

DS #:

5026

APN:

138.29.401.011

PROJECT:

Summerlin Resort Hotel & Casino

SUBMITTAL:

1st

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		August 27, 2018
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: Summerlin Resort Hotel & Casino – Update for Parking Garage Expansion		COPIES TO: TRU Engineering
Cross Streets:	SWC of Summerlin Parkway & Rampart Blvd.	Hotspur Resorts Nevada, Ltd.
File Number:	F:\Depot\DSMemos\DS5026A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	138-29-401-011	
Zoning Action:	CRG-xxxxx	
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES NO X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	8/14/2018	8/27/2018	See Comments Below	\$400.00	497971: \$400
			TOTAL FEES (LDDRS):	\$400.00	----

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public Works Department concurrence.

1. Provide a copy of the zoning/planning conditions associated with this site (**CRG-xxxxx**) with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.
2. Provide the following note on the grading plan: **"All Onsite Storm Drains and the associated facilities are Privately Owned and to be Privately Maintained by the Property Owner"**.

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: T20S/R60E/29
AREA L-29

TRANSACTION REPORT

AUG/27/2018/MON 05:08 PM

FAX (TX)

#	DATE	START T.	RECEIVER	COM.TIME	PAGE	TYPE/NOTE	FILE
001	AUG/27	05:07PM	7025450987	0:00:26	1	MEMORY OK	SG3 2036

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: August 27, 2018
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: Summerlin Resort Hotel & Casino - Update for Parking Garage Expansion		COPIES TO: TRU Engineering
Cross Streets:	SWC of Summerlin Parkway & Rampart Blvd.	Hotspur Resorts Nevada, Ltd.
File Number:	F:\Depot\DSMemos\DS5026A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	138-29-401-011	
Zoning Action:	CRG-xxxxx	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	8/14/2018	8/27/2018	See Comments Below	\$400.00	497971: \$400
TOTAL FEES (LDDRS):				\$400.00	----

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public Works Department concurrence.

1. Provide a copy of the zoning/planning conditions associated with this site (CRG-xxxxx) with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.
2. Provide the following note on the grading plan: **"All Onsite Storm Drains and the associated facilities are Privately Owned and to be Privately Maintained by the Property Owner"**.

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: T20S/R60E/29
AREA L-29

Paul F Fritz

From: Albert Sung <YSung@LasVegasNevada.GOV>
Sent: Tuesday, August 14, 2018 2:41 PM
To: Paul F Fritz
Subject: Rampart Garage

Paul,

The invoice is ready for pick up now. Please note that the review fee for this update is \$400 because you/your company are a different engineer from the original one.

Albert Y. Sung

Project Engineer
Public Works Dept. / Flood Control
(702) 229-6541
333 N. Rancho Dr. 7th Floor
Las Vegas, NV 89106



lasvegasnevada.gov

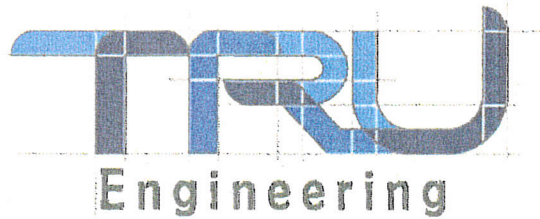


Your opinion is important! Click [here](#) to take a short survey.

LETTER OF TRANSMITTAL

DATE: August 14, 2018

TO: Albert Sung
FIRM: CLV Flood Control
ADDRESS: 333 N. Rancho Dr. - 7th Floor
Las Vegas, NV 89106



PROJECT NAME: Rampart Garage Expansion
PROJECT #: 18-003
REGARDING: TDS Submittal Fee

TRANSMITTED:	☒	Prints/Mylars/Vellums	☐	Proposal	☐	Studies	☐	CD's/Disks	☒	Other
VIA:	☒	Hand Delivery	☐	Pickup	☐	Air/ Overnight	☐	U.S. Mail	☐	E-Mail

COPIES	NUMBER OF SHEETS	DESCRIPTION (SHEET NAMES)	DATE
1	1	Check #17159 - \$400.00	8/15/18

☒	For Your Use	☐	Review	☐	Per Your Request	☐	Signature	☒	Approval	☐	For Your Records
-------------------------------------	--------------	--------------------------	--------	--------------------------	------------------	--------------------------	-----------	-------------------------------------	----------	--------------------------	------------------

THANK YOU,

FROM:

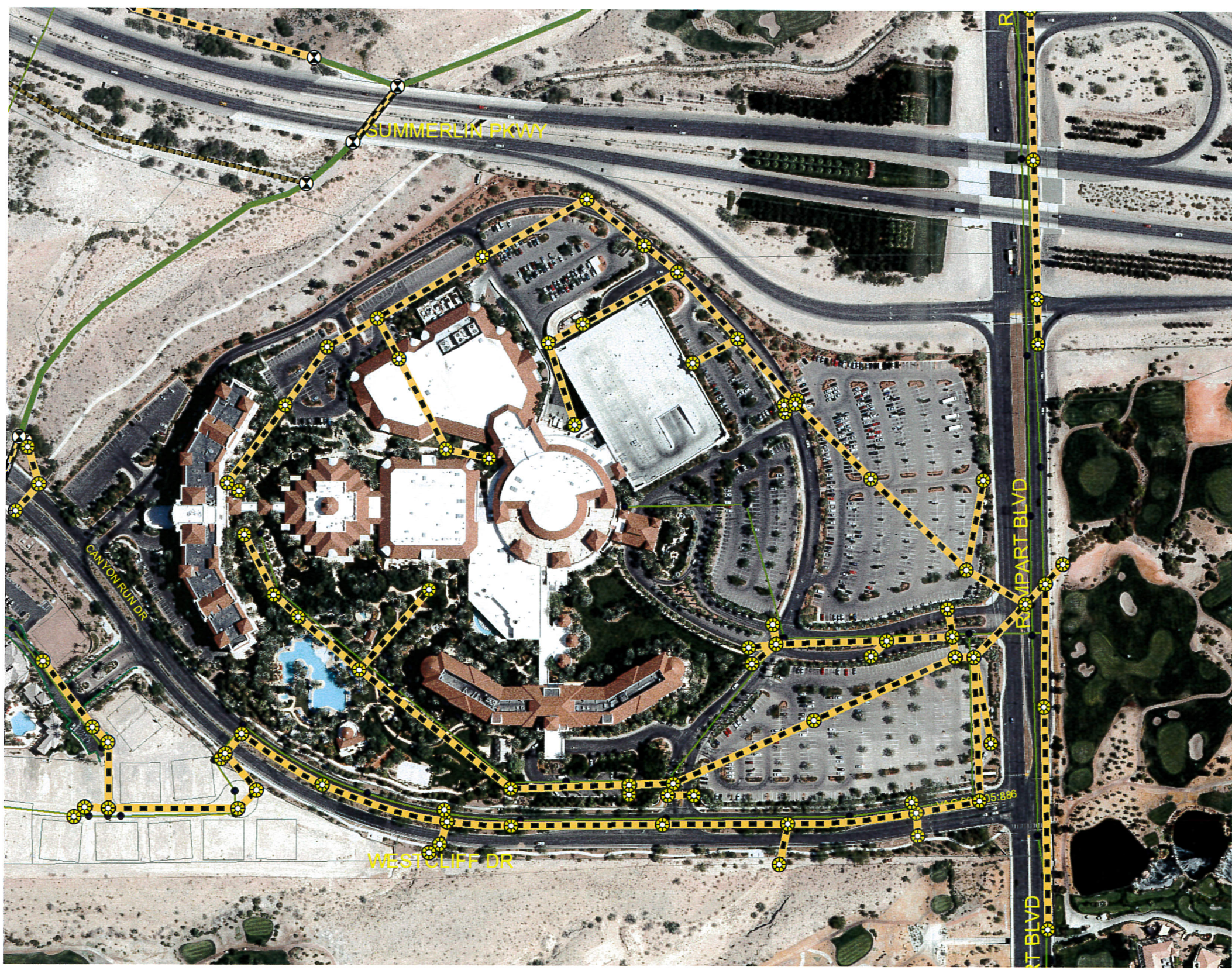
PAUL F FRITZ, P.E.

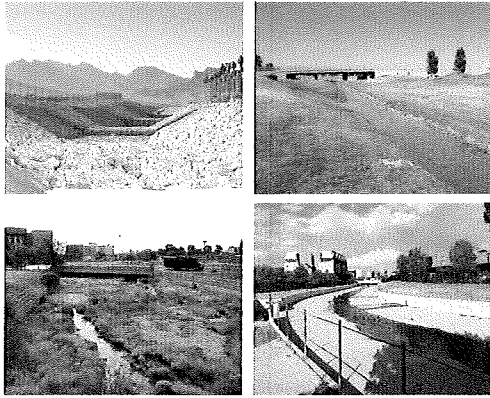
RECEIVED

DATE

CC:

X:\Projects\18-003\Civil\Admin\Transmittals\T1800815 CLV TDS Check Transmittal.docx





UPDATE #3 TO THE TECHNICAL DRAINAGE STUDY FOR SUMMERLIN RESORT HOTEL AND CASINO PARKING GARAGE EXPANSION

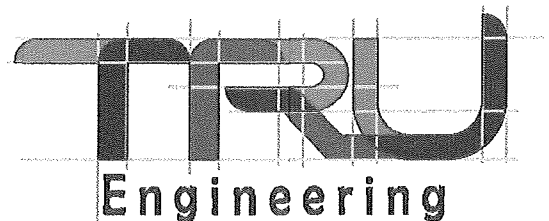
**TRU Engineering Project No. 018-002
Original CLV Project No. DS2080
August 2018**

Prepared By:

**TRU Engineering
9555 Hillwood Drive, STE 110
Las Vegas, Nevada 89134
Phone: (702) 545-0355
Fax: (702) 545-0987**

Prepared For:

**Hotspur Resorts Nevada, LTD.
221 N Rampart Blvd.
Las Vegas, NV 89145
Phone: (702) 205-6262**



August 14, 2018

Albert Y. Sung, PE
Flood Control Project Manager
City of Las Vegas – Land Development Services
333 N. Rancho Drive
Las Vegas, NV 89106

**SUBJECT: UPDATE #3 TO THE TECHNICAL DRAINAGE STUDY FOR THE SUMMERLIN HOTEL
RESORT AND CASINO
TRU Project No. 018-002
Original CLV Project No. DS2080**

Dear Mr. Sung:

Enclosed please find two (2) copies of Update #3 to the Technical Drainage Study for the Summerlin Resort and Casino Parking Garage Expansion (The Project) for your review, comment and approval. The proposed Project consists of the addition of an expansion of the existing parking garage on about 1.20 acres of developed land. The hotel property is located at the northwest corner of Rampart Blvd. and Canyon Run Drive, with the garage expansion located on the east edge of the property adjacent to Summerlin Parkway exit ramp.

We look forward to your acceptance of this report. If you have any questions or additional information is needed, please contact our office at 702-545-0355.

Respectfully,

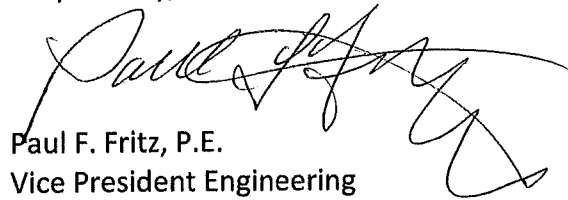

Paul F. Fritz, P.E.
Vice President Engineering
TRU Engineering

TABLE OF CONTENTS

STANDARD FORM 1

STANDARD FORM 2

STANDARD FORM 2 (CLV Supplement)

I.	INTRODUCTION	
	A. Study Overview And Purpose	1
	B. Site Description and Location	1
	C. Master Planning Information	2
	D. Floodplain Information	2
	E. Previous Drainage Study	2
II.	HYDROLOGIC PARAMETERS	2
	A. Precipitation	3
	B. Soil Classification	3
	C. Time of Concentration and Lag Time	4
III.	HYDROLOGY	5
	A. Existing Drainage Condition	5
	B. Developed Drainage Condition	7
IV.	HYDRAULIC ANALYSIS	8
	A. Peak Flows	8
	B. Flow Depth Analysis	9
	C. Entrance Requirements	10
	D. Drop Inlet Calculations	10
	E. Onsite Storm Drain Analysis	10
	F. On-Site Parking Lot Storm Water Treatment	10
V.	SUMMARY	11
	A. Conclusion	11
	B. References	11

APPENDICES

Appendix A – Figures

Appendix B – Hydrologic Parameters

Appendix C – Hydraulic Analysis

Appendix D – Reference Material

Appendix E –Grading Plans

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Rampart Parking Garage Expansion Date: 08/14/18

Location of Development: a) Descriptive (Cross Streets) North/South: Rampart Blvd

East/West: Summerlin Parkway

b) Section: 29 Township: 20S Range: 60E

c) APN: 138-29-401-011

Name of Owner: Hotspur Resorts Nevada, Ltd.

Telephone No.: 702-205-6262 Fax No.: _____ E-Mail Address: donavon.mckee@jwmarriottlv.com

Address: 221 N. Rampart Blvd., Las Vegas, NV 89145

Contact Person-Name: Paul F. Fritz Telephone No.: 702-570-5677

* E-Mail Address: pf@trudevco.com Fax No.: 702-545-0987

Firm: TRU Engineering

Address: 9555 Hillwood Dr. Ste 110, Las Vegas, NV 89134

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: 39.99 ac. Being Developed/Disturbed: 1.20 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

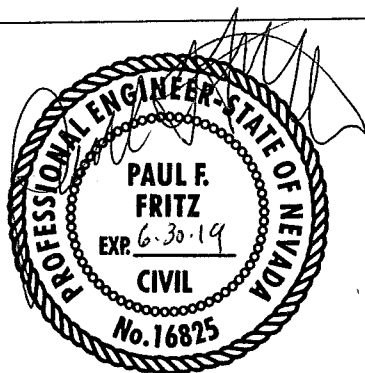
4. Proposed type of development (Residential, Commercial, Etc.): Commercial

5. Approximate upstream land area which drains to the subject site: 1.01 ac - Ex. Parking Structure

6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: TDS for Summerlin REsort Hotel and Caswino, Add #1, #2, Update #1, #2 - CLV Project No. 2080

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Proposed discharge points will match ex. discharge points which are the on-site storm drain facilities.

8. Briefly describe your proposed schedule for the subject project: ASAP - Construction to commence in October 2018.



Engineer's Seal

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

*New Required Field

****Review and concurrence of the Clark County Regional Flood Control District is required.**

	Revision	Date
Local Entity File No. _____		

REFERENCE:

STANDARD FORM 1

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL																										
DRAINAGE SUBMITTAL CHECKLIST																										
Project Name: Rampart Parking Garage Expansion	Map ID:																									
Firm Name: TRU Engineering	Engineer: Paul F. Fritz																									
Address: 9555 Hillwood Dr. Ste 110																										
City: Las Vegas	State: NV	Zip: 89134																								
Phone Number: 702-570-5677	Fax Number: 702-545-0987																									
Property Owner: Hotspat Resorts Nevada, Ltd.																										
Address: 221 N. Rampart Blvd.																										
City: Las Vegas,	State: NV	Zip: 89145																								
Reviewed By:	Date Received:	Date Accepted for Review:																								
The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL). This document is intended as an aid in preparing Technical Drainage Studies. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use. If items are not applicable for the subject site, provide N/A. I. GENERAL REQUIREMENT <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td style="width: 10%; text-align: center;">No</td> <td></td> </tr> <tr> <td style="text-align: center;"><u> X </u></td> <td style="text-align: center;"><u> </u></td> <td>Design Manual Standard Form 1 with the engineer's seal and signature.</td> </tr> <tr> <td style="text-align: center;"><u> X </u></td> <td style="text-align: center;"><u> </u></td> <td>Design Manual Standard Form 4.</td> </tr> <tr> <td style="text-align: center;"><u> X </u></td> <td style="text-align: center;"><u> </u></td> <td>2 copies of the 24" x 36" Drainage Plan.</td> </tr> <tr> <td style="text-align: center;"><u> </u></td> <td style="text-align: center;"><u> NA </u></td> <td>A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.</td> </tr> </table> II. MAPS AND EXHIBITS <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td style="width: 10%; text-align: center;">No</td> <td></td> </tr> <tr> <td style="text-align: center;"><u> X </u></td> <td style="text-align: center;"><u> </u></td> <td>A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.</td> </tr> <tr> <td style="text-align: center;"><u> X </u></td> <td style="text-align: center;"><u> </u></td> <td>A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.</td> </tr> </table>			Yes	No		<u> X </u>	<u> </u>	Design Manual Standard Form 1 with the engineer's seal and signature.	<u> X </u>	<u> </u>	Design Manual Standard Form 4 .	<u> X </u>	<u> </u>	2 copies of the 24" x 36" Drainage Plan.	<u> </u>	<u> NA </u>	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.	Yes	No		<u> X </u>	<u> </u>	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.	<u> X </u>	<u> </u>	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.
Yes	No																									
<u> X </u>	<u> </u>	Design Manual Standard Form 1 with the engineer's seal and signature.																								
<u> X </u>	<u> </u>	Design Manual Standard Form 4 .																								
<u> X </u>	<u> </u>	2 copies of the 24" x 36" Drainage Plan.																								
<u> </u>	<u> NA </u>	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.																								
Yes	No																									
<u> X </u>	<u> </u>	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.																								
<u> X </u>	<u> </u>	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.																								
REFERENCE:		STANDARD FORM 2																								

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
☐	☒ NA	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
☐	☒ NA	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.
☒ X	☐	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
☐	☒ NA	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required).

IV. HYDROLOGIC ANALYSIS

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
☐	NA	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
X	☐	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. $Q_{100} d \times v \leq 8$. $Q_{10} d \times v \leq 6$ and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
☐	NA	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.
☐	NA	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
☐	NA	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
X	☐	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, whichever is greater.
☐	NA	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
X	☐	Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
☐	NA	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
X	☐	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.
☐	NA	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE:

STANDARD FORM 2



CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

Project: Rampart Parking Garage Expansion

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	Call 229-6541 to set up an appointment to submit a new drainage study
	N/A	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.)
	X	Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions. CITY REFERRAL GROUP - AUG 17, 2018
X		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	
X		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
X		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
X		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.)

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

II. GRADING PLAN INFORMATION		
Yes	No	
X		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.
X		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.
X		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.
X		Back of lot elevations and lot drainage pattern for all lots including common lots.
	X	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. Noted - Approval will be obtained
X		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.)
	N/A	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.
	N/A	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	
X		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.
	N/A	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.
	N/A	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.
X		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.
	N/A	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.

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	N/A	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.
	N/A	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.

I. INTRODUCTION

A. Study Purpose and Overview

The purpose of this study is to provide detailed hydrologic and hydraulic analysis for a proposed parking garage expansion at the Summerlin Hotel Resort and Casino (also known as the J.W. Marriot Hotel and Casino or Rampart Casino) to obtain an approved study to allow development of the site. This update will address the existing and developed drainage conditions specific to the proposed project. The proposed project is about 1.32 acres in size and is located on a portion of Parcel 1 per File 115, Page 34 of Parcel Maps and is fully developed.

The ultimate conditions of this parcel were designed, and the existing conditions created through the development of the *Resort at Summerlin Improvement Plans CLV #107-V2830 and CLV approved TDS #DS2080 with updates*. These TDS studies and improvement plans established the conditions for this study by isolating the lot as a “stand alone” onsite only parcel as follows: The surrounding streets have been developed such that they do not impact the site, the existing garage works together with the adjacent, to-be-developed parking lot and existing storm drain laterals will be utilized in the same manner as currently provided along the northeast edge of the project to allow for the discharge of the entire project as previously approved.

The following tasks were performed in the preparation of this report:

- 1) Identified the Federal Emergency Management Agency (FEMA) Flood Plain designation for the project site
- 2) Identified known existing or planned Clark County Regional Flood Control District (CCRFCD) or local drainage facilities that affect or are affected by the site
- 3) Reviewed approved drainage studies for the surrounding sites and other projects near the site
- 4) Estimated runoff generated within and around the project site for the 10-year and 100-year, six-hour storm events, to provide recommendations for drainage facilities

B. Site Description and Location

The project site is within Section 29, Township 20 South, Range 60 East, in the city of Las Vegas, Nevada on a portion of APN 138-29-401-011. More specifically the site is located within the overall property on the southwest corner of Rampart Blvd. and Summerlin Pkwy. The site consists of a parking lot, sidewalk and landscape areas. The site slopes from the northwest to the southeast with various slopes ranging from 3 to 5 percent in the parking lot and 3:1 max in landscape. The site has an existing piped storm drainage system with a “B” type inlet in the parking lot for the existing garage overflow and the exterior parking lot. The site is bordered by existing drive aisles and the existing parking

garage. (See Figure 1 - Vicinity Map and Figure 2 – Site Map and Figure 7 Assessor's Parcel Map included in Appendix A.)

C. Master Planning Information

According to the Clark County Regional Flood Control District (CCRFCD) Figures F-25 of the 2013 Las Vegas Valley Flood Control Master Plan Update, the site is located east/southeast of the Angel Park – Middle Branch (APMB) and Angel Park Summerlin Parkway (APSP). (See Figures 3 & 4 in Appendix A). The site is not affected by these facilities nor does it contribute to the facilities.

D. Floodplain Information

According to the Federal Emergency Management Agency (FEMA) Community Panel FM32003C2145F, Clark County, Nevada and Incorporated Areas, revised November 16, 2011, the proposed site is located within Zone "X". Zone "X" is described as an area to be outside of the 500-year floodplain. (See Figure 6, FIRM Flood Insurance Rate Map, in Appendix A)

E. Previous Drainage Studies

The following approved drainage studies were reviewed in the preparation of this technical drainage study update.

1. DS 2080: Technical Drainage Study for Summerlin Resort Hotel and Casino – first approved July 31, 1997, prepared by Martin & Martin, Inc.
2. DS 3914: Technical Drainage Study and Updates for PMP 6436 (Hot Springs Resort) Update #1, approved January 6, 2006, prepared by Poggemeyer Design Group, Inc.
3. DS 3721: TDS Summerlin Resort & Hotel Casino Update #2- approved February 3, 2005, prepared by Carter Burgess

TRU Engineering has reviewed these studies and concurs with and accepts the analysis as presented in these approved drainage studies. (refer to specific cited sections of these studies in Appendix D)

II. HYDROLOGIC PARAMETERS

The SCS Unit Hydrograph Methodology in conjunction with the HEC-1 Flood Hydrograph Package, from the US Army Corps of Engineers, was used to determine the peak runoff generated by the 10-year and 100-year, 6-hour storm events. Parameters used in the HEC-1 analysis are described in the following paragraphs. (refer to HEC-1 output data in Appendix B)

A. Precipitation

The project site is located just outside of the McCarran Airport Rainfall Area. The 6-hour, 10-year and 100-year storm event rainfall depths were obtained from the Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual (CCRFCD HC&DDM). Since the drainage area for this project site encompasses less than eight (8) square miles, the Storm Distribution Number Three (SDN3) was utilized. (refer to Tables 503 in Appendix B)

The rainfall depth of 1.35-inches and 2.05-inches during the 10-year and 100-year 6-hour storm events, respectively, were calculated using Figures 503 and Figure 506 (included in Appendix B) of the CCRFCD HC&DDM.

The precipitation adjustment factors of 1.24 and 1.43 during the 10-year and 100-year storm events, respectively, are applied to the rainfall depth for the final precipitation values. These adjustment factors are obtained from Table 501 (included in Appendix B) of the CCRFCD HC&DDM.

The six-hour depth-area reduction factor of 1.00 during the 10-year and 100-year storm event has been applied to the rainfall depth for the final precipitation values since the drainage area for these basins are less than 0.5 square miles. These adjustment factors are obtained from Table 502 (included in Appendix B) of the CCRFCD HC&DDM.

The final precipitation values with adjustment factors are 1.67-inches and 2.93-inches during the 10-year and 100-year events respectively. The 10-year/100-year precipitation ratio for the HEC-1 analysis is 0.571.

B. Soil Classification

The proposed site is on fully developed land and consists of soil type 152 (Cave gravelly fine sandy loam, 0 to 4 percent slopes). As shown on the Soil Survey Map included in Appendix B, 100% of the site is within soil type 152 therefore, the CN value is calculated using a single soil type (refer to soil survey maps in Appendix B).

The Existing Condition CN value (92) was taken from Table 602, Sheet 1 of 4, with cover description of Open Space in good condition, CN=80, combined with Impervious Areas, CN=98, both in soil group D. The open space covers about 33% of the entire developed acres. This combined with the 67% impervious area yields a composite curve number for the existing condition of 92.06 or CN=92. The Developed Condition CN value (96) was taken from Table 602, Sheet 1 of 4, with cover description of Open Space in good condition, CN=80, combined with Impervious Areas, CN=98, both in soil group D. The open space covers about 10% of the entire 1.32 developed acres. This combined with the 80% impervious area yields a composite curve number for the developed condition of 96.20 or CN=96. (See composite curve number calculations in Appendix B).

