CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: June 11, 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: **Elysian Renaissance**			**COPIES TO:** GCW Engineers / Surveyors
Cross Streets:	SEC of Alta Drive & Rampart Boulevard			The Calida Group
File Number:	F:\Depot\DSMemos\DS4957B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	138-32-723-003			CCRFCD
Zoning Action:	SDR-70293			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/26/2018 & 3/26/2018	4/13/2018	Not Approved	$400.00	493677: $400
2nd Submittal	5/28/2018	6/11/2018	See Comments Below	$400.00	496253: $400
			TOTAL FEES (LDDRS):	**$800.00**	**----**

REMARKS:

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

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

1. **Sheet GP-2 & Sheet GP-4**:

   It appears that offsite grading is proposed in the parcel adjacent to the west. Obtain a notarized letter of permission for grading from the adjacent parcel owner prior to the final acceptance of the improvement plans.

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/32

AREA L-32

TRANSACTION REPORT

JUN/12/2018/TUE 11:42 AM

FAX(TX)

#	DATE	START T.	RECEIVER	COM.TIME	PAGE	TYPE/NOTE	FILE
001	JUN/12	11:42AM	7028042299	0:00:23	1	MEMORY OK SG3	1465

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**			**DATE:** June 11, 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: **Elysian Renaissance**		**COPIES TO:** GCW Engineers / Surveyors
Cross Streets:	SEC of Alta Drive & Rampart Boulevard		The Calida Group
File Number:	F:\Depot\DSMemos\DS4957B.doc		Bart Anderson, P.E., DevCo
Parcel Number:	138-32-723-003		CCRFCD
Zoning Action:	SDR-70293		
FEMA Flood Zone	YES	NO X	
Proposed Storm Drain	YES	NO X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/26/2018 & 3/26/2018	4/13/2018	Not Approved	$400.00	493677: $400
2nd Submittal	5/28/2018	6/11/2018	See Comments Below	$400.00	496253: $400
			TOTAL FEES (LDDRS):	**$800.00**	

REMARKS:

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

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

1. **Sheet GP-2 & Sheet GP-4:**

   It appears that offsite grading is proposed in the parcel adjacent to the west. Obtain a notarized letter of permission for grading from the adjacent parcel owner prior to the final acceptance of the improvement plans.

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/32
AREA L-32

GCW
ENGINEERS \ SURVEYORS

840-060

June 12, 2018

Ms. Linda Maynard and Mr. John Alabado
City Planning and Development
City of Las Vegas
333 North Rancho Drive
Las Vegas, Nevada 89106

RE: Elysian at Renaissance

Dear Ms. Maynard and Mr. Alabado:

We are currently preparing civil improvement plans for the Renaissance project located south of Alta Drive and east of Rampart Blvd., in the northwesterly portion of Boca Park (APN: 138-32-312-013). The owner intends to develop this site with a three-lot commercial subdivision. At this time, the project will create super-pads, driveway access and utilities to service the 3-parcels. GCW Engineering has submitted and received comments for the Technical Drainage Study (DS-4991-A). Comment #2 to the Technical Drainage Study references the need for an approval of the grade differential in excess of 2-feet from the existing ground surface.

In the early 2000's, this site was rough graded as part of the overall Boca Park Commercial Subdivision for the development of several commercial buildings which were never constructed. Parcel Map 122-11 created Lot 1 (a 7.8 acre parcel) that was purchased by the R A Southeast Land Company for the development of the proposed commercial subdivision described above. The site must be re-graded to conform to the new lot layout. Most of the grading differential is less than 2-ft, but there are a few isolated areas where the differential is over 2-ft as shown on the accompanying Cut-Fill Map.

We have worked diligently to minimize the impact of our project to this site and the surrounding area. We would ask for your support and approval of our grading plan included with this package.

Thank you for your cooperation.

Cordially,

GCW, INC.

Todd Kelley, PE
Project Manager

Attachments

PLANS APPROVED
PLANNING
Dept. of Planning
City of Las Vegas, Nevada
2' GRADE DIFFERENCE ONLY
LHM JUN 15 2018

Conforms to the minimum requirement of LVMC Title 19; applicable Master Plan Development standards and/or Conditions of Approval. Make No Change Without Approval. Plan is Not a Permit to Violate Any Ordinance.

1555 South Rainbow Boulevard
Las Vegas, Nevada 89146
O 702.804.2000
F 702.804.2299
info@gcwengineering.com
gcwengineering.com

TECHNICAL DRAINAGE STUDY
FOR
ELYSIAN RENAISSANCE

894-002

MARCH 2018

GCW
ENGINEERS \ SURVEYORS

Prepared for:

The Calida Group
10777 W. Twain Avenue
Las Vegas, NV 89135
(702) 947-2000

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Elysian Renaissance Date: March 26, 2018

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

East/West: Alta Drive

b) Section: 32 Township: 20S Range: 60E

c) APN : 138-32-723-003

Name of Owner: The Calida Group

Telephone No.: 702-947-2000 Fax No.: 702-925-5506 E-Mail Address: jnelson@thecalidagroup.com

Address: 10777 W. Twain Avenue Suite 115 Las Vegas, NV 89135

Contact Person-Name: Todd Kelley, P.E. **Telephone No.:** (702) 804-2144

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

Firm: GCW

Address: 1555 S. Rainbow Blvd Las Vegas, NV 89146

Type of Land Development/Land Disturbance Process:

	Rezoning		Subdivision Map		Clearing and Grading Only
	Parcel Map		Planned Unit Development	X	Other (Please specify below)
	Large Parcel Map		Building Permit		Apartment Homes

1. Total Owned Land Area: At Site: 15.6 ac Being Developed/Disturbed: 15.6 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.): Residential
5. Approximate upstream land area which drains to the subject site: 6 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Boca Park North Phase III @ Peccole Town Center DS 2799 & Peccole Town Center DS2248
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: 60" RCP under Alta Drive and surface flow to Alta Drive
8. Briefly describe your proposed schedule for the subject project: ASAP

Engineer's Seal

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

***New Required Field**

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

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Elysian Renaissance	Map ID:
Firm Name: GCW	Engineer: Todd Kelley
Address: 1555 S. Rainbow Boulevard	
City: Las Vegas	State: NV Zip: 89145
Phone Number: (702) 804-2144	Fax Number: (702) 804-2299
Property Owner: The Calida Group	
Address: 10777 W. Twain Ave Suite 115	
City: Las Vegas	State: NV Zip: 89146

Reviewed By:	Date Received:	Date Accepted for Review:

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

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

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

I. GENERAL REQUIREMENT

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

II. MAPS AND EXHIBITS

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
	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.
X		Right-of-way lines and widths, existing and proposed.
X		Existing improvements and their elevations.
X		Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
X		Concentration points and drainage flow direction with 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.
X		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.
X		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.
X		Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
X		Building and/or lot numbers.
	NA	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
X		Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
	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.
	NA	Calculation for impervious area for parking lots and LIDs (if required).

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
	X	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 x v $\leq$ 8. Q_{10} d x v $\leq$ 6 and 12 foot dry lane for rights-of-way $\geq$ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
X		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.)
X		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.
X		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)

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	
	NA	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.
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.)

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.
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.)
	X	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.
	X	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	
	NA	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.
	NA	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.
	NA	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.
X		Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

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

Table of Contents

LIST OF APPENDICES **2**

1. INTRODUCTION **3**

1.1 PROJECT OVERVIEW & STUDY PURPOSE 3
1.2 SITE DESCRIPTION & LOCATION 3
1.3 FEMA FLOOD ZONE DESIGNATION 3
1.4 CCRFCD FACILITY INFORMATION 3
1.5 REFERENCE STUDIES 4

2. METHODOLOGY **5**

2.1 COMPLIANCE 5
2.2 HYDROLOGIC MODELING 5

3. EXISTING CONDITIONS DRAINAGE **6**

3.1 ONSITE AND OFFSITE EXISTING CONDITIONS 6

4. INTERIM CONDITIONS DRAINAGE **7**

4.1 ONSITE INTERIM CONDITIONS 7
4.2 OFFSITE INTERIM CONDITIONS 8

5. DEVELOPED CONDITIONS DRAINAGE **8**

6. HYDRAULICS **8**

6.1 DROP INLET CALCULATIONS 8
6.2 NORMAL DEPTH CALCULATIONS 9
6.3 WSPG 10

7. CONCLUSIONS & RECOMMENDATIONS **11**

8. REFERENCES **11**

LIST OF APPENDICES

Appendix A Figures

Figure 1 – Vicinity Map
Figure 2 – Location Map
Figure 3 – Existing Conditions Drainage Map
Figure 4 – Interim Conditions Drainage Map
Figure 5 – Developed Conditions Drainage Map

Appendix B Supporting Documents

Assessor's Parcel Map
FEMA FIRM Map
2008 MPU CCRFCD Hydrologic Map
2013 MPU CCRFCD Facilities Map
Custom Soils Report

Appendix C Hydrologic Analysis

Supporting Excerpts from HCDDM
Runoff Curve Number Calculations
Standard Form 4
Existing & Developed Conditions HEC-1 Analysis

Appendix D Hydraulics

Drop Inlet Calculations
Normal Depth & Weir Flow Calculations
WSPG

Appendix E Reference Material

Technical Drainage Study for Boca Park Phase III
Technical Drainage Study for Village at Queensridge
Technical Drainage Study for Queens Borrough Culvert
Technical Drainage Study for Peccole Town Center

Appendix F Grading Plans and Details

1. INTRODUCTION

1.1 Project Overview & Study Purpose

The purpose of this technical drainage study submittal for *Elysian Renaissance* is to address grading/drainage design of the proposed 15.6-acre residential site. The subject site is in the western portion of the Las Vegas Valley in the City of Las Vegas, Nevada.

This Technical Drainage Study was prepared in accordance with criteria specified in the *Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual* (latest update), which is referred to in this document as the "*Drainage Manual*". All pertinent reference material and calculations is presented in the Appendix of this report.

Waters of the United States. Many of the dry streams of the southwestern United States have been found to be jurisdictional Waters of the United States (WOUS) which requires special permitting from the United States Army Corps of Engineers (USACE) to commence grading/construction. The purpose of this Technical Drainage Study was only to provide concurrence with local drainage criteria as stated above. The scope of this Technical Drainage Study does not include an assessment of Jurisdictional WOUS for the subject property and therefore does not address special permitting that may be required by the USACE.

1.2 Site Description & Location

The subject site is specifically located in the north half (N1/2) of the southeast Quarter (SE1/4) of Section 32, Township 20 South, Range 60 East, M.D.B. & M., Clark County, Nevada. The subject site is bound on the north by Alta Drive which is an 80-foot ROW fully developed. It is bound on the east by an existing residential subdivision and on the south and west by commercial property.

See *Figure 1, Vicinity Map*, and *Figure 2*, *Location Map*.

1.3 FEMA Flood Zone Designation

The subject site is not located within a Federal Emergency Management Agency Special Flood Hazard Area Zone A. According to the FEMA FIRM Map Index, Panel 32003C2145F, dated November 16, 2011, the subject site is located within "Zone X" which is described as "Areas determined to be outside the 0.2% annual chance floodplain". The FIRM Map Index Page has been annotated and included in the appendix of this report.

1.4 CCRFCD Facility Information

The subject site proposes to discharge runoff into an existing 60" RCP under Alta Drive that outlets into Regional Facility APSO 0000 (dual 12'x12' RCB's). Please refer to Figure F-30, from the 2013 CCRFCD Las Vegas Valley Flood Control Master Plan Update (MPU) for facility location and description. The subject study will be submitted to the CCRFCD for approval.

1.5 Reference Studies

There were several approved drainage studies on file for developments near the subject site. Some studies were reviewed for general, while some were cited for specific hydrologic/hydraulic data. We generally concur with all data cited from the following studies unless stated otherwise:

1. **Technical Drainage Study for Boca Park North (Phase III) at Peccole Town Center, By; VTN, December 12, 2000 DS2799**

The Technical Drainage Study (TDS) for Boca Park North (Phase III) at Peccole Town Center was prepared for a 42-acre commercial site on the southeast corner of Rampart Boulevard and Alta Drive - which includes the subject site parcel. This study was reviewed to help evaluate offsite hydrologic conditions and reference existing storm drain runoff.

2. **Technical Drainage Study for The Village at Queensridge – Update #5, By; GC Wallace, April 2010, DS4018**

The Technical Drainage Study (TDS) for The Village at Queensridge was prepared for a commercial site on the northeast corner of Rampart Boulevard and Alta Drive. This study was reviewed to reference surface runoff on the north side of Alta Drive.

3. **Technical Drainage Study for Queens Borrough Culvert, By; GC Wallace Inc., October 2004, DS3674**

The Technical Drainage Study for Queens Borrough Culvert was prepared for the hydrologic and hydraulic analysis of the Regional Drainage Facility APSO 0000. This study referenced the HGL in the 60" RCP storm drain under Alta Drive.

4. **Technical Drainage Study for Peccole Town Center, By; VTN., June 1998, DS2248**

The Technical Drainage Study for Peccole Town Center was prepared for the hydrologic and hydraulic analysis of a 42-acre commercial site on the southeast corner of Rampart Boulevard and Alta Drive - which includes the subject site. This study was referenced for runoff in Rampart Boulevard.

2. METHODOLOGY

2.1 Compliance

The methodologies utilized in the preparation of this study comply with the CCRFCD Hydrologic Criteria and *Drainage Design Manual* (latest update).

2.2 Hydrologic Modeling

Modeling: The SCS Unit Hydrograph Method (SCS Method) was utilized to determine peak flow rates. The SCS Method utilizes precipitation, drainage area, curve number and lag time parameters to determine peak flow rates. The SCS Method routine within the U.S. Army Corp of Engineers ***HEC-1*** was utilized to model the drainage sub-basins analyzed by this study.

Precipitation: Rainfall depths were calculated based on the CCRFCD Drainage Manual Criteria. This site is not located within the McCarran airport rainfall area. The rainfall depths of 1.6" and 2.86" in the 10- and 100-year, 6-hour storm events respectively were determined using Figures 503 & 506 from the CCRFCD Manual (see appendix). In the hydrologic HEC-1 model, there were no losses allowed for Depth Area.

Curve Number: The Hydrologic Soils Group (HSG) for the subject site was determined from the USDA Soils Conservation Service to be within Group D (see appendix). A Curve Number Determination spreadsheet is in the appendix.

Lag Time: The lag time is defined as the time measured from the center of mass of effective rainfall to the time to peak of the outflow hydrograph. The lag time is related to the time of concentration as 0.6 times the time of concentration. The time of concentration is defined as the time required for runoff to flow from the hydraulically most distant point of a sub-basin to the outlet point of the sub-basin. Standard Form 4, as outlined in the *Drainage Manual*, was utilized to determine the lag times for sub-basins modeled. A copy of lag time computations is included in the appendix. The model included no losses in the hydrograph due to translation (no routing reaches).

It is noted that the *Drainage Manual* limits the lag time for steep and small watersheds. For undeveloped areas, the limit is 0.1 hours, while for developed areas, the limit is 0.05 hours. In the subject study, the limit was met and hence the times of concentration were shortened only to the limit allowed by the *Drainage Manual* for several basins studied.

3. EXISTING CONDITIONS DRAINAGE

Under existing drainage conditions, the subject site and surrounding offsite areas are analyzed in current conditions.

3.1 Onsite and Offsite Existing Conditions

Existing basins and/or combination points are shown on Figure 3 *Existing Conditions Drainage Map* - along with runoff results. Existing conditions are described as follows:

Offsite basins were determined by analyzing existing topography along with the Bocca Park Basin map (see annotated excerpts from the Bocca Park study in Appendix E). The existing storm drain system as shown on Figure 3 was designed to intercept most of the runoff generated from the offsite areas surrounding the subject site – except for the following:

Rampart Boulevard: Runoff in Rampart Boulevard was estimated from the Peccole Town Center study. Per the attached annotated excerpts, runoff in Rampart Boulevard just south of Alta Drive is estimated to be 2/47 cfs in the 10yr/100yr storm events. These results include runoff intercepted by drop inlets along Rampart Boulevard. It is expected that a portion of this runoff will flow east down Alta Drive. For conservative results, the subject study analyzed Alta Drive to include runoff from the east half of Rampart Boulevard (1/24 cfs at point RAM). See annotated excerpts from the Peccole Town Center study in Appendix E.

Alta Drive: Basin OFF1E is part of an existing developed commercial site. Runoff from basin OFF1E combines with OFF2E (which has been rough graded) at point ECP1. Runoff at ECP1 discharges onto the subject site and combines with onsite basin ON1E at point ECP2. Runoff from basins ON3E and ON4E combine and flow north within an existing concrete lined channel (adjacent to the residential site on the east) to point ECP3. Runoff from points ECP2 and ECP3 combine with point RAM along with basins OFF3E and ALT at point ALTS. Runoff at point ALTS is runoff generated on the southern half of Alta Drive.

Basin ON2E slopes to the southeast and discharges runoff onto the existing parking lot as shown on Figure 3.

Please note that there are existing drop inlets throughout the subject site, however no runoff interception was calculated. Although the site is partially rough graded, there is no flow path to direct runoff to these inlets. In addition, since the area is rough graded it is likely that these inlets would become clogged during a 100-year storm event. Therefore, the existing analysis assumed a worst-case scenario that these onsite inlets become clogged.

4. INTERIM CONDITIONS DRAINAGE

Under interim conditions, the onsite area becomes developed, and the offsite areas remain in existing conditions. This scenario was found to be the worst-case condition.

4.1 Onsite Interim Conditions

Referring to Figure 4, *Interim Conditions Drainage Map,* the subject site is divided into multiple drainage basins. In addition, there is an existing storm drain system that has been partially revised to accommodate the site layout. The existing storm drain system is shown on Figure 3 and the revised system is shown on Figure 4. Existing storm drain runoff was referenced from the Bocca Park study (see annotated excerpts in the appendix). The basins and storm drain system with a 100-year storm event are described as follows:

Storm drain section P-7 (see annotated excerpts from the Bocca Park Study in Appendix E) on the south side of the subject site conveys 89 cfs. Proposed Inlet 1 was designed to intercept 2 cfs of the 5 cfs generated from Basin ON1D at point D1 into the storm drain system. This will total 91 cfs in the storm drain system while the remaining 3 cfs at D2 will continue north in a proposed valley gutter. Existing Inlet 2 was designed to intercept runoff from Basin ON9D into the storm drain system. Since Basin ON9D from the HEC-1 generates negligible runoff, Basin I from the Bocca Park Storm CAD model was referenced at this inlet - which generates 1 cfs. Just north of Inlet 2 is proposed Inlet 2A. Runoff at Inlet 2A is generated by point D2 plus runoff from basin ON2DA (5 cfs) totaling 8 cfs at point D3. Inlet 2A was designed to intercept 4 cfs of the 8 cfs into the storm drain system - totaling 96 cfs (91 cfs + 1 cfs + 4 cfs) into the storm drain system. The remaining surface runoff at point D4 (4 cfs) continues north in a proposed valley gutter. Basin ON2DB generates 4 cfs and combines with point D4 totaling 8 cfs at point D5. Basin ON2DC generates 2 cfs where 1 cfs is intercepted into the storm drain system by Inlet 3A - leaving 1 cfs at point D6. Points D5 and D6 combine at a low point totaling 9 cfs which is intercepted into the storm drain by sump Inlet 3. The total runoff in the storm drain is 106 cfs (96 cfs + 1 cfs + 9 cfs). Basin ON7D generates 11 cfs that converges at a low point D7 – which is intercepted by sump Inlet 4. Runoff in the storm drain just downstream is 117 cfs (106 cfs + 11 cfs). This portion of the storm drain system has been labeled Main Line 2.

Basin ON3D generates 1 cfs which is intercepted into a realigned storm drain at Inlet 5. Basin ON4D generates 2 cfs which is also intercepted into the realigned storm drain at Inlet 6. The combined storm drain runoff of 3 cfs converges with an existing storm drain lateral at section P-56 (conveying 4 cfs) - to total 7 cfs. Basin ON5D generates 10 cfs and 3 cfs is intercepted into the storm drain at Inlet 7 to total 10 cfs in the storm drain. This portion of the storm drain system has been labeled Main Line 3. The 10 cfs from Main Line 3 discharges into Main Line 1 which is an existing 48” storm drain at section P-78 conveying 125 cfs (see annotated excerpts from the Bocca Park Study in Appendix E) to total 135 cfs. The 135 cfs combines with the 117 cfs (from Main Line 2) to total 252 cfs as shown on Figure 4. The remaining 7 cfs from Basin ON5D surface flows to the north in a proposed valley gutter to point D8. Runoff at point D8 (7 cfs) is intercepted by sump Inlet 8 into the storm drain system to total 259 cfs (7 cfs + 252 cfs). Please note that this is a reduction in runoff from the 295 cfs that the storm drain was designed for (see P-50 from the Bocca Park study in Appendix E).

Runoff at point ECP1 (see Figure 3) discharges onto the perimeter road and combines with basin ON6D at ICP1 to total 21 cfs. Runoff at this location discharges onto Alta Drive via a concrete u-shaped channel.

Basin ON11D generates negligible runoff and outlets onto the existing parking lot on the south side of the subject site.

4.2 Offsite Interim Conditions

Runoff that discharges onto Alta Drive (point RAM) from Rampart Boulevard was explained in Section 3.1 and estimated to be 24 cfs. This runoff will combine with basin OFF3E, ICP1, ON8D, ON10D, and ALT at point ALTS - totaling 65 cfs on the south side of Alta Drive.

5. DEVELOPED CONDITIONS DRAINAGE

Under developed conditions, the onsite and offsite area are analyzed applying future developed conditions. Per the Bocca Park study (see annotated excerpts in Appendix E), runoff generated from the parcel to the west will be intercepted by the existing storm drain system shown on Figure 3. Therefore, runoff generated at point ALTS does not include runoff from point ECP1 and OFF3E. This was found to be the only difference between Interim and Future conditions. See Figure 5 for developed conditions drainage basin map and results.

6. HYDRAULICS

6.1 Drop Inlet Calculations

The drop inlet designs are explained below, and the results are shown on Figures 4 & 5.

Inlet 1: Inlet 1 is a 2'x2' grate inlet (on grade) designed to intercept 2 cfs of the 5 cfs at point D1. A 50% clogging factor was applied to the calculation.

Inlet 2: Inlet 2 is an existing 3'x3' grate inlet (on grade) designed to intercept runoff from Basin ON9D. Since the subject study HEC-1 yields negligible results, runoff from Basin I from the Bocca Park study (1 cfs) was applied at this location. A 50% clogging factor was applied to the calculation.

Inlet 2A: Inlet 2A is a 3'x3' grate inlet (on grade) designed to intercept 2 cfs of the 5 cfs at point D3. A 50% clogging factor was applied to the calculation.

Inlet 3A: Inlet 3A is a 3'x3' grate inlet (on grade) designed to intercept 1 cfs of the 2 cfs from basin ON2DC. A 50% clogging factor was applied to the calculation.

Inlet 3: Inlet 3 is a 4'x4' grate inlet (in a sump) designed to intercept 9 cfs from D5 and D6. The depth at this location is 0.31 feet. The emergency overflow path if the inlet becomes clogged is the existing concrete lined channel adjacent to the residential site on the east.

Inlet 4: Inlet 4 is a 3'x3' grate inlet (in a sump) designed to intercept 11 cfs generated by basin ON7D. The depth at this location is 0.47 feet. The emergency overflow path is the parking lot to the north and ultimately Alta Drive.

Inlet 5: Inlet 5 is a 4-foot type A curb inlet in a sump designed to intercept 1 cfs generated by ON3D. A curb inlet height of 0.25 feet was applied to the calculation to account for a 50% clogging factor. The depth at this location in 0.25 feet. The emergency overflow path is the entrance to the subject site on the east.

Inlet 6: Inlet 6 is a 4-foot type A curb inlet in a sump designed to intercept 2 cfs generated by ON4D. A curb inlet height of 0.25 feet was applied to the calculation to account for a 50% clogging factor. The depth at this location in 0.32 feet. The emergency overflow path is the entrance to the subject site on the east.

Inlet 7: Inlet 7 is a 2'x2' grate inlet (on grade) designed to intercept 3 cfs of the 10 cfs generated from basin ON5D. A 50% clogging factor was applied to the calculation.

Inlet 8: Inlet 4 is a 2'x2' grate inlet (in a sump) designed to intercept 7 cfs at point D8. The depth at this location is 0.45 feet. The emergency overflow path is the perimeter road and ultimately Alta Drive.

6.2 Normal Depth Calculations

Normal depth flow calculations for the 10- and 100-year storm events under developed conditions have been analyzed using the Flow Master V8i computer program. Cross section locations and results are shown on Figures 4 &5 and described as follows;

Section 1 10yr Dry Lane Capacity Alta Drive: This was analyzed at the southern half street of Alta Drive to determine the flow capacity to maintain a 12 -foot dry lane during the 10yr storm event. The results estimate 23 cfs.

Section 1 INTERIM: Section 1 is the southern have of Alta Drive. Runoff at this location during the 10yr/100yr storm event is 21/65 cfs for interim conditions. The results on Figure 4 show that the DxV criteria is met for both conditions as well as the 10yr dry lane criteria.

Section 1 DEVELOPED: Section 1 is the southern have of Alta Drive. Runoff at this location during the 10yr/100yr storm event is 8/37 cfs for developed conditions. The results on Figure 4 show that the DxV criteria is met for both conditions as well as the 10yr dry lane criteria.

Section A: Section A is taken across an interior parking lot and drive access. Runoff generated at this location is at point D5 (8 cfs) and the depth of flow is approximately 0.45 feet.

Section A Weir: Section A Weir was analyzed to determine the WSE if Inlet 3 becomes clogged. This would yield worst case flow depth conditions to analyze adjacent finished floors - see table on Figures 4 & 5.

Section B: Section B is taken across an interior parking lot and drive access. Runoff generated at this location is at point point D7 (11 cfs) and the depth of flow is approximately 0.44 feet.

Section B Weir: Section B Weir was analyzed to determine the WSE if Inlet 4 becomes clogged. This would yield worst case flow depth conditions to analyzed adjacent finished floors - see table on Figures 4 & 5.

Section C: Section C is taken across an interior parking lot and drive access. Runoff generated at this location is from basin ON5D (10 cfs) and the depth of flow is approximately 0.46 feet.

Section D: Section D is taken across the perimeter street to the subject site. Runoff generated at this location is at point ICP2 (21 cfs) and the depth of flow is approximately 0.48 feet.

Section E: Section E is taken across a U-shaped channel that discharges runoff onto Alta Drive. Runoff generated at this location is at point ICP2 (21 cfs) and the depth of flow is approximately 0.47 feet.

Section F: Section F is taken across an existing concrete lined channel adjacent to the residential site to the east. Runoff generated at this location is from basin ON10D (4 cfs) and the depth of flow is approximately 0.53 feet.

Section F Overflow: Section F Overflow is taken across an existing concrete lined channel adjacent to the residential site to the east. Runoff generated at this location is from basin ON10D (4 cfs) and points D5 (8 cfs) and D6 (1 cfs) in the event that sump Inlet 3 is clogged – totaling 13 cfs. The depth of flow is approximately 1.27 feet.

6.3 WSPG

The WSPG program was used to model the storm drain system as shown on Figure 4. Three separate main lines were modeled separately along with 5 laterals. The results are explained as follows:

Main Line 1: Main Line 1 is delineated on an exhibit in the results. It extends from the invert of the existing dual 12'x12' RCB's (Regional APSO 0000) to existing P-78 storm drain as shown in the Bocca Park study. The outlet HGL was referenced from Village at Queensridge Culvert.

Main Line 2: Main Line 2 is delineated on an exhibit in the results. It extends from STA 3+03.67 (or STA 10+000 as applied in the WSPG model) from Main Line 1 upstream to existing P-7 as shown in the Bocca Park study. The outlet HGL was referenced from Main Line 1.

Main Line 3: Main Line 3 is delineated on an exhibit in the results. It extends from STA 4+23.62 (or STA 10+119.95 as applied in the WSPG model) from Main Line 1 upstream to STA 11+128.21. The outlet HGL was referenced from Main Line 1.

The laterals for Inlets 1 (SD-7C), 2A (SD-7B), 3 (SD-7A), 4 (SD-4), and 8 (6A) were modeled separately and the results are in the appendix. The outlet HGL's were referenced from corresponding Main Lines.

7. CONCLUSIONS & RECOMMENDATIONS

This study and improvement drawings complies with the drainage laws and regulations set forth by Clark County Public Works Department and the Clark County Regional Flood Control District.

Development of the site and the offsite street improvements is not expected to have a negative drainage impact on any upstream or downstream properties.

The proposed roadway sections are adequately protected from flood damage caused by a 100-year flood or less, as specified by the CCRFCD Hydrologic Criteria and Drainage Design Manual.

This site is not within a Special Flood Hazard Zone as designated by FEMA.

Nuisance flows are directed from the proposed site into public street sections and storm drains.

Finished floors have been elevated for 100-year flood protection and meet the criteria stated in the CCRFCD Manual. See table on Figures 4 & 5.

8. REFERENCES

1. **Hydrologic Criteria and Drainage Design Manual. Clark County Regional Flood Control District, 1990.**

2. **USCS Web soil survey http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm**

3. **FlowMaster V8i Hydraulic Toolbox**

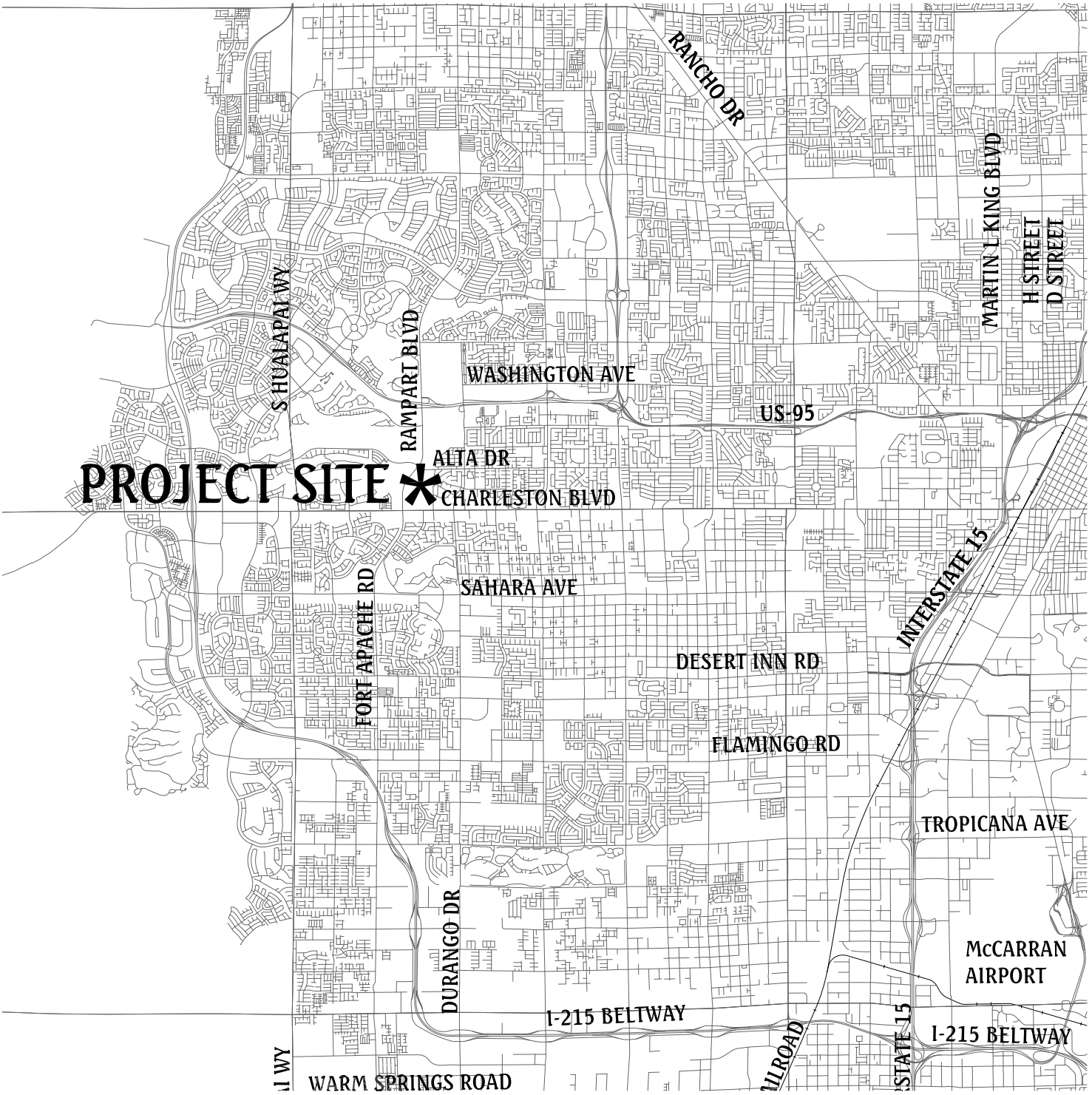
4. **Technical Drainage Study for Boca Park North (Phase III) at Peccole Town Center, By; VTN, December 12, 2000 DS2799**

5. **Technical Drainage Study for The Village at Queensridge – Update #5, By; GC Wallace, April 2010, DS4018**

6. **Technical Drainage Study for Queens Borrough Culvert, By; GC Wallace Inc., October 2004, DS3674**

7. **Technical Drainage Study for Peccole Town Center, By; VTN., June 1998, DS2248**

APPENDIX A FIGURES



ELYSIAN RENAISSANCE

FIGURE 1

VICINITY MAP

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com



NORTH

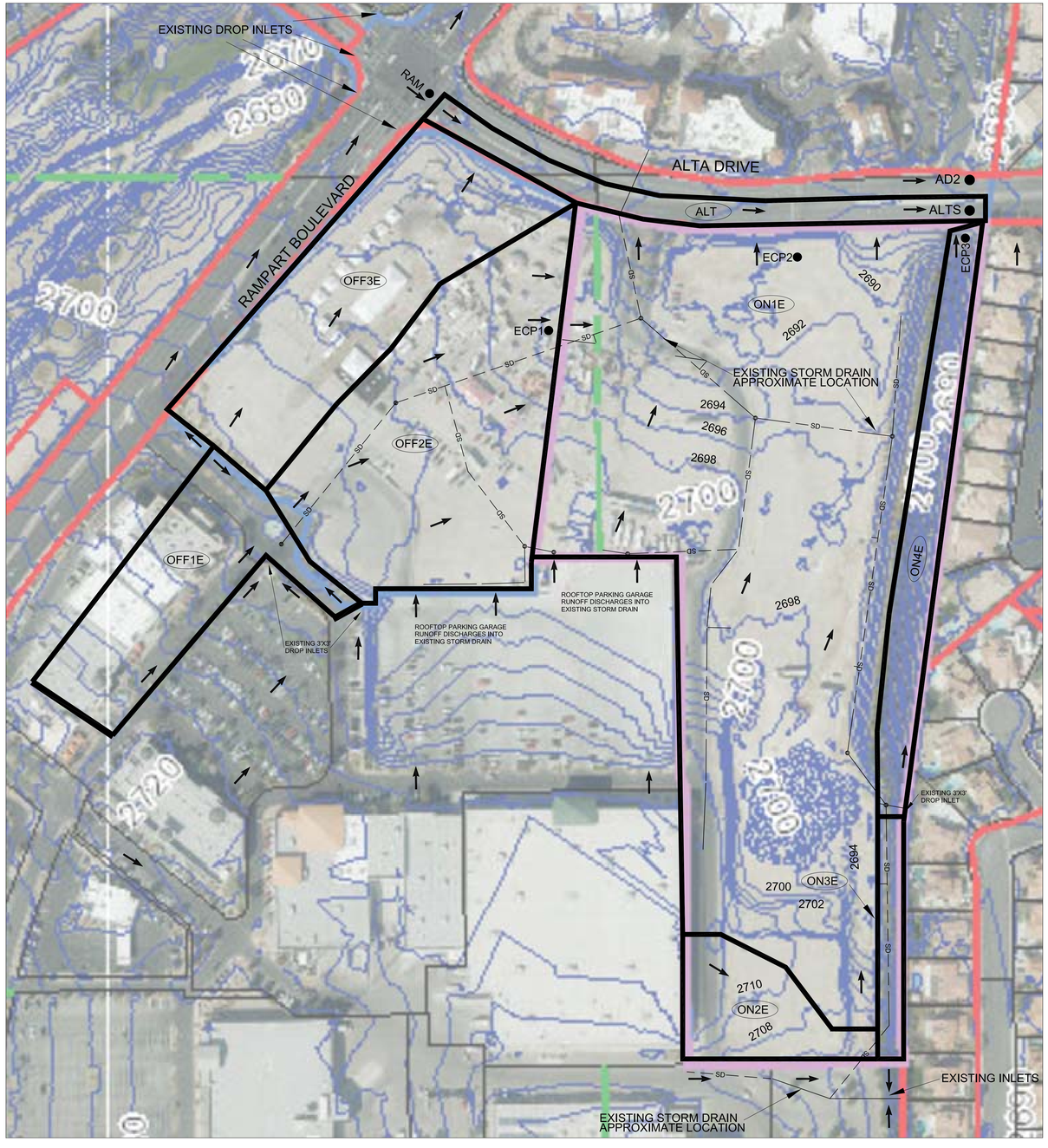
NTS

ELYSIAN RENAISSANCE

FIGURE 2

LOCATION MAP

GCW ENGINEERS & SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com



NORTH

GRAPHIC SCALE

100 0 50 100

(IN FEET)

1 inch = 100 ft.

DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
CPT4	CONCENTRATION POINT
	FLOW PATH

PEAK FLOW RATES FOR EXISTING CONDITIONS
ELYSIAN RENAISSANCE

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS		NOTES
		10-YR	100-YR	
OFF1E		3	7	
OFF2E		6	12	
ECP1		9	19	OFF1E+OFF2E
ON1E		18	38	
ECP2		28	56	ECP1+ON1E
ON3E		<1	1	
ON4E		1	3	
ECP3		1	4	ON3E+ON4E
OFF3E		4	9	
ALT		2	3	
COM1E		35	72	ECP2+OFF3E+ECP3+ALT
RAM		1	24	1
ALTS		36	96	COM1E+RAM (South side of Alta)
AD2		9	15	2
ON2E		2	3	

1. Referenced from Peccole Town Center study. Runoff generated from eastern half of Rampart Boulevard expected to flow down the south half of Alta Drive.
2. Referenced from Village at Queensridge study. Runoff on the north half of Alta Drive

REV. | DATE | DESCRIPTION | DATE | AGEN. APP | DATE | CCW APP

PROJECT NO.

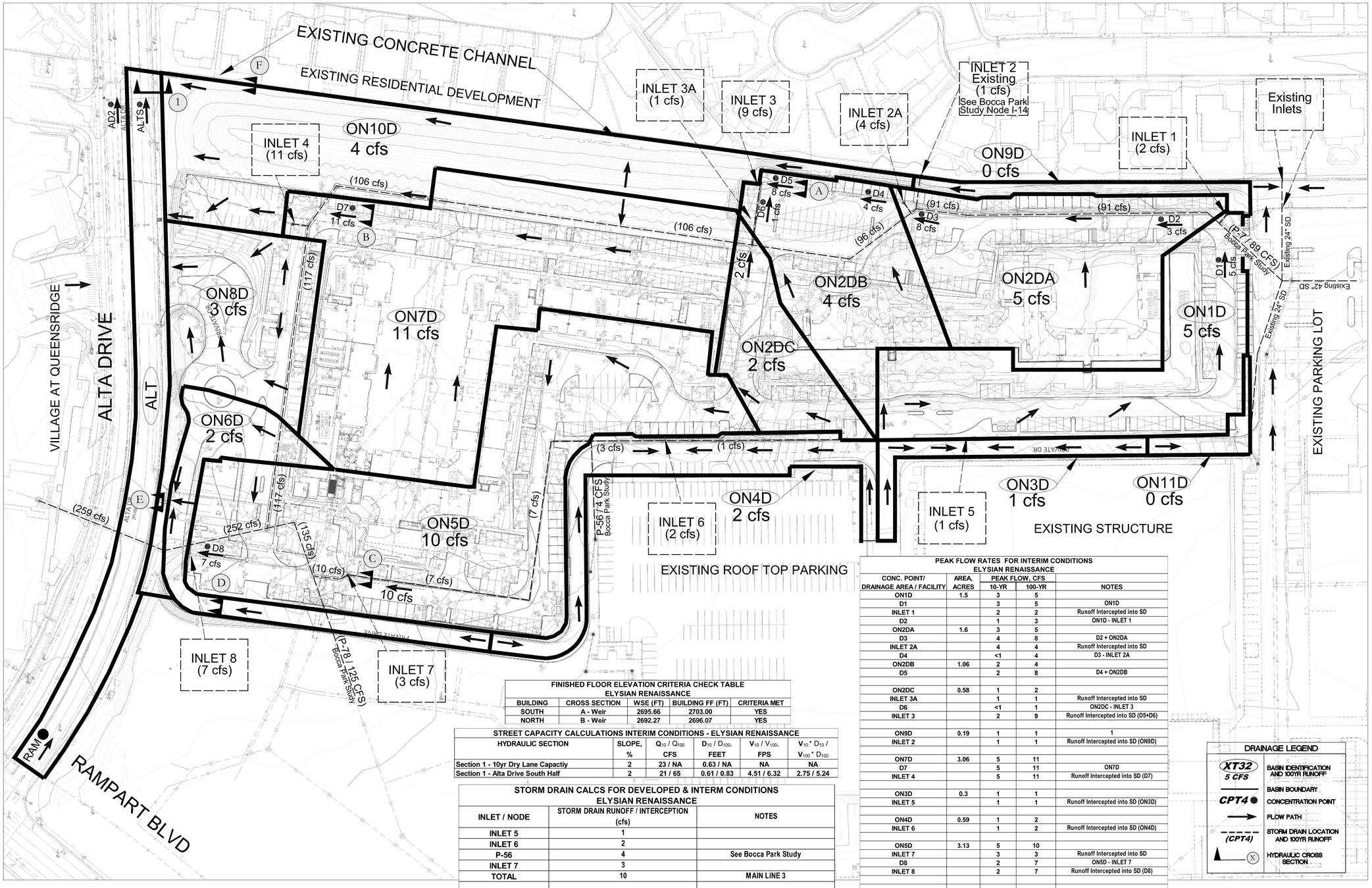
DESIGN: | DRAWN: LLP | CHECK: | PLOT DATE: | PLOT TIME:

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

FIGURE 3

EXISTING CONDITIONS DRAINAGE MAP

ELYSIAN RENAISSANCE



FINISHED FLOOR ELEVATION CRITERIA CHECK TABLE ELYSIAN RENAISSANCE				
BUILDING	CROSS SECTION	WSE (FT)	BUILDING FF (FT)	CRITERIA MET
SOUTH	A - Weir	2695.66	2703.00	YES
NORTH	B - Weir	2692.27	2696.07	YES

STREET CAPACITY CALCULATIONS INTERIM CONDITIONS - ELYSIAN RENAISSANCE					
HYDRAULIC SECTION	SLOPE, %	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	V_{10} * D_{10} / V_{100} * D_{100}
Section 1 - 10yr Dry Lane Capactiy	2	23 / NA	0.63 / NA	NA	NA
Section 1 - Alta Drive South Half	2	21 / 65	0.61 / 0.83	4.51 / 6.32	2.75 / 5.24

STORM DRAIN CALCS FOR DEVELOPED & INTERM CONDITIONS ELYSIAN RENAISSANCE		
INLET / NODE	STORM DRAIN RUNOFF / INTERCEPTION (cfs)	NOTES
INLET 5	1	
INLET 6	2	
P-56	4	See Bocca Park Study
INLET 7	3	
TOTAL	10	MAIN LINE 3
P-7	89	See Bocca Park Study
INLET 1	2	
INLET 2	1	See Node I-14 Bocca Park Study
INLET 2A	4	
INLET 3	9	
INLET 3A	1	
INLET 4	11	
TOTAL	117	MAIN LINE 2
P-78	125	
Main Line 2	117	
Main Line 3	10	
INLET 8	7	
TOTAL	259	MAIN LINE 1

NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES ELYSIAN RENAISSANCE INTERIM CONDITIONS							
HYDRAULIC SECTION LABEL	DESCRIPTION	SLOPE, %	Q_{100} CFS	D_{100} NORMAL FEET	V_{100} NORMAL FEET/SEC	V_{h100} Vel. Head FEET	WEIR DEPTH FEET
A	Interior Parking Lot - Runoff at D5	1.06	8	0.45	3.18	0.16	NA
B	Interior Parking Lot - Runof at D7	1.34	11	0.49	3.92	0.24	NA
C	Interior Parking Lot - Runof at ON5D	1.33	10	0.46	3.61	0.20	NA
D	Interior Parking Lot - Runof at ICP1	3.60	21	0.48	5.41	0.45	NA
E	Concrete U gutter - Runoff at ICP1	6.60	21	0.47	14.83	3.42	NA
F	Concrete gutter - ON10D	1.00	4	0.53	5.02	0.39	NA
F	Concrete gutter - Overflow (D5+D6+ON10D)	1.00	13	1.27	5.19	0.42	NA

PEAK FLOW RATES FOR INTERIM CONDITIONS ELYSIAN RENAISSANCE				
CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
ON1D	1.5	3	5	
D1		3	5	ON1D
INLET 1		2	2	Runoff Intercepted into SD
D2		1	3	ON1D - INLET 1
ON2DA	1.6	3	5	
D3		4	8	D2 + ON2DA
INLET 2A		4	4	Runoff Intercepted into SD
D4		<1	4	D3 - INLET 2A
ON2DB	1.06	2	4	
D5		2	8	D4 + ON2DB
ON2DC	0.58	1	2	
INLET 3A		1	1	Runoff Intercepted into SD
D6		<1	1	ON2DC - INLET 3
INLET 3		2	9	Runoff Intercepted into SD (D5+D6)
ON9D	0.19	1	1	1
INLET 2		1	1	Runoff Intercepted into SD (ON9D)
ON7D	3.06	5	11	
D7		5	11	ON7D
INLET 4		5	11	Runoff Intercepted into SD (D7)
ON3D	0.3	1	1	
INLET 5		1	1	Runoff Intercepted into SD (ON3D)
ON4D	0.59	1	2	
INLET 6		1	2	Runoff Intercepted into SD (ON4D)
ON5D	3.13	5	10	
INLET 7		3	3	Runoff Intercepted into SD
D8		2	7	ON5D - INLET 7
INLET 8		2	7	Runoff Intercepted into SD (D8)
RAM		1	24	2
OFF3E		4	9	See Figure 3
ECP1		9	19	See Figure 3
ON6D	0.64	1	2	
ICP1		10	21	ECP1 + ON6D
ON8D	1.03	2	4	
ON10D	2	2	4	
ALT	0.94	2	3	
ALTS		21	65	3
AD2		9	15	4
ON11D	0.11	<1	<1	

1. HEC-1 results yield runoff less than 1 cfs. Use results from Bocca Park study at Node I-14 to be conservative.
2. Referenced from Peccole Town Center study. Runoff generated from eastern half of Rampart Boulevard expected to flow down the south half of Alta Drive.
3. RAM+OFF3E+ICP1+ON8D+ON10D+ALT
4. Referenced from Village at Queensridge study. Runoff on the north half of Alta Drive

DRAINAGE LEGEND

- XT32 / 5 CFS — BASIN IDENTIFICATION AND 100YR RUNOFF
- BASIN BOUNDARY
- CPT4 — CONCENTRATION POINT
- FLOW PATH
- (CPT4) — STORM DRAIN LOCATION AND 100YR RUNOFF
- X — HYDRAULIC CROSS SECTION

NORTH

GRAPHIC SCALE

60 0 30 60

(IN FEET)

1 inch = 60 ft.

PROJECT NO.

DESIGN:
DRAWN: LP
CHECK:
PLOT DATE:
PLOT TIME:

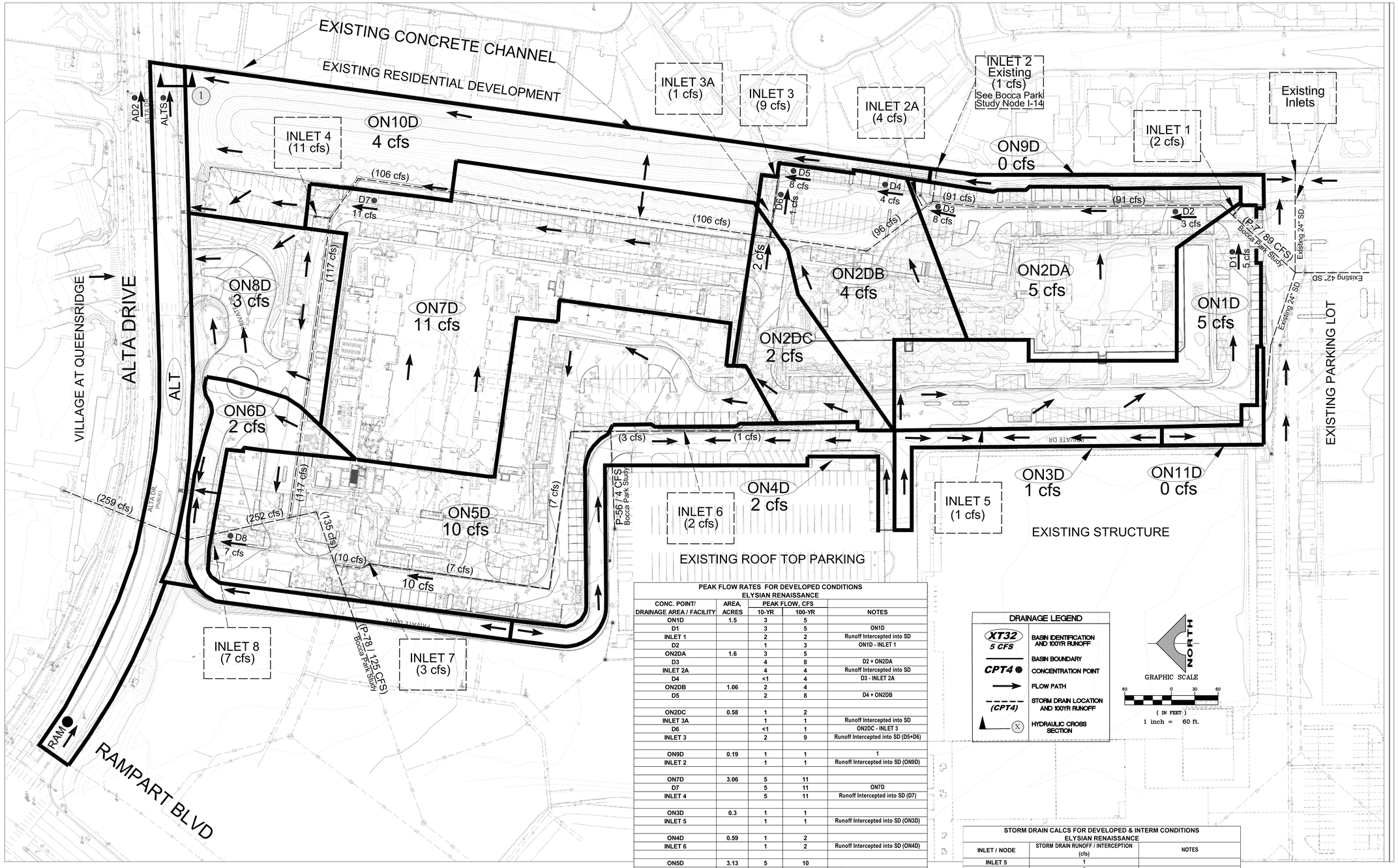
REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

FIGURE 4

INTERIM CONDITIONS DRAINAGE MAP

ELYSIAN RENAISSANCE



PEAK FLOW RATES FOR DEVELOPED CONDITIONS ELYSIAN RENAISSANCE				
CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
ON1D	1.5	3	5	
D1		3	5	ON1D
INLET 1		2	2	Runoff Intercepted into SD
D2		1	3	ON1D - INLET 1
ON2DA	1.6	3	5	
D3		4	8	D2 + ON2DA
INLET 2A		4	4	Runoff Intercepted into SD
D4		<1	4	D3 - INLET 2A
ON2DB	1.06	2	4	
D5		2	8	D4 + ON2DB
ON2DC	0.58	1	2	
INLET 3A		1	1	Runoff Intercepted into SD
D6		<1	1	ON2DC - INLET 3
INLET 3		2	9	Runoff Intercepted into SD (D5+D6)
ON9D	0.19	1	1	1
INLET 2		1	1	Runoff Intercepted into SD (ON9D)
ON7D	3.06	5	11	
D7		5	11	ON7D
INLET 4		5	11	Runoff Intercepted into SD (D7)
ON3D	0.3	1	1	
INLET 5		1	1	Runoff Intercepted into SD (ON3D)
ON4D	0.59	1	2	
INLET 6		1	2	Runoff Intercepted into SD (ON4D)
ON5D	3.13	5	10	
INLET 7		3	3	Runoff Intercepted into SD
D8		2	7	ON5D - INLET 7
INLET 8		2	7	Runoff Intercepted into SD (D8)
RAM		1	24	2
ON6D	0.64	1	2	
ON8D	1.03	2	4	
ON10D	2	2	4	
ALT	0.94	2	3	
ALTS		8	37	3
ON11D	0.11	<1	<1	
AD2		9	15	4

1. HEC-1 results yield runoff less than 1 cfs. Use results from Bocca Park study at Node I-14 to be conservative.
2. Referenced from Peccole Town Center study. Runoff generated from eastern half of Rampart Boulevard expected to flow down the south half of Alta Drive.
3. RAM+ON6D+ON8D+ON10D+ALT
4. Referenced from Village at Queensridge study.

DRAINAGE LEGEND

- XT32 / 5 CFS — BASIN IDENTIFICATION AND 100YR RUNOFF
- BASIN BOUNDARY
- CPT4 ● — CONCENTRATION POINT
- FLOW PATH
- (CPT4) — STORM DRAIN LOCATION AND 100YR RUNOFF
- X — HYDRAULIC CROSS SECTION

NORTH

GRAPHIC SCALE
60 0 30 60
(IN FEET)
1 inch = 60 ft.

STORM DRAIN CALCS FOR DEVELOPED & INTERM CONDITIONS ELYSIAN RENAISSANCE		
INLET / NODE	STORM DRAIN RUNOFF / INTERCEPTION (cfs)	NOTES
INLET 5	1	
INLET 6	2	
P-56	4	See Bocca Park Study
INLET 7	3	
TOTAL	10	MAIN LINE 3
P-7	89	See Bocca Park Study
INLET 1	2	
INLET 2	1	See Node I-14 Bocca Park Study
INLET 2A	4	
INLET 3	9	
INLET 3A	1	
INLET 4	11	
TOTAL	117	MAIN LINE 2
P-78	125	
Main Line 2	117	
Main Line 3	10	
INLET 8	7	
TOTAL	259	MAIN LINE 1

STREET CAPACITY CALCULATIONS DEVELOPED CONDITIONS - ELYSIAN RENAISSANCE					
HYDRAULIC SECTION	SLOPE, %	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	$V_{10} * D_{10}$ / $V_{100} * D_{100}$
Section 1 - Alta Drive South Half	2	8 / 37	0.46 / 0.71	3.99 / 5.36	1.83 / 3.81

FINISHED FLOOR ELEVATION CRITERIA CHECK TABLE ELYSIAN RENAISSANCE				
BUILDING	CROSS SECTION	WSE (FT)	BUILDING FF (FT)	CRITERIA MET
SOUTH	A - Weir	2695.66	2703.00	YES
NORTH	B - Weir	2692.27	2696.07	YES

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO.
DESIGN: LP
DRAWN:
CHECK:
PLOT DATE:
PLOT TIME:

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

FIGURE 5

DEVELOPED CONDITIONS DRAINAGE MAP

ELYSIAN RENAISSANCE

APPENDIX B SUPPORTING DOCUMENTS

NOTES

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

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

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

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

0 100 200 400 600 800

MAP LEGEND

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

- PARCEL BOUNDARY
- SUB BOUNDARY
- PM/LD BOUNDARY
- ROAD EASEMENT
- MATCH / LEADER LINE
- HISTORIC LOT LINE
- HISTORIC SUB BOUNDARY
- HISTORIC PM/LD BOUNDARY
- SECTION LINE
- CONDOMINIUM UNIT
- AIR SPACE PCL
- RIGHT OF WAY PCL
- SUB-SURFACE PCL
- 001 ROAD PARCEL NUMBER
- 001 PARCEL NUMER
- 1.00 ACREAGE
- 202 PARCEL SUB/SEQ NUMBER
- PB 24-45 PLAT RECORDING NUMBER
- 5 BLOCK NUMBER
- 5 LOT NUMBER
- GL5 GOV. LOT NUMBER

BOOK T20S R60E

126	125	124
137	138	139
164	163	162
175	176	177

SEC. 32

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

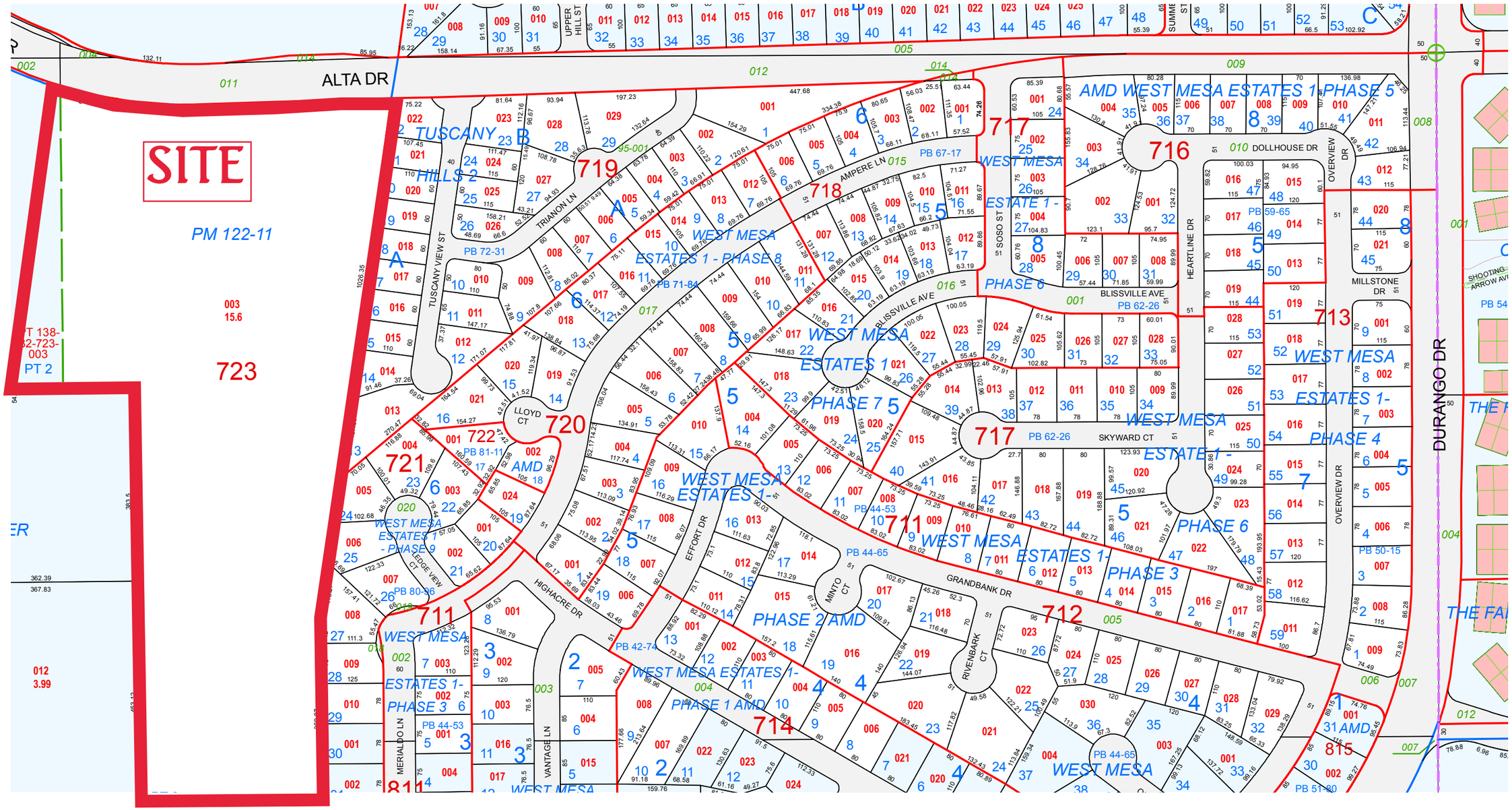
MAP N 2 SE 4

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

138-32-7

CLARK COUNTY ASSESSOR MAPPING DIVISION NEVADA

Scale: 1" = 200' Rev: 4/10/2017



TAX DIST 200

NOTES

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

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

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

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

0 100 200 400 600 800

MAP LEGEND

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

- PARCEL BOUNDARY
- SUB BOUNDARY
- PM/LD BOUNDARY
- ROAD EASEMENT
- MATCH / LEADER LINE
- HISTORIC LOT LINE
- HISTORIC SUB BOUNDARY
- HISTORIC PM/LD BOUNDARY
- SECTION LINE
- CONDOMINIUM UNIT
- AIR SPACE PCL
- RIGHT OF WAY PCL
- SUB-SURFACE PCL
- 001 ROAD PARCEL NUMBER
- 001 PARCEL NUMER
- 1.00 ACREAGE
- 202 PARCEL SUB/SEQ NUMBER
- PB 24-45 PLAT RECORDING NUMBER
- 5 BLOCK NUMBER
- 5 LOT NUMBER
- GL5 GOV. LOT NUMBER

BOOK T20S R60E

SEC. 32

MAP S 2 SE 4

138-32-8

137	138	139
164	163	162

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

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

Scale: 1" = 200'

Rev: 2/26/2014

SITE

(PT1)

PT 138-32-412-003

PECCOLE RANCH TOWN CENTER

PB 86-23

PT 138-32-412-029

VERANO CONDOMINIUMS

PB 124-63

See Condo List Page "A"

WEST MESA ESTATES 1-PHASE 3

WEST MESA ESTATES 1-PHASE 2 AMD

WEST MESA ESTATES 1-PHASE 1 AMD

WEST MESA ESTATES 1-PHASE 4

WEST MESA

PB 44-53

PB 44-65

PB 51-80

PB 42-74

PB 80-96

PB 50-15

PB 44-74

PB 80-82

PM 57-61

PM 62-82

PM 103-44

PM 60-16

MERIALDO LN

VANTAGE LN

HILLGROVE CT

HIGHACRE DR

OVERVIEW DR

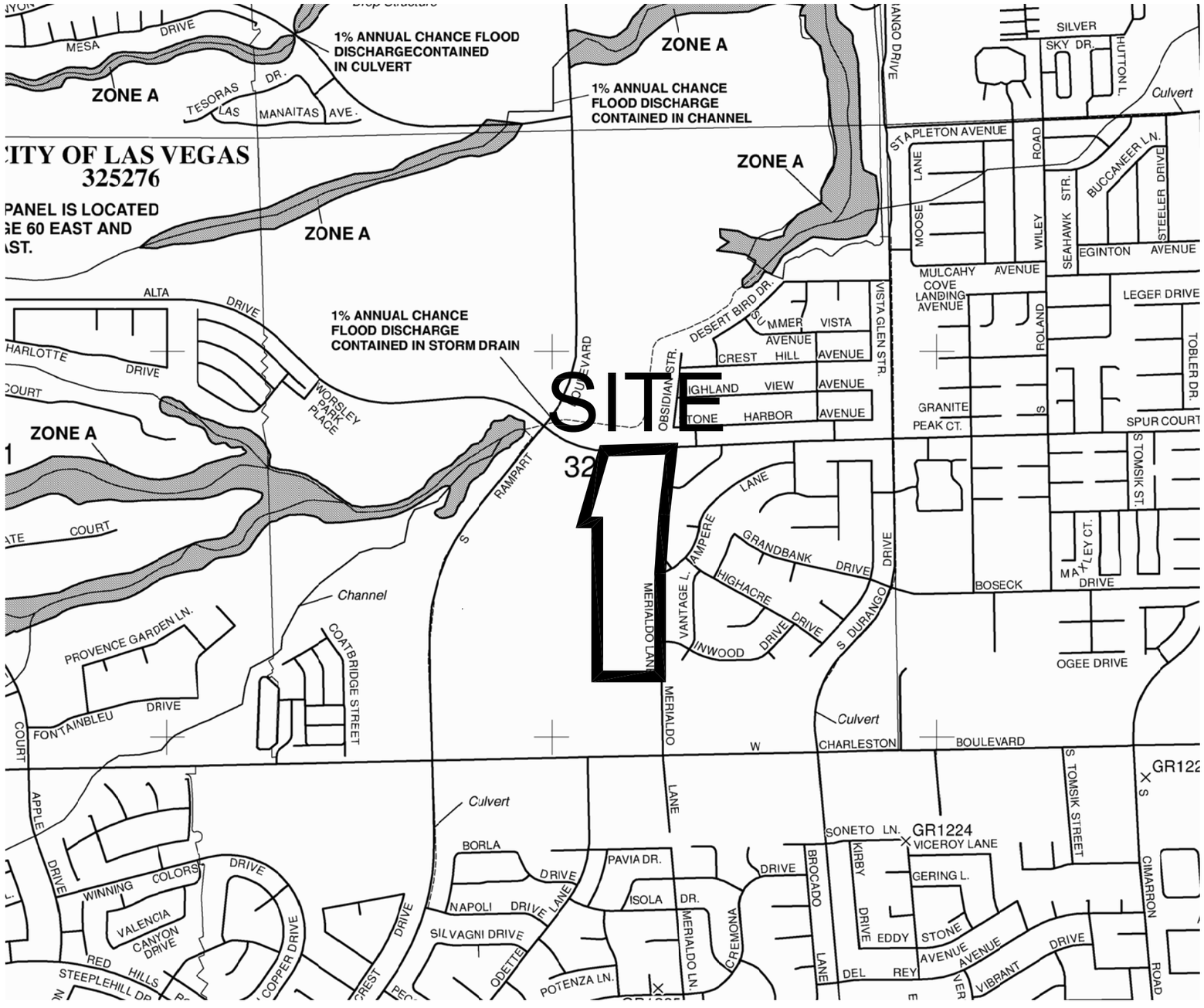
INWOOD DR

DURANGO DR

HEAVENLY HILLS CT

DURANGO/CHARLESTON

TAX DIST 200



NATIONAL FLOOD INSURANCE PROGRAM

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

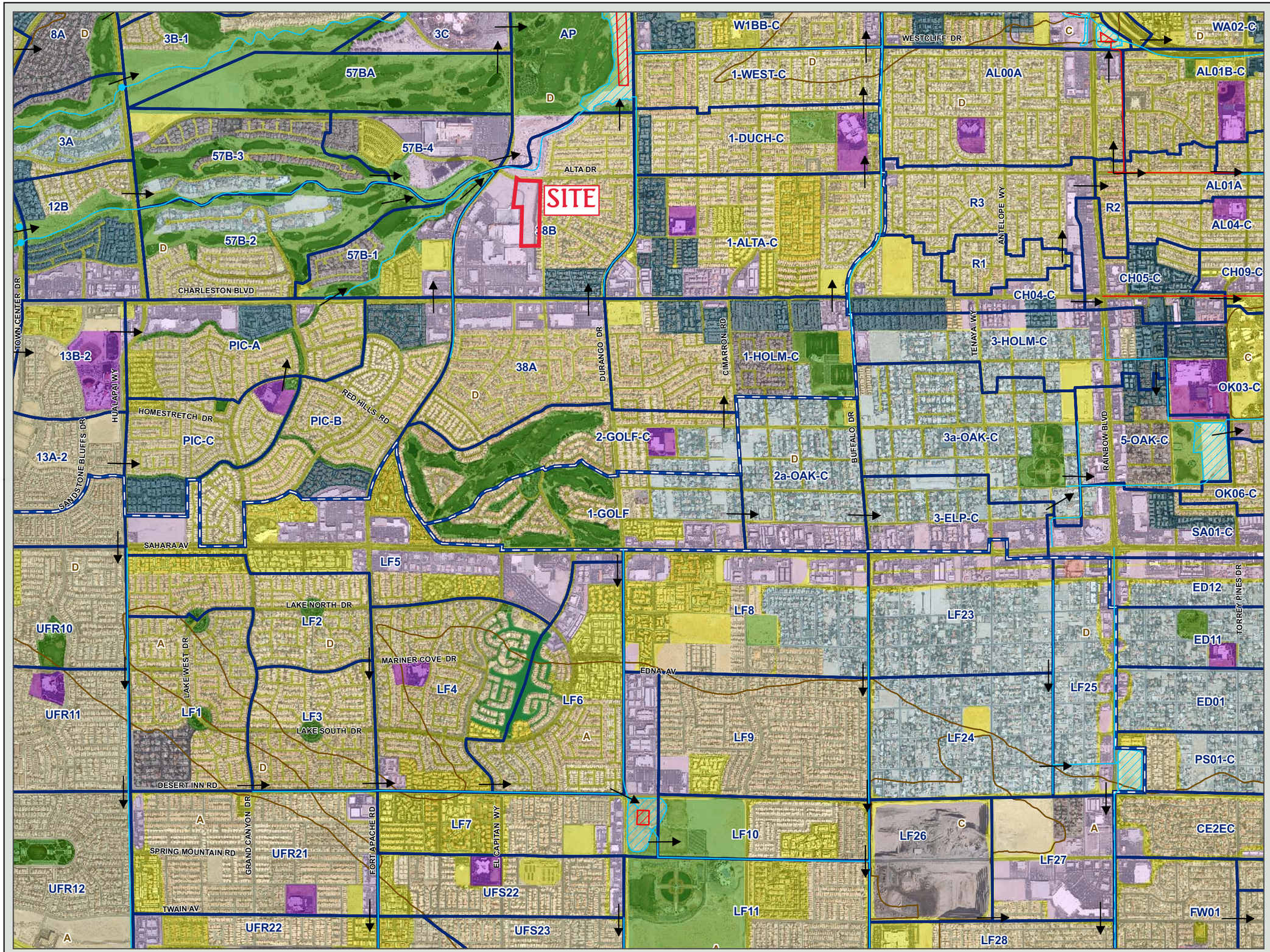
MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

