DS #: 4839

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

PROJECT: Lucky Dragon Casino - Temporary Parking

SUBMITTAL: 2nd Submittal

SCANNED BY/DATE:

CHECKED BY/DATE:

CITY OF LAS VEGAS NEVADA

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: December 15, 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\DS4839B.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	Not Approved	$400.00	463770: $400
2nd Submittal	12/1/2016	12/15/2016	See Comments Below	$400.00	467654: $400
			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

To: Albert Sung
Flood Control
City of Las Vegas Dept of Public Works

HORROCKS ENGINEERS

From: Larry Bitton

Date: 12-01-16

TRANSMITTAL

Subject: Lucky Dragon Temp Parking
File # DS4839A (SDR 66780)

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
1	Nov 29, 2016 Response to Nov 18, 2016 CLV Comments on Drainage Study Update for Lucky Dragon Temp Parking

General Remarks:

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

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

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.

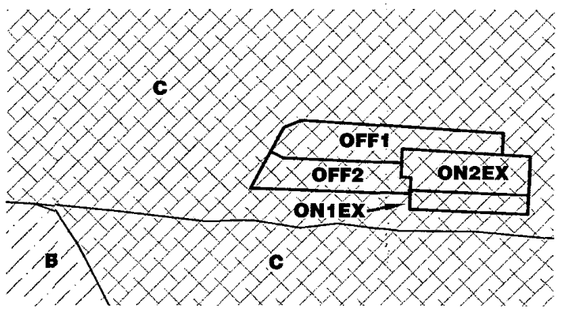
**Q VALUES REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN*

NORTH
1"=300'

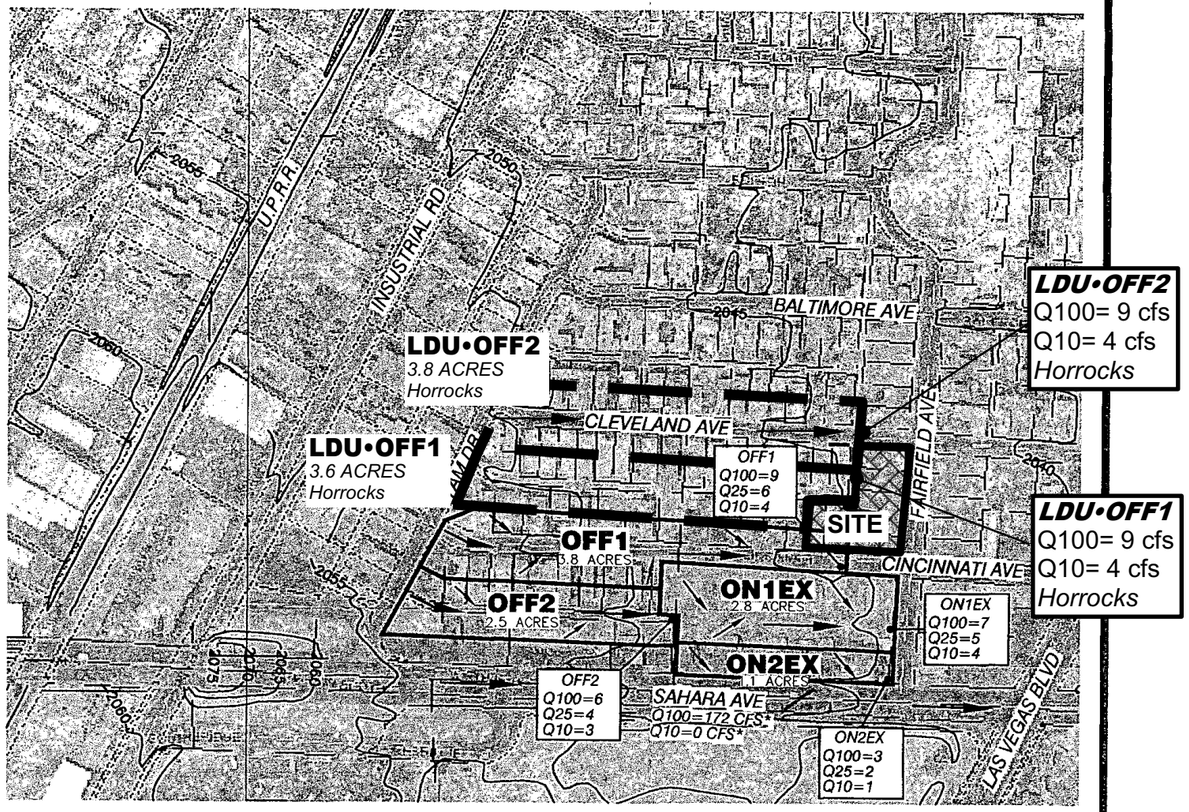
GRAPHIC SCALE

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

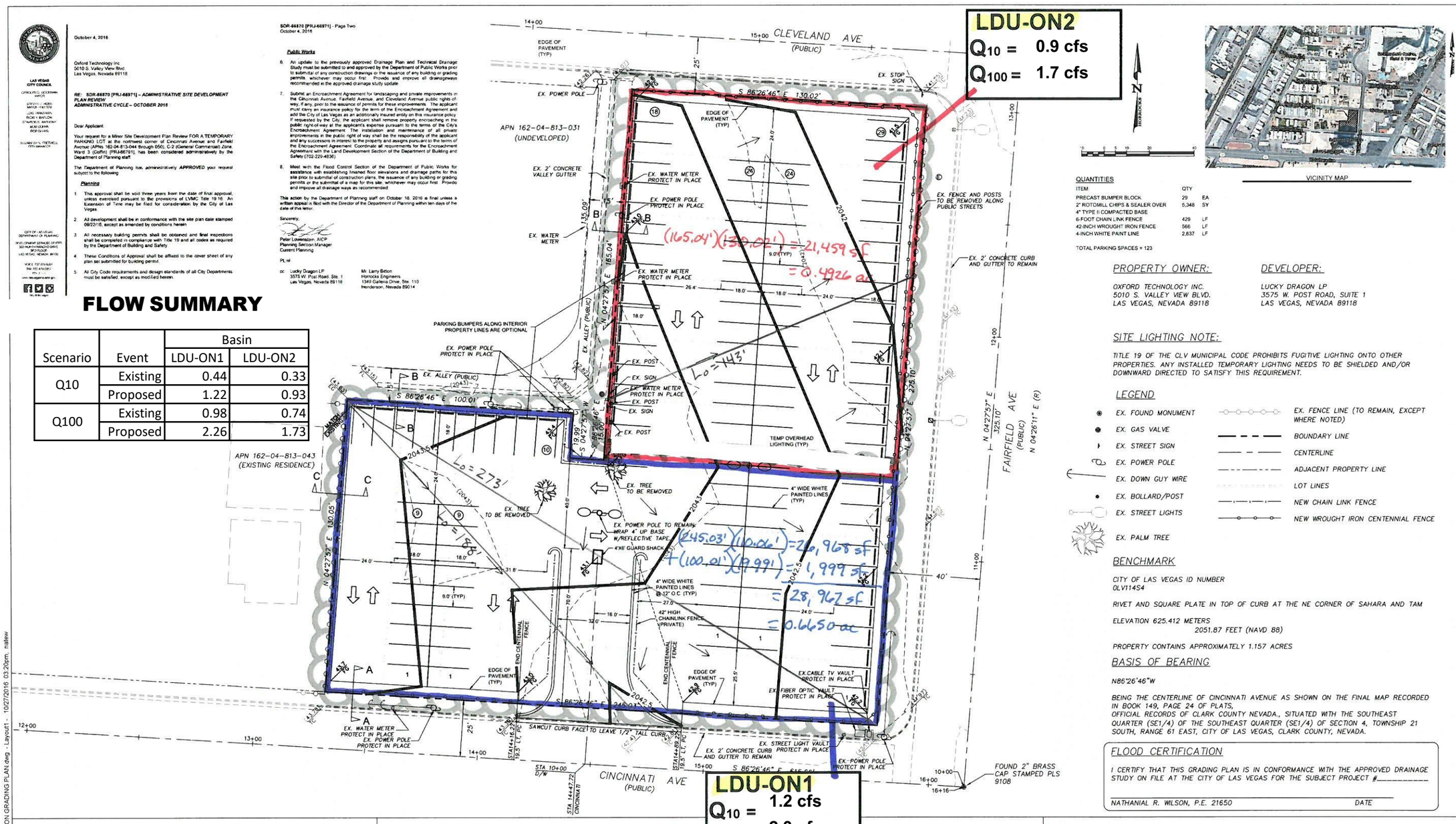
Pl.ml

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

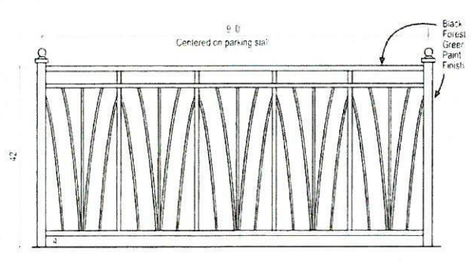
N86°26'46"W

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.

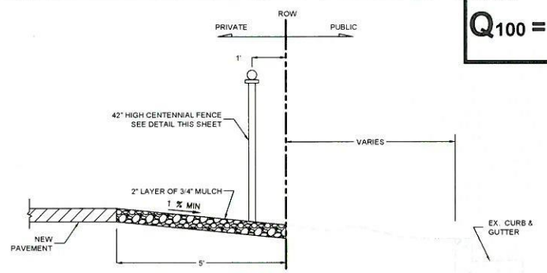
FLOOD CERTIFICATION

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 #_____

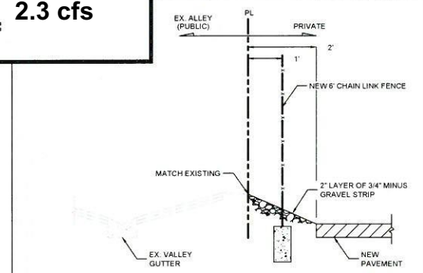
NATHANIAL R. WILSON, P.E. 21650 DATE



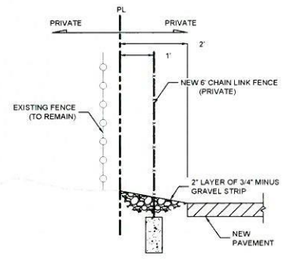
DOWNTOWN CENTENNIAL PLAN FENCE DETAIL
N.T.S.



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:

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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.

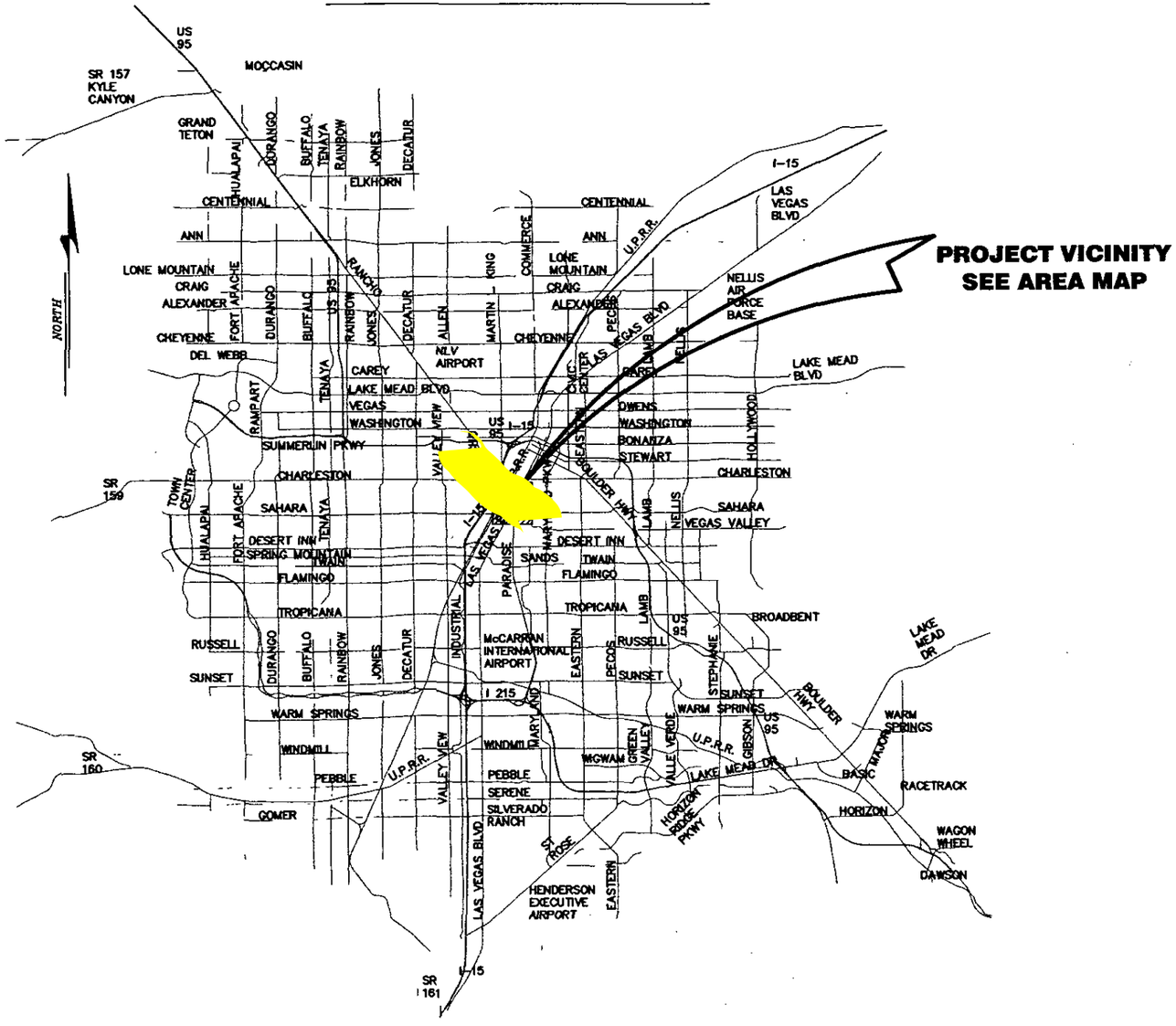
The west side of the site is adjacent to an existing 20.0 foot public alley that currently conveys drainage for Basin OFF2 north to the Cincinnati right of

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.