C. Time of Concentration and Lag Time

Time of Concentration calculations were performed per section 602 of the HCDDM for basins less than one square mile. The methodology was developed by the Federal Aviation Administration (FAA1970) and is outlined as follows:

$$t_c = t_i + t_t$$

TLAG = $0.60t_c / 60$ (hr) – Lag time used in HEC1 model

In which t_c = Time of Concentration (min)
 t_i = Initial, Inlet, or Overland Flow Time (min)
 t_t = Travel Time in the Ditch, Gutter, Storm Sewer, etc.(min)

The initial overland flow time is calculated as follows:

$$t_i = 1.8(1.1-K)L_o^{1/2}/S^{1/3}$$

Where K = flow resistance factor
 L_o = overland flow length
 L = length of channel (etc.)
 S = average slope of basin (%)

For SCS & TR55 unit hydrographic Methods

$$K = 0.0132(CN) - 0.39$$

Where: CN = SCS runoff curve number
 $t_t = L/60V$ (min)
 V = average channel velocity (ft/sec)

Velocity determination for time of concentration

At the upstream end of a drainage area, the initial overland flows begin to collect and gradually increase from small, shallow flows to larger, deeper flows with greater velocities. To estimate the average velocity for flow condition that constantly varies throughout the length of drainage area, two generalized relationships can be used. Velocity V_1 applies to the small shallow flows in the first 500 feet or less of travel distance and velocity V_2 applies to the remainder of the travel distance where the velocity is greater. Manning's equation was used to derive formulas for estimating the two travel time velocities. The equations are as follows:

$$V = CS^{1/2} \quad C = 1.49/n R^{2/3} \quad R = A/P$$

Where: V = Average Velocity (fps)
S = Average Slope (ft/ft)
N = Manning's Roughness Coefficient
R = Hydraulic Radius (ft)
P = Wetted Perimeter (ft)
A = Area of Flow (sq. ft.)

Two sets of coefficients were determined, one for developed conditions and the other for undeveloped conditions. For the first developed-conditions velocity (V1), the appropriate coefficient (C=20.2) represents street flow with $n = 0.016$ and a depth of flow in the gutter of 0.3 feet. For the second developed-conditions velocity (V2), the appropriate coefficient (C=30.6) represents curb height street flow. As may be noted, V2 is approximately equal to 1.5 times V1. Typically, drainage areas are delineated such that the channelized flow considered in the calculations of travel times is within streets and other minor watercourses and does not include significant lengths of major improvement floodway and channels in the travel distance for the time of concentration. For the first undeveloped conditions velocity (V1), the appropriate coefficient (C = 14.8) represents wide channel flow with $D = 0.25'$ and $n = 0.04$. For the second undeveloped conditions velocity (V2), the appropriate coefficient (C = 29.4) represents wide channel flow with a depth of 0.7 feet and $n = 0.04$.

For urbanized basins, the time of concentration should not exceed the time of concentration calculated by the following equation.

$$t_c = L / 180 + 10$$

Where: L = Watershed Length (ft)

Additionally, the minimum t_c for urbanized areas is 5 minutes.

These methods are consistent with the methods outlined in Technical Release 55, SCS (TR55) for calculating the time of concentration and should provide times of concentration and lag times that are consistent with one another and with the degree of accuracy of typical hydrologic modeling.

The Standard Form 4s for Existing and Developed conditions are included in Appendix B.

III. HYDROLOGY

A. Existing Drainage Condition

The following description refers to Figure 8, Appendix A, "Existing Conditions Basin Map Ground Level."

As briefly discussed earlier, the existing conditions for this parcel were established using the flown topography, GIS topography, site visits and previously approved drainage studies to determine the areas impacting the site. (See reference material Appendix D) The project site is completely contained within the parcel boundaries and no public offsite flow impacts the site. The site is an existing outdoor valet parking lot located to the east of an existing 4-story parking structure. The overall watershed of the existing area is about 1.099 acres.

The existing basins are labeled ONX1-ONX4 and OFFX1 which represent the approximate limits of the proposed development disturbance. ONX1 represents the majority of the existing condition flow and slopes to the east at about 4.5% then collects in an “L” curb and gutter and discharges at the east corner of the parking lot into an existing Type “B” drop inlet at CON1. The Type “B” inlet is connected via an 18-inch RCP to the back of an existing Type “C” drop inlet in the perimeter drive at CON2. ONX1 contains AC paving and two areas of landscaping. It is also the discharge basin for the overflow drains from the existing garage to the west. ONX2 and ONX4 are mostly landscape areas but include the existing driveway entrances to the parking lot. Both of these basins discharge to the adjacent perimeter drive aisles of the overall parcel. ONX2 eventually discharges to the Type “C” drop inlet at the east corner of the proposed project at CON2. ONX4 flow combines with the perimeter drive to the south and discharges to a driveway valley gutter and then to the south away from the parking lot. ONX3 is the perimeter landscape area which discharges to the east perimeter drive and then combines at CON2. The east perimeter drive adjacent to the parking lot is labeled OFFX1. Two (2) drop inlets pick up flow both before and after the basin limits which isolates the perimeter road basin to the area to the immediate east of the parking lot. The east corner of the parking lot and the intersection of the two perimeter roads serves as the historical discharge point for the existing project limits.

As determined from site visits and existing as-built plans, the roof level drains of the existing parking garage are the only source of flow to the west of the existing parking lot. The flows are contained within a piped storm drain system within the existing parking garage structure. This piped system discharges underground to the east of the garage at five locations and then combined into an 18-inch RCP under the valet parking lot, which connects to a stormdrain manhole in the parcel’s main stormdrain system in the east perimeter road. The overflow drains for the existing parking garage discharge at grade in five locations into the landscape area along the east edge of the garage. (See reference material Appendix D.)

The drive aisle to the north of the site is the drive to the entrance to the existing garage. The drive aisle slopes to the north away from the site and collects in an “L” curb and gutter. It then into a driveway valley gutter and into a drop inlet on the north corner of the site in the perimeter road. The drive aisle to the south of the site slopes at about 6% and discharges flows to the east into an 8-foot wide driveway valley gutter and then flows to the south away from the site.

The basin area and flow rates during the 10-year and 100-year storm events, respectively, in the existing drainage condition, are included in Table 1 below.

B. Developed Drainage Condition

(The following description refers to Figure 9, Developed Basin Map Roof Deck Level and the Grading Plan sheet C4.01.)

The developed condition analysis was created to quantify the ultimate onsite basins and combine them with the accepted approved flows in the surrounding areas to determine the overall drainage effect of the proposed development on the subject site. As shown on Figure 9, included in Appendix A, the proposed development is comprised of basins OND1 thru OND8 and perimeter road basin OFFD1. The garage entry road to the north and the perimeter road to the south are areas outside of the subject site which do not contribute to the flow of the overall onsite watershed area and do not affect the ultimate discharge point. The proposed site is a 4-story parking garage which will encompass about 90% of the entire site and will connect to the existing 4-story parking structure to the west. The overall watershed of the proposed disturbed area is about 1.132 acres and is comprised of four (4) parts: the ground level of the garage, the upper/roof level of the garage, the existing roof drain system of the west garage and the proposed roof drain system of the new garage.

The proposed ground level of the proposed garage has been graded to closely mirror the existing valet parking lot and follow the historical drainage pattern of west to east at about 4.5%. (See sheet C4.01 – Grading Plan Appendix E). This ultimately discharges at east corner of the garage at CON1 and then pipes to CON2 which is the project's ultimate discharge point. The purpose of this was three-fold: first, perpetuate the historical drainage pattern for the overflow drains of the existing garage, provide enough cover over the proposed structural footings of the new garage and minimize the import/export for the site. At the east corner of the site the existing Type "B" drop inlet occupied the same location as a key proposed column and footing of the new parking structure. The inlet has been removed and a comparable catch basin in sump is provided. The specified inlet was designed to collect the same flow as the existing drop inlet. (See Appendix C for inlet calcs.)

The upper/roof level of the proposed garage is shown in Figure 9. It is comprised of basins OND1-OND4. These four (4) basins will surface flow and discharge in a roof drain piped system. (See sheets P1.01 and P1.04 reference material Appendix D.) OND5 is a ground level basin open to above which is an AC paved surface. OND5 discharges to a valley gutter inside the proposed ground level of the garage. (See Grading Plan Appendix E) OND6 is a landscape area discharging to the south perimeter road and flows south of the project. OND7 is also a landscaped area discharging to the east perimeter road OFFD1 and combine at the east corner of the project at CON2. OND8 is a landscape

area which discharges to the north and combines with entry road to the garage and discharges to the drop inlet at the north corner of the site.

In order to avoid conflicts with the new proposed footings and columns, the existing west garage piped roof drain system will be intercepted and rerouted through the new garage and connect to the historical piped system at the east edge of the new garage. (See plumbing plans sheet P1.01 reference material Appendix D.) It has been recommended to the owner to remove the existing stormdrain system under the new garage, abandon in place with slurry filled pipes or to crush in place.

The proposed garage upper/roof level will collect the flows from OND1-OND4 in roof drains as shown on P1.04 and Figure 9 and discharge to a piped system that runs along the ceiling of the ground level. The pipe will drop down a column at the south end of the garage and continue underground to connect to the 36"x36" catch basin at the east corner of the garage at CON1, mirroring the historical flow discharge point. (See reference material P1.01 in Appendix D.) The removed 18-inch RCP connecting the Type "B" inlet to the perimeter drive inlet will be replaced with a new 18-inch RCP which will connect the 36"x36" catch basin to the existing drop inlet.

A 100-year depth-of-flow FlowMaster section was created for east corner of the site. The section was taken where the flow would most likely have an effect on the garage ground level.

The basin areas and flow rates during the 10-year and 100-year storm events, respectively, in the developed drainage condition, are included in Table 1.

IV. HYDRAULIC ANALYSIS

A. Peak Flows

The following Table 1 shows a summary of the runoff generated by each basin determined from the HEC-1 models and prorated by area. The HEC-1 analyses in the existing and developed conditions are included in Appendix B.

Table 1
Peak Flow Summary

Basin	Area (ac)	10-year Flow (cfs)	100-year Flow (cfs)
Existing Condition (FIGURE 8)			
ONX1	0.7094	0.998	2.493
ONX2	0.1661	0.234	0.584
ONX3	0.1131	0.159	0.398
ONX4	0.1107	0.156	0.389

OFX1	0.3230	0.454	1.135
	1.4223 ac		
CON1		1	2
CON2		2	5
Developed Condition (FIGURE 9)			
OND1	0.1221	0.258	0.430
OND2	0.1055	0.223	0.372
OND3	0.3367	0.712	1.187
OND4	0.2713	0.574	0.956
OND5	0.0984	0.208	0.347
OND6	0.0773	0.164	0.272
OND7	0.0976	0.206	0.344
OND8	0.0236	0.050	0.083
OFD1	0.2858	0.604	1.008
	1.4183 ac		
CON1	-	2	4
CON2	-	3	5

B. Flow Depth Analysis

The Flow Master v5.15 computer program was utilized to determine the maximum velocity and depth for the onsite section. The following Table 2 summarizes the flow depth analysis for the 100-year storm events for the hydraulic section shown on Figure 9. A copy of the flow depth calculations is included in Appendix C.

Table 2
Flow Depth Analysis

Hydraulic Section	Section Width (ft)	Flow 100-year (cfs)	Slope (%)	Depth 100-year (ft)	Velocity 100-year (ft/s)	D x V 100-year
FM1	48.4	1.00	2.50	0.19	2.59	0.49

Please note that the flow values in the referenced developed condition are utilized for the worst-case flow depth analysis at CON2.

Section FM1 indicates that the flow from the east perimeter drive will be contained within the street with the required freeboard (see Appendix C.) The lowest finished floor elevation of the garage falls at the east corner of the site where FM1 was taken and is about 4.77 feet above the TC elevation at the existing drop inlet in the east perimeter drive.

C. Entrance Requirements

The project proposes to use the existing garage entrance for the new parking garage and no direct access to the structure are proposed.

D. Drop Inlet and Catch Basin Calculations

One (1) existing Type “B” drop inlet and associated 18-inch RCP is set to be demolished and being replaced with a 36”x36” precast grated catch basin inlet structure. As discussed earlier a key column and footing need to be placed where the existing and pipe are currently located. The proposed 36”x36” was designed to capture the same or greater flow than the existing Type “B” inlet. The catch basin will accept flows from proposed garage roof drains via underground pipe system shown on the plumbing plans and the flow from the existing garage overflow drains via surface flow. The catch basin will discharge to an 18-inch RCP storm drain pipe at 5% slope to match the existing StormCAD model system designed for the overall site in the approved master study. A 50% clogging factor was applied to both using the built-in clogging factor. The resulting inlet intercepted flows are shown in Appendix C.

E. Onsite Storm Drain Analysis

The existing onsite storm drain system will remain in place per the previously approved studies with the exception of the storm drain system serving the existing garage. This system is not discussed or modeled in the previous StormCAD analysis or studies. Since the pipe is being run inside the proposed garage structure the plumbing engineer has rerouted the storm drains from the existing garage through the new garage and ties into the existing 18-inch RCP system at the east edge of the new garage.

The proposed 18-inch RCP storm drain pipe connecting the two inlets at the historical concentration point of the site at the east corner is replacing an existing reach length, inverts and slope in-kind and is therefore not considered a change to the existing system.

F. Onsite Parking Lot Storm Water Treatment

Per section 1502.2 of the CCRFCD manual, parking lot designs must be submitted to local entities with the TDS. Basins OND1-OND5 represent the parking lot with a total area of 0.934 acres which is less than the one (1) acre required for treatment.

V. SUMMARY

A. Conclusion

As detailed in this study, the Rampart Parking Garage Expansion development is in compliance with the CCRFCD HC&DDM. Runoff from the project site will continue to flow in accordance with the natural historical drainage patterns. Water surface elevations within the existing/designed adjacent streets will not impact the project site or negatively impact adjacent or downstream properties.

- The onsite grading has been designed to mimic the historical drainage patterns and conform to the approved master study for this property
- The existing onsite storm drain system is of sufficient size to accept the discharge from the proposed development.
- The parking structure ground finished floor elevation has been established for the proposed building.
- The existing garage and proposed garage roof drain systems have been designed to perpetuate the existing historical flows.

B. References

Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual, Adopted August 1999, WRC Engineering (updated by Montgomery Watson).
Revised September 12, 2013

Clark County Regional Flood Control District Website, <http://www.ccrfcd.org>

2013 Clark County Regional Flood Control District Flood Control Master Plan Update, PBS&J, G.C. Wallace and Louis Berger Group.

HEC-1 Flood Hydrograph Package Version 4.1, June 1998, U.S. Army Corps of Engineers.

Flood Insurance Rate Map Number 32003C2145F, dated November 16, 2011, Federal Emergency Management Agency

Federal Emergency Management Agency Website,
https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=firnetteHelp_A&title=FIRMettes

Web soil survey website,
<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

DS 2080: Technical Drainage Study for Summerlin Resort Hotel and Casino – first approved July 31, 1997, prepared by Martin & Martin, Inc.

DS 3914: Technical Drainage Study and Updates for PMP 6436 (Hot Springs Resort) Update #1, approved January 6, 2006, prepared by Poggemeyer Design Group, Inc.

DS 3721: TDS Summerlin Resort & Hotel Casino Update #2- approved February 3, 2005, prepared by Carter Burgess

TABLE OF APPENDICES

APPENDIX A (Figures)

- Figure 1 - Vicinity Map
- Figure 2 - Site Map
- Figure 3 - F-25 Flood Control Facilities CCRFCD 2013
- Figure 4 - F-25 Facility Inventory - CCRFCD 2013
- Figure 5 - H-25 Hydrologic Summary MPU 2008
- Figure 6 - FIRM Flood Insurance Rate Map FM32003C2145F
- Figure 7 - Assessors Maps
- Figure 8 - Existing Condition Drainage Basin Map
- Figure 9 - Developed Condition Drainage Basin Map

APPENDIX B (Hydrologic Parameters)

- Rainfall Calculation
- Rainfall Depth-Duration-Frequency Values 10-Year, 6-Hour (Figure 503)
- Rainfall Depth-Duration-Frequency Values 100-Year, 6-Hour (Figure 506)
- Precipitation Adjustment Ratios (Table 501)
- Six-Hour Depth Area Reduction Factors (Table 502)
- Six-Hour Storm Distributions (Table 503)
- Curve Number Calculations and Summary
- Runoff Curve Numbers – Urban Area (Table 602 Sheet 1 of 4)
- Soil Survey Maps
- Standard Form 4 (Existing and Developed Conditions)
- HEC-1 Analysis (Existing and Developed Conditions)

APPENDIX C
(Hydraulic Analysis)

- Flow Depth Analysis section FM1
- Drop Inlet & Catch Basin Capacity Calculations

APPENDIX D
(Reference Material)

- Reference Material 1
 - Approval Letters
 - Plumbing Plans P1.01 & P1.04
 - StormCAD Analysis Output
 - Improv Plans #107-V2830 Utility plans C4.04, C4.05 & C4.02
 - Improv Plans #107-V2830 Utility plans C3.04, C3.05 & C3.02

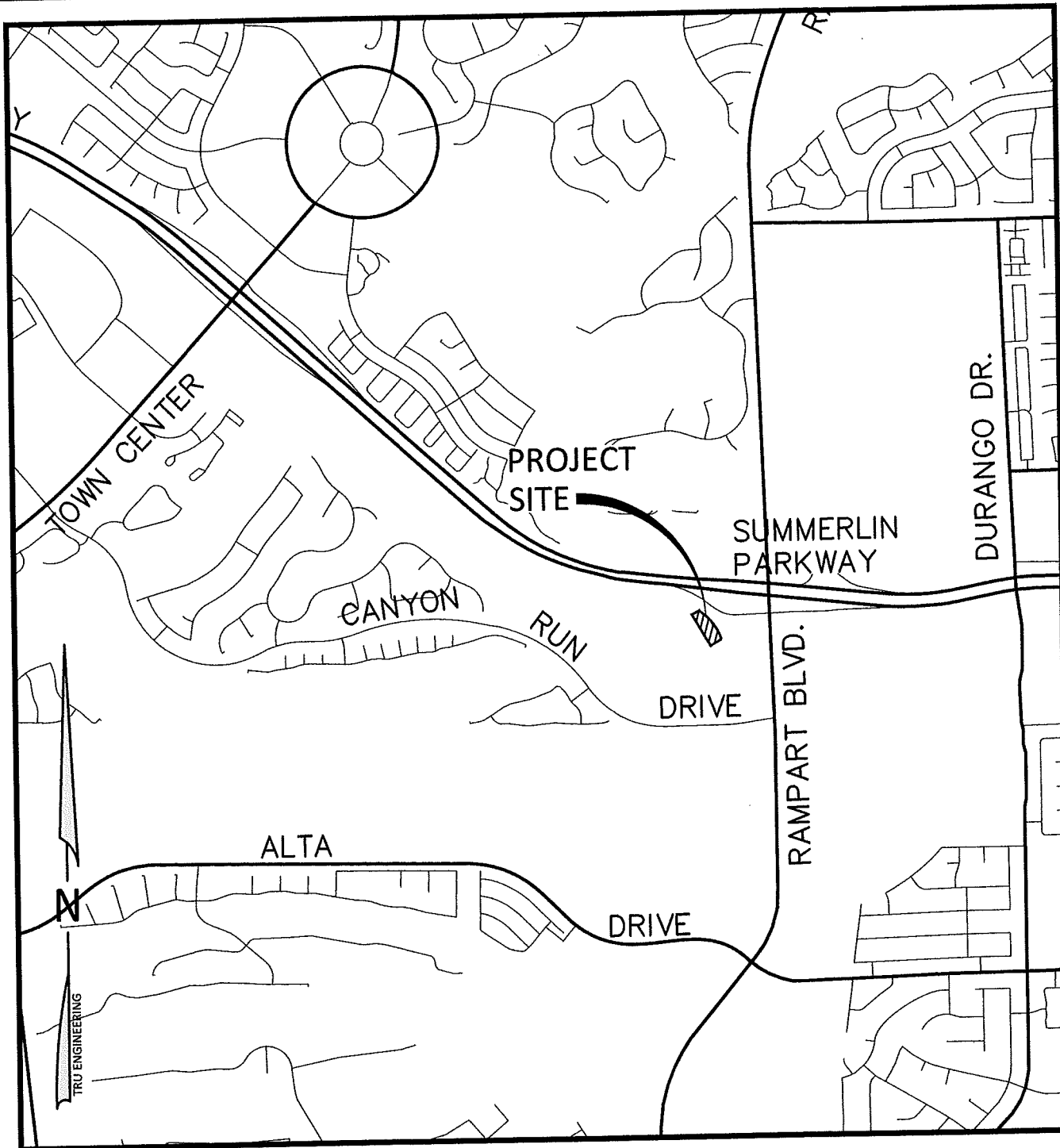
APPENDIX E
(Plans)

- Grading Plans

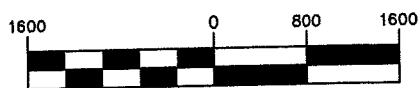
APPENDIX A

(Figures)

- Figure 1 - Vicinity Map
- Figure 2 - Site Map
- Figure 3 - F-29 Flood Control Facilities CCRFCD 2013
- Figure 4 - F-29 Facility Inventory - CCRFCD 2013
- Figure 5 - H-29 Hydrologic Summary MPU 2008
- Figure 6 - FIRM Flood Insurance Rate Map FM32003C2150E
- Figure 7 - Assessors Map
- Figure 8 - Existing Condition Drainage Basin Map
- Figure 9 - Developed Condition Drainage Basin Map



GRAPHIC SCALE

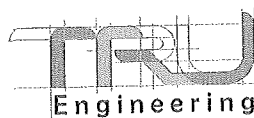


(IN FEET)

1 inch = 1600 ft.

RAMPART PARKING GARAGE EXPANSION

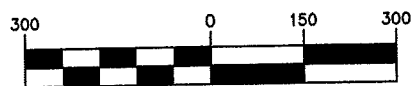
FIGURE 1 VICINITY MAP



9555 HILLWOOD DRIVE, STE.110
LAS VEGAS, NV 89134
T: 702.545.0355
F: 702.545.0987
TRUDevCo.com



GRAPHIC SCALE

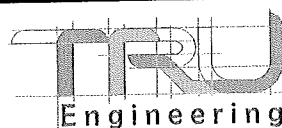


(IN FEET)

1 inch = 300 ft.