ELYSIAN RENAISSANCE

FIRM PANEL 2145F



REGIONAL FLOOD CONTROL DISTRICT

2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE H- 30
HYDROLOGIC SUMMARY

LEGEND

- Ultimate Development Boundary
- Watershed Boundary
- Subbasin Boundary
- Drought Ordinance Boundary
- Flow Arrows

Flood Control Facilities

- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Category A Remove & Replace/ Parallel Facilities
- Category B Remove & Replace/ Parallel Facilities

Type Hydrologic Soil Groups

- A Low Runoff Potential
- B Moderately Low Runoff Potential
- C Moderately High Runoff Potential
- D High Runoff Potential/Rock Outcrops

Typical Land Use

- 1 Undeveloped Land, Open Desert
- 2 Parks, Golf Courses
- 3 Rural
- 4 / 14* Low Density Residential
- 5 / 15* Medium Density Residential
- 6 / 16* High Density Residential
- 7 / 17* Public Facility, Residential
- 8 / 18* Very High Density Residential
- 9 / 19* Commerical, Retail, Casino, High Rise Condominiums
- 10 / 20* Light Industrial
- 11 / 21* Heavy Industrial
- 12 / 22* Schools
- 13 Lakes

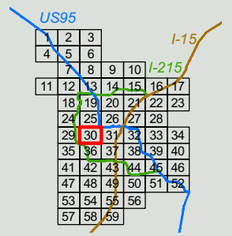
* Drought Ordinance Applied

N

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

Scale: 1 inch = 2,000 feet

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



PBS&J
PB

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
APDG		**ANGEL PARK - DURANGO**						
0000	E	84" RCP	2600	842	C38B	ALLGOW3	0.79	0.70
0060	E	72" RCP	1901	374	38A	ALLGOW3	0.35	0.96
APMD		**ANGEL PARK - MIDDLE BRANCH**						
0027	E	1: 12' X 10' and 2: 12' X 2' RCBC @ Canyon Run	170	6048	C11A-3*	ALLGOW4	11.31	3.00
0030	E	Natural Wash	7000	6048	C11A-3*	ALLGOW4	11.31	3.00
0132	E	2: 12'x10' RCBC @ Hualapai	120	6048	C11A-3*	ALLGOW4	11.31	1.00
0133	E	Natural Wash	3015	6048	C11A-3*	ALLGOW4	11.31	3.00
APNO		**ANGEL PARK NORTH**						
0001	E	1,512 ac-ft Angel Park Detention Basin		9199	ANGLPKIN	ALLGOW5	21.99	
APP1		**ANGEL PARK - PECCOLE 1**						
0000	E	72" RCP	2982	442	PIC-B	ALLGOW3	0.44	2.40
0056	E	2: 60" RCP	1385	442	PIC-B	ALLGOW3	0.44	2.40
APP2		**ANGEL PARK - PECCOLE 2**						
0000	E	Grass Chnl 10'W 5'D 2:1 SS	4793	2004	C57B-1	ALLGOW3	1.93	2.10
APSO		**ANGEL PARK - SOUTH BRANCH**						
0000	E	2: 12' X 12' RCB	2506	4628	CC57B-4	ALLGOW3	5.24	1.62
0020	E	2: 12' X 12' RCBC @ Rampart	350	4628	CC57B-4	ALLGOW3	5.24	1.80
0050	E	Natural Wash	209	4628	CC57B-4	ALLGOW3	5.24	1.84
0067	E	Natural Wash	8300	2384	C57B-2	ALLGOW3	2.67	2.10
0204	E	2: 8' X 8' RCBC @ Hualapai	326	2056	C12B	ALLGOW3	2.00	2.66
0205	E	Natural Wash	2380	2056	C12B	ALLGOW3	2.00	3.46
0254	E	2: 8' X 8' RCBC @ Town Center Dr.	190	1932	C12A	ALLGOW3	1.74	3.00
0255	E	24' X 12' RCAC @ Town Center Dr.	140	1932	C12A	ALLGOW3	1.74	3.00
FLBF		**FLAMINGO WASH - BUFFALO**						
0152	E	10' X 7' RCB	3460	814	CLF11	FLAM3A	4.29	0.32
0228	E	96" RCP	1330	746	CLF9	FLAM3A	0.94	1.00
0252	E	9' X 6' RCB	170	746	CLF9	FLAM3A	0.94	1.00
0258	E	96" RCP	1140	746	CLF9	FLAM3A	0.94	0.50
0278	E	90" RCP	2640	506	LF8	FLAM3A	0.51	0.50
0328	E	54" RCP	660	506	LF8	FLAM3A	0.51	0.30
FLDI		**DESERT INN DRAIN**						
0000	E	9' X 6' RCB	190	1145	CLF4	FLAM3A	1.38	2.71
0004	E	96" RCP	2670	1145	CLF4	FLAM3A	1.38	1.00
0050	E	90" RCP	1390	1145	CLF4	FLAM3A	1.38	1.65
0075	E	84" RCP	1010	874	CLF3	FLAM3A	0.94	1.87
0095	E	96" RCP	200	874	CLF3	FLAM3A	0.94	1.87
0100	E	72" RCP	190	277	LF1	FLAM3A	0.37	1.86
0105	E	60" RCP	2510	277	LF1	FLAM3A	0.37	1.85
FLDR		**DURANGO COLLECTOR**						
0179	E	60" RCP	1810	260	CUFS23	FLAM3A	0.45	1.21
FLDY		**FLAMINGO WASH - DARBY STORM DRAIN**						
0000	E	84" RCP	100	558	CLF24	FLAM3A	0.76	0.25
0002	E	10' X 3' RCB	50	558	CLF24	FLAM3A	0.76	0.25
0004	E	60" RCP	680	558	CLF24	FLAM3A	0.76	2.80
0013	E	78" RCP	560	558	CLF24	FLAM3A	0.76	1.79
FLLA		**FLAMINGO WASH - LATERAL (FLAMINGO/RAINBOW)**						
0227	E	93" RCP	1360	640	CLF28	FLAM3B	1.03	0.40
0254	E	90" RCP	2730	403	CLF27	FLAM3A	1.54	0.40
0305	E	1,556 cfs PMF Spillway		1556	CLF25	FLAM3A	1.03	
0306	E	30" RCP with 18" Orifice Outlet	160	29	DIDB	FLAM3A	1.03	0.43
0308	E	62 ac-ft Desert Inn Detention Basin		744	CLF25	FLAM3A	1.03	
0322	E	81" RCP	1370	224	LF25	FLAM3A	0.27	0.50
0345	E	81" RCP	1340	224	LF25	FLAM3A	0.27	0.50
0369	E	72" RCP	670					0.50
0379	E	66" RCP	1320					0.50

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
FLMN		**FLAMINGO WASH - MONTESSOURI NORTH STORM DRAIN**						
0000	E	78" RCP	1340	558	CLF24	FLAM3A	0.76	0.50
0025	E	72" RCP	1330	558	CLF24	FLAM3A	0.76	0.50
0050	E	66" RCP	500	372	LF23	FLAM3A	0.38	0.50
0060	E	54" RCP	800	372	LF23	FLAM3A	0.38	0.50
0075	E	48" RCP	30	372	LF23	FLAM3A	0.38	0.50
FLMS		**FLAMINGO WASH - MONTESSOURI SOUTH STORM DRAIN**						
0000	E	54" RCP	630					0.52
FLSM		**SPRING MOUNTAIN DRAIN**						
0000	E	60" RCP	4590	116	CLF10W	FLAM3A	2.84	2.50
0083	E	36" RCP	570	86	LAKEDB	FLAM3A	2.62	1.90
0086	E	36" RCP Outlet	90	86	LAKEDB	FLAM3A	2.62	
0087	E	143 ac-ft Lakes Detention Basin		1976	CLF7	FLAM3A	2.62	
0088	P1	Upgrade to 165 ac-ft Lakes Detention Basin		1976	CLF7	FLAM3A	2.62	
0100	E	12' X 8' RCB	310	1976	CLF7	FLAM3A	2.62	1.25
0125	E	96" RCP	3040	750	CLF6N	FLAM3A	0.87	0.80
0180	E	90" RCP	2350	526	LF5	FLAM3A	0.49	0.50
GOSO		**GOWAN SOUTH FACILITIES**						
0297	E	12' X 7' RCB	2124	1825	CW1BB-C	ALLGOW3	2.14	1.60
0336	E	12' X 7' RCB	602	1593	C1-WESTC	ALLGOW3	1.84	3.40
0352	E	2: 8' X 5' RCB	2740	1374	C1-DUCHC	ALLGOW3	1.60	0.73
0404	E	2: 8' X 4' RCB	2660	1125	C1-ALTAC	ALLGOW3	1.32	0.80
0455	E	2: 12' X 4' RCB	350	665	C1-HOLMC	ALLGOW3	0.81	0.30
0462	E	12' X 4' RCB	1330	665	C1-HOLMC	ALLGOW3	0.81	0.30
GOWC		**GOWAN SOUTH FACILITIES - WEST CLIFF**						
0000	E	24" RCP	5400	257	1-WEST-C	ALLGOW3	0.24	1.67
LCCH		**LAS VEGAS CREEK CHANNEL**						
0438	E	60" RCP	1090	162	CLC01-C	SW3	1.20	1.60
0458	E	60" RCP	1060	162	CLC01-C	SW3	1.20	1.60
0478	E	60" RCP	1110	162	CLC01-C	SW3	1.20	0.55
0499	E	42" RCP Outlet	660	85	RAINBWDB	SW3	1.11	1.88
0513	E	102 ac-ft Rainbow Detention Basin		970	RAINBWIN	SW3	1.11	
0518	E	60" RCP Connector Pipe Under Rainbow Blvd	670	970	RAINBWIN	SW3	1.11	1.85
LCLO		**LAS VEGAS CREEK - LORENZI**						
0000	E	7' X 6' RCB	445	265	DAL00A	SW3	0.41	3.37
0008	E	7' X 6' RCB	2415	265	DAL00A	SW3	0.41	0.40
0054	E	7' X 5' RCB	169	265	DAL00A	SW3	0.41	1.00
MEAL		**MEADOWS ALTA**						
0160	E	36" RCP	2600	331	CUS	SW3	0.56	1.25
0209	E	48" RCP	2500	150	DCR2	SW3	0.41	1.70
0256	E	38" X 60" HERCP	81	150	DCR2	SW3	0.41	1.48
0258	E	48" RCP	275	150	DCR2	SW3	0.41	4.07
MECH		**EXTENSION OF MEADOWS / CHARLESTON**						
0310	E	24" RCP	1000	32	OAKEYOT	SW3	1.88	1.43
0323	E	15" RCP Outlet	200	32	OAKEYDB	SW3	1.88	
0324	E	201 ac-ft Oakey Detention Basin		1652	OAKEYIN	SW3	1.88	
0334	E	11' X 6' RCB	200	573	C5-OAK-C	SW3	0.56	0.50
0337	E	9' X 6' RCB	520	573	C5-OAK-C	SW3	0.56	0.50
0338	E	10' X 8' RCB	2060	1131	C3A-OAKC	SW3	1.32	1.62
0351	E	90" RCP	1350	573	C5-OAK-C	SW3	0.56	0.50
0378	E	10' X 8' RCB	745	1131	C3A-OAKC	SW3	1.32	2.00
0380	E	66" RCP	385	352	3-HOLM-C	SW3	0.33	2.00
0387	E	66" RCP	300	403	3A-OAK-C	SW3	0.43	3.08
0390	E	83" X 53" RCP	50	352	3-HOLM-C	SW3	0.33	2.00
0400	E	10' X 6' RCB	1890	823	C3-ELP-C	SW3	0.88	1.43
0405	E	66" RCP	1390	403	3A-OAK-C	SW3	0.43	1.00
0410	E	66" RCP	182	352	3-HOLM-C	SW3	0.33	2.00
0420	E	66" RCP	1410	352	3-HOLM-C	SW3	0.33	2.00

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
MECN		**MEADOWS - CHARLESTON**						
0123	P1	8' X 6' RCB	5200	821	CCH09-C	SW3	0.72	1.64
0223	P1	6' X 5' RCB	2700	422	CCH05-C	SW3	0.34	2.04
RRFA		**RED ROCK - FORT APACHE COLLECTOR**						
0105	E	78" RCP	1330	463	CUFR22	FLAM3A	0.77	0.94
0130	E	66" RCP	690	331	UFR21	FLAM3A	0.51	0.93
0143	E	48" RCP	1330	331	UFR21	FLAM3A	0.51	2.54
RRHU		**RED ROCK - HUALAPAI COLLECTOR**						
0015	E	10' X 10' RCB	560	1199	CUFR13N	FLAM3A	1.52	1.30
0025	E	11' X 5.5' RCAP	3310	1199	CUFR13N	FLAM3A	1.52	1.30
0079	E	8' X 6' RCB	2650	981	CUFR11	FLAM3A	1.09	1.30
0129	E	7' X 6' RCB	2630	842	CUFR10	FLAM3A	0.82	1.20

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

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

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

REGIONAL FLOOD CONTROL DISTRICT

2013 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F - 30

LEGEND

ID (Facility Identifier) AABB
- Parent Stream Name
- Stream Name

River Mile 0000
- Distance Above Confluence with Parent Stream (Miles)
- Miles in Hundredths

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

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

Construction Features

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

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 30
FLOOD CONTROL FACILITIES

LEGEND

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

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

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

N

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

Scale: 1 inch = 2,000 feet

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

US95 I-15 I-215

	1	2	3		A1	A2
4	5	6			A3	A4
	7	8	9	10	A5	A6
11	12	13	14	15	16	17
	18	19	20	21	22	23
	24	25	26	27	28	
	29	30	31	32	33	34
	35	36	37	38	39	40
	41	42	43	44	45	46
	47	48	49	50	51	52
	53	54	55	56		
	57	58	59			

Search

Properties and Qualities Ratings

Open All | Close All

- Soil Chemical Properties
- Soil Erosion Factors
- Soil Health Properties
- Soil Physical Properties
- **Soil Qualities and Features**
  - AASHTO Group Classification (Surface)
  - Depth to a Selected Soil Restrictive Layer
  - Depth to Any Soil Restrictive Layer
  - Drainage Class
  - Frost Action
  - Frost-Free Days
  - Hydrologic Soil Group

View Description | View Rating

View Options

Map ☑
Table ☑
Description of Rating ☑
Rating Options ☑
Detailed Description ☐

Advanced Options

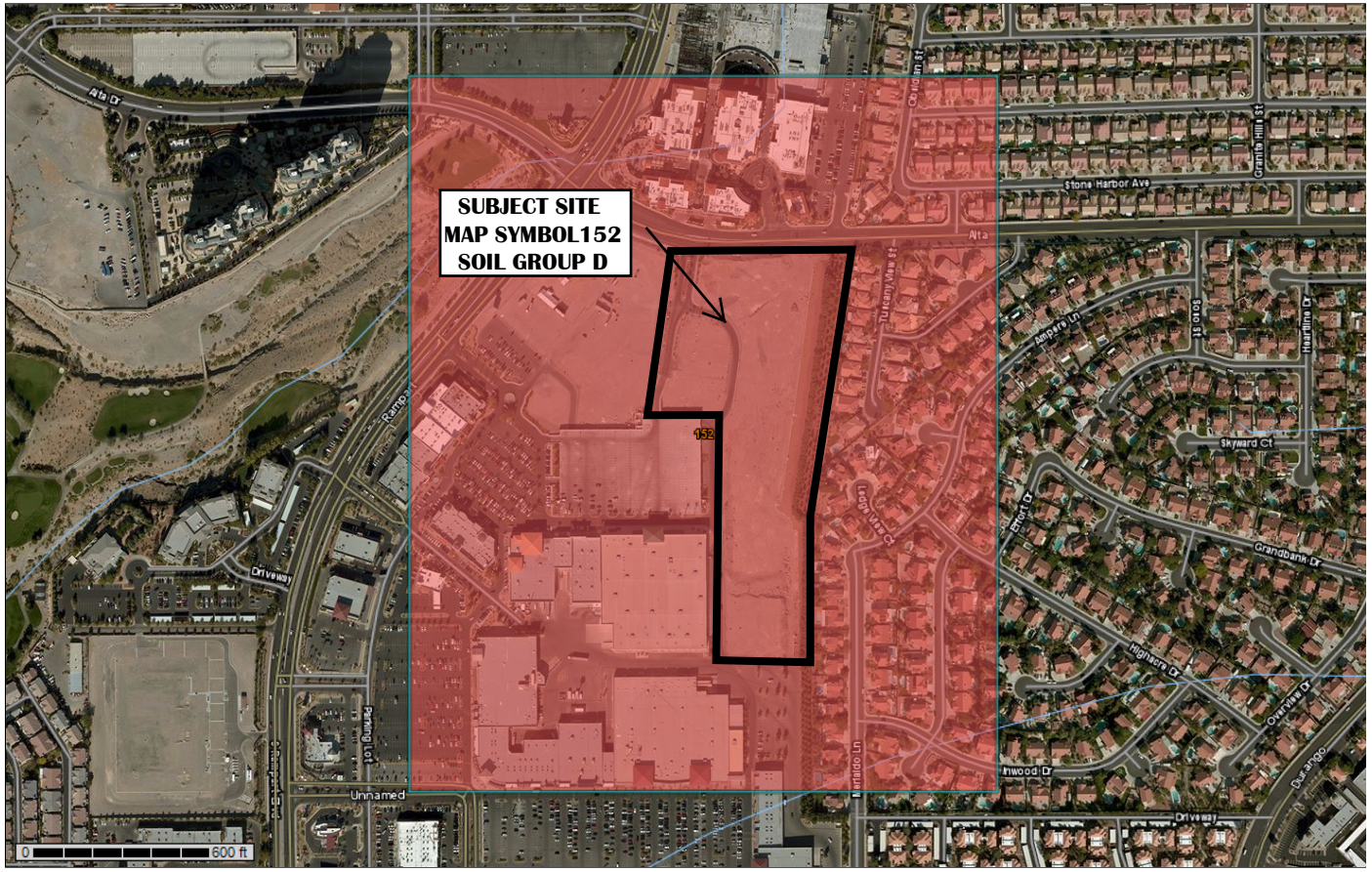
Aggregation Method: Dominant Component
Component Percent Cutoff:
Tie-break Rule: Lower / Higher

View Description | View Rating

- Map Unit Name
- Parent Material Name
- Representative Slope
- Unified Soil Classification (Surface)
- Water Features

Map — Hydrologic Soil Group

Scale (not to scale)



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

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:24,000. The design of map units and the level of detail shown in the resulting soil map are dependent o that map 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.

Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Las Vegas Valley Area, Nevada, Part of Clark County (NV788)

Summary by Map Unit — Las Vegas Valley Area, Nevada, Part of Clark County (NV788)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
152	Cave gravelly fine sandy loam, 0 to 4 percent slopes	D	113.3	100.0%
Totals for Area of Interest			**113.3**	**100.0%**

Description — Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

APPENDIX C HYDROLOGIC ANALYSIS

PRECIPITATION ADJUSTMENT RATIOS

Recurrence Interval	Ratio to NOAA Atlas 2
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.

Revision	Date

SIX-HOUR STORM DISTRIBUTIONS

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

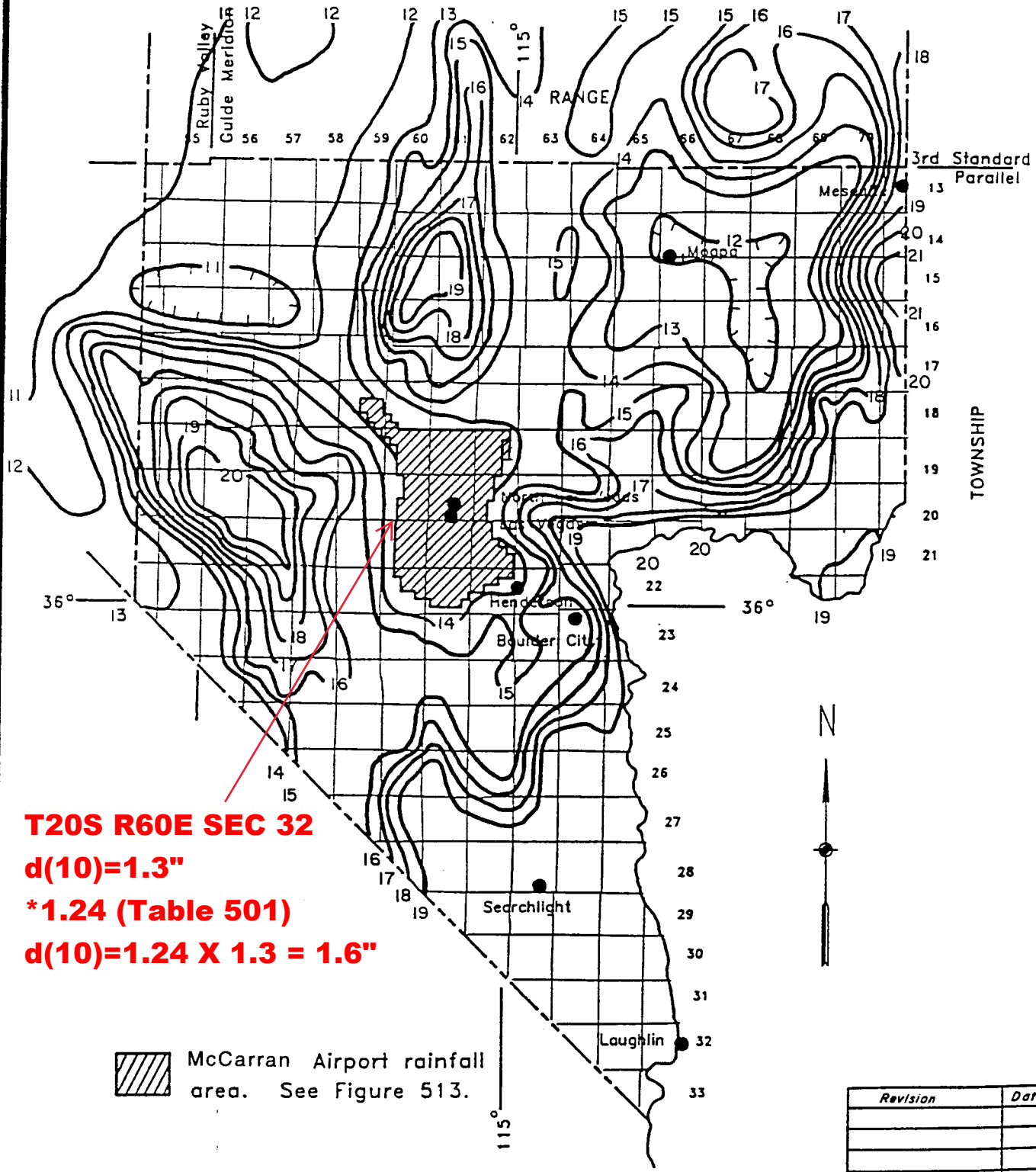
Notes:
1. For drainage areas less than 8 square miles in size, use SDN 3.
2. For drainage areas greater than or equal to 8 square miles and less than 12 square miles in size, use SDN 4.
3. For drainage areas greater than or equal to 12 square miles, use SDN 5.
4. A graphical representation of these values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

Revision	Date

REFERENCE:

TABLE 503

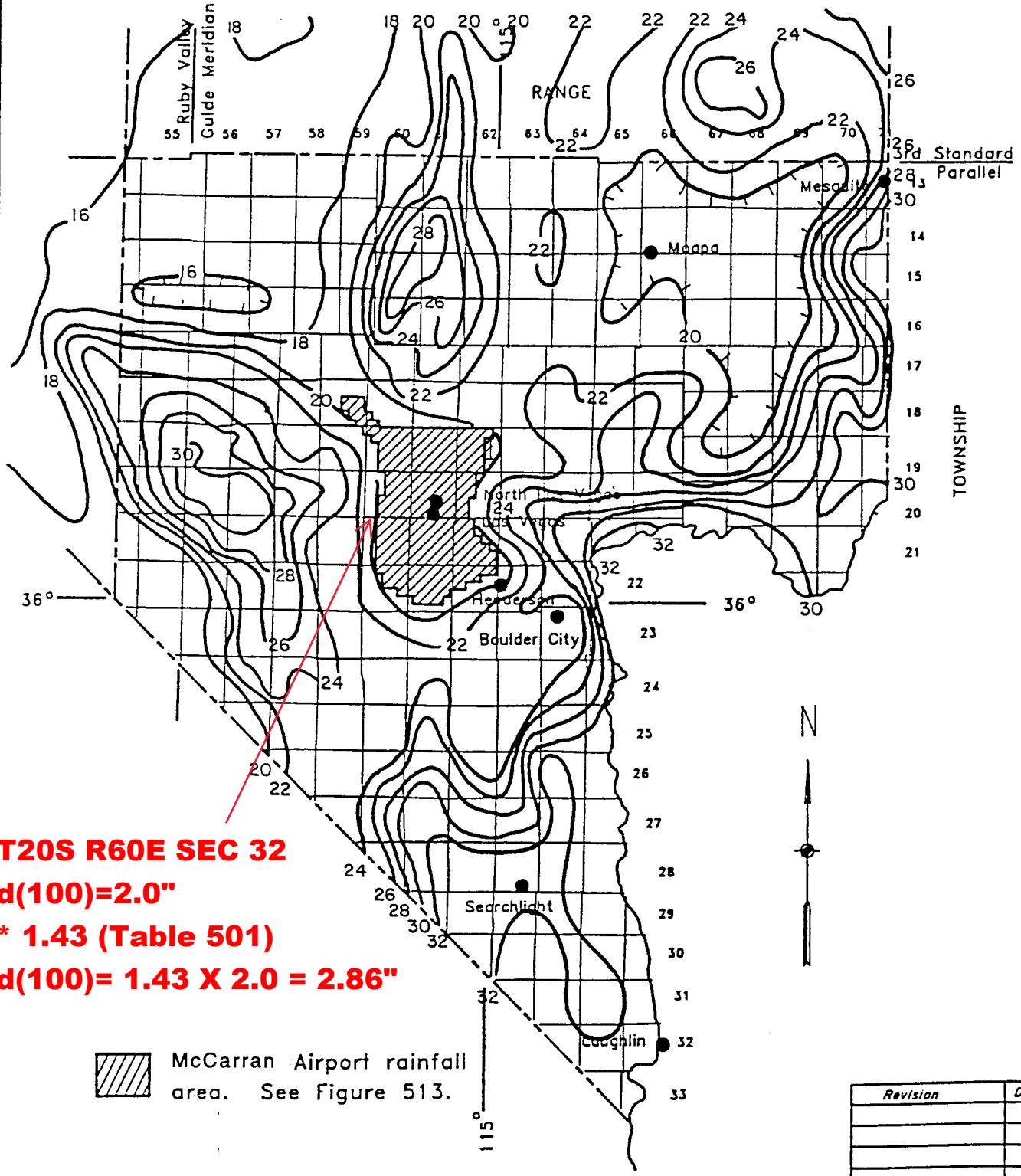
RAINFALL DEPTH-DURATION-FREQUENCY
10-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



Revision	Date

WRC ENGINEERING	REFERENCE: NOAA ATLAS 2, VOLUME VII NEVADA, 1973	FIGURE 503

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



Revision	Date

WRC ENGINEERING	REFERENCE: NOAA ATLAS 2, VOLUME VII NEVADA, 1973	FIGURE 506

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

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

See Table 602A

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

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

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

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

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

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

Revision	Date

RUNOFF CURVE NUMBERS
(SEMIARID RANGELANDS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

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

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

[3]Curve numbers for group A have been developed only for desert shrub.

Revision	Date

CURVE NUMBER DETERMINATION

Elysian Renaissance

2/12/2018 BY L. PROCTOR

BASIN	HYDROLOGIC SOIL GROUP	LAND USE	CURVE NUMBER	PERCENT OF TOTAL	FINAL CN	REMARKS
ON1D, ON2DA, ON2B, ON2C ON5D, ON6D, ON7D, OFF1E, ON8D	D	COMMERCIAL & BUSINESS	95	100	**95**	Table 602, 1 of 4
ON10D	D	STREETS AND ROADS	98	8	9.8	Table 602, 1 of 4
	D	DESERT SHRUB (Fair Condition)	86	92	77.4	Table 602, 4 of 4
					87	
ON9D, ON3E, ON4E	D	DESERT SHRUB (Fair Condition)	86	100	**86**	Table 602, 4 of 4
OFF1D, OFF2D, ON3D, ON4D, ALTS	D	STREETS AND ROADS	98	100	**98**	Table 602, 1 of 4
OFF2E, ON1E, ON2E	D	NEWLEY GRADED	94	100	**94**	Table 602, 1 of 4

STANDARD FORM 4 - Elysain Renaissance

Momentum Engineers, Ltd.
6101 Kings Brook Ct.
Las Vegas NV 89149

Sub-Basin Data					Initial/Overland Time (T_i)			Travel Time (T_t)					T_c	T_c Check (Urbanized Basins)		Final T_c	T_{lag}	Remarks
DESIG	CN	K	AREA (acres)	AREA (mi^2)	LENGTH (ft)	SLOPE (%)	T_i (min)	LENGTH (ft)	SLOPE (%)	V_1 (fps)	V_2 (fps)	T_t (min)	$T_c=T_i+T_t$ (min)	TOTAL (ft)	T_c (min)	T_c (min)	T_{lag} (hrs)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
DEVELOPED CONDITIONS																		
ON1D	95	0.864	1.50	0.0023	50	2.5	2.2	665	1.6	2.6	3.9	4.0	6.2	715	14.0	6.2	0.062	
ON2DA	95	0.864	1.60	0.0025	50	0.5	3.8	410	1.2	2.2	N/A	3.1	6.9	460	12.6	6.9	0.069	
ON2DB	95	0.864	1.06	0.0017	50	0.5	3.8	175	1.2	2.2	N/A	1.3	5.1	225	11.3	5.1	0.051	
ON2DC	95	0.864	0.58	0.0009	50	0.5	3.8	350	1.2	2.2	N/A	2.7	6.5	400	12.2	6.5	0.065	
ON3D	98	0.904	0.30	0.0005	25	2	1.4	345	1.0	2.0	N/A	2.8	4.2	370	12.1	4.2	0.050	
ON4D	98	0.904	0.59	0.0009	25	2	1.4	460	0.6	1.6	N/A	4.9	6.3	485	12.7	6.3	0.063	
ON5D	95	0.864	3.13	0.0049	50	0.5	3.8	1049	2.0	2.9	4.3	5.0	8.8	1099	16.1	8.8	0.088	
ON6D	95	0.864	0.64	0.0010	25	2	1.7	520	3.5	3.8	5.7	2.3	3.9	545	13.0	3.9	0.050	
ON7D	95	0.864	3.06	0.0048	40	4	1.7	570	1.1	2.1	3.2	4.4	6.1	610	13.4	6.1	0.061	
ON8D	95	0.864	1.03	0.0016	40	4	1.7	385	5.0	4.5	N/A	1.4	3.1	425	12.4	3.1	0.050	
ON9D	86	0.745	0.19	0.0003	38	15	1.6	425	0.4	1.3	N/A	5.5	7.1	463	12.6	7.1	0.071	
ON10D	87	0.758	2.00	0.0031	75	6.6	2.8	748	0.4	1.3	1.9	8.7	11.5	823	14.6	11.5	0.115	
ALT	98	0.904	0.94	0.0015	25	2	1.4	930	1.0	2.0	3.1	6.5	7.9	955	15.3	7.9	0.079	
ON11D	98	0.904	0.11	0.0002	12	2	1.0	236	5.0	4.5	N/A	0.9	1.8	248	11.4	1.8	0.050	
OFF1E	95	0.864	1.94	0.0030	50	0.5	3.8	465	3.1	3.5	N/A	2.2	6.0	515	12.9	6.0	0.060	
UNDEVELOPED CONDITIONS																		
OFF2E	94	0.851	4.17	0.0065	100	0.5	5.7	540	2.1	2.2	4.3	4.0	9.7	N/A	N/A	9.7	0.100	
OFF3E	94	0.851	3.12	0.0049	100	0.5	5.7	635	1.6	2.6	3.9	3.8	9.5	N/A	N/A	9.5	0.100	
ON1E	94	0.851	12.78	0.0200	100	0.5	5.7	540	2.1	2.2	4.3	4.0	9.7	N/A	N/A	9.7	0.100	
ON2E	94	0.851	1.12	0.0018	100	0.5	5.7	540	2.1	2.2	4.3	4.0	9.7	N/A	N/A	9.7	0.100	
ON3E	86	0.745	0.48	0.0008	100	0.5	8.0	540	2.1	2.2	4.3	4.0	12.1	N/A	N/A	12.1	0.121	
ON4E	86	0.745	1.23	0.0019	100	0.5	8.0	540	2.1	2.2	4.3	4.0	12.1	N/A	N/A	12.1	0.121	

$T_i=(1.8(1.1-K)L^{(1/2)})/(S^{1/3})$
$T_c=T_i+T_t$
$K=0.0132(CN)-.39$
$T_{lag} = 0.6T_c$

For the travel time (T_t) calculations,
V_1 applies to the first 500 feet of travel distance;
V_2 applies to the remaining travel distance.

Travel Time Velocity Formulas

Existing	Developed
$V_1 = 14.8*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$
$V_2 = 29.4*(S/100)^{1/2}$	$V_2 = 30.6*(S/100)^{1/2}$

All basins over one square mile are calculated by the equation
$T_{lag}=20Kn(L*L_c/S^{0.5})^{0.33}$
(SEE SEPARATE SPREADSHEET)

REFERENCE: **CCRFCD HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL**

STANDARD FORM 4

```
1*****************************************                    *****************************************
 *                                       *                    *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                    *    U.S. ARMY CORPS OF ENGINEERS       *
 *             JUN   1998                *                    *    HYDROLOGIC ENGINEERING CENTER      *
 *            VERSION 4.1                *                    *          609 SECOND STREET            *
 *                                       *                    *       DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   12FEB18  TIME  07:19:26   *                    *          (916) 756-1104               *
 *                                       *                    *                                       *
 *****************************************                    *****************************************

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

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

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


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

                         *DIAGRAM
            1            ID
            2            ID     6- HOUR, 10- AND 100-YEAR  EXISTING AND DEVELOPED CONDITIONS MODEL
            3            ID     ELYSIAN RENAISSANCE
            4            ID     MOMENTUM ENGINEERS FOR GCW - L PROCTOR
            5            ID
            6            ID
            7            ID     6-HOUR STORM DISTRIBUTION #3
            8            ID     10 AND 100 YEAR STORM EVENTS
            9            ID     OUTSIDE OF MCCARRAN AIRPORT RAINFALL AREA
           10            ID
           11            ID
           12            ID
           13            IT       5       0       0     300
           14            IO       5       0       0
           15            IN       5       0       0
           16            JR    PREC    0.56       1

           17            KK   OFF1E
           18            KM          <<<<<<<<<<<<<<<<<<<<EXISTING CONDITIONS>>>>>>>>>>>>>>>>>>>>
           19            BA   .0030
           20            PB    2.86
           21            KM           SDN #3
           22            PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
           23            PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
           24            PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
           25            PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
           26            PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
           27            PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
           28            PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
           29            PC   0.998   0.999   1.000
           30            LS       0      95
           31            UD   0.060
                         *

           32            KK   OFF2E
           33            BA   .0065
           34            LS       0      94
           35            UD   0.100
                         *

           36            KK    ECP1
           37            KM   OFF1E+OFF2E
           38            HC       2
                         *

           39            KK    ON1E
           40            BA   .0200
           41            LS       0      94
           42            UD   0.100
                         *
```



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

           43            KK    ECP2
           44            KM   ECP1+ON1E
           45            HC       2
```

```
                *
 46             KK    ON3E
 47             BA   .0008
 48             LS       0      86
 49             UD   0.121
                *
 50             KK    ON4E
 51             BA   .0019
 52             LS       0      86
 53             UD   0.121
                *
 54             KK    ECP3
 55             KM   ON3E+ON4E
 56             HC       2
                *
 57             KK   OFF3E
 58             BA   .0049
 59             LS       0      94
 60             UD   0.100
                *
 61             KK     ALT
 62             BA   .0015
 63             LS       0      98
 64             UD   0.079
                *
 65             KK   COM1E
 66             KM   RUNOFF ON THE SOUTH SIDE OF ALTA
 67             HC       4
                *
 68             KK    ON2E
 69             BA   .0018
 70             LS       0      94
 71             UD   0.100
                *
 72             KK     COM
 73             KM   COMBINE EXISTING BASINS
 74             HC       2
                *
1                                        HEC-1 INPUT                                                PAGE  3

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


 75             KK    ON1D
 76             KM          <<<<<<<<<<<<<<<<<<<<DEVELOPED CONDITIONS>>>>>>>>>>>>>>>>>>>>
 77             BA   .0023
 78             LS       0      95
 79             UD   0.062
                *
 80             KK   ON2DA
 81             BA   .0025
 82             LS       0      95
 83             UD   0.069
                *
 84             KK   ON2DB
 85             BA   .0017
 86             LS       0      95
 87             UD   0.051
                *
 88             KK   ON2DC
 89             BA   .0009
 90             LS       0      95
 91             UD   0.065
                *
 92             KK     COM
 93             HC       4
                *
 94             KK    ON3D
 95             BA   .0005
 96             LS       0      98
 97             UD   0.050
                *
 98             KK    ON4D
 99             BA   .0009
100             LS       0      98
101             UD   0.063
                *
102             KK    ON5D
103             BA   .0049
104             LS       0      95
105             UD   0.088
                *
```

```
            106           KK    ON7D
            107           BA   .0048
            108           LS       0      95
            109           UD   0.061
                          *
1                                                    HEC-1 INPUT                                                    PAGE  4

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


            110           KK     COM
            111           HC       4
                          *

            112           KK    ON6D
            113           BA   .0010
            114           LS       0      95
            115           UD   0.050
                          *

            116           KK    ON8D
            117           BA   .0016
            118           LS       0      95
            119           UD   0.050
                          *

            120           KK    ON9D
            121           BA   .0003
            122           LS       0      86
            123           UD   0.071
                          *

            124           KK   ON10D
            125           BA   .0031
            126           LS       0      87
            127           UD   0.115
                          *

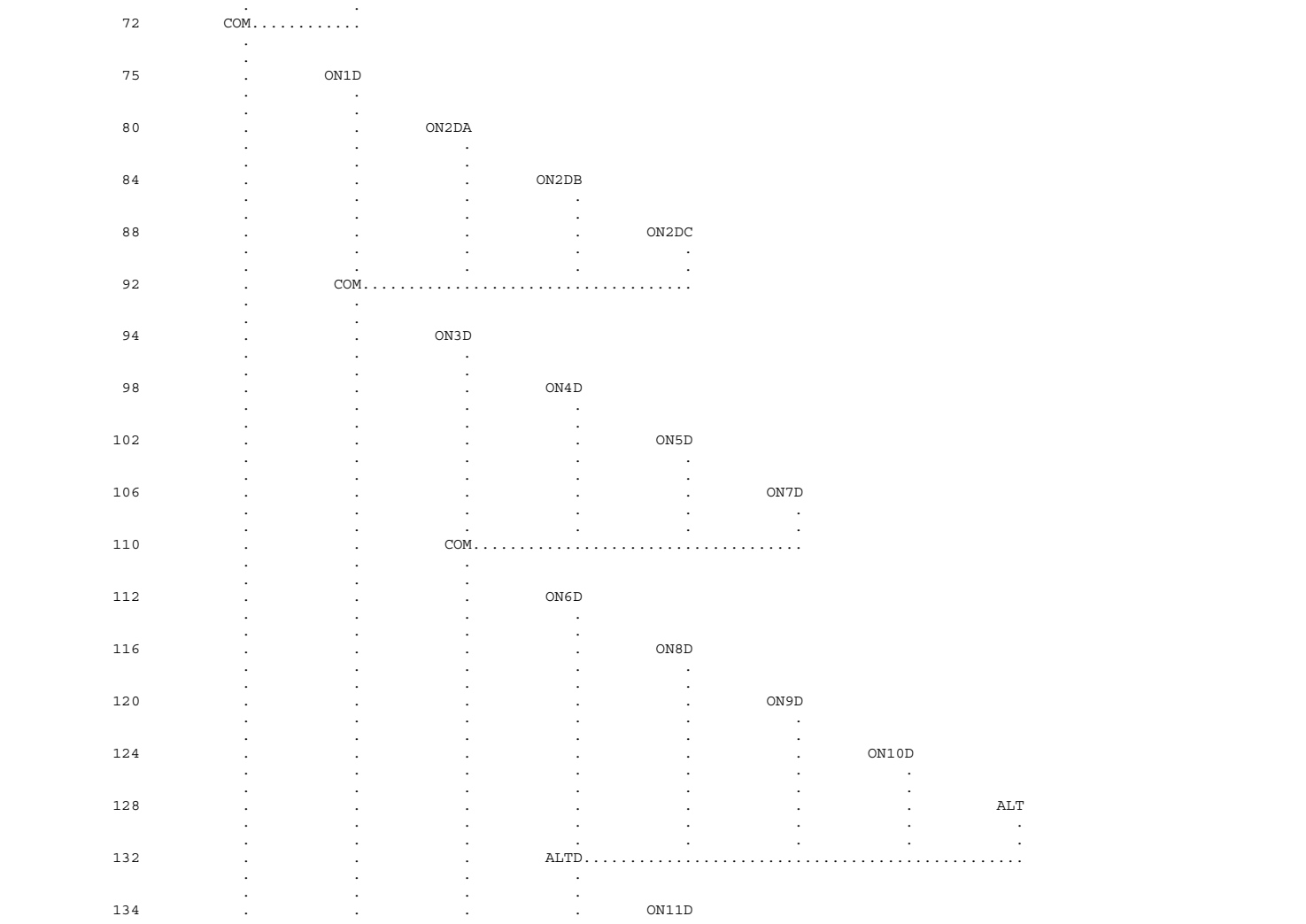
            128           KK     ALT
            129           BA   .0015
            130           LS       0      98
            131           UD   0.079
                          *

            132           KK    ALTD
            133           HC       5
                          *

            134           KK   ON11D
            135           BA   .0002
            136           LS       0      98
            137           UD   0.050
                          *
            138           ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    17       OFF1E
                 .
                 .
    32           .       OFF2E
                 .           .
                 .           .
    36         ECP1.............
                 .
                 .
    39           .        ON1E
                 .           .
                 .           .
    43         ECP2.............
                 .
                 .
    46           .        ON3E
                 .           .
                 .           .
    50           .           .        ON4E
                 .           .           .
                 .           .           .
    54           .        ECP3.............
                 .           .
                 .           .
    57           .           .       OFF3E
                 .           .           .
                 .           .           .
    61           .           .           .         ALT
                 .           .           .           .
                 .           .           .           .
    65       COM1E.....................................
                 .
                 .
    68           .        ON2E
                 .           .
```



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   12FEB18  TIME  07:19:26   *
*                                       *
*****************************************
```

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

6- HOUR, 10- AND 100-YEAR EXISTING AND DEVELOPED CONDITIONS MODEL
ELYSIAN RENAISSANCE
MOMENTUM ENGINEERS FOR GCW - L PROCTOR

