229-6337
	☐ Engineering Design	382-3232	229-6272
	☐ Pavement Management	366-0032	229-2453
	☐ Special Improvement Districts	366-0032	229-2136
	☐ Survey	804-8582	229-6217
☑	**Engineering Planning**	382-8551	229-6541
	☑ Flood Control	382-8551	229-6541
	☐ Land Development	383-9767	229-6371
	☐ Right-of-Way	382-8551	229-6483
	☐ Roadway Planning	382-8551	229-6541
	☐ Sanitary Sewer	382-8551	229-6541
☐	**Streets, Sanitation and Parks**	256-7817	229-6227
	☐ Downtown Beautification Office	384-0220	229-6521
	☐ Parks Maintenance	229-6144	229-6571
☐	**Traffic Engineering**	366-0032	229-6327
	☐ LVACTS	229-6613	229-6611
	☐ Traffic/Electrical Field Operations	382-0366	229-6331
	☐ Traffic Signal Repair	382-5845	229-6075
	☐ Transportation	474-7083	229-2452
☐	**Environmental (Water Pollution Control Facility)**	641-9738	229-6200
	☐ Industrial Waste Pretreatment	641-9738	229-6200
	☐ Lab	431-5133	229-6444
	☐ Supply	431-7835	229-6414

Message:

DS # 3760

DS INDEX:

APN: 162-04-812-001 & 027

PROJECT: Allure Condominiums

SUBMITTAL Plans

DS #: 4825

APN: 162.04.807.004 & 162-04.814.002

PROJECT: Lucky Dragon

SUBMITTAL: 1st Submittal

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: September 6, 2016
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: **Lucky Dragon – Update by a different engineer**			**COPIES TO:** Lochsa Engineering
Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue			Grand Canyon Development
File Number:	F:\Depot\DSMemos\DS4825A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-807-004 & 162-04-814-002			CCRFCD
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891			NDOT
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	9/1/2016	9/6/2016	See Comments Below	$400.00	457214: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

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. Provide a profile for the proposed extension of the 18"-lateral. The profile shall verify whether enough cover is provided for the storm drain.

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, 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.

END OF REMARKS

ays

T/R/S: T21S/R61E/04
AREA R-04

****
*** FAX TX REPORT ***
****

TRANSMISSION OK

JOB NO.	1240
DESTINATION ADDRESS	7023659317
PSWD/SUBADDRESS	
DESTINATION ID	
ST. TIME	09/06 10:36
USAGE T	00'30
PGS.	1
RESULT	OK

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: September 6, 2016

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:
Lucky Dragon – Update by a different engineer

Cross Streets: NWC of Sahara Blvd. & Fairfield Avenue

File Number: F:\Depot\DSMemos\DS4825A.doc

Parcel Number: 162-04-807-004 & 162-04-814-002

Zoning Action: TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891

FEMA Flood Zone	YES	NO **X**
Proposed Storm Drain	YES	NO **X**

COPIES TO:
Lochsa Engineering
Grand Canyon Development
Bart Anderson, P.E., DevCo
CCRFCD
NDOT

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	9/1/2016	9/6/2016	See Comments Below	$400.00	457214: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

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.

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Update to the Technical Drainage Study for Lucky Dragon

August 2016

Prepared for:

Terry Barnes
Grand Canyon Development
6841 S. Eastern Avenue, Suite 103
Las Vegas, Nevada 89119
(702) 492-5335

Prepared by:

Lochsa Engineering
6345 South Jones Boulevard, Suite 100
Las Vegas, Nevada 89118
(702) 365-9312

Lochsa Job No. 151059

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Date: August 25, 2016

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Avenue

East/West: Sahara Avenue

b) Section: 4 Township: 21 South Range: 61 East

c) APN : 162-04-816-001

Name of Owner: Terry Barnes - Grand Canyon Development

Telephone No.: (702) 492-5335 Fax No.: (702) 877-4700 E-Mail Address:

Address: 6841 S. Eastern Avenue, Suite 103, Las Vegas, Nevada 89119

Contact Person-Name: Mark Hedge, PE **Telephone No.:** (702) 365-9312

* **E-Mail Address:** chris.blake@lochsa.com **Fax No.:** (702) 365-9317

Firm: Lochsa Engineering

Address: 6345 South Jones Boulevard, Suite 100, Las Vegas, Nevada 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: 2.28 +/- Acres Being Developed/Disturbed: 2.28 +/- 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 (Casino/Hotel)
5. Approximate upstream land area which drains to the subject site: 6.3 +/- Acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Allure Condominiums (DS 3760)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Cincinnati Avenue and Sahara 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.**

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name:	Lucky Dragon	Map ID:	
Firm Name:	Lochsa Engineering	Engineer:	Mark Hedge, PE
Address:	6345 South Jones Boulevard Suite 100		
City:	Las Vegas	State: Nevada	Zip: 89118
Phone Number:	(702) 365-9312	Fax Number:	(702) 365-9317
Property Owner:	Grand Canyon Development		
Address:	6841 S. Eastern Avenue, Suite 103		
City:	Las Vegas	State: NV	Zip: 89119

Reviewed By:	Date Received:	Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

This document is intended as an aid in preparing Technical Drainage Studies. Each study is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT

Yes	No	
✓		Design Manual **Standard Form 1** with the engineer's seal and signature.
✓		Design Manual **Standard Form 4.**
✓		2 copies of the 24" x 36" Drainage Plan
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

REFERENCE:	**STANDARD FORM 2**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS

Yes	No	
✓	____	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
✓	____	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.
✓	____	Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.
✓	____	On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs.
✓	____	Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

Yes	No	
✓	____	Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
✓	____	Minimum scale: 1" = 60'.
✓	____	Project name.
✓	____	Vicinity Map with local and major cross streets.
✓	____	Revision box.
✓	____	North arrow and bar scale.
✓	____	Engineer's/consultant's address and phone number.
✓	____	Elevation datum and benchmark.
✓	____	Legend for symbols and abbreviations.
✓	____	Cut/fill scarps, where applicable.
✓	____	Street names, grades, widths.
✓	____	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.

REFERENCE:	**STANDARD FORM 2**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
✓		Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
✓		Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
	N/A	Proposed typical street sections.
	N/A	Streets with off-set crowns.
✓		Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
✓		Property lines.
✓		Right-of-way lines with widths, existing and proposed.
✓		Existing improvements and their elevations.
✓		Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
✓		Concentration points and drainage flow directions with Q_{100} and V_{100} and D_{100} in streets.
✓		Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
✓		Location and cross-section of street capacity calculations.
	N/A	Cross-sectional detail for channels, including cutoff wall locations.
✓		Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
✓		Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
	N/A	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
	N/A	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
____	N/A	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
✓	____	Building and/or lot numbers.
____	N/A	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
____	N/A	Limits of existing floodplain based on current FIRM of best available information; limits of proposed floodplains based on best available information.
____	N/A	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table.
✓	____	Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
✓	____	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.

IV. HYDROLOGIC ANALYSIS

Yes	No	
✓	____	Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
✓	____	Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
✓	____	Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
✓	____	Use of correct precipitation values in and around the McCarran Airport rainfall area.
✓	____	A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
✓	____	A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.
✓	____	Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
✓	____	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
____	N/A	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
✓	____	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. Q_{100} d x v $\leq$ 8. Q_{10} d x v $\leq$ 6 and 12 foot dry lane for rights-of-way $\geq$ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
✓	____	A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
____	N/A	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged).
✓	____	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
✓	____	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow of depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height of flow depth, which ever is greater.
____	N/A	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones.

- Field survey data
- Input and output information
- Plotted cross-sections based on survey with proper encroachments.
- A map showing the locations of the cross-sections.
- Analysis of both sub and super-critical flow segments.
- A summary table and a discussion of the results in the text of the report.

Provide a 50 percent clogging factor in the capacity calculation for drop inlets.

____	N/A	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
✓	____	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

The following checklist is intended as a supplemental guide for the engineer preparing a Technical Drainage Study submittal to the City of Las Vegas. This supplement focuses on requirements specific to the City of Las Vegas. The requirements presented are in addition to the Clark County Regional Flood Control District (CCRFCD) Manual Standard Form 2. The listed items are the minimum information required prior to the City performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the CCRFCD Hydrologic Criteria and Drainage Design Manual (Design Manual).

An appointment must be made to preview this checklist in conjunction with CCRFCD Standard Form 2 prior to the City accepting a new drainage study for review. The engineer must contact the Flood Control Section at (702) 229-6541 to schedule a submittal appointment.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT		
Yes	No	
	✓	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
	✓	Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
✓		An electronic copy of the complete submittal is required to be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output device replicating your submittal. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats. If figures are in color, they must be scanned in color and saved as a separate file. _____ by initial here, the engineer on record acknowledges that the electronic copy is an identical replicate of the original hard copy submitted to the City of Las Vegas.

II. GRADING PLAN INFORMATION		
Yes	No	
✓		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
✓		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
✓		Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet* around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)

II. GRADING PLAN INFORMATION		
Yes	No	
	✓	Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
	✓	All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
✓		Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
	✓	Back of lot elevations and lot drainage pattern for all lots including common lots.
	✓	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
✓		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
	✓	This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
✓		Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
✓		Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
	✓	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
	✓	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
✓		Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
	✓	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	✓	Lots with "B and C Type Drainage" that drain from one lot to another through a drainage easement shall be required to install an underground nuisance drainage system or a 2-foot valley gutter. 16" x 24" minimum block wall openings are required for both options.
	✓	Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36". Inlets must be sized to match the pipe size provided.

- Contact the Flood Control Section regarding the drainage study review fee. These fees are payable at the time of submittal.
- The Drainage Study must be conditionally approved prior to submitting improvement plans to the Civil and Planning Development of the Department of Building and Safety for review.

This document is intended as an **aid** in preparing Technical Drainage Studies for the City of Las Vegas. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all-inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

T 702-365-9312 | F 702-365-9317
6345 S Jones Blvd, Suite 100
Las Vegas, NV 89118

Lochsa engineering

September 1, 2016

Mr. Albert Sung, P.E.
City of Las Vegas Public Works
Flood Control Division
333 North Rancho Drive
Las Vegas, NV 89106

Subject: **Update to Technical Drainage Study for Lucky Dragon**
Previous DS4659
Lochsa Job # 151059

Dear Mr. Sung,

This letter is intended as an Update to the approved "Technical Drainage Study for Lucky Dragon", hereinafter will be referred to as the 'Original Study'. The Original Study was prepared by G.C. Wallace Companies, and was approved by the City of Las Vegas on May 22, 2014 (DS4659). The proposed development within the Original Study included a hotel and a casino on the undeveloped land to the west of the existing Allure Condominium Complex. The proposed development also includes a drive aisle, associated surface parking, curb and gutter. The site is located near the northwest corner of Las Vegas Blvd. and Sahara Avenue intersection. The improvements are currently under construction per the approved study and approved plans. A Minor revision for the storm drain in Sahara Avenue is being proposed to the site plan to better accommodate the use of the existing storm drain and proposed NDOT type 3 DI. The revision is limited to eliminating the 18" RCP storm drain that runs along the frontage of the site in the north portion of the Sahara Avenue Right-of-Way (NDOT) from west to east (approximately 190 feet) and also relocating the proposed NDOT Type 3 DI located just west of the driveway entrance. Instead, we are proposing to extend a portion of the 18" RCP lateral to the north curb line of the proposed 12-foot right turn lane. With this revision, we are proposing to eliminate the proposed manhole and instead extend the lateral north to a NDOT Type 3 drop inlet (our revised location) to connect and extend the existing 18" RCP into. The previously approved grading plan has been revised to accommodate these site plan revisions. This Update is being submitted to address this revision to the approved grading plan.

The previously approved design by GC Wallace added a proposed Manhole where an existing NDOT Type 3 Drop inlet existed, and then chased an 18" RCP storm drain to the west along Sahara Avenue where they have relocated the NDOT Type 3 DI just west of the proposed driveway entrance. During construction of the site, they found out the proposed Manhole did not have the minimum cover required over the pipe as was shown on the approved plans. Therefore the manhole could not be constructed at this location.

Lochsa Engineering is doing an Update for the 18" RCP storm drain. We are proposing to eliminate the relocation of the NDOT Type 3 DI to the west (by GC Wallace) and the 18" RCP that runs to the west. Instead, we are eliminating the proposed Manhole (by GC Wallace) and extending the 18" lateral (concrete-cased) to the north where the north half of Sahara Avenue is extended to include a 12-foot right turn lane. We have maintained the existing 18" RCP lateral slope (0.80%) to the north to the proposed curb of the right turn lane where we are proposing a NDOT Type 3 DI. We have revised the longitudinal slope of the right turn lane (west of proposed NDOT Type 3 DI) to 0.40%, to help provide cover over the pipe at the revised location of the NDOT Type 3 DI. We have included the necessary revised plans for clarity. Please note that we have achieved 1ft of cover over the crown of the pipe (worst case). If you add the thickness of the pipe (3-inches), the cover to the top of pipe is 9-inches (worst case).

Please note that the proposed NDOT type 3 drop inlet at this location has the same capacity as the previously approved proposed NDOT Type 3 drop inlet west of the project driveway. Therefore, no NDOT right-of-way, downstream facilities or properties will be impacted. Please note that the 10-year flow in Sahara Avenue ROW is 0cfs, as all storm runoff in the ROW is maintained in existing drainage facilities.

As shown in the included copies of the approved and revised grading plan (Sheet C-6), proposed revisions do not impact the previously approved drainage pattern. As shown in the previously approved Figure 6 (FIG-6) for the "Drainage Basin Map, Proposed Conditions", the project site was delineated into two basins ON1(3/6cfs, 2.00acres) and ON2(1/2cfs, 0.50acres). As described in the Original Study, runoff from ON1 travels northerly to Cincinnati Avenue and combines with referenced offsite basins **OFF1 (3.80ac.- 4/9cfs) and **OFF2 (2.50ac.- 2/6cfs) at Concentration Point 1 (CP1- 9/19cfs). The runoff from onsite basin ON2 is conveyed south to Sahara Avenue through the proposed driveway entrance. The hydrology and drainage patterns all remain the same. Also, the grading plan was not revised for this Update. Therefore, we have not provided a revised drainage exhibit. The previously approved exhibit illustrates the correct delineated onsite basins as they remain unchanged from the Original Study. Review of the offsite watershed impacting the site, Sahara Avenue and Cincinnati Avenue also indicates that offsite flows will remain as determined in the Original Study.

As described in the Original Study, the project site is located approximately 800ft west of the intersection of Las Vegas Blvd. and Sahara Ave. within the City of Las Vegas jurisdiction, Nevada. West Cincinnati Ave. borders the site from the north and is a fully developed 50ft right-of-way. Sahara Ave. borders the site from the south and is a fully developed 120ft right-of-way. The western boundary of the site is surrounded by a commercial site (APN 162-04-807-003) and a Condo subdivision. The remainder eastern boundary of the site is surrounded by the Allure Condominiums with Assessor's Parcel Number (APN) 162-04-815-000. The site is specifically located within a portion of the Southern Half (S 1/2) of the Southeast Quarter (SE 1/4) of Section 04, Township 21 South, Range 61 East, of the M.D.M., in the City of Las Vegas, Nevada. The project site is also identified with APN 162-04-816-001. Please refer to the copy of the Assessor's Parcel Map and the vicinity map (Figure 1) for the subject site as referenced from the Original Study.

The "*2008 Las Vegas Valley Flood Control Master Plan Update*", as prepared by Post Buckley Schuh and Jernigan, Inc. (PBS&J), in association with Louis Berger Group and Parsons Brinckerhoff, for the Clark County Regional Flood Control District (CCRFCD) illustrates the existing and proposed master-planned facilities. The CCRFCD facility exhibits and inventory tables were updated in 2013. As shown in Figure F-31 of the 2013 MPU, the future CCRFCD facility runs along the south side of Sahara Avenue adjacent to our site. The storm drain is identified as a 14'x12' RCB (labeled as BHSA 0289), with a design flow of 3,566cfs and a 0.87% slope.

The project site is covered by Flood Insurance Rate Map (FIRM) for Clark County, Nevada, and incorporated areas, community panel number: 32003C2170F, effective date: November 16, 2011. Review of Panel 2170 indicates that the site is entirely located within Zone "X" (unshaded), described by FEMA as: "*Areas determined to be outside the 0.2% annual chance floodplain*". Please refer to the attached referenced Figure 2 from the Original Study for the location of the site on a portion of the above referenced FIRM.

The subject drainage study update is specifically provided as a support document for the aforementioned revisions to the Lucky Dragon. This update is in conformance with the approved "Technical Drainage Study for Lucky Dragon", (DS4659). The drainage design associated with the proposed revisions is based on generally accepted engineering practices and is in compliance with the CCRFCD's "*Hydrologic Criteria and Drainage Design Manual*" and 2008 MPU. The proposed revisions do not impact the previously approved drainage pattern. Please refer to the attached grading plan and details for further clarification of the proposed revisions.

If you have any questions or comments, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
LOCHSA ENGINEERING

Mark Hedge, P.E.
Principal

REVISED FIGURE F-31 FROM 2013 MPU

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 31
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin

- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

PROJECT SITE

N

0 500 1,000 2,000 3,000
Feet

Scale: 1 inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)

US95 I-15 I-215

	1	2	3							A1	A2	
	4	5	6							A3	A4	
		7	8	9	10					A5	A6	
11	12	13	14	15	16	17						
	18	19	20	21	22	23						
	24	25	26	27	28							
	29	30	31	32	33	34						
	35	36	37	38	39	40						
	41	42	43	44	45	46						
	47	48	49	50	51	52						
	53	54	55	56								
	57	58	59									

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BHSA		BOULDER HIGHWAY SAHARA AVENUE						
0175	P1	14' X 14' RCB	6000	3837	CSA13	SW3	7.93	0.67
0289	P1	14' X 12' RCB	2300	3566	CSA11	SW3	7.55	0.67
0331	P1	14' X 11' RCB	2000	3232	CSA10-1	SW3	7.15	1.00
CHRA		WEST CHARLESTON DRAINS - RANCHO						
0000	E	6' X 5' RCB	310	286	CAL95	SW3	0.62	1.92
0006	E	5' X 5' RCB	420	286	CAL95	SW3	0.62	1.00
0014	E	5' X 4' RCB	600	286	CAL95	SW3	0.62	1.50
FLBN		FLAMINGO - BOULDER HIGHWAY NORTH						
0281	P1	10' X 7' RCB	1300	1259	CCH56	SW3	1.64	1.33
0312	P1	7' X 4' RCB	1800	555	CCH52	SW3	0.55	4.20
0342	P1	7' X 4' RCB	2500	555	CCH52	SW3	0.55	4.20
FLFA		FLAMINGO - FASHION						
0000	E	12' X 5' RCB	2050	747	CFW17N	FLAM3A	0.72	0.28
0037	E	8' X 5' RCB	3060	526	FW14	FLAM3A	0.44	0.45
FW15		FREEWAY CHANNEL FROM DESERT INN TO EXPRESSWAY						
0000	E	3: 12' X 10' RCB	2170	3728	CAL93	SW4	10.63	0.17
0010	E	3: 12' X 10' RCB	677	3403	CAL96	SW4	10.10	0.17
0038	E	3: 12' X 10' RCB	1945	3344	CCCH22	SW4	9.92	0.17
0050	E	3: 12' X 10' RCB	870	2613	CCH50	SW4	8.54	0.17
0089	E	3: 12' X 10' RCB	980	2448	CCWAL2	SW4	8.28	0.17
0100	E	3: 12' X 9' RCB	1575	2295	COK11C	SW3	7.83	0.17
0125	E	2: 10' X 8' RCB	1350	1450	DCCSA08	SW3	6.67	0.80
0150	E	2: 10' X 8' RCB	1067	1450	DCCSA08	SW3	6.67	0.80
0175	E	2: 10' X 8' RCB	985	1450	DCCSA08	SW3	6.67	0.75
0214	P1	2: 12' X 10' RCB	1610	4104	CED10-C	SW3	6.25	0.73
0242	P1	2: 12' X 9' RCB	1500	3968	CCPS08	SW3	6.03	0.93
0271	P1	2: 12' X 10' RCB	1520	3674	CPS08	SW3	5.59	0.59
0301	P1	Conc Chnl 12'W 4'D 2:1 SS	1300	433	CCE3FD-C	SW3	0.54	0.42
FWCH		WEST CHARLESTON DRAIN						
0000	E	10' X 7' RCB	1710	1008	CCH22	SW3	1.38	0.74
0020	E	10' X 7' RCB	840	783	CCCH18-C	SW3	1.15	0.40
0036	E	9' X 7' RCB	425	783	CCCH18-C	SW3	1.15	0.40
0044	E	9' X 7' RCB	145	538	CCH18-C	SW3	0.53	0.40
0047	E	7' X 5' RCB	710	538	CCH18-C	SW3	0.53	2.05
0060	E	5' X 4' RCB	400	538	CCH18-C	SW3	0.53	0.40
FWOK		OAKEY DRAIN						
0000	E	10' X 8' RCB	1350	928	1COK11C	SW3	1.16	0.62
0020	E	10' X 8' RCB	1025	928	1COK11C	SW3	1.16	0.60
0040	E	8' X 8' RCB	960	721	COK10	SW3	0.85	1.00
0060	E	5' X 5' RCB	970	453	COK09-C	SW3	0.55	1.50
0076	E	6' X 6' RCB	1175	453	COK09-C	SW3	0.55	9.40
0100	E	6' X 6' RCB	980	453	COK09-C	SW3	0.55	1.98
FWPS		PALMYRA / SIRIUS DRAIN						
0000	P1	12' X 11' RCB	3000	3240	CCPS06	SW3	4.88	1.50
0057	P1	10' X 10' RCB	5220	1941	CPS06	SW3	2.78	1.28
0157	P1	2: 66" RCP	5100	521	CPS03	SW3	0.60	1.15
FWR2		FREEWAY CHANNEL - RAILROAD CHANNEL						
0000	E	5' X 5' RCB	377					1.60
0020	E	Earth Chnl 10'W 4'D 2:1 SS	650					0.50
FWRR		FREEWAY CHANNEL BYPASS FACILITY RR BRANCH						
0000	E	48" RCP	70					1.22
0010	E	Conc Chnl 4'W 4'D 0:1 SS	220					1.22
FWSA		FREEWAY CHANNEL - SAHARA						
0000	P1	7' X 5' RCB	5700	486	CSA08	SW3	0.42	1.49
FWSH		SHADOW LANE DRAIN						
0000	E	7' X 4' RCB	950	253	CH22-C	SW3	0.23	0.20

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
FWUP		FREEWAY CHANNEL BYPASS FACILITY						
0000	E	10' X 9' RCB	350	242	CH50	SW3	0.26	0.37
0010	E	10' X 8' RCB	804	242	CH50	SW3	0.26	0.37
0059	E	10' X 6' RCB	2680	242	CH50	SW3	0.26	0.40
0100	E	8' X 4' RCB	1440	242	CH50	SW3	0.26	0.47
FWVV		VALLEY VIEW DRAIN						
0000	P1	12' X 11' RCB	1320	1475	CCE3FA	SW3	2.67	0.30
0025	P1	10' X 10' RCB	2665	1006	CR4C1	SW3	1.74	0.30
0050	P1	8' X 6' RCB	7785	712	DFW5	SW3	1.34	1.50
FWWL		FREEWAY CHANNEL-WALDMAN AVENUE						
0000	E	6' X 6' RCB	1000	418	CWAL2	SW3	0.45	0.20
LCCH		LAS VEGAS CREEK CHANNEL						
0000	E	2: 12' X 7' RCB	730	2894	CLC20-C	MEADOWS4	9.68	1.28
0013	E	2: 12' X 6' RCB	2035	2894	CLC20-C	MEADOWS4	9.68	0.82
0051	E	2:14' X 7' RCB	3113	2894	CLC20-C	MEADOWS4	9.68	0.60
0110	E	Transition Structure	220	2798	CCLC16-C	MEADOWS4	9.51	
0114	E	2: 14' X 7' RCB	670	2329	CRMEDET	MEADOWS4	8.25	0.80
0127	E	Transition Structure	110	2329	CRMEDET	MEADOWS4	8.25	
0129	E	2: 14' X 7' RCB	1130	2329	CRMEDET	MEADOWS4	8.25	0.50
0150	E	2: 13' X 7' RCB	200	2329	CRMEDET	MEADOWS4	8.25	0.95
0154	E	Transition Structure	190	2329	CRMEDET	MEADOWS4	8.25	
0157	E	2: 12' X 6' RCB	1650	1631	CCLC14-C	SW3	2.99	1.06
0230	E	12' X 6' RCB	2140	1381	CLC14-C	SW3	2.54	1.74
0270	E	12' X 6' RCB	1705	774	CCWA02-C	SW3	1.84	0.54
0302	E	8' X 6' RCB	3940	774	CCWA02-C	SW3	1.84	2.49
0377	E	10' X 7' RCB	1226	774	CCWA02-C	SW3	1.84	0.74
0400	E	Transition Structure	110	437	CWA02-C	SW3	1.47	0.49
0402	E	8' X 6' RCB @ Jones	535	437	CWA02-C	SW3	1.47	0.49
0412	E	60" RCP	1370	437	CWA02-C	SW3	1.47	1.08
0438	E	60" RCP	1090	162	CLC01-C	SW3	1.20	1.60
0458	E	60" RCP	1060	162	CLC01-C	SW3	1.20	1.60
0478	E	60" RCP	1110	162	CLC01-C	SW3	1.20	0.55
LCDE		LAS VEGAS CREEK - DECATUR						
0000	E	6' X 5' RCB	1800	404	LC11-C	SW3	0.38	1.26
0034	E	72" RCP	700	404	LC11-C	SW3	0.38	0.50
LCJO		LAS VEGAS CREEK - JONES						
0000	E	6' X 6' RCB	380	358	AL01B-C	SW3	0.37	0.50
0007	E	6' X 5' RCB	675	358	AL01B-C	SW3	0.37	0.62
LCME		LAS VEGAS CREEK - MEADOWS						
0000	E	14' X 8' RCB	895	1423	MEADOWDB	SW3SC	5.67	0.72
0016	E	Stilling Basin	140	1423	MEADOWDB	SW3SC	5.67	0.21
0017	E	3,300 cfs Spillway (Replace w/ LCME0018)		3300	MEADOWIN	SW3SC	5.67	
0018	P1	Modify Spillway, raise height by 1' (Replaces LCME0017)		3300	MEADOWIN	SW3SC	5.67	
0019	E	1: 11' X 5' RCB and 1: 11.5' X 5' RCB	110	1423	MEADOWDB	SW3SC	5.67	0.81
0020	E	213 ac-ft Meadows Detention Basin		4713	MEADOWIN	SW3SC	5.67	
0021	P1	Upgrade to 235 ac-ft Meadows Detention Basin		4713	MEADOWIN	SW3SC	5.67	
0026	E	Energy Dissipator	110	4713	MEADOWIN	SW3SC	5.67	2.94
0028	E	Conc Chnl 42'W 9'D 0:1 SS	922	4713	MEADOWIN	SW3SC	5.67	0.40
0040	E	Conc Chnl 40'W 10'D 0:1 SS	525	4593	CAL90-C	SW3SC	5.44	0.40
0070	E	Conc Chnl 40'W 8.5'D 0:1 SS	255	4593	CAL90-C	SW3SC	5.44	0.40
0076	E	Free Span Bridge 18'W 8'D @ Alta	100	4441	CCAL16	SW3SC	5.27	1.89
0077	E	Conc Chnl 18'W 8'D 1:1 SS	618	4441	CCAL16	SW3SC	5.27	1.89
0085	E	10' X 6' RCBC @ Valley View	275	1661	1CAL16	SW3	2.09	1.89
LCRA		LAS VEGAS CREEK - RANCHO						
0000	E	12' X 8' RCB	380	783	CLC16-C	SW3	1.71	0.60
0004	E	12' X 6' RCB	2367	783	CLC16-C	SW3	1.71	0.77
LVOE		OWENS AVENUE - EAST						
0345	P1	13' X 11' RCB	1685	2369	DLVOE	SW5	22.79	0.60

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
LVWH		WASHINGTON AVENUE CHANNEL						
0431	E	3: 14.33' X 10' RCB	665	2870	DCLC21	SW5	22.79	0.15
0446	E	Junction Structure	69	2870	DCLC21	SW5	22.79	0.15
0447	E	3: 14.33' X 10' RCB	1955	4978	CCAL93	SW5	22.19	0.15
0484	E	Confluence Structure	455	4978	CCAL93	SW5	22.19	0.15
MEAL		MEADOWS ALTA						
0000	E	Conc Chnl 8'W 11'D 1:1 SS	700	1207	CAL13-3	SW3	1.48	1.58
0012	E	12' X 6' RCBC @ Red Sky	160	1161	CAL10-C	SW3	1.42	3.03
0013	E	Conc Chnl 8'W 11'D 1:1 SS	320	1161	CAL10-C	SW3	1.42	3.03
0015	E	72" RCP	2500	1126	CAL11-C	SW3	1.38	1.94
0060	E	60" RCP	905	792	CBR3	SW3	1.08	1.00
0100	E	72" RCP	1160	792	CBR3	SW3	1.08	1.00
0120	E	60" RCP	3500	733	CAL05-C	SW3	1.01	1.00
0130	E	6' X 4' RCB	1150	186	AL04-C	SW3	0.18	0.40
0150	E	60" RCP	285	499	CCUS	SW3	0.74	1.40
0160	E	36" RCP	2600	331	CUS	SW3	0.56	1.25
0209	E	48" RCP	2500	150	DCR2	SW3	0.41	1.70
MECH		EXTENSION OF MEADOWS / CHARLESTON						
0059	E	36" RCP	1310					0.25
0084	E	30" RCP	2960					1.26
0108	E	30" RCP	8550	32	OAKEYOT	SW3	1.88	1.43
0310	E	24" RCP	1000	32	OAKEYOT	SW3	1.88	1.43
0323	E	15" RCP Outlet	200	32	OAKEYDB	SW3	1.88	
0324	E	201 ac-ft Oakey Detention Basin		1652	OAKEYIN	SW3	1.88	
0334	E	11' X 6' RCB	200	573	C5-OAK-C	SW3	0.56	0.50
0337	E	9' X 6' RCB	520	573	C5-OAK-C	SW3	0.56	0.50
0338	E	10' X 8' RCB	2060	1131	C3A-OAKC	SW3	1.32	1.62
0351	E	90" RCP	1350	573	C5-OAK-C	SW3	0.56	0.50
MECN		MEADOWS - CHARLESTON						
0000	P1	9' X 8' RCB	1570	1105	CCH10	SW3	1.00	1.09
0061	P1	8' X 7' RCB	3300	1105	CCH10	SW3	1.00	1.82
0123	P1	8' X 6' RCB	5200	821	CCH09-C	SW3	0.72	1.64
0223	P1	6' X 5' RCB	2700	422	CCH05-C	SW3	0.34	2.04
MEOK		OAKEY MEADOWS STORMDRAIN						
0000	E	19' X 7' RCB	900	2718	COK13	SW3SC	2.94	0.91
0017	E	19' X 8' RCB	1550	2718	COK13	SW3SC	2.94	0.80
0048	E	18' X 9' RCB	1700	2718	COK13	SW3SC	2.94	0.50
0070	E	7' X 6' RCB	1320	226	CH14B	SW3	0.22	0.44
0079	E	18' X 8' RCB	630	2450	COK12	SW3SC	2.62	0.50
0091	E	18' X 8' RCB	850	2450	COK12	SW3SC	2.62	0.50
0110	E	12' X 8' RCB	2304	1491	COK08	SW3	1.58	0.77
0150	P3	12' X 8' RCB	642	1491	COK08	SW3	1.58	0.77
0166	P3	12' X 9' RCB	1350	1491	COK08	SW3	1.58	0.45
0191	P3	12' X 7' RCB	660	957	COK07	SW3	0.93	0.71
0204	P3	12' X 6' RCB	655	957	COK07	SW3	0.93	0.71
0217	P3	12' X 5' RCB	1276	556	CSA06	SW3	0.52	0.44
MEPA		MEADOWS PARALLEL						
0000	E	10' X 6' RCB	1370	259	CCH14A	SW3	0.25	0.50
0022	E	6' X 5' RCB	200	259	CCH14A	SW3	0.25	1.45
0025	E	78" RCP	470	259	CCH14A	SW3	0.25	1.16
PSDE		PALMYRA / SIRIUS DRAIN - DECATUR LATERAL						
0000	P1	12' X 8' RCB	1330	1018	CED02	SW3	1.21	0.38
0025	P1	10' X 8' RCB	1320	598	CED13	SW3	0.65	0.25
WAGC		WASHINGTON AVENUE CHANNEL - GRAND CENTRAL						
0000	E	2: 12' X 4' RCB	700	557	LC21	SW3	0.60	0.20
0014	E	1: 12' X 4' RCB and 1: 11' X 4' RCB	2440	557	LC21	SW3	0.60	0.20
0060	E	12' X 4' RCB	455	557	LC21	SW3	0.60	0.20

** The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.*

*** As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.*

^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e., HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

REGIONAL FLOOD CONTROL DISTRICT

2013 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F - 31

LEGEND

ID (Facility Identifier) AABB
Parent Stream Name
Stream Name
River Mile 0000
Distance Above Confluence with Parent Stream (Miles)
Miles in Hundredths

Existing Facility.....E
Proposed or Modified Facility.....P
Contingency Level
Category B.....P0
Master Plan.....P1
Preliminary Design.....P2
Design.....P3

Bottom Width.....W
Depth.....D
Side Slope, H:V.....SS

Construction Features

Cast in Place Concrete Pipe.....CIPCP
Corrugated Metal Arch Pipe Culvert.....CMAP
Corrugated Metal Pipe Culvert.....CMPC
High Density Polyethylene.....HDPE
Horizontal Elliptical Reinforced Concrete Pipe.....HERCP
Reinforced Concrete Arch Pipe.....RCAP
Reinforced Concrete Arch Culvert.....RCAC
Reinforced Concrete Box.....RCB
Reinforced Concrete Box Culvert.....RCBC
Reinforced Concrete Pipe.....RCP
Reinforced Concrete Pipe Culvert.....RCPC
Storm Sewer Pipe.....SSP

FIGURES

APN MAP

FIRM

NOTES

This map is for assessment use only and does NOT represent a survey.