RAMPART PARKING GARAGE EXPANSION

FIGURE 2 SITE MAP



9555 HILLWOOD DRIVE, STE.110
LAS VEGAS, NV 89134
T: 702.545.0355
F: 702.545.0987
TRUDevCo.com

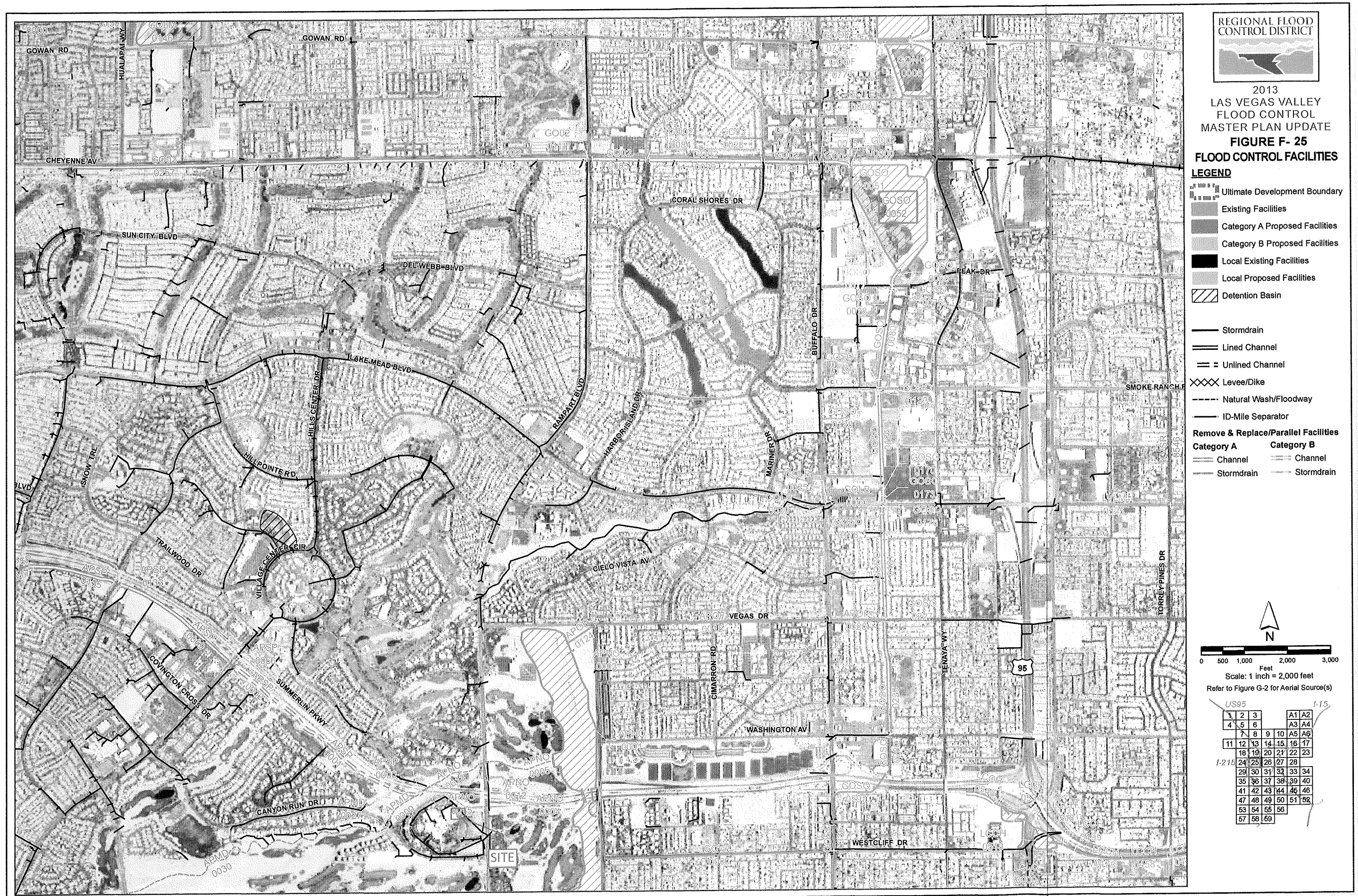
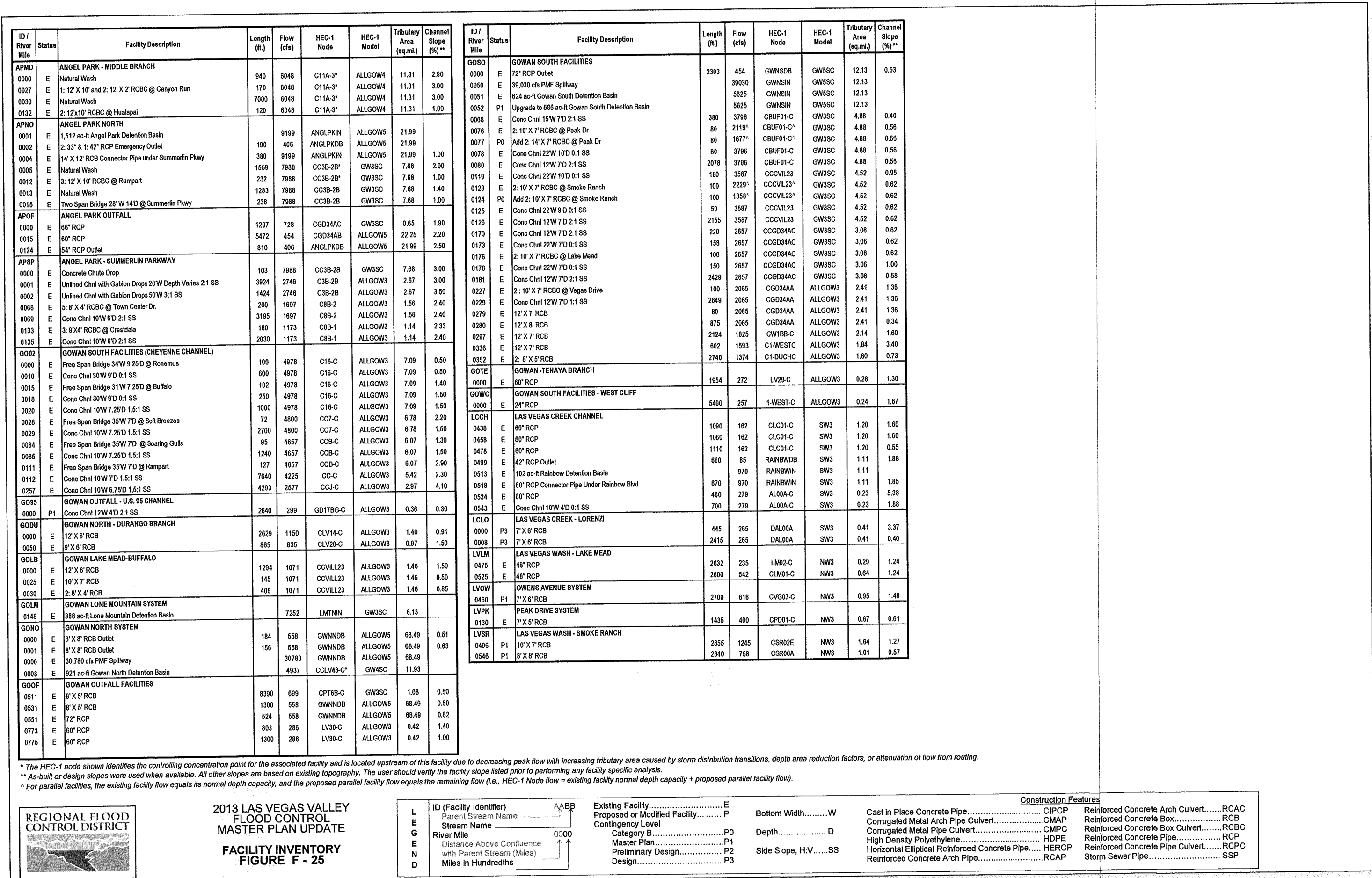


FIGURE 3



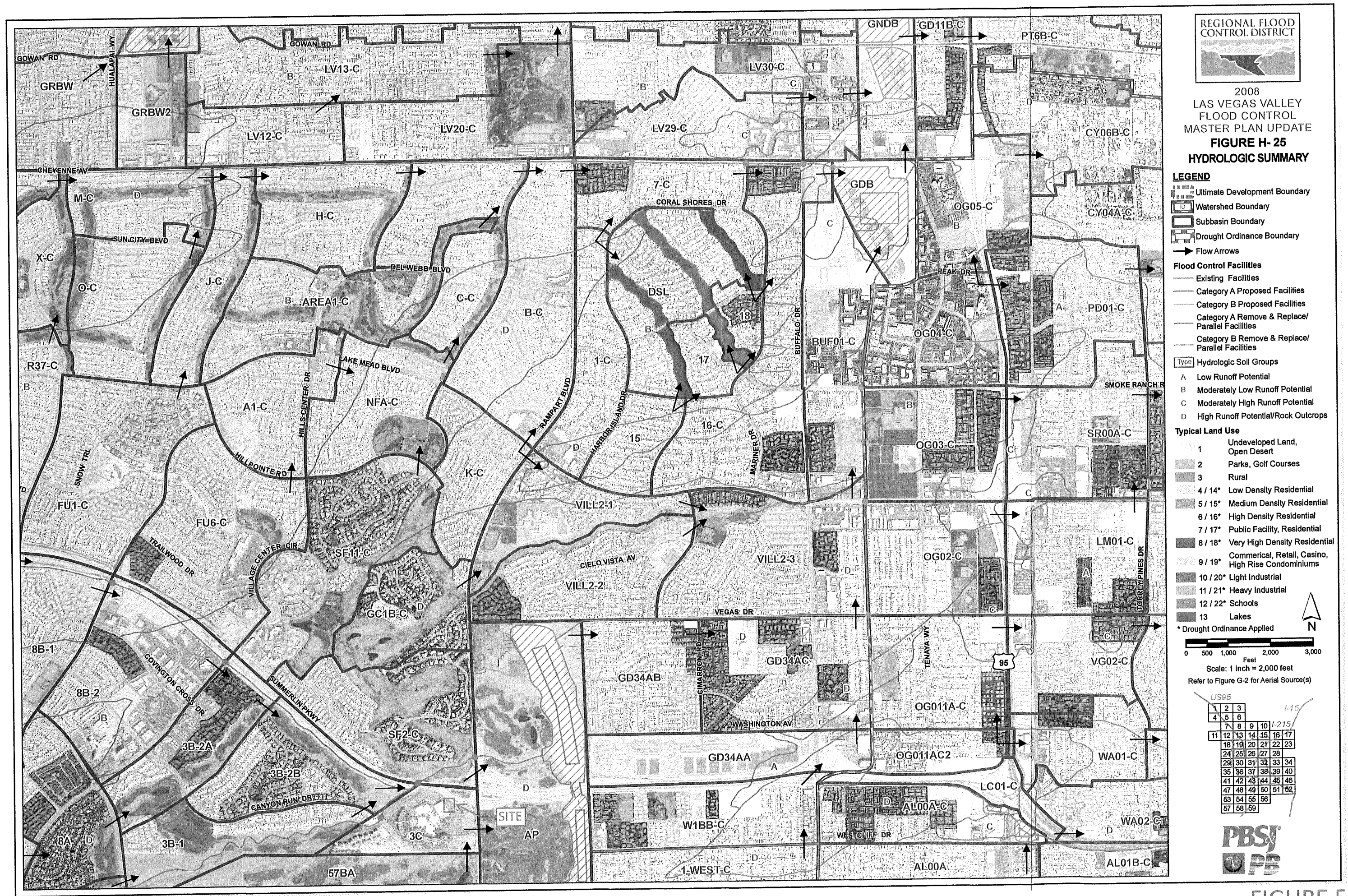


FIGURE 5

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2145F

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA

AND INCORPORATED AREAS

PANEL 2145 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2145	F
LAS VEGAS, CITY OF	325276	2145	F

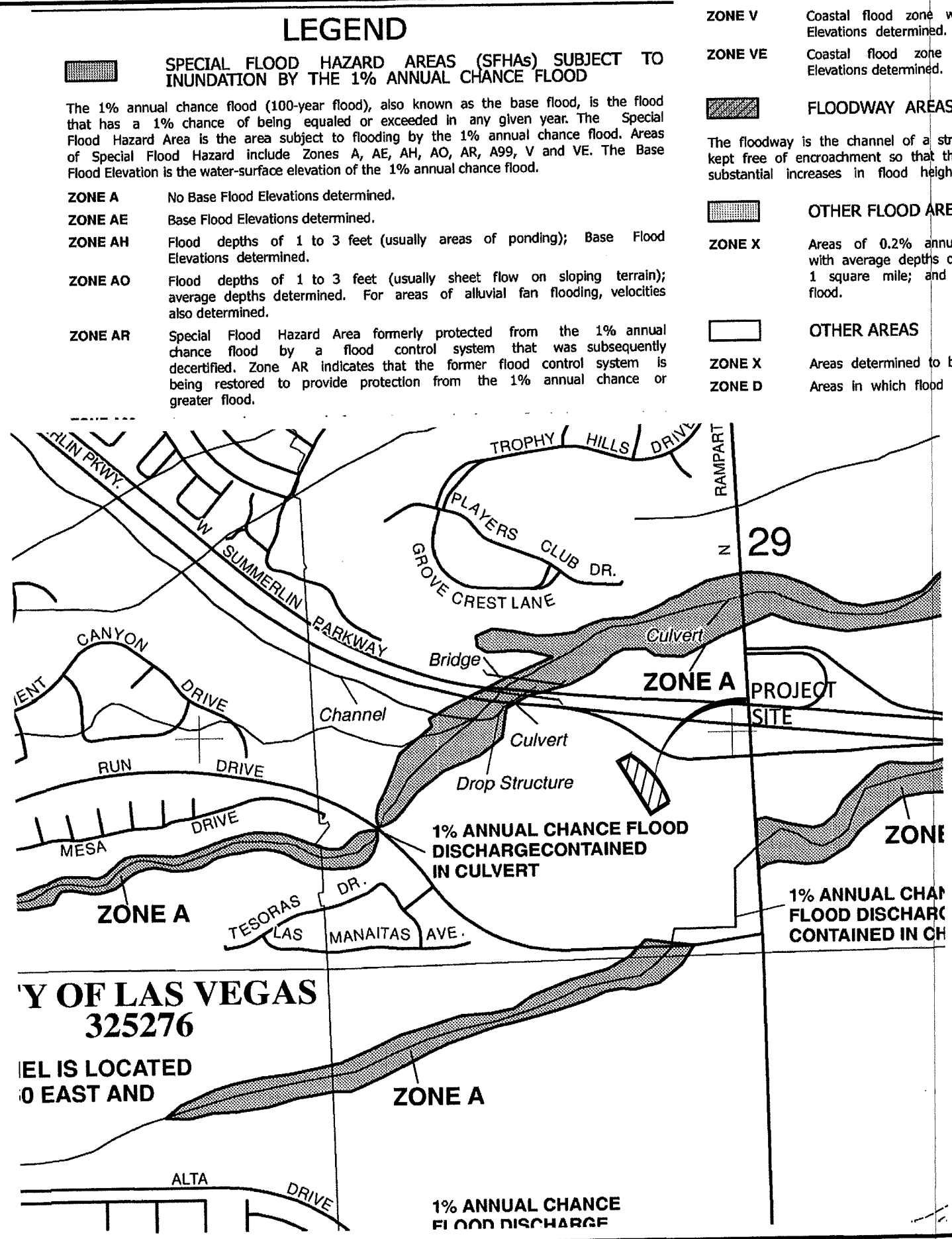
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
32003C2145F

MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency



CITY OF LAS VEGAS
325276

PROJECT IS LOCATED
ON EAST AND

RAMPART PARKING
GARAGE EXPANSION

FIGURE 6
FIRM MAP

9555 HILLWOOD DRIVE, STE. 110
LAS VEGAS, NV 89134
T: 702.545.0355
F: 702.545.0987
TRUDevCo.com

NOTES

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

No liability is assumed for the accuracy of the data delineated 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.

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

ASSESSOR'S PARCELS - CLARK CO., NV.

Michele W. Shafe - Assessor

BOOK

T20S R60E

SEC

29

MAP

S 2 SW 4

138-29-4



001 ROAD PARCEL NUMBER

001 PARCEL NUMBER

1.00 ACREAGE

202 PARCEL SUB/SEQ NUMBER

PB 24-45 PLAT RECORDING NUMBER

5 BLOCK NUMBER

5 LOT NUMBER

GL5 GOV. LOT NUMBER

127 128 125 124

136 137 138 139

165 164 163 162

174 175 176 177

6 5 4 3 2 1

7 8 9 10 11 12

13 14 15 16 17 18

19 20 21 22 23 24

25 26 27 28 29 30

31 32 33 34 35 36

8 4 8 4

5 1 5 1

6 2 6 2

7 3 7 3

8 4 8 4

5 1 5 1

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

0 100 200 400 600 800

Scale: 1" = 200'

Rev: 02/09/2011

The map displays several parcels and their boundaries. Key features include:

- Parcel 401:** A large central parcel with a hatched area labeled "SITE". It is bounded by "SUMMERLIN VILLAGE 3 UNIT NO. 1B" to the north and "WESTCLIFF DR" to the south.
- Parcel 412:** Located to the west of Parcel 401, it is part of "SUMMERLIN VILLAGE 3 UNIT NO. 1B".
- Parcel 413:** Located south of Parcel 412, it is part of "MIRA VILLAS CONDOMINIUMS".
- Parcel 414:** Located south of Parcel 413, it is also part of "MIRA VILLAS CONDOMINIUMS".
- Parcel 415:** Located south of Parcel 414, it is part of "MIRA VILLAS CONDOMINIUMS".
- Parcel 416:** Located south of Parcel 415, it is part of "MIRA VILLAS CONDOMINIUMS".
- Parcel 816:** Located west of Parcel 413, it is part of "MIRA VILLAS CONDOMINIUMS".
- Parcel 818:** Located west of Parcel 816, it is part of "MIRA VILLAS CONDOMINIUMS".
- Parcel 819:** Located west of Parcel 818, it is part of "MIRA VILLAS CONDOMINIUMS".

The map also shows "EAGLE ROCK AND SUMMERLIN VILLAGE 3 - UNIT NO. 1B AMD" to the north of Parcel 412, "CANYON RUN DR" running through the parcels, and "RAMPART BLVD" to the east. Various lot numbers, acreage, and recording numbers are provided for each parcel and boundary line.

TAX DIST 200
FIGURE 7

APPENDIX B

(Hydrologic Parameters)

- Rainfall Calculation
- Rainfall Depth-Duration-Frequency Values 10-Year, 6-Hour (Figure 503)
- Rainfall Depth-Duration-Frequency Values 100-Year, 6-Hour (Figure 506)
- Precipitation Adjustment Ratios (Table 501)
- Six-Hour Depth Area Reduction Factors (Table 502)
- Six-Hour Storm Distributions (Table 503)
- Curve Number Calculations and Summary
- Runoff Curve Numbers – Urban Area (Table 602 Sheet 1 of 4)
- Soil Survey Maps
- Standard Form 4 (Existing and Developed Conditions)
- HEC-1 Analysis (Existing and Developed Conditions)

RAMPART PARKING GARAGE EXPANSION
JOB NO. 18-003

RAINFALL CALCULATION

Per Figure 503 and 506; Table 501 and 502 of the *Hydrologic Criteria and Drainage Design Manual*.

STORM EVENT	RAINFALL DEPTH (IN)	PRECIPITATION ADJUSTMENT RATIOS	SIX-HOUR DEPTH AREA REDUCTION FACTORS	DESIGN RAINFALL DEPTH (IN)
10-YEAR	1.35	1.24	1.00	1.67
100-YEAR	2.05	1.43	1.00	2.93

10YEAR/100-YEAR DESIGN RAINFALL DEPTH RATIO:

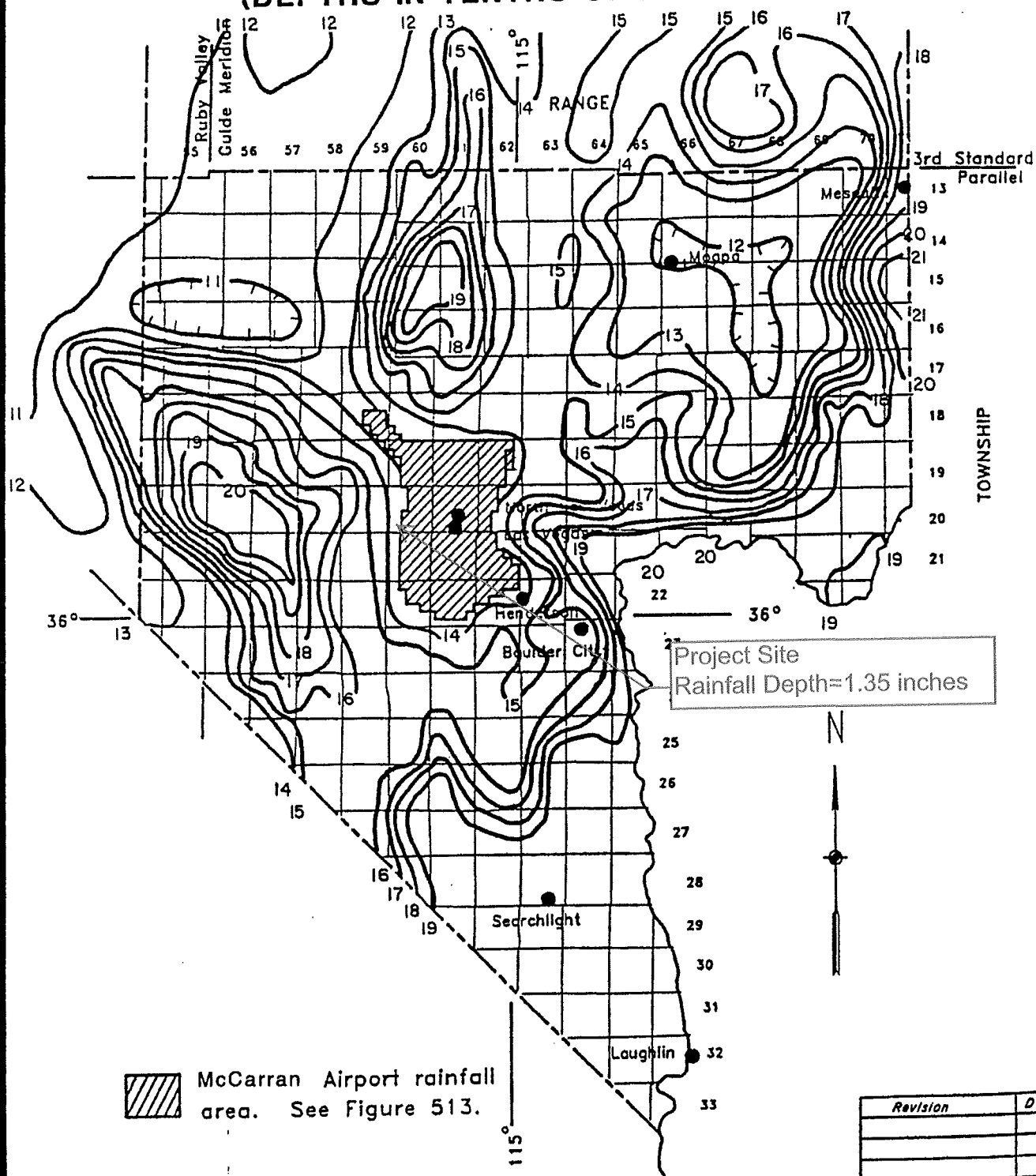
0.571

NOTE:

1. Rainfall Depth are taken from Figure 503 and 506 of the Drainage Design Manual.
2. Precipitation Adjustment Ratios are taken from Table 501 of the Drainage Design Manual.
3. Six-Hour Depth Area Reduction Factors is taken from Table 502.

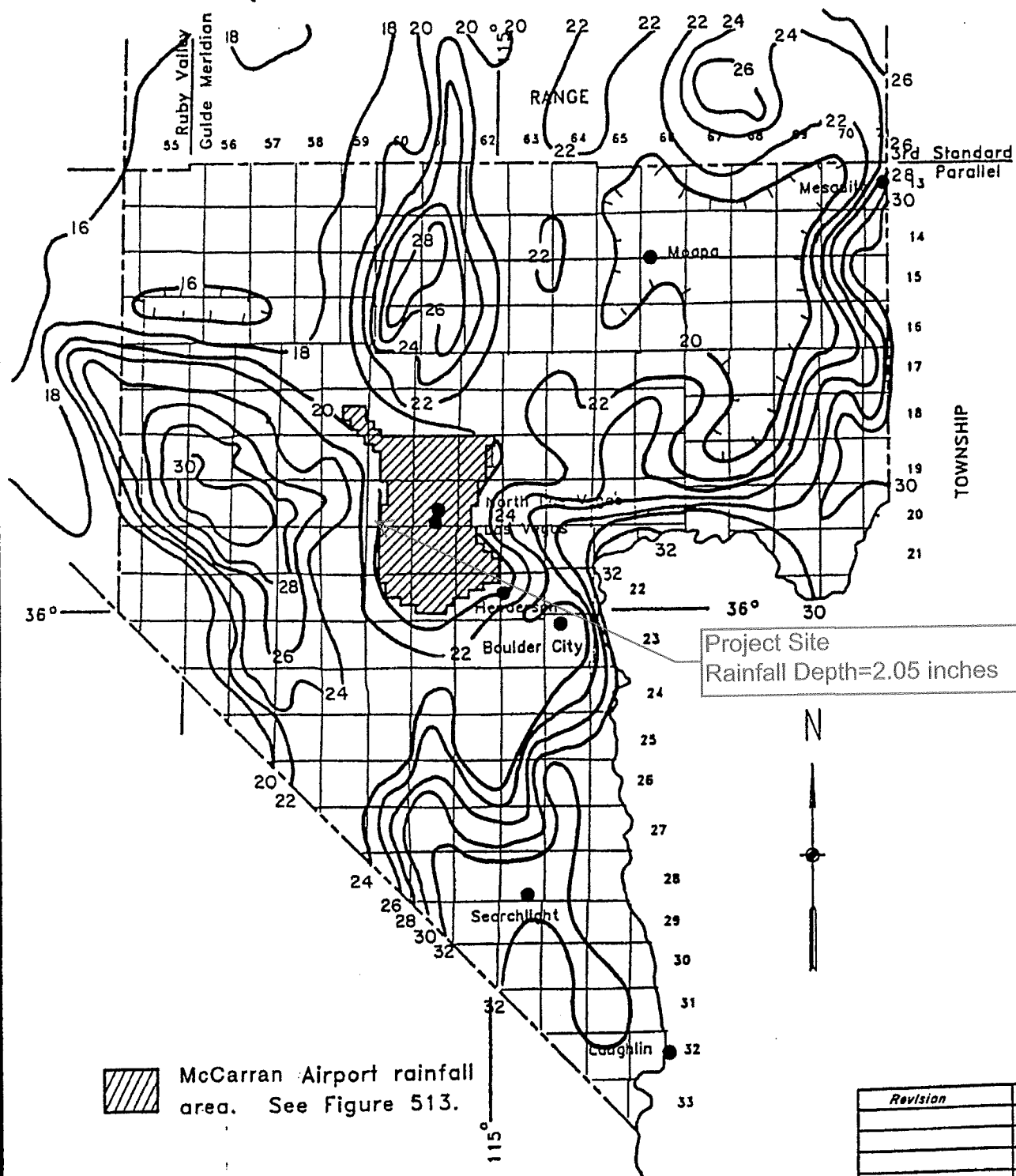
HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RAINFALL DEPTH-DURATION-FREQUENCY 10-YEAR, 6-HOUR (DEPTHS IN TENTHS OF INCHES)



HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RAINFALL DEPTH-DURATION-FREQUENCY 100-YEAR, 6-HOUR (DEPTHS IN TENTHS OF INCHES)



HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

PRECIPITATION ADJUSTMENT RATIOS

<u>Recurrence Interval</u>	<u>Ratio to NOAA Atlas 2</u>
2-year	1.00
5-year	1.16
10-year	1.24
25-year	1.33
50-year	1.39
100-year	1.43

- NOTE: 1. Multiply the values obtained from the NOAA Atlas 2 by the above ratios to obtain the adjusted precipitation values.
2. NOAA Atlas 2 values for use with TR-55 shall not be adjusted by the above ratios.
3. Tables 505 and 506 require no adjustments.