6-HOUR STORM DISTRIBUTION #3
10 AND 100 YEAR STORM EVENTS
OUTSIDE OF MCCARRAN AIRPORT RAINFALL AREA

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

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

                  COMPUTATION INTERVAL     .08 HOURS
```

TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.56 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 .56	RATIO 2 1.00
HYDROGRAPH AT						
+	OFF1E	.00	1	FLOW	3.	7.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	OFF2E	.01	1	FLOW	6.	12.
				TIME	3.50	3.50
2 COMBINED AT						
+	ECP1	.01	1	FLOW	9.	19.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON1E	.02	1	FLOW	18.	38.
				TIME	3.50	3.50
2 COMBINED AT						
+	ECP2	.03	1	FLOW	28.	56.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON3E	.00	1	FLOW	0.	1.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON4E	.00	1	FLOW	1.	3.
				TIME	3.58	3.58
2 COMBINED AT						
+	ECP3	.00	1	FLOW	1.	4.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	OFF3E	.00	1	FLOW	4.	9.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ALT	.00	1	FLOW	2.	3.
				TIME	3.50	3.50
4 COMBINED AT						
+	COM1E	.04	1	FLOW	35.	72.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON2E	.00	1	FLOW	2.	3.
				TIME	3.50	3.50
2 COMBINED AT						
+	COM	.04	1	FLOW	37.	76.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON1D	.00	1	FLOW	3.	5.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON2DA	.00	1	FLOW	3.	5.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON2DB	.00	1	FLOW	2.	4.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON2DC	.00	1	FLOW	1.	2.
				TIME	3.50	3.50
4 COMBINED AT						

+	COM	.01	1	FLOW	8.	16.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON3D	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON4D	.00	1	FLOW	1.	2.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON5D	.00	1	FLOW	5.	10.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON7D	.00	1	FLOW	5.	11.
				TIME	3.50	3.50
4 COMBINED AT						
+	COM	.01	1	FLOW	12.	24.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON6D	.00	1	FLOW	1.	2.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON8D	.00	1	FLOW	2.	4.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON9D	.00	1	FLOW	0.	0.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON10D	.00	1	FLOW	2.	4.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ALT	.00	1	FLOW	2.	3.
				TIME	3.50	3.50
5 COMBINED AT						
+	ALTD	.01	1	FLOW	7.	14.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON11D	.00	1	FLOW	0.	0.
				TIME	3.50	3.50

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

APPENDIX D HYDRAULIC CALCULATIONS

DROP INLET CALCULATIONS

Worksheet for Inlet 1: 2'x2' Grate (on grade)

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.016	
Slope		0.02500	ft/ft
Left Side Slope		20.00	ft/ft (H:V)
Right Side Slope		0.10	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		5.00	ft³/s
Grate Width		2.00	ft
Grate Length		2.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		38.28	%
Intercepted Flow		1.91	ft³/s
Bypass Flow		3.09	ft³/s
Flow Area		1.19	ft²
Wetted Perimeter		7.74	ft
Top Width		7.53	ft
Velocity		4.21	ft/s
Splash Over Velocity		5.66	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.00	
Grate Flow Ratio		0.38	
Active Grate Length		1.00	ft
Critical Depth		0.31	ft
Critical Slope		0.00656	ft/ft
Froude Number		1.87	
Flow Type	Supercritical		
Specific Energy		0.50	ft
Velocity Head		0.28	ft
Depth		0.23	ft

Worksheet for Inlet 2: 3'x3' Existing Grate (on grade)

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.025	
Slope		0.00200	ft/ft
Left Side Slope		20.00	ft/ft (H:V)
Right Side Slope		0.10	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		1.00	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		87.76	%
Intercepted Flow		0.88	ft³/s
Bypass Flow		0.12	ft³/s
Flow Area		1.28	ft²
Wetted Perimeter		7.99	ft
Top Width		7.77	ft
Velocity		0.78	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.72	
Grate Flow Ratio		0.56	
Active Grate Length		1.50	ft
Critical Depth		0.13	ft
Critical Slope		0.02021	ft/ft
Froude Number		0.34	
Flow Type	Subcritical		
Specific Energy		0.25	ft
Velocity Head		0.01	ft
Depth		0.24	ft

Worksheet for Inlet 2A: 3'x3' Grate (on grade)

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.016	
Slope		0.01000	ft/ft
Left Side Slope		20.00	ft/ft (H:V)
Right Side Slope		0.10	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		8.00	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		54.09	%
Intercepted Flow		4.33	ft³/s
Bypass Flow		3.67	ft³/s
Flow Area		2.34	ft²
Wetted Perimeter		10.49	ft
Top Width		10.16	ft
Velocity		3.42	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.16	
Grate Flow Ratio		0.46	
Active Grate Length		1.50	ft
Critical Depth		0.40	ft
Critical Slope		0.00616	ft/ft
Froude Number		1.25	
Flow Type	Supercritical		
Specific Energy		0.54	ft
Velocity Head		0.18	ft
Depth		0.36	ft

Worksheet for Inlet 3: 4'x4' Grate (sag)

Project Description

Solve For	Spread

Input Data

Discharge		9.00	ft³/s
Left Side Slope		30.00	ft/ft (H:V)
Right Side Slope		0.50	ft/ft (H:V)
Bottom Width		4.00	ft
Grate Width		4.00	ft
Grate Length		4.00	ft
Local Depression		1.00	in
Local Depression Width		4.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	13.56	ft
Depth	0.31	ft
Wetted Perimeter	13.76	ft
Top Width	13.56	ft
Open Grate Area	7.20	ft²
Active Grate Weir Length	12.00	ft

Worksheet for Inlet 3A: 3'x3' Grate (on grade)

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.016	
Slope		0.02300	ft/ft
Left Side Slope		20.00	ft/ft (H:V)
Right Side Slope		0.10	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		2.00	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		73.30	%
Intercepted Flow		1.47	ft³/s
Bypass Flow		0.53	ft³/s
Flow Area		0.64	ft²
Wetted Perimeter		6.01	ft
Top Width		5.88	ft
Velocity		3.15	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.18	
Grate Flow Ratio		0.68	
Active Grate Length		1.50	ft
Critical Depth		0.19	ft
Critical Slope		0.00747	ft/ft
Froude Number		1.69	
Flow Type	Supercritical		
Specific Energy		0.30	ft
Velocity Head		0.15	ft
Depth		0.14	ft

Worksheet for Inlet 4: 3'x3' Grate (sag)

Project Description

Solve For	Spread

Input Data

Discharge		11.00	ft³/s
Left Side Slope		20.00	ft/ft (H:V)
Right Side Slope		0.10	ft/ft (H:V)
Bottom Width		3.00	ft
Grate Width		3.00	ft
Grate Length		3.00	ft
Local Depression		1.00	in
Local Depression Width		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	12.37	ft
Depth	0.47	ft
Wetted Perimeter	12.80	ft
Top Width	12.37	ft
Open Grate Area	4.05	ft²
Active Grate Weir Length	9.00	ft

Worksheet for Inlet 5: 4' Type A DI (sag)

Project Description

Solve For	Spread

Input Data

Discharge		1.00	ft^3/s
Gutter Width		1.50	ft
Gutter Cross Slope		0.11	ft/ft
Road Cross Slope		0.02	ft/ft
Curb Opening Length		4.00	ft
Opening Height		0.25	ft
Curb Throat Type	Horizontal		
Local Depression		1.00	in
Local Depression Width		4.00	ft
Throat Incline Angle		90.00	degrees

Results

Spread	2.55	ft
Depth	0.25	ft
Gutter Depression	0.14	ft
Total Depression	0.22	ft

Worksheet for Inlet 6: 4' Type A DI (sag)

Project Description

Solve For	Spread

Input Data

Discharge		2.00	ft^3/s
Gutter Width		1.50	ft
Gutter Cross Slope		0.11	ft/ft
Road Cross Slope		0.02	ft/ft
Curb Opening Length		4.00	ft
Opening Height		0.25	ft
Curb Throat Type	Horizontal		
Local Depression		1.00	in
Local Depression Width		4.00	ft
Throat Incline Angle		90.00	degrees

Results

Spread	3.06	ft
Depth	0.32	ft
Gutter Depression	0.14	ft
Total Depression	0.22	ft

Worksheet for Inlet 7: 2'x2' Grate (on grade)

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.016	
Slope		0.02000	ft/ft
Left Side Slope		20.00	ft/ft (H:V)
Right Side Slope		0.10	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		10.00	ft³/s
Grate Width		2.00	ft
Grate Length		2.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		31.67	%
Intercepted Flow		3.17	ft³/s
Bypass Flow		6.83	ft³/s
Flow Area		2.14	ft²
Wetted Perimeter		10.05	ft
Top Width		9.74	ft
Velocity		4.68	ft/s
Splash Over Velocity		5.66	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.00	
Grate Flow Ratio		0.31	
Active Grate Length		1.00	ft
Critical Depth		0.45	ft
Critical Slope		0.00597	ft/ft
Froude Number		1.76	
Flow Type	Supercritical		
Specific Energy		0.68	ft
Velocity Head		0.34	ft
Depth		0.34	ft

Worksheet for Inlet 8: 2'x2' Grate (sag)

Project Description

Solve For	Spread

Input Data

Discharge		7.00	ft³/s
Left Side Slope		20.00	ft/ft (H:V)
Right Side Slope		20.00	ft/ft (H:V)
Bottom Width		2.00	ft
Grate Width		2.00	ft
Grate Length		2.00	ft
Local Depression		1.00	in
Local Depression Width		2.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	19.98	ft
Depth	0.45	ft
Wetted Perimeter	20.00	ft
Top Width	19.98	ft
Open Grate Area	1.80	ft²
Active Grate Weir Length	6.00	ft

NORMAL DEPTH & WEIR FLOW CALCULATIONS

Worksheet for Section 1 10yr Dry Lane Capacity Alta Drive

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.63	ft

Section Definitions

Station (ft)	Elevation (ft)
0+54	1.37
0+54	1.00
0+83	0.17
0+83	0.13
0+85	0.00
0+85	0.50
0+85	0.50
0+90	0.60
0+90	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+54, 1.37)	(0+90, 1.00)	0.016

Options

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

Results

Discharge	23.37	ft³/s
Elevation Range	0.00 to 1.37 ft	
Flow Area	5.01	ft²
Wetted Perimeter	23.66	ft

Worksheet for Section 1 10yr Dry Lane Capacity Alta Drive

Results

Hydraulic Radius		0.21	ft
Top Width		23.07	ft
Normal Depth		0.63	ft
Critical Depth		0.74	ft
Critical Slope		0.00585	ft/ft
Velocity		4.67	ft/s
Velocity Head		0.34	ft
Specific Energy		0.97	ft
Froude Number		1.77	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.63	ft
Critical Depth	0.74	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00585	ft/ft

Cross Section for Section 1 10yr Dry Lane Capacity Alta Drive

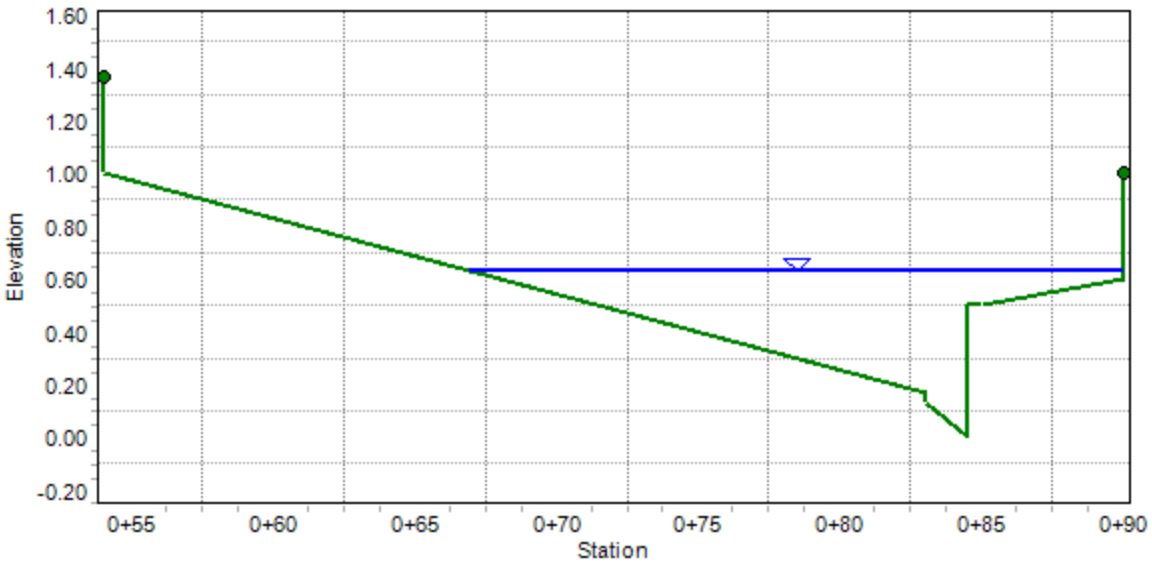
Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.63	ft
Discharge	23.37	ft³/s

Cross Section Image



Worksheet for Section 1 10yr Developed

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+54	1.37
0+54	1.00
0+83	0.17
0+83	0.13
0+85	0.00
0+85	0.50
0+85	0.50
0+90	0.60
0+90	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+54, 1.37)	(0+90, 1.00)	0.016

Options

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

Results

Normal Depth		0.46	ft
Elevation Range	0.00 to 1.37 ft		
Flow Area		2.00	ft²
Wetted Perimeter		11.96	ft

Worksheet for Section 1 10yr Developed

Results

Hydraulic Radius		0.17	ft
Top Width		11.46	ft
Normal Depth		0.46	ft
Critical Depth		0.55	ft
Critical Slope		0.00680	ft/ft
Velocity		3.99	ft/s
Velocity Head		0.25	ft
Specific Energy		0.70	ft
Froude Number		1.68	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.46	ft
Critical Depth	0.55	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00680	ft/ft

Cross Section for Section 1 10yr Developed

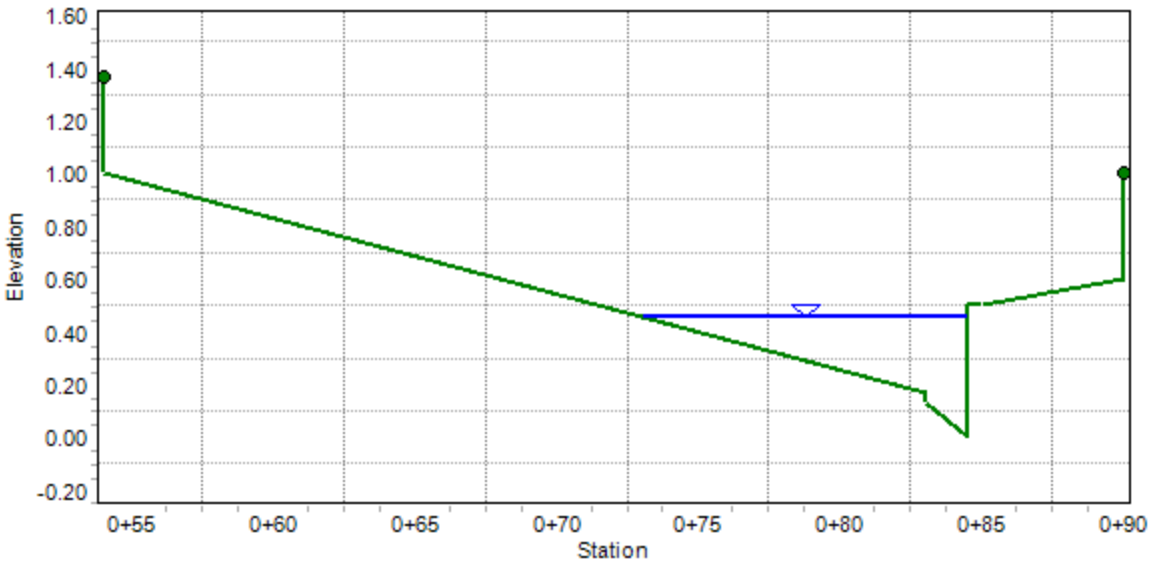
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.46	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for Section 1 100yr Developed

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Discharge	37.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+54	1.37
0+54	1.00
0+83	0.17
0+83	0.13
0+85	0.00
0+85	0.50
0+85	0.50
0+90	0.60
0+90	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+54, 1.37)	(0+90, 1.00)	0.016

Options

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

Results

Normal Depth		0.71	ft
Elevation Range	0.00 to 1.37 ft		
Flow Area		6.90	ft²
Wetted Perimeter		26.44	ft

Worksheet for Section 1 100yr Developed

Results

Hydraulic Radius		0.26	ft
Top Width		25.78	ft
Normal Depth		0.71	ft
Critical Depth		0.85	ft
Critical Slope		0.00545	ft/ft
Velocity		5.36	ft/s
Velocity Head		0.45	ft
Specific Energy		1.15	ft
Froude Number		1.83	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.71	ft
Critical Depth	0.85	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00545	ft/ft

Cross Section for Section 1 100yr Developed

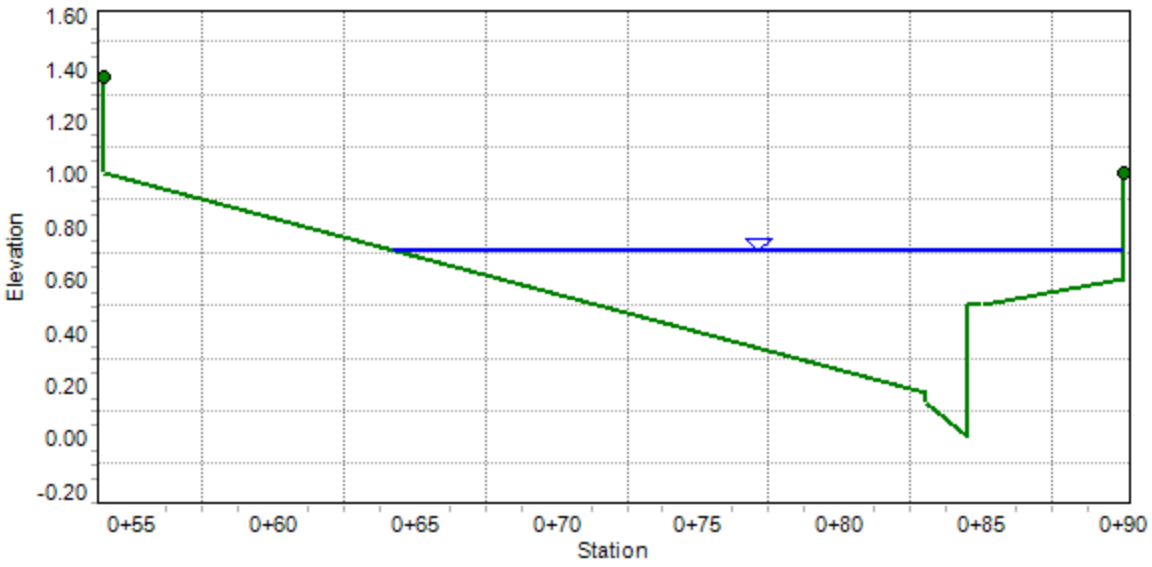
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.71	ft
Discharge	37.00	ft³/s

Cross Section Image



Worksheet for Section 1 10yr Interim

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Discharge	21.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+54	1.37
0+54	1.00
0+83	0.17
0+83	0.13
0+85	0.00
0+85	0.50
0+85	0.50
0+90	0.60
0+90	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+54, 1.37)	(0+90, 1.00)	0.016

Options

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

Results

Normal Depth	0.61	ft
Elevation Range	0.00 to 1.37 ft	
Flow Area	4.65	ft²
Wetted Perimeter	23.10	ft

Worksheet for Section 1 10yr Interim

Results

Hydraulic Radius		0.20	ft
Top Width		22.53	ft
Normal Depth		0.61	ft
Critical Depth		0.71	ft
Critical Slope		0.00595	ft/ft
Velocity		4.51	ft/s
Velocity Head		0.32	ft
Specific Energy		0.93	ft
Froude Number		1.75	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.61	ft
Critical Depth	0.71	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00595	ft/ft

Cross Section for Section 1 10yr Interim

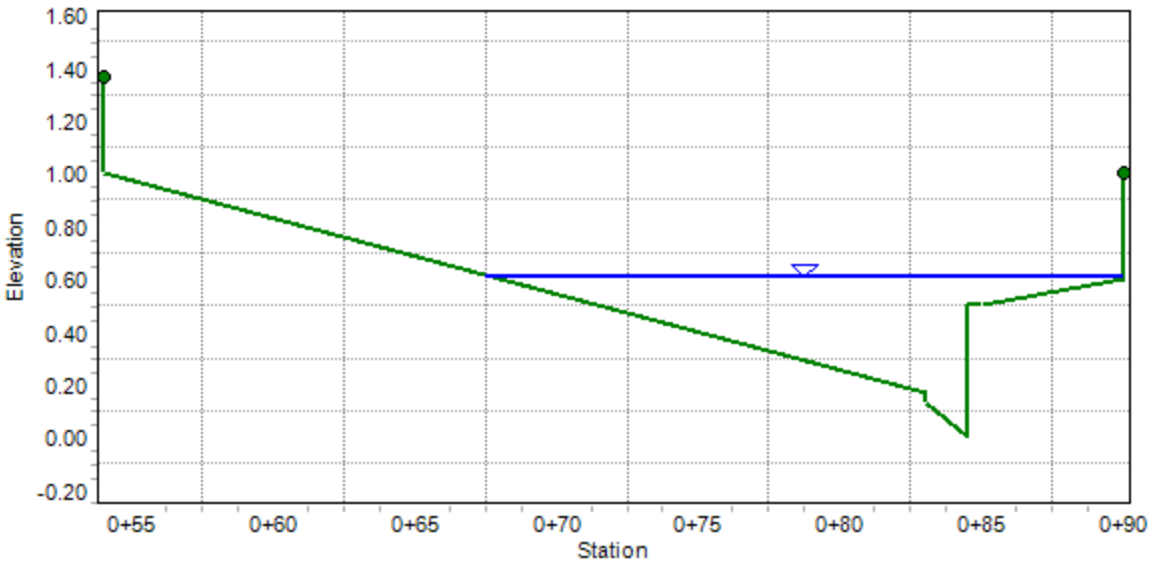
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.61	ft
Discharge	21.00	ft³/s

Cross Section Image



Worksheet for Section 1 100yr Interim

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Discharge	65.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+54	1.37
0+54	1.00
0+83	0.17
0+83	0.13
0+85	0.00
0+85	0.50
0+85	0.50
0+90	0.60
0+90	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+54, 1.37)	(0+90, 1.00)	0.016

Options

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

Results

Normal Depth		0.83	ft
Elevation Range	0.00 to 1.37 ft		
Flow Area		10.28	ft²
Wetted Perimeter		30.80	ft

Worksheet for Section 1 100yr Interim

Results

Hydraulic Radius		0.33	ft
Top Width		30.01	ft
Normal Depth		0.83	ft
Critical Depth		1.02	ft
Critical Slope		0.00499	ft/ft
Velocity		6.32	ft/s
Velocity Head		0.62	ft
Specific Energy		1.45	ft
Froude Number		1.90	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.83	ft
Critical Depth	1.02	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00499	ft/ft

Cross Section for Section 1 100yr Interim

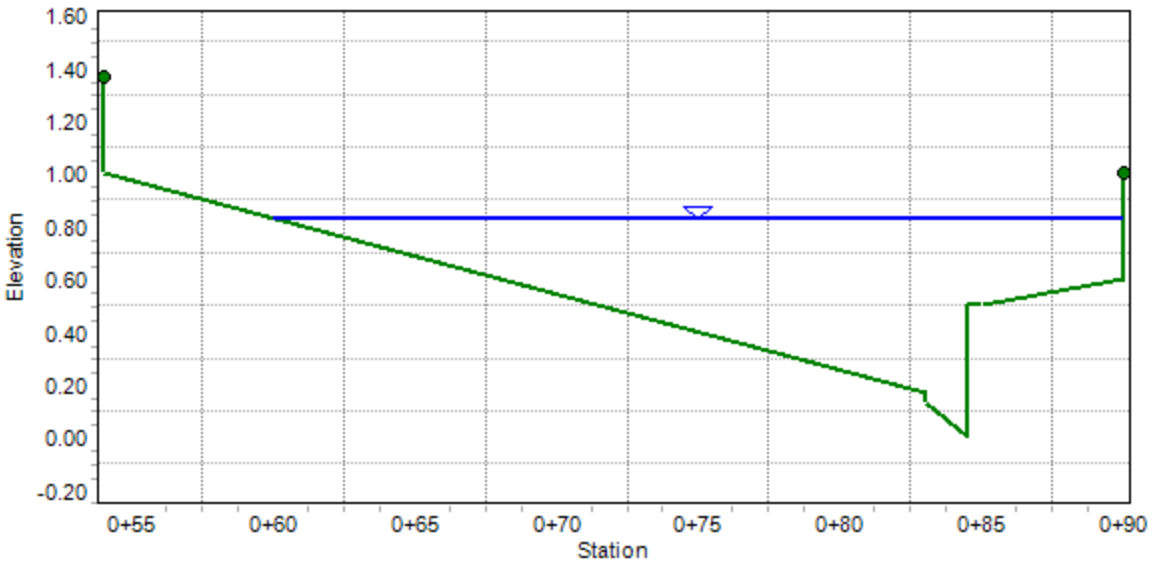
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.83	ft
Discharge	65.00	ft³/s

Cross Section Image



Worksheet for Section A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01060	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.74
0+22	0.16
0+23	0.00
0+25	0.16
0+25	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.74)	(0+22, 0.16)	0.016
(0+22, 0.16)	(0+25, 0.50)	0.013

Options

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

Results

Normal Depth	0.45	ft
Elevation Range	0.00 to 0.74 ft	
Flow Area	2.51	ft²
Wetted Perimeter	13.79	ft
Hydraulic Radius	0.18	ft
Top Width	13.48	ft
Normal Depth	0.45	ft

Worksheet for Section A

Results

Critical Depth		0.49	ft
Critical Slope		0.00606	ft/ft
Velocity		3.18	ft/s
Velocity Head		0.16	ft
Specific Energy		0.61	ft
Froude Number		1.30	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.45	ft
Critical Depth	0.49	ft
Channel Slope	0.01060	ft/ft
Critical Slope	0.00606	ft/ft

Cross Section for Section A

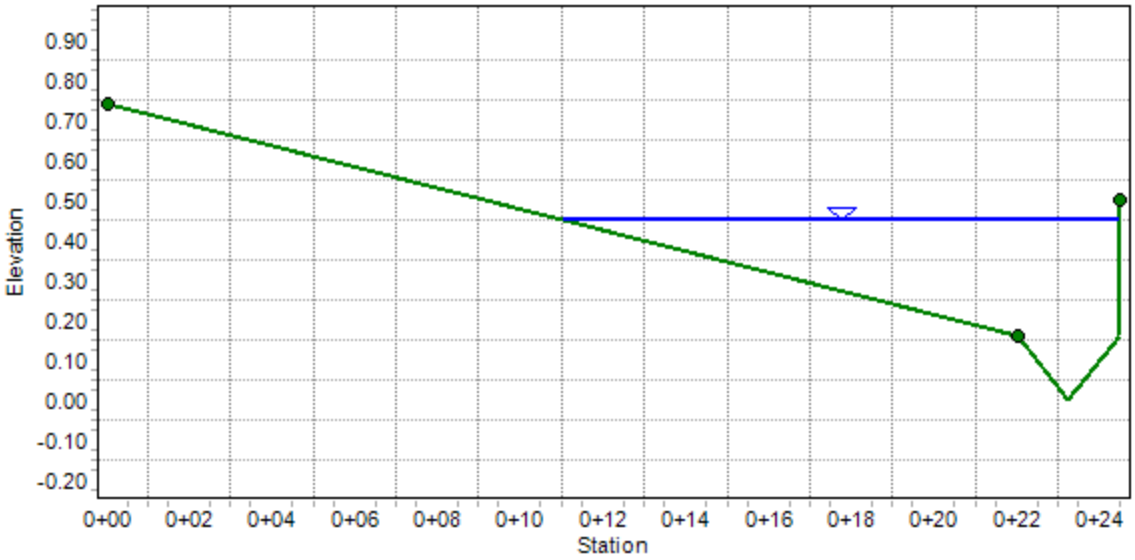
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01060	ft/ft
Normal Depth	0.45	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for Section A Weir

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		9.00	ft³/s
Crest Elevation		2695.21	ft
Tailwater Elevation		2695.21	ft
Weir Coefficient		3.00	US
Crest Length		10.00	ft
Number Of Contractions	0		

Results

Headwater Elevation	2695.66	ft
Headwater Height Above Crest	0.45	ft
Tailwater Height Above Crest	0.00	ft
Flow Area	4.48	ft²
Velocity	2.01	ft/s
Wetted Perimeter	10.90	ft
Top Width	10.00	ft

Worksheet for Section B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01340	ft/ft
Discharge	11.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.85
0+22	0.16
0+23	0.00
0+25	0.16
0+25	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.85)	(0+22, 0.16)	0.016
(0+22, 0.16)	(0+25, 0.50)	0.013

Options

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

Results

Normal Depth	0.49	ft
Elevation Range	0.00 to 0.85 ft	
Flow Area	2.81	ft²
Wetted Perimeter	13.49	ft
Hydraulic Radius	0.21	ft
Top Width	13.13	ft
Normal Depth	0.49	ft

Worksheet for Section B

Results

Critical Depth		0.57	ft
Critical Slope		0.00570	ft/ft
Velocity		3.92	ft/s
Velocity Head		0.24	ft
Specific Energy		0.73	ft
Froude Number		1.49	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.49	ft
Critical Depth	0.57	ft
Channel Slope	0.01340	ft/ft
Critical Slope	0.00570	ft/ft

Cross Section for Section B

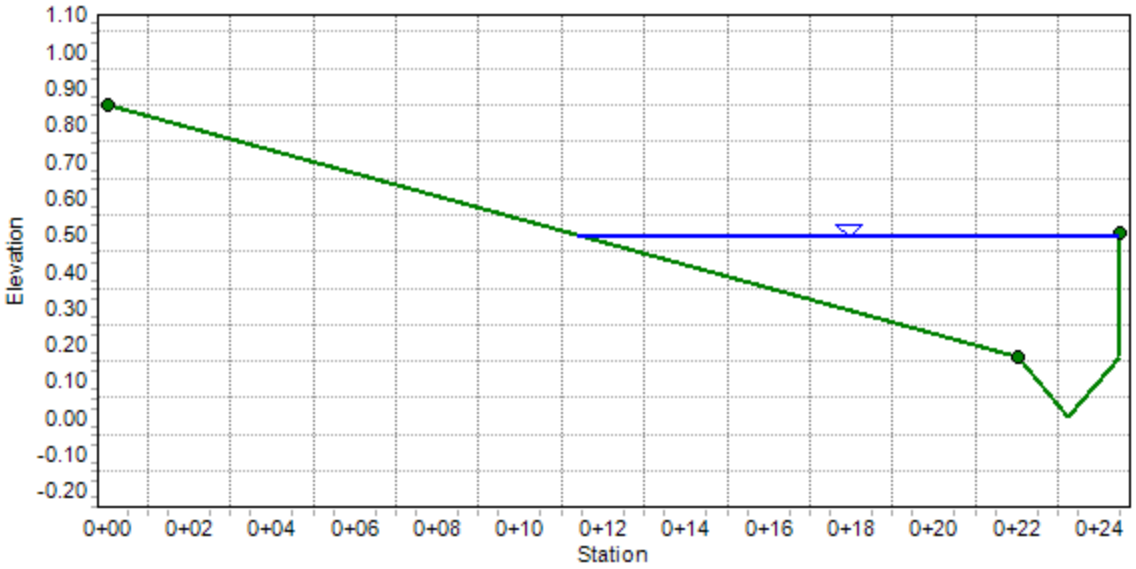
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01340	ft/ft
Normal Depth	0.49	ft
Discharge	11.00	ft³/s

Cross Section Image



Worksheet for Section B Weir

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		11.00	ft³/s
Crest Elevation		2691.76	ft
Tailwater Elevation		2691.76	ft
Weir Coefficient		3.00	US
Crest Length		10.00	ft
Number Of Contractions	0		

Results

Headwater Elevation	2692.27	ft
Headwater Height Above Crest	0.51	ft
Tailwater Height Above Crest	0.00	ft
Flow Area	5.12	ft²
Velocity	2.15	ft/s
Wetted Perimeter	11.02	ft
Top Width	10.00	ft

Worksheet for Section C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01330	ft/ft
Discharge	10.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.71
0+22	0.16
0+23	0.00
0+25	0.16
0+25	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.71)	(0+22, 0.16)	0.016
(0+22, 0.16)	(0+25, 0.50)	0.013

Options

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

Results

Normal Depth	0.46	ft
Elevation Range	0.00 to 0.71 ft	
Flow Area	2.77	ft²
Wetted Perimeter	14.89	ft
Hydraulic Radius	0.19	ft
Top Width	14.56	ft
Normal Depth	0.46	ft

Worksheet for Section C

Results

Critical Depth		0.52	ft
Critical Slope		0.00596	ft/ft
Velocity		3.61	ft/s
Velocity Head		0.20	ft
Specific Energy		0.66	ft
Froude Number		1.46	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.46	ft
Critical Depth		0.52	ft
Channel Slope		0.01330	ft/ft
Critical Slope		0.00596	ft/ft

Cross Section for Section C

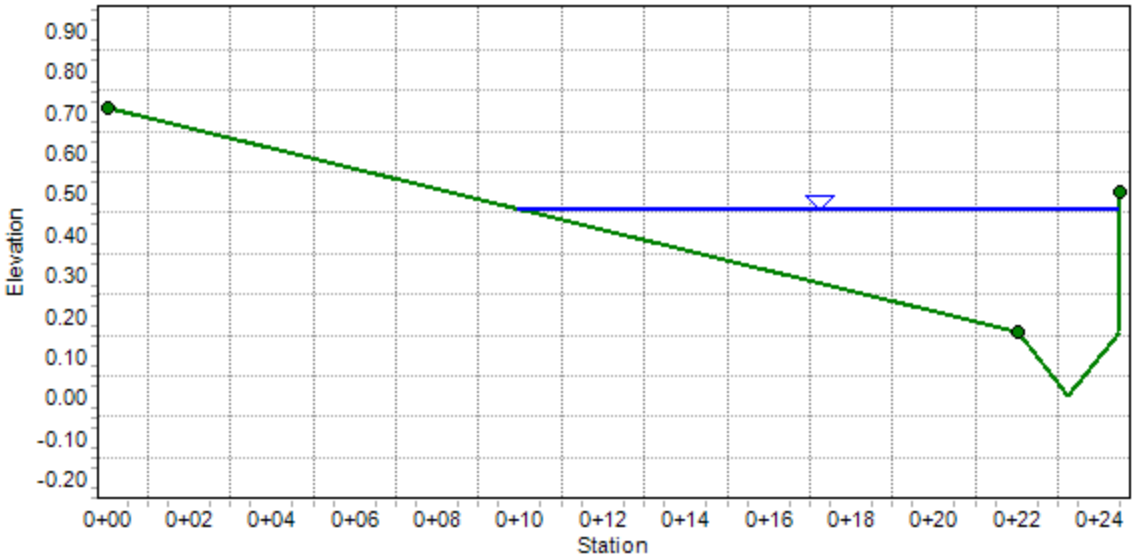
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01330	ft/ft
Normal Depth	0.46	ft
Discharge	10.00	ft³/s

Cross Section Image



Worksheet for Section D Interim

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03600	ft/ft
Discharge	21.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	90.16
0+01	90.16
0+01	89.66
0+02	89.79
0+02	89.83
0+25	90.17
0+25	90.67
0+25	90.67

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 90.16)	(0+25, 90.67)	0.016

Options

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

Results

Normal Depth	0.48	ft
Elevation Range	89.66 to 90.67 ft	
Flow Area	3.88	ft²
Wetted Perimeter	22.78	ft
Hydraulic Radius	0.17	ft

Worksheet for Section D Interim

Results

Top Width		22.25	ft
Normal Depth		0.48	ft
Critical Depth		0.61	ft
Critical Slope		0.00591	ft/ft
Velocity		5.41	ft/s
Velocity Head		0.45	ft
Specific Energy		0.94	ft
Froude Number		2.28	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.48	ft
Critical Depth	0.61	ft
Channel Slope	0.03600	ft/ft
Critical Slope	0.00591	ft/ft

Cross Section for Section D Interim

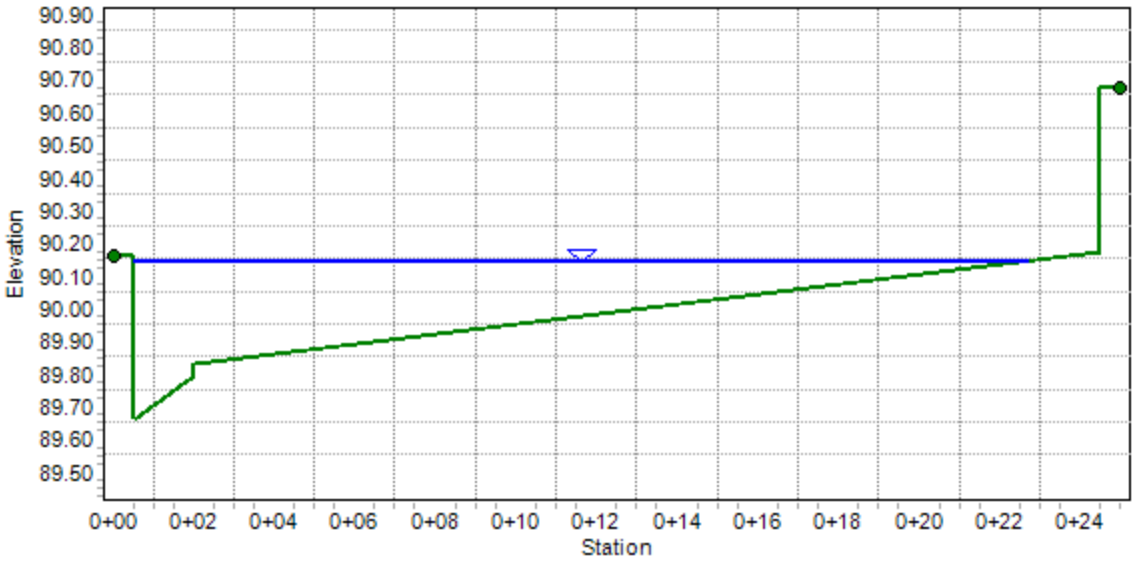
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03600	ft/ft
Normal Depth	0.48	ft
Discharge	21.00	ft³/s

Cross Section Image



Worksheet for Section E

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.06600	ft/ft
Bottom Width	3.00	ft
Discharge	21.00	ft^3/s

Results

Normal Depth	0.47	ft
Flow Area	1.42	ft^2
Wetted Perimeter	3.94	ft
Hydraulic Radius	0.36	ft
Top Width	3.00	ft
Critical Depth	1.15	ft
Critical Slope	0.00502	ft/ft
Velocity	14.83	ft/s
Velocity Head	3.42	ft
Specific Energy	3.89	ft
Froude Number	3.80	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.47	ft
Critical Depth	1.15	ft
Channel Slope	0.06600	ft/ft
Critical Slope	0.00502	ft/ft

Cross Section for Section E

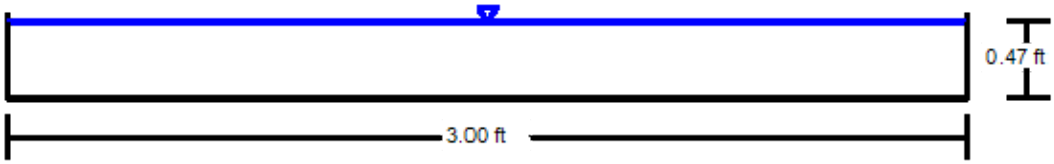
Project Description

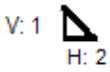
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.06600	ft/ft
Normal Depth	0.47	ft
Bottom Width	3.00	ft
Discharge	21.00	ft³/s

Cross Section Image





Worksheet for Section F

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Discharge	4.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	5.50
0+08	1.50
0+08	1.00
0+10	1.00
0+10	2.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5.50)	(0+08, 1.50)	0.025
(0+08, 1.50)	(0+10, 2.50)	0.013

Options

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

Results

Normal Depth	0.53	ft
Elevation Range	1.00 to 5.50 ft	
Flow Area	0.80	ft²
Wetted Perimeter	2.60	ft
Hydraulic Radius	0.31	ft
Top Width	1.56	ft
Normal Depth	0.53	ft

Worksheet for Section F

Results

Critical Depth		0.63	ft
Critical Slope		0.00634	ft/ft
Velocity		5.02	ft/s
Velocity Head		0.39	ft
Specific Energy		0.92	ft
Froude Number		1.24	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.53	ft
Critical Depth		0.63	ft
Channel Slope		0.01000	ft/ft
Critical Slope		0.00634	ft/ft

Cross Section for Section F

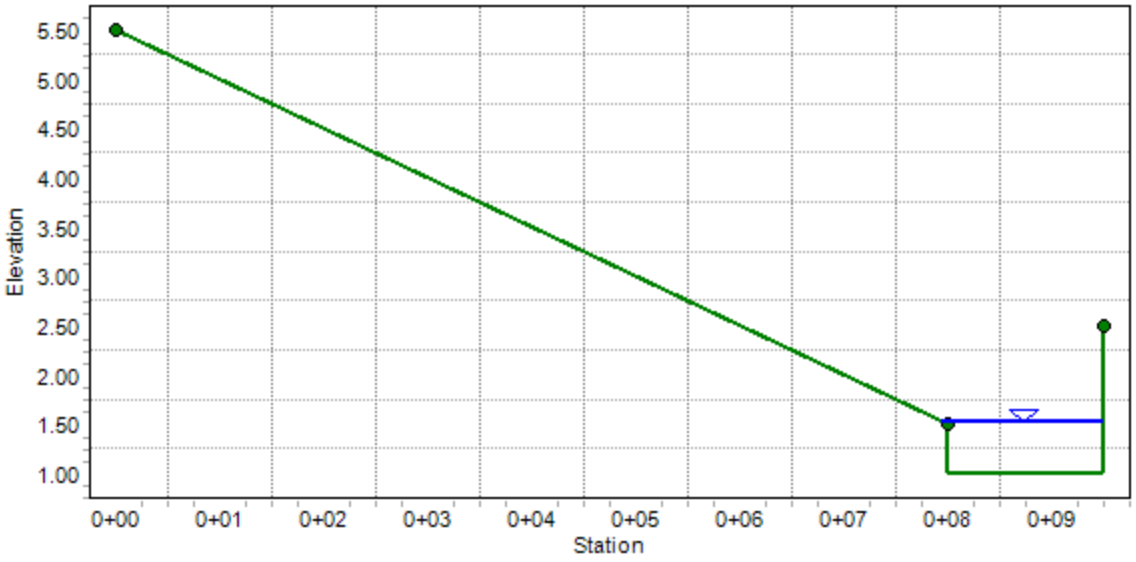
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Normal Depth	0.53	ft
Discharge	4.00	ft³/s

Cross Section Image



Worksheet for Section F Emergency Overflow

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Discharge	13.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	5.50
0+08	1.50
0+08	1.00
0+10	1.00
0+10	2.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5.50)	(0+08, 1.50)	0.025
(0+08, 1.50)	(0+10, 2.50)	0.013

Options

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

Results

Normal Depth	1.27	ft
Elevation Range	1.00 to 5.50 ft	
Flow Area	2.51	ft²
Wetted Perimeter	5.00	ft
Hydraulic Radius	0.50	ft
Top Width	3.05	ft
Normal Depth	1.27	ft

Worksheet for Section F Emergency Overflow

Results

Critical Depth		1.28	ft
Critical Slope		0.00983	ft/ft
Velocity		5.19	ft/s
Velocity Head		0.42	ft
Specific Energy		1.69	ft
Froude Number		1.01	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		1.27	ft
Critical Depth		1.28	ft
Channel Slope		0.01000	ft/ft
Critical Slope		0.00983	ft/ft

Cross Section for Section F Emergency Overflow

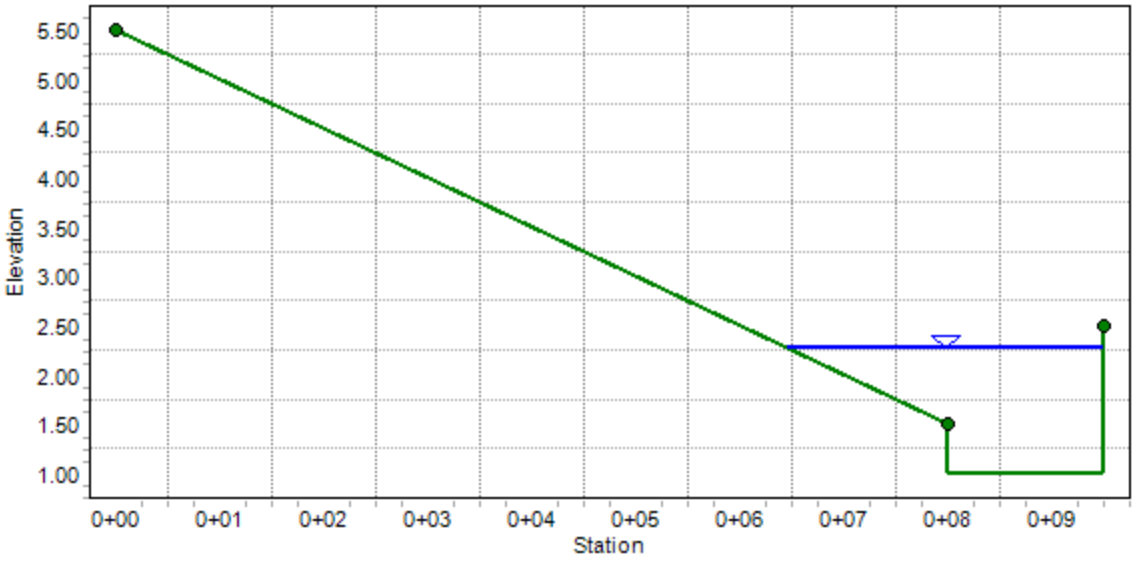
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

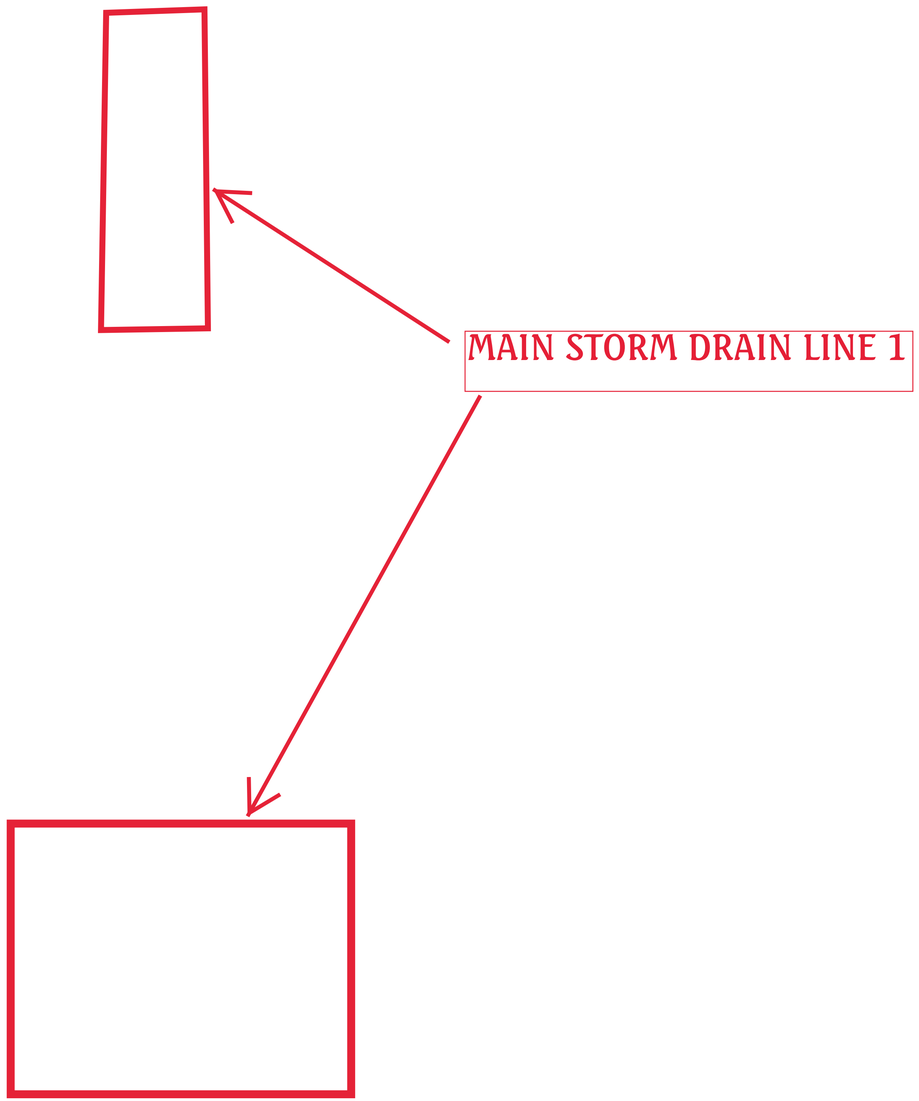
Input Data

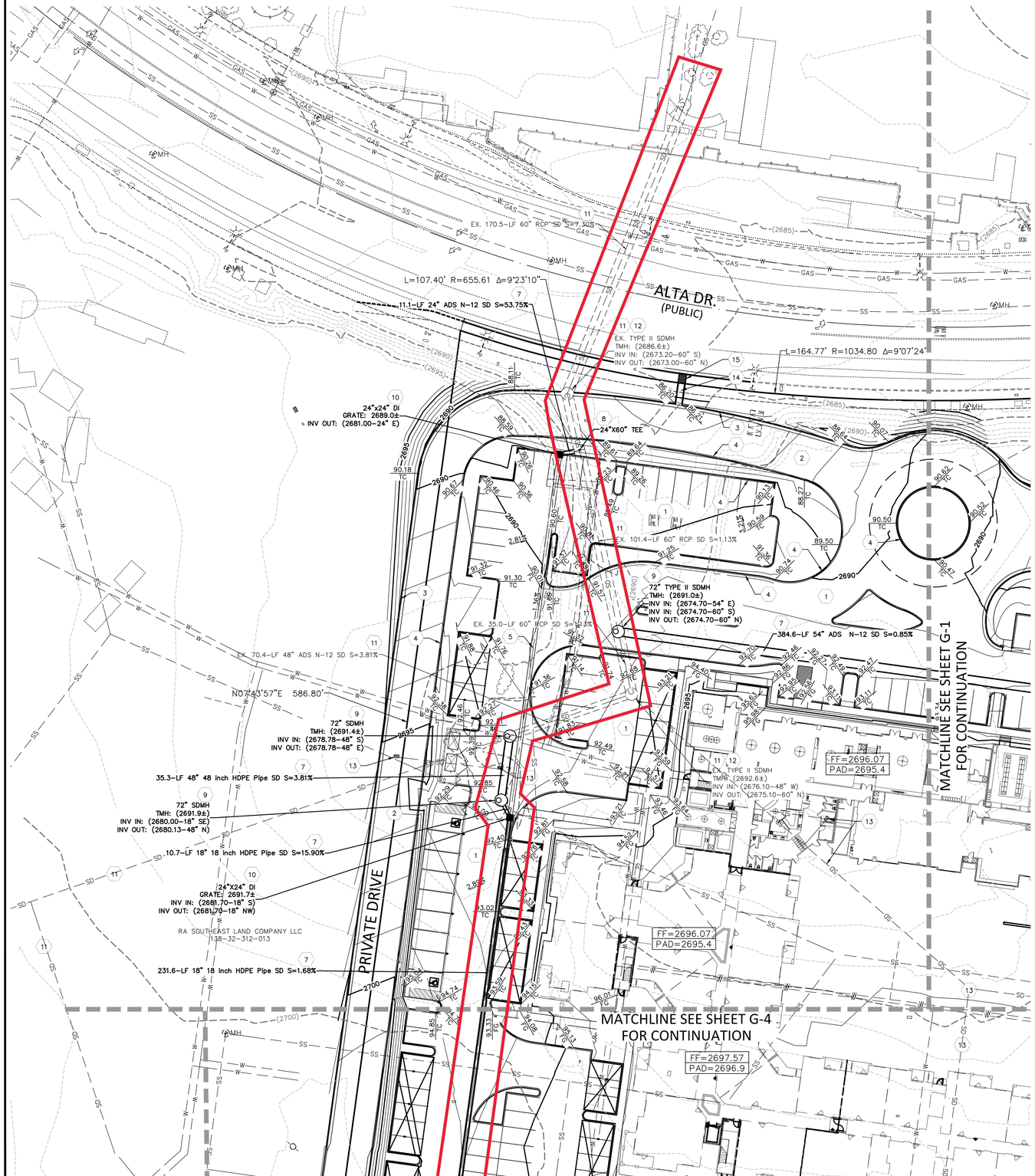
Channel Slope	0.01000	ft/ft
Normal Depth	1.27	ft
Discharge	13.00	ft³/s

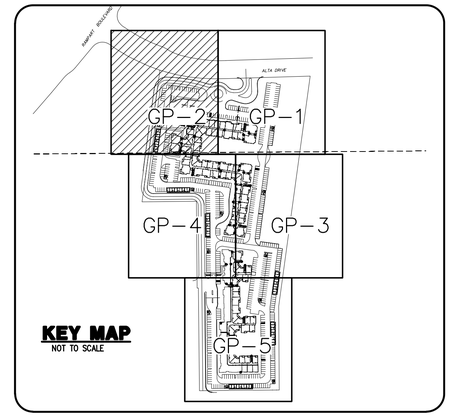
Cross Section Image



WSPG ELY1


MAIN STORM DRAIN LINE 1





NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

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

H# —

CLV DWG# —

STATE OF NEVADA — ENGINEER — TODD N. KELLEY — Exp. 6/30/2019 — CIVIL — PROFESSIONAL

DATE:

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002

DESIGN:
DRAWN:
CHECK:

PLOT DATE: 03-13-18
PLOT TIME: 15:09:49

GCW ENGINEERS SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

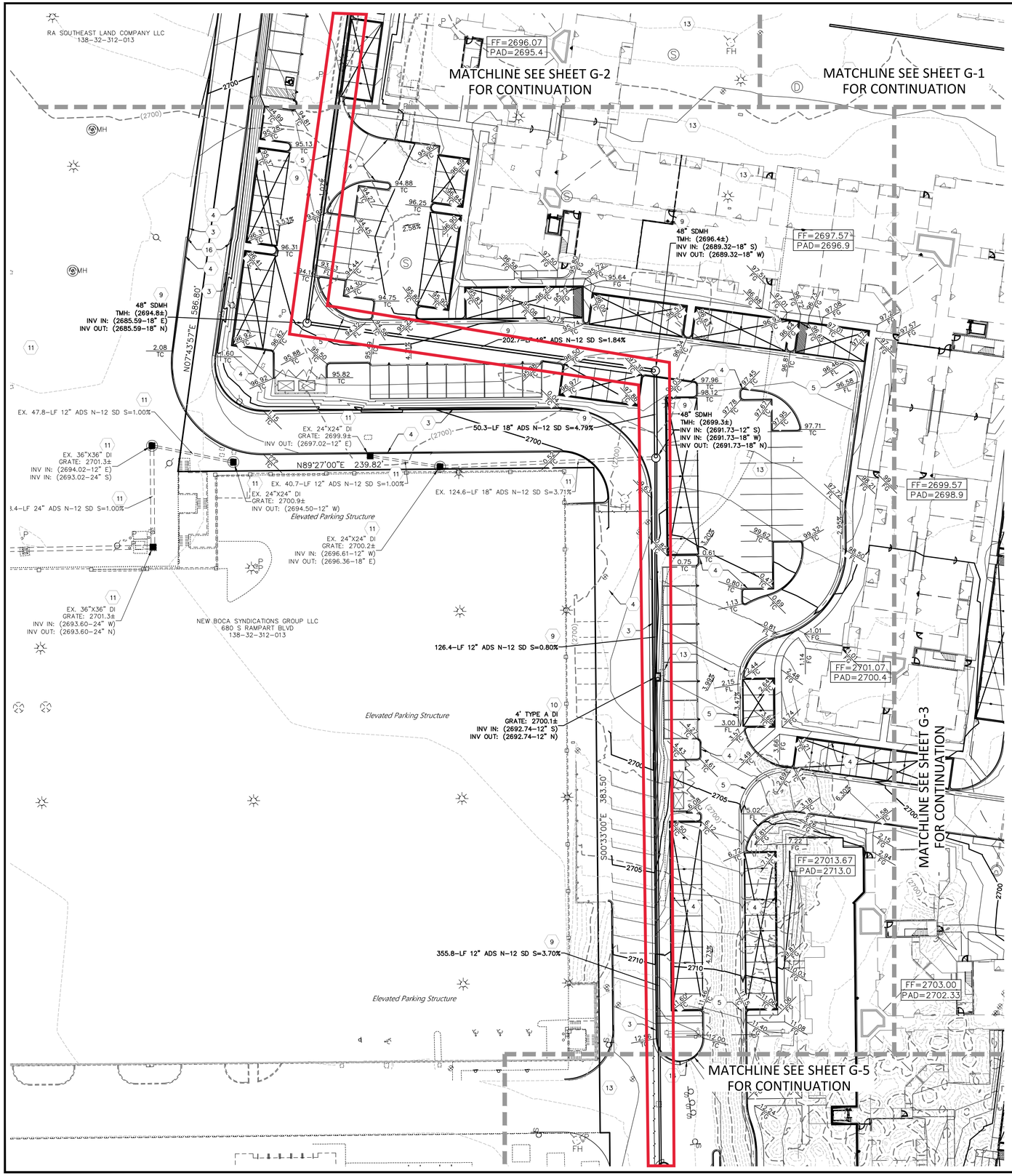
F:\Projects\800\894-002\DWG\Production\894z012.dwg
Todd Kelley

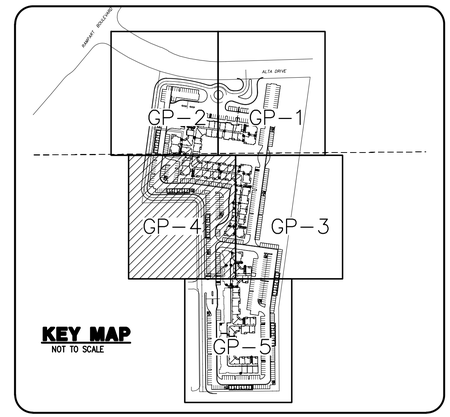
THE CALIDA GROUP

ELYSIAN RENAISSANCE

GRADING PLAN 2

DRAWING
GP-2
12 OF 31 SHTS





KEY MAP
NOT TO SCALE

NORTH

30' 0' 15' 30'

SCALE: 1" = 30'

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# -

CLV DWG# -

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

STATE OF NEVADA
ENGINEER
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
No. 14711
PROFESSIONAL

DATE:
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP

PROJECT NO.
894-002

DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 16:44:06

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

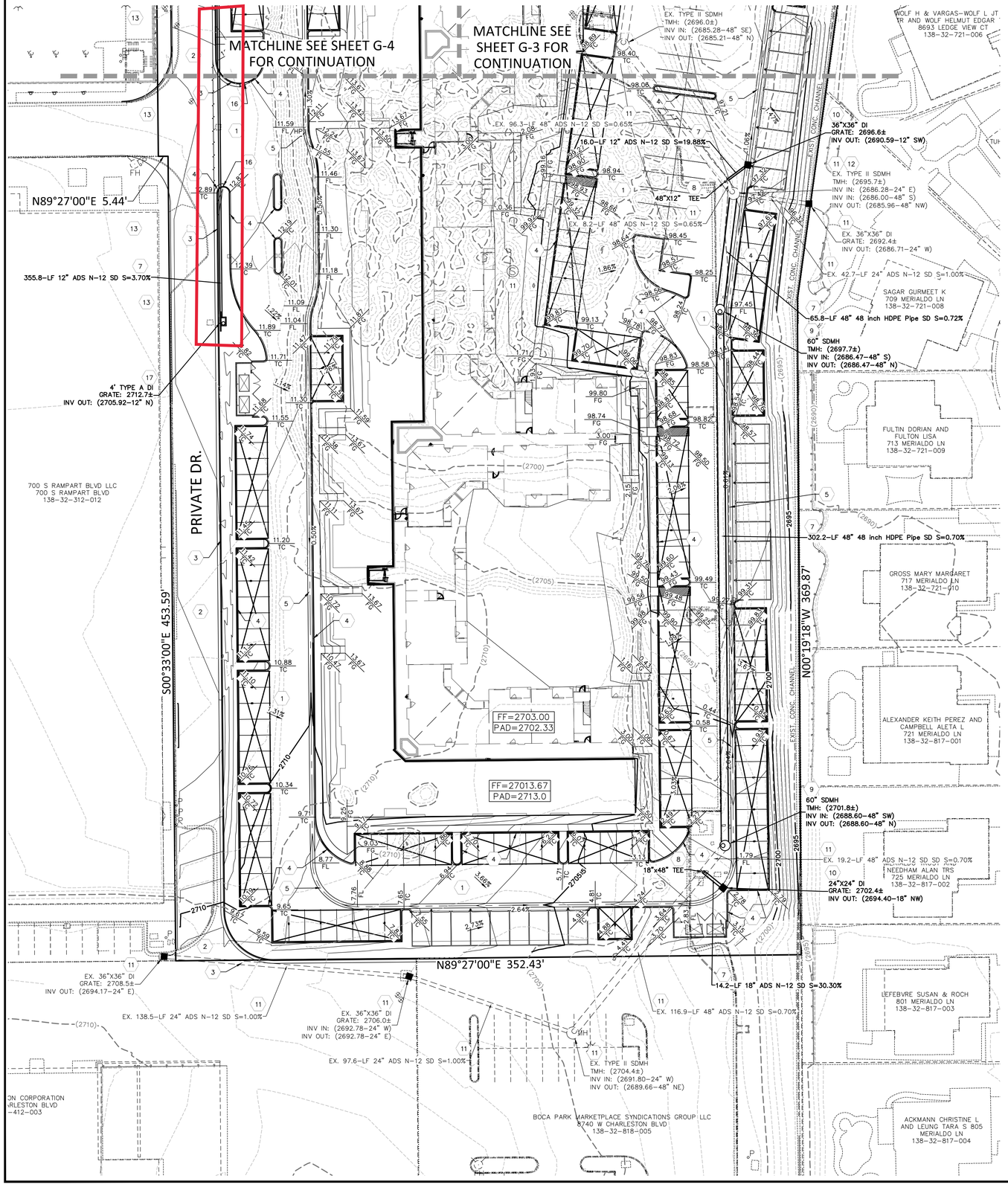
F:\Projects\800\894-002\DWG\Production\8942c014.dwg
Todd Kelley

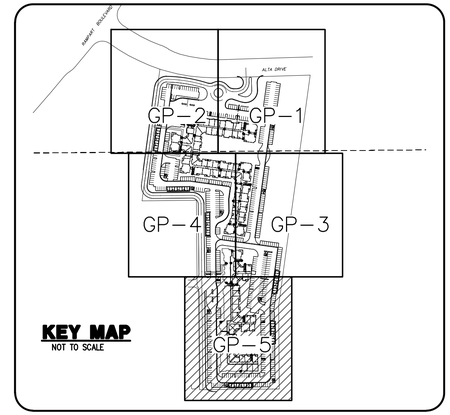
THE CALIDA GROUP

ELYSIAN RENAISSANCE

GRADING PLAN 4

DRAWING
GP-4
14 OF 31 SHTS





KEY MAP
NOT TO SCALE

NORTH

30' 0' 15' 30'
SCALE: 1" = 30'

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

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

H# –

CLV DWG# –

ENGINEER - STATE OF NEVADA
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
14711
PROFESSIONAL

DATE:
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 17:27:10

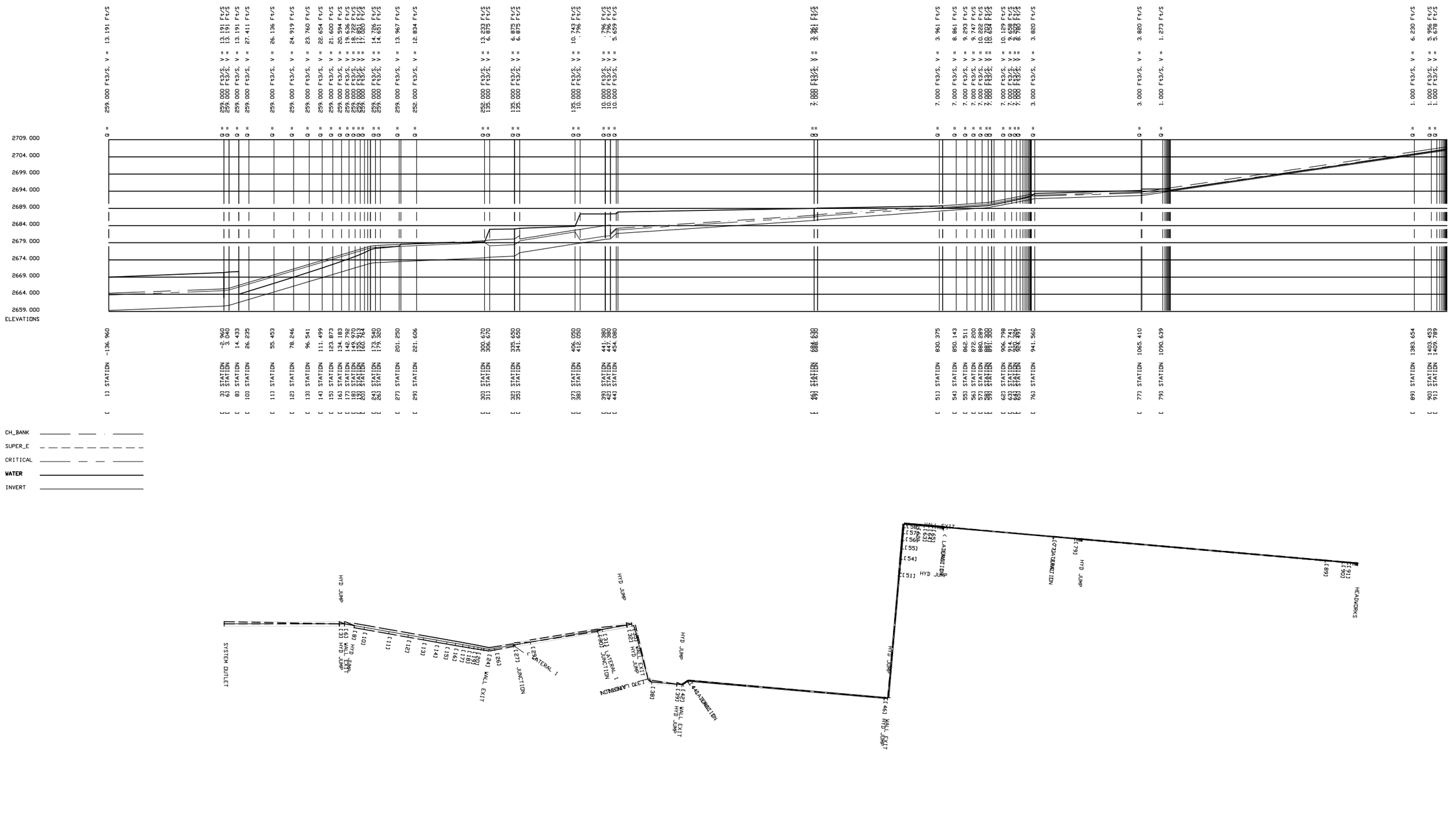
GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894zc015.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN RENAISSANCE
GRADING PLAN 5

DRAWING
GP-5
15 OF 31 SHTS

WATER SURFACE PRESSURE GRADIENT ANALYSIS (PLAN & PROFILE) ELY1



Program Package Serial Number: 7204 Date: 3-20-2018 Time: 6:17:41 File: ELY1.WSW

Calida Renaissance Revision ELY1 1

[No.]	TYPE OPERATION	STATION (FT)	INV ELEV (FT)	WATER LEVEL (FT)	CHAN HT (FT)	TYPE CHANNEL	'N'	#PIER/PIP	FLOW RATE (CFS)	VELOCITY (FT/S)	TOP WIDTH (FT)	CHAN WDTH (FT)	PIER WIDTH (FT)	ZL	ZR	SUPEL RT B (FT)	SUPEL LT B (FT)	CRIT DPTH (FT)	RADIUS/<PT (FT	DR <)	RMKS
[1]	SYSTEM OUTLET	-136.960	2659.300	9.700	5.000	PIPE	.013	0	259.000	13.191	.000	5.000	.000	.000	.000	.000	.000	4.477	.000		
[2]	REACH	-136.960	2659.300	9.700	5.000	PIPE	.013	0	259.000	13.191	.000	5.000	.000	.000	.000	.000	.000	4.477	.000		
[3]	HYD JUMP	-2.960	2660.570	9.755	5.000	PIPE	.014	0	259.000	13.191	.000	5.000	.000	.000	.000	.000	.000	4.477	.000		HYD JUMP
[4]	HYD JUMP	-2.960	2660.570	2.382	5.000	PIPE	.014	0	259.000	28.062	4.994	5.000	.000	.000	.000	.000	.000	4.477	.000		HYD JUMP
[5]	REACH	-2.960	2660.570	9.755	5.000	PIPE	.014	0	259.000	13.191	.000	5.000	.000	.000	.000	.000	.000	4.477	.000		
[6]	REACH	3.040	2660.770	9.713	5.000	PIPE	.013	0	259.000	13.191	.000	5.000	.000	.000	.000	.000	.000	4.477	.000		
[7]	WALL EXIT	3.040	2660.770	9.714	5.000	PIPE	.013	0	259.000	13.191	.000	5.000	.000	.000	.000	.000	.000	4.477	10.000		
[8]	HYD JUMP	14.433	2661.617	8.979	5.000	PIPE	.013	0	259.000	13.191	.000	5.000	.000	.000	.000	.000	.000	4.477	.000		HYD JUMP
[9]	REACH	14.433	2661.617	2.393	5.000	PIPE	.013	0	259.000	27.896	4.995	5.000	.000	.000	.000	.000	.000	4.477	.000		
[10]	REACH	26.235	2662.494	2.427	5.000	PIPE	.013	0	259.000	27.411	4.998	5.000	.000	.000	.000	.000	.000	4.477	.000		
[11]	REACH	55.453	2664.667	2.518	5.000	PIPE	.013	0	259.000	26.136	5.000	5.000	.000	.000	.000	.000	.000	4.477	.000		
[12]	REACH	78.246	2666.361	2.616	5.000	PIPE	.013	0	259.000	24.919	4.995	5.000	.000	.000	.000	.000	.000	4.477	.000		
[13]	REACH	96.541	2667.721	2.717	5.000	PIPE	.013	0	259.000	23.760	4.981	5.000	.000	.000	.000	.000	.000	4.477	.000		
[14]	REACH	111.499	2668.833	2.824	5.000	PIPE	.013	0	259.000	22.654	4.958	5.000	.000	.000	.000	.000	.000	4.477	.000		
[15]	REACH	123.873	2669.753	2.937	5.000	PIPE	.013	0	259.000	21.600	4.923	5.000	.000	.000	.000	.000	.000	4.477	.000		
[16]	REACH	134.183	2670.520	3.056	5.000	PIPE	.013	0	259.000	20.594	4.875	5.000	.000	.000	.000	.000	.000	4.477	.000		
[17]	REACH	142.792	2671.160	3.183	5.000	PIPE	.013	0	259.000	19.636	4.810	5.000	.000	.000	.000	.000	.000	4.477	.000		
[18]	REACH	149.970	2671.694	3.318	5.000	PIPE	.013	0	259.000	18.722	4.725	5.000	.000	.000	.000	.000	.000	4.477	.000		
[19]	REACH	155.913	2672.136	3.462	5.000	PIPE	.013	0	259.000	17.851	4.614	5.000	.000	.000	.000	.000	.000	4.477	.000		
[20]	REACH	160.764	2672.496	3.619	5.000	PIPE	.013	0	259.000	17.020	4.472	5.000	.000	.000	.000	.000	.000	4.477	.000		
[21]	REACH	164.623	2672.783	3.788	5.000	PIPE	.013	0	259.000	16.228	4.285	5.000	.000	.000	.000	.000	.000	4.477	.000		
[22]	REACH	167.540	2673.000	3.975	5.000	PIPE	.014	0	259.000	15.472	4.037	5.000	.000	.000	.000	.000	.000	4.477	.000		
[23]	REACH	167.816	2673.009	3.983	5.000	PIPE	.014	0	259.000	15.445	4.026	5.000	.000	.000	.000	.000	.000	4.477	.000		
[24]	REACH	173.540	2673.200	4.195	5.000	PIPE	.013	0	259.000	14.726	3.676	5.000	.000	.000	.000	.000	.000	4.477	.000		
[25]	WALL EXIT	173.540	2673.200	4.194	5.000	PIPE	.013	0	259.000	14.729	3.677	5.000	.000	.000	.000	.000	.000	4.477	-20.000		
[26]	REACH	179.320	2673.265	4.219	5.000	PIPE	.013	0	259.000	14.651	3.630	5.000	.000	.000	.000	.000	.000	4.477	.000		
[27]	REACH	201.250	2673.510	4.477	5.000	PIPE	.014	0	259.000	13.967	3.060	5.000	.000	.000	.000	.000	.000	4.477	.000		
[28]	JUNCTION	203.250	2673.530	5.030	5.000	PIPE	.013	0	252.000	12.834	.000	5.000	.000	.000	.000	.000	.000	4.435	.000		
[29]	REACH	221.606	2673.732	5.000	5.000	PIPE	.013	0	252.000	12.834	.000	5.000	.000	.000	.000	.000	.000	4.435	.000		
[30]	REACH	300.670	2674.600	4.655	5.000	PIPE	.014	0	252.000	13.233	2.535	5.000	.000	.000	.000	.000	.000	4.435	.000		
[31]	JUNCTION	306.670	2674.800	8.117	5.000	PIPE	.013	0	135.000	6.875	.000	5.000	.000	.000	.000	.000	.000	3.327	.000		
[32]	HYD JUMP	335.650	2675.100	7.895	5.000	PIPE	.014	0	135.000	6.875	.000	5.000	.000	.000	.000	.000	.000	3.327	.000		HYD JUMP
[33]	HYD JUMP	335.650	2675.100	1.916	5.000	PIPE	.014	0	135.000	19.502	4.861	5.000	.000	.000	.000	.000	.000	3.327	.000		HYD JUMP
[34]	REACH	335.650	2675.100	7.895	5.000	PIPE	.014	0	135.000	6.875	.000	5.000	.000	.000	.000	.000	.000	3.327	.000		
[35]	REACH	341.650	2676.100	7.119	5.000	PIPE	.013	0	135.000	6.875	.000	5.000	.000	.000	.000	.000	.000	3.327	.000		
[36]	WALL EXIT	341.650	2676.100	7.120	4.000	PIPE	.013	0	135.000	10.743	.000	4.000	.000	.000	.000	.000	.000	3.463	85.000		
[37]	REACH	406.050	2678.680	5.109	4.000	PIPE	.014	0	135.000	10.743	.000	4.000	.000	.000	.000	.000	.000	3.463	4.911		
[38]	JUNCTION	412.050	2678.880	8.504	4.000	PIPE	.013	0	10.000	.796	.000	4.000	.000	.000	.000	.000	.000	.921	.000		
[39]	HYD JUMP	441.380	2680.000	7.386	4.000	PIPE	.014	0	10.000	.796	.000	4.000	.000	.000	.000	.000	.000	.921	.000		HYD JUMP
[40]	HYD JUMP	441.380	2680.000	.467	4.000	PIPE	.014	0	10.000	12.183	2.569	4.000	.000	.000	.000	.000	.000	.921	.000		HYD JUMP
[41]	REACH	441.380	2680.000	7.386	4.000	PIPE	.014	0	10.000	.796	.000	4.000	.000	.000	.000	.000	.000	.921	.000		
[42]	REACH	447.380	2680.130	7.257	4.000	PIPE	.013	0	10.000	.796	.000	4.000	.000	.000	.000	.000	.000	.921	.000		
[43]	WALL EXIT	447.380	2680.130	7.258	1.500	PIPE	.013	0	10.000	5.659	.000	1.500	.000	.000	.000	.000	.000	1.219	-40.000		
[44]	REACH	454.080	2681.680	5.768	1.500	PIPE	.014	0	10.000	5.659	.000	1.500	.000	.000	.000	.000	.000	1.219	2.865		
[45]	JUNCTION	456.080	2681.720	6.251	1.500	PIPE	.013	0	7.000	3.961	.000	1.500	.000	.000	.000	.000	.000	1.024	.000		
[46]	HYD JUMP	684.630	2685.490	3.496	1.500	PIPE	.014	0	7.000	3.961	.000	1.500	.000	.000	.000	.000	.000	1.024	.000		HYD JUMP
[47]	HYD JUMP	684.630	2685.490	.710	1.500	PIPE	.014	0	7.000	8.498	1.498	1.500	.000	.000	.000	.000	.000	1.024	.000		HYD JUMP
[48]	REACH	684.630	2685.490	3.496	1.500	PIPE	.014	0	7.000	3.961	.000	1.500	.000	.000	.000	.000	.000	1.024	.000		
[49]	REACH	688.630	2685.690	3.389	1.500	PIPE	.013	0	7.000	3.961	.000	1.500	.000	.000	.000	.000	.000	1.024	.000		
[50]	WALL EXIT	688.630	2685.690	3.389	1.500	PIPE	.013	0	7.000	3.961	.000	1.500	.000	.000	.000	.000	.000	1.024	-90.000		
[51]	REACH	830.375	2688.208	1.500	1.500	PIPE	.013	0	7.000	3.961	.000	1.500	.000	.000	.000	.000	.000	1.024	.000		
[52]	HYD JUMP	834.249	2688.277	1.441	1.500	PIPE	.013	0	7.000	4.015	.586	1.500	.000	.000	.000	.000	.000	1.024	.000		HYD JUMP
[53]	REACH	834.249	2688.277	.714	1.500	PIPE	.013	0	7.000	8.448	1.498	1.500	.000	.000	.000	.000	.000	1.024	.000		
[54]	REACH	850.143	2688.560	.687	1.500	PIPE	.013	0	7.000	8.861	1.495	1.500	.000	.000	.000	.000	.000	1.024	.000		
[55]	REACH	862.511	2688.780	.662	1.500	PIPE	.013	0	7.000	9.293	1.490	1.500	.000	.000	.000	.000	.000	1.024	.000		
[56]	REACH	872.200	2688.952	.639	1.500	PIPE	.013	0	7.000	9.747	1.484	1.500	.000	.000	.000	.000	.000	1.024	.000		
[57]	REACH	880.289	2689.095	.617	1.500	PIPE	.013	0	7.000	10.222	1.476	1.500	.000	.000	.000	.000	.000	1.024	.000		
[58]	REACH	887.300	2689.220	.596	1.500	PIPE	.014	0	7.000	10.703	1.468	1.500	.000	.000	.000	.000	.000	1.024	.000		
[59]	REACH	891.300	2689.420	.598	1.500	PIPE	.013	0	7.000	10.654	1.469	1.500	.000	.000	.000	.000	.000	1.024	.000		
[60]	WALL EXIT	891.300	2689.420	.596	1.500	PIPE	.013	0	7.000	10.699	1.468	1.500	.000	.000	.000	.000	.000	1.024	90.000		
[61]	REACH	894.163	2689.557	.599	1.500	PIPE	.013	0	7.000	10.624	1.469	1.500	.000	.000	.000	.000	.000	1.024	.000		
[62]	REACH	906.798	2690.161	.621	1.500	PIPE	.013	0	7.000	10.129	1.478	1.500	.000	.000	.000	.000	.000	1.024	.000		
[63]	REACH	914.741	2690.540	.644	1.500	PIPE	.013	0	7.000	9.658	1.485	1.500	.000	.000	.000	.000	.000	1.024	.000		
[64]	REACH	920.326	2690.807	.667	1.500	PIPE	.013	0	7.000	9.209	1.491	1.500	.000	.000	.000	.000	.000	1.024	.000		
[65]	REACH	924.491	2691.006	.692	1.500	PIPE	.013	0	7.000	8.780	1.496	1.500	.000	.000	.000	.000	.000	1.024	.000		
[66]	REACH	927.707	2691.159	.719	1.500	PIPE	.013	0	7.000	8.371	1.499	1.500	.000	.000	.000	.000	.000	1.024	.000		
[67]	REACH	930.228	2691.280	.745	1.500	PIPE	.013	0	7.000	7.982	1.500	1.500	.000	.000	.000	.000	.000	1.024	.000		
[68]	REACH	932.227	2691.375	.774	1.500	PIPE	.013	0	7.000	7.610	1.499	1.500	.000	.000	.000	.000	.000	1.024	.000		
[69]	REACH	933.807	2691.451	.804	1.500	PIPE	.013	0	7.000	7.256	1.496	1.500	.000	.000	.000	.000	.000	1.024	.000		
[70]	REACH	935.047	2691.510	.836	1.500	PIPE	.013	0	7.000	6.919	1.490	1.500	.000	.000	.000	.000	.000	1.024	.000		
[71]	REACH	936.000	2691.555	.869	1.500	PIPE	.013	0	7.000	6.597	1.481	1.500	.000	.000	.000	.000	.000	1.024	.000		
[72]	REACH	936.701	2691.589	.904	1.500	PIPE	.013	0	7.000	6.290	1.468	1.500	.000	.000	.000	.000	.000	1.024	.000		
[73]	REACH	937.183	2691.612	.941	1.500	PIPE	.013	0	7.000	5.997	1.450	1.500	.000	.000	.000	.000	.000	1.024	.000		
[74]	REACH	937.465	2691.625	.981	1.500	PIPE	.013	0	7.000	5.718	1.427	1.500	.000	.000	.000	.000	.000	1.024	.000		
[75]	REACH	937.560	2691.630	1.024	1.500	PIPE	.014	0	7.000	5.446	1.396	1.500	.000	.000	.000	.000	.000	1.024	.000		
[76]	JUNCTION	941.560	2691.830	1.514	1.000	PIPE	.013	0	3.000	3.820	.000	1.000	.000	.000	.000	.000	.000	.742	.000		
[77]	REACH	1065.410	2692.740	1.482	1.000	PIPE	.014	0	3.000	3.820	.000	1.000	.000	.000	.000	.000	.000	.742	.000		
[78]	JUNCTION	1066.410	2692.750	1.879	1.000	PIPE	.013	0	1.000	1.273	.000	1.000	.000	.000	.000	.000	.000	.420	.000		
[79]	REACH	1090.639	2693.648	1.000	1.000	PIPE	.013	0	1.000	1.273	.000	1.000	.000	.000	.000	.000	.000	.420	.000		
[80]	REACH	1093.096	2693.739	.907	1.000	PIPE	.013	0	1.000	1.335	.580	1.000	.000	.000	.000	.000	.000	.420	.000		
[81]	REACH	1094.500	2693.791	.854	1.000	PIPE	.013	0	1.000	1.401	.707	1.000	.000	.000	.000	.000	.000	.420	.000		
[82]	REACH	1095.639	2693.833	.809	1.000	PIPE	.013	0	1.000	1.469	.786	1.000	.000	.000	.000	.000	.000	.420	.000		
[83]	REACH	1096.621	2693.870	.770	1.000	PIPE	.013	0	1.000	1.541	.842	1.000	.000	.000	.000	.000	.000	.420	.000		
[84]	REACH	1097.488	2693.902	.735	1.000	PIPE	.013	0	1.000	1.616	.883	1.000	.000	.000	.000	.000	.000	.420	.000		
[85]	REACH	1098.266	2693.931	.703	1.000	PIPE	.013	0	1.000	1.695	.914	1.000	.000	.000	.000	.000	.000	.420	.000		
[86]	REACH	1098.967	2693.957	.673	1.000	PIPE	.013	0	1.000	1.777	.938	1.000	.000	.000	.000	.000	.000	.420	.000		
[87]	HYD JUMP	1099.529	2693.977	.646	1.000	PIPE	.013	0	1.000	1.864	.957	1.000	.000	.000	.000	.000	.000	.420	.000		HYD JUMP
[88]	REACH	1099.529	2693.977	.258	1.000	PIPE	.013	0	1.000	6.230	.875	1.000	.000	.000	.000	.000	.000	.420	.000		
[89]	REACH	1383.654	2704.508	.258	1.000	PIPE	.013	0	1.000	6.230	.875	1.000	.000	.000	.000	.000	.000	.420	.000		
[90]	REACH	1403.453	2705.242	.267	1.000	PIPE	.013	0	1.000	5.956	.884	1.000	.000	.000	.000	.000	.000	.420	.000		
[91]	REACH	1409.789	2705.477	.276	1.000	PIPE	.013	0	1.000	5.678	.894	1.000	.000	.000	.000	.000	.000	.420	.000		
[92]	REACH	1413.284	2705.607	.285	1.000	PIPE	.013	0	1.000	5.414	.903	1.000	.000	.000	.000	.000	.000	.420	.000		
[93]	REACH	1415.596	2705.692	.296	1.000	PIPE	.013	0	1.000	5.162	.912	1.000	.000	.000	.000	.000	.000	.420	.000		
[94]	REACH	1417.247	2705.754	.305	1.000	PIPE	.013	0	1.000	4.922	.921	1.000	.000	.000	.000	.000	.000	.420	.000		
[95]	REACH	1418.478	2705.799	.316	1.000	PIPE	.013	0	1.000	4.693	.930	1.000	.000	.000	.000	.000	.000	.420	.000		
[96]	REACH	1419.415	2705.834	.327	1.000	PIPE	.013	0	1.000	4.474	.938	1.000	.000	.000	.000	.000	.000	.420	.000		
[97]	REACH	1420.130	2705.861	.338	1.000	PIPE	.013	0	1.000	4.266	.947	1.000	.000	.000	.000	.000	.000	.420	.000		
[98]	REACH	1420.674	2705.881	.351	1.000	PIPE	.013	0	1.000	4.068	.955	1.000	.000	.000	.000	.000	.000	.420	.000		
[99]	REACH	1421.084	2705.896	.364	1.000	PIPE	.013	0	1.000	3.878	.962	1.000	.000	.000	.000	.000	.000	.420	.000		
[100]	REACH	1421.381	2705.907	.376	1.000	PIPE	.013	0	1.000	3.698	.969	1.000	.000	.000	.000	.000	.000	.420	.000		
[101]	REACH	1421.578	2705.914	.390	1.000	PIPE	.013	0	1.000	3.526	.975	1.000	.000	.000	.000	.000	.000	.420	.000		
[102]	REACH	1421.693	2705.918	.405	1.000	PIPE	.013	0	1.000	3.362	.981	1.000	.000	.000	.000	.000	.000	.420	.000		
[103]	HEADWORKS	1421.730	2705.920	.420	1.000	PIPE	.013	0	1.000	3.195	.987	1.000	.000	.000	.000	.000	.000	.420	.000		

```
T1 Calida Renaissance Revision ELY1 1                                                                  0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   -136.9602659.300  2                          2669.000
WX   -136.9602659.300  2
R      -2.9602660.570  2      .013                                    .000  00.000
WE     -2.9602660.570  2       .20
R       3.0402660.770  2      .014                                    .000  10.000 0
WX      3.0402660.770  2
R     167.5402673.000  2      .013                                    .000 000.000 0
WE    167.5402673.000  2       .20
R     173.5402673.200  2      .014                                    .000 -20.000 0
WX    173.5402673.200  2
R     201.2502673.510  2      .013                                    .000  00.000 0
JX    203.2502673.530  2  4   .014    7.000         2676.060          45.0       00.000
R     300.6702674.600  2      .013                                    .000  00.000 0
JX    306.6702674.800  2  5   .014  117.000         2675.200          80.0       00.000
R     335.6502675.100  2      .013                                    .000  00.000 0
WE    335.6502675.100  2       .20
R     341.6502676.100  2      .014                                    .000  85.000 0
WX    341.6502676.100  1
R     406.0502678.680  1      .013                                    .000  00.000 0
JX    412.0502678.880  1  1   .014  125.000         2678.780          90.0      -70.000
R     441.3802680.000  1      .013                                    .000  00.000 0
WE    441.3802680.000  1       .20
R     447.3802680.130  1      .014                                    .000 -40.000 0
WX    447.3802680.130  3
R     454.0802681.680  3      .013                                    .000  00.000 0
JX    456.0802681.720  3  3   .014    3.000         2681.700          90.0       40.000
R     684.6302685.490  3      .013                                    .000  00.000 0
WE    684.6302685.490  3       .20
R     688.6302685.690  3      .014                                    .000 -90.000 0
WX    688.6302685.690  3
R     887.3002689.220  3      .013                                    .000  00.000 0
WE    887.3002689.220  3       .20
R     891.3002689.420  3      .014                                    .000  90.000 0
WX    891.3002689.420  3
R     937.5602691.630  3      .013                                    .000  00.000 0
JX    941.5602691.830  3  4   .014    4.000    0.0002691.730000.000  90.0000.000000.00
R    1065.4102692.740  4      .013                                    .000  00.000 0
JX   1066.4102692.750  4  4   .014    2.000    0.0002692.750000.000  90.0000.000000.00
R    1421.7302705.920  4      .013                                    .000  00.000 0
SH   1421.7302705.920  4                          2705.920
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   5.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  4   0    .000   1.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             1.000   .0
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	0		4.000														
CD	2	4	0		5.000														
CD	3	4	0		1.500														
CD	4	4	0		1.000														
CD	5	4	0		4.500														
CD	6	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	5.000	3.000	.000	.000	.00										

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Calida Renaissance Revision ELY1 1

HEADING LINE NO 2 IS -

1 2 3 4 5 6 7

HEADING LINE NO 3 IS -

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	-136.960	2659.300	2	2669.000

ELEMENT NO 2 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	-136.960	2659.300	2

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-2.960	2660.570	2	.013	.000	.000	.000	0

ELEMENT NO 4 IS A WALL ENTRANCE *

U/S DATA	STATION	INVERT	SECT	FP
	-2.960	2660.570	2	.200

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3.040	2660.770	2	.014	.000	.000	10.000	0

ELEMENT NO 6 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	3.040	2660.770	2

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	167.540	2673.000	2	.013	.000	.000	.000	0

ELEMENT NO 8 IS A WALL ENTRANCE *

U/S DATA	STATION	INVERT	SECT	FP
	167.540	2673.000	2	.200

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	173.540	2673.200	2	.014	.000	.000	-20.000	0

ELEMENT NO 10 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	173.540	2673.200	2

ELEMENT NO 11 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT		N			RADIUS	ANGLE	ANG PT	MAN H
	201.250	2673.510	2		.013			.000	.000	.000	0

ELEMENT NO 12 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	203.250	2673.530	2	4	0	.014	7.000	.000	2676.060	.000	45.000	.000

RADIUS	ANGLE
.000	.000

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 13 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT		N			RADIUS	ANGLE	ANG PT	MAN H
	300.670	2674.600	2		.013			.000	.000	.000	0

ELEMENT NO 14 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	306.670	2674.800	2	5	0	.014	117.000	.000	2675.200	.000	80.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 15 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT		N			RADIUS	ANGLE	ANG PT	MAN H
	335.650	2675.100	2		.013			.000	.000	.000	0