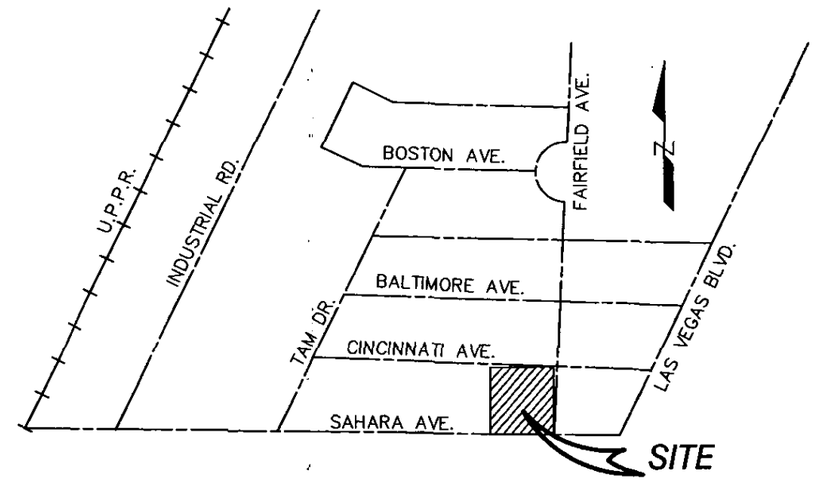
CONCLUSIONS

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:

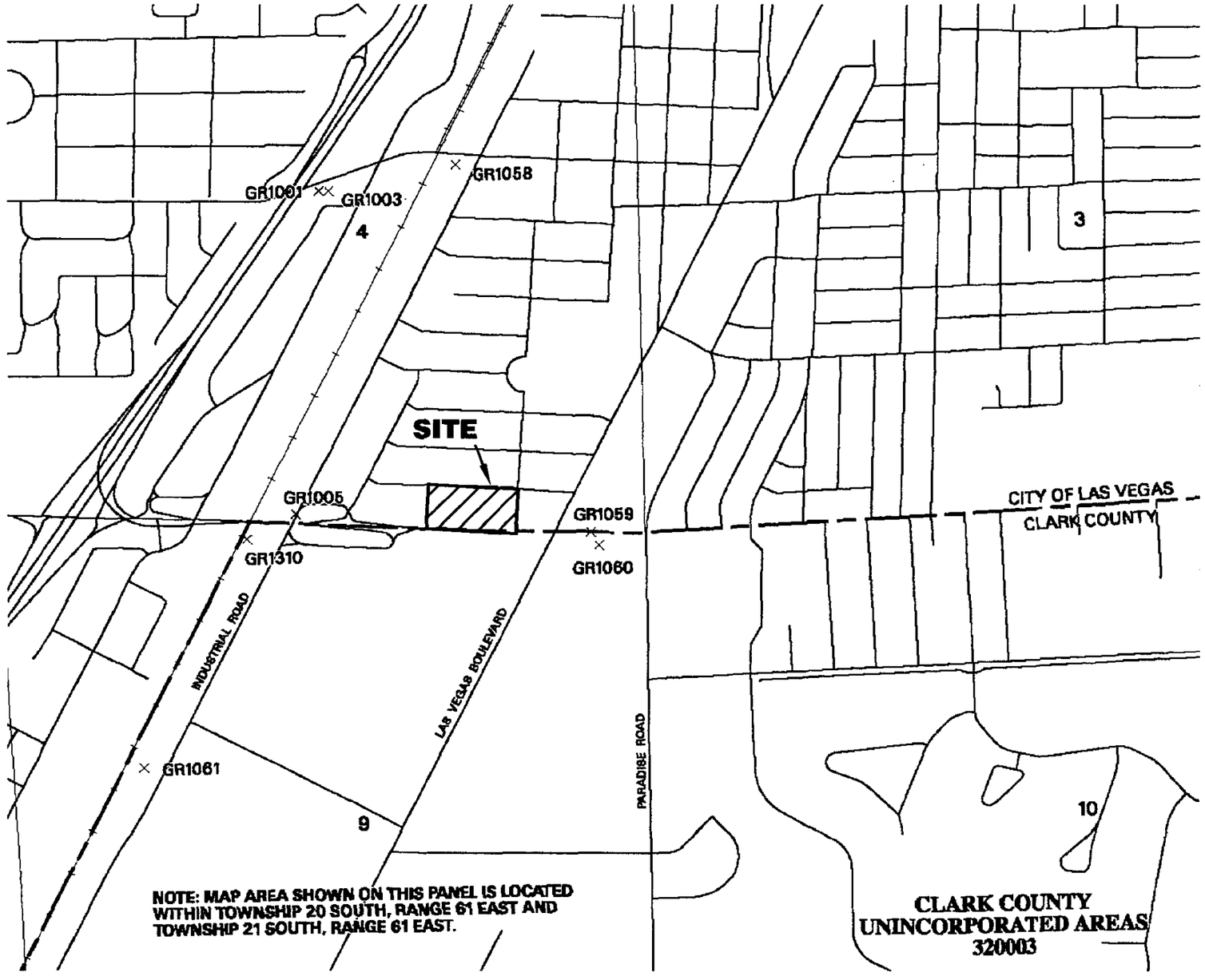
AREA MAP
ALLURE CONDOMINIUMS

CITY OF LAS VEGAS, NEVADA

FIGURE: **1**

1 OF 1

I:\Temp-14\SAHACOND\Flood\SC-AREA.dwg Mon Feb 21 15:18:35 2005



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

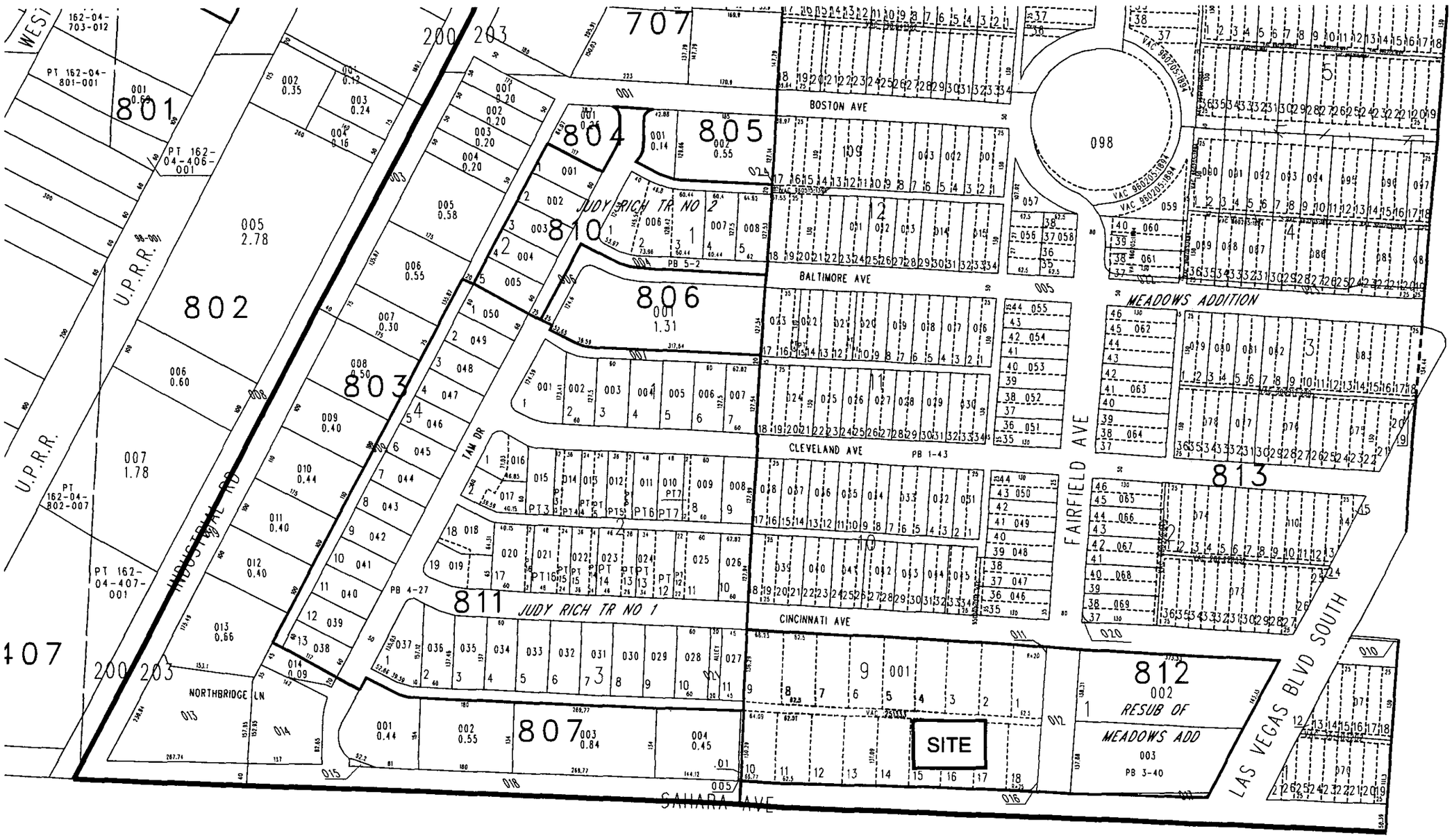
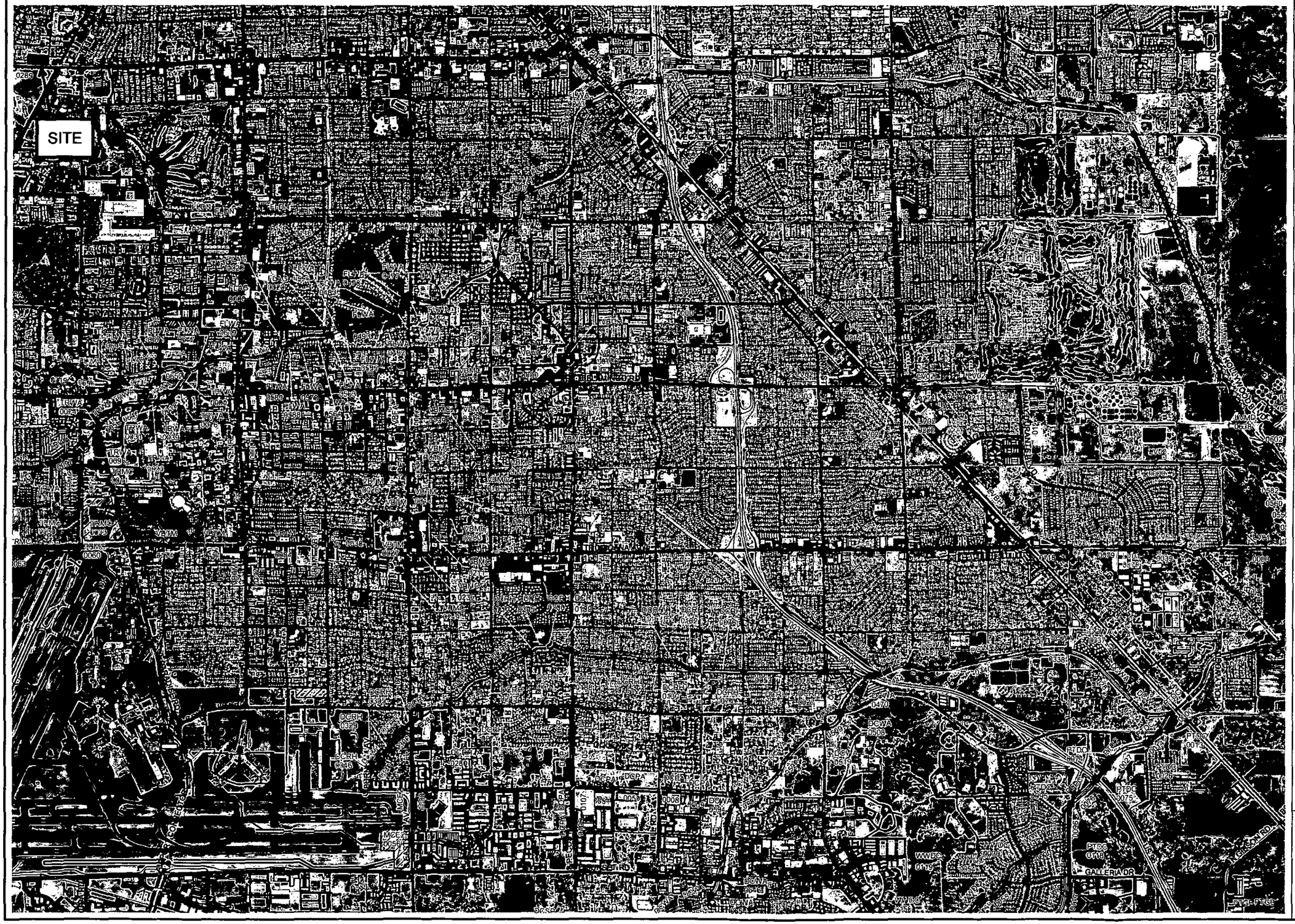


FIGURE 3



REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDAT

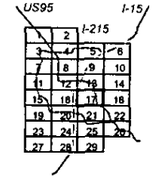
LEGEND

- 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

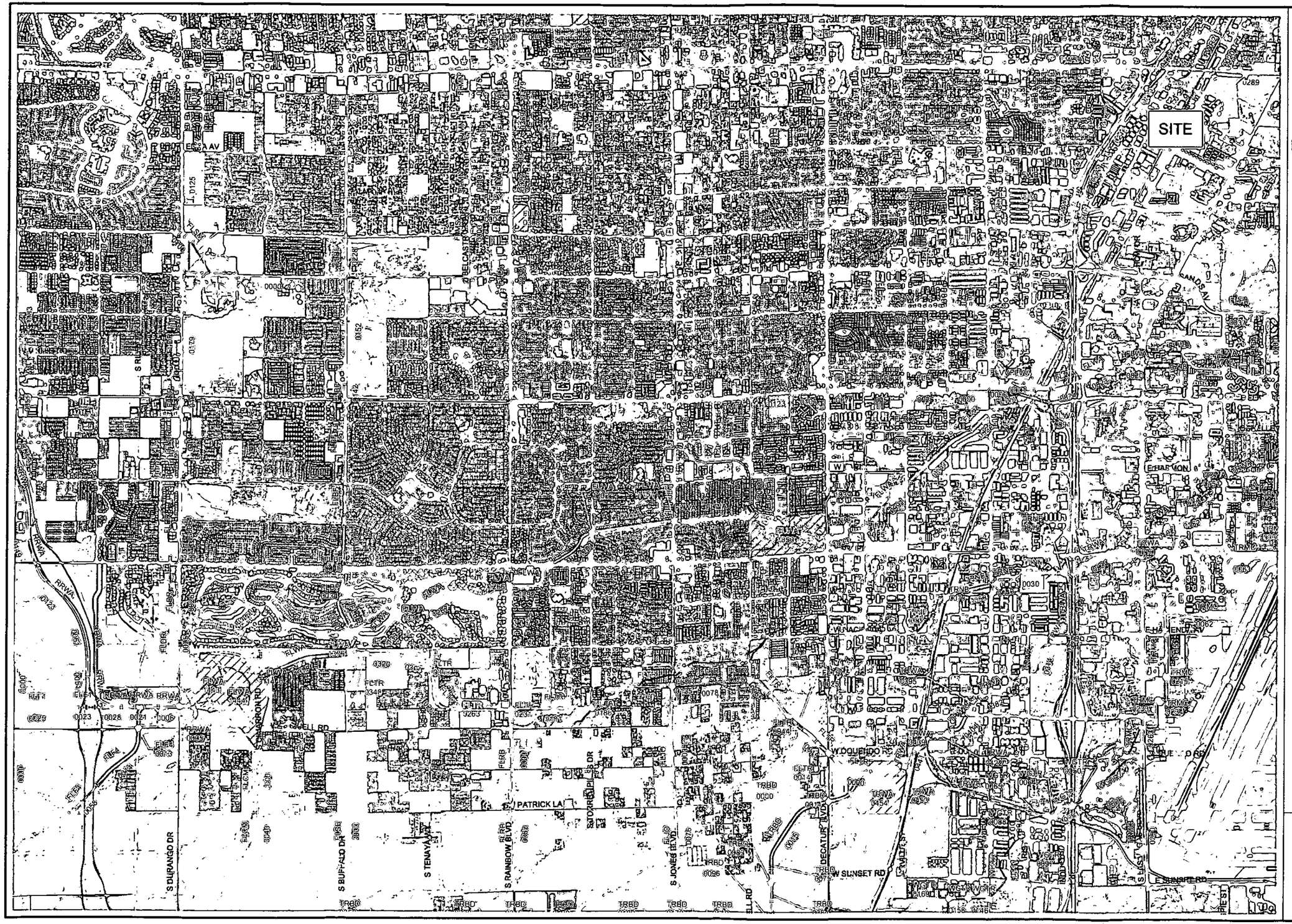


FLOOD CONTROL FACILITIES
FIGURE F-17

PBS&J

C.C. WALLACE, INC.