<i>Revision</i>	<i>Date</i>

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

SIX HOUR DEPTH-AREA REDUCTION FACTORS

<u>Drainage Area (Square Miles)</u>	<u>Six-Hour Depth-Area Reduction Factor</u>
0.0	1.00
0.5	0.98
1.0	0.97
2.0	0.93
4.0	0.91
6.0	0.90
8.0	0.88
10.0	0.86
20.0	0.79
30.0	0.74
50.0	0.68
100.0	0.60
150.0	0.55
200.0	0.51
300.0	0.46
400.0	0.42
500.0	0.39

- NOTES: 1. A graphical representation of these factors is presented in Figure 514.
2. Consult with the local entity and/or the CCRFCD for guidance in using the Depth-Area Reduction Factors for drainage areas greater than 200 square miles.

<i>Revision</i>	<i>Date</i>

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

SIX-HOUR STORM DISTRIBUTIONS

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

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

Revision	Date

REFERENCE:

TABLE 503

Project Rampart Parking Garage ExpansionBy PFFDate 8/13/2018Location CITY OF LAS VEGAS

Checked _____

Date _____

Circle one: Existing DevelopedOverall Site

1. Runoff Curve Number (CN)

Soil Name and hydrologic group (Appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN ¹			Area ☐ acres ☐ mi ² ☒ %	Product of CN x area
		Table 602	Fig. 2-3	Fig. 2-4		
D	Open Space (Good Condition)	80			33.0%	26.40
D	Impervious (Paved)	98			67.0%	65.66
Totals =					100%	92.06

1 Use only one CN source per line

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{92.06}{1.00} = 92.06 \quad \text{Use CN} = \boxed{92}$$

Project Rampart Parking Garage ExpansionBy PFFDate 8/13/2018Location CITY OF LAS VEGAS

Checked _____

Date _____

Circle one: Existing DevelopedOverall Site

1. Runoff Curve Number (CN)

Soil Name and hydrologic group (Appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN ¹			Area acres mi² ☒ %	Product of CN x area
		Table 602	Fig. 2-3	Fig. 2-4		
D	Open Space (Good Condition)	80			10.0%	8.00
D	Impervious (Paved)	98			90.0%	88.20
Totals =					100%	96.20

1 Use only one CN source per line

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{96.20}{1.00} = 96.20 \quad \text{Use CN} = \boxed{96}$$

Rampart Parking Garage Expansion
JOB NO. 18-003
SHEET 1 OF 1

CURVE NUMBER CALCULATION

Per Table 602 Sheet 1 of 4 in the *Hydrologic Criteria and
Drainage Design Manual and the National Cooperative Soil Survey*

SOIL #152 - Cave gravelly fine sandy loam				
SOIL	%	HYDRO-LOGIC GROUP	EXISTING CN SEE NOTE #1	DEVELOPED CN SEE NOTE #2
152	100	D	92	96
COMPOSITE CN			92.0	96.0

CN = CURVE NUMBER

NOTE:

1. Developed Curve Number Urban areas, Open Space in good condition and impervious, per Table 602, sheet 1 of 4, in the Drainage Design Manual.
See weighted curve No. Calculation
2. Developed Curve Number Urban areas, Open Space in good condition and impervious, per Table 602, sheet 1 of 4, in the Drainage Design Manual.
See weighted curve No. Calculation

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (URBAN AREAS¹)

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

See Table 602A

Developing urban areas

Newly graded areas (pervious areas only, no vegetation) ⁵	77	86	91	94
--	----	----	----	----

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

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

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

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

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

Revision	Date

Soil Map—Las Vegas Valley Area, Nevada, Part of Clark County
(Rampart Garage Expansion)



MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 12, Sep 15, 2017

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

Date(s) aerial images were photographed: Sep 26, 2013—Feb 25, 2014

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

MAP LEGEND

	Area of Interest (AOI)		Soil Map Unit Polygons		Soil Map Unit Lines		Soil Map Unit Points		Special Point Features		Water Features		Streams and Canals		Transportation		Rails		Interstate Highways		US Routes		Major Roads		Local Roads		Background		Aerial Photography								
	Blowout		Borrow Pit		Clay Spot		Closed Depression		Gravel Pit		Gravelly Spot		Landfill		Lava Flow		Marsh or swamp		Mine or Quarry		Miscellaneous Water		Perennial Water		Rock Outcrop		Saline Spot		Sandy Spot		Severely Eroded Spot		Sinkhole		Slide or Slip		Sodic Spot

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
152	Cave gravelly fine sandy loam, 0 to 4 percent slopes	1.1	100.0%
Totals for Area of Interest		1.1	100.0%

Las Vegas Valley Area, Nevada, Part of Clark County

152—Cave gravelly fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: hr9v
Elevation: 2,000 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Cave and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cave

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 12 inches: gravelly fine sandy loam
H2 - 12 to 36 inches: indurated
H3 - 36 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 12, Sep 15, 2017

Rampart Ex.DAT

*DIAGRAM

ID TRU Engineering
 ID Rampart Parking Garage Expansion
 ID CITY OF LAS VEGAS, NV
 ID
 ID EXISTING CONDITION
 ID
 ID INPUT FILE :Rampart Ex.DAT
 ID OUTPUT FILE:Rampart Ex.OUT
 ID

 ID * ONSITE DRAINAGE BASIN AREA = 1.35 ACRES *
 ID * DEPTH-DURATION-FREQUENCY VALUE = 2.93-in *
 ID * DEPTH-AREA REDUCTION VALUE = 1.0 *
 ID * STORM DISTRIBUTION #1 *
 ID * ABSTRACTION METHOD: SCS CN *
 ID * HYDROLOGIC METHOD: SCS UH *
 ID * ROUTING METHOD: *
 ID * RATIO 1 = 10-YEAR EVENT *
 ID * RATIO 2 = 100-YEAR EVENT *
 ID * STARTED: 7/24/18 *
 ID * REVISED: 8/13/18 *
 ID *****

ID
 ID
 JR PREC .571 1.000
 IT 5 0 0 360
 IO 5 0 0
 IN 5 0 0
 *

KK ONX1
 BA .0011
 PB 2.93
 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
 PC .998 .999 1.00
 LS 0 92.0

UD 0.050
 *

KK ONX2
 BA .0003
 LS 0 86.0
 UD 0.062
 *

Rampart Ex.DAT

KK ONX3
BA .0002
LS 0 86.0
UD 0.050
*
KK OFX1
BA .0005
LS 0 98.0
UD 0.050
*
KK CON2
KM COMBINE ONSITE BASINS
HC 4
*
KK ONX4
BA .0002
LS 0 92.0
UD 0.050
*
ZZ

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 13AUG18 TIME 11:05:05
*
*****

```

```

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

```

```

X X XXXXXX XXXX X
X X X X X XX
X X X X X
XXXXXXX XXXX X XXXXX X
X X X X X
X X X X X
X X XXXXXX XXXX XXX

```

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

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

HEC-1 INPUT

PAGE 1

1

```

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

*DIAGRAM
1 ID TRU Engineering
2 ID Rampart Parking Garage Expansion
3 ID CITY OF LAS VEGAS, NV
4 ID
5 ID EXISTING CONDITION
6 ID
7 ID INPUT FILE :Rampart Ex.DAT
8 ID OUTPUT FILE:Rampart Ex.OUT
9 ID
10 ID *****
11 ID * ONSITE DRAINAGE BASIN AREA = 1.35 ACRES *
12 ID * DEPTH-DURATION-FREQUENCY VALUE = 2.93-in *
13 ID * DEPTH-AREA REDUCTION VALUE = 1.0 *
14 ID * STORM DISTRIBUTION #1 *
15 ID * ABSTRACTION METHOD: SCS CN *
16 ID * HYDROLOGIC METHOD: SCS UH *
17 ID * ROUTING METHOD: *
18 ID * RATIO 1 = 10-YEAR EVENT *
19 ID * RATIO 2 = 100-YEAR EVENT *
20 ID * STARTED: 7/24/18 *
21 ID * REVISED: 8/13/18 *
22 ID *****
23 ID
24 JR PREC .571 1.000
25 IT 5 0 0 360
26 IO 5 0 0
27 IN 5 0 0
*

28 KK ONX1
29 BA .0011
30 PB 2.93
31 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
32 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
33 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
34 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
35 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
36 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
37 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
38 PC .998 .999 1.00
39 LS 0 92.0
40 UD 0.050
*

```


41 KK ONX2
 42 BA .0003
 43 LS 0 86.0
 44 UD 0.062
 *

HEC-1 INPUT

PAGE 2

1

LINE	ID	1	2	3	4	5	6	7	8	9	10
45	KK	ONX3									
46	BA	.0002									
47	LS	0	86.0								
48	UD	0.050									
	*										
49	KK	OFX1									
50	BA	.0005									
51	LS	0	98.0								
52	UD	0.050									
	*										
53	KK	CON2									
54	KM	COMBINE ONSITE BASINS									
55	HC	4									
	*										
56	KK	ONX4									
57	BA	.0002									
58	LS	0	92.0								
59	UD	0.050									
	*										
60	ZZ										

SCHEMATIC DIAGRAM OF STREAM NETWORK

1

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
28	ONX1	
	.	
41	ONX2	
	.	
45	ONX3	
	.	
49	OFX1	
	.	
53	CON2.....	
	.	
56	ONX4	

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1 *****

* FLOOD HYDROGRAPH PACKAGE (HEC-1) *

* JUN 1998 *

* VERSION 4.1 *

* RUN DATE 13AUG18 TIME 11:05:05 *

* *****

* U.S. ARMY CORPS OF ENGINEERS *

* HYDROLOGIC ENGINEERING CENTER *

* 609 SECOND STREET *

* DAVIS, CALIFORNIA 95616 *

* (916) 756-1104 *

* *****

TRU Engineering
 Rampart Parking Garage Expansion
 CITY OF LAS VEGAS, NV

EXISTING CONDITION

INPUT FILE :Rampart Ex.DAT
 OUTPUT FILE:Rampart Ex.OUT

* ONSITE DRAINAGE BASIN AREA = 1.35 ACRES *

```

*      DEPTH-DURATION-FREQUENCY VALUE = 2.93-in      *
*      DEPTH-AREA REDUCTION VALUE = 1.0              *
*      STORM DISTRIBUTION #1                          *
*      ABSTRACTION METHOD: SCS CN                     *
*      HYDROLOGIC METHOD: SCS UH                      *
*      ROUTING METHOD:                                *
*      RATIO 1 = 10-YEAR EVENT                       *
*      RATIO 2 = 100-YEAR EVENT                     *
*      STARTED: 7/24/18                             *
*      REVISED: 8/13/18                             *
*****

```

26 IO OUTPUT CONTROL VARIABLES

```

IPRNT      5 PRINT CONTROL
IPLOT      0 PLOT CONTROL
QSCAL      0. HYDROGRAPH PLOT SCALE

```

IT HYDROGRAPH TIME DATA

```

NMIN      5 MINUTES IN COMPUTATION INTERVAL
IDATE     1 0 STARTING DATE
ITIME     0000 STARTING TIME
NQ        360 NUMBER OF HYDROGRAPH ORDINATES
NDDATE    2 0 ENDING DATE
NDTIME    0555 ENDING TIME
ICENT     19 CENTURY MARK

```

```

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 29.92 HOURS

```

ENGLISH UNITS

```

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

```

JP MULTI-PLAN OPTION

```

NPLAN              1 NUMBER OF PLANS

```

JR MULTI-RATIO OPTION

```

RATIOS OF PRECIPITATION
.57      1.00

```

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1 .57	RATIO 2 1.00
HYDROGRAPH AT +	ONX1	.00	1 FLOW TIME	1. 3.50	2. 3.50
HYDROGRAPH AT +	ONX2	.00	1 FLOW TIME	0. 3.50	1. 3.50
HYDROGRAPH AT +	ONX3	.00	1 FLOW TIME	0. 3.50	0. 3.50
HYDROGRAPH AT +	OFX1	.00	1 FLOW TIME	1. 3.50	1. 3.50
4 COMBINED AT +	CON2	.00	1 FLOW TIME	2. 3.50	5. 3.50
HYDROGRAPH AT +	ONX4	.00	1 FLOW TIME	0. 3.50	0. 3.50

Rampart Dv.DAT

*DIAGRAM

ID TRU Engineering
 ID Rampart Parking Garage Expansion
 ID CITY OF LAS VEGAS, NV
 ID
 ID DEVELOPED CONDITION
 ID
 ID INPUT FILE :Rampart Dv.DAT
 ID OUTPUT FILE:Rampart Dv.OUT

ID *****
 ID * ONSITE DRAINAGE BASIN AREA = 0.89 ACRES *
 ID * DEPTH-DURATION-FREQUENCY VALUE = 2.93-in *
 ID * DEPTH-AREA REDUCTION VALUE = 1.0 *
 ID * STORM DISTRIBUTION #3 *
 ID * ABSTRACTION METHOD: SCS CN *
 ID * HYDROLOGIC METHOD: SCS UH *
 ID * ROUTING METHOD: *
 ID * RATIO 1 = 10-YEAR EVENT *
 ID * RATIO 2 = 100-YEAR EVENT *
 ID * STARTED: 7/24/18 *
 ID * REVISED: 8/13/18 *
 ID *****

ID
 ID JR PREC .571 1.000
 ID IT 5 0 0 360
 ID IO 5 0 0
 ID IN 5 0 0
 ID *

KK OND1
 BA .0002
 PB 2.93
 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
 PC .998 .999 1.00
 LS 0 96.0
 UD 0.050
 ID *
 KK OND2
 BA .0002
 LS 0 98.0
 UD 0.050
 ID *

Rampart Dv.DAT

KK OND3
BA .0005
LS 0 98.0
UD 0.050
*
KK OND4
BA .0004
LS 0 98.0
UD 0.050
*
KK OND5
BA .0002
LS 0 98.0
UD 0.050
*
KK CON1
KM COMBINE ONSITE BASINS
HC 5
*
KK OFD1
BA .0004
LS 0 98.0
UD 0.050
*
KK OND7
BA .0002
LS 0 96.0
UD 0.050
*
KK CON2
KM COMBINE ONSITE BASINS
HC 3
*
KK OND6
BA .0001
LS 0 96.0
UD 0.050
*
ZZ

```

*****
1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 13AUG18 TIME 11:02:26
*
*****

```

```

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

```

```

X X XXXXXX XXXX X
X X X X XX
X X X X X
XXXXXX XXXX X XXXX X
X X X X X
X X X X X
X X XXXXXX XXXX XXX

```

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,

DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION

KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT

PAGE 1

1

```

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

*DIAGRAM
1 ID TRU Engineering
2 ID Rampart Parking Garage Expansion
3 ID CITY OF LAS VEGAS, NV
4 ID
5 ID DEVELOPED CONDITION
6 ID
7 ID INPUT FILE :Rampart Dv.DAT
8 ID OUTPUT FILE:Rampart Dv.OUT
9 ID
10 ID *****
11 ID * ONSITE DRAINAGE BASIN AREA = 0.89 ACRES *
12 ID * DEPTH-DURATION-FREQUENCY VALUE = 2.93-in *
13 ID * DEPTH-AREA REDUCTION VALUE = 1.0 *
14 ID * STORM DISTRIBUTION #3 *
15 ID * ABSTRACTION METHOD: SCS CN *
16 ID * HYDROLOGIC METHOD: SCS UH *
17 ID * ROUTING METHOD: *
18 ID * RATIO 1 = 10-YEAR EVENT *
19 ID * RATIO 2 = 100-YEAR EVENT *
20 ID * STARTED: 7/24/18 *
21 ID * REVISED: 8/13/18 *
22 ID *****
23 ID
24 JR PREC .571 1.000
25 IT 5 0 0 360
26 IO 5 0 0
27 IN 5 0 0
*