ELEMENT NO 16 IS A WALL ENTRANCE *

U/S DATA	STATION	INVERT	SECT		FP						
	335.650	2675.100	2		.200						

ELEMENT NO 17 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT		N			RADIUS	ANGLE	ANG PT	MAN H
	341.650	2676.100	2		.014			.000	.000	85.000	0

ELEMENT NO 18 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	341.650	2676.100	1

ELEMENT NO 19 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT		N			RADIUS	ANGLE	ANG PT	MAN H
	406.050	2678.680	1		.013			.000	.000	.000	0

ELEMENT NO 20 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	412.050	2678.880	1	1	0	.014	125.000	.000	2678.780	.000	90.000	.000

RADIUS	ANGLE
4.911	-70.000

ELEMENT NO 21 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT		N			RADIUS	ANGLE	ANG PT	MAN H
	441.380	2680.000	1		.013			.000	.000	.000	0

ELEMENT NO 22 IS A WALL ENTRANCE *

U/S DATA	STATION	INVERT	SECT		FP						
	441.380	2680.000	1		.200						

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 23 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT		N			RADIUS	ANGLE	ANG PT	MAN H
	447.380	2680.130	1		.014			.000	.000	-40.000	0

ELEMENT NO 24 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	447.380	2680.130	3

```
 ELEMENT NO  25 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             454.080 2681.680    3              .013                           .000     .000      .000     0
 ELEMENT NO  26 IS A JUNCTION          *         *     *     *               *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             456.080 2681.720    3     3     0   .014     3.000      .000  2681.700      .000  90.000     .000
                                                                                          RADIUS    ANGLE
                                                                                           2.865  40.000
 ELEMENT NO  27 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             684.630 2685.490    3              .013                           .000     .000      .000     0
 ELEMENT NO  28 IS A  WALL  ENTRANCE                 *
                  U/S DATA   STATION    INVERT  SECT             FP
                             684.630 2685.490    3              .200
 ELEMENT NO  29 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             688.630 2685.690    3              .014                           .000     .000   -90.000     0
 ELEMENT NO  30 IS A  WALL  EXIT                     *
                  U/S DATA   STATION    INVERT  SECT
                             688.630 2685.690    3
 ELEMENT NO  31 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             887.300 2689.220    3              .013                           .000     .000      .000     0
 ELEMENT NO  32 IS A  WALL  ENTRANCE                 *
                  U/S DATA   STATION    INVERT  SECT             FP
                             887.300 2689.220    3              .200
 ELEMENT NO  33 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             891.300 2689.420    3              .014                           .000     .000    90.000     0
 ELEMENT NO  34 IS A  WALL  EXIT                     *
                  U/S DATA   STATION    INVERT  SECT
                             891.300 2689.420    3
                                              W S P G W                                                        PAGE NO   5
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  35 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             937.560 2691.630    3              .013                           .000     .000      .000     0
 ELEMENT NO  36 IS A JUNCTION          *         *     *     *               *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             941.560 2691.830    3     4     0   .014     4.000      .000  2691.730      .000  90.000     .000
                                                                                          RADIUS    ANGLE
                                                                                            .000    .000
WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS
 ELEMENT NO  37 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            1065.410 2692.740    4              .013                           .000     .000      .000     0
 ELEMENT NO  38 IS A JUNCTION          *         *     *     *               *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                            1066.410 2692.750    4     4     0   .014     2.000      .000  2692.750      .000  90.000     .000
                                                                                          RADIUS    ANGLE
                                                                                            .000    .000
 ELEMENT NO  39 IS A REACH             *         *     *
```

	U/S DATA	STATION	INVERT	SECT	N		RADIUS	ANGLE	ANG PT	MAN H
		1421.730	2705.920	4	.013		.000	.000	.000	0

ELEMENT NO 40 IS A SYSTEM HEADWORKS * *

	U/S DATA	STATION	INVERT	SECT	W S ELEV
		1421.730	2705.920	4	2705.920

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-136.960	2659.300	9.700	2669.000	259.00	13.19	2.70	2671.70	.00	4.48	.00	5.000	.000	.00	0 .0
WALL EXIT														
-136.960	2659.300	9.700	2669.000	259.00	13.19	2.70	2671.70	.00	4.48	.00	5.000	.000	.00	0 .0
134.000	.0095					.0099	1.33	9.70	.00	4.20	.013	.00	.00	PIPE
-2.960	2660.570	9.755	2670.325	259.00	13.19	2.70	2673.03	.00	4.48	.00	5.000	.000	.00	0 .0
HYDRAULIC JUMP														
-2.960	2660.570	2.382	2662.952	259.00	28.06	12.23	2675.18	.00	4.48	4.99	5.000	.000	.00	0 .0
HYDRAULIC DROP														
-2.960	2660.570	9.755	2670.325	259.00	13.19	2.70	2673.03	.00	4.48	.00	5.000	.000	.00	0 .0
6.000	.0333					.0115	.07	9.76	.00	2.75	.014	.00	.00	PIPE
3.040	2660.770	9.713	2670.483	259.00	13.19	2.70	2673.19	.00	4.48	.00	5.000	.000	.00	0 .0
WALL EXIT														
3.040	2660.770	9.714	2670.484	259.00	13.19	2.70	2673.19	.00	4.48	.00	5.000	.000	.00	0 .0
11.393	.0743					.0099	.11	9.71	.00	2.09	.013	.00	.00	PIPE
14.433	2661.617	8.979	2670.596	259.00	13.19	2.70	2673.30	.00	4.48	.00	5.000	.000	.00	0 .0
HYDRAULIC JUMP														
14.433	2661.617	2.393	2664.010	259.00	27.90	12.08	2676.09	.00	4.48	5.00	5.000	.000	.00	0 .0
11.802	.0743					.0449	.53	2.39	3.61	2.09	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
26.235	2662.494	2.426	2664.921	259.00	27.41	11.67	2676.59	.00	4.48	5.00	5.000	.000	.00	0 .0
29.219	.0743					.0412	1.20	2.43	3.51	2.09	.013	.00	.00	PIPE
55.453	2664.667	2.518	2667.185	259.00	26.14	10.61	2677.79	.00	4.48	5.00	5.000	.000	.00	0 .0
22.793	.0743					.0363	.83	2.52	3.27	2.09	.013	.00	.00	PIPE
78.246	2666.361	2.615	2668.977	259.00	24.92	9.64	2678.62	.00	4.48	4.99	5.000	.000	.00	0 .0
18.294	.0743					.0320	.59	2.62	3.04	2.09	.013	.00	.00	PIPE
96.541	2667.721	2.717	2670.438	259.00	23.76	8.77	2679.20	.00	4.48	4.98	5.000	.000	.00	0 .0
14.958	.0743					.0282	.42	2.72	2.83	2.09	.013	.00	.00	PIPE
111.499	2668.833	2.824	2671.657	259.00	22.65	7.97	2679.63	.00	4.48	4.96	5.000	.000	.00	0 .0
12.374	.0743					.0249	.31	2.82	2.63	2.09	.013	.00	.00	PIPE
123.873	2669.753	2.937	2672.690	259.00	21.60	7.24	2679.93	.00	4.48	4.92	5.000	.000	.00	0 .0
10.310	.0743					.0220	.23	2.94	2.44	2.09	.013	.00	.00	PIPE
134.183	2670.520	3.056	2673.576	259.00	20.59	6.59	2680.16	.00	4.48	4.87	5.000	.000	.00	0 .0
8.609	.0743					.0195	.17	3.06	2.26	2.09	.013	.00	.00	PIPE
142.792	2671.160	3.183	2674.343	259.00	19.64	5.99	2680.33	.00	4.48	4.81	5.000	.000	.00	0 .0
7.178	.0743					.0173	.12	3.18	2.09	2.09	.013	.00	.00	PIPE
149.970	2671.694	3.318	2675.012	259.00	18.72	5.44	2680.45	.00	4.48	4.72	5.000	.000	.00	0 .0
5.943	.0743					.0154	.09	3.32	1.93	2.09	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
155.913	2672.136	3.463	2675.598	259.00	17.85	4.95	2680.55	.00	4.48	4.61	5.000	.000	.00	0 .0
4.851	.0743					.0137	.07	3.46	1.77	2.09	.013	.00	.00	PIPE
160.764	2672.496	3.618	2676.115	259.00	17.02	4.50	2680.61	.00	4.48	4.47	5.000	.000	.00	0 .0
3.858	.0743					.0123	.05	3.62	1.63	2.09	.013	.00	.00	PIPE
164.623	2672.783	3.788	2676.571	259.00	16.23	4.09	2680.66	.00	4.48	4.29	5.000	.000	.00	0 .0
2.917	.0743					.0111	.03	3.79	1.48	2.09	.013	.00	.00	PIPE
167.540	2673.000	3.975	2676.975	259.00	15.47	3.72	2680.69	.00	4.48	4.04	5.000	.000	.00	0 .0
.277	.0333					.0121	.00	3.98	1.34	2.75	.014	.00	.00	PIPE
167.816	2673.009	3.983	2676.992	259.00	15.44	3.70	2680.70	.00	4.48	4.03	5.000	.000	.00	0 .0
5.723	.0333					.0116	.07	3.98	1.33	2.75	.014	.00	.00	PIPE
173.540	2673.200	4.195	2677.395	259.00	14.73	3.37	2680.76	.00	4.48	3.68	5.000	.000	.00	0 .0
WALL	EXIT													
173.540	2673.200	4.194	2677.394	259.00	14.73	3.37	2680.76	.00	4.48	3.68	5.000	.000	.00	0 .0
5.780	.0112					.0095	.05	4.19	1.19	3.85	.013	.00	.00	PIPE
179.320	2673.265	4.219	2677.484	259.00	14.65	3.33	2680.82	.00	4.48	3.63	5.000	.000	.00	0 .0
21.930	.0112					.0091	.20	4.22	1.17	3.85	.013	.00	.00	PIPE
201.250	2673.510	4.477	2677.987	259.00	13.97	3.03	2681.02	.00	4.48	3.06	5.000	.000	.00	0 .0
JUNCT STR	.0100					.0105	.02	4.48	1.00		.014	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
203.250	2673.530	5.030	2678.560	252.00	12.83	2.56	2681.12	.00	4.44	.00	5.000	.000	.00	0 .0
18.356	.0110					.0093	.17	5.03	.00	3.79	.013	.00	.00	PIPE
221.606	2673.732	5.000	2678.732	252.00	12.83	2.56	2681.29	.00	4.44	.00	5.000	.000	.00	0 .0
79.064	.0110					.0087	.69	5.00	.00	3.79	.013	.00	.00	PIPE
300.670	2674.600	4.655	2679.255	252.00	13.23	2.72	2681.97	.00	4.44	2.53	5.000	.000	.00	0 .0
JUNCT STR	.0333					.0063	.04	4.65	.85		.014	.00	.00	PIPE
306.670	2674.800	8.117	2682.917	135.00	6.88	.73	2683.65	.00	3.33	.00	5.000	.000	.00	0 .0
28.980	.0104					.0027	.08	8.12	.00	2.53	.013	.00	.00	PIPE
335.650	2675.100	7.895	2682.995	135.00	6.88	.73	2683.73	.00	3.33	.00	5.000	.000	.00	0 .0
HYDRAULIC JUMP														
335.650	2675.100	1.916	2677.016	135.00	19.50	5.91	2682.92	.00	3.33	4.86	5.000	.000	.00	0 .0
HYDRAULIC DROP														
335.650	2675.100	7.895	2682.995	135.00	6.88	.73	2683.73	.00	3.33	.00	5.000	.000	.00	0 .0
6.000	.1667					.0031	.02	7.89	.00	1.25	.014	.00	.00	PIPE
341.650	2676.100	7.119	2683.219	135.00	6.88	.73	2683.95	.00	3.33	.00	5.000	.000	.00	0 .0
WALL EXIT														
341.650	2676.100	7.120	2683.220	135.00	10.74	1.79	2685.01	.00	3.46	.00	4.000	.000	.00	0 .0
64.400	.0401					.0088	.57	7.12	.00	1.93	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
406.050	2678.680	5.109	2683.789	135.00	10.74	1.79	2685.58	.00	3.46	.00	4.000	.000	.00	0 .0
JUNCT STR	.0333					.0052	.03	.00	.00		.014	.00	.00	PIPE
412.050	2678.880	8.504	2687.384	10.00	.80	.01	2687.39	.00	.92	.00	4.000	.000	.00	0 .0
29.330	.0382					.0000	.00	8.50	.00	.52	.013	.00	.00	PIPE
441.380	2680.000	7.386	2687.386	10.00	.80	.01	2687.40	.00	.92	.00	4.000	.000	.00	0 .0
HYDRAULIC JUMP														
441.380	2680.000	.467	2680.467	10.00	12.18	2.30	2682.77	.00	.92	2.57	4.000	.000	.00	0 .0
HYDRAULIC DROP														
441.380	2680.000	7.386	2687.386	10.00	.80	.01	2687.40	.00	.92	.00	4.000	.000	.00	0 .0
6.000	.0216					.0001	.00	7.39	.00	.61	.014	.00	.00	PIPE
447.380	2680.130	7.257	2687.387	10.00	.80	.01	2687.40	.00	.92	.00	4.000	.000	.00	0 .0
WALL	EXIT													
447.380	2680.130	7.258	2687.388	10.00	5.66	.50	2687.88	.00	1.22	.00	1.500	.000	.00	0 .0
6.700	.2314					.0091	.06	7.26	.00	.45	.013	.00	.00	PIPE
454.080	2681.680	5.768	2687.448	10.00	5.66	.50	2687.95	.00	1.22	.00	1.500	.000	.00	0 .0
JUNCT STR	.0200					.0078	.02	.00	.00		.014	.00	.00	PIPE
456.080	2681.720	6.251	2687.971	7.00	3.96	.24	2688.21	.00	1.02	.00	1.500	.000	.00	0 .0
228.550	.0165					.0044	1.01	6.25	.00	.77	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
684.630	2685.490	3.496	2688.986	7.00	3.96	.24	2689.23	.00	1.02	.00	1.500	.000	.00	0 .0
HYDRAULIC JUMP														
684.630	2685.490	.710	2686.200	7.00	8.50	1.12	2687.32	.00	1.02	1.50	1.500	.000	.00	0 .0
HYDRAULIC DROP														
684.630	2685.490	3.496	2688.986	7.00	3.96	.24	2689.23	.00	1.02	.00	1.500	.000	.00	0 .0
4.000	.0500					.0052	.02	3.50	.00	.58	.014	.00	.00	PIPE
688.630	2685.690	3.389	2689.079	7.00	3.96	.24	2689.32	.00	1.02	.00	1.500	.000	.00	0 .0
WALL EXIT														
688.630	2685.690	3.389	2689.079	7.00	3.96	.24	2689.32	.00	1.02	.00	1.500	.000	.00	0 .0
141.745	.0178					.0044	.62	3.39	.00	.75	.013	.00	.00	PIPE
830.375	2688.208	1.500	2689.708	7.00	3.96	.24	2689.95	.00	1.02	.00	1.500	.000	.00	0 .0
3.874	.0178					.0041	.02	1.50	.00	.75	.013	.00	.00	PIPE
834.249	2688.277	1.440	2689.718	7.00	4.01	.25	2689.97	.00	1.02	.59	1.500	.000	.00	0 .0
HYDRAULIC JUMP														
834.249	2688.277	.713	2688.991	7.00	8.45	1.11	2690.10	.00	1.02	1.50	1.500	.000	.00	0 .0
15.894	.0178					.0225	.36	.71	2.00	.75	.013	.00	.00	PIPE
850.143	2688.560	.688	2689.247	7.00	8.86	1.22	2690.47	.00	1.02	1.49	1.500	.000	.00	0 .0
12.368	.0178					.0256	.32	.69	2.15	.75	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
862.511	2688.780	.663	2689.442	7.00	9.29	1.34	2690.78	.00	1.02	1.49	1.500	.000	.00	0 .0
9.690	.0178					.0292	.28	.66	2.30	.75	.013	.00	.00	PIPE
872.200	2688.952	.639	2689.591	7.00	9.75	1.48	2691.07	.00	1.02	1.48	1.500	.000	.00	0 .0
8.088	.0178					.0332	.27	.64	2.47	.75	.013	.00	.00	PIPE
880.289	2689.095	.617	2689.712	7.00	10.22	1.62	2691.33	.00	1.02	1.48	1.500	.000	.00	0 .0
7.011	.0178					.0378	.27	.62	2.64	.75	.013	.00	.00	PIPE
887.300	2689.220	.596	2689.816	7.00	10.70	1.78	2691.59	.00	1.02	1.47	1.500	.000	.00	0 .0
4.000	.0500					.0462	.18	.60	2.83	.58	.014	.00	.00	PIPE
891.300	2689.420	.598	2690.018	7.00	10.65	1.76	2691.78	.00	1.02	1.47	1.500	.000	.00	0 .0
WALL	EXIT													
891.300	2689.420	.596	2690.016	7.00	10.70	1.78	2691.79	.00	1.02	1.47	1.500	.000	.00	0 .0
2.863	.0478					.0397	.11	.60	2.82	.57	.013	.00	.00	PIPE
894.163	2689.557	.599	2690.156	7.00	10.62	1.75	2691.91	.00	1.02	1.47	1.500	.000	.00	0 .0
12.635	.0478					.0369	.47	.60	2.80	.57	.013	.00	.00	PIPE
906.798	2690.161	.621	2690.782	7.00	10.13	1.59	2692.38	.00	1.02	1.48	1.500	.000	.00	0 .0
7.943	.0478					.0324	.26	.62	2.61	.57	.013	.00	.00	PIPE
914.741	2690.540	.644	2691.184	7.00	9.66	1.45	2692.63	.00	1.02	1.48	1.500	.000	.00	0 .0
5.585	.0478					.0285	.16	.64	2.44	.57	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
920.326	2690.807	.668	2691.474	7.00	9.21	1.32	2692.79	.00	1.02	1.49	1.500	.000	.00	0 .0
4.165	.0478					.0250	.10	.67	2.27	.57	.013	.00	.00	PIPE
924.491	2691.006	.692	2691.698	7.00	8.78	1.20	2692.90	.00	1.02	1.50	1.500	.000	.00	0 .0
3.217	.0478					.0220	.07	.69	2.12	.57	.013	.00	.00	PIPE
927.707	2691.159	.718	2691.878	7.00	8.37	1.09	2692.97	.00	1.02	1.50	1.500	.000	.00	0 .0
2.520	.0478					.0194	.05	.72	1.98	.57	.013	.00	.00	PIPE
930.228	2691.280	.746	2692.025	7.00	7.98	.99	2693.01	.00	1.02	1.50	1.500	.000	.00	0 .0
1.999	.0478					.0170	.03	.75	1.84	.57	.013	.00	.00	PIPE
932.227	2691.375	.774	2692.149	7.00	7.61	.90	2693.05	.00	1.02	1.50	1.500	.000	.00	0 .0
1.580	.0478					.0150	.02	.77	1.71	.57	.013	.00	.00	PIPE
933.807	2691.451	.804	2692.255	7.00	7.26	.82	2693.07	.00	1.02	1.50	1.500	.000	.00	0 .0
1.240	.0478					.0132	.02	.80	1.59	.57	.013	.00	.00	PIPE
935.047	2691.510	.836	2692.346	7.00	6.92	.74	2693.09	.00	1.02	1.49	1.500	.000	.00	0 .0
.953	.0478					.0117	.01	.84	1.48	.57	.013	.00	.00	PIPE
936.000	2691.555	.869	2692.424	7.00	6.60	.68	2693.10	.00	1.02	1.48	1.500	.000	.00	0 .0
.701	.0478					.0103	.01	.87	1.37	.57	.013	.00	.00	PIPE
936.701	2691.589	.904	2692.493	7.00	6.29	.61	2693.11	.00	1.02	1.47	1.500	.000	.00	0 .0
.483	.0478					.0092	.00	.90	1.27	.57	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
937.184	2691.612	.941	2692.553	7.00	6.00	.56	2693.11	.00	1.02	1.45	1.500	.000	.00	0 .0
.282	.0478					.0081	.00	.94	1.18	.57	.013	.00	.00	PIPE
937.465	2691.625	.981	2692.606	7.00	5.72	.51	2693.11	.00	1.02	1.43	1.500	.000	.00	0 .0
.095	.0478					.0072	.00	.98	1.09	.57	.013	.00	.00	PIPE
937.560	2691.630	1.024	2692.654	7.00	5.45	.46	2693.11	.00	1.02	1.40	1.500	.000	.00	0 .0
JUNCT STR	.0500					.0044	.02	1.02	1.00		.014	.00	.00	PIPE
941.560	2691.830	1.514	2693.344	3.00	3.82	.23	2693.57	.00	.74	.00	1.000	.000	.00	0 .0
123.850	.0073					.0071	.88	1.51	.00	.80	.013	.00	.00	PIPE
1065.410	2692.740	1.482	2694.222	3.00	3.82	.23	2694.45	.00	.74	.00	1.000	.000	.00	0 .0
JUNCT STR	.0100					.0046	.00	1.48	.00		.014	.00	.00	PIPE
1066.410	2692.750	1.879	2694.629	1.00	1.27	.03	2694.65	.00	.42	.00	1.000	.000	.00	0 .0
24.229	.0371					.0008	.02	1.88	.00	.26	.013	.00	.00	PIPE
1090.639	2693.648	1.000	2694.648	1.00	1.27	.03	2694.67	.00	.42	.00	1.000	.000	.00	0 .0
2.457	.0371					.0007	.00	1.00	.00	.26	.013	.00	.00	PIPE
1093.096	2693.739	.907	2694.646	1.00	1.34	.03	2694.67	.00	.42	.58	1.000	.000	.00	0 .0
1.404	.0371					.0007	.00	.91	.21	.26	.013	.00	.00	PIPE
1094.500	2693.791	.853	2694.645	1.00	1.40	.03	2694.67	.00	.42	.71	1.000	.000	.00	0 .0
1.139	.0371					.0008	.00	.85	.25	.26	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1095.639	2693.833	.809	2694.642	1.00	1.47	.03	2694.68	.00	.42	.79	1.000	.000	.00	0 .0
.982	.0371					.0008	.00	.81	.28	.26	.013	.00	.00	PIPE
1096.621	2693.870	.770	2694.640	1.00	1.54	.04	2694.68	.00	.42	.84	1.000	.000	.00	0 .0
.867	.0371					.0009	.00	.77	.31	.26	.013	.00	.00	PIPE
1097.488	2693.902	.735	2694.637	1.00	1.62	.04	2694.68	.00	.42	.88	1.000	.000	.00	0 .0
.779	.0371					.0011	.00	.74	.34	.26	.013	.00	.00	PIPE
1098.266	2693.931	.703	2694.634	1.00	1.69	.04	2694.68	.00	.42	.91	1.000	.000	.00	0 .0
.701	.0371					.0012	.00	.70	.37	.26	.013	.00	.00	PIPE
1098.967	2693.957	.673	2694.630	1.00	1.78	.05	2694.68	.00	.42	.94	1.000	.000	.00	0 .0
.562	.0371					.0013	.00	.67	.40	.26	.013	.00	.00	PIPE
1099.529	2693.977	.646	2694.623	1.00	1.86	.05	2694.68	.00	.42	.96	1.000	.000	.00	0 .0
HYDRAULIC JUMP														
1099.529	2693.977	.258	2694.235	1.00	6.23	.60	2694.84	.00	.42	.88	1.000	.000	.00	0 .0
284.125	.0371					.0371	10.53	.26	2.56	.26	.013	.00	.00	PIPE
1383.654	2704.508	.258	2704.766	1.00	6.23	.60	2705.37	.00	.42	.88	1.000	.000	.00	0 .0
19.799	.0371					.0349	.69	.26	2.56	.26	.013	.00	.00	PIPE
1403.453	2705.242	.266	2705.509	1.00	5.96	.55	2706.06	.00	.42	.88	1.000	.000	.00	0 .0
6.336	.0371					.0306	.19	.27	2.41	.26	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1409.789	2705.477	.276	2705.753	1.00	5.68	.50	2706.25	.00	.42	.89	1.000	.000	.00	0 .0
3.495	.0371					.0268	.09	.28	2.25	.26	.013	.00	.00	PIPE
1413.284	2705.607	.285	2705.892	1.00	5.41	.46	2706.35	.00	.42	.90	1.000	.000	.00	0 .0
2.311	.0371					.0234	.05	.29	2.11	.26	.013	.00	.00	PIPE
1415.596	2705.692	.295	2705.988	1.00	5.16	.41	2706.40	.00	.42	.91	1.000	.000	.00	0 .0
1.651	.0371					.0205	.03	.30	1.97	.26	.013	.00	.00	PIPE
1417.247	2705.754	.305	2706.059	1.00	4.92	.38	2706.44	.00	.42	.92	1.000	.000	.00	0 .0
1.230	.0371					.0180	.02	.31	1.85	.26	.013	.00	.00	PIPE
1418.478	2705.799	.316	2706.115	1.00	4.69	.34	2706.46	.00	.42	.93	1.000	.000	.00	0 .0
.937	.0371					.0157	.01	.32	1.73	.26	.013	.00	.00	PIPE
1419.415	2705.834	.327	2706.161	1.00	4.47	.31	2706.47	.00	.42	.94	1.000	.000	.00	0 .0
.716	.0371					.0138	.01	.33	1.62	.26	.013	.00	.00	PIPE
1420.130	2705.861	.339	2706.199	1.00	4.27	.28	2706.48	.00	.42	.95	1.000	.000	.00	0 .0
.544	.0371					.0121	.01	.34	1.51	.26	.013	.00	.00	PIPE
1420.674	2705.881	.351	2706.232	1.00	4.07	.26	2706.49	.00	.42	.95	1.000	.000	.00	0 .0
.410	.0371					.0106	.00	.35	1.41	.26	.013	.00	.00	PIPE
1421.084	2705.896	.363	2706.260	1.00	3.88	.23	2706.49	.00	.42	.96	1.000	.000	.00	0 .0
.296	.0371					.0093	.00	.36	1.32	.26	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:17:41

Calida Renaissance Revision ELY1 1

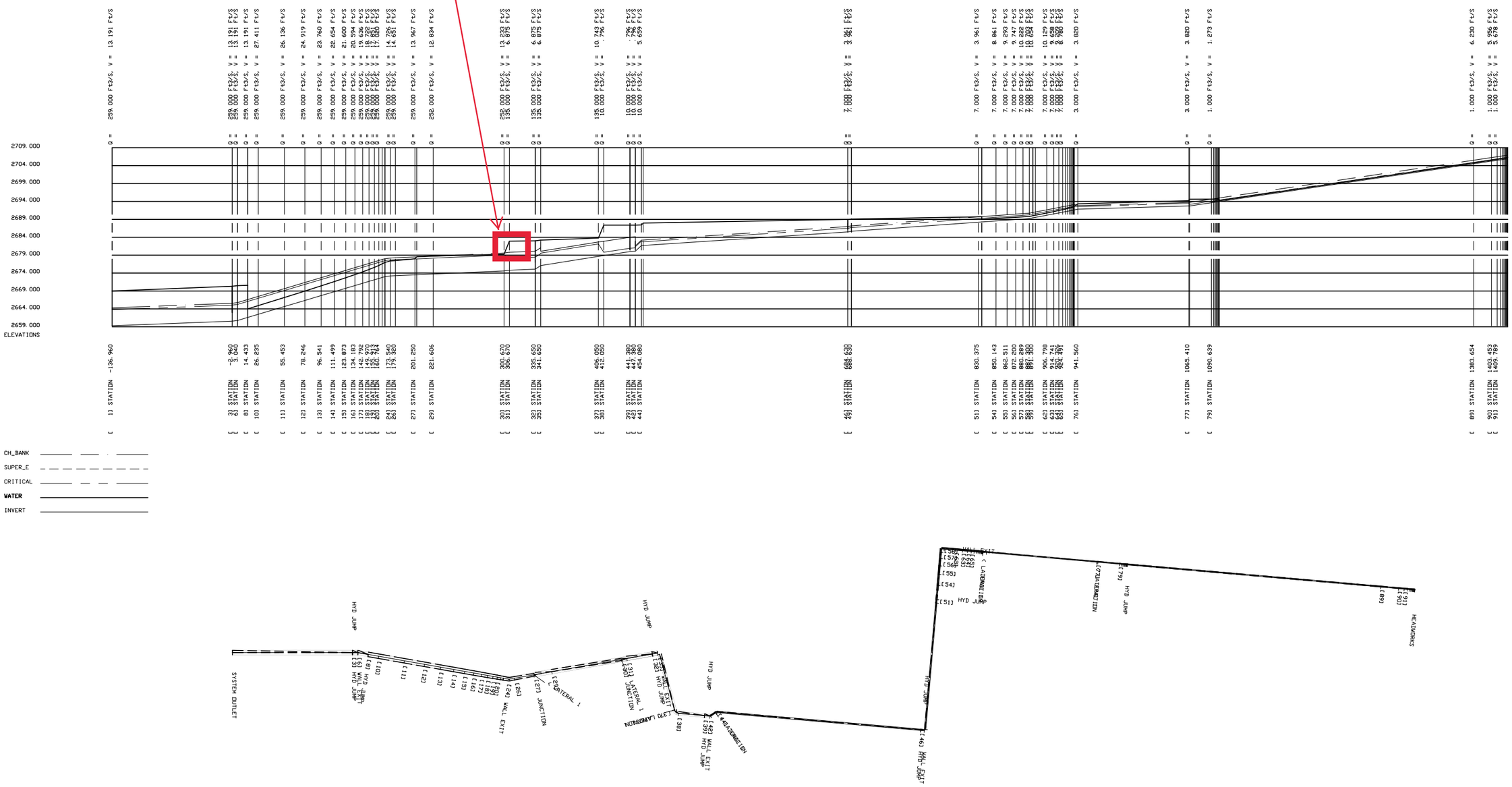
```
                1         2         3         4         5         6         7
       4567890123456789012345678901234567890123456789012345678901234567890123
```

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1421.381	2705.907	.376	2706.283	1.00	3.70	.21	2706.50	.00	.42	.97	1.000	.000	.00	0 .0
.197	.0371					.0081	.00	.38	1.23	.26	.013	.00	.00	PIPE
1421.578	2705.914	.390	2706.304	1.00	3.53	.19	2706.50	.00	.42	.98	1.000	.000	.00	0 .0
.115	.0371					.0071	.00	.39	1.15	.26	.013	.00	.00	PIPE
1421.693	2705.918	.404	2706.323	1.00	3.36	.18	2706.50	.00	.42	.98	1.000	.000	.00	0 .0
.037	.0371					.0062	.00	.40	1.08	.26	.013	.00	.00	PIPE
1421.730	2705.920	.420	2706.340	1.00	3.20	.16	2706.50	.00	.42	.99	1.000	.000	.00	0 .0

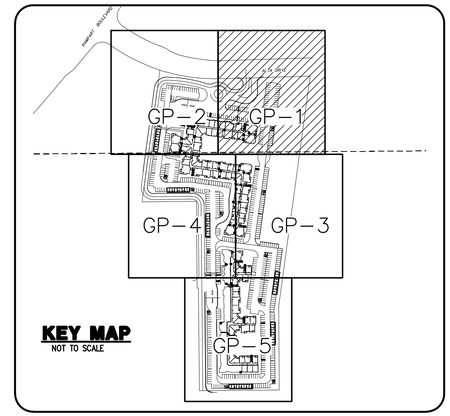
WSPG ELY2

HGL = 2682.92
See ELY1 Main

WATER SURFACE PRESSURE GRADIENT ANALYSIS (PLAN & PROFILE) ELY1







KEY MAP
NOT TO SCALE

NORTH

30' 0' 15' 30'

SCALE: 1" = 30'

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

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

H# —

CLV DWG# —

STATE OF NEVADA — PROFESSIONAL ENGINEER
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
No. 14711

DATE:

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002

DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 13:14:56

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

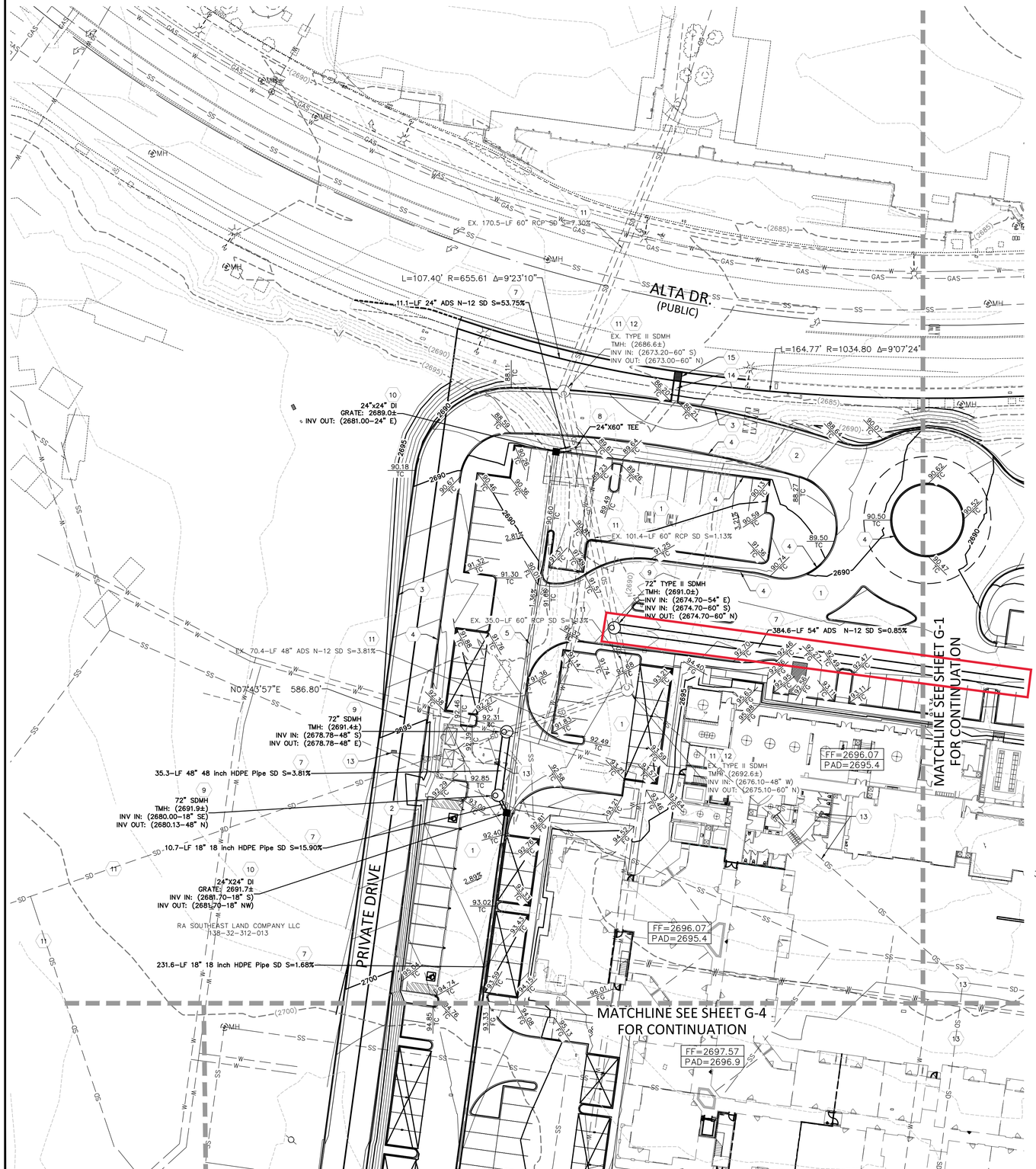
F:\Projects\800\894-002\DWG\Production\894z001.dwg
Todd Kelley

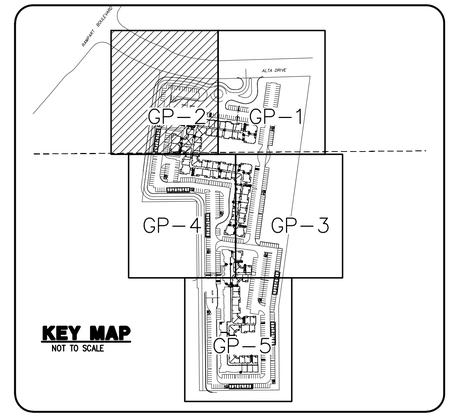
THE CALIDA GROUP

ELYSIAN RENAISSANCE

GRADING PLAN 1

DRAWING
GP-1
11 OF 31 SHTS





NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT–1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N–12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT–2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U–CHANNEL, SEE DETAIL K SHT DT–1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L–CURB TO A–CURB TRANSITION PER DETAIL J SHT. DT–1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE–OBSERVED 2005–2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

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

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

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

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# –

CLV DWG# –

ENGINEER – STATE OF NEVADA
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
No. 14711
PROFESSIONAL

DATE:

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002

DESIGN:
DRAWN:
CHECK:

PLOT DATE: 03-13-18
PLOT TIME: 15:09:49

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

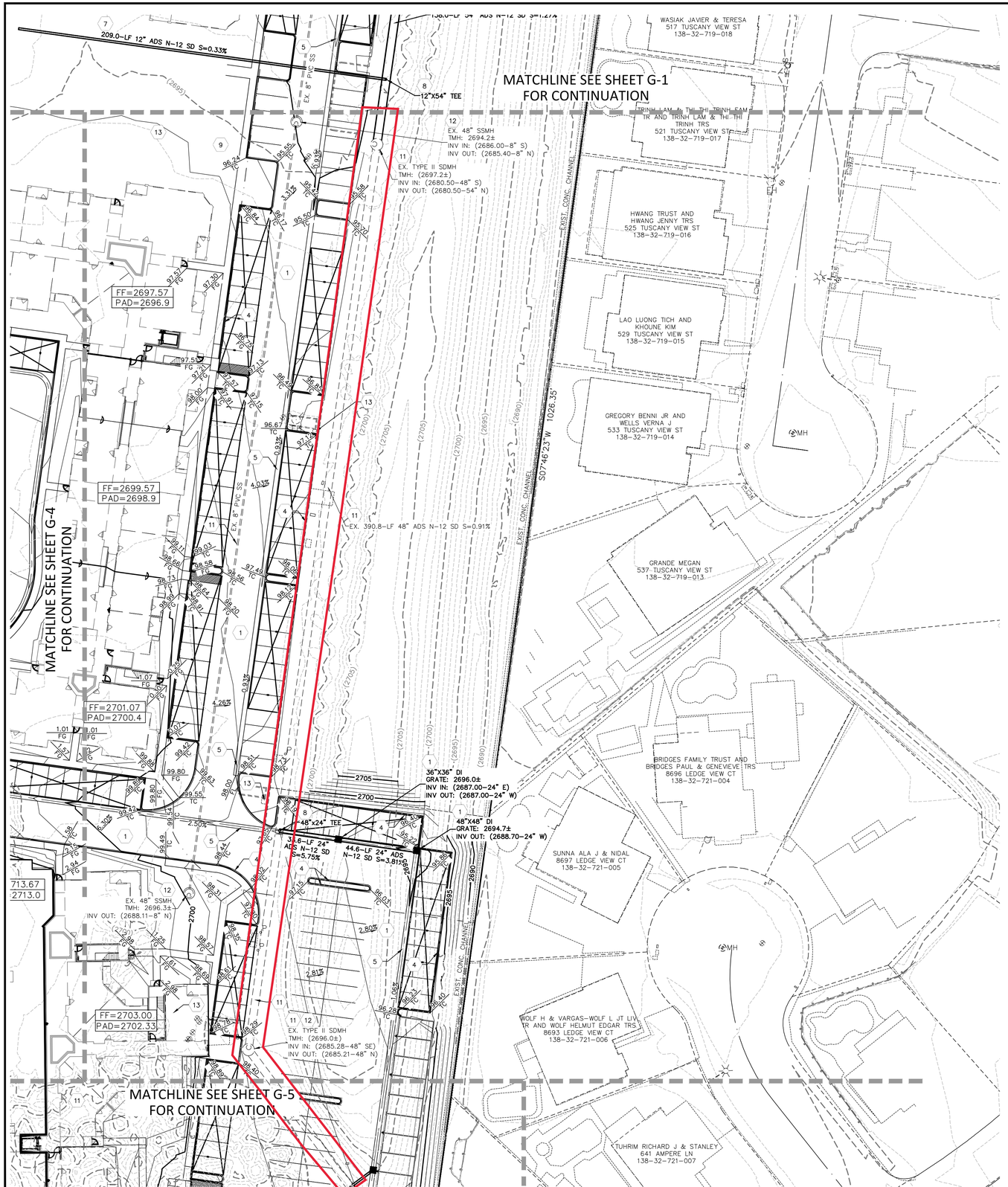
F:\Projects\800\894-002\DWG\Production\894z012.dwg
Todd Kelley

THE CALIDA GROUP

ELYSIAN RENAISSANCE

GRADING PLAN 2

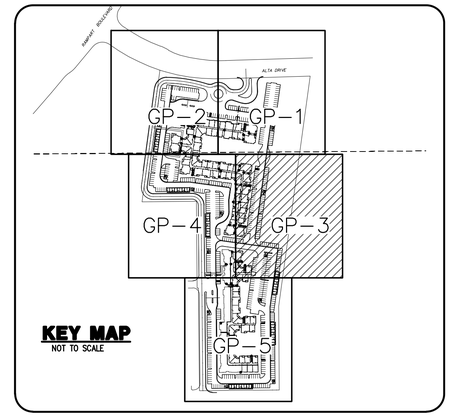
DRAWING
GP-2
12 OF 31 SHTS



NORTH

30' 0' 15' 30'

SCALE: 1" = 30'



KEY MAP
NOT TO SCALE

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

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

H# –

CLV DWG# –

STATE OF NEVADA
ENGINEER
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
PROFESSIONAL

DATE:
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP	DATE

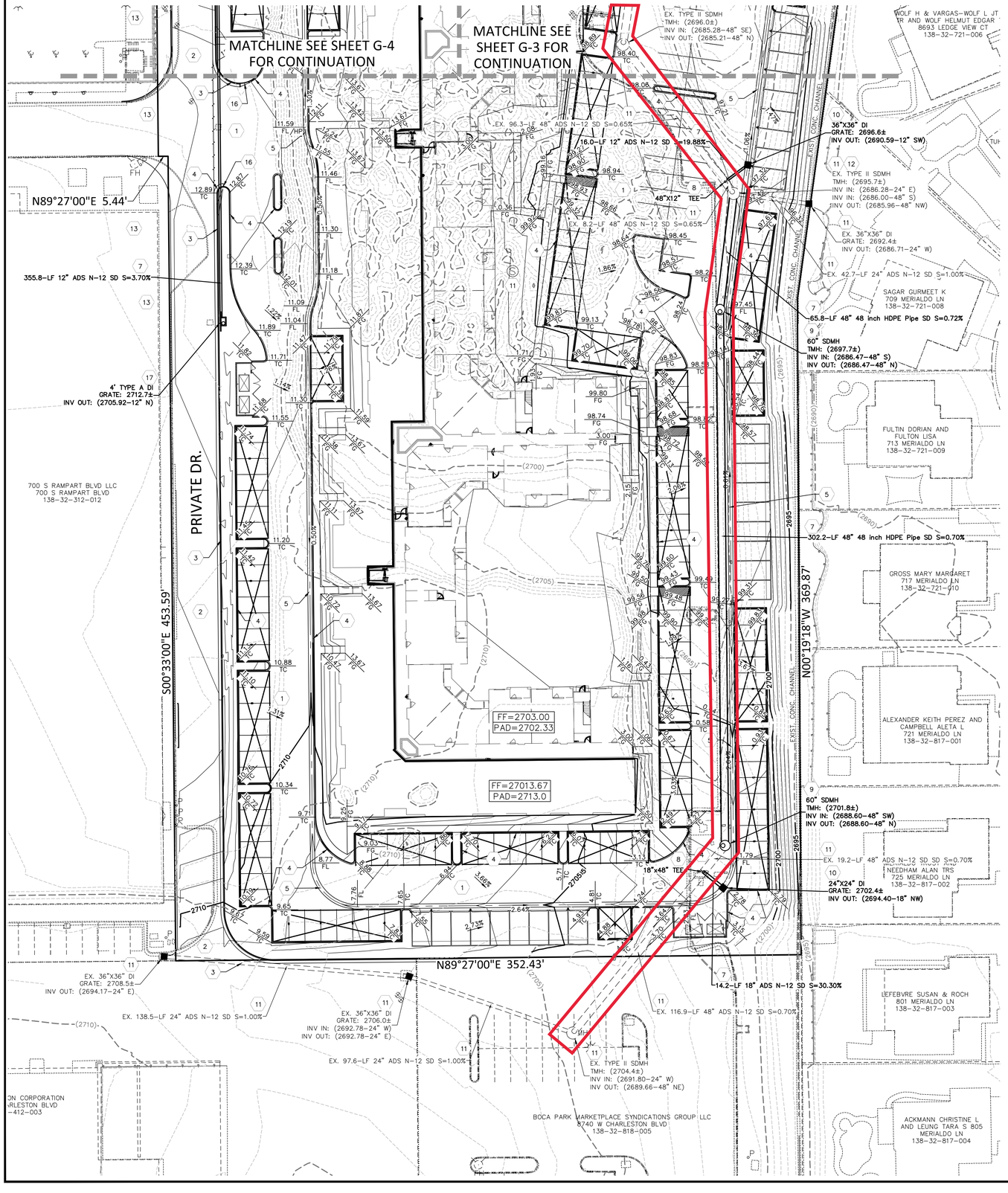
PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 16:04:20

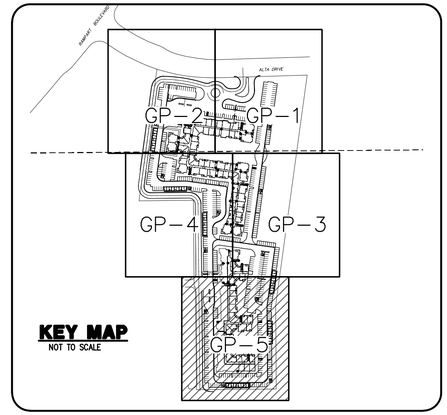
GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894z013.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN RENAISSANCE
GRADING PLAN 3

DRAWING
GP-3
13 OF 31 SHTS





KEY MAP
NOT TO SCALE

NORTH

30' 0' 15' 30'
SCALE: 1" = 30'

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

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

H# –

CLV DWG# –

ENGINEER - STATE OF NEVADA
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
No. 14711
PROFESSIONAL

DATE:
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 17:27:10

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894zc015.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN RENAISSANCE
GRADING PLAN 5

DRAWING
GP-5
15 OF 31 SHTS

```
T1 Calida Renaissance ELY2                                                0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   -337.0202674.800  5                          2682.920
WX   -337.0202674.800  5
R      41.5802677.860  5      .013                                  .000  00.000
JX     47.5802678.060  5  4   .014   11.000         2677.960         90.0       30.000
R     103.8702678.650  5      .013                                  .000  00.000 0
WE    103.8702678.650  5       .20
R     109.8702678.850  5      .014                                  .000  65.000 0
WX    109.8702678.850  5
R     241.8402680.400  5      .013                                  .000  00.000 0
WE    241.8402680.400  5       .20
R     247.8402680.600  5      .014                                  .000  00.000 0
WX    247.8402680.600  1
R     633.6802684.050  1      .013                                  .000  00.000
JX    637.6802684.080  1  4   .014   10.000         2686.070         90.0       00.000
R     757.2802685.210  1      .013                                  .000  00.000 0
WE    757.2802685.210  1       .20
R     763.2802685.280  1      .014                                  .000 -40.000 0
WX    763.2802685.280  1
R     854.6202685.890  1      .013                                  .000  00.000
JX    858.6202685.920  1  4   .014    4.000         2687.410         90.0       00.000
R     861.8402685.960  1      .013                                  .000  00.000
JX    867.8402686.000  1  4   .014    1.000         2686.280         90.0       40.000
R     928.1902686.370  1      .013                                  .000  00.000 0
WE    928.1902686.370  1       .20
R     933.1902686.570  1      .014                                  .000  -5.000 0
WX    933.1902686.570  1
R    1230.3502688.500  1      .013                                  .000  00.000 0
WE   1230.3502688.500  1       .20
R    1235.3502688.700  1      .014                                  .000  40.000 0
WX   1235.3502688.700  1
R    1250.0702688.820  1      .013                                  .000  00.000
JX   1254.0702688.850  1  3   .014    2.000         2686.280         90.0       00.000
R    1366.0102689.660  1      .013                                  .000  00.000 0
SH   1366.0102689.660  1                          2689.660
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   5.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  4   0    .000   2.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q            89.000   .0
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	0		4.000														
CD	2	4	0		5.000														
CD	3	4	0		1.500														
CD	4	4	0		2.000														
CD	5	4	0		4.500														
CD	6	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	5.000	3.000	.000	.000	.00										

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Calida Renaissance ELY2 0

HEADING LINE NO 2 IS -

1 2 3 4 5 6 7

HEADING LINE NO 3 IS -

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	-337.020	2674.800	5	2682.920

ELEMENT NO 2 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	-337.020	2674.800	5

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	41.580	2677.860	5	.013	.000	.000	.000	0

ELEMENT NO 4 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	47.580	2678.060	5	4	0	.014	11.000	.000	2677.960	.000	90.000	.000

RADIUS	ANGLE
11.459	30.000

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	103.870	2678.650	5	.013	.000	.000	.000	0

ELEMENT NO 6 IS A WALL ENTRANCE *

U/S DATA	STATION	INVERT	SECT	FP
	103.870	2678.650	5	.200

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	109.870	2678.850	5	.014	.000	.000	65.000	0

ELEMENT NO 8 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	109.870	2678.850	5

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	241.840	2680.400	5	.013	.000	.000	.000	0

ELEMENT NO 10 IS A WALL ENTRANCE *

```
                  U/S DATA   STATION    INVERT  SECT              FP
                             241.840 2680.400    5               .200
ELEMENT NO  11 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             247.840 2680.600    5               .014                           .000     .000      .000     0
ELEMENT NO  12 IS A  WALL  EXIT                     *
                  U/S DATA   STATION    INVERT  SECT
                             247.840 2680.600    1
                                                 W S P G W                                                        PAGE NO   3
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  13 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             633.680 2684.050    1               .013                           .000     .000      .000     0
ELEMENT NO  14 IS A JUNCTION          *         *     *     *               *                    *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                             637.680 2684.080    1     4     0   .014    10.000      .000  2686.070      .000  90.000     .000
                                                                                          RADIUS    ANGLE
                                                                                           .000     .000
ELEMENT NO  15 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             757.280 2685.210    1               .013                           .000     .000      .000     0
ELEMENT NO  16 IS A  WALL  ENTRANCE                 *
                  U/S DATA   STATION    INVERT  SECT              FP
                             757.280 2685.210    1               .200
ELEMENT NO  17 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             763.280 2685.280    1               .014                           .000     .000   -40.000     0
ELEMENT NO  18 IS A  WALL  EXIT                     *
                  U/S DATA   STATION    INVERT  SECT
                             763.280 2685.280    1
ELEMENT NO  19 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             854.620 2685.890    1               .013                           .000     .000      .000     0
ELEMENT NO  20 IS A JUNCTION          *         *     *     *               *                    *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                             858.620 2685.920    1     4     0   .014     4.000      .000  2687.410      .000  90.000     .000
                                                                                          RADIUS    ANGLE
                                                                                           .000     .000
ELEMENT NO  21 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             861.840 2685.960    1               .013                           .000     .000      .000     0
ELEMENT NO  22 IS A JUNCTION          *         *     *     *               *                    *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                             867.840 2686.000    1     4     0   .014     1.000      .000  2686.280      .000  90.000     .000
                                                                                          RADIUS    ANGLE
                                                                                          8.594  40.000
                                                 W S P G W                                                        PAGE NO   4
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  23 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             928.190 2686.370    1               .013                           .000     .000      .000     0
ELEMENT NO  24 IS A  WALL  ENTRANCE                 *
```

```
                  U/S DATA   STATION    INVERT  SECT              FP
                              928.190 2686.370    1              .200
ELEMENT NO  25 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                              933.190 2686.570    1              .014                           .000     .000    -5.000      0
ELEMENT NO  26 IS A  WALL  EXIT                     *
                  U/S DATA   STATION    INVERT  SECT
                              933.190 2686.570    1
ELEMENT NO  27 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             1230.350 2688.500    1              .013                           .000     .000      .000      0
ELEMENT NO  28 IS A  WALL  ENTRANCE                 *
                  U/S DATA   STATION    INVERT  SECT              FP
                             1230.350 2688.500    1              .200
ELEMENT NO  29 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             1235.350 2688.700    1              .014                           .000     .000    40.000      0
ELEMENT NO  30 IS A  WALL  EXIT                     *
                  U/S DATA   STATION    INVERT  SECT
                             1235.350 2688.700    1
ELEMENT NO  31 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             1250.070 2688.820    1              .013                           .000     .000      .000      0
ELEMENT NO  32 IS A JUNCTION          *         *     *     *               *                    *                 *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             1254.070 2688.850    1     3     0   .014     2.000      .000 2686.280      .000  90.000     .000
                                                                                                RADIUS    ANGLE
                                                                                                  .000     .000
ELEMENT NO  33 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             1366.010 2689.660    1              .013                           .000     .000      .000      0
ELEMENT NO  34 IS A SYSTEM HEADWORKS                *                    *
                  U/S DATA   STATION    INVERT  SECT                                W S ELEV
                             1366.010 2689.660    1                              2689.660
                                                  W S P G W                                                    PAGE NO   5
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:21:53

Calida Renaissance ELY2

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-337.020	2674.800	8.120	2682.920	117.00	7.36	.84	2683.76	.00	3.18	.00	4.500	.000	.00	0 .0
WALL EXIT														
-337.020	2674.800	8.120	2682.920	117.00	7.36	.84	2683.76	.00	3.18	.00	4.500	.000	.00	0 .0
378.600	.0081					.0035	1.34	8.12	.00	2.67	.013	.00	.00	PIPE
41.580	2677.860	6.400	2684.260	117.00	7.36	.84	2685.10	.00	3.18	.00	4.500	.000	.00	0 .0
JUNCT STR	.0333					.0037	.02	.00	.00		.014	.00	.00	PIPE
47.580	2678.060	6.524	2684.584	106.00	6.66	.69	2685.27	.00	3.03	.00	4.500	.000	.00	0 .0
56.290	.0105					.0029	.16	6.52	.00	2.32	.013	.00	.00	PIPE
103.870	2678.650	6.098	2684.748	106.00	6.66	.69	2685.44	.00	3.03	.00	4.500	.000	.00	0 .0
HYDRAULIC JUMP														
103.870	2678.650	2.212	2680.862	106.00	13.63	2.88	2683.74	.00	3.03	4.50	4.500	.000	.00	0 .0
HYDRAULIC DROP														
103.870	2678.650	6.098	2684.748	106.00	6.66	.69	2685.44	.00	3.03	.00	4.500	.000	.00	0 .0
6.000	.0334					.0034	.02	6.10	.00	1.74	.014	.00	.00	PIPE
109.870	2678.850	6.066	2684.916	106.00	6.66	.69	2685.61	.00	3.03	.00	4.500	.000	.00	0 .0
WALL EXIT														
109.870	2678.850	6.067	2684.917	106.00	6.66	.69	2685.61	.00	3.03	.00	4.500	.000	.00	0 .0
131.970	.0117					.0029	.38	6.07	.00	2.24	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:21:53

Calida Renaissance ELY2

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) / SF Ave	Water Elev / HF	Q (CFS) / SE Dpth	Vel (FPS) / Froude N	Vel Head / Norm Dp	Energy Grd.El. / "N"	Super Elev / X-Fall	Critical Depth / ZR	Flow Top Width / Type Ch	Height/Dia.-FT / No Wth Prs/Pip	Base Wt or I.D.	ZL
241.840	2680.400	4.901	2685.301	106.00	6.66	.69	2685.99	.00	3.03	.00	4.500	.000	.00
												0	.0
HYDRAULIC JUMP													
241.840	2680.400	2.318	2682.718	106.00	12.84	2.56	2685.28	.00	3.03	4.50	4.500	.000	.00
												0	.0
HYDRAULIC DROP													
241.840	2680.400	4.901	2685.301	106.00	6.66	.69	2685.99	.00	3.03	.00	4.500	.000	.00
												0	.0
6.000	.0334					.0034	.02	4.90	.00	1.74	.014	.00	.00
												PIPE	
247.840	2680.600	4.721	2685.321	106.00	6.66	.69	2686.01	.00	3.03	.00	4.500	.000	.00
												0	.0
WALL EXIT													
247.840	2680.600	4.721	2685.321	106.00	8.44	1.10	2686.43	.00	3.12	.00	4.000	.000	.00
												0	.0
206.246	.0089					.0054	1.12	4.72	.00	2.66	.013	.00	.00
												PIPE	
454.086	2682.444	4.000	2686.444	106.00	8.44	1.10	2687.55	.00	3.12	.00	4.000	.000	.00
												0	.0
66.956	.0089					.0051	.34	4.00	.00	2.66	.013	.00	.00
												PIPE	
521.042	2683.043	3.629	2686.672	106.00	8.85	1.22	2687.89	.00	3.12	2.32	4.000	.000	.00
												0	.0
9.552	.0089					.0048	.05	3.63	.69	2.66	.013	.00	.00
												PIPE	
530.594	2683.128	3.552	2686.680	106.00	8.99	1.25	2687.93	.00	3.12	2.52	4.000	.000	.00
												0	.0
HYDRAULIC JUMP													
530.594	2683.128	2.720	2685.849	106.00	11.65	2.11	2687.96	.00	3.12	3.73	4.000	.000	.00
												0	.0
3.427	.0089					.0084	.03	2.72	1.31	2.66	.013	.00	.00
												PIPE	

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:21:53

Calida Renaissance ELY2

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
534.021	2683.159	2.720	2685.880	106.00	11.65	2.11	2687.99	.00	3.12	3.73	4.000	.000	.00	0 .0
70.459	.0089					.0079	.56	2.72	1.31	2.66	.013	.00	.00	PIPE
604.479	2683.789	2.841	2686.630	106.00	11.10	1.91	2688.54	.00	3.12	3.63	4.000	.000	.00	0 .0
23.411	.0089					.0071	.17	2.84	1.21	2.66	.013	.00	.00	PIPE
627.890	2683.998	2.972	2686.970	106.00	10.59	1.74	2688.71	.00	3.12	3.50	4.000	.000	.00	0 .0
5.790	.0089					.0064	.04	2.97	1.10	2.66	.013	.00	.00	PIPE
633.680	2684.050	3.116	2687.166	106.00	10.09	1.58	2688.75	.00	3.12	3.32	4.000	.000	.00	0 .0
JUNCT STR	.0075					.0061	.02	3.12	1.00		.014	.00	.00	PIPE
637.680	2684.080	4.016	2688.096	96.00	7.64	.91	2689.00	.00	2.97	.00	4.000	.000	.00	0 .0
3.199	.0094					.0044	.01	4.02	.00	2.44	.013	.00	.00	PIPE
640.879	2684.110	4.000	2688.110	96.00	7.64	.91	2689.02	.00	2.97	.00	4.000	.000	.00	0 .0
52.775	.0094					.0042	.22	4.00	.00	2.44	.013	.00	.00	PIPE
693.654	2684.609	3.629	2688.238	96.00	8.01	1.00	2689.23	.00	2.97	2.32	4.000	.000	.00	0 .0
21.400	.0094					.0040	.09	3.63	.62	2.44	.013	.00	.00	PIPE
715.054	2684.811	3.414	2688.225	96.00	8.40	1.10	2689.32	.00	2.97	2.83	4.000	.000	.00	0 .0
.618	.0094					.0042	.00	3.41	.74	2.44	.013	.00	.00	PIPE
715.671	2684.817	3.414	2688.231	96.00	8.40	1.10	2689.33	.00	2.97	2.83	4.000	.000	.00	0 .0

HYDRAULIC JUMP

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:21:53

Calida Renaissance ELY2

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
715.671	2684.817	2.577	2687.394	96.00	11.21	1.95	2689.35	.00	2.97	3.83	4.000	.000	.00	0 .0
9.484	.0094					.0079	.08	2.58	1.32	2.44	.013	.00	.00	PIPE
725.155	2684.906	2.591	2687.497	96.00	11.15	1.93	2689.43	.00	2.97	3.82	4.000	.000	.00	0 .0
32.125	.0094					.0074	.24	2.59	1.31	2.44	.013	.00	.00	PIPE
757.280	2685.210	2.702	2687.912	96.00	10.63	1.75	2689.67	.00	2.97	3.75	4.000	.000	.00	0 .0
6.000	.0117					.0079	.05	2.70	1.21	2.39	.014	.00	.00	PIPE
763.280	2685.280	2.759	2688.039	96.00	10.38	1.67	2689.71	.00	2.97	3.70	4.000	.000	.00	0 .0
WALL	EXIT													
763.280	2685.280	2.758	2688.038	96.00	10.39	1.68	2689.71	.00	2.97	3.70	4.000	.000	.00	0 .0
76.615	.0067					.0064	.49	2.76	1.16	2.75	.013	.00	.00	PIPE
839.895	2685.792	2.839	2688.630	96.00	10.07	1.57	2690.20	.00	2.97	3.63	4.000	.000	.00	0 .0
14.725	.0067					.0058	.09	2.84	1.09	2.75	.013	.00	.00	PIPE
854.620	2685.890	2.970	2688.860	96.00	9.59	1.43	2690.29	.00	2.97	3.50	4.000	.000	.00	0 .0
JUNCT STR	.0075					.0053	.02	2.97	1.00		.014	.00	.00	PIPE
858.620	2685.920	3.534	2689.454	92.00	7.83	.95	2690.41	.00	2.91	2.57	4.000	.000	.00	0 .0
3.220	.0124					.0037	.01	3.53	.64	2.17	.013	.00	.00	PIPE
861.840	2685.960	3.485	2689.445	92.00	7.92	.97	2690.42	4.00	2.91	2.68	4.000	.000	.00	0 .0
JUNCT STR	.0067							4.00	.67		.014	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:21:53

Calida Renaissance ELY2

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
867.840	2686.000	2.567	2688.567	91.00	10.68	1.77	2690.34	.00	2.89	3.84	4.000	.000	.00	0 .0
17.690	.0061					.0074	.13	2.57	1.26	2.73	.013	.00	.00	PIPE
885.530	2686.108	2.531	2688.639	91.00	10.86	1.83	2690.47	.00	2.89	3.86	4.000	.000	.00	0 .0
42.660	.0061					.0081	.34	2.53	1.30	2.73	.013	.00	.00	PIPE
928.190	2686.370	2.431	2688.801	91.00	11.38	2.01	2690.81	.00	2.89	3.91	4.000	.000	.00	0 .0
.947	.0400					.0097	.01	2.43	1.40	1.61	.014	.00	.00	PIPE
929.137	2686.408	2.462	2688.870	91.00	11.21	1.95	2690.82	.00	2.89	3.89	4.000	.000	.00	0 .0
2.425	.0400					.0090	.02	2.46	1.37	1.61	.014	.00	.00	PIPE
931.562	2686.505	2.564	2689.069	91.00	10.69	1.78	2690.84	.00	2.89	3.84	4.000	.000	.00	0 .0
1.628	.0400					.0080	.01	2.56	1.27	1.61	.014	.00	.00	PIPE
933.190	2686.570	2.674	2689.244	91.00	10.20	1.61	2690.86	.00	2.89	3.77	4.000	.000	.00	0 .0
WALL	EXIT													
933.190	2686.570	2.672	2689.242	91.00	10.20	1.62	2690.86	.00	2.89	3.77	4.000	.000	.00	0 .0
36.565	.0065					.0065	.24	2.67	1.17	2.67	.013	.00	.00	PIPE
969.755	2686.808	2.672	2689.480	91.00	10.20	1.62	2691.10	.00	2.89	3.77	4.000	.000	.00	0 .0
113.097	.0065					.0066	.75	2.67	1.17	2.67	.013	.00	.00	PIPE
1082.851	2687.542	2.644	2690.186	91.00	10.33	1.66	2691.84	.00	2.89	3.79	4.000	.000	.00	0 .0
94.107	.0065					.0071	.67	2.64	1.19	2.67	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:21:53

Calida Renaissance ELY2

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1176.959	2688.153	2.536	2690.689	91.00	10.83	1.82	2692.51	.00	2.89	3.85	4.000	.000	.00	0 .0
53.391	.0065					.0080	.43	2.54	1.29	2.67	.013	.00	.00	PIPE
1230.350	2688.500	2.436	2690.936	91.00	11.35	2.00	2692.94	.00	2.89	3.90	4.000	.000	.00	0 .0
1.155	.0400					.0096	.01	2.44	1.40	1.61	.014	.00	.00	PIPE
1231.505	2688.546	2.475	2691.021	91.00	11.14	1.93	2692.95	.00	2.89	3.89	4.000	.000	.00	0 .0
2.314	.0400					.0089	.02	2.48	1.35	1.61	.014	.00	.00	PIPE
1233.819	2688.639	2.578	2691.217	91.00	10.63	1.75	2692.97	.00	2.89	3.83	4.000	.000	.00	0 .0
1.531	.0400					.0079	.01	2.58	1.25	1.61	.014	.00	.00	PIPE
1235.350	2688.700	2.689	2691.389	91.00	10.13	1.59	2692.98	.00	2.89	3.76	4.000	.000	.00	0 .0
WALL	EXIT													
1235.350	2688.700	2.688	2691.388	91.00	10.13	1.59	2692.98	.00	2.89	3.76	4.000	.000	.00	0 .0
10.189	.0082					.0062	.06	2.69	1.15	2.47	.013	.00	.00	PIPE
1245.539	2688.783	2.766	2691.549	91.00	9.82	1.50	2693.05	.00	2.89	3.69	4.000	.000	.00	0 .0
4.531	.0082					.0056	.03	2.77	1.09	2.47	.013	.00	.00	PIPE
1250.070	2688.820	2.891	2691.712	91.00	9.36	1.36	2693.07	.00	2.89	3.58	4.000	.000	.00	0 .0
JUNCT STR	.0075					.0053	.02	2.89	1.00		.014	.00	.00	PIPE
1254.070	2688.850	3.282	2692.132	89.00	8.07	1.01	2693.14	.00	2.86	3.07	4.000	.000	.00	0 .0
12.712	.0072					.0040	.05	3.28	.75	2.53	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-20-2018 Time: 6:21:53

Calida Renaissance ELY2

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1266.782	2688.942	3.179	2692.121	89.00	8.31	1.07	2693.19	.00	2.86	3.23	4.000	.000	.00	0 .0
HYDRAULIC JUMP														
1266.782	2688.942	2.556	2691.498	89.00	10.50	1.71	2693.21	.00	2.86	3.84	4.000	.000	.00	0 .0
61.150	.0072					.0068	.42	2.56	1.25	2.53	.013	.00	.00	PIPE
1327.931	2689.385	2.623	2692.008	89.00	10.19	1.61	2693.62	.00	2.86	3.80	4.000	.000	.00	0 .0
31.519	.0072					.0062	.19	2.62	1.18	2.53	.013	.00	.00	PIPE
1359.450	2689.613	2.736	2692.349	89.00	9.72	1.47	2693.81	.00	2.86	3.72	4.000	.000	.00	0 .0
6.560	.0072					.0055	.04	2.74	1.09	2.53	.013	.00	.00	PIPE
1366.010	2689.660	2.859	2692.519	89.00	9.26	1.33	2693.85	.00	2.86	3.61	4.000	.000	.00	0 .0