No liability is assumed for the accuracy of the data deliniated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL

0 100 200 400 600 800

MAP LEGEND

PARCEL BOUNDARY
SUB BOUNDARY
PM/LD BOUNDARY
ROAD EASEMENT
MATCH / LEADER LINE
HISTORIC LOT LINE
HISTORIC SUB BOUNDARY
HISTORIC PM/LD BOUNDARY
SECTION LINE

CONDOMINIUM UNIT
AIR SPACE PCL
RIGHT OF WAY PCL
SUB-SURFACE PCL

001 ROAD PARCEL NUMBER
001 PARCEL NUMER
1.00 ACREAGE
202 PARCEL SUB/SEQ NUMBER
PB 24-45 PLAT RECORDING NUMBER
5 BLOCK NUMBER
5 LOT NUMBER
GLS GOV. LOT NUMBER

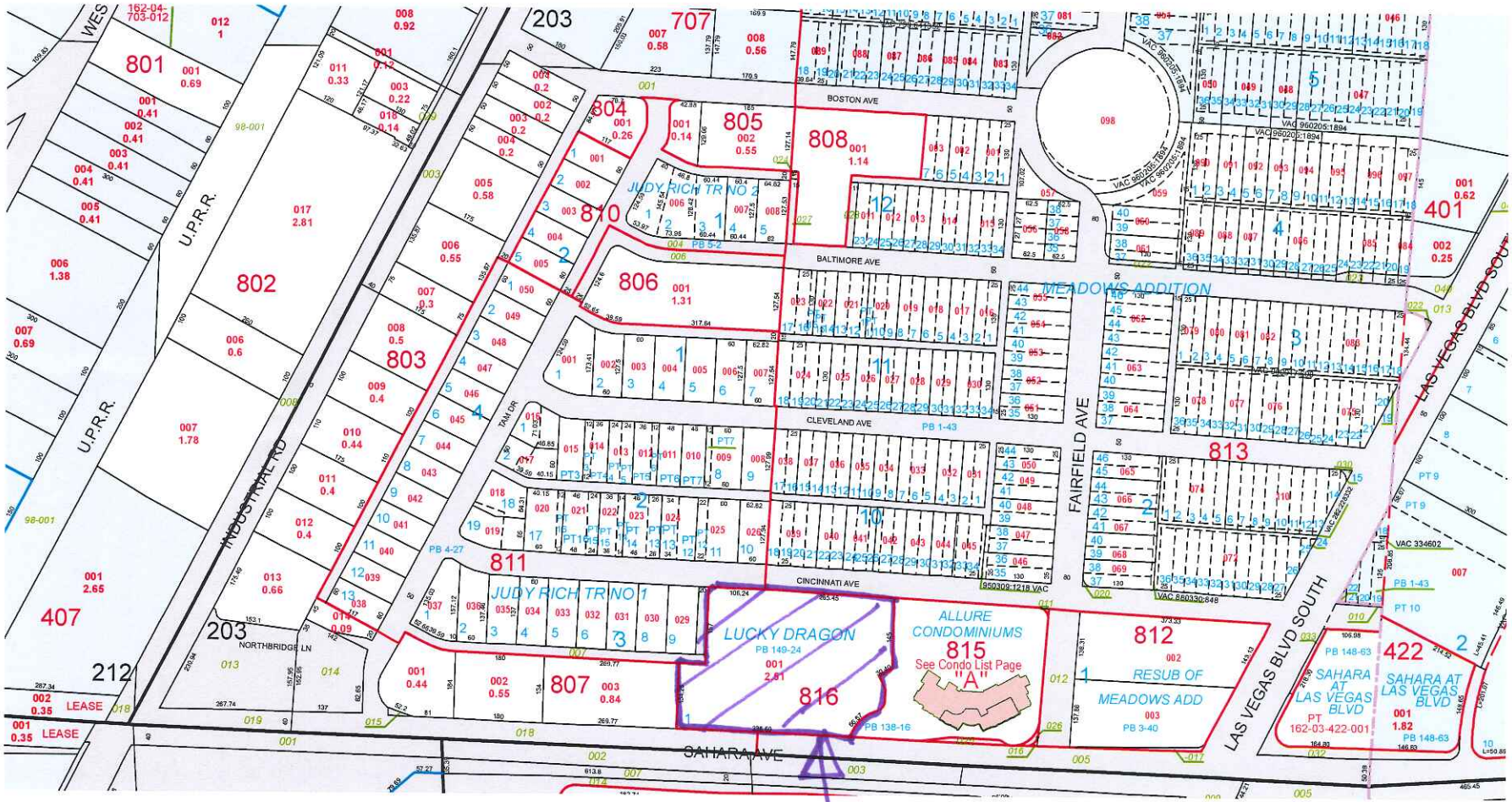
ASSESSOR'S PARCELS - CLARK CO., NV.
Michele W. Shafe - Assessor

BOOK T21S R61E | SEC. 4 | MAP S 2 SE 4 | 162-04-8

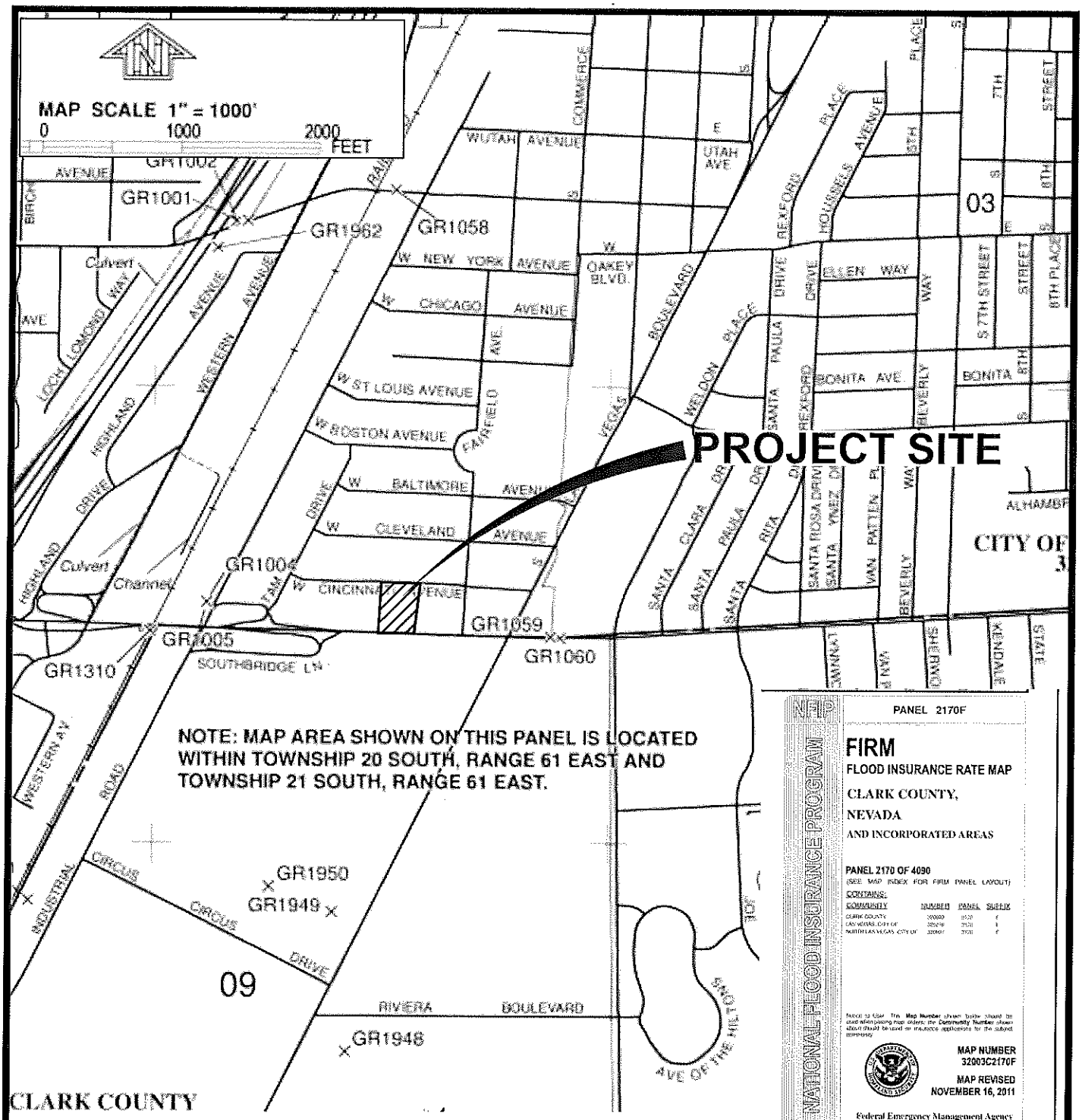
138	139	140
163	162	161

Scale: 1" = 200' Rev: 4/28/2015

CLARK COUNTY ASSESSOR PARCEL MAP DIVISION NEVADA



TAX DIST 212,203



DRAWN BY: CB	SCALE: 1" = 1000'	FLOOD INSURANCE RATE MAP (FIGURE 2)	PROJECT No.: 151059
CHECKED BY: CB	DATE: 08-24-16		SHEET No. 2

Lochsa engineering
6345 South Jones Blvd. Suite 100
Las Vegas, NV 89118
Phone (702) 365-9312 - Fax (702) 365-9317

LUCKY DRAGON

SHEET 1 OF 1

EXCERPTS FROM THE

"TDS FOR THE LUCKY DRAGON"

(DS 4659)

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 14, 2014
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: **Lucky Dragon**			**COPIES TO:** G.C. Wallace Companies
Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue			Lucky Dragon LP
File Number:	F:\Depot\DSMemos\DS4659B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-807-004 & 162-04-814-002			CCRFCD
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891			CCPW
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/10/2014	3/24/2014	Not Approved	$400.00	350152: $400
2nd Submittal	4/10/2014	4/14/2014	See Comments Below	$400.00	353390: $400
			TOTAL FEES (LDDRS):	**$800.00**	----

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.
X	is conditionally approved subject to Clark County Public Works Department concurrence.

1. **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.
2. This project is also adjacent to the jurisdiction of *Clark County* to the south of *Sahara Avenue*. *Clark County Public Works Department*'s concurrence must be obtained prior to the final approval of the drainage study.
3. The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right of way (*Sahara*). The engineer must contact NDOT for encroachment permit for the proposed development.

REGIONAL FLOOD CONTROL DISTRICT

Rec'd: 5/13/14
DS 4659
R-04
N/C

Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

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Chairman
Clark County

Debra March
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City of Las Vegas

Mayor Roger Tobler
City of Boulder City

Mayor Mark Wier
City of Mesquite

May 1, 2014

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

DISTRICT CONCURRENCE: LUCKY DRAGON HOTEL & CASINO
(DS 4659B) (RFCD No. 14-9307)

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated February 26, 2014, Addendum No. 1 dated April 9, 2014, for above-mentioned project as submitted by G.C. WALLACE COMPANIES. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas dated April 14, 2014.

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

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 G.C. WALLACE COMPANIES 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.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

BY: _____
Abigail Mayrena, P.E., CFM
Senior Engineer

AM:eb

c: Jerry E. Pruitt, P.E., G.C. Wallace Companies

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2014\L-14-9307.doc

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 685-0000 • FAX: (702) 685-0001
Website: http://www.regionalflood.org

TECHNICAL DRAINAGE STUDY
FOR
LUCKY DRAGON

398-A436C

March 2014

Prepared For:

Lucky Dragon LP
3575 West Post Road
Las Vegas, Nevada 89118
Phone: (702) 897-5625

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Date: 04/09/2014

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Ave

East/West: Sahara Avenue

b) Section: 4 Township: 21 Range: 61 East

c) APN : 162-04-807-004

162-04-814-002

Name of Owner: Lucky Dragon LP - David S Jacoby

Telephone No.: (702) 897-5625 Fax No.: E-Mail Address: jacobyd@ggamllc.com

Address: 3575 West Post Road, Las Vegas, NV 89118

Contact Person-Name: Jerry E. Pruitt **Telephone No.:** (702) 804-2000

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

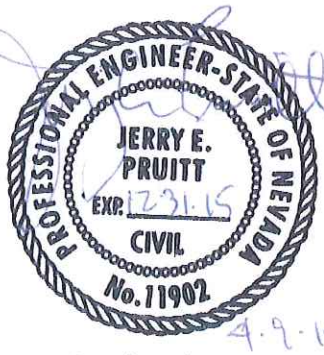
Firm: G.C. Wallace Inc.

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	X	Building Permit		

1. Total Owned Land Area: At Site: +/- 2.28 acres Being Developed/Disturbed: +/-2.28 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: +/- 6.3 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Allure Condominiums
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Cincinnati Avenue and Sahara Avenue
8. Briefly describe your proposed schedule for the subject project: ASAP



4-9-14

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.

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

I. INTRODUCTION

Lucky Dragon LP is proposing to develop a hotel and casino on the undeveloped land to the west of the existing Allure Condominium Complex. The project area lies within the approximately 2.5 acres parcels APN 162-04-807-004, 162-04-811-028, 162-04-814-002, and 162-04-899-021. This study addresses the development of the proposed hotel and casino. Design flow rates and drainage patterns for the site were previously established in the Allure Condominiums Hydrology Study (Reference 1, hereinafter referred to as the Allure Study).

The purpose of this report is to accompany the grading plans, to provide detailed hydrologic and hydraulic analyses for the site, and to determine adequate protection for the project from offsite and onsite flows. The following tasks were performed in the preparation of this report:

- Identify previous drainage studies for the project site and surrounding areas.
- Identify the FEMA floodplain designation for the project site.
- Identify existing and proposed regional drainage facilities adjacent to the site.
- Estimate runoff generated for the peak 10-year, 25-year, and 100-year return period storms for existing and proposed conditions.
- Recommend drainage facilities to protect the project from storm runoff.

II. LOCATION AND DESCRIPTION

The project site is located in Section 4, Township 21 South, Range 61 East, M.D.M., in City of Las Vegas, Clark County, Nevada. Please refer to Figures 1 and 2 for the vicinity and location of the project site. The site is presently undeveloped and is bordered by Cincinnati Avenue to the north, Allure Condominium development to the east, high density residential and commercial property to the west, and Sahara Avenue to the south. For this study, the proposed onsite improvements include a hotel and casino, streets, parking, curb and gutter, etc.

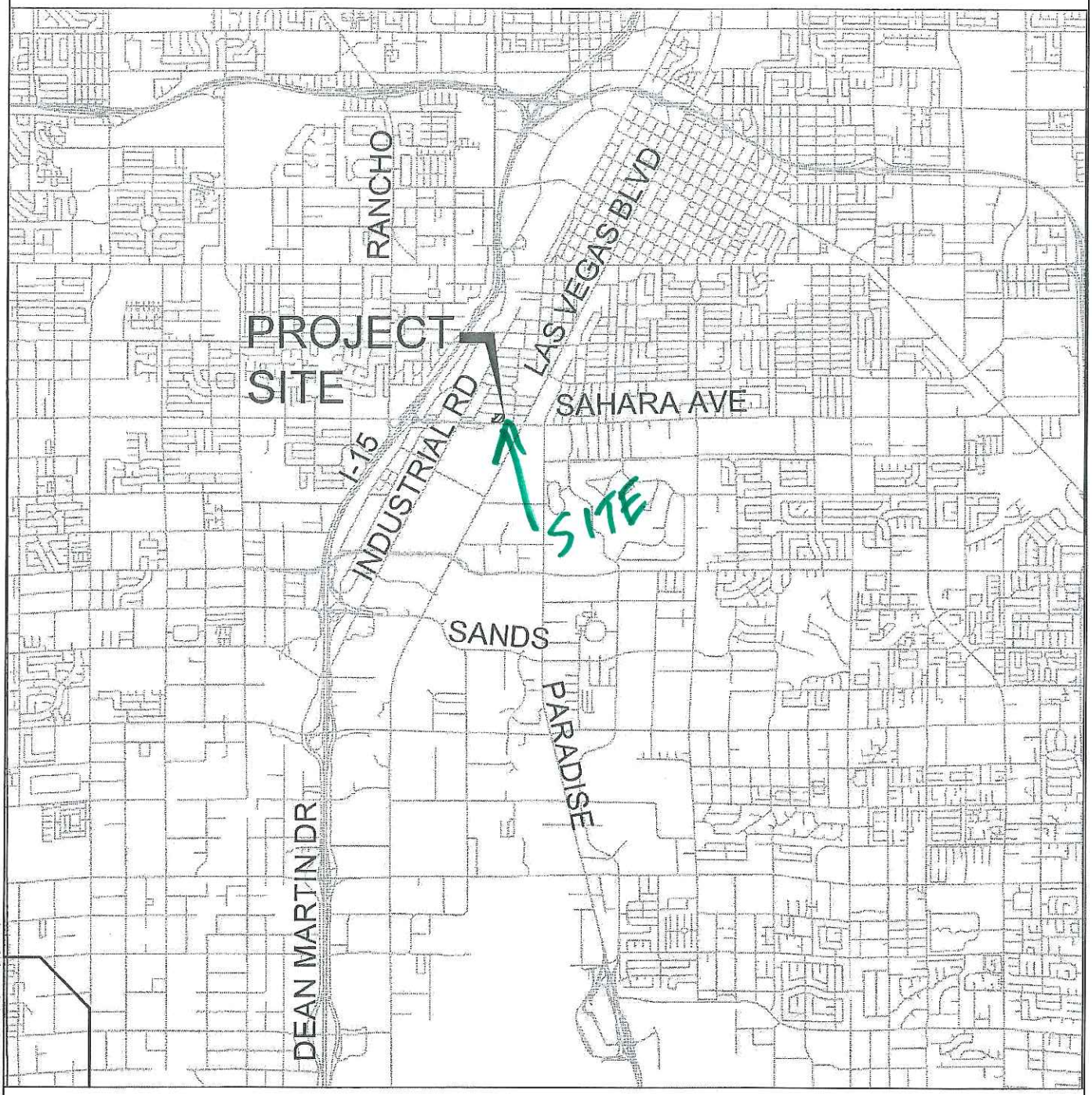
III. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD ANALYSIS

Based on the FEMA Flood Insurance Rate Map (FIRM) Community Panel 32003C 2170F, dated November 16, 2011, this project is not currently located in a FEMA

designated Special Flood Hazard Area (SFHA). Figure 3 shows the site denoted on a portion of the aforementioned FIRM.

IV. CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (CCRFCD) FACILITIES

Figure 4 is reproduced from Figure F-31 of the CCRFCD 2013 Las Vegas Valley Master Plan Update (Reference 3, hereinafter referred to as the 2013 MPU). This figure depicts the project site in relation to existing and proposed CCRFCD Facilities. As shown on the figure, the project is adjacent to the proposed CCRFCD Facility identified as BHSA 0289 (14-foot wide by 12-foot high reinforced concrete box). Flows generated onsite will be discharged either to the north to the existing Cincinnati Avenue right-of-way or to the south to the existing Sahara Avenue right-of-way which ultimately drains to the Flamingo Wash east of the site.



GRAPHIC SCALE

5000 0 2500 5000

(IN FEET)

1 inch = 5000 ft.

NORTH

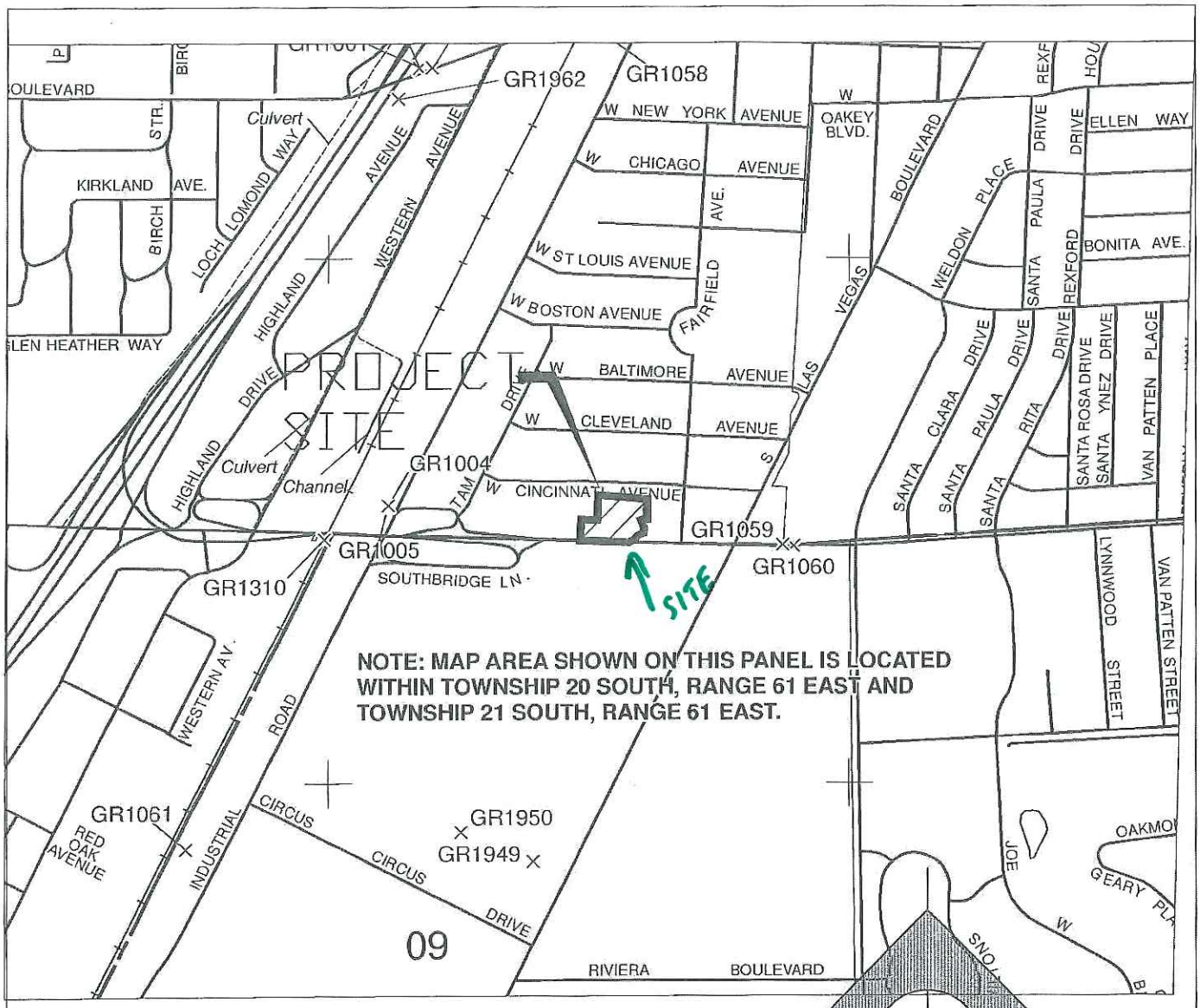
LUCKY DRAGON

FIGURE 1

VICINITY MAP

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
6655 S. CIMARRON ROAD · LAS VEGAS, NV 89113
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

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NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2170F

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2170 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2170	F
LAS VEGAS, CITY OF	320276	2170	F
NORTH LAS VEGAS, CITY OF	320007	2170	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 32003C2170F

MAP REVISED NOVEMBER 16, 2011

Federal Emergency Management Agency

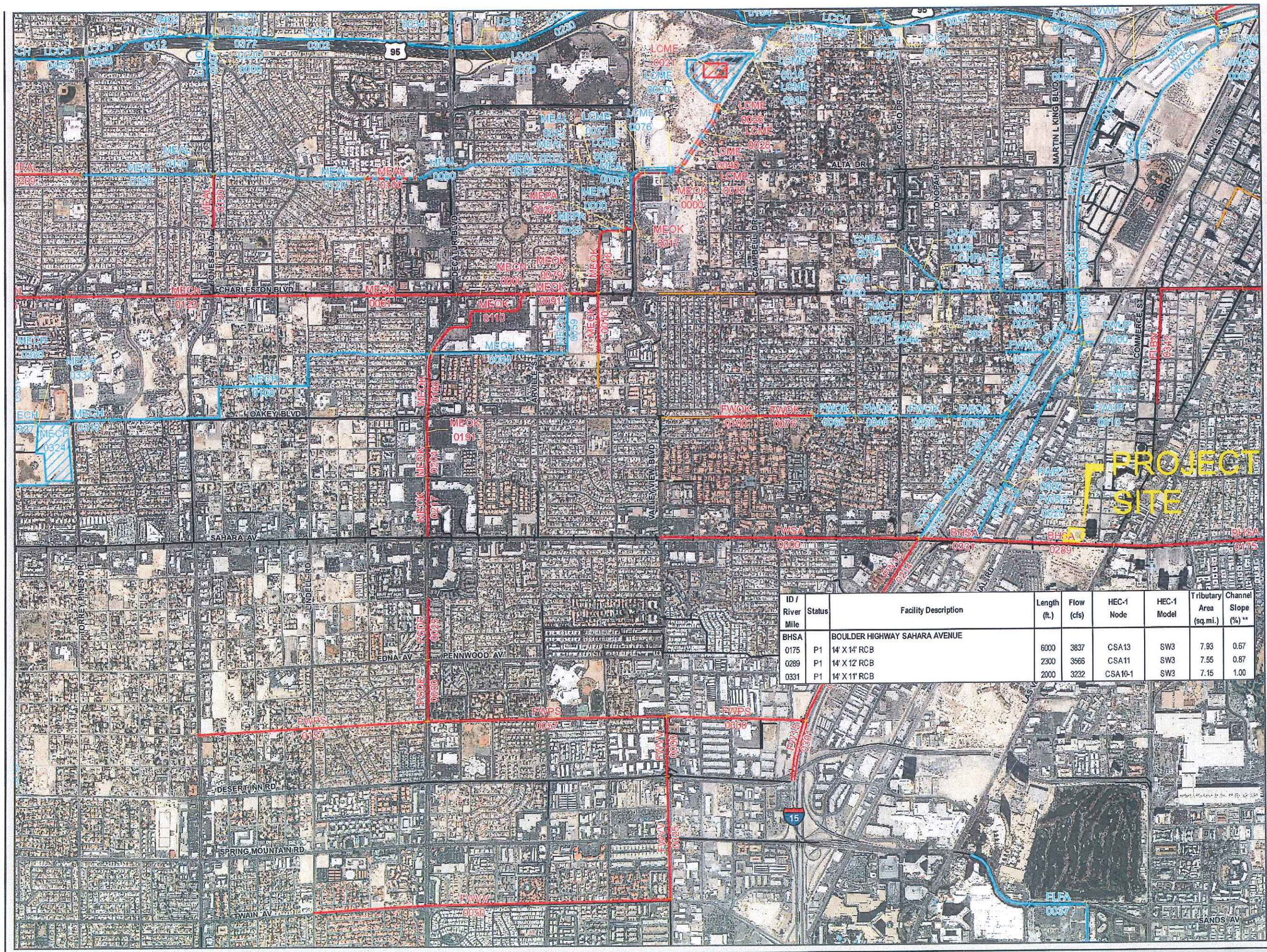
LUCKY DRAGON

FIGURE 3

F.I.R.M.

G. C. WALLACE COMPANIES
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1555 S. RAINBOW BOULEVARD · LAS VEGAS, NV 89146
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Joyson 02-24-14 17:45:42 F:\Projects\300\398-A436\Division\Fct1\Figures\FIG_3.dwg



ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BHSA		BOULDER HIGHWAY SAHARA AVENUE						
0175	P1	14' X 14' RCB	6000	3837	CSA13	SW3	7.93	0.67
0289	P1	14' X 12' RCB	2300	3566	CSA11	SW3	7.55	0.87
0331	P1	14' X 11' RCB	2000	3232	CSA10-1	SW3	7.15	1.00

REGIONAL FLOOD CONTROL DISTRICT

2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-31
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

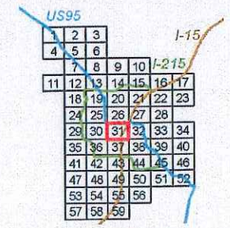
Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

FIGURE 4

N

0 500 1,000 2,000 3,000
Feet
Scale: 1 inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)



PBSJ
PB

V. HYDROLOGY

The methodology presented in this study is in compliance with the *CCRFCD Hydrologic Criteria and Drainage Design Manual* (Reference 4, hereinafter referred to as the Manual).

Model Description - The drainage basins were modeled using the SCS Unit Hydrograph method within the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package (Reference 5). Since the drainage area for each watershed within the project is less than 8 square miles, an SDN 3 design storm was selected for use in the HEC-1 computer model.

Precipitation – The project site and tributary drainage areas lie within the McCarran Rainfall Area as identified in the Manual Figure 513. The adjusted point precipitation values for the drainage subbasins are 2.77 inches, 2.05 inches, and 1.58 inches for the 100, 25, and 10-year storm events, respectively in accordance with the Manual Table 505.

Curve Numbers (CN) – The soils information for the project watershed was referenced from the *Allure Study* (Reference 6). Figure H-31 of the 2013 MPU depicts the project site in relation hydrologic soil groups (HSG). The figure shows that the project area and the offsite subbasins are classified as HSG Type "C."

The land uses or land covers used for the onsite basins consist of "Newly Graded" for undeveloped areas, the offsite basins consist of "Apartments/Condos" for developed areas, and onsite basins consist of "Commercial" for developed areas.

CN values were determined from appropriate columns of Table 602 of the Manual. CN values are 91 for the undeveloped areas, 91 for the offsite developed areas, and 94 for the onsite developed areas.

Drainage Areas and Flow Patterns - The subbasins and flow patterns used for the hydrologic modeling were determined from elevations established for the project site in a master grading digital file. Aerial topography with 1-foot contour intervals has been used for subbasin delineations.

Lag Time - The lag time (TLAG) is described as the time between the center of mass of rainfall and the time of peak discharge from a basin. Lag time can be related to time of concentration (Tc) by the following relationship: TLAG = 0.6 (Tc). The time of concentration (Tc) is defined as the time required for runoff to flow from the most hydraulically distant area of the basin to the outlet of the basin or a design point. The procedure for calculating Tc is outlined in Section 602 of the Manual. Lag time calculations for the drainage subbasins have been included in Appendix A on Standard Form 4. Referenced lag time calculations for the offsite subbasins have been included in Appendix C.