28 KK OND1
29 BA .0002
30 PB 2.93
31 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
32 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
33 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
34 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
35 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
36 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
37 PC .982 .985 .987 .989 .990 .993 .994 .995 .998
38 PC .998 .999 1.00
39 LS 0 96.0
40 UD 0.050
*

```

41 KK OND2
 42 BA .0002
 43 LS 0 98.0
 44 UD 0.050
 *

HEC-1 INPUT

PAGE 2

1

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

45 KK OND3
 46 BA .0005
 47 LS 0 98.0
 48 UD 0.050
 *

49 KK OND4
 50 BA .0004
 51 LS 0 98.0
 52 UD 0.050
 *

53 KK OND5
 54 BA .0002
 55 LS 0 98.0
 56 UD 0.050
 *

57 KK CON1
 58 KM COMBINE ONSITE BASINS
 59 HC 5
 *

60 KK OFD1
 61 BA .0004
 62 LS 0 98.0
 63 UD 0.050
 *

64 KK OND7
 65 BA .0002
 66 LS 0 96.0
 67 UD 0.050
 *

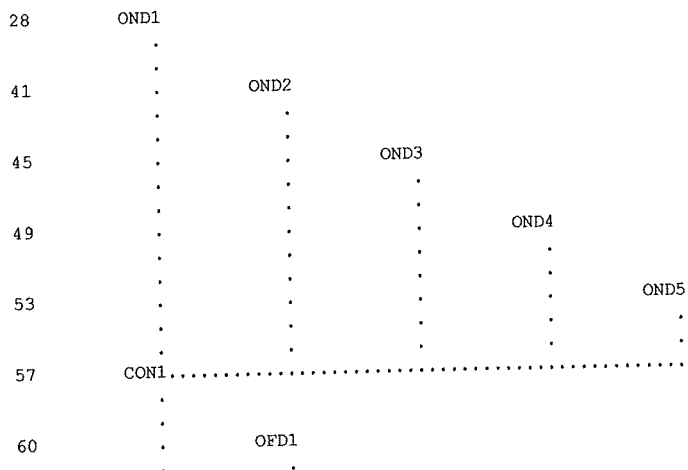
68 KK CON2
 69 KM COMBINE ONSITE BASINS
 70 HC 3
 *

71 KK OND6
 72 BA .0001
 73 LS 0 96.0
 74 UD 0.050
 *
 75 ZZ

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW



64 OND7

 68 CON2.....

 71 OND6

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
 1*****
 * FLOOD HYDROGRAPH PACKAGE (HEC-1) *
 * JUN 1998 *
 * VERSION 4.1 *
 * RUN DATE 13AUG18 TIME 11:02:26 *
 * *****

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

TRU Engineering
 Rampart Parking Garage Expansion
 CITY OF LAS VEGAS, NV

DEVELOPED CONDITION

INPUT FILE :Rampart Dv.DAT
 OUTPUT FILE:Rampart Dv.OUT

 * ONSITE DRAINAGE BASIN AREA = 0.89 ACRES *
 * DEPTH-DURATION-FREQUENCY VALUE = 2.93-in *
 * DEPTH-AREA REDUCTION VALUE = 1.0 *
 * STORM DISTRIBUTION #3 *
 * ABSTRACTION METHOD: SCS CN *
 * HYDROLOGIC METHOD: SCS UH *
 * ROUTING METHOD: *
 * RATIO 1 = 10-YEAR EVENT *
 * RATIO 2 = 100-YEAR EVENT *
 * STARTED: 7/24/18 *
 * REVISED: 8/13/18 *
 * *****

26 IO OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE
 IT HYDROGRAPH TIME DATA
 NMIN 5 MINUTES IN COMPUTATION INTERVAL
 IDATE 1 0 STARTING DATE
 ITIME 0000 STARTING TIME
 NQ 360 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 2 0 ENDING DATE
 NDTIME 0555 ENDING TIME
 ICENT 19 CENTURY MARK
 COMPUTATION INTERVAL .08 HOURS
 TOTAL TIME BASE 29.92 HOURS

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

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS
 JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 .57 1.00

FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION	
					RATIO 1 .57	RATIO 2 1.00
HYDROGRAPH AT +	OND1	.00	1	FLOW TIME	0. 3.50	0. 3.50
HYDROGRAPH AT +	OND2	.00	1	FLOW TIME	0. 3.50	0. 3.50
HYDROGRAPH AT +	OND3	.00	1	FLOW TIME	1. 3.50	1. 3.50
HYDROGRAPH AT +	OND4	.00	1	FLOW TIME	1. 3.50	1. 3.50
HYDROGRAPH AT +	OND5	.00	1	FLOW TIME	0. 3.50	0. 3.50
5 COMBINED AT +	CON1	.00	1	FLOW TIME	2. 3.50	4. 3.50
HYDROGRAPH AT +	OFD1	.00	1	FLOW TIME	1. 3.50	1. 3.50
HYDROGRAPH AT +	OND7	.00	1	FLOW TIME	0. 3.50	0. 3.50
3 COMBINED AT +	CON2	.00	1	FLOW TIME	3. 3.50	5. 3.50
HYDROGRAPH AT +	OND6	.00	1	FLOW TIME	0. 3.50	0. 3.50

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

APPENDIX C

(Hydraulic Analysis)

- Flow Depth Analysis section FM1
- Drop Inlet & Catch Basin Capacity Calculations

East Perimeter Drive FM1
Worksheet for Irregular Channel

Project Description	
Project File	untitled.fm2
Worksheet	Rampart Garage Expansion FM1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

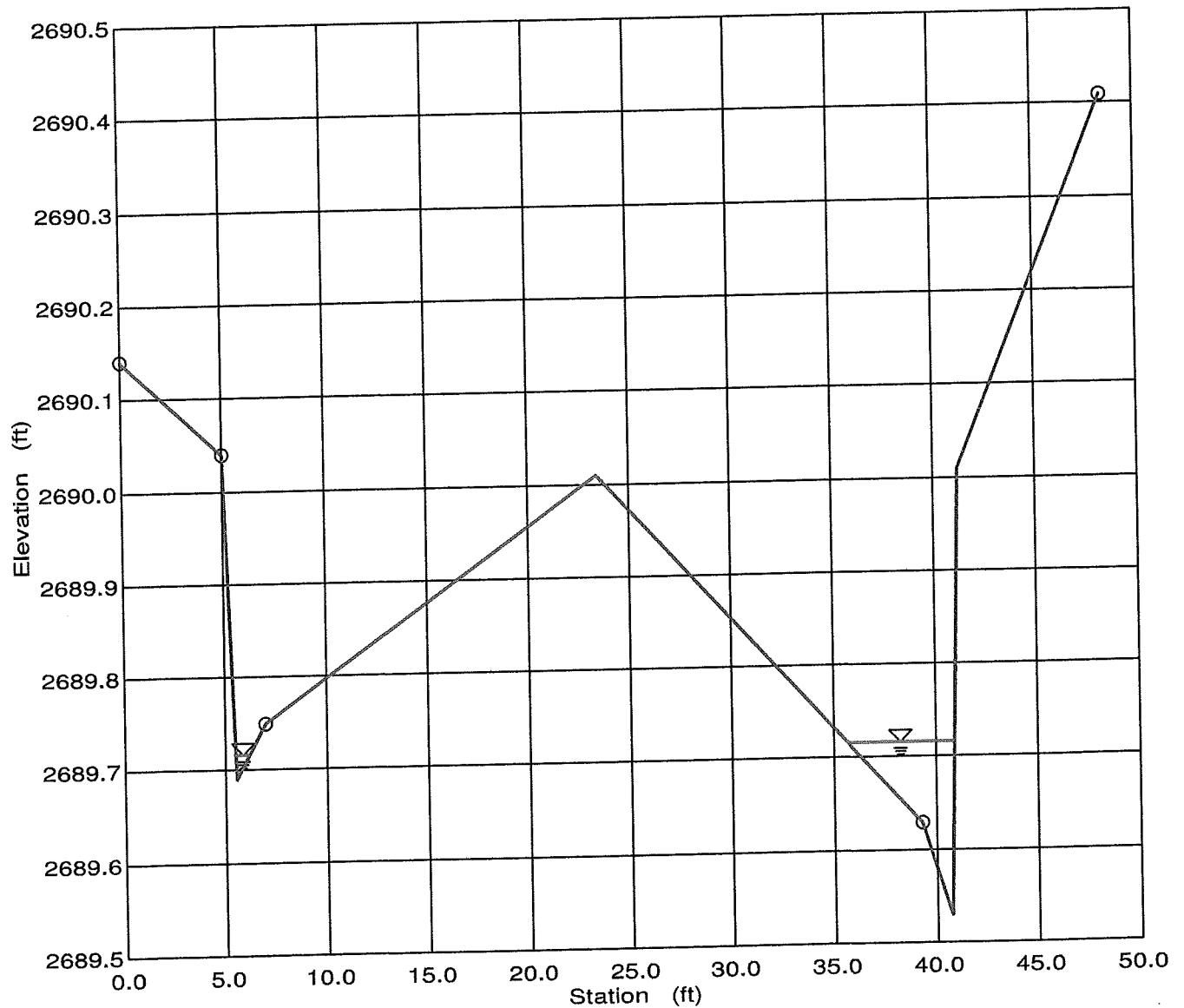
Input Data					
Channel Slope		0.025000 ft/ft			
Elevation range: 2,689.53 ft to 2,690.41 ft.					
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness	
0.00	2,690.14	0.00	5.00	0.025	
5.00	2,690.04	5.00	7.00	0.012	
5.50	2,689.69	7.00	39.26	0.016	
7.00	2,689.75	39.26	48.42	0.012	
23.45	2,690.01				
39.26	2,689.63				
40.72	2,689.53				
41.22	2,690.01				
48.42	2,690.41				
Discharge	1.00	cfs			

Results		
Wtd. Mannings Coefficient	0.014	
Water Surface Elevation	2,689.72	ft
Flow Area	0.39	ft ²
Wetted Perimeter	6.09	ft
Top Width	6.00	ft
Height	0.19	ft
Critical Depth	2,689.75	ft
Critical Slope	0.007391	ft/ft
Velocity	2.59	ft/s
Velocity Head	0.10	ft
Specific Energy	2,689.82	ft
Froude Number	1.80	
Flow is supercritical.		
Flow is divided.		

FM1 Cross Section Cross Section for Irregular Channel

Project Description	
Project File	untitled.fm2
Worksheet	Rampart Garage Expansion FM1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.014
Channel Slope	0.025000 ft/ft
Water Surface Elevation	2,689.72 ft
Discharge	1.00 cfs



36" Catch Basin #1 Sizing in Sump

3' x 3' Catch Basin #1 SE Corner of Garage

Known:

D_p = Ponding Depth at Inlet	0.6	ft
W = Gutter Width	3	ft
L_g = Length of Grate	3.0	ft
L_c = Length of Curb Opening	0.0	ft
H_c = Curb Opening Height	0	ft
C_{wc} = Weir coefficient for curb opening	2.3	
C_{wg} = Weir coefficient for grate	3.0	
C_o = Orifice coefficient	0.67	
R_o = Grate opening factor	0.60	
C_{fg} = Clogging Factor for Grate	50	%
C_{fc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

P_g = Active grate weir length (agwl) = $2*W+L_g$	9.00 ft
P_{agl} = Adjusted agwl = $2*(1-C_{fg}/100)*W+L_g$	6.00 ft
A_g = Grate area = $W*L_g$	9.00 ft ²
A_{aga} = Adjusted open grate area = $A_g*R_o*(1-C_{fg}/100)$	2.70 ft ²
check - If $D_p < 1.792*A_{aga}/P_{agl}$; weir; else orifice	weir
Q_{ig} = Flow intercepted by grate If "weir" controls $Q_{ig} = C_{wg}*P_{agl}*D_p^{1.5}$ If "orifice" controls $Q_{ig} = C_o*A_{aga}*(64.4*D_p)^{0.5}$	8.4 cfs

Curb Opening Capacity Calculations

P_c = Active curb opening weir length (acowl) = $L_c+1.8*W$	5.40 ft
P_{acl} = Adjusted acowl = $L_c+1.8*(1-C_{fc}/100)*W$	2.70 ft
A_c = curb opening area (coa) = L_c*H_c	0.00 ft ²
A_{aca} = Adjusted coa = $A_c*(1-C_{fc}/100)$	0.00 ft ²
check - If $D_p < H_c$; weir; else orifice	orifice
Q_{ic} = Flow intercepted by curb opening If "weir" controls $Q_{ic} = C_{wc}*P_{acl}*D_p^{1.5}$ If "orifice" controls $Q_{ic} = C_o*A_{aca}*(64.4*D_p-H_c/2)^{0.5}$	0.0 cfs

Total Inlet Calculations

Q_{ti} = Total flow intercepted = $Q_{ig}+Q_{ic}$	8.4 cfs
q = Interception per unit ratio = Q_{ti}/L_g	2.79 cfs/ft

Ex. Type "B" Drop Inlet Sizing in Sump

On-Site DI at E Cor. of Parking Lot

Known:

D_p = Ponding Depth at Inlet	0.5	ft
W = Gutter Width	1.5	ft
L_g = Length of Grate	2.5	ft
L_c = Length of Curb Opening	2.5	ft
H_c = Curb Opening Height	0.67	ft
C_{wc} = Weir coefficient for curb opening	2.3	
C_{wg} = Weir coefficient for grate	3.0	
C_o = Orifice coefficient	0.67	
R_o = Grate opening factor	0.60	
C_{fg} = Clogging Factor for Grate	50	%
C_{fc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

P_g = Active grate weir length (agwl) = $2*W+L_g$	5.50 ft
P_{agl} = Adjusted agwl = $2*(1-C_{fg}/100)*W+L_g$	4.00 ft
A_g = Grate area = $W*L_g$	3.75 ft ²
A_{aga} = Adjusted open grate area = $A_g*R_o*(1-C_{fg}/100)$	1.13 ft ²
check - If $D_p < 1.792*A_{aga}/P_{agl}$; weir; else orifice	weir
Q_{ig} = Flow intercepted by grate If "weir" controls $Q_{ig} = C_{wg}*P_{agl}*D_p^{1.5}$ If "orifice" controls $Q_{ig} = C_o*A_{aga}*(64.4*D_p)^{0.5}$	4.2 cfs

Curb Opening Capacity Calculations

P_c = Active curb opening weir length (acowl) = $L_c+1.8*W$	5.20 ft
P_{acl} : Adjusted acowl = $L_c+1.8*(1-C_{fc}/100)*W$	3.85 ft
A_c = curb opening area (coa) = L_c*H_c	1.68 ft ²
A_{aca} = Adjusted coa = $A_c*(1-C_{fc}/100)$	0.84 ft ²
check - If $D_p < H_c$; weir; else orifice	weir
Q_{ic} = Flow intercepted by curb opening If "weir" controls $Q_{ic} = C_{wc}*P_{acl}*D_p^{1.5}$ If "orifice" controls $Q_{ic} = C_o*A_{aca}*(64.4*D_p-H_c/2)^{0.5}$	3.1 cfs

Total Inlet Calculations

Q_{ti} = Total flow intercepted = $Q_{ig}+Q_{ic}$	7.4 cfs
q = Interception per unit ratio = Q_{ti}/L_g	2.95 cfs/ft

APPENDIX D

(Reference Material)

- Reference Material
 - A Approval Letters
 - Plumbing Plans P1.01 & P1.04
 - StormCAD Analysis Output
 - Improv Plans #107-V2830 Utility plans C4.04, C4.05 & C4.02
 - Improv Plans #107-V2830 Utility plans C3.04, C3.05 & C3.02

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		July 27, 1999
Land Development Services Department of Public Works		FROM: Dennis W. Stransky, P.E. Flood Control Project Manager Department of Public Works
SUBJECT: Drainage Study for: "Summerlin Resort Hotel and Casino" Employee Parking Lot		COPIES TO: Martin & Martin, Inc. Seven Circle Resorts Cheri Edelman, P. E., DEVCO
FILE NO. \\khan\lood\Depot\DSMEMOS\DSArchive\DS2080H.doc		
FEMA Flood Zone	YES No X	
Proposed Storm Drain	YES No X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES
1st Submittal	06/24/97	07/02/97	Not Accepted	\$250.00
2nd Submittal	07/21/97	07/31/97	Accepted	\$250.00
CCRFCD	08/22/97	08/25/97	Accepted	\$00.00
3rd Submittal	11/26/97	12/2/97	Not Accepted	\$100.00
4th Submittal	2/12/98	2/25/98	Accepted	\$100.00
5th Submittal	04/15/98	04/21/98	Accepted	\$100.00
6th Submittal	7/16/1999	7/27/1999	See Comments Below	\$100.00
TOTAL FEES:				\$900.00

REMARKS:

Update for the employee parking lot south of the site.

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

X	is acceptable in concept subject to conformance to all CLV standards.
	must be resubmitted or supplemented including the following:
	must have Clark County Regional Flood Control District concurrence

- Although it appears an opening is intended at the area where the parking islands connect to the "L" curb along the north property line, a detail should be provided showing the opening to provide positive flow through these area.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the City of Las Vegas Flood Control Section. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the City of Las Vegas reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction.

PLANS SENT TO LAND DEVELOPMENT yes (initial)

END OF REMARKS

dws

T/R/S: 20S/60E/29
AREA L-29

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		April 1, 2005
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. <i>AS</i> Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	
	Summerlin Resort Hotel & Casino – Update #2	
Cross Streets:	North of Canyon Run Dr. & W. of Rampart	
File Number:	F:\Depot\DSMemos\DS3721C.doc	
Parcel Number:	138-29-401-002	
Zoning Action:	TCP-5756	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
COPIES TO:		
		Carter Burgess
		J. W. Marriott
		Bart Anderson, P.E., DevCo
		CCRFGD

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1 st Submittal	12/29/2004	1/13/2005	Not Approved	\$400.00	14235: \$400
2 nd Submittal	1/24/2005	2/3/2005	Conditionally Approved	\$400.00	15114: \$400
3 rd Submittal	3/28/2005	4/01/2005	See Comments Below	0	N/A
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.

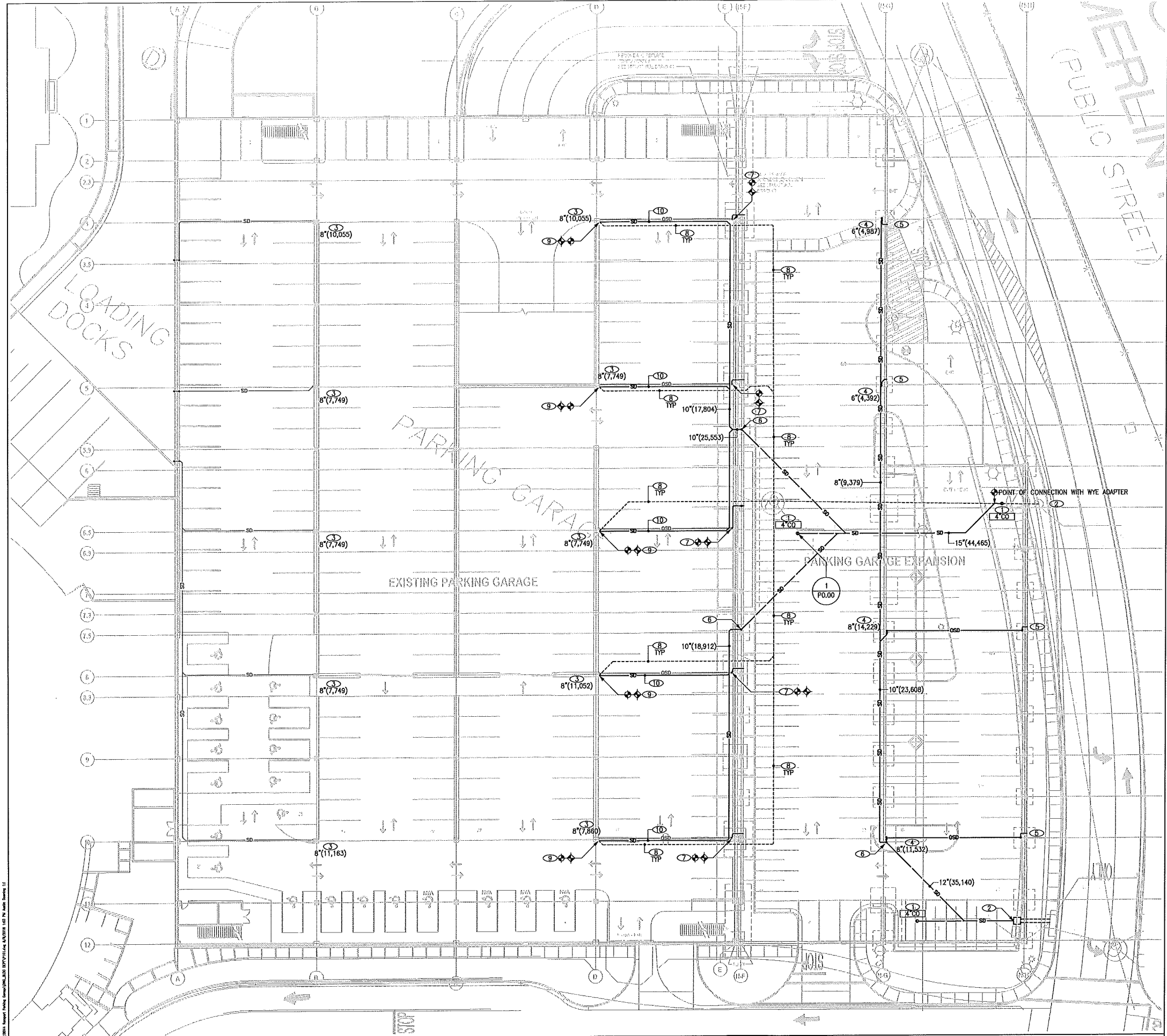
NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the City of Las Vegas Flood Control Section. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the City of Las Vegas reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429

END OF REMARKS

Ays/pbj

T/R/S: T20S/R60E/29
AREA L-29



P:\2017\10081-000 Rampart Hotel and Casino Parking Garage Expansion.dwg, 8/2/2018, 1:17 PM, User: [redacted]

A GROUND LEVEL
1/16" = 1' - 0"

NOTICE

PIPE SIZES IS BASED ON 1/8" FT. SLOPE.

KEY NOTES

1. CLEAN-OUT TO GRADE.
2. REFER TO CIVIL SITE UTILITY PLAN FOR CONTINUATION.
3. EXISTING SD-OSD DOWN FROM DRAIN IS ABOVE.
4. SD-OSD DOWN FROM DRAIN IS ABOVE.
5. OSD DOWN, TERMINATE @ 12" ABOVE FINISHED GRADE. REFER TO ARCHITECTURAL DETAILS FOR TERMINATION.
6. SD DOWN TO BELOW GRADE WITH CLEAN-OUT. PROVIDE WITH PIPE SHROUD TO MATCH EXISTING.
7. REMOVE AND REPLACE EXISTING OSD. REFER TO ARCHITECTURAL DETAILS FOR TERMINATION.
8. REMOVE OR ABANDON IF PLACE EXISTING SD PIPES AND APPURTANANCES.
9. RELOCATE EXISTING PIPE SHROUD TO NEW DROP LOCATION.
10. INSTALL NEW SD PIPING PARALLEL TO OSD PIPING.



**RAMPART HOTEL
AND CASINO**
221 N. Rampart Blvd., Las Vegas
NV, 89145

Parking Garage
Expansion



3783 HOWARD HUGHES PARKWAY, SUITE
120 LAS VEGAS, NEVADA 89169

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTIVITY	BY
Manager	
Design	
Draw	
Check	

STAMP



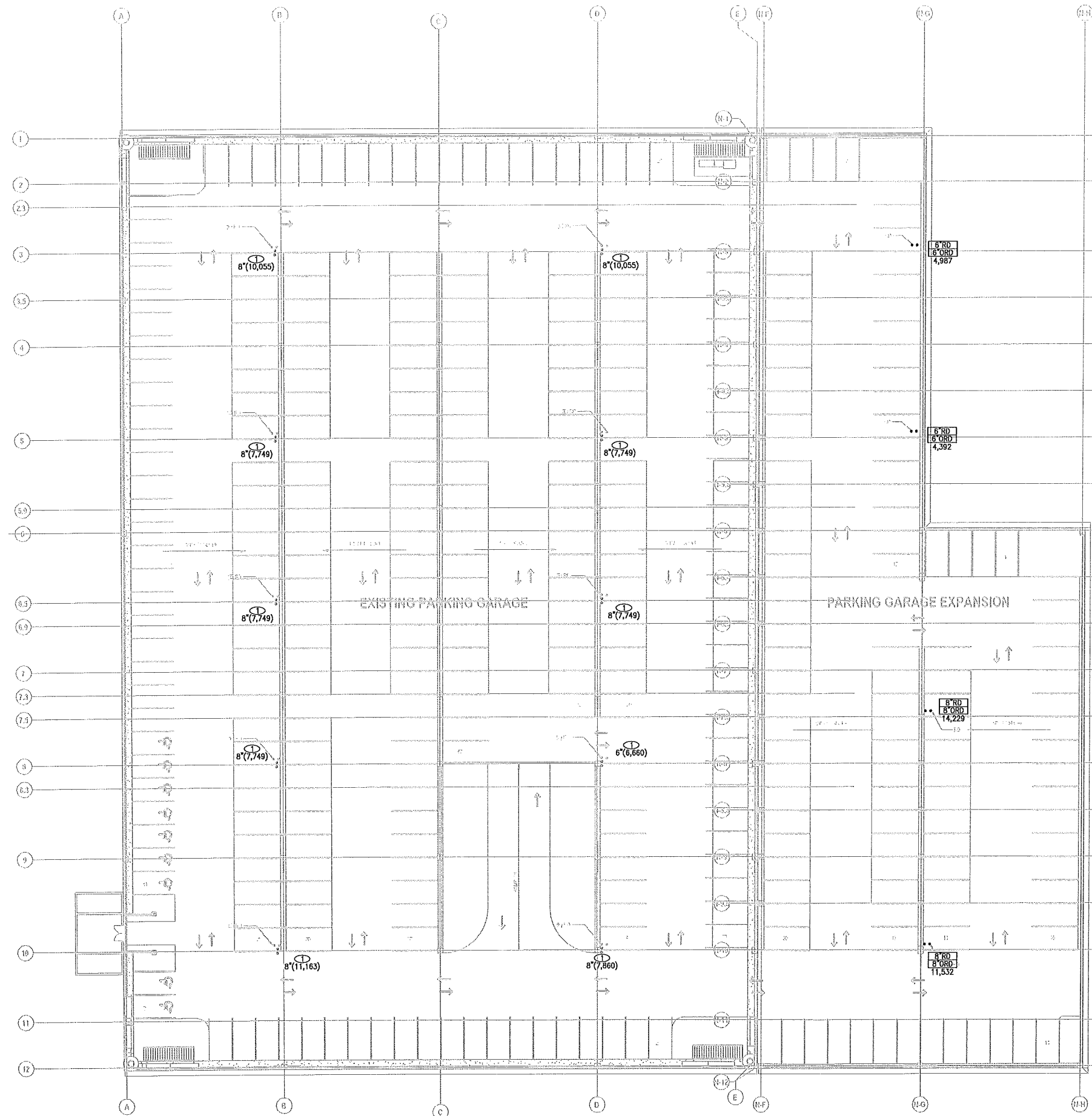
Project No. 076-10081-000
Issue Date: August 06, 2018

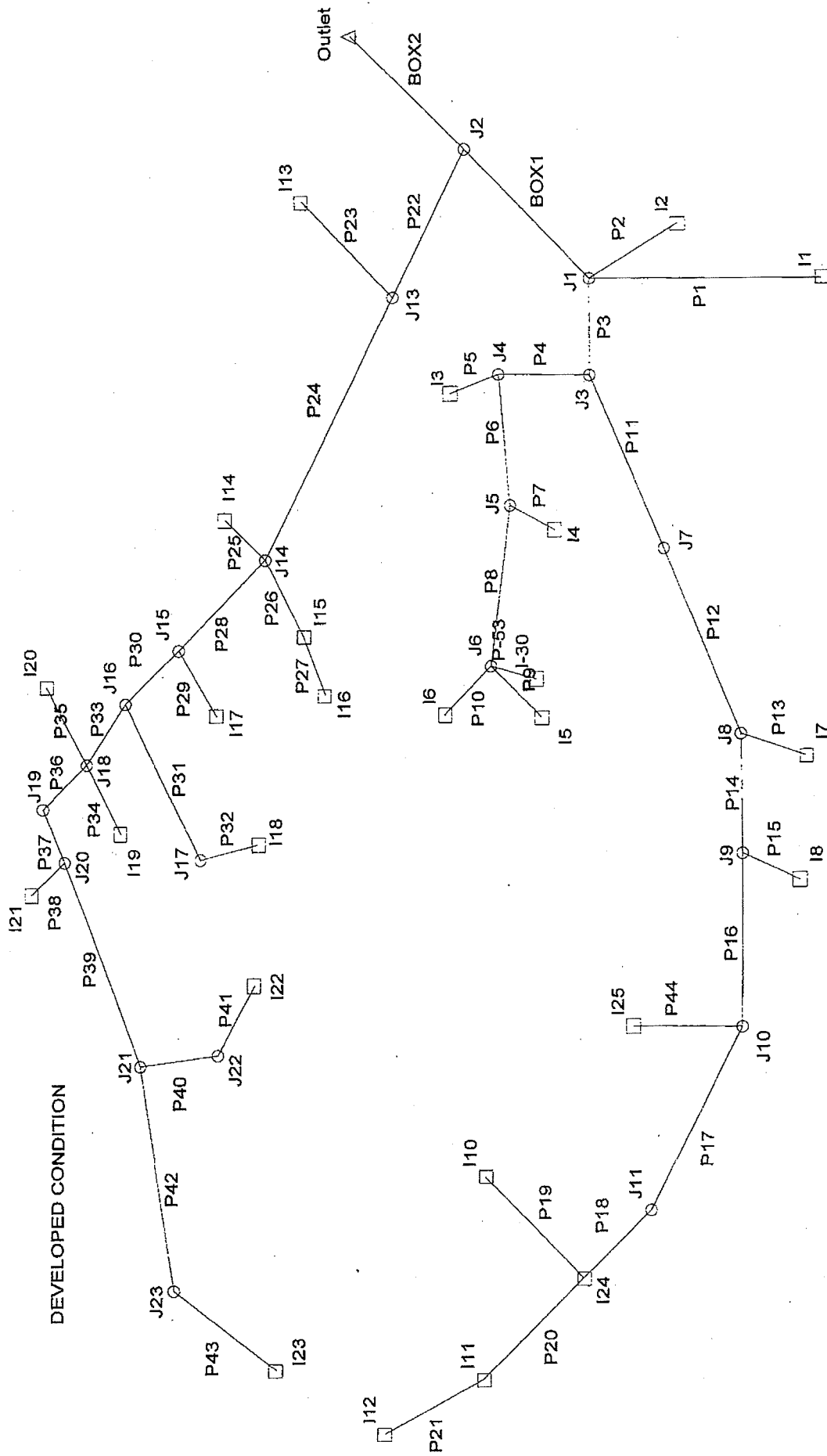
GROUND LEVEL

P1.01

Copyright © 2017 LEO A DALY Company

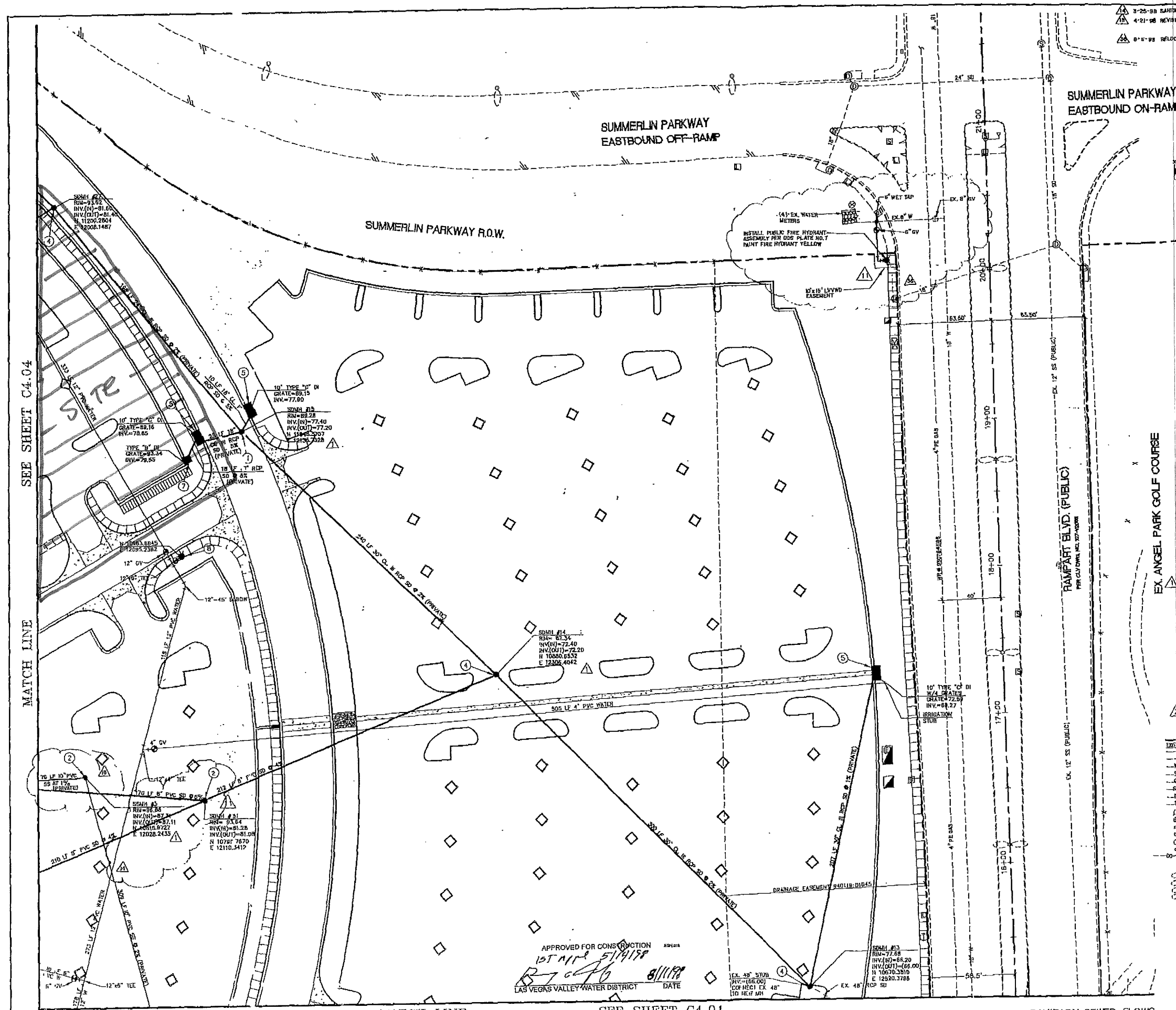
DESIGN DEVELOPMENT



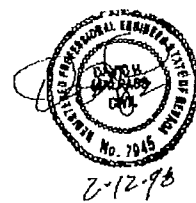


Combined Pipe/Node Report

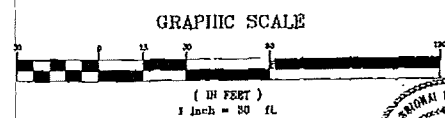
Pipe	Upstream Node	Downstream Node	Length (ft)	Capacity (cfs)	Discharge (cfs)	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Section Size	Section Shape	Roughness	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream HGL (ft)	Downstream HGL (ft)
P38	I21	J20	13.00	5.04	1.00	0.020000	1.27	12 inch	Circular	0.013	2,690.82	2,690.56	2,699.72	2,700.00	2,693.70	2,693.89
P43	I23	J23	200.00	14.85	7.00	0.020000	5.44	18 inch	Circular	0.013	2,711.36	2,707.36	2,725.00	2,719.00	2,712.38	2,708.38
P42	J23	J21	305.00	14.85	7.00	0.020000	4.70	18 inch	Circular	0.013	2,707.36	2,701.26	2,719.00	2,710.61	2,708.38	2,704.91
P41	I22	J22	100.00	10.50	8.00	0.010000	4.53	18 inch	Circular	0.013	2,705.21	2,704.21	2,710.50	2,713.00	2,706.71	2,706.13
P40	J22	J21	210.00	12.02	8.00	0.013095	4.53	18 inch	Circular	0.013	2,704.01	2,701.26	2,713.00	2,710.61	2,706.13	2,704.91
P39	J21	J20	550.00	14.65	15.00	0.019455	8.49	18 inch	Circular	0.013	2,701.06	2,690.36	2,710.61	2,700.00	2,704.91	2,693.69
P37	J20	J19	20.00	14.85	16.00	0.020000	9.05	18 inch	Circular	0.013	2,690.06	2,689.66	2,700.00	2,699.97	2,693.69	2,693.23
P36	J19	J18	105.00	14.85	16.00	0.020000	9.05	18 inch	Circular	0.013	2,689.46	2,687.36	2,699.97	2,699.00	2,693.23	2,690.79
P34	I19	J18	25.00	23.49	1.60	0.050000	0.91	18 inch	Circular	0.013	2,688.61	2,687.36	2,698.81	2,699.00	2,690.84	2,690.79
P35	I20	J18	10.00	23.49	7.60	0.050000	4.30	18 inch	Circular	0.013	2,687.86	2,687.36	2,698.81	2,699.00	2,690.84	2,690.79
P33	J18	J16	95.00	31.99	25.20	0.020000	8.02	24 inch	Circular	0.013	2,687.36	2,685.46	2,699.00	2,698.05	2,690.79	2,689.61