WSPG SD4 LATERAL



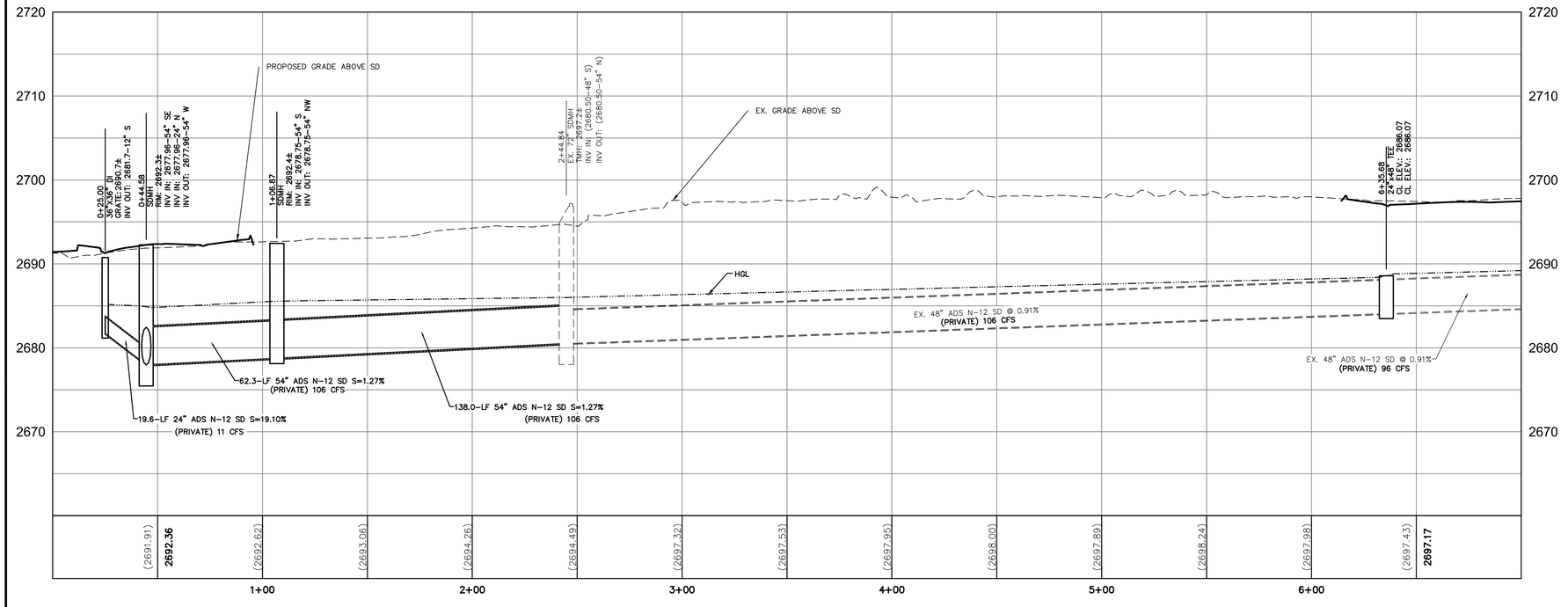
SD-4 PLAN VIEW

SCALE: 1"=30' HORIZONTAL

NORTH

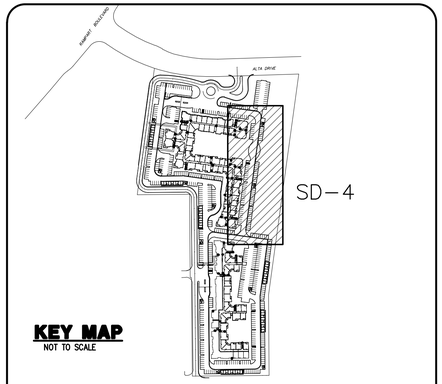
30' 0' 15' 30'

SCALE: 1" = 30'



SD-4 PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



KEY MAP
NOT TO SCALE

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

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N–12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT JENSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D–2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	FIRST	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE–OBSERVED 2005–2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# –

CLV DWG# –

NOT FOR CONSTRUCTION

DATE:

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP	DATE

PROJECT NO. 894-002

DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-14-18
PLOT TIME: 11:16:49

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
F:\Projects\800\894-002\DWG\Production\8942c019.dwg
Todd Kelley

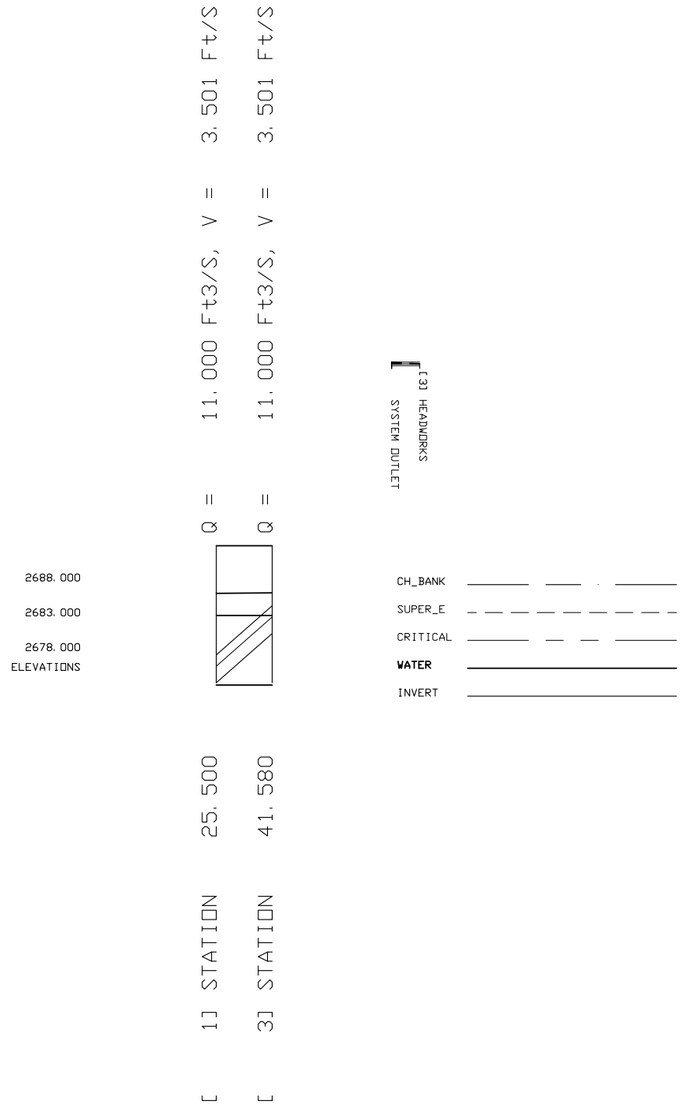
THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

STORM DRAIN PLAN AND PROFILE 4

DRAWING
SD-4
19 OF 31 SHTS

WATER SURFACE PRESSURE GRADIENT ANALYSIS (PLAN & PROFILE) SD4



Program Package Serial Number: 7204 Date: 3-21-2018 Time: 6: 2:34 File: ELYSD4.WSW

Calida Renaissance Lateral SD4 at Inlet 4

[No.]	TYPE OPERATION	STATION (FT)	INV ELEV (FT)	WATER LEVEL (FT)	CHAN HT (FT)	TYPE CHANNEL	"N"	#PIER/PIP	FLOW RATE (CFS)	VELOCITY (FT/S)	TOP WIDTH (FT)	CHAN WDTH (FT)	PIER WIDTH (FT)	ZL	ZR	SUPEL RT B (FT)	SUPEL LT B (FT)	CRIT DPTH (FT)	RADIUS/<PT (FT OR <)	RMKS
[1]	SYSTEM OUTLET	25.500	2678.160	6.420	2.000	PIPE	.013	0	11.000	3.501	.000	2.000	.000	.000	.000	.000	.000	1.189	.000	
[2]	REACH	25.500	2678.160	6.421	2.000	PIPE	.013	0	11.000	3.501	.000	2.000	.000	.000	.000	.000	.000	1.189	.000	
[3]	HEADWORKS	41.580	2681.700	2.919	2.000	PIPE	.013	0	11.000	3.501	.000	2.000	.000	.000	.000	.000	.000	1.189	.000	

```
T1 Calida Renaissance Lateral SD4 at Inlet 4                                0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO     25.5002678.160  3                          2684.580
WX     25.5002678.160  3
R      41.5802681.700  3      .013                                    000.000
SH     41.5802681.700  3                          2681.700
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   5.000     .000  .000  .000   .00
CD   3  4   0    .000   2.000     .000  .000  .000   .00
CD   4  4   0    .000   1.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q            11.000   .0
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	0		4.000														
CD	2	4	0		5.000														
CD	3	4	0		2.000														
CD	4	4	0		1.000														
CD	5	4	0		4.500														
CD	6	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	5.000	3.000	.000	.000	.00										

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Calida Renaissance Lateral SD4 at Inlet 4

HEADING LINE NO 2 IS -

1 2 3 4 5 6 7

HEADING LINE NO 3 IS -

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	25.500	2678.160	3	2684.580

ELEMENT NO 2 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	25.500	2678.160	3

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	41.580	2681.700	3	.013	.000	.000	.000	0

ELEMENT NO 4 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	41.580	2681.700	3	2681.700

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 6: 2:34

Calida Renaissance Lateral SD4 at Inlet 4

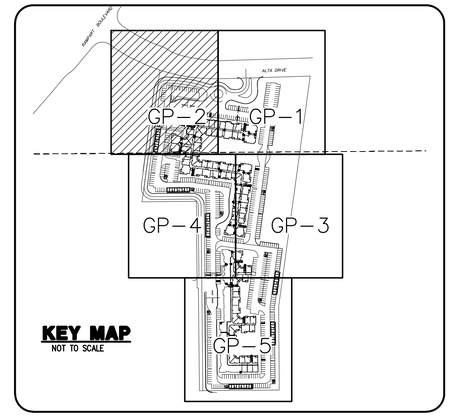
1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
25.500	2678.160	6.420	2684.580	11.00	3.50	.19	2684.77	.00	1.19	.00	2.000	.000	.00	0 .0
WALL	EXIT													
25.500	2678.160	6.421	2684.581	11.00	3.50	.19	2684.77	.00	1.19	.00	2.000	.000	.00	0 .0
16.080	.2202					.0024	.04	6.42	.00	.43	.013	.00	.00	PIPE
41.580	2681.700	2.919	2684.619	11.00	3.50	.19	2684.81	.00	1.19	.00	2.000	.000	.00	0 .0

WSPG SD6A LATERAL





KEY MAP
NOT TO SCALE

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

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

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

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

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# –

CLV DWG# –

NOT FOR CONSTRUCTION

DATE:

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 15:09:49

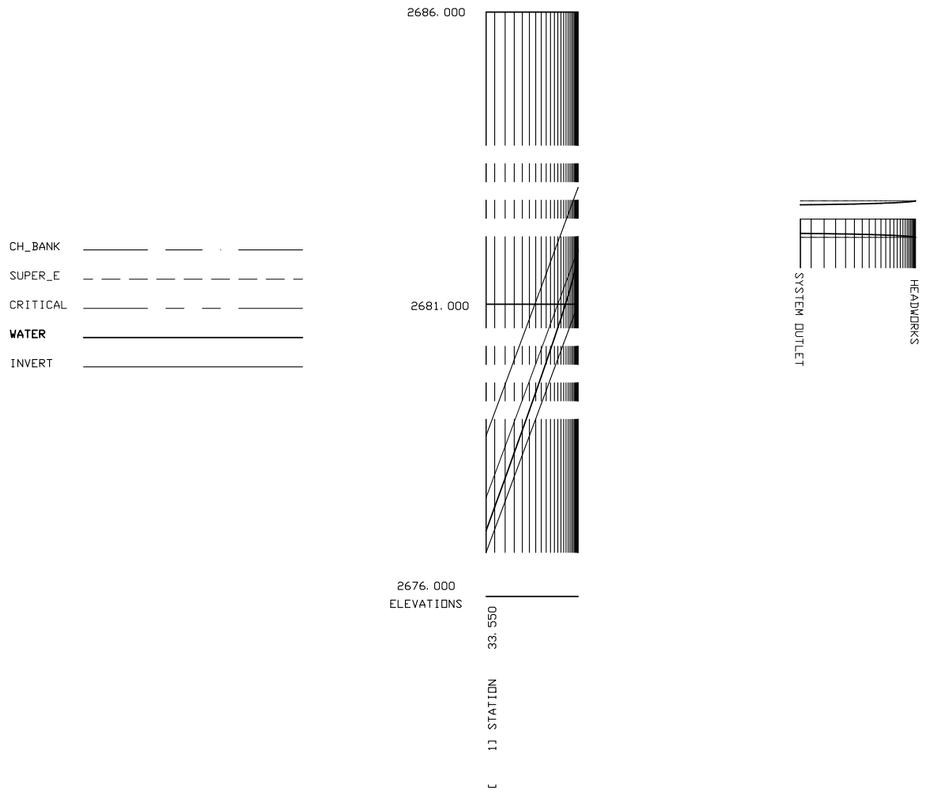
GCW
ENGINEERS & SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894z012.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN RENAISSANCE
GRADING PLAN 2

DRAWING
GP-2
12 OF 31 SHTS

WATER SURFACE PRESSURE GRADIENT ANALYSIS (PLAN & PROFILE) SD6A



Program Package Serial Number: 7204 Date: 3-21-2018 Time: 3: 2:15 File: ELYSD6A. WSW

Calida Renaissance Lateral SD6A at Inlet 8

[No.]	TYPE OPERATION	STATION (FT)	INV ELEV (FT)	WATER LEVEL (FT)	CHAN HT (FT)	TYPE CHANNEL	'N'	#PIER/PIP	FLOW RATE (CFS)	VELOCITY (FT/S)	TOP WIDTH (FT)	CHAN WDTH (FT)	PIER WIDTH (FT)	ZL	ZR	SUPEL RT B (FT)	SUPEL LT B (FT)	CRIT DPTH (FT)	RADIUS/<PT (FT OR <)	RMKS
[1]	SYSTEM OUTLET	33. 550	2676. 750	. 375	2. 000	PIPE	. 013	0	7. 000	17. 192	1. 561	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[2]	REACH	33. 550	2676. 750	. 373	2. 000	PIPE	. 013	0	7. 000	17. 305	1. 558	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[3]	REACH	34. 137	2677. 146	. 382	2. 000	PIPE	. 013	0	7. 000	16. 711	1. 572	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[4]	REACH	34. 851	2677. 627	. 395	2. 000	PIPE	. 013	0	7. 000	15. 933	1. 592	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[5]	REACH	35. 476	2678. 050	. 408	2. 000	PIPE	. 013	0	7. 000	15. 192	1. 612	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[6]	REACH	36. 026	2678. 421	. 422	2. 000	PIPE	. 013	0	7. 000	14. 485	1. 632	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[7]	REACH	36. 512	2678. 748	. 437	2. 000	PIPE	. 013	0	7. 000	13. 811	1. 652	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[8]	REACH	36. 941	2679. 038	. 451	2. 000	PIPE	. 013	0	7. 000	13. 168	1. 672	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[9]	REACH	37. 322	2679. 294	. 467	2. 000	PIPE	. 013	0	7. 000	12. 555	1. 692	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[10]	REACH	37. 659	2679. 522	. 483	2. 000	PIPE	. 013	0	7. 000	11. 971	1. 712	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[11]	REACH	37. 959	2679. 724	. 500	2. 000	PIPE	. 013	0	7. 000	11. 414	1. 731	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[12]	REACH	38. 225	2679. 904	. 516	2. 000	PIPE	. 013	0	7. 000	10. 883	1. 751	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[13]	REACH	38. 461	2680. 063	. 534	2. 000	PIPE	. 013	0	7. 000	10. 376	1. 770	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[14]	REACH	38. 670	2680. 204	. 553	2. 000	PIPE	. 013	0	7. 000	9. 893	1. 789	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[15]	REACH	38. 856	2680. 329	. 572	2. 000	PIPE	. 013	0	7. 000	9. 433	1. 808	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[16]	REACH	39. 019	2680. 439	. 592	2. 000	PIPE	. 013	0	7. 000	8. 994	1. 826	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[17]	REACH	39. 163	2680. 536	. 613	2. 000	PIPE	. 013	0	7. 000	8. 575	1. 844	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[18]	REACH	39. 289	2680. 621	. 635	2. 000	PIPE	. 013	0	7. 000	8. 176	1. 861	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[19]	REACH	39. 399	2680. 696	. 656	2. 000	PIPE	. 013	0	7. 000	7. 796	1. 878	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[20]	REACH	39. 494	2680. 760	. 679	2. 000	PIPE	. 013	0	7. 000	7. 433	1. 895	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[21]	REACH	39. 575	2680. 815	. 704	2. 000	PIPE	. 013	0	7. 000	7. 087	1. 910	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[22]	REACH	39. 644	2680. 861	. 730	2. 000	PIPE	. 013	0	7. 000	6. 757	1. 925	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[23]	REACH	39. 702	2680. 900	. 756	2. 000	PIPE	. 013	0	7. 000	6. 443	1. 939	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[24]	REACH	39. 749	2680. 932	. 783	2. 000	PIPE	. 013	0	7. 000	6. 143	1. 952	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[25]	REACH	39. 787	2680. 957	. 811	2. 000	PIPE	. 013	0	7. 000	5. 857	1. 964	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[26]	REACH	39. 815	2680. 976	. 841	2. 000	PIPE	. 013	0	7. 000	5. 585	1. 974	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[27]	REACH	39. 835	2680. 990	. 871	2. 000	PIPE	. 013	0	7. 000	5. 325	1. 983	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[28]	REACH	39. 846	2680. 997	. 904	2. 000	PIPE	. 013	0	7. 000	5. 077	1. 991	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	
[29]	HEADWORKS	39. 850	2681. 000	. 939	2. 000	PIPE	. 013	0	7. 000	4. 834	1. 996	2. 000	. 000	. 000	. 000	. 000	. 000	. 939	. 000	

```
T1 Calida Renaissance Lateral SD6A at Inlet 8                                0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO     33.5502676.750  3                          2678.560
WX     33.5502676.750  3
R      39.8502681.000  3      .013                                    000.000
SH     39.8502681.000  3                          2681.000
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   5.000     .000  .000  .000   .00
CD   3  4   0    .000   2.000     .000  .000  .000   .00
CD   4  4   0    .000   1.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             7.000   .0
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	0		4.000														
CD	2	4	0		5.000														
CD	3	4	0		2.000														
CD	4	4	0		1.000														
CD	5	4	0		4.500														
CD	6	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	5.000	3.000	.000	.000	.00										

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Calida Renaissance Lateral SD6A at Inlet 8

HEADING LINE NO 2 IS -

1 2 3 4 5 6 7

HEADING LINE NO 3 IS -

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	33.550	2676.750	3	2678.560

ELEMENT NO 2 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	33.550	2676.750	3

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	39.850	2681.000	3	.013	.000	.000	.000	0

ELEMENT NO 4 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	39.850	2681.000	3	2681.000

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 3: 2:15

Calida Renaissance Lateral SD6A at Inlet 8

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
33.550	2676.750	.375	2677.125	7.00	17.19	4.59	2681.71	.00	.94	1.56	2.000	.000	.00	0 .0
WALL EXIT														
33.550	2676.750	.373	2677.123	7.00	17.31	4.65	2681.77	.00	.94	1.56	2.000	.000	.00	0 .0
.587	.6746					.1582	.09	.37	5.98	.27	.013	.00	.00	PIPE
34.137	2677.146	.382	2677.528	7.00	16.71	4.34	2681.86	.00	.94	1.57	2.000	.000	.00	0 .0
.714	.6746					.1409	.10	.38	5.71	.27	.013	.00	.00	PIPE
34.851	2677.627	.395	2678.022	7.00	15.93	3.94	2681.96	.00	.94	1.59	2.000	.000	.00	0 .0
.626	.6746					.1231	.08	.40	5.35	.27	.013	.00	.00	PIPE
35.476	2678.050	.408	2678.458	7.00	15.19	3.58	2682.04	.00	.94	1.61	2.000	.000	.00	0 .0
.550	.6746					.1075	.06	.41	5.01	.27	.013	.00	.00	PIPE
36.026	2678.421	.422	2678.843	7.00	14.48	3.26	2682.10	.00	.94	1.63	2.000	.000	.00	0 .0
.485	.6746					.0940	.05	.42	4.69	.27	.013	.00	.00	PIPE
36.512	2678.748	.437	2679.185	7.00	13.81	2.96	2682.15	.00	.94	1.65	2.000	.000	.00	0 .0
.429	.6746					.0822	.04	.44	4.39	.27	.013	.00	.00	PIPE
36.941	2679.038	.451	2679.489	7.00	13.17	2.69	2682.18	.00	.94	1.67	2.000	.000	.00	0 .0
.380	.6746					.0718	.03	.45	4.12	.27	.013	.00	.00	PIPE
37.322	2679.294	.467	2679.761	7.00	12.56	2.45	2682.21	.00	.94	1.69	2.000	.000	.00	0 .0
.338	.6746					.0628	.02	.47	3.85	.27	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 3: 2:15

Calida Renaissance Lateral SD6A at Inlet 8

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
37.659	2679.522	.483	2680.005	7.00	11.97	2.23	2682.23	.00	.94	1.71	2.000	.000	.00	0 .0
.300	.6746					.0549	.02	.48	3.61	.27	.013	.00	.00	PIPE
37.959	2679.724	.499	2680.224	7.00	11.41	2.02	2682.25	.00	.94	1.73	2.000	.000	.00	0 .0
.266	.6746					.0480	.01	.50	3.38	.27	.013	.00	.00	PIPE
38.225	2679.904	.517	2680.420	7.00	10.88	1.84	2682.26	.00	.94	1.75	2.000	.000	.00	0 .0
.236	.6746					.0420	.01	.52	3.16	.27	.013	.00	.00	PIPE
38.461	2680.063	.535	2680.597	7.00	10.38	1.67	2682.27	.00	.94	1.77	2.000	.000	.00	0 .0
.209	.6746					.0368	.01	.53	2.96	.27	.013	.00	.00	PIPE
38.670	2680.204	.553	2680.757	7.00	9.89	1.52	2682.28	.00	.94	1.79	2.000	.000	.00	0 .0
.185	.6746					.0322	.01	.55	2.77	.27	.013	.00	.00	PIPE
38.856	2680.329	.572	2680.901	7.00	9.43	1.38	2682.28	.00	.94	1.81	2.000	.000	.00	0 .0
.164	.6746					.0281	.00	.57	2.59	.27	.013	.00	.00	PIPE
39.019	2680.439	.592	2681.031	7.00	8.99	1.26	2682.29	.00	.94	1.83	2.000	.000	.00	0 .0
.144	.6746					.0246	.00	.59	2.43	.27	.013	.00	.00	PIPE
39.163	2680.536	.613	2681.149	7.00	8.58	1.14	2682.29	.00	.94	1.84	2.000	.000	.00	0 .0
.126	.6746					.0216	.00	.61	2.27	.27	.013	.00	.00	PIPE
39.289	2680.621	.634	2681.256	7.00	8.18	1.04	2682.29	.00	.94	1.86	2.000	.000	.00	0 .0
.110	.6746					.0189	.00	.63	2.12	.27	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 3: 2:15

Calida Renaissance Lateral SD6A at Inlet 8

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
39.399	2680.696	.657	2681.352	7.00	7.80	.94	2682.30	.00	.94	1.88	2.000	.000	.00	0 .0
.095	.6746					.0166	.00	.66	1.99	.27	.013	.00	.00	PIPE
39.494	2680.760	.680	2681.439	7.00	7.43	.86	2682.30	.00	.94	1.89	2.000	.000	.00	0 .0
.082	.6746					.0145	.00	.68	1.86	.27	.013	.00	.00	PIPE
39.575	2680.815	.704	2681.519	7.00	7.09	.78	2682.30	.00	.94	1.91	2.000	.000	.00	0 .0
.069	.6746					.0127	.00	.70	1.74	.27	.013	.00	.00	PIPE
39.644	2680.861	.729	2681.591	7.00	6.76	.71	2682.30	.00	.94	1.93	2.000	.000	.00	0 .0
.058	.6746					.0111	.00	.73	1.62	.27	.013	.00	.00	PIPE
39.702	2680.900	.755	2681.656	7.00	6.44	.64	2682.30	.00	.94	1.94	2.000	.000	.00	0 .0
.047	.6746					.0098	.00	.76	1.52	.27	.013	.00	.00	PIPE
39.749	2680.932	.783	2681.715	7.00	6.14	.59	2682.30	.00	.94	1.95	2.000	.000	.00	0 .0
.037	.6746					.0086	.00	.78	1.42	.27	.013	.00	.00	PIPE
39.787	2680.957	.811	2681.768	7.00	5.86	.53	2682.30	.00	.94	1.96	2.000	.000	.00	0 .0
.028	.6746					.0075	.00	.81	1.32	.27	.013	.00	.00	PIPE
39.815	2680.976	.841	2681.817	7.00	5.58	.48	2682.30	.00	.94	1.97	2.000	.000	.00	0 .0
.020	.6746					.0066	.00	.84	1.24	.27	.013	.00	.00	PIPE
39.835	2680.990	.872	2681.861	7.00	5.32	.44	2682.30	.00	.94	1.98	2.000	.000	.00	0 .0
.012	.6746					.0058	.00	.87	1.15	.27	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 3: 2:15

Calida Renaissance Lateral SD6A at Inlet 8

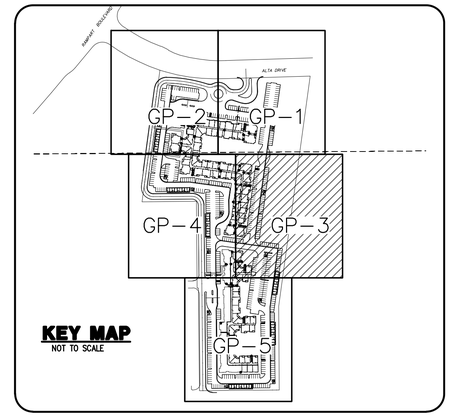
1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
39.846	2680.997	.904	2681.901	7.00	5.08	.40	2682.30	.00	.94	1.99	2.000	.000	.00	0 .0
.004	.6746					.0051	.00	.90	1.08	.27	.013	.00	.00	PIPE
39.850	2681.000	.939	2681.939	7.00	4.83	.36	2682.30	.00	.94	2.00	2.000	.000	.00	0 .0

WSPG SD6B LATERAL





NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

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

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

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

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# –

CLV DWG# –

STATE OF NEVADA
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
PROFESSIONAL ENGINEER

DATE:
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP	DATE

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 16:04:20

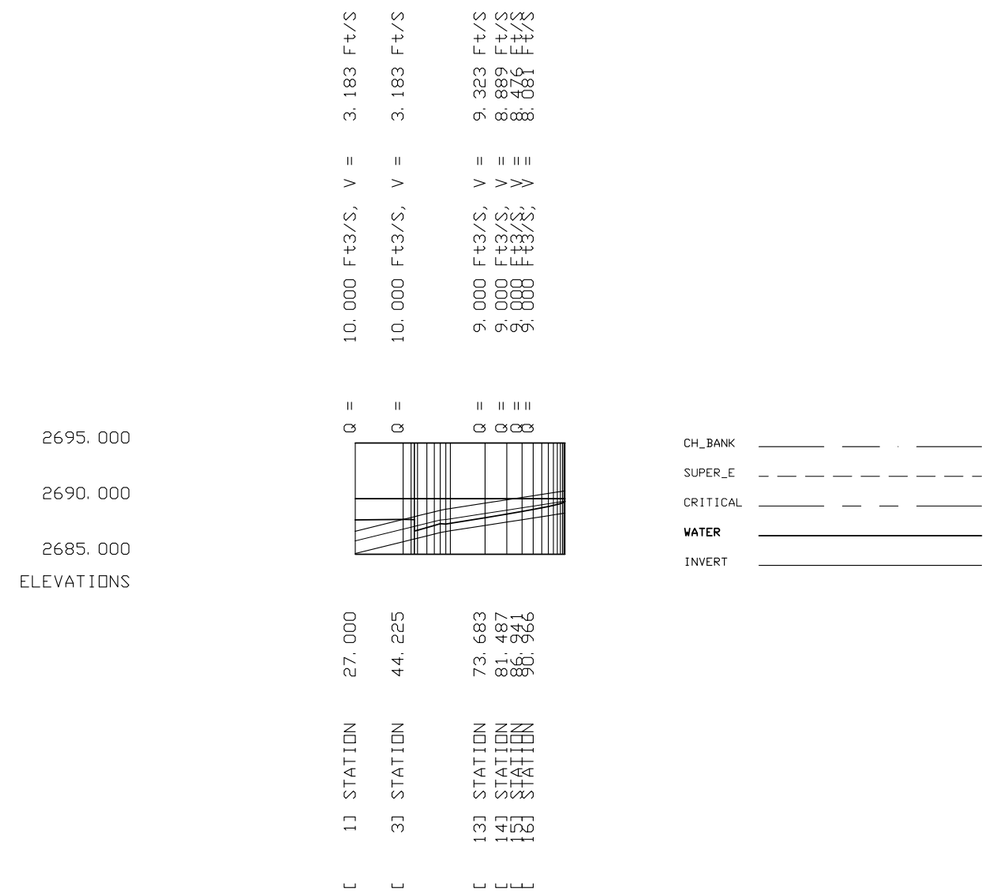
GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894z013.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN RENAISSANCE
GRADING PLAN 3

DRAWING
GP-3
13 OF 31 SHTS

WATER SURFACE PRESSURE GRADIENT ANALYSIS (PLAN & PROFILE) SD6B



Program Package Serial Number: 7204 Date: 3-21-2018 Time: 2: 6:10 File: ELYSD6B.WSW

Calida Renaissance Lateral SD=6B at Inlet 3

[No.]	TYPE OPERATION	STATION (FT)	INV ELEV (FT)	WATER LEVEL (FT)	CHAN HT (FT)	TYPE CHANNEL	"N"	#PIER/PIP	FLOW RATE (CFS)	VELOCITY (FT/S)	TOP WIDTH (FT)	CHAN WDTH (FT)	PIER WIDTH (FT)	ZL	ZR	SUPEL RT B (FT)	SUPEL LT B (FT)	CRIT DPTH (FT)	RADIUS/<PT (FT OR <)	RMKS
[1]	SYSTEM OUTLET	27.000	2685.070	3.020	2.000	PIPE	.014	0	10.000	3.183	.000	2.000	.000	.000	.000	.000	.000	1.132	.000	
[2]	REACH	27.000	2685.070	3.021	2.000	PIPE	.014	0	10.000	3.183	.000	2.000	.000	.000	.000	.000	.000	1.132	.000	
[3]	REACH	44.225	2686.130	2.000	2.000	PIPE	.014	0	10.000	3.183	.000	2.000	.000	.000	.000	.000	.000	1.132	.000	
[4]	REACH	47.064	2686.304	1.815	2.000	PIPE	.014	0	10.000	3.339	1.160	2.000	.000	.000	.000	.000	.000	1.132	.000	
[5]	HYD JUMP	48.238	2686.376	1.732	2.000	PIPE	.014	0	10.000	3.460	1.363	2.000	.000	.000	.000	.000	.000	1.132	.000	HYD JUMP
[6]	REACH	48.238	2686.376	.718	2.000	PIPE	.014	0	10.000	9.877	1.918	2.000	.000	.000	.000	.000	.000	1.132	.000	
[7]	REACH	49.384	2686.447	.717	2.000	PIPE	.014	0	10.000	9.876	1.918	2.000	.000	.000	.000	.000	.000	1.132	.000	
[8]	REACH	52.736	2686.653	.743	2.000	PIPE	.014	0	10.000	9.417	1.933	2.000	.000	.000	.000	.000	.000	1.132	.000	
[9]	REACH	55.406	2686.817	.770	2.000	PIPE	.014	0	10.000	8.978	1.946	2.000	.000	.000	.000	.000	.000	1.132	.000	
[10]	REACH	57.560	2686.950	.797	2.000	PIPE	.014	0	10.000	8.561	1.958	2.000	.000	.000	.000	.000	.000	1.132	.000	
[11]	JUNCTION	59.560	2687.050	.667	2.000	PIPE	.014	0	9.000	9.820	1.886	2.000	.000	.000	.000	.000	.000	1.071	.000	
[12]	REACH	61.174	2687.112	.669	2.000	PIPE	.014	0	9.000	9.778	1.887	2.000	.000	.000	.000	.000	.000	1.071	.000	
[13]	REACH	73.683	2687.594	.693	2.000	PIPE	.014	0	9.000	9.323	1.903	2.000	.000	.000	.000	.000	.000	1.071	.000	
[14]	REACH	81.487	2687.895	.717	2.000	PIPE	.014	0	9.000	8.889	1.918	2.000	.000	.000	.000	.000	.000	1.071	.000	
[15]	REACH	86.941	2688.105	.743	2.000	PIPE	.014	0	9.000	8.476	1.933	2.000	.000	.000	.000	.000	.000	1.071	.000	
[16]	REACH	90.966	2688.260	.769	2.000	PIPE	.014	0	9.000	8.081	1.946	2.000	.000	.000	.000	.000	.000	1.071	.000	
[17]	REACH	94.026	2688.378	.797	2.000	PIPE	.014	0	9.000	7.705	1.958	2.000	.000	.000	.000	.000	.000	1.071	.000	
[18]	REACH	96.393	2688.469	.826	2.000	PIPE	.014	0	9.000	7.346	1.970	2.000	.000	.000	.000	.000	.000	1.071	.000	
[19]	REACH	98.226	2688.540	.856	2.000	PIPE	.014	0	9.000	7.005	1.979	2.000	.000	.000	.000	.000	.000	1.071	.000	
[20]	REACH	99.638	2688.594	.888	2.000	PIPE	.014	0	9.000	6.679	1.987	2.000	.000	.000	.000	.000	.000	1.071	.000	
[21]	REACH	100.704	2688.635	.921	2.000	PIPE	.014	0	9.000	6.368	1.994	2.000	.000	.000	.000	.000	.000	1.071	.000	
[22]	REACH	101.476	2688.665	.956	2.000	PIPE	.014	0	9.000	6.071	1.998	2.000	.000	.000	.000	.000	.000	1.071	.000	
[23]	REACH	101.995	2688.685	.992	2.000	PIPE	.014	0	9.000	5.789	2.000	2.000	.000	.000	.000	.000	.000	1.071	.000	
[24]	REACH	102.295	2688.696	1.030	2.000	PIPE	.014	0	9.000	5.520	1.999	2.000	.000	.000	.000	.000	.000	1.071	.000	
[25]	HEADWORKS	102.390	2688.700	1.071	2.000	PIPE	.014	0	9.000	5.257	1.995	2.000	.000	.000	.000	.000	.000	1.071	.000	

```
T1 Calida Renaissance Lateral SD=6B at Inlet 3                                  0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO     27.0002685.070  3                          2688.090
WX     27.0002685.070  3
R      57.5602686.950  3      .014                                  .000  00.000
JX     59.5602687.050  3  3   .014    1.000    0.0002687.0000000.000 90.0000.   00.000
R     102.3902688.700  3      .014                                  .000  00.000
SH    102.3902688.700  3                          2688.700
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   5.000     .000  .000  .000   .00
CD   3  4   0    .000   2.000     .000  .000  .000   .00
CD   4  4   0    .000   1.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             9.000   .0
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	0		4.000														
CD	2	4	0		5.000														
CD	3	4	0		2.000														
CD	4	4	0		1.000														
CD	5	4	0		4.500														
CD	6	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	5.000	3.000	.000	.000	.00										

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Calida Renaissance Lateral SD=6B at Inlet 3

HEADING LINE NO 2 IS -

1 2 3 4 5 6 7

HEADING LINE NO 3 IS -

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	27.000	2685.070	3	2688.090

ELEMENT NO 2 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	27.000	2685.070	3

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	57.560	2686.950	3	.014	.000	.000	.000	0

ELEMENT NO 4 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	59.560	2687.050	3	3	0	.014	1.000	.000	2687.000	.000	90.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	102.390	2688.700	3	.014	.000	.000	.000	0

ELEMENT NO 6 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	102.390	2688.700	3	2688.700

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 2: 6:10

Calida Renaissance Lateral SD=6B at Inlet 3

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
27.000	2685.070	3.020	2688.090	10.00	3.18	.16	2688.25	.00	1.13	.00	2.000	.000	.00	0 .0
WALL EXIT														
27.000	2685.070	3.021	2688.091	10.00	3.18	.16	2688.25	.00	1.13	.00	2.000	.000	.00	0 .0
17.225	.0615					.0022	.04	3.02	.00	.59	.014	.00	.00	PIPE
44.225	2686.130	2.000	2688.130	10.00	3.18	.16	2688.29	.00	1.13	.00	2.000	.000	.00	0 .0
2.839	.0615					.0021	.01	2.00	.00	.59	.014	.00	.00	PIPE
47.064	2686.304	1.815	2688.119	10.00	3.34	.17	2688.29	.00	1.13	1.16	2.000	.000	.00	0 .0
1.174	.0615					.0020	.00	1.81	.37	.59	.014	.00	.00	PIPE
48.238	2686.376	1.732	2688.108	10.00	3.46	.19	2688.29	.00	1.13	1.36	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
48.238	2686.376	.717	2687.094	10.00	9.88	1.51	2688.61	.00	1.13	1.92	2.000	.000	.00	0 .0
1.146	.0615					.0299	.03	.72	2.40	.59	.014	.00	.00	PIPE
49.384	2686.447	.717	2687.164	10.00	9.88	1.51	2688.68	.00	1.13	1.92	2.000	.000	.00	0 .0
3.351	.0615					.0281	.09	.72	2.40	.59	.014	.00	.00	PIPE
52.735	2686.653	.743	2687.396	10.00	9.42	1.38	2688.77	.00	1.13	1.93	2.000	.000	.00	0 .0
2.671	.0615					.0246	.07	.74	2.24	.59	.014	.00	.00	PIPE
55.406	2686.817	.769	2687.587	10.00	8.98	1.25	2688.84	.00	1.13	1.95	2.000	.000	.00	0 .0
2.154	.0615					.0216	.05	.77	2.09	.59	.014	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 2: 6:10

Calida Renaissance Lateral SD=6B at Inlet 3

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
57.560	2686.950	.797	2687.747	10.00	8.56	1.14	2688.89	.00	1.13	1.96	2.000	.000	.00	0 .0
JUNCT STR	.0500					.0261	.05	.80	1.95		.014	.00	.00	PIPE
59.560	2687.050	.667	2687.717	9.00	9.82	1.50	2689.21	.00	1.07	1.89	2.000	.000	.00	0 .0
1.614	.0385					.0318	.05	.67	2.48	.63	.014	.00	.00	PIPE
61.174	2687.112	.669	2687.781	9.00	9.78	1.48	2689.27	.00	1.07	1.89	2.000	.000	.00	0 .0
12.509	.0385					.0296	.37	.67	2.47	.63	.014	.00	.00	PIPE
73.683	2687.594	.692	2688.287	9.00	9.32	1.35	2689.64	.00	1.07	1.90	2.000	.000	.00	0 .0
7.805	.0385					.0260	.20	.69	2.31	.63	.014	.00	.00	PIPE
81.487	2687.895	.717	2688.612	9.00	8.89	1.23	2689.84	.00	1.07	1.92	2.000	.000	.00	0 .0
5.454	.0385					.0228	.12	.72	2.16	.63	.014	.00	.00	PIPE
86.941	2688.105	.743	2688.848	9.00	8.48	1.12	2689.96	.00	1.07	1.93	2.000	.000	.00	0 .0
4.025	.0385					.0200	.08	.74	2.02	.63	.014	.00	.00	PIPE
90.966	2688.260	.769	2689.029	9.00	8.08	1.01	2690.04	.00	1.07	1.95	2.000	.000	.00	0 .0
3.060	.0385					.0175	.05	.77	1.88	.63	.014	.00	.00	PIPE
94.026	2688.378	.797	2689.175	9.00	7.71	.92	2690.10	.00	1.07	1.96	2.000	.000	.00	0 .0
2.367	.0385					.0154	.04	.80	1.76	.63	.014	.00	.00	PIPE
96.393	2688.469	.826	2689.295	9.00	7.35	.84	2690.13	.00	1.07	1.97	2.000	.000	.00	0 .0
1.833	.0385					.0135	.02	.83	1.64	.63	.014	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 2: 6:10

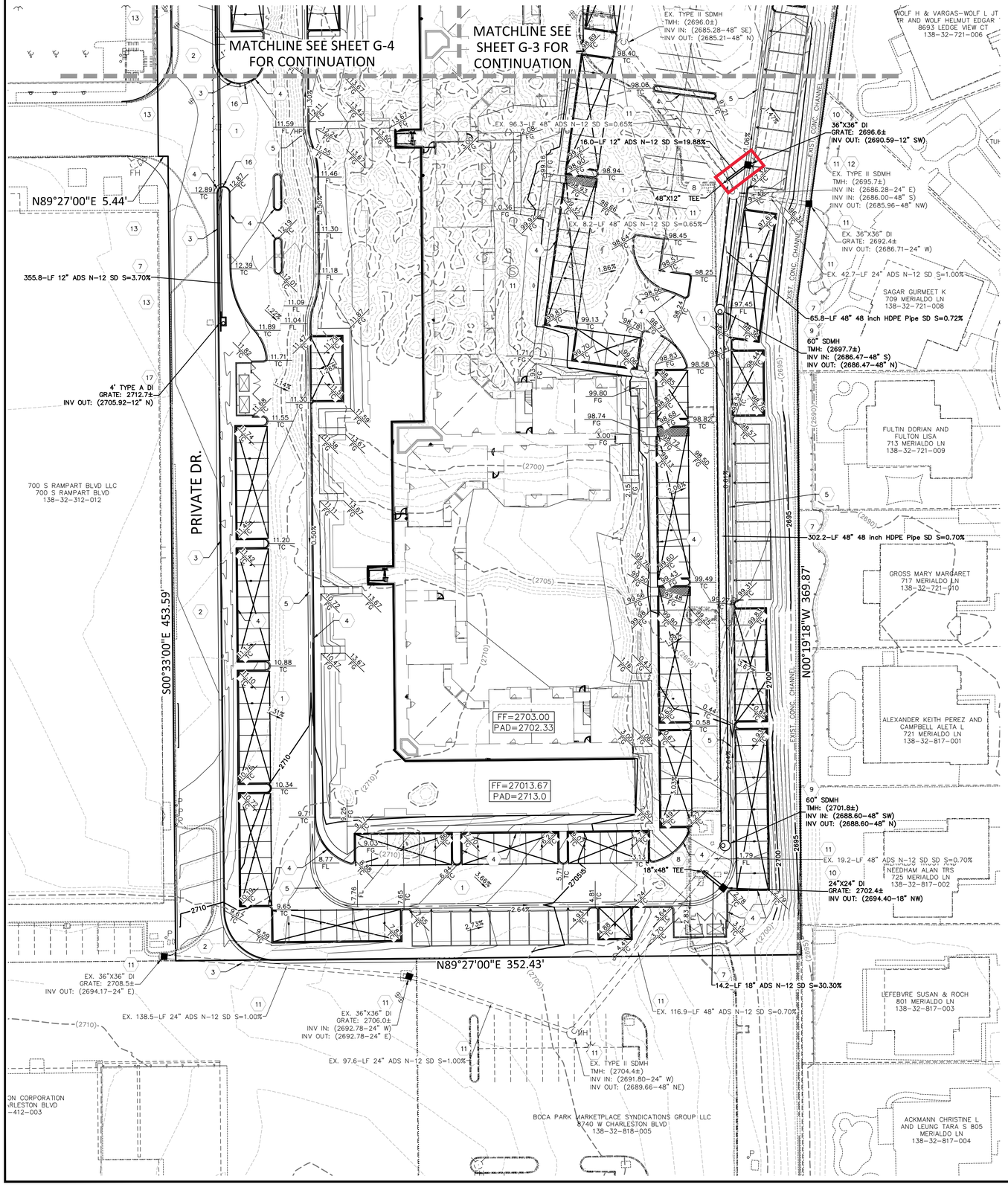
Calida Renaissance Lateral SD=6B at Inlet 3

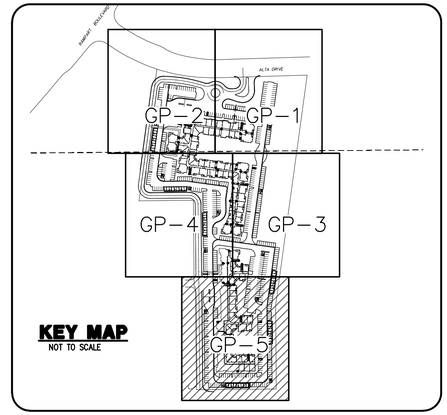
1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
98.226	2688.540	.857	2689.396	9.00	7.00	.76	2690.16	.00	1.07	1.98	2.000	.000	.00	0 .0
1.412	.0385					.0119	.02	.86	1.53	.63	.014	.00	.00	PIPE
99.638	2688.594	.888	2689.482	9.00	6.68	.69	2690.17	.00	1.07	1.99	2.000	.000	.00	0 .0
1.066	.0385					.0104	.01	.89	1.43	.63	.014	.00	.00	PIPE
100.704	2688.635	.921	2689.556	9.00	6.37	.63	2690.19	.00	1.07	1.99	2.000	.000	.00	0 .0
.771	.0385					.0092	.01	.92	1.33	.63	.014	.00	.00	PIPE
101.476	2688.665	.956	2689.621	9.00	6.07	.57	2690.19	.00	1.07	2.00	2.000	.000	.00	0 .0
.520	.0385					.0081	.00	.96	1.24	.63	.014	.00	.00	PIPE
101.995	2688.685	.992	2689.677	9.00	5.79	.52	2690.20	.00	1.07	2.00	2.000	.000	.00	0 .0
.299	.0385					.0071	.00	.99	1.16	.63	.014	.00	.00	PIPE
102.295	2688.696	1.030	2689.726	9.00	5.52	.47	2690.20	.00	1.07	2.00	2.000	.000	.00	0 .0
.095	.0385					.0062	.00	1.03	1.08	.63	.014	.00	.00	PIPE
102.390	2688.700	1.071	2689.771	9.00	5.26	.43	2690.20	.00	1.07	1.99	2.000	.000	.00	0 .0

WSPG SD7A LATERAL





KEY MAP
NOT TO SCALE

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U-CHANNEL, SEE DETAIL K SHT DT-1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L-CURB TO A-CURB TRANSITION PER DETAIL J SHT. DT-1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

NORTH

30' 0' 15' 30'

SCALE: 1" = 30'

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# –

CLV DWG# –

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

STATE OF NEVADA
ENGINEER
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
14711
PROFESSIONAL

DATE:
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03-13-18
PLOT TIME: 17:27:10

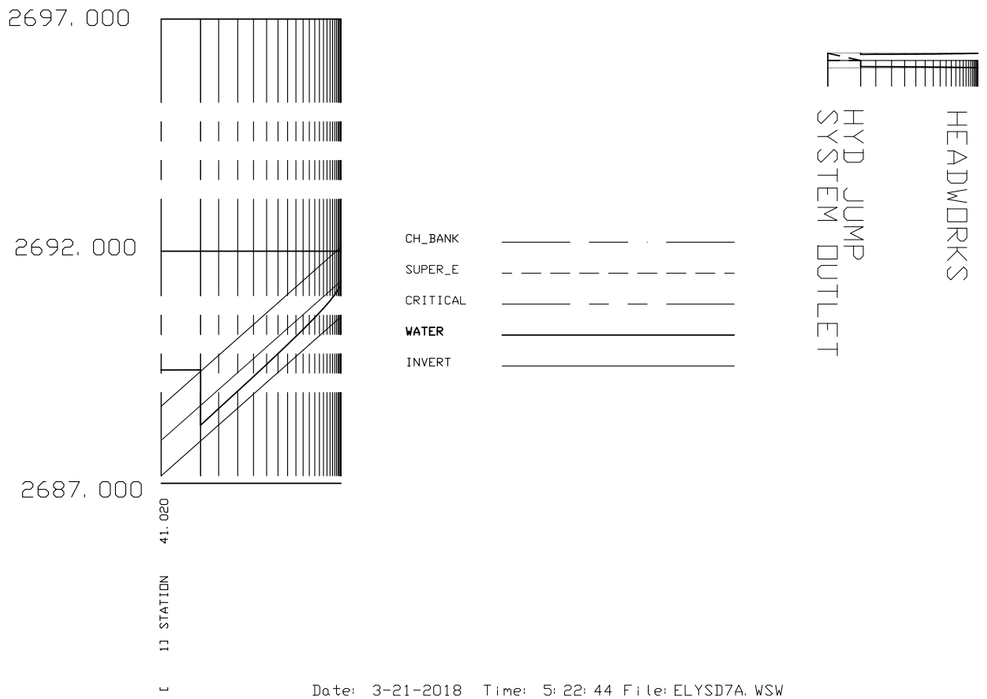
GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894zc015.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN RENAISSANCE
GRADING PLAN 5

DRAWING
GP-5
15 OF 31 SHTS

WATER SURFACE PRESSURE GRADIENT ANALYSIS (PLAN & PROFILE) SD7A



Program Package Serial Number: 7204 Date: 3-21-2018 Time: 5:22:44 File: ELYSD7A.WSW

Calida Renaissance Lateral SD-7A at Inlet 2A

[No.]	TYPE OPERATION	STATION (FT)	INV ELEV (FT)	WATER LEVEL (FT)	CHAN HT (FT)	TYPE CHANNEL	"N"	#PIER/PIP	FLOW RATE (CFS)	VELOCITY (FT/S)	TOP WIDTH (FT)	CHAN WDTH (FT)	PIER WIDTH (FT)	ZL	ZR	SUPEL RT B (FT)	SUPEL LT B (FT)	CRIT DPTH (FT)	RADIUS/<PT (FT OR <)	RMKS
[1]	SYSTEM OUTLET	41.020	2687.160	2.280	1.500	PIPE	.013	0	4.000	2.264	.000	1.500	.000	.000	.000	.000	.000	.765	.000	
[2]	REACH	41.020	2687.160	2.280	1.500	PIPE	.013	0	4.000	2.264	.000	1.500	.000	.000	.000	.000	.000	.765	.000	
[3]	HYD JUMP	44.412	2687.910	1.532	1.500	PIPE	.013	0	4.000	2.264	.000	1.500	.000	.000	.000	.000	.000	.765	.000	HYD JUMP
[4]	REACH	44.412	2687.910	.342	1.500	PIPE	.013	0	4.000	13.222	1.258	1.500	.000	.000	.000	.000	.000	.765	.000	
[5]	REACH	45.971	2688.256	.353	1.500	PIPE	.013	0	4.000	12.606	1.273	1.500	.000	.000	.000	.000	.000	.765	.000	
[6]	REACH	47.613	2688.619	.365	1.500	PIPE	.013	0	4.000	12.020	1.287	1.500	.000	.000	.000	.000	.000	.765	.000	
[7]	REACH	48.971	2688.920	.377	1.500	PIPE	.013	0	4.000	11.460	1.302	1.500	.000	.000	.000	.000	.000	.765	.000	
[8]	REACH	50.113	2689.172	.391	1.500	PIPE	.013	0	4.000	10.927	1.317	1.500	.000	.000	.000	.000	.000	.765	.000	
[9]	REACH	51.084	2689.387	.405	1.500	PIPE	.013	0	4.000	10.418	1.331	1.500	.000	.000	.000	.000	.000	.765	.000	
[10]	REACH	51.916	2689.571	.419	1.500	PIPE	.013	0	4.000	9.933	1.345	1.500	.000	.000	.000	.000	.000	.765	.000	
[11]	REACH	52.632	2689.730	.432	1.500	PIPE	.013	0	4.000	9.471	1.359	1.500	.000	.000	.000	.000	.000	.765	.000	
[12]	REACH	53.251	2689.867	.447	1.500	PIPE	.013	0	4.000	9.030	1.373	1.500	.000	.000	.000	.000	.000	.765	.000	
[13]	REACH	53.788	2689.986	.463	1.500	PIPE	.013	0	4.000	8.610	1.386	1.500	.000	.000	.000	.000	.000	.765	.000	
[14]	REACH	54.254	2690.089	.479	1.500	PIPE	.013	0	4.000	8.210	1.399	1.500	.000	.000	.000	.000	.000	.765	.000	
[15]	REACH	54.658	2690.178	.497	1.500	PIPE	.013	0	4.000	7.827	1.412	1.500	.000	.000	.000	.000	.000	.765	.000	
[16]	REACH	55.008	2690.255	.515	1.500	PIPE	.013	0	4.000	7.463	1.424	1.500	.000	.000	.000	.000	.000	.765	.000	
[17]	REACH	55.309	2690.322	.533	1.500	PIPE	.013	0	4.000	7.116	1.436	1.500	.000	.000	.000	.000	.000	.765	.000	
[18]	REACH	55.568	2690.379	.552	1.500	PIPE	.013	0	4.000	6.785	1.447	1.500	.000	.000	.000	.000	.000	.765	.000	
[19]	REACH	55.789	2690.428	.572	1.500	PIPE	.013	0	4.000	6.469	1.457	1.500	.000	.000	.000	.000	.000	.765	.000	
[20]	REACH	55.974	2690.469	.592	1.500	PIPE	.013	0	4.000	6.168	1.466	1.500	.000	.000	.000	.000	.000	.765	.000	
[21]	REACH	56.129	2690.503	.614	1.500	PIPE	.013	0	4.000	5.881	1.475	1.500	.000	.000	.000	.000	.000	.765	.000	
[22]	REACH	56.254	2690.531	.636	1.500	PIPE	.013	0	4.000	5.607	1.483	1.500	.000	.000	.000	.000	.000	.765	.000	
[23]	REACH	56.353	2690.553	.659	1.500	PIPE	.013	0	4.000	5.346	1.489	1.500	.000	.000	.000	.000	.000	.765	.000	
[24]	REACH	56.427	2690.570	.684	1.500	PIPE	.013	0	4.000	5.097	1.494	1.500	.000	.000	.000	.000	.000	.765	.000	
[25]	REACH	56.479	2690.581	.710	1.500	PIPE	.013	0	4.000	4.860	1.498	1.500	.000	.000	.000	.000	.000	.765	.000	
[26]	REACH	56.510	2690.588	.736	1.500	PIPE	.013	0	4.000	4.634	1.500	1.500	.000	.000	.000	.000	.000	.765	.000	
[27]	HEADWORKS	56.520	2690.590	.765	1.500	PIPE	.013	0	4.000	4.411	1.500	1.500	.000	.000	.000	.000	.000	.765	.000	

```
T1 Calida Renaissance Lateral SD-7A at Inlet 2A                                  0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO     41.0202687.160  3                          2689.440
WX     41.0202687.160  3
R      56.5202690.590  3      .013                                    000.000
SH     56.5202690.590  3                          2690.590
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   5.000     .000  .000  .000   .00
CD   3  4   0    .000   1.000     .000  .000  .000   .00
CD   4  4   0    .000   1.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             4.000   .0
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	0		4.000														
CD	2	4	0		5.000														
CD	3	4	0		1.500														
CD	4	4	0		1.000														
CD	5	4	0		4.500														
CD	6	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	5.000	3.000	.000	.000	.00										

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Calida Renaissance Lateral SD-7A at Inlet 2A

HEADING LINE NO 2 IS -

1 2 3 4 5 6 7

HEADING LINE NO 3 IS -

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	41.020	2687.160	3	2689.440

ELEMENT NO 2 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	41.020	2687.160	3

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	56.520	2690.590	3	.013	.000	.000	.000	0

ELEMENT NO 4 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	56.520	2690.590	3	2690.590

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:22:44

Calida Renaissance Lateral SD-7A at Inlet 2A

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
41.020	2687.160	2.280	2689.440	4.00	2.26	.08	2689.52	.00	.77	.00	1.500	.000	.00	0 .0
WALL EXIT														
41.020	2687.160	2.280	2689.440	4.00	2.26	.08	2689.52	.00	.77	.00	1.500	.000	.00	0 .0
3.392	.2213					.0015	.00	2.28	.00	.29	.013	.00	.00	PIPE
44.412	2687.910	1.532	2689.442	4.00	2.26	.08	2689.52	.00	.77	.00	1.500	.000	.00	0 .0
HYDRAULIC JUMP														
44.412	2687.910	.341	2688.252	4.00	13.22	2.71	2690.97	.00	.77	1.26	1.500	.000	.00	0 .0
1.559	.2213					.1052	.16	.34	4.75	.29	.013	.00	.00	PIPE
45.971	2688.256	.353	2688.609	4.00	12.61	2.47	2691.08	.00	.77	1.27	1.500	.000	.00	0 .0
1.641	.2213					.0920	.15	.35	4.45	.29	.013	.00	.00	PIPE
47.613	2688.619	.365	2688.984	4.00	12.02	2.24	2691.23	.00	.77	1.29	1.500	.000	.00	0 .0
1.359	.2213					.0805	.11	.37	4.17	.29	.013	.00	.00	PIPE
48.971	2688.920	.378	2689.297	4.00	11.46	2.04	2691.34	.00	.77	1.30	1.500	.000	.00	0 .0
1.142	.2213					.0704	.08	.38	3.90	.29	.013	.00	.00	PIPE
50.113	2689.172	.391	2689.563	4.00	10.93	1.85	2691.42	.00	.77	1.32	1.500	.000	.00	0 .0
.971	.2213					.0616	.06	.39	3.65	.29	.013	.00	.00	PIPE
51.084	2689.387	.404	2689.792	4.00	10.42	1.69	2691.48	.00	.77	1.33	1.500	.000	.00	0 .0
.831	.2213					.0539	.04	.40	3.42	.29	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:22:44

Calida Renaissance Lateral SD-7A at Inlet 2A

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
51.915	2689.571	.418	2689.990	4.00	9.93	1.53	2691.52	.00	.77	1.35	1.500	.000	.00	0 .0
.716	.2213					.0471	.03	.42	3.20	.29	.013	.00	.00	PIPE
52.632	2689.730	.433	2690.162	4.00	9.47	1.39	2691.56	.00	.77	1.36	1.500	.000	.00	0 .0
.619	.2213					.0413	.03	.43	2.99	.29	.013	.00	.00	PIPE
53.251	2689.867	.448	2690.314	4.00	9.03	1.27	2691.58	.00	.77	1.37	1.500	.000	.00	0 .0
.537	.2213					.0361	.02	.45	2.80	.29	.013	.00	.00	PIPE
53.788	2689.986	.464	2690.449	4.00	8.61	1.15	2691.60	.00	.77	1.39	1.500	.000	.00	0 .0
.466	.2213					.0316	.01	.46	2.62	.29	.013	.00	.00	PIPE
54.254	2690.089	.480	2690.568	4.00	8.21	1.05	2691.61	.00	.77	1.40	1.500	.000	.00	0 .0
.404	.2213					.0277	.01	.48	2.45	.29	.013	.00	.00	PIPE
54.658	2690.178	.497	2690.675	4.00	7.83	.95	2691.63	.00	.77	1.41	1.500	.000	.00	0 .0
.350	.2213					.0243	.01	.50	2.29	.29	.013	.00	.00	PIPE
55.008	2690.255	.514	2690.770	4.00	7.46	.86	2691.63	.00	.77	1.42	1.500	.000	.00	0 .0
.302	.2213					.0213	.01	.51	2.14	.29	.013	.00	.00	PIPE
55.309	2690.322	.533	2690.855	4.00	7.12	.79	2691.64	.00	.77	1.44	1.500	.000	.00	0 .0
.259	.2213					.0186	.00	.53	2.00	.29	.013	.00	.00	PIPE
55.568	2690.379	.552	2690.931	4.00	6.78	.71	2691.65	.00	.77	1.45	1.500	.000	.00	0 .0
.220	.2213					.0163	.00	.55	1.87	.29	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:22:44

Calida Renaissance Lateral SD-7A at Inlet 2A

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
55.789	2690.428	.571	2691.000	4.00	6.47	.65	2691.65	.00	.77	1.46	1.500	.000	.00	0 .0
.185	.2213					.0143	.00	.57	1.75	.29	.013	.00	.00	PIPE
55.974	2690.469	.592	2691.061	4.00	6.17	.59	2691.65	.00	.77	1.47	1.500	.000	.00	0 .0
.154	.2213					.0126	.00	.59	1.63	.29	.013	.00	.00	PIPE
56.128	2690.503	.614	2691.117	4.00	5.88	.54	2691.65	.00	.77	1.47	1.500	.000	.00	0 .0
.126	.2213					.0110	.00	.61	1.53	.29	.013	.00	.00	PIPE
56.254	2690.531	.636	2691.167	4.00	5.61	.49	2691.66	.00	.77	1.48	1.500	.000	.00	0 .0
.099	.2213					.0097	.00	.64	1.42	.29	.013	.00	.00	PIPE
56.353	2690.553	.660	2691.212	4.00	5.35	.44	2691.66	.00	.77	1.49	1.500	.000	.00	0 .0
.074	.2213					.0085	.00	.66	1.33	.29	.013	.00	.00	PIPE
56.427	2690.570	.684	2691.254	4.00	5.10	.40	2691.66	.00	.77	1.49	1.500	.000	.00	0 .0
.052	.2213					.0075	.00	.68	1.24	.29	.013	.00	.00	PIPE
56.479	2690.581	.710	2691.291	4.00	4.86	.37	2691.66	.00	.77	1.50	1.500	.000	.00	0 .0
.030	.2213					.0066	.00	.71	1.16	.29	.013	.00	.00	PIPE
56.510	2690.588	.736	2691.324	4.00	4.63	.33	2691.66	.00	.77	1.50	1.500	.000	.00	0 .0
.010	.2213					.0058	.00	.74	1.08	.29	.013	.00	.00	PIPE
56.520	2690.590	.765	2691.355	4.00	4.41	.30	2691.66	.00	.77	1.50	1.500	.000	.00	0 .0

WSPG SD7B LATERAL

MATCHLINE SEE SHEET G-4 FOR CONTINUATION

MATCHLINE SEE SHEET G-3 FOR CONTINUATION

N89°27'00"E 5.44'

355.8–LF 12" ADS N–12 SD S=3.70%

4' TYPE A DI
GRATE: 2712.75±
INV OUT: (2705.92–12" N)

PRIVATE DR.