FIGURE 4



REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDAT

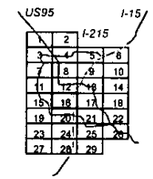
LEGEND

- 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
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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.

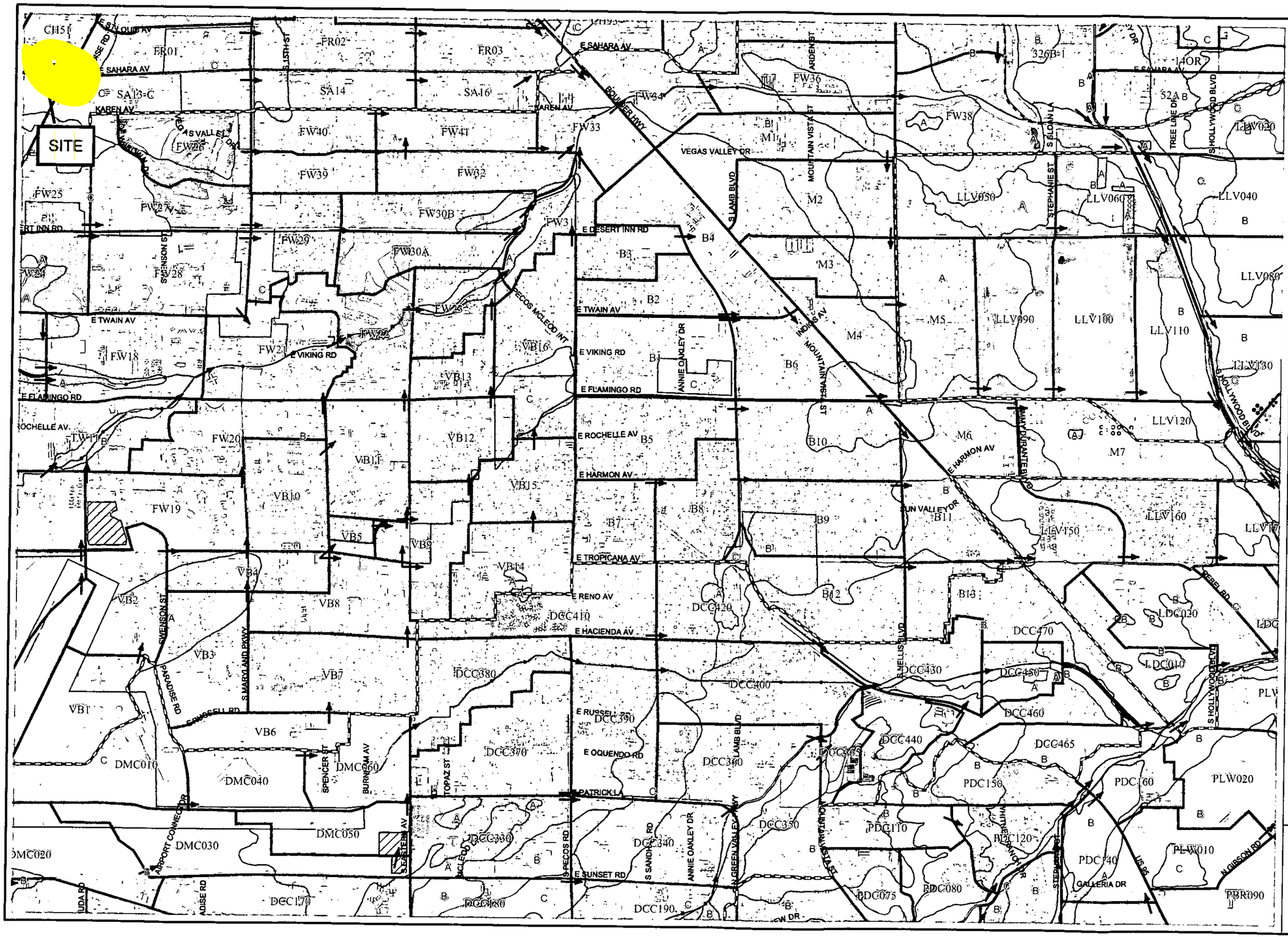
FIGURE 4A

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	DID8	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

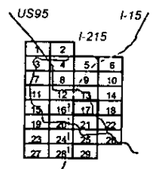
Typical Land Use

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



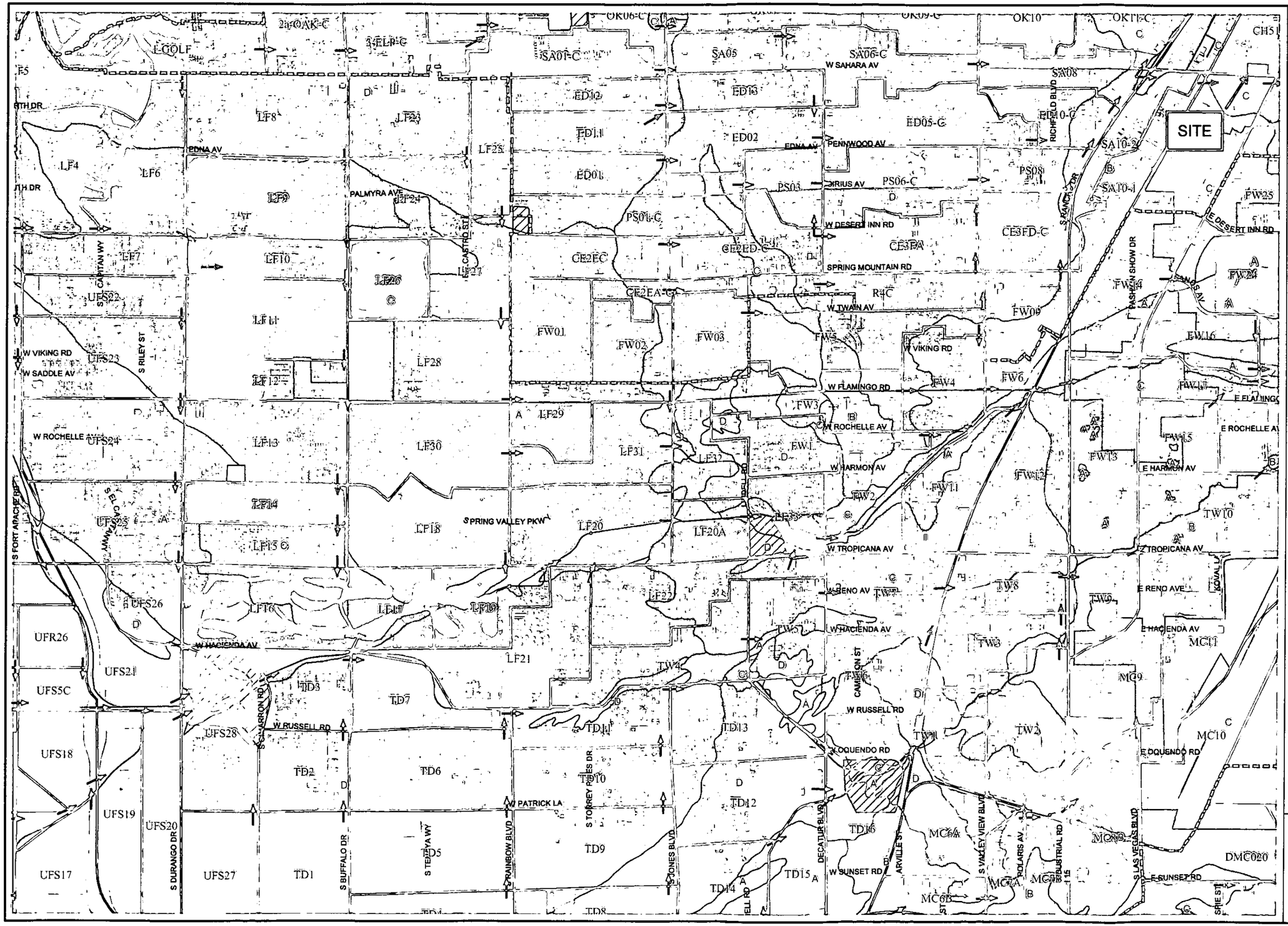
HYDROLOGIC SUBAREAS, LAND USE & SOILS

FIGURE H-17

PBS&J

C.C. WILLIAMS, 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

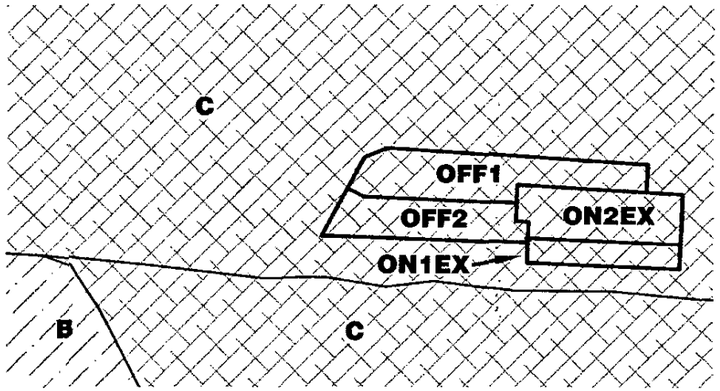
1"=300'

GRAPHIC SCALE

300 0 150 300 600

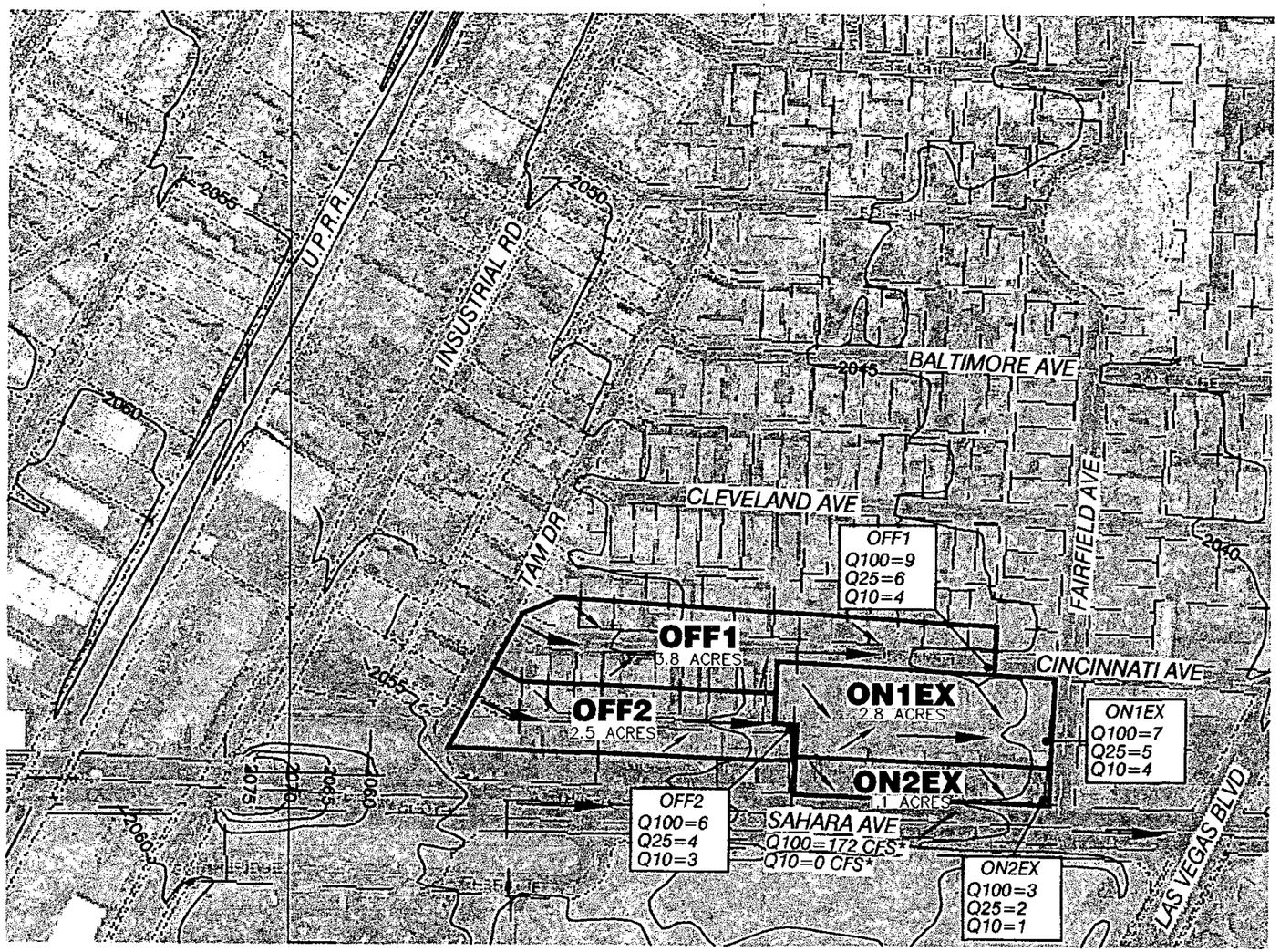
(IN FEET)

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 11:05:35 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