P32	I18	J17	210.00	7.21	8.00	0.004714	4.53	18 inch	Circular	0.013	2,690.00	2,689.01	2,693.50	2,699.20	2,692.77	2,691.56
P31	J17	J16	335.00	10.50	8.00	0.010000	4.53	18 inch	Circular	0.013	2,688.81	2,685.46	2,699.20	2,698.05	2,691.56	2,689.61
P30	J16	J15	35.00	31.53	33.20	0.019429	10.57	24 inch	Circular	0.013	2,685.26	2,684.58	2,698.05	2,697.50	2,689.61	2,688.86
P29	I17	J15	22.00	7.89	1.00	0.049091	1.27	12 inch	Circular	0.013	2,686.66	2,685.58	2,697.50	2,697.50	2,688.88	2,688.86
P28	J15	J14	400.00	29.54	34.20	0.017050	10.97	24 inch	Circular	0.013	2,684.58	2,677.76	2,697.50	2,689.28	2,688.86	2,679.67
P27	I16	I15	18.00	23.49	10.40	0.050000	6.34	18 inch	Circular	0.013	2,679.41	2,678.51	2,693.34	2,689.16	2,680.65	2,679.92
P26	I15	J14	25.00	50.58	15.30	0.050000	5.67	24 inch	Circular	0.013	2,678.51	2,677.26	2,689.16	2,689.28	2,679.92	2,679.41
P25	I14	J14	10.00	23.49	4.90	0.050000	2.77	18 inch	Circular	0.013	2,677.76	2,677.06	2,689.05	2,689.28	2,679.43	2,679.41
P24	J14	J13	543.00	58.00	54.40	0.020000	12.40	30 inch	Circular	0.013	2,677.06	2,666.20	2,689.28	2,677.88	2,679.41	2,668.12
P23	I13	J13	210.00	41.01	37.60	0.010000	9.06	30 inch	Circular	0.013	2,668.30	2,666.20	2,672.59	2,677.88	2,670.37	2,668.08
P22	J13	J2	160.00	126.96	92.00	0.007813	7.32	48 inch	Circular	0.013	2,661.00	2,659.75	2,677.88	2,672.00	2,665.29	2,664.64
P-53	I-30	J6	70.00	5.04	1.00	0.020000	2.42	12 inch	Circular	0.013	2,688.70	2,687.30	2,696.43	2,696.36	2,689.12	2,688.02
P9	I5	J6	60.00	24.07	1.30	0.052500	2.34	18 inch	Circular	0.013	2,690.45	2,687.30	2,697.83	2,696.36	2,690.88	2,688.02
P10	I6	J6	45.00	23.49	1.30	0.050000	2.34	18 inch	Circular	0.013	2,689.55	2,687.30	2,696.83	2,696.36	2,693.96	2,688.02
P8	J6	J5	250.00	23.49	3.60	0.050000	3.66	18 inch	Circular	0.013	2,687.10	2,674.60	2,696.36	2,686.00	2,687.92	2,675.55
P7	I4	J5	50.00	23.49	2.40	0.050000	2.90	18 inch	Circular	0.013	2,677.10	2,674.60	2,686.86	2,686.00	2,677.89	2,675.55
P6	J5	J4	150.00	23.49	6.00	0.050000	8.11	18 inch	Circular	0.013	2,674.60	2,667.10	2,686.00	2,678.74	2,675.55	2,667.82
P5	I3	J4	63.00	23.49	2.40	0.050000	2.93	18 inch	Circular	0.013	2,670.25	2,667.10	2,678.26	2,678.74	2,670.84	2,668.02
P4	J4	J3	48.00	22.74	8.40	0.046875	5.34	18 inch	Circular	0.013	2,666.90	2,664.65	2,678.74	2,681.36	2,668.02	2,667.61
P44	I25	J10	140.00	31.99	5.00	0.020000	2.59	24 inch	Circular	0.013	2,703.05	2,700.25	2,711.00	2,710.84	2,703.96	2,704.04
P21	I12	I11	125.00	10.50	1.00	0.010000	1.79	18 inch	Circular	0.013	2,713.60	2,712.35	2,721.50	2,724.09	2,713.97	2,713.53
P20	I11	I24	300.00	10.50	2.00	0.010000	1.15	18 inch	Circular	0.013	2,712.15	2,709.15	2,724.09	2,717.10	2,713.53	2,713.43
P19	I10	I24	250.00	22.62	17.00	0.010000	5.41	24 inch	Circular	0.013	2,711.65	2,709.15	2,714.90	2,717.10	2,714.84	2,713.43
P18	I24	J11	150.00	22.62	31.00	0.010000	9.87	24 inch	Circular	0.013	2,708.95	2,707.45	2,717.10	2,715.05	2,713.43	2,710.61
P17	J11	J10	350.00	31.99	31.00	0.020000	9.87	24 inch	Circular	0.013	2,707.25	2,700.25	2,715.05	2,710.84	2,710.61	2,704.04
P16	J10	J9	250.00	39.18	36.00	0.030000	11.46	24 inch	Circular	0.013	2,700.05	2,692.55	2,710.84	2,706.00	2,704.04	2,697.70
P15	I8	J9	22.00	14.85	7.00	0.020000	3.96	18 inch	Circular	0.013	2,692.99	2,692.55	2,706.47	2,706.00	2,697.80	2,697.70



3-25-98 SANITARY SEWER & STORM DRAIN REVISIONS *N/A* *BP*
4-21-98 REVISE 10" BS LOCATION *N/A* *p*
8-5-98 RELOCATE FH CONNECTION *N/A* *10*



2-12-98



BASIS OF BEARING

NORTH 01°53'54" WEST, BEING THE CENTERLINE OF
RAMPART BLVD. AS PER A MAP IN FILE 82-1-1-54
OF PARCEL MAPS, CLARK COUNTY RECORDERS' OFFICE
CLARK COUNTY, NEVADA.

BENCHMARK

OLYOD JOSEE6, BEING A RIVET AND PLATE, NEVADA
POWER VAULT #U-795, 9201, SUMMERLIN PARKWAY.
ELEV: 828.1527 METERS NAVD88 (2717.03 FEET)

UTILITY NOTES

- ① CONNECT 8" PVC SANITARY SEWER TO EXISTING 55MM ADJUST RM ELEVATION AS SHOWN.
- ② INSTALL 48" TYPE 1 SANITARY SEWER MANHOLE PER SUMMERLIN STD. DWG. NO. D-2.
- ③ CONNECT 24" RCP STORM DRAIN TO EXISTING 8"x5' RCB STORM DRAIN. PER DETAIL S
C601
- ④ INSTALL 60" TYPE 1 STORM DRAIN MANHOLE PER SUMMERLIN STD. DWG. NO. D-2.
- ⑤ INSTALL TYPE "C" DROP INLET PER SUMMERLIN STD. DWG. NO. D-14.
- ⑥ INSTALL TYPE "A" DROP INLET PER SUMMERLIN STD. DWG. NO. D-12.
- ⑦ INSTALL TYPE "B" DROP INLET PER SUMMERLIN STD. DWG. NO. D-13.
- ⑧ INSTALL PRIVATE FIRE HYDRANT ASSEMBLY PER UDS PLATE NO. 7. PAINT HYDRANT RED.
- ⑨ ALL WATER LINES TO BE AWWA C900 CL. 150.
- ⑩ INSTALL JENSEN PRECAST 2424-36-40 DROP INLET.
- ⑪ ALL PVC STORM DRAIN TO BE SDR.35.
- ⑫ INSTALL 10"x6" FMCT PER UDS PLATE NO. 210.
- ⑬ INSTALL DUAL 10" RPPA'S PER UDS PLATE NO. 118 AND DETAIL 1
C4.D8
- ⑭ INSTALL JENSEN PRECAST 2424-H-D1 SUMP BASIN OR EQUIVALENT.
- ⑮ INSTALL ACO-XHD 475 TRENCH DRAIN OR EQUIVALENT.
- ⑯ RELOCATE EXISTING STREET LIGHT TO LOCATION SHOWN.
- ⑰ ALL WATER LINE SHALL BE AWWA C900 CLASS 150.
- ⑱ INSTALL JENSEN PRECAST 2424-S-D1 AREA DRAIN OR APPROVED EQUIVALENT.
- ⑲ INSTALL FREE STANDING FIRE DEPARTMENT CONNECTION PER CLV FIRE DEPARTMENT STANDARDS.
- ⑳ INSTALL "P" TRAP (REFER TO DWGS. BY STO).
- ㉑ ALL PVC SEWER TO BE SDR 35.

LEGEND

[illegible]

AVOID CUTTING THROUGH UTILITY LINES. ITS COSTLY. Call before you Dig— 1-800-227-2600 MIDWESTERN SERVICE ALERT (MSA)	AVOID OVERHEAD POWER LINE CONTACT Call before you OVERHEAD 1-702-593-8111 TOWNS POWER MANAGEMENT AND POWER SERVICES CERTIFIED
---	---

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE



PAUL STEELMAN LTD
ARCHITECTURE PLANNING
3320 N. DESSERT DR. #2
LAS VEGAS, NEVADA 89102
PHONE 702-475-0221 FAX 702-387-3963

MARTIN & MARTIN
CIVIL ENGINEERS
1909 SOUTH JONES BLVD
SUITE 2
LAS VEGAS, NEVADA 89102
PHONE (702) 242-0000

[illegible]

DATE 2-11-98
SOLG 1-30
BY AND FOR 1970
PROJECT: AIGED UTILITY COORDINATES & 4" GV
A CIV ENG. COMMENTS 8-29-97 JWB
A BUILT IN 1955 NEGATIVE 2-27-98

SHEET TITLE AND LOCATION

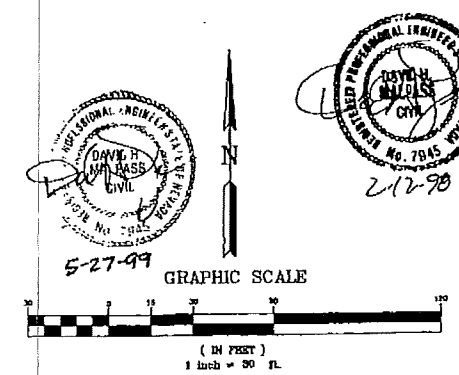
UTILITY PLAN

SHEET NUMBER
C4.02
SHEET 21 OF 32
REVISION
ISSUED FOR
CONTRACT
BULLETIN 38
107-K-2830

\\GAD\1570\libar 2-11-98 7:47:59 am EST

[illegible]

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.



NORTH 01°53'54" WEST, BEING THE CENTERLINE OF
RAMPART BLVD. AS PER A MAP IN FILE 82, PAGE 64,
OF PARCEL MAPS, CLARK COUNTY RECORDER'S OFFICE.
CLARK COUNTY, NEVADA.

OLYD0 30SEE0, BEING A RIVET AND PLATE, NEVADA
POWER VAULT #UJ-795, 9201, SUMMERLIN PARKWAY.
ELEV: 828.1527 METERS NAVD83 (2717.03 FEET)

- ① CONNECT 8" PVC SANITARY SEWER TO EXISTING SS4H. ADJUST RIG. ELEVATION AS SHOWN.
- ② INSTALL 48" TYPE 1 SANITARY SEWER MANHOLE PER SUMMERLIN STD. DWG. NO. D-2.
- ③ CONNECT 24" RCB STORM DRAIN TO EXISTING 8"x5' RCB STORM DRAIN. PER DETAIL 5
C501
- ④ INSTALL 60" TYPE 1 STORM DRAIN MANHOLE PER SUMMERLIN STD. DWG. NO. D-2.
- ⑤ INSTALL TYPE "C" DROP INLET PER SUMMERLIN STD. DWG. NO. D-14.
- ⑥ INSTALL TYPE "A" DROP INLET PER SUMMERLIN STD. DWG. NO. D-12.
- ⑦ INSTALL TYPE "B" DROP INLET PER SUMMERLIN STD. DWG. NO. D-13.
- ⑧ INSTALL PRIVATE FIRE HYDRANT ASSEMBLY PER UDS PLATE NO. 7. PAINT HYDRANT RED.
- ⑨ ALL WATER LINES TO BE AWWA C900 CL. 150.
- ⑩ INSTALL JENSEN PRECAST 2424-36-40 DROP INLET.
- ⑪ ALL PVC STORM DRAIN TO BE SDR 35.
- ⑫ INSTALL 10"x6" FUCT PER UDS PLATE NO. 210.
- ⑬ INSTALL DUAL 10" RPPA'S PER UDS PLATE NO. 11B AND DETAIL C406
- ⑭ INSTALL JENSEN PRECAST 2424-H-DI SUMP BASIN OR EQUIVALENT.
- ⑮ INSTALL ACO-XHD 475 TRENCH DRAIN OR EQUIVALENT.
- ⑯ RELOCATE EXISTING STREET LIGHT TO LOCATION SHOWN.
- ⑰ ALL WATER LINE SHALL BE AWWA C900 CLASS 150.
- ⑱ INSTALL JENSEN PRECAST 2424-S-DI AREA DRAIN OR APPROVED EQUIVALENT.
- ⑲ INSTALL FREE STANDING FIRE DEPARTMENT CONNECTION PER CLV FIRE DEPARTMENT STANDARDS.
- ⑳ INSTALL "P" TRAP (REFER TO DWGS. BY STO).
- ㉑ ALL PVC SEWER TO BE SDR 35.

SANITARY SEWER FLOWS
AVERAGE DAILY = 0.23 MGD
PEAK = 0.46 MGD



PAUL STEELMAN LTD
ARCHITECTURE PLANNING
3350 W. DESERT INN RD. LAS VEGAS, NEVADA, 89102
PHONE 702-673-4221 FAX 702-367-2543

MARTIN & MARTIN
CIVIL ENGINEERS
1100 SOUTH JONES AVE
SUITE B
LAS VEGAS, NEVADA 89102
PHONE: (702) 944-8000

THE RESORT AT SUMMERLIN
HOTEL, CASINO & ENTERTAINMENT COMPLEX
LAS VEGAS, NEVADA

[illegible]

UTILITY PLAN

SET 1
C4
SHEETS
REVIEW
ISSUES
CONTENTS
CITY

107-V2830

\\jcfs\0251\JOY\H
Wed Feb 11 03:37:21 1998

16275

SEE SHEET C3.04

MATCH LINE

MATCH LINE

SEE SHEET C3.01

REVISIONS
12-11-98 ADD SPEED HUMP
2-11-98 SIDEWALK REVISION



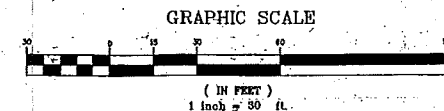
PAUL STEELMAN LTD
ARCHITECTURE PLANNING
3300 W. DESERT INN RD.
LAS VEGAS, NEVADA 89102
PHONE (702) 497-0521

MARTIN & MARTIN
CIVIL ENGINEERS
1909 SOUTH JONES BLVD.
SUITE 8
LAS VEGAS, NEVADA 89102
PHONE (702) 246-8000

THE RESORT AT SUMMERLIN
HOTEL, CASINO & ENTERTAINMENT COMPLEX
LAS VEGAS, NV 89135
DATE: 2-17-98
DRAWN BY: J.M.
CHECKED BY: J.M.
APPROVED BY: J.M.
PROJECT NO. 98-001

GRADING PLAN

SHEET NUMBER
C3.02
SHEET 13 OF 32
REVISION
ISSUED FOR
CONTRACT
107-12838



BASIS OF BEARING

NORTH 01°53'54" WEST, BEING THE CENTERLINE OF
RAMPART BLVD. PER A MAP IN FILE 82, PAGE 64,
OF PARCEL MAPS, CLARK COUNTY RECORDER'S OFFICE,
CLARK COUNTY, NEVADA.

BENCHMARK

OLV00 30SEEB, BEING A RIVET AND PLATE, NEVADA
POWER VAULT #U-795, 9201, SUMMERLIN PARKWAY.
ELEV: 828.1527 METERS NAVD88 (2717.03 FEET)

NOTE:
FOR DETAILS OF THE LANDSCAPE AREAS, SEE
THE LANDSCAPE ARCHITECT PLANS.

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE
APPROVED DRAINAGE STUDY ON RECORD WITH THE CITY
OF LAS VEGAS.
David H. Malpass 2-17-98
DAVID H. MALPASS, P.E. NO. 7945 DATE

NOTE:
REFER TO HORIZONTAL CONTROL
PLANS FOR CONSTRUCTION NOTES.

LEGEND

EXISTING	PROPOSED	EXISTING	PROPOSED
RIGHT-OF-WAY	RIGHT-OF-WAY	SCREEN / RETAINING WALL	SCREEN / RETAINING WALL
CENTERLINE	CENTERLINE	CHAIN LINK FENCE	CHAIN LINK FENCE
WATER LINE	WATER LINE	TRASH ENCLOSURE	TRASH ENCLOSURE
SEWAGE LINE	SEWAGE LINE	GRADE BREAK	GRADE BREAK
GAS LINE	GAS LINE	EDGE FENCE	EDGE FENCE
STORM DRAIN	STORM DRAIN	IF-0.00 FRESH FLOOR	IF-0.00 FRESH FLOOR
POWER LINE / POWER POLE	POWER LINE / POWER POLE	MEANOUT ADJUST ELEVATION	MEANOUT ADJUST ELEVATION
TELEPHONE LINE	TELEPHONE LINE	FLOW LINE	FLOW LINE
FIRE HYDRANT	FIRE HYDRANT	FRESH GRADE	FRESH GRADE
WATER VALVE	WATER VALVE	BACK OF SIDEWALK	BACK OF SIDEWALK
SEWERS / PUMP BOXES	SEWERS / PUMP BOXES	TOP OF CURB	TOP OF CURB
REINFORCED	REINFORCED	TOP OF WALL	TOP OF WALL
MANHOLE	MANHOLE	A.C. PAVING	A.C. PAVING
CLEANOUT	CLEANOUT	TYPE "A" CURB & GUTTER	TYPE "A" CURB & GUTTER
CONTOUR	CONTOUR	TYPE "B" CURB	TYPE "B" CURB
STREET LIGHTS	STREET LIGHTS	CONCRETE	CONCRETE
100 W.H.P.S.	100 W.H.P.S.	TOP RAMP	TOP RAMP
150 W.H.P.S.	150 W.H.P.S.	WS - WATER SURFACE	WS - WATER SURFACE
200 W.H.P.S.	200 W.H.P.S.		
250 W.H.P.S.	250 W.H.P.S.		

AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.
Call before you Dig
1-800-422-2600
UNDERGROUND SERVICE ALERT (USA)

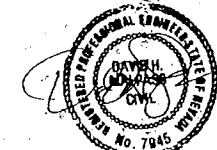
AVOID OVERHEAD POWER
LINE CONTACT
Call before you
OVERHEAD
1-702-593-6111
NEVADA POWER ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS
AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED
FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S
RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES
PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD
VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT
EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE
FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.

MATCH LINE

SEE SHEET C3.05

- REVISIONS
- 2-26-98 ADDED BASEMENT WALL DRAINAGE SYSTEM
 - 5-1-98 SIDEWALK REVISION PER CLV
 - 8-12-98 GRADE REVISIONS
 - 10-16-98 REVISE GRADING



GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft

BASIS OF BEARING

NORTH 01°53'54" WEST, BEING THE CENTERLINE OF
RAMPAW BLVD. AS PER A MAP IN FILE 82, PAGE 64,
OF PARCEL MAPS, CLARK COUNTY RECORDER'S OFFICE,
CLARK COUNTY, NEVADA.

BENCHMARK

OLV00-30SEE6, BEING A RIVET AND PLATE, NEVADA
POWER VAULT #U-795, 9201-SUMMERLIN PARKWAY.
ELEV: 828.1527 METERS NAVD88 (2717.03 FEET)

NOTE:

FOR DETAILS OF THE LANDSCAPE AREAS, SEE
THE LANDSCAPE ARCHITECT PLANS.

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE
APPROVED DRAINAGE STUDY ON RECORD WITH THE CITY
OF LAS VEGAS.

DAVID H. MALPASS, P.E. NO: 7945

DATE: 2-12-98

NOTE:
REFER TO HORIZONTAL CONTROL
PLANS FOR CONSTRUCTION NOTES.

LEGEND

EXISTING	PROPOSED	EXISTING	PROPOSED
RIGHT-OF-WAY	RIGHT-OF-WAY	SCREEN / RETAINING WALL	SCREEN / RETAINING WALL
CENTERLINE	CENTERLINE	ORAN LINK FENCE	ORAN LINK FENCE
WATER LINE	WATER LINE	IRISH EXCLUSION	IRISH EXCLUSION
SEWER LINE	SEWER LINE	GRADE BREAK	GRADE BREAK
GAS LINE	GAS LINE	WIRE FENCE	WIRE FENCE
STORM DRAIN	STORM DRAIN	FINISH FLOOR	FINISH FLOOR
POWER LINE / POWER POLE	POWER LINE / POWER POLE	CLEANOUT INVERT ELEV.	CLEANOUT INVERT ELEV.
TELEPHONE LINE	TELEPHONE LINE	FLOW LINE	FLOW LINE
FIRE HYDRANT	FIRE HYDRANT	FINISH GRADE	FINISH GRADE
WATER VALVE	WATER VALVE	F.S.	F.S.
METERS / PULL BOXES	METERS / PULL BOXES	BACK OF SIDEWALK	BACK OF SIDEWALK
SEWER	SEWER	B.S.W.	B.S.W.
MANHOLE	MANHOLE	TOP OF CURB	TOP OF CURB
CLEANOUT	CLEANOUT	TOP OF WALL	TOP OF WALL
CONTOUR	CONTOUR	T.O.M.	T.O.M.
STREET LIGHTS	STREET LIGHTS	A.C. PAVING	A.C. PAVING
100 W.H.P.S.	100 W.H.P.S.	TYPE "L" CURB & GUTTER	TYPE "L" CURB & GUTTER
150 W.H.P.S.	150 W.H.P.S.	TYPE "A" CURB	TYPE "A" CURB
200 W.H.P.S.	200 W.H.P.S.	CONCRETE	CONCRETE
250 W.H.P.S.	250 W.H.P.S.	R.P. RAP	R.P. RAP
		WS	WS
		WS	WS

Call before you Dig
1-800-227-2600
UNDERGROUND SERVICE ALERT (USA)

Call before you Dig
OVERHEAD
1-702-593-6111
NEVADA POWER AND LIGHTING
SAFETY SERVICE DEPARTMENT

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS
AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED
FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S
RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES
PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD
VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT
EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE
FIELD, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESOLVING THE DISCREPANCY.



PAUL STEELMAN LTD.
ARCHITECTURE PLANNING
3300 S. GARDEN BLVD., SUITE 200
LAS VEGAS, NEVADA 89109
PHONE: 702-737-3505