700 S RAMPART BLVD LLC
700 S RAMPART BLVD
138–32–312–012

S00°33'00"E 453.59'

EX. 96.3–LF 48" ADS N–12 SD S=0.65%

16.0–LF 12" ADS N–12 SD S=19.88%

48"X12" TEE

EX. 8.2–LF 48" ADS N–12 SD S=0.65%

EX. TYPE II SDMH
TMH: (2696.0±)
INV IN: (2685.28–48" SE)
INV OUT: (2685.21–48" N)

WOLF H & VARGAS–WOLF L JT TR AND WOLF HELMUT EDGAR
8693 LEDGE VIEW CT
138–32–721–006

36"X36" DI
GRATE: 2696.6±
INV OUT: (2690.59–12" SW)

EX. TYPE II SDMH
TMH: (2695.7±)
INV IN: (2686.28–24" E)
INV IN: (2686.00–48" S)
INV OUT: (2685.96–48" NW)

EX. 36"X36" DI
GRATE: 2692.4±
INV OUT: (2686.71–24" W)

EX. 42.7–LF 24" ADS N–12 SD S=1.00%

SAGAR GURMEET K
709 MERIALDO LN
138–32–721–008

65.8–LF 48" 48 inch HDPE Pipe SD S=0.72%

60" SDMH
TMH: (2697.7±)
INV IN: (2686.47–48" S)
INV OUT: (2686.47–48" N)

FULTIN DORIAN AND FULTON LISA
713 MERIALDO LN
138–32–721–009

302.2–LF 48" 48 inch HDPE Pipe SD S=0.70%

GROSS MARY MARGARET
717 MERIALDO LN
138–32–721–010

N00°19'18"W 369.87'

ALEXANDER KEITH PEREZ AND CAMPBELL ALETA L
721 MERIALDO LN
138–32–817–001

EXIST. CONC. CHANNEL

FF=2703.00
PAD=2702.33

FF=27013.67
PAD=2713.0

60" SDMH
TMH: (2701.8±)
INV IN: (2688.60–48" SW)
INV OUT: (2688.60–48" N)

EX. 19.2–LF 48" ADS N–12 SD SD S=0.70%

NEEDHAM ALAN TRS
725 MERIALDO LN
138–32–817–002

24"X24" DI
GRATE: 2702.4±
INV OUT: (2694.40–18" NW)

18"x48" TEE

N89°27'00"E 352.43'

14.2–LF 18" ADS N–12 SD S=30.30%

EX. 36"X36" DI
GRATE: 2708.5±
INV OUT: (2694.17–24" E)

EX. 138.5–LF 24" ADS N–12 SD S=1.00%

EX. 36"X36" DI
GRATE: 2706.0±
INV IN: (2692.78–24" W)
INV OUT: (2692.78–24" E)

EX. 97.6–LF 24" ADS N–12 SD S=1.00%

EX. TYPE II SDMH
TMH: (2704.4±)
INV IN: (2691.80–24" W)
INV OUT: (2689.66–48" NE)

EX. 116.9–LF 48" ADS N–12 SD S=0.70%

LEFEBVRE SUSAN & ROCH
801 MERIALDO LN
138–32–817–003

ACKMANN CHRISTINE L AND LEUNG TARA S
805 MERIALDO LN
138–32–817–004

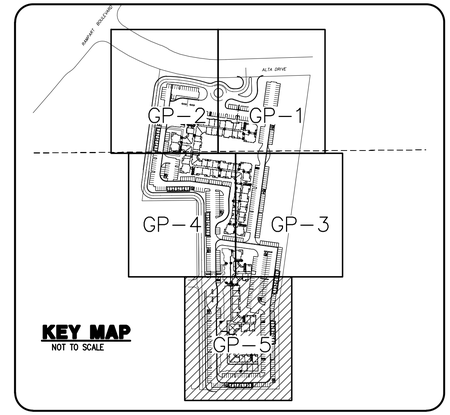
BOCA PARK MARKETPLACE SYNDICATIONS GROUP LLC
8740 W CHARLESTON BLVD
138–32–818–005

ON CORPORATION
ARLESTON BLVD
–412–003

NORTH

30' 0' 15' 30'

SCALE: 1" = 30'



KEY MAP
NOT TO SCALE

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT–1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N–12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT–2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 3' CONC. U–CHANNEL, SEE DETAIL K SHT DT–1.
15. CONSTRUCT SIDEWALK UNDERDRAIN PER USDCCA DWG NO. 236.
16. CONSTRUCT 5' L–CURB TO A–CURB TRANSITION PER DETAIL J SHT. DT–1.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE–OBSERVED 2005–2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

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

H# –

CLV DWG# –

NOT FOR CONSTRUCTION

DATE:

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	CCW APP

PROJECT NO. 894-002

DESIGN:
DRAWN:
CHECK:
PLOT DATE: 03–13–18
PLOT TIME: 17:27:10

TODD N. KELLEY
STATE OF NEVADA
No. 14711
CIVIL
REGISTERED PROFESSIONAL ENGINEER
Exp. 6/30/2019

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894–002\DWG\Production\894zc015.dwg
Todd Kelley

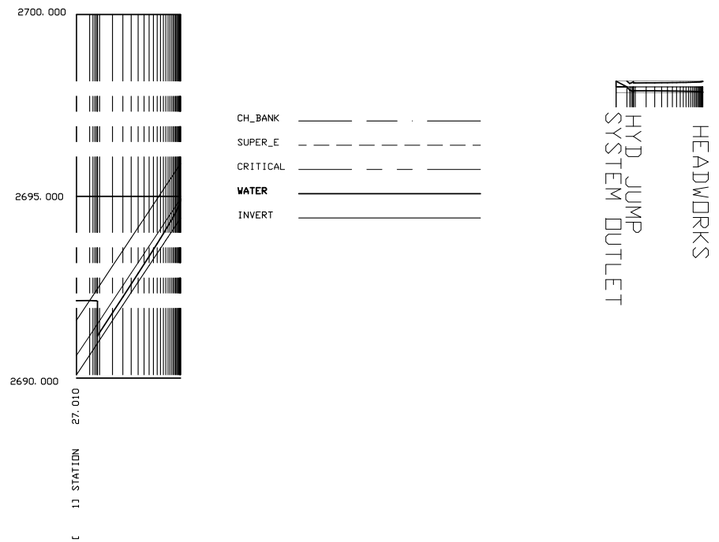
THE CALIDA GROUP

ELYSIAN RENAISSANCE

GRADING PLAN 5

DRAWING
GP-5
15 OF 31 SHTS

WATER SURFACE PRESSURE GRADIENT ANALYSIS (PLAN & PROFILE) SD7B



Program Package Serial Number: 7204

Date: 3-21-2018 Time: 5:48: 1 File: ELYSD7B.WSW

Calida Renaissance Lateral SD7B at Inlet 1

[No.]	TYPE OPERATION	STATION (FT)	INV ELEV (FT)	WATER LEVEL (FT)	CHAN HT (FT)	TYPE CHANNEL	"N"	#PIER/PIP	FLOW RATE (CFS)	VELOCITY (FT/S)	TOP WIDTH (FT)	CHAN WDTH (FT)	PIER WIDTH (FT)	ZL	ZR	SUPEL RT B (FT)	SUPEL LT B (FT)	CRIT DPTH (FT)	RADIUS/<PT (FT OR <)	RMKS
[1]	SYSTEM OUTLET	27.010	2690.090	2.040	1.500	PIPE	.013	0	2.000	1.132	.000	1.500	.000	.000	.000	.000	.000	.533	.000	
[2]	REACH	27.010	2690.090	2.040	1.500	PIPE	.013	0	2.000	1.132	.000	1.500	.000	.000	.000	.000	.000	.533	.000	
[3]	REACH	28.447	2690.631	1.500	1.500	PIPE	.013	0	2.000	1.132	.000	1.500	.000	.000	.000	.000	.000	.533	.000	
[4]	REACH	28.808	2690.767	1.361	1.500	PIPE	.013	0	2.000	1.187	.870	1.500	.000	.000	.000	.000	.000	.533	.000	
[5]	REACH	29.018	2690.846	1.280	1.500	PIPE	.013	0	2.000	1.245	1.061	1.500	.000	.000	.000	.000	.000	.533	.000	
[6]	REACH	29.188	2690.910	1.214	1.500	PIPE	.013	0	2.000	1.306	1.179	1.500	.000	.000	.000	.000	.000	.533	.000	
[7]	HYD JUMP	29.312	2690.957	1.155	1.500	PIPE	.013	0	2.000	1.370	1.262	1.500	.000	.000	.000	.000	.000	.533	.000	HYD JUMP
[8]	REACH	29.312	2690.957	.200	1.500	PIPE	.013	0	2.000	14.184	1.022	1.500	.000	.000	.000	.000	.000	.533	.000	
[9]	REACH	29.546	2691.045	.207	1.500	PIPE	.013	0	2.000	13.525	1.036	1.500	.000	.000	.000	.000	.000	.533	.000	
[10]	REACH	30.974	2691.583	.214	1.500	PIPE	.013	0	2.000	12.896	1.050	1.500	.000	.000	.000	.000	.000	.533	.000	
[11]	REACH	32.104	2692.008	.222	1.500	PIPE	.013	0	2.000	12.296	1.065	1.500	.000	.000	.000	.000	.000	.533	.000	
[12]	REACH	33.026	2692.355	.229	1.500	PIPE	.013	0	2.000	11.724	1.079	1.500	.000	.000	.000	.000	.000	.533	.000	
[13]	REACH	33.792	2692.643	.237	1.500	PIPE	.013	0	2.000	11.178	1.094	1.500	.000	.000	.000	.000	.000	.533	.000	
[14]	REACH	34.441	2692.887	.245	1.500	PIPE	.013	0	2.000	10.658	1.108	1.500	.000	.000	.000	.000	.000	.533	.000	
[15]	REACH	34.995	2693.096	.253	1.500	PIPE	.013	0	2.000	10.162	1.123	1.500	.000	.000	.000	.000	.000	.533	.000	
[16]	REACH	35.472	2693.275	.262	1.500	PIPE	.013	0	2.000	9.689	1.138	1.500	.000	.000	.000	.000	.000	.533	.000	
[17]	REACH	35.886	2693.431	.270	1.500	PIPE	.013	0	2.000	9.238	1.153	1.500	.000	.000	.000	.000	.000	.533	.000	
[18]	REACH	36.247	2693.567	.279	1.500	PIPE	.013	0	2.000	8.808	1.168	1.500	.000	.000	.000	.000	.000	.533	.000	
[19]	REACH	36.562	2693.686	.288	1.500	PIPE	.013	0	2.000	8.398	1.183	1.500	.000	.000	.000	.000	.000	.533	.000	
[20]	REACH	36.839	2693.790	.298	1.500	PIPE	.013	0	2.000	8.007	1.198	1.500	.000	.000	.000	.000	.000	.533	.000	
[21]	REACH	37.082	2693.881	.309	1.500	PIPE	.013	0	2.000	7.635	1.213	1.500	.000	.000	.000	.000	.000	.533	.000	
[22]	REACH	37.295	2693.961	.319	1.500	PIPE	.013	0	2.000	7.279	1.228	1.500	.000	.000	.000	.000	.000	.533	.000	
[23]	REACH	37.482	2694.031	.330	1.500	PIPE	.013	0	2.000	6.941	1.243	1.500	.000	.000	.000	.000	.000	.533	.000	
[24]	REACH	37.646	2694.093	.341	1.500	PIPE	.013	0	2.000	6.618	1.257	1.500	.000	.000	.000	.000	.000	.533	.000	
[25]	REACH	37.789	2694.147	.353	1.500	PIPE	.013	0	2.000	6.310	1.272	1.500	.000	.000	.000	.000	.000	.533	.000	
[26]	REACH	37.914	2694.194	.365	1.500	PIPE	.013	0	2.000	6.016	1.287	1.500	.000	.000	.000	.000	.000	.533	.000	
[27]	REACH	38.022	2694.235	.377	1.500	PIPE	.013	0	2.000	5.736	1.302	1.500	.000	.000	.000	.000	.000	.533	.000	
[28]	REACH	38.115	2694.270	.390	1.500	PIPE	.013	0	2.000	5.469	1.316	1.500	.000	.000	.000	.000	.000	.533	.000	
[29]	REACH	38.195	2694.300	.404	1.500	PIPE	.013	0	2.000	5.215	1.331	1.500	.000	.000	.000	.000	.000	.533	.000	
[30]	REACH	38.262	2694.325	.418	1.500	PIPE	.013	0	2.000	4.972	1.345	1.500	.000	.000	.000	.000	.000	.533	.000	
[31]	REACH	38.318	2694.346	.433	1.500	PIPE	.013	0	2.000	4.741	1.359	1.500	.000	.000	.000	.000	.000	.533	.000	
[32]	REACH	38.364	2694.364	.447	1.500	PIPE	.013	0	2.000	4.520	1.373	1.500	.000	.000	.000	.000	.000	.533	.000	
[33]	REACH	38.400	2694.377	.463	1.500	PIPE	.013	0	2.000	4.310	1.386	1.500	.000	.000	.000	.000	.000	.533	.000	
[34]	REACH	38.426	2694.387	.480	1.500	PIPE	.013	0	2.000	4.109	1.399	1.500	.000	.000	.000	.000	.000	.533	.000	
[35]	REACH	38.445	2694.394	.497	1.500	PIPE	.013	0	2.000	3.918	1.412	1.500	.000	.000	.000	.000	.000	.533	.000	
[36]	REACH	38.456	2694.398	.514	1.500	PIPE	.013	0	2.000	3.735	1.424	1.500	.000	.000	.000	.000	.000	.533	.000	
[37]	HEADWORKS	38.460	2694.400	.533	1.500	PIPE	.013	0	2.000	3.553	1.436	1.500	.000	.000	.000	.000	.000	.533	.000	

```
T1 Calida Renaissance Lateral SD7B at Inlet 1                                    0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO     27.0102690.090  3                          2692.130
WX     27.0102690.090  3
R      38.4602694.400  3      .013                                    000.000
SH     38.4602694.400  3                          2694.400
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   5.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  4   0    .000   1.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             2.000   .0
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	0		4.000														
CD	2	4	0		5.000														
CD	3	4	0		1.500														
CD	4	4	0		1.000														
CD	5	4	0		4.500														
CD	6	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	5.000	3.000	.000	.000	.00										

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Calida Renaissance Lateral SD7B at Inlet 1

HEADING LINE NO 2 IS -

1 2 3 4 5 6 7

HEADING LINE NO 3 IS -

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	27.010	2690.090	3	2692.130

ELEMENT NO 2 IS A WALL EXIT *

U/S DATA	STATION	INVERT	SECT
	27.010	2690.090	3

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	38.460	2694.400	3	.013	.000	.000	.000	0

ELEMENT NO 4 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	38.460	2694.400	3	2694.400

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:48: 1

Calida Renaissance Lateral SD7B at Inlet 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
27.010	2690.090	2.040	2692.130	2.00	1.13	.02	2692.15	.00	.53	.00	1.500	.000	.00	0 .0
WALL EXIT														
27.010	2690.090	2.040	2692.130	2.00	1.13	.02	2692.15	.00	.53	.00	1.500	.000	.00	0 .0
1.437	.3764					.0004	.00	2.04	.00	.18	.013	.00	.00	PIPE
28.447	2690.631	1.500	2692.131	2.00	1.13	.02	2692.15	.00	.53	.00	1.500	.000	.00	0 .0
.362	.3764					.0003	.00	1.50	.00	.18	.013	.00	.00	PIPE
28.808	2690.767	1.361	2692.128	2.00	1.19	.02	2692.15	.00	.53	.87	1.500	.000	.00	0 .0
.209	.3764					.0003	.00	1.36	.15	.18	.013	.00	.00	PIPE
29.018	2690.846	1.280	2692.126	2.00	1.24	.02	2692.15	.00	.53	1.06	1.500	.000	.00	0 .0
.171	.3764					.0004	.00	1.28	.18	.18	.013	.00	.00	PIPE
29.188	2690.910	1.214	2692.124	2.00	1.31	.03	2692.15	.00	.53	1.18	1.500	.000	.00	0 .0
.124	.3764					.0004	.00	1.21	.20	.18	.013	.00	.00	PIPE
29.312	2690.957	1.155	2692.112	2.00	1.37	.03	2692.14	.00	.53	1.26	1.500	.000	.00	0 .0
HYDRAULIC JUMP														
29.312	2690.957	.201	2691.157	2.00	14.18	3.12	2694.28	.00	.53	1.02	1.500	.000	.00	0 .0
.233	.3764					.2296	.05	.20	6.73	.18	.013	.00	.00	PIPE
29.546	2691.045	.208	2691.252	2.00	13.53	2.84	2694.09	.00	.53	1.04	1.500	.000	.00	0 .0
1.428	.3764					.2005	.29	.21	6.31	.18	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:48: 1

Calida Renaissance Lateral SD7B at Inlet 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
30.974	2691.583	.215	2691.797	2.00	12.90	2.58	2694.38	.00	.53	1.05	1.500	.000	.00	0 .0
1.131	.3764					.1750	.20	.21	5.91	.18	.013	.00	.00	PIPE
32.104	2692.008	.222	2692.230	2.00	12.30	2.35	2694.58	.00	.53	1.06	1.500	.000	.00	0 .0
.921	.3764					.1528	.14	.22	5.54	.18	.013	.00	.00	PIPE
33.026	2692.355	.229	2692.584	2.00	11.72	2.13	2694.72	.00	.53	1.08	1.500	.000	.00	0 .0
.767	.3764					.1334	.10	.23	5.20	.18	.013	.00	.00	PIPE
33.792	2692.643	.237	2692.880	2.00	11.18	1.94	2694.82	.00	.53	1.09	1.500	.000	.00	0 .0
.648	.3764					.1165	.08	.24	4.87	.18	.013	.00	.00	PIPE
34.441	2692.887	.245	2693.132	2.00	10.66	1.76	2694.90	.00	.53	1.11	1.500	.000	.00	0 .0
.554	.3764					.1017	.06	.24	4.56	.18	.013	.00	.00	PIPE
34.995	2693.096	.253	2693.349	2.00	10.16	1.60	2694.95	.00	.53	1.12	1.500	.000	.00	0 .0
.477	.3764					.0888	.04	.25	4.28	.18	.013	.00	.00	PIPE
35.472	2693.275	.261	2693.537	2.00	9.69	1.46	2694.99	.00	.53	1.14	1.500	.000	.00	0 .0
.414	.3764					.0776	.03	.26	4.01	.18	.013	.00	.00	PIPE
35.886	2693.431	.270	2693.701	2.00	9.24	1.33	2695.03	.00	.53	1.15	1.500	.000	.00	0 .0
.361	.3764					.0678	.02	.27	3.76	.18	.013	.00	.00	PIPE
36.247	2693.567	.279	2693.846	2.00	8.81	1.20	2695.05	.00	.53	1.17	1.500	.000	.00	0 .0
.315	.3764					.0592	.02	.28	3.52	.18	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:48: 1

Calida Renaissance Lateral SD7B at Inlet 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
36.562	2693.686	.289	2693.974	2.00	8.40	1.10	2695.07	.00	.53	1.18	1.500	.000	.00	0 .0
.277	.3764					.0517	.01	.29	3.30	.18	.013	.00	.00	PIPE
36.839	2693.790	.298	2694.088	2.00	8.01	1.00	2695.08	.00	.53	1.20	1.500	.000	.00	0 .0
.243	.3764					.0452	.01	.30	3.09	.18	.013	.00	.00	PIPE
37.082	2693.881	.309	2694.190	2.00	7.63	.91	2695.09	.00	.53	1.21	1.500	.000	.00	0 .0
.213	.3764					.0395	.01	.31	2.89	.18	.013	.00	.00	PIPE
37.295	2693.961	.319	2694.280	2.00	7.28	.82	2695.10	.00	.53	1.23	1.500	.000	.00	0 .0
.187	.3764					.0345	.01	.32	2.71	.18	.013	.00	.00	PIPE
37.482	2694.031	.330	2694.361	2.00	6.94	.75	2695.11	.00	.53	1.24	1.500	.000	.00	0 .0
.164	.3764					.0302	.00	.33	2.54	.18	.013	.00	.00	PIPE
37.646	2694.093	.341	2694.434	2.00	6.62	.68	2695.11	.00	.53	1.26	1.500	.000	.00	0 .0
.143	.3764					.0264	.00	.34	2.38	.18	.013	.00	.00	PIPE
37.789	2694.147	.353	2694.500	2.00	6.31	.62	2695.12	.00	.53	1.27	1.500	.000	.00	0 .0
.125	.3764					.0231	.00	.35	2.23	.18	.013	.00	.00	PIPE
37.914	2694.194	.365	2694.559	2.00	6.02	.56	2695.12	.00	.53	1.29	1.500	.000	.00	0 .0
.108	.3764					.0202	.00	.36	2.09	.18	.013	.00	.00	PIPE
38.022	2694.235	.377	2694.612	2.00	5.74	.51	2695.12	.00	.53	1.30	1.500	.000	.00	0 .0
.093	.3764					.0176	.00	.38	1.95	.18	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:48: 1

Calida Renaissance Lateral SD7B at Inlet 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
38.115	2694.270	.390	2694.660	2.00	5.47	.46	2695.13	.00	.53	1.32	1.500	.000	.00	0 .0
.080	.3764					.0154	.00	.39	1.83	.18	.013	.00	.00	PIPE
38.195	2694.300	.404	2694.704	2.00	5.21	.42	2695.13	.00	.53	1.33	1.500	.000	.00	0 .0
.067	.3764					.0135	.00	.40	1.71	.18	.013	.00	.00	PIPE
38.262	2694.325	.418	2694.743	2.00	4.97	.38	2695.13	.00	.53	1.34	1.500	.000	.00	0 .0
.056	.3764					.0118	.00	.42	1.60	.18	.013	.00	.00	PIPE
38.318	2694.346	.432	2694.779	2.00	4.74	.35	2695.13	.00	.53	1.36	1.500	.000	.00	0 .0
.045	.3764					.0103	.00	.43	1.50	.18	.013	.00	.00	PIPE
38.364	2694.364	.448	2694.811	2.00	4.52	.32	2695.13	.00	.53	1.37	1.500	.000	.00	0 .0
.036	.3764					.0091	.00	.45	1.40	.18	.013	.00	.00	PIPE
38.400	2694.377	.463	2694.840	2.00	4.31	.29	2695.13	.00	.53	1.39	1.500	.000	.00	0 .0
.027	.3764					.0079	.00	.46	1.31	.18	.013	.00	.00	PIPE
38.426	2694.387	.479	2694.867	2.00	4.11	.26	2695.13	.00	.53	1.40	1.500	.000	.00	0 .0
.019	.3764					.0069	.00	.48	1.23	.18	.013	.00	.00	PIPE
38.445	2694.394	.496	2694.891	2.00	3.92	.24	2695.13	.00	.53	1.41	1.500	.000	.00	0 .0
.011	.3764					.0061	.00	.50	1.15	.18	.013	.00	.00	PIPE
38.456	2694.398	.514	2694.912	2.00	3.74	.22	2695.13	.00	.53	1.42	1.500	.000	.00	0 .0
.004	.3764					.0053	.00	.51	1.07	.18	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-21-2018 Time: 5:48: 1

Calida Renaissance Lateral SD7B at Inlet 1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
38.460	2694.400	.533	2694.933	2.00	3.55	.20	2695.13	.00	.53	1.44	1.500	.000	.00	0 .0

APPENDIX E REFERENCES

TDS FOR BOCCA PARK

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: July 20, 2001

TO:
Land Development Services
Department of Public Works

FROM:
Albert Sung, P.E.
Flood Control Project Engineer
Department of Public Works

SUBJECT:	Drainage Study for: **"Boca Park North (Phase III) @ Peccole Town Center"**		**COPIES TO:** VTN Nevada
Cross Streets:	SE corner of Alta Drive & Rampart Blvd.		Triple Five Nevada Development
File Number:	F:\Depot\DSmemos\DS2799D.doc		Cheri Edelman, P. E., DevCo
Parcel Number:	138-32-412-016		CCRFCD
Zoning Action:	C-1		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X** onsite	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES
1st Submittal	11/15/2000	11/27/2000	Not Acceptable	$250.00
Express Plan Check	12/12/2000	12/12/2000	Conditionally Accepted	$250.00
CCRFCD	1/18/2001	1/18/2001	Concurrence	NC
2nd Submittal	7/11/2001	7/20/2001	See Comments Below	$250.00
			TOTAL FEES (LDDRS):	**$750.00**

REMARKS:

2nd Submittal (Update No. 1 to Update No. 7 to DS2248)

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

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

1. Per previous comment #1, approval from CLV Current Planning Division must be obtained prior to final acceptance of the improvement plans.
2. A technical drainage update will be required for each specific site upon development.

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 CLV Flood Control Section. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the City of Las Vegas reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

END OF REMARKS
Ssn, ays

T/R/S: **T20S/R60E/32**
AREA L-32

5334-2

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



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

BOARD OF DIRECTORS

Larry Brown
Chairman
City of Las Vegas

Cresent Hardy
Vice-Chairman
City of Mesquite

Dario Herrera
Clark County

Mayor Oscar Goodman
City of Las Vegas

Bryan A. Nix
City of Boulder City

John K. Rhodes
City of North Las Vegas

Mayor James Gibson
City of Henderson

Bruce L. Woodbury
Clark County

January 10, 2001

Mr. Randy Fultz, P. E.
City of Las Vegas Public Works
731 4th Street
Las Vegas, NV 89101

DISTRICT CONCURRENCE: **BOCA PARK NORTH (PHASE III) AT PECCOLE TOWN CENTER (DS2799)**

Dear Mr. Fultz:

The District has reviewed the Technical Drainage Study dated November 15, 2000, and Addendum No. 1 dated December 12, 2000, for the above-captioned project as submitted by VTN Nevada. In addition, the District is in receipt of the Conditional Letter of Acceptance from the City of Las Vegas Public Works dated December 12, 2000.

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

The District's review of this project was limited to issues of Regional Flood Control Significance as defined in the Uniform Regulations for the Control of Drainage.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, the information submitted by VTN Nevada may be superseded. Compliance with the regulatory elements and design standards specified in the Uniform Regulations for the Control of Drainage does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for the information, data, or conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

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

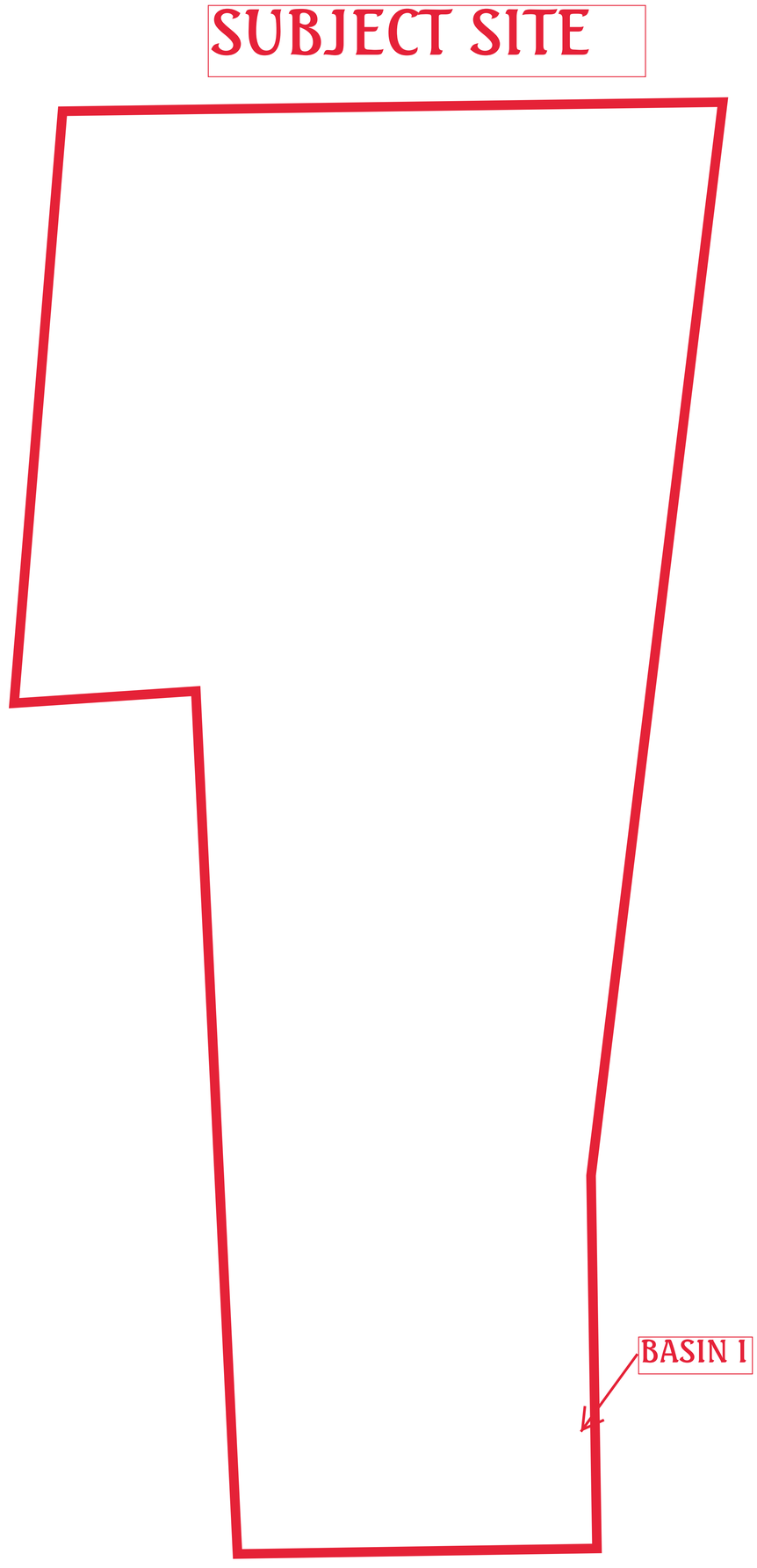
BY: Jon H. Hayslip, P.E.
Senior Engineer

cc: VTN Nevada

JHH:jms

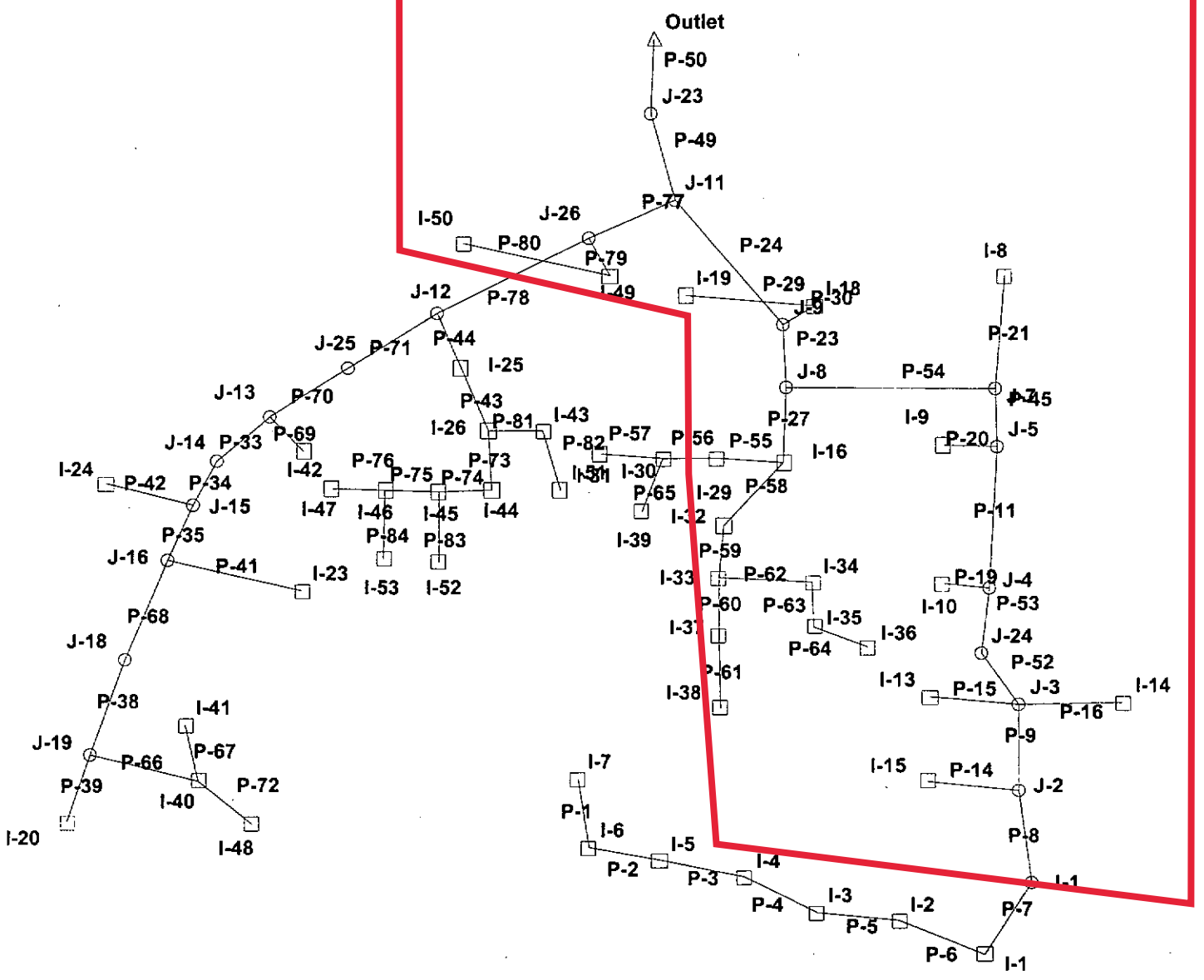
File: 20-60-32.vtn

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: http://www.ccrfcd.org


SUBJECT SITE
BASIN 1

BASIN	AREA	%	@ 4.16 CFS/AC	GRATE EFFECTIVE PERIMETER
A	1.1	2.5	4	12
B	1.9	4.4	8	12
C	1	2.5	4	12
D	0.6	1.4	2	9
E	0.5	1.1	2	12
F	0.2	0.4	1	12
G	0.5	1.1	2	9
H	1.8	4.2	7	9
I	0.2	0.4	1	12
J	1.1	2.5	4	9
K	1.1	2.5	4	9
L	1.5	3.5	6	NA
M	0.7	1.6	3	9
N	3.2	7.5	13	NA
O	0.7	1.6	3 + (3 from b)	9
P	0.05	0.1	0	8
Q	0.1	0.2	0	8
R	0.1	0.2	0	8
S	0.4	0.9	2	9
T	0.2	0.4	1	9
U	0.2	0.4	1	8
V	0.05	0.1	0	8
W	0.05	0.1	0	8
X	0.3	0.7	1	9
Y	0.2	0.4	1	9
Z	1	2.3	3	12
1	0.2	0.4	1	9
2	0.2	0.4	1	9
3	2.7	6.3	11	9
4	2.8	6.5	12	18
5	1.4	3.2	6	9
6	2	4.6	8	9
7	2.8	6.5	12	NA
8	2	4.6	8	NA
9	0.8	1.8	3	NA
10	0.4	0.9	2 + (4 from 1/2a)	9
11	0.9	2.1	4 + (4 from 1/2a)	9
12	0.4	0.9	2	8
13	0.9	2.1	4	8
14	0.1	0.2	0	12
15	0.06	0.1	0	8
16	1	2.3	3	8
17	1.5	3.5	6	8
18	1.1	2.5	4	8
a	1.7	3.9	7	add to #10 & #11
b	0.7	1.6	3	add to letter O
c	1.1	2.5	4	9

SUBJECT SITE



Scenario: Base

Combined Pipe\Node Report

Label	Upstream Node	Downstream Node	Length (ft)	Section Size	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Energy Grade Line In (ft)
P-1	I-7	I-6	94.00	18 inch	N/A	2,708.45	2,707.45	0.010638	N/A	N/A	N/A
P-2	I-6	I-5	147.00	18 inch	N/A	2,707.25	2,705.10	0.014626	N/A	N/A	N/A
P-3	I-5	I-4	212.00	24 inch	N/A	2,704.60	2,702.00	0.012264	N/A	N/A	N/A
P-4	I-4	I-3	56.00	24 inch	N/A	2,701.80	2,700.60	0.021429	N/A	N/A	N/A
P-5	I-3	I-2	141.00	24 inch	N/A	2,700.40	2,697.50	0.020567	N/A	N/A	N/A
P-6	I-2	I-1	91.00	24 inch	N/A	2,697.30	2,691.80	0.060440	N/A	N/A	N/A
P-7	I-1	J-1	147.00	48 inch	N/A	2,689.60	2,688.60	0.006803	N/A	N/A	N/A
P-8	J-1	J-2	223.00	48 inch	N/A	2,688.55	2,686.95	0.007175	N/A	N/A	N/A
P-9	J-2	J-3	131.00	48 inch	N/A	2,686.94	2,686.00	0.007176	N/A	N/A	N/A
P-11	J-4	J-5	210.00	48 inch	N/A	2,683.91	2,681.99	0.009133	N/A	N/A	N/A
P-14	I-15	J-2	13.00	24 inch	N/A	2,688.40	2,688.00	0.030769	N/A	N/A	N/A
P-15	I-13	J-3	9.00	24 inch	N/A	2,688.40	2,688.22	0.020000	N/A	N/A	N/A
P-16	I-14	J-3	37.00	24 inch	N/A	2,688.50	2,687.76	0.020000	N/A	N/A	N/A
P-19	I-10	J-4	9.00	24 inch	N/A	2,688.90	2,685.40	0.388889	N/A	N/A	N/A
P-20	I-9	J-5	9.00	24 inch	N/A	2,688.99	2,683.50	0.610000	N/A	N/A	N/A
P-21	I-8	J-7	190.00	18 inch	N/A	2,688.58	2,684.78	0.020000	N/A	N/A	N/A
P-23	J-8	J-9	112.00	54 inch	N/A	2,677.82	2,676.57	0.011143	N/A	N/A	N/A
P-24	J-9	J-11	126.00	54 inch	N/A	2,676.57	2,675.25	0.010476	N/A	N/A	N/A
P-27	I-16	J-8	212.00	30 inch	N/A	2,690.70	2,680.95	0.045991	N/A	N/A	N/A
P-29	I-19	I-18	49.00	18 inch	N/A	2,687.00	2,685.33	0.034082	N/A	N/A	N/A
P-30	I-18	J-9	16.00	24 inch	N/A	2,685.00	2,678.10	0.431250	N/A	N/A	N/A
P-33	J-14	J-13	158.00	42 inch	N/A	2,699.20	2,695.53	0.023228	N/A	N/A	N/A
P-34	J-15	J-14	48.00	42 inch	N/A	2,699.79	2,699.30	0.010208	N/A	N/A	N/A
P-35	J-16	J-15	83.00	42 inch	N/A	2,700.62	2,699.79	0.010000	N/A	N/A	N/A
P-38	J-19	J-18	158.00	42 inch	N/A	2,706.00	2,704.42	0.010019	N/A	N/A	N/A
P-39	I-20	J-19	157.00	36 inch	N/A	2,708.13	2,706.53	0.010191	N/A	N/A	N/A
P-41	I-23	J-16	130.00	24 inch	N/A	2,705.20	2,701.46	0.028769	N/A	N/A	N/A
P-42	I-24	J-15	31.00	24 inch	N/A	2,704.30	2,700.70	0.116129	N/A	N/A	N/A
P-43	I-26	I-25	142.00	30 inch	N/A	2,692.60	2,691.46	0.008028	N/A	N/A	N/A
P-44	I-25	J-12	155.00	30 inch	N/A	2,691.40	2,690.15	0.008065	N/A	N/A	N/A
P-45	J-5	J-7	162.00	48 inch	N/A	2,681.99	2,680.50	0.009210	N/A	N/A	N/A
P-49	J-11	J-23	158.00	60 inch	N/A	2,675.10	2,673.20	0.012025	N/A	N/A	N/A
P-50	J-23	Outlet	145.00	60 inch	N/A	2,673.00	2,659.23	0.094945	N/A	N/A	N/A
P-52	J-3	J-24	95.00	48 inch	N/A	2,685.96	2,685.26	0.007368	N/A	N/A	N/A
P-53	J-24	J-4	140.00	48 inch	N/A	2,685.21	2,683.91	0.009286	N/A	N/A	N/A
P-54	J-7	J-8	213.00	54 inch	N/A	2,680.13	2,677.90	0.010469	N/A	N/A	N/A
P-55	I-29	I-16	68.00	18 inch	N/A	2,693.50	2,691.72	0.026176	N/A	N/A	N/A
P-56	I-30	I-29	68.00	12 inch	N/A	2,694.50	2,693.60	0.013235	N/A	N/A	N/A
P-57	I-31	I-30	61.00	12 inch	N/A	2,695.50	2,694.75	0.012295	N/A	N/A	N/A
P-58	I-32	I-16	84.00	24 inch	N/A	2,691.85	2,690.90	0.011310	N/A	N/A	N/A
P-59	I-33	I-32	63.00	24 inch	N/A	2,692.90	2,691.97	0.014762	N/A	N/A	N/A
P-60	I-37	I-33	42.00	18 inch	N/A	2,693.40	2,692.95	0.010714	N/A	N/A	N/A
P-61	I-38	I-37	109.00	18 inch	N/A	2,706.70	2,705.72	0.008991	N/A	N/A	N/A
P-62	I-34	I-33	42.00	18 inch	N/A	2,693.40	2,692.95	0.010714	N/A	N/A	N/A
P-63	I-35	I-34	55.00	18 inch	N/A	2,694.00	2,693.45	0.010000	N/A	N/A	N/A
P-64	I-36	I-35	70.00	12 inch	N/A	2,695.00	2,694.30	0.010000	N/A	N/A	N/A
P-65	I-39	I-30	85.00	12 inch	N/A	2,700.90	2,694.75	0.072353	N/A	N/A	N/A
P-66	I-40	J-19	23.00	24 inch	N/A	2,710.00	2,706.53	0.150870	N/A	N/A	N/A
P-67	I-41	I-40	39.00	18 inch	N/A	2,712.00	2,710.50	0.038462	N/A	N/A	N/A
P-68	J-18	J-16	371.00	42 inch	N/A	2,704.42	2,700.62	0.010243	N/A	N/A	N/A
P-69	I-42	J-13	28.00	18 inch	N/A	2,698.10	2,696.40	0.060714	N/A	N/A	N/A

Scenario: Base

Combined Pipe\Node Report

Label	Upstream Node	Downstream Node	Length (ft)	Section Size	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Energy Grade Line In (ft)
P-70	J-13	J-25	133.00	42 inch	N/A	2,695.53	2,692.45	0.023158	N/A	N/A	N/A
P-71	J-25	J-12	64.00	48 inch	N/A	2,692.01	2,689.52	0.038906	N/A	N/A	N/A
P-72	I-48	I-40	80.00	18 inch	N/A	2,712.05	2,710.50	0.019375	N/A	N/A	N/A
P-73	I-44	I-26	60.00	24 inch	N/A	2,693.24	2,692.71	0.008833	N/A	N/A	N/A
P-74	I-45	I-44	58.00	24 inch	N/A	2,693.70	2,693.24	0.007931	N/A	N/A	N/A
P-75	I-46	I-45	118.00	24 inch	N/A	2,694.80	2,693.76	0.008814	N/A	N/A	N/A
P-76	I-47	I-46	16.00	18 inch	N/A	2,696.60	2,694.80	0.112500	N/A	N/A	N/A
P-77	J-26	J-11	77.00	48 inch	N/A	2,679.09	2,676.10	0.038831	N/A	N/A	N/A
P-78	J-12	J-26	269.00	48 inch	N/A	2,689.52	2,679.09	0.038773	N/A	N/A	N/A
P-79	I-49	J-26	16.00	24 inch	N/A	2,686.80	2,680.30	0.406250	N/A	N/A	N/A
P-80	I-50	I-49	58.00	18 inch	N/A	2,690.90	2,689.22	0.028966	N/A	N/A	N/A
P-81	I-43	I-26	54.00	12 inch	N/A	2,694.80	2,693.46	0.024815	N/A	N/A	N/A
P-82	I-51	I-43	80.00	12 inch	N/A	2,700.90	2,694.80	0.076250	N/A	N/A	N/A
P-83	I-52	I-45	70.00	12 inch	N/A	2,700.90	2,694.60	0.090000	N/A	N/A	N/A
P-84	I-53	I-46	70.00	12 inch	N/A	2,700.90	2,694.80	0.087143	N/A	N/A	N/A

```
------------------ Beginning Calculation Cycle ------------------
Discharge: 3.00 cfs  at node I-39
Discharge: 1.00 cfs  at node I-31
Discharge: 4.00 cfs  at node I-30
Discharge: 4.00 cfs  at node I-29
Discharge: 2.00 cfs  at node I-38
Discharge: 3.00 cfs  at node I-37
Discharge: 1.00 cfs  at node I-36
Discharge: 2.00 cfs  at node I-35
Discharge: 3.00 cfs  at node I-34
Discharge: 7.00 cfs  at node I-33
Discharge: 8.00 cfs  at node I-32
Discharge: 28.00 cfs  at node I-16
Discharge: 13.00 cfs  at node I-8
Discharge: 4.00 cfs  at node I-10
Discharge: 4.00 cfs  at node I-7
Discharge: 4.00 cfs  at node I-6
Discharge: 12.00 cfs  at node I-5
Discharge: 16.00 cfs  at node I-4
Discharge: 18.00 cfs  at node I-3
Discharge: 22.00 cfs  at node I-2
Discharge: 89.00 cfs  at node I-1
Discharge: 89.00 cfs  at node J-1
Discharge: 7.00 cfs  at node I-15
Discharge: 96.00 cfs  at node J-2
Discharge: 4.00 cfs  at node I-13
Discharge: 1.00 cfs  at node I-14
Discharge: 101.00 cfs  at node J-3
Discharge: 101.00 cfs  at node J-24
Discharge: 105.00 cfs  at node J-4
Discharge: 3.00 cfs  at node I-9
Discharge: 108.00 cfs  at node J-5
Discharge: 121.00 cfs  at node J-7
Discharge: 149.00 cfs  at node J-8
Discharge: 4.00 cfs  at node I-19
Discharge: 8.00 cfs  at node I-18
Discharge: 157.00 cfs  at node J-9
Discharge: 3.00 cfs  at node I-52
Discharge: 6.00 cfs  at node I-53
Discharge: 2.00 cfs  at node I-47
Discharge: 8.00 cfs  at node I-46
Discharge: 11.00 cfs  at node I-45
Discharge: 11.00 cfs  at node I-44
Discharge: 4.00 cfs  at node I-51
Discharge: 4.00 cfs  at node I-43
Discharge: 18.00 cfs  at node I-26
Discharge: 22.00 cfs  at node I-25
Discharge: 6.00 cfs  at node I-24
Discharge: 12.00 cfs  at node I-23
Discharge: 66.00 cfs  at node I-20
Discharge: 1.00 cfs  at node I-48
Discharge: 11.00 cfs  at node I-41
Discharge: 13.00 cfs  at node I-40
Discharge: 79.00 cfs  at node J-19
Discharge: 79.00 cfs  at node J-18
Discharge: 91.00 cfs  at node J-16
Discharge: 97.00 cfs  at node J-15
Discharge: 97.00 cfs  at node J-14
Discharge: 6.00 cfs  at node I-42
Discharge: 103.00 cfs  at node J-13
```

```
Discharge: 103.00 cfs  at node J-25
Discharge: 125.00 cfs  at node J-12
Discharge: 7.50 cfs  at node I-50
Discharge: 13.00 cfs  at node I-49
Discharge: 138.00 cfs  at node J-26
Discharge: 295.00 cfs  at node J-11
Discharge: 295.00 cfs  at node J-23
Discharge: 295.00 cfs  at node Outlet
Beginning iteration 1
Discharge: 3.00 cfs  at node I-39
Discharge: 1.00 cfs  at node I-31
Discharge: 4.00 cfs  at node I-30
Discharge: 4.00 cfs  at node I-29
Discharge: 2.00 cfs  at node I-38
Discharge: 3.00 cfs  at node I-37
Discharge: 1.00 cfs  at node I-36
Discharge: 2.00 cfs  at node I-35
Discharge: 3.00 cfs  at node I-34
Discharge: 7.00 cfs  at node I-33
Discharge: 8.00 cfs  at node I-32
Discharge: 28.00 cfs  at node I-16
Discharge: 13.00 cfs  at node I-8
Discharge: 4.00 cfs  at node I-10
Discharge: 4.00 cfs  at node I-7
Discharge: 4.00 cfs  at node I-6
Discharge: 12.00 cfs  at node I-5
Discharge: 16.00 cfs  at node I-4
Discharge: 18.00 cfs  at node I-3
Discharge: 22.00 cfs  at node I-2
Discharge: 89.00 cfs  at node I-1
Discharge: 89.00 cfs  at node J-1
Discharge: 7.00 cfs  at node I-15
Discharge: 96.00 cfs  at node J-2
Discharge: 4.00 cfs  at node I-13
Discharge: 1.00 cfs  at node I-14
Discharge: 101.00 cfs  at node J-3
Discharge: 101.00 cfs  at node J-24
Discharge: 105.00 cfs  at node J-4
Discharge: 3.00 cfs  at node I-9
Discharge: 108.00 cfs  at node J-5
Discharge: 121.00 cfs  at node J-7
Discharge: 149.00 cfs  at node J-8
Discharge: 4.00 cfs  at node I-19
Discharge: 8.00 cfs  at node I-18
Discharge: 157.00 cfs  at node J-9
Discharge: 3.00 cfs  at node I-52
Discharge: 6.00 cfs  at node I-53
Discharge: 2.00 cfs  at node I-47
Discharge: 8.00 cfs  at node I-46
Discharge: 11.00 cfs  at node I-45
Discharge: 11.00 cfs  at node I-44
Discharge: 4.00 cfs  at node I-51
Discharge: 4.00 cfs  at node I-43
Discharge: 18.00 cfs  at node I-26
Discharge: 22.00 cfs  at node I-25
Discharge: 6.00 cfs  at node I-24
Discharge: 12.00 cfs  at node I-23
Discharge: 66.00 cfs  at node I-20
Discharge: 1.00 cfs  at node I-48
Discharge: 11.00 cfs  at node I-41
```

```
Discharge: 13.00 cfs  at node I-40
Discharge: 79.00 cfs  at node J-19
Discharge: 79.00 cfs  at node J-18
Discharge: 91.00 cfs  at node J-16
Discharge: 97.00 cfs  at node J-15
Discharge: 97.00 cfs  at node J-14
Discharge: 6.00 cfs  at node I-42
Discharge: 103.00 cfs  at node J-13
Discharge: 103.00 cfs  at node J-25
Discharge: 125.00 cfs  at node J-12
Discharge: 7.50 cfs  at node I-50
Discharge: 13.00 cfs  at node I-49
Discharge: 138.00 cfs  at node J-26
Discharge: 295.00 cfs  at node J-11
Discharge: 295.00 cfs  at node J-23
Discharge: 295.00 cfs  at node Outlet
Discharge Convergence Achieved in 1 iterations: relative error:  0.0
Warning: No Duration data exists in IDF Table
Information: Outlet Known flow propogated from upstream junctions.
Information: J-23 Known flow propogated from upstream junctions.
Information: J-11 Known flow propogated from upstream junctions.
Information: J-9 Known flow propogated from upstream junctions.
Information: J-8 Known flow propogated from upstream junctions.
---------- Calculations Complete ----------