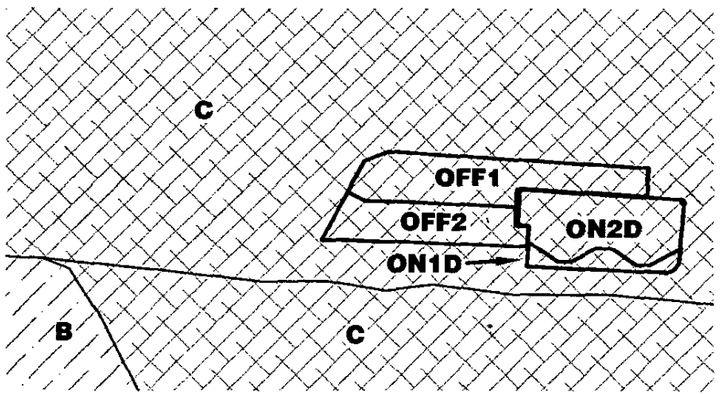
1"=300'

GRAPHIC SCALE

300 0 150 300 600

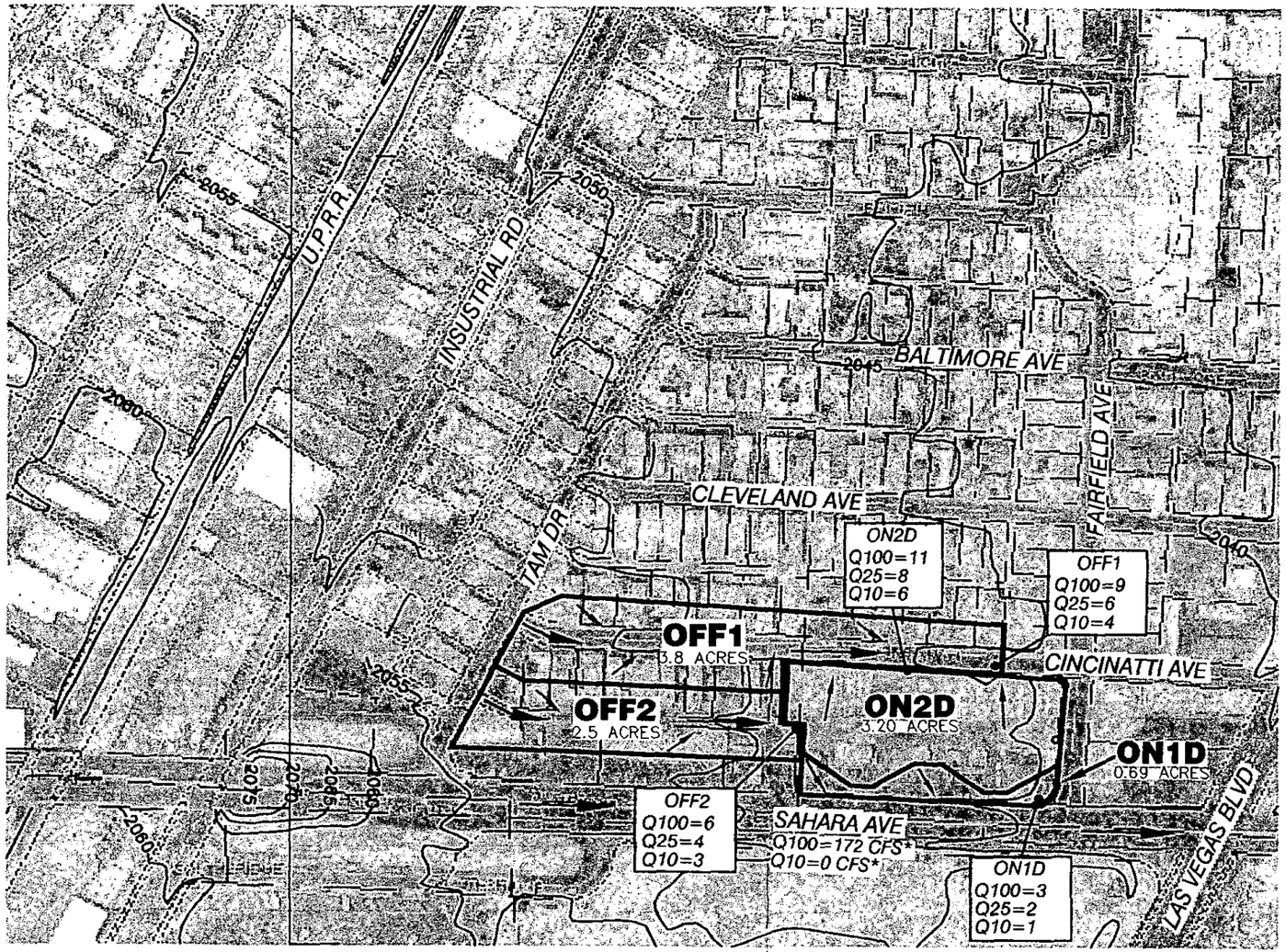
(IN FEET)

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

I:\Temp-14\SAHACOND\Flood\SC-BASDV.dwg Tue Mar 01 07:02:17 2005

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
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

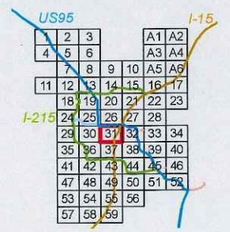
PROJECT SITE

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)



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

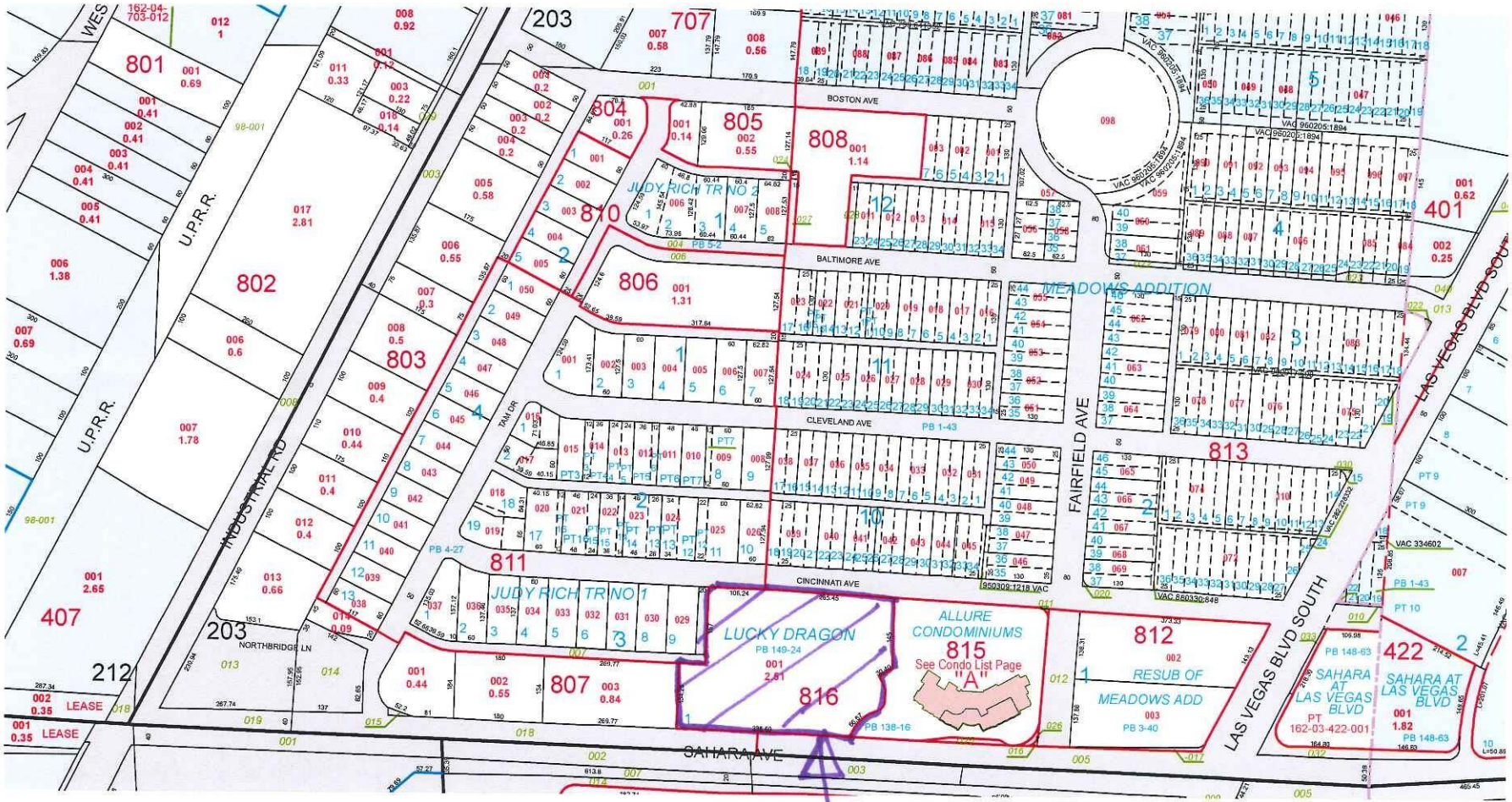
ASSESSOR'S PARCELS - CLARK CO., NV.
Michele W. Shafe - Assessor

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

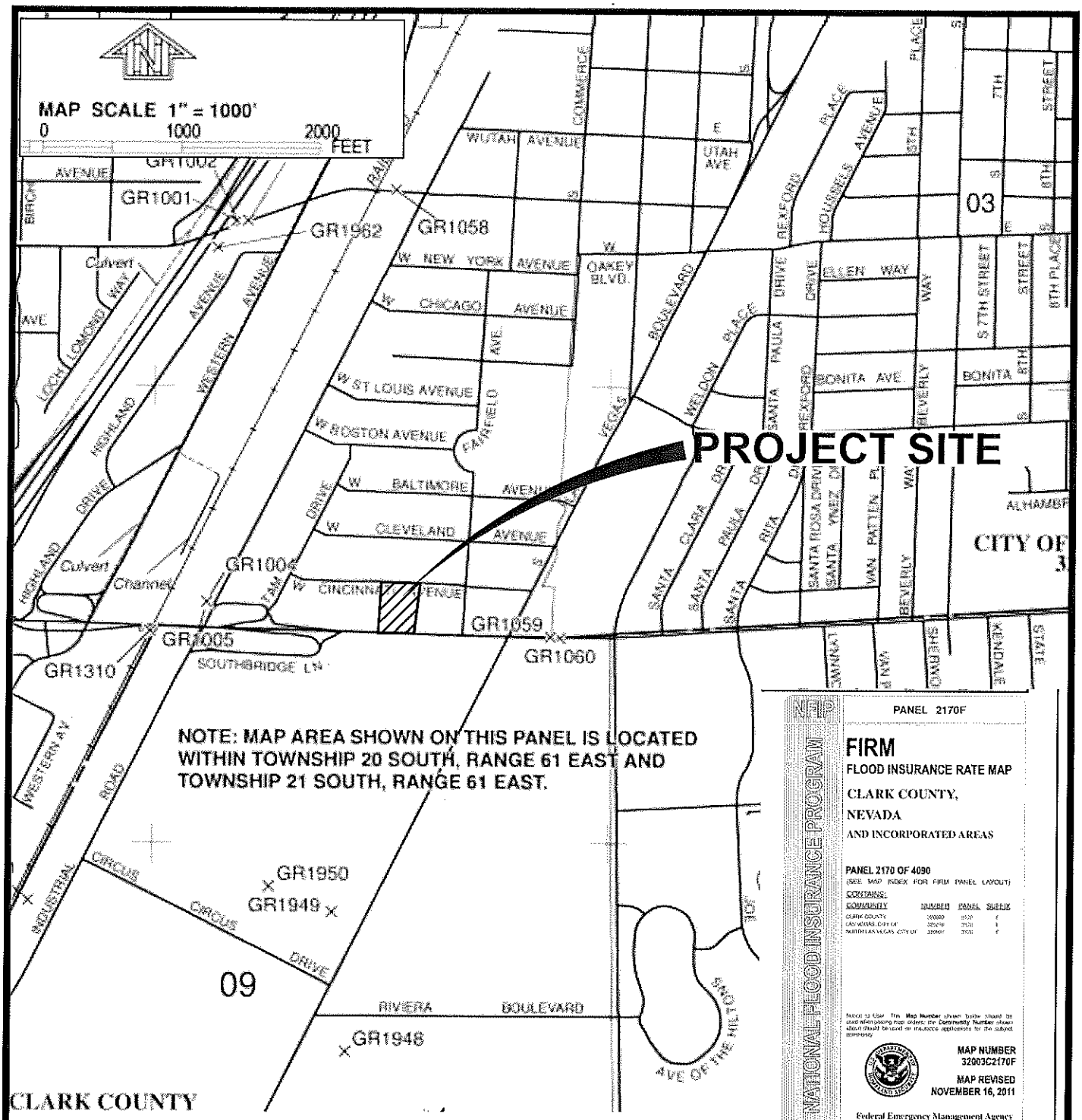
138	139	140
163	162	161

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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Chairman
Clark County

Debra March
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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

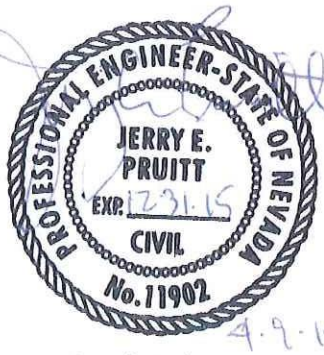
Firm: G.C. Wallace Inc.

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.