FAX: 702-737-3505



MARTIN & MARTIN
CIVIL ENGINEERS
1000 SOUTH JONES BLVD., SUITE 100
LAS VEGAS, NEVADA 89109
PHONE: (702) 248-8000

THE RESORT AT SUMMERLIN
HOTEL, CASINO & ENTERTAINMENT COMPLEX
LAS VEGAS, NEVADA

DATE: 2-11-98
DRAWN BY: JLM
CHECKED BY: JLM
DESIGNED BY: JLM
PROJECT NO.: 98-001
SHEET NO.: 1 OF 1

GRADING PLAN

SHEET NUMBER
C3.04
SHEET 1 OF 1
107-V-2830

SEE SHEET C3.07

MATCH LINE

MATCH LINE

SEE SHEET C3.03

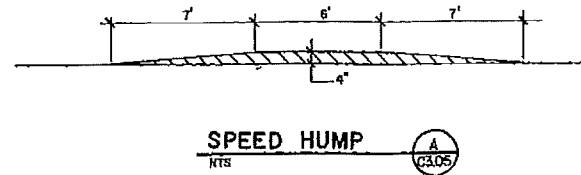
LEGEND

EXISTING	PROPOSED	EXISTING	PROPOSED
ROAD-OF-WAY	ROAD-OF-WAY	SCREEN / RETURN WALL	SCREEN / RETURN WALL
CENTERLINE	CENTERLINE	CHAIN LINK FENCE	CHAIN LINK FENCE
WATER LINE	WATER LINE	TRASH ENCLOSURE	TRASH ENCLOSURE
SANITARY SEWER LINE	SANITARY SEWER LINE	RAVE BROAD	RAVE BROAD
GAS LINE	GAS LINE	WIRE FENCE	WIRE FENCE
STORM DRAIN	STORM DRAIN	TRASH FLOOR	TRASH FLOOR
POWER LINE / POWER POLE	POWER LINE / POWER POLE	CLEARANCE INVERT ELEVATION	CLEARANCE INVERT ELEVATION
TELEPHONE LINE	TELEPHONE LINE	TLL / LINE	TLL / LINE
FIRE HYDRANT	FIRE HYDRANT	FINISH GRADE	FINISH GRADE
WATER VALVE	WATER VALVE	T.C.	T.C.
METERS / PAUL DORIES	METERS / PAUL DORIES	BACK OF SIDEWALK	BACK OF SIDEWALK
REDUCER	REDUCER	TOP OF CURB	TOP OF CURB
MANHOLE	MANHOLE	TOP OF WALL	TOP OF WALL
CLEANOUT	CLEANOUT	CONCRETE	CONCRETE
STREET LIGHTS	STREET LIGHTS	TOP HAP	TOP HAP
100 W.H.P.S.	100 W.H.P.S.		
150 W.H.P.S.	150 W.H.P.S.		
200 W.H.P.S.	200 W.H.P.S.		
250 W.H.P.S.	250 W.H.P.S.		

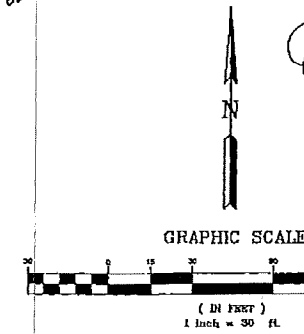
AVOID CUTTING UNDERGROUND UTILITIES. ITS DIRT.
Call before you Dig-
1-800-227-2600
UNDERGROUND SERVICE ALERT (USA)

AVOID OVERHEAD POWER LINE CONTACT
Call before you OVERHEAD
1-702-593-6111
AVOID POWER OVERHEADS AT ALL TIMES. REMEDIATE.

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.



REVISIONS
5-1-98 SIDEWALK REVISIONS PER CLV
12-11-98 ADD SPEED HUMP W/A 66



BASIS OF BEARING

NORTH 01°53'54" WEST, BEING THE CENTERLINE OF RAMPART BLVD. AS PER A MAP IN FILE 82, PAGE 104, OF PARCEL MAPS, CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA.

BENCHMARK

OLV00 30566, BEING A RIVET AND PLATE, NEVADA POWER VAULT #00-795, 9201, SUMMERLIN PARKWAY. ELEV: 828.1527 METERS NAVD88 (2717.03 FEET)

NOTE:

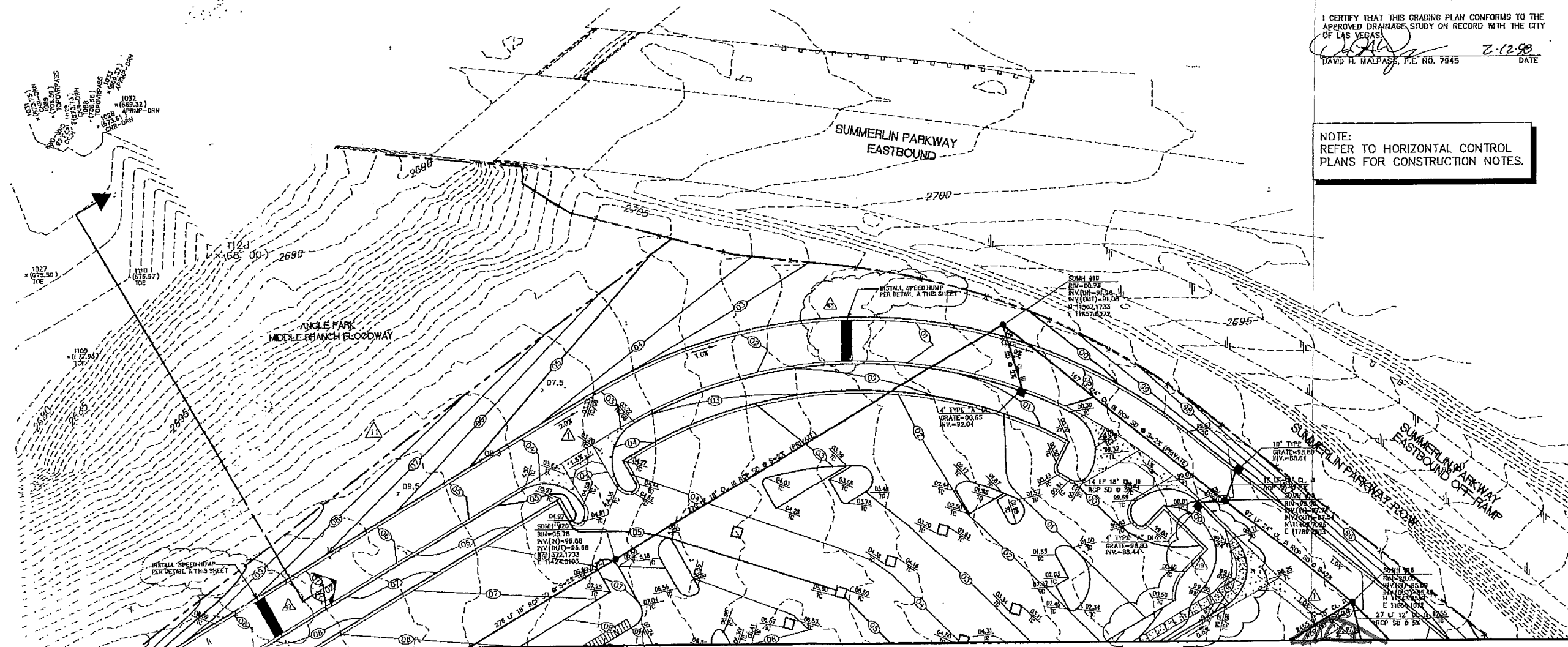
FOR DETAILS OF THE LANDSCAPE AREAS, SEE THE LANDSCAPE ARCHITECT PLANS.

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY ON RECORD WITH THE CITY OF LAS VEGAS.

DAVID H. MALPASE, P.E. NO. 7945 DATE 2-12-98

NOTE:

REFER TO HORIZONTAL CONTROL PLANS FOR CONSTRUCTION NOTES.



MATCH LINE SEE SHEET C3.07

MATCH LINE

SEE SHEET C3.04



PAUL STEELMAN LTD
ARCHITECTURE PLANNING
1000 S. LAS VEGAS BLVD., SUITE 100
LAS VEGAS, NEVADA 89101
PHONE: (702) 241-8000

MARTIN & MARTIN
1000 S. LAS VEGAS BLVD., SUITE 100
LAS VEGAS, NEVADA 89101
PHONE: (702) 241-8000

THE RESORT AT SUMMERLIN
HOTEL, CASINO & ENTERTAINMENT COMPLEX
LAS VEGAS, NEVADA

DATE	BY	REVISION
2-11-98	DM	1.00
2-12-98	DM	1.01

GRADING PLAN

SHEET NUMBER
C3.05
SHEET 18 OF 32
ISSUED FOR CONTRACT
107-V2830

APPENDIX E

(Plans)

- Grading Plans



TO TONOPAH, RENO

TO MT. CHARLESTON

TO LOS ANGELES

TO SALT LAKE CITY

TO LAUGHLIN

SCALE: N.T.S.

PROJECT SITE

SUMMERLIN

LAS VEGAS

HENDERSON

LAKE LAS VEGAS

BOULDER CITY

TO Pahrump

TO LOS ANGELES

TO SALT LAKE CITY

TO LAUGHLIN

SCALE: N.T.S.

SHT.	NO.	SHEET TITLE
1	C1.01	COVER SHEET
2	C1.02	PROJECT DATA SHEET
3	C1.03	GENERAL NOTES SHEET
4	C2.01	DEMOLITION PLAN
5	C3.01	HORIZONTAL CONTROL PLAN
6	C4.01	GRADING PLAN
7	C6.01	UTILITY PLAN
8	C8.01	DETAILS & SECTIONS

A PORTION OF PARCEL 1 OF FILE 115, PAGE 34 OF PARCEL MAPS LYING WITHIN THE SOUTHWEST (SW 1/4) OF SECTION 29, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., CLARK COUNTY, NEVADA

ENGINEER

TRU Engineering

9555 HILLWOOD DR.
LAS VEGAS, NV. 89134
OFFICE: (702) 545-0355
FAX: (702) 545-0987
pf@trudevco.com

OWNER/DEVELOPER
**Hotspur Resorts
Nevada, LTD.**
221 N. RAMPART BLVD.
LAS VEGAS, NV. 89145
OFFICE: (702) 205-6262

APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEViate FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER "DEVIATIONS FROM STANDARDS". THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN "DEVIATIONS FROM STANDARDS" IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA.

ALLEN PAVELKA: PE # 9029
CITY ENGINEER

LAS VEGAS FIRE & RESCUE

CHRIS KNIGHT, DIRECTOR, BUILDING AND SAFETY

THIS PLAN CONFORMS TO THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

COX COMMUNICATIONS LAS VEGAS, INC.

THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

CENTRAL TELEPHONE CO., DBA CENTURYLINK

NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY

SOUTHWEST GAS CORP.

- MAINTAIN MINIMUM 12" VERTICAL SEPERATION AT ALL PONTS OF CROSSING
- MAINTAIN MINIMUM 3' PARALLEL SEPERATION
- ANY EXCAVATION AT BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. N/A FIRST APPROVED DATE: _____

ON-SITE REVIEW ONLY

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-2080 UPDATE #3 AND UPDATES ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

PAUL F. FRITZ P.E. 16825

JULIE CLEAVER
VICE PRESIDENT, PLANNING & DESIGN

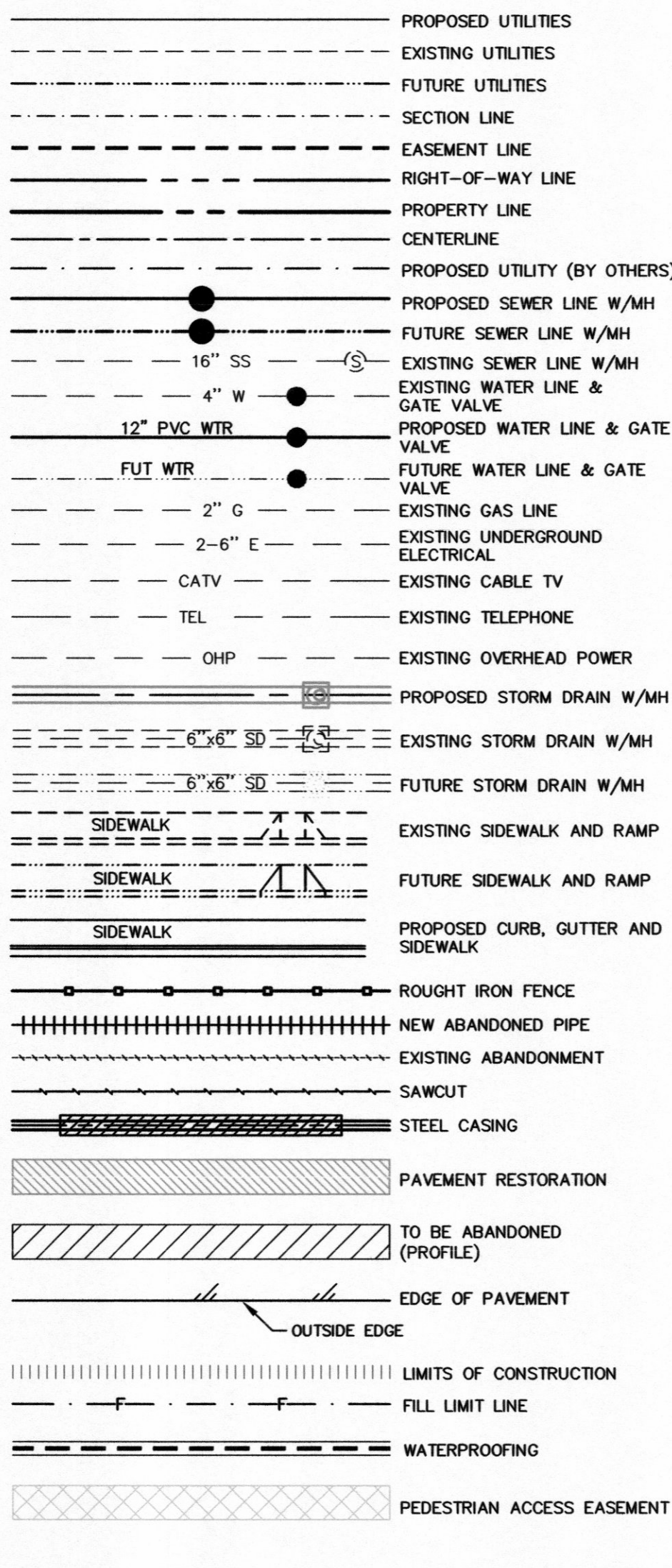
NORTH 01°53'54" WEST, BEING THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 29, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 115, PAGE 34 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

CLV BM#	ELEVATION	DESCRIPTION
0LV0029S	810.49342 (+)	BEING A RIVET AND PLATE IN TOP OF CURB ON THE EAST SIDE OF RAMPART @ CL OF SUMMERLIN PARKWAY.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007). BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88). PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUMS. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS IN CONJUNCTION WITH OLDER DRAWINGS.

RAMPART HOTEL AND CASINO PARKING GARAGE EXPANSION COVER SHEET		DRAWING C1.01 1 OF 8 SHTS	
9555 HILLWOOD DRIVE, STE.110 LAS VEGAS, NV 89134 T: 702.545.0355 F: 702.545.0987 TRUDevCo.com		PROJECT NO. 18-003 DESIGN: PFF DRAWN: PFF CHECK: PFF PLOT DATE: 08-13-18 PLOT TIME: 15:05:50	
X: V:\Projects\18-003\Civil\DWG\Production\018-003_C1.01_COVR.dwg Paul Fritz			
DATE: 08-13-18		NO. DATE DESCRIPTION	

LEGEND



QUANTITIES

SIZE	DESCRIPTION	PUBLIC	PRIVATE	QTY	UNIT
12"	PVC WATER	0	471	471	LF
6"	PVC WATER	0	20	20	LF
6"	GATE VALVE	0	1	1	EA
	FIRE HYDRANT RELOCATION	0	1	1	EA
18"	RCP SD	0	17	17	LF
36"x36"	CATCH BASIN	0	1	1	EA

EARTHWORK QUANTITIES

VOLUME SUMMARY			
AREA 44,694 SF	CUT 171 CY	FILL 398 CY	NET 218 CY

DOES NOT INCLUDE EXCAVATION FOR FOOTINGS OR UTILITY TRENCHING

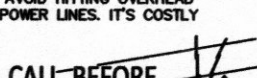
Call before you Dig
Avoid cutting underground utility lines. It's costly.

Call
811

OR
1-800-227-2600

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

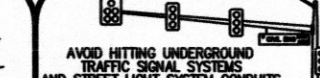
**AVOID HITTING OVERHEAD
POWER LINES. IT'S COSTLY.**



**CALL BEFORE
YOU DO
OVERHEAD**

1-702-227-2929

**AVOID HITTING UNDERGROUND
TRUNK, SIGNAL, SYSTEM
AND STREET LIGHT SYSTEM CONDUITS
IT'S COSTLY.**



**CALL BEFORE
YOU DO
UNDERGROUND**

**UnderGround
1-702-432-5300**

**FREEWAY AND ARTERIAL
SYSTEM OF TRANSPORTATION (FAST)**

BASIS OF BEARINGS

NORTH 01°53'54" WEST, BEING THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 29, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 115, PAGE 34 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

BENCHMARK

CLV BM#	ELEVATION	DESCRIPTION
OLV0029SE	810.49342 (M) 2659.09 (FT.)	BEING A RIVET AND PLATE IN TOP OF CURB ON THE EAST SIDE OF RAMPART @ CL OF SUMMERLIN PARKWAY.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007). BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88). PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUMS. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS IN CONJUNCTION WITH OLDER DRAWINGS.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. N/A FIRST APPROVED DATE: N/A

9555 HILLWOOD DRIVE, STE.110
LAS VEGAS, NV 89134

9555 HILLWOOD
LAS VEGAS, NV 8

F: 702.545.0987
TRUDevCo.com

003 C1.01 COVR.dwg

RAMPART HOTEL AND CASINO

PARKING GARAGE EXPANSION

PROJECT DATA SHEET

DRAWING
C1.02

2 OF 8 SHTS

- CITY OF LAS VEGAS SEWER NOTES**
1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS. CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
 2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS, ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
 3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
 4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
 5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
 6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" 'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
 7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS. WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
 8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
 9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED AND REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
 10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.
- REVISED 04/15/10

- LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES**
- LVVWD PROJECT # 126XXX**
1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
 2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS), THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
 3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
 4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
 5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
 6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
 7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
 8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
 9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
 10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
 11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
 12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
 13. TELEPHONE "CALL BEFORE YOU DIG" AT 811 OR 1-800-227-2600
 14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORMED STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR ON THE STREET SURFACE.
- ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ADJUTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.
15. NO LEAD COMPLIANCE NOTE: TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATERWORKS BRASS PRODUCTS PROPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD-FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE USED.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. N/A FIRST APPROVED DATE: N/A

- CITY OF LAS VEGAS GRADING NOTES**
1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
 2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
 3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
 4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
 5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
 6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:
- | | HORIZONTAL | VERTICAL | COMPACTION |
|---------------------------|------------|----------------|------------------|
| A. PAVEMENT AREA SUBGRADE | 0.1'± | +0.0' TO -0.1' | SEE SOILS REPORT |
| B. ENGINEERED FILL | 0.5'± | +0.1' TO -0.1' | SEE SOILS REPORT |
- COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE. COMPACTION SHALL COMPLY WITH THE REQUIREMENTS OF THE ENGINEER.
7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
 8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
 9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
 10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, SUCH ITEM SHALL BE PROVIDED, AS DIRECTED BY THE CITY ENGINEER, AT NO EXPENSE TO THE CITY OF LAS VEGAS. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.
- REVISED 4/15/10

- STORMWATER RUNOFF MANAGEMENT**
1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIAL SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
 2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
 3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI00000, SECTION III.A.5.
 4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPs WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI00000, SECTION III.A.12.
 5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

FLOOD ZONE NOTE

NO PORTION OF THE PROJECT SITE FALLS WITHIN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA. THE SITE IS LOCATED ON PANEL 32003G2145F, DATED NOVEMBER 16, 2011. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE X AND NOT LOCATED WITHIN A FEMA DESIGNATED 100-YEAR ZONE A OR SPECIAL FLOOD HAZARD AREA.

DEVIATION FROM STANDARD

NONE

- CITY OF LAS VEGAS TRAFFIC NOTES**
1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
 2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
 3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCED WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
 4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
 5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL UTILIZE TYPE X1 RETROREFLECTIVE SHEETING IN ACCORDANCE WITH USSCCA 627 AND 716 AND SHALL HAVE AN ANTI-GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPLEMENT TO, AND OF THE SAME MANUFACTURER AS THE RETROREFLECTIVE SHEETING TO WHICH IT IS APPLIED. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
 7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
 8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
 9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
 10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO IN OR AROUND THE WORK ZONE. ALL NEW TRAFFIC SIGNS SHALL BE INSTALLED AT THE REQUEST OF THE CITY TRAFFIC ENGINEER. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR INSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT-OF-WAY.
 11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
 12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
 13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
 14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
 15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.
- REVISED 7/3/13

- CITY OF LAS VEGAS STREETLIGHT NOTES**
1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION (USS), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA"(USD), LATEST REVISION.