VI. EXISTING CONDITIONS

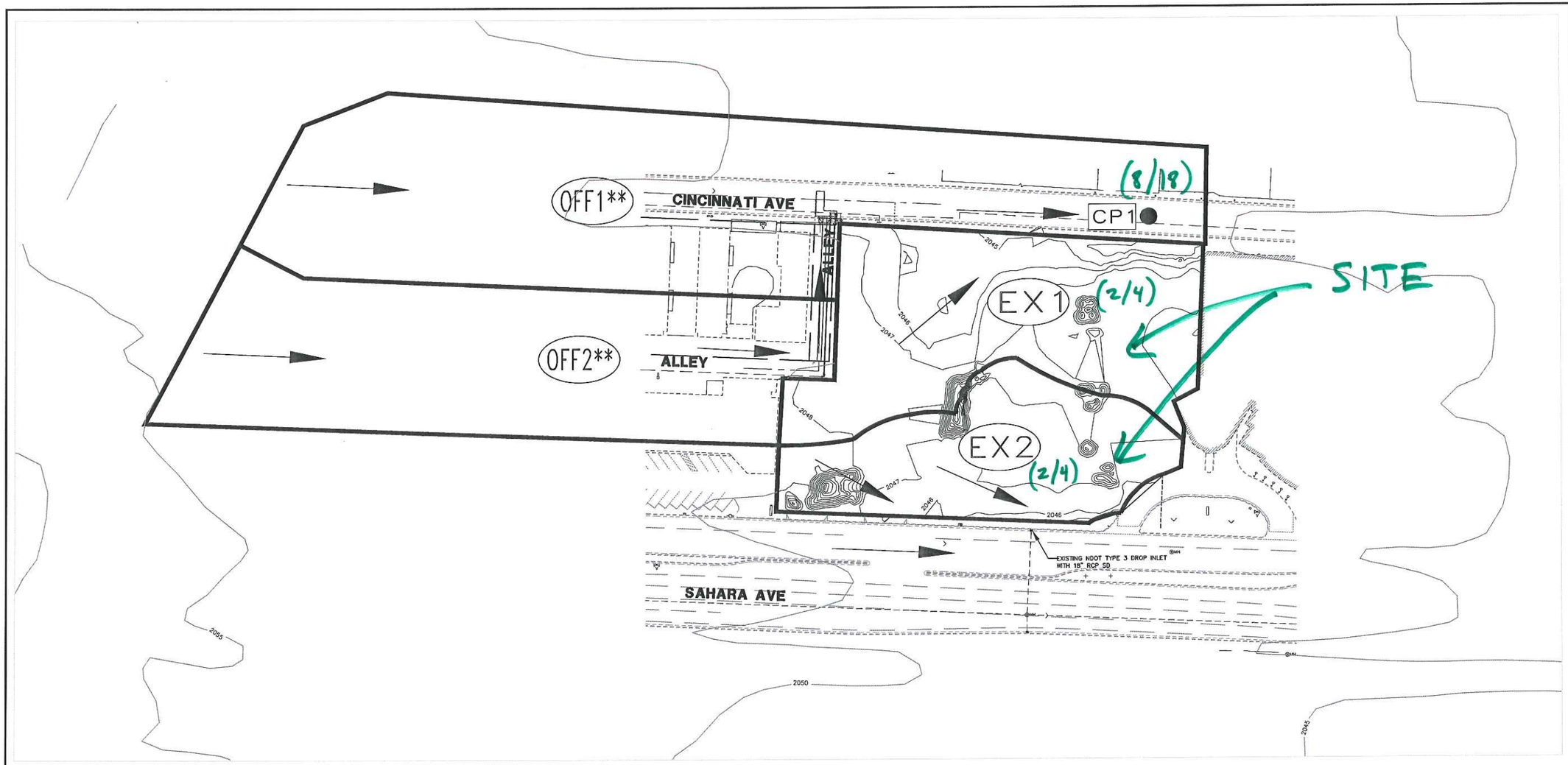
Existing conditions for the project site consists of the site undeveloped with developed offsite subbasins. Offsite subbasins from the Allure Study have been referenced and discharge a total of 15 cfs toward the western boundary of the project site. Pertinent reference material has been included in Appendix C. Offsite flows impacting the project site and flows generated onsite will be conveyed northerly and southerly to Cincinnati Avenue and Sahara Avenue, respectively.

The project-specific existing conditions hydrology consists of two onsite subbasins (Subbasins EX1 and EX2) and two offsite subbasins (Subbasins OFF1 and OFF2). Figure 5, Existing Conditions Drainage Map, depicts the subbasins and drainage patterns used in the existing conditions hydrologic analysis for this project and are generally consistent with the subbasins and drainage patterns of the approved Allure Study. Hydrologic calculations have been included in Appendix A. Table 1 summarizes the HEC-1 results for existing conditions. Referenced hydrologic calculations and information have been included in Appendix C.

TABLE 1 EXISTING CONDITIONS HEC-1 MODEL SUMMARY			
SB OR GP[1]	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	3
EX1	1.50	4	2
CP1	-	18	8
EX2	1.00	4	2

[1]See Figure 5

**Referenced from the Technical Drainage Study for Allure Condominiums



EXISTING CONDITIONS HEC-1 MODEL SUMMARY			
SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	3
EX1	1.50	4	2
CP1	-	18	8
EX2	1.00	4	2

**Referenced from the Technical Drainage Study for Allure Condominiums

NORTH

GRAPHIC SCALE
50 0 25 50
(IN FEET)
1 inch = 50 ft.

LEGEND
- (EX1) DRAINAGE SUBBASIN
- CP1 ● CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION

% COMPLETE

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE

PROJECT NO.
398-A436
DESIGN:
DRAWN:
CHECK:
PLOT DATE:03-07-14
PLOT TIME:18:37:27

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM
LAS VEGAS

F:\Projects\300\398-A436\Division V\civil\Figures\Fig5 - Existing Conditions.dgn
Joanne Ayson

LUCKY DRAGON LP
LUCKY DRAGON CASINO
EXISTING CONDITIONS DRAINAGE MAP

DRAWING
FIG-5
SHT OF SHTS

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UDF

VII. PROPOSED CONDITIONS

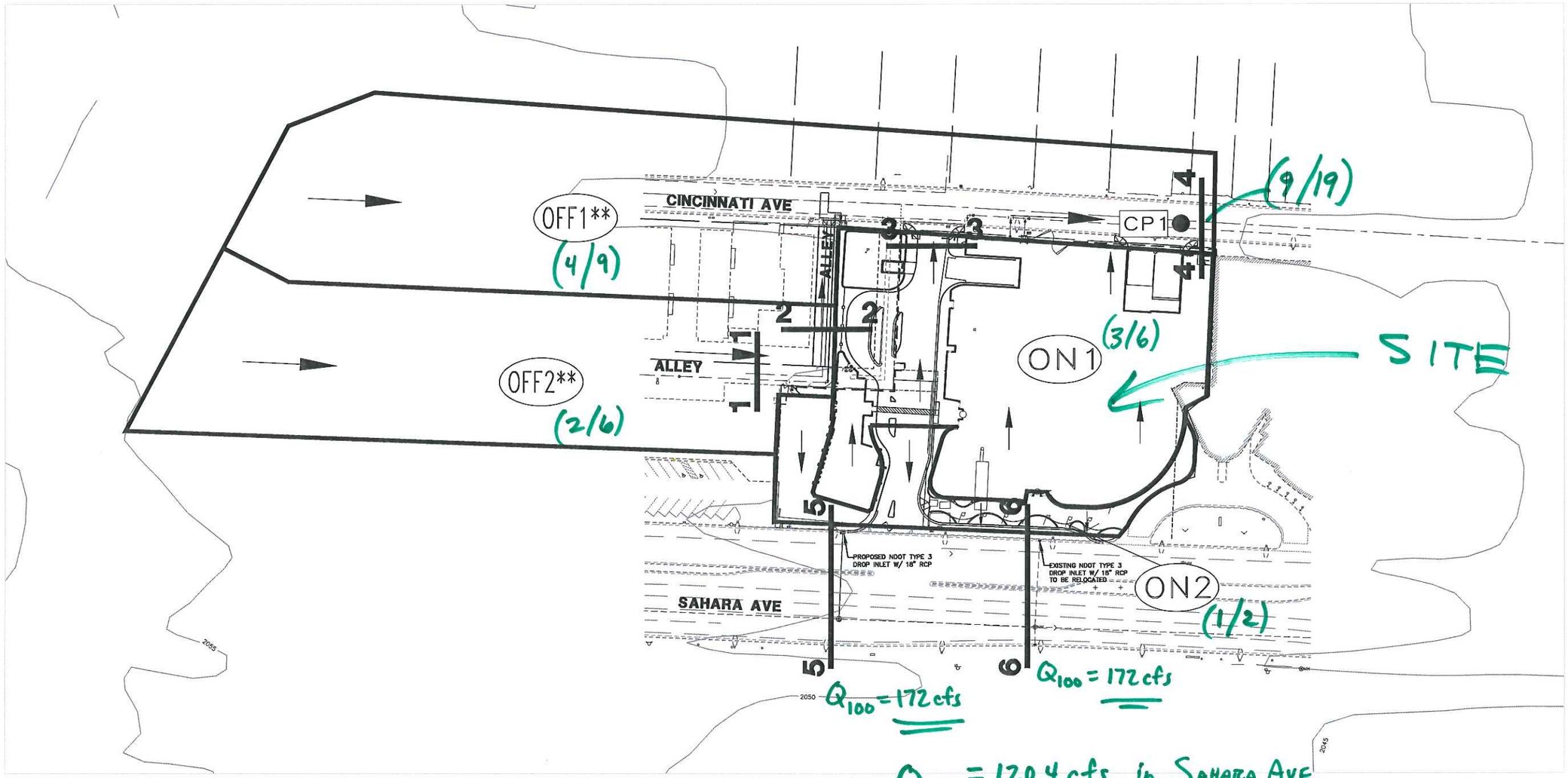
The proposed improvements consist of a hotel, casino, and parking garage. The interior street improvements include pavement, curb and gutter. Figure 6, Proposed Conditions Drainage Map, depicts the subbasins and drainage patterns used in the proposed conditions hydrologic analysis for this project and are generally consistent with the subbasins and drainage patterns of the approved Allure Study. Hydrologic calculations have been included in Appendix A. Table 2 summarizes the HEC-1 results for proposed conditions. Referenced hydrologic calculations and information have been included in Appendix C. Since the upstream watershed is fully developed, the ultimate conditions are the same as the proposed conditions.

TABLE 2
PROPOSED CONDITIONS HEC-1 MODEL SUMMARY

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	2
ON1	2.00	6	3
CP1	-	19	9
ON2	0.50	2	1

**Referenced from the Technical Drainage Study for Allure Condominiums

The north half of Sahara Avenue will be extended to include a proposed 12-foot right turn lane. Due to the roadway improvements, the existing NDOT Type 3 drop inlet at this location will be removed and the existing 18-inch reinforced concrete pipe (RCP) attached to the drop inlet will be plugged. The NDOT Type 3 drop inlet will be relocated upstream just west of the project driveway and connected to a proposed 18-inch RCP. The proposed 18-inch RCP will convey flow from the roadway to the existing 42-inch RCP storm drain. The proposed improvements are depicted in Figure 6.



PROPOSED CONDITIONS HEC-1 MODEL SUMMARY

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
OFF1**	3.80	9	4
OFF2**	2.50	6	2
ON1	2.00	6	3
CP1	-	19	9
ON2	0.50	2	1

**Referenced from the Technical Drainage Study for Allure Condominiums

100-YEAR STREET FLOW CHARACTERISTICS PROPOSED CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 1-1	1.05	6	0.21	2.54	0.53
Section 2-2	1.05	6	0.21	2.54	0.53
Section 3-3	1.15	6	0.35	2.69	0.94
Section 4-4	0.50	19	0.54	2.32	1.25
Section 5-5	0.90	172	1.11	4.64	5.15
Section 6-6	0.40	172	1.06	3.41	3.61

25-YEAR STREET FLOW CHARACTERISTICS PROPOSED/EXISTING CONDITIONS

Location	Slope (%)	Q_{25} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 5-5 (Existing)	0.90	120.4	1.00	4.29	4.29
Section 6-6 (Existing)	0.79	120.4	0.93	4.04	3.76
Section 6-6 (Proposed)	0.40 (min)	120.4	0.94	3.10	2.91

NORTH

GRAPHIC SCALE
50 0 25 50
(IN FEET)
1 inch = 50 ft.

LEGEND
- EX1 — DRAINAGE SUBBASIN
- CP1 ● — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- 1 1 — CROSS SECTION

% COMPLETE

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE

PROJECT NO. 398-A436
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-07-14
PLOT TIME: 18:34:27

G.C. WALLACE COMPANIES
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LAS VEGAS

F:\Projects\260\398-A436\Division\Civil\Figures\Fig6 - Proposed Conditions.dwg
Jolonno Ayson

LUCKY DRAGON LP
LUCKY DRAGON CASINO
PROPOSED CONDITIONS DRAINAGE MAP

DRAWING
FIG-6
SHT OF SHTS
HTE: 00-00000

LDP:

In general, the drainage patterns for the proposed conditions subbasins are consistent with existing conditions. Subbasins OFF1 and OFF2 will generate total flowrates of 9 cfs and 6 cfs, respectively, during the 100-year storm event. The offsite flows will be conveyed north toward Cincinnati Avenue via a 20-foot alley with a 4-foot wide concrete gutter. The offsite runoff will then continue towards the east end of the street and combine with runoff from onsite Subbasin ON1 for a total of 19 cfs at Concentration Point 1. The onsite Subbasin ON2 will generate 2 cfs of flow and will be conveyed south towards Sahara Avenue. The flow will continue east along Sahara Avenue and combines with the 172 cfs of street flow referenced from the Allure Study. Pertinent reference material has been included in Appendix C.

VIII. STREET HYDRAULICS

The resulting street flow data based on the flows generated during the 100-year and 25-year storm events are presented in Tables 3 and 4, respectively. Figure 6 shows the locations of the cross sections corresponding to the calculations included in Tables 3 and 4. Hydraulic calculations have been included in Appendix B. The flowrates and normal depth sections for Cincinnati Avenue and Sahara Avenue have been referenced and/or revised from the Allure Study. Pertinent reference material has been included in Appendix C.

TABLE 3
100-YEAR STREET FLOW CHARACTERISTICS
PROPOSED CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 1-1	1.05	6	0.21	2.54	0.53
Section 2-2	1.05	6	0.21	2.54	0.53
Section 3-3	1.15	6	0.35	2.69	0.94
Section 4-4	0.50	19	0.54	2.32	1.25
Section 5-5	0.90	172	1.11	4.64	5.15
Section 6-6	0.40	172	1.06	3.41	3.61

TABLE 4
25-YEAR STREET FLOW CHARACTERISTICS
PROPOSED/EXISTING CONDITIONS

Location	Slope (%)	Q_{25} (cfs)*	Depth (ft)	Velocity (ft/s)	D*V
Section 5-5 (Existing)	0.90	120.4	1.00	4.29	4.29
Section 6-6 (Existing)	0.79	120.4	0.93	4.04	3.76
Section 6-6 (Proposed)	0.40 (min)	120.4	0.94	3.10	2.91

*25-year storm flow calculated from ratio in Pima County Hydrology Manual (Reference 5)

Cross Section 1-1 and 2-2 are located on 20-foot alleys west of the project site and convey a flow of 6 cfs. The alleys on these cross sections direct offsite flows toward Cincinnati Avenue.

Cross Section 3-3 is located near the entrance to the parking garage and conveys a flow of 6 cfs towards Cincinnati Avenue.

Cross Section 4-4 is located in Cincinnati Avenue, northwest of the project site, and conveys a flow of 19 cfs. Flows generated at Concentration Point 1 will be conveyed east within Cincinnati Avenue.

Cross Section 5-5 is on Sahara Avenue adjacent to the relocated NDOT Type 3 drop inlet. The cross section remains the same during existing and proposed conditions. The proposed NDOT Type 3 drop inlet at this location has the same capacity as the existing inlet that will be removed, and therefore no NDOT right-of-way, downstream facilities or properties will be impacted.

Cross Section 6-6 is located in the north half of Sahara Avenue, just east of the project driveway. In proposed conditions, a 12-foot right turn lane is added to the north half of Sahara Avenue with a longitudinal street slope of 0.40%. Due to the aforementioned improvements, the 25-year depth of flow at this location increases from 0.93 ft during existing conditions to 0.94 ft during proposed conditions. Although a majority of the street section at this location has a longitudinal street slope of 0.79% during proposed conditions, a slope of 0.40% is used in the hydraulic calculations which is conservative. Therefore, the proposed conditions will not adversely impact Sahara Avenue.

Review of the Allure Study shows Sahara Avenue with a total flow rate of 172 cfs. The proposed flowrate of 2 cfs discharging into the road by the onsite Subbasin ON2 is less than the 3 cfs discharging into the road in the referenced Allure Study, and therefore

does not pose any negative impacts on the downstream facilities or properties. Additionally, the 2 cfs of flow discharging into Sahara Avenue in proposed conditions is less than the 4 cfs discharging into the road in existing conditions. Pertinent reference materials have been included in Appendix C.

The street criteria within the project are met during both the 10- and 100-year storm events as illustrated by the largest 100-year peak flow within the project of 172 cfs on Sahara Avenue. The maximum velocity (V) times depth (D) in the project is 5.15 with a corresponding depth of 1.11 feet and velocity of 4.64 feet per second. At the minimum longitudinal street slope on Sahara Avenue of 0.40%, the associated D is 1.06 feet and the V is 3.41 feet per second, resulting in V times D of 3.61 during the 100-year event.

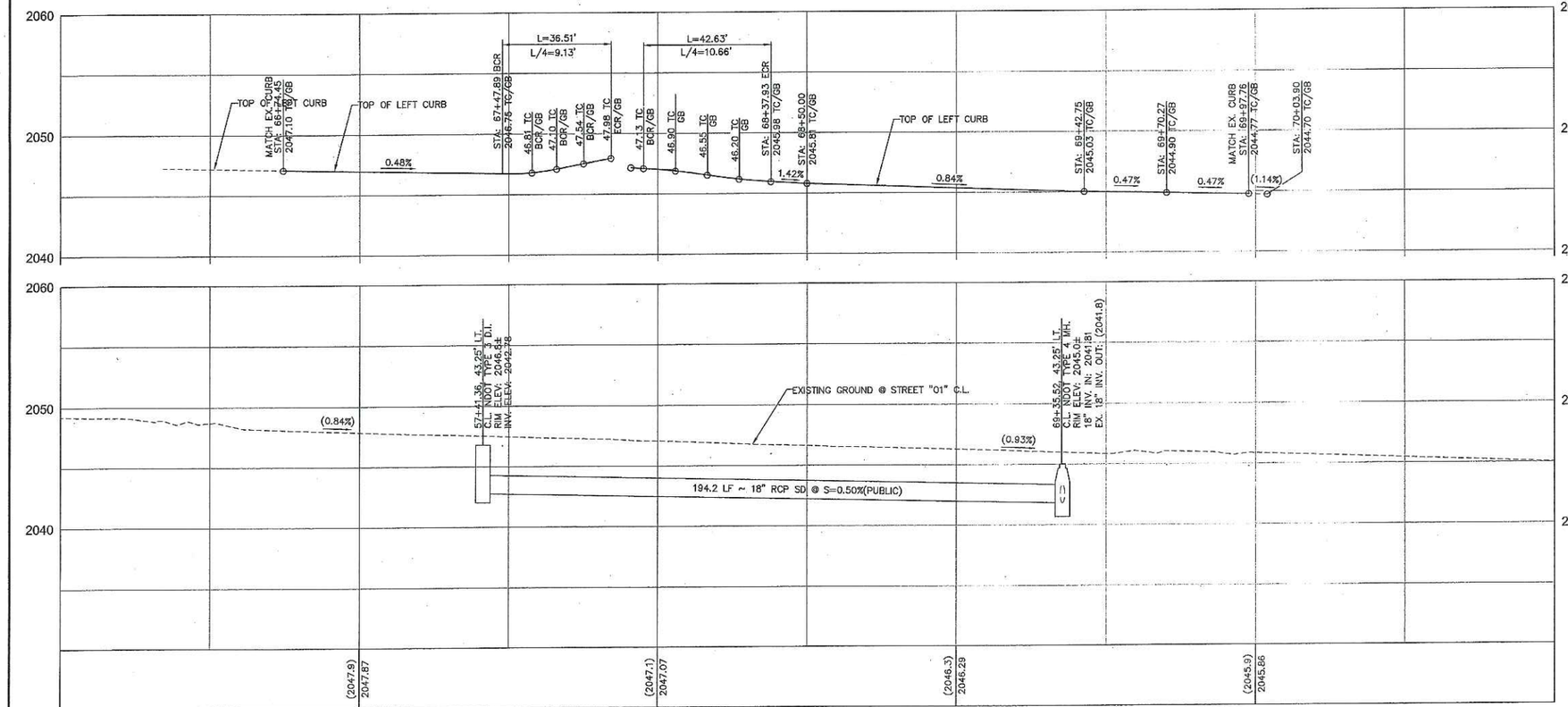
The Manual criteria for a major roadway requires a 12-foot wide dry lane in addition to a dry center turn lane in each direction for streets with a right of way (ROW) greater than 80 feet during a 10-year storm event. The 10-year flow in the Sahara Avenue ROW is zero, as all storm runoff in the ROW is maintained in existing drainage facilities. Therefore, the calculated 10-year depth for Sahara Avenue is 0 feet to provide for 19-foot dry lane which includes 7 feet of the center turn lane, and the 10-year maximum street flow depth of will be met.

A separate HEC-1 model for the 25-year storm event is included in Appendix A. The 25-year Sahara Avenue storm flow was determined using the Pima County Hydrology Manual (Reference 5). Based on the depths presented in Table 4, the NDOT criteria under existing conditions is not met as there is storm flow in the travel lane. Thus, the NDOT criteria under proposed conditions will not be met either. However, the proposed development will not worsen the roadway's existing conditions.

IX. FLOOD PROTECTION FACILITIES

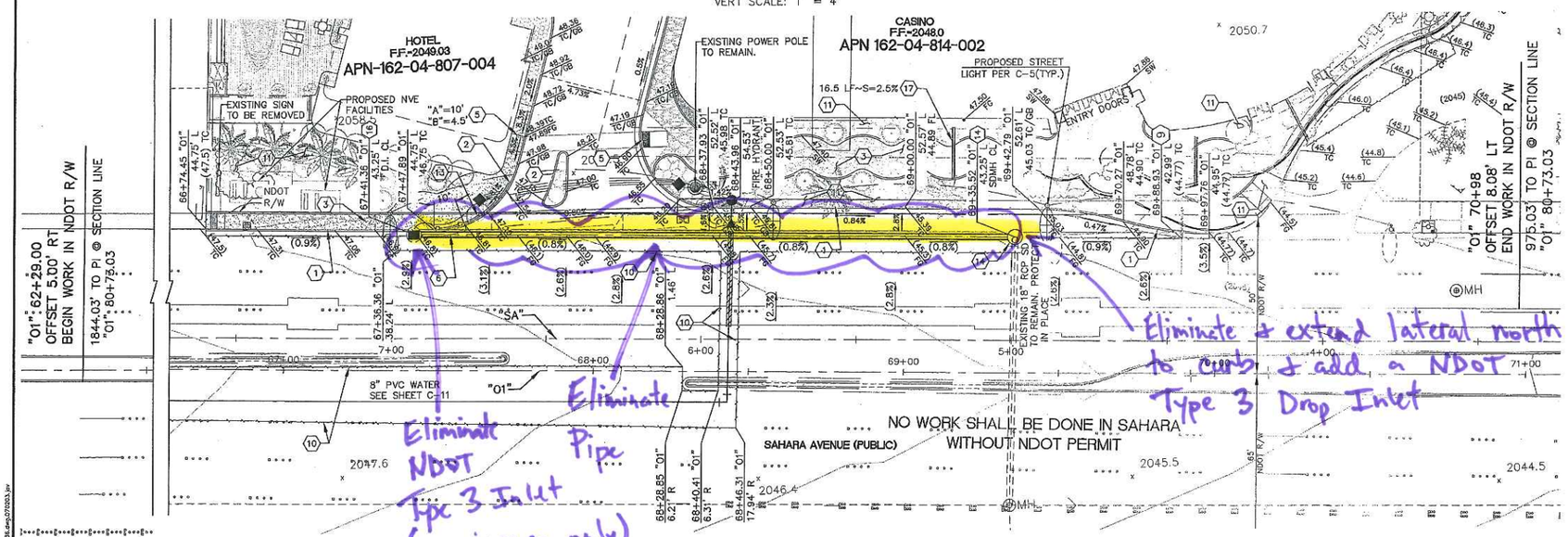
Finished Floor Elevations

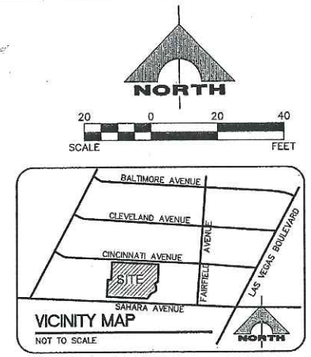
The proposed finish floor elevations of the mechanical room, hotel, and casino/parking garage are 2047.90, 2048.68, and 2047.88, respectively. All finished floor elevations are greater than two times the depth of flow above the flow line elevations in the adjacent streets and alleys.



SAHARA AVENUE PLAN & PROFILE

HORIZ SCALE: 1" = 20'
VERT SCALE: 1" = 4'





VICINITY MAP
NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT OLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234) (SEE ARCHITECTURAL PLANS PER SURFACE SECTION)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. CONSTRUCT 6" TO 0" CURB DETAIL PER DETAIL "B" SHEET C8.
7. CONSTRUCT SIDEWALK UNDERDRAIN (USDCCA NO. 236)
8. CONSTRUCT ASPHALT PAVEMENT (3" A/C OVER 8" TYPE II COMPACTED TO 95%)
9. REMOVE EXISTING 6"X3" SIDEWALK UNDERDRAIN.
10. SAWCUT REMOVE AND REPLACE EXISTING PAVEMENT PER NDOT.
11. CONSTRUCT PLANTER, PER ARCHITECTURAL PLANS.
12. SEE ARCH PLANS FOR SIDEWALK RAMPS
13. INSTALL HAND RAIL PER DEAIL A SHEET C8.
14. REMOVE EXISTING NDOT TYPE 3 INLET IN IT'S ENTIRETY. REPLACE WITH NDOT TYPE 4 MANHOLE PER DWG. R-4.3.2
15. NOT USED.
16. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421
17. INSTALL 3"X6" RECTANGULAR TUBING SIDEWALK UNDER DRAIN PER DETAIL "C" SHT. C-8.

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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES IT'S COSTLY
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1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 (Nevada Registration Approval) 10/24/14 DATE

ENGINEER - STATE OF NEVADA - PROFESSIONAL ENGINEER - No. 8354 - ROY D. CLARK - Exp. 12/31/2014 - CIVIL - DATE: 10/24/14

DESCRIPTION	DATE	AGEN. APP	DATE	CONV APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 10-28-14
PLOT TIME: 14:01:41

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LAS VEGAS

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Rudy Lopez

LUCKY DRAGON LP

LUCKY DRAGON CASINO
SAHARA AVENUE IMPROVEMENTS

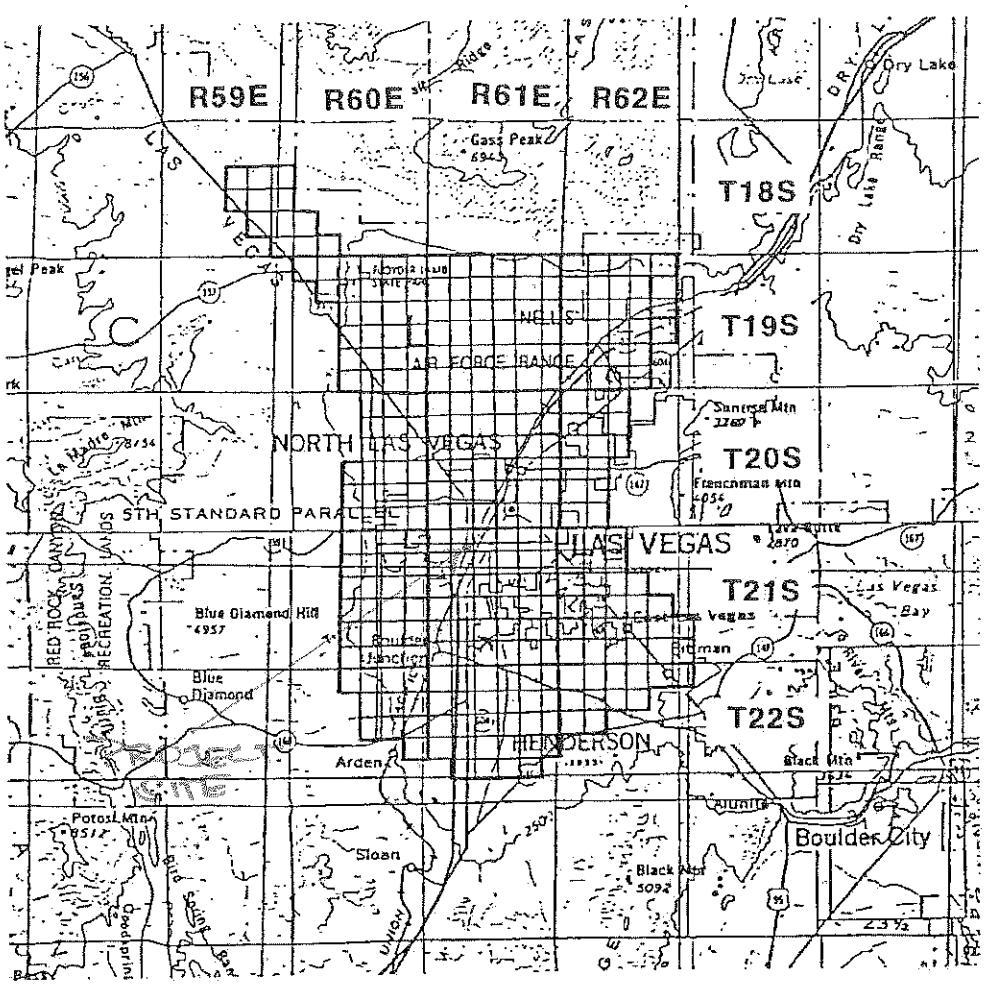
SAHARA AVENUE
PLAN + PROFILE

DRAWING
C-9
9 OF 12 SHTS

APPENDIX A

Hydrologic Calculations and Information

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP	RANGE	SECTIONS	TOWNSHIP	RANGE	SECTIONS
18 South	59 East	13-15,22-26,36	20 South	62 East	4-9,16-20,29-32
18 South	60 East	30-32	21 South	60 East	1-4,9-16,21-28,33-36
19 South	60 East	1-6,8-16,21-28,33-36	21 South	61 East	ALL SECTIONS
19 South	61 East	ALL SECTIONS	21 South	62 East	4-9,15-23, 25-36
19 South	62 East	2-11,14-23,27-34	22 South	60 East	1-4,10-15,24
20 South	60 East	1-3,10-15,21-28,33-36	22 South	61 East	1-24,26-29
20 South	61 East	ALL SECTIONS	22 South	62 East	1-10,17-18

Notes:
1. Refer to Table 505 and Figure 516 Depth-Duration- Frequency values in the McCarran Airport Rainfall Area.
2. Refer to Table 506 and Figure 517 for Time-Intensity-Frequency values on the McCarran Airport Rainfall Area.