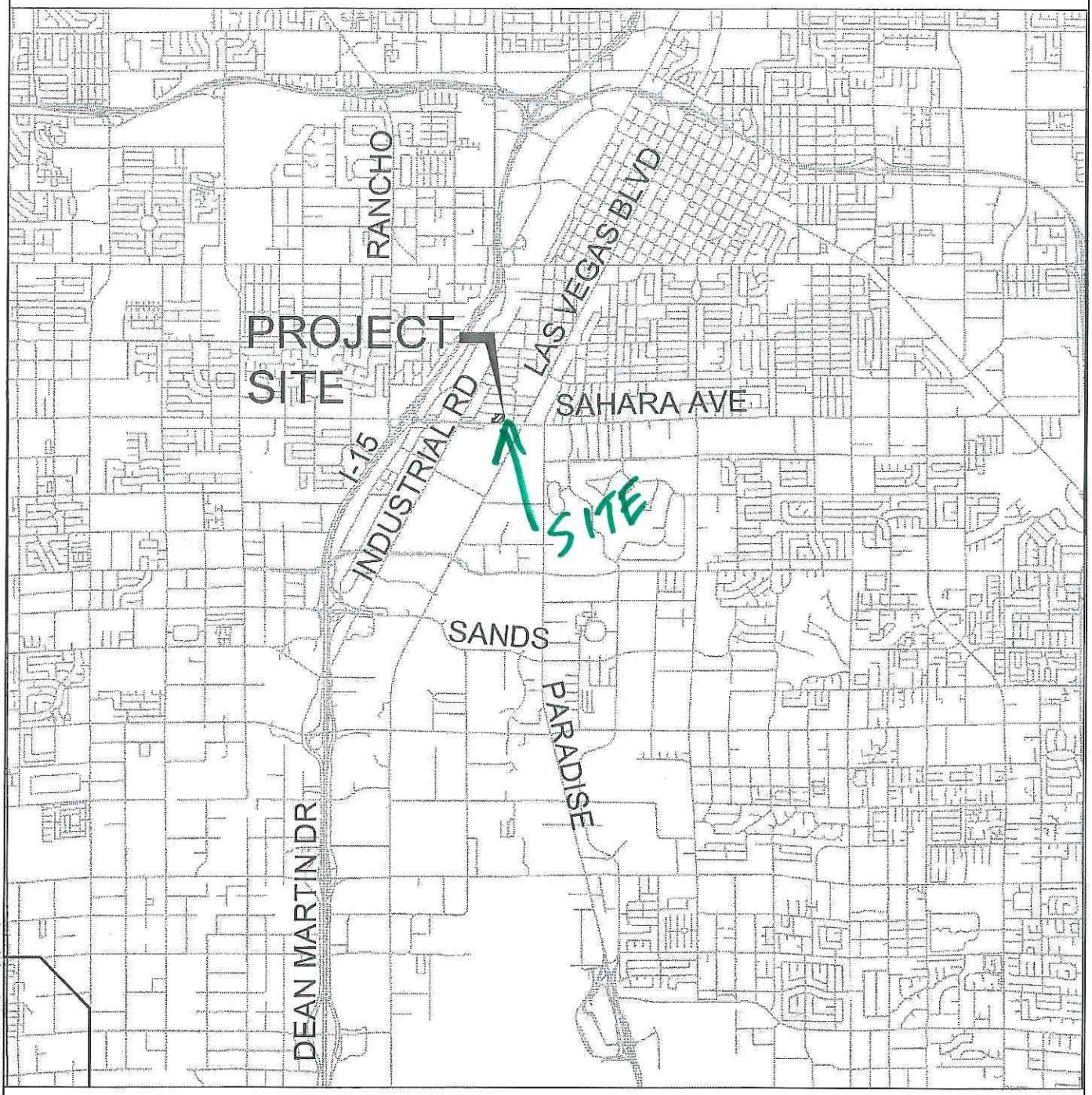
III. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD ANALYSIS

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

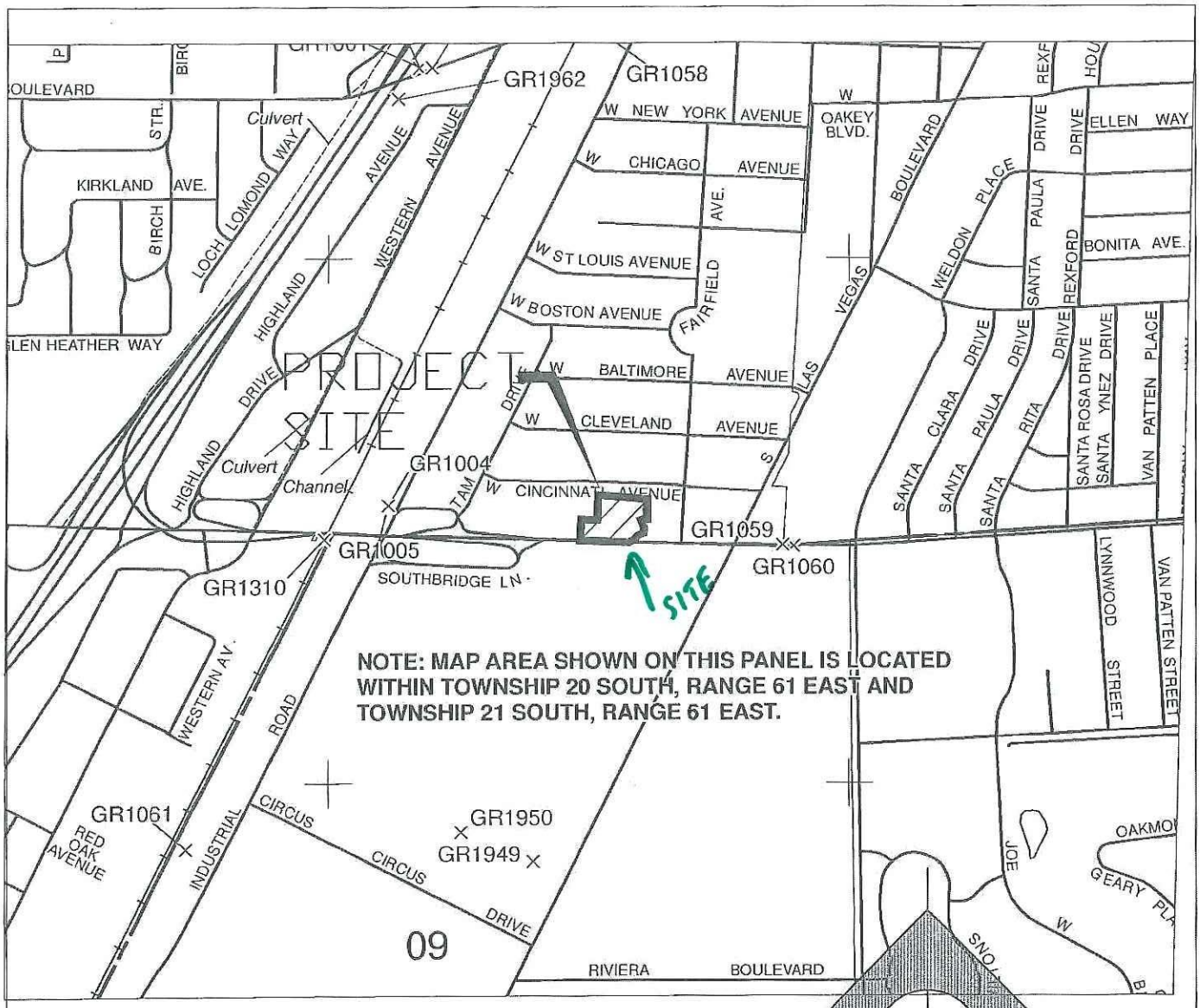
LUCKY DRAGON

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

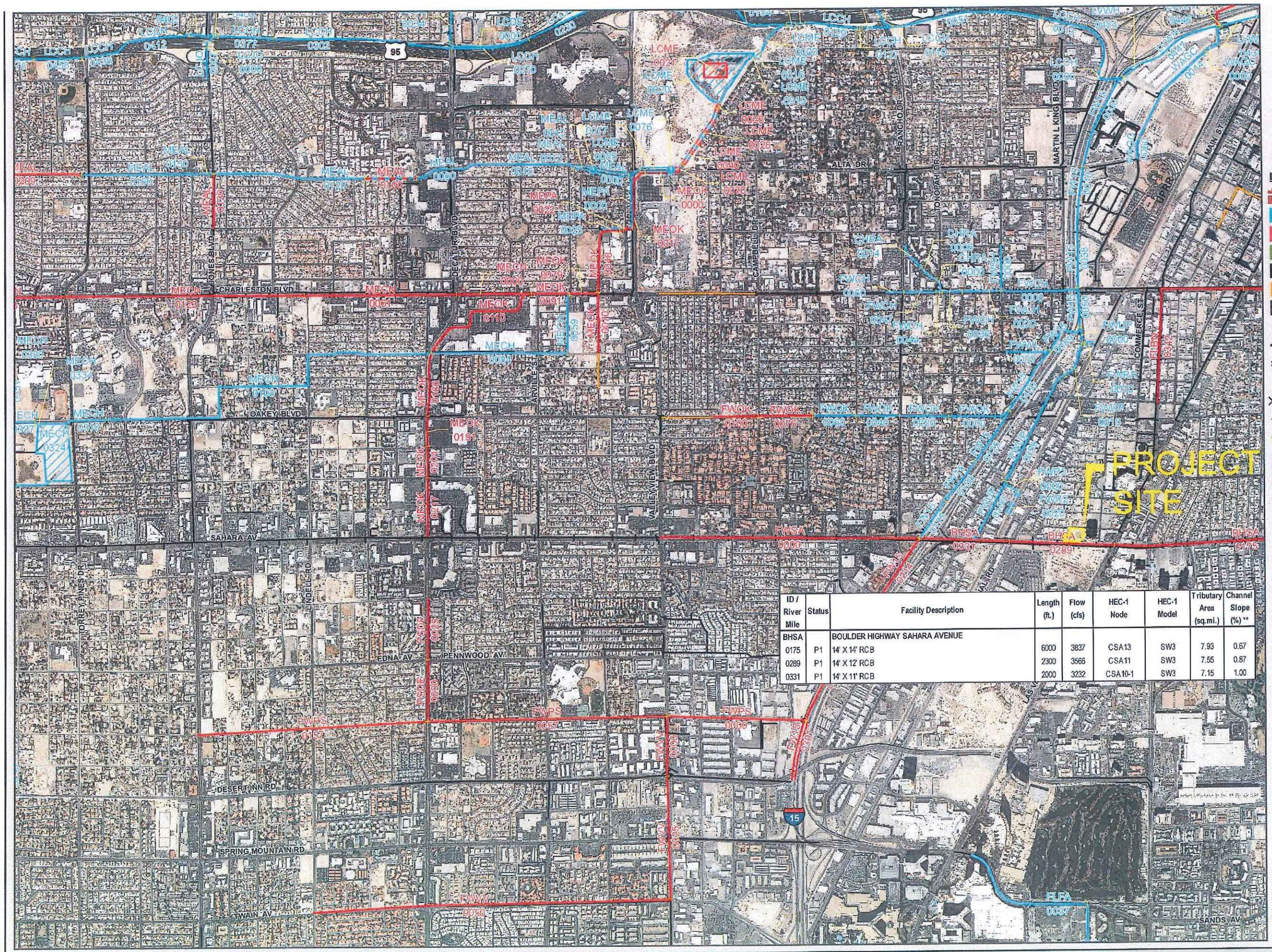
LUCKY DRAGON

FIGURE 3

F.I.R.M.

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

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

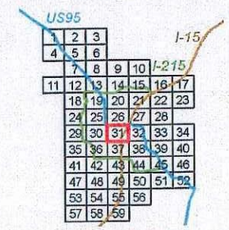
Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

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)



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

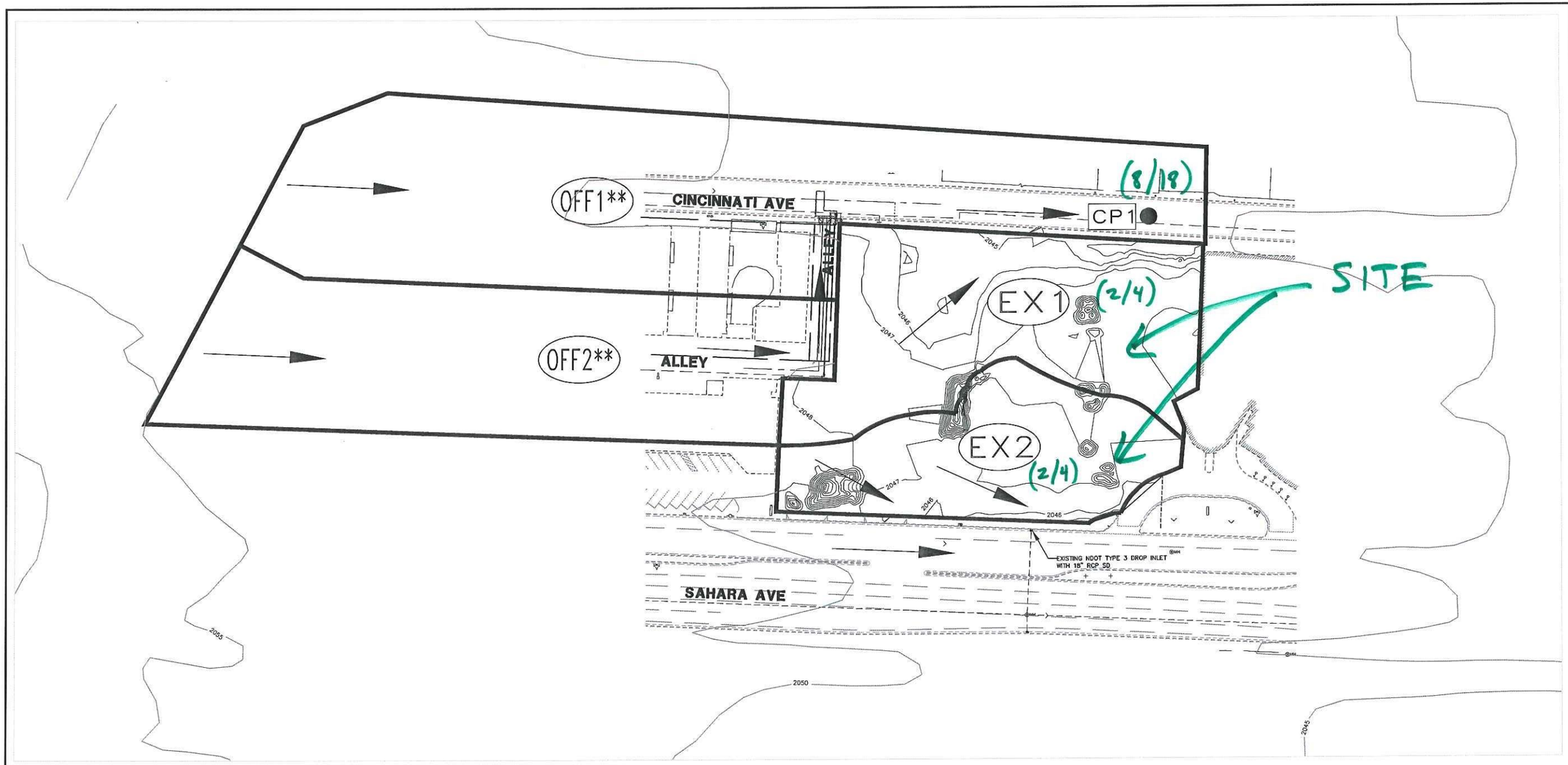
Existing conditions for the project site consists of the site undeveloped with developed offsite subbasins. Offsite subbasins from the Allure Study have been referenced and discharge a total of 15 cfs toward the western boundary of the project site. Pertinent reference material has been included in Appendix 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