 2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC AND CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
 3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 G.03.01 OF THE USS.
 4. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN #8 AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 G.02.01 OF THE USS PRIOR TO FINAL INSPECTION.
 5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN COMPLIANCE WITH THE USD NO. 320A WHEN POLE IS INSTALLED BEHIND SIDEWALK, AND SHALL AT NO TIME COMPLETELY ENCLOSE THE STREET LIGHTING POLE.
 6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TRAFFIC ENGINEERING DIVISION PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
 7. SERVICE POINTS SHALL BE COORDINATED WITH NV ENERGY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE CIVIL PLANS.
 8. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREETLIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED BEFORE STREETLIGHT BASES ARE INSTALLED AT NO EXPENSE TO THE CITY OF LAS VEGAS.
 9. THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.
- REVISED JUNE 28, 2016 (LD VERSION)

- LAS VEGAS FIRE AND RESCUE GENERAL NOTES**
1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6325 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
 2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S - APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
 3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. [IFC SECTION 105.7.12]
 4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [IFC SECTION 3310, SECTION 3312]
 5. TO IDENTIFY FIRE HYDRANT LOCATIONS, CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF STREET ADJACENT TO THE FIRE HYDRANTS [IFC SECTION 507.5.7.3]
 6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [IFC SECTION 106.3]
 7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.M.A. APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [IFC SECTION 507.2.1]
 8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. [IFC SECTION 507]
 9. PRIVATE FIRE HYDRANTS SHALL BE PAINTED RED. [IFC SECTION 507]
 10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC SECTION 507]
 11. FIRE HYDRANTS SPACING SHALL BE AS FOLLOWS: [IFC SECTION C102]
 - RESIDENTIAL - 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
 - COMMERCIAL - 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
 12. WHERE NEW WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WATER FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES. FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM 1,000 FOOT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FEET ON AN ALTERNATING BASIS. [IFC SECTION C102.8]
 13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FEET OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
 14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FEET OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [IFC SECTION C102.12]
 15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC SECTION C102.4]
 16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FEET, AS MEASURED BY AN APPROVED ROUTE. [IFC SECTION C102.7]
 17. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [IFC SECTION C102.6]
 18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [IFC SECTION C104]
 19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. [IFC SECTION 503.2.3]
 20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FEET PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. [IFC SECTION 503.2.7, SECTION 503.2.8]
 21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FEET OUTSIDE AND 28 FEET INSIDE TURNING RADIUS. [IFC 503.2.4]
 22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FEET 6 INCHES. [IFC SECTION 503.2.1]
 23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW LINE TO FLOW LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW LINE TO FLOW LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24 FT WIDE, FLOW LINE TO FLOW LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL NOT BE LESS THAN 24 FT. [IFC SECTION 503.1.1.1]
 24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL FO THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [IFC SECTION 503.1.1]
 25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [IFC SECTION 503.1.2]
 26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [IFC SECTION 503.2.5]
 27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE IN STALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. [IFC SECTION 503.3]
 28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE IFC SECTION 503.6 AND IFC APPENDIX M.

LAS VEGAS FIRE DEPARTMENT

DATE

REVISED MARCH 1, 2016

- CITY OF LAS VEGAS GENERAL NOTES:**
1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE, THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION, THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA, AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
 2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
 3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
 4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
 5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
 6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
 7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
 8. AC PAVEMENT TO BE ONE-HALF INCH (1/2") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
 9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
 10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
 11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
 12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (ANGLE ENGINEERING, PROJECT #77004-1 DATE: OCTOBER 21, 2015) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
 13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
 14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
 15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.
 16. WALL NOTES:
 17. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
 18. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
 19. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
 20. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
 21. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC., THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
 22. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET. THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
 23. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
 24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.
- REVISED 02/03/15

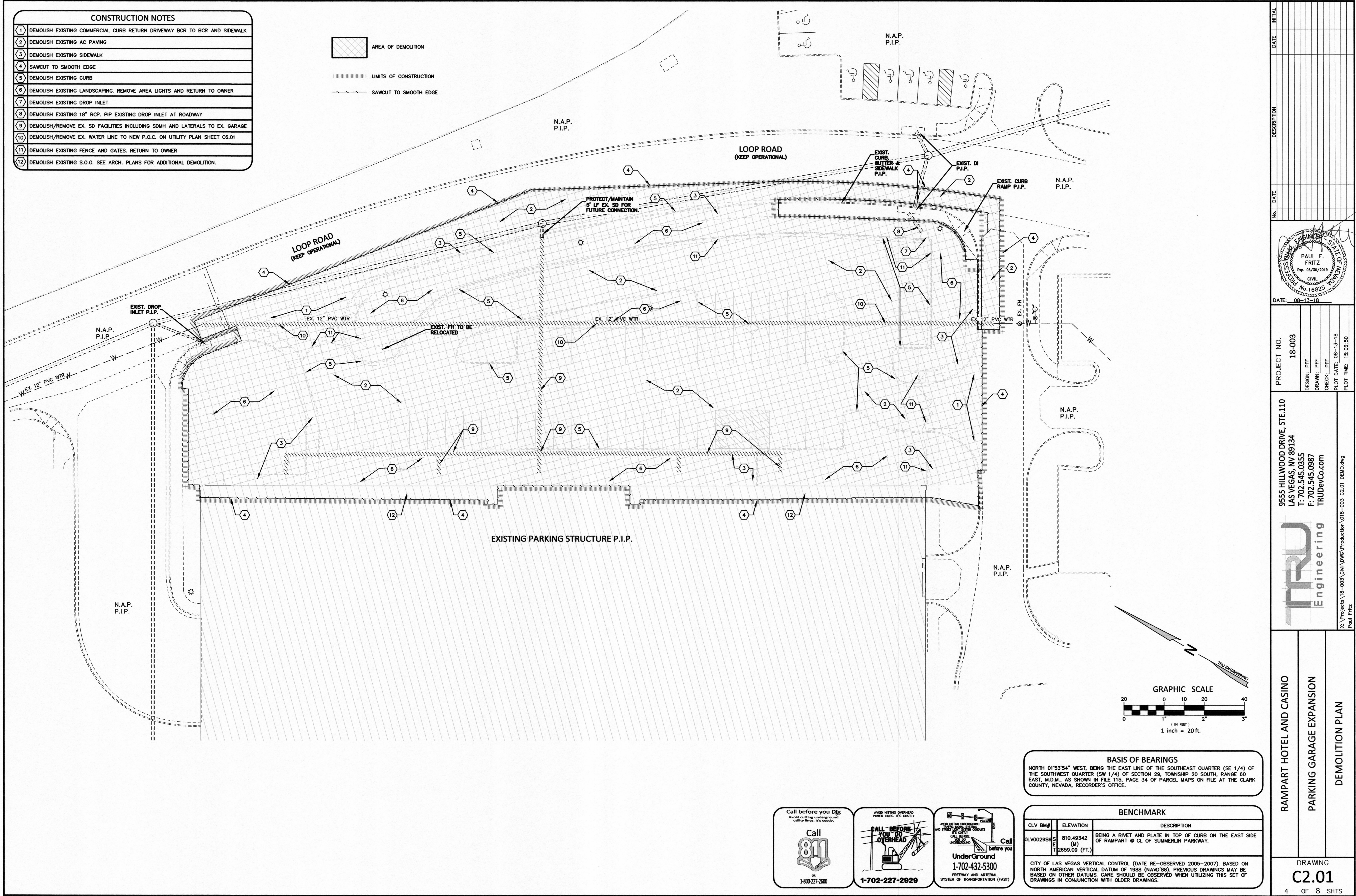
BASIS OF BEARINGS

NORTH 01°53'54" WEST, BEING THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 29, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 115, PAGE 34 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

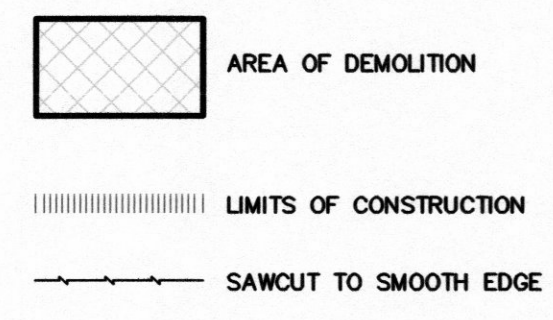
BENCHMARK		
CLV BM#	ELEVATION	DESCRIPTION
OLV002958E	810.49342 ±2659.09 (FT.)	BEING A RIVET AND PLATE IN TOP OF CURB ON THE EAST SIDE OF RAMPART @ CL. OF SUMMERLIN PARKWAY.
CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007), BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88). PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS IN CONJUNCTION WITH OLDER DRAWINGS.		

PROJECT NO.	18-003
DESIGN: PFF	DRAWN: PFF
CHECK: PFF	PLOT DATE: 08-13-18
PLOT TIME: 15:06:17	
9555 HILLWOOD DRIVE, STE.110 LAS VEGAS, NV 89134 T: 702.545.0355 F: 702.545.0987 TRUDevCo.com	
Engineering	
X:\Projects\18-003\Civil\DWG\Production\18-003 C1.01 CORR.dwg Paul Fritz	
DRAWING C1.03 3 OF 8 SHTS	

RAMPART HOTEL AND CASINO
PARKING GARAGE EXPANSION
GENERAL NOTES SHEET



- CONSTRUCTION NOTES
- 1 DEMOLISH EXISTING COMMERCIAL CURB RETURN DRIVEWAY BOR TO BOR AND SIDEWALK
 - 2 DEMOLISH EXISTING AC PAVING
 - 3 DEMOLISH EXISTING SIDEWALK
 - 4 SAWCUT TO SMOOTH EDGE
 - 5 DEMOLISH EXISTING CURB
 - 6 DEMOLISH EXISTING LANDSCAPING. REMOVE AREA LIGHTS AND RETURN TO OWNER
 - 7 DEMOLISH EXISTING DROP INLET
 - 8 DEMOLISH EXISTING 18" RCP. PIP EXISTING DROP INLET AT ROADWAY
 - 9 DEMOLISH/REMOVE EX. SD FACILITIES INCLUDING SDMH AND LATERALS TO EX. GARAGE
 - 10 DEMOLISH/REMOVE EX. WATER LINE TO NEW P.O.C. ON UTILITY PLAN SHEET C6.01
 - 11 DEMOLISH EXISTING FENCE AND GATES. RETURN TO OWNER
 - 12 DEMOLISH EXISTING S.O.G. SEE ARCH. PLANS FOR ADDITIONAL DEMOLITION.



INITIAL	
DATE	
DESCRIPTION	
No.	
DATE	

PROJECT NO. 18-003

DESIGN: PFF

DRAWN: PFF

CHECK: PFF

PLOT DATE: 08-13-18

PLOT TIME: 15:06:50

9555 HILLWOOD DRIVE, STE.110
LAS VEGAS, NV 89134
T: 702.545.0355
F: 702.545.0987
TRUdevCo.com

tru
Engineering

X:\Projects\18-003\Civil\DWG\Production\018-003 C2.01 DEMO.dwg
Paul Fritz

RAMPART HOTEL AND CASINO

PARKING GARAGE EXPANSION

DEMOLITION PLAN

DRAWING
C2.01
4 OF 8 SHTS

BASIS OF BEARINGS
NORTH 01°53'54" WEST, BEING THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 29, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 115, PAGE 34 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

BENCHMARK		
CLV BM#	ELEVATION	DESCRIPTION
OLV002956	810.48342 (M) 2659.09 (FT.)	BEING A RIVET AND PLATE IN TOP OF CURB ON THE EAST SIDE OF RAMPART @ CL. OF SUMMERLIN PARKWAY.
CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007). BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88). PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUMS. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS IN CONJUNCTION WITH OLDER DRAWINGS.		

Call before you Dig
Avoid hitting overhead power lines. It's costly.

Call 811
OR
1-800-227-2600

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

CALL BEFORE YOU DIG OVERHEAD

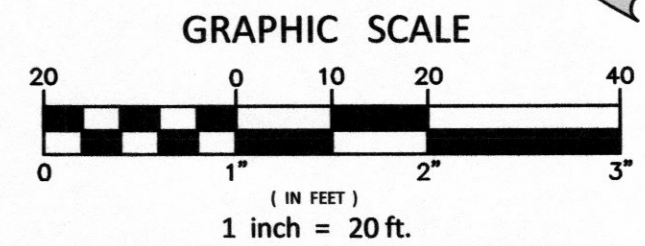
1-702-227-2929

AVOID HITTING UNDERGROUND UTILITY LINES. IT'S COSTLY. CALL BEFORE YOU DIG UNDERGROUND.

UnderGround
1-702-432-5300

FREEMAN AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

1	INSTALL "L" CURB AND GUTTER PER USDOCA DWG. NO. 216
2	INSTALL 4" THICK CONCRETE SIDEWALK/SLAB-ON-GRADE PER USDOCA DWG. NO. 234. PLANS FOR WIDTH
3	INSTALL 3" AC OVER 4" TYPE II AGG. BASE PAVEMENT SECTION (CAR) PER DETAIL 1 SHEET C8.01 AND GEOTECHNICAL REPORT
4	INSTALL 3" AC OVER 4" TYPE II AGG. BASE PAVEMENT SECTION (TRUCK) PER DETAIL 1 SHEET C8.01 AND GEOTECHNICAL REPORT
5	INSTALL 36"x36" PRECAST CATCH BASIN SD INLET
6	INSTALL 18" RCP SD PIPE
7	SAWTOOTH TO SMOOTH EDGE AND FEATHER INTO EXISTING AC PAVING PER USDOCA DWG. NOS. 500.3 AND 500.5
8	MAINTAIN POSITIVE SLOPE IN "L" CURB ALONG COLUMNS
9	INSTALL 6" DEEP LEAN MIX CONC. BELOW BOTTOM OF FOOTING TO MITIGATE SURCHARGE ON DROP INLET. 8" WIDE ON SIDES FACING INLET
10	INSTALL 8" KEYSTONE BLOCK, MAX. 3 COURSES TO PROVIDE 3:1 MAX. SOPE IN LANDSCAPE AREA BETWEEN GARAGE AND SIDEWALK
11	LANDSCAPE AREA SEE LANDSCAPE PLANS
12	INSTALL 3' WIDE CONC. VALLEY GUTTER PER DETAIL 3 & 4 SHEET C8.01



ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE
ENTITLED "GEOTECHNICAL EVALUATION PROPOSED SUMMERLIN RESORT SEC RAMPART BLVD. &
SUMMERLIN PKWY. LAS VEGAS, NEVADA"

PROJECT NO.: 4127JC028, DATED MARCH 14, 1997
UPDATE LETTER OF APPLICABILITY DATED MAY 24, 2018

PREPARED BY: WESTERN TECHNOLOGIES, INC.
6813 WEST POST ROAD
LAS VEGAS, NV 89118
PHONE NO. (702) 798-8050
FAX NO. (702) 798-7664

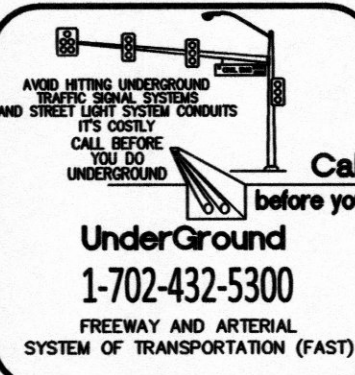
GEOLOGICAL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED
PROFESSIONAL GEOLOGICAL ENGINEER.

EX. PARKING GARAGE ROOF DRAINS REROUTED TO BELOW FIRST ELEVATED LEVEL IN NEW PARKING EXPANSION. SEE PLUMBING PLANS FOR ROUTING AND DROP DOWN PIPE. OVERFLOW DRAINS TO REMAIN AT EXISTING LOCATIONS. PROPOSED GARAGE EXPANSION ROOF DRAINS SHALL DISCHARGE AT SE CORNER OF GARAGE INTO PROPOSED 3'x3' CATCH BASIN INLET. SEE PLUMBING PLANS FOR ROUTING, DROP DOWN PIPE AND POCs.

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16 2011. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE X DEFINED AS BEING OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AND NOT LOCATED WITHIN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA.

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 DS-2080

PAUL F. FRITZ, PE NO. 16825 DATE



NORTH 01°53'54" WEST, BEING THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 29, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 115, PAGE 34 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

CLV BM#	ELEVATION	DESCRIPTION
OLV0029S6	810.49342 (M) 2659.09 (FT.)	BEING A RIVET AND PLATE IN TOP OF CURB ON THE EAST SIDE OF RAMPART @ CL OF SUMMERLIN PARKWAY.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007). BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88). PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUMS. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS IN CONJUNCTION WITH OLDER DRAWINGS.

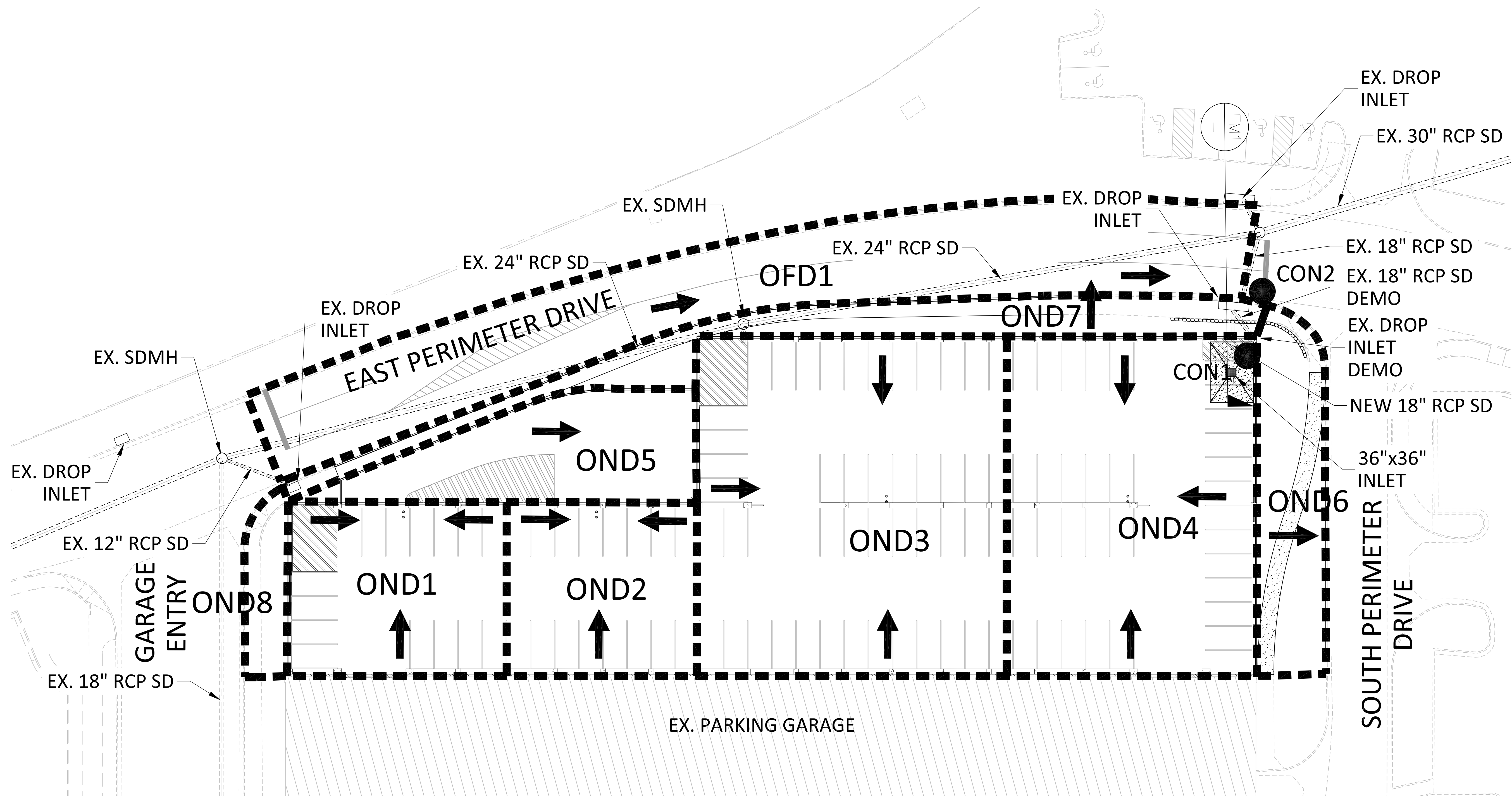


TRL
Engineering

GRADING PLAN

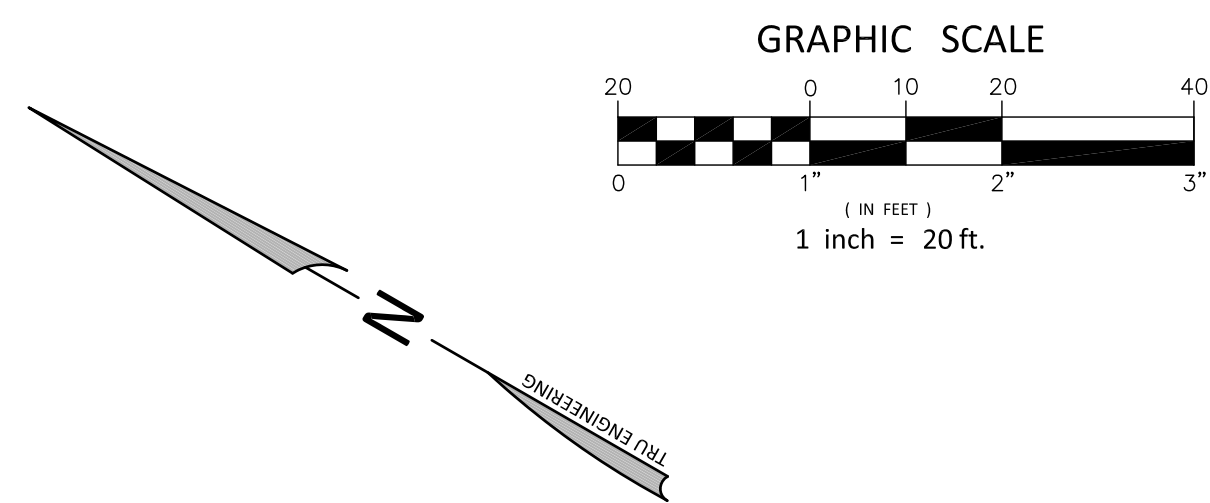
DRAWING
C4.01

6 OF 8 SHTS



GARAGE FLOOR ELEVATIONS:

GROUND LEVEL = 2701.05 - 2693.78
FIRST ELEVATED LEVEL = 2711.50
SECOND ELEVATED LEVEL = 2722.00
UPPER DECK/ROOF =2733.50



DRAINAGE AREA SUMMARY TABLE			
BASIN ID	AREA (ACRES)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)
OND1	0.1221	0.258	0.430
OND2	0.1055	0.223	0.372
OND3	0.3367	0.713	1.187
OND4	0.2713	0.574	0.956
OND5	0.0984	0.208	0.347
OND6	0.0773	0.164	0.272
OND7	0.0976	0.206	0.344
OND8	0.0236	0.050	0.083
OFD1	0.2858	0.604	1.008

CONCENTRATION POINT SUMMARY TABLE		
CONCENTRATION POINT	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)
CON1	2	4
CON2	3	5

PROJECT NO. 18-003	DESIGN: PFF DRAWN: PFF CHECK: PFF PLOT DATE: 08-13-18 PLOT TIME: 12:52:13	DATE: 08-13-18	No.	DATE	INITIAL					
DATE: 08-13-18										
PROJECT NO. 18-003										
DESIGN: PFF DRAWN: PFF CHECK: PFF PLOT DATE: 08-13-18 PLOT TIME: 12:52:13										
9555 HILLWOOD DRIVE, STE.110 LAS VEGAS, NV 89134 T: 702.545.0355 F: 702.545.0987 TRUDevCo.com										
X:\Projects\18-003\Civil\Admin\YDS Update\DWG\Fig.9 DEV BASIN MAP.dwg Paul Fritz										
RAMPART HOTEL AND CASINO		DRAWING		FIG 9						
PARKING GARAGE EXPANSION		1		OF 1 SHTS						
DEVELOPED BASIN MAP ROOF DECK LEVEL										