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

SIX-HOUR STORM DISTRIBUTIONS

Storm Time (In Minutes)	Percent of Total Storm Depth SDN3	SDN4	SDN5	Storm Time (In Minutes)	Percent of Total Storm Depth SDN3	SDN4	SDN5
0	0.0	0.0	0.0	185	32.2	37.6	43.0
5	2.0	2.0	2.0	190	35.2	41.5	47.7
10	5.7	5.8	5.9	195	40.9	46.2	51.4
15	7.0	7.5	8.0	200	49.9	53.0	56.1
20	8.7	9.9	11.0	205	59.0	61.0	63.0
25	10.8	12.6	14.4	210	71.0	71.0	71.0
30	12.4	13.7	15.0	215	74.4	73.2	72.0
35	13.0	14.5	16.0	220	78.1	75.6	73.1
40	13.0	14.9	16.8	225	81.2	78.2	75.2
45	13.0	15.1	17.1	230	81.9	79.9	77.9
50	13.0	15.5	18.0	235	83.5	81.3	79.0
55	13.0	15.6	18.2	240	85.1	82.3	79.5
60	13.0	15.9	18.7	245	85.6	83.0	80.4
65	13.3	16.2	19.0	250	86.0	83.5	81.0
70	14.0	16.9	19.7	255	86.8	84.4	82.0
75	14.2	17.2	20.2	260	87.6	85.1	82.6
80	14.8	17.9	21.0	265	88.8	86.4	84.0
85	15.8	18.9	22.0	270	91.0	88.5	85.9
90	17.2	20.1	23.0	275	92.6	90.8	88.9
95	18.1	21.1	24.1	280	93.7	92.4	91.0
100	19.0	22.0	25.0	285	95.0	94.4	93.8
105	19.7	22.8	25.9	290	97.0	96.8	96.6
110	19.9	23.2	26.5	295	97.6	97.3	97.0
115	20.0	24.0	28.0	300	98.2	97.8	97.4
120	20.1	24.6	29.0	305	98.5	98.2	97.9
125	20.4	25.2	30.0	310	98.7	98.4	98.1
130	21.4	26.0	30.5	315	98.9	98.6	98.3
135	22.9	26.9	30.9	320	99.0	98.8	98.5
140	24.1	27.6	31.0	325	99.3	99.1	98.9
145	24.9	28.3	31.7	330	99.3	99.2	99.0
150	25.1	28.6	32.1	335	99.4	99.3	99.2
155	25.6	29.2	32.7	340	99.5	99.4	99.3
160	27.0	30.2	33.3	345	99.8	99.7	99.6
165	27.8	31.2	34.6	350	99.8	99.8	99.7
170	28.1	32.1	36.1	355	99.9	99.9	99.9
175	28.3	33.2	38.1	360	100.0	100.0	100.0
180	29.5	35.2	40.8				

Notes:
1. For drainage areas less than 8 square miles in size, use SDN 3.
2. For drainage areas greater than or equal to 8 square miles and less than 12 square miles in size, use SDN 4.
3. For drainage areas greater than or equal to 12 square miles, use SDN 5.
4. A graphical representation of these values is presented on **Figure 515**.

Revision	Date

REFERENCE:

TABLE 503

DEPTH-DURATION-FREQUENCY VALUES FOR McCARRAN AIRPORT RAINFALL AREA

(IN INCHES)

	RECURRENCE INTERVAL					
TIME	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5 min.	0.15	0.27	0.35	0.46	0.54	0.63
10 min.	0.25	0.44	0.57	0.74	0.89	1.02
15 min.	0.33	0.57	0.74	0.97	1.15	1.32
30 min.	0.44	0.78	1.01	1.31	1.55	1.79
1 hour	0.52	0.89	1.15	1.50	1.78	2.06
2 hour	0.59	1.01	1.30	1.70	2.01	2.30
3 hour	0.64	1.08	1.39	1.82	2.15	2.48
6 hour	0.72	1.22	1.58	2.05	2.41	2.77
24 hour (TR-55)	1.20	1.60	1.80	2.40	2.70	2.96

NOTE: 1. Refer to Figure 513 for a description and drawing of the area included in the McCarran Airport Rainfall Area.

2. The 24 hour values presented above are for use with TR-55 only.

3. Table 501 adjustments not required.

Revision	Date

WRC ENGINEERING

REFERENCE: USACE, Los Angeles District, 1988

TABLE 505

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					

See Table 602A

Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system. Impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 603.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using Figure 603 based on the impervious area percentage (CN #98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using Figure 603 based on the degree of development impervious area percentage) and the CN's for the newly graded pervious areas.

Revision	Date

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

Average Lot Size or Usage[1]	Percent Impervious[2]	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Apartments/Condos	72	81	88	91	93
Townhouses/6,000 sq ft lots or less[3]	69	80	87	90	92
7,000 sq ft lots	63	76	84	89	91
8,000 sq ft lots	58	73	82	88	90
10,000 sq ft lots	38	61	75	83	87
14,000 sq ft lots	30	57	72	81	86
20,000 sq ft lots	25	54	70	80	85
40,000 sq ft lots	20	51	68	79	84
80,000 sq ft lots	12	46	65	77	82

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.
2 Actual percent impervious value should be compared to selected land use type.
3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

Revision	Date

REFERENCE:

TABLE 602A

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

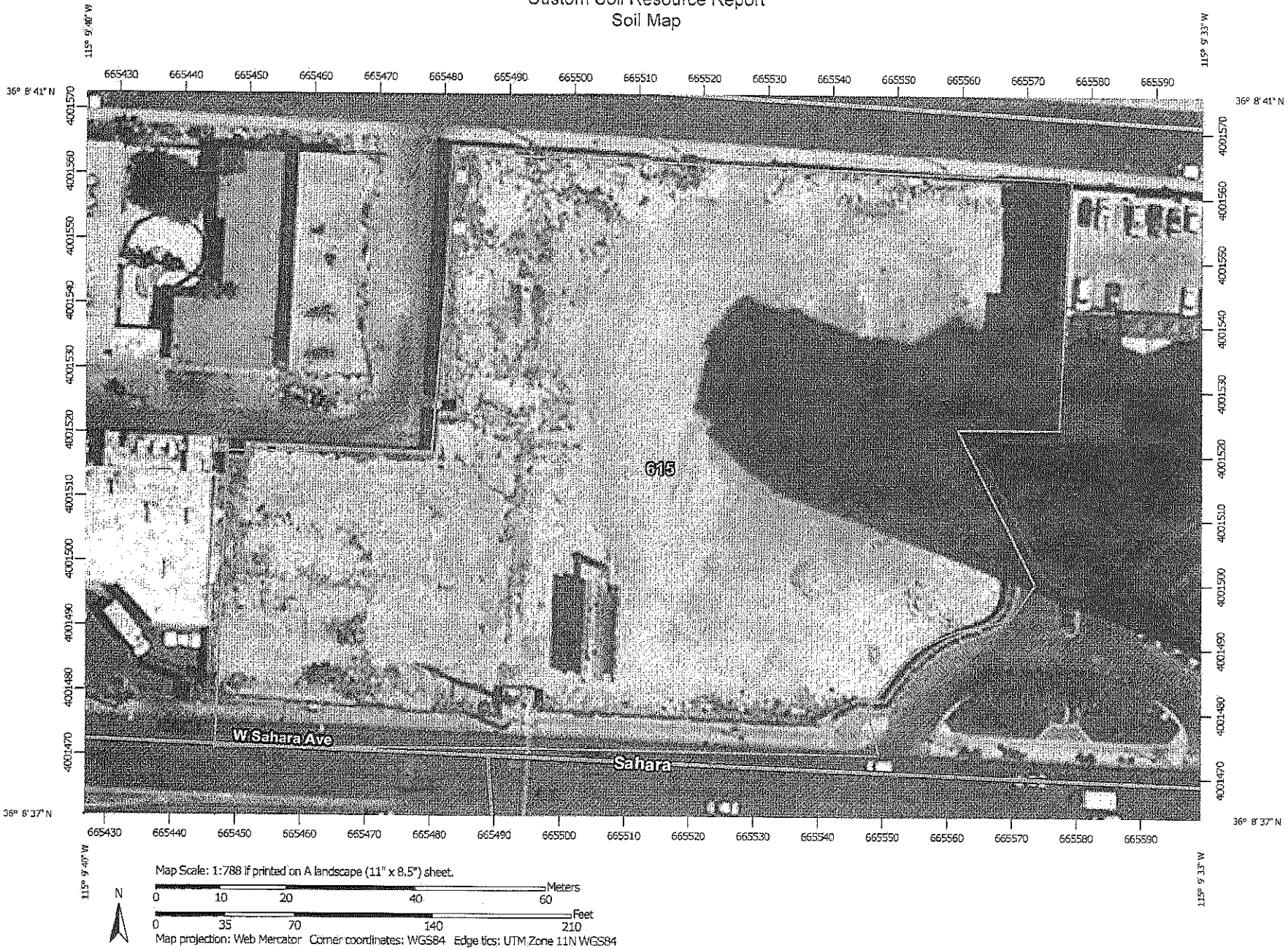
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Las Vegas Valley Area, Nevada, Part of Clark County



February 7, 2014

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 9, Dec 14, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2011—Oct 17, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Las Vegas Valley Area, Nevada, Part of Clark County (NV788)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
615	Urban land	2.3	100.0%
Totals for Area of Interest		2.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series.* Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Las Vegas Valley Area, Nevada, Part of Clark County

615—Urban land

Map Unit Composition

Urban land: 100 percent

Description of Urban Land

Setting

Landform: Valleys
Down-slope shape: Convex
Across-slope shape: Convex

Properties and qualities

Frequency of flooding: Rare

APPROXIMATE RATIOS OF LESSER MAGNITUDE FLOODS TO THE 100-YEAR FLOOD

In an attempt to both simplify and reduce the computational procedures and time involved in estimating peak discharge values for floods of lesser magnitude than the 100-year flood, the following procedure may be employed if the user so desires:

First, the predicted value for the peak discharge of the 100-year flood which would occur upon the watershed under investigation should be determined using the procedures as outlined within this Manual.

Next, peak discharge values for floods of lesser magnitude than the 100-year flood may be calculated approximately by multiplying the previously determined 100-year flood value for the watershed under investigation by the factors shown within the table below:

WATERSHED DEVELOPMENT	RECURRENCE INTERVAL			
	2-Yr.	10-Yr.	25-Yr.	50-Yr.
Rural	0.10	0.35	0.55	0.75
Suburban	0.15	0.40	0.60	0.80
Moderately Urban	0.20	0.45	0.65	0.85
Highly Urban	0.25	0.50	0.70	0.85

Q_{100} ON SAMPLE = 172 CFS

$\rightarrow Q_{25} = 172 \times 0.70 = \boxed{120.4 \text{ CFS}}$

Where

Rural = Watersheds which will remain in a natural condition (undeveloped), or where the anticipated future development will be negligible.

Suburban = Watersheds which contain two (2) houses per acre, or less, with drainage improvements being relatively few or nonexistent.

Moderately Urban = Watersheds which contain from two (2) to five (5) houses per acre (detached), with moderate to extensive drainage improvements present.

Highly Urban = Watersheds which contain more than five (5) houses per acre (including multiple dwellings, commercial and industrial development), with extensive drainage improvements present.

It is to be noted that the above factors are only applicable under typically "average" watershed conditions upon generally homogeneous drainage basins. For atypical or nonhomogeneous watersheds, all flood peaks, whatever their recurrence intervals, should be determined in a complete and detailed manner as outlined within this Manual; otherwise, serious errors might easily arise as a consequence of choosing expediency over good engineering judgement.

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

G. C. WALLACE COMPANIES
Engineers/Planners/Surveyors

The Lucky Dragon Casino
Existing Conditions

Project No: 398-A436
Date: 2-Feb-14
Calculated by: JYA

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Sq Mi	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY fps	V2 VELOCITY fps	Tt Min	TOTAL LENGTH Feet	Tc = (L/180)+10 Min	Min	Tlag = 0.6Tc/60 Hours	Remarks:
(1)		(16)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(11)	(12)	(13)	(14)	(15)	
Onsite Basins																		
EX1	D	94	0.8508	1.5	0.002	100	1.00	4.5	400	1.00	2.0	3.1	3.3	500	12.8	7.8	0.078	
EX2	D	94	0.8508	1.0	0.002	175	0.80	6.4	156	1.00	2.0	3.1	1.3	331	11.8	7.7	0.077	
Offsite Basins Referenced From Approved Study																		
OFF1**	D	91	0.8112	3.8	0.006	100	0.50	6.5	1000	0.70	1.7	2.6	8.2	1100	16.1	14.7	0.147	
OFF2**	D	91	0.8112	2.5	0.004	130	0.50	7.5	670	0.70	1.7	2.6	6.0	800	14.4	13.5	0.135	

$Tc = Ti + Tt$ $Tlag = 0.6\ Tc$

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

$K = 0.0132\ (CN) - 0.39$

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$ $V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

REFERENCE:

STANDARD FORM 4

```
1*****************************************
*                                       *
*    FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   05MAR14  TIME  14:55:38   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*            (916) 756-1104             *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
                    *DIAGRAM
*** FREE ***
               1    ID   ********************************************************************
               2    ID   * .------------------------------------------------------------. *
               3    ID   * :                                                            : *
               4    ID   * :                                                            : *
               5    ID   * :              THE LUCKY DRAGON CASINO                       : *
               6    ID   * :              EXISTING CONDITIONS                           : *
               7    ID   * :                                                            : *
               8    ID   * :              RETURN PERIOD_ _ _ _100 & 10 -YEAR            : *
               9    ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3               : *
              10    ID   * :              PROJECT NO_ _ _ _ _ 398-A436                  : *
              11    ID   * :              FILENAME_ _ _ _ _ _ EX1.H1                    : *
              12    ID   * :              DATE MODELED_ _ _ _ 02/24/2014                : *
              13    ID   * :              MODELED BY_ _ _ _ _ JYA                       : *
              14    ID   * :............................................................: *
              15    ID   * :                                                            : *
              16    ID   * :............................................................: *
              17    ID   ********************************************************************
              18    ID
              19    ID
              20    IT      5       0       0     300
              21    IO      5       0       0
              22    IN      5       0       0
              23    JR    PREC      1    0.57
                    *
              24    KK    OFF1
              25    KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              26    BA  0.0059
              27    PB    2.77
              28    PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
              29    PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
              30    PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
              31    PC   .2530   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
              32    PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
              33    PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
              34    PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
              35    PC   .9980   .9990  1.000
              36    LS      0      91
              37    UD    .147
                    *
              38    KK    OFF2
              39    KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              40    BA  0.0039
              41    LS      0      91
              42    UD    .135
                    *
```



```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
              43    KK     EX1
              44    KM  BASIN EX1
              45    BA   0.002
              46    LS      0      94
              47    UD    .078
                    *
              48    KK     CP1
              49    KM  COMBINES OFF1, OFF2, & EX1
              50    HC      3
                    *
              51    KK     EX2
              52    KM  BASIN EX2
```

```
          53          BA   0.002
          54          LS       0       94
          55          UD    .077
                      *
          56          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
              .
              .
    38        .         OFF2
              .           .
              .           .
    43        .           .         EX1
              .           .          .
              .           .          .
    48        CP1.........          .
              .                      .
              .                      .
    51        .         EX2
 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         JUN  1998                     *
*        VERSION 4.1                    *
*                                       *
*  RUN DATE   05MAR14  TIME  14:55:38   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*            (916) 756-1104             *
*                                       *
*****************************************
```

```
*********************************************************************
*  .............................................................    *
*  :                                                           :    *
*  :                THE LUCKY DRAGON CASINO                    :    *
*  :                EXISTING CONDITIONS                        :    *
*  :...........................................................:    *
*  :                RETURN PERIOD_ _ _ _100 & 10 -YEAR         :    *
*  :                DISTRIBUTION_ _ _ _ _ 6-HOUR SDN3          :    *
*  :                PROJECT NO_ _ _ _ _ _ 398-A436             :    *
*  :                FILENAME_ _ _ _ _ _ _ EX1.H1               :    *
*  :                DATE MODELED_ _ _ _ _ 02/24/2014           :    *
*  :                MODELED BY_ _ _ _ _ _ JYA                  :    *
*  :...........................................................:    *
*  :                                                           :    *
*  :...........................................................:    *
*********************************************************************
```

```
   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1   0  STARTING DATE
                       ITIME       0000  STARTING TIME
                          NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2   0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL      .08 HOURS
                        TOTAL TIME BASE   24.92 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA          SQUARE MILES
                 PRECIPITATION DEPTH    INCHES
                 LENGTH, ELEVATION      FEET
                 FLOW                   CUBIC FEET PER SECOND
                 STORAGE VOLUME         ACRE-FEET
                 SURFACE AREA           ACRES
                 TEMPERATURE            DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                      NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                    1.00       .57
1

                PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                              FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                          TIME TO PEAK IN HOURS

                                                                RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN                RATIO 1  RATIO 2
                                                             1.00       .57

 HYDROGRAPH AT
+                  OFF1        .01      1   FLOW             9.        4.
```

						EX.OUT
				TIME	3.58	3.58
HYDROGRAPH AT						
+	OFF2	.00	1	FLOW	6.	3.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	EX1	.00	1	FLOW	4.	2.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1	.01	1	FLOW	18.	8.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	EX2	.00	1	FLOW	4.	2.
				TIME	3.50	3.50

$Q_{100} = 4$ cfs

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   05MAR14  TIME  14:37:17   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
         LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
                       *DIAGRAM
 *** FREE ***
              1        ID   ********************************************************************
              2        ID   *  .....................................................  *
              3        ID   *  :                                                   :  *
              4        ID   *  :                                                   :  *
              5        ID   *  :                THE LUCKY DRAGON CASINO            :  *
              6        ID   *  :                25-YEAR NDOT CRITERIA (EXISTING CONDITIONS)  :  *
              7        ID   *  :...................................................:  *
              8        ID   *  :                RETURN PERIOD_ _ _ _25-YEAR        :  *
              9        ID   *  :                DISTRIBUTION_ _ _ _ 6-HOUR SDN3    :  *
             10        ID   *  :                PROJECT NO_ _ _ _ _ 398-A436       :  *
             11        ID   *  :                FILENAME_ _ _ _ _ _ 25YEAREX.H1    :  *
             12        ID   *  :                DATE MODELED_ _ _ _ 03/05/2014     :  *
             13        ID   *  :                MODELED BY_ _ _ _ _ JYA/JEP        :  *
             14        ID   *  :...................................................:  *
             15        ID   *  :                                                   :  *
             16        ID   *  :...................................................:  *
             17        ID   ********************************************************************
             18        ID
             19        ID
             20        IT       5       0       0     300
             21        IO       5       0       0
             22        IN       5       0       0
             23        JR    PREC   .7401
                       *
             24        KK    OFF1
             25        KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
             26        BA  0.0059
             27        PB    2.77
             28        PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
             29        PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
             30        PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
             31        PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
             32        PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
             33        PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
             34        PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
             35        PC   .9980   .9990  1.000
             36        LS      0      91
             37        UD    .145
                       *
             38        KK    OFF2
             39        KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
             40        BA  0.0039
             41        LS      0      91
             42        UD    .179
                       *
```



```
         LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
             43        KK     EX1
             44        KM  BASIN EX1
             45        BA   0.002
             46        LS      0      94
             47        UD    .100
                       *
             48        KK     CP1
             49        KM  COMBINES OFF1, OFF2, & ON1
             50        HC      3
                       *
             51        KK     EX2
             52        KM  BASIN EX2
```

```
            53           BA   0.002
            54           LS       0      94
            55           UD    .100
                         *
            56           ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
              .
              .
    38        .         OFF2
              .         .
              .         .
    43        .         .          EX1
              .         .           .
              .         .           .
    48        CP1.......................
              .
              .
    51        .          EX2

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   05MAR14  TIME  14:37:17   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
*************************************************************
* .......................................................... *
* :                                                        : *
* :                                                        : *
* :              THE LUCKY DRAGON CASINO                   : *
* :              25-YEAR NDOT CRITERIA (EXISTING CONDITIONS) : *
* :........................................................: *
* :              RETURN PERIOD_ _ _ _25-YEAR               : *
* :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3           : *
* :              PROJECT NO_ _ _ _ _ 398-A436              : *
* :              FILENAME_ _ _ _ _ _ 25YEAREX.H1           : *
* :              DATE MODELED_ _ _ _ 03/05/2014            : *
* :              MODELED BY_ _ _ _ _ JYA/JEP               : *
* :........................................................: *
* :                                                        : *
* :........................................................: *
*************************************************************
```

```
   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1   0  STARTING DATE
                       ITIME        0000  STARTING TIME
                         NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE     2   0  ENDING DATE
                       NDTIME       0055  ENDING TIME
                       ICENT          19  CENTURY MARK

                     COMPUTATION INTERVAL      .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA          SQUARE MILES
                 PRECIPITATION DEPTH    INCHES
                 LENGTH, ELEVATION      FEET
                 FLOW                   CUBIC FEET PER SECOND
                 STORAGE VOLUME         ACRE-FEET
                 SURFACE AREA           ACRES
                 TEMPERATURE            DEGREES FAHRENHEIT

      JP           MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR           MULTI-RATIO OPTION
                       RATIOS OF PRECIPITATION
                       .74
1

                PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                              FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                          TIME TO PEAK IN HOURS

                                                                  RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN            RATIO 1
                                                          .74

 HYDROGRAPH AT
+                 OFF1         .01      1   FLOW           6.
```

				TIME	3.58
HYDROGRAPH AT					
+	OFF2	.00	1	FLOW	4.
				TIME	3.58
HYDROGRAPH AT					
+	EX1	.00	1	FLOW	3.
				TIME	3.50
3 COMBINED AT					
+	CP1	.01	1	FLOW	12.
				TIME	3.58
HYDROGRAPH AT					
+	EX2	.00	1	FLOW	3.
				TIME	3.50

*** NORMAL END OF HEC-1 ***

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

G. C. WALLACE COMPANIES
Engineers/Planners/Surveyors

The Lucky Dragon Casino
Proposed Conditions

Project No: 398-A436
Date: 2-Feb-14
Calculated by: JYA

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Sq Mi	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY fps	V2 VELOCITY fps	Tt Min	TOTAL LENGTH Feet	Tc = (L/180)+10 Min	Min	Tlag = 0.6Tc/60 Hours	Remarks:
(1)		(16)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(11)	(12)	(13)	(14)	(15)	
Onsite Basins																		
ON1	D	94	0.8508	2.0	0.003	110	1.00	4.7	460	0.83	1.8	2.8	4.2	570	13.2	8.9	0.089	
ON2	D	94	0.8508	0.5	0.001	30	1.15	2.3	400	0.50	1.4	2.2	4.7	430	12.4	7.0	0.070	
Offsite Basins Referenced From Approved Study																		
OFF1**	D	91	0.8112	3.8	0.006	100	0.50	6.5	1000	0.70	1.7	2.6	8.2	1100	16.1	14.7	0.147	
OFF2**	D	91	0.8112	2.5	0.004	130	0.50	7.5	670	0.70	1.7	2.6	6.0	800	14.4	13.5	0.135	

Tc = Ti + Tt Tlag = 0.6 Tc

$Ti = 1.8\,(1.1 - K)\,L^{1/2} / S^{1/3}$

K = 0.0132 (CN) - 0.39

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$
$V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$
$V2 = 30.6*(S/100)^{1/2}$

REFERENCE:

STANDARD FORM 4

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   25FEB14  TIME  15:40:50   *
*                                       *
*****************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*          609 SECOND STREET        *
*        DAVIS, CALIFORNIA 95616    *
*            (916) 756-1104         *
*                                   *
*************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
                    *DIAGRAM
*** FREE ***
               1    ID   ************************************************************
               2    ID   * .......................................................... *
               3    ID   * :                                                        : *
               4    ID   * :                                                        : *
               5    ID   * :              THE LUCKY DRAGON CASINO                   : *
               6    ID   * :              PROPOSED CONDITIONS                       : *
               7    ID   * :........................................................: *
               8    ID   * :              RETURN PERIOD_ _ _ _100 & 10 -YEAR        : *
               9    ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3           : *
              10    ID   * :              PROJECT NO_ _ _ _ _ 398-A436              : *
              11    ID   * :              FILENAME_ _ _ _ _ _ PRO.H1                : *
              12    ID   * :              DATE MODELED_ _ _ _ 02/24/2014            : *
              13    ID   * :              MODELED BY_ _ _ _ _ JYA/JEP               : *
              14    ID   * :........................................................: *
              15    ID   * :                                                        : *
              16    ID   * :........................................................: *
              17    ID   ************************************************************
              18    ID
              19    ID
              20    IT       5       0       0     300
              21    IO       5       0       0
              22    IN       5       0       0
              23    JR    PREC       1    0.57
                    *
              24    KK    OFF1
              25    KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              26    BA  0.0059
              27    PB    2.77
              28    PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
              29    PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
              30    PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
              31    PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
              32    PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
              33    PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
              34    PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
              35    PC   .9980   .9990  1.000
              36    LS       0      91
              37    UD    .145
                    *
              38    KK    OFF2
              39    KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              40    BA  0.0039
              41    LS       0      91
              42    UD    .179
                    *
```

1 HEC-1 INPUT PAGE 2

```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

              43    KK     ON1
              44    KM  BASIN ON1
              45    BA   0.003
              46    LS       0      94
              47    UD    .089
                    *
              48    KK     CP1
              49    KM  COMBINES OFF1, OFF2, & ON1
              50    HC       3
                    *
              51    KK     ON2
              52    KM  BASIN ON2
```

```
          53          BA   0.001
          54          LS      0      94
          55          UD    .070
                      *
          56          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
                .
                .
    38          .        OFF2
                .          .
                .          .
    43          .          .          ON1
                .          .           .
                .          .           .
    48        CP1.........................
                .
                .
    51          .          ON2

  (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   25FEB14  TIME  15:40:50   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*            (916) 756-1104             *
*                                       *
*****************************************
```

```
**************************************************************
*                                                            *
*                                                            *
*                                                            *
*                THE LUCKY DRAGON CASINO                     *
*                PROPOSED CONDITIONS                         *
*                                                            *
*                                                            *
*                RETURN PERIOD_ _ _ _100 & 10 -YEAR          *
*                DISTRIBUTION_ _ _ _ 6-HOUR SDN3             *
*                PROJECT NO_ _ _ _ _ 398-A436                *
*                FILENAME_ _ _ _ _ _ PRO.HI                  *
*                DATE MODELED_ _ _ _ 02/24/2014              *
*                MODELED BY_ _ _ _ _ JYA/JEP                 *
*                                                            *
*                                                            *
*                                                            *
**************************************************************
```

```
  21 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT           HYDROGRAPH TIME DATA
                      NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1    0  STARTING DATE
                     ITIME         0000  STARTING TIME
                        NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2    0  ENDING DATE
                    NDTIME         0055  ENDING TIME
                     ICENT          19  CENTURY MARK

                   COMPUTATION INTERVAL      .08 HOURS
                       TOTAL TIME BASE    24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                     NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                    RATIOS OF PRECIPITATION
                   1.00       .57
1

               PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                                   FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                                TIME TO PEAK IN HOURS

                                                                    RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN          RATIO 1  RATIO 2
                                                       1.00       .57

 HYDROGRAPH AT
+                 OFF1         .01      1   FLOW          9.        4.
```

						PRO.OUT
				TIME	3.58	3.58
HYDROGRAPH AT						
+	OFF2	.00	1	FLOW	6.	2.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON1	.00	1	FLOW	6.	3.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1	.01	1	FLOW	19.	9.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON2	.00	1	FLOW	2.	1.
				TIME	3.50	3.50

$Q_{100} = 2$ cfs

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   05MAR14  TIME  14:34:37   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X              X         X
XXXXXXX  XXXX           X   XXXXX   X
X     X  X              X         X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
                    *DIAGRAM
 *** FREE ***
               1    ID   ************************************************************
               2    ID   * .......................................................... *
               3    ID   * :                                                        : *
               4    ID   * :                                                        : *
               5    ID   * :              THE LUCKY DRAGON CASINO                   : *
               6    ID   * :              25-YEAR NDOT CRITERIA (PROPOSED CONDITIONS) : *
               7    ID   * :........................................................: *
               8    ID   * :              RETURN PERIOD_ _ _ _25-YEAR               : *
               9    ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3           : *
              10    ID   * :              PROJECT NO_ _ _ _ _ 398-A436              : *
              11    ID   * :              FILENAME_ _ _ _ _ _ 25YEAR                : *
              12    ID   * :              DATE MODELED_ _ _ _ 03/05/2014            : *
              13    ID   * :              MODELED BY_ _ _ _ _ JYA/JEP               : *
              14    ID   * :........................................................: *
              15    ID   * :                                                        : *
              16    ID   * :........................................................: *
              17    ID   ************************************************************
              18    ID
              19    ID
              20    IT      5       0       0     300
              21    IO      5       0       0
              22    IN      5       0       0
              23    JR    PREC   .7401
                    *
              24    KK    OFF1
              25    KM  BASIN OFF1 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              26    BA  0.0059
              27    PB    2.77
              28    PC  0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
              29    PC  .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
              30    PC  .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
              31    PC  .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
              32    PC  .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
              33    PC  .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
              34    PC  .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
              35    PC  .9980   .9990  1.000
              36    LS      0      91
              37    UD   .145
                    *
              38    KK    OFF2
              39    KM  BASIN OFF2 REFERENCED FROM ALLURE CONDOMINIUMS STUDY
              40    BA  0.0039
              41    LS      0      91
              42    UD   .179
                    *
```

1 HEC-1 INPUT PAGE 2

```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
              43    KK    ON1
              44    KM  BASIN ON1
              45    BA   0.003
              46    LS      0      94
              47    UD   .089
                    *
              48    KK    CP1
              49    KM  COMBINES OFF1, OFF2, & ON1
              50    HC      3
                    *
              51    KK    ON2
              52    KM  BASIN ON2
```

```
          53          BA   0.001
          54          LS      0      94
          55          UD    .070
                      *
          56          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE      (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24        OFF1
                .
                .
    38          .         OFF2
                .           .
                .           .
    43          .           .          ON1
                .           .           .
                .           .           .
    48         CP1.....................
                .
                .
    51          .          ON2

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   05MAR14  TIME  14:34:37   *
*                                       *
*****************************************

*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*          (916) 756-1104               *
*                                       *
*****************************************

*****************************************************************
*                                                               *
*                                                               *
*                                                               *
*                THE LUCKY DRAGON CASINO                        *
*                25-YEAR NDOT CRITERIA (PROPOSED CONDITIONS)    *
*                                                               *
*                RETURN PERIOD_ _ _ _25-YEAR                    *
*                DISTRIBUTION_ _ _ _ 6-HOUR SDN3                *
*                PROJECT NO_ _ _ _ _ 398-A436                   *
*                FILENAME_ _ _ _ _ _ 25YEAR                     *
*                DATE MODELED_ _ _ _ 03/05/2014                 *
*                MODELED BY_ _ _ _ _ JYA/JEP                    *
*                                                               *
*                                                               *
*                                                               *
*****************************************************************

   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1   0  STARTING DATE
                       ITIME       0000  STARTING TIME
                          NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2   0  ENDING DATE
                      NDTIME       0055  ENDING TIME
                      ICENT         19  CENTURY MARK

                    COMPUTATION INTERVAL      .08 HOURS
                        TOTAL TIME BASE    24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                      .74
1
                PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                              FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                          TIME TO PEAK IN HOURS

                                                                  RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN            RATIO 1
                                                          .74

 HYDROGRAPH AT
+                 OFF1         .01      1   FLOW          6.
```

```
                                        TIME          3.58

 HYDROGRAPH AT
+                    OFF2       .00    1  FLOW          4.
                                        TIME          3.58

 HYDROGRAPH AT
+                     ON1       .00    1  FLOW          4.
                                        TIME          3.50

   3 COMBINED AT
+                     CP1       .01    1  FLOW         13.
                                        TIME          3.58

 HYDROGRAPH AT
+                     ON2       .00    1  FLOW          1.
                                        TIME          3.50