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Joanne Ayson

LUCKY DRAGON LP

LUCKY DRAGON CASINO

EXISTING CONDITIONS DRAINAGE MAP

DRAWING
FIG-5
SHT OF SHTS

HTE: 00-00000

VII. PROPOSED CONDITIONS

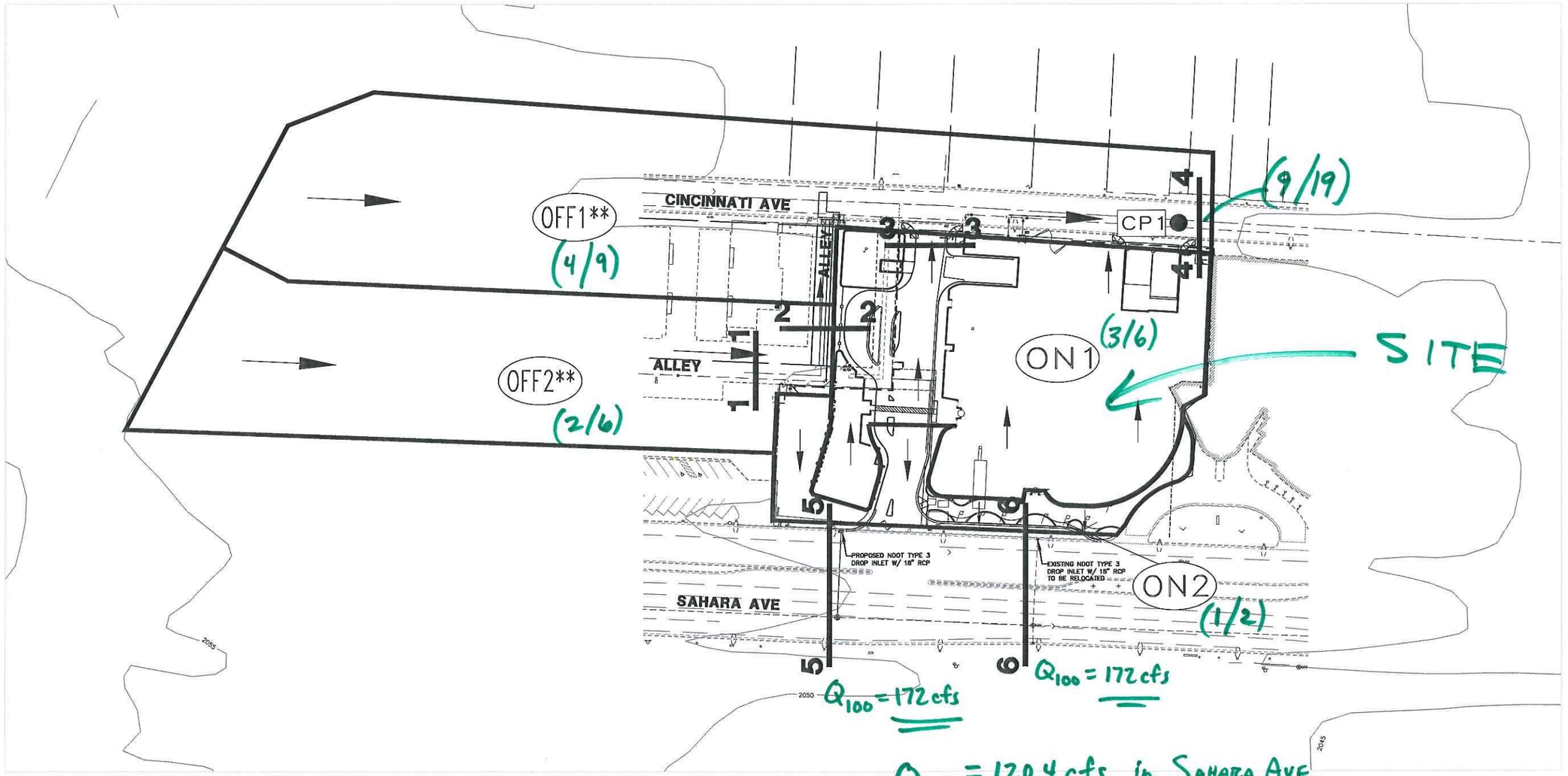
The proposed improvements consist of a hotel, casino, and parking garage. The interior street improvements include pavement, curb and gutter. Figure 6, Proposed Conditions Drainage Map, depicts the subbasins and drainage patterns used in the proposed conditions hydrologic analysis for this project and 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.

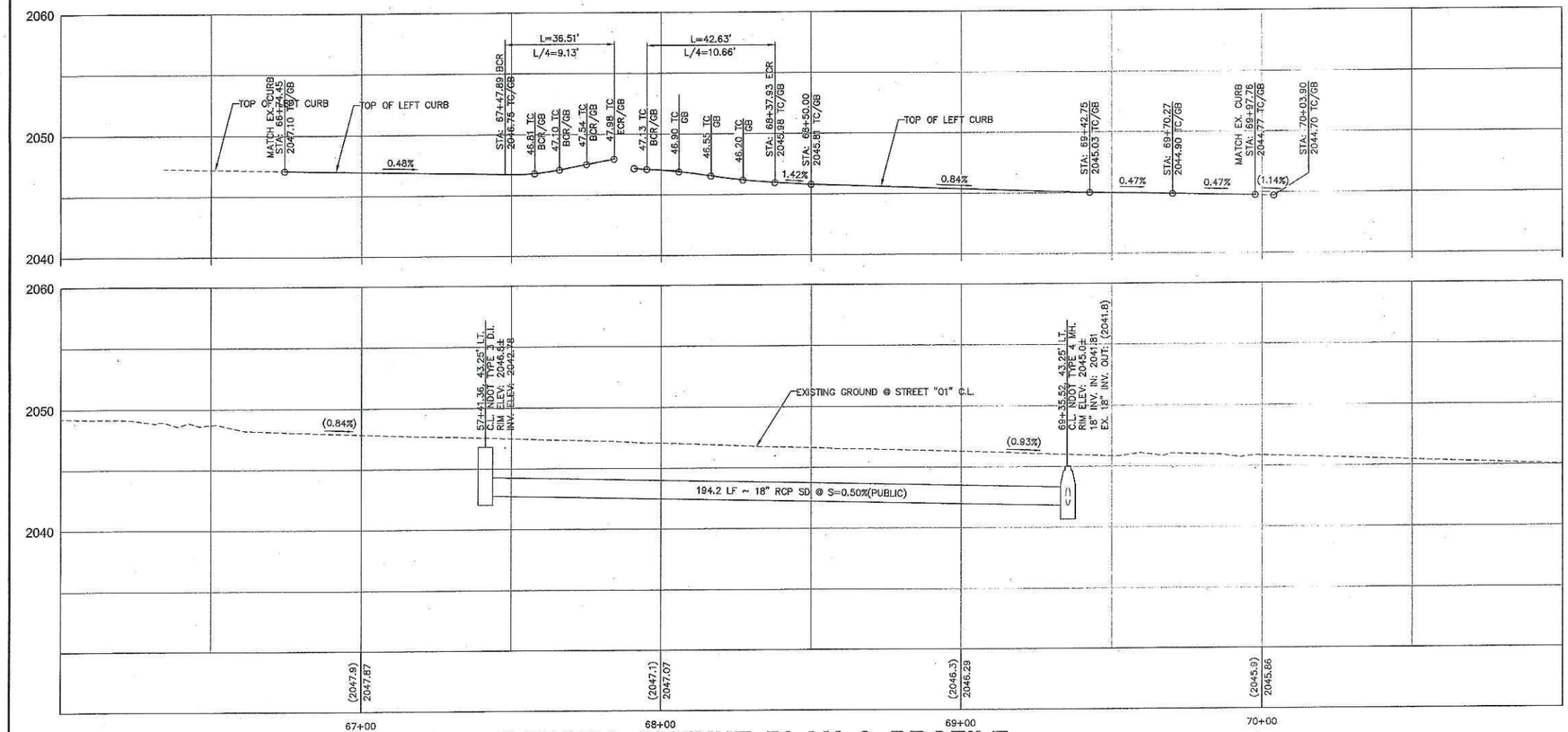
The Manual criteria for a major roadway requires a 12-foot wide dry lane in addition to a dry center turn lane in each direction for streets with a right of way (ROW) greater than 80 feet during a 10-year storm event. The 10-year flow in the Sahara Avenue ROW is zero, as all storm runoff in the ROW is 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

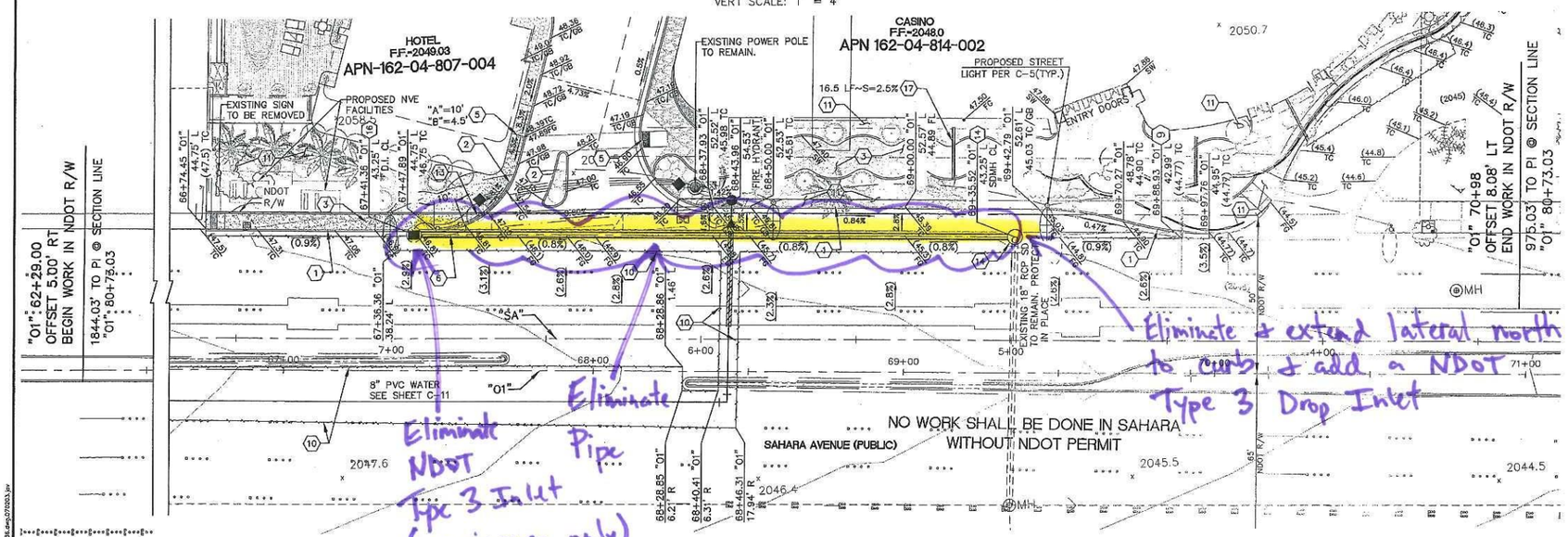
Finished Floor Elevations

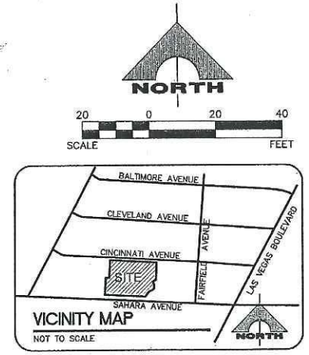
The proposed finish floor elevations of the mechanical room, hotel, and casino/parking garage are 2047.90, 2048.68, and 2047.88, respectively. All finished floor elevations are greater than two times the depth of flow above the flow line elevations in the adjacent streets and alleys.



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

F:\Projects\3001\398-A436\DWG\Production\PHASE 4\A436x4-dPRO.dwg
Rudy Lopez

LUCKY DRAGON LP

LUCKY DRAGON CASINO
SAHARA AVENUE IMPROVEMENTS

SAHARA AVENUE
PLAN + PROFILE

DRAWING
C-9
9 OF 12 SHTS

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

RESPONSE TO CLV COMMENTS DATED NOV 18, 2016

Prepared by:
Horrocks Engineers
1349 Galleria Dr Suite 110
Henderson, NV 89014

November 29, 2016

HORROCKS
ENGINEERS

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.:**

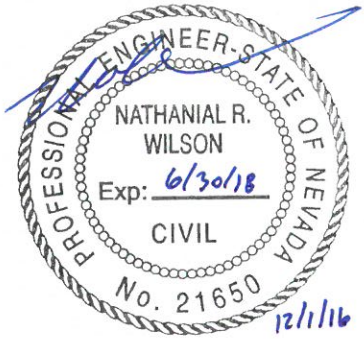
Firm: Horrocks Engineers

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.**

Local Entity File No.

Revision	Date
#1	**Nov 29, 2016**

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HORROCKS
ENGINEERS

November 29, 2016

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

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

Dear Mr. Sung,

In response to the CLV comments dated November 18th Horrocks Engineers hereby submits the following responses. We expect the responses satisfactorily address the City comments and look forward to your approval of the drainage study update.

CLV Comment #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 improvement must provide for Low Impact Development (LID) measures. Please review and address the issue in the next submittal"

Horrocks Engineers Response:

The grading plan has been updated to further address the requirements outlined in Section 1500 of the Clark County Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual (HCDDM). The site is separated into disconnected impervious areas in accordance with Conceptual Layout 1 of Figure 1501 in HCDDM Section 1500. The site size categorizes the parking lot in the Medium category per Section 1502.1. In accordance with CLV Comment #2 landscape swales have been added to settle out sediment. The landscape swales will capture runoff from 83% of the site which exceeds the minimum 75% requirement in Section 1502.2. See Exhibit 1 which identifies the capture areas and location of the swales. The previously proposed perimeter gravel buffer strip has been revised to a rock lined landscape swale (as allowed in Section 1503.4.1) and has been designed in accordance within minimums & maximums of the design criteria in 1503.4.3 (copied below for reference) with exception of

the side slopes which are 6:1, typical. Since the swale accepts side flows, the swale depth varies from 0-in to 6-in maximum.

Tributary Area (ac)	Swale Slope	Minimum Swale Length (ft)	Size of Swale
0.5 – 1.0	≤ 1%	40	9" deep maximum, 6 ft wide at top average, 4 ft wide at top minimum, 4:1 side slope (Length 30-ft min for 0.5 acre tributary areas and 40-ft min for up to 1.0 acre tributary areas)

Table 1 – Swale Design Criteria per CCRFCD 1503.4.5

Reference the cross sections on the grading plan for additional information on the swales. Section 1503.4.5 suggests a minimum rock size $D_{(50)}$ of 3". Since the slope of the swale is so shallow and velocities are under 1 ft/s due to the flat existing conditions of the site and the adjacent roadways, Horrocks Engineers has determined that a 1-inch rock size $D_{(50)}$ is sufficient. Further justifying the smaller rock size is the location of the parking lot and the increased potential for damage due to vandalism with larger rock sizes. See Figures 1, 2, & 3 for swale BMP runoff calculations, swale flow characteristics and riprap calculations.

CLV Comment #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.

Horrocks Engineers Response: As allowed in Section 1503.4.1 the landscape swale has been added to the plan and clearly identified. We acknowledge the City's preference for a grass-lined swale, however since the parking lot is temporary only and there is no water commitment, water service, or irrigation planned for the parcel, the swale is rock-lined only. The above note has been added to the plan.

CLV Comment #3

Provide additional cross-section along Fairfield Avenue and Cincinnati Avenue.