** Analysis Options **
Friction method:  Manning's Formula
HGL Convergence Test:  0.001000
Maximum Network Traversals:  5
Number of Pipe Profile Steps:  5
Discharge Convergence Test:  0.001000
Maximum Design Passes:  3
```

---------- Network Quick View ----------

Label	Length	Size	Discharge	Hydraulic Grade Upstream	Hydraulic Grade Downstream
P-1	94.00	18 inch	4.00	2,709.22	2,708.05
P-2	147.00	18 inch	4.00	2,708.02	2,705.84
P-3	212.00	24 inch	12.00	2,705.84	2,703.24
P-4	56.00	24 inch	16.00	2,703.24	2,701.93
P-5	141.00	24 inch	18.00	2,701.93	2,698.98
P-6	91.00	24 inch	22.00	2,698.98	2,692.64
P-7	147.00	48 inch	89.00	2,692.46	2,691.41
P-8	223.00	48 inch	89.00	2,691.41	2,689.91
P-9	131.00	48 inch	96.00	2,689.91	2,689.00
P-11	210.00	48 inch	105.00	2,687.01	2,685.14
P-14	13.00	24 inch	7.00	2,689.88	2,689.91
P-15	9.00	24 inch	4.00	2,689.10	2,689.00
P-16	37.00	24 inch	1.00	2,688.97	2,689.00
P-19	9.00	24 inch	4.00	2,689.60	2,687.01
P-20	9.00	24 inch	3.00	2,689.59	2,685.14
P-21	190.00	18 inch	13.00	2,689.93	2,685.80
P-23	112.00	54 inch	149.00	2,681.40	2,680.24
P-27	212.00	30 inch	28.00	2,692.50	2,681.88
P-29	49.00	18 inch	4.00	2,687.77	2,686.01
P-30	16.00	24 inch	8.00	2,686.01	2,680.24

| Hydraulic Grade |

Label	Length	Size	Discharge	Upstream	Downstream
P-33	158.00	42 inch	97.00	2,702.23	2,698.63
P-34	48.00	42 inch	97.00	2,702.82	2,702.23
P-35	83.00	42 inch	91.00	2,703.58	2,702.82
P-38	158.00	42 inch	79.00	2,708.78	2,707.20
P-39	157.00	36 inch	66.00	2,710.73	2,708.79
P-41	130.00	24 inch	12.00	2,706.44	2,703.58
P-42	31.00	24 inch	6.00	2,705.17	2,702.82
P-43	142.00	30 inch	18.00	2,694.04	2,693.00
P-44	155.00	30 inch	22.00	2,693.00	2,692.88
P-45	162.00	48 inch	108.00	2,685.14	2,683.37
P-49	158.00	60 inch	295.00	2,679.75	2,677.65
P-50	145.00	60 inch	295.00	2,677.65	2,663.88
P-24	126.00	54 inch	157.00	2,680.24	2,679.75
P-52	95.00	48 inch	101.00	2,689.00	2,688.26
P-53	140.00	48 inch	101.00	2,688.26	2,687.01
P-54	213.00	54 inch	121.00	2,683.37	2,681.40
P-55	68.00	18 inch	4.00	2,694.27	2,692.50
P-56	68.00	12 inch	4.00	2,695.35	2,694.34
P-57	61.00	12 inch	1.00	2,695.92	2,695.35
P-58	84.00	24 inch	8.00	2,692.86	2,692.50

				Hydraulic Grade	
Label	Length	Size	Discharge	Upstream	Downstream
P-59	63.00	24 inch	7.00	2,693.84	2,692.86
P-60	42.00	18 inch	3.00	2,694.06	2,693.84
P-61	109.00	18 inch	2.00	2,707.23	2,706.16
P-62	42.00	18 inch	3.00	2,694.06	2,693.84
P-63	55.00	18 inch	2.00	2,694.53	2,694.06
P-64	70.00	12 inch	1.00	2,695.42	2,694.65
P-65	85.00	12 inch	3.00	2,701.64	2,695.35
P-66	23.00	24 inch	13.00	2,711.30	2,708.78
P-67	39.00	18 inch	11.00	2,713.27	2,711.32
P-68	371.00	42 inch	79.00	2,707.20	2,703.58
P-69	28.00	18 inch	6.00	2,699.05	2,698.63
P-70	133.00	42 inch	103.00	2,698.63	2,695.08
P-71	64.00	48 inch	103.00	2,695.08	2,692.88
P-72	80.00	18 inch	1.00	2,712.42	2,711.30
P-73	60.00	24 inch	11.00	2,694.43	2,694.04
P-74	58.00	24 inch	11.00	2,694.89	2,694.43
P-75	118.00	24 inch	8.00	2,695.81	2,694.89
P-76	16.00	18 inch	2.00	2,697.13	2,695.81
P-77	77.00	48 inch	138.00	2,682.58	2,679.75
P-78	269.00	48 inch	125.00	2,692.88	2,682.58

				Hydraulic Grade	
Label	Length	Size	Discharge	Upstream	Downstream
P-79	16.00	24 inch	13.00	2,688.10	2,682.58
P-80	58.00	18 inch	7.50	2,691.96	2,689.87
P-81	54.00	12 inch	4.00	2,695.65	2,694.05
P-82	80.00	12 inch	4.00	2,701.75	2,695.65
P-83	70.00	12 inch	3.00	2,701.64	2,694.95
P-84	70.00	12 inch	6.00	2,701.86	2,695.81

		Elevations		
Label	Discharge	Ground	Upstream HGL	Downstream HGL
I-1	89.00	2,704.80	2,692.46	2,692.46
I-2	22.00	2,705.50	2,698.98	2,698.98
I-3	18.00	2,708.60	2,701.93	2,701.93
I-4	16.00	2,708.00	2,703.24	2,703.24

I-5	12.00	2,708.10	2,705.84	2,705.84
I-6	4.00	2,712.95	2,708.02	2,708.02
I-7	4.00	2,712.95	2,709.22	2,709.22
J-1	89.00	2,704.60	2,691.41	2,691.41
J-2	96.00	2,697.40	2,689.91	2,689.91
J-3	101.00	2,693.00	2,689.00	2,689.00
J-4	105.00	2,699.00	2,687.01	2,687.01
J-5	108.00	2,701.00	2,685.14	2,685.14
J-7	121.00	2,698.00	2,683.37	2,683.37
I-8	13.00	2,691.56	2,689.93	2,689.93
I-9	3.00	2,696.10	2,689.59	2,689.59
I-10	4.00	2,696.90	2,689.60	2,689.60
I-13	4.00	2,692.40	2,689.10	2,689.10
I-14	1.00	2,691.50	2,688.97	2,688.97
I-15	7.00	2,692.40	2,689.88	2,689.88
J-8	149.00	2,694.30	2,681.40	2,681.40

Inlet 2

		Elevations		
Label	Discharge	Ground	Upstream HGL	Downstream HGL
J-9	157.00	2,691.80	2,680.24	2,680.24
J-11	295.00	2,692.40	2,679.75	2,679.75
Outlet	295.00	2,680.00	2,663.88	2,663.88
I-16	28.00	2,697.70	2,692.50	2,692.50
I-18	8.00	2,691.00	2,686.01	2,686.01
I-19	4.00	2,691.00	2,687.77	2,687.77
J-12	125.00	2,701.50	2,692.88	2,692.88
J-13	103.00	2,704.00	2,698.63	2,698.63
J-14	97.00	2,708.40	2,702.23	2,702.23
J-15	97.00	2,710.50	2,702.82	2,702.82
J-16	91.00	2,712.50	2,703.58	2,703.58
J-18	79.00	2,715.85	2,707.20	2,707.20
I-20	66.00	2,718.60	2,710.73	2,710.73
J-19	79.00	2,716.90	2,708.78	2,708.78
I-23	12.00	2,710.20	2,706.44	2,706.44
I-24	6.00	2,710.30	2,705.17	2,705.17
I-25	22.00	2,699.90	2,693.00	2,693.00
I-26	18.00	2,701.10	2,694.04	2,694.04
J-23	295.00	2,687.50	2,677.65	2,677.65
J-24	101.00	2,698.00	2,688.26	2,688.26

		Elevations		
Label	Discharge	Ground	Upstream HGL	Downstream HGL
I-29	4.00	2,699.50	2,694.27	2,694.27
I-30	4.00	2,699.50	2,695.35	2,695.35
I-31	1.00	2,699.50	2,695.92	2,695.92
I-32	8.00	2,697.85	2,692.86	2,692.86
I-33	7.00	2,697.90	2,693.84	2,693.84
I-34	3.00	2,698.40	2,694.06	2,694.06
I-35	2.00	2,698.00	2,694.53	2,694.53
I-36	1.00	2,698.00	2,695.42	2,695.42
I-37	3.00	2,711.70	2,694.06	2,694.06
I-38	2.00	2,711.70	2,707.23	2,707.23
I-39	3.00	2,712.90	2,701.64	2,701.64
I-40	13.00	2,716.00	2,711.30	2,711.30
I-41	11.00	2,716.00	2,713.27	2,713.27
I-42	6.00	2,703.10	2,699.05	2,699.05
J-25	103.00	2,702.10	2,695.08	2,695.08
I-43	4.00	2,701.30	2,695.65	2,695.65
I-44	11.00	2,700.70	2,694.43	2,694.43
I-45	11.00	2,700.70	2,694.89	2,694.89
I-46	8.00	2,700.70	2,695.81	2,695.81
I-47	2.00	2,700.60	2,697.13	2,697.13

Label	Discharge	Elevations		
		Ground	Upstream HGL	Downstream HGL
I-48	1.00	2,716.05	2,712.42	2,712.42
I-49	13.00	2,694.80	2,688.10	2,688.10
I-50	7.50	2,694.90	2,691.96	2,691.96
J-26	138.00	2,695.30	2,682.58	2,682.58
I-51	4.00	2,712.90	2,701.75	2,701.75
I-52	3.00	2,712.90	2,701.64	2,701.64
I-53	6.00	2,712.90	2,701.86	2,701.86

Elapsed: 0 minute(s) 21 second(s)

TDS FOR VILLAGE AT QUEENSRIDGE

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: April 26, 2010
TO: **Land Development Services** Department of Public Works			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **The Village at Queensridge – Update # 5**		**COPIES TO:** G. C. Wallace, Inc.
Cross Streets:	NEC of Rampart Boulevard & Alta Drive		Great Wash Park, LLC.
File Number:	F:\Depot\DSMemos\DS4018K.doc		Bart Anderson, P.E., DevCo
Parcel Number:	138-32-601-003		CCRFCD
Zoning Action:	SDR-10770, VAR-10773 & VAC-13822		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal & Supplement	6/6/2006 & 6/20/2006	7/11/2006	Not Approved	$400.00	47169: $400
2nd Submittal & Supplement	9/14/2006 & 10/11/2006	10/12/2006	Approved	$400.00	53862: $400
3rd Submittal & Supplement	10/5/2006 & 11/1/2006	11/7/2006	Not Approved	$400.00	55429: $400
4th Submittal & Supplement	1/4/2007 & 1/16/2007	1/18/2007	Approved	$400.00	60644: $400
5th Submittal	3/19/2007	3/22/2007	CCRFCD Concurrence	N/C	N/C
6th Submittal & Supplement	4/5/2007 & 5/29/2007	6/12/2007	Approved	$100.00	66412: $100
7th Submittal & Supplement	6/24/2009 & 7/1/2009	7/1/2009	Approved	$100.00	124167: $100
8th Submittal	11/12/2009	11/23/2009	Approved	$100.00	133423: $100
9th Submittal	12/15/2009	12/22/2009	Approved	$100.00	135174: $100
10th Submittal	4/22/2010	4/26/2010	See Comments Below	$100.00	143501: $100
			TOTAL FEES (LDDRS):	$2,100.00	----

REMARKS: 10th Submittal: Revise storm drain lateral in Alta, west of Rampart.

9th Submittal: Update #4 to add new driveways and grading at truck docks along Alta Drive

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.

1. Flood Control takes no exception to the revised storm drain lateral location due to existing utility conflicts.

2. The site has obtained a LOMR from FEMA therefore, the site is no longer considered within a FEMA Special Flood Hazard Area. The existing twin 12' x 12' RCB's (CLV # 107Y4889 CUL) convey the 100-year flows through the site.
3. A technical drainage study update is required prior to further development of the site.

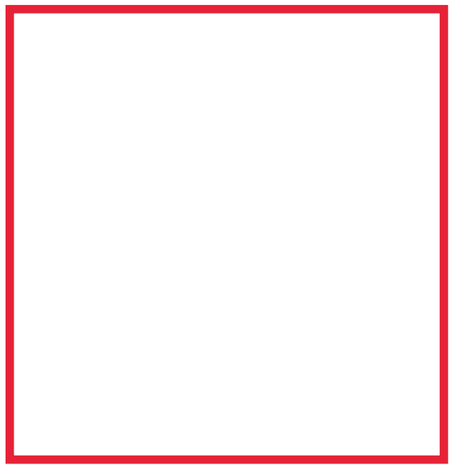
NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section.* Additionally, conditional 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.

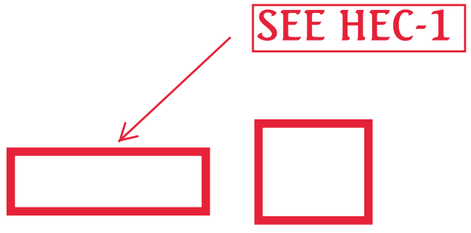
NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on 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/32
AREA L-32

Runoff on the north side of Alta west of Rampart is intercepted by storm drains.




SEE HEC-1











Runoff on the south side of Alta west of Rampart will either be intercepted by storm drains or will overtop the curb and be routed under Alta.





TDS FOR QUEENS BORROUGH CULVERT

R. Clark K Gremlich F.C. File
C. Miller C Luquette

RECEIVED
AUG 3 1 2005
G C WALLACE

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: August 30, 2005
TO: **Land Development Services** Department of Public Works			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Technical Drainage Study for: **Queens Borrough Culvert**		COPIES TO: G. C. Wallace, Inc.
Cross Streets:	NEC of Alta Drive & Rampart Boulevard		JMA Architecture
File Number:	F:\Depot\DSMEMOS\DS3674D.ZNA.doc		Bart Anderson, P.E., DevCo
Parcel Number:	138-32-601-003		CCRFCD
FEMA Flood Zone	YES X	NO	
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	10/25/2004	11/9/2004	Not Approved	$400.00	11413: $400
2nd Submittal	12/6/2004	12/20/2004	See Comments Below	$400.00	13199: $400
3rd Submittal	3/4/2005	3/18/2005	Conditionally Approved	N/C	--
4th Submittal	8/9/2005	8/23/2005	See Comments Below	$400.00	27281: $400
			TOTAL FEES (LDDRS):	**$1,200.00**	---

REMARKS: Regional Concurrence received.

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.

1. The proposed 48'-public drainage easement must be dedicated and recorded by final map or separate document prior to the final approval of the future technical drainage study upon onsite development. **The public drainage easement must be privately maintained both on the surface and within the box culvert.**

2. The engineer has provided a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.

NOTE: **The engineer must submit the drainage study to FEMA for a Conditional Letter of Map Revision (CLOMR). A favorable CLOMR must be obtained prior to the issuance of any permits.** This site is located in a **FEMA Zone A**. Clark County Regional Flood Control District (CCRFCD) review and approval is required prior to recordation of final map or issuance of building/grading permits. The Engineer must send a copy of the report to the CCRFCD for review. **The developer/engineer must also obtain a Letter of Map Revision (LOMR) using the approved drainage study as technical support to inform FEMA of the modifications within the flood zone. The approved LOMR must be submitted to the City of Las Vegas prior to the release of the bond.** FEMA Elevation Certificates, showing as-built finish floor elevations, must be completed for each building in the FEMA A Zone. The certificate must be submitted to the City of Las Vegas Flood Control Section prior to scheduling a framing inspection.

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

END OF REMARKS
B&H/ays/pbj

T/R/S: T20S/R60E/32
AREA L-32

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



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

BOARD OF DIRECTORS

Larry Brown
Chairman
City of Las Vegas

Chip Maxfield
Vice-Chairman
Clark County

Shari Buck
City of North Las Vegas

Andy Hafen
City of Henderson

Michael Mack
City of Las Vegas

Mayor Bill Nicholes
City of Mesquite

Roger Tobler
City of Boulder City

Bruce L. Woodbury
Clark County

February 24, 2005

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 Fourth Street
Las Vegas, NV 89101

DISTRICT CONCURRENCE: QUEENS BORROUGH CULVERT (CLV #DS3674) (RFCD #04-6118)

Dear Mr. Fultz:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated October 20, 2004, Addendum No. 1 dated December 3, 2004, for the above-mentioned project as submitted by G.C. Wallace, Inc. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Public Works dated December 21, 2004.

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

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

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by G.C. Wallace, Inc may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

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

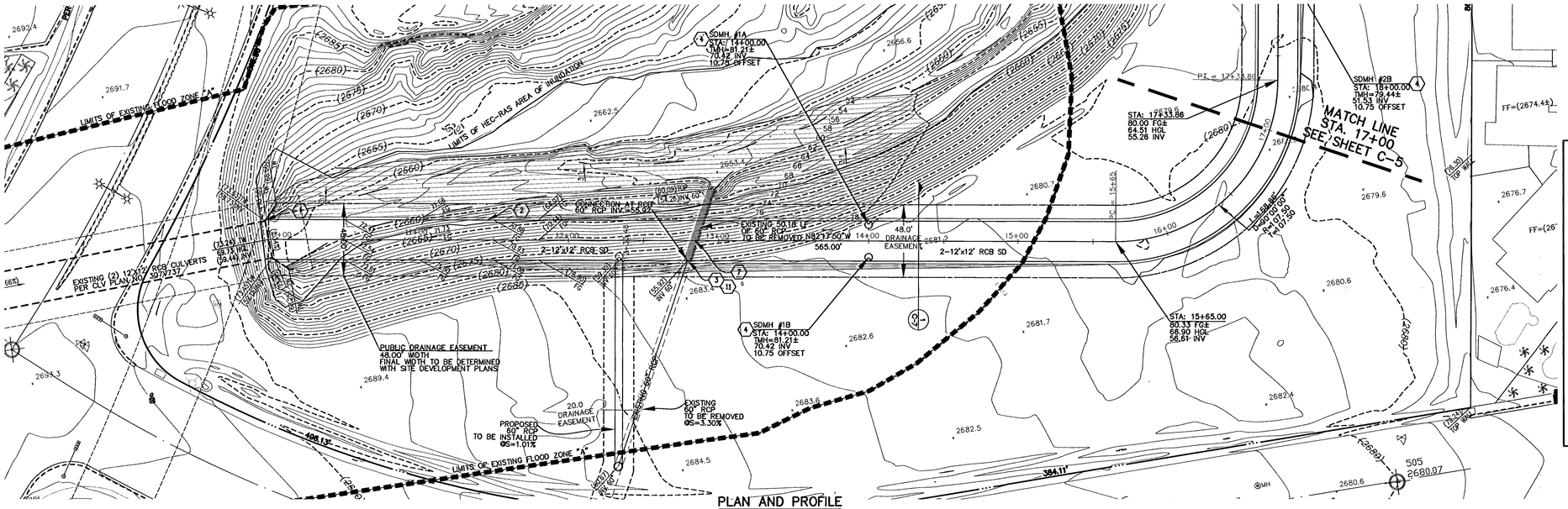
BY: _____
Andrew R. Trelease, P.E.
Senior Civil Engineer

ART:mak

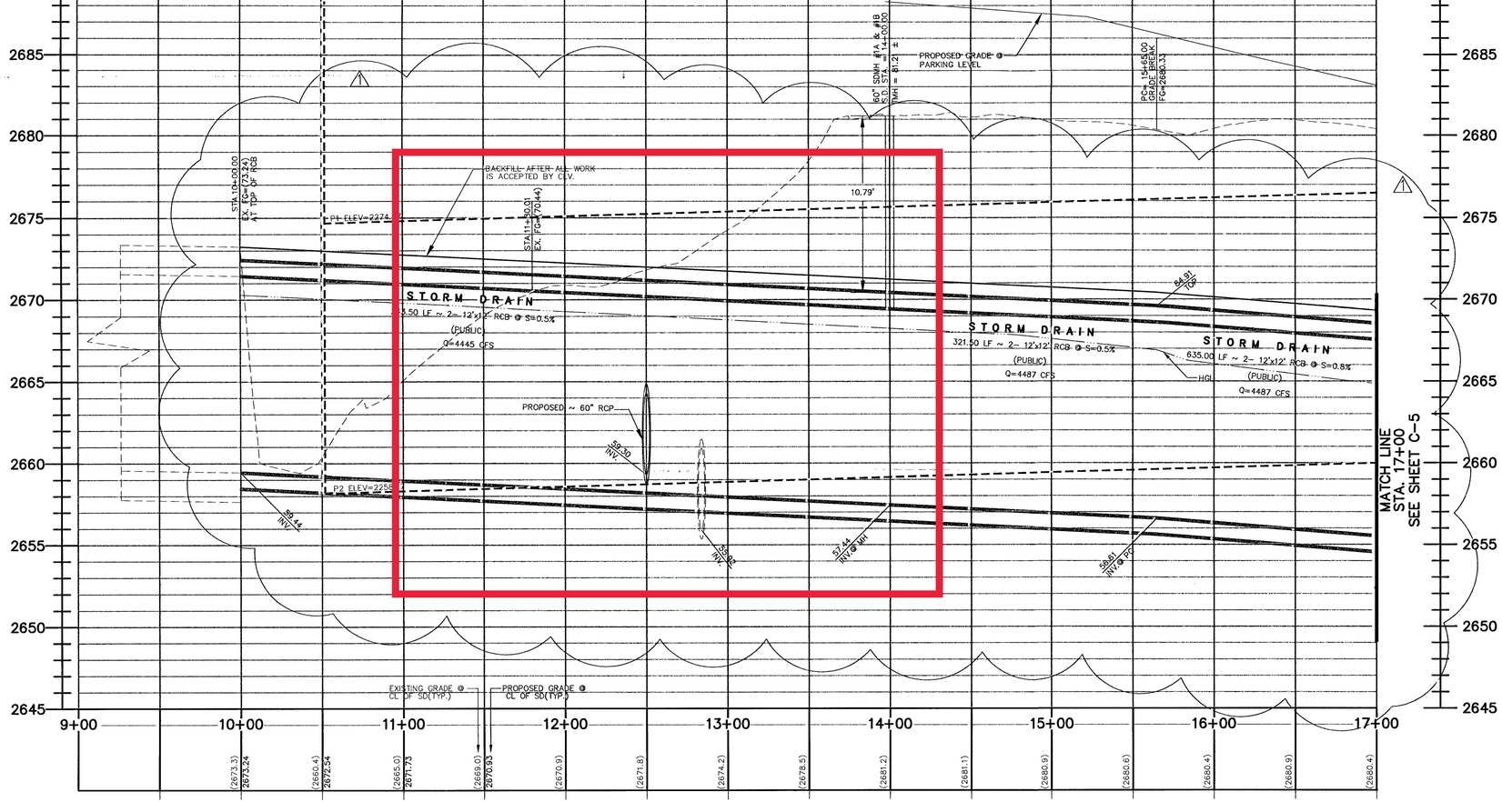
c: Christopher Luquette, P.E., G.C. Wallace, Inc.

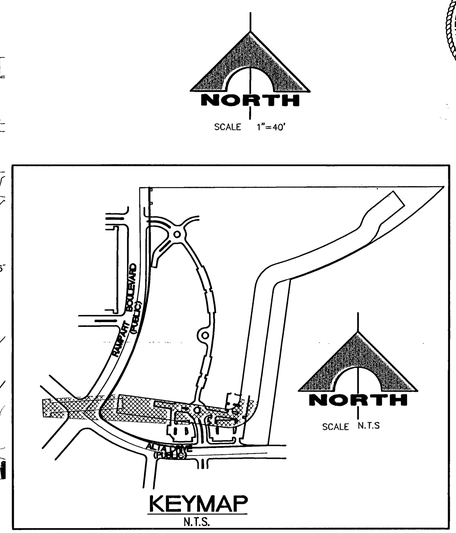
File: 20-60-32.gcw.doc

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: *http://www.ccrfcd.org*



PLAN AND PROFILE
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'





KEYMAP
N.T.S.

NORTH
SCALE 1"=40'

BASIS OF BEARING

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF "RAMPART BOULEVARD" AS SHOWN BY MAP THEREOF ON FILE IN FILE 64, PAGE 93 OF SURVEYS IN THE COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA, LYING WITHIN THE NORTH HALF (N 1/2) OF SECTION 32, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

BENCHMARK

RIVET AND PLATE IN TOP OF CURB @ TOWN CENTER AND VILLAGE CENTER ON WEST EDGE OF ROUNDABOUT.

CITY OF LAS VEGAS BENCHMARK OLV00 32E6
LOCATED ON THE NORTHEAST CORNER OF ALTA DR. AND UPPER HILL.
NAVD 88 ELEVATION = 814.1281 METERS, 2671.02 FEET
SUMMERLIN ELEVATION: 2726.11 FEET
NOTE: ADD 2.27' TO THE CURRENTLY USED SUMMERLIN BENCHMARK TO EQUAL TO THE APPROVED CITY OF LAS VEGAS BENCHMARK.

GRADING CONSTRUCTION NOTES

1. CONTRACTOR TO MATCH TO EXISTING 2-12'x12' RCB CULVERT.
2. CONSTRUCT 2-12'x12' RCB CULVERT PER NDOT DETAIL B-20.1.3 & TRENCH RCB SECTION PER DETAIL 1, SHEET C-7.
3. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 60" RCP.
4. INSTALL 60" STORM DRAIN MANHOLE PER CLARK COUNTY STANDARD DRAWING #403.
5. INSTALL 24" CLASS V RCP STUB PER DETAIL 2, SHEET C-7.
6. INSTALL 24" CLASS IV RCP STUB PER DETAIL 2, SHEET C-7.
7. INSTALL EQUALIZATION CHAMBER PER DETAIL A, SHEET C-7.
8. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 18" RCP.
9. CONSTRUCT RCB CULVERT TYPE I HEADWALLS PER NDOT DETAIL B-20.1.5.
10. NOT USED
11. CONSTRUCT LATERAL PER DETAIL 2, SHEET C-7.
12. CONCRETE PAD PER DETAIL "C" SHEET C-7.

NOTE

THIS PROJECT SITE IS LOCATED WITHIN "THE LIMITS OF EXISTING FLOOD ZONE "A"

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

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

Call before you Dig
Underground
1-702-455-7511
1-702-229-6611

This grading plan is a part of drainage study which was received on 3/14/2016 by CLV

CLV DWG #

ENGINEER - STATE OF NEVADA
ROYCE CLARK
No. 8354
PROFESSIONAL
CIVIL
Exp. 12/31/2008
DATE 12/16/05

REV	DATE	DESCRIPTION
A	12-7-06	REVISE SLOPE ON CULVERT

DESIGN JO/OGS
DRAWN OGS
CHECK RDC
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 12-13-05
PLOT TIME: 11:31:43

ISSUED FOR DRAINAGE SUBMITTAL

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
gwinc@cox.net

G:\619-295\dwg\jmarov\DRAINAGE\QUEFc004.dwg

THE VILLAGE AT QUEENSRIDGE CULVERT

JMA ARCHITECTURE STUDIOS

STORM DRAIN PLAN AND PROFILE
STA. 10+00.00 TO 17+00.00

DRAWING
C-4
4 OF 11 SHTS

24x36.dwg 030924.wsk

TDS FOR PECCOLE TOWN CENTER

5334

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: July 9, 1998

TO:
Land Development Services
Department of Public Works

FROM:
Dennis W. Stransky, P.E. RFS for
Flood Control Project Manager
Department of Public Works

SUBJECT: Drainage Study for:
Peccole Town Center
Charleston and Rampart

FILE NO. \\khan\flood\Depot\DSMEMOS\DS2248D.doc

COPIES TO:
VTN Nevada
Triple Five Development
Cheri Edelman, P. E., DEVCO
CCRFCD

FEMA Flood Zone	YES	No X
Proposed Storm Drain	YES X	No

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES
1st Submittal	3/09/98	3/23/98	Not Accepted	$250.00
2nd Submittal	6/23/98	6/29/98	Not Accepted	$250.00
3rd Submittal	7/2/98	7/2/98	Accepted	$250.00
CCRFCD	07/08/98	07/09/98	See Comments Below	N/C
			TOTAL FEES	$750.00

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

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

1. A technical update to the drainage study, once accepted, must be submitted for each phase or lot as they are developed.
2. Conditional approval is subject to inlet details, map legends, construction notes and horizontal control being provided for Phase 1 construction.

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
dbm

T/R/S: **20S/60E32**
AREA L-32

RECEIVED
JUL 10 1998



CONSULTING ENGINEERS • PLANNERS • SURVEYORS
PROVIDING QUALITY PROFESSIONAL
SERVICES SINCE 1960

June 19, 1998
W.O. #5334

City of Las Vegas
Department of Public Works
731 South Fourth Street
Las Vegas, Nevada 89101

Attention: Mr. Dennis W. Stransky, P.E.
Flood Control Project Manager

SUBJECT: **ADDENDUM #1 TO THE TECHNICAL HYDROLOGY STUDY FOR PECCOLE TOWN CENTER**

Mr. Stransky:

This Addendum #1 is being submitted to the City of Las Vegas Department of Public Works to address the review comments to the above mentioned study that were issued on March 23, 1998. In addition, a meeting was held with the City of Las Vegas Flood Control Department on March 26, 1998, to discuss these comments.

The subject review comments are listed and addressed as follows:

Comment #1.

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

We acknowledge that concurrence from Clark County Regional Flood Control District is required prior to final acceptance of the Drainage Study.

Comment #2.

> **Permanent public drainage easements to be privately maintained must be provided where flows or storm drains will cross property lines. These easements must be addressed prior to recording the commercial subdivision map.**

2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89102-5148
TEL. (702) 873-7550 FAX: 362-2597

In a phone conversation on June 9, 1998, with the City of Las Vegas, it was agreed to that there will be public easements to be privately maintained designated on the 96 acres commercial subdivision Final Map for Phase 1. City Council conditions of the design review gave four (4) years to start the second phase. Therefore, drainage easements for the interim drainage improvements in future phases will be provided to the City of Las Vegas. The City has agreed to hold off recording these easements for 5 years. They will record these easements at that time unless they are replaced by easements prepared for the permanent drainage improvements.

Comment #3.

> **The permanent drainage facilities along the east property line must be addressed in the study. The existing wall can not be used as part of the drainage design. The grading for the interim facilities showing the water being conveyed to the culvert at Alta Drive must be shown on the plans and constructed with the first phase of construction.**

The permanent drainage facilities along the east property line will be constructed with the first phase. The facilities are shown on the Grading Plans. The interim earthen swales that convey the water to the Alta Drive culvert are also shown on the Grading Plan. There will be no flow against the existing wall on the east side of the property.

Comment #4.

> **The finish floors of the existing buildings and buildings under construction along the east side of the property must be shown on the grading plans.**

The finished floors of the buildings to the east have been added to the Grading Plan, included in the Appendix.

Comment #5.

> **Top of curb elevations must be shown for both sides of the adjacent roadways.**

Top of curb elevations for both sides of roadways have been added to Rampart Boulevard, Charleston Boulevard and Merialdo Lane. For Alta Drive, no curb exists on the north side of the road. This information has been added to the Grading Plan, included in the Appendix.

Comment #6.

> **There is insufficient data on the grading plan to determine compliance with the CCRFCD Design Manual's finished floor criteria. A complete grading plan must be submitted showing the limits of the Phase 1 construction including detailed grades and physical improvements.**

Finished floors will be set at twice the ponding depth of the adjacent on-site inlets and an overflow path has been provided. A complete Grading Plan showing the limits of Phase 1 has been included in the Appendix.

Comment #7.

> **Plan and profile and hydraulic calculations must be provided for the storm drains. The hydraulic gradeline must be shown on the profile.**

In a meeting held on March 26, 1998 with the City of Las Vegas, it was agreed to that plan and profiles for the on-site storm drains will not be required. A STORM CAD analysis for the on-site storm drain has been included in the Appendix.

Comment #8.

> **The Q100 flows intercepted by the storm drain system must be shown on the Onsite Basin Map.**

In a meeting hold on March 26, 1998, with the City of Las Vegas, it was agreed that the *On-Site Basin Map* did not need to show flows being intercepted by the storm drain system. This will not be needed since a STORM CAD analysis will show how much flow will be intercepted by the storm drain system. The reviewer should have realized that the Q100 flows intercepted by the storm drain are shown on the *Pipe and Inlet Map* (Figure 6B).

Comment #9.

> **The finished floor elevations along Rampart are lower than the roadway. A cross section must be provided showing how these buildings will be protected from the Q100 flow depth of 0.62' in Rampart Boulevard. A flood wall must be provided to protect the site and landscaping along Rampart Boulevard.**

This study initially stated that there would be 85 cfs in Rampart Boulevard as surface flow. This flow did not take into consideration the drop inlets along Rampart Boulevard. Calculations were done showing the capacity of the inlets and have been included in the Appendix. A total of 38 cfs were intercepted by the inlets during the 100-year storm. With 38 cfs intercepted by the inlets, a total of 47 cfs will remain as surface flow in Rampart Boulevard. The depth of flow will be 0.51 feet. With a depth of flow below back of walk, flood walls or stem walls will not be required to protect the landscaping and site. Plans done by G.C. Wallace, Inc., showing size and type of inlets have been included in the Appendix.

*THIS IS TO SHOW THE CAPACITY OF THE DROP INLETS ALONG RAMPART BOULEVARD.

PONDING DEPTH = 0.5 FEET

INLETS #7-12

4-FOOT TYPE 'A'

FROM FIGURE 804
1 OF 3

$$\frac{2.2 \text{ CFS}}{0.80} = 2.75 \text{ CFS}$$

2.75 CFS * 0.5 = 1.37 CFS

(0.5 ← 50% CLOGGING FACTOR)

1.37 CFS IS THE CAPACITY OF THE 4-FOOT TYPE 'A' INLET

INLETS # 1, 2, 3 & 6

10-FOOT TYPE 'A'

FIGURE 804
2 OF 3

$$\frac{5.5 \text{ CFS}}{0.80} = 6.87 \text{ CFS}$$

6.87 CFS * 0.5 = 3.43 CFS

(0.5 ← 50% CLOGGING)

3.43 CFS IS THE CAPACITY OF THE 10-FOOT TYPE 'A' INLET

50 SHEETS 22-141
100 SHEETS 22-142
200 SHEETS 22-144
AMPAD

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

INLETS # 4 & 5

20-FOOT TYPE 'C'

FIGURE 804
3 OF 3

$\frac{10 \text{ CFS}}{0.8} = 12.5 \text{ CFS}$

$12.5 \text{ CFS} * 0.5 = 6.25 \text{ CFS}$

50% CLOGGING

FIGURE 806

$\frac{5 \text{ CFS}}{0.70} = 7.14 \text{ CFS}$

$7.14 \text{ CFS} * 0.5 = 3.57 \text{ CFS}$

CAPACITY OF 20-FOOT TYPE 'C' = 6.25 + 3.57 = 9.82 CFS

RUNOFF IN RAMPART:

Q100 = 85 CFS - 38 CFS = 47 CFS

Q10 = 40 CFS - 38 CFS = 2 CFS

TOTAL FLOW INTERCEPTED BY DROP INLETS

$6 * 1.37 \text{ CFS} + 4 * 3.43 \text{ CFS} + 2 * 9.82 \text{ CFS} = 38.15 \text{ CFS}$

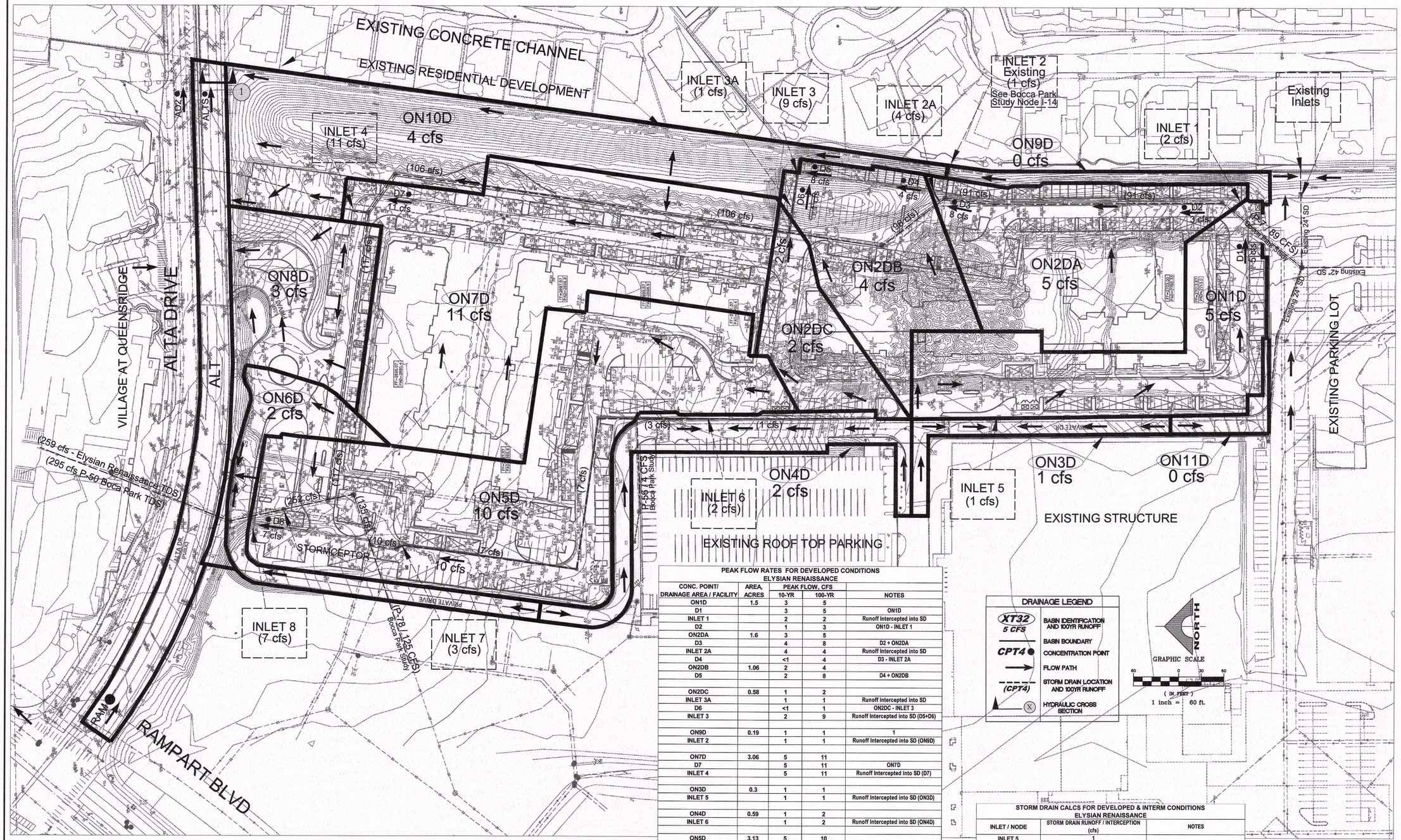
6 → 4-FOOT TYPE 'A'

4 → 10-FOOT TYPE 'A'

2 → 20-FOOT TYPE 'C'

THIS IS THE AMOUNT OF FLOW THAT WILL BE SUBTRACTED FROM THE FLOW IN RAMPART TO GET THE TOTAL STREET FLOW.

APPENDIX F PLANS AND DETAILS



STREET CAPACITY CALCULATIONS DEVELOPED CONDITIONS - ELYSIAN RENAISSANCE

HYDRAULIC SECTION	SLOPE, %	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	$V_{10} * D_{10}$ / $V_{100} * D_{100}$
Section 1 - Alta Drive South Half	2	8 / 37	0.46 / 0.71	3.99 / 5.36	1.83 / 3.81

FINISHED FLOOR ELEVATION CRITERIA CHECK TABLE ELYSIAN RENAISSANCE

BUILDING	CROSS SECTION	WSE (FT)	BUILDING FF (FT)	CRITERIA MET
SOUTH	A - Weir	2695.66	2703.00	YES
NORTH	B - Weir	2692.27	2696.07	YES

PEAK FLOW RATES FOR DEVELOPED CONDITIONS ELYSIAN RENAISSANCE

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
ON1D	1.5	3	5	
D1		3	5	ON1D
INLET 1		2	2	Runoff Intercepted into SD
D2		1	3	ON1D - INLET 1
ON2DA	1.6	3	5	
D3		4	8	D2 + ON2DA
INLET 2A		4	4	Runoff Intercepted into SD
D4		<1	4	D3 - INLET 2A
ON2DB	1.06	2	4	
D5		2	8	D4 + ON2DB
ON2DC	0.58	1	2	
INLET 3A		1	1	Runoff Intercepted into SD
D6		<1	1	ON2DC - INLET 3
INLET 3		2	9	Runoff Intercepted into SD (D5+D6)
ON9D	0.19	1	1	1
INLET 2		1	1	Runoff Intercepted into SD (ON9D)
ON7D	3.06	5	11	
D7		5	11	ON7D
INLET 4		5	11	Runoff Intercepted into SD (D7)
ON3D	0.3	1	1	
INLET 5		1	1	Runoff Intercepted into SD (ON3D)
ON4D	0.59	1	2	
INLET 6		1	2	Runoff Intercepted into SD (ON4D)
ON5D	3.13	5	10	
INLET 7		3	3	Runoff Intercepted into SD
D8		2	7	ON5D - INLET 7
INLET 8		2	7	Runoff Intercepted into SD (D8)
RAM		1	24	2
ON6D	0.64	1	2	
ON8D	1.03	2	4	
ON10D	2	2	4	
ALT	0.94	2	3	
ALTS		8	37	3
ON11D	0.11	<1	<1	
AD2		9	15	4

1. HEC-1 results yield runoff less than 1 cfs. Use results from Bocca Park study at Node I-14 to be conservative.
2. Referenced from Peccole Town Center study. Runoff generated from eastern half of Rampart Boulevard expected to flow down the south half of Alta Drive.
3. RAM+ON6D+ON8D+ON10D+ALT
4. Referenced from Village at Queensridge study.

DRAINAGE LEGEND

- XT32 / 5 CFS — BASIN IDENTIFICATION AND 100YR RUNOFF
- BASIN BOUNDARY
- CPT4 — CONCENTRATION POINT
- FLOW PATH
- (CPT4) — STORM DRAIN LOCATION AND 100YR RUNOFF
- X — HYDRAULIC CROSS SECTION

NORTH

GRAPHIC SCALE

60 0 30 60

(IN FEET)

1 inch = 60 ft.

STORM DRAIN CALCS FOR DEVELOPED & INTERM CONDITIONS ELYSIAN RENAISSANCE

INLET / NODE	STORM DRAIN RUNOFF / INTERCEPTION (cfs)	NOTES
INLET 5	1	
INLET 6	2	
P-56	4	See Bocca Park Study
INLET 7	3	
TOTAL	10	MAIN LINE 3
P-7	89	See Bocca Park Study
INLET 1	2	
INLET 2	1	See Node I-14 Bocca Park Study
INLET 2A	4	
INLET 3	9	
INLET 3A	1	
INLET 4	11	
TOTAL	117	MAIN LINE 2
P-78	125	
Main Line 2	117	
Main Line 3	10	
INLET 8	7	
TOTAL	259	MAIN LINE 1

PROJECT NO.

DESIGN:
DRAWN: MP
CHECK:
PLOT DATE:
PLOT TIME:

NO.	DESCRIPTION	DATE	AGEN APP	DATE	GOV APP

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

FIGURE 5

ADDENDUM 1 DEVELOPED CONDITIONS DRAINAGE MAP

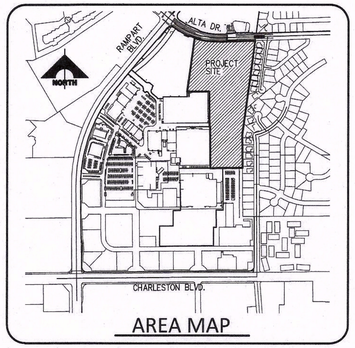
ELYSIAN RENAISSANCE

ELYSIAN AT RENAISSANCE

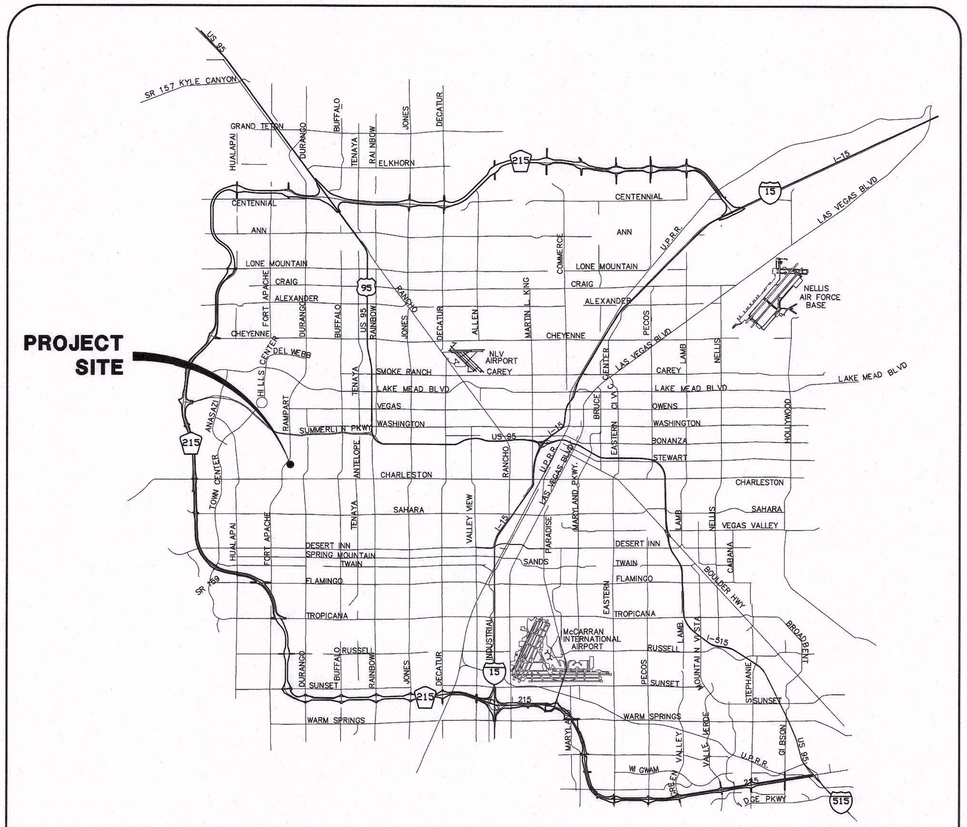
CIVIL IMPROVEMENTS

APN: 138-32-723-003

359 RESIDENTIAL APARTMENT UNITS



AREA MAP



VICINITY MAP

NOT TO SCALE

LEGAL DESCRIPTION

PARCEL 2 OF THAT CERTAIN PARCEL MAP ON FILE IN FILE 122 OF PARCEL MAPS, PAGE 11, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

(EXCEPTION #9 PER TITLE REPORT)

A NON-EXCLUSIVE EASEMENT FOR INGRESS AND EGRESS AS SET FORTH IN THAT CERTAIN DECLARATION OF RESTRICTIONS AND OPERATION AND EASEMENT AGREEMENT RECORDED OCTOBER 22, 1998 IN BOOK 981022, AS INSTRUMENT NO. 01589, AND AS MODIFIED BY THE FOLLOWING INSTRUMENTS: RECORDED JUNE 9, 1999, IN BOOK 990609, INSTRUMENT NO. 01024; RECORDED JULY 16, 1999, IN BOOK 990716, INSTRUMENT NO. 00353; RECORDED NOVEMBER 23, 1999, IN BOOK 991123, INSTRUMENT NO. 01360; RECORDED DECEMBER 15, 1999, IN BOOK 991215, INSTRUMENT NO. 01470; RECORDED JANUARY 26, 2000, IN BOOK 20000126, INSTRUMENT NO. 01082; RECORDED FEBRUARY 17, 2000, IN BOOK 20000217, INSTRUMENT NO. 01008; RECORDED MARCH 22, 2000, IN BOOK 20000322, INSTRUMENT NO. 01459; RECORDED JUNE 14, 2000, IN BOOK 20000614, INSTRUMENT NO. 00540; RECORDED SEPTEMBER 29, 2000, IN BOOK 20000929, INSTRUMENT NO. 04059; RECORDED NOVEMBER 7, 2000, IN BOOK 20001107, INSTRUMENT NO. 00075; RECORDED MAY 22, 2001, IN BOOK 20010522, INSTRUMENT NO. 01895; RECORDED AUGUST 15, 2001, IN BOOK 20010815, INSTRUMENT NO. 01443; RECORDED AUGUST 27, 2001, IN BOOK 20010827, INSTRUMENT NO. 00590; AND RECORDED JUNE 14, 2011, IN BOOK 20110614, INSTRUMENT NO. 00406, OF OFFICIAL RECORDS

DRAWING INDEX

NO.	DWG	DESCRIPTION
1	CV-1	COVER SHEET
2	CV-2	GENERAL NOTES
3	CV-3	ABBREVIATIONS, LEGEND AND QUANTITIES
4	DM-1	DEMOLITION PLAN
5	HC-1	HORIZONTAL CONTROL PLAN 1
6	HC-2	HORIZONTAL CONTROL PLAN 2
7	HC-3	HORIZONTAL CONTROL PLAN 3
8	HC-4	HORIZONTAL CONTROL PLAN 4
9	HC-5	HORIZONTAL CONTROL PLAN 5
10	HC-6	HORIZONTAL CONTROL LINE AND CURVE TABLES
11	GP-1	GRADING PLAN 1
12	GP-2	GRADING PLAN 2
13	GP-3	GRADING PLAN 3
14	GP-4	GRADING PLAN 4
15	GP-5	GRADING PLAN 5
16	PP-5	ALTA PLAN AND PROFILE
17	SD-1	STORM DRAIN PLAN AND PROFILE 1
18	SD-2	STORM DRAIN PLAN AND PROFILE 2
19	SD-3	STORM DRAIN PLAN AND PROFILE 3
20	SD-4	STORM DRAIN PLAN AND PROFILE 4
21	SD-5	STORM DRAIN PLAN AND PROFILE 5
22	SD-6	STORM DRAIN PLAN AND PROFILE 6
23	SD-7	STORM DRAIN PLAN AND PROFILE 7
24	MU-1	MASTER UTILITY PLAN
25	UP-1	UTILITY PLAN 1
26	UP-2	UTILITY PLAN 2
27	UP-3	UTILITY PLAN 3
28	UP-4	UTILITY PLAN 4
29	UP-5	UTILITY PLAN 5
30	DT-1	DETAIL SHEET 1
31	DT-2	DETAIL SHEET 2
32	TR-1	ONSITE FIRE LANE, SIGNAGE AND STRIPING PLAN
33	TR-2	OFFSITE SIGNAGE AND STRIPING PLAN
34	TR-3	ALTA DRIVE/PROJECT DW TRAFFIC SIGNAL PLAN
35	TR-4	TRAFFIC SIGNAL SCHEDULES AND DETAILS

UTILITY/AGENCY APPROVALS

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

CENTRAL TELEPHONE CO, DBA CENTURYLINK — DATE

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

NV ENERGY — DATE

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.

SOUTHWEST GAS CORP. — DATE

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — 05-23-18 DATE

ALLEN PAVELKA, PE# 9029 — DATE
CITY ENGINEER/ACTING
CITY OF LAS VEGAS, NEVADA

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.

CLV BUILDING AND SAFETY DEPARTMENT

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE CITY OF LAS VEGAS PLANNING DEPARTMENT

CHRIS KNIGHT, DIRECTOR BUILDING AND SAFETY — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
PROJECT NO._____ DATE: _____
SHEETS: –
LVVWD APPROVED FIRE FLOW – GPM AT 20 PSI RESIDUAL

APPROVED FOR CONSTRUCTION

LAS VEGAS FIRE AND RESCUE, FIRE FLOW GPM AT 20 PSI RESIDUAL — DATE

H# –

CLV DWG# –

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SEA LEVEL DATUM	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2000 TO ALL SPOT ELEVATION TAGS.

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

ENGINEER

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

OWNER

RA SOUTHEAST LAND COMPANY LLC
9755 W CHARLESTON
LAS VEGAS, NV 89117

DEVELOPER

THE CALIDA GROUP
10777 W. TWAIN AVE., SUITE 115
LAS VEGAS, NV 89135
(702) 947-2000

STATE OF NEVADA — PROFESSIONAL ENGINEER — TODD N. KELLEY — No. 14711 — Exp. 9/30/2019 — CIVIL
DATE: 5-23-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 894-002
DESIGN: TNK
DRAWN: TNK
CHECK: TNK
PLOT DATE: 05-23-18
PLOT TIME: 08:44:12

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\GWS\Production\8942c001.dwg
Todd Kelley

THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

COVER SHEET

DRAWING
CV-1
1 OF 35 SHTS

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 WAY OF THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

CITY OF LAS VEGAS SEWER NOTES

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

REVISED 04/15/10

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

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.W.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 WHERE 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 40FT 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 503.2.1.1]
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF 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 IIS 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-EANDS 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

FLOOD ZONE NOTE

NO PORTION OF THE SITE FALLS WITHIN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA. SITE LOCATED ON PANEL 32003C2145F, DATED NOVEMBER 16, 2011. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN A ZONE X AND NOT LOCATED WITHIN A FEMA DESIGNATED 100-YEAR ZONE A OR SPECIAL FLOOD HAZARD AREA.

DEVIATION FROM STANDARDS

1. 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 "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM; SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANIT-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT-OF-WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED 4/15/10

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS.