*** NORMAL END OF HEC-1 ***
```

Q_{25} in proposed conditions

APPENDIX B

Hydraulic Calculations

Worksheet for Section 5-5 Existing Sahara Ave (25-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Discharge	120.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.600
0+05.0	0.500
0+05.5	0.500
0+05.5	0.000
0+07.0	0.130
0+07.0	0.170
0+74.8	1.356
0+74.8	1.856
0+79.3	1.856
0+79.3	1.360
1+16.3	0.620
1+16.3	0.580
1+17.8	0.450
1+17.8	0.950
1+18.3	0.950
1+23.3	1.050
1+23.3	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.170)	0.013
(0+07.0, 0.170)	(1+16.3, 0.620)	0.017
(1+16.3, 0.620)	(1+23.3, 2.000)	0.013

Worksheet for Section 5-5 Proposed Sahara Ave (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Discharge	172.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.600
0+05.0	0.500
0+05.5	0.500
0+05.5	0.000
0+07.0	0.130
0+07.0	0.170
0+74.8	1.356
0+74.8	1.856
0+79.3	1.856
0+79.3	1.360
1+16.3	0.620
1+16.3	0.580
1+17.8	0.450
1+17.8	0.950
1+18.3	0.950
1+23.3	1.050
1+23.3	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.170)	0.013
(0+07.0, 0.170)	(1+16.3, 0.620)	0.017
(1+16.3, 0.620)	(1+23.3, 2.000)	0.013

Worksheet for Section 5-5 Proposed Sahara Ave (100-Yr. Storm Event)

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		1.11	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		37.06	ft²
Wetted Perimeter		93.45	ft
Hydraulic Radius		0.40	ft
Top Width		91.78	ft
Normal Depth		1.11	ft
Critical Depth		1.19	ft
Critical Slope		0.00524	ft/ft
Velocity		4.64	ft/s
Velocity Head		0.33	ft
Specific Energy		1.44	ft
Froude Number		1.29	
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	1.11	ft
Critical Depth	1.19	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00524	ft/ft

Cross Section for Section 5-5 Proposed Sahara Ave (100-Yr. Storm

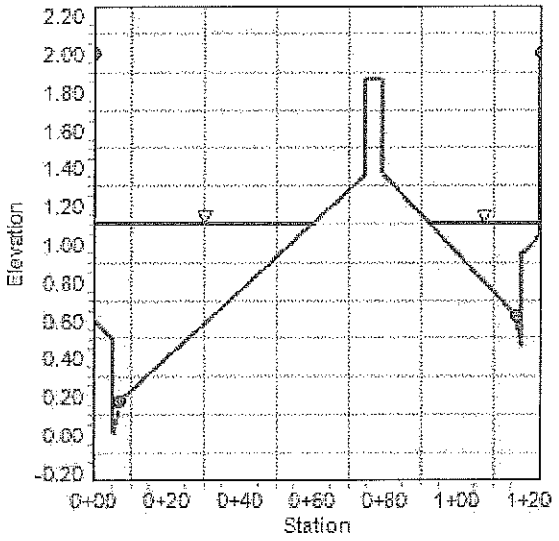
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Normal Depth	1.11	ft
Discharge	172.00	ft³/s

Cross Section Image



Worksheet for Section 5-5 Existing Sahara Ave (25-Yr. Storm Event)

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		1.00	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		28.07	ft²
Wetted Perimeter		79.55	ft
Hydraulic Radius		0.35	ft
Top Width		78.04	ft
Normal Depth		1.00	ft
Critical Depth		1.07	ft
Critical Slope		0.00552	ft/ft
Velocity		4.29	ft/s
Velocity Head		0.29	ft
Specific Energy		1.29	ft
Froude Number		1.26	
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	1.00	ft
Critical Depth	1.07	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00552	ft/ft

Cross Section for Section 5-5 Existing Sahara Ave (25-Yr. Storm Event)

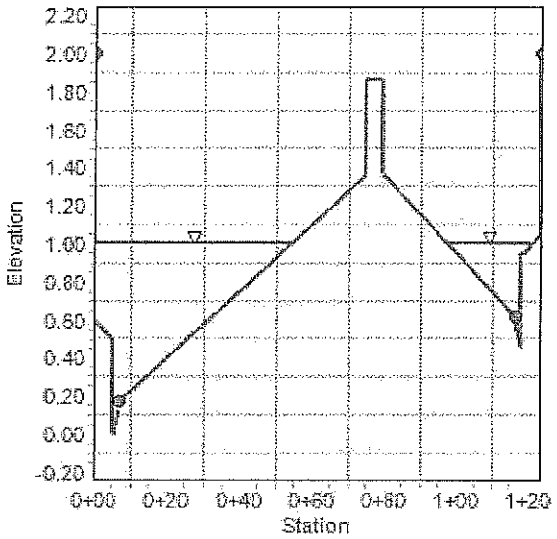
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00900	ft/ft
Normal Depth	1.00	ft
Discharge	120.40	ft³/s

Cross Section Image



Worksheet for Section 6-6 Proposed Sahara Ave (100-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Discharge	172.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.690
0+05.0	0.590
0+05.5	0.590
0+05.5	0.090
0+07.0	0.220
0+07.0	0.260
0+19.0	0.320
0+63.5	1.210
0+63.5	1.710
0+68.2	1.710
0+68.2	1.210
1+20.2	0.170
1+20.2	0.130
1+21.7	0.000
1+21.7	0.500
1+22.2	0.500
1+27.2	0.600
1+27.2	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.260)	0.013
(0+07.0, 0.260)	(1+20.2, 0.170)	0.017

Worksheet for Section 6-6 Proposed Sahara Ave (100-Yr. Storm Event)

Input Data

Start Station	Ending Station	Roughness Coefficient
(1+20.2, 0.170)	(1+27.2, 2.000)	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		1.06	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		50.45	ft²
Wetted Perimeter		109.15	ft
Hydraulic Radius		0.46	ft
Top Width		107.22	ft
Normal Depth		1.06	ft
Critical Depth		1.01	ft
Critical Slope		0.00531	ft/ft
Velocity		3.41	ft/s
Velocity Head		0.18	ft
Specific Energy		1.24	ft
Froude Number		0.88	
Flow Type	Subcritical		

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	1.06	ft
Critical Depth	1.01	ft

Worksheet for Section 6-6 Proposed Sahara Ave (100-Yr. Storm Event)

GVF Output Data

Channel Slope	0.00400	ft/ft
Critical Slope	0.00531	ft/ft

Cross Section for Section 6-6 Proposed Sahara Ave (100-Yr. Storm

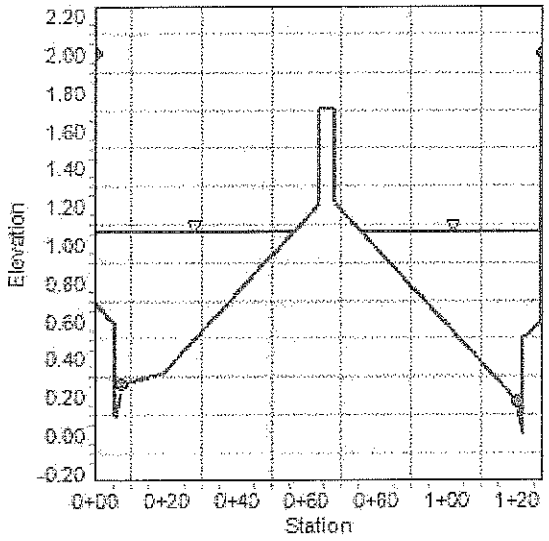
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Normal Depth	1.06	ft
Discharge	172.00	ft³/s

Cross Section Image



Worksheet for Section 6-6 Existing Sahara Ave (25-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00790	ft/ft
Discharge	120.40	ft^3/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.750
0+05.0	0.650
0+05.5	0.650
0+05.5	0.150
0+07.0	0.280
0+07.0	0.320
0+51.5	1.210
0+51.5	1.710
0+56.2	1.710
0+56.2	1.210
1+08.2	0.170
1+08.2	0.130
1+09.7	0.000
1+09.7	0.500
1+10.2	0.500
1+15.2	0.600
1+15.2	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.320)	0.013
(0+07.0, 0.320)	(1+08.2, 0.170)	0.017
(1+08.2, 0.170)	(1+15.2, 2.000)	0.013

Worksheet for Section 6-6 Existing Sahara Ave (25-Yr. Storm Event)

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		0.93	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		29.82	ft²
Wetted Perimeter		84.51	ft
Hydraulic Radius		0.35	ft
Top Width		82.89	ft
Normal Depth		0.93	ft
Critical Depth		0.98	ft
Critical Slope		0.00547	ft/ft
Velocity		4.04	ft/s
Velocity Head		0.25	ft
Specific Energy		1.19	ft
Froude Number		1.19	
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	0.93	ft
Critical Depth	0.98	ft
Channel Slope	0.00790	ft/ft
Critical Slope	0.00547	ft/ft

Cross Section for Section 6-6 Existing Sahara Ave (25-Yr. Storm Event)

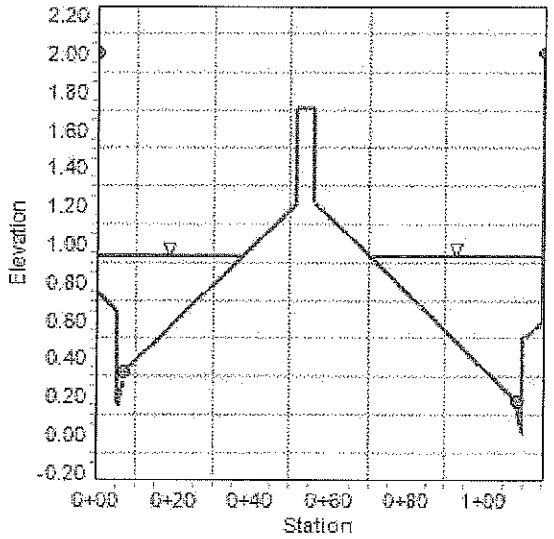
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00790	ft/ft
Normal Depth	0.93	ft
Discharge	120.40	ft³/s

Cross Section Image



Worksheet for Section 6-6 Proposed Sahara Ave (25-Yr. Storm Event)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Discharge	120.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	2.000
0+00.0	0.690
0+05.0	0.590
0+05.5	0.590
0+05.5	0.090
0+07.0	0.220
0+07.0	0.260
0+19.0	0.320
0+63.5	1.210
0+63.5	1.710
0+68.2	1.710
0+68.2	1.210
1+20.2	0.170
1+20.2	0.130
1+21.7	0.000
1+21.7	0.500
1+22.2	0.500
1+27.2	0.600
1+27.2	2.000

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 2.000)	(0+07.0, 0.260)	0.013
(0+07.0, 0.260)	(1+20.2, 0.170)	0.017

Worksheet for Section 6-6 Proposed Sahara Ave (25-Yr. Storm Event)

Input Data

Start Station	Ending Station	Roughness Coefficient
(1+20.2, 0.170)	(1+27.2, 2.000)	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		0.94	ft
Elevation Range	0.00 to 2.00 ft		
Flow Area		38.87	ft²
Wetted Perimeter		97.52	ft
Hydraulic Radius		0.40	ft
Top Width		95.82	ft
Normal Depth		0.94	ft
Critical Depth		0.90	ft
Critical Slope		0.00556	ft/ft
Velocity		3.10	ft/s
Velocity Head		0.15	ft
Specific Energy		1.09	ft
Froude Number		0.86	
Flow Type	Subcritical		

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	0.94	ft
Critical Depth	0.90	ft

Worksheet for Section 6-6 Proposed Sahara Ave (25-Yr. Storm Event)

GVF Output Data

Channel Slope	0.00400	ft/ft
Critical Slope	0.00556	ft/ft

Cross Section for Section 6-6 Proposed Sahara Ave (25-Yr. Storm

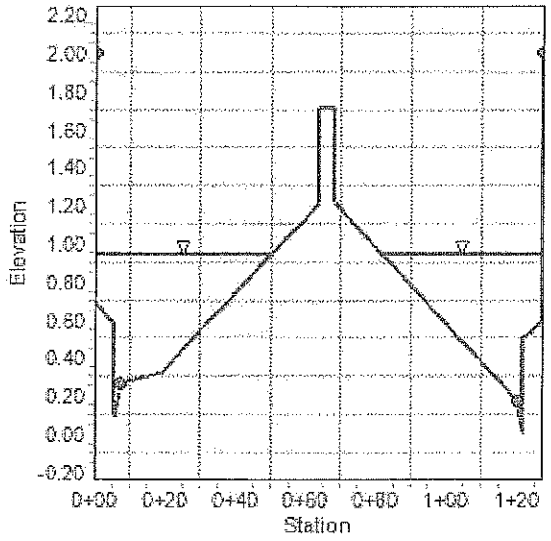
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00400	ft/ft
Normal Depth	0.94	ft
Discharge	120.40	ft³/s

Cross Section Image



APPENDIX C

Reference Materials

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: March 18, 2005
TO: Land Development Services Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Technical Drainage Study for: Allure Condominiums			COPIES TO: JHR Associates
Cross Streets:	NWC Sahara Av. & Fairfield Av. (W of LVBl)			SP Sahara Development.
File Number:	F:\Depot\DSMEMOS\DS3760A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-812-001 & 027			CCDDS
Zoning Action:	SDR-4534, VAC-5902, SUP-4540			CCRFCD
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	B&H

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	3/4/2005	3/18/2005	See Comments Below	$400.00	17484: $400
			TOTAL FEES (LDDRS):	$400.00	—

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.
X	must have Clark County Department of Development Services concurrence

1. **This drainage study is acceptable in concept**, however, the 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.
2. The project is also adjacent to the jurisdiction of Clark County to the south of Sahara Avenue. *Clark County Department of Development Services* must be obtained prior to the final approval of the drainage study.
3. The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right-of-way. The engineer must contact NDOT for encroachment permit for the proposed project.
4. This project is shown as being developed in two Phases. A technical drainage study update is required for Phase 2.
5. Show the limits of the alley replacement. The alley reconstruction must be included as part of the Phase 1 improvements.
6. On Sheets G1 & G2: Indicate the building footprint. Provide the existing plan number for the storm drain within Sahara Ave. Extend the flood protection berm along Sahara Avenue to the center point of the Phase 2 building or provide a solid grouted 8" CMU stem wall a minimum of three cells above the back of walk. Show the roof drain discharge locations and connect to the streets using sidewalk underdrains. Review and revise the plan accordingly.

Post-It® Fax Note 7671	Date	# of pages ▶
To Reese Jarrell	From Albert Sung	

7. Landscape areas are not allowed to drain over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the street. Revise all pertinent details accordingly.

8. Sheet C11, Detail C: Indicate the minimum ramp elevation on the cross section and provide the minimum slope of the landscape area.

9. Sheet C11, Detail D: Provide the retaining wall height and provide railing as needed.

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
B&H/PBJ

T/R/S: T21S/R61E/04
AREA R-04

Department of Development Services
Civil Engineering Division

500 S Grand Central Pky 1st Fl • PO Box 551799 • Las Vegas NV 89155-1799
(702) 455-4600 • Fax (702) 388-2550

Phil Rosenquist, Director

June 6, 2005

05-21511
LTR

JHR Associates
4880 W. University Avenue, Suite B-2
Henderson, Nevada 89103

Re: **Technical Drainage Study Concurrence** for Allure Condominiums
Dated: March 4, 2005
Location: NWC Sahara Avenue and Fairfield Avenue
(Sec. 04, T21S, R61E)
CLV# DS3760A
HTE# 05-21511

The above-referenced project is located within the **City of Las Vegas** adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence on May 13, 2005. In addition, the County has received the City of Las Vegas acceptance letter dated March 18, 2005 for the Technical Drainage Study.

The County concurs with the acceptance of this Technical Drainage Study by the City of Las Vegas. Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas.

No liability is assumed by the County for information, data, and conclusions of the consulting engineer.

DEPARTMENT OF DEVELOPMENT SERVICES

By _____
Jeffery J. Jensen, P.E.
Senior Civil Engineer
Civil Engineering Division

cc: Development File
Albert Sung, P.E., City of Las Vegas

BOARD OF COUNTY COMMISSIONERS
RORY REID, Chairman • MYRNA WILLIAMS, Vice Chair
TOM COLLINS • YVONNE ATKINSON GATES • CHIP MAXFIELD • LYNETTE BOGGS McDONALD • BRUCE L. WOODBURY
THOM REILLY, County Manager

STANDARD FORM 4

124-04-555 Allure Condominiums

BASIN IDENTIFIER	RCN	K	TOTAL AREA (acres)	TOTAL AREA (miles^2)	L (ft)	SLOPE (%)	T_i (min)	L (ft)	SLOPE (%)	V (ft/sec)	T_t (min)	TOTAL L (ft)	$T_c=T_i+T_t$ (min)	CHECK $T_c=(L/180)+10$ (min)	ACCEPTED T_c (min)	TLAG (hrs)	COMMENTS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
OFFSITE DRAINAGE BASINS - EXISTING CONDITION																	
OFF1**	91	0.811	3.8	0.0059	100	0.5	6.55	1000	0.7	2.10	7.94	1100	14.49	N/A	14.49	0.145	Developed - apartments
OFF2**	91	0.811	2.5	0.0039	130	0.5	7.47	670	0.7	1.07	10.44	800	17.90	N/A	17.90	0.179	Developed - apartments
ONSITE DRAINAGE BASIN - EXISTING CONDITION																	
ON1EX	94	0.851	2.80	0.0044	75	0.8	4.18	575	0.8	0.95	10.09	650	14.27	N/A	14.27	0.143	Urban - commercial
ON2EX	94	0.851	1.10	0.0017	140	0.8	5.72	620	0.8	0.76	13.60	760	19.31	N/A	19.31	0.193	Urban - commercial
		$K = 0.0132 * RCN - 0.39$					$T_i = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3}$									$TLAG = (T_c * 0.6) / 60$	
KK	LS	n/a	n/a	BA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	UD	HEC-1 CARD

STANDARD FORM 4

124-04-555 Allure Condominiums

BASIN IDENTIFIER	RCN	K	TOTAL AREA (acres)	TOTAL AREA ($miles^2$)	L (ft)	SLOPE (%)	T_i (min)	L (ft)	SLOPE (%)	V (ft/sec)	T_t (min)	TOTAL L (ft)	$T_c=T_i+T_t$ (min)	CHECK $T_c=(L/180)+10$ (min)	ACCEPTED T_c (min)	TLAG (hrs)	COMMENTS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
ONSITE DRAINAGE BASINS - DEVELOPED CONDITION																	
ON1D	98	0.904	0.69	0.0011	45	0.7	2.62	60	1.6	2.83	0.35	105	2.98	10.58	2.98	0.050	Developed residential
ON2D	98	0.904	3.20	0.0050	288	1.0	6.00	123	1.0	2.45	0.84	411	6.84	12.28	6.84	0.068	Developed residential
		$K = 0.0132 * RCN - 0.39$					$T_i = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3}$									TLAG = $(T_c * 0.6) / 60$	
KK	LS	n/a	n/a	BA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	UD	HEC-1 CARD

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*            JUN 1998               *
*          VERSION 4.1              *
*                                   *
*  RUN DATE  28FEB05  TIME 14:38:51 *
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*                                   *
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTE     *
*       609 SECOND STREET           *
*     DAVIS, CALIFORNIA 95616       *
*       (916) 756-1104              *
*                                   *
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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    1     ID
          *DIAGRAM
    2     ID
    3     ID   ***** ALLURE CONDOMINIUMS
    4     ID   ***** LOCATED ON THE NORTHWEST CORNER OF
    5     ID   ***** SAHARA BLVD AND FAIRFIELD AVE
    6     ID   ***** JHR PROJECT NO. 124-04-556
    7     ID   ***** FILENAME: ALLURE.DAT
    8     ID
    9     ID        ANALYSIS BY;    JHR ASSOCIATES, LTD.
   10     ID                        4880 W.UNIVERSITY, SUITE B-2
   11     ID                        LAS VEGAS, NEVADA 89103
   12     ID                        (702) 876-2341
   13     ID
   14     ID
   15     ID   100-YR STORM EVENT RATIO FOR (JR) CARD: 1.0000
   16     ID    25-YR STORM EVENT RATIO FOR (JR) CARD: 0.7401
   17     ID    10-YR STORM EVENT RATIO FOR (JR) CARD: 0.5704
   18     ID
   19     ID   THE RATIOS APPLIED FOR THE 10-YEAR AND 100-YEAR STORM EVENT
   20     ID   ARE BASED ON THE MCCARRAN PRECIPITATION RATIOS
   21     ID   THE PROJECT SITE: 100-YEAR 6 HR STORM - 2.77 INCHES
   22     ID   THE PROJECT SITE:  25-YEAR 6 HR STORM - 2.05 INCHES
   23     ID   THE PROJECT SITE:  10-YEAR 6 HR STORM - 1.58 INCHES
   24     ID
   25     IT      5       0       0       0     300
   26     IO      5       0       0       0
   27     IN      5       0       0       0
   28     JR    PREC   1.000  0.7401  0.5704

   29     KK    OFF1
   30     KM   STORM RUNOFF FROM OFFSITE BASIN OFF1
   31     BA  0.0059
   32     PB   2.77
   33     PC  0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
   34     PC  0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
   35     PC  0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
   36     PC  0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.489
   37     PC  0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
   38     PC  0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
   39     PC  0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
   40     PC  0.998   0.999   1.000
   41     LS      0      91
   42     UD  0.145

   43     KK    OFF2
   44     KM   STORM RUNOFF FROM OFFSITE BASIN OFF2 - EXISTING CONDITION
   45     BA  0.0039
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   47     UD  0.179
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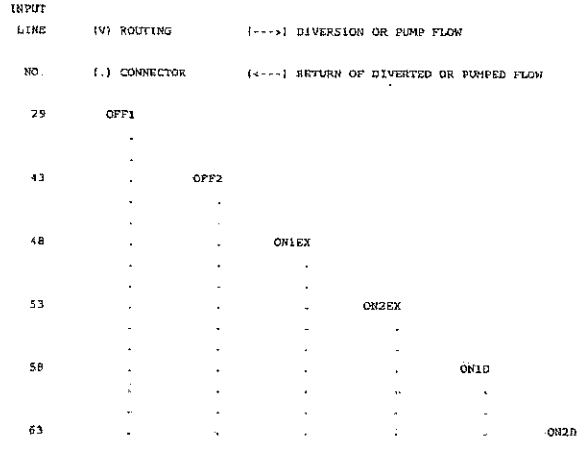
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  52      UD   0.143

  53      KK   ON2EX
  54      KM   STORM RUNOFF FROM PROJECT ONSITE BASIN ON2EX
  55      BA  0.0017
  56      LS       0      94
  57      UD   0.153

  58      KK    ON1D
  59      KM   STORM RUNOFF FROM ONSITE BASIN ON1D - DEVELOPED CONDITION
  60      BA  0.0011
  61      LS       0      98
  62      UD   0.050

  63      KK    ON2D
  64      KM   STORM RUNOFF FROM ONSITE BASIN ON2D - DEVELOPED CONDITION
  65      BA  0.0050
  66      LS       0      98
  67      UD   0.068
  68      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1)     *
*            JUN  1998                  *
*         VERSION 4.1                   *
*                                       *
*  RUN DATE  28FEB05  TIME  14:38:51    *
*                                       *
*****************************************
```

```
*********************************
*                               *
*  U.S. ARMY CORPS OF ENGINEERS *
*  HYDROLOGIC ENGINEERING CENTE *
*       609 SECOND STREET       *
*     DAVIS, CALIFORNIA 95616   *
*       (916) 756-1104          *
*                               *
*********************************
```

***** ALLURE CONDOMINIUMS
***** LOCATED ON THE NORTHWEST CORNER OF
***** SAHARA BLVD AND FAIRFIELD AVE
***** JHR PROJECT NO. 124-04-555
***** FILENAME: ALLURE.DAT

ANALYSIS BY: JHR ASSOCIATES, LTD.
4880 W.UNIVERSITY, SUITE B-2
LAS VEGAS, NEVADA 89103
(702) 875-2341

100-YR STORM EVENT RATIO FOR (JR) CARD: 1.0000
25-YR STORM EVENT RATIO FOR (JR) CARD: 0.7401
10-YR STORM EVENT RATIO FOR (JR) CARD: 0.5704

THE RATIOS APPLIED FOR THE 10-YEAR AND 100-YEAR STORM EVENT
ARE BASED ON THE MCCARRAN PRECIPITATION RATIOS
THE PROJECT SITE: 100-YEAR 6 HR STORM - 2.77 INCHES
THE PROJECT SITE: 25-YEAR 6 HR STORM - 2.05 INCHES
THE PROJECT SITE: 10-YEAR 6 HR STORM - 1.58 INCHES

26 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		101	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0820	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 8.33 HOURS

	FLOW	CUBIC FEET PER SECOND
	STORAGE VOLUME	ACRE-FEET
	SURFACE AREA	ACRES
	TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION

RATIOS OF PRECIPITATION

1.00 .74 .57

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .74	RATIO 3 .57
HYDROGRAPH AT							
+	OFF1	.01	1	FLOW	9.	6.	4.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	OFF2	.00	1	FLOW	6.	4.	3.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ON1EX	.00	1	FLOW	7.	5.	4.
				TIME	3.50	3.58	3.58
HYDROGRAPH AT							
+	ON2EX	.00	1	FLOW	3.	2.	1.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ON1D	.00	1	FLOW	3.	2.	1.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ON2D	.00	1	FLOW	11.	8.	6.
				TIME	3.50	3.50	3.50

*** NORMAL END OF HEC-1 ***

PROJECT SITE

BASIN DATA

BASIN ID	AREA (AC)	SOIL GROUP	RCN	COMMENTS
ON1D	0.69 AC	C	98	DEVELOPED
ON2D	3.20 AC	C	98	DEVELOPED

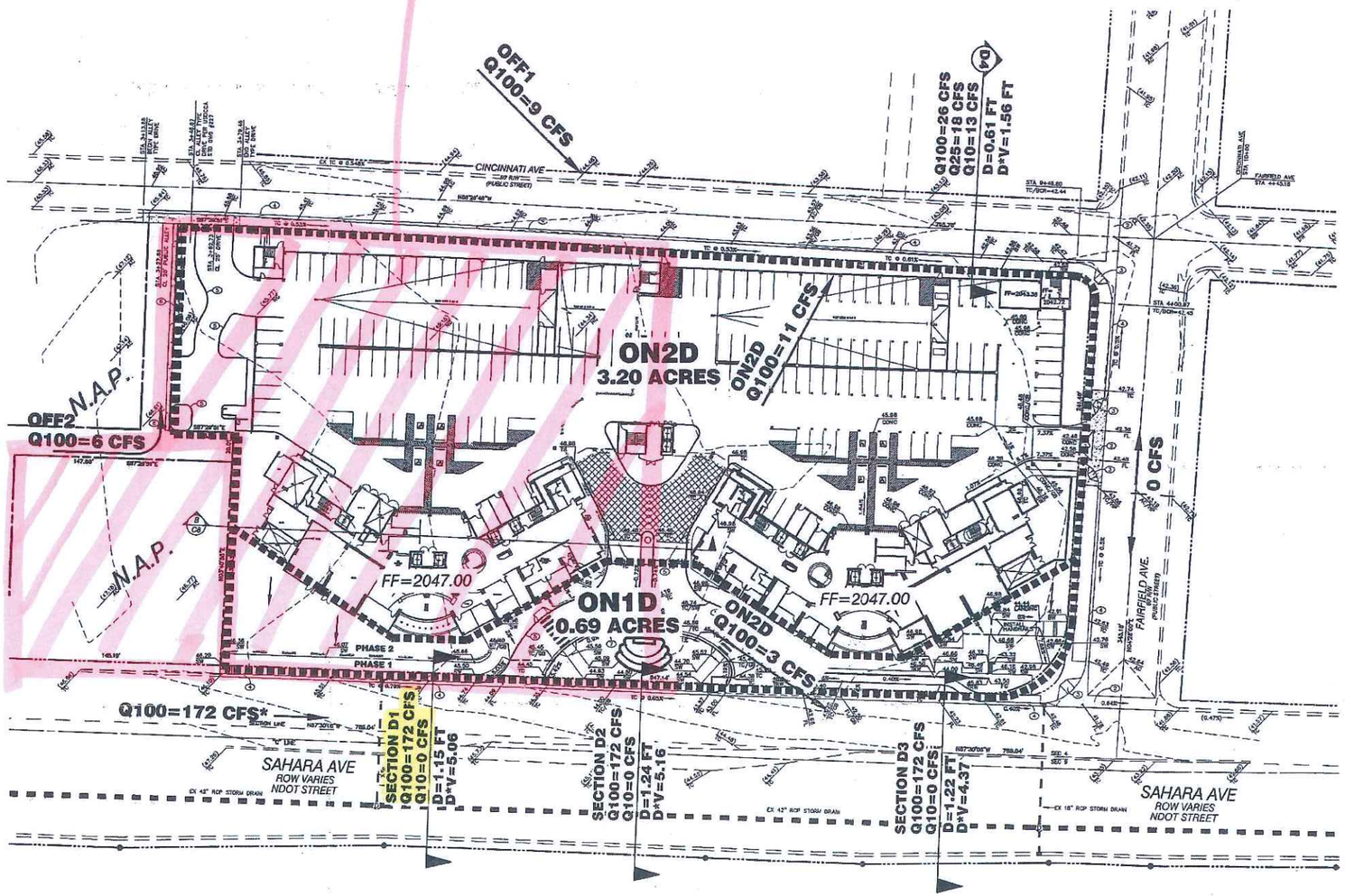
FLOW DATA

BASIN ID	10-YEAR	25-YEAR	100-YEAR	COMMENTS
ON1D	1 CFS	2 CFS	3 CFS	DEVELOPED
ON2D	6 CFS	8 CFS	11 CFS	DEVELOPED

GRAPHIC SCALE

40 20 0 40 120

(IN FEET)
1 inch = 40 ft.





AREA MAP
N.T.S.

LEGEND

- PROPERTY LINE
- RIGHT OF WAY
- CENTERLINE
- AD CUTLINE
- EXISTING CURB
- PROPOSED CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF PAVEMENT
- EXISTING BLOCK WALL
- PROPOSED BLOCK WALL
- 2051 CONTOUR LINE
- OHP OHP EXISTING OVER HEAD POWER
- AC ASPHALTIC CONCRETE
- BC BACK OF CURB
- BCR BEGINNING OF CURB RADIUS
- BW BACK OF WALK
- CG CURB & GUTTER
- CL CENTERLINE
- CONC CONCRETE
- ECR END OF CURB RADIUS
- EP EDGE OF PAVEMENT
- EX EXISTING
- FG FINISH GRADE
- FL FLOW LINE
- GB GRADE BREAK
- HP HIGH POINT
- LP LOW POINT
- NG NATURAL GROUND
- PL PROPERTY LINE
- STA STATION
- SW SIDEWALK
- TC TOP OF CURB
- TF TOP OF FOOTING
- TRW TOP OF RETAINING WALL
- TW TOP OF WALL
- EXISTING 250W STREET LIGHT
- EXISTING GUY WIRE
- EXISTING POWER POLE
- SIGHT VISIBILITY RESTRICTION ZONE (SVRZ) NOTHING OVER 24-INCHES IN HEIGHT AS MEASURED FROM TOP OF CURB ALLOWED IN SVZ EXCEPT TRAFFIC CONTROL DEVICES
- EXISTING INGRESS/EGRESS EASEMENT

BASIS OF BEARINGS

N04°28'00"E BEING THE CENTERLINE OF FAIRFIELD AVENUE, CALCULATED FROM BOOK 1, PAGE 43 OF PLATS.

BENCHMARK

C.V BM# CLV11 4SCS

BEING A RIVET AND PLATE IN TOP OF CURB, 20' EAST OF N.E. RETURN SAHARA AVENUE AND LAS VEGAS BOULEVARD.

ELEV. = 621.9630 (M) 2040.56 (FT) NAVD '88

LEGAL DESCRIPTION

PARCEL 1:

LOT ELEVEN (11) IN BLOCK THREE (3) OF JUDY RICH TRACT, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 4 OF PLATS, PAGE 27, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.
EXCEPTING THEREFROM THE INTEREST IN AND TO THE WEST 20 FEET THEREOF AS CONVEYED TO THE CITY OF LAS VEGAS FOR ALLEY AND INCIDENTAL PURPOSES BY DEED RECORDED JANUARY 9, 1973 AS DOCUMENT NO. 251334.

PARCEL 2:

LOTS ONE (1) THROUGH EIGHTEEN (18) INCLUSIVE IN BLOCK NINE (9) OF MEADOWS ADDITION, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 3 OF PLATS, PAGE 40, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.
TOGETHER WITH THAT VACATED ALLEY AS DESCRIBED BY ORDER OF VACATION RECORDED JANUARY 4, 1973 AS DOCUMENT NO. 251333, OFFICIAL RECORDS.
EXCEPTING THEREFROM THOSE PORTIONS OF THE RESUBDIVISION OF PORTIONS OF BLOCKS 1 AND 9, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 3 OF PLATS, PAGE 40 AS CONVEYED TO THE CITY OF LAS VEGAS BY DEED RECORDED AUGUST 10, 1987 IN BOOK 870810 AS DOCUMENT NO. 00704, OFFICIAL RECORDS.