Horrocks Engineers Response: Noted. The sections have been added to the plan.

CLV Comment #4

Provide FEMA FIRM information on the grading plan.

Horrocks Engineers Response: Noted. The FEMA FIRM information has been added to the grading plan.

A copy of the revised grading plan accompanies this response. 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.

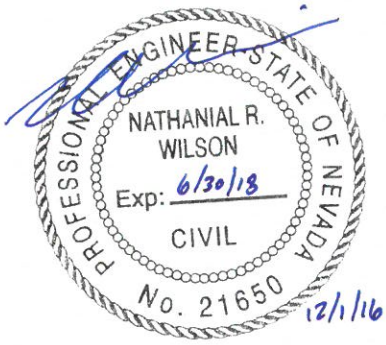
Sincerely
Horrocks Engineers

Larry Bitton
Land Development Mgr.

Enclosures

Horrocks Engineers

Nate Wilson, PE



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
Oxford Technology, Inc.
Bart Anderson, P.E., DevCo

Cross Streets:	SEQ of Fairfield Avenue and Cincinnati Avenue
File Number:	F:\Depot\DSMemos\DS4839A.doc
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

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89106
VOICE 702-229-6301

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 (APN 162-04-813-031) was approved by the Department of Planning on October 4, 2016 subject to the following conditions:

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.

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

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.
8. Dedicate additional right-of-way and easements, if any, as determined by the Director of Public Works 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

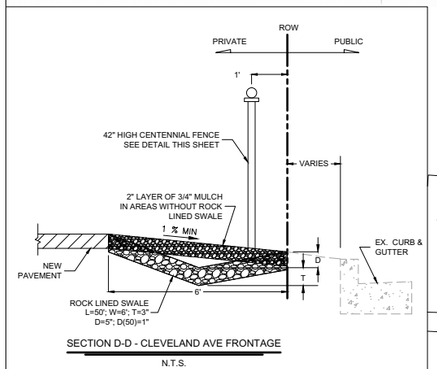
PL:nl

IMPERVIOUS AREA #2 = 0.67 acres (61% of site)

IMPERVIOUS AREA #1 = 0.24 acres (22% of site)

Rock-lined swale

Rock-lined swale



SECTION D-D - CLEVELAND AVE FRONTAGE

N.T.S.

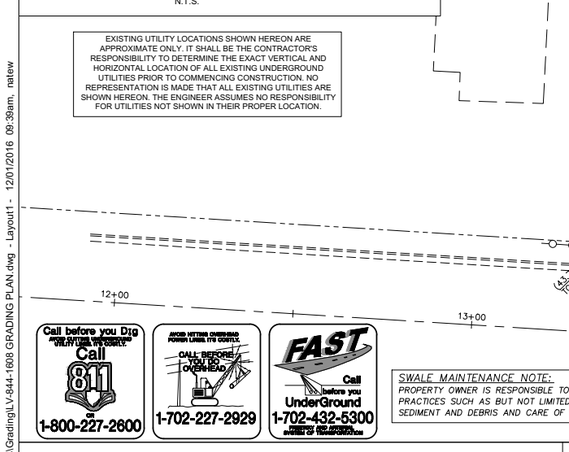
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Call before you Dig — Call 811 or 1-800-227-2600

CALL BEFORE YOU DIG OVERHEAD — 1-702-227-2929

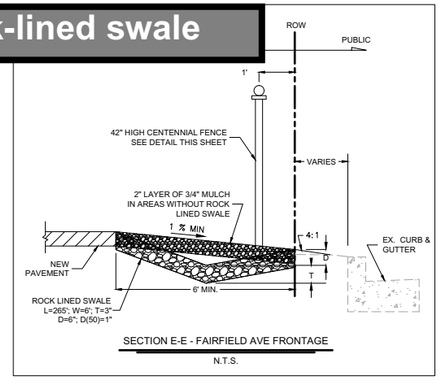
FAST — Call before you UnderGround 1-702-432-5300

SWALE MAINTENANCE NOTE:
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 VEGETATION.





VICINITY MAP



SECTION E-E - FAIRFIELD AVE FRONTAGE

N.T.S.

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

BENCHMARK
CITY OF LAS VEGAS ID NUMBER
OLV11454
RIVET AND SQUARE PLATE IN TOP OF CURB AT THE NE CORNER OF SAHARA AND TAM
ELEVATION 625.412 METERS OR 2051.87 FEET (NAVD 88)
PROPERTY CONTAINS APPROXIMATELY 1.157 ACRES

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

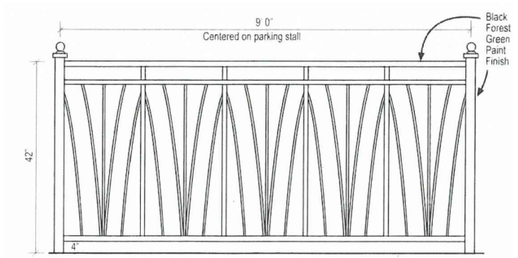
DEVELOPER:
LUCKY DRAGON LP
3575 W. POST ROAD, SUITE 1
LAS VEGAS, NEVADA 89118

THIS PROJECT IS LOCATED ON FEMA FIRM MAP NO. 32003C2170F, PANEL 2170F

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.

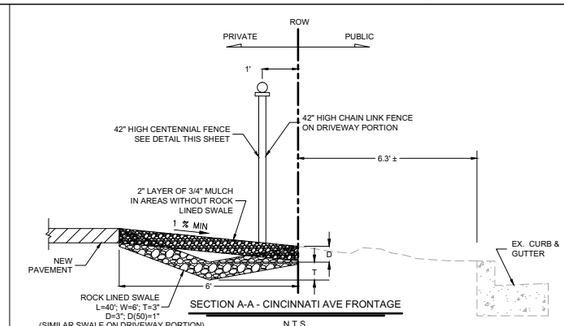
FLOOD CERTIFICATION
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT #_____

NATHANIAL R. WILSON, P.E. 21650 *DATE*



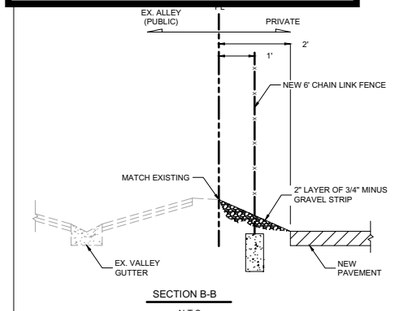
DOWNTOWN CENTENNIAL PLAN FENCE DETAIL

N.T.S.



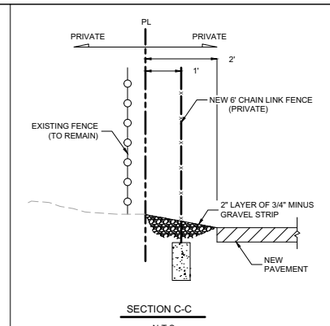
SECTION A-A - CINCINNATI AVE FRONTAGE

N.T.S.



SECTION B-B

N.T.S.



SECTION C-C

N.T.S.

ESTIMATED 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

REVISIONS	DESCRIPTION	BY	DATE	REV.

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

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
CLVSDR-66870 [PRJ-66791]

EXHIBIT 1 - DRAINAGE FACILITIES PLAN

H:\2016\LV-844-1608 Lucky Dragon Temp Parking\Project Data\Sheet_Files\Grading\LV-844-1608 GRADING PLAN.dwg - Layout1 - 12/01/2016 09:39am, natew

DEPTH-DURATION-FREQUENCY VALUES FOR McCARRAN AIRPORT RAINFALL AREA

(IN INCHES)

TIME	RECURRENCE INTERVAL					
	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

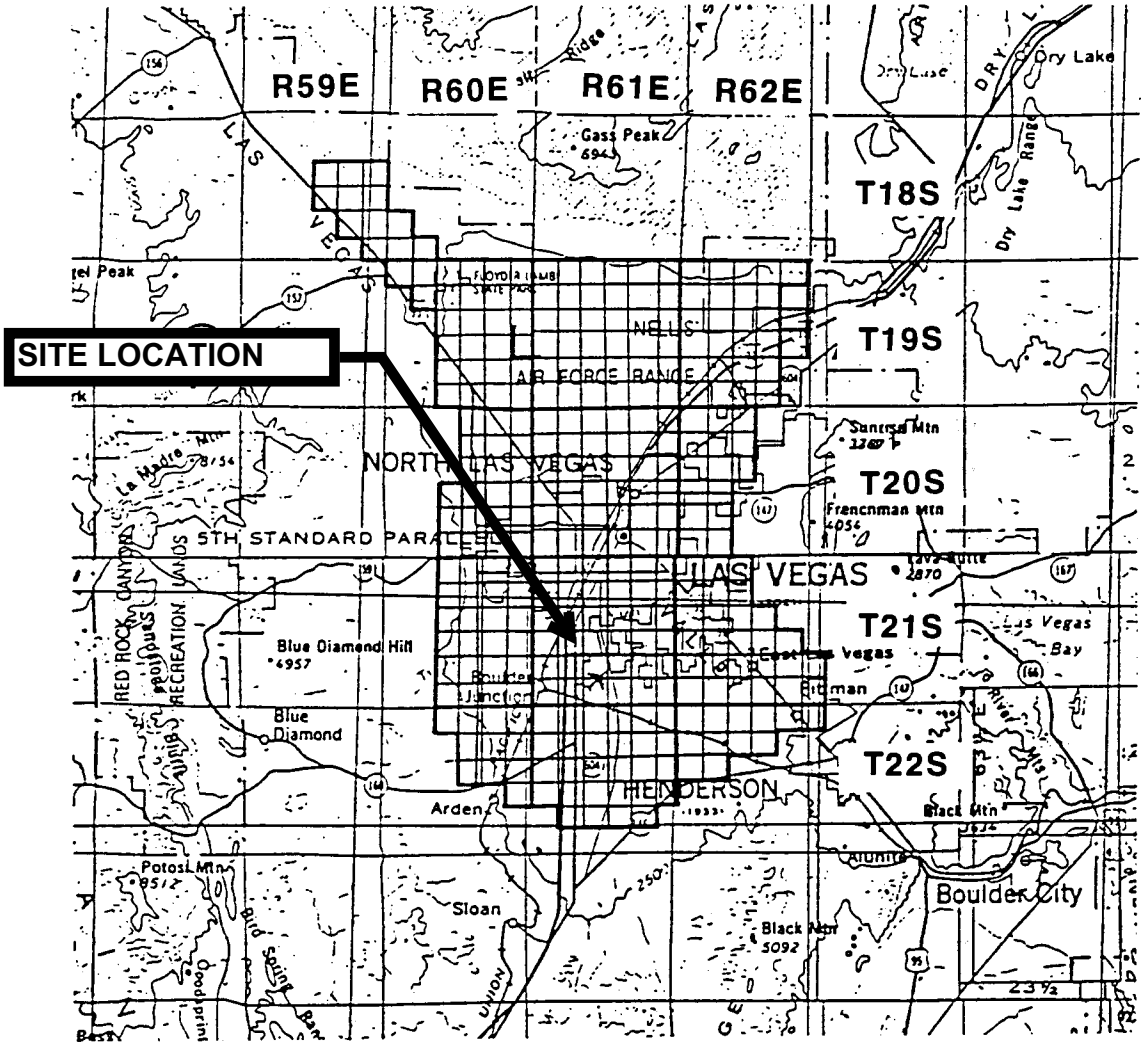
NOTE: 1. Refer to Figure 513 for a description and drawing of the area included in the McCarran Airport Rainfall Area.

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

3. Table 501 adjustments not required.

Revision	Date

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

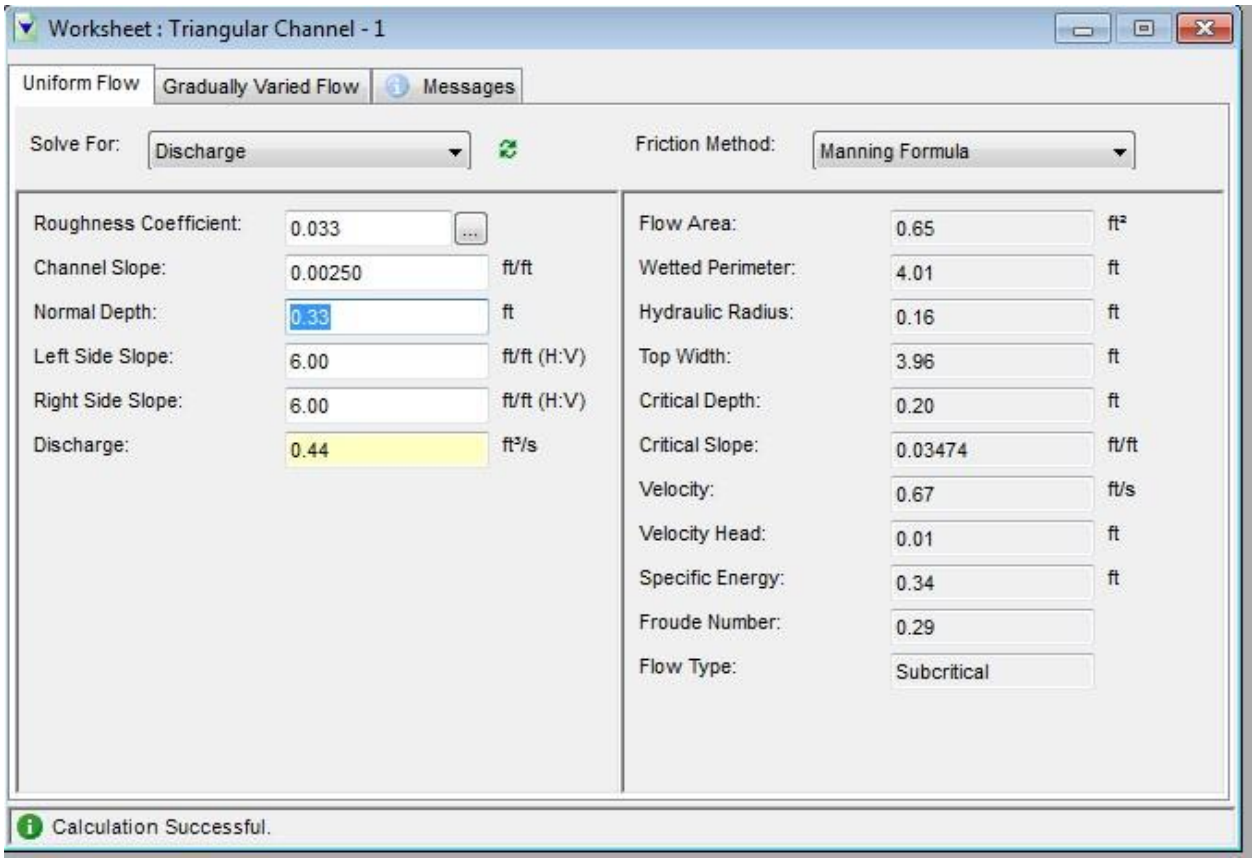
Notes:
1. Refer to Table 505 and Figure 516 Depth-Duration- Frequency values in the McCarran Airport Rainfall Area.
2. Refer to Table 506 and Figure 517 for Time-Intensity-Frequency values on the McCarran Airport Rainfall Area.