2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC ENGINEER AND THE CITY ENGINEER.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.
4. ALL STREET LIGHTING CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE. WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO PB, IT SHALL HAVE MINIMUM OF 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TEFO PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE PLANS.
8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.
9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.
10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.
11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ANY NEW SERVICE REQUIREMENTS. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHT/S AND/OR SERVICE/S INSTALLED UNDER THIS PLAN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION. COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEFO) AT (702) 229-6331.

REVISED 04/15/10

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

LVVWD PROJECT # –

(Revised 01/09/2017)

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

ABBREVIATIONS

A	AIR
AB	AGGREGATE BASE
AC	ASPHALT CONCRETE, ACRE
ACP	ASBESTOS CEMENT PIPE
ADD'L	ADDITIONAL
A.E.	ACCESS EASEMENT
AP	ANGLE POINT
APN	ASSESSOR'S PARCEL NUMBER
APPROX	APPROXIMATELY
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AVE	AVENUE
AVAR	AIR VALVE, AIR RELEASE ASSEMBLY
AWWA	AMERICAN WATER WORKS ASSOCIATION
BC	BACK OF CURB
BCR	BEGIN CURB RETURN
BLM	BUREAU OF LAND MANAGEMENT
BLVD	BOULEVARD
BM	BENCHMARK
BO	BLOW-OFF
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BACK OF SIDEWALK
BWV	BACK WATER VALVE
C, ℄	CENTERLINE
C&G	CURB AND GUTTER
CATV	UNDERGROUND CABLE TV
CCBM	CLARK COUNTY BENCH MARK
CCPW	CLARK COUNTY PUBLIC WORKS
CCTV	CLOSED-CIRCUIT TELEVISION
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT
C.E.	COMMON ELEMENT
CFS	CUBIC FEET PER SECOND
CIP	CAPITAL IMPROVEMENTS PROJECT, CORRUGATED IRON PIPE
CIPM	CURED-IN-PLACE MANHOLE
CIPP	CURED-IN-PLACE PIPE
CIR	CIRCLE
CLR	CLEAR OR CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CLV	CITY OF LAS VEGAS
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CNLV	CITY OF NORTH LAS VEGAS
CO	CLEANOUT
CONC	CONCRETE
COND	CONDUIT
CONST	CONSTRUCT OR CONSTRUCTION
COORD	COORDINATE
COR	CORNER
CPEP	CORRUGATED POLYETHELYNE PIPE
CT	COURT
CY	CUBIC YARD(S)
Δ	DELTA
DCS	DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEM (LATEST EDITION)
D.E.	DRAINAGE EASEMENT
DEFL	DEFLECTION
DG	DESIGNED GRADE
D.I.	DROP INLET
DIA, ø	DIAMETER
DIP	DUCTILE IRON PIPE
DR	DRIVE
DS	DOWNSPOUT
DTL	DETAIL
DW	DRIVEWAY
DWG	DRAWING
E	EAST
E.A.E.	EMERGENCY ACCESS EASEMENT
ECR	END CURB RETURN
ELE,ELEC	ELECTRICAL
ELEV	ELEVATION
EP, EOP	EDGE OF PAVEMENT
ESMT	EASEMENT
EVC	END VERTICAL CURVE
EXIST,EX	EXISTING
EXP	EXPANSION JOINT
FC	FACE OF CURB
FF, FFE	FINISH FLOOR ELEVATION
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FO	FIBER OPTIC
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FINISH SURFACE
FT	FOOT/FEET
FTG	FOOTING
FUT	FUTURE
G	GAS
GA	GAGE, GUY ANCHOR
GB	GRADE BREAK
GND	GROUND
GRD	GRADE, GROUND
H, HGT	HEIGHT
HDWL	HEADWALL
HGL	HYDRAULIC GRADE LINE
HOA	HOME OWNERS ASSOCIATION
HORIZ	HORIZONTAL
HP	HIGH POINT, HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
IBC	INTERNATIONAL BUILDING CODE
INV	INVERT
INT	INTERIM
JT	JOINT
L	LENGTH
L, LT	LEFT
LF	LINEAR FEET
LIP	LIP OF GUTTER
LN	LANE
LP	LIGHT POLE
LSCP	LANDSCAPE
LVWD	LAS VEGAS VALLEY WATER DISTRICT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MLCP	MORTAR LINED AND COATED PIPE
MOD	MODIFY/MODIFIED
MON	MONUMENT
MPH	MILES PER HOUR
N	NORTH
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
NO	NUMBER
NOSHA	STATE OF NEVADA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
NPC	NEVADA POWER COMPANY
NTS	NOT TO SCALE
OC	ON CENTER
OHC	OVERHEAD COX COMMUNICATION
OHP	OVERHEAD POWER LINE
P.A.E.	PEDESTRIAN ACCESS EASEMENT
PB	PULL BOX
PC	POINT OF CURVE, PRESSURE CLASS
PCC	POINT OF COMPOUND CURVE
P.D.E.	PUBLIC DRAINAGE EASEMENT
PE	PROJECT ENGINEER OR POLYETHYLENE
PED	PEDESTRIAN
PGL	PROFILE GRADE LINE
PH	POTHOLE
PI	POINT OF INTERSECTION
PIV	POST INDICATOR VALVE
P/L	PROPERTY LINE
PLCP	POLYURETHANE LINED AND COATED STEEL PIPE
PMF	PAVEMENT MARKING FILM
POB	POINT OF BEGINNING
POC	POINT ON CURVE
P.O.C.	POINT OF CONNECTION
POT	POINT ON TANGENT
PP	POWER POLE
PROP	PROPOSED
PRC	POINT OF REVERSE CURVE
P.S.E.	PUBLIC SEWER EASEMENT TO BE PRIVATELY MAINTAINED BY HOA
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
P.U.E.	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	PRIVATE
PZ	PRESSURE ZONE
R, RAD	RADIAL, RADIUS
R, RT	RIGHT
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REC	RECTANGULAR
REF	REFERENCE
REINF	REINFORCED
REQD	REQUIRED
RIM	TOP OF RIM ELEVATION
RND	ROUND
ROW,R/W	RIGHT OF WAY
RP	RADIUS POINT
RPM	RAISED PAVEMENT MARKERS
RPPA	REDUCED PRESSURE PRINCIPAL ASSEMBLY
RSGV	RESILIENT SEAT GATE VALVE
S	SEWER, SOUTH
SCH	SCHEDULE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SECT	SECTION
SF	SQUARE FOOT/FEET
SHLDR	SHOULDER
SHT	SHEET
SL	STREET LIGHT
SP	SERVICE POINT
SQ	SQUARE
SR	SEWER RECLAIM MAIN
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
STA	STATION
ST	STREET
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURE
SVZ	SIGHT VISIBILITY ZONE
SW	SIDEWALK
SWG	SOUTHWEST GAS
T	TELEPHONE OR TOP
TAN	TANGENT
TB	TOP OF BERM
TC	TOP OF CURB
TCE	TEMPORARY CONSTRUCTION ESMT
TEL,TELE	TELEPHONE
TEMP	TEMPORARY
TF	TOP OF FOOTING
TG	TOP OF GRATE
TMH	TOP OF MANHOLE
TOP	TOP OF PIPE
TP	TELEPHONE POLE
TRANS	TRANSITION
TS	TRAFFIC SIGNAL
TW	TOP OF RETAINING WALL
TYP,(TYP)	TYPICAL
UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS (LATEST EDITION)
UG	UNDERGROUND
ULT	ULTIMATE
USDCCA	UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY AREA, NEVADA (LATEST EDITION)
UT	UNDERGROUND TELEPHONE
VAR	VARIABLE/VARIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VG	VALLEY GUTTER
VOL	VOLUME
W	WATER, WEST, WATT
W/	WITH
W.I.	WROUGHT IRON
WS	WATER SUPPLY
WT	WEIGHT
WTR	WATER
XING	CROSSING
YD	YARD, YARD DRAIN
Z	PRESSURE ZONE

LEGEND

(1) LOT NUMBER	[54.10] FUTURE ELEVATION
(1) BLOCK NUMBER	59.33 TC or FG — GRADE BREAK ELEVATION
PAD= 00.0 / F.F.= 00.0 — PAD ELEVATION FINISH FLOOR ELEVATION	56.22 TC or FG — PROPOSED ELEVATION
PAD= (00.0) / F.F.= (00.0) — EXISTING PAD ELEVATION EXIST. FINISH FLOOR ELEV.	(56.21) — EXISTING ELEVATION
SCARP	RIGHT-OF-WAY
4510 — EXISTING CONTOUR (5' INTERVAL)	PROPERTY LINE
EXISTING CONTOUR (1' INTERVAL)	CENTER LINE
CONCRETE DRIVEWAY	RETAINING WALL
TF — TOP OF FOOTING	KNEE WALL
TW — TOP OF RETAINING WALL	PERIMETER WALL
SDMH — STORM DRAIN MANHOLE	STORM DRAIN LINE
SVZ - SIGHT VISIBILITY ZONE, NO STRUCTURES/ LANDSCAPING TALLER THAN 24"	SIDEWALK
	DITCH OR SWALE
	CURB TRANSITION AT SIDEWALK RAMP (ROLL CURB TO "L" CURB)

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

APPROVED FOR CONSTRUCTION

LAS VEGAS FIRE AND RESCUE, FIRE FLOW GPM AT 20 PSI RESIDUAL DATE

H# –

CLV DWG# –

ENGINEER - STATE OF NEVADA - PROFESSIONAL
TODD N. KELLEY
No. 14711
Exp. 6/30/2019
DATE: 5-25-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 894-002

DESIGN: TNK
DRAWN: TNK
CHECK: TNK
PLOT DATE: 05-23-18
PLOT TIME: 08:44:23

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

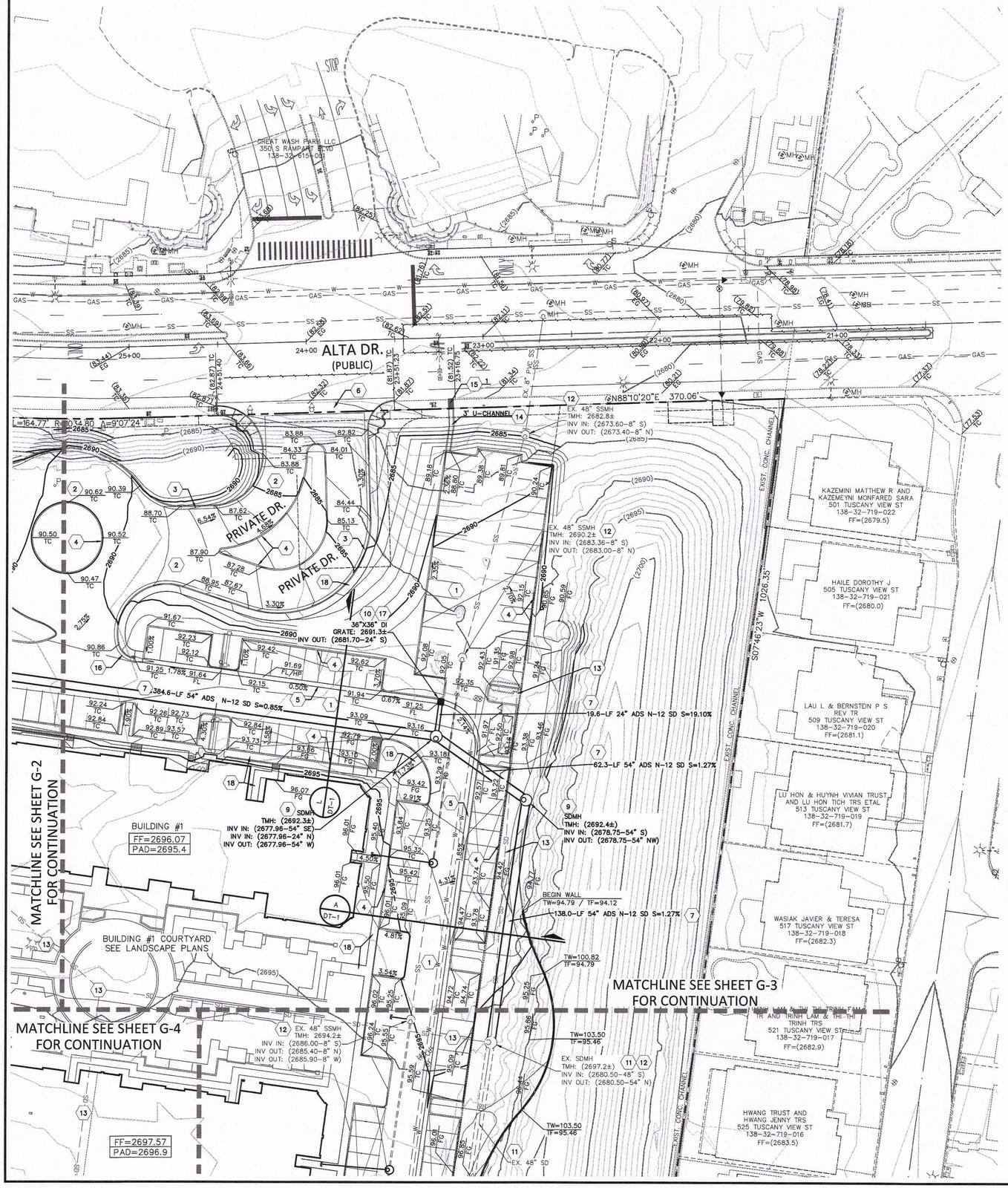
F:\Projects\890\894-002\DWG\Production\8942c001.dwg
Todd Kelley

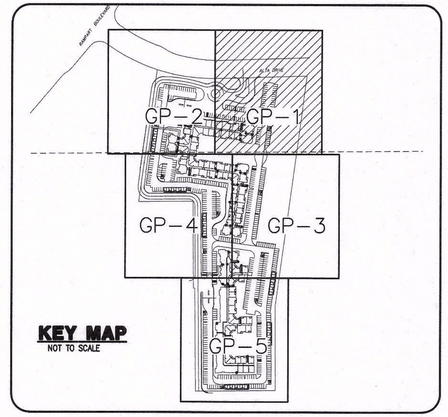
THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

ABBREVIATIONS, LEGEND AND QUANTITIES

DRAWING
CV-3
3 OF 35 SHTS





KEY MAP
NOT TO SCALE

NORTH

30' 0' 15' 30'

SCALE: 1" = 30'

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

STORM DRAIN NOTES

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONTRACTOR TO CLEAN-OUT AND CONDUCT A FLOW TEST OF THE EXISTING STORM DRAIN SYSTEM PRIOR TO ROUGH GRADING. NOTIFY ENGINEER OF ANY FLOW ISSUES.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 2' OR 4' CONC. U-CHANNEL PER DETAIL O SHT DT-1. SEE PLAN FOR SIZE.
15. CONSTRUCT SIDEWALK UNDERDRAIN(S) PER USDCCA DWG NO. 236. SEE PLAN FOR NUMBER.
16. CONSTRUCT L-CURB TO A-CURB TRANSITION PER DETAIL R SHT. DT-1.
17. PLACE STORM WATER QUALITY MANAGEMENT STAMP PER USDCCA DWG. #421 IN CONC. PAD NEXT TO INLET.
18. CONSTRUCT 4' CONC. SIDEWALK
19. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
20. INSTALL TYPE I SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

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

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

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

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# –

CLV DWG# –

STATE OF NEVADA PROFESSIONAL ENGINEER
TODD N. KELLEY
No. 14711
Exp. 9/30/2019
CIVIL

DATE: 5-28-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

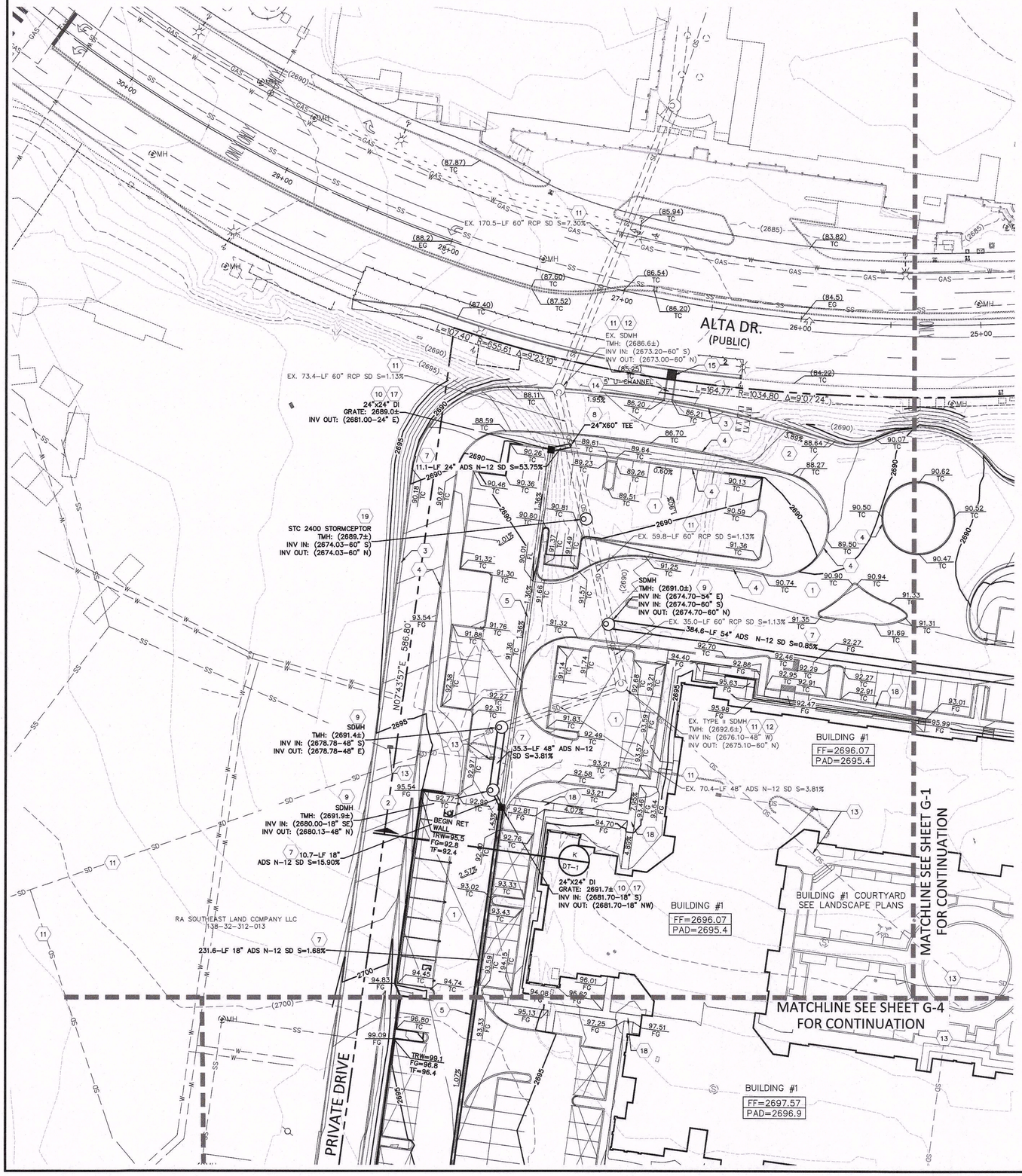
PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:46:30

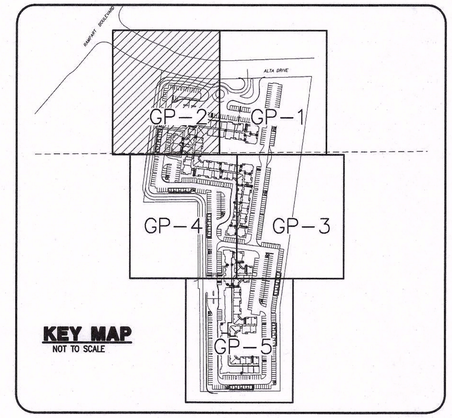
GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\8942d01.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
GRADING PLAN 1

DRAWING
GP-1
11 OF 35 SHTS





NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

STORM DRAIN NOTES

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONTRACTOR TO CLEAN-OUT AND CONDUCT A FLOW TEST OF THE EXISTING STORM DRAIN SYSTEM PRIOR TO ROUGH GRADING. NOTIFY ENGINEER OF ANY FLOW ISSUES.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 2' OR 4' CONC. U-CHANNEL PER DETAIL O SHT DT-1. SEE PLAN FOR SIZE.
15. CONSTRUCT SIDEWALK UNDERDRAIN(S) PER USDCCA DWG NO. 236. SEE PLAN FOR NUMBER.
16. CONSTRUCT L-CURB TO A-CURB TRANSITION PER DETAIL R SHT. DT-1.
17. PLACE STORM WATER QUALITY MANAGEMENT STAMP PER USDCCA DWG. #421 IN CONC. PAD NEXT TO INLET.
18. CONSTRUCT 4' CONC. SIDEWALK
19. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
20. INSTALL TYPE I SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION	ELEVATION	DESCRIPTION
QLVOO 32C4	S 820.819 (M) E T 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

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

H# -

CLV DWG# -

PROFESSIONAL ENGINEER - STATE OF NEVADA - TODD N. KELLEY - No. 14711 - 9/30/2019 - CIVIL - DATE: 5-23-2018

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	AGEN APP	DATE	GOW APP	DATE

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:46:50

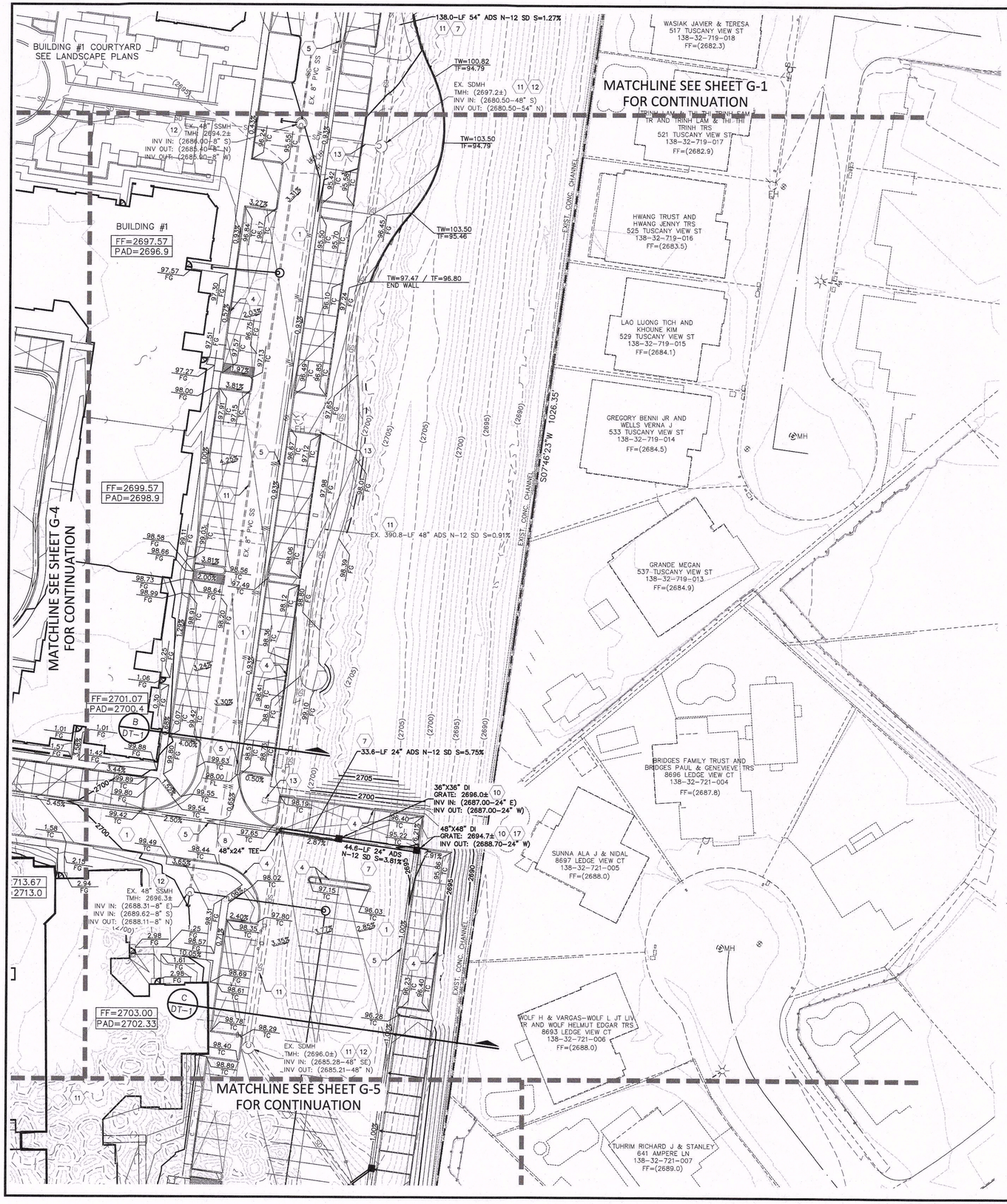
GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
F:\Projects\800\894-002\DWG\Production\894gcd12.dwg
Todd Kelley

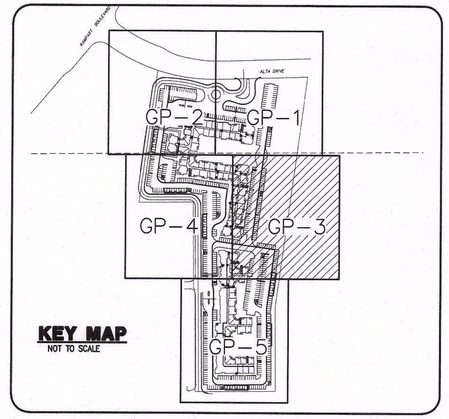
THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

GRADING PLAN 2

DRAWING GP-2
12 OF 35 SHTS





KEY MAP
NOT TO SCALE

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

STORM DRAIN NOTES

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONTRACTOR TO CLEAN-OUT AND CONDUCT A FLOW TEST OF THE EXISTING STORM DRAIN SYSTEM PRIOR TO ROUGH GRADING. NOTIFY ENGINEER OF ANY FLOW ISSUES.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 2' OR 4' CONC. U-CHANNEL PER DETAIL O SHT DT-1. SEE PLAN FOR SIZE.
15. CONSTRUCT SIDEWALK UNDERDRAIN(S) PER USDCCA DWG NO. 236. SEE PLAN FOR NUMBER.
16. CONSTRUCT L-CURB TO A-CURB TRANSITION PER DETAIL R SHT. DT-1.
17. PLACE STORM WATER QUALITY MANAGEMENT STAMP PER USDCCA DWG. #421 IN CONC. PAD NEXT TO INLET.
18. CONSTRUCT 4' CONC. SIDEWALK
19. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
20. INSTALL TYPE I SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

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

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

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

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# –

CLV DWG# –

ENGINEER - STATE OF NEVADA
TODD N. KELLEY
Exp. 6/30/2018
No. 14711
PROFESSIONAL
DATE: 5-23-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 894-002

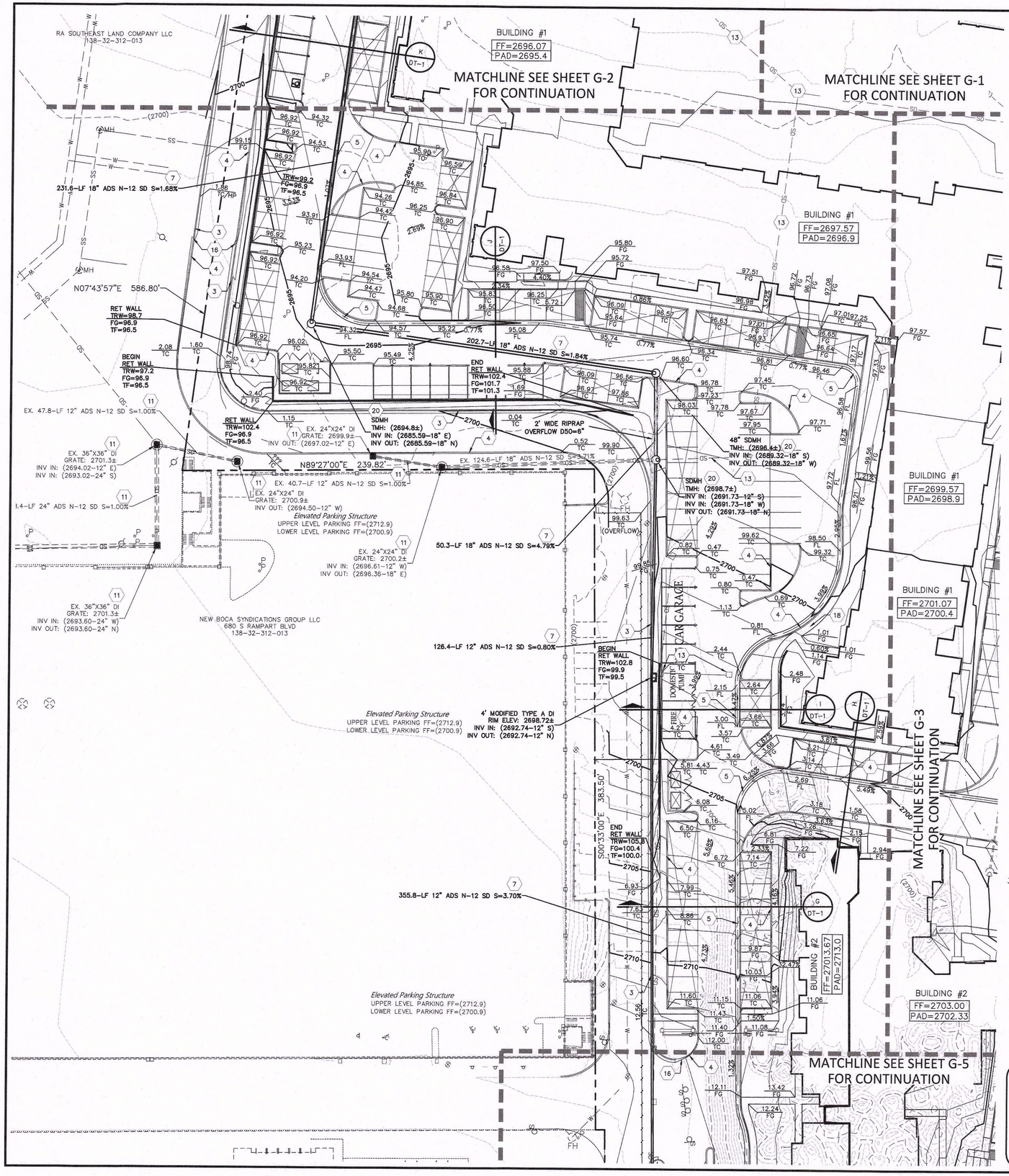
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:47:13

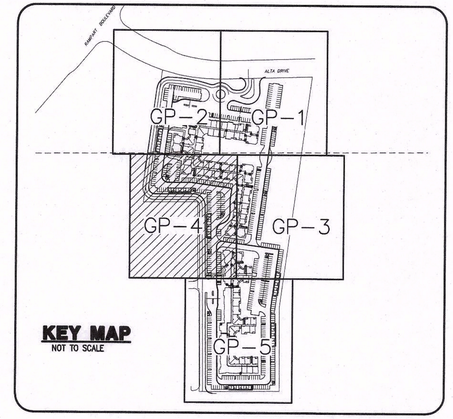
GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894gp03.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
GRADING PLAN 3

DRAWING
GP-3
13 OF 35 SHTS





KEY MAP
NOT TO SCALE

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

STORM DRAIN NOTES

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONTRACTOR TO CLEAN-OUT AND CONDUCT A FLOW TEST OF THE EXISTING STORM DRAIN SYSTEM PRIOR TO ROUGH GRADING. NOTIFY ENGINEER OF ANY FLOW ISSUES.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT-1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT-2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 2' OR 4' CONC. U-CHANNEL PER DETAIL O SHT DT-1. SEE PLAN FOR SIZE.
15. CONSTRUCT SIDEWALK UNDERDRAIN(S) PER USDCCA DWG NO. 236. SEE PLAN FOR NUMBER.
16. CONSTRUCT L-CURB TO A-CURB TRANSITION PER DETAIL R SHT. DT-1.
17. PLACE STORM WATER QUALITY MANAGEMENT STAMP PER USDCCA DWG. #421 IN CONC. PAD NEXT TO INLET.
18. CONSTRUCT 4' CONC. SIDEWALK
19. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
20. INSTALL TYPE I SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	S E T	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# -

CLV DWG# -

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

STATE OF NEVADA
PROFESSIONAL ENGINEER
TODD N. KELLEY
No. 14711
DATE: 5-29-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	AGEN APP	DATE	CCW APP

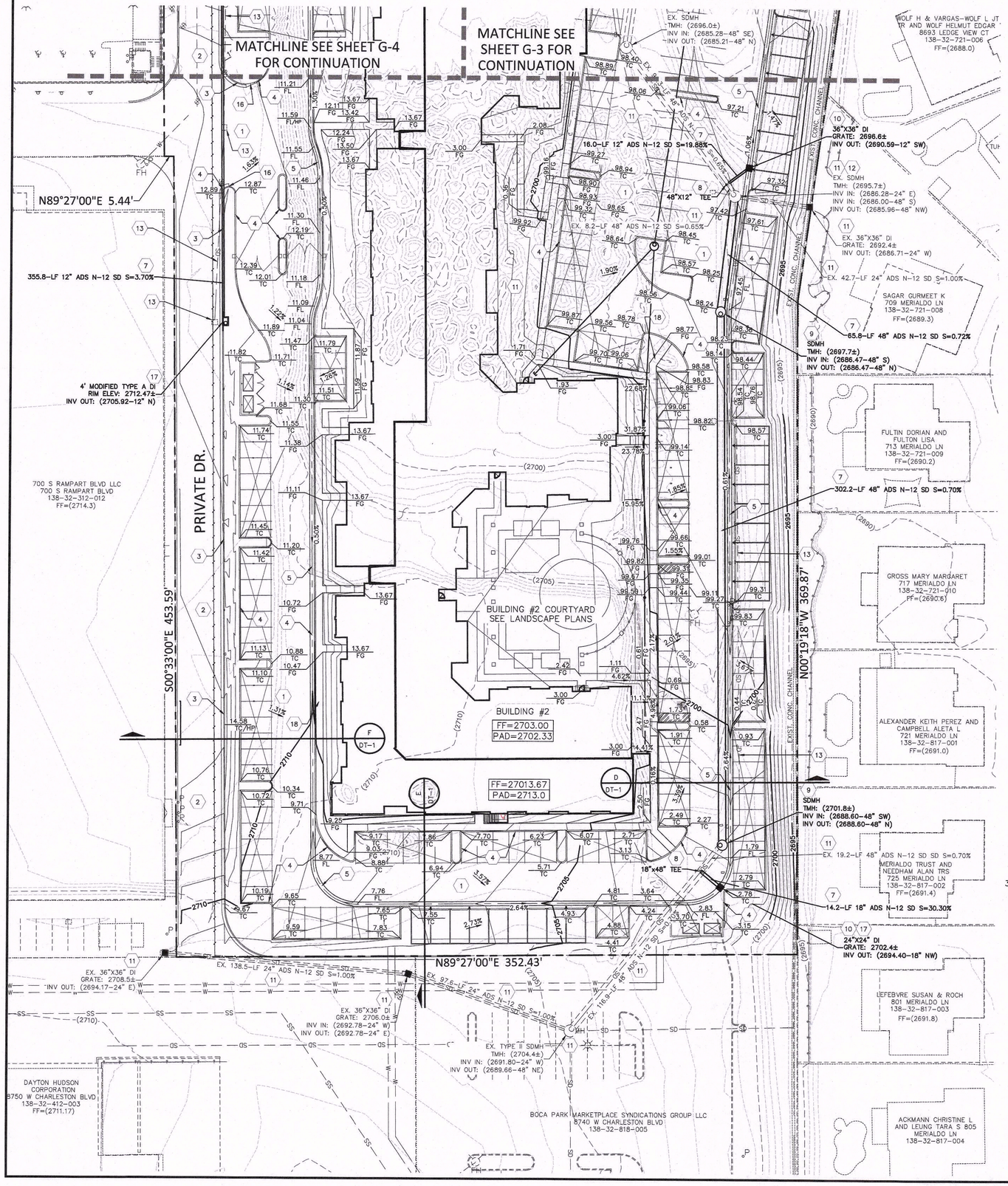
PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:47:35

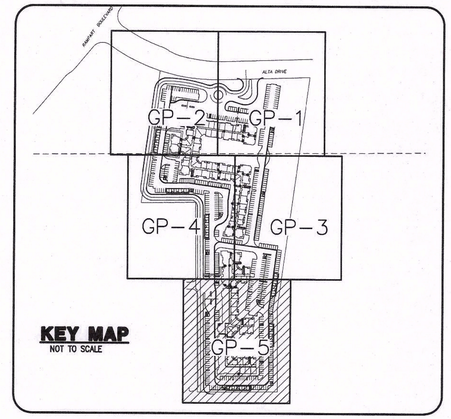
GCW
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
ENGINEERS \ SURVEYORS

F:\Projects\800\894-002\DWG\Production\89420014.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
GRADING PLAN 4

DRAWING
GP-4
14 OF 35 SHTS





KEY MAP
NOT TO SCALE

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

STORM DRAIN NOTES

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONTRACTOR TO CLEAN–OUT AND CONDUCT A FLOW TEST OF THE EXISTING STORM DRAIN SYSTEM PRIOR TO ROUGH GRADING. NOTIFY ENGINEER OF ANY FLOW ISSUES.

CONSTRUCTION NOTES

GRADING

1. CONSTRUCT 2" AC OVER 4" TYPE II AB.
2. CONSTRUCT 3" AC OVER 4" TYPE II AB OVER 6" TYPE I AB 95% COMPACTION.
3. CONSTRUCT 24" L TYPE CURB AND GUTTER PER USDCCA DWG NO. 216.
4. CONSTRUCT "A" CURB PER PER USDCCA DWG NO. 219.
5. CONSTRUCT 30" VALLEY GUTTER PER DETAIL I SHT DT–1.
6. CONSTRUCT 8' CROSS GUTTER PER USDCCA DWG NO. 228.
7. INSTALL ADS N–12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
8. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
9. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
10. CONSTRUCT JENSEN PRECAST SD DRAIN INLET PER DETAIL A SHT DT–2 WITH TRAFFIC FRAME AND GRATE. SEE PLAN FOR SIZE, USE EXTENSIONS AS NEEDED.
11. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
12. ADJUST TO NEW FINISH GRADE.
13. ABANDON EXISTING STORM DRAIN STRUCTURE.
14. CONSTRUCT 2' OR 4' CONC. U–CHANNEL PER DETAIL O SHT DT–1. SEE PLAN FOR SIZE.
15. CONSTRUCT SIDEWALK UNDERDRAIN(S) PER USDCCA DWG NO. 236. SEE PLAN FOR NUMBER.
16. CONSTRUCT L–CURB TO A–CURB TRANSITION PER DETAIL R SHT. DT–1.
17. PLACE STORM WATER QUALITY MANAGEMENT STAMP PER USDCCA DWG. #421 IN CONC. PAD NEXT TO INLET.
18. CONSTRUCT 4' CONC. SIDEWALK
19. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT–2.
20. INSTALL TYPE I SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE–OBSERVED 2005–2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

DRAINAGE CERTIFICATION

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

TODD N. KELLEY P.E. 14711 — DATE

H# – | CLV DWG# –

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

STATE OF NEVADA — PROFESSIONAL ENGINEER
TODD N. KELLEY
No. 14711
DATE: 5-23-2018

NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

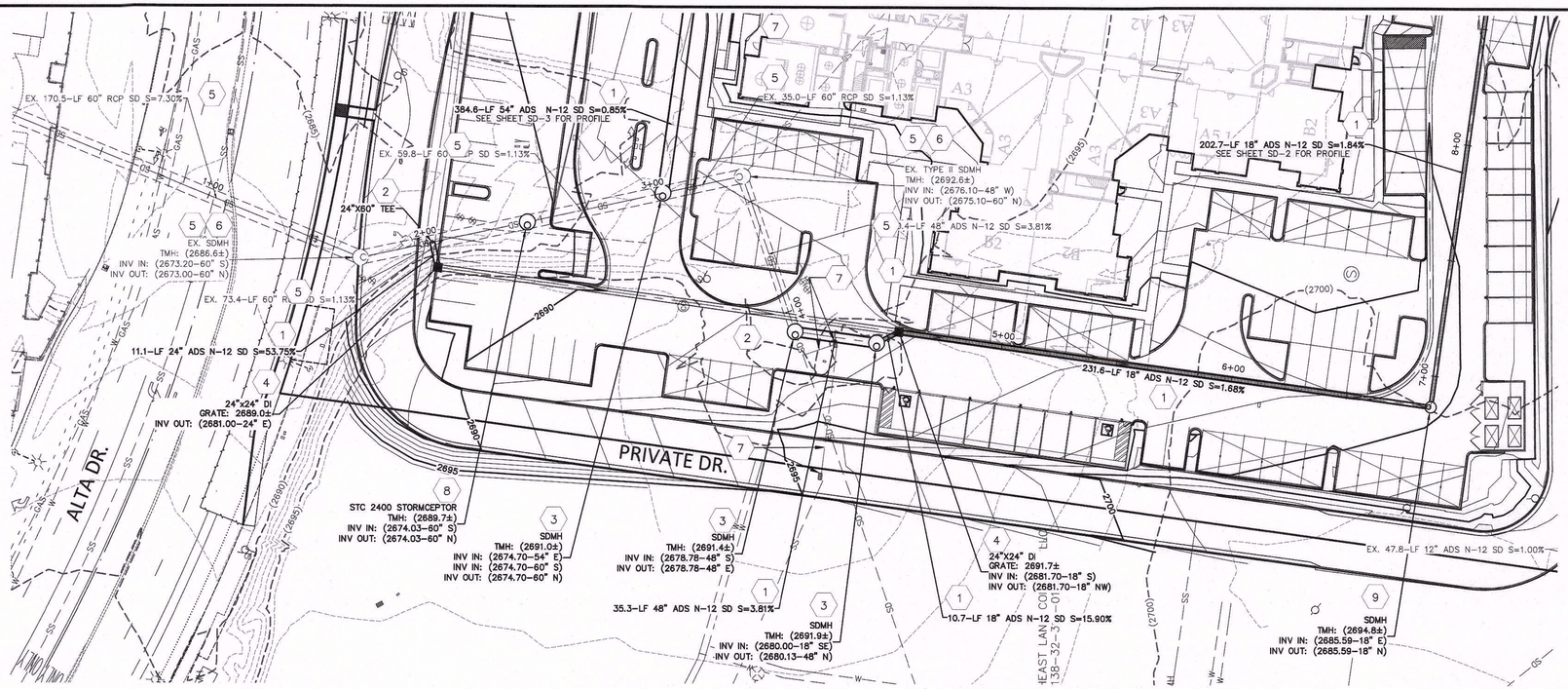
PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05–23–18
PLOT TIME: 08:47:53

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894–002\DWG\Production\894z015.dwg
Todd Kelley

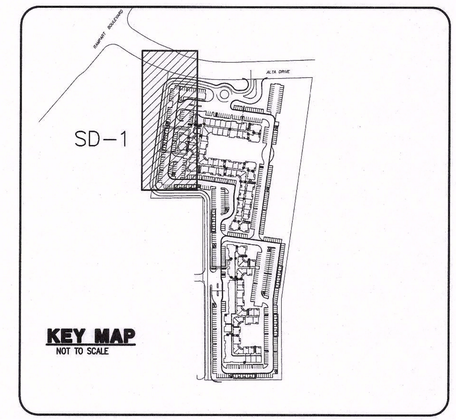
THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
GRADING PLAN 5

DRAWING
GP–5
15 OF 35 SHTS

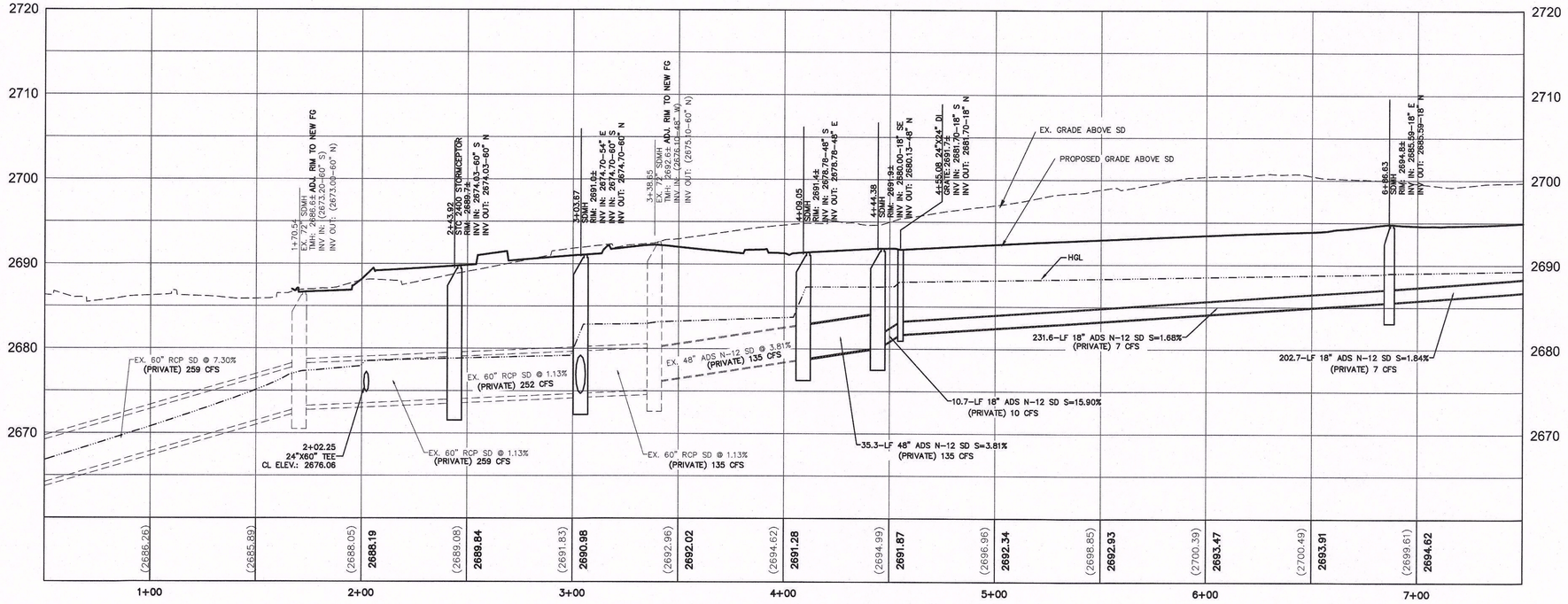


SD-1 PLAN VIEW

SCALE: 1"=30' HORIZONTAL



KEY MAP
NOT TO SCALE



SD-1 PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT JENSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D-2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.
8. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
9. INSTALL TYPE 1 SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	NGVD 29	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# -

CLV DWG# -

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

ENGINEER - STATE OF NEVADA
PROFESSIONAL
TODD N. KELLEY
Exp. 6/30/2019
CIVIL
No. 14711
DATE: 5-23-2018

NOT FOR CONSTRUCTION

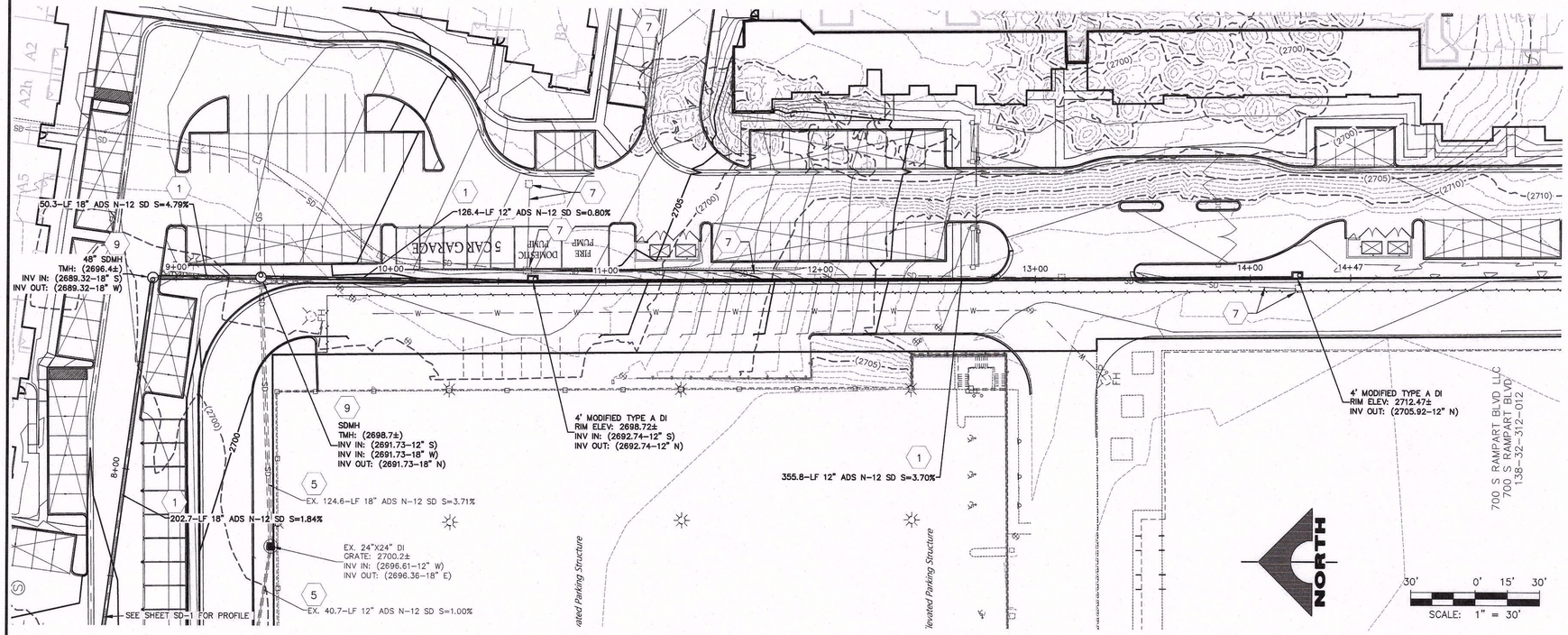
REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:49:52

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
F:\Projects\800\894-002\LWG\Production\8942c017.dwg
Todd Kelley

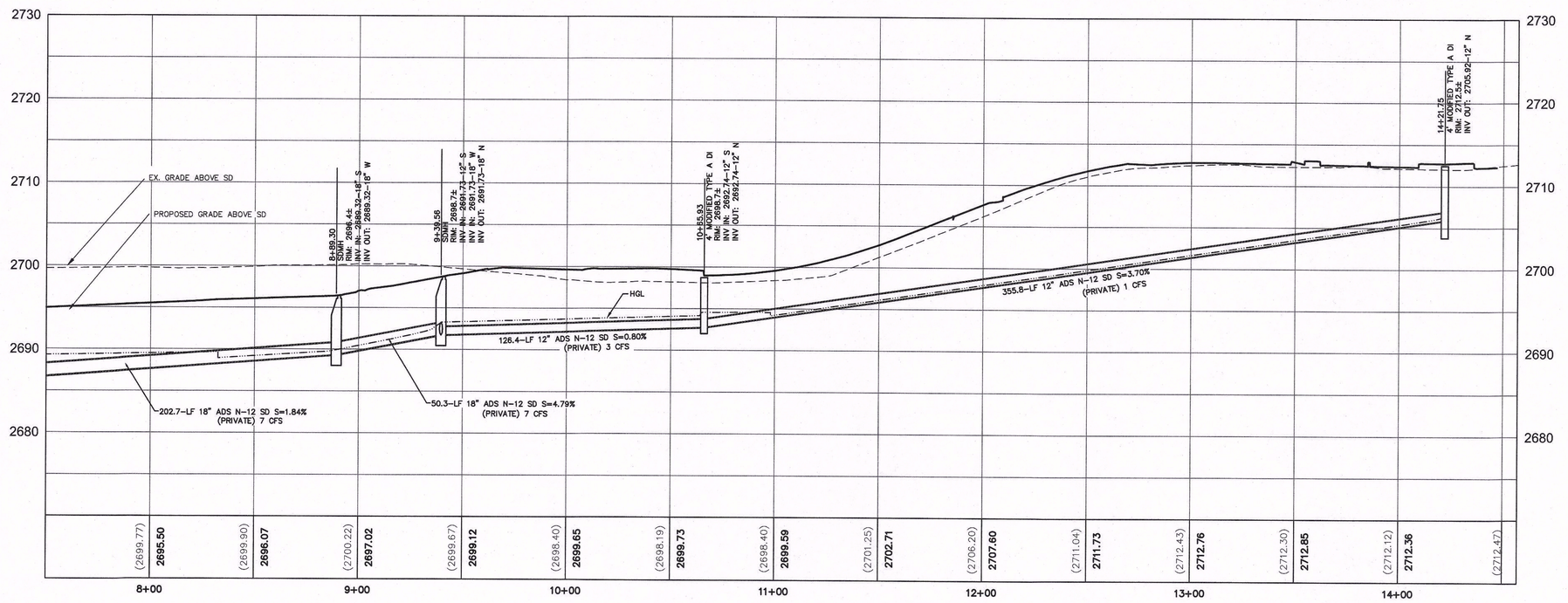
THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
STORM DRAIN PLAN AND PROFILE 1

DRAWING
SD-1
17 OF 35 SHTS



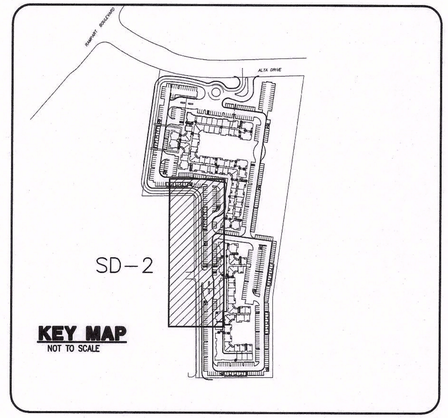
SD-2 PLAN VIEW

SCALE: 1"=30' HORIZONTAL



SD-2 PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



KEY MAP
NOT TO SCALE

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

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N–12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT 4'MSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D–2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.
8. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT–2.
9. INSTALL TYPE 1 SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE–OBSERVED 2005–2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# –

CLV DWG# –

STATE OF NEVADA — PROFESSIONAL ENGINEER — TODD N. KELLEY — No. 14711 — Exp. 9/30/2019 — Civil
DATE: 5-23-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:50:14

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

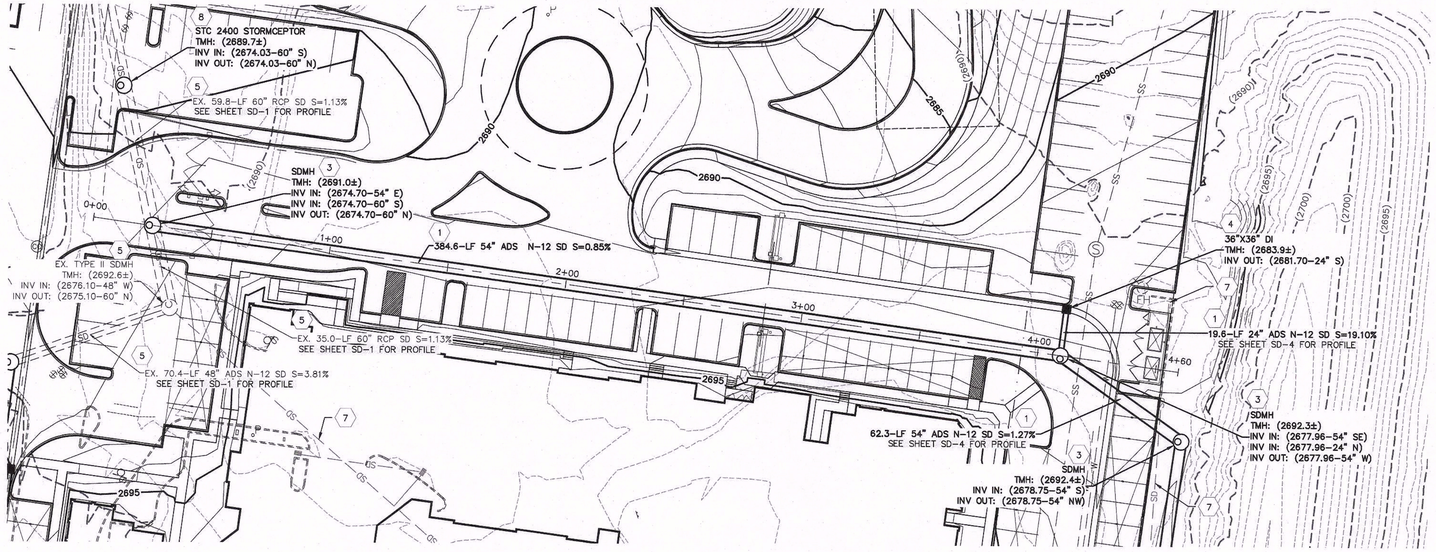
F:\Projects\800\894-002\DWG\Production\894-2018.dwg
Todd Kelley

THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

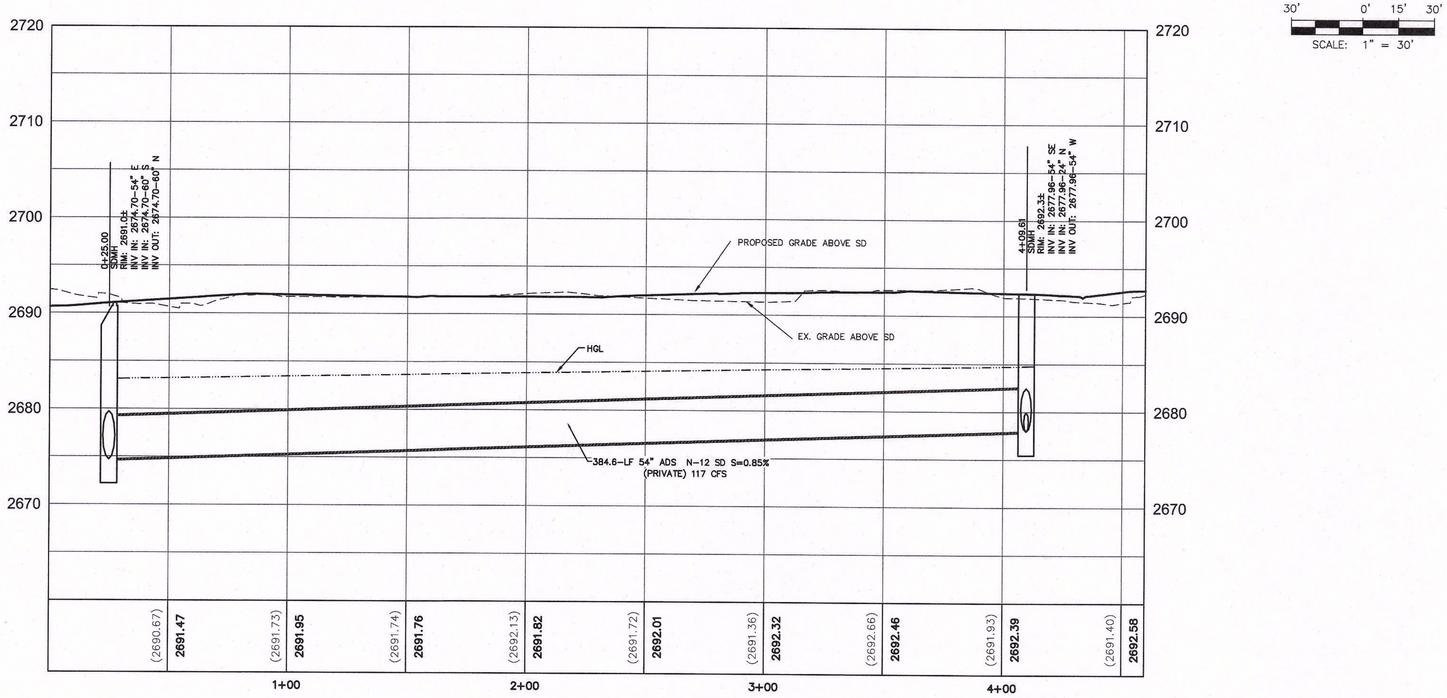
STORM DRAIN PLAN AND PROFILE 2

DRAWING
SD-2
18 OF 35 SHTS



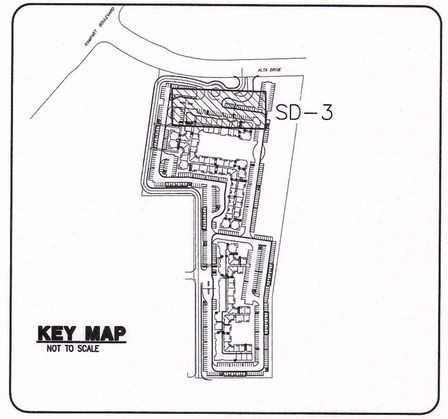
SD-3 PLAN VIEW

SCALE: 1"=30' HORIZONTAL



SD-3 PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



NORTH

30' 0' 15' 30'
SCALE: 1" = 30'

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

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT JENSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D-2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.
8. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
9. INSTALL TYPE 1 SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SEA LEVEL	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# –

CLV DWG# –

STATE OF NEVADA PROFESSIONAL ENGINEER TODD N. KELLEY No. 14711 exp. 9/30/2019 Civil
DATE: 5-23-2018
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

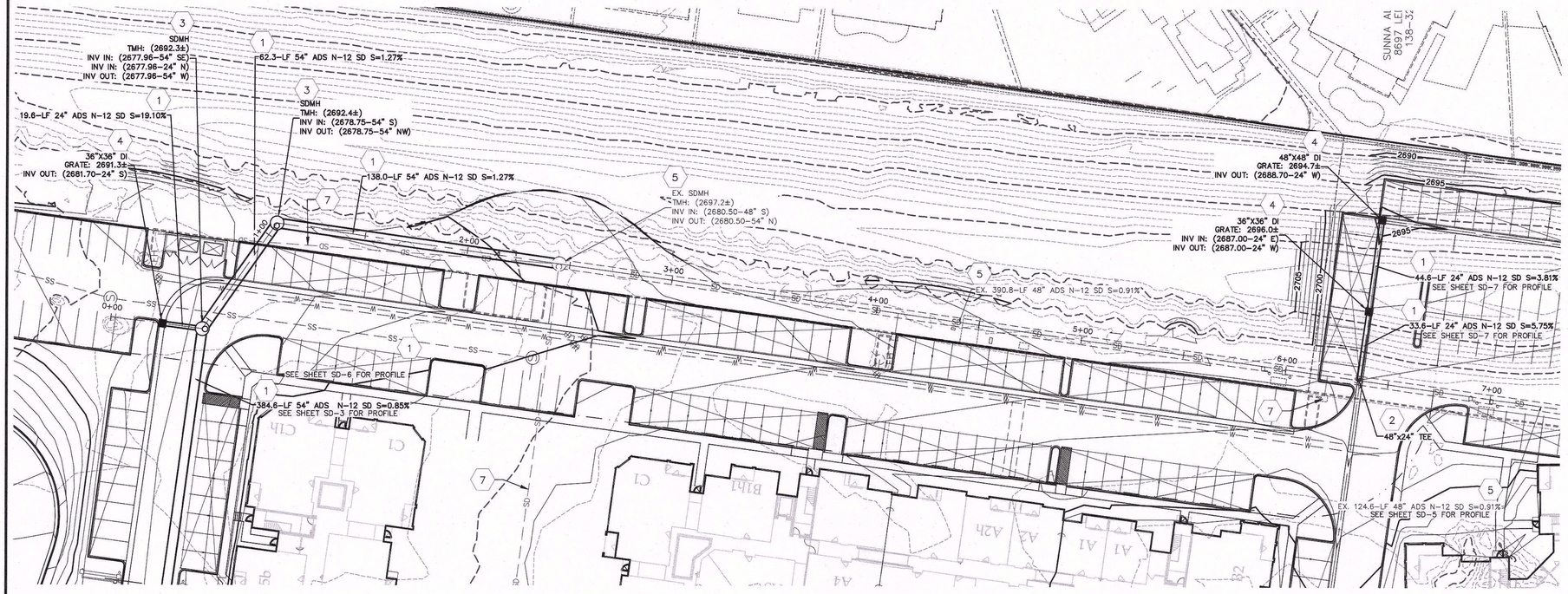
PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:50:33

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\SD402c018.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
STORM DRAIN PLAN AND PROFILE 3

DRAWING
SD-3
19 OF 35 SHTS



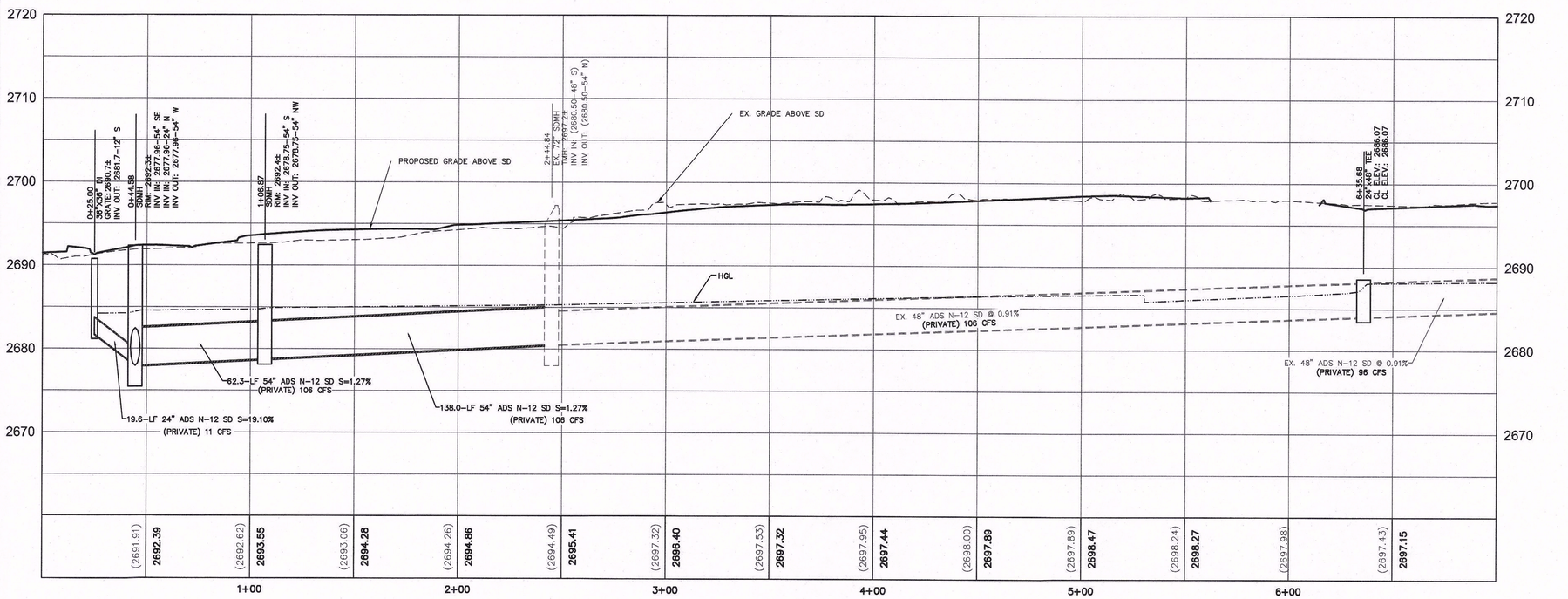
SD-4 PLAN VIEW

SCALE: 1"=30' HORIZONTAL

NORTH

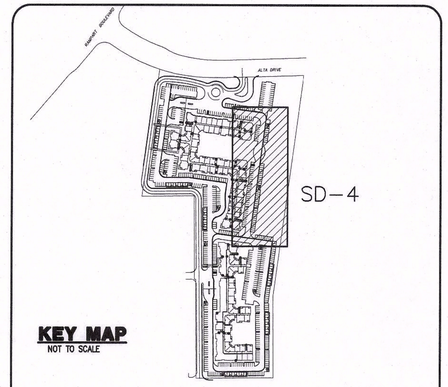
30' 0' 15' 30'

SCALE: 1" = 30'



SD-4 PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



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

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N–12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT JENSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D–2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.
8. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT–2.
9. INSTALL TYPE 1 SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE–OBSERVED 2005–2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# –

CLV DWG# –

STATE OF NEVADA
PROFESSIONAL ENGINEER
TODD N. KELLEY
No. 14711
DATE: 5-23-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE AGEN APP	DATE GOW APP

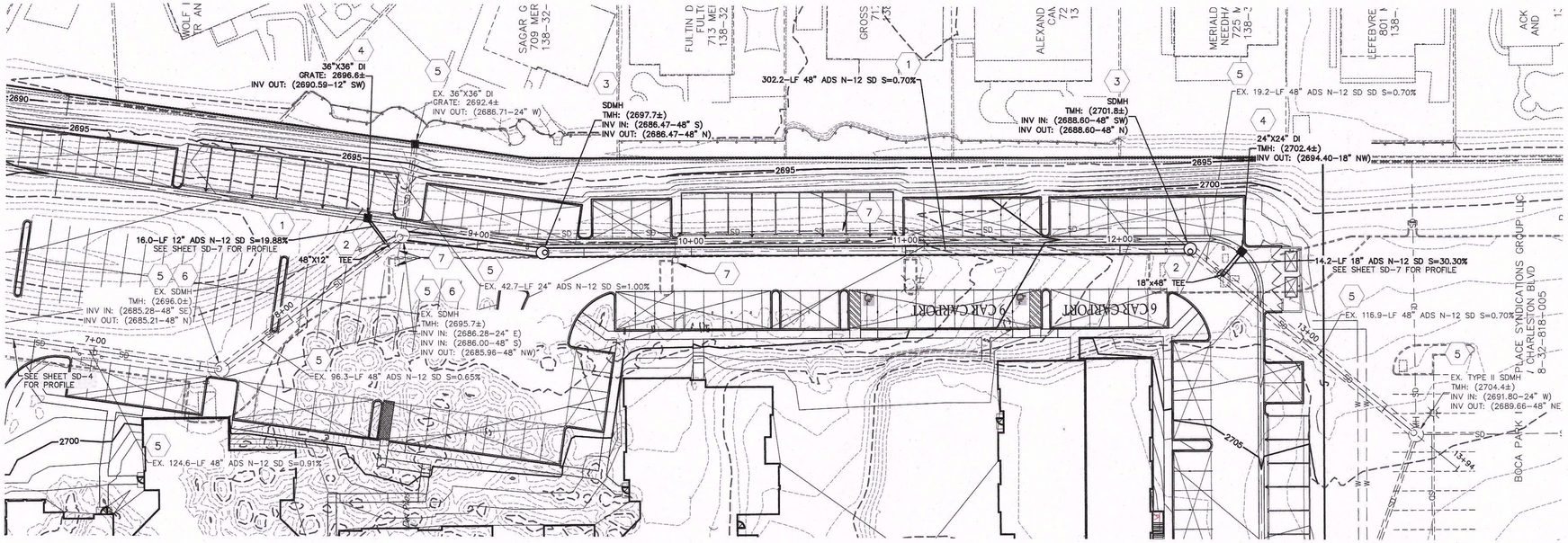
PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:50:54

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\$8942020.dwg
Todd Kelley

THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
STORM DRAIN PLAN AND PROFILE 4

DRAWING
SD-4
20 OF 35 SHTS



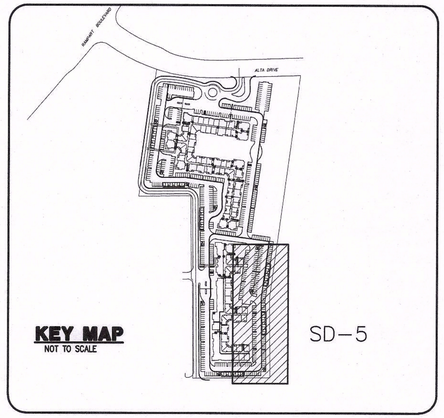
SD-5 PLAN VIEW

SCALE: 1"=30' HORIZONTAL

NORTH

30' 0' 15' 30'

SCALE: 1" = 30'



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

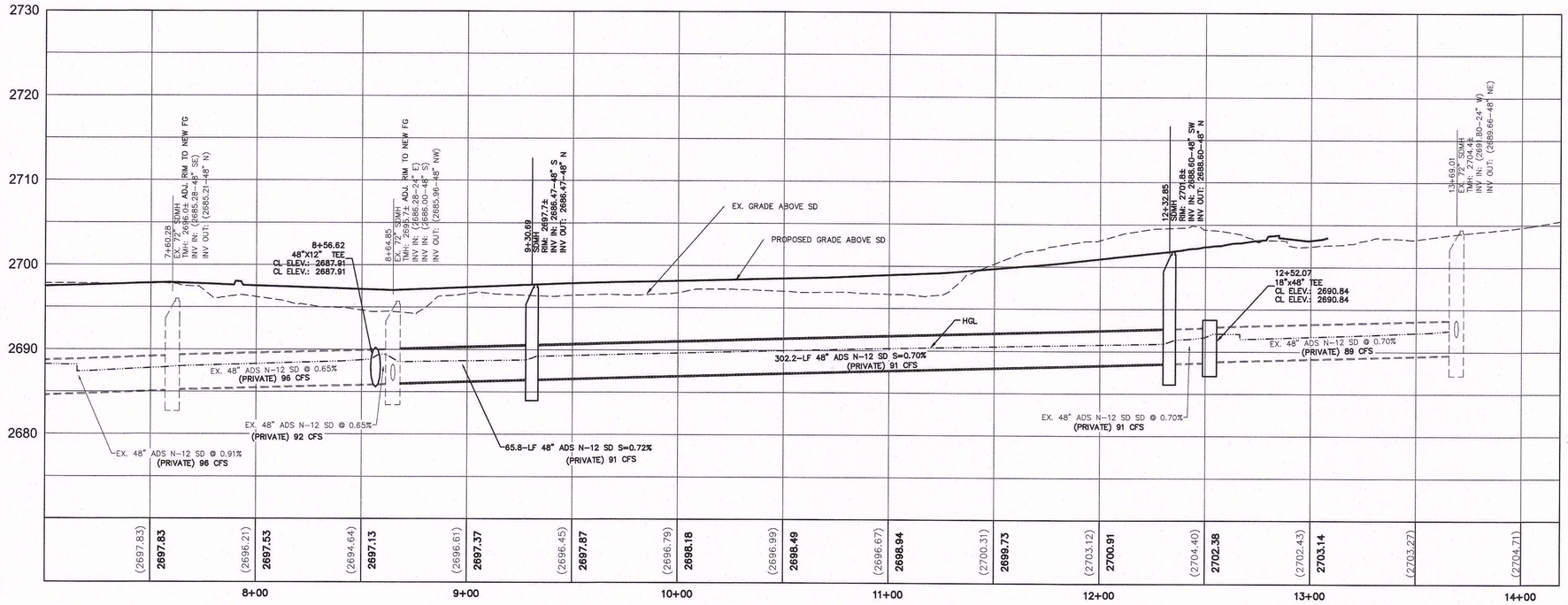
AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.



SD-5 PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT JENSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D-2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.
8. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
9. INSTALL TYPE 1 SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SET	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# –

CLV DWG# –

NOT FOR CONSTRUCTION

PROFESSIONAL ENGINEER STATE OF NEVADA
TODD N. KELLEY
No. 14711
Exp. 9/30/2019
CIVIL
DATE: 5-23-2018

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GOW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:51:14

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

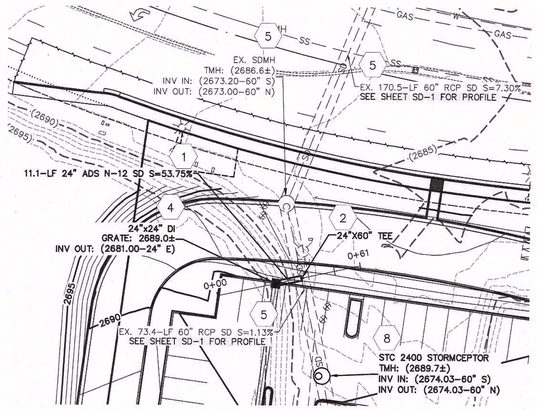
F:\Projects\800\804-002\DWG Production\8942c021.dwg
Todd Kelley

THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

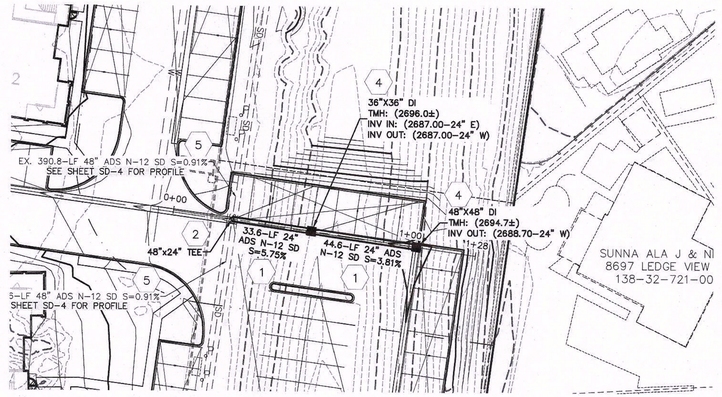
STORM DRAIN PLAN AND PROFILE 5

DRAWING
SD-5
21 OF 35 SHTS



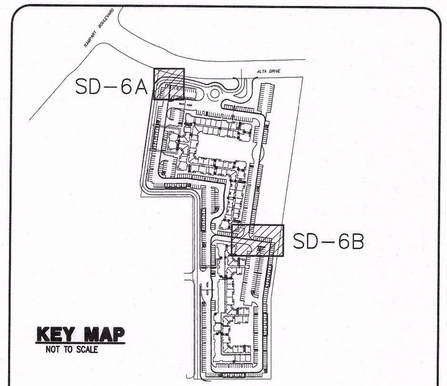
SD-6A PLAN VIEW

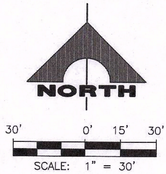
SCALE: 1"=30' HORIZONTAL

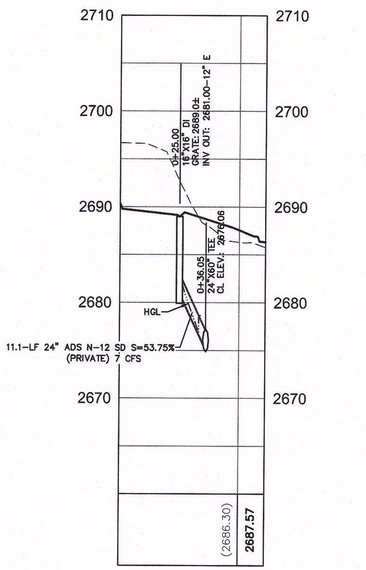


SD-6B PLAN VIEW

SCALE: 1"=30' HORIZONTAL

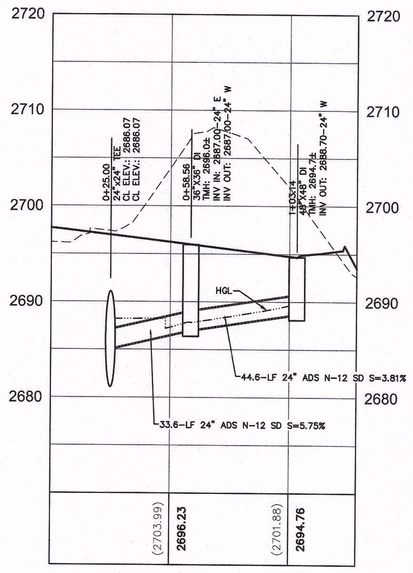






SD-6A PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



SD-6B PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL

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

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

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

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N-12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT JENSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D-2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.
8. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT-2.
9. INSTALL TYPE 1 SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	S T	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE-OBSERVED 2005-2007)
BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# –

CLV DWG# –

STATE OF NEVADA
PROFESSIONAL ENGINEER
TODD N. KELLEY
Exp. 6/30/2019
No. 14711
DATE: 5-23-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION
	DATE	AGEN APP
	DATE	GCW APP

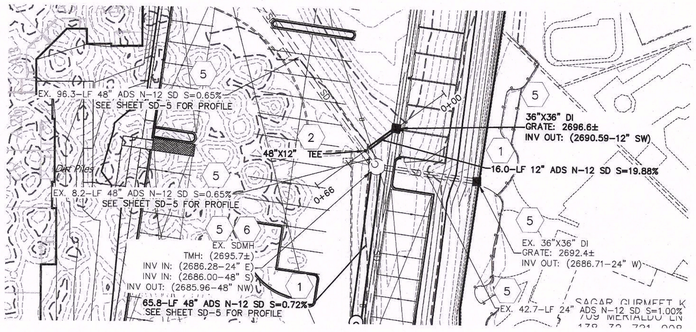
PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:51:39

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\894-002\DWG\Production\894gcd22.dwg
Todd Kelley

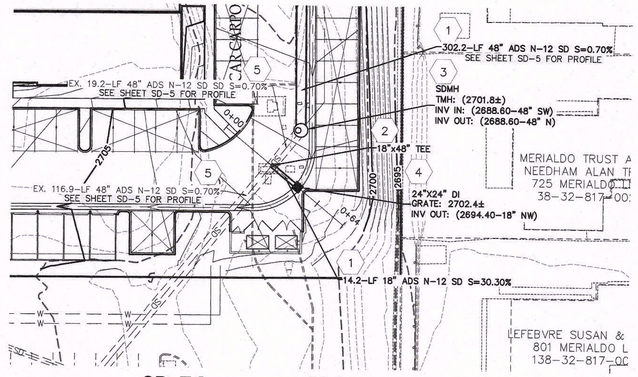
THE CALIDA GROUP
ELYSIAN AT RENAISSANCE
STORM DRAIN PLAN AND PROFILE 6

DRAWING
SD-6
22 OF 35 SHTS



SD-7B PLAN VIEW

SCALE: 1"=30' HORIZONTAL

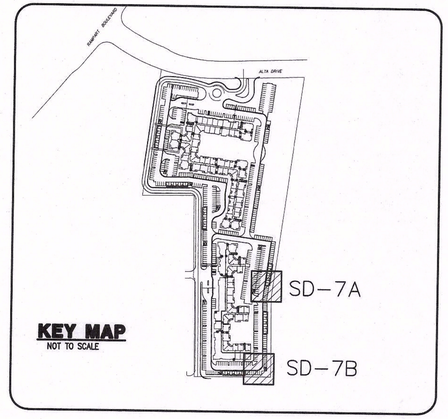


SD-7C PLAN VIEW

SCALE: 1"=30' HORIZONTAL

30' 0' 15' 30'

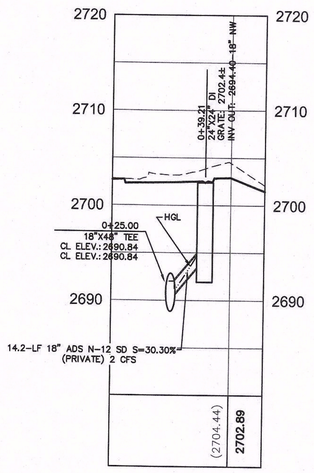
SCALE: 1" = 30'



KEY MAP
NOT TO SCALE

SD-7A PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



SD-7B PROFILE

SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL

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

NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

NOTE

ALL ONSITE STORM DRAINS AND ASSOCIATED STORM FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL ADS N–12 STORM DRAIN PIPE, SEE PLAN FOR SIZE.
2. INSTALL ADS INSERTA TEE, SEE PLAN FOR SIZE.
3. CONSTRUCT TYPE II SD MANHOLE PER USDCCA DWG NO. 405.2, SEE PLAN FOR SIZE.
4. CONSTRUCT JENSEN PRECAST SD DROP INLET WITH TRAFFIC FRAME AND GRATE PER DETAIL SHEET D–2, SEE PLAN FOR SIZE. USE EXTENSIONS AS NEEDED.
5. RETAIN AND PROTECT EXISTING STORM DRAIN STRUCTURE.
6. ADJUST TO NEW FINISH GRADE.
7. ABANDON EXISTING STORM DRAIN STRUCTURE.
8. INSTALL RINKER 2400 STC STORMCEPTOR PER DETAIL C SHT DT–2.
9. INSTALL TYPE 1 SDMH PER USDCCA DWG NO. 403.

NOTE: SEE SHEET C2, C3 & C4 FOR ABBREVIATIONS AND QUANTITIES

BENCHMARK

STATION		ELEVATION	DESCRIPTION
OLVOO 32C4	SITE	820.819 (M) 2692.97 (FT.)	BEING A RIVET & PLATE TOP CURB SE CORNER OF RAMPART AND ALTA.

CITY OF LAS VEGAS VERTICAL CONTROL (DATE RE–OBSERVED 2005–2007) BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

ADD 2600 TO ALL SPOT ELEVATION TAGS.

BASIS OF BEARINGS

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF RAMPART BOULEVARD AS SHOWN IN FILE 117, PAGE 83 OF PARCEL MAPS ON FILE AT CLARK COUNTY, NEVADA RECORDER'S OFFICE.

H# –

CLV DWG# –

STATE OF NEVADA
PROFESSIONAL ENGINEER
TODD N. KELLEY
Exp. 6/30/2019
No. 14711
DATE: 5-23-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:52:08

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

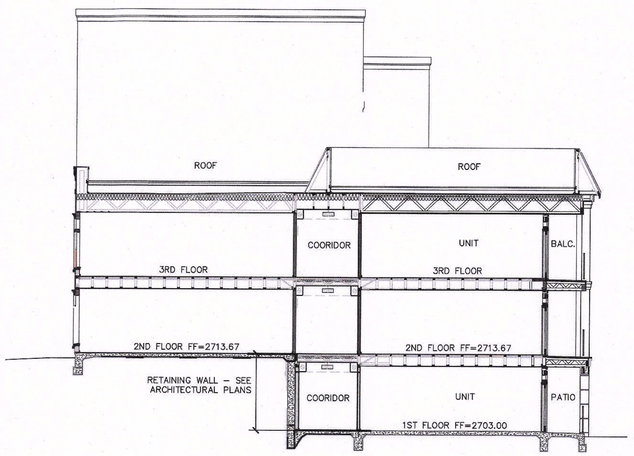
F:\Projects\800\894-002\DWG\Production\8942c023.dwg
Todd Kelley

THE CALIDA GROUP

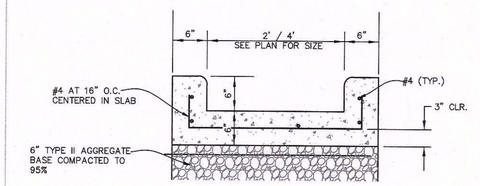
ELYSIAN AT RENAISSANCE

STORM DRAIN PLAN AND PROFILE 7

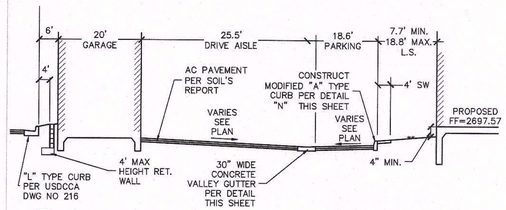
DRAWING
SD-7
23 OF 35 SHTS



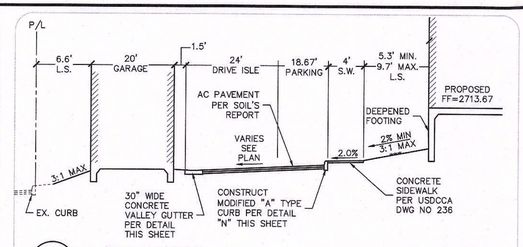
R – BUILDING SECTION
NOT TO SCALE



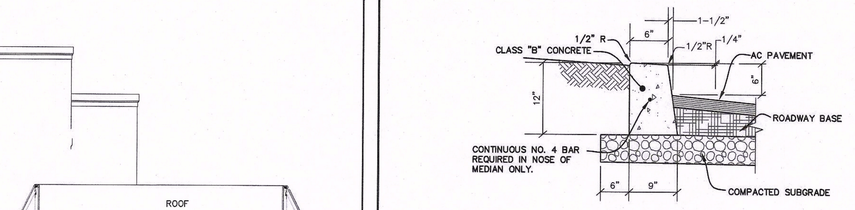
O – 2' OR 4' CONCRETE U-CHANNEL
NOT TO SCALE



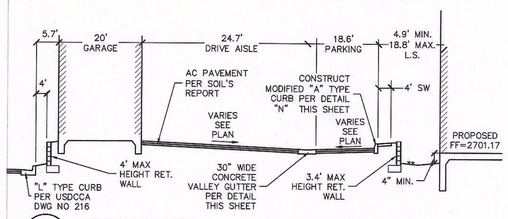
J – TYPICAL SECTION
NOT TO SCALE



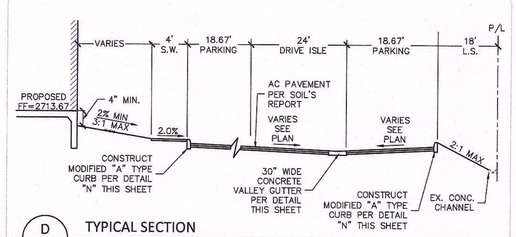
E – TYPICAL SECTION
NOT TO SCALE



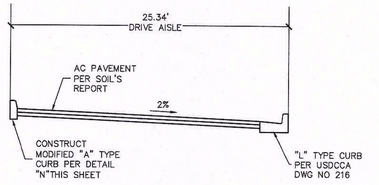
N – MODIFIED "A" CURB DETAIL
NOT TO SCALE



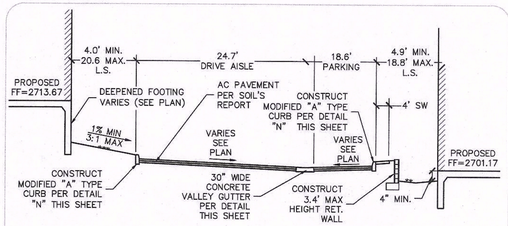
I – TYPICAL SECTION
NOT TO SCALE



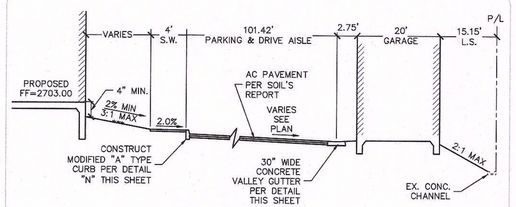
D – TYPICAL SECTION
NOT TO SCALE



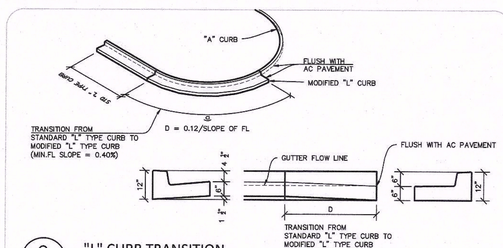
M – TYPICAL SECTION
NOT TO SCALE



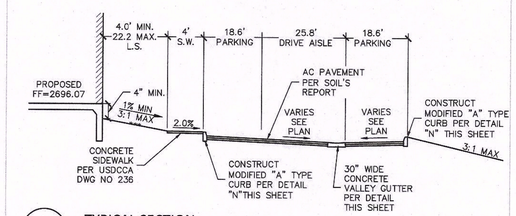
H – TYPICAL SECTION
NOT TO SCALE



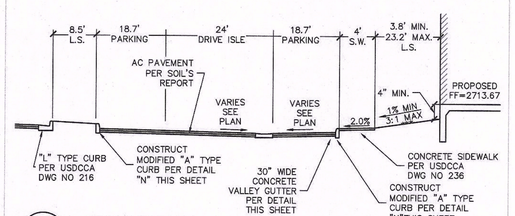
C – TYPICAL SECTION
NOT TO SCALE



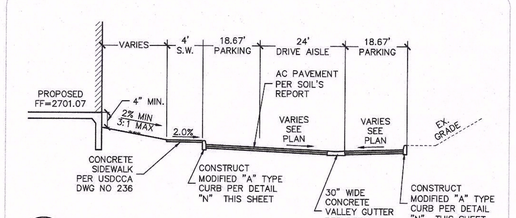
Q – "L" CURB TRANSITION
NOT TO SCALE



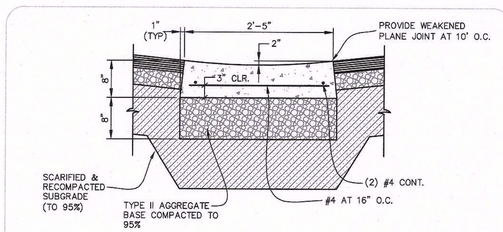
L – TYPICAL SECTION
NOT TO SCALE



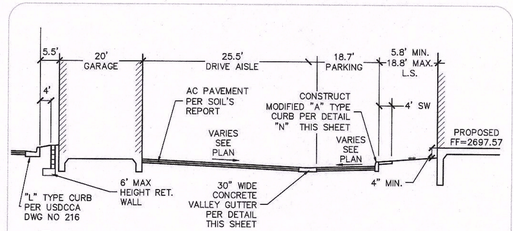
G – TYPICAL SECTION
NOT TO SCALE



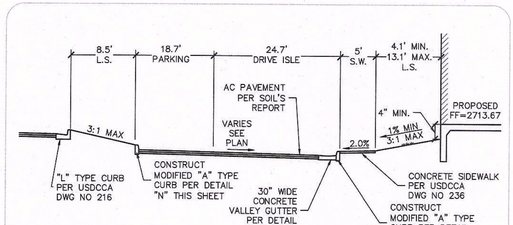
B – TYPICAL SECTION
NOT TO SCALE



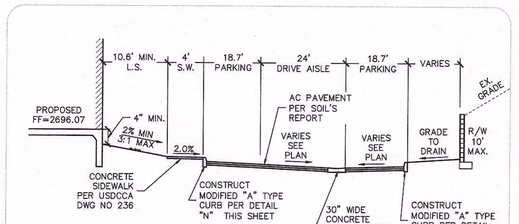
P – TYPICAL SECTION
NOT TO SCALE



K – TYPICAL SECTION
NOT TO SCALE



F – TYPICAL SECTION
NOT TO SCALE



A – TYPICAL SECTION
NOT TO SCALE

H# –

CLV DWG# –

NOT FOR CONSTRUCTION

DATE: 5-23-2018

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCV APP

PROJECT NO. 894-002

DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:55:35

GCV
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcvengineering.com

F:\Projects\800\894-002\DWG\Production\8942d030.dwg
Todd Kelley

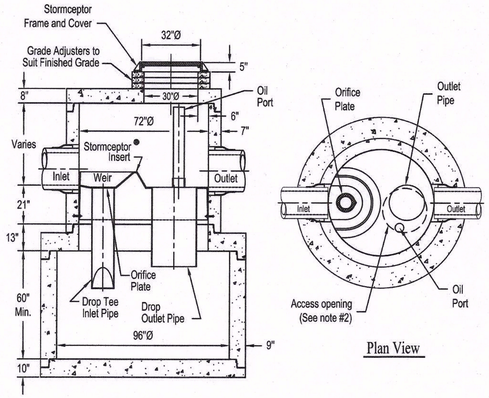
THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

SECTIONS AND DETAILS I

DRAWING
DT-1
30 OF 35 SHTS

STC 2400 Precast Concrete Stormceptor®
(2400 U.S. Gallon Capacity)



Section Thru Chamber

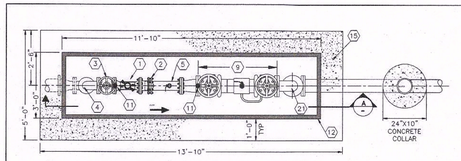
Plan View

Notes:

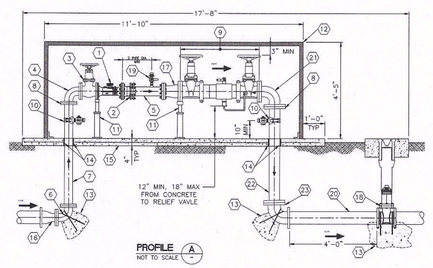
1. The Use Of Flexible Connection is Recommended at The Inlet and Outlet Where Applicable.
2. The Cover Should be Positioned Over The Outlet Drop Pipe and The Oil Port.
3. The Stormceptor System is protected by one or more of the following U.S. Patents: #5753115, #5849181, #6068765, #6371690, #7582216, #7666303.
4. Contact a Concrete Pipe Division representative for further details not listed on this drawing.

Rinker 031

C RINKER STC 2400
NTS



PLAN VIEW OF 4" METER ASSEMBLY WITH 6" RPPA
NOT TO SCALE



PROFILE
NOT TO SCALE

MATERIAL LIST

1. 4" WATER METER (OCTAVE-ULTRASONIC)
2. 4" RPCA RESTRAINED FLANGED COUPLING ADAPTER
3. 4" FLG X FLG NRS GATE VALVE
4. 4" FLG X FLG 90° BEND
5. 4" FLG X PE DIP SPOOL WITH 2" TEST PORT
6. 4" FLG X MJ OR FLG X FLG 90° BEND
7. 4" FLG x PE DIP SPOOL (CUT AS REQUIRED)
8. ADAPTER FLANGE (RESTRAINED)
9. APPROVED IN LINE 6" REDUCED PRESSURE PRINCIPLE ASSEMBLY RPPA (WITH NRS VALVES)
10. 2" SERVICE SADDLE AND 2" N.P.T. CORP STOP W/ BRASS CAP (BYPASS TO BE INSTALLED 45° OFFSET FROM FLOW)
11. ADJUSTABLE PIPE SUPPORT
12. INSULATED ENCLOSURE
13. CONCRETE THRUST/ANCHOR BLOCK
14. 1/2" EXPANSION JOINT MATERIAL
15. CONCRETE PAD (4" THICK) WITH WELDED WIRE FABRIC, 4 x 4 - W1.4 x W1.4
16. 6" X 4" REDUCER FLANGED TO 90° BEND (FOR 3" OR 4" METER INSTALLATION ONLY)
17. 6" X 4" FLG REDUCER
18. PO X PO GATE VALVE TO MATCH PIPE SIZE
19. 2" BALL VALVE WITH 2.5"x2" ADAPTER AND BRASS CAP
20. 6" PE X PE PIPE SPOOL
21. 6" FLG X FLG 90° BEND
22. 6" FLG x PE DIP SPOOL (CUT AS REQUIRED)
23. 6" FLG X MJ OR FLG X FLG 90° BEND

DIMENSION NOTES:

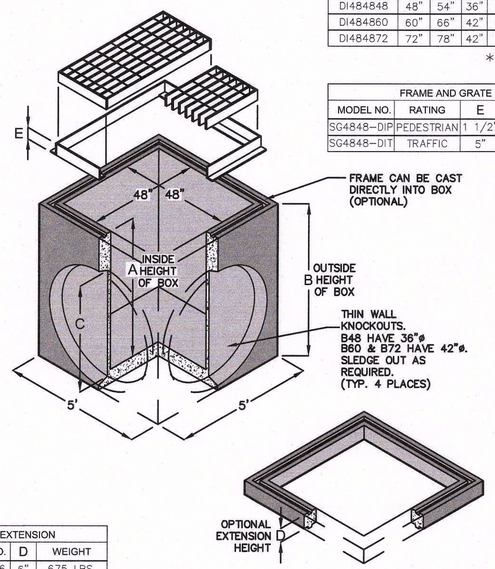
1. FOR 6" METER INSTALLATION, ALL PIPE SIZE AS SHOWN WILL INCREASE TO 6", WITH 8" PIPE AFTER AN 8" RPPA INSTALLATION
2. 8" X 6" REDUCER IS REQUIRED BETWEEN THE RFCA RESTRAINED FLANGED COUPLING ADAPTER AND THE RPPA FOR THE INSTALLATION OF AN 8" RPPA
3. ENCLOSURE SIZE FOR A 6" METER WITH A 6" RPPA (L x W x H) IS: 12FT X 3FT X 4.5FT (FOR ASSEMBLIES WITH NRS GATE VALVES)
4. ENCLOSURE SIZE FOR A 6" METER WITH AN 8" RPPA (L x W x H) IS: 14.5FT X 3.5FT X 5.5FT (FOR ASSEMBLIES WITH NRS GATE VALVES)
5. IF USING WATTS 909 SERIES PRRA, DIMENSIONS ARE: (L + 2FT) X (W+1FT) X H

B ULTRA SONIC METER WITH RPPA ASSEMBLY
NTS

DROP INLET				
MODEL NO.	A	B	C	*WEIGHT
DI484848	48"	54"	36"	4995 LBS.
DI484860	60"	66"	42"	6433 LBS.
DI484872	72"	78"	42"	7872 LBS.

*BOX ONLY

FRAME AND GRATE			
MODEL NO.	RATING	E	WEIGHT
SG4848-DIP	PEDESTRIAN	1 1/2"	242 LBS.
SG4848-DIT	TRAFFIC	5"	1000 LBS.



EXTENSION		
MODEL NO.	D	WEIGHT
RS484806	6"	675 LBS.
RS484812	12"	1350 LBS.

- FRAME AND GRATE ASSEMBLY AVALIABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- FRAME AND SOLID COVER ASSEMBLY AVALIABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- DESIGN FOR H-20-44 BRIDGE LOADING.
- ASSEMBLY TO BE PLACED ON A 6" BASE OF CRUSHER RUN FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.
- ILLUSTRATION IS TYPICAL ONLY OF GENERAL SERIES CONFIGURATION. FOR SPECIFIC CONFIGURATION, CALL JENSEN PRECAST.

48" X 48" DRAIN INLET

(REV) DWG DATE	(REV) DWG DATE
11-28-00	

JENSEN PRECAST

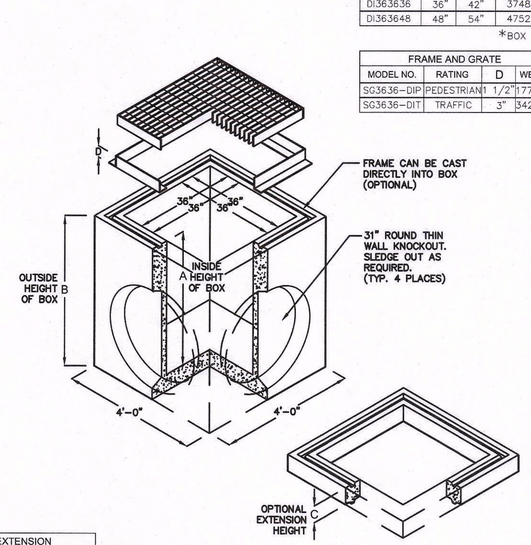
DI4848

8.07

DROP INLET			
MODEL NO.	A	B	*WEIGHT
DI363636	36"	42"	3748 LBS.
DI363648	48"	54"	4752 LBS.

*BOX ONLY

FRAME AND GRATE			
MODEL NO.	RATING	D	WEIGHT
SG3636-DIP	PEDESTRIAN	1 1/2"	177 LBS.
SG3636-DIT	TRAFFIC	3"	342 LBS.



EXTENSION		
MODEL NO.	C	WEIGHT
RS363606	6"	525 LBS.
RS363612	12"	1050 LBS.

- FRAME AND GRATE ASSEMBLY AVALIABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- FRAME AND SOLID COVER ASSEMBLY AVALIABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- DESIGN FOR H-20-44 BRIDGE LOADING.
- ASSEMBLY TO BE PLACED ON A 6" BASE OF CRUSHER RUN FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.
- ILLUSTRATION IS TYPICAL ONLY OF GENERAL SERIES CONFIGURATION. FOR SPECIFIC CONFIGURATION, CALL JENSEN PRECAST.

36" X 36" DRAIN INLET

(REV) DWG DATE	(REV) DWG DATE
11-28-00	

JENSEN PRECAST

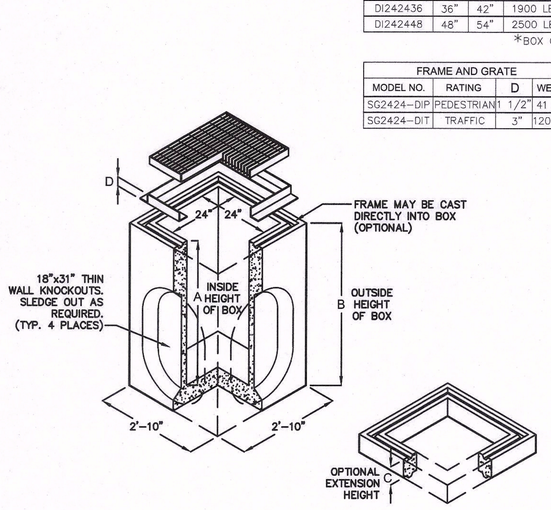
DI3636

8.05

DROP INLET			
MODEL NO.	A	B	*WEIGHT
DI242436	36"	42"	1900 LBS.
DI242448	48"	54"	2500 LBS.

*BOX ONLY

FRAME AND GRATE			
MODEL NO.	RATING	D	WEIGHT
SG2424-DIP	PEDESTRIAN	1 1/2"	41 LBS.
SG2424-DIT	TRAFFIC	3"	120 LBS.



EXTENSION		
MODEL NO.	C	WEIGHT
RS242406	6"	300 LBS.
RS242412	12"	600 LBS.

- FRAME AND GRATE ASSEMBLY AVALIABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- FRAME AND SOLID COVER ASSEMBLY AVALIABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- DESIGN FOR H-20-44 BRIDGE LOADING.
- ASSEMBLY TO BE PLACED ON A 6" BASE OF CRUSHER RUN FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.
- ILLUSTRATION IS TYPICAL ONLY OF GENERAL SERIES CONFIGURATION. FOR SPECIFIC CONFIGURATION, CALL JENSEN PRECAST.

24" X 24" DRAIN INLET

(REV) DWG DATE	(REV) DWG DATE
11-28-00	

JENSEN PRECAST

DI2424

8.01

A JENSEN PRECAST DRAIN INLET
NTS

H# –

CLV DWG# –

STATE OF NEVADA — PROFESSIONAL ENGINEER — TODD N. KELLEY — No. 14711 — CIVIL — DATE: 5-22-2018

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE

PROJECT NO. 894-002
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 05-23-18
PLOT TIME: 08:55:37

GCW
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gowengineering.com
ENGINEERS \ SURVEYORS

F:\Projects\800\894-002\DWG\Production\8642c030.dwg
Todd Kelley

THE CALIDA GROUP

ELYSIAN AT RENAISSANCE

SECTIONS AND DETAILS 2

DRAWING
DT-2
31 OF 35 SHTS