CONSTRUCTION NOTES

1. CONSTRUCT DRIVEWAY PER USDCCA STD DWG'S #222-A AND #225
2. CONSTRUCT CROSS GUTTER PER USDCCA STD DWG #228
3. CONSTRUCT HANDICAP RAMPS PER USDCCA STD DWG # 235
4. REMOVE AND REPLACE EXISTING 2' "L" TYPE CURB PER STD DWG #216
5. INSTALL 6" "A" TYPE CURB PER DETAIL THIS SHEET
6. INSTALL 2' CONCRETE WATERWAY PER DETAIL THIS SHEET
7. INSTALL 2' "L" TYPE CURB PER STD DWG #216

GRADING NOTES

1. ALL GRADING AND PAVING TO BE COMPLETED IN STRICT ACCORDANCE WITH KLEINFELDER SOILS REPORT PROJECT No. 49939 DATED JANUARY 14, 2005
2. PAD ELEVATION IS BASED ON FOUR (4") INCHES TYPE II OVERLAIN WITH A 10 MIL 10 MIL VISQUEEN MEMERANE ALL UNDER CONCRETE SLAB OF 4" MINIMUM
*** SEE SOILS REPORT FOR ALTERNATIVE ***

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you Dig.
1-800-227-2600
(48 hrs. Advance Notice Required)

AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
Call before you OVERHEAD
1-702-227-2929
NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UNDERGROUND
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

SUBMITTAL
PRINTED
MAR 22 2005
JHR ASSOC.

05-21511 TDSMAPS

REV	DATE	BY	DESCRIPTION

CLIENT: SP SAHARA DEVELOPMENT, LLC.
20 N. WACKER DRIVE #2300 CHICAGO, ILLINOIS 60606
PHONE: (312) 424-6228 FAX: (312) 855-1719

PREPARED: JHR Associates Ltd.
4980 W. UNIVERSITY, SUITE B-2 PH (702) 876-2341
LAS VEGAS, NEVADA 89103 FAX (702) 876-8395

SHEET: DRAINAGE PLAN

PROJECT: ALLURE CONDOMINIUMS
WEST SAHARA AVENUE
CITY OF LAS VEGAS, NEVADA

DRAWN BY: JGR
DESIGNED BY:
CHECKED BY:
DATE: 2-22-05
PROJECT NO. 124-04-555
SCALE: HORIZ. 1"=40' VERT. N/A

SEAL
REESE P. JARRELL
Exp. 6-30-05
CIVIL
No. 7867

SHEET
DR1
SHEET 1 OF 1 SHEETS

\\Temp-1A\SAHACAD\DV1\dwg\SC-DRW.dwg Fri Mar 04 12:41:39 2005

LEGEND / ABBREVIATIONS

⟶	CHANNEL FLOW DIRECTION
→	RUNOFF FLOW DIRECTION
●—	BASIN DISCHARGE POINT
OFF1	BASIN IDENTIFIER
Q100	100-YEAR EVENT FLOW QUANTITY
Q25	25-YEAR EVENT FLOW QUANTITY
Q10	10-YEAR EVENT FLOW QUANTITY
CFS	CUBIC FEET PER SECOND

NOTES:

THE GENERAL TOPOGRAPHY OR FALL OF THE PROJECT SITE IS APPROXIMATELY 0.8% FROM THE WEST TO THE EAST.

**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH

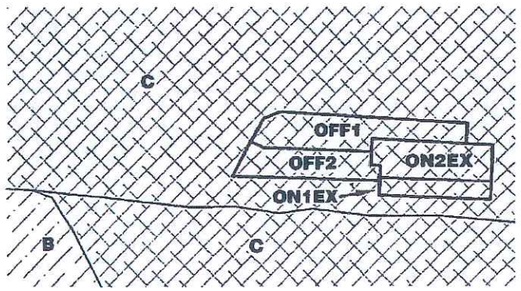
1"=300'

GRAPHIC SCALE

300 0 150 300 600

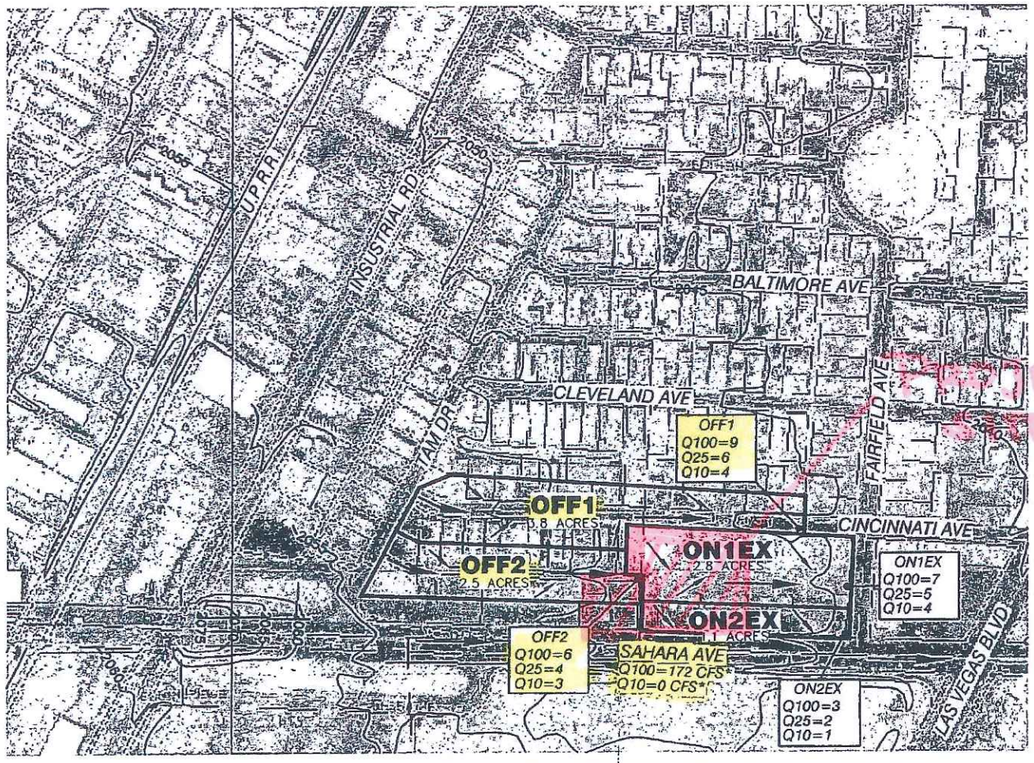
(IN FEET)

1 inch = 300 FT



SOIL GROUP CLASSIFICATION

SCALE 1"=100'



SOURCE: CLARK COUNTY GEOGRAPHICAL INFORMATION SYSTEMS (GIS): IMAGE AS OF FALL 2004 CONTOURS AS OF 1996

THE PROJECT SITE IS LOCATED WITHIN REGIONAL DRAINAGE BASIN CH51 OF THE CENTRAL WATERSHED. THE SOIL CLASSIFICATION IS TYPE C, WHICH IS INDICATIVE OF MODERATELY HIGH RUNOFF POTENTIAL.

JHR Associates, Ltd.
4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	02/05	BY:	JGR
PROJECT #:	124-04-555	SCALE:	1"=300'

DESCRIPTION:

OFFSITE DRAINAGE BASIN MAP

EXISTING CONDITION

ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: 6

1 OF 1

I:\Temp-14\SAHACOND\Flood\SC-BASEX.dwg Tue Mar 01 11:05:36 2005

LEGEND / ABBREVIATIONS

→	CHANNEL FLOW DIRECTION
→	RUNOFF FLOW DIRECTION
●—	BASIN DISCHARGE POINT
ON1D	BASIN IDENTIFIER
Q100	100-YEAR EVENT FLOW QUANTITY
Q25	25-YEAR EVENT FLOW QUANTITY
Q10	10-YEAR EVENT FLOW QUANTITY
CFS	CUBIC FEET PER SECOND

NOTES:

THE GENERAL TOPOGRAPHY OR FALL OF THE PROJECT SITE IS APPROXIMATELY 0.8% FROM THE WEST TO THE EAST.

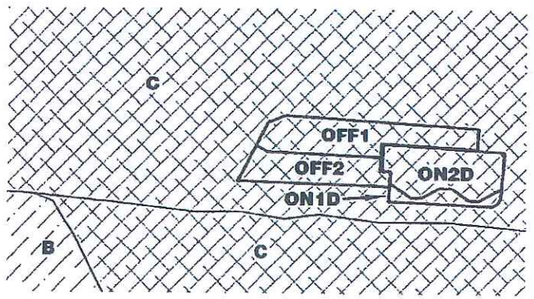
**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH
1" = 300'

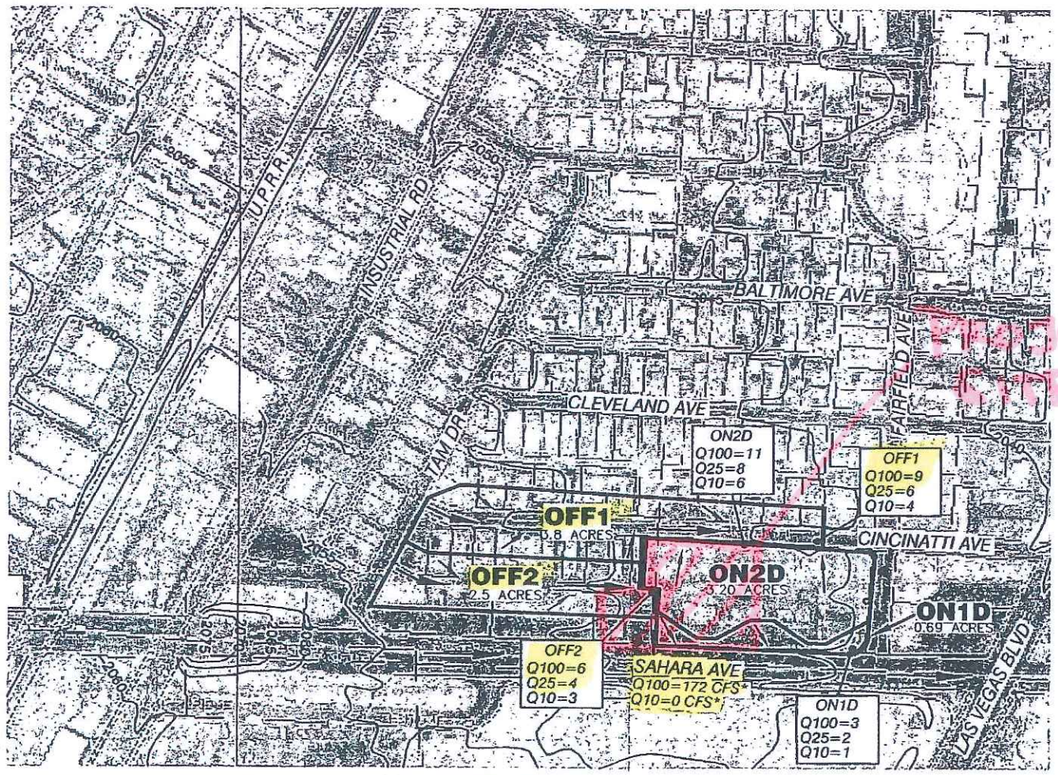
GRAPHIC SCALE

300 0 150 300 600

(IN FEET)
1 inch = 300 FT



SOIL GROUP CLASSIFICATION
SCALE 1"=100'



SOURCE: CLARK COUNTY GEOGRAPHICAL INFORMATION SYSTEMS (GIS): IMAGE AS OF FALL 2004
CONTOURS AS OF 1996

THE PROJECT SITE IS LOCATED WITHIN REGIONAL DRAINAGE BASIN CH51 OF THE CENTRAL WATERSHED. THE SOIL CLASSIFICATION IS TYPE C, WHICH IS INDICATIVE OF MODERATELY HIGH RUNOFF POTENTIAL.

JHR Associates, Ltd.
4880 W. UNIVERSITY AVE., SUITE NO. B2
LAS VEGAS, NEVADA 89103
PH: (702) 876-2341 FAX: (702) 876-8395

DATE:	02/05	BY:	JGR
PROJECT #:	124-04-555	SCALE:	1"=300'

DESCRIPTION:

OFFSITE DRAINAGE BASIN MAP
DEVELOPED CONDITION
ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: 7

1 OF 1

I:\Temp-14\SAHACOND\Flood\SC-BASDV.dwg Tue Mar 01 07:02:17 2005

UPDATE TO THE TECHNICAL DRAINAGE STUDY FOR LUCKY DRAGON

398-A436C

October 2014

Prepared for:

The Howard Hughes Company, LLC
10801 W. Charleston Blvd., 3rd floor
Las Vegas, Nevada 89146
Phone: (702) 791-4300
Fax: (702) 791-4450

Prepared by:

G. C. Wallace Companies
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: May 27, 2014

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:
Lucky Dragon

COPIES TO:
G.C. Wallace Companies
Lucky Dragon LP
Bart Anderson, P.E., DevCo
CCRFCD
CCPW
NDOT

Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue
File Number:	F:\Depot\DSMemos\DS4659D.doc
Parcel Number:	162-04-807-004 & 162-04-814-002
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891

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	3/10/2014	3/24/2014	Not Approved	$400.00	350152: $400
2nd Submittal	4/10/2014	4/14/2014	Conditional Approval	$400.00	353390: $400
CCRFCD	5/13/2014	5/22/2014	Concurrence Recv'd	N/C	N/C
CCPW & NDOT	5/22/2014	5/27/2014	Concurrence Recv'd	N/C	N/C
			TOTAL FEES (LDDRS):	**$800.00**	**----**

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.

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: T21S/R61E/04
AREA R-04

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: November 13, 2014
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: **Lucky Dragon**			**COPIES TO:** G.C. Wallace Companies
Cross Streets:	NWC of Sahara Blvd. & Fairfield Avenue			Lucky Dragon LP
File Number:	F:\Depot\DSMemos\DS4659E.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-04-807-004 & 162-04-814-002			CCRFCD
Zoning Action:	TMP-44450; GPA-43887; SUP-43889; SDR-43890 & VAC-43891			CCPW
FEMA Flood Zone	YES	NO	X	NDOT
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/10/2014	3/24/2014	Not Approved	$400.00	350152: $400
2nd Submittal	4/10/2014	4/14/2014	Conditional Approval	$400.00	353390: $400
CCRFCD	5/13/2014	5/22/2014	Concurrence Recv'd	N/C	N/C
CCPW & NDOT	5/22/2014	5/27/2014	Concurrence Recv'd	N/C	N/C
3rd Submittal	10/29/2014	11/13/2014	See Comments Below	$100.00	375181: $100
			TOTAL FEES (LDDRS):	**$900.00**	**----**

REMARKS:

3rd Submittal: Update to Re-route an NDOT Inlet on Sahara Avenue because of utility conflict

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.

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: T21S/R61E/04
AREA R-04

Department of Public Works

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@ClarkCountyNV.gov

Concurrence Letter

Rec'd: 5/22/14

Date: May 15, 2014
Firm: G.C. Wallace Companies
Engineer: Jerry E. Pruitt, P.E.
Address: 1555 South Rainbow Blvd., Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299
E-mail: JPruitt@GCWallace.com

Subject: Technical Drainage Study for Lucky Dragon LP
Location: Approximately 430 ft west of Fairfield Avenue and Sahara Avenue on the north side of Sahara Avenue
APN: 162-04-807-004, 162-04-814-002, 162-04-807-005
Sec, Township, Range: S4, T21S, R61E
Flood Zone & Panel: Zone X, 2170F, November 16, 2011
Application Tracking #: 14-14780

HTE14-12215

Submittals	Date Received	Date Returned	Reviewer	Miscellaneous
Concurrence	04/14/2014	05/15/2014	JRH	

The above-referenced project is located within the **City of Las Vegas** adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence on April 14, 2014. In addition, the County has received the City of Las Vegas acceptance letter dated April 14, 2014 for the Technical Drainage Study (DS4659B) as well as acceptance letters dated March 26, 2014 by the Nevada Department of Transportation (#398-4436C) and Clark County Regional Flood Control District (RFCD #14-9307).

BOARD OF COUNTY COMMISSIONERS
STEVE SISOLAK, Chairman • LARRY BROWN, Vice Chairman
SUSAN BRAGER • TOM COLLINS • CHRIS GIUNCHIGLIANI • MARY BETH SCOW • LAWRENCE WEEKLY
DONALD G. BURNETTE, County Manager

14-14780

The County concurs with the acceptance of this Drainage Study by the City of Las Vegas. Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas.

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

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

cc: HERServices, Inc.

398-A436C

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

BRIAN SANDOVAL
Governor

RUDY MALFABON, P.E., *Director*

In Reply Refer to:

March 26, 2014

C010
Jerry Pruitt
G.C. Wallace, Inc.
1555 South Rainbow Blvd.
Las Vegas, NV 89146-2903

TECHNICAL DRAINAGE STUDY
Lucky Dragon Casino
Clark

Dear Mr. Pruitt:

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

Document:	Dated:
TDS	3/10/2014
Drainage Information Form	3/06/2014
RCI Transmittal	3/10/2014

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.
XX	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:
	must be supplemented or modified to satisfy the following comment(s) before preliminary Hydraulic Section approval can be granted:

1. Please note that per NDOT Std. Specs section 202.03.06 Closing Culverts, when abandoning or closing existing culverts within construction limits, culverts must be 5 feet or great below finished grade. Completely fill the ends of the culvert with satisfactory soil for a distance of at least 2 feet plus the opening of the structure. In this case the minimum distance would be 3.5 feet. If existing culvert is not a minimum of 5 feet below the existing surface, it should be removed.

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.

Please call me at (775)-888-7287 should you have any questions.

Sincerely,

Amy Mac Quarrie, P.E.
Senior Hydraulic Engineer

c: Mary Martini, P.E., District I Engineer
Rudye Lucero, District I Permits
Charlton S. Pratt, HQ Permit Coordinator
Thaddeus Stephenson, District I Permits
David S. Jacoby, Lucky Dragon LP

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Date: 10/29/2014

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Ave

East/West: Sahara Avenue

b) Section: 4 Township: 21 Range: 61 East

c) APN : 162-04-807-004

162-04-814-002

Name of Owner: Lucky Dragon LP - David S Jacoby

Telephone No.: (702) 897-5625 Fax No.: E-Mail Address: jacobyd@ggamllc.com

Address: 3575 West Post Road, Las Vegas, NV 89118

Contact Person-Name: James A. Monroe Jr. **Telephone No.:** (702) 804-2000

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

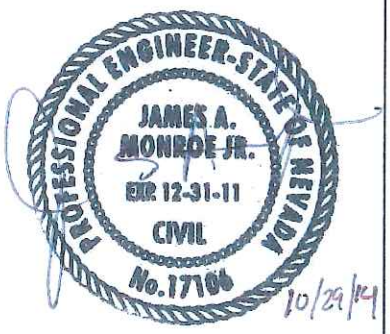
Firm: G.C. Wallace Inc.

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	X	Building Permit		

1. Total Owned Land Area: At Site: +/- 2.28 acres Being Developed/Disturbed: +/-2.28 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: +/- 6.3 acres
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Technical Drainage Study for Allure Condominiums
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Cincinnati Avenue and Sahara 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.**

Local Entity File No.

Revision	Date

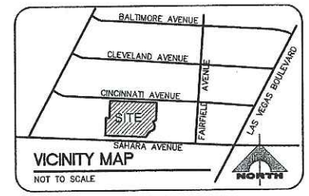
REFERENCE:

STANDARD FORM 1



NORTH

SCALE 30 0 30 60 FEET



VICINITY MAP

NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'08" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT GLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. CONSTRUCT 3' CONCRETE VALLEY GUTTER
7. CONSTRUCT SIDEWALK UNDERDRAIN (USDCCA NO. 236)
8. CONSTRUCT ASPHALT PAVEMENT (X" A/C OVER X" TYPE II COMPACTED TO 95%)
9. ADJUST EXISTING UTILITY TO FINISHED GRADE
10. SAWCUT EXISTING PAVEMENT
11. CONSTRUCT PLANTER WALL, PER ARCHITECTURAL PLANS
12. PROVIDE TRENCH DRAIN IN DOCK AREA
13. PROVIDE 0" CURB FACE
14. PROVIDE METAL SCREEN WALL PER ARCHITECTURAL PLANS
15. PROVIDE 0" CURB FACE
16. CONSTRUCT CMU WALL PER ARCHITECTURAL PLANS
17. REMOVE EXISTING NDOT TYPE 3 INLET, CLOSE CULVERT PER NDOT STD. SPEC. SECTION 202.03.06
18. INSTALL NDOT TYPE 4 MANHOLE PER DWG. R-4.3.2.
19. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421

Call before you Dig — Avoid cutting underground utility lines! It's safety. Call 811 or 1-800-227-2600

FAST — Call before you UnderGround. 1-702-432-5300 — Freeway and Arterial System of Transportation

Avoid hitting overhead power lines it's easy. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 — DATE

STATE OF NEVADA — ROY D. CLARK — No. 8354 — PROFESSIONAL ENGINEER — Exp. 12/31/2014 — DATE: 4/1/14

DATE	DESCRIPTION	REV	DATE	AGEN APP	DATE	CCW APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 04-09-14
PLOT TIME: 08:20:09

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
2535 S. RAINBOW BLVD. LAS VEGAS, NV 89146
P: 702.804.2000 F: 702.804.2299 GCWALLACE.COM
LAS VEGAS

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Bob Boone

LUCKY DRAGON LP

LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY

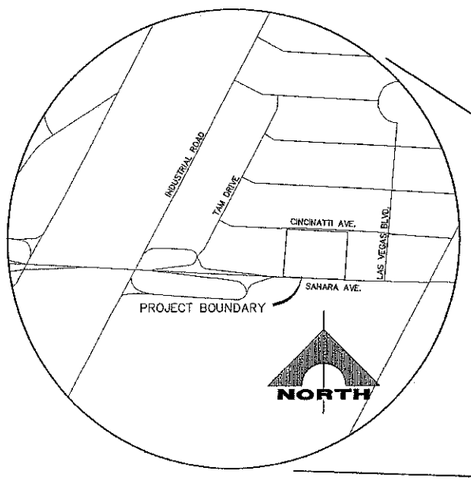
GRADING PLAN

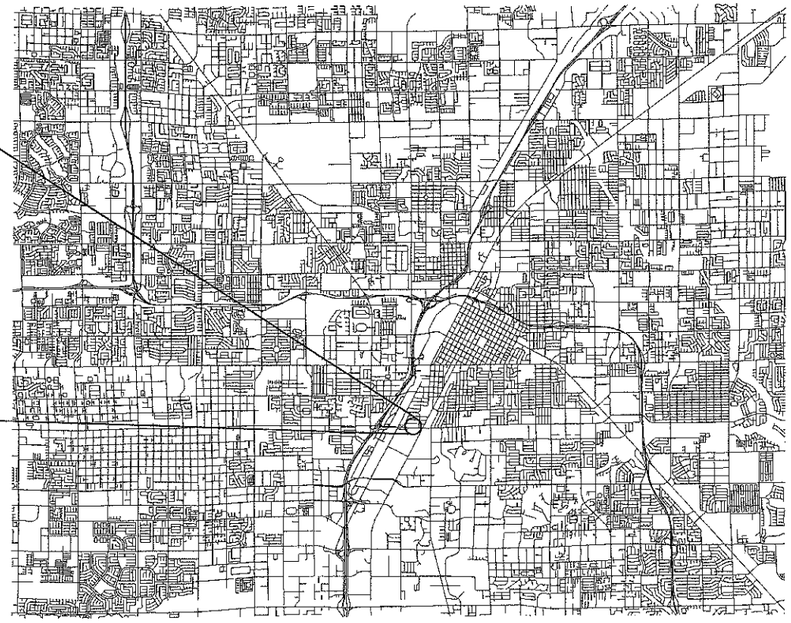
DRAWING C-3
3 OF 4 SHTS
CLV #

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IMPROVEMENT PLANS
FOR
LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY

CITY OF LAS VEGAS
STATE OF NEVADA
APN# 162-04-814-002
305 W. CINCINATTI AVENUE





QUANTITIES

UTILITY/AGENCY APPROVALS

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

CENTRAL TELEPHONE COMPANY d/b/a/CENTURYLINK — DATE

THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

NV ENERGY — DATE

NEVADA POWER COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NEVADA POWER COMPANY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY – TRANSMISSION ENGINEERING — DATE

SOUTHWEST GAS CORP. — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

PROJECT NO. _____ DATE: _____
SHEETS C1-C3

CLV PLANNING DEPARTMENT
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT

CHRIS KNIGHT, DIRECTOR, BUILDING & SAFETY — DATE

APPROVED FOR CONSTRUCTION

CITY OF LAS VEGAS FIRE DEPARTMENT — DATE

"APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND / OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND / OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARDS IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA".

DAVID BOWERS, PE #16736, PTOE — DATE
CITY ENGINEER
CITY OF LAS VEGAS, NEVADA

INDEX OF DRAWINGS

SHT.	NO.	SHEET TITLE
1	C-1	COVER SHEET
2	C-2	NOTES AND ABBREVIATIONS
3	C-3	GRADING PLAN
4	C-4	DETAIL SHEET

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT OLV145SE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
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BUREAU AND INTERNAL SYSTEM OF SMARTSTREETS

AVOID HITTING BURIED POWER LINES IT'S EASY!
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

OWNER/DEVELOPER
LUCKY DRAGON LP
3575 W. POST ROAD
LAS VEGAS, NV. 89118

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

STATE OF NEVADA — PROFESSIONAL ENGINEER — D. CLARK — No. 16736 — CIVIL — Date: 12/21/2014 — DATE: 4/4/14

REV	DESCRIPTION	DATE	AGEN. APP.	DATE	CONV. APP.

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 04-09-14
PLOT TIME: 09:20:20

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD. LAS VEGAS, NV 89146
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LASVEGAS
F:\Projects\300\398-A436\DWG\Production\PHASE 3\A36-c01-02.dwg
Bob Doore

LUCKY DRAGON LP
LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY
COVER SHEET

DRAWING C-1
1 OF 4 SHTS
CLV #

a:\A36.dwg 070303.jpg

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" 'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

REVISED 04/15/10

LAS VEGAS VALLEY WATER DISTRICT (LVWD) STANDARD NOTES

LVWD PROJECT # _____

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS
9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT 811 OR 1-800-227-2600.
14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.

    ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF IT'S FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

APPROVED FOR CONSTRUCTION

_____

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

PROJECT NO._____ DATE:_____

Call before you Dig
Avoid cutting underground utility lines it's costly.
Call 811 or 1-800-227-2600

ABOVE LISTING OVERHEAD POWER LINES ITS DANGER
CALL BEFORE YOU DO OVERHEAD
811
1-702-227-2929

FAST
Call before you Dig Underground.
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION, ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL	COMPACTION
A. PAVEMENT AREA SUBGRADE	0.5'±	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5'±	+0.1' TO -0.1'	SEE SOILS REPORT

    COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE. COMPACTION SHALL COMPLY WITH THE REQUIREMENTS OF THE ENGINEER.
7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, SUCH ITEM SHALL BE PROVIDED, AS DIRECTED BY THE CITY ENGINEER, AT NO EXPENSE TO THE CITY OF LAS VEGAS. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

REVISED 4/15/10

STORMWATER RUNOFF MANAGEMENT

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT THAT RESULTS IN A MEASURED ACCUMULATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS.
2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC ENGINEER AND THE CITY ENGINEER.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.
4. ALL STREET LIGHTING CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE. WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO PB, IT SHALL HAVE MINIMUM OF 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TEFO PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE PLANS.
8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.
9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.
10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.
11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ANY NEW SERVICE REQUIREMENTS. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHTS AND/OR SERVICES INSTALLED UNDER THIS PLAN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION. COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEFO) AT (702) 229-6331.