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513



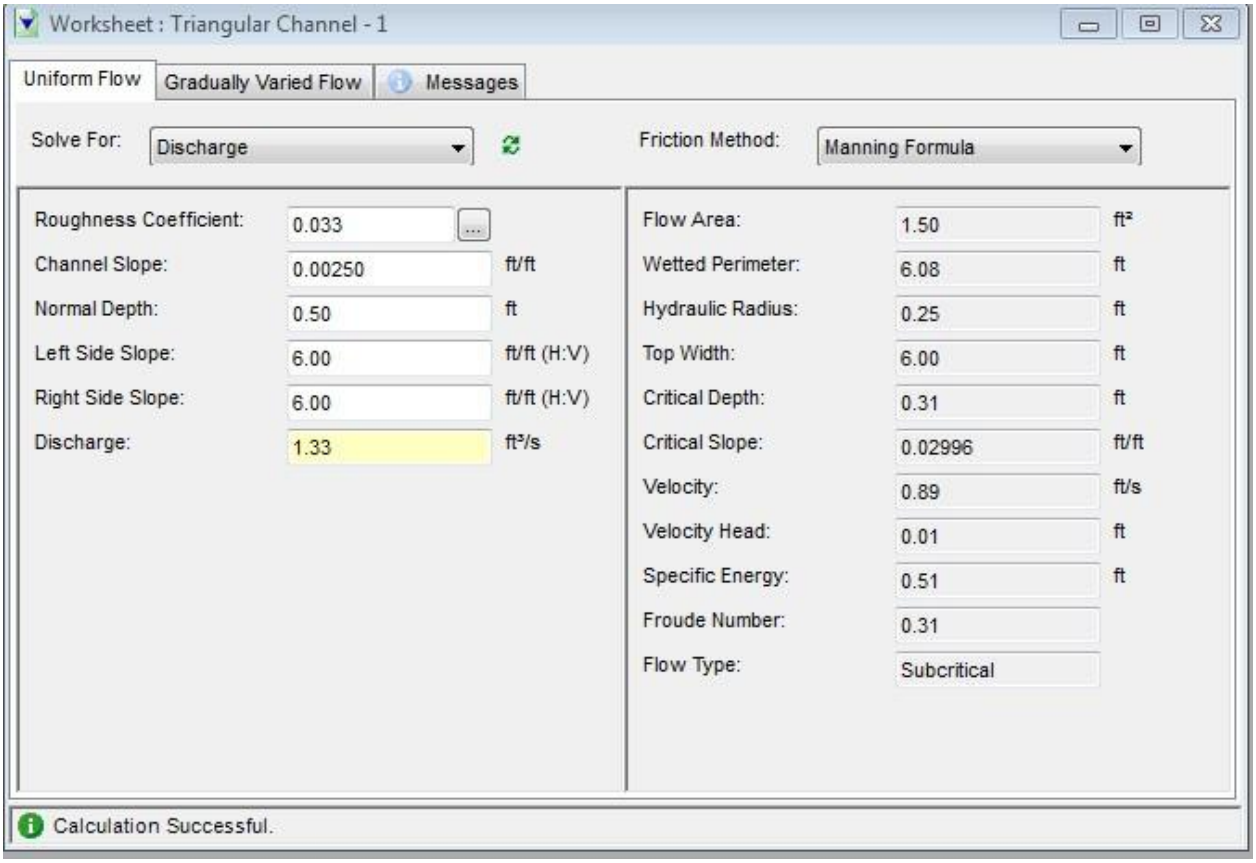


FIGURE 1 – SWALE CROSS SECTION CALCULATIONS (per Bentley FlowMaster)

HCDDM Section 705.4.6

Equation 734 $D_{50} = 0.010\ V^{2.44}$

Determine allowable velocity for 1" rip rap

Assume D_{50} = 1" = .08 ft

$$0.08 = 0.010\ V^{2.44}$$

$$8 = V^{2.44}$$

$$8^{1/2.44} = V$$

$$2.3 \text{ ft/s} = V$$

Calculated velocities at 6" and 4" depth are .89 ft/s and .67 ft/s respectively (see Figure 1). Therefore D_{50} of 1" is sufficient.

FIGURE 2 – RIPRAP SIZING CALCULATIONS (per CCRFCD HCDDM)

BMP Design Discharge per process in HCDDM Section 1502.3

1. Determine BMP Design Precipitation – 85th Percentile Rainfall Depth
    a. Site is located in McCarran Airport Area (Figure 513 – attached)
    b. D_2 = 0.72" (2 yr 6-hr) (Adjusted Rainfall Depth per Table 505 – attached)
    c. D_2 Adjustment ratio = 1.0 (within McCarran area)
    d. D_2 Ratio = 0.72 * 1.0 = 0.72
    e. $D_{85(McCarran)}$ = 0.32 for McCarran Area, per Section 1502.3
    f. $D_{85(site)}$ = 0.32 * D_2 Ratio = 0.32 * 1.0 = 0.32 inches

2. Calculate BMP Unit Discharge vs 85th Percentile for 90% average Impervious
    a. Q_p /A (90%) = 1.5042 * D_{85} – 0.0066 (equation per 1502.3)
    b. Q_p /A (90%) = 1.5042 * 0.32 – 0.0066
    c. Q_p /A (90%) = .47 cfs/ac

3. Calculate Adjusted Qp/A relative to 90% impervious
    a. Actual percent impervious is 95% (conservatively assumed)
    b. Qp/A (adj for 95% impervious) = Qp/A(90%) * Adj
    c. Qp/A (adj for 95% impervious) = Qp/A(90%) * (0.0059(0.95)) + 0.4688)
    d. Qp/A (95%) = 0.47 * (0.0059(0.95) + 0.4688)
    e. Qp/A (95%) = 0.22 cfs/acre

4. Calculate Adjusted BMP Design Discharge
    a. Qp = Qp/A(95%) * A
    b. Qp (1.1 acre site) = 0.22 cfs/ac * 1.1 acres = **0.25 cfs for entire site**
    c. Sub-areas are much smaller and are not calculated.

FIGURE 3 – Design BMP Runoff Calculations

REVISED GRADING PLAN
(ATTACHED)

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 059), C-2 (General Commercial) Zone, Ward 3 (Coffin) [PRJ-66971], 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 valid 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.

LAS VEGAS CITY COUNCIL
CAROLYN G. GOODMAN MAYOR
STEVEN G. FIORE MAYOR PRO TEM
LOIS TARKANIAN
FRANK X. GIORDANO
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

SDR-66870 [PRJ-66971] - Page Two
October 4, 2016

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 (702-229-4839).
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.

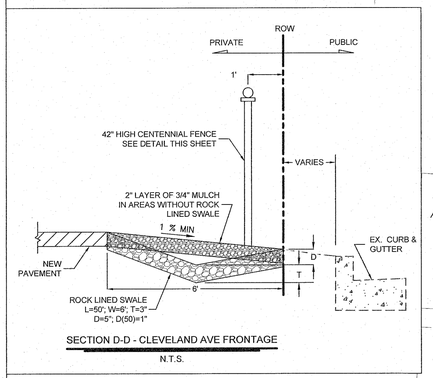
Sincerely,

Peter Lowenstein, AICP
Planning Section Manager
Current Planning

PL:ml

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

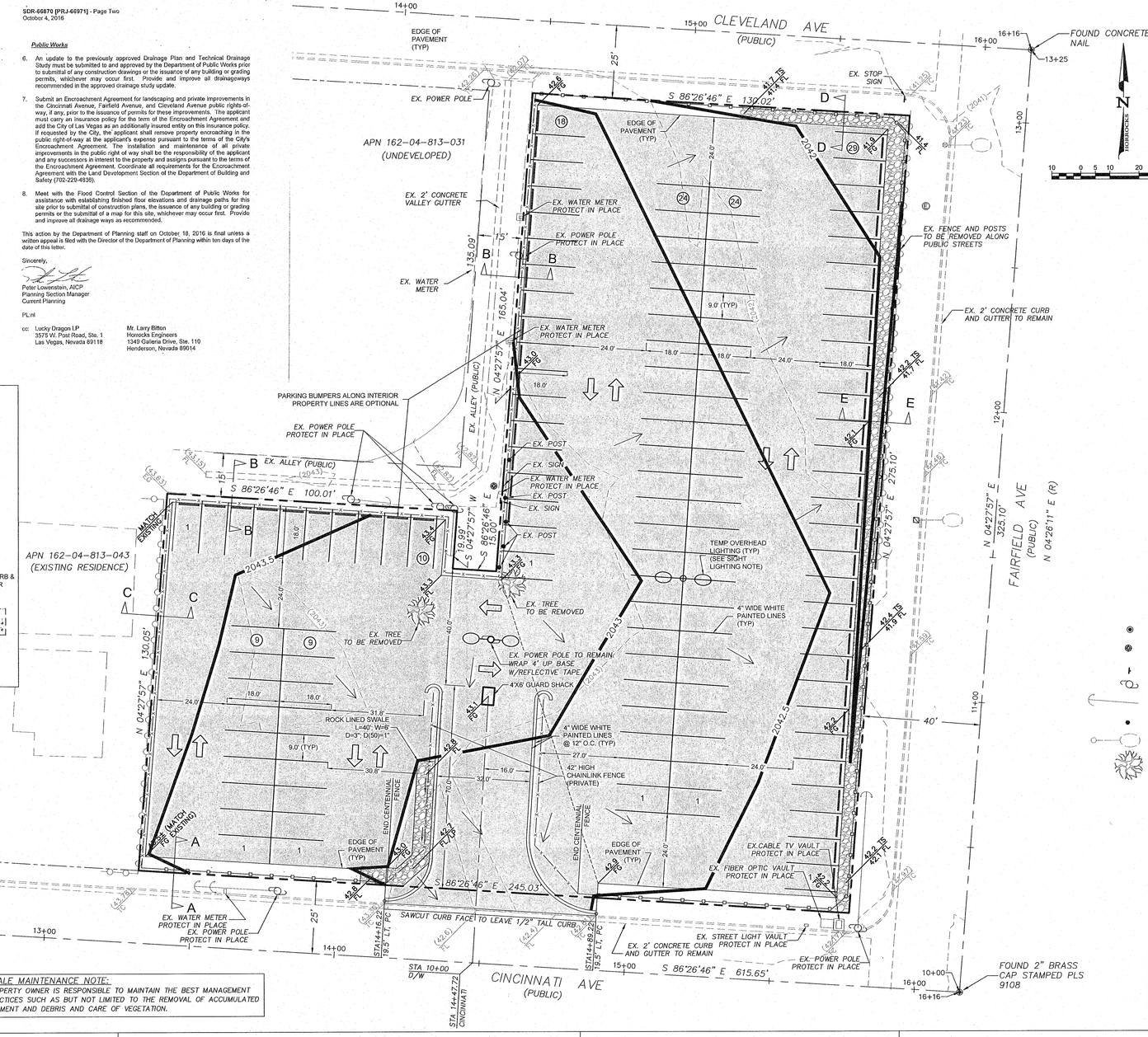
Mr. Larry Bitton
Horrocks Engineers
1349 Galleria Drive, Ste. 110
Henderson, Nevada 89014



SECTION D-D - CLEVELAND AVE FRONTAGE

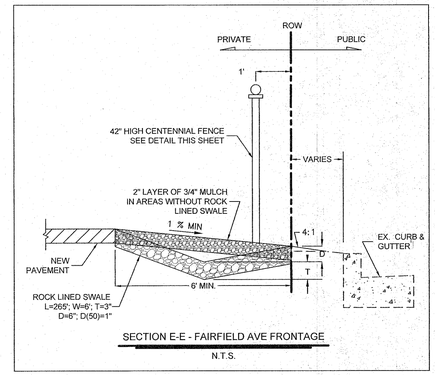
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VICINITY MAP



SECTION E-E - FAIRFIELD AVE FRONTAGE

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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

PROPERTY OWNER:
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5010 S. VALLEY VIEW BLVD.
LAS VEGAS, NEVADA 89118

DEVELOPER:
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THIS PROJECT IS LOCATED ON FEMA FIRM MAP NO. 32003C2170F, PANEL 2170F

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FLOOD CERTIFICATION

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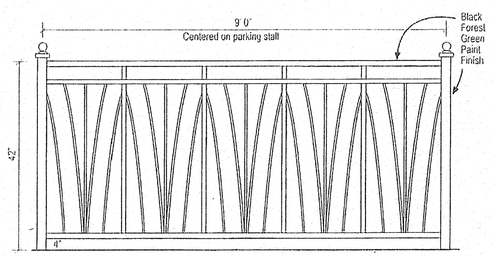
LARRY M. BITTON, P.E. 10159 — *12/19/16* DATE

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Call before you Dig — AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call 811 OR 1-800-227-2600

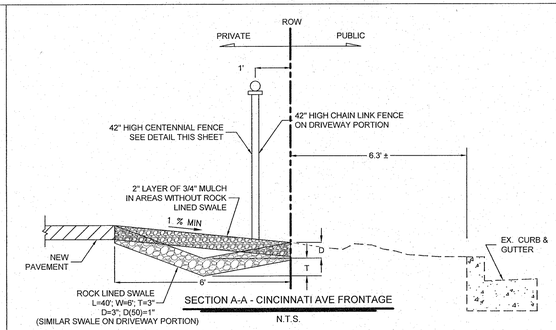
AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

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



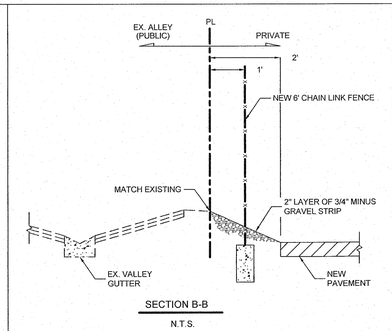
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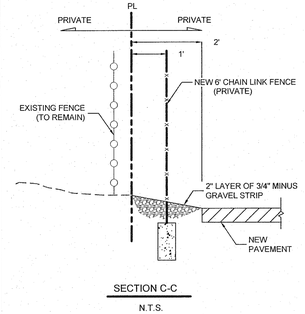
SECTION A-A - CINCINNATI AVE FRONTAGE

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SECTION B-B

N.T.S.



SECTION C-C

N.T.S.

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TOTAL PARKING SPACES = 123

PROFESSIONAL ENGINEER STATE OF NEVADA — LARRY M. BITTON — 12/19/16 — CIVIL — No.010159

REV	DATE	BY	DESCRIPTION
			REVISIONS

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

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]

PROJECT NO.
LV-844-1608

SHEET NO.
1 OF 1

FILE NAME:

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