REVISED 04/15/10

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCED WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM; SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT-OF-WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED 4/15/10

LEGEND

- (1) DETAIL DRAWING NUMBER
- (1/-) DRAWING NUMBER FOR DETAIL DRAWN ON SAME SHEET
- (1/7) DRAWING NUMBER FOR DETAIL WITH REFERENCE TO IT'S SHEET
- INDICATES SEWER MANHOLE IN PROFILE
- INDICATES STORM DRAIN MANHOLE IN PROFILE
- (60.0) TC — EXIST. ELEVATION
- 60.50 TC — PROPOSED ELEVATION
- (2356.1) — EXIST. SPOT ELEVATION
- SUBDIVISION BOUNDARY
- EASEMENT LINE
- FUTURE LINE
- STREET CENTERLINE
- CONCRETE CURB & GUTTER
- EXISTING IMPROVEMENTS
- (2612) — EXISTING GROUND CONTOURS
- 34 — FINISH GROUND CONTOUR LINE
- DRAINAGE FLOW LINE
- BLOCK WALL
- EXISTING BLOCK WALL

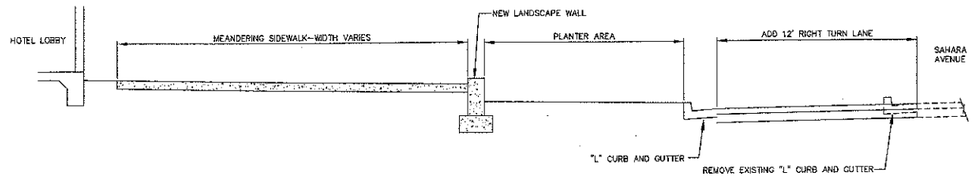
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TOP — YY — PROPOSED

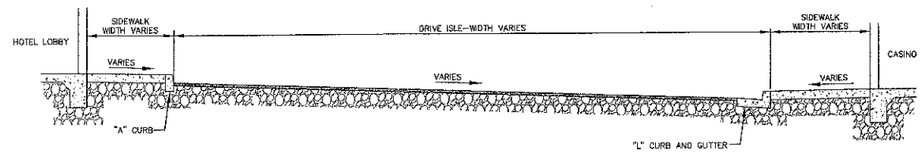
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CITY OF LAS VEGAS GENERAL NOTES

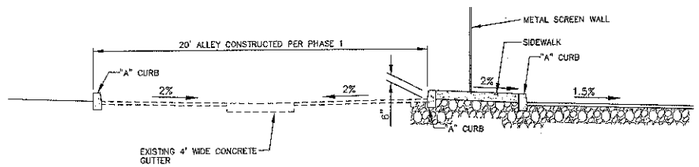
1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE, WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER OR OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 PSI MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE 1/2" ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER USD 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER USD 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY, REPORT #, DATE) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE DETERMINED IN THE FIELD BY A CITY ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 AND CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOW LINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.
16. ALL WALLS NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES, SUCH AS MARKER BALLS, LOCATING RIBBON, ETC., THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE OFFSITE INSPECTION AND TESTING PRIOR TO PROJECT ACCEPTANCE. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VER



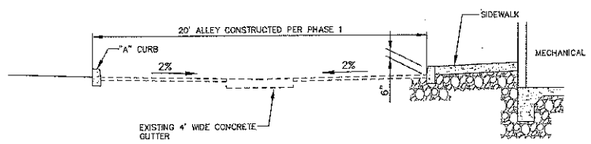
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A / C-3



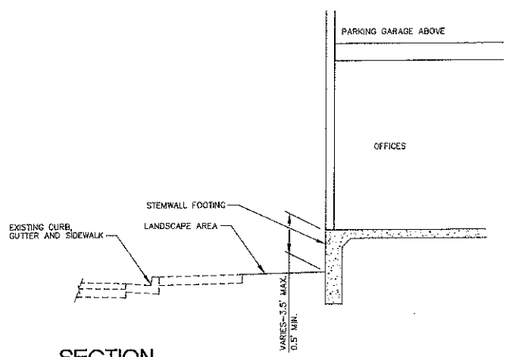
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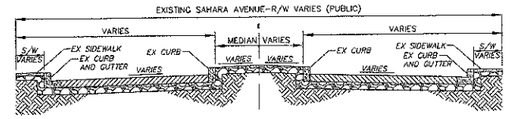
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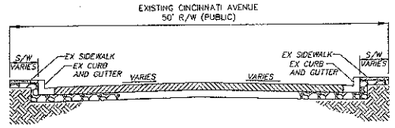
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D / C-3



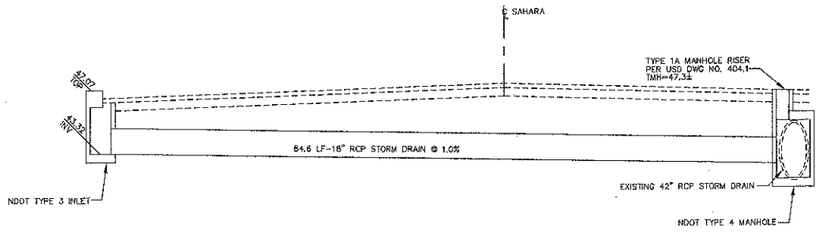
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E / C-3



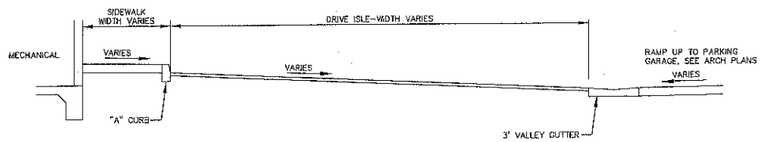
SAHARA AVENUE–NDOT STREET
NOT TO SCALE



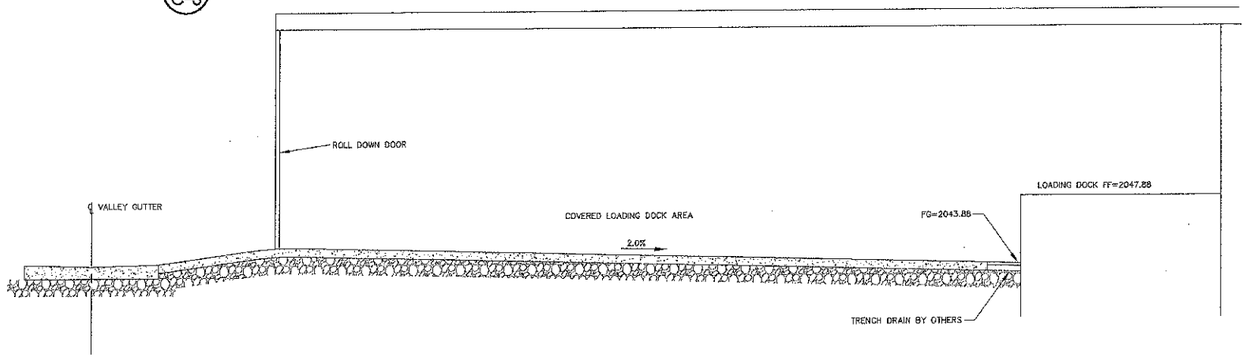
CINCINATTI AVENUE
NOT TO SCALE



PROFILE–18" STORM DRAIN
NOT TO SCALE



SECTION
SCALE: 1"=4'-0"
F / C-3



SECTION
SCALE: 1"=4'-0"
G / C-3

STATE OF NEVADA — ROY D. CLARK — No. 8354 — PROFESSIONAL ENGINEER — 12/31/14

REV	DATE	DESCRIPTION	AGEN APP	DATE	GCW APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: BD
PLOT DATE: 04-09-14
PLOT TIME: 09:29:18

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD - LAS VEGAS, NV 89146
T: 702.804.2000 - F: 702.804.2299 - GCWALLACE.COM
LAS VEGAS

F:\Projects\300\398-A436\DWG\Production\PHASE 3\v136-dDET.dwg
Bob Doone

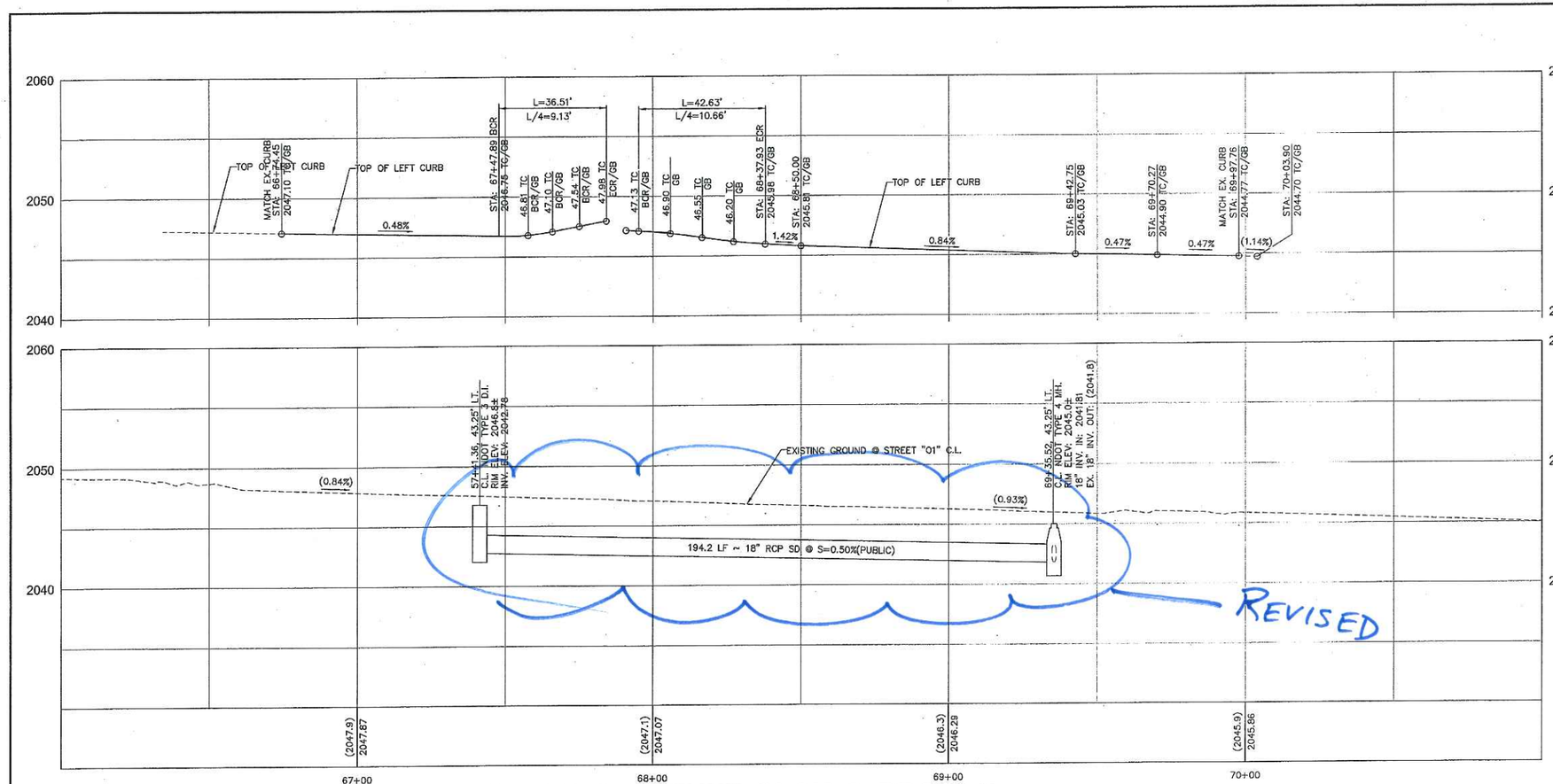
LUCKY DRAGON LP

LUCKY DRAGON CASINO
PHASE 3-TECHNICAL DRAINAGE STUDY

DETAILS

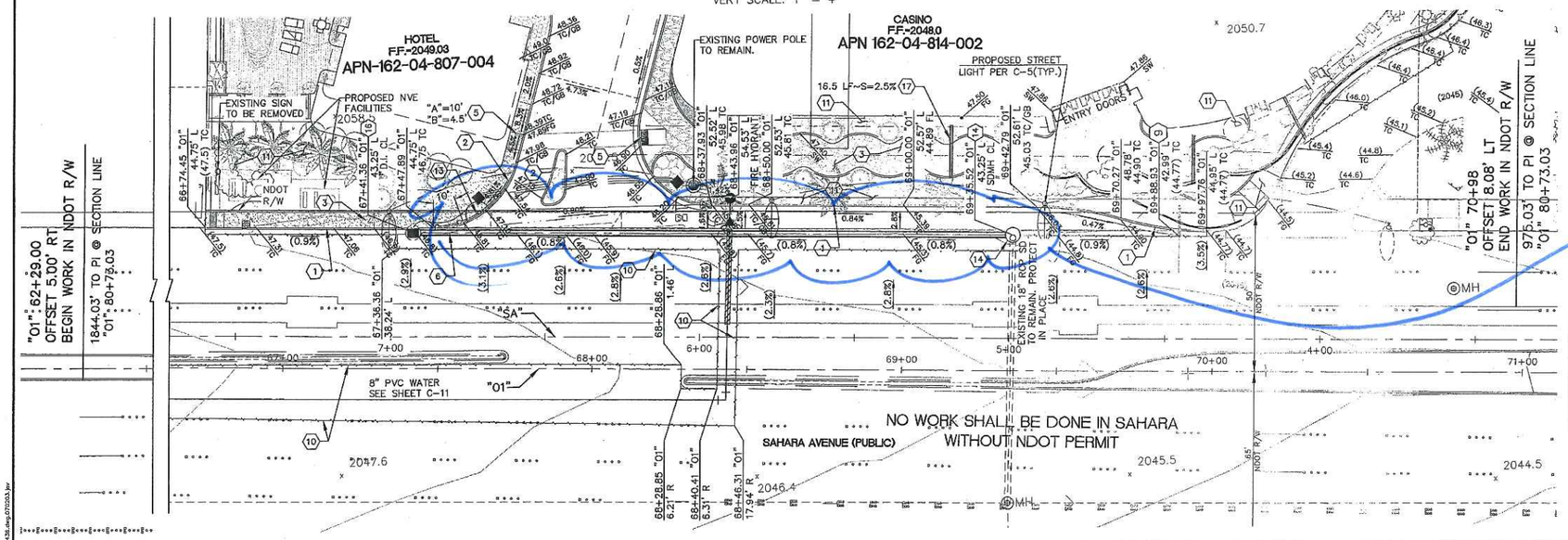
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4 OF 4 SHTS
CLV #

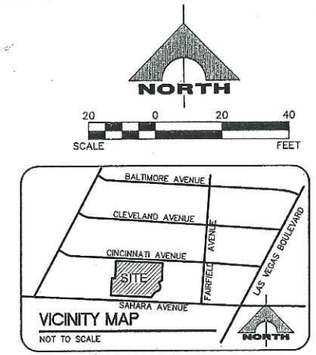
398-A436.dwg 2/7/2013 JBY



SAHARA AVENUE PLAN & PROFILE

HORIZ SCALE: 1" = 20'
VERT SCALE: 1" = 4'





VICINITY MAP
NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT OLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005–2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234) (SEE ARCHITECTURAL PLANS PER SURFACE SECTION)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. CONSTRUCT 6" TO 0" CURB DETAIL PER DETAIL "B" SHEET C8.
7. CONSTRUCT SIDEWALK UNDERDRAIN (USDCCA NO. 236)
8. CONSTRUCT ASPHALT PAVEMENT (3" A/C OVER 8" TYPE II COMPACTED TO 95%)
9. REMOVE EXISTING 6"X3" SIDEWALK UNDERDRAIN.
10. SAWCUT REMOVE AND REPLACE EXISTING PAVEMENT PER NDOT.
11. CONSTRUCT PLANTER, PER ARCHITECTURAL PLANS.
12. SEE ARCH PLANS FOR SIDEWALK RAMPS
13. INSTALL HAND RAIL PER DEAIL A SHEET C8.
14. REMOVE EXISTING NDOT TYPE 3 INLET IN IT'S ENTIRETY. REPLACE WITH NDOT TYPE 4 MANHOLE PER DWG. R-4.3.2
15. NOT USED.
16. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421
17. INSTALL 3"X6" RECTANGULAR TUBING SIDEWALK UNDER DRAIN PER DETAIL "C" SHT. C-8.

Call before you Dig
Avoid cutting underground utility lines in county.
Call 811 or 1-800-227-3600

FAST
Call before you UnderGround.
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING ENERGIZED POWER LINES IT'S DEADLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 — (Revised by this Approval) — 10/29/14 DATE

STATE OF NEVADA — ROY D. CLARK — No. 8354 — PROFESSIONAL ENGINEER — Exp. 12/31/2014 — CIVIL — DATE: 10/24/14

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GOW APP

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 10-28-14
PLOT TIME: 14:01:41

G.C. WALLACE COMPANIES
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LAS VEGAS

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Rudy Lopez

LUCKY DRAGON LP
LUCKY DRAGON CASINO
SAHARA AVENUE IMPROVEMENTS
SAHARA AVENUE PLAN + PROFILE

DRAWING C-9
9 OF 12 SHTS

The "*2008 Las Vegas Valley Flood Control Master Plan Update*", as prepared by Post Buckley Schuh and Jernigan, Inc. (PBS&J), in association with Louis Berger Group and Parsons Brinckerhoff, for the Clark County Regional Flood Control District (CCRFCD) illustrates the existing and proposed master-planned facilities. The CCRFCD facility exhibits and inventory tables were updated in 2013. As shown in Figure F-31 of the 2013 MPU, the future CCRFCD facility runs along the south side of Sahara Avenue adjacent to our site. The storm drain is identified as a 14'x12' RCB (labeled as BHSA 0289), with a design flow of 3,566cfs and a 0.87% slope.

The project site is covered by Flood Insurance Rate Map (FIRM) for Clark County, Nevada, and incorporated areas, community panel number: 32003C2170F, effective date: November 16, 2011. Review of Panel 2170 indicates that the site is entirely located within Zone "X" (unshaded), described by FEMA as: "*Areas determined to be outside the 0.2% annual chance floodplain*". Please refer to the attached referenced Figure 2 from the Original Study for the location of the site on a portion of the above referenced FIRM.

The subject drainage study update is specifically provided as a support document for the aforementioned revisions to the Lucky Dragon. This update is in conformance with the approved "Technical Drainage Study for Lucky Dragon", (DS4659). The drainage design associated with the proposed revisions is based on generally accepted engineering practices and is in compliance with the CCRFCD's "*Hydrologic Criteria and Drainage Design Manual*" and 2008 MPU. The proposed revisions do not impact the previously approved drainage pattern. Please refer to the attached grading plan and details for further clarification of the proposed revisions.

If you have any questions or comments, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
LOCHSA ENGINEERING

Mark Hedge, P.E.
Principal



HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lucky Dragon Date: August 25, 2016

Location of Development: a) Descriptive (Cross Streets) North/South: Fairfield Avenue

East/West: Sahara Avenue

b) Section: 4 Township: 21 South Range: 61 East

c) APN : 162-04-816-001

Name of Owner: Terry Barnes - Grand Canyon Development

Telephone No.: (702) 492-5335 Fax No.: (702) 877-4700 E-Mail Address:

Address: 6841 S. Eastern Avenue, Suite 103, Las Vegas, Nevada 89119

Contact Person-Name: Mark Hedge, PE **Telephone No.:** (702) 365-9312

* **E-Mail Address:** chris.blake@lochsa.com **Fax No.:** (702) 365-9317

Firm: Lochsa Engineering

Address: 6345 South Jones Boulevard, Suite 100, Las Vegas, Nevada 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: 2.28 +/- Acres Being Developed/Disturbed: 2.28 +/- 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 (Casino/Hotel)
5. Approximate upstream land area which drains to the subject site: 6.3 +/- Acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Allure Condominiums (DS 3760)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Cincinnati Avenue and Sahara Avenue
8. Briefly describe your proposed schedule for the subject project: ASAP



8-31-16

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.**

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

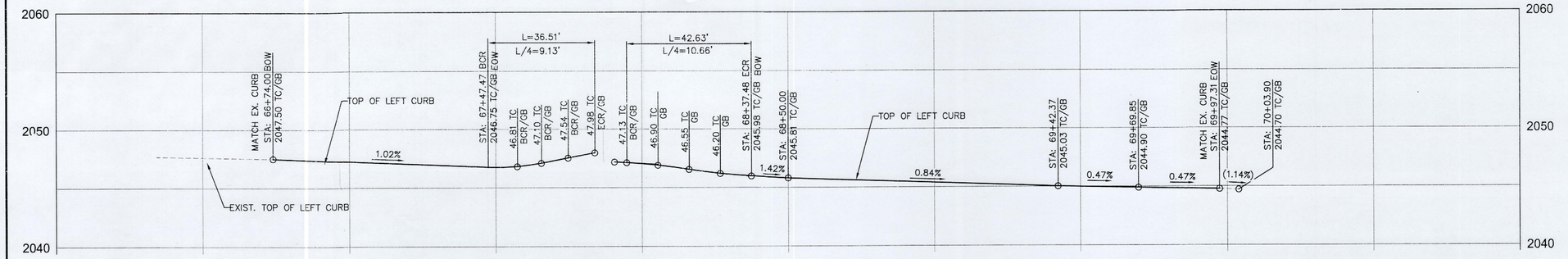
The following checklist is intended as a supplemental guide for the engineer preparing a Technical Drainage Study submittal to the City of Las Vegas. This supplement focuses on requirements specific to the City of Las Vegas. The requirements presented are in addition to the Clark County Regional Flood Control District (CCRFCD) Manual Standard Form 2. The listed items are the minimum information required prior to the City performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the CCRFCD Hydrologic Criteria and Drainage Design Manual (Design Manual).

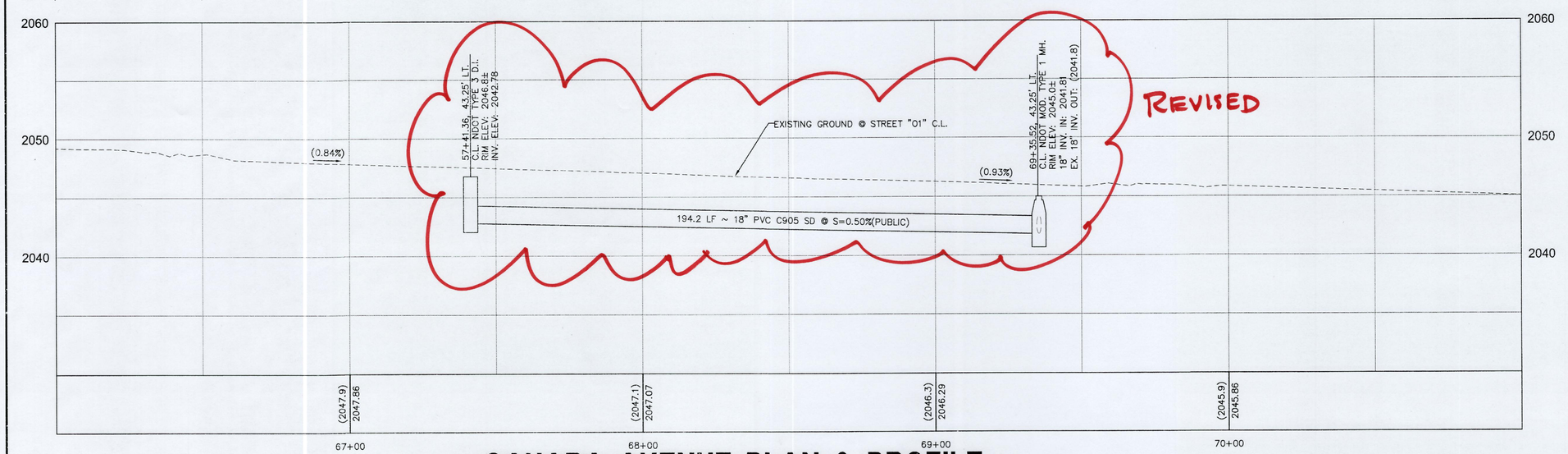
An appointment must be made to preview this checklist in conjunction with CCRFCD Standard Form 2 prior to the City accepting a new drainage study for review. The engineer must contact the Flood Control Section at (702) 229-6541 to schedule a submittal appointment.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT		
Yes	No	
	✓	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
	✓	Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
✓		An electronic copy of the complete submittal is required to be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output device replicating your submittal. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats. If figures are in color, they must be scanned in color and saved as a separate file. MLH by initial here, the engineer on record acknowledges that the electronic copy is an identical replicate of the original hard copy submitted to the City of Las Vegas.

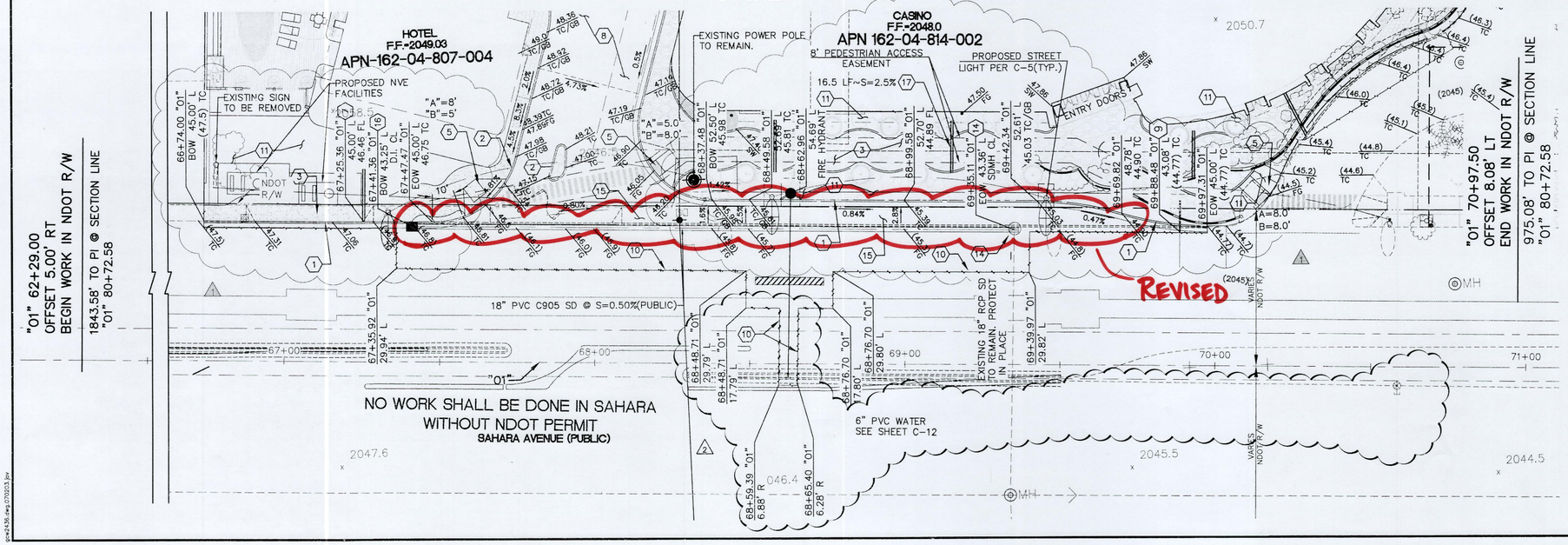
II. GRADING PLAN INFORMATION		
Yes	No	
✓		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
✓		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
✓		Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet* around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)

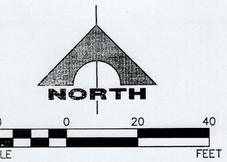


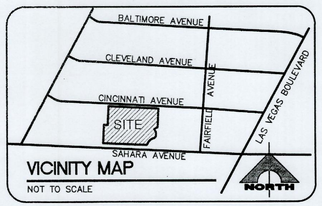


SAHARA AVENUE PLAN & PROFILE

HORIZ SCALE: 1" = 20'
VERT SCALE: 1" = 4'







VICINITY MAP
NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT OLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234) (SEE ARCHITECTURAL PLANS PER SURFACE SECTION)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. NOT USED.
7. CONSTRUCT UNDER SIDEWALK DRAIN PER DETAIL "C" SHT C-8.
8. CONSTRUCT ASPHALT PAVEMENT (5" A/C OVER 8" TYPE II COMPACTED TO 95%) PER USD #202 AND 200.
9. REMOVE EXISTING 6"X3" SIDEWALK UNDERDRAIN.
10. SAWCUT REMOVE AND REPLACE EXISTING PAVEMENT PER NDOT.
11. CONSTRUCT PLANTER, PER ARCHITECTURAL PLANS.
12. SEE ARCH PLANS FOR SIDEWALK RAMPS
13. NOT USED.
14. REMOVE EXISTING NDOT TYPE 3 INLET IN IT'S ENTIRETY. REPLACE WITH NDOT MODIFIED TYPE 2 MANHOLE PER DWG. R-4.4.1
15. CONSTRUCT 9" PBS OVER 10" TYPE II AGGREGATE BASE WITH 1" OPEN GRADE WITH NDOT APPROVED 1/2" AGGREGATE MIX DESIGN. (2)
16. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421
17. INSTALL 3"X6" RECTANGULAR TUBING SIDEWALK UNDER DRAIN PER DETAIL "C" SHT. C-8.

ABBREVATION

BOW – BEGINNING OF WORK
EOW – ENDING OF WORK

FOR REVISION 1 AND 2 ONLY

Call before you Dig
Avoid cutting underground utility lines! It's costly.
Call 811
or
1-800-227-2600

FAST
Call before you UnderGround.
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES IT'S COSTLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 — DATE

PREVIOUSLY APPROVED

ENGINEER — STATE OF NEVADA — ROY D. CLARK — Exp. 12/31/2016 — CIVIL — No. 8354 — PROFESSIONAL

REV	DATE	DESCRIPTION	AGEN APP	DATE	GCW APP	DATE
1	10/9/15	REMOVED LANDSCAPING, NEW ENGINEERING COMPANY				
2	12/23/15	REMOVED PROPOSED 8" WATERLINE, UPDATED SAWCUT LIMITS	SB	3/16/16		

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 02-24-16
PLOT TIME: 09:51:28

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD. LAS VEGAS, NV. 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM
LAS VEGAS
T:\CAD\151069\Drawings\Plot Drawings\A36x4--ePRO--C-10.dwg
Dsgn: Sperrod

LUCKY DRAGON LP
LUCKY DRAGON HOTEL/CASINO
ONSITE IMPROVEMENT PLANS
SAHARA AVENUE
PLAN + PROFILE

DRAWING C-10
10 OF 13 SHTS
CLV # 54912

I B I AMERICA
APN: 162-04-811-024

I B I AMERICA
308 W. CINCINNATI AVENUE
APN: 162-04-811-025
EXISTING BUILDING FF=(2047.10)

JAMES G. MAGER
APN: 162-04-811-026

RICHARD D. WEISBART FAMILY TRUST AND RICHARD + SHARON CO. TRUST
240 W. CINCINNATI AVENUE
APN: 162-04-813-039
FF=(2046.90)
EXISTING BUILDING

RICHARD D. WEISBART FAMILY TRUST AND RICHARD + SHARON CO. TRUST
240 W. CINCINNATI AVENUE
APN: 162-04-813-040
FF=(2046.60)
EXISTING BUILDING

OXFORD TECHNOLOGY INC
228 W. CINCINNATI AVENUE
APN: 162-04-813-041

MANUEL CORCHUELO
224 W. CINCINNATI AVE.
APN: 162-04-813-042

MEHRNAZ SEPEHRIPOUR AND ALI R NADER
220 W. CINCINNATI AVE.
APN: 162-04-813-043

PRIVATE DRIVEWAY PER USD #225

CINCINNATI AVENUE (PUBLIC)

25' R/W-CL
50' R/W
25' R/W-CL

8+00 7+00 6+00 5+00 4+00 3+00

LUCKY DRAGON LLC
305 W. CINCINNATI AVENUE
APN: 162-04-811-028

MECHANICAL
F.F.=2047.90

APN 162-04-899-021

UP TO PARKING GARAGE

F.F.=2046.00

PARKING GARAGE ABOVE OFFICES
F.F.=2046.00

LOADING DOCK
F.F.=2048.00

I B I AMERICA
309 W. CINCINNATI AVENUE
APN: 162-04-811-029
FF=(2047.73)
EXISTING APARTMENT BUILDING

EXISTING PUBLIC ALLEY
CLV #107V6236

PROPOSED WALL
14' HIGH X 61 LF LONG

EXISTING PUBLIC ALLEY
APN: 162-04-899-007

FOR PRIVATE DRIVE CENTER LINE PROFILE SEE DETAIL D C-8

PARKING GARAGE ABOVE OFFICES
F.F.=2048.00

APN #162-04-815-000
EXISTING ALLURE CONDOMINIUMS
FF=47.00

308 W. SAHARA AVENUE
APN: 162-04-807-003
FF=(2049.64)
EXISTING BUILDING

APN: 162-04-807-004
0.46 ACRES

POOL AREA

POOL AREA
SEE DET. 'E'
SHEET C-8

HOTEL
F.F.=2049.03

PROPOSED NVE TRANSFORMER LOCATION

ENTRY DOORS
SAHARA INVESTMENTS, LLC
BOOK 20070314, INST. NO. 00598 O.R.
APN: 162-04-807-005
721 S.F.
0.01 ACRES

SAHARA INVESTMENTS, LLC
BOOK 20070212, INST. NO. 03346 O.R.
APN: 162-04-814-002
79365 S.F.
1.82 ACRES
CASINO
F.F.=2048.0

FRONT DOOR RAMP SEE DETAIL "F" SHEET C-8

ENTRY DOORS

8' PEDESTRIAN ACCESS EASEMENT

SEE STRUCTURAL PLAN FOR RETAINING WALL AND HANDRAIL DETAILS

SEE STRUCTURAL PLAN FOR RETAINING WALL AND HANDRAIL DETAILS

EXISTING SIDEWALK

EXIST. TRANSMISSION POLE

18" PVC C905 SD SEE SHT. C-9 FOR PROFILE.

SAHARA AVENUE (PUBLIC)
(NDOT)

67+00 68+00 69+00 70+00 71+00

NO WORK SHALL BE DONE IN SAHARA WITHOUT NDOT PERMIT

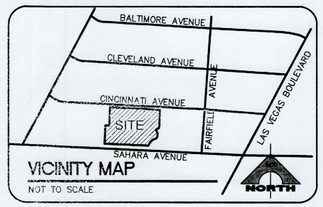
EXIST. 18" RCP TO REMAIN.

FOR BEGIN CONSTRUCTION NDOT ROW SEE SHEET NO. C-10

FOR ENDING CONSTRUCTION NDOT ROW SEE SHEET NO. C-10

NORTH

SCALE 20 0 20 40 FEET
FOR REVISION 1AND 2 ONLY



VICINITY MAP
NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

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ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

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2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. CONSTRUCT 3' CONCRETE VALLEY GUTTER
7. CONSTRUCT SIDEWALK RAMP, CASE II (USDCCA NO. 235)
8. CONSTRUCT ASPHALT PAVEMENT (3" A/C OVER 8" TYPE II COMPACTED TO 95%)
9. ADJUST EXISTING UTILITY TO FINISHED GRADE
10. SAWCUT EXISTING PAVEMENT
11. CONSTRUCT PLANTER WALL, PER ARCHITECTURAL PLANS
12. SEE ARCH PLANS FOR SIDEWALK RAMPS
13. PROVIDE 0" CURB FACE
14. PROVIDE METAL SCREEN WALL PER ARCHITECTURAL PLANS
15. CONSTRUCT DRIVEWAY PER STD. DWG. 227.S1
16. CONSTRUCT CMU WALL PER ARCHITECTURAL PLANS
17. REMOVE EXISTING NDOT TYPE 3 INLET IN IT'S ENTIRETY. REPLACE WITH NDOT MOD. TYPE 1 MANHOLE PER DWG. R-4.3.1
18. CONSTRUCT 9" PBS OVER 10" TYPE II AGGREGATE BASE WITH 1" OPEN GRADE WITH NDOT APPROVED 1/2" AGGREGATE MIX DESIGN
19. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421
20. PROPOSED DEDICATED TO THE RIGHT TURN POCKET.
21. NOT USED.
22. PROPOSED HUMP (MAX SLOPE 12:1).
23. INSTALL UNDER SIDEWALK ROOF DRAIN PER DETAIL "C" SHEET C-8.
24. INSTALL CONCRETE POLE BARRIER PER DETAIL "I" SHEET C-9

Call before you Dig
Avoid cutting underground utility lines! It's costly.
Call 811
OR 1-800-227-2600

FAST
Call before you Underground.
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY!
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 — DATE

ENGINEER - STATE OF NEVADA
PROFESSIONAL ENGINEER
ROY D. CLARK
Exp. 12/31/2016
CIVIL
No. 8354

NATIONAL ENGINEER - STATE OF NEVADA
MARK KOROSEC
CIVIL
No. 8445

REV	DATE	DESCRIPTION	AGEN APP	DATE	CGW APP	DATE
2	12/23/15	REVISED CURB RADIUS AT ENTRANCE AT CINCINNATI MODIFIED ONSITE CURB AND GRADES. REVISED SAWCUT LIMITS.	SB	3/31/16		
1	10/8/15	SIDEWALK WIDTH. REVISED SIDEWALK GRADING AT THE NORTHEAST CORNER OF THE PRIVATE DRIVEWAY NEAR THE BUILDING. REVISED CURB LAYOUT AND DESIGN ON PRIVATE DRIVE. LANDSCAPE - NEW ENGINEERING COMPANY TOOK OVER				

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 02-24-16
PLOT TIME: 09:50:34

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD - LAS VEGAS, NV 89146
T: 702.804.2000 - F: 702.804.2299 - GCWALLACE.COM
LAS VEGAS
T:\CAD\151059\Drawings\Plot Drawings\A36-cGRD-P4-C-6.dwg
Dion Spenard

LUCKY DRAGON LP

LUCKY DRAGON HOTEL/CASINO
ONSITE IMPROVEMENT PLANS

GRADING PLAN

DRAWING C-6
6 OF 13 SHTS
CLV # 54912

PREVIOUSLY APPROVED

I B I AMERICA
APN: 162-04-811-024

I B I AMERICA
308 W. CINCINNATI AVENUE
APN: 162-04-811-025
EXISTING BUILDING FF=(2047.10)

JAMES G. MAGER
APN: 162-04-811-026

RICHARD D. WEISBART FAMILY TRUST AND RICHARD + SHARON CO. TRUST
240 W. CINCINNATI AVENUE
APN: 162-04-813-039
FF=(2046.90)
EXISTING BUILDING

RICHARD D. WEISBART FAMILY TRUST AND RICHARD + SHARON CO. TRUST
240 W. CINCINNATI AVENUE
APN: 162-04-813-040
FF=(2046.60)
EXISTING BUILDING

OXFORD TECHNOLOGY INC
228 W. CINCINNATI AVENUE
APN: 162-04-813-041

MANUEL CORCHUELO
224 W. CINCINNATI AVE.
APN: 162-04-813-042

MEHRNAZ SEPEHRIPOUR AND ALI R NADER
220 W. CINCINNATI AVE.
APN: 162-04-813-043

NORTH
SCALE 20 0 20 40 FEET
FOR REVISION 1, 2, AND 4 ONLY

ROY D. CLARK
No. 8354
PROFESSIONAL ENGINEER - STATE OF NEVADA
Exp. 12/31/2015
CIVIL
MARK E. PETTE
No. 8445
PROFESSIONAL ENGINEER - STATE OF NEVADA
Exp. 12/31/2015
CIVIL

PRIVATE DRIVEWAY PER USD #225

CINCINNATI AVENUE (PUBLIC)

LUCKY DRAGON LLC
305 W. CINCINNATI AVENUE
APN: 162-04-811-028

MECHANICAL
F.F.=2047.90

APN: 162-04-899-021

UP TO PARKING GARAGE

F.F.=2046.00

PARKING GARAGE ABOVE OFFICES
F.F.=2046.00

LOADING DOCK
F.F.=2048.00

I B I AMERICA
309 W. CINCINNATI AVENUE
APN: 162-04-811-029
FF=(2047.73)
EXISTING APARTMENT BUILDING

EXISTING PUBLIC ALLEY
CLV #107V6236

PROPOSED WALL
14' HIGH X 61 LF LONG

EXISTING PUBLIC ALLEY
APN: 162-04-899-007

APN: 162-04-807-004
0.46 ACRES

308 W. SAHARA AVENUE
APN: 162-04-807-003
FF=(2049.64)
EXISTING BUILDING

POOL AREA

POOL AREA
SEE DET. "E"
SHEET C-8

HOTEL
F.F.=2049.03

PROPOSED NV ENERGY TRANSFORMER LOCATION

FOR BEGIN CONSTRUCTION NDOT ROW
SEE SHEET NO. C-10

NO WORK SHALL BE DONE IN SAHARA WITHOUT NDOT PERMIT

FOR PRIVATE DRIVE CENTER LINE PROFILE SEE DETAIL D C-8

PARKING GARAGE ABOVE OFFICES
F.F.=2048.00

STEEL RAILING
LANDING
RAMP @ 7.5%
6' MAX
1' (TYP)
RAILING:
1 1/2" SCHEDULE 40 STEEL PIPE (1.90" O.D.) AS SHOWN. GRIND WELDS SMOOTH. PREP PRIME & PAINT. PAINT WITH OIL BASE, HIGH GLOSS PAINT TO MATCH BUILDING COLOR.
HANDRAIL DETAIL A
NTS

SAHARA INVESTMENTS, LLC
BOOK 20070212, INST. NO. 03346 O.R.
APN: 162-04-814-002
79365 S.F.
1.82 ACRES
CASINO
F.F.=2048.0

ENTRY DOORS
SAHARA INVESTMENTS, LLC
BOOK 20070314, INST. NO. 00598 O.R.
APN: 162-04-807-005
721 S.F.
0.01 ACRES

FRONT DOOR RAMP SEE DETAIL "F" SHEET C-8

8' PEDESTRIAN ACCESS EASEMENT

ENTRY DOORS

SEE STRUCTURAL PLAN FOR RETAINING WALL AND HANDRAIL DETAILS

SEE STRUCTURAL PLAN FOR RETAINING WALL AND HANDRAIL DETAILS

APN #162-04-815-000
EXISTING ALLURE CONDOMINIUMS
FF=47.00

EXISTING SIDEWALK

REMOVE 13LF OF EX. 18" RCP SD REPLACE WITH 20LF CLASS IV RCP 18" SD @0.80% (PUBLIC) WITH 4" MIN CEMENT SLURRY CLSM II

EXIST. TRANSMISSION POLE

SAHARA AVENUE (PUBLIC)
(NDOT)

EXIST. 18" RCP TO REMAIN.

FOR ENDING CONSTRUCTION NDOT ROW
SEE SHEET NO. C-10

VICINITY MAP
NOT TO SCALE
BALTIMORE AVENUE
CLEVELAND AVENUE
CINCINNATI AVENUE
SITE
SAHARA AVENUE
FAIRFIELL AVENUE
LAS VEGAS BOULEVARD
NORTH

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT CLV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. CONSTRUCT 3' CONCRETE VALLEY GUTTER
7. CONSTRUCT SIDEWALK RAMP, CASE II (USDCCA NO. 235)
8. CONSTRUCT ASPHALT PAVEMENT (3" A/C OVER 8" TYPE II COMPACTED TO 95%)
9. ADJUST EXISTING UTILITY TO FINISHED GRADE
10. SAWCUT EXISTING PAVEMENT
11. CONSTRUCT PLANTER WALL, PER ARCHITECTURAL PLANS
12. SEE ARCH PLANS FOR SIDEWALK RAMPS
13. PROVIDE 0" CURB FACE
14. PROVIDE METAL SCREEN WALL PER ARCHITECTURAL PLANS
15. CONSTRUCT DRIVEWAY PER STD. DWG. 227.S1
16. CONSTRUCT CMU WALL PER ARCHITECTURAL PLANS
17. REMOVE EXISTING NDOT TYPE 3 INLET IN IT'S ENTIRETY
18. CONSTRUCT 9" PBS OVER 10" TYPE II AGGREGATE BASE WITH 1" OPEN GRADE WITH NDOT APPROVED 1/2" AGGREGATE MIX DESIGN.
19. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421
20. PROPOSED DEDICATED TO THE RIGHT TURN POCKET.
21. NOT USED.
22. PROPOSED HUMP (MAX SLOPE 12:1).
23. INSTALL UNDER SIDEWALK ROOF DRAIN PER DETAIL "C" SHEET C-8
24. INSTALL CONCRETE POLE BARRIER PER DETAIL "I" SHEET C-9A.
25. INSTALL HANDRAIL PER "A" DETAIL THIS SHEET.

Call before you Dig
Avoid cutting underground utility lines as it's costly.
Call 811
OR 1-800-227-2600

FAST
Call before you UnderGround.
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES IT'S COSTLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 — DATE

REV	DATE	DESCRIPTION	ENGR APP	DATE
4	8/1/16	REVISED SIDEWALK GRADE AND DESIGN, ADDED NOTE, REVISED CURB RETURN, LANDSCAPE, LONG HAUL A		
3	1/26/16	REVISED SIDEWALK GRADE AND DESIGN, ADDED NOTE, REVISED CURB RETURN, LANDSCAPE, LONG HAUL A		
2	12/23/15	REVISED CURB RADIUS AT ENTRANCE AT CINCINNATI AVENUE, REMOVED STORM DRAIN IN SAHARA REVISED CURB.		
1	10/8/15	REVISED DRIVEWAY WIDTH, REVISED SIDEWALK SAWCUT LIMITS.		
		GRADING AT THE NORTHEAST CORNER OF THE PROPERTY WITH NEW BUILDING, REVISED PRIVATE DRIVEWAY WITH NEW BUILDING, REVISED ADDED TRASH ENCLOSURE TO PLANS, REMOVED LANDSCAPE, NEW ENGINEERING COMPANY, TOOK OVER JOB.		

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 09-01-16
PLOT TIME: 08:29:58

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 SOUTH RAINBOW BLVD. LAS VEGAS, NEVADA 89146
T: 702.804.2000 F: 702.804.2299 GCWALLACE.COM
LAS VEGAS

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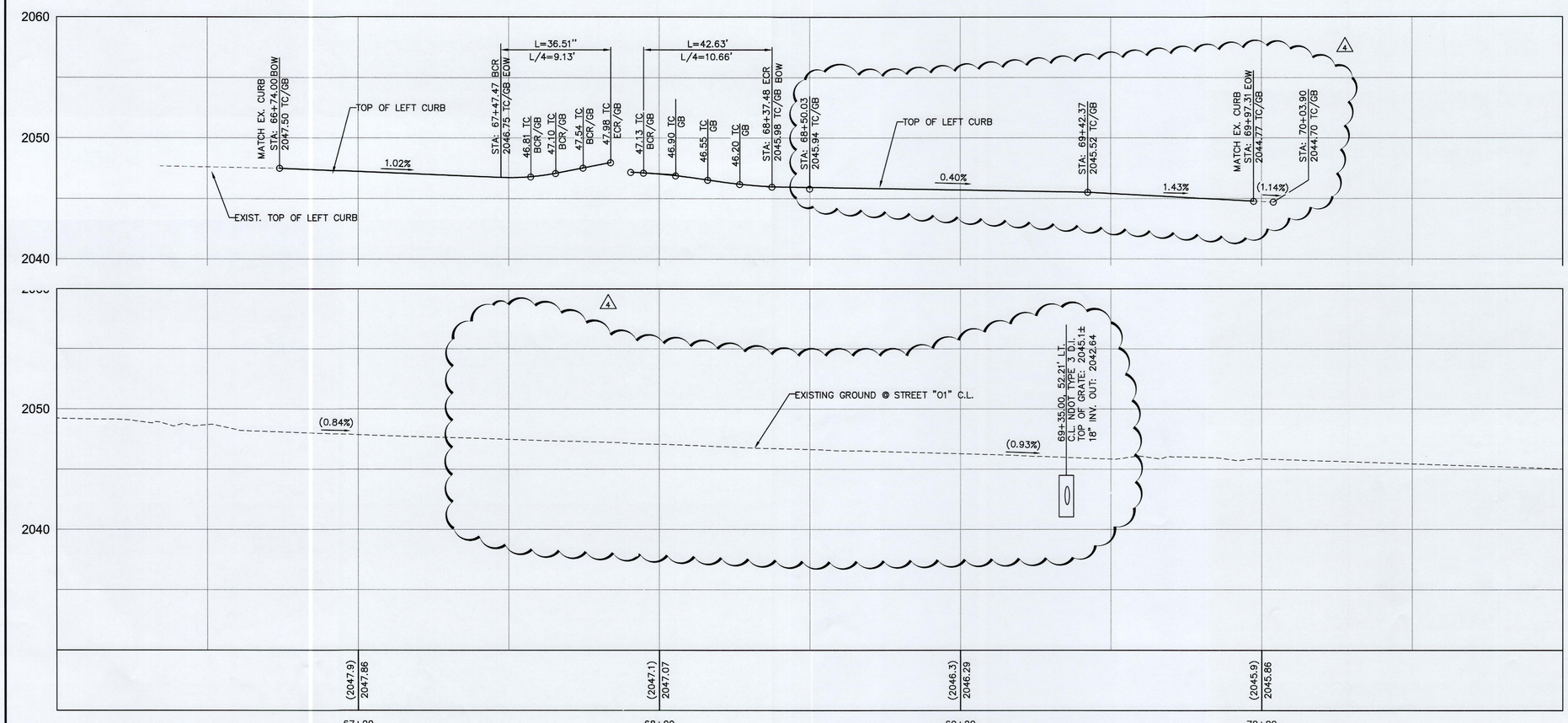
LUCKY DRAGON LP

LUCKY DRAGON HOTEL/CASINO
ONSITE IMPROVEMENT PLANS

GRADING PLAN

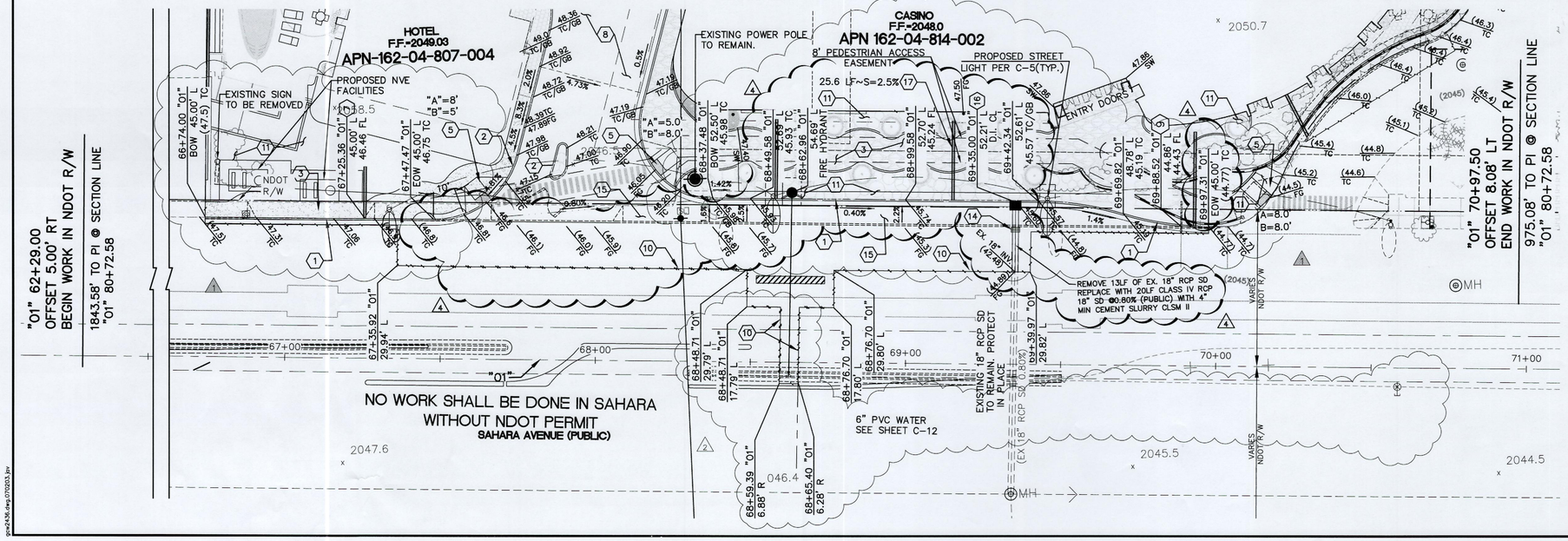
DRAWING C-6
6 OF 29 SHTS
CLV # 54912

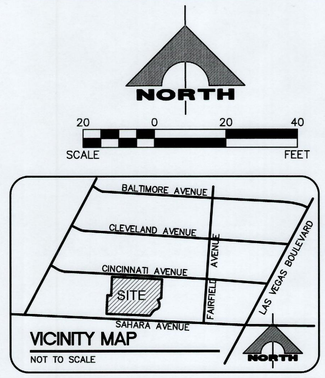
gc2436.dwg 070203.pv



SAHARA AVENUE PLAN & PROFILE

HORIZ SCALE: 1" = 20'
VERT SCALE: 1" = 4'





VICINITY MAP
NOT TO SCALE

BASIS OF BEARING

SOUTH 87°03'06" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN IN BOOK 135, PAGE 64 OF PLATS IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL POINT 0LV114SSE6, BEING A RIVET & PLATE IN TOP OF CURB @ 300 WEST SAHARA.

ELEVATION: 2047.46 (FEET)
624.066 (METERS)
ADJUSTMENT (UPDATED 2005-2007)
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

GRADING CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA NO. 216)
2. CONSTRUCT "A" TYPE CURB (USDCCA NO. 219)
3. CONSTRUCT CONCRETE SIDEWALK (USDCCA NO. 234) (SEE ARCHITECTURAL PLANS PER SURFACE SECTION)
4. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA NO. 228)
5. CONSTRUCT SIDEWALK RAMP, CASE I (USDCCA NO. 235)
6. NOT USED.
7. CONSTRUCT UNDER SIDEWALK DRAIN PER DETAIL "C" SHT C-8.
8. CONSTRUCT ASPHALT PAVEMENT (5" A/C OVER 8" TYPE II COMPACTED TO 95%) PER USD #202 AND 200.
9. REMOVE EXISTING 6"X3" SIDEWALK UNDERDRAIN.
10. SAWCUT REMOVE AND REPLACE EXISTING PAVEMENT PER NDOT.
11. CONSTRUCT PLANTER, PER ARCHITECTURAL PLANS.
12. SEE ARCH PLANS FOR SIDEWALK RAMPS
13. NOT USED.
14. REMOVE EXISTING NDOT TYPE 3 INLET IN IT'S ENTIRETY. 4
15. CONSTRUCT 9" PBS OVER 10" TYPE II AGGREGATE BASE WITH 1" OPEN GRADE WITH NDOT APPROVED 1/2" AGGREGATE MIX DESIGN. 2
16. INSTALL NDOT TYPE 3 INLET PER DWG. R-4.2.3. AND USDCCA DRAWING No. 421
17. INSTALL 3"X6" RECTANGULAR TUBING SIDEWALK UNDER DRAIN PER DETAIL "C" SHT. C-8.

ABBREVATION

BOW – BEGINNING OF WORK
EOW – ENDING OF WORK

FOR REVISION 1, 2, AND 4 ONLY

Call before you Dig
Avoid cutting underground utility lines& it's costly.
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or
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FAST
Call before you UnderGround.
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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

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DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY D. CLARK, PE NO. 8354 — DATE

ENGINEER - STATE OF NEVADA
ROY D. CLARK
No. 8354
PROFESSIONAL
EXP. 12/31/2015
CIVIL

REV	DATE	DESCRIPTION	AGEN APP	DATE	GCW APP	DATE
4	8/1/16	REMOVED LISTORM DRAIN LATERAL IN SAHARA. REVISED GRADING PLAN AND GRADING NOTES.				
3		REVISED PROFILE, REVISED SIDEWALK UNDERDRAIN LENGTHS.				
2	12/23/15	REMOVED PROPOSED 8" WATERLINE, UPDATED GRADING NOTES				
1	10/8/15	REMOVED LANDSCAPING, NEW ENGINEERING COMPANY				
		TOOK OVER JOB.				

PROJECT NO. 398-A436
DESIGN: BD
DRAWN: BD
CHECK: RC
PLOT DATE: 09-01-16
PLOT TIME: 08:26:34

G.C. WALLACE COMPANIES
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T: 702.804.8000 F: 702.804.8299 GCWALLACE.COM
LAS VEGAS
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Dion Spenard

LUCKY DRAGON LP

LUCKY DRAGON HOTEL/CASINO
ONSITE IMPROVEMENT PLANS

SAHARA AVENUE
PLAN + PROFILE

DRAWING
C-10
10 OF 29 SHTS
CLV # 54912

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
2ND FLOOR
LAS VEGAS, NEVADA 89106

VOICE: 702.229.6301
FAX: 702.474.0352
TTY 7-1-1
www.lasvegasnevada.gov

City of the Legends

October 4, 2016

Oxford Technology Inc.
5010 S. Valley View Blvd.
Las Vegas, Nevada 89118

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
MAYOR

STEVEN D. ROSS
MAYOR PRO TEM

LOIS TARKANIAN
RICKY Y. BARLOW
STAVROS S. ANTHONY
BOB COFFIN
BOB BEERS

ELIZABETH N. FRETWELL
CITY MANAGER

RE:* SDR-66870 [PRJ-66971] – *ADMINISTRATIVE SITE DEVELOPMENT PLAN REVIEW
ADMINISTRATIVE CYCLE – OCTOBER 2016

Dear Applicant:

Your request for a Minor Site Development Plan Review FOR A TEMPORARY PARKING LOT at the northwest corner of Cincinnati Avenue and Fairfield Avenue (APNs 162-04-813-044 through 050), C-2 (General Commercial) Zone, Ward 3 (Coffin) [PRJ-66791], has been considered administratively by the Department of Planning staff.

The Department of Planning has administratively ***APPROVED*** your request subject to the following:

Planning

1. This approval shall be void three years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.
2. All development shall be in conformance with the site plan date stamped 09/22/16, except as amended by conditions herein.
3. All necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.
4. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.
5. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

6. An update to the previously approved Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to submittal of any construction drawings or the issuance of any building or grading permits, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage study update.
7. Submit an Encroachment Agreement for landscaping and private improvements in the Cincinnati Avenue, Fairfield Avenue, and Cleveland Avenue public rights-of-way, if any, prior to the issuance of permits for these improvements. The applicant must carry an insurance policy for the term of the Encroachment Agreement and add the City of Las Vegas as an additionally insured entity on this insurance policy. If requested by the City, the applicant shall remove property encroaching in the public right-of-way at the applicant's expense pursuant to the terms of the City's Encroachment Agreement. The installation and maintenance of all private improvements in the public right of way shall be the responsibility of the applicant and any successors in interest to the property and assigns pursuant to the terms of the Encroachment Agreement. Coordinate all requirements for the Encroachment Agreement with the Land Development Section of the Department of Building and Safety (702-229-4836).
8. Meet with the Flood Control Section of the Department of Public Works for assistance with establishing finished floor elevations and drainage paths for this site prior to submittal of construction plans, the issuance of any building or grading permits or the submittal of a map for this site, whichever may occur first. Provide and improve all drainage ways as recommended.

This action by the Department of Planning staff on October 18, 2016 is final unless a written appeal is filed with the Director of the Department of Planning within ten days of the date of this letter.

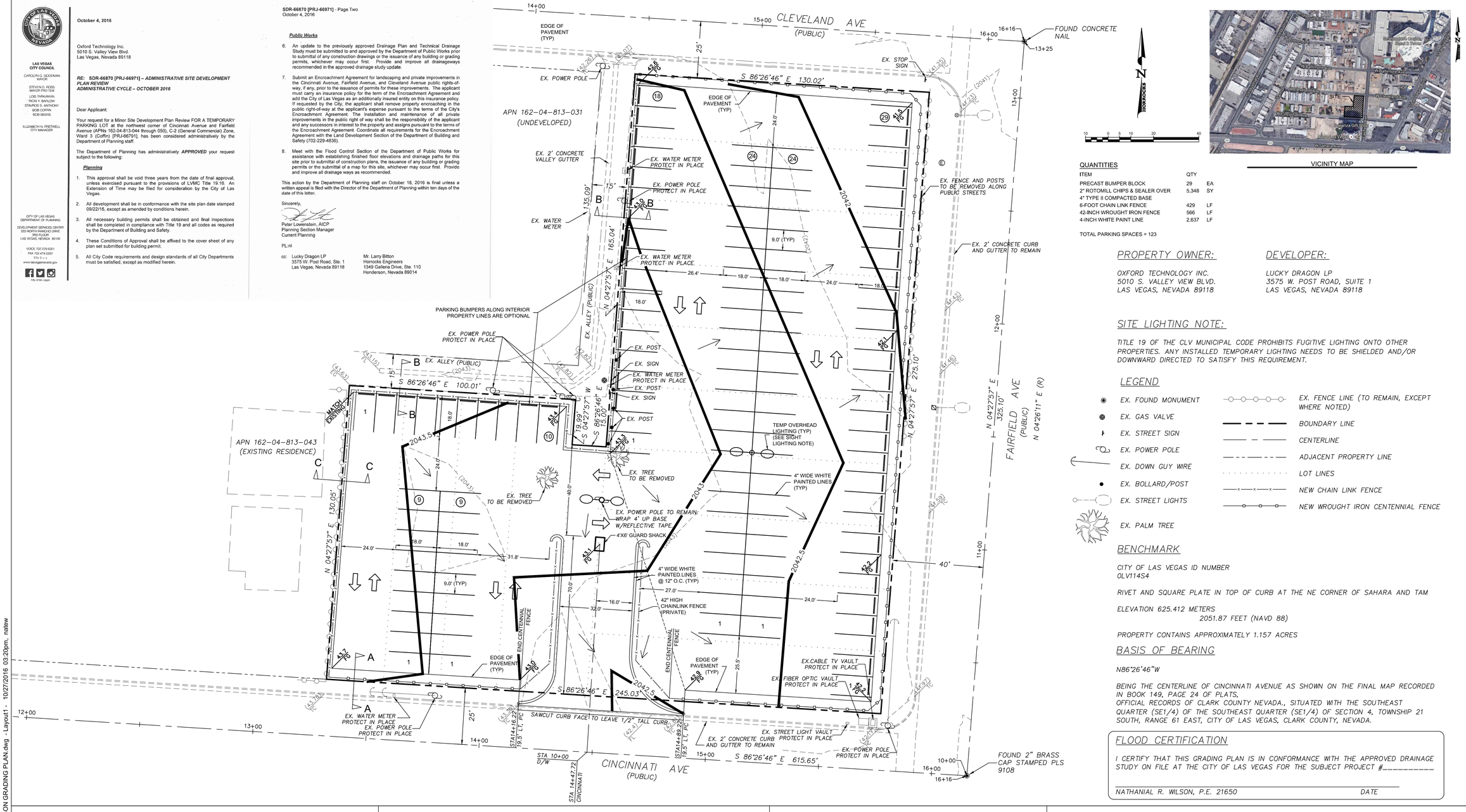
Sincerely,

Peter Lowenstein, AICP
Planning Section Manager
Current Planning

PL:nl

cc: Lucky Dragon LP
3575 W. Post Road, Ste. 1
Las Vegas, Nevada 89118

Mr. Larry Bitton
Horrocks Engineers
1349 Galleria Drive, Ste. 110
Henderson, Nevada 89014



VICINITY MAP

QUANTITIES

ITEM	QTY	
PRECAST BUMPER BLOCK	29	EA
2" ROTOMILL CHIPS & SEALER OVER 4" TYPE II COMPACTED BASE	5,348	SY
6-FOOT CHAIN LINK FENCE	429	LF
42-INCH WROUGHT IRON FENCE	566	LF
4-INCH WHITE PAINT LINE	2,637	LF

TOTAL PARKING SPACES = 123

PROPERTY OWNER:

OXFORD TECHNOLOGY INC.
5010 S. VALLEY VIEW BLVD.
LAS VEGAS, NEVADA 89118

DEVELOPER:

LUCKY DRAGON LP
3575 W. POST ROAD, SUITE 1
LAS VEGAS, NEVADA 89118

SITE LIGHTING NOTE:

TITLE 19 OF THE CLV MUNICIPAL CODE PROHIBITS FUGITIVE LIGHTING ONTO OTHER PROPERTIES. ANY INSTALLED TEMPORARY LIGHTING NEEDS TO BE SHIELDED AND/OR DOWNWARD DIRECTED TO SATISFY THIS REQUIREMENT.

LEGEND

- EX. FOUND MONUMENT
- EX. GAS VALVE
- EX. STREET SIGN
- EX. POWER POLE
- EX. DOWN GUY WIRE
- EX. BOLLARD/POST
- EX. STREET LIGHTS
- EX. PALM TREE
- EX. FENCE LINE (TO REMAIN, EXCEPT WHERE NOTED)
- BOUNDARY LINE
- CENTERLINE
- ADJACENT PROPERTY LINE
- LOT LINES
- NEW CHAIN LINK FENCE
- NEW WROUGHT IRON CENTENNIAL FENCE

BENCHMARK

CITY OF LAS VEGAS ID NUMBER
OLV114S4

RIVET AND SQUARE PLATE IN TOP OF CURB AT THE NE CORNER OF SAHARA AND TAM

ELEVATION 625.412 METERS
2051.87 FEET (NAVD 88)

PROPERTY CONTAINS APPROXIMATELY 1.157 ACRES

BASIS OF BEARING

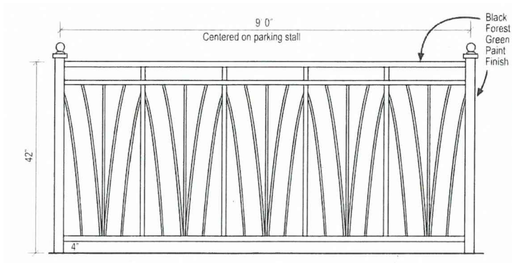
N86°26'46"W

BEING THE CENTERLINE OF CINCINNATI AVENUE AS SHOWN ON THE FINAL MAP RECORDED IN BOOK 149, PAGE 24 OF PLATS, OFFICIAL RECORDS OF CLARK COUNTY NEVADA., SITUATED WITH THE SOUTHEAST QUARTER (SE1/4) OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 4, TOWNSHIP 21 SOUTH, RANGE 61 EAST, CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

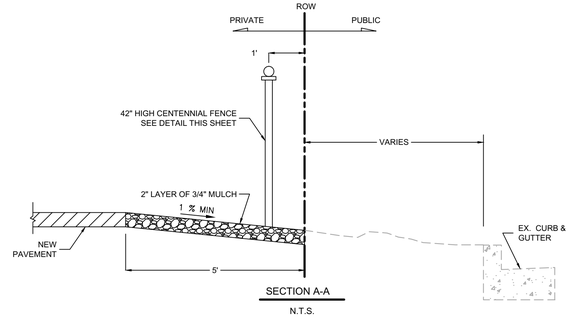
FLOOD CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT #_____

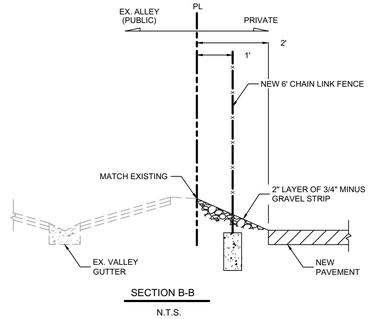
NATHANIAL R. WILSON, P.E. 21650 *DATE*



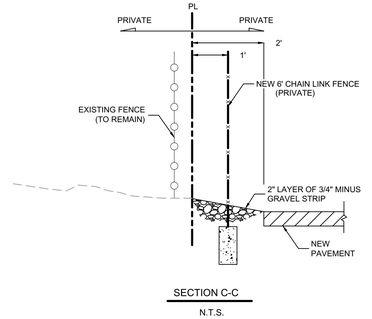
DOWNTOWN CENTENNIAL PLAN FENCE DETAIL
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

HORROCKS ENGINEERS
1349 Galleria Drive
Suite 110
Henderson, NV 89014
(702) 966-4063

REV.	DATE	BY	DESCRIPTION
			REVISIONS

DESIGNED	DATE	CHECKED
NW	10/27/16	LB
DRAWN	DATE	
NW	10/27/16	

LUCKY DRAGON CASINO

TEMPORARY EMPLOYEE PARKING PLAN

APNS: 162-04-813-044 THRU 050
CLVSDR-66870 [PRJ-66791]

PROJECT NO.
LV-844-1608

SHEET NO.
1 OF 1

FILE NAME:

H:\2016_Lucky Dragon Parking\DWGS\Working\2016 10 27_LUCKY DRAGON GRADING PLAN.dwg - Layout1 - 10/27/2016 03:20pm